

Cuyama Basin Groundwater Sustainability Agency

Sustainability Agency Meeting and Public Workshops

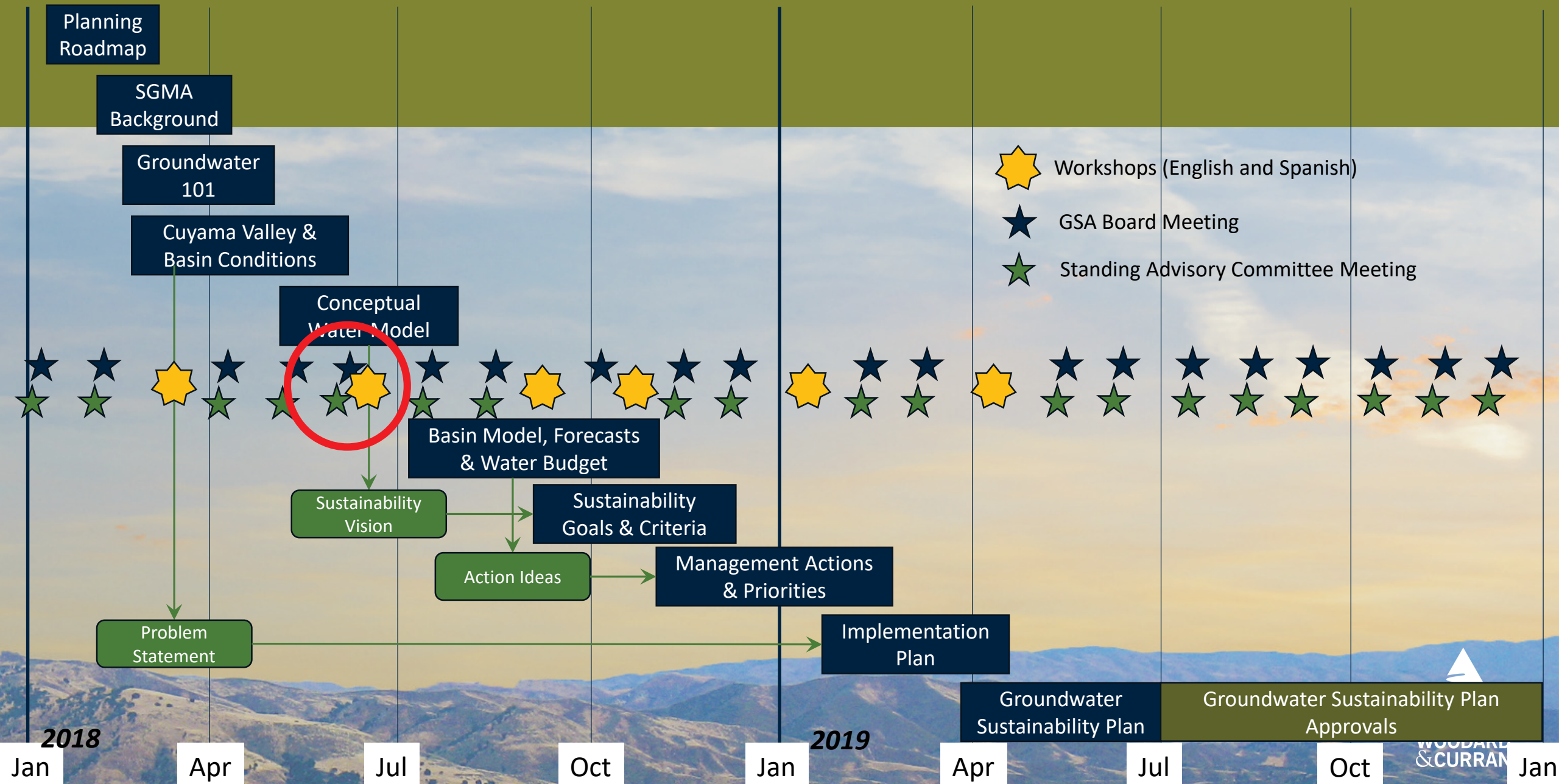
June 6, 2018



Agenda

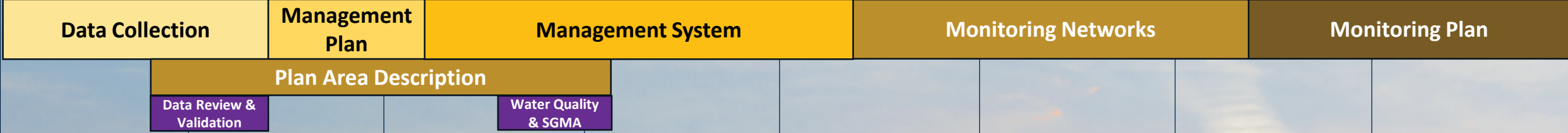
- Welcome and Introduction (5 min)
- Cuyama Basin - Physical Conditions Overview (20 min)
- Questions/Discussion (30 min)
- Interactive Discussion on Groundwater Sustainability in the Cuyama Basin (40 min)
- Summary and Next Steps (15 min)

Cuyama Basin Groundwater Sustainability Plan – Planning Roadmap

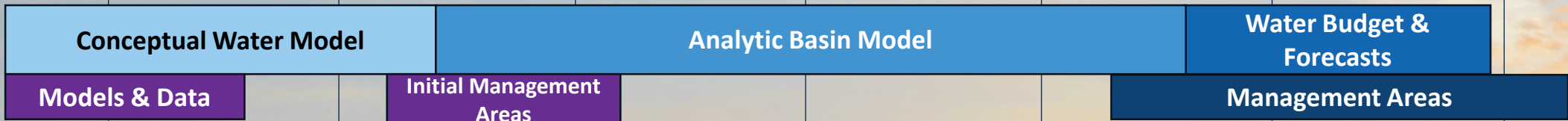


Cuyama Basin Groundwater Sustainability Plan – Discussion Topics

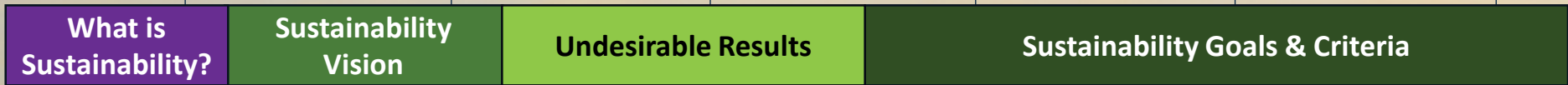
Data & Information



Basin Model



Sustainability Goals



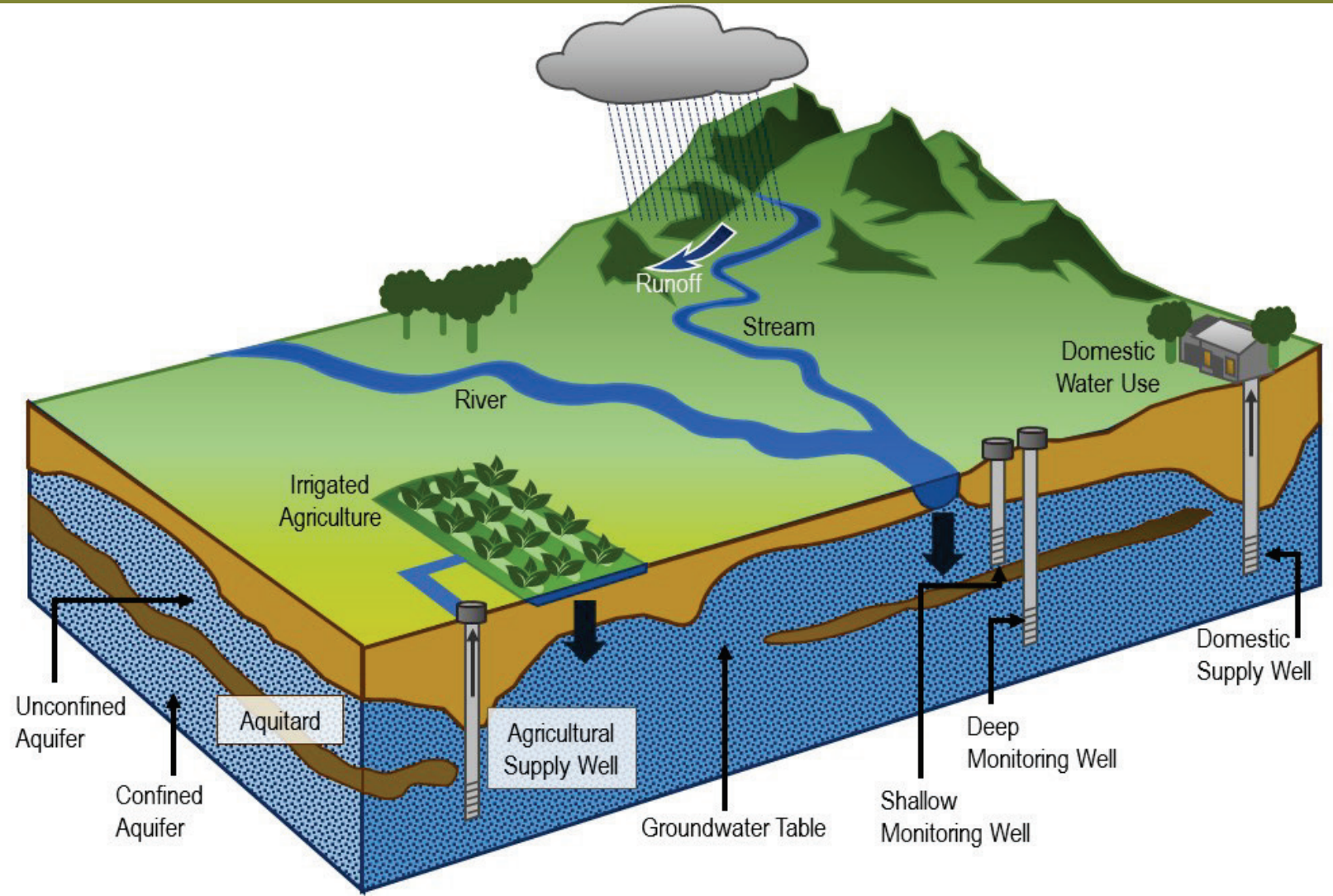
Education Topics

2018 Mar Apr May Jun Jul Aug Sep Oct



Components of a Groundwater Basin

- Groundwater aquifers
- Agricultural and domestic pumping
- Recharge
- Surface water interaction



