

State Water Resources Control Board San Joaquin River Restoration Program Workshop

Seepage Management & Monitoring Program
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Bureau of Reclamation
November 15, 2010

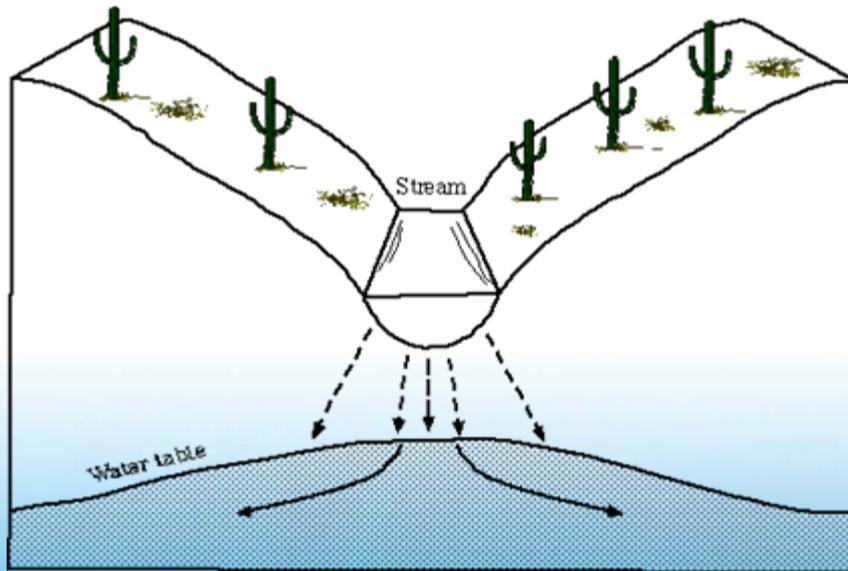


San Joaquin River Settlement Act Requirements

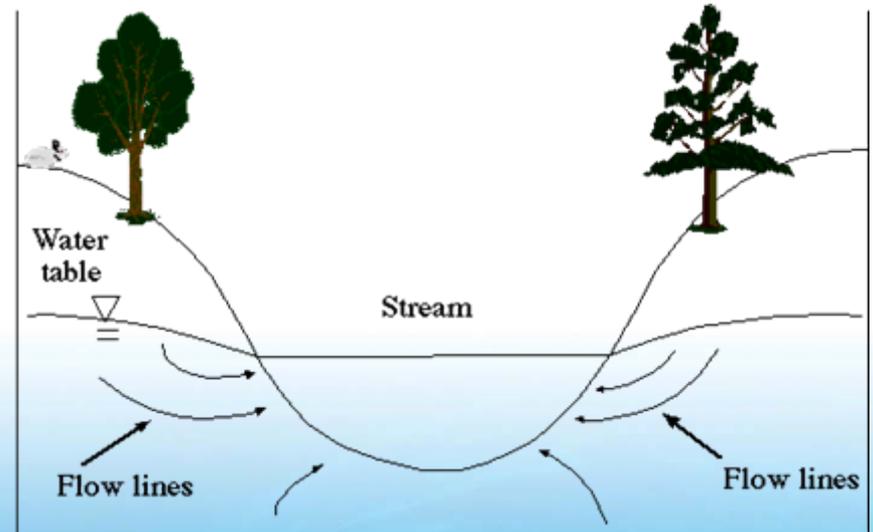
- Analyze channel conveyance capacity and potential for groundwater seepage
- Implement Seepage Monitoring Program
- Evaluate possible impacts associated with the release of Interim Flows
- Monitor flows

Seepage: Movement of water from the stream channel into the subsurface near the river

Losing Stream



Gaining Stream





Seepage Management Plan

- Identifies potential impacts
- Describes a Monitoring Program
- Development of thresholds
- Identifies potential response actions
- First Draft completed Dec. 2009

