

A drinking water vulnerability screening tool for domestic well communities

Water Equity Science Shop (WESS)

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Presentation Outline

- Background on the WESS
- Framing the problem
- Study Questions/Goals
- Methods
- Results
- Next steps
- Additional applications
- Questions/ Feedback

Water Equity Science Shop (WESS)



Support community organizations, research, and policy

Water Equity Science Shop (WESS)



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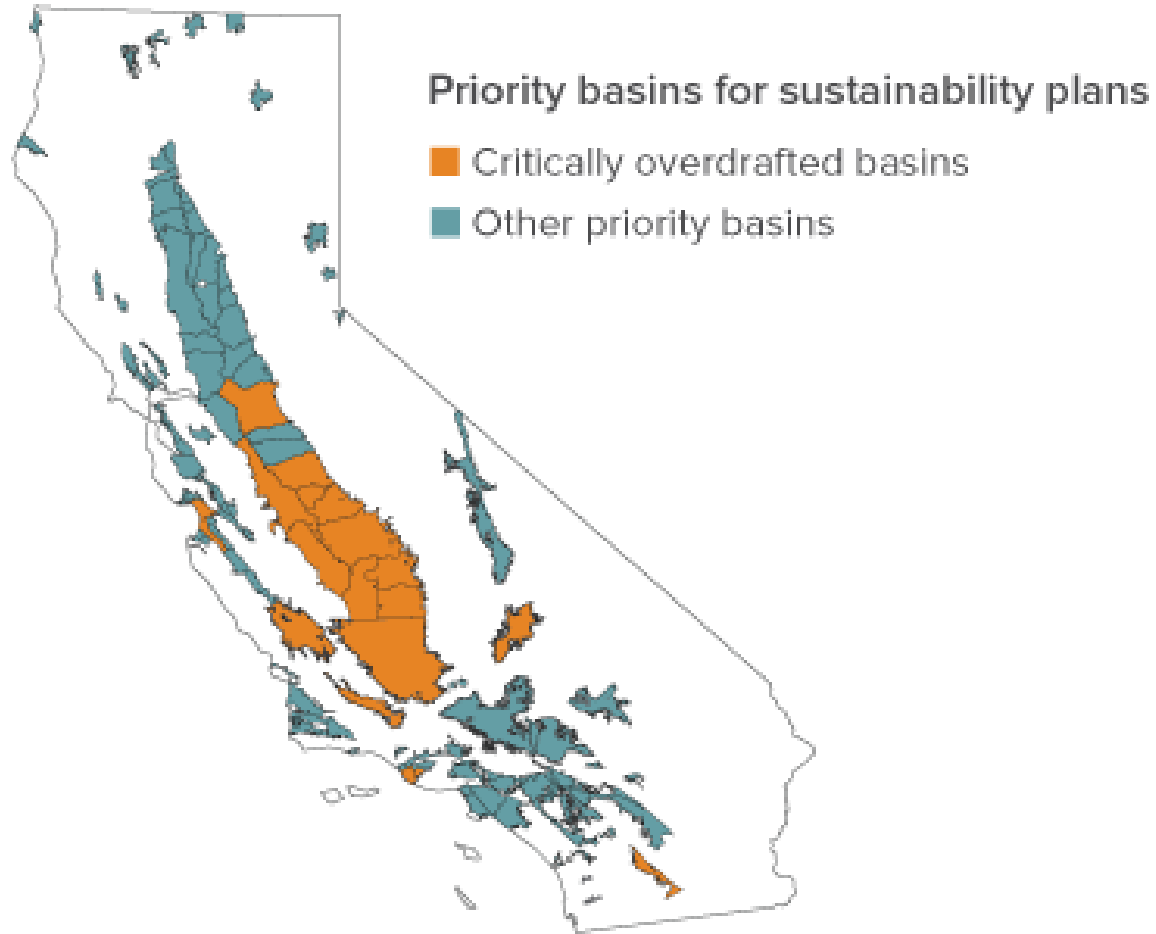


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Framing the problem



85% of California's population relies on groundwater¹

250,000 residents in the Central Valley are exposed to nitrate levels that exceed federal safety standards²

2 million Californians are estimated to use unregulated water sources³

Significant data gap: Where are domestic well communities located? What is their water quality?

