Playa Lakes in the Southern High Plains: Runoff, Infiltration, and Recharge

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Andrew Weinberg, P.G.
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Cover photo courtesy of Andrew Weinberg.
"Durrett playa, Armstrong County, November 2013"

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Executive summary

The Texas Water Development Board (TWDB) playa research program examined the feasibility of using surface water collected in ephemeral lakes on the Texas High Plains, known as playas, as a source of managed recharge for the Ogallala Aquifer. The Texas Legislature, in its 80th session, appropriated funding for the project in 2009. Field work took place from 2011 to 2017. A parallel playa research program, funded through the U.S. Department of Agriculture and conducted by the Agricultural Research Service and Texas Tech University, lasted from 2006 through 2015.

The TWDB project was conceived as a two-phase effort. Phase 1 of the project estimated the volume of water available in playas and evaluated current infiltration rates and processes at selected sites. Phase 2 was to implement recharge modifications at a subset of Phase 1 sites but was never funded.

Background

Playas are shallow, internally drained, ephemeral wetlands characteristic of the Southern High Plains landscape, most of which does not drain to any stream or river system. There are nearly 20,000 mapped playas on the Texas High Plains. Playas average 20 acres in area, ranging from less than one acre to several hundred acres, and are roughly circular in shape. Playas provide essential habitat for migratory birds and endemic wetland plant and animal communities.

Previous studies found that playas collect several million acre-feet of water per year, a substantial fraction of the four to six million acre-feet of groundwater per year that is pumped from the Ogallala Aquifer to support irrigated agricultural on the Southern High Plains. These studies suggest that playas represent a significant, under-utilized resource in a water-limited agricultural economy.

Playas are generally accepted to be a source of recharge to the Ogallala Aquifer, but there are few direct measurements of infiltration and recharge from playas that could be used as the basis for assessing recharge modifications. Numerous studies have found evidence for recharge beneath playas. But these studies do not provide quantitative estimates of recharge at individual playas needed for an engineering analysis of recharge modifications.

Understanding infiltration mechanisms is also important for designing recharge modifications. Several studies have documented macro-pore infiltration from playa lakes but limited subsurface data has been available to quantify its importance. Playa-bottom soils develop a network of deep desiccation cracks as they dry up. These cracks allow rapid infiltration into dry playas. Once wetted, the cracks close and the playa-bottom permeability drops. In contrast, the soil around the playa margins typically has higher infiltration rates. The balance between macro-pore and playa-edge infiltration may affect location selection for any recharge modifications.

Study design

Phase 1 of the TWDB study addresses three basic questions about playas:

1. How much water do playas collect overall?
2. How much infiltration do playas produce and how does it vary across the region?
3. What processes control recharge from playas, and can we effectively modify them?

The field study focuses on a 12,000-square-mile area, extending from near Plainview to northeast of Amarillo, covered by one Landsat image tile (Row 30, Path 36). We selected the study area because of its abundance of playas and potential for recharge. This area contains approximately one-half of all Texas playas and has the highest density of playas of any part of the Southern High Plains. The study area also lies along the eastern margin of the Southern High Plains where precipitation is generally higher than to the west, promoting more frequent playa flood events. We collected field data on a total of 83 playas, 76 of which are within the study area.

Key findings

Much less water is captured by playas than suggested by previous studies. Between 1996 and 2017, playas captured a total annual average water volume of 221,000 acre-feet. The maximum volume collected in any single time (July 2015) was under 800,000 acre-feet, even though 2015 was the wettest year on record for many locations in the Southern High Plains. The 221,000-acre-foot average volume represents approximately 10 percent of previous 'conservative' estimates by the Bureau of Land Management.

Measurable infiltration occurred at all studied playas. Average infiltration rates ranged from less than 0.04 to over 0.8 inches per day for the instrumented playas. The daily infiltration rates at any single playa varied as a function of flood depth, following the general principles of flow through porous media. Infiltration varies as a function of soil texture and soil type across the study area.

Most infiltration occurs as flow through the porous matrix of the soil rather than through macropores and cracks. Macro-pore infiltration is important only for a short period when runoff enters a previously dry playa. Macro-pores typically do not extend through the entire depth of the clay-rich layer on the playa bottoms, and macro-pore flow is almost entirely taken up by re-wetting of the dry near-surface soils. As a result, macro-pores contribute little, if any to deeper percolation and recharge.

Recharge systems could potentially capture much of the water currently lost to evaporation, though the cost of constructing and maintaining recharge systems is high relative to volume available. Projects using recharge from large, deep playas to supplement small public water supply systems may be economically viable. Upland recharge basins taking advantage of higher inter-basin percolation rates and free or low-cost night-time electricity may be more feasible than direct modification of playa basins themselves.

1.0 Background

The Texas Legislature, in its 80th session, appropriated funding for the Texas Water Development Board (TWDB) to conduct research on playa lakes in the Texas High Plains, with the goal of increasing recharge to Ogallala Aquifer. This work builds on previous research projects conducted by the TWDB, which characterized Texas playa lakes and investigated processes controlling recharge to the Ogallala Aquifer; work by the U.S. Department of Agriculture's Agricultural Research Service (USDA-ARS) and Texas Tech University to quantify the water balance in playas; and a 2009 synthesis report by Gurdak and Roe on the role of playa lakes in recharge to the Ogallala Aquifer. Findings from these works are summarized below.

Playas are shallow, internally drained, ephemeral wetlands characteristic of the Southern High Plains landscape, most of which does not drain to any stream or river system. There are nearly 20,000 mapped playas on the Texas High Plains. Playas average 20 acres in area, ranging from less than one acre to several hundred acres, and are roughly circular in shape. Playas provide essential habitat for migratory birds and endemic wetland plant and animal communities.

Previous estimates suggested that the volume of water in playas represented a significant fraction of the 4 to 6 million acre-feet of groundwater used for irrigation annually on the Southern High Plains. Water collected in playa lakes is of obvious interest to agricultural producers on the High Plains, an area without perennial surface water resources. Exactly how much water might be captured and potentially available from playas has been difficult to determine because of the large number of playa lakes and the relatively infrequent, highly variable nature of flood events. Hauser (1966) cites estimates of 1.8 to 5.7 million acre-feet of water per year available in playas. Cronin and Meyers (1964) present data from surveys of 50 playas in a four-county area in 1957 and 1958 that suggest volumes of 600,000 to 3.2 million acre-feet per year if projected to all playas in the Southern High Plains. Havens (1966) estimated that over 100,000 acre-feet per year were available in northern Lea County, New Mexico alone. The U.S. Bureau of Reclamation (1982) derived a 'consensus' annual water volume estimate of 2 to 3 million acre-feet. And an analysis of Landsat imagery suggested that only 5.5 percent of the playas were dry more than 25 percent of time, with almost 60 percent holding water at least 75 percent of the time (Howard, Wells, Prosperie, Petrossian, Li, and Thapa, 2003). All these studies suggested that playas represented a significant, underutilized resource in a water-limited agricultural economy.

The role of playa lakes in groundwater recharge has likewise been examined by numerous researchers. There is a consensus that playas represent recharge features, but questions remain concerning how recharge is distributed geographically and whether the recharge reaches the aquifer rapidly along macro-pores and preferential flow paths or more slowly through interstitial porosity in the soil matrix. White, Broadhurst, and Lang (1946) describe the subsurface geology beneath playas, finding that caliche is typically thin or absent beneath playas, which they ascribe to solution channeling. They also note that most playas have an annular zone of sandy material around the edge of the basin that facilitates recharge, and present hydrographs for several wells near playas, indicating recharge at the water table 20 to 40 feet below ground surface within weeks to months of playa flooding. Lotspeich, Lehman, Hauser, and Stewart (1971) examined the regional geology and hydrogeology of playas and presented a detailed characterization of one playa at the U.S. Department of Agriculture Bushland Research Center. Wood and Osterkamp (1984a) found chemical and isotopic evidence for playa recharge associated with carbonate dissolution and macro-pore flow. Nativ (1988) used stable isotope and tritium data to conclude that playas provide focused recharge to the aquifer with minimal evaporation. Wood and Sanford (1995) used chloride and tritium data to quantify recharge to the Ogallala Aquifer, proposing a conceptual model of macro-pore dominated flow from playas coupled with a low-volume, high solute recharge from inter-playa areas. Scanlon, Goldsmith, and Mullican (1997) examined the variability of unsaturated flow in playa and inter-playa settings, finding focused recharge along preferential flow paths beneath playas and negligible unsaturated zone flow in inter-playa areas. Wood, Rainwater, and Thompson (1997) used chemical and isotopic tracers to examine the role of macro-pore recharge in two playas near the Pantex facility, northeast of Amarillo, finding that between 60 and 80 percent of infiltration occurs through macro-pores.

Gurdak and Roe (2009) reviewed the existing literature on playas and groundwater recharge and provided a useful summary of open questions, including the subsurface rate of water movement and the fate of agro-chemicals potentially contained in the flood water. They stress the need for more data from the unsaturated zone and groundwater aquifers in addition to water balance and surface infiltration studies.

1.1 Purpose

This project addresses three major issues. First, we ask how much water is captured in the playa lakes and potentially contributes for recharge. Second, we examine infiltration rates at a sample population of playa lakes, using water balance measurements to estimate infiltration rates at each playa and evaluating the geographic distribution of recharge. Finally, we investigate how infiltration moves through the unsaturated zone to the underlying aquifer in terms of the flow rate, the balance of macro-pore and interstitial flow, and the importance of different soil zones within the playa basin. Understanding how much water is captured by playas, how much of that water contributes to infiltration and recharge, and what processes control its movement through the unsaturated zone will help to evaluate the potential effectiveness of landowner-implemented playa modifications or land management changes for increasing the fraction of playa flood water that contributes to recharge.

1.2 Study area description

The study area generally consists of the Texas portion of the Southern High Plains. The Southern High Plains are defined by the erosional limits of the Ogallala Aquifer, known as the caprock escarpments, to the east and west, the Canadian River on the north, and the gradational boundary with the Edwards Plateau on the south. The study area is generally flat and has poorly developed surface drainage. Land use is divided approximately evenly between irrigated agriculture, dryland agriculture, and ranching.

Playas are internally-drained wetlands that capture about 90 percent of the surface runoff across the Southern High Plains (U.S. Bureau of Reclamation, 1982). The playa wetlands are characterized by surface flooding for at least seven days during the typical growing season, wetlands vegetation, and hydric soils (NRCS, 2017a). Some rapidly draining playas, especially in the southwestern portion of the Southern High Plains, are not characterized as wetlands. Mulligan, Barbato, and Seshadri (2014) compiled a database of 64,726 wetland features in the

High Plains region of Texas, New Mexico, and Oklahoma, including data on wetland location, size, depth, soil type, and surrounding land use. The database catalogs 20,702 playas in Texas, averaging 18.76 acres in area, and covering a combined area of 388,398 acres. Playas cover 1.7 percent of the 23.2-million-acre extent of the Ogallala Aquifer in Texas.

The Pliocene Ogallala Formation was deposited as fluvial outwash from the Rocky Mountain uplift on a Cretaceous, Tertiary, and Permian erosional surface, with increasing eolian silt and clay deposits in the upper portion of the formation. The Ogallala Formation is up to 500 feet thick in some areas of the Southern High Plains, where deposition occurred in paleo-valleys (Cronin and Meyers, 1963). The Blackwater Draw Formation overlies the Ogallala Formation in most of the study area, consisting of up to 80 feet of eolian loess and caliche (Nativ, 1988). The Blackwater Draw sediment was derived from the Pecos River valley and transported by prevailing southwesterly winds, resulting in a gradient of increasingly fine sediments to the northeast across the study area (Gustavson, 1996; Gustavson and Holliday, 1999).

A thick, indurated caliche horizon known as the caprock caliche occurs at the top of the Ogallala Formation. The caprock caliche is understood to have formed through authigenic processes as carbonates were leached from overlying soil horizons and precipitated to form the caprock. Thick sections of the caprock can function as a barrier to recharge because of their low permeability, but several studies have shown that the caliche is locally dissolved or fragmented by percolating water beneath playa lakes (White, Broadhurst, and Lang, 1946; Wood and Osterkamp, 1984 a and b; Allison, Stone, and Hughes, 1985). Gustavson and Holliday (1999) also recognize that caliche is locally absent beneath many playas but propose that a lack of caliche development in wetland areas is responsible, rather than the dissolution of previously formed pedogenic carbonates.

Soils developed on the Blackwater Draw vary from sandy loams in the southwestern part of the study area to clayey loams in the northern and northeastern parts of the study area (Figure 1-1). Soil types are classified as fine sandy loam and fine loamy sand in the southwest (Patricia and Amarillo soil series) to Pullman clay loam in the north. Mean clay content generally decreases from about 36 percent in the northern part of the Southern High Plains to about 23 percent in the southern part (Scanlon, Reedy, and Tachovsky, 2007). All the major soils series in the area consist of very deep soils that formed in clayey eolian deposits from the Blackwater Draw Formation of Pleistocene age. The soils are on nearly level to very gently sloping plains or playa slopes. Extensive caliche and carbonate concretions are common in the lower soil horizons.

Soils in the playa bottoms are classified as Randall clay across most of the study area, except in southwestern portions of the study area where playa bottoms are classified as Ranco and Sparenberg soils. All these soil series consist of very deep, poorly drained, very slowly permeable soils that formed in clayey lacustrine sediments derived from the Blackwater Draw Formation (NRCS, 2017b). The playa bottom soils are classified as Vertisols. The shrink-swell behavior of Vertisols and its effect on the soil hydraulic properties has been extensively studied in Texas (Amidu and Dunbar, 2007; Arnold, Potter, King and Allen, 2005; Kishne, Morgan, and Miller, 2009; Nordt and Driese, 2009), but most work has focused on the Coastal Prairie region, rather than the High Plains, where Vertisols in playas constitute only two to three percent of the land area.

The Ogallala Aquifer is the sole source of water for irrigation in the region. Extensive development of irrigated agriculture, starting in the 1950s, has depleted the groundwater volume in the aquifer, with water level declines exceeding 150 feet in parts of the Southern High Plains (Deeds and others, 2015). The 2008 saturated thickness of the Ogallala Aquifer beneath much of the Southern High Plains was less than 50 feet (Center for Geospatial Technology, 2016). Depth to water varies from less than 10 feet in parts of Lynn County to over 400 feet in parts of Carson and Gray Counties.

During the period of project field activities, the climate varied between extreme drought and flood conditions. The Texas High Plains climate is classified as continental steppe. It is semi-arid and characterized by large variations in daily temperatures, low relative humidity, and irregularly spaced rainfall of moderate amounts (Deeds and others, 2015). Average annual precipitation increases from west to east, with averages ranging from approximately 18 to 22 inches per year across the study area. Most rainfall occurs during the summer growing season and is typically associated with intense convective storms with high rainfall rates.

Average annual pan evaporation rates in the study area range from 64 to 68 inches per year (TWDB, 2017). Precipitation data for Lubbock and Amarillo covering the period of record addressed by this study are shown in Figure 1-2; monthly total precipitation and the monthly standardized precipitation index (SPI) calculated using the National Drought Mitigation Center SPI program are shown for each location (National Drought Mitigation Center, 2017). The SPI represents the normalized departure from mean monthly precipitation at a given location. The SPI values indicate the number of standard deviations above or below normal monthly total precipitation; for example, the normal monthly precipitation has an SPI of zero, while the probability of an SPI value of more than 1 or less than -1 is approximately 15%; values of more than 2 or less than -2 have a probability of 2.3 percent, and values of more than 3 or less than -3 have a probability of less than 0.14 percent. At the height of the 2011 drought, the 12-month Lubbock SPI of -3.78 represents a probability of only 0.008 percent, or one in 12,500, based on the Lubbock Airport rainfall data from 1946 to 2016. Three years later, in May 2015, the area received record rainfall, breaking the drought and causing extensive flooding.

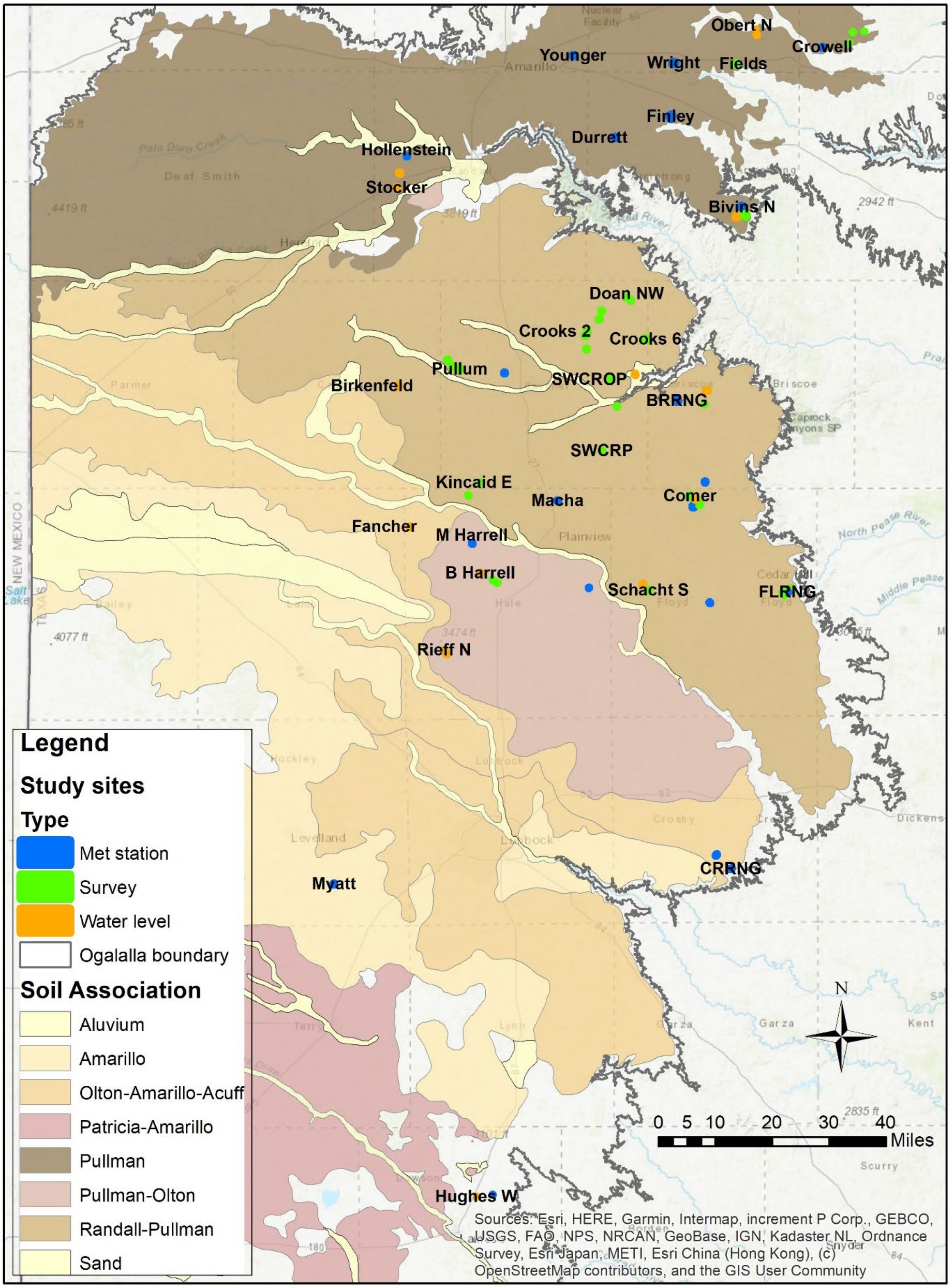
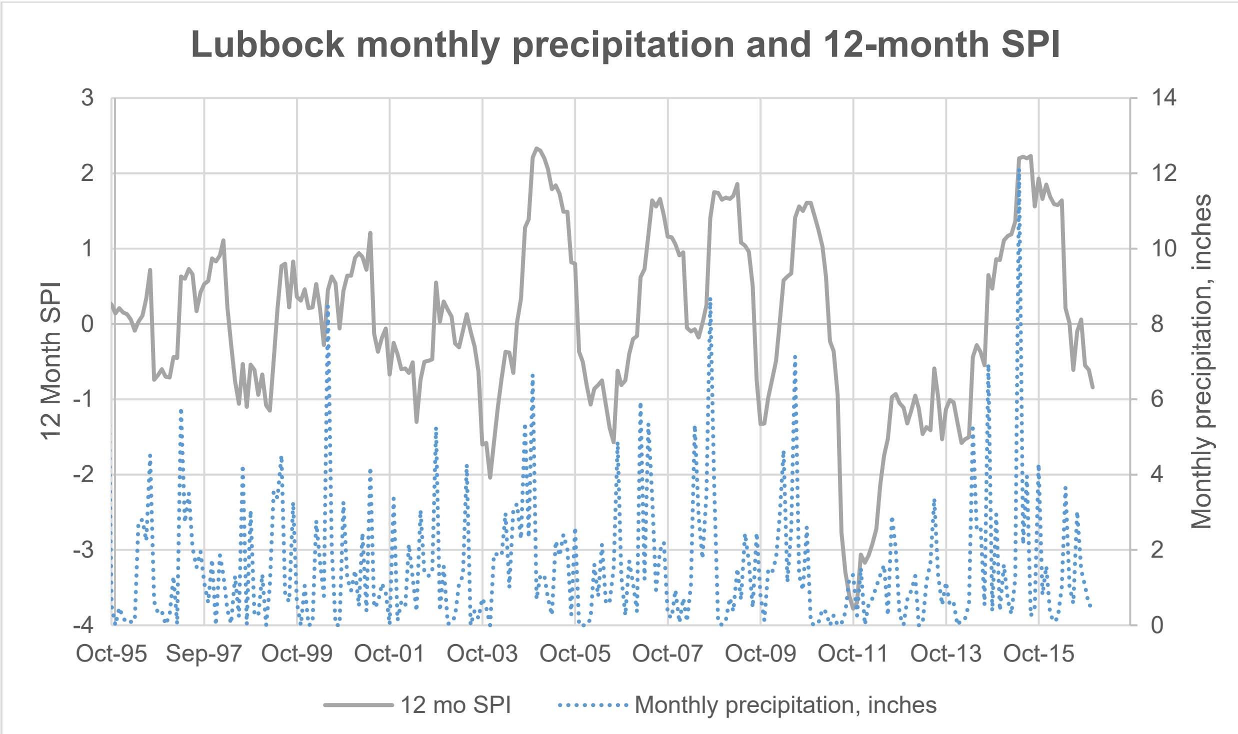


Figure 1-1. Generalized soil association map of the project area including locations of the playas that were studied (data from NRCS, 2017).



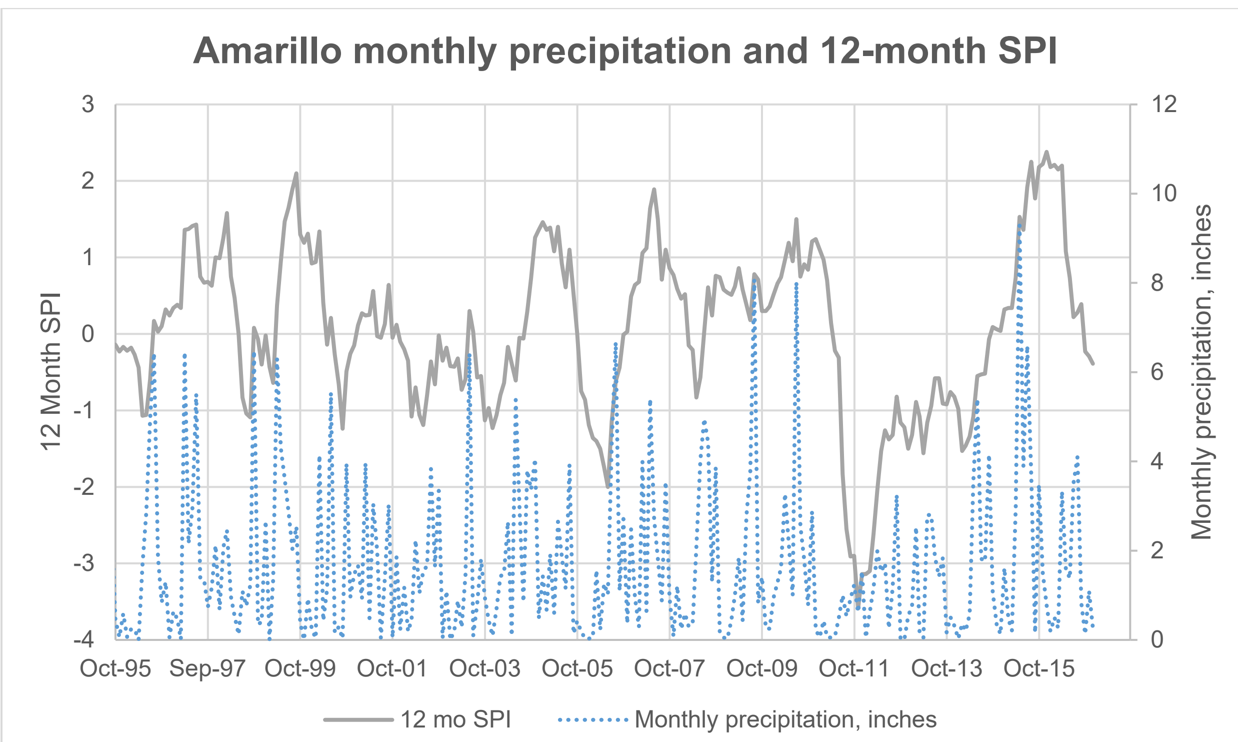


Figure 1-2. 12-month standardized precipitation index and monthly total precipitation for Lubbock and Amarillo, 1996 through 2016 (data from National Drought Mitigation Center, 2017).

2.0 Study design and methods

The TWDB playa research program started in November 2009. Field monitoring began in April 2011 and the last sites were decommissioned in April 2017. Instrumentation was modeled on the systems deployed by the USDA-ARS for a parallel playa study initiated in 2006 (NRCS, 2007; Ganesan and others, 2016). Overall, 83 playas and unclassified wetland areas were included in the study. We installed and operated weather stations and soil moisture sensors at 18 sites, recorded water levels at 39 sites, and completed topographic surveys at 76 sites in conjunction with analysis of 322 Landsat satellite images covering the period from January 1996 through February 2017. We also reanalyzed data from several USDA-ARS sites to augment the spatial coverage of the TWDB project.

A location map of the study sites (Figure 2-1) indicates the playas used for each phase of the study. Descriptive data for each of the studied playas from the Playas and Wetlands Database (Mulligan, Barbato, and Seshadri, 2014) and a comparison of the study sample and the overall population of Texas playas is included as Table 2-1.

2.1 Playa classification

The Playas and Wetlands Database lists 12 of the wetlands included in the study as unclassified wetlands, with the remainder listed as playas. The U.S. Fish and Wildlife Service Wetlands Mapper (USFWS, 2017) classifies 43 of the wetlands as lacustrine and 40 as palustrine, with additional modifiers for vegetation, shoreline conditions, duration of flooding, and status of excavations or farming within the wetland areas.

Playas in the study were not specifically selected based on land use in the watershed area but are generally representative of the land use patterns in the Southern High Plains, with a mix of sites in rangeland (42 percent), dry-land farm (25 percent), and irrigated farm (33 percent) settings. Many of the playas included in the study have been impacted by development to some extent. The Playa and Wetlands Database lists 43 of the 83 sites as ‘modified’ versus 40 sites that are unmodified (Mulligan, Barbato, and Seshadri, 2014). Modifications include excavation, diking, and farming within the wetland area. Modifications range in size from pits covering less than one percent of the playa area to farming and excavation covering 100 percent of the playa.

2.2 Watershed areas

We derived watershed areas for the study area playas from the National Elevation Dataset 10-meter digital elevation model using the ArcHydro tools in ArcMap 10.3. These watershed areas are approximate and do not reflect influences of roads, ditches, and culverts that may impact the drainage patterns around the playas. In several cases, the digital elevation model did not indicate any depression associated with the playa; in these cases, watershed areas were estimated by hand. The sample of playa lakes included in this study is biased towards larger features, with an average area of 36 acres for the sites evaluated using Landsat imagery and 52 acres for sites with meteorological stations, compared to 20 acres for the overall population of Texas playas. Larger playas were generally selected for this study because the volume of water potentially captured in larger, deeper features was expected to be greater and, therefore, more likely to justify investments in playa modification. However, several clusters of closely spaced large and small playas were included in the study to test the role of playa size on the volume of water captured.

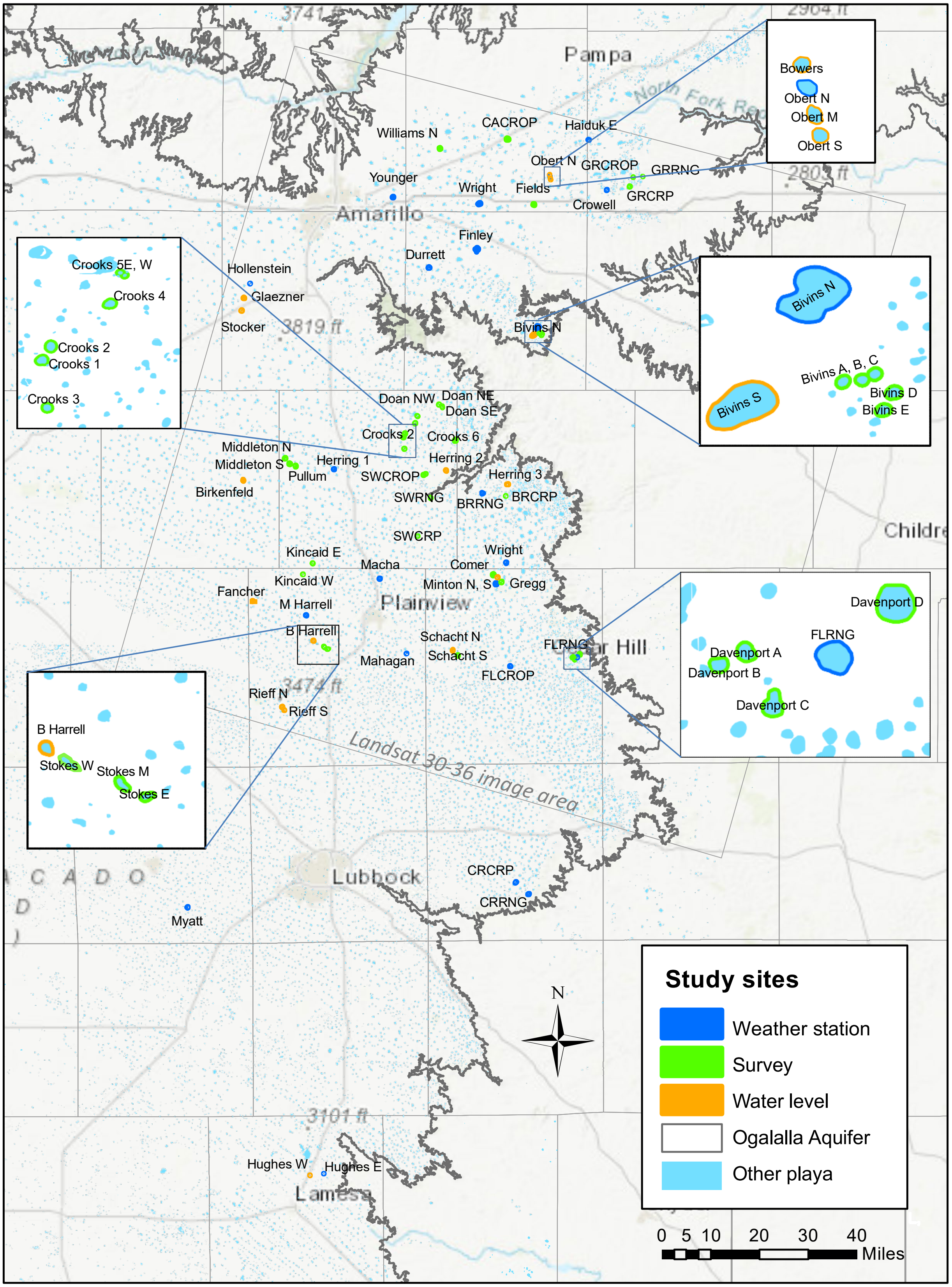


Figure 2-1. Location of playa lakes included in this study. Doerrie playa located outside the map area.

Table 2-1. Description of playas included in this study (USDA-ARS sites in italics).

Playa ID	Data types	Playa area, acres	Watershed area, acres	Land use	Latitude	Longitude
Bivins N	Met	157.2	4,329	Range	34.902	-101.232
BRRNG	Met	39.9	392	Range	34.497	-101.396
CRCROP[1]	Met	41.1	688	Dryland farm	33.540	-101.298
Crowell	Met	25.8	132	Irrigated farm	35.235	-101.028
CRRNG[1]	Met	39.3	519	Range	33.511	-101.260
CSCROP	Met	51.1	1,048	Irrigated farm	34.544	-102.231
CSRNG	Met	94.0	2,705	Range	34.666	-102.220
Durrett	Met	61.4	1,025	Dryland farm	35.047	-101.555
Finley	Met	180.6	2,865	Range	35.094	-101.415
FLCROP	Met	30.3	614	Irrigated farm	34.073	-101.314
FLRNG	Met	27.9	536	Range	34.095	-101.115
Haiduk[2]	Met	23.9	293	Dryland farm	35.356	-101.082
Herring 1	Met	33.3	504	Range	34.556	-101.836
Hollenstein	Met	17.6	231	Dryland farm	35.008	-102.084
Hughes E[1]	Met	9.0	242	Dryland farm	32.817	-101.866
M.Harrell	Met	30.6	685	Irrigated farm	34.198	-101.918
Macha	Met	32.2	980	Irrigated farm	34.287	-101.700
Mahagan	Met	15.3	427	Irrigated farm	34.104	-101.621
Minton S	Met	67.6	797	Dryland farm	34.276	-101.356
Moore	Met	39.9	465	Dryland farm	34.327	-101.326
Myatt[1]	Met	35.8	961	Irrigated farm	33.479	-102.270
Obert N	Met	12.2	53	Irrigated farm	35.268	-101.197
Wright	Met	111.7	2,956	Range	35.202	-101.405
Younger	Met	47.8	744	Dryland farm	35.218	-101.661
B Harrell	WL	32.1	197	Irrigated farm	34.135	-101.897
B Harrell S	WL	25.7	876	Irrigated farm	34.131	-101.889
Birkenfeld	WL	30.4	729	Dryland farm	34.528	-102.105
Bivins S	WL	135.2	2,320	Range	34.883	-101.245
Bowers	WL	10.4	101	Range	35.268	-101.197
Doerrie[1]	WL	193.3	NA	Dryland farm	36.497	-100.586
Fancher	WL	31.8	723	Irrigated farm	34.231	-102.075
Fields	WL	70.8	976	Irrigated farm	35.200	-101.244
Glaezner	WL	49.6	1,761	Dryland farm	34.973	-102.103
Herring 2	WL	37.8	451	Range	34.553	-101.504
Herring 3	WL	25.9	467	Range	34.519	-101.318
Herring 3a	WL	11.6	180	Range	34.518	-101.323
Hughes W[1]	WL	11.1	495	Irrigated farm	32.813	-101.907
Minton N	WL	36.1	404	Dryland farm	34.291	-101.351
Obert M	WL	10.9	508	Irrigated farm	35.263	-101.195
Obert S	WL	9.5	176	Irrigated farm	35.260	-101.194
Rieff N	WL	32.2	807	Irrigated farm	33.965	-101.983
Rieff S	WL	17.3	341	Irrigated farm	33.973	-101.989
Schacht N	WL	34.0	830	Irrigated farm	34.113	-101.486
Stocker[2]	WL	50.6	1202	Dryland farm	34.943	-102.109
Bivins A	Survey	5.1	27.7	Range	34.887	-101.229
Bivins B	Survey	4.4	26.9	Range	34.887	-101.225
Bivins C	Survey	4.9	37	Range	34.888	-101.223
Bivins D	Survey	6.9	52.7	Range	34.885	-101.220
Bivins E	Survey	5.8	54.7	Range	34.882	-101.222
BRCRP	Survey	14.6	163	Range	34.490	-101.328
Comer	Survey	68.3	637	Irrigated farm	34.298	-101.363
Crooks 1	Survey	42.9	441	Range	34.633	-101.630
Crooks 2	Survey	43.8	962	Range	34.642	-101.626
Crooks 3	Survey	25.0	453	Range	34.629	-101.624
Crooks 4	Survey	40.4	770	Dryland farm	34.685	-101.588

Playa ID	Data types	Playa area, acres	Watershed area, acres	Land use	Latitude	Longitude
Crooks 5	Survey	7.0	21	Dryland farm	34.686	-101.590
Crooks 5W	Survey	9.3	173	Dryland farm	34.667	-101.596
Crooks 6	Survey	80.9	1,956	Range	34.626	-101.477
CSCRP	Survey	37.7	1,113	Range	34.575	-102.220
Davenport A	Survey	7.0	152	Range	34.096	-101.127
Davenport B	Survey	5.4	73	Range	34.094	-101.131
Davenport C	Survey	10.6	539	Range	34.089	-101.124
Davenport D	Survey	37.7	1,077	Range	34.102	-101.108
Doan NE	Survey	16.2	198	Range	34.710	-101.516
Doan NW	Survey	31.1	480	Range	34.713	-101.526
Doan SE	Survey	5.9	336	Range	34.706	-101.515
Fields	Survey	70.8	976	Irrigated farm	35.200	-101.244
GRCROP	Survey	11.2	131	Irrigated farm	35.267	-100.950
GRCRP	Survey	24.1	121	Range	35.243	-100.960
Gregg	Survey	43.3	573	Range	34.280	-101.339
GRRNG	Survey	6.3	22	Range	35.268	-100.922
Kinkaid E	Survey	27.2	539	Irrigated farm	34.325	-101.899
Kinkaid W	Survey	19.7	569	Irrigated farm	34.299	-101.928
Middleton N	Survey	48.6	404	Dryland farm	34.582	-101.980
Middleton S	Survey	60.0	795	Dryland farm	34.568	-101.967
Pullum	Survey	52.2	1,182	Dryland farm	34.562	-101.949
Schacht S	Survey	35.6	474	Irrigated farm	34.099	-101.468
Stokes E	Survey	12.9	377	Dryland farm	34.115	-101.855
Stokes M	Survey	25.8	1,268	Irrigated farm	34.121	-101.867
Stokes W	Survey	53.3	858	Dryland farm	34.128	-101.886
SWCROP	Survey	26.2	337	Irrigated farm	34.542	-101.570
SWCROP E	Survey	22.3	666	Irrigated farm	34.544	-101.564
SWCRP	Survey	14.7	227	Range	34.392	-101.588
SWRNG	Survey	23.5	652	Range	34.486	-101.548
Williams NW	Survey	62.9	862	Irrigated farm	35.335	-101.523
Williams SW	Survey	25.1	692	Irrigated farm	35.330	-101.523

Summary statistics for playa sample and population					
	Number	Median area (acres)	Mean area (acres)	Maximum area (acres)	Minimum area (acres)
All Texas playas[3]	19,835	10.5	19.9	916	0.09
Landsat sample area	76	29.1	36.1	181	4.3
Met station playas[4]	24	39.3	52.2	181	9.0

Table 2-1 notes:

Met = on-site meteorological, soil moisture, and water level measurements
WL = on-site water level measurements
Survey = topographic survey and Landsat data only
NA = not available
[1] Outside the Landsat path 30 row 36 image area
[2] Playa not surveyed; not included in Landsat analysis
[3] Source: Playa wetlands database, 2014
[4] includes USDA-ARS sites

2.3 Remote sensing and image analysis

Landsat imagery provides a long period of record with which to assess playa water volumes. We used Landsat images to estimate the surface area covered by water together with topographic surveys of playa basins to relate water area to water depth and volume in each basin. We selected a single Landsat image tile, generally covering the area from Lubbock to Amarillo, which contains over half of all Texas playas (Figure 2-1). We determined that enough relatively cloud-free images were available for the period from 1996 to 2017 to reconstruct playa water levels over time. The Landsat archives for previous years had fewer suitable images per year, such that we could not reconstruct a reasonably continuous record of water extent.

Each Landsat satellite records images every 16 days in multiple spectral bands, which have varying sensitivity to vegetation, mineral components, heat, and moisture. We found that the infrared Band 5 on the Landsat 5 and 7 satellites and Band 6 on Landsat 8 were best for identifying water areas, which show up as uniformly dark, or cool, areas on the images with good contrast to land areas. More sophisticated multi-band water detection algorithms tended to be confused by the presence of vegetation and the high suspended solids content of the playa water and performed more poorly than the single-band detection scheme.

We evaluated Landsat images with known water areas (e.g. Lake McKenzie) to determine an upper cut-off value distinguishing water areas from adjacent wet soil. We seasonally adjusted the cut-off value to account for changes in water reflectance as a function of the solar incidence angle using the metadata provided with the Landsat imagery on the U.S. Geological Survey Earth Explorer website and U.S. Geological Survey guidance on Landsat data processing (USGS, 2015).

Each Landsat image was contoured at an interval corresponding to the water cut-off value for the image date using ArcMap 10.3. We selected the water contours and converted them to polygons to obtain playa water areas for each image date. We inspected the water polygons for each date together with raw Band 5 imagery to identify issues with cloud coverage, ice, dust, or other factors that can complicate image analysis, and extracted the water area for each of the 76 surveyed playas.

2.4 Surveying

We completed topographic surveys of each playa basin using a Trimble R-6 geographic positioning system (GPS) base station and rover mounted on a Honda Rancher all-terrain vehicle. Between 1,000 and 15,000 real-time kinematic points were collected for each basin, with a 15-foot point spacing along the survey line. We gridded the survey points using the default ordinary kriging parameters in Surfer 12 and used the Surfer grid volume utility to calculate the volume above the surface at 0.1-foot to 0.5-foot intervals. We fit polynomial curves to the area-depth-volume relationships using Microsoft Excel and then used the polynomials to calculate water depth and volume from the water areas derived from the Landsat images. We projected the water volume estimates for the study playas to the entire population of Texas playas based on the proportion of the total playa area (388,398 acres) to the playa area in the study sample (2,405 acres).

We assume that the playa basin topography has remained constant over the 21-year period of record and that sediment deposition has had a negligible effect on the area-volume relationship. Topographic maps, area-elevation, and elevation-volume curves for each playa basin are included as Attachment 1.

2.5 Water balance

We used water balance measurements as our primary tool for estimating playa infiltration rates. Actual recharge at the water table is difficult to measure directly. Groundwater response to surface phenomena may be delayed by months, years, or decades in semi-arid areas with thick unsaturated zones. Chloride mass balance provides a useful check on regional, historical trends but is of limited use for measuring current recharge at individual playas where active recharge is taking place. For example, previous studies by Scanlon and others (1997) found that the chloride enrichment typically present in soils beneath upland areas was absent beneath playas. Other environmental tracers such as tritium, sulfur hexafluoride, and chlorofluorocarbons may be more suitable for measuring individual playa recharge rates but were outside the scope and budget of this study.

Since the playas have no surface outflow, daily infiltration is calculated as the difference between the measured water level change and the evaporation rate plus direct precipitation for days with no surface runoff entering the playa. Evaporation rates were calculated using data from weather stations installed at selected playas. Because we had no way to measure runoff entering the playa, we excluded days when there was a water level rise in the playa from our calculations. We used measurements of soil moisture changes at various depths below the playas as a secondary tool for estimating infiltration. At one playa we released a calcium bromide tracer and measured nano-scale soil displacement as additional measures of infiltration.

At the 18 TWDB weather station sites, a Campbell Scientific CR1000 datalogger measured the water level in a stilling well at the low point in the playa basin with a Campbell Scientific CS450 vented pressure transducer at 30 second intervals and reported 15 minute, hourly, and daily averages. The datalogger recorded precipitation measurements from a MetOne 360-1 tipping bucket rain gauge mounted on the equipment tripod.

We calculated daily evaporation rates using the Penman-Montieth equation, with on-site data for air temperature, relative humidity, barometric pressure, and wind speed. Daily average maximum and minimum values for these parameters were calculated from measurements made at 30-second intervals with a Vaisala WXT 520 weather transmitter (some sites used a Climatronics all-in-one weather transmitter). We measured incident solar radiation using a LiCor Li200x pyranometer; some sites had an additional LiCor NR-Lite net radiometer.

Most sites also included a suite of four Campbell Scientific 229 heat dissipation sensors measuring soil moisture content at depths of approximately 5, 10, 15, and 20 feet below ground surface at hourly intervals. Auger boreholes at several sites allowed access to deeper subsurface soil to depths of 50 feet or more. We installed a suite of tensiometers (Electronic Engineering Innovations, Las Cruces, New Mexico) in parallel with the heat dissipation sensors at most sites, however, the tensiometers failed to produce useful data in all but three sites.

We collected soil samples for moisture content and particle size distribution testing during subsurface sensor installation. Particle size distribution was determined using the Agricultural Research Service simplified method (Kettler, Doran, and Gilbert, 2001). At the water-level only field measurement sites, we simply measured hourly water levels in a stilling well using an Onset Computer Corporation Hobo U-30 data logger.

Instrumentation at the Agricultural Research Service sites included in this study consisted of a Texas Electronics TE-525 tipping bucket rain gauge, a Campbell Scientific CS-450 pressure transducer, an NR-Lite net radiometer and a Li-200x pyranometer, a Met One 014A anemometer, a Campbell Scientific HMP50-L temperature and relative humidity sensor, and a type K thermocouple mounted on a Styrofoam float to measure the water surface temperature. The Agricultural Research Service sites did not measure barometric pressure or soil moisture. All sensors were measured at 1-second intervals and recorded as 15-minute averages using a CR-1000 datalogger.

2.6 Soil moisture movement

We conducted a tracer test and experimented with soil displacement sensors at the FLRNG playa. We sprayed a calcium bromide tracer solution on the mowed surface of the dry playa at a rate of 25 grams of bromide per square meter in three 75-meter square plots. We collected pre-application background soil samples and additional samples after 2014 and 2015 flood events. All soil samples were analyzed for bromide by the Lower Colorado River Authority Environmental Service Laboratory in Austin, Texas and for moisture content by the TWDB.

We measured soil displacement using Nano-G differential variable reluctance transducers (soil extensometers) manufactured by Lord-Microstrain, of Williston, Vermont. The soil extensometers were anchored approximately two meters below the base of two-inch PVC access tubes grouted into boreholes four and six meters deep at the FLRNG and Hollenstein playas, with the assistance of Prof. Larry Murdoch and Colby Thrash of Clemson University (Figure 2-2). The Clemson team provided instrument mountings and downhole signal conditioners and software of their design to convert the analog output from the soil extensometers to a digital signal that was transmitted to the datalogger (Murdoch, Freeman, Germanovich, Thrash, and DeWolf, 2015; Thrash, 2016). We used the measured displacement from known loadings to calibrate soil response to flood events.

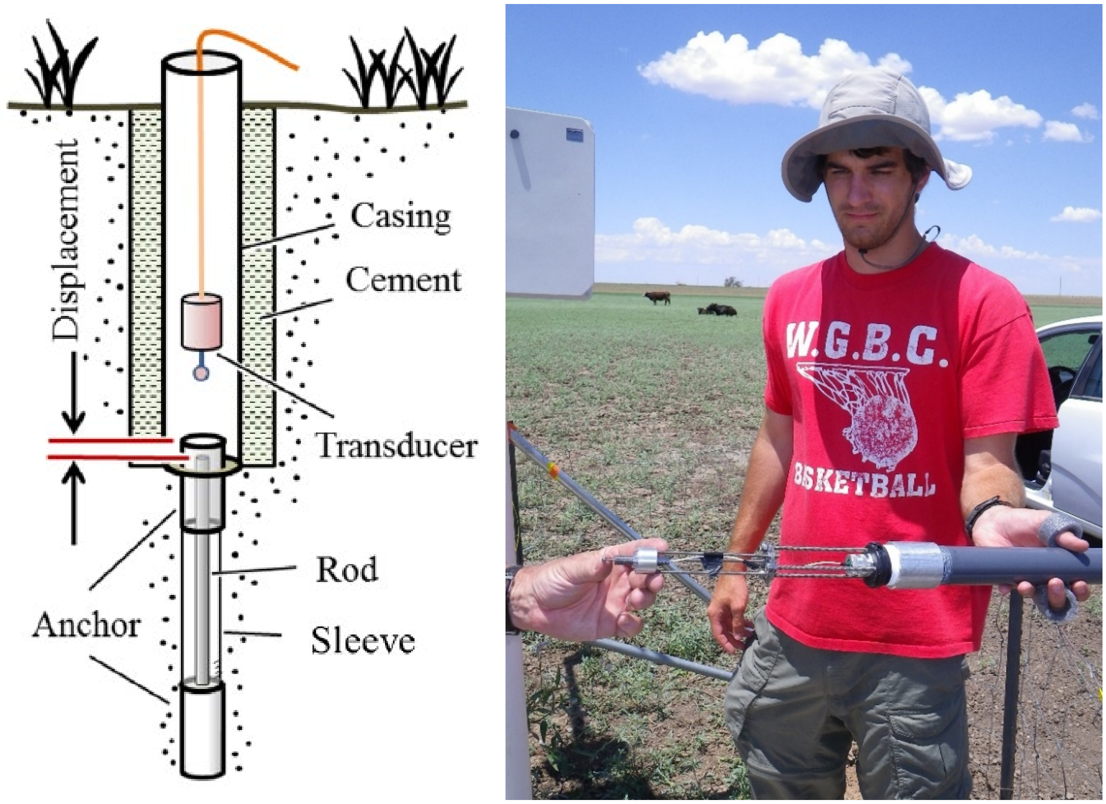


Figure 2-2. **Left: Soil displacement sensor installation schematic (from Thrash, 2016). Right: C. Thrash with sensor ready to install at Hollenstein playa (photo courtesy of Andrew Weinberg).**

2.7 Groundwater monitoring

We monitored groundwater levels in wells in or near seven playas. Summary data for these wells is included in Table 2-2. The TWDB drilled and constructed 2-inch PVC-cased monitor wells at five playas (Bivins, Bowers, Crowell, Finley, and Younger), with depths ranging from 100 to 380 feet. The wells were grouted above the screen intervals and sealed at the surface to prevent flood water from entering the borehole. Pressure transducers collected water level and barometric pressure readings in the wells at hourly intervals. We also placed transducers in unused irrigation wells adjacent to the Herring and Hollenstein playas and in an old recharge well at the Finley site. All TWDB wells were plugged and abandoned at the conclusion of project field work.

Table 2-2. **Playa monitoring well construction data**

Well ID	Latitude	Longitude	Surface elevation, feet	Depth, feet	Screen interval, feet	2017 water level, feet below top of casing
Bivins	34.902121	-101.232129	3,254	200	108-200	95.78
Bowers	35.272346	-101.197829	3,340	380	360-380	337.75
Crowell	35.235021	-101.027904	3,253	310	270-310	284.68
Finley	35.093522	-101.414956	3,334	84	84-104	79.95
Herring	34.554164	-101.838754	3,523	~130	unknown	102.8
Hollenstein	35.007398	-102.083039	3,738	~140	unknown	121.68
Younger	35.217840	-101.662252	3,553	224	184-224	179.74

2.8 Evaporation and infiltration calculations

We calculated infiltration rates from the measured climatological data using the water balance method. The playas have no surface outflow, and except for days immediately following heavy rains, no surface inflow. Under these conditions, any changes in water level (ΔWL) are a result of evaporation (Evap), infiltration (Infilt), and direct precipitation (Precip) onto the water surface:

ΔWL = Evap + Infilt – Precip, or
Infilt = ΔWL – Evap + Precip

Daily average water level and daily total precipitation are output directly from the datalogger measurements. We calculate daily total evaporation using the Penman-Montieth method outlined by the United Nations Food and Agriculture Organization (Allen, Pereira, Raes, and Smith, 1998), using constants for open water evaporation from Maidment (1993), and implemented in an Excel spreadsheet.

The Penman-Montieth equation, as formulated by Maidment (1993) takes the form:

$$E_p = \frac{\Delta}{(\Delta+\gamma)}\frac{R_n}{\rho_w \lambda} + (\frac{\gamma}{\Delta+\gamma})(\frac{6.43(1+0.536U_2)D}{\lambda})$$

Where:
- E_p = potential evaporation (mm/d),
- R_n = net radiation exchange for the free water surface (mm/d),
- U_2 = wind speed, measured at 2 m (m/d),
- D = vapor pressure deficit (kPa),
- λ = latent heat of vaporization (MJ/kg),
- Δ = gradient of vapor pressure (kPa/C),
- γ = psychrometric constant (kPa/C), and
- ρ_w = density of water (kg/m^3).

We excluded days with potential runoff into the playas from infiltration estimates, including days with rainfall exceeding one inch (25 mm), days with increases in water level, and periods of several days after major flooding events. In general, the calculated evaporation rates were less than or approximately equal to the observed changes in water level, but in some playa basins with especially tight soils we frequently calculated negative daily infiltration rates, although average infiltration rates over longer periods were positive. Because infiltration cannot be less than zero, the negative daily values indicate error or bias in our measurement systems.

2.9 Uncertainty

Multiple factors affect the accuracy of the field measurements. Equipment failures associated with animal activity were common, including spiders, bird nests and droppings in rain gauges; cattle and rodents chewing through electrical cables; and wasps colonizing temperature sensor radiation shields. Cold, cloudy winter weather resulted in power failures at several sites. The Climatronics weather transmitters frequently had issues with moisture getting in the wind and humidity sensors, resulting in off-scale measurements. Other sources of measurement uncertainty include sediment plugging or ice formation in the pressure transducers, and wind induced movement of water within the playa basins. For sites without weather stations, or during periods of instrument failure when we estimated evaporation from nearby sites, micro-climate differences in atmospheric conditions and rainfall distribution between playas also affect our calculations.

We also note that the form of the Penman-Montieth equation used in this analysis does not account for thermal energy storage in the playa water or soil, which may affect infiltration estimates. These effects are likely most pronounced during spring and fall seasons when average daily temperature variations are the greatest.

We did not attempt any formal uncertainty analysis of the playa data. Remote-sensing estimates of playa depth were checked against field data for instrumented playas and generally agreed within about 0.5 feet. Instrumental data was frequently checked for consistency and faulty instruments were replaced. In most cases, instruments either operated according to specifications, produced obviously off-scale readings, or gave no response at all. Planned confirmation of calculated evaporation rates using eddy covariance were abandoned when the target playa flooded before instrument setup could be completed. Soil moisture and soil displacement data generally confirm infiltration estimates from water balance calculations for initial wetting of previously dry playas but cannot be applied under previously saturated conditions.

3.0 Results

Data generated by the project is maintained in several different electronic formats and is too massive to include with this report. Digital archives are available upon request to the TWDB Groundwater Division, including survey results, processed and classified Landsat imagery, instrumental data from playa weather stations, and soil core sample data. This section of the report presents summary data and illustrates important observations with selected records that best represent the relevant processes. More complete data for individual sites is included as attachments.

3.1 Playa water volumes, 1996 to 2017

The sum of the estimated water volumes in Texas playas for each image date from April 1996 through February 2017 (Figure 3-1) illustrates the extreme seasonal and inter-annual variability of the High Plains climate. The observation period includes very wet years (1997, 1999, 2015) associated with strong El Nino events and very dry years (2002, 2003, 2011, 2012, 2013) associated with regional drought. The largest peaks in water volume occur in the summer, but playa flooding can occur in any season of the year.

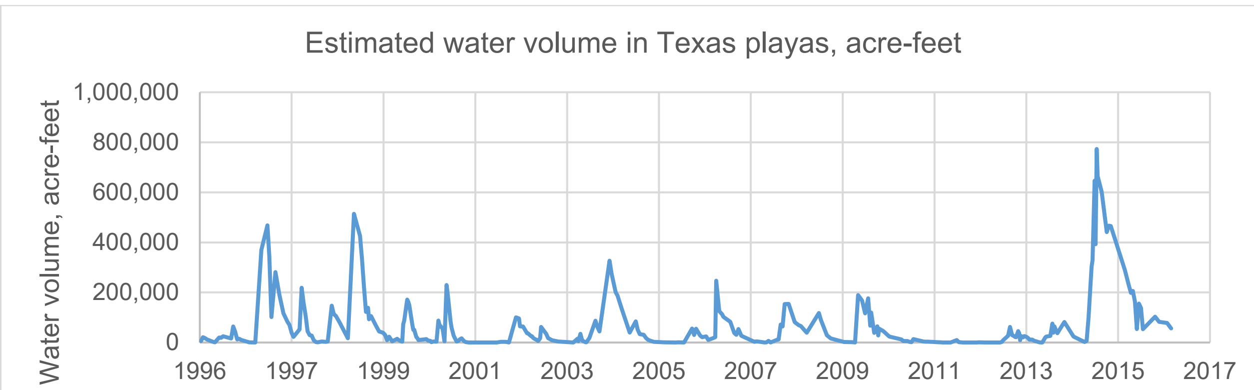


Figure 3-1. Estimated water volume in Texas playas, 1996 to 2017.

The estimated water volume in Texas playas at the time of each Landsat observation ranges from a low of 187 acre-feet on September 26, 2012 to a high of 773,122 acre-feet on July 9, 2015. The average estimated water volume in all playas at any observation time over the 21-year period of record is 67,900 acre-feet, with a median volume of 24,000 acre-feet. We estimated the average annual water volume collected in Texas playas by summing the added volume at each peak value, shown in Figure 4, and dividing by the number of years of record. We find that Texas playas capture an average of 221,000 acre-feet of water per year, with annual values ranging from 10,400 acre-feet in 2012 to 1,027,000 acre-feet in 2015.

A summary listing of flood frequency, number of flood events, average hydroperiod, and average flood volume for each monitored playa is included as Table 3-1. Hydrographs showing water depth over the 21-year period of record for each playa are included as Attachment 2.

Table 3-1. Summary of Landsat observations of flood events at selected playas, 1996 to 2017

Playa ID	Number of flood events	Fraction time flooded	Average flood duration, days	Total flood volume, acre-feet	Annual avg volume, acre-feet	Annual avg volume, acre feet/acre
B Harrell	13	0.07	42	32	1.5	0.05
B Harrell S	16	0.11	53	162	7.7	0.30
Birkenfeld	16	0.18	96	293	13.9	0.5
Bivins A	10	0.06	43	4	0.2	0.04
Bivins B	11	0.07	49	8	0.4	0.08
Bivins C	11	0.07	52	9	0.4	0.08
Bivins D	10	0.08	59	16	0.8	0.11
Bivins E	11	0.09	65	22	1.1	0.18
Bivins N	11	0.28	199	3,989	188.8	1.20
Bivins S	12	0.14	93	1,572	74.4	0.55
Bowers	14	0.14	76	49	2.3	0.22
BRCRP	14	0.14	77	60	2.8	0.19
BRRNG	19	0.38	155	546	25.9	0.65
Comer	18	0.21	88	378	17.9	0.26
Crooks 1	10	0.10	74	145	6.9	0.16
Crooks 2	8	0.10	99	272	12.9	0.29
Crooks 3	14	0.15	84	253	12.0	0.48
Crooks 4	14	0.17	92	397	18.8	0.47
Crooks 5	21	0.14	50	21	1.0	0.14
Crooks 5W	17	0.15	69	37	1.8	0.19
Crooks 6	15	0.27	140	2,170	102.7	1.27
Crowell	26	0.24	71	247	11.7	0.45
CSCROP	11	0.29	207	544	25.7	0.50
CSCRP	8	0.05	51	73	3.5	0.09
CSRNG	16	0.27	118	587	27.8	0.30
Davenport A	12	0.08	52	32	1.5	0.22
Davenport B	8	0.05	45	13	0.6	0.11
Davenport C	12	0.15	94	67	3.2	0.30
Davenport D	13	0.43	254	1,764	83.5	2.22
Doan NE	13	0.17	100	121	5.7	0.35
Doan NW	15	0.36	184	601	28.5	0.91
Doan SE	15	0.09	48	13	0.6	0.10
Durrett	13	0.29	172	1,024	48.5	0.79
Fancher	23	0.15	49	147	6.9	0.22
Fields	19	0.19	79	852	40.3	0.57
Finley	12	0.27	176	2,703	127.9	0.7
FLCROP	10	0.32	249	799	37.8	1.25
FLRNG	14	0.36	197	1,179	55.8	2.00
Glaezner	14	0.28	156	1,341	63.5	1.28
GRCROP	17	0.21	96	88	4.2	0.38
GRCRP	14	0.21	113	224	10.6	0.44
Gregg	19	0.18	74	159	7.5	0.17
GRRNG	15	0.16	85	25	1.2	0.19
Herring 1	17	0.26	119	701	33.2	0.99
Herring 3	13	0.12	69	176	8.3	0.32
Herring 3a	13	0.12	69	176	8.3	0.32
Hollenstein	15	0.24	123	245	11.6	0.66
Kinkaid E	16	0.17	84	242	11.5	0.42
Kinkaid W	19	0.19	76	331	15.7	0.80

Playa ID	Number of flood events	Fraction time flooded	Average flood duration, days	Total flood volume, acre-feet	Annual avg volume, acre-feet	Annual avg volume, acre feet/acre
M.Harrell	11	0.16	109	259	12.2	0.40
Macha	16	0.08	38	127	6.0	0.19
Mahagan	21	0.23	84	390	18.5	1.21
Middleton N	9	0.15	126	472	22.4	0.46
Middleton S	9	0.15	124	383	18.1	0.30
Minton N	18	0.26	113	413	19.6	0.54
Minton S	18	0.37	158	1,377	65.2	0.96
Moore	14	0.28	157	603	28.5	0.72
Obert M	17	0.16	73	91	4.3	0.39
Obert N	17	0.15	68	105	5.0	0.41
Obert S	17	0.17	78	82	3.9	0.41
Pullum	21	0.25	91	532	25.2	0.48
Rieff N	21	0.24	88	404	19.1	0.59
Rieff S	27	0.22	62	183	8.7	0.50
Schacht N	26	0.25	54	1,000	47.3	1.4
Schacht S	8	0.03	32	47	2.2	0.1
Stokes E	13	0.07	39	128	6.0	0.47
Stokes M	22	0.16	57	912	43.1	1.67
Stokes W	16	0.15	74	636	30.1	0.57
SWCROP	22	0.41	158	1,042	49.3	1.9
SWCROP E	18	0.29	145	378	17.9	0.8
SWCRP	14	0.16	89	91	4.3	0.3
SWRNG	12	0.15	97	154	7.3	0.3
Williams NW	8	0.47	452	2,178	103.1	1.6
Williams SW	11	0.15	105	714	33.8	1.3
Wright	15	0.31	159	1,904	90.1	0.81
Younger	13	0.18	104	327	15.5	0.32
Averages	**15**	**0.19**	**104**	**524**	**24.8**	**0.57**

The playa water volumes determined in this study are substantially lower than prior estimates, with an annual average volume representing approximately 10 percent of the ‘consensus’ 1982 U.S. Bureau of Reclamation estimate of 2 million acre-feet per year. Even the maximum volume measured in 2015 is just 50 percent of the low end of the range of values quoted by the U.S. Bureau of Reclamation (1982). A combination of factors may be responsible for the differences. For example, land use changes, such as conversion from row crops to conservation reserve easements, have likely reduced runoff.

Changes in farming practices, including contour plowing and conversion from furrow-flood to center pivot irrigation, have had major impacts on landscape hydrology (Colaizzi, Gowda, Marek, and Porter, 2009), including reductions in runoff to playas. Previous studies also had too short a duration to fully evaluate the variability in playa behavior. Finally, these estimates appear overly optimistic and unrealistic; 5 million acre-feet of water would cover all 408,000 acres of playas in Texas, Oklahoma, and New Mexico, almost 20 feet deep. Geochronological studies of playa lakes (Holliday, Hovorka and Gustavson, 1996) provide little evidence for this amount of water on the High Plains in the last few millennia.

Our data do not show a strong relationship between playa water volumes and the major land-use in the watershed area. The mean annual water volume captured by playas in dryland farm areas is 0.54 acre-feet per acre of playa area per year, compared to 0.68 in irrigated playas and 0.49 in range-land playas (Figure 3-2), but the difference is not statistically significant at the 95-percent confidence level. A more detailed analysis of the effects of land use might find more definitive differences; land use within the playa watersheds is not all a single type and, in many cases, has changed over the last 20 years. This analysis does not account for these factors.

Playa wetland type also has poor correlation with the captured water volume. Playas classified as lacustrine have a mean annual water volume of 0.49 acre-feet per acre per year of playa area, compared to 0.36 acre-feet per acre per year for palustrine playas (Figure 3-3). These differences are less than the standard deviation of the values for each class of playa. The U.S. Fish and Wildlife Service recently completed an extensive review of playa classification based on aerial photography from 2004 and field verification in 2006 for the Texas portion of the playa lakes region (Dick and McHale, 2007). The high variability in playa flooding seen in our data suggest that classification based on any two years may be misleading, although some playa features evaluated in the field visits, such as soil profile development, may reflect environmental conditions over several previous years.

3.1.1 Factors affecting playa water volume

The average annual volume of runoff captured by the playas largely is a function of playa size, watershed size, and longitude. Multiple regression analysis indicates that these three variables explain over 86 percent of the variance in the annual water volume collected by the sample population. Larger playas and larger watersheds collect and hold more water than smaller ones. Precipitation increases across the Southern High Plains from the west to east and more precipitation creates more runoff. Other factors, including land use, vegetation, and soil type also affect runoff and may be important in determining the amount of runoff captured by any individual playa lake, but were not found to be statistically significant or were not explicitly evaluated in this model. Soil type is relatively uniform across the area of this Landsat image tile and may be a more important factor affecting runoff volumes at larger scales where more dissimilar soil types are present. The average watershed slope was not a significant factor. Parameter values do not significantly differ by land use classification, given the relatively small sample size and high variance between individual playas. Table 3-2 shows the estimated parameters for the regression model.

Landsat water volume estimates most likely underestimate the total volume of water in playas. Satellite observations generally miss the peak volume in the playas because the observations occur on a relatively infrequent, fixed schedule and because of increased cloudiness during wet periods. Daily or hourly measurements from on-site weather stations typically show multiple peaks in water depth associated with storm events that are not resolved by the satellite observations. The low frequency of satellite observations may result in failure to detect water in playas that hold water for only a few days, either because of the shallow depth of the basin or because of high infiltration rates; these playas may fill and drain in the interval between Landsat observations.

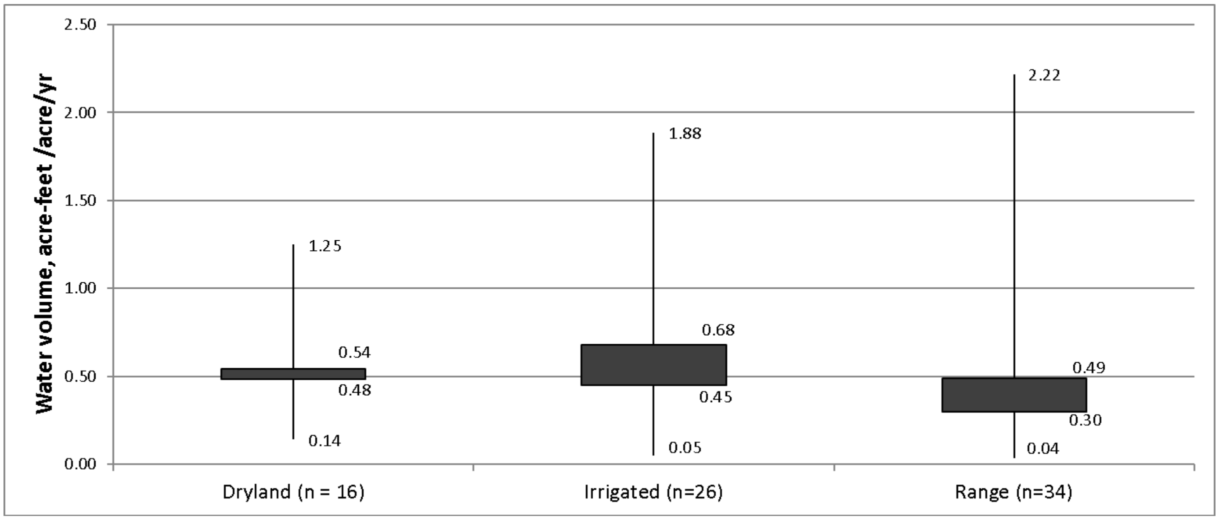


Figure 3-2. **Maximum, mean, median, and minimum annual water volumes in playas, by land use classification.**

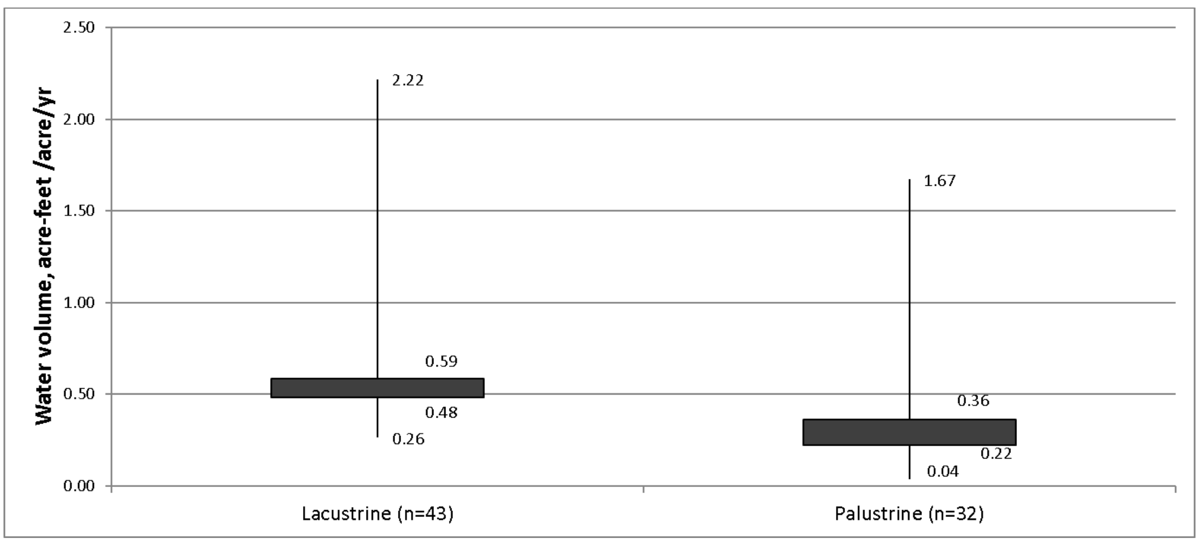


Figure 3-3. **Maximum, mean, median, and minimum annual water volumes in playas by wetland type.**

Table 3-2. Regression model for average annual playa water volume, in acre-feet.

Regression Statistics	
Multiple R	0.86328
R Square	0.745252
Adjusted R Square	0.734637
Standard Error	17.15321
Observations	76

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	3	61974.74	20658.25	70.21057	2.47E-21
Residual	72	21184.76	294.2327		
Total	75	83159.5			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2042.458	612.1628	3.336462	0.001345	822.1338	3262.782
Watershed area, acres	0.02467	0.005951	4.14531	9.15E-05	0.012806	0.036533
Playa area, acres	0.338624	0.133789	2.531035	0.013558	0.071921	0.605327
Longitude, degrees	20.16241	6.030824	3.343227	0.001317	8.140186	32.18464

Our analysis of the playa flooding record prior to 2015 (Weinberg, Backhouse, and Gitz, 2015) suggested that there was a long-term trend of decreasing water volume in Texas playas. The record rainfall and runoff in 2015 changed that trend. Many locations in the Texas Panhandle received more rain in 2015 than in any year in over 100 years of records, and many playas in the study sample experienced the greatest extent of flooding over the 21-year period of our Landsat observations. Because of the large influence of outlier years such as 2015 on trend analysis, a much longer period of record is needed to assess if the trend of decreasing flood volume is real.

3.2 Playa water balance and infiltration rates

After severe drought from 2011 through 2013, near-normal rainfall produced small flood events in most playas in 2014, and record rainfall in 2015 flooded all the playas monitored in the study. These events provide an opportunity to assess the geographic variability of playa infiltration rates and to separate the effects of macro-pore and matrix infiltration. We present results for a sample of 16 playa lakes, which flooded at least 75 cm deep in 2015, located in an 11,000-square mile area extending from 32.8 to 35.2 degrees north and from -101.1 to -102.2 degrees west. Summary data on the 2015 flood events at these 16 locations is included as Table 3-3.

The 2015 daily water level records for each of the 16 playas are shown in Figure 3-4. The x-axis is scaled as time in days since initial flooding, but almost all the playas initially flooded in May 2015, so the seasonal climate trends are the same for all the sites. The hydroperiod, or duration of flooding, varies from 77 days for the Birkenfeld playa to over 680 days for the Bivins playa. The difference in hydroperiods is a result of differences in initial flood depth and infiltration rates, as reflected in the height and slope of the water level plot for each playa.

The estimated total infiltration associated with the 2015 flood events ranged from approximately 200 to 1,800 mm. Figure 3-5 shows cumulative daily infiltration for the 2015 flood event for each of the 16 playas. In general, the infiltration curves flatten out over time as water levels in the playas decline. Abrupt increases in the slope of the infiltration curves, for instance at day 20 at the Mahagan playa, are associated with additional flooding.

The geographic distribution of infiltration rates (Figure 3-6) shows a general trend with the highest infiltration in the southwestern part of the study area and the lowest in the northeast. The geographic distribution of infiltration parallels the trend in generalized soil types across the region, reflecting geographic differences in the parent upland soil materials from which the playa basin soils were derived. The range of infiltration rates estimated in this study is consistent with previous work by the Agricultural Research Service. Ganesan, Rainwater, Gitz, Hall, Zartman, Hudnall, and Smith (2016), estimated infiltration rates at nine playas in Bailey, Briscoe, Castro, Floyd, Gray, Hockley, and Swisher counties based on water budget monitoring as part of the Agricultural Research Service program. Average infiltration rates ranged from 0.025 to 0.84 inches per day, with higher infiltration to south and west across the study area.

Table 3-3. Playa flooding and infiltration in 2015

Playa	Area, acres	Flood depth, inches		Flood duration, days	2015 infiltration rate, inches per day	Effective hydraulic conductivity, inches per year	Infiltration as percent of total flood water
		Maximum	Average				
Birkenfeld	28.2	42.5	18.5	77	0.348	26.73	52
Bivins	88.4	85.4	42.1	683	0.029	0.98	11
BRRNG	87.8	39.0	22.8	283[a]	0.054	3.38	28
CRCROP	90.4	29.5	16.1	132	0.090	8.00	36
CRRNG	86.5	35.8	24.0	147[a]	0.025	1.49	11
Durrett	55.0	61.8	42.9	234[a]	0.083	2.77	26
Finley	176.4	71.7	41.3	440	0.073	2.54	18
FLCROP	66.7	46.9	22.4	318	0.062	3.95	23
FLRNG	29.0	67.7	39.4	412	0.056	2.53	21
Herring 2[b]	83.2	37.4	18.5	299	0.044	3.46	19
Hughes W	22.0	61.4	25.2	104	0.839	32.91	77
Mahagan	13.7	70.9	40.9	126	0.571	19.97	68
Minton	71.1	60.6	29.1	315	0.162	8.05	41
Myatt	23.3	48.4	19.7	112	0.496	36.36	62
Rieff	28.8	46.9	30.7	114	0.372	17.53	53
Stocker	51.7	83.5	45.7	448	0.167	5.25	60
Averages	**59.0**	**55.5**	**29.9**	**269**	**0.204**	**10.06**	**36**

[a] Still flooded on date of last measurement

[b] The deepest part of the Herring 2 playa was not accessible. Maximum measured water depth is approximately 20 cm less than the total depth.

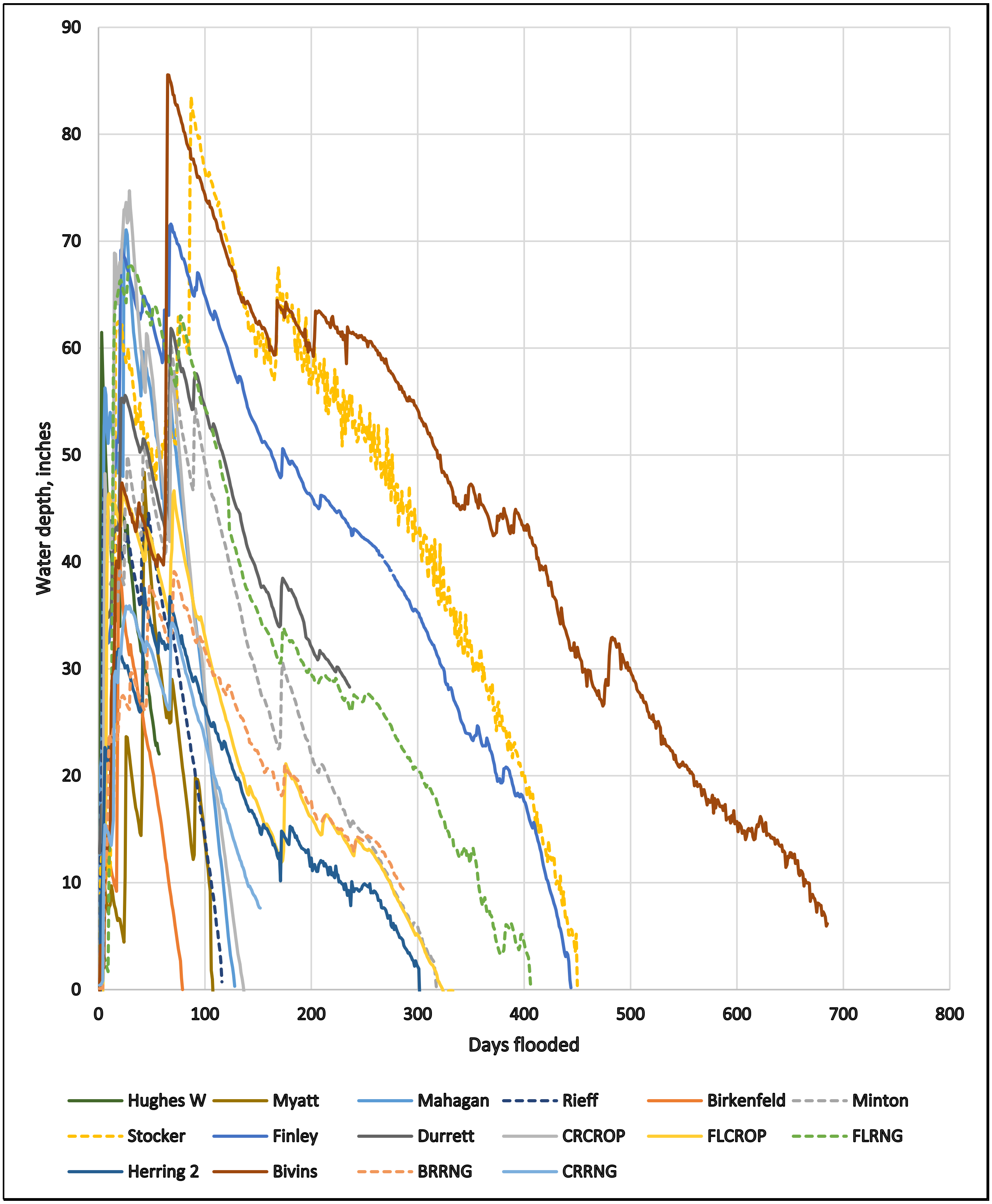


Figure 3-4. **2015 water level records for selected playas, showing lake depth, in inches, over time, in days, since initial flooding.**

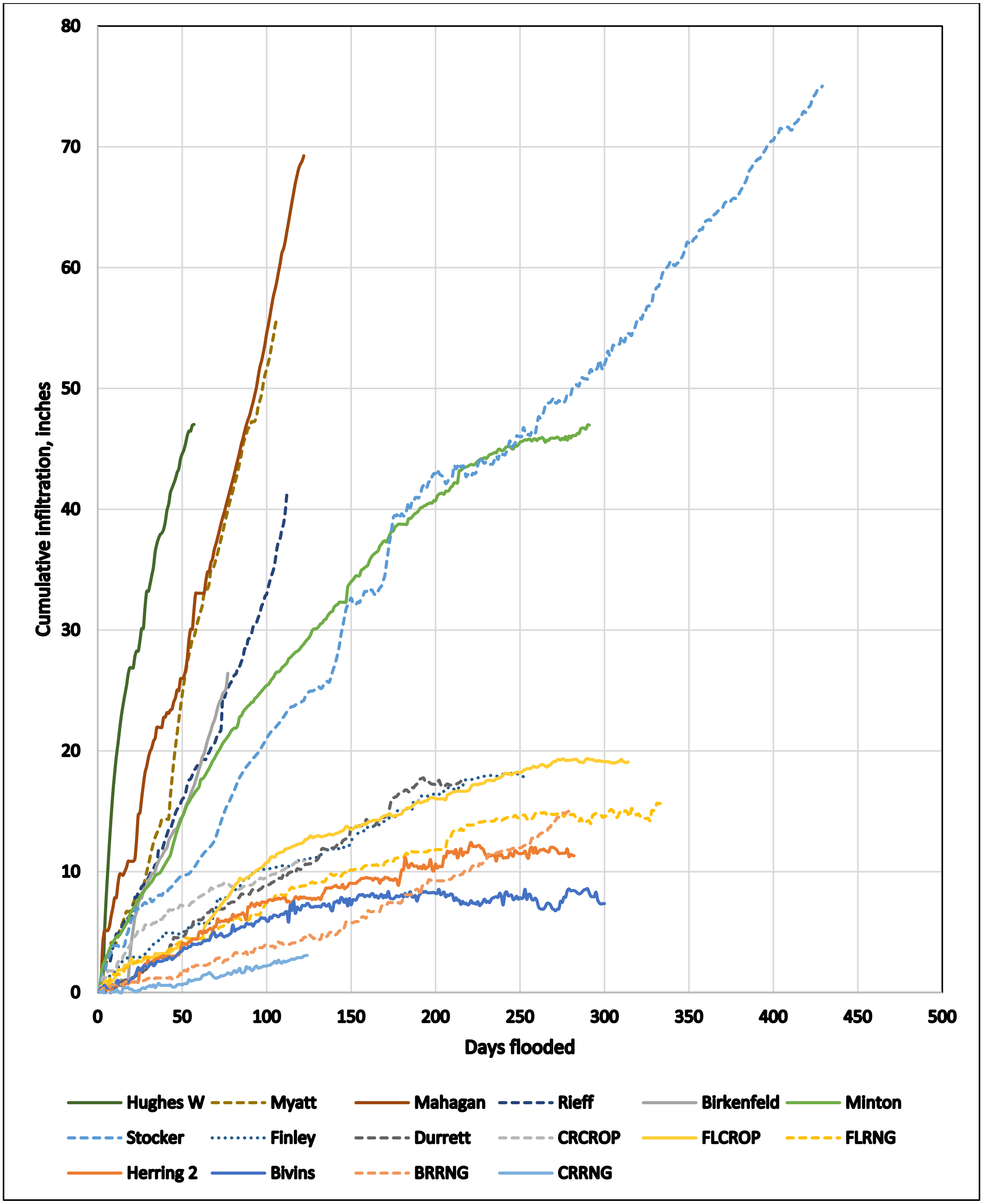


Figure 3-5. Cumulative infiltration estimates in inches, for 2015 flood events.

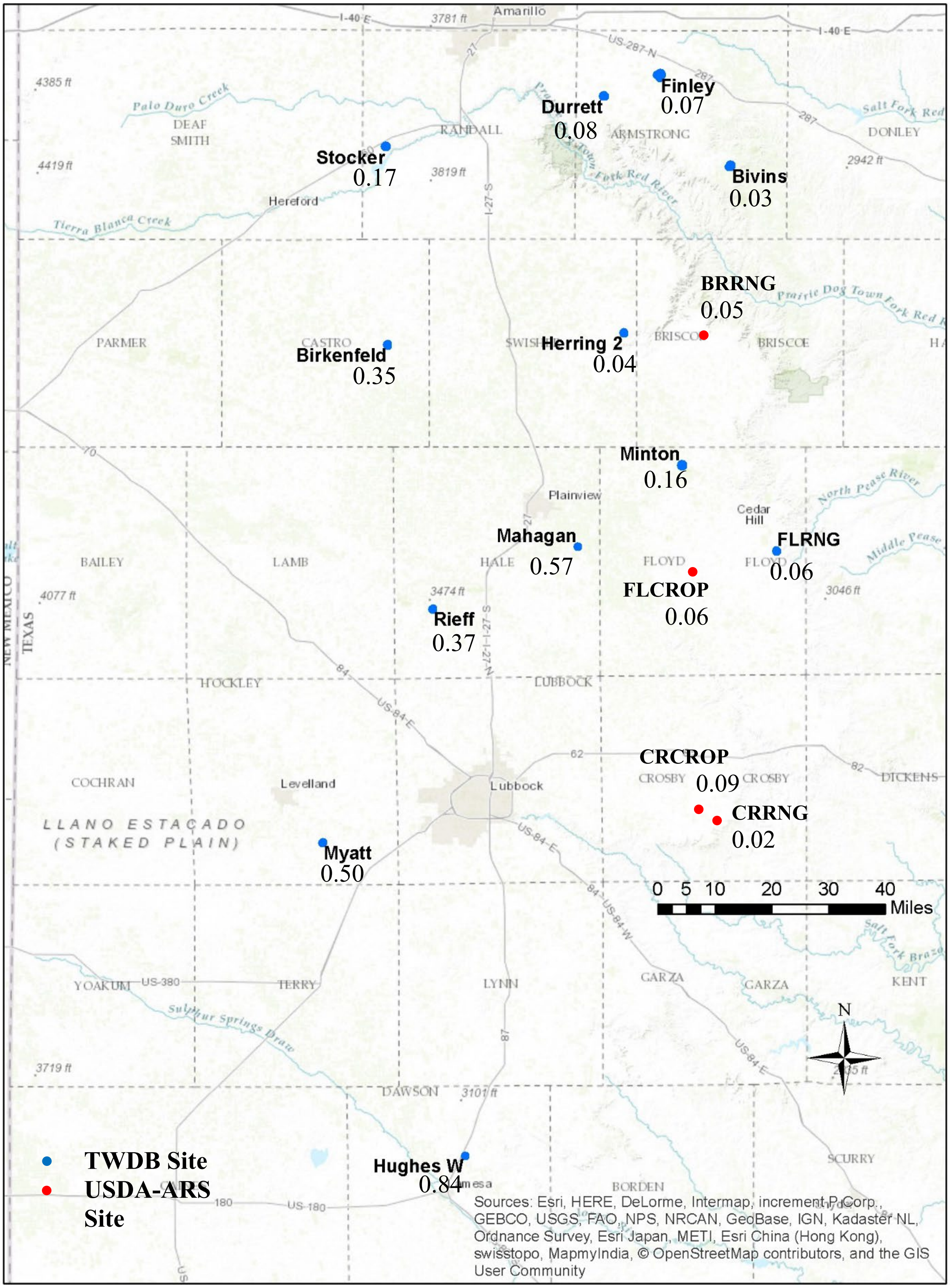


Figure 3-6. Geographic distribution of average infiltration rates for 2015, in inches per day.

3.3 Infiltration rates and water depth

Infiltration rates increase with flood depth because of increased hydraulic gradients and the presence of higher permeability soils around the playa margins. For most flood events observed during this project the effects of increased hydraulic head appear to dominate. For example, the estimated monthly average infiltration rate at the FLRNG playa during 2014 and 2015 flood events varies linearly with the average pressure head (water depth), shown in Figure 3-7 and Table 3-4, as predicted by equations for flow through porous media. Data reported by Hauser (1966) for playas near Lubbock, Texas, shows a similar linear trend. The slope of the FLRNG trendline provides an estimate of the effective hydraulic conductivity of the total thickness of sediments in playa basin, which equals 0.0016 inches per day per inch of head. If the top 6.5 feet of soil represents the most restrictive part of the soil profile, this would equate to an average sediment hydraulic conductivity of about 0.12 inches per day, within the expected range for a silty clay, but substantially higher than measured values from soil core samples.

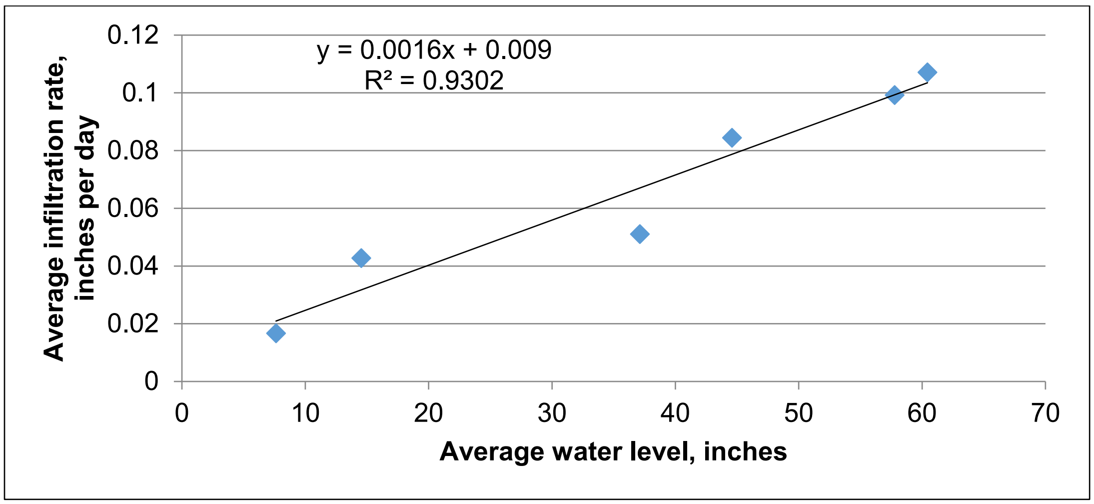


Figure 3-7. 2014 to 2015 infiltration rate and water depth, FLRNG playa.

Table 3-4. Monthly average water depth and infiltration at FLRNG playa

Date	Water depth, inches	Infiltration rate, inches per day
June 2014	3.6	0.022
July 2014	14.5	0.043
October 2014	7.6	0.016
June 2015	60.4	0.106
July 2015	57.8	0.098
August 2015	44.6	0.083
September 2015	37.1	0.051

3.4 Effective hydraulic conductivity

We divided the 2015 infiltration rates by the average daily flood depth to represent the effective hydraulic conductivity of the playa bottoms. Values range from 0.98 inches per year at the Bivins playa in the northeastern part of the study area to 36.3 inches per year at the Myatt site in the southwest (Figure 3-8).

The effective hydraulic conductivity provides a better measure of playas' recharge potential than the infiltration rate. Because infiltration rates depend on the water depth during individual flood events, they are difficult to compare between various locations and dates. By normalizing infiltration rates by flood depth, we obtain a better measure for comparing infiltration and recharge from playas across the region.

The geographic distribution of effective hydraulic conductivity from this project suggests that groundwater recharge from individual playas generally increases to the south and west. To estimate the overall geographic distribution of groundwater recharge from our playa data, we would need to estimate average playa density and flood frequency, duration, and depth across the area, which was outside the scope of the project. However, we note that these results differ in important respects from the recharge distribution used in the development of the most recent groundwater availability model for the High Plains Aquifer (Deeds and Hamlin, 2015). Model parameters are based on assumptions that almost all recharge under pre-development conditions came from the playa lakes, with a minor component from the draws and washes outside playa watersheds. The groundwater availability model used data on rainfall distribution, soil types, slope and land cover, and chemical and isotopic tracers to estimate the distribution of recharge (Figure 3-9) and differentiates a low recharge zone to the south and southwest of the Southern High Plains and higher recharge to the north and northeast, roughly demarcated by the 500 milligram per liter total dissolved solids line (Deeds and Hamlin, 2015). In contrast, the results from this suggest that more recharge may occur from individual playas south and west of the 500 milligram per liter line, while playas in the northeastern part of the study area contribute relatively less infiltration.

While the numerical infiltration values determined for single flood events at individual playas cannot be directly compared to the regional recharge rates estimated by Deeds and Hamlin (2015), the distribution of the data from the playas suggests that further examination of Ogallala Aquifer recharge may be warranted.

Estimated infiltration rates or hydraulic conductivity rates for individual playa flood events reflect the initial soil conditions in the playas as well as broader geographic trends. In 2015, the playa soils across the region were already saturated at the onset of flooding because of remaining moisture from 2014 rainfall and runoff, creating a common starting point. Under saturated soil conditions in 2015, the measured infiltration rates represent matrix flow rather than macro-pore flow. Smaller flood events occurring under drought conditions in 2012, 2013, and 2014 show clear evidence of macro-pore flow through desiccated and cracked soils, but our data suggest that macro-pore flow is limited in time and space, and that matrix flow is the dominant mechanism responsible for deep infiltration and groundwater recharge, as discussed in the following section.

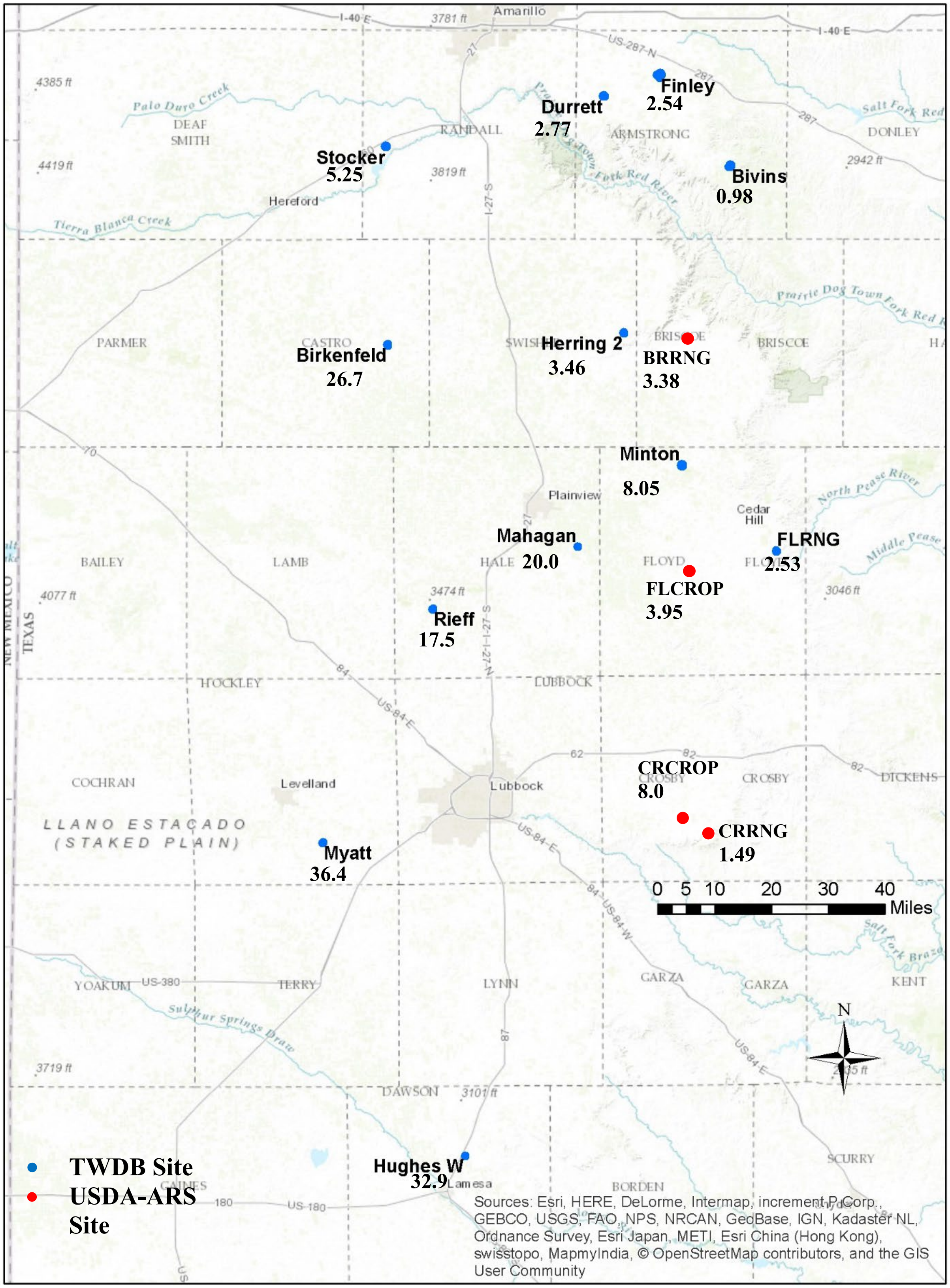


Figure 3-8. **Geographic distribution of effective hydraulic conductivity, in inches per year, for selected playa lakes flooded in 2015.**

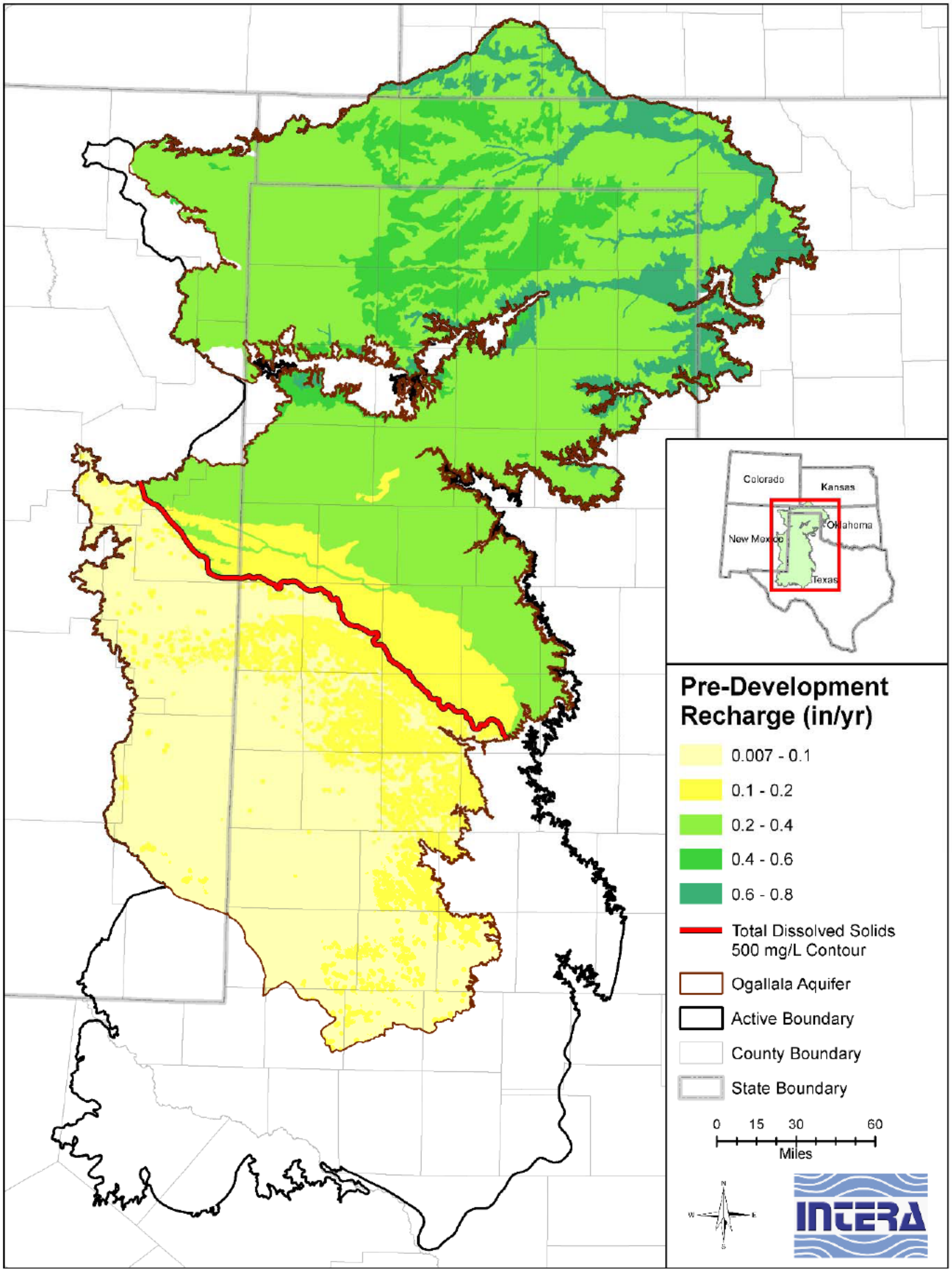


Figure 3-9. **Pre-development recharge distribution for the Ogallala Aquifer, in inches per year, used in the High Plains Aquifer groundwater availability model development (from Deeds and Hamlin, 2015). Notes: in/yr = inches per year; mg/L = milligrams per liter.**

3.5 Other measures of infiltration

Playa flooding is highly variable. Intense storms following drought periods may produce runoff but no flooding. Small floods in previously dry playas tend to disappear quickly. After large flood events, the water level initially drops quickly and then slows down. Some flood events last for over a year, while similar flood events at other times of the year may disappear in months. And water levels often drop the fastest in the final stages of drying up. We need an explanation of all these aspects of playa behavior to fully understand the relationship between playa infiltration and groundwater recharge. Much of this variability is caused by dynamic changes in soil properties, especially the soil moisture content and associated cracking and macro-pore development.

Figure 3-10. Desiccation cracks in Younger playa, July 2011. Photo by A. Weinberg.

The soil moisture conditions within a playa basin have a major effect on infiltration. Playa soils are classified as Vertisols and have strong shrink-swell behavior in response to drying and wetting. Dry playa soils develop a network of large cracks that allow rapid infiltration of runoff (Figure 3-10). In late 2011, at the height of the severe drought in Texas that year, cracks in some playas were three to four inches wide and over three feet deep. Large amounts of water enter the soil rapidly when runoff first flows into such desiccated playas. For the first few hours of a flood event, and especially for small flood events in initially dry playas, crack flow dominates the water budget, resulting in very high infiltration rates. However, data from this project suggests that these high infiltration rates last less than one day and only affect the top six to nine feet of soil. Furthermore, infiltrated water stored in the top six to nine feet of soil is subject to evapotranspiration and does not percolate deeper into the soil profile unless more water is supplied by interstitial infiltration. Thus, small flood events can produce significant amounts of stored soil moisture for plant growth but are unlikely to result in any groundwater recharge unless followed by interstitial infiltration associated with additional flood events.

3.5.1 Soil moisture results

Soil moisture measurements give us information on macro-pore infiltration that occurs before flooding takes place, the velocity at which interstitial flow moves through the soil column, and an independent estimate of infiltration volumes. Soil samples were collected at all sites during initial equipment installation and were analyzed for moisture content and particle size distribution. Two soil samples from the FLRNG playa were submitted for hydrological properties analysis at the Daniel B. Stephens laboratory in Albuquerque, New Mexico, and heat dissipation sensor data were collected from 12 sites. Additional sites had tensiometers installed in the subsurface, but the instruments lost hydraulic connection with the soil in all but three of the sites and did not provide useful data. Initial soil moisture content and particle size distribution, as well as time-series plots of the soil moisture data for each of the sites and laboratory soil characterization data are included as Attachment 3.

The heat dissipation probe soil moisture plots show the sensor response relative to calibration endpoints, with zero representing oven-dry conditions and one representing complete saturation. Because the sensors respond to soil moisture tension, which is a strongly non-linear function of soil moisture content, the sensitivity of the measurements declines under near-saturated conditions, and once the soil becomes fully saturated the sensors no longer provide useful information on soil moisture movement. The following paragraphs include general comments on playa soil response to flooding and more detailed interpretation of selected data from specific sites.

In general, the soil data demonstrate the complexity of unsaturated flow through playa soils. Flooding may be preceded by runoff events that do not produce ponding. Non-ponding runoff may result in rapid increases in soil moisture to depths of six feet or more, as the runoff flows into open cracks in the soil, producing local saturation along crack boundaries. Data on the timing of rainfall, soil moisture increases, and flooding from the Harrell site in June 2012 (Figure 3-11) illustrate that runoff events produce flooding only after the near-surface soil is saturated. Intense rainfall started at 5:30 a.m. on June 6, 2012, generating runoff into the playa basin. The soil moisture sensor at 3-foot depth stared to respond at 6:00 a.m. and reached saturation by about 8:00 a.m. Water did not begin to pond in the playa until between 8:00 and 9:00 a.m., after the soil at 3-foot depth reached saturation. Soil at 6-foot depth did not respond to the flooding until after 8:00 p.m., about 12 hours after water ponded at the surface, and continued to gain moisture gradually, without reaching saturation, over the duration of the flood event, which lasted until mid-July 2012. During the entire flood event, the soil at 12- and 20-foot depth continued to lose moisture very gradually. These observations suggest that surface cracks begin to close within a few hours after runoff enters a playa and stop transmitting water through the soil well before the entire soil profile is saturated.

In the days and weeks after a flood event, moisture is redistributed from the vicinity of the soil cracks into the soil matrix and downward through the soil profile, resulting in an unsaturated soil profile below the ponded water. Playa center soil moisture data for the FLRNG site for 2014 and

2015 flood events (Figure 3-12) show the transition from unsaturated to saturated conditions especially well since we installed more sensors at this site than in other playas.

Shaded areas A, B, and C in Figure 3-12 highlight varying soil response to three different hydrological events. Area A typifies playa response to small pulses of runoff under previously dry conditions. Runoff in late November 2013 abruptly increases the moisture content of the upper three feet (one meter) of soil but deeper soil is unaffected. The top meter of soil never reaches saturation and returns to dry conditions by May 2014 as moisture is gradually lost to evapotranspiration. Below the top three feet (one meter), the soil profile has an upward gradient in moisture potential, indicating a lack of recharge.

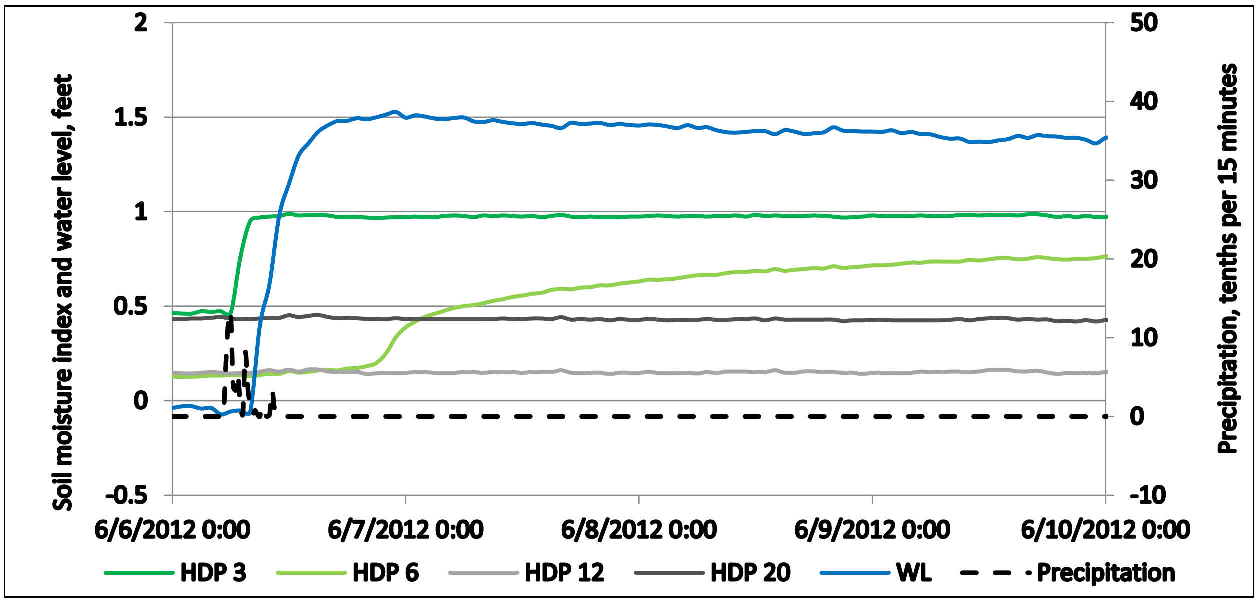


Figure 3-11. **Soil moisture, precipitation, and water level during 2012 flood event, Harrell site. Soil at 3-foot depth (HDP 3) saturates several hours before water ponds in the playa. Soil at 6-foot depth (HDP 6) starts to wet approximately 12 hours later; deeper soil is unaffected by the surface flooding.**

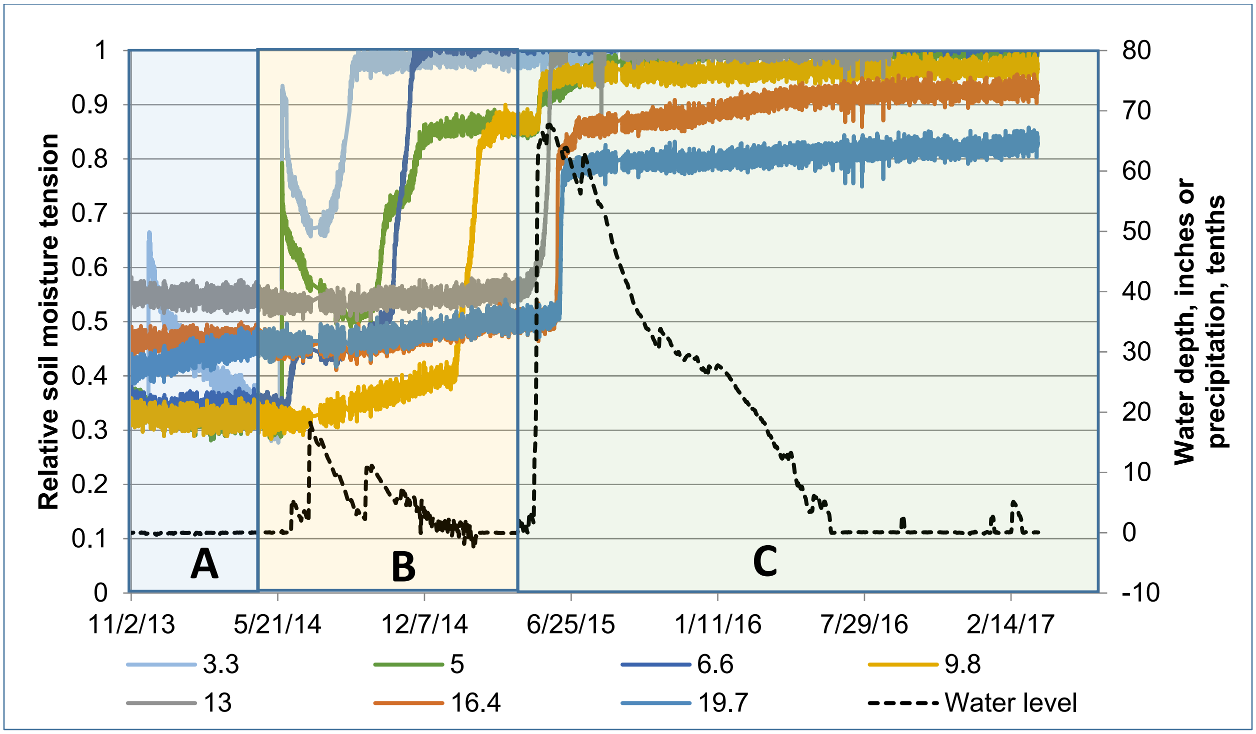


Figure 3-12. **Soil moisture results at depths from 3.3 to 19.7 feet, FLRNG playa center**

Area B typifies playa response to larger amounts of runoff, sufficient to cause flooding. The moisture content of soil at 3 to 4.5 feet (1 to 1.5 meters) increases rapidly to near saturation in response to runoff on May 26, 2014, prior to playa flooding. Moisture content in the upper soil quickly drops despite additional runoff and flooding beginning on June 9, 2014 as surface cracks swell shut and the initial pulse of runoff is redistributed through the soil matrix. With continued flooding up to 18 inches (45 centimeters) deep, a wetting front migrates downward through the soil profile at a rate of about ½ inch (1 centimeter) per day, eventually bringing the near-surface soil to saturation. Soil below 10-foot (3-meter) depth remains dry through early 2015 indicating that despite playa flooding no recharge is taking place.

Area C typifies playa response to larger flood events under previously wet conditions, leading to recharge. Flood depths reached 5.6 feet in May 2015 following a series of storms. Saturated flow conditions in the upper soil profile and increased hydraulic pressure advanced the wetting front at a rate of 4 inches per day, reaching 20-foot depth within a month and developing a downward gradient in moisture potential, allowing recharge to take place. Soil moistures remained near saturation throughout the duration of playa flooding.

Importantly, the presence of an unsaturated soil profile a several feet beneath ponded water indicates that the top several feet of soil control the infiltration rate from the playa. If the hydraulic conductivity of the playa soil decreased with depth as a result of increasing compaction or development of cemented layers in the soil, we would expect to find saturated soils extending throughout the profile.

Using the time lag between arrivals of the interstitial wetting front at successive depths, we estimate travel times and infiltration rates for successive soil horizons (Table 3-5). We find that infiltration estimates derived from changes in soil moisture content mirror infiltration estimates from water balance calculations. The moisture movement from the surface to 3.3 feet in depth travels at a rate of approximately 0.4 inches per day. The change in volumetric moisture content from the pre-flood value of 33 percent to the saturation moisture content of 49 percent by volume reached in September 2014 shows that the wetting front increased soil moisture by an average of 16 percent in the top 3.3 feet of soil. Multiplying the migration rate by the water volume change gives an estimated interstitial infiltration rate through the top 3.3 feet of soil of 0.066 inches per day, with lower values deeper in the soil column. The average infiltration rate for the top 13 feet of soil is 0.042 inches per day. For comparison, the average infiltration rate for the 2014 flood event derived from the water balance measurements is 0.045 inches per day.

Table 3-5. Infiltration rates estimated from soil moisture measurements at FLRNG playa

Depth, feet	Start date	End date	Time, days	Wetting front migration, inches/day	Initial volumetric moisture content	Final volumetric moisture content	Moisture content change, percent	Infiltration, inches/day
0-3.3	5/26/2014	8/29/2014	95	0.41	0.33	0.49	0.16	0.066
3.3-6.6	8/29/2014	11/23/2014	86	0.46	0.38	0.49	0.11	0.050
6.6-9.9	11/23/2014	2/12/2015	81	0.48	0.35	0.41	0.05	0.024
9.9-13.1	2/12/2015	6/12/2015	120	0.33	0.41	0.49	0.08	0.026

Moisture tension can also be related to volumetric moisture content and used to estimate infiltration rates. We calculated total changes in soil moisture at the playa center using the heat dissipation sensor data for the periods before and after water ponded in early June 2014. We converted the sensor response to moisture tension using the procedures outlined by Reece (1996) and Flint, Campbell, Ellett, and Callissendorff (2002). We estimate that a total of 7.9 inches of water infiltrated the soil column in the playa center between May and June 2014, prior to ponding, and another 6.4 inches of water infiltrated after ponding between mid-June 2014 and the end of the year (Table 3-6). The latter figure agrees reasonably well with the 5.9-inch infiltration estimate derived from the water balance measurements. Estimating water volumes from the point values for soil moisture measured by the heat dissipation sensors is problematic, especially for the pre-flood runoff, which is probably not uniformly distributed across the playa or across blocks of soil separated by desiccation cracks and other soil structures. These moisture content estimates also are based on the moisture retention curve derived for near-surface soil; our estimates for deeper soil horizons are more uncertain because of changes in soil texture and compaction with depth.

Similar calculations for the Mahagan playa for flood events in 2012 and 2013 (Figure 3-12 and Table 3-7) also give good agreement with infiltration estimates from the water balance. The 2012 flood event had an initial depth of 7.5 inches of water with 6.5 inches infiltration estimated from the water balance. Soil moisture data gave a 6.48-inch infiltration estimate. The 2013 flood event had an initial depth of 28.7 inches with 8.03 inches infiltration from the water balance and 7.83 inches from soil moisture data. Following the 2014 flood event, subsurface soils stayed largely saturated and the subsequent flood events in 2014 and 2015 produced minimal changes in soil moisture. Thus, water balance measurements for 2014 and 2015 could not be verified using soil moisture data. Since the soil profile was largely saturated at the start of the 2015 flood event, any infiltration that year must have displaced stored moisture downward past the maximum depth of our instrumentation. Unfortunately, we do not have any groundwater level data for this site.

Table 3-6. Soil moisture water balance calculations, FLRNG playa, in percent by volume

Depth, meters	5/8/14 moisture content	7/1/14 moisture content	12/1/14 moisture content	Moisture change, 5/28 to 7/1	Moisture change, 7/1 to 12/1
1	33	44.75	49	11.75	4.25
1.5	32.5	42.25	47	9.75	4.75
2	34.25	38.75	50	4.5	11.25
3	32.75	33.25	36.5	0.5	3.25
4	41.25	41	41.25	-0.25	0.25
5	38.75	39.5	39.5	0.75	0
6	38.75	39	39.5	0.25	0.5
Total pre-flood infiltration, inches of water				7.93	
Post-flood infiltration, July to Dec, inches of water					6.40

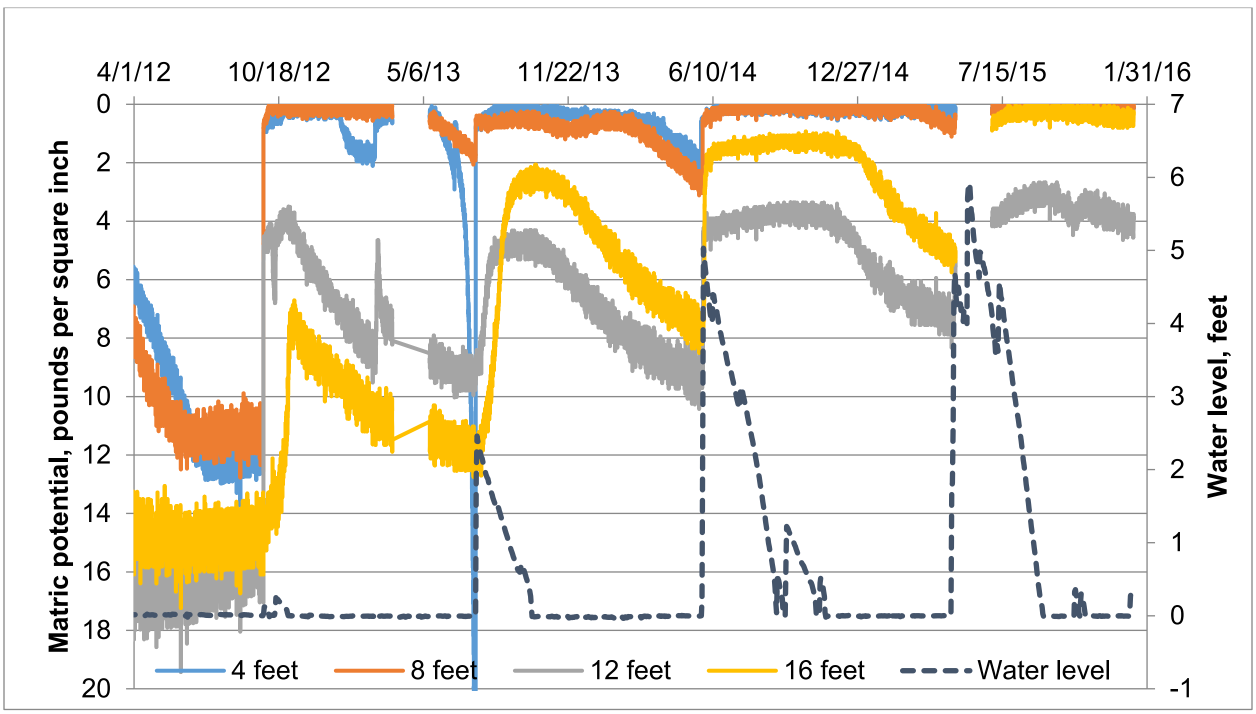


Figure 3-13. Soil moisture and playa water level data for the Mahagan site.

Table 3-7. Soil moisture water balance calculations, Mahagan site, in percent by volume

Depth, feet	Moisture content, 9/15/12	Moisture content, 11/11/12	Moisture content, 7/16/13	Moisture content, 10/1/13	Moisture change, 9/12 to 11/12	Moisture change, 7/13 to 10/13
4	44.5	49	39.5	50	4.5	10.5
8	44.75	48	48.2	49	3.25	0.8
12	43.5	47	45.5	47	3.5	1.5
16	43.75	46	44.5	48	2.25	3.5
2012 soil moisture flux, inches of water					6.5	
2012 water balance flux, inches of water					6.5	
2013 soil moisture flux, inches of water						7.8
2013 water balance flux, inches of water						8.0

Similar calculations for the Myatt playa result in 2012 infiltration estimates of 18.8 inches and 16.8 inches for the water balance and soil moisture methods, respectively. For the 2013 flood event, infiltration estimates are 3.9 and 7.0 inches for water balance and soil moisture, while for 2014 the values are 3.9 inches and 14.2 inches for water balance and soil moisture. The spread in values is likely a result of applying the moisture retention curves for soil from FLRNG playa to sites with different soil properties, as well as movement of water past the depth of the soil moisture sensors in 2013 and 2014 as the soil column became more fully saturated.

3.5.2 Bromide tracer test results

We applied a calcium bromide solution to the soil at three locations in the FLRNG playa as another method of tracing soil moisture movement. Bromide is a widely-used groundwater tracer. Bromide has a very low background concentration and in solution it acts as a conservative ion and has little or no reactivity with soil materials that might slow tracer movement with respect to the water itself (Davis, Campbell, Bentley, and Flynn, 1985). We used calcium bromide instead of sodium bromide to prevent sodium absorption and swelling in the clay-rich playa soils. The soil map of the playa (Figure 3-13) shows that the center site is on Randall clay, the south site is on Olton clay loam, and the north site is mostly on Randall clay with a small area of Estacado clay loam (NRCS, 2017). In the field, the north site appeared to be an erosional area where the playa was cutting into the uplands to the north; the south site was at the distal end of a drainage channel discharging sandy sediment to the playa, while the center received little sediment input. The entire playa bottom was vegetated with grasses and smartweed.

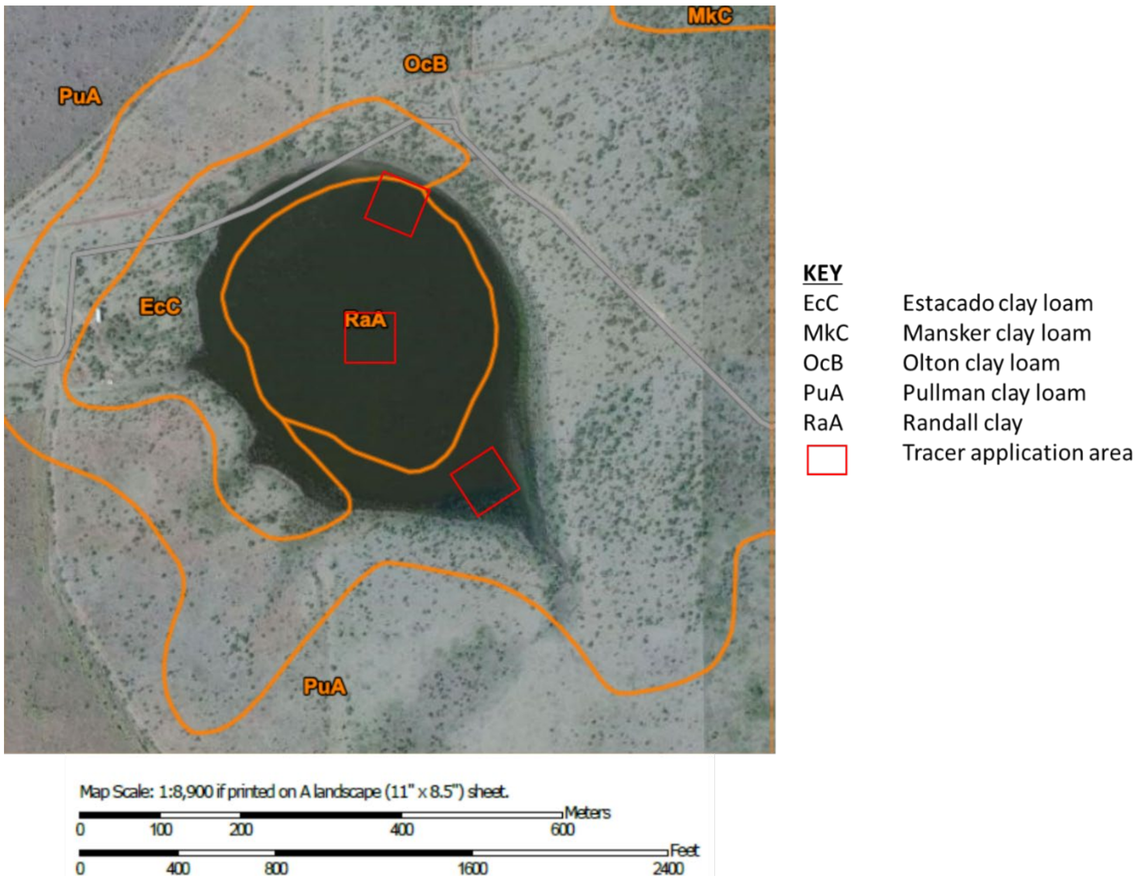


Figure 3-14. Soil map of the FLRNG playa, showing locations of the tracer application areas. (adapted from NRCS, 2017.

Analytical results for soil samples collected after the 2014 flood event, in January 2015 at the north and south plots and in April 2015 at the center plot, show the depth of bromide penetration with the infiltrated moisture (Figure 3-15, left side). At the north plot, the peak bromide concentration is displaced to a depth of six feet, with a maximum detected depth of eight feet. In the playa center, the bromide is evenly dispersed from the surface to eight feet and the deepest detection above background concentration is nine feet deep. At the southeast plot, the peak bromide concentration is displaced to a depth of five feet, but concentrations above background are detected to a depth of 10 feet. We interpret the April 2015 tracer results to reflect a mixture of macro-pore and matrix flow. The north and south sites both show double peaks, with a small near-surface peak and a larger peak at five- to six- foot depth; the deeper peaks may represent the depth of macro-pore flow while the shallow peaks represent the depth of matrix flow. The center site does not show a clear bimodal distribution of flowpaths.

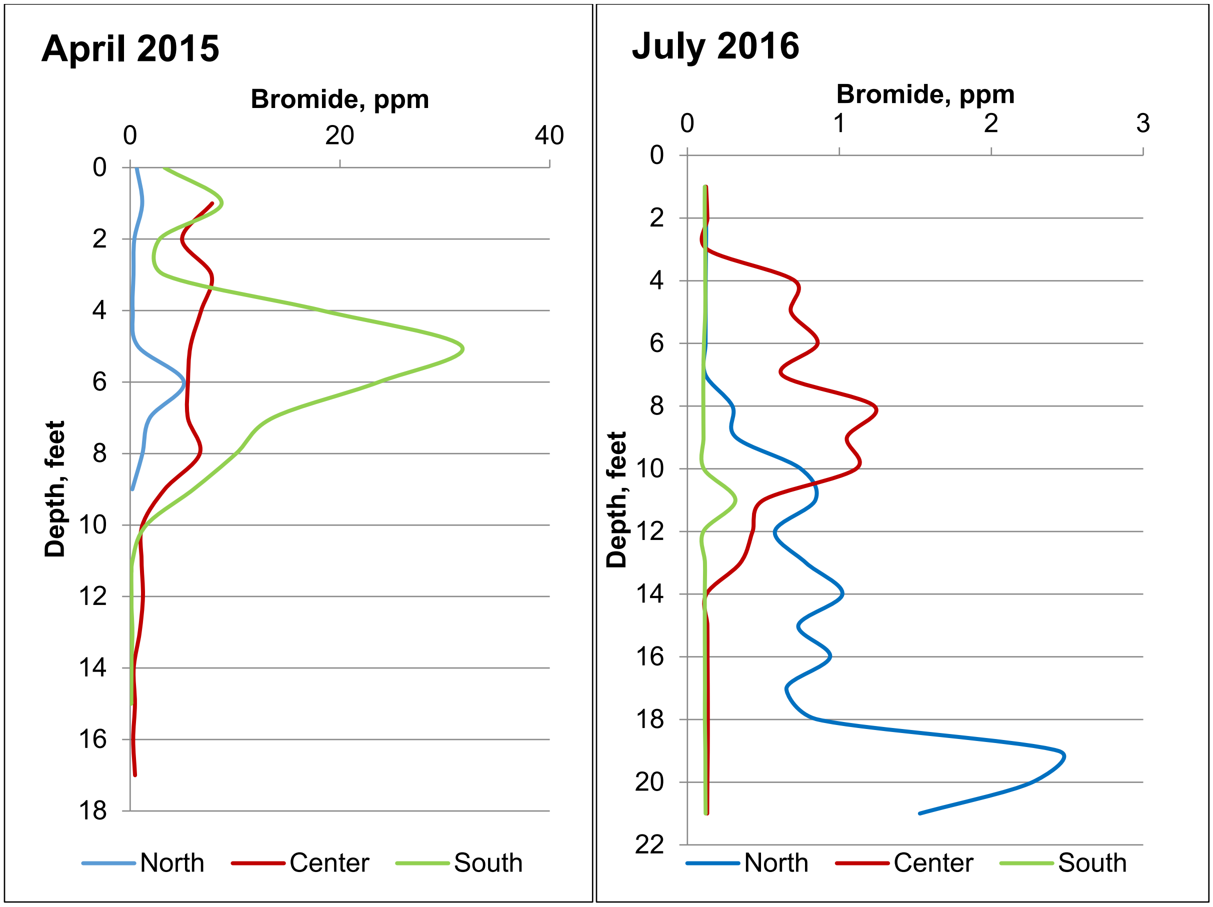


Figure 3-15. **Left: April 2015 tracer results for the FLRNG playa. Right: July 2016 tracer results for the FLRNG playa. Note: ppm = parts per million.**

Bromide concentrations in soil samples collected in July 2016, after the 2015 flood event, reflect additional infiltration under matrix flow conditions since the soil profile remained saturated during the entire interval (Figure 3-15, right). At the north site, the maximum bromide concentration shifted from six feet to 19 feet below ground surface, and detectable concentrations of bromide were present at 21 feet, the maximum depth sampled. Bromide concentrations above background remained in all samples below eight feet, while no bromide was detected in samples from one to seven feet below ground surface. At the center site, the maximum bromide concentration remained at eight feet, but there was a sharp decline in concentration below 10 feet and the maximum depth of bromide detection increased to 13 feet. At the south site, the 2016 depth of the peak bromide concentration was at 11 feet and no bromide was detected above background in any other samples from that site; it is possible that the actual peak concentration is deeper than the maximum depth sampled.

We calculated tracer migration rates from the tracer results using the depth of the 'peak' concentration and multiplied the migration rates by the average soil volumetric moisture content at each site to obtain estimated infiltration rates (Table 3-8). The center infiltration rate is slightly lower than estimates from water balance calculations while the north rate is substantially higher, and the south has an intermediate rate. If we accept the 0.055 inches per day 2015 infiltration rate from the water balance and combine the center and south sites together in a zone with an average infiltration of 0.03 inches per day, then we find that the north zone contributes approximately 50 percent of the total infiltration.

Table 3-8. Tracer data analysis

	Sample dates			Elapsed time, days			Peak depth, feet		
	Center	**North**	**South**	**Center**	**North**	**South**	**Center**	**North**	**South**
tracer applied	5/1/2014	5/1/2014	5/1/2014	0	0	0	0	0	0
1st samples	4/15/2015	1/13/2015	1/13/2015	349	257	257	8	6	5
2nd samples	7/20/2016	7/20/2016	7/20/2016	462	554	554	10	19	11
Migration rates, inches per day							0.051	0.28	0.13
Infiltration rates, inches per day							0.027	0.079	0.032

3.5.3 Soil displacement data

The soil displacement sensors or extensometers, installed at two depths in the FLRNG playa center, give another independent measurement of changes in the total water volume in the playa over time, including both soil moisture and free water at the surface. The extensometer at 13.1-foot depth drifted off-scale before flooding occurred, but the extensometer at 20-foot depth provided a clear response to runoff and flooding events in May and June 2014 before the access tube filled with water and shorted the instrument out in early July. Based on the observed 0.332 volt response to an additional 16.9 inches water added to the already flooded playa in early July 2014, and assuming a linear response curve, we estimate that a total of 12.2 inches of water were added to the playa on June 9, of which 5.5 inches ponded at the surface, and that 4.7 inches of soil water were added by the storm event on May 26, 2014, which did not cause surface flooding (Figure 3-15).

The extensometer data show that a total of 33.8 inches of water were added to the playa between May 15 and July 4, 2014. An estimated 11.4 inches of water from the storm events infiltrated the soil before water first ponded in the playa on June 9, 2014 (16.9 inches total water from the extensometer estimates minus 5.5 inches free water measured at the surface on June 10). This is approximately 3.9 inches more than the estimate derived from the changes in moisture content measured by the heat dissipation sensors. Given all the uncertainties in each of the measurement systems, this level of agreement is good.

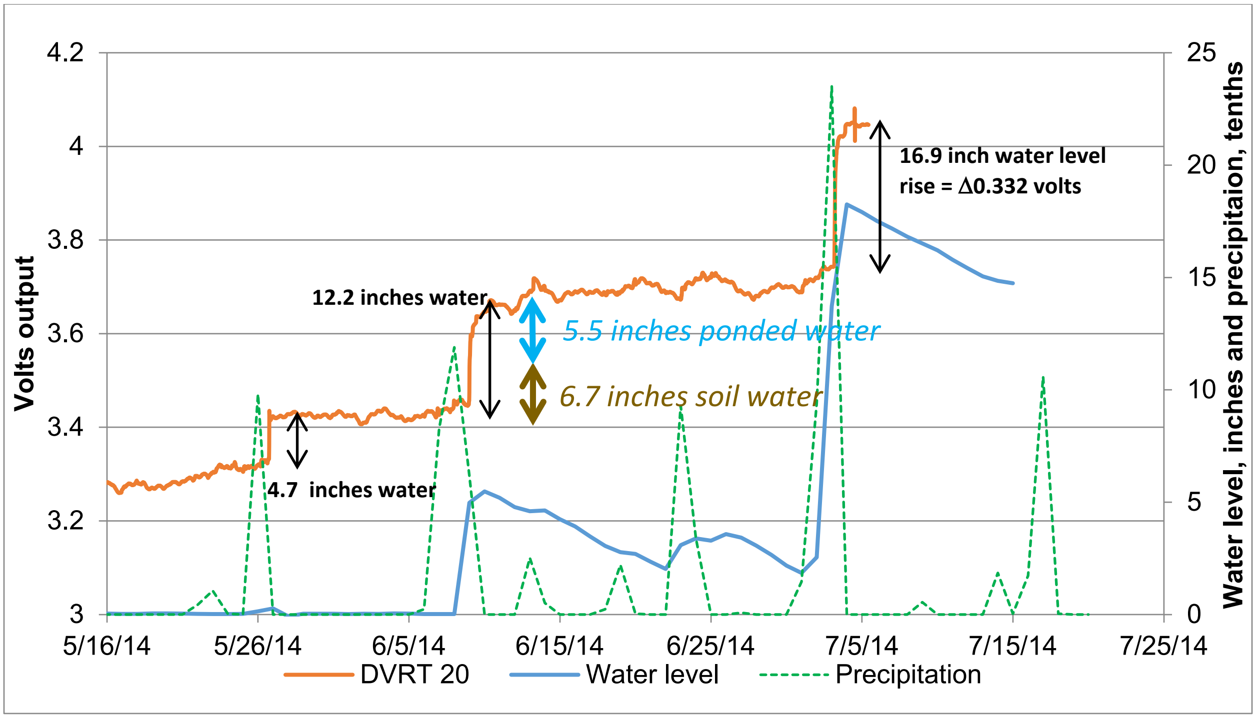


Figure 3-16. **Extensometer response, 20-foot depth, at FLRNG playa center.**

Interestingly, the total mass of water measured by the extensometers does not show any decline after the peak of each runoff event, as water evaporates from the playa surface and/or moves through the soil profile and past the depth at which the extensometer is placed. There was over three inches of evaporation from June 10 through June 23, 2014, but the extensometer response does not reflect any mass loss over this period. There are several possible explanations for this, including some hysteresis in the soil response to water loading or inelastic soil response to loading under field conditions. Soil swelling in response to increased moisture is unlikely since the soil at the extensometer anchor point at 20-foot depth did not respond to the flooding until June 2015, nearly a year after the 2014 flood event. The extensometers provide an intriguing perspective on soil dynamics, but future applications in playa settings will require more robust installation procedures to withstand flooding.

Although we cannot rule out the possibility that some runoff penetrates past the depth of our sensors through macro-pore flow and escapes measurement, we believe the volumes involved are limited. First, our data suggest that deep conduits are much less common than surface cracks. Deep soils have much more stable moisture regimes and consequently are less prone to cracking. If there were a pervasive network of deep macro-pores, then we would expect to see rapid changes in deep soil moisture during flooding, which we do not. Second, deep macro-pore flow is restricted to a matter of hours after the beginning of a runoff event. The cracks and openings in the near-surface soils largely swell shut within the first day of flooding, effectively limiting macro-pore flow. Ben-Hur and Lado (2008) found that slaking forces associated with differential swelling, escape of entrapped air, release of heat during wetting, and action of moving water can break down clay aggregates and effectively seal Vertisol cracks. They found that the faster the wetting process, the greater these slaking forces are, limiting deep infiltration under rapid flood conditions. Third, macro-pore flow only applies to a subset of flood events occurring into playa basins under dry conditions, when there is a network of open desiccation cracks. While some macro-pores, such as burrows and root-tubes, are present under moist soil conditions, these features have a smaller cross-sectional area and therefore a smaller effect on infiltration than surface cracks. Finally, we recall the experience of previous generations of water researchers in the Texas Panhandle, whose efforts to use playa water in recharge wells in a set of tests during the 1960s ran into difficulties associated with sediment plugging, even with well-engineered systems (Hauser and Lotspeich, 1968). Playa flood waters carry a high sediment load that quickly plugs openings in porous media.

For these reasons, we believe that the soil moisture data generated by this project are an accurate representation of the extent of macro-pore flow in playa settings. Runoff events can quickly add large amounts of water to the soil profile as flood water enters cracks, but macro-pores do not provide a direct conduit to the underlying aquifer and macro-pore flow by itself does not typically bring the soil to saturation. Moving water from the soil profile down to the aquifer is likely through matrix flow, requires progressive saturation of deeper soils, and probably requires multiple flood events.

3.6 From infiltration to recharge

How quickly does soil moisture move through the unsaturated zone to the Ogallala Aquifer? At most sites, we did not have monitor wells to observe aquifer response to playa flooding and our data don't do much to help answer this question. And at most of the sites where we did monitor groundwater levels, we did not see any aquifer response to playa flooding. However, data from one site does show a groundwater response to surface flooding and helps us better understand the unsaturated zone flow processes involved in moving from infiltration to recharge.

Water level data from an unused irrigation well within 25 feet of the Hollenstein playa show apparent recharge beginning approximately one month after the May 2015 flooding, which reached up to the base of the well at its maximum extent (Figure 3-16). The water level in the monitoring well rose 21.7 inches from about 122 feet below ground surface to a maximum of 120.2 feet below ground surface over a period of about 90 days, then gradually declined to 120.7 feet below ground surface and stabilized at that level as the flood water in the playa dried up (Figure 3-17). Water level fluctuations have been widely used to estimate groundwater recharge (Freeze and Cherry, 1979; Healy and Cook, 2002; USGS, 2017). Recharge is calculated as the product of the water level rise and the aquifer specific yield:

$$R(\mathrm{t_j}) = Sy^* \Delta H(\mathrm{t_j})$$

Where:

$R(t_j)$ (inches) is recharge occurring between times t_0 and t_j,
Sy is specific yield (dimensionless), and
$\Delta H(t_j)$ is the peak water level rise attributed to the recharge period (inches).

Using a value of 0.15 for the Ogallala Aquifer specific yield and 21.7 inches for ΔH(tj) gives a recharge estimate of 3.25 inches, or less than five percent of the total water associated with the 2015 flooding. This equates to a total recharge from the 22 acres of water area of six acre-feet.

Actual recharge is likely larger than this estimate because recharge was not a discrete event, but continued over a period of months, and the slow rate of water table rise below the playa allows the recharging water to disperse laterally away from the well.

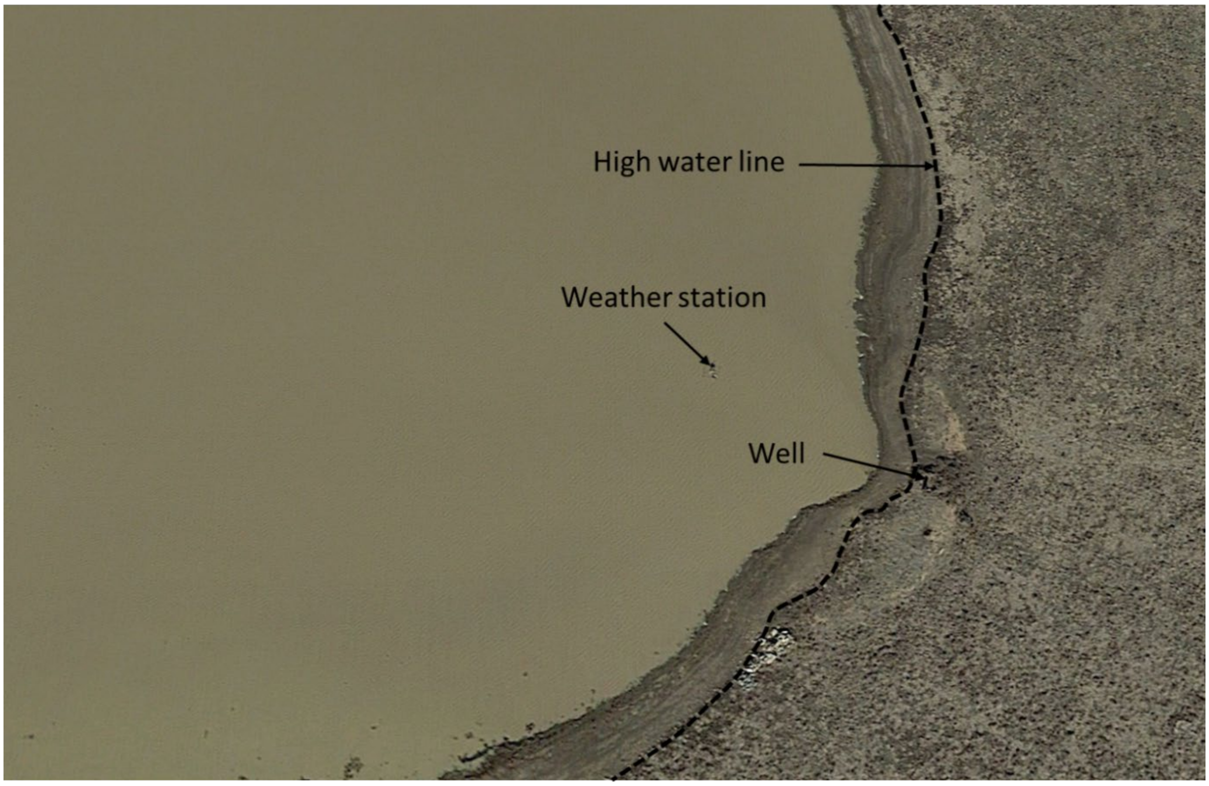


Figure 3-17. Well location and extent of 2015 flooding, Hollenstein playa.

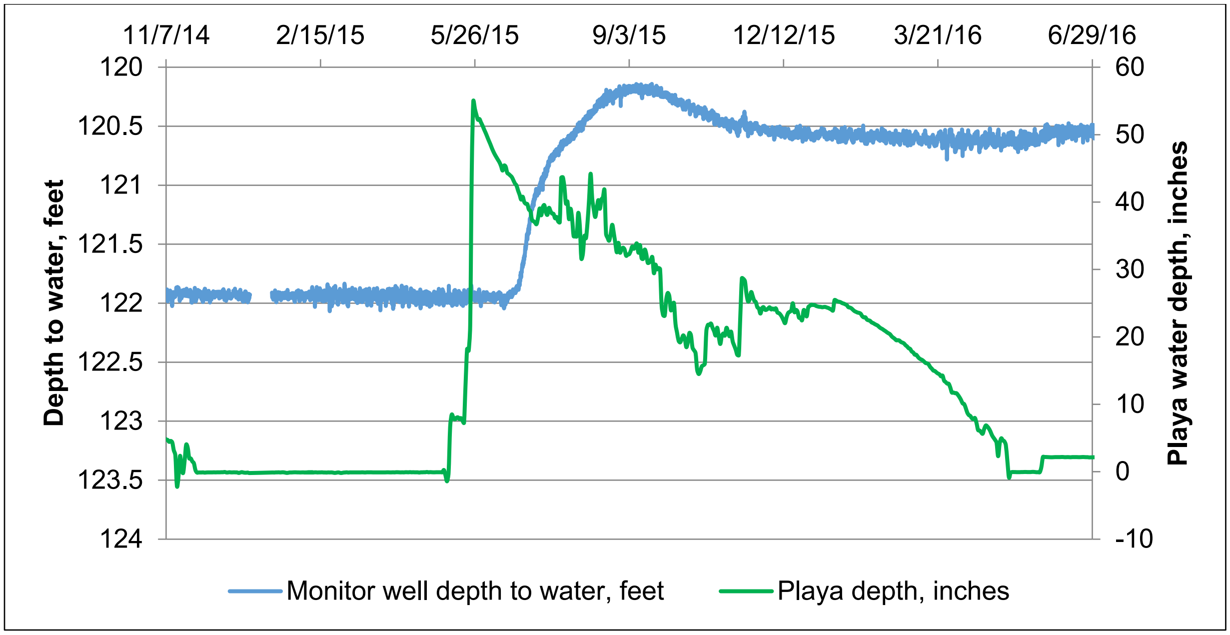


Figure 3-18. Depth to groundwater and playa water level, Hollenstein site. Playa water level data for July through December 2015 are approximate; mud repeatedly clogged the pressure transducer during this interval.

Unfortunately, the Hollenstein playa water level data for much of the 2015 flood event are unusable because mud repeatedly clogged the pressure transducers, so we do not have a good infiltration estimate from the water balance calculations. Using the effective hydraulic estimates from before and after the transducers were clogged, which have a mean of 3×10^{-4} feet per day (1.0×10^{-2} centimeters per day) and median of 1.4×10^{-4} feet per day (4.4×10^{-3} centimeters per day), we calculate that infiltration from the 2015 flood totaled between 3.3 and 7.2 feet (100 and 220 centimeters). These water balance results suggest that the water level fluctuation method significantly underestimates recharge from playa lakes to the Ogallala Aquifer in the Southern High Plains.

We conducted a slug test in the Hollenstein well in January 2016, using a 4-foot long, 2.5-inch diameter weighted PVC slug, flowing the method outlined in Cunningham and Schalk (2011). We evaluated the results using the Bouwer-Rice method for partially penetrating wells (Halford and Kuniansky, 2002), and obtained a hydraulic conductivity value of 0.014 centimeters per second, or 39.4 feet per day, confirming that lateral movement in the aquifer is fast relative to the recharge rate. The 2015 recharge from the Hollenstein playa does not necessarily represent surface water flowing 120 feet (37 meters) through the unsaturated zone to the water table in a months' time.

Using an average saturation moisture content of 40 percent by volume, the soil column from the ground surface to 6 meters (20 feet) depth holds approximately eight feet (240 centimeters) of water. The soil moisture data for the site indicate that smaller flood events in 2012, 2013, and 2014 had progressively saturated this soil column and it remained near saturation before the May 2015 flood began. As the 2015 flood water entered the soil column, the water infiltrated during previous flood events was displaced downward. The infiltration reaching the water table in June

2015 may represent flood water from years before this study was started. More detailed subsurface data and modeling are needed to accurately evaluate travel times for recharging water.

The time delay between surface events and groundwater recharge is important for groundwater management and water quality. From a water management perspective, it is important to know when infiltration will reach the water table and become available to wells completed in the aquifer. From a water quality perspective, the lag time is an important factor in attenuating chemical and biological contaminants and preventing groundwater pollution. Data from the Hollenstein site suggest that the lag time for recharge may be significantly less than the lag time for solute transport, even if the dissolved constituents are not reactive with the aquifer or unsaturated zone matrix.

Data from the Finley site offer another perspective on aquifer recharge from playa lakes. A 14-inch diameter recharge well was installed in the Finley playa in the early 1960's, by the current landowner's grandfather. The recharge well is constructed of slotted steel casing completed in sand at a total depth of approximately 100 feet with a loosely fitted steel cap on the top to allow water entry. In 2011, the TWDB installed a 2-inch PVC monitor well approximately 25 feet from the recharge well using an air rotary drill rig. During the monitor well installation, we observed air bubbling out of the water in the recharge well demonstrating good hydraulic connection between the two wells. Both wells were equipped with pressure transducers to monitor water level changes. Data from the monitoring well (Figure 3-19) clearly show recharge events associated with 2013 and 2015 flood events, which were deep enough to flow into the recharge well for periods of about 17 days and 365 days, respectively, but not from the small 2014 flood, which did not reach the opening of the recharge well, about 45 centimeters above the ground surface.

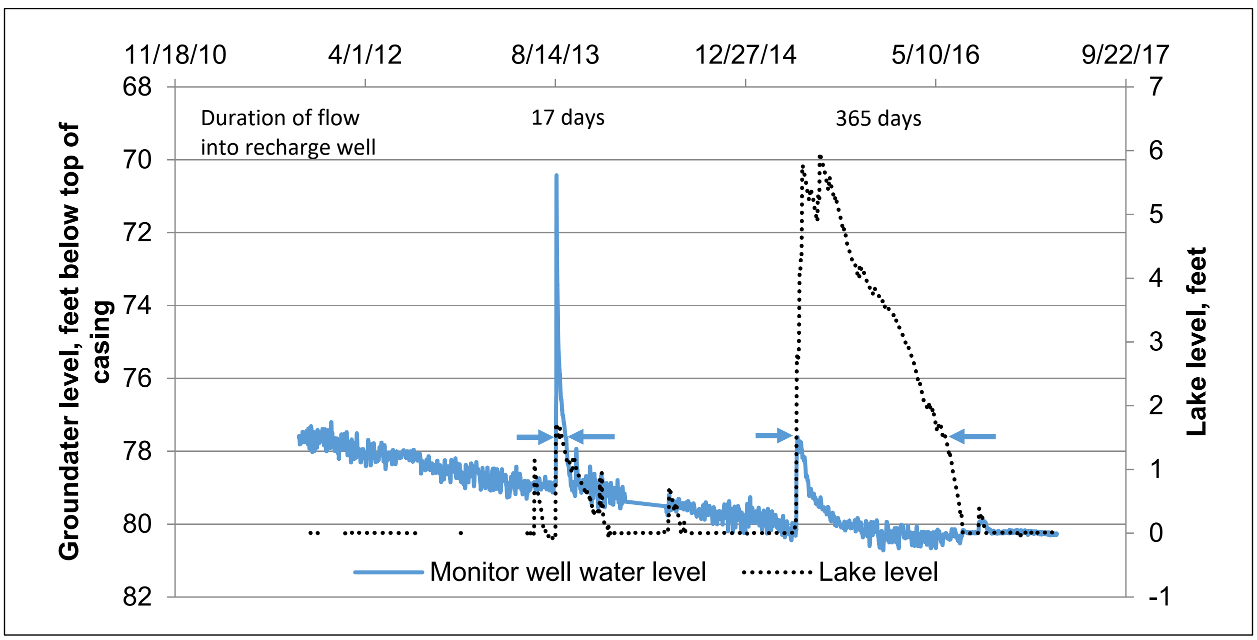


Figure 3-19. Water level records for the Finley monitor well and playa water level, 2011 to 2017.

When water from the 2013 flood event entered the recharge well, the water level in the monitor well increased by as much as nine feet and remained above its initial level over a period of about 40 days. After the lake level dropped below the top of the recharge well, the monitor well water level quickly returned to its initial level and resumed a long-term declining trend of about 0.5 feet per year. The rapid decline in the peak monitor well water level during the 17 days that the recharge well inlet remained below the lake level suggests that flow into the recharge well was initially rapid, but quickly declined, presumably because the formation was progressively plugged by sediment. The larger 2015 flood event produced a smaller response in the monitor well, increasing the water level by a maximum of just over two feet; the monitor well water level gradually declined back to baseline conditions over a period of about four months, even though the recharge well remained submerged and open to the lake for nearly one year.

In both cases, inflow from the recharge well behaved more like a slug of water added to the aquifer rather than a sustained recharge flow, and had a small, localized effect on the groundwater system, as reflected in the contrasting shape of the hydrographs from the Hollenstein well and the Finley well. At the Hollenstein site, the monitor well water level rose gradually in response to inflow over a broad area and maintained an increased elevation after the recharge period ended. At the Finley site, the monitor well water level increased abruptly and then declined back to its original level even before the flood event ended.

The High Plains Underground Water Conservation District No. 1 also maintains a network of observation wells across the Southern High Plains, and several of their wells are near playas. Water levels in most High Plains Underground Water Conservation District No. 1 observation wells are only measured annually, making it difficult to resolve the daily or seasonal impacts of pumping on water level changes, but a smaller number are equipped with pressure transducers and collected daily measurements; a still smaller subset of these daily wells have been active for at least five years and are free of major interference by nearby irrigation wells. Most of this subset of wells show no discernable evidence of recharge associated with 2015 playa flooding. At least one High Plains Underground Water Conservation District No. 1 observation well, identified as transducer well 183, located within 2,000 feet of a 97-acre playa, shows an abrupt change in trend in October 2015 (Figure 3-20), like the recharge signal at the Hollenstein well. The water level in well 183 rose approximately two feet between October 2015 and December 2016, from 134.75 feet below ground surface to 132.75 feet below ground surface.

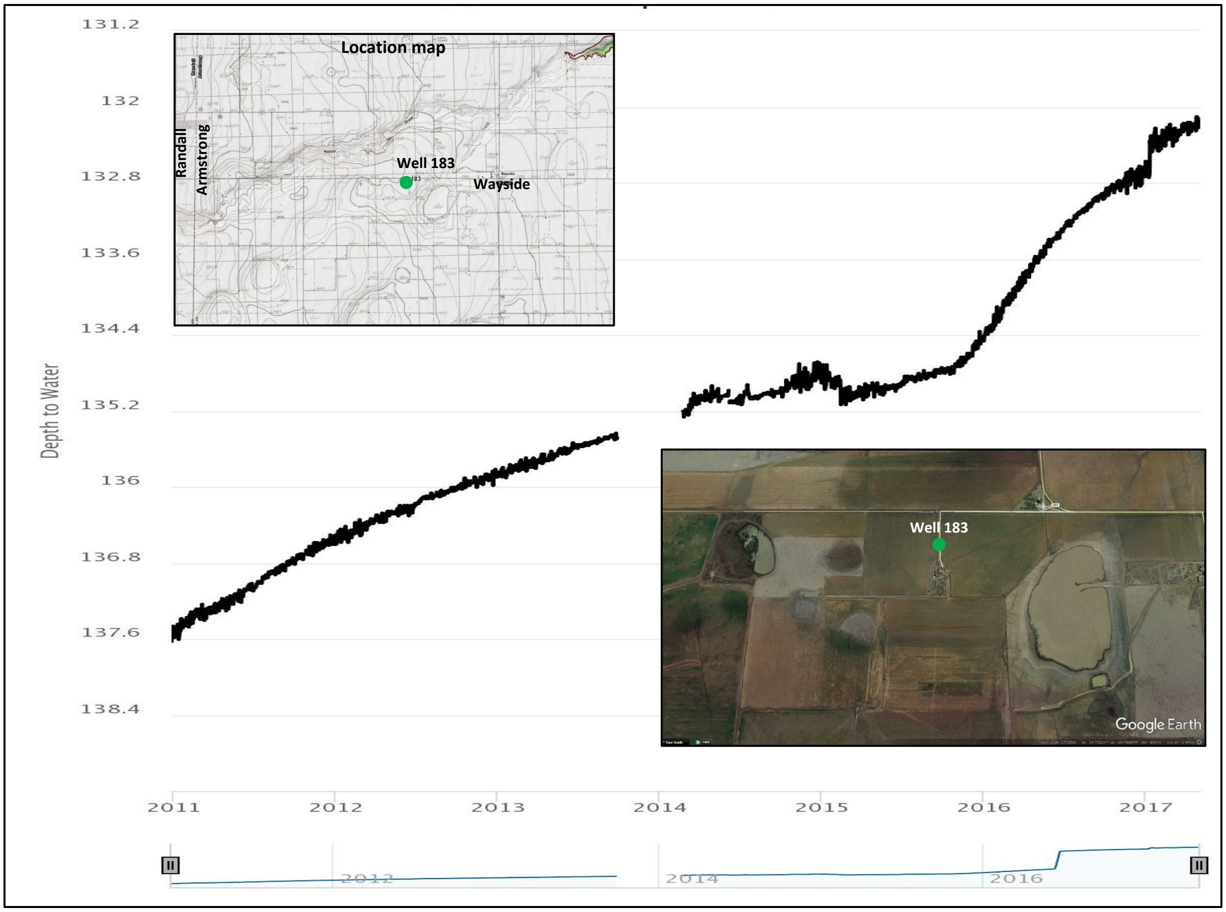


Figure 3-20. Hydrograph for High Plains Underground Water Conservation District No. 1 transducer well 183, near Wayside, TX, showing increased recharge starting in October 2015. Inset shows extent of playa flooding near well as of February 7, 2016 (from High Plains Water District, 2017 and Google Earth).

Another High Plains Underground Water Conservation District No. 1 observation well, state well 23-35-710, which is located near a large playa near Slaton, southeast of Lubbock, TX, also shows evidence of recharge. Only annual observations are available for well 23-35-710 (Figure 3-21), but they show a reversal from a generally declining trend in 2016, with the water level rising approximately 7.5 feet from the 2015 level, from 173.85 feet below ground surface in 2015 to 166.3 feet below ground surface in 2016. A smaller increase in water level is also seen in 2011, following locally extensive flooding in 2010.

These examples are insufficient in number to support any general conclusions about regional groundwater recharge dynamics, but they do indicate that recharge at the water table is detectable even in areas with an unsaturated zone thickness exceeding 120 feet and that recharge can occur within months of surface flooding events. As the High Plains Underground Water Conservation District No. 1 and the TWDB deploy more daily water level recorders, and especially if those recorders are deployed in locations away from active irrigation wells but near playas, we should be able to better assess the timing and magnitude of groundwater recharge events associated with surface flooding.

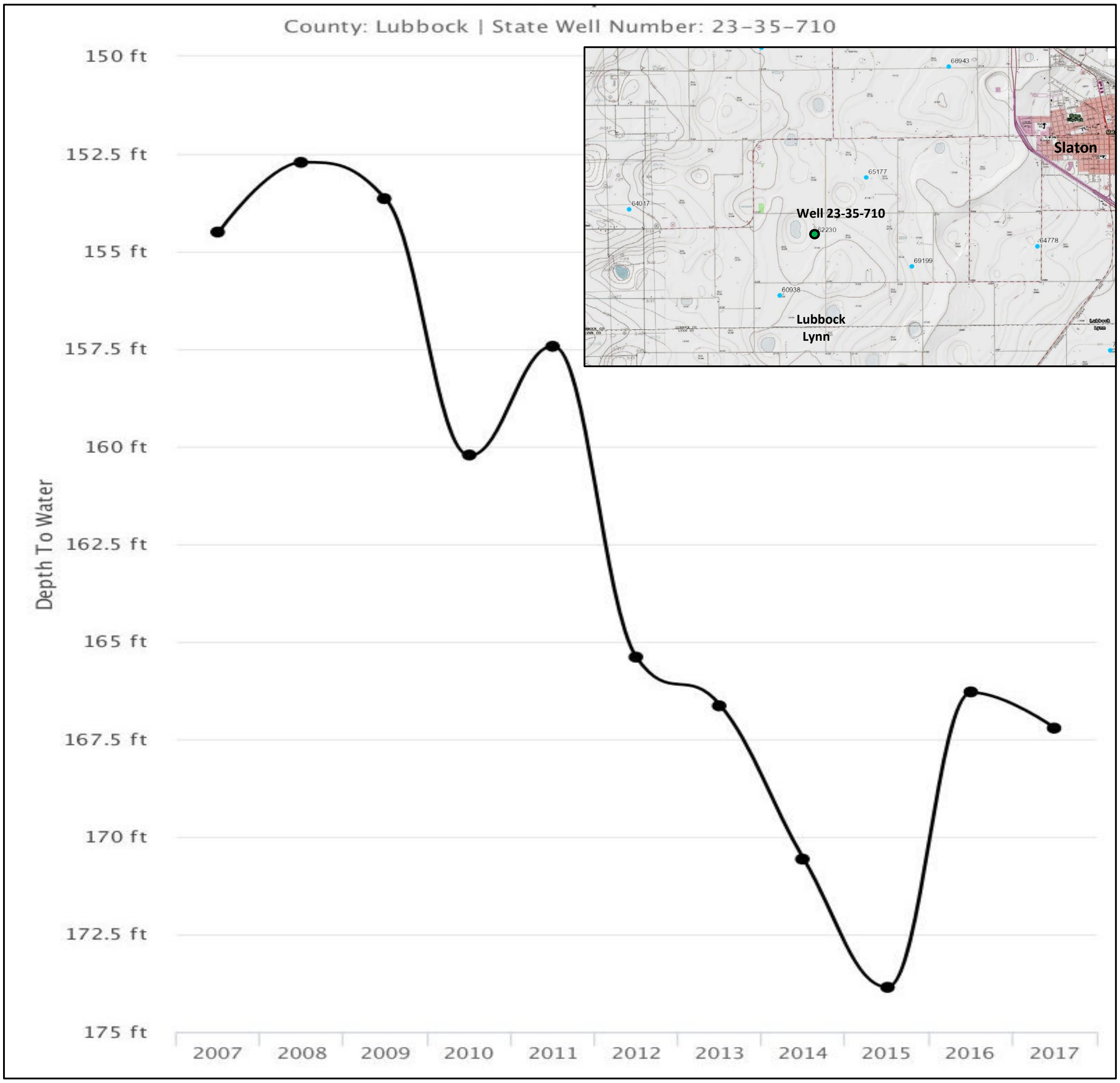


Figure 3-21. **Hydrograph for well 23-35-710, near Slaton, TX. No Google Earth imagery from 2015 is available for this site (from High Plains Water District, 2017).**

4.0 Conclusions

The total water volume collected in Texas playas is significantly less than previously estimated. The results of this study indicate that the average volume of water captured by playas in Texas is approximately 220,000 acre-feet per year for the period from 1996 to 2017. This value is approximately 10 percent of the 'conservative' estimate of 2 million acre-feet per year published by the U.S. Bureau of Reclamation in 1982. On average, the playas in this study held water less than 20 percent of the time, much less than was estimated in previous satellite data surveys (Howard and others, 2003). Current data do not indicate any long-term trends in playa water volume since 1996, but changes in land-use and farming practices between the 1960s and the

1990s have contributed to major changes in the landscape hydrology of the Southern High Plains and have potentially reduced runoff to the playas from the levels seen during the height of furrow-flood irrigation in the 1960s.

The estimated water volume captured by playa lakes represents a small fraction of groundwater usage in the region. Total groundwater pumping from the Ogallala Aquifer in Texas averaged approximately 7.6 million acre-feet per year from 2010 through 2015 (TWDB, 2016); playa water resources represent just 2.9 percent of that amount. Given the comparatively small volume of water captured in playas, more intensive utilization of playas for groundwater recharge cannot offset the regional drawdown of the Ogallala Aquifer in response to current irrigation demands. At a local scale, playas may be a viable source of recharge for some small-volume, high value applications; such applications would require a detailed engineering analysis.

The distribution of infiltration from playas follows a general trend, increasing to the south and west across the Southern High Plains. Infiltration rates at 16 playas ranged from less than 0.04 inch (one millimeter) per day to over 0.8 inch (21 millimeters) per day during 2015 flooding. Infiltration accounted for between 11 and 77 percent of the total water volume captured in the playas, with an average of 36 percent. The remainder of the water evaporated. The general pattern of increasing playa infiltration to the south and west appears to be at odds with the recharge distribution used in the current groundwater availability model for the region, but more work is needed to assess the influence of rainfall distribution, soil type, playa density, and other factors relating the behavior of individual playas to the overall landscape hydrology. Infiltration rates at individual playas also vary with flood depth, in accordance with the basic principles of flow through porous media. We normalized infiltration rates by water depth to obtain an effective hydraulic conductivity for the playa bottom. The effective hydraulic conductivity has a more regular distribution across the study area than the infiltration rate because it does not depend on the water depth in the playa at the time of measurement and thus provides a better comparison between playas or between successive flood events at a single playa.

Overall, infiltration is dominated by flow through the soil matrix. We used a suite of heat dissipation sensors, tensiometers, and extensometers to monitor soil water movement and validate infiltration estimates from water balance calculations. These data show that macro-pore flow, largely into the extensive network of desiccation cracks that develops in Randall clay playa bottoms, dominates infiltration before playas flood. Small runoff events into dry playas may be entirely infiltrated into open networks of cracks. However, data from heat dissipation sensors shows that this initial pulse of water typically does not penetrate beyond six feet (two meters) depth and is prone to evapotranspiration and loss from the soil unless additional runoff is captured by the playa. Close analysis of soil moisture data collected during flood events indicates that surface ponding does not occur until the upper meter of soil is saturated, at which point surface cracks swell closed and deeper soil horizons may remain unsaturated for a period of weeks to months until the matrix infiltration wetting front advances through the soil profile. Deep infiltration, below the base of the root zone, generally depends on repeated flood events or deeper flooding that persists over periods of months, building a saturated soil profile.

We document measurable groundwater recharge occurring within a month of surface flooding through a 120-foot thick unsaturated zone at one playa, but groundwater below several other playa lakes instrumented as part of this research effort showed no evidence of recharge during the time period of the study. The observed recharge appears to be the product of repeated flood events that saturated at least the upper 20 feet of soil followed by a larger, prolonged flood that displaced soil moisture from previous events downward, rather than rapid soil water transport through the entire depth of the unsaturated zone. Water level data from selected monitoring wells operated by High Plains Underground Water Conservation District No. 1 also indicates recharge potentially associated with playa flooding in 2015.

Water storage and recharge from Texas playas is dominated by the behavior of a relatively small number of large, deep playas. Most of the playas are small, with a median size of approximately 10 acres, and are correspondingly shallow. The few large, deep playas contain most of the water. At the maximum extent of flooding, in July 2015, the largest 10 percent of the monitored playas contained more water than the other 90 percent. These large lakes contribute most of the recharge. Because the water in these large lakes is deeper, it has relatively smaller surface area and evaporative losses are a smaller percentage of the total volume. The greater water depth also increases the pressure driving the water downward through the soil, proportionally increasing the infiltration rate. And because water stands in the larger, deeper lakes for longer, less of the soil moisture is subject to re-evaporation than for small lakes that rapidly dry out. More of the water in large playas percolates down past the root zone to depths where the wetlands vegetation cannot extract it after the surface water dries up.

4.1 Continued monitoring and potential applications

While the volume of water captured in Texas playa lakes is much less than irrigation demands, the hydrological behavior of the playas is worth monitoring for other reasons. Possible monitoring approaches are listed below.

- Continued monitoring of playa lake hydrology can be accomplished without maintaining an extensive network of sensors in the field. This project has demonstrated that Landsat imagery can be used to monitor water levels in playa lakes with a high degree of accuracy, especially when more than one satellite is operational. While this effort required field surveying to obtain topographic maps accurate enough to develop reliable rating curves for the playas, in the future, LIDAR data with centimeter-scale vertical resolution will be available for the entire state.
- When accurate digital elevation models are available, GIS tools to process multi-spectral Landsat data and quantify water areas for all playas in all cloud-free images can be developed and implemented, as demonstrated by Pekel, Cottam, Gorelick, and Belward (2016) in their global water resource mapping project.
- Once the appropriate tools are in place, maintaining an on-going long-term record of playa hydrology can be largely automated and extended for as long as Landsat satellites continue to provide multispectral imagery.
- Daily water level monitoring at selected wells near playas would help quantify recharge events, providing information useful for managing groundwater availability and groundwater quality. Data from this project and from High Plains Underground Water Conservation District No. 1 demonstrate that water level monitoring in wells adjacent to

playas can detect groundwater recharge events. Water level measurements on at least a daily frequency would help assess the timing and magnitude of recharge associated with surface processes.

- For a start, wells already in the TWDB and High Plains Underground Water Conservation District No. 1 water level monitoring networks should be evaluated for factors including proximity to playas that capture significant volumes of water and distance from active irrigation pumping. A selection of monitoring wells scoring highly on such criteria could be equipped with pressure transducers to record daily water levels. Communication links could be added to transmit data in real time but would increase the cost of the monitoring program several-fold.

