Cuyama Basin Groundwater Sustainability Agency

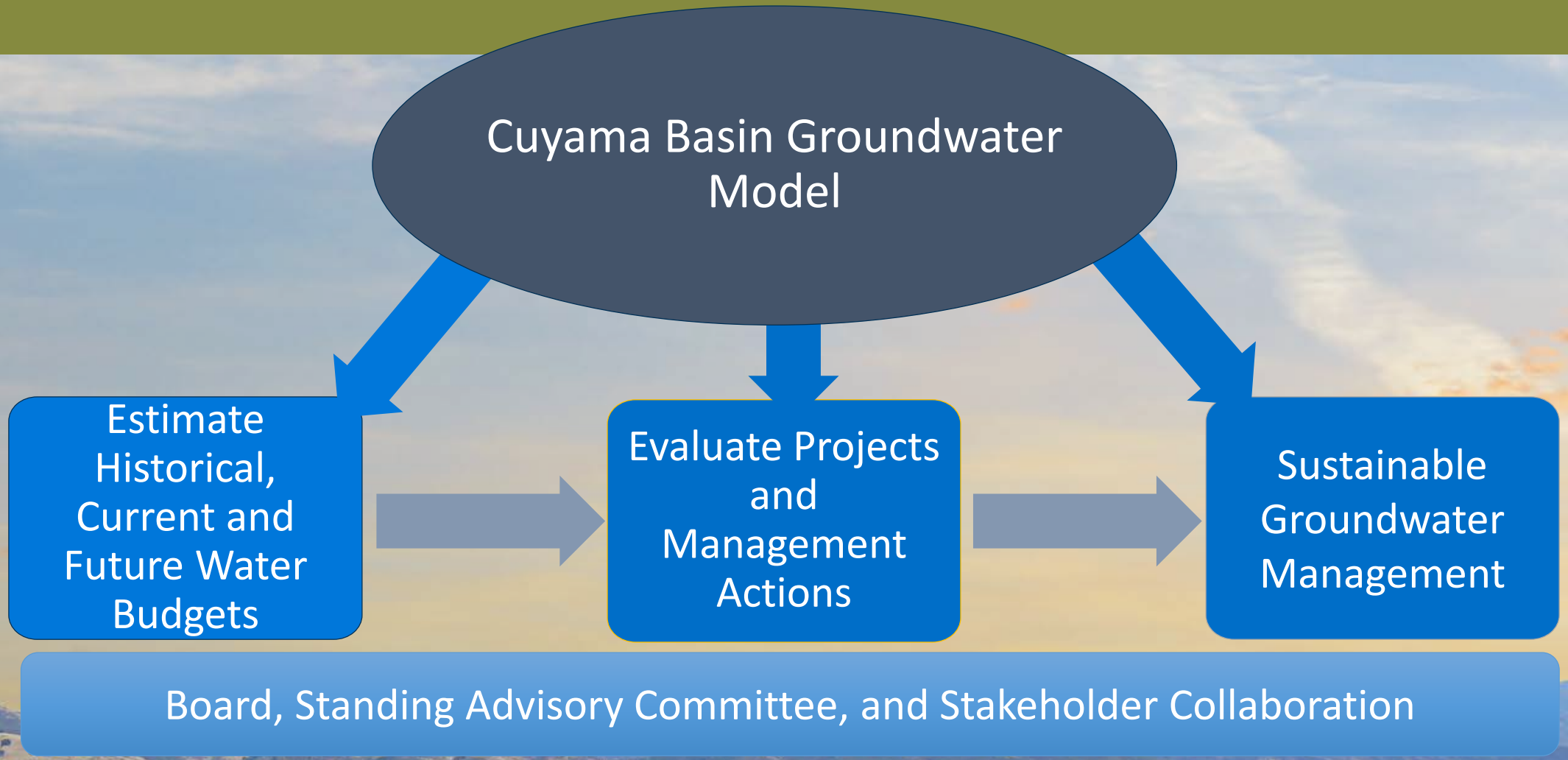
Attachment 1

What Makes A Good Groundwater Model?

