Use of C2VSimFG: Applications and Lessons Learned

Tyler Hatch PhD, PE

DWR, Sustainable Groundwater Management Office

Ali Taghavi PhD, PE

Woodard & Curran

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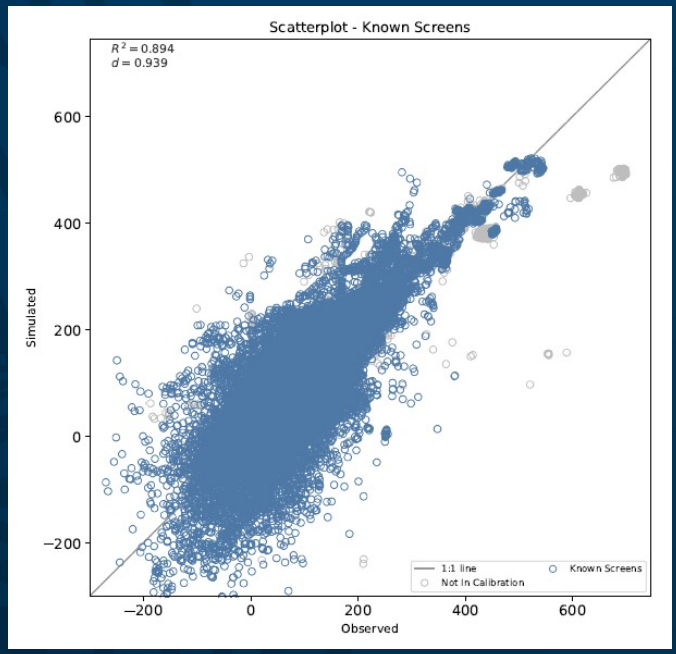
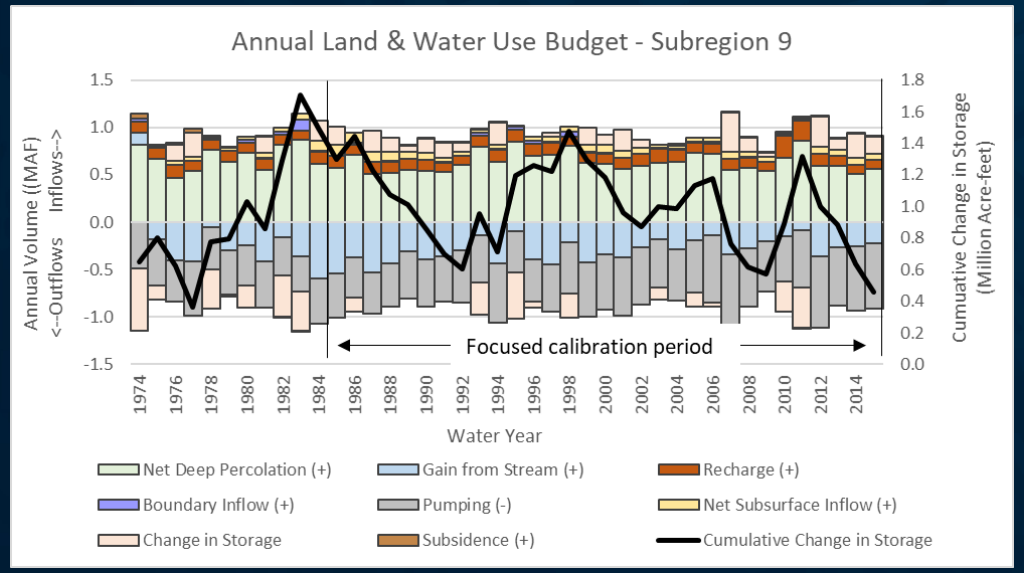
C2VSimFG Purpose

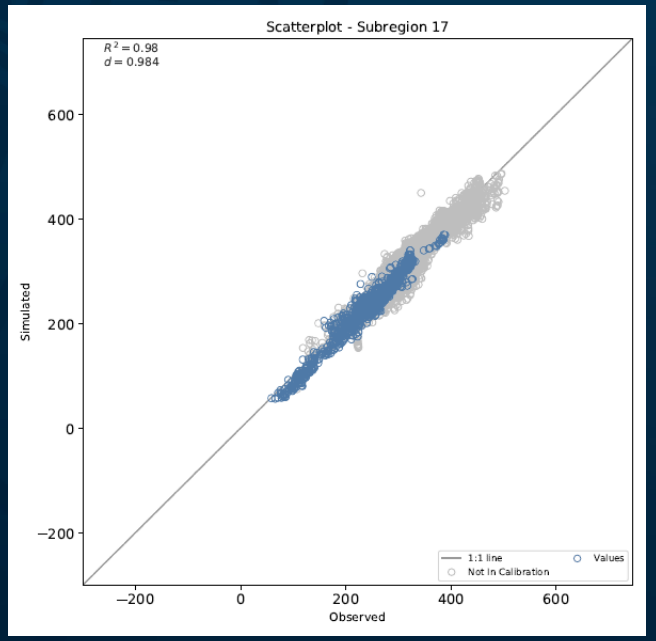
- Estimate regional groundwater budgets
- Provide insights for groundwater management

C2VSimFG v1.01

- Represent observations with known construction information fairly well on a regional basis
- Some areas represent individual groundwater level observations very well







Data Availability

<u>Available Data</u>

- Land Use*
- Irrigation Methods*
- Soils*
- Streamflows*
- Surface Water Diversions*
- Precipitation