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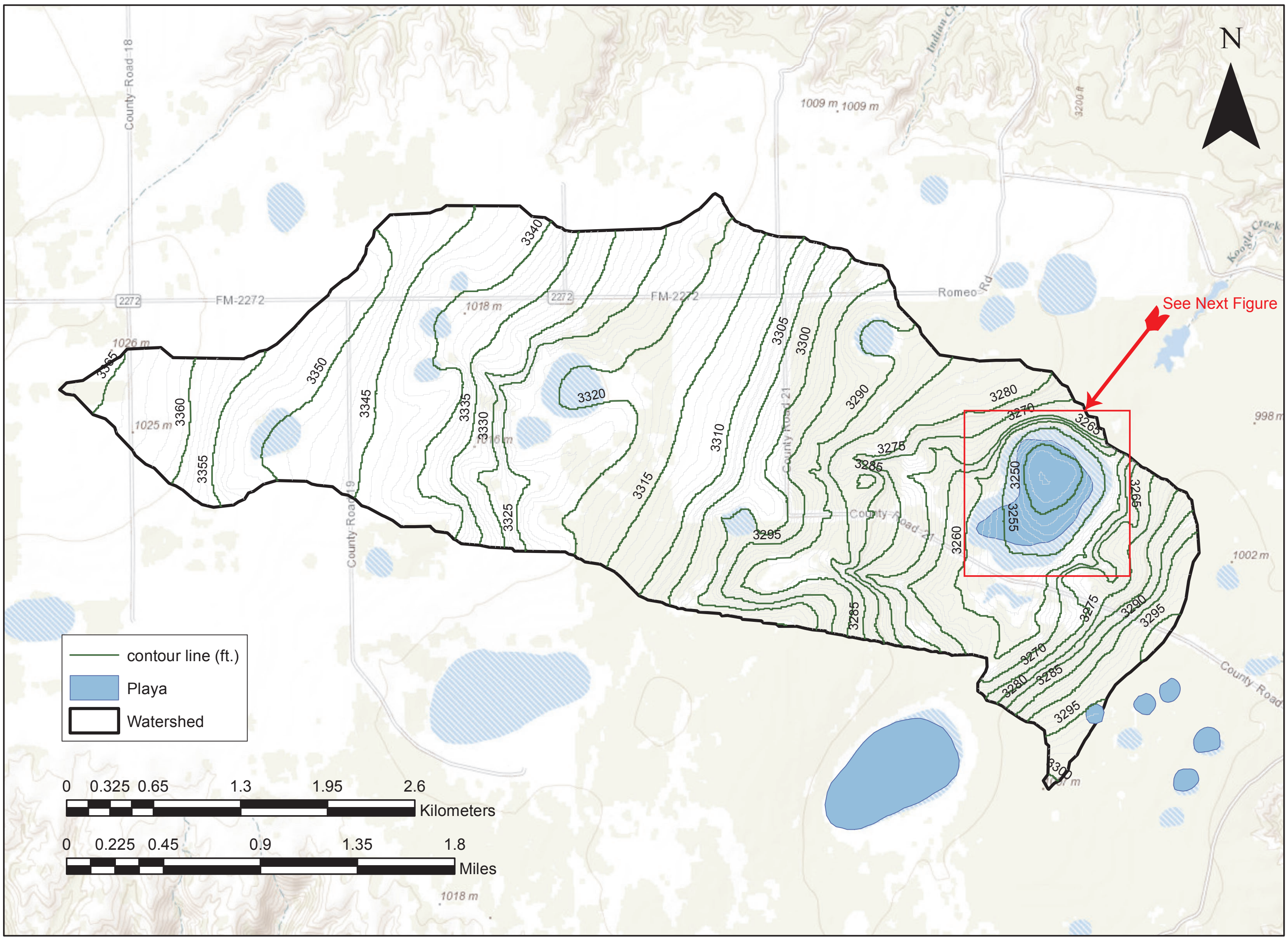
Attachment 1. Playa survey data

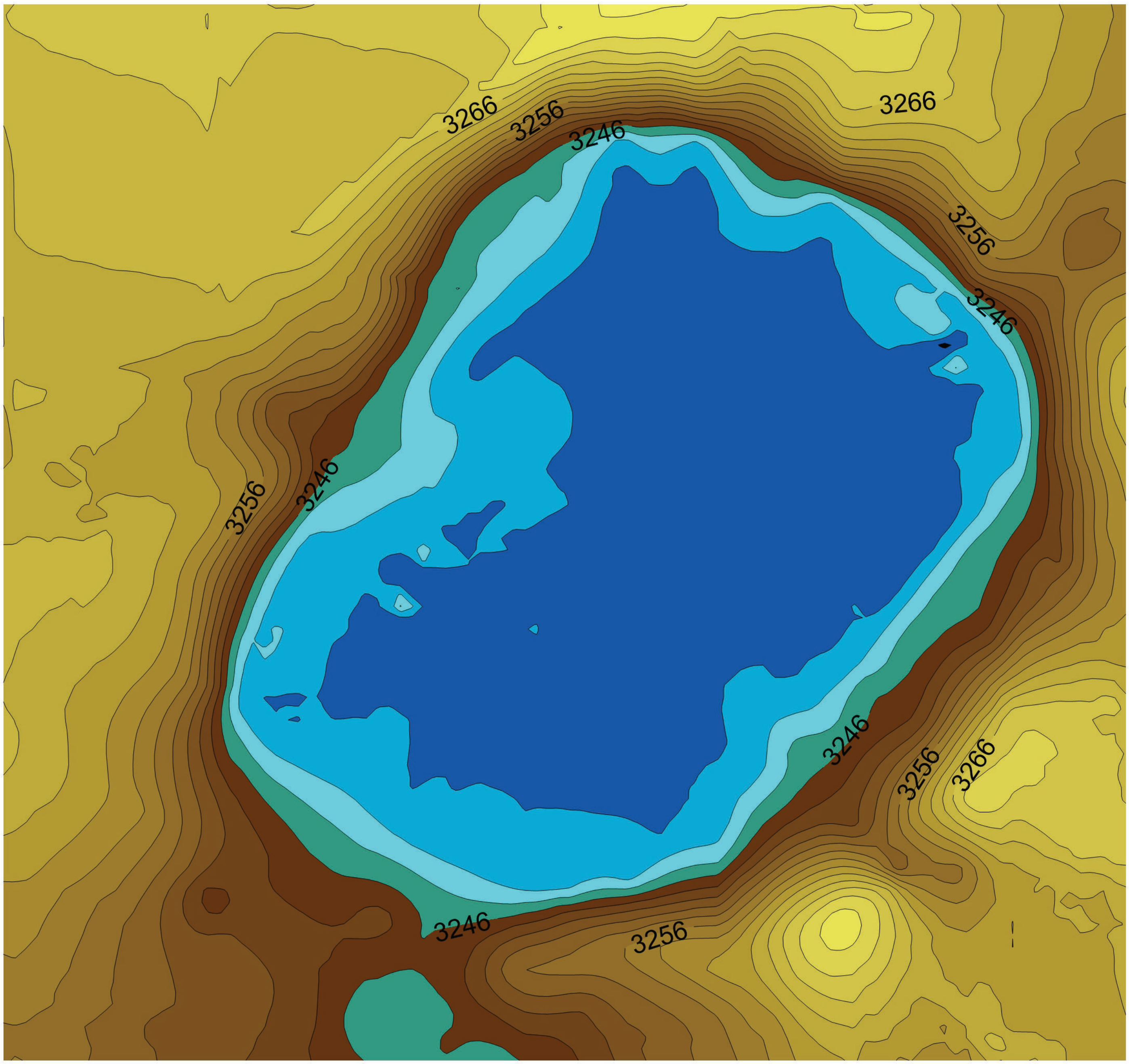
1A: Watershed and survey maps for weather station sites

1B: Survey maps for other sites

1C: Area-elevation and area-volume rating curves



Bivins North watershed map



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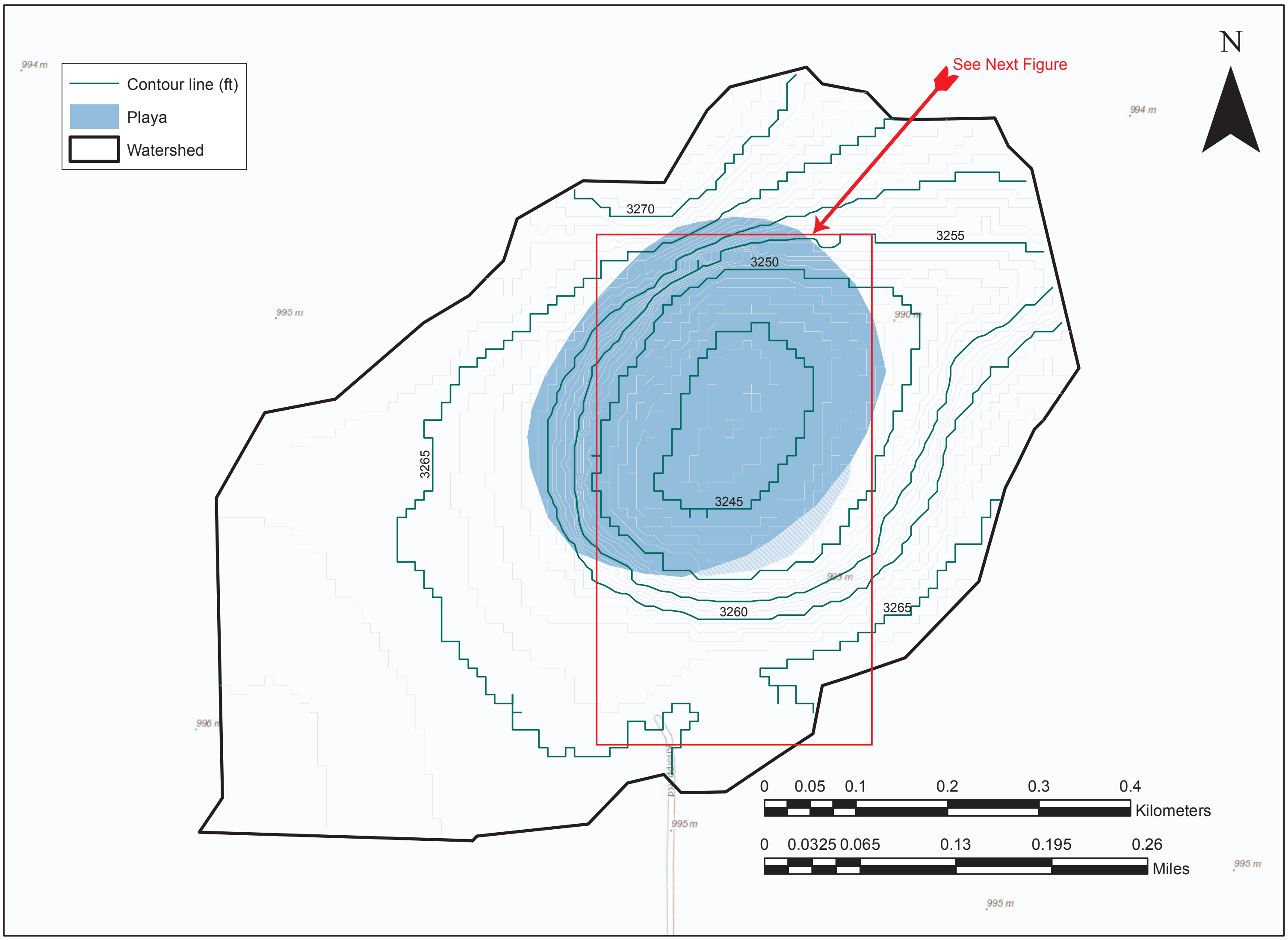
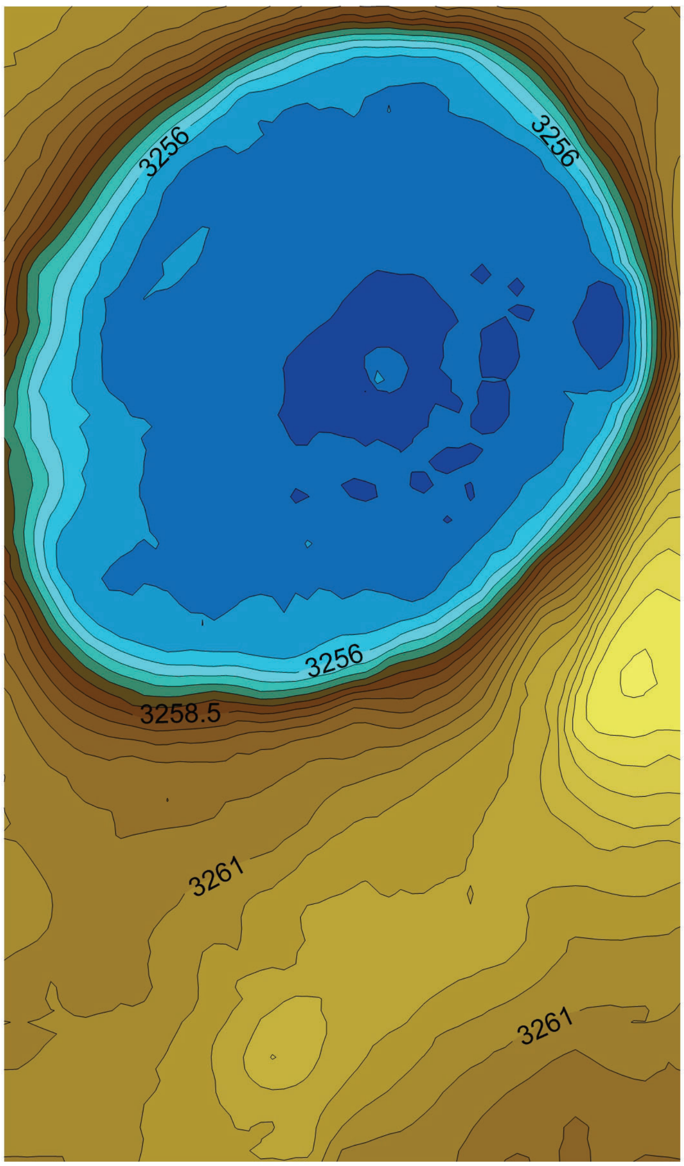


Crowell watershed map



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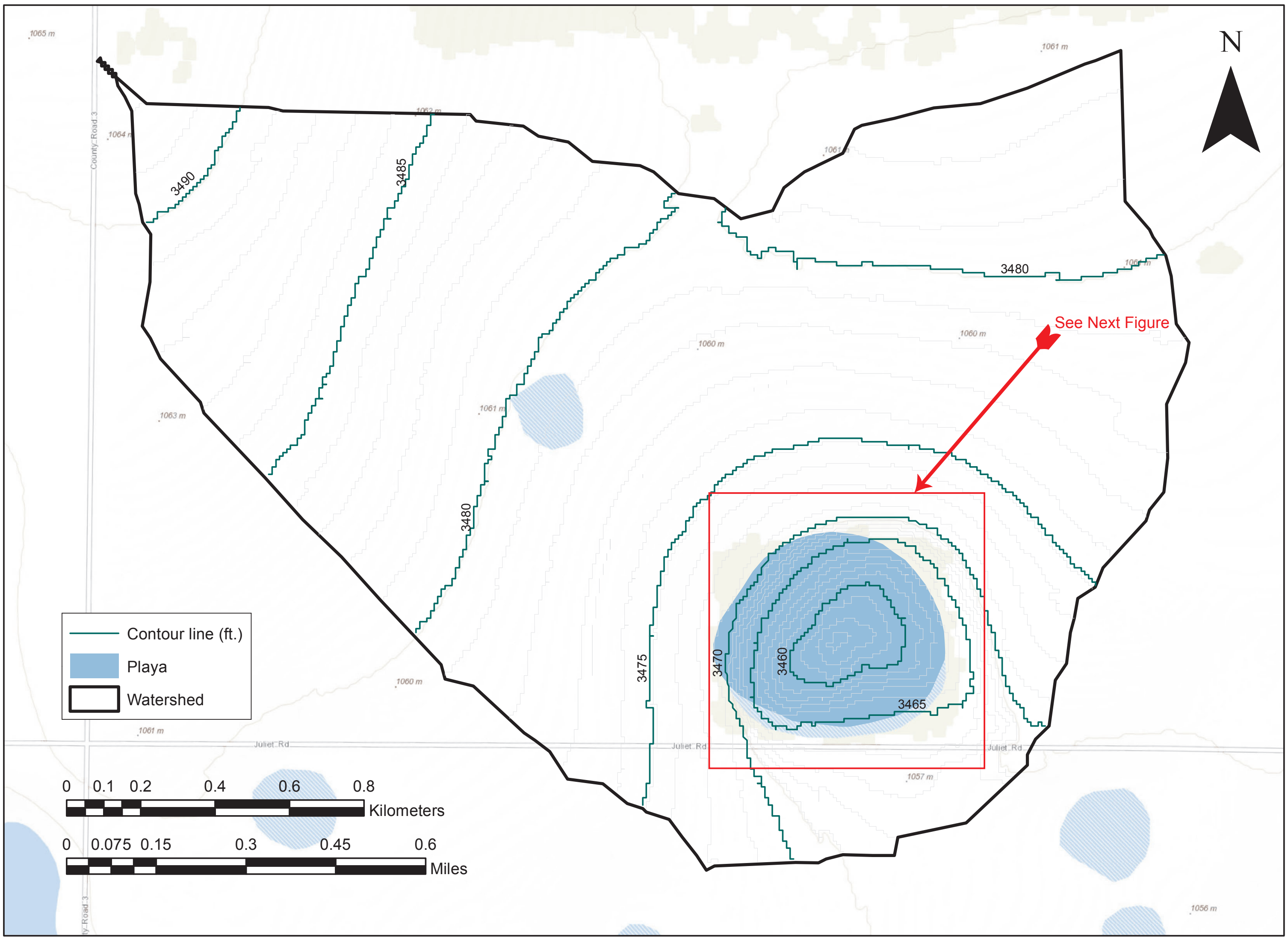
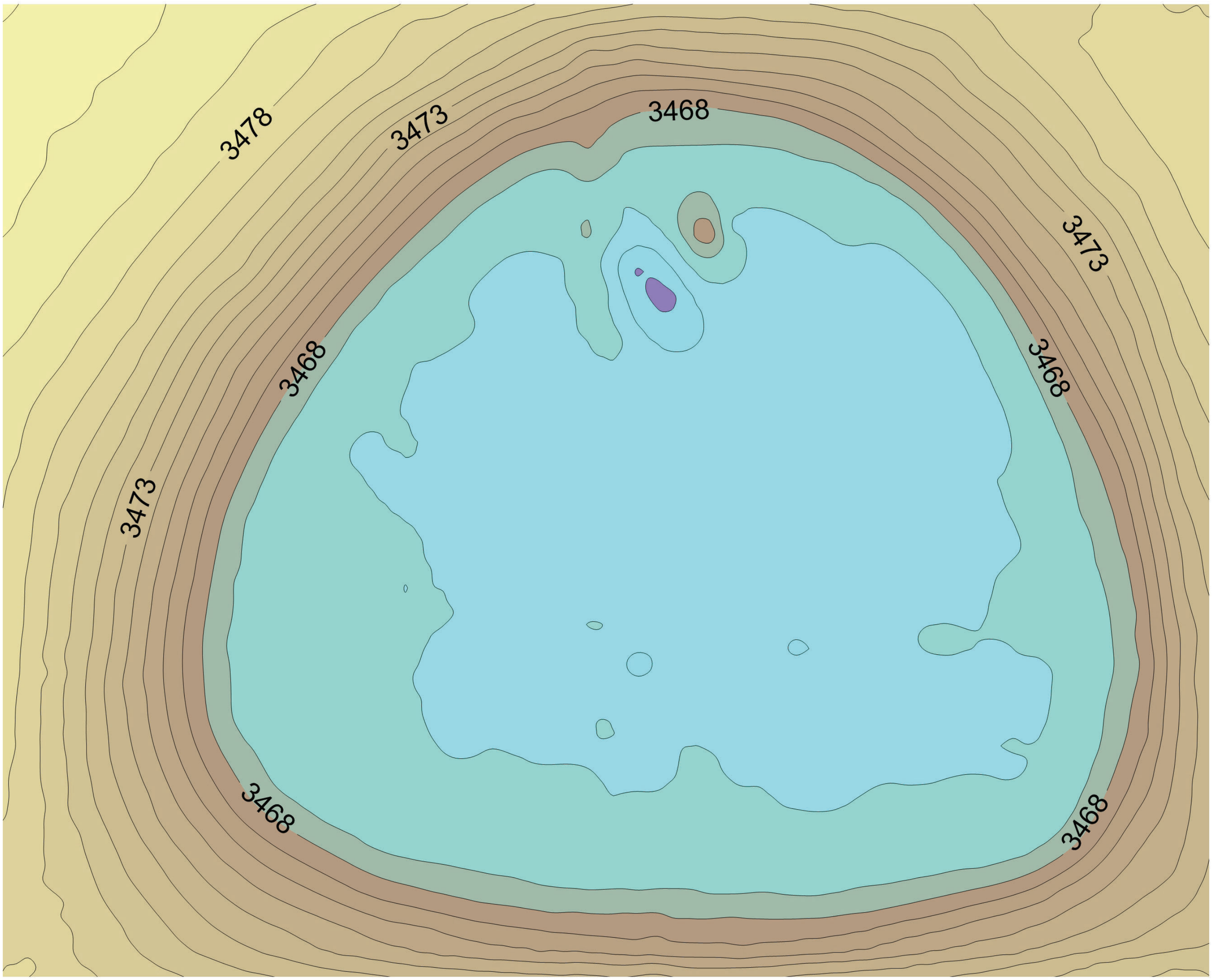
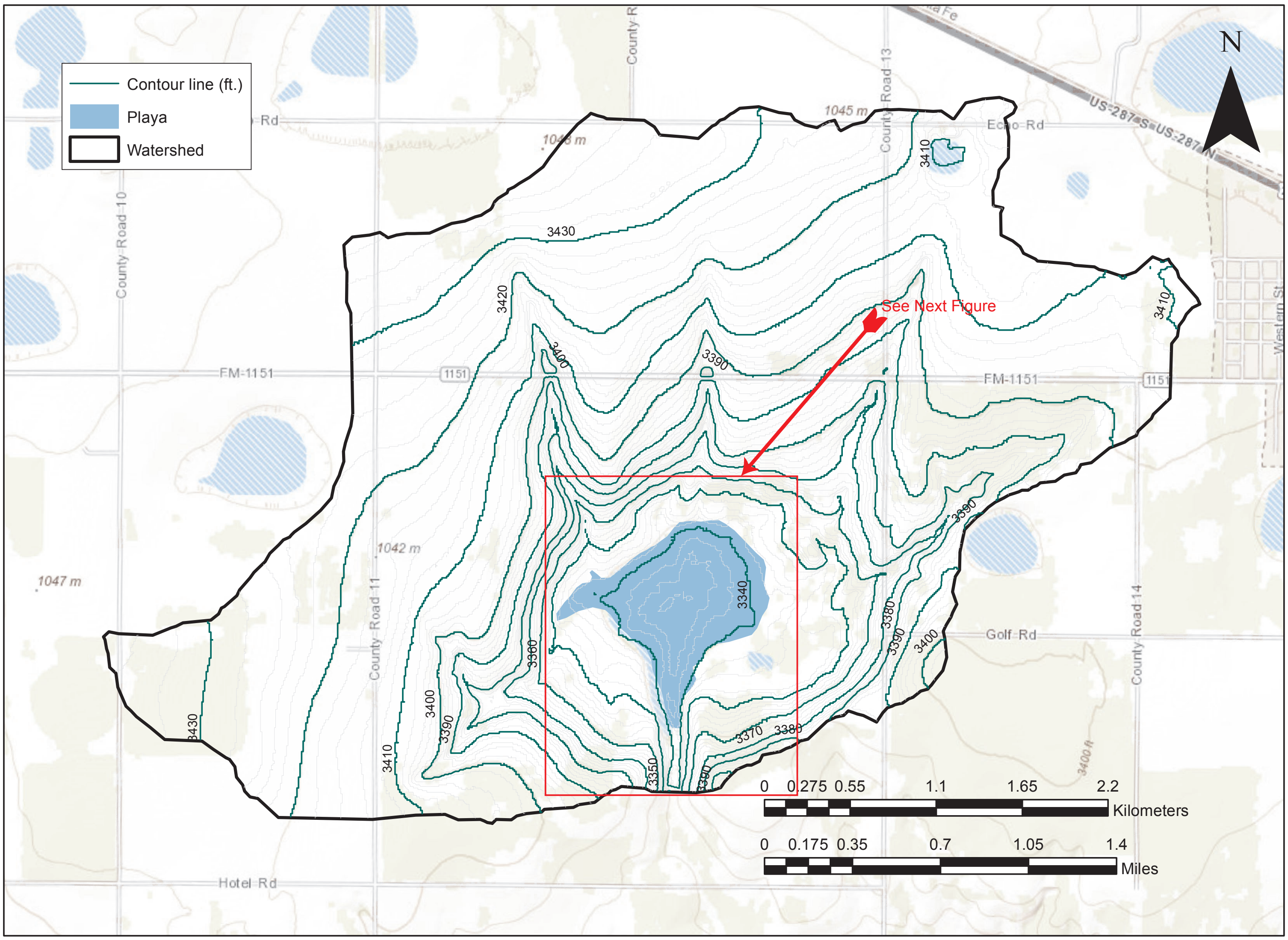


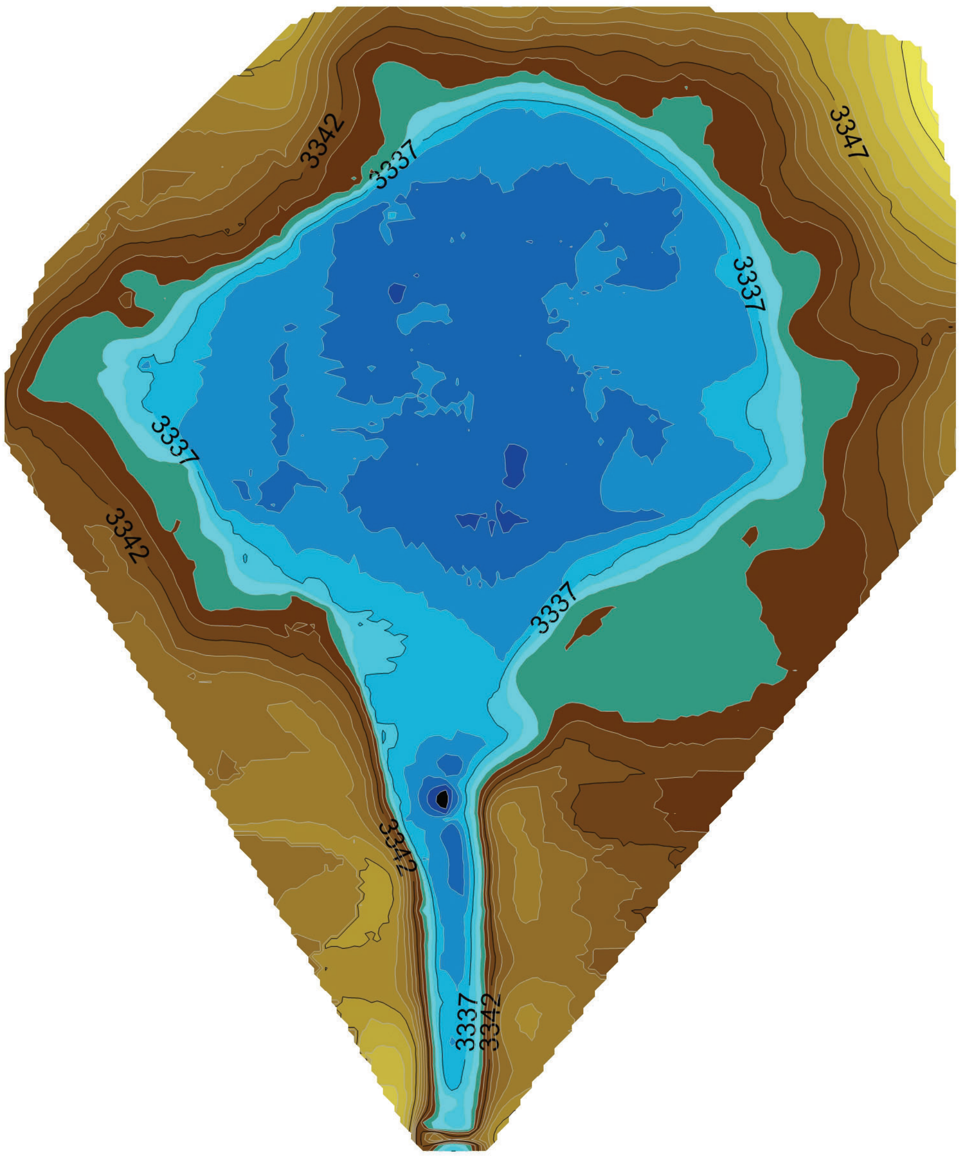
Durrett watershed map



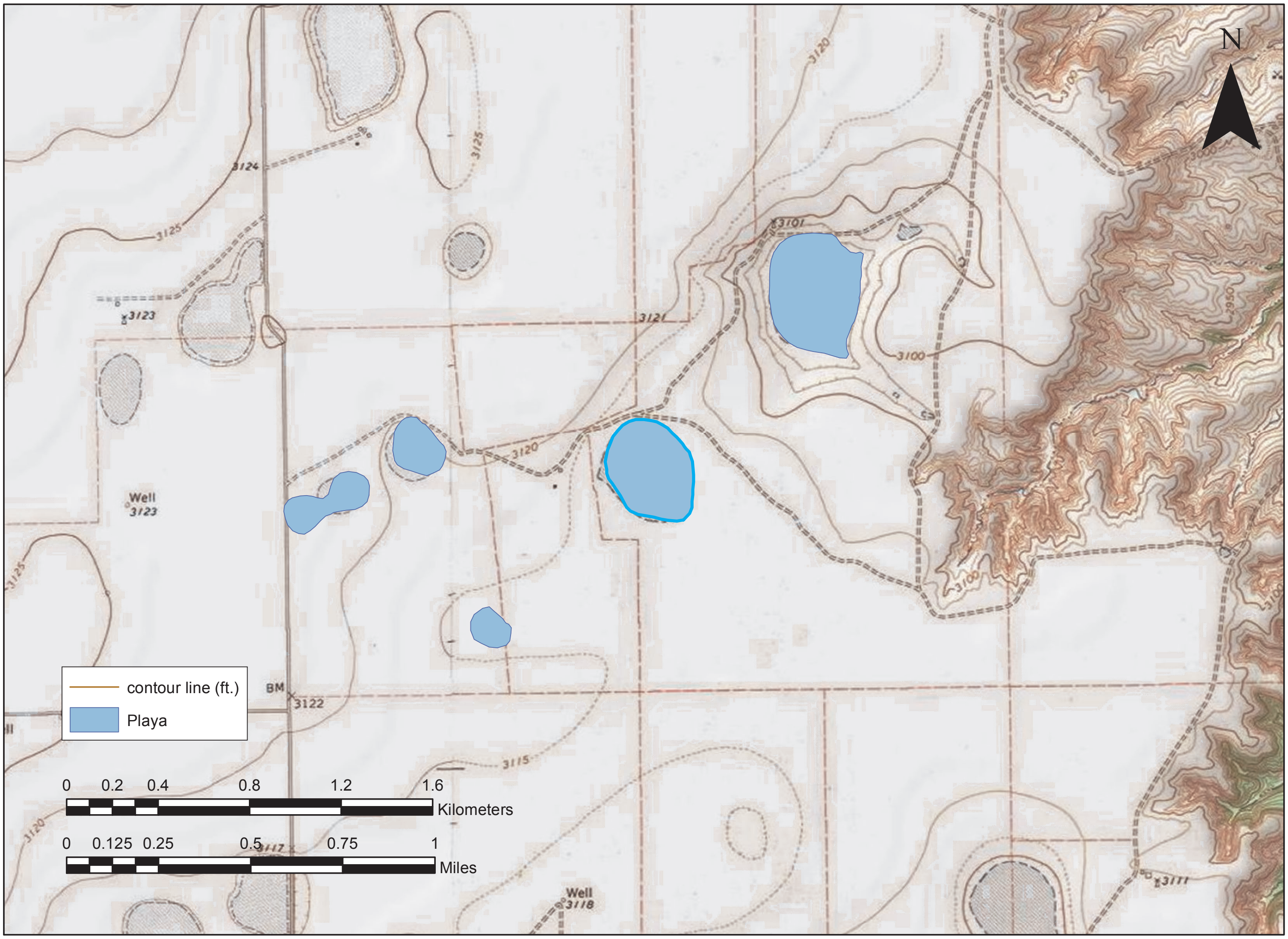
Durrett survey map



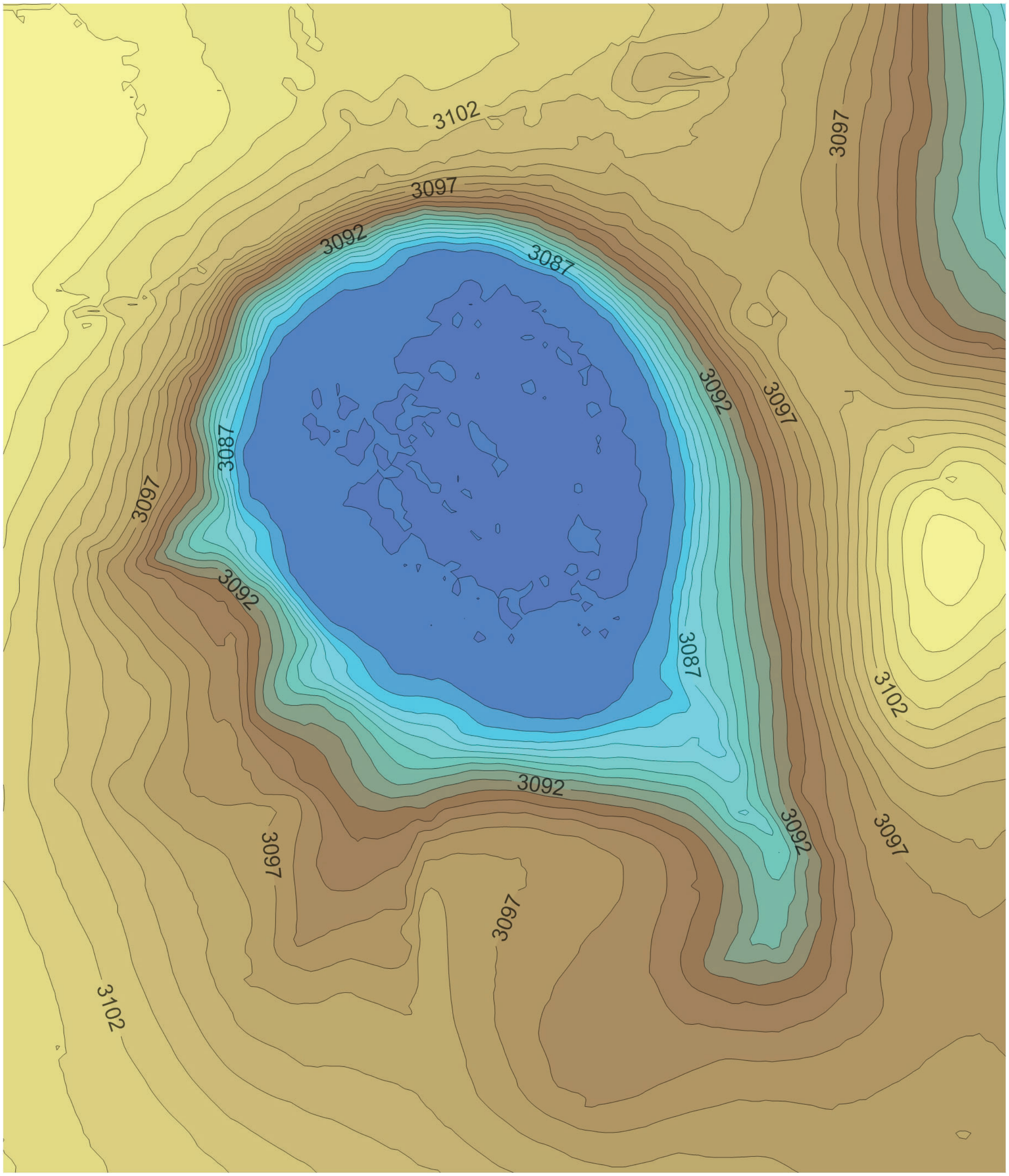
Finley watershed map



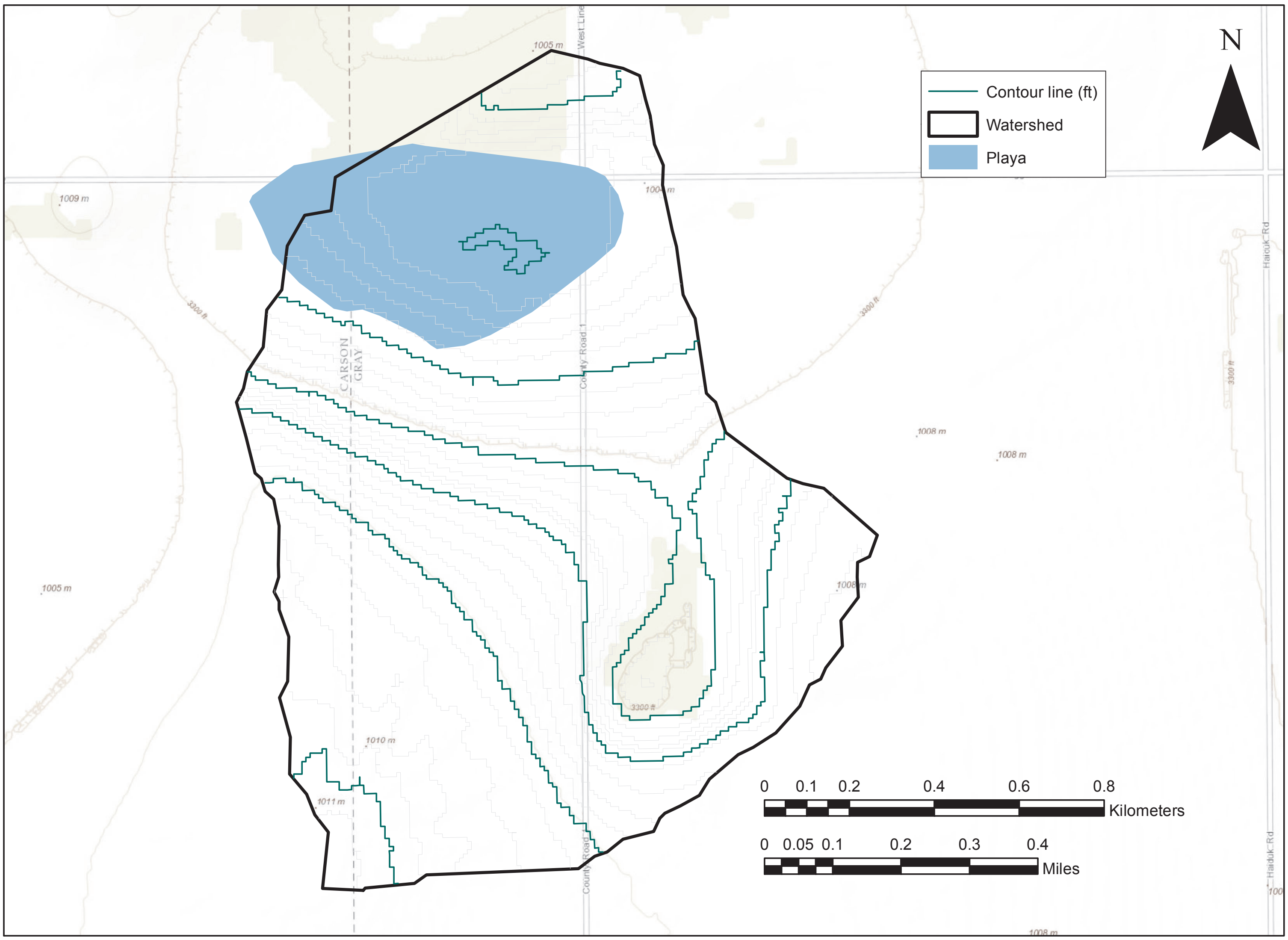
Finley survey map



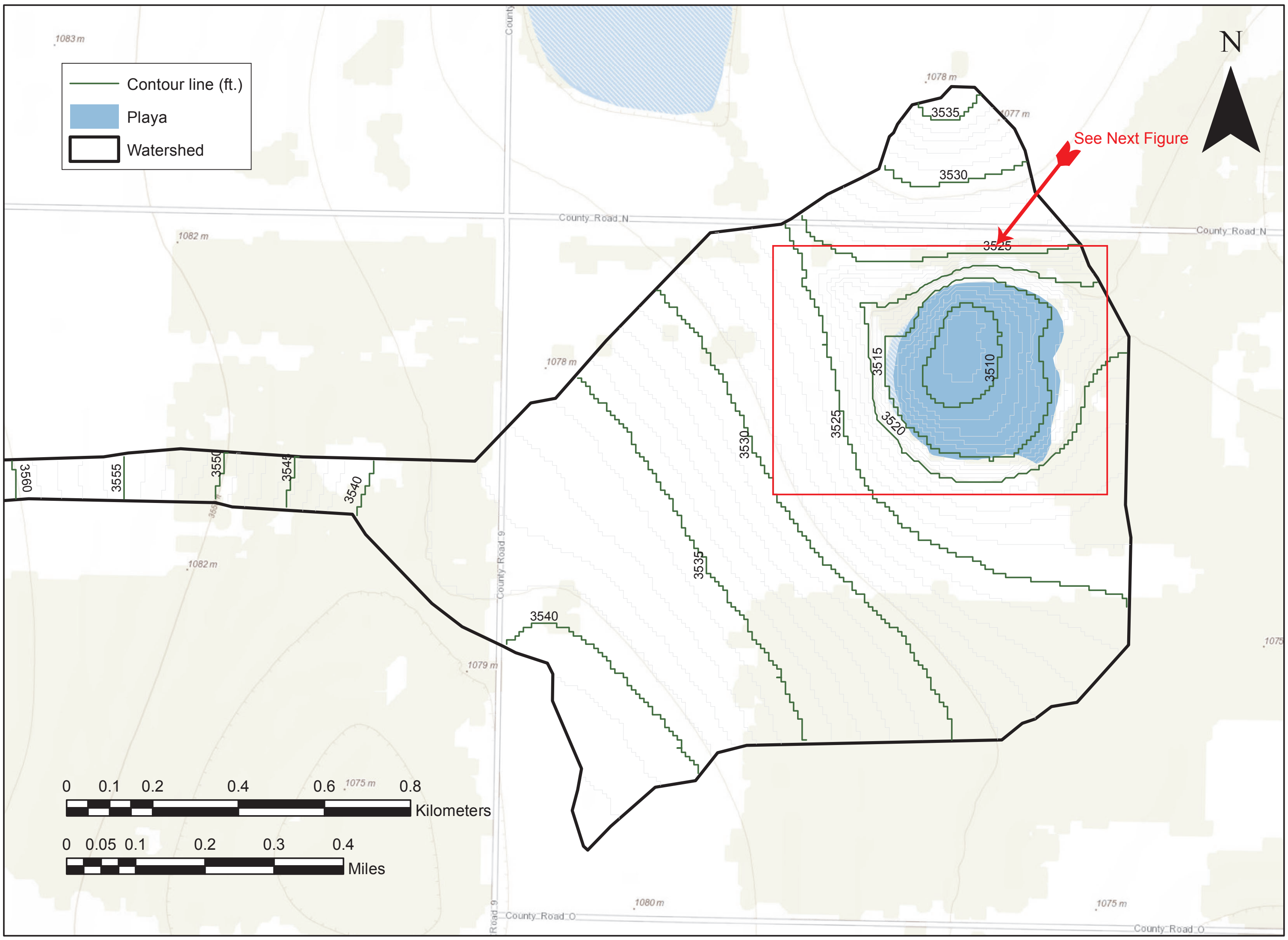
FLRNG watershed map; digital elevation models do not show any topographic expression for the FLRNG playa



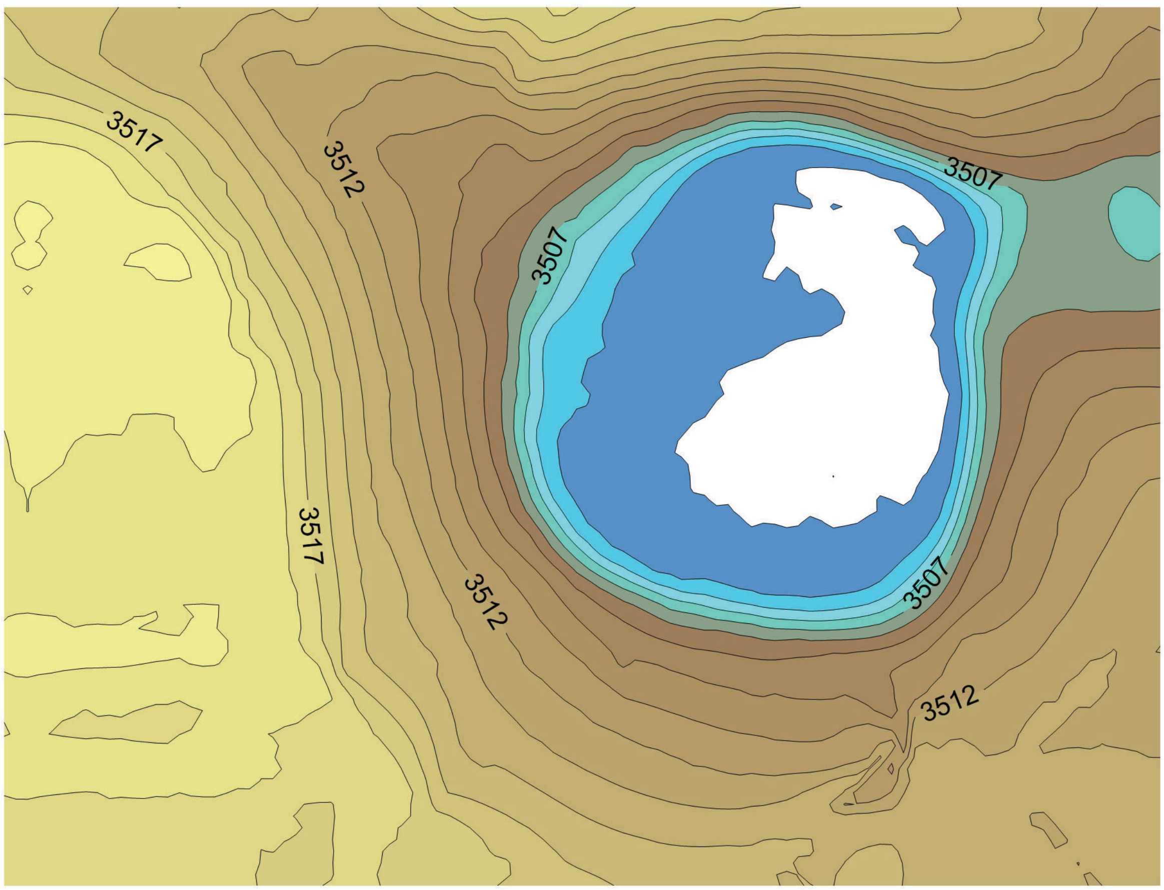
FLRNG survey map



Haiduk watershed map. No field survey was completed for this playa because of access issues.



Herring 1 watershed map



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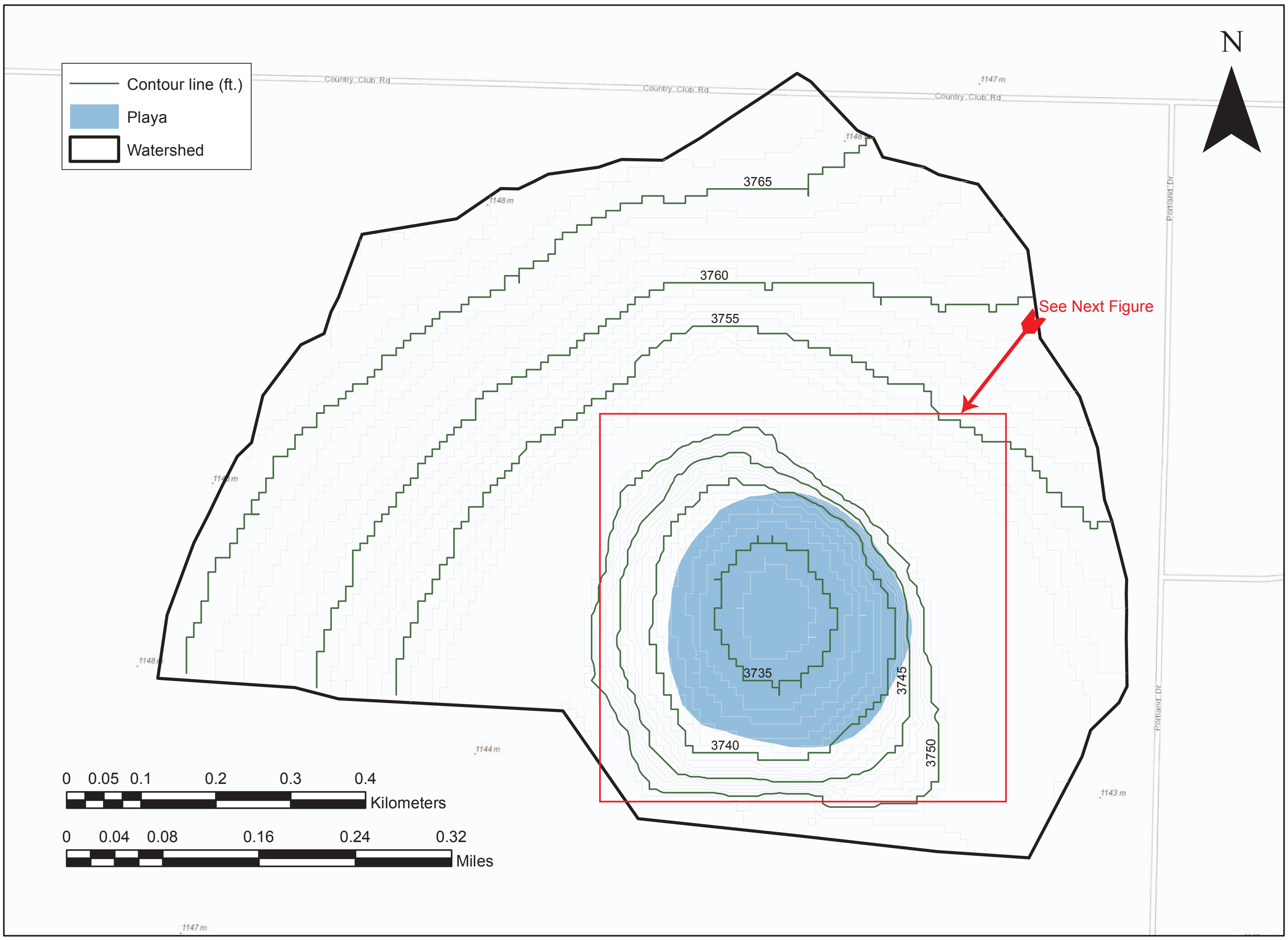
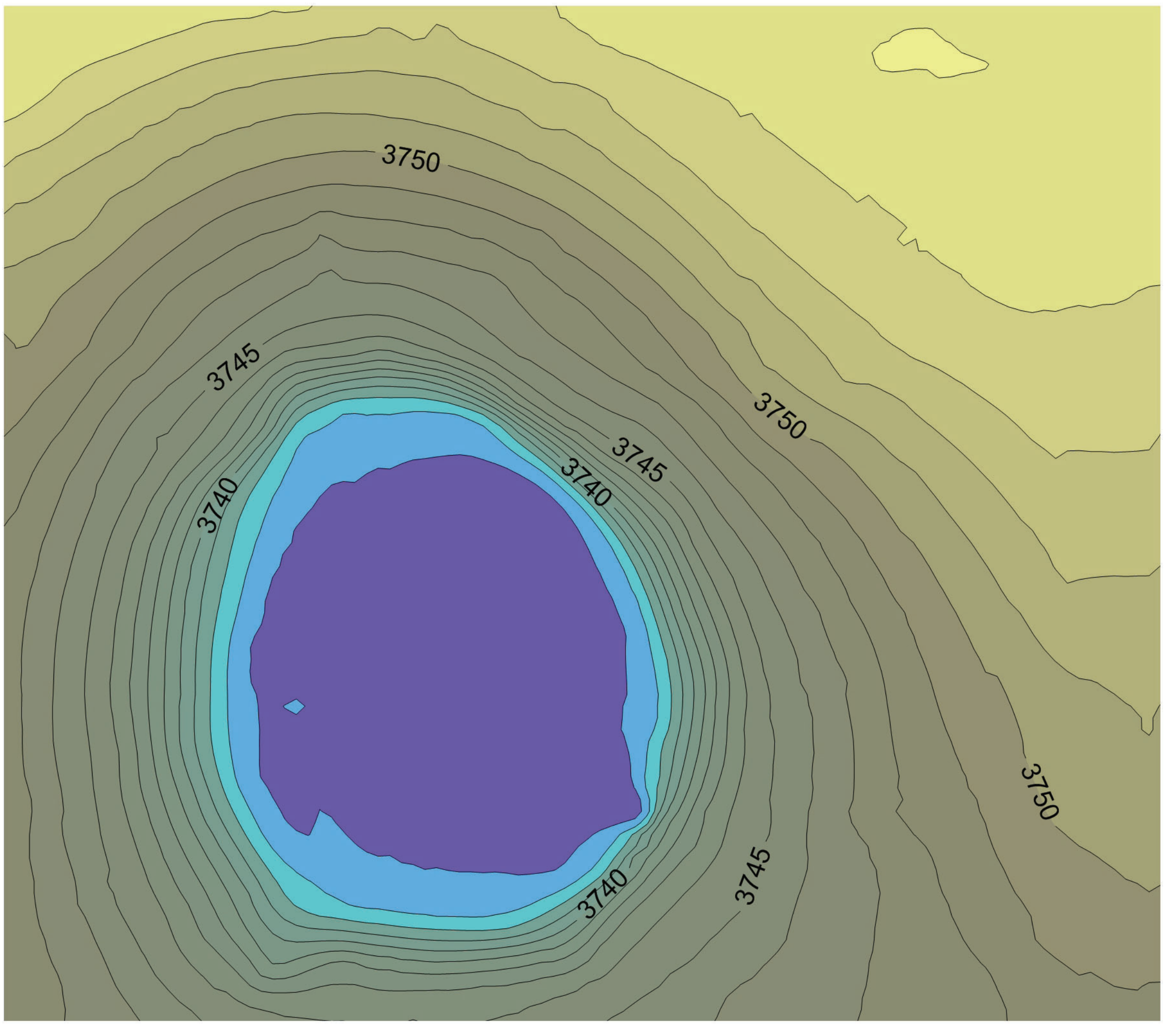


Hollenstein watershed map



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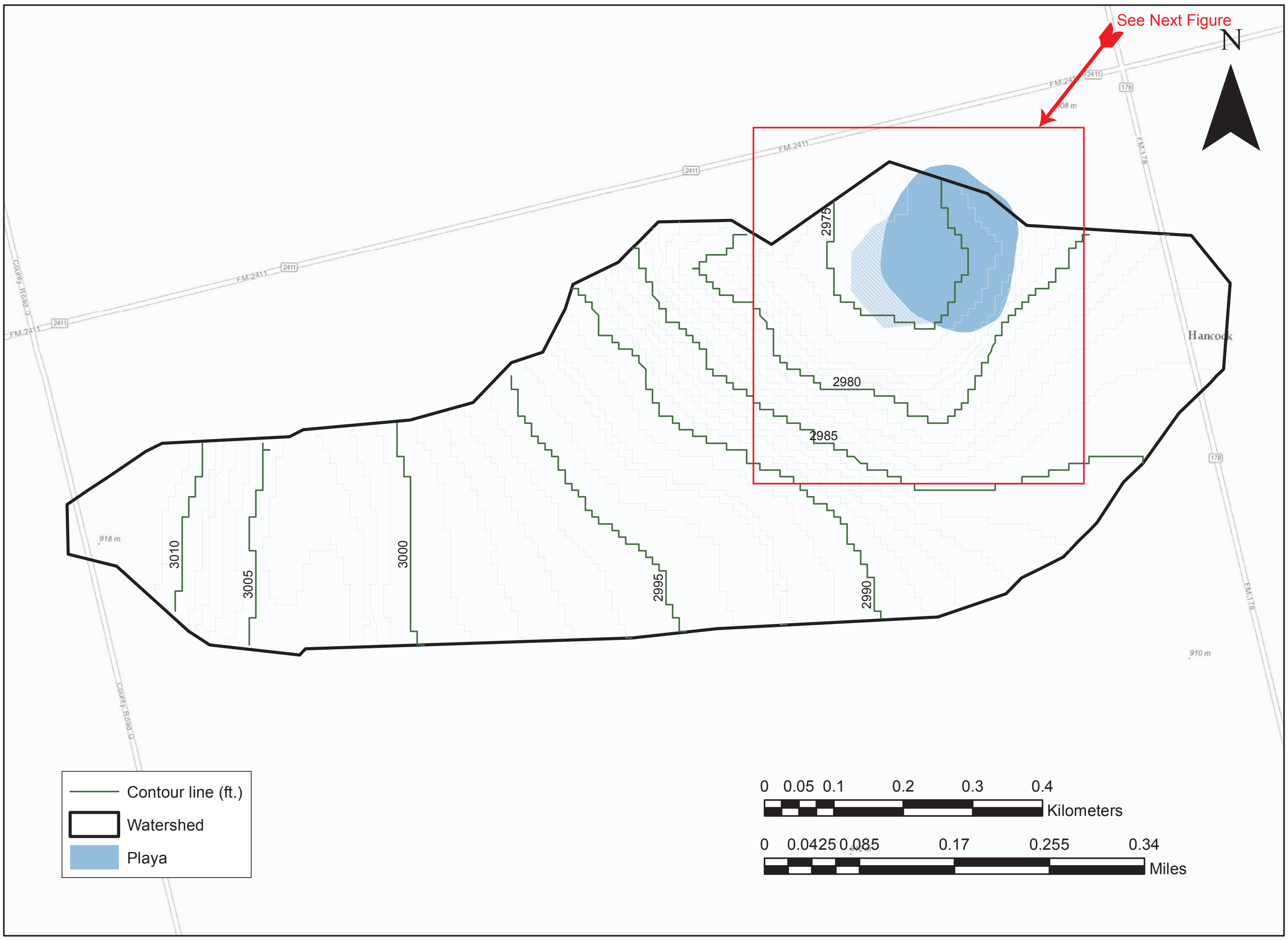
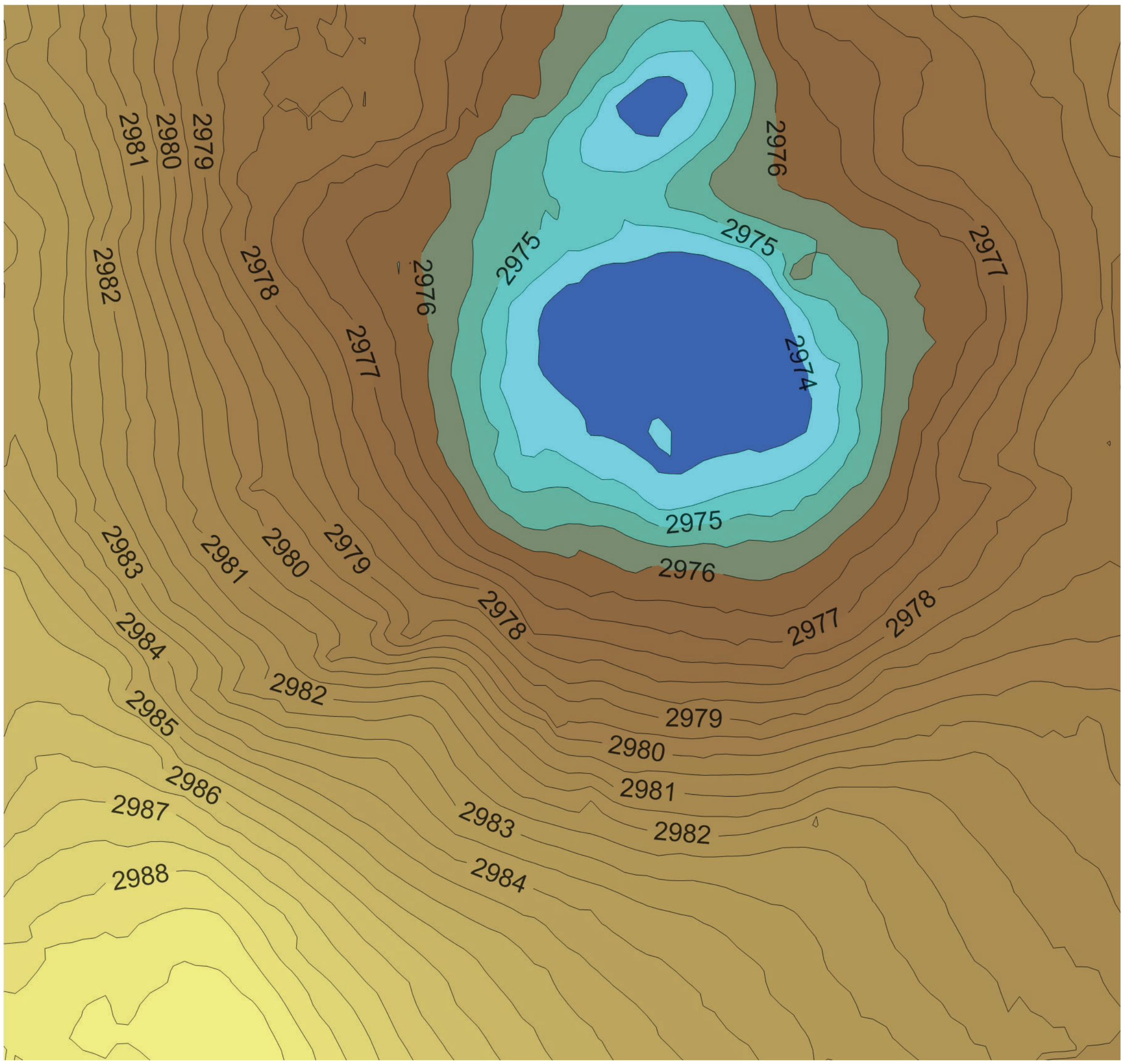
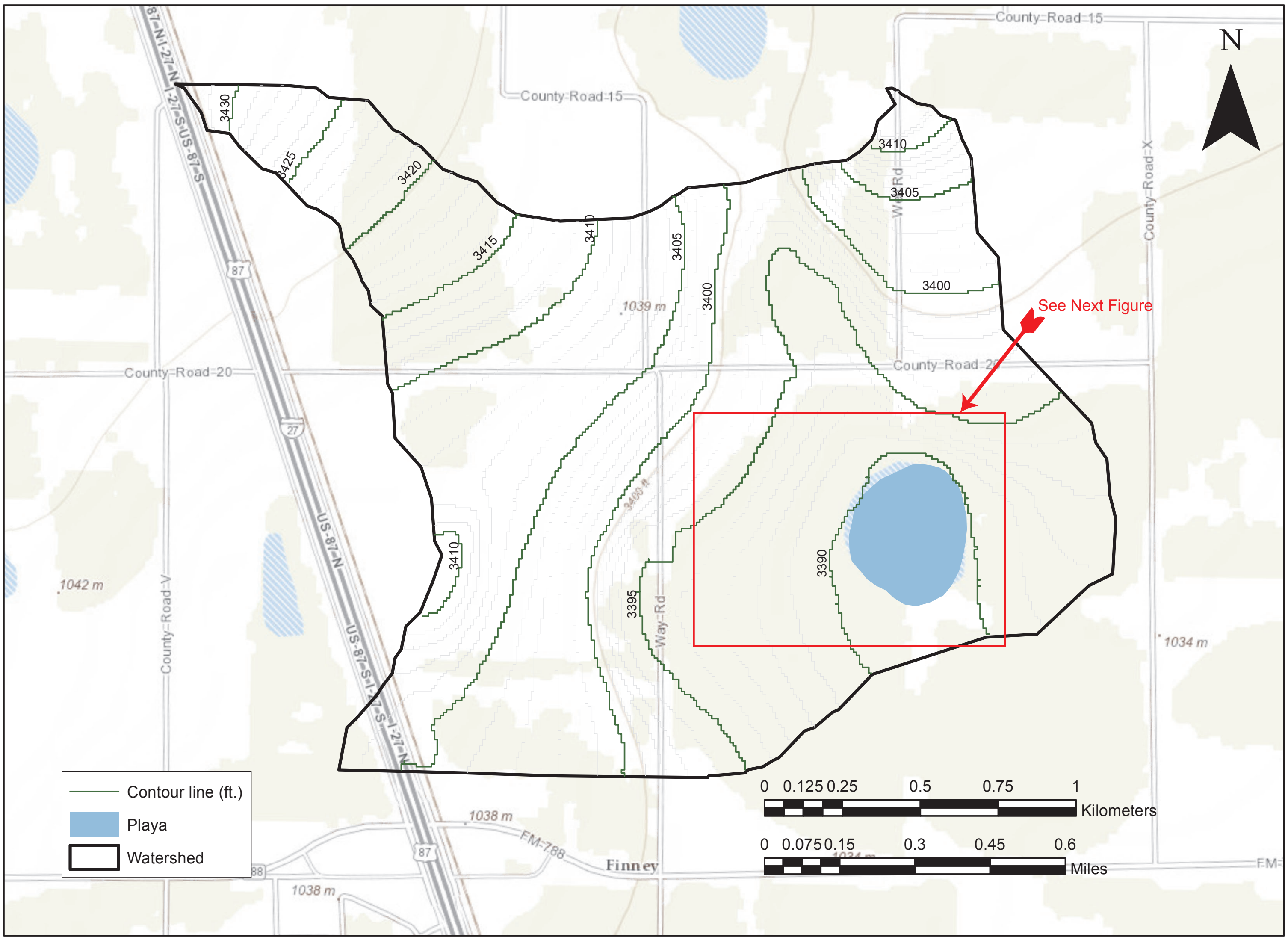


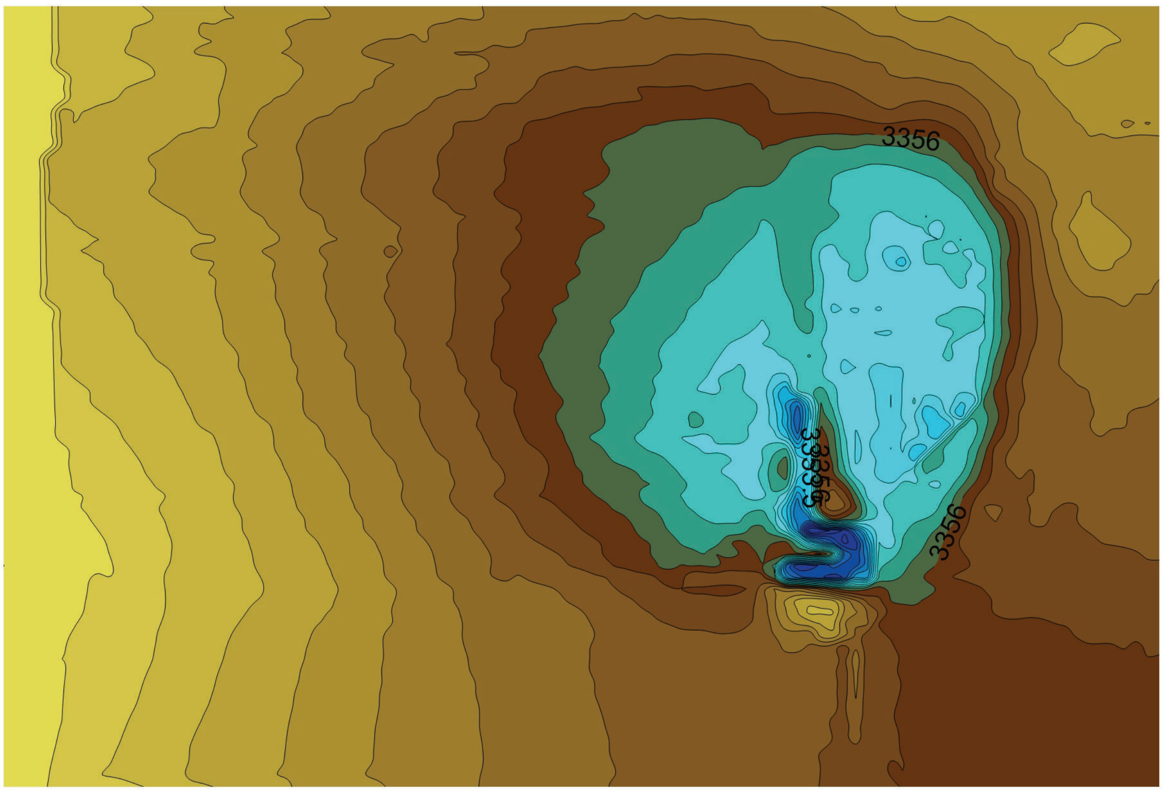
Hughes East watershed map



Hughes East survey map



Macha watershed map



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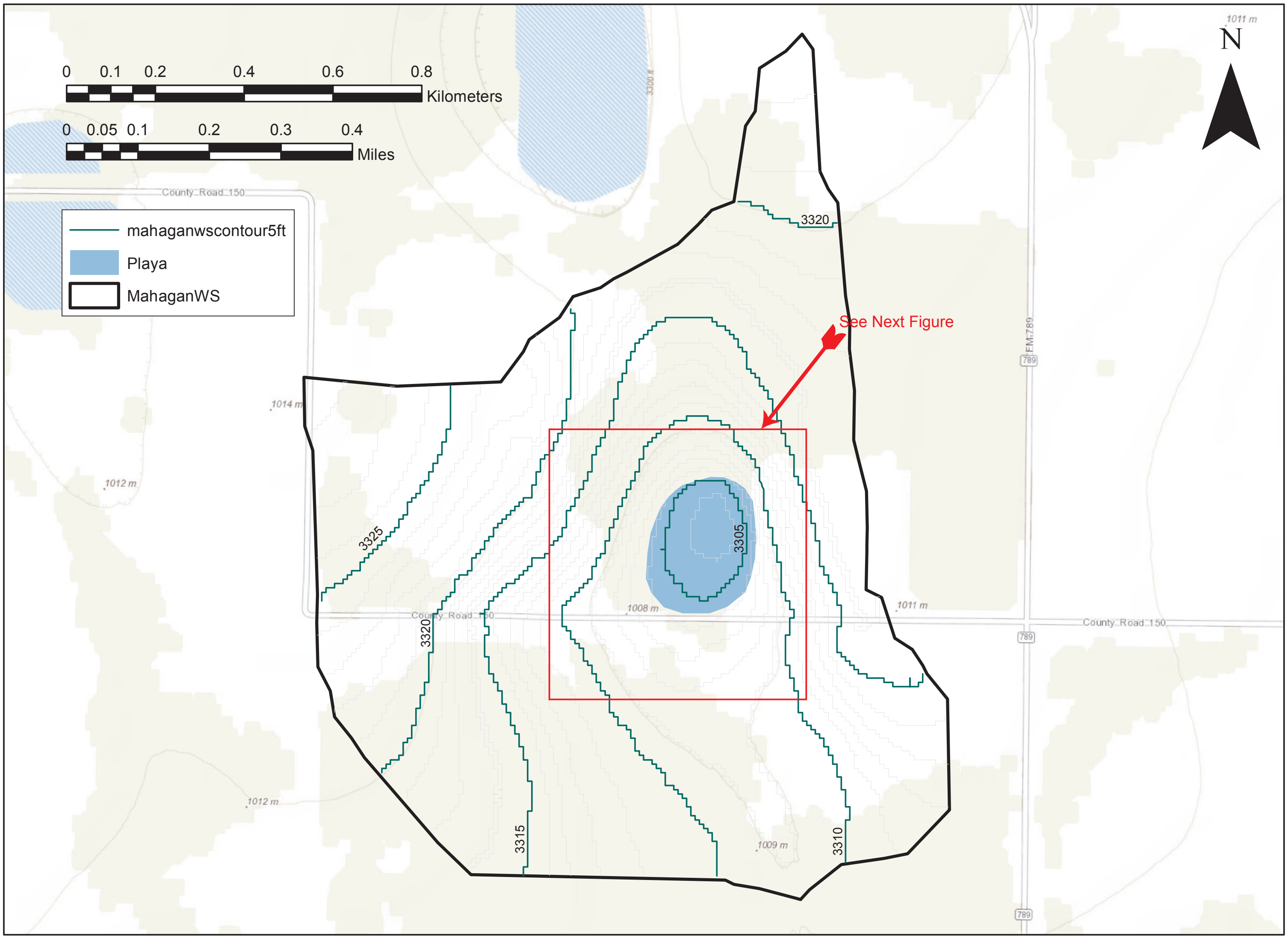
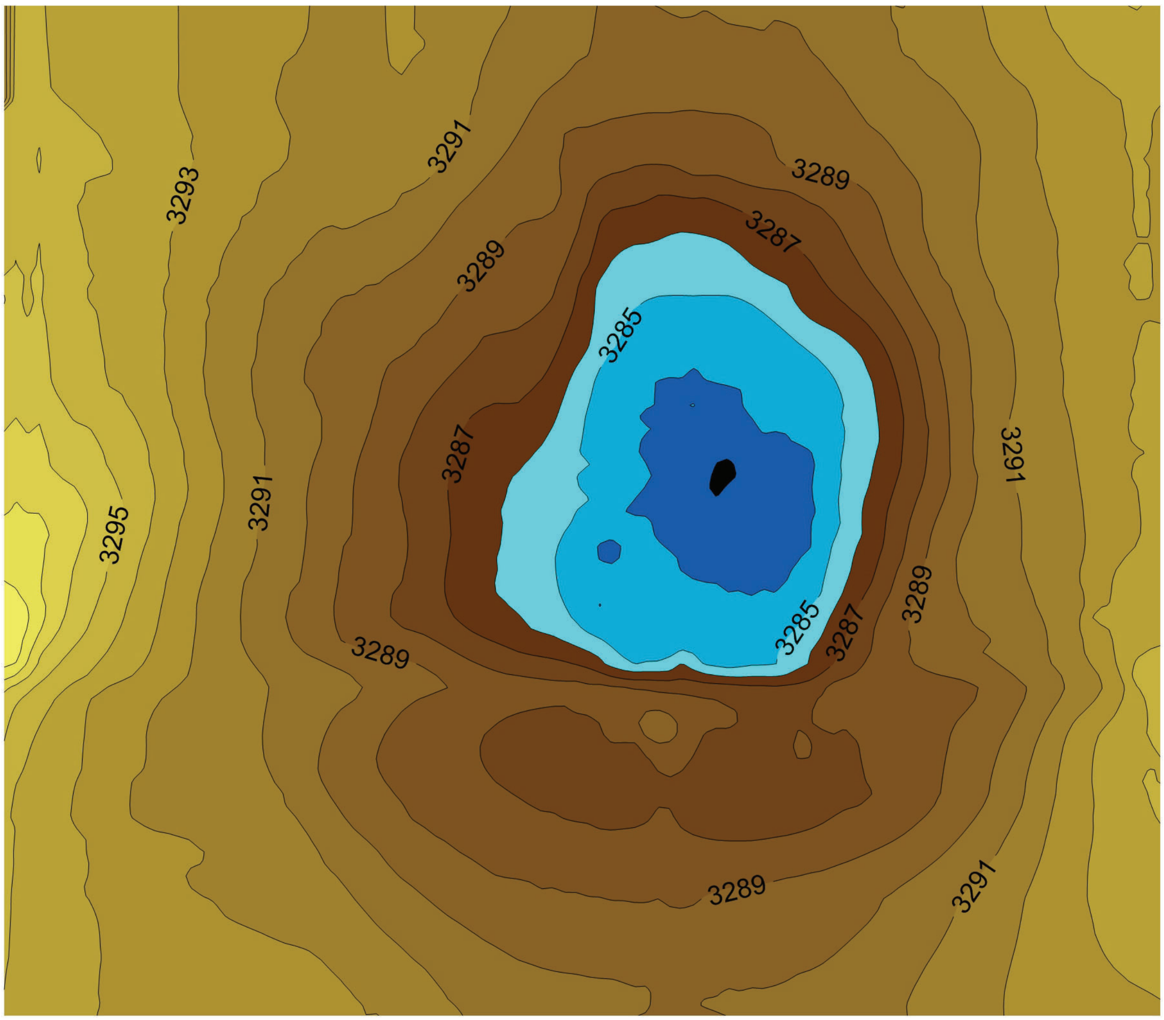
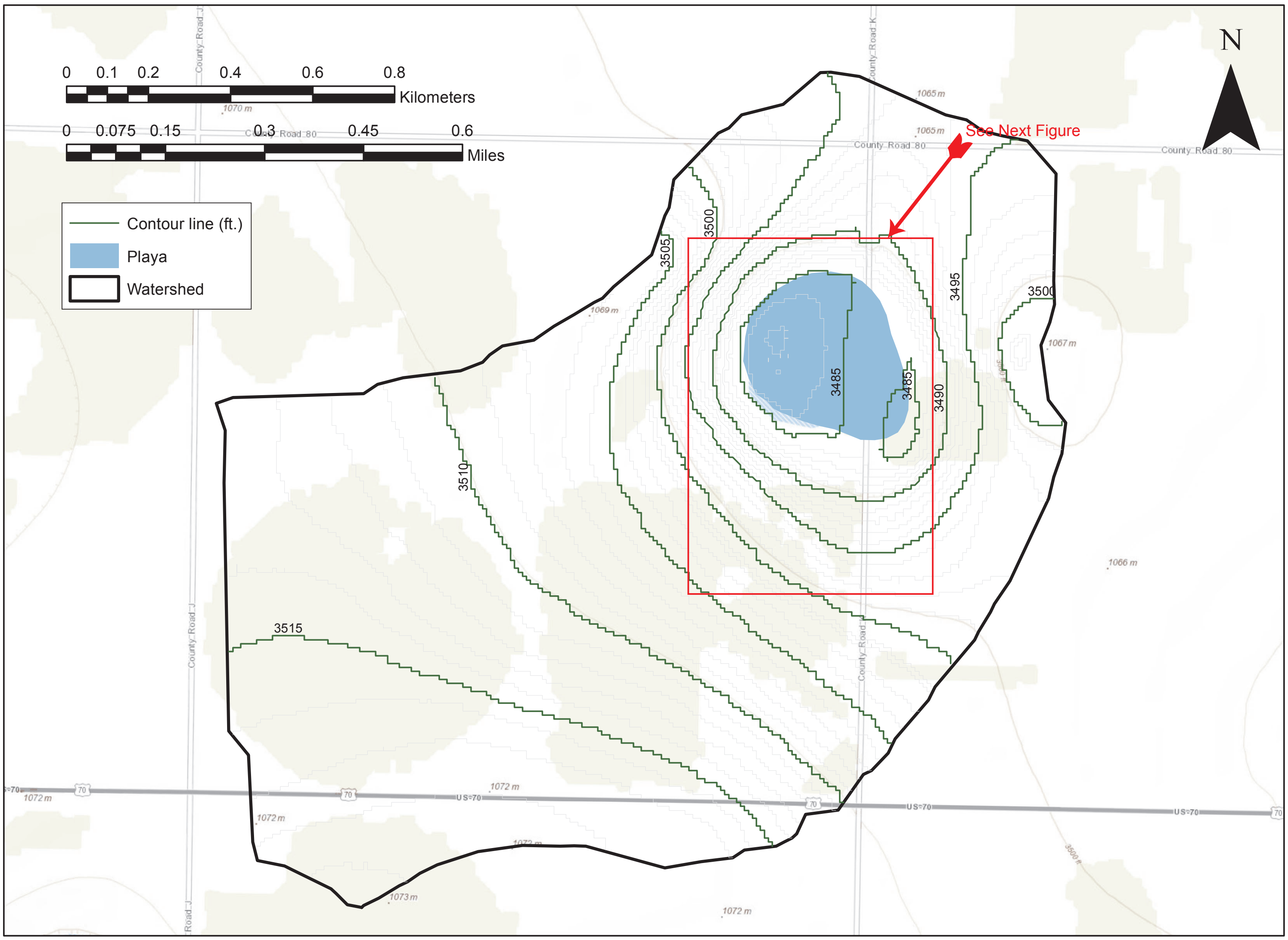


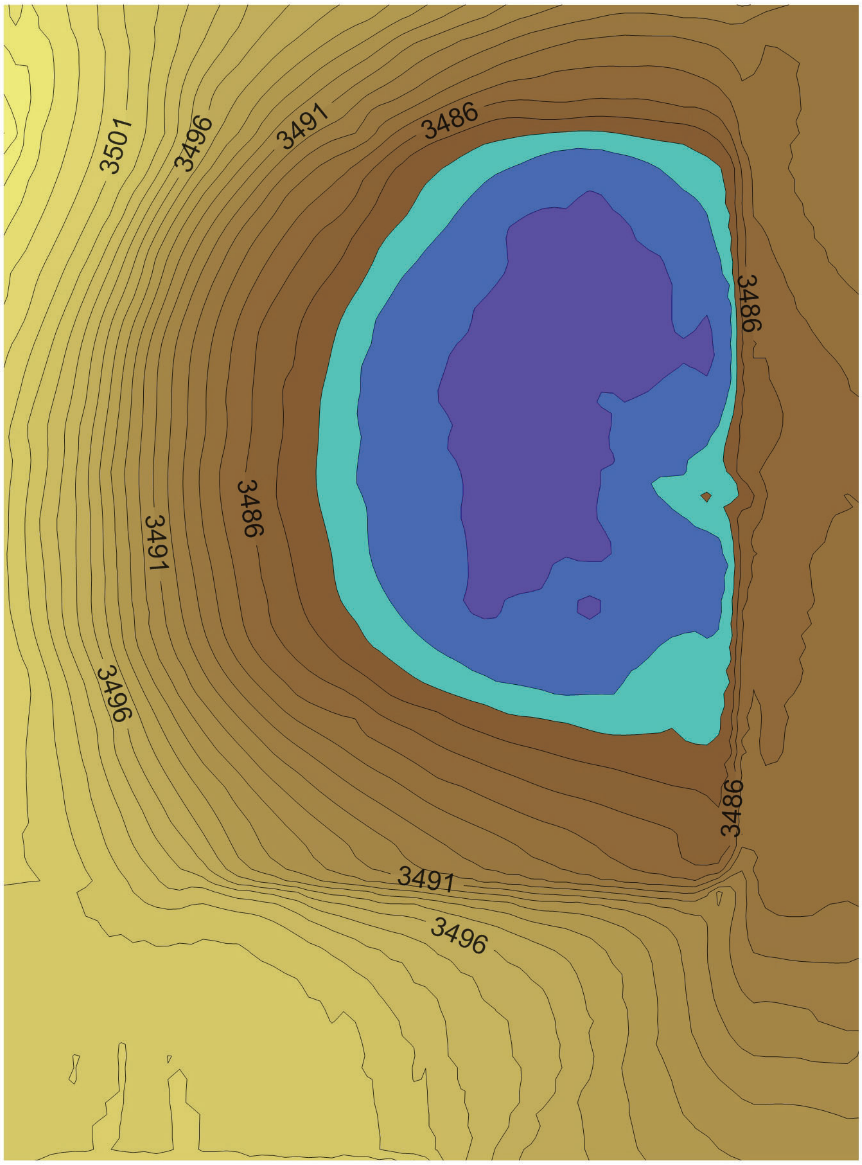
Mahagan watershed map



Mahagan survey map



M. Harrell watershed map



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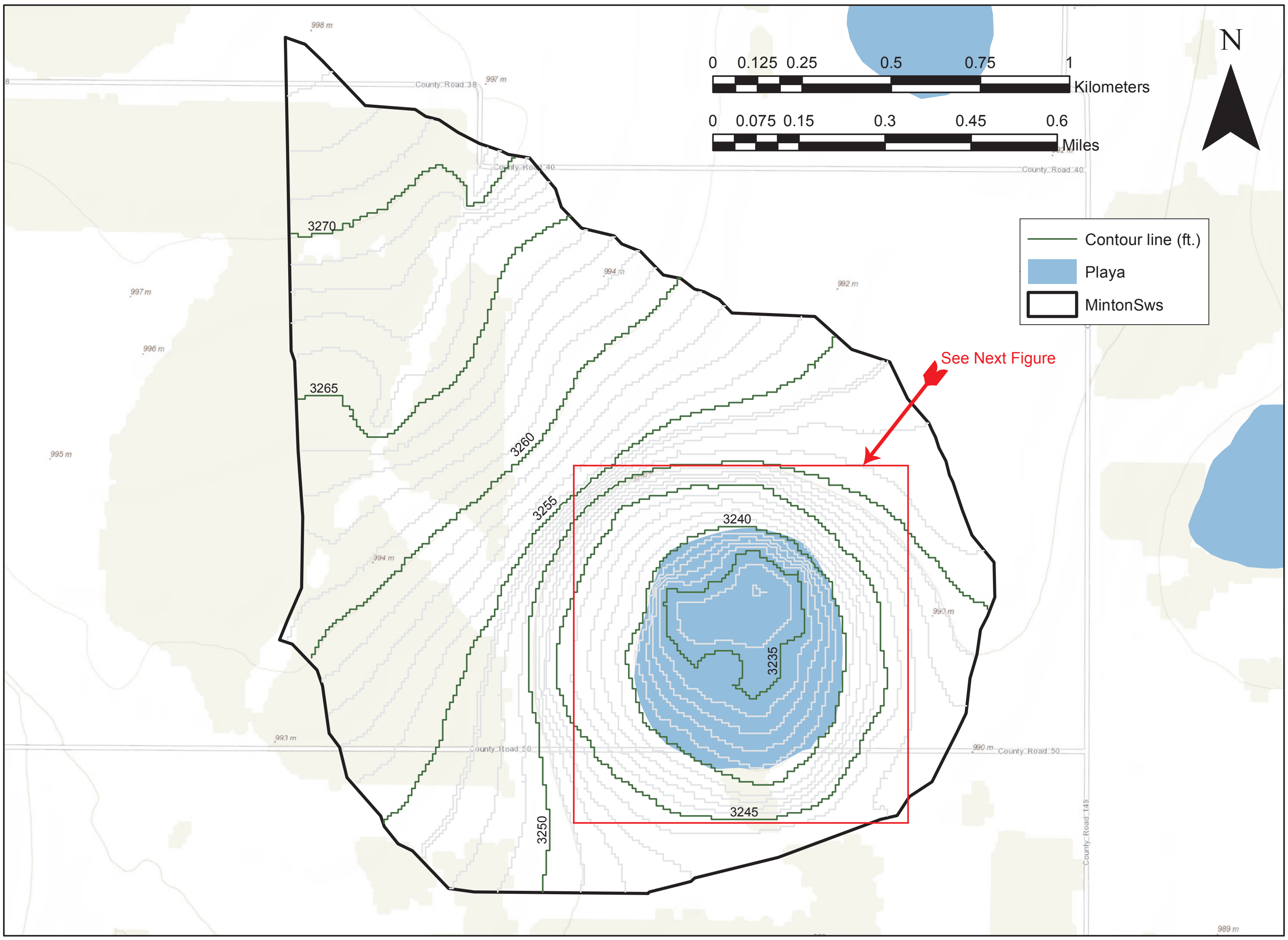
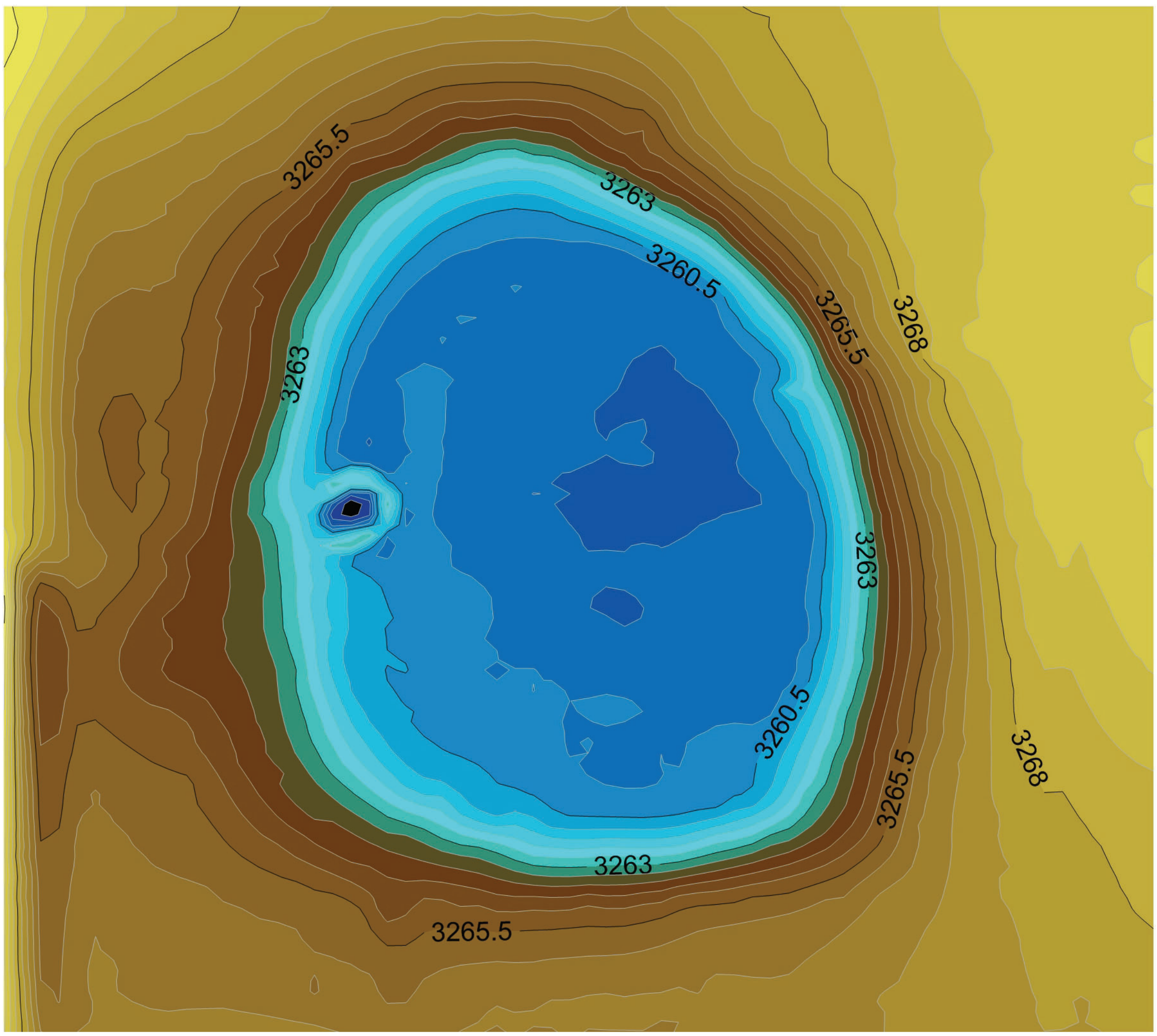


Minton S. watershed map



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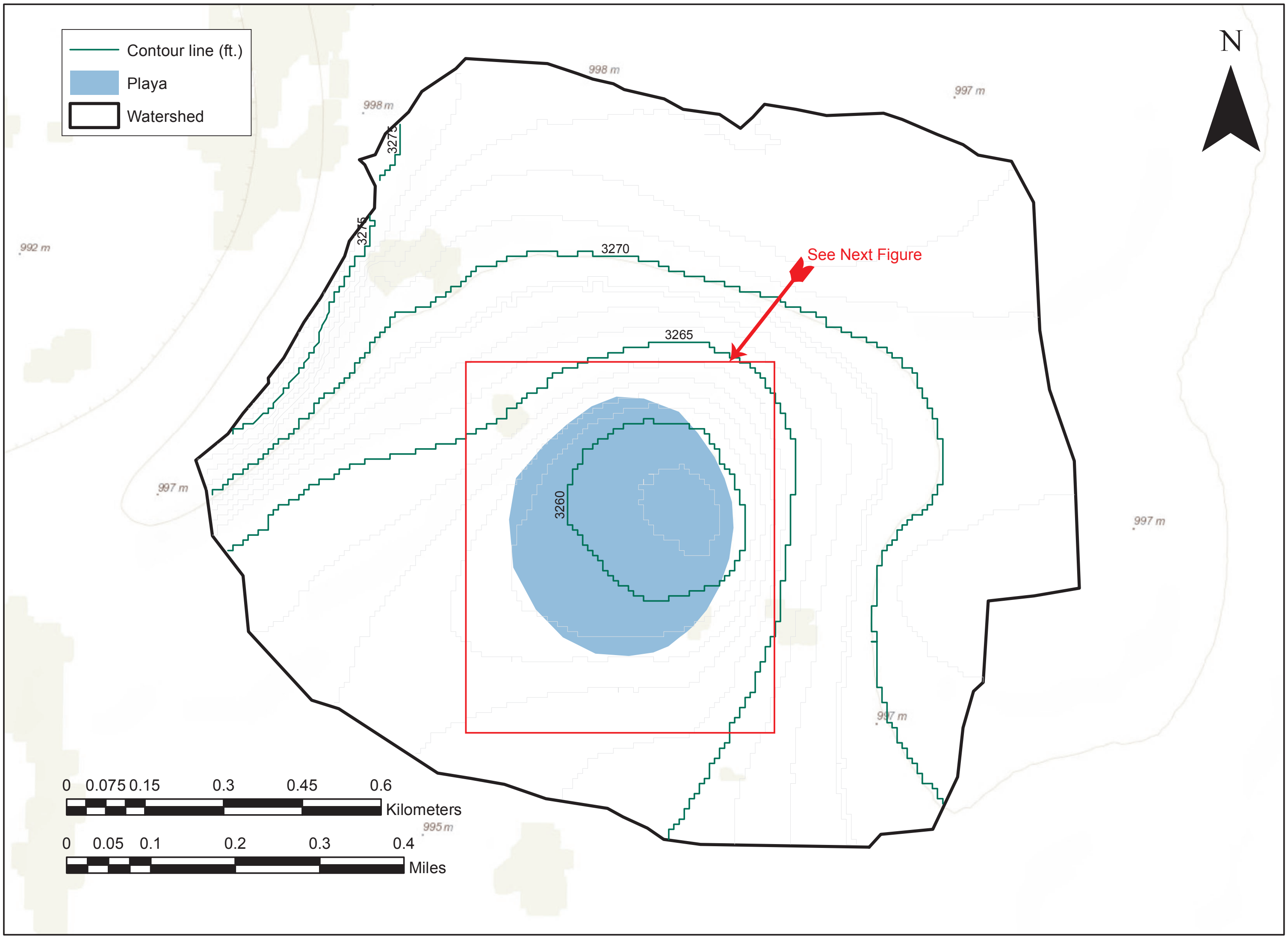
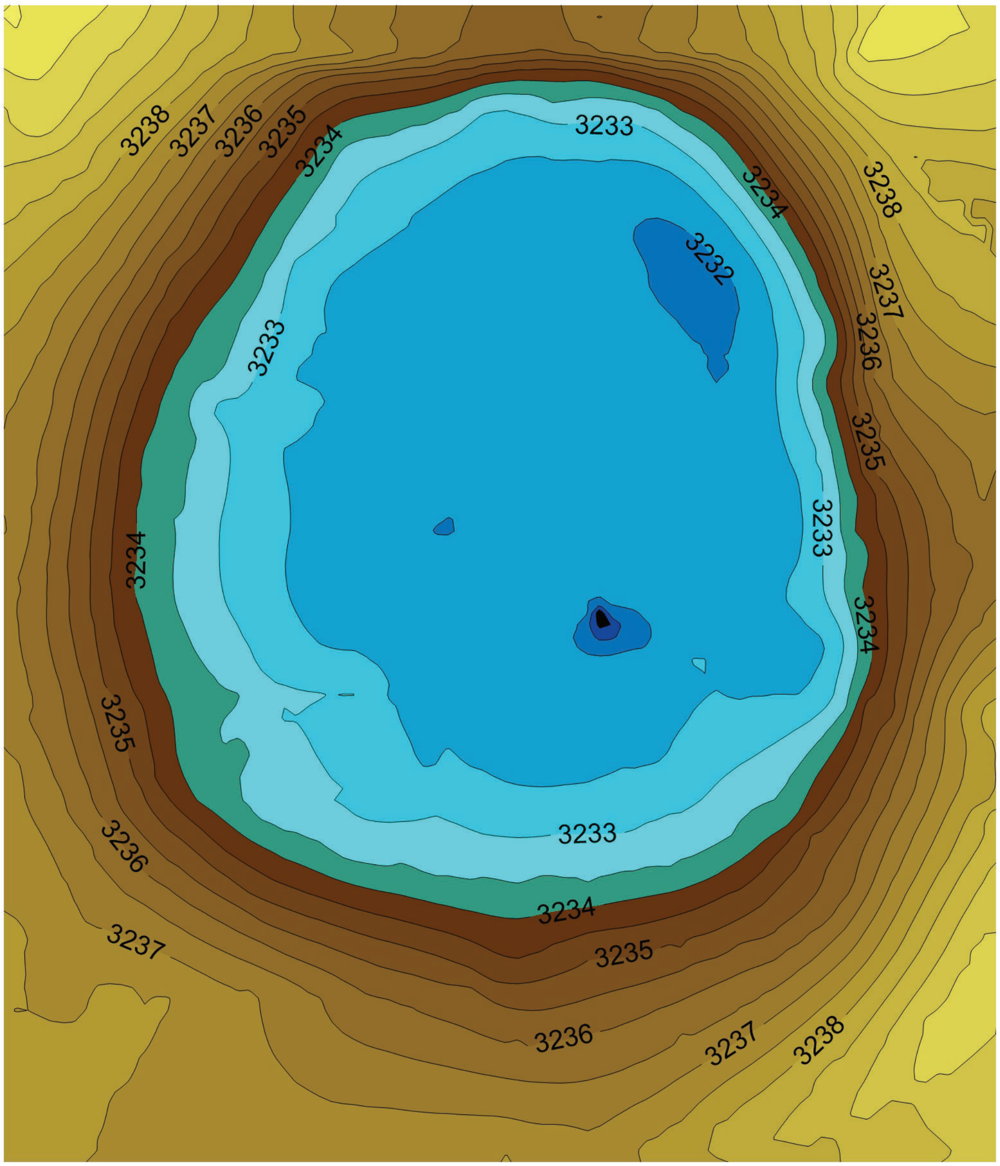


Moore watershed map



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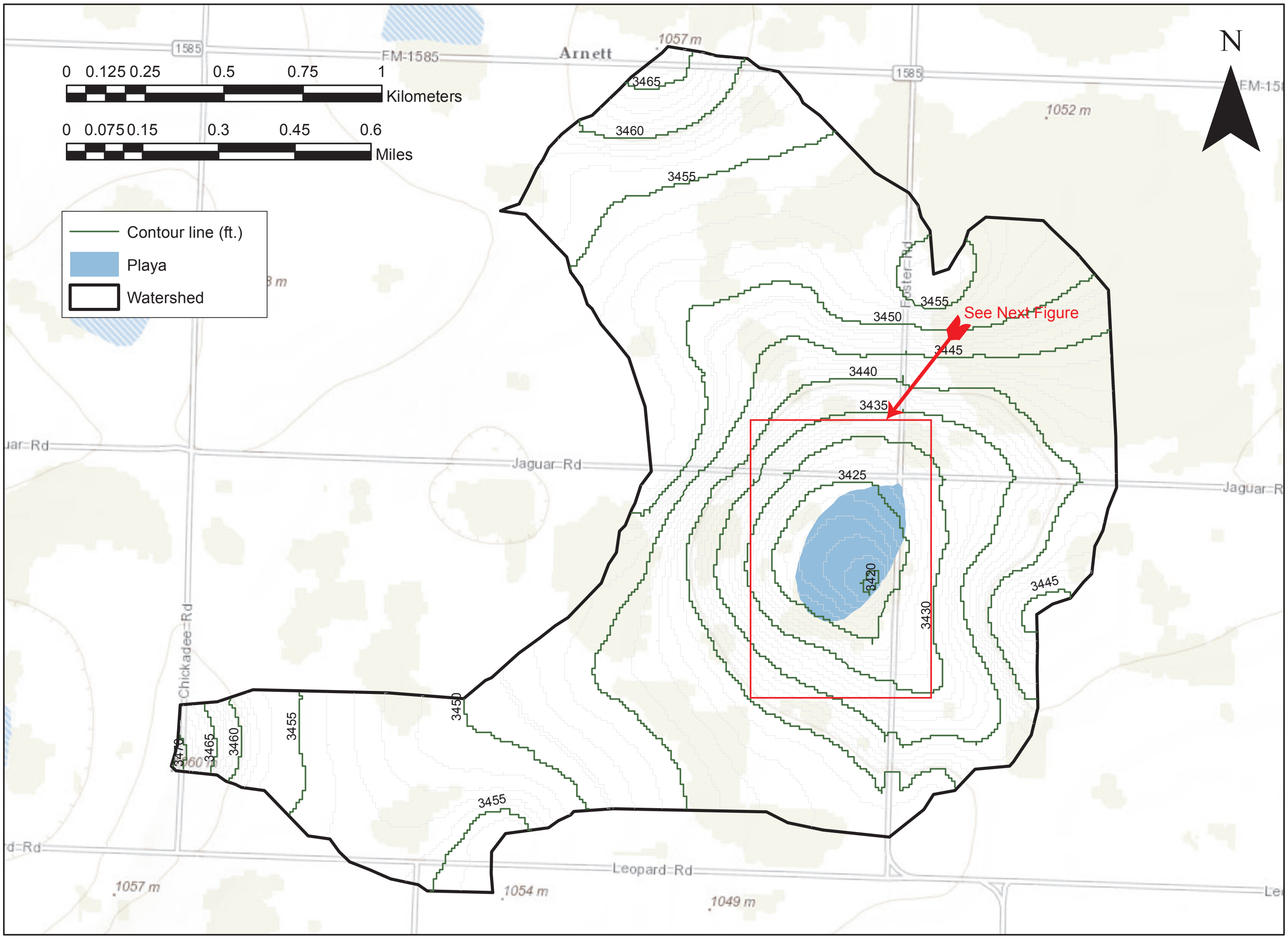
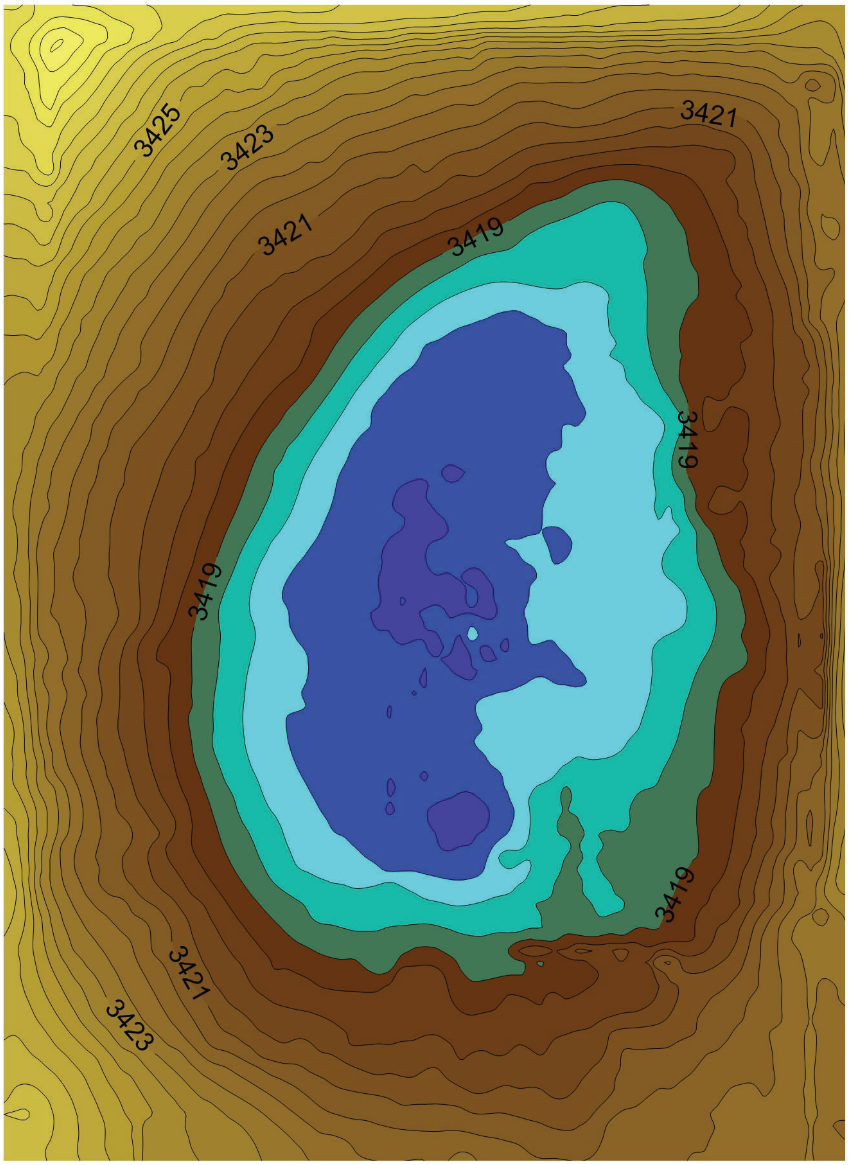


Myatt watershed map



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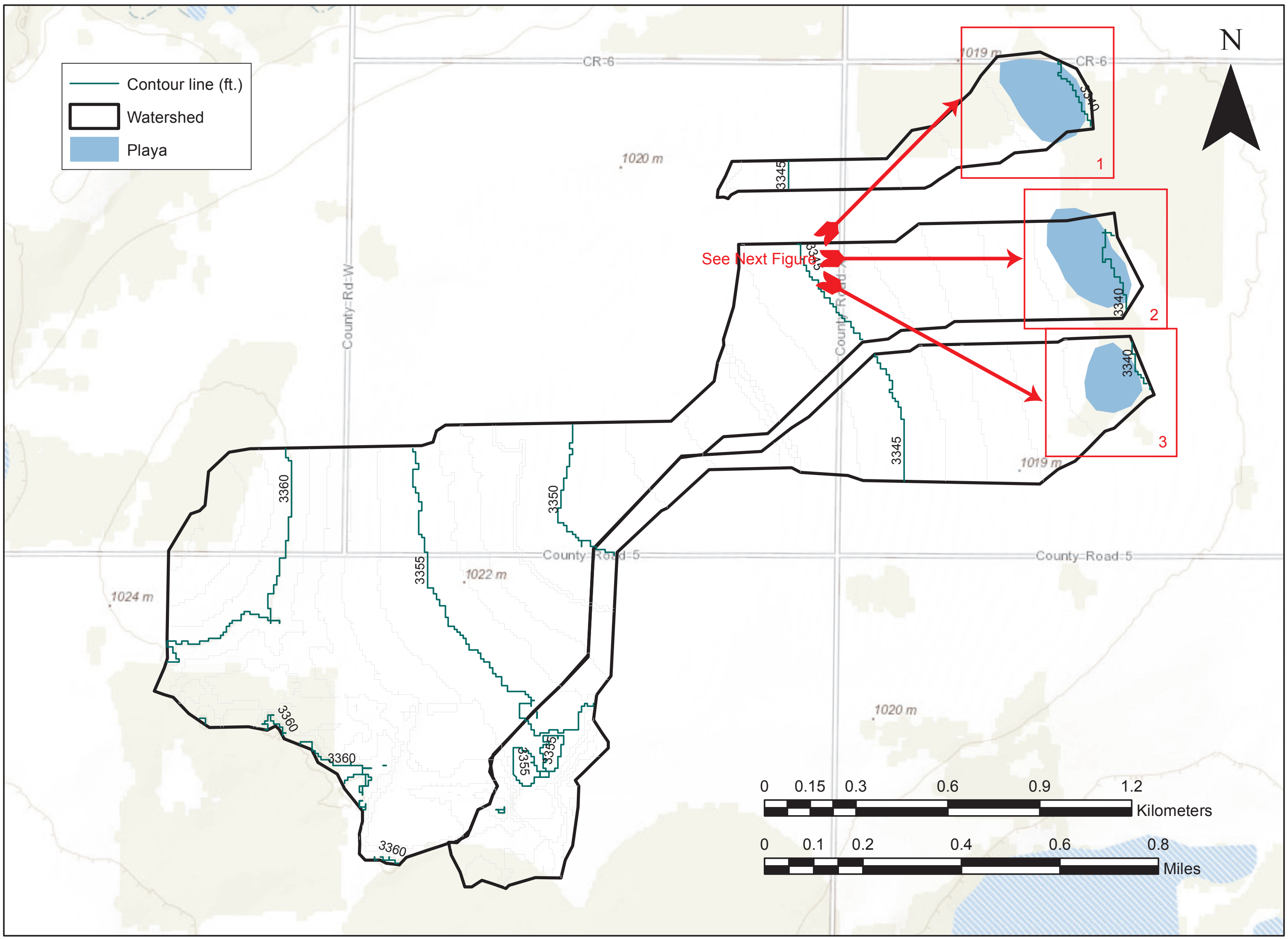
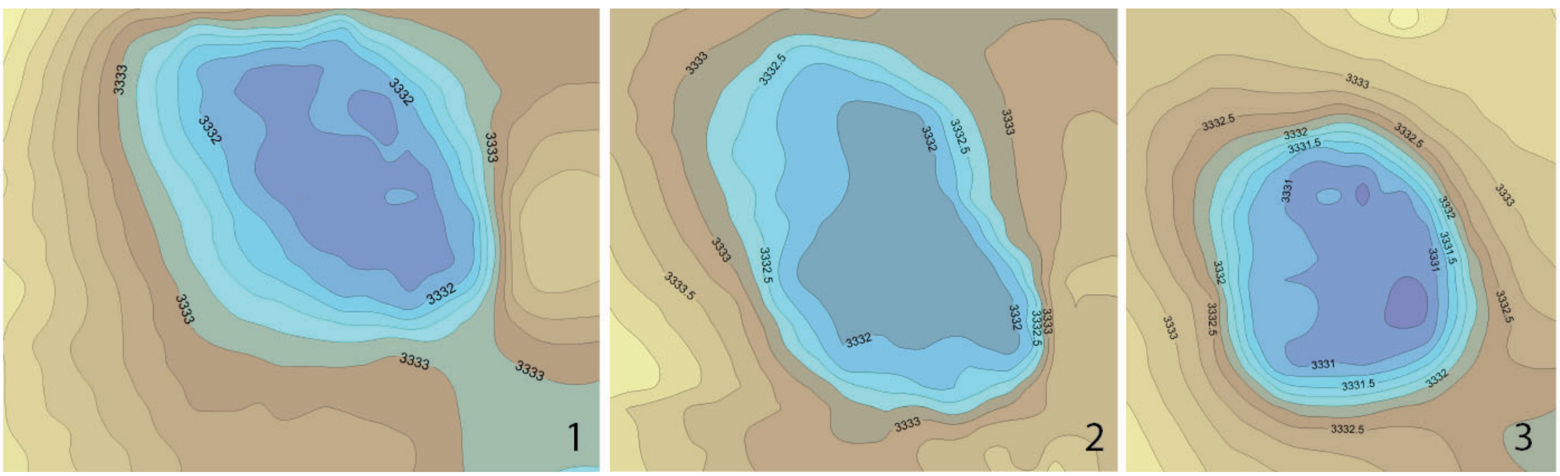
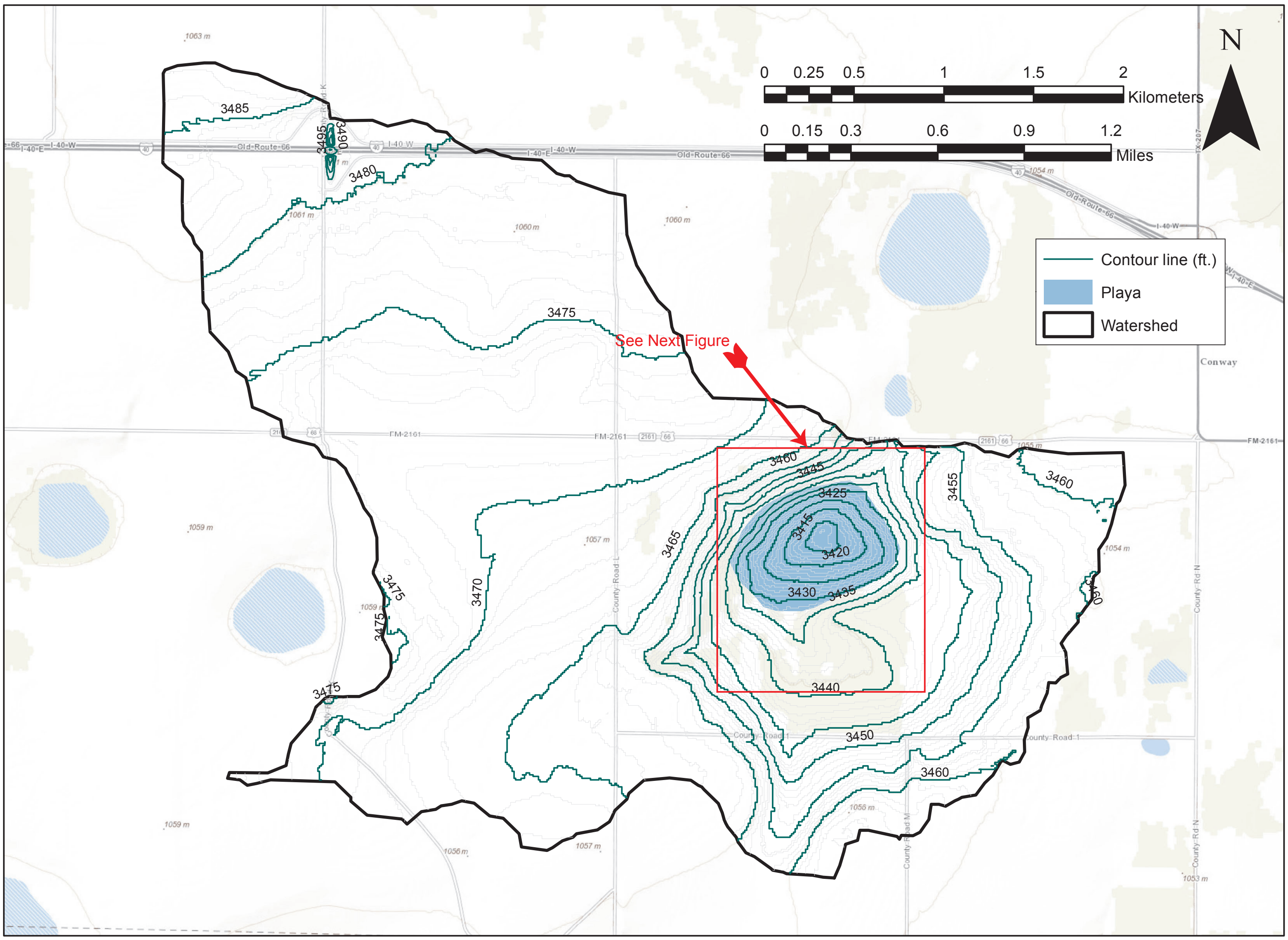


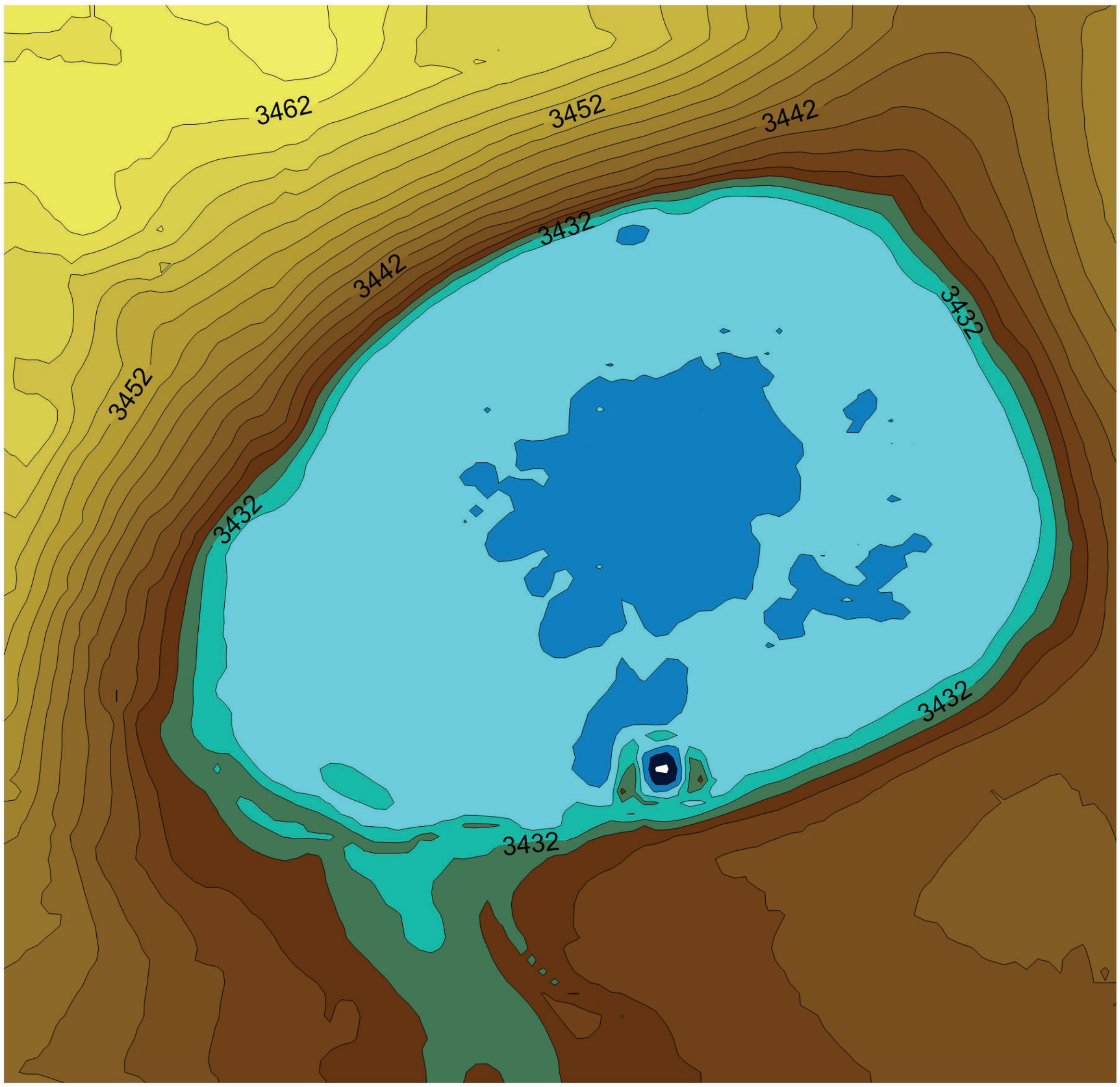
Obert N, M, and S watershed map



Obert survey maps



Wright watershed map



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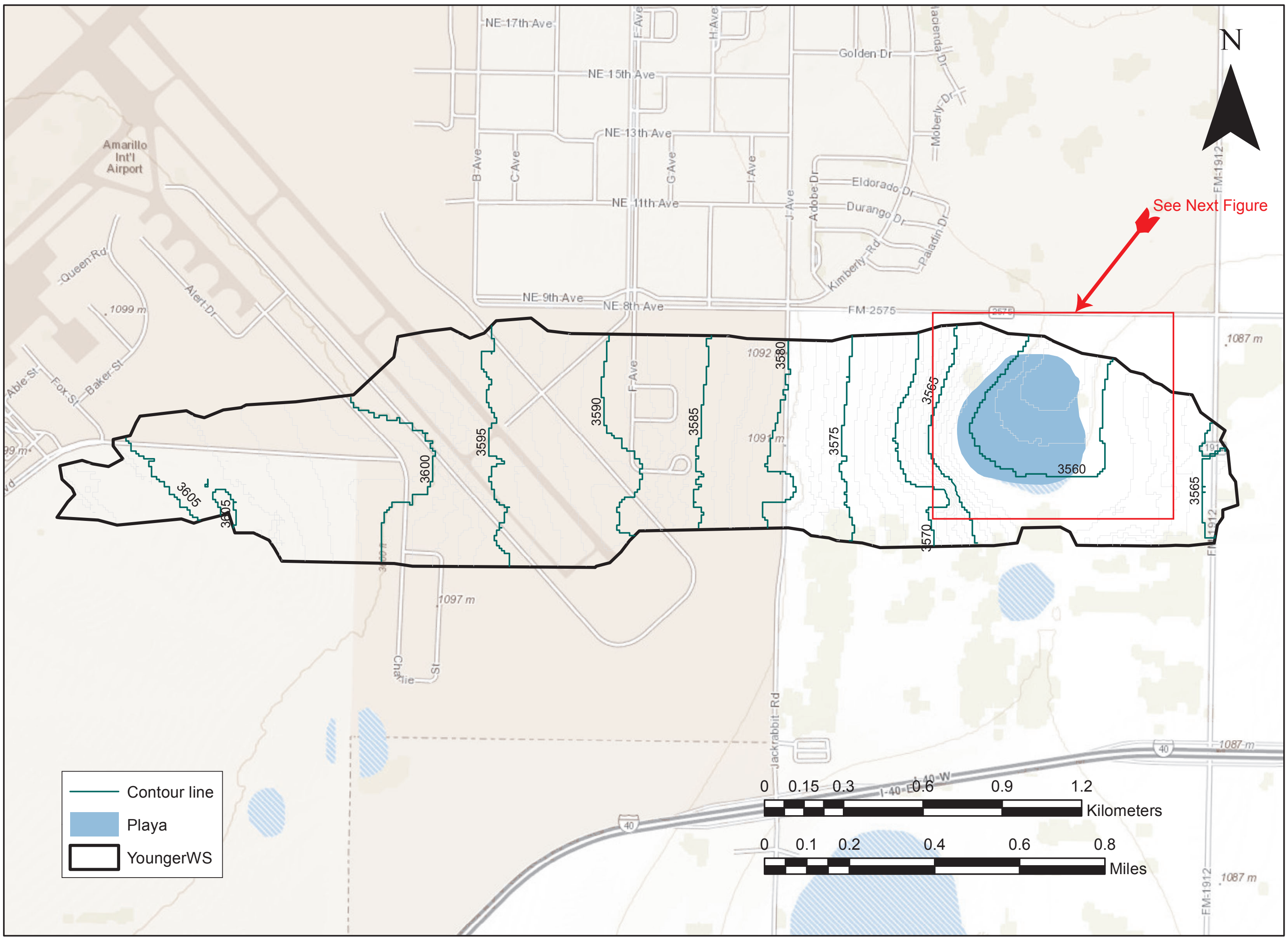
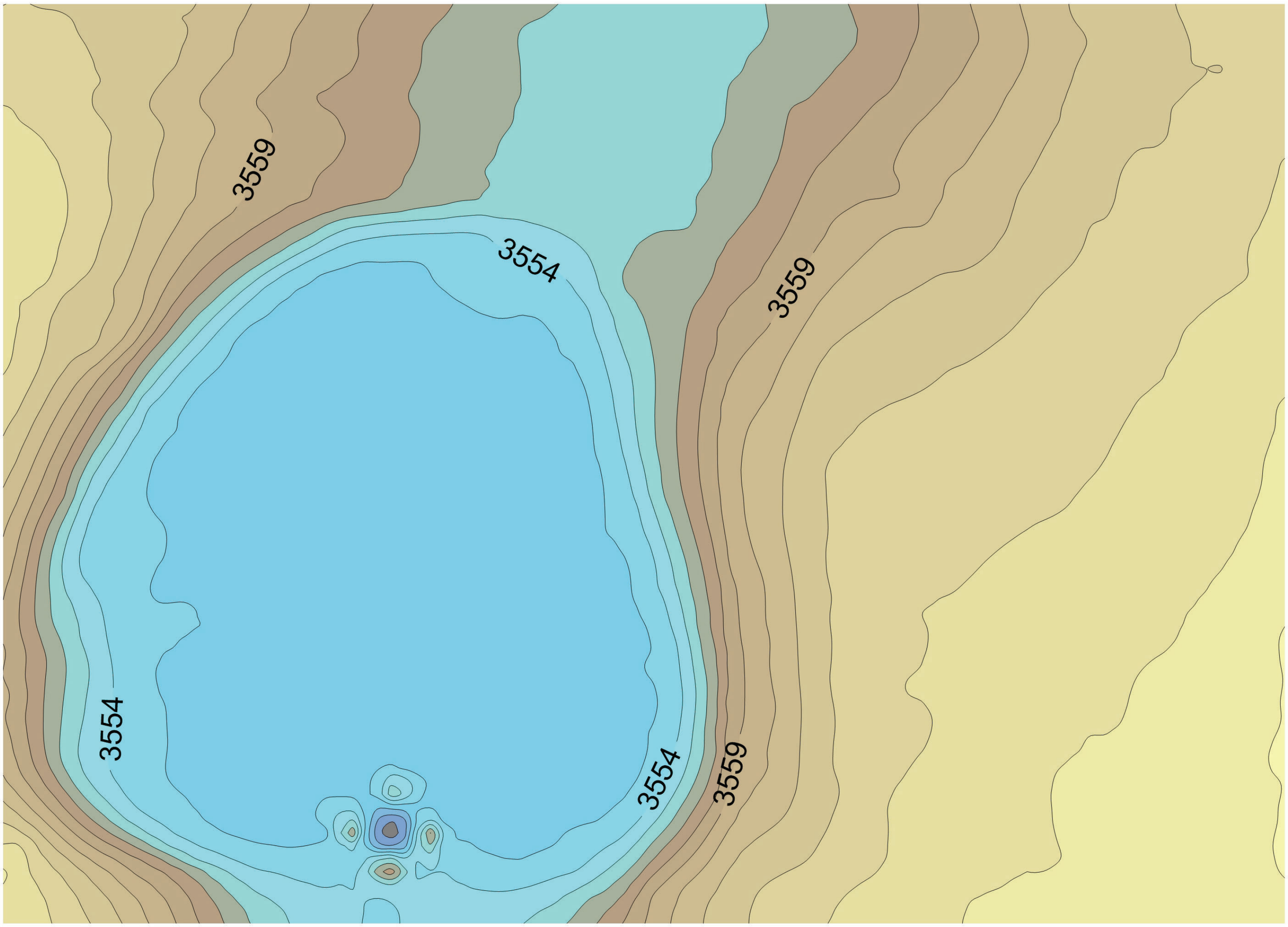
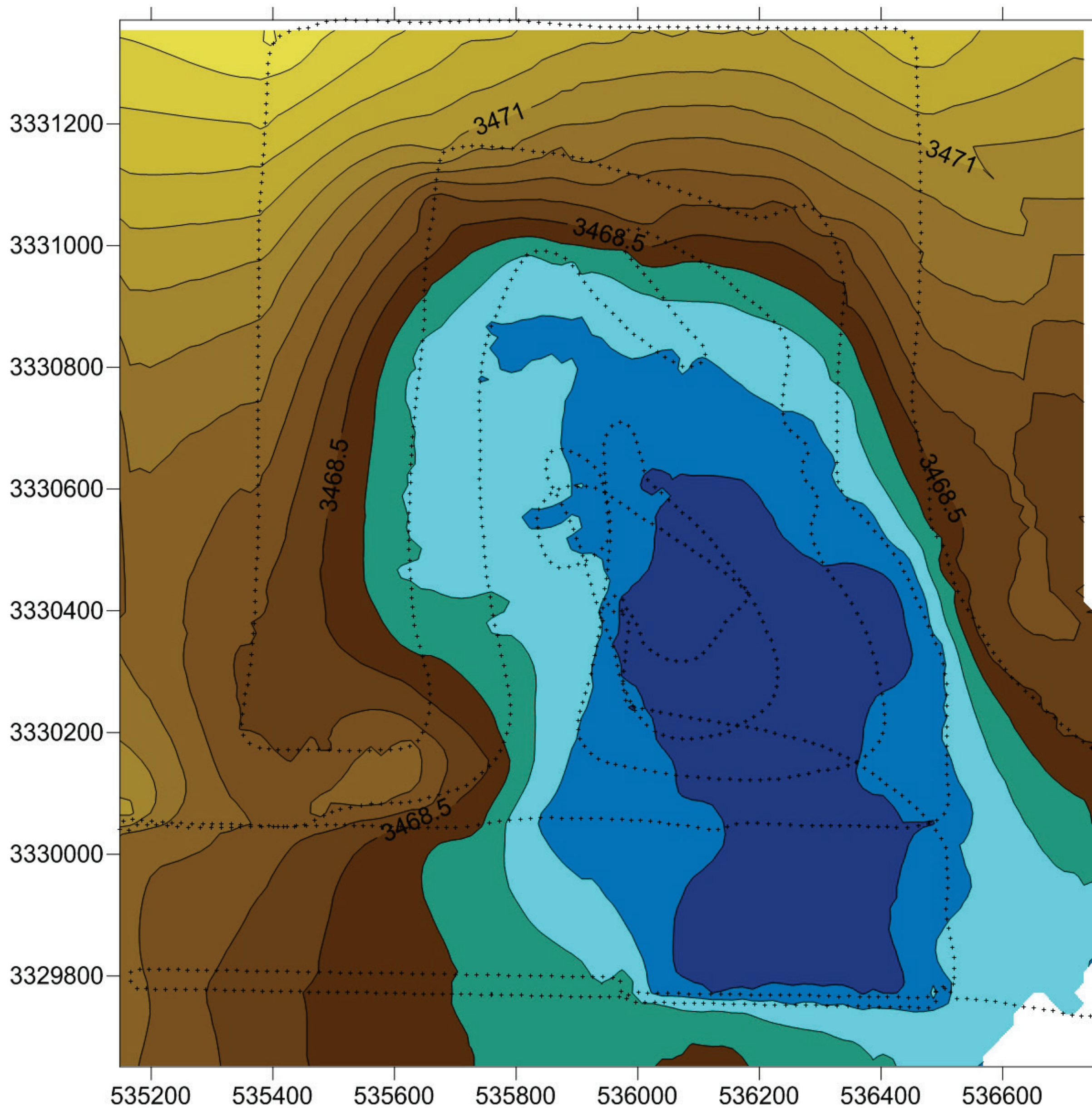


Younger watershed map



Younger survey map

B. Harrell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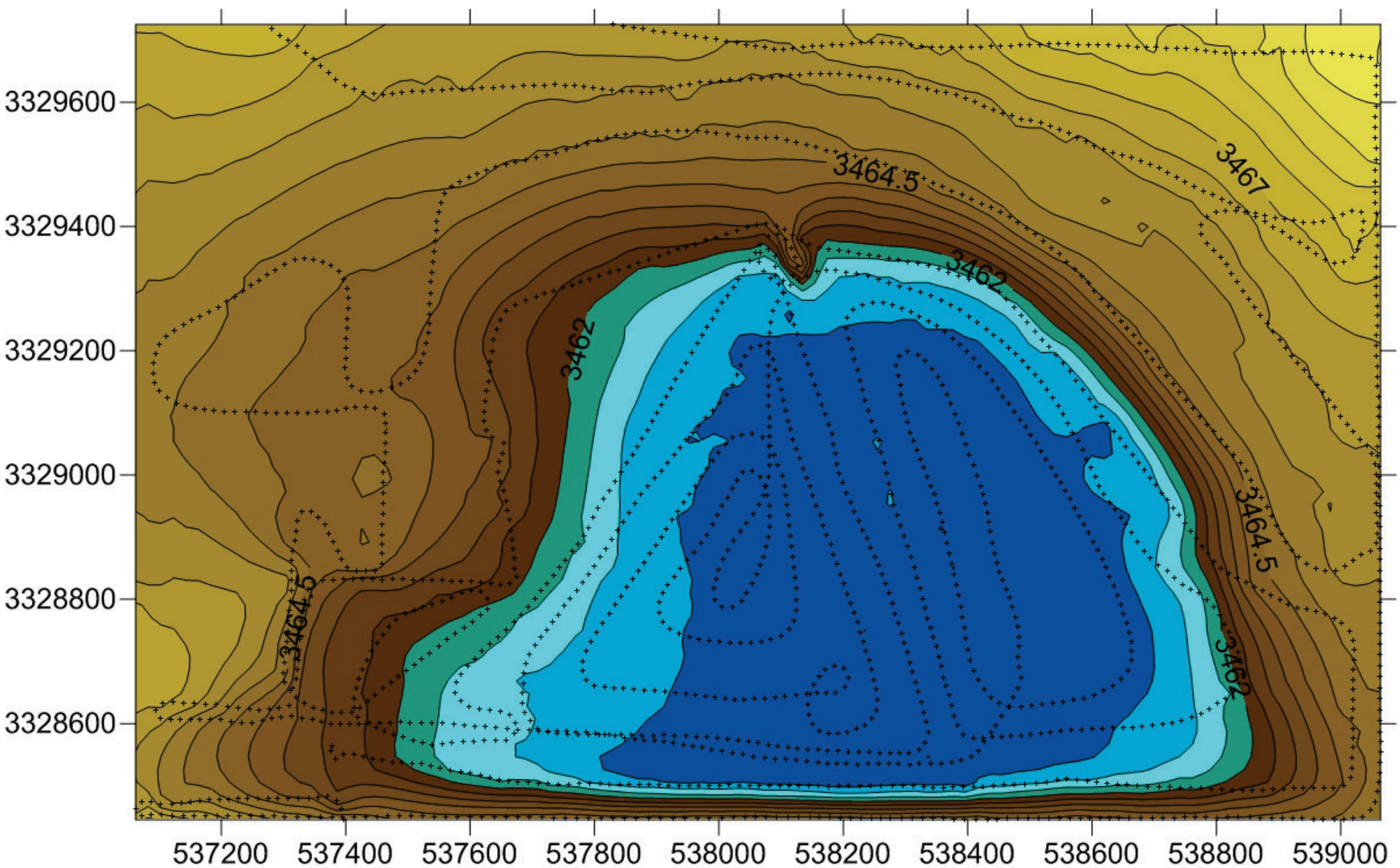

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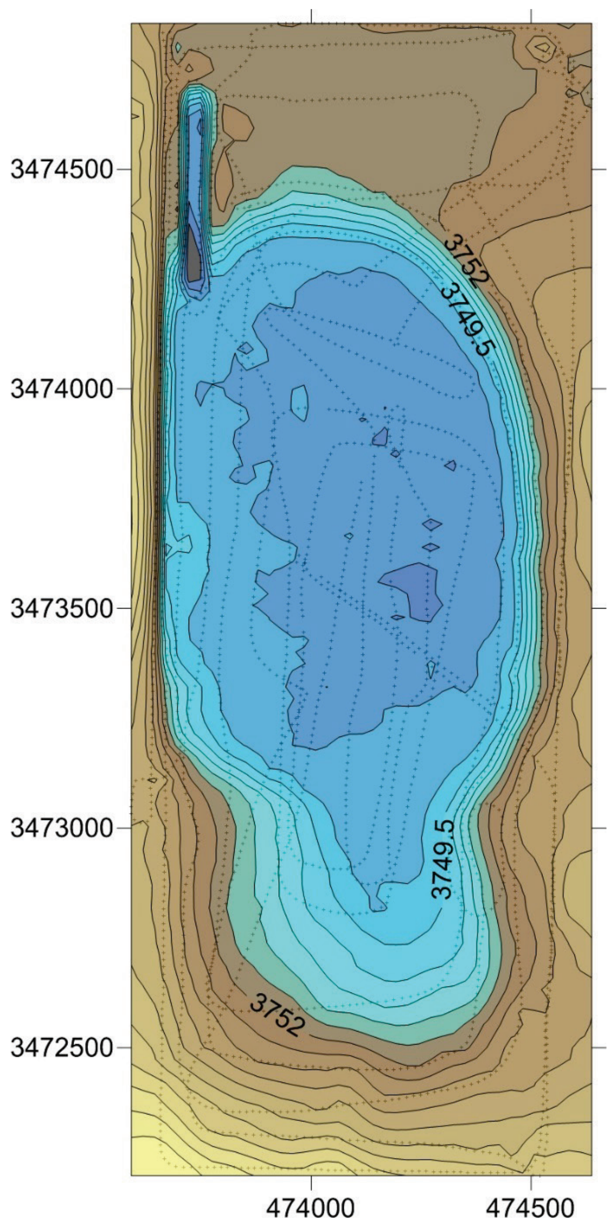
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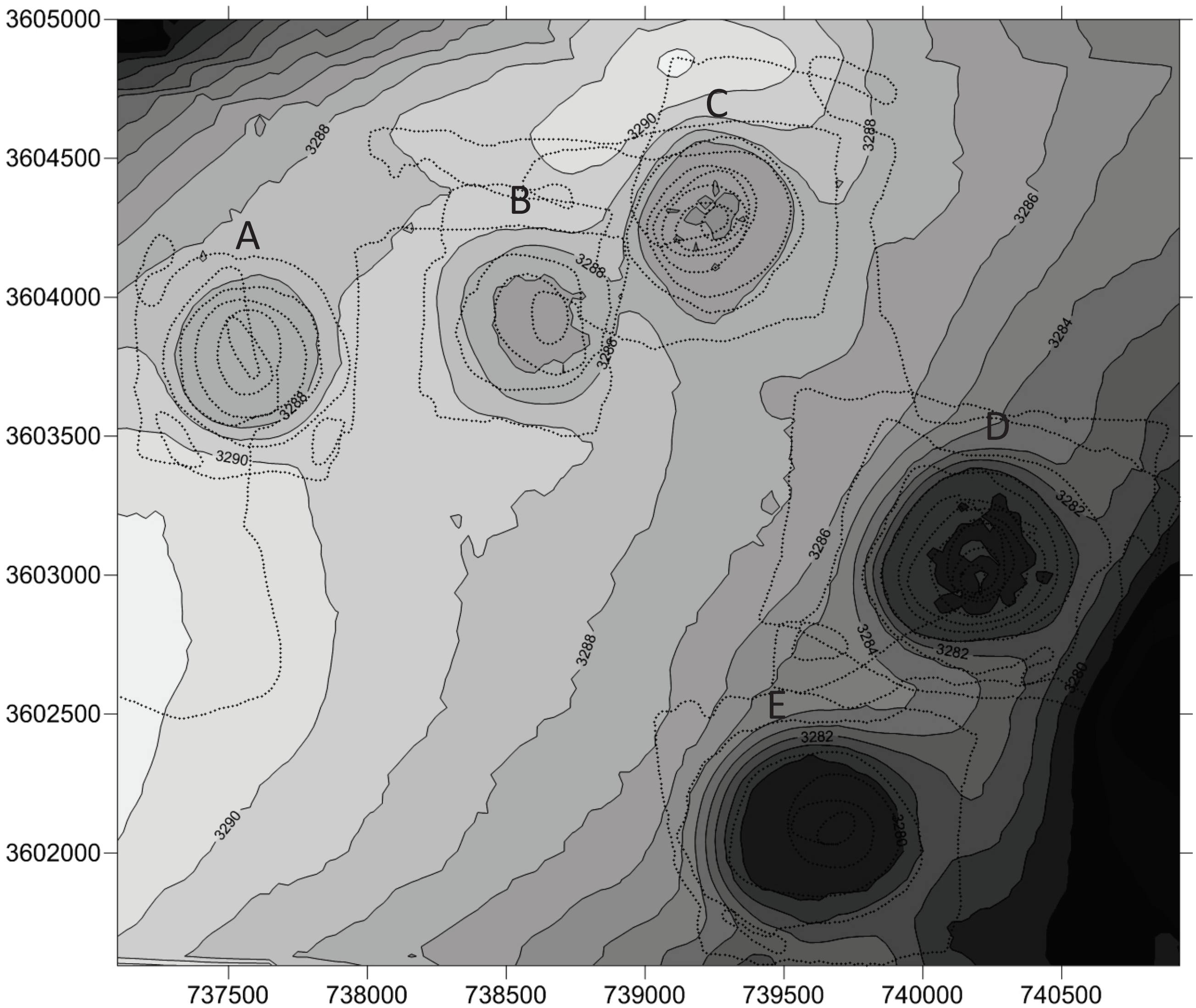
Bivins A to E



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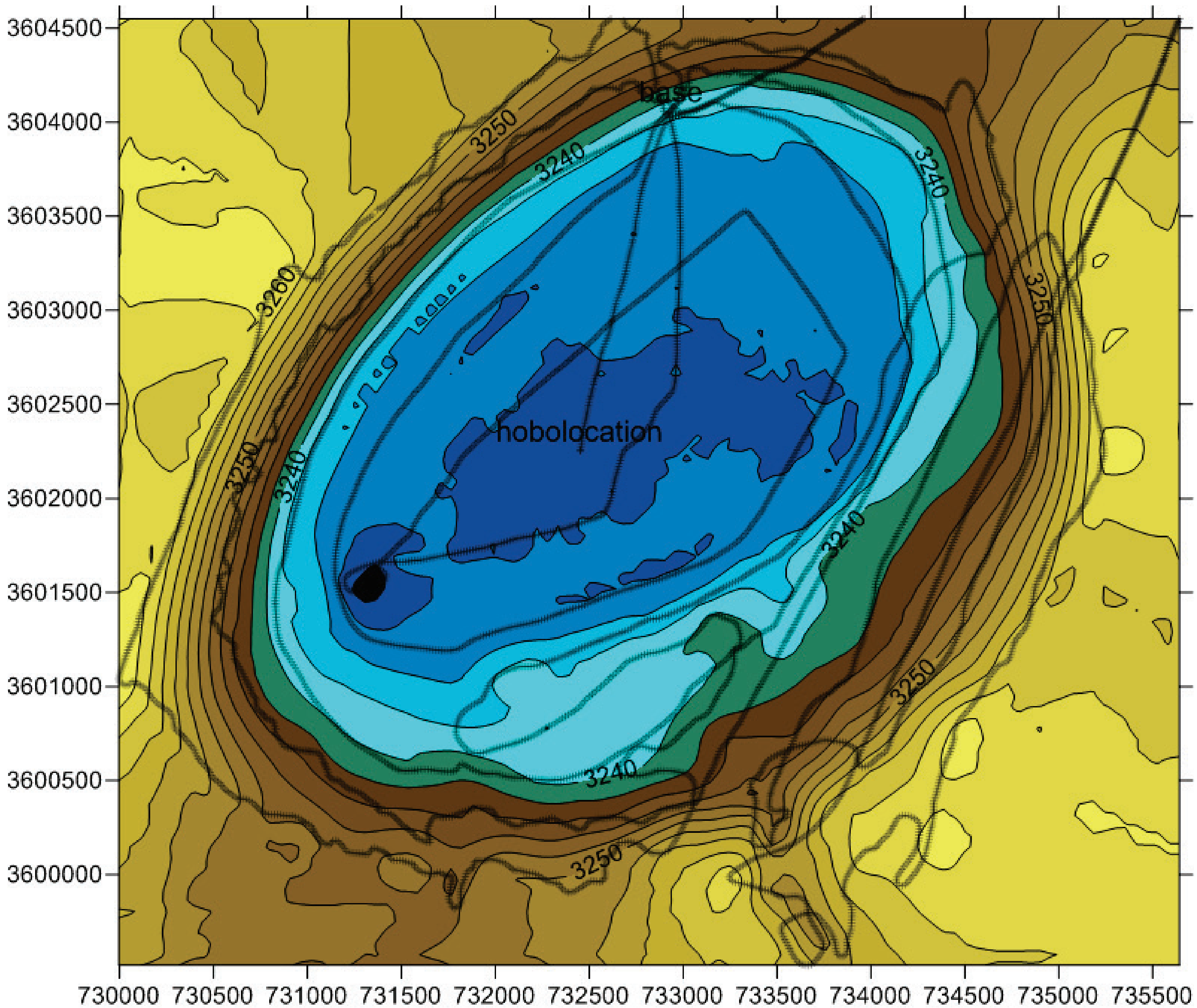
Bivins South

Survey Control Points and Well Data

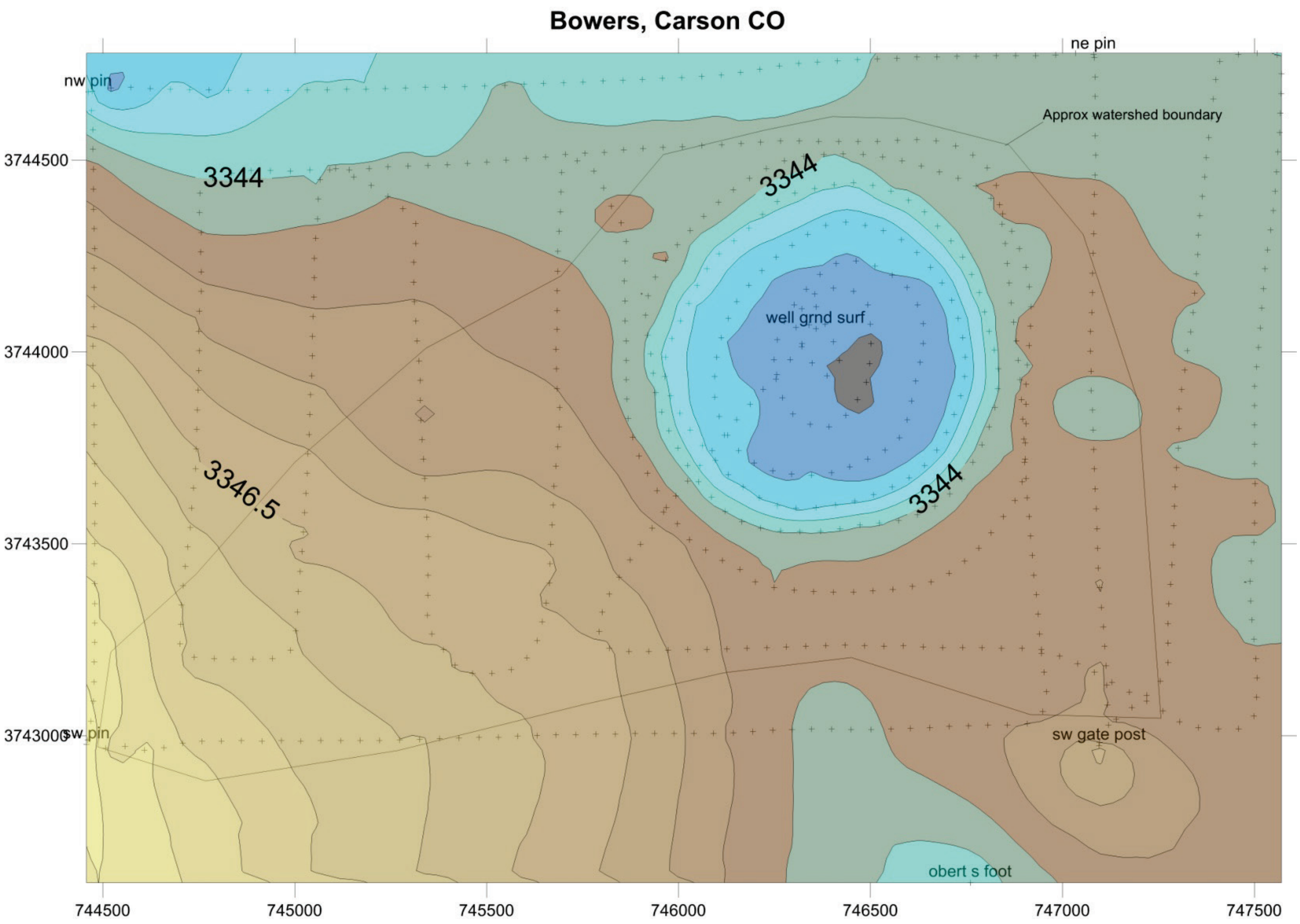
Easting	Northing	Elevation	Location ID
732939.11	3604058.79	3239.561	Base
732451.69	3602252.64	3233.359	Data Logger



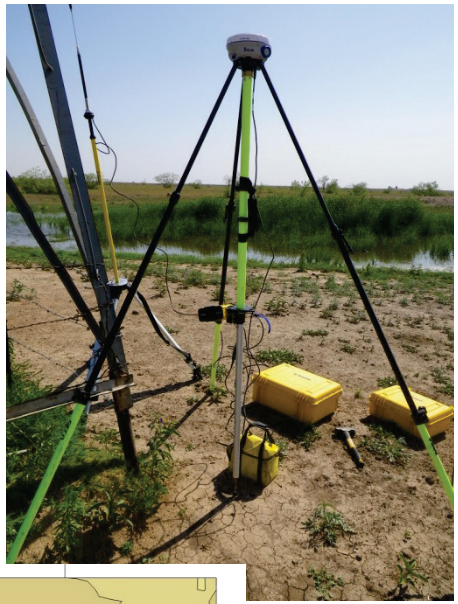
Bowers

Survey Control Points and Well Data

Easting	Northing	Elevation	Location ID
747095.62	3742974.43	3346.286	Base: sw gate post
746357.25	3744060.40	3345.312	well toc
747081.25	3744775.55	3344.336	ne pin
746357.61	3744060.44	3341.903	well grnd surf
744462.27	3744677.93	3343.405	nw pin
744457.51	3742977.53	3349.687	sw pin
746760.11	3742616.98	3343.607	Obert met station south foot-pad



Briscoe County Range Playa - BRRNG



Survey Control Points and Well Data

Easting	Northing	Elevation	Location ID
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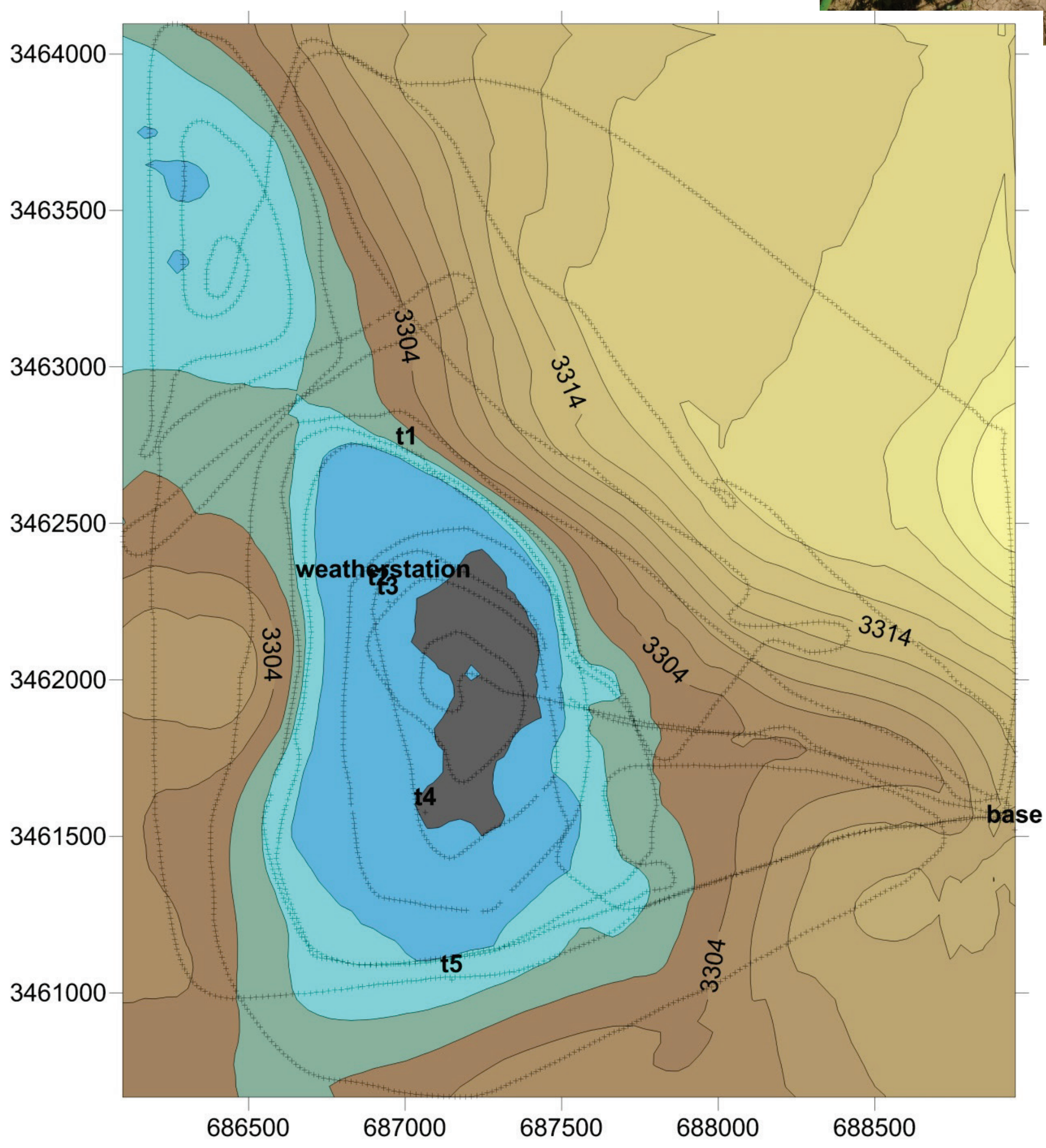
687006.18	3462728.59	3299.339	t1
686930.40	3462303.85	3296.195	Weather station
686916.05	3462278.58	3296.101	t2
686945.75	3462249.39	3295.891	t3
687065.06	3461575.95	3295.573	t4
687149.30	3461041.82	3298.760	t5



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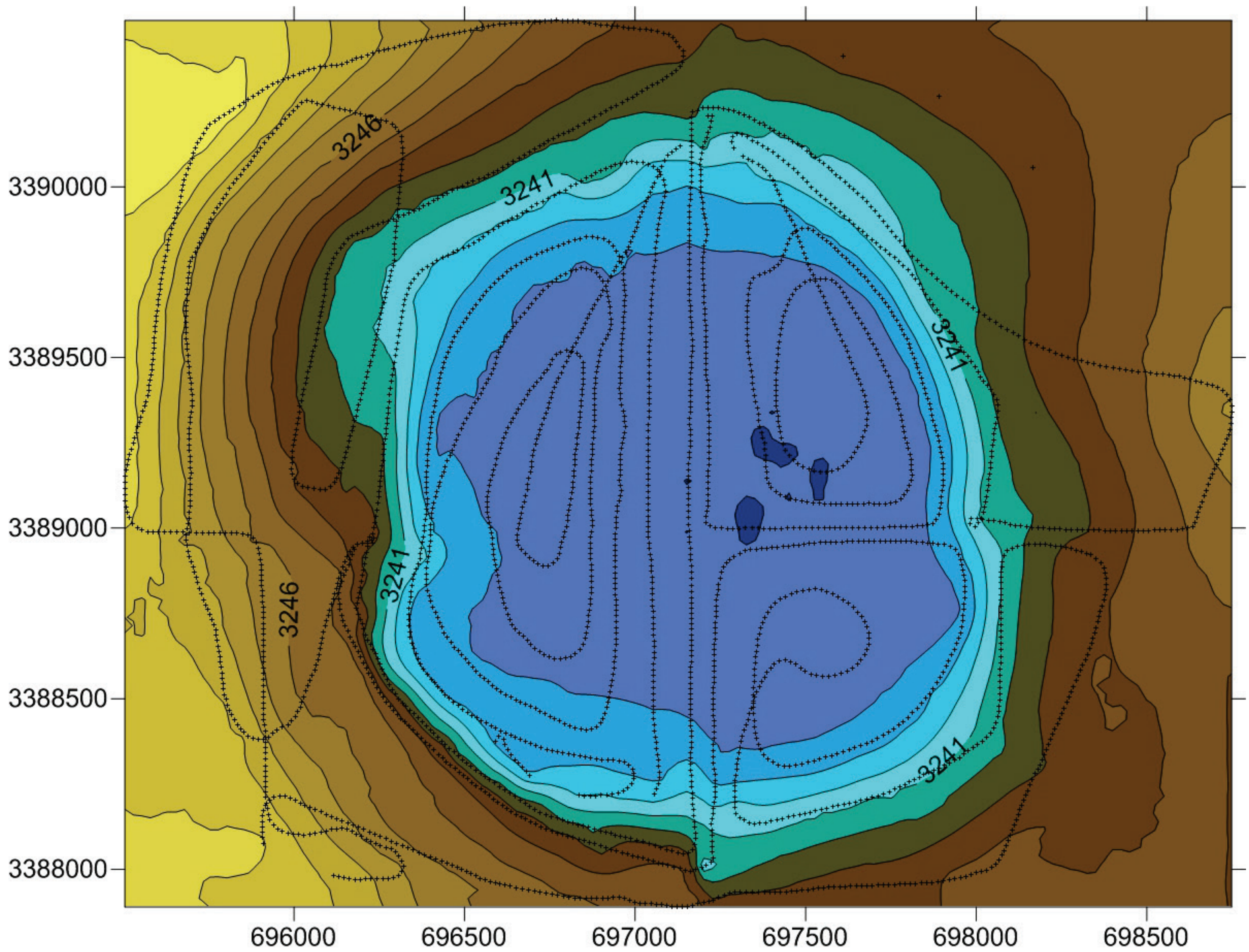

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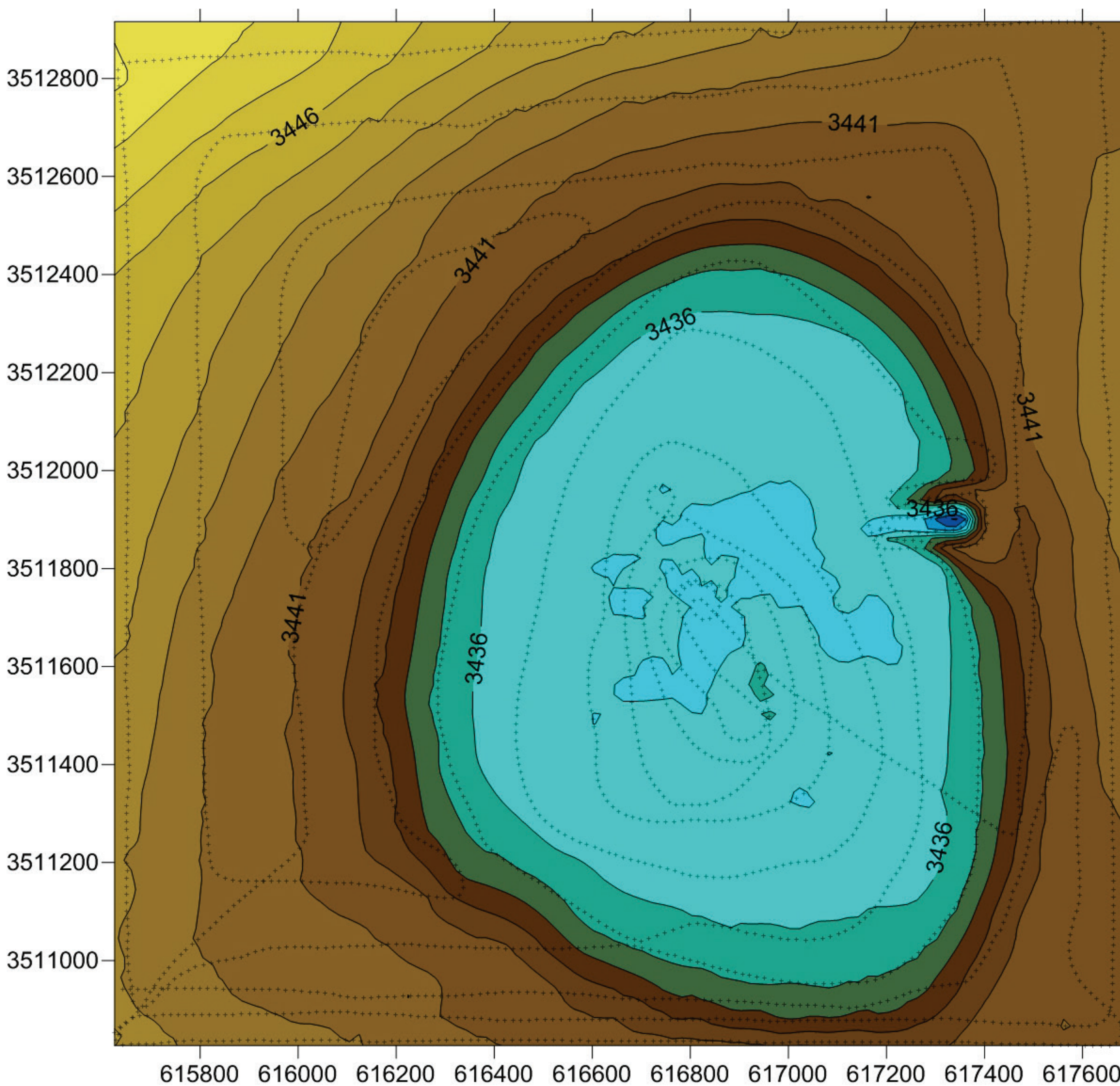

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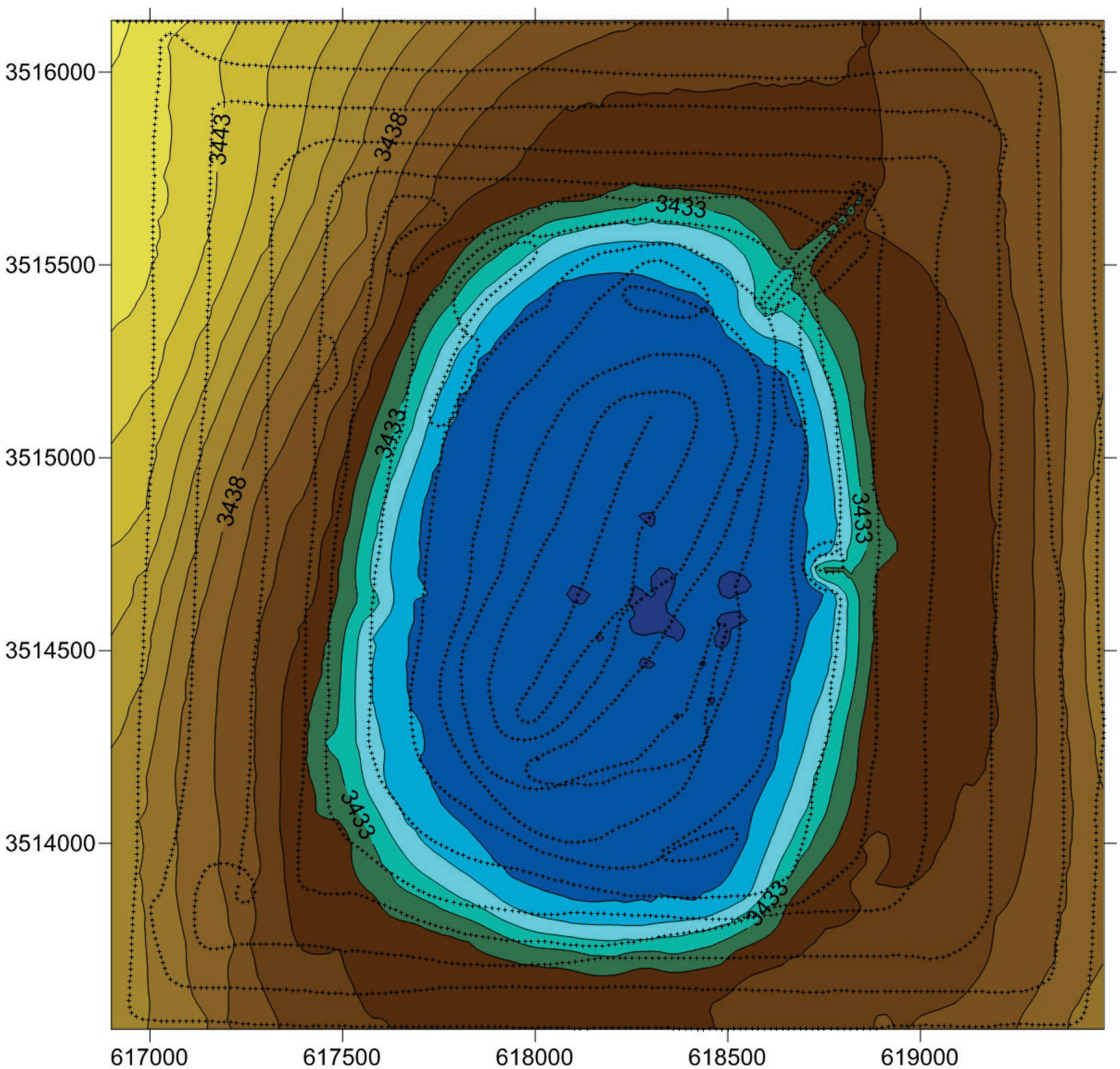
Crooks 2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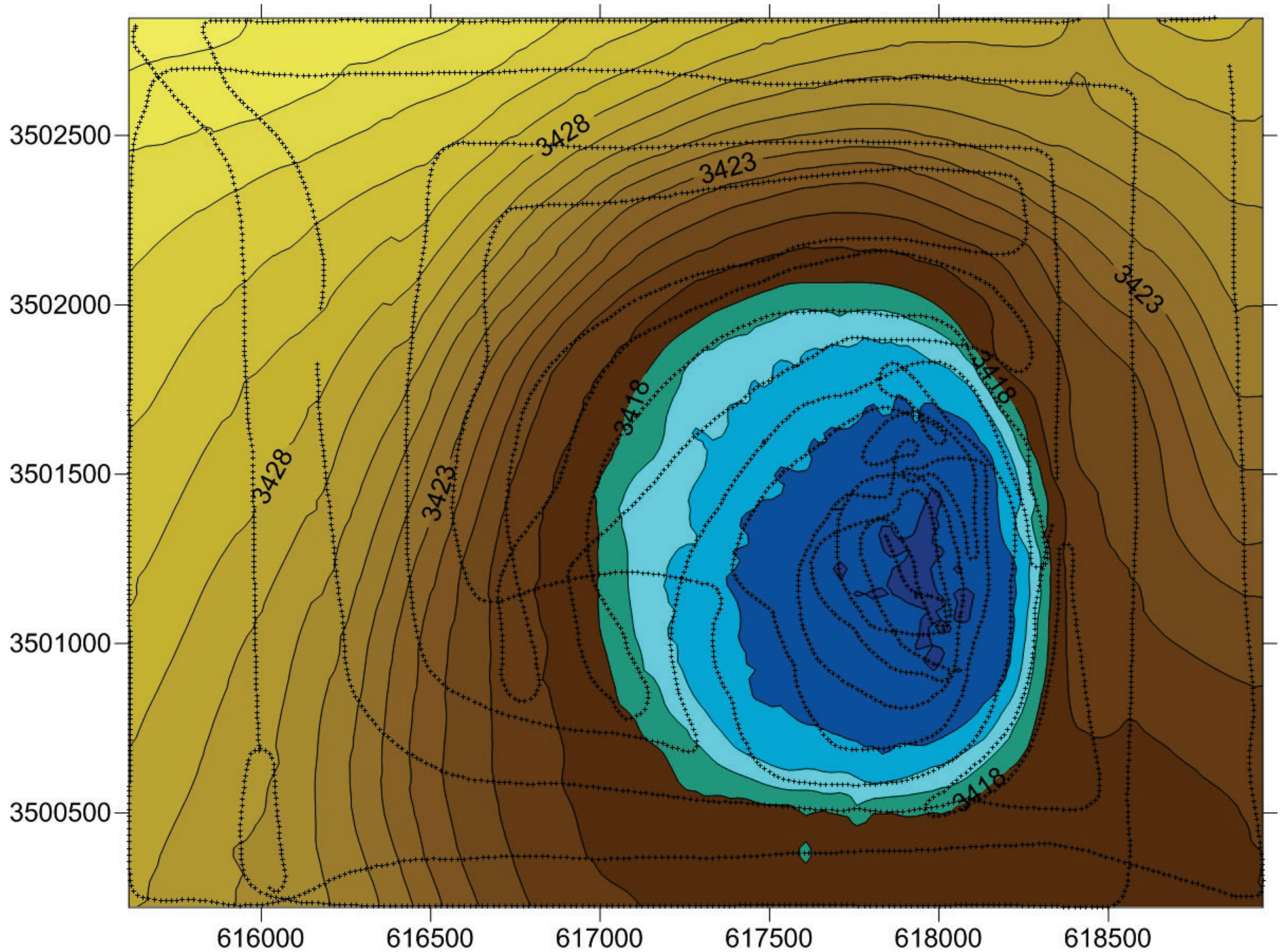

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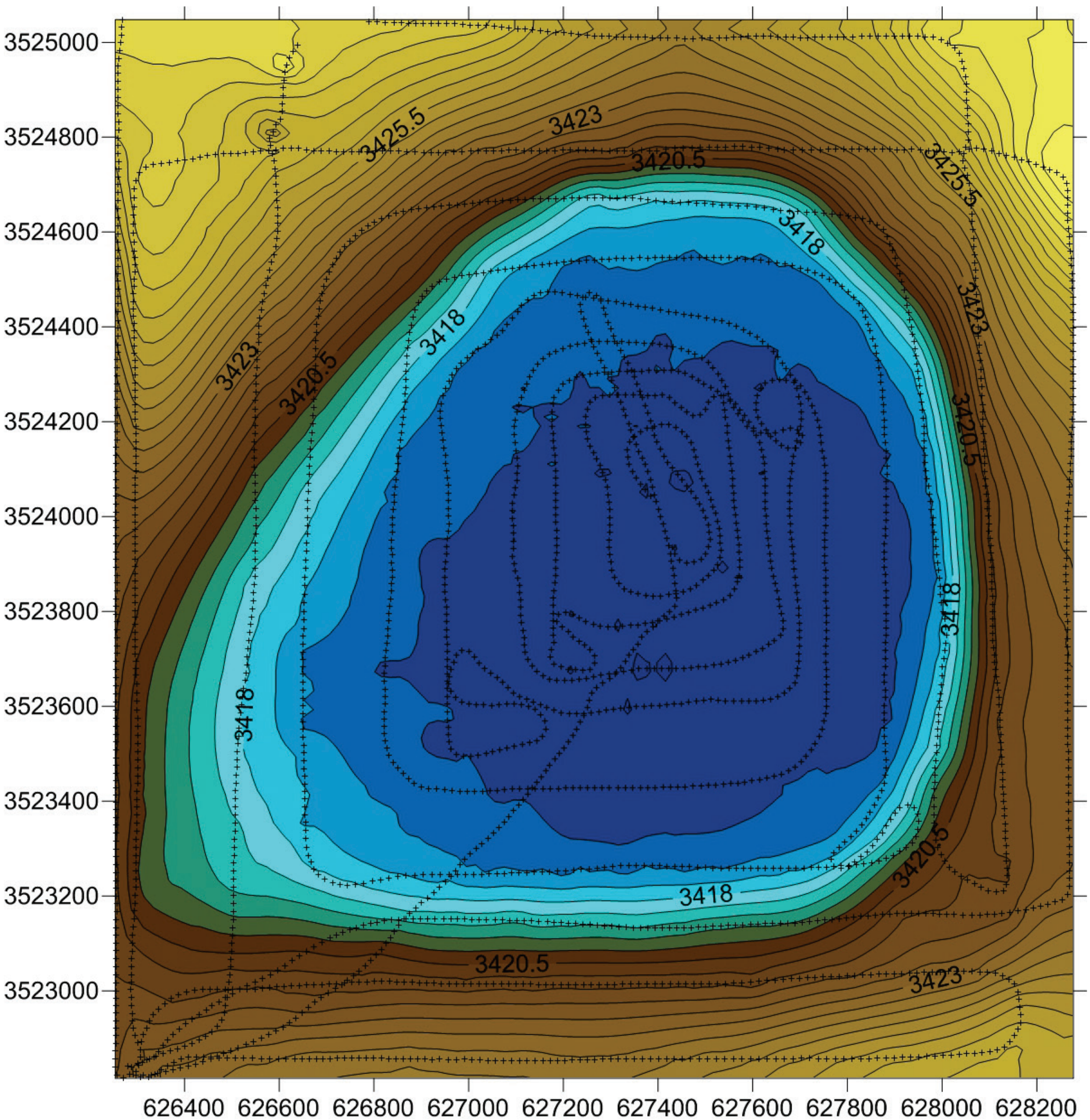
Crooks 4



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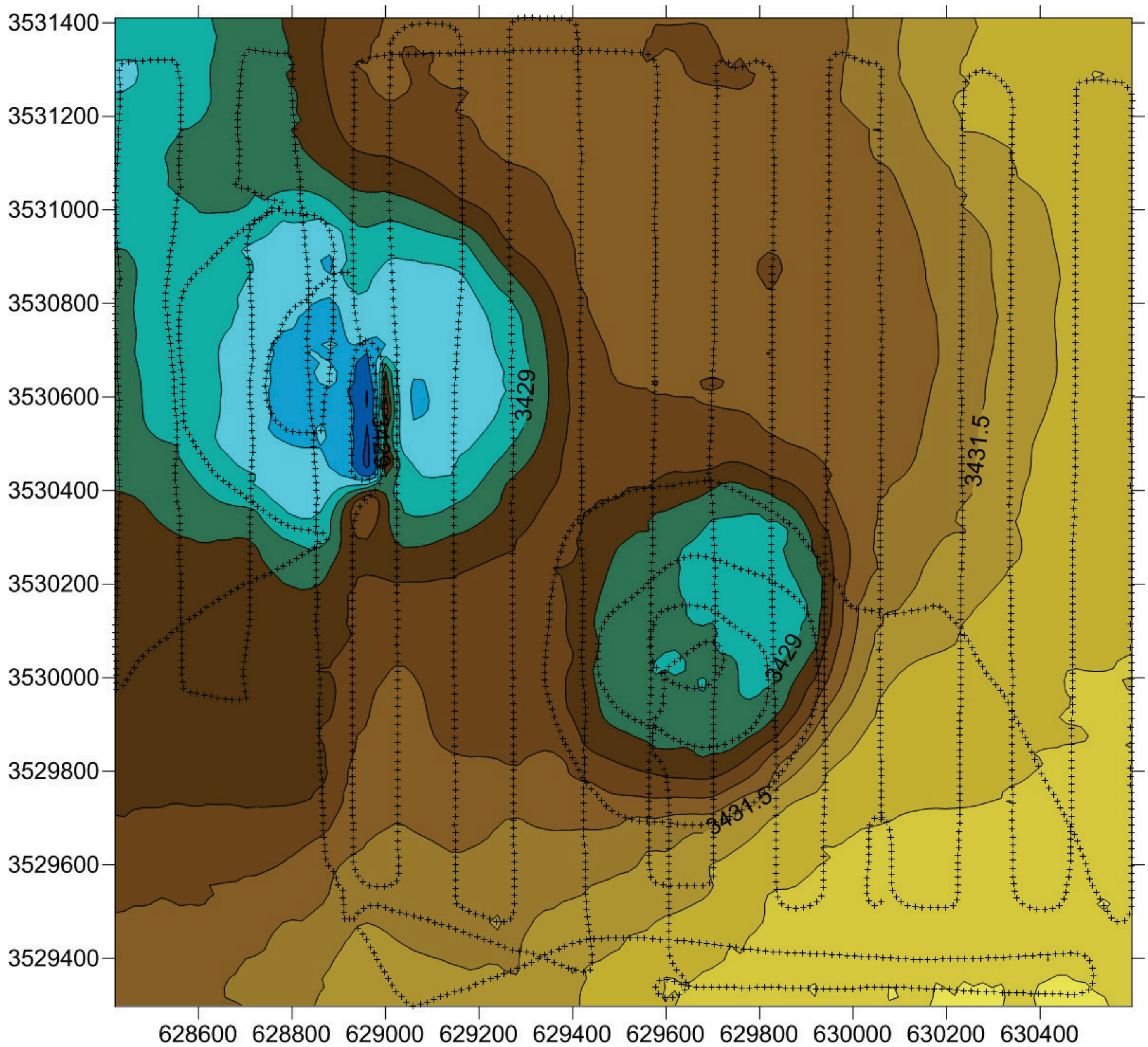
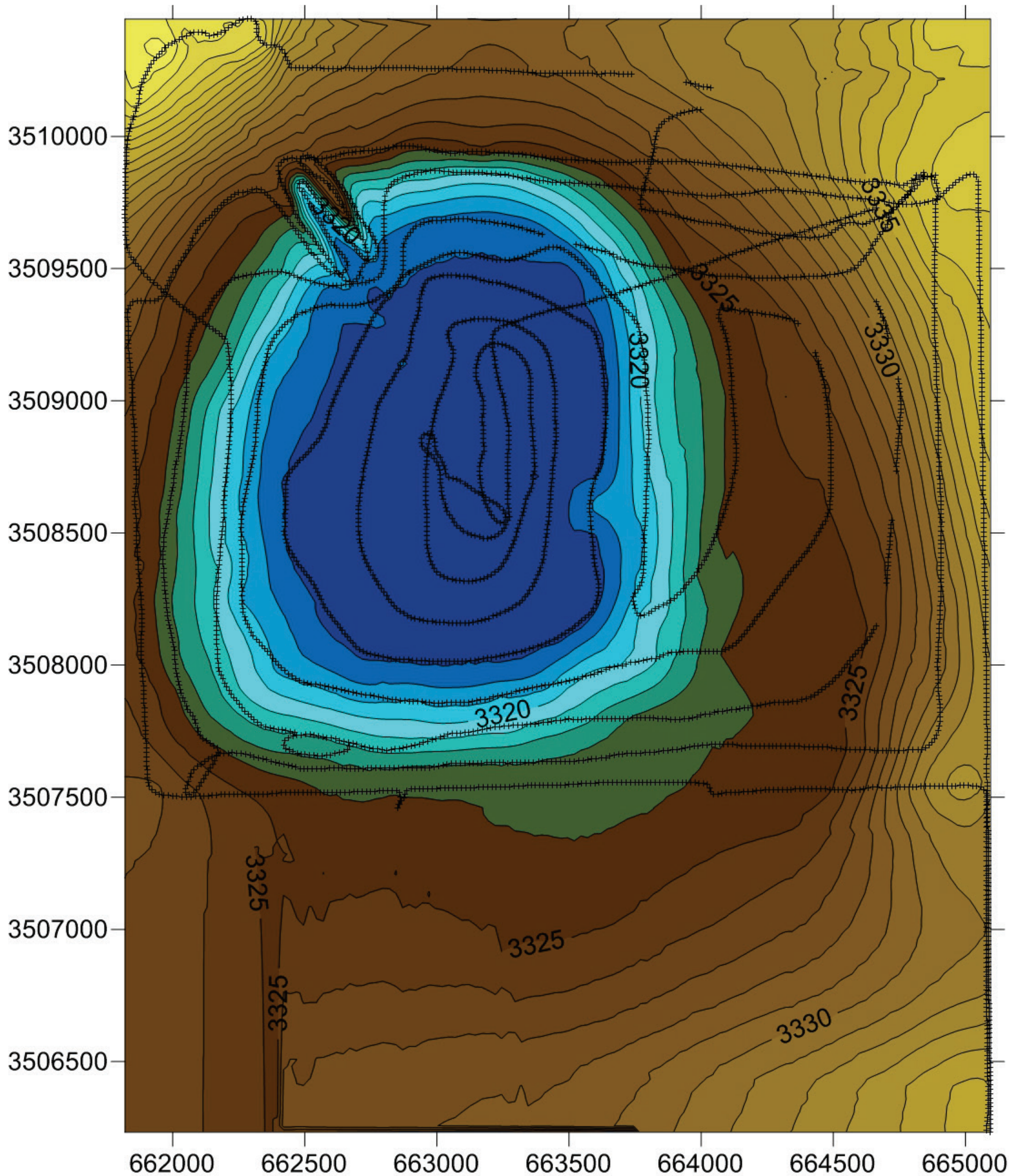
Crooks 5 and 5W