March 29, 2018

WOODARD &CURRAN

Building the Cuyama Basin Groundwater Model



Model Calibration/Verification Requires Data for Each Year of Calibration Period

- Model Calibration Period
  2000 to 2015
- Selected based on reliability of available data
- Provides historical water budgets

- Representative Groundwater Wells:
  - Location and construction info
  - Historical groundwater elevations
- Land and Water Use:
  - Land use and cropping patterns
  - Population
  - Historical pumping
- Hydrologic Data:
  - Precipitation
  - Streamflow

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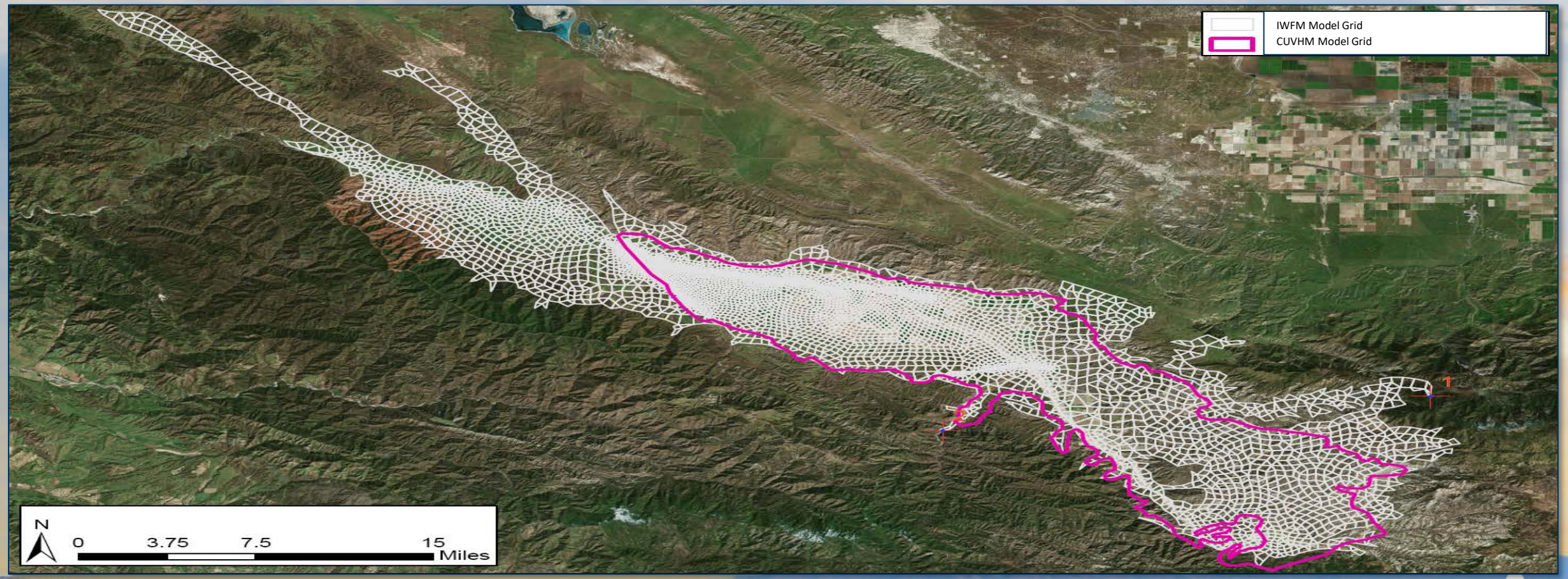
Hydrogeologic Model and Associated Data Will be Expanded to Cover the Entire Basin



