Arroyo Grande Subbasin GSP

Stakeholder Workshop #3: Sustainable Management Criteria, Integrated Model and GSP Implementation

July 25, 2022

Presenters

MICHAEL CRUIKSHANK, PG, CHG

Hydrogeologist, Water Systems Consulting

Spencer Harris, PG, CHG

Hydrogeologist, Cleath Harris Geologists

DAVID O'ROURKE, PG, CHG

Hydrogeologist, GSI Water Solutions

Q&A Panelists

Brandon Zuniga

County of San Luis Obispo

SHANE TAYLOR

City of Arroyo Grande

Workshop Goals

- Share project overview, timeline and alignment with other projects
- Overview of Recently Released Chapters
- Integrated Model Update
- Introduction to Projects and Management Actions and Implementation Plan

Workshop Agenda

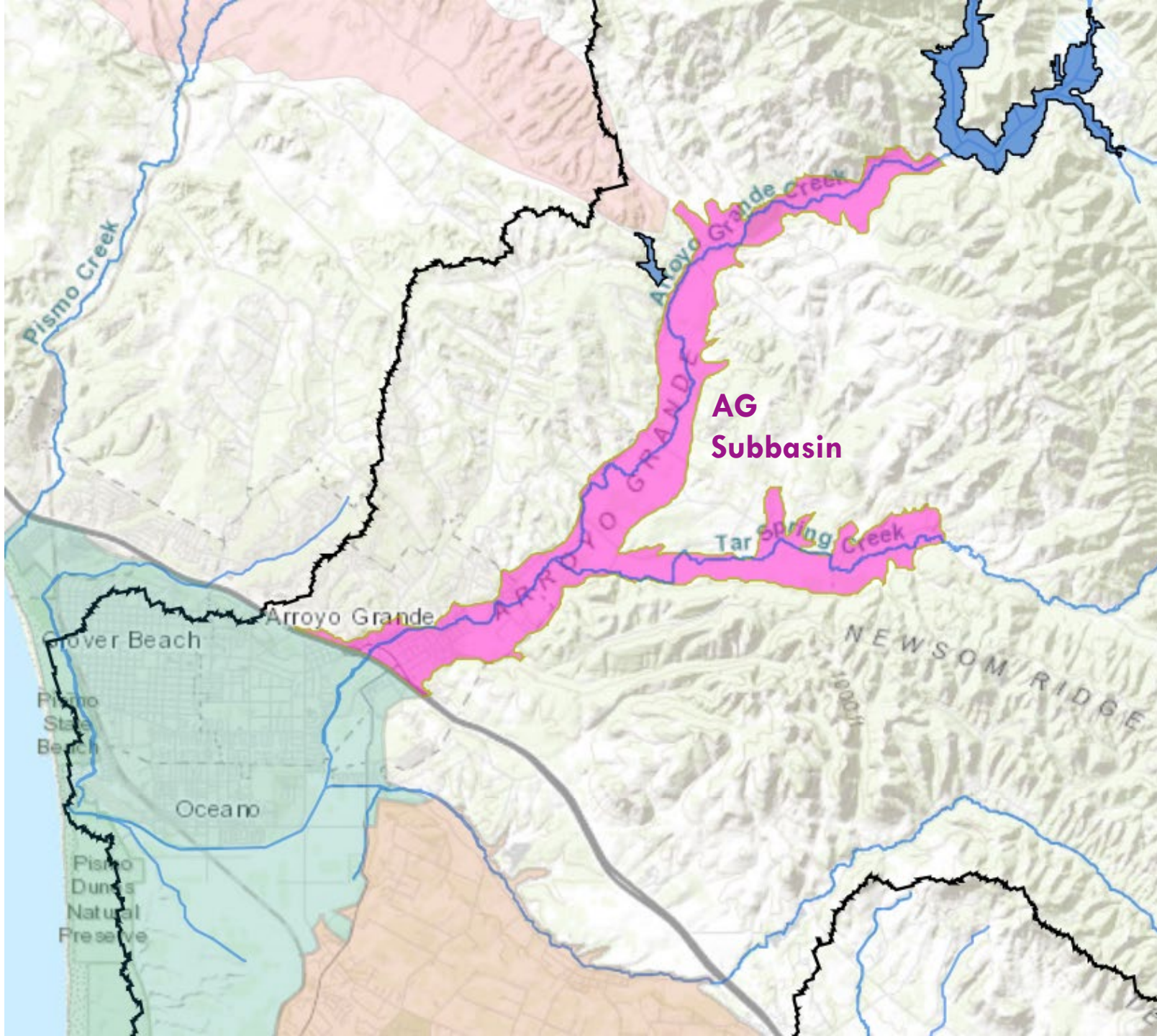
10 min	Project Overview
10 min	Overview of Chapter 7 Monitoring Network
20 min	Overview of Chapter 8 Sustainable Management Criteria
20 min	Integrated Groundwater/Surface Water Model Update
10 min	What's Next – Projects and Management Actions, Implementation Plan, Admin Draft

Project Overview

MICHAEL CRUIKSHANK, WSC

Continuing to secure sustainable groundwater in the Arroyo Grande Subbasin

- SGMA-compliant GSP
- Not required for low priority basins
- Supports parallel efforts
- Includes development of a surface water / groundwater model

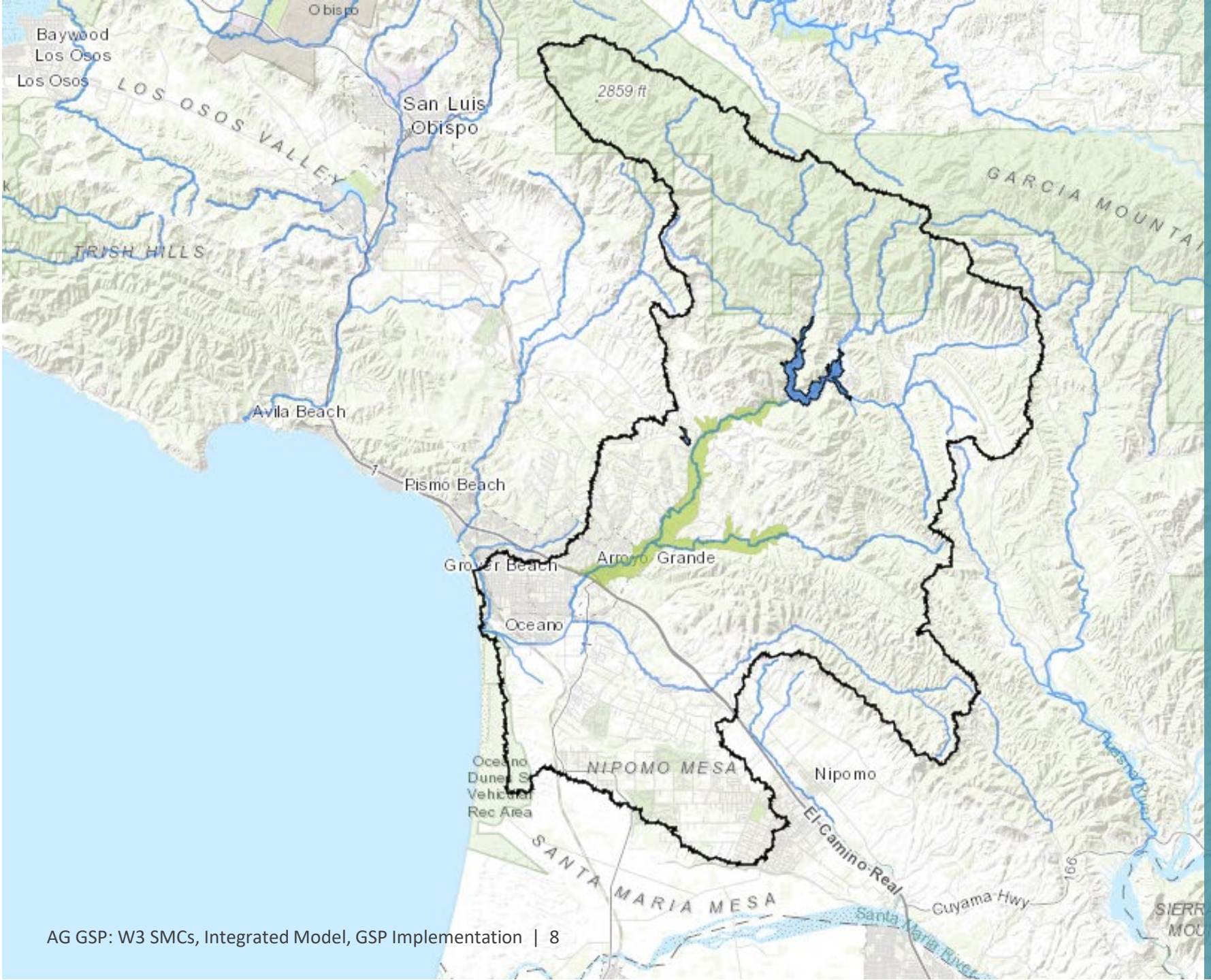


Basin Governance

GROUNDWATER SUSTAINABILITY AGENCY (GSA) MEMBERS

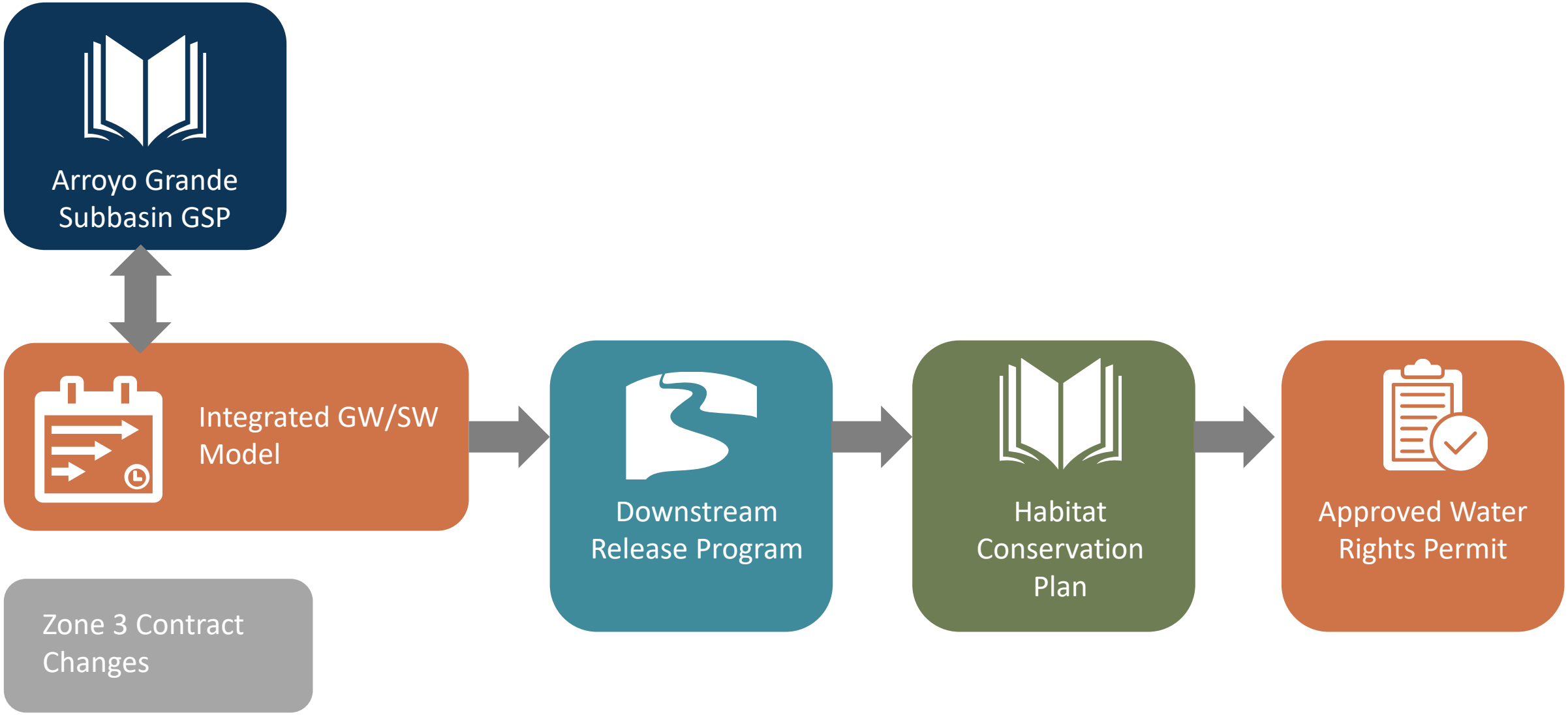
Brandon Zuniga
GSA Member
Water Resources Engineer,
County of San Luis Obispo

Shane Taylor
GSA Member
Utilities Manager,
City of Arroyo Grande



The Arroyo Grande Subbasin is a critical component of a much larger regional surface and groundwater system.

GSP Supports Critical AG Creek Initiatives



GSP Project Benefits

Regulatory Compliance

- National Marine Fisheries Services (NMFS) need for enhanced modeling toolsets to support the HCP
- HCP is required for an incidental-take permit and approved water rights permit

Leveraged Grant Funding

- SGMA GSP grant provides a funding source for development of critical modeling toolsets

GSP Project Benefits

Improved Hydrologic Analysis

- Surface water/groundwater hydrologic model for entire Arroyo Grande Creek watershed
- Upper watershed (above the dam) modeling allows for more accurate evaluation of climate change and cloud seeding impacts on reservoir inflow
- Enhanced stormwater flow and capture evaluation opportunities

Enhanced Management

- The surface water/groundwater model integrated with the reservoir operations model (MODSIM)


Questions?

Overview of Monitoring Network and Sustainable Management Criteria (Chapters 7 and 8)

Dave O'Rourke, GSI

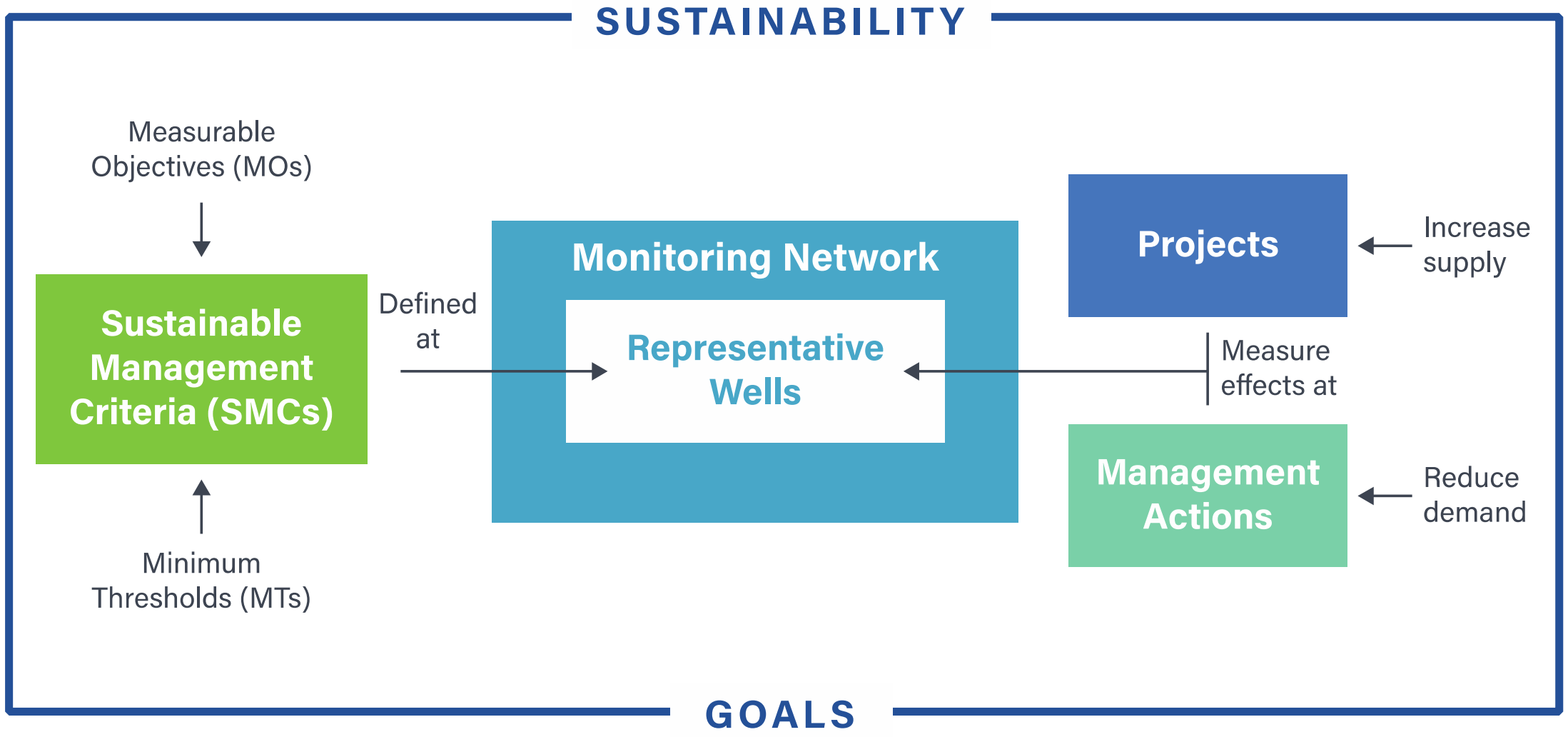
SUSTAINABLE MANAGEMENT CRITERIA

Subsidence not an issue, but will be monitored with InSAR data, not water levels.