Cuyama Basin Groundwater Sustainability Agency

Cuyama Basin - Physical Conditions Overview

June 6, 2018



Physical Conditions Overview

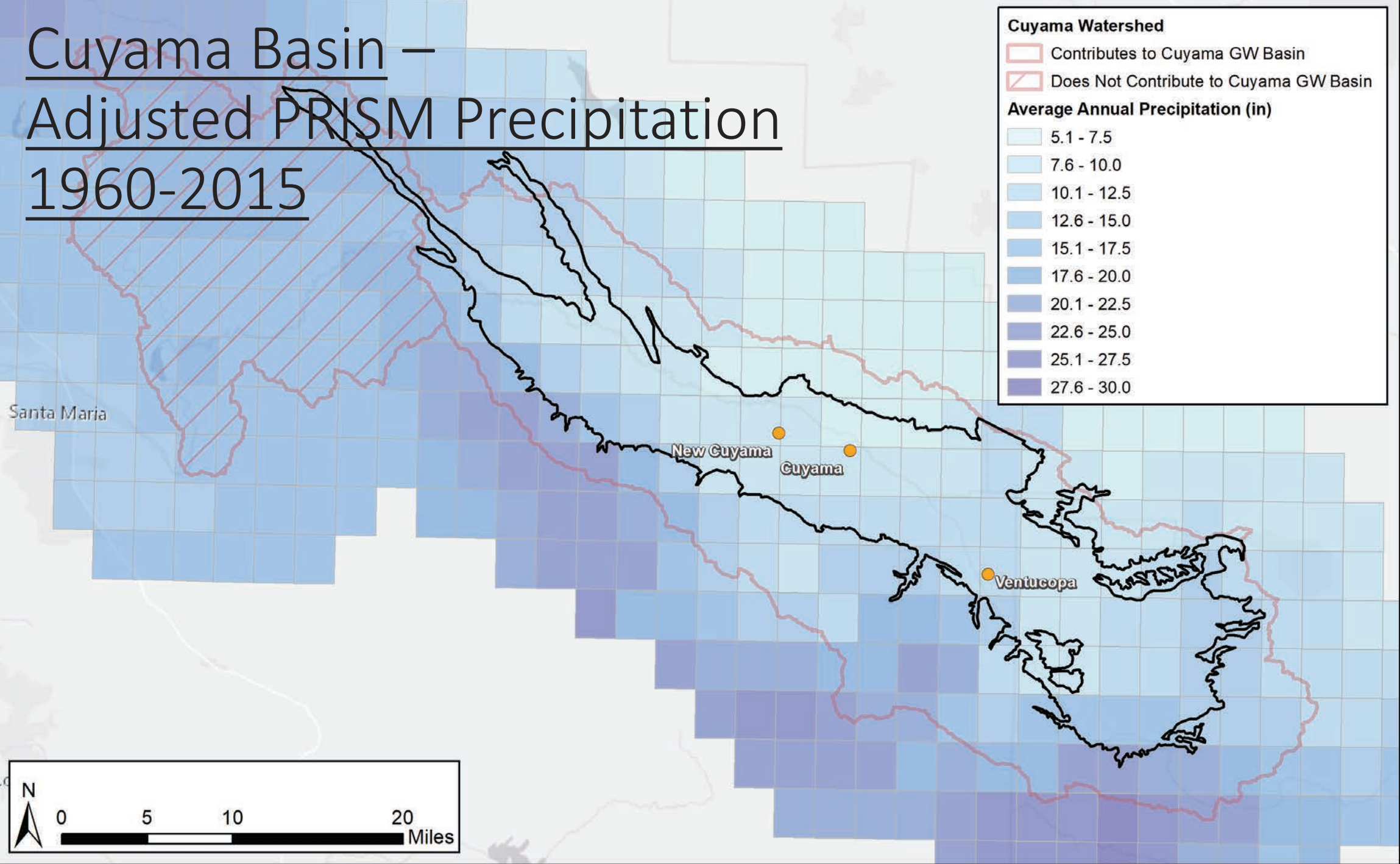
- Watersheds and Surface Water
- Rainfall
- Regional Setting
- Topography
- River and Groundwater Profile
- Geologic Maps
- Faults
- Model Layers

Cuyama Watershed and Major Streams

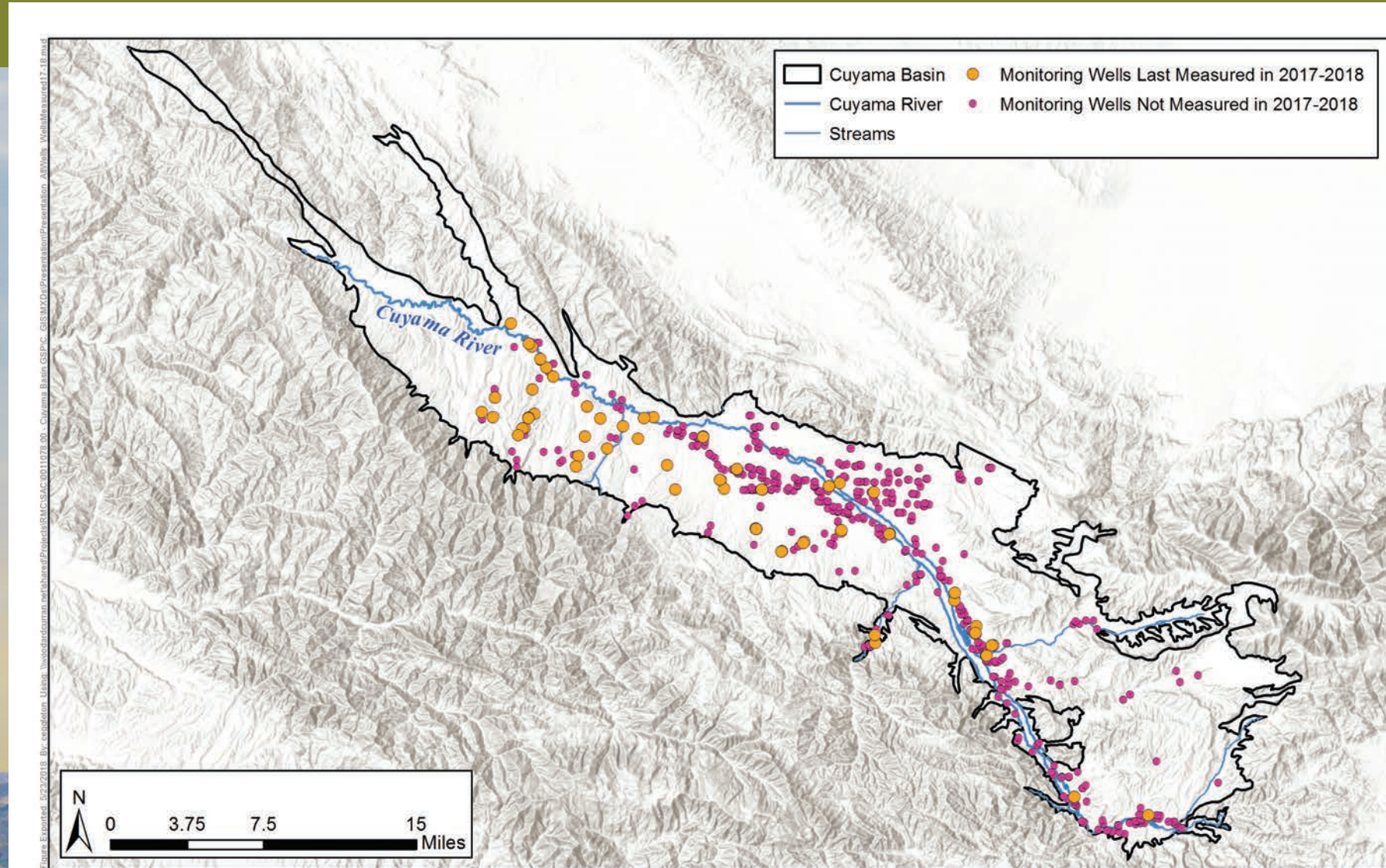
Cuyama Basin	Highways	Cuyama Watershed
Cuyama River	Local Roads	Contributes to Cuyama GW Basin
Towns	Streams	Does Not Contribute to Cuyama GW Basin



