INTERCONNECTED SURFACE WATER

What It Means and Why It Matters

Think about the beauty of your local waterways, the vibrant wildlife, or taking a walk along Big Chico Creek in Bidwell Park. Did you know this water, in some places and at some times, is connected to the groundwater beneath your feet? This connection is where streams and groundwater meet and exchange flow, and the exchange can happen in both directions. Stream-aquifer connections can support aquatic ecosystems, native vegetation such as Valley Oak, and water rights holders. Protecting this connection is crucial because it influences the natural environment and water availability for farms and communities.

The Vina Groundwater Sustainability Agency (GSA) is responsible for monitoring and evaluating interconnected surface water depletion, one of the six sustainability indicators used to track groundwater conditions. The GSA can also implement project and management actions to protect interconnected surface waters. Vina GSA is working to understand and protect these essential connections.

What is Interconnected Surface Water, and Why Does it Matter to You?

Interconnected surface water (ISW) describes where groundwater and rivers or streams, also known as surface water, interact or connect. This vital connection has several benefits, including:

- **Supporting The Environment:** Helps support plants, fish, and wildlife that depend on river flows or groundwater.
- **Maintaining Flows:** Helps maintain streamflow during dry periods by contributing groundwater, thereby preventing local waterways from drying up.
- **Benefiting Communities:** Ensures water is available for surface water rights holders, including agricultural users.

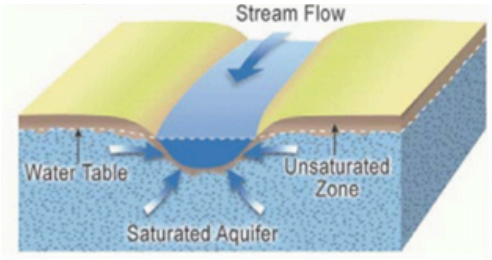
How Interconnected Surface Water Is Measured

The connection between streams and groundwater is a complex one. Vina GSA is actively gathering more data to bridge current gaps in knowledge. The GSA is measuring stream depletion—when streams lose water into the groundwater systems beneath—through:

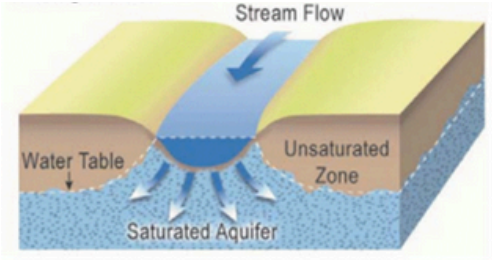
- **Field Monitoring**: expanding the network of groundwater wells and streamflow monitors to collect data.
- **Modeling**: Updating and refining the Butte Basin Groundwater Model (BBGM), which helps estimate where streams gain water from groundwater or lose water to recharge it.

Types of ISW

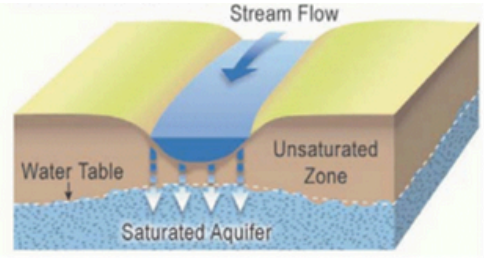
A Gaining Stream
Surface water gains water from the groundwater, creating more streamflow.



A Losing Stream
Surface water loses water to groundwater, reducing streamflow.



Disconnected Stream
Surface water body loses water to the unsaturated zone - groundwater level changes do not influence stream depletion.



How Vina Stays Sustainable

Improving the GSA's understanding of the interconnection between groundwater and rivers and streams, such as the Sacramento River and Butte Creek, is critical to achieving sustainable groundwater management in the Vina Subbasin. The Vina GSA is still working to understand the connection.

What The GSA Knows

- **River Connection**: Some shallow wells near the Sacramento River show a connection between groundwater and the river.
- **No Interaction**: Wells in Chico show water levels significantly below nearby streambeds, suggesting limited and potentially seasonal direct interaction there.
- **Complex System**: The overall picture is complex and influenced by many factors, such as climate, topography, subsurface characteristics, and conditions both inside and outside the subbasin.

What The GSA Is Doing To Learn More And Manage The Connection

Developing a more robust monitoring network: Using existing and new wells that represent conditions in the shallow, intermediate, and deep aquifer layers, and using continuous monitoring to understand seasonal changes.

Studying Specific Areas: Collecting data to better understand the Chico Urban Forest and its water sources.

Mapping and Modeling: Updating maps of groundwater-dependent ecosystems and developing a more detailed hydrogeologic framework to improve understanding.

Using Groundwater Levels: Installing new shallow monitoring wells in areas of interest and expanding the streamflow monitoring network.

Vina GSA's interconnected surface water project is funded through the California Department of Water Resources' Sustainable Groundwater Management Grant Program.

You Can Help Protect Vina's Groundwater

Conserve Water
Support water conservation efforts that reduce groundwater pumping.

Stay Informed
Keep up-to-date on ecosystem health and community discussions.

Get Involved
Visit *www.vinagsa.org* to learn more and help protect our groundwater!