SUSTAINABILITY INDICATOR	CHRONIC LOWERING OF GROUNDWATER LEVELS	REDUCTION OF GROUNDWATER STORAGE	WATER QUALITY DEGRADATION	LAND SUBSIDENCE	INTER-CONNECTED SURFACE WATER DEPLETIONS	SEAWATER INTRUSION
METRIC(S) USED	Groundwater Elevation	Total Volume	- Migration Plumes - # of Supply Wells - Volume - Location of Isocontour	Rate and extent of land subsidence	Volume or rate of surface water depletion	Chloride Concentration Isocontour

SGMA allows all indicators but water quality to be assessed using **WATER LEVELS** as a proxy metric for direct measurement.

GETTING TO SUSTAINABILITY



REPRESENTATIVE MONITORING SITES (RMS)

Monitoring Wells used for water level maps, hydrographs

RMS Wells are a Subset of Monitoring Network

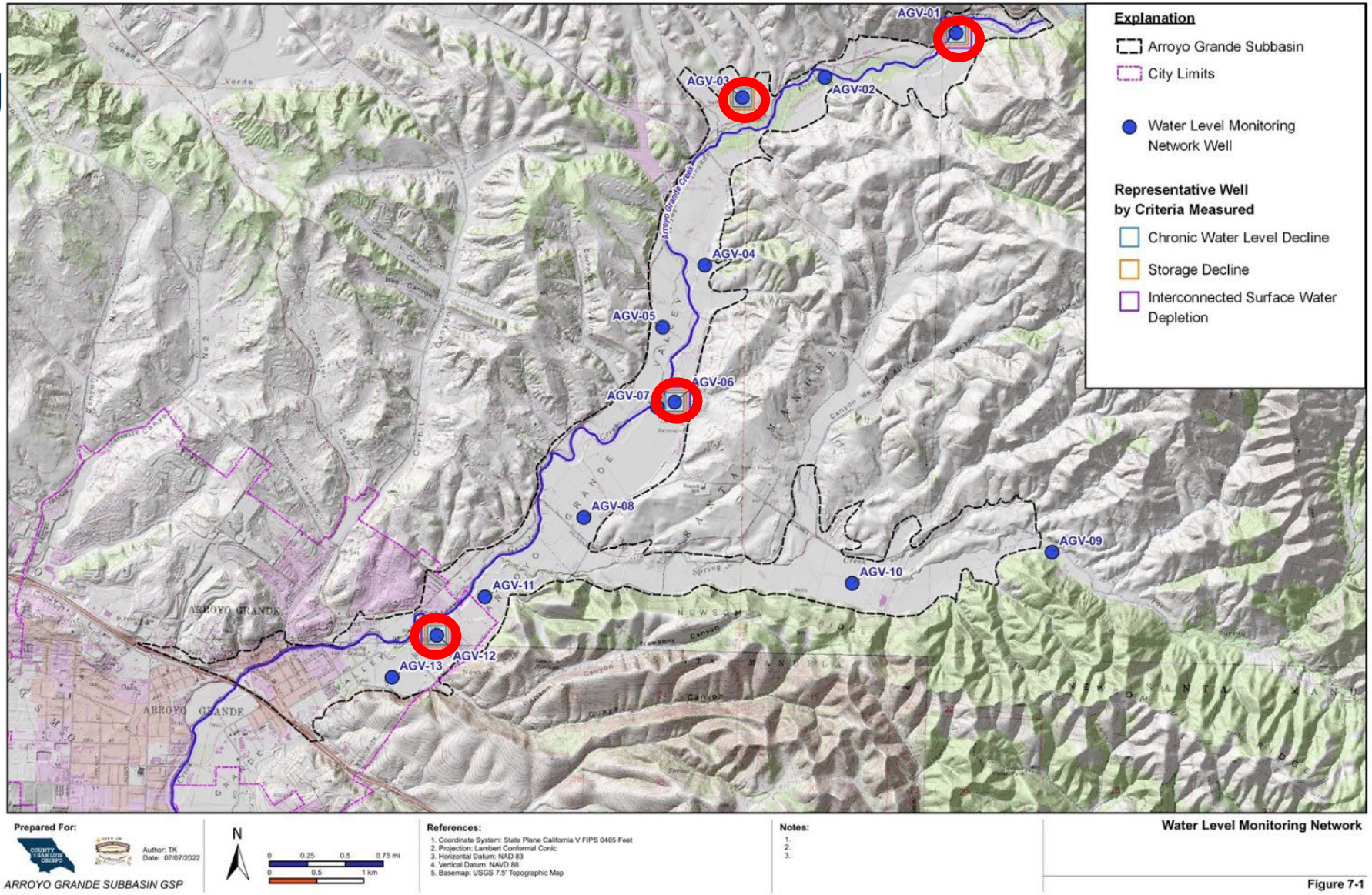
- For reference, SLO Basin has
  - 40 wells in monitoring network.
  - 10 wells are designated as RMS.
- Arroyo Grande Subbasin is much smaller.
  - 13 wells in Monitoring Network
  - 4 RMS wells

Qualities desired for representative wells. (Not required at start of program.)

- Located in areas of interest or data gaps
- Accessibility of well for measurements
- Long Period of Record
- Documented Well Construction Details
- Dedicated Monitoring Well Preferred– No Pump

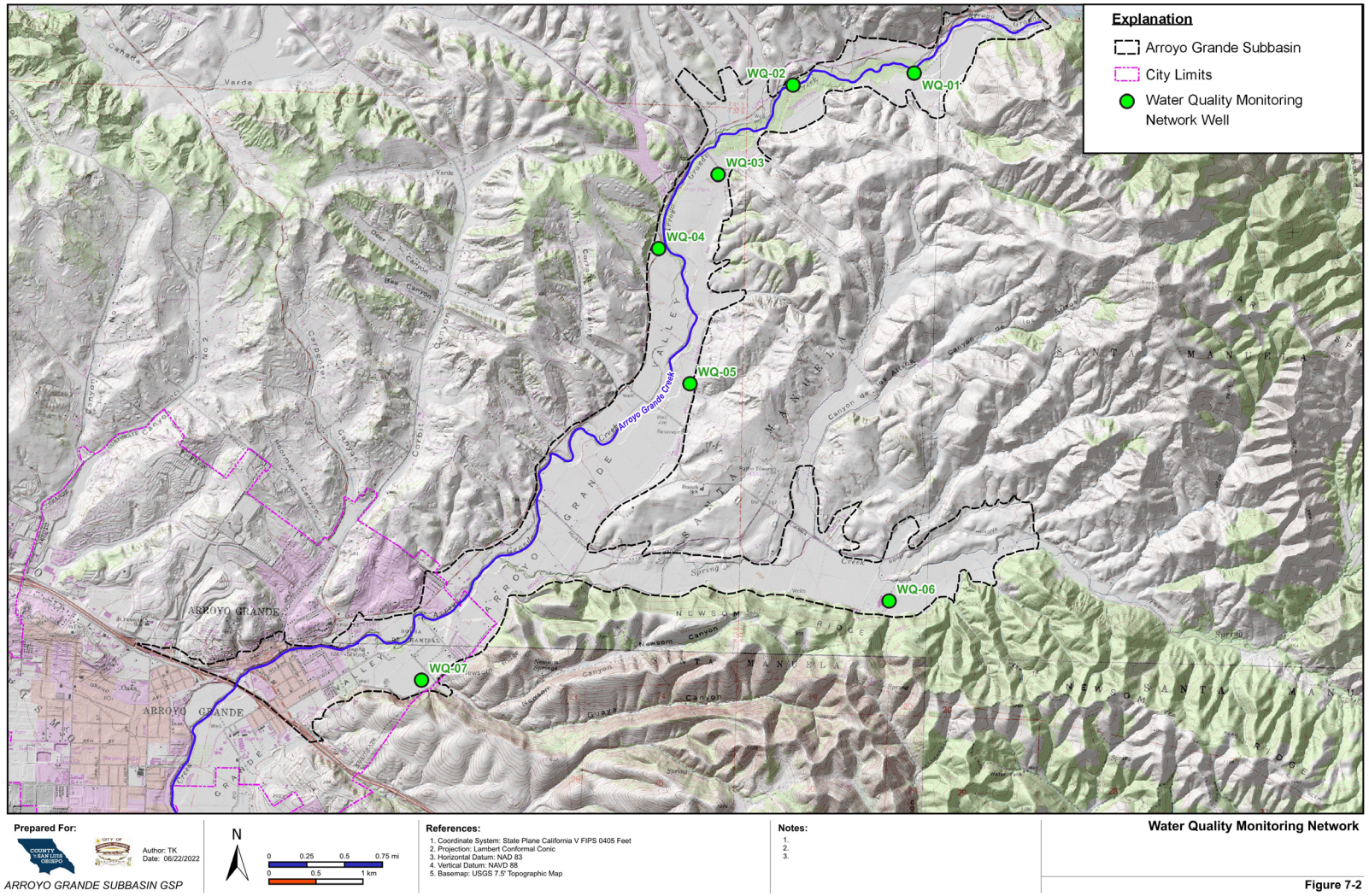
Water Level/Storage Monitoring Network

- 13 Monitoring Wells
- Water level maps, hydrographs
- 4 RMS Wells (SMCs)



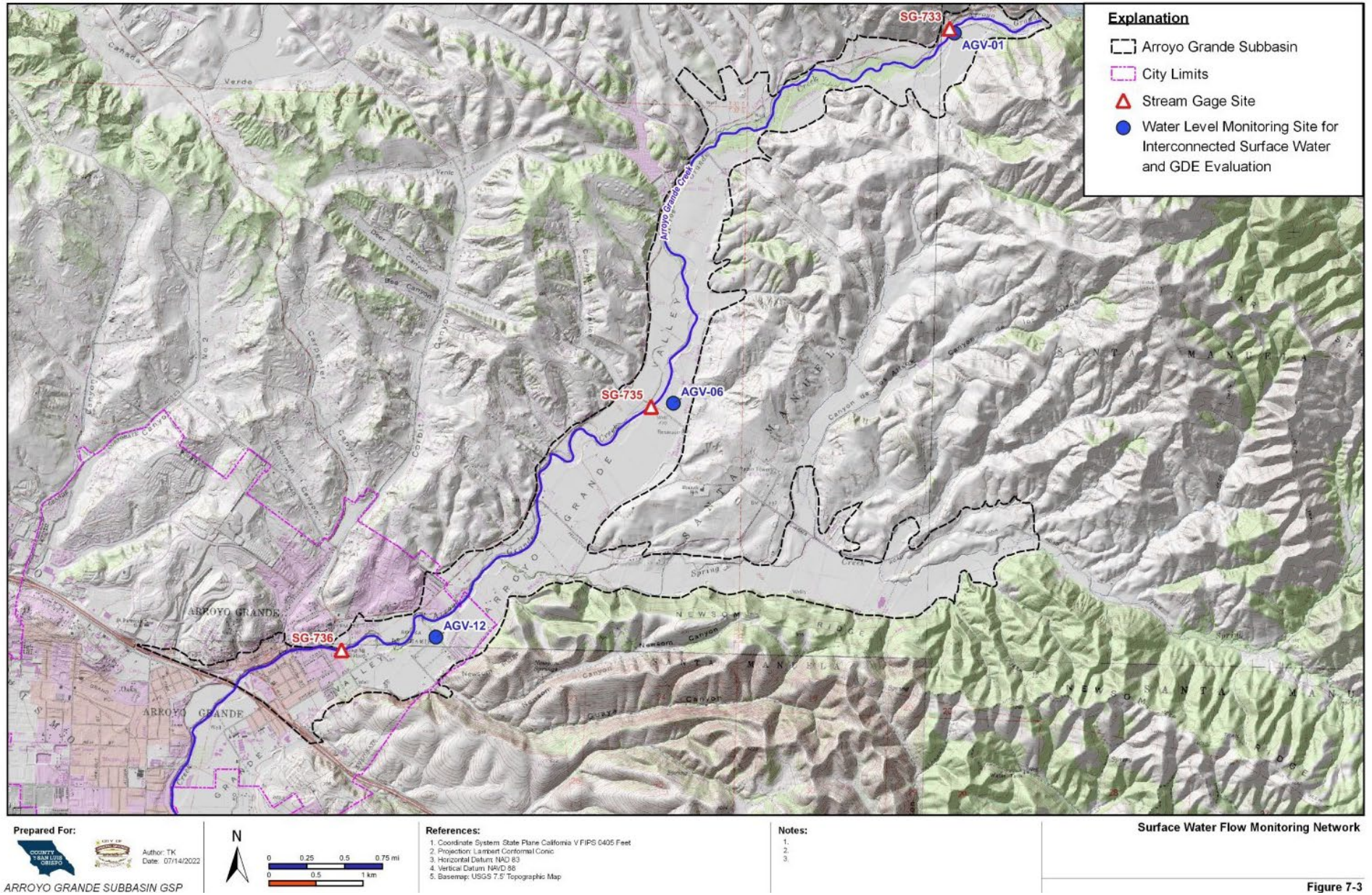
Water Quality Monitoring Network

- 7 Wells
- Monitoring for Total Dissolved Solids, Nitrate
- Water Quality sampling performed under existing programs



Surface Water Monitoring Network

- 3 Stream Gages
- 3 Wells to monitor Interconnected Surface Water



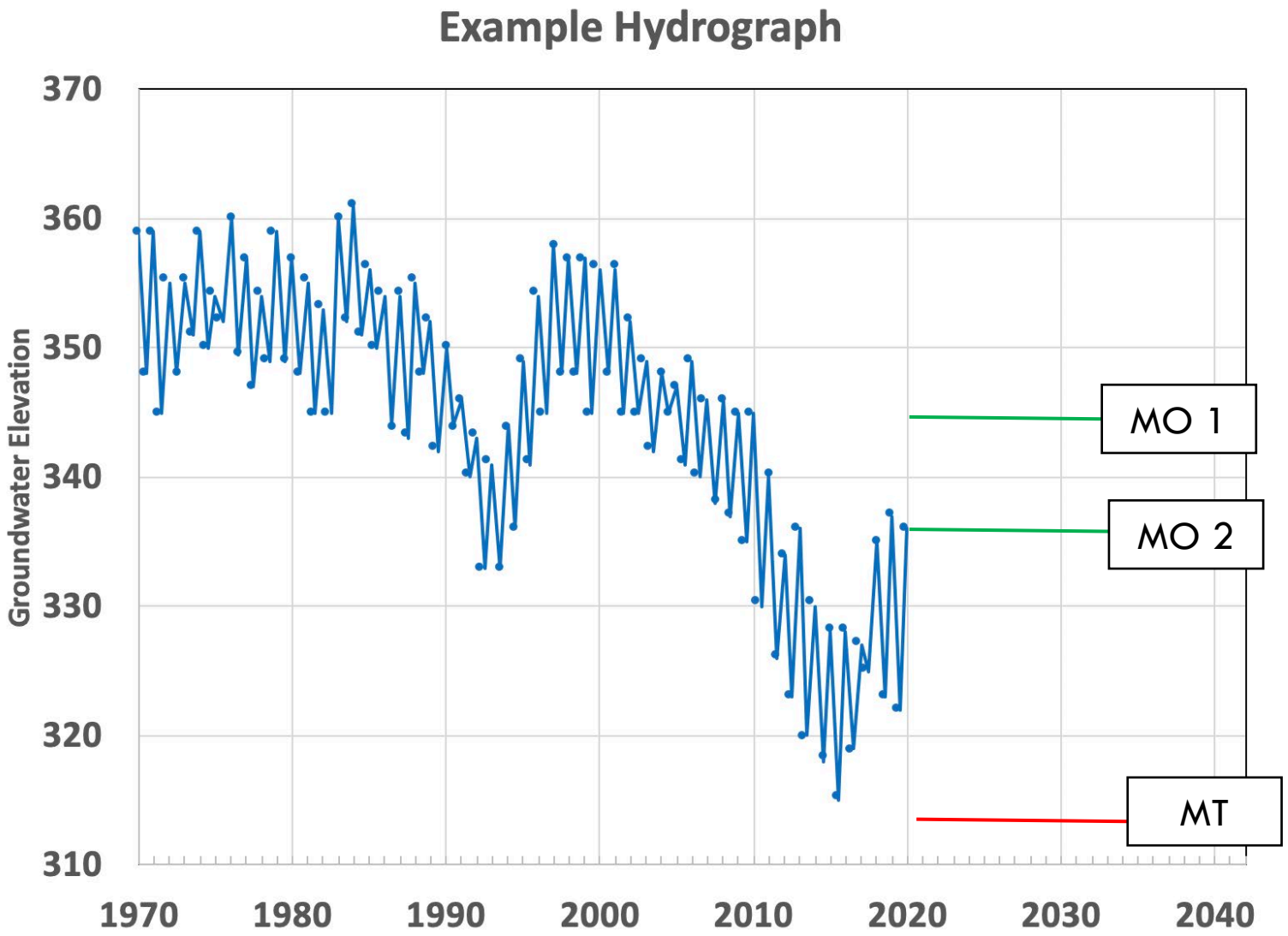
CHRONIC LOWERING OF GROUNDWATER LEVELS &

