Sustainability of the San Joaquin River under Climate Change and the Sustainable Groundwater Management Act

California Water and Environmental Modeling Forum

March 20, 2017

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SYSTECH WATER RESOURCES

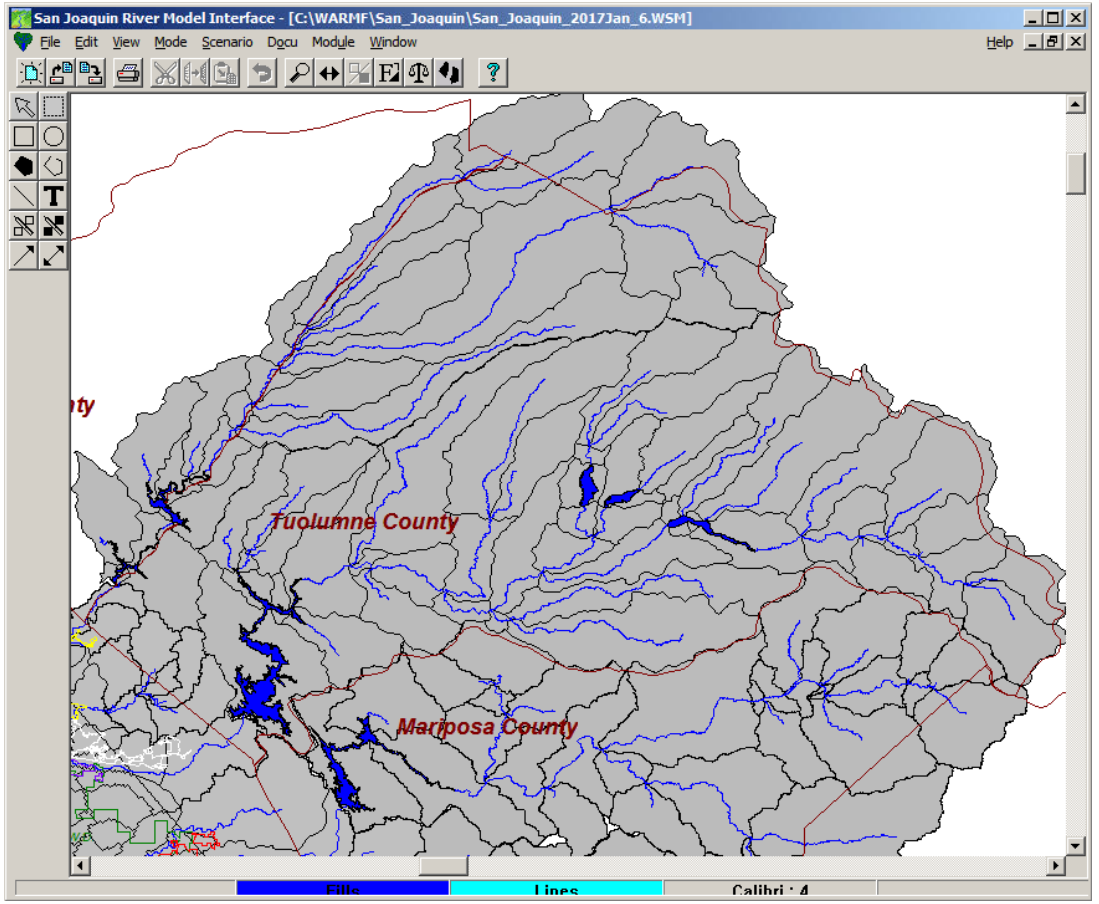
Water. Tools. Decisions. Solutions.

About the Project

- Funded by USDA/NIFA, led by UC Davis
- Determine the impact of future conditions on San Joaquin Valley agriculture:
  - Climate change effects on water supply, water quality
  - Climate change effects on nutrient usage, water usage, crop yield
  - Implementation of the Sustainable Groundwater Management Act
  - Economic impacts
- Determine how the San Joaquin Valley can adapt
  - Reservoir management
  - Trading surface, groundwater supplies
  - Crop selection

