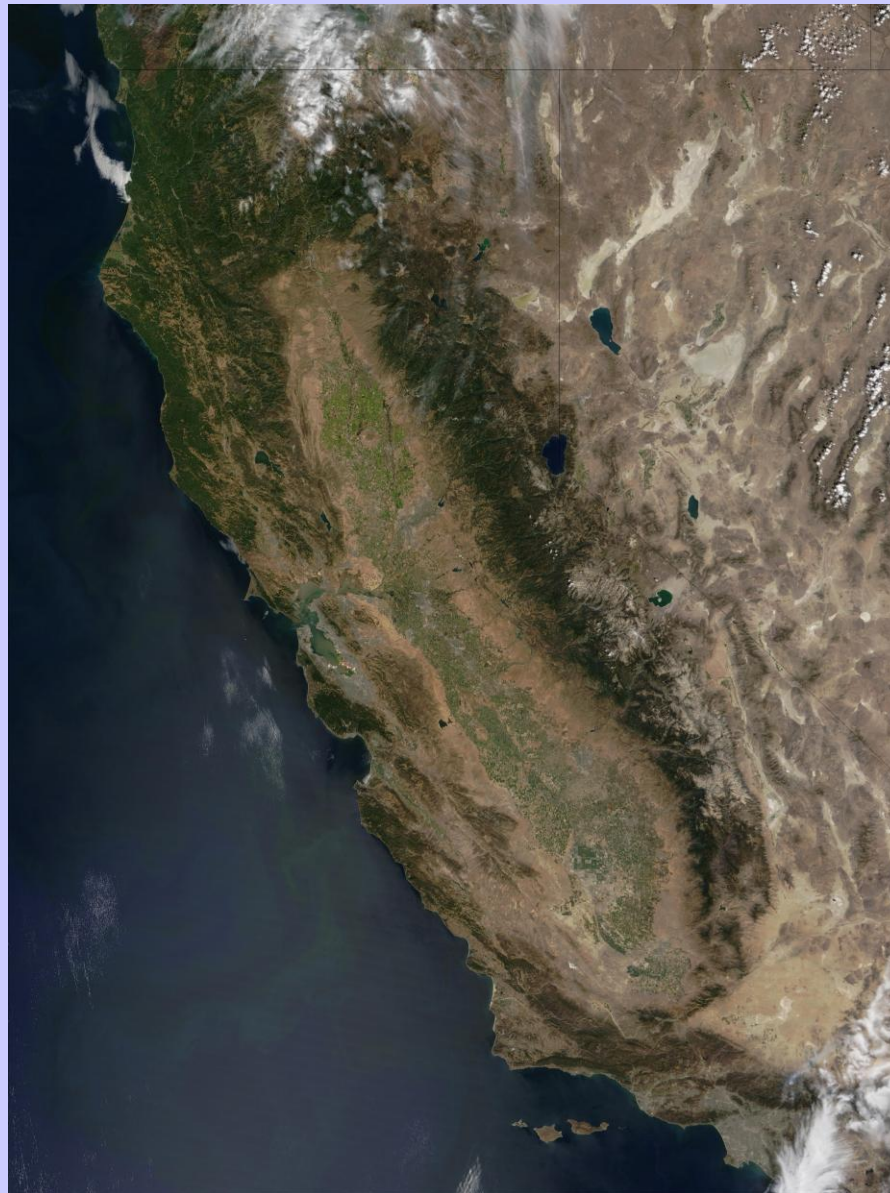




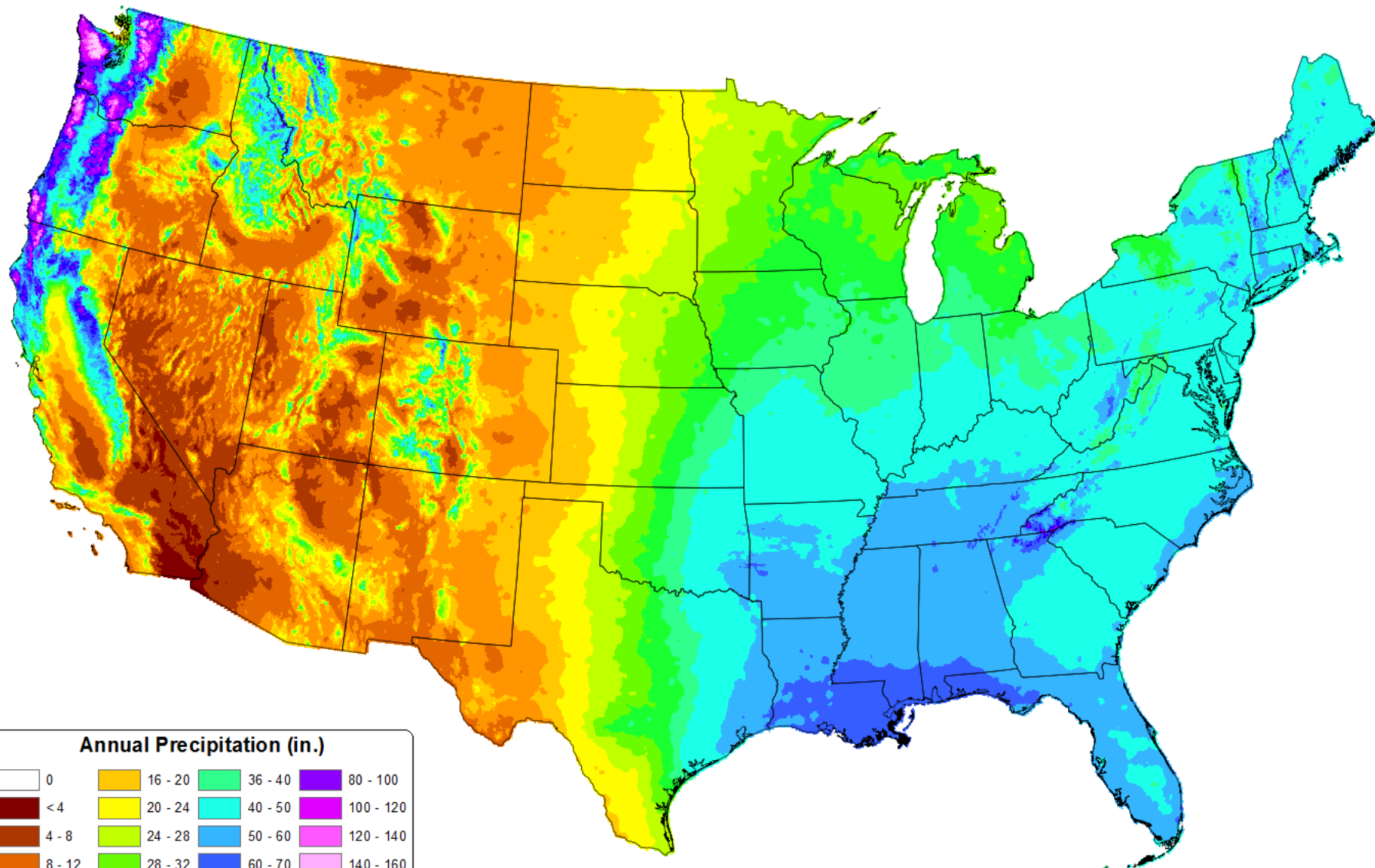
CALIFORNIA GROUNDWATER MANAGEMENT

Jeanine Jones, California Department of Water Resources



30-yr Normal Precipitation: Annual

Period: 1981-2010



Annual Precipitation (in.)