REDUCTION OF GROUNDWATER STORAGE

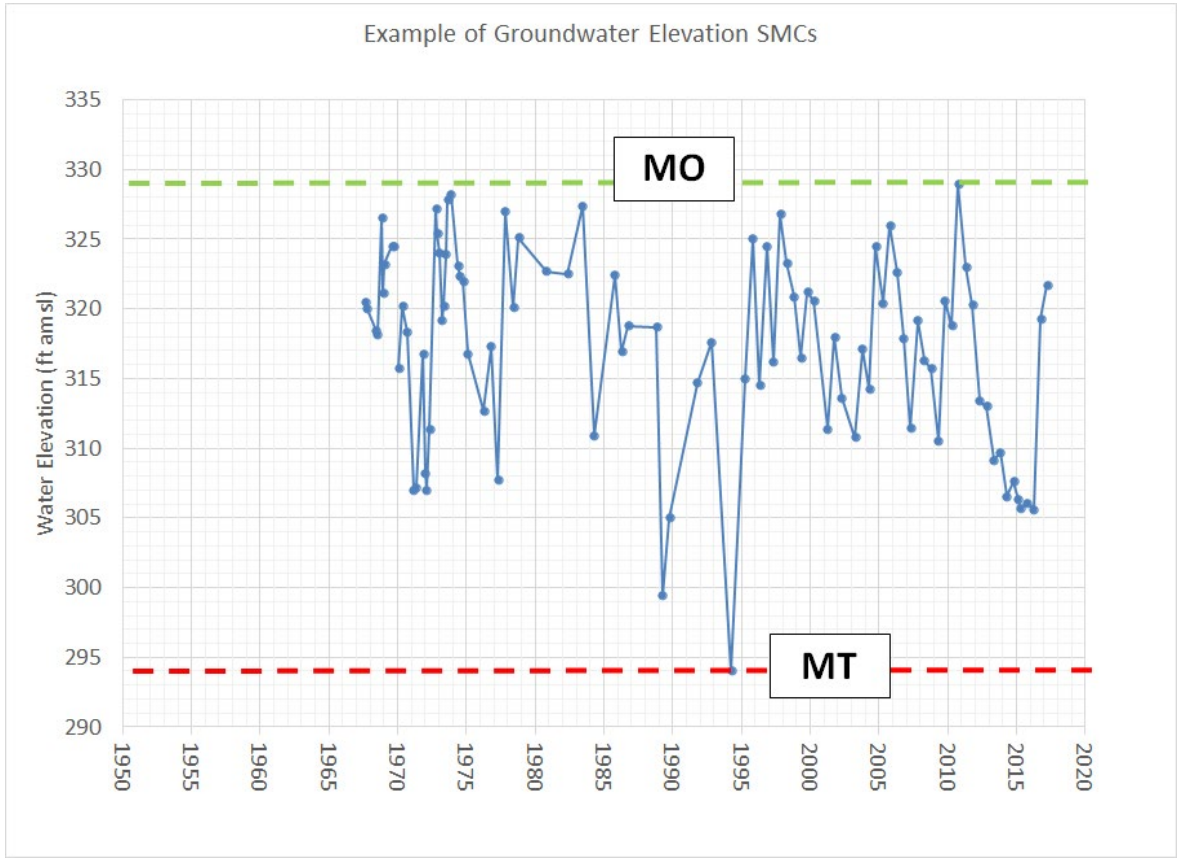
DWR DEFINITIONS

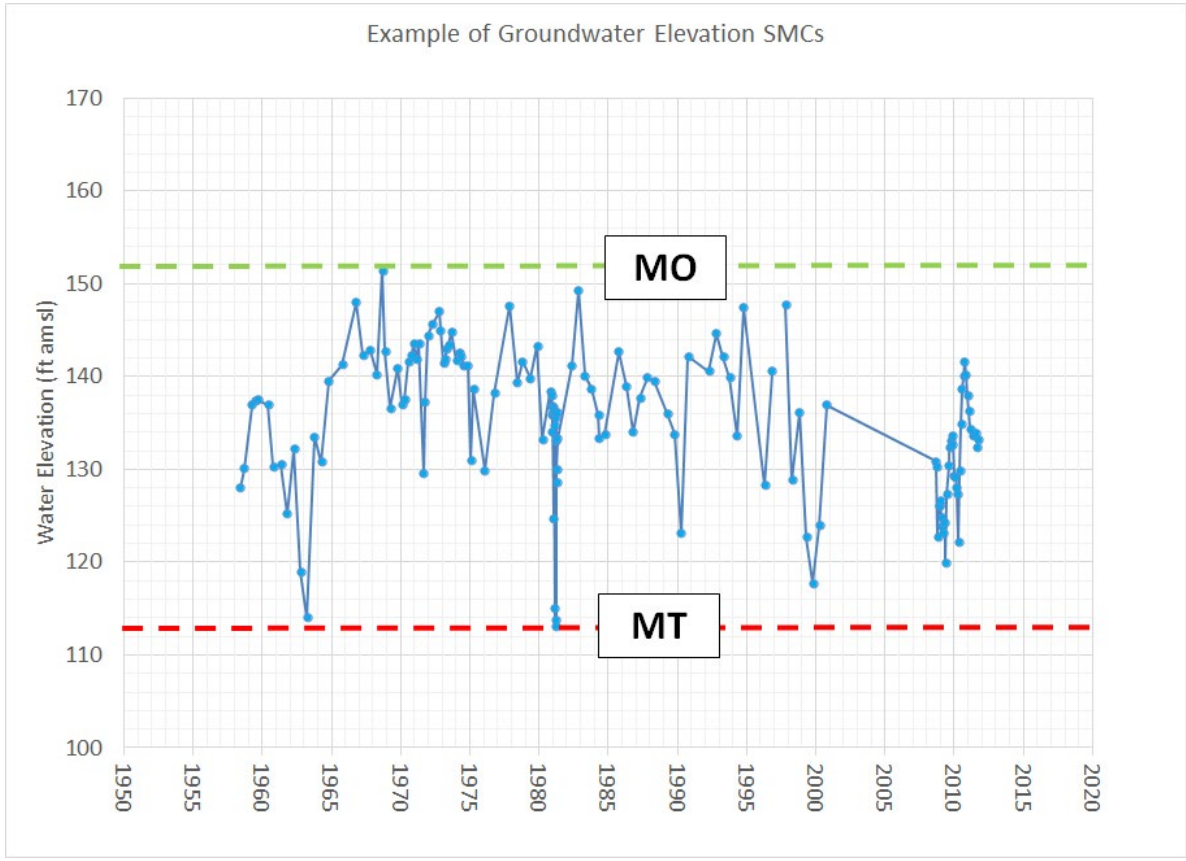
Minimum Thresholds (MTs).
The value that represents groundwater conditions at a representative monitoring site that, when exceeded individually or in combination with MTs at other monitoring sites, may cause an undesirable result(s) in the basin.

Measurable Objectives (MOs).
Measurable objectives are quantitative goals (usually water levels) that reflect the basin's desired groundwater conditions and allow the GSA to achieve the sustainability goal within 20 years.



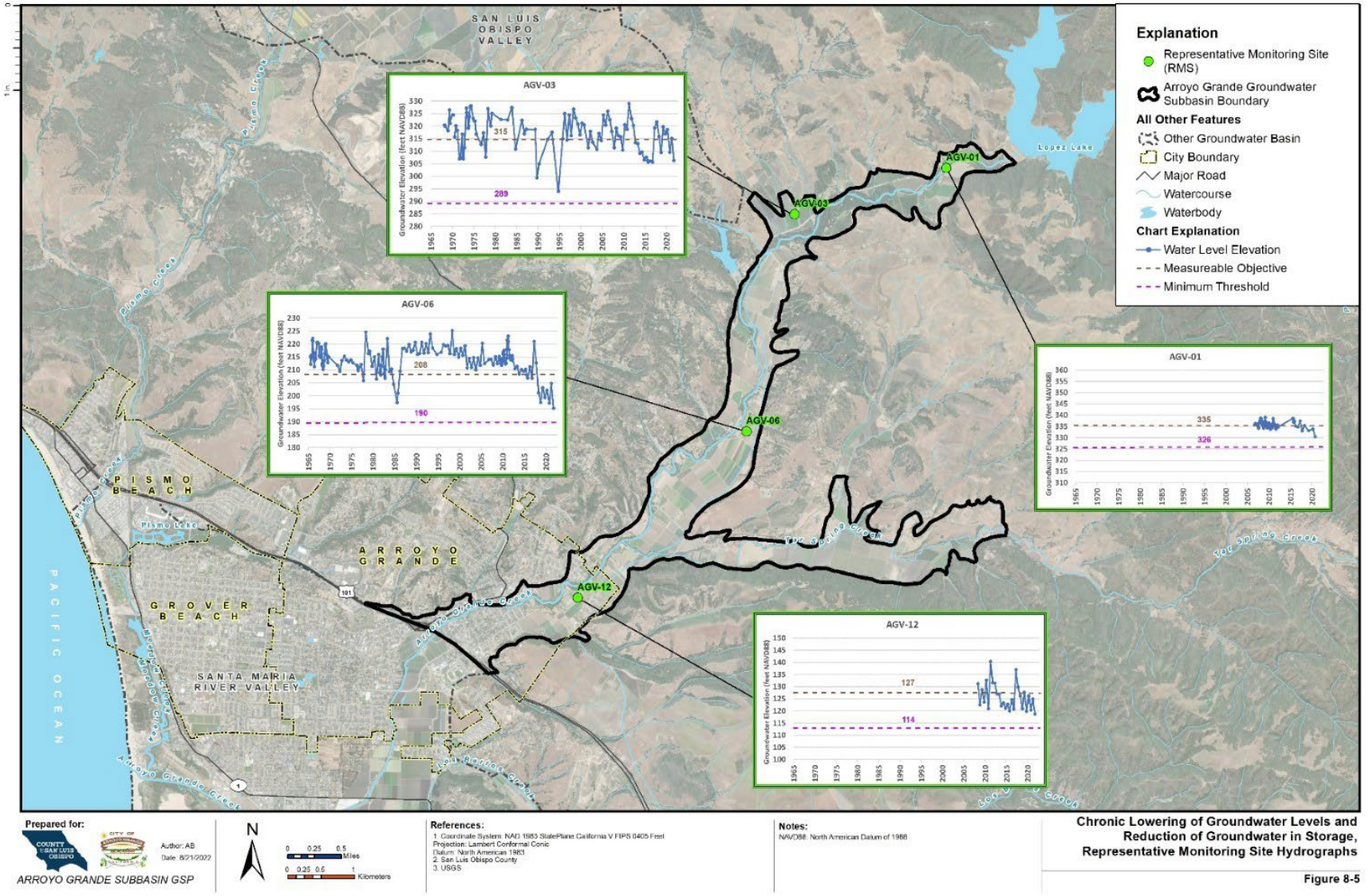
Examples of Groundwater Elevation SMCs





RMS Wells for Water Levels and Storage Depletion

- 4 RMS wells selected out of 14 wells in monitoring network
- Criteria for MTs.
  - Minimum Observed WL
  - 5 feet lower



Hydrograph and Proposed SMCs for AGV-01

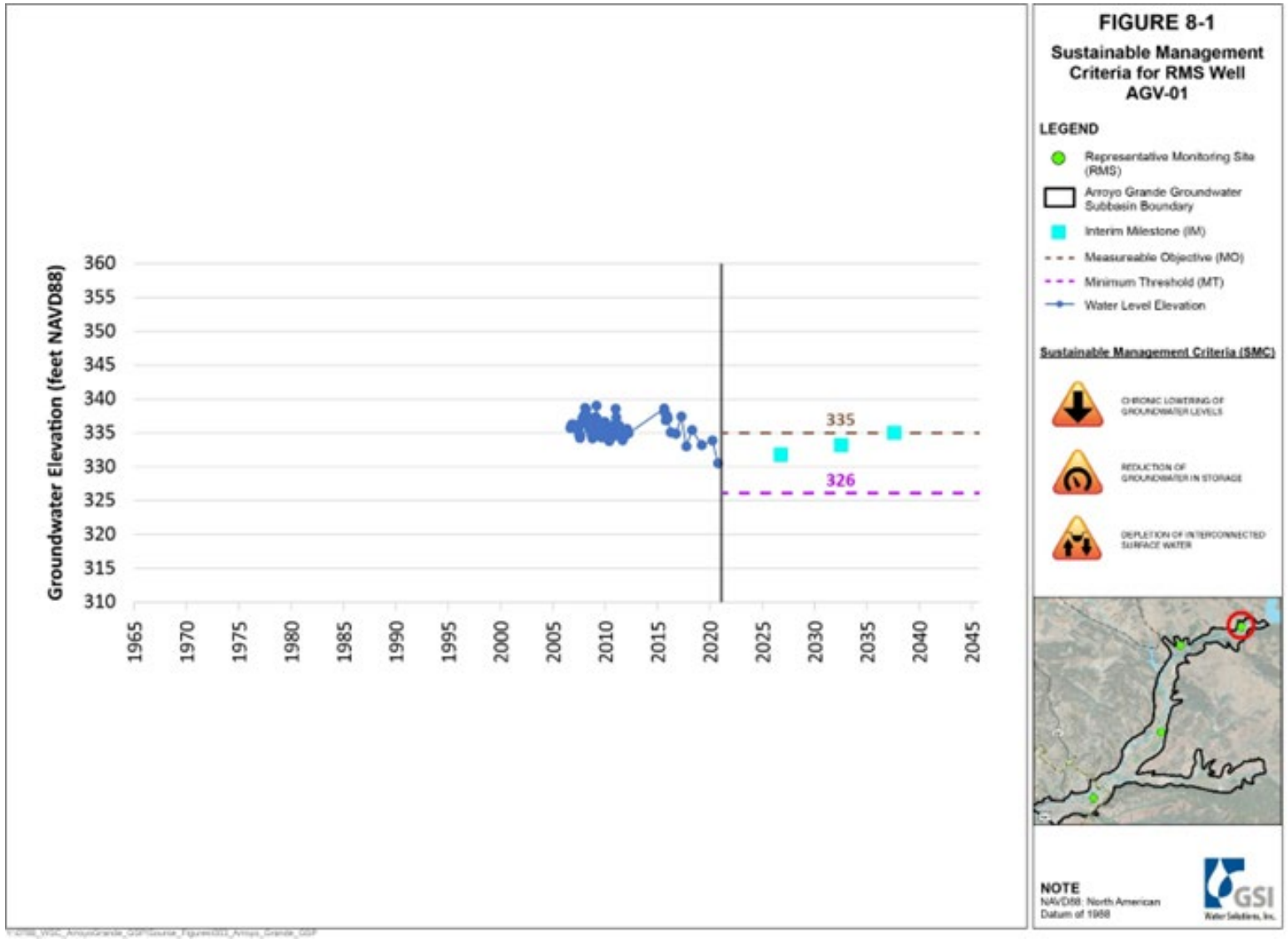


FIGURE 8-1

Sustainable Management Criteria for RMS Well AGV-01

LEGEND

- Representative Monitoring Site (RMS)
- Arroyo Grande Groundwater Subbasin Boundary
- Interim Milestone (IM)
- Measureable Objective (MO)
- Minimum Threshold (MT)
- Water Level Elevation