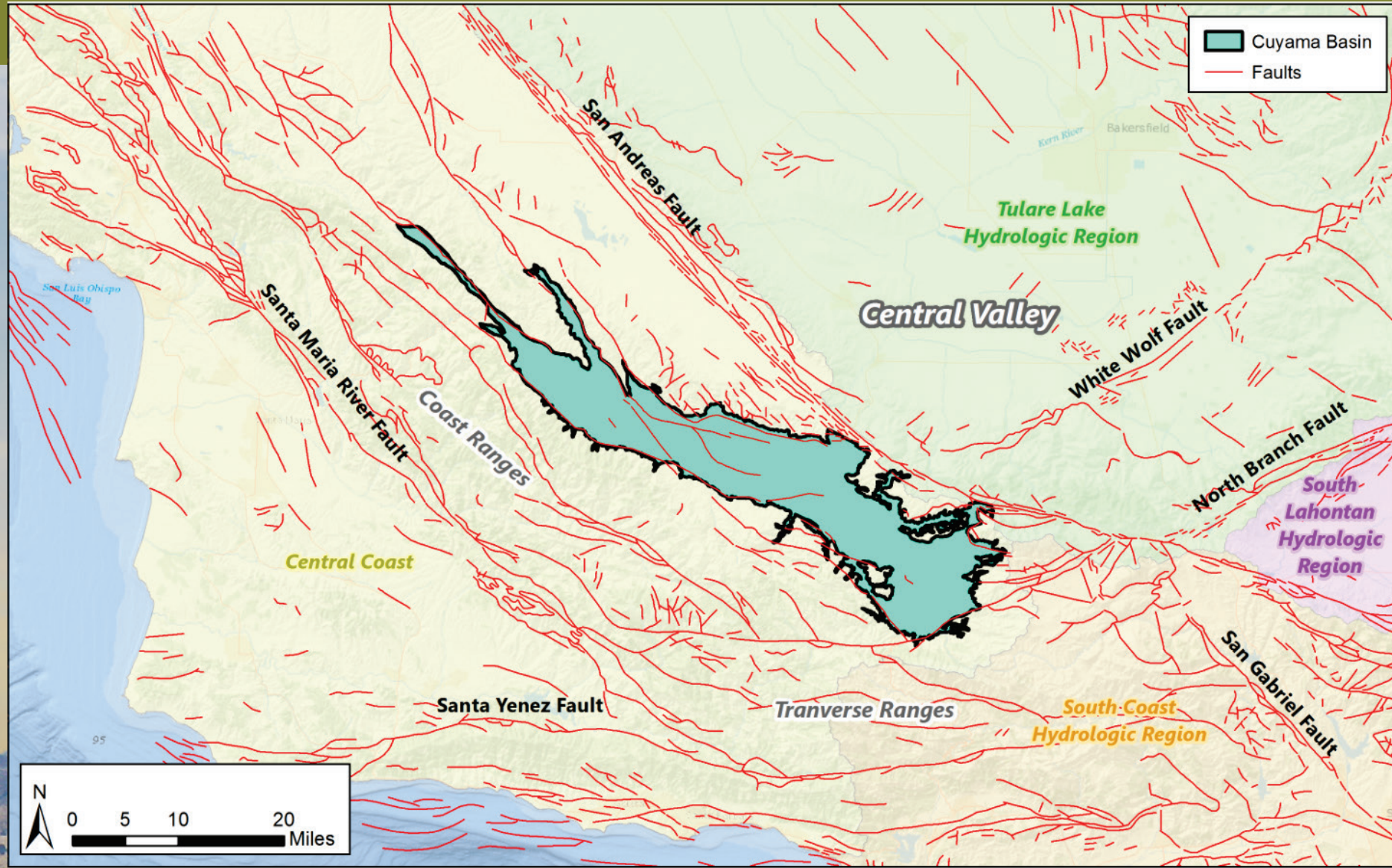
Cuyama Basin – Adjusted PRISM Precipitation 1960-2015



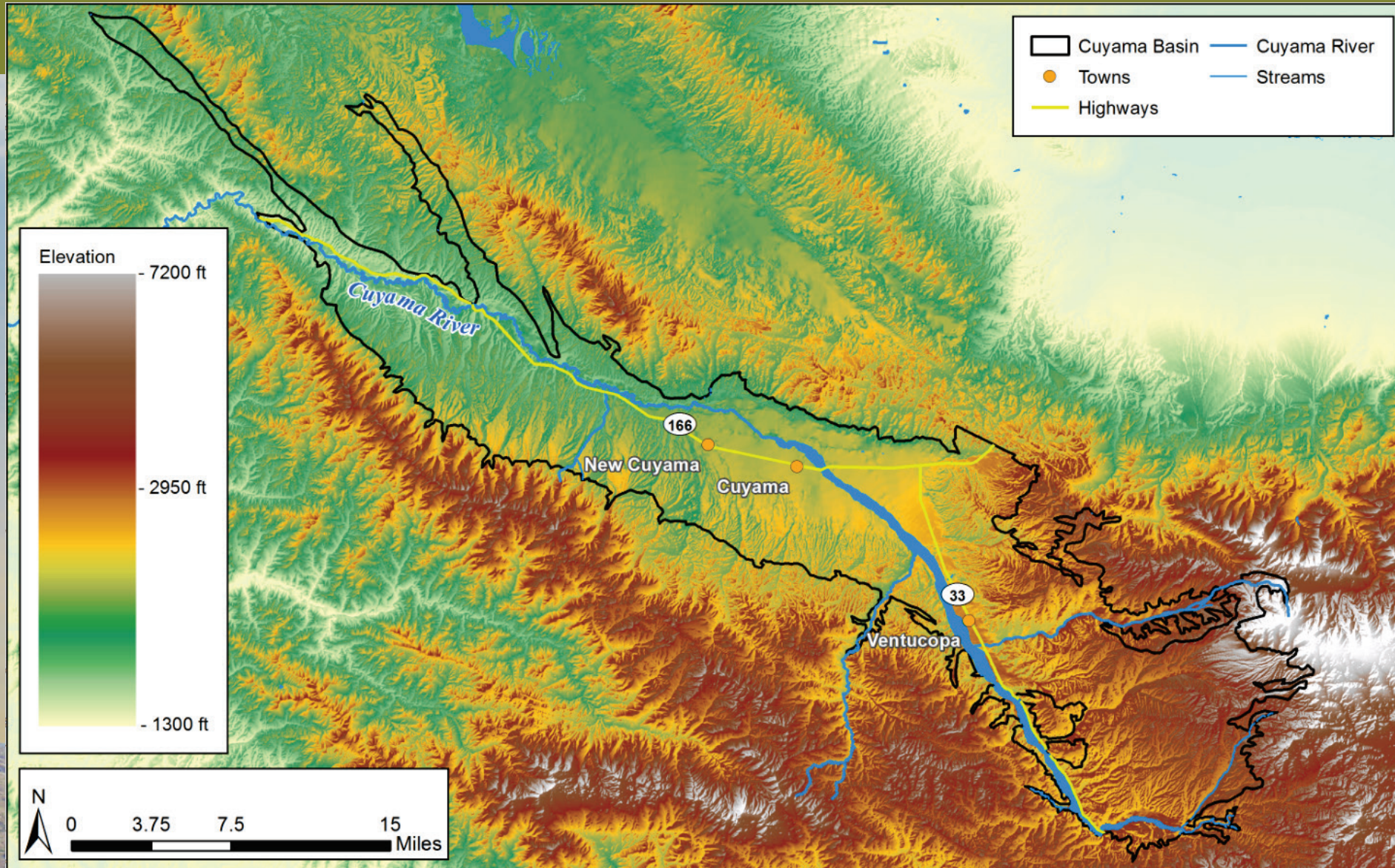
Groundwater Level Monitoring



Regional Setting



Topography



Ground Surface and Groundwater Elevation Profile

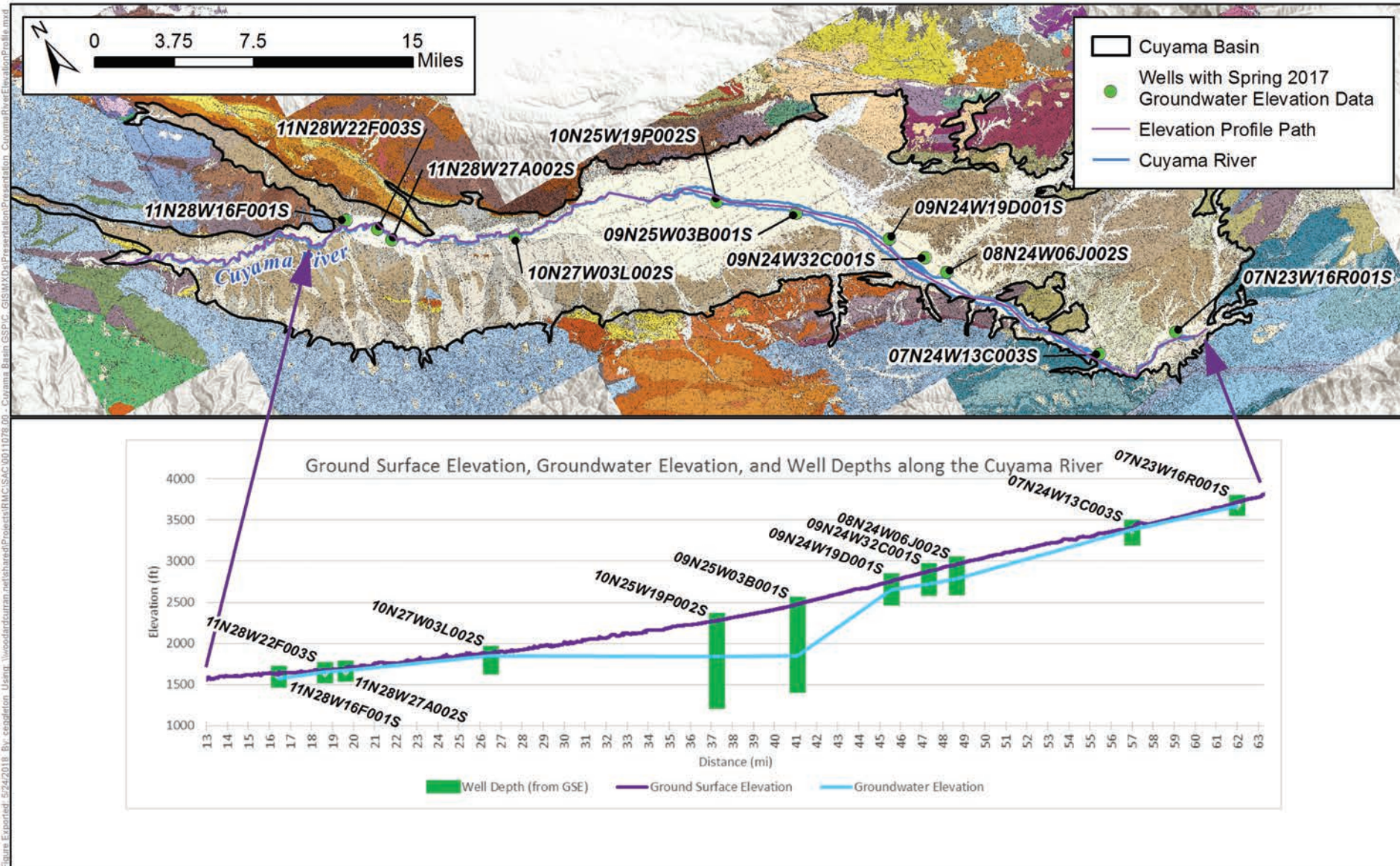
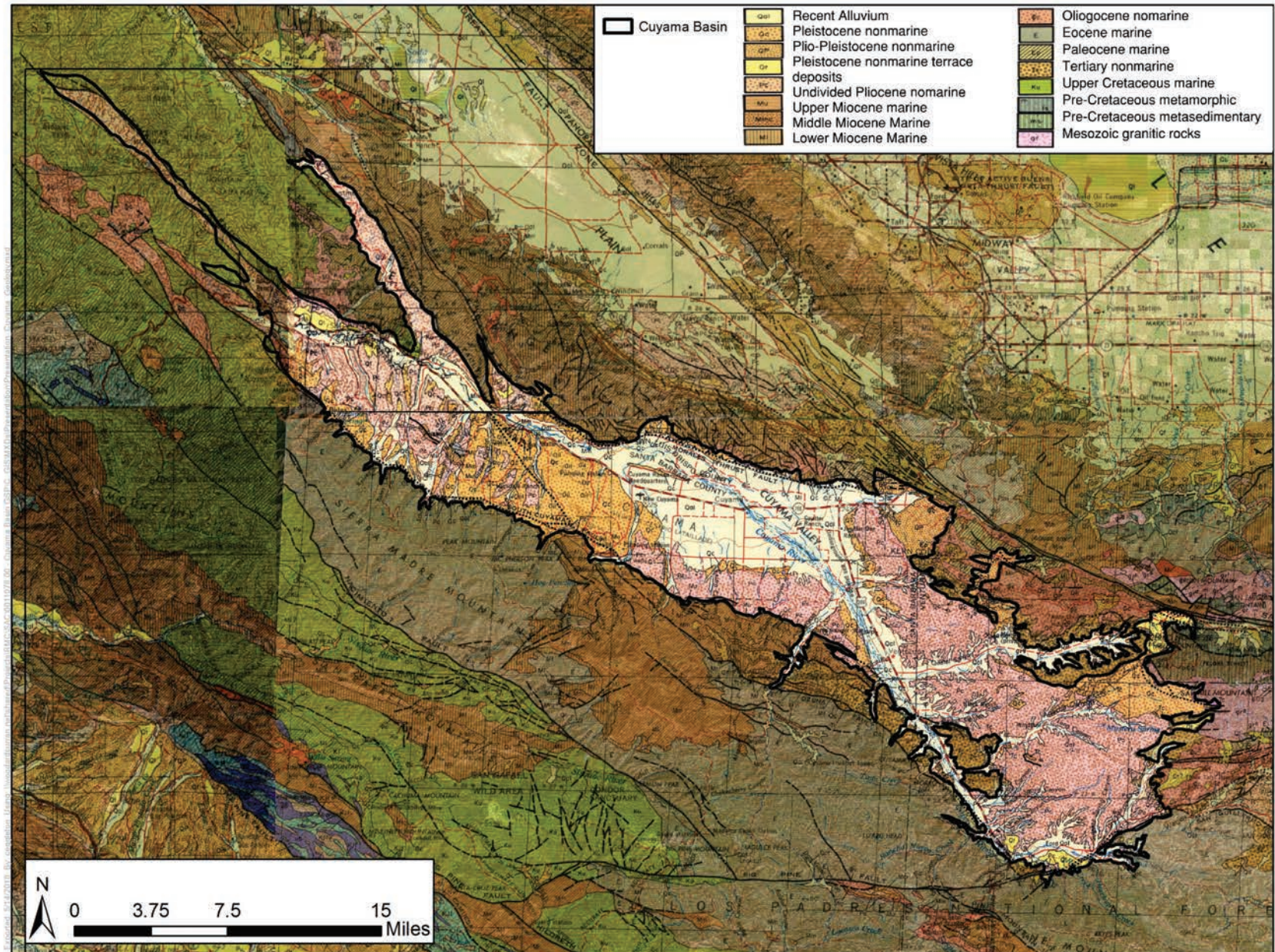


