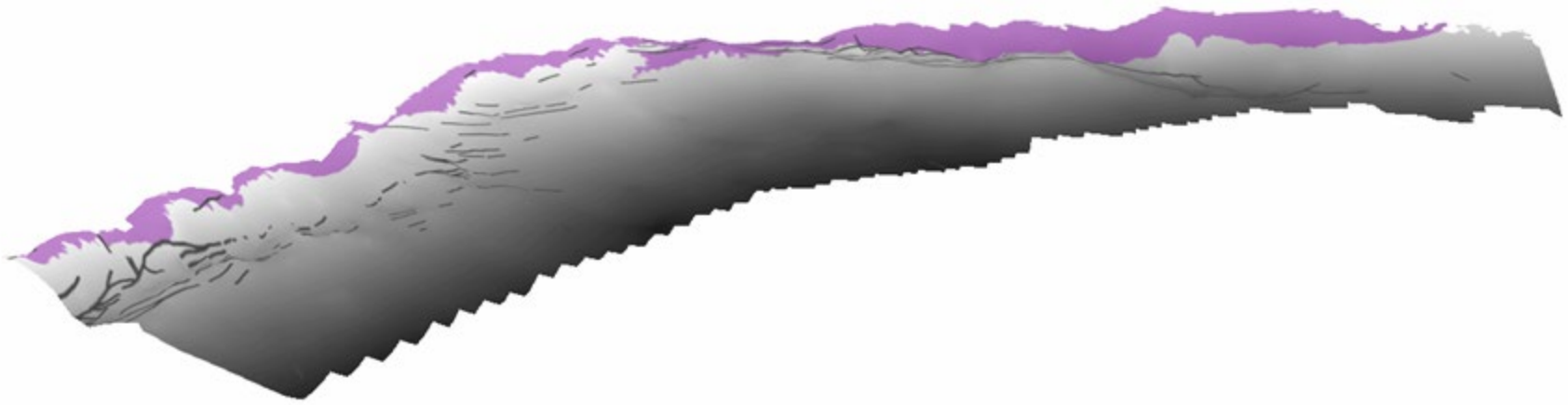
Welcome
to the

Nacatoch Aquifer Groundwater Availability Model

Stakeholder Advisory Forum



Thank you for signing in early.

The meeting will begin at 10:00 am, Central Daylight Time

Please stay muted during the meeting and use the chat box to submit questions

Agenda

- Introduction to the Groundwater Availability Modeling (GAM) Program
- Update on GAM for the Nacatoch Aquifer
- Data requests
- Question and Answer

Introduction to the Groundwater Availability Modeling (GAM) Program

GAM Program Overview

Aim: Develop groundwater flow models for the major and minor aquifers of Texas.