Crooks 6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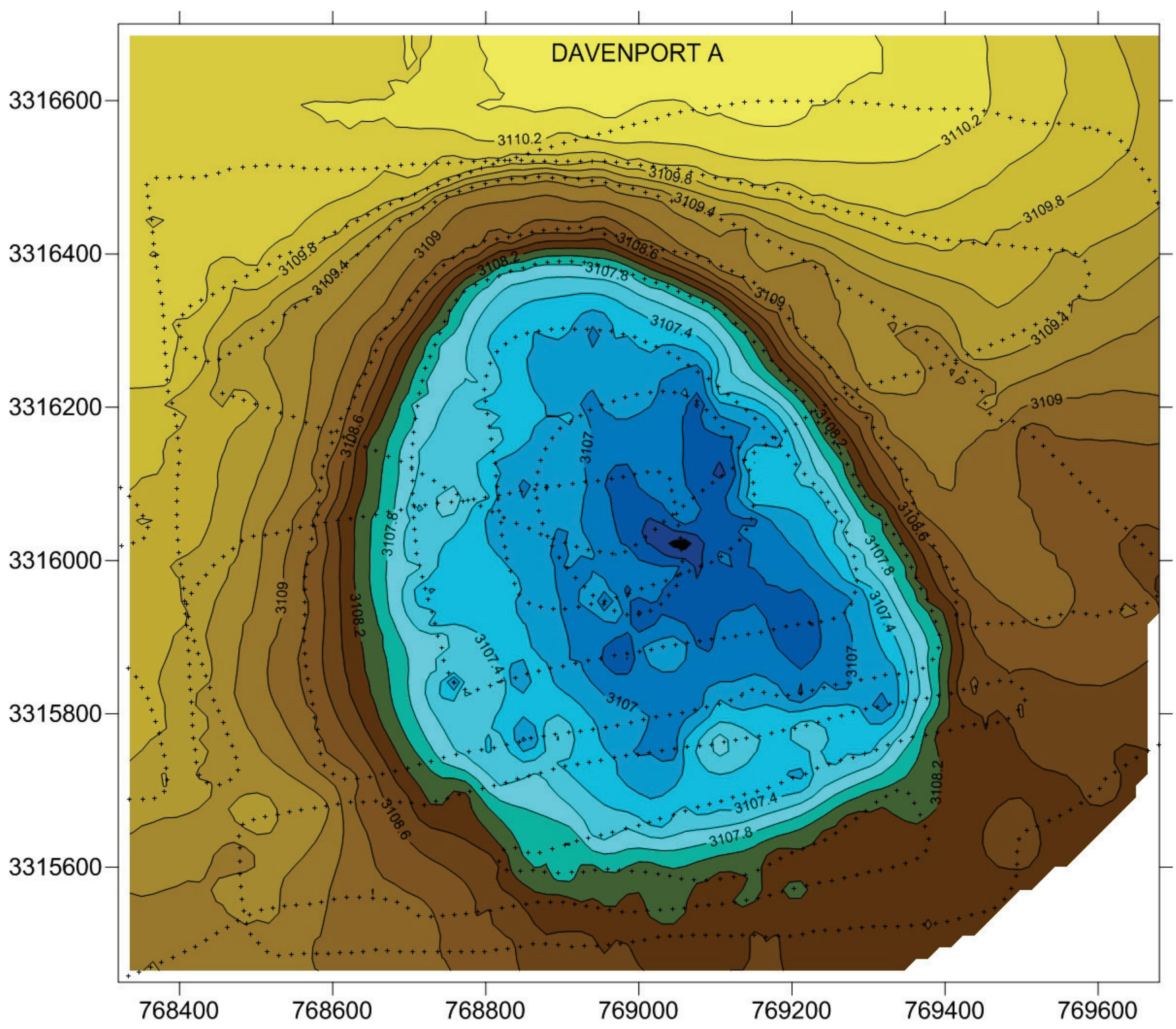
Davenport A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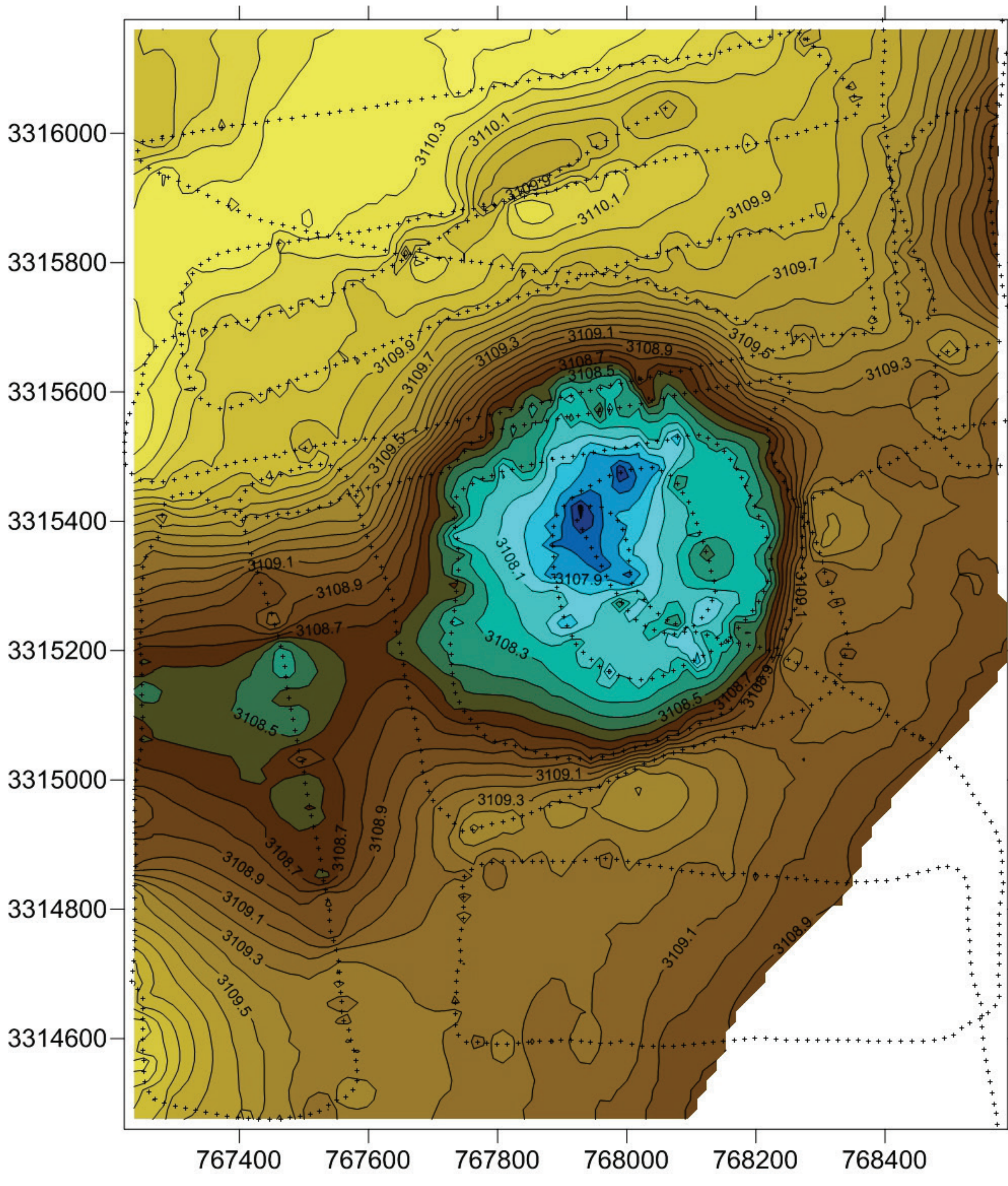
Davenport B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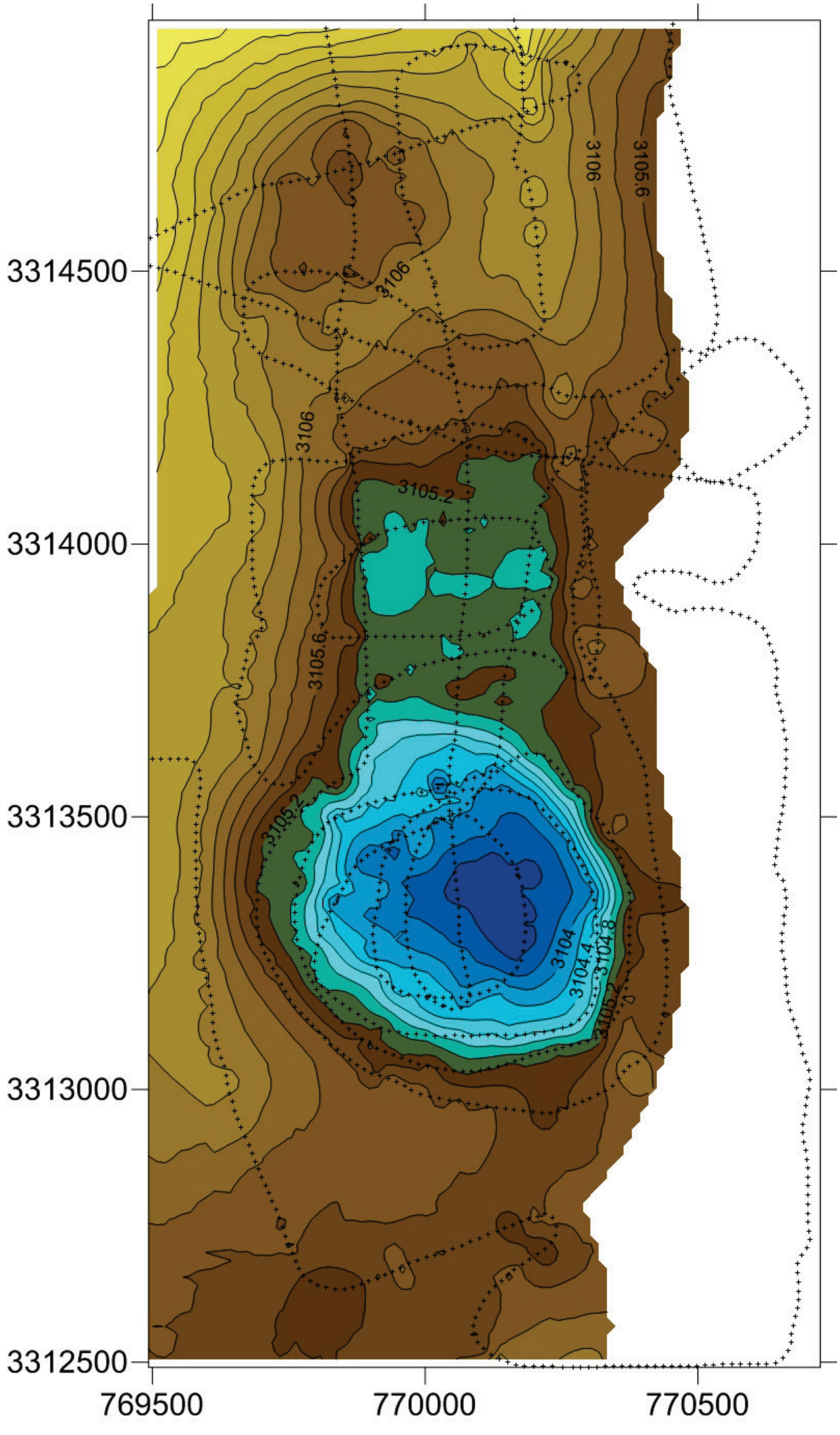
Davenport C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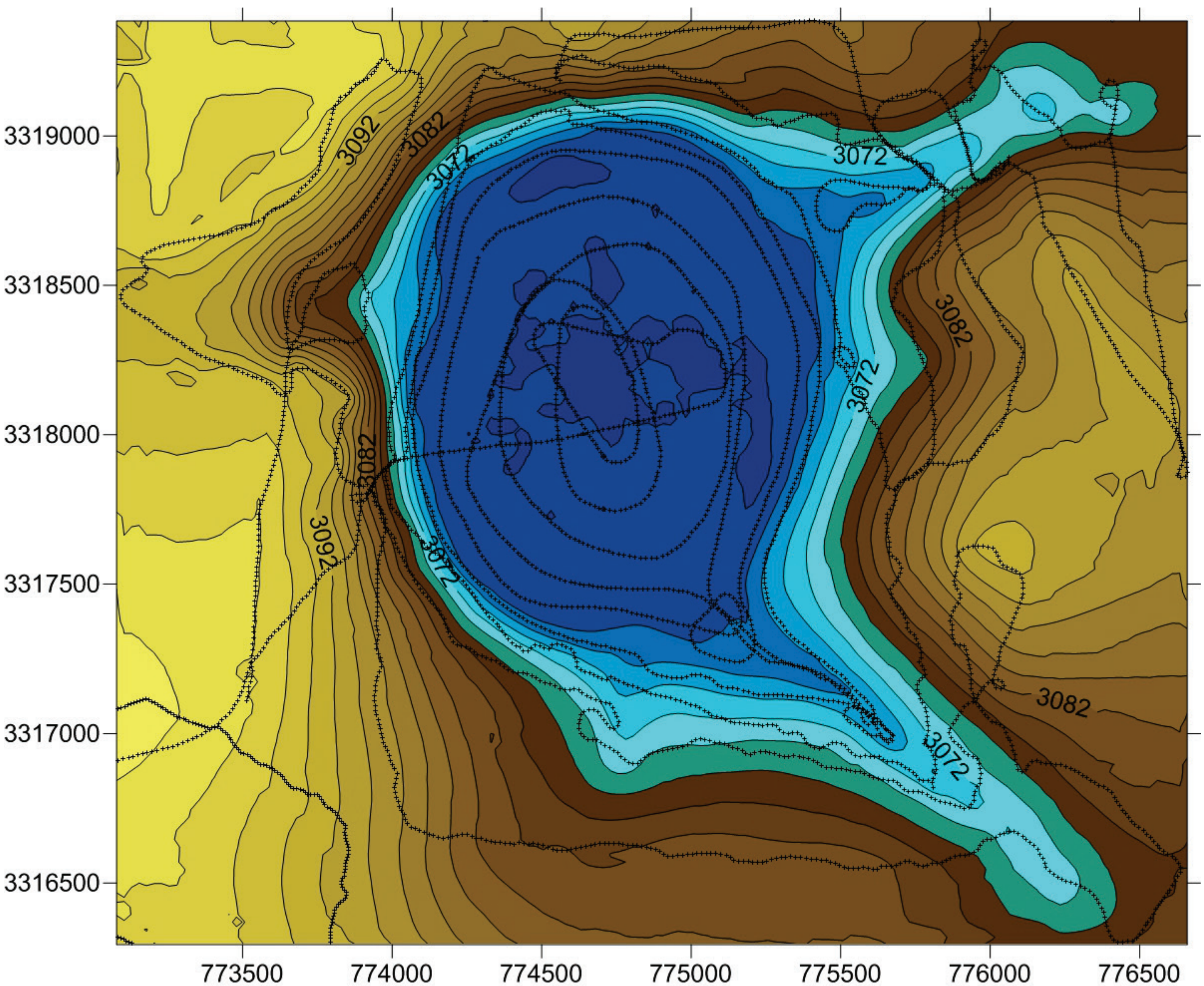
Davenport D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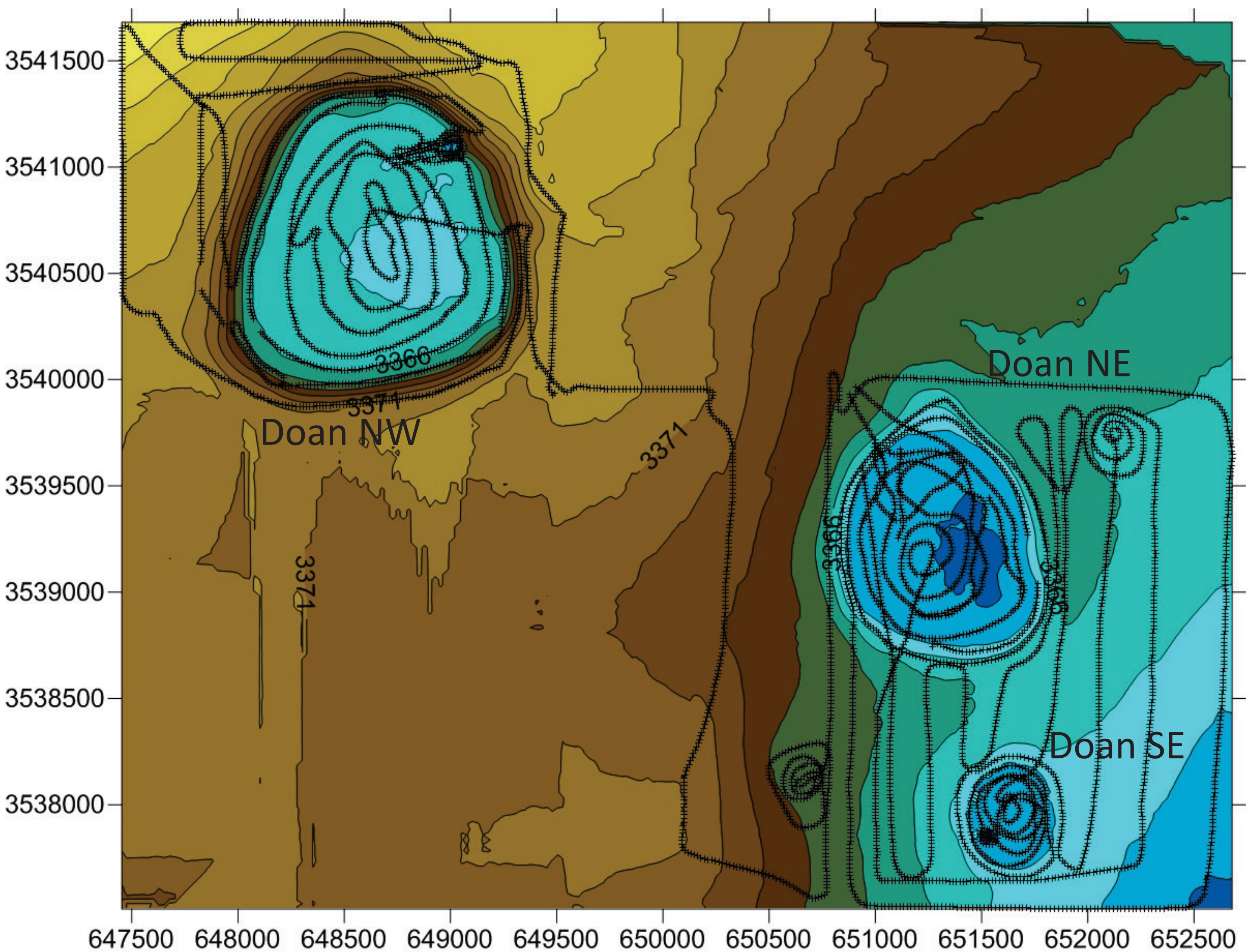

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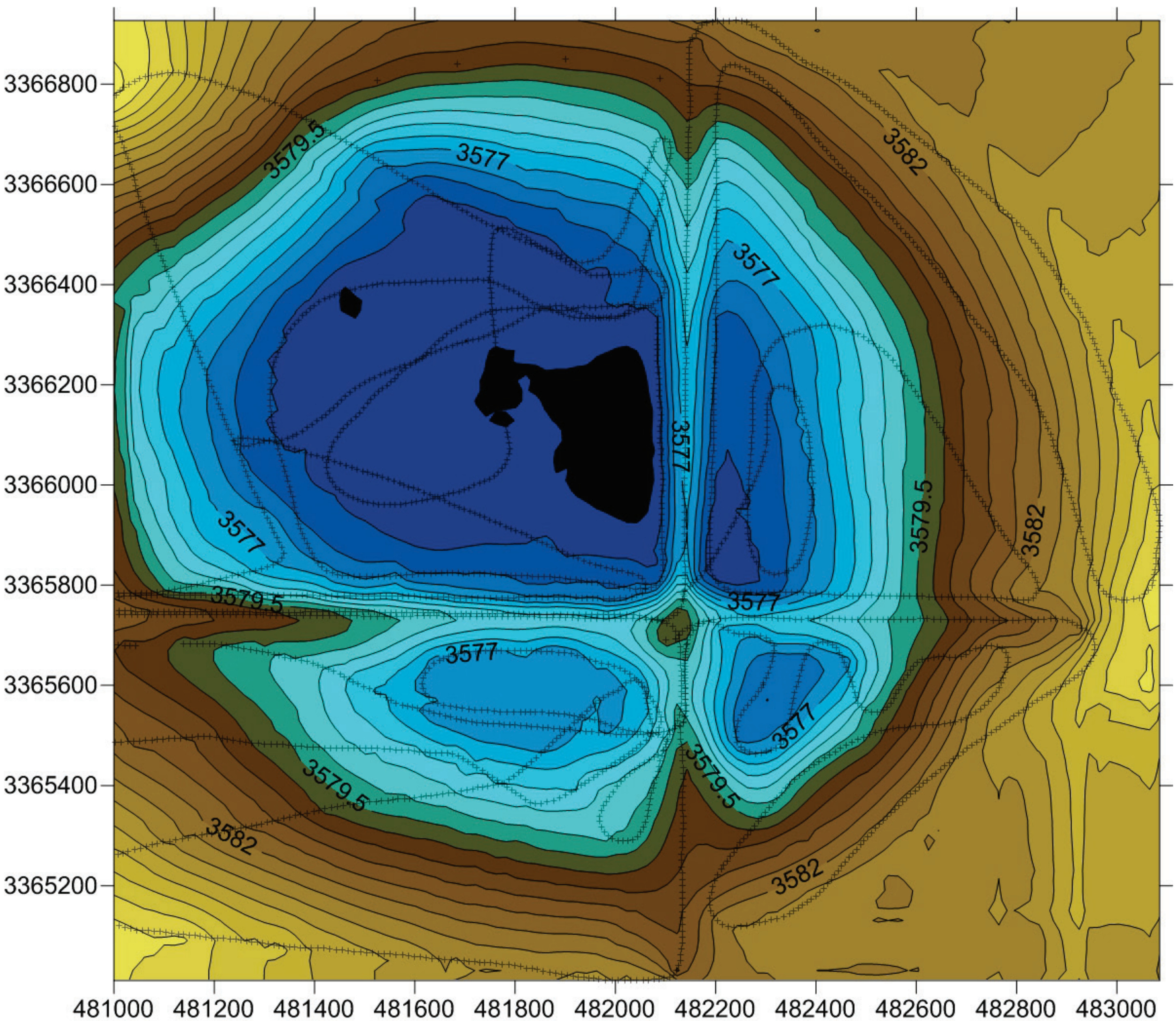
Fancher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3579.5
3582
3582

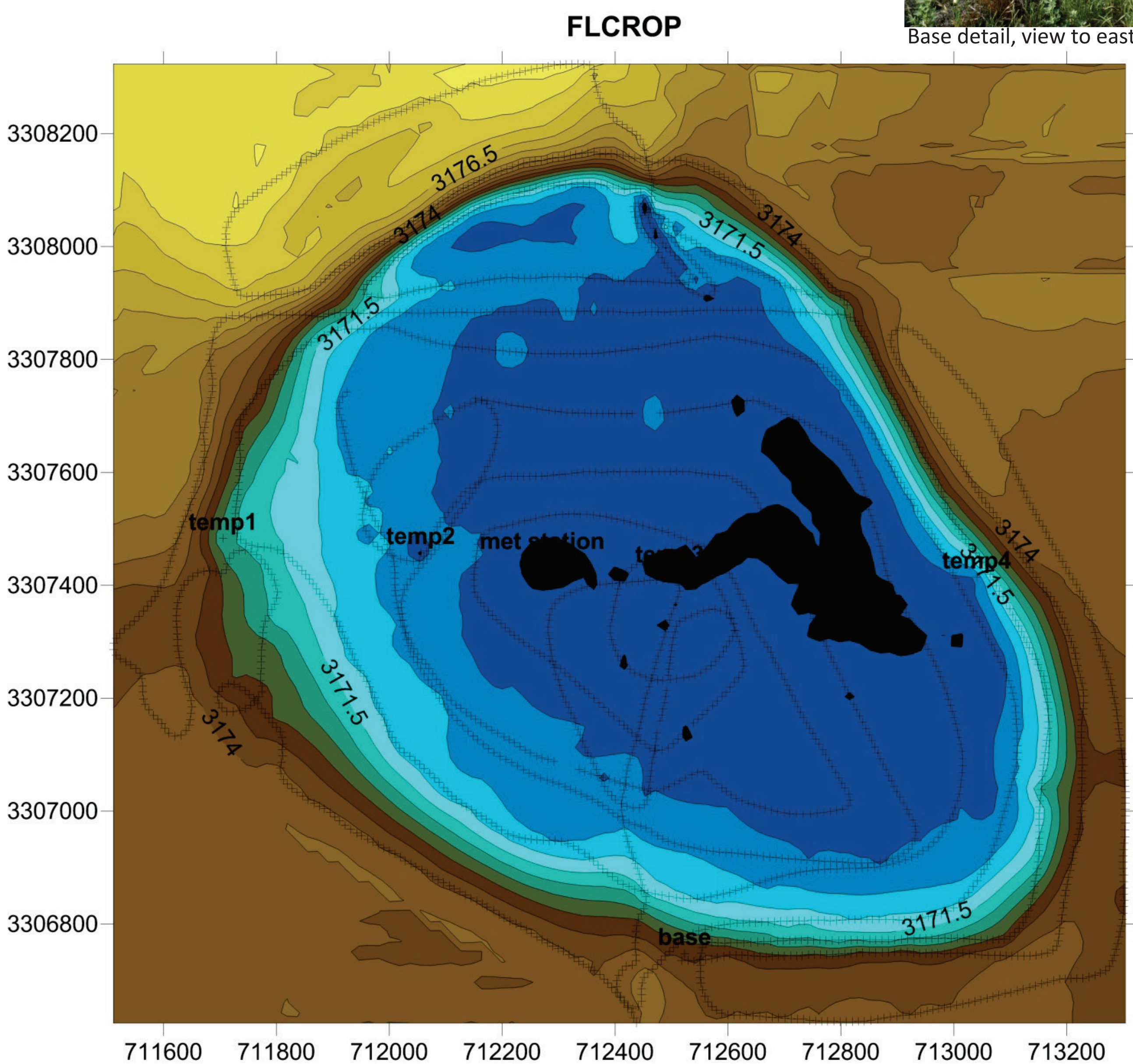
Floyd County Crop Playa

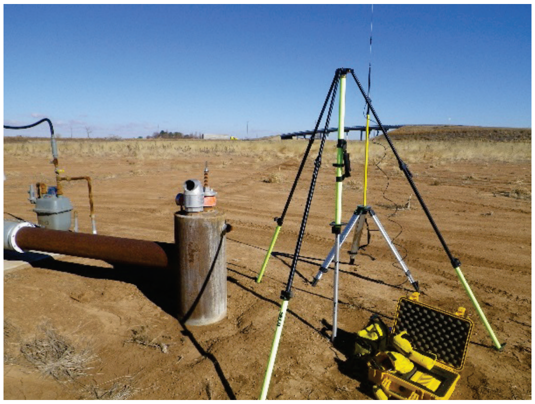
Survey base, view to north

Survey Control Points and Well Data

Easting	Northing	Elevation	Location ID
712523.27	3306747.53	3173.414	base
712271.06	3307448.77	3169.145	met station
711705.77	3307482.73	3171.925	temp1
712055.95	3307457.73	3169.219	temp2
712497.02	3307425.14	3168.603	temp3
713040.75	3307414.37	3169.87	temp4

Base detail, view to east





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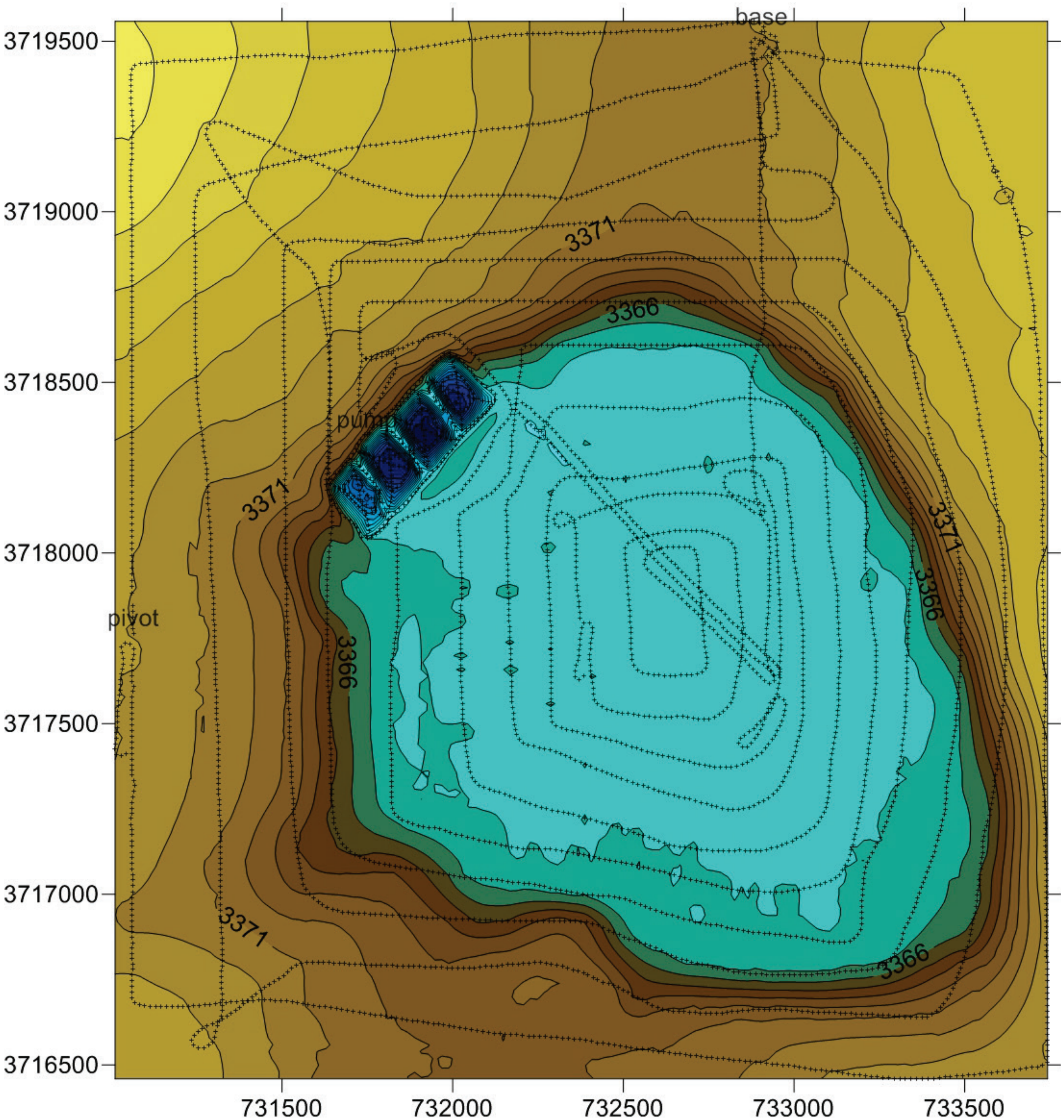

base
pump
pivot
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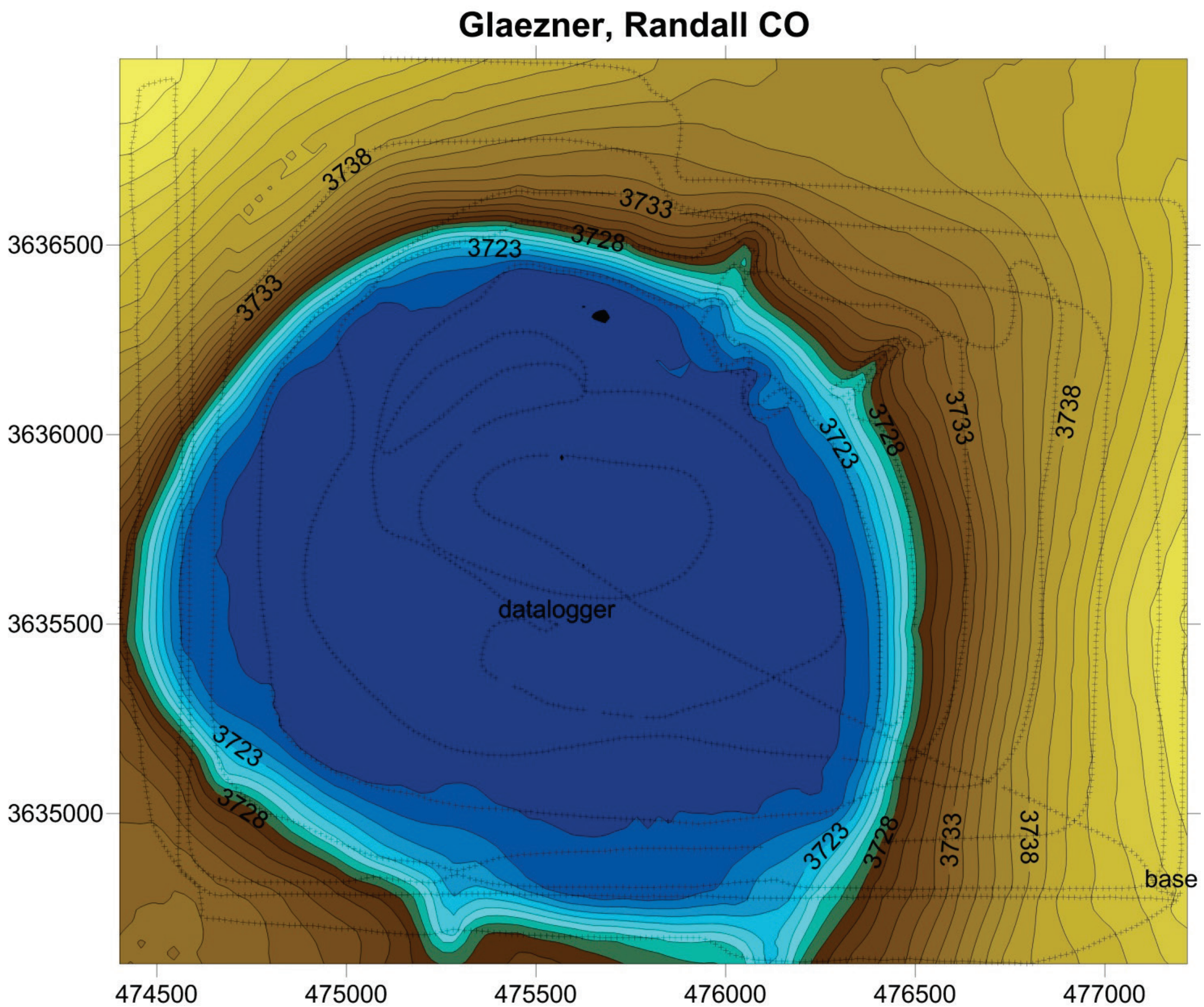
733000
733500

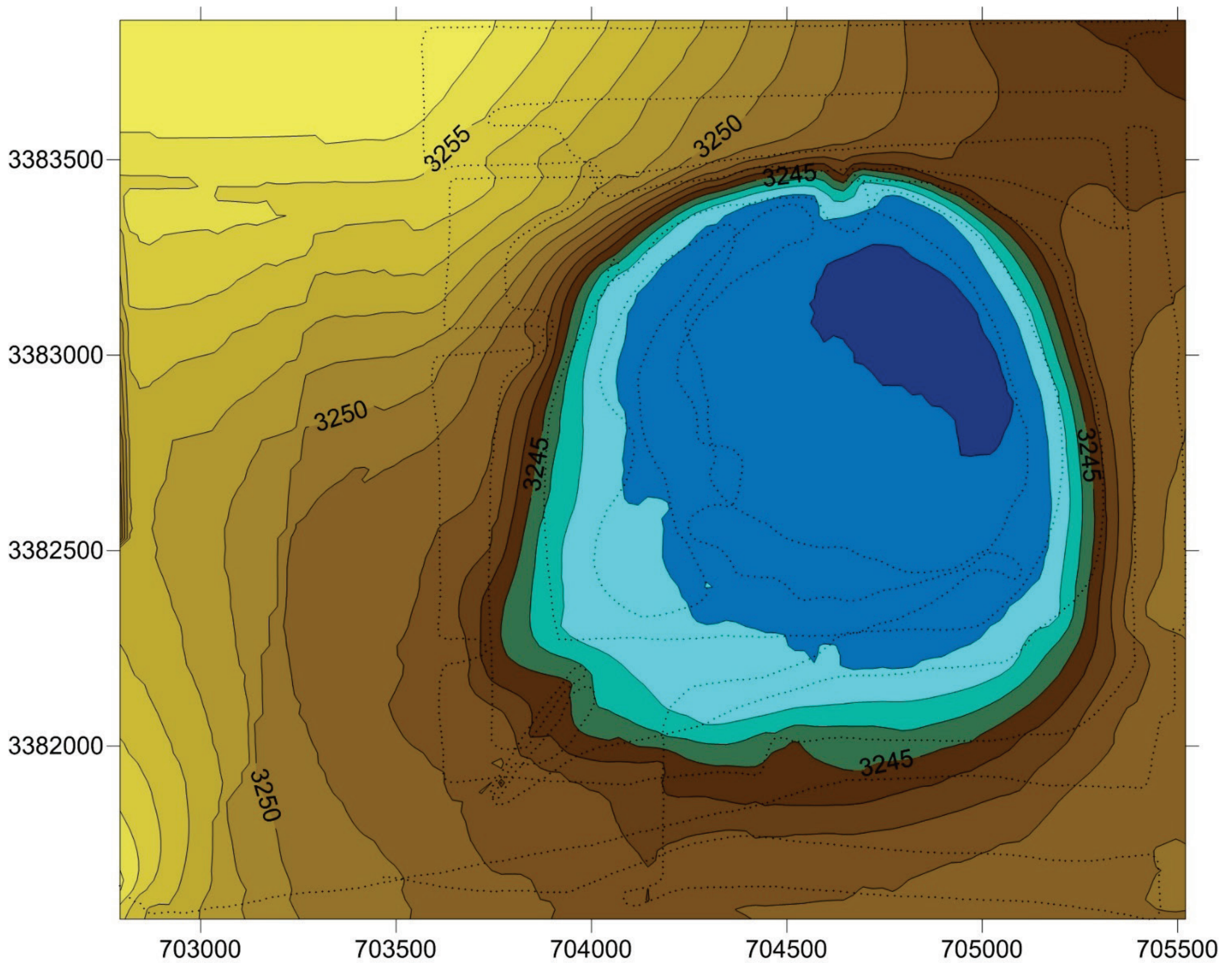
Glaezner

Survey Control Points and Well Data

Easting	Northing	Elevation	Location ID
477175.73	3634786.34	3743.866	base
475555.71	3635497.59	3719.208	datalogger



Gregg



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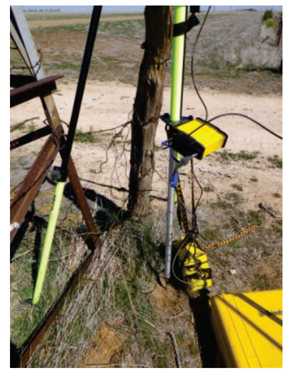
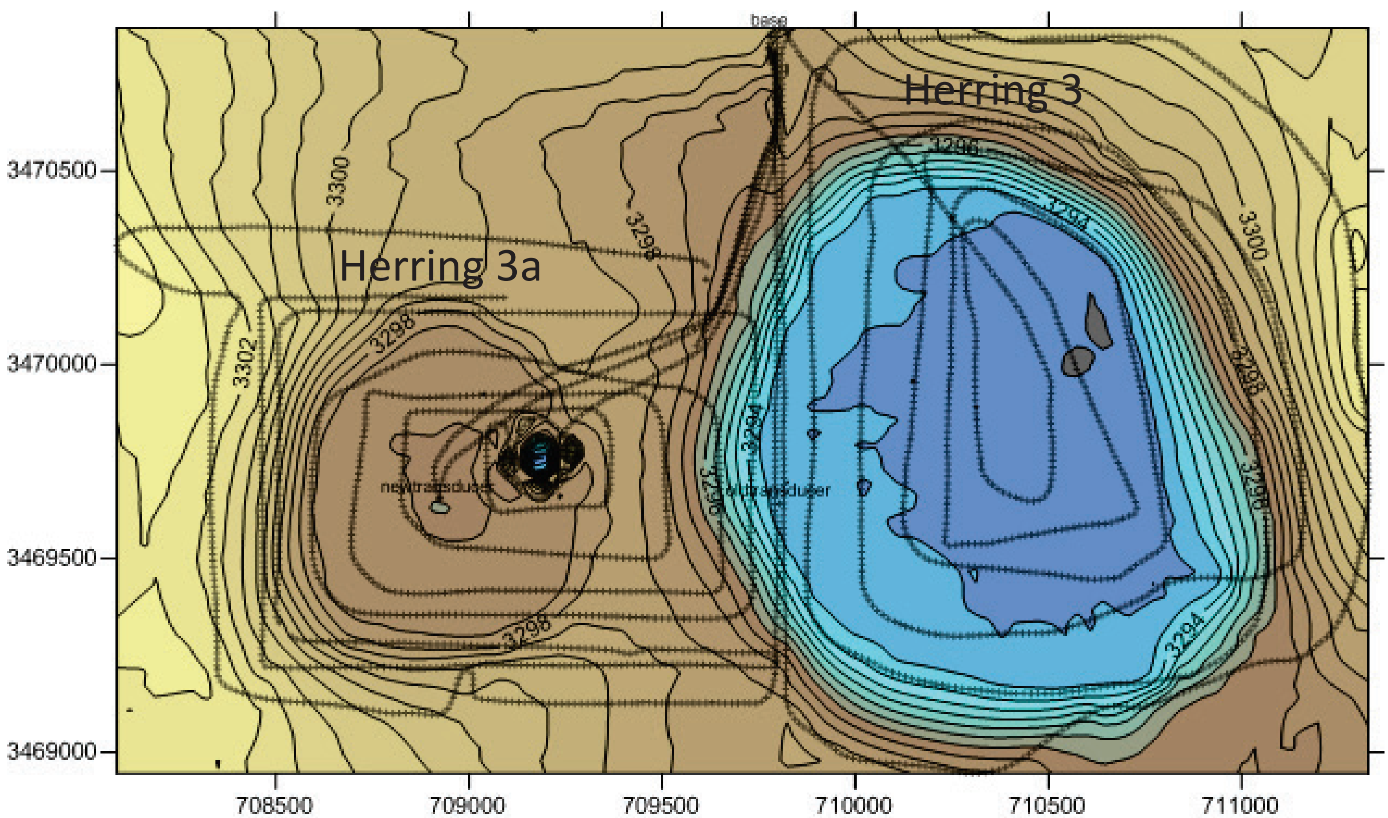
3245

Herring 3 and 3a

Survey Control Points and Logger Data

Easting	Northing	Elevation	Location ID
709780.62	3470854.87	3299.319	Base
708922.56	3469651.34	3296.017	Transducer 3a (new)
709803.75	3469641.21	3293.101	Transducer 3 (old)

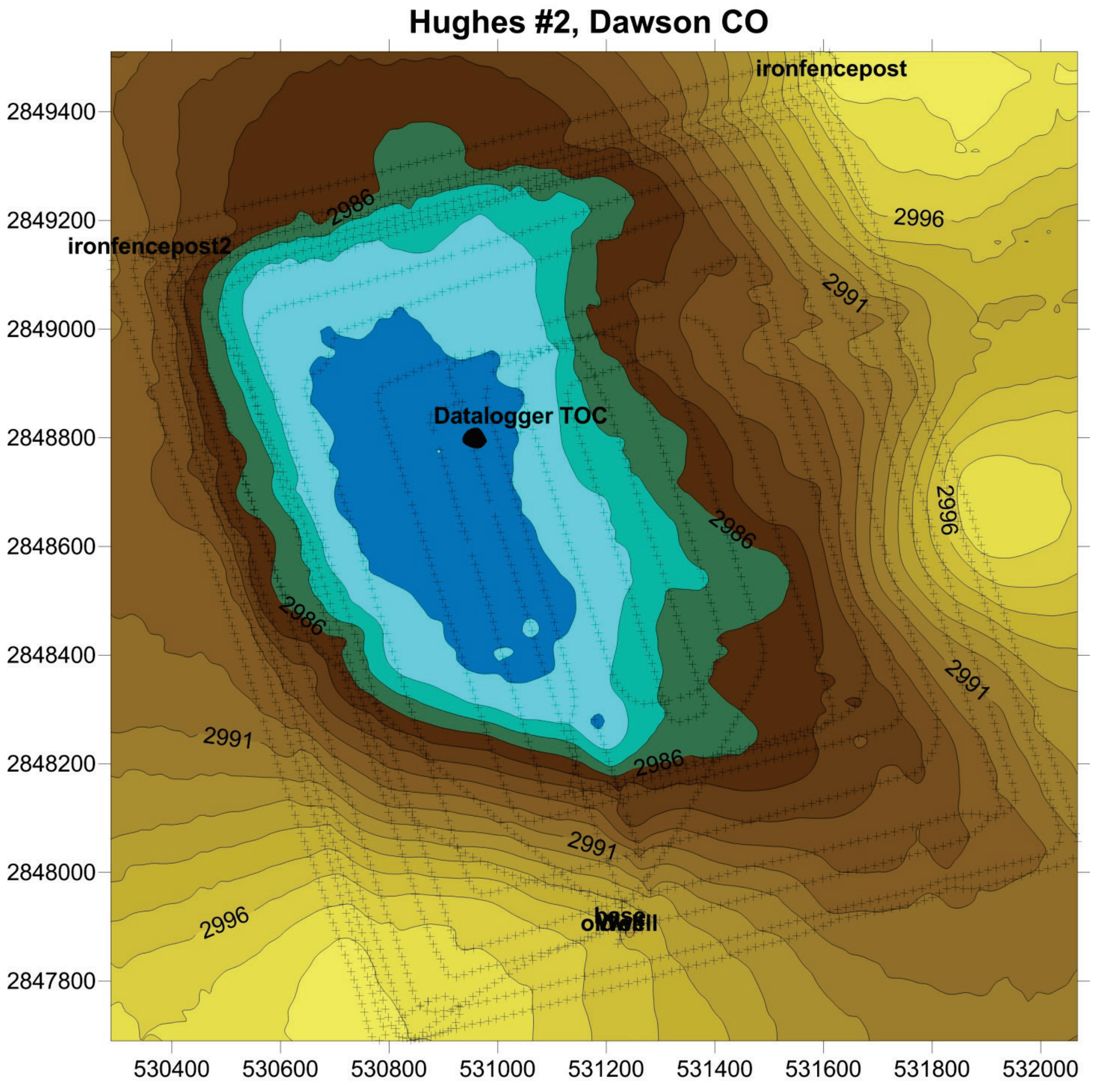




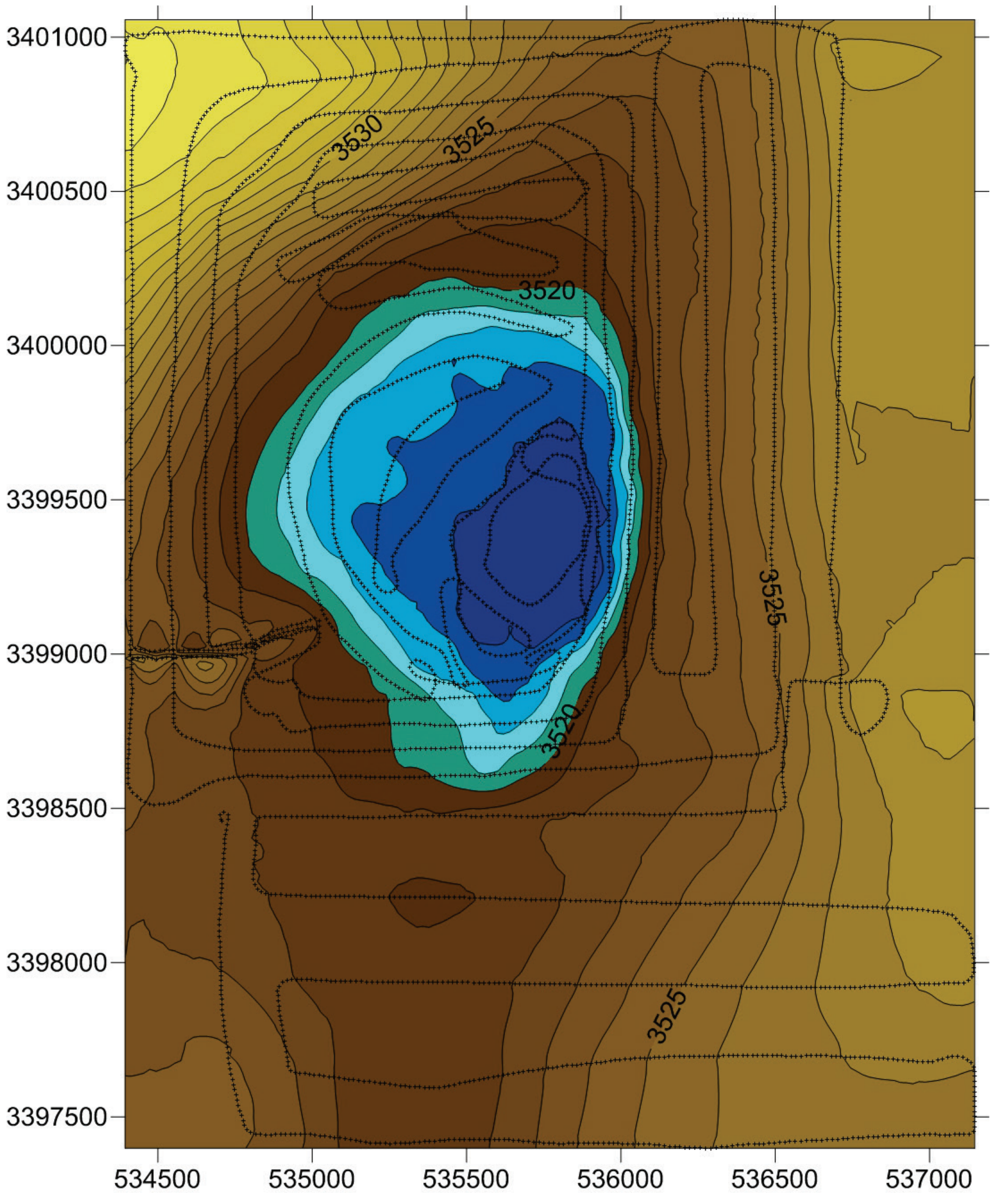
Hughes West

Survey Control Points and Well Data

Easting	Northing	Elevation	Location ID
531225.31	2847890.65	2995.746	base
531042.87	2848810.56	2983.172	Datalogger TOC
531614.77	2849449.89	2998.885	ironfencepost
530359.23	2849122.82	2989.4	ironfencepost2
531226.70	2847876.73	2996.092	Well



Kinkaid NE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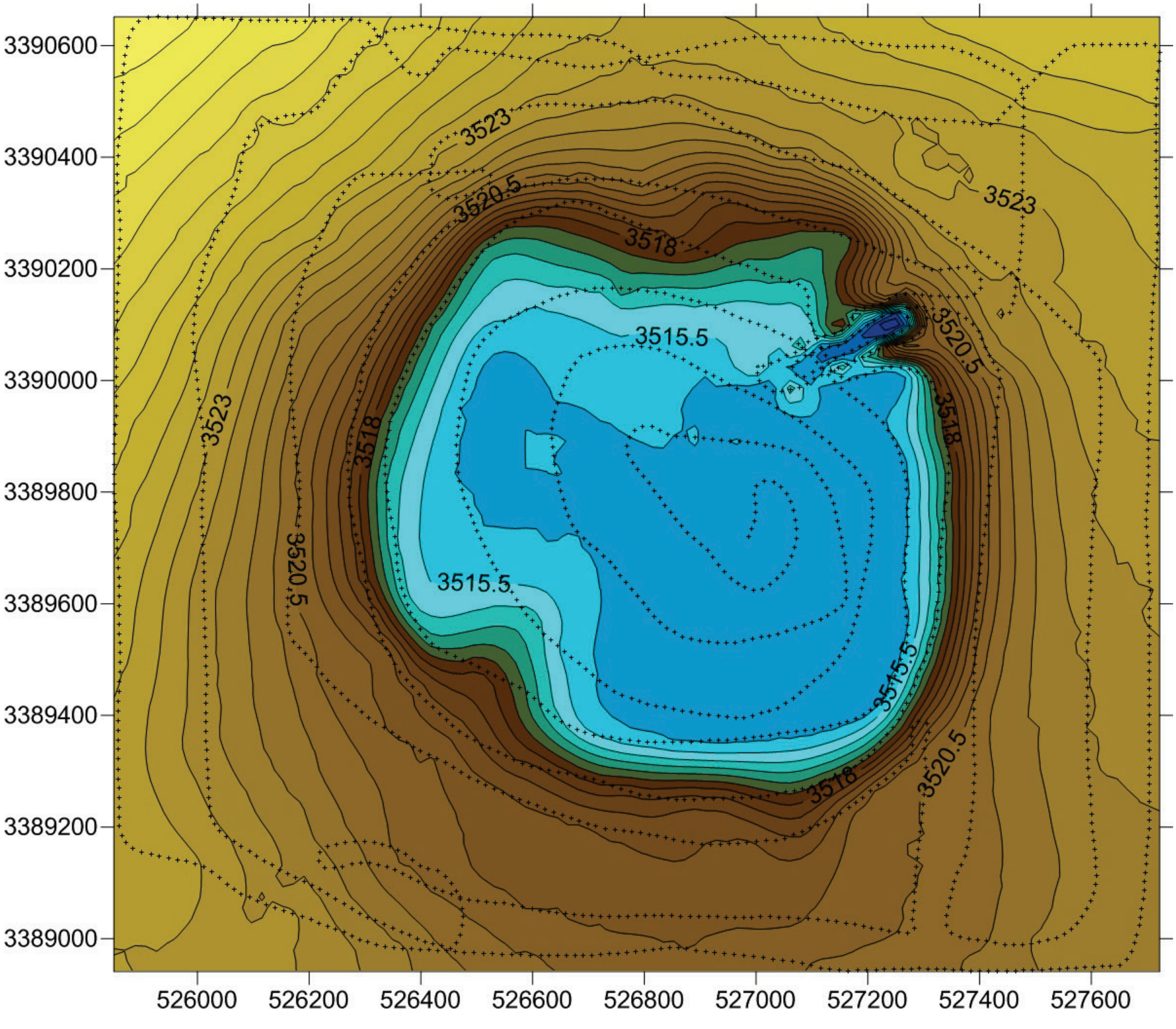
Kinkaid SW



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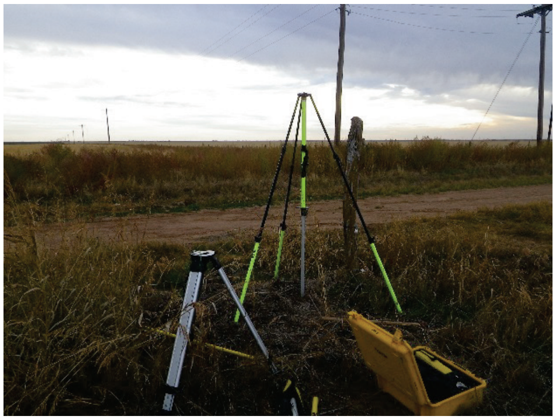
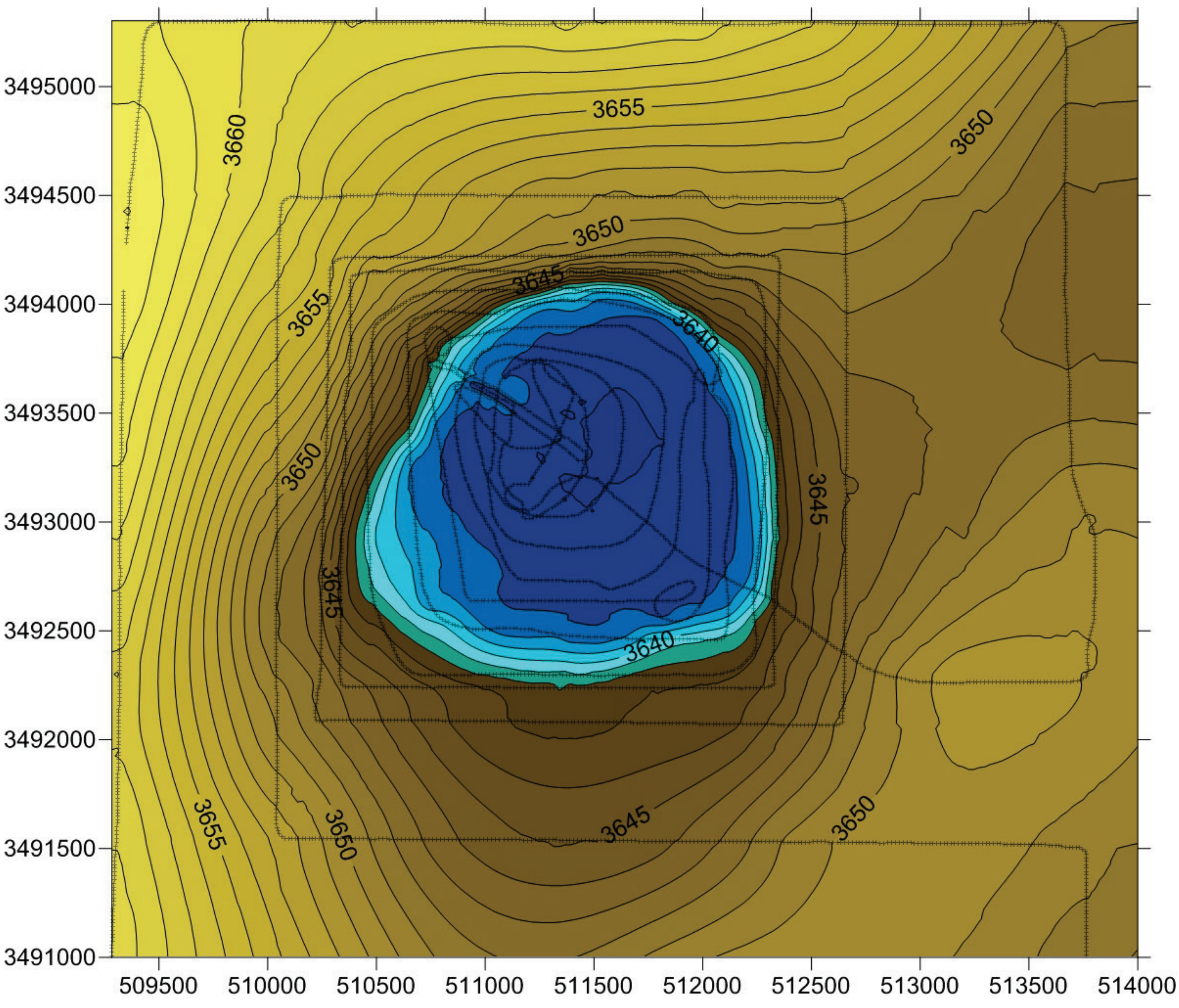
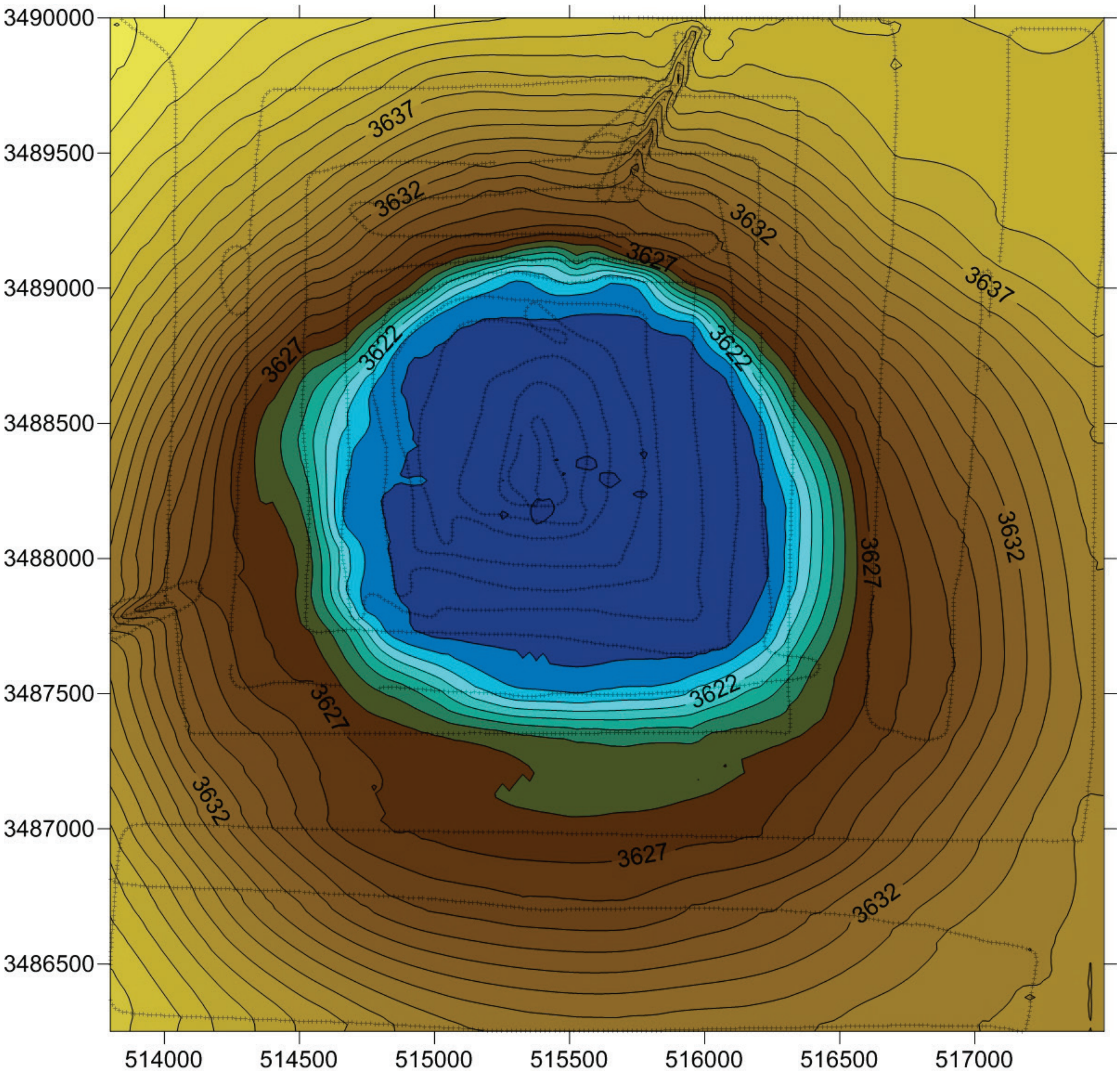
Middleton North

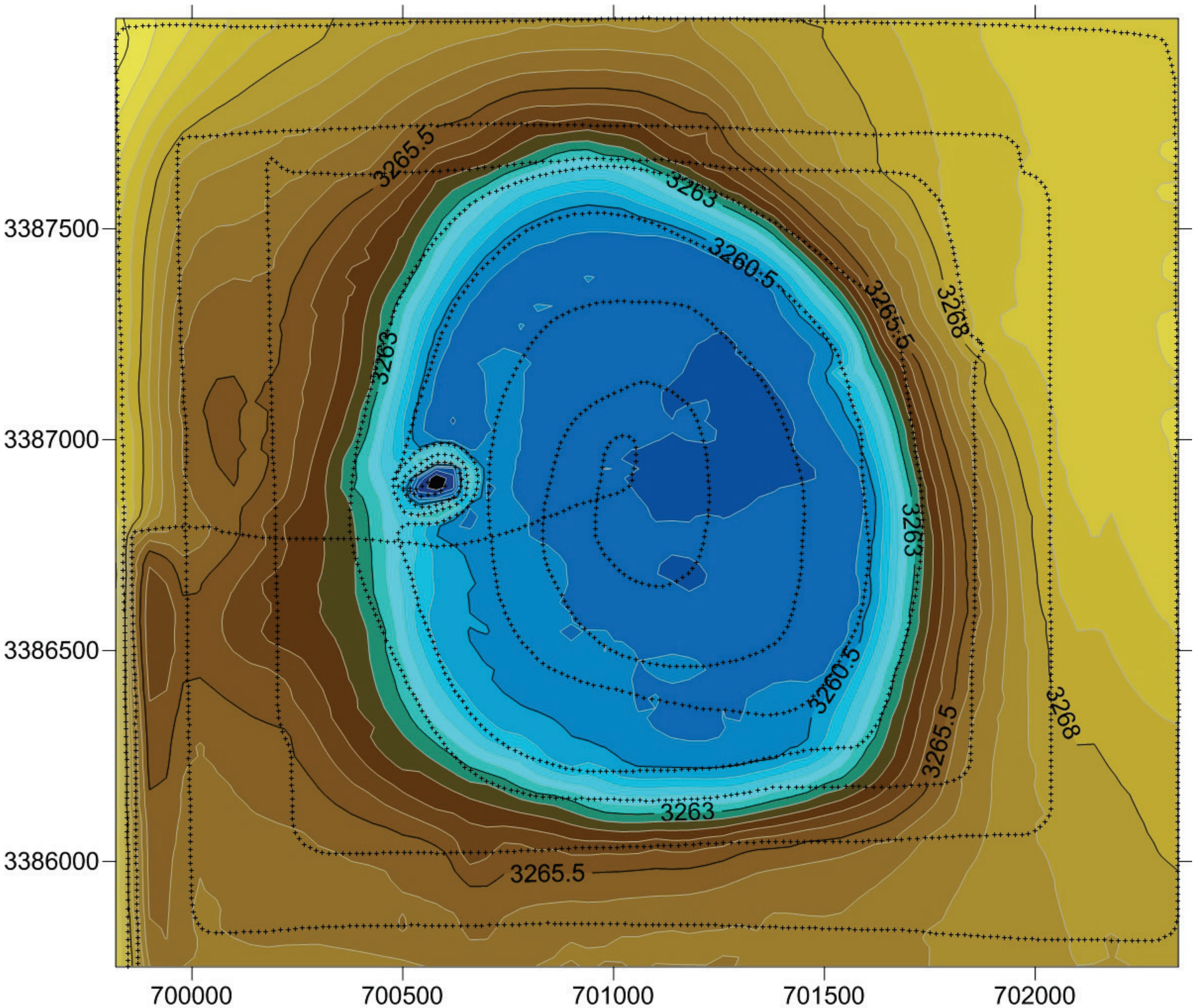




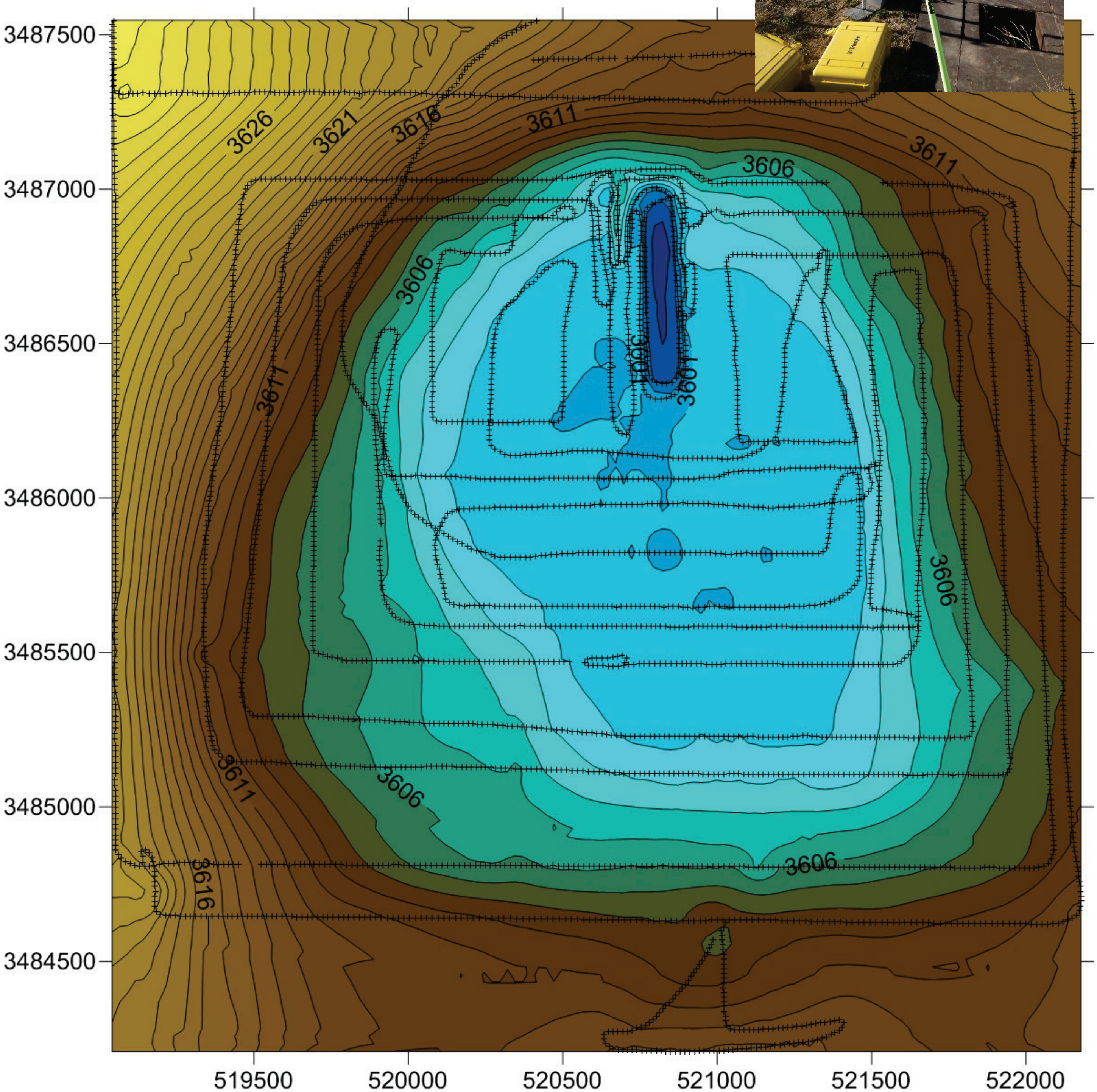
Middleton South



Minton North



Pullum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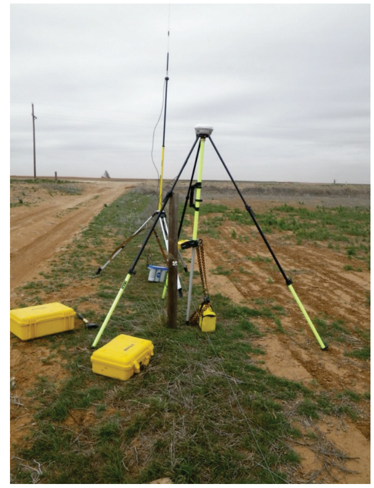
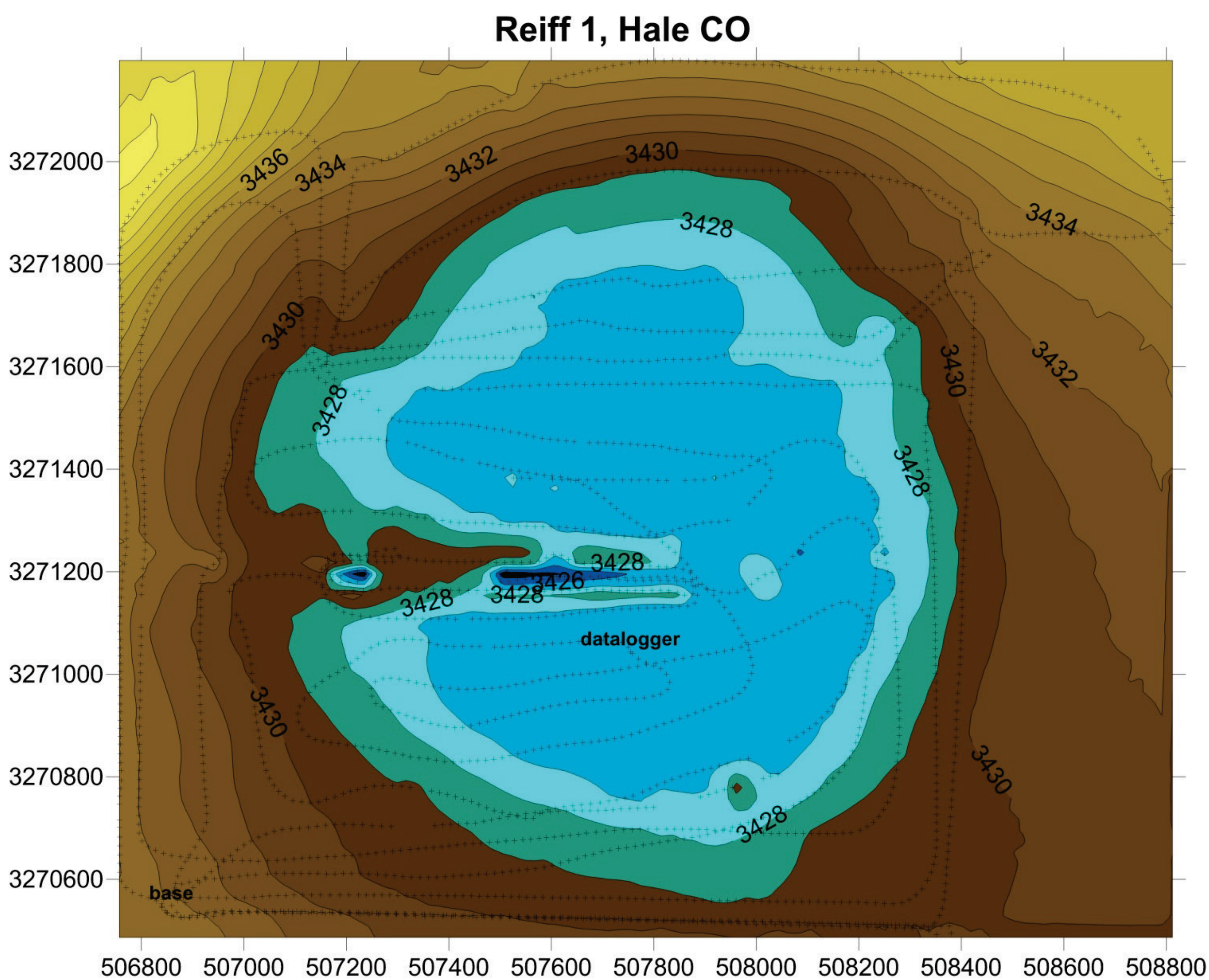
3616
3611
3606
3601

Rieff No. 1

Easting	Northing	Elev	ID
506858.84	3270548.36	3433.819	Base
508454.56	3271817.57	3432.599	pivot
507754.72	3271043.85	3426.437	datalogger

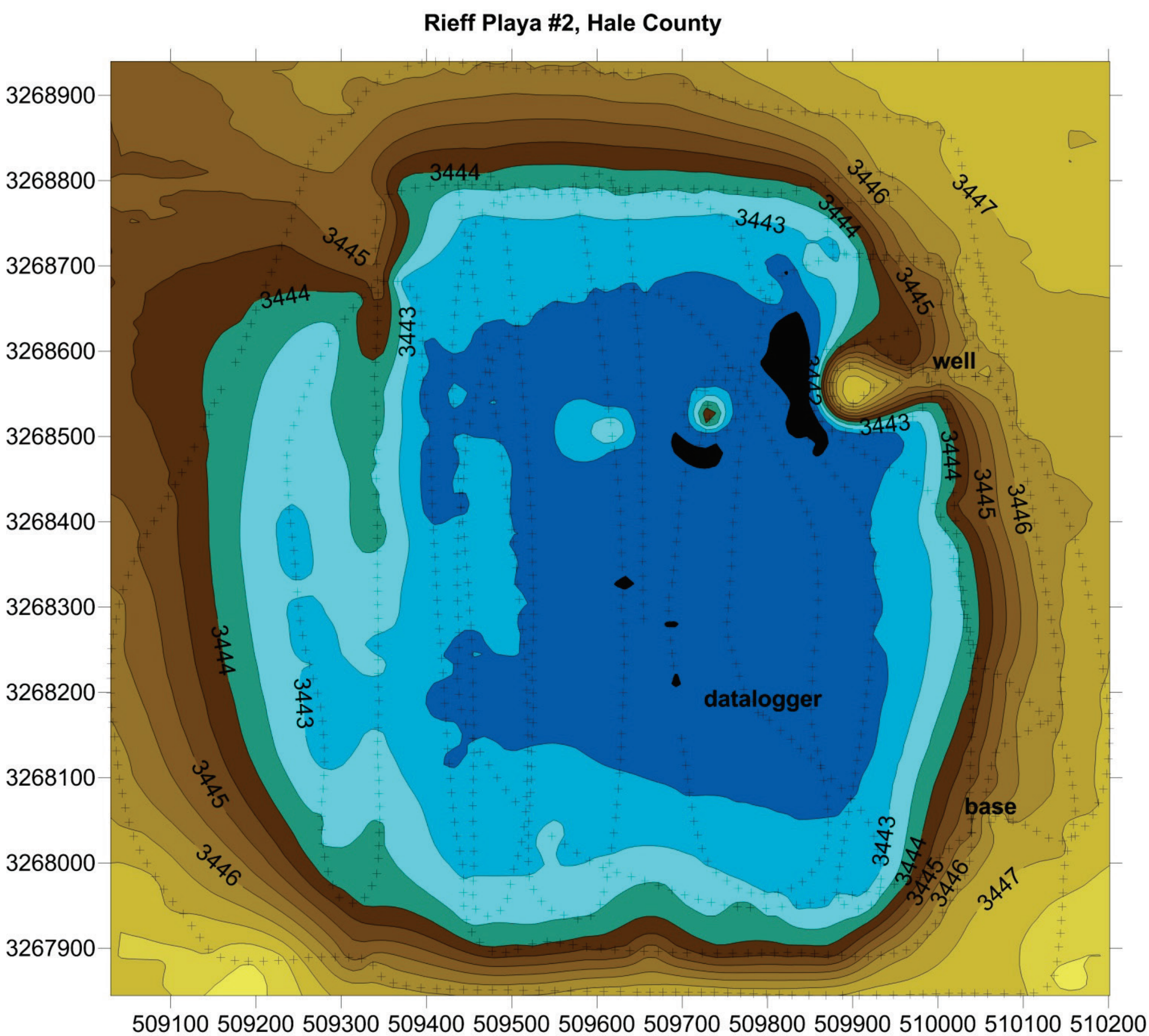


Rieff 1 survey base, view to west

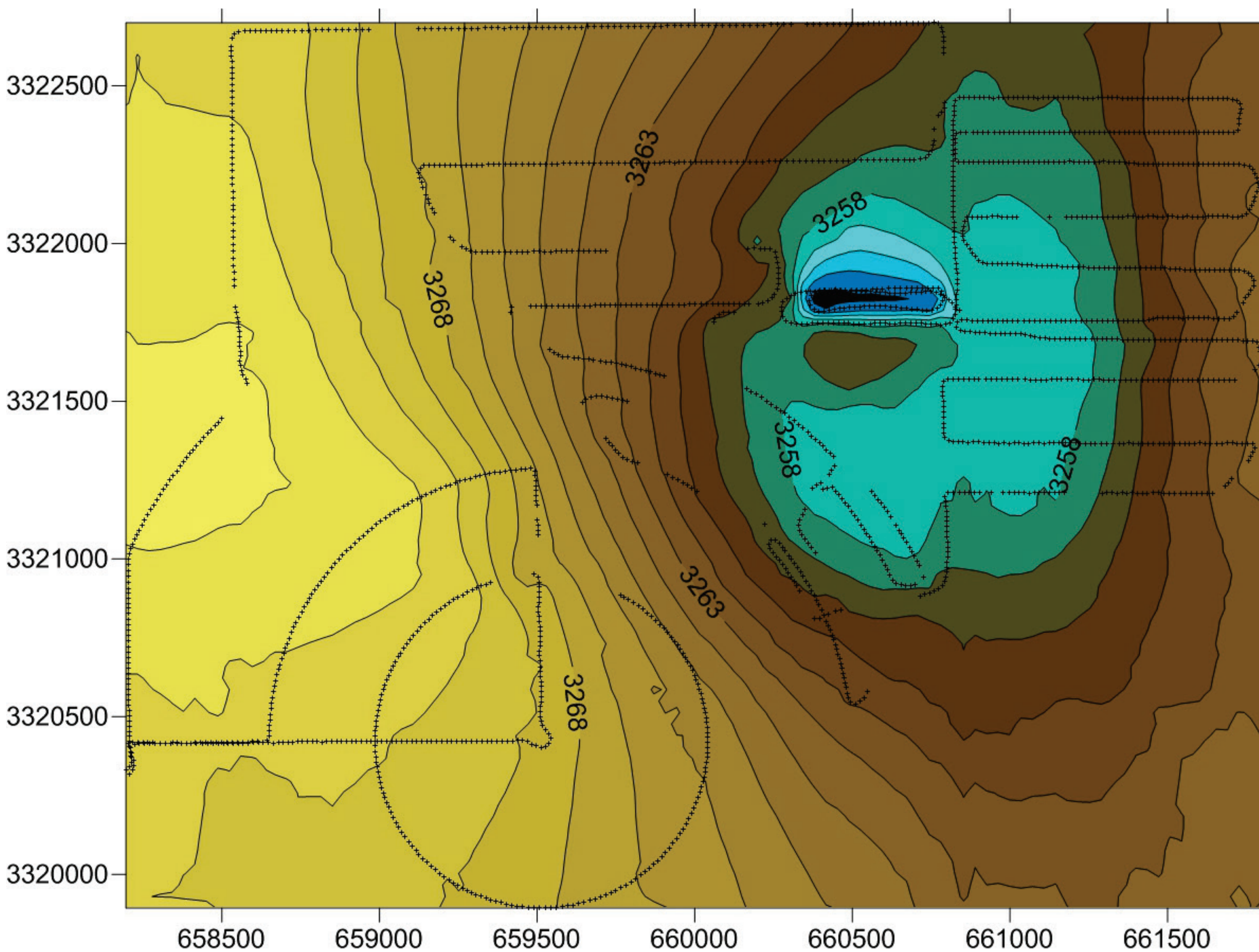


Rieff No. 2

Easting	Northing	Elev	ID
510062	3268047	3446.629	base
509794.9	3268173	3442.123	datalogger
510019.4	3268570	3446.551	well



Schacht 1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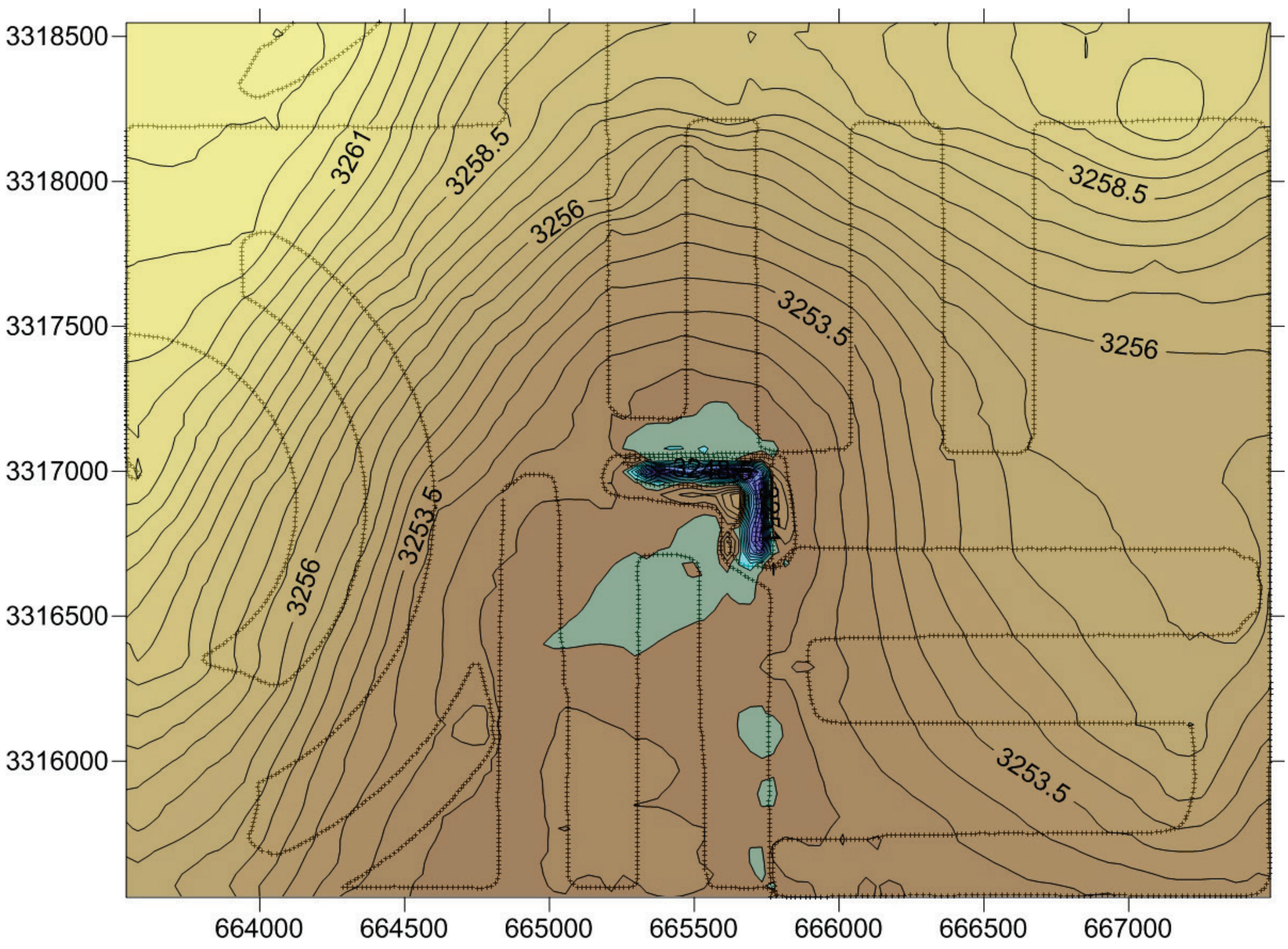
Schacht 2



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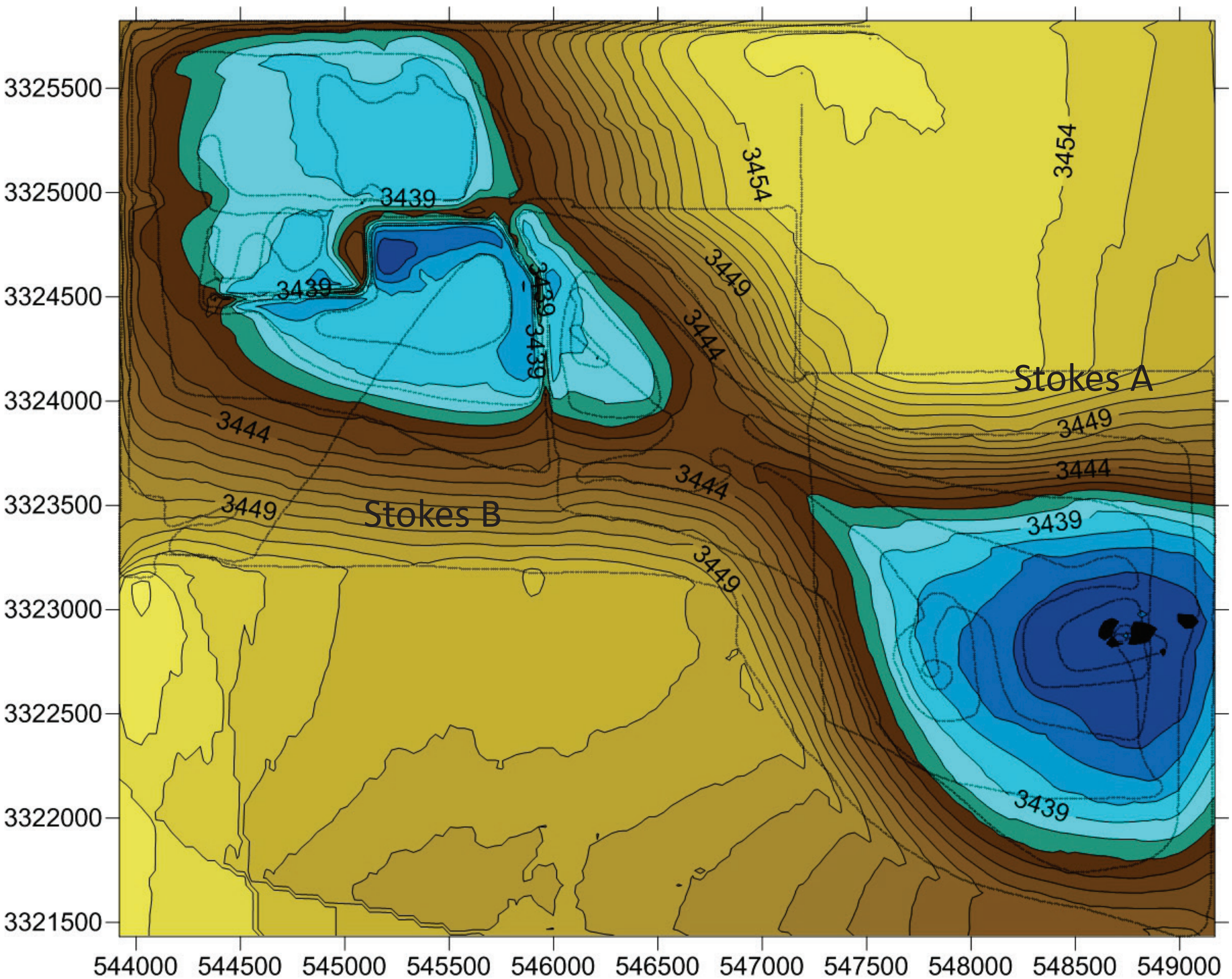
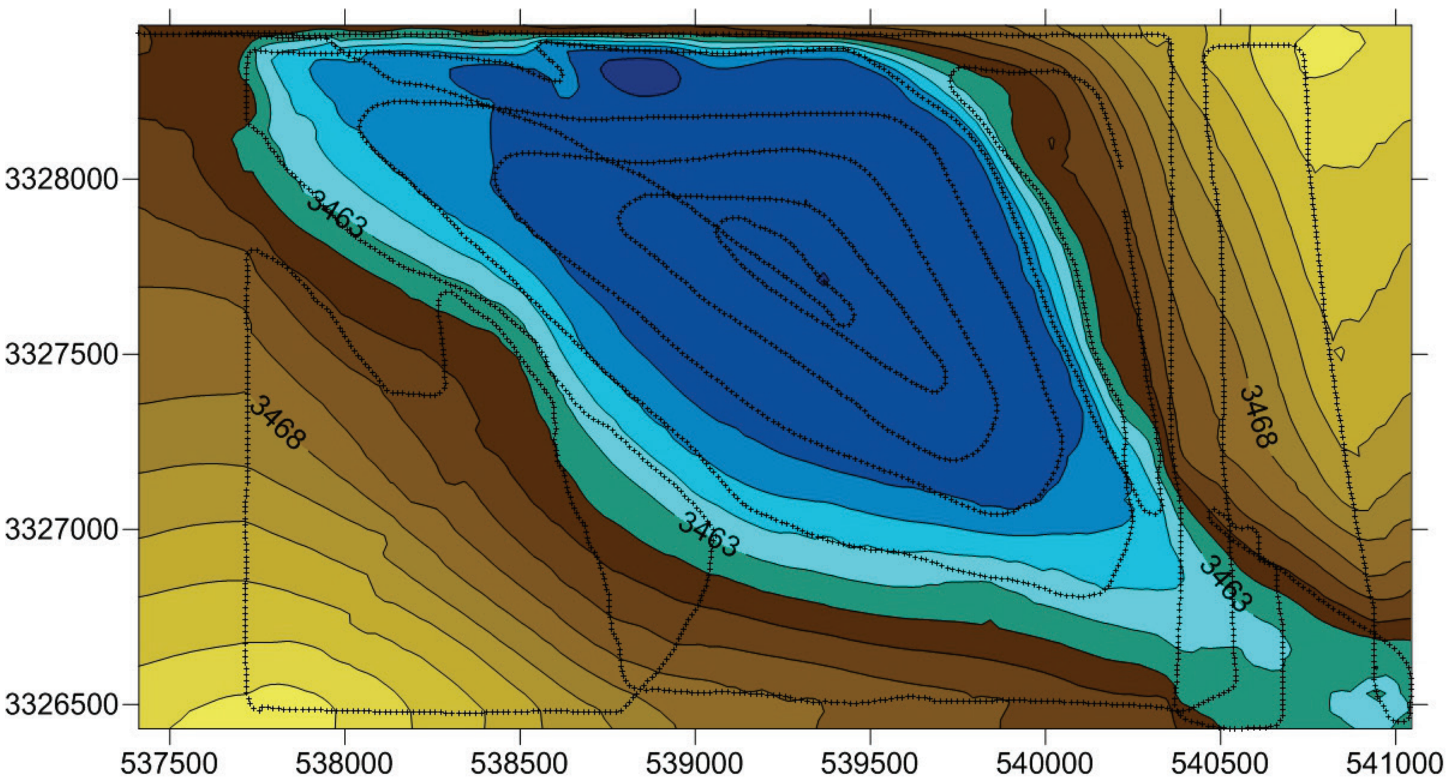
Stokes A and B



Stokes C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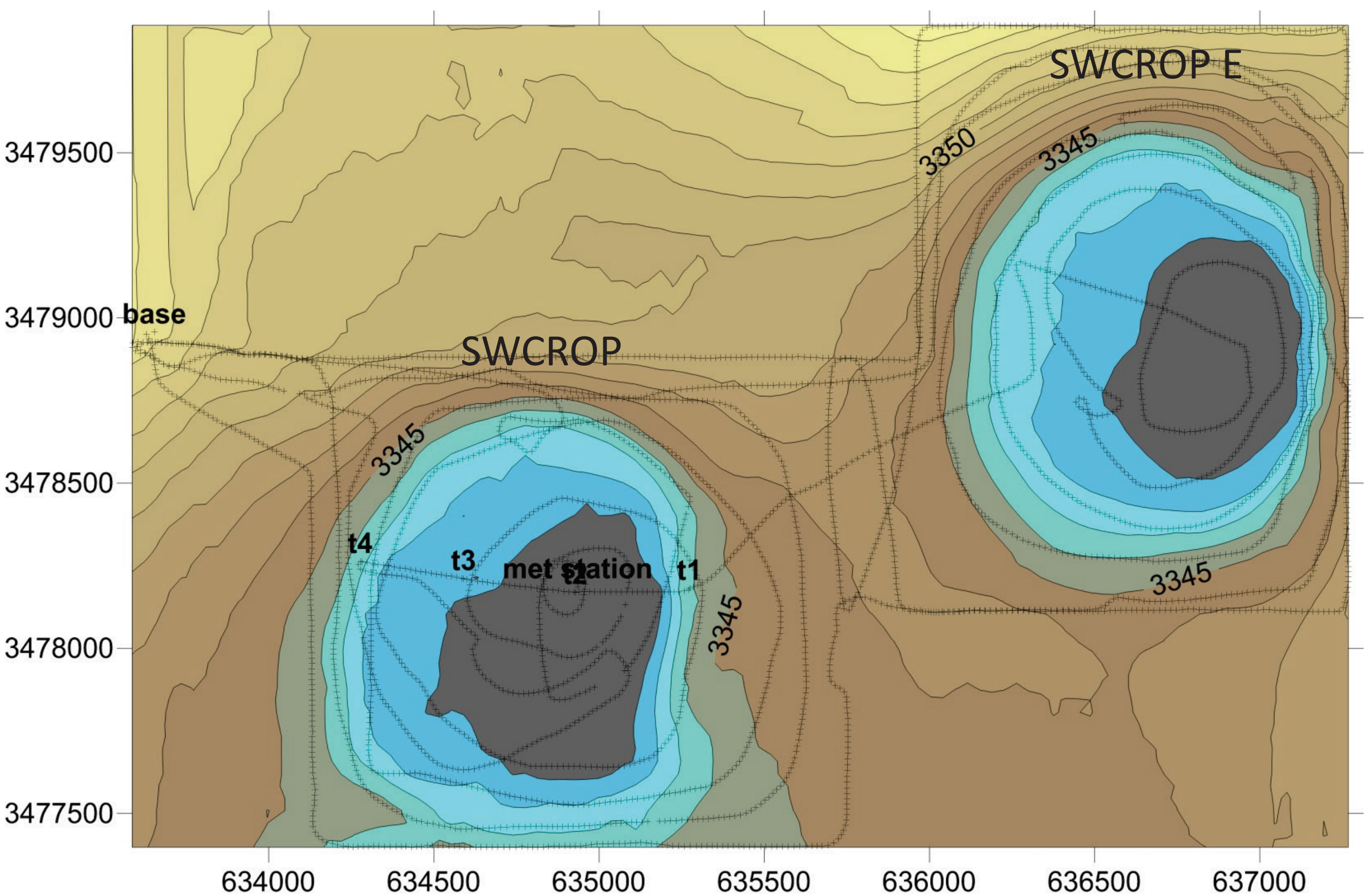
3468

Swisher County Crop Playa

Survey Control Points and Well Data

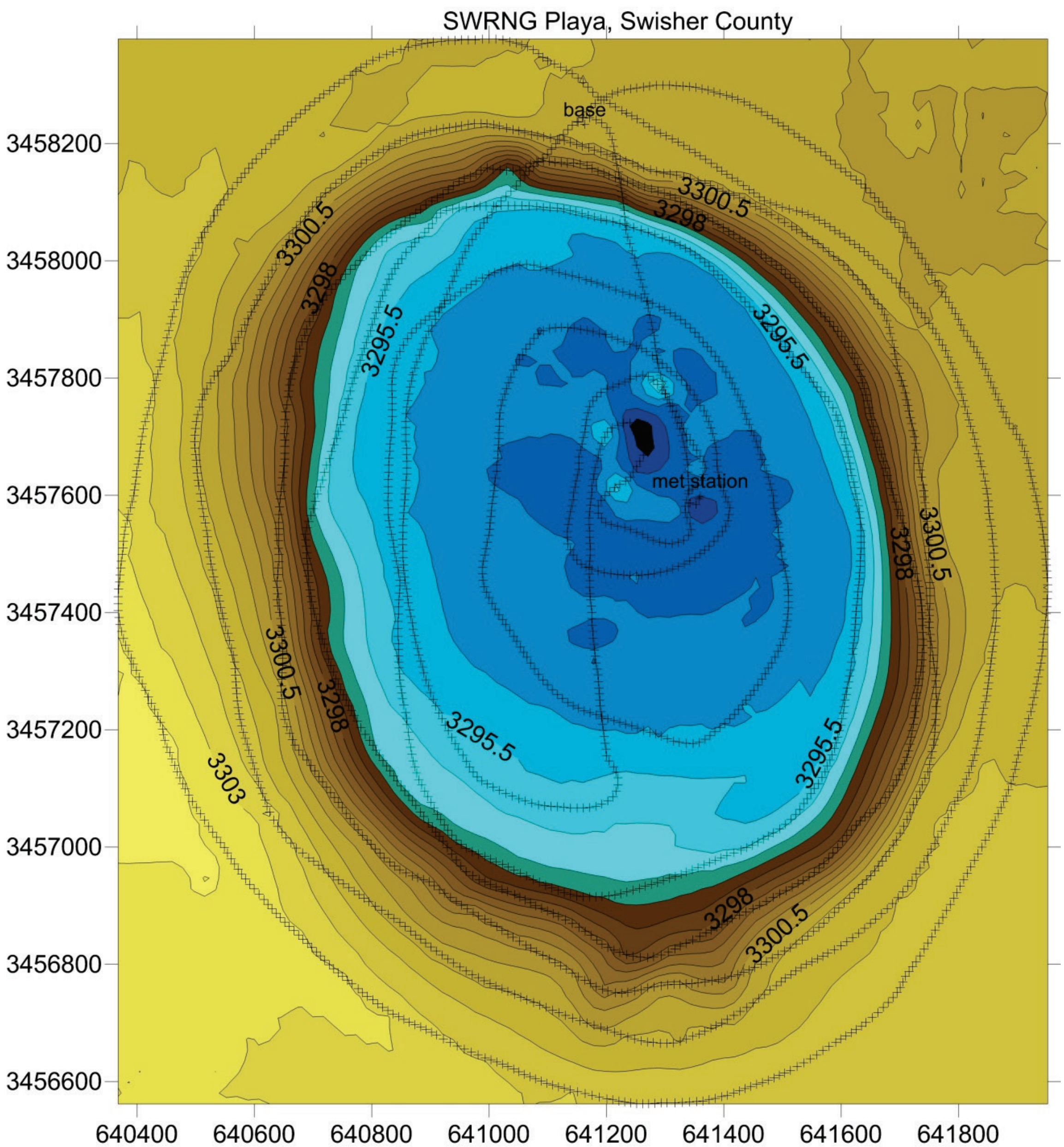
Easting	Northing	Elevation	Location ID
747498.07	3740231.78	3335.139	Base @ tank
748546.51	3740310.12	3333.401	Well
746766.21	3742611.36	3331.733	met station
747087.55	3740998.24	3331.849	wl recorder 2
747359.75	3739723.40	3330.982	wl recorder 3



Swisher County Range Playa

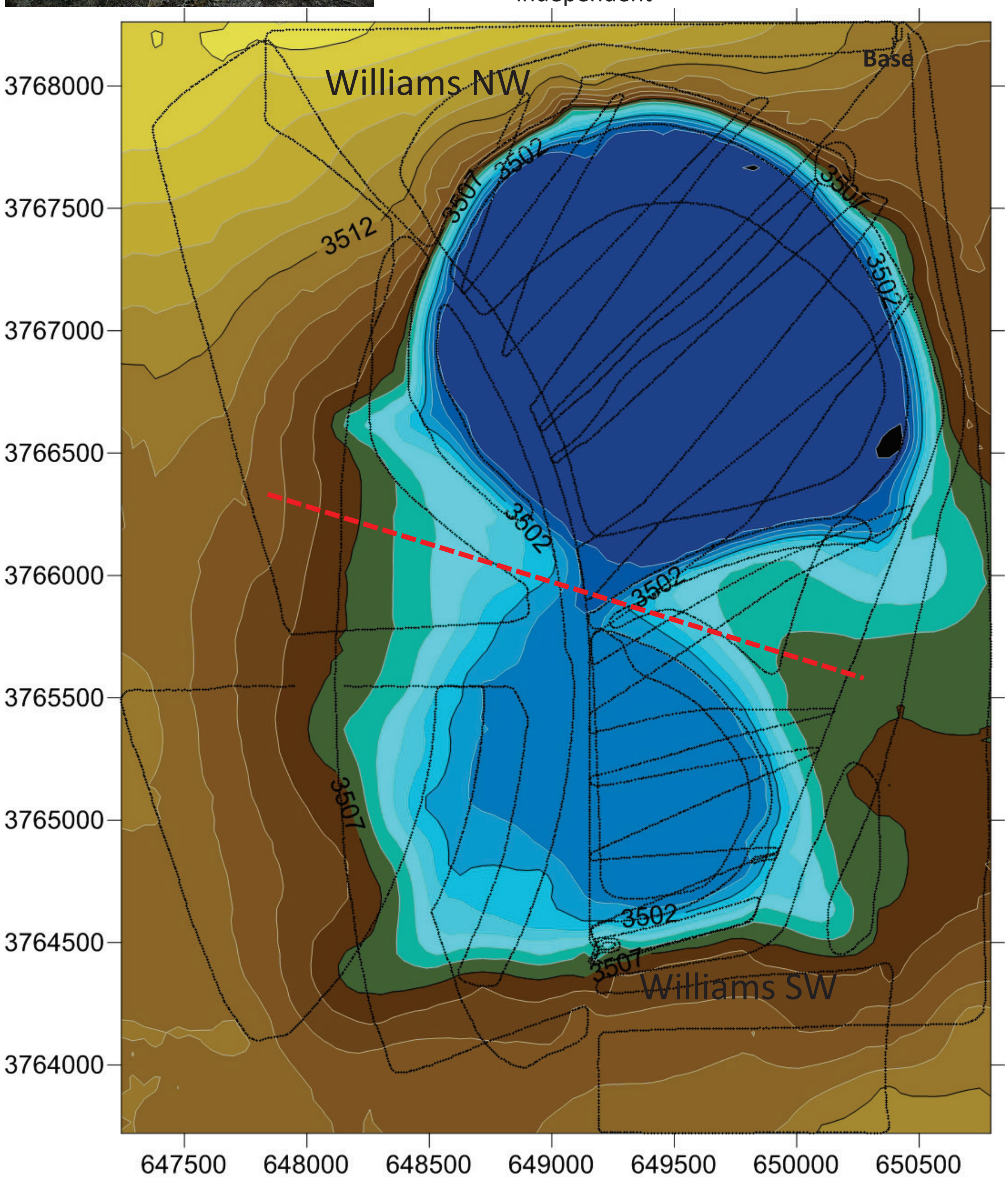
LOCID	Easting	Northing	Elev, ft
base	641163.271	3458232.653	3301.66
met station	641360.061	3457599.071	3294.143


SWRNG survey base



Williams

Note: except at high water levels the north and south parts of the playa are independent

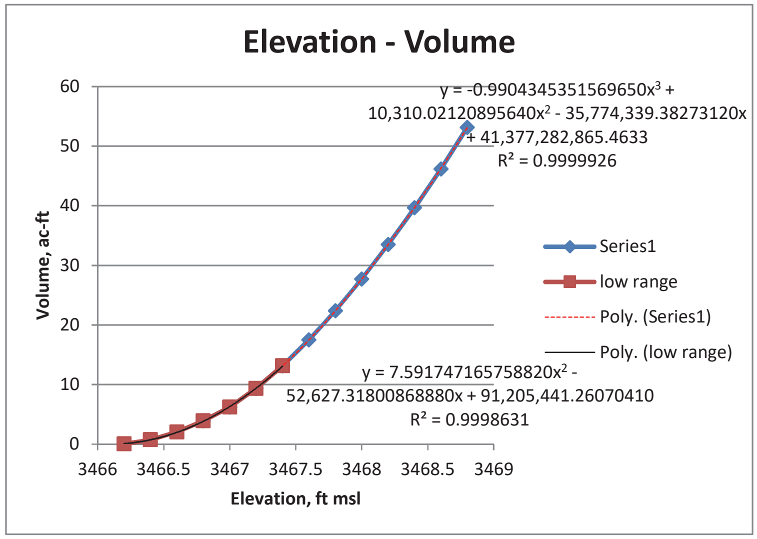


Max flood depth, cm	43.6		tot vol 2011-2014	13.03089
max elev, ft	3467.816		2015 vol	117.5
water volume, ac ft	22.77644			

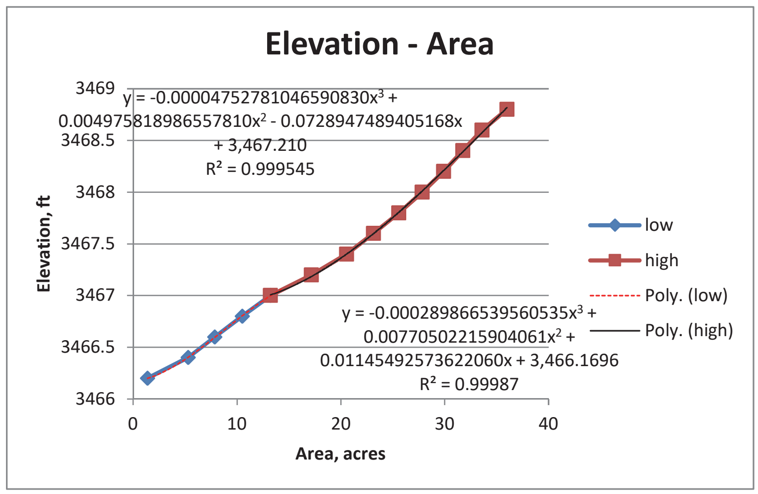
B. Harrell Area Volume Calcs
11 2013 survey

	resurvey
Grid Z Min	3466.03
Datalogger Ground S	3466.4
Datalogger	3466.4

Elevation	vol cu ft	vol ac ft
3466.2	3094.513764	0.07104
3466.4	32017.64546	0.735024
3466.6	89499.53187	2.054627
3466.8	170117.6198	3.905363
3467	272001.7844	6.244302
3467.2	406926.4683	9.341746
3467.4	572128.4246	13.13426
3467.6	763114.6355	17.5187
3467.8	975567.1041	22.39594
3468	1207820.746	27.72775
3468.2	1459420.777	33.50369
3468.4	1727849.429	39.66596
3468.6	2012347.234	46.19714
3468.8	2315423.374	53.15481

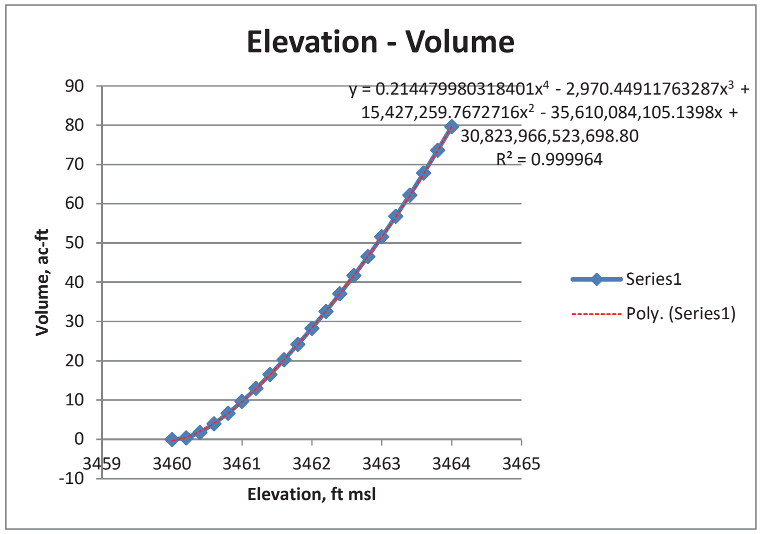


Elevation	area sq ft	area ac
3466.2	60400.31991	1.386601
3466.4	230515.9476	5.291918
3466.6	342238.1414	7.856707
3466.8	457305.3563	10.49829
3467	576669.5117	13.23851
3467.2	747782.1648	17.16672
3467.4	895961.9209	20.56846
3467.6	1008876.153	23.16061
3467.8	1114104.469	25.57632
3468	1212480.486	27.83472
3468.2	1302206.276	29.89454
3468.4	1382756.371	31.74372
3468.6	1463480.396	33.59689
3468.8	1567835.167	35.99254



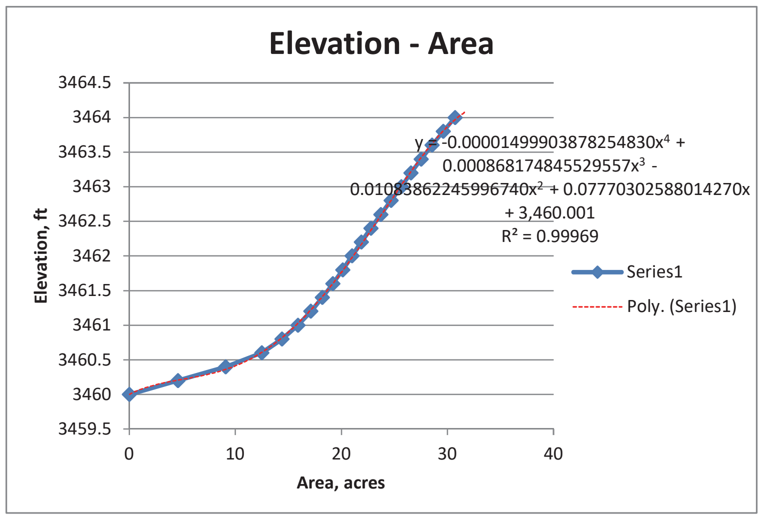
Max flood depth, cm	32.8
max elev, ft	3461.07098
water volume, ac ft	10.6914063

B. Harrell South Area-Volume Calcs
11 2013 survey



	resurvey	
Grid Z Min	3459.994863	
Datalogger Ground Surf		
Datalogger		

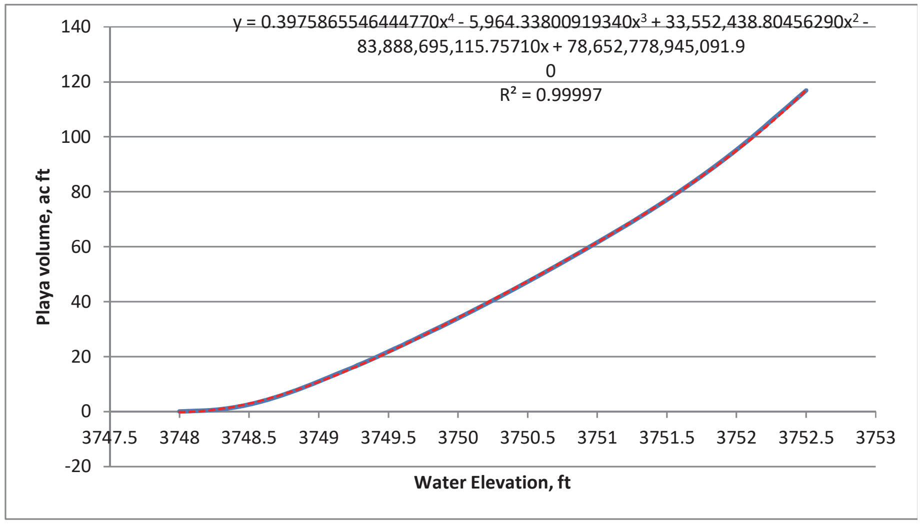
Elevation	vol cu ft	vol ac ft
3460	0.046490065	1.07E-06
3460.2	15043.53396	0.345352
3460.4	76573.54941	1.757887
3460.6	171705.2532	3.94181
3460.8	289467.2949	6.645255
3461	421668.0723	9.680167
3461.2	565617.046	12.98478
3461.4	719354.1824	16.5141
3461.6	882195.1516	20.25241
3461.8	1053416.085	24.18311
3462	1232518.674	28.29474
3462.2	1419224.288	32.58091
3462.4	1613674.426	37.04487
3462.6	1816022.417	41.69014
3462.8	2026749.595	46.52777
3463	2245913.511	51.55908
3463.2	2473270.704	56.77848
3463.4	2708817.671	62.1859
3463.6	2952839.841	67.78788
3463.8	3205932.867	73.59809
3464	3468437.586	79.62437



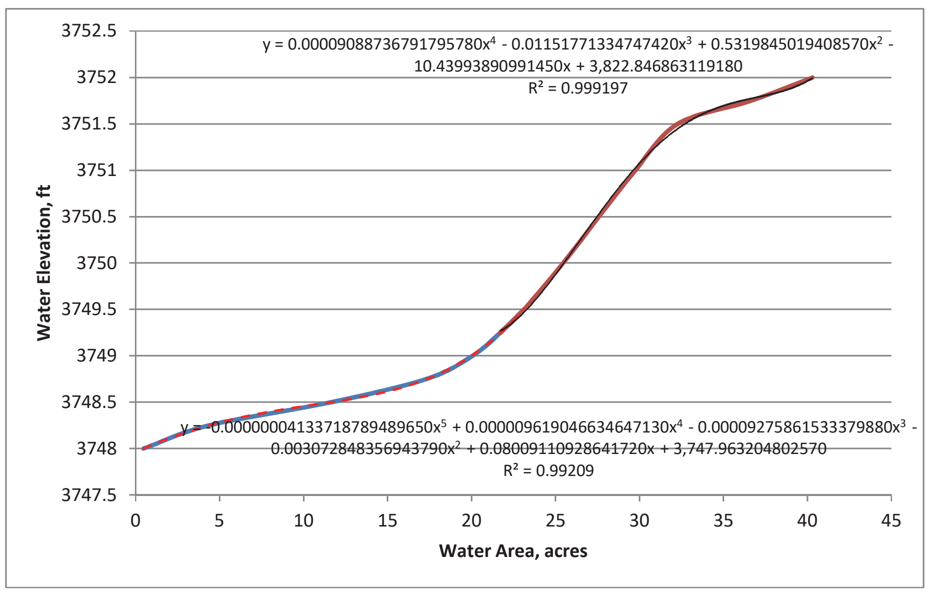
Elevation	area sq ft	area ac
3460	28.62726105	0.000657
3460.2	200111.8454	4.593936
3460.4	396217.1578	9.095894
3460.6	543960.5748	12.48762
3460.8	626988.7625	14.39368
3461	692346.7476	15.89409
3461.2	745288.2167	17.10946
3461.4	792079.3607	18.18364
3461.6	835731.9267	19.18577
3461.8	876327.5016	20.11771
3462	914622.2089	20.99684
3462.2	952770.9711	21.87261
3462.4	991912.279	22.77117
3462.6	1032836.201	23.71066
3462.8	1074694.416	24.67159
3463	1116662.047	25.63503
3463.2	1157185.644	26.56533
3463.4	1198701.499	27.5184
3463.6	1242819.474	28.53121
3463.8	1288932.929	29.58983
3464	1337657.926	30.7084

Birkenfeld playa			depth, cm	100
ac/ft^2		2.3E-05	elevation, ft	3751.58084
Met station ground surfa		3748.311		80.53125
Grid Z min		3747.011		

Elevation -	vol cu ft	vol ac ft
3748	3449.32168	0.079186
3748.25	27419.3177	0.629461
3748.5	112470.518	2.581968
3748.75	273129.351	6.270187
3749	479083.829	10.99825
3749.25	706924.881	16.22876
3749.5	951105.902	21.83439
3750	1481260.12	34.00505
3750.5	2058873.82	47.26524
3751	2682653.03	61.58524
3751.5	3356928.39	77.06447
3752	4149113.97	95.25055
3752.5	5090027.3	116.8509



Elevation -	area sq ft	area ac
3748	20405.0451	0.468435
3748.25	190042.736	4.362781
3748.5	507080.879	11.64098
3748.75	753867.271	17.30641
3749	873713.219	20.0577
3749.25	945906.324	21.71502
3749.5	1007291.43	23.12423
3750	1109003.9	25.45923
3750.5	1201581.53	27.58452
3751	1295903.12	29.74984
3751.5	1406184.01	32.28154
3751.75	1596569.16	36.65218
3752	1755327.56	40.29678
3752.5	1979024.07	45.43214



Bivins A
microplaya surveyed 9/20/13

2.3E-05

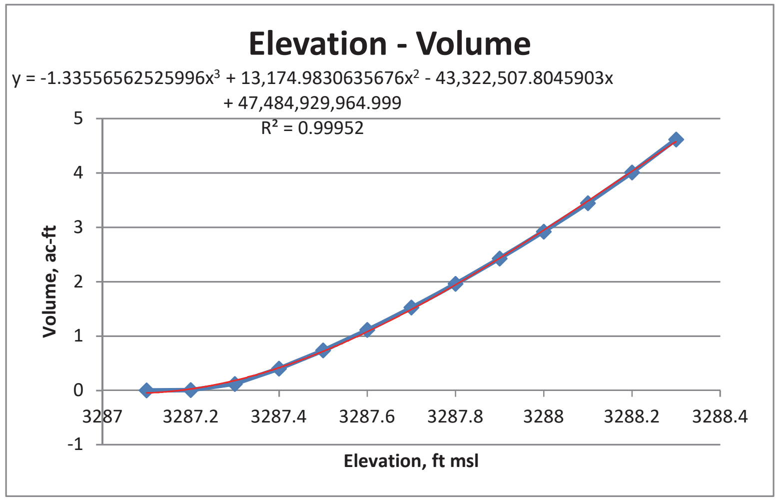
input units = feet

Grid Z Min 3287.046

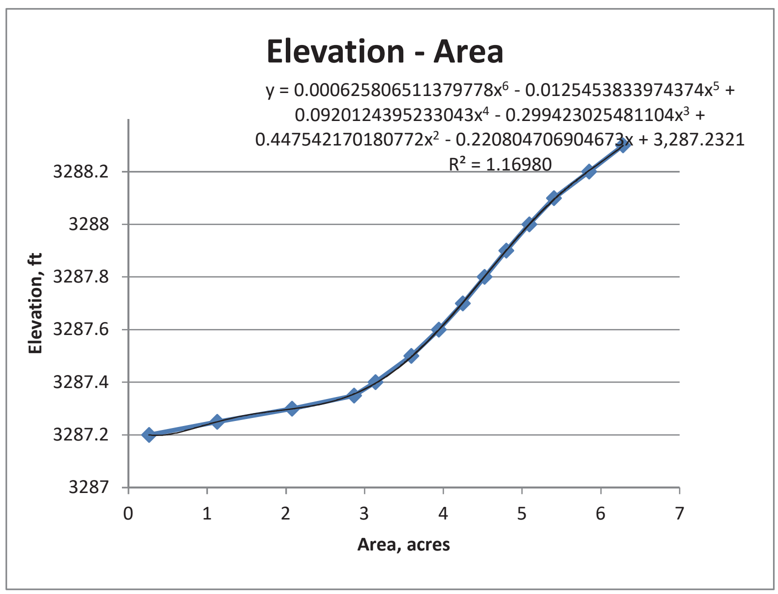
Datalogger NA

Datalogger NA

Elevation -	vol cu ft	vol ac ft
3287.1	3.50985	8.06E-05
3287.2	283.8236	0.006516
3287.3	5234.943	0.120178
3287.4	17327.06	0.397775
3287.5	32026.93	0.735237
3287.6	48460.94	1.11251
3287.7	66309.25	1.522251
3287.8	85406.83	1.960671
3287.9	105700.6	2.426551
3288	127221.9	2.920614
3288.1	150060.1	3.444906
3288.2	174505.3	4.00609
3288.3	201089.4	4.616377



Elevation -	area sq ft	area ac
3287.1	317.5935	0.007291
3287.15	1593.896	0.036591
3287.2	11437.62	0.262572
3287.25	49104.13	1.127276
3287.3	90480.22	2.07714
3287.35	124789	2.864761
3287.4	136736.4	3.139037
3287.5	156441.1	3.591393
3287.6	171752.1	3.942885
3287.7	184927.7	4.245355
3287.8	197008	4.522681
3287.9	208954.2	4.796929
3288	221695.7	5.089433
3288.1	235402.9	5.404108
3288.2	254925	5.852272
3288.3	273590.6	6.280776



Bivins B
microplaya surveyed 9/20/13

2.3E-05

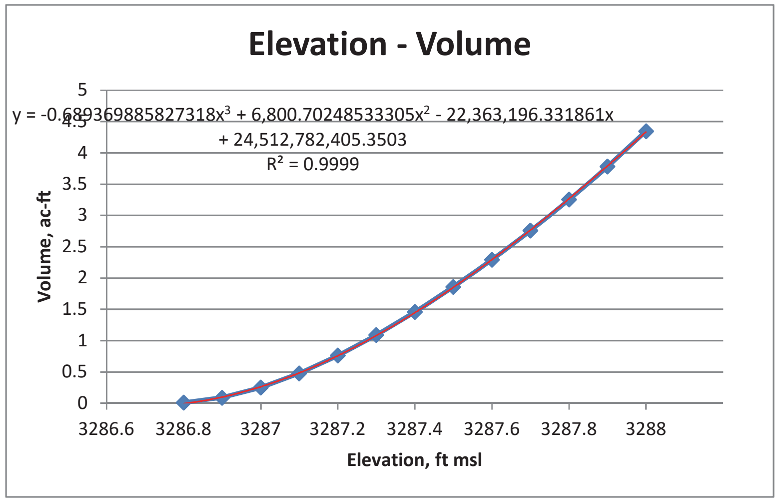
input units = feet

Grid Z Min 3286.56

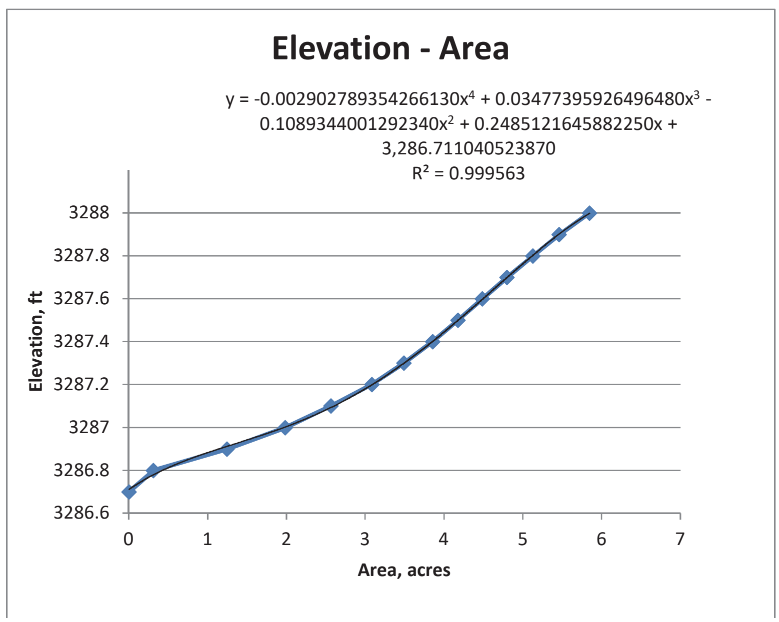
Datalogger NA

Datalogger NA

Elevation -	vol cu ft	vol ac ft
3286.8	364.4415	0.008366
3286.9	3750.594	0.086102
3287	10759.47	0.247003
3287.1	20712.37	0.475491
3287.2	33025.72	0.758166
3287.3	47396.7	1.088079
3287.4	63412.74	1.455756
3287.5	80929.01	1.857874
3287.6	99811.9	2.291366
3287.7	120039	2.755717
3287.8	141661.1	3.252092
3287.9	164719.4	3.781437
3288	189327.8	4.346367



Elevation -	area sq ft	area ac
3286.7	220.4659	0.005061
3286.8	13667.38	0.31376
3286.9	54320.1	1.247018
3287	86543.49	1.986765
3287.1	111799.4	2.566561
3287.2	134401.7	3.085438
3287.3	152221.9	3.494535
3287.4	168002.9	3.856816
3287.5	182061.6	4.17956
3287.6	195542.7	4.489042
3287.7	209141.7	4.801233
3287.8	223368.5	5.127836
3287.9	237933.2	5.462194
3288	254671.3	5.84645



Bivins C
microplaya surveyed 9/20/13

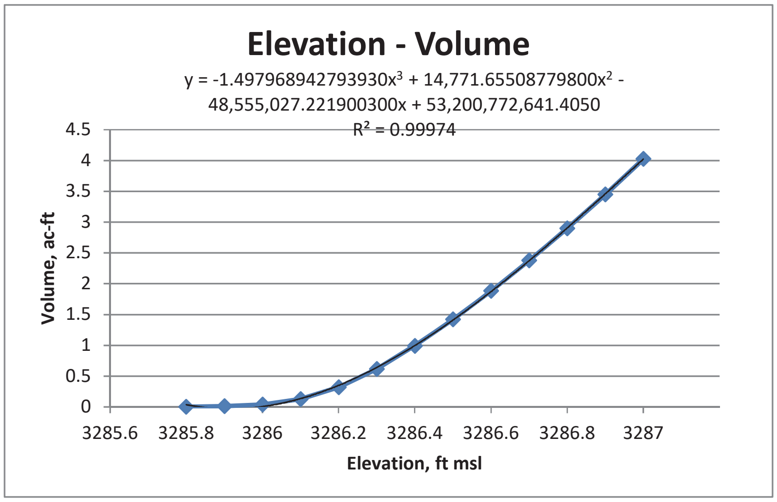
2.3E-05

input units = feet

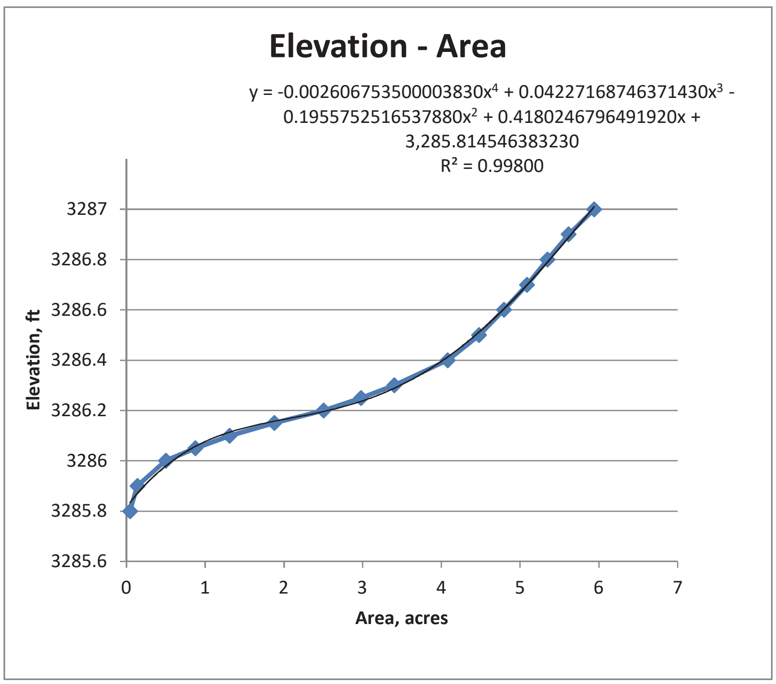
Grid Z Min 3285.624

Datalogger NA
Datalogger NA

Elevation -	vol cu ft	vol ac ft
3285.8	101.5635	0.002332
3285.9	470.3837	0.010799
3286	1679.905	0.038565
3286.1	5545.931	0.127317
3286.2	13803.76	0.316891
3286.3	26738.75	0.613837
3286.4	43200.49	0.991747
3286.5	61891.56	1.420835
3286.6	82101.34	1.884787
3286.7	103633.6	2.379101
3286.8	126359.7	2.90082
3286.9	150223.3	3.448653
3287	175331.7	4.025062



Elevation -	area sq ft	area ac
3285.8	2009.003	0.04612
3285.9	6094.511	0.139911
3286	21847.17	0.501542
3286.05	38188.72	0.876692
3286.1	57177.66	1.312619
3286.15	81883.78	1.879793
3286.2	109156.3	2.505885
3286.25	129763.3	2.978955
3286.3	148244.8	3.403232
3286.4	177656.4	4.078429
3286.5	195019.4	4.477029
3286.6	208940.2	4.796608
3286.7	221537.3	5.085797
3286.8	232940.1	5.347568
3286.9	244564.9	5.614438
3287	258667.1	5.938178



Bivins D
microplaya surveyed 9/20/13

2.3E-05

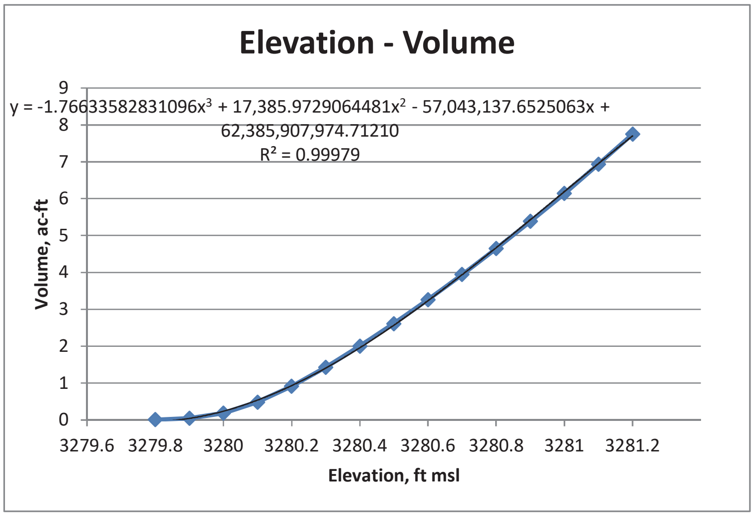
input units = feet

Grid Z Min 3279.495

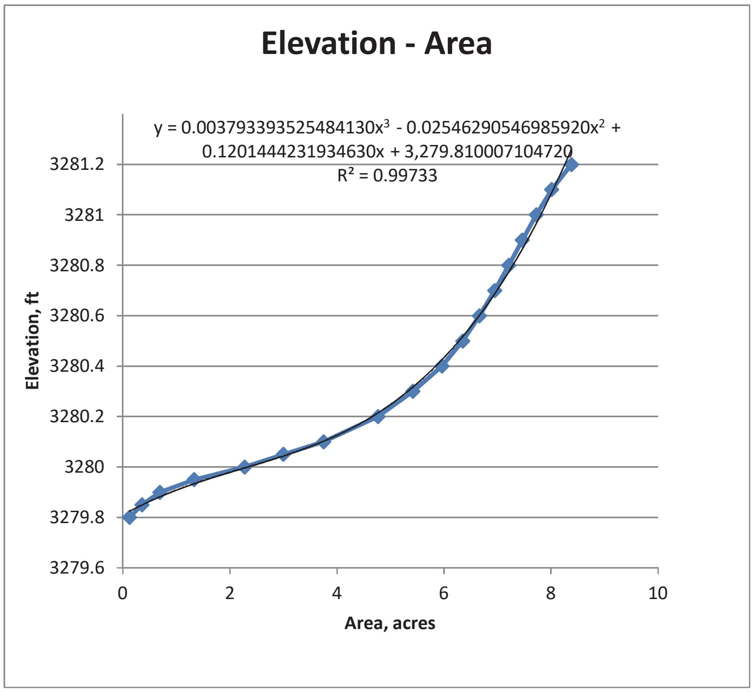
Datalogger Grc NA

Datalogger NA

Elevation - Volu	vol cu ft	vol ac ft
3279.8	291.9692	0.006703
3279.9	1912.53	0.043906
3280	7953.878	0.182596
3280.1	21072.09	0.483749
3280.2	39842.19	0.914651
3280.3	62089.17	1.425371
3280.4	86918.86	1.995382
3280.5	113777.3	2.611968
3280.6	142126.2	3.262768
3280.7	171769	3.943275
3280.8	202602.2	4.651106
3280.9	234561.5	5.384792
3281	267637.4	6.14411
3281.1	301892.4	6.930496
3281.2	337566.3	7.749455



Elevation - Are	area sq ft	area ac
3279.8	5532.09	0.126999
3279.85	15632.24	0.358867
3279.9	30086.68	0.690695
3279.95	57912	1.329477
3280	98990.37	2.272506
3280.05	130701.7	3.000498
3280.1	163331.7	3.749581
3280.2	207600.8	4.765858
3280.3	235894.2	5.415385
3280.4	259599.6	5.959587
3280.5	276599.7	6.349855
3280.6	290152.4	6.660982
3280.7	302550.9	6.945612
3280.8	314050.2	7.209601
3280.9	325126.1	7.463868
3281	336508.6	7.725175
3281.1	348863.5	8.008803
3281.2	364962.2	8.378379



Bivins E
microplaya surveyed 9/20/13

2.3E-05

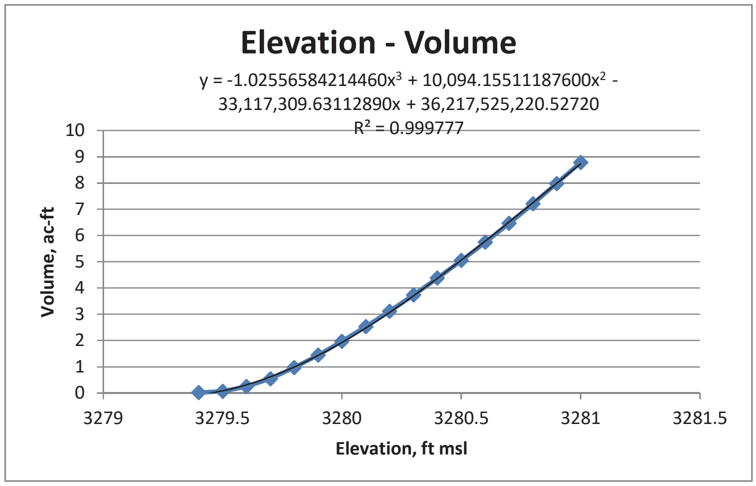
input units = feet

Grid Z Min 3279.137

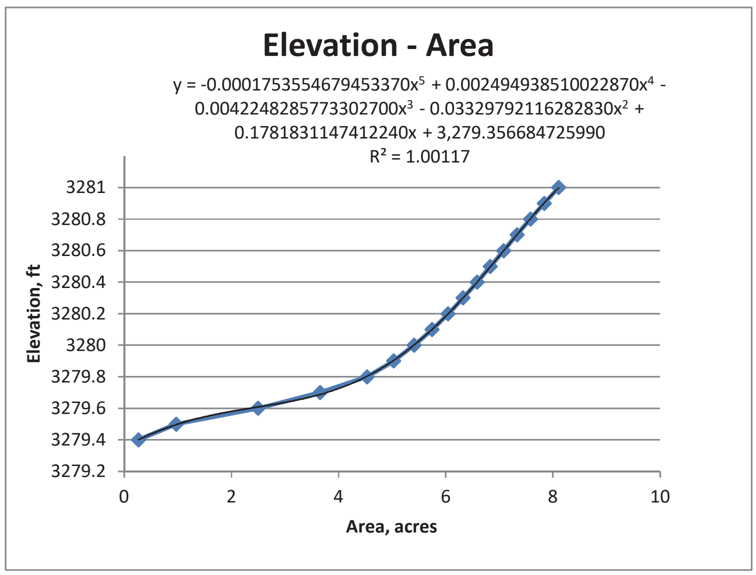
Datalogger NA

Datalogger NA

Elevation - vol cu ft		vol ac ft
3279.4	765.8113374	0.017581
3279.5	3221.781702	0.073962
3279.6	10849.76156	0.249076
3279.7	24028.9752	0.551629
3279.8	42141.13973	0.967427
3279.9	63031.86642	1.447013
3280	85790.1284	1.96947
3280.1	110086.6494	2.527242
3280.2	135766.013	3.116759
3280.3	162699.0978	3.735057
3280.4	190803.5915	4.380248
3280.5	220020.3535	5.050972
3280.6	250318.6193	5.746525
3280.7	281698.7437	6.466913
3280.8	314161.8437	7.212164
3280.9	347732.526	7.98284
3281	382451.0471	8.779868



Elevation - area sq ft		area ac
3279.4	11455.38141	0.262979
3279.5	42350.98035	0.972245
3279.6	108783.6158	2.497328
3279.7	159064.4206	3.651617
3279.8	197294.1872	4.529251
3279.9	219024.928	5.02812
3280	235652.6982	5.409842
3280.1	250077.5653	5.740991
3280.2	263281.3275	6.044108
3280.3	275296.0638	6.319928
3280.4	286704.9407	6.58184
3280.5	297597.9383	6.831909
3280.6	308401.5445	7.079925
3280.7	319223.7047	7.328368
3280.8	330129.1336	7.578722
3280.9	341388.0122	7.83719
3281	353143.178	8.107052

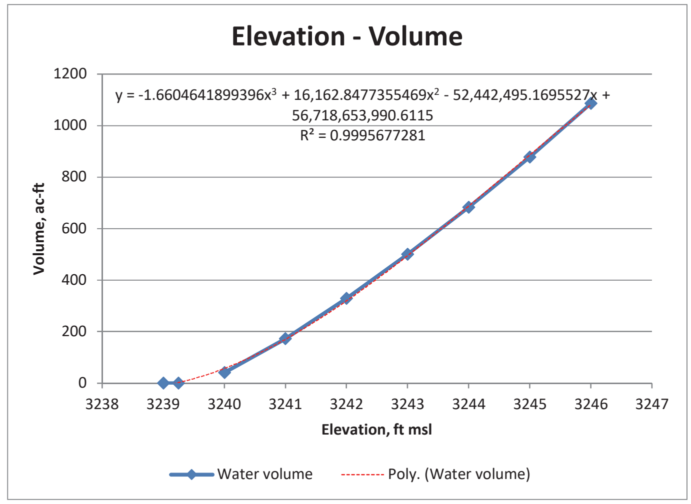


Bivins North Area Volume Calcs

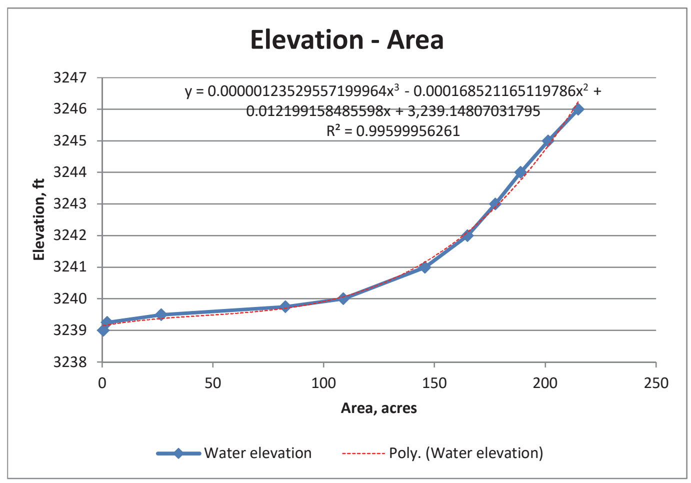
depth, ft	7.05
elevation, ft	3246.497
volume, ac-ft	1173.52421

Grid Z Min	3237.26
Datalogger Ground Surfac	3239.447
Datalogger	3239.4

	Orig survey		resurvey	
Elevation - Volume	vol cu ft	vol ac ft	vol cu ft	vol ac ft
3239	24365	0.559343	8886	0.203994
3239.25			20636	0.473737
			128554	2.951194
			759227	17.42945
3240	2178157	50.0036	1825107.759	41.89871
3241	8274443	189.9551	7551836.515	173.3663
3242	15403384	353.613	14329785.36	328.9666
3243	23191222	532.3972	21795820.92	500.3632
3244	31477028	722.6131	29771349.58	683.4561
3245	40202945	922.9326	38247685.95	878.046
3246	49453133	1135.288	47311090.81	1086.113

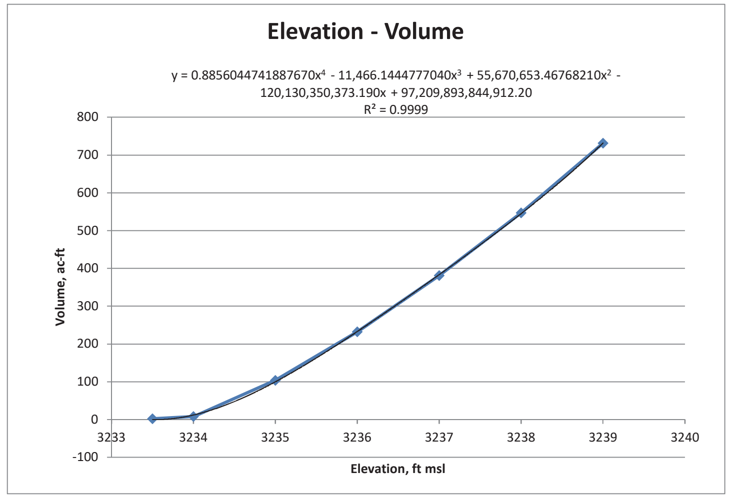


	Orig survey		resurvey	
Elevation - Area	area sq ft	area ac	area sq ft	area ac
3239	140742	3.230992	22863.6	0.524876
3239.25			94217	2.162925
3239.5			1160922	26.6511
3239.75			3601743	82.68464
3240	5240853	120.3134	4735757.828	108.718
3241	6686391	153.4984	6344512.209	145.65
3242	7506541	172.3265	7181019.649	164.8535
3243	8050983	184.8251	7729157.356	177.437
3244	8510199	195.3673	8222089.971	188.7532
3245	8970504	205.9344	8762236.774	201.1533
3246	9535438	218.9035	9359486.993	214.8643

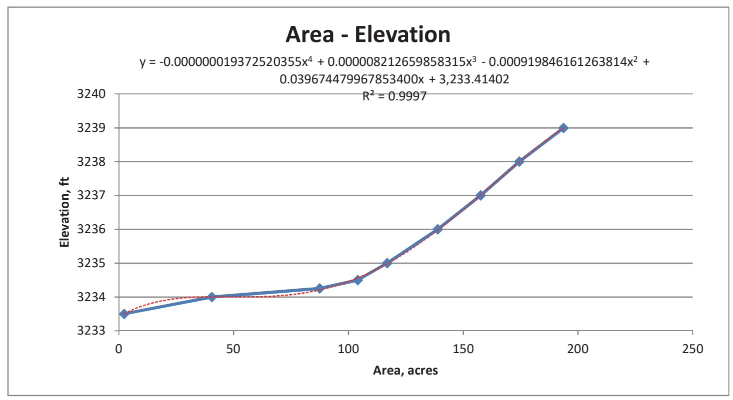


Bivins South Area Volume Calcs

Grid Z Min		3245.93				
Datalogger Ground Surfac		3248.892				
Datalogger		3247.6			resurvey	
Elevation - Volume		vol cu ft	vol ac ft		vol cu ft	vol ac ft
	3249	224132	5.145363	3232	8574.8031	0.19685
	3250	3130309	71.86201	3232.5	24600.061	0.56474
	3251	8547913	196.2331	3233	49951.572	1.14673
				3233.5	88687	2.035973
	3252	14867252	341.3051	3234	334442.14	7.677735
	3253	21957121	504.0661	3235	4529001.4	103.9716
	3254	29799951	684.1127	3236	10115419	232.2181
	3255	38428018	882.1859	3237	16594510	380.9575
			0	3238	23825398	546.9559
			0	3239	31845569	731.0737
			0			0

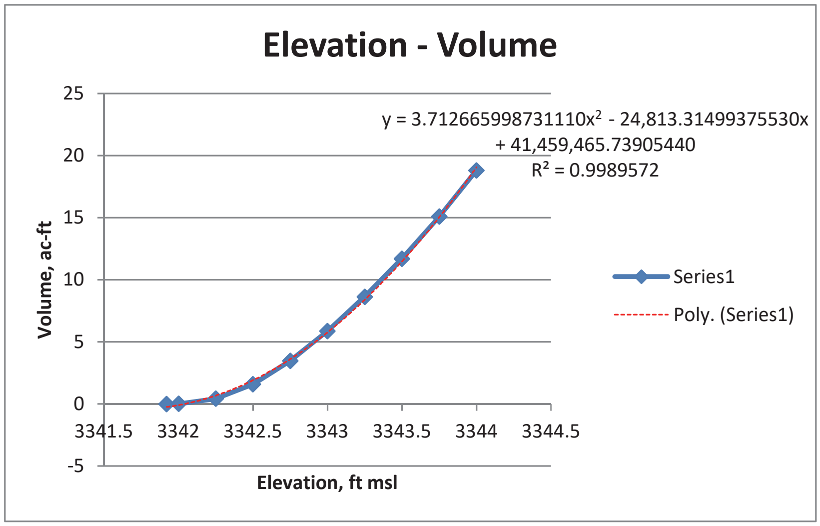


					resurvey	
Elevation - Area		area sq ft	area ac	Elev	area sq ft	area ac
	3249	686685	15.76412	3232	23636.381	0.542617
	3250	4851295	111.3704	3232.5	40797.313	0.936577
	3251	5906497	135.5945	3233	61739.423	1.417342
				3233.5	98436	2.25978
	3252	6713944	154.1309	3234	1760922.8	40.42523
				3234.25	3812613	87.52555
	3253	7464672	171.3653	3234.5	4531819	104.0362
	3254	8224847	188.8165	3235	5090527.2	116.8624
	3255	9036819	207.4568	3236	6051925.2	138.9331
			0	3237	6863762.7	157.5703
			0	3238	7596804.9	174.3986
				3239	8435808.1	193.6595

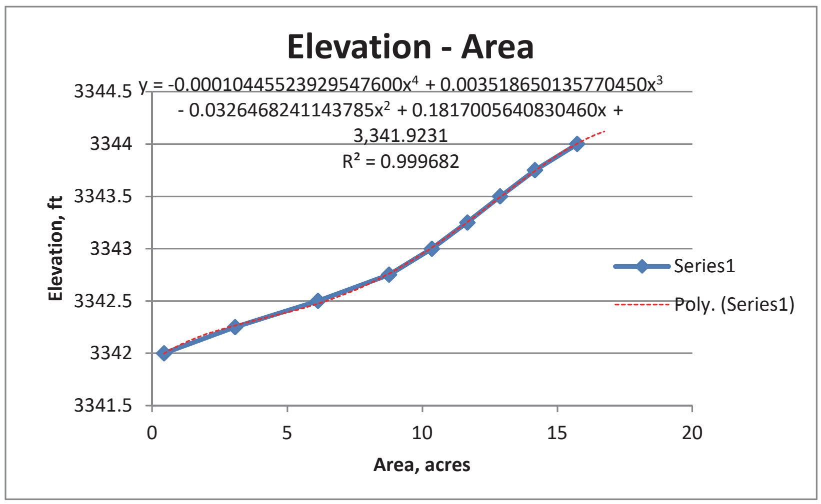


Bowers Area Volume Calcs

Grid Z Min	3341.924185	
Met Sta Ground Surf	3341.903	
Datalogger	3341.9	
Elevation	vol cu ft	vol ac ft
3341.92	0	0
3342	541.8689669	0.01244
3342.25	18924.72162	0.434452
3342.5	68987.56839	1.583737
3342.75	151510.4489	3.478201
3343	256093.106	5.879089
3343.25	376160.0012	8.635445
3343.5	509864.8761	11.70489
3343.75	657043.1117	15.08363
3344	819600.6302	18.81544



Elevation	area sq ft	area ac
3342	18900.65994	0.433899
3342.25	133478.2974	3.06424
3342.5	267523.5006	6.141494
3342.75	382166.5873	8.773338
3343	451250.1944	10.35928
3343.25	508233.7174	11.66744
3343.5	561278.6727	12.88519
3343.75	617342.8705	14.17224
3344	685708.192	15.74169



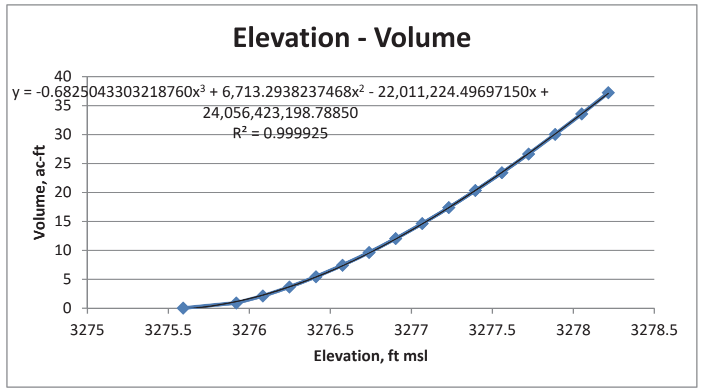
BRCRP Area Volume Calcs

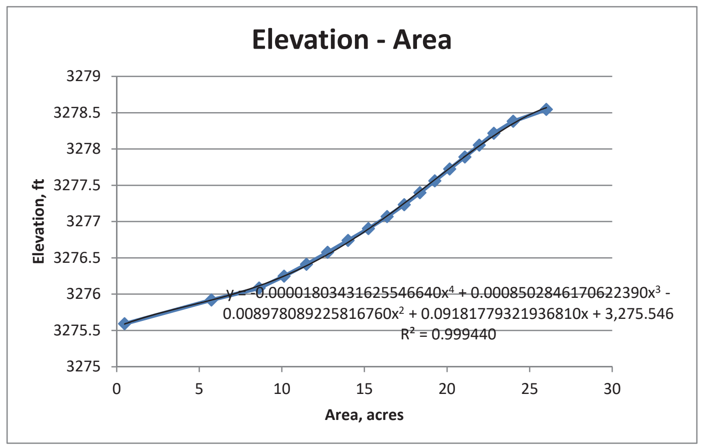
input units = meters

Grid Z Min	998.369	0.0002471
Datalogger Ground Surface	998.5	0.0008107
Datalogger	998.5	

Elevation - Volume	elev, ft	vol m^3	vol ac ft
998.4	3275.6	22.8	0.018484
998.5	3275.9	1122.2	0.909782
998.55	3276.1	2619	2.123258
998.6	3276.2	4525.50294	3.668885
998.65	3276.4	6710.92054	5.440632
998.7	3276.6	9163.21222	7.428737
998.75	3276.7	11874.0156	9.626421
998.8	3276.9	14832.808	12.02515
998.85	3277.1	18032.5389	14.61922
998.9	3277.2	21452.0221	17.39144
998.95	3277.4	25071.187	20.32554
999	3277.6	28876.6348	23.41067
999.05	3277.7	32863.5336	26.6429
999.1	3277.9	37035.0117	30.02477
999.15	3278.1	41390.314	33.55567
999.2	3278.2	45917.642	37.22604
999.25	3278.4	50646.294	41.05962
999.3	3278.5	55708.2803	45.16344

Elevation - Area		area m^2	area ac
998.4	3275.6	1928	0.476419
998.5	3275.9	23211.898	5.73578
998.55	3276.1	34889.8081	8.621452
998.6	3276.2	41022.1767	10.13679
998.65	3276.4	46480.3447	11.48553
998.7	3276.6	51672.6646	12.76858
998.75	3276.7	56672.2819	14.00401
998.8	3276.9	61661.2225	15.23681
998.85	3277.1	66261.2706	16.3735
998.9	3277.2	70441.3188	17.40641
998.95	3277.4	74285.1005	18.35623
999	3277.6	77921.1959	19.25473
999.05	3277.7	81576.4757	20.15797
999.1	3277.9	85291.9564	21.07608
999.15	3278.1	88826.9094	21.94959
999.2	3278.2	92397.081	22.8318
999.25	3278.4	97146.2066	24.00533
999.3	3278.5	105276.926	26.01447

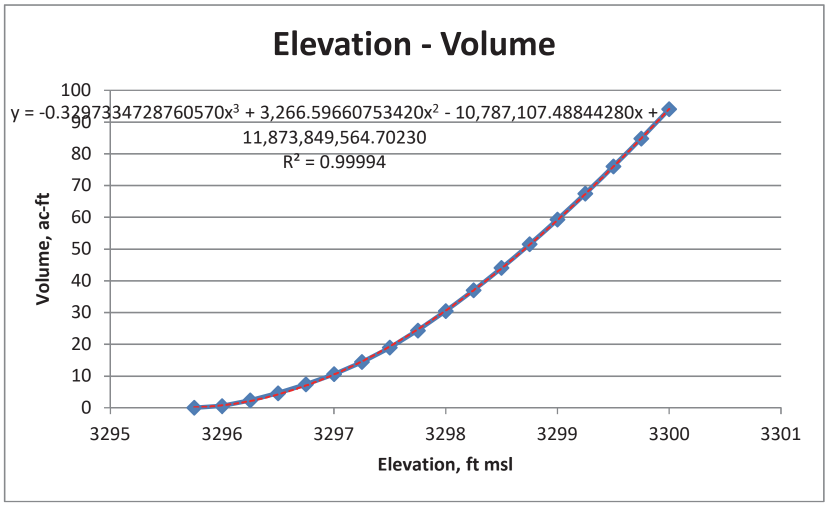




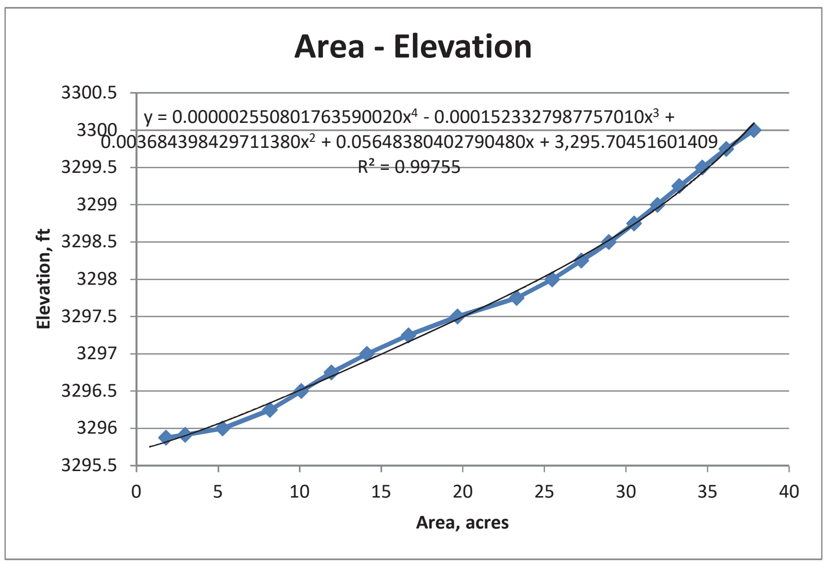
BRRNG playa

	ac/ft^2	2.3E-05
Met station ground su		3296.195
Grid Z min		3295.629

Elevation -	vol cu ft	vol ac ft
3295.75	325.1081	0.007463
3296	24484.43	0.562085
3296.25	99855.63	2.29237
3296.5	199376.5	4.577056
3296.75	319133.6	7.3263
3297	460684.7	10.57587
3297.25	628439.4	14.42698
3297.5	824958.2	18.93843
3297.75	1060365	24.34263
3298	1326680	30.45637
3298.25	1613966	37.05156
3298.5	1920198	44.08167
3298.75	2243905	51.51296
3299	2583926	59.31878
3299.25	2938903	67.46793
3299.5	3308820	75.96006
3299.75	3694376	84.8112
3300	4096960	94.05326



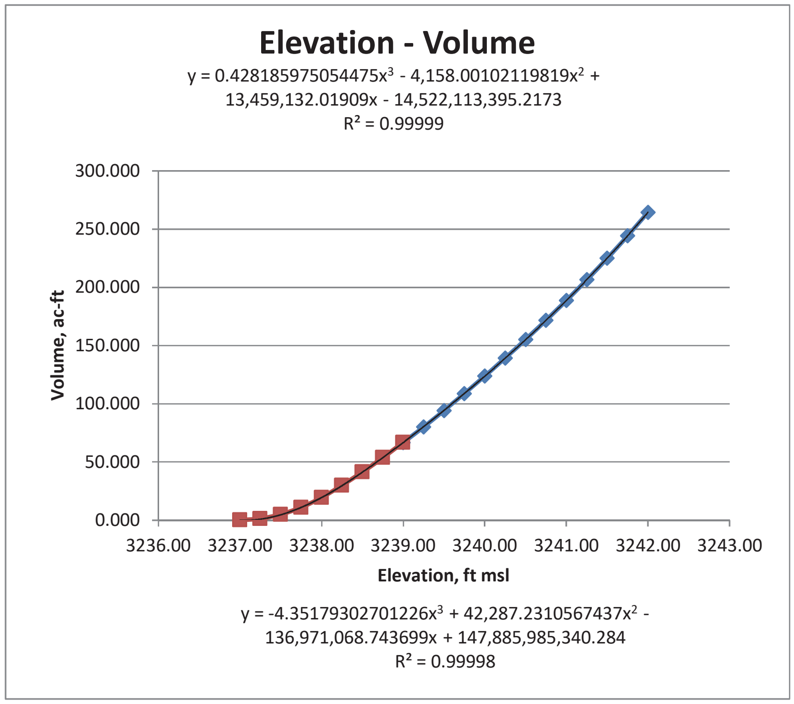
Elevation -	area sq ft	area ac
3295.75	9041.16	0.207556
3295.875	78786.3	1.808685
3295.913	129852.2	2.980995
3296	229960.6	5.279168
3296.25	356773.6	8.190395
3296.5	440316.8	10.10828
3296.75	520382	11.94633
3297	615051.5	14.11964
3297.25	725969.2	16.66596
3297.5	857102.5	19.67637
3297.75	1015087	23.3032
3298	1109849	25.47864
3298.25	1187778	27.26763
3298.5	1261380	28.9573
3298.75	1328700	30.50275
3299	1390708	31.92627
3299.25	1449463	33.2751
3299.5	1510695	34.68078
3299.75	1574878	36.15421
3300	1648306	37.8399



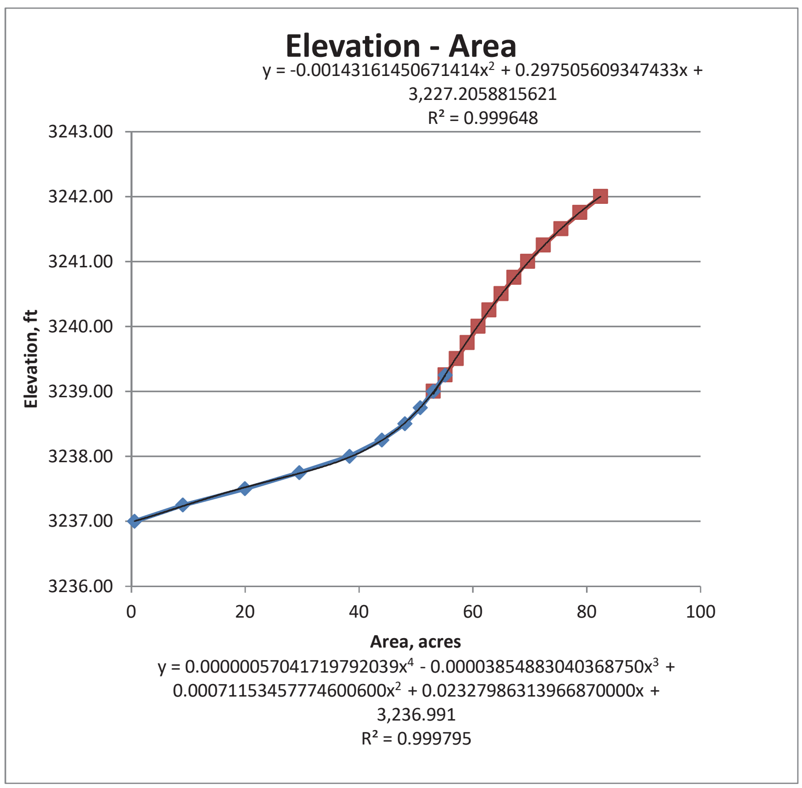
Comer Playa - Floyd County

Grid Z Min	3236.56765	
Datalogger NA		2.3E-05
Datalogger NA		

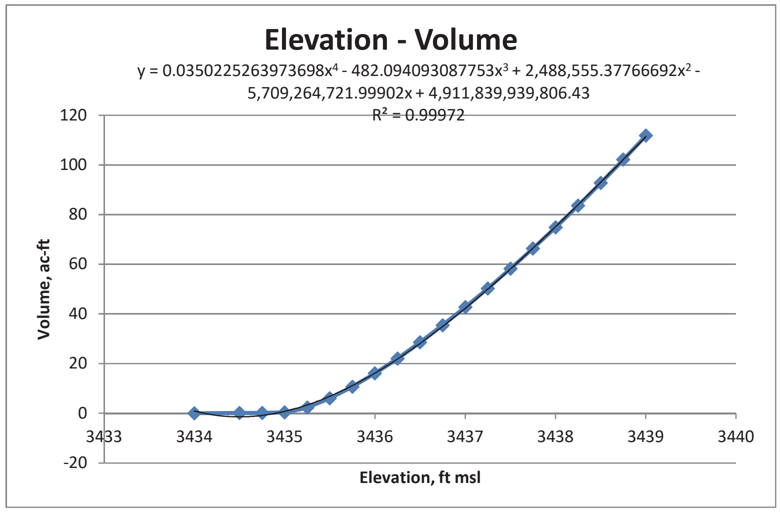
Elevation -	vol cu ft	vol ac ft
3236.75	74.38225879	0.002
3237.00	1219.718538	0.028
3237.25	49373.99418	1.133
3237.50	205355.7862	4.714
3237.75	473782.6297	10.877
3238.00	845858.8823	19.418
3238.25	1297069.833	29.777
3238.50	1799673.381	41.315
3238.75	2338392.889	53.682
3239.00	2904081.299	66.669
3239.25	3493347.367	80.196
3239.50	4104435.676	94.225
3239.75	4736623.08	108.738
3240.00	5389662.327	123.730
3240.25	6063578.264	139.201
3240.50	6759285.788	155.172
3240.75	7478911.846	171.692
3241.00	8224076.174	188.799
3241.25	8996878.861	206.540
3241.50	9801553.845	225.013
3241.75	10641387.43	244.293
3242.00	11519280.23	264.446

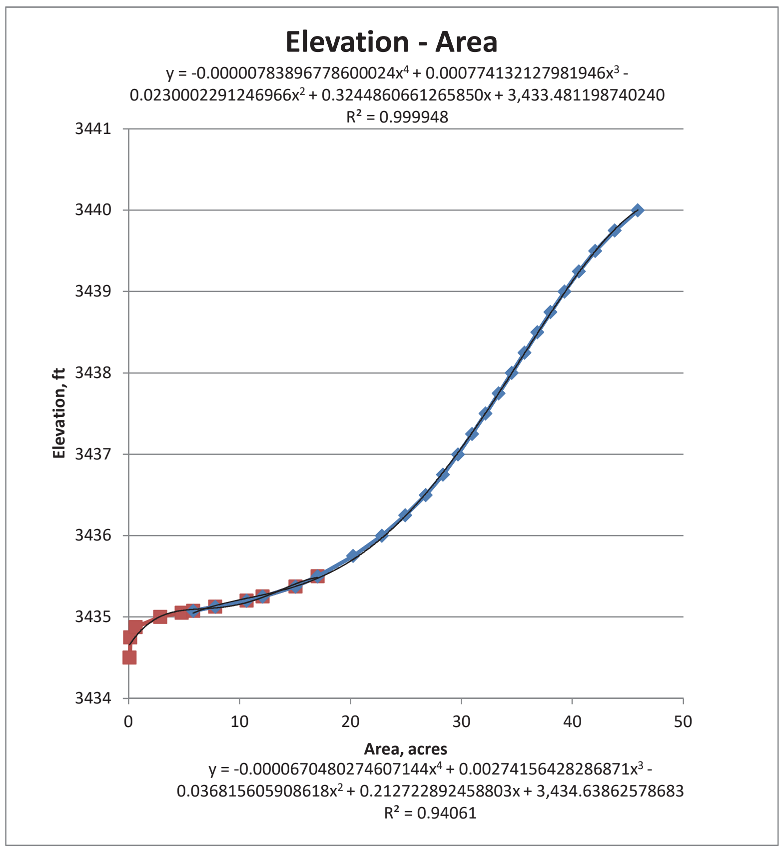


Elevation -	area sq ft	area ac
3236.75	1021.069416	0.023441
3237.00	23918.2185	0.549087
3237.25	392631.2281	9.013573
3237.50	868216.7474	19.93151
3237.75	1285522.363	29.51153
3238.00	1669077.701	38.31675
3238.25	1917266.655	44.01439
3238.50	2092898.381	48.04634
3238.75	2211619.894	50.77181
3239.00	2311489.486	53.0645
3239.25	2401596.237	55.13306
3239.50	2486684.805	57.08643
3239.75	2570569.458	59.01215
3240.00	2653716.067	60.92094
3240.25	2738169.573	62.85972
3240.50	2829544.193	64.9574
3240.75	2928343.818	67.22552
3241.00	3033993.225	69.6509
3241.25	3152134.782	72.36306
3241.50	3287156.652	75.46273
3241.75	3433444.684	78.82104
3242.00	3590691.183	82.43093



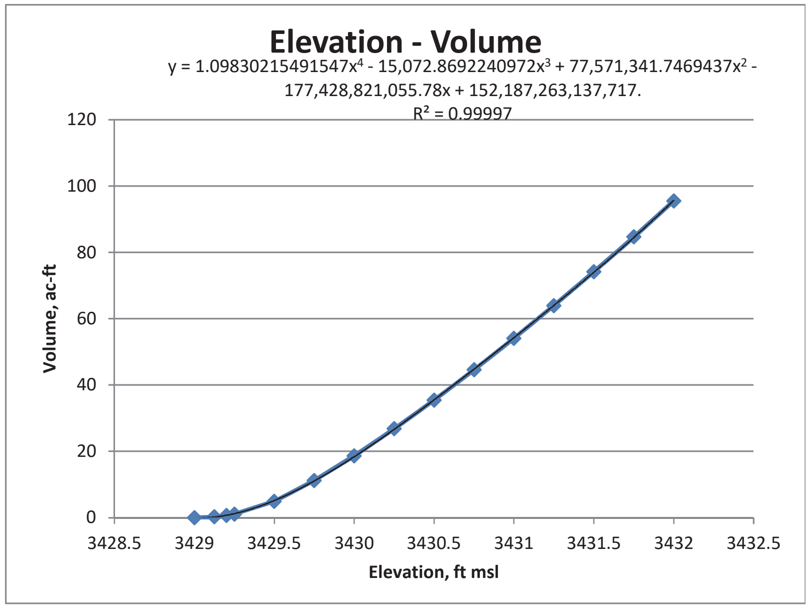
Crooks 1 playa		11/2013 survey	
Grid Z Min	3431.825664		
Datalogger Gr	NA		2.3E-05
Datalogger	NA		
Elevation - Vo	vol cu ft	vol ac ft	
3434	2122.378602	0.048723	
3434.5	3832.037489	0.087971	
3434.75	5278.828125	0.121185	
3435	15234.05563	0.349726	
3435.25	99225.14315	2.277896	
3435.5	261428.2251	6.001566	
3435.75	465268.0147	10.68108	
3436	700166.1755	16.0736	
3436.25	960891.5487	22.05903	
3436.5	1242901.237	28.53309	
3436.75	1543433.28	35.43235	
3437	1859725.246	42.69342	
3437.25	2190120.617	50.27825	
3437.5	2533893.558	58.17019	
3437.75	2890749.749	66.36248	
3438	3260480.845	74.85034	
3438.25	3642922.789	83.63	
3438.5	4037987.626	92.69944	
3438.75	4445763.803	102.0607	
3439	4866757.681	111.7254	
3439.25	5301692.761	121.7101	
3439.5	5751695.345	132.0408	
3439.75	6218964.793	142.7678	
3440	6707026.767	153.9721	



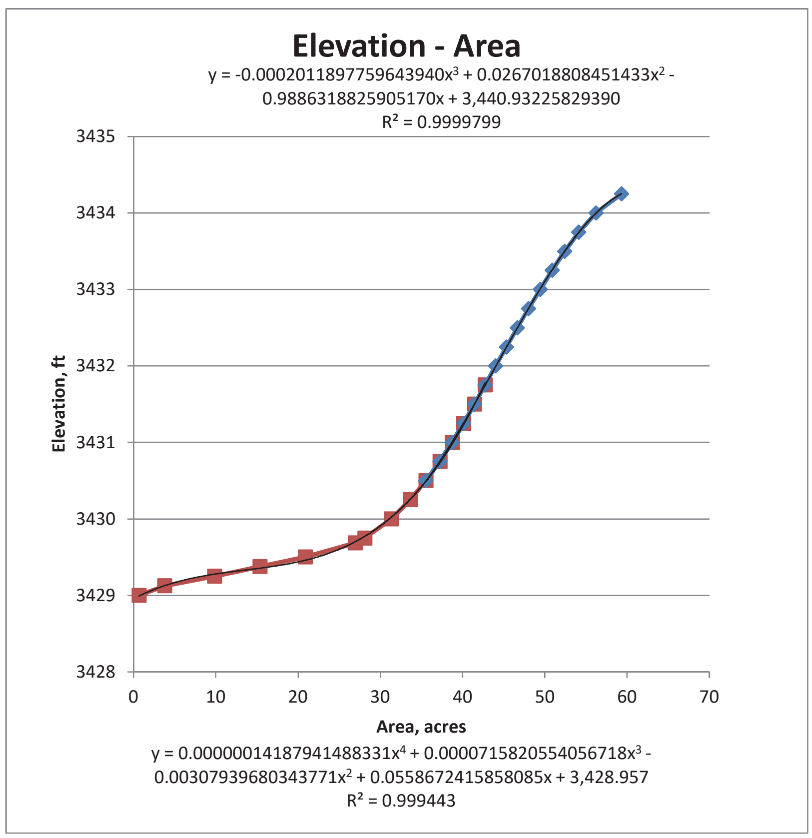


Elevation - Ar	area sq ft	area ac
3434	2669.713335	0.061288
3434.5	4663.662976	0.107063
3434.75	7525.982786	0.172773
3434.875	28257.82192	0.64871
3435	125296.4343	2.87641
3435.05	208653.9249	4.790035
3435.075	253794.6445	5.826323
3435.125	340562.3588	7.818236
3435.2	463936.9984	10.65053
3435.25	527258.4204	12.10419
3435.375	655924.3784	15.05795
3435.5	743301.5504	17.06386
3435.75	881615.3047	20.2391
3436	995311.4706	22.84921
3436.25	1087290.558	24.96076
3436.5	1167149.63	26.79407
3436.75	1235417.09	28.36127
3437	1294149.459	29.70958
3437.25	1348765.408	30.96339
3437.5	1401596.741	32.17623
3437.75	1453490.896	33.36756
3438	1504681.016	34.54272
3438.25	1555216.514	35.70286
3438.5	1605832.889	36.86485
3438.75	1657313.298	38.04668
3439	1711693.799	39.29508
3439.25	1769082.705	40.61255
3439.5	1832895.461	42.07749
3439.75	1908656.151	43.81672
3440	1999846.36	45.91016

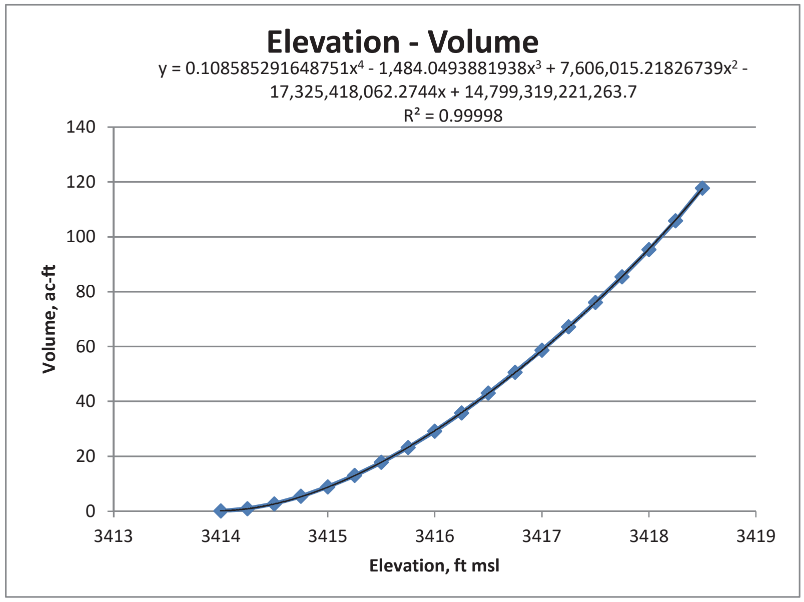
Crooks 2 playa		11/2013 survey	
Grid Z Min	3428.757695		
Datalogger Gr	NA		2.3E-05
Datalogger	NA		
Elevation - Vo	vol cu ft	vol ac ft	
3429	1457.735535	0.033465	
3429.125	12618.37604	0.289678	
3429.2	29933.9527	0.687189	
3429.25	48264.18657	1.107993	
3429.5	215772.1065	4.953446	
3429.75	490039.7493	11.24976	
3430	814890.3961	18.70731	
3430.25	1169207.823	26.84132	
3430.5	1546142.751	35.49455	
3430.75	1942590.453	44.59574	
3431	2356348.392	54.09432	
3431.25	2785758.775	63.95222	
3431.5	3229849.138	74.14713	
3431.75	3688148.9	84.66825	
3432	4160473.476	95.51133	
3432.25	4646899.145	106.6781	
3432.5	5147633.071	118.1734	
3432.75	5663131.707	130.0076	
3433	6193734.813	142.1886	
3433.25	6739954.884	154.7281	
3433.5	7302251.814	167.6366	
3433.75	7882127.636	180.9488	
3434	8482608.039	194.7339	
3434.25	9110015.276	209.1372	



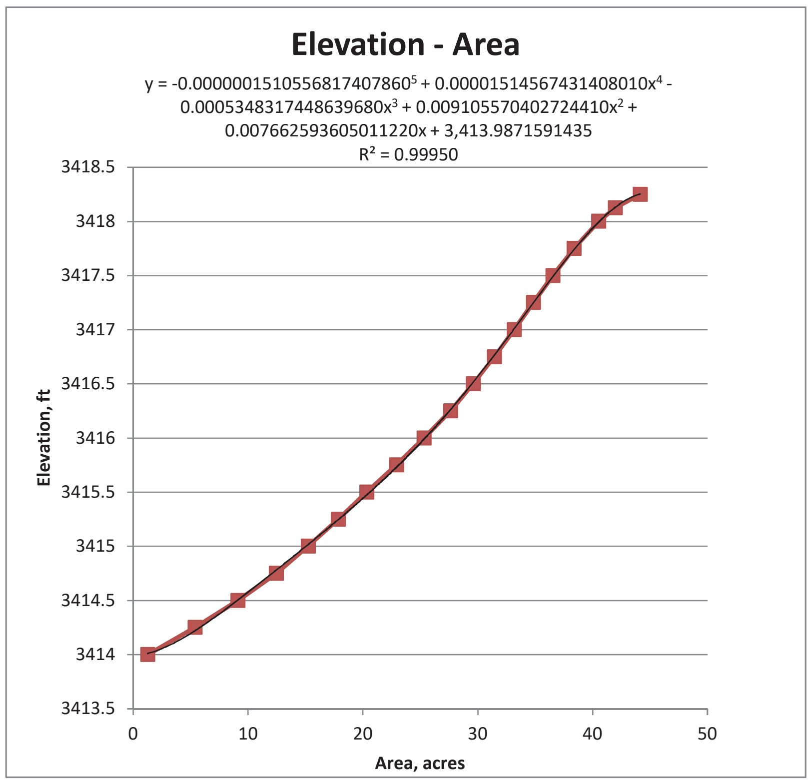
Elevation - Ar	area sq ft	area ac
3429	29265.77123	0.67185
3429.125	164340.6528	3.772742
3429.25	428359.3248	9.833777
3429.375	668927.9516	15.35647
3429.5	909675.2333	20.88327
3429.685	1173377.99	26.93705
3429.75	1224823.526	28.11808
3430	1365072.847	31.33776
3430.25	1465164.946	33.63556
3430.5	1548467.12	35.54791
3430.75	1621749.717	37.23025
3431	1687292.94	38.73492
3431.25	1747471.359	40.11642
3431.5	1805146.918	41.44047
3431.75	1861176.486	42.72673
3432	1917451.335	44.01863
3432.25	1974121.843	45.3196
3432.5	2032047.507	46.64939
3432.75	2091906.671	48.02357
3433	2153452.436	49.43647
3433.25	2216291.594	50.87905
3433.5	2282923.348	52.40871
3433.75	2357930.997	54.13065
3434	2449188.737	56.22564
3434.25	2584050.29	59.32163



