

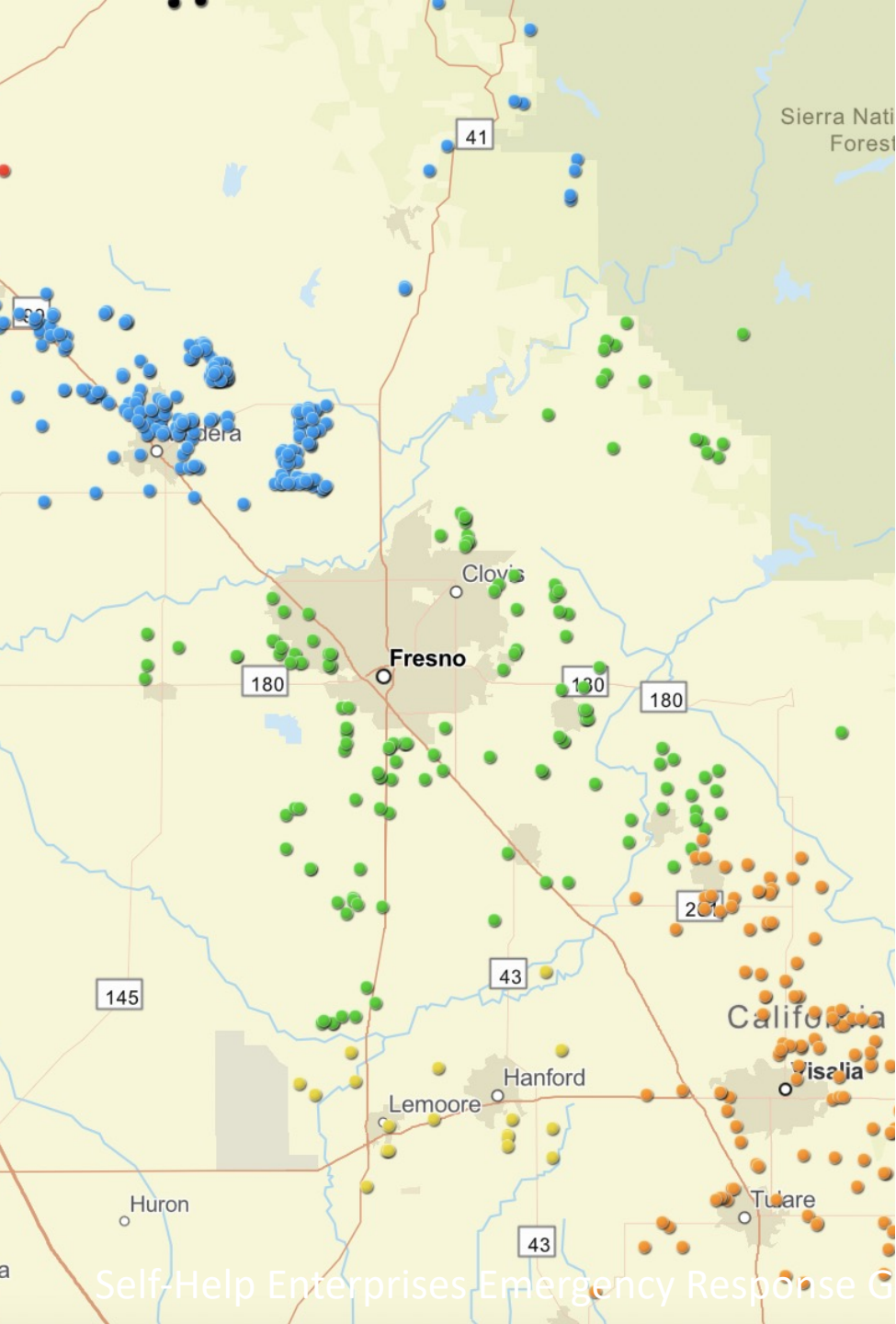
# Groundwater Markets, Drinking Water Racial Inequities, and Climate Change Resiliency in California's Central Valley



Erick Orellana  
CSU Sacramento  
Water Resources and Policy Initiatives Annual Conference  
April 7, 2022

# Water Markets

- Increasingly relevant in the early implementation stage of the Sustainable Groundwater Management Act of 2014
- Market-based approach to groundwater sustainability
- Effective groundwater markets will:
  - Establish and enforce groundwater allocations
  - Create an accounting system to balance groundwater aquifers
  - Address impacts of land following on local regions by allocating water to most profitable uses
  - Provide transparency on transactions taking place in the market
  - (Hanak et. al, 2021).