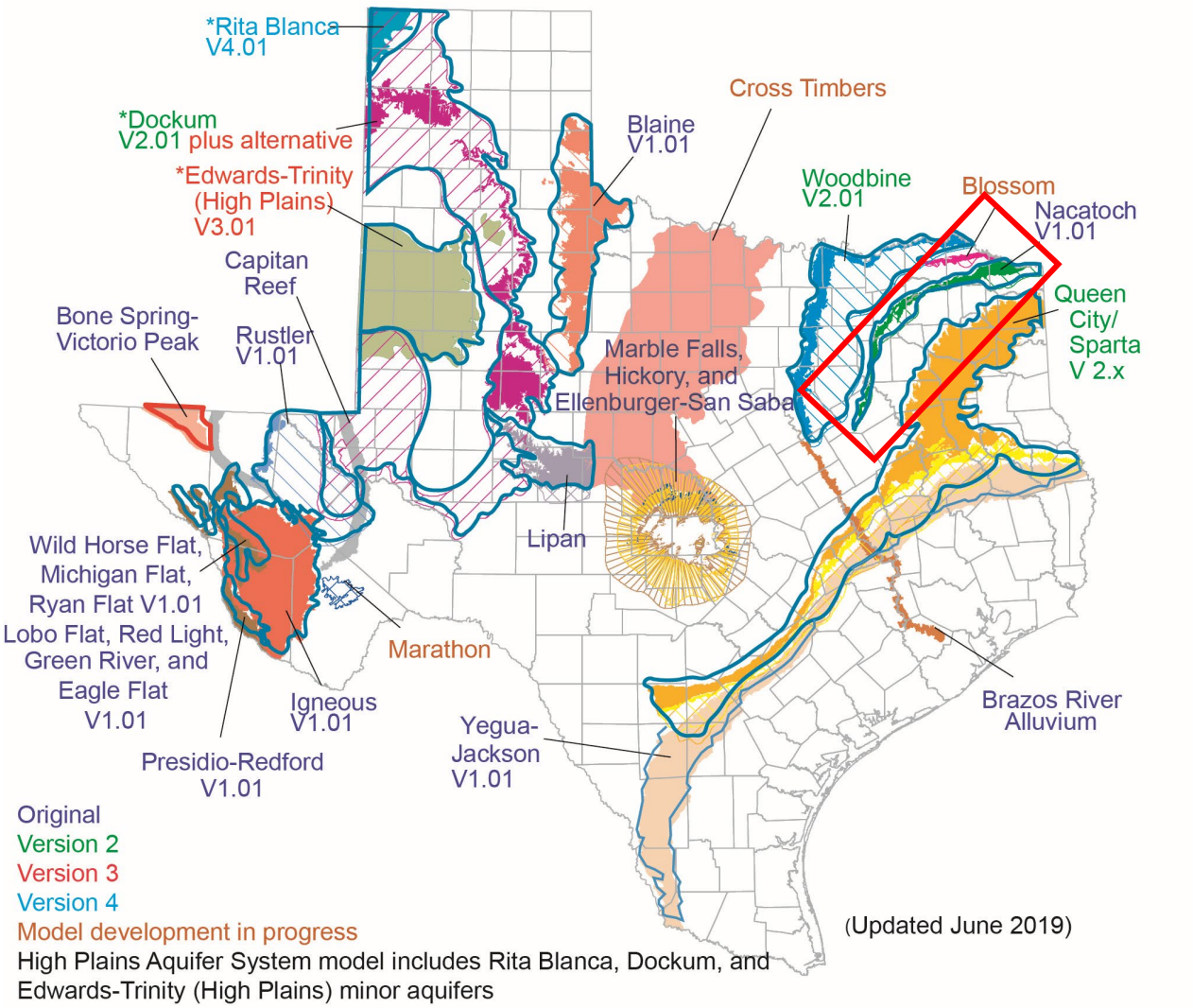
Purpose: Tools that can be used to aid in groundwater resources management by stakeholders.

Public process: Stakeholder involvement during model development process.

Models: Freely available, standardized, thoroughly documented. Reports available over the internet.

Living tools: Periodically updated.