Figure E:\portal\524\2018_Ely\ceadation_L1\map\WoodwardCurran\external\Projects\BNC\SSAC\0011078\00 - Cuyama Basin GSP\3. GIS\Map\Presentation\Presentation - Cuyama River Elevation Profile.mxd

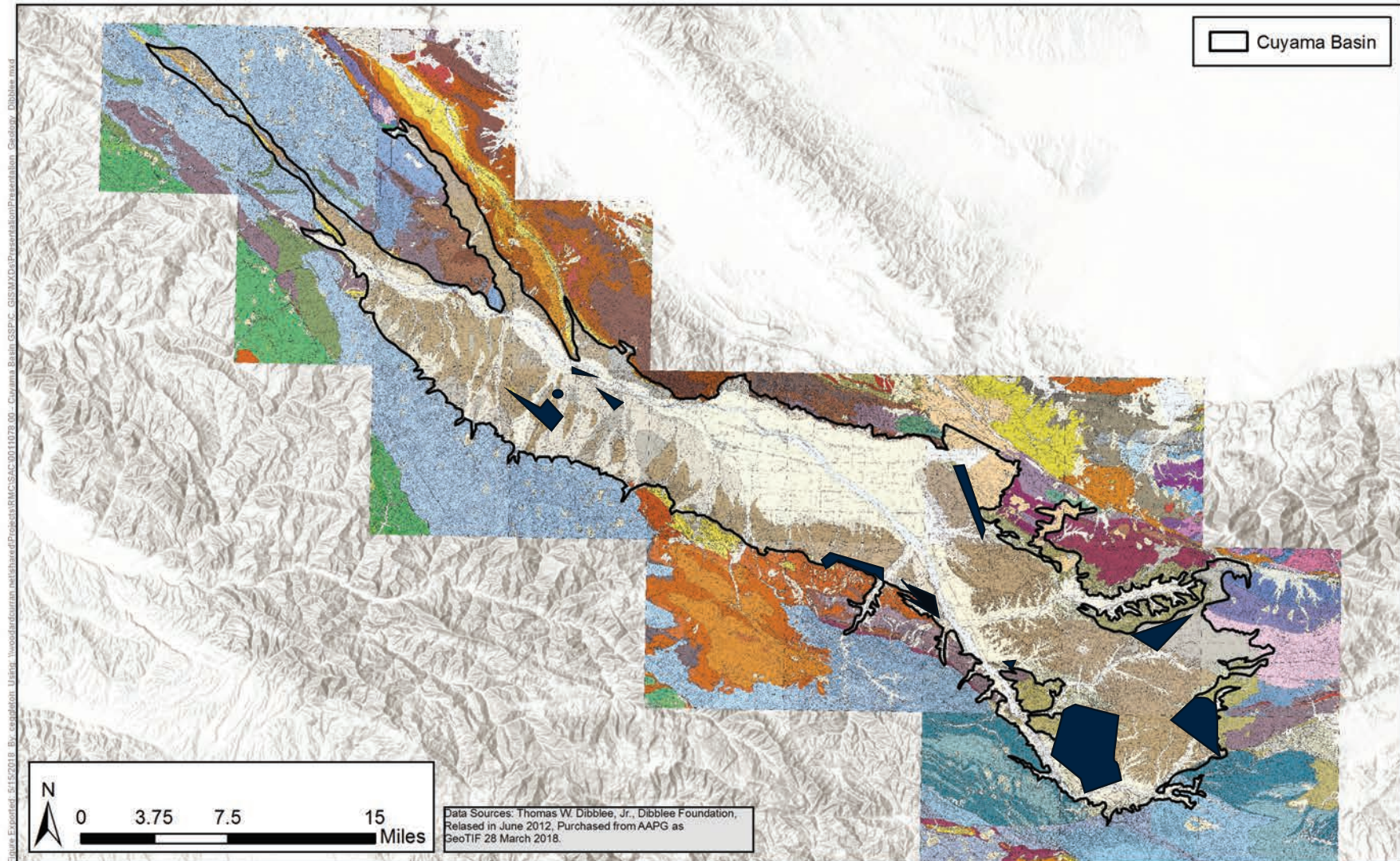
Geology

- 1:250,000 Scale
- Basin boundary defined at this scale
- Basin boundary is boundary between aquifer materials and bedrock