# Impacts to Private Drinking Water Wells

---

- Nearly 1,000 Drinking Water Wells experienced outages in 2021
- Households were without running water in their homes for weeks
- California shouldering the costs of replacement water
- Significant impact on communities
- “We could save for a well instead of saving for our daughter’s college, but it would be a gamble. We could never afford a well as deep as those of the farmers.”  
–Lorena Bolaños, Madera Co. Resident

# Impacts to Drinking Water Wells

- *Groundwater Management and Safe Drinking Water in the San Joaquin Valley* (Water Foundation 2020)
  - Between 4,000 and 12,000 failed drinking water wells by 2040
  - About 46,000-127,000 Californians
- Critical Aquifer Overdraft Accelerates Degradation of Groundwater Quality in California's Central Valley During Drought (Levy et. al, 2021)
  - “A direct linkage between... aquifer pumpage and groundwater quality on a regional scale”
  - “Relations between over-draft and water quality in the Central Valley are driven by... intensive irrigation and pumpage”



77

871

PROPERTY OF  
SELF HELP  
ENTERPRISES

TSG

PRIVATE  
PROPERTY



California  
3WCP880

# Racial Inequities in California Drinking Water

- *Drinking Water and Exclusion: A Case Study from California's Central Valley* (Pannu, 2012)
  - “Valley counties sought to “starve out” unincorporated communities of color through policies of withholding public support”
- *Inequities in Drinking Water Quality Among Domestic Well Communities and Community Water Systems, California* (Pace, Balazs et. al,
  - “Communities of color statewide are disproportionately affected by arsenic, nitrate, and Cr(VI) contamination of drinking water, both in CWSs and DWAs, with findings most pronounced in DWAs”

Nuestros Niños  
Merecen AGUA  
LIMPIA!

Mi familia gasta  
\$110.00 por mes en  
agua embotellada

ARV

I spend \$90.00  
per month on  
bottled water!