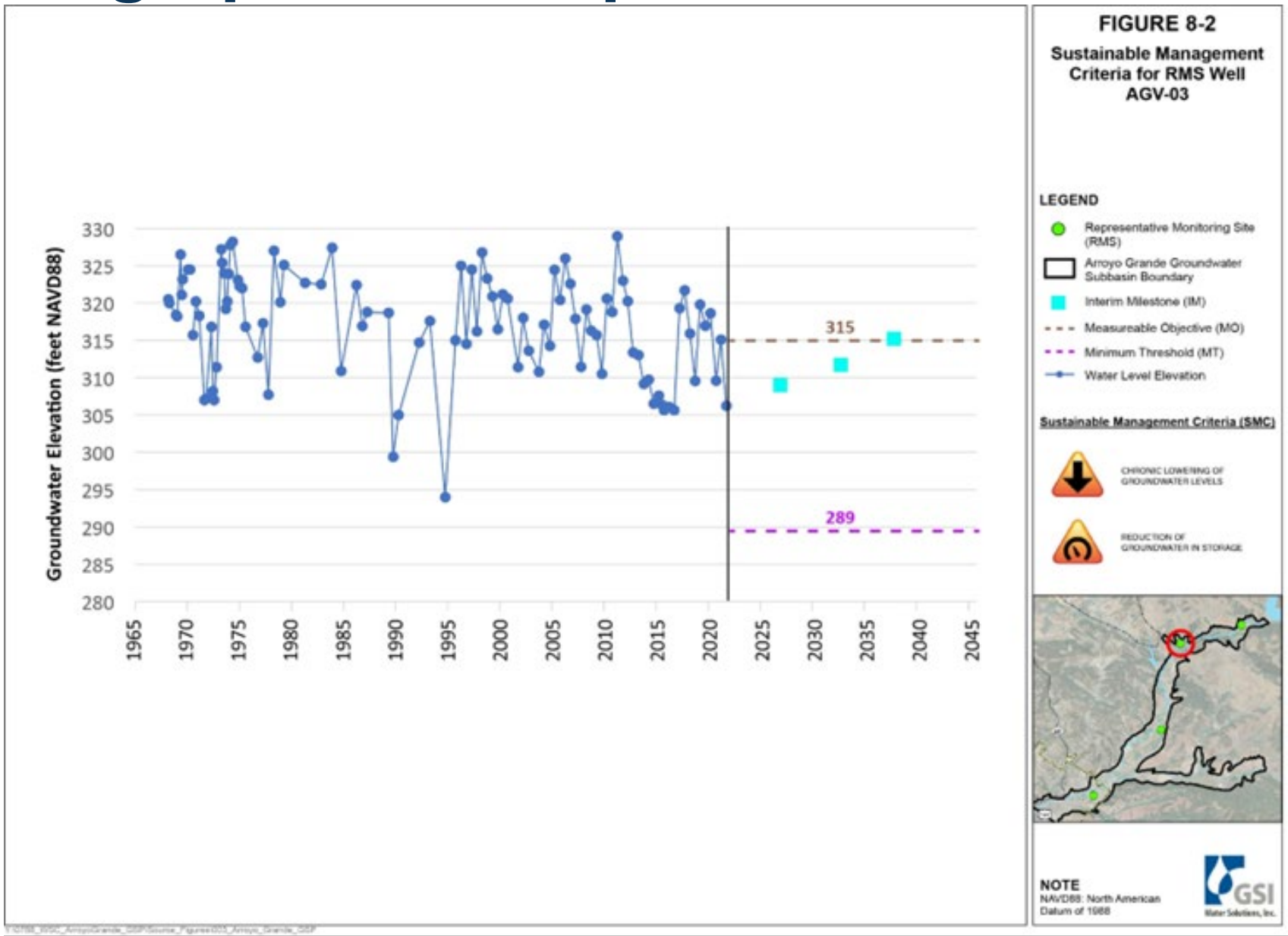
Sustainable Management Criteria (SMC)

- CHRONIC LOWERING OF GROUNDWATER LEVELS
- REDUCTION OF GROUNDWATER IN STORAGE
- DEPLETION OF INTERCONNECTED SURFACE WATER

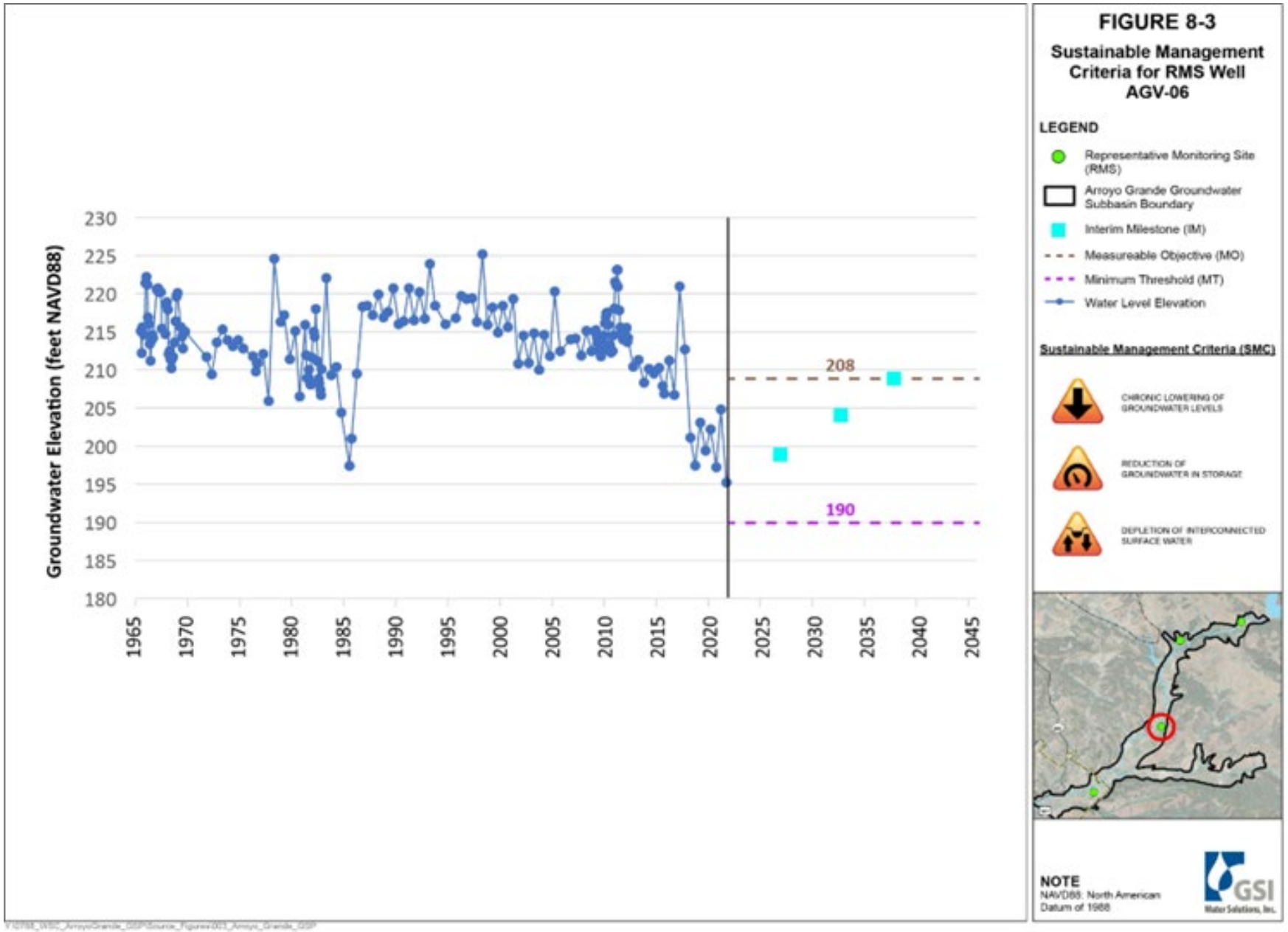
NOTE
NAVD88: North American Datum of 1988

GSI Water Solutions, Inc.

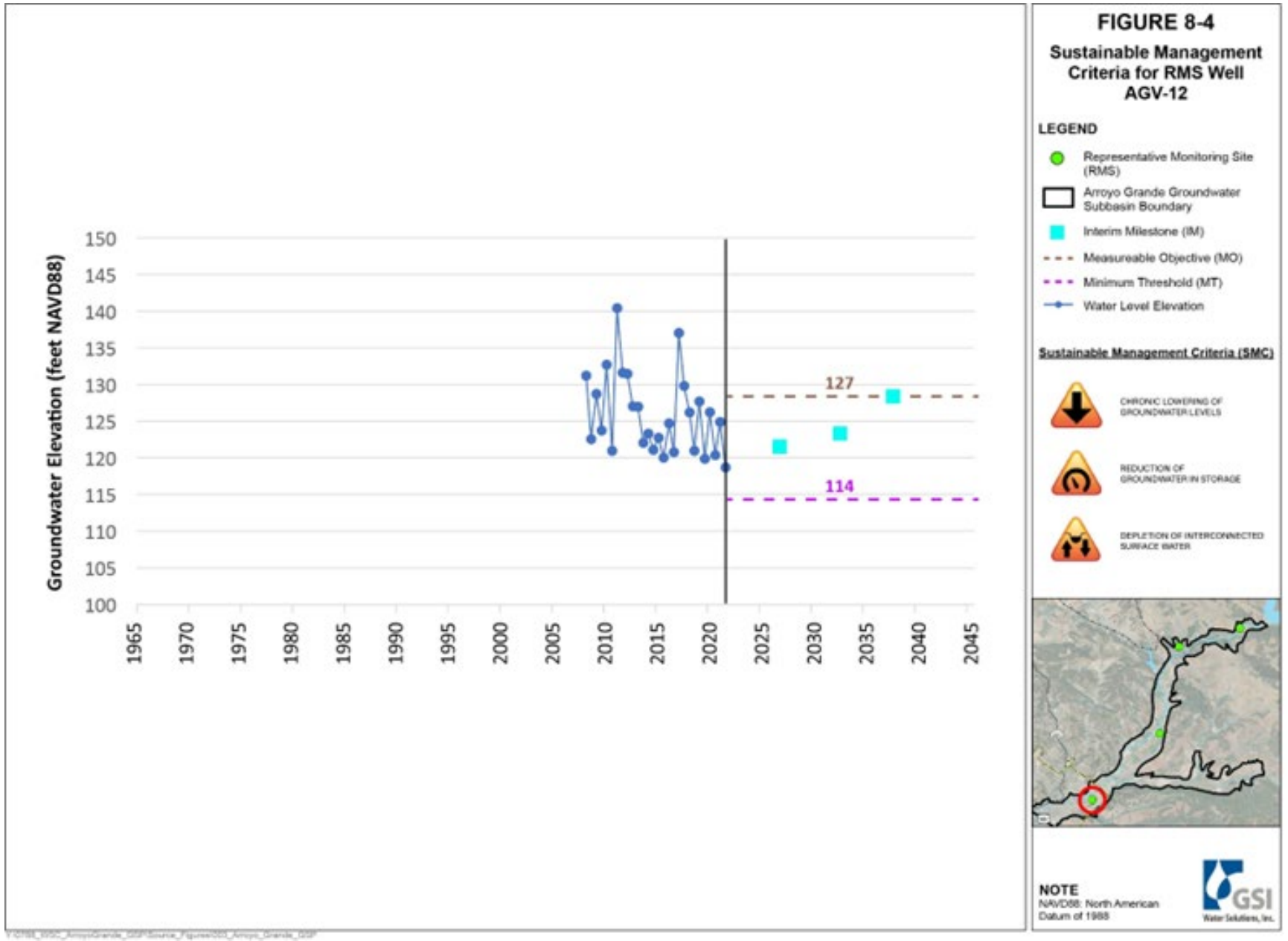
Hydrograph and Proposed SMCs for AGV-03



Hydrograph and Proposed SMCs for AGV-06



Hydrograph and Proposed SMCs for AGV-12



Water Quality Proposed MTs

ID	TDS MT (ppm)	NO3 MT (ppm)
WQ-1	800	10
WQ-2	800	10
WQ-3	800	10
WQ-4	800	10
WQ-5	800	10
WQ-6	900	10
WQ-7	900	10

CHAPTER 7 and 8: Monitoring Network and Sustainable Management Criteria

REVIEW

Chapter 7 and 8: Monitoring Network and SMCs

Released on July 15, 2022

Public Comment period closes 8/1/22.

www.SLOCounty/ca/gov/AGBasin


Questions?

Integrated Groundwater/Surface Water Model Update

DAVE O'ROURKE, GSI

Integrated GW/SW Model

We are using GSFLOW, a USGS modeling platform that incorporates

- PRMS (Precipitation Runoff Modeling System) to simulate Rainfall/Runoff modeling of surface water features, and
- MODFLOW for modeling groundwater flow.

In addition, when complete, the GSFLOW model will be linked to MODSIM, a reservoir operations model. This will benefit future Habitat Conservation Plan efforts supporting the re-licensing of Lopez Dam.

GSFLOW Model Historical Calibration is complete (SW and GW).

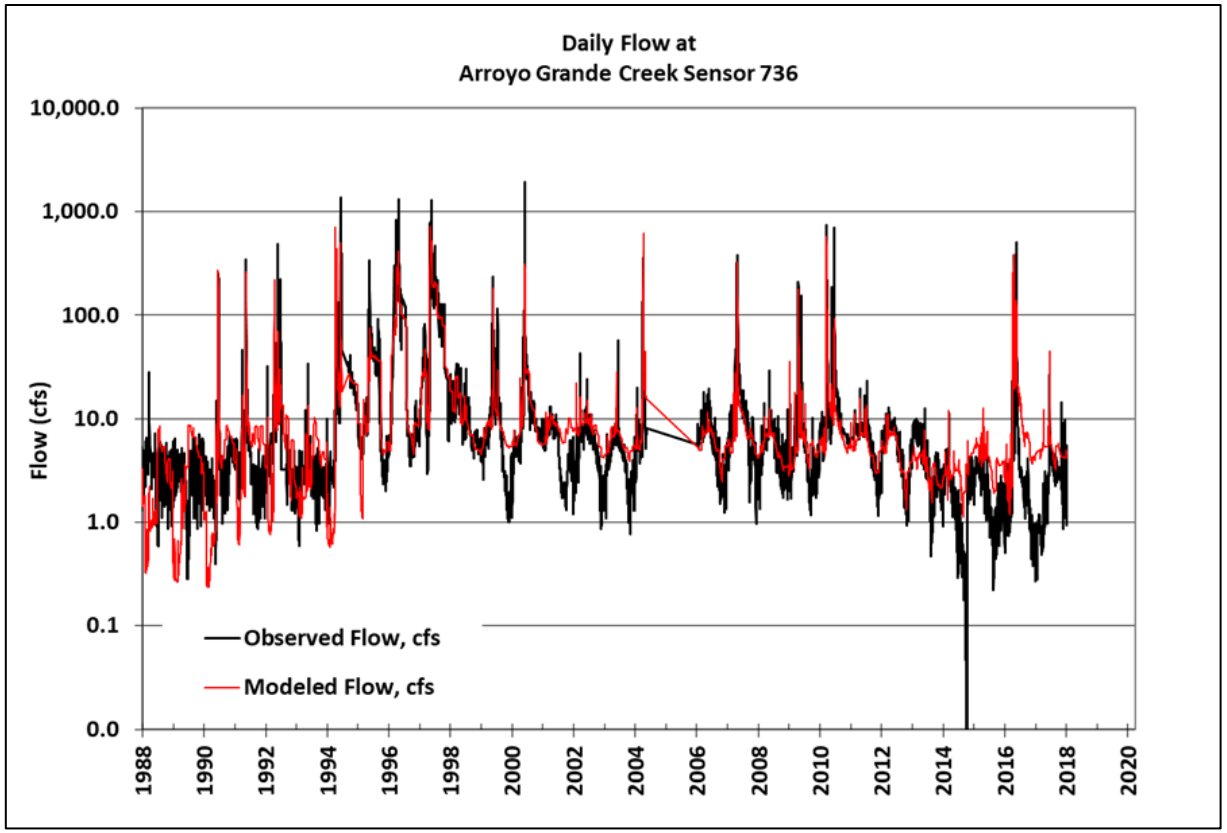
MODSIM integration is ongoing,

Model Area

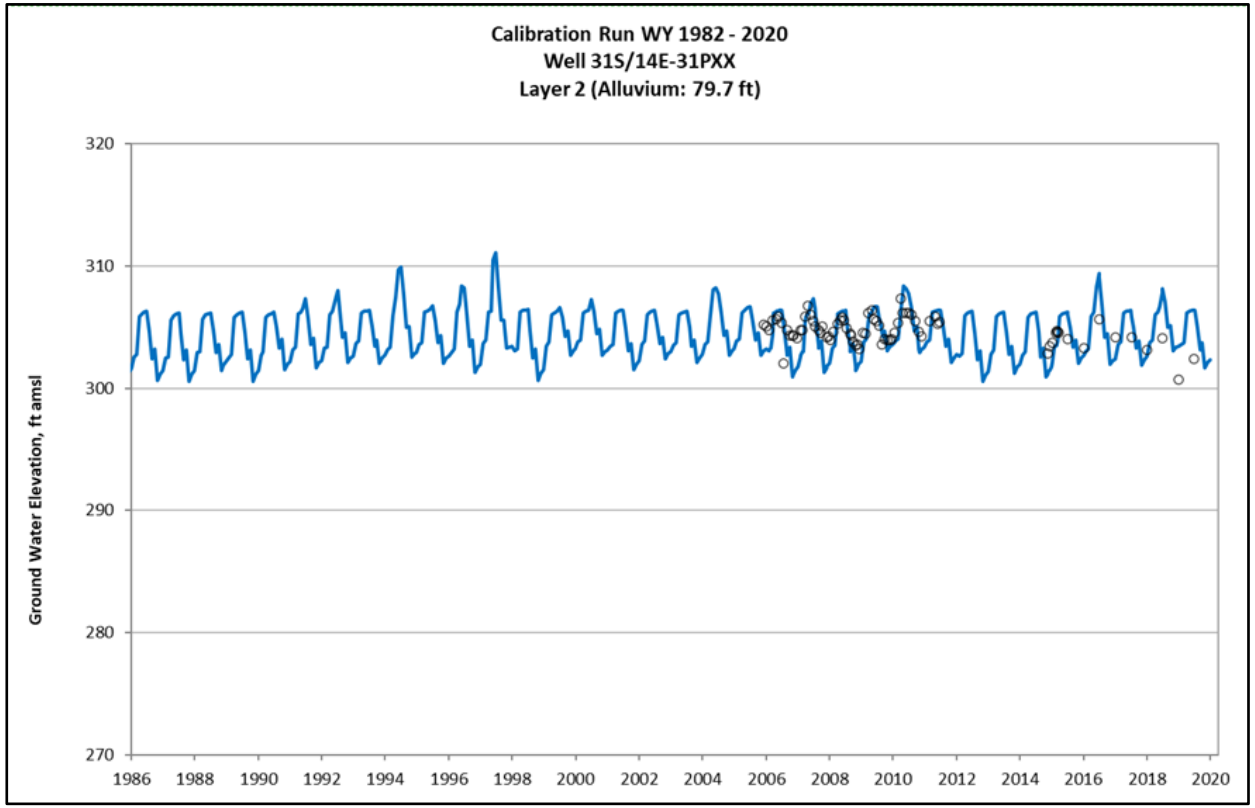
- All contributing watershed area to Arroyo Grande Creek
- Much larger area than Arroyo Grande Subbasin Boundary
- Designed to support future HCP work.