Geology

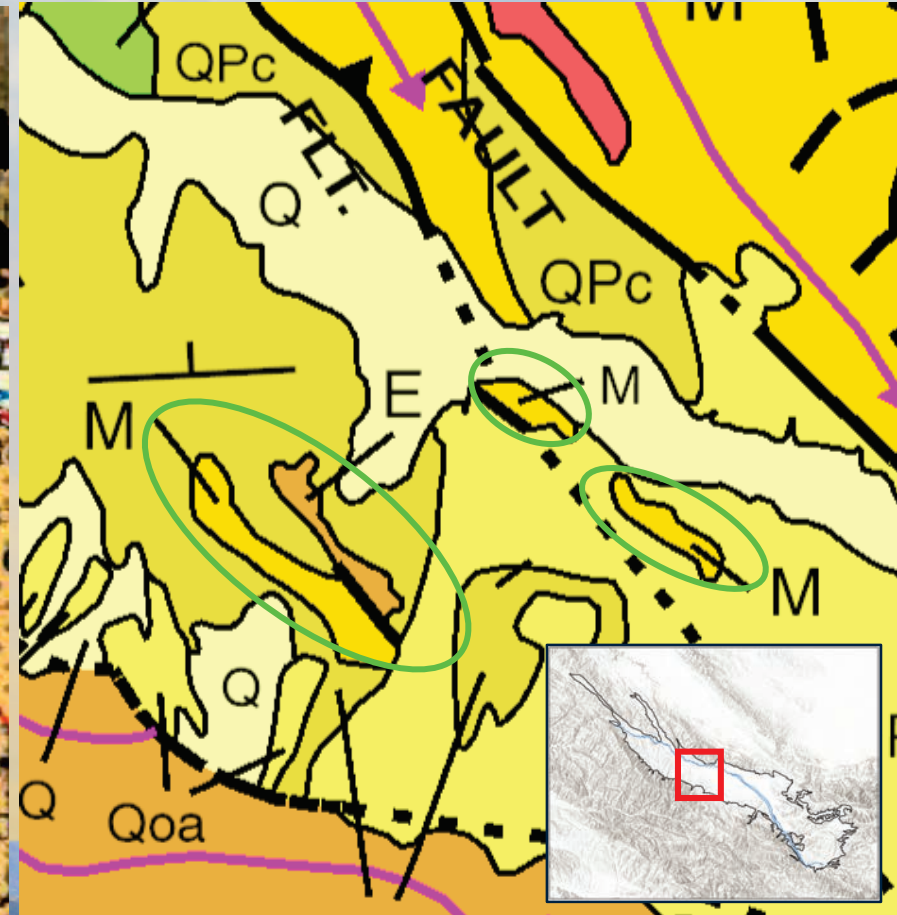
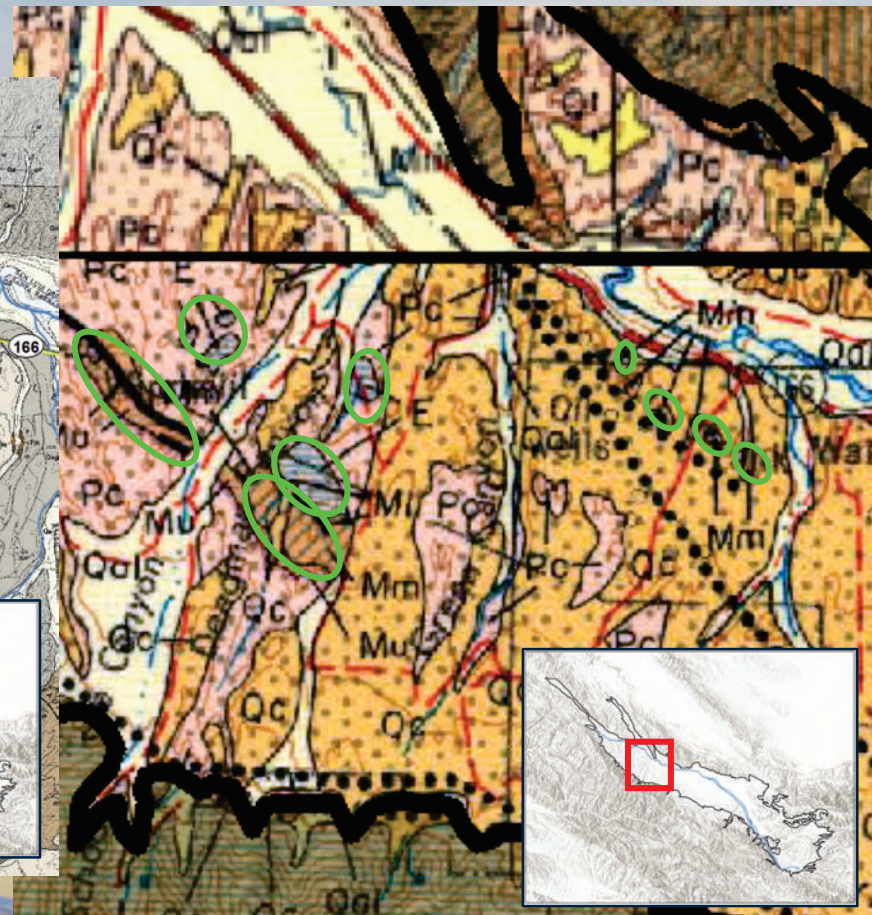
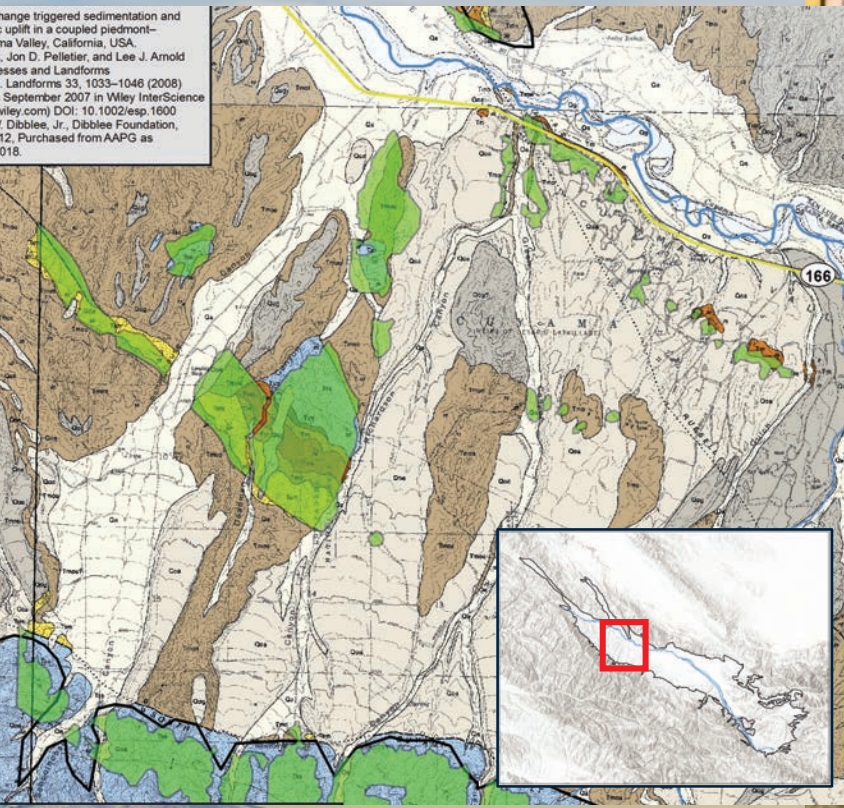
- Dibblee
1:24,000 scale
- Increased detail
- Outcrops in basin



Geology

Qal	Recent Alluvium	Gr	Oligocene nonmarine
Qc	Pleistocene nonmarine	E	Eocene marine
Qp	Plio-Pleistocene nonmarine	Pa	Paleocene marine
Qt	Pleistocene nonmarine terrace deposits	Tn	Tertiary nonmarine
Pc	Undivided Pliocene nonmarine	Ku	Upper Cretaceous marine
Mu	Upper Miocene marine	Pr	Pre-Cretaceous metamorphic
Mm	Middle Miocene Marine	Md	Pre-Cretaceous metasedimentary
Ml	Lower Miocene Marine	Gr	Mesozoic granitic rocks

change triggered sedimentation and uplift in a coupled piedmont-mountain valley, California, USA. Jon D. Pelletier, and Lee J. Arnold. *Landforms* 33, 1033-1046 (2008) September 2007 in *Wiley InterScience* Wiley.com DOI: 10.1002/esp.1600 Dibblee, Jr. Dibblee Foundation, 12. Purchased from AAPG as 018.