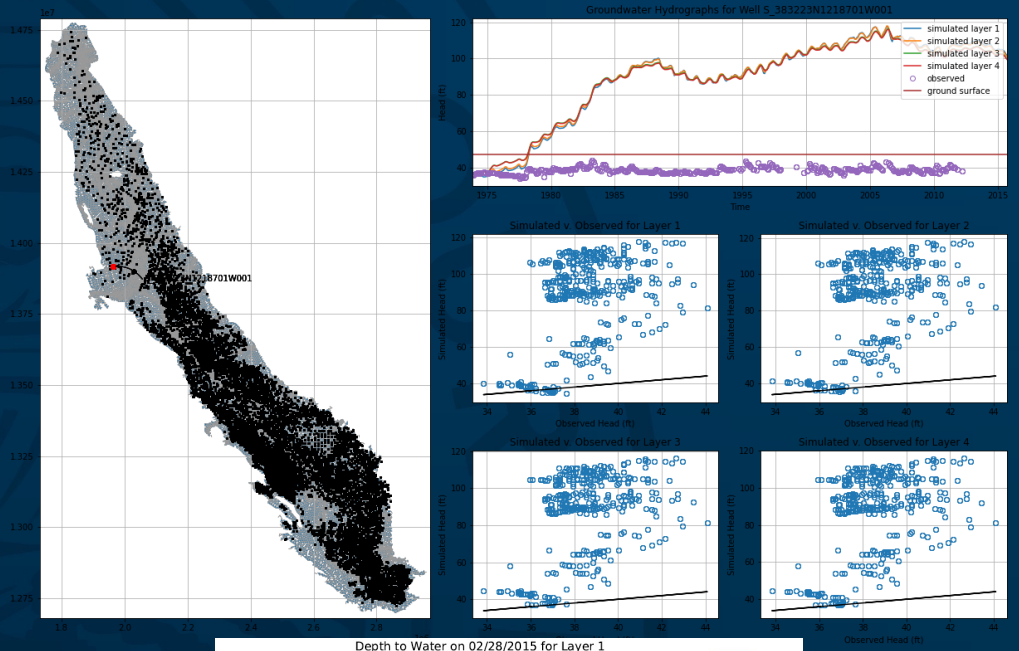
Not all “available data” is complete so we have to be creative in how we fill in the blanks.

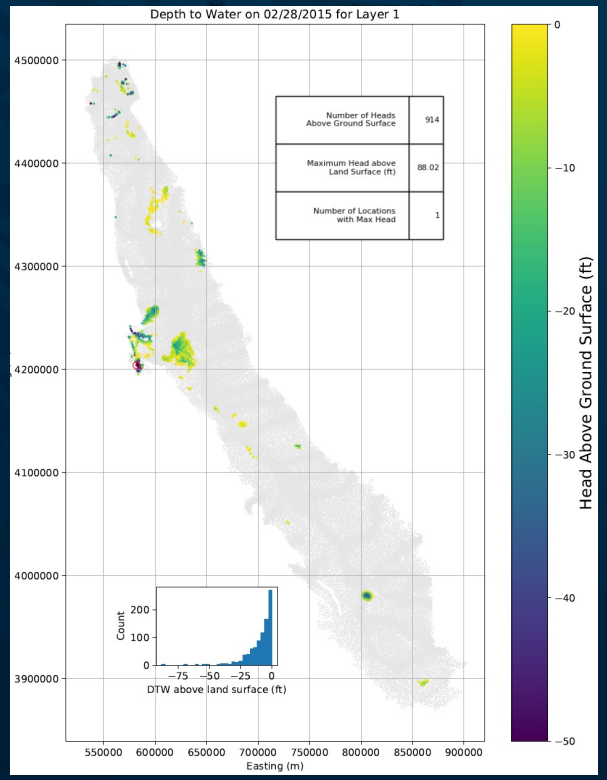
We spend a lot of time estimating these “known” quantities using assumptions

- Use Available Data and physical relationships to estimate the following:
  - Groundwater Pumping
  - Recharge

What the model tells us about our data?