Model Calibration – Matching Observed Data

Surface Water Calibration (stream flows)

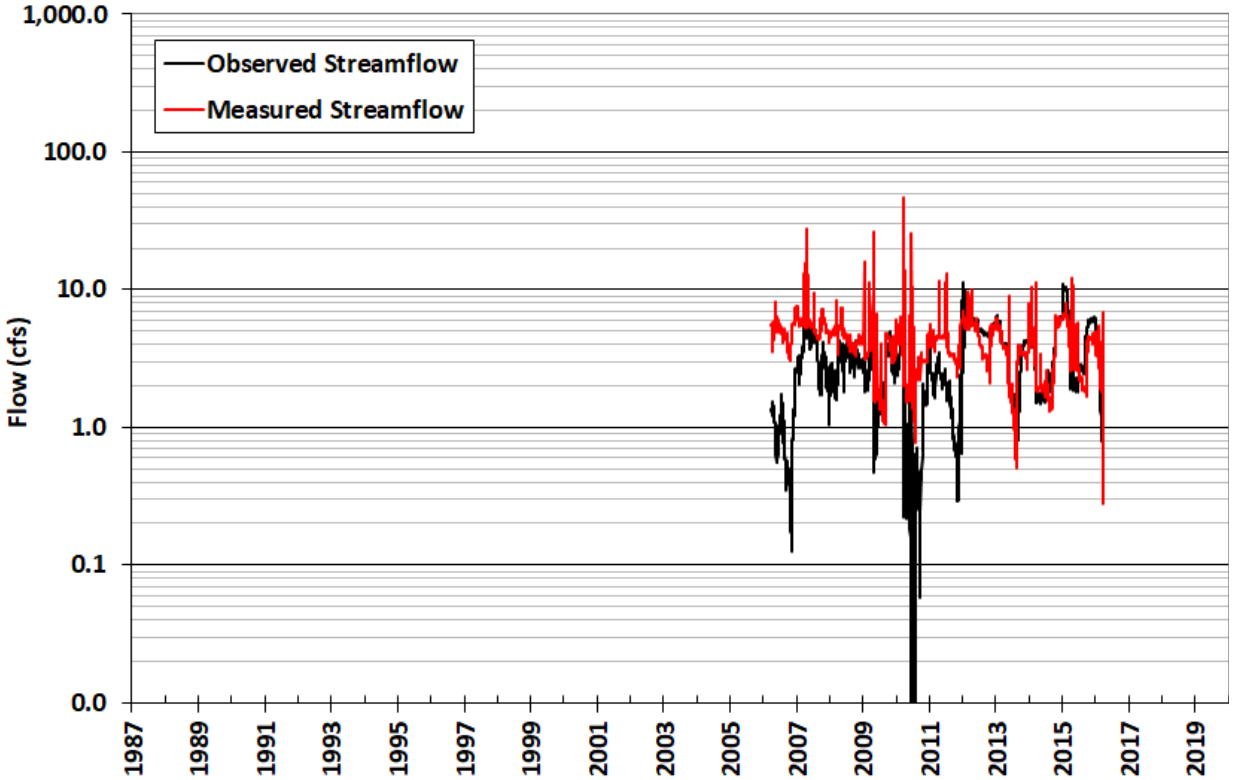


Groundwater Calibration (water levels)