California  
Needs a  
Safe and  
Affordable  
Drinking

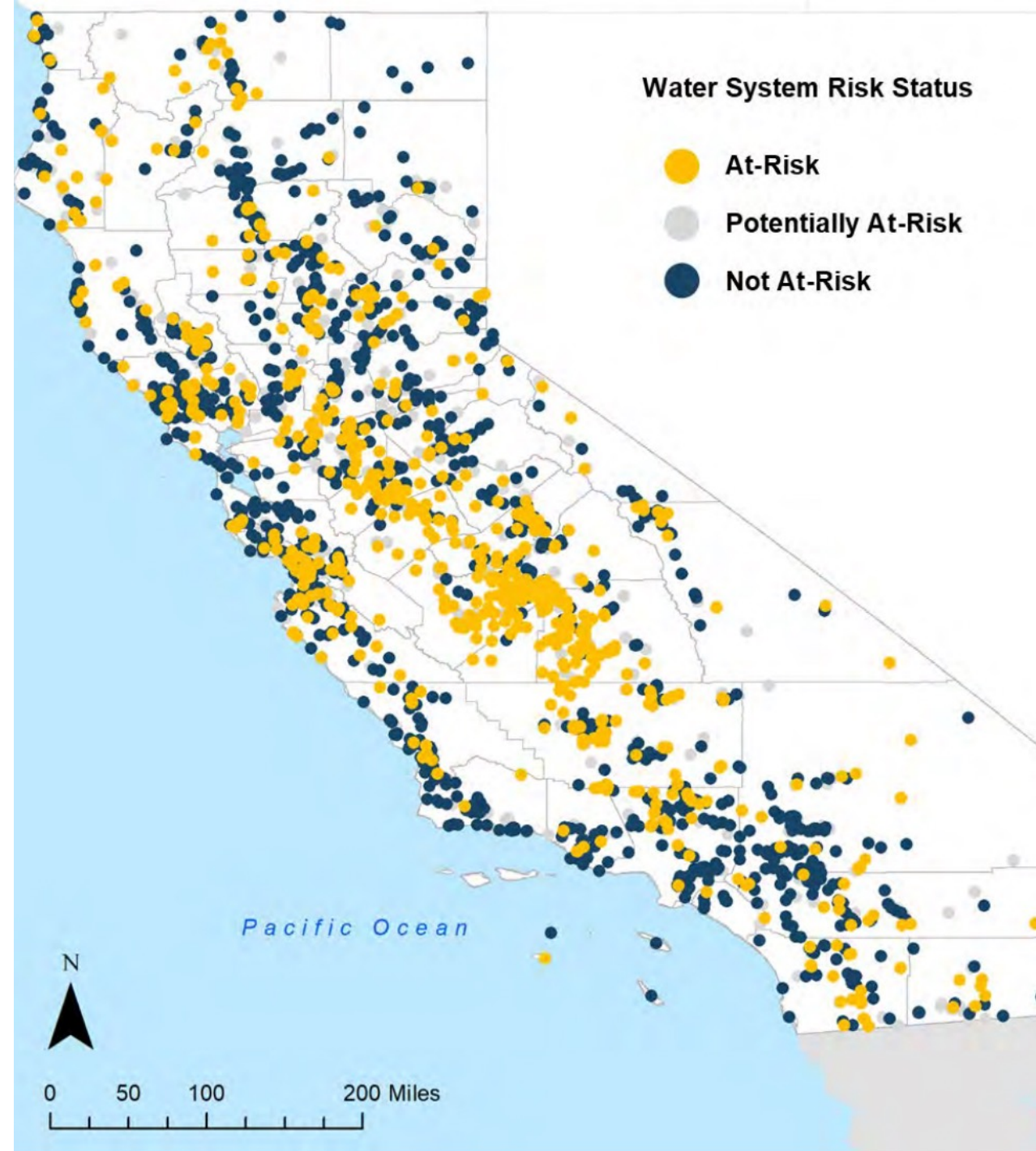




# Failing & At-Risk Systems in California

California State Water Resources Control Board's *2021 Drinking Water Needs' Assessment* found:

- 610 Small Water Systems
- 600+ Public Water Systems
- 80,000 Domestic Wells
- Total Cost to address short-term and long-term costs –
- \$4.5B-\$10.25B



# Climate Change Dwindling Coveted Supply

- *Climate Change in the Sierra Nevada* (UCLA Center for Climate Science, 2018).
  - “Temperatures across the Sierra [could] rise by as much as 10 degrees Fahrenheit”
  - “Warming increases the ratio of rainfall to snowfall, and rain runs off right away”
- *A Low-to-No Snow Future and its Impacts on Water Resources in the Western United States* (Siirila-Woodburn, Rhoades, et. Al, 2021).
  - Predicts, “onset of episodic low- to- no snow ...in California, emerges in the late 2040s”

# Case Study: Tule Sub-Basin Groundwater Sustainability Agency

- One of the first GSAs to implement pumping restrictions with fees
  - Generated \$11M from growers/pumpers
- According to DWR's Household Water Supply Shortage Reporting System, 13 reported failed drinking water wells since 2021
- 13 residents receiving emergency hauled water every 2 weeks through SWRCB-funded program through Self-Help Enterprises.
- \$17,224/household annually (SWRCB DFA)
- Costs associated with deepening domestic wells are upwards of \$30,000

# Multi-Benefits

- Provide GSAs critical information of drinking water wells within their sub-basin
- GSAs lack community engagement – providing drinking water solutions opens a relationship between the agency and beneficial users
- Helps ensure drinking water wells are drilled to minimum thresholds + buffer room for periods of drought
- Access to State Water Resources Control Board and Department of Water Resources grants



# Policy Recommendations

- State Water Resources Control Board should recover costs from fee revenues generated by GSAs
- Fee per each drinking water well failed because of lowered groundwater table within the GSA's purview
- Fees should offset cost of providing emergency bottled water supplies and cost of bringing drinking water wells back into operation