- Simulated Groundwater levels
  - Too High in some places
    - Are recharge rates reasonable?
    - Is water demand too small?
- Water Budgets
  - Mismatches between supply and demand
- Revisit Land use, ET, soils





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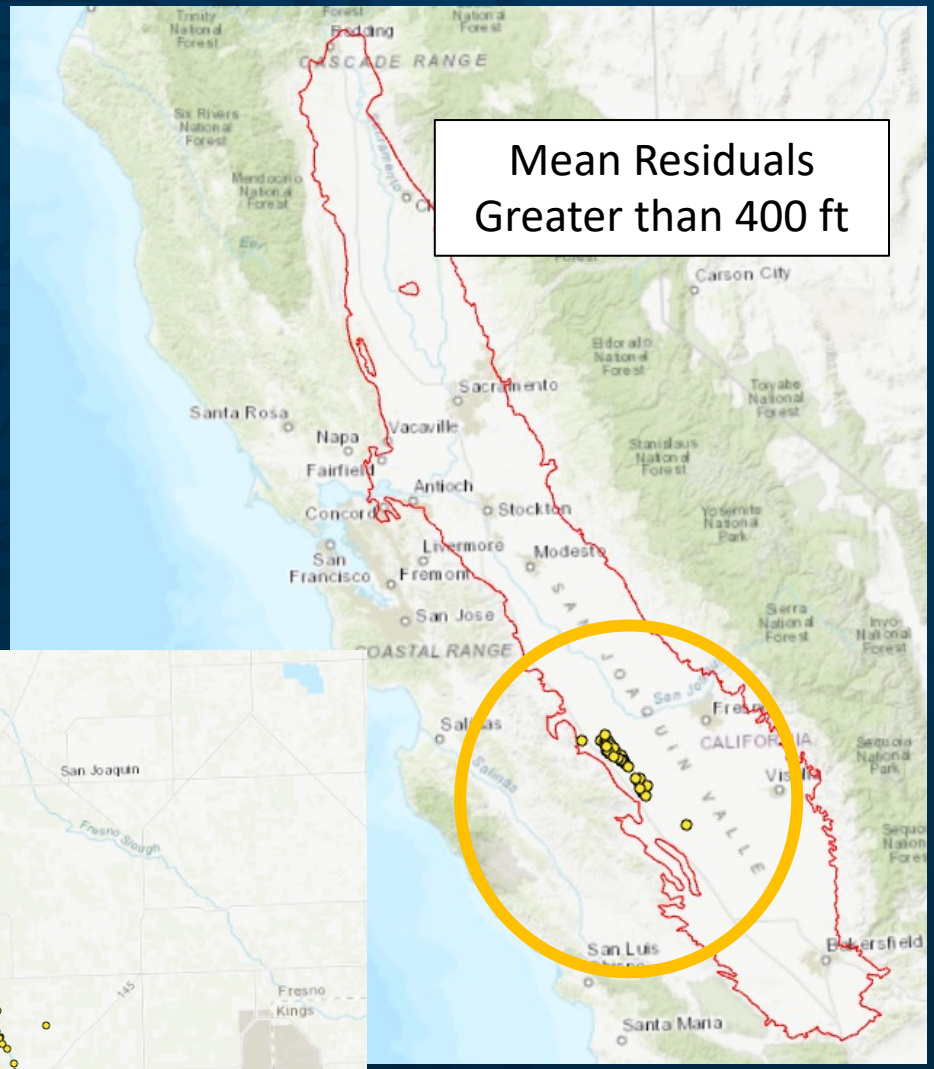
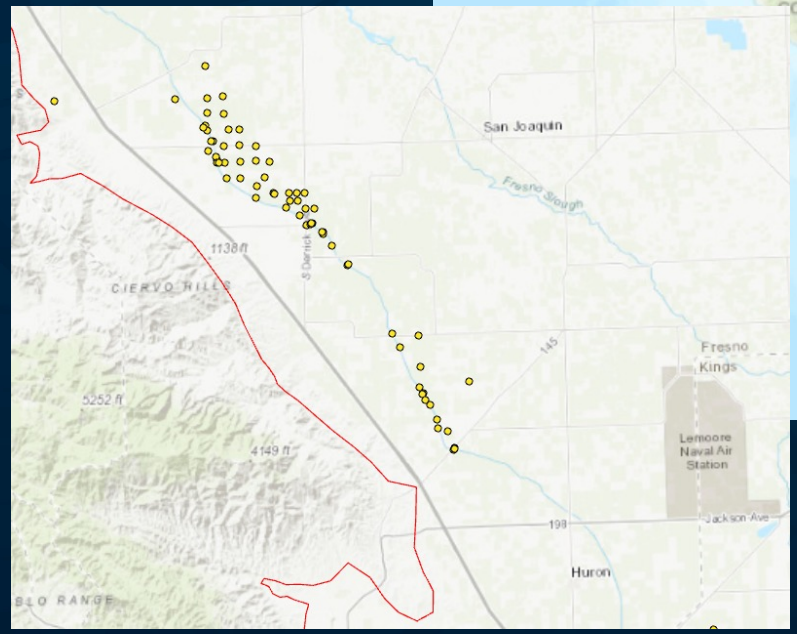
Model Structure