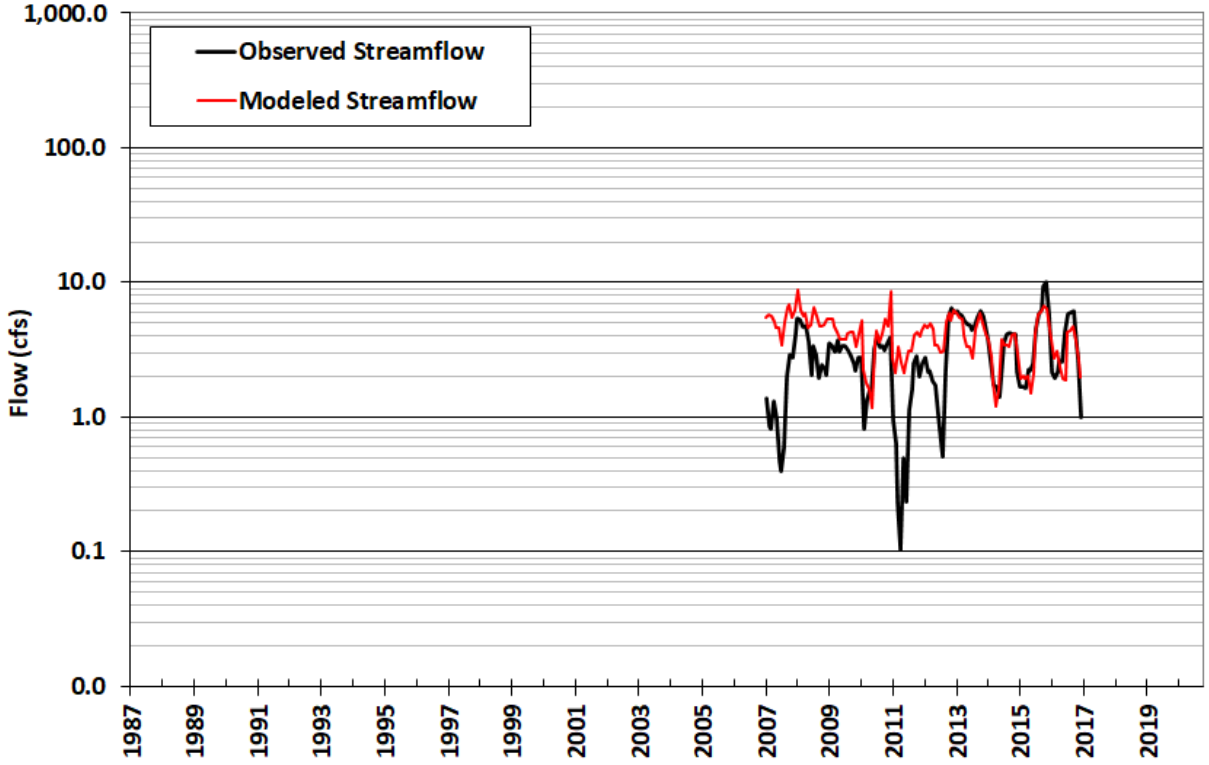


Rodriguez Gage SW Flow Calibration

Daily Flows

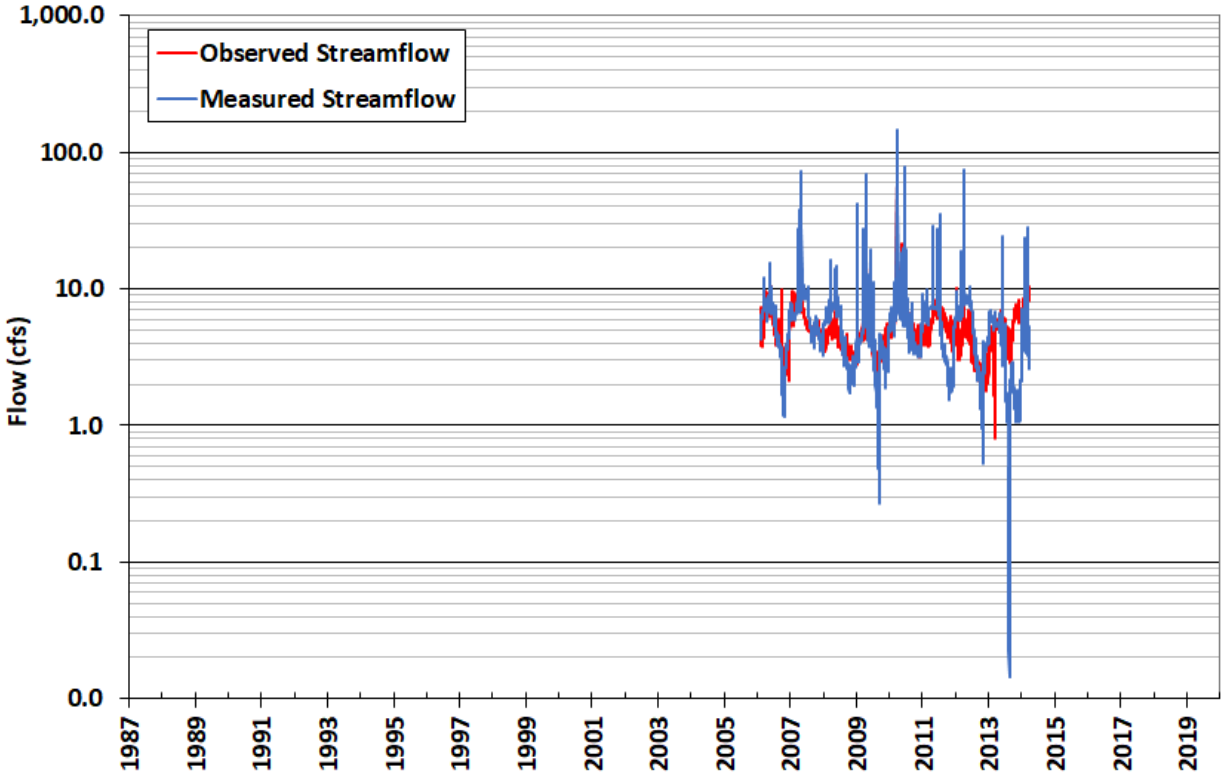


Monthly Flows

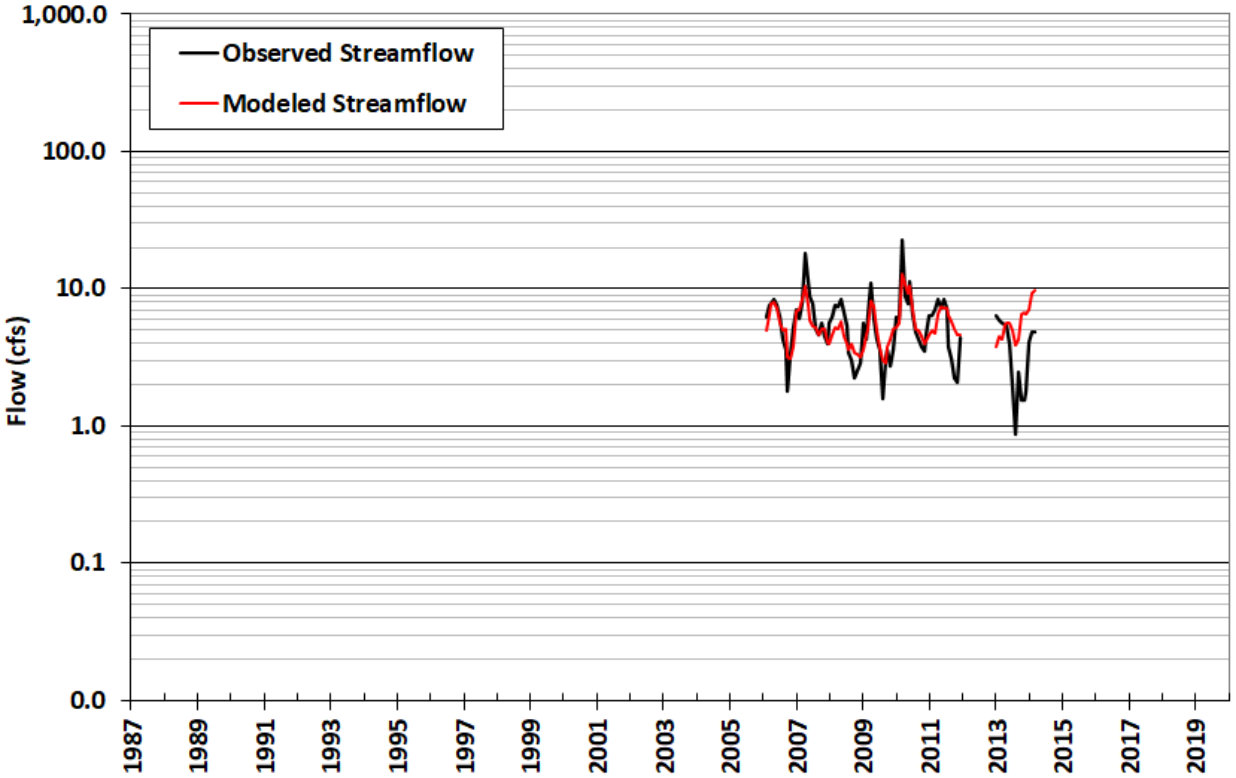


Cecchetti Gage SW Flow Calibration

Daily Flows

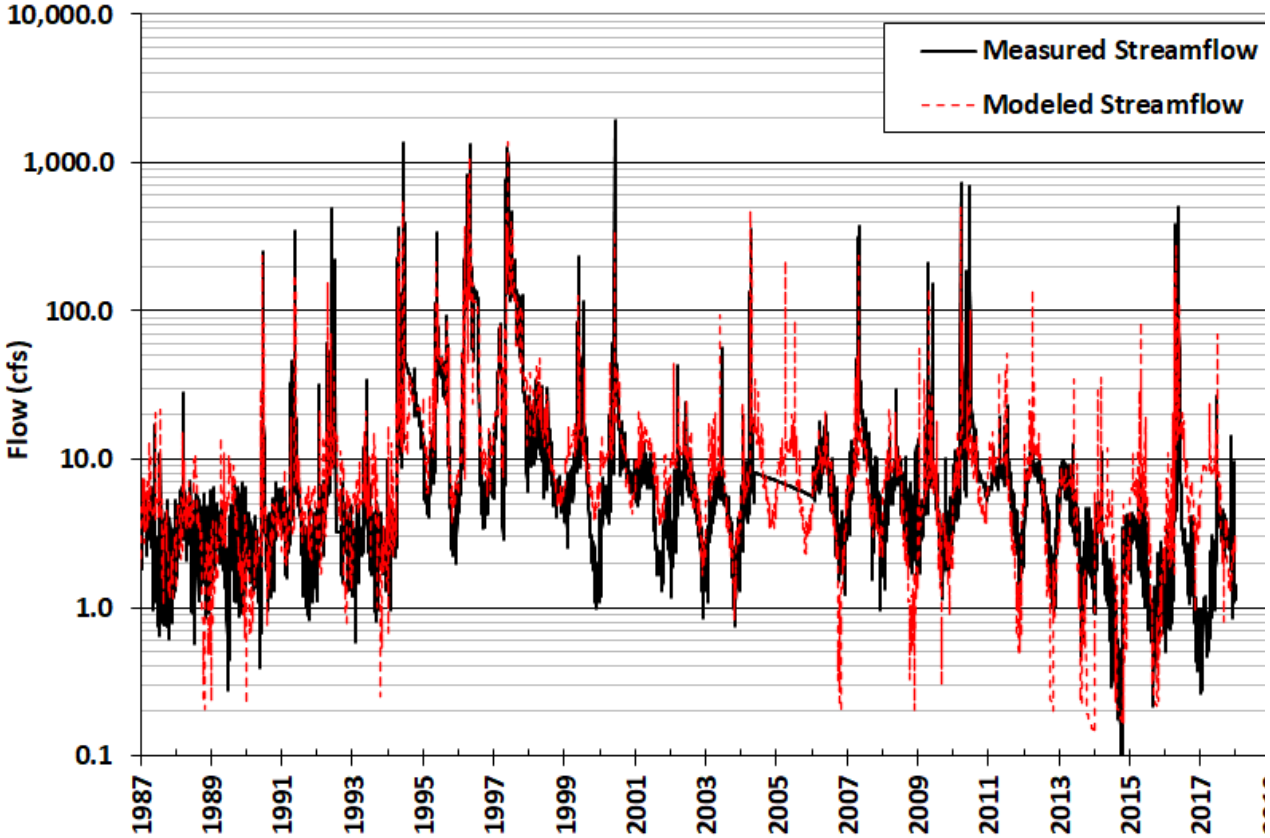


Monthly Flows

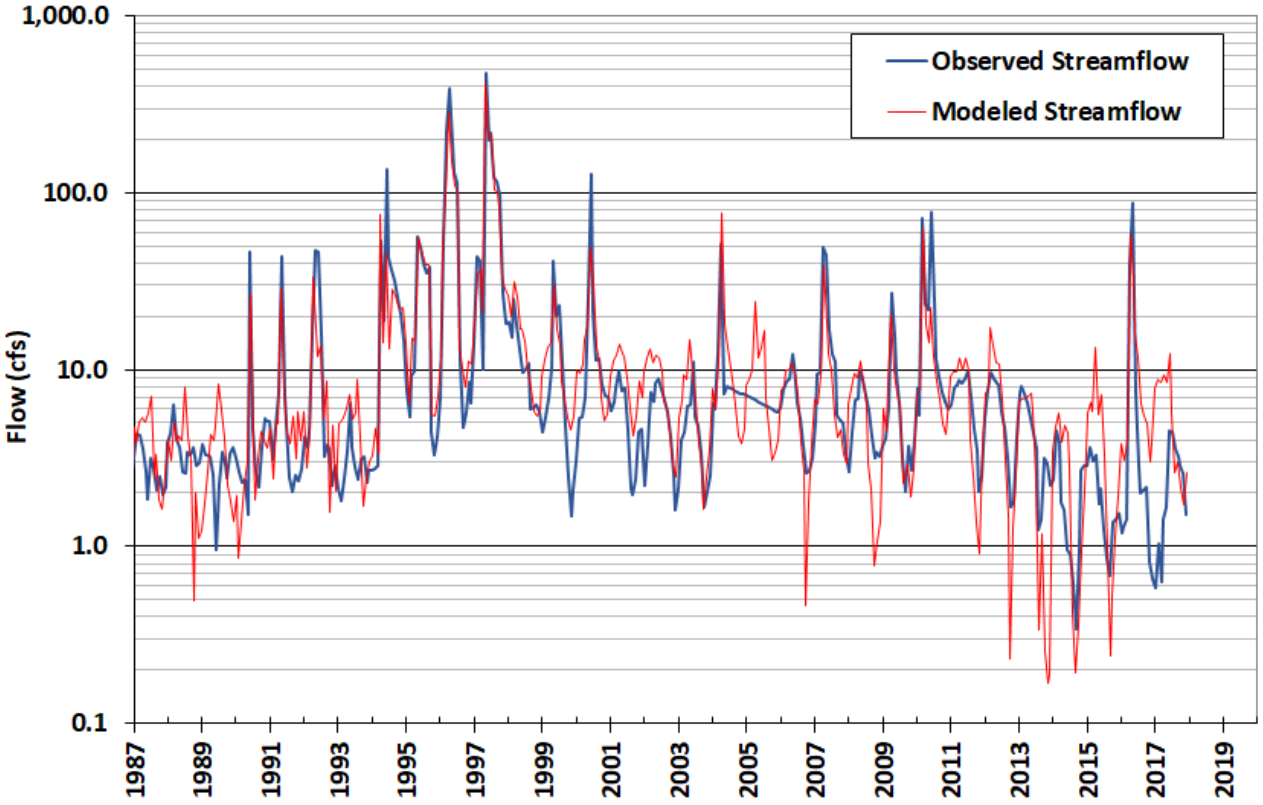


Arroyo Grande Gage SW Flow Calibration

Daily Flows

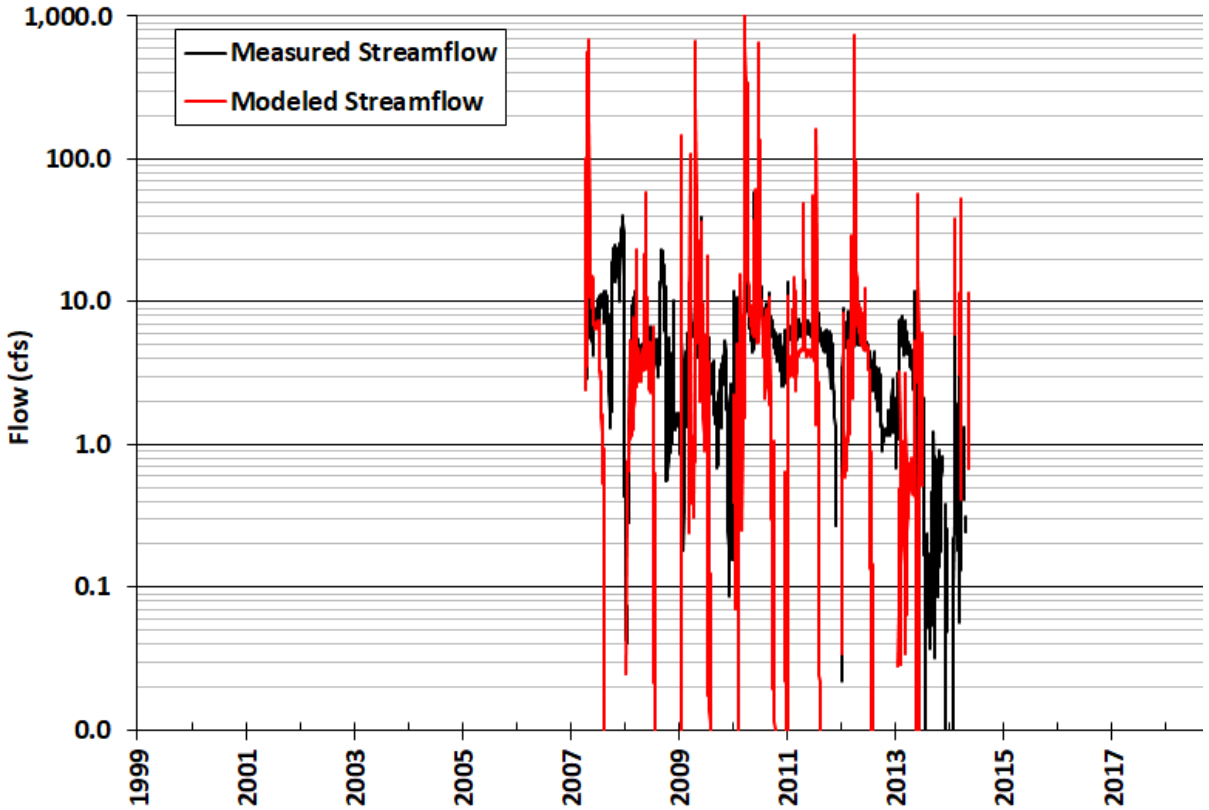


Monthly Flows

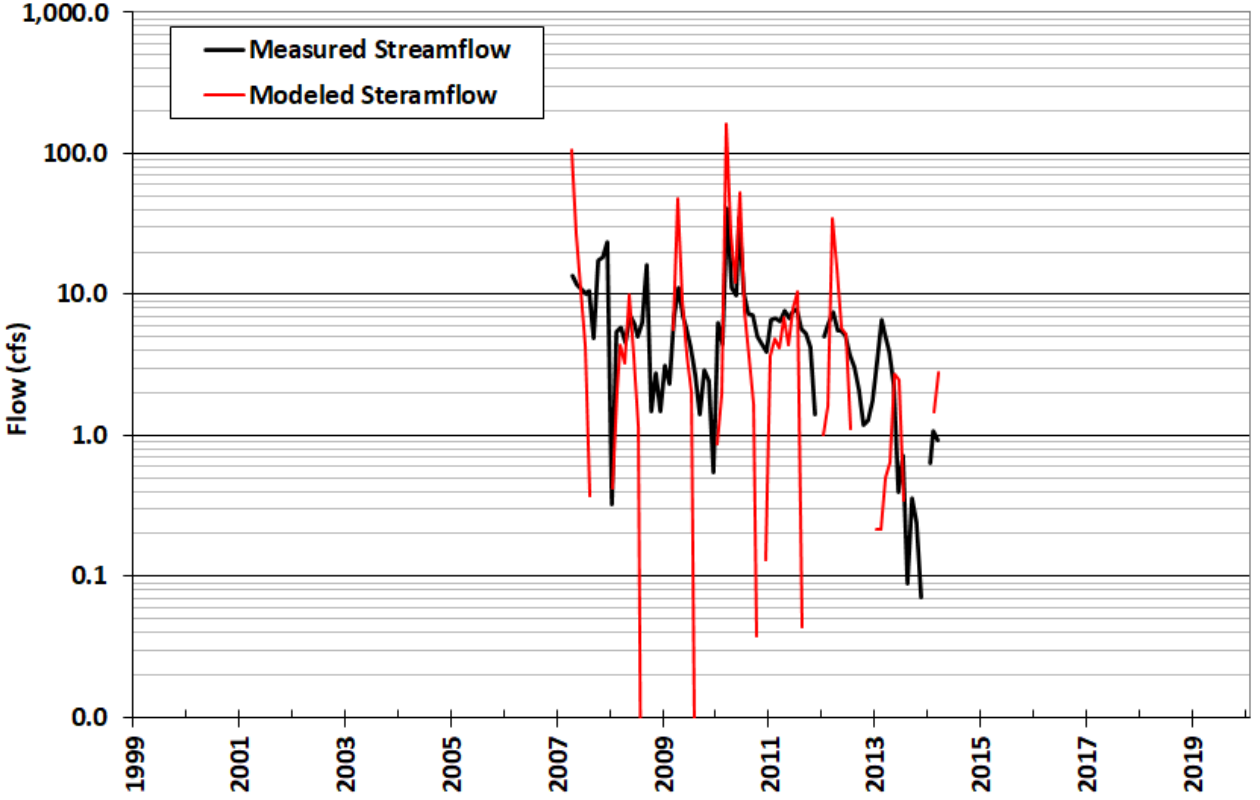


22nd Street Gage Surface Water Flow Calibration

Daily Flows



Monthly Flows

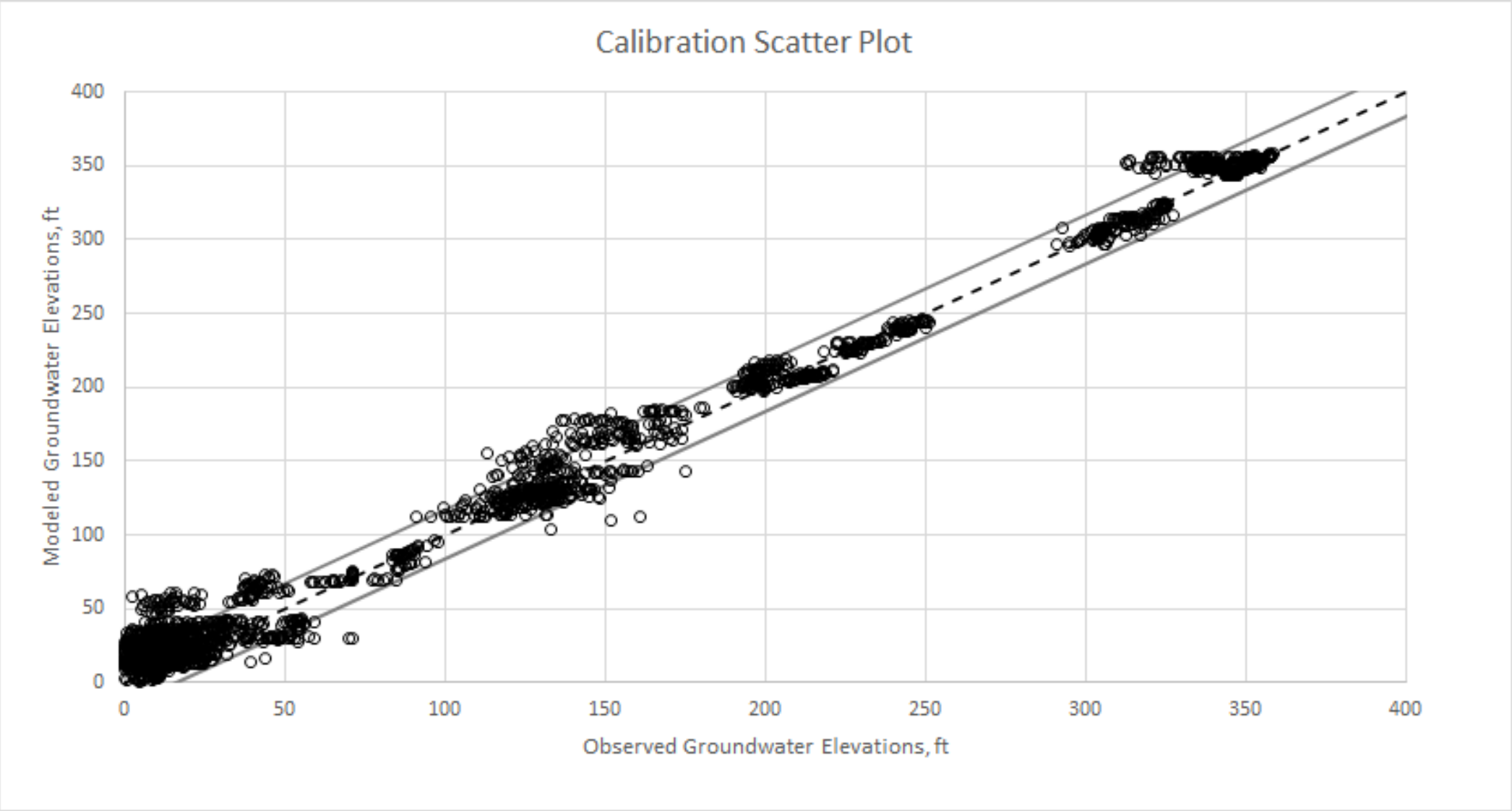


Groundwater Elevation Calibration

- **90 Wells**
- **3,218 Water Level Measurements**
- **Calibration Statistics**

All Wells DRAFT	
Mean Residual	-7.6 ft
Range Of Observed WLs	460 ft
Rel Error	2.1%
Count	3218

Groundwater Elevation Calibration



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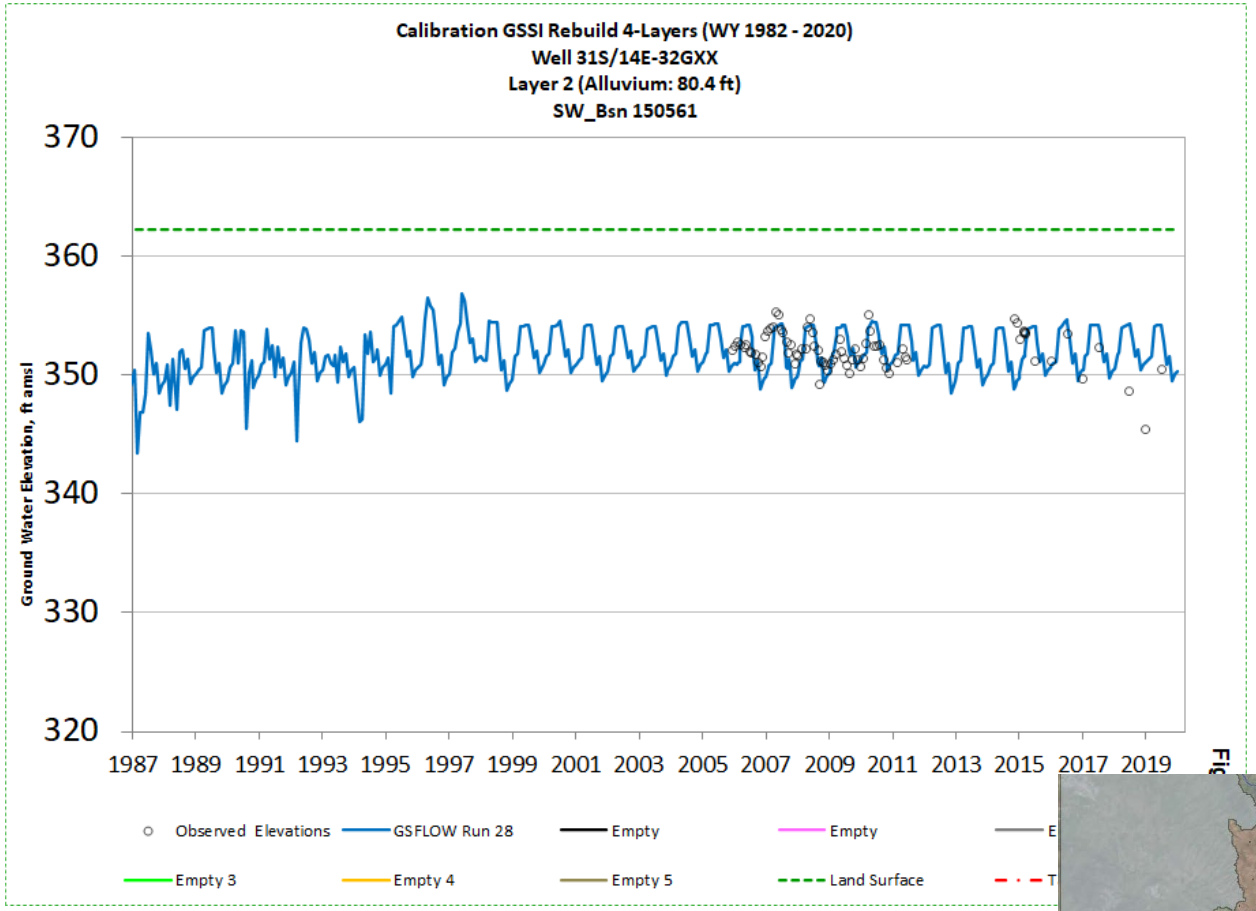