Study question/goals

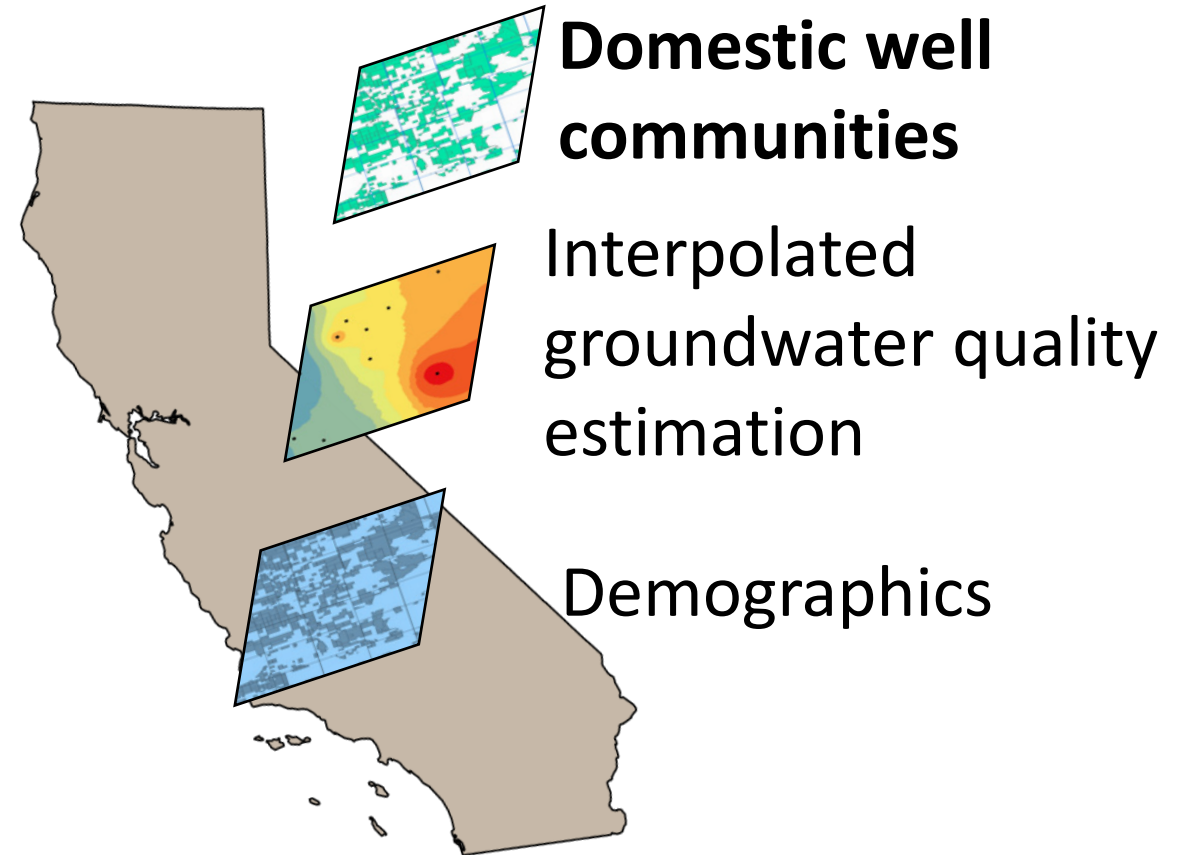
Locate domestic well communities

Estimate water quality

Identify vulnerable populations

Domestic Well Screening Tool

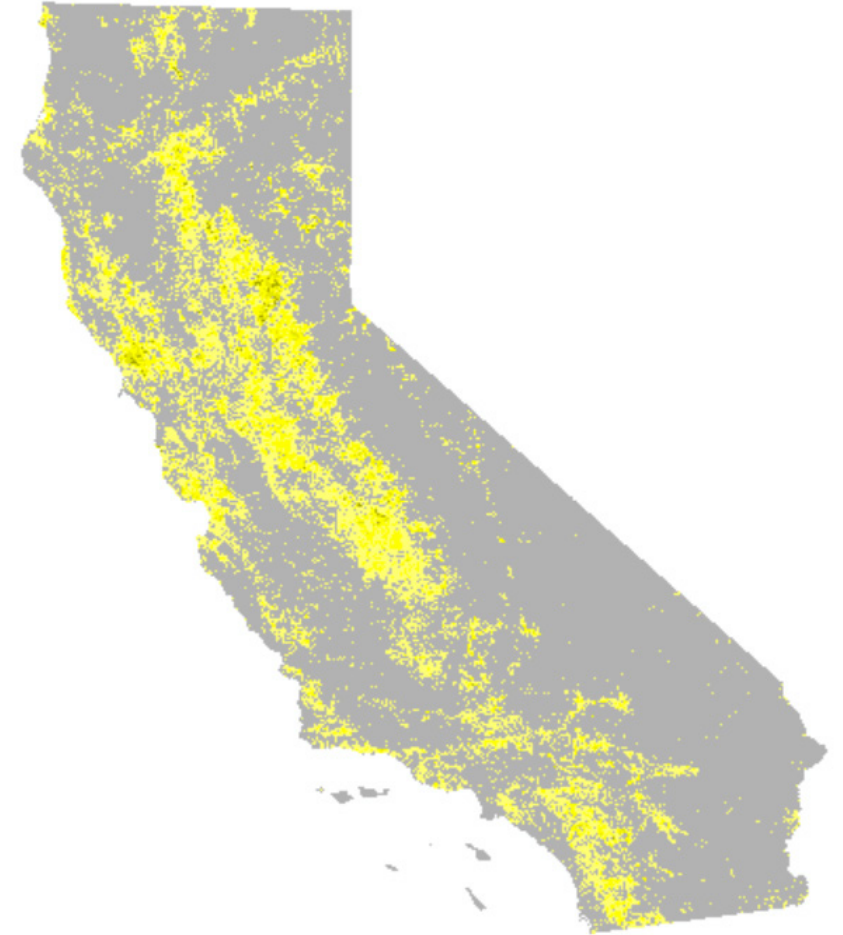
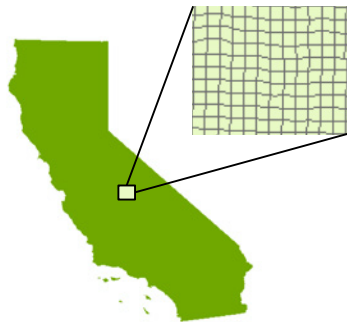
Layers