0	16 - 20	36 - 40	80 - 100
< 4	20 - 24	40 - 50	100 - 120
4 - 8	24 - 28	50 - 60	120 - 140
8 - 12	28 - 32	60 - 70	140 - 160
12 - 16	32 - 36	70 - 80	> 160

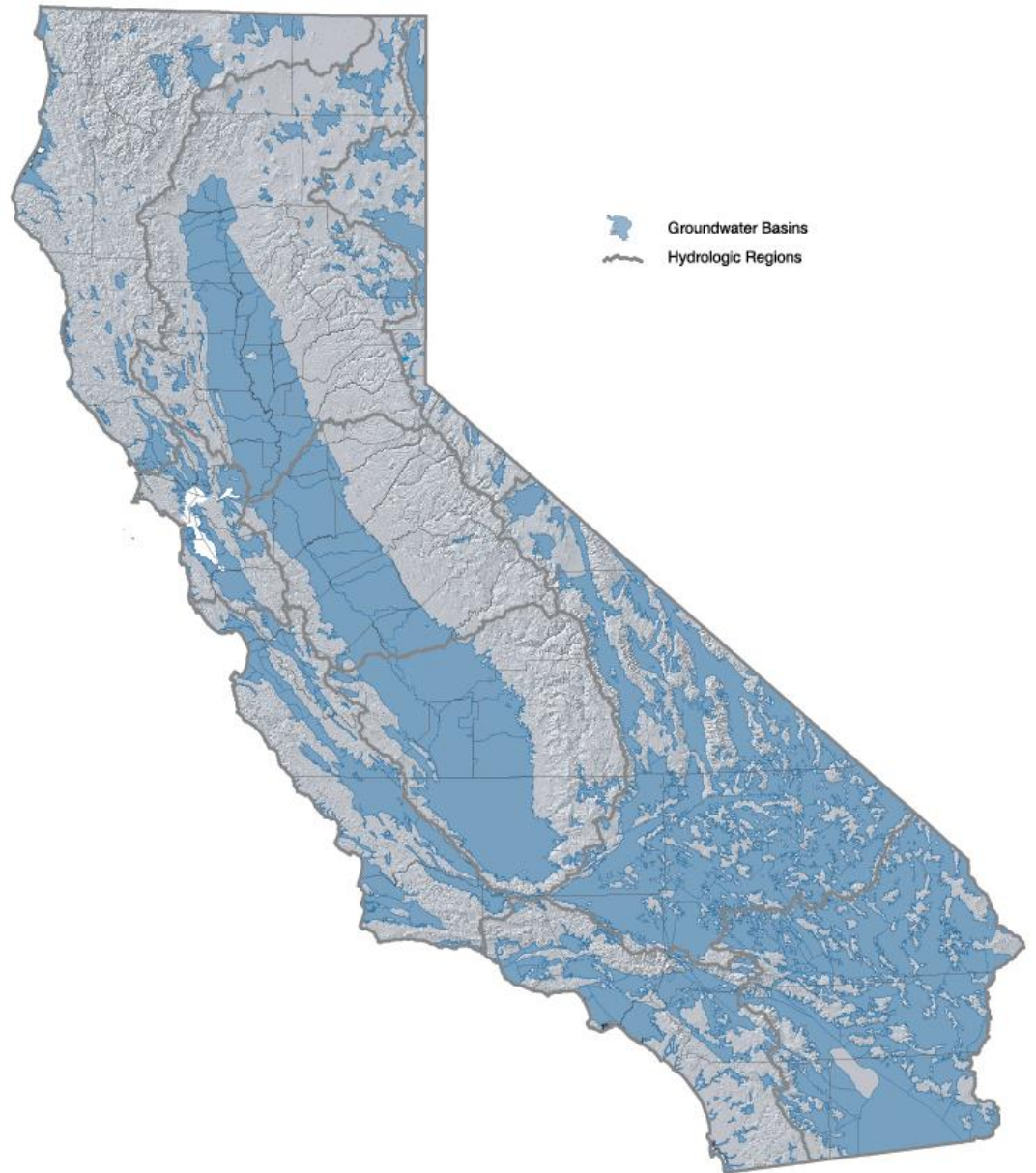
California Hydrology

- Average annual runoff from precipitation falling on California is 71 MAF
- Average annual surface water supplies are the 71 MAF of in-state runoff plus 7 MAF from flows in interstate rivers, for a total of 78 MAF
- More than 70% of the surface runoff occurs in Northern California, while more than 70% of the needs for water occur in Southern California