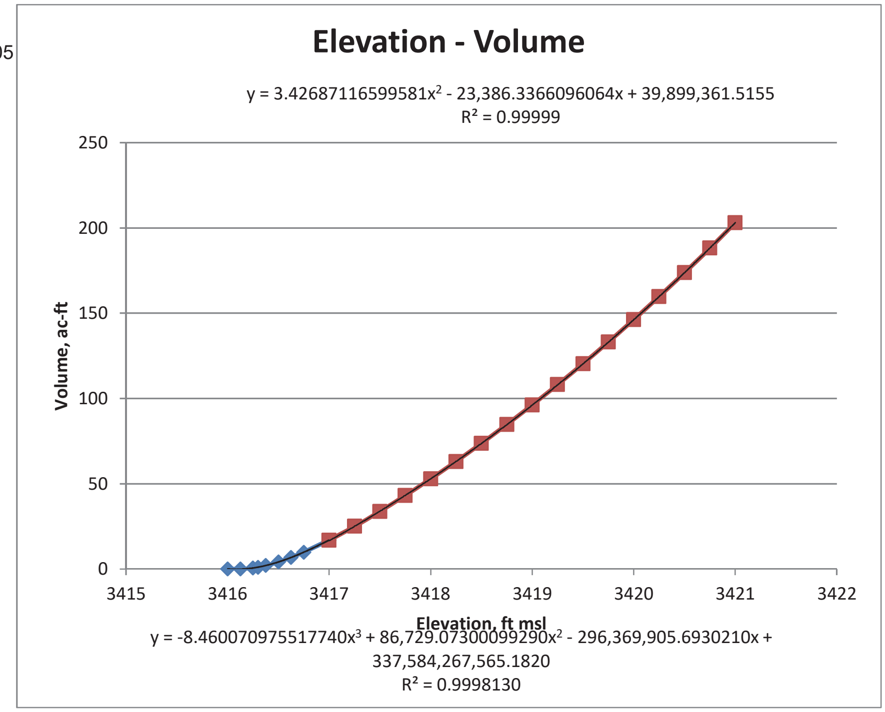
Crooks 3 playa		11/2013 survey
Grid Z Min	3413.824	
Datalogger Gr	NA	2.3E-05
Datalogger	NA	
Elevation - Vo	vol cu ft	vol ac ft
3414	2265.727403	0.052014
3414.25	39131.09537	0.898326
3414.5	118395.5437	2.717988
3414.75	236064.7435	5.419301
3415	387009.5682	8.884517
3415.25	567056.7989	13.01783
3415.5	775182.8504	17.79575
3415.75	1010046.687	23.18748
3416	1273075.008	29.22578
3416.25	1561390.832	35.8446
3416.5	1873241.071	43.0037
3416.75	2205592.411	50.63343
3417	2557393.926	58.70969
3417.25	2927628.028	67.20909
3417.5	3316013.522	76.1252
3417.75	3723601.717	85.48213
3418	4152583.397	95.3302
3418.25	4610903.063	105.8518
3418.5	5131378.25	117.8002

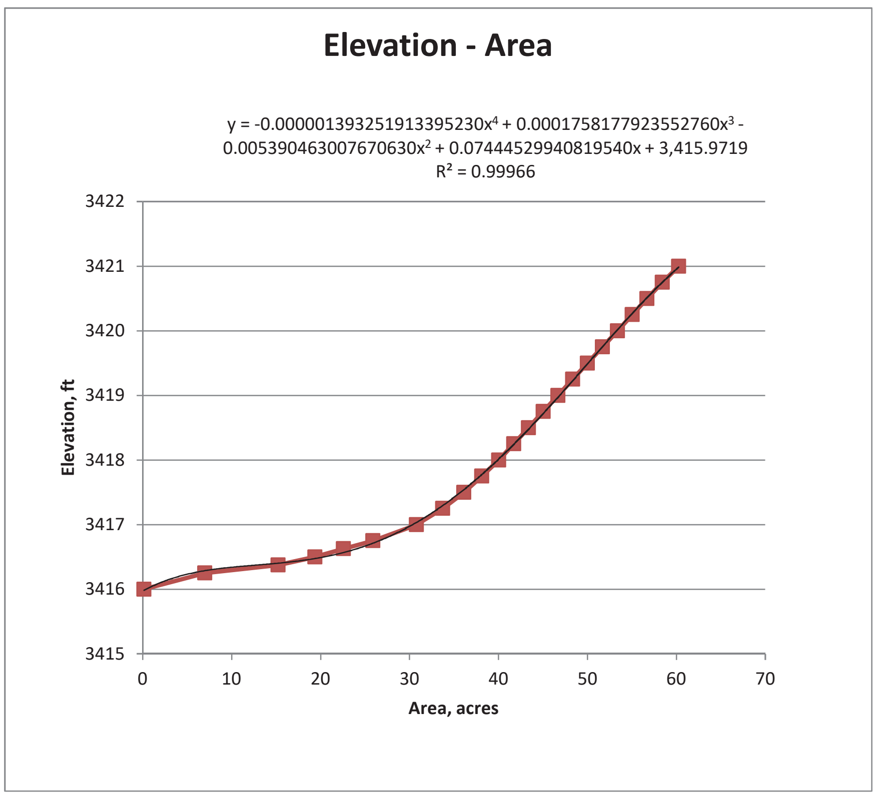


Elevation - Ar	area sq ft	area ac
3414	54780.27342	1.257582
3414.25	234438.4162	5.381965
3414.5	396189.6627	9.095263
3414.75	542245.9395	12.44825
3415	662909.8323	15.21832
3415.25	777052.8481	17.83868
3415.5	885122.4568	20.31962
3415.75	997933.5892	22.9094
3416	1101840.672	25.29478
3416.25	1203585.728	27.63053
3416.5	1289630.549	29.60584
3416.75	1369006.209	31.42806
3417	1444687.302	33.16546
3417.25	1517139.844	34.82874
3417.5	1590842.735	36.52072
3417.75	1671110.662	38.36342
3418	1764870.299	40.51585
3418.125	1827402.798	41.9514
3418.25	1922609.035	44.13703
3418.375	2076490.54	47.66966
3418.5	2296044.413	52.70993



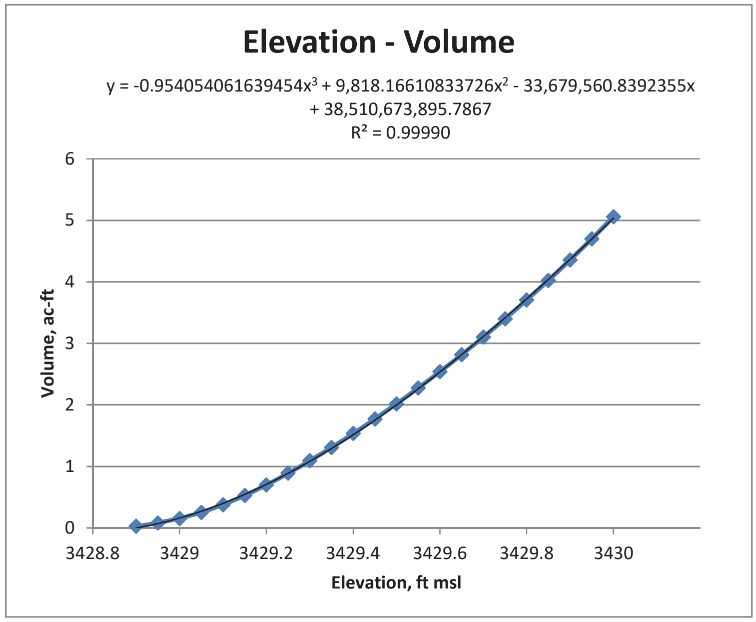
Crooks 4 playa		11/2013 survey	
Grid Z Min	3415.778793		
Datalogger Gr NA			2.3E-05
Datalogger	NA		
Elevation - Vo vol cu ft		vol ac ft	
3416	305.4166067	0.007011	
3416.125	3861.390842	0.088645	
3416.25	24675.0807	0.566462	
3416.3	44206.49333	1.014841	
3416.375	87472.81413	2.008099	
3416.5	182614.4456	4.192251	
3416.625	296736.7808	6.812139	
3416.75	428830.6215	9.844596	
3417	740216.3921	16.99303	
3417.25	1092258.27	25.0748	
3417.5	1472932.836	33.81389	
3417.75	1877186.316	43.09427	
3418	2302853.974	52.86625	
3418.25	2748138.542	63.08858	
3418.5	3211673.14	73.72987	
3418.75	3693044.292	84.78063	
3419	4192460.498	96.24565	
3419.25	4709866.942	108.1237	
3419.5	5245444.119	120.4188	
3419.75	5799375.499	133.1353	
3420	6371594.274	146.2717	
3420.25	6961974.529	159.8249	
3420.5	7570528.848	173.7954	
3420.75	8197468.243	188.188	
3421	8843690.795	203.0232	
Elevation - Ar area sq ft		area ac	
3416	6893.062761	0.158243	
3416.25	304253.3112	6.984695	
3416.375	663644.6747	15.23519	
3416.5	844153.0348	19.37909	
3416.625	983934.5881	22.58803	
3416.75	1128018.495	25.89574	
3417	1340184.663	30.76641	
3417.25	1470176.426	33.75061	
3417.5	1572240.555	36.09368	
3417.75	1660626.455	38.12274	
3418	1743130.85	40.01678	
3418.25	1818078.972	41.73735	
3418.5	1889760.735	43.38294	
3418.75	1961503.786	45.02993	
3419	2033637.784	46.6859	
3419.25	2105822.813	48.34304	
3419.5	2178959.089	50.02202	
3419.75	2252456.363	51.70928	
3420	2325272.65	53.38091	
3420.25	2397835.797	55.04674	
3420.5	2470561.978	56.7163	
3420.75	2545579.543	58.43847	
3421	2624971.254	60.26105	



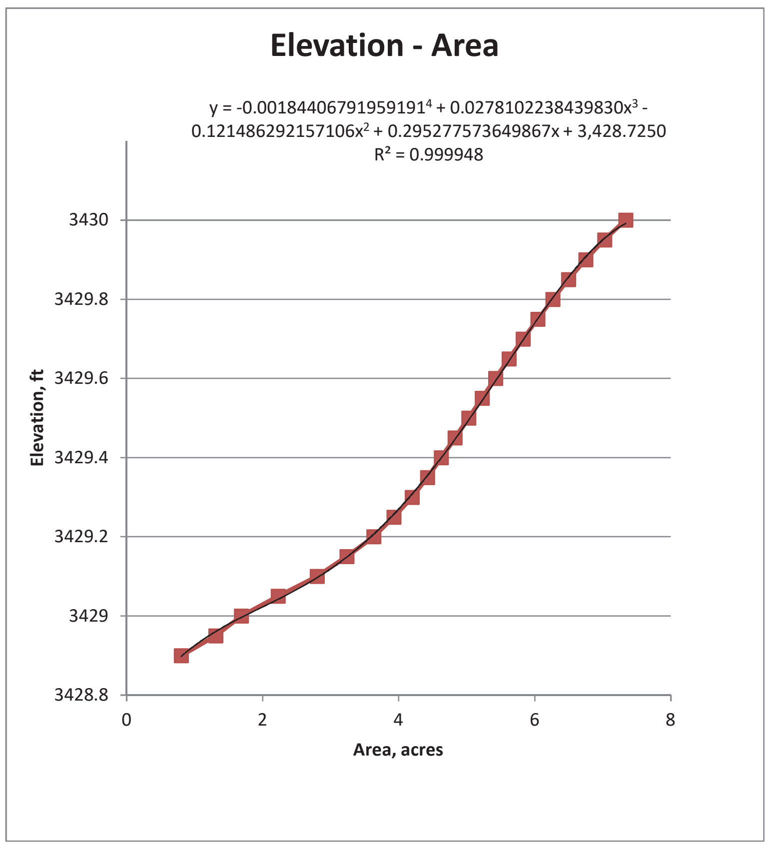


Crooks 5 east playa 11/2013 survey
Grid Z Min 3428.788713
Datalogger Gr NA 2.3E-05
Datalogger NA

Elevation - Vo	vol cu ft	vol ac ft
3428.9	1145.103158	0.026288
3428.95	3473.493656	0.07974
3429	6730.992455	0.154522
3429.05	10947.23408	0.251314
3429.1	16452.71366	0.377702
3429.15	23055.9256	0.529291
3429.2	30531.29868	0.700902
3429.25	38773.36044	0.890114
3429.3	47623.44023	1.093284
3429.35	57021.56235	1.309035
3429.4	66876.10507	1.535264
3429.45	77168.54783	1.771546
3429.5	87894.56811	2.017782
3429.55	99060.35726	2.274113
3429.6	110656.011	2.540312
3429.65	122681.1315	2.816371
3429.7	135148.6222	3.102585
3429.75	148074.104	3.399314
3429.8	161471.4808	3.706875
3429.85	175363.3424	4.025788
3429.9	189779.1455	4.35673
3429.95	204767.2219	4.700809
3430	220397.6345	5.059633



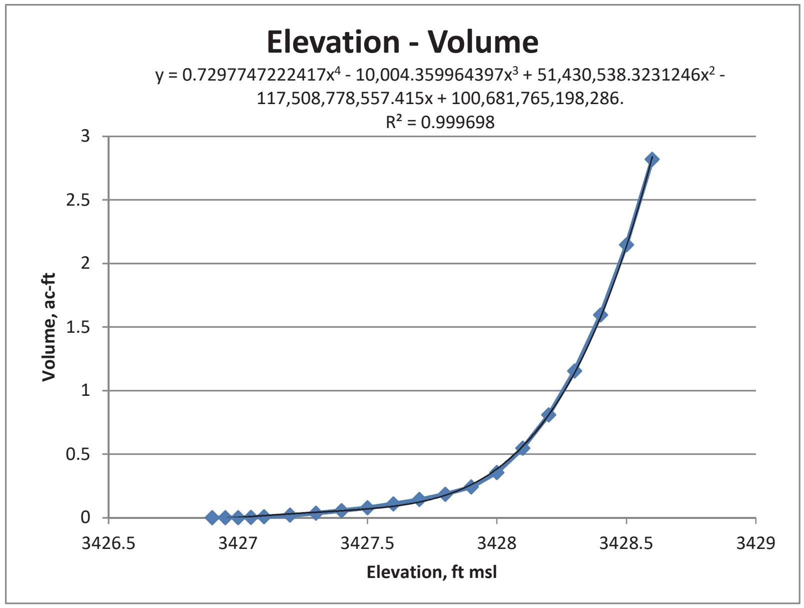
Elevation - Ar	area sq ft	area ac
3428.9	34976.08996	0.802941
3428.95	57007.83786	1.30872
3429	73395.37318	1.684926
3429.05	96897.51519	2.224461
3429.1	122000.9763	2.800757
3429.15	141080.2273	3.238756
3429.2	158100.0862	3.629479
3429.25	171096.6817	3.927839
3429.3	182845.4174	4.197553
3429.35	192677.8149	4.423274
3429.4	201467.4281	4.625056
3429.45	210201.9065	4.825572
3429.5	218903.1861	5.025326
3429.55	227658.525	5.226321
3429.6	236173.8162	5.421805
3429.65	244870.4413	5.621452
3429.7	253891.1113	5.828538
3429.75	263158.9758	6.041299
3429.8	272797.4947	6.262569
3429.85	282978.2721	6.496287
3429.9	293852.357	6.745922
3429.95	305925.8048	7.02309
3430	319495.1828	7.3346



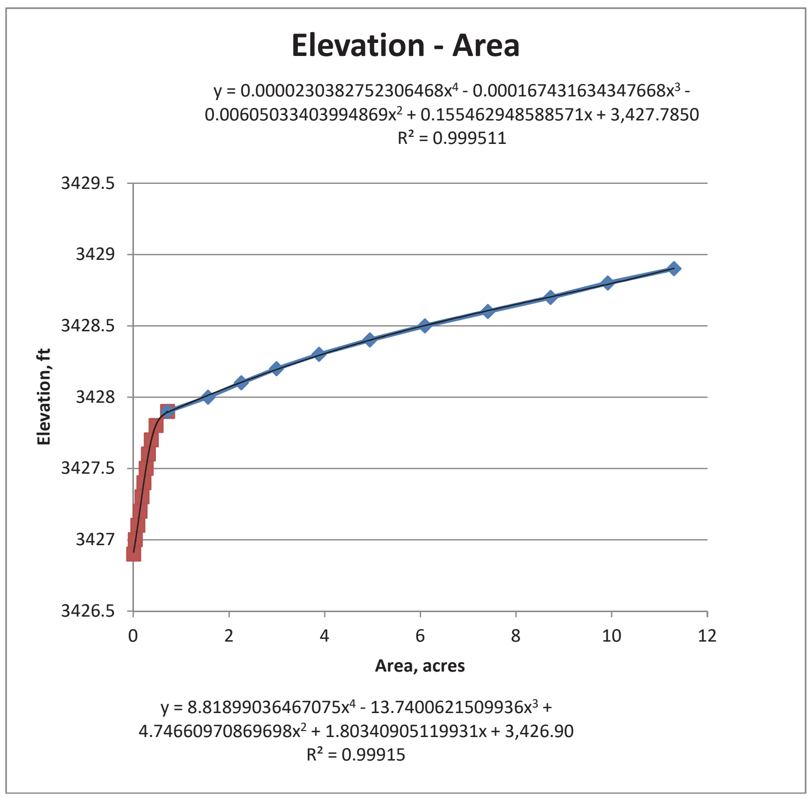
Crooks 1 playa 11/2013 survey

Grid Z Min	3426.836031		
Datalogger Gr	NA		2.3E-05
Datalogger	NA		

Elevation - Vo	vol cu ft	vol ac ft
3426.9	7.576333342	0.000174
3426.95	34.59072753	0.000794
3427	92.53123907	0.002124
3427.05	209.8671159	0.004818
3427.1	389.1064407	0.008933
3427.2	890.147914	0.020435
3427.3	1575.998066	0.03618
3427.4	2443.751396	0.056101
3427.5	3498.983138	0.080326
3427.6	4760.32037	0.109282
3427.7	6253.640174	0.143564
3427.8	8064.3726	0.185133
3427.9	10528.62593	0.241704
3428	15497.1643	0.355766
3428.1	23857.66347	0.547697
3428.2	35227.55891	0.808713
3428.3	50331.80466	1.155459
3428.4	69519.05452	1.595938
3428.5	93531.94192	2.147198
3428.6	122845.8403	2.820152
3428.7	158097.2477	3.629413
3428.8	198605.6316	4.559358
3428.9	244797.301	5.619773

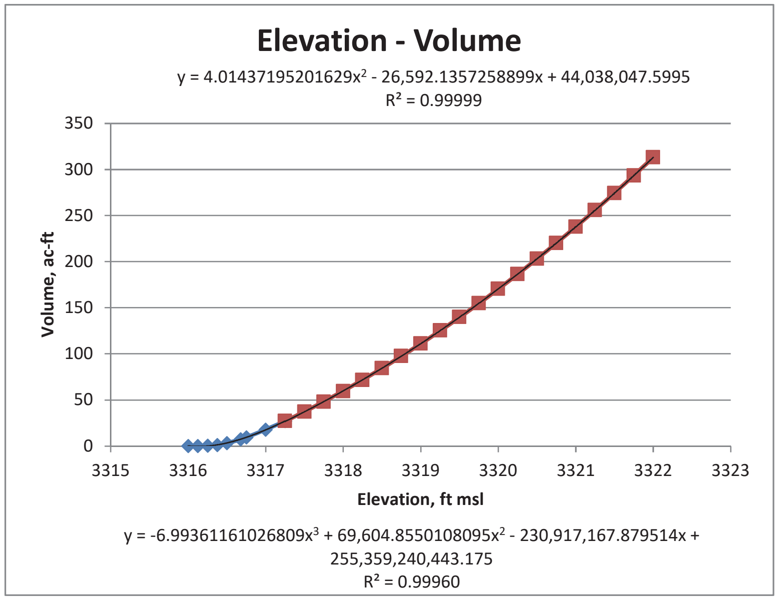


Elevation - Ar	area sq ft	area ac
3426.9	307.939875	0.007069
3427	1675.659514	0.038468
3427.1	4075.412785	0.093559
3427.2	5955.46238	0.136719
3427.3	7749.184387	0.177897
3427.4	9599.49814	0.220374
3427.5	11555.35457	0.265274
3427.6	13713.35264	0.314815
3427.7	16213.81465	0.372218
3427.8	20688.28573	0.474938
3427.9	31095.66178	0.713858
3428	68064.19688	1.562539
3428.1	98345.9394	2.257712
3428.2	130485.0012	2.995523
3428.3	169158.062	3.883335
3428.4	215467.3799	4.94645
3428.5	265343.7602	6.091455
3428.6	322765.3625	7.409673
3428.7	379740.7865	8.717649
3428.8	432045.6664	9.918404
3428.9	492179.4533	11.29889

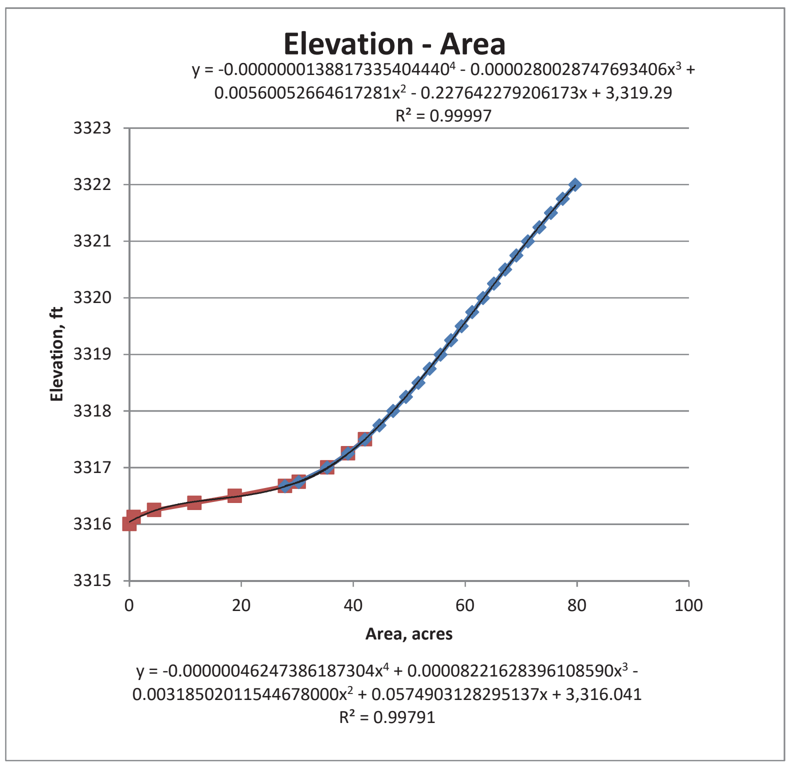


Crooks 6 playa 11/2013 survey
Grid Z Min 3315.901434
Datalogger Gr NA 2.3E-05
Datalogger NA

Elevation - Vo	vol cu ft	vol ac ft
3316	16.65276925	0.000382
3316.125	1280.286403	0.029391
3316.25	13213.08769	0.303331
3316.375	56548.18856	1.298168
3316.5	140256.5841	3.219848
3316.675	320757.8831	7.363588
3316.75	415974.7659	9.549467
3317	775664.6594	17.80681
3317.25	1181182.63	27.11622
3317.5	1623810.176	37.27755
3317.75	2096736.027	48.13444
3318	2596554.654	59.60869
3318.25	3122372.879	71.67982
3318.5	3672794.621	84.31576
3318.75	4246278.247	97.48113
3319	4841342.268	111.1419
3319.25	5456948.279	125.2743
3319.5	6092980.781	139.8756
3319.75	6749743.377	154.9528
3320	7427484.849	170.5116
3320.25	8126439.135	186.5574
3320.5	8846785.304	203.0942
3320.75	9588996.066	220.1331
3321	10353201.02	237.6768
3321.25	11139670.6	255.7316
3321.5	11948593.47	274.302
3321.75	12780378.23	293.3971
3322	13636037.87	313.0404

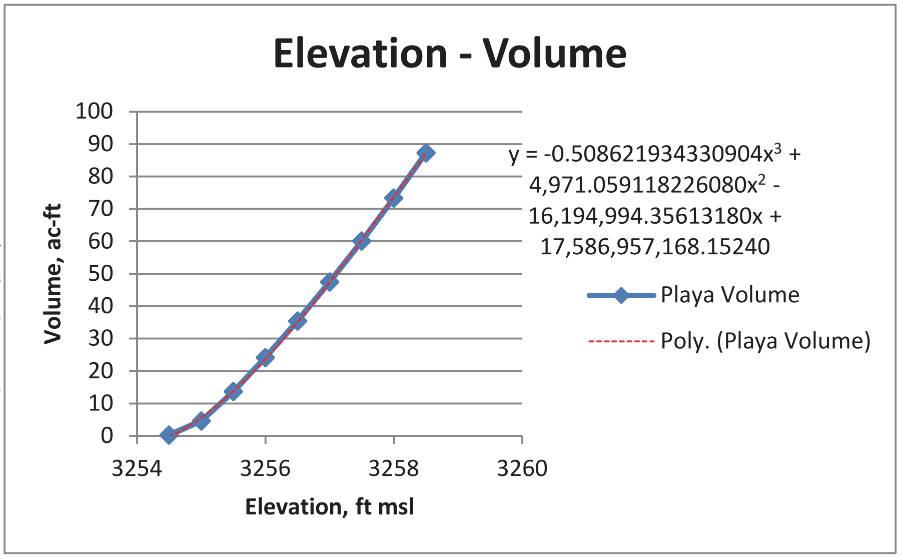


Elevation - Ar	area sq ft	area ac
3316	528.0939293	0.012123
3316.125	30843.59814	0.708072
3316.25	191729.6621	4.401507
3316.375	504602.3571	11.58408
3316.5	820002.8588	18.82468
3316.675	1211452.633	27.81113
3316.75	1318651.85	30.27208
3317	1539933.287	35.352
3317.25	1700847.094	39.04608
3317.5	1833581.648	42.09324
3317.75	1946417.605	44.6836
3318	2052040.376	47.10836
3318.25	2153390.631	49.43505
3318.5	2249256.18	51.63582
3318.75	2337836.805	53.66935
3319	2421781.525	55.59645
3319.25	2503226.583	57.46617
3319.5	2585188.715	59.34777
3319.75	2668836.008	61.26804
3320	2753355.471	63.20834
3320.25	2838288.855	65.15815
3320.5	2924812.811	67.14446
3320.75	3012860.751	69.16577
3321	3101011.237	71.18942
3321.25	3190845.24	73.25173
3321.5	3280799.563	75.31679
3321.75	3374272.137	77.46263
3322	3471354.789	79.69134

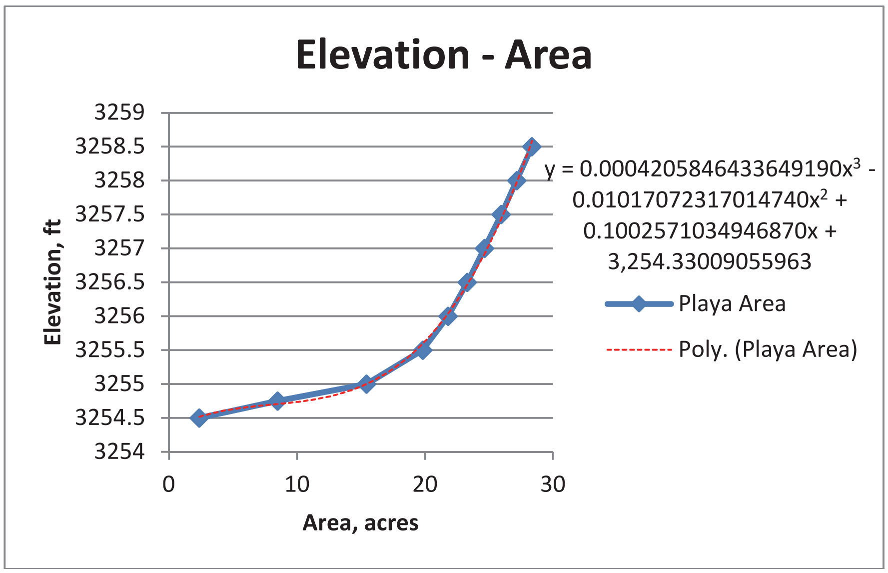


			Max flood depth, cm	81.5
	Crowell resurvey		max elev,m	3256.786
Grid Z Min	3253.996807		water volume, ac ft	42.01982
Datalogger	3254.112			
Datalogger	3254.1			

Elevation	vol cu ft	vol ac ft
3254.5	12323.18548	0.282901
3255	203286.9123	4.666825
3255.5	598528.2678	13.74032
3256	1053378.853	24.18225
3256.5	1545127.132	35.47124
3257	2067355.879	47.45996
3257.5	2618339.311	60.1088
3258	3197012.027	73.3933
3258.5	3801559.631	87.2718

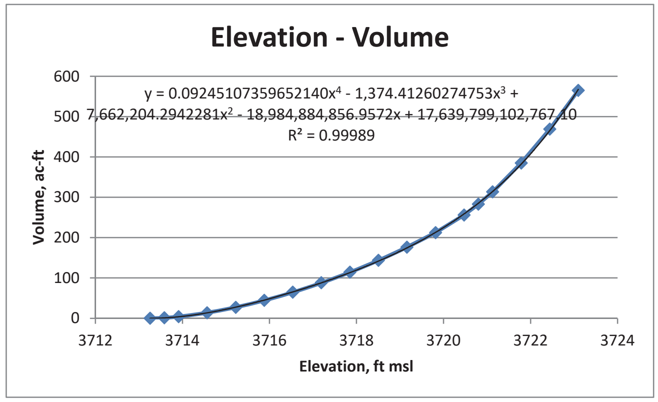


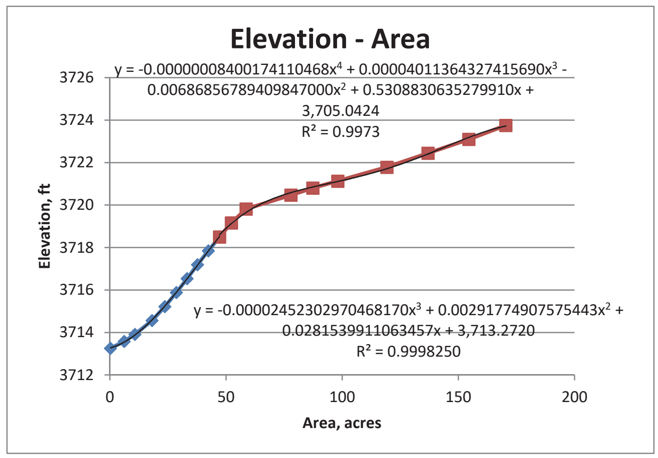
Elevation	area sq ft	area ac
3254.5	103359.7521	2.372813
3254.75	369292.9961	8.477801
3255	672155.9797	15.43058
3255.5	863564.6779	19.82472
3256	950095.7425	21.8112
3256.5	1015140.964	23.30443
3257	1073509.957	24.6444
3257.5	1130517.769	25.95312
3258	1183593.381	27.17157
3258.5	1235386.373	28.36057



Castro Crop playa

input units = meters					
Grid Z Min			998.369		0.000247
Datalogger Ground Surface			998.5		0.0008107
Datalogger			998.5		
Elevation - Volume		elev, ft	vol m^3	vol ac ft	
	1131.8	3713.255	2.56	0.002075	
	1131.9	3713.583	1361.28698	1.103613	
	1132	3713.911	4780	3.875209	
	1132.2	3714.567	16609.0812	13.4652	
	1132.4	3715.223	33615.25	27.25233	
	1132.6	3715.879	54795.5402	44.42347	
	1132.8	3716.536	79818.9313	64.71026	
	1133	3717.192	108495.439	87.95868	
	1133.2	3717.848	140878.129	114.2118	
	1133.4	3718.504	177116.883	143.591	
	1133.6	3719.16	217339.24	176.1998	
	1133.8	3719.816	262076.619	212.469	
	1134	3720.473	315652.043	255.9033	
	1134.1	3720.801	349097.174	283.0177	
	1134.2	3721.129	386564.723	313.3931	
	1134.4	3721.785	474879.483	384.9911	
	1134.6	3722.441	578594.419	469.0741	
	1134.8	3723.097	696603.895	564.746	
	1135	3723.753	826065.728	669.7024	
Elevation - Area			area m^2	area ac	
	1131.8	3713.255	973.27	0.2405	
	1131.9	3713.583	24936.3563	6.161902	
	1132	3713.911	43551	10.76168	
	1132.2	3714.567	73453.1709	18.15066	
	1132.4	3715.223	95741.0464	23.65811	
	1132.6	3715.879	115753.469	28.60328	
	1132.8	3716.536	134404.948	33.21216	
	1133	3717.192	152508.079	37.68553	
	1133.2	3717.848	171417.524	42.35816	
	1133.4	3718.504	191016.624	47.20119	
	1133.6	3719.16	211641.757	52.29777	
	1133.8	3719.816	237301.398	58.6384	
	1134	3720.473	315426.283	77.94346	
	1134.1	3720.801	353468.099	87.34379	
	1134.2	3721.129	396979.8	98.09576	
	1134.4	3721.785	482596.041	119.252	
	1134.6	3722.441	554307.873	136.9723	
	1134.8	3723.097	625321.546	154.5202	
	1135	3723.753	689715.724	170.4323	



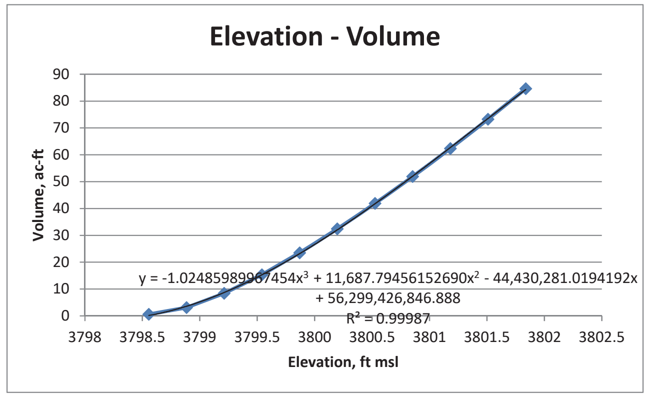


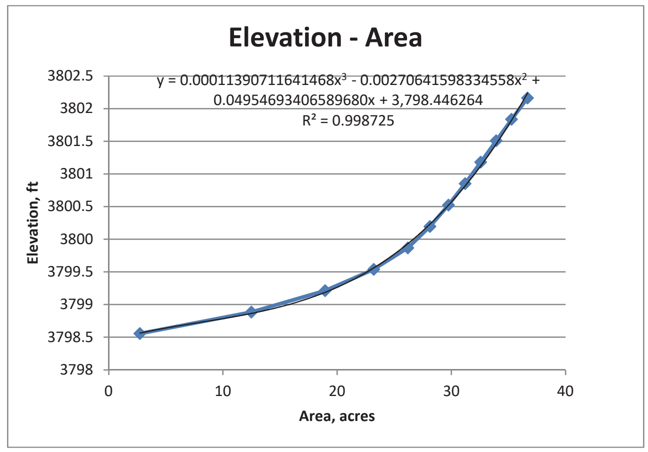
Castro CRP Crp playa

input units = meters			
Grid Z Min	1157.128		0.00024711
Datalogger Ground Surface	1157.8		0.0008107
Datalogger	1157.8		

Elevation - Volume	elev, ft	vol m^3	vol ac ft
1157.8	3798.557	720.560538	0.584168
1157.9	3798.885	3822.08737	3.098617
1158	3799.213	10344.4632	8.386393
1158.1	3799.541	18916.6066	15.33594
1158.2	3799.869	28956.5852	23.47549
1158.3	3800.197	39962	32.39772
1158.4	3800.525	51676	41.89442
1158.5	3800.853	64012.8923	51.8961
1158.6	3801.181	76918.2614	62.35865
1158.7	3801.509	90369.8244	73.26401
1158.8	3801.837	104366.384	84.6112
1158.9	3802.165	118916.757	96.40738
1159	3802.494	134053.921	108.6793
1159.1	3802.822	149826.49	121.4663
1159.2	3803.15	166260.929	134.7899
1159.3	3803.478	183415.231	148.6971
1159.4	3803.806	201357.042	163.2428
1159.5	3804.134	220215.416	178.5315

Elevation - Area		area m^2	area ac
1157.8	3798.557	11048.545	2.730153
1157.9	3798.885	50550.2119	12.49122
1158	3799.213	76667.9003	18.94503
1158.1	3799.541	93927.2841	23.20992
1158.2	3799.869	105963	26.184
1158.3	3800.197	113805	28.1218
1158.4	3800.525	120366	29.74306
1158.5	3800.853	126292.875	31.20762
1158.6	3801.181	131807.774	32.57038
1158.7	3801.509	137261.562	33.91804
1158.8	3801.837	142717.777	35.2663
1158.9	3802.165	148386.108	36.66697
1159	3802.494	154508.188	38.17977
1159.1	3802.822	160992.031	39.78196
1159.2	3803.15	167871.326	41.48187
1159.3	3803.478	175375.145	43.3361
1159.4	3803.806	183648.315	45.38045
1159.5	3804.134	194065.556	47.9546

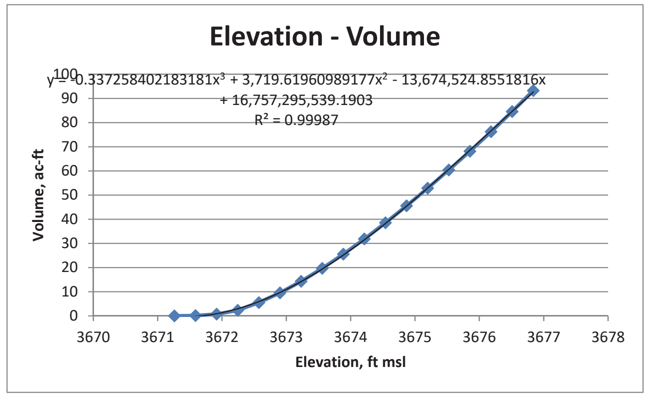




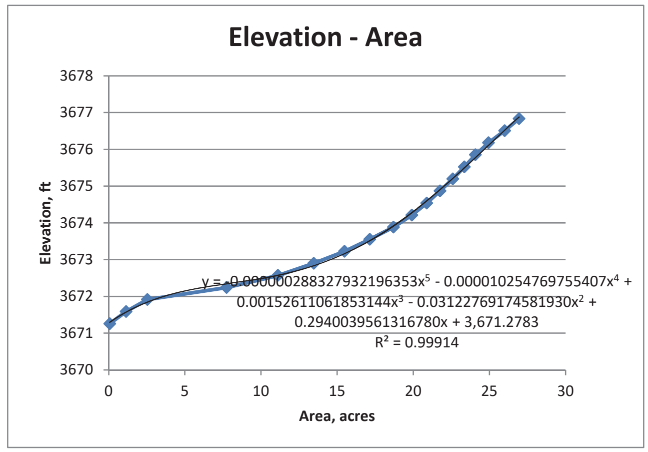
Castro Range playa

input units = meters

Grid Z Min		1118.96676		0.00024711
Datalogger Ground Surface		1119		0.0008107
Datalogger		1119		
Elevation - Volume	elev, ft	vol m^3	vol ac ft	
1119	3671.26	3.0714862	0.00249	
1119.1	3671.588	200.606386	0.162634	
1119.2	3671.916	919.906171	0.74578	
1119.3	3672.244	2884.45433	2.338465	
1119.4	3672.572	6769.61824	5.488219	
1119.5	3672.9	11749.0888	9.525141	
1119.6	3673.228	17623.1785	14.28734	
1119.7	3673.557	24233.587	19.64649	
1119.8	3673.885	31493.5291	25.53222	
1119.9	3674.213	39312.738	31.87136	
1120	3674.541	47571.2574	38.56665	
1120.1	3674.869	56199.8099	45.56193	
1120.2	3675.197	65173.7072	52.83718	
1120.3	3675.525	74471.0036	60.37463	
1120.4	3675.853	84067.42	68.15457	
1120.5	3676.181	93971.5268	76.18396	
1120.6	3676.509	104278.433	84.5399	
1120.7	3676.837	114988.169	93.22243	



Elevation - Area		area m^2	area ac
1119	3671.26	259.276153	0.064068
1119.1	3671.588	4606.75782	1.138354
1119.2	3671.916	10254.3802	2.53391
1119.3	3672.244	31337.123	7.743565
1119.4	3672.572	44953.1847	11.10816
1119.5	3672.9	54484.4557	13.46339
1119.6	3673.228	62646.9424	15.48038
1119.7	3673.557	69374.6658	17.14284
1119.8	3673.885	75667.6272	18.69786
1119.9	3674.213	80560.2545	19.90685
1120	3674.541	84524.0192	20.88632
1120.1	3674.869	88020.7433	21.75038
1120.2	3675.197	91441.1139	22.59557
1120.3	3675.525	94507.1721	23.35321
1120.4	3675.853	97454.7835	24.08158
1120.5	3676.181	100938.71	24.94248
1120.6	3676.509	105200.647	25.99562
1120.7	3676.837	109041.555	26.94473



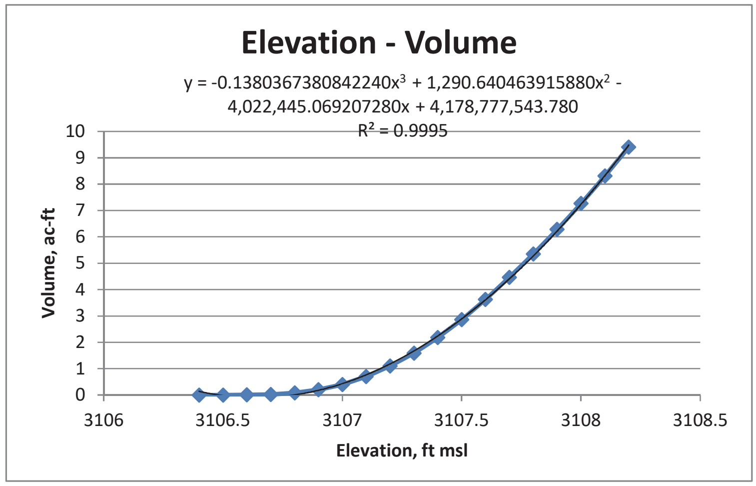
Davenport A
Microplaya W of FLRNG surveyed 9/18/13
2.3E-05
input units = feet

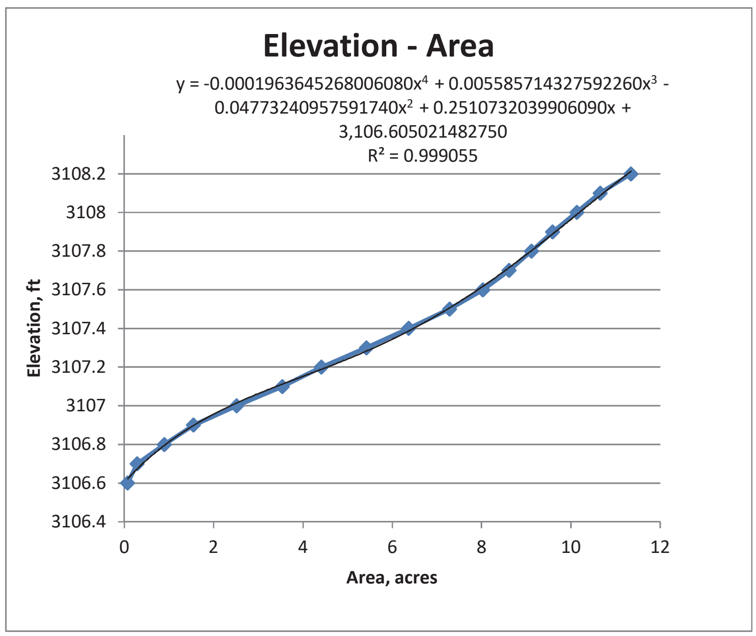
Grid Z Min 3106.29162

Datalogger NA
Datalogger NA

Elevation - vol cu ft		vol ac ft
3106.4	10.50232205	0.000241
3106.5	70.58505943	0.00162
3106.6	263.8412922	0.006057
3106.7	980.5191482	0.02251
3106.8	3353.273305	0.076981
3106.9	8640.610967	0.198361
3107	17472.64651	0.401117
3107.1	30598.54126	0.702446
3107.2	47917.34499	1.100031
3107.3	69267.6904	1.590167
3107.4	94976.6202	2.180363
3107.5	124672.2975	2.862082
3107.6	158094.2045	3.629344
3107.7	194365.2342	4.462012
3107.8	233009.4701	5.349161
3107.9	273753.6556	6.284519
3108	316652.2098	7.269334
3108.1	361898.4564	8.308045
3108.2	409724.1676	9.405973

Elevation - area sq ft		area ac
3106.4	281.4573133	0.006461
3106.5	1072.640829	0.024624
3106.6	3176.641485	0.072926
3106.7	12563.04736	0.288408
3106.8	38879.22041	0.892544
3106.9	67422.43112	1.547806
3107	109580.782	2.515629
3107.1	154111.8312	3.537921
3107.2	192200.0151	4.412305
3107.3	236141.2245	5.421057
3107.4	277405.4084	6.368352
3107.5	317286.4376	7.283894
3107.6	349549.8722	8.024561
3107.7	375318.578	8.616129
3107.8	397136.5109	9.117
3107.9	417762.7476	9.590513
3108	441256.4688	10.12985
3108.1	464067.2281	10.65352
3108.2	494218.9314	11.34571





Davenport B W of FLRNG playa
microplaya surveyed 9/18/13

2.3E-05

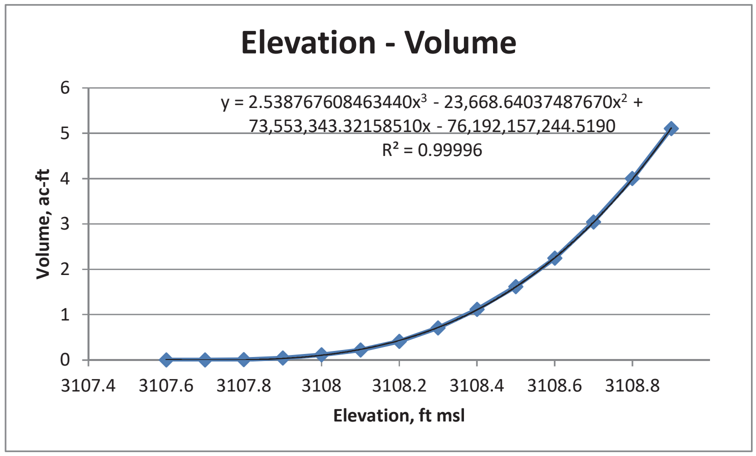
input units = feet

Grid Z Min 3107.566032

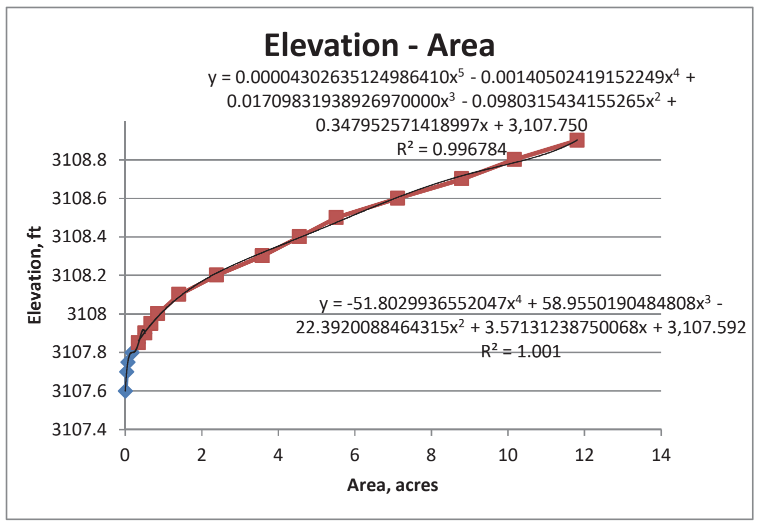
Datalogger (NA

Datalogger NA

Elevation - \	vol cu ft	vol ac ft
3107.6	1.172971065	2.69E-05
3107.7	72.80800421	0.001671
3107.8	424.5116674	0.009745
3107.9	1958.406847	0.044959
3108	4910.690246	0.112734
3108.1	9714.599591	0.223017
3108.2	17907.43953	0.411098
3108.3	30931.90547	0.710099
3108.4	48682.14358	1.117588
3108.5	70385.02058	1.615818
3108.6	97765.21927	2.244381
3108.7	132670.5296	3.045696
3108.8	174258.739	4.00043
3108.9	222357.2687	5.10462



Elevation - /	area sq ft	area ac
3107.6	104.4337072	0.002397
3107.7	1602.755259	0.036794
3107.75	3075.440365	0.070602
3107.8	7829.068978	0.179731
3107.85	15254.53787	0.350196
3107.9	22514.06931	0.516852
3107.95	29385.69144	0.674603
3108	37073.73432	0.851096
3108.1	60932.4327	1.398816
3108.2	103984.3582	2.387152
3108.3	155985.1513	3.580926
3108.4	198222.7575	4.550568
3108.5	240161.2214	5.513343
3108.6	310045.0605	7.117655
3108.7	382896.7953	8.790101
3108.8	442755.5556	10.16427
3108.9	514199.8949	11.80441



Davenport C SW of FLRNG playa
smaller playa surveyed 9/18/13

2.3E-05

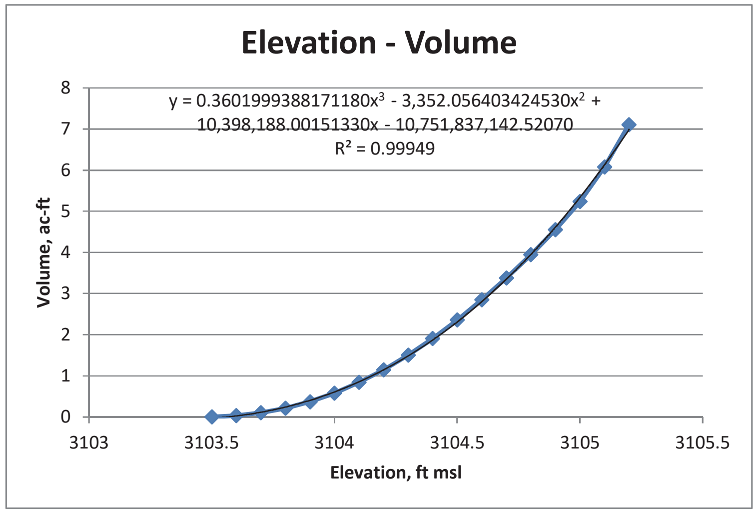
input units = feet

Grid Z Min 3103.38

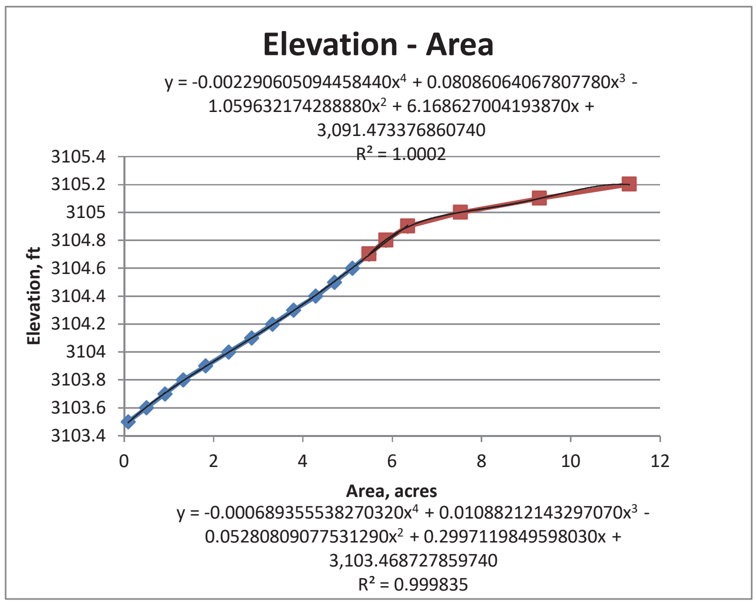
Datalogger NA

Datalogger NA

Elevation -	vol cu ft	vol ac ft
3103.5	64.42468826	0.001479
3103.6	1401.248265	0.032168
3103.7	4506.942715	0.103465
3103.8	9361.081415	0.214901
3103.9	16182.12627	0.371491
3104	25257.18526	0.579825
3104.1	36582.78419	0.839825
3104.2	50035.53335	1.148658
3104.3	65523.58369	1.504214
3104.4	83141.10153	1.908657
3104.5	102752.808	2.35888
3104.6	124138.2124	2.849821
3104.7	147215.6455	3.379606
3104.8	171896.7018	3.946205
3104.9	198361.519	4.553754
3105	228249.1826	5.23988
3105.1	264782.4625	6.078569
3105.2	309665.3912	7.108939

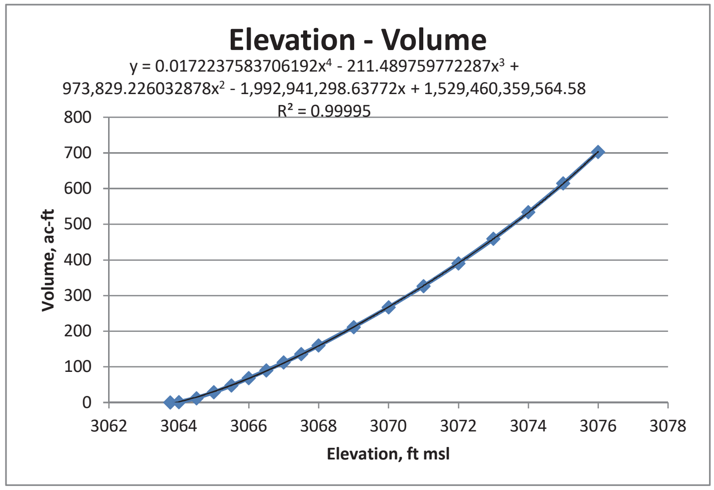


Elevation -	area sq ft	area ac
3103.5	3884.547621	0.089177
3103.6	21522.111	0.49408
3103.7	39843.10921	0.914672
3103.8	57654.21422	1.323559
3103.9	79237.94966	1.819053
3104	101773.3131	2.336394
3104.1	124240.0515	2.852159
3104.2	144585.6295	3.319229
3104.3	165152.0535	3.791369
3104.4	186799.1607	4.288319
3104.5	205069.3486	4.707744
3104.6	222559.1714	5.109256
3104.7	238808.2255	5.482282
3104.8	255222.7583	5.859108
3104.9	276443.8597	6.346278
3105	328093.0016	7.531979
3105.1	405038.265	9.298399
3105.2	492702.7256	11.3109

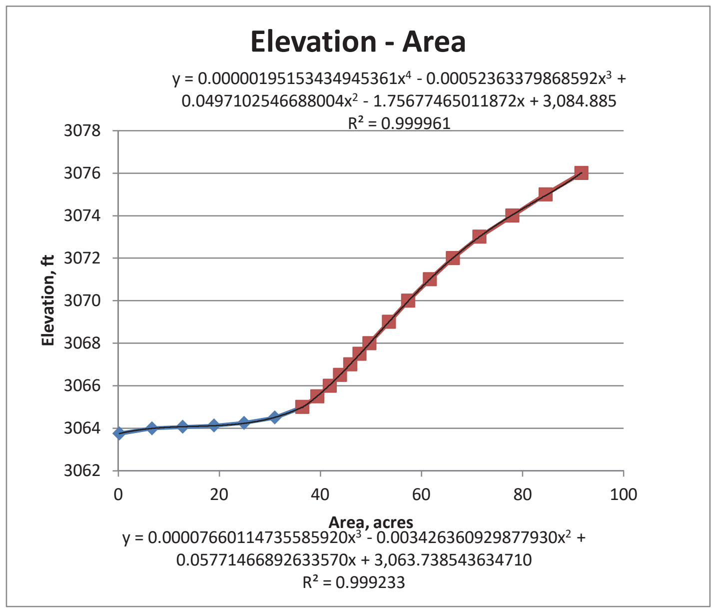


Davenport D

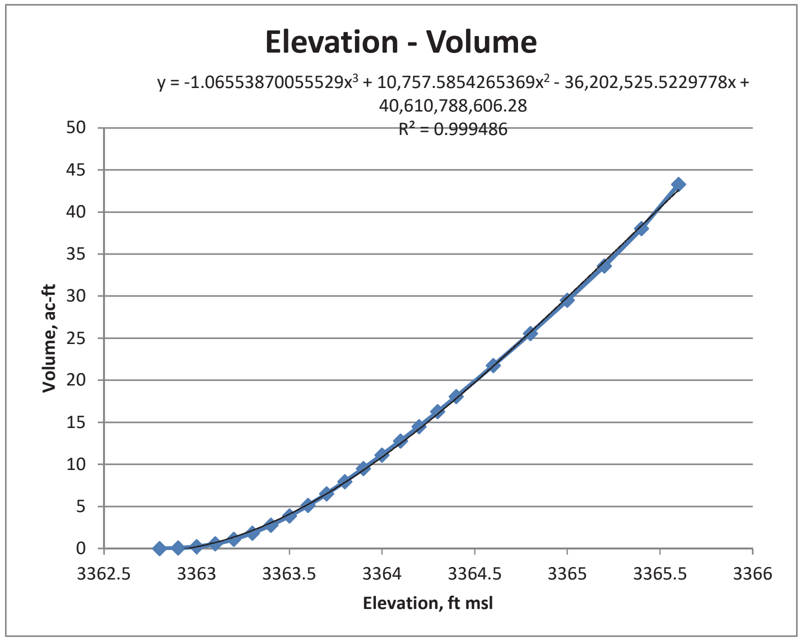
Grid Z Min	3063.492584	
Datalogger Ground Surf	NA	
Datalogger	NA	
Elevation - Volume	vol cu ft	vol ac ft
3063.75	892.8903071	0.020498
3064	21230.64096	0.487388
3064.5	518416.4526	11.9012
3065	1260510.707	28.93734
3065.5	2087897.027	47.93152
3066	2973744.12	68.26777
3066.5	3907792.165	89.71056
3067	4885282.904	112.1507
3067.5	5905469.152	135.5709
3068	6966966.045	159.9395
3069	9215598.746	211.561
3070	11631170.64	267.0149
3071	14220818.53	326.4651
3072	17002189.09	390.3166
3073	19996641.03	459.0597
3074	23246367.88	533.6632
3075	26783684.93	614.8688
3076	30618772.97	702.9103



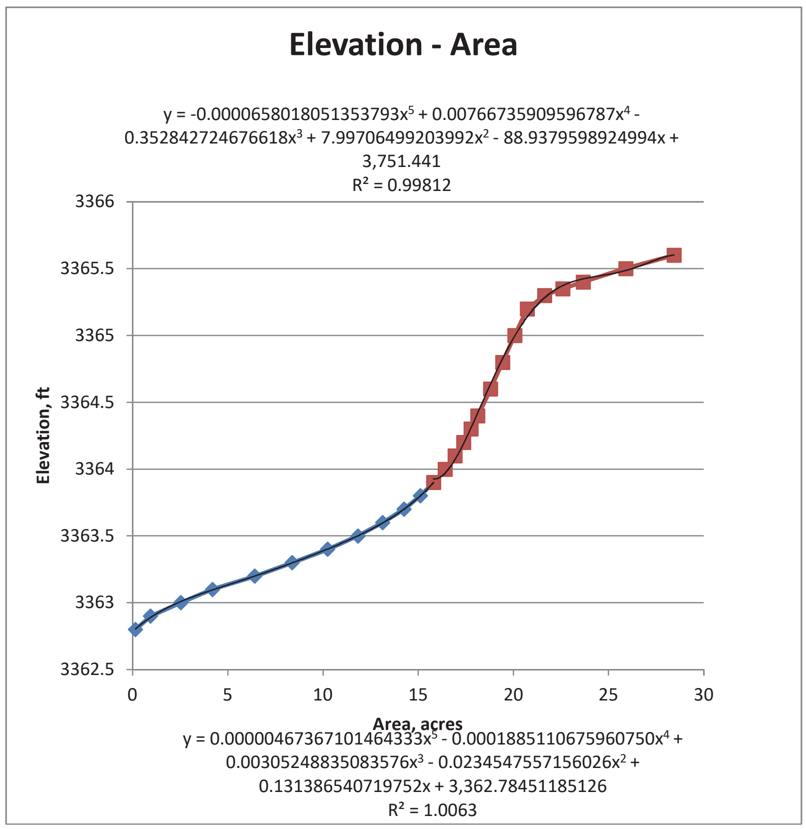
Elevation - Area	area sq ft	area ac
3063.75	9282.961871	0.213107
3064	291320.9943	6.68781
3064.065	557107.2942	12.78942
3064.125	825752.8575	18.95668
3064.25	1084883.26	24.90549
3064.5	1350453.328	31.00214
3065	1585741.659	36.40362
3065.5	1717149.49	39.42033
3066	1822347.81	41.83535
3066.5	1911934.711	43.89198
3067	1998729.555	45.88452
3067.5	2080820.85	47.76907
3068	2164650.869	49.69355
3069	2333863.195	53.57813
3070	2498772.028	57.36391
3071	2685133.547	61.64218
3072	2884016.242	66.2079
3073	3112411.694	71.45114
3074	3397629.794	77.99885
3075	3684324.229	84.58045
3076	3993743.106	91.68373



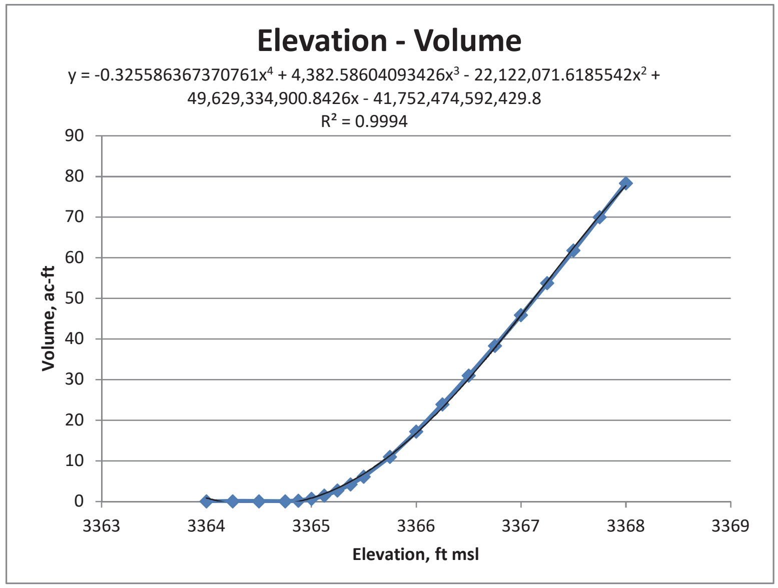
Doan NE		11/2013 survey	
Grid Z Min	3362.681281		
Datalogger Gr	NA		2.3E-05
Datalogger	NA		
Elevation - Vo	vol cu ft	vol ac ft	
3362.8	205.6128446	0.00472	
3362.9	2318.798664	0.053232	
3363	9771.415909	0.224321	
3363.1	24459.4553	0.561512	
3363.2	47451.32436	1.089333	
3363.3	79588.57017	1.827102	
3363.4	120339.7375	2.76262	
3363.5	168447.4096	3.86702	
3363.6	222976.8905	5.118845	
3363.7	282645.4995	6.488648	
3363.8	346725.0501	7.959712	
3363.9	414091.1783	9.506225	
3364	484311.1185	11.11825	
3364.1	556969.4908	12.78626	
3364.2	631725.2319	14.50242	
3364.3	708309.8829	16.26056	
3364.4	786513.9614	18.05588	
3364.6	947361.5248	21.74843	
3364.8	1113830.269	25.57002	
3365	1285825.875	29.5185	
3365.2	1463482.317	33.59693	
3365.4	1655984.356	38.01617	
3365.6	1885691.113	43.28951	

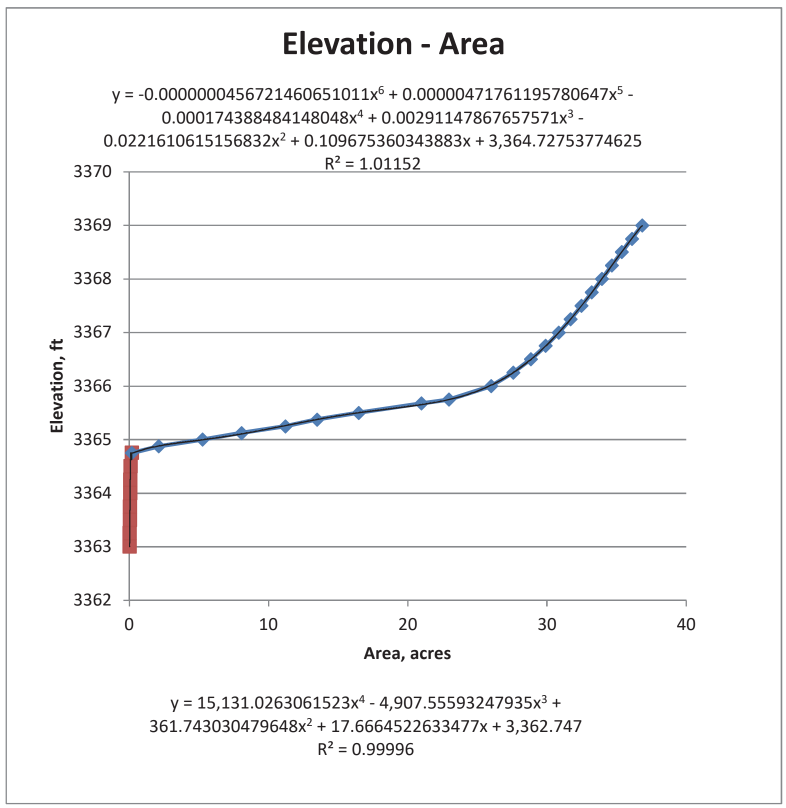


Elevation - Ar	area sq ft	area ac
3362.8	6748.048497	0.154914
3362.9	41273.54671	0.94751
3363	110282.5211	2.531738
3363.1	182906.1599	4.198948
3363.2	279803.1897	6.423397
3363.3	365288.1669	8.385862
3363.4	446607.099	10.25269
3363.5	515549.137	11.83538
3363.6	571870.626	13.12834
3363.7	621316.5304	14.26346
3363.8	658374.2769	15.11419
3363.9	688425.3126	15.80407
3364	715107.4767	16.41661
3364.1	737507.1323	16.93083
3364.2	757176.299	17.38238
3364.3	774182.0706	17.77277
3364.4	789709.0018	18.12922
3364.6	818461.0104	18.78928
3364.8	846132.1414	19.42452
3365	873915.2883	20.06233
3365.2	903004.7579	20.73014
3365.3	942592.3121	21.63894
3365.35	983784.2591	22.58458
3365.4	1031105.557	23.67093
3365.5	1128259.917	25.90128
3365.6	1238242.961	28.42615



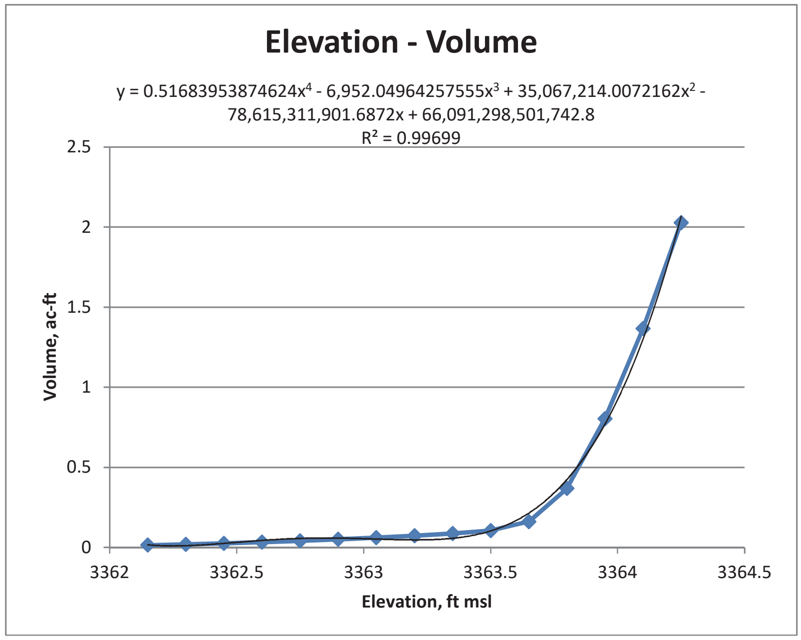
Doan NW		11/2013 survey	
Grid Z Min	3362.685418		
Datalogger Gr	NA		2.3E-05
Datalogger	NA		
Elevation - Vo	vol cu ft	vol ac ft	
3363	48.84833101	0.001121	
3363.25	230.5801599	0.005293	
3363.5	512.5228847	0.011766	
3363.75	899.0594255	0.02064	
3364	1384.72678	0.031789	
3364.25	1977.175924	0.04539	
3364.5	2699.226717	0.061966	
3364.75	3694.697071	0.084819	
3364.875	8665.023032	0.198922	
3365	28591.28011	0.656365	
3365.125	64700.40701	1.485317	
3365.25	118020.2591	2.709372	
3365.375	184983.5024	4.246637	
3365.5	265969.1215	6.105811	
3365.75	479396.8129	11.00544	
3366	749054.1299	17.19592	
3366.25	1041066.506	23.8996	
3366.5	1348325.039	30.95328	
3366.75	1668226.404	38.29721	
3367	1999107.442	45.89319	
3367.25	2339715.384	53.71247	
3367.5	2689176.802	61.735	
3367.75	3046873.677	69.94659	
3368	3412483.169	78.33983	
3368.25	3785924.384	86.91286	
3368.5	4167122.072	95.66396	
3368.75	4556173.506	104.5954	
3369	4953222.361	113.7103	
Elevation - Ar	area sq ft	area ac	
3363	526.0081674	0.012075	
3363.25	916.5501242	0.021041	
3363.5	1343.030827	0.030832	
3363.75	1742.724724	0.040007	
3364	2147.123578	0.049291	
3364.25	2607.604627	0.059862	
3364.5	3229.740969	0.074145	
3364.75	7464.889424	0.17137	
3364.875	92050.93427	2.113199	
3365	228399.2632	5.243326	
3365.125	350540.5082	8.047303	
3365.25	488638.0484	11.21759	
3365.375	586966.3023	13.47489	
3365.5	717276.715	16.46641	
3365.675	913338.1544	20.96736	
3365.75	1000236.487	22.96227	
3366	1131563.292	25.97712	
3366.25	1200854.115	27.56782	
3366.5	1255709.377	28.82712	
3366.75	1302422.702	29.89951	
3367	1343670.166	30.84642	
3367.25	1380606.291	31.69436	
3367.5	1414670.504	32.47637	
3367.75	1446683.137	33.21127	
3368	1478166.339	33.93403	
3368.25	1509286.622	34.64845	
3368.5	1540366.481	35.36195	
3368.75	1572196.715	36.09267	
3369	1604283.095	36.82927	



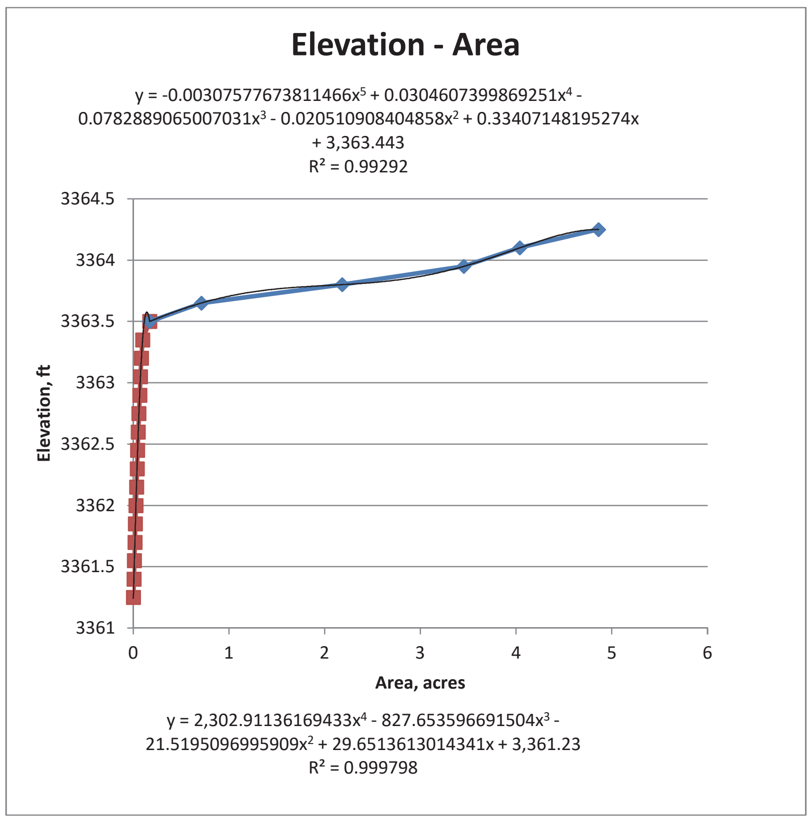


Doan SE	11/2013 survey	
Grid Z Min	3361.22	
Datalogger Gr NA		2.3E-05
Datalogger NA		

Elevation - Vo	vol cu ft	vol ac ft
3361.25	0.152089451	3.49E-06
3361.4	25.63733788	0.000589
3361.55	82.51603426	0.001894
3361.7	168.3142391	0.003864
3361.85	287.0840435	0.006591
3362	443.1674483	0.010174
3362.15	638.0510577	0.014648
3362.3	871.958281	0.020017
3362.45	1145.927229	0.026307
3362.6	1461.027642	0.033541
3362.75	1819.940129	0.04178
3362.9	2226.215705	0.051107
3363.05	2683.528797	0.061605
3363.2	3196.223925	0.073375
3363.35	3787.677088	0.086953
3363.5	4608.256018	0.105791
3363.65	7041.634312	0.161654
3363.8	16112.84491	0.3699
3363.95	35018.94632	0.803924
3364.1	59545.05428	1.366966
3364.25	88316.31196	2.027464



Elevation - Ar	area sq ft	area ac
3361.25	17.43447916	0.0004
3361.4	285.1838684	0.006547
3361.55	471.9229532	0.010834
3361.7	676.9732379	0.015541
3361.85	911.5442802	0.020926
3362	1171.464766	0.026893
3362.15	1427.803288	0.032778
3362.3	1692.368532	0.038851
3362.45	1961.413773	0.045028
3362.6	2243.038339	0.051493
3362.75	2546.54418	0.058461
3362.9	2874.546197	0.065991
3363.05	3227.044389	0.074083
3363.2	3632.893828	0.0834
3363.35	4254.09987	0.097661
3363.5	7483.684767	0.171802
3363.65	31004.93009	0.711775
3363.8	95143.75655	2.1842
3363.95	150436.3496	3.453543
3364.1	175907.4518	4.038279
3364.25	211756.6814	4.861264

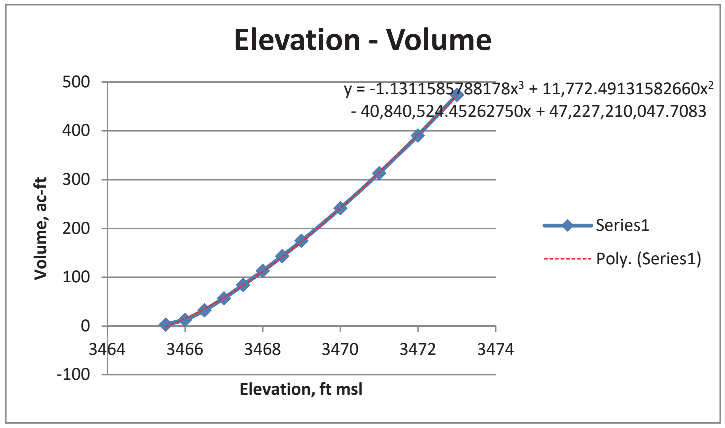


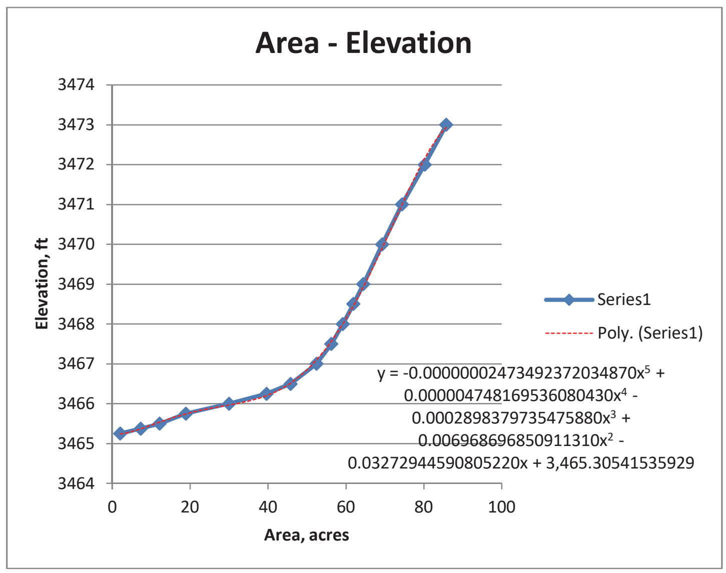
Durrett Area Volume Calcs

Grid Z Min	3463.621339		
Met Sta Ground Surf	3465.655	2.033661	
Datalogger	3465.7		

Elevation	vol cu ft	vol ac ft	vol, m^3
3465	12940.93626	0.297083	
3465.1	16111.46965		
3465.2			
3465.3			
3465.4			
3465.5	102700.2105	2.357672	2908.146
3466	535415.6331	12.29145	15161.28
3466.5	1385530.604	31.80741	39233.86
3467	2461644.733	56.51159	69706.02
3467.5	3647141.678	83.72685	103275.6
3468	4904719.939	112.5969	138886.2
3468.5	6224134.435	142.8865	176247.9
3469	7600644.066	174.4868	215226.3
3470	10514593.16	241.3818	297740.1
3471	13640533.05	313.1435	386256.9
3472	17004498.76	390.3696	481513.8
3473	20624041.63	473.4628	584007.8

Elevation	area sq ft	area ac	area, hectare
3465	27774.40719	0.637613	0.258033
3465.25	90684.61165	2.081832	0.842488
3465.375	317186.9894	7.281611	2.946766
3465.5	529854.231	12.16378	4.922511
3465.75	823038.8112	18.89437	7.646288
3466	1304694.478	29.95166	12.12102
3466.25	1724701.54	39.5937	16.02302
3466.5	1994091.471	45.77804	18.52573
3467	2283465.837	52.42116	21.21411
3467.5	2448545.472	56.21087	22.74775
3468	2579090.755	59.20778	23.96056
3468.5	2697082.173	61.91649	25.05674
3469	2808513.641	64.4746	26.09197
3470	3018660.399	69.29891	28.0443
3471	3238419.299	74.34388	30.08593
3472	3493843.981	80.20762	32.4589
3473	3735444.649	85.75401	34.70345





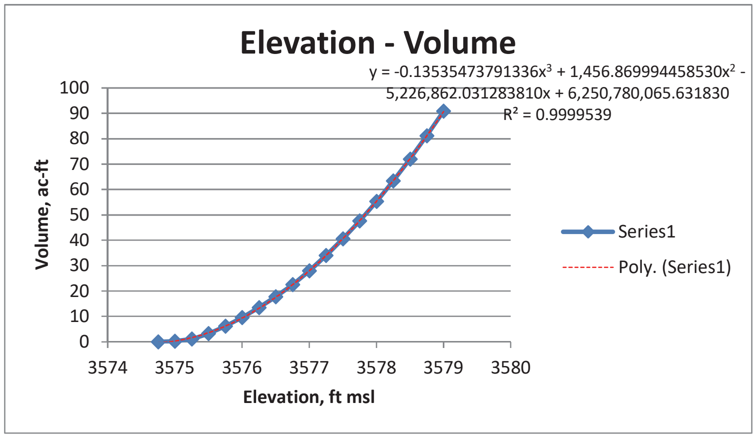
Fancher Area Volume Calcs

Max flood depth, cm	60.9
max elev, ft	3578.037
water volume, ac ft	56.5141

Grid Z Min	3574.583257
Logger Ground Surf	3576.039

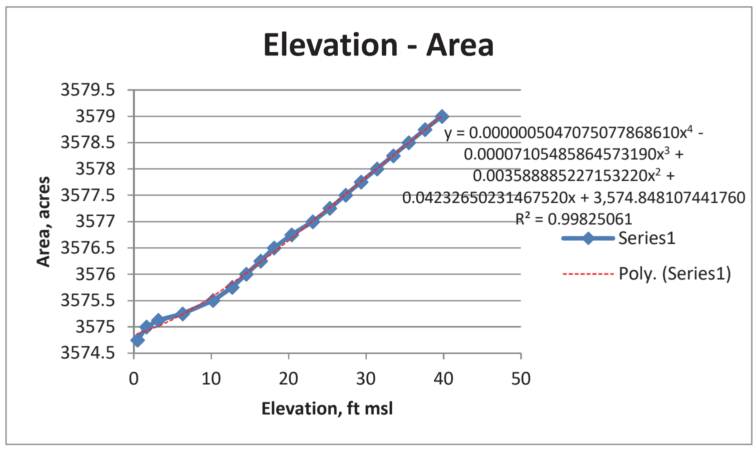
Elevation - Volume

	vol cu ft	vol ac ft
3574.75	1695.245362	0.038917
3575	11219.49711	0.257564
3575.25	50234.70684	1.15323
3575.5	143053.5706	3.284058
3575.75	268155.7053	6.156008
3576	416453.7133	9.560462
3576.25	584705.781	13.423
3576.5	772544.2256	17.73518
3576.75	980288.6585	22.50433
3577	1217729.319	27.95522
3577.25	1481526.896	34.01118
3577.5	1768176.833	40.59175
3577.75	2076672.388	47.67384
3578	2407156.181	55.2607
3578.25	2760405.857	63.3702
3578.5	3135976.343	71.99211
3578.75	3533676.151	81.12204
3579	3954717.559	90.78782



Elevation - Area

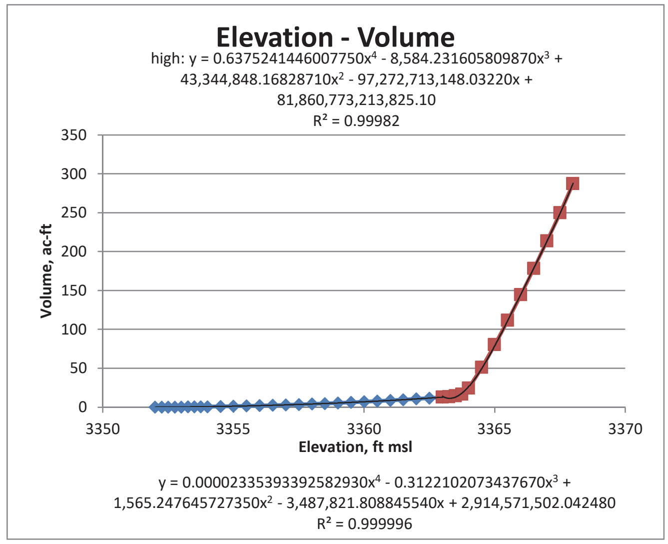
	area sq ft	area ac
3574.75	20366.75058	0.467556
3575	71052.90412	1.63115
3575.125	137062.9404	3.146532
3575.25	273052.3037	6.268418
3575.5	445024.5361	10.21636
3575.75	552522.1128	12.68416
3576	631685.7301	14.50151
3576.25	713430.0006	16.3781
3576.5	788960.8419	18.11205
3576.75	886586.7389	20.35323
3577	1005670.448	23.08702
3577.25	1102101.679	25.30077
3577.5	1190476.08	27.32957
3577.75	1277919.734	29.337
3578	1366947.427	31.38079
3578.25	1459038.663	33.49492
3578.5	1546118.015	35.49399
3578.75	1636832.162	37.5765
3579	1731976.386	39.76071

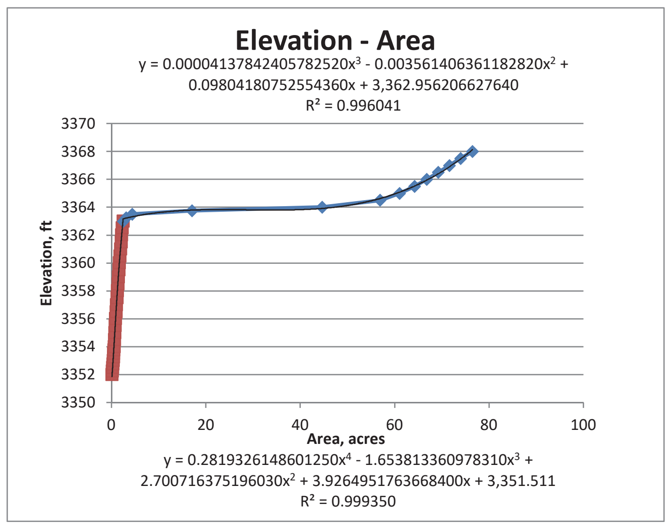


Fields E playa 12/2013 survey
Grid Z Min 3351.47035
Datalogger (NA 2.3E-05
Datalogger NA

Elevation - \	vol cu ft	vol ac ft
3352	860.1462676	0.019746
3352.25	2106.995268	0.04837
3352.5	4265.202126	0.097916
3352.75	7129.801163	0.163678
3353	10579.38037	0.242869
3353.25	14515.96344	0.333241
3353.5	18931.66164	0.434611
3353.75	23824.08168	0.546926
3354	29186.47454	0.670029
3354.5	41243.53933	0.946821
3355	54892.78632	1.260165
3355.5	70088.71209	1.609015
3356	87020.37892	1.997713
3356.5	106105.3809	2.435844
3357	127467.2524	2.926245
3357.5	150989.4368	3.466241
3358	176605.606	4.054307
3358.5	204278.9795	4.6896
3359	234109.9564	5.374425
3359.5	266207.3501	6.11128
3360	300636.1553	6.901656
3360.5	337446.8902	7.746715
3361	376712.7673	8.648135
3361.5	418489.1894	9.60719
3362	462663.6346	10.6213
3362.5	509212.3977	11.68991
3363	558433.4522	12.81987
3363.25	586906.7903	13.47353
3363.5	626318.504	14.37829
3363.75	714602.4608	16.40502
3364	1068936.81	24.53941
3364.5	2219354.405	50.94937
3365	3504037.742	80.44164
3365.5	4867723.582	111.7476
3366	6293481.958	144.4785
3366.5	7773777.4	178.4614
3367	9306140.75	213.6396
3367.5	10889641.51	249.9918
3368	12526183.08	287.5616

Elevation -	area sq ft	area ac
3352	3647.482	0.083735
3352.25	6889.139	0.158153
3352.5	10183.92	0.233791
3352.75	12720.86	0.292031
3353	14835.03	0.340565
3353.25	16751.34	0.384558
3353.5	18690.54	0.429076
3353.75	20600.26	0.472917
3354	22483.82	0.516158
3354.5	25918	0.594995
3355	29023.33	0.666284
3355.5	32314.7	0.741844
3356	36245.16	0.832074
3356.5	40936.51	0.939773
3357	45400.42	1.04225
3357.5	49807.24	1.143417
3358	53985.21	1.23933
3358.5	58291.53	1.338189
3359	62844.15	1.442703
3359.5	67564.94	1.551078
3360	72403.67	1.66216
3360.5	77333.42	1.775331
3361	82469.79	1.893246
3361.5	87463.83	2.007893
3362	92319.84	2.119372
3362.5	97218.43	2.231828
3363	106128.6	2.436377
3363.25	132064.3	3.03178
3363.5	189347.5	4.346821
3363.75	742053.9	17.03521
3364	1944247	44.63378
3364.5	2477339	56.87187
3365	2657511	61.00805
3365.5	2795602	64.17819
3366	2909580	66.79476
3366.5	3015491	69.22615
3367	3118287	71.58602
3367.5	3221171	73.94791
3368	3331595	76.4829





Max flood depth, cm	171
max elev,m	3339.91
water volume, ac ft	814.8208

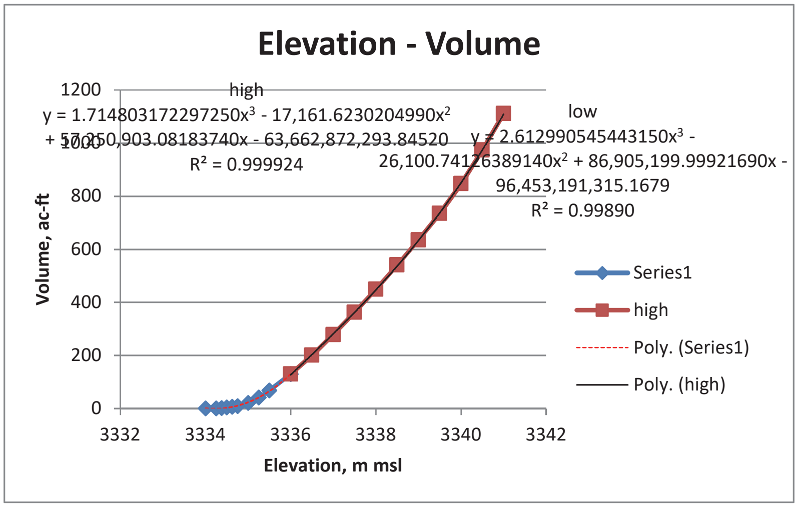
Finley Area Volume Calcs

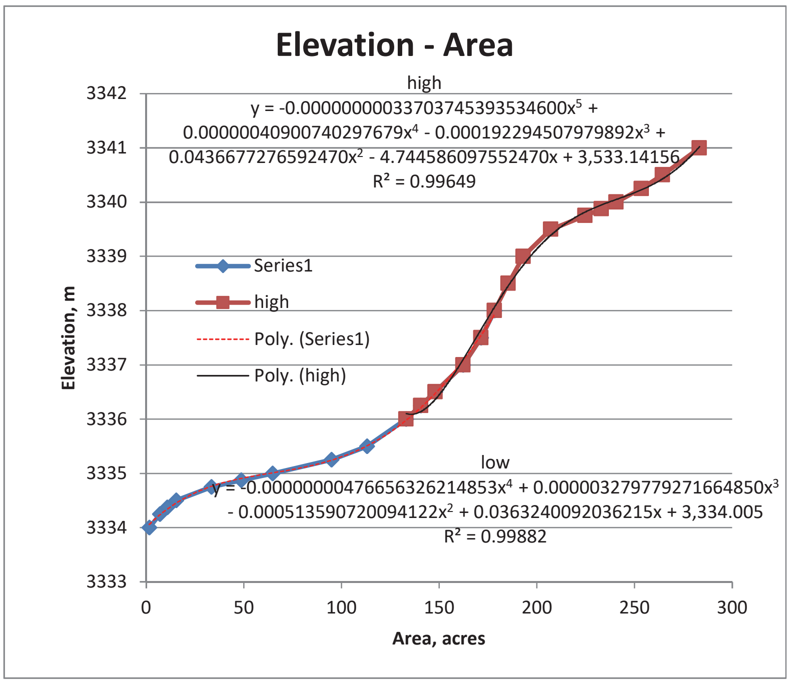
Based on survey data 07/02/2015

Grid Z Min		3332.39
Met Sta Ground Sur		3334.3
Datalogger		3334.3

Elevation, ft	vol cu ft	vol ac ft
3333		0
3333.5	4782.494563	0.109791
3334	14609.19947	0.335381
3334.25	56782.12433	1.303538
3334.375	104906.7445	2.408327
3334.5	175525.9665	4.029522
3334.625	276098.2483	6.338344
3334.75	426285.7663	9.786175
3335	955864.5739	21.94363
3335.25	1830235.432	42.01642
3335.5	2973979.437	68.27317
3336	5676830.948	130.3221
3336.5	8737086.581	200.5759
3337	12126802.82	278.3931
3337.5	15768493.88	361.9948
3338	19579596.88	449.4857
3338.5	23540236.54	540.4095
3339	27660286.57	634.9928
3339.5	31995502.05	734.5157
3340	36873009.48	846.4878
3340.5	42396430.1	973.2881
3341	48369859.58	1110.419

Elevation, m	area sq ft	area ac
3333		0
3333.5	9259.65128	0.212572
3334	66002.2215	1.515203
3334.25	304255.3174	6.984741
3334.375	468563.0033	10.75673
3334.5	668853.4842	15.35476
3334.75	1457348.107	33.45611
3334.875	2117355.298	48.60779
3335	2818343.284	64.70026
3335.25	4132089.889	94.85973
3335.5	4927709.355	113.1246
3336	5796145.295	133.0612
3336.25	6121291.32	140.5255
3336.5	6448093.517	148.0279
3337	7069925.853	162.3032
3337.5	7469839.475	171.4839
3338	7769508.109	178.3634
3338.5	8072907.483	185.3285
3339	8411692.647	193.1059
3339.5	9023090.112	207.1416
3339.75	9785771.671	224.6504
3339.875	10153095.54	233.083
3340	10483277.19	240.6629
3340.25	11044134.45	253.5384
3340.5	11519591.45	264.4534
3341	12340525.43	283.2995

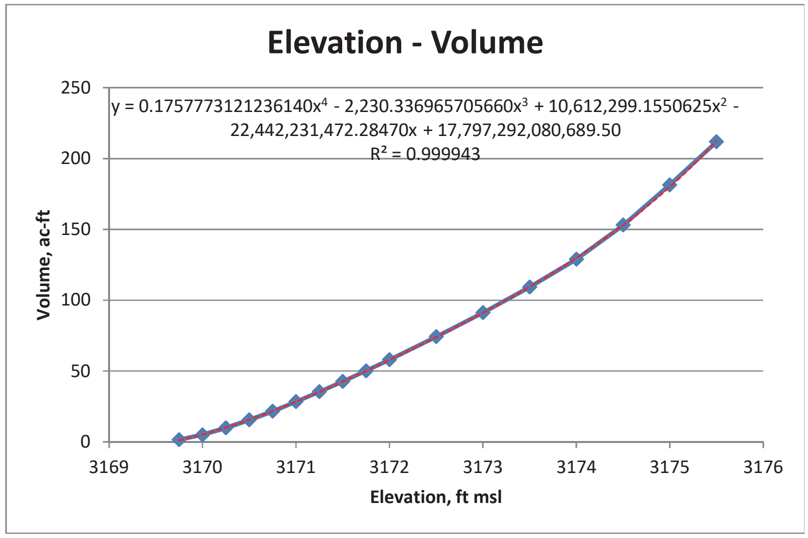




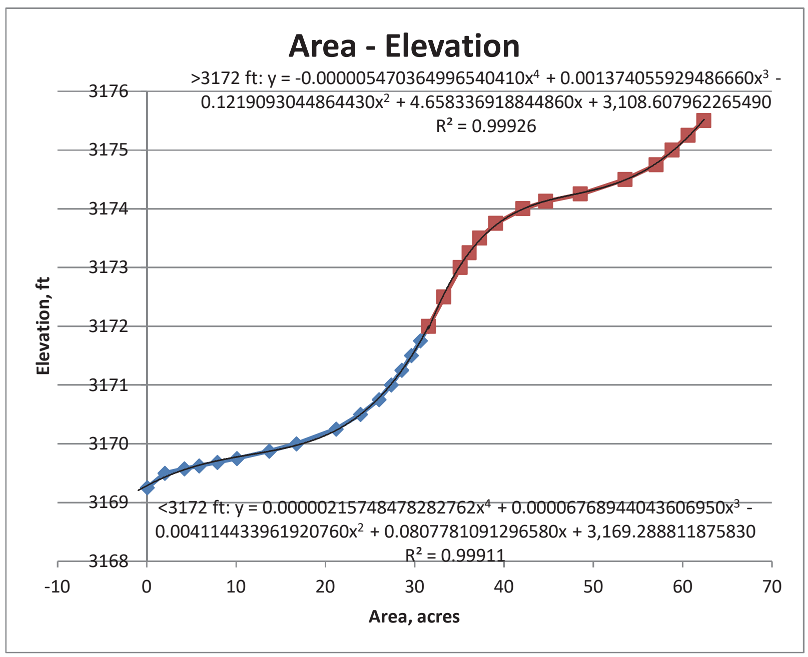
FL CROP playa

	ac/ft^2	2.3E-05
Met station ground surface		3169.145
Grid Z min		3169.045

Elevation - Volume	vol cu ft	vol ac ft
3169.25	138.0987973	0.00317
3169.5	4783.317968	0.10981
3169.75	68959.87369	1.583101
3170	216754.02	4.975988
3170.25	425595.763	9.770334
3170.5	671635.4614	15.41863
3170.75	944079.1795	21.67308
3171	1234837.532	28.34797
3171.25	1539263.358	35.33662
3171.5	1855911.733	42.60587
3171.75	2183791.58	50.13296
3172	2522175.716	57.90119
3172.5	3228367.034	74.11311
3173	3972016.301	91.18495
3173.5	4758632.803	109.2432
3174	5612527.976	128.8459
3174.5	6662708.03	152.9547
3175	7898192.469	181.3175
3175.5	9219238.797	211.6446



Elevation - Area	area sq ft	area ac
3169.25	1618.07163	0.037146
3169.5	86883.99683	1.994582
3169.575	182837.9762	4.197382
3169.625	253426.5668	5.817873
3169.685	343866.7046	7.894093
3169.75	438762.9173	10.07261
3169.875	595960.4301	13.68137
3170	728258.4997	16.71851
3170.25	922209.8372	21.17102
3170.5	1041099.731	23.90036
3170.75	1132025.178	25.98772
3171	1191481.037	27.35264
3171.25	1243169.024	28.53923
3171.5	1289881.483	29.6116
3171.75	1332988.939	30.60122
3172	1374112.516	31.54528
3172.5	1449564.182	33.27741
3173	1528360.4	35.08633
3173.25	1572743.095	36.10521
3173.5	1623323.871	37.26639
3173.75	1701519.456	39.06151
3174	1835120.13	42.12856
3174.125	1945501.33	44.66256
3174.25	2115020.565	48.55419
3174.5	2333529.661	53.57047
3174.75	2484234.953	57.03019
3175	2563206.533	58.84313
3175.25	2641562.483	60.64193
3175.5	2717834.022	62.39288

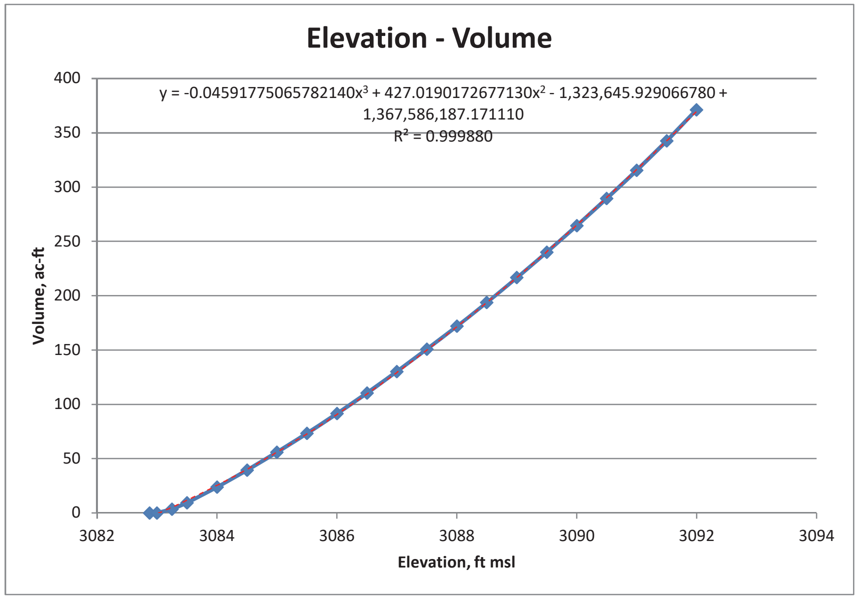


FLRNG Area Volume Calcs

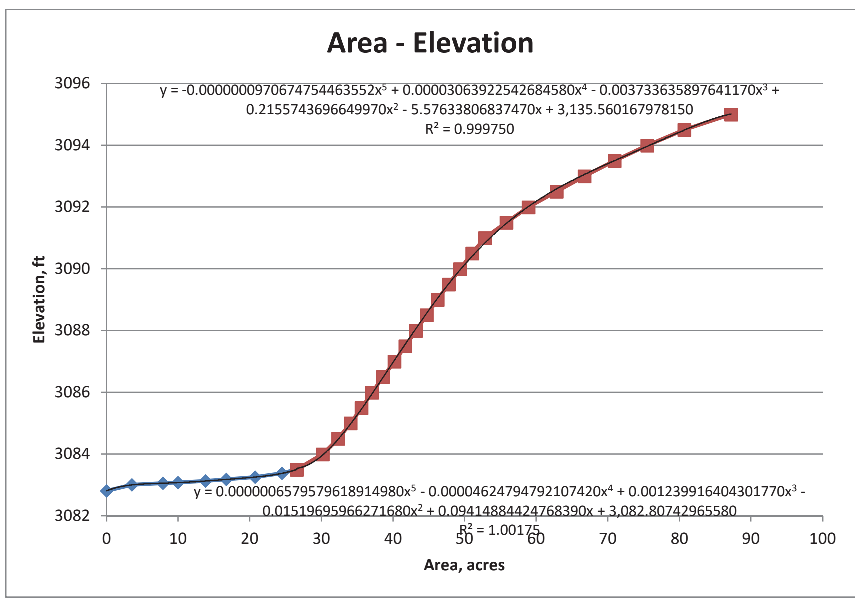
water depth, cm	172		2014 vol	66.2	81656.38
elevation, ft	3088.713045		2015 vol	219.7	270995.6
volume, ac ft	203.5035946				
volume, cu meters	251,018				

Grid Z Min	3082.807	2.3E-05
Datalogger Ground Surfac	3083.07	
Datalogger	3083.07	

Elevation - Volume	vol cu ft	vol ac ft
3082.875	12.05	0.000277
3083	5076	0.116529
3083.25	148280	3.40404
3083.5	411784	9.45326
3084	1035153.6	23.76386
3084.5	1717010.08	39.41713
3085	2440652.3	56.02967
3085.5	3199687.72	73.45472
3086	3991542.83	91.63321
3086.5	4815195.24	110.5417
3087	5673130.65	130.2372
3087.5	6565289.41	150.7183
3088	7490064.33	171.9482
3088.5	8447316.05	193.9237
3089	9437407.97	216.6531
3089.5	10460906	240.1494
3090	11518593.2	264.4305
3090.5	12611828.7	289.5277
3091	13742424	315.4826
3091.5	14924967.6	342.6301
3092	16173286.3	371.2876
3092.5	17499167.3	401.7256
3093	18909079.1	434.0927
3093.5	20407526.9	468.4924
3094	22000805.7	505.069
3094.5	23699100.1	544.0565
3095	25523283.9	585.934



Elevation - Area	area sq ft	area ac
3082.807	0	0
3083	153852	3.531956
3083.05	344405.223	7.906456
3083.075	435782.273	10.00418
3083.125	603282.058	13.84945
3083.175	729292.118	16.74224
3083.25	903644.219	20.74482
3083.375	1068197.57	24.52244
3083.5	1157117.02	26.56375
3084	1315136.42	30.19138
3084.5	1407892.42	32.32076
3085	1484257.13	34.07386
3085.5	1551494.22	35.61741
3086	1615748.03	37.09247
3086.5	1680555.95	38.58026
3087	1751842.82	40.21678
3087.5	1817268.45	41.71874
3088	1882344.89	43.21269
3088.5	1947718.86	44.71347
3089	2013822.85	46.23101
3089.5	2081431.62	47.78309
3090	2151086.4	49.38215
3090.5	2223740.72	51.05006
3091	2301904.14	52.84445
3091.5	2431930.41	55.82944
3092	2566792.77	58.92545
3092.5	2737851.68	62.85243
3093	2907255.79	66.74141
3093.5	3090577.64	70.9499
3094	3288403.07	75.49135
3094.5	3514170.25	80.67425
3095	3798915.47	87.2111

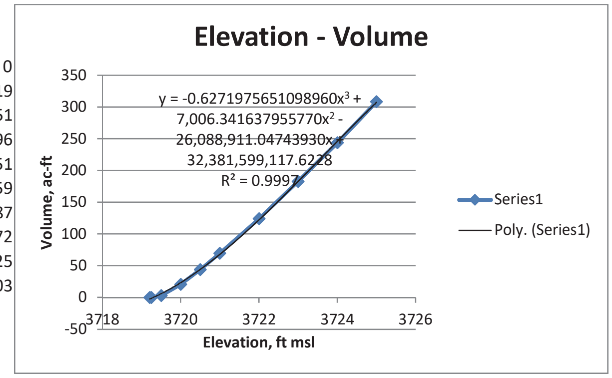


Glaezner Area Volume Calcs

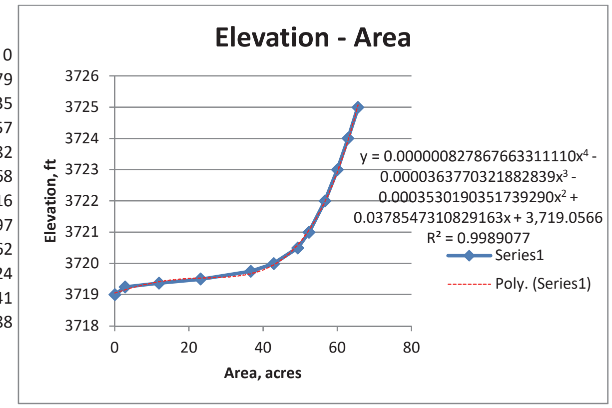
				Resurvey		
Grid Z Min	3733.22		Grid Z Min	3718.967		
Datalogger Ground Surfac	3734.328		Datalogger	3719.208		
Datalogger	3733.0		Datalogger	3717.9		

Max flood depth, cm	125
max elev,m	3723.309
water volume, ac ft	202.5048

Elevation - Volume		vol cu ft	vol ac ft	Elevation	vol cu ft	vol ac ft
	3734	107072	2.458035	3719.208	0	0
	3735	1271886	29.19848	3719.25	6992.204	0.160519
	3736	3258054	74.79463	3719.5	138449	3.178351
	3737	5478069	125.7592	3720	914322.7	20.98996
	3738	7879762	180.8944	3720.5	1930776	44.32451
	3739	10445702	239.8003	3721	3039556	69.77859
				3722	5418373	124.3887
				3723	7961549	182.772
				3724	10637027	244.1925
				3725	13434787	308.4203

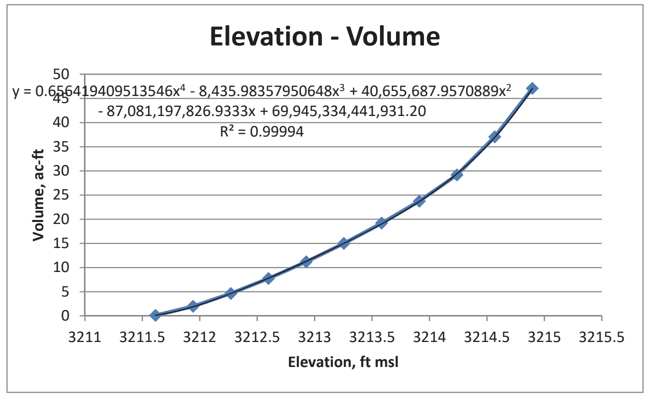


Elevation - Area		area sq ft	area ac	Elevation	area sq ft	area ac
	3734	325643	7.475735	3719	0	0
				3719.25	122729.4	2.817479
	3735	1831524	42.04601	3719.375	517987.1	11.89135
				3719.5	1007791	23.1357
	3736	2117491	48.6109	3719.75	1598514	36.69682
	3737	2314987	53.14479	3720	1868449	42.89368
	3738	2485759	57.06517	3720.5	2146992	49.28816
	3739	2645109	60.72335	3721	2279842	52.33797
				3722	2467875	56.65462
				3723	2613915	60.00724
				3724	2738360	62.8641
				3725	2856398	65.57388

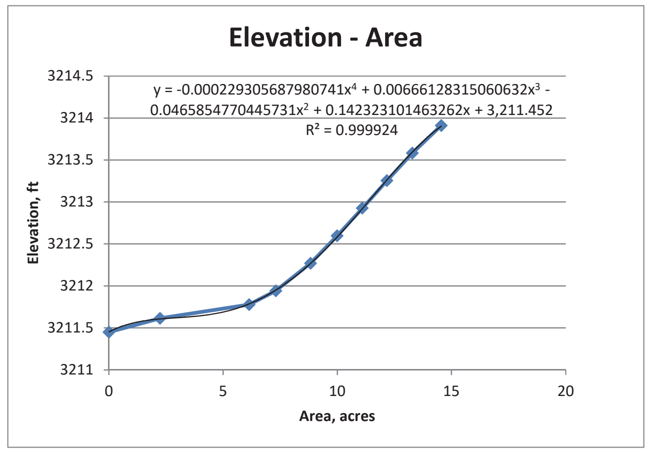


Gray Crop playa

input units = meters				
Grid Z Min		978.866411		0.00024711
Datalogger Ground Surface		978.9		0.0008107
Datalogger		978.9		
Elevation - Volume	elev, ft	vol m^3	vol ac ft	
978.9	3211.614	121.587103	0.098572	
979	3211.942	2449.49618	1.985839	
979.1	3212.27	5734.56114	4.649084	
979.2	3212.599	9546.41682	7.739406	
979.3	3212.927	13813.5182	11.1988	
979.4	3213.255	18519.8995	15.01433	
979.5	3213.583	23667.4612	19.18752	
979.6	3213.911	29287.7064	23.74393	
979.7	3214.239	35980.2777	29.16969	
979.8	3214.567	45690.4588	37.04186	
979.9	3214.895	58064.3383	47.07353	



Elevation - Area		area m^2	area ac
978.85	3211.45	0	0
978.9	3211.614	9043.23538	2.23463
978.95	3211.778	24837.1323	6.137384
979	3211.942	29558.575	7.304076
979.1	3212.27	35711.7263	8.824552
979.2	3212.599	40438.005	9.99244
979.3	3212.927	44886.6414	11.09172
979.4	3213.255	49250.5365	12.17006
979.5	3213.583	53759.8652	13.28434
979.6	3213.911	58870.2341	14.54714
979.7	3214.239	82395.3046	20.36031
979.8	3214.567	111131.954	27.46128
979.9	3214.895	137351.071	33.94016

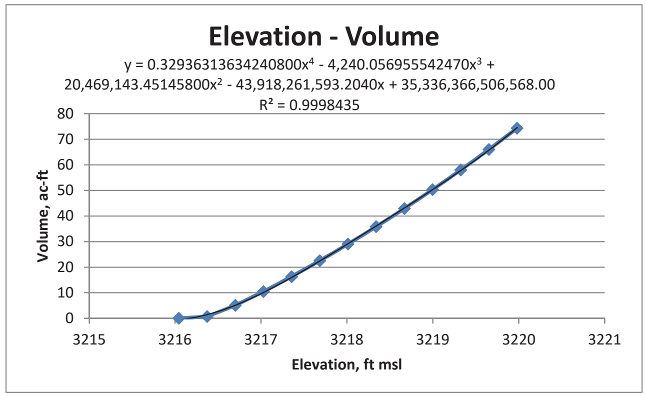


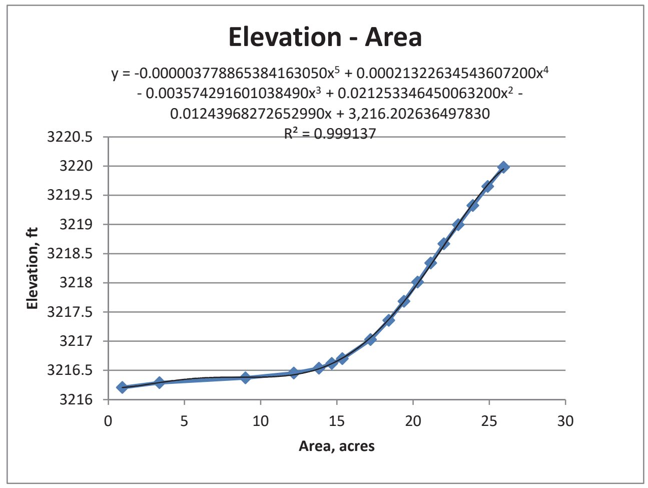
Gray CRP playa

input units = meters

Grid Z Min	980.241183	0.00024711
Datalogger Ground Surface	980.25	0.0008107
Datalogger	980.25	

Elevation - Volume	elev, ft	vol m^3	vol ac ft
980.25	3216.043	0.10063023	8.16E-05
980.35	3216.371	886.872873	0.719
980.45	3216.7	6261.4236	5.076219
980.55	3217.028	12890.4182	10.45043
980.65	3217.356	20106.2228	16.30038
980.75	3217.684	27760.5074	22.50581
980.85	3218.012	35796.1845	29.02044
980.95	3218.34	44183.4914	35.82014
981.05	3218.668	52917.37	42.90081
981.15	3218.996	62014.5519	50.27602
981.25	3219.324	71499.3526	57.96547
981.35	3219.652	81372.0543	65.9694
981.45	3219.98	91653.3572	74.30459



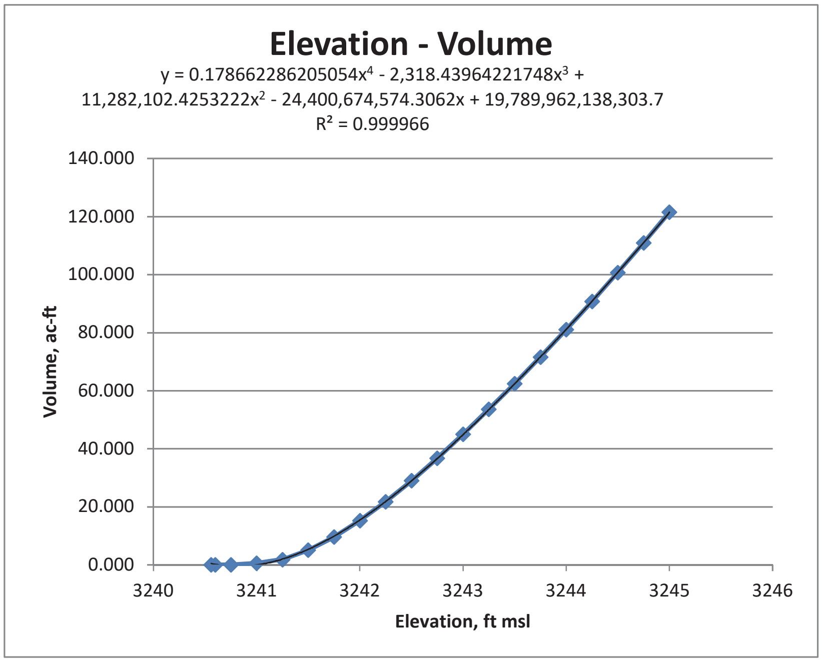


Elevation - Area		area m^2	area ac
980.25	3216.043	40.903245	0.010107
980.3	3216.207	3717.83245	0.918696
980.325	3216.289	13576.023	3.354705
980.35	3216.371	36424.4257	9.000664
980.375	3216.454	49251.4764	12.17029
980.4	3216.536	55953.4163	13.82638
980.425	3216.618	59346.739	14.66489
980.45	3216.7	62133.6833	15.35355
980.55	3217.028	69644.9258	17.20962
980.65	3217.356	74473.7242	18.40284
980.75	3217.684	78524.8606	19.4039
980.85	3218.012	82143.7952	20.29816
980.95	3218.34	85608.3242	21.15426
981.05	3218.668	89109.9447	22.01953
981.15	3218.996	92914.5466	22.95966
981.25	3219.324	96791.5284	23.91769
981.35	3219.652	100733.981	24.89189
981.45	3219.98	104943.251	25.93202

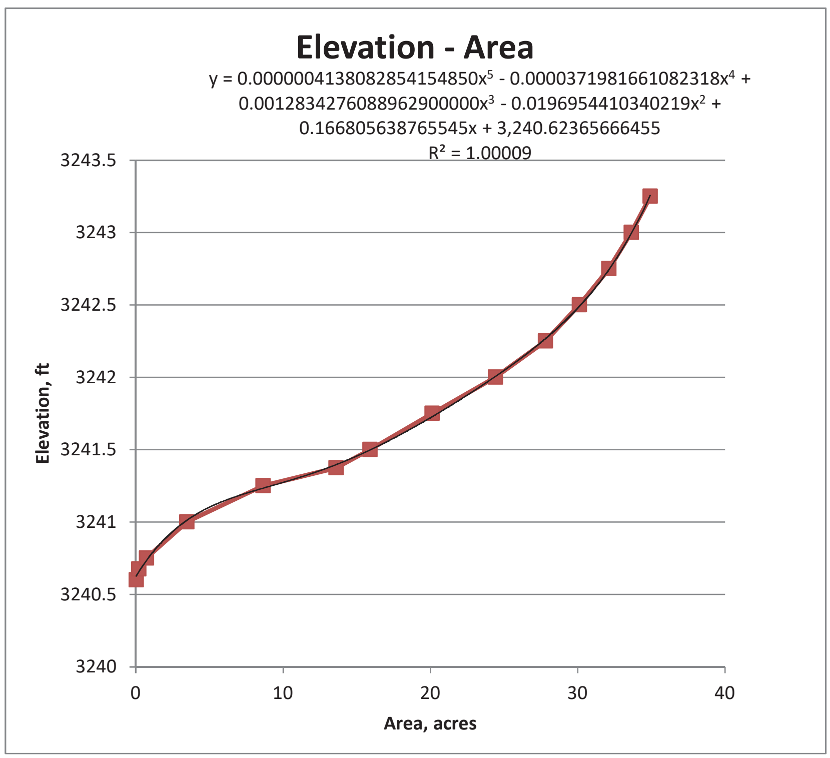
Gregg Playa

Grid Z Min	3240.58		
Datalogger NA			2.3E-05
Datalogger NA			

Elevation - vol cu ft		vol ac ft
3240.6	7.608132	0.000
3240.56	364.7909	0.008
3240.75	1702.894	0.039
3241	26179.1	0.601
3241.25	80172.52	1.841
3241.5	222816.3	5.115
3241.75	418190	9.600
3242	662127.8	15.200
3242.25	946731.1	21.734
3242.5	1262920	28.993
3242.75	1602206	36.782
3243	1960432	45.005
3243.25	2333839	53.578
3243.5	2720571	62.456
3243.75	3119753	71.620
3244	3530976	81.060
3244.25	3953999	90.771
3244.5	4388689	100.750
3244.75	4835350	111.004
3245	5295043	121.557
3246.75	8931971	205.050



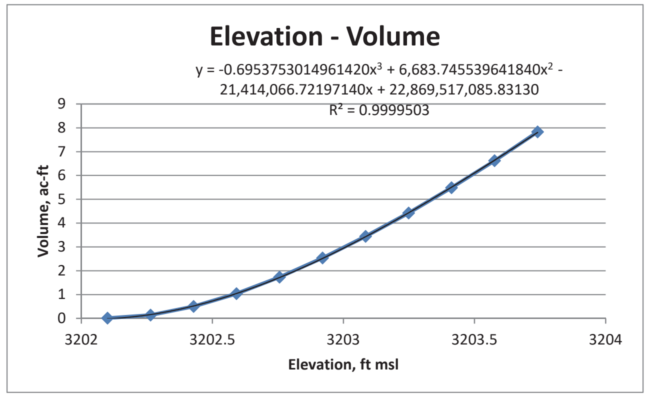
Elevation - area sq ft		area ac
3240.6	983.348	0.022575
3240.675	8998.615	0.20658
3240.75	30961.77	0.710784
3241	150577.4	3.456782
3241.25	376066.9	8.633307
3241.375	591711.2	13.58382
3241.5	692145.8	15.88948
3241.75	876141.8	20.11345
3242	1063096	24.40531
3242.25	1211242	27.80629
3242.5	1311730	30.11318
3242.75	1399102	32.11896
3243	1464759	33.62624
3243.25	1521177	34.92143
3243.5	1572101	36.09047
3243.75	1621076	37.21477
3244	1668601	38.30582
3244.25	1715408	39.38035
3244.5	1762284	40.45647
3244.75	1811916	41.59586
3245	1866616	42.8516
3246.75	2313794	53.11739

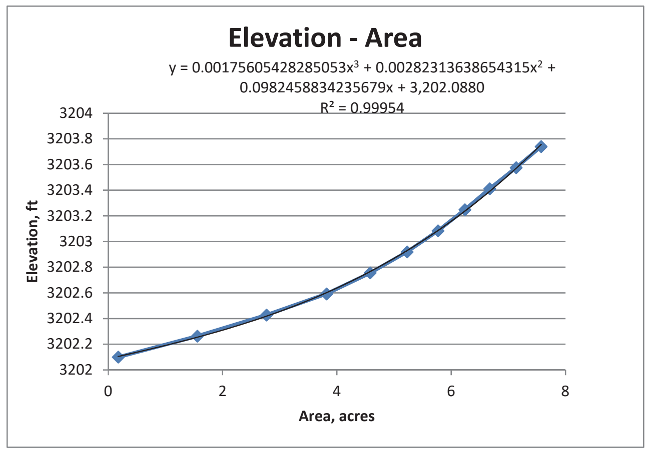


Gray RNG playa **playa spills over to wash at SE corner - only grid volume up to pour over point calculated**

input units = meters

Grid Z Min		975.907255		0.00024711
Datalogger Ground Surface		976		0.0008107
Datalogger		976		
Elevation - Volume	elev, ft	vol m^3	vol ac ft	
976	3202.1	8.86010878	0.007183	
976.05	3202.264	170.339081	0.138096	
976.1	3202.428	614.055728	0.497823	
976.15	3202.592	1282.87324	1.040042	
976.2	3202.756	2135.66756	1.731414	
976.25	3202.92	3130.12847	2.537636	
976.3	3203.084	4244.11602	3.440761	
976.35	3203.248	5459.97348	4.426473	
976.4	3203.412	6766.63964	5.485804	
976.45	3203.576	8162.74877	6.617648	
976.5	3203.74	9655.89073	7.828158	



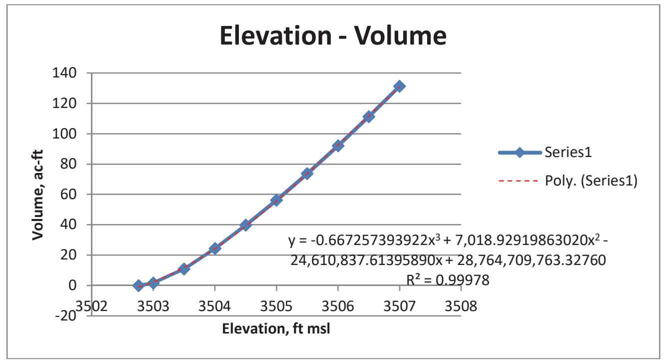


Elevation - Area		area m^2	area ac
976	3202.1	697.509896	0.172358
976.05	3202.264	6304.48297	1.55787
976.1	3202.428	11196.7963	2.766786
976.15	3202.592	15456.9042	3.819481
976.2	3202.756	18543.2613	4.582136
976.25	3202.92	21157.0779	5.228023
976.3	3203.084	23344.8794	5.76864
976.35	3203.248	25251.5078	6.239778
976.4	3203.412	27010.2631	6.674375
976.45	3203.576	28881.0518	7.136657
976.5	3203.74	30651.9775	7.574262

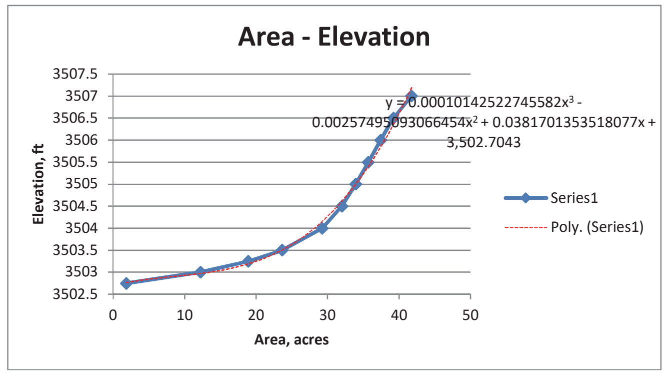
Herring Playa #1 Area Volume Calcs

depth cm	40	
depth, ft	1.312336	
elev	3504.073	
vol	26.435143	

				resurvey	
Grid Z Min	3514.18		Grid Z Min	3502.57	
Datalogger Ground Surfac	3516.04		Datalogger	3502.761	
Datalogger	3516.0		Datalogger	3502.8	
Elevation - Volume	vol cu ft	vol ac ft	Elevation	vol cu ft	vol ac ft
			3502.76		0
3516	83412	1.914876	3503	73839.59	1.695124
3516.5	321650.352	7.384076	3503.5	480141	11.02252
3517	770097.123	17.679	3504	1066916	24.49302
3517.5	1357016.51	31.15281	3504.5	1737389	39.88497
3518	2039693.85	46.82493	3505	2455934	56.38049
3518.5	2808267.23	64.46894	3505.5	3214222	73.78839
3519	3661080.6	84.04685	3506	4010424	92.06666
3519.5	4601696.29	105.6404	3506.5	4844917	111.224
3520	5638525.07	129.4427	3507	5722766	131.3766



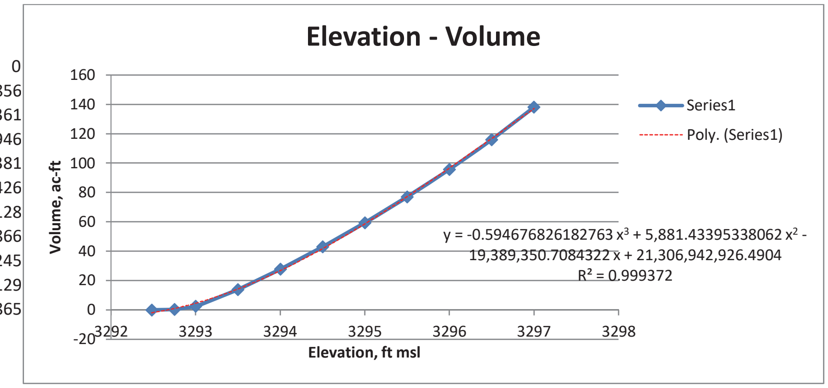
Elevation - Area	area sq ft	area ac	Elevation	area sq ft	area ac
			3502.75	79450.89	1.823942
3516	203747	4.677388	3503	533078	12.23779
			3503.25	823013.8	18.8938
3516.5	694155.365	15.93561	3503.5	1029626	23.63695
3517	1062973.35	24.40251	3504	1274563	29.25995
3517.5	1275142.32	29.27324	3504.5	1394537	32.01415
3518	1452409.64	33.34274	3505	1478108	33.93269
3518.5	1621288.57	37.21966	3505.5	1554731	35.69172
3519	1791422.68	41.12541	3506	1630514	37.43146
3519.5	1974054.98	45.31807	3506.5	1708409	39.21968
3520	2178858.59	50.01971	3507	1818836	41.75473



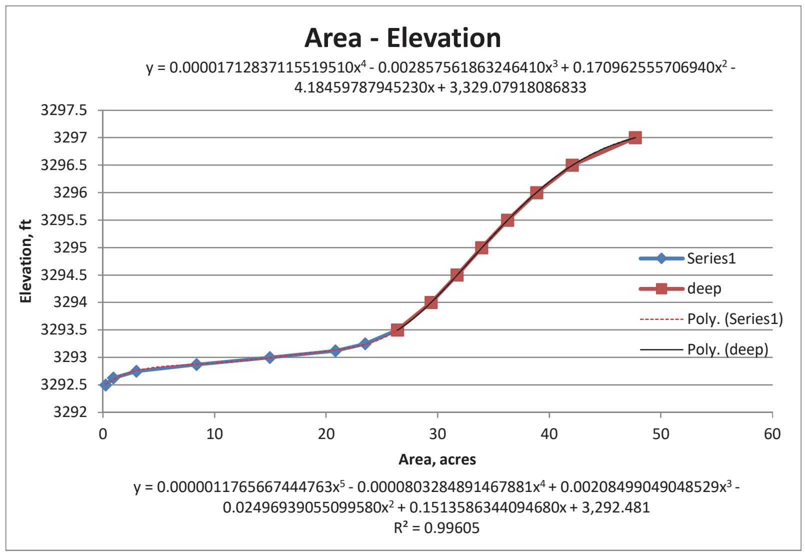
Herring Playa #3 Area Volume Calcs

	resurvey			2.29568E-05	depth, cm	15.36	2015 vol tot	45.64
Grid Z Min		3292.218			elevation, ft	3293.703		
Datalogger Ground Su		3293.199			volume, ac ft	19.09547		
Datalogger		3291.9						

Elevation	vol cu ft	vol ac ft
3292.48	0	0
3292.75	13104.62769	0.300840856
3293	105848.8993	2.429956361
3293.5	599354.65	13.75928946
3294	1209549.419	27.76743381
3294.5	1875587.067	43.05755426
3295	2590180.462	59.46236128
3295.5	3354018.017	76.99765866
3296	4171464.272	95.76364245
3296.5	5050608.332	115.9460129
3297	6022252.184	138.2518865



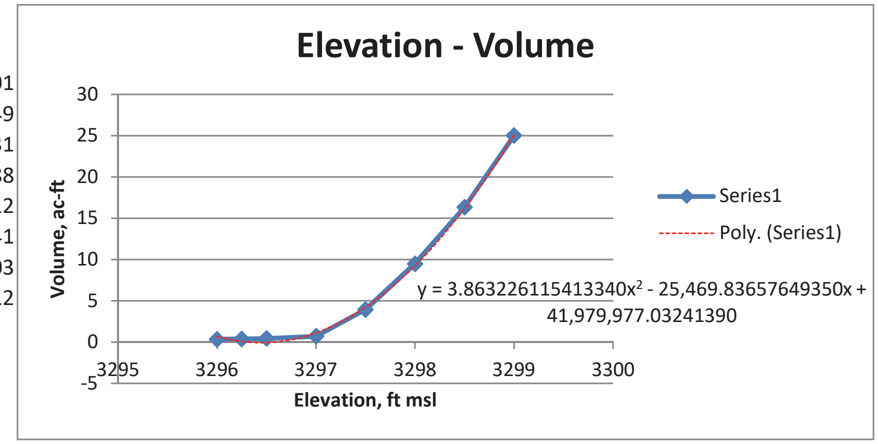
Elevation	area sq ft	area ac
3292.5	10656.92502	0.244649334
3292.625	39809.05342	0.913890114
3292.75	129722.748	2.978024513
3292.875	364964.369	8.378429026
3293	650735.2329	14.93882534
3293.125	906589.0619	20.81242104
3293.25	1023830.992	23.50392539
3293.5	1148810.308	26.3730557
3294	1280999.928	29.40771179
3294.5	1381289.528	31.7100442
3295	1477490.256	33.91850904
3295.5	1579519.293	36.26077341
3296	1692646.997	38.85782815
3296.5	1830982.407	42.03357217
3297	2077515.333	47.69318938



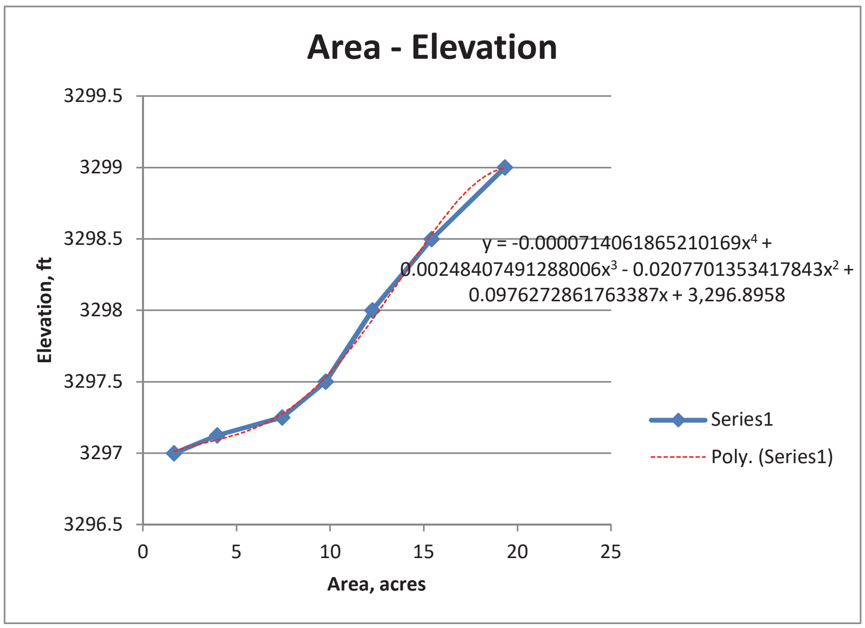
Herring Playa #3a Area Volume Calcs

	resurvey		2.29568E-05		
				depth, cm	32.8	6.563
				Elev, ft	3297.093
				volume ac ft	1.560214

Grid Z Min	3292.105	
Datalogger Ground S	3296.017	
Datalogger	3294.7	
Elevation	vol cu ft	vol ac ft
3296	15115.35	0.347001
3296.25	17096.88	0.39249
3296.5	19463.95	0.446831
3297	31018.57	0.712088
3297.5	172720.6	3.96512
3298	413638.8	9.495841
3298.5	712817.1	16.36403
3299	1090795	25.0412



Elevation	area sq ft	area ac
3296	7653.813	0.175707
3296.25	8492.327	0.194957
3296.5	10894.97	0.250114
3297	72068.81	1.654472
3297.125	172881.4	3.968811
3297.25	324293.4	7.444752
3297.5	424835	9.75287
3298	533744.5	12.25309
3298.5	671766	15.42163
3299	841804.2	19.32516

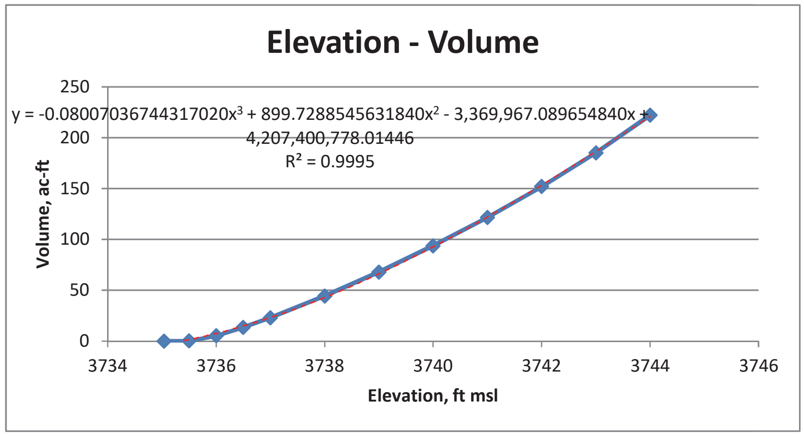


Hollenstein Resurvey Area Volume Calcs

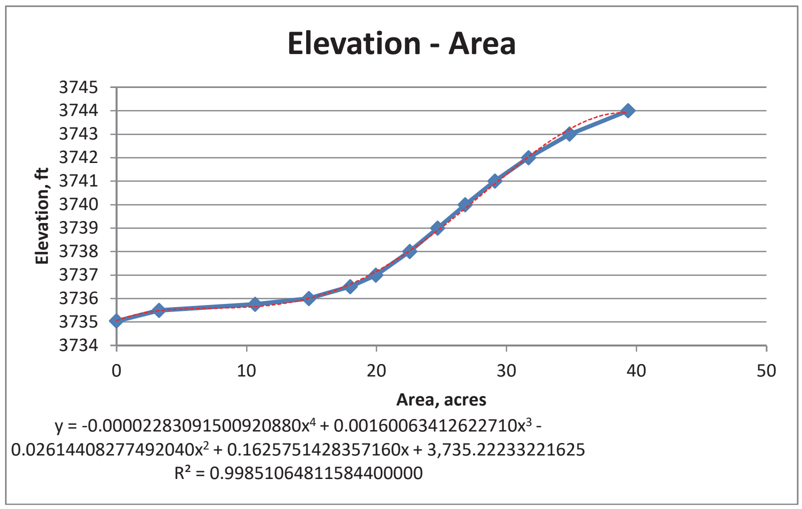
Max flood depth, cm	139	
max elev,m	3740.013	tot vol 2011-2014
water volume, ac ft	93.20306	94.99

Grid Z Min	3735.0479	
Met station ground rod	3735.453	
Datalogger	3735.3	

Elevation - Volume	vol cu ft	vol ac ft
3735.04	0	0
3735.5	10770.1994	0.24725
3736	229687.461	5.272899
3736.5	590619.858	13.55877
3737	1004651.59	23.06363
3738	1932801.18	44.37101
3739	2962269.19	68.00434
3740	4083834.99	93.75195
3741	5300426.58	121.6811
3742	6622763.52	152.0377
3743	8068318.07	185.2231
3744	9676394.15	222.1394



Elevation	area sq ft	area ac
3735.04	0	0
3735.5	142010.849	3.26012
3735.75	463899.263	10.64966
3736	644251.191	14.78997
3736.5	783052.351	17.97641
3737	868500.607	19.93803
3738	981821.856	22.53953
3739	1076062.42	24.70299
3740	1168001.19	26.81362
3741	1267847.75	29.10578
3742	1380177.29	31.68451
3743	1517663.12	34.84075
3744	1714541.22	39.36045

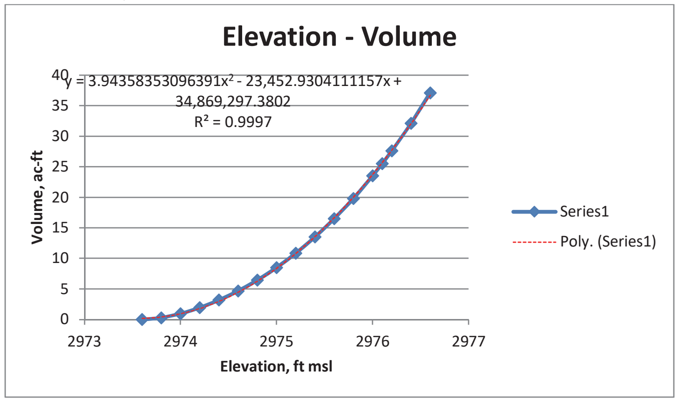


Hughes E Area Volume Calcs

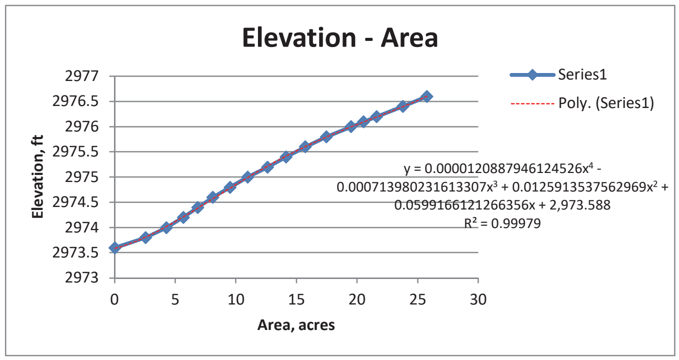
Resurvey data		
Grid Z Min	2973.5636	
Datalogger Ground Surfa	2973.804	
Datalogger	2973.8	

Max flood depth, cm	30.5	tot vol 2011 - 2014	65.19184
max elev, ft	2974.8047		
area	9.7619877		
water volume, ac ft	6.3263256		

Elevation - Volume	vol cu ft	vol ac ft
2973.6	7.76801231	0.000178
2973.8	11362.9597	0.260858
2974	40898.8032	0.938907
2974.2	84226.0042	1.933563
2974.4	138680.162	3.183658
2974.6	203719.642	4.676759
2974.8	280237.535	6.433369
2975	369571.783	8.484201
2975.2	472298.236	10.84248
2975.4	588871.089	13.51862
2975.6	718962.98	16.50512
2975.8	863328.562	19.8193
2976	1024312.59	23.51498
2976.1	1111484.18	25.51617
2976.2	1203298.25	27.62393
2976.4	1400794.62	32.15782
2976.6	1616699.42	37.11431



Elevation - Area	area sq ft	area ac
2973.6	1048.89641	0.024079
2973.8	110480.734	2.536289
2974	185999.415	4.269959
2974.2	246157.659	5.651002
2974.4	298545.055	6.853651
2974.6	352297.978	8.087649
2974.8	414535.949	9.516436
2975	478282.794	10.97986
2975.2	549176.128	12.60735
2975.4	616255.073	14.14727
2975.6	685004.233	15.72553
2975.8	760863.859	17.46703
2976	849501.375	19.50187
2976.1	894692.824	20.53932
2976.2	940861.571	21.59921
2976.4	1035768.7	23.77798
2976.6	1121994.66	25.75745

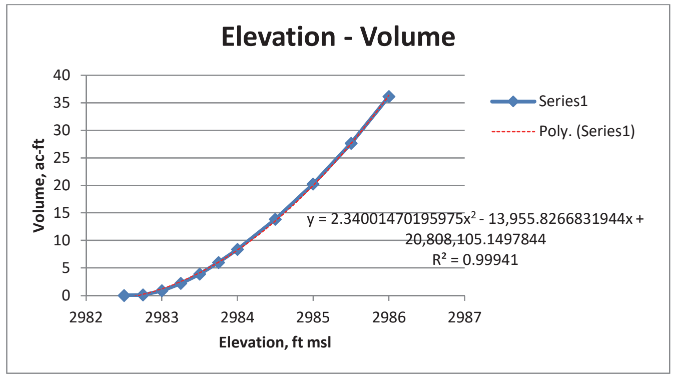


Hughes W Area Volume Calcs

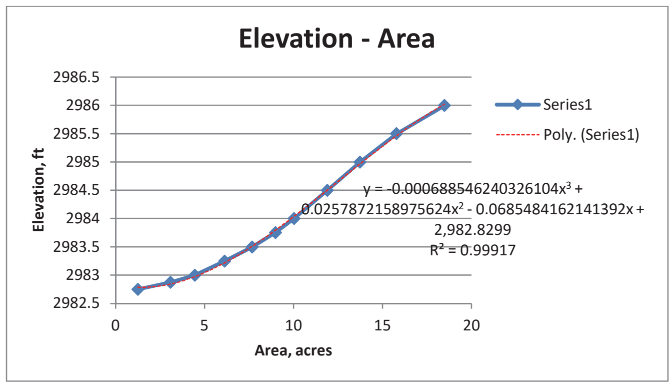
				Resurvey
Grid Z Min	2998.12		Grid Z Min	2981.255
Datalogger Ground Surfa(	2998.887		Datalogger	2983.172
Datalogger	2997.6		Datalogger	2981.8

Max flood depth, cm	113		tot vol 2011-2014	33.43348		
max elev, ft	2986.879					
water volume, ac ft	54.68873		6.391968	23.77609	-9.2757	12.54113

Elevation - Volume	vol cu ft	vol ac ft	Elevation	vol cu ft	vol ac ft
2998.5	5410	0.124197	2982.5	1404.202	0.032236
2999	87810	2.01584	2982.75	5670.411	0.130175
2999.5	240816	5.528375	2983	38363.42	0.880703
3000	441295	10.13074	2983.25	96458.55	2.214384
3000.5	684923	15.72367	2983.5	171312.2	3.932786
3001	971470	22.30188	2983.75	262288.6	6.021317
3001.5	1310219	30.07849	2984	365815.1	8.39796
3002	1705612	39.15546	2984.5	604897.1	13.88653
3002.5	2163381	49.66439	2985	882804.3	20.2664
3003	2683451	61.60356	2985.5	1203609	27.63106
			2986	1575510	36.16874



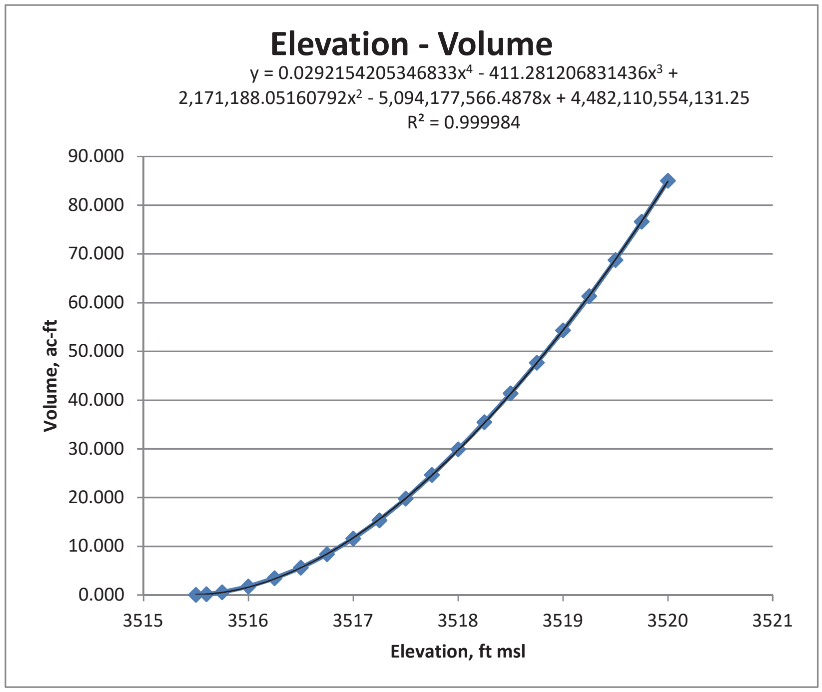
Elevation - Area	area sq ft	area ac	Elevation	area sq ft	area ac
2998.5	61704	1.416529	2982.5	3910.674	0.089777
2999	248732	5.710101	2982.75	54487.67	1.250865
			2982.875	134496.5	3.087615
2999.5	356495	8.183999	2983	193633.9	4.445222
3000	444702	10.20895	2983.25	266964.6	6.128665
3000.5	529919	12.16527	2983.5	334108.9	7.670084
3001	620647	14.24809	2983.75	390984.5	8.975769
3001.5	733770	16.84504	2984	436481.7	10.02024
3002	850240	19.51882	2984.5	517768.1	11.88632
3002.5	979850	22.49426	2985	598318.7	13.73551
3003	1097684	25.19936	2985.5	687501.3	15.78286
			2986	804837.3	18.47652



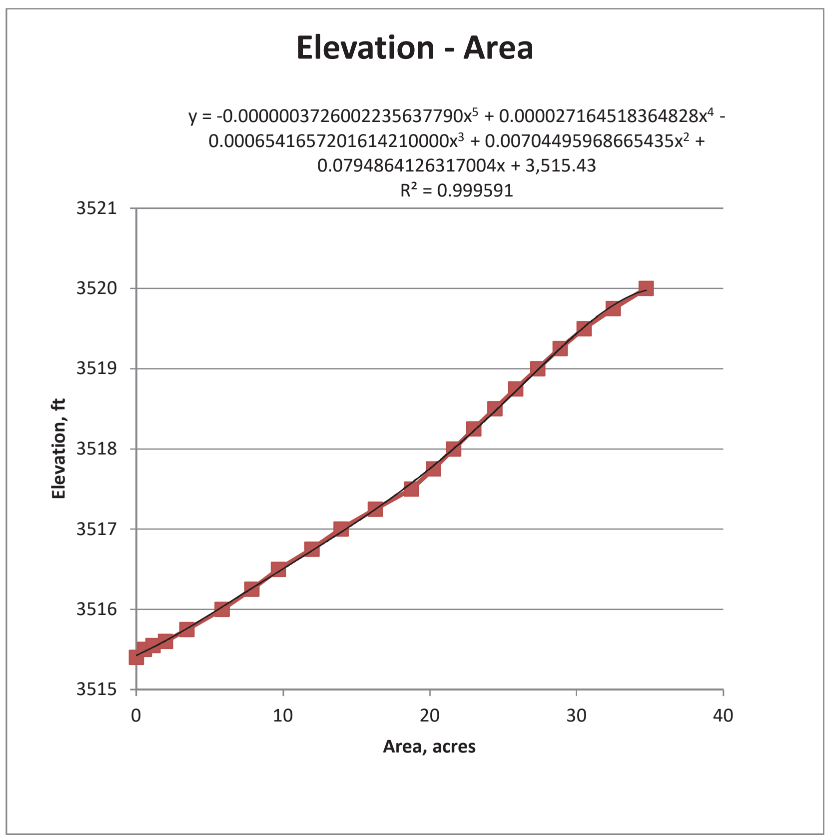
Kinkaid E Playa

Grid Z Min	3515.279	
Datalogger NA		2.3E-05
Datalogger NA		

Elevation - vol cu ft		vol ac ft
3515.5	693.7513	0.016
3515.6	5844.373	0.134
3515.75	23714.1	0.544
3516	74959.06	1.721
3516.25	149274.7	3.427
3516.5	244423	5.611
3516.75	362863.8	8.330
3517	504028.2	11.571
3517.25	667602.3	15.326
3517.5	860481.2	19.754
3517.75	1072912	24.631
3518	1300983	29.866
3518.25	1543866	35.442
3518.5	1802161	41.372
3518.75	2075937	47.657
3519	2365576	54.306
3519.25	2671550	61.330
3519.5	2994707	68.749
3519.75	3337253	76.613
3520	3702884	85.007

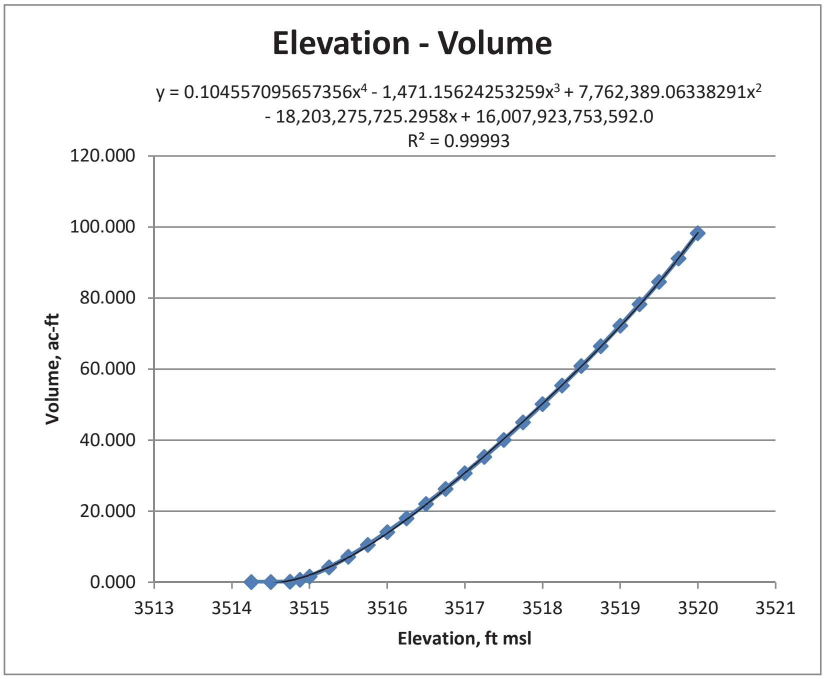


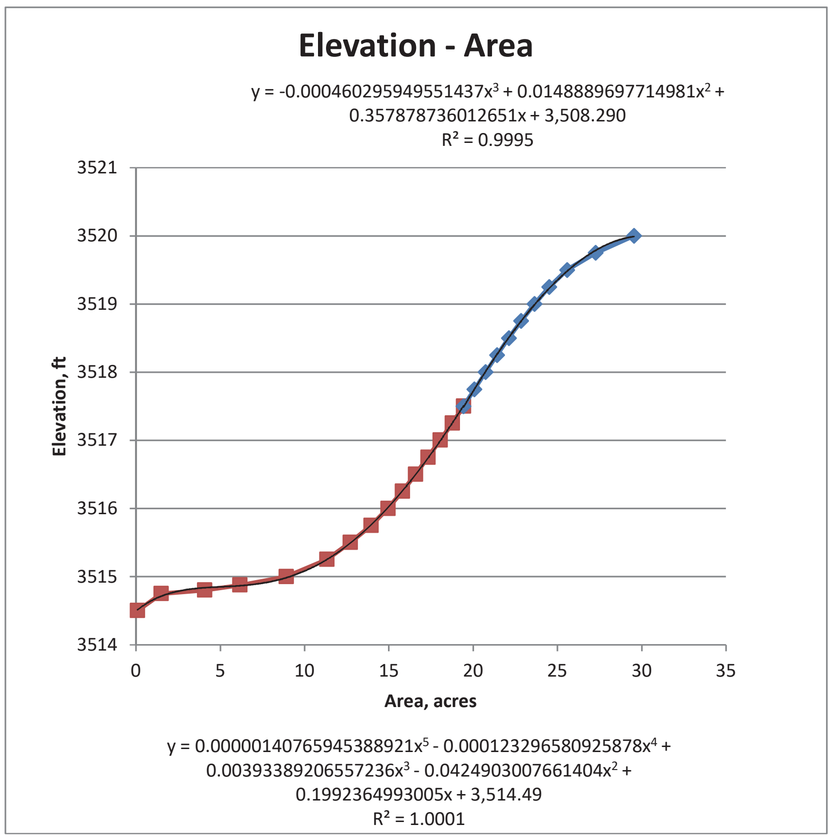
Elevation - area sq ft		area ac
3515.4	159.2981	0.003657
3515.5	23895.89	0.548574
3515.55	49389.95	1.133837
3515.6	86465.72	1.98498
3515.75	150544.5	3.456027
3516	254588	5.844537
3516.25	342638.9	7.865906
3516.5	421479.9	9.675846
3516.75	520899.9	11.95822
3517	607301.3	13.94172
3517.25	708794.6	16.27168
3517.5	816838.6	18.75203
3517.75	881716.5	20.24142
3518	942183.9	21.62957
3518.25	1001681	22.99543
3518.5	1064164	24.42984
3518.75	1126389	25.85834
3519	1191062	27.34301
3519.25	1257443	28.86693
3519.5	1328845	30.50608
3519.75	1415113	32.48654
3520	1513322	34.74108



Kinkaid W Playa (Kinkaid 1)

Grid Z Min	3513.019	
Datalogger NA		2.3E-05
Datalogger NA		
Elevation -	vol cu ft	vol ac ft
3514	468.8726	0.011
3514.25	909.2746	0.021
3514.5	1636.341	0.038
3514.75	6125.227	0.141
3514.875	29145.28	0.669
3515	70243.23	1.613
3515.25	182754.8	4.195
3515.5	313745.8	7.203
3515.75	458914	10.535
3516	616396.9	14.151
3516.25	783882.9	17.995
3516.5	960225.4	22.044
3516.75	1144760	26.280
3517	1337225	30.698
3517.25	1537548	35.297
3517.5	1745465	40.070
3517.75	1960561	45.008
3518	2182766	50.109
3518.25	2412277	55.378
3518.5	2649274	60.819
3518.75	2894104	66.439
3519	3147181	72.249
3519.25	3409270	78.266
3519.5	3681818	84.523
3519.75	3968320	91.100
3520	4277959	98.208
Elevation -	area sq ft	area ac
3514	1420.312	0.032606
3514.25	2188.865	0.050249
3514.5	3859.013	0.088591
3514.75	65019.19	1.492635
3514.8	177403.6	4.072626
3514.875	268205.1	6.157142
3515	388136.8	8.910395
3515.25	493055.8	11.319
3515.5	553147.6	12.69852
3515.75	607273.4	13.94108
3516	651167.5	14.94875
3516.25	688169.5	15.7982
3516.5	722011.5	16.5751
3516.75	754062.7	17.3109
3517	785719.9	18.03765
3517.25	816888.3	18.75317
3517.5	846167.3	19.42533
3517.75	874518.8	20.07619
3518	903326	20.73751
3518.25	932838.4	21.41502
3518.5	963448.7	22.11774
3518.75	995383.2	22.85085
3519	1029582	23.63594
3519.25	1068118	24.52061
3519.5	1113920	25.57208
3519.75	1187681	27.26541
3520	1287012	29.54574



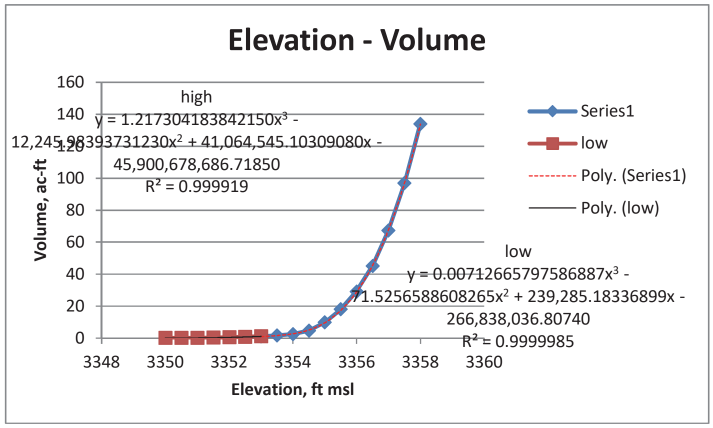


Macha Area Volume Calcs

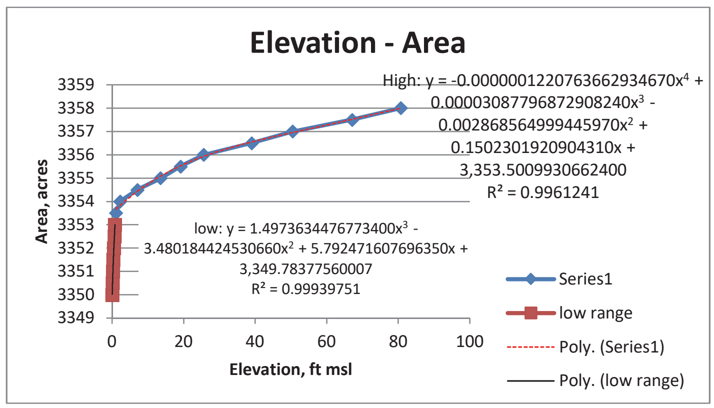
2015 vol tot	71.4		Max flood depth, cm	76.4
			max elev, ft	3356.468
			water volume, ac ft	44.47336

Grid Z Min	3348.995014
Met Sta Ground Surf	3353.961

Elevation - Volume		vol cu ft	vol ac ft
	3350	562.5605239	0.012915
	3350.5	2192.553082	0.050334
	3351	6247.847446	0.143431
	3351.5	12888.11825	0.29587
	3352	22273.74928	0.511335
	3352.5	34728.05546	0.797246
	3353	50520.93224	1.159801
	3353.5	71287.4354	1.636534
	3354	106013.2504	2.433729
	3354.5	201440.7006	4.624442
	3355	430306.6005	9.87848
	3355.5	788764.9668	18.10755
	3356	1271807.29	29.19668
	3356.5	1965788.505	45.12829
	3357	2936936.308	67.42278
	3357.5	4219044.304	96.85593
	3358	5838852.293	134.0416



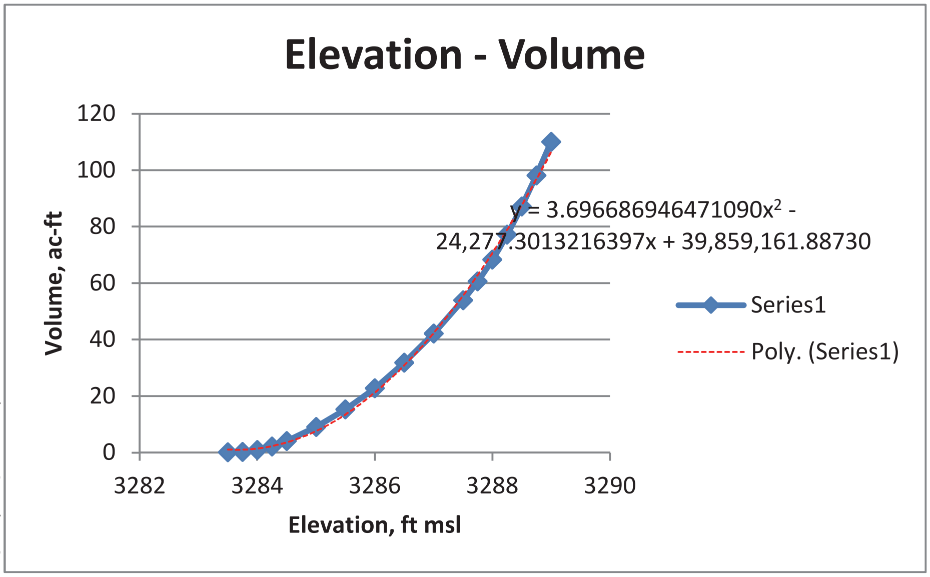
Elevation - Area		area sq ft	area ac
	3350	1853.550304	0.042552
	3350.5	5394.1808	0.123833
	3351	10793.93677	0.247795
	3351.5	15802.85103	0.362784
	3352	21937.04415	0.503605
	3352.5	28227.88591	0.648023
	3353	35528.83707	0.81563
	3353.5	50263.75844	1.153897
	3354	98223.49803	2.254901
	3354.5	310617.5383	7.130797
	3355	590875.7131	13.56464
	3355.5	834660.5705	19.16117
	3356	1117926.435	25.66406
	3356.5	1700047.152	39.02771
	3357	2201839.524	50.54728
	3357.5	2924903.766	67.14655
	3358	3516151.025	80.71972

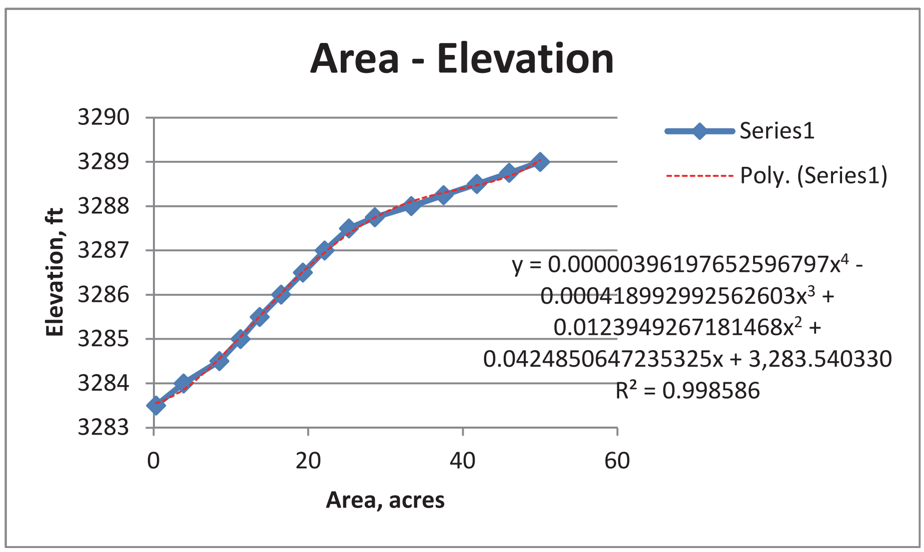


Mahagan Area Volume Calcs

	resurvey		max elev, ft	3288.139		2015 vol	158
Grid Z Min	3282.135		water volume, ac ft	72.08247	3.571281	20.91483	86.61533
			Max flood depth, cm	139	tot vol 2011-2014		111.1014

Datalogger	3283.579	
Datalogger	3283.6	
Elevation	vol cu ft	vol ac ft
3283.5	4790.97	0.1099855
3283.75	11296.31	0.2593275
3284	37845.42	0.8688112
3284.25	95750.63	2.1981319
3284.5	179136.9	4.1124169
3285	395949.1	9.0897411
3285.5	666961.1	15.311319
3286	994582.4	22.83247
3286.5	1385063	31.796674
3287	1836085	42.150707
3287.5	2349738	53.942566
3287.75	2640547	60.618624
3288	2976766	68.337136
3288.25	3362309	77.188
3288.5	3794950	87.120074
3288.75	4273352	98.102654
3289	4795894	110.09858
Elevation	area sq ft	area ac
3283.5	12638.1	0.2901309
3284	167802.8	3.8522221
3284.5	369931.4	8.4924571
3285	489158.5	11.229533
3285.5	596286.1	13.688846
3286	717590.9	16.473621
3286.5	841367.5	19.315141
3287	962774.3	22.102257
3287.5	1100404	25.26179
3287.75	1246770	28.621891
3288	1450816	33.30616
3288.25	1634658	37.526591
3288.5	1822181	41.831522
3288.75	2002909	45.980466
3289	2177659	49.992178

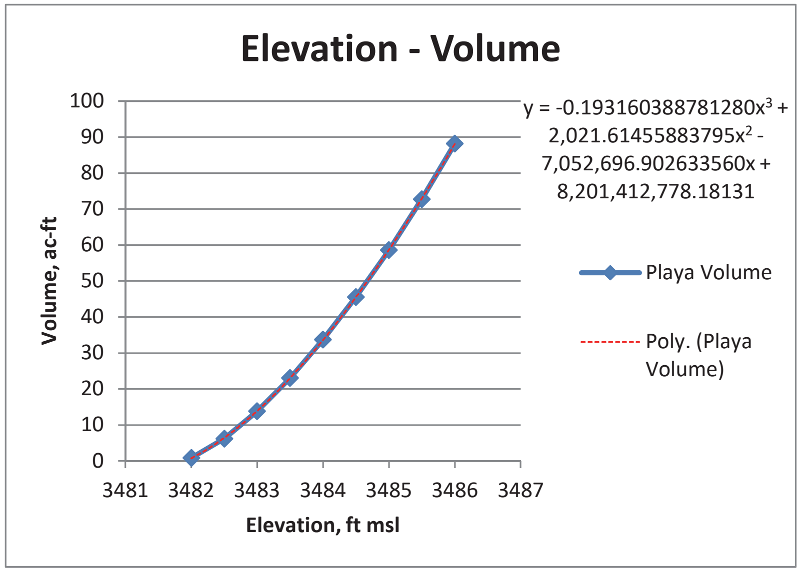




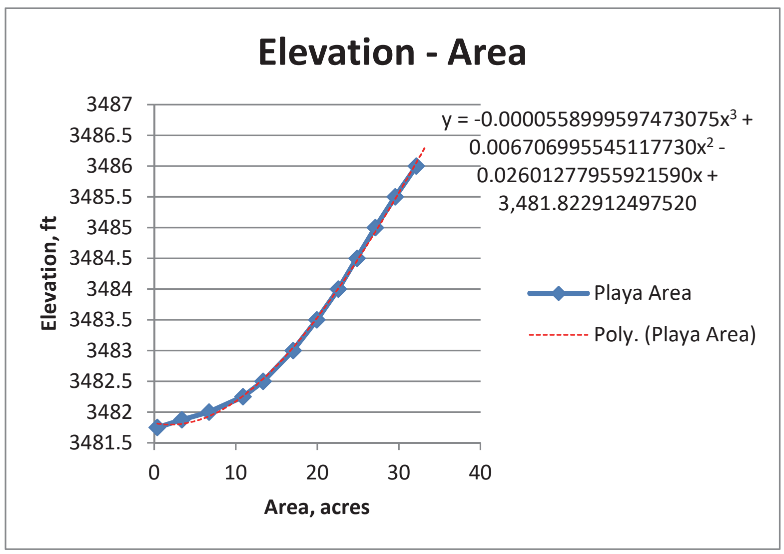
Max flood depth, cm	67.4	2015 vol	70.4
max elev, ft	3484.485		
water volume, ac ft	45.15532		

M. Harrell Area Volume Calcs

	resurvey	
Grid Z Min	3481.657555	
Met Sta Ground Sur	3482.274	
Datalogger	3482.3	
Elevation	vol cu ft	vol ac ft
3481.75	443.047903	0.010171
3482	37829.41585	0.868444
3482.5	268963.6369	6.174555
3483	601501.8395	13.80858
3483.5	1004916.075	23.0697
3484	1468880.911	33.72087
3484.5	1985931.18	45.59071
3485	2551506.7	58.57453
3485.5	3168629.914	72.74173
3486	3839784.716	88.14933

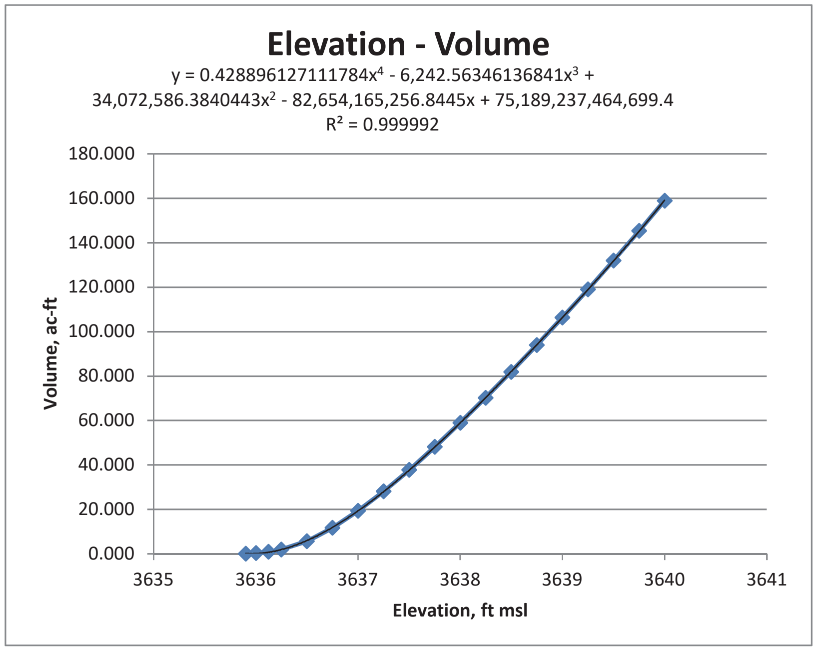


Elevation	area sq ft	area ac
3481.75	17212.22258	0.395138
3481.875	148843.1342	3.416968
3482	292767.5595	6.721018
3482.25	474468.7432	10.8923
3482.5	581357.4954	13.34613
3483	741620.5041	17.02526
3483.5	869372.544	19.95805
3484	983463.017	22.5772
3484.5	1082852.876	24.85888
3485	1181649.145	27.12693
3485.5	1287015.55	29.54581
3486	1400130.731	32.14258

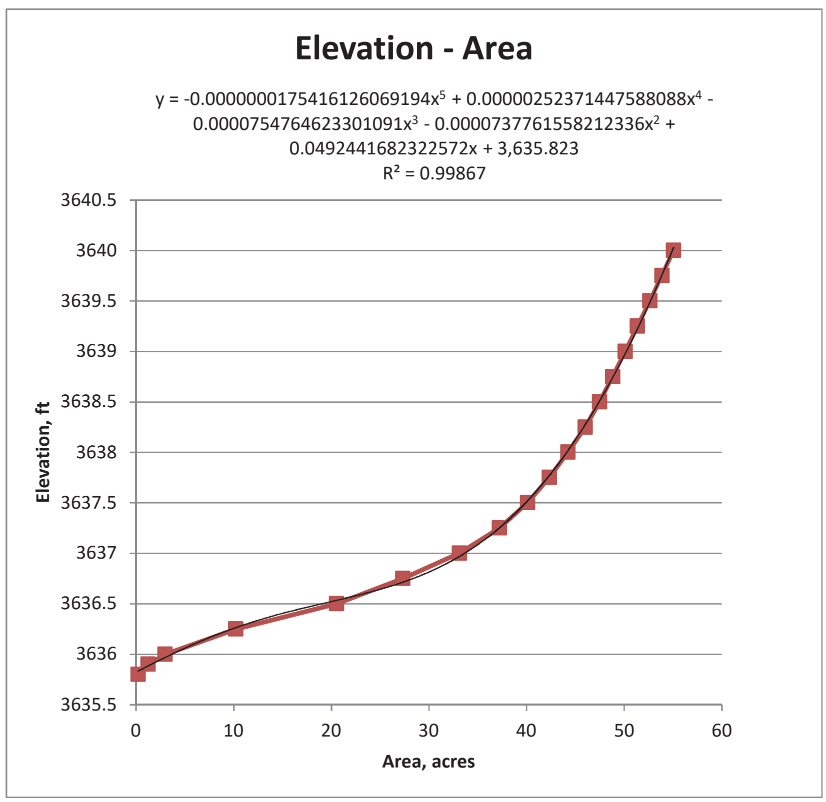


Midleton N Playa

Grid Z Min	3635.705		
Datalogger	NA		2.3E-05
Datalogger	NA		
Elevation -	vol cu ft	vol ac ft	
3635.8	229.3287	0.005	
3635.9	3176.279	0.073	
3636	12178.62	0.280	
3636.125	37078.79	0.851	
3636.25	82034.02	1.883	
3636.5	248071	5.695	
3636.75	509757.4	11.702	
3637	840479.7	19.295	
3637.25	1225176	28.126	
3637.5	1646743	37.804	
3637.75	2095984	48.117	
3638	2567454	58.941	
3638.25	3058947	70.224	
3638.5	3567983	81.910	
3638.75	4092180	93.944	
3639	4630664	106.305	
3639.25	5183037	118.986	
3639.5	5749058	131.980	
3639.75	6328752	145.288	
3640	6921741	158.901	



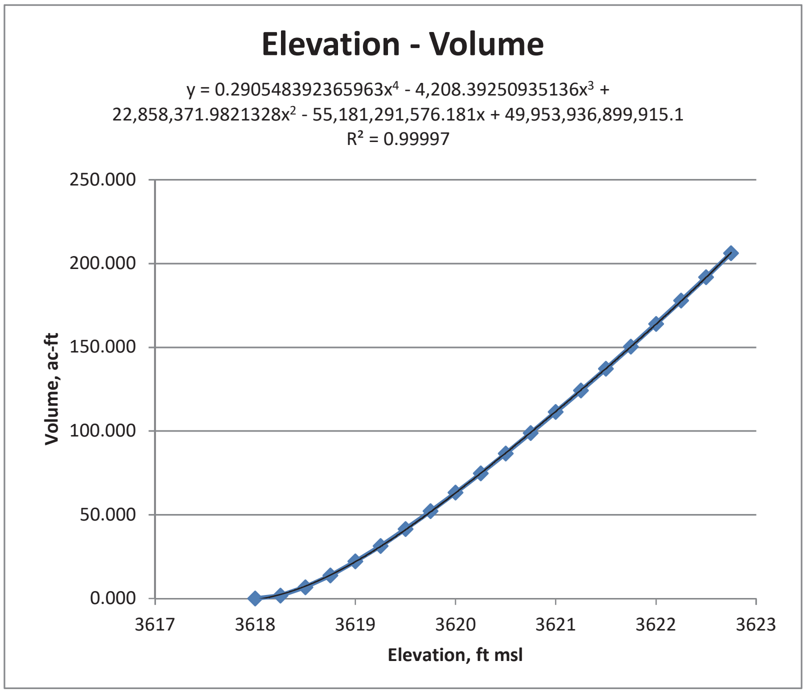
Elevation -	area sq ft	area ac
3635.8	8649.956	0.198576
3635.9	53497.5	1.228134
3636	129445.8	2.971668
3636.25	444341.5	10.20068
3636.5	894654.1	20.53843
3636.75	1189970	27.31795
3637	1442582	33.11712
3637.25	1621612	37.22708
3637.5	1746170	40.08655
3637.75	1843949	42.33124
3638	1926784	44.23288
3638.25	2003474	45.99343
3638.5	2067309	47.45889
3638.75	2125679	48.79888
3639	2182011	50.09209
3639.25	2236686	51.34725
3639.5	2291662	52.60933
3639.75	2345585	53.84722
3640	2398258	55.05642