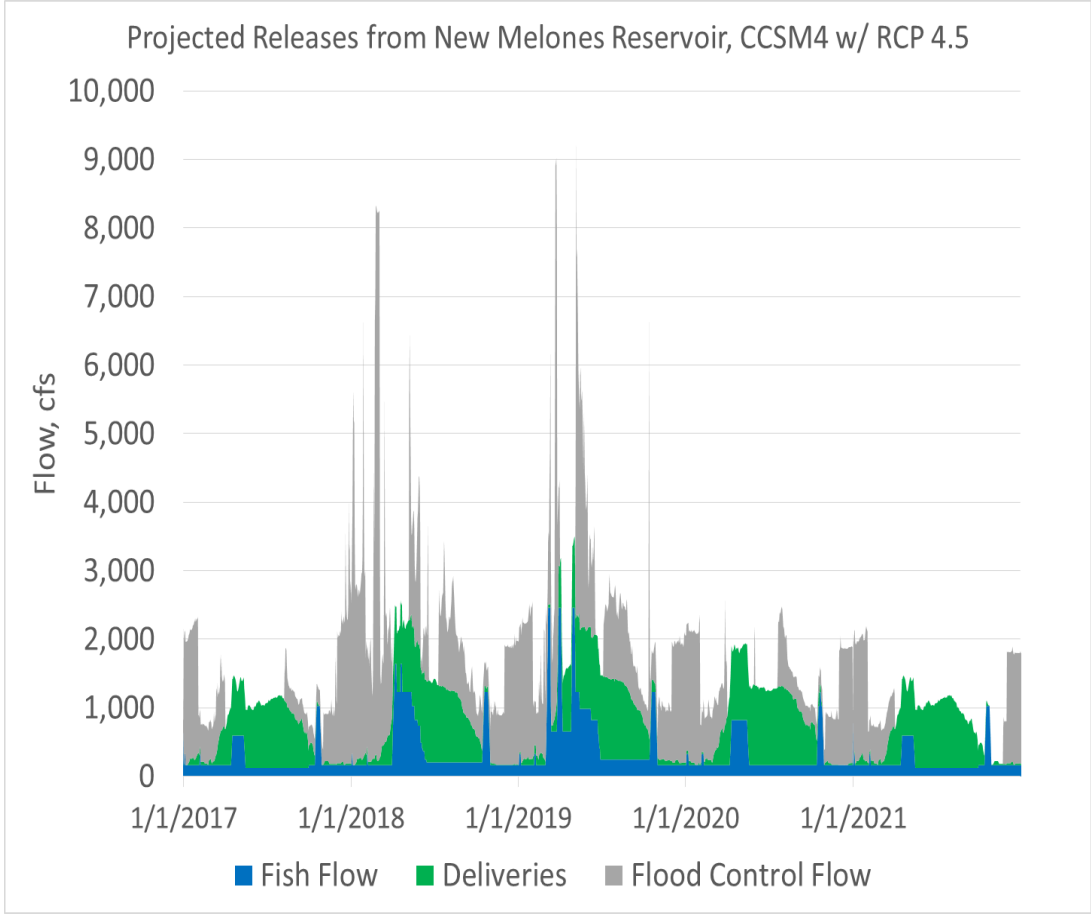
Climate Change Impact

- Use multiple GCMs, RCP 4.5, RCP 8.5 as WARMF meteorology input
- Run WARMF to determine reservoir inflows from 2006-2099
- Determine flood control volume, fish flows, deliveries
- Scale releases up or down to balance each reservoir
- Run lower watershed in WARMF with same climate scenarios, calculate flow & water quality



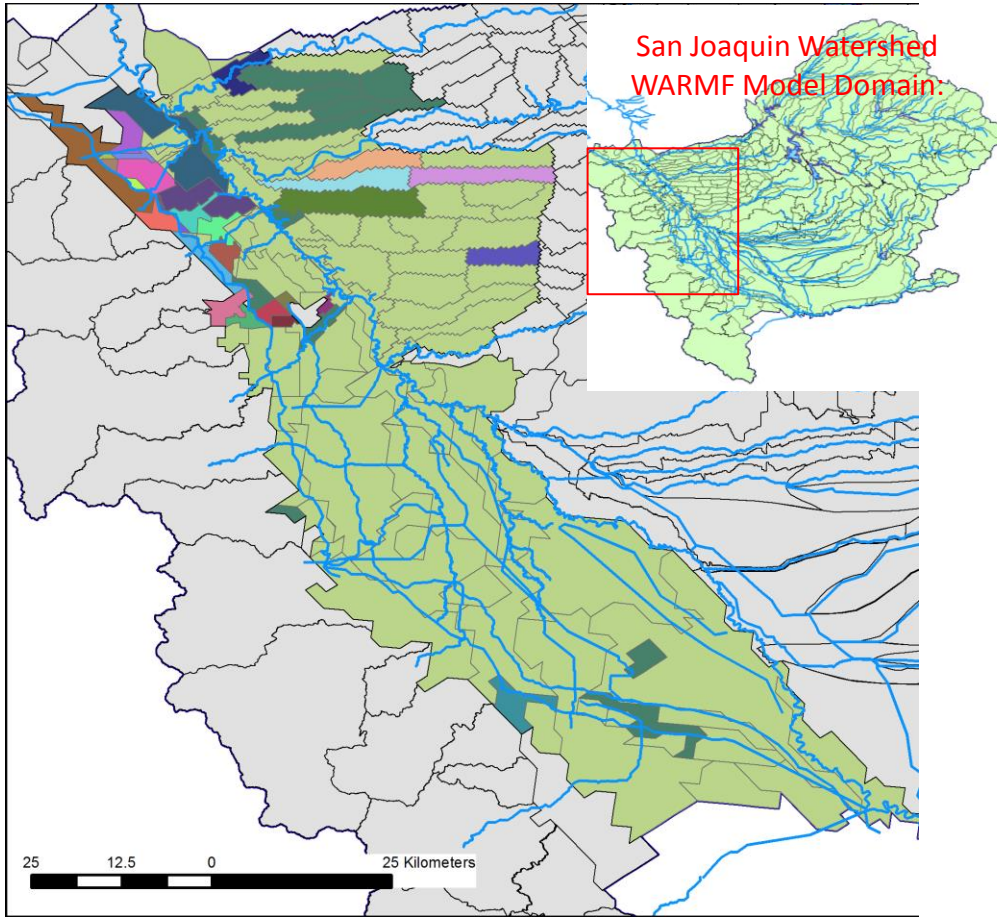
Adapting Reservoir Operations

- Reservoir operations must adapt to changing climate
- Variable flood control volume calculated to prevent flooding downstream of reservoirs
- Fish flows based on current agreements by water year type
- Deliveries based on historical data by water year type



Sustainable Groundwater Management Act

- Lower San Joaquin River transitioned to a losing river ~2014
- Stabilize groundwater table for sustainable use without draining San Joaquin River
- WARMF simulation of root zone, unconfined aquifer to find balance between pumping and recharge
- Look for opportunities for supplemental GW recharge, trading with surface water supplies



Acknowledgment & Contact Information

- Project funded by USDA / National Institute of Food & Agriculture
- Project led by University of California at Davis
- Project collaborators include Bachand & Associates, Tetra Tech

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