**Groundwater
supplies about
40% of California
water use in
average years,
60% in drought
years**

**DWR has
delineated 515
basins**



Regulatory Background

- 1914: present system of state surface water regulation enacted
- Subsequently: small number of groundwater basins with mandatory local management created through locally-driven court adjudications or special act local districts
- Late 20th century: minor state legislation authorizing generic local groundwater management enacted
- 2014: Sustainable Groundwater Management Act (SGMA) enacted, requiring mandatory local groundwater management in designated basins

SGMA Statutory Timeline, 1 of 3

- Enacted 2014, takes effect Jan 1, 2015
- Jan 31, 2015 – DWR must set initial basin prioritization
- Jan 1, 2016 – DWR must adopt emergency regs for basin boundary revisions
- June 1, 2016, DWR must adopt emergency regs for evaluating Groundwater Sustainability Plans (GSPs)
- December 31, 2016 – DWR must publish estimate of water available for groundwater recharge

SGMA Statutory Timeline, 2 of 3

- Jan 1, 2017 – Medium & high priority basins must submit alternatives to a Groundwater Sustainability Plan (GSP) if applicable to DWR
- Jan 1, 2017 – DWR must publish BMPs for groundwater management
- June 30, 2017 – Local agencies must have formed a GSA for entire basin
- Jan 31, 2020 – Critically overdrafted basins must submit GSPs to DWR
- January 31, 2022 – All remaining basins must submit GSPs to DWR