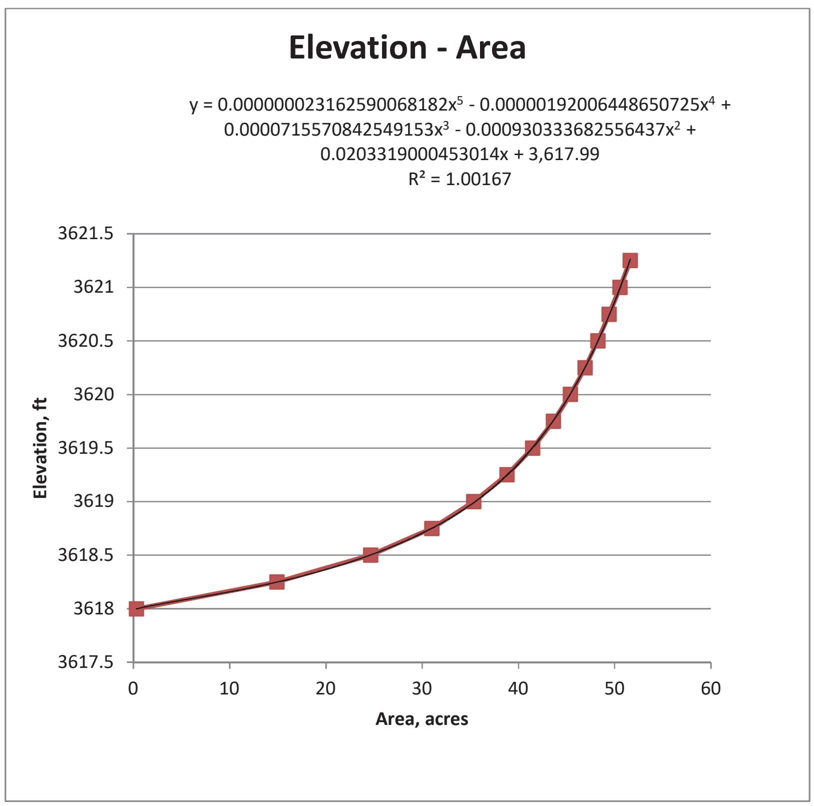
Middleton S Playa

Grid Z Min	3617.894		
Datalogger NA			2.3E-05
Datalogger NA			

Elevation - vol cu ft		vol ac ft
3618	339.4233	0.008
3618.25	74290.62	1.705
3618.5	294103.3	6.752
3618.75	599877.2	13.771
3619	962120.3	22.087
3619.25	1366944	31.381
3619.5	1804764	41.432
3619.75	2268589	52.080
3620	2753650	63.215
3620.25	3256542	74.760
3620.5	3774790	86.657
3620.75	4306705	98.868
3621	4851127	111.367
3621.25	5407404	124.137
3621.5	5975124	137.170
3621.75	6554055	150.460
3622	7144073	164.005
3622.25	7745211	177.806
3622.5	8357578	191.864
3622.75	8981217	206.180
3623	9616262	220.759



Elevation - area sq ft		area ac
3618	14715.96	0.337832
3618.25	649367.3	14.90742
3618.5	1074179	24.65975
3618.75	1350070	30.99335
3619	1540717	35.36999
3619.25	1690699	38.81312
3619.5	1807075	41.48472
3619.75	1900431	43.62789
3620	1977839	45.40494
3620.25	2043590	46.91437
3620.5	2101265	48.23841
3620.75	2153259	49.43203
3621	2201730	50.54476
3621.25	2248209	51.61178
3621.5	2293419	52.64965
3621.75	2337931	53.6715
3622	2382240	54.6887
3622.25	2426959	55.7153
3622.5	2471961	56.7484
3622.75	2517267	57.78849
3623	2563212	58.84324

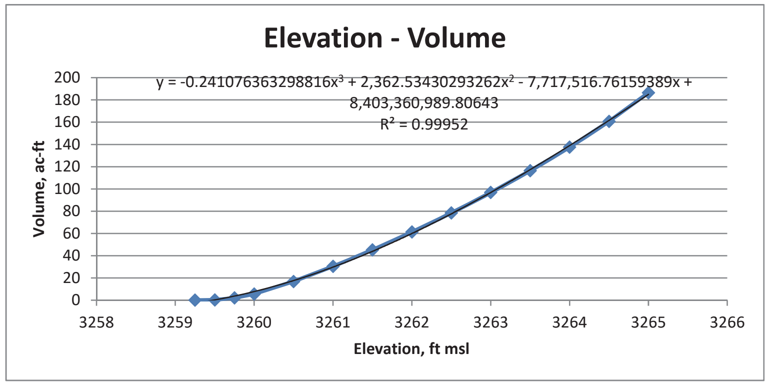


Minton North Area Volume Calcs

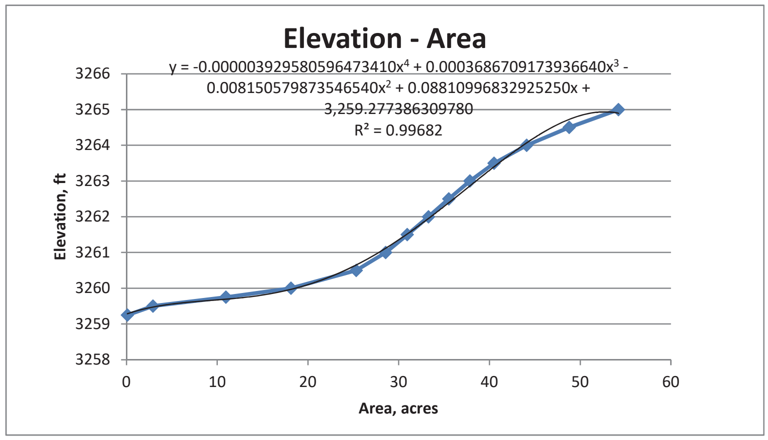
			Max flood depth, cm above GS	138.8	tot vol 2012-2014		168.3897
			max elev, ft	3263.834	2015 tot		241.4
Grid Z Min	3257.97	2.3E-05	water volume, ac ft	131.6912	48.64779	-38.483	43.3108

Datalogger Ground Surfac	3259.28
Datalogger	3258.03

Elevation - Volume	vol cu ft	vol ac ft
3258.75	696.8	0.016
3259	1445.297	0.03318
3259.25	2419.74705	0.05555
3259.5	13720.8505	0.31499
3259.75	90841.334	2.08543
3260	245271.077	5.63065
3260.5	733900.685	16.848
3261	1324270.73	30.4011
3261.5	1972637.03	45.2855
3262	2672052.28	61.3419
3262.5	3421172.96	78.5393
3263	4219527.45	96.867
3263.5	5071668.83	116.429
3264	5990195.52	137.516
3264.5	7002049.81	160.745
3265	8121802.32	186.451



Elevation - Area	area sq ft	area ac
3258.75	2499	0.05737
3259	3442	0.07902
3259.25	4380.04449	0.10055
3259.5	127017.24	2.91591
3259.75	476924.282	10.9487
3260	789331.999	18.1206
3260.5	1102427.81	25.3083
3261	1244139.03	28.5615
3261.5	1348013.3	30.9461
3262	1449639.88	33.2792
3262.5	1547143.06	35.5175
3263	1648315.84	37.8401
3263.5	1764552.65	40.5086
3264	1921275.56	44.1064
3264.5	2125063.8	48.7848
3265	2362023.7	54.2246

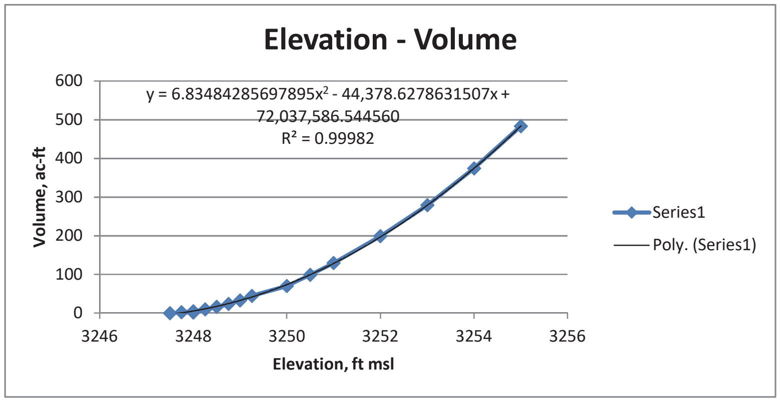


Minton South Area Volume Calcs

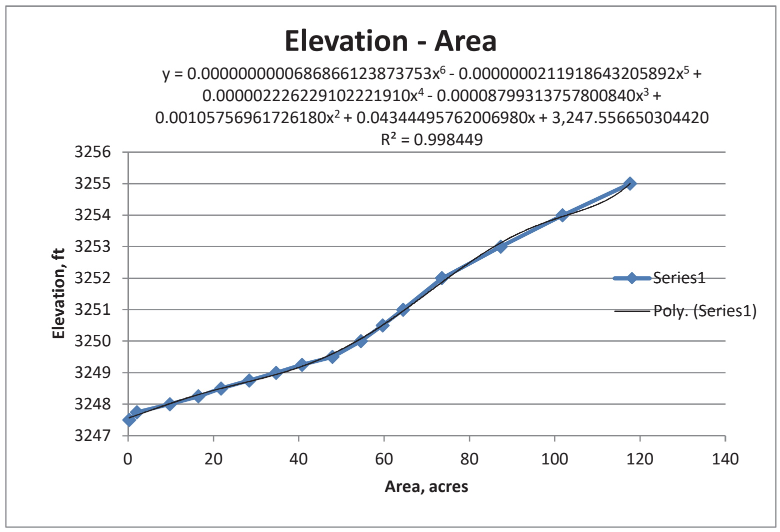
Max flood depth, cm	137		tot vol 2012-2014			297.3675
max elev, ft	3252.27					
water volume, ac ft	217.4869		15.94103	17.18065		106.4871

Grid Z Min	3245.705	vol ac ft
Datalogger Ground Surfa(	3247.775	
Datalogger	3247.775	

Elevation - Volume	vol cu ft	vol ac ft
3247.5	3415.45619	0.078408
3248	70038.6073	1.607865
3247.75	90108.9697	2.068617
3248	217128.727	4.98459
3248.25	425213	9.761547
3248.5	697975.301	16.02331
3248.75	1041615.58	23.9122
3249	1451088.17	33.3124
3249.25	1935259.3	44.42744
3250	3057146.08	70.18242
3250.5	4301308.35	98.74445
3251	5653346.22	129.783
3252	8654025.15	198.6691
3253	12159795.4	279.1505
3254	16280741.1	373.7544
3255	21057591.6	483.4158



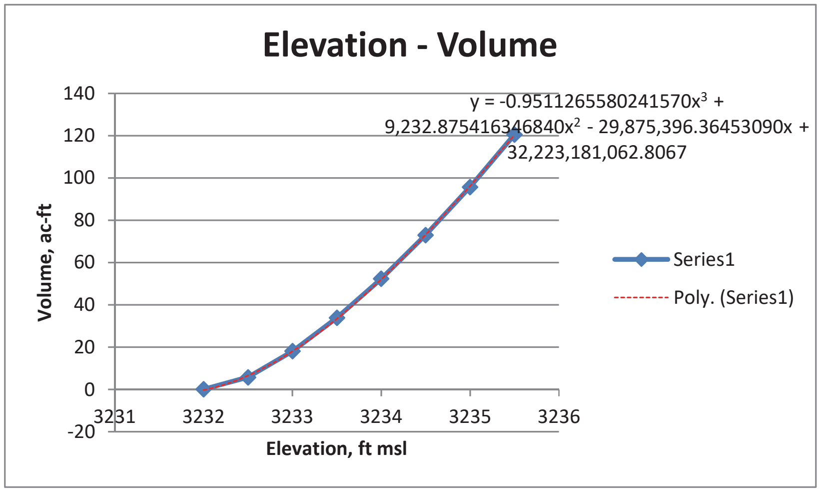
Elevation - Area	area sq ft	area ac
3247.5	11830.5834	0.271593
3247.75	90117.9129	2.068823
3248	425598.039	9.770387
3248.25	717471.667	16.47088
3248.5	948755.867	21.78044
3248.75	1235492.07	28.363
3249	1510244.19	34.67044
3249.25	1775469.64	40.75917
3249.5	2086091.31	47.89007
3250	2375328.67	54.53004
3250.5	2598061.09	59.64328
3251	2805905.52	64.41473
3252	3204146.6	73.55708
3253	3802864.32	87.30175
3254	4435963.1	101.8357
3255	5124000.92	117.6309

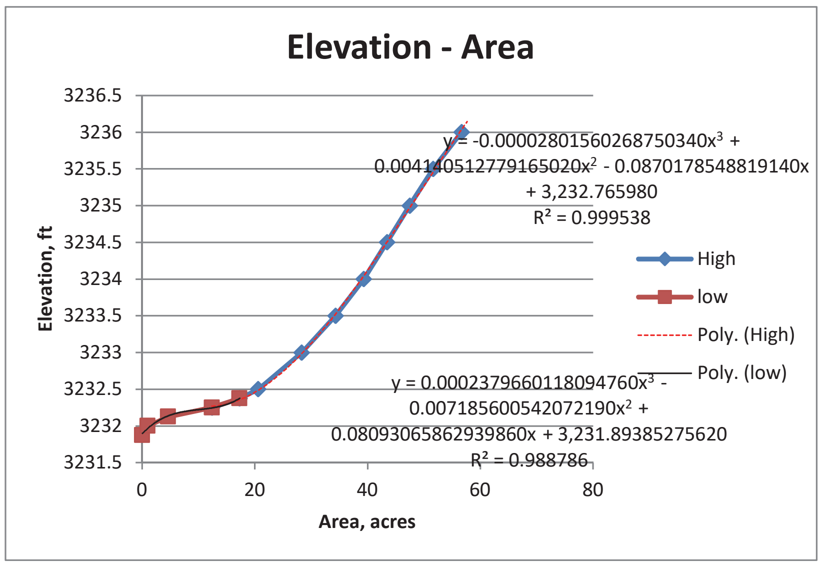


Max flood depth, cm	55.7	21.73
max elev,m	3233.955	1.827428
water volume, ac ft	50.27992	3.22E+10

Moore Area Volume Calcs

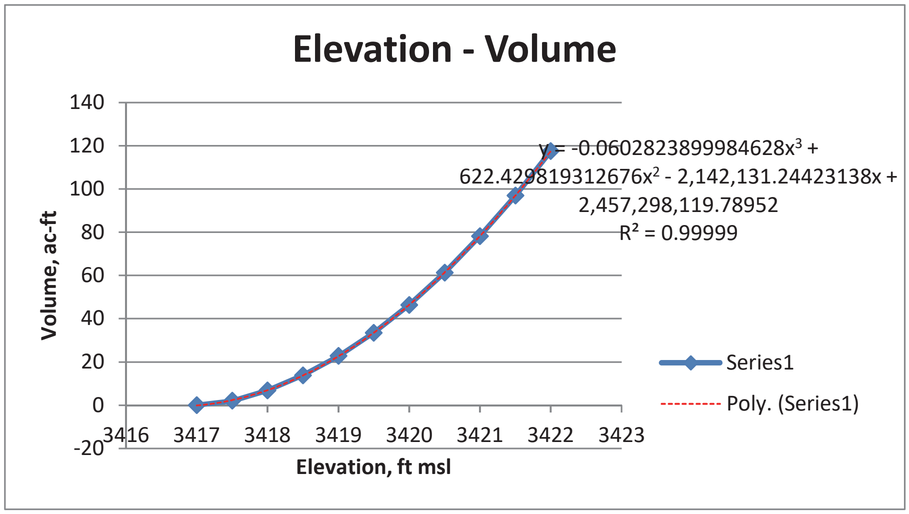
Grid Z Min	3230.563325	
Met Sta Ground Surf	3232.128	
Datalogger	3232.1	
Elevation	vol cu ft	vol ac ft
3231		
3231.5		
3232	5569.495473	0.127858
3232.5	251201.6076	5.766795
3233	788898.946	18.11063
3233.5	1473567.702	33.82846
3234	2279396.097	52.32773
3234.5	3181081.814	73.02759
3235	4170946.965	95.75177
3235.5	5249948.63	120.5222
3236	6427246.899	147.5493
Elevation	area sq ft	area ac
3231.875	2000	0.045914
3232	43273.89928	0.993432
3232.125	201087.628	4.616337
3232.25	539751.9801	12.391
3232.375	754236.9839	17.3149
3232.5	897488.9373	20.60351
3233	1232970.402	28.30511
3233.5	1494709.737	34.31381
3234	1713624.504	39.33941
3234.5	1892071.511	43.43599
3235	2067759.942	47.46924
3235.5	2250077.161	51.65466
3236	2468198.576	56.66204



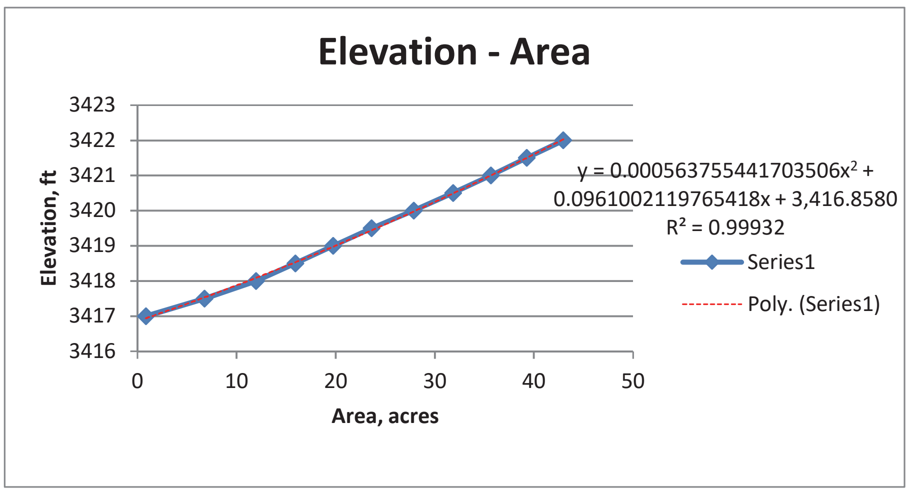


		Max flood depth, cm	122.9		
	Myatt resurvey	max elev, ft	3421.076	tot vol 2011-2014	2015 vol
Grid Z Min	3416.594667	water volume, ac ft	80.99718	70.848	108.3
Datalogger	3417.044				
Datalogger	3417.0				

Elevation	vol cu ft	vol ac ft
3417	1860.229766	0.042705
3417.5	90737.27182	2.083041
3418	300883.0296	6.907324
3418.5	602487.066	13.8312
3419	992791.358	22.79135
3419.5	1462329.924	33.57048
3420	2023558.523	46.45451
3420.5	2673273.987	61.36993
3421	3409052.357	78.26107
3421.5	4224575.823	96.98292
3422	5120254.522	117.5449



Elevation	area sq ft	area ac
3417	36701.64852	0.842554
3417.5	294082.7946	6.751212
3418	520159.3083	11.94121
3418.5	694204.0268	15.93673
3419	860152.7258	19.74639
3419.5	1028583.032	23.61302
3420	1214208.947	27.8744
3420.5	1387421.839	31.85082
3421	1552444.408	35.63922
3421.5	1710563.277	39.26913
3422	1871091.782	42.95436

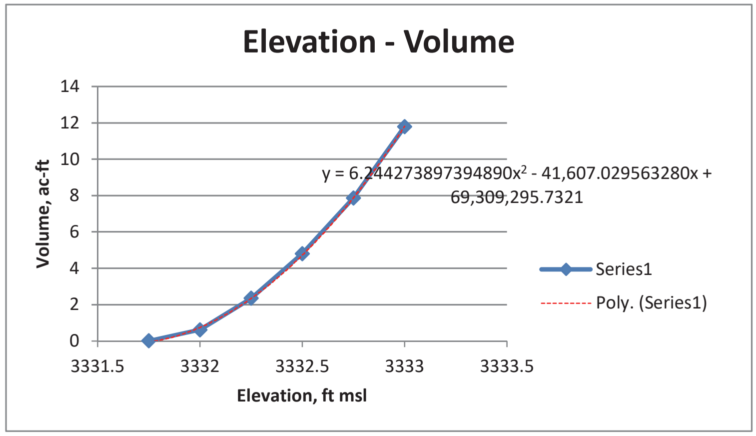


Obert No 2 (Center) Area Volume Calcs

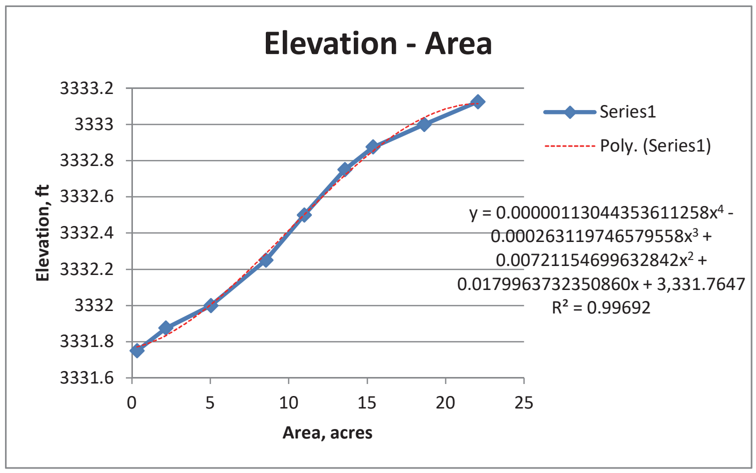
depth, cm	20.9	
elev ft	3332.535	
vol ac ft	5.111559	
tot vol	54.43	

Grid Z Min	3331.6576	
Datalogger Ground Surfac	3331.849	
Datalogger	3330.6	

Elevation - Volume	vol cu ft	vol ac ft
3331.75	534	0.012259
3332	26838	0.616116
3332.25	102531	2.353788
3332.5	209524	4.810009
3332.75	342695	7.867195
3333	513417	11.78643



Elevation - Area	area sq ft	area ac
3331.75	14115	0.324036
3331.875	94295.0642	2.164717
3332	219362	5.035859
3332.25	372293	8.546671
3332.5	479149	10.99975
3332.75	591480	13.57851
3332.875	670234.087	15.38646
3333	811640	18.63269
3333.125	961040.768	22.06246

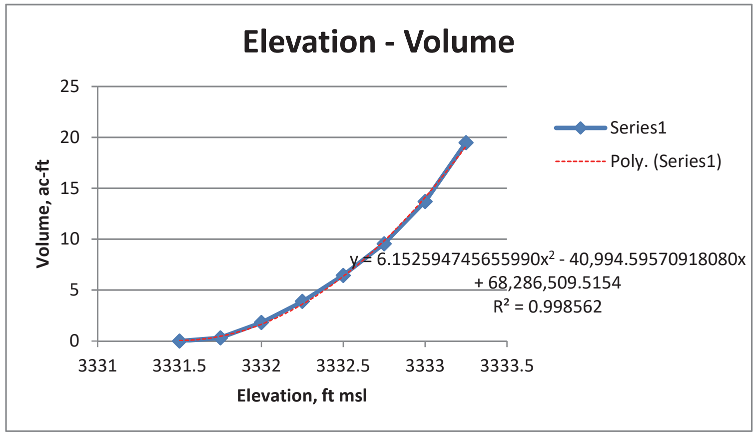


Obert No 1 (North) Area Volume Calcs

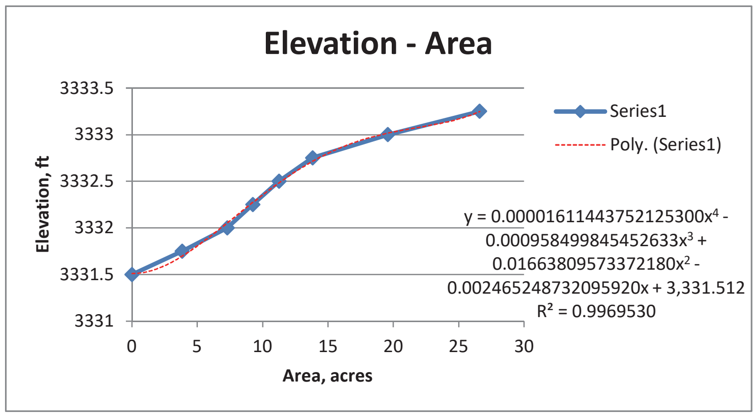
Grid Z Min	3331.4965
Datalogger Ground Surfac	3331.733
Datalogger	3331.7

depth, cm	61.2	
elev, ft	3333.741	
vol, ac ft	31.26625	
tot vol	60	

Elevation - Volume	vol cu ft	vol ac ft
3331.5	0.0161	3.7E-07
3331.75	14165	0.325184
3332	79230	1.818871
3332.25	169413	3.889187
3332.5	280780	6.445822
3332.75	416680	9.565657
3333	597161.897	13.70895
3333.25	848777.397	19.48525



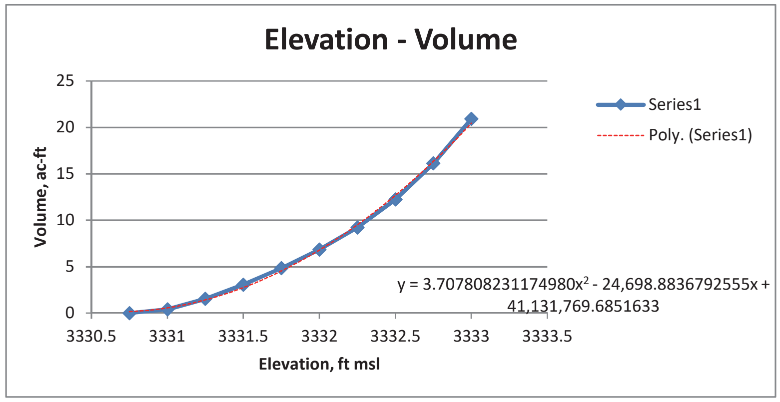
Elevation - Area	area sq ft	area ac
3331.5	13.66	0.000314
3331.75	167627	3.848186
3332	317482	7.288384
3332.25	402918	9.249725
3332.5	490450	11.25918
3332.75	602678	13.83558
3333	853313.079	19.58937
3333.25	1159205.18	26.61169



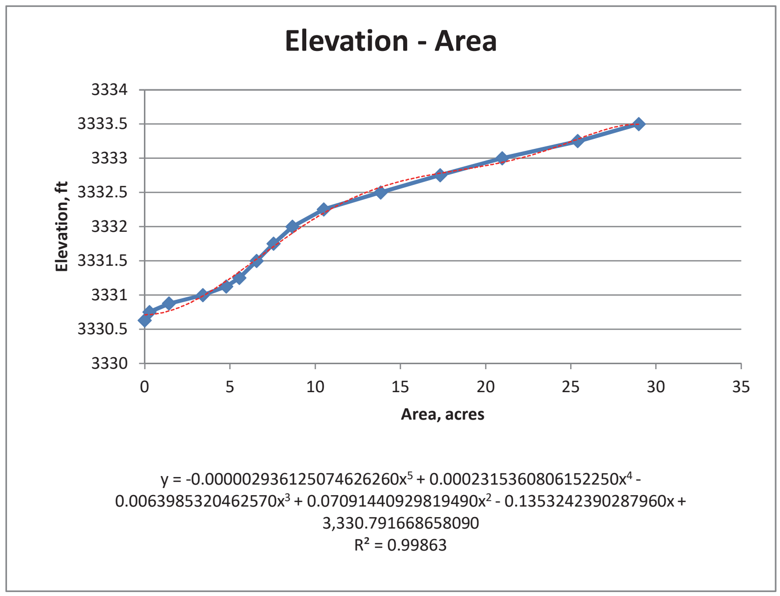
Obert No 3 (South) Area Volume Calcs

depth, ft	2.1		tot vol	36.27
elev	3333.082			
vol	21.90456			

Grid Z Min	3330.628	
Datalogger Ground Surfa(	3330.982	
Datalogger	3329.7	
Elevation - Volume	vol cu ft	vol ac ft
3330.75	299	0.006864
3331	17238	0.39573
3331.25	67964	1.560239
3331.5	133825	3.072199
3331.75	210593	4.83455
3332	298766	6.858724
3332.25	401404	9.214968
3332.5	533058	12.23733
3332.75	702868.459	16.13564
3333	911181.362	20.91785
3334	1290957.64	29.63631



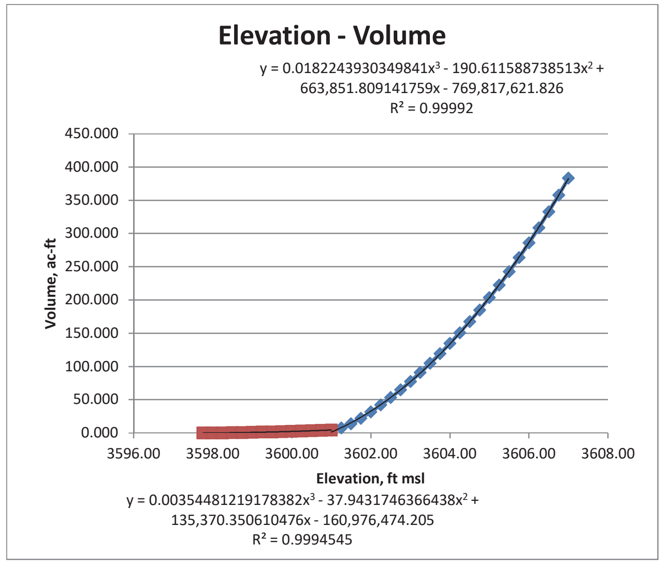
Elevation - Area	area sq ft	area ac
3330.628	0	0
3330.75	11672	0.267952
3330.875	61712.577	1.416726
3331	148688	3.413407
3331.125	208232.009	4.780349
3331.25	241244	5.5382
3331.5	285388	6.551607
3331.75	329152	7.55629
3332	377500	8.666208
3332.25	457277	10.49764
3332.5	602614	13.83411
3332.75	755031.27	17.33313
3333	913136.509	20.96273
3333.25	1106197.31	25.3948
3333.5	1262362.36	28.97985
3334	1290979.19	29.6368

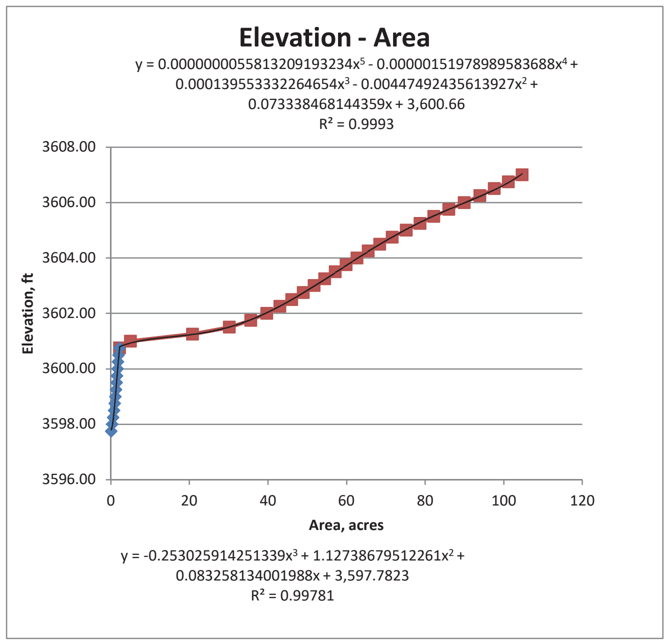


Pullum Playa

Grid Z Min 3597.528036
Datalogger NA 2.3E-05
Datalogger NA

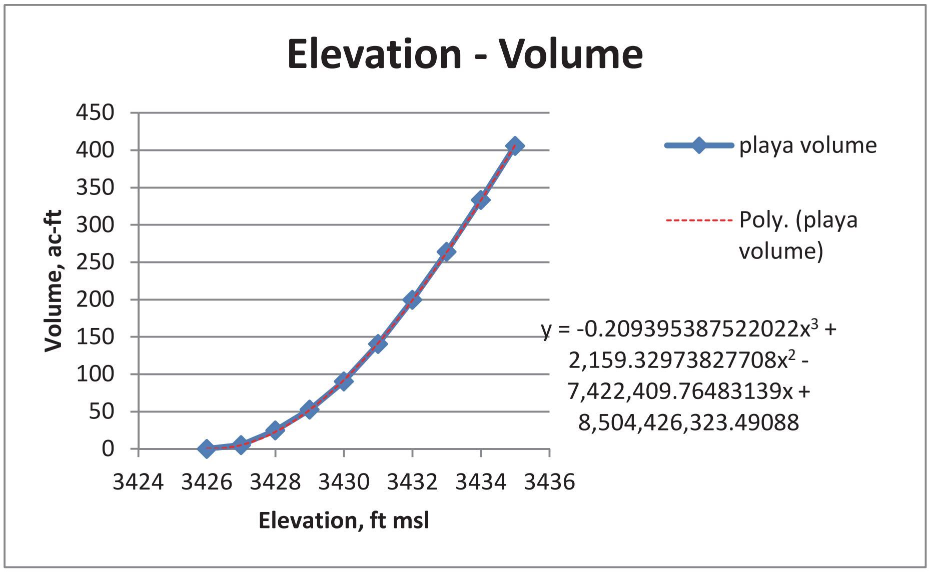
Elevation - vol cu ft		vol ac ft	Elevation - area sq ft		area ac
3597.75	394.0596229	0.009	3597.75	4687.97	0.107621
3598.00	2612.81141	0.060	3598.00	14882.85	0.341663
3598.25	7974.965073	0.183	3598.25	27105.26	0.622251
3598.50	15915.31716	0.365	3598.50	36318.65	0.833761
3598.75	26045.24418	0.598	3598.75	44498.31	1.021541
3599.00	38099.74786	0.875	3599.00	51782.22	1.188756
3599.25	51832.38378	1.190	3599.25	58029.57	1.332176
3599.50	67056.89764	1.539	3599.50	63769.29	1.463941
3599.75	83670.22064	1.921	3599.75	69241.62	1.589569
3600.00	101666.9962	2.334	3600.00	74905.38	1.719591
3600.25	121105.7929	2.780	3600.25	80784.47	1.854556
3600.50	142059.6564	3.261	3600.50	87346.2	2.005193
3600.75	165185.5335	3.792	3600.75	98391.58	2.25876
3601.00	196991.2527	4.522	3601.00	218090.2	5.006663
3601.25	331422.9699	7.608	3601.25	905103	20.77831
3601.50	612429.0796	14.059	3601.50	1312895	30.13991
3601.75	973729.3891	22.354	3601.75	1551504	35.61763
3602.00	1384671.375	31.788	3602.00	1729416	39.70193
3602.25	1835724.55	42.142	3602.25	1874497	43.03252
3602.50	2320950.038	53.282	3602.50	2006765	46.06899
3602.75	2838986.089	65.174	3602.75	2135622	49.02713
3603.00	3387722.458	77.771	3603.00	2254300	51.75161
3603.25	3965838.145	91.043	3603.25	2370967	54.4299
3603.50	4573133.686	104.985	3603.50	2489229	57.14483
3603.75	5210499.972	119.617	3603.75	2609261	59.90039
3604.00	5877652.677	134.932	3604.00	2729777	62.66706
3604.25	6575696.295	150.957	3604.25	2855341	65.5496
3604.50	7305239.546	167.705	3604.50	2982827	68.47628
3604.75	8068055.651	185.217	3604.75	3121682	71.66396
3605.00	8867397.219	203.567	3605.00	3274902	75.1814
3605.25	9705256.35	222.802	3605.25	3427155	78.67665
3605.50	10581253.74	242.912	3605.50	3583238	82.25982
3605.75	11497841.1	263.954	3605.75	3749960	86.08724
3606.00	12456177.56	285.954	3606.00	3918626	89.95927
3606.25	13457339.04	308.938	3606.25	4090777	93.91132
3606.50	14500113.85	332.877	3606.50	4253641	97.65016
3606.75	15582767.14	357.731	3606.75	4407078	101.1726
3607.00	16703352.18	383.456	3607.00	4559541	104.6726



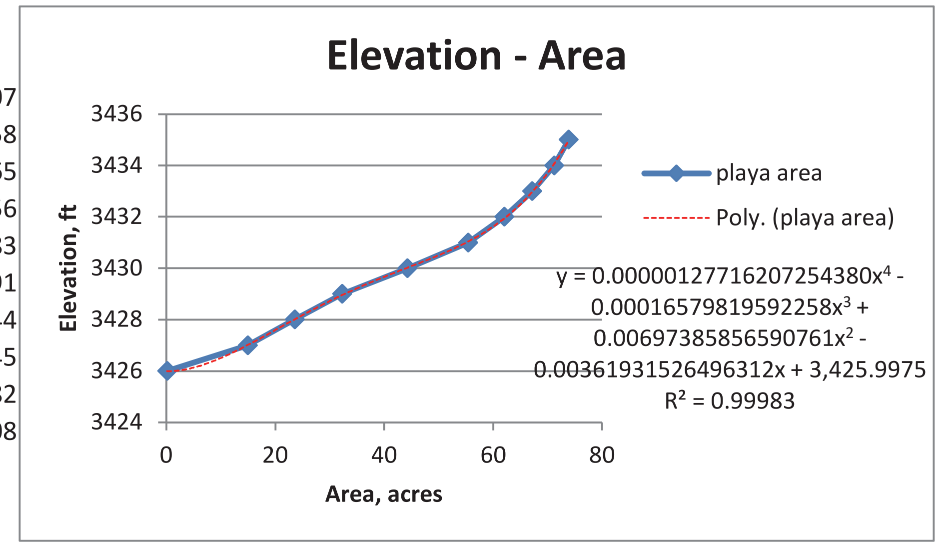


			Max flood depth, cm	113.3	tot vol 2011-2014		98.76959
Rieff N Resurvey			max elev, ft	3430.154	2015 vol		135.7
Grid Z Min	3424.201		water volume, ac ft	99.32505	43.90535	37.5728	17.29143
Datalogger Gr	3426.437						
Datalogger	3425.1						

Elevation	vol cu ft	vol ac ft
3426	3707.365	0.085109
3427	230567.6	5.293104
3428	1077682	24.74017
3429	2291642	52.60886
3430	3938014	90.40436
3431	6119003	140.473
3432	8686680	199.4187
3433	11503959	264.0946
3434	14523290	333.4089
3435	17681793	405.9181



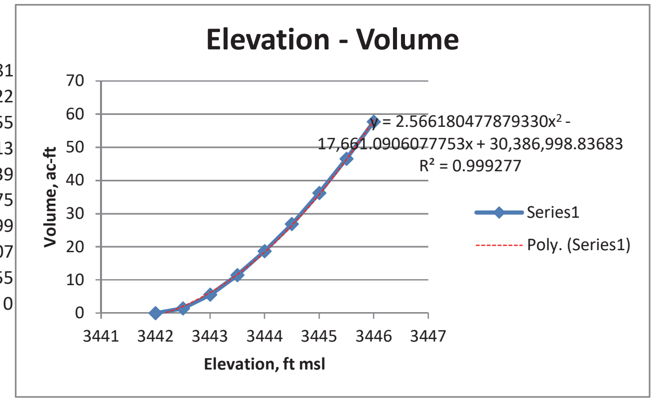
Elevation	Resurvey area sq ft	area ac
3426	6717.27	0.154207
3427	650724.4	14.93858
3428	1026557	23.5665
3429	1406361	32.2856
3430	1928394	44.26983
3431	2413185	55.3991
3432	2703440	62.06244
3433	2925509	67.16045
3434	3101247	71.19482
3435	3216561	73.84208



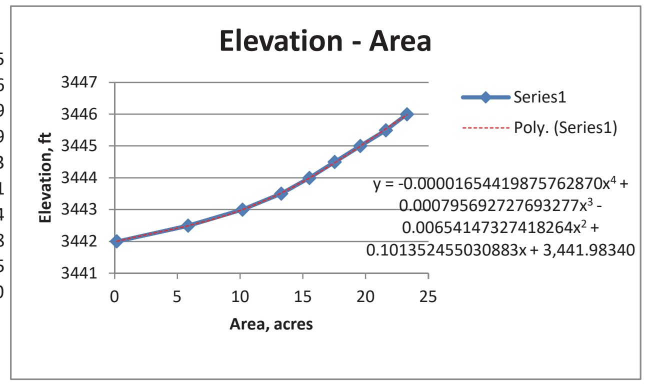
Rieff S Area Volume Calcs

Max flood depth, cm	80.6		tot vol 2011-2014			28.93037
max elev, ft	3444.767			2015 vol		44.5
water volume, ac ft	31.26998		6.196667	4.433369		8.822976

				resurvey	
Grid Z Min		3444.04961	Grid Z Min	3441.57	
Datalogger Ground Surfa(		3445.568	Datalogger	3442.123	
Datalogger		3444.2	Datalogger	3440.8	
Elevation	vol cu ft	vol ac ft	Elevation	vol cu ft	vol ac ft
3444			3442	1088.157	0.024981
3444.5	139	0.003191	3442.5	61263.76	1.406422
3445	2230	0.051194	3443	240950.2	5.531455
3445.5	52267	1.199885	3443.5	497983.4	11.43213
3446	215388	4.944628	3444	813543.5	18.67639
3446.5	451942	10.37516	3444.5	1172450	26.91575
3447	745080	17.10468	3445	1576480	36.19099
3447.5	1088891	24.9975	3445.5	2025107	46.49007
3448	1483528	34.05712	3446	2514087	57.7155
3448.5	1934513	44.41031			0



				resurvey	
Elevation	area sq ft	area ac	Elevation	area sq ft	area ac
3444			3442	7780.478	0.178615
3444.5	1048	0.024059	3442.5	255380.8	5.862736
3445	13278	0.304821	3443	444172	10.19679
3445.5	233421	5.358609	3443.5	578385.1	13.2779
3446	407913	9.364394	3444	675312.2	15.50303
3446.5	532826	12.232	3444.5	762975.5	17.51551
3447	638027	14.64708	3445	852225.5	19.5644
3447.5	737238	16.92466	3445.5	941174	21.60638
3448	843118	19.35533	3446	1014602	23.29205
3448.5	962589	22.098			0

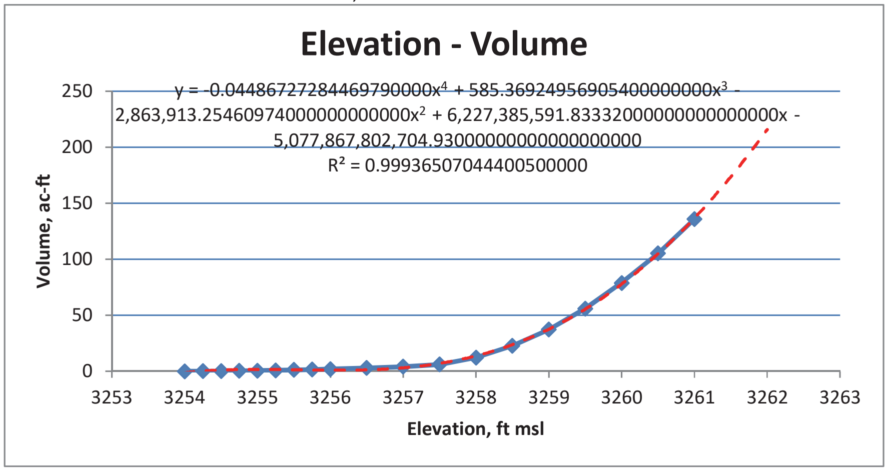


depth, cm	172.2		tot vol 2012-2014
elevation, ft	3259.153		
volume, ac ft	42.57031		
vol, lo	41.51563		

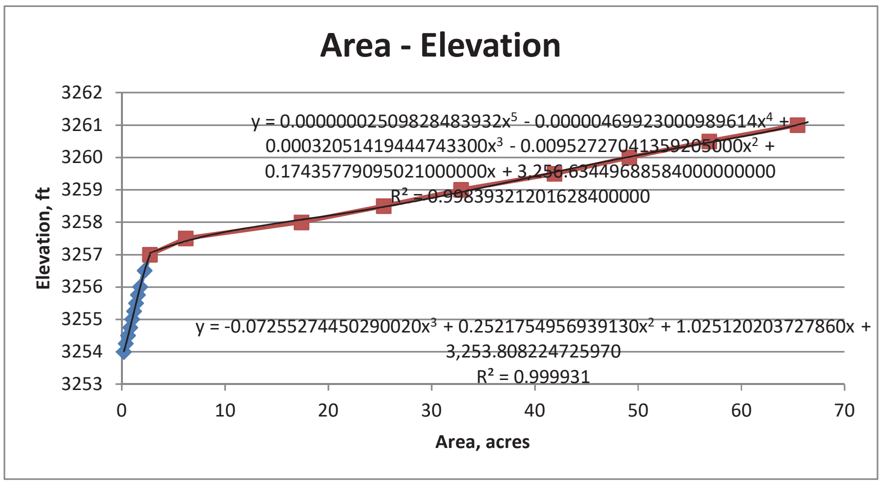
Schacht N playa (datalogger in pit)

	ac/ft^2	2.3E-05
Met station ground surface		3294.143
Grid Z min		3253.55

Elevation -	vol cu ft	vol ac ft
3254	1144.912717	0.026284
3254.25	4240.792375	0.097355
3254.5	9618.514451	0.220811
3254.75	17297.38191	0.397093
3255	27153.52937	0.623359
3255.25	38946.76807	0.894095
3255.5	52779.6692	1.211654
3255.75	68700.73364	1.577152
3256	86748.1626	1.991464
3256.5	129763.1432	2.978952
3257	182983.1407	4.200715
3257.5	264933.0607	6.082026
3258	525703.8576	12.0685
3258.5	992151.6356	22.77667
3259	1626822.236	37.3467
3259.5	2440403.498	56.02396
3260	3434520.751	78.84575
3260.5	4588574.074	105.3392
3261	5919046.19	135.8826



Elevation -	area sq ft	area ac
3254	7963.301966	0.182812
3254.25	16891.42461	0.387774
3254.5	26131.72413	0.599902
3254.75	35261.16666	0.809485
3255	43355.48424	0.995305
3255.25	51184.77901	1.175041
3255.5	59526.39423	1.366538
3255.75	67926.07205	1.559368
3256	76635.97206	1.75932
3256.5	95768.13006	2.198534
3257	118195.1136	2.713386
3257.5	270158.0926	6.201976
3258	758968.8694	17.42353
3258.5	1105750.664	25.38454
3259	1431452.613	32.86163
3259.5	1825578.33	41.90951
3260	2141970.644	49.17288
3260.5	2478743.56	56.90412
3261	2851060.021	65.45133

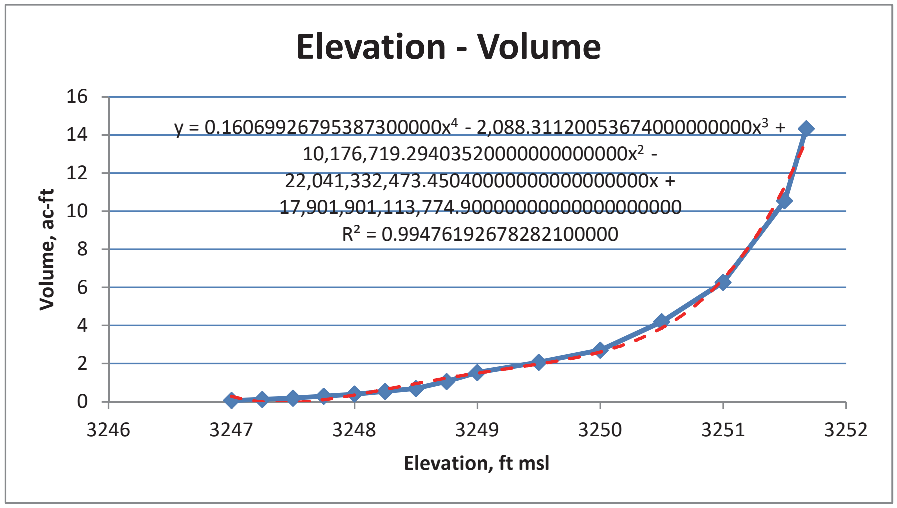


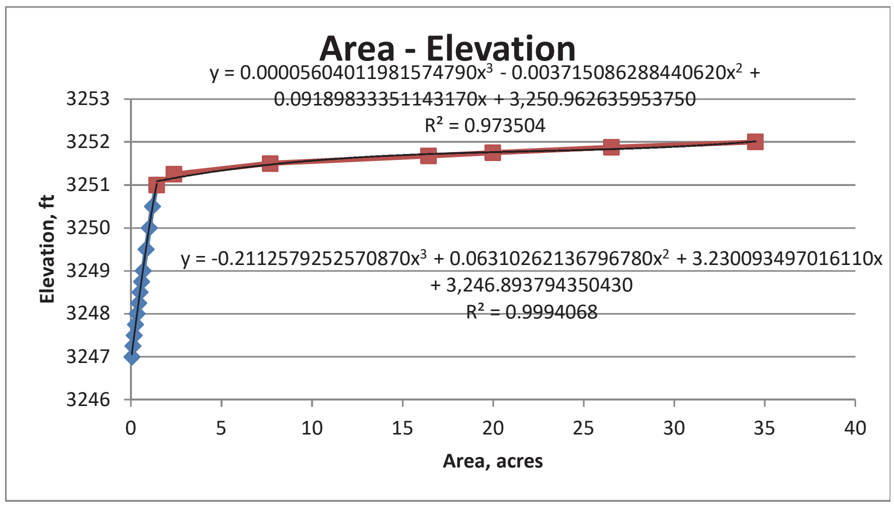
Schacht S playa (no datalogger in pit)

	ac/ft^2	2.3E-05
Met station ground surface		
Grid Z min		3246.275

Elevation -	vol cu ft	vol ac ft
3247	547.7143	0.012574
3247.25	1364.171	0.031317
3247.5	2883.398	0.066194
3247.75	5221.147	0.119861
3248	8417.031	0.193228
3248.25	12519.5	0.287408
3248.5	17552.31	0.402946
3248.75	23493.78	0.539343
3249	30323.52	0.696132
3249.5	46661.26	1.071195
3250	66629.46	1.529602
3250.5	90310.4	2.073241
3251	118176.4	2.712957
3251.5	183449.9	4.211431
3251.675	273170.5	6.271132
3251.875	459198.3	10.54174
3252	624059.9	14.32644

Elevation -	area sq ft	area ac
3247	2198.757	0.050477
3247.25	4557.327	0.104622
3247.5	7710.073	0.176999
3247.75	11088.22	0.254551
3248	14612.97	0.335468
3248.25	18356.72	0.421412
3248.5	22058.64	0.506397
3248.75	25662.7	0.589135
3249	29221.92	0.670843
3249.5	36456.36	0.836923
3250	43798.91	1.005485
3250.5	51489.17	1.182029
3251	62262.39	1.429348
3251.25	103720.7	2.381099
3251.5	335897.3	7.711141
3251.675	716228	16.44233
3251.75	870772.7	19.99019
3251.875	1156664	26.55334
3252	1502792	34.49936





Stokes playa W of 1424 between CR 135 and CR 145, Hale CO
surveyed 9/17/13

2.3E-05

input units = feet

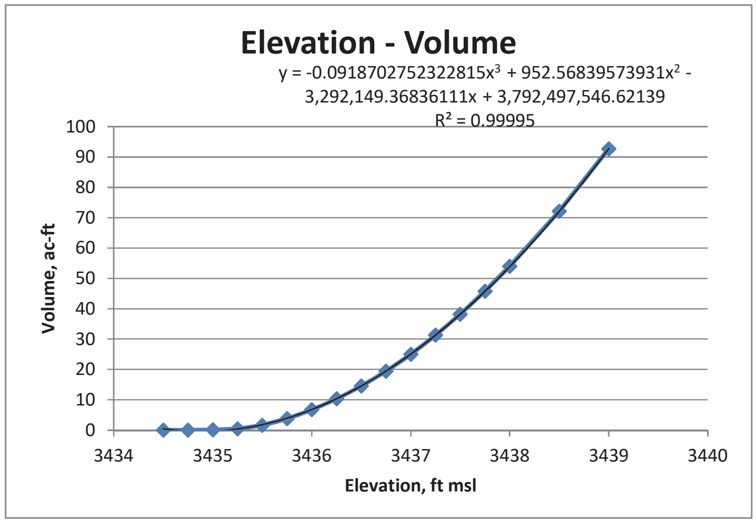
Grid Z Min 3433.740803

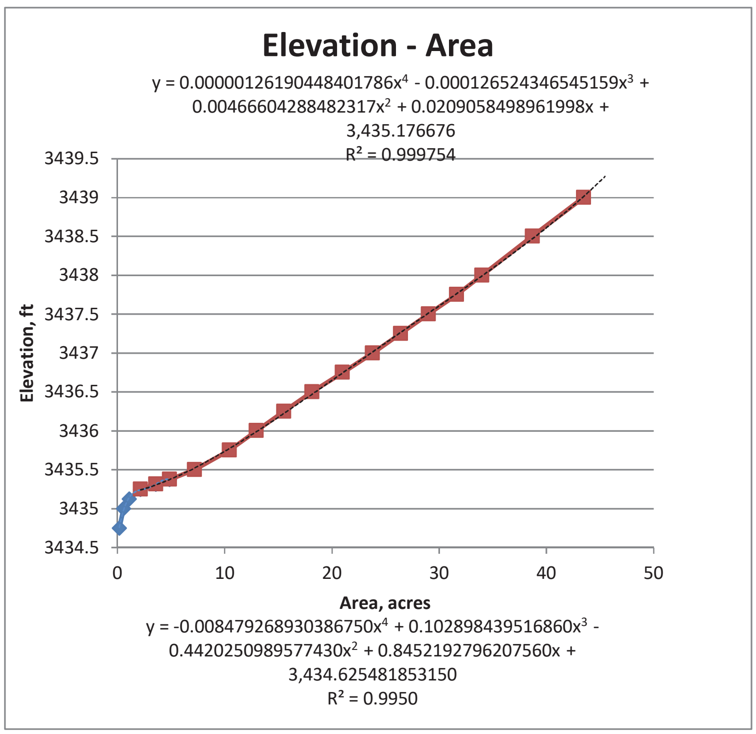
Datalogger NA

Datalogger NA

Elevation -	vol cu ft	vol ac ft
3434.5	1027.449792	0.023587
3434.75	2379.587678	0.054628
3435	5462.987916	0.125413
3435.25	18171.48143	0.41716
3435.5	70634.22271	1.621539
3435.75	167182.4342	3.837981
3436	295042.6188	6.773247
3436.25	449967.4242	10.32983
3436.5	633089.4814	14.53373
3436.75	845980.8056	19.42105
3437	1089900.118	25.02066
3437.25	1363009.571	31.29039
3437.5	1664911.991	38.22112
3437.75	1995440.976	45.80902
3438	2352530.134	54.00666
3438.5	3143303.953	72.16033
3439	4038550.827	92.71237

Elevation -	area sq ft	area ac
3434.5	3673.072613	0.084322
3434.75	7614.261147	0.174799
3435	24062.24526	0.552393
3435.125	48525.64655	1.113996
3435.25	93724.81022	2.151626
3435.313	156119.4105	3.584008
3435.375	211382.4956	4.852674
3435.5	313590.9463	7.199058
3435.75	454955.3863	10.44434
3436	564456.8695	12.95815
3436.25	675614.1601	15.50997
3436.5	790219.6768	18.14095
3436.75	913414.2306	20.96911
3437	1035679.778	23.77594
3437.25	1150072.562	26.40203
3437.5	1263265.817	29.00059
3437.75	1377052.852	31.61278
3438	1479612.275	33.96722
3438.5	1685303.264	38.68924
3439	1892854.54	43.45396





Stokes playa at corner of CR 135 and CR 140, Hale CO
surveyed 9/17/13

2.3E-05

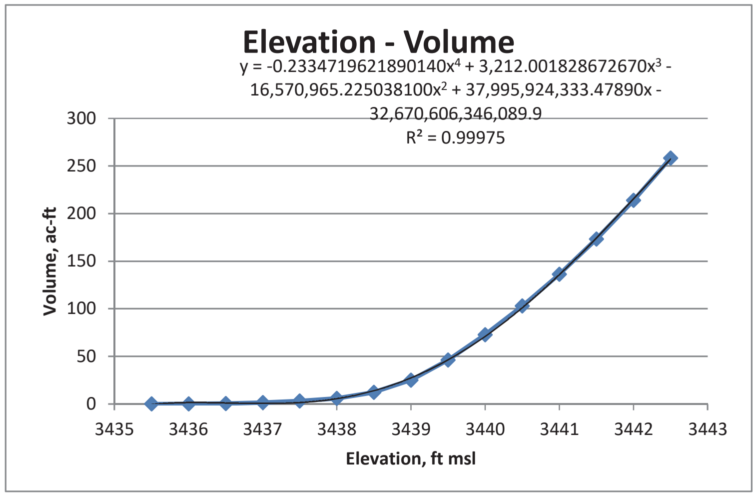
input units = feet

Grid Z Min 3435.02597

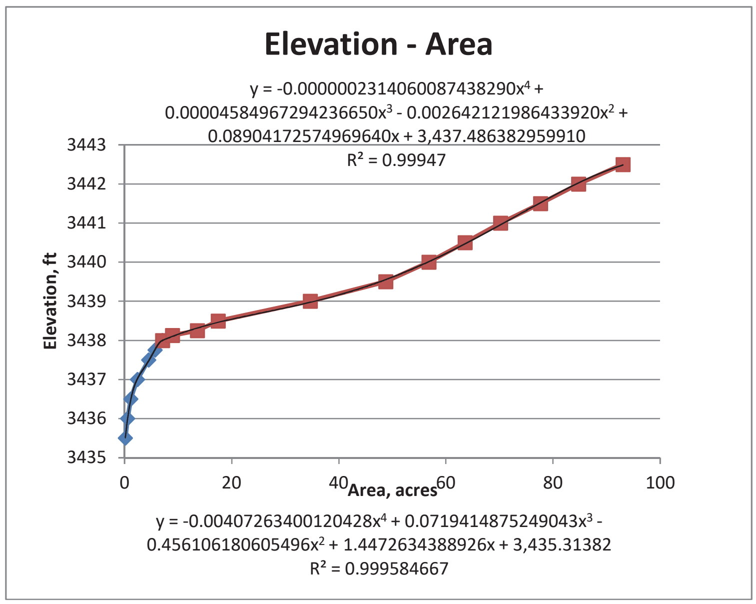
Datalogger G NA

Datalogger NA

Elevation - Vo	vol cu ft	vol ac ft
3435.5	1225.910421	0.028143
3436	8233.634419	0.189018
3436.5	25530.9125	0.586109
3437	64681.53095	1.484884
3437.5	138546.5933	3.180592
3438	263277.778	6.044026
3438.5	540461.2997	12.40728
3439	1095917.501	25.1588
3439.5	2016190.315	46.28536
3440	3171498	72.80758
3440.5	4482450.789	102.9029
3441	5938125.022	136.3206
3441.5	7545327.554	173.2169
3442	9315672.315	213.8584
3442.5	11255598.33	258.393



Elevation - Ar	area sq ft	area ac
3435.5	6296.596457	0.14455
3436	23943.06726	0.549657
3436.5	50986.73389	1.170494
3437	105320.6468	2.417829
3437.5	195544.0327	4.489073
3437.75	248303.1029	5.700255
3438	308803.2522	7.089147
3438.125	389081.2994	8.932078
3438.25	591401.204	13.5767
3438.5	760845.4978	17.46661
3439	1508801.569	34.63732
3439.5	2123146.571	48.74074
3440	2473664.403	56.78752
3440.5	2768742.414	63.56158
3441	3056769.734	70.17378
3441.5	3381599.018	77.63083
3442	3692615.509	84.77079
3442.5	4051942.278	93.0198



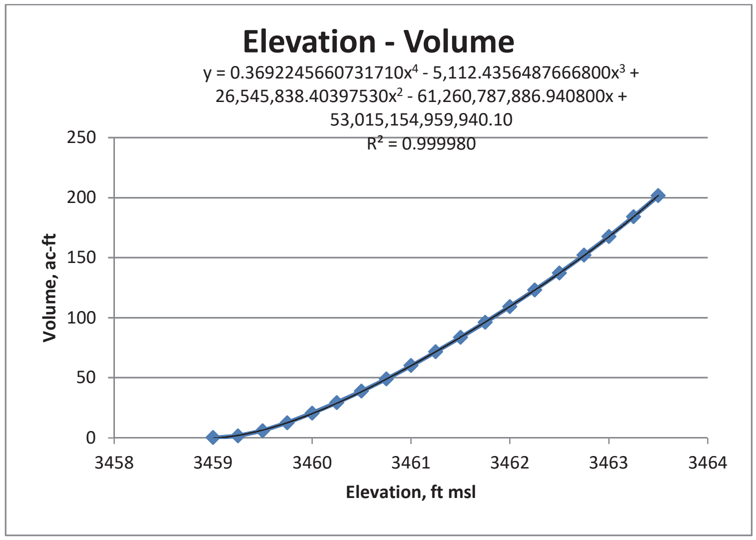
Stokes playa on south side of FM 1071, Hale CO
surveyed 10/31/13

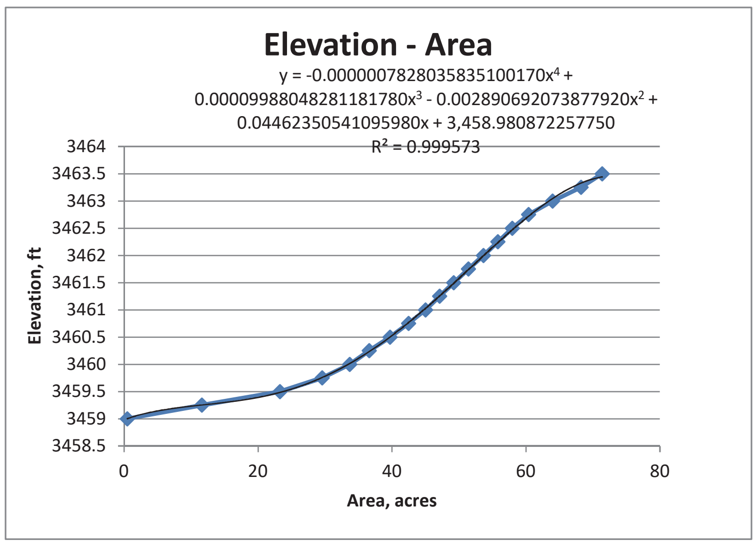
2.3E-05

input units = feet

Grid Z Min	3458.532992	
Datalogger G	NA	
Datalogger	NA	
Elevation - Vo	vol cu ft	vol ac ft
3459	4460.956041	0.102409
3459.25	66860.78822	1.534912
3459.5	258013.6298	5.923178
3459.75	545906.8501	12.5323
3460	892806.2224	20.49601
3460.25	1275720.013	29.2865
3460.5	1691577.722	38.83328
3460.75	2138980.972	49.10425
3461	2615942.75	60.05378
3461.25	3117683.79	71.57217
3461.5	3642127.86	83.61175
3461.75	4189954.026	96.18811
3462	4761899.739	109.3182
3462.25	5358010.297	123.003
3462.5	5977400.987	137.2222
3462.75	6621376.901	152.0059
3463	7296464.368	167.5038
3463.25	8018886.323	184.0883
3463.5	8779109.528	201.5406

Elevation - Ar	area sq ft	area ac
3459	20287.22056	0.46573
3459.25	506502.287	11.62769
3459.5	1012613.945	23.24642
3459.75	1287642.274	29.5602
3460	1467789.828	33.69582
3460.25	1594342.645	36.60107
3460.5	1730348.613	39.72334
3460.75	1850838.639	42.48941
3461	1959624.33	44.98678
3461.25	2052770.204	47.12512
3461.5	2143435.113	49.2065
3461.75	2238831.407	51.3965
3462	2337068.751	53.65172
3462.25	2430905.274	55.80591
3462.5	2525047.25	57.96711
3462.75	2630164.413	60.38027
3463	2786347.321	63.96573
3463.25	2972039.59	68.22864
3463.5	3109604.748	71.3867

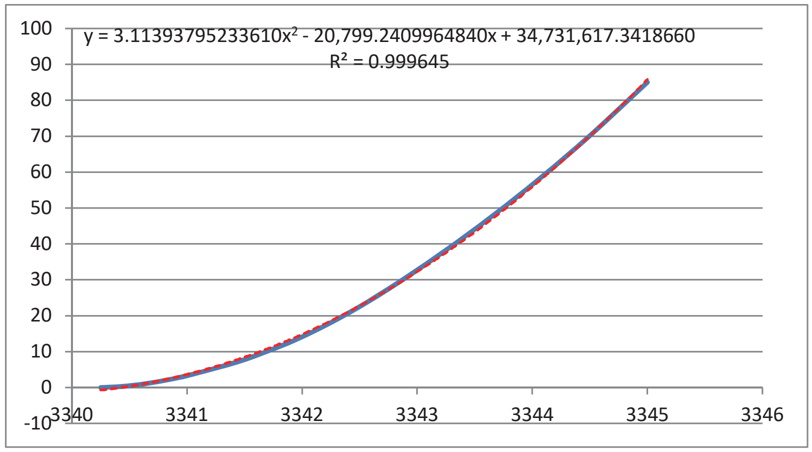




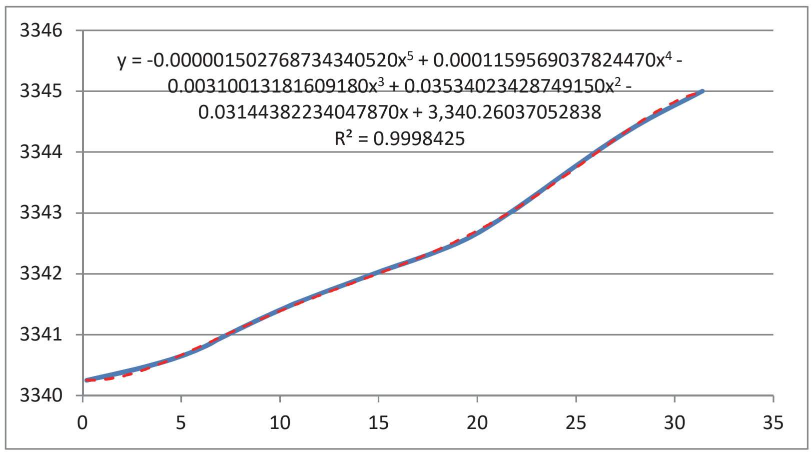
SWCROP East playa

	ac/ft^2	2.3E-05
Met station ground surface		
Grid Z min		3340.067

Elevation -	vol cu ft	vol ac ft
3340.25	374.3888	0.008595
3340.5	20551	0.471786
3340.75	72157	1.656497
3341	143886.5188	3.30318
3341.5	339501.0287	7.793871
3342	615083.7793	14.12038
3342.5	980800.6229	22.51608
3343	1425721.691	32.73007
3343.5	1920839.265	44.0964
3344	2462896.894	56.54033
3344.5	3054740.08	70.12718
3345	3704935.195	85.05361



Elevation -	area sq ft	area ac
3340.25	9232.385596	0.211946
3340.5	152965	3.511593
3340.75	253086.2584	5.810061
3341	319692.2432	7.339124
3341.5	464879.4248	10.67216
3342	643144.2199	14.76456
3342.5	826407.5113	18.97171
3343	942409.8097	21.63475
3343.5	1037036.151	23.80707
3344	1132208.418	25.99193
3344.5	1238083.799	28.42249
3345	1367606.865	31.39593

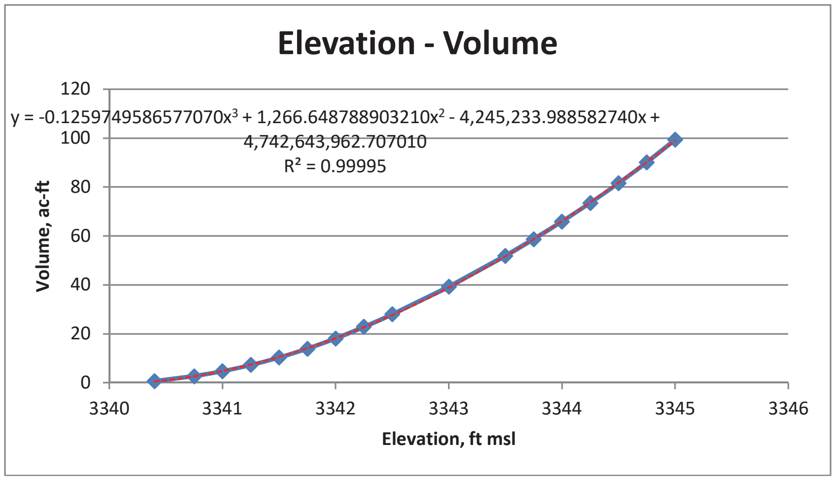


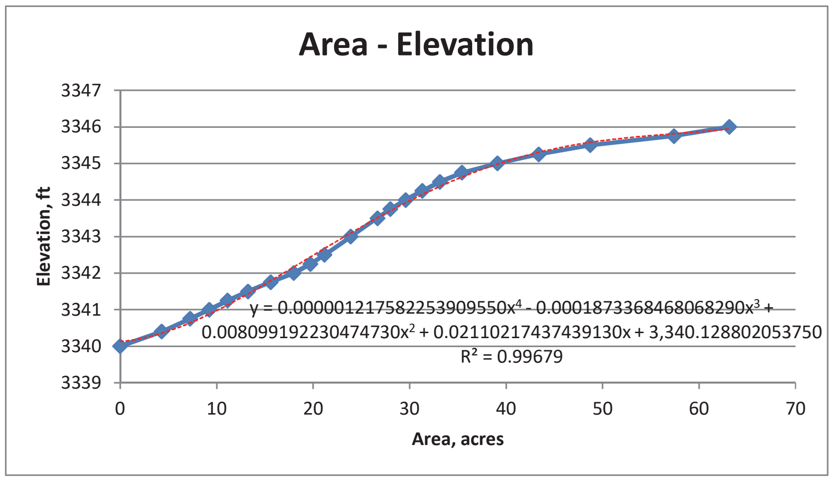
SWCROP playa

	ac/ft^2	2.3E-05
Met station ground surface		3340.404
Grid Z min		3339.987

Elevation - Volume	vol cu ft	vol ac ft
3340.4	28174.26	0.646792
3340.75	115518.4	2.651937
3341	205754.6	4.723476
3341.25	316863.1	7.274176
3341.5	449282.9	10.31412
3341.75	606151.7	13.91533
3342	788914	18.11097
3342.25	994626	22.83347
3342.5	1217485	27.94962
3343	1708379	39.21899
3343.5	2258686	51.8523
3343.75	2556334	58.68536
3344	2869751	65.88041
3344.25	3201110	73.48737
3344.5	3552442	81.55284
3344.75	3924381	90.09138
3345	4328354	99.36533
3345.5	5278820	
3346	6423073	

Elevation - Area	area sq ft	area ac	
3340	0	0	
3340.4	187327.2	4.300441	
3340.75	315005.7	7.231537	
3341	402906.3	9.249455	
3341.25	485317.3	11.14135	
3341.5	576817.1	13.2419	
3341.75	679311.2	15.59484	
3342	783796.2	17.99349	
3342.25	859242.3	19.72549	
3342.5	922569	21.17927	
3343	1040078	23.87691	
3343.5	1161674	26.66837	
3343.75	1220285	28.01389	
3344	1288447	29.57868	
3344.25	1364470	31.32391	
3344.5	1443664	33.14196	
3344.75	1543070	35.42402	
3345	1703295	39.10227	
3345.25	1889965	43.38763	
3345.5	2122017	48.71481	
3345.75	2500000	57.3921	estimate
3346	2750000	63.13131	estimate





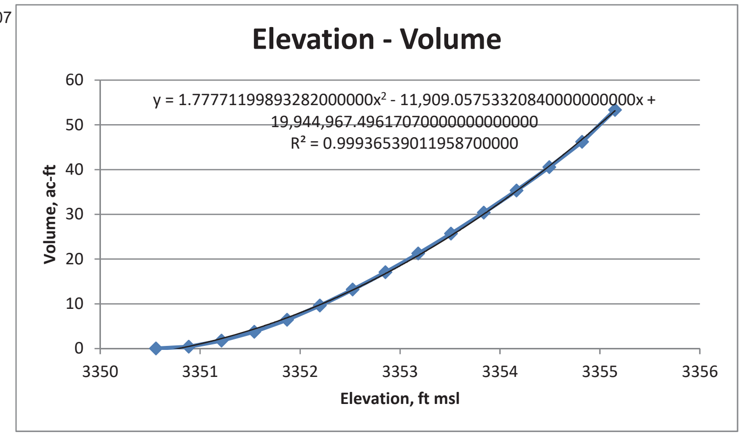
SWCRP playa revised grid w added points on E side to accommodate max flooding area

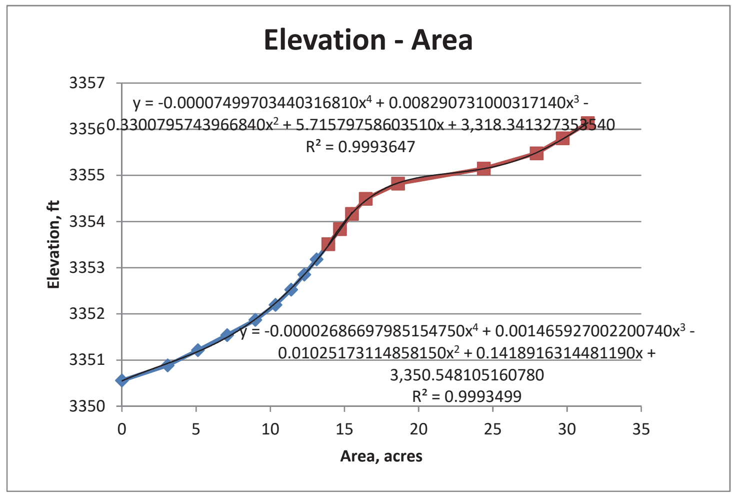
input units = meters

Grid Z Min		1021.248	0.000247
Datalogger Ground Surface		1021.25	0.0008107
Datalogger		1021.25	

Elevation - Volume	elev, ft	vol m^3	vol ac ft
1021.25	3350.558	0.05477832	4.44095E-05
1021.35	3350.886	500.922957	0.406104851
1021.45	3351.214	2170.00788	1.759254016
1021.55	3351.542	4632.98806	3.756024551
1021.65	3351.87	7919.27287	6.420259004
1021.75	3352.198	11849.4663	9.606518669
1021.85	3352.526	16260.4078	13.18252711
1021.95	3352.854	21059.5897	17.07328725
1022.05	3353.183	26203.835	21.24379477
1022.15	3353.511	31674.5108	25.67894378
1022.25	3353.839	37463.7302	30.37234038
1022.35	3354.167	43573.3455	35.32548613
1022.45	3354.495	50030.7186	40.56056369
1022.55	3354.823	56992.1459	46.20428466
1022.65	3355.151	65784.437	53.33231103
1022.75	3355.479	76472.1595	61.9969887
1022.85	3355.807	88177.2556	71.48646451
1022.95	3356.135	100527.275	81.49878828

Elevation - Area		area m^2	area ac
1021.25	3350.558	22.2736261	0.005503928
1021.35	3350.886	12498.1657	3.088361274
1021.45	3351.214	20741.6113	5.125359235
1021.55	3351.542	28713.7024	7.095304111
1021.65	3351.87	36420.1806	8.99961467
1021.75	3352.198	41916.6011	10.35780854
1021.85	3352.526	46160.4462	11.40648459
1021.95	3352.854	49759.7673	12.2958954
1022.05	3353.183	53099.5365	13.12116961
1022.15	3353.511	56318.2083	13.91652003
1022.25	3353.839	59481.5034	14.6981866
1022.35	3354.167	62770.7108	15.51096674
1022.45	3354.495	66505.5898	16.43387462
1022.55	3354.823	75337.7072	18.61633643
1022.65	3355.151	98726.4844	24.39582401
1022.75	3355.479	113110.081	27.95008511
1022.85	3355.807	120248.423	29.71400607
1022.95	3356.135	127079.228	31.4019333



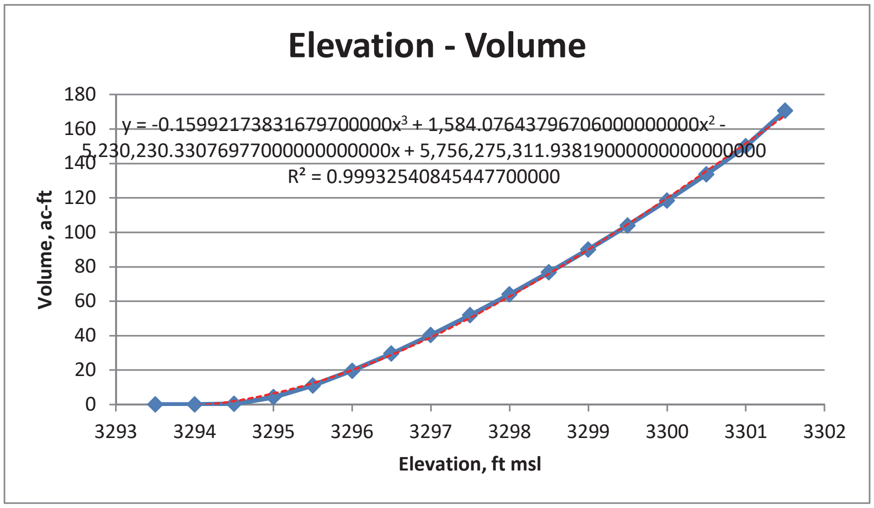


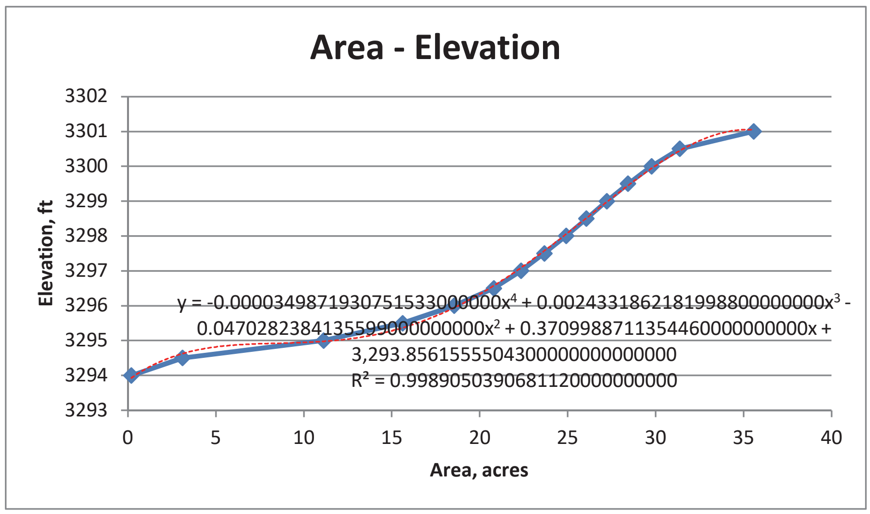
Swisher Range playa

	ac/ft^2	2.3E-05
Met station ground surfac		3294.143
Grid Z min		3293.23

Elevation -	vol cu ft	vol ac ft
3293.5	179	0.004109
3294	2564.974538	0.058884
3294.5	19787.28433	0.454254
3295	189539.0254	4.351217
3295.5	483811.7812	11.10679
3296	857316.8155	19.68129
3296.5	1287948.053	29.56722
3297	1758391.124	40.36711
3297.5	2259661.282	51.87468
3298	2788807.645	64.02221
3298.5	3343891.582	76.76519
3299	3923944.83	90.08138
3299.5	4529635.666	103.9861
3300	5163054.366	118.5274
3300.5	5828016.586	133.7929
3301	6535958.416	150.045
3301.5	7434948.706	170.6829

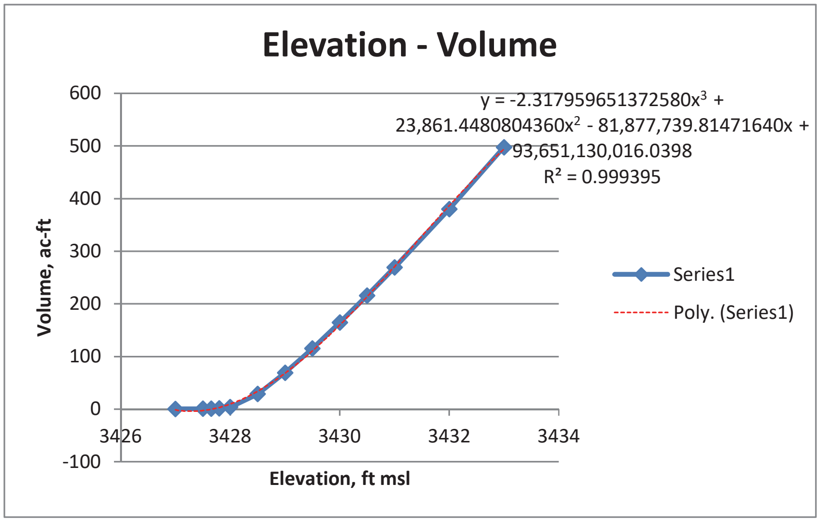
Elevation -	area sq ft	area ac
3293.5	1693	0.038866
3294	8712.49937	0.200011
3294.5	135228.5353	3.10442
3295	484331.6358	11.11872
3295.5	680101.7916	15.61299
3296	807575.0834	18.53937
3296.5	906140.8188	20.80213
3297	973226.736	22.34221
3297.5	1031142.308	23.67177
3298	1085084.03	24.9101
3298.5	1135385.677	26.06487
3299	1185537.308	27.21619
3299.5	1238444.507	28.43077
3300	1296955.028	29.77399
3300.5	1366436.985	31.36908
3301	1549527.837	35.57226
3301.5	1953727.587	44.85141



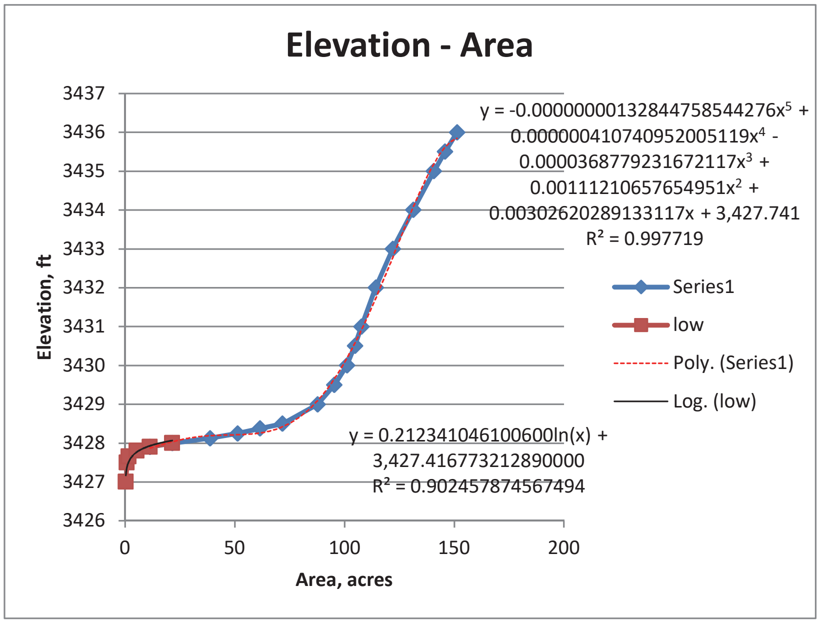


Max flood depth, cm	262
max elev,ft	3435.811
water volume, ac ft	632.0284

Wright Area Volume Calcs

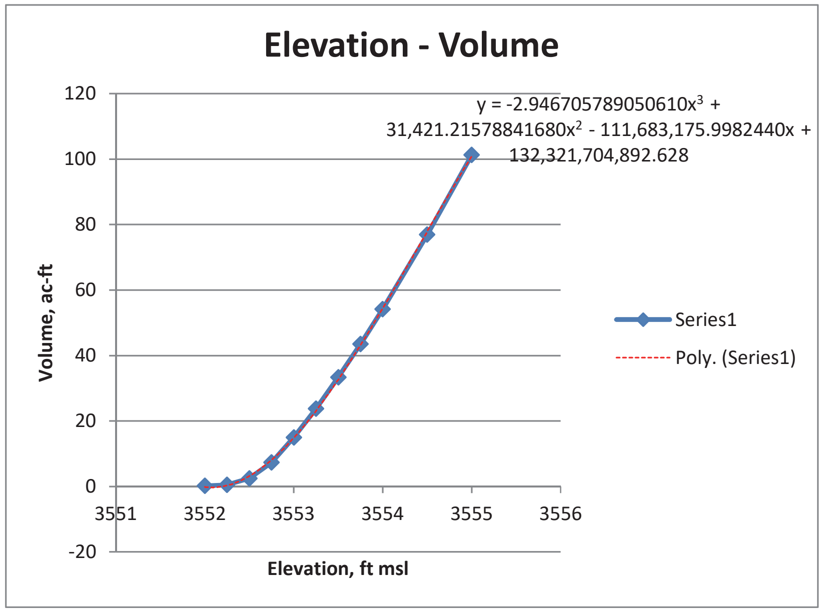


Grid Z Min	3423.560705	
Met Sta Ground Surf	3427.215	
Datalogger	3427.2	
Elevation	vol cu ft	vol ac ft
3427	20704.94569	0.47532
3427.5	31732.22388	0.728472
3427.65	39531.42928	0.907517
3427.8	59724.09582	1.371077
3428	164723.4707	3.781531
3428.5	1249266.039	28.6792
3429	3018281.278	69.2902
3429.5	5016014.39	115.1518
3430	7158849.255	164.3446
3430.5	9404519.991	215.8981
3431	11718506.8	269.0199
3432	16541332.26	379.7367
3433	21681140.01	497.7305
3434	27192923.81	624.2636
3435	33105940.23	760.0078
3435.5	36226419.52	831.6442
3436	39461129.75	905.9029
Elevation	area sq ft	area ac
3427	13461.14819	0.309025
3427.5	37487.42659	0.860593
3427.65	72029.12934	1.653561
3427.8	234288.7121	5.378529
3427.9	492844.67	11.31416
3428	936256.9806	21.4935
3428.125	1685593.869	38.69591
3428.25	2233097.005	51.26485
3428.375	2676525.034	61.44456
3428.5	3125950.935	71.76196
3429	3820863.495	87.71496
3429.5	4153333.812	95.34742
3430	4404443.371	101.1121
3430.5	4563534.468	104.7643
3431	4694008.71	107.7596
3432	4975422.87	114.22
3433	5313550.489	121.9823
3434	5719525.938	131.3022
3435	6129128.723	140.7054
3435.5	6353409.703	145.8542
3436	6590608.189	151.2995

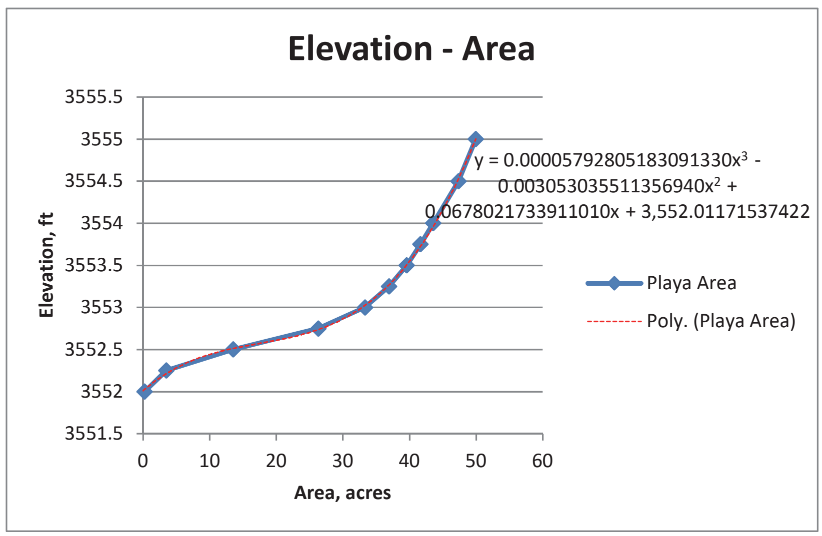


Younger Area Volume Calcs

Grid Z Min	3549.339322	
Met Sta Ground Surf	3552.824	
Datalogger	3552.8	
Elevation	vol cu ft	vol ac ft
3552	9734.745142	0.223479
3552.25	20730.67483	0.475911
3552.5	107759.2152	2.473811
3552.75	319769.4402	7.340896
3553	651303.028	14.95186
3553.25	1034112.354	23.73995
3553.5	1451421.862	33.32006
3553.75	1893964.151	43.47943
3554	2357629.68	54.12373
3554.5	3350061.617	76.90683
3555	4410636.57	101.2543
		0
		0
		0



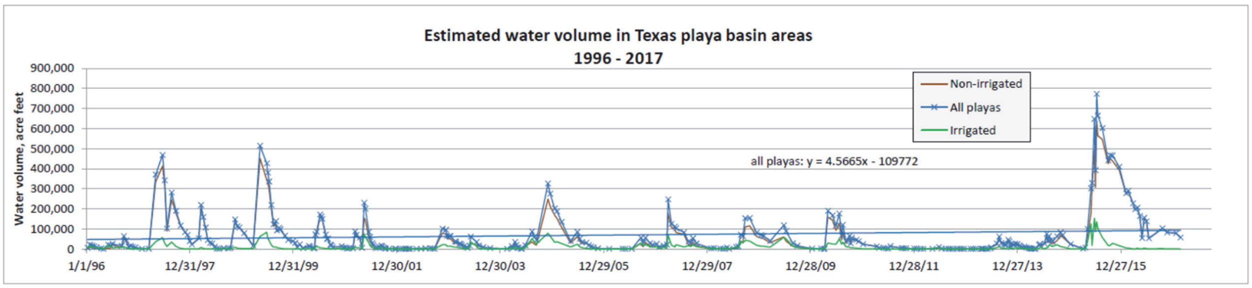
Elevation	area sq ft	area ac
3552	9050.167161	0.207763
3552.25	150842.1216	3.462859
3552.5	590186.3098	13.54881
3552.75	1145360.64	26.29386
3553	1450892.946	33.30792
3553.25	1607868.948	36.91159
3553.5	1724073.058	39.57927
3553.75	1813736.482	41.63766
3554	1897774.31	43.5669
3554.5	2063430.382	47.36984
3555	2175913.687	49.9521
		0
		0



Attachment 2. Playa water level records from Landsat observations

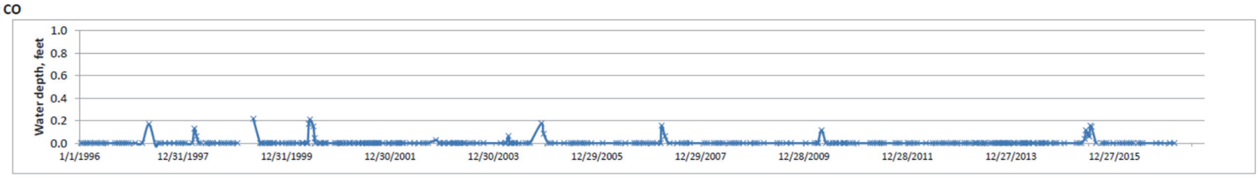
Attachment 2. Playa water level records from Landsat observations

All Sites

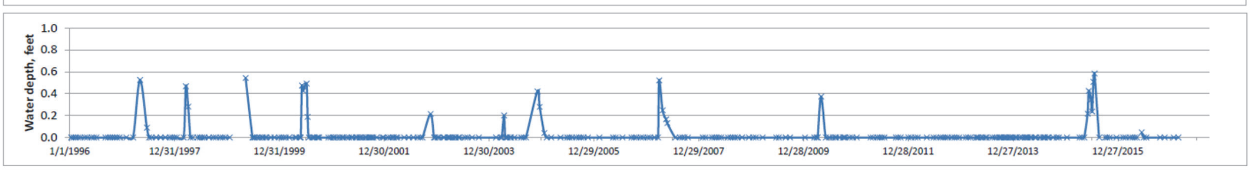


Armstrong CO

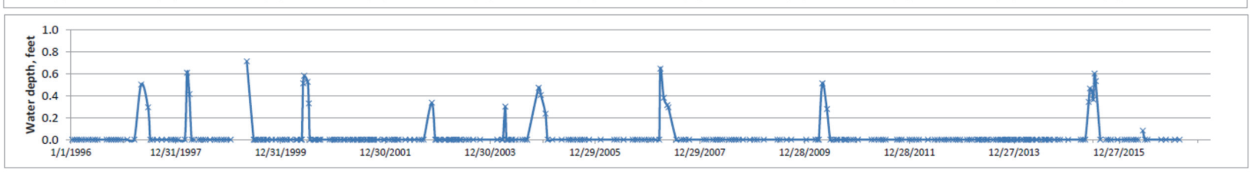
BVN A



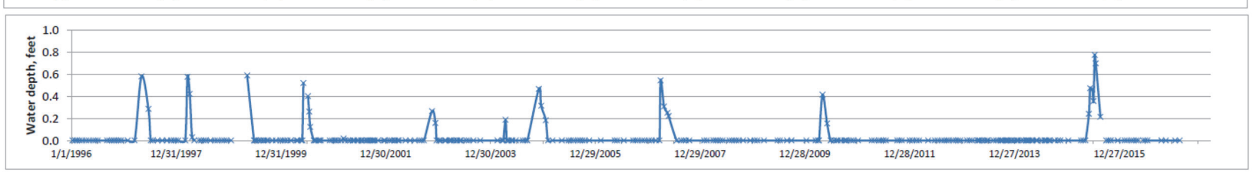
BVN B



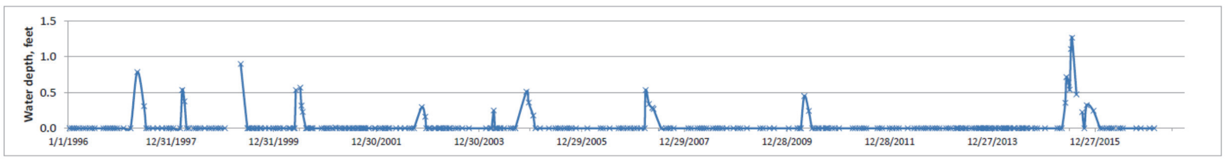
BVN C



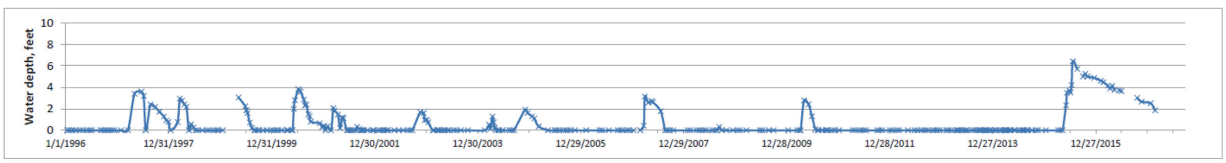
BVN D



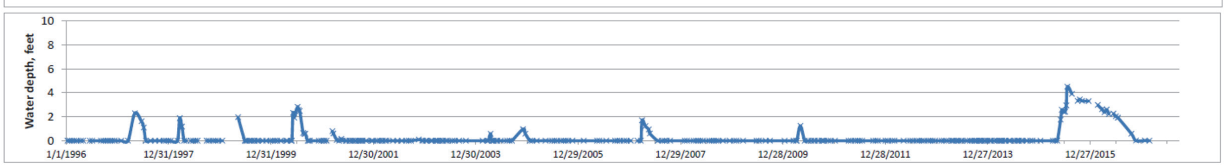
BVN E



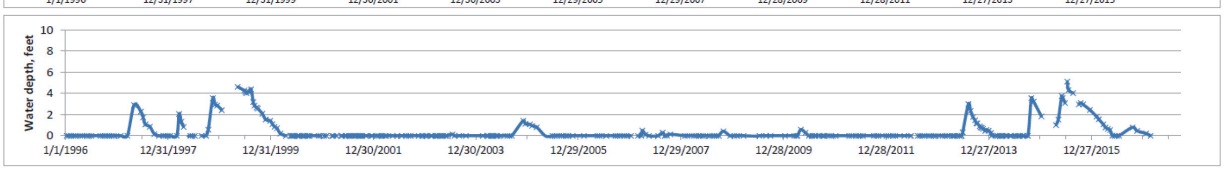
BVN N



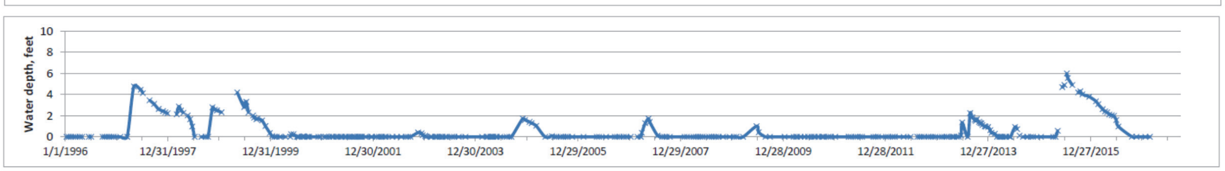
BVN S



DRRT

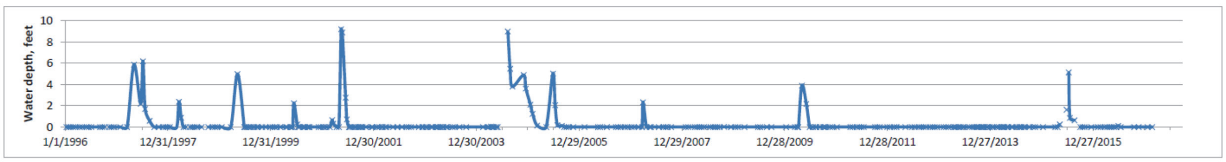


FNLY

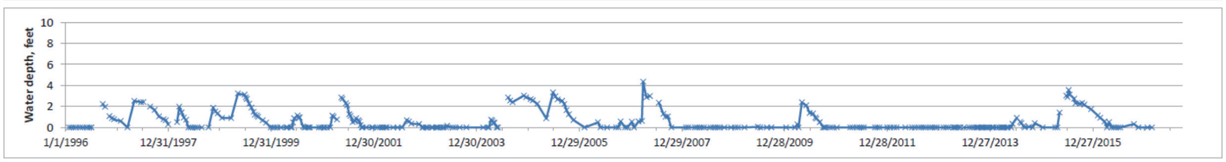


Briscoe CO

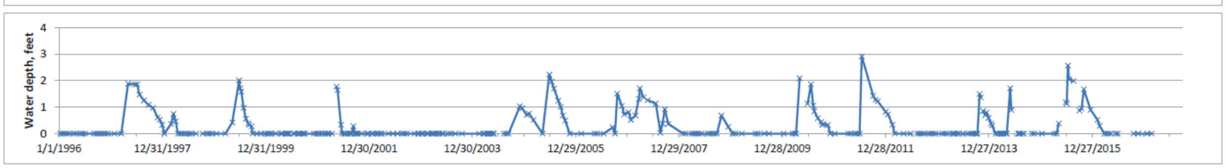
BRCRP



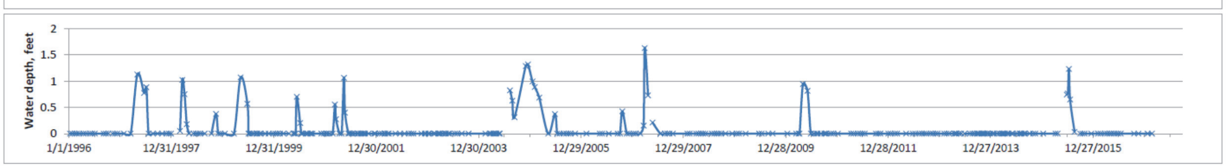
BRRNG



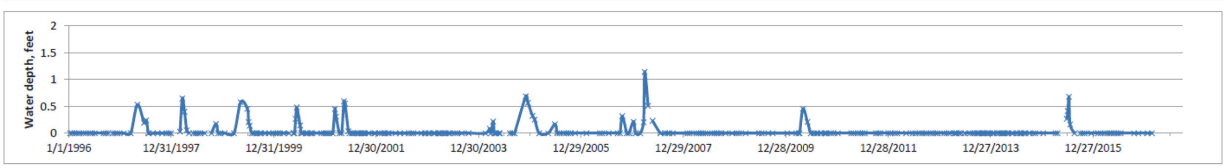
MRE

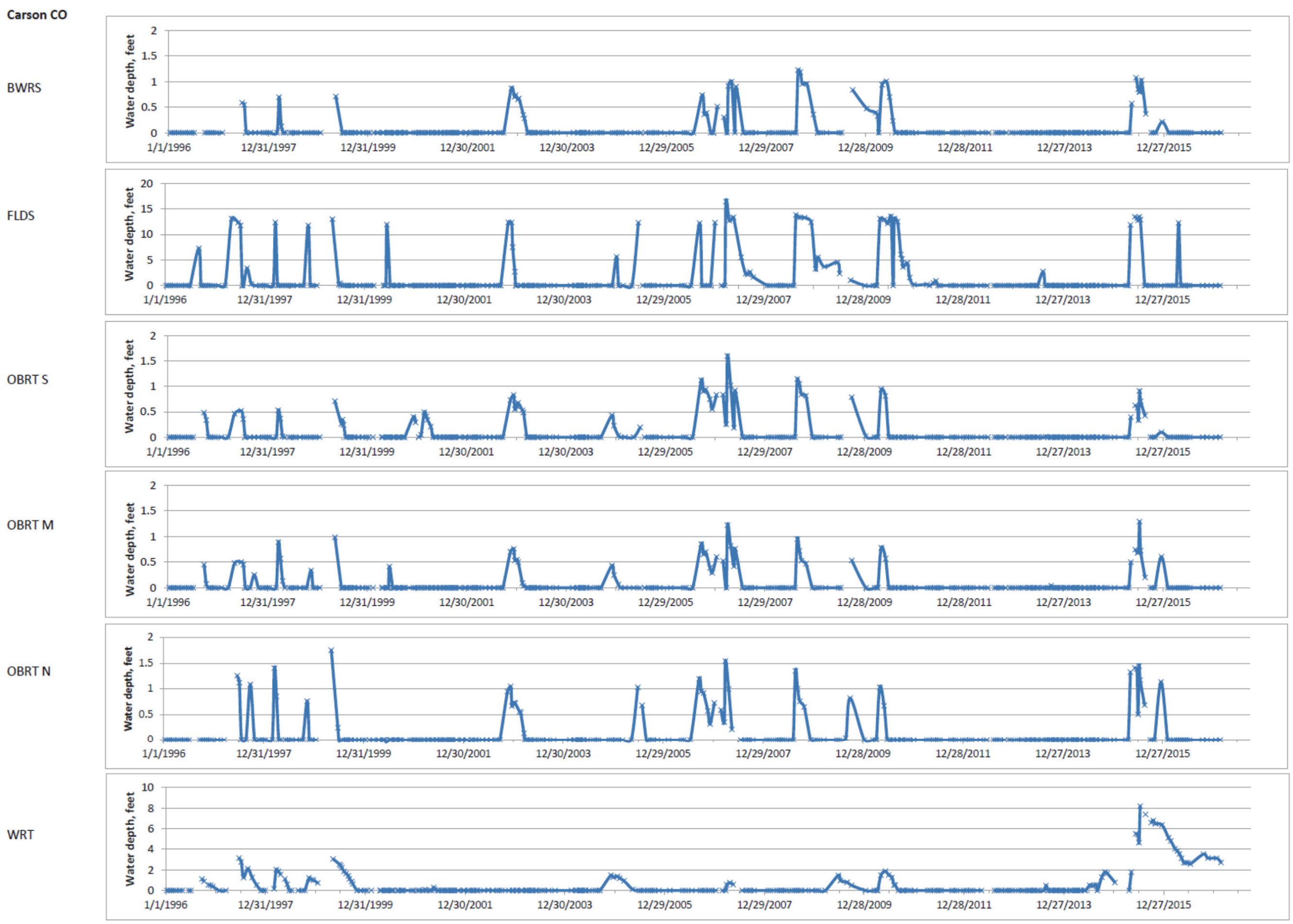


HRNG 3 E



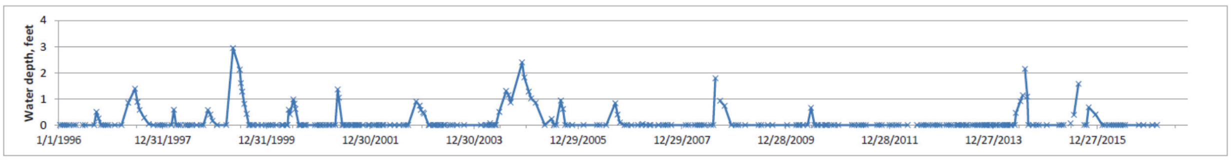
HRNG 3 W



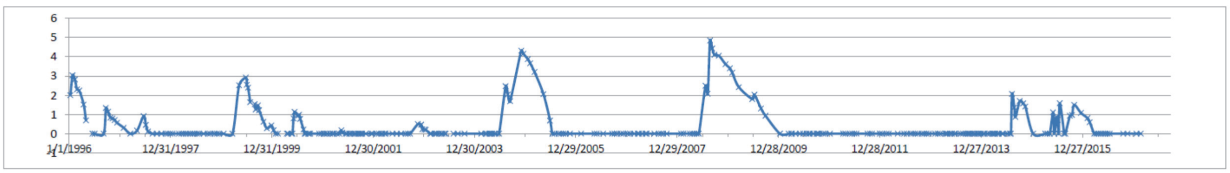

Carson CO
BWRS
FLDS
OBRT S
OBRT M
OBRT N
WRT
Water depth, feet
1/1/1996
12/31/1997
12/31/1999
12/30/2001
12/30/2003
12/29/2005
12/29/2007
12/28/2009
12/28/2011
12/27/2013
12/27/2015

Castro CO

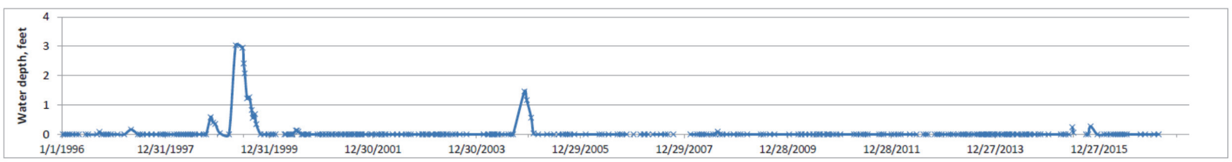
BKFD



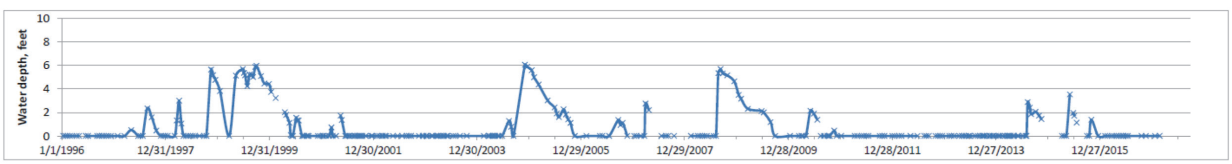
CSCROP



CSCRP

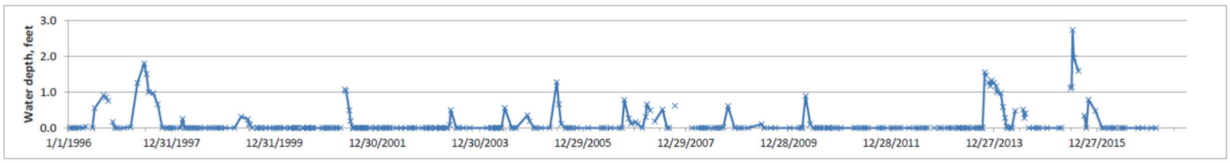


CSRNG

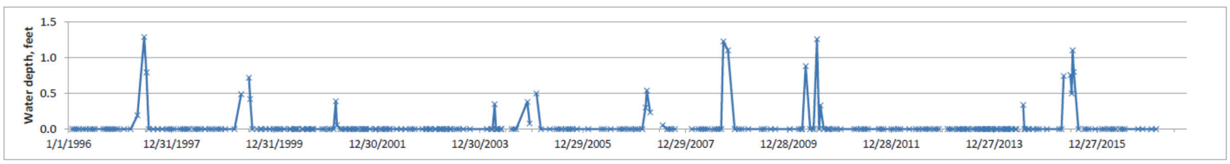


Floyd CO

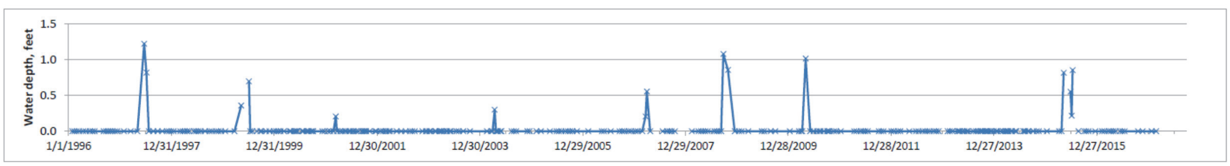
CMR



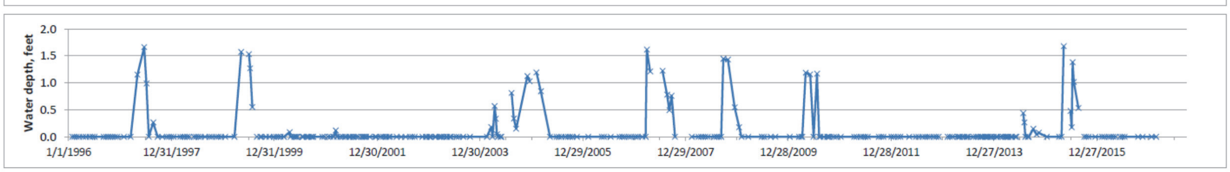
DVPT A



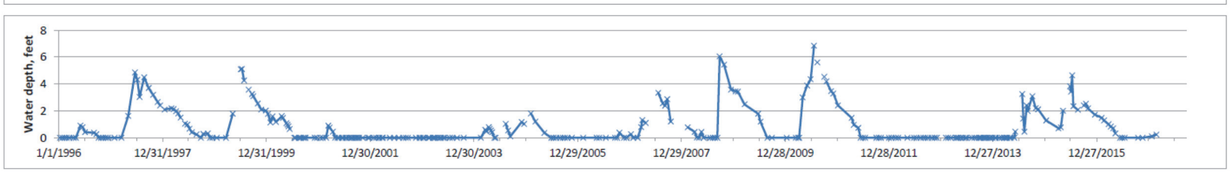
DVPT B



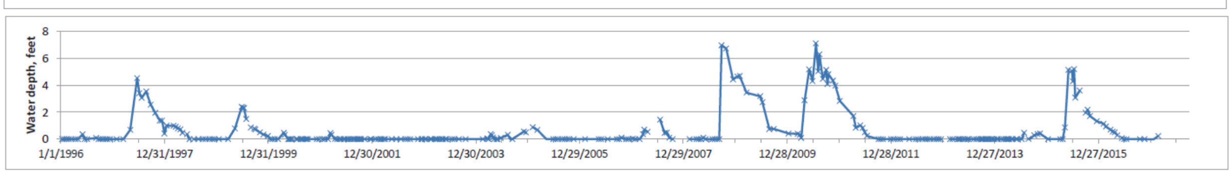
DVPT C

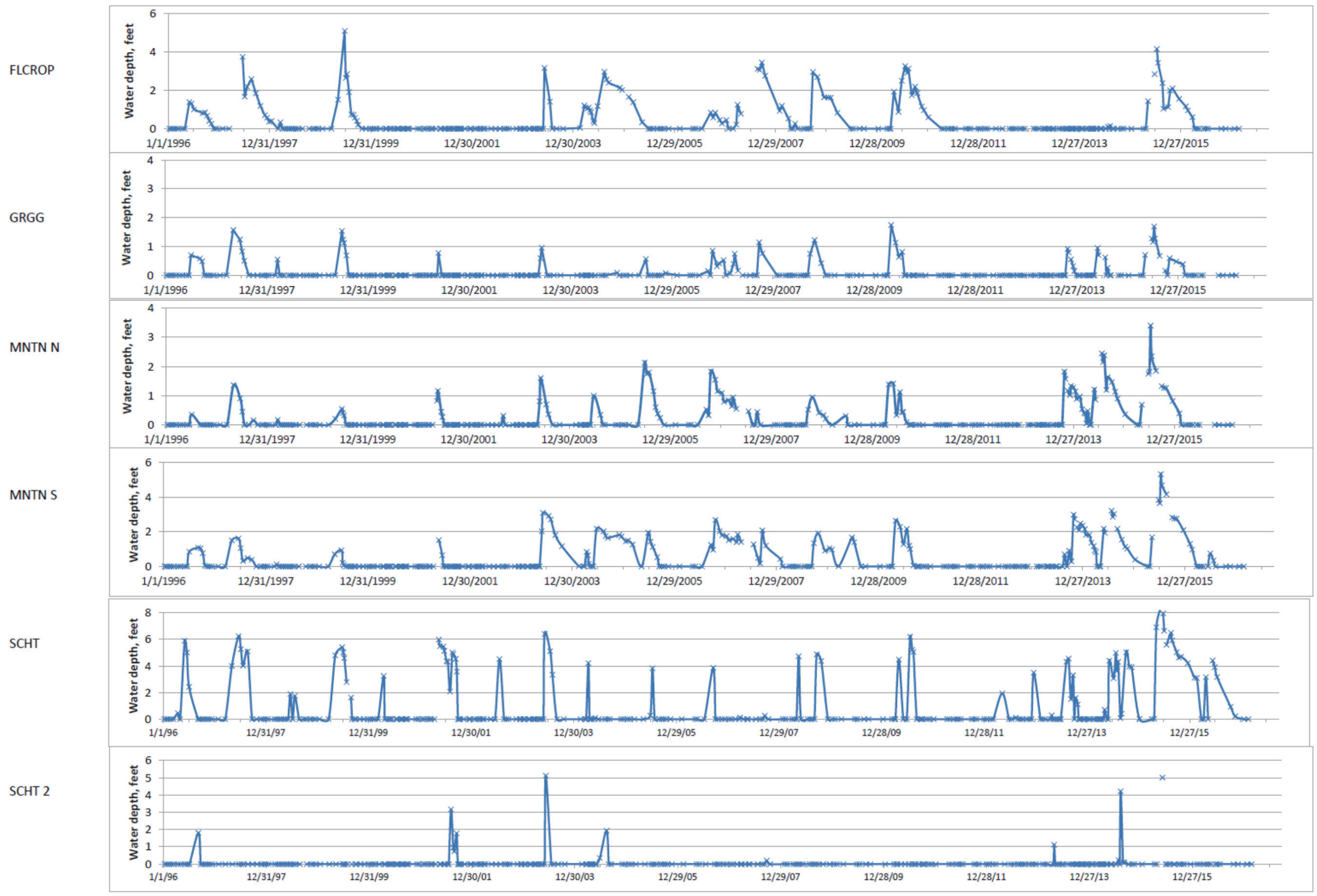


DVPT D



FLRNG




FLCROP
GRGG
MNTN N
MNTN S
SCHT
SCHT 2
Water depth, feet
1/1/1996
12/31/1997
12/31/1999
12/30/2001
12/30/2003
12/29/2005
12/29/2007
12/28/2009
12/28/2011
12/27/2013
12/27/2015
1/1/96
12/31/97
12/31/99
12/30/01
12/30/03
12/29/05
12/29/07
12/28/09
12/28/11
12/27/13
12/27/15

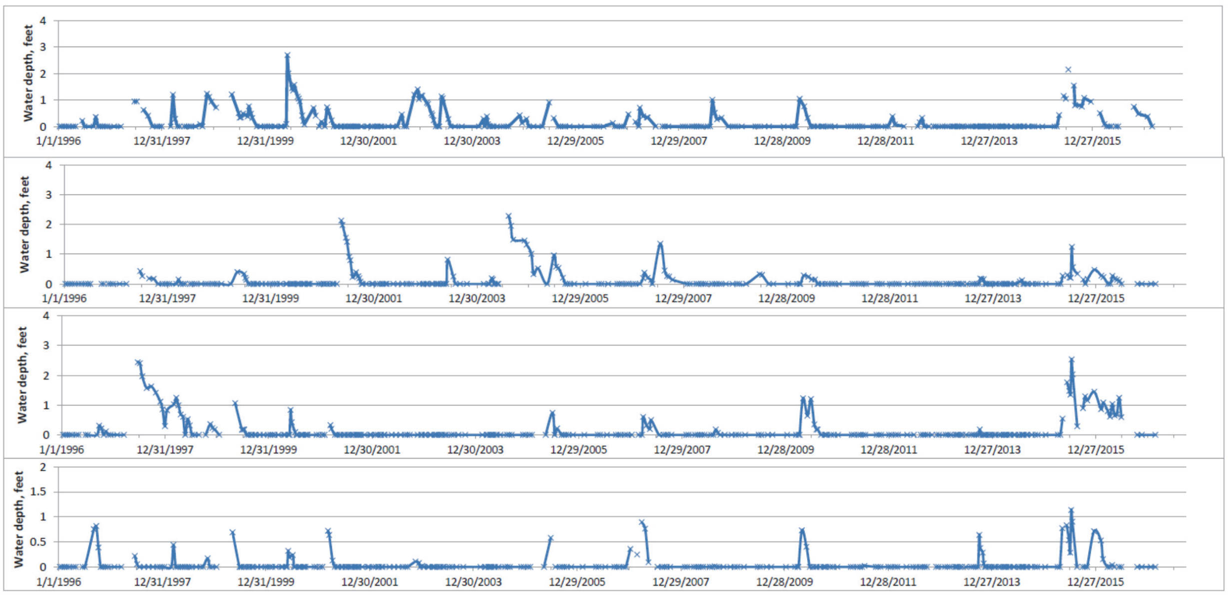
Gray CO

CRWL

GRCROP

GRCRP

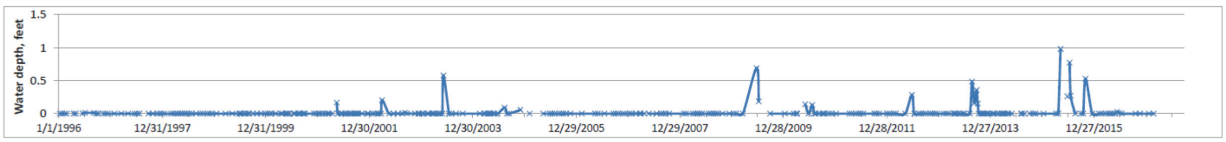
GRRNG



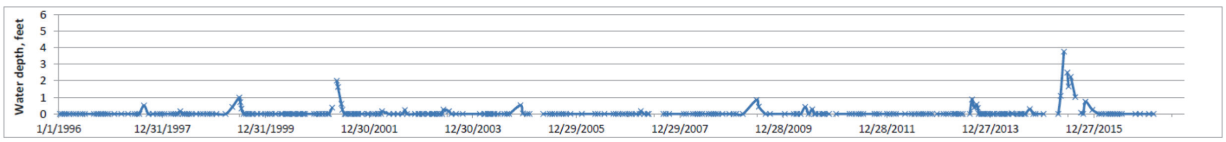
A2-8

Hale CO

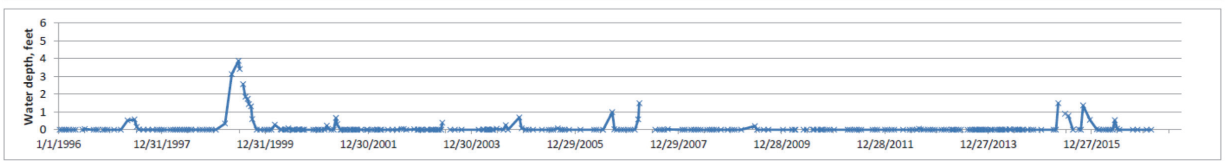
BHARR



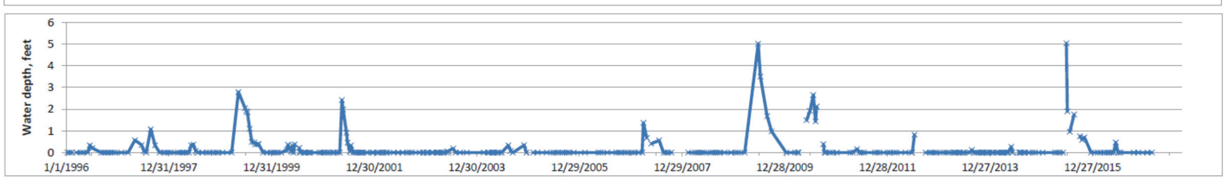
BHARR S



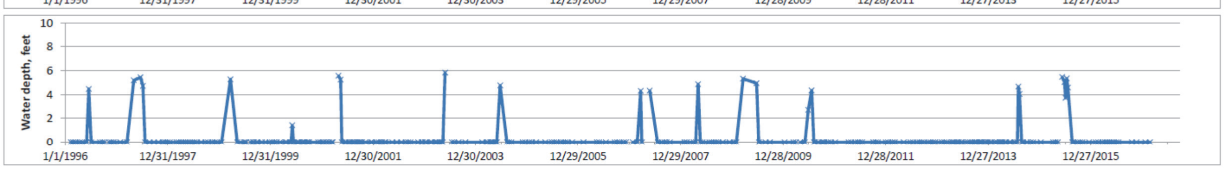
FNCR



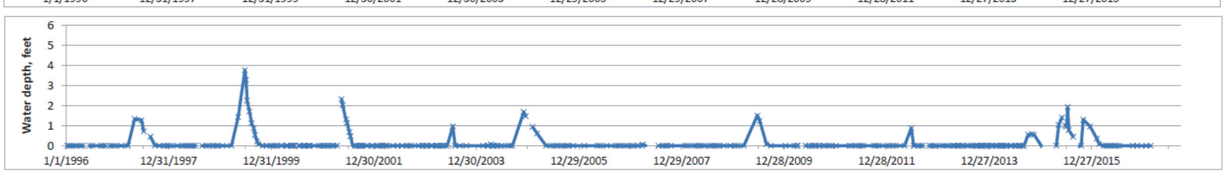
KNKD W



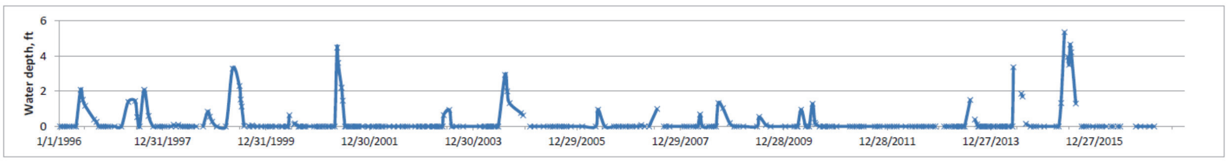
MCHA



MHARR



MHGN



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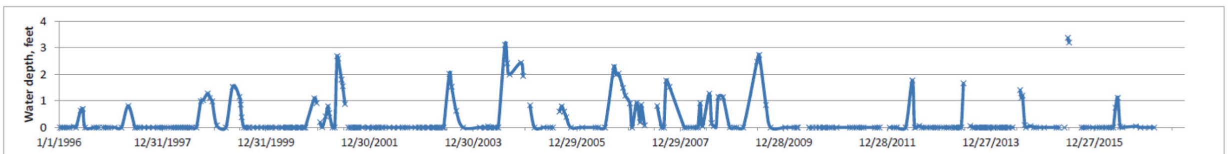

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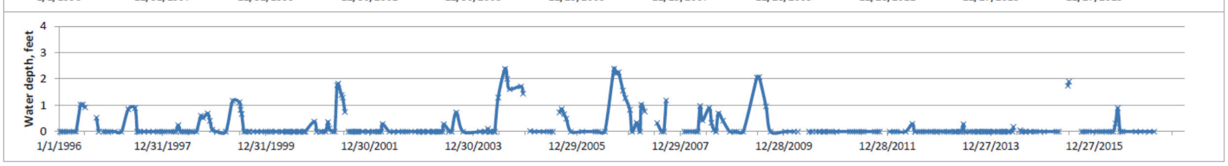

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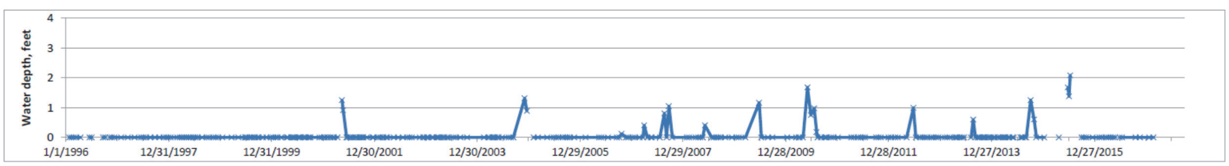

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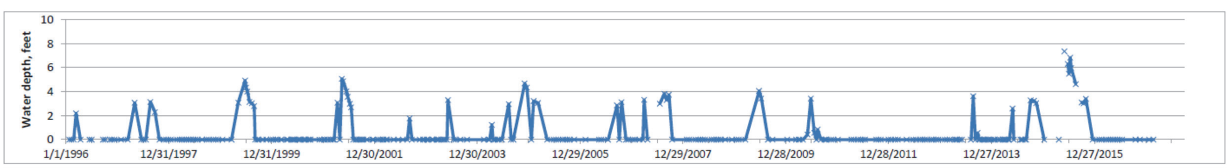

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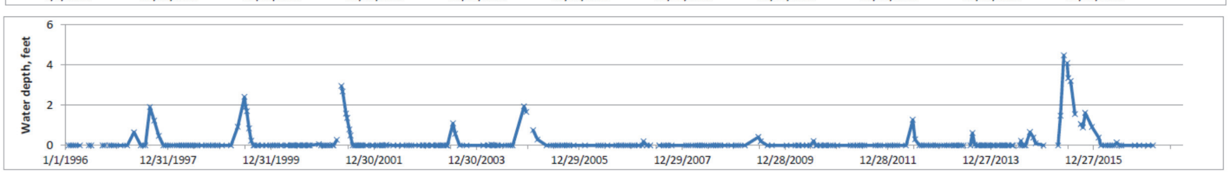
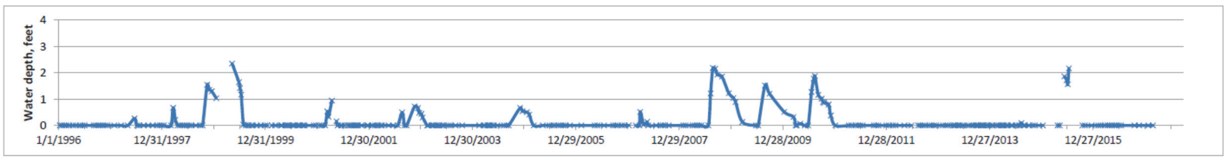


A2-10

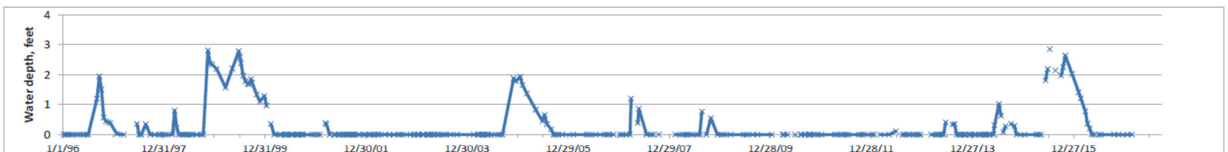
Potter CO

YNGR



Randall CO

HOLL



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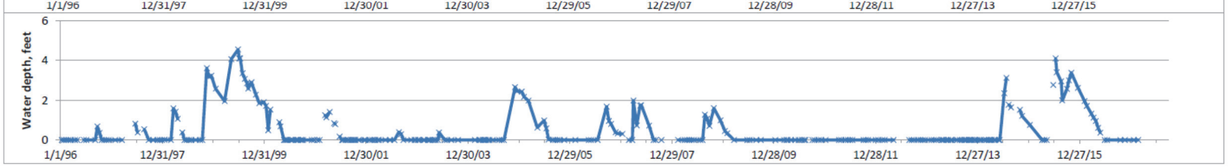
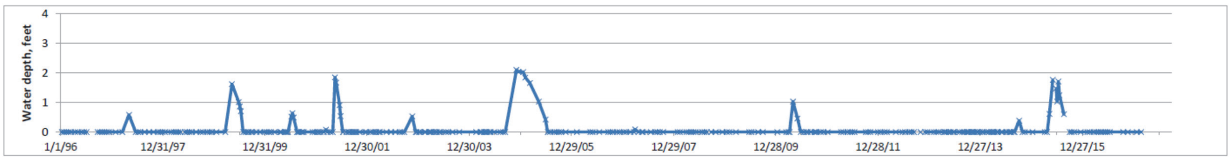


Swisher CO

CRKS 1



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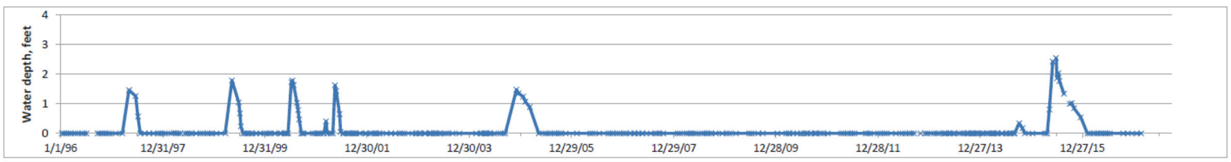

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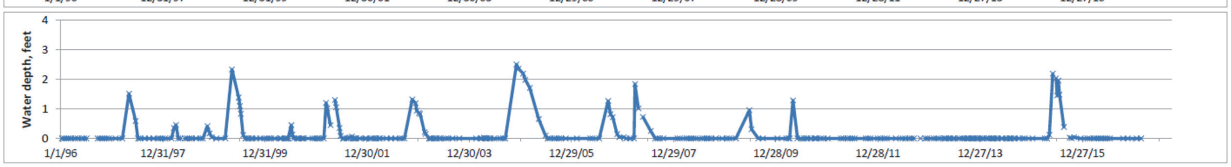

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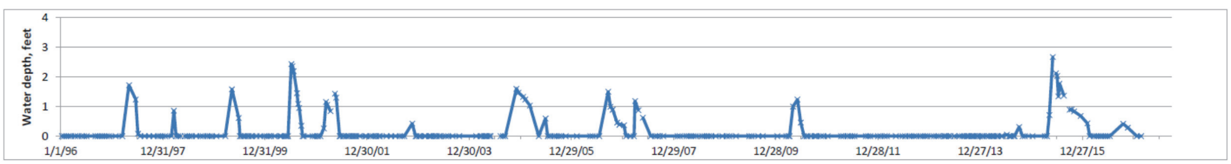

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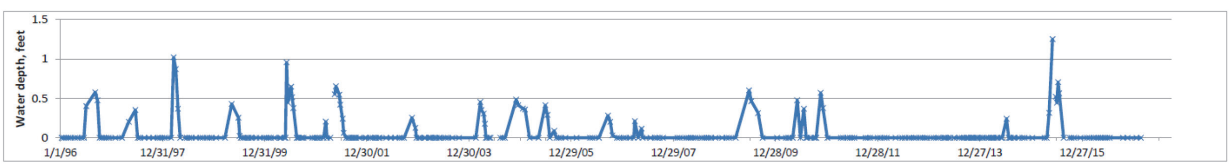

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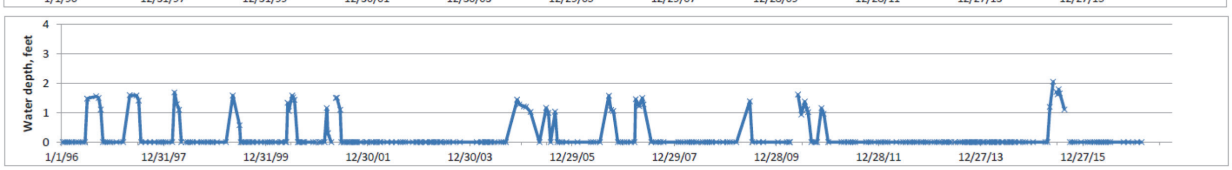
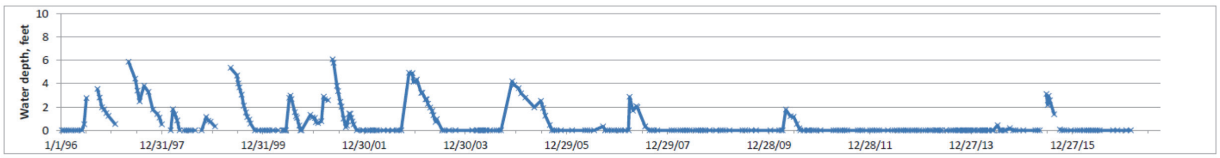


A2-12

CRKS 6



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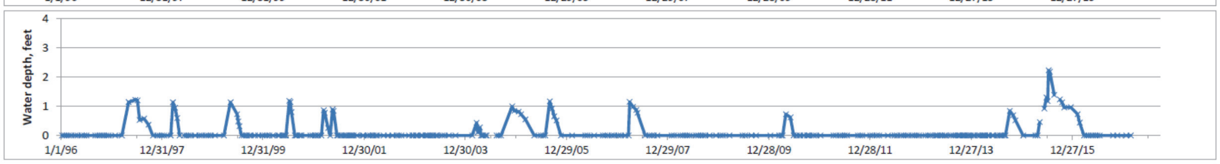

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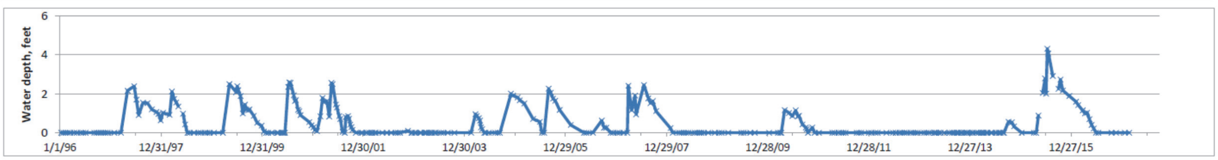

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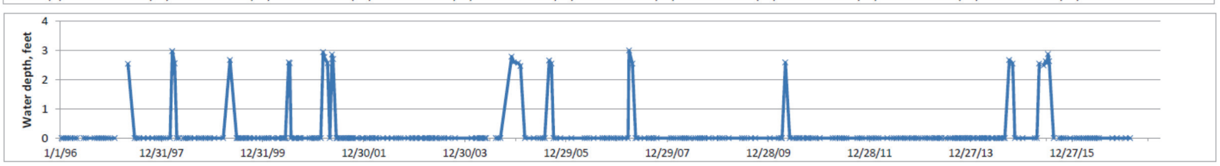
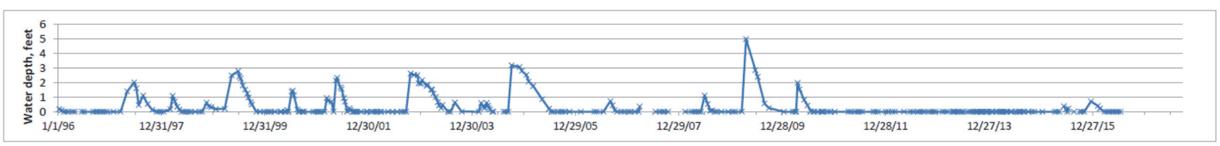


HRNG 1



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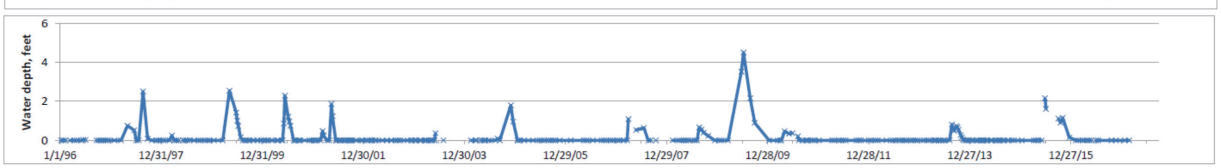

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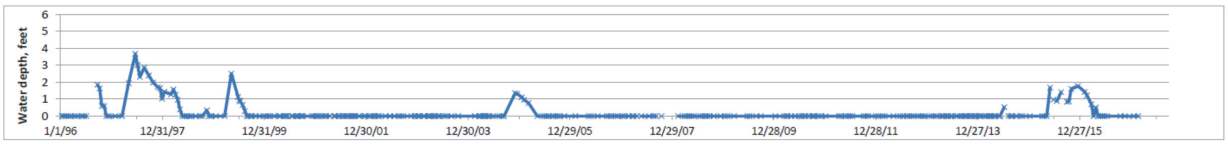

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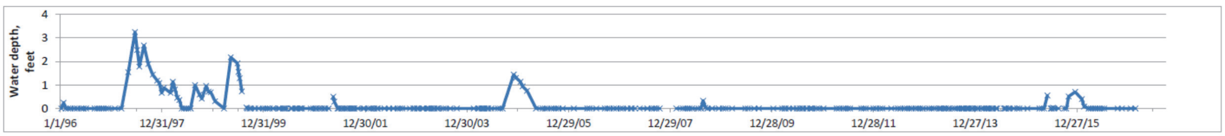
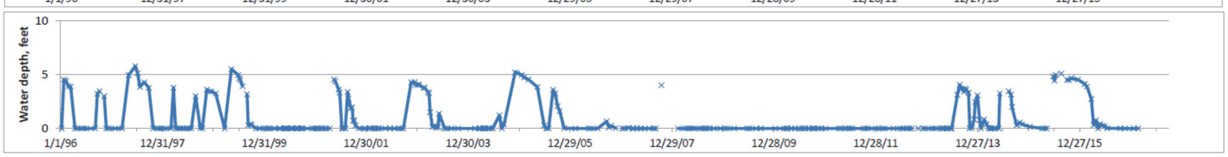
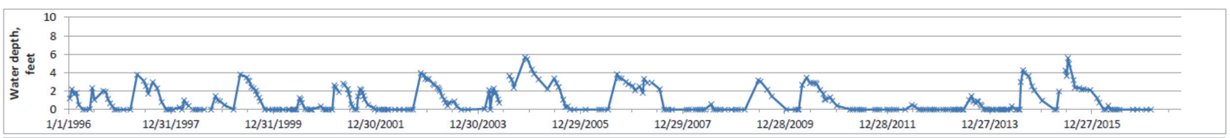


PULM



SWCROP



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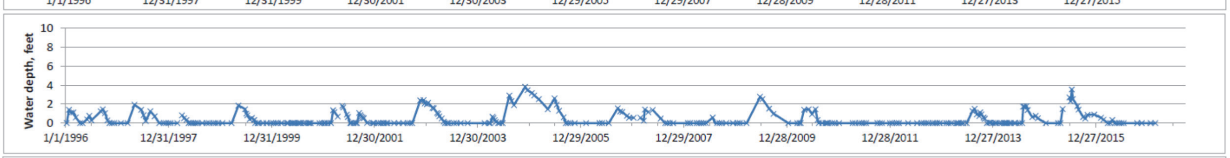
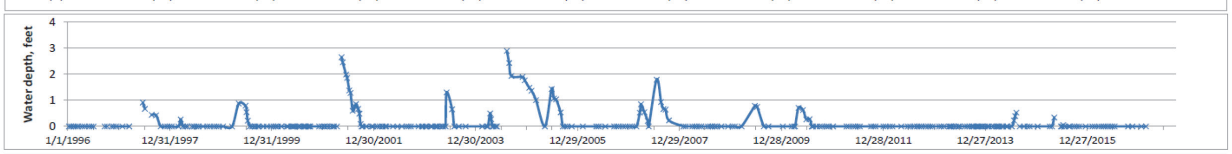
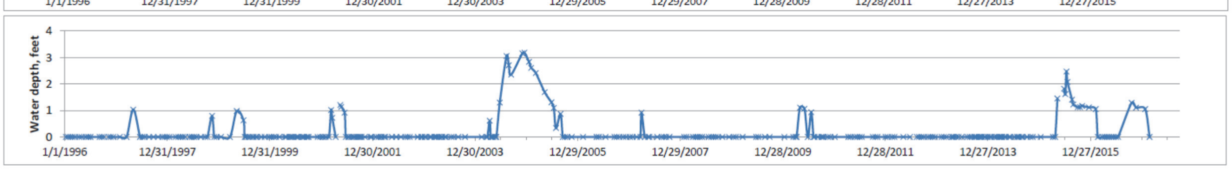


SWCRP



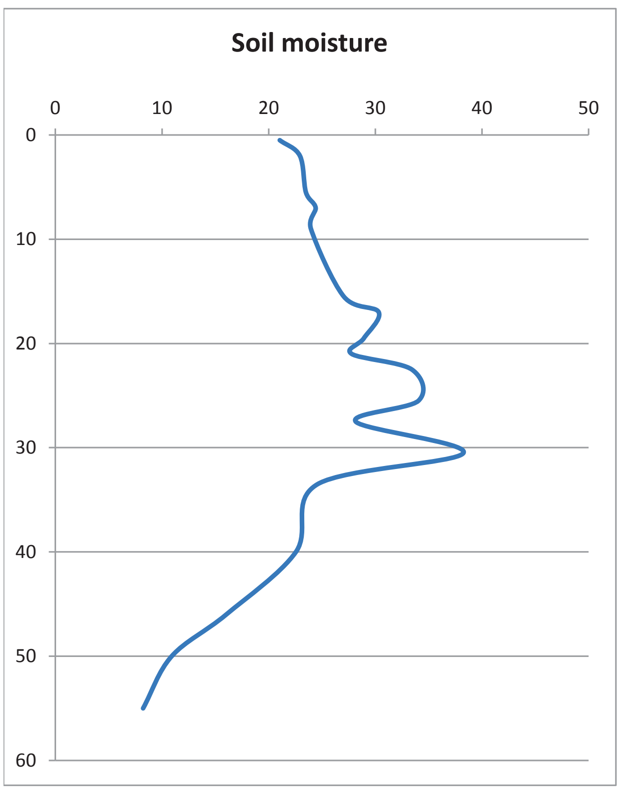
SWRNG

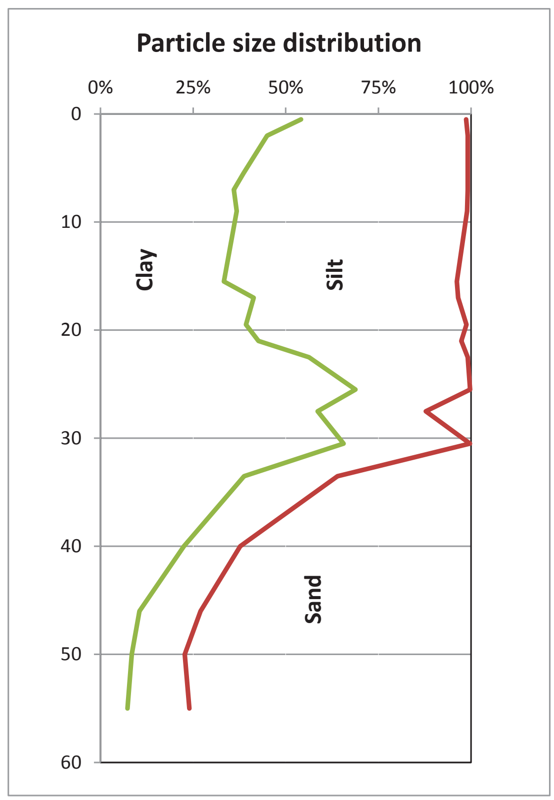


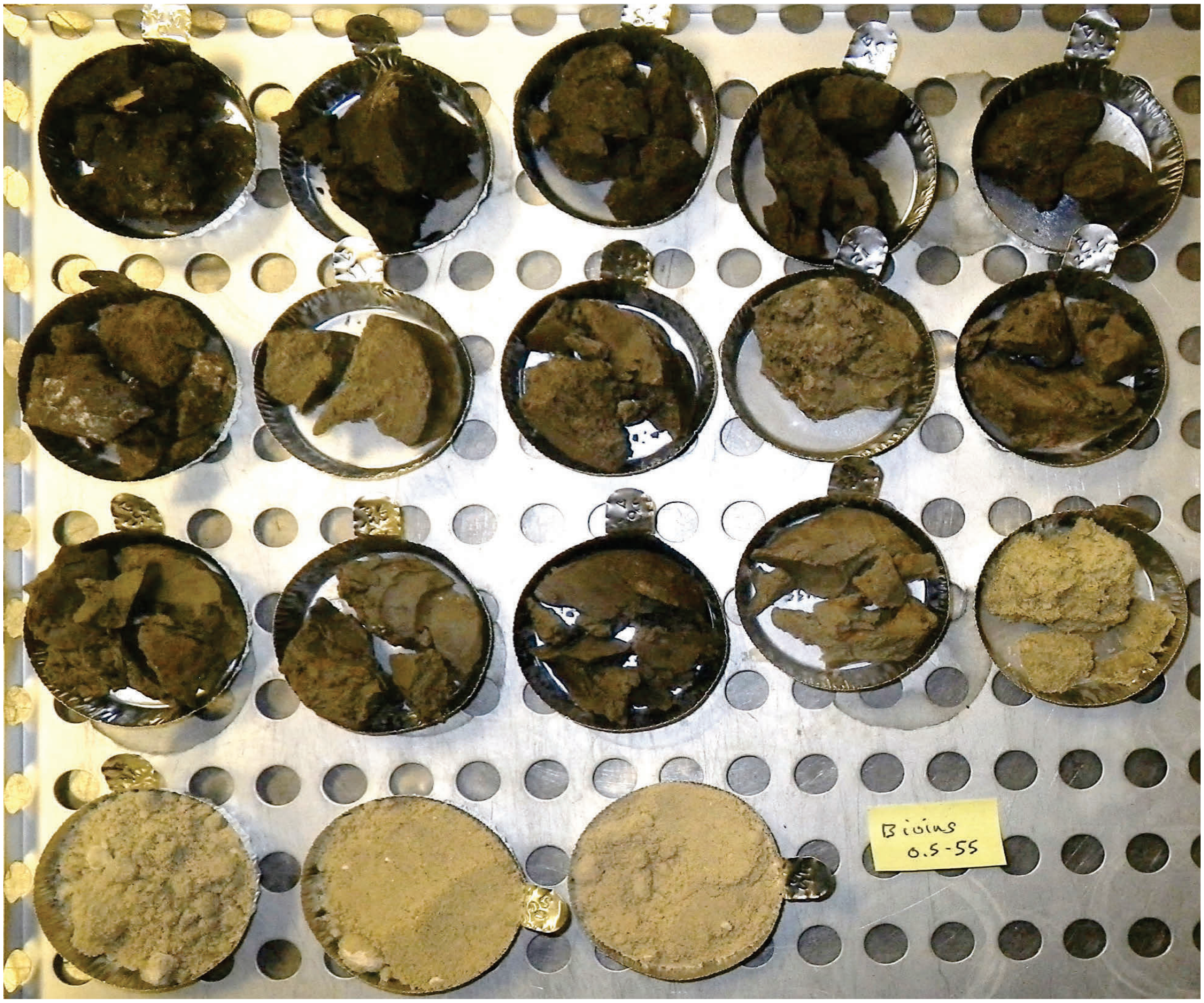
Attachment 3. Soil properties and soil moisture data from playa sites
3A: Initial soil moisture, particle size distribution, and photographic records of playa soils
3B: Time series data – water level, soil moisture, and precipitation by site
3C: Laboratory characterization of FLRNG soil samples

Bivins soil properties **7/15/2011**

Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil texture class	Soil description
0.5	21.05	1.35	44.52	54.13	clay	
2	22.94	0.92	54.11	44.97	silty clay	
5.5	23.50	0.86	60.53	38.61	silty clay loam	
7	24.41	0.87	63.16	35.97	silty clay loam	Silty clay with abundant fine roots. Dry, hard, very dark grey brown (10YR 3/2) grading to dark grey (10YR 4/1).
9	23.97	1.11	62.15	36.74	silty clay loam	
15.5	27.05	3.86	62.83	33.31	silty clay loam	
17	30.32	3.51	55.15	41.34	silty clay	
19.5	28.93	1.26	59.44	39.30	silty clay loam	
21	27.79	2.59	54.73	42.68	silty clay	
22.5	33.43	0.94	42.80	56.26	silty clay	
25.5	34.04	0.25	30.94	68.80	clay	Clay and silty clay, as above with higher clay content around 30 ft. Grey (10YR 5/1) with brown and orange-red staining on parting surfaces. Moist to damp; wetter at ~27 ft. Crumbly structure with fine sandy partings.
27.5	28.17	12.25	29.18	58.58	clay	
30.5	38.27	0.26	34.11	65.63	clay	
33.5	24.58	36.05	25.22	38.72	clay loam	
40	22.56	62.31	15.21	22.48	sandy loam	Sand; very fine sand with carbonate nodules. Very pale brown (10YR 7/3), moist, loose. Increasing caliche to 60 ft; hard drilling, poor recovery.
46	16.03	72.97	16.55	10.48	sandy loam	
50	10.91	77.26	14.31	8.43	loamy sand	
55	8.23	76.00	16.71	7.29	loamy sand	







Bivins North Playa Soil Core 7/15/2011

5 0

10 5

No recovery 10' – 15'

20 15

25 20

30 25

35 30

42.5 40

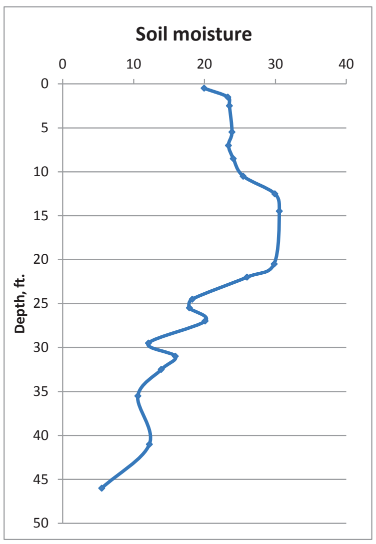
48 45

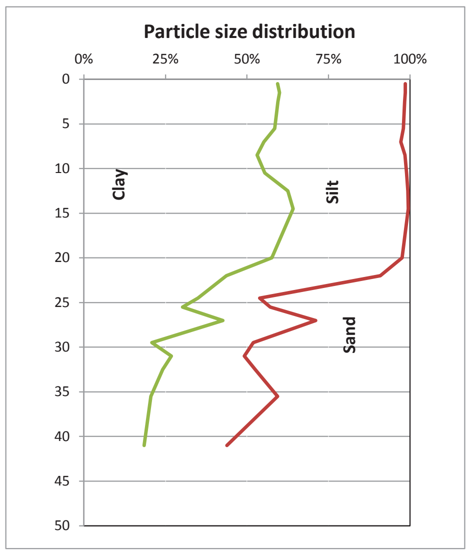
50 - 55

55 - 60

Crowell soil properties **7/14/2011**

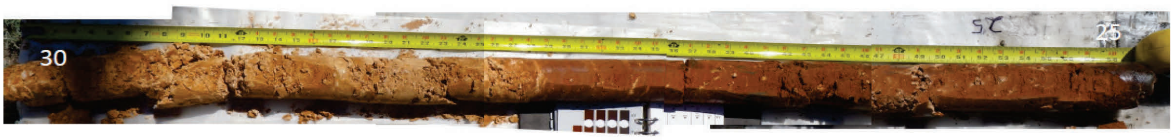
Depth, ft	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0.5	19.93	1.4%	39.2%	59.4%	
1.5	23.29	1.5%	38.6%	59.9%	
2.5	23.51	1.7%	38.8%	59.5%	
5.5	23.88	2.0%	39.4%	58.6%	Clay, very dark grey (10YR 3/1) to dark brown (10YR 3/3). Dry and hard at top, grading to damp, firm at 20 ft. Olive grey mottling and black streaks.
7	23.39	2.8%	41.9%	55.2%	
8.5	24.07	1.6%	45.3%	53.1%	
10.5	25.46	1.1%	43.5%	55.4%	
12.5	29.93	0.6%	36.8%	62.6%	
14.5	30.55	0.5%	35.3%	64.2%	
20.5	29.81	2.4%	40.0%	57.6%	
22	25.99	9.1%	47.2%	43.7%	
24.5	18.26	46.1%	18.9%	34.9%	
25.5	17.88	42.9%	26.9%	30.2%	Sandy clay, red (2.5YR 4/8) to reddish yellow (5YR 7/8); hard to firm, moist to damp, with 30% to 50% carbonates.
27	20.09	28.9%	28.5%	42.6%	
29.5	12.10	48.1%	31.2%	20.8%	
31	15.90	50.8%	22.4%	26.8%	
32.5	13.92	47.5%	28.4%	24.1%	
35.5	10.60	40.6%	38.9%	20.5%	
41	12.23	56.2%	25.4%	18.5%	Fine silty sand with carbonates. Very pale brown (10YR 8.5/2), hard, damp to dry, layered sand and caliche
46	5.51				





Crowell Playa Soil Boring 7/14/2011

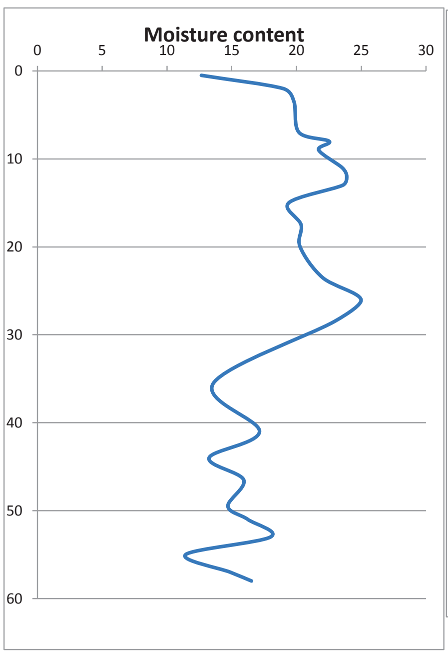
15’ to 20’: no recovery

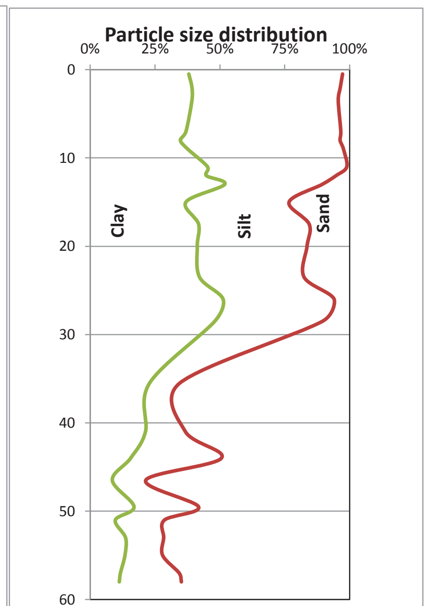


48 45

Durrett soil properties

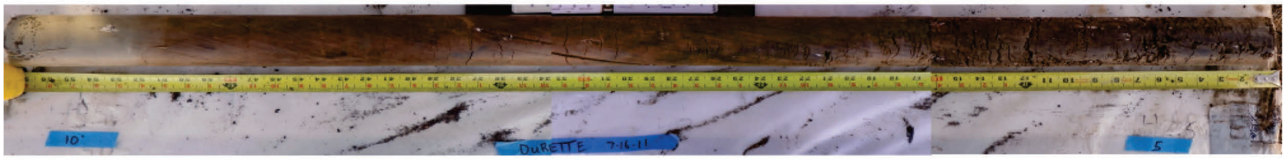
Depth, ft.	content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0.5	12.66	2.7%	59.2%	38.0%	
2	18.97	3.6%	57.2%	39.2%	
3.5	19.81	4.4%	56.4%	39.2%	
7	20.20	3.4%	59.7%	36.9%	Silty clay; dry to damp and hard to 7 ft. then moist and
8	22.53	3.7%	61.5%	34.8%	firm. Dark grey (10YR 4/1) to dark yellowish brown
9	21.72	2.4%	60.0%	37.6%	(10YR 4/4) and greyish brown (2.5Y 2/2). Trace fine
11	23.53	1.1%	53.7%	45.2%	roots and clay-filled fractures. Sandy parting at 12 ft.
12	23.88	5.2%	50.0%	44.8%	
13	23.56	10.6%	37.6%	51.8%	
15	19.40	23.4%	39.7%	36.9%	
17.5	20.36	15.6%	42.6%	41.8%	
20	20.28	16.4%	42.3%	41.3%	
23.5	22.02	17.6%	40.3%	42.2%	Silty clay with carbonate nodules. Dark yellowish brown
26	24.99	6.0%	42.8%	51.2%	(10YR 4/6) to to reddish brown (5YR 5/3) and grey (2.5Y
28.5	22.91	10.5%	41.5%	48.0%	6/2). Hard, moist.
35.5	13.59	65.5%	11.6%	22.9%	
41	17.15	63.3%	15.4%	21.3%	
44	13.25	49.4%	35.0%	15.6%	
46.5	15.92	78.6%	12.9%	8.6%	Sand and silty sand. Light grey (2.5Y 7/2) to pale brown
49.5	14.70	58.2%	24.9%	16.9%	(10YR 8/2) with white carbonates. Hard cemented
51	16.24	71.4%	18.9%	9.7%	intervals, otherwise firm to soft. Abundant root tubes
53	17.99	71.7%	14.7%	13.7%	and vertical partings to 45 ft.
55	11.44	72.1%	14.5%	13.4%	
57	14.88	65.7%	22.6%	11.7%	
58	16.53	64.8%	23.9%	11.2%	



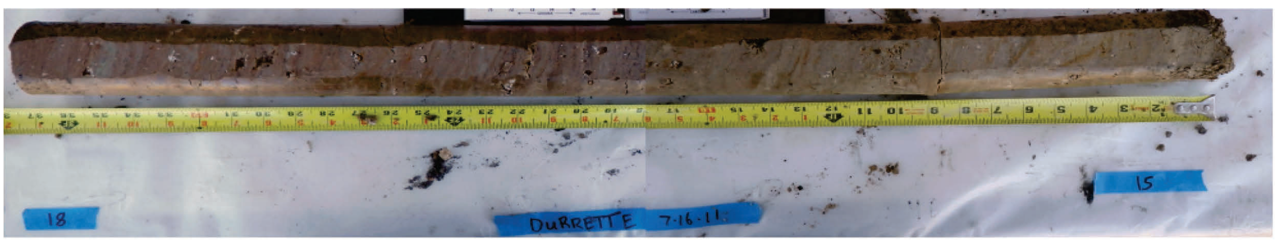


Durrett Playa Soil Core 7/16/2011

5 ft 0 ft



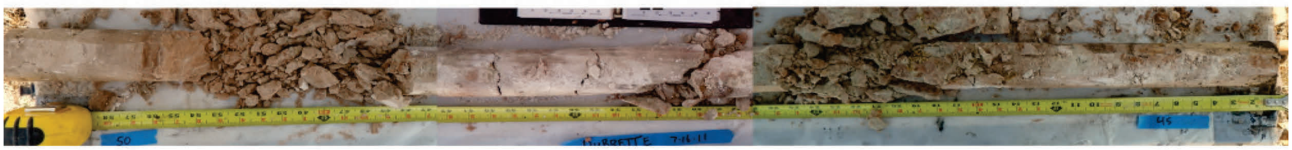
13 ft 10 ft



30 ft 25ft


35
8037
DURRETTE 7-16-11


45
DURRETTE 7-16-11
40


50
45

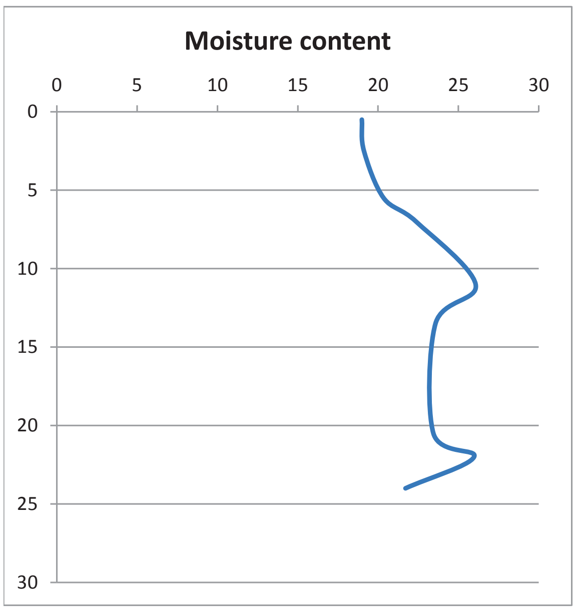

55
DURRETTE 7-16-11
50

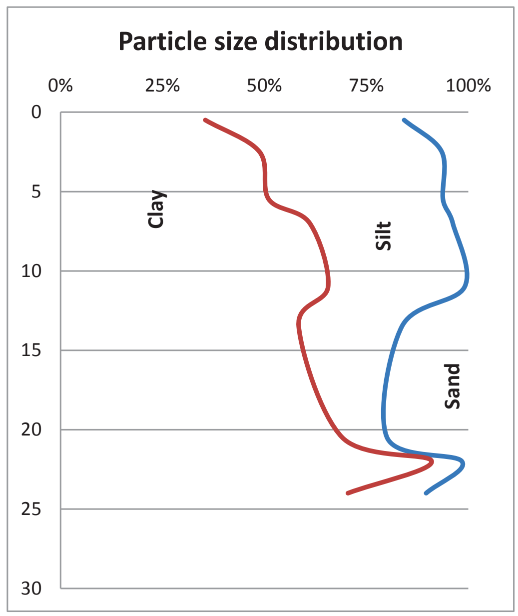

60
DURRETTE 7-16-11
55

Finley soil properties **7/15/2011**

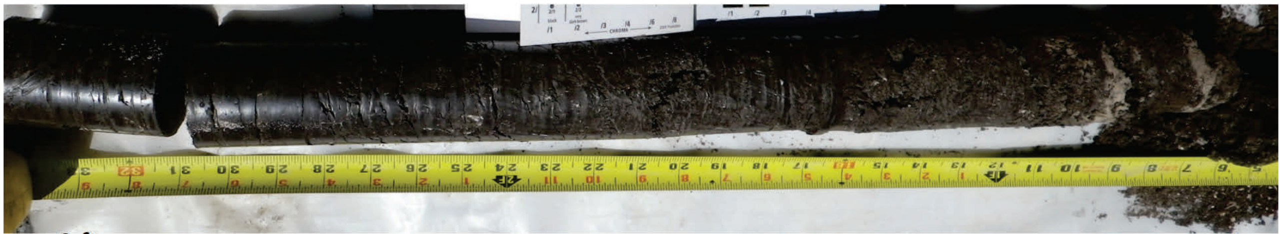
Depth, ft	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0.5	18.99	15.7%	48.8%	35.5%	
2.5	19.12	6.5%	44.7%	48.8%	
5.5	20.35	6.2%	42.7%	51.1%	
7	22.37	3.8%	35.1%	61.1%	Clay to silty clay; hard, very dark grey (10YR 3/1), dry,
11	26.07	0.9%	33.5%	65.6%	grading to light brownish grey (10YR 6/2). Crumbly
13.5	23.57	16.3%	25.3%	58.4%	structure, red staining on partings. Isolated caliche nodules.
20.5	23.44	19.9%	11.0%	69.1%	
22	25.97	1.6%	7.4%	91.0%	
24	21.70	10.3%	19.2%	70.5%	
30					Caliche and sand. Hard, dry, well cemented.
40					Fine sand and caliche; red brown to yellow brown, loose to
100					flowing when saturated.

Note: soil samples collected outside playa bottom area.
Soil description is for second boring within playa area.