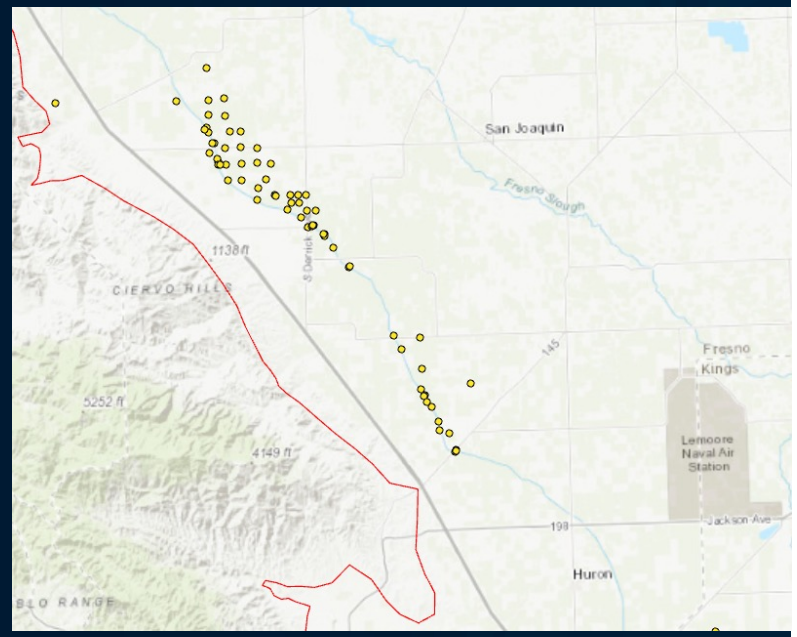
- Do our simplifications to the physical system work?
  - Parsimonious approach – start simple, build more detail as needed.