Domestic Wells

327,265 domestic wells aggregated to 1x1 mile Public Land Survey System (PLSS) sections in CA

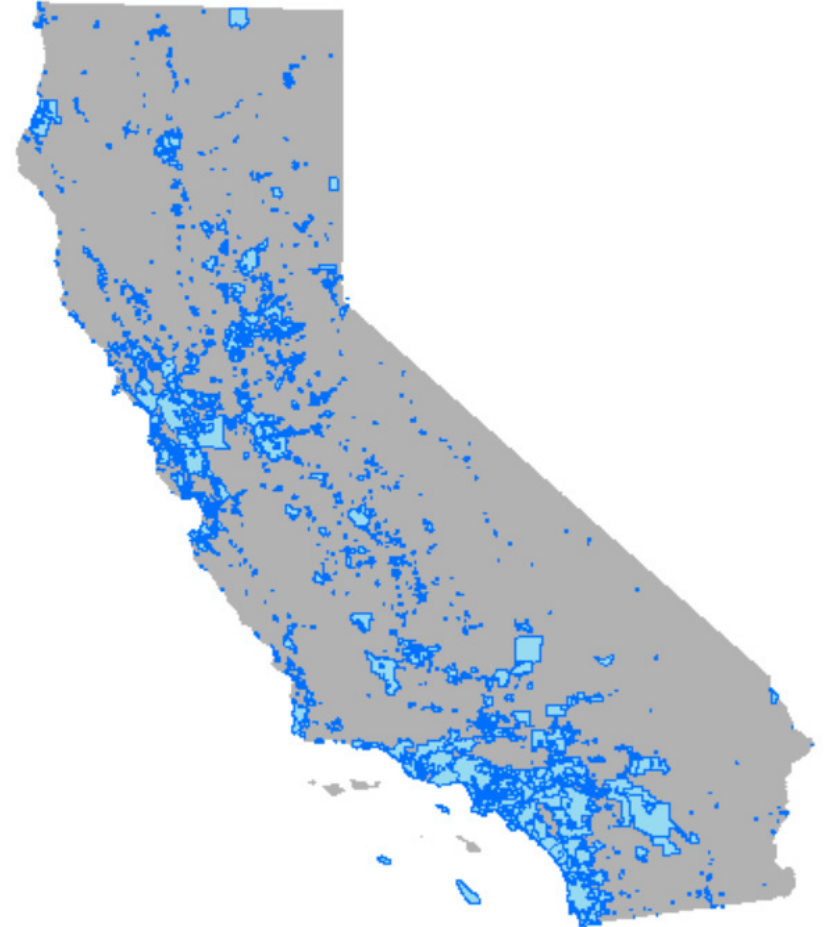
PLSS Sections



Domestic wells aggregated to PLSS sections

Community Drinking Water systems

2,887 community water systems
with geographic boundaries



Source: SDWIS Public Portal; CDPH Water Boundary Tool

CWS have 15+ service connections; SSWS have 5-14 service connections

Populated areas

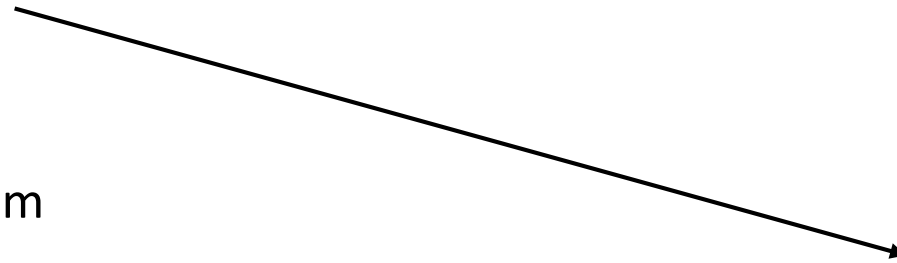
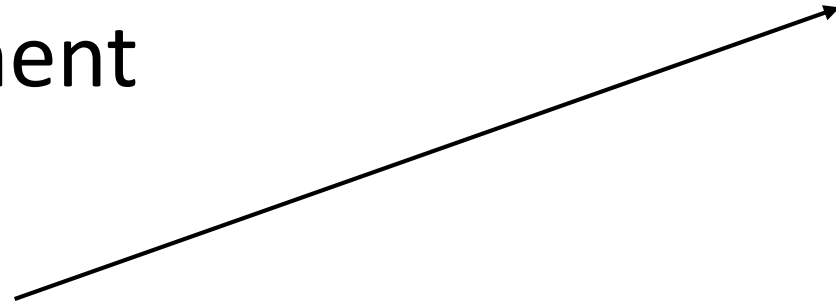
403,398 Populated Census Blocks