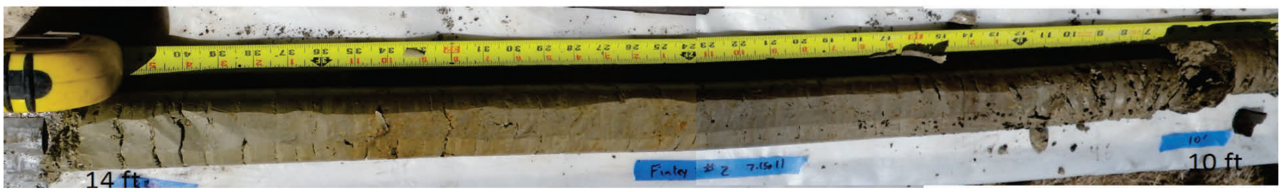


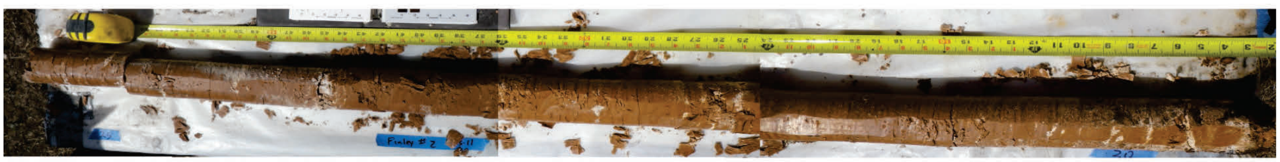
Finley Playa Soil Core 7/15/2011



3 ft 0 ft

8.5 ft 5 ft



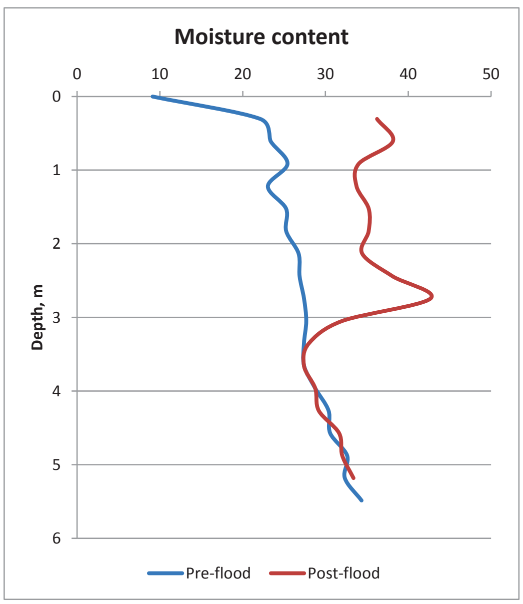


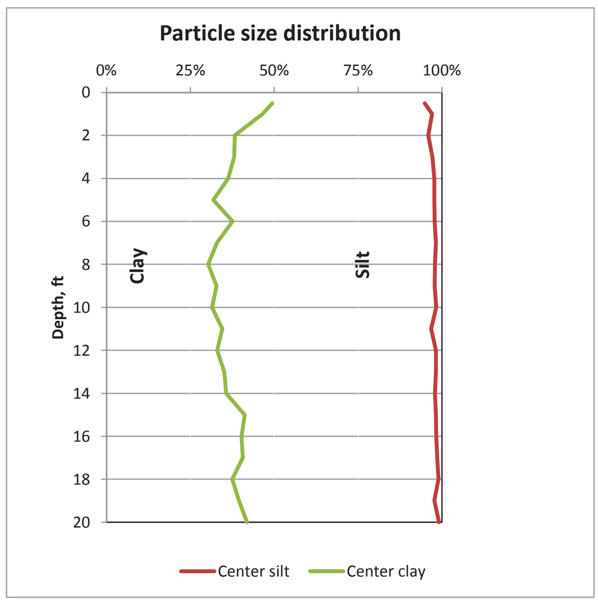
25 ft 20 ft

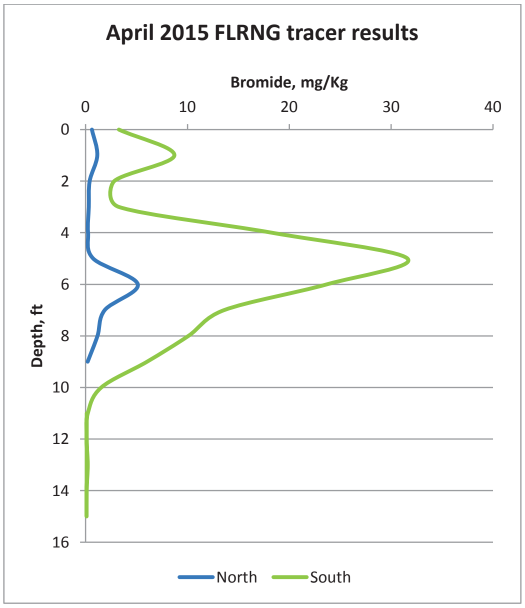
TD of Hollow-Stem Auger Hole = 27 feet

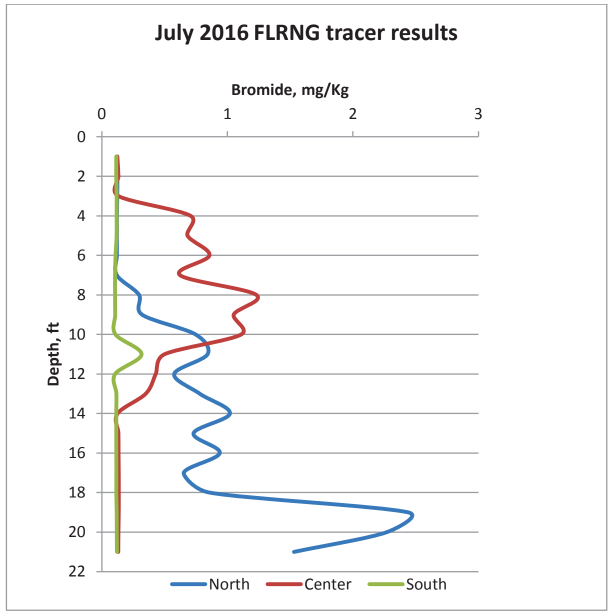
Moisture content analysis FLRNG center

Sample depth	depth, m	Moisture content, percent by weight 7/9/2013	Moisture content, percent by weight 4/15/2015	Playa center Depth	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0	0	9.12280702		0.5	5.1%	45.4%	49.4%	
1	0.3048	22.1344441	36.2308326	1	2.9%	50.5%	46.6%	
2	0.6096	23.395603	38.1354765	2	4.0%	57.7%	38.2%	
3	0.9144	25.4124534	34.010136	3	2.9%	59.1%	38.0%	
4	1.2192	23.0449363	33.752691	4	2.3%	61.5%	36.2%	
5	1.524	25.2475979	35.2251816	5	2.2%	65.9%	31.8%	
6	1.8288	25.2584721	35.217274	6	2.2%	60.2%	37.6%	
7	2.1336	26.7569212	34.4387618	7	1.8%	65.3%	32.9%	
8	2.4384	26.8718802	38.067787	8	2.1%	67.6%	30.3%	
9	2.7432	27.4083732	42.6845079	9	2.2%	65.0%	32.8%	Clay and silty clay; dark grey brown grading
10	3.048	27.6796407	32.0239589	10	1.7%	66.9%	31.5%	to olive grey. Abundant fine roots at top
11	3.3528	27.4020808	27.9963537	11	3.2%	62.3%	34.5%	with trace roots to 10 ft depth.
12	3.6576	27.4163165	27.4087062	12	1.8%	65.2%	33.0%	
13	3.9624	28.7647813	28.7633588	13	1.8%	63.1%	35.1%	
14	4.2672	30.3776949	29.1942215	14	2.1%	62.3%	35.7%	
15	4.572	30.5667389	31.6460853	15	1.8%	57.0%	41.2%	
16	4.8768	32.6203209	32.0280076	16	1.7%	58.1%	40.2%	
17	5.1816	32.3372465	33.3843307	17	1.4%	58.0%	40.6%	
18	5.4864	34.3579134		18	1.0%	61.5%	37.5%	
19	5.7912	33.6339044		19	2.3%	58.2%	39.5%	
20	6.096	33.1312809		20	0.9%	57.3%	41.9%	





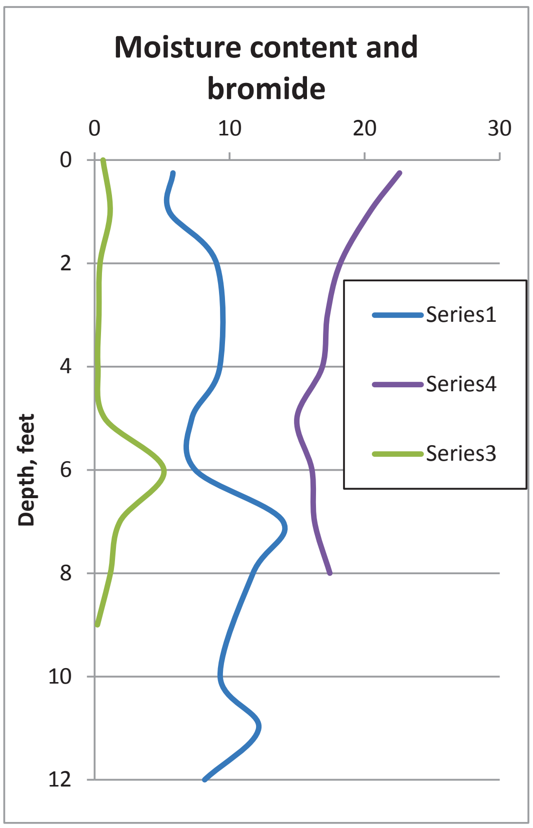

April 2015 FLRNG tracer results
Bromide, mg/Kg
0
10
20
30
40
Depth, ft
0
2
4
6
8
10
12
14
16
North
South

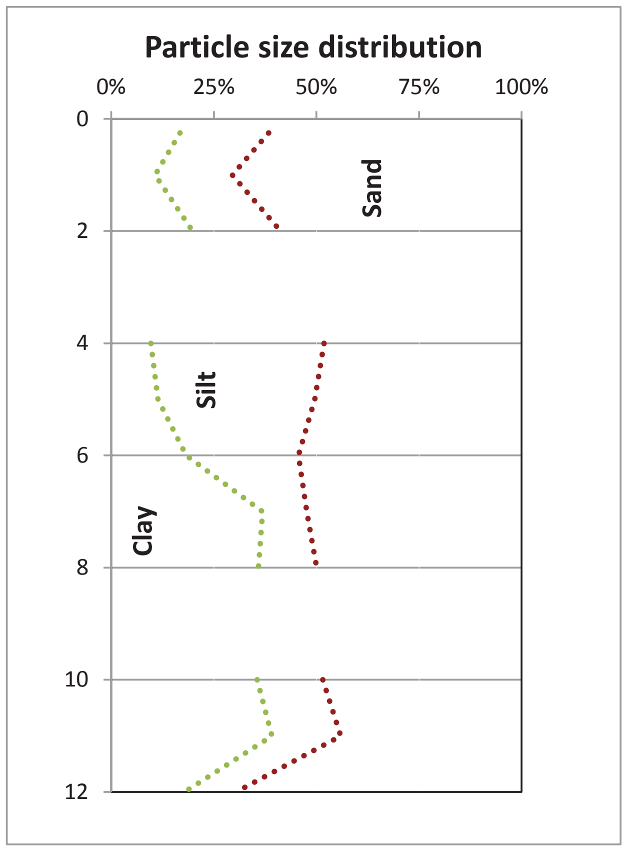

July 2016 FLRNG tracer results
Bromide, mg/Kg
0
1
2
3
Depth, ft
0
2
4
6
8
10
12
14
16
18
20
22
North
Center
South


FLRNG 0 - 20'

FLRNG NE soil properties

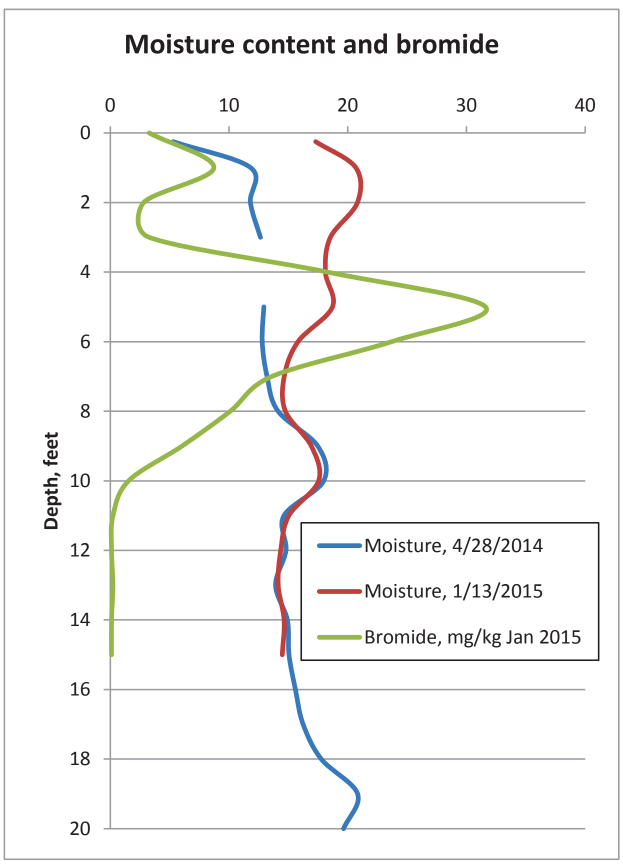
Depth, ft.	Depth, m	Moisture content, percent by weight 4/28/2014	Depth, m	1/13/2015	Bromide, mg/kg	Depth, ft.	Sand %	Silt %	Clay %
0.25	0.0762	5.80	0.0762	22.58	0.624	0.25	61.6%	21.7%	16.7%
1	0.3048	5.53	0.3048	20.39	1.15	1	70.5%	18.8%	10.7%
2	0.6096	9.03	0.6096	18.19	0.401	2	58.8%	21.4%	19.8%
4	1.2192	9.28	0.9144	17.24	0.319	4	48.1%	42.2%	9.7%
5	1.524	7.20	1.2192	16.87	0.244	5	50.4%	38.2%	11.4%
6	1.8288	7.45	1.524	14.98	0.748	6	54.4%	27.4%	18.2%
7	2.1336	13.95	1.8288	16.10	5.13	7	52.4%	10.7%	36.9%
8	2.4384	11.73	2.1336	16.29	1.88	8	49.9%	14.2%	35.8%
10	3.048	9.30	2.4384	17.42	1.17	10	48.5%	16.0%	35.6%
11	3.3528	12.15	2.7432	16.29	0.207	11	44.1%	16.8%	39.2%
12	3.6576	8.15				12	69.6%	12.6%	17.8%

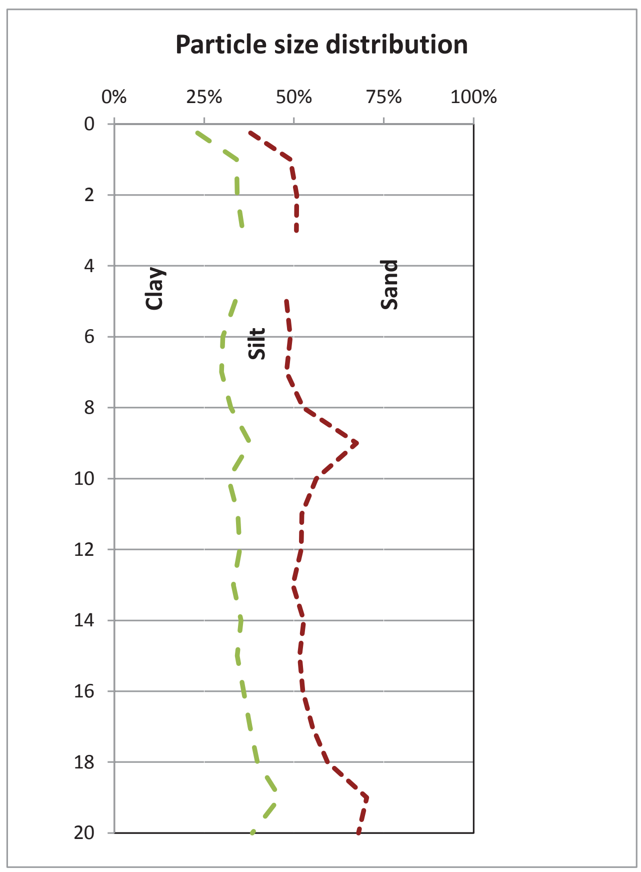




FLRNG SE tracer site soil properties

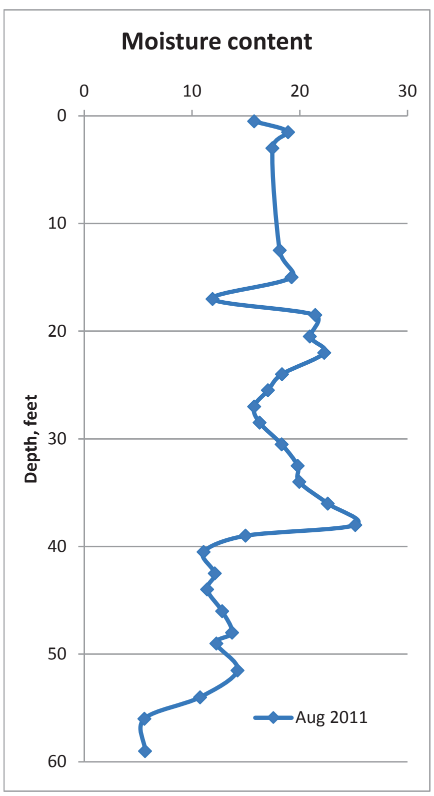
		Moisture content, percent by weight					
Depth, ft.	Depth, m	Moisture, 4/28/2014	Moisture, 1/13/2015	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0.25	0.0762	5.28409091	17.2970689	0.620823513	0.1473728	0.231803688	Sandy Clay Loam
1	0.3048	11.8255054	20.6790035	0.510523239	0.14951768	0.339959076	Sandy Clay Loam
2	0.6096	11.7984132	20.815189	0.49271879	0.16541779	0.341863424	Sandy Clay Loam
3	0.9144	12.647232	18.5371812	0.493638677	0.14942041	0.35694091	Sandy Clay
4	1.2192		18.1195893				----------
5	1.524	12.9335594	18.709815	0.520592593	0.14251852	0.336888889	Sandy Clay Loam
6	1.8288	12.793409	15.8111759	0.510329341	0.18787425	0.301796407	Sandy Clay Loam
7	2.1336	13.2015209	14.6480105	0.520744759	0.18047207	0.29878317	Sandy Clay Loam
8	2.4384	14.1294006	14.7479105	0.474775187	0.20134126	0.323883554	Sandy Clay Loam
9	2.7432	17.4672489	16.9291452	0.325811437	0.29675425	0.377434312	Clay Loam
10	3.048	17.9731695	17.546464	0.438310709	0.2438914	0.317797888	Clay Loam
11	3.3528	14.6233608	15.0350441	0.477948718	0.17831502	0.343736264	Sandy Clay Loam
12	3.6576	14.7931873	14.3528761	0.47960137	0.17144192	0.348956711	Sandy Clay
13	3.9624	13.9191291	14.1390719	0.502770705	0.16579302	0.331436274	Sandy Clay Loam
14	4.2672	14.9122807	14.6390414	0.472481828	0.17445483	0.353063344	Sandy Clay
15	4.572	15.0495693	14.4815814	0.484545738	0.17358726	0.341867	Sandy Clay Loam
16	4.8768	15.591227		0.475209764	0.16506484	0.3597254	Sandy Clay
17	5.1816	16.240285		0.448650326	0.17359603	0.377753646	Sandy Clay
18	5.4864	17.7725857		0.406482307	0.19580731	0.397710378	Clay Loam/Clay
19	5.7912	20.8313195		0.297544609	0.24203142	0.460423974	Clay
20	6.096	19.6440235		0.320148906	0.29610672	0.383744377	Clay Loam

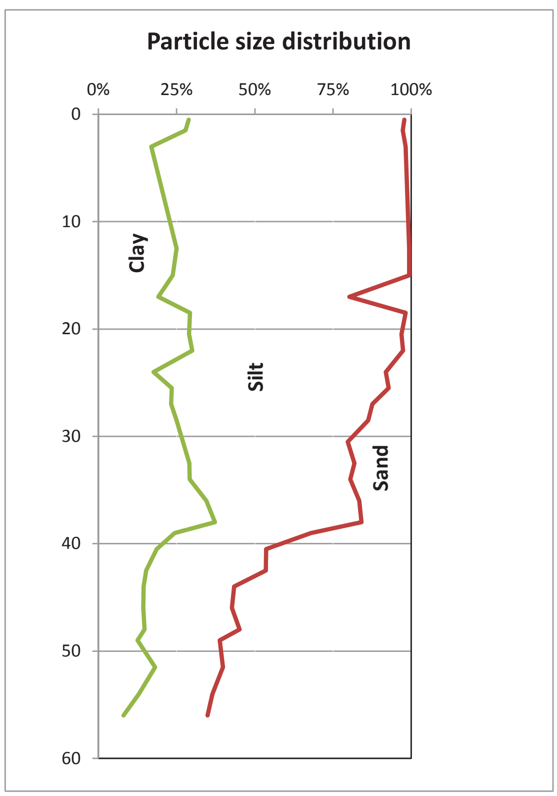




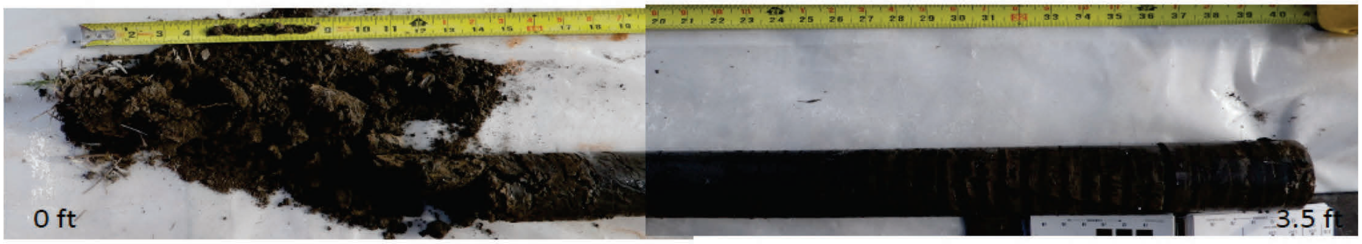
Haiduk East soil properties ########

Depth, ft	Moisture content,percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0.5	15.76	2.2%	68.9%	28.9%	
1.5	18.91	2.7%	69.4%	27.9%	Clay; black (7.5 YR 2.5/1), hard, dry, grading to grey at 5
3	17.47	1.8%	81.3%	16.9%	ft.
12.5	18.13	0.7%	74.4%	25.0%	
15	19.24	0.7%	75.6%	23.8%	
17	11.91	19.7%	61.2%	19.1%	
18.5	21.43	1.7%	69.0%	29.3%	
20.5	20.94	3.2%	67.8%	29.0%	
22	22.28	2.6%	67.4%	30.0%	Clay and silt with layer of very fine sand at about 20 ft.
24	18.33	8.2%	74.2%	17.6%	Strong brown (7.5YR 5/6) to grey-brown (10YR 5/2) and
25.5	17.05	7.2%	69.4%	23.5%	yellowish red (5YR 4/6). Moisture and clay content
27	15.77	12.4%	64.4%	23.3%	increasing with depth. Abundant caliche as soft masses
28.5	16.28	13.7%	61.3%	25.0%	with hard centers from 30 to 40 ft.
30.5	18.32	20.2%	52.7%	27.1%	
32.5	19.80	18.1%	52.8%	29.1%	
34	19.95	19.4%	51.4%	29.2%	
36	22.59	16.6%	48.9%	34.5%	
38	25.15	15.9%	46.9%	37.3%	
39	14.97	32.1%	43.6%	24.3%	
40.5	11.07	46.4%	35.0%	18.7%	
42.5	12.11	46.4%	38.3%	15.3%	
44	11.41	56.6%	29.0%	14.5%	
46	12.79	57.3%	28.3%	14.4%	Silty sand; damp to dry, hard red to reddish yellow
48	13.71	54.8%	30.4%	14.8%	(2.5YR 5/8 to 5YR 6/6), abundant caliche in masses and
49	12.25	61.2%	26.3%	12.5%	cemented intervals.
51.5	14.22	60.2%	21.6%	18.1%	
54	10.74	63.6%	23.5%	12.9%	
56	5.58	65.1%	26.9%	8.0%	
59	5.65				



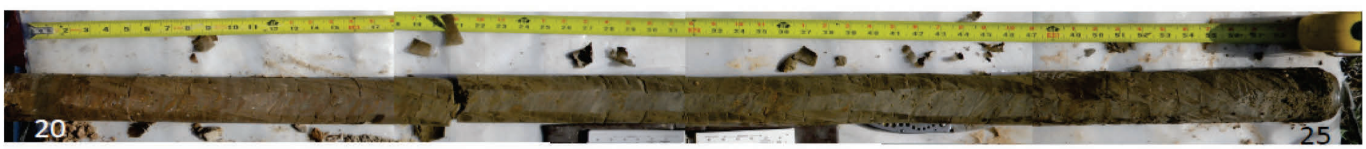


Haiduk Playa Soil Boring 7/14/2011



5 ft – 10 ft: no recovery

10 ft 12 ft



30 35

35 40

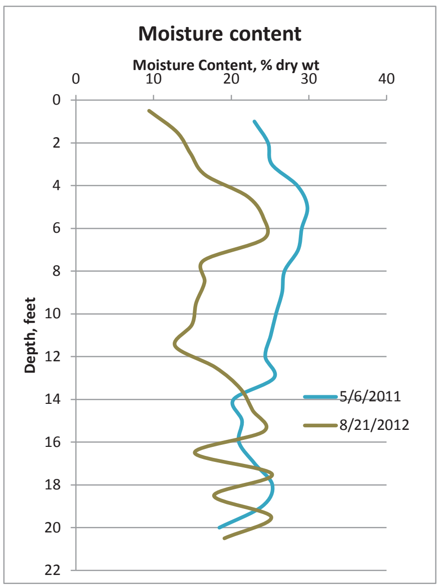
40 45

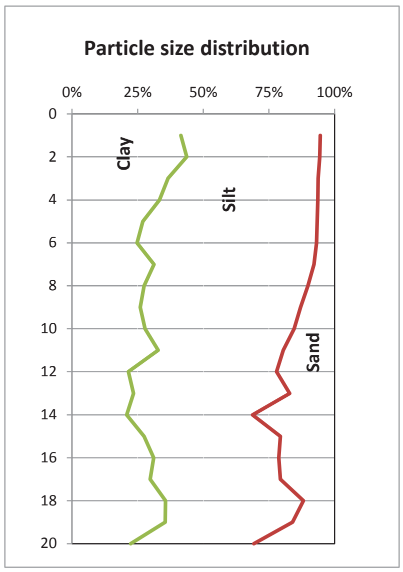

50
55

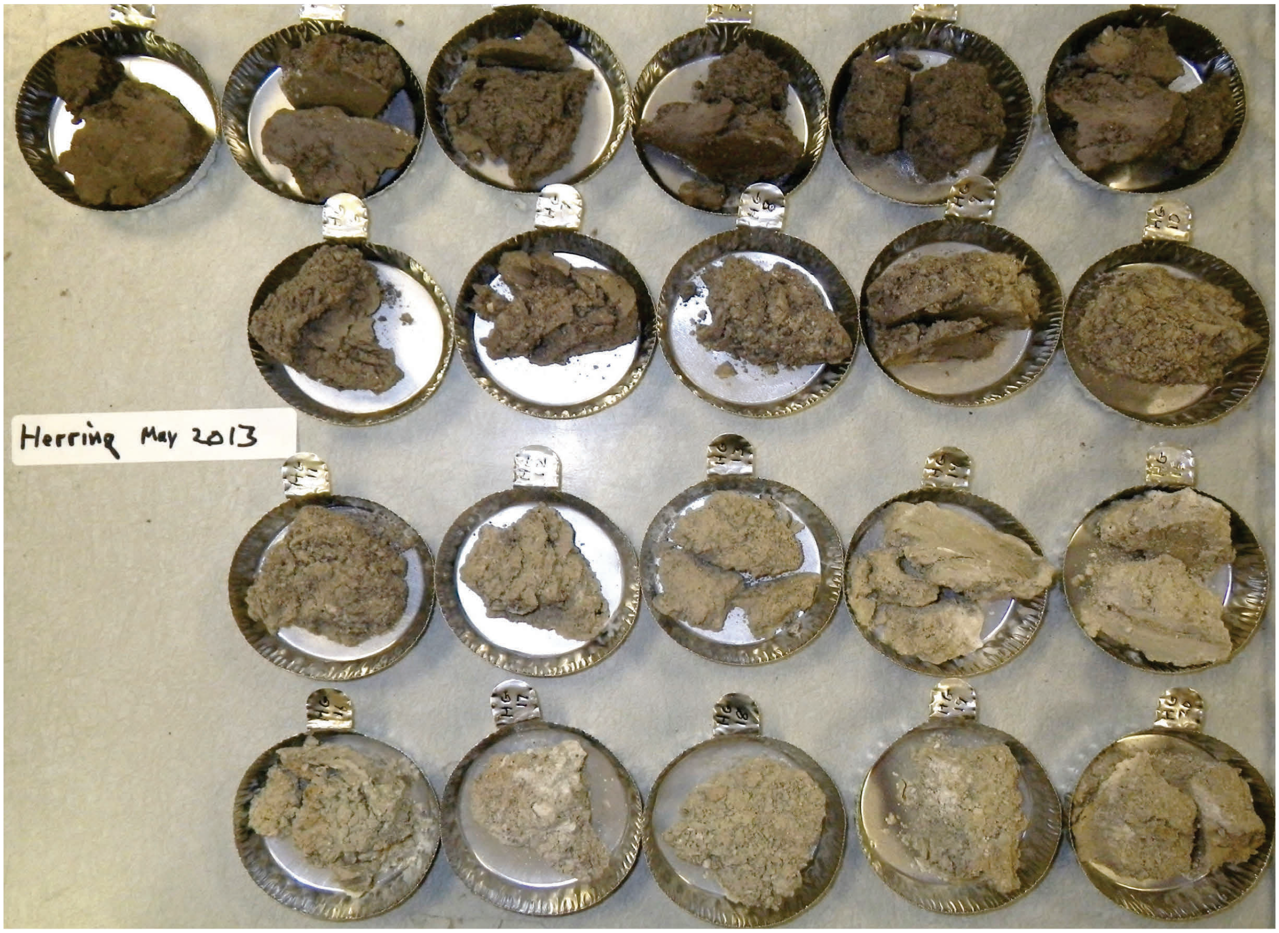

55
55
60

Herring soil properties

Moisture content, percent by weight				Particle size distribution, percent by weight				
Depth, ft.	5/6/2011	Depth	8/21/2012	Depth, ft.	Sand	Silt	Clay	Soil description
1	23.0	0.5	9.43	1	5.5%	53.1%	41.5%	
2	24.7	1.5	13.02	2	5.7%	50.6%	43.7%	Silty clay; stiff, dry to moist, dark brown (2.5Y 3/1); fine roots.
3	25.2	2.5	14.77	3	6.3%	57.1%	36.6%	
4	28.5	3.5	16.65	4	6.4%	60.3%	33.3%	
5	29.8	4.5	22.07	5	6.6%	66.4%	27.0%	
6	29.1	5.5	24.14	6	6.9%	68.4%	24.8%	Silty clay; stiff, moist, grey brown (10YR 3/1 to 10YR 3/2. Minor iron oxide and caliche concretions.
7	28.6	6.5	24.17	7	7.9%	60.9%	31.2%	
8	26.9	7.5	16.46	8	10.2%	62.3%	27.5%	
9	26.6	8.5	16.57	9	13.0%	61.0%	26.0%	
10	25.8	9.5	15.48	10	15.4%	56.9%	27.8%	
11	25.1	10.5	14.95	11	19.6%	47.6%	32.9%	
12	24.4	11.5	12.78	12	22.1%	56.4%	21.5%	
13	25.5	12.5	17.95	13	17.2%	59.4%	23.4%	
14	20.3	13.5	21.19	14	31.2%	47.9%	20.8%	
15	21.4	14.5	22.74	15	20.7%	51.9%	27.5%	Clayey sandy silt; grey (2.5Y 5/2) with darker (7.5YR 6/4) mottling, slightly moist, firm but crumbly; caliche up to 30%.
16	21.0	15.5	24.17	16	21.3%	47.7%	31.1%	
17	23.0	16.5	15.31	17	20.6%	49.6%	29.8%	
18	25.3	17.5	25.26	18	11.9%	52.5%	35.6%	
19	24.0	18.5	17.78	19	16.0%	48.5%	35.5%	
20	18.5	19.5	25.16	20	30.7%	46.9%	22.4%	
		20.5	19.12					

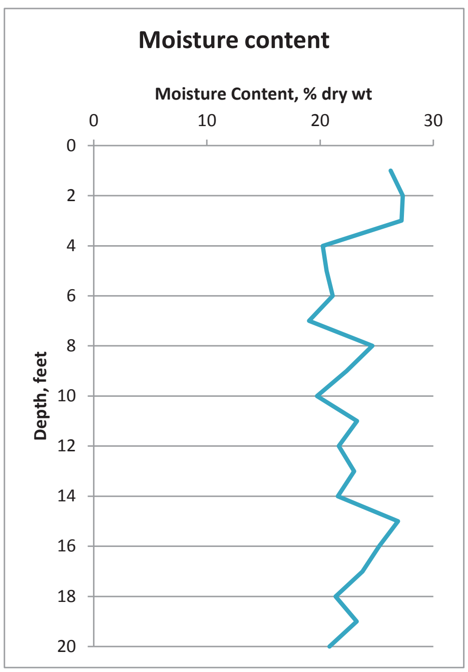


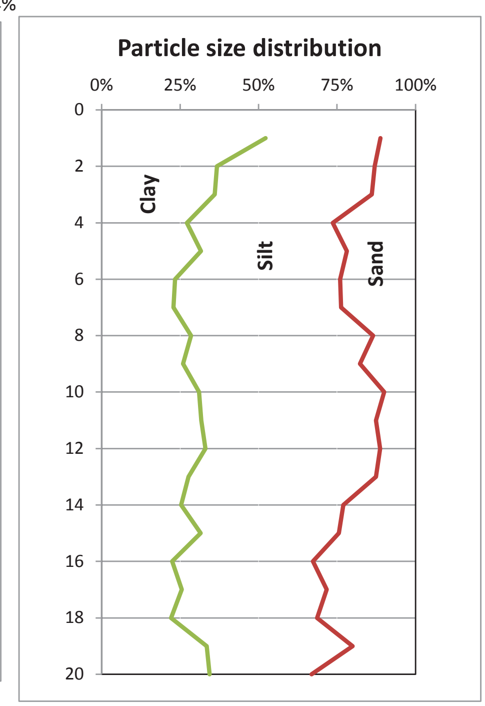


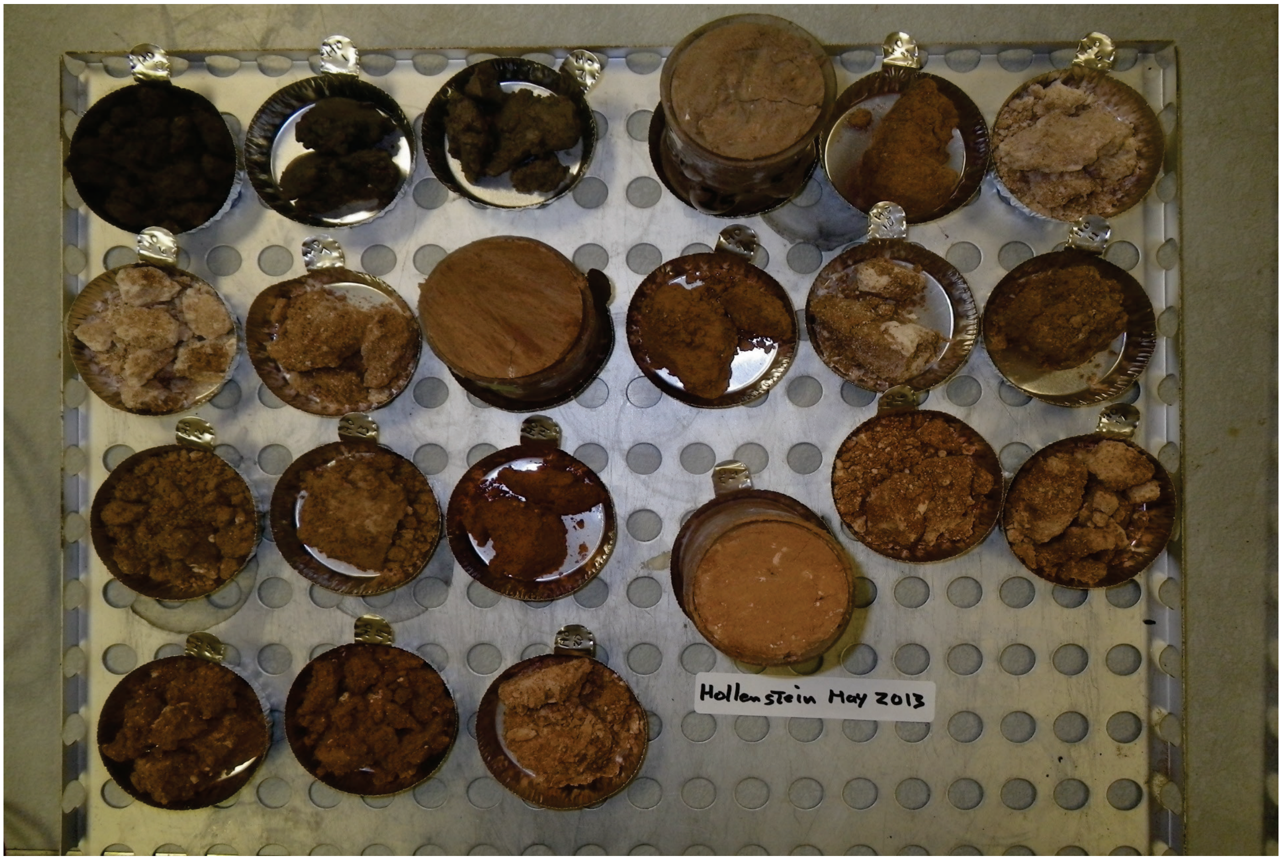

Herring May 2013

Hollenstein soil properties

Depth, ft	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
1	26.24	11.1%	36.6%	52.2%	
2	27.30	13.1%	50.2%	36.8%	Silty clay; very dark brown, moist, hard.
3	27.20	14.0%	50.0%	36.0%	
4	20.22	26.4%	46.5%	27.1%	
5	20.57	21.9%	46.4%	31.7%	
6	21.10	24.0%	52.5%	23.4%	
7	19.02	23.8%	53.4%	22.9%	
8	24.61	13.5%	57.9%	28.5%	Clayey silt. Damp, firm to hard, grey to reddish brown.
9	22.32	17.7%	56.4%	25.9%	
10	19.71	10.0%	59.0%	31.0%	
11	23.26	12.6%	55.6%	31.8%	
12	21.66	11.3%	55.6%	33.1%	
13	23.00	12.6%	59.7%	27.7%	
14	21.55	23.0%	51.6%	25.3%	
15	26.89	24.4%	44.1%	31.5%	
16	25.20	32.7%	44.8%	22.5%	
17	23.73	28.3%	46.2%	25.5%	
18	21.37	31.4%	46.5%	22.1%	Very fine red-brown silty sand with white caliche.
19	23.24	20.1%	46.4%	33.5%	
20	20.83	33.1%	32.5%	34.4%	

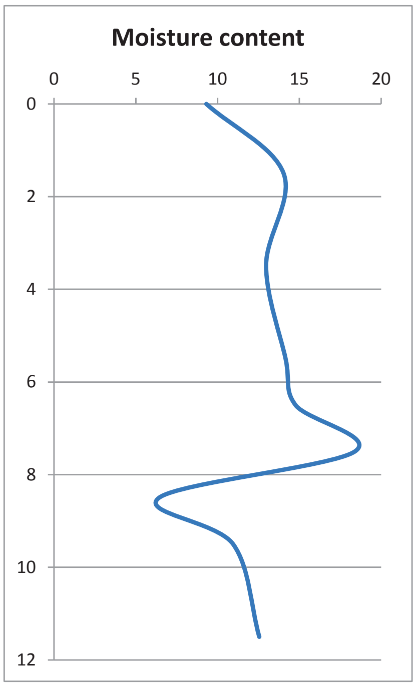


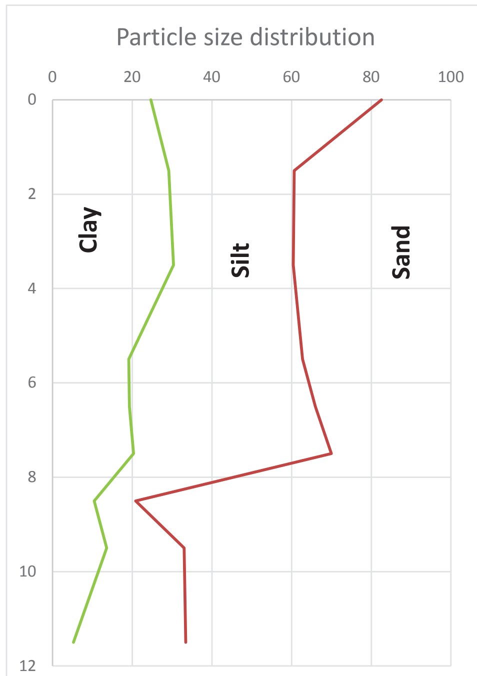



Hollenstein May 2013

Hughes east soil properties 4/30/2013

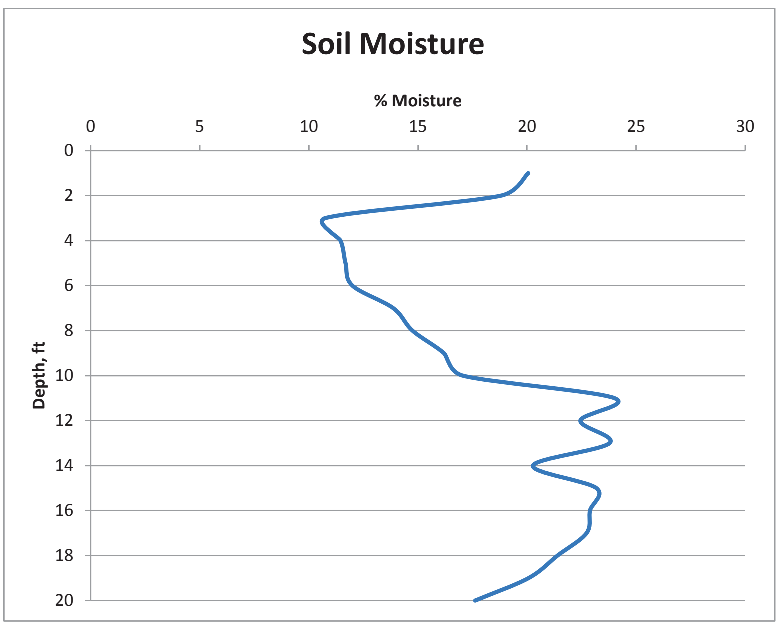
Depth ft	Moisture % by weight	Sand %	Silt %	Clay %	Soil Texture Class
0	9.3	17.4	57.9	24.7	Silty Loam
1 - 2	14.0	39.3	31.5	29.2	Clay Loam
3 - 4	13.0	39.6	30.0	30.4	Clay Loam
5 - 6	14.2	37.2	43.7	19.1	Loam
6 - 7	14.8	34.1	46.7	19.3	Loam
7 - 8	18.4	30.0	49.6	20.4	Silty Loam
8 - 9	6.4	79.1	10.4	10.5	Sandy Loam
9 - 10	11.0	67.0	19.4	13.6	Sandy Loam
11 - 12	12.5	66.6	28.2	5.2	Sandy Loam and caliche





Macha soil properties 4/11/2011

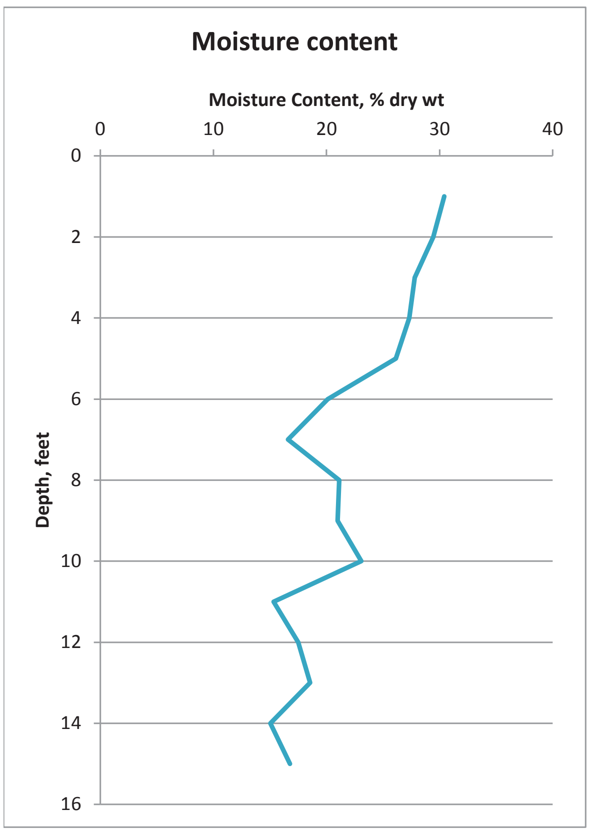
depth, feet	Moisture, percent by weight	Soil description
1	20.06	
2	18.81	Randall clay; dry to moist, hard. Very dark brown (10YR3/1).
3	10.76	Desiccation cracks to 18 inches.
4	11.45	
5	11.68	Silty sand. Yellowish grey (2.5Y 8/2), damp, very fine sand and
6	12.00	silt with clastic fragments to ~1 mm diameter.
7	13.87	Caliche. Light reddish brown (7.5YR 7/6) silt and sand with
8	14.75	carbonates in root tubes and as soft masses.
9	16.19	
10	17.05	Silty clay and silty sand with caliche. Grey (7.5 YR 6/3 to 2.5 Y
11	24.00	7/3) with reddish brown bands. Firm, moist, slightly plastic.
12	22.44	Increasing caliche at 14 feet; very hard digging.
13	23.78	
14	20.27	
15	23.18	
16	22.88	Silty sand. Yellowish grey (2.5Y 6/2). Hard, drier than above.
17	22.73	Little or no caliche.
18	21.40	
19	20.07	
20	17.62	

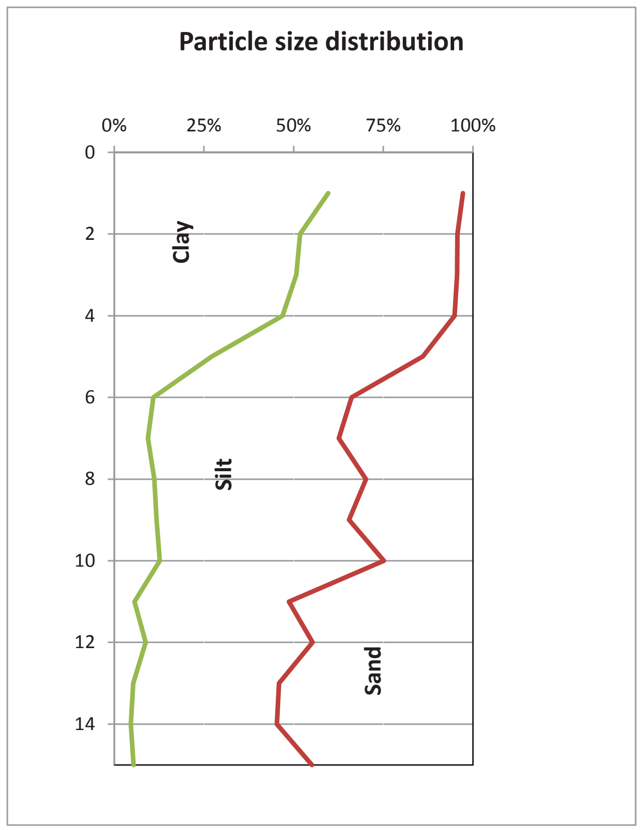



J. Macha 1'-20'

Mahagan soil properties

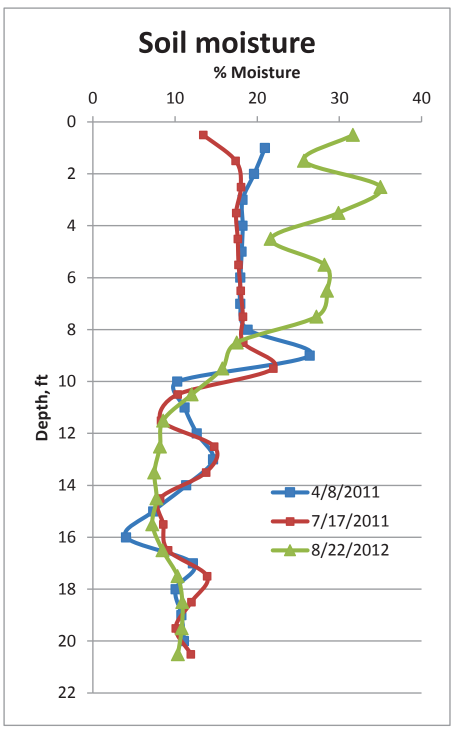
Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
1	30.4	2.8%	37.6%	59.6%	CLAY; black (10YR2/1) to v. dark grey (10YR3/1); dry at surface , damp to moist at 2' depth. Blocky/angular cleavages, highly plastic.
2	29.4	4.3%	43.9%	51.8%	
3	27.8	4.4%	44.9%	50.7%	
4	27.3	5.2%	47.9%	47.0%	Silty CLAY; dark grey (10YR4/1) mottled with greyish brown (2.5Y5/2); moist, firm, moderately plastic.
5	26.1	13.9%	58.8%	27.2%	
6	20.1	33.9%	55.2%	10.9%	SILT; greyish brown (2.5Y5/2) with light grey (2.5Y7/2) 1-2 mm specks of caliche increasing with depth and small clay inclusions; firm, damp, non-plastic.
7	16.6	37.4%	53.2%	9.4%	
8	21.1	29.8%	59.0%	11.2%	SILT with v. fine sand. Light yellowish brown (2.5Y6/3), with small grey and olive yellow (2.5Y6/6) and black spotting and soft to hard caliche nodules at 9 ft.
9	21.0	34.6%	53.6%	11.8%	
10	23.1	24.8%	62.5%	12.7%	Clayey SILT; light yellowish brown, dense, compact; minor caliche
11	15.3	51.3%	43.1%	5.6%	Very fine silty SAND; pale brown (2.5Y7/3), soft, friable, damp
12	17.5	44.7%	46.5%	8.7%	
13	18.6	54.1%	40.6%	5.3%	Increasing caliche as hard compact masses to 3/4 inch dia replacing silica sand fraction; approx 70% carbonate. Auger refusal at 16 ft. in hard caliche.
14	15.0	54.7%	40.7%	4.6%	
15	16.8	44.9%	49.7%	5.4%	

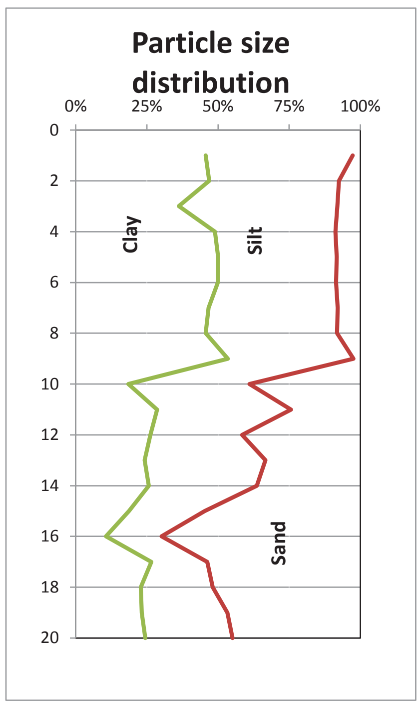


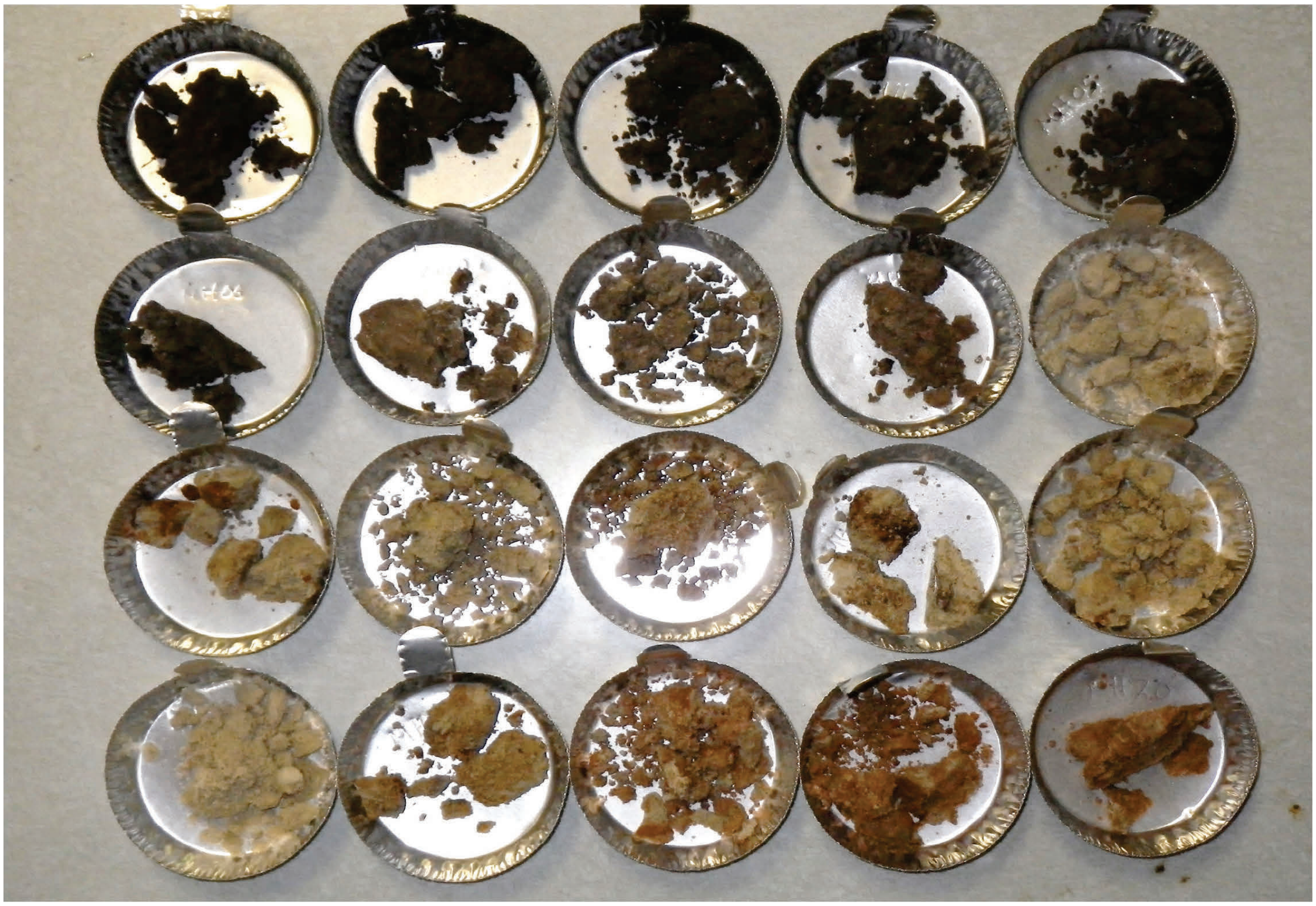


M Harrell soil properties

Sample date:	4/8/2011		7/17/2011	8/22/2012	Particle size distribution, percent by weight				
Depth, ft.	Moisture, percent by weight	depth	Moisture, percent by weight	Moisture, percent by weight	Depth	Sand	Silt	Clay	Soil description
1	20.95	0.5	13.44	31.68	1	2.7%	51.6%	45.7%	Silty, red-brown (10 YR4/6) hard clay
2	19.64	1.5	17.38	25.71	2	7.5%	45.6%	46.9%	
3	18.21	2.5	18.01	35.00	3	8.1%	55.7%	36.2%	
4	18.24	3.5	17.43	29.92	4	8.7%	42.4%	48.9%	Dark grey-brown (10YR3/2) hard clay with
5	18.12	4.5	17.63	21.67	5	8.3%	41.7%	50.0%	occasional small roots and flecks of caliche; yellow-
6	17.96	5.5	17.73	28.18	6	8.5%	41.5%	50.0%	brown mineralization along fracture surfaces
7	17.94	6.5	18.00	28.52	7	7.9%	45.4%	46.7%	
8	18.86	7.5	18.26	27.23	8	8.2%	46.2%	45.7%	
9	26.42	8.5	18.30	17.52	9	2.4%	44.1%	53.5%	Lighter color (10YR5/2) and increasing caliche;
10	10.30	9.5	21.96	15.76	10	38.9%	42.5%	18.5%	looser and sandier texture. Still occasional roots.
11	11.16	10.5	10.30	12.04	11	24.3%	47.1%	28.6%	
12	12.66	11.5	8.30	8.55	12	41.5%	32.2%	26.3%	
13	14.65	12.5	14.77	8.17	13	33.4%	42.5%	24.2%	
14	11.38	13.5	13.77	7.49	14	36.3%	37.9%	25.7%	
15	7.34	14.5	8.16	7.75	15	54.7%	26.6%	18.7%	Silty sand and very fine sand. Grey matrix (2.5Y 8/1)
16	4.05	15.5	8.56	7.25	16	69.8%	19.5%	10.6%	with small nodules of dark brown to black (10YR
17	12.19	16.5	9.13	8.48	17	53.8%	19.7%	26.5%	5/8) iron precipitates
18	10.07	17.5	13.91	10.31	18	51.8%	25.3%	22.9%	
19	10.79	18.5	11.98	10.90	19	46.7%	30.1%	23.2%	
20	11.11	19.5	10.08	10.82	20	44.9%	30.7%	24.4%	
		20.5	11.93	10.36					

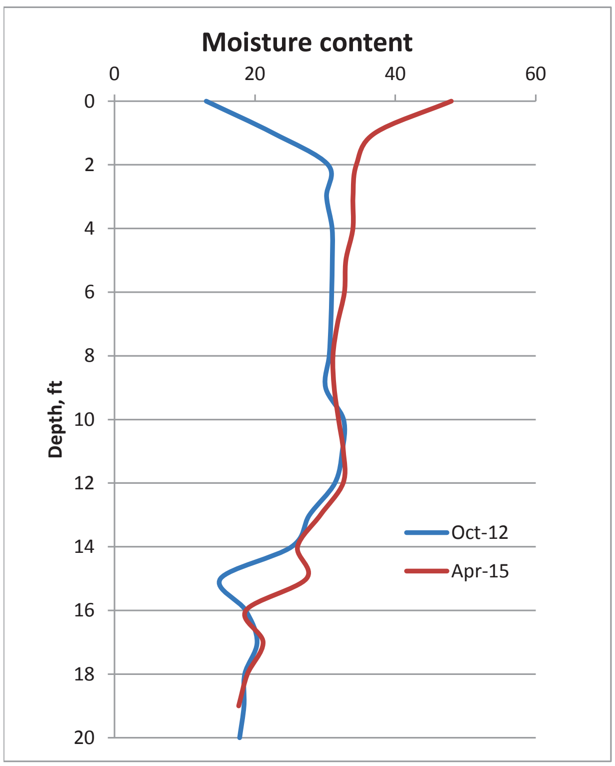


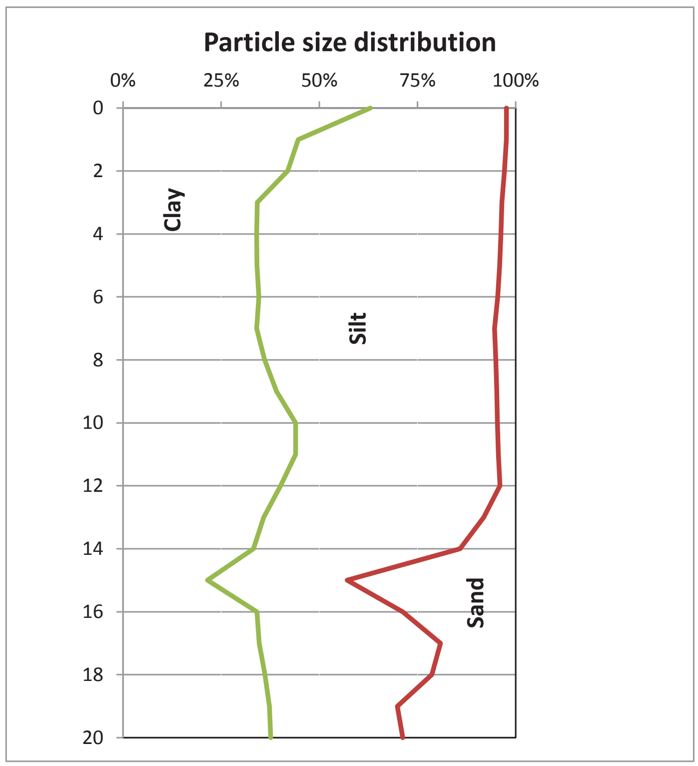




Minton soil properties

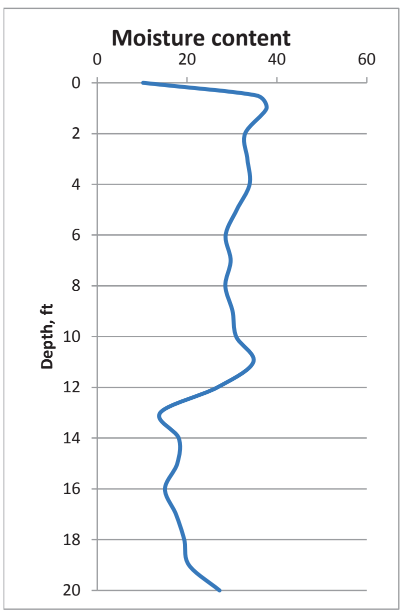
Depth, ft.	Moisture content, percent by weight 10/23/2012	4/15/2015	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0	13.1	48.0	2.4%	34.7%	63.0%	Silty clay; greyish brown, loose, dry
1	22.6	37.1	2.4%	53.0%	44.6%	
2	30.4	34.4	2.8%	55.2%	41.9%	
3	30.2	34.0	3.5%	62.3%	34.2%	
4	31.0	34.0	3.8%	62.2%	34.0%	
5	31.0	33.0	4.1%	61.8%	34.1%	
6	30.9	32.8	4.6%	60.8%	34.6%	
7	30.8	31.8	5.4%	60.5%	34.1%	Silty clay; black (10YR2/1) grading to greyish brown
8	30.6	31.1	5.1%	58.8%	36.1%	(10YR4/2) and yellowish brown (2.5Y6/3); moist, firm,
9	30.1	31.3	4.8%	56.1%	39.1%	with open cracks between soil peds in upper zone and
10	32.6	31.9	4.6%	51.4%	44.0%	dark brown silty partings and crack fill in lower zones.
11	32.4	32.6	4.4%	51.6%	44.0%	Dispersed caliche in small irregular masses.
12	31.4	32.6	4.0%	55.8%	40.2%	
13	27.8	29.3	8.1%	56.1%	35.8%	Silty sand and clay; moist, soft, light yellowish brown;
14	25.2	26.1	14.2%	52.7%	33.2%	trace caliche.
15	15.1	27.3	42.9%	35.6%	21.5%	Sand; fine to very fine, moist, soft to firm, light yellowish
16	18.7	18.7	28.7%	37.2%	34.1%	brown (10YR6/4)
17	20.3	21.2	19.2%	46.1%	34.7%	
18	18.5	18.9	21.3%	42.6%	36.1%	Silty clayey sand; firmer and drier than above; reddish
19	18.4	17.7	30.1%	32.6%	37.3%	yellow (7.5YR6/8 with black mottling on cleavages;
20	17.8		28.8%	33.6%	37.6%	increasing clay with depth.

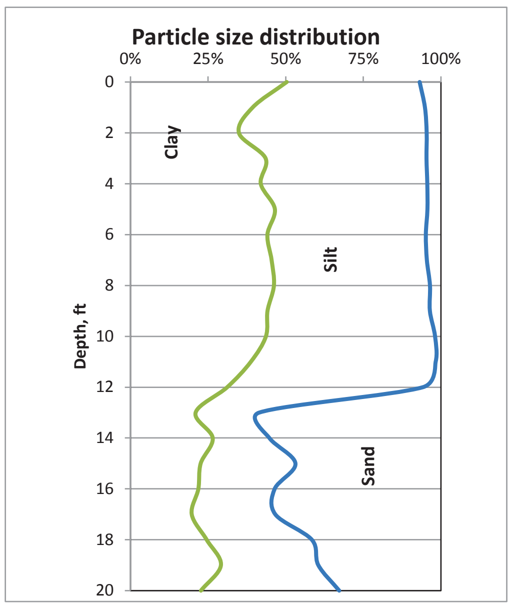


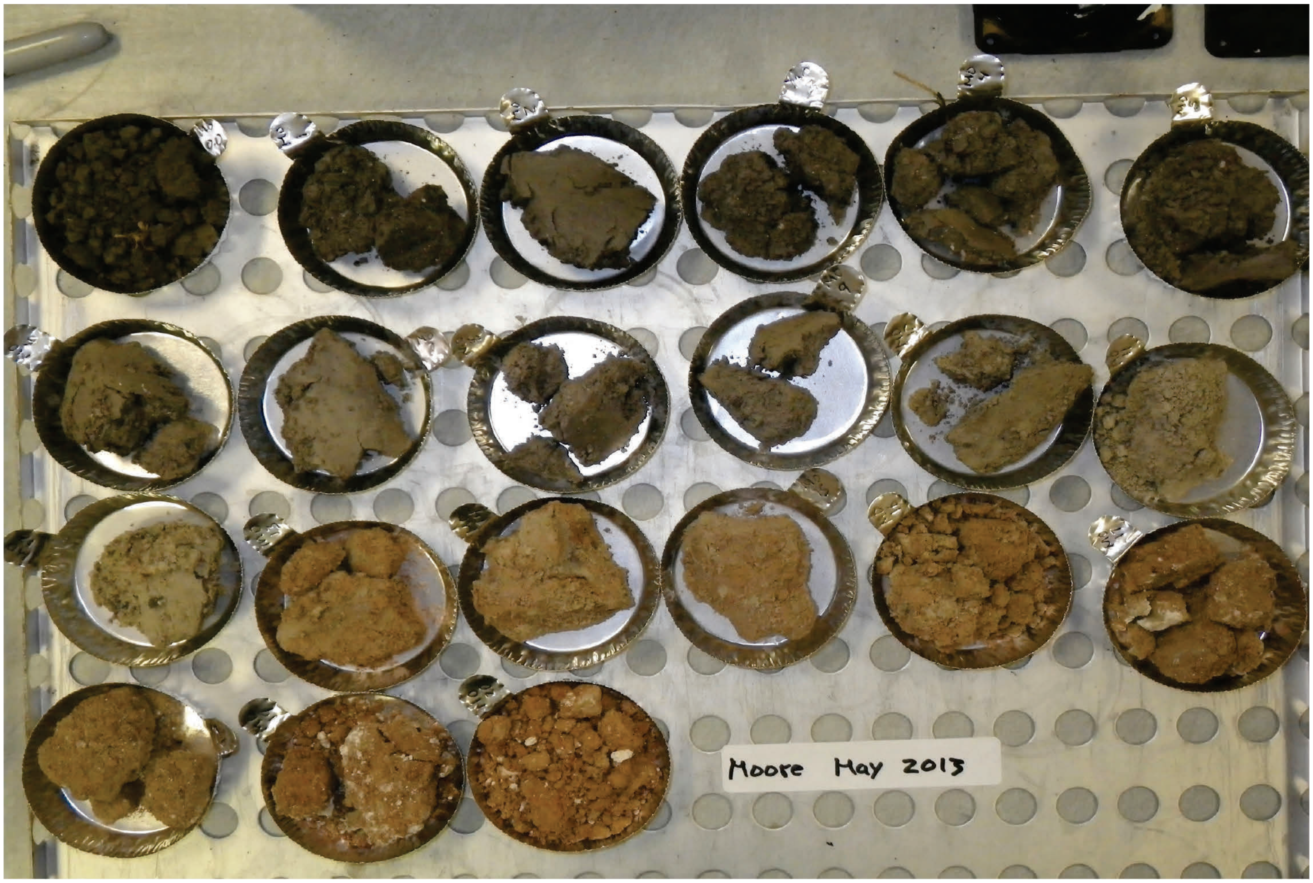


Moore soil properties 5/1/2013

Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0	10.2	6.9%	42.8%	50.3%	
0.5	35.4				
1	37.7	5.2%	55.5%	39.3%	
2	32.9	4.6%	60.5%	34.9%	
3	33.4	4.7%	51.8%	43.5%	
4	33.9	4.4%	53.6%	42.0%	Silty clay; dark brown grading to grey; wet and sticky, highly plastic.
5	31.1	4.4%	49.1%	46.5%	
6	28.6	4.9%	51.0%	44.1%	
7	29.7	4.5%	50.0%	45.5%	
8	28.5	3.5%	50.3%	46.2%	
9	30.1	3.6%	52.3%	44.1%	
10	30.9	1.9%	54.5%	43.6%	
11	34.7	1.7%	59.5%	38.8%	
12	26.7	5.8%	63.0%	31.2%	
13	14.0	58.6%	20.4%	21.0%	
14	18.1	55.2%	18.3%	26.5%	
15	17.8	46.9%	30.5%	22.6%	Silty clayey sand; grey grading to red-brown, soft, friable, drier than clay above.
16	15.1	53.6%	24.6%	21.9%	
17	17.5	53.4%	26.9%	19.7%	
18	19.4	41.6%	33.9%	24.5%	
19	20.4	39.5%	31.4%	29.1%	
20	27.2	32.8%	44.5%	22.7%	

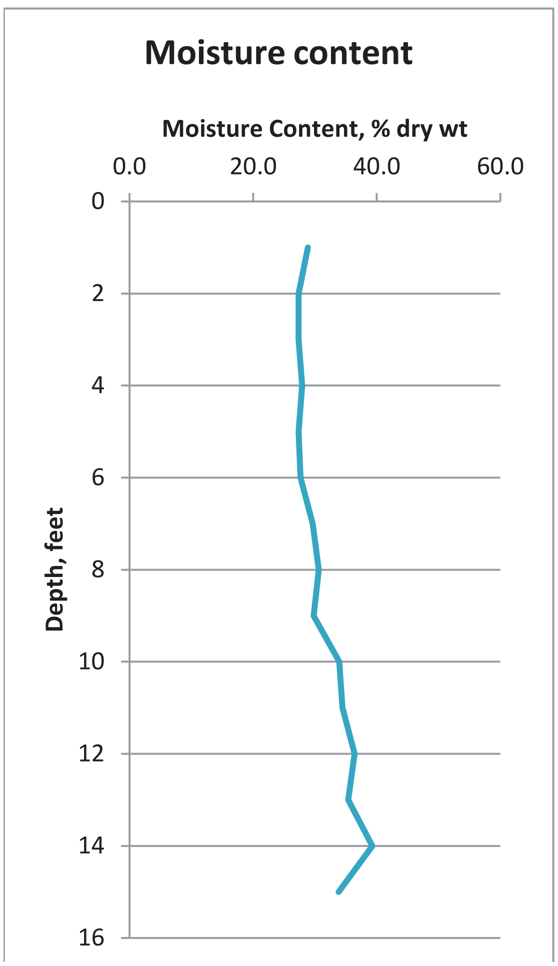


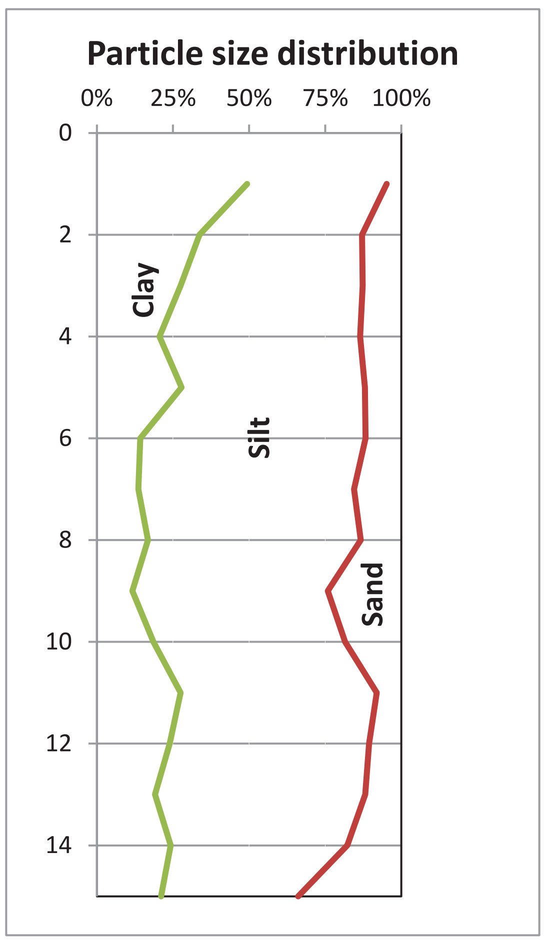



Moore May 2013

Myatt playa moisture content

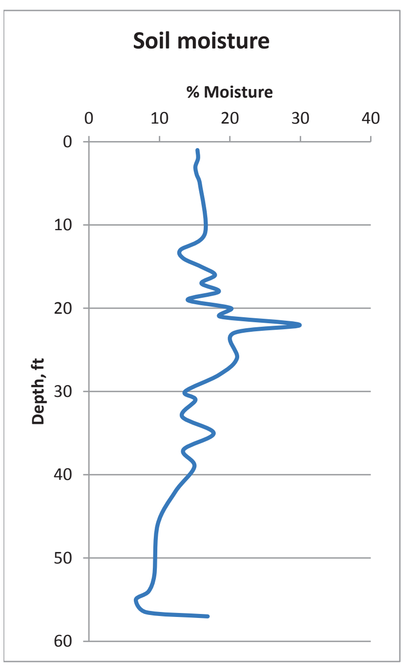
Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
1	28.9	4.8%	45.9%	49.3%	Silty clay and clayey silt loam; dark brown (10YR 2/2) grading to dark yellow brown (10YR 3/4), hard to firm, dry to damp. Blocky fractures and fine roots.
2	27.4	12.9%	53.4%	33.7%	
3	27.4	12.7%	59.9%	27.5%	
4	27.9	13.6%	65.9%	20.6%	
5	27.4	12.0%	60.2%	27.8%	
6	27.7	11.7%	74.0%	14.3%	
7	29.6	16.0%	70.8%	13.7%	Silty sand with weakly cemented silt aggregates. Light brownish grey (10YR 6/2) to light grey (10YR 7/2), damp to dry, firm to hard.
8	30.6	16.3%	69.9%	16.8%	
9	29.8	25.5%	64.2%	11.7%	
10	33.9	22.9%	63.0%	18.5%	
11	34.4	18.7%	64.5%	27.5%	
12	36.4	19.2%	65.5%	23.9%	
13	35.4	13.6%	69.0%	19.1%	
14	39.3	21.9%	58.0%	24.2%	
15	33.8	38.7%	45.0%	21.1%	Silty sand with hard caliche-cemented layers.

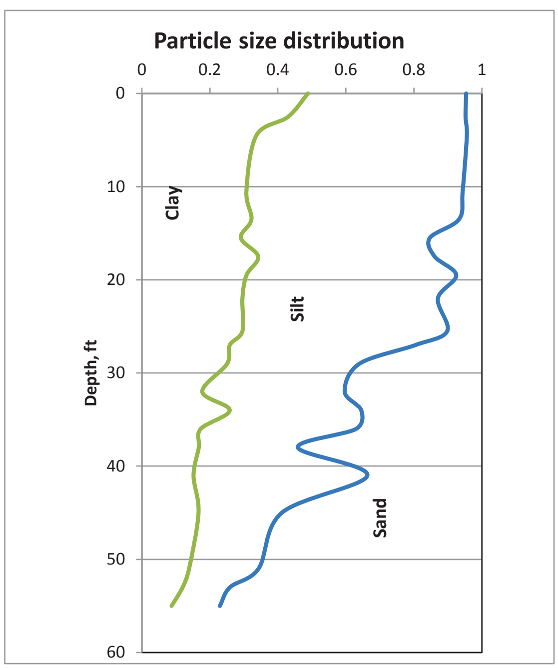




Obert North soil properties 7/14/2011

Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
1	15.4019981	4.6%	46.5%	48.8%	
2	15.4857964	4.8%	52.2%	43.0%	
3	15.1109002				Clay; very dark brown, dry, hard.
4	15.3167124	4.4%	61.9%	33.7%	
5	15.7371948				
11	16.4711459	5.7%	63.6%	30.8%	
13	12.9802156				
14	13.3927635	6.7%	61.0%	32.2%	
15	15.9122356				
16	17.8948437	15.3%	55.6%	29.1%	Silty clay and sandy clay. Dark grey at top (7.5 YR 2/3), grading to reddish yellow (7.5YR 7/6) and brown (7.5YR 5/8). Moist, firm to hard. Layered very fine sand and sandy/silty clay. Isolated caliche nodules at 7.5 to 10 ft.
17	15.9670686				
18	18.426259	13.9%	51.9%	34.2%	
19	14.0223193				
20	20.1926832	7.6%	61.7%	30.8%	
21	18.6309776				
22	29.9103768	13.0%	57.5%	29.6%	
23	20.4920956				
26	21.0077519	10.2%	60.2%	29.6%	
28	18.4554702	19.6%	54.6%	25.9%	
30	13.6502614	36.0%	38.9%	25.1%	
31	15.1198343				Sand and sandy clay with caliche. Hard, dry, semi-indurated. Strong brown (7.5YR 4/6) to red (2.5YR 5/8) matrix with white to pink caliche nodules
33	13.2241077	40.4%	41.9%	17.8%	
35	17.7064428	35.5%	38.7%	25.8%	
37	13.4047061	37.0%	45.7%	17.3%	
39	14.9706015	54.1%	29.1%	16.7%	
42	12.2765197	33.7%	51.1%	15.2%	
46	9.75153914	58.9%	24.5%	16.7%	Silty, clayey sand with caliche. Firm to very hard, damp to dry, yellowish red (5YR 5/8). Auger refusal at 56 feet in massive caliche.
52	9.28882438	65.7%	20.4%	13.9%	
54	8.46560847	74.1%	13.9%	12.0%	
55	6.66171635	77.1%	14.2%	8.7%	
56.5	8.1239531				
57	16.8544194				





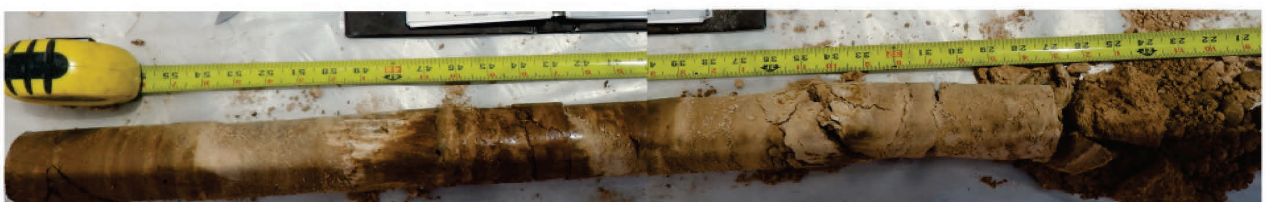
Obert Playa Soil Boring 7/13/2011

5 0

5' to 10': Poor recovery, no photos – dark brown Randall clay

15 10

20 15

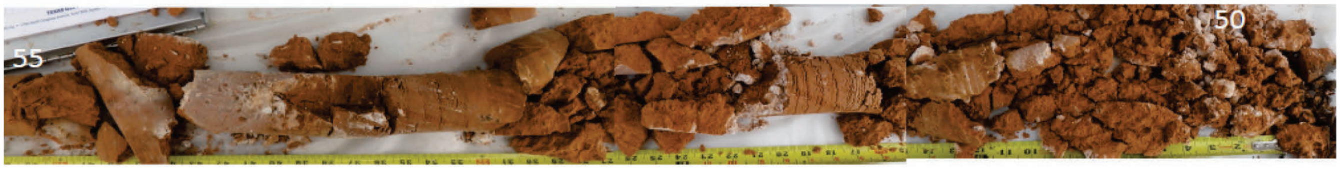


25 20

30 25

35 30

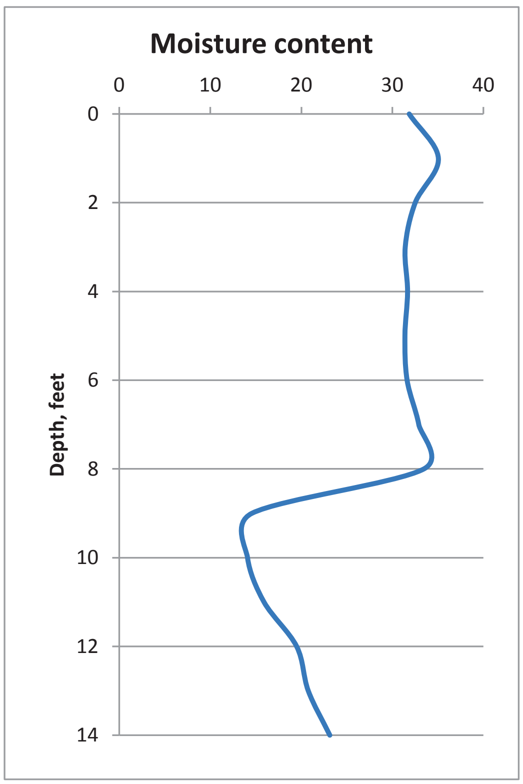
40 ft – 50 ft: poor recovery, no photos

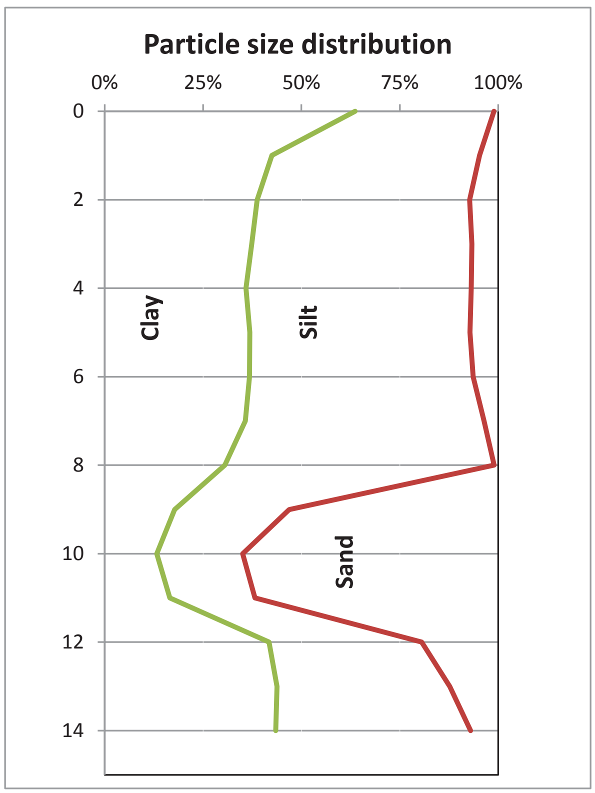


Rieff soil properties

Sample dat 2/12/2012

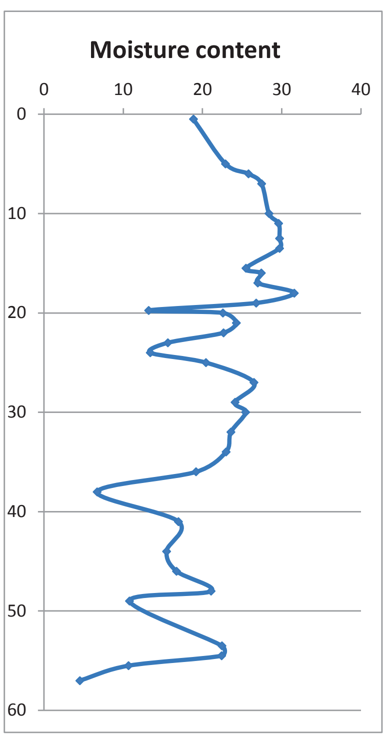
Depth, ft.	Moisture content, percent by weight	Sand, percent by weight	Silt, percent by weight	Clay, percent by weight	Soil description
0	31.9	1.1%	35.3%	63.6%	Clay
1	35.1	4.7%	52.8%	42.5%	Clay
2	32.5	7.3%	54.0%	38.8%	Clay
3	31.4	6.7%	56.0%	37.3%	Clay
4	31.7	6.9%	57.2%	35.9%	silty clay
5	31.4	7.2%	55.9%	36.9%	silty clay
6	31.6	6.3%	56.8%	36.8%	silty clay
7	32.9	3.6%	60.7%	35.7%	silty clay
8	33.5	1.0%	68.4%	30.5%	silty clay
9	14.6	53.1%	29.1%	17.7%	sand
10	14.1	64.9%	21.8%	13.2%	sand
11	15.9	61.9%	21.6%	16.5%	silty sand
12	19.5	19.5%	38.8%	41.8%	clayey sand
13	20.8	12.3%	43.9%	43.8%	clayey sand
14	23.1	7.0%	49.5%	43.5%	clayey sand

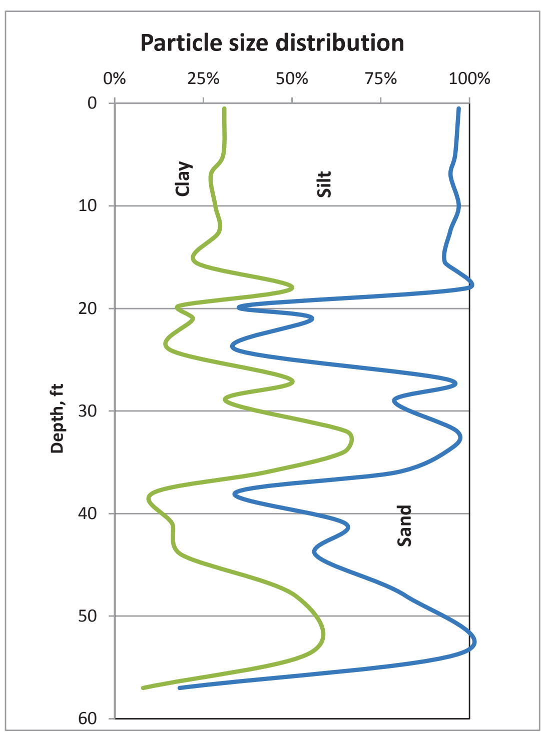




Wright soil properties

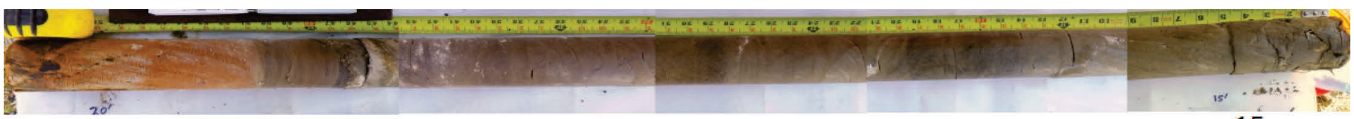
Depth	Moisture	Sand	Silt	Clay	Soil description
0.5	18.85023	3.0%	66.1%	30.9%	
5	22.90621	4.0%	65.4%	30.6%	
6	25.80509				
7	27.45041	5.3%	67.6%	27.1%	
10	28.39736	3.0%	68.6%	28.4%	
11	29.61885				
12.5	29.71617	5.5%	65.1%	29.4%	
13.5	29.72296				
15.5	25.49146	6.9%	70.3%	22.8%	Clayey silt; very dark brown to greyish brown (10YR4/2
16	27.4243				to 10YR5/2), hard, dry to moist, plastic, trace fine roots
17	26.9995				and root tubes.
18	31.60064	0.4%	49.6%	50.0%	
19	26.78455				Clay; Sharp transition to yellowish red, firm to hard.
19.75	13.19675	63.8%	18.1%	18.1%	
20	22.57623				
21	24.29063	44.3%	33.6%	22.0%	
22	22.64418				
23	15.64899				
24	13.40621	65.9%	18.7%	15.4%	Fine sand with clay;yellowish red (10YR4/6),slightly
25	20.42692				plastic, moist, firm to hard,
27	26.50007	5.4%	44.7%	49.9%	
29	24.09962	21.2%	47.5%	31.3%	
30	25.4519				
32	23.58274	3.4%	31.2%	65.4%	
34	22.96341	6.7%	28.7%	64.6%	Clay with caliche; red (5YR4/6), damp, hard; black
36	19.18985	20.9%	37.0%	42.1%	staining on partings
38	6.701366	66.1%	23.2%	10.7%	
41	16.98422	34.8%	48.9%	16.2%	Fine sand and clayey fine sand in alternating bands;
44	15.46158	43.4%	37.8%	18.8%	hard, damp to dry, reddish yellow to strong brown
46	16.73241				(5YR6/6 to 7.5YR/5/6). Minor caliche nodules.
48	21.09346	18.1%	31.0%	50.9%	
49	10.80596				
53.5	22.4453	1.6%	42.9%	55.5%	Silty clay; wetter, slightly plastic, slickenside surfaces and
54.5	22.40752				black stain on partings.
55.5	10.68855				Sand; fine to very fine yellowish red sand (5YR5/8);
57	4.514139	81.7%	10.3%	8.0%	loose, damp to dry.



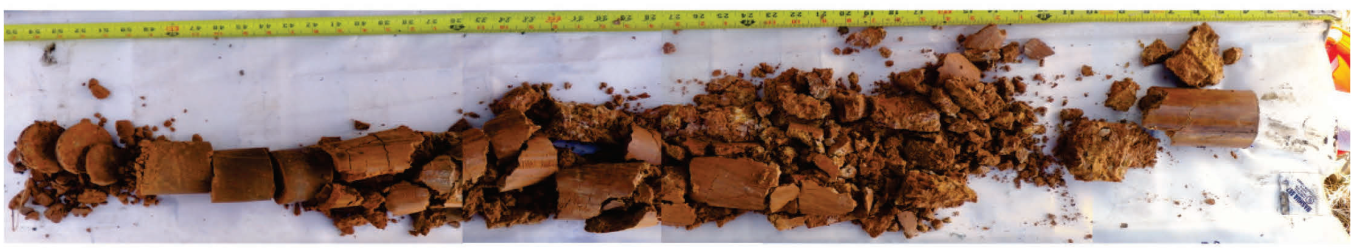


Wright Playa Soil Boring 7/13/2011

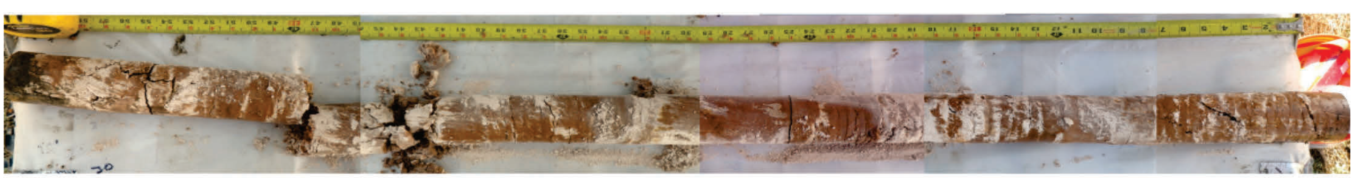
0 to 5 ft: No recovery



20 15



25 20



30 25

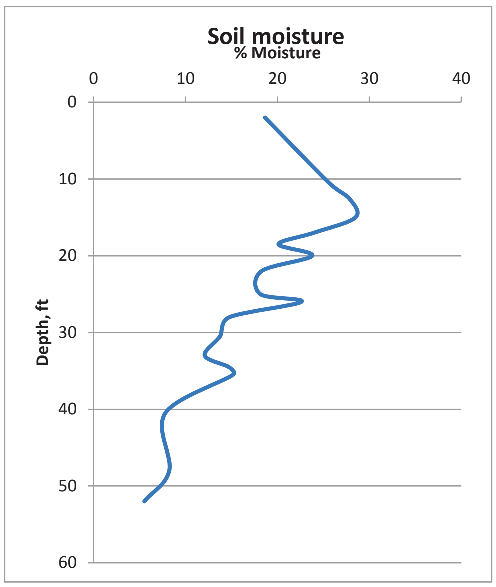
35 30

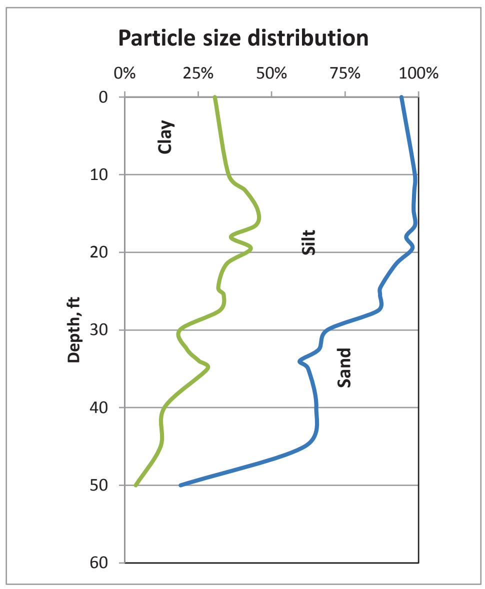
40 35

45 40

Younger soil properties **7/12/2011**

Depth, ft.	Moisture content, percent by weight	Sand	Silt	Clay	Soil description
2	18.65	5.8%	63.5%	30.6%	
10.5	25.61	1.3%	63.4%	35.3%	Silty clay; very dark brown, dry to moist, hard.
12.5	27.79	1.5%	57.6%	41.0%	
15	28.49	1.7%	53.1%	45.2%	
17	23.98	1.2%	54.2%	44.6%	
18.5	20.11	4.2%	59.7%	36.1%	Silty clay grading to fine sandy clay. Medium brown
20	23.78	2.1%	55.0%	42.9%	grading to grey brown with strong red-brown staining
22	18.27	7.7%	57.7%	34.6%	along fissures and pores.
25	18.13	13.0%	55.2%	31.8%	
26	22.61	13.1%	53.2%	33.7%	
28	14.79	13.8%	53.9%	32.3%	
30.5	13.75	31.0%	50.2%	18.8%	Medium brown to buff sandy clay and white, hard caliche
33	12.09	33.9%	44.9%	21.2%	in indurated intervals. Moist to dry.
34.5	14.71	40.5%	34.2%	25.3%	
35.5	15.17	37.6%	34.3%	28.1%	
40.5	7.80	34.8%	51.7%	13.5%	
48	8.23	38.8%	49.0%	12.2%	Fine to very fine sand with caliche partings. Soft, damp,
52	5.52	81.0%	15.3%	3.7%	loose.





Younger Playa Soil Core, 7/12/2011

0-5 ft, Randall Clay, no photos
5 – 10 ft, no recovery

15 10

20 15

25 20

25 – 30 ft: sandy clay and caliche; no photos

35 30

35 – 40 ft: no recovery

48 45


25
2 3 4 5 6 7 8 9 10 11 12 13 14 15
52
50

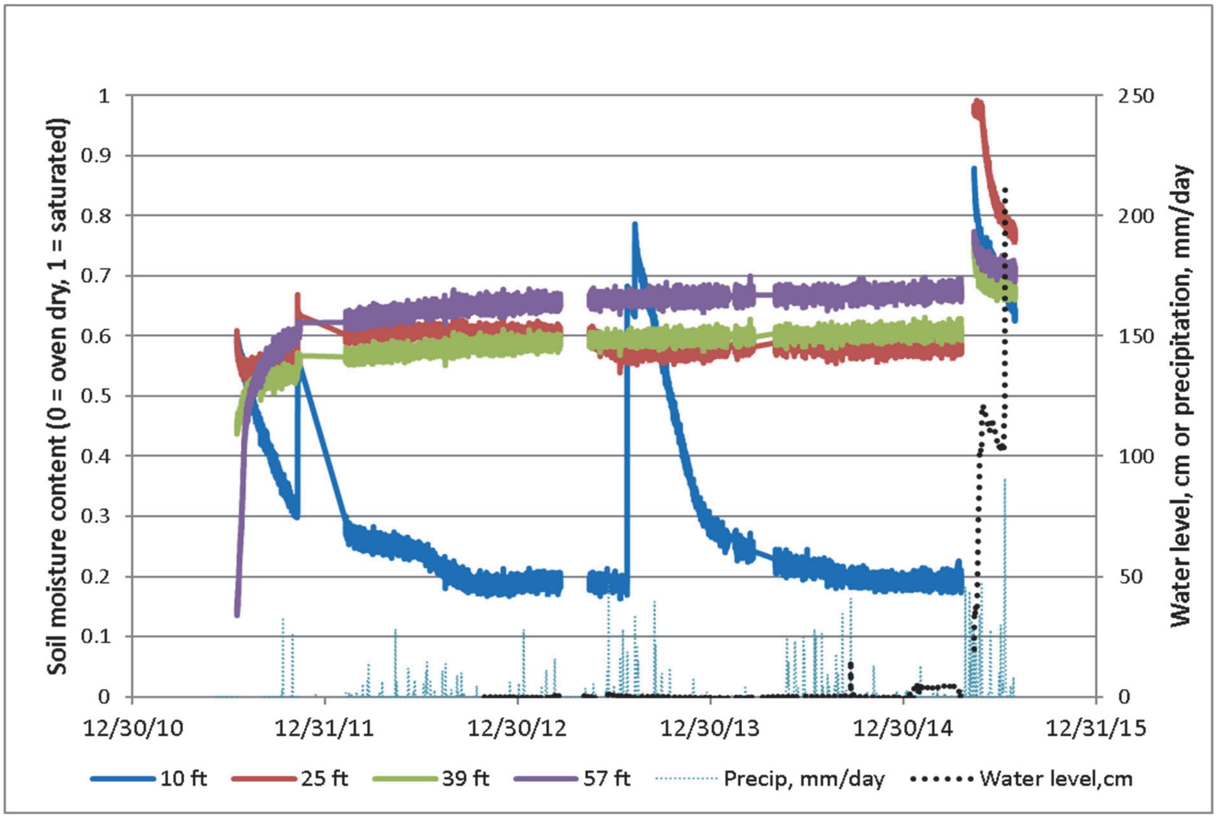


Figure 1. Bivins soil moisture

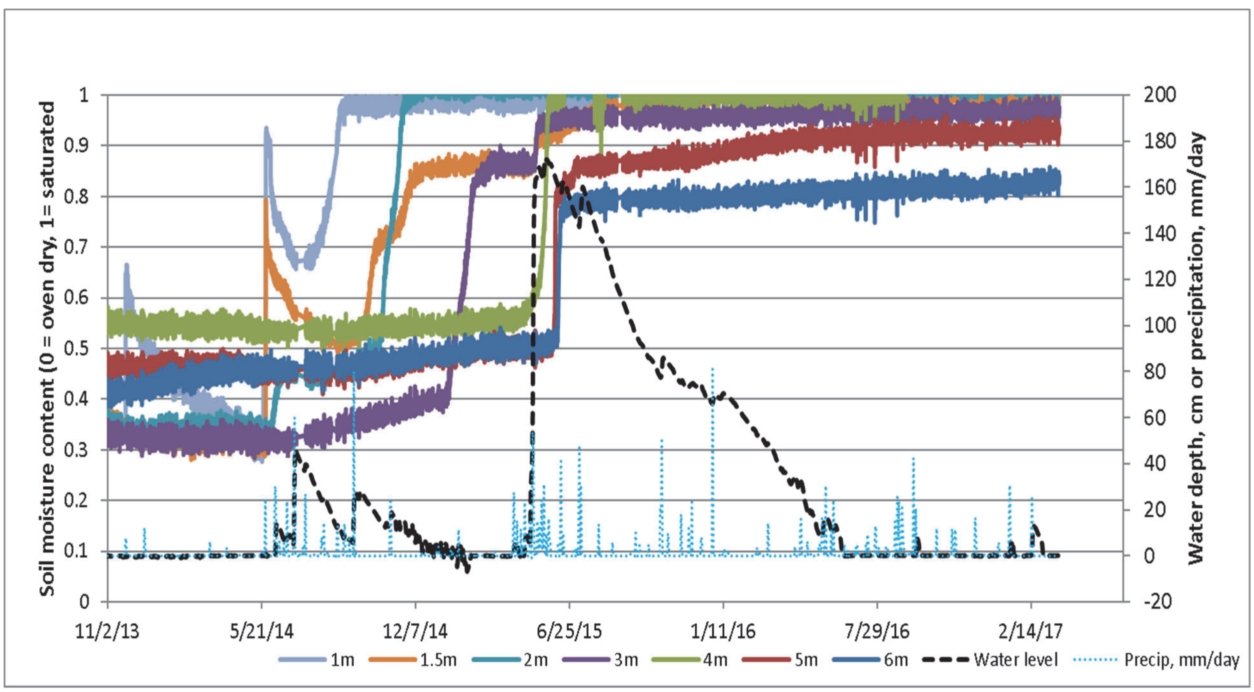


Figure 2. FLRNG soil moisture.

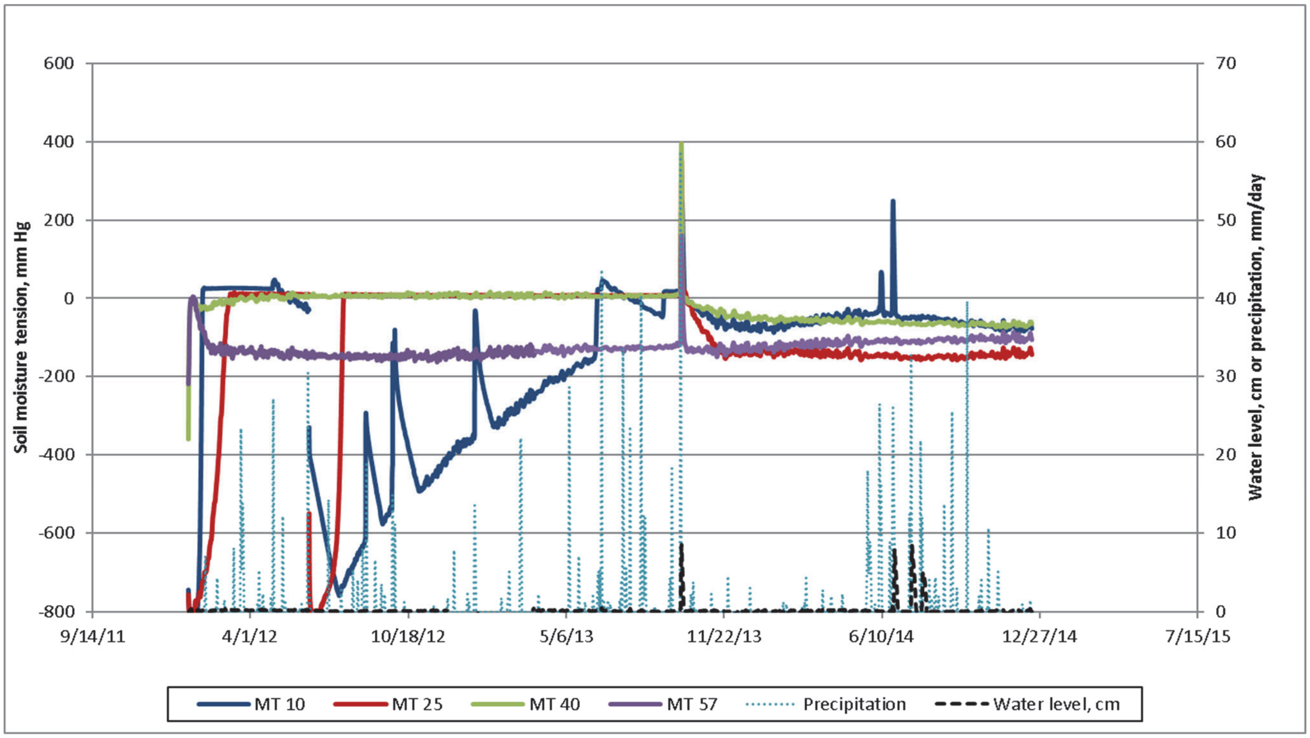


Figure 3. Haiduk soil moisture tension. This site was instrumented with tensiometers instead of HDPs, and was decommissioned before the 2015 flooding.

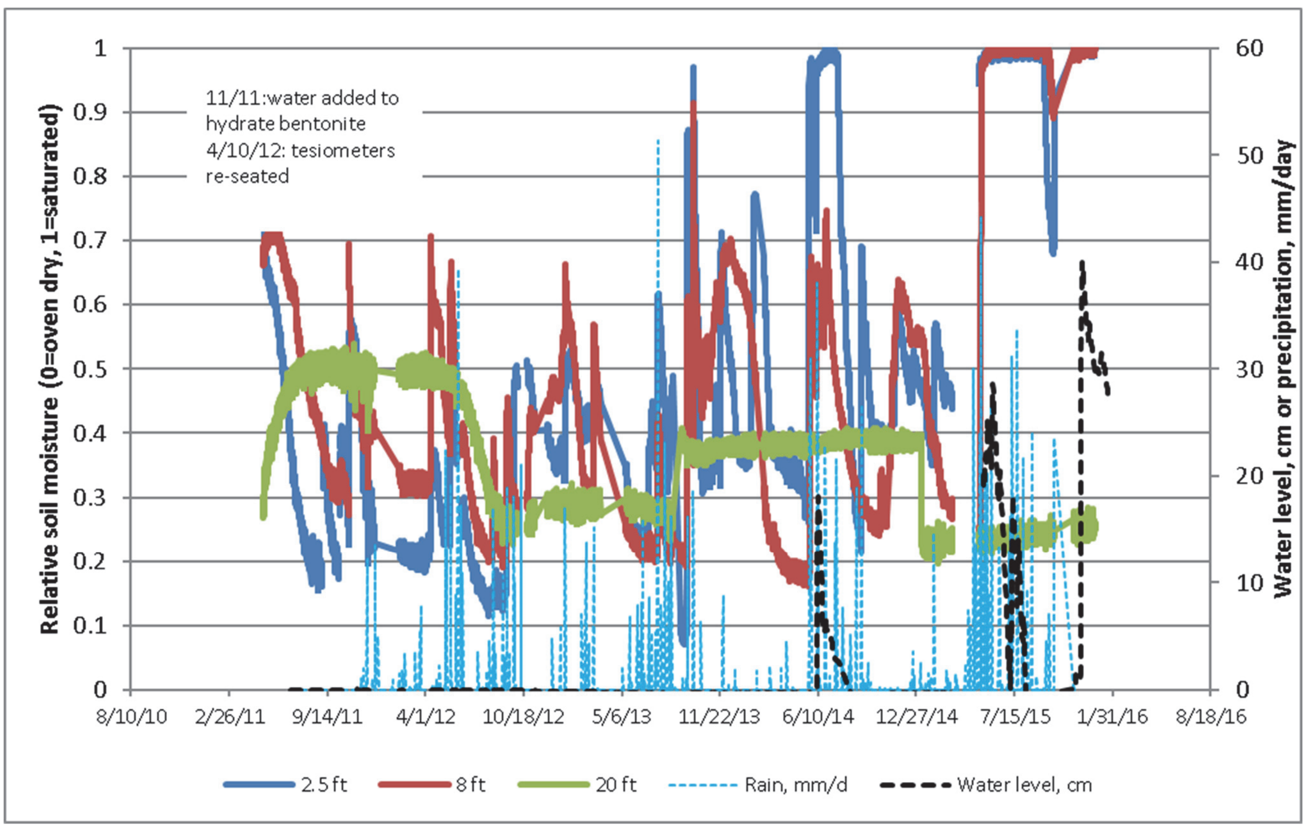


Figure 4. Herring soil moisture.

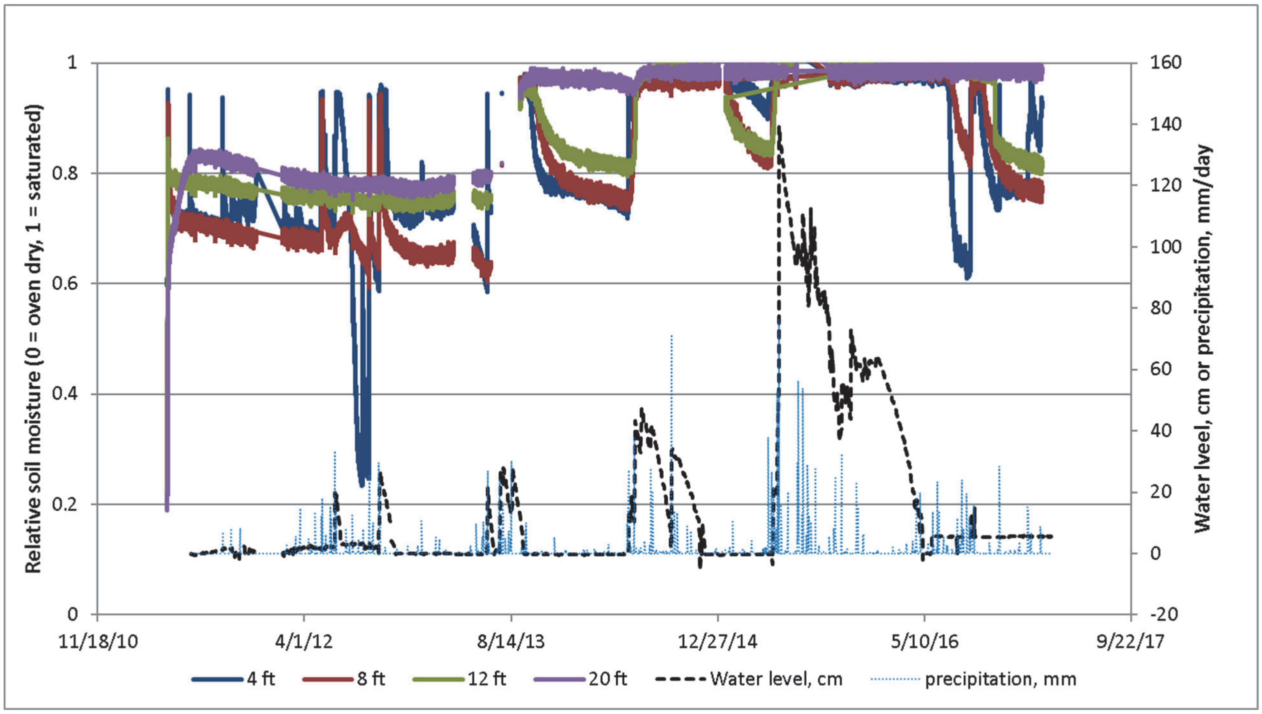


Figure 5. Hollenstein soil moisture.

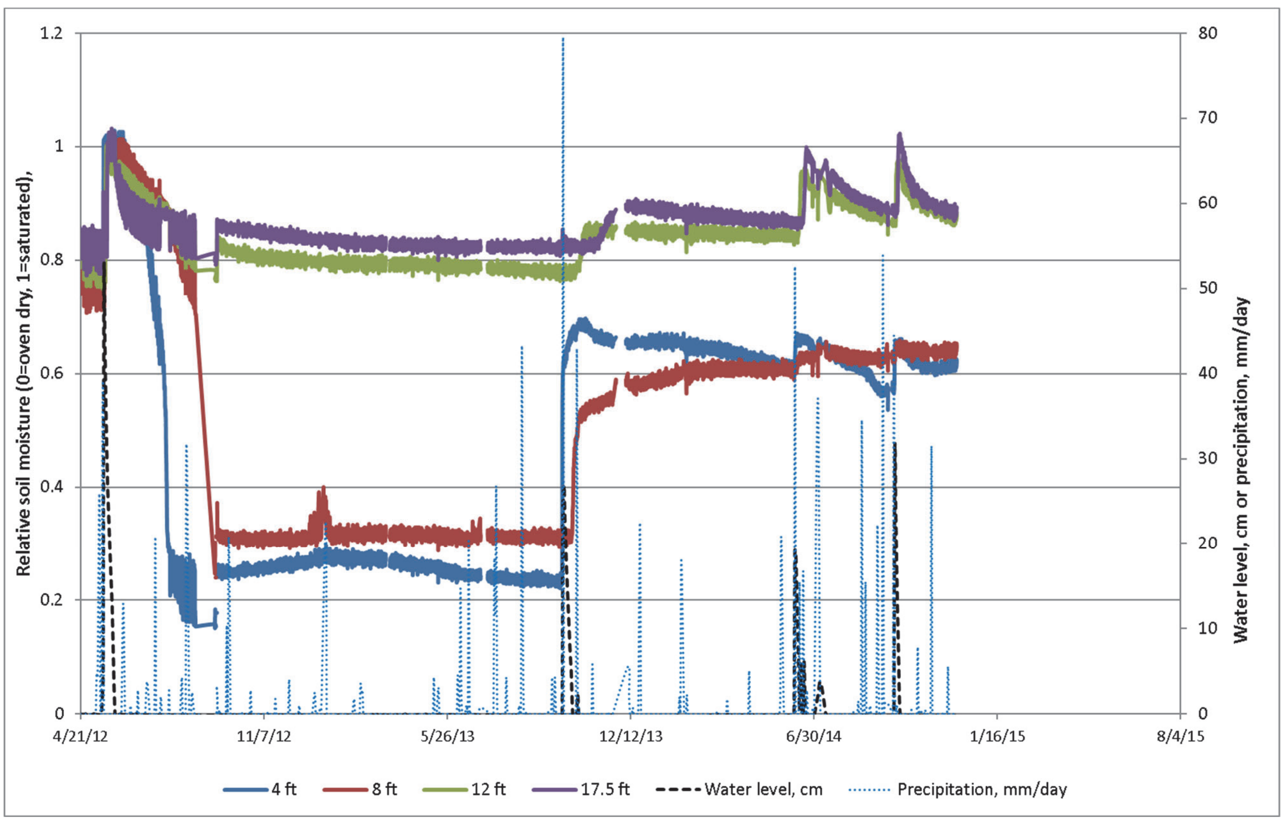


Figure 6. Hughes soil moisture. The site was decommissioned in December 2014.

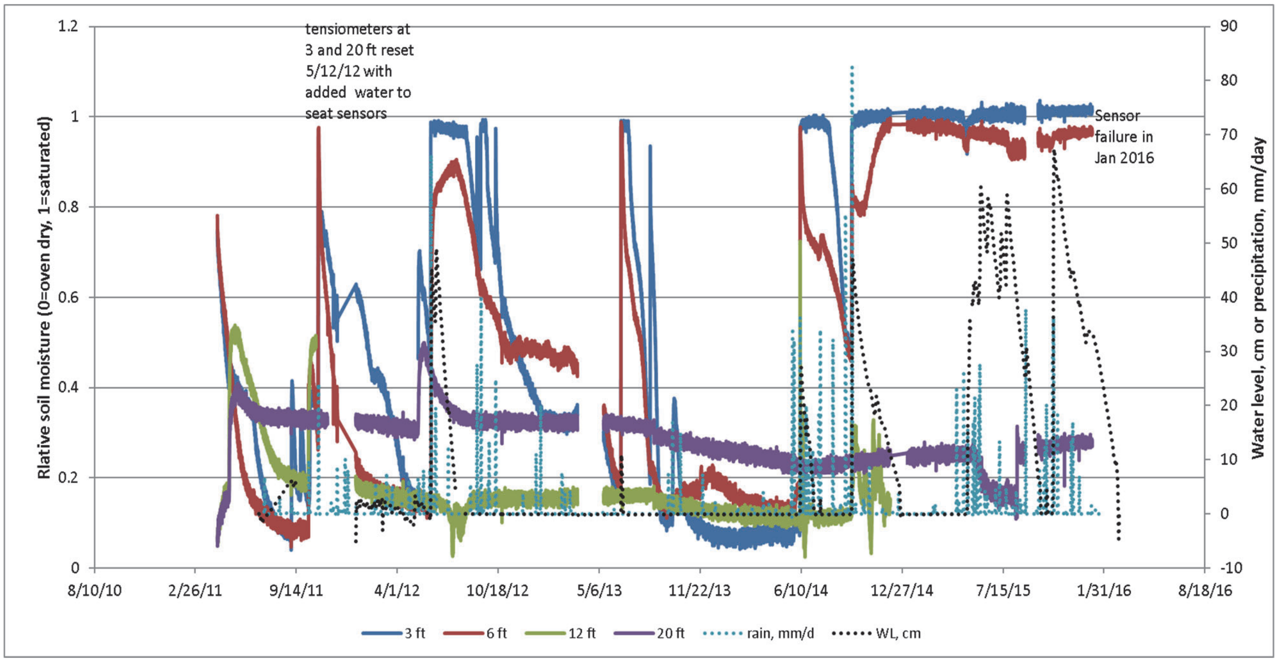


Figure 7. M. Harrell soil moisture

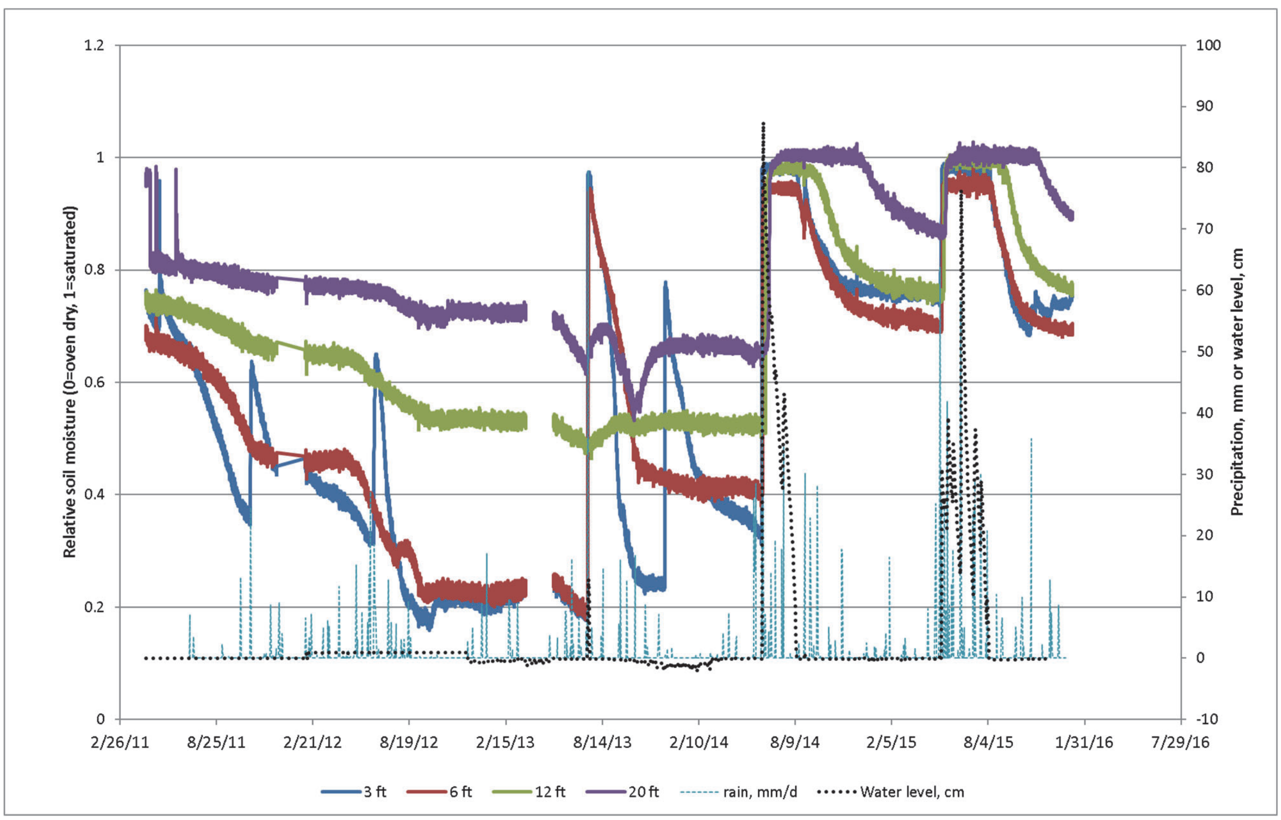


Figure 8. Macha soil moisture

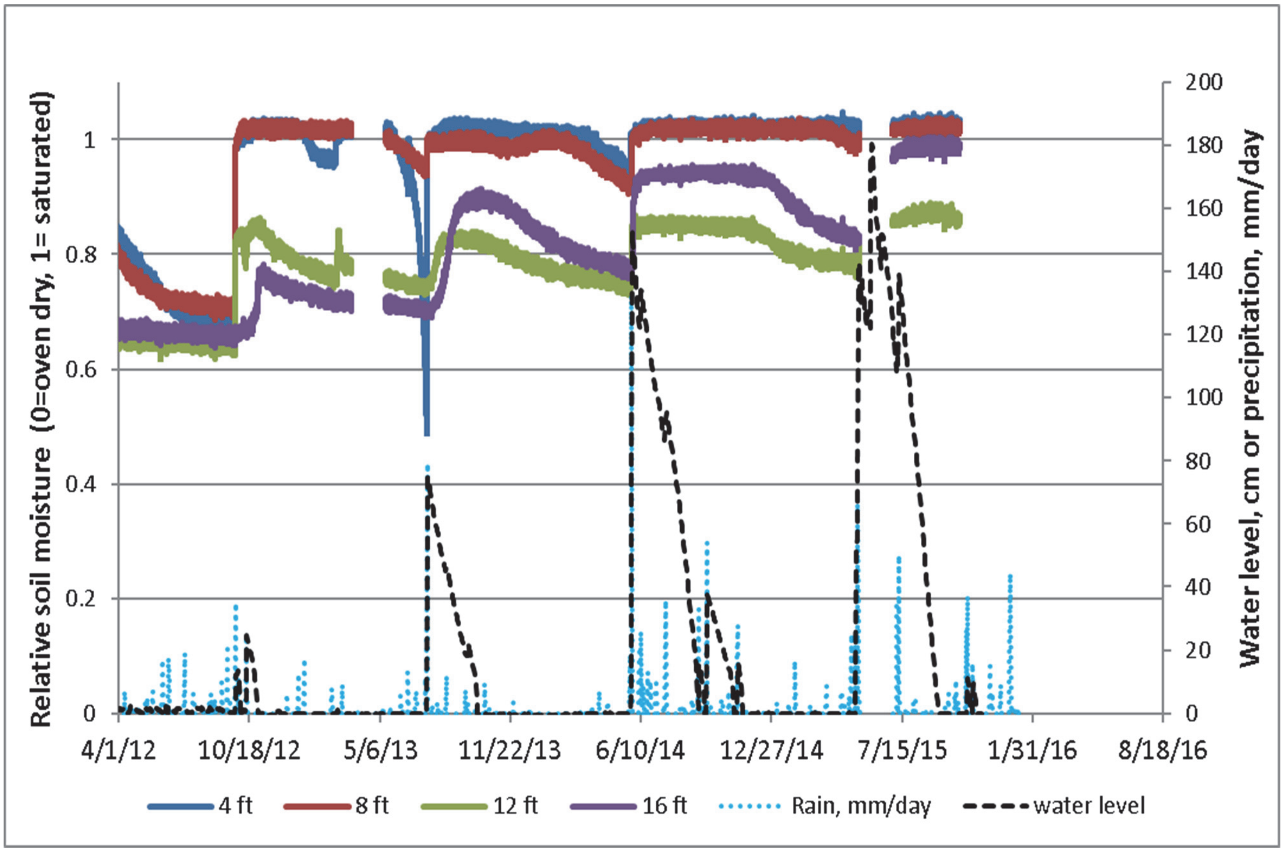


Figure 9. Mahagan soil moisture.

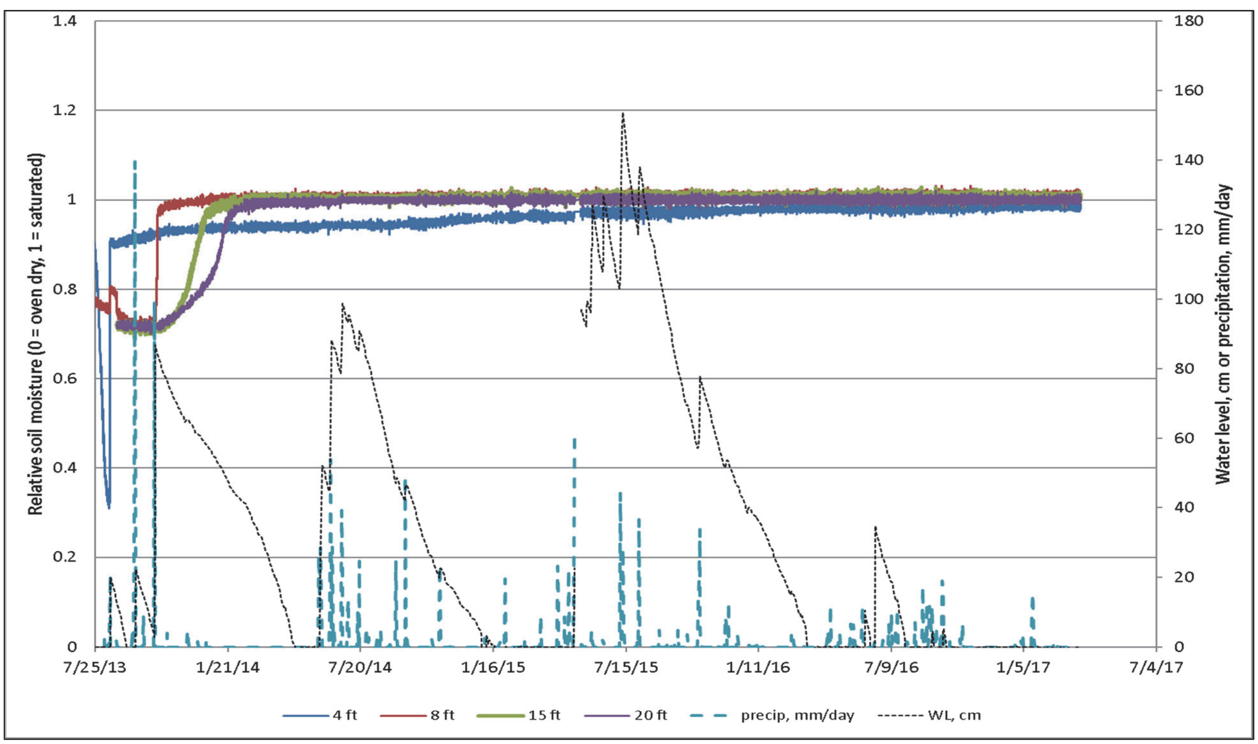


Figure 10. Minton soil moisture.

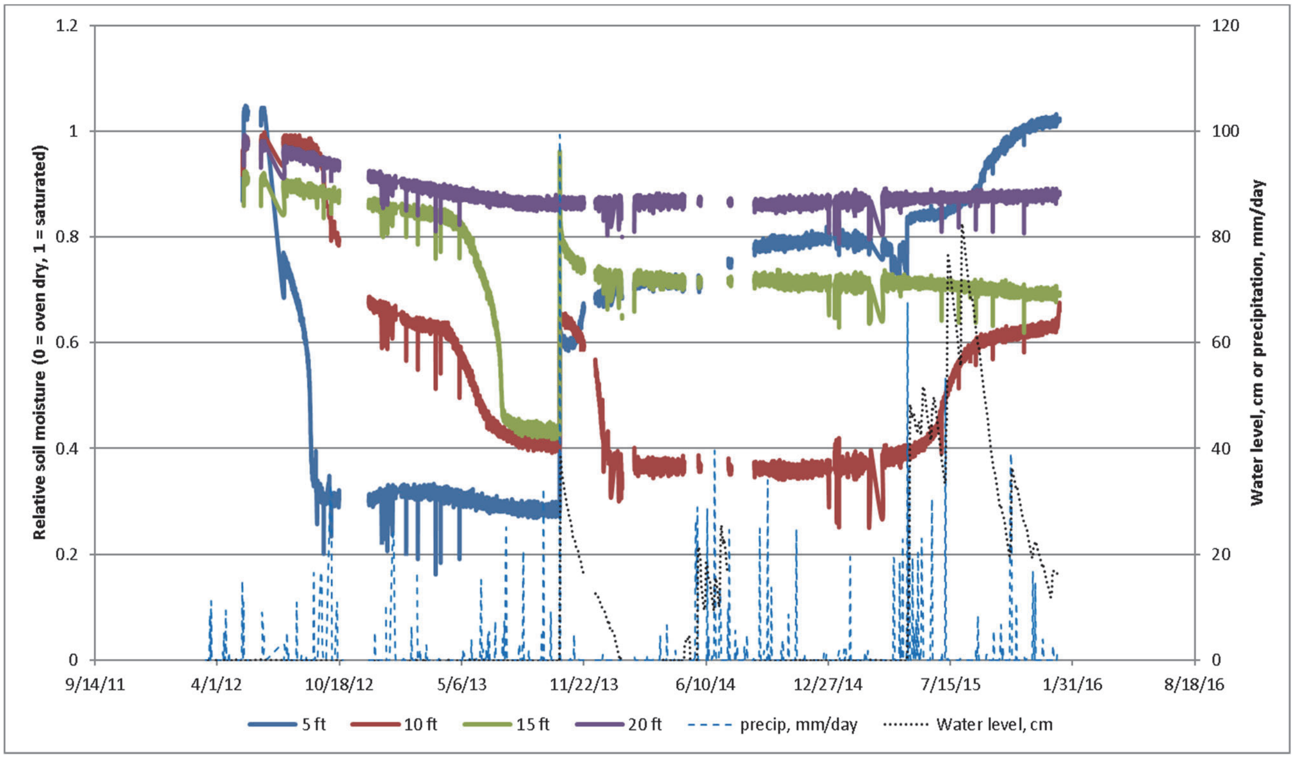


Figure 11. Moore soil moisture

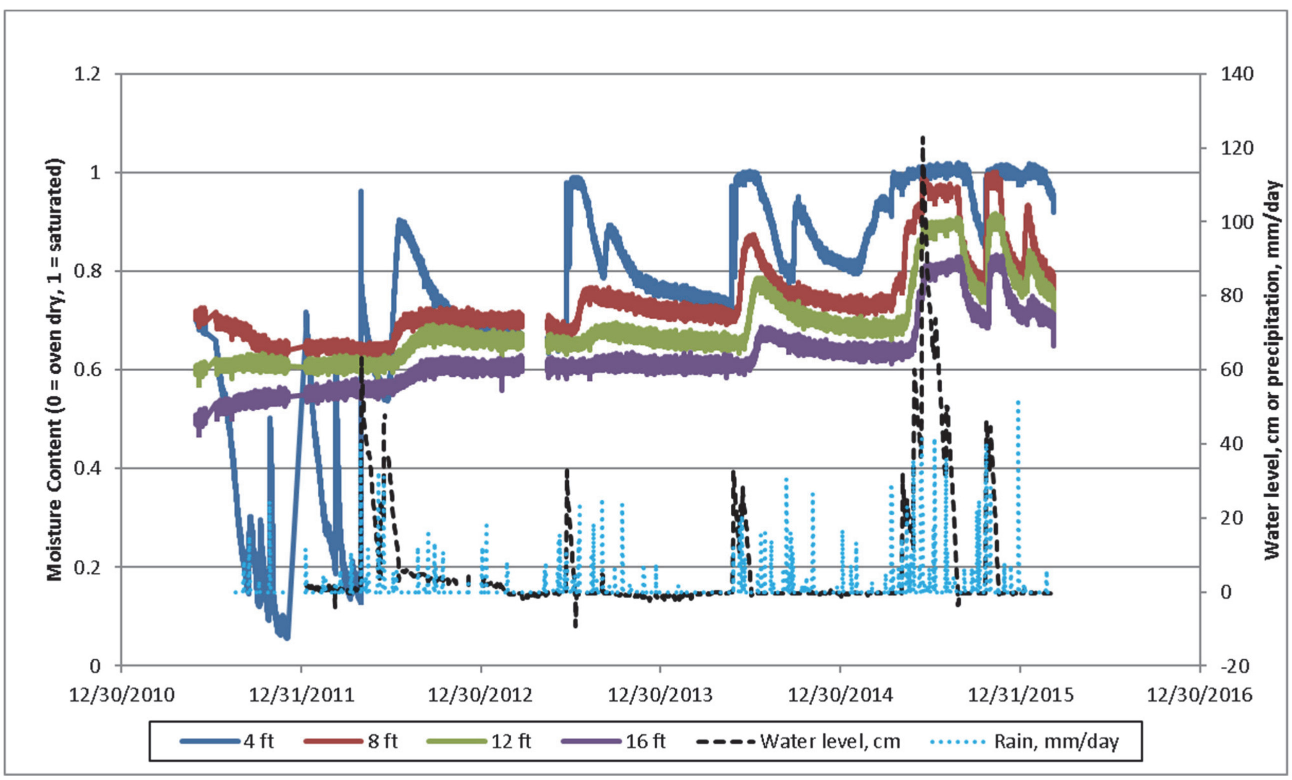


Figure 12. Myatt soil moisture.

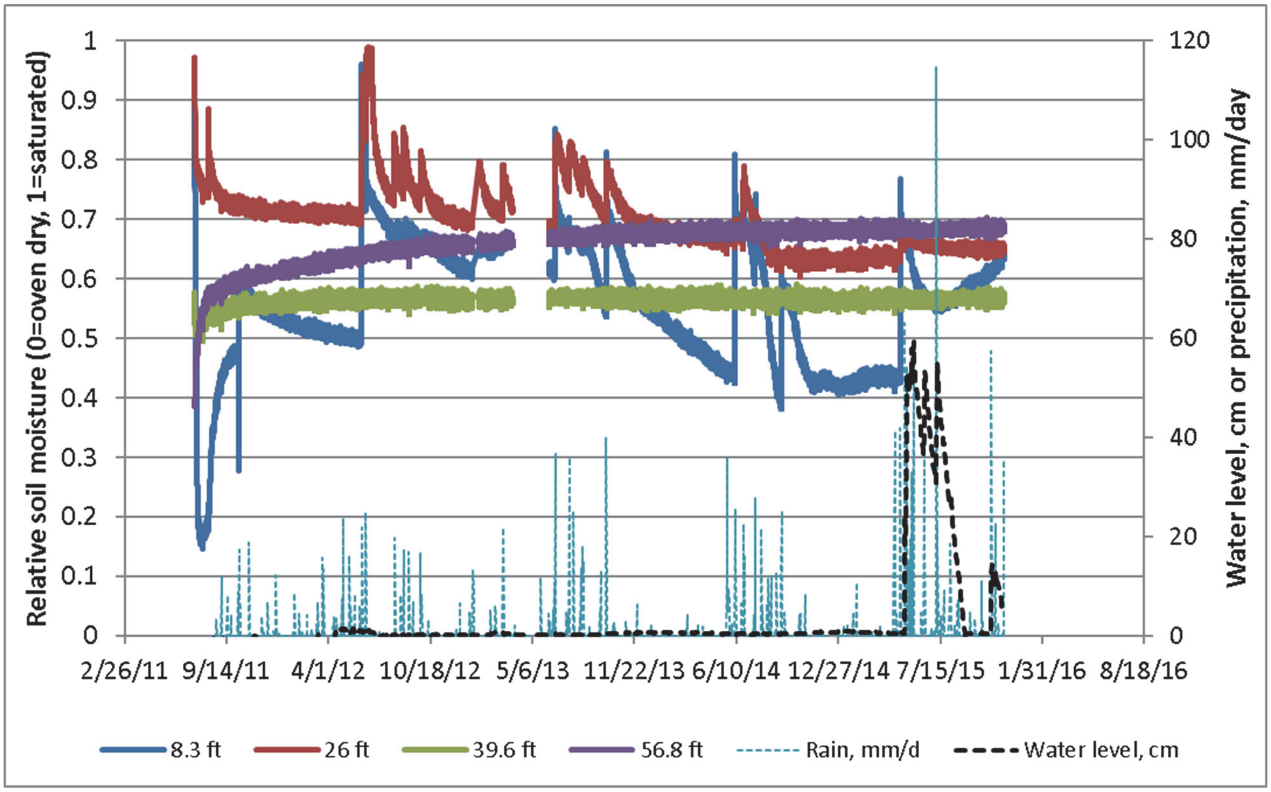


Figure 13. Obert soil moisture.

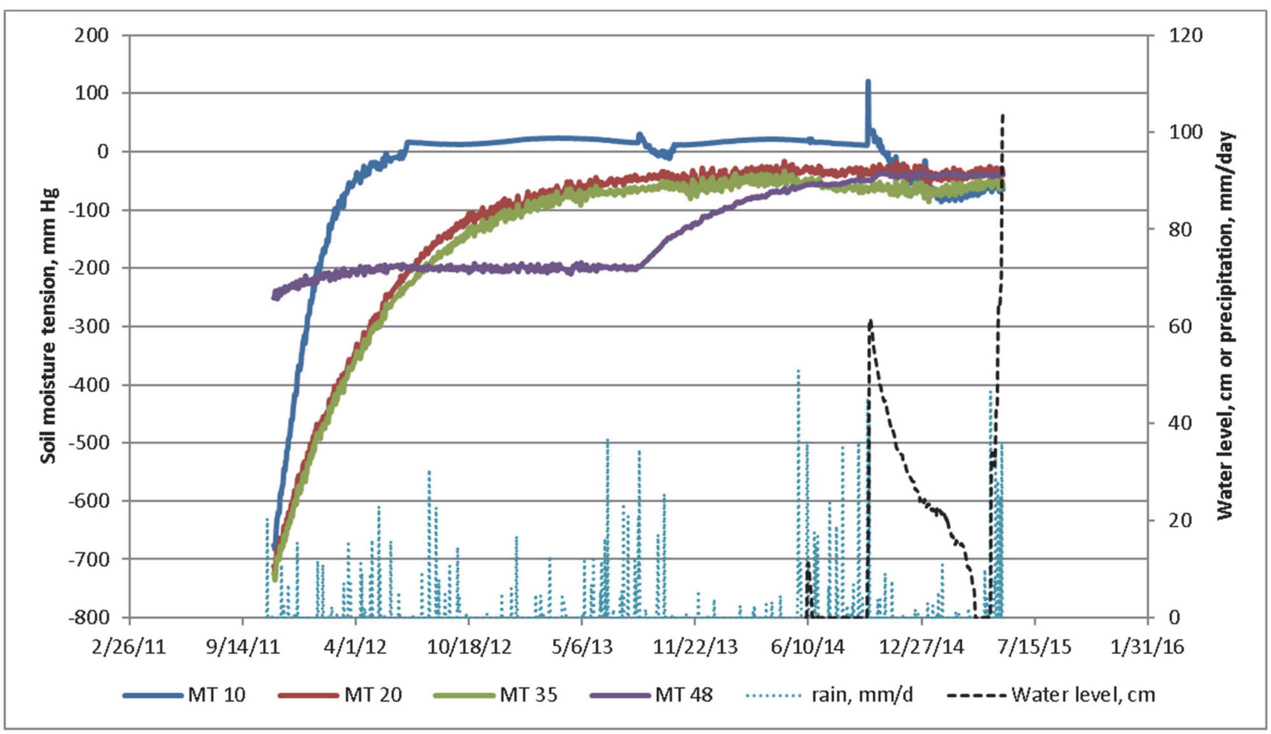


Figure 14. Wright soil moisture tension. The site was equipped with tensiometers instead of heat dissipation sensors and was decommissioned because of excessive flooding in July 2015.

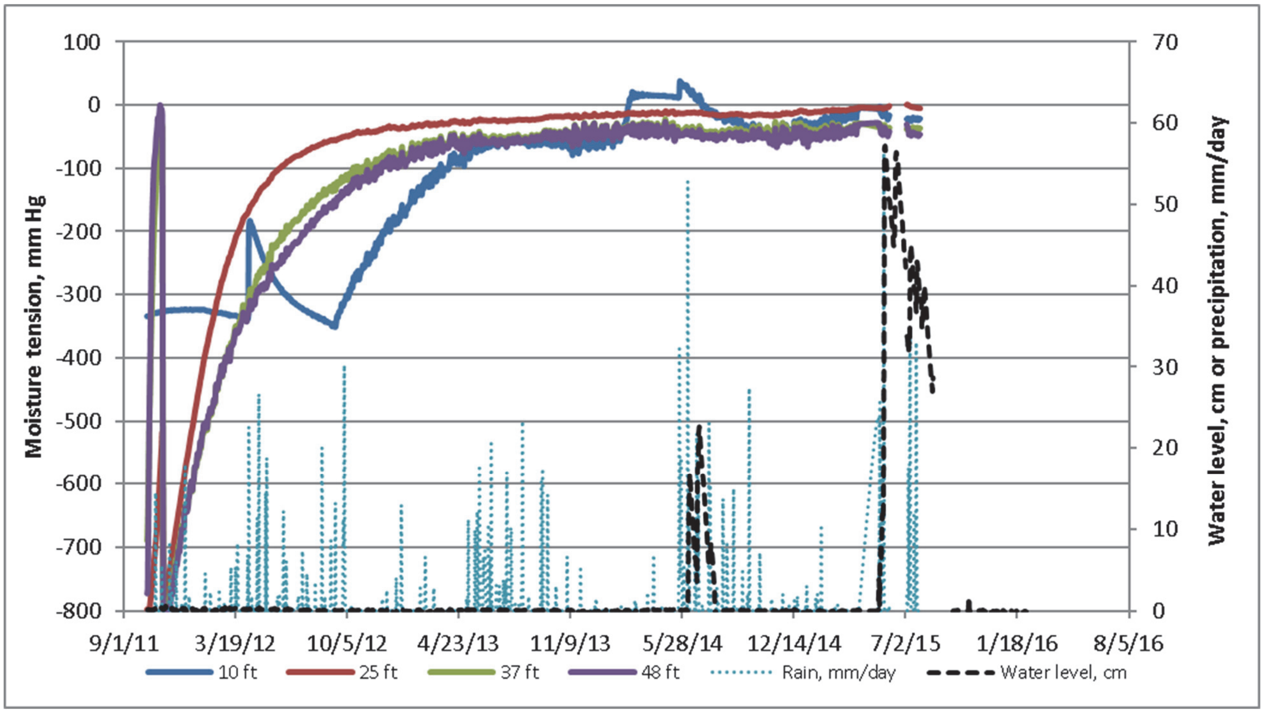


Figure 15. Younger moisture tension. The site was equipped with tensiometers instead of HDPs.

Laboratory Report for
Texas Water Development Board

PO # 580-14-0646

July 29, 2014

Daniel B. Stephens & Associates, Inc.

4400 Alameda Blvd. NE, Suite C • Albuquerque, New Mexico 87113

July 29, 2014

Andrew Weinberg
Texas Water Development Board
1700 N. Congress Ave., Room 610B
Austin, TX 78701
(512) 626-6019

Re: DBS&A Laboratory Report for the Texas Water Development Board PO # 580-14-0646 Samples

Dear Mr. Weinberg:

Enclosed is the report for the Texas Water Development Board PO # 580-14-0646 samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to TWDB and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory
4400 Alameda Blvd. NE, Suite C
Albuquerque, NM 87113
505-889-7752
FAX 505-889-0258

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
FLRNG SE (0-6")	X	X			X		X	X		X	X			X								
FLRNG Center (2-6")	X	X			X		X	X		X	X			X								

1 G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method
2 CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall
3 HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity
4 DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer
5 F = Fine (<4.75mm), C = Coarse (>4.75mm)

Notes

Sample Receipt:
Two samples were received, each in a 2" x 6" acetate sleeve sealed with plastic end caps, on June 10, 2014.

Preparation and Testing Notes:
An intact sub-sample was obtained from the bottom of each sample by cutting the sleeve. Each sub-sample was subjected to initial properties analysis, saturated hydraulic conductivity, and the hanging column and pressure chamber portions of the moisture retention testing.

Adjacent sample material was used for the dewpoint potentiometer and relative humidity chamber portions of the moisture retention testing.

An assumed specific gravity value of 2.65 was used for all porosity and percent saturation calculations in this report

Summary of Sample Preparation/Volume Changes

	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
Sample Number	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
FLRNG SE (0-6")	17.6	1.71	1.71	---	100.0%	1.71	---	100.0%
FLRNG Center (2-6")	34.1	1.38	1.38	---	100.0%	1.38	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Initial Moisture Content, Dry Bulk Density
Wet Bulk Density and Calculated Porosity

	Moisture Content						
	As Received		Remolded				
Sample Number	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
FLRNG SE (0-6")	17.6	30.2	---	---	1.71	2.01	35.4
FLRNG Center (2-6")	34.1	47.2	---	---	1.38	1.86	47.8

NA = Not analyzed
--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
FLRNG SE (0-6")	6.0E-08	NA		X
FLRNG Center (2-6")	5.5E-08	NA		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
FLRNG SE (0-6")	0	34.6
	57	34.0
	183	32.8
	337	29.1
	1530	27.7
	8770	18.8
	56191	13.0
	148279	10.4
	851293	5.5
FLRNG Center (2-6")	0	50.5
	54	49.8
	193	48.7
	337	45.4
	1530	42.6
	8464	29.7
	18152	24.0
	109629	18.1
	851293	9.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
FLRNG SE (0-6")	0.0014	1.2272	0.00	33.73	NA	NA
FLRNG Center (2-6")	0.0010	1.2359	0.00	49.66	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
FLRNG SE (0-6")	17.6	30.2	---	---	1.71	2.01	35.4
FLRNG Center (2-6")	34.1	47.2	---	---	1.38	1.86	47.8

NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	TX Water Development Board
Job Number:	LB14.0117.00
Sample Number:	FLRNG SE (0-6")
PO Number:	580-14-0646
Depth:	0-6"

	As Received	Remolded
Test Date:	12-Jun-14	---
Field weight of sample* (g):	133.00	
Tare weight, ring (g):	10.04	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	104.53	
Sample volume (cm^3):	61.10	
Assumed particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	17.6	
Volumetric Moisture Content (% vol):	30.2	
Dry bulk density (g/cm^3):	1.71	
Wet bulk density (g/cm^3):	2.01	
Calculated Porosity (% vol):	35.4	
Percent Saturation:	85.1	

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	TX Water Development Board
Job Number:	LB14.0117.00
Sample Number:	FLRNG Center (2-6")
PO Number:	580-14-0646
Depth:	2-6"

	As Received	Remolded
Test Date:	12-Jun-14	---
Field weight of sample* (g):	124.77	
Tare weight, ring (g):	9.87	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	85.67	
Sample volume (cm^3):	61.89	
Assumed particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	34.1	
Volumetric Moisture Content (% vol):	47.2	
Dry bulk density (g/cm^3):	1.38	
Wet bulk density (g/cm^3):	1.86	
Calculated Porosity (% vol):	47.8	
Percent Saturation:	98.9	

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
FLRNG SE (0-6")	6.0E-08	NA		X
FLRNG Center (2-6")	5.5E-08	NA		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Saturated Hydraulic Conductivity
Falling Head Method

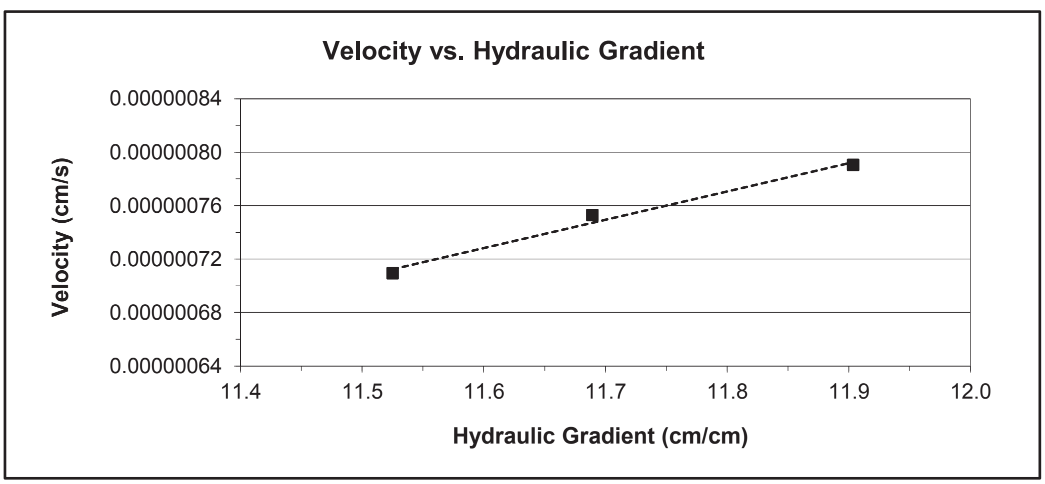
Job Name: TX Water Development Board
Job Number: LB14.0117.00
Sample Number: FLRNG SE (0-6")
PO Number: 580-14-0646
Depth: 0-6"

Type of water used: TAP
Backpressure (psi): 0.0
Offset (cm): 5.1
Sample length (cm): 3.50
Sample x-sectional area (cm^2): 17.45
Reservoir x-sectional area (cm^2): 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
19-Jun-14	10:27:00	22.5	47	41.9	22838	6.6E-08	6.3E-08
19-Jun-14	16:47:38	22.5	46.55	41.5			
Test # 2:							
19-Jun-14	16:47:38	22.5	46.55	41.5	55957	6.4E-08	6.1E-08
20-Jun-14	8:20:15	22.5	45.5	40.4			
Test # 3:							
20-Jun-14	8:20:15	22.5	45.5	40.4	5655	6.2E-08	5.8E-08
20-Jun-14	9:54:30	22.5	45.4	40.3			

Average Ksat **(cm/sec):** **6.0E-08**
Oversize Corrected Ksat **(cm/sec):** **NA**

Comments:
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not applicable



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Falling Head Method

Job Name:	TX Water Development Board	*Type of water used:*	TAP
Job Number:	LB14.0117.00	*Backpressure* (psi)*:*	0.0
Sample Number:	FLRNG Center (2-6")	*Offset* (cm)*:*	4.2
PO Number:	580-14-0646	*Sample length* (cm)*:*	3.60
Depth:	2-6"	*Sample x-sectional area* (cm^2)*:*	17.19
		Reservoir x-sectional area (cm^2)*:*	0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
18-Jun-14	13:37:40	22.5	48.85	44.7	75003	6.5E-08	6.1E-08
19-Jun-14	10:27:43	22.5	47.4	43.2			
Test # 2:							
19-Jun-14	10:27:43	22.5	47.4	43.2	22817	5.7E-08	5.4E-08
19-Jun-14	16:48:00	22.5	47.02	42.8			
Test # 3:							
19-Jun-14	16:48:00	22.5	47.02	42.8	55260	5.4E-08	5.1E-08
20-Jun-14	8:09:00	22.5	46.15	42.0			

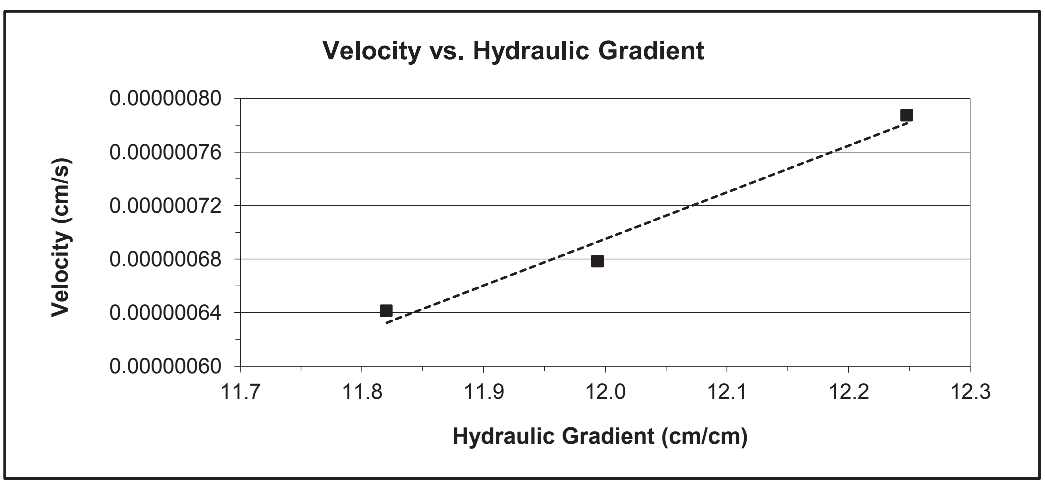
Average Ksat* (cm/sec)*: **5.5E-08**

Oversize Corrected Ksat* (cm/sec)*: **NA**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not applicable



Laboratory analysis by: D. O'Dowd

Data entered by: D. O'Dowd

Checked by: J. Hines

Moisture Retention Characteristics

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm³/cm³)
FLRNG SE (0-6")	0	34.6
	57	34.0
	183	32.8
	337	29.1
	1530	27.7
	8770	18.8
	56191	13.0
	148279	10.4
	851293	5.5
FLRNG Center (2-6")	0	50.5
	54	49.8
	193	48.7
	337	45.4
	1530	42.6
	8464	29.7
	18152	24.0
	109629	18.1
	851293	9.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
FLRNG SE (0-6")	0.0014	1.2272	0.00	33.73	NA	NA
FLRNG Center (2-6")	0.0010	1.2359	0.00	49.66	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name:	TX Water Development Board	*Dry wt. of sample* (g):	104.53
Job Number:	LB14.0117.00	*Tare wt., ring* (g):	10.04
Sample Number:	FLRNG SE (0-6")	*Tare wt., screen & clamp* (g):	22.28
PO Number:	580-14-0646	*Initial sample volume* (cm^3):	61.10
Depth:	0-6"	*Initial dry bulk density* (g/cm^3):	1.71
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	35.44

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content † (% vol)
Hanging column:	20-Jun-14	10:45	157.98	0	34.58
	27-Jun-14	12:30	157.60	57.0	33.96
	3-Jul-14	7:45	156.92	183.0	32.85
Pressure plate:	11-Jul-14	15:00	154.62	337	29.08
	22-Jul-14	16:05	153.80	1530	27.74

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	57.0	---	---	---	---
	183.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1530	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: FLRNG SE (0-6")

Initial sample bulk density (g/cm^3)*:* 1.71
Fraction of bulk sample used (<2.00mm fraction) (%): 99.20

Dry weight of dew point potentiometer sample* (g)*:* 155.63
Tare weight, jar (g)*:* 115.30

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	12-Jul-14	9:03	160.09	8770	18.77
	11-Jul-14	12:44	158.71	56191	12.96
	10-Jul-14	12:28	158.09	148279	10.35

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	8770	---	---	---	---
	56191	---	---	---	---
	148279	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.32
Tare weight (g)*:* 39.51

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Jul-14	12:15	68.23	851293	5.54

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	851293	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

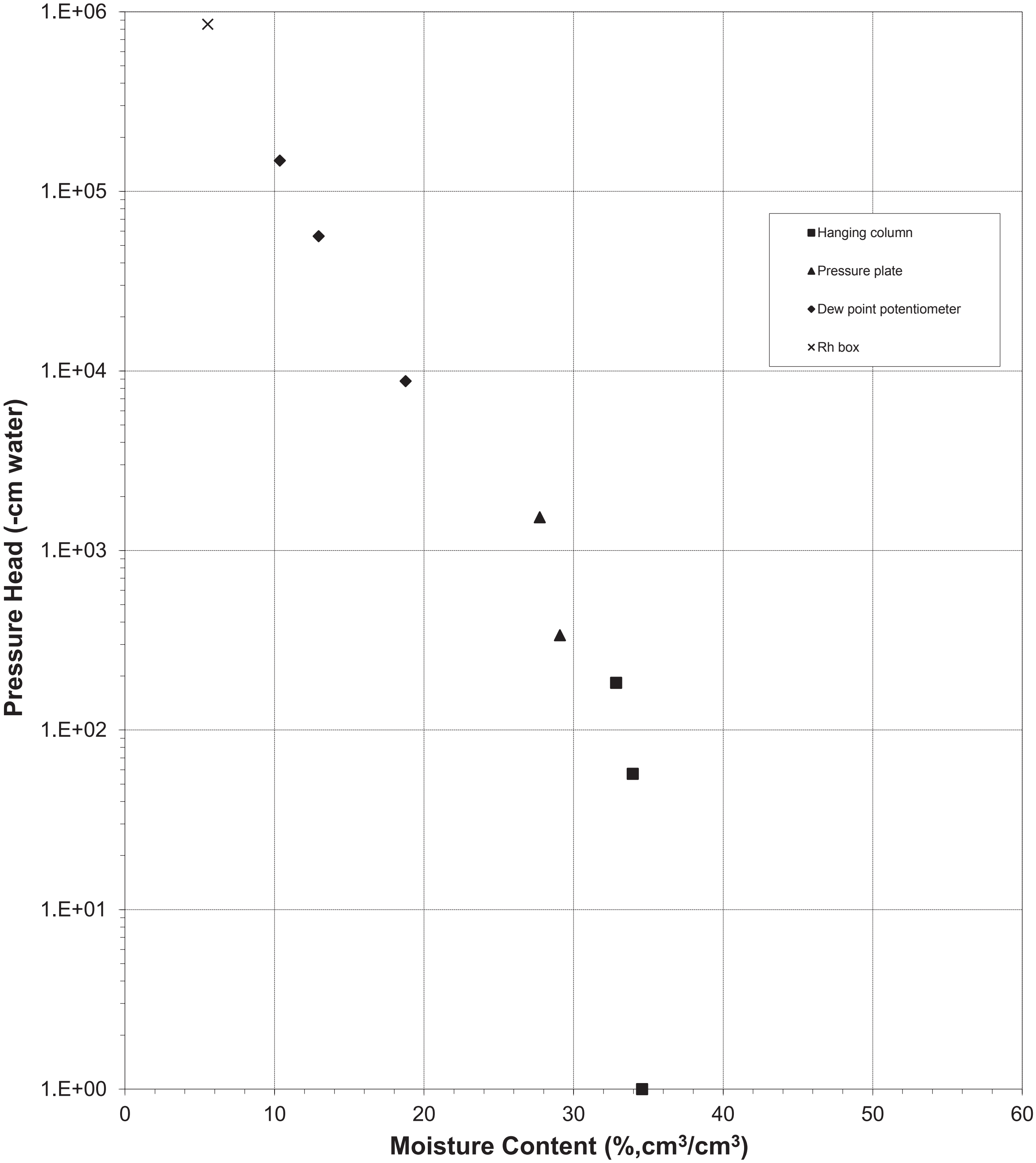
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

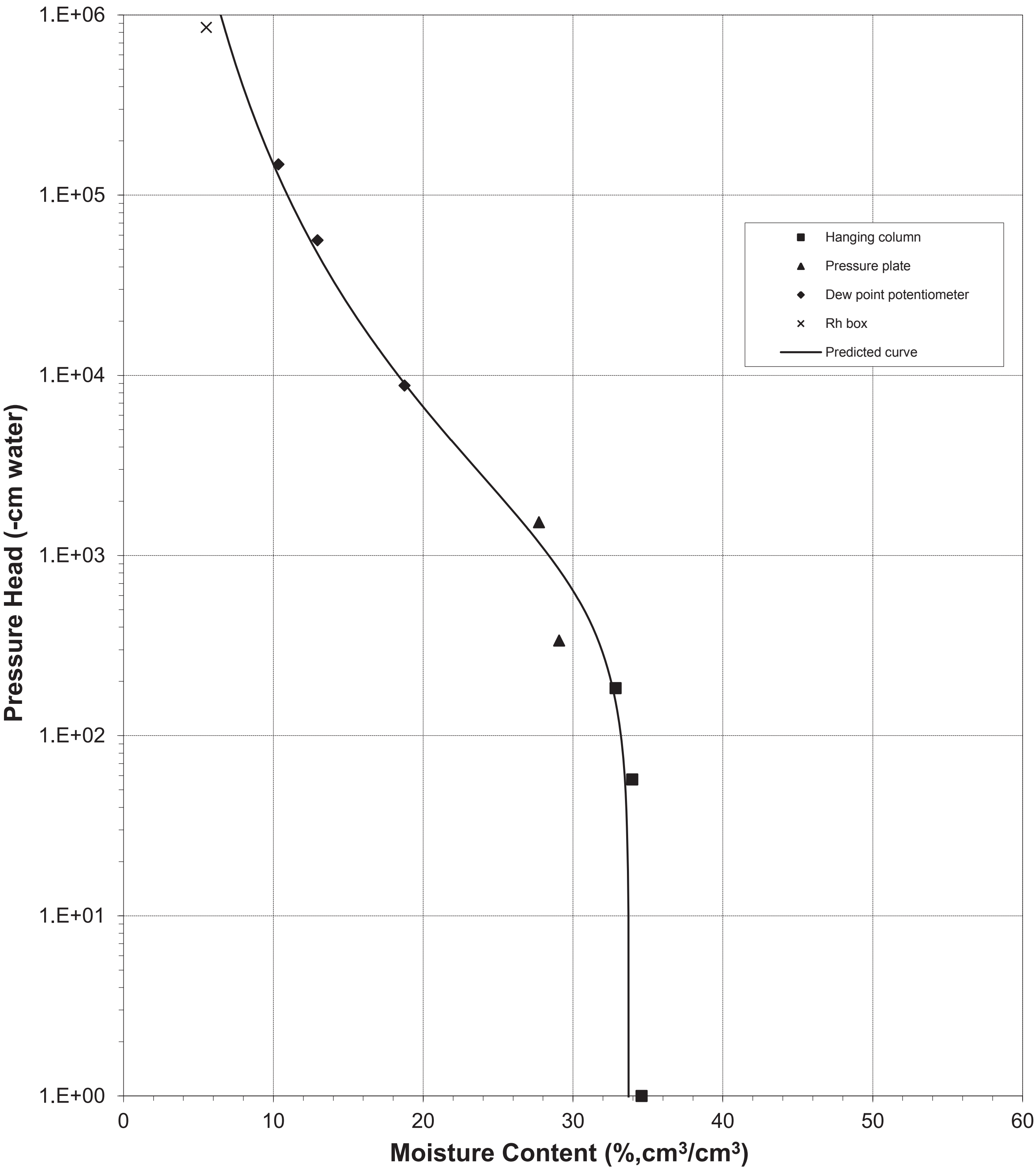
Water Retention Data Points

Sample Number: FLRNG SE (0-6")



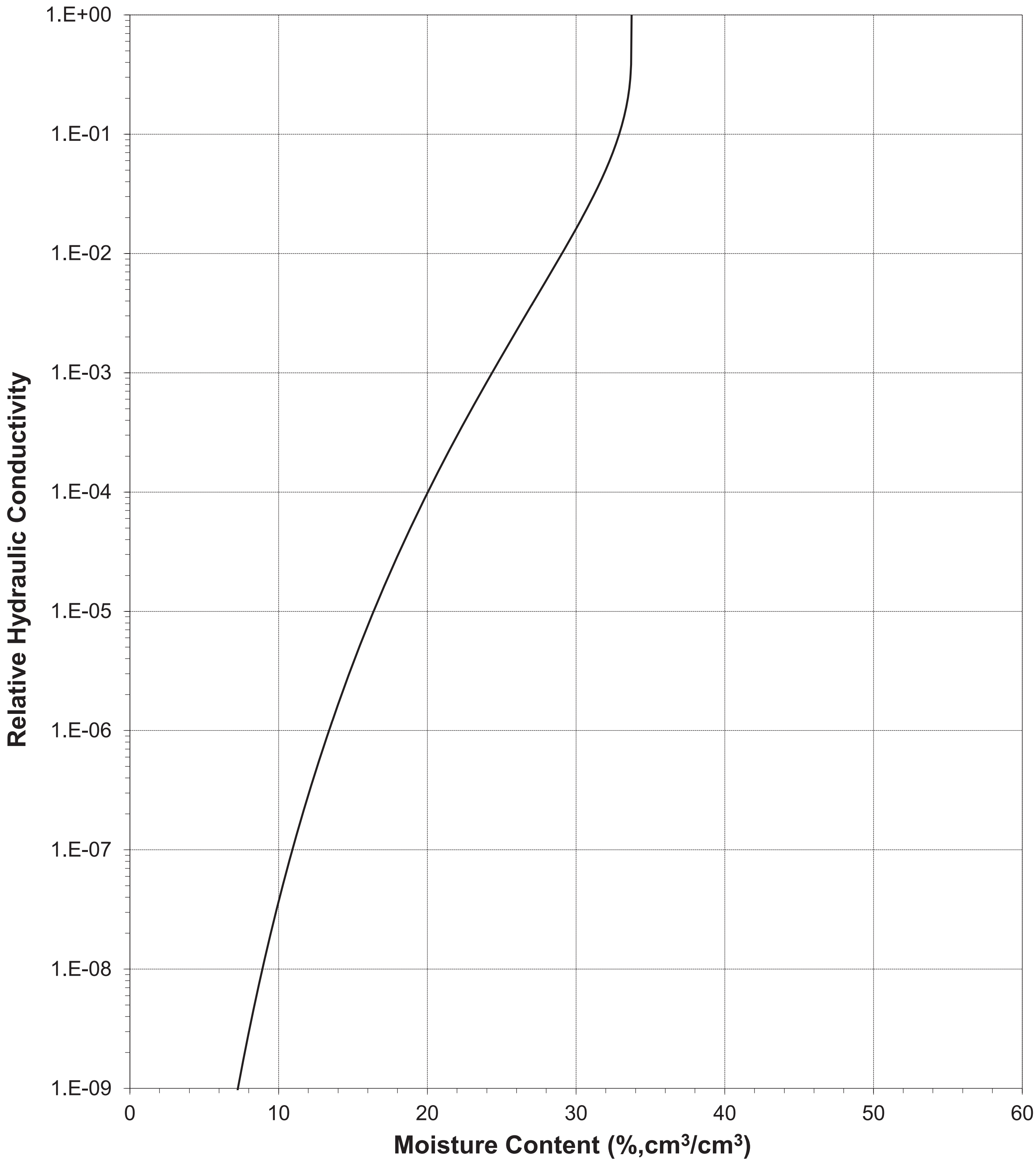
Predicted Water Retention Curve and Data Points

Sample Number: FLRNG SE (0-6")



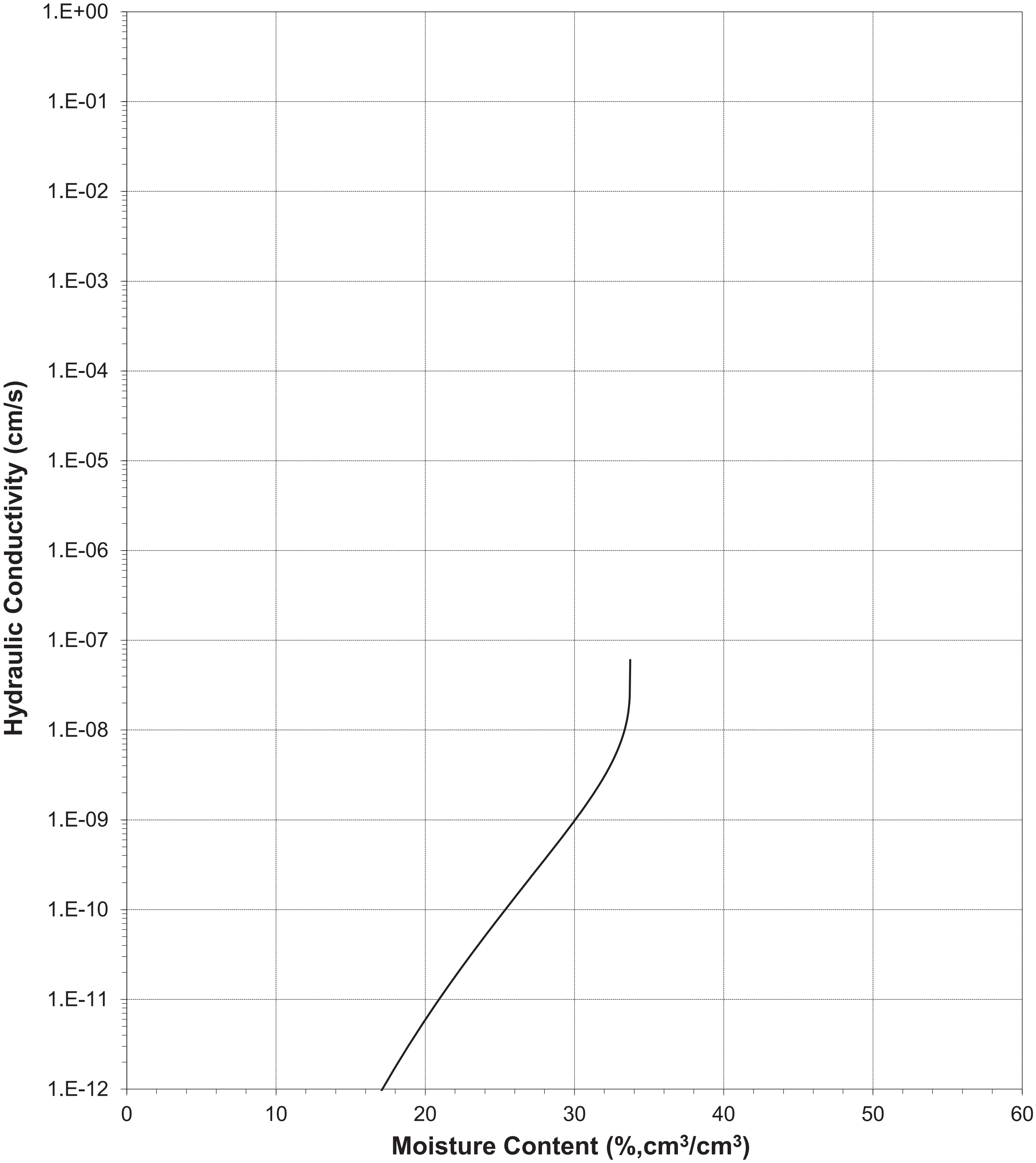
Plot of Relative Hydraulic Conductivity vs Moisture Content

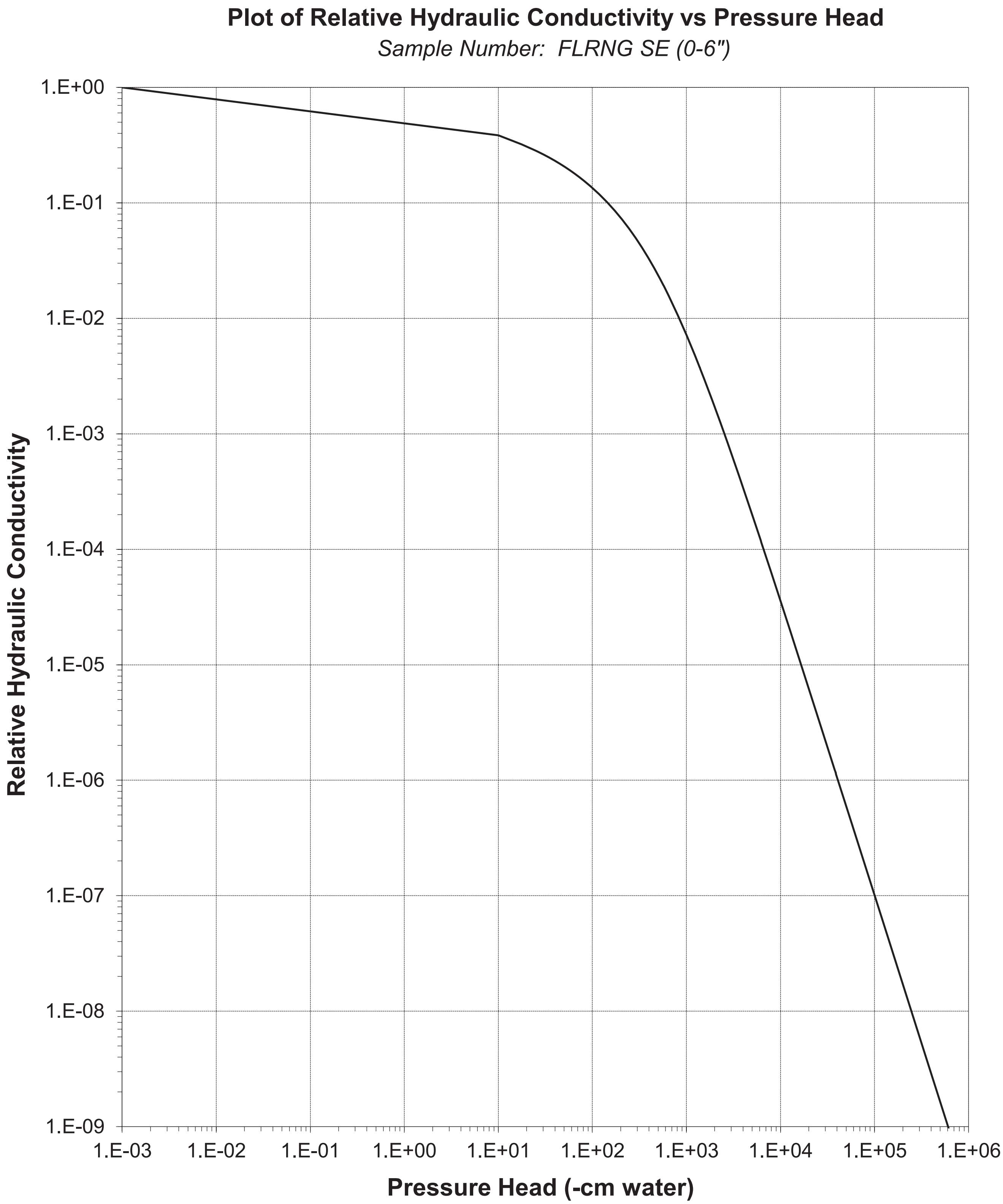
Sample Number: FLRNG SE (0-6")



Plot of Hydraulic Conductivity vs Moisture Content

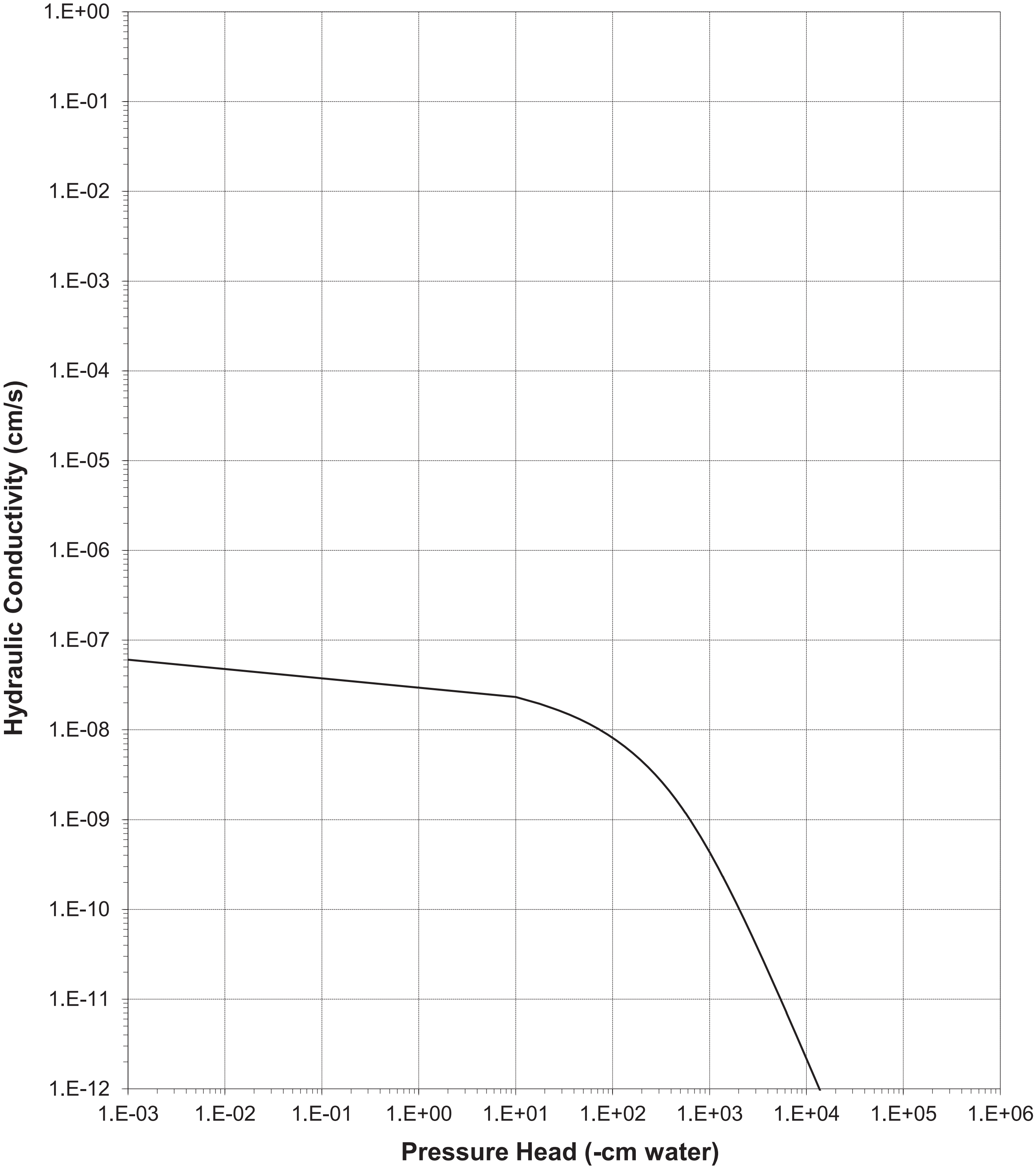
Sample Number: FLRNG SE (0-6")




Plot of Relative Hydraulic Conductivity vs Pressure Head
Sample Number: FLRNG SE (0-6")
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
Relative Hydraulic Conductivity
1.E-03
1.E-02
1.E-01
1.E+00
1.E+01
1.E+02
1.E+03
1.E+04
1.E+05
1.E+06
Pressure Head (-cm water)

Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: FLRNG SE (0-6")



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name:	TX Water Development Board	*Dry wt. of sample* (g):	85.67
Job Number:	LB14.0117.00	*Tare wt., ring* (g):	9.87
Sample Number:	FLRNG Center (2-6")	*Tare wt., screen & clamp* (g):	24.81
PO Number:	580-14-0646	*Initial sample volume* (cm^3):	61.89
Depth:	2-6"	*Initial dry bulk density* (g/cm^3):	1.38
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	47.77

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content † (% vol)
Hanging column:	20-Jun-14	10:45	151.58	0	50.46
	27-Jun-14	12:30	151.16	54.0	49.78
	3-Jul-14	7:40	150.48	193.0	48.68
Pressure plate:	11-Jul-14	15:00	148.46	337	45.42
	22-Jul-14	16:05	146.73	1530	42.62

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	54.0	---	---	---	---
	193.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1530	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: FLRNG Center (2-6")

Initial sample bulk density (g/cm^3)*:* 1.38
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 153.79
Tare weight, jar (g)*:* 124.10

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	12-Jul-14	8:45	160.15	8464	29.65
	11-Jul-14	15:55	158.94	18152	24.01
	10-Jul-14	12:03	157.68	109629	18.14

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	8464	---	---	---	---
	18152	---	---	---	---
	109629	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 53.65
Tare weight (g)*:* 41.04

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Jul-14	12:15	54.49	851293	9.29

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	851293	---	---	---	---

Comments:

1 Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

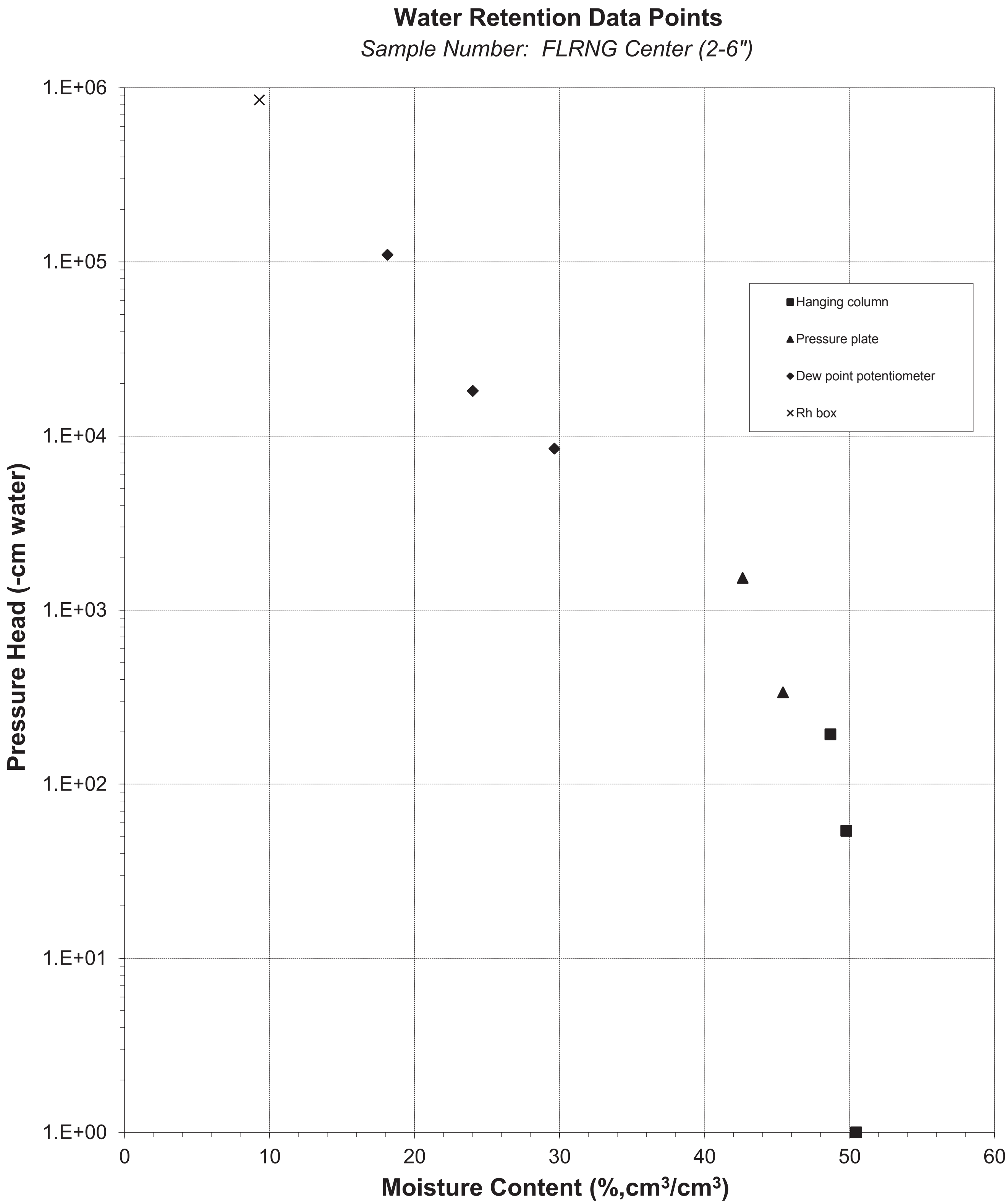
2 Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

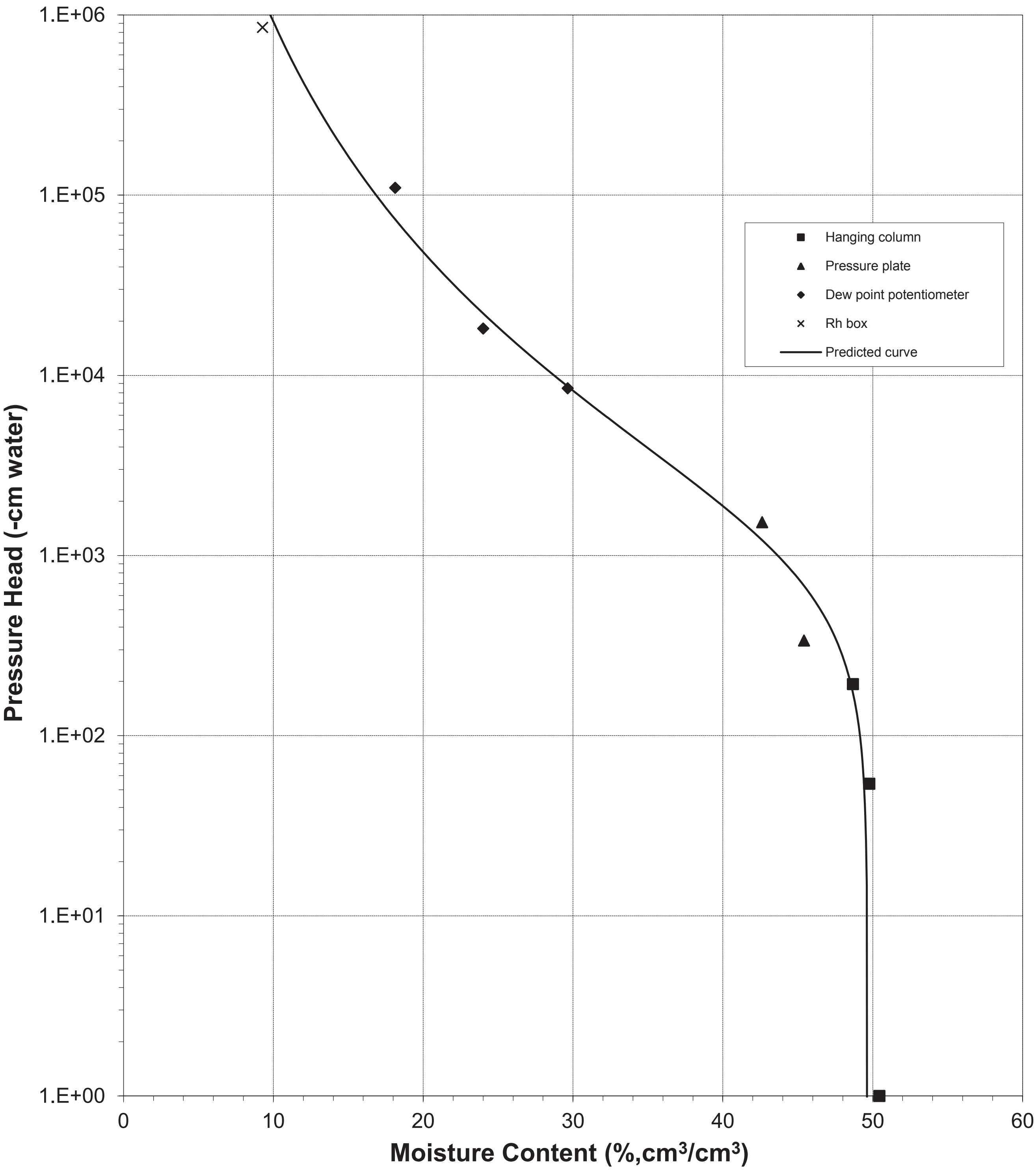
‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines


Water Retention Data Points
Sample Number: FLRNG Center (2-6")
Pressure Head (-cm water)
1.E+06
1.E+05
1.E+04
1.E+03
1.E+02
1.E+01
1.E+00
0
10
20
30
40
50
60
Moisture Content (%,cm3/cm3)
Hanging column
Pressure plate
Dew point potentiometer
Rh box