Potential Impacts

- Water logging of crops
- Root zone salinization
- Levee instability

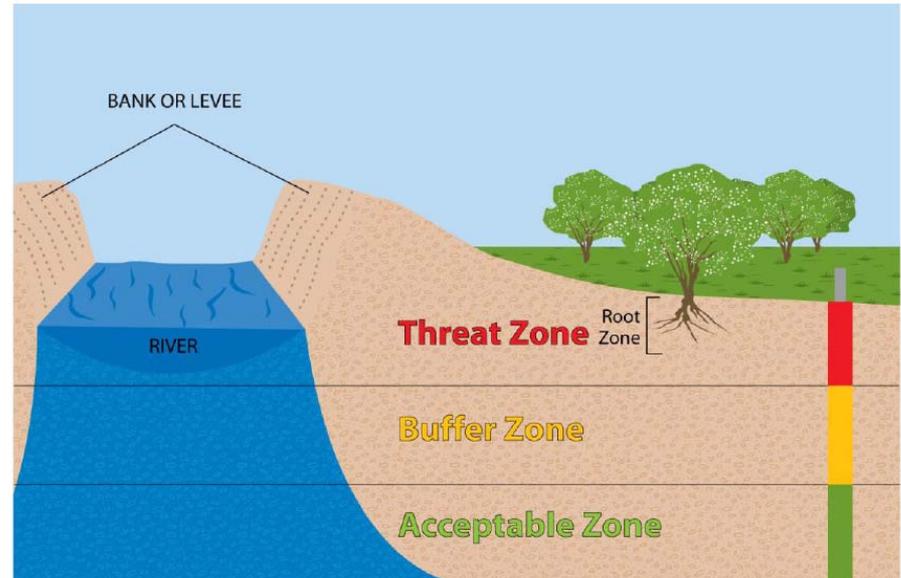


Figure F1.
Diagram of Conceptual Zones in the Shallow Subsurface Showing the Relative Threat to Crop Health Based on Position of the Water Table