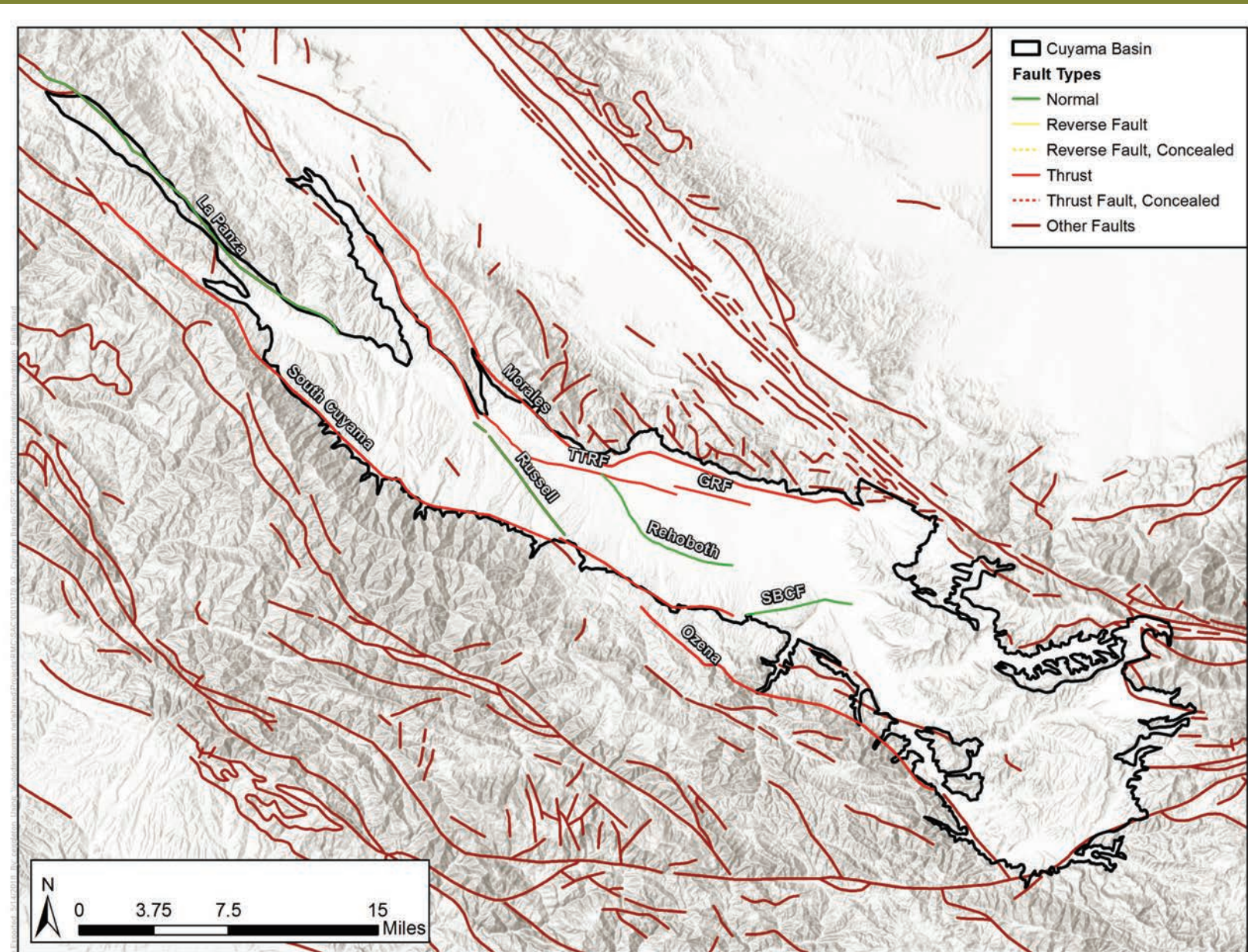


250k Map

750k Map

Faults

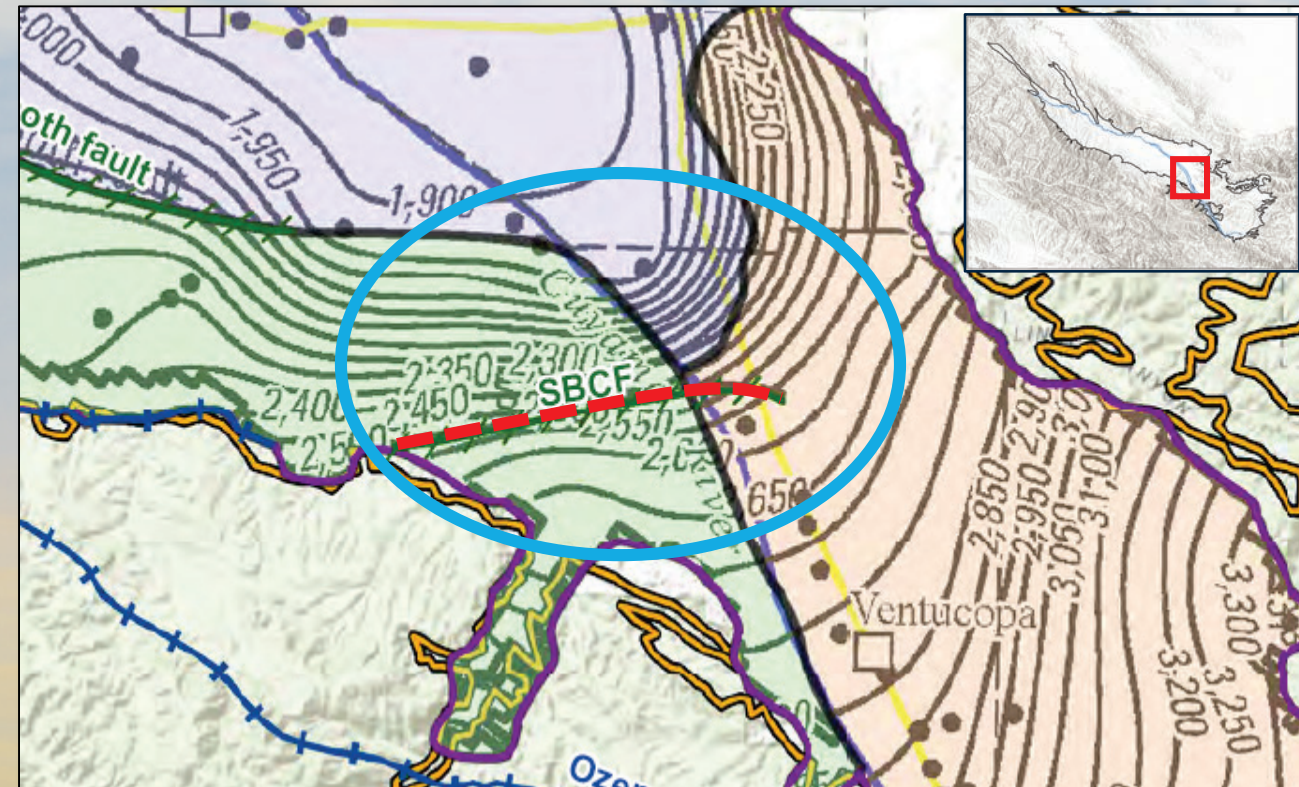
- Tectonically active region
- Faults form a portion of the basin boundary
- Faults also cross portions of the basin



Santa Barbara Canyon Fault

- Considered a barrier to flow in multiple references
- Steep hydraulic gradients at SBCF location
- Uncertain how far east it extends or how close to the surface it reaches
- Partial barrier to flow in region

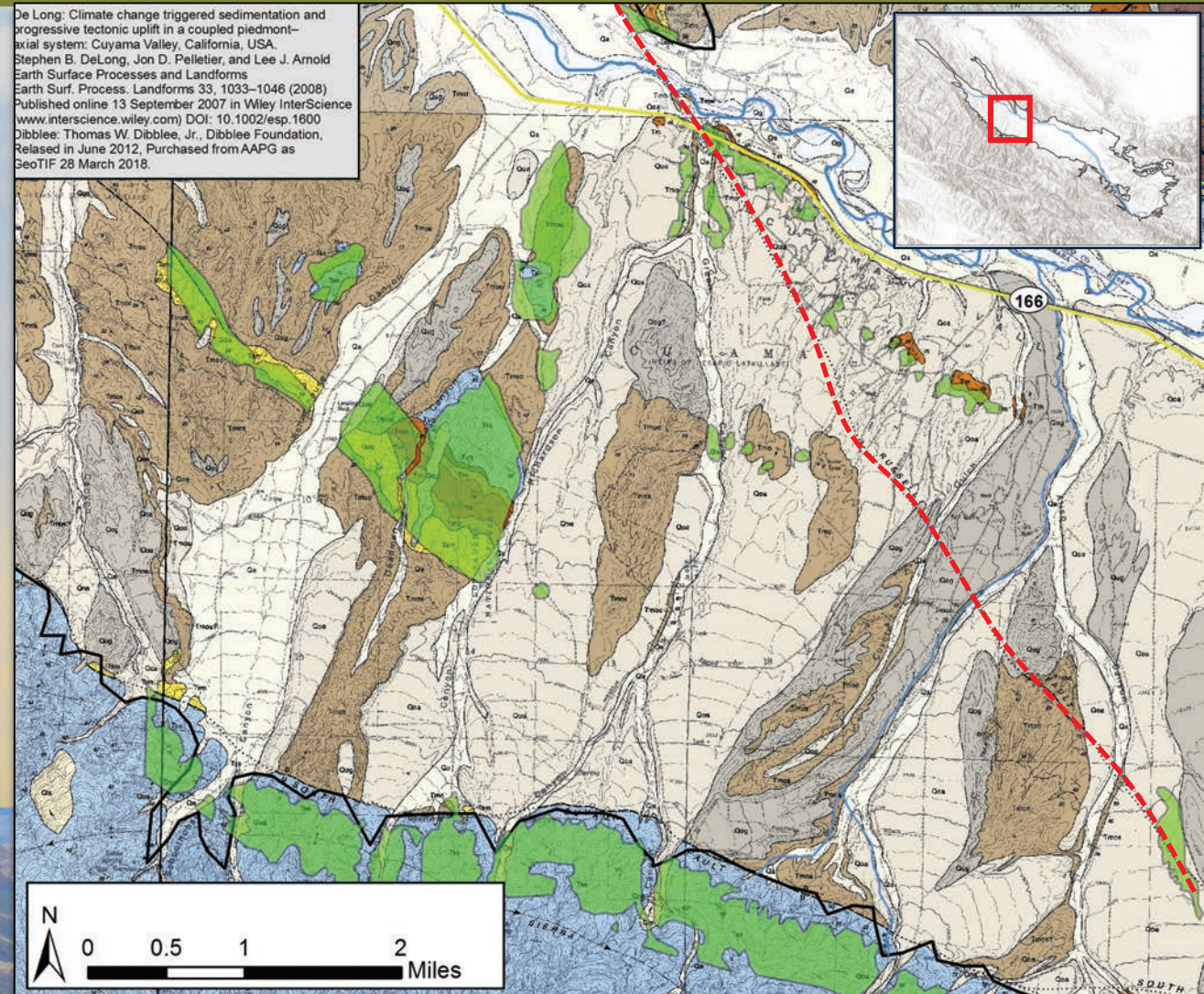
2010 Groundwater Elevation Contours



Source: EKI 2017

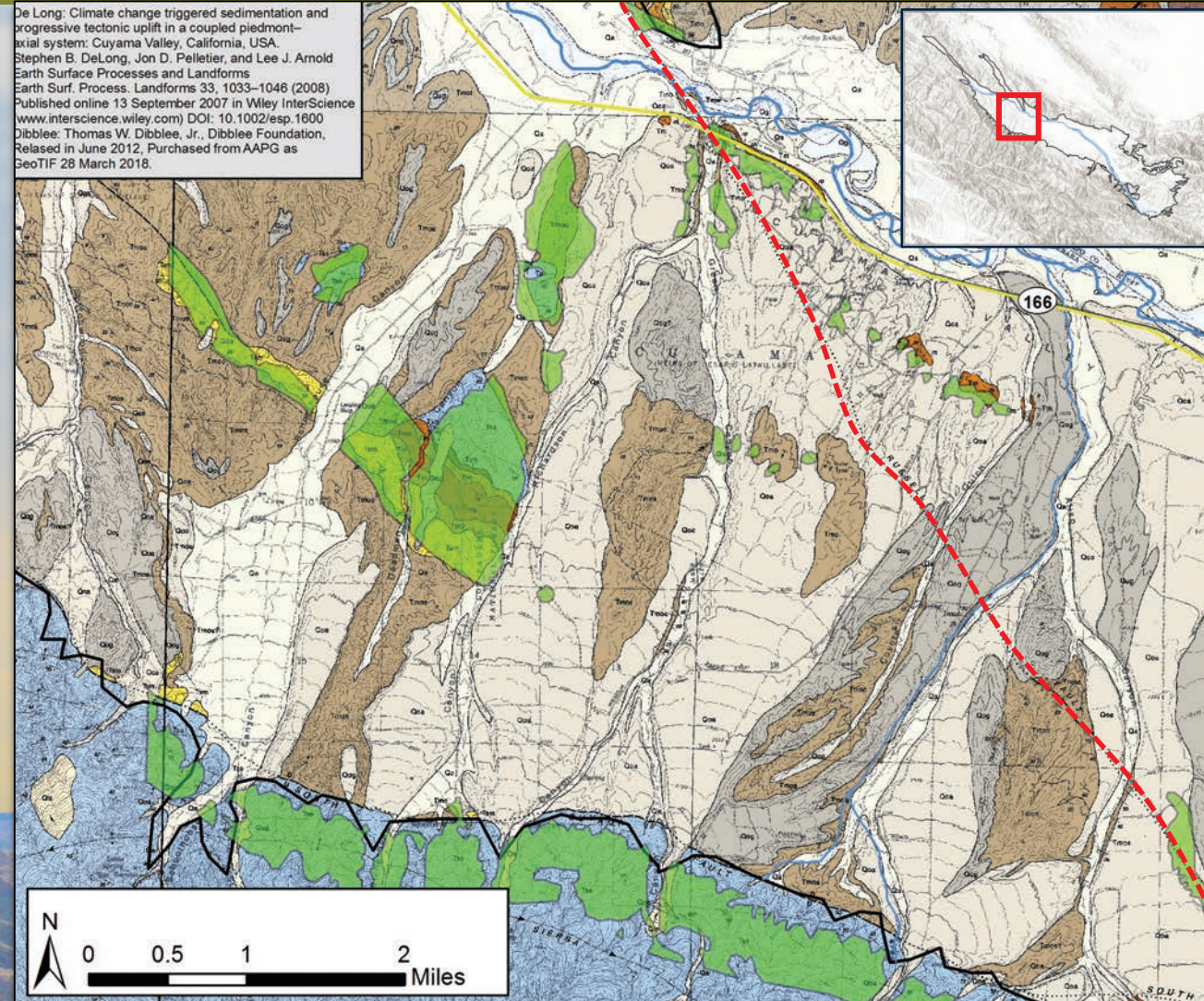
Russell Fault – Preliminary Conclusions

- Uncertain at this time if fault itself is barrier to flow
- Reduced thickness of Morales and Alluvium to the west
- Outcrops of marine units restrict groundwater flow pathways