GAMs for Minor Aquifers



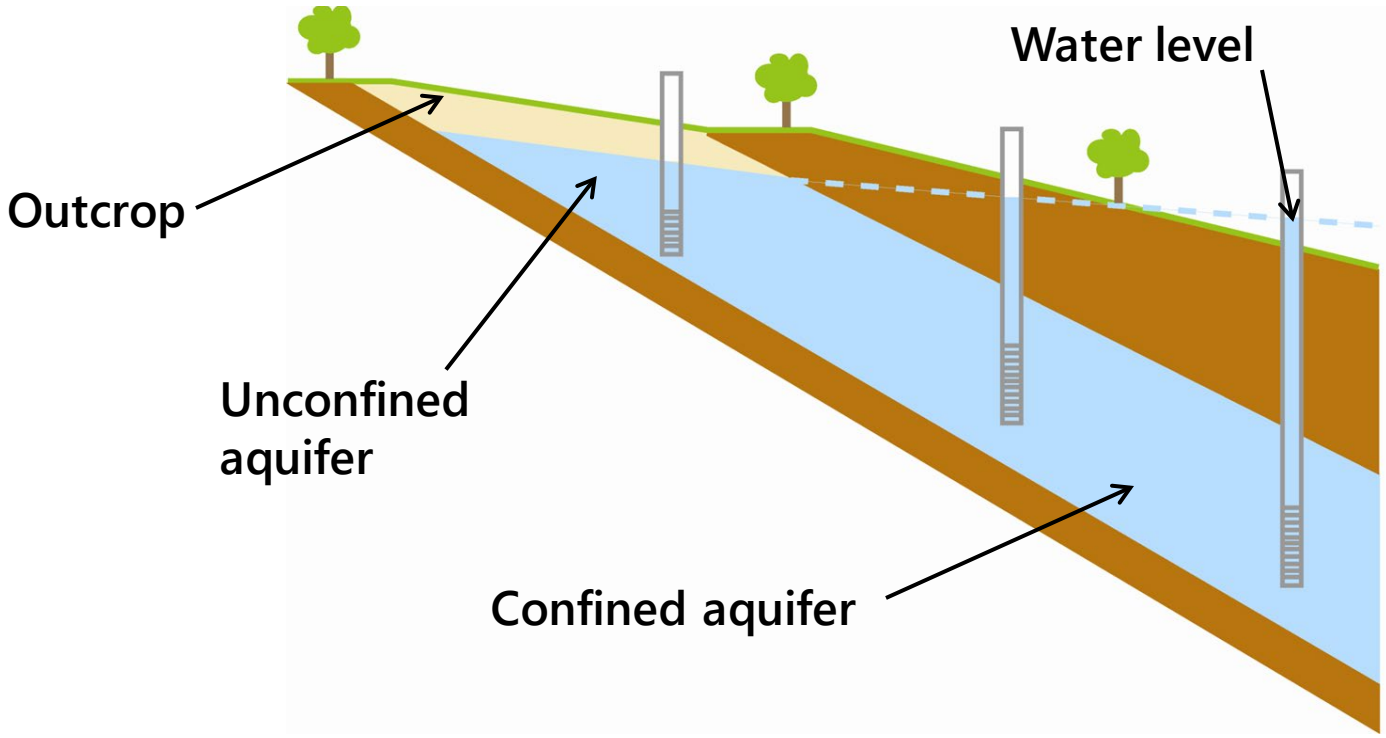
Why Stakeholder Advisory Forums?

- Keep stakeholders updated about progress of the model
- Inform how the groundwater model can, should, and should not be used
- Provide stakeholders with the opportunity to provide input and data to assist with model development

Nacatoch Aquifer GAM Update

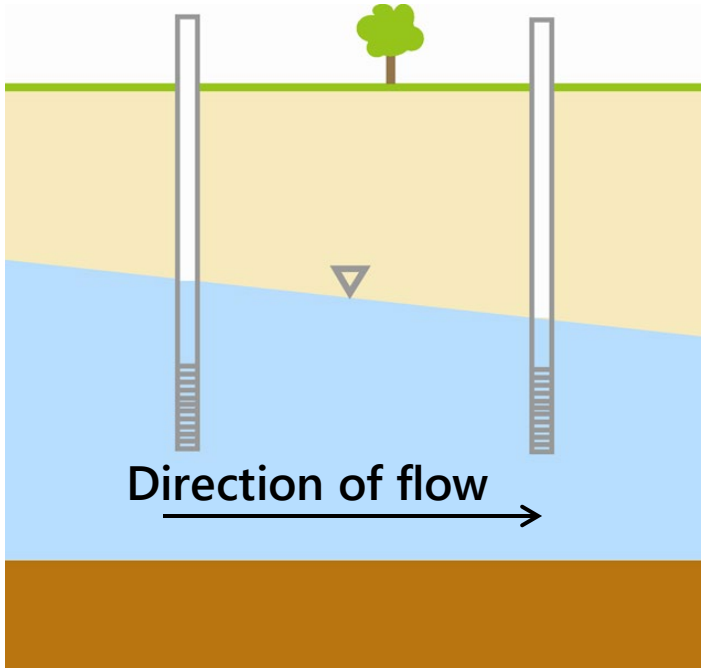
Groundwater Basics

- Aquifer = subsurface geologic material (rocks, dirt) that can store and transmit enough water for a particular demand
- Aquifers can be confined and unconfined