Population assigned by areal apportionment



Population from census blocks



Community Water Systems (CWS)

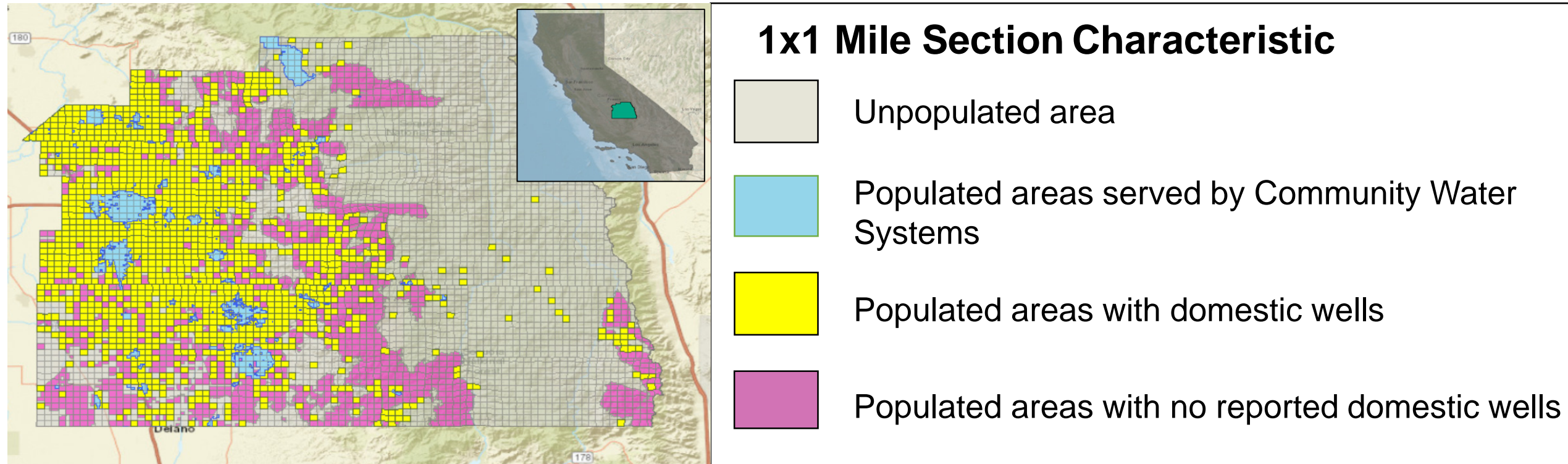


PLSS sections with a well



Populated areas not served by a CWS or a domestic well

Example Results in Tulare County

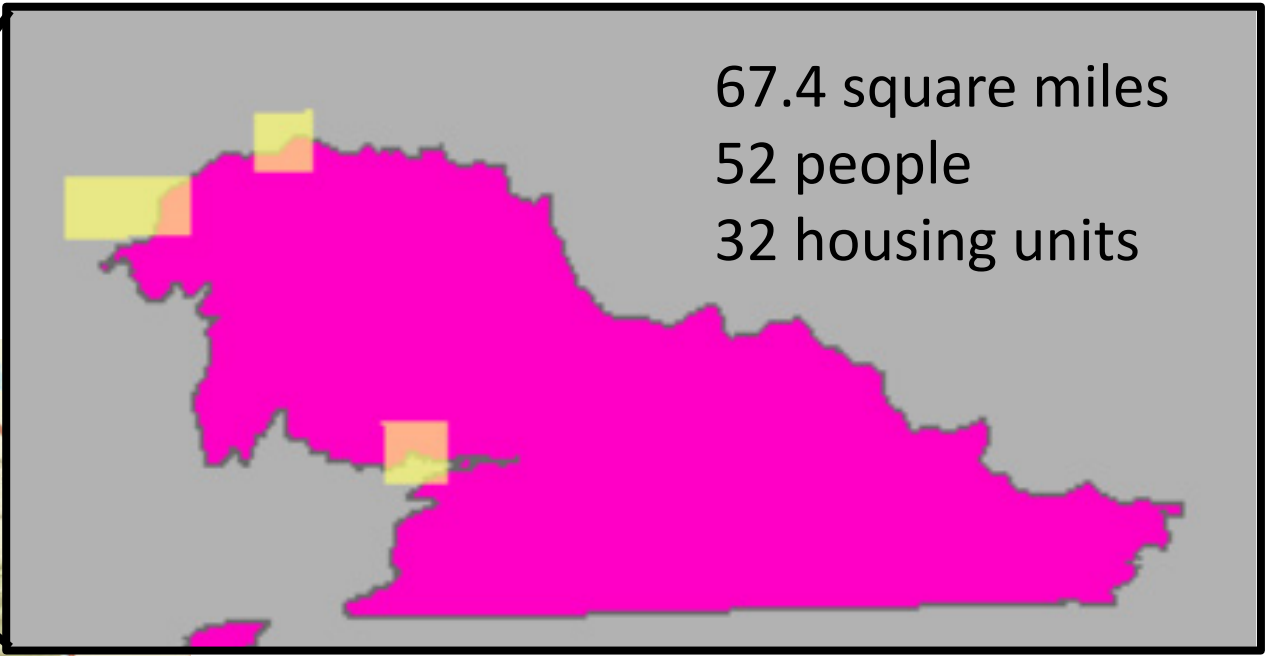