Thresholds

- Depth to groundwater
- Root zone salinity
- Visual observations

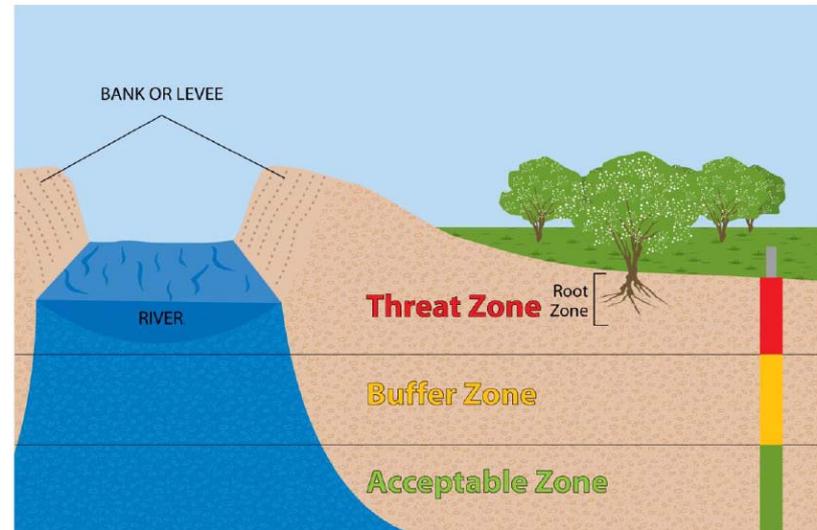


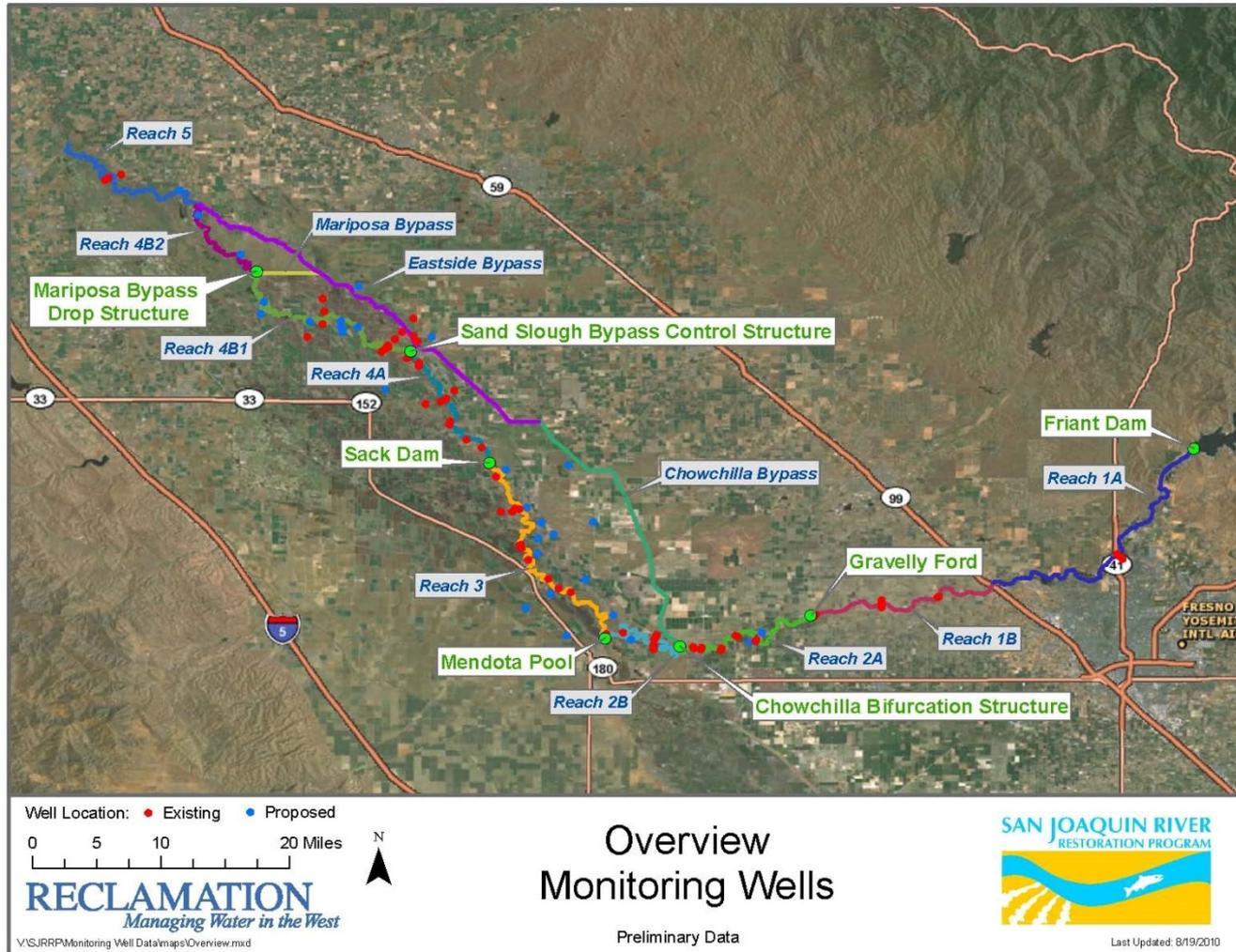
Figure F1.
Diagram of Conceptual Zones in the Shallow Subsurface Showing the Relative Threat to Crop Health Based on Position of the Water Table



Seepage Monitoring Program

- Monitoring well transects
- Monitoring wells on private lands
- Real-time Groundwater monitoring
- Soil salinity monitoring
- Seepage hotline: 916-978-4398
- SJRRP Weekly Groundwater Report
- SJRRP Well Atlas