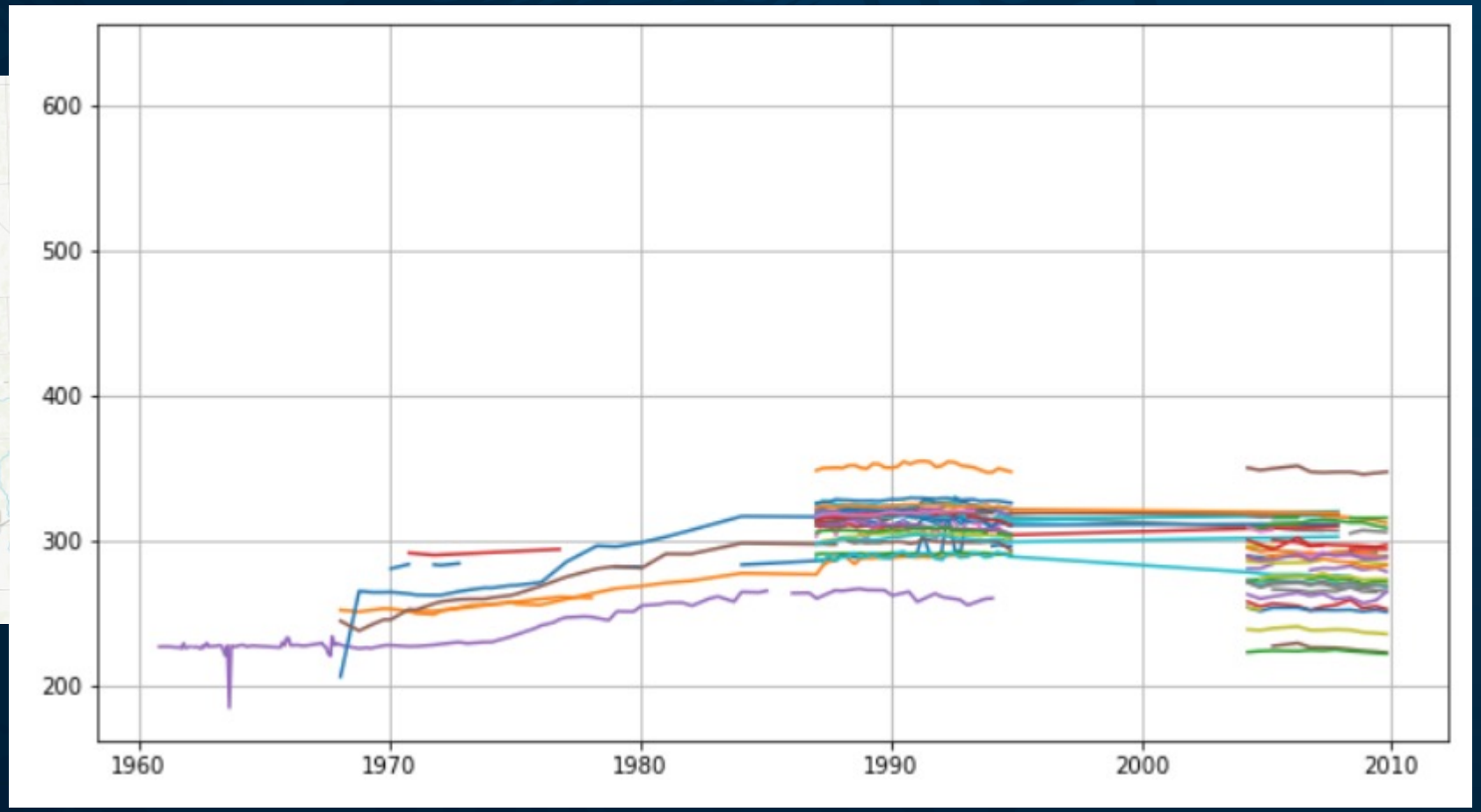
- Do we need more detail to represent this area?





Model Structure





Model Structure

- Do our simplifications to the physical system work?
  - Investigate model layering –
    - if layers are too thick they may represent multiple aquifers with distinct potentiometric heads and calibration wouldn't be able to match observations
  - Investigate observation layer assignments
    - Many observation wells do not have well construction information

Model Review Tools

- Useful to quickly visualize model results and examine results
- Benefits to looking at information in multiple ways
  - QA
  - Focus efforts and refinements

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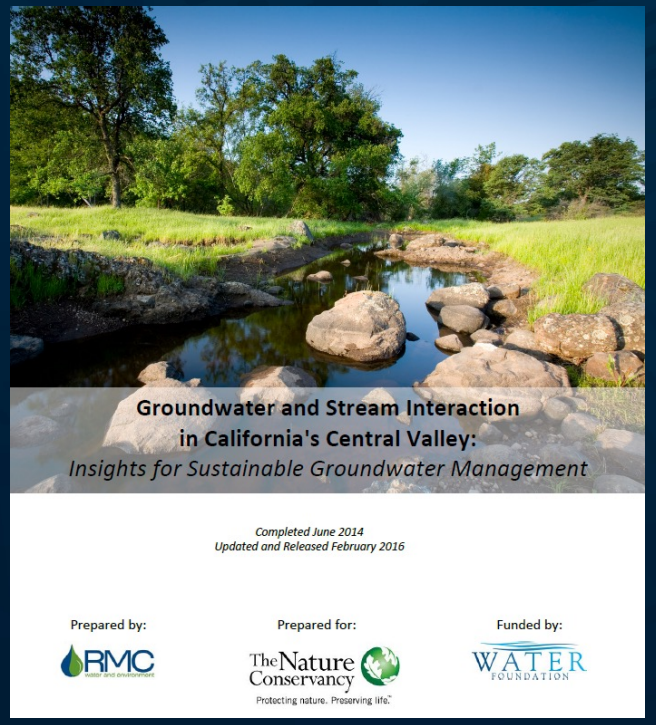
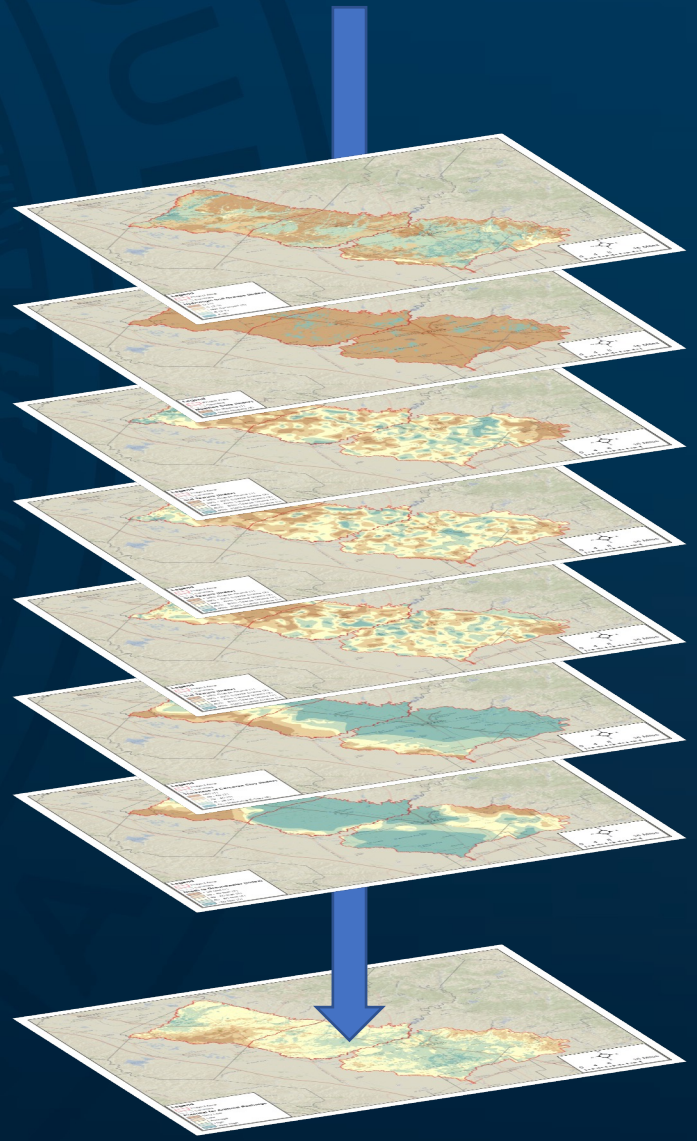
C2VSimFG was Used to Support Several Key Studies Leading to SGMA