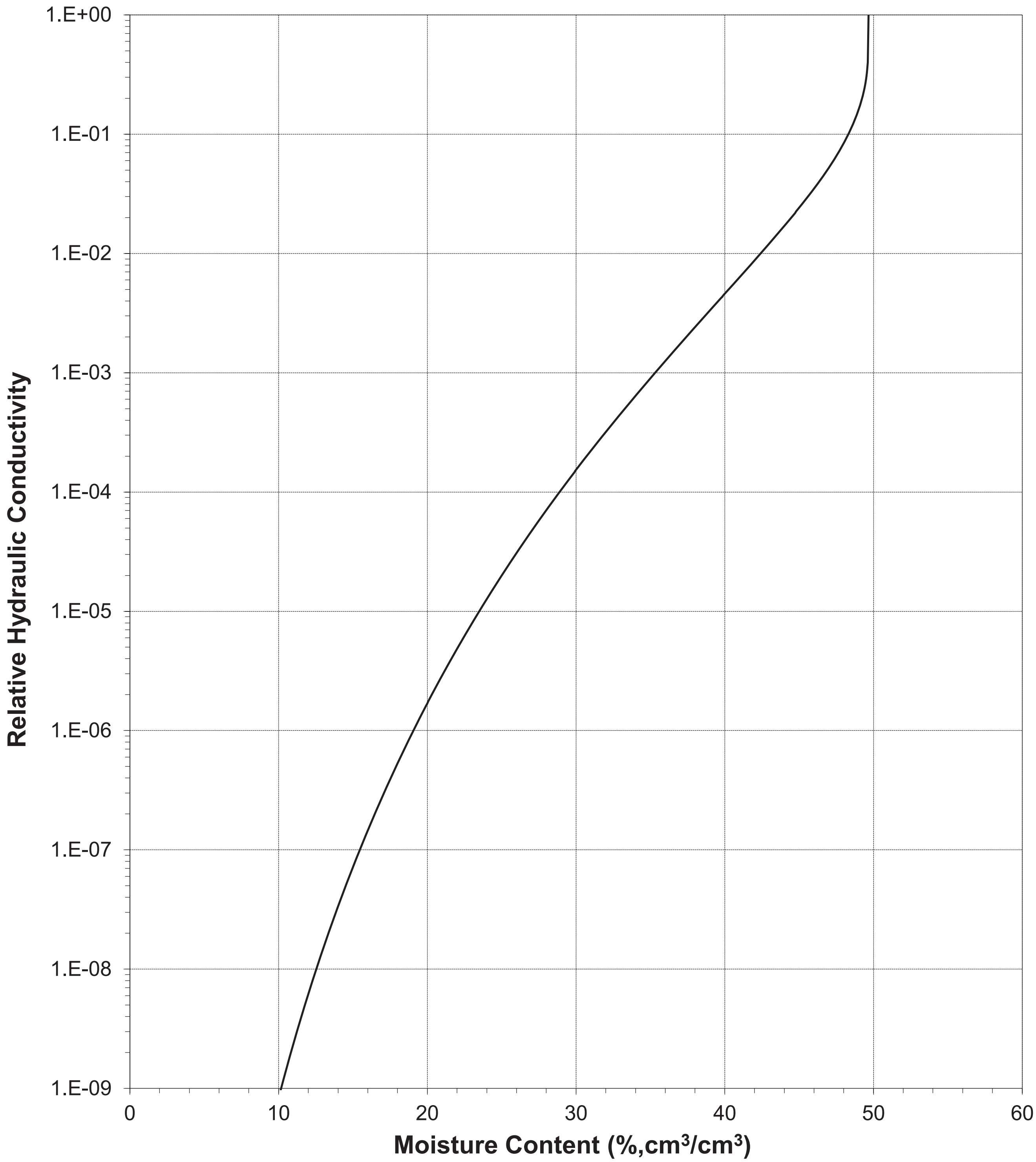
Predicted Water Retention Curve and Data Points

Sample Number: FLRNG Center (2-6")



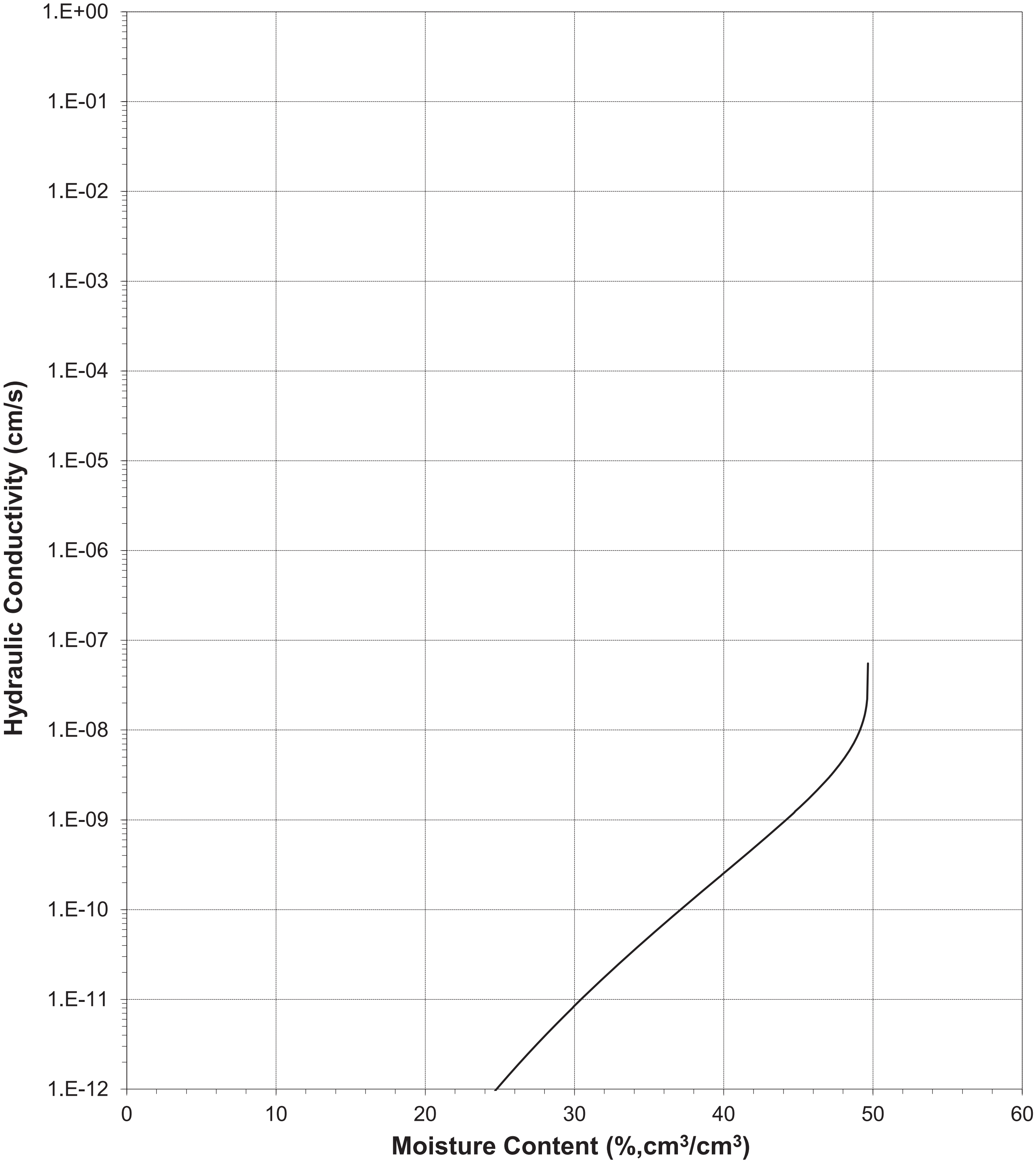
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: FLRNG Center (2-6")



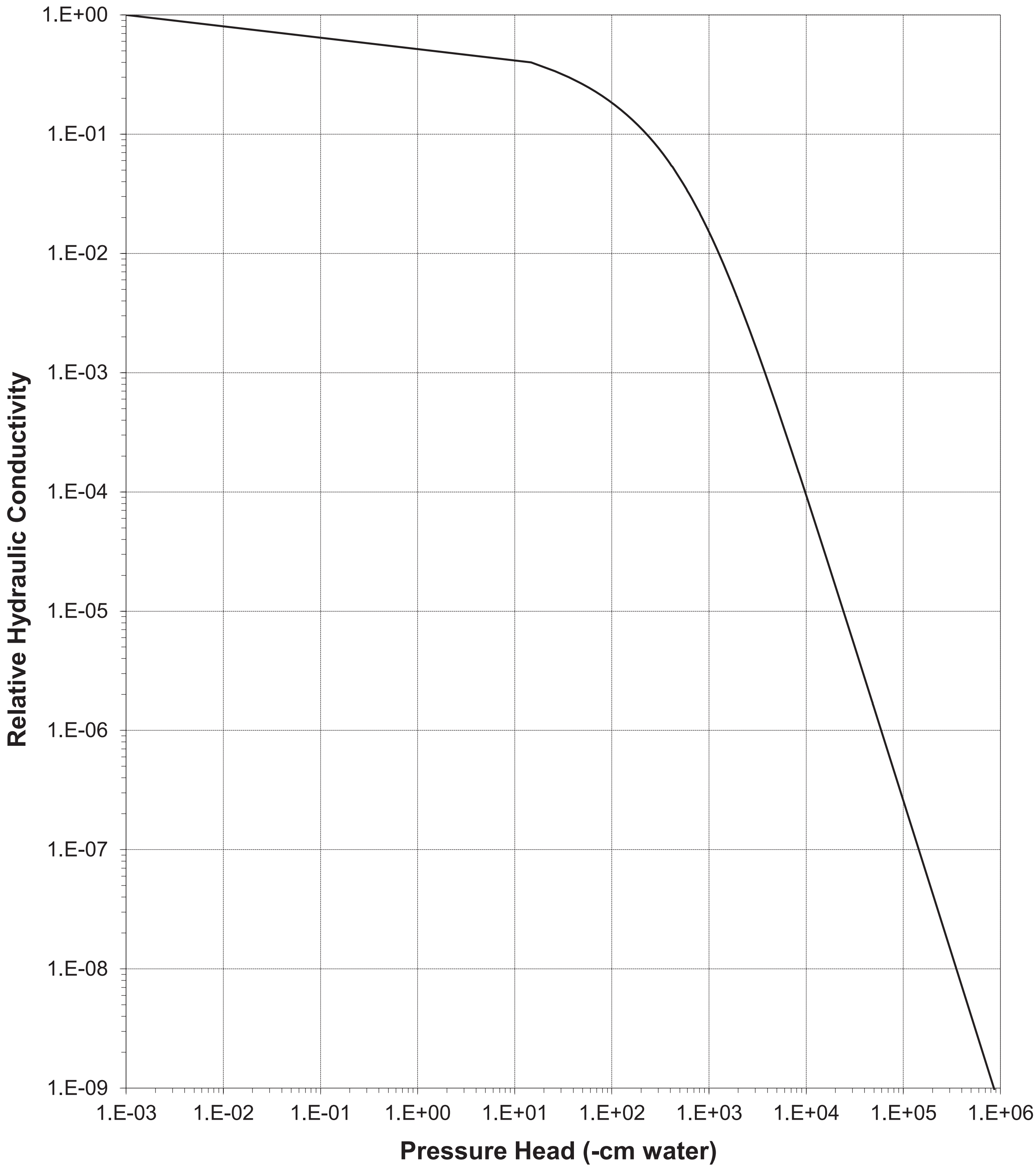
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: FLRNG Center (2-6")



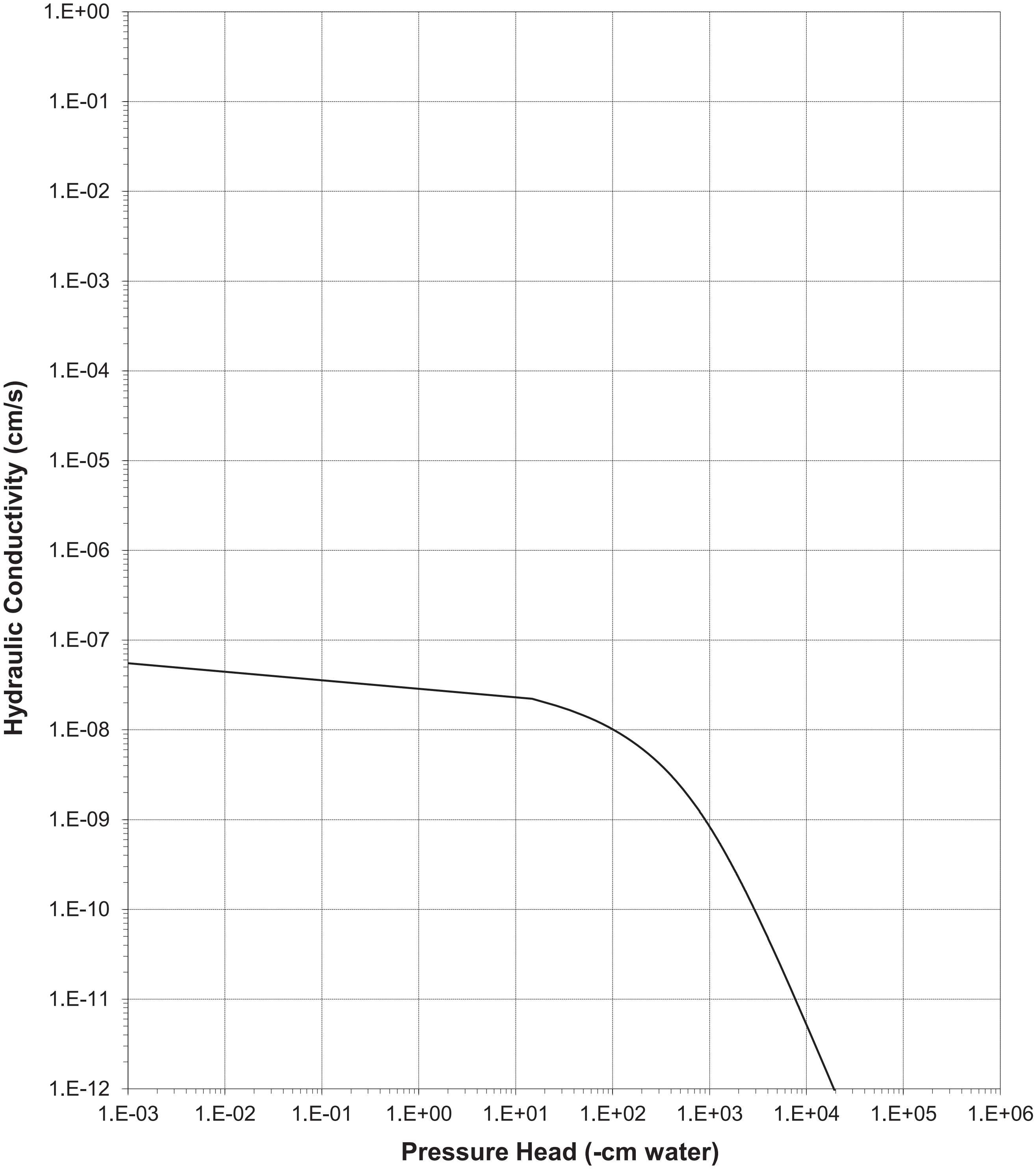
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: FLRNG Center (2-6")



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: FLRNG Center (2-6")



Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity:	
Falling Head: (Rigid Wall)	Klute, A. and C. Dirkson. 1986. Hydraulic Conductivity and Diffusivity: Laboratory Methods.Chp. 28, pp. 700-703, in A. Klute (ed.), Methods of Soil Analysis, Part 1, American Society of Agronomy, Madison, WI
Hanging Column Method:	ASTM D6836 (modified apparatus)
Pressure Plate Method:	ASTM D6836 (modified apparatus)
Water Potential (Dewpoint Potentiometer) Method:	ASTM D6836
Relative Humidity (Box) Method:	Campbell, G. and G. Gee. 1986. Water Potential: Miscellaneous Methods. Chp. 25, pp. 631-632, in A. Klute (ed.), Methods of Soil Analysis. Part 1. American Society of Agronomy, Madison, WI; Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays. SSA Journal 46:1321-1325
Moisture Retention Characteristics & Calculated Unsaturated Hydraulic Conductivity:	ASTM D6836; van Genuchten, M.T. 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. SSSAJ 44:892-898; van Genuchten, M.T., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, Oklahoma. EPA/600/2091/065. December 1991

Attachment 4. Example daily meteorological data table, Mahagan site

TIMESTAMP	RECORD	BattV_Min	AirTemp_Max	AirTemp_Min	AirTemp_Avg	RH_Max	RH_Min	RH_Avg	BP_Avg	WindSpeed_Avg	Precip_TB_Tot	Precip_US_Tot	SolarRad_MJ/day	Lake_Temp_Avg	Lake_Lvl_Avg	SW_Temp_Avg	Tot Precip		Corr WL	0.5952096	Net Rad w/albedo	Potential Evaporation	Evap line
TS	RN	Volts	degrees C	degrees C	degrees C	percent	percent	percent	millibars	m/sec	mm	mm		deg C	feet	Deg C	mm/d	cm	ft	Julian date	MJ/m2/day	mm/day	cm
		Min	Max	Min	Avg	Max	Min	Avg	Avg	Avg	Tot		Avg	Avg	Avg	Avg		avg	avg		R_n	E_p	
7/3/2011 0:00	1	12.42	35.9	16.6	26.57	73	25	45.68	904.89	3.281	0		26.39	28.79	-0.125		0	-0.22	0.00	184	18.48	9.95	
7/4/2011 0:00	2	12.37	37	19.9	27.88	73	20	44.38	903.108	3.38	0		25.41	29.6	-0.143		0	-0.20	0.00	185	17.82	10.27	
7/5/2011 0:00	3	12.42	37.1	19.7	27.29	71	19	45.04	902.2004	2.848	0		20.63	29.24	-0.153		0	-0.27	0.00	186	14.84	9.00	
7/6/2011 0:00	4	12.41	37.1	17.1	26.86	64	22	40.17	902.7369	2.571	0		21.79	27.92	-0.149		0	-0.42	0.00	187	15.46	8.89	
7/7/2011 0:00	5	12.42	38.3	16.6	27.8	65	17	35.93	903.1016	2.623	0		26.36	28.83	-0.146		0	-0.49	0.00	188	17.88	10.06	
7/8/2011 0:00	6	12.42	39.3	17.7	28.71	55	14	31.86	901.2673	2.562	0		29.34	29.98	-0.166		0	-0.62	-0.01	189	19.18	10.84	
7/9/2011 0:00	7	12.4	39.5	18.8	29.47	65	16	34.88	899.4859	2.286	0		28.74	31.49	-0.185		0	-0.71	-0.01	190	19.30	10.38	
7/10/2011 0:00	8	12.43	40.1	21.3	30.47	51	16	33.57	899.3455	3.865	0		27.26	31.68	-0.187		0	-0.76	-0.01	191	18.23	11.96	
7/11/2011 0:00	9	12.41	37.7	18.4	28.16	66	20	42.02	901.3125	3.207	0.254		26.27	29.59	-0.167		0.254	-0.77	-0.01	192	18.07	10.39	
7/12/2011 0:00	10	12.41	36.1	16.7	26.41	86	24	50.87	902.4555	3.921	1.778		24.71		-0.157		1.778	-0.93	-0.01	193	17.55	10.05	
7/13/2011 0:00	11	12.38	37.4	19.3	26.46	89	27	60.65	902.3478	4.436	0		22.84		-0.158		0	-0.92	-0.01	194	16.74	10.31	
7/14/2011 0:00	12	12.41	38.4	21	28.23	78	22	50.89	900.9678	3.813	0		23.55		-0.178		0	-1.52	-0.02	195	16.90	10.45	
7/15/2011 0:00	13	12.42	38	18.9	28.94	79	18	43.23	899.8347	3.088	0		29.03		-0.193		0	-1.86	-0.02	196	19.86	10.75	
7/16/2011 0:00	14	12.42	38.2	18.7	29.76	64	22	37.47	899.6557	3.242	0		27.09		-0.199		0	-2.28	-0.02	197	18.62	10.48	
7/17/2011 0:00	15	12.43	38.8	19.2	29.98	66	21	37.91	901.7939	2.865	0		26.48		-0.211		0	-5.66	-0.06	198	18.26	10.17	
7/18/2011 0:00	16	12.42	36.5	18.5	28.78	76	25	44.31	904.6871	2.642	0		25.77		-0.333		0	0.00		199	18.13	9.29	
7/19/2011 0:00	17	12.42	37.8	18.1	28.92	73	24	41.26	904.1895	1.784	0		26.27				0	0.00		200	18.34	8.95	
7/20/2011 0:00	18	12.42	38.9	18.7	29.49	72	22	38.69	901.0443	1.924	0		25.28				0	0.00		201	17.66	9.07	
7/21/2011 0:00	19	12.4	38.7	20.3	30	65	22	39.33	898.3641	3.944	0		26.64				0	0.00		202	18.40	11.14	
7/22/2011 0:00	20	12.4	38	19.7	29.66	71	22	41.15	897.8245	3.556	0		26.04				0	0.00		203	18.10	10.45	
7/23/2011 0:00	21	12.42	37.1	20.3	29.54	64	24	41.38	898.451	3.596	0		25.99				0	0.00		204	18.02	10.33	
7/24/2011 0:00	22	12.42	36.9	22.4	29.45	75	28	45.63	900.3339	4.143	0		27.72				0	0.00		205	19.68	10.92	
7/25/2011 0:00	23	12.33	37.5	20.4	28.92	68	22	43.61	903.7772	3.164	0		26.6				0	0.00		206	18.34	10.27	
7/26/2011 0:00	24	12.43	38.4	19.2	29.4	71	17	39.55	902.1363	2.646	0		27.17				0	0.00		207	18.35	10.09	
7/27/2011 0:00	25	12.4	39.2	19.6	29.76	64	17	35.97	898.0066	3.28	0		26.54				0	0.00		208	17.84	10.75	
7/28/2011 0:00	26	12.39	39	21.4	30.46	57	20	34.86	897.6226	3.718	0		28.07				0	0.00		209	18.85	11.41	
7/29/2011 0:00	27	12.39	38.6	18.8	29.86	63	19	35.54	899.7648	3.257	0		25.38				0	0.00		210	17.20	10.26	
7/30/2011 0:00	28	12.39	37.6	18.8	28.62	67	20	42.05	902.7839	2.247	0		21.48				0	0.00		211	15.02	8.49	
7/31/2011 0:00	29	12.39	36.8	19.9	28.43	72	27	46.55	904.7374	2.315	0		21.89				0	0.00		212	15.67	8.33	
8/1/2011 0:00	30	12.39	36.8	19.3	27.87	80	28	50.83	906.2621	2.931	0		22.64				0	0.00		213	16.26	8.85	
8/2/2011 0:00	31	12.36	37.4	17.2	27.54	60	18	37.32	904.5984	3.124	0		27.97				0	0.00		214	18.33	10.56	
8/3/2011 0:00	32	12.36	39.5	17.6	28.83	58	13	33.41	901.4824	2.621	0		27.96				0	0.00		215	17.89	10.52	
8/4/2011 0:00	33	12.36	38.7	20.4	28.95	66	22	39.6	900.986	2.394	0		25.98				0	0.00		216	17.76	9.65	
8/5/2011 0:00	34	12.37	39.5	21.5	29.81	69	18	39.73	900.696	2.561	0		26.73				0	0.00		217	18.08	10.15	
8/6/2011 0:00	35	12.37	39.6	20.2	29.84	60	18	36.29	900.5666	2.406	0		26.38				0	0.00		218	17.54	9.93	
8/7/2011 0:00	36	12.37	39.6	19.6	30.47	71	19	39.49	900.8675	3.021	0		24.93				0	0.00		219	16.97	10.03	
8/8/2011 0:00	37	12.37	39.2	22.3	30.69	60	15	35.86	900.1345	3.081	0		26.78				0	0.00		220	17.60	10.65	
8/9/2011 0:00	38	12.39	41.8	20	31.09	63	17	35.49	897.6587	3.584	0		25.83				0	0.00		221	17.19	11.32	
8/10/2011 0:00	39	12.38	39.9	21.8	30.24	75	19	41.79	898.6465	2.613	0		24.4				0	0.00		222	16.83	9.68	
8/11/2011 0:00	40	12.36	39.7	17.9	30.36	64	15	37.35	897.645	3.147	0		25.37				0	0.00		223	16.57	10.29	
8/12/2011 0:00	41	12.35	37.9	20.7	27.8	84	28	56.51	899.7238	4.358	0		22.21				0	0.00		224	15.96	10.03	
8/13/2011 0:00	42	12.31	36	19.3	27.55	83	30	54.87	900.8212	2.78	0		26.03				0	0.00		225	18.21	9.10	
8/14/2011 0:00	43	12.36	35.4	20.2	27.12	81	33	56.79	904.0419	2.781	0		23.32				0	0.00		226	16.64	8.46	
8/15/2011 0:00	44	12.37	35.2	16.3	25.67	84	29	55.69	905.447	2.145	0		24.38				0	0.00		227	16.89	8.19	
8/16/2011 0:00	45	12.35	37.1	19.3	27.83	79	23	47.77	901.9988	3.568	0		25.24				0	0.00		228	17.22	9.98	
8/17/2011 0:00	46	12.34	38.1	19	29.13	60	19	36.93	902.1234	3.522	0		25.93				0	0.00		229	16.91	10.45	
8/18/2011 0:00	47	12.36	38.3	19.3	28.84	66	22	40.99	905.9933	2.612	0		23.31				0	0.00		230	15.76	9.11	
8/19/2011 0:00	48	12.3	37.9	18.9	28.66	67	24	42.1	903.9476	2.541	0		19.54				0	0.00		231	13.65	8.19	
8/20/2011 0:00	49	12.36	37.9	18.6	28.08	65	19	38.2	901.0986	3.122	0		25.59				0	0.00		232	16.70	10.00	
8/21/2011 0:00	50	12.35	37.5	16.7	27.74	63	21	37.34	902.1339	3.187	0		25.16				0	0.00		233	16.42	9.78	
8/22/2011 0:00	51	12.37	37.7	19.1	28.5	74	22	40.15	905.0609	2.301	0		24.8				0	0.00		234	16.61	8.91	
8/23/2011 0:00	52	12.35	37.2	19.1	27.96	57	20	37.99	905.1024	3.187	0		24.94				0	0.00		235	16.12	9.85	
8/24/2011 0:00	53	12.35	38.1	17.8	28.53	65	19	39.71	903.0886	3.294	0		25.27				0	0.00		236	16.33	10.00	
8/25/2011 0:00	54	12.36	40.3	20	29.57	60	18	36.83	903.0894	2.101	0		24.93				0	0.00		237	16.10	9.31	
8/26/2011 0:00	55	12.36	38	22.3	29.6	58	24	38.91	905.1268	3.057	0		23.94				0	0.00		238	15.93	9.58	
8/27/2011 0:00	56	12.37	39.5	19.9	28.77	77	13	43.77	905.6364	1.688	0		24.6				0	0.00		239	15.84	8.72	
8/28/2011 0:00	57	12.34	39.6	18	28.71	67	16	34.47	905.0843	2.036	0		24.05				0	0.00		240	15.37	8.90	
8/29/2011 0:00	58	12.36	40.8	18	30.02	52	13	27.2	902.1776	3.41	0		23.77				0	0.00		241	14.61	10.53	
8/30/2011 0:00	59	12.26	37.9	22.4	28.84	65	17	36.76	901.6893	2.479	0.508		17.2				0.508	0.00		242	11.84	7.96	
8/31/2011 0:00	60	12.32	41.3	19.1	30.08	55	14	30.86	899.7359	2.929	0		24.08				0	0.00		243	14.89	10.16	
9/1/2011 0:00	61	12.34	38.7	22.3	30.07	43	19	29.28	902.1155	4.284	0		21.77				0	0.00		244	13.82	10.71	
9/2/2011 0:00	62	12.3	35.5	16.4	26.54	59	23	37.44	904.8079	3.535	0		23.62				0	0.00		245	15.05	9.31	
9/3/2011 0:00	63	12.31	35.8	13.8	25.37	65	21	38.75	903.2029	2.22	0		23.94				0	0.00		246	15.07	8.28	
9/4/2011 0:00	64	12.3	37.6	16.2	25.4	87	23	50.36	902.2523	2.162	3.302		20.35				3.302	0.00		247	13.72	7.82	
9/5/2011 0:00	65	12.22	22.7	13.9	17.77	92	39	75.03	908.4694	5.079	0		7.138				0	0.00		248	6.31	4.56	

Attachment 4: Example daily meteorological data table, Mahagan site - Page 1

9/6/2011 0:00	66	12.14	26	8	16.44	84	30	55.33	909.7275	2.035	0	24.73			0	0.00		249	15.65	6.54
9/7/2011 0:00	67	12.27	30.5	5.9	18.38	86	18	42.86	904.5585	2.347	0	24.14			0	0.00		250	14.75	7.55
9/8/2011 0:00	68	12.22	27.8	11.4	19.25	51	19	33.67	907.3276	2.312	0	10.93			0	0.00		251	8.04	5.55
9/9/2011 0:00	69	12.16	28.2	14.6	20.2	64	24	43.17	908.7441	1.813	0	21.49			0	0.00		252	13.53	6.55
9/10/2011 0:00	70	12.3	28.2	11.8	19.9	75	27	47.02	905.5089	1.69	0	18.89			0	0.00		253	12.32	5.85
9/11/2011 0:00	71	12.23	28	11	19.83	85	30	52.58	905.3449	1.963	0	13.74			0	0.00		254	9.72	5.05
9/12/2011 0:00	72	12.2	32.4	11.5	21.64	84	21	49.05	906.3152	1.872	0	22.72			0	0.00		255	14.11	7.12
9/13/2011 0:00	73	12.28	38.2	12.9	25.2	61	14	33.51	904.5166	3.022	0	22.21			0	0.00		256	13.10	9.33
9/14/2011 0:00	74	12.31	36.5	16.8	26.54	55	16	32.57	901.8556	2.968	0	16.56			0	0.00		257	10.54	8.00
9/15/2011 0:00	75	12.27	25.6	16.2	19.81	85	33	68.8	902.8786	3.335	0.254	8.6			0.254	0.00		258	6.95	4.66
9/16/2011 0:00	76	12.1	17.2	11	12.65	97	78	92.8	906.5407	3.479	8.89	3.359			8.89	0.00		259	3.98	1.67
9/17/2011 0:00	77	12.02	22.8	11.9	16.06	97	68	88.8	903.6947	3.468	0.254	14.49			0.254	0.00		260	10.47	3.99
9/18/2011 0:00	78	12.07	33.2	15.7	22.6	96	19	67.26	900.1437	3.65	0.254	20.74			0.254	0.00		261	13.11	8.25
9/19/2011 0:00	79	12.17	29.1	12.2	20.3	87	20	57.58	903.2097	2.928	0	22.5			0	0.00		262	13.59	7.26
9/20/2011 0:00	80	12.32	30.5	8.7	19.64	90	24	52.93	906.0164	2	0	22.14			0	0.00		263	13.44	6.62
9/21/2011 0:00	81	12.3	35.1	10.4	22.03	76	18	42.71	901.0998	3.713	0	19.32			0	0.00		264	11.66	8.72
9/22/2011 0:00	82	12.29	29.5	12.9	19.98	74	28	50.78	902.8939	3.105	0	21.29			0	0.00		265	13.00	7.18
9/23/2011 0:00	83	12.22	23.3	10.1	15.98	87	40	60.34	907.3798	3.247	0	19.04			0	0.00		266	12.12	5.53
9/24/2011 0:00	84	12.18	32.6	7.4	18.61	93	12	52.85	905.6061	2.025	0	22.06			0	0.00		267	12.44	7.21
9/25/2011 0:00	85	12.27	35.9	11.9	22.62	65	11	36.1	899.9124	2.471	0	21.33			0	0.00		268	11.68	8.15
9/26/2011 0:00	86	12.28	31	11.5	21.48	62	24	39.1	897.2499	2.436	0	21.28			0	0.00		269	12.33	6.92
9/27/2011 0:00	87	12.26	32.4	7.8	20.15	83	22	48.39	897.8524	2.766	0	21.38			0	0.00		270	12.42	7.34
9/28/2011 0:00	88	12.22	35	11.8	22.45	71	19	46.18	900.7599	1.906	0	19.53			0	0.00		271	11.35	6.91
9/29/2011 0:00	89	12.3	35.9	12.9	23.26	78	14	45.23	901.0098	1.597	0	20.93			0	0.00		272	11.73	6.97
9/30/2011 0:00	90	12.3	34.2	14.3	23.51	59	19	36.26	902.8026	3.854	0	20.38			0	0.00		273	11.45	8.67
10/1/2011 0:00	91	12.27	26.9	9.4	17.15	52	14	31.12	909.5937	2.419	0	20.8			0	0.00		274	10.98	6.55
10/2/2011 0:00	92	12.2	29.4	5.1	16.93	73	15	33.39	907.1149	2.495	0	20.87			0	0.00		275	11.20	6.79
10/3/2011 0:00	93	12.24	31.8	7	19.49	62	18	35.36	905.9988	2.806	0	20.49			0	0.00		276	11.04	7.31
10/4/2011 0:00	94	12.18	30.9	8.3	20.06	76	20	42.34	905.9191	3.028	0	20.39			0	0.00		277	11.26	7.11
10/5/2011 0:00	95	12.26	28.2	6.1	17.56	75	15	39.94	905.2375	3.487	0	20.72			0	0.00		278	10.95	7.22
10/6/2011 0:00	96	12.23	21.2	12.6	17.05	92	30	64.9	901.3843	3.485	0.508	7.133			0.508	0.00		279	5.70	3.86
10/8/2011 0:00	0	12.49	27.6	22.5	24.5	58	44	52.23	896.2768	7.062	0	0.208	23.49	0.81	0	2.07	0.02	281	2.31	5.68
10/9/2011 0:00	1	12.25	22.9	9.6	15.09	95	39	71.01	899.5139	3.75	13.72	8.62	15.8	0.838	13.72	1.57	0.02	282	6.34	4.09
10/10/2011 0:00	2	12.17	19	9.4	12.78	97	64	88.6	903.1752	3.038	0.254	13.66	14.61	0.875	0.254	1.53	0.02	283	8.94	3.32
10/11/2011 0:00	3	12.18	23.9	10.7	15.77	97	35	77.4	902.5863	3.367	0	17.93	17.4	0.875	0	2.13	0.02	284	10.53	5.28
10/12/2011 0:00	4	12.28	26.3	10.8	16.59	97	49	82	897.1407	4.26	0	13.42	16.95	0.82	0	2.19	0.02	285	8.74	4.91
10/13/2011 0:00	5	12.23	25.9	9.3	16.79	97	27	70.68	897.9037	3.559	0	18.66	17.69	0.828	0	2.21	0.02	286	10.42	5.93
10/14/2011 0:00	6	12.18	26.2	4.8	15.24	93	26	57.27	901.897	2.574	0	19.04	16.18	0.866	0	1.94	0.02	287	10.26	5.50
10/15/2011 0:00	7	12.19	28.8	6.5	17.54	88	18	51.65	898.9538	2.454	0	19.11	18.77	0.836	0	1.94	0.02	288	9.84	5.98
10/16/2011 0:00	8	12.2	28.7	9.1	17.14	87	26	59.87	902.9238	2.385	0	18.58	19.02	0.877	0	1.99	0.02	289	10.02	5.72
10/17/2011 0:00	9	12.18	32.7	9.2	20.06	86	15	48.11	901.4438	3.047	0	18.74	20.36	0.861	0	1.90	0.02	290	9.43	7.12
10/18/2011 0:00	10	12.17	32.6	6.2	17.09	83	9	48.72	897.7292	5.265	0	16.48	17.37	0.822	0	1.79	0.02	291	8.04	9.73
10/19/2011 0:00	11	12.2	18	3.9	10.63	81	21	51.39	907.2699	6.186	0	18.35	11.67	0.917	0	1.56	0.02	292	9.27	6.32
10/20/2011 0:00	12	12.13	19.9	2.1	9.72	66	22	43.22	906.0269	2.627	0	18.15	11.06	0.897	0	0.82	0.01	293	8.94	4.80
10/21/2011 0:00	13	12.12	28.4	0.8	12.59	77	11	43.35	900.7966	2.746	0	18.27	12.9	0.845	0	0.96	0.01	294	8.34	6.51
10/22/2011 0:00	14	12.12	27.8	2.8	14.33	76	17	44.87	903.9482	2.391	0	17.8	15.01	0.878	0	1.04	0.01	295	8.49	5.72
10/23/2011 0:00	15	12.12	27.3	3.4	14.4	81	20	51.6	901.1113	1.655	0	17.68	15.99	0.855	0	1.64	0.02	296	8.59	4.93
10/24/2011 0:00	16	12.13	27.9	5.7	15.12	91	18	54.31	904.1578	1.498	0	17.39	17.11	0.886	0	1.63	0.02	297	8.48	4.84
10/25/2011 0:00	17	12.1	29	5.1	17.04	85	24	52.49	904.7682	4.038	0	16.63	16.35	0.893	0	1.71	0.02	298	8.35	6.58
10/26/2011 0:00	18	12.27	31.8	11.9	20.49	75	18	44.15	899.6141	3.744	0	16.13	20.23	0.842	0	1.86	0.02	299	7.91	7.05
10/27/2011 0:00	19	12.17	19.1	4.9	12.79	82	41	55.22	899.6681	5.067	0.254	15.77	14.65	0.839	0.254	1.51	0.02	300	8.27	4.76
10/28/2011 0:00	20	12.05	5.5	0.4	2.891	95	80	91.8	904.2653	5.548	25.91	4.93	3.871	0.876	25.91	0.52	0.01	301	4.25	1.38
10/29/2011 0:00	21	11.95	13.5	-2	4.635	96	42	78.09	908.5867	1.596	0	16.67	5.811	0.922	0	0.71	0.01	302	8.46	2.80
10/30/2011 0:00	22	12.18	18.5	-2	7.204	95	37	72.97	904.0716	3.456	0	16.33	7.178	0.877	0	0.82	0.01	303	8.17	4.10
10/31/2011 0:00	23	12.17	18	1.9	9.28	93	35	66.95	904.0228	3.569	0	16.19	9.43	0.879	0	1.07	0.01	304	8.02	4.10
11/1/2011 0:00	24	12.11	22.8	0.1	10.92	94	27	63.52	904.413	3.051	0	16	10.31	0.884	0	1.17	0.01	305	7.65	4.71
11/2/2011 0:00	25	12.15	27.2	6.3	16.12	92	21	56.84	898.8703	4.091	0	15.89	15.86	0.832	0	1.62	0.02	306	7.44	6.11
11/3/2011 0:00	26	12.14	15.2	1.3	8.24	88	51	69.04	903.6046	8.01	0	12.95	8.85	0.875	0	1.09	0.01	307	6.94	4.38
11/4/2011 0:00	27	12.04	13.5	-4.2	3.284	89	26	60.86	911.3	2.522	0	16.22	5.424	0.948	0	0.55	0.01	308	7.43	3.32
11/5/2011 0:00	28	12.05	17.8	-3	6.943	80	21	47.76	902.963	3.769	0	14.84	7.167	0.865	0	0.75	0.01	309	6.70	4.54
11/6/2011 0:00	29	12.1	24.9	4.9	11.95	53	16	40.19	893.3258	5.313	0	13.28	11.29	0.773	0	1.38	0.01	310	5.77	7.37
11/7/2011 0:00	30	12.17	19.7	-0.6	9.73	76	20	45.75	898.0817	3.253	0	15.36	10.18	0.82	0	1.23	0.01	311	6.60	4.51
11/8/2011 0:00	31	12.15	25.1	3.8	13.98	88	25	62.4	896.7159	3.284	0	12.99	13.95	0.808	0	1.42	0.01	312	6.20	4.85
11/9/2011 0:00	32	12.21	15.2	0	8.53	95	0	68.17	899.2964	5.58	0	14.54	10.16	0.84	0	1.99	0.02	313	5.95	5.34
11/10/2011 0:00	33	12.11	13.2	-3.7	4.509	91	28	65.34	911.7833	3.528	0	13.19	5.383	0.955	0	0.75	0.01	314	6.19	3.36
11/11/2011 0:00	34	12.04	17.4	-4.6	4.993	86	14	50.3	911.3379	3.131	0	15.01	5.393	0.95	0	0.71	0.01	315	6.11	4.27
11/12/2011 0:00	35	12.1	22	-2.4	10.02	69	9	32.86	900.4907	4.825	0	13.85	9.66	0.845	0	1.27	0.01	316	5.33	6.24
11/13/2011 0:00	36	12.09	23.4	2.1	12.59	54	8	29.59	894.2579	5.148	0	10.83	11.41	0.784	0	1.53	0.02	317	4.58	6.69
11/14/2011 0:00	37	12.13	24.2	8.1	15.6	58	21	37.27	893.4534	5.392	0	12.5	14.86	0.778	0	1.75	0.02	318	5.33	6.35
11/15/2011 0:00	38	12.14	20.4	7.2	14.76	86	33	54.43	894.7208	3.329	0	5.241	14.1	0.79	0	1.65	0.02	319	3.91	3.26
11/16/2011 0:00	39	12.01	21.9	2.7	10.78	84	16	51.21	894.6659	2.488	0	14.27	11.54	0.786	0	1.31	0.01	320	5.61	4.21

11/17/2011 0:00	40	12.15	11.9	-1.1	5.224	73	33	49.35	902.8467	3.638	0	13.8	5.757	0.864	0	0.77	0.01	321	5.89	3.23
11/18/2011 0:00	41	12.05	12.5	-8.2	2.126	82	28	54.12	908.7925	4.138	0	13.87	2.469	0.92	0	0.30	0.00	322	5.83	3.54
11/19/2011 0:00	42	12.09	21.8	1.7	9.84	89	26	58.21	896.6605	5.657	0	12.45	9.37	0.806	0	1.28	0.01	323	5.40	5.67
11/20/2011 0:00	43	12.11	26.1	5.1	12.98	84	11	47.41	893.8409	4.639	0	12.12	12.09	0.78	0	1.55	0.02	324	4.74	6.57
11/21/2011 0:00	44	12.12	16.2	0.4	5.845	78	31	58.09	902.1617	2.602	0	12.25	7.511	0.859	0	0.97	0.01	325	5.28	3.20
11/22/2011 0:00	45	12.02	8.4	3.4	6.44	97	63	92.8	900.8907	2.307	0.508	1.843	6.438	0.846	0.508	0.96	0.01	326	2.83	1.19
11/23/2011 0:00	46	11.9	16.8	2	8.42	98	45	87.3	903.3297	2.615	0.508	10.1	8.32	0.874	0.508	1.27	0.01	327	5.05	2.60
11/24/2011 0:00	47	11.88	20.6	0.1	8.86	97	30	72.58	907.6003	2.089	0	13.7	8.17	0.917	0	1.22	0.01	328	5.56	3.32
11/25/2011 0:00	48	12.05	20.9	0.4	9.84	94	33	69.59	903.609	3.459	0	13.39	8.97	0.877	0	1.29	0.01	329	5.51	3.93
11/26/2011 0:00	49	12.11	14.2	7	10.32	95	67	83	896.1312	4.108	0.254	4.686	9.22	0.801	0.254	1.32	0.01	330	3.61	1.86
11/27/2011 0:00	50	12	9.2	-0.7	5.61	89	34	60.22	904.7114	9.24	0	12.5	5.097	0.885	0	0.97	0.01	331	5.21	4.18
11/28/2011 0:00	51	12.06	12.9	-4.7	2.72	63	14	41.98	910.9331	4.09	1.016	13.54	2.327	0.946	1.016	0.72	0.01	332	4.65	4.01
11/29/2011 0:00	0	12.31	22.8	2.9	12.42	67	13	37.25	901.8597	0.899	0	14.19	11.92	0.781	0	-6.53	-0.07	333	4.40	3.07
11/30/2011 0:00	1	12.14	11.4	-2.9	4.904	89	43	58.71	907.9801	3.359	0	9.69	4.743	0.915	0	0.63	0.01	334	4.58	2.40
12/1/2011 0:00	2	12.02	16.6	-5.4	4.645	90	27	62.13	902.0992	4.076	0	12.93	3.847	0.856	0	0.73	0.01	335	4.90	3.89
12/2/2011 0:00	3	12.06	9.1	-3.4	2.868	84	49	68.44	903.0952	6.514	0	12.54	2.948	0.862	0	0.31	0.00	336	5.19	3.01
12/3/2011 0:00	0	11.96	0.6	-0.8	0.025	96	91	94.1	902.4307	2.476	0.254	0.919	0.614	0.853	0.254	0.09	0.00	337	2.49	0.57
12/4/2011 0:00	1	11.88	10.2	-1.3	2.811	97	68	86.9	899.2493	4.295	1.016	10.78	3.524	0.826	1.016	0.64	0.01	338	5.03	1.89
12/5/2011 0:00	2	11.93	4.7	-3	0.3	89	65	80.6	903.1302	3.061	2.286	8.68	1.591	0.863	2.286	0.38	0.00	339	4.40	1.44
12/6/2011 0:00	3	11.77	0.5	-8.4	-4.358	94	82	87.5	907.178	7.624	0	4.975	-2.754	0.896	0	-0.45	0.00	340	3.54	1.06
12/7/2011 0:00	4	11.63	-3.5	-13.2	-8.85	90	68	81.4	907.5802	3.307	0	12.79	-5.388	0.894	0	-1.06	-0.01	341	5.49	1.07
12/8/2011 0:00	5	11.74	12.1	-12.1	-1.885	92	34	71.51	905.859	2.112	0.508	12.66	-2.061	0.883	0.508	-0.40	0.00	342	4.87	2.34
12/9/2011 0:00	6	11.94	12.5	-3.9	1.966	94	37	76.09	900.9994	3.095	0.254	12.52	1.887	0.843	0.254	0.55	0.01	343	4.83	2.63
12/10/2011 0:00	7	12.02	4.7	-4.7	-0.719	94	73	87.3	907.567	4.485	0	9.48	0.201	0.906	0	0.15	0.00	344	4.56	1.42
12/11/2011 0:00	8	11.85	0.4	-3	-1.412	95	92	93.8	912.2834	1.896	0	2.931	-0.824	0.955	0	0.24	0.00	345	2.98	0.60
12/12/2011 0:00	9	11.65	4	0.4	2.127	97	93	96.1	905.8077	4.679	0.254	1.47	1.613	0.893	0.254	0.65	0.01	346	2.60	0.67
12/13/2011 0:00											0.8				0.8	0.00				
12/14/2011 0:00											0.8				0.8	0.00				
12/15/2011 0:00											0				0	0.00				
12/16/2011 0:00											0				0	0.00				
12/17/2011 0:00											0				0	0.00				
12/18/2011 0:00											0				0	0.00				
12/19/2011 0:00											3.3				3.3	0.00				
12/20/2011 0:00											9.1				9.1	0.00				
12/21/2011 0:00											0				0	0.00				
12/22/2011 0:00											0				0	0.00				
12/23/2011 0:00											0				0	0.00				
12/24/2011 0:00											0				0	0.00				
12/25/2011 0:00											3.8				3.8	0.00				
12/26/2011 0:00											1.5				1.5	0.00				
12/27/2011 0:00											0				0	0.00				
12/28/2011 0:00											0				0	0.00				
12/29/2011 0:00											0				0	0.00				
12/30/2011 0:00											0				0	0.00				
12/31/2011 0:00											0				0	0.00				
1/1/2012 0:00											0				0	0.00				
1/2/2012 0:00											0				0	0.00				
1/3/2012 0:00											0				0	0.00				
1/4/2012 0:00											0				0	0.00				
1/5/2012 0:00											0				0	0.00				
1/6/2012 0:00											0				0	0.00				
1/7/2012 0:00											0				0	0.00				
1/8/2012 0:00											0				0	0.00				
1/9/2012 0:00											0				0	0.00				
1/10/2012 0:00	0	12.28	6	-0.9	3.946	70	42	54.72	903.8271	2.232	5.08	0.25	4.059	0.853	5.08	-1.33	-0.01	10	2.55	1.53
1/11/2012 0:00	1	12.15	15.4	-5.8	2.88	82	32	61.24	899.1671	3.072	0	12.79	2.96	0.827	0	0.82	0.01	11	5.09	3.23
1/12/2012 0:00	2	12.44	10.2	-5.2	1.642	87	50	69.73	894.3156	7.236	0	11.73	1.206	0.769	0	-0.03	0.00	12	5.24	3.26
1/13/2012 0:00	3	12.39	6.9	-10.6	-2.576	77	26	54.18	905.5132	4.537	0	13	-1.066	0.88	0	-0.35	0.00	13	5.24	2.96
1/14/2012 0:00	4	12.4	13.6	-10.2	1.031	85	15	47.62	904.2482	2.765	0	13.24	0.974	0.87	0	-0.06	0.00	14	4.96	3.30
1/15/2012 0:00	5	12.46	17.4	-5	4.305	60	12	37.32	906.1188	2.979	0	13.51	3.634	0.894	0	0.43	0.00	15	4.64	4.16
1/16/2012 0:00	6	12.5	21.7	-4.8	7.172	72	9	39.21	900.9631	4.801	0	13.1	5.603	0.846	0	0.89	0.01	16	4.48	6.25
1/17/2012 0:00	7	12.56	22.8	2.9	12.32	74	26	49.27	896.261	6.272	0	10.76	10.81	0.804	0	1.48	0.01	17	4.78	6.11
1/18/2012 0:00	8	12.54	10.2	-6.2	1.926	79	27	51.2	905.1629	4.715	0	13.43	3.978	0.883	0	0.31	0.00	18	5.52	3.44
1/19/2012 0:00	9	12.42	17.9	-9.7	2.434	81	14	49.16	902.8276	3.822	0	11.18	1.583	0.859	0	0.29	0.00	19	4.72	4.69
1/20/2012 0:00	10	12.56	21.4	1.4	11.65	54	17	33.35	895.2748	4.07	0	13.67	10.94	0.797	0	1.79	0.02	20	5.00	5.18
1/21/2012 0:00	11	12.57	24.3	-0.4	10.88	75	8	41.53	893.6241	4.821	0	13.21	9.46	0.771	0	0.87	0.01	21	4.73	6.68
1/22/2012 0:00	12	12.51	17.8	-6.5	5.161	86	24	55.1	897.1647	4.087	0	13.78	5.444	0.812	0	1.36	0.01	22	5.72	4.40
1/23/2012 0:00	13	12.59	17.4	-1.1	9.37	72	20	41	890.1661	7.706	0	11.15	8.73	0.735	0	0.80	0.01	23	5.02	6.10
1/24/2012 0:00	14	12.5	17.7	-4	6.361	84	17	48.3	899.3116	3.715	0	13.91	6.05	0.829	0	0.87	0.01	24	5.65	4.40
1/25/2012 0:00	15	12.53	12.7	-2.3	6.189	93	47	70.46	896.4984	3.614	0	5.644	5.729	0.802	0	1.04	0.01	25	4.07	2.32
1/26/2012 0:00	16	12.43	11.8	-4.5	3.916	93	39	71.21	900.2396	7.196	0	8.42	4.673	0.839	0	0.93	0.01	26	4.86	3.75

1/27/2012 0:00	17	12.36	16.3	-4.5	5.082	78	21	50.84	900.9778	4.123	0	14.4	4.151	0.843	0	0.57	0.01	27	6.08	4.42
1/28/2012 0:00	18	12.65	17.5	2.5	8.42	67	26	48.75	898.6403	6.269	0	13.82	7.675	0.822	0	0.86	0.01	28	6.05	5.65
1/29/2012 0:00	19	12.57	10.4	-5.9	1.479	81	23	51.93	911.3917	2.734	0	12.4	3.027	0.947	0	0.35	0.00	29	5.88	2.88
1/30/2012 0:00	20	12.47	19.4	-10.4	2.928	82	15	51.06	907.793	2.978	0	14.96	2.953	0.91	0	0.32	0.00	30	6.24	4.64
1/31/2012 0:00	21	12.53	22.3	-4.8	7.743	84	9	48.44	900.4554	4.222	0	13.92	6.74	0.842	0	1.01	0.01	31	5.75	6.07
2/1/2012 0:00	22	12.56	21.1	-2.8	8.38	89	14	49.55	899.9662	3.02	0	15.1	8.87	0.837	0	1.00	0.01	32	6.38	4.74
2/2/2012 0:00	23	12.52	19.2	-2.6	6.34	68	13	41.59	903.0499	2.498	0	15.34	5.627	0.868	0	0.96	0.01	33	6.35	4.34
2/3/2012 0:00	24	12.52	14.9	-2.6	7.151	92	49	73.54	899.1843	4.578	0	5.046	4.613	0.829	0	1.00	0.01	34	4.10	2.75
2/4/2012 0:00	25	12.47	14.7	0.7	8.72	95	66	81	899.0695	5.182	0	10.05	9.84	0.826	0	0.82	0.01	35	6.03	2.65
2/5/2012 0:00	26	12.39	9	-4.2	1.873	86	51	72.91	908.3009	6.545	0	13.73	2.707	0.913	0	0.11	0.00	36	7.14	3.28
2/6/2012 0:00	27	12.53	8.5	-6.8	-0.527	90	32	64.34	910.967	3.202	0	15.77	0.951	0.941	0	0.19	0.00	37	7.66	2.89
2/7/2012 0:00	28	12.51	12.4	-9	1.443	75	28	53.46	905.4979	2.516	0	15.39	1.784	0.891	0	0.76	0.01	38	7.43	3.19
2/8/2012 0:00	29	12.54	4.5	-8.9	-0.004	88	60	75.03	907.3055	6.41	0	9.03	0.886	0.9	0	-0.18	0.00	39	5.71	2.20
2/9/2012 0:00	30	12.35	9.8	-12.1	-2.161	90	37	67.38	910.0872	2.67	0	15.85	-1.046	0.926	0	-0.42	0.00	40	8.04	2.75
2/10/2012 0:00	31	12.57	13.4	-0.5	4.165	87	42	70.49	902.8394	4.527	0.254	8.73	4.251	0.863	0.254	0.67	0.01	41	5.57	3.27
2/11/2012 0:00	32	12.42	12.9	-2.7	3.777	92	25	63.63	905.8412	3.71	0	16.63	5.233	0.892	0	0.51	0.01	42	8.14	3.88
2/12/2012 0:00	33	12.57	2.2	-8.1	-3.464	88	33	60.84	912.092	5.104	0	16.16	-0.921	0.946	0	-0.46	0.00	43	8.37	2.80
2/13/2012 0:00	34	12.36	-4.6	-8	-6.719	93	61	78.5	907.0745	4.564	0	5.752	-4.814	0.895	0	-0.44	0.00	44	4.63	1.17
2/14/2012 0:00	35	12.29	15.1	-4.6	2.895	95	39	79.82	893.7231	6.13	3.048	16.36	2.521	0.768	3.048	0.47	0.00	45	8.59	4.73
2/15/2012 0:00	36	12.62	20.6	-2.7	8.51	91	23	58.5	894.1095	3.262	0	15.85	6.951	0.775	0	0.78	0.01	46	8.05	4.81
2/16/2012 0:00	37	12.63	15.4	-0.4	8.27	86	37	56.52	897.3644	5.376	0	17.1	8.4	0.807	0	0.66	0.01	47	8.92	4.64
2/17/2012 0:00	38	12.55	11.7	-3.8	3.227	94	48	76.31	905.377	3.16	0	11.54	3.714	0.887	0	0.49	0.00	48	7.02	2.69
2/18/2012 0:00	39	12.47	8.4	2.6	5.44	95	77	89.8	901.8397	1.721	1.524	4.331	5.113	0.855	1.524	0.89	0.01	49	4.14	1.21
2/19/2012 0:00	40	12.3	6.3	2.9	4.885	97	89	95	900.6366	3.191	0.254	3.136	5.055	0.84	0.254	0.62	0.01	50	3.61	0.96
2/20/2012 0:00	41	12.22	10.2	2.9	5.514	96	73	90.1	898.6243	5.175	0	6.511	5.252	0.823	0	0.97	0.01	51	5.14	1.93
2/21/2012 0:00	42	12.14	13	-3.6	5.557	97	12	60.58	896.3768	5.818	0	13.2	5.713	0.795	0	0.46	0.00	52	7.44	4.97
2/22/2012 0:00	43	12.35	21.2	-6.5	6.678	72	11	38.25	899.4025	4.577	0	14.83	5.183	0.828	0	0.68	0.01	53	7.73	6.55
2/23/2012 0:00	44	12.62	24.9	0.8	13.02	52	14	29.02	892.5397	4.875	0	14.87	11.36	0.768	0	1.68	0.02	54	7.70	7.27
2/24/2012 0:00	45	12.65	21.5	2.6	12.55	46	20	32.44	888.8942	9.3	0	13.82	11.47	0.722	0	0.79	0.01	55	7.59	9.15
2/25/2012 0:00	46	12.56	12.2	-6.7	3.077	74	13	38.9	906.7101	2.768	0	15.89	5.137	0.897	0	0.13	0.00	56	8.60	3.88
2/26/2012 0:00	47	12.49	16.9	-8.9	5.007	76	18	40.76	904.269	6.268	0	15.75	3.625	0.875	0	0.42	0.00	57	8.66	6.35
2/27/2012 0:00	48	12.56	24.8	-3.4	11.01	79	15	42.92	897.8156	4.391	0	15.99	11.03	0.814	0	0.90	0.01	58	8.61	6.93
2/28/2012 0:00	49	12.54	9.5	5.5	7.468	97	35	66.51	904.838	4.846	0.508	3.09	7.093	0.883	0.508	0.64	0.01	59	3.79	2.53
2/29/2012 0:00	50	12.49	25.2	6.7	15.21	98	8	60.98	896.9015	7.728	0	14.49	13.97	0.812	0	1.63	0.02	60	8.25	9.11
3/1/2012 0:00	51	12.58	22.6	0.4	9.73	50	6	26.42	899.6475	5.53	0	18.43	9.47	0.833	0	0.93	0.01	61	9.08	8.39
3/2/2012 0:00	52	12.58	26.4	-0.1	13.32	46	3	20.36	892.3337	5.85	0	18.18	11.49	0.763	0	1.39	0.01	62	8.69	9.53
3/3/2012 0:00	0	12.76	14.6	2.2	8.3	84	25	47.24	896.663	5.431	0	18.815	11.67	0.757	0	-3.63	-0.04	63	10.58	5.43
3/4/2012 0:00	1	12.49	12.6	-5	2.832	90	14	51.2	903.2649	3.515	0	18.81	4.195	0.863	0	0.24	0.00	64	10.44	4.52
3/5/2012 0:00	2	12.48	21.4	-5.5	7.267	54	12	30.84	903.7691	2.726	0	19.01	6.202	0.868	0	0.23	0.00	65	10.04	5.74
3/6/2012 0:00	3	12.52	24.5	-4.5	10.17	65	10	29.63	904.8278	4.013	0	18.94	8.23	0.882	0	0.55	0.01	66	9.99	7.33
3/7/2012 0:00	4	12.6	25.9	3	15.05	77	21	48.72	896.7238	7.052	0	18.67	13.8	0.807	0	1.31	0.01	67	10.57	8.92
3/8/2012 0:00	5	12.6	27.5	9.1	16.97	91	16	57.55	893.5663	6.855	0	17.91	16.08	0.774	0	1.23	0.01	68	10.41	9.19
3/9/2012 0:00	6	12.54	17.1	0.1	5.094	93	38	69.49	906.3098	11.08	0	7.831	7.826	0.891	0	-0.06	0.00	69	6.14	6.78
3/10/2012 0:00	7	12.48	9.9	-0.4	4.849	91	23	51.23	913.684	4.844	2.032	10.41	5.278	0.967	2.032	0.02	0.00	70	7.31	3.77
3/11/2012 0:00	8	12.4	6.4	1.7	3.688	95	44	87.1	906.0081	2.715	3.302	3.844	4.029	0.889	3.302	0.04	0.00	71	4.28	1.77
3/12/2012 0:00	9	12.31	22.5	0.8	9.83	96	20	64.78	897.0297	5.3	0	21.45	9	0.802	0	0.50	0.00	72	12.25	7.48
3/13/2012 0:00	10	12.64	27.4	2.5	13.46	73	6	36.49	899.3497	4.309	0	22.64	11.57	0.825	0	0.43	0.00	73	11.77	8.80
3/14/2012 0:00	11	12.63	29.8	0.1	14.33	76	10	37.5	901.1927	3.122	0	20.24	11.9	0.843	0	0.35	0.00	74	11.10	7.80
3/15/2012 0:00	12	12.69	26.7	10.7	18.42	96	33	71.54	900.5008	4.336	0	14.52	17.14	0.85	0	1.76	0.02	75	9.75	5.97
3/16/2012 0:00	13	12.65	30.7	7.5	18.41	97	4	55.78	901.3169	3.396	0	22.4	18.06	0.858	0	1.73	0.02	76	12.21	8.32
3/17/2012 0:00	14	12.64	30.3	6.9	17.53	97	25	75.38	899.4771	5.022	0	19.47	17.19	0.839	0	1.70	0.02	77	12.04	8.38
3/18/2012 0:00	15	12.65	30.8	13	19.4	97	7	64.55	896.465	5.729	0	19.54	18.72	0.808	0	1.67	0.02	78	11.62	9.96
3/19/2012 0:00	16	12.66	28.9	15	20.37	91	12	61.34	892.7411	7.154	0	15.86	18.97	0.77	0	1.67	0.02	79	10.20	9.61
3/20/2012 0:00	17	12.6	18.6	5	9.54	95	55	76.63	890.908	5.017	8.89	13.67	10.62	0.741	8.89	0.64	0.01	80	9.59	4.27
3/21/2012 0:00	18	12.52	13.2	-2.8	4.906	93	25	68.87	891.2927	2.697	0.508	15.25	5.924	0.738	0.508	-0.05	0.00	81	10.02	3.87
3/22/2012 0:00	19	12.52	8	2.1	5.086	92	74	87.5	894.3697	5.567	3.302	7.35	5.642	0.77	3.302	0.01	0.00	82	6.24	2.13
3/23/2012 0:00	20	12.47	14.9	3.5	8.4	94	48	75.67	895.953	4.435	0.254	16.8	8.74	0.79	0.254	0.40	0.00	83	11.22	4.32
3/24/2012 0:00	21	12.6	25.1	0	11.9	95	0	63.1	900.1238	2.064	0	22.22	11.94	0.842	0	1.34	0.01	84	12.42	6.51
3/25/2012 0:00	22	12.65	30.9	2.8	16.44	95	13	56.99	900.4913	2.554	0	23.26	15.25	0.846	0	1.37	0.01	85	13.61	7.73
3/26/2012 0:00	23	12.67	31.1	6.9	19.43	97	18	57.61	901.3456	4.122	0	22.67	17.58	0.858	0	1.70	0.02	86	13.83	8.64
3/27/2012 0:00	24	12.65	28.5	5.3	17.97	94	29	60.58	899.4636	5.299	0	18.37	15.92	0.839	0	1.72	0.02	87	12.04	7.81
3/28/2012 0:00	25	12.64	31.6	9.5	19.44	95	5	47.42	898.474	2.965	0	23.77	19.64	0.828	0	1.63	0.02	88	13.80	8.47
3/29/2012 0:00	26	12.62	32.2	5.1	19.41	80	11	44.54	898.4002	3.986	0	22.83	18.7	0.828	0	1.70	0.02	89	13.41	9.29
3/30/2012 0:00	27	12.62	33	6.5	19.25	95	3	47.01	895.4623	2.826	0	23.94	19.79	0.798	0	1.70	0.02	90	13.63	8.75
3/31/2012 0:00	28	12.61	29.5	4.9	17.01	80	20	50.52	895.0518	2.91	0	23.24	17.04	0.789	0	1.22	0.01	91	14.25	7.68
4/1/2012 0:00	29	12.62	33.9	7.1	19.34	96	7	51.15	895.6889	2.216	0	23.55	19.28	0.797	0	1.37	0.01	92	13.90	8.21
4/2/2012 0:00	30	12.62	34.1	7.7	20.11	45	4	20.69	890.5005	4.509	0	24.53	19.4	0.744	0	1.36	0.01	93	13.27	11.23
4/3/2012 0:00	31	12.64	28.8	9.9	18.24	72	8	26.59	887.7999	4.7	0	23.49	18	0.719	0	1.61	0.02	94	13.95	9.59
4/4/2012 0:00	32	12.6	21.1	5.3	12.54	74	21	38.52	894.9984	3.7	0	21.49	14.14	0.79	0	1.37	0.01	95	13.57	6.67
4/5/2012 0:00	33	12.55	20.4	-0.9	9.86	89	29	59.69	897.4837	4.099	0	22.46	11.63	0.813	0	1.14	0.01	96	14.40	6.44
4/6/2012 0:00	34	12.55	28.4	0.6	13.88	87	18	53.14	897.1395	2.575	0	24.55	13.92	0.809	0	1.09	0.01	97	15.13	7.58

4/7/2012 0:00	35	12.63	29.5	10.1	18.23	91	31	64.46	898.6057	6.272	0	21.78	16.88	0.829	0	1.59	0.02	98	14.54	9.33
4/8/2012 0:00	36	12.65	19.2	11.9	15.96	88	30	57.57	904.5358	6.54	0	14.94	15.93	0.884	0	1.04	0.01	99	10.68	6.31
4/9/2012 0:00	37	12.6	24.7	8.1	15.34	69	37	54.12	909.3079	2.807	0	18.37	17.09	0.936	0	1.38	0.01	100	12.55	5.93
4/10/2012 0:00	38	12.62	29.8	7.2	18.13	94	22	61.27	904.4726	3.584	6.858	21.18	17.1	0.886	6.858	1.31	0.01	101	13.94	7.89
4/11/2012 0:00	39	12.62	28.2	8.3	18.26	96	31	65.91	903.2402	2.47	0	20.2	16.65	0.872	0	1.17	0.01	102	13.76	6.40
4/12/2012 0:00	40	12.63	28.2	10.1	19.38	94	33	62.69	901.9085	4.448	0	18.93	17.18	0.859	0	1.22	0.01	103	13.16	7.25
4/13/2012 0:00	41	12.63	29.5	10.9	19.07	95	11	59.42	896.9891	4.907	0	15.62	17.38	0.807	0	1.04	0.01	104	10.87	8.45
4/14/2012 0:00	42	12.64	28.8	7.8	19.98	83	7	41.73	895.9373	3.703	0	20.39	18.39	0.796	0	1.01	0.01	105	13.01	8.16
4/15/2012 0:00	43	12.67	32.2	14.5	23.52	84	4	47.95	889.6072	8.78	0	18.51	21.42	0.732	0	1.07	0.01	106	12.18	12.99
4/16/2012 0:00	44	12.59	21.6	3.5	12.86	70	14	30.84	894.6302	6.211	0	22.46	13.65	0.772	0	-0.05	0.00	107	14.31	8.83
4/17/2012 0:00	45	12.56	21.8	3.7	11.86	86	27	57.99	904.4485	3.283	0.508	19.92	12.47	0.88	0.508	0.73	0.01	108	13.48	6.15
4/18/2012 0:00	46	12.53	26.5	2.2	14.61	96	19	58.21	906.0062	3.538	0	23.18	13.81	0.902	0	1.35	0.01	109	15.10	7.76
4/19/2012 0:00	47	12.63	32.5	10.8	20.31	65	9	36.92	900.111	6.301	0	23.15	19.58	0.851	0	2.26	0.02	110	14.45	12.32
4/20/2012 0:00	48	12.65	30.4	11	19.67	84	11	45.39	895.469	4.581	1.27	14.79	19.16	0.797	1.27	1.59	0.02	111	10.54	8.46
4/21/2012 0:00	49	12.6	23	8.4	14.81	89	28	59.3	902.0905	4.909	0	22.69	15.94	0.862	0	1.34	0.01	112	15.29	7.60
4/22/2012 0:00	50	12.57	30.1	2.9	16.31	83	17	47.72	902.6226	2.533	0	23.96	16.63	0.866	0	1.20	0.01	113	15.47	7.97
4/23/2012 0:00	51	12.62	27.6	8.2	18.49	81	27	47.85	905.7714	3.295	0	23.57	18.44	0.898	0	1.18	0.01	114	15.77	7.69
4/24/2012 0:00	52	12.62	26.3	7.9	16.04	84	22	48.56	906.3484	3.388	1.016	21.2	16.26	0.904	1.016	1.20	0.01	115	14.33	7.39
4/25/2012 0:00	53	12.59	36	5.3	21.3	80	11	36.96	898.9221	3.419	0	24.22	19.87	0.829	0	1.27	0.01	116	15.36	10.17
4/26/2012 0:00	54	12.68	40.4	13.9	27.47	59	2	21.63	894.9696	3.918	0	24.56	25.13	0.79	0	1.40	0.01	117	14.61	11.86
4/27/2012 0:00	55	12.67	34.9	14.6	24.27	72	18	43.5	896.1763	4.49	0	17.11	23.74	0.801	0	1.27	0.01	118	12.11	9.33
4/28/2012 0:00	56	12.64	31.9	11	22.06	91	10	36.25	893.0337	6.077	0	24.85	21.66	0.767	0	1.07	0.01	119	16.13	11.38
4/29/2012 0:00	57	12.64	28.4	11.3	19.81	63	24	36.69	895.8897	4.717	0	24.57	20.53	0.792	0	0.66	0.01	120	16.26	9.34
4/30/2012 0:00	58	12.62	26.8	12.3	19.41	90	49	66.13	898.6121	5.002	0	17.55	20.53	0.819	0	0.59	0.01	121	13.06	6.52
5/1/2012 0:00	59	12.63	31.4	14.4	21.4	94	30	70.24	898.675	5.176	1.016	18.47	20.67	0.821	1.016	0.72	0.01	122	13.46	8.52
5/2/2012 0:00	60	12.67	36.6	14.1	24.79	85	5	41.05	894.6215	5.206	0	25.68	23.88	0.779	0	0.65	0.01	123	16.35	12.41
5/3/2012 0:00	61	12.67	37.3	18	26.35	91	7	42.99	895.45	5.736	0	25.59	25.51	0.787	0	0.61	0.01	124	16.89	12.84
5/4/2012 0:00	62	12.64	37.5	9.8	24.47	80	3	21.57	898.1796	3.885	0	24.98	23.2	0.811	0	0.23	0.00	125	15.53	11.27
5/5/2012 0:00	63	12.66	37.5	12.6	26.16	50	1	15.42	898.5967	4.486	0	26.33	25.2	0.816	0	0.30	0.00	126	15.50	12.25
5/6/2012 0:00	64	12.64	38.1	12.2	25.38	67	4	16.63	896.7755	4.818	0	25.09	24.51	0.796	0	0.16	0.00	127	15.59	12.55
5/7/2012 0:00	65	12.65	29	11.3	20.33	72	19	38.28	899.0555	5.284	0	24.78	22	0.816	0	-0.17	0.00	128	16.52	10.03
5/8/2012 0:00	66	12.62	23.3	13.4	16.97	84	44	64.25	903.5936	6.522	0	16.36	19.91	0.861	0	-0.29	0.00	129	12.29	6.91
5/9/2012 0:00	67	12.62	20.5	9	14.99	63	31	45.74	905.3394	4.694	0	11.05	17.22	0.887	0	0.53	0.01	130	8.90	5.72
5/10/2012 0:00	68	12.51	27.2	4.9	16.1	76	20	44.02	903.0397	1.926	0	25.94	17.82	0.873	0	1.47	0.01	131	17.17	7.39
5/11/2012 0:00	69	12.66	20.8	8.3	13.57	94	52	74.24	898.4091	2.427	1.778	8.52	13.98	0.823	1.778	1.19	0.01	132	7.50	3.29
5/12/2012 0:00	70	12.54	19.7	11.6	14.05	96	64	89.6	899.5978	4.721	4.826	12.41	15.03	0.834	4.826	1.08	0.01	133	10.00	4.05
5/13/2012 0:00	71	12.53	22.1	9	14.96	95	44	72.15	907.4716	3.892	0	17.97	16.12	0.917	0	1.35	0.01	134	13.30	5.69
5/14/2012 0:00	72	12.69	22.2	8.4	15.03	94	47	76.22	908.4774	2.227	3.048	13.16	15.53	0.927	3.048	1.33	0.01	135	10.38	4.22
5/15/2012 0:00	73	12.54	15.9	10.3	13.36	96	85	91.2	906.4156	2.552	5.08	5.481	13.41	0.903	5.08	1.03	0.01	136	5.57	1.78
5/16/2012 0:00	74	12.43	27.9	6.7	16.96	96	24	61.93	905.4117	1.804	0	25.83	16.61	0.894	0	1.15	0.01	137	17.63	7.25
5/17/2012 0:00	75	12.71	31.3	9.9	20.54	86	15	47.43	903.699	2.192	0	26.83	19.83	0.879	0	1.40	0.01	138	17.84	8.50
5/18/2012 0:00	76	12.66	32.6	9.4	21.61	81	12	39.61	899.6431	4.961	0	25.89	18.36	0.837	0	1.33	0.01	139	17.07	11.06
5/19/2012 0:00	77	12.69	36.1	15	24.92	74	15	41.44	894.326	6.844	0	25.04	20.77	0.784	0	1.46	0.01	140	16.91	13.43
5/20/2012 0:00	78	12.68	35.8	14.9	25.91	82	6	38.2	895.9857	4.125	0	26.2	24.19	0.798	0	1.16	0.01	141	17.14	11.12
5/21/2012 0:00	79	12.67	25.4	15.1	19.41	81	47	64.32	904.9697	5.289	0	16.38	20.63	0.886	0	0.80	0.01	142	12.52	6.65
5/22/2012 0:00	80	12.62	28.9	13.2	19.92	95	37	70.71	907.3206	3.295	0	18.12	20.09	0.911	0	0.91	0.01	143	13.59	6.67
5/23/2012 0:00	81	12.65	33.7	14.3	23.66	94	21	56.77	899.6397	5.01	6.858	22.58	22.25	0.839	6.858	1.54	0.02	144	16.03	10.10
5/24/2012 0:00	82	12.66	40.3	15.8	27.68	83	2	33.02	888.1952	5.34	0	26.94	25.76	0.728	0	2.11	0.02	145	17.22	13.94
5/25/2012 0:00	83	12.67	35.1	16.5	25.07	64	12	28.27	888.2708	3.858	0	25.7	25.24	0.728	0	2.03	0.02	146	17.07	10.76
5/26/2012 0:00	84	12.66	39.4	14.3	27.82	70	7	32.44	893.2059	5.012	0	24.66	25.87	0.775	0	1.70	0.02	147	16.14	12.67
5/27/2012 0:00	85	12.68	35	20.2	27.39	76	27	50.28	897.0547	8.2	0	24.28	25.48	0.817	0	1.97	0.02	148	17.42	12.88
5/28/2012 0:00	86	12.67	37.6	20.8	27.83	74	7	40.95	895.1582	7.523	0	26.57	26.61	0.795	0	1.71	0.02	149	17.74	15.25
5/29/2012 0:00	87	12.66	36.2	13.1	25.54	85	4	31.74	897.6166	3.349	0	28.29	26.45	0.818	0	1.50	0.02	150	18.19	10.90
5/30/2012 0:00	88	12.63	37.5	12.5	25.62	93	2	41.66	897.931	2.78	0	27.27	25.94	0.819	0	1.28	0.01	151	17.55	10.45
5/31/2012 0:00	89	12.63	39.2	12.8	25.95	80	2	28.25	894.6931	4.06	0	27.42	23.73	0.785	0	1.18	0.01	152	17.33	12.46
6/1/2012 0:00	90	12.65	28.5	15.3	21.71	89	37	55.69	899.8054	4.923	0	25.89	22.61	0.835	0	0.97	0.01	153	18.57	8.96
6/2/2012 0:00	91	12.62	34.1	15.1	23.44	69	27	46.93	900.771	5.771	0.254	24.31	23.11	0.846	0.254	1.08	0.01	154	17.12	11.33
6/3/2012 0:00	92	12.66	37.1	20.1	27.18	74	16	43.6	898.5797	4.792	0.762	21.77	25.95	0.822	0.762	0.92	0.01	155	15.47	11.11
6/4/2012 0:00	93	12.65	39.9	19.7	29.05	70	11	36.75	897.045	5.516	0.254	23.82	27.12	0.805	0.254	0.78	0.01	156	16.32	13.09
6/5/2012 0:00	94	12.66	35.9	16.9	25.35	90	26	54.46	898.9829	3.79	2.54	17.48	26.4	0.822	2.54	0.51	0.01	157	13.23	8.47
6/6/2012 0:00	95	12.59	28.3	16.7	21.2	92	38	70.16	899.9282	2.665	3.048	18.11	22.87	0.83	3.048	0.34	0.00	158	13.75	6.30
6/7/2012 0:00	96	12.59	27.6	15.3	20.45	97	50	81.8	899.0278	3.166	17.02	17.08	21	0.819	17.02	0.16	0.00	159	13.25	5.78
6/8/2012 0:00	97	12.63	22.8	17.7	19.49	97	79	90.6	902.6392	4.386	0	8.36	19.96	0.853	0	-0.12	0.00	160	7.51	2.99
6/9/2012 0:00	98	12.54	21.2	16.6	18.4	97	79	89.7	903.1008	3.361	0	7.28	19.11	0.858	0	-0.09	0.00	161	6.77	2.57
6/10/2012 0:00	99	12.47	34.9	16.4	24.31	95	23	66.99	895.8226	5.459	0	24.34	23.48	0.786	0	0.13	0.00	162	17.45	10.99
6/11/2012 0:00	100	12.68	39.8	18.3	28.56	84	4	37.12	894.4637	4.485	0	28.32	27.2	0.77	0	-0.08	0.00	163	18.59	12.94
6/12/2012 0:00	101	12.69	34.1	15	24.54	78	25	44.69	901.3359	4.502	0	26.01	25.15	0.835	0	-0.59	-0.01	164	18.24	10.48
6/13/2012 0:00	102	12.68	30.6	19.2	24.25	71	34	53.68	902.9796	6.256	0	23.59	24.76	0.879	0	2.13	0.02	165	17.06	10.30
6/14/2012 0:00	0	12.85	32.7	22.8	28.22	72	40	51.6	898.5464	6.059	0	20.616	28.68	0.793	0	-1.95	-0.02	166	15.57	9.50
6/15/2012 0:00	1	12.7	37.4	15.5	25.89	93	26	60.95	896.6786	6.003	8.13	20.62	25.6	0.811	8.13	1.76	0.02	167	15.24	11.09
6/16/2012 0:00	2	12.65	32.9	15.8	23.63	96	33	65.72	899.4941	5.375	17.27	26.09	24.17	0.836	17.27	1.39	0.01	168	18.90	10.21

6/17/2012 0:00	3	12.64	32.8	16.6	23.98	93	39	65.23	902.5294	3.897	10.67	24.48	23.84	0.866	10.67	1.29	0.01	169	18.07	8.77
6/18/2012 0:00	4	12.67	33.6	18	25.32	89	28	59.37	900.5809	4.441	0	27.91	25.65	0.85	0	1.68	0.02	170	19.90	10.43
6/19/2012 0:00	5	12.69	37.7	19.5	28.08	78	22	50.61	893.0574	6.639	0	28.36	27.12	0.77	0	1.35	0.01	171	19.89	13.58
6/20/2012 0:00	6	12.69	35	19.2	27.2	81	35	56.47	893.7401	7.455	0	27.92	27.23	0.775	0	1.15	0.01	172	20.23	12.40
6/21/2012 0:00	7	12.69	34.4	21.6	27.03	81	33	57.5	896.6987	6.693	0	26.69	27.66	0.803	0	0.94	0.01	173	19.47	11.78
6/22/2012 0:00	8	12.68	32	19.3	24.68	92	46	70.58	903.8239	2.976	0.508	21.21	28.49	0.873	0.508	0.67	0.01	174	16.18	7.30
6/23/2012 0:00	9	12.67	34.6	18.6	25.96	95	33	63.78	902.6024	3.941	0	27.56	27.68	0.862	0	0.82	0.01	175	20.09	9.94
6/24/2012 0:00	10	12.68	35.6	18.3	27.06	79	22	47.56	900.3881	3.909	0	28.9	28.18	0.838	0	0.67	0.01	176	20.09	10.93
6/25/2012 0:00	11	12.66	37	15.5	26.81	82	18	45.44	902.7186	2.419	0	29.07	28.93	0.86	0	0.50	0.00	177	19.85	10.04
6/26/2012 0:00	12	12.67	39.7	17.6	28.13	74	9	39.32	902.5506	1.963	0	29.32	30.89	0.857	0	0.37	0.00	178	19.28	10.36
6/27/2012 0:00	13	12.67	40.6	16.8	29.62	71	11	34.43	900.1	2.617	0	28.62	31.13	0.831	0	0.27	0.00	179	18.93	10.91
6/28/2012 0:00	14	12.68	40.9	17.4	29.89	68	13	34.23	899.755	2.871	0	27.8	31.47	0.836	0	1.12	0.01	180	18.60	11.06
6/29/2012 0:00	15	12.68	39.3	18.2	29.79	75	17	38.51	901.3157	3.583	0	27.74	31.35	0.856	0	1.53	0.02	181	19.05	11.24
6/30/2012 0:00	16	12.67	38.4	18	28.9	70	20	39.15	899.8621	3.813	0	27.09	30.31	0.842	0	1.61	0.02	182	18.72	11.13
7/1/2012 0:00	17	12.68	37.5	19.1	28.61	67	23	38.4	898.2352	3.235	0	26.91	30.89	0.824	0	1.47	0.01	183	18.76	10.40
7/2/2012 0:00	18	12.68	34.7	19.9	27.05	75	26	47.98	900.0417	3.512	0	25.57	30.01	0.842	0	1.43	0.01	184	18.20	9.76
7/3/2012 0:00	19	12.67	33.2	17.9	25.95	84	35	55.79	901.2101	4.865	0	26.71	28.08	0.854	0	1.44	0.01	185	19.29	10.09
7/4/2012 0:00	20	12.68	33.9	20.1	27	76	36	54.88	900.2996	5.032	0	22.76	28.61	0.845	0	1.46	0.01	186	16.79	9.65
7/5/2012 0:00	21	12.68	35.6	20.8	27.64	69	34	50.95	899.6322	5.202	0	24.63	29.08	0.837	0	1.35	0.01	187	17.91	10.76
7/6/2012 0:00	22	12.67	35.2	18.6	26.47	79	30	53.67	901.3268	4.732	0	26.24	27.97	0.853	0	1.22	0.01	188	18.79	10.66
7/7/2012 0:00	23	12.66	35.6	15	25.69	89	25	51.86	903.4026	3.082	0	26.41	27.79	0.873	0	1.10	0.01	189	18.62	9.58
7/8/2012 0:00	24	12.67	36.8	17.3	27.77	74	23	41.83	904.3744	1.836	0	24.03	31.51	0.88	0	0.81	0.01	190	16.98	8.47
7/9/2012 0:00	25	12.67	37.2	17.8	26.66	74	23	48.82	903.9756	2.919	0	24.16	30.38	0.875	0	0.72	0.01	191	17.08	9.57
7/10/2012 0:00	26	12.68	31	19.7	23.92	84	41	65.63	905.1582	3.754	0	17.8	26.18	0.887	0	0.71	0.01	192	13.65	7.19
7/11/2012 0:00	27	12.41	25.8	19.6	21.77	97	70	86.1	905.1209	3.494	19.05	12.05	22.38	0.884	19.05	0.45	0.00	193	10.04	4.08
7/12/2012 0:00	28	12.32	31.5	18.3	24.12	94	38	68.23	905.0314	2.044	0	24.43	25.5	0.885	0	0.64	0.01	194	17.96	7.57
7/13/2012 0:00	29	12.38	35.2	16	25.45	94	22	54.75	903.9907	1.402	0	27.39	28.63	0.873	0	0.50	0.01	195	19.14	8.47
7/14/2012 0:00	30	12.44	36.2	17.1	26.82	86	24	47.73	904.1021	1.789	0	26.92	29.35	0.874	0	0.49	0.00	196	18.91	8.83
7/15/2012 0:00	31	12.44	35.4	17.5	26.88	80	22	46.62	904.3846	2.195	0	23.52	28.96	0.876	0	0.40	0.00	197	16.62	8.44
7/16/2012 0:00	32	12.42	34	16	25.57	82	27	51.58	903.8239	2.224	0	22.09	28.04	0.87	0	0.37	0.00	198	15.87	7.84
7/17/2012 0:00	33	12.39	34	16.8	23.66	87	28	61.53	901.4143	3.284	0	19.57	25.17	0.844	0	0.23	0.00	199	14.42	8.16
7/18/2012 0:00	34	12.37	34.1	19.6	25.94	76	27	53.8	900.8248	3.267	0	25.15	26.54	0.837	0	0.13	0.00	200	17.82	9.36
7/19/2012 0:00	35	12.46	34.9	17.9	26.48	83	24	51.94	903.377	2.878	0	27.13	28.29	0.862	0	0.03	0.00	201	18.93	9.51
7/20/2012 0:00	36	12.44	35.5	17.6	26.96	81	25	48.07	906.3085	2.497	0	27.5	29.59	0.891	0	-0.06	0.00	202	19.16	9.36
7/21/2012 0:00	37	12.44	36.2	19.9	27.16	69	25	48.13	906.9241	2.221	0	26.36	29.74	0.896	0	-0.19	0.00	203	18.37	9.23
7/22/2012 0:00	38	12.44	37.7	19.2	27.45	73	22	46.56	905.4042	1.822	0	22.38	29.73	0.879	0	-0.34	0.00	204	15.87	8.35
7/23/2012 0:00	39	12.41	37.8	18.1	28.29	77	20	45.22	903.0533	1.781	0	26.57	31.64	0.868	0	0.96	0.01	205	18.28	9.05
7/24/2012 0:00	40	12.46	36.8	17.1	27.97	92	23	45.61	902.5391	2.944	6.096	20.56	30.07	0.869	6.096	1.58	0.02	206	14.92	8.43
7/25/2012 0:00	41	12.41	34.2	19.8	26.11	91	32	59.66	901.6348	3.432	2.032	19.66	23.75	0.859	2.032	1.50	0.02	207	14.69	7.98
7/26/2012 0:00	42	12.46	37.1	22.1	28.8	67	26	45.95	897.9694	4.016	0	22.37	26.44	0.822	0	1.54	0.02	208	16.02	10.02
7/27/2012 0:00	43	12.44	33.4	19.8	26.01	86	35	62.67	899.8331	2.805	0	22.18	28.05	0.837	0	1.14	0.01	209	16.28	7.93
7/28/2012 0:00	44	12.43	33.7	16.7	25.85	93	29	60.75	903.9129	2.15	0	24.49	28.09	0.878	0	1.08	0.01	210	17.44	8.03
7/29/2012 0:00	45	12.44	34.3	17.5	26.52	90	31	58.46	905.6066	2.628	0	23.37	27.98	0.901	0	1.65	0.02	211	16.83	8.18
7/30/2012 0:00	46	12.41	36.5	16.3	26.93	75	22	44.68	904.2911	2.8	0	27.38	27.09	0.888	0	1.69	0.02	212	18.56	9.78
7/31/2012 0:00	47	12.42	38.3	16.2	27.74	75	17	39.58	902.4398	2.187	0	27.3	29.37	0.867	0	1.48	0.01	213	18.19	9.62
8/1/2012 0:00	48	12.46	38.8	19.7	28.53	59	15	37.34	902.3464	2.238	0	26.51	30.2	0.866	0	1.48	0.01	214	17.42	9.83
8/2/2012 0:00	49	12.47	39.4	20.7	29.69	56	17	35.22	900.9538	2.694	0	26.83	30.37	0.851	0	1.40	0.01	215	17.71	10.38
8/3/2012 0:00	50	12.46	41.1	19.3	30.13	58	17	33.81	897.9599	2.871	0	24.39	30.4	0.82	0	1.35	0.01	216	16.34	10.32
8/4/2012 0:00	51	12.48	39	22.1	30.71	52	15	30.73	897.2238	3.656	0	26.78	31.15	0.813	0	1.40	0.01	217	17.43	11.24
8/5/2012 0:00	52	12.46	38.9	21	29.92	63	16	37.47	900.1682	3.299	0	26.73	30.71	0.839	0	1.00	0.01	218	17.70	10.76
8/6/2012 0:00	53	12.45	35.4	19.2	26.94	72	31	50.85	906.5956	3.622	0	25.12	29.44	0.912	0	1.74	0.02	219	17.60	9.60
8/7/2012 0:00	54	12.42	38	17.3	28.38	84	21	44.88	905.1659	1.932	0	26.25	30.32	0.895	0	1.50	0.02	220	17.92	8.97
8/8/2012 0:00	55	12.48	38.1	21.5	30.06	61	21	39.09	902.105	2.61	0	19.57	31.67	0.862	0	1.32	0.01	221	13.79	8.49
8/9/2012 0:00	56	12.41	33.7	18.9	25.63	88	32	60.76	904.0579	2.684	0.762	15.21	27.58	0.88	0.762	1.13	0.01	222	11.60	6.53
8/10/2012 0:00	57	12.33	38.7	16.5	27.58	85	15	46.32	903.3714	2.018	0	26.39	29.24	0.874	0	1.23	0.01	223	17.48	9.29
8/11/2012 0:00	58	12.46	34.5	16.8	25.3	71	26	46.19	903.97	2.291	0	25.21	27.58	0.879	0	1.12	0.01	224	17.10	8.56
8/12/2012 0:00	59	12.44	37.8	17.2	27.27	59	20	36.64	901.7842	3.558	0	25	27.69	0.858	0	1.25	0.01	225	16.49	10.40
8/13/2012 0:00	60	12.49	37.2	22.5	29.5	51	19	32.83	901.3748	3.555	0	21.26	30.36	0.851	0	0.97	0.01	226	14.35	9.75
8/14/2012 0:00	61	12.43	35.7	17.4	26.98	68	17	36.54	904.8882	2.247	0	25	29.23	0.886	0	0.89	0.01	227	16.38	8.79
8/15/2012 0:00	62	12.42	36.9	16.8	26.34	85	26	48.75	900.6512	3.075	0.254	19.79	27.23	0.842	0.254	0.81	0.01	228	14.08	8.38
8/16/2012 0:00	63	12.4	35.8	18.8	27.27	94	31	57.25	898.5911	3.408	0	24.44	29.17	0.821	0	0.81	0.01	229	17.33	8.99
8/17/2012 0:00	64	12.44	32.6	18.4	25.3	93	39	63.89	902.6014	2.589	1.27	18.1	26.85	0.86	1.27	0.62	0.01	230	13.43	6.55
8/18/2012 0:00	65	12.41	28.1	17.4	22.7	95	49	67.84	902.8742	2.147	4.572	13.61	23.61	0.874	4.572	1.74	0.02	231	10.60	4.71
8/19/2012 0:00	66	12.37	34.5	19.6	24.9	91	35	68.8	899.9714	2.675	0	19.84	26.37	0.842	0	1.50	0.01	232	14.48	7.41
8/20/2012 0:00	67	12.43	32	16.9	23.85	96	31	64.61	902.512	2.032	0	19.42	26.57	0.866	0	1.31	0.01	233	13.91	6.59
8/21/2012 0:00	68	12.37	32.8	14.3	22.73	94	36	56.75	902.7454	3.129	6.096	16.83	24.86	0.867	6.096	1.17	0.01	234	12.35	6.76
8/22/2012 0:00	69	12.36	26.6	16.8	19.64	95	59	85.3	903.8502	3.817	0.762	13.72	20.69	0.877	0.762	1.04	0.01	235	10.67	4.86
8/23/2012 0:00	70	12.32	29.1	16	21.08	97	52	79.24	903.7766	2.992	0	14.14	21.77	0.877	0	1.12	0.01	236	10.89	5.10
8/24/2012 0:00	71	12.27	28.8	19.5	23.47	86	54	71.87	901.088	4.258	0	11.72	22.57	0.849	0	1.06	0.01	237	9.37	5.21
8/25/2012 0:00	72	12.19	33.4	18.8	25.13	94	36	67.3	897.8414	4.243	1.016	23.63	23.99	0.815	1.016	0.97	0.01	238	16.67	8.73
8/26/2012 0:00	73	12.4	35.6	19.2	25.93	92	26	62.94	896.8182	3.529	4.826	24.16	26.5	0.802	4.826	0.71	0.01	239	16.59	9.18

8/27/2012 0:00	74	12.46	31.8	17.7	24.22	97	43	74.24	903.3005	2.273	0	0	18.53	24.43	0.865	0	0.40	0.00	240	13.56	6.16	
8/28/2012 0:00	75	12.35	33.4	15.4	23.6	97	25	66.85	906.933	1.603	0	0	23.81	23.9	0.901	0	0.30	0.00	241	16.00	7.32	
8/29/2012 0:00	76	12.39	32.7	13.9	22.82	92	16	55.45	905.4467	2.339	0	0	24.18	22.97	0.897	0	1.42	0.01	242	15.52	8.01	
8/30/2012 0:00	77	12.35	32.5	10.7	21.35	80	14	46.39	902.8589	1.744	0	0	24.35	22.2	0.87	0	1.35	0.01	243	15.08	7.59	
8/31/2012 0:00	78	12.32	33.6	10.6	21.79	79	15	44.67	900.3458	1.399	0	0	23.21	22.64	0.847	0	1.62	0.02	244	14.49	7.24	
9/1/2012 0:00	79	12.35	34.7	11.5	22.77	75	15	41.62	901.9167	1.351	0	0	24.06	23.83	0.859	0	1.22	0.01	245	14.85	7.48	
9/2/2012 0:00	80	12.36	36.8	11.9	24.77	81	15	42.63	903.1652	1.814	0	0	23.4	25.31	0.872	0	1.24	0.01	246	14.59	8.03	
9/3/2012 0:00	81	12.41	36.3	16	26.17	82	25	50.22	901.8625	2.227	0	0	22.59	27	0.859	0	1.27	0.01	247	14.94	7.96	
9/4/2012 0:00	82	12.42	36.3	17	26.73	83	27	52.11	900.988	1.777	0	0	21.74	28.88	0.849	0	1.16	0.01	248	14.60	7.39	
9/5/2012 0:00	83	12.43	38.7	17	28.17	80	26	48.16	899.7339	2.155	0	0	21.32	29.81	0.836	0	1.14	0.01	249	14.32	7.95	
9/6/2012 0:00	84	12.47	38.2	18.5	27.4	95	28	53.93	899.4846	3.702	9.65	9.65	20.41	29.01	0.832	9.65	1.00	0.01	250	14.17	8.80	
9/7/2012 0:00	85	12.4	34.1	17.7	24.8	93	34	67.23	901.3992	2.24	0.254	0.254	22.53	24.25	0.851	0.254	0.94	0.01	251	15.39	7.36	
9/8/2012 0:00	86	12.42	36.7	17.2	24.33	90	26	59.85	901.0918	4.716	0	0	22.11	22.29	0.846	0	0.76	0.01	252	14.74	10.02	
9/9/2012 0:00	87	12.34	25.1	13.2	17.93	89	32	62.9	909.4008	2.449	0.254	0.254	13.98	18.91	0.929	0.254	0.58	0.01	253	9.95	5.00	
9/10/2012 0:00	88	12.27	30.3	11.7	19.93	90	16	52.31	907.8403	1.414	0	0	21.56	21.16	0.914	0	0.68	0.01	254	13.42	6.41	
9/11/2012 0:00	89	12.36	31.9	8.8	20.66	85	21	46	905.045	2.498	0	0	22.25	20.38	0.885	0	0.63	0.01	255	13.78	7.44	
9/12/2012 0:00	90	12.42	34.9	14.6	25.05	52	21	32.82	901.6724	4.005	0	0	21.66	23.9	0.852	0	0.76	0.01	256	13.16	9.30	
9/13/2012 0:00	91	12.37	29.5	13.3	20.86	88	34	58.83	902.2399	2.622	1.016	1.016	8.3	21.59	0.853	1.016	0.29	0.00	257	6.81	4.59	
9/14/2012 0:00	92	12.09	16	11.7	13.17	95	77	89.7	909.667	6.087	20.07	20.07	4.999	14.42	0.923	20.07	-0.29	0.00	258	4.95	2.27	
9/15/2012 0:00	93	11.98	17.3	10.4	13.39	92	55	78.16	911.8069	4.255	0	0	9.92	13.9	0.947	0	-0.07	0.00	259	7.68	3.53	
9/16/2012 0:00	94	11.83	19.8	11.7	15.19	96	64	85.4	908.6893	1.775	0	0	8.76	16.2	0.918	0	0.21	0.00	260	7.08	2.65	
9/17/2012 0:00	95	11.65	29.4	8.4	17.14	97	22	68.48	903.3944	1.509	0.254	0.254	21.92	18.7	0.865	0.254	0.31	0.00	261	13.42	6.16	
9/18/2012 0:00	96	11.87	30.1	7.3	18.8	97	25	62.61	900.1581	2.451	0	0	21.04	19.15	0.831	0	0.21	0.00	262	13.02	6.67	
9/19/2012 0:00	97	12.04	25.3	10.7	17.28	93	37	65.84	906.3624	2.762	3.302	3.302	21.12	18.94	0.894	3.302	0.18	0.00	263	13.42	5.92	
9/20/2012 0:00	98	12.17	32.2	10	20.25	96	26	62.4	903.9315	3.412	0	0	20.99	19.4	0.87	0	0.26	0.00	264	13.07	7.66	
9/21/2012 0:00	99	12.28	32.9	10.7	21.1	90	24	56.96	902.3742	3.1	0	0	20.94	20.5	0.854	0	0.25	0.00	265	12.86	7.63	
9/22/2012 0:00	100	12.37	33.9	11	22.15	87	19	50.06	902.1932	1.939	0	0	20.97	22.47	0.851	0	0.13	0.00	266	12.53	6.95	
9/23/2012 0:00	101	12.34	34.7	9.9	21.75	89	16	48.54	905.4155	1.782	0	0	20.09	21.83	0.882	0	-0.05	0.00	267	11.86	6.88	
9/24/2012 0:00	102	12.35	33.7	10	21.38	82	15	44.47	907.2984	2.574	0	0	20.32	20.71	0.902	0	0.03	0.00	268	11.74	7.52	
9/25/2012 0:00	103	12.38	31.8	13.6	22.2	77	24	48.76	903.5581	3.729	0	0	16.72	21.09	0.865	0	0.14	0.00	269	10.50	7.30	
9/26/2012 0:00	104	12.37	34.5	12.6	22.89	88	16	49.84	899.1361	2.62	0	0	18.67	22.73	0.819	0	0.05	0.00	270	11.13	7.30	
9/27/2012 0:00	105	12.35	31.4	11.8	20.37	96	37	67.8	901.707	2.608	34.8	34.8	15.34	21.01	0.871	34.8	2.63	0.03	271	10.25	5.65	
9/28/2012 0:00	106	12.28	20.1	13.9	17.06	97	74	90	905.8879	2.756	14.73	14.73	5.486	16.01	1.008	14.73	12.07	0.12	272	5.04	2.08	
9/29/2012 0:00	107	12.12	22.6	15.6	17.88	98	74	92.6	905.8928	2.016	1.016	1.016	7.523	18.4	1.011	1.016	12.36	0.12	273	6.20	2.37	
9/30/2012 0:00	108	11.95	20.3	13.8	16.6	97	78	91.4	904.9456	1.987	11.43	11.43	8.48	18.47	1.012	11.43	13.43	0.13	274	6.70	2.33	13.43
10/1/2012 0:00	109	11.74	26.2	13.3	18.04	97	44	79.03	902.8381	1.824	0	0	17.15	20.26	0.987	0	13.08	0.13	275	11.09	4.68	12.96
10/2/2012 0:00	110	11.88	23.5	11	16.92	91	47	72.29	903.4095	4.443	0	0	17.87	17.91	0.972	0	10.99	0.11	276	11.23	5.46	12.41
10/3/2012 0:00	111	11.96	24.2	7.4	15.25	94	38	70.24	903.8462	1.772	0	0	19.7	16.85	0.952	0	8.55	0.09	277	11.76	4.82	11.93
10/4/2012 0:00	112	12.14	27.3	8.7	17.84	95	38	67.57	899.8932	3.211	0	0	19.49	16.93	0.858	0	3.18	0.03	278	11.74	5.86	11.34
10/5/2012 0:00	113	12.27	17.8	7.8	13.39	92	50	69.37	906.224	4.764	0	0	14.26	12.59	0.877	0	-1.38	-0.01	279	9.15	4.23	10.92
10/6/2012 0:00	114	12.12	21.4	5.7	12.29	95	50	74.44	904.9235	2.5	0	0	18.75	12.81	0.882	0	0.45	0.00	280	11.32	4.36	10.49
10/7/2012 0:00	115	12.03	9.2	3.7	6.647	76	53	61.74	906.7734	4.08	0	0	5.798	7.211	0.898	0	0.16	0.00	281	5.04	2.50	10.23
10/8/2012 0:00	116	11.84	11.2	0.8	5.19	87	48	68.54	907.5667	1.826	0	0	10.98	6.838	0.909	0	0.45	0.00	282	7.34	2.48	9.99
10/9/2012 0:00	117	11.65	21.5	-1.3	9.26	92	37	67.02	902.6747	3.291	0	0	18.88	9.11	0.863	0	0.84	0.01	283	10.71	5.02	9.49
10/10/2012 0:00	118	11.96	31.2	7.6	18.28	92	11	51.47	898.2694	3.257	0	0	18.9	16.03	0.821	0	1.13	0.01	284	9.77	7.35	8.75
10/11/2012 0:00	119	11.95	14.6	7.8	11.06	90	56	72.64	905.6879	3.891	0	0	6.073	11.24	0.89	0	0.47	0.00	285	5.09	2.58	8.49
10/12/2012 0:00	120	11.79	27.6	9.1	18.02	93	53	78.25	903.4361	3.481	0	0	14.66	17.39	0.872	0	0.97	0.01	286	9.37	4.76	
10/13/2012 0:00	121	11.81	24.7	15.9	19.62	97	68	85.8	903.2109	3.885	24.64	24.64	7.697	19.01	0.909	24.64	4.90	0.05	287	6.00	2.98	
10/14/2012 0:00	122	11.76	23	11.7	19.05	97	24	64.11	898.4355	5.572	9.65	9.65	18.14	17.68	1.058	9.65	24.67	0.25	288	10.06	6.29	24.67
10/15/2012 0:00	123	12.19	26.8	9.2	15.89	88	26	59.55	905.4827	2.746	0	0	14.25	14.49	1.114	0	23.08	0.23	289	8.26	5.23	24.14
10/16/2012 0:00	124	12.42	25.4	8.1	15.82	88	26	60.29	902.9456	2.949	0	0	8.26	15.33	1.086	0	22.87	0.23	290	5.79	4.46	23.70
10/17/2012 0:00	125	12.54	28.9	10.8	18.37	91	21	56.54	893.076	2.725	0	0	15.63	16.12	0.978	0	22.13	0.22	291	8.62	5.67	23.13
10/18/2012 0:00	126	12.62	23.8	8.7	16.62	69	27	42.88	892.954	3.426	0	0	14.57	15.07	0.956	0	20.05	0.20	292	8.00	5.23	22.61
10/19/2012 0:00	127	12.55	20.9	3.3	11.56	82	21	50.77	900.9731	1.551	0	0	15.07	13.89	1.03	0	19.28	0.19	293	7.99	3.92	22.21
10/20/2012 0:00	128	12.52	24.6	3	13.3	87	25	55.71	900.4255	2.241	0	0	11.39	14.44	1.02	0	18.84	0.19	294	6.73	4.30	21.78
10/21/2012 0:00	129	12.55	31.4	4.5	17.38	91	9	47.73	893.9763	2.52	0	0	16.29	14.74	0.946	0	18.01	0.18	295	7.72	6.33	21.15
10/22/2012 0:00	130	12.58	30.3	10.2	19.32	78	17	45.63	894.7673	3.68	0	0	15.7	15.06	0.943	0	16.91	0.17	296	7.92	6.74	20.48
10/23/2012 0:00	131	12.62	28.8	13.6	21.29	91	21	48.79	897.2433	4.237	0	0	14.31	15.65	0.959	0	15.98	0.16	297	7.84	6.21	19.86
10/24/2012 0:00	132	12.6	29.8	12	20.34	96	26	65.93	897.7004	3.497	0	0	15.16	17.22	0.954	0	15.01	0.15	298	8.28	5.83	19.27
10/25/2012 0:00	133	12.59	28.5	12.4	20.62	97	50	76.4	895.9005	4.072	0	0	11.62	17.32	0.927	0	14.15	0.14	299	7.39	4.52	18.82
10/26/2012 0:00	134	12.55	19.7	4.9	11.45	95	48	71.61	901.4164	6.083	0	0	14.19	14.19	0.965	0	12.33	0.12	300	7.94	4.66	18.36
10/27/2012 0:00	135	12.45	11.4	-0.1	4.665	86	30	59.51	910.5412	4.955	0	0	14.57	8.64	1.042	0	10.72	0.11	301	7.53	3.94	17.96
10/28/2012 0:00	136	12.41	13.1	-5.7	3.449	93	31	60.32	907.9667	2.293	0	0	14.7	9.16	1.003	0	9.45	0.09	302	7.53	3.05	17.66
10/29/2012 0:00	137	12.43	16.3	-2.7	6.26	89	29	56.69	906.4667	2.252	0	0	12.92	9.51	0.972	0	7.88	0.08	303	6.80	3.29	17.33
10/30/2012 0:00	138	12.45	21.2	-1.6	9.38	85	32	56.14	905.0176	2.599	0	0	14.12	9.21	0.915	0	3.65	0.04	304	7.18	4.04	16.92
10/31/2012 0:00	139	12.49	27.1	0.9	12.06	90	21	57.21	902.149	1.021	0	0	14.22	9.92	0.849	0	-0.02	0.00	305	6.87	3.97	16.53
11/1/2012 0:00	140	12.5	26.9	3	14.29	81	18	48.73	903.3103	1.417	0	0	13.95	11.81	0.862	0	0.09	0.00	306	6.56	4.22	16.10
11/2/2012 0:00	141	12.53	27.5	6.3	15.57	73	18	46.81	902.389	2.561	0	0	13.81	12.48	0.854	0	0.23	0.00	307	6.42	5.19	15.58
11/3/2012 0:00	142	12.54	29	5.5	15.73	94	11	50.94	899.6615	2.427	0	0	13.83	13.18	0.826	0	0.22	0.00	308	6.23	5.38	15.05
11/4/2012 0:00	143	12.53	18.1	5	11.19	77	42	59.66	904.9002	3.182	0	0	11.41	10.51	0.874	0	-0.33	0.00	309	6.16	3.48	14.70
11/5/2012 0:00	144	12.44	22.8	1.9	11.28	86	34	62.2	905.6042	1.724	0	0	13.05	11.25	0.884	0	-0.04	0.00	310	6.55	3.52	14.35

11/6/2012 0:00	145	12.51	21.2	4.9	11.58	80	27	53.13	905.9742	3.378	0	13.04	10.93	0.887	0	-0.12	0.00	311	6.28	4.45	13.90
11/7/2012 0:00	146	12.47	27.1	3.9	13.4	72	17	45.91	905.9129	1.473	0	13.34	12.77	0.887	0	-0.06	0.00	312	5.86	4.27	13.47
11/8/2012 0:00	147	12.51	26.4	2.6	13.94	83	21	50.4	904.4775	2.391	0	13.23	12.89	0.874	0	0.10	0.00	313	6.01	4.64	13.01
11/9/2012 0:00	148	12.5	29.5	2.9	16.14	92	12	49.22	899.4129	2.532	0	12	14.05	0.822	0	0.07	0.00	314	5.35	5.26	12.48
11/10/2012 0:00	149	12.55	27.6	10.2	18.74	90	21	51.71	897.641	3.81	0	12.81	16.98	0.805	0	0.18	0.00	315	6.03	5.41	11.94
11/11/2012 0:00	150	12.55	27.2	11.7	18.86	89	21	59.88	894.3369	5.123	0	10.68	17.34	0.771	0	0.14	0.00	316	5.44	6.01	11.34
11/12/2012 0:00	151	12.51	14.8	-0.5	8.72	71	13	38.62	900.6498	4.626	0.254	12.75	9.36	0.823	0.254	-1.09	-0.01	317	5.42	4.45	10.90
11/13/2012 0:00	152	12.35	12.5	-6.3	1.665	85	20	52.97	912.6488	1.266	0	13.6	4.799	0.942	0	-1.43	-0.01	318	5.85	2.50	10.65
11/14/2012 0:00	153	12.37	14.3	-7.5	2.996	83	22	47.59	910.7431	2.601	0	13.15	3.991	0.925	0	-1.18	-0.01	319	5.69	3.24	
11/15/2012 0:00	154	12.4	18.3	-4.4	5.875	69	20	44.77	909.2359	2.357	0	13.21	6.66	0.913	0	-0.85	-0.01	320	5.42	3.69	
11/16/2012 0:00	155	12.46	18.5	-0.1	7.468	75	20	48.54	907.3663	2.389	0	12.06	7.685	0.893	0	-0.94	-0.01	321	5.16	3.63	
11/17/2012 0:00	156	12.43	18.2	-1.2	7.314	82	45	62.89	910.5463	2.766	0	10.84	7.949	0.927	0	-0.78	-0.01	322	5.38	3.02	
11/18/2012 0:00	157	12.48	18.2	1.7	9.98	91	51	70.48	908.2753	3.158	0	10.47	9.89	0.907	0	-0.47	0.00	323	5.38	2.86	
11/19/2012 0:00	158	12.48	19.2	5.3	12.08	92	50	72.39	904.6797	3.303	0	7.801	11.51	0.871	0	-0.40	0.00	324	4.60	2.80	
11/20/2012 0:00	159	12.46	22.3	4.8	11.77	96	20	66.78	905.5448	2.18	0	12.53	12.51	0.879	0	-0.48	0.00	325	5.24	3.72	
11/21/2012 0:00	160	12.5	23.3	1.1	10.66	79	19	51.96	908.1387	2.106	0	12.5	11.31	0.904	0	-0.63	-0.01	326	4.92	3.96	
11/22/2012 0:00	161	12.48	23.6	0	11.46	91	38	65.05	906.4229	3.323	0	9.22	10.33	0.886	0	-0.68	-0.01	327	4.75	3.84	
11/23/2012 0:00	162	12.51	24.8	7.4	15.05	95	18	58.06	902.7167	4.189	0	12.08	14.42	0.85	0	-0.50	-0.01	328	4.98	5.20	
11/24/2012 0:00	163	12.52	12.7	-1.9	6.63	68	24	44.95	915.0004	3.967	0	12.08	7.668	0.969	0	-1.13	-0.01	329	4.85	3.48	
11/25/2012 0:00	164	12.41	18.9	-2.5	6.399	63	23	44.37	907.4158	3.705	0	12.27	5.836	0.894	0	-0.89	-0.01	330	4.70	4.41	
11/26/2012 0:00	165	12.46	24.6	-2.2	9.43	82	12	46.63	897.4191	2.052	0	12.51	10.06	0.794	0	-0.70	-0.01	331	4.34	4.27	
11/27/2012 0:00	166	12.46	13.4	-0.2	6.085	63	41	50.79	903.6262	5.403	0	11.99	5.903	0.85	0	-1.43	-0.01	332	4.97	3.76	
11/28/2012 0:00	167	12.37	13.9	-7.3	2.134	86	32	59.8	911.2274	2.692	0	11.88	3.298	0.928	0	-1.38	-0.01	333	4.91	2.82	
11/29/2012 0:00	168	12.41	23.8	-2.1	9.16	79	14	47.98	906.2634	2.794	0	11.74	8.18	0.897	0	0.58	0.01	334	4.18	4.66	
11/30/2012 0:00	169	12.49	24.5	2.5	11.41	87	19	53.78	901.8391	2.708	0	11.38	10.79	0.854	0	0.79	0.01	335	4.38	4.35	
12/1/2012 0:00	170	12.47	24.8	1.4	11.55	67	17	40.9	900.0865	2.574	0	11.5	10.41	0.835	0	0.68	0.01	336	4.10	4.46	
12/2/2012 0:00	171	12.51	25.6	3.8	13.96	55	12	31.97	898.9847	3.466	0	10.54	11.43	0.823	0	0.61	0.01	337	3.66	5.35	
12/3/2012 0:00	172	12.44	25.9	0.5	11.63	59	11	35.38	900.2371	2.786	0	11.69	10.49	0.835	0	0.53	0.01	338	3.68	5.04	
12/4/2012 0:00	173	12.5	24.6	5.4	13.84	88	20	48.44	898.4487	3.868	0	11.01	13.05	0.817	0	0.55	0.01	339	4.29	4.88	
12/5/2012 0:00	174	12.78	17.3	-0.2	10.3	56	0	32.68	908.7385	2.73555208	0	9.222	13.35	-0.006	0	-0.18	-0.01	340	3.31	3.77	
12/6/2012 0:00	175	12.55	18	-2.1	6.601	73	23	44.38	904.8837	2.76	0	9.22	6.077	-0.009	0	-0.27	-0.01	341	3.92	3.44	
12/7/2012 0:00	176	12.53	21	0.8	10.87	79	27	47.81	895.7185	3.442	0	10.17	10.86	-0.006	0	-0.18	-0.01	342	4.15	3.92	
12/8/2012 0:00	177	12.52	15.7	-1.5	5.921	81	34	58.75	895.4734	2.297	0	8.31	7.322	-0.008	0	-0.24	-0.01	343	3.96	2.59	
12/9/2012 0:00	178	12.42	18.1	-1.6	7.068	95	30	64.19	894.7407	2.982	0	10.53	7.808	-0.007	0	-0.21	-0.01	344	4.31	3.23	
12/10/2012 0:00	179	12.5	9.1	-3	3.464	82	34	50.67	897.7711	7.45	0	10.58	4.595	-0.008	0	-0.24	-0.01	345	4.34	3.66	
12/11/2012 0:00	180	12.35	4	-12.8	-4.645	88	38	66.79	901.907	2.931	0	11.71	-1.052	-0.012	0	-0.37	-0.01	346	4.75	1.80	
12/12/2012 0:00	181	12.37	10.9	-10.7	-2.425	86	19	58.74	900.2169	1.589	0	11.65	-0.305	-0.012	0	-0.37	-0.01	347	4.25	2.24	
12/13/2012 0:00	182	12.36	17.6	-8.8	2.607	75	14	44.09	901.2538	3.893	0	11.59	1.849	-0.009	0	-0.27	-0.01	348	3.87	4.54	
12/14/2012 0:00	183	12.41	19.4	-8	5.871	79	21	45.48	901.7023	2.735	0	11.41	5.491	-0.007	0	-0.21	-0.01	349	4.05	3.67	
12/15/2012 0:00	184	12.54	18.3	6.9	10.6	95	53	77.9	895.1661	7.311	6.096	6.134	10.63	-0.002	6.096	-0.06	0.00	350	3.74	3.60	
12/16/2012 0:00	185	12.43	14.6	3.8	7.832	70	33	56.2	894.5445	6.403	0	9.14	5.755	-0.005	0	-0.15	-0.01	351	3.94	4.36	
12/17/2012 0:00	186	12.44	15	-0.2	7.345	87	34	58.77	893.5394	5.544	0	9.67	5.634	-0.005	0	-0.15	-0.01	352	4.12	3.72	
12/18/2012 0:00	187	12.43	15.9	-2.2	6.266	73	25	47.53	895.139	4.801	0	11.29	5.591	-0.006	0	-0.18	-0.01	353	4.08	4.12	
12/19/2012 0:00	188	12.5	19.2	-1.3	7.997	79	21	50.68	893.7156	3.058	0	11.34	7.453	-0.006	0	-0.18	-0.01	354	3.99	3.74	
12/20/2012 0:00	189	12.43	19.7	-1.8	8.28	69	22	45.57	890.5539	7.004	0	4.866	6.43	-0.005	0	-0.15	-0.01	355	3.24	6.04	
12/21/2012 0:00	0	12.74	9.8	-5.7	0.598	54	16	38	910.6612	1.527	0	5.231	2.447	-0.007	0	-0.21	-0.01	356	3.27	2.15	
12/22/2012 0:00	1	12.53	16.4	-6.8	2.399	54	5	31.92	908.6297	3.041	0	12.36	1.556	-0.009	0	-0.27	-0.01	357	3.41	4.15	
12/23/2012 0:00	2	12.51	15.6	-6	4.709	58	15	32.33	901.266	2.97	0	7.964	3.131	-0.008	0	-0.24	-0.01	358	3.48	3.48	
12/24/2012 0:00	3	12.43	20.4	-1.8	6.437	59	8	36.15	896.8395	3.807	0	9.53	4.681	-0.007	0	-0.21	-0.01	359	3.31	5.18	
12/25/2012 0:00	4	12.44	9.1	-5.3	2.231	65	36	47.43	895.5732	3.057	0	7.039	2.394	-0.009	0	-0.27	-0.01	360	3.68	2.29	
12/26/2012 0:00	5	12.34	0.5	-8.6	-5.109	78	55	69.77	897.4119	9.64	0	7.481	-2.385	-0.01	0	-0.30	-0.01	361	3.96	2.37	
12/27/2012 0:00	6	12.35	3.5	-10.6	-5.147	81	41	65.57	901.4758	4.16	0	10.43	-2.755	-0.012	0	-0.37	-0.01	362	4.48	2.01	
12/28/2012 0:00	7	12.36	8.6	-10.2	-1.779	83	34	62.48	892.947	2.369	0	5.659	-2.082	-0.012	0	-0.37	-0.01	363	3.51	1.93	
12/29/2012 0:00	8	12.36	4.3	-9.1	-3.942	86	41	66.78	899.2212	4.95	0	12.08	-1.46	-0.011	0	-0.34	-0.01	364	4.83	2.28	
12/30/2012 0:00	9	12.41	9.4	-10.3	-2.404	84	25	57.51	907.8703	2.289	0	12.27	-0.486	-0.011	0	-0.34	-0.01	365	4.57	2.33	
12/31/2012 0:00	10	12.39	4.7	-7.2	-0.458	66	36	49.77	903.3021	3.838	0	4.415	-1.345	-0.01	0	-0.30	-0.01	366	3.31	2.07	
1/1/2013 0:00	11	12.36	9.4	-2.6	2.554	96	48	85.5	897.8424	4.849	12.7	9.74	3.035	-0.007	12.7	-0.21	-0.01	1	4.46	2.40	
1/2/2013 0:00	12	12.54	3.1	-6	-2.581	90	60	81.7	903.951	4.578	0	12.01	0.297	-0.009	0	-0.27	-0.01	2	5.09	1.72	
1/3/2013 0:00	13	12.43	6.3	-6.5	-1.772	92	44	79.36	905.9189	2.829	0	11.98	-0.191	-0.01	0	-0.30	-0.01	3	4.93	1.88	
1/4/2013 0:00	14	12.42	4.7	-8.1	-2.857	91	37	74.91	910.4851	2.225	0	7.417	-1.359	-0.011	0	-0.34	-0.01	4	3.97	1.59	
1/5/2013 0:00	15	12.4	1.5	-4.8	-1.321	92	73	84	908.925	3.057	0	4.009	-1.068	-0.01	0	-0.30	-0.01	5	3.30	0.98	
1/6/2013 0:00	16	12.37	12.8	-3.8	2.025	92	22	65.09	904.9188	4.904	0	12.91	2.407	-0.007	0	-0.21	-0.01	6	4.75	3.87	
1/7/2013 0:00	17	12.57	10.9	-6.5	0.418	88	31	65.39	909.7661	2.346	0	13.06	2.791	-0.008	0	-0.24	-0.01	7	5.02	2.42	
1/8/2013 0:00	18	12.48	11.2	-6.8	0.797	87	35	64.76	903.0836	2.414	0	10.76	0.88	-0.009	0	-0.27	-0.01	8	4.67	2.33	
1/9/2013 0:00	19	12.45	12	-5.4	1.894	94	60	78.13	899.0347	2.223	0	10.11	2.002	-0.009	0	-0.27	-0.01	9	4.90	1.80	
1/10/2013 0:00	20	12.42	8.8	-2.3	3.063	96	54	81.5	904.3758	6.602	17.27	4.019	2.121	-0.008	17.27	-0.24	-0.01	10	3.35	2.30	
1/11/2013 0:00	21	12.39	10.9	3.1	5.48	96	75	91.2	896.9921	4.672	0.254	8.37	5.601	-0.006	0.254	-0.18	-0.01	11	4.63	1.74	
1/12/2013 0:00	22	12.41	17.5	1.5	7.782	93	35	72.99	891.6672	5.284	0	8.82	5.849	-0.005	0	-0.15	-0.01	12	4.43	3.98	
1/13/2013 0:00	23	12.4	3.3	-5.5	0.264	90	52	72.79	896.1444	5.833	0	8.5	1.702	-0.008	0	-0.24	-0.01	13	4.52	2.02	
1/14/2013 0:00	24	12.37	0.6	-8.3	-4.607	90	56	77.57	902.9082	3.974	0	13.43	-0.555	-0.01	0	-0.30	-0.01	14	5.89	1.65	
1/15/2013 0:00	25	12.36	-2.7	-8.5	-5.468	85	51	66.55	905.0292	3.476	0	7.742	-2.753	-0.011	0	-0.34	-0.01	15	4.41	1.31	

1/16/2013 0:00	26	12.35	1.4	-9.7	-4.645	89	52	71.86	904.5018	2.479	0		9.47	-2.323	-0.012		0	-0.37	-0.01	16	4.90	1.38
1/17/2013 0:00	27	12.36	11.2	-9.6	-0.406	89	42	68.86	905.381	3.864	0		10.12	-0.485	-0.011		0	-0.34	-0.01	17	4.99	2.67
1/18/2013 0:00	28	12.41	13.9	-3.9	2.671	88	31	65.25	912.3448	2.797	0		13.54	3.053	-0.008		0	-0.24	-0.01	18	5.63	3.03
1/19/2013 0:00	29	12.54	16	-4.6	3.975	91	30	64.37	908.6813	3.971	0		13.69	2.728	-0.008		0	-0.24	-0.01	19	5.71	3.82
1/20/2013 0:00	30	12.53	17.5	-4.4	4.683	89	18	58.37	903.731	3.29	0		14.27	4.662	-0.007		0	-0.21	-0.01	20	5.52	4.11
1/21/2013 0:00	31	12.51	18.6	-4.6	4.874	82	16	52.91	904.3746	2.741	0		14.31	4.999	-0.008		0	-0.24	-0.01	21	5.45	4.07
1/22/2013 0:00	32	12.51	9.1	-5.1	0.424	90	44	70.02	906.2873	3.496	0		13.98	3.536	-0.008		0	-0.24	-0.01	22	6.26	2.53
1/23/2013 0:00	33	12.41	18.7	-6.1	3.932	88	21	61.48	904.395	3.016	0		14.23	3.717	-0.008		0	-0.24	-0.01	23	5.79	4.15
1/24/2013 0:00	34	12.53	22.3	-4.3	6.126	90	16	54.42	904.5202	2.129	0		14.71	6.777	-0.007		0	-0.21	-0.01	24	5.73	4.25
1/25/2013 0:00	35	12.51	25.2	-3.9	9.31	68	9	39.45	903.0394	3.139	0		14.5	8.81	-0.006		0	-0.18	-0.01	25	5.16	5.76
1/26/2013 0:00	36	12.54	15.7	-1.9	7.826	91	31	55.34	903.728	3.036	0		11.22	9.15	-0.005		0	-0.15	-0.01	26	5.52	3.18
1/27/2013 0:00	37	12.41	17.2	-2.9	7.127	88	39	65.27	901.9393	3.132	0		9.13	7.001	-0.006		0	-0.18	-0.01	27	5.10	3.11
1/28/2013 0:00	38	12.54	23.5	8.3	14.99	94	25	63.01	896.9995	5.222	0		13.27	13.7	-0.002		0	-0.06	0.00	28	6.25	5.53
1/29/2013 0:00	39	12.57	23.8	3.7	12.85	83	24	53.34	895.2717	4.663	0		13.65	11.78	-0.003		0	-0.09	0.00	29	6.16	5.64
1/30/2013 0:00	40	12.54	11.8	-0.2	7.385	81	23	53.36	889.8584	5.61	0		8.85	7.754	-0.005		0	-0.15	-0.01	30	4.97	3.87
1/31/2013 0:00	41	12.4	8.6	-4.4	0.532	81	16	49.32	899.5714	6.408	0		15.49	3.059	-0.008		0	-0.24	-0.01	31	6.75	4.45
2/1/2013 0:00	42	12.39	17.4	-7.3	4.084	80	14	46.07	903.0391	3.128	0		15.33	4.98	-0.008		0	-0.24	-0.01	32	6.46	4.39
2/2/2013 0:00	43	12.41	16.9	-8.8	3.113	92	20	57.85	904.9	4.024	0		15.59	3.976	-0.008		0	-0.24	-0.01	33	6.90	4.65
2/3/2013 0:00	44	12.43	16.2	-2.5	5.164	71	20	47.86	907.5141	3.823	0		15.6	6.69	-0.006		0	-0.18	-0.01	34	6.83	4.53
2/4/2013 0:00	45	12.42	16.1	-5.5	6.388	78	29	53.89	904.5583	4.219	0		12.12	5.145	-0.007		0	-0.21	-0.01	35	6.20	4.08
2/5/2013 0:00	46	12.53	16.5	-1.5	8.8	74	23	50.22	896.9115	4.407	0		16.02	9.64	-0.004		0	-0.12	0.00	36	7.22	4.65
2/6/2013 0:00	47	12.51	21.2	-4	6.301	87	17	48.55	898.4028	1.993	0		16.32	7.577	-0.007		0	-0.21	-0.01	37	7.21	4.24
2/7/2013 0:00	48	12.53	22.5	-0.2	10	97	16	61.31	896.4611	3.412	0		16.11	10.41	-0.005		0	-0.15	-0.01	38	7.29	5.25
2/8/2013 0:00	49	12.57	14.2	-1.1	8.34	70	32	46.97	899.6974	6.531	0		16.09	8.27	-0.005		0	-0.15	-0.01	39	7.70	5.01
2/9/2013 0:00	50	12.39	13.2	-4.8	4.027	83	22	49.52	904.482	4.08	0		13.41	4.049	-0.008		0	-0.24	-0.01	40	6.83	3.97
2/10/2013 0:00	51	12.47	21.4	0.7	10.03	59	15	42.61	892.8434	6.401	0		14.12	9.13	-0.004		0	-0.12	0.00	41	6.64	7.38
2/11/2013 0:00	52	12.46	14.7	-2.3	5.496	51	12	34.51	894.4306	4.928	0		17.35	6.154	-0.006		0	-0.18	-0.01	42	7.59	5.49
2/12/2013 0:00	53	12.41	10.9	-3.5	3.095	71	33	52.25	900.4688	4.194	0		15.76	4.493	-0.007		0	-0.21	-0.01	43	7.97	3.73
2/19/2013 0:00	60	12.59	12.2	-4.7	5.783	72	27	44.19	896.4322	5.662	0		18.26	6.772	-0.005		0	-0.15	-0.01	50	9.29	4.84
2/20/2013 0:00	61	12.4	13.5	-8	3.315	87	24	52.91	902.9633	5.046	0		14.59	3.532	-0.008		0	-0.24	-0.01	51	8.03	4.57
2/21/2013 0:00	62	12.4	5.2	1.8	3.435	97	84	93.8	894.0013	8.3	7.366		2.669	3.977	-0.006		7.366	-0.18	-0.01	52	3.44	1.26
2/22/2013 0:00	63	12.38	8.6	-2.4	2.182	97	68	87.7	889.9449	5.702	7.874		17.39	3.119	-0.007		7.874	-0.21	-0.01	53	9.99	2.91
2/23/2013 0:00	64	12.6	7.2	-6.4	-0.34	93	58	79.14	898.5972	2.837	0		16.35	2.492	-0.009		0	-0.27	-0.01	54	9.47	2.46
2/24/2013 0:00	65	12.57	15.1	-4	3.559	94	19	66.19	895.9922	3.423	0		19.21	4.809	-0.007		0	-0.21	-0.01	55	9.97	4.61
2/25/2013 0:00	66	12.57	20.8	-1.3	7.506	84	14	51.05	889.1314	5.366	0		17.05	8.22	-0.005		0	-0.15	-0.01	56	8.91	6.95
2/26/2013 0:00	67	12.52	0.8	-5.3	-1.736	96	84	93.7	891.2186	17.12	0		12.39	1.316	-0.008		0	-0.24	-0.01	57	8.02	2.23
2/27/2013 0:00	68	12.37	7.9	-11.9	-2.377	95	69	88.2	894.4578	2.823	0.508		20.48	0.752	-0.009		0.508	-0.27	-0.01	58	11.83	2.54
2/28/2013 0:00	69	12.52	5.6	-3.3	0.678	91	60	78.6	903.5148	5.942	0		19.99	0.705	-0.009		0	-0.27	-0.01	59	11.43	3.24
3/1/2013 0:00	70	12.44	8.7	-5.2	0.979	93	39	73.22	907.189	2.698	0		20.16	1.508	-0.009		0	-0.27	-0.01	60	11.29	3.26
3/2/2013 0:00	71	12.5	11	-3.3	3.239	94	34	70.08	907.1155	3.817	0		20.32	2.51	0.028		0	0.85	0.03	61	11.33	4.01
3/3/2013 0:00	72	12.51	17.9	-3.2	6.001	93	29	67.27	908.6397	2.634	0		20.23	5.736	0.033		0	1.01	0.03	62	11.20	4.57
3/4/2013 0:00	73	12.55	26.4	-1.2	10.85	85	10	48.49	897.269	3.75	0		17.31	5.727	-0.006		0	-0.18	-0.01	63	9.27	7.27
3/5/2013 0:00	74	12.6	25.1	6	16.22	66	19	34.42	891.7514	6.278	0		18.89	11.41	-0.004		0	-0.12	0.00	64	10.27	8.30
3/6/2013 0:00	75	12.52	11.8	-3.1	3.584	86	30	56.33	909.1264	4.648	0		20.75	6.495	-0.007		0	-0.21	-0.01	65	11.69	4.68
3/7/2013 0:00	76	12.41	16.1	-6.3	4.617	79	21	46.44	905.9262	4.624	0		16.25	5.066	-0.007		0	-0.21	-0.01	66	9.53	5.34
3/8/2013 0:00	77	12.52	26.3	-2.1	10.9	75	16	41.96	899.8376	3.908	0		18.93	11.03	-0.005		0	-0.15	-0.01	67	10.41	7.40
3/9/2013 0:00	78	12.59	25.5	8.1	15.44	96	27	63.09	897.0211	6.005	8.89		15.11	15.37	-0.002		8.89	-0.06	0.00	68	9.50	7.13
3/10/2013 0:00	79	12.58	16.4	4.9	12.53	95	25	61.56	892.4691	5.64	0.254		18.13	12.22	-0.003		0.254	-0.09	0.00	69	10.82	5.59
3/11/2013 0:00	80	12.51	8.6	-2.9	3.395	75	24	51.33	899.6057	10.36	0		21.42	4.58	-0.007		0	-0.21	-0.01	70	12.22	6.61
3/12/2013 0:00	81	12.4	20.1	-5	6.433	83	18	48.18	900.2523	3.121	0		22	7.979	-0.007		0	-0.21	-0.01	71	12.22	5.86
3/13/2013 0:00	82	12.55	13.7	-2	6.354	86	38	58.84	904.3518	4.872	0		21.17	7.922	-0.006		0	-0.18	-0.01	72	12.55	4.97
3/14/2013 0:00	83	12.42	20.6	-3.1	7.675	93	24	59.02	909.4464	4.057	0		21.37	8.44	-0.006		0	-0.18	-0.01	73	12.37	6.23
3/15/2013 0:00	84	12.54	26.5	0.4	12	79	17	49.86	905.9242	2.297	0		22.16	13.13	-0.005		0	-0.15	-0.01	74	12.38	6.46
3/16/2013 0:00	85	12.57	30.4	2.7	15.2	80	9	44.39	899.8506	2.747	0		21.48	14.59	-0.004		0	-0.12	0.00	75	11.68	7.70
3/17/2013 0:00	86	12.59	21.2	3.9	13.77	71	28	47.84	894.0558	4.393	0		22.05	14.66	-0.003		0	-0.09	0.00	76	12.90	6.58
3/18/2013 0:00	87	12.54	23.7	0.6	11.13	88	20	55.92	892.7566	3.787	0		20.94	13.02	-0.004		0	-0.12	0.00	77	12.29	6.79
3/19/2013 0:00	88	12.54	19	4.5	10.75	69	22	42.08	896.7669	4.077	0		22.7	13.51	-0.004		0	-0.12	0.00	78	13.13	6.47
3/20/2013 0:00	89	12.51	14.9	-2.4	7.073	88	48	65.78	900.2865	2.749	0		10.5	8.54	-0.006		0	-0.18	-0.01	79	7.76	3.08
3/21/2013 0:00	90	12.4	17.4	-2.1	8.18	93	23	54.35	905.0502	4.119	0		21.33	9.82	-0.005		0	-0.15	-0.01	80	12.83	5.77
3/22/2013 0:00	91	12.6	26.5	3.3	15.16	81	15	39.48	888.6199	5.02	0		20.15	13.58	-0.003		0	-0.09	0.00	81	11.94	8.32
3/23/2013 0:00	92	12.56	15.1	2.9	8.12	92	23	69.42	892.8873	4.176	0		16.97	11.79	-0.004		0	-0.12	0.00	82	10.90	5.02
3/24/2013 0:00	0	12.72	-1.4	-3.1	-2.254	73	71	72.13	899.5359	13.59	0		0.017	1.126	-0.016	-2.174	0	-0.49	-0.02	83	2.36	2.24
3/25/2013 0:00	1	12.43	9	-5.7	-0.126	75	20	50.07	902.7196	6.474	0		23.83	4.307	-0.02	2.69	0	-0.61	-0.02	84	14.26	5.79
3/26/2013 0:00	2	12.4	10.2	-9.5	0.025	85	28	54.75	907.9728	2.301	0		22.17	4.495	-0.022	5.303	0	-0.67	-0.02	85	13.72	3.90
3/27/2013 0:00	3	12.42	16.9	-9	4.455	83	16	41.92	907.0843	4.828	0		23.16	5.046	-0.019	7.579	0	-0.58	-0.02	86	13.83	6.65
3/28/2013 0:00	4	12.55	26.9	2.8	13.81	54	13	32.43	900.6004	4.713	0		22	13.29	-0.009	14.7	0	-0.27	-0.01	87	12.77	9.05
3/29/2013 0:00	5	12.57	27.2	3.9	13.98	87	14	47.45	901.1375	2.041	0		22.83	16.26	-0.01	16.37	0	-0.30	-0.01	88	13.64	6.70
3/30/2013 0:00	6	12.6	26.2	9	16.35	89	31	61.47	901.3228	2.694	0		16.41	18	-0.008	17.9	0	-0.24	-0.01	89	11.15	5.65
3/31/2013 0:00	7	12.59	29.7	4.8	16.88	95	18	56.62	899.1046	2.897	0		23.74	18.71	-0.009	18.93	0	-0.27	-0.01	90	14.50	7.75
4/1/2013 0:00	8	12.59	22.7	9	14.46	85	32	58.66	900.811	3.246	0		20.83	17.65	-0.009	17.47	0	-0.27	-0.01	91	13.53	6.14
4/2/2013 0:00	9	12.54	27.7	4.8	13.98	90	27	68.99	899.5143	4.137	1.27		19.46	14.52	-0.01	16.3	1.27	-0.30	-0.01	92	12.72	7.55

4/3/2013 0:00	10	12.44	5.8	0.5	2.461	96	90	93.9	901.6588	5.716	0	4.497	5.246	-0.02	5.371	0	-0.61	-0.02	93	4.79	1.23
4/4/2013 0:00	11	12.37	4.8	0.3	2.114	95	81	89.1	903.9639	5.449	0	8.2	4.381	-0.02	4.01	0	-0.61	-0.02	94	6.91	1.81
4/5/2013 0:00	12	12.33	21.1	1.5	9.07	90	22	65.04	904.7369	3.139	0	24.85	11.52	-0.013	10.31	0	-0.40	-0.01	95	15.41	6.57
4/6/2013 0:00	13	12.67	26.3	-2.8	12.82	95	17	52.75	901.5385	4.943	0	21.62	11.06	-0.012	13.12	0	-0.37	-0.01	96	13.59	8.58
4/7/2013 0:00	14	12.69	23.7	7.9	15.57	76	26	47.73	896.2732	3.538	0	16.71	16.34	-0.008	14.86	0	-0.24	-0.01	97	11.36	6.17
4/8/2013 0:00	15	12.63	30.6	3.9	16.46	90	12	48.1	892.4473	2.78	0	24.09	15.33	-0.01	17.12	0	-0.30	-0.01	98	14.70	8.24
4/9/2013 0:00	16	12.63	31.5	5.2	18.85	56	11	28.83	888.0157	4.613	0	24.76	16.32	-0.007	19.52	0	-0.21	-0.01	99	14.60	10.33
4/10/2013 0:00	17	12.67	25.4	-0.9	12.59	87	31	61.55	889.8391	8.28	0	21.89	14.3	-0.008	13.89	0	-0.24	-0.01	100	14.37	9.82
4/11/2013 0:00	18	12.51	10.3	-6	0.8	83	28	50.5	899.2381	7.154	0	20.02	4.706	-0.02	2.606	0	-0.61	-0.02	101	13.31	5.71
4/12/2013 0:00	19	12.49	20.1	-7.5	6.141	82	18	44.79	895.3583	2.572	0	25.33	7.989	-0.018	10.27	0	-0.55	-0.02	102	15.80	6.25
4/13/2013 0:00	20	12.59	24.7	1.8	13.72	70	18	40.37	896.5901	3.784	0	23.56	13.84	-0.01	15.95	0	-0.30	-0.01	103	14.80	7.79
4/14/2013 0:00	21	12.6	25.3	3.2	14.84	92	25	57.42	894.4397	4.83	0	24.44	15.18	-0.007	17.6	0	-0.21	-0.01	104	15.78	8.23
4/15/2013 0:00	22	12.61	30	10.5	19.68	93	10	45.16	887.5581	6.093	0	25.28	17.45	-0.004	20.89	0	-0.12	0.00	105	15.86	10.96
4/16/2013 0:00	23	12.6	29.8	2.8	16.66	72	11	36.44	890.452	2.985	0	25.77	17.56	-0.008	19.29	0	-0.24	-0.01	106	15.66	8.67
4/17/2013 0:00	24	12.57	23.2	4.1	13.2	92	31	62.04	894.9388	3.803	0	25.27	16.07	-0.009	15.69	0	-0.27	-0.01	107	16.57	7.20
4/18/2013 0:00	25	12.61	32.3	4	18.52	93	4	61.23	890.6974	7.005	0	24.52	17.86	-0.004	20.14	0	-0.12	0.00	108	14.87	13.16
4/19/2013 0:00	26	12.56	11.3	-3.5	3.908	80	29	54.8	900.3245	7.854	0	26.52	7.75	-0.015	5.535	0	-0.46	-0.02	109	17.14	6.95
4/20/2013 0:00	27	12.46	18.3	-6.3	6.29	79	13	40.45	904.9359	3.311	0	26.59	7.696	-0.018	9.02	0	-0.55	-0.02	110	16.64	6.77
4/21/2013 0:00	28	12.57	25.7	4.9	15.06	38	7	22.41	896.7815	5.863	0	23.66	13.59	-0.008	15.75	0	-0.24	-0.01	111	14.30	10.59
4/22/2013 0:00	29	12.59	25.9	1.5	15.92	72	16	34.54	899.5869	2.789	0	26.25	18.87	-0.007	18.25	0	-0.21	-0.01	112	16.49	7.74
4/23/2013 0:00	30	12.6	31.9	4.1	19.03	94	7	44.76	896.0577	4.995	0	26.61	17.82	-0.007	20.47	0	-0.21	-0.01	113	16.37	11.12
4/24/2013 0:00	31	12.54	8.1	-1.2	1.747	82	0	73.8	902.3369	9.11	0	11.47	5.686	-0.019	2.718	0	-0.58	-0.02	114	8.86	6.47
4/25/2013 0:00	32	12.41	17.4	-5.3	5.87	87	19	49.36	907.2117	3.072	0	26.85	9.46	-0.016	7.89	0	-0.49	-0.02	115	17.26	6.34
4/26/2013 0:00	33	12.61	20.5	-2.1	10.72	81	25	46.55	905.9302	4.262	0	16.47	11.33	-0.012	12.42	0	-0.37	-0.01	116	11.70	6.13
4/27/2013 0:00	34	12.61	28.6	12.2	18.9	84	14	48.18	900.5232	6.499	0	26.75	17.88	-0.004	20.38	0	-0.12	0.00	117	17.29	11.32
4/28/2013 0:00	35	12.59	27.5	4.7	15.94	89	14	49.98	903.7518	2.522	0	25.78	19.3	-0.008	18.06	0	-0.24	-0.01	118	16.58	7.84
4/29/2013 0:00	36	12.59	30.6	5.5	18.84	67	14	39.32	898.6304	3.368	0	25.83	18.11	-0.008	20.34	0	-0.24	-0.01	119	16.38	9.20
4/30/2013 0:00	37	12.63	31.9	10.3	21.49	72	14	35.82	894.3406	5.35	0	26.98	19.47	-0.005	22.12	0	-0.15	-0.01	120	17.20	11.25
5/1/2013 0:00	38	12.64	34.2	12.2	22.65	74	10	39.26	890.8898	4.817	0	25.78	21.68	-0.004	23.38	0	-0.12	0.00	121	16.44	11.38
5/2/2013 0:00	39	12.66	24.8	3.9	15.48	78	23	53.06	897.8621	7.664	0	25.91	17.16	-0.007	16.57	0	-0.21	-0.01	122	17.04	10.48
5/3/2013 0:00	40	12.49	9.2	-2.7	3.783	88	39	65.78	913.1613	9.8	0	15.23	5.535	-0.019	4.095	0	-0.58	-0.02	123	11.31	5.40
5/4/2013 0:00	41	12.44	20.7	-4.8	7.678	77	14	41.92	907.5692	3.36	0	28.03	8.49	-0.018	9.8	0	-0.55	-0.02	124	17.89	7.55
5/5/2013 0:00	42	12.54	22.8	-1.6	11.4	76	15	37.18	901.3339	2.084	0	26.59	13.69	-0.012	15.2	0	-0.37	-0.01	125	17.14	6.90
5/6/2013 0:00	43	12.57	21.1	-0.9	11.07	71	18	37.4	904.6536	2.01	0	22.52	13.35	-0.012	13.79	0	-0.37	-0.01	126	15.05	6.04
5/7/2013 0:00	44	12.57	21.1	4.6	13.71	75	33	51.1	902.8096	3.393	0	15.06	13.87	-0.01	15.47	0	-0.30	-0.01	127	11.20	5.42
5/8/2013 0:00	45	12.59	28.6	8.1	17.92	86	23	56.9	899.7792	4.588	0	26.58	18.56	-0.005	20.38	0	-0.15	-0.01	128	17.78	9.47
5/9/2013 0:00	46	12.65	30.8	9.7	19.95	81	11	47.38	896.9913	4.192	0	22.2	20.07	-0.004	21.04	0	-0.12	0.00	129	14.84	9.48
5/10/2013 0:00	47	12.61	28	7.7	16.78	83	24	59.98	898.8195	4.151	0	23.63	18.83	-0.008	19.1	0	-0.24	-0.01	130	16.13	8.62
5/11/2013 0:00	48	12.57	18.2	6.8	12.65	93	57	81	904.2982	2.971	2.032	11.81	14.35	-0.011	13.78	2.032	-0.34	-0.01	131	9.52	3.63
5/12/2013 0:00	49	12.52	25.1	5.3	14.7	94	22	62.67	907.9655	2.186	0	20.66	15.8	-0.01	14.92	0	-0.30	-0.01	132	14.43	6.33
5/13/2013 0:00	50	12.61	27.2	2.3	16.04	96	22	53.17	907.0479	3.067	0	26.82	16.61	-0.009	17.63	0	-0.27	-0.01	133	17.93	8.14
5/14/2013 0:00	51	12.62	30.3	8.4	20.39	69	15	35.03	905.917	4.24	0	28.43	19.87	-0.006	21.09	0	-0.18	-0.01	134	18.35	10.29
5/15/2013 0:00	52	12.81	30.5	18.1	24.75	57	21	34.04	898.3362	5.258	0	18.3	26.01	0	26.05	0	0.00	0.00	135	13.05	9.35
5/16/2013 0:00	53	12.64	32.9	13.8	20.86	81	19	51.88	896.1234	3.21	0	23.69	22.96	-0.005	23.24	0	-0.15	-0.01	136	16.29	9.15
5/17/2013 0:00	54	12.63	36.1	13.4	23.08	95	15	57.83	894.9022	3.097	0	27.66	26.35	-0.005	26.82	0	-0.15	-0.01	137	18.62	10.30
5/18/2013 0:00	55	12.63	37.3	9.3	25.15	96	5	52.67	895.5655	2.552	0	27.52	27.4	-0.006	27.89	0	-0.18	-0.01	138	17.57	10.03
5/19/2013 0:00	56	12.68	36.8	15.7	28.04	60	7	25.87	893.9772	4.065	0	26.07	26.96	-0.004	27.63	0	-0.12	0.00	139	16.67	11.19
5/20/2013 0:00	57	12.62	32.1	10.1	22.82	38	9	20.3	892.5516	4.918	0	27.62	21.43	-0.006	23.99	0	-0.18	-0.01	140	17.13	11.55
5/21/2013 0:00	58	12.6	32.3	8.4	20.93	53	7	26.38	893.6276	3.237	0	28.3	21.45	-0.009	23.74	0	-0.27	-0.01	141	17.60	10.21
5/22/2013 0:00	59	12.61	24.2	8.4	17.7	83	32	51.19	897.2377	4.771	2.286	21.95	19.8	-0.008	18.26	2.286	-0.24	-0.01	142	15.53	7.62
5/23/2013 0:00	60	12.55	33.7	7.4	21.71	83	13	42.06	896.8127	4.642	0	25.56	20.4	-0.008	18.81	0	-0.24	-0.01	143	16.96	10.94
5/24/2013 0:00	61	12.66	35.9	17.6	23.58	74	20	52.7	897.9078	5.527	0	23.93	25.2	-0.003	23.76	0	-0.09	0.00	144	16.70	12.05
5/25/2013 0:00	62	12.63	30	13.2	22.1	83	35	56.7	903.0817	5.322	0	27.52	25.17	-0.005	24.26	0	-0.15	-0.01	145	19.31	9.88
5/26/2013 0:00	63	12.65	31.2	16.7	22.88	88	37	63.84	902.503	5.156	0	24.31	25.59	-0.004	26.02	0	-0.12	0.00	146	17.66	9.33
5/27/2013 0:00	64	12.65	35.1	14.9	25.92	69	25	48.15	898.5935	5.947	0	27.22	26.49	-0.003	27.75	0	-0.09	0.00	147	18.73	12.01
5/28/2013 0:00	65	12.67	37.1	19.9	27.47	82	10	51.6	895.46	5.683	0	26.1	28.69	-0.002	29.45	0	-0.06	0.00	148	17.78	12.82
5/29/2013 0:00	66	12.64	31.6	15.2	23.78	93	27	65.49	893.0353	7.136	0	23.73	24.9	-0.002	25.81	0	-0.06	0.00	149	16.99	10.81
5/30/2013 0:00	67	12.64	35.2	19.7	25.94	88	7	46.99	888.6417	6.311	0	25.33	26.1	-0.002	27.19	0	-0.06	0.00	150	17.33	12.87
5/31/2013 0:00	68	12.65	34.6	17.5	25.75	55	7	23.95	891.4417	3.617	0	28.87	27.33	-0.005	28.16	0	-0.15	-0.01	151	18.35	11.19
6/1/2013 0:00	69	12.62	37.3	12.8	26.13	46	9	23.27	892.6078	3.015	0	29.47	27.77	-0.006	29.06	0	-0.18	-0.01	152	18.40	11.04
6/2/2013 0:00	70	12.62	29.9	14	21.86	77	15	39.94	899.9598	4.625	0	29.85	25.33	-0.007	26.68	0	-0.21	-0.01	153	19.83	10.81
6/3/2013 0:00	71	12.59	30.1	10.1	20.69	77	26	45.7	903.4523	3.804	0	29.02	25.09	-0.007	26.08	0	-0.21	-0.01	154	19.73	9.67
6/4/2013 0:00	72	12.63	35.8	19.2	26.88	70	24	40.71	897.5615	5.211	0	28.01	29.46	-0.003	29.8	0	-0.09	0.00	155	19.48	11.95
6/5/2013 0:00	73	12.68	39.3	20.3	30.07	68	7	37.13	895.1377	3.797	0	29.13	33.14	-0.003	32.81	0	-0.09	0.00	156	19.00	12.11
6/6/2013 0:00	74	12.65	31.2	16.2	24.43	92	33	52.62	897.6184	5.898	1.524	27.59	29.34	-0.005	29.61	1.524	-0.15	-0.01	157	19.72	10.39
6/7/2013 0:00	75	12.32	25.2	14.6	18.47	95	54	80.5	901.3704	4.512	5.588	20.26	20.64	-0.01	20.64	5.588	-0.30	-0.01	158	15.29	6.45
6/8/2013 0:00	76	12.3	28.4	14.4	20.35	97	31	70.1	901.3586	3.585	0	18.9	21.6	-0.008	20.78	0	-0.24	-0.01	159	14.10	7.09
6/9/2013 0:00	77	12.33	32.1	15.5	23.44	86	35	60.19	896.2153	5.69	0	23.69	24.53	-0.005	23.06	0	-0.15	-0.01	160	17.24	9.81
6/10/2013 0:00	78	12.39	31.4	16.2	23.43	95	32	66.17	900.4858	3.283	0.508	25.84	27.2	-0.006	24.7	0.508	-0.18	-0.01	161	18.64	8.66
6/11/2013 0:00	79	12.37	36.5	15.5	26.78	90	21	50.6	900.7404	4.738	0	28.39	27.43	-0.005	26.7	0	-0.15	-0.01	162	19.76	11.54
6/12/2013 0:00	80	12.38	36.6	14.9	26.85	71	18	41.17	900.7407	5.246	0	29.05	27.62	-0.005	27.32	0	-0.15	-0.01	163	19.59	12.47

6/13/2013 0:00	81	12.39	36.3	18.1	26.88	83	25	51.12	901.7048	4.559	0	28.41	29.65	-0.005	28.56	0	-0.15	-0.01	164	20.05	11.36	
6/14/2013 0:00	82	12.37	35.1	14.7	26.06	89	31	55.33	903.0123	3.631	0	27.38	29.94	-0.006	28.7	0	-0.18	-0.01	165	19.56	9.84	
6/15/2013 0:00	83	12.38	29.2	16.6	22.8	86	40	68.66	902.4282	3.779	0	18.08	26.16	-0.007	25.74	0	-0.21	-0.01	166	13.75	6.96	
6/16/2013 0:00	84	12.34	32.1	19	24.41	93	41	69.27	901.4914	4.496	0	22.7	28.82	-0.005	27.07	0	-0.15	-0.01	167	17.05	8.55	
6/17/2013 0:00	85	12.39	35.8	17.6	26.64	94	32	62.17	901.3627	4.256	0	26.08	30.81	-0.005	29.29	0	-0.15	-0.01	168	19.06	10.08	
6/18/2013 0:00	86	12.4	33	16.7	24.87	95	43	67.3	902.1718	3.905	12.95	22.12	30.57	-0.005	28.87	12.95	-0.15	-0.01	169	16.68	8.10	
6/19/2013 0:00	87	12.35	29.3	16.1	22.68	91	47	68.65	903.7391	4.418	0	26.08	24.64	-0.009	24.02	0	-0.27	-0.01	170	19.16	8.48	
6/20/2013 0:00	88	12.36	27.9	17.6	22.07	94	46	76.3	901.4286	6.127	1.27	17.68	22.16	-0.006	21.99	1.27	-0.18	-0.01	171	13.65	7.34	
6/21/2013 0:00	89	12.33	35.1	19.2	25.73	87	32	59.85	900.7371	6.535	1.016	23.93	24.73	-0.005	22.96	1.016	-0.15	-0.01	172	17.62	11.28	
6/22/2013 0:00	90	12.43	34.3	22	27.28	80	36	56.75	901.4172	7.199	0	22.34	26.07	-0.003	24.09	0	-0.09	0.00	173	16.73	11.01	
6/23/2013 0:00	91	12.4	35.9	18.8	27.5	75	34	52.74	899.7345	6.947	0	25.07	27.05	-0.003	25.2	0	-0.09	0.00	174	18.26	11.92	
6/24/2013 0:00	92	12.41	37.8	20.6	28.56	63	22	45	898.6002	6.537	0	26.09	28.56	-0.004	26.77	0	-0.12	0.00	175	18.24	13.43	
6/25/2013 0:00	93	12.41	35	20.6	27.46	74	38	54.71	899.9448	6.732	0	22.78	27.83	-0.004	26.9	0	-0.12	0.00	176	16.95	10.92	
6/26/2013 0:00	94	12.4	38.7	21.2	29.34	72	14	44.29	899.7205	4.491	0	27.17	31	-0.004	29.49	0	-0.12	0.00	177	18.65	12.18	
6/27/2013 0:00	95	12.41	42.4	21	31.37	81	4	43.09	899.038	3.645	0	29.05	33.86	-0.004	32.52	0	-0.12	0.00	178	19.10	12.65	
6/28/2013 0:00	96	12.43	40.2	20.6	31.12	80	14	40.75	900.8861	3.554	0	28.74	33.89	-0.005	32.24	0	-0.15	-0.01	179	19.74	11.63	
6/29/2013 0:00	97	12.41	37.8	20.7	30.13	67	23	37.67	903.0712	3.309	0	28.91	34.54	-0.005	32.41	0	-0.15	-0.01	180	20.10	10.89	
6/30/2013 0:00	98	12.33	34.1	16.9	25.33	96	30	56.51	901.5036	2.796	6.858	22.39	25.79	-0.009	26.66	6.858	-0.27	-0.01	181	16.50	8.15	
7/1/2013 0:00	99	12.37	30.7	18	23.74	94	39	65.25	902.9028	2.913	5.08	26.87	26.05	-0.009	26	5.08	-0.27	-0.01	182	19.61	8.40	
7/2/2013 0:00	100	12.36	28.8	17.1	22.55	85	34	55.25	905.6516	2.228	0.254	21.58	26.02	-0.009	24.42	0.254	-0.27	-0.01	183	15.83	6.98	
7/3/2013 0:00	101	12.25	29.7	10.9	21.02	91	22	49.27	906.3976	2.026	0	27.68	25.31	-0.01	24.15	0	-0.30	-0.01	184	18.99	8.16	
7/4/2013 0:00	102	12.31	29.2	13.8	21.55	78	26	45.41	903.4554	3.186	0	19.61	22.64	-0.009	21.23	0	-0.27	-0.01	185	14.24	7.49	
7/5/2013 0:00	103	12.26	32.1	14.8	23.59	83	25	47.9	900.8611	3.941	0.254	26.53	24.84	-0.008	22.85	0.254	-0.24	-0.01	186	18.52	9.68	
7/6/2013 0:00	104	12.38	34.7	15.1	25.95	72	23	41.68	899.5217	4.998	0	26.68	26.38	-0.007	24.34	0	-0.21	-0.01	187	18.41	11.13	
7/7/2013 0:00	105	12.4	35.3	18.6	27.1	61	20	37.07	899.3512	5.264	0	26.89	28.17	-0.005	26.08	0	-0.15	-0.01	188	18.33	11.91	
7/8/2013 0:00	106	12.37	34.6	15.1	26.42	74	25	42.65	901.9312	3.752	0	27.28	29.51	-0.006	27.48	0	-0.18	-0.01	189	18.89	10.13	
7/9/2013 0:00	107	12.39	35.4	18.4	27.27	70	27	45.91	904.2155	2.951	0	24.88	30.47	-0.007	28.87	0	-0.21	-0.01	190	17.63	9.28	
7/10/2013 0:00	108	12.4	35.5	21	27.94	72	29	48.83	905.0091	3.649	0	27.9	31.59	-0.006	31.37	0	-0.18	-0.01	191	19.79	10.42	
7/11/2013 0:00	109	12.39	36.8	18.9	27.98	76	27	48.29	904.6464	2.976	0	27.08	31.99	-0.006	32.09	0	-0.18	-0.01	192	19.17	9.91	
7/12/2013 0:00	110	12.4	36.6	19.1	28.07	72	26	45.58	903.1619	2.49	0	19.07	31.14	-0.007	31.18	0	-0.21	-0.01	193	14.08	7.96	
7/13/2013 0:00	111	12.35	36.5	18.3	28.09	78	27	47.86	902.186	3.318	0	21.62	30.79	-0.007	30.71	0	-0.21	-0.01	194	15.73	8.95	
7/14/2013 0:00	112	12.33	37.4	16.1	27.55	71	19	39.88	903.1044	2.562	0	27.45	30.86	-0.007	31.27	0	-0.21	-0.01	195	18.64	9.91	
7/15/2013 0:00	113	12.36	36.2	14.4	23.36	96	20	51.51	902.0994	4.056	11.43	19.01	26.62	-0.008	26.86	11.43	-0.24	-0.01	196	13.90	9.45	
7/16/2013 0:00	114	12.24	23.1	14.3	17.82	97	59	82.2	905.6661	3.377	2.286	17.7	19.74	-0.011	21.01	2.286	-0.34	-0.01	197	13.56	5.17	
7/17/2013 0:00	115	12.21	21.6	15.1	18.08	97	74	90.5	907.7083	2.549	16.76	10.4	19.51	-0.01	20.58	16.76	-0.30	-0.01	198	8.82	3.16	
7/18/2013 0:00	116	12.12	23.1	17.3	19.83	98	80	93.4	910.9575	4.49058333	79.25	11.58	19.32	1.892	20.01	79.25	57.67	1.89	199	9.67	3.57	
7/19/2013 0:00	117	12.36	26.3	18.9	21.81	96	61	84.8	908.723	4.471	0	22.2	21.88	2.459	22.77	0	74.95	2.46	200	16.82	6.72	74.95
7/20/2013 0:00	118	12.54	28.2	18.3	23.14	96	53	77.24	905.5853	4.442	0	24.39	23.78	2.401	24.57	0	73.18	2.40	201	18.17	7.67	74.18
7/21/2013 0:00	119	12.68	29.8	18.4	24.19	93	44	70.95	903.1212	3.763	0	25.93	24.46	2.347	25.8	0	71.54	2.35	202	18.96	8.30	73.35
7/22/2013 0:00	120	12.63	31.4	18.6	25.13	92	38	67.35	901.9384	4.519	0	26.4	25.12	2.299	26.27	0	70.07	2.30	203	19.13	9.22	72.43
7/23/2013 0:00	121	12.63	31.6	19.9	25.69	92	47	70.4	902.2677	4.486	0	27.49	25.1	2.253	27.16	0	68.67	2.25	204	20.27	9.15	71.52
7/24/2013 0:00	122	12.64	33.8	20.8	27.16	91	40	67.31	902.4487	3.624	0	26.09	25.66	2.21	28.58	0	67.36	2.21	205	19.24	9.06	70.61
7/25/2013 0:00	123	12.64	33.8	18.5	26.08	90	45	73.22	903.9003	2.543	2.54	23.26	26.69	2.174	29.24	2.54	66.26	2.17	206	17.36	7.71	69.84
7/26/2013 0:00	124	12.61	29.1	20	23.35	91	54	77.31	906.7655	4.563	0	15.27	26.18	2.152	26.27	0	65.59	2.15	207	12.08	6.08	69.23
7/27/2013 0:00	125	12.61	28.8	20.1	24.19	88	50	72.4	907.2167	4.243	0	26.35	25.82	2.112	25.97	0	64.37	2.11	208	19.32	8.37	68.40
7/28/2013 0:00	126	12.61	29.6	16.3	22.64	95	29	67.38	907.3721	3.023	0	23.1	25.48	2.063	26.01	0	62.88	2.06	209	16.50	7.73	67.62
7/29/2013 0:00	127	12.61	30.6	15.7	23.58	86	37	60.37	903.3236	4.85	0	25.77	24.66	2.023	24.84	0	61.66	2.02	210	18.27	9.21	66.70
7/30/2013 0:00	128	12.63	33.8	20.4	26.42	91	38	65.91	902.8205	5.657	0	24.6	25.58	1.987	25.89	0	60.56	1.99	211	18.06	9.94	65.71
7/31/2013 0:00	129	12.66	33.2	19.8	26.54	90	42	66.38	906.4155	3.156	0	25.97	26.2	1.946	26.8	0	59.31	1.95	212	19.01	8.59	64.85
8/1/2013 0:00	130	12.64	33.8	20.9	26.48	95	38	70.88	908.9928	2.671	0	25.38	28.18	1.915	28.85	0	58.37	1.92	213	18.65	8.39	64.01
8/2/2013 0:00	131	12.65	31.2	20.1	24.78	90	52	72.84	908.3188	3.353	3.556	18.17	27.94	1.892	28.08	3.556	57.67	1.89	214	13.99	6.50	63.36
8/3/2013 0:00	132	12.59	35.3	20.9	27.72	88	24	55.89	903.9427	4.189	0	26.79	26.8	1.872	26.91	0	57.06	1.87	215	18.81	10.37	62.32
8/4/2013 0:00	133	12.66	35.4	20	27.99	81	28	50.51	904.9016	4.535	0	26.84	26.73	1.83	26.72	0	55.78	1.83	216	18.81	10.54	61.27
8/5/2013 0:00	134	12.62	33.1	17.5	25.91	87	34	57.32	906.9318	3.346	0	26.36	26.74	1.788	26.74	0	54.50	1.79	217	18.62	8.95	60.37
8/6/2013 0:00	135	12.62	34	18.8	26.55	87	31	57.59	905.2225	3.585	0	26.84	27.39	1.753	27.38	0	53.43	1.75	218	18.89	9.45	59.43
8/7/2013 0:00	136	12.64	36.7	19.2	28.32	82	26	51.08	902.3551	3.537	0	26.08	27.53	1.716	27.58	0	52.30	1.72	219	18.18	9.92	58.44
8/8/2013 0:00	137	12.64	34.8	21.7	27.34	78	31	54.73	902.9555	3.233	0.508	21.9	26.95	1.681	27.12	0.508	51.24	1.68	220	15.82	8.57	57.58
8/9/2013 0:00	138	12.63	33.3	19	25.26	90	35	69.39	903.1481	3.101	0	22.88	27.5	1.651	27.65	0	50.32	1.65	221	16.53	8.13	56.77
8/10/2013 0:00	139	12.62	28.1	17.2	22.02	91	51	74.01	907.833	3.117	0	25.13	25.97	1.614	26.18	0	49.19	1.61	222	18.13	7.33	56.03
8/11/2013 0:00	140	12.6	32.1	15.8	22.71	95	34	70.28	911.4503	2.24	0	24.72	25.95	1.582	26.11	0	48.22	1.58	223	17.44	7.73	55.26
8/12/2013 0:00	141	12.62	31.4	19.4	23.61	87	43	70.91	910.0812	2.345	0	18.37	26.85	1.556	27.09	0	47.43	1.56	224	13.74	6.40	54.62
8/13/2013 0:00	142	12.6	32.1	19.4	25.05	95	36	70.04	908.5674	3.55	0.254	23.28	26.38	1.528	26.42	0.254	46.57	1.53	225	16.79	8.15	53.81
8/14/2013 0:00	143	12.62	31.6	18	23.13	92	48	77.31	908.4263	2.761	0.254	21.15	26.5	1.496	26.7	0.254	45.60	1.50	226	15.63	6.92	53.11
8/15/2013 0:00	144	12.6	28.5	16.5	23	95	56	80.9	909.1387	3.168	1.016	17.76	25.76	1.478	26.05	1.016	45.05	1.48	227	13.41	5.72	52.54
8/16/2013 0:00	145	12.59	31.4	16	22.75	97	46	76.84	903.175	2.448	11.94	24.4	24.36	1.515	24.51	11.94	46.18	1.52	228	17.56	7.32	51.81
8/17/2013 0:00	146	12.63	29.1	18.5	23.04	95	50	75.39	903.7845	3.506	0	24.92	25.83	1.493	25.95	0	45.51	1.49	229	18.00	7.53	51.06
8/18/2013 0:00	147	12.62	29.6	16.7	23.14	96	46	73.05	904.2965	3.695	0	24.54	26.05	1.462	26.18	0	44.56	1.46	230	17.53	7.66	50.29
8/19/2013 0:00	148	12.62	30.4	17	23.45	93	47	69.41	903.45	4.358	0	23.6	25.48	1.427	25.67	0	43.49	1.43	231	16.95	7.90	49.50
8/20/2013 0:00	149	12.62	31.8	16.9	24.19	89	41	65.66	902.4323	3.951	0	23.7	24.98	1.394	25.21	0	42.49	1.39	232	16.80	8.21	48.68
8/21/2013 0:00	150	12.61	31.8	18.1	24.93	87	37	61.75	902.1443	4.468	0	21.42	24.83	1.36	24.96	0	41.45	1.36	233	15.26	8.23	47.86
8/22/2013 0:00	151	12.62	30.8	15.9	23.58	90	35	62.79	903.5798	2.994	0	24.85	24.58	1.326	24.77	0	40.42	1.33	234	17.12	7.90	47.07

8/23/2013 0:00	152	12.61	31.6	14.4	23.53	93	23	60.46	903.8248	2.404	0	24.8	24.73	1.295	24.82	0	39.47	1.30	235	16.53	7.88	46.28
8/24/2013 0:00	153	12.62	31.9	17.4	25.07	91	38	62.13	903.0397	3.141	0	23.22	25.16	1.264	25.57	0	38.53	1.26	236	16.34	7.73	45.51
8/25/2013 0:00	154	12.62	32.1	18.1	25.08	89	36	62.69	904.3141	3.111	0	23.77	25.33	1.23	26.94	0	37.49	1.23	237	16.59	7.94	44.71
8/26/2013 0:00	155	12.64	32.6	17.8	25.48	90	38	62.05	906.3821	2.876	0	23.24	25.47	1.197	27.29	0	36.48	1.20	238	16.33	7.69	43.94
8/27/2013 0:00	156	12.63	30.6	17.4	24.36	90	41	63.99	907.0087	3.28	0	23.72	25.4	1.164	26.99	0	35.48	1.16	239	16.58	7.62	43.18
8/28/2013 0:00	157	12.61	30.7	15.5	23.43	93	36	64.93	904.8409	2.365	0	23.79	24.97	1.131	26.92	0	34.47	1.13	240	16.34	7.23	42.46
8/29/2013 0:00	158	12.6	30.8	17.3	23.66	93	40	67.52	904.4982	3.549	0	21.27	24.97	1.104	26.17	0	33.65	1.10	241	15.03	7.31	41.73
8/30/2013 0:00	159	12.59	32.8	15.7	24.06	85	31	58.75	904.1111	3.264	0	23.04	24.32	1.071	25.77	0	32.64	1.07	242	15.60	8.14	40.91
8/31/2013 0:00	160	12.63	35	16.8	25.72	83	31	55.38	902.5802	3.047	0	23.1	24.05	1.036	26.02	0	31.58	1.04	243	15.71	8.36	40.08
9/1/2013 0:00	161	12.63	34.5	16.3	25.85	82	28	51.49	900.2589	2.44	0	23.53	24.17	1.002	26.24	0	30.54	1.00	244	15.71	7.97	39.28
9/2/2013 0:00	162	12.6	36.1	17.2	25.73	88	25	54.57	900.0588	1.88	0	20.68	24.21	0.968	26.06	0	29.50	0.97	245	14.10	7.35	38.55
9/3/2013 0:00	163	12.62	31.5	18	24.98	88	37	63.27	903.1027	2.531	0	21.39	24.45	0.937	26.04	0	28.56	0.94	246	14.84	6.98	37.85
9/4/2013 0:00	164	12.62	32.5	15.5	24.38	88	32	59.28	903.8989	1.967	0	23.48	23.99	0.905	25.98	0	27.58	0.91	247	15.72	7.21	37.13
9/5/2013 0:00	165	12.61	32.8	14.6	24.15	91	26	55.91	905.1095	1.621	0	21.22	23.81	0.875	25.43	0	26.67	0.88	248	14.14	6.70	36.46
9/6/2013 0:00	166	12.61	33.7	14	23.31	91	18	52.94	905.8986	1.668	0	23.62	23.22	0.843	24.64	0	25.69	0.84	249	15.00	7.40	35.72
9/7/2013 0:00	167	12.62	32.7	15.6	24.46	91	32	58.9	904.945	1.972	0	21.47	23.48	0.813	24.81	0	24.78	0.81	250	14.50	6.83	35.04
9/8/2013 0:00	168	12.61	33.7	16.4	23.95	87	34	59.68	903.3464	2.089	0	19.32	23.59	0.785	24.52	0	23.93	0.79	251	13.33	6.67	34.37
9/9/2013 0:00	169	12.59	32	15.3	23.84	92	33	60.71	901.5058	2.436	0	22.47	23.46	0.755	24.23	0	23.01	0.76	252	15.00	7.13	33.65
9/10/2013 0:00	170	12.62	29.7	16.5	23.28	91	42	64.8	900.8651	3.458	0	21.49	23	0.726	23.36	0	22.13	0.73	253	14.68	6.96	32.96
9/11/2013 0:00	171	12.59	28.6	16.5	22.59	89	51	70.34	902.5397	3.731	0	19.96	22.79	0.696	23	0	21.21	0.70	254	13.92	6.40	32.32
9/12/2013 0:00	172	12.62	28.3	18.7	22.62	90	46	71.65	904.3925	3.508	0	14.49	22.67	0.667	22.58	0	20.33	0.67	255	10.61	5.49	31.77
9/13/2013 0:00	173	12.61	29.2	15.5	22.98	89	43	61.93	904.5754	2.529	0	19.02	22.72	0.639	22.82	0	19.48	0.64	256	13.06	5.97	31.17
9/14/2013 0:00	174	12.59	29.5	17.6	22.94	96	43	67.33	902.5176	2.624	7.366	15.31	22.73	0.615	22.68	7.366	18.75	0.62	257	11.03	5.34	30.64
9/15/2013 0:00	175	12.59	29.5	17.5	22.34	97	38	75.44	901.2704	2.636	0.508	19.43	22.99	0.624	23.1	0.508	19.02	0.62	258	13.29	6.19	30.02
9/16/2013 0:00	176	12.59	30.2	16	22.94	91	37	66.16	902.5784	2.887	0	19.02	23.04	0.596	23.01	0	18.17	0.60	259	12.84	6.39	29.38
9/17/2013 0:00	177	12.49	29.8	17.3	20.91	97	49	81.5	905.0762	2.413	3.302	15.47	22.72	0.599	22.66	3.302	18.26	0.60	260	11.16	5.14	28.87
9/18/2013 0:00	178	12.39	26.2	17.1	21.22	97	59	82.7	903.7141	3.058	0.508	15.1	22.01	0.709	21.98	0.508	21.61	0.71	261	10.95	4.62	28.40
9/19/2013 0:00	179	12.28	28.7	17.2	22.61	94	50	75.69	900.5612	3.954	0.254	21.48	22.51	0.686	22.69	0.254	20.91	0.69	262	14.58	6.64	27.74
9/20/2013 0:00	180	12.46	24.9	17.8	20.82	95	72	84.2	900.2026	3.203	0	10.85	21.94	0.66	21.8	0	20.12	0.66	263	8.43	3.46	27.39
9/21/2013 0:00	181	12.26	20.2	12.6	17.73	95	70	85.5	902.8654	2.789	0.254	9.14	20.81	0.639	20.37	0.254	19.48	0.64	264	7.24	2.82	27.11
9/22/2013 0:00	182	12.13	26.3	9	17.05	97	39	69.03	902.5706	1.658	0	21.88	19.72	0.617	19.39	0	18.81	0.62	265	13.79	5.48	26.56
9/23/2013 0:00	183	12.37	27.5	9.6	18.22	92	33	62.14	897.2099	2.866	0	21.99	19.53	0.59	19.1	0	17.98	0.59	266	13.56	6.44	25.92
9/24/2013 0:00	184	12.54	28.5	9.4	18.9	89	18	52.98	894.8795	3.181	0	21.83	18.95	0.557	18.34	0	16.98	0.56	267	12.74	7.18	25.20
9/25/2013 0:00	185	12.53	30.2	10.7	19.05	86	27	58.04	901.6994	2	0	21.48	19.44	0.521	19.19	0	15.88	0.52	268	12.96	6.40	24.56
9/26/2013 0:00	186	12.53	30.6	9.1	19.74	92	24	56.57	897.6115	2.631	0	21.44	19.77	0.491	19.44	0	14.97	0.49	269	12.76	6.86	23.88
9/27/2013 0:00	187	12.56	33.7	14	24.48	85	27	51.47	895.1619	4.465	0	20.61	20.44	0.449	20.24	0	13.69	0.45	270	12.65	8.35	23.04
9/28/2013 0:00	188	12.67	30.4	16.3	23.01	87	46	69.5	896.0607	4.991	0	16	21.01	0.398	20.85	0	12.13	0.40	271	10.88	6.54	22.39
9/29/2013 0:00	189	12.62	24	6.7	15.6	95	33	68.66	903.6102	3.27	0.508	21	19.81	0.381	18.69	0.508	11.61	0.38	272	12.54	5.87	21.80
9/30/2013 0:00	190	12.54	25.8	3.8	14.51	96	29	67.02	903.9347	1.886	0	21.46	18.17	0.33	16.98	0	10.06	0.33	273	12.50	5.50	21.25
10/1/2013 0:00	191	12.57	31.3	8	17.44	88	14	57.98	897.0313	1.818	0	21.48	19.24	0.268	18.12	0	8.17	0.27	274	11.75	6.60	20.59
10/2/2013 0:00	192	12.58	33.2	8.6	20.52	90	15	53.35	896.8738	3.153	0	20.74	18.72	0.139	17.77	0	4.24	0.14	275	11.48	7.81	19.81
10/3/2013 0:00	193	12.62	31.7	13.1	22.37	92	21	59.9	898.0092	3.662	0	20.51	18.47	-0.01	20.26	0	-0.30	-0.01	276	11.91	7.52	19.06
10/4/2013 0:00	194	12.6	32.7	12.3	22.96	96	23	60.18	896.3726	3.949	0	19.93	19.22	-0.009	20.91	0	-0.27	-0.01	277	11.71	7.66	18.29
10/5/2013 0:00	195	12.61	31.9	15.3	22.83	90	16	55.33	896.8754	3.895	0	19.96	20.74	-0.009	21.12	0	-0.27	-0.01	278	11.37	7.83	17.51
10/6/2013 0:00	196	12.55	19.3	3.5	11.16	77	27	46.61	905.9158	3.775	0	19.75	13.17	-0.015	12.01	0	-0.46	-0.02	279	10.98	5.52	16.96
10/7/2013 0:00	197	12.45	24.9	1.5	12.12	82	14	47.67	907.4444	2.041	0	20.38	13.15	-0.015	12.94	0	-0.46	-0.02	280	10.63	5.63	16.39
10/8/2013 0:00	198	12.54	27.9	3.9	15.14	80	17	45.89	906.806	1.606	0	19.98	16.06	-0.014	15.2	0	-0.43	-0.01	281	10.54	5.57	15.84
10/9/2013 0:00	199	12.51	28.4	3.6	15.78	80	17	43.05	902.124	3.117	0	18	14.92	-0.013	14.47	0	-0.40	-0.01	282	9.68	6.60	15.18
10/10/2013 0:00	200	12.52	28.2	7.2	17.51	72	28	49.86	900.0281	3.75	0	18.28	16.7	-0.011	16.44	0	-0.34	-0.01	283	10.19	6.65	14.51
10/11/2013 0:00	201	12.54	28.3	9.9	19.94	90	39	60.35	898.2773	4.915	0	18.39	19.48	-0.008	19.56	0	-0.24	-0.01	284	10.89	6.58	13.85
10/12/2013 0:00	202	12.53	26.6	8	16.58	80	17	44.58	898.5952	3.241	0	19.49	16.51	-0.011	16.12	0	-0.34	-0.01	285	10.13	6.43	13.21
10/13/2013 0:00	203	12.45	24.4	2.8	13.67	77	28	50.75	904.482	2.227	0	18.79	15.56	-0.014	14.24	0	-0.43	-0.01	286	10.10	5.08	12.70
10/14/2013 0:00	204	12.33	16.5	10.8	14.12	97	62	89.1	907.6157	3.426	9.4	1.94	13.96	-0.013	13.83	9.4	-0.40	-0.01	287	3.09	1.81	12.52
10/15/2013 0:00	205	12.21	26.6	14.4	18.96	96	40	82.7	901.8127	3.749	0.508	10.61	17.91	-0.009	18.4	0.508	-0.27	-0.01	288	7.20	4.62	12.06
10/16/2013 0:00	206	12.04	17.9	7.7	11.18	88	52	67.68	904.9107	4.282	0	10.68	11.46	-0.015	10.95	0	-0.46	-0.02	289	7.05	3.62	11.70
10/17/2013 0:00	207	11.9	14	4.6	8.76	88	47	68.47	905.697	2.379	0	11.94	10.82	-0.016	10.15	0	-0.49	-0.02	290	7.43	2.91	11.41
10/18/2013 0:00	208	11.84	21.7	2.1	10.64	96	48	80.8	901.0021	2.489	0	17.6	12.22	-0.015	12.35	0	-0.46	-0.02	291	9.96	4.09	11.00
10/19/2013 0:00	209	12.07	16.9	-1.8	9.22	96	51	84.7	900.7839	4.242	0	11.37	10.86	-0.015	10.06	0	-0.46	-0.02	292	7.16	3.41	10.66
10/20/2013 0:00	210	11.88	18.4	-1.5	7.482	94	23	61.23	903.9959	3.028	1.27	18.48	9.17	-0.017	9.4	1.27	-0.52	-0.02	293	9.34	4.62	10.19
10/21/2013 0:00	211	12.12	27	1.9	13.34	91	11	52.18	896.27	2.916	0	18.25	12.94	-0.013	13.47	0	-0.40	-0.01	294	8.55	6.19	9.58
10/22/2013 0:00	212	12.22	18	1	10.67	91	39	61.36	902.7654	4.158	0	17.16	12.18	-0.014	12.26	0	-0.43	-0.01	295	9.13	4.44	9.13
10/23/2013 0:00	213	12.29	24.5	1.2	11.35	92	23	60.98	905.2067	2.939	0	17.39	12.31	-0.015	12.71	0	-0.46	-0.02	296	8.69	5.35	8.60
10/24/2013 0:00	214	12.38	25.7	1.7	13.32	84	15	48.44	903.9302	2.86	0	17.57	13.11	-0.014	13.91	0	-0.43	-0.01	297	8.22	5.68	8.03
10/25/2013 0:00	215	12.47	19.6	3.6	11.29	87	42	63.9	906.793	3.186	0	17.02	13.05	-0.014	12.39	0	-0.43	-0.01	298	8.95	4.18	7.61
10/26/2013 0:00	216	12.46	18.4	3.3	10.25	84	56	72.17	908.717	3.024	0	12.29	12.38	-0.014	12.39	0	-0.43	-0.01	299	7.25	3.20	7.29
10/27/2013 0:00	217	12.44	22.4	5.6	13.35	96	43	72.74	905.3253	2.888	0	15.92	14.93	-0.012	15.36	0	-0.37	-0.01	300	8.59	4.14	6.88
10/28/2013 0:00	218	12.42	22.8	0.5	10.63	92	21	59.05	903.1232	2.946	0	17.02	12.73	-0.015	13.47	0	-0.46	-0.02	301	8.06	5.00	6.38
10/29/2013 0:00	219	12.48	25.1	6	15.58	96	54	78.5	898.7245	3.849	0	10.02	15.6	-0.011	16.09	0	-0.34	-0.01	302	6.39	3.77	6.00
10/30/2013 0:00	220	12.45	25.3	16.4	19.73	93	49	78.93	899.3883	4.338	0	10.74	19.93	-0.007	20.38	0	-0.21	-0.01	303	6.80	4.24	5.58
10/31/2013 0:00	221	12.33	25.8	14.7	19.57	93	26	69.56	896.253	4.31	1.524	8.53	18.95	-0.007	19.4	1.524	-0.21	-0.01	304	5.50	4.88	5.09
11/1/2013 0:00	222	12.18	20.4	3.1	12.22	79	18	42.68	895.6873	3.865	0	16.47	13.46	-0.013	14.08	0	-0.40	-0.01	305	7.38	5.11	4.58