Groundwater Flow

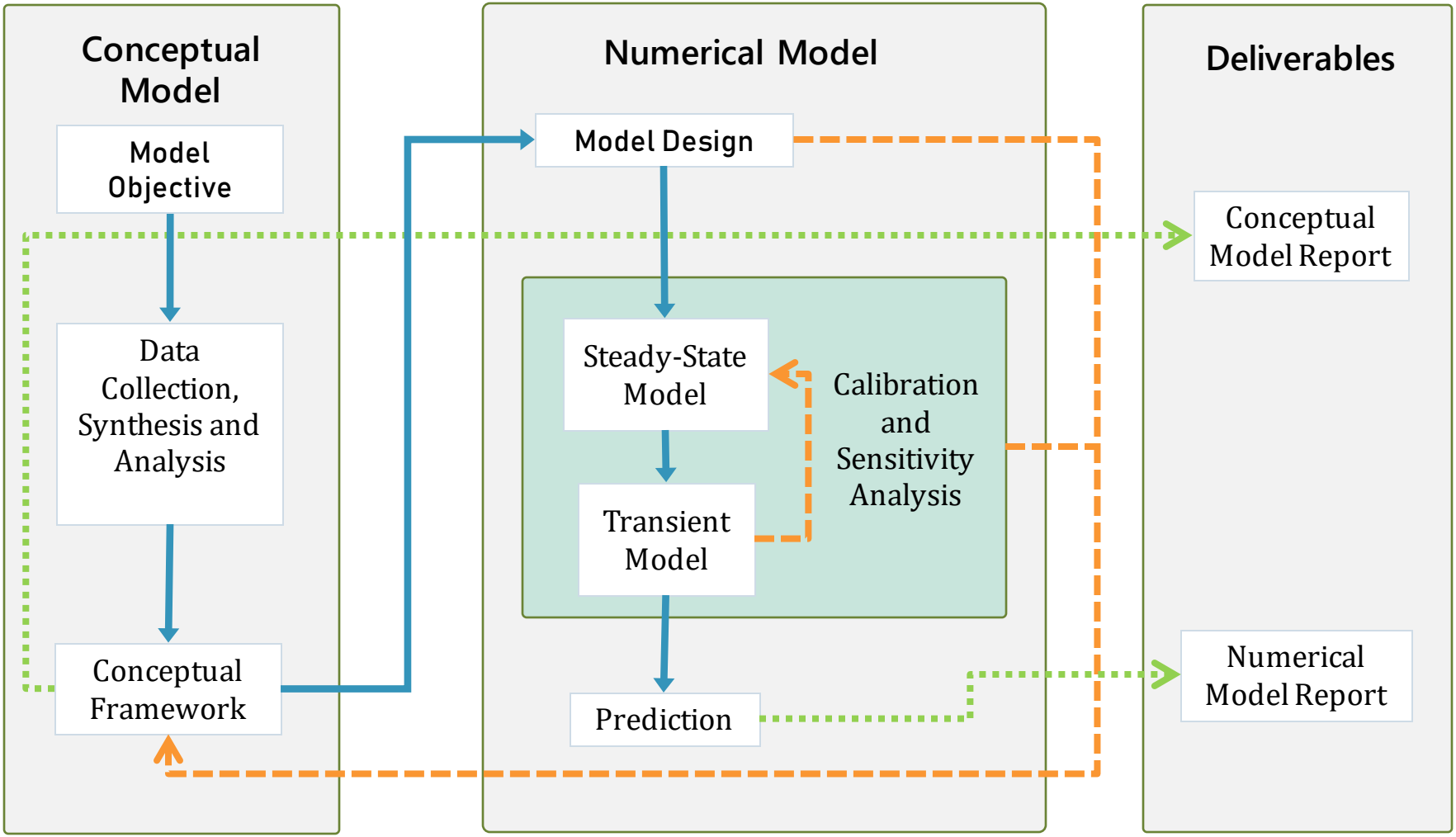
- Water flows from areas where water levels are higher to areas where water levels are lower
- Flow is controlled by slope of water table and physical properties of the aquifer