- TNC- CV GW Assessment
- CWF- Ag Land Recharge Opportunities
- TNC- GW and Stream Interaction in CV





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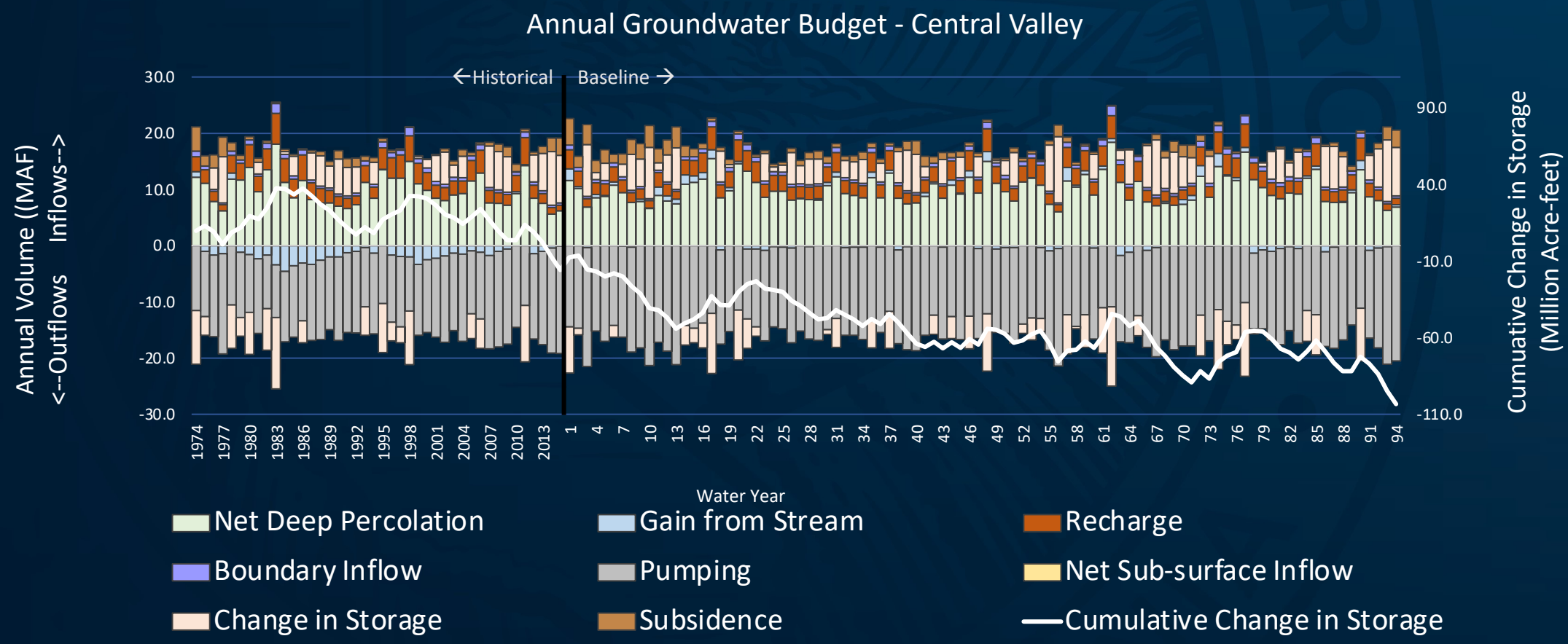
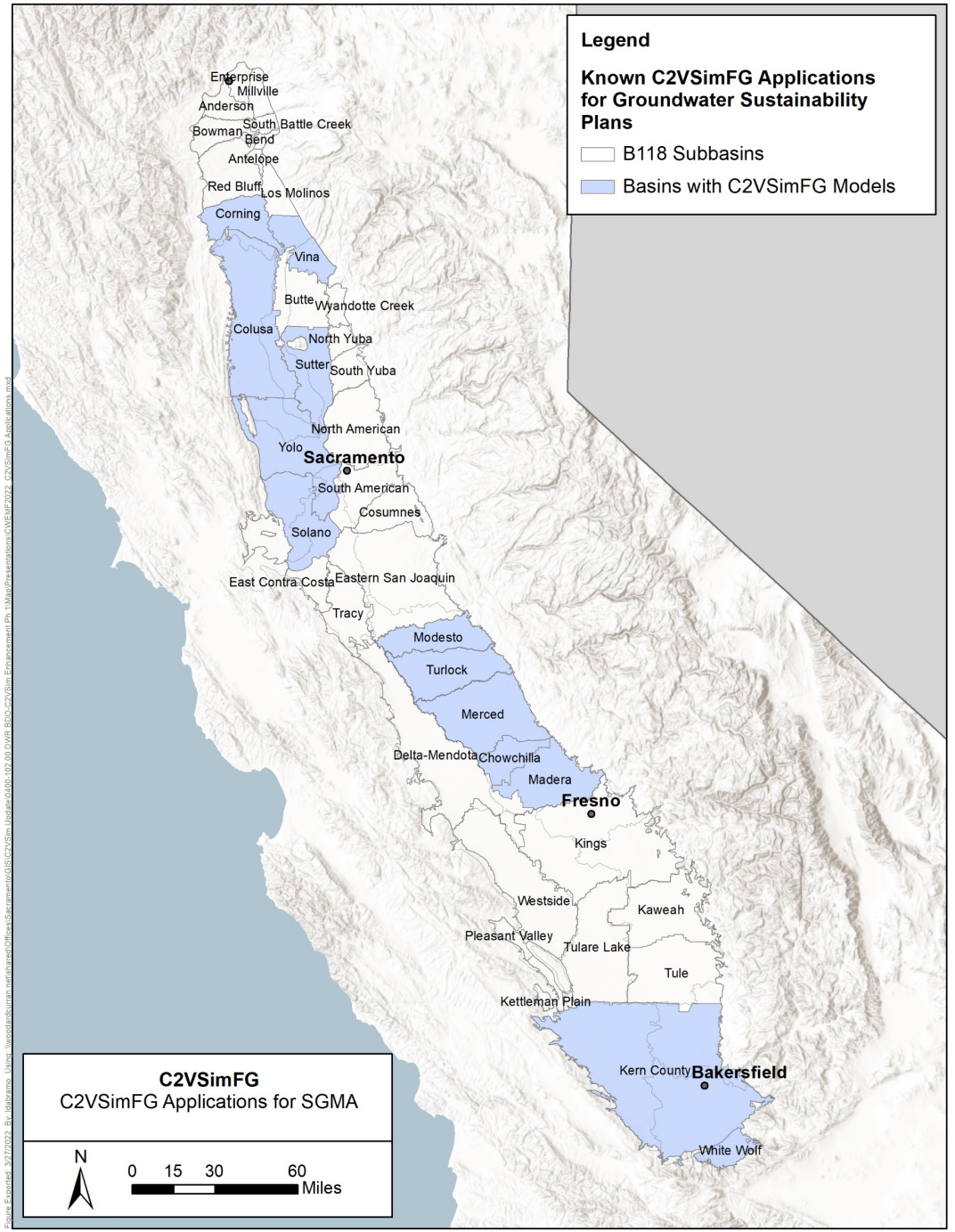
C2VSimFG Can Provide Historical and Projected GW Budgets for Various Geographies