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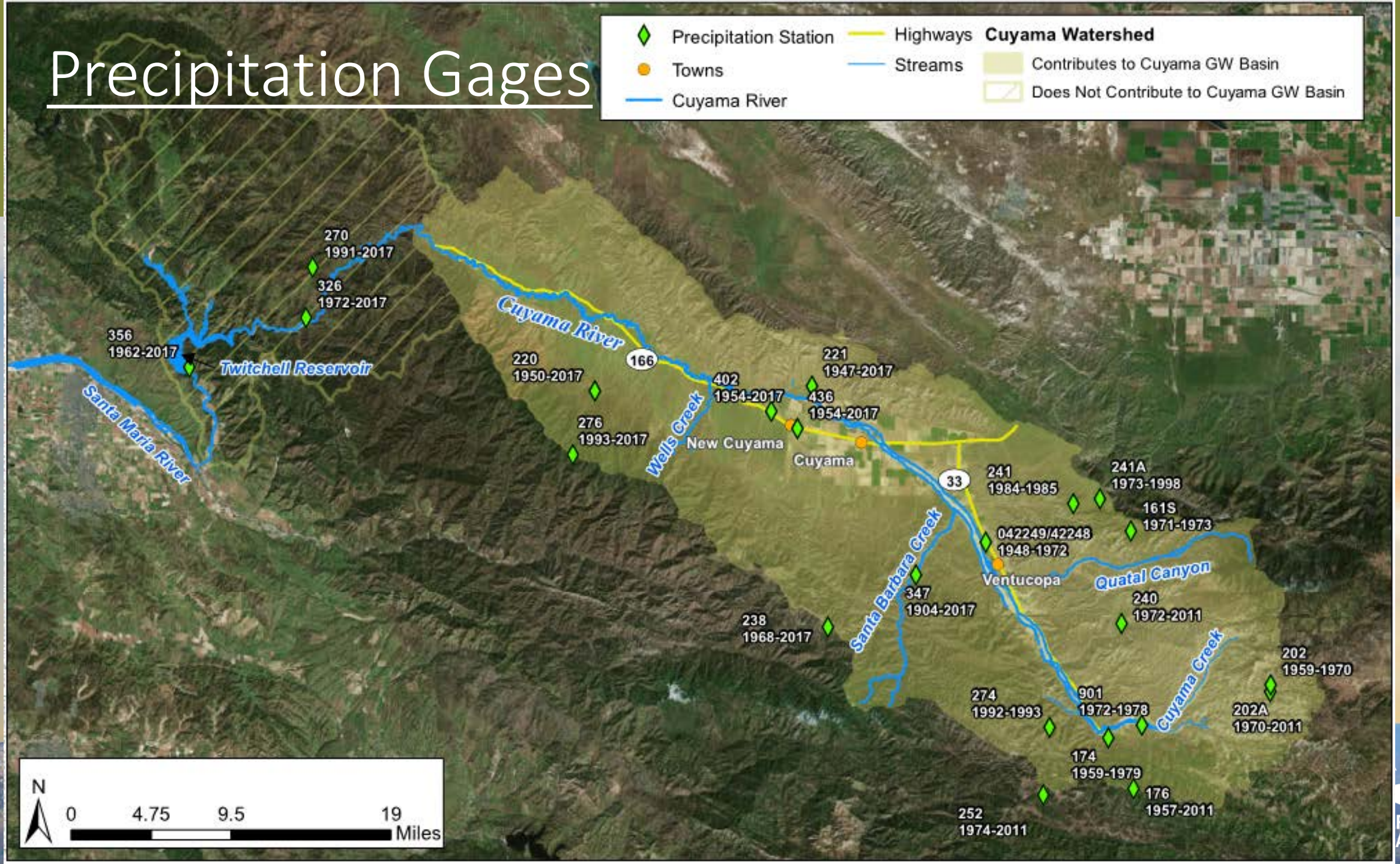
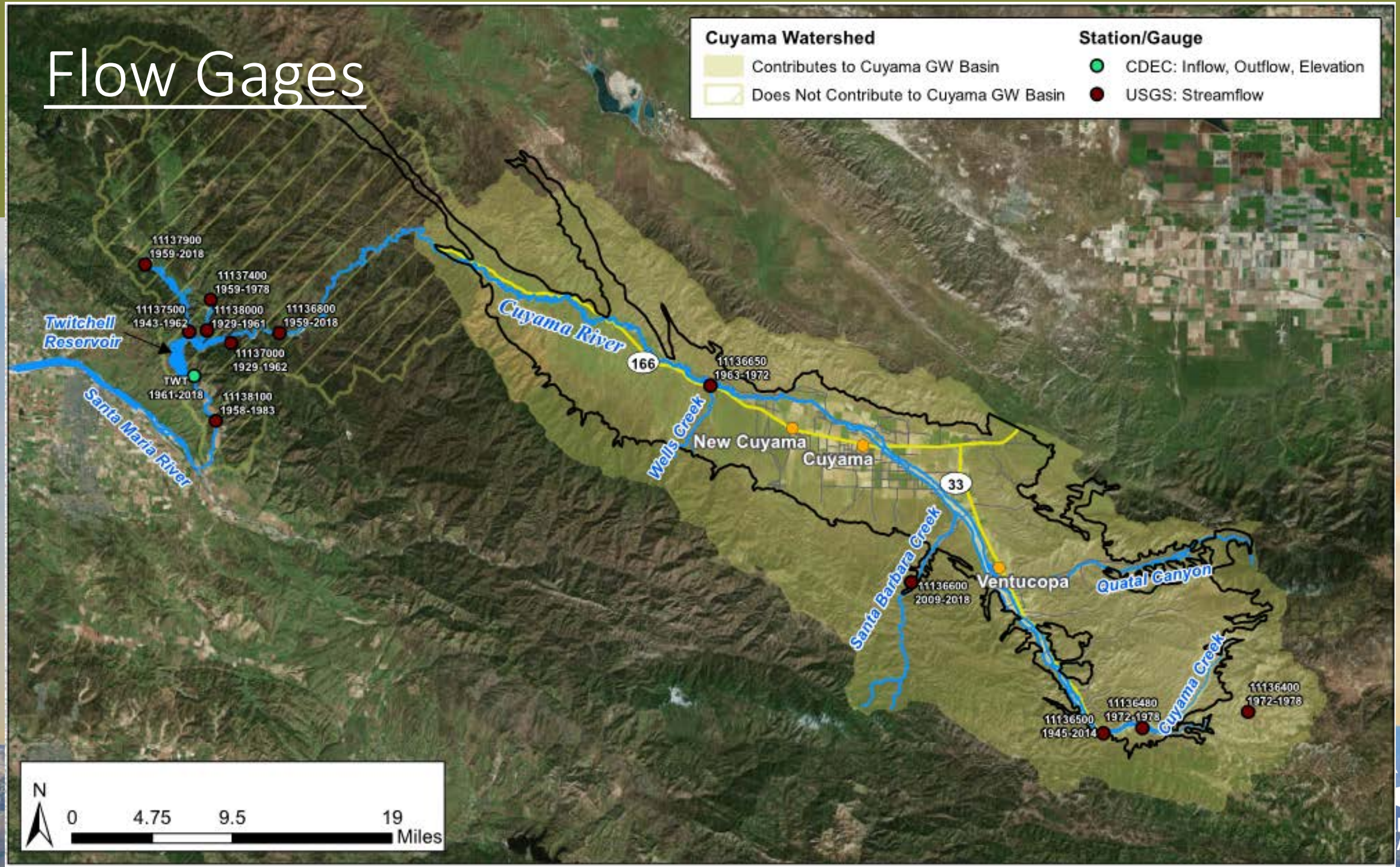