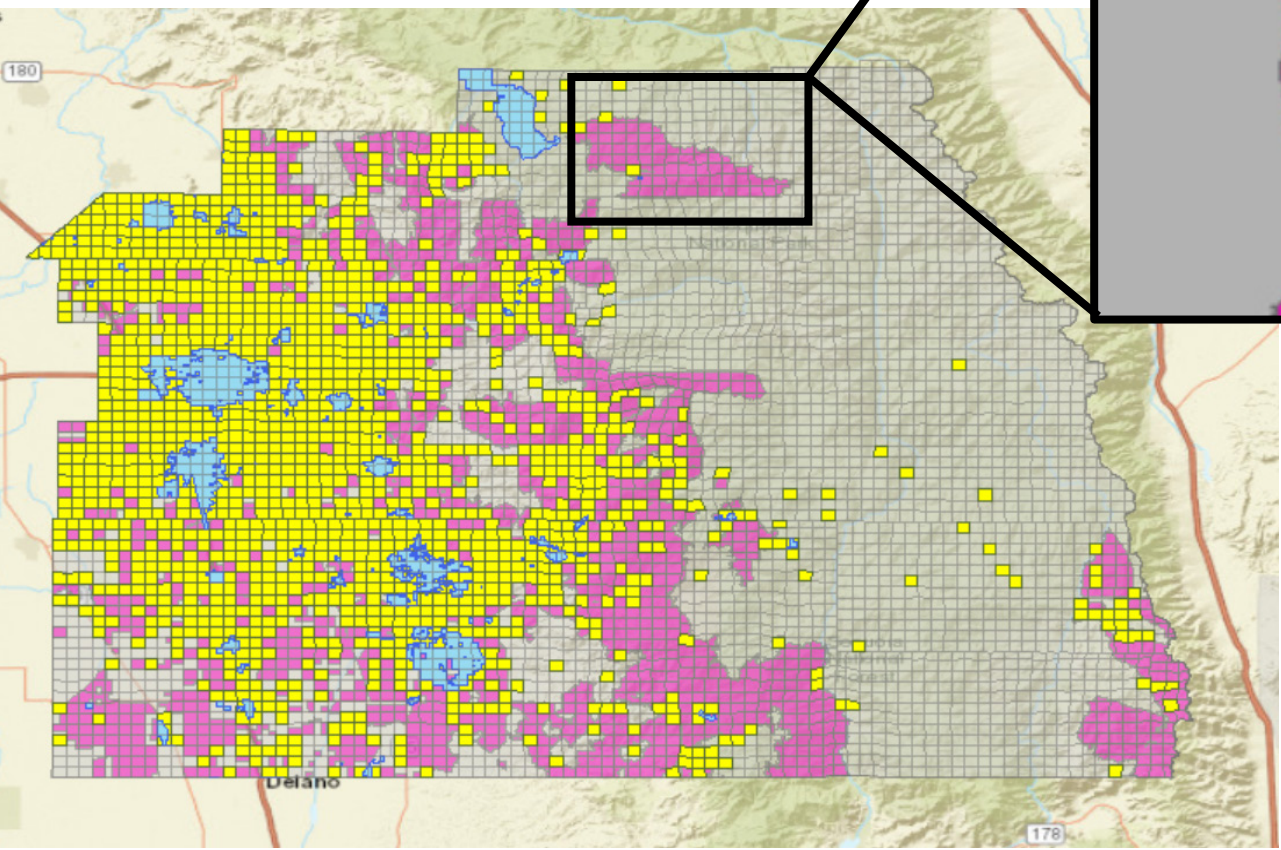




- Approximately 397,744 people (89.95%) in Tulare county are served by Community Water Systems (blue areas).
- Approximately 33,295 people (7.53%) in Tulare County live in areas with domestic wells (yellow areas).
- Approximately 11,140 people (2.52%) in Tulare county have an unknown water source (pink areas).