SJRRP Monitoring Well Network



Monitoring Well Transects

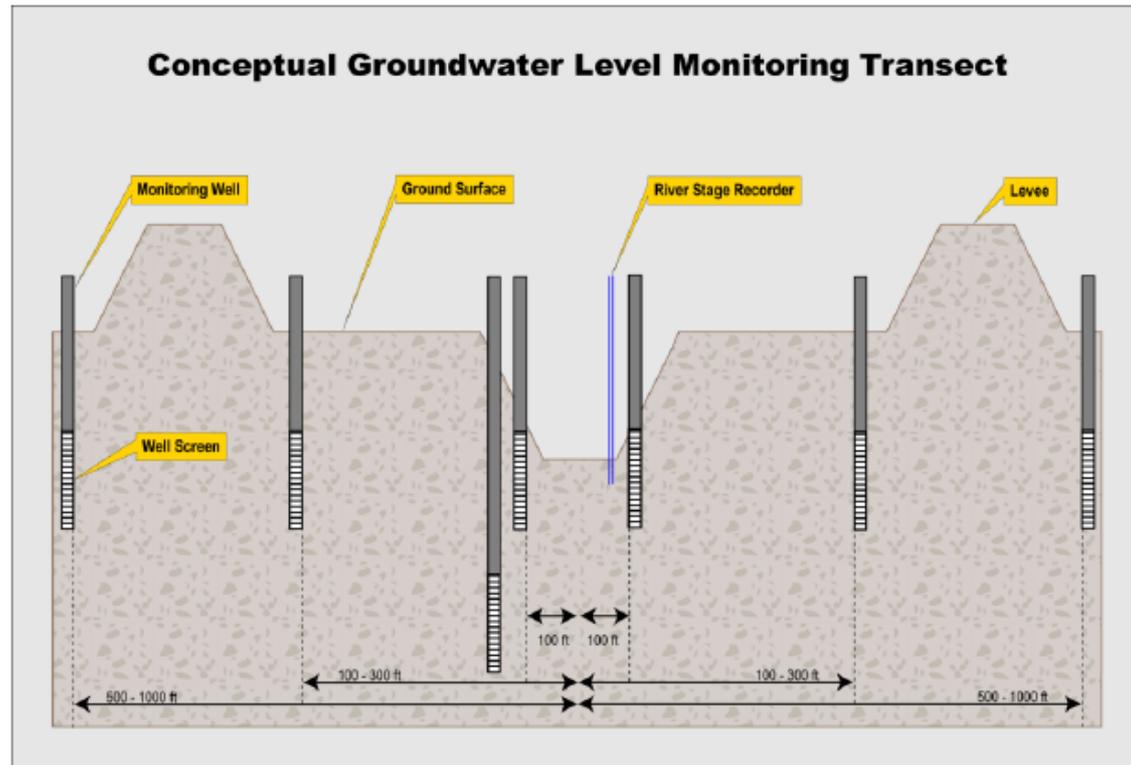


Figure G2.
Conceptual Design of Cross-River Monitoring Well Transect

Real-time Groundwater Monitoring



Well and data logger are below-ground in a vault (foreground). Power is supplied by a solar panel on the pole, and data are transmitted via satellite using the antenna on top of the pole.