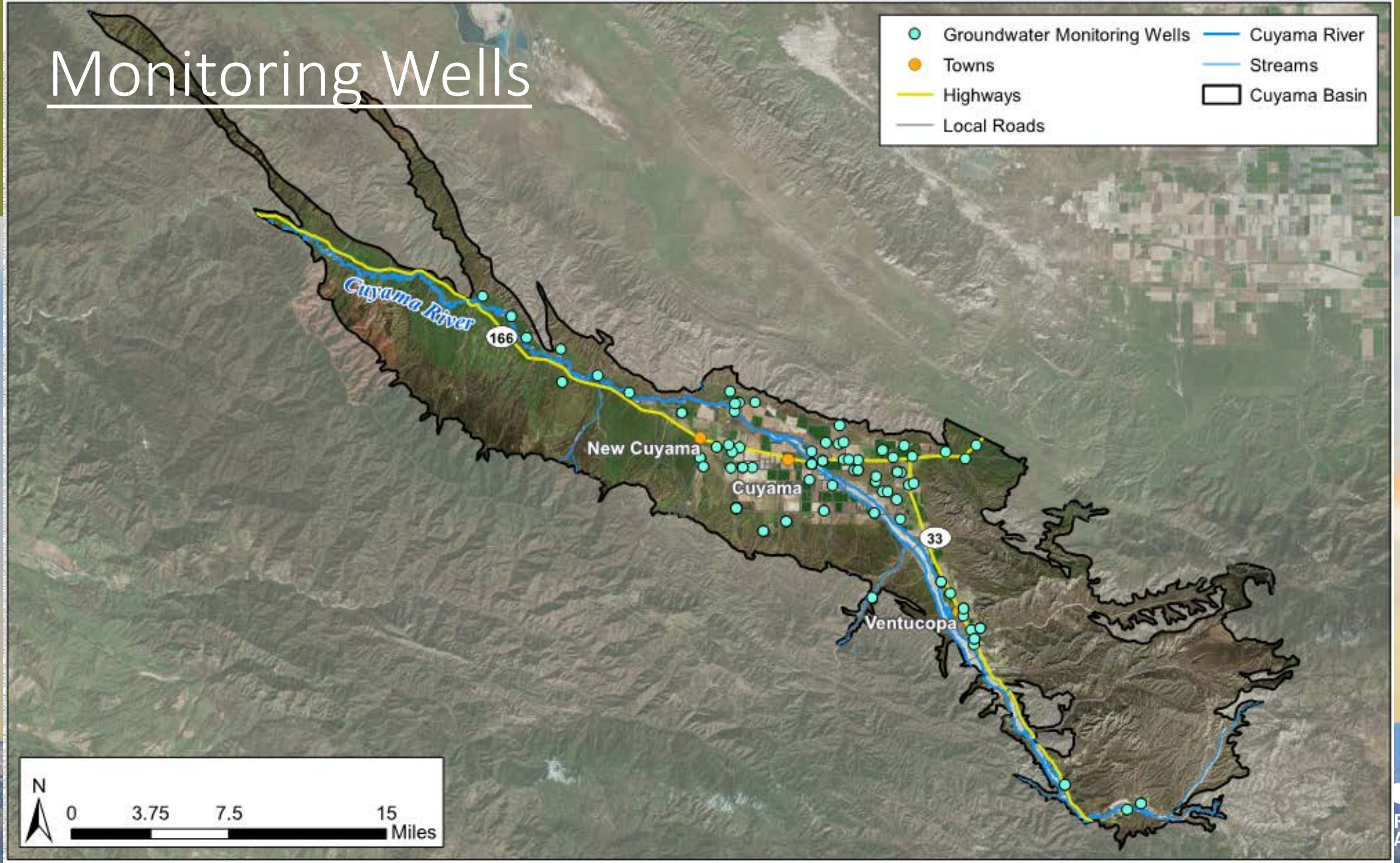
Precipitation Gages