Results

Tulare County, CA

Census Block Geography

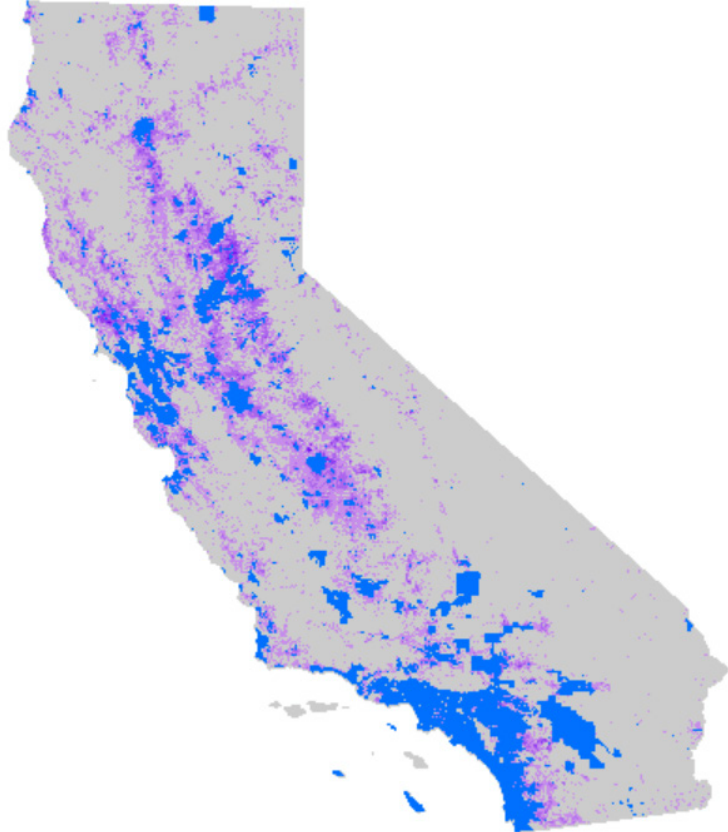


-  Populated areas with domestic wells
-  Populated areas with no reported domestic wells

Next steps

Completed Layers:

Domestic Well Communities
Community Water Systems

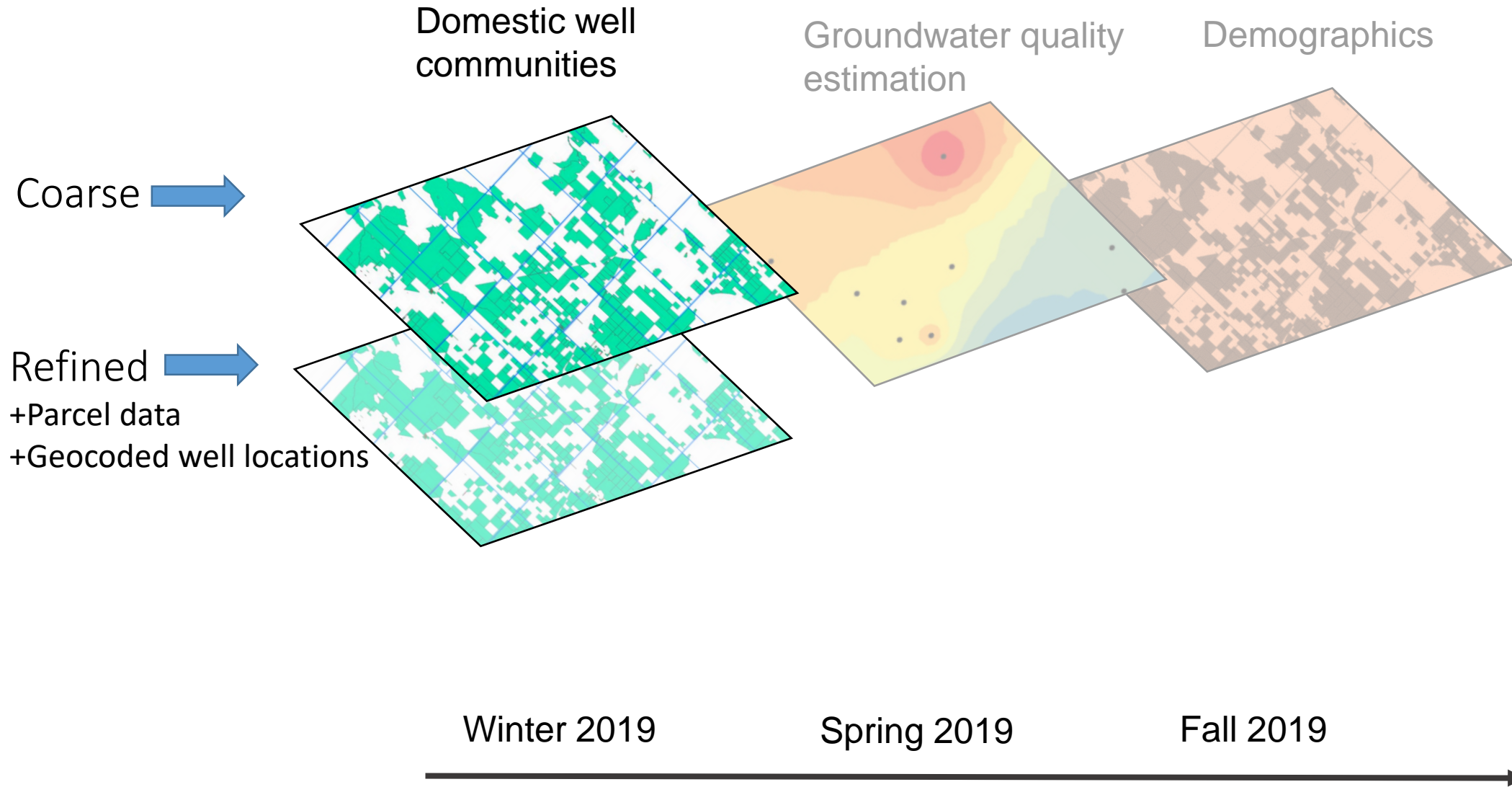


Currently in Progress:

Population in each water type



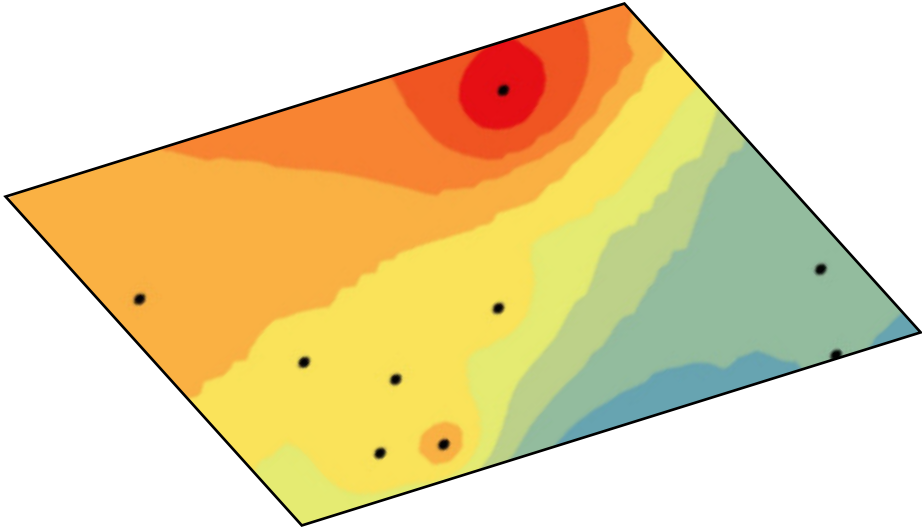
Next Steps



Next Steps

Chemical contaminants:	Nitrate Arsenic 1,2,3-trichloropropane (1,2,3-TCP) Hexavalent chromium (Cr(VI))
Source:	OEHHA (CalEnviroScreen 3.0)
Underlying data sources:	
Community water systems	(SWRCB) Water Quality monitoring (2005-2013)
Domestic well communities / state smalls	raw or untreated groundwater quality test results from (SWRCB) Water Quality Monitoring (2005-2013); USGS Priority Basins well-water data from 2004-2012; GAMA 2002-2011

Groundwater quality estimation

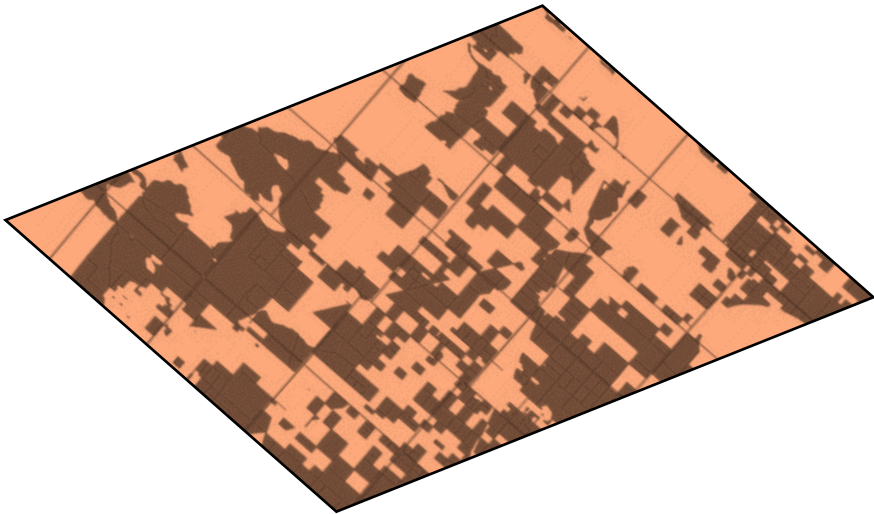


Spring 2019

Next Steps

Data source:	American Community Survey 5-year estimates (2012-16)
Demographic measures:	Median household income
	Disadvantaged community status
	Education
	Race/ethnicity