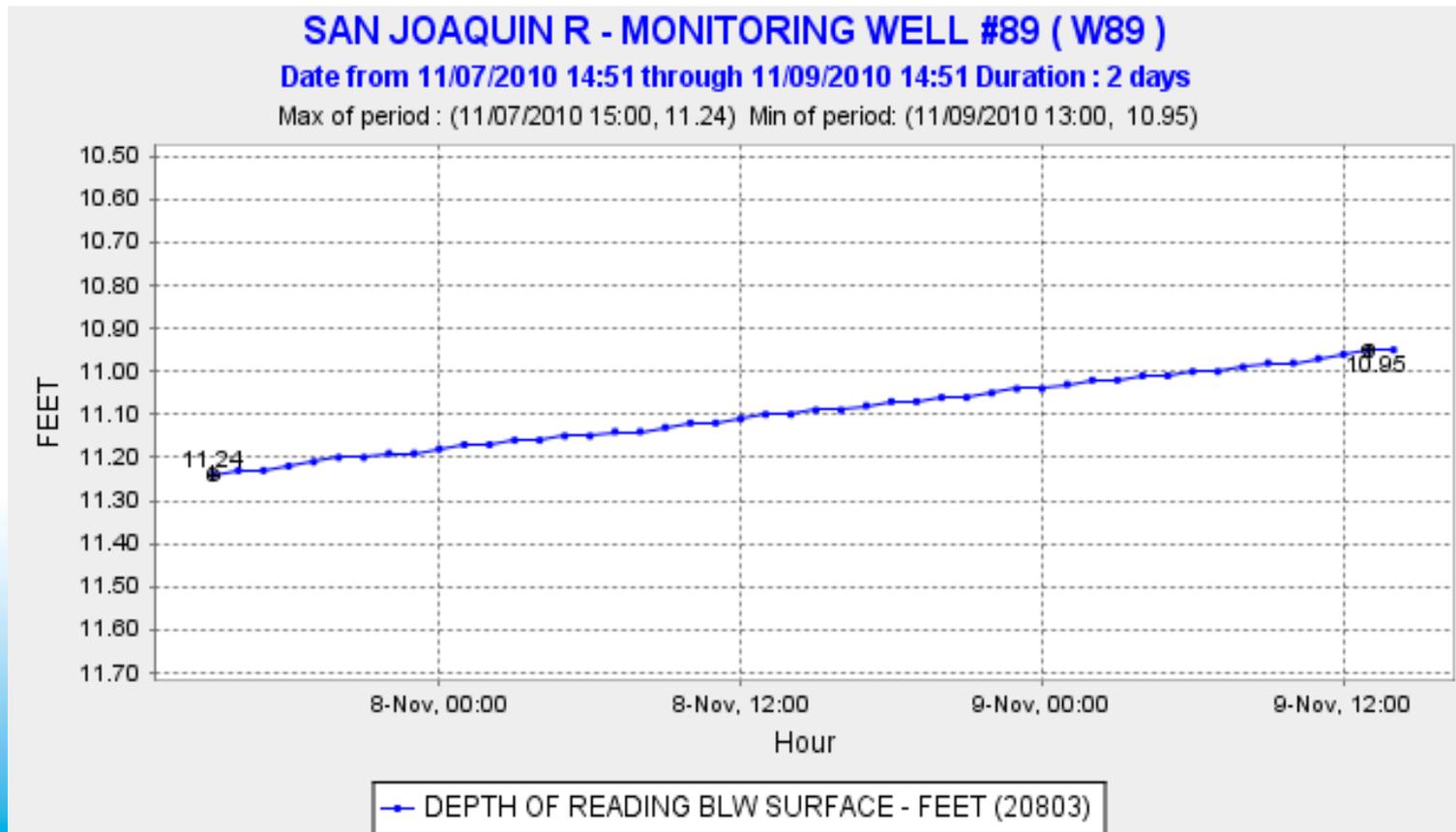
Figure G3.

Photo of a Real-Time Monitoring Well Installed By the SJRRP

- Five sites in Reaches 2-4
- Hourly depth to groundwater, temperature, and EC
- Available online at www.restoresjr.net and <http://cdec.water.ca.gov>
- Support water management decisions