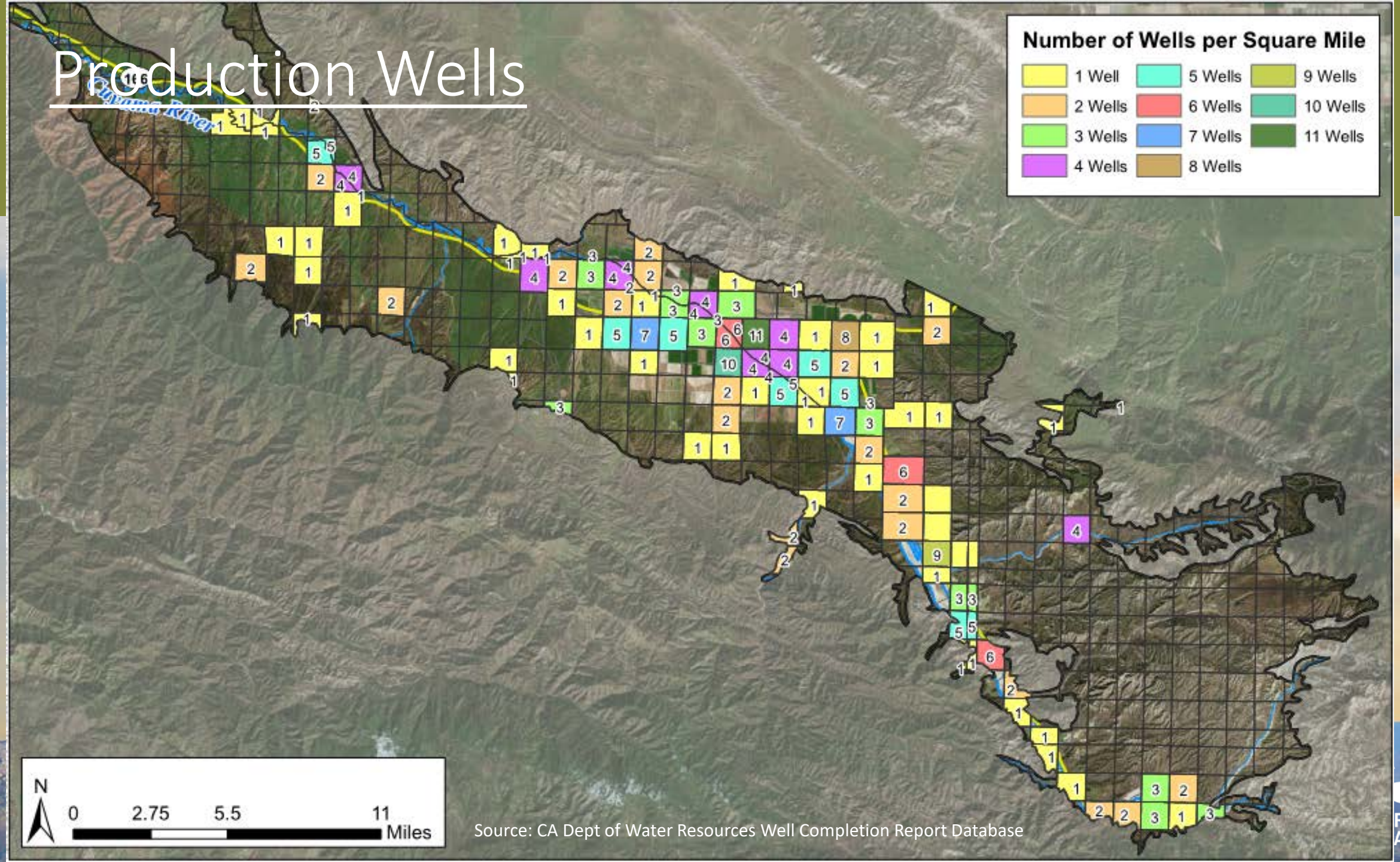
Flow Gages


Cuyama Watershed
Contributes to Cuyama GW Basin
Does Not Contribute to Cuyama GW Basin
Station/Gauge
CDEC: Inflow, Outflow, Elevation
USGS: Streamflow
11137900
1959-2018
11137400
1959-1978
11137500
1943-1962
11138000
1929-1961
11136800
1959-2018
11137000
1929-1962
TWT
1961-2018
11138100
1958-1983
Twitchell Reservoir
Santa Maria River
Cuyama River
166
11136650
1963-1972
Wells Creek
New Cuyama
Cuyama
33
Santa Barbara Creek
11136600
2009-2018
Ventucopa
Quatal Canyon
Cuyama Creek
11136480
1972-1978
11136500
1945-2014
11136400
1972-1978
N
0
4.75
9.5
19
Miles

Monitoring Wells



Production Wells



Source: CA Dept of Water Resources Well Completion Report Database

Last Steps to Finalize Data Collection Effort

- Meeting with Vineyard representatives
- Meeting with Cuyama Basin Water District representatives

Proposed Model Simulation Periods

Recent Historical Period: 2000 – 2015

- Used for model calibration and verification
- Historical water budgets

Current Conditions: 2015

- Current land use, irrigation practices, and population
- Based on long-term historical precipitation and streamflow data