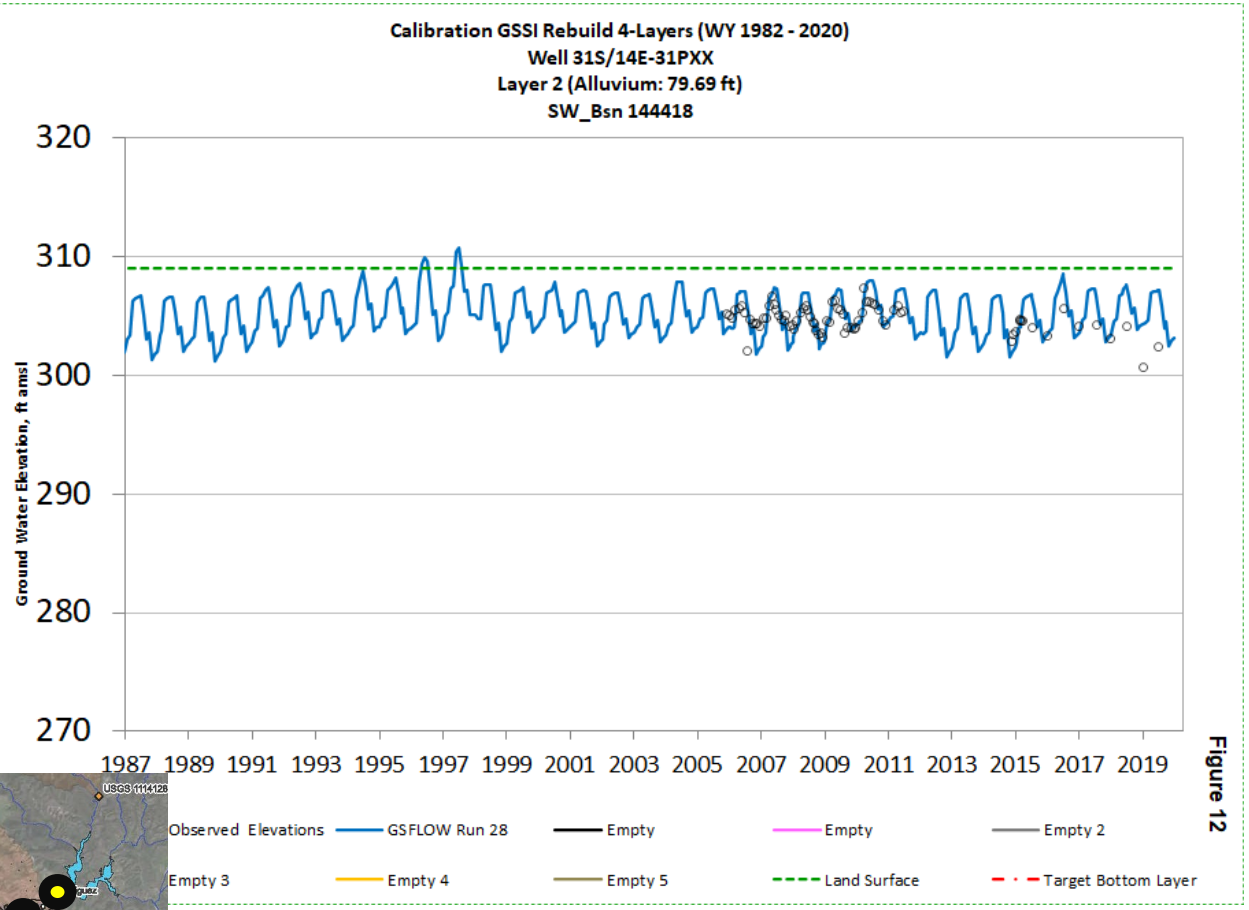
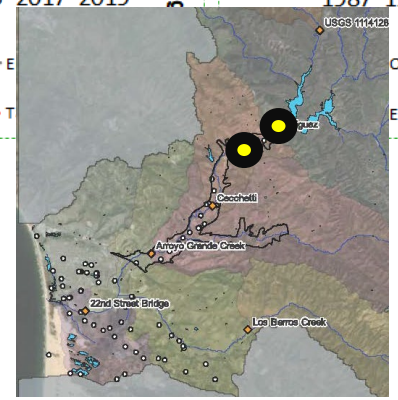
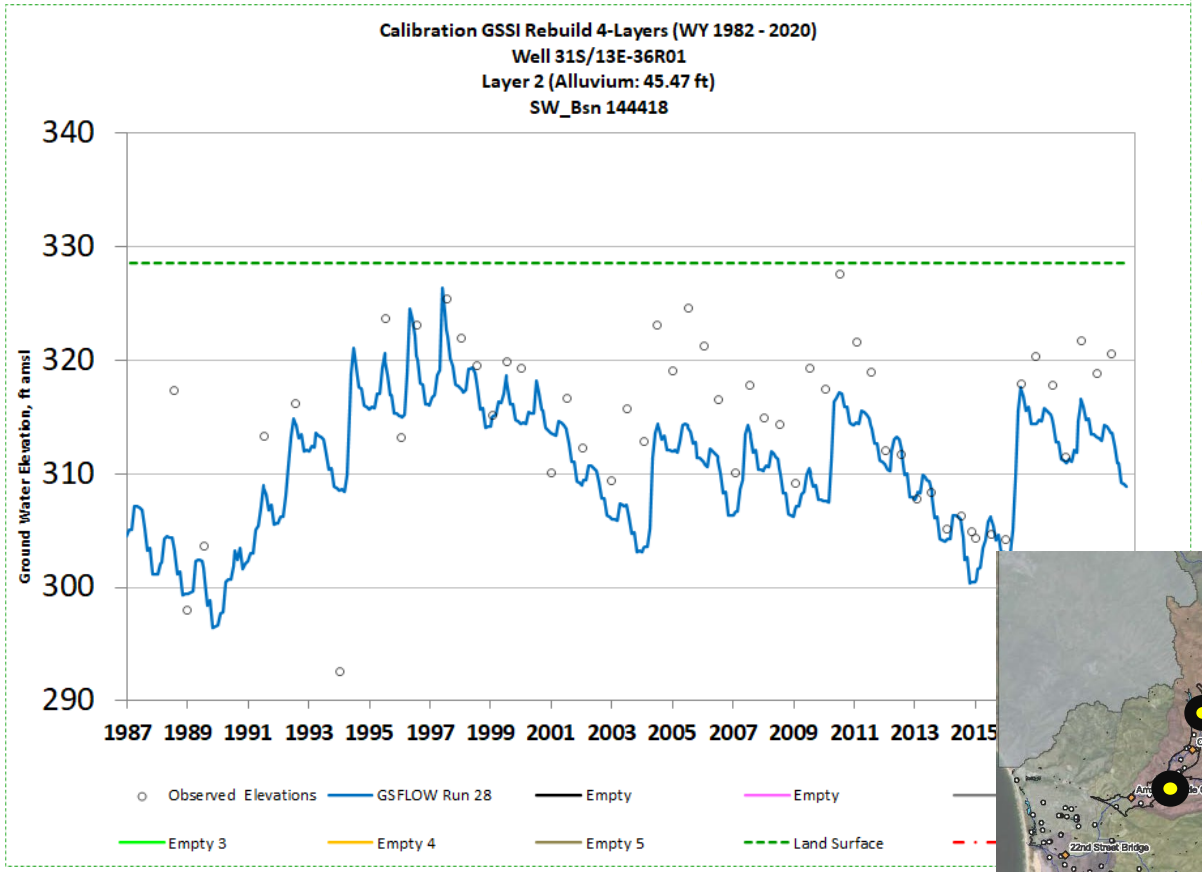
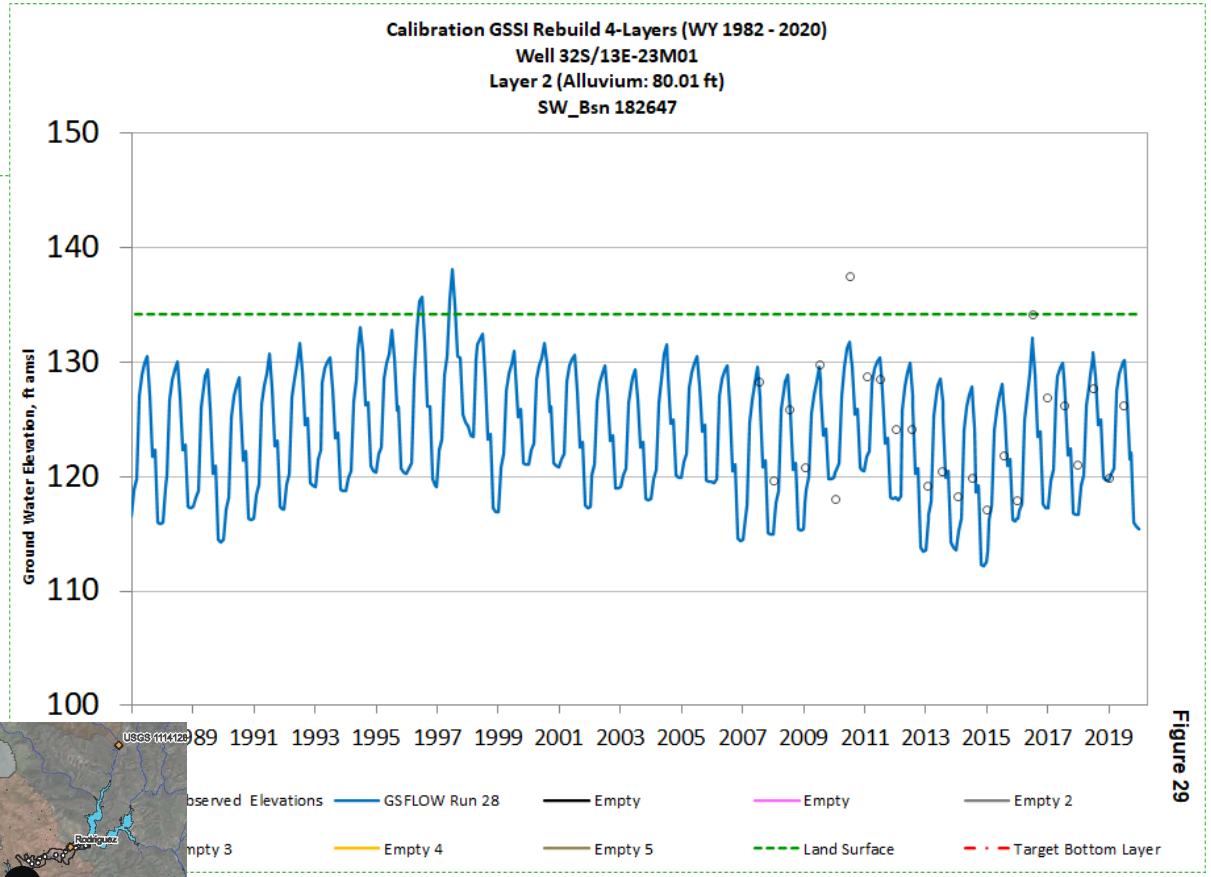


Figure 12



Groundwater Elevation Calibration





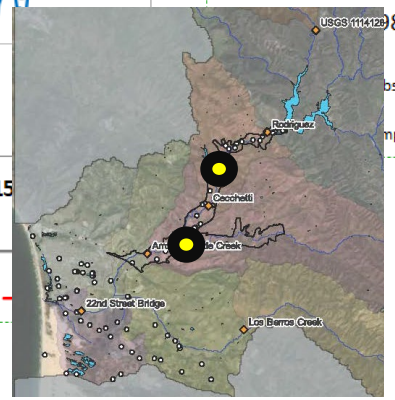


Figure 29

Groundwater Elevation Calibration

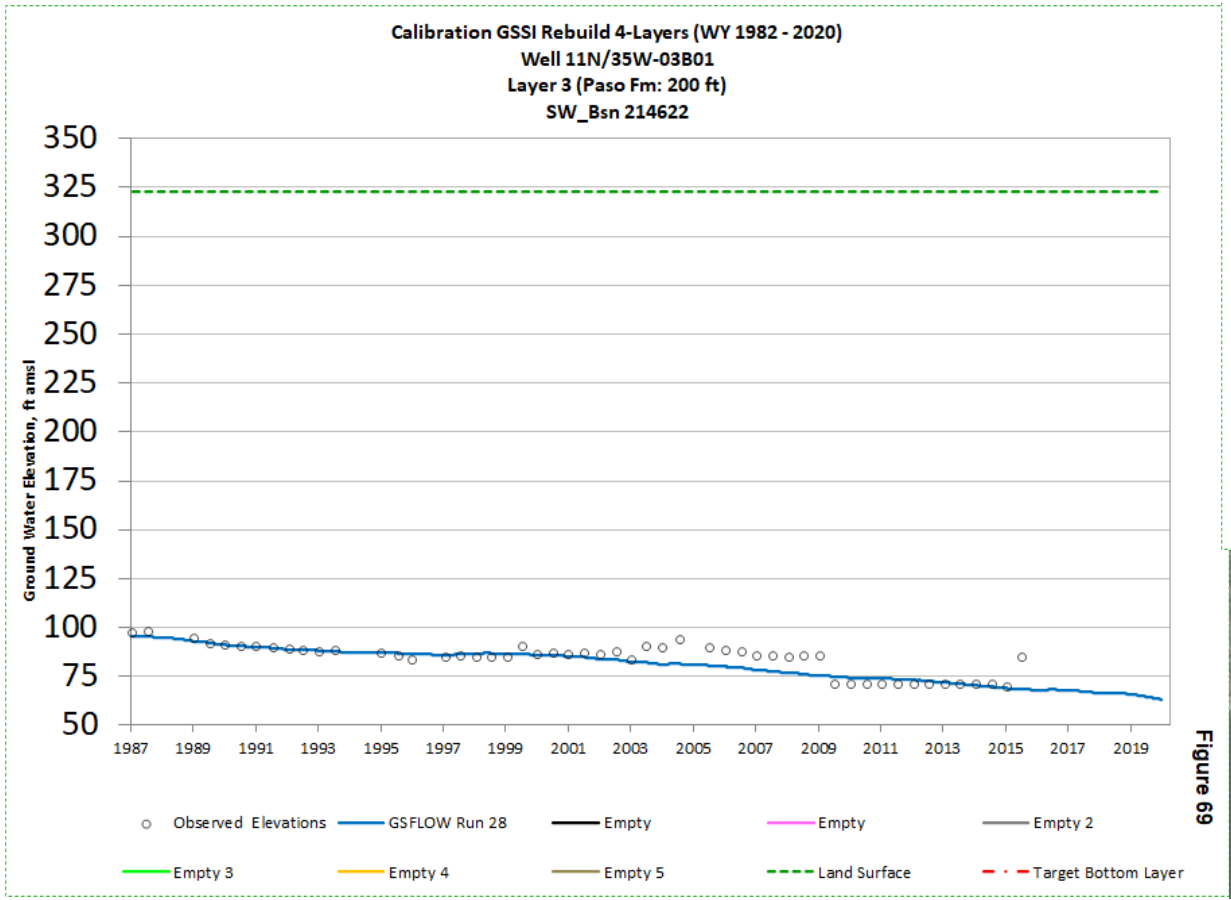


Figure 69

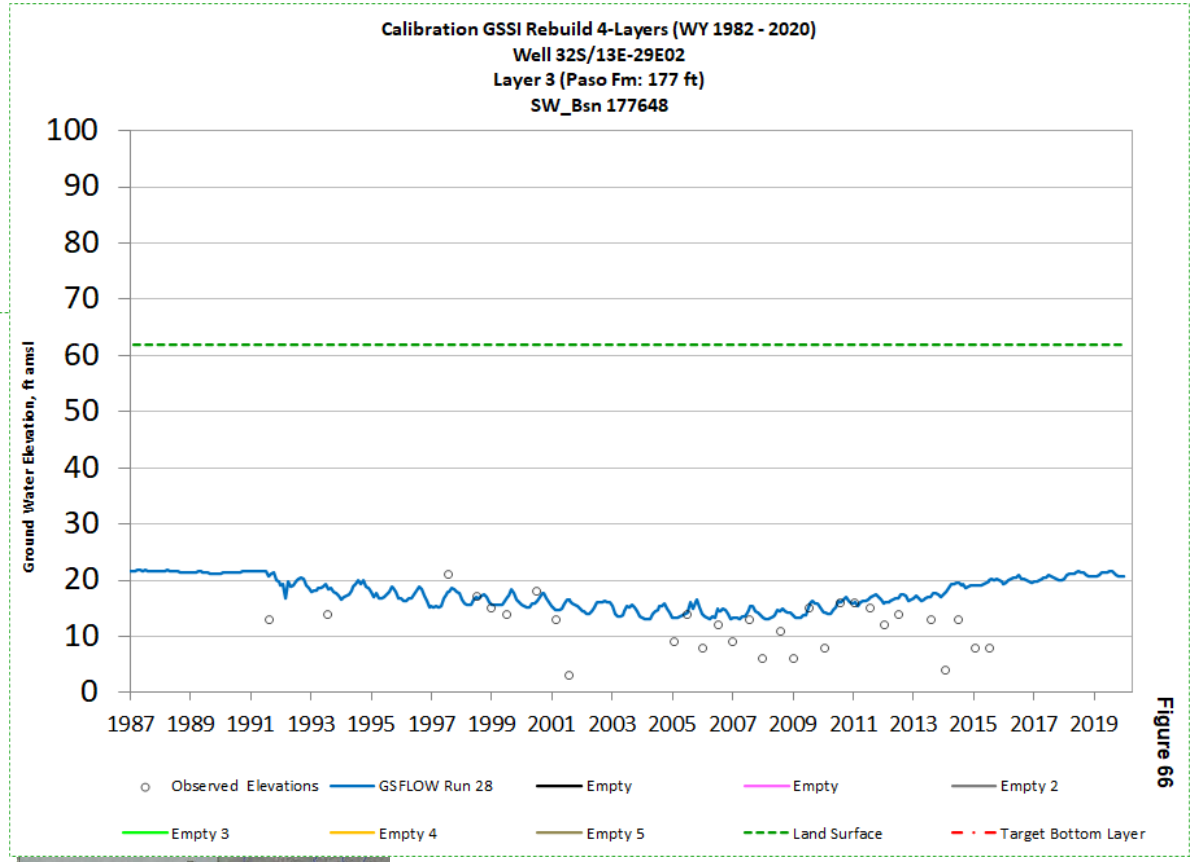
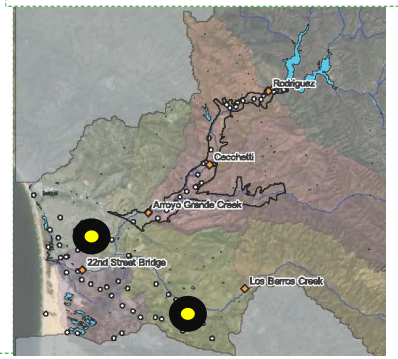


Figure 66



Integrated SW/GW Model Summary

- Model calibration of surface water and groundwater conditions to observed historical data is complete.
- Integration with MODSIM is ongoing.
- Model captures flow regime on Arroyo Grande Creek during non-storm conditions.
- Model will be useful during current and future HCP support.