Real-time Groundwater Monitoring

Available online: www.restoresjr.net



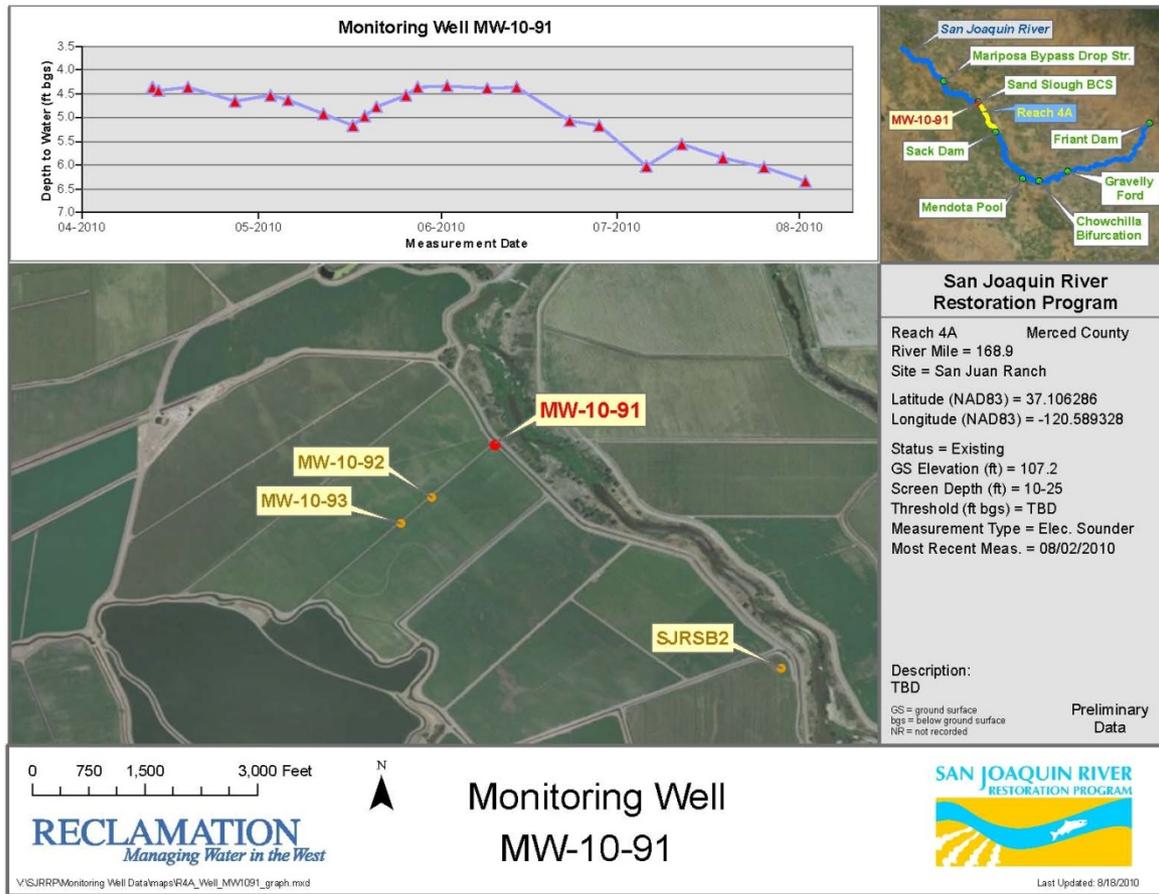


Groundwater Monitoring Frequency

- Real-time
- Weekly soundings in key wells
- Hourly water level recorders
- Monthly soundings