C2VSimFG Has Been Used to Support Groundwater Sustainability Plans (GSPs)

- Several subbasins utilizing C2VSimFG framework for Groundwater Sustainability Plans
- Some used model directly and some integrated and enhanced model with local data for GSP applications



Considerations for Adapting C2VSimFG for Local Water Resource Planning

Model Basic Structure

- Consistency with the DWR Efforts
- Collaboration with Neighboring Basins using C2VSimFG
- Use C2VSimFG database to map to New Model grid rather than cropping out the grid

Stream Specifications

- Major rivers are included
- Small streams and creeks or other surface water features may need to be approximated

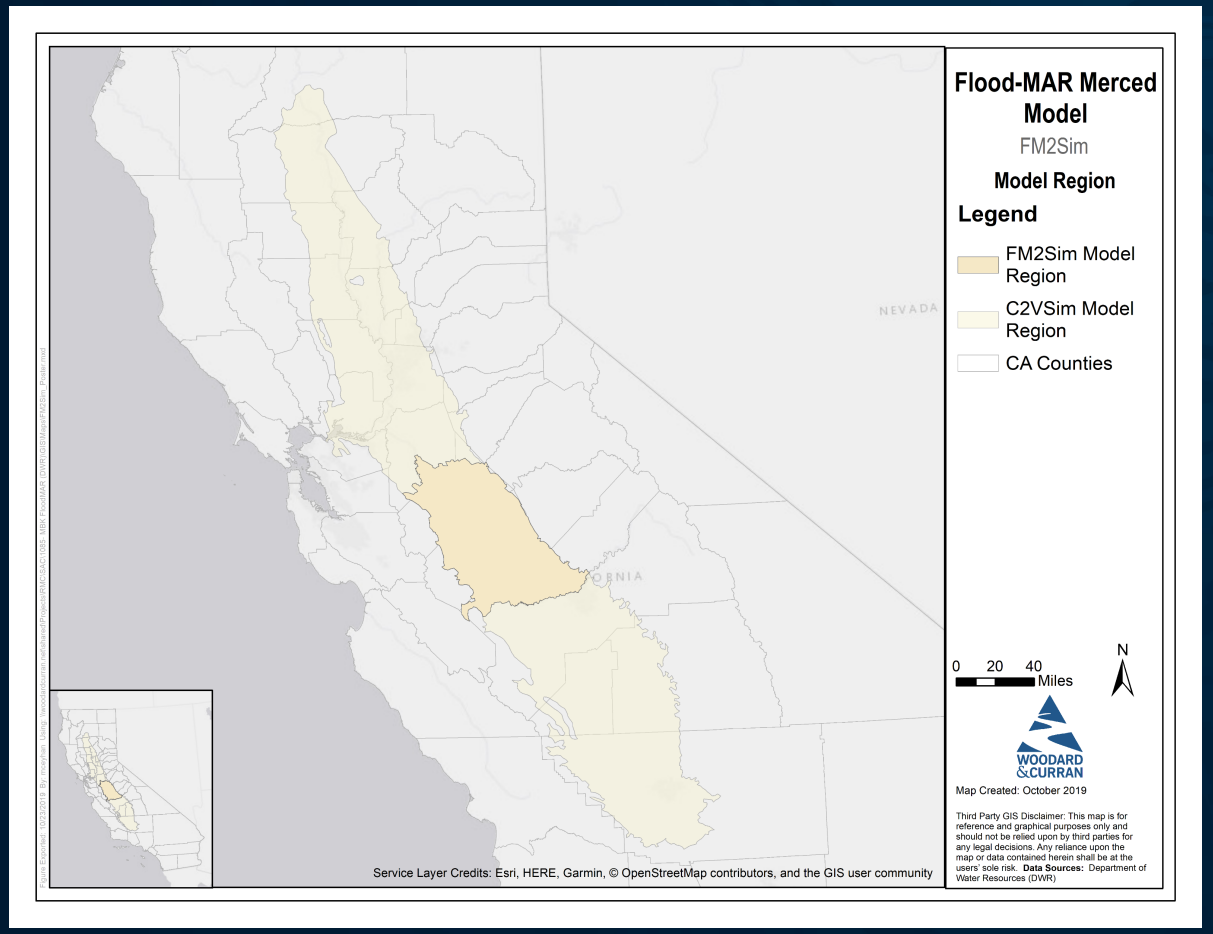
Local Data Refinements

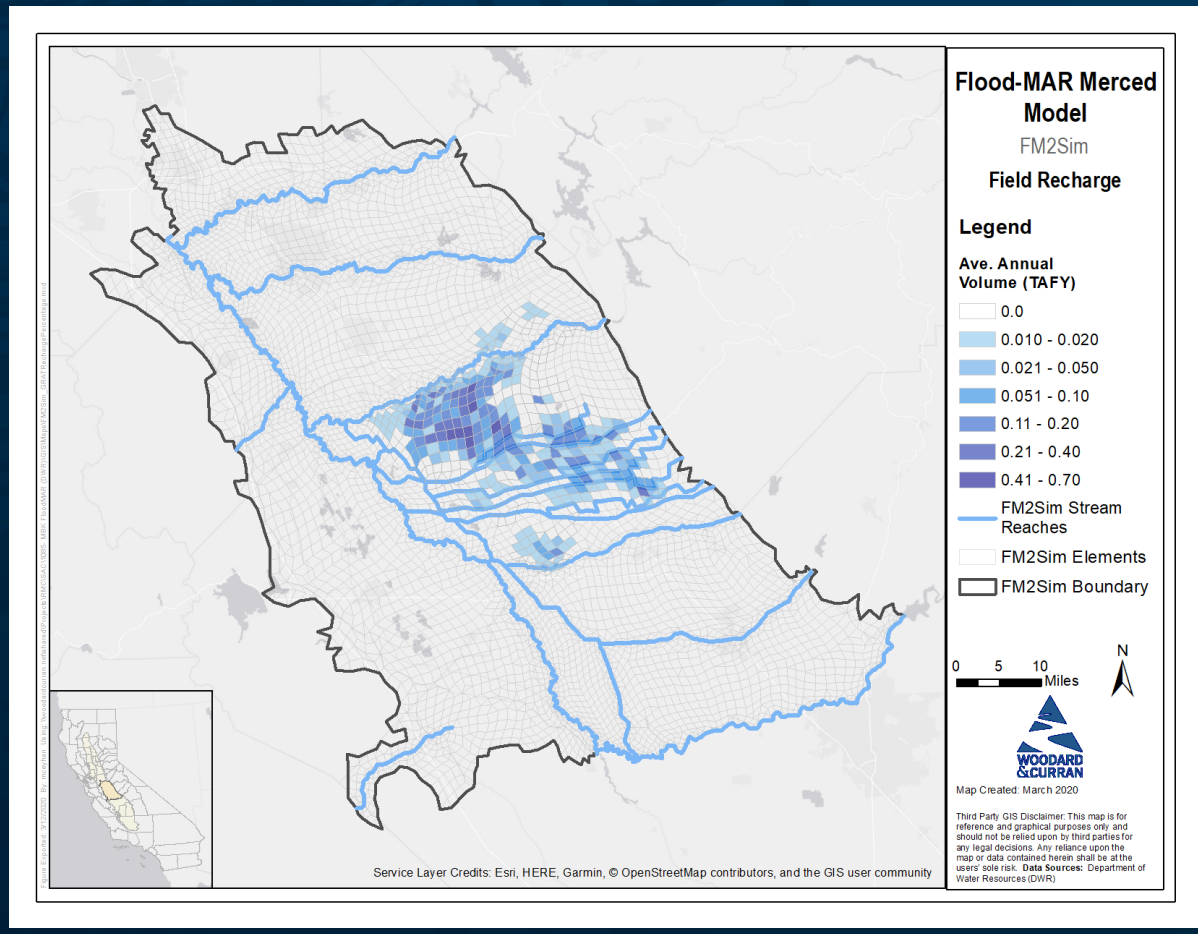
- Refined Surface Water Delivery Areas
- Historical Water Deliveries and Transfers
- Agency and/or City Well Pumping

Stratigraphy

- Refine Based on Localized Information / Models

C2VSimFG has been used as the basis for Pilot Flood-MAR Application (FM2Sim)