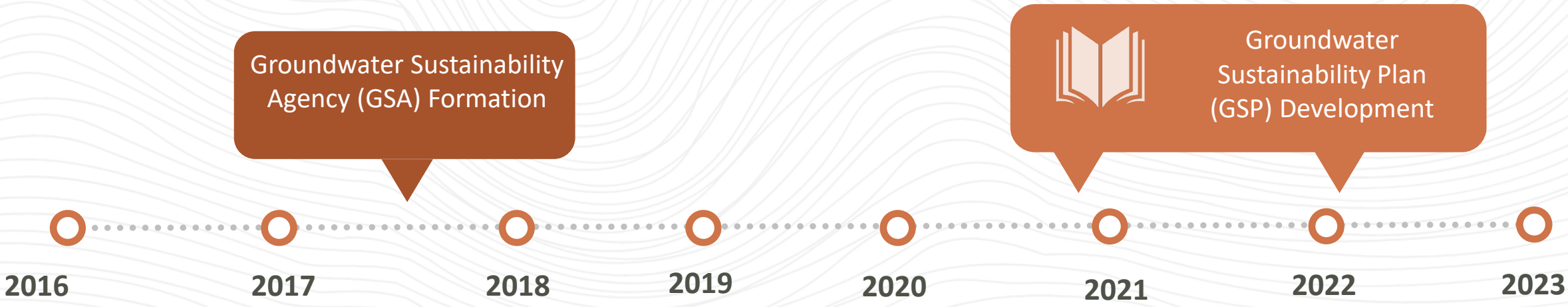
AG GSP: W3 SMCs, Integrated Model, GSP Implementation | 45

What's Next?
Projects and Management Actions, Implementation Plan, Admin Draft

Michael Cruikshank, WSC

Arroyo Grande Subbasin

The City of AG and County of SLO decided to proceed with the development of the GSP as a proactive measure to support the HCP.



AG Subbasin was classified as a very low priority basin not in critical overdraft and is not required to submit a GSP to DWR.

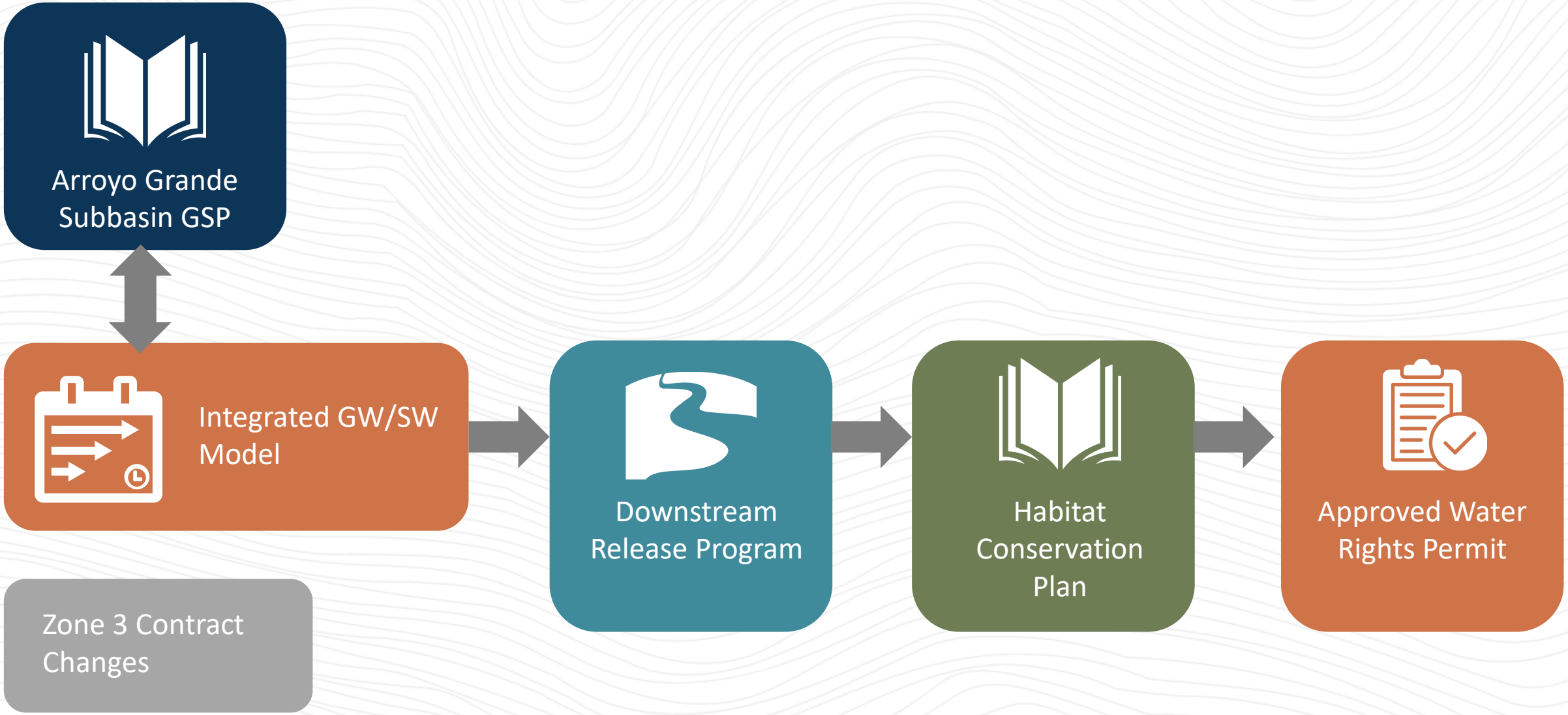
SGMA Requirements for very low priority Basins?

- Basins previously prioritized as high- or medium-priority that are now low- or very low-priority are not subject to the requirements in SGMA to form a GSA and prepare a GSP or an alternative to avoid potential State Water Resources Control Board intervention. However, these basins are still encouraged to form GSAs and develop GSPs, update existing groundwater management plans, and coordinate with others to develop a new groundwater management plan in accordance with Water Code Section 10750 et seq.

Water Code Section 10750

a) The Legislature finds and declares that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.
b) The Legislature also finds and declares that additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in this state.

GSP Supports Critical AG Creek Initiatives



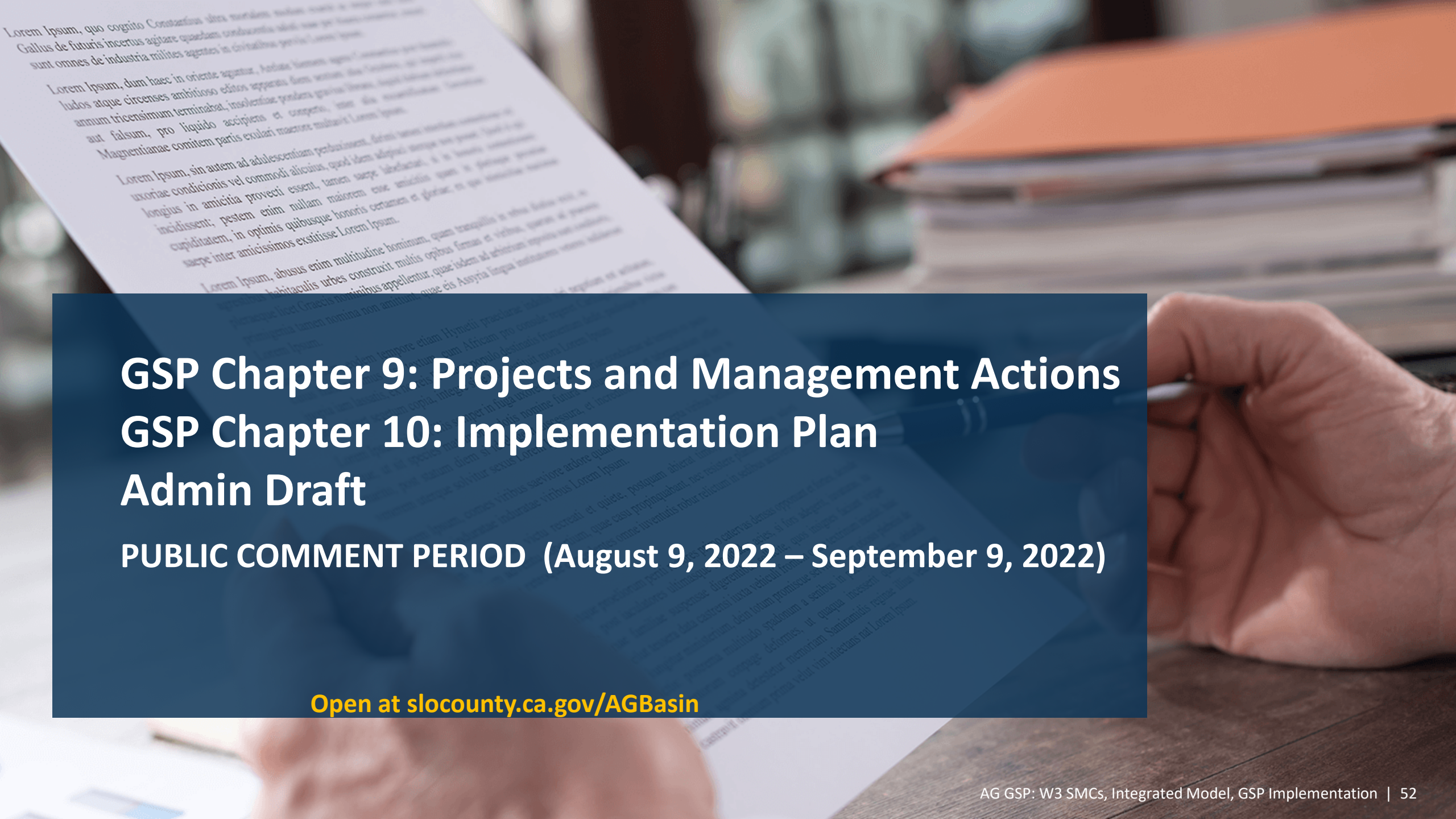
Projects and Management Actions Chapter Organization

- Introduction
- Integrated Surface Water and Groundwater Modeling
- *Project –Lopez Lake Operations*
  - *Downstream Release Program*
  - *Habitat Conservation Plan (HCP)*
    - *Project Benefits (§ 354.44.5)*
    - *Supply Reliability (§ 354.44.6)*
    - *Project Costs (§ 354.44.8)*
    - *Project Implementation (§ 354.44.4)*
    - *Basin Uncertainty (§ 354.44.9d)*
    - *Legal Authority (§ 354.44.7)*
    - *Permitting and Regulatory Processes (§ 354.44.3)*
    - *Public Notice and Outreach (§ 354.44B)*

Implementation Chapter

- GSP Implementation, Administration, and Management
  - Administrative Approach/Governance Structure
  - Implementation Schedule
  - Implementation Costs
  - Outreach and Communication
- Funding
- Reporting
  - Annual Reports
  - Five Year Evaluation Reports

Note: The sections listed above are requirements for high and medium priority SGMA Basins, thus non-applicable to AG. The County still anticipates continued monitoring and future reporting as part of the Master Water Report Update.



GSP Chapter 9: Projects and Management Actions
GSP Chapter 10: Implementation Plan
Admin Draft

PUBLIC COMMENT PERIOD (August 9, 2022 – September 9, 2022)

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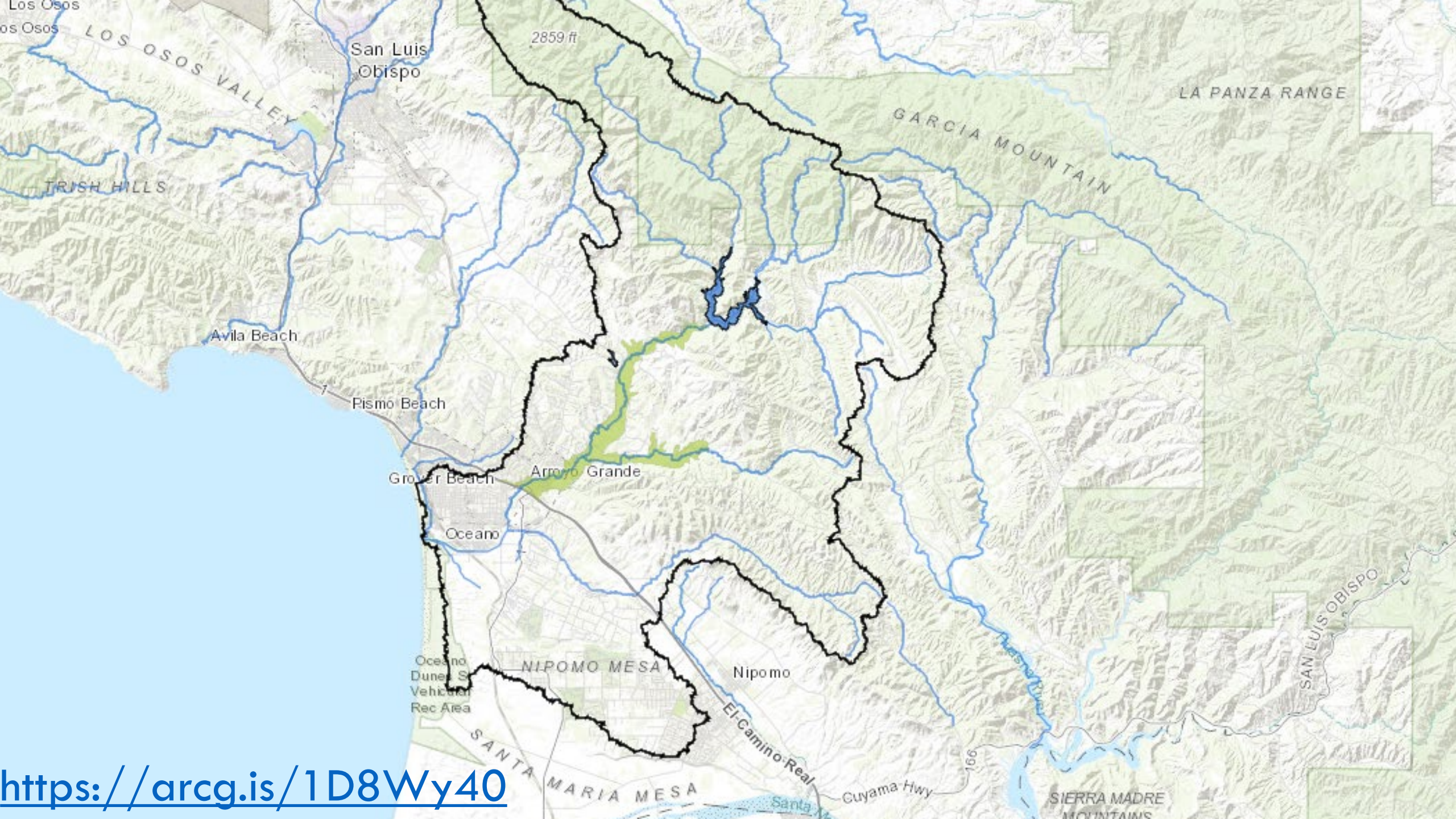
Questions?



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