Surface Water/Ground Water Characterization in the Upper Coleto Creek Watershed, South Texas

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U.S. Department of the Interior
U.S. Geological Survey

COOPERATING AGENCIES

- Guadalupe-Blanco River Authority (GBRA)
- San Antonio River Authority (SARA)
- Goliad County Groundwater Conservation District
- Victoria County Groundwater Conservation District
- Pecan Valley Groundwater Conservation District

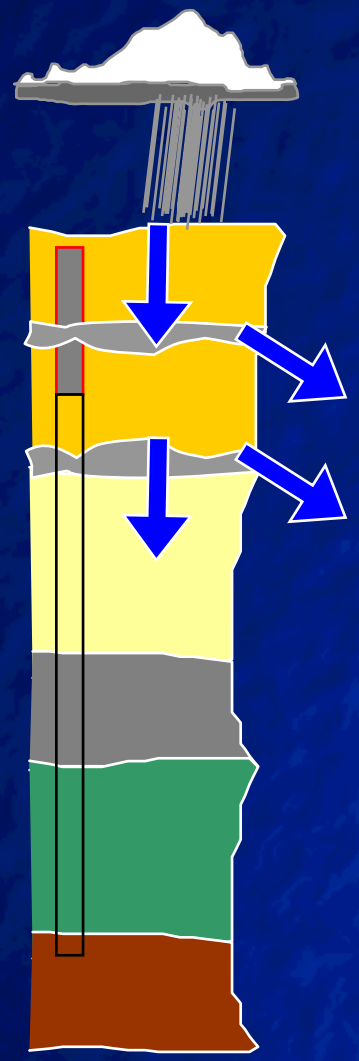
OBJECTIVE AND SCOPE

- Characterize the SW and GW interaction in the upper part of the Coleto Creek Watershed

Figure 1. Coleto Creek Reservoir contributing area.

USGS

Gulf Coast Aquifer System



Chicot aquifer

Evangeline aquifer

Burkeville Confining System

Jasper aquifer

APPROACH

Task 1 – Site selection

- SW recon and site selection completed 6/09.
- Well inventory completed by cooperators 6/09.
- Review of data by USGS and selection of sample sites completed 7/09. Sites selected for GW sampling and GW level synoptic.

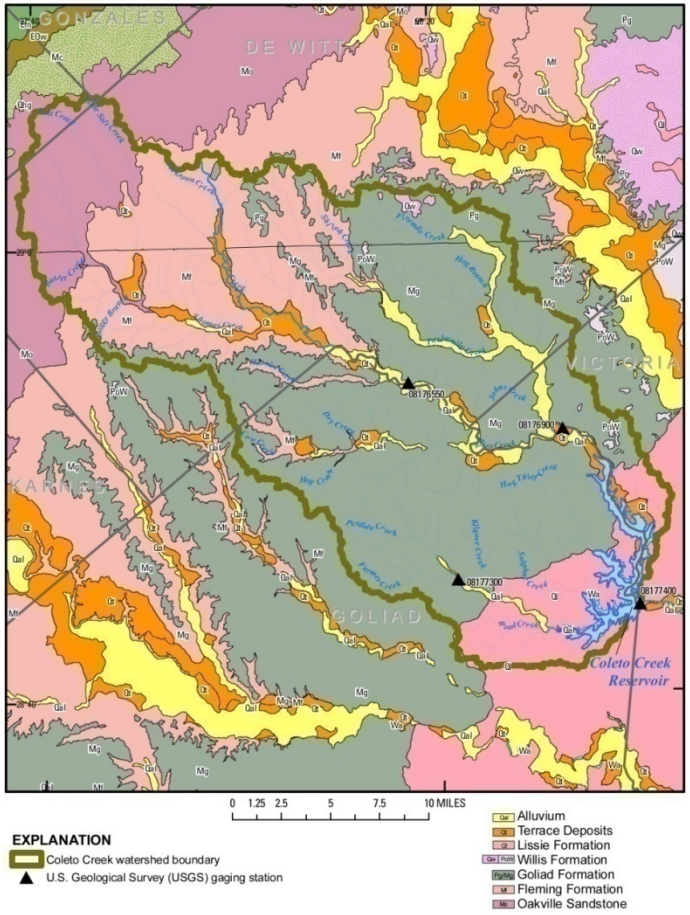


Figure 2. Surface geology of the Coleto Creek Reservoir contributing area.

APPROACH

Task 2 – Synoptic Gain-Loss Surveys & GW Synoptics

- First synoptic done 8/09 during extended drought. All SW sites w/exception of Audilet Springs were dry.
- Second synoptic done 1/10 after fall rains recharged system.
- Third synoptic planned for April-June 2010.

Coleto Creek at Arnold Road Crossing

APPROACH

Task 3 – GW and SW Sampling

- Sampling done coincident w/ gain/loss survey and GW level synoptics.
- August 2009 -- 1st round, 13 GW sites and 1 SP site sampled.January 2010 --2nd round, 4 SW sites, 9 GW sites, 1 SP site sampled.
- 3rd round of sampling planned for May-June 2010.

USGS

APPROACH

Task 3 – GW and SW Sampling

- Constituents include major ions, trace elements, nutrients, $^{18}O/^{16}O$ isotopes, and $^{87}Sr/^{86}Sr$ isotopes.
- QA samples include equipment blank, field blanks, and replicates.

USGS

APPROACH

- Task 4 – Data Analysis (2010)
  - Historical data analysis
  - Hydrologic data (rainfall, GW levels, gain/loss measurements, QW analyses).
  - Spatial and temporal variability in the Evangeline aquifer
- Task 5 – SIR report (2011)