11/2/2013 0:00	223	12.34	19.9	3.1	11.03	71	24	44.01	899.8787	4.415	0	16.14	11.3	-0.015	12.07	0	-0.46	-0.02	306	7.33	5.27	4.05
11/3/2013 0:00	224	12.37	19.4	-2.1	8.26	85	24	53.77	907.8183	3.352	0	16.04	10.65	-0.017	10.67	0	-0.52	-0.02	307	7.31	4.52	3.60
11/4/2013 0:00	225	12.43	20.1	4.3	10.97	83	30	54.19	898.822	4.543	0	14.12	11.47	-0.012	11.68	0	-0.37	-0.01	308	6.89	4.88	3.11
11/5/2013 0:00	226	12.39	18.9	1	10.42	95	41	72.22	897.6256	3.134	0	14.38	12.06	-0.014	12.55	0	-0.43	-0.01	309	7.21	3.61	2.75
11/6/2013 0:00	227	12.44	23.2	6.5	14.46	90	48	76.04	898.009	5.046	0	9.01	15.28	-0.009	15.34	0	-0.27	-0.01	310	5.54	4.16	2.33
11/7/2013 0:00	228	12.31	15.3	-0.9	6.128	86	24	54.57	907.8876	3.54	0	15.7	9.2	-0.017	9.85	0	-0.52	-0.02	311	6.96	3.97	1.93
11/8/2013 0:00	229	12.52	18.1	-6.1	5.764	81	20	49.47	911.9986	3.08	0	14.66	7.443	-0.019	7.465	0	-0.58	-0.02	312	6.41	4.20	1.51
11/9/2013 0:00	230	12.52	17.9	-2	8.04	85	27	55.04	904.6353	4.825	0	11.38	8.38	-0.015	8.52	0	-0.46	-0.02	313	5.68	4.54	1.06
11/10/2013 0:00	231	12.53	19.9	3.8	10.05	96	37	72.4	901.5598	3.116	0	14.78	12.56	-0.012	13.33	0	-0.37	-0.01	314	6.97	3.80	0.68
11/11/2013 0:00	232	12.5	15.9	2.7	8.1	97	69	88.6	907.4145	2.289	0	5.904	9.08	-0.016	8.42	0	-0.49	-0.02	315	4.32	1.71	0.51
11/12/2013 0:00	233	12.44	24.2	4.8	12.9	97	37	79.83	906.9031	2.898	0	12.72	14.53	-0.011	14.45	0	-0.34	-0.01	316	6.32	4.02	0.11
11/13/2013 0:00	234	12.49	10.7	-5.3	1.942	94	30	64.94	918.8824	5.204	0	13	4.352	-0.021	4.25	0	-0.64	-0.02	317	6.03	3.56	
11/14/2013 0:00	235	12.39	15.6	-5.6	3.877	76	29	49.01	913.0292	2.957	0	14.26	5.341	-0.02	5.479	0	-0.61	-0.02	318	6.13	3.51	
11/15/2013 0:00	236	12.43	19.9	0.9	8.91	69	38	50.06	899.8531	3.56	0	11.22	9.44	-0.014	9.6	0	-0.43	-0.01	319	5.46	3.93	
11/16/2013 0:00	237	12.46	24.3	-2.3	10.74	90	24	58.18	895.0209	3.243	0	10.88	10	-0.014	11.07	0	-0.43	-0.01	320	5.13	4.64	
11/17/2013 0:00	238	12.53	25.4	11.8	17.86	74	22	49.69	890.203	6.496	0	12.49	15.74	-0.005	17.79	0	-0.15	-0.01	321	5.47	6.85	
11/18/2013 0:00	239	12.52	23.8	6.1	14.67	71	20	43.18	895.7635	3.541	0	13.83	14.48	-0.01	15.19	0	-0.30	-0.01	322	5.43	4.94	
11/19/2013 0:00	240	12.49	16.1	1.1	8.86	69	20	39.76	905.0869	2.88	0	9.49	9.78	-0.016	9.24	0	-0.49	-0.02	323	4.54	3.43	
11/20/2013 0:00	241	12.42	21.9	-0.7	11.45	83	37	54.44	899.7944	3.236	0	12.93	12.06	-0.013	12.42	0	-0.40	-0.01	324	5.72	3.87	
11/21/2013 0:00	242	12.55	23.5	10.6	15.16	93	27	65.1	894.93	3.406	0	10.96	15.69	-0.009	15.94	0	-0.27	-0.01	325	5.22	4.21	
11/22/2013 0:00	243	12.49	21.5	-2.7	8.33	96	35	71.11	901.2167	5.301	0	12.85	10.72	-0.014	10.41	0	-0.43	-0.01	326	5.60	4.97	
11/23/2013 0:00	244	12.32	-2.5	-5.2	-3.822	87	67	75.16	912.9948	8.75	0	2.355	-1.945	-0.03	-3.273	0	-0.91	-0.03	327	2.98	1.46	
11/24/2013 0:00	245	12.18	-0.8	-4.2	-2.59	93	76	87.2	915.6299	6.193	0	1.649	-1.322	-0.028	-2.304	0	-0.85	-0.03	328	2.76	1.00	
11/25/2013 0:00	246	12.09	-1.3	-4.2	-2.983	94	85	91.4	911.0885	3.569	0	6.943	-0.04	-0.025	-0.053	0	-0.76	-0.03	329	4.27	0.90	
11/26/2013 0:00	247	12.03	3	-2.4	-0.881	95	72	89.4	902.2171	5.211	3.556	7.263	1.209	-0.021	-0.235	3.556	-0.64	-0.02	330	4.30	1.39	
11/27/2013 0:00	248	11.91	6.2	-4.9	-0.373	93	52	80.7	909.0224	3.651	3.048	13.11	1.067	-0.023	0.979	3.048	-0.70	-0.02	331	5.64	2.02	
11/28/2013 0:00	249	12.35	11.5	-7.5	1.022	94	49	79.63	909.1542	2.467	0	12.61	1.457	-0.023	2.874	0	-0.70	-0.02	332	5.45	2.15	
11/29/2013 0:00	250	12.47	13.8	-3.5	3.563	93	37	73.74	906.6982	2.352	0	12.88	4.292	-0.019	5.029	0	-0.58	-0.02	333	5.24	2.56	
11/30/2013 0:00	251	12.51	16.6	-5.2	4.156	95	40	75.08	908.0397	3.149	0	12.5	3.926	-0.021	5.145	0	-0.64	-0.02	334	5.20	3.06	
12/1/2013 0:00	252	12.5	19.3	-1.6	7.766	93	36	71.88	905.1044	2.263	0	9.15	7.231	-0.016	7.67	0	-0.49	-0.02	335	4.39	2.87	
12/2/2013 0:00	253	12.5	18.4	1.4	7.942	92	38	73.37	901.5449	2.011	0	7.986	7.534	-0.016	8.07	0	-0.49	-0.02	336	4.15	2.57	
12/3/2013 0:00	254	12.44	22.1	0.6	8.84	83	23	56.16	893.4121	2.343	0	12.58	9.05	-0.016	10.03	0	-0.49	-0.02	337	4.58	3.78	
12/4/2013 0:00	255	12.53	24.6	4.9	13.6	65	12	34.62	887.7974	4.986	0	11.84	10.55	-0.011	12.26	0	-0.34	-0.01	338	3.86	6.29	
12/5/2013 0:00	256	12.5	13.8	-2.6	4.806	80	38	63.23	890.6898	3.642	0	7.431	6.063	-0.018	5.511	0	-0.55	-0.02	339	3.91	2.82	
12/6/2013 0:00	257	12.3	-2.6	-8.5	-7.053	83	57	70.55	901.976	5.741	0	3.401	-3.739	-0.032	-5.115	0	-0.98	-0.03	340	3.14	1.36	
12/7/2013 0:00	258	12.21	-3.2	-11.1	-8.32	85	64	77.66	907.0708	3.634	0	10.06	-4.334	-0.033	-5.479	0	-1.01	-0.03	341	4.74	1.13	
12/8/2013 0:00	259	12.19	-8.6	-13.5	-10.9	89	64	76.97	908.6321	2.407	0	3.475	-7.451	-0.038	-9.2	0	-1.16	-0.04	342	3.14	0.63	
12/9/2013 0:00	260	12.13	13.2	-9.2	-1.069	94	28	73.26	897.5587	4.562	0	11.47	-0.766	-0.023	-0.602	0	-0.70	-0.02	343	4.48	3.62	
12/10/2013 0:00	261	12.29	-2.4	-13.1	-6.467	92	62	80.1	904.0329	3.541	0	4.63	-4.2	-0.03	-4.904	0	-0.91	-0.03	344	3.40	0.97	
12/11/2013 0:00	262	12.11	10.5	-14	-2.483	90	16	58.19	906.9707	3.661	0	12.56	-2.078	-0.028	-0.791	0	-0.85	-0.03	345	4.42	3.20	
12/12/2013 0:00	263	12.5	5.4	-10.1	-1.419	86	44	60.46	910.7424	5.002	1.27	11.77	-0.61	-0.024	-0.47	1.27	-0.73	-0.02	346	4.77	2.29	
12/13/2013 0:00	264	12.44	7.3	-9.9	-0.758	87	43	69.69	910.6298	2.979	0	4.388	-0.753	-0.024	-0.834	0	-0.73	-0.02	347	3.29	1.75	
12/14/2013 0:00	265	12.33	17.3	0.6	6.781	92	39	67.54	895.6814	4.763	0.508	10.63	6.255	-0.012	6.611	0.508	-0.37	-0.01	348	4.45	3.64	
12/15/2013 0:00	266	12.5	10.1	-5.4	2.042	79	36	57.67	904.6227	5.555	0	11.95	2.098	-0.019	2.348	0	-0.58	-0.02	349	4.53	3.26	
12/16/2013 0:00	267	12.42	15.7	-8.9	2.048	87	23	57.46	906.3284	2.675	0	12.21	1.884	-0.021	2.552	0	-0.64	-0.02	350	4.29	3.18	
12/17/2013 0:00	268	12.41	21.6	-4.4	5.373	76	13	47.54	904.481	1.585	0	12.37	6.301	-0.018	7.569	0	-0.55	-0.02	351	3.75	3.51	
12/18/2013 0:00	269	12.45	20.6	-4.8	4.916	81	17	51.44	907.068	2.021	0	12.27	5.566	-0.02	6.467	0	-0.61	-0.02	352	3.95	3.59	
12/19/2013 0:00	270	12.46	21	-5.4	7.083	86	22	52.92	901.307	3.785	0	10.91	5.521	-0.018	6.881	0	-0.55	-0.02	353	4.00	4.47	
12/20/2013 0:00	271	12.49	22.2	4.8	10.97	71	14	44.01	891.5269	4.436	0	9.74	9.66	-0.011	10.69	0	-0.34	-0.01	354	3.58	5.37	
12/21/2013 0:00	272	12.39	7.2	-2.3	1.383	94	36	71.84	893.2403	3.768	0.762	3.013	2.305	-0.02	1.989	0.762	-0.61	-0.02	355	3.01	1.99	
12/22/2013 0:00	273	12.25	6.6	-3.1	0.995	97	87	94.8	887.2385	3.88	1.778	3.412	2.401	-0.019	2.032	1.778	-0.58	-0.02	356	3.08	0.86	
12/23/2013 0:00	274	12.13	5.3	-6.7	-1.396	92	53	78.13	902.057	3.112	0	10.84	-0.34	-0.024	1.08	0	-0.73	-0.02	357	4.62	1.66	
12/24/2013 0:00	275	12.37	7.4	-9.7	-2.369	94	51	80.5	909.9244	2.169	0	12.03	-1.688	-0.028	0.502	0	-0.85	-0.03	358	4.88	1.64	
12/25/2013 0:00	276	12.47	16.3	-9	2.697	93	30	70.46	905.6157	4.722	0	12.09	1.622	-0.02	2.852	0	-0.61	-0.02	359	4.49	4.02	
12/26/2013 0:00	277	12.5	9.1	-8.2	1.751	92	45	74.63	909.4238	4.423	0	9.44	1.808	-0.021	2.539	0	-0.64	-0.02	360	4.28	2.34	
12/27/2013 0:00	278	12.39	12.7	-8.9	-0.577	91	27	67.45	909.5592	2.212	0	12.27	-0.132	-0.026	1.114	0	-0.79	-0.03	361	4.49	2.55	
12/28/2013 0:00	279	12.41	14.9	-7.2	1.155	88	19	61.24	908.9944	1.81	0	12.33	2.404	-0.023	3.621	0	-0.70	-0.02	362	4.26	2.75	
12/29/2013 0:00	280	12.42	12.6	-7.8	1.199	89	43	70.41	900.0854	3.095	0	12.13	1.624	-0.022	2.084	0	-0.67	-0.02	363	4.81	2.50	
12/30/2013 0:00	281	12.44	0.8	-11.2	-3.696	92	53	73.31	902.2899	6.242	0	7.255	-2.835	-0.029	-2.881	0	-0.88	-0.03	364	3.97	1.72	
12/31/2013 0:00	282	12.32	12.3	-11.9	-2.25	87	28	64.34	905.8926	3.025	0	12.21	-2.03	-0.029	-0.896	0	-0.88	-0.03	365	4.61	2.89	
1/1/2014 0:00	283	12.44	14.4	-8.1	2.03	84	29	57.56	905.8589	3.754	0	12.21	0.954	-0.023	2.25	0	-0.70	-0.02	1	4.58	3.39	
1/2/2014 0:00	284	12.47	19.7	-3.5	6.008	78	22	52.81	899.4774	5.598	0	12.08	5.14	-0.016	6.604	0	-0.49	-0.02	2	4.29	5.57	
1/3/2014 0:00	285	12.42	10.2	-9.3	-0.634	89	33	65.15	910.1617	3.114	0	12.41	1.703	-0.023	2.56	0	-0.70	-0.02	3	4.83	2.54	
1/4/2014 0:00	286	12.38	16.9	-10.2	3.51	92	30	59.53	900.5405	5.131	0	12.1	2.6	-0.02	3.811	0	-0.61	-0.02	4	4.71	4.33	
1/5/2014 0:00	287	12.46	16.3	-2	5.579	80	26	57.87	892.6508	5.722	0	11	6.349	-0.015	7.577	0	-0.46	-0.02	5	4.37	4.64	
1/6/2014 0:00	288	12.38	1.3	-11	-4.64	85	33	61.7	904.7798	6.748	0	12.75	-1.929	-0.026	-1.477	0	-0.79	-0.03	6	5.15	2.59	
1/7/2014 0:00	289	12.28	0.7	-16.9	-8.33	86	37	62.48	913.6066	3.163	0	12.77	-4.818	-0.034	-5.63	0	-1.04	-0.03	7	5.35	1.67	
1/8/2014 0:00	290	12.32	11.7	-11.9	-1.751	75	24	52.15	905.0237	3.734	0	11.92	-1.141	-0.026	-0.895	0	-0.79	-0.03	8	4.69	3.30	
1/9/2014 0:00	291	12.43	10.5	-4.6	2.17	80	37	56.39	899.2736	4.447	0	12.42	2.778	-0.018	4.127	0	-0.55	-0.02	9	5.03	3.00	
1/10/2014 0:00	292	12.4	13.2	-9.3	0.909	92	37	70.66	900.1365	3.009	0	11.61	2.627	-0.02	3.378	0	-0.61	-0.02	10	4.98	2.72	
1/11/2014 0:00	293	12.44	16.8	-1.3	6.827	80	18	48.92	892.8525	3.66	0	12.43	5.852	-0.014	7.589	0	-0.43	-0.01	11	4.63	3.98	

1/12/2014 0:00	294	12.45	18	-5.7	4.98	66	16	40.63	900.2943	2.638	0		13.02	5.675	-0.018	6.141	0	-0.55	-0.02	12	4.58	3.80
1/13/2014 0:00	295	12.46	24.3	-1.7	10.13	64	12	35.11	893.9083	4.852	0		12.38	7.875	-0.012	9.81	0	-0.37	-0.01	13	4.23	6.56
1/14/2014 0:00	296	12.44	14.2	-4.9	3.732	80	11	40.23	901.4097	3.132	0		13.29	4.357	-0.019	5.45	0	-0.58	-0.02	14	4.78	3.63
1/15/2014 0:00	297	12.42	13.4	-5.1	3.505	68	31	44.46	905.0677	5.077	0		12.87	3.233	-0.02	4.311	0	-0.61	-0.02	15	5.20	3.97
1/16/2014 0:00	298	12.38	14	-7.3	1.687	82	23	53.6	906.9209	3.635	0		12.84	2.081	-0.021	2.478	0	-0.64	-0.02	16	5.16	3.62
1/17/2014 0:00	299	12.43	14.4	-4.6	3.964	67	25	44.35	903.4754	4.113	0		13.06	3.448	-0.02	4.184	0	-0.61	-0.02	17	5.19	3.91
1/18/2014 0:00	300	12.39	13.8	-7.7	1.518	73	21	45.63	906.972	2.385	0		12.9	2.389	-0.022	2.93	0	-0.67	-0.02	18	5.19	3.09
1/19/2014 0:00	301	12.4	17.8	-5.8	3.848	77	17	45.52	903.5759	3.613	0		13.55	3.142	-0.021	4.073	0	-0.64	-0.02	19	5.20	4.47
1/20/2014 0:00	302	12.4	20.8	-7.1	6.017	70	11	37.24	904.2793	3.934	0		13.95	4.113	-0.018	5.793	0	-0.55	-0.02	20	4.98	5.45
1/21/2014 0:00	303	12.48	19.5	-1.5	7.458	52	14	33.86	901.5844	4.772	0		13.97	6.723	-0.016	8.24	0	-0.49	-0.02	21	5.02	5.74
1/22/2014 0:00	304	12.4	17.9	-7.5	3.287	74	16	43.32	908.7325	3.375	0		14.01	2.967	-0.021	3.837	0	-0.64	-0.02	22	5.44	4.46
1/23/2014 0:00	305	12.38	10.5	-10.8	1.097	79	32	50.24	901.1738	3.848	0		10.2	1.231	-0.023	1.273	0	-0.70	-0.02	23	5.14	2.92
1/24/2014 0:00	306	12.3	2.1	-14.2	-5.734	79	22	52.99	913.2716	7.029	0		4.874	-3.868	-0.03	-4.931	0	-0.91	-0.03	24	3.80	2.92
1/25/2014 0:00	307	12.18	10.5	-15.6	-4.339	82	23	53.7	911.9541	3.258	0		13.45	-3.492	-0.032	-3.278	0	-0.98	-0.03	25	6.00	3.13
1/26/2014 0:00	308	12.57	19.8	-3.9	6.273	60	19	40.42	903.1915	3.629	0		13.04	6.74	-0.015	6.757	0	-0.46	-0.02	26	5.47	4.86
1/27/2014 0:00	309	12.54	19.3	-1.2	7.2	61	21	39.77	893.9608	3.773	0		14.65	6.679	-0.016	8.06	0	-0.49	-0.02	27	5.95	4.85
1/28/2014 0:00	310	12.49	4.7	-10.3	-4.239	68	26	38.6	904.6087	5.908	0		8.53	-2.057	-0.027	-2.985	0	-0.82	-0.03	28	4.88	3.15
1/29/2014 0:00	311	12.32	1.1	-15.8	-8.91	56	29	43.1	908.9547	2.484	0		14.92	-5.105	-0.036	-4.609	0	-1.10	-0.04	29	6.91	1.96
1/30/2014 0:00	312	12.37	10.8	-13.4	-1.804	54	19	34.61	902.7979	4.497	0		14.41	-1.108	-0.026	-1.207	0	-0.79	-0.03	30	6.35	4.03
1/31/2014 0:00	313	12.48	23.1	-1.1	8.83	53	19	32.77	891.0986	5.383	0		9.26	7.075	-0.012	8.2	0	-0.37	-0.01	31	4.88	6.68
2/1/2014 0:00	314	12.41	19	-0.6	6.71	62	27	45.12	891.7044	3.332	0		6.564	6.056	-0.014	6.401	0	-0.43	-0.01	32	4.40	4.00
2/2/2014 0:00	315	12.29	7.7	-2.5	1.014	80	45	64.39	895.0337	4.579	0		10.52	3.32	-0.019	3.269	0	-0.58	-0.02	33	5.82	2.71
2/3/2014 0:00	316	12.29	2.7	-8.3	-4.294	92	64	83.9	903.5135	4.618	0		10.23	-0.946	-0.025	-2.317	0	-0.76	-0.03	34	5.96	1.69
2/4/2014 0:00	317	12.23	0.5	-9.8	-3.781	95	86	91.3	899.9645	3.107	0		5.366	-2.098	-0.025	-3.481	0	-0.76	-0.03	35	4.28	0.86
2/5/2014 0:00	318	12.15	5.3	-3.9	-0.715	95	72	87.5	895.496	5.384	0		6.542	0.388	-0.02	-0.224	0	-0.61	-0.02	36	4.72	1.58
2/6/2014 0:00	319	12.02	-3.8	-13.6	-10.6	83	66	75.76	910.357	7.015	0		8.79	-6.674	-0.036	-8.24	0	-1.10	-0.04	37	5.61	1.45
2/7/2014 0:00	320	11.87	-6.7	-15.3	-11.34	85	72	79.18	909.1826	4.09	0		10.79	-6.114	-0.035	-7.926	0	-1.07	-0.04	38	6.48	1.06
2/8/2014 0:00	321	12.1	7.9	-11.5	-3.927	90	48	75.36	900.8282	4.688	0		15.36	-1.695	-0.024	-2.501	0	-0.73	-0.02	39	7.96	2.82
2/9/2014 0:00	322	12.44	19.2	-5.5	5.689	87	24	57.92	898.476	3.974	0		14.73	3.519	-0.016	4.92	0	-0.49	-0.02	40	7.24	4.90
2/10/2014 0:00	323	12.54	10.9	-3.9	1.636	93	44	71.88	899.7609	4.53	0		13.52	3.048	-0.018	2.992	0	-0.55	-0.02	41	7.33	3.17
2/11/2014 0:00	324	12.34	-3.7	-7.5	-5.957	93	81	89.1	904.3194	4.403	0		3.709	-3.513	-0.028	-4.057	0	-0.85	-0.03	42	3.76	0.83
2/12/2014 0:00	325	12.23	0.7	-7.8	-4.472	92	65	82.5	904.514	3.379	0		6.591	-1.531	-0.025	-2.441	0	-0.76	-0.03	43	4.93	1.29
2/13/2014 0:00	0	12.66	13.1	0.3	6.082	55.3	20.2	34.64	901.0342	1.875	0.254	0	3.854	6.674	-0.011	5.658	0.254	-0.34	-0.01	44	3.94	2.66
2/14/2014 0:00	1	12.49	19.9	-4.5	7.698	73.2	19.6	43.08	897.6934	3.144	0	0	17.13	8.46	-0.014	9.11	0	-0.43	-0.01	45	8.16	4.92
2/15/2014 0:00	2	12.6	15.2	-0.6	7.904	58.5	22.4	39.07	899.872	4.347	0	0	16.33	7.862	-0.014	8.25	0	-0.43	-0.01	46	8.00	4.84
2/16/2014 0:00	3	12.55	29.1	-2.7	10.88	60.4	10.8	35.25	900.6951	2.81	0	0	15.46	10.48	-0.014	11.01	0	-0.43	-0.01	47	7.19	6.74
2/17/2014 0:00	4	12.57	26.7	-0.5	12.48	79.3	10.5	40.32	899.6309	3.509	0	0	17.45	13.62	-0.01	14.19	0	-0.30	-0.01	48	8.04	6.69
2/18/2014 0:00	5	12.59	18.6	-1.1	11.16	44.6	8.5	22.77	904.0192	3.895	0	0	16.78	11.83	-0.011	12.11	0	-0.34	-0.01	49	7.72	5.54
2/19/2014 0:00	6	12.52	26.1	0.1	11.55	42.6	9	25.24	899.4645	3.916	0	0	17.49	10.64	-0.013	11.91	0	-0.40	-0.01	50	7.76	7.37
2/20/2014 0:00	7	12.55	23.6	1.9	11.84	48.5	12.1	27.82	894.1207	3.168	0	0	14.78	12.16	-0.012	12.51	0	-0.37	-0.01	51	7.35	5.82
2/21/2014 0:00	8	12.58	15.6	-4.6	8.2	57.7	17.8	29.25	897.1249	5.24	0	0	18.47	9.51	-0.012	10.22	0	-0.37	-0.01	52	9.11	5.63
2/22/2014 0:00	9	12.44	19.5	-8.4	5.913	52	7.6	25.7	900.1139	3.707	0	0	14.98	4.963	-0.019	6.597	0	-0.58	-0.02	53	7.59	5.75
2/23/2014 0:00	10	12.51	23.5	-2.9	10.09	44.2	12	24.73	896.519	3.341	0	0	18.86	10.33	-0.014	11.63	0	-0.43	-0.01	54	8.85	6.34
2/24/2014 0:00	11	12.55	14.3	0	6.132	55.8	27.9	38.31	901.2017	3.391	0	0	18.75	8.27	-0.015	8.93	0	-0.46	-0.02	55	9.72	4.55
2/25/2014 0:00	12	12.48	20.9	-4.4	6.29	69.4	19.8	48.39	902.0193	2.972	0	0	16.93	8.5	-0.015	9.27	0	-0.46	-0.02	56	8.96	5.26
2/26/2014 0:00	13	12.52	6	-0.7	2.535	90.2	56	71.35	903.1215	3.743	0	0	6.447	5.128	-0.017	5.149	0	-0.52	-0.02	57	5.23	1.95
2/27/2014 0:00	14	12.41	7.1	-7.3	-1.414	77.8	36.5	53.67	905.766	4.167	0	0	17.17	3.738	-0.02	4.054	0	-0.61	-0.02	58	9.76	3.36
2/28/2014 0:00	15	12.52	19.2	-8.3	4.844	86.6	26.5	53.12	897.0422	4.234	0	0	18.58	6.103	-0.018	7.424	0	-0.55	-0.02	59	10.18	5.57
3/1/2014 0:00	16	12.51	24.1	6.5	14.86	63.8	10.5	29.28	892.0922	5.827	0	0	19.41	14.14	-0.007	15.38	0	-0.21	-0.01	60	9.75	8.30
3/2/2014 0:00	17	12.52	28.5	-1.8	10.55	87.4	10.3	44.66	897.4539	4.409	0	0	17.19	12.4	-0.012	12.65	0	-0.37	-0.01	61	9.06	8.53
3/3/2014 0:00	18	12.34	-1.6	-11.9	-8.49	82.6	64.4	72.71	904.4667	6.636	0	0.5	4.432	-3.825	-0.031	-4.29	0.5	-0.94	-0.03	62	4.41	1.49
3/4/2014 0:00	19	12.26	4.5	-15.5	-5.678	81.9	32.2	56.59	907.8116	3.148	0	0	15.33	-1.261	-0.024	-1.211	0	-0.73	-0.02	63	9.37	2.64
3/5/2014 0:00	20	12.58	20.1	-8.1	5.336	67.4	18.7	40.77	899.3964	3.425	0	0	19.74	7.556	-0.011	7.976	0	-0.34	-0.01	64	10.67	5.80
3/6/2014 0:00	21	12.64	8.2	-3.1	5.123	92.2	41.4	62.14	900.6307	5.5	0	0	10.72	5.864	-0.009	5.65	0	-0.27	-0.01	65	7.37	3.20
3/7/2014 0:00	22	12.49	20.7	-6.2	6.879	94.9	17.1	53.93	903.4913	3.638	0	0	20.39	7.954	-0.011	7.731	0	-0.34	-0.01	66	11.17	6.03
3/8/2014 0:00	23	12.59	26.8	4.8	14.83	55	9.1	28.97	894.4712	4.724	0	0	18.46	14.75	-0.004	14.82	0	-0.12	0.00	67	9.71	8.37
3/9/2014 0:00	24	12.54	9.7	-3.8	3.724	79.8	43.2	61.03	905.0617	7.783	0	0.1	17.08	6.249	-0.009	5.704	0.1	-0.27	-0.01	68	10.42	4.69
3/10/2014 0:00	25	12.46	18.2	-6.5	5.262	82.2	16.9	47	908.4009	2.068	0	0	21.66	8.26	-0.013	9.01	0	-0.40	-0.01	69	11.90	4.85
3/11/2014 0:00	26	12.51	25.9	-2.5	11.21	63.6	6.5	29.63	899.8192	3.701	0	0	22.25	11.41	-0.009	12.58	0	-0.27	-0.01	70	11.28	7.88
3/12/2014 0:00	27	12.58	26.1	2.1	14.26	65.2	10.2	33.73	892.5428	7.381	0	0	21.84	14.23	-0.006	15.19	0	-0.18	-0.01	71	11.50	10.60
3/13/2014 0:00	28	12.54	12.3	-4.7	4.414	76.6	16.9	44.72	909.0879	5.666	0	0	22.01	8.07	-0.01	7.649	0	-0.30	-0.01	72	12.40	5.85
3/14/2014 0:00	29	12.45	18.5	-8	6.164	65.6	16.1	33.34	904.7162	3.547	0	0	20.06	6.998	-0.013	8.38	0	-0.40	-0.01	73	11.40	5.80
3/15/2014 0:00	30	12.55	21.5	1	12.16	53.7	13.8	28.76	899.4595	4.395	0	0	20.67	13.05	-0.006	13.51	0	-0.18	-0.01	74	11.42	7.09
3/16/2014 0:00	31	12.54	19.6	0.5	9.79	80.1	29.3	47.01	896.0541	3.057	0.762	0.2	10.31	11.06	-0.008	11.21	0.762	-0.24	-0.01	75	7.42	4.24
3/17/2014 0:00	32	12.53	11.3	-4.3	5.631	70.9	21.9	49.29	904.4413	9.13	0	0	22.18	7.283	-0.008	7.165	0	-0.24	-0.01	76	12.87	7.00
3/18/2014 0:00	33	12.44	24.4	-6.3	9.3	76.5	10.5	35.49	894.4351	4.579	0	0	20.95	8.72	-0.01	10.8	0	-0.30	-0.01	77	11.75	8.12
3/19/2014 0:00	34	12.59	20.7	3.7	13.44	43.6	7	20.01	890.025	7.938	0	0	20.44	12.77	-0.003	14.34	0	-0.09	0.00	78	11.22	9.73
3/20/2014 0:00	35	12.5	15.7	-3.1	5.628	70.1	17.5	39.84	906.0399	2.885	0	0	22.07	9.61	-0.01	9.73	0	-0.30	-0.01	79	12.81	5.23
3/21/2014 0:00	36	12.47	25.7	-4.5	10.76	54.4	9.3	27.01	902.6028	4.258	0	0	22.77	10.49	-0.009	12.43	0	-0.27	-0.01	80	12.45	8.54
3/22/2014 0:00	37	12.59	24.5	7.7	15.6	48.1	8.7	25.14	897.2448	5.273	0	0	22.4	16.01	-0.004	17.08	0	-0.12	0.00	81	12.29	9.02
3/23/2014 0:00	38	12.56	14.5	3.8	8.69	52.6	33	41.09	903.1843	4.402	0	0	20.41	12.49	-0.007	11.49	0	-0.21	-0.01	82	12.44	5.65

3/24/2014 0:00	39	12.48	12.4	-4.8	3.893	62.9	28.8	42.58	909.2139	4.192	0	0	22.54	8.91	-0.01	7.829	0	-0.30	-0.01	83	13.60	5.20	
3/25/2014 0:00	40	12.5	18.9	-1.2	8.36	53.2	19.2	36.06	904.3727	4.598	0	0	22.43	9.75	-0.009	10.77	0	-0.27	-0.01	84	13.15	6.98	
3/26/2014 0:00	41	12.49	14.6	-4.9	5.389	74	21	43.66	907.575	3.928	0	0	16.9	8.09	-0.01	8.02	0	-0.30	-0.01	85	10.85	5.02	
3/27/2014 0:00	42	12.53	21.9	3.3	11.95	90.9	28.6	57.61	895.6204	6.62	2.794	0.1	17.19	11.16	-0.004	11.62	2.794	-0.12	0.00	86	11.27	7.27	
3/28/2014 0:00	43	12.58	23.2	5.7	14.45	89.7	13.9	49.52	892.1091	6.575	0	0	22.37	13.59	-0.001	14.39	0	-0.03	0.00	87	13.50	8.86	
3/29/2014 0:00	44	12.56	21.8	3.7	12.42	74.4	20	43.51	898.5878	3.174	0	0	23.39	14.53	-0.006	15.5	0	-0.18	-0.01	88	14.08	6.60	
3/30/2014 0:00	45	12.5	21.3	-2.2	9.83	84.9	14.5	41.7	907.7912	3.259	0	0	24.02	11.73	-0.009	12.98	0	-0.27	-0.01	89	14.28	6.71	
3/31/2014 0:00	46	12.55	27.1	4.3	16.49	43.6	21	32.32	899.8365	6.952	0	0	21.62	15.88	-0.003	17.38	0	-0.09	0.00	90	13.05	10.32	
4/1/2014 0:00	47	12.61	25.9	5.9	17.32	75	7.8	29	896.6248	5.592	0	0	25.06	16.73	-0.004	18.75	0	-0.12	0.00	91	14.48	9.56	
4/2/2014 0:00	48	12.56	26.5	2.3	13.4	51.1	14.5	32.76	897.451	4.017	0	0	24.13	15.51	-0.007	16.56	0	-0.21	-0.01	92	14.11	8.64	
4/3/2014 0:00	49	12.57	29.1	5.7	18.32	85.7	8.3	36.83	892.5189	4.747	0	0	20.75	16.87	-0.004	19.18	0	-0.12	0.00	93	12.66	9.04	
4/4/2014 0:00	50	12.61	21.2	4.3	15.07	57.7	9.9	22.46	894.3663	7.201	0	0	24.54	15.41	-0.003	16.68	0	-0.09	0.00	94	14.40	9.60	
4/5/2014 0:00	51	12.47	18.1	-4.1	8.09	87.6	16.8	43.79	904.2346	3.007	0	0	24.46	11.4	-0.01	12.36	0	-0.30	-0.01	95	15.01	6.04	
4/6/2014 0:00	52	12.54	17.8	6.2	11.2	48.8	19.9	33.14	899.3117	6.176	0	0	19.59	13.45	-0.004	12.97	0	-0.12	0.00	96	12.42	7.77	
4/7/2014 0:00	53	12.51	17.2	2.8	8.77	91.5	36.3	63.12	895.5212	3.361	6.858	6.8	20	12.74	-0.007	12.59	6.858	-0.21	-0.01	97	13.33	5.11	
4/8/2014 0:00	54	12.52	17.4	3.4	9.31	93.3	24.8	63.54	899.9195	5.532	0	0	17.56	8.83	-0.009	9.9	0	-0.27	-0.01	98	11.89	6.15	
4/9/2014 0:00	55	12.5	23	0	11.59	80.2	15.9	44.8	907.0863	3.816	0	0	24.29	11.69	-0.008	11.99	0	-0.24	-0.01	99	14.98	7.56	
4/10/2014 0:00	56	12.54	31.4	1.8	16.66	70.5	7.4	31.96	902.7532	3.904	0	0	25.9	14.17	-0.007	14.42	0	-0.21	-0.01	100	15.07	10.06	
4/11/2014 0:00	57	12.6	30.2	9.3	20.48	38.6	8.4	21.4	898.4976	3.944	0	0	24.42	20.86	-0.005	19.05	0	-0.15	-0.01	101	14.13	9.55	
4/12/2014 0:00	58	12.54	29	5	16.86	71.6	15.7	39.22	899.7419	3.019	0	0	22.6	18.43	-0.007	17.67	0	-0.21	-0.01	102	14.19	7.94	
4/13/2014 0:00	59	12.53	31.6	3.6	19.54	67.3	9.9	28.38	894.2872	4.142	0	0	19.41	17.69	-0.006	18.64	0	-0.18	-0.01	103	12.30	9.08	
4/14/2014 0:00	60	12.61	27.8	3.4	20.1	65.3	12.7	30.62	890.8461	7.818	0	0	26.09	20.28	-0.003	21.29	0	-0.09	0.00	104	15.78	11.52	
4/15/2014 0:00	61	12.46	8.3	-4.9	2.449	72.7	27.4	52.2	905.996	9.36	0	0	22.68	5.246	-0.012	5.084	0	-0.37	-0.01	105	14.86	6.54	
4/16/2014 0:00	62	12.37	18.1	-6.8	6.624	76	10.9	36.26	905.228	4.463	0	0	26.85	7.836	-0.003	10.19	0	-0.09	0.00	106	16.50	7.51	
4/17/2014 0:00	63	12.54	27.3	3.1	15.6	34	8.7	19.83	895.147	5.771	0	0	26.16	16.75	0.002	17.98	0	0.06	0.00	107	15.29	11.06	
4/18/2014 0:00	64	12.56	14.6	3.4	9.95	85.5	30.3	59.75	903.2672	4.299	0	0	12.63	12.32	0	13.17	0	0.00	0.00	108	9.51	4.52	
4/19/2014 0:00	65	12.47	21.6	1.5	12.19	89.5	38.5	62.43	906.2106	3.234	0	0	22.95	14.89	0	16.21	0	0.00	0.00	109	15.46	6.11	
4/20/2014 0:00	66	12.62	21.7	6.5	14.27	92.6	48	70.3	903.6277	3.907	0	3.7	14	15.27	0.001	16.3	3.7	0.03	0.00	110	10.54	4.80	
4/21/2014 0:00	67	12.51	25.1	7.7	16.1	95.4	26.6	72.79	901.6351	3.864	0	0	19.74	15.48	0.001	15.18	0	0.03	0.00	111	13.61	6.89	
4/22/2014 0:00	68	12.55	27.4	7.6	17.81	90	26.7	56.3	902.8285	3.989	0	0	26.25	17.81	-0.001	16.12	0	-0.03	0.00	112	17.28	8.42	
4/23/2014 0:00	69	12.58	28.1	7	18.49	93	20.9	49.71	903.2203	3.856	0	0	25.87	19.65	-0.001	17.6	0	-0.03	0.00	113	16.88	8.57	
4/24/2014 0:00	70	12.6	31.6	13.6	21.54	61.6	11.8	38.22	893.947	6.737	0	0	18.91	19.91	0.002	20.46	0	0.06	0.00	114	12.62	11.53	
4/25/2014 0:00	71	12.59	24.1	10.7	17.12	51.4	13.4	28.29	898.2722	5.381	0	0	26.66	17.99	-0.001	18.88	0	-0.03	0.00	115	16.56	9.86	
4/26/2014 0:00	72	12.53	32	6.4	19.43	50.4	9.8	27.25	897.9269	5.006	0	0	25.56	18.5	0	20.8	0	0.00	0.00	116	15.63	11.32	
4/27/2014 0:00	73	12.62	32	16	23.63	71.6	8	31.57	890.4376	6.016	0	0	20.99	22.32	0	24.32	0	0.00	0.00	117	13.85	11.09	
4/28/2014 0:00	74	12.58	23	9.1	17.33	39.2	12.3	23.6	886.9869	8.74	0	0	22.43	17.51	0.005	18.36	0	0.15	0.01	118	14.28	11.47	
4/29/2014 0:00	75	12.42	23.3	2.1	14.58	71.1	11.9	32	891.4001	5.375	0	0	23.62	15.35	0	17.25	0	0.00	0.00	119	15.23	8.87	
4/30/2014 0:00	76	12.48	16.8	6.8	12.38	58.1	20.4	34.33	900.3594	8.62	0	0	20.47	13.37	0.003	14.18	0	0.09	0.00	120	13.82	8.89	
5/1/2014 0:00	77	12.51	16.9	3.3	9.93	65.6	16.5	37.83	906.6062	6.361	0	0	27.04	12.17	0.001	12.61	0	0.03	0.00	121	17.35	8.57	
5/2/2014 0:00	78	12.53	19.1	-0.1	10.28	59.3	19.5	34.07	906.473	3.673	0	0	25.71	12.81	-0.001	13.85	0	-0.03	0.00	122	16.65	7.17	
5/3/2014 0:00	79	12.47	24.4	1.6	13.51	67	12.2	32.2	902.6839	2.852	0	0	28.24	15.88	-0.002	17.07	0	-0.06	0.00	123	17.72	8.07	
5/4/2014 0:00	80	12.58	32.5	3.8	19.89	40.3	7.9	18.29	900.8871	3.209	0	0	28.48	20.29	-0.003	21.68	0	-0.09	0.00	124	17.04	10.12	
5/5/2014 0:00	81	12.61	34.5	12.7	24.3	24.8	5.8	13.94	899.426	5.019	0	0	28.79	24.01	-0.001	26.08	0	-0.03	0.00	125	16.55	12.62	
5/6/2014 0:00	82	12.56	35.9	15.3	25.53	31.3	5	14.64	896.4046	5.026	0	0	28.7	25.37	-0.003	26.55	0	-0.09	0.00	126	16.64	13.02	
5/7/2014 0:00	83	12.57	33.9	11.5	24.25	26.6	5.8	13.64	892.6141	5.055	0	0	27.01	23.7	-0.002	25.28	0	-0.06	0.00	127	15.89	12.10	
5/8/2014 0:00	84	12.57	32.6	14.3	23.71	38.6	12	21.54	891.8878	4.839	0	0	24.52	23.47	-0.002	25.3	0	-0.06	0.00	128	15.52	11.09	
5/9/2014 0:00	85	12.54	27.1	10.5	20.21	35.3	7.1	17.97	895.4939	4.089	0	0	28.63	21.38	-0.002	22.74	0	-0.06	0.00	129	17.27	10.02	
5/10/2014 0:00	86	12.52	28.6	9.1	17.82	55.4	8.6	26.28	898.753	3.178	0	0	27.41	20.71	-0.003	21.48	0	-0.09	0.00	130	17.15	9.35	
5/11/2014 0:00	87	12.54	33.3	7.6	22.28	32.2	7.5	16.15	894.458	4.085	0	0	28.32	23.27	-0.003	24.4	0	-0.09	0.00	131	16.97	11.16	
5/12/2014 0:00	88	12.64	35.1	18.4	26.5	68.1	6.6	32.17	890.1277	7.582	0	0	27.71	26.19	-0.001	27.8	0	-0.03	0.00	132	17.75	14.61	
5/13/2014 0:00	89	12.56	26.6	7.4	14.34	65.3	23.5	44.18	899.7641	8.8	0	0	27.26	18.19	-0.001	16.49	0	-0.03	0.00	133	18.02	12.77	
5/14/2014 0:00	90	12.43	17.2	5	10.65	58.6	20.1	36.73	909.6819	6.845	0	0	19.09	12.83	-0.001	11.78	0	-0.03	0.00	134	13.33	7.98	
5/15/2014 0:00	91	12.48	20.1	0.2	10.88	55.9	14	30.25	910.8875	3.681	0	0	26.66	13.59	-0.002	13.04	0	-0.06	0.00	135	17.26	7.75	
5/16/2014 0:00	92	12.5	26.8	0.3	15.06	52.5	9.9	24.32	907.0419	2.866	0	0	27.66	17.63	-0.002	17.81	0	-0.06	0.00	136	17.44	8.63	
5/17/2014 0:00	93	12.61	30.5	6.1	19.06	59.8	9.4	26.99	901.6962	2.47	0	0	26.62	22.51	-0.002	22.65	0	-0.06	0.00	137	16.93	8.80	
5/18/2014 0:00	94	12.61	25.7	11.4	18.42	73.8	24.8	46.59	901.4918	5.495	0	0	25.12	21.65	-0.002	21.35	0	-0.06	0.00	138	17.13	9.35	
5/19/2014 0:00	95	12.59	32.6	10.9	22.1	88.8	20.8	49.59	899.4577	5.904	0	0	26.47	24.89	-0.001	24.61	0	-0.03	0.00	139	18.03	11.33	
5/20/2014 0:00	96	12.62	35.9	14.3	25.19	77.7	5.8	36.51	896.8956	5.478	0	0	23.52	25.93	-0.002	26.18	0	-0.06	0.00	140	15.55	12.19	
5/21/2014 0:00	97	12.62	36.8	17.9	27.67	62.1	7.1	29.18	898.48	4.975	0	0	26.24	28.49	-0.004	29.5	0	-0.12	0.00	141	16.97	12.33	
5/22/2014 0:00	98	12.61	33	15.8	24.44	70.3	24.7	46.45	900.5397	4.865	0	1.6	18.17	26.67	-0.004	26.04	1.6	-0.12	0.00	142	13.27	9.15	
5/23/2014 0:00	99	12.55	31.2	11.9	21.97	91.2	30.3	58.74	902.5931	4.518	0	0	24.24	24.61	-0.004	21.43	0	-0.12	0.00	143	17.18	9.12	
5/24/2014 0:00	100	12.56	19.3	15.6	16.79	94.3	69.2	88.9	903.3076	3.719	0	18.7	9.32	17.44	-0.003	17.8	18.7	-0.09	0.00	144	8.10	3.22	
5/25/2014 0:00	101	12.5	19.9	13.8	16.66	94	69.4	86.8	901.596	4.922	0	5	10.16	16.7	-0.001	17.17	5	-0.03	0.00	145	8.64	3.62	
5/26/2014 0:00	102	12.52	21	12.6	17.05	93.3	65.8	82.7	900.672	4.862	0	10.2	17.44	17.92	0.214	18.14	10.2	6.52	0.21	146	13.36	5.12	
5/27/2014 0:00	103	12.37	17.3	11.6	13.5	93.6	74.9	88.8	901.6879	3.288	0	132.3	2.095	13.95	2.698	13.34	132.3	82.24	2.70	147	3.42	1.65	
5/28/2014 0:00	104	12.43	24	11.8	17.71	94.3	45.4	74.44	900.9402	3.451	0	0	26.23	14.73	5.03	15.2	0	153.31	5.03	148	18.74	7.22	153.31
5/29/2014 0:00	105	12.7	27	13.9	20.59	93	38.2	68.54	903.006	2.499	0	0	27.59	17.38	4.91	19.52	0	149.66	4.91	149	19.58	7.73	152.54
5/30/2014 0:00	106	12.66	27.7	15.9	22.15	91.9	35.1	65.2	902.0587	2.077	0	0	27.06	17.55	4.809	20.96	0	146.58	4.81	150	19.27	7.66	151.78
5/31/2014 0:00	107	12.65	29.9	18.3	23.77	87.6	28.6	59.18	901.4121	2.194	0	0	26.58	17.77	4.707	24.98	0	143.47	4.71	151	18.90	8.14	150.96
6/1/2014 0:00	108	12.64	29.1	17.5	23.3	90.3	43	66.16	901.7796	3.404	0	0	25.11	17.95	4.607	23.39	0	140.42	4.61	152	18.40	7.97	150.16
6/2/2014 0:00	109	12.64	32.6	18.5	25.51	88.2	33.7	60.01	898.4731	6.802	0	0	26.21	21.4	4.515	22.2	0	137.62	4.52	153	18.98	11.02	149.06

6/3/2014 0:00	110	12.62	30.4	18.7	25.25	88.7	44.1	63.03	899.0557	3.33	0	0	26.89	22.32	4.418	22.2	0	134.66	4.42	154	19.72	8.49	148.21
6/4/2014 0:00	111	12.63	31.9	19.3	25.77	89.3	35.4	61.94	900.4929	6.142	0	0	26.61	23.57	4.333	23.53	0	132.07	4.33	155	19.36	10.44	147.17
6/5/2014 0:00	112	12.62	37.2	19.3	28.5	85.1	15.6	48.59	895.9111	5.543	0	0	27.55	23.22	4.245	23.18	0	129.39	4.25	156	19.08	12.46	145.92
6/6/2014 0:00	113	12.63	33.3	20.6	27.72	72.7	30.5	48.37	895.726	5.289	0	0	27.26	23.43	4.154	23.39	0	126.61	4.15	157	19.41	10.86	144.84
6/7/2014 0:00	114	12.62	31.2	18.8	26.14	86.8	40.8	57.58	897.7217	5.798	0	8.7	23.41	24.48	4.079	24.48	8.7	124.33	4.08	158	17.36	9.19	143.92
6/8/2014 0:00	115	12.62	27.3	16.1	23.09	94.7	47.1	71.66	899.2567	5.208	0	21.2	17.34	23.34	4.024	23.35	21.2	122.65	4.02	159	13.38	6.66	144.12
6/9/2014 0:00	116	12.58	22.3	15.9	18.81	94.9	63.7	83	899.7374	4.423	0	3.9	15.2	20.79	4.011	20.88	3.9	122.26	4.01	160	12.04	4.84	145.76
6/10/2014 0:00	117	12.55	22.4	12.8	17.3	95	34.2	68.81	899.3516	7.027	0	26	29.15	19.37	4.395	19.45	26	133.96	4.40	161	20.39	9.34	145.21
6/11/2014 0:00	118	12.55	26.6	12.9	19.06	88.5	31.6	63.03	900.8168	3.486	0	0	29.34	17.61	4.387	17.66	0	133.72	4.39	162	20.41	8.70	146.94
6/12/2014 0:00	119	12.6	32.2	15.2	23.39	88.8	22.2	59.03	896.8555	4.328	0	0	25.77	19.16	4.326	19.13	0	131.86	4.33	163	18.10	9.90	145.95
6/13/2014 0:00	120	12.62	24	17.7	20.89	88.2	55.4	70.83	900.8405	6.101	0	0	18.25	20.88	4.258	20.9	0	129.78	4.26	164	14.01	6.59	145.30
6/14/2014 0:00	121	12.56	27.5	16.6	21.03	91.3	47.1	73.74	902.9117	3.895	0	8.7	22.45	20.77	4.203	20.79	8.7	128.11	4.20	165	16.73	7.30	144.57
6/15/2014 0:00	122	12.61	31	17.6	23.41	91.5	41.4	70.8	896.0101	6.876	0	0	26.67	22.16	4.19	22.17	0	127.71	4.19	166	19.54	10.36	144.40
6/16/2014 0:00	123	12.63	31.5	17.1	24.51	86.8	24	60.05	897.2054	4.408	0	0	29.34	22.4	4.125	22.42	0	125.73	4.13	167	20.45	10.41	143.36
6/17/2014 0:00	124	12.61	32.7	21.8	26.76	82.9	30	60.09	898.4532	7.702	0	0	27.34	23.4	4.067	23.43	0	123.96	4.07	168	19.76	12.23	142.13
6/18/2014 0:00	125	12.62	33.8	20.1	26.7	86.2	19.9	57.82	898.6208	5.718	0	0	28.95	23.23	4	23.24	0	121.92	4.00	169	20.27	11.93	140.94
6/19/2014 0:00	126	12.59	30.6	20.1	25.33	81	30.4	57	898.5351	5.91	0	2.7	24.37	22.82	3.937	22.88	2.7	120.00	3.94	170	17.66	10.09	139.93
6/20/2014 0:00	127	12.59	29.2	18.1	23.42	89.2	41.3	69.06	901.6478	4.486	0	13	20.37	23.21	3.888	23.29	13	118.51	3.89	171	15.34	7.65	139.44
6/21/2014 0:00	128	12.62	27.6	18.7	22.46	87.7	41.8	65.96	904.355	5.397	0	0	28.44	22.47	3.859	22.51	0	117.62	3.86	172	20.56	9.45	139.79
6/22/2014 0:00	129	12.62	26.3	17.7	21.81	93.5	51.5	77.41	901.8773	5.315	0	0	22.26	22.91	3.808	22.93	0	116.07	3.81	173	16.73	7.43	139.05
6/23/2014 0:00	130	12.61	30.8	19.4	24.62	93.4	38.1	70.09	898.4639	4.763	0	0	25.99	22.56	3.761	22.58	0	114.64	3.76	174	19.12	9.23	138.13
6/24/2014 0:00	131	12.61	27.3	16.8	21.92	93.4	48.1	72.32	901.2879	4.241	0	5.7	26.76	22.1	3.713	22.16	5.7	113.17	3.71	175	19.61	8.18	137.31
6/25/2014 0:00	132	12.54	26.3	16	21.53	92.5	50.7	76.95	903.8099	4.526	0	10.3	19.45	21.7	3.689	21.71	10.3	112.44	3.69	176	14.78	6.63	137.22
6/26/2014 0:00	133	12.57	27.2	17.3	22.27	94.6	51.6	74.14	903.2395	4.541	0	0	23	21.95	3.661	21.94	0	111.59	3.66	177	17.24	7.39	137.51
6/27/2014 0:00	134	12.62	31.8	18.4	24.9	94.2	39	68.18	898.8456	5.992	0	0	27.76	23.27	3.62	23.15	0	110.34	3.62	178	20.30	10.31	136.47
6/28/2014 0:00	135	12.64	33.6	20.6	26.11	86.6	31.6	62.41	893.9048	7.835	0	0	23.72	23.3	3.57	23.34	0	108.81	3.57	179	17.48	11.64	135.31
6/29/2014 0:00	136	12.63	34.6	20.8	27.27	87	22.3	58.59	895.5452	5.603	0	0	28.62	22.79	3.518	22.81	0	107.23	3.52	180	20.26	11.83	134.13
6/30/2014 0:00	137	12.62	36.2	21.3	28.48	86.7	27.2	58.11	898.9528	7.031	0	0	28.21	23.97	3.467	23.99	0	105.67	3.47	181	20.34	12.85	132.84
7/1/2014 0:00	138	12.61	35.1	21.8	28.1	79	33.9	55.32	897.5958	7.447	0	0	27.92	24.59	3.412	24.68	0	104.00	3.41	182	20.30	12.59	131.59
7/2/2014 0:00	139	12.59	26.8	18.8	23.79	89.5	51.7	66.62	901.5341	4.84	7.62	7.5	22.78	23.01	3.372	23.11	7.62	102.78	3.37	183	17.07	7.52	130.83
7/3/2014 0:00	140	12.57	24.5	18.4	21.06	92.9	65.2	82.1	906.1254	3.953	9.4	2.9	14.7	22.12	3.365	22.18	9.4	102.57	3.37	184	11.79	4.86	131.10
7/4/2014 0:00	141	12.59	25.8	18.2	21.5	94	62.4	82.5	907.5321	3.603	9.14	7.7	23.62	21.81	3.368	21.89	9.14	102.66	3.37	185	17.83	6.72	130.71
7/5/2014 0:00	142	12.62	30	18.2	23.84	93.8	37.6	67.98	907.6752	4.747	0	0	27	22.29	3.342	22.28	0	101.86	3.34	186	19.61	9.27	130.56
7/6/2014 0:00	143	12.62	31.3	17.7	24.74	86	30.5	58.73	906.2169	4.236	0	0	27	23.22	3.295	23.25	0	100.43	3.30	187	19.22	9.59	129.60
7/7/2014 0:00	144	12.63	30.7	18.9	24.81	82.3	33.2	57.97	903.5826	3.43	0	0	19.27	23.19	3.249	23.32	0	99.03	3.25	188	14.41	7.50	128.85
7/8/2014 0:00	145	12.6	31.9	17.8	25.25	84.7	25.5	55.48	902.2711	2.916	0	0	26.82	22.82	3.207	22.86	0	97.75	3.21	189	18.89	8.98	127.95
7/9/2014 0:00	146	12.61	31.8	17.6	25.42	80.6	26.5	52.57	903.4442	2.398	0	0	25.48	22.48	3.16	22.51	0	96.32	3.16	190	18.01	8.38	127.11
7/10/2014 0:00	147	12.62	31.6	19.2	25.93	85.6	32.2	55.15	903.7232	2.592	0	0	23.11	22.36	3.117	22.39	0	95.01	3.12	191	16.88	7.86	126.33
7/11/2014 0:00	148	12.6	31.8	19.3	25.81	82.2	24.2	50.95	902.58	4.007	0	0	26.81	22.57	3.072	22.58	0	93.63	3.07	192	18.85	9.77	125.35
7/12/2014 0:00	149	12.59	29.7	18	24.39	82.2	39.2	57.5	904.447	4.21	0	0	26.93	22.66	3.022	22.7	0	92.11	3.02	193	19.34	9.04	124.45
7/13/2014 0:00	150	12.6	30.9	18.8	24.54	85.2	37.5	61	906.2206	4.106	0	0	20.71	22.56	2.975	22.58	0	90.68	2.98	194	15.42	7.99	123.65
7/14/2014 0:00	151	12.59	31.9	18	25.43	82.9	29.2	54.76	906.014	2.081	0	0	21.71	22.16	2.931	22.23	0	89.34	2.93	195	15.78	7.38	122.91
7/15/2014 0:00	152	12.61	31.2	19.3	24.33	84.5	35.7	65.8	904.8734	2.744	2.54	2.4	12.82	21.87	2.896	21.9	2.54	88.27	2.90	196	10.33	5.82	122.33
7/16/2014 0:00	153	12.54	25.6	18.6	21.67	90.5	54.3	72.8	906.1563	3.253	0	0	20.64	21.87	2.868	21.92	0	87.42	2.87	197	15.58	6.30	121.94
7/17/2014 0:00	154	12.62	29	18.7	22.73	90.8	52.2	72.19	901.2004	4.076	1.016	0	19.89	21.49	2.835	21.53	1.016	86.41	2.84	198	15.17	6.89	121.25
7/18/2014 0:00	155	12.59	21.6	16.1	18.56	94.4	74.9	87.7	901.2783	3.435	35.81	33.5	12.23	20.41	3.064	20.67	35.81	93.39	3.06	199	10.05	3.69	120.88
7/19/2014 0:00	156	12.57	24.8	16.9	20.2	92.6	57.3	78.21	903.3956	2.381	0	0	19.56	19.89	3.133	19.98	0	95.49	3.13	200	14.82	5.57	123.67
7/20/2014 0:00	157	12.61	28.9	17.4	22.35	93.8	56.1	79.28	902.746	3.578	0	0	20.95	20.35	3.097	20.36	0	94.40	3.10	201	15.90	6.68	123.00
7/21/2014 0:00	158	12.62	32.1	21.2	26.19	90.4	43.7	68.13	901.8208	4.06	0	0	24.85	20.82	3.058	20.77	0	93.21	3.06	202	18.51	8.67	122.14
7/22/2014 0:00	159	12.6	33.2	21.3	27.15	89.7	38.1	64.4	903.2018	3.9	0	0	25.18	21.72	3.012	21.66	0	91.81	3.01	203	18.57	9.02	121.23
7/23/2014 0:00	160	12.63	33	22.5	27.28	82.6	35.6	64.2	905.7761	2.406	0	0	24.3	22.21	2.965	22.21	0	90.37	2.97	204	17.84	8.19	120.42
7/24/2014 0:00	161	12.61	32.9	20	26.65	89.9	34.4	61.97	907.9381	1.313	0	0	25.79	22.45	2.922	22.43	0	89.06	2.92	205	18.70	7.72	119.64
7/25/2014 0:00	162	12.6	32.9	19.7	26.68	85.7	32.9	59	905.584	2.166	0.254	0	25.68	22.67	2.877	22.66	0.254	87.69	2.88	206	18.46	8.24	118.82
7/26/2014 0:00	163	12.6	34.5	19.3	27.13	85.4	22.7	52.48	902.7833	3.414	0	0	25.96	23.12	2.828	23.12	0	86.20	2.83	207	18.19	9.59	117.86
7/27/2014 0:00	164	12.59	34.1	18.1	26.72	79.1	24.7	48.58	901.9738	3.115	0	0	26.54	23.21	2.774	23.21	0	84.55	2.77	208	18.40	9.39	116.92
7/28/2014 0:00	165	12.59	33.9	18.7	26.79	83.1	31.3	54.66	904.8524	1.693	0	0	25.96	23.33	2.723	23.28	0	83.00	2.72	209	18.44	8.13	116.11
7/29/2014 0:00	166	12.6	26.4	19.4	23.11	89.1	58.6	68.07	908.8067	4.177	0	0	22.19	23.65	2.67	23.67	0	81.38	2.67	210	16.60	6.87	115.42
7/30/2014 0:00	167	12.57	25.7	18.7	21.89	89.8	55.5	70.77	907.3358	2.43	0	0	11.1	23.43	2.623	23.47	0	79.95	2.62	211	9.20	4.13	115.01
7/31/2014 0:00	168	12.57	29.4	19.6	23.78	90.8	45.3	69.5	903.316	4.152	0	0	24.38	22.99	2.581	23.01	0	78.67	2.58	212	17.87	8.09	114.20
8/1/2014 0:00	169	12.59	25.8	16.5	20.55	88.2	36.8	64.59	906.2613	3.521	0	0	24.53	22.36	2.525	22.51	0	76.96	2.53	213	17.36	7.57	113.44
8/2/2014 0:00	170	12.58	25.7	14.7	20.44	90	28.6	63.68	906.3561	1.413	0	0	15.04	21.99	2.478	22.07	0	75.53	2.48	214	11.36	4.98	112.95
8/3/2014 0:00	171	12.57	29.4	16.6	22.63	86.5	27.3	56.6	906.9468	1.333	0	0	24.91	22.13	2.434	22.17	0	74.19	2.43	215	17.32	7.13	112.23
8/4/2014 0:00	172	12.57	29.6	15.6	22.87	86	28.5	55.46	906.8357	1.44	0	0	23.28	22.86	2.385	22.88	0	72.69	2.39	216	16.30	6.88	111.54
8/5/2014 0:00	173	12.57	30.1	15.4	23.01	82.4	24.8	55.49	905.9996	2.143	0	0	25.98	23.62	2.335	23.63	0	71.17	2.34	217	17.69	7.94	110.75
8/6/2014 0:00	174	12.57	31	16.8	24.3	82.6	30.5	53.38	904.9567	2.828	0	0	22.99	23.96	2.28	23.97	0	69.49	2.28	218	16.20	7.83	109.97
8/7/2014 0:00	175	12.58	34.3	17	25.87	78.8	25.2	49.12	902.2331	3.025	0	0	24.66	24.09	2.225	24.11	0	67.82	2.23	219	17.01	8.94	109.07
8/8/2014 0:00	176	12.62	35.7	18.8	27.43	70.6	20.3	45.27	900.5099	2.498	0	0	24.43	24.58	2.167	24.58	0	66.05	2.17	220	16.58	8.90	108.18
8/9/2014 0:00	177	12.61	33.3	20.3	25.29	81.3	27.8	59.22	901.9977	2.766	1.016	1.5	22.11	25.09	2.11	25.1	1.5	64.31	2.11	221	15.73	8.14	107.37
8/10/2014 0:00	178	12.56	30.6	18.7	23.74	85	33.9	67.13	903.0195	2.786	0	0	8.14	23.87	2.055	24.12	0	62.64	2.06	222	7.18	4.88	107.03
8/11/2014 0:00	179	12.52	30.8	21.5	25.2	77	34.3	59.54	905.1209	2.706	0	0	23.33	23.84	2.001	23.99	0	60.99	2.00	223	16.59	7.88	106.24
8/12/2014 0:00	180	12.64	29	18.7	22.97	91	42.3	71.33	908.0561	2.365	1.524	0	17.3	24.91	1.946	25.01	1.524	59.31	1.95	224	12.99	5.87	105.66

8/13/2014 0:00	181	12.57	30.2	17.2	23.82	92.5	29.8	63.11	907.7026	1.956	0	0	26.06	25.41	1.891	25.52	0	57.64	1.89	225	18.03	7.66	104.89
8/14/2014 0:00	182	12.58	31.8	16.5	24.44	86.2	28.6	56.75	906.0051	2.549	0	0	26.2	25.74	1.826	25.98	0	55.66	1.83	226	17.92	8.31	104.06
8/15/2014 0:00	183	12.61	32	17	24.75	81.6	26.1	52.03	903.9738	3.19	0	0	24.64	25.87	1.757	26.16	0	53.55	1.76	227	16.81	8.57	103.20
8/16/2014 0:00	184	12.61	33.5	17.5	25.44	84.7	28.5	52.41	901.7446	4.114	2.032	0.6	22.45	25.05	1.687	25.49	2.032	51.42	1.69	228	15.70	8.92	102.31
8/17/2014 0:00	185	12.58	32.4	18.3	24.87	89.4	30.7	61.96	901.6514	2.331	0	0	24.3	24.95	1.624	25.35	0	49.50	1.62	229	16.97	7.85	101.59
8/18/2014 0:00	186	12.58	33.6	21	26.13	77.7	26.6	54.65	902.4384	2.203	0	0.1	24	26.24	1.557	26.5	0.1	47.46	1.56	230	16.59	8.14	100.77
8/19/2014 0:00	187	12.59	31.3	16.3	24.42	90.3	32.1	61.6	901.3232	2.012	0	0	23.77	26.43	1.489	26.79	0	45.38	1.49	231	16.50	7.30	100.05
8/20/2014 0:00	188	12.59	30.3	16.8	23.55	94.4	40.3	70.51	899.2994	2.512	0	0	17.28	25.96	1.423	26.37	0	43.37	1.42	232	12.79	6.01	99.45
8/21/2014 0:00	189	12.59	32.7	19.5	25.78	83.4	33.2	61.78	898.9924	4.971	0	0	21.93	25.58	1.357	26.01	0	41.36	1.36	233	15.50	9.02	98.55
8/22/2014 0:00	190	12.58	33.4	21.1	27	75.4	35.3	56.89	900.9486	4.899	0	0	17.92	24.93	1.282	25.41	0	39.08	1.28	234	13.07	8.38	97.71
8/23/2014 0:00	191	12.58	33	19	26.71	85.1	30	52.71	901.9071	4.272	0	0	22.07	25.09	1.209	25.55	0	36.85	1.21	235	15.41	8.67	96.84
8/24/2014 0:00	192	12.61	32.1	18.7	25.79	78	31.8	48.81	900.9641	3.978	0	0	19.87	24.31	1.134	24.86	0	34.56	1.13	236	13.98	8.00	96.04
8/25/2014 0:00	193	12.57	33.7	18.3	25.89	75.9	27.7	49.55	900.3211	3.41	0	0	17.93	23.53	1.061	24.05	0	32.34	1.06	237	12.69	7.72	95.27
8/26/2014 0:00	194	12.57	32.2	18	25.1	82	33.9	58.05	902.201	2.917	0	0	16.77	24.05	0.991	24.48	0	30.21	0.99	238	12.17	6.67	94.61
8/27/2014 0:00	195	12.62	31.5	19.9	25.41	85.9	31.9	59.81	904.6051	2.494	3.556	2.6	20.51	24.96	0.938	25.25	3.556	28.59	0.94	239	14.45	7.06	93.90
8/28/2014 0:00	196	12.59	31.4	19.1	25.17	86.7	35.5	59.79	904.5244	2.776	0	0	15.25	24.59	0.877	25.07	0	26.73	0.88	240	11.31	6.09	93.55
8/29/2014 0:00	197	12.54	31.5	18.5	23.36	92.5	34.6	70.03	900.7394	3.103	1.778	3	16.57	24.2	0.822	24.66	3	25.05	0.82	241	12.11	6.54	92.90
8/30/2014 0:00	198	12.54	30.6	16.1	22.4	94.6	29	71.84	900.9262	1.82	0	0	21.82	23.29	0.768	23.65	0	23.41	0.77	242	14.91	6.69	92.53
8/31/2014 0:00	199	12.58	31.4	15.1	23.79	94.8	27.6	63.11	902.0443	2.242	0	0	21.32	23.9	0.707	24.36	0	21.55	0.71	243	14.50	6.93	91.83
9/1/2014 0:00	200	12.51	34.6	17.4	26.73	89.2	26.9	52.38	898.9258	4.692	0	0	21.34	23.16	0.641	23.77	0	19.54	0.64	244	14.58	9.06	90.93
9/2/2014 0:00	201	12.62	36.4	19.9	28.25	77.4	24.3	47.81	897.7176	3.225	0	0	22.73	24.24	0.572	24.42	0	17.43	0.57	245	15.22	8.84	90.04
9/3/2014 0:00	202	12.58	34.3	20.6	27.54	72.6	33.1	50.71	899.5565	3.946	0	0	22.5	24.95	0.491	25.32	0	14.97	0.49	246	15.35	8.77	89.17
9/4/2014 0:00	203	12.61	32.2	18.6	25.93	80.4	34.3	57.07	900.3533	4.749	0	0	22.9	23.81	0.37	24.1	0	11.28	0.37	247	15.52	8.78	88.29
9/5/2014 0:00	204	12.59	30.6	18.7	24.64	83.9	38.4	59.83	901.507	5.441	0	0	21.74	21.98	0.161	22.76	0	4.91	0.16	248	14.96	8.48	87.44
9/6/2014 0:00	205	12.59	28	16.1	21.45	93.3	43.1	72.73	905.0419	3.397	33.02	18.6	11.82	20.7	0.041	21.58	33.02	1.25	0.04	249	9.08	5.01	86.94
9/7/2014 0:00	206	12.46	16.8	13.4	15.3	92.9	86.2	90.3	908.3547	4.272	8.38	0	4.676	17.65	0.508	18.51	8.38	15.48	0.51	250	4.81	1.83	88.62
9/8/2014 0:00	207	12.44	24.1	15.6	18.76	93.1	62	83	906.8337	1.812	0.508	0	12.89	20.19	0.509	19.88	0.508	15.51	0.51	251	9.78	3.76	88.24
9/9/2014 0:00	208	12.61	27.6	16.6	21.64	94	54.1	78.16	903.1548	3.077	0	0	16.43	22.23	0.478	21.99	0	14.57	0.48	252	11.94	5.26	87.71
9/10/2014 0:00	209	12.63	32.4	18.4	25.02	85.5	36.5	62.67	898.8483	4.086	0	0	21.67	22.87	0.427	22.77	0	13.01	0.43	253	14.74	8.02	86.91
9/11/2014 0:00	210	12.63	29.3	17.8	23.29	87.7	45.6	65.89	898.3459	3.785	0	0	19.6	22.65	0.362	22.93	0	11.03	0.36	254	13.64	6.67	86.25
9/12/2014 0:00	211	12.59	22.2	15	17.5	91.2	59.3	81.9	904.2314	2.385	2.794	0	11.35	19.33	0.312	20.36	2.794	9.51	0.31	255	8.70	3.59	85.89
9/13/2014 0:00	212	12.46	16.7	9.1	12.45	93	78.8	87.6	908.8022	5.11	3.048	0	3.143	15.12	0.278	16.91	3.048	8.47	0.28	256	3.90	1.88	85.70
9/14/2014 0:00	213	12.38	17.3	8.1	11.85	87.7	60.9	76.53	909.9993	3.083	0	0	15.71	14.45	0.233	15.45	0	7.10	0.23	257	10.92	3.90	85.31
9/15/2014 0:00	214	12.6	19.9	13.2	16.15	92	73.2	86.6	907.4549	3.293	0.508	0	8.09	16.62	0.033	17.26	0.508	1.01	0.03	258	6.75	2.72	85.04
9/16/2014 0:00	215	12.47	24.7	15.5	19.72	93.3	56.5	79.8	906.7556	2.654	0	0	14.02	19.23	-0.003	19.55	0	-0.09	0.00	259	10.21	4.31	84.61
9/17/2014 0:00	216	12.58	26.5	15.5	20.23	92	55.1	79.57	906.5956	2.466	0	0	15.29	20.86	-0.004	21.13	0	-0.12	0.00	260	10.94	4.66	84.14
9/18/2014 0:00	217	12.58	25.7	17.5	20.5	93.2	64.4	87.1	902.4591	1.607	5.334	0.8	6.909	20.77	-0.004	21.09	5.334	-0.12	0.00	261	6.03	2.67	83.87
9/19/2014 0:00	218	12.48	21	17.3	18.81	93.8	77.6	89.4	900.9468	2.95	54.1	42.5	6.235	19.3	0.751	19.67	54.1	22.89	0.75	262	5.61	2.29	83.72
9/20/2014 0:00	219	12.39	22.8	18.3	20.14	93.4	75.4	87.7	901.5127	2.433	1.016	0	7.971	20.87	1.222	20.78	1.016	37.25	1.22	263	6.66	2.65	87.71
9/21/2014 0:00	220	12.41	24.7	19.4	21.17	93.9	70.2	88.1	902.762	2.053	1.016	0	8.18	21.73	1.204	21.66	1.016	36.70	1.20	264	6.78	2.81	87.43
9/22/2014 0:00	221	12.41	26.6	19.1	21.07	94.7	59.3	86.3	906.8057	2.525	0.254	0	11.32	22.98	1.183	22.85	0.254	36.06	1.18	265	8.63	3.86	87.04
9/23/2014 0:00	222	12.51	23.6	16.6	19.37	89.8	52.8	74.33	909.0214	3.186	0	0	17.89	22.03	1.154	22.27	0	35.17	1.15	266	12.08	5.11	86.53
9/24/2014 0:00	223	12.56	26.3	14.8	20.65	88.9	51.5	74.68	905.9548	3.285	0	0	18.38	22.46	1.127	22.69	0	34.35	1.13	267	12.30	5.49	85.98
9/25/2014 0:00	224	12.56	25.2	16.6	19.8	91.4	52.7	81.2	906.1008	2.826	2.032	0	11.44	22.06	1.101	22.47	2.032	33.56	1.10	268	8.45	4.06	85.57
9/26/2014 0:00	225	12.47	23.5	15.7	18.87	92.6	59.4	81.8	907.453	1.617	0.254	0	12.82	21.56	1.089	21.86	0.254	33.19	1.09	269	9.22	3.58	85.42
9/27/2014 0:00	226	12.48	23.9	13.2	18.65	94.1	30.9	74.27	905.7769	1.972	0.254	0	19.21	22.15	1.069	22.45	0.254	32.58	1.07	270	11.98	5.15	84.90
9/28/2014 0:00	227	12.54	24.3	12.9	18.52	93.5	51.2	77.36	903.921	2.831	0	0	19.54	21.65	1.044	22.13	0	31.82	1.04	271	12.61	5.15	84.39
9/29/2014 0:00	228	12.59	24.5	12.8	18.22	93.9	46.7	76.65	904.2405	2.145	0	0	19.06	21.51	1.017	21.94	0	31.00	1.02	272	12.20	4.93	83.90
9/30/2014 0:00	229	12.53	24.9	12.7	18.56	92.6	48.9	74.18	902.3881	2.712	0	0	18.58	21.24	0.992	21.75	0	30.24	0.99	273	11.94	5.06	83.39
10/1/2014 0:00	230	12.58	27.3	13.5	20.11	92.4	47.4	73.93	896.7677	2.506	0	0	18.63	21.62	0.969	21.91	0	29.54	0.97	274	12.01	5.28	82.86
10/2/2014 0:00	231	12.52	28.7	10.7	19.44	90.2	27	61.18	895.0798	1.957	0	0	20.54	21.43	0.945	22.01	0	28.80	0.95	275	12.07	5.85	82.28
10/3/2014 0:00	232	12.48	21.5	9.7	15.52	85.4	32.7	63.24	899.6317	3.834	0	0	19.89	19.27	0.916	20.28	0	27.92	0.92	276	11.68	5.72	81.71
10/4/2014 0:00	233	12.58	18.7	5.9	11.9	89.6	33.4	65.64	907.9939	2.362	0	0	19.82	17.29	0.885	18.26	0	26.97	0.89	277	11.51	4.60	81.25
10/5/2014 0:00	234	12.52	25.7	5.1	14.02	89.8	32.5	64.54	904.7617	2.123	0	0	19.51	17.07	0.861	17.74	0	26.24	0.86	278	11.35	5.28	80.72
10/6/2014 0:00	235	12.5	27.1	8.5	17.21	90.8	32.7	66.47	897.7038	1.72	0	0	19.15	18.84	0.84	19.18	0	25.60	0.84	279	11.26	5.14	80.20
10/7/2014 0:00	236	12.48	28.5	9	17.95	89.6	28.3	62.63	898.6808	1.838	0	0	19.09	19.27	0.816	19.77	0	24.87	0.82	280	11.03	5.45	79.66
10/8/2014 0:00	237	12.51	30.7	6.8	17.79	87.5	17.9	55.21	898.5172	2.156	0	0	18.3	18.59	0.79	19.23	0	24.08	0.79	281	10.08	6.15	79.04
10/9/2014 0:00	238	12.53	28.7	11.4	19.56	81.6	37.9	63.38	900.1893	2.411	0	0	15.71	19.68	0.764	19.89	0	23.29	0.76	282	9.69	5.18	78.53
10/10/2014 0:00	239	12.59	28.3	16	21.56	81.8	44.4	64.57	898.4554	3.208	0	0	15.42	20.82	0.741	20.98	0	22.59	0.74	283	9.82	5.33	77.99
10/11/2014 0:00	240	12.52	19.8	8.3	14.08	89	68.8	81.9	901.4831	4.98	2.54	3.9	5.515	17.18	0.719	18.44	3.9	21.92	0.72	284	4.86	2.72	77.72
10/12/2014 0:00	241	12.42	17.2	7.6	10.64	88.7	51	75.79	904.9724	3.062	0	0	11.96	14.18	0.7	15.08	0	21.34	0.70	285	7.78	3.37	77.77
10/13/2014 0:00	242	12.53	27.9	7	15.57	90	25	66.26	894.7305	3.986	2.286	0.9	16.34	15.52	0.686	16.18	2.286	20.91	0.69	286	9.24	6.56	77.12
10/14/2014 0:00	243	12.54	17.7	5.7	11.65	84.7	28.3	59.08	900.5223	8.11	2.032	0.1	18.4	13.08	0.666	14.25	2.032	20.30	0.67	287	9.98	6.82	76.53
10/15/2014 0:00	244	12.49	22.1	3	11.77	86.1	24.3	60.14	906.0381	2.365	0	0	18.49	13.16	0.636	13.75	0	19.39	0.64	288	9.76	4.86	76.05
10/16/2014 0:00	245	12.48	26.3	3.8	14.22	86.9	20.1	55.49	903.7264	2.064	0	0	18.52	15.45	0.614	15.82	0	18.71	0.61	289	9.55	5.29	75.52
10/17/2014 0:00	246	12.5	31.3	7.4	17.32	79.3	15.2	47.7	898.9063	2.636	0	0	17.04	15.95	0.589	16.43	0	17.95	0.59	290	8.68	6.55	74.87
10/18/2014 0:00	247	12.52	23.5	6.2	14.23	81.3	26.4	53.24	901.9976	2.426	0	0	13.93	15.72	0.558	16.44	0	17.01	0.56	291	7.88	4.54	74.41
10/19/2014 0:00	248	12.5	17.6	6.4	11.57	88.5	47	69.65	906.0691	1.84	0	0	7.735	14.1	0.529	14.85	0	16.12	0.53	292	5.62	2.58	74.16
10/20/2014 0:00	249	12.47	21.8	6.5	13.67	89.8	60.5	81	904.5403	1.912	0	0	8.04	15.2	0.513	15.43	0	15.64	0.51	293	5.83	2.59	73.90
10/21/2014 0:00	250	12.45	24.6	8.7	15.89	93.5	42.9	75.85	903.7336	1.168	0	0	12.44	17.65	0.493	17.75	0	15.03	0.49	294	7.62	3.37	73.56
10/22/2014 0:00	251	12.56	23.6	9.1	16.03	91.5	39.5	69.88	903.7761	1.627	0	0	14.47	18.05	0.467	18.18	0	14.23	0.47	295	8.32	3.77	73.18

10/23/2014 0:00	252	12.54	19.9	11.5	15.7	92.9	71	84.3	904.0532	2.93	6.858	0.1	7.027	17.03	0.461	17.54	6.858	14.05	0.46	296	5.35	2.31	72.95
10/24/2014 0:00	253	12.46	22.5	10	15.44	93.4	55.3	84.6	904.4478	2.205	0	0	12.55	17.72	0.449	17.76	0	13.69	0.45	297	7.71	3.33	72.63
10/25/2014 0:00	254	12.52	28.6	8.4	17.58	93.8	28.7	70.64	905.0047	1.902	0.254	0	15.73	18.38	0.417	18.36	0.254	12.71	0.42	298	8.41	4.74	72.15
10/26/2014 0:00	255	12.54	28.4	7.7	17.56	90.4	31	65.7	905.2	2.199	0	0	15.62	18.06	0.379	18.15	0	11.55	0.38	299	8.32	4.83	71.67
10/27/2014 0:00	256	12.49	30.6	9.3	19.21	92	24.4	58.81	899.0697	2.874	0	0	14.08	17.59	0.337	17.79	0	10.27	0.34	300	7.54	5.56	71.11
10/28/2014 0:00	257	12.48	24.6	10.9	17.57	90.1	37.2	61.22	896.1113	2.616	0	0	6.845	16.38	0.295	16.89	0	8.99	0.30	301	4.99	3.46	70.77
10/29/2014 0:00	258	12.29	18.8	4.6	11.46	81	32.3	53.73	905.3154	2.405	0	0	12.07	13.88	0.249	14.03	0	7.59	0.25	302	6.63	3.55	70.41
10/30/2014 0:00	259	12.53	20.8	2	10.91	88.8	35	62.59	906.8709	2.019	2.794	0	13.7	12.78	0.17	12.87	2.794	5.18	0.17	303	7.23	3.58	70.06
10/31/2014 0:00	260	12.5	23.6	4.3	12.54	92.5	19.7	60.9	906.1885	3.163	0	0	13.16	12.07	-0.003	12.44	0	-0.09	0.00	304	6.66	4.90	69.57
11/1/2014 0:00	261	12.44	17.1	2.9	9.19	73.4	27.9	52.07	912.1145	2.427	0	0	13.04	9.96	-0.004	10.54	0	-0.12	0.00	305	6.61	3.59	69.21
11/2/2014 0:00	262	12.43	17.2	0.4	8.85	80.3	41.5	58.27	907.486	4.063	0	0	12.05	8.89	-0.003	9.06	0	-0.09	0.00	306	6.51	3.77	68.83
11/3/2014 0:00	263	12.5	19.6	11.5	14.46	77.6	48.8	61.4	902.2111	5.58	0	0	7.683	12.55	0	11.6	0	0.00	0.00	307	5.13	4.08	68.42
11/4/2014 0:00	264	12.44	19.5	12.5	15.99	92.2	61.5	75.45	901.4139	4.083	15.75	12.1	4.689	14.83	0.008	14.16	15.75	0.24	0.01	308	4.03	2.47	68.18
11/5/2014 0:00	265	12.25	12.6	4.6	7.381	92.5	58.3	82.1	907.0464	4.091	27.94	5.8	3.316	10.52	0.45	10.54	27.94	13.72	0.45	309	3.50	2.04	69.18
11/6/2014 0:00	266	12.19	16.9	4.6	8.64	90.6	29.9	72.56	908.0743	1.221	0	0	8.84	10.49	0.516	10.63	0	15.73	0.52	310	5.21	2.53	69.51
11/7/2014 0:00	267	12.25	18.4	1.7	9.15	90.4	31.4	66.28	912.5396	1.743	0	0	14.62	11.55	0.482	11.91	0	14.69	0.48	311	6.89	3.22	69.19
11/8/2014 0:00	268	12.58	19.2	2.2	9.83	90.6	36.3	68.94	904.6934	3.515	0	0	14.45	11.06	0.443	11.56	0	13.50	0.44	312	6.90	3.95	68.79
11/9/2014 0:00	269	12.56	16.8	5.2	10.79	91.3	39.3	64	907.6243	3.872	0	0	14.18	11.65	0.394	11.79	0	12.01	0.39	313	6.86	3.66	68.43
11/10/2014 0:00	270	12.52	24.3	4.9	13.09	85.8	23.8	58.34	899.5601	4.283	0	0	13.91	11.18	0.333	11.52	0	10.15	0.33	314	6.28	5.52	67.87
11/11/2014 0:00	271	12.54	26	2.1	15	71.9	20.8	46.97	889.8338	6.365	0	0	14.16	11.18	0.266	11.06	0	8.11	0.27	315	5.98	7.32	67.14
11/12/2014 0:00	272	12.42	3.7	-4.6	-1.082	68.6	32.5	52.18	904.3344	5.887	0	0	13.9	2.876	0.046	2.861	0	1.40	0.05	316	6.33	3.15	66.83
11/13/2014 0:00	273	12.31	-3.6	-7.8	-6.056	71.1	41.5	54.9	911.7621	5.696	0	0	5.478	-1.905	-0.02	-0.515	0	-0.61	-0.02	317	4.04	1.82	
11/14/2014 0:00	274	12.2	-3.2	-8.5	-6.228	69.9	43.6	54.32	913.8133	3.296	0	0	8.1	-2.286	-0.013	-2.191	0	-0.40	-0.01	318	4.79	1.50	
11/15/2014 0:00	275	12.11	5.5	-5.3	-0.887	69.2	40	52.42	905.4262	4.527	0	0	12.92	-0.4	-0.008	-1.013	0	-0.24	-0.01	319	5.95	2.71	
11/16/2014 0:00	276	12.52	21	-2	7.208	77.4	21.8	52.33	897.8652	4.354	0	0	13.38	3.31	-0.004	4.003	0	-0.12	0.00	320	5.54	5.29	
11/17/2014 0:00	277	12.25	3.5	-11.9	-5.608	88.7	58.7	78.22	903.1234	3.512	0	0	3.011	-1.991	-0.011	0.394	0	-0.34	-0.01	321	3.24	1.29	
11/18/2014 0:00	278	12.02	4.9	-14.8	-4.617	85.9	32.8	63.64	909.6274	1.398	0.508	0	13.89	-1.561	-0.011	-0.532	0.508	-0.34	-0.01	322	6.15	1.75	
11/19/2014 0:00	279	12.47	10.9	-8.5	-0.235	86.5	26.6	60.71	907.9426	2.654	0	0	13.62	0.572	-0.007	1.573	0	-0.21	-0.01	323	5.73	2.76	
11/20/2014 0:00	280	12.47	14.6	-3.3	4.491	79.2	21.8	52.39	904.0897	2.801	0	0	12.89	4.264	-0.004	3.308	0	-0.12	0.00	324	5.28	3.32	
11/21/2014 0:00	281	12.52	17.5	-2.2	5.887	85.9	17.2	56.05	900.2035	1.961	0	0	13.24	7.056	-0.003	5.391	0	-0.09	0.00	325	5.16	3.28	
11/22/2014 0:00	282	12.5	19	-3.2	5.895	90.7	23.4	67.12	900.5206	1.823	0	0	11.7	7.52	-0.005	5.848	0	-0.15	-0.01	326	4.99	3.16	
11/23/2014 0:00	283	12.52	19.2	3.9	10.34	93.3	47.4	78.65	897.0598	2.17	0	0	7.768	10.71	-0.001	8.67	0	-0.03	0.00	327	4.47	2.48	
11/24/2014 0:00	284	12.51	16	0.7	8.61	82.8	25.8	49	890.2192	6.204	0	0	11.47	8.38	0	7.163	0	0.00	0.00	328	4.89	4.68	
11/25/2014 0:00	285	12.44	11.8	-4.3	3.164	88.4	22.2	59.57	901.3342	2.304	0	0	12.51	6.284	-0.005	5.266	0	-0.15	-0.01	329	5.05	2.66	
11/26/2014 0:00	286	12.42	12.3	-5.3	3.575	80.3	21.8	46.02	906.1434	3.72	0	0	12.68	4.835	-0.004	3.761	0	-0.12	0.00	330	4.96	3.35	
11/27/2014 0:00	287	12.46	12.8	-0.6	5.009	68.4	31	47.94	906.7339	3.192	0	0	12.44	6.79	-0.004	5.238	0	-0.12	0.00	331	4.95	3.09	
11/28/2014 0:00	288	12.41	14.4	-6	3.897	85.9	33.6	58.59	911.7798	2.94	0	0	12.32	5.61	-0.005	4.766	0	-0.15	-0.01	332	5.06	2.94	
11/29/2014 0:00	289	12.44	26.3	-2.3	10.44	86.3	12.8	48	902.3287	3.58	0	0	12.55	10.35	-0.003	6.976	0	-0.09	0.00	333	4.28	5.79	
11/30/2014 0:00	290	12.44	26.8	1.2	11.82	60.9	10.6	34.93	896.0438	3.936	0	0	12.67	11.72	-0.002	7.758	0	-0.06	0.00	334	3.90	6.36	
12/1/2014 0:00	291	12.38	25.1	-1.6	10.77	67.7	12	36.19	898.6328	4.355	0	0	12.07	10.87	-0.002	7.766	0	-0.06	0.00	335	3.97	6.20	
12/2/2014 0:00	292	12.43	1.8	-8.8	-4.552	60.8	26.6	43.14	912.0214	4.674	0	0	12.12	0.334	-0.009	0.787	0	-0.27	-0.01	336	4.83	2.51	
12/3/2014 0:00	293	12.3	13.7	-7.7	2.244	69.5	26.4	48.61	905.0456	3.103	0	0	9.93	3.161	-0.005	3.09	0	-0.15	-0.01	337	4.24	3.10	
12/4/2014 0:00	294	12.37	14.9	1.6	8.08	92.3	28	58.21	902.5331	2.799	0	0	10.96	9.63	0.001	7.043	0	0.03	0.00	338	4.53	2.85	
12/5/2014 0:00	295	12.36	11.3	0.2	6.42	93.2	81.3	89.8	901.8591	2.338	0	0	2.96	7.07	0	7.27	0	0.00	0.00	339	3.02	1.04	
12/6/2014 0:00	296	12.27	16.1	2.3	10.3	91.5	47.5	73.45	903.4764	3.973	0	0	11.21	11.37	0.002	9.43	0	0.06	0.00	340	4.87	2.87	
12/7/2014 0:00	297	12.5	16.2	0.1	7.178	89.3	41.6	71.22	912.9327	1.678	0	0	9.84	9.06	-0.002	7.719	0	-0.06	0.00	341	4.43	2.26	
12/8/2014 0:00	298	12.5	14.8	2.1	7.525	90.7	52.6	79.01	909.8792	2.252	0	0	8.76	9.39	0	8.65	0	0.00	0.00	342	4.33	2.08	
12/9/2014 0:00	299	12.46	18.8	0.6	7.852	93.4	34	69.12	909.9063	1.955	0	0	11.05	9.83	-0.002	7.959	0	-0.06	0.00	343	4.52	2.77	
12/10/2014 0:00	300	12.43	18.1	0	7.894	92.9	42.7	75.53	909.1862	1.648	0	0	9.2	9.33	-0.002	8.26	0	-0.06	0.00	344	4.29	2.31	
12/11/2014 0:00	301	12.42	14.4	3.3	9.51	93.3	68	84.1	904.6125	1.728	0	0	3.924	9.76	0.001	9.44	0	0.03	0.00	345	3.23	1.36	
12/12/2014 0:00	302	12.28	14.9	5.6	10.41	90.3	53.2	77.93	904.3627	2.298	0	0	8.19	12.22	0.001	10.74	0	0.03	0.00	346	4.18	2.05	
12/13/2014 0:00	303	12.28	16.4	4.1	10.32	93.3	58.2	83.9	905.0629	2.949	0	0	6.862	11.41	0.001	10.47	0	0.03	0.00	347	3.92	2.09	
12/14/2014 0:00	304	12.26	17.6	5.9	12.45	93.6	62.4	83.7	901.4651	4.525	0	0	6.424	12.7	0.002	11.37	0	0.06	0.00	348	3.86	2.36	
12/15/2014 0:00	305	12.19	15.1	6.7	11.99	86.6	28	53.62	893.9826	8.1	0.254	0.3	10.87	11.84	0.006	9.64	0.3	0.18	0.01	349	4.32	4.76	
12/16/2014 0:00	306	12.35	12.7	-2.3	5.151	79.6	32.3	53.89	900.7714	3.209	0	0	11.48	8.19	-0.002	7.289	0	-0.06	0.00	350	4.35	2.78	
12/17/2014 0:00	307	12.3	11.4	-3.9	3.893	84.3	33.4	56.61	908.4323	2.788	0	0	10.21	6.858	-0.003	6.334	0	-0.09	0.00	351	4.19	2.42	
12/18/2014 0:00	308	12.17	8.8	3.9	5.893	84.9	48.1	63.47	902.2199	3.528	0	0	3.697	6.918	0	7.306	0	0.00	0.00	352	3.14	1.93	
12/19/2014 0:00	309	11.95	8.5	-2	3.263	93.2	60.4	81.6	902.4631	3.04	0	0	9.48	6.372	-0.002	6.514	0	-0.06	0.00	353	4.40	1.68	
12/20/2014 0:00	310	11.9	5.2	2.5	3.648	92	80.3	87.6	904.5996	2.013	0.762	0.1	2.53	4.944	-0.002	6.612	0.762	-0.06	0.00	354	2.87	0.88	
12/21/2014 0:00	311	11.86	9.3	1.5	4.144	92.9	63.2	82.6	903.2512	3.343	0	0	9.26	6.267	-0.001	6.805	0	-0.03	0.00	355	4.39	1.75	
12/22/2014 0:00	312	11.93	17	1.6	8.64	92.9	27.7	61.65	894.275	4.429	0	0	10.31	9.1	0.002	7.574	0	0.06	0.00	356	4.16	3.71	
12/23/2014 0:00	313	12.07	11.7	3.4	7.572	82.8	38.9	55.12	890.9708	4.327	0	0	6.117	7.797	0	7.054	0	0.00	0.00	357	3.56	2.68	
12/24/2014 0:00	314	11.87	5.9	0.4	2.687	87.2	40.5	66.99	897.5679	7.237	0	0.2	5.132	3.679	-0.002	4.54	0.2	-0.06	0.00	358	3.41	2.74	
12/25/2014 0:00	315	11.82	9	-7.7	1.215	84.4	25.7	53.78	901.0802	4.54	0	0	11.8	3.49	-0.004	3.165	0	-0.12	0.00	359	4.38	2.99	
12/26/2014 0:00	316	12.08	13.1	-0.4	5.672	65.6	26.6	46.51	892.2606	5.397	0	0	6.569	5.038	-0.001	4.186	0	-0.03	0.00	360	3.51	3.89	
12/27/2014 0:00	317	11.88	11.2	-0.5	4.807	87.1	38.2	57.97	895.9974	4.106	0	0	9.17	7.136	0	5.683	0	0.00	0.00	361	4.13	2.67	
12/28/2014 0:00	318	11.86	2.8	-8	-2.11	90.5	40.6	73.11	906.8004	3.682	0	0	8.78	1.558	-0.006	3.511	0	-0.18	-0.01	362	4.17	1.75	
12/29/2014 0:00	319	11.79	10.9	-9.8	-0.337	88.7	28.8	64.23	902.5502	3.799	0	0	11.46	1.048	-0.006	1.53	0	-0.18	-0.01	363	4.45	2.91	
12/30/2014 0:00	320	12.15	13.8	-5.3	2.976	74.8	18.5	49.1	900.5782	2.956	0	0	11.9	5.948	-0.003	3.73	0	-0.09	0.00	364	4.16	3.22	
12/31/2014 0:00	321	11.9	-0.5	-12.5	-6.818	88.3	65.4	80.8	912.4882	3.651	0	0	1.981	-2.429	-0.012	0.113	0	-0.37	-0.01	365	2.77	0.95	
1/1/2015 0:00	322	11.81	-8.2	-13.4	-10.95	88.3	77.6	83.3	912.7485	0	0	0	4.168	-4.867	-0.015	-1.278	0	-0.46	-0.02	1	3.32	0.44	

1/2/2015 0:00	323	11.81	-3.2	-8.5	-5.4	90.4	86.2	88.4	904.296	0	0	0	3.396	-2.894	-0.01	-0.809	0	-0.30	-0.01	2	3.12	0.51
1/3/2015 0:00	324	11.8	-0.6	-4.3	-2.43	90.8	70.9	85.4	901.6433	0	0.254	0.2	2.68	-1.276	-0.007	-0.339	0.254	-0.21	-0.01	3	2.96	0.63
1/4/2015 0:00	325	11.77	2.5	-5.4	-1.422	91.7	74.3	86.2	896.0538	1.253	3.302	0	7.677	-0.303	-0.005	0.376	3.302	-0.15	-0.01	4	4.20	0.97
1/5/2015 0:00	326	11.85	0.8	-10	-4.633	87.5	50.2	71.67	912.6994	4.204	0.508	0	12.15	-0.965	-0.007	-0.481	0.508	-0.21	-0.01	5	5.16	1.69
1/6/2015 0:00	327	12.2	12.7	-7	1.098	87.7	39	70.01	910.9667	4.823	0	0	12.24	0.464	-0.004	0.003	0	-0.12	0.00	6	4.96	3.29
1/7/2015 0:00	328	12.38	10.6	-2.8	3.373	90.5	44.8	68.41	910.7673	2.795	0	0	11.86	4.235	-0.001	3.011	0	-0.03	0.00	7	5.02	2.23
1/8/2015 0:00	329	12.24	-2	-6.6	-4.622	90.1	38.8	67.8	920.1903	5.27	0	0	4.872	-1.827	-0.009	0.567	0	-0.27	-0.01	8	3.52	1.63
1/9/2015 0:00	330	12.09	11.8	-8.3	-0.187	84.8	37.9	59.2	908.5923	4.056	0	0	11.8	0.797	-0.005	0.208	0	-0.15	-0.01	9	4.96	2.97
1/10/2015 0:00	331	12.18	1.4	-5.3	-1.425	75.5	34.9	53.91	912.963	4.523	0	0	7.102	0.714	-0.005	1.361	0	-0.15	-0.01	10	4.00	2.06
1/11/2015 0:00	332	11.93	4.2	-6	-1.125	87.3	30.9	58.39	906.7278	4.73	0	0	8.35	0.455	-0.004	1.03	0	-0.12	0.00	11	4.29	2.36
1/12/2015 0:00	333	11.89	17.1	-4.2	3.947	91.5	34.5	70.52	900.3051	2.911	0	0	11.75	4.933	-0.003	3.549	0	-0.09	0.00	12	5.02	3.20
1/13/2015 0:00	334	11.94	1.5	-3.3	-1.448	92.9	61.4	82	910.2024	5.841	0	0	2.399	0.23	-0.006	1.899	0	-0.18	-0.01	13	2.97	1.42
1/14/2015 0:00	335	11.86	1.6	-5.1	-2.25	70.9	48.5	59.57	911.004	2.586	0	0	5.313	0.191	-0.006	1.458	0	-0.18	-0.01	14	3.72	1.46
1/15/2015 0:00	336	11.84	3	-1.6	0.372	86.4	68.1	77.86	908.1661	1.209	0	0	2.871	1.717	-0.003	2.461	0	-0.09	0.00	15	3.12	0.92
1/16/2015 0:00	337	11.74	13.8	-6.3	1.795	91.8	20.5	63.67	908.9548	2.78	0	0	12.75	3.543	-0.004	2.635	0	-0.12	0.00	16	5.14	3.18
1/17/2015 0:00	338	12.06	17.6	-6	4.465	86.5	17.5	51.37	905.7702	3.485	0	0	13.08	4.852	-0.003	3.009	0	-0.09	0.00	17	5.07	4.19
1/18/2015 0:00	339	12.35	17	-4.7	6.958	65.1	17.7	40.24	903.4329	5.844	0	0	12.9	5.848	-0.002	4.566	0	-0.06	0.00	18	4.97	5.40
1/19/2015 0:00	340	12.36	21.7	-4.6	7.219	70.7	16.6	42.27	906.5157	4.471	0	0	13.17	6.214	-0.001	4.354	0	-0.03	0.00	19	5.00	5.72
1/20/2015 0:00	341	12.47	22.5	-1.2	8.27	68.2	16.6	42.52	901.4937	1.749	0	0	13.06	10.28	-0.004	6.468	0	-0.12	0.00	20	5.00	3.85
1/21/2015 0:00	342	12.41	14.5	0.6	7.265	75.2	29.7	47.82	901.3512	4.214	0	0	12.89	8.11	-0.001	6.638	0	-0.03	0.00	21	5.54	3.76
1/22/2015 0:00	343	12.31	9.8	-0.6	3.279	92.7	41.4	73.67	905.0395	3.243	3.302	0	8.41	5.073	-0.002	5.297	3.302	-0.06	0.00	22	4.73	2.29
1/23/2015 0:00	344	12.21	0	-5	-1.005	92.6	88.4	90.8	909.3481	3.549	0	0	5.433	1.295	-0.006	2.913	0	-0.18	-0.01	23	4.02	0.89
1/24/2015 0:00	345	12.05	0.2	-10.6	-4.322	90.2	75.8	83.5	907.4003	2.841	0.508	0	14.2	-0.292	-0.007	1.064	0.508	-0.21	-0.01	24	6.87	1.36
1/25/2015 0:00	346	12.27	10.7	-3.5	2.436	79.2	46.2	68.25	904.8958	3.744	0.508	0	13.92	2.44	-0.004	2.1	0.508	-0.12	0.00	25	6.39	2.83
1/26/2015 0:00	347	12.36	13.3	-0.3	5.109	86.8	34.8	63.75	905.5627	3.734	0	0	13.9	4.878	-0.002	4.181	0	-0.06	0.00	26	6.30	3.34
1/27/2015 0:00	348	12.44	21.7	-1	8.67	88.5	22.6	57.55	907.6384	3.164	0	0	13.82	8.39	-0.002	6.084	0	-0.06	0.00	27	6.01	4.54
1/28/2015 0:00	349	12.33	22.9	1.3	10.04	81.9	20.8	56.38	906.5079	2.177	0	0	13.9	11.02	-0.003	7.6	0	-0.09	0.00	28	6.00	4.16
1/29/2015 0:00	350	12.35	23.3	2.2	10.67	84.1	23.7	57.68	902.7552	3.35	0	0	13.37	10.33	-0.001	8.11	0	-0.03	0.00	29	6.07	4.86
1/30/2015 0:00	351	12.43	11.7	1.6	6.318	85.1	31.4	59	911.4623	4.556	0	0	8.09	5.951	-0.002	6.019	0	-0.06	0.00	30	4.85	3.24
1/31/2015 0:00	352	12.28	5.9	2.4	3.819	81.2	51.8	64.01	911.6472	2.488	0.508	0	4.132	4.773	-0.002	5.533	0.508	-0.06	0.00	31	3.74	1.63
2/1/2015 0:00	353	11.95	6.3	1.3	3.568	92.9	79.9	90.3	899.8897	2.648	16.51	0.5	1.953	4.11	-0.002	4.629	16.51	-0.06	0.00	32	2.96	0.96
2/2/2015 0:00	354	11.89	7.1	0.1	4.025	92.9	50.6	76.92	902.2137	5.521	0	0	12.5	4.62	-0.001	5.307	0	-0.03	0.00	33	6.58	2.71
2/3/2015 0:00	355	11.88	10.1	-3.9	1.828	83.8	41.2	67.72	906.2493	4.345	0	0	13.73	2.892	-0.003	3.609	0	-0.09	0.00	34	6.87	3.12
2/4/2015 0:00	356	12.08	19.1	-4.2	6.134	90.7	27.4	67.74	901.9037	3.134	0	0	15.1	6.516	-0.002	5.353	0	-0.06	0.00	35	7.10	4.21
2/5/2015 0:00	357	12.23	18.6	-4	2.528	91.7	32.3	79.41	901.9508	5.92	0	0	11.41	4.611	-0.004	5.006	0	-0.12	0.00	36	6.15	5.40
2/6/2015 0:00	358	12.21	8.7	-4.2	-0.301	89.6	46.7	76.93	909.9521	3.152	0	0	10.64	2.782	-0.005	3.507	0	-0.15	-0.01	37	6.10	2.32
2/7/2015 0:00	359	12.22	27.7	-3.7	9.12	89	12.6	56.06	905.1329	3.72	0	0	15.94	8.61	-0.003	5.76	0	-0.09	0.00	38	6.89	7.11
2/8/2015 0:00	360	12.48	27.5	2.4	13.28	69.4	13.2	40.28	897.5225	4.352	0	0	16.26	12.08	-0.001	8.32	0	-0.03	0.00	39	6.96	7.28
2/9/2015 0:00	361	12.46	24.6	4.2	14.11	60.5	12.3	32.42	899.7825	4.167	0	0	16	13.04	-0.002	9.15	0	-0.06	0.00	40	6.90	6.42
2/10/2015 0:00	362	12.44	24.8	-0.1	11.58	79	15.9	44.01	904.3616	2.975	0	0	16.11	11.97	-0.004	8.71	0	-0.12	0.00	41	7.35	5.49
2/5/2015 0:00	357	12.23	18.6	-4	2.528	91.7	32.3	79.41	901.9508	5.92	0	0	11.41	4.611	-0.004	5.006	0	-0.12	0.00	36	6.15	5.40
2/6/2015 0:00	358	12.21	8.7	-4.2	-0.301	89.6	46.7	76.93	909.9521	3.152	0	0	10.64	2.782	-0.005	3.507	0	-0.15	-0.01	37	6.10	2.32
2/7/2015 0:00	359	12.22	27.7	-3.7	9.12	89	12.6	56.06	905.1329	3.72	0	0	15.94	8.61	-0.003	5.76	0	-0.09	0.00	38	6.89	7.11
2/8/2015 0:00	360	12.48	27.5	2.4	13.28	69.4	13.2	40.28	897.5225	4.352	0	0	16.26	12.08	-0.001	8.32	0	-0.03	0.00	39	6.96	7.28
2/9/2015 0:00	361	12.46	24.6	4.2	14.11	60.5	12.3	32.42	899.7825	4.167	0	0	16	13.04	-0.002	9.15	0	-0.06	0.00	40	6.90	6.42
2/10/2015 0:00	362	12.44	24.8	-0.1	11.58	79	15.9	44.01	904.3616	2.975	0	0	16.11	11.97	-0.004	8.71	0	-0.12	0.00	41	7.35	5.49
2/11/2015 0:00	363	12.46	26.4	1.9	12.98	74.1	14.7	42.83	898.8312	2.416	0	0	16.32	14.39	-0.004	10.33	0	-0.12	0.00	42	7.39	5.37
2/12/2015 0:00	364	12.43	8.8	2.8	5.352	79.6	52.6	68.79	905.8239	7.313	0	0	5.323	6.191	-0.003	7.112	0	-0.09	0.00	43	4.41	3.05
2/13/2015 0:00	365	12.31	12.6	-4.4	4.115	85.2	22.2	51.01	912.2075	3.008	0	0	16.66	8.02	-0.003	6.793	0	-0.09	0.00	44	8.21	3.68
2/14/2015 0:00	366	12.49	21	-2.3	8.1	76.7	17.8	45.34	908.0613	2.541	0	0	16.35	10.28	-0.003	7.851	0	-0.09	0.00	45	7.86	4.71
2/15/2015 0:00	367	12.47	23.7	0.3	11.2	72.7	20.3	48.08	906.5884	3.245	0	0	16.73	11.87	-0.002	8.86	0	-0.06	0.00	46	8.11	5.55
2/16/2015 0:00	368	12.49	23.1	-3.1	7.766	91.2	29.8	64.17	899.3394	4.97	0	0	14.11	10.23	-0.002	8.89	0	-0.06	0.00	47	7.71	6.04
2/17/2015 0:00	369	12.4	8.3	-4.7	0.718	78.1	35.4	53.52	902.6268	5.254	0	0	14.05	4.627	-0.004	4.978	0	-0.12	0.00	48	7.80	3.58
2/18/2015 0:00	370	12.41	9.3	-5.7	1.656	92.3	34.4	64.26	905.6798	3.303	0	0	11.61	4.576	-0.003	5.382	0	-0.09	0.00	49	6.97	2.82
2/19/2015 0:00	371	12.34	14.8	-7.2	2.775	91.5	23.8	62.18	906.1972	1.902	0	0	15.96	6.872	-0.004	5.428	0	-0.12	0.00	50	8.47	3.41
2/20/2015 0:00	372	12.42	22.6	-5.4	7.673	92	18.7	55.31	902.723	3.932	0	0	15.62	8.76	-0.002	6.703	0	-0.06	0.00	51	8.19	5.93
2/21/2015 0:00	373	12.45	26	-3.2	11.46	86.1	12.6	45.55	892.7332	3.315	0	0	15	12.66	-0.002	9.32	0	-0.06	0.00	52	7.76	6.19
2/22/2015 0:00	374	12.47	15	1.6	7.819	77	24	57.01	898.2075	5.036	0	0	15.16	11.31	0	9.68	0	0.00	0.00	53	8.31	4.97
2/23/2015 0:00	375	12.26	5	-8.8	-2.342	89.7	72.4	82.9	907.0886	2.442	0.508	0	2.141	1.324	-0.008	4.02	0.508	-0.24	-0.01	54	3.25	1.00
2/24/2015 0:00	376	12.16	-6.9	-10.3	-8.65	87.7	76.8	82.9	912.9047	2.446	0	0.4	6.068	-3.909	-0.012	-1.029	0.4	-0.37	-0.01	55	5.04	0.84
2/25/2015 0:00	377	12.07	7.7	-7.1	-0.963	88.3	31	68.3	903.2426	4.266	2.032	0	12.66	-0.052	-0.005	1.076	2.032	-0.15	-0.01	56	7.73	3.18
2/26/2015 0:00	378	12.16	16.6	-6	4.987	91.9	21.2	60.96	896.0468	3.99	0	0	17.36	6.404	-0.001	4.725	0	-0.03	0.00	57	9.43	4.95
2/27/2015 0:00	379	12.49	7.3	-6.5	-3.138	92.7	61.8	80.7	905.9002	6.064	1.27	0	9.94	0.921	-0.005	3.242	1.27	-0.15	-0.01	58	6.85	2.45
2/28/2015 0:00	380	12.34	-5.8	-11	-9.41	86.3	56.9	75.95	908.0734	3.936	0	0	12.92	-3.415	-0.009	-0.168	0	-0.27	-0.01	59	8.29	1.53
3/1/2015 0:00	381	12.29	-5.4	-11.3	-8.48	89.1	83.6	86.2	905.2974	1.573	0	0	12.51	-2.674	-0.008	0.046	0	-0.24	-0.01	60	8.24	1.14
3/2/2015 0:00	382	12.29	0.1	-5.5	-2.616	90.2	81.5	87.6	907.4351	1.574	1.016	0	11.19	0.379	-0.003	0.944	1.016	-0.09	0.00	61	7.60	1.40
3/3/2015 0:00	383	12.32	0.7	-3.1	-1.118	92.7	82.3	88.6	906.835	3.307	0	0	8.97	0.74	-0.001	2.008	0	-0.03	0.00	62	6.58	1.40
3/4/2015 0:00	384	12.3	15.6	0.6	7.229	92.7	45.5	76.81	896.588	3.479	0	0	10.12	6.412	0.004	5.951	0	0.12	0.00	63	7.06	3.26
3/5/2015 0:00	385	12.14	10.5	-6.2	-0.76	92.4	70.9	84.9	901.5082	5.546	0	0	3.991	2.016	-0.003	3.737	0	-0.09	0.00	64	4.22	1.89
3/6/2015 0:00	386	12.01	5	-12.2	-3.008	87.2	42.8	71.28	913.7528	3.545	0.508	0	20.43	0.52	-0.004	1.383	0.508	-0.12	0.00	65	11.92	3.03
3/7/2015 0:00	387	12.24	13.9	-6.6	2.312	89.9	34.4	68.49	911.7798	3.222	0	0	20.27	4.292	-0.001	4.109	0	-0.03	0.00	66	11.66	4.20

3/8/2015 0:00	388	12.4	15.9	-5.3	5.61	91.1	36.2	65.06	909.1354	2.332	0	0	15.3	7.311	0	6.212	0	0.00	0.00	67	9.50	3.64	
3/9/2015 0:00	389	12.39	19.3	0.6	9.57	88.8	30.1	60.17	901.9977	1.816	0	0	13.25	10.73	0.001	8.9	0	0.03	0.00	68	8.53	3.76	
3/10/2015 0:00	390	12.38	13.1	0.6	6.734	93.3	58.3	82.6	900.5991	2.115	0	0	7.892	8.09	0.001	7.978	0	0.03	0.00	69	6.23	2.20	
3/11/2015 0:00	391	12.28	21.4	-0.3	9.88	93.4	23.8	65.6	902.1173	1.878	0	0	18.87	12.79	-0.002	9.85	0	-0.06	0.00	70	11.05	4.75	
3/12/2015 0:00	392	12.5	21.2	2	10.92	93.3	20.4	60.25	908.1899	1.833	0	0	17.31	13.04	-0.002	10.88	0	-0.06	0.00	71	10.36	4.63	
3/13/2015 0:00	393	12.47	20.6	-0.3	10.04	87.8	20.4	53.63	906.3892	1.658	0	0	20.79	13.11	-0.003	11.09	0	-0.09	0.00	72	11.90	4.85	
3/14/2015 0:00	394	12.48	21.5	1.4	11	85.8	17.1	51.27	904.279	3.472	0	0	20.42	12.32	-0.001	10.77	0	-0.03	0.00	73	11.69	6.16	
3/15/2015 0:00	395	12.5	18.5	0.6	10.38	65.8	14.4	42.11	908.6513	4.616	0	0	21.32	11.75	-0.001	10.7	0	-0.03	0.00	74	11.91	6.64	
3/16/2015 0:00	396	12.43	21	-2.5	8.99	73.5	18.6	43.52	909.9734	1.609	0	0	21.26	12.22	-0.004	10.76	0	-0.12	0.00	75	12.13	5.03	
3/17/2015 0:00	397	12.45	25.7	0.8	13.45	79.29999	19.2	47.44	906.5649	3.766	0	0	19.7	14.54	-0.002	11.83	0	-0.06	0.00	76	11.55	7.04	
3/18/2015 0:00	398	12.51	12.9	5.7	9.35	83	44.7	64.64	906.1943	4.853	0	0	9.39	10.43	-0.001	10.58	0	-0.03	0.00	77	7.13	3.60	
3/19/2015 0:00	399	12.45	18.4	4.8	10.5	88	40.5	66.17	901.6968	2.836	0	0	17.69	13.79	-0.001	12.31	0	-0.03	0.00	78	11.35	4.53	
3/20/2015 0:00	400	12.45	22.6	5	12.82	92.1	35.7	72.3	899.1411	3.929	1.778	2.4	13.02	14.82	-0.001	13.34	2.4	-0.03	0.00	79	9.02	5.08	
3/21/2015 0:00	401	12.41	13.9	5	8.71	90.20002	57.6	79	906.9293	2.691	8.13	8.6	11.1	9.64	-0.001	10.74	8.6	-0.03	0.00	80	8.17	2.90	
3/22/2015 0:00	402	12.33	17.2	5.4	11.06	91.8	45.3	74.31	904.5171	1.626	0	0	10.71	11.52	0	11.57	0	0.00	0.00	81	7.95	3.04	
3/23/2015 0:00	403	12.26	26.7	4.9	14.35	93.20002	17.1	66.47	901.6142	2.412	0	0	21.92	16.49	-0.002	14.94	0	-0.06	0.00	82	13.08	6.58	
3/24/2015 0:00	404	12.47	29.7	3.5	16.72	93.4	12.5	50.35	900.3939	3.052	0	0	20.74	17.47	-0.003	15.52	0	-0.09	0.00	83	12.30	7.55	
3/25/2015 0:00	405	12.39	27.1	3.9	16.46	71.9	9.9	35.08	898.5731	3.3	0	0	23.04	17.83	-0.004	15.75	0	-0.12	0.00	84	13.08	7.71	
3/26/2015 0:00	406	12.42	27.8	4.7	14.55	84.3	11.2	46.98	897.6446	5.452	0	0	20.63	15.73	-0.003	14.36	0	-0.09	0.00	85	12.28	9.49	
3/27/2015 0:00	407	12.37	17.5	0.2	8.02	84.20002	18.4	51.81	907.331	4.452	0	0	22.29	12.47	-0.003	12.98	0	-0.09	0.00	86	13.49	6.40	
3/28/2015 0:00	408	12.42	24	-1.1	11.74	75	17.4	41.94	905.379	2.622	0	0	22.48	14.48	-0.004	13.84	0	-0.12	0.00	87	13.42	6.50	
3/29/2015 0:00	409	12.39	28.8	2	15.57	85.20002	13.5	43.66	901.759	2.289	0	0	22.75	17.44	-0.004	15.47	0	-0.12	0.00	88	13.50	7.12	
3/30/2015 0:00	410	12.45	25.5	5	15.46	78.1	15.4	40.78	902.9366	4.976	0	0	22.67	15.03	-0.004	14.13	0	-0.12	0.00	89	13.64	8.51	
3/31/2015 0:00	411	12.45	23.5	2.8	13.78	71.1	23.6	45.35	905.8748	2.797	0	0	16.78	15.23	-0.003	13.93	0	-0.09	0.00	90	11.00	5.73	
4/1/2015 0:00	412	12.5	30.7	4.8	17.1	89.9	12.6	51.3	899.7524	2.455	0	0	20.51	18.16	-0.004	16.13	0	-0.12	0.00	91	12.64	7.35	
4/2/2015 0:00	413	12.5	30	9	19.39	71.6	13.7	40.16	895.4083	3.835	0	0	22.48	19.79	-0.003	17.15	0	-0.09	0.00	92	13.61	8.64	
4/3/2015 0:00	414	12.49	30.2	4.7	18.38	74.1	11.4	35.59	895.6325	3.661	0	0	23.16	18.81	-0.004	16.72	0	-0.12	0.00	93	13.78	8.70	
4/4/2015 0:00	415	12.52	17.5	4.4	10.23	69.7	25.6	49.78	905.8899	6.954	0	0	20.93	12.27	-0.002	12.11	0	-0.06	0.00	94	13.33	7.59	
4/5/2015 0:00	416	12.44	16.9	0	9.26	73.9	18.6	43.77	909.3663	3.73	0	0	19.17	11.36	-0.002	12.08	0	-0.06	0.00	95	12.34	5.73	
4/6/2015 0:00	417	12.47	26	5.5	16.1	84.20002	26.7	52.92	898.1427	4.198	0	0	20.68	17.68	-0.002	15.53	0	-0.06	0.00	96	13.47	7.35	
4/7/2015 0:00	418	12.48	30.3	7.9	19.68	88.20002	13.1	48.26	896.171	4.86	0	0	21.14	18.58	-0.001	16.42	0	-0.03	0.00	97	13.35	9.23	
4/8/2015 0:00	419	12.54	31	12.2	20.69	92.8	11.3	47.09	897.926	4.012	0	0	24.31	20.57	-0.002	17.94	0	-0.06	0.00	98	15.17	9.23	
4/9/2015 0:00	420	12.58	30.6	10.4	20.45	92.4	19.9	50.51	894.7069	5.389	0	0	18.42	19.49	-0.002	17.09	0	-0.06	0.00	99	12.40	8.88	
4/10/2015 0:00	421	12.51	22.1	5.3	15.75	90	19	51.02	898.7086	4.102	0	0	21.42	17.12	-0.003	16.12	0	-0.09	0.00	100	13.85	6.90	
4/11/2015 0:00	422	12.5	20.1	1.1	10.99	81	26.8	49.52	905.5327	3.682	0	0	22.95	13.09	-0.003	13.26	0	-0.09	0.00	101	14.78	6.45	
4/12/2015 0:00	423	12.52	24.9	6.5	16.17	80.70002	40.3	60.87	900.2586	4.6	0	0	21.59	17.39	-0.002	16.9	0	-0.06	0.00	102	14.57	7.07	
4/13/2015 0:00	424	12.55	27.4	14.7	18.7	88.20002	26.8	67.97	896.292	5.313	7.112	6.1	18.27	19.39	-0.001	18.21	7.112	-0.03	0.00	103	12.72	8.01	
4/14/2015 0:00	425	12.52	15.1	8.4	12.36	90.1	56.6	79.55	902.3067	6.551	5.334	2.2	8.37	11.83	-0.002	13.63	5.334	-0.06	0.00	104	7.15	3.71	
4/15/2015 0:00	426	12.71	18.1	9.3	14.65	81.7	36.7	51.52	903.6395	2.52	0	0	40.06	17.01	0	20.58	0	0.00	0.00	105	24.90	8.17	
4/16/2015 0:00	427	12.55	26.1	5.7	15.57	91	20.7	59.79	897.7482	4.651	0	0	25.52	15.21	0	15.41	0	0.00	0.00	106	16.34	8.68	
4/17/2015 0:00	428	12.55	25.5	8.3	17.82	91.7	27.7	61.12	896.8514	4.272	2.286	2.1	21.65	16.82	0	17.49	2.286	0.00	0.00	107	14.58	7.39	
4/18/2015 0:00	429	12.54	22.8	8.9	16.31	90.5	13.2	57.75	899.4218	2.548	2.794	2.7	24.93	16.68	-0.001	17.72	2.794	-0.03	0.00	108	15.97	6.92	
4/19/2015 0:00	430	12.51	23.5	4.8	14.76	93.1	13.7	51.48	896.9256	2.858	0	0	25.53	15.12	-0.001	14.69	0	-0.03	0.00	109	16.21	7.24	
4/20/2015 0:00	431	12.49	16.6	4	10.58	80.8	40	57.2	898.0052	5.006	0	0	21.08	11.53	-0.001	11.41	0	-0.03	0.00	110	14.37	5.95	
4/21/2015 0:00	432	12.44	19.6	-0.1	10.47	86.5	25	52.06	900.7746	2.611	0	0	25.46	12.55	-0.002	13	0	-0.06	0.00	111	16.52	6.22	
4/22/2015 0:00	433	12.48	26.2	2.7	15.48	87.3	15.8	50	898.3216	2.399	0	0	25.27	17.03	-0.002	16.78	0	-0.06	0.00	112	16.13	7.33	
4/23/2015 0:00	434	12.53	24.3	9.6	16.97	89.7	46.4	69.87	897.1549	4.202	0	0	17.48	18.06	-0.001	17.66	0	-0.03	0.00	113	12.72	5.91	
4/24/2015 0:00	435	12.52	20.6	13.8	16.17	92.6	62.8	83.3	897.9286	3.765	0	0	10.82	17.42	-0.001	17.18	0	-0.03	0.00	114	8.82	3.73	
4/25/2015 0:00	436	12.48	25	9.9	17.55	91.1	21.9	52.62	893.7299	5.874	2.032	5.4	22.65	15.26	0.002	15.21	5.4	0.06	0.00	115	15.26	8.69	
4/26/2015 0:00	437	12.51	26.1	6.6	16.62	65.5	16.3	38.83	893.5594	4.331	0	0	26.42	16.16	0	16	0	0.00	0.00	116	16.74	9.08	
4/27/2015 0:00	438	12.47	25.6	4	14.5	88.8	14.6	51.28	891.8996	2.424	6.858	2.2	14.62	14.18	-0.002	14.39	6.858	-0.06	0.00	117	10.60	5.85	
4/28/2015 0:00	439	12.45	10.5	5.1	8.35	90.8	77.8	87	896.8187	6.102	24.89	11	7.09	9.14	-0.001	9.84	24.89	-0.03	0.00	118	6.53	2.36	
4/29/2015 0:00	440	12.37	15.7	5.1	9.28	89.4	41.8	72.34	905.9338	4.371	1.016	0	18.75	9.04	0	10.98	1.016	0.00	0.00	119	13.35	5.18	
4/30/2015 0:00	441	12.55	20.9	2.9	12.1	89.7	27.7	62.06	904.2522	1.718	0	0	25.44	12.52	-0.001	14.59	0	-0.03	0.00	120	16.95	6.00	
5/1/2015 0:00	442	12.54	25.1	5.5	15.67	87.9	20.9	53.18	900.5244	2.985	0	0	25.37	14.68	0	16.2	0	0.00	0.00	121	16.76	7.53	
5/2/2015 0:00	443	12.52	25.2	4.7	16.41	91.6	22.7	53	902.5869	2.841	0	0	24.06	16.06	-0.001	17.05	0	-0.03	0.00	122	16.14	7.17	
5/3/2015 0:00	444	12.53	28	7.2	18.83	90.9	19	49.86	901.0814	4.116	0	0	23.09	17.04	0	17.36	0	0.00	0.00	123	15.55	8.44	
5/4/2015 0:00	445	12.54	28.9	9.6	20.24	76.6	27.7	49.1	899.0278	4.297	0.254	0	24.1	18.38	0	18.52	0.254	0.00	0.00	124	16.39	8.70	
5/5/2015 0:00	446	12.51	24.9	13.9	18.82	91.9	45.8	67.51	900.6489	4.543	25.4	18.1	15.72	18.06	-0.001	17.48	25.4	-0.03	0.00	125	11.95	5.90	
5/6/2015 0:00	0	12.37	20.4	12.5	16.28	89.3	62.8	77.46	896.6746	4.081	6.858	11	25.73	15.9	1.745	15.66	11	53.19	1.75	126	18.32	6.41	
5/7/2015 0:00	1	12.32	25.9	14.2	19.46	91.9	31.8	68.56	896.0071	5.578	0	0	24.29	17.85	1.82	17.5	0	55.47	1.82	127	17.00	8.61	
5/8/2015 0:00	2	12.3	19.2	11.8	16.15	92.3	67.7	87.7	896.4671	3.878	51.31	68.2	5.662	17.52	2.663	17.54	68.2	81.17	2.66	128	5.68	2.64	
5/9/2015 0:00	3	12.18	17.9	11.7	14.98	93.7	79.5	90.1	897.6899	3.869	23.11	31.5	9.54	15.46	4.264	15.54	31.5	129.97	4.26	129	8.16	2.86	
5/10/2015 0:00	4	12.14	25	13.5	19.14	93.8	27.3	63.94	895.1917	5.358	8.89	9.1	24.93	16.58	4.69	16.47	9.1	142.95	4.69	130	17.30	8.58	142.95
5/11/2015 0:00	5	12.35	19.9	10.2	15.09	86.3	34.5	61.84	898.0731	2.975	0	0	25.75	17.17	4.635	17.13	0	141.27	4.64	131	17.71	6.67	143.19
5/12/15											0							133.01				6.27	142.57
5/13/15											0							129.76				5.19	142.05
5/14/15											24.38							134.34				4.19	141.63
5/15/15											4.318							137.12				7.79	140.85
5/16/15											0							135.41				7.67	140.08
5/17/15											8.3							132.63				6.11	139.47

5/18/15										0							130.20				7.72	138.70
5/19/15										0							127.32				7.79	137.92
5/20/15										44.8							128.17				5.80	137.34
5/21/15										0							124.99				2.19	137.12
5/22/15										0							122.75				2.31	136.89
5/23/15										8.64							127.45				2.62	136.63
5/24/15										0.762							126.97				7.14	135.92
5/25/15										0							125.38				7.94	135.12
5/26/15										0							124.02				5.27	134.59
5/27/15										0							121.91				8.04	133.79
5/28/15										13.7							174.44				7.33	133.06
5/29/15										0.508							179.23				4.06	132.65
5/30/15										26.3							180.50				7.46	180.50
5/31/15										7.112							179.34				6.68	179.83
6/1/15										0							174.77				5.75	179.25
6/2/15										0							168.70				7.95	178.46
6/3/15										0							167.32				9.25	177.53
6/4/15										0							163.41				9.41	176.59
6/5/15										0							159.54				9.89	175.60
6/6/15										0							156.15				8.28	174.78
6/7/15										0							153.96				8.44	173.93
6/8/15										0							151.37				7.55	173.18
6/9/15										1.27							149.37				7.18	172.46
6/10/15										0							147.76				8.30	171.63
6/11/15										0							145.56				8.09	170.82
6/12/15										0							143.88				10.42	169.78
6/13/15										24.4							141.03				5.84	169.19
6/14/15										58.17							151.71				5.14	151.71
6/15/15										1.016							151.46				6.32	151.08
6/16/15										0							151.05				5.11	150.57
6/17/15										5.08							148.38				6.07	149.96
6/18/15										0							147.58				7.17	149.25
6/19/15										0							145.79				8.20	148.43
6/20/15										5.08							145.23				7.20	147.71
6/21/15										0							143.58				9.60	146.75
6/22/15										0							142.45				9.12	145.83
6/23/15										0							140.09				8.87	144.95
6/24/15										0							138.26				9.59	143.99
6/25/15										0							135.67				9.19	143.07
6/26/15										0							134.92				9.14	142.15
6/27/15										0							131.62				7.95	141.36
6/28/15										0							130.84				7.39	140.62
6/29/15										0							129.52				8.80	139.74
6/30/15										1.524							127.46				7.46	138.99
7/1/2015 0:00	7	12.55	28.3	21	24.07	74.1	37.6	56.2	902.5002	2.938	0	0	3.208	23.09	4.09	23.01	0	124.66	4.09	182	4.21	3.88	138.61
7/2/2015 0:00	8	12.5	31.6	18.7	25.24	87.8	31	59.52	901.6897	4.317	0	0	27.09	23.99	3.93	23.06	0	119.79	3.93	183	19.43	9.68	137.64
7/3/2015 0:00	9	12.77	31.4	20.4	25.48	84	33	60.61	900.8264	3.173	0	0	21.13	24.42	3.829	23.72	0	116.71	3.83	184	15.71	7.83	136.86
7/4/2015 0:00	10	12.78	30.4	20	24.92	83.2	34.2	61.55	901.8159	2.646	0	0	22.18	23.82	3.865	23.4	0	117.81	3.87	185	16.36	7.58	136.10
7/5/2015 0:00	11	12.79	30.7	19.9	25.83	85.7	35.2	58.52	901.5248	3.339	0	0	25.15	24.09	3.702	23.25	0	112.84	3.70	186	18.33	8.50	135.25
7/6/2015 0:00	12	12.79	31.2	20.6	25.97	81.9	37.1	59.8	900.8602	4.625	0	0	25.05	25.46	3.558	24.04	0	108.45	3.56	187	18.32	9.28	134.32
7/7/2015 0:00	13	12.78	32.4	20.2	24.76	92.7	40.8	70.1	899.9277	4.797	28.7	35.3	19.03	25.19	3.572	24.37	35.3	108.87	3.57	188	14.62	8.02	133.52
7/8/2015 0:00	14	12.73	21.9	17.1	19.04	92.4	74.6	86.9	902.7659	5.411	11.68	0	7.4	23.16	3.7	23.58	11.68	112.78	3.70	189	6.84	3.20	136.73
7/9/2015 0:00	15	12.71	26.1	16.3	20.49	89.8	55.3	75.92	901.4111	3.238	0	0	19.88	21.59	3.62	22.14	0	110.34	3.62	190	15.07	6.13	136.11
7/10/2015 0:00	16	12.71	26.6	16.5	22.2	93.1	63.9	79.57	901.8472	5.174	39.88	50.1	19.03	21.49	4.205	21.77	50.1	128.17	4.21	191	14.68	6.23	135.49
7/11/2015 0:00	17	12.71	28.1	18.8	22.83	90.5	56.6	79.14	902.9554	4.442	8.89	5.2	20.82	22.35	4.568	21.68	8.89	139.23	4.57	192	15.88	6.95	139.23
7/12/2015 0:00	18	12.7	28.9	20.7	24.14	87.6	55.4	74.02	904.6268	4.428	0.254	0	21.48	23.84	4.462	23.02	0.254	136.00	4.46	193	16.39	7.34	139.02
7/13/2015 0:00	19	12.7	32	20.1	25.77	84.3	40.4	65.4	903.9091	4.12	0	0	27.16	23.86	4.367	23.11	0	133.11	4.37	194	19.81	9.39	138.08
7/14/2015 0:00	20	12.69	33.7	20.4	26.84	83.3	31.9	59.75	900.6647	3.521	0	0	27.74	24.27	4.333	23.43	0	132.07	4.33	195	19.91	9.72	137.11
7/15/2015 0:00	21	12.68	33.9	19.5	26.55	85	26.6	58.08	898.9291	2.765	0	0	27.83	24.26	4.241	23.58	0	129.27	4.24	196	19.68	9.38	136.17
7/16/2015 0:00	22	12.67	31.3	19.4	25.28	85.1	28.5	60.1	899.8121	3.492	0	0	27.03	24.82	4.182	23.73	0	127.47	4.18	197	19.17	9.23	135.25
7/17/2015 0:00	23	12.67	33.2	21.3	26.83	78.2	32.4	56.9	900.0768	3.657	0	0	26.63	25.39	4.089	24.46	0	124.63	4.09	198	19.12	9.58	134.29
7/18/2015 0:00	24	12.67	32.8	21	27.11	80.3	31.4	53.83	899.6323	4.161	0	0.1	26.89	25.31	4.018	24.32	0.1	122.47	4.02	199	19.24	9.84	133.30
7/19/2015 0:00	25	12.66	33	21.4	26.69	78.3	29.6	56.96	900.7437	3.806	0	0	27.46	25.34	3.941	24.71	0	120.12	3.94	200	19.51	9.90	132.32
7/20/2015 0:00	26	12.66	31.8	19	25.74	84.5	36.9	61.94	901.9712	3.448	0	0	27.06	24.69	3.865	24.2	0	117.81	3.87	201	19.45	9.01	131.42
7/21/2015 0:00	27	12.66	32.7	20.3	26.43	87.8	38.4	63.99	900.9415	2.883	1.016	1.5	22.28	24.87	3.795	24.19	1.5	115.67	3.80	202	16.57	7.80	130.64
7/22/2015 0:00	28	12.65	29.1	20.1	23.91	88.3	47	69.67	900.4236	2.54	0	0	22.04	25	3.729	24.42	0	113.66	3.73	203	16.48	6.93	130.10
7/23/2015 0:00	29	12.66	32.4	20.2	26.22	93.3	34	65.79	899.1653	2.923	0	0	25.05	25.01	3.663	24.29	0	111.65	3.66	204	18.27	8.39	129.26
7/24/2015 0:00	30	12.66	32.7	20.3	26.45	79.3	36.7	59.18	901.0778	2.896	0	0	18.91	25.55	3.592	24.71	0	109.48	3.59	205	14.19	7.28	128.53
7/25/2015 0:00	31	12.65	33	20.7	27.03	81.8	35.5	57.87	902.5735	2.745	0	0.1	23.67	25.61	3.522	24.81	0.1	107.35	3.52	206	17.27	8.19	127.71
7/26/2015 0:00	32	12.66	33.1	19.9	26.85	81.4	29.2	55.78	901.5367	2.988	0	0.1	26.19	25.77	3.449	24.95	0.1	105.13	3.45	207	18.55	8.99	126.83
7/27/2015 0:00	33	12.65	33.4	20.7	27.29	85.1	30.9	57.49	900.2982	2.999	0	0	25.74	25.91	3.376	25.1	0	102.90	3.38	208	18.46	8.88	125.95

7/28/2015 0:00	34	12.65	33.3	20.5	27.25	86.3	34.8	58.97	899.8174	3.448	0	0	24.3	26.44	3.304	25.3	0	100.71	3.30	209	17.68	8.70	125.08
7/29/2015 0:00	35	12.66	33.9	20.3	27.79	81.9	34.2	54.16	900.5594	3.869	0	0	26.25	26.47	3.228	25.72	0	98.39	3.23	210	18.82	9.49	124.13
7/30/2015 0:00	36	12.64	31.9	19.1	25.18	86.9	38.8	64.88	905.0213	2.648	0	0	25.2	25.75	3.151	25.37	0	96.04	3.15	211	18.23	8.11	123.32
7/31/2015 0:00	37	12.64	30.6	20.2	24.91	88.5	46.2	70.97	907.1506	3.011	0	0	23.04	26.03	3.08	25.2	0	93.88	3.08	212	17.08	7.50	122.57
8/1/2015 0:00	38	12.64	30.4	21.7	25.31	91.3	43.1	70.54	906.8417	3.206	0	0	22.89	26.66	3.007	25.72	0	91.65	3.01	213	17.01	7.61	121.81
8/2/2015 0:00	39	12.64	28.7	19.3	23.28	91	54.2	75.36	904.6528	3.675	3.302	1	17.42	25.9	2.943	25.55	3.302	89.70	2.94	214	13.41	6.09	121.20
8/3/2015 0:00	40	12.64	32.2	19.7	25.4	88.9	35.4	65.27	901.0052	2.566	0	0.1	23.07	25.48	2.878	25.12	0.1	87.72	2.88	215	16.76	7.74	120.52
8/4/2015 0:00	41	12.64	30.6	21	24.9	91.2	44.3	70.74	900.5341	2.77	3.81	3.8	18.69	26.21	2.819	25.33	3.81	85.92	2.82	216	14.19	6.51	119.88
8/5/2015 0:00	42	12.62	31.8	19	25.07	90.3	41.5	67.53	900.9144	3.208	0	0	24.97	25.88	2.749	25.37	0	83.79	2.75	217	18.12	8.19	119.44
8/6/2015 0:00	43	12.65	34.6	20.2	26.91	85.6	33	61.16	900.5839	2.964	0	0	20.68	26.49	2.686	25.65	0	81.87	2.69	218	15.18	7.91	118.65
8/7/2015 0:00	44	12.65	35.9	19.4	27.62	86	24.4	54.15	899.3334	3.705	0	0	26.02	26.76	2.622	25.88	0	79.92	2.62	219	18.12	9.93	117.66
8/8/2015 0:00	45	12.64	34.2	19.2	27.59	80.3	22.9	48.78	899.3623	3.052	0	0	26.28	26.31	2.544	25.88	0	77.54	2.54	220	17.99	9.26	116.73
8/9/2015 0:00	46	12.64	34.5	18.7	26.64	80.9	32.6	56.18	898.9256	3.17	0	0	24.52	26.88	2.473	25.99	0	75.38	2.47	221	17.35	8.81	115.85
8/10/2015 0:00	47	12.64	33.9	21.8	27.37	79.7	29.4	54.85	900.4663	2.566	0	0	22.41	27.19	2.395	26.41	0	73.00	2.40	222	16.04	8.08	115.05
8/11/2015 0:00	48	12.64	31.8	20	26.53	79.5	37.4	56.56	902.7571	3.136	0	0	23.4	27.62	2.317	26.7	0	70.62	2.32	223	16.73	8.05	114.24
8/12/2015 0:00	49	12.64	31.7	20.2	25.65	83.6	36.2	62.88	906.9444	3.607	0	0	22.43	26.06	2.218	26.12	0	67.60	2.22	224	16.14	8.13	113.43
8/13/2015 0:00	50	12.64	32.7	20.3	26.14	87.5	33.5	62.13	907.6951	2.328	0	0	22.92	26.47	2.128	25.99	0	64.86	2.13	225	16.44	7.64	112.66
8/14/2015 0:00	51	12.63	35.3	18.4	26.47	85.5	23.8	56.57	905.2028	2.394	0	0	24.48	26.7	2.057	26.1	0	62.70	2.06	226	16.88	8.55	111.81
8/15/2015 0:00	52	12.64	33.6	19.4	27.08	84.1	30.8	55	904.4583	2.428	0	0	19.96	27.12	1.978	26.43	0	60.29	1.98	227	14.39	7.27	111.08
8/16/2015 0:00	53	12.63	31.8	19.4	25.65	87.5	39.1	63.25	904.8013	2.677	0	0	21.98	26.82	1.893	26.33	0	57.70	1.89	228	15.88	7.35	110.35
8/17/2015 0:00	54	12.64	31.6	20.3	25.13	85.6	37.9	60.77	902.9709	2.592	1.27	1.3	17.13	26.2	1.802	26.02	1.3	54.92	1.80	229	12.78	6.42	109.70
8/18/2015 0:00	55	12.62	31	18.7	24.07	85.6	30.6	57.31	901.0878	3.378	0	0	15.49	25.37	1.723	25.53	0	52.52	1.72	230	11.54	6.71	109.16
8/19/2015 0:00	56	12.62	33.5	18.3	25.91	73.5	29.9	49.74	896.3496	2.992	0	0	24.08	24.33	1.629	24.56	0	49.65	1.63	231	16.50	8.53	108.31
8/20/2015 0:00	57	12.62	24.2	13.6	18.37	89.7	48.7	71.84	900.7385	4.884	1.27	1.1	11.61	22.9	1.547	24.05	1.27	47.15	1.55	232	9.20	5.09	107.80
8/21/2015 0:00	58	12.59	25.1	13.2	19.19	88.2	42.2	64.4	902.2685	2.651	0	0	18.68	21.13	1.464	21.85	0	44.62	1.46	233	13.35	5.73	107.34
8/22/2015 0:00	59	12.62	31.6	17.9	24.3	90.7	36.6	63.47	899.1467	3.905	0	0	22.92	23.39	1.39	22.83	0	42.37	1.39	234	16.17	8.14	106.52
8/23/2015 0:00	60	12.62	33.8	17.6	26	78.8	26.9	51.67	898.4156	4.052	0	0	23.88	24.34	1.307	23.8	0	39.84	1.31	235	16.18	9.24	105.60
8/24/2015 0:00	61	12.64	24.4	15.6	20.42	80.7	47.4	65.1	904.6153	4.169	0	0	14.35	23.28	1.223	23.88	0	37.28	1.22	236	10.76	5.51	105.05
8/25/2015 0:00	62	12.6	30.8	12.8	21.49	85	37.3	62.14	906.9146	1.715	0	0	21.79	21.19	1.143	21.66	0	34.84	1.14	237	15.08	6.55	104.39
8/26/2015 0:00	0	12.58	31.4	22.6	26.94	72.1	36.1	52.82	905.2006	2.033	0	0	8.19	26.36	1.056	24.39	0	32.19	1.06	238	7.07	4.54	103.94
8/27/2015 0:00	1	12.57	31.8	16.9	24.69	87.8	27.1	58.66	906.934	1.694	0	0	11.88	24.51	1.009	24.1	0	30.75	1.01	239	9.16	5.09	103.43
8/28/2015 0:00	2	12.56	33.7	16.8	25.45	84.6	16	49.82	904.3223	3.267	0	0	9.32	25.03	0.936	24.7	0	28.53	0.94	240	7.59	6.41	102.79
8/29/2015 0:00	3	12.56	33.4	16.1	24.71	79	27.1	51.56	901.7275	2.983	0.508	0	7.893	24.22	0.851	24.26	0.508	25.94	0.85	241	6.82	5.57	102.23
8/30/2015 0:00	4	12.55	29	18.6	22.47	89.1	34.3	68.42	904.3728	1.816	0	0	10.81	24.28	0.771	24.23	0	23.50	0.77	242	8.57	4.55	101.78
8/31/2015 0:00	5	12.52	31.2	15	22.12	88.2	23.7	60.19	903.2952	1.811	0	0	14.03	24.03	0.684	23.98	0	20.85	0.68	243	10.20	5.61	101.22
9/1/2015 0:00	6	12.55	31.5	13.1	22.75	86.7	23.3	52.69	901.7556	3.119	0	0	17.44	23.51	0.592	24.07	0	18.04	0.59	244	11.98	7.07	100.51
9/2/2015 0:00	7	12.55	32.1	14.4	23.81	82.6	27.6	51.62	902.3395	3.211	0	0	17.54	23.65	0.504	23.65	0	15.36	0.50	245	12.14	7.10	99.80
9/3/2015 0:00	8	12.54	31.9	14.3	23.66	80.1	29.4	51.46	902.5266	3.099	0	0	17.37	23.64	0.416	23.92	0	12.68	0.42	246	12.03	6.93	99.11
9/4/2015 0:00	9	12.55	32.9	15.5	24.7	77.6	25.8	47.96	900.3209	3.263	0	0	17.74	23.33	0.34	23.67	0	10.36	0.34	247	12.12	7.38	98.37
9/5/2015 0:00	10	12.54	32.2	15.2	24.53	81	29.4	50.44	900.1769	2.932	0	0	18.2	23.55	0.268	23.75	0	8.17	0.27	248	12.47	6.95	97.67
9/6/2015 0:00	11	12.55	32.4	17	25.07	80.6	31.1	53.11	901.6625	2.9	0	0	16.72	23.64	0.216	23.88	0	6.58	0.22	249	11.72	6.66	97.01
9/7/2015 0:00	12	12.56	33.4	16.4	25.42	83.7	28.5	52.87	902.2214	2.263	0	0	18.24	24.05	0.173	24.14	0	5.27	0.17	250	12.50	6.66	96.34
9/8/2015 0:00	13	12.54	33.6	16.7	25.5	78.9	26.1	51.49	901.5165	2.466	0	0	17.78	23.02	0.114	23.94	0	3.47	0.11	251	12.09	6.86	95.66
9/9/2015 0:00	14	12.57	32.7	18.5	25.22	83.5	29.9	57.78	899.6934	2.672	0	0	12.43	22.38	0.026	23.34	0	0.79	0.03	252	9.26	5.81	95.07
9/10/2015 0:00	15	12.54	26.3	16.8	22.02	88.6	51	73.07	902.3177	2.917	0	0	15.96	22.27	-0.01	23.03	0	-0.30	-0.01	253	11.49	5.15	94.56
9/11/2015 0:00	16	12.52	30	13.9	21.87	92.5	26.2	61.06	901.8504	1.707	0	0	17.82	22.29	-0.008	22.54	0	-0.24	-0.01	254	11.98	5.78	93.98
9/12/2015 0:00	17	12.56	25.6	15.9	21.11	79.2	43.6	60.27	904.5931	4.083	0	0	15.72	21.02	-0.008	20.52	0	-0.24	-0.01	255	11.03	5.85	93.40
9/13/2015 0:00	18	12.51	27.3	15.3	20.41	83.3	39.6	61.1	905.6912	3.038	0	0	14.43	20.93	-0.007	20.21	0	-0.21	-0.01	256	10.26	5.45	92.85
9/14/2015 0:00	19	12.54	33.7	13.9	24.55	68.4	24.2	44.3	899.5609	4.493	0	0	17.34	23.17	-0.008	19.69	0	-0.24	-0.01	257	11.33	8.42	92.01
9/15/2015 0:00	20	12.56	33.6	18.9	25.93	68.1	20.9	42.86	898.9506	5.61	0	0	18.62	25.45	-0.008	20.09	0	-0.24	-0.01	258	11.97	9.67	91.04
9/16/2015 0:00	21	12.56	31.9	12.6	23.87	72.7	25.8	43.75	901.1418	4.607	0	0	18.67	23.95	-0.009	19.45	0	-0.27	-0.01	259	11.95	8.15	90.23
9/17/2015 0:00	22	12.58	33.4	18.5	25.98	78.7	30.3	50.61	901.4165	5.031	0	0	17.59	26.52	-0.01	21.62	0	-0.30	-0.01	260	11.84	8.30	89.40
9/18/2015 0:00	23	12.57	34	18.6	26.4	84.2	33.2	54.51	899.7186	4.218	0	0	18.61	28.38	-0.01	23.34	0	-0.30	-0.01	261	12.58	7.80	88.62
9/19/2015 0:00	24	12.59	34.9	19.6	26.78	75.1	18.1	49.14	897.7114	4.426	1.524	2	14.97	27.72	-0.01	23	2	-0.30	-0.01	262	10.00	8.33	87.78
9/20/2015 0:00	25	12.52	24.7	15.3	19.5	76.8	42.4	60.81	903.6376	4.017	0	0	15.76	22	-0.01	19.14	0	-0.30	-0.01	263	10.67	5.76	87.41
9/21/2015 0:00	26	12.52	28.5	17.3	22.22	86.7	36.7	63.74	902.7891	3.791	0	0	19.47	25.06	-0.009	21.69	0	-0.27	-0.01	264	12.81	6.74	86.73
9/22/2015 0:00	27	12.55	30.9	13.9	22.54	92.3	29.6	61.36	902.1385	2.936	0	0	18.93	24.51	-0.01	22.19	0	-0.30	-0.01	265	12.20	6.60	86.07
9/23/2015 0:00	28	12.59	30.3	21	26.01	61.8	24.3	40.86	903.0337	5.175	0	0	25.46	27.64	-0.009	22.65	0	-0.27	-0.01	266	14.98	9.59	85.12
9/24/2015 0:00	29	12.52	25.3	16.2	20.41	88.7	44.9	65.95	903.2067	3.056	6.096	1.7	13.83	20.49	-0.007	20.7	6.096	-0.21	-0.01	267	9.68	4.79	84.64
9/25/2015 0:00	30	12.51	24.3	15.9	19.64	89.8	40.6	74.66	905.044	1.55	1.778	0	11.42	21.05	-0.009	20.46	1.778	-0.27	-0.01	268	8.28	3.79	84.43
9/26/2015 0:00	31	12.53	28.8	13.6	20.86	90.6	29.1	63.86	906.6635	1.505	0	0	19.6	23.3	-0.009	21.41	0	-0.27	-0.01	269	12.22	5.56	83.87
9/27/2015 0:00	32	12.54	27.1	11.6	19.53	88.7	39.7	63.15	903.6627	2.131	0	0	20.02	21.49	-0.009	20.75	0	-0.27	-0.01	270	12.58	5.54	83.32
9/28/2015 0:00	33	12.5	29	11.9	20.25	89.6	29.8	59.23	901.0865	1.864	0	0	19.35	22.68	-0.009	21.3	0	-0.27	-0.01	271	11.92	5.70	82.75
9/29/2015 0:00	34	12.51	30.2	9.4	20.28	87.9	27	53.89	899.6268	1.706	0	0	19.59	22.76	-0.009	21.47	0	-0.27	-0.01	272	11.77	5.79	82.17
9/30/2015 0:00	35	12.51	30.2	9.7	20.2	84.2	27.1	52.91	902.1031	1.469	0	0	19.61	22.97	-0.01	21.71	0	-0.30	-0.01	273	11.69	5.64	81.61
10/1/2015 0:00	36	12.52	28.6	13.1	20.98	79.2	31.7	52.69	904.7546	2.144	0	0	18.22	23.52	-0.01	22.22	0	-0.30	-0.01	274	11.16	5.65	81.04
10/2/2015 0:00	37	12.55	30.5	16.3	23.51	71.2	29.4	49.48	904.398	3.132	0	0	18.63	25.88	-0.011	22.87	0	-0.34	-0.01	275	11.27	6.69	80.37
10/3/2015 0:00	38	12.53	23.7	12.3	17.64	84.2	36.3	58.12	903.9574	4.8	0	0	16.11	19.93	-0.007	18.95	0	-0.21	-0.01	276	10.09	5.92	79.78
10/4/2015 0:00	39	12.42	14.1	10	11.94	86.1	48.4	69.27	899.8998	3.679	5.842	4.3	4.207	11.66	-0.004	14.93	5.842	-0.12	0.00	277	4.36	2.59	79.52
10/5/2015 0:00	40	12.39	17.7	10.2	13.15	90.4	60.4	81.8	903.4959	2.085	1.27	0	6.272	13.25	-0.004	15.28	1.27	-0.12	0.00	278	5.35	2.31	79.72
10/6/2015 0:00	41	12.38	18	11.5	14.23	90.4	59.8	81.1	906.0914	1.984	10.67	0.4	7.049	14.3	-0.004	15.99	10.67	-0.12	0.00	279	5.72	2.41	79.48

10/7/2015 0:00	42	12.34	25.7	7.7	16.46	91.4	43.5	69.78	905.798	2.259	0	0	17.52	17.43	-0.006	17.26	0	-0.18	-0.01	280	10.72	4.79	79.04
10/8/2015 0:00	43	12.64	26.4	14.1	20.02	81.7	36.1	54.8	904.3534	2.62	0	0	13.47	20.86	-0.007	19.35	0	-0.21	-0.01	281	8.66	4.80	78.56
10/9/2015 0:00	44	12.6	22	14.4	17.16	91.6	53.8	81.7	904.8921	2.327	3.81	1.3	6.432	17.01	-0.006	18.32	3.81	-0.18	-0.01	282	5.36	2.77	78.28
10/10/2015 0:00	45	12.54	20.6	12.1	16.75	91.9	67.3	82.6	909.2181	2.643	0	0	6.999	16.73	-0.005	17.61	0	-0.15	-0.01	283	5.65	2.48	78.17
10/11/2015 0:00	46	12.49	25.3	11.2	18.09	92.4	46.6	75.38	907.2524	3.448	0	0	16.14	19.29	-0.005	18.35	0	-0.15	-0.01	284	10.01	4.93	77.67
10/12/2015 0:00	47	12.6	31.3	14	21.25	89.2	23.8	60.42	898.0785	4.189	0	0	17.96	21.76	-0.006	19.4	0	-0.18	-0.01	285	10.27	7.35	76.94
10/13/2015 0:00	48	12.57	26.4	9.7	18.55	74.3	18	46.22	900.1586	4.847	0	0	17.55	18.63	-0.005	17.12	0	-0.15	-0.01	286	9.33	7.17	76.22
10/14/2015 0:00	49	12.51	28.6	7.3	17.24	82.4	21	51.14	904.2216	2.35	0	0	17.68	18.21	-0.008	17.3	0	-0.24	-0.01	287	9.47	5.74	75.65
10/15/2015 0:00	50	12.51	30.9	8.8	19.53	85.7	21.3	53.06	903.5303	2.441	0	0	17.44	20.66	-0.008	18.89	0	-0.24	-0.01	288	9.43	6.01	75.05
10/16/2015 0:00	51	12.53	31.7	11	20.93	90.8	23.7	57	902.9119	2.877	0	0	16.31	21.72	-0.008	19.79	0	-0.24	-0.01	289	9.18	6.16	74.43
10/17/2015 0:00	52	12.54	19	9.3	14.19	76.2	46.5	58.19	911.1406	4.791	0.254	0	10.21	15.42	-0.006	16.15	0.254	-0.18	-0.01	290	6.72	4.20	74.01
10/18/2015 0:00	53	12.46	24.5	5.8	14.8	81.3	29.3	54.78	910.121	2.745	0	0	15.83	16.23	-0.006	16.41	0	-0.18	-0.01	291	8.69	4.96	73.51
10/19/2015 0:00	54	12.45	24.6	7.1	15.58	82.5	30.5	54.71	908.4633	4.019	0	0	16	16.11	-0.005	16.08	0	-0.15	-0.01	292	8.77	5.64	72.95
10/20/2015 0:00	55	12.49	24.9	8	16.21	80.6	40.5	60.5	904.4738	4.082	0	0	13.54	16.99	-0.006	16.5	0	-0.18	-0.01	293	7.99	5.07	72.44
10/21/2015 0:00	56	12.53	24.4	11.7	16.33	90.2	38	75.94	902.026	3.817	24.64	26.6	6.237	15.78	-0.005	15.98	26.6	-0.15	-0.01	294	4.95	4.04	72.04
10/22/2015 0:00	57	12.48	20.4	14	17.01	90.1	65.6	79.84	902.9528	4.056	2.032	0.6	6.372	15.82	-0.003	16.45	2.032	-0.09	0.00	295	5.06	2.72	74.43
10/23/2015 0:00	58	12.43	18.7	12.9	14.98	91	71	86.9	900.3099	3.599	37.08	26	5.047	15.68	0.33	15.91	37.08	10.06	0.33	296	4.42	2.18	74.27
10/24/2015 0:00	59	12.36	24.3	11.4	17.56	92.5	31.2	69.26	900.0096	3.157	0	0	15.66	18.03	0.356	17.54	0	10.85	0.36	297	8.56	4.83	76.39
10/25/2015 0:00	60	12.58	15.7	4.9	11.43	86.2	40	67.44	906.2828	4.009	0	0	9.78	13.47	0.29	14.42	0	8.84	0.29	298	6.13	3.44	76.04
10/26/2015 0:00	61	12.43	19.3	2.1	9.35	88.1	13.7	59.96	908.4756	1.509	0	0	16.32	13.39	0.238	13.51	0	7.25	0.24	299	7.79	3.83	75.66
10/27/2015 0:00	62	12.48	19.8	2.5	10.31	86.9	16	56.19	904.0941	1.409	0	0	15.1	13.16	0.18	13.63	0	5.49	0.18	300	7.39	3.67	75.29
10/28/2015 0:00	63	12.48	23.8	4	12.72	83	25.6	59.6	896.5527	2.44	0	0	15.3	13.62	0.113	14.19	0	3.44	0.11	301	7.65	4.58	74.83
10/29/2015 0:00	64	12.51	18.4	6.2	11.99	81.2	28.9	59.28	899.4164	4.024	0	0	13.93	10.87	0.012	13.38	0	0.37	0.01	302	7.22	4.48	74.39
10/30/2015 0:00	65	12.46	21.8	4.1	12.88	86	28.3	59.53	896.55	3.128	0	0	12.83	10.1	-0.005	12.74	0	-0.15	-0.01	303	6.79	4.33	73.95
10/31/2015 0:00	66	12.49	20.7	10.6	13.88	91.8	47.9	76.92	892.9924	3.379	15.75	11.5	8.82	13.57	0.189	13.6	15.75	5.76	0.19	304	5.72	3.31	73.62
11/1/2015 0:00	67	12.48	18.7	5.7	11.81	88.4	29.9	66.08	897.687	3.327	0	0	14.94	13.68	0.304	13.99	0	9.27	0.30	305	7.43	4.12	74.36
11/2/2015 0:00	68	12.46	22.9	3.5	12.02	87.4	16	59.71	901.2897	1.254	0	0	14.66	13.39	0.261	13.12	0	7.96	0.26	306	6.78	3.75	73.99
11/3/2015 0:00	69	12.48	27.2	4	13.7	86.7	19.9	59.11	898.4835	2.661	0	0	14.85	13.69	0.224	13.8	0	6.83	0.22	307	6.88	5.25	73.46
11/4/2015 0:00	70	12.47	25.4	4.3	14.31	89.4	26.7	62.05	898.4094	3.094	0	0	13.65	13.71	0.18	13.76	0	5.49	0.18	308	6.74	4.82	72.98
11/5/2015 0:00	71	12.5	24.8	8.7	16.26	91.5	38.8	74.04	898.101	4.638	0	0	10.3	15	0.127	14.79	0	3.87	0.13	309	5.97	4.68	72.51
11/6/2015 0:00	72	12.51	22.5	7	14.68	92	22.6	57.7	900.1241	4.637	0	0	13.55	12.22	0.049	14.38	0	1.49	0.05	310	6.53	5.24	71.99
11/7/2015 0:00	73	12.42	19.1	-1.1	8.9	87.4	20.7	55.5	904.6196	2.199	0	0	13.22	6.856	-0.007	10.08	0	-0.21	-0.01	311	6.16	3.65	71.62
11/8/2015 0:00	74	12.43	14.8	2.7	7.691	88	33.2	64.73	910.4838	2.95	0	0	12.83	6.493	-0.006	9.49	0	-0.18	-0.01	312	6.32	3.23	71.30
11/9/2015 0:00	75	12.39	15.4	-0.4	6.616	91.5	27	61.8	908.3311	2.748	0	0	11.6	5.544	-0.006	8.12	0	-0.18	-0.01	313	5.79	3.23	70.98
11/10/2015 0:00	76	12.42	22.1	1.5	10.82	85.6	29.1	61.11	901.3638	3.752	0	0	13.08	9.84	-0.004	9.21	0	-0.12	0.00	314	6.16	4.63	70.51
11/11/2015 0:00	77	12.49	24.6	5.8	13.76	90.6	22.1	67.52	898.1683	4.521	0	0	11.3	13.21	-0.002	11.18	0	-0.06	0.00	315	5.54	5.50	69.96
11/12/2015 0:00	78	12.49	17.3	1.6	11.47	87.8	18.4	50.05	897.1542	5.353	0	0	12.79	11.02	-0.001	10.63	0	-0.03	0.00	316	5.72	4.78	69.48
11/13/2015 0:00	79	12.37	16.3	-2.1	6.083	87.9	21.9	56.2	907.6481	2.01	0	0	12.63	6.932	-0.007	8.2	0	-0.21	-0.01	317	5.68	3.13	69.17
11/14/2015 0:00	80	12.37	17.5	-1.4	7.283	83.3	22.4	53.1	908.6137	2.558	0	0	12.14	7.419	-0.007	8.1	0	-0.21	-0.01	318	5.48	3.51	68.82
11/15/2015 0:00	81	12.4	15.4	0.1	7.801	86.4	43	67.05	906.7232	2.923	0	0	8.39	7.888	-0.005	8.36	0	-0.15	-0.01	319	4.80	2.68	68.55
11/16/2015 0:00	82	12.4	15.1	8.5	12.39	91	78.6	85.6	901.4123	5.828	0.254	0.1	2.616	12.12	0	11.31	0.254	0.00	0.00	320	3.06	1.73	68.38
11/17/2015 0:00	83	12.35	22.8	6.4	15.84	89.6	47.4	73.99	890.5053	7.643	0.508	0.6	8.99	16.02	0.003	14	0.6	0.09	0.00	321	5.09	4.88	67.90
11/18/2015 0:00	84	12.51	9.1	2.3	6.277	72	42.9	54.62	887.0566	8.08	0	0	8.48	6.083	-0.002	8.16	0	-0.06	0.00	322	4.65	3.78	67.58
11/19/2015 0:00	85	12.42	19.5	-1.3	7.077	86.2	20.9	55.24	892.1827	3.478	0	0	13.04	7.326	-0.005	7.43	0	-0.15	-0.01	323	5.33	4.34	67.15
11/20/2015 0:00	86	12.47	13.2	-0.5	5.781	78.2	27.9	53.97	904.9321	3.378	0	0	12.75	7.581	-0.004	8.02	0	-0.12	0.00	324	5.40	3.26	66.82
11/21/2015 0:00	87	12.42	22.7	-2.1	8.61	90.2	19.1	58.64	899.4291	3.345	0	0	12.71	8.45	-0.006	8.07	0	-0.18	-0.01	325	5.08	4.77	66.35
11/22/2015 0:00	88	12.45	6.8	-4.8	1.107	73.4	26.5	54.84	909.6185	5.919	0	0	13	3.28	-0.005	5.738	0	-0.15	-0.01	326	5.39	3.46	66.00
11/23/2015 0:00	89	12.35	18	-5.6	3.653	75.7	16.5	49.65	905.7853	2.137	0	0	12.97	4.951	NAN	5.61	0			327	4.89	3.54	65.65
11/24/2015 0:00	90	12.41	15.8	-5.1	5.161	81.2	23.4	52.98	904.2381	2.434	0	0	9.24	5.204	-0.008	5.969	0	-0.24	-0.01	328	4.40	3.02	65.34
11/25/2015 0:00	91	12.41	22.1	-1.7	9.1	85.9	19.9	53.36	898.8033	3.763	0	0	12.56	9.43	-0.004	7.798	0	-0.12	0.00	329	4.84	4.83	64.86
11/26/2015 0:00	92	12.49	22.6	6.8	13.25	90.2	27.2	65.93	897.7303	5.714	0	0	11.74	13.88	0	10.83	0	0.00	0.00	330	5.03	5.41	64.32
11/27/2015 0:00	93	12.48	22.4	0.9	12.81	90.7	45.3	80.2	901.1203	6.596	14.22	15.2	5.645	13.59	0	12.85	15.2	0.00	0.00	331	3.80	4.41	63.88
11/28/2015 0:00	94	12.18	1	-2.9	-1.674	90	85.1	87.6	908.3188	3.239	3.302	9	1.302	-0.26	-0.007	4.265	9	-0.21	-0.01	332	2.63	0.73	65.33
11/29/2015 0:00	95	12.12	-0.2	-3.3	-1.68	88.8	85	87	907.3927	0.341	0	0.5	2.125	-0.433	-0.008	3.014	0.5	-0.24	-0.01	333	2.85	0.59	66.17
11/30/2015 0:00	96	12	2.7	-0.7	0.636	91.3	84.2	88.6	904.001	0.835	6.604	0	3.034	1.232	-0.005	4.073	6.604	-0.15	-0.01	334	3.09	0.72	66.14
12/1/2015 0:00	97	11.97	11.6	-1.5	4.546	91.8	34	72.01	900.1159	3.25	0	0	11.95	3.774	-0.002	5.571	0	-0.06	0.00	335	4.92	2.66	65.88
12/2/2015 0:00	98	12.36	14.7	-4.6	3.066	91	21.5	65.21	900.0657	2.794	0	0	12.28	1.359	-0.006	4.352	0	-0.18	-0.01	336	4.64	3.16	65.56
12/3/2015 0:00	99	12.48	13.5	-4.2	2.904	84.7	21.4	58.73	906.2738	1.65	0	0	12.13	1.543	-0.007	4.455	0	-0.21	-0.01	337	4.55	2.51	65.31
12/4/2015 0:00	100	12.47	15.1	-4.8	4.226	85.1	26.5	61.76	908.7023	2.672	0	0	11.99	3.499	-0.005	4.993	0	-0.15	-0.01	338	4.59	3.02	65.01
12/5/2015 0:00	101	12.47	14.1	-3.4	4.352	89.6	39.7	70.89	909.428	3.543	0	0	11.72	3.909	-0.004	5.139	0	-0.12	0.00	339	4.81	2.88	64.72
12/6/2015 0:00	102	12.48	15.1	-2.3	5.049	91.6	42.1	73.77	908.4396	3.248	0	0	9.34	4.806	-0.004	5.404	0	-0.12	0.00	340	4.36	2.70	64.45
12/7/2015 0:00	103	12.46	16.2	-1.6	5.617	81.3	22.8	56.86	913.8966	2.613	0	0	11.78	6.612	-0.004	6.148	0	-0.12	0.00	341	4.34	3.19	64.13
12/8/2015 0:00	104	12.46	18.8	-2.7	5.725	83.8	20	59.22	906.1163	2.454	0	0	11.82	6.06	-0.006	5.993	0	-0.18	-0.01	342	4.22	3.50	63.78
12/9/2015 0:00	105	12.47	19.4	-0.5	8.3	80.9	20.6	48.45	899.5994	3.405	0	0	8.07	7.373	-0.004	6.043	0	-0.12	0.00	343	3.72	3.91	63.39
12/10/2015 0:00	106	12.46	20.8	0.4	9.18	79.2	19.8	52.64	899.5679	2.963	0	0	10.15	8.74	-0.003	7.009	0	-0.09	0.00	344	3.92	3.93	63.00
12/11/2015 0:00	107	12.51	22.8	5.6	12.74	62.9	16	40.01	895.4995	3.279	0	0	10.53	13.11	-0.003	9.14	0	-0.09	0.00	345	3.71	4.57	62.54
12/12/2015 0:00	108	12.48	22.5	3.1	11	74.2	19.7	47.76	891.8837	3.04	0	0	8.18	10.22	-0.004	8.51	0	-0.12	0.00	346	3.64	4.15	62.13
12/13/2015 0:00	109	12.46	19.6	1.8	9.72	92.2	48.8	73.04	889.7841	4.259	7.366	9	7.158	9.28	-0.003	8.53	9	-0.09	0.00	347	3.93	3.10	61.82
12/14/2015 0:00	110	12.39	4.5	1.6	2.975	85.9	70.5	78.99	888.0833	6.005	0.508	0.1	3.777	2.828	-0.005	5.7	0.508	-0.15	-0.01	348	3.18	1.59	62.56
12/15/2015 0:00	111	12.33	18.5	-2.7	6.715	85.3	25.2	59.73	889.2299	3.519	0	0	11.76	6.131	-0.005	5.65	0	-0.15	-0.01	349	4.24	3.80	62.19
12/16/2015 0:00	112	12.54	10.1	-2.3	5.201	73.4	19.4	45.76	890.301	6.147	0	0	11.23	5.05	-0.002	5.445	0	-0.06	0.00	350	4.07	3.90	61.80

12/17/2015 0:00	113	12.42	7.4	-8	-0.212	88	29.5	58.38	897.7125	1.862	0	0	11.61	1.945	-0.009	3.9	0	-0.27	-0.01	351	4.45	1.89	61.61
12/18/2015 0:00	114	12.38	7.3	-8.1	-0.795	88.2	30.9	62.28	900.456	4.563	0	0	11.58	-0.486	-0.009	2.838	0	-0.27	-0.01	352	4.46	2.67	61.34
12/19/2015 0:00	115	12.35	12.9	-8.8	-0.187	88.9	23.8	63.17	906.0078	3.232	0	0	11.35	0.344	-0.01	2.193	0	-0.30	-0.01	353	4.22	3.07	61.04
12/20/2015 0:00	116	12.41	17.6	-4.6	5.947	82.3	20.4	53.2	905.35	4.126	0	0	10.14	5.571	-0.005	4.122	0	-0.15	-0.01	354	3.87	4.15	60.62
12/21/2015 0:00	117	12.49	18.8	4.9	10.88	80.6	26.4	55.98	898.239	6.497	0	0	7.024	10.17	0.001	7.362	0	0.03	0.00	355	3.60	5.03	60.12
12/22/2015 0:00	118	12.4	16.1	-4	6.148	82.9	23.8	49.49	898.5095	4.391	0	0	11.49	6.405	-0.003	6.079	0	-0.09	0.00	356	4.15	3.90	59.73
12/23/2015 0:00	119	12.42	17.4	-3.1	6.969	81.4	22.5	50.41	888.7437	4.388	0	0	6.32	5.87	-0.004	5.268	0	-0.12	0.00	357	3.45	4.00	59.33
12/24/2015 0:00	120	12.42	17.9	6	10.82	64.1	26	46.08	884.9854	5.826	0	0	10.88	11.34	0	7.687	0	0.00	0.00	358	4.01	4.96	58.83
12/25/2015 0:00	121	12.49	11.8	1.1	6.648	70.5	22.8	47.43	896.3945	2.843	0	0	11.07	8.42	-0.003	7.665	0	-0.09	0.00	359	4.07	2.80	58.55
12/26/2015 0:00	122	12.4	14.4	-2.8	5.58	78.6	50.9	64.19	897.4899	3.462	0	0	4.558	5.012	-0.004	5.872	0	-0.12	0.00	360	3.32	2.31	58.32
12/27/2015 0:00	123	12.27	9.5	-2.4	4.087	91.4	40	67.55	894.457	8.71	0	12.9	2.646	4.224	-0.001	5.855	12.9	-0.03	0.00	361	2.95	3.38	57.98
12/28/2015 0:00	124	12.14	-2.4	-5.7	-4.402	87.7	76	85.4	898.153	13.6	0	44.1	3.881	-3.129	-0.002	1.64	44.1	-0.06	0.00	362	3.21	1.63	59.11
12/29/2015 0:00	125	12.05	2.6	-8.1	-3.47	87.5	36.3	68.45	895.8177	6.596	0	0	11.67	-0.758	-0.004	2.261	0	-0.12	0.00	363	4.70	2.55	63.26
12/30/2015 0:00	126	12.43	2.3	-10.9	-4.091	90.5	61.2	78.78	897.655	2.271	0	0	10.21	-1.79	-0.007	1.951	0	-0.21	-0.01	364	4.68	1.23	63.14
12/31/2015 0:00	127	12.45	4.1	-5.6	-0.34	90.8	59.6	82.5	904.3306	2.56	1.016	0	11.15	0.128	-0.004	1.711	1.016	-0.12	0.00	365	4.85	1.47	62.99
1/1/2016 0:00	128	12.38	-1.3	-10.3	-4.764	90.7	82.5	87.6	909.0484	3.322	0	0	5.525	-0.911	-0.005	1.613	0	-0.15	-0.01	1	3.66	0.80	62.91
1/2/2016 0:00	129	12.35	2.8	-1.9	-0.848	85.4	46.8	70.14	914.675	2.462	0.254	0	7.183	-0.062	-0.004	1.567	0.254	-0.12	0.00	2	3.92	1.48	62.77
1/3/2016 0:00	130	12.36	6.6	-4.3	0.93	89	55.8	73.65	910.2073	2.738	0	0	10.42	0.194	-0.004	1.52	0	-0.12	0.00	3	4.70	1.68	62.60
1/4/2016 0:00	131	12.38	7.9	-6	-0.221	87	37.8	66.51	909.077	2.094	0	0	12.08	-0.455	-0.005	1.457	0	-0.15	-0.01	4	4.86	1.94	62.40
1/5/2016 0:00	132	12.38	5.2	-7	-1.075	87.3	44	72.13	908.7657	1.271	0	0	11.49	-0.855	-0.006	1.371	0	-0.18	-0.01	5	4.88	1.49	62.25
1/6/2016 0:00	133	12.38	2.7	-4	-0.673	90.6	80.8	86.7	903.895	3.317	1.524	0	2.3	-0.433	-0.004	1.374	1.524	-0.12	0.00	6	2.87	0.87	62.17
1/7/2016 0:00	134	12.3	6.3	0.7	3.62	91.7	83.6	88.6	897.8693	4.698	0	0	4.423	0.906	0.028	1.163	0	0.85	0.03	7	3.44	1.16	62.05
1/8/2016 0:00	135	12.18	13.1	-0.4	5.484	91.8	37.8	67.22	892.3102	5.515	0	0	11.6	2.484	0.269	2.213	0	8.20	0.27	8	4.90	3.45	61.71
1/9/2016 0:00	136	12.49	5.7	-2.1	1.217	91.2	69.3	84.5	892.7201	2.802	1.778	0.2	6.448	2.75	0.305	3.555	1.778	9.30	0.31	9	3.97	1.30	61.58
1/10/2016 0:00	137	12.38	0.2	-5	-2.193	90	68.5	79.87	901.4601	5.323	0	0	5.424	1.483	0.291	2.998	0	8.87	0.29	10	3.72	1.30	61.47
1/11/2016 0:00	138	12.29	0	-6.8	-2.704	89.9	70.8	83.6	905.1866	2.679	0	0	6.587	1.329	0.245	3.582	0	7.47	0.25	11	4.06	1.04	61.36
1/12/2016 0:00	139	12.22	8.2	-6.3	-0.252	89.7	36.1	73.36	903.6329	1.95	0	0	12.36	3.221	0.235	4.259	0	7.16	0.24	12	5.21	2.00	61.16