Groundwater Modeling

- "A model is a tool designed to represent a simplified version of reality" (Wang and Anderson, 1982)
- Digital groundwater models allow us to synthesize large amounts of data into a product that allows for predictions of water levels and groundwater discharge
- Nacatoch GAM, like other GAMs, will use a program called MODFLOW, developed by the United States Geological Survey and freely available
- Regional scale flow model
- Allows for calculation of Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAG), used in regional and state water plans

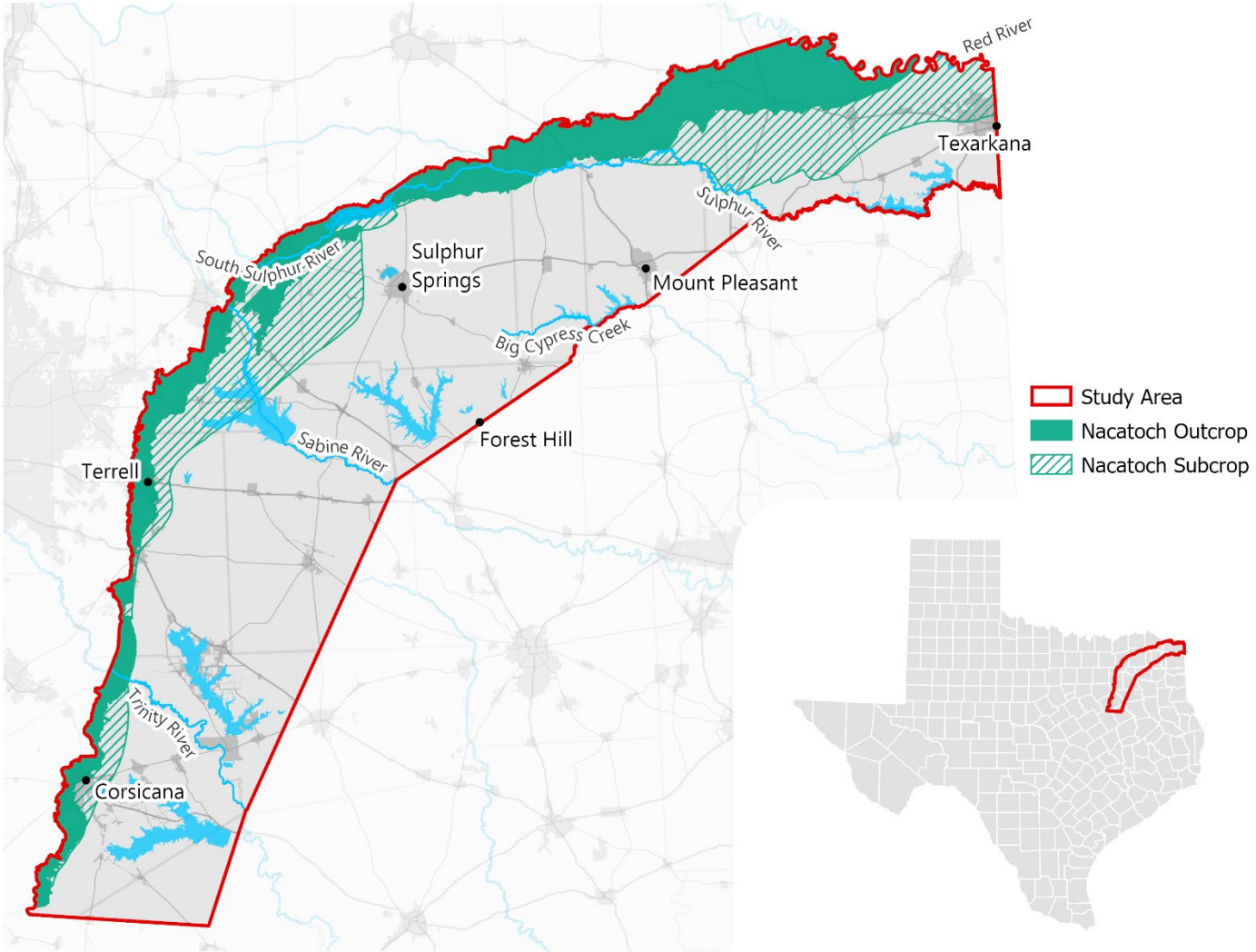
Modeling Process



Documentation and Metadata Throughout!