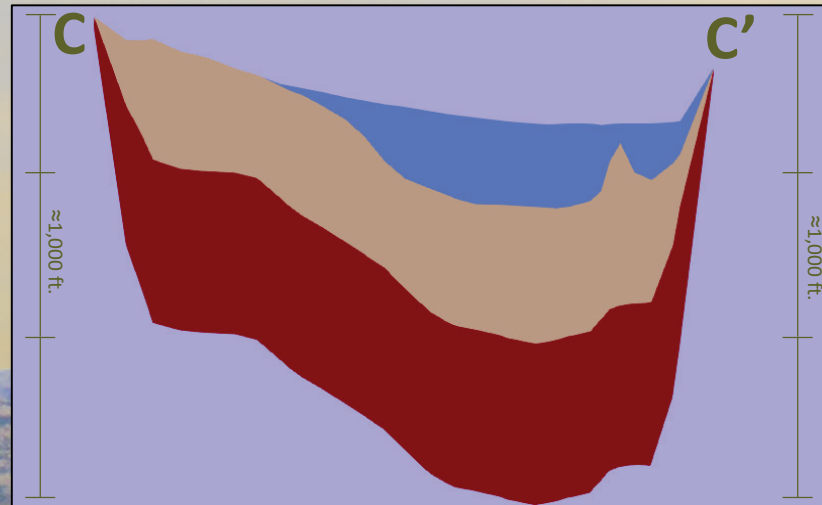
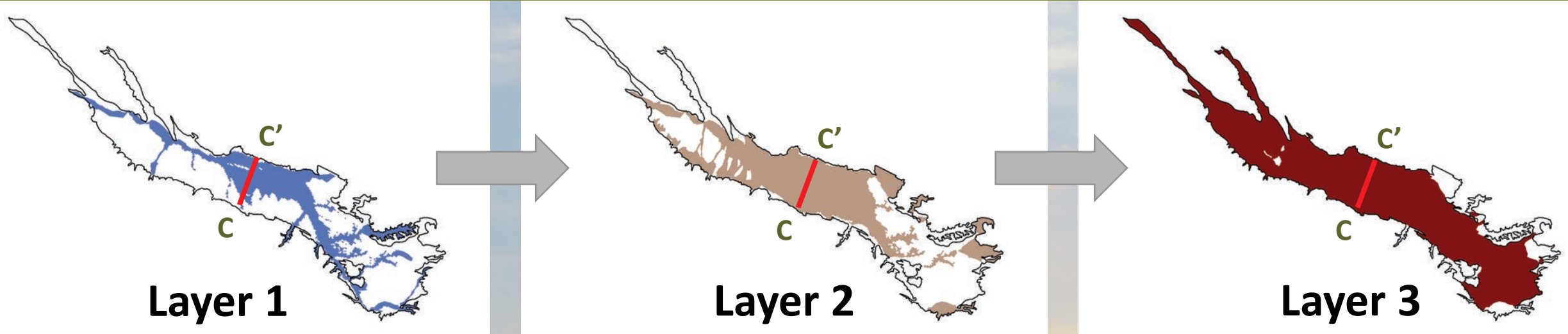


Russell Fault

- Refine fault understanding over time:
 - Continue monitoring on west side of fault
 - Additional study by GSA:
 - Expand monitoring grid (drill new wells or use existing) to have concurrent monitoring on both sides of fault
 - Other analysis
- Revise GSP with improved understanding at 5 year update



Three Model Layers Created to Represent the Basin Hydrogeology



Questions/Discussion

- Questions/Discussion about Cuyama Basin physical conditions




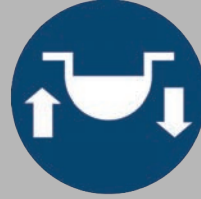

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Interactive Discussion on Groundwater Sustainability in the Cuyama Basin

June 6, 2018

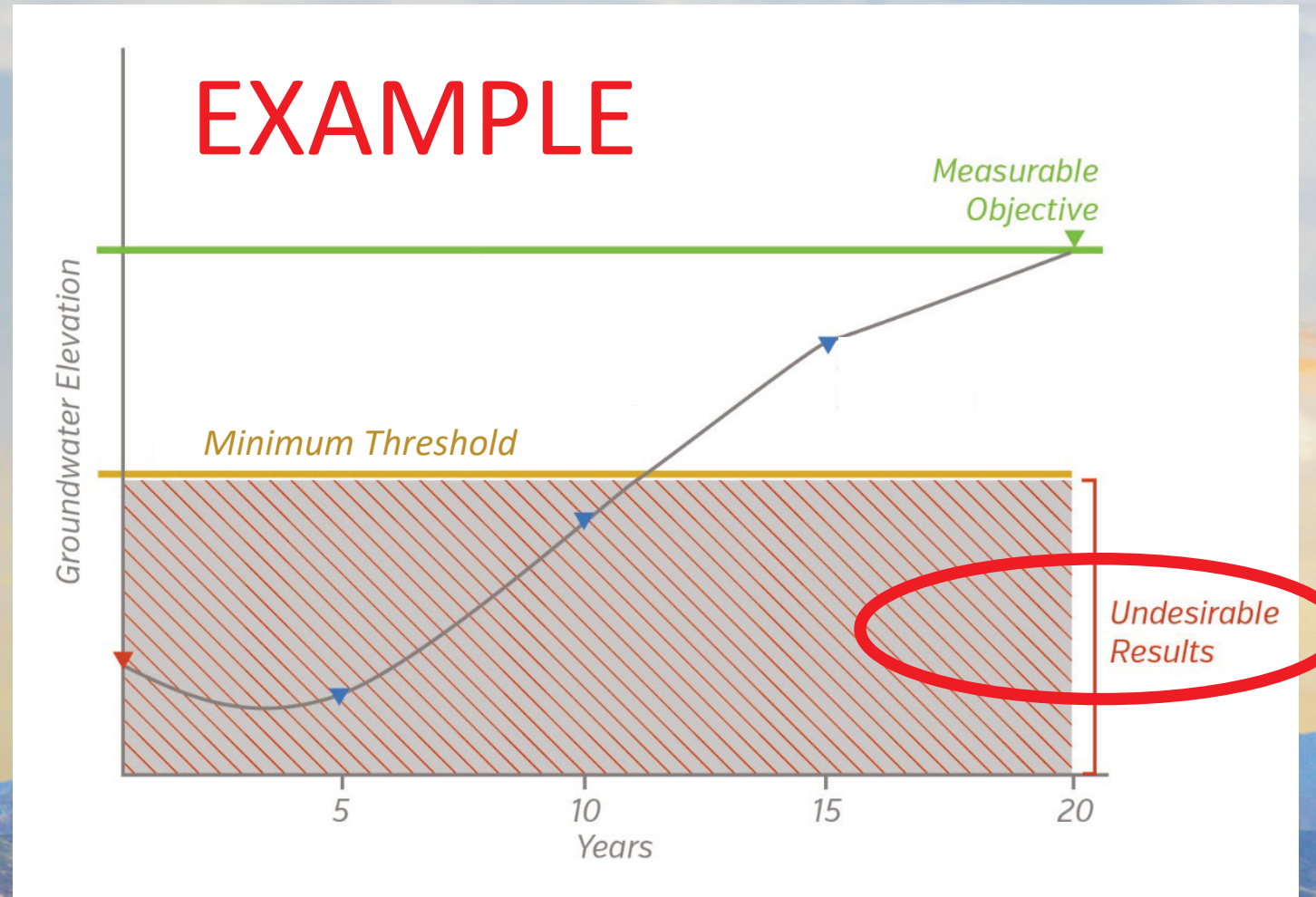


Sustainability Indicators in the Cuyama Basin

Sustainability Indicators	Lowering GW Levels	Reduction of Storage	Land Subsidence	Surface Water Depletion	Degraded Water Quality
					
Metrics Defined by SGMA	Groundwater elevation	Total volume	Rate and extent of subsidence	Volume or rate of depletion	Migration of plumes; constituent concentrations
Example Problems	Dry wells; low pumping production	Dry wells; low pumping production	Unleveling of fields; damage to structures	Dry out Cuyama River earlier / more often	Higher salinity; nitrates in drinking water