Future Conditions: 2040

- Projected land use and population data
- Based on long-term historical precipitation and streamflow data

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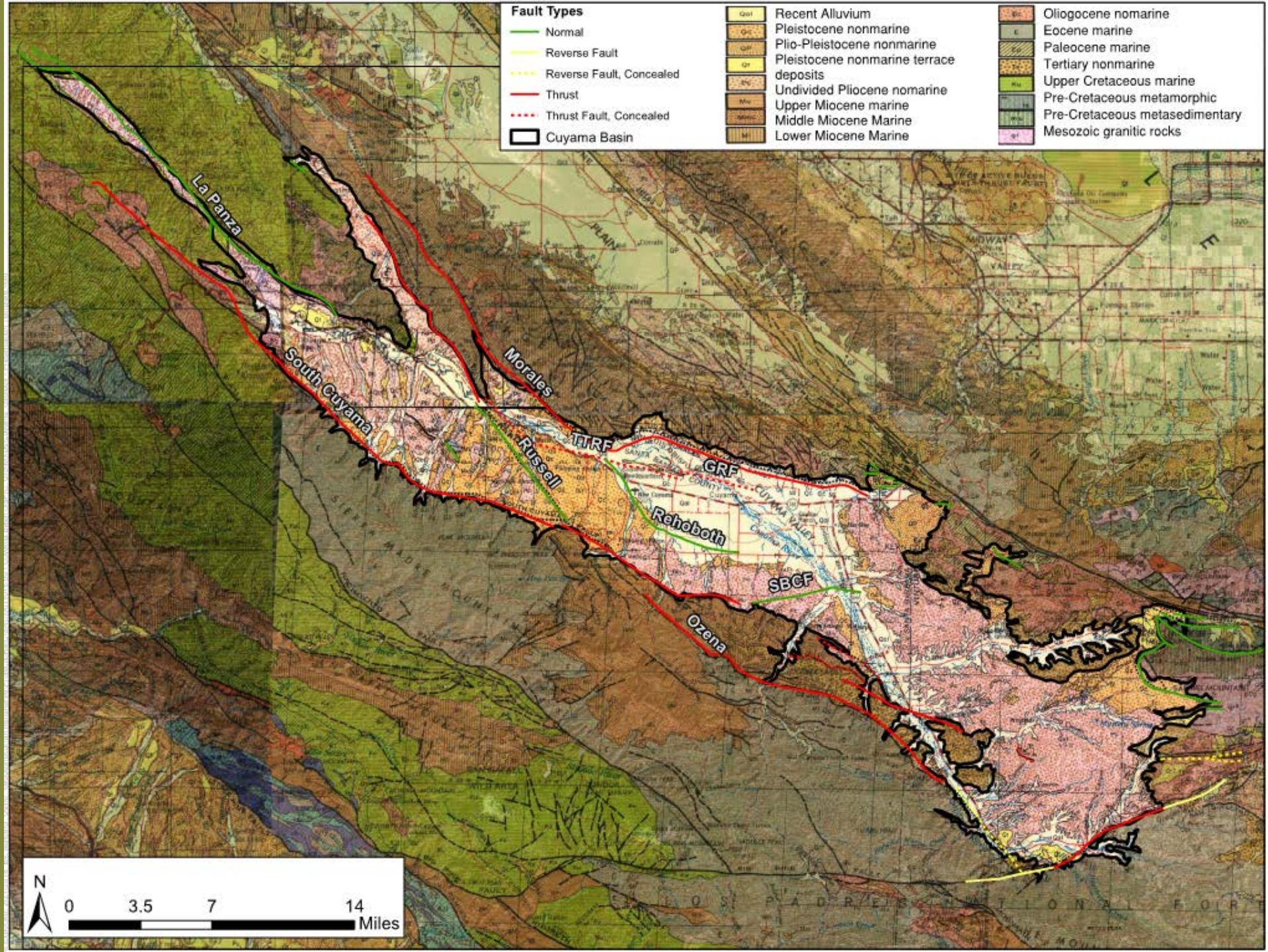
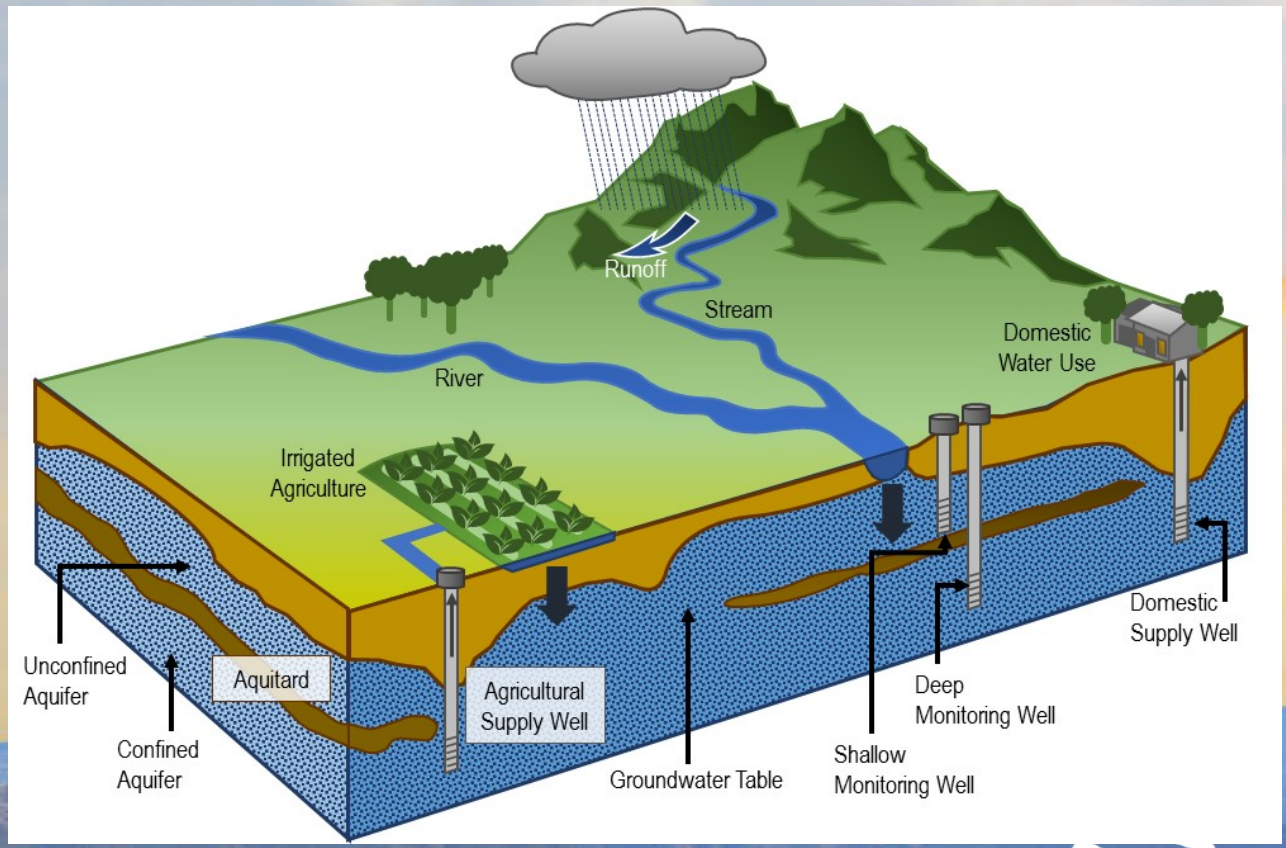
Geology is Basis for Conceptual Model

- Faults
- Formations
- Rivers and streams



Conceptual Basin Model Development

- Conceptual model is a general understanding of the Basin's physical characteristics:
  - Regional hydrology
  - Land use
  - Geology and geologic structure
  - Water quality,
  - Principal aquifers and aquitards
- Sources for Cuyama Basin:
  - USGS Model documents
  - Existing studies (USGS, EKI, Dudek, Cleath)
  - Geologic and topographic maps
  - Flow gages
  - Well logs



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