Flow chart after Anderson and Woessner, 2002

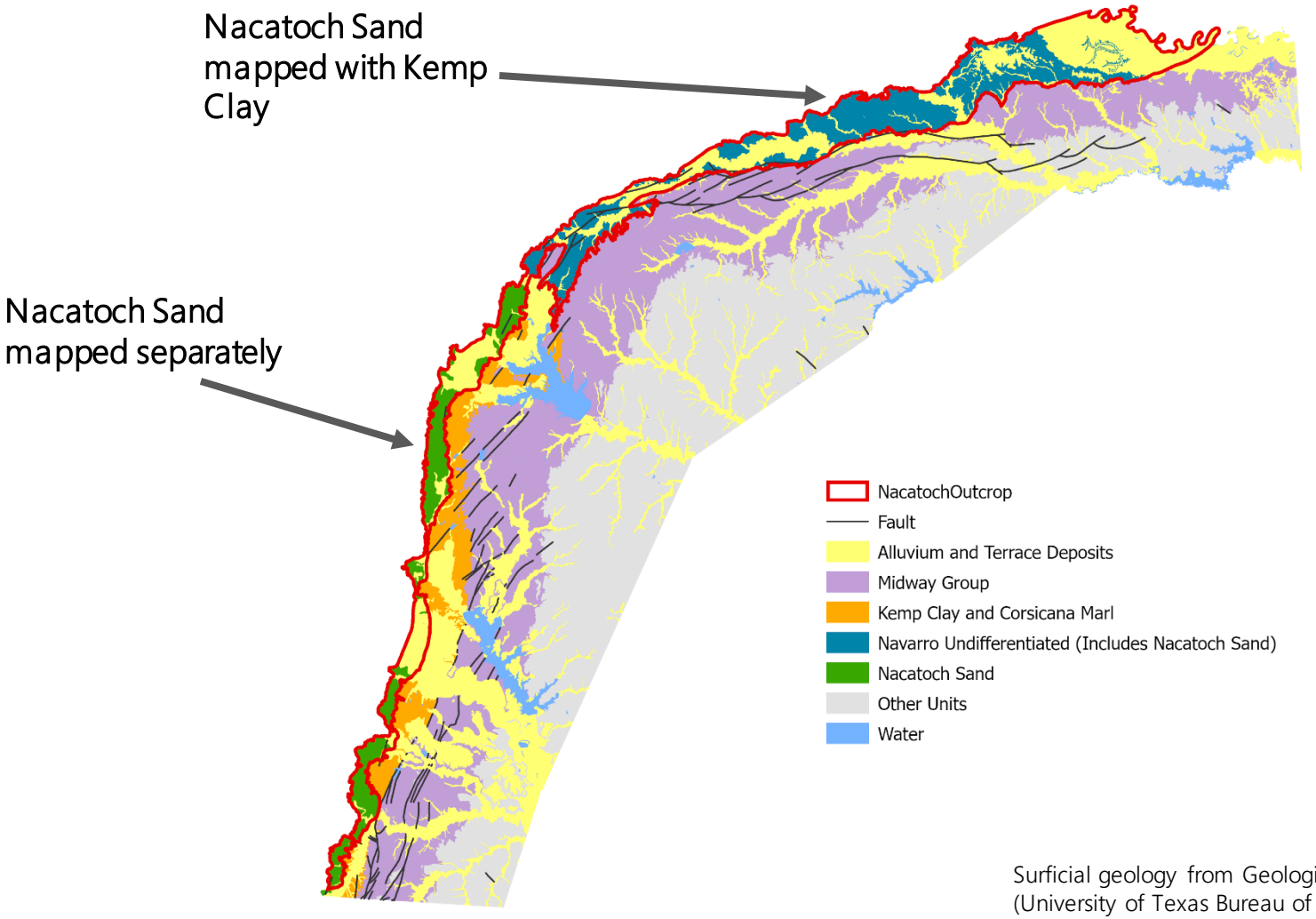
Nacatoch GAM Study Area



Nacatoch Aquifer Geology

System	Group	Stratigraphic Unit	Description
Quaternary		**Alluvium and Terrace Deposits**	Sand, silt, clay, and gravel
Tertiary	Midway	Wills Point Formation	Mostly clay, calcareous, some silt
		Kincaid Formation	Sand and clay
Cretaceous	Navarro	Kemp Clay and Corsicana Marl	Clay, clacareous, locally silty
		Nacatoch Sand	Alternating sand and mudstone
		Neylandville Formation	Clay, clacareous, silty, sandy
	Taylor	Marlbrook Marl	Marl, clay, calcareous

Nacatoch Aquifer Geology Map