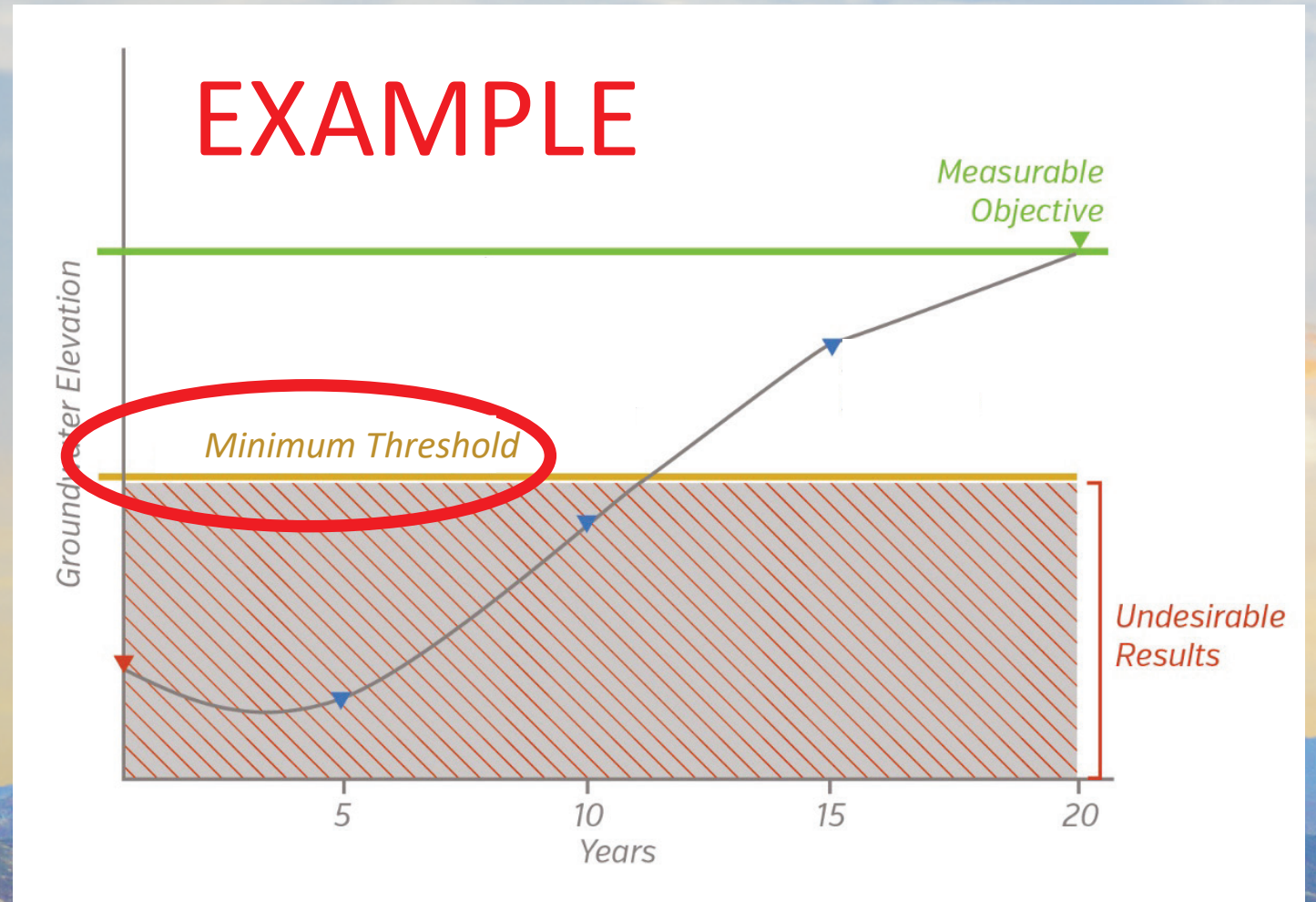
Undesirable Results, Minimum Thresholds & Measurable Objectives

- Undesirable Results:
 - Must be “Significant and Unreasonable”
 - Statement that describes conditions that we do not want to have happen
 - Defined for each sustainability indicator



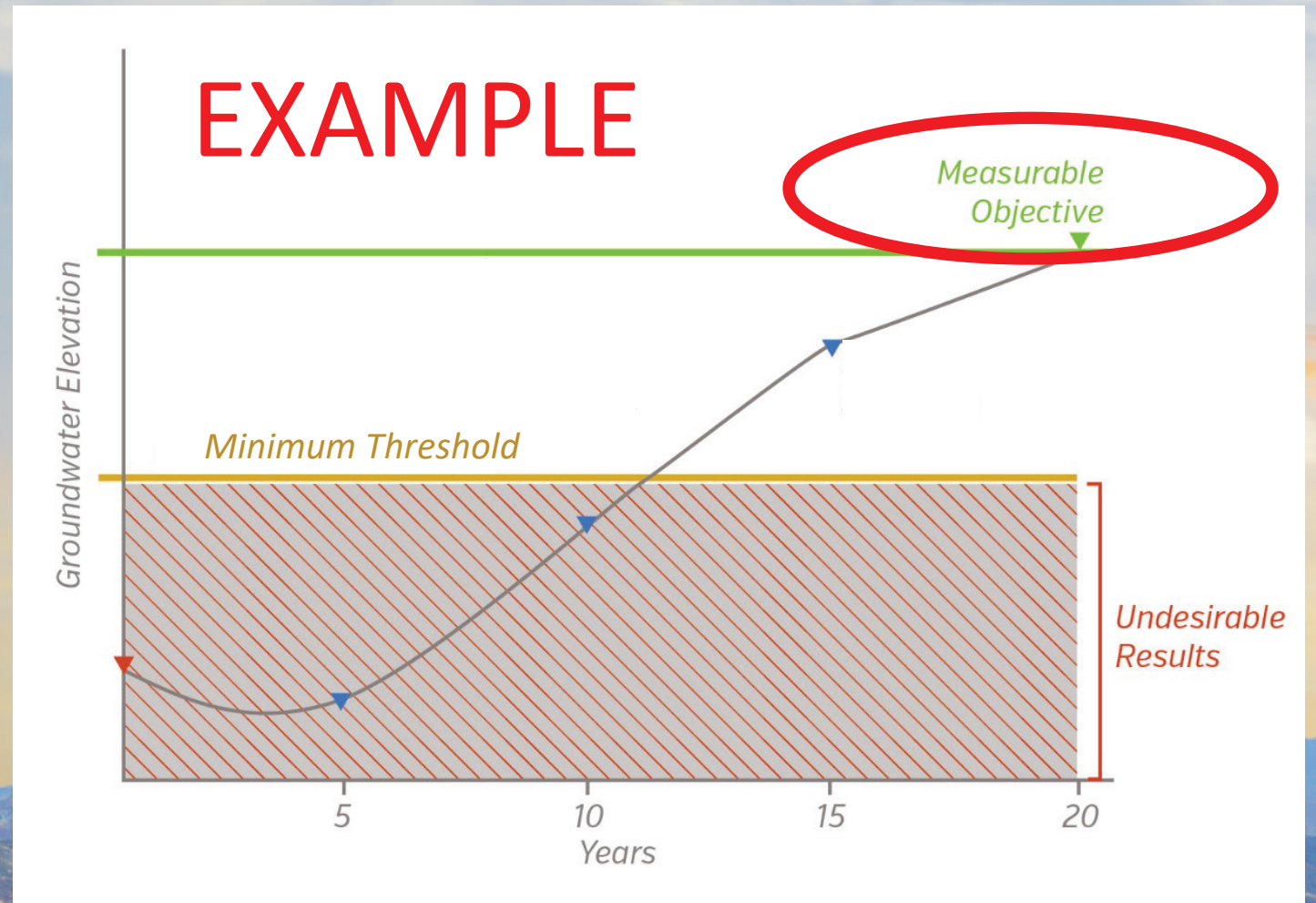
Undesirable Results, Minimum Thresholds & Measurable Objectives

- **Minimum Thresholds:**
 - Anything worse is considered an “undesirable result”
 - The lowest the basin can go without something significant and unreasonable happening to groundwater



Undesirable Results, Minimum Thresholds & Measurable Objectives

- Measurable Objectives:
 - A management target that provides a usable buffer for use during droughts, etc
 - Establishes the upper targeted boundary for basin management



Workshop Discussion Questions

Sustaining the future of the Cuyama Valley

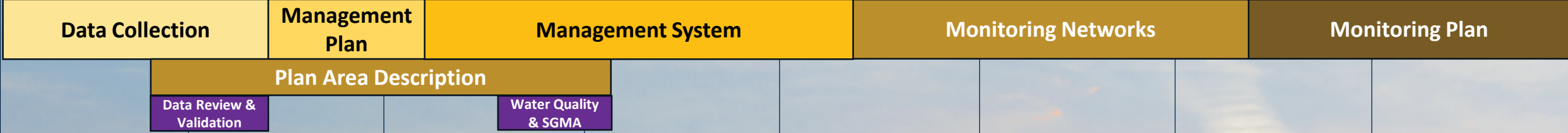
- What does sustainability of the Cuyama Valley mean for you?
- Is your picture of the future different from the Cuyama Valley you know today, if it is, how is it different?

The role of water in the future of the Cuyama Valley

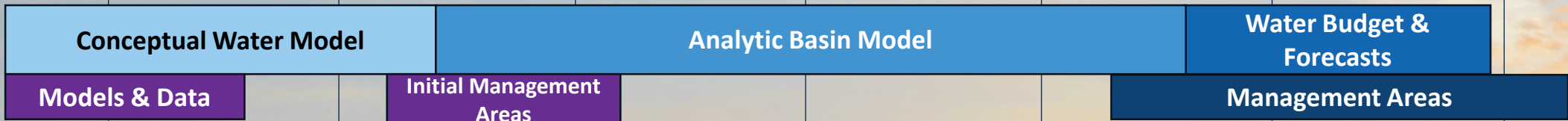
- What do you see as important challenges or undesirable effects for the future of water in the Valley for the following?
 - Water and Jobs
 - Water and Community/Households
 - Water and Small Farms
 - Water and Large Farms
 - Water and Natural Resources

Cuyama Basin Groundwater Sustainability Plan – Discussion Topics

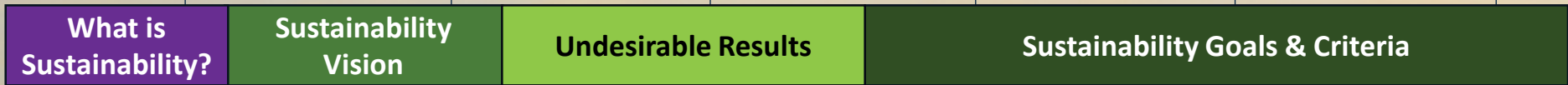
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