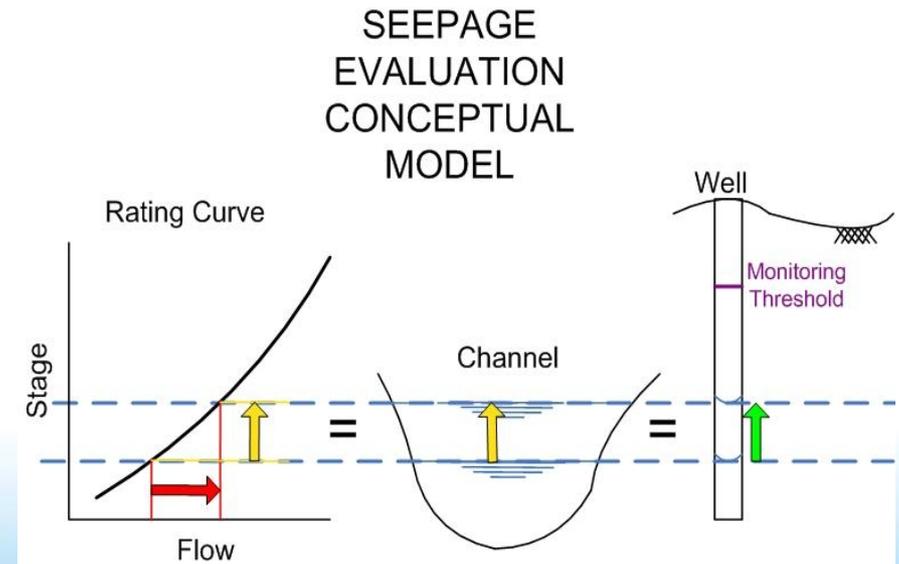
SJRRP Well Atlas

Available online: www.restoresjr.net



Water Management Decision Support

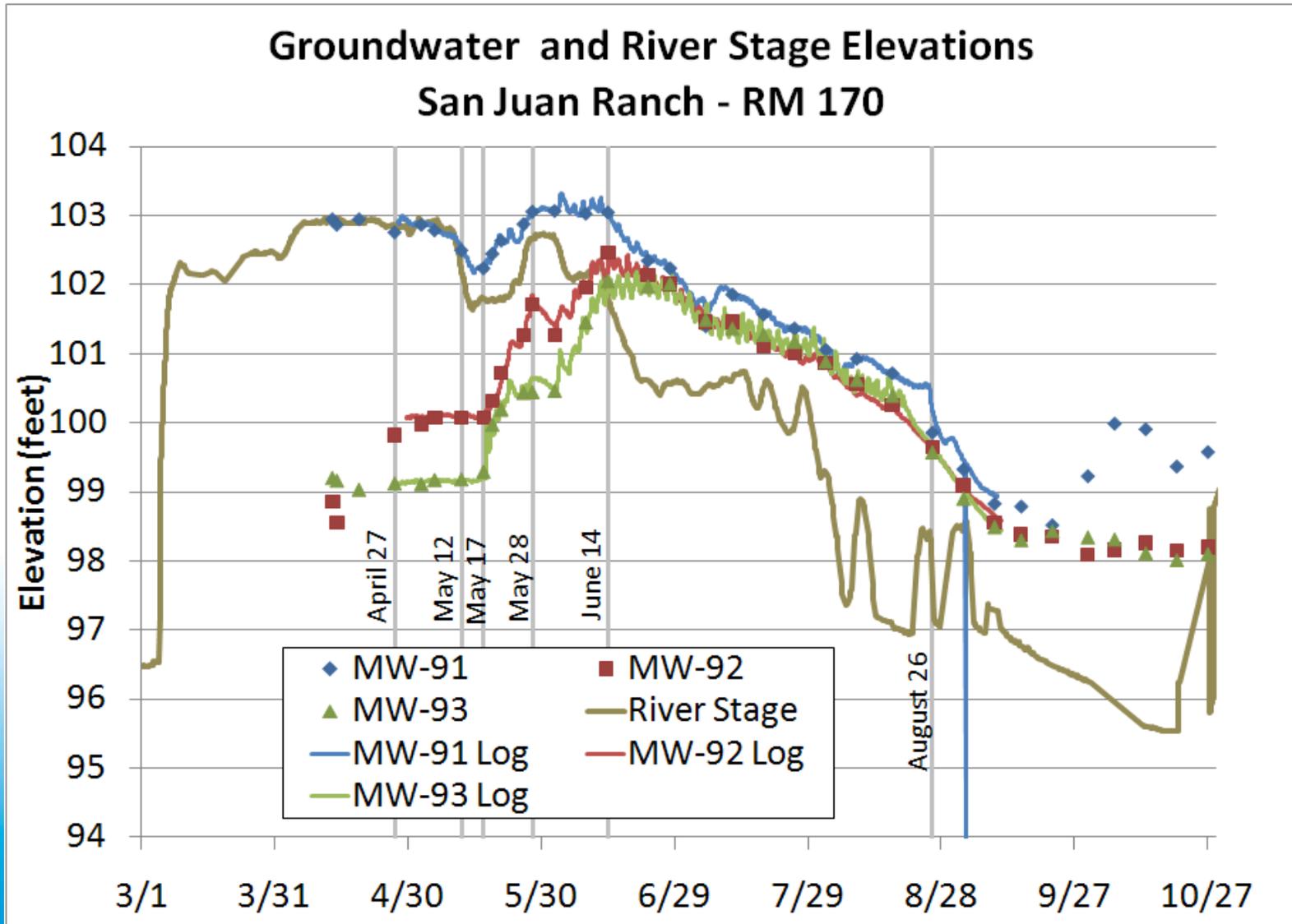
- Monitoring is used to inform water management decisions
- Flow bench evaluations
- Threshold evaluation
- Experience from past monitoring



Response Actions

- Limit Releases – i.e. 1300 cfs in Reach 2B
- Reduction of flows – i.e. currently 70 cfs in Reach 4A
- Easements
- Engineering solutions such as drains, berms, slurry walls

Ongoing Studies



Monitoring Challenges