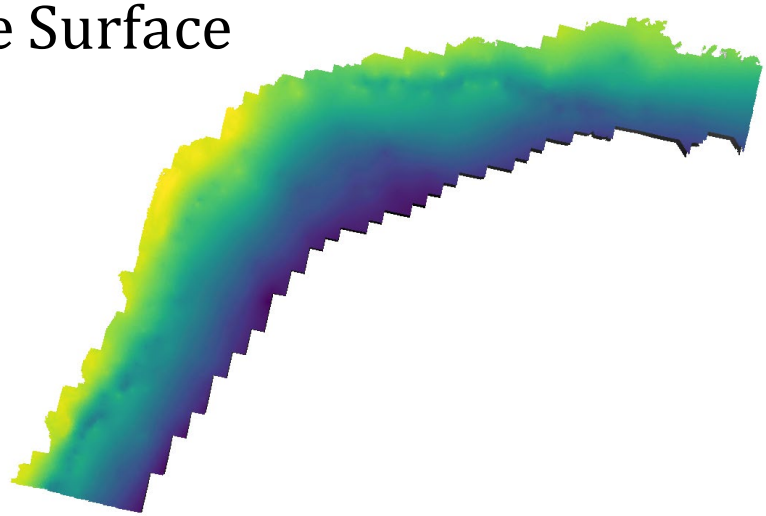
Surficial geology from Geologic Atlas of Texas (University of Texas Bureau of Economic Geology)

Previous Model

- First Nacatoch GAM completed in 2009 for TWDB by LBG-Guyton Associates and INTERA, Inc.
- 2 Layers
  - Layer 1 – Midway Group, Kemp Clay, alluvium and terrace deposits
  - Layer 2 – Nacatoch Aquifer
- 365,150 square grid cells per layer, ¼ mile sides
- MODFLOW 2000
- Time period
  - Steady state/pre-development – prior to 1980, with some pumping in Hunt County at end
  - Calibration/Transient – 1980 to 1997, annual timestep

Why Update?

