MEADOWS RESEARCH INSTITUTE FOR WEST TEXAS WATER

SAN SOLOMON SPRINGS COLLABORATIVE GROUNDWATER MONITORING NETWORK

THE SAN SOLOMON SPRINGS SYSTEM HAS LONG BEEN THE FOCUS OF SCIENTISTS FROM RESEARCH INSTITUTIONS ACROSS TEXAS. Understanding how this spring system works, its condition, and what's needed to keep springs flowing is essential for the life of Balmorhea, and importantly for the future of all ranchlands within the springshed.

Much groundwork has been laid to provide a general awareness of the movement of water that feeds these springs. Yet many questions remain. What are the sources of water? Where does it recharge? How is it stored? Is it all connected? How is it being used? How long will it last?

A regional groundwater monitoring network is being established to collect aquifer level data that can be analyzed over time to help answer these questions and lead to solutions with a pro-active approach to protecting this important shared groundwater resource.

This groundwater monitoring network will be housed and maintained by The Meadows Research Institute for West Texas Water at Sul Ross State University. Groundwater conservation districts working in this study area are encouraged to participate by sharing data they are collecting for their respective GCDs. Other research partners include the Bureau of Economic Geology (BEG), Southwest Research Institute (SwRI), the Texas Water Development Board (TWDB) and Rio Grande Joint Venture (RGJV).

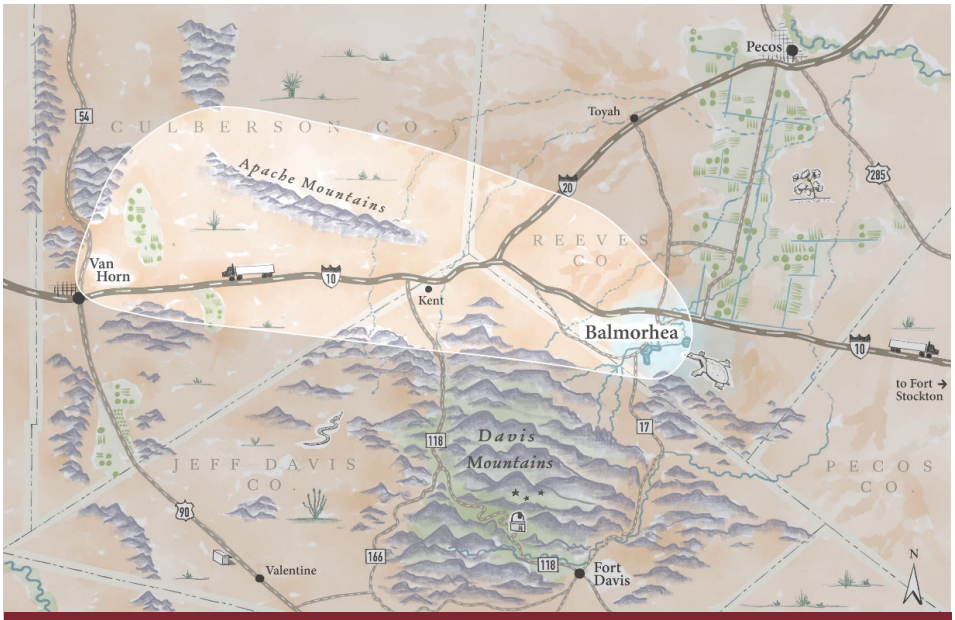
- Participation in the network is completely voluntary.
- With permission, an on-site evaluation of pre-identified wells will take place to determine equipment needs, well depth, and ease of access. Findings will be shared with the landowner.

Groundwater monitoring field work

- Recommendations for installation, monitoring equipment and any additional set up services will be provided to the landowner.
- With approval, water level monitoring equipment (preferably with telemetry for real-time data) will be installed.
- Protocols for ongoing monitoring and access will be determined.
- Landowners will receive monthly reports of well-level data on their ranch as well as the regional well-level trends.

EXPANDED RESEARCH NEEDS

In addition to nurturing the San Solomon Springs Collaborative, which is an essential framework for landowner and community member participation in science; and expanding the groundwater monitoring network framework for data collection; the following research objectives have been identified collectively and remain priorities:



THE SAN SOLOMON SPRINGS GROUNDWATER RESEARCH STUDY AREA

Harmonize San Solomon Springs System data. A data storage system is being established at Meadows Research Institute. A coordinated effort is needed to compile existing and new data into a single location and in a format to be shared by researchers.

Fund the evaluation of existing data. Valuable research has been conducted by the Bureau of Economic Geology (BEG) leading to published studies about San Solomon Springs in 2001 and 2021. Funding has not been available to fully analyze groundwater data that has been collected by the BEG in recent years.

Perform a water balance on the San Solomon Springs System and Groundwater Flow Model. By working through recorded data and estimates of source water contributions (i.e. regional groundwater, more locally influenced groundwater, storm water, irrigation return flow); A "water balance," will inform researchers of sources to the spring system and any shortfalls or overestimates highlighting areas of needed focus to establish a more complete groundwater flow model.

Continue water chemistry sampling. Investigations of groundwater, spring and surface water chemistry data is an ongoing monitoring activity that needs to be continued, expanded and coordinated with the research activities of the groundwater monitoring network.

Conduct long-term data on precipitation events on the Davis Mountains. Intense storm events provide an opportunity to identify recharge sites by correlating data from San Solomon Spring discharge, temperatures, and chemistry.

Collect stratigraphic data. Develop a better understanding of the regional water levels relative to the Permian, Cretaceous and Tertiary strata.

Conduct dye studies. This can be an important tool to confirm expected spring flow source water in specific locations.

Delineate to the best of our abilities the Springshed Boundary(s). Ultimately this will best inform landowners of opportunities to support stewardship practices that sustain the springs.

ASSEMBLE THE NECESSARY FUNDING AND PARTNERSHIPS

Funding is necessary to accomplish all these ambitious research objectives. By working together, the Collaborative can streamline the budget and accomplish collective goals more efficiently. Funding sources can include:

- Grants from private philanthropy
- Landowner financial contributions
- In-kind research contributions from partners
- Groundwater Conservation District donations
- Groundwater Conservation District data sharing and in-kind support
- Texas Water Development Board research grants

TO LEARN MORE AND PARTICIPATE CONTACT

MEADOWS RESEARCH INSTITUTE INTERIM DIRECTOR
Billy Tarrant | Billy.Tarrant@sulross.edu

MEADOWS RESEARCH INSTITUTE SENIOR RESEARCH SCIENTIST
Dr. Kevin Urbanczyk | Kevinu@sulross.edu