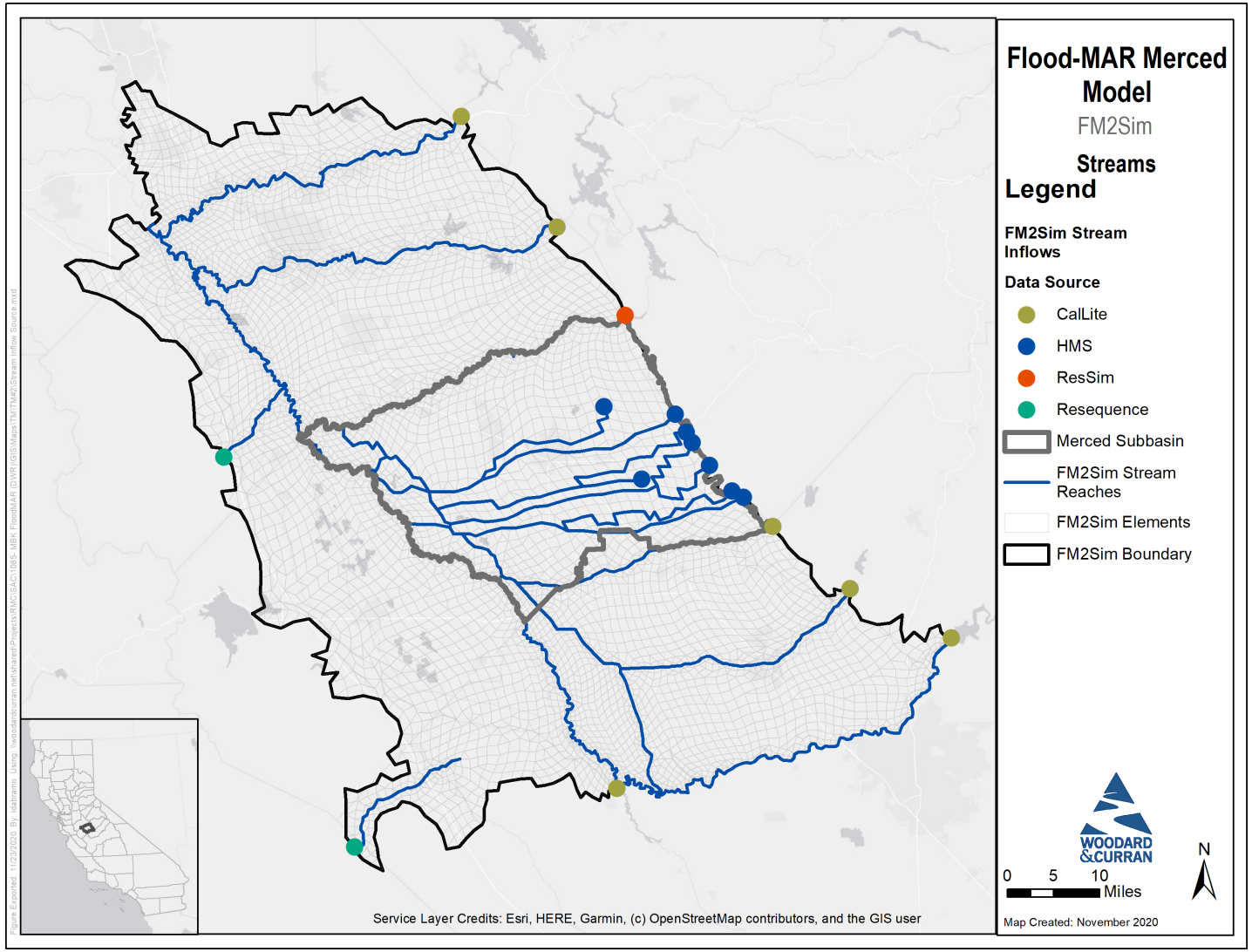


Pilot Flood-MAR Application is integrated with Other Models

FM2Sim
(Groundwater Model)

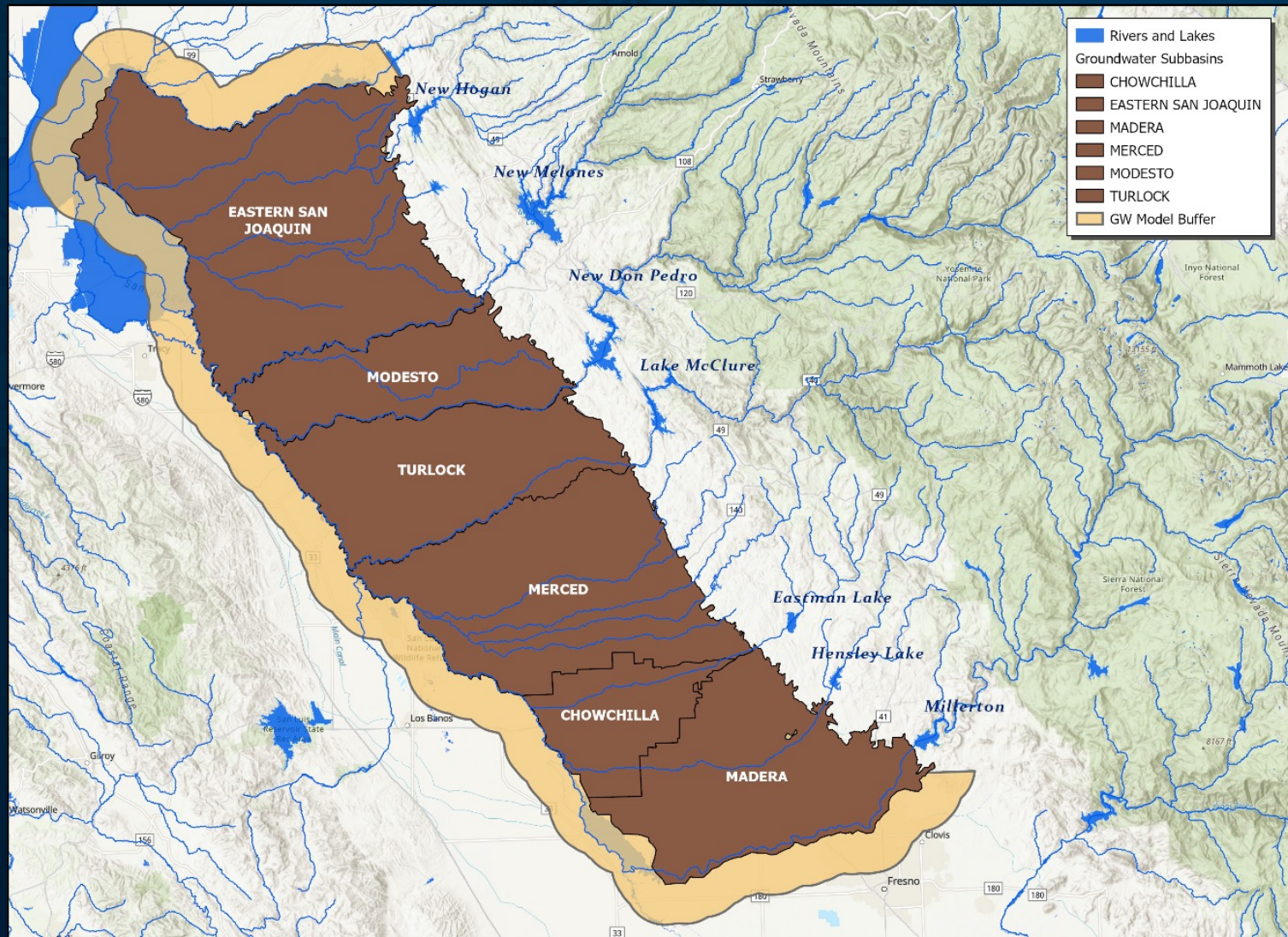
GRAT
(Recharge Operations)

ResSim
(Surface Water Operations)



C2VSimFG is Considered for San Joaquin River Basin Watershed Studies

- Cover Multiple watershed and Subbasins
- Use C2VSimFG as the Core Database
- Refine Database with Local Model / Information
- Include Detail Features Relevant to the FloodMAR Studies
- Use Weather Generator to develop Hydrologic Sequence



Other Potential C2VSimFG Applications

- Regional Conjunctive Use
- Regional Water Conveyance / Water Transfers
- Land Repurposing
- Economic Evaluation
- SGMA Projects & Management Actions
- Water Market Assessment

Discussions