- Update code – Current GAM is MODFLOW 2000, update to MODFLOW 6 or MODFLOW-NWT
- New data
  - Geologic framework created by TWDB Brackish Resources Aquifer Characterization System (BRACS)
  - Updated pumping and water levels to extend calibration period from 1997 to ~2018
- Explore opportunities to improve Surface water/Groundwater interaction
- Explore recharge improvements

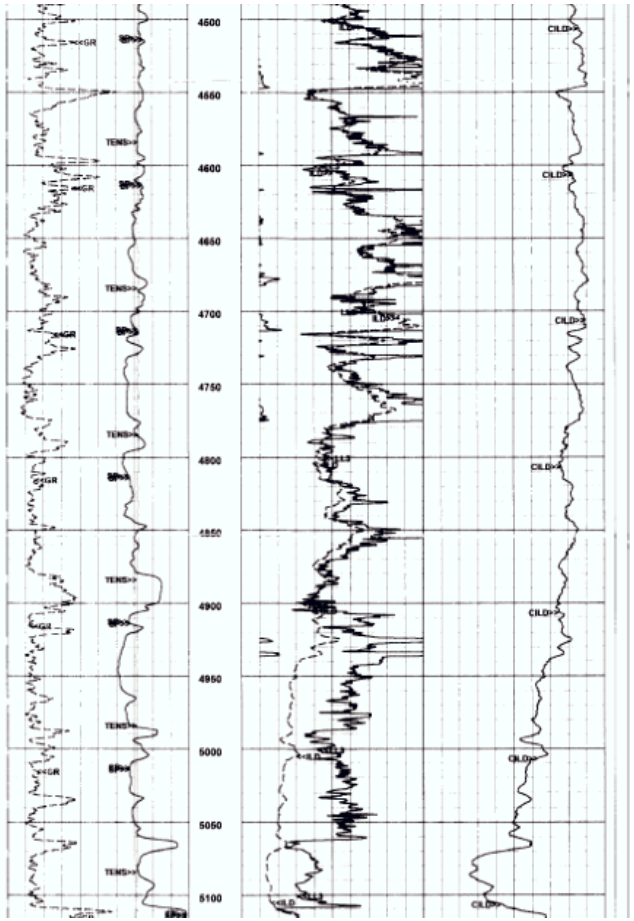


Schedule

- **Conceptual Model**
  - Feb. 2021 – May 2022
- **Numerical Model**
  - May 2022 – Dec. 2022
- **Stakeholder Meetings**
  - May 2022
  - Dec. 2022
- **Completion by Dec. 2022**

Data Request

- Groundwater well location, well construction, and water level data
- Geophysical well logs
- Aquifer properties, pump tests
- Historic pumping data, especially associated with well location and construction
- Surface water data – river dimensions, flow, returns, permitted extraction
- Anything possibly relevant



Send data to **stephen.bond@twdb.texas.gov** by August 31st, 2021

Contacts

- **Stephen Bond, P.G.**
  - Geoscientist, Lead Modeler
  - stephen.bond@twdb.texas.gov
  - 512-475-1520

- **Cindy Ridgeway, P.G.**
  - Groundwater Modeling Manager
  - cindy.ridgeway@twdb.texas.gov
  - 512-936-2386

- **Project Website**
  - https://www.twdb.texas.gov/groundwater/models/gam/nctc/nctc.asp

Q&A

Questions?

Stakeholder Advisory Forum Attendees

Name	Affiliation
Cindy Ridgeway	Texas Water Development Board
Daryn Hardwick	Texas Water Development Board
Grayson Dowlearn	Texas Water Development Board
Ian Jones	Texas Water Development Board
Jerry Shi	Texas Water Development Board
Ki Young Cha	Texas Water Development Board
Larry French	Texas Water Development Board
Natalie Ballew	Texas Water Development Board
Radu Boghici	Texas Water Development Board
Robert Bradley	Texas Water Development Board
Roberto Anaya	Texas Water Development Board
Shirley Wade	Texas Water Development Board
Stephen Bond	Texas Water Development Board
Tony Schroer	Barr