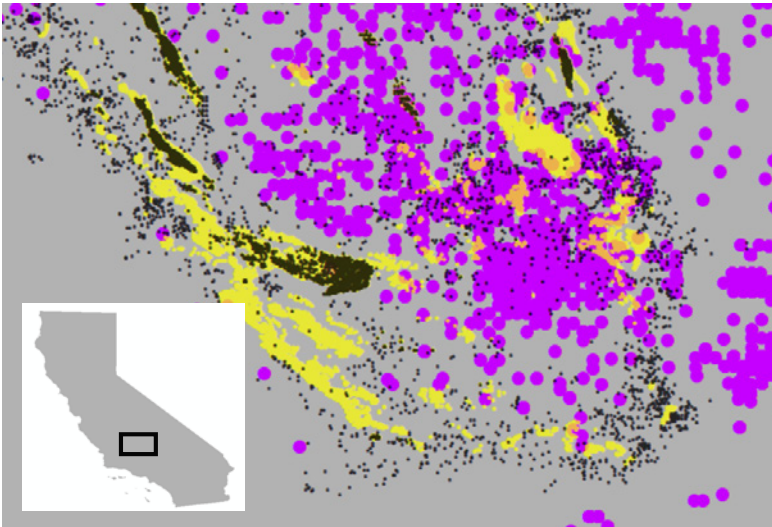
Demographics



Fall 2019

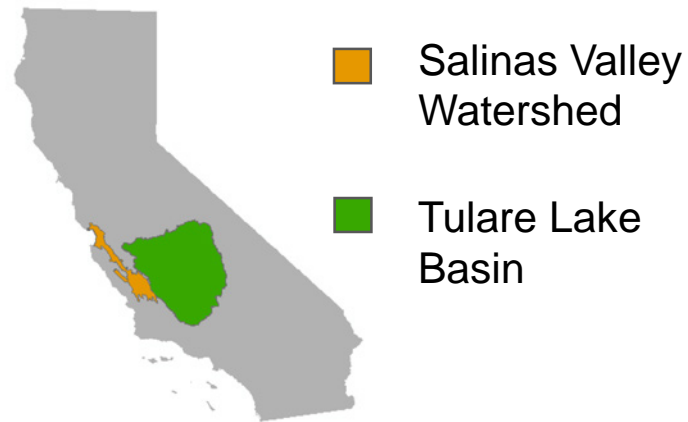
Additional applications for the domestic well layer

Oil and Gas activities: impact on water quality and health



- Domestic well clusters
- Stimulated fracking well
- Active oil and gas well

Identifying communities for targeted and non-targeted sampling of tap water

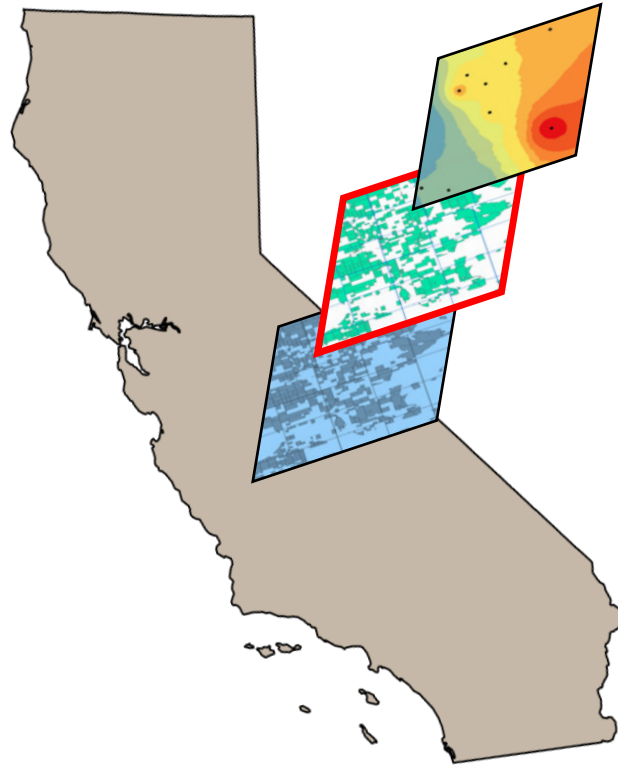


- Salinas Valley Watershed
- Tulare Lake Basin

Integration with California's Human Right to Water



Questions and feedback



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