SGMA Statutory Timeline, 3 of 3

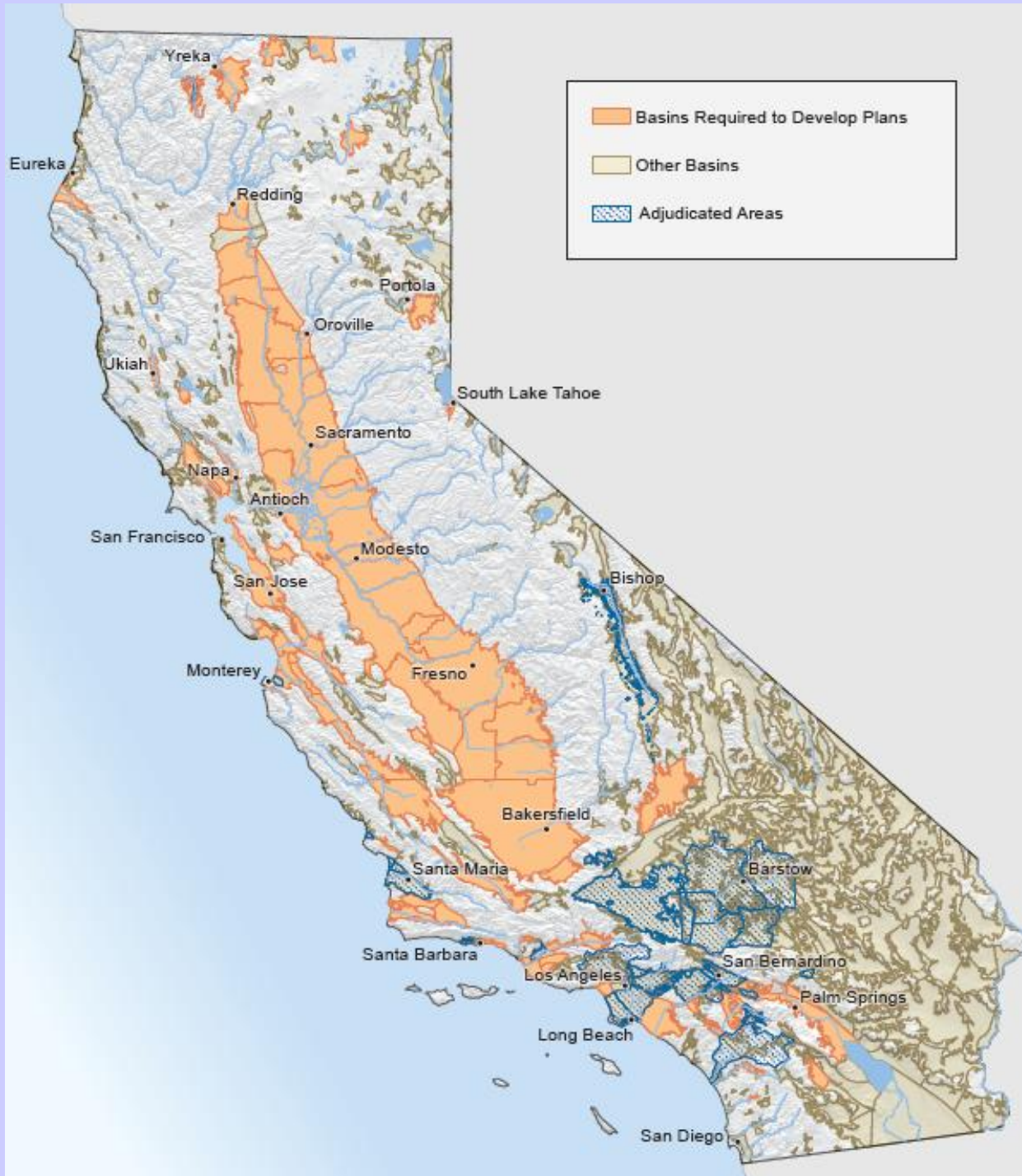
- Jan 31, 2022-Jan 31, 2024 -- DWR must issue an assessment of each GSP within 2 years of submission
- Jan 31, 2040-Jan 31, 2042 – Basins have 20 years to achieve sustainability (must meet progress objectives at 5-year check-ins). (Annual reports are also required)

Enforcement

- Where DWR finds a GSP incomplete/inadequate, it is returned to the GSA for correction
- Plans not adequately corrected are referred to SWRCB for action. SWRCB may designate a basin as probationary and impose an interim plan

SGMA Statistics

- 94 of California's 515 groundwater basins subject to SGMA management requirements, accounting for more than 95 percent of state groundwater use.
- 20 of the 94 basins are designated as critically overdrafted.
- More than 250 GSAs formed
- All basins met the 2017 deadline to submit GSPs.
- DWR has reviewed all submitted GSPs, most were approved, some designated incomplete/inadequate, referrals made to SWRCB for inadequate ones.
- SWRCB beginning probationary hearings, placed 2 basins on probation in 2024.



SGMA's "Six Sins"

- Significant/unreasonable:
 - Declines in groundwater levels
 - Reductions in groundwater storage
 - Saltwater intrusion
 - Water quality degradation
 - Land subsidence
 - Surface water depletion

Reflections on Submitted GSPs

- Everybody likes recharge!
- Challenges for GSPs, especially in Central Valley
 - Setting future acceptable water levels
 - Land subsidence
 - Dewatering private residential wells/establishing local agency dry well programs

Recharge Background

- California's earliest recharge projects began in the 1910s. Large-scale banking (1 MAF projects) began in the 1970s-80s in the San Joaquin Valley
- Recharge projects are very common. DWR has provided \$100sM grant funding for them.
- Post-SGMA, big push for FloodMAR and temporary recharge permits/projects

Rio Hondo, LA County



Windy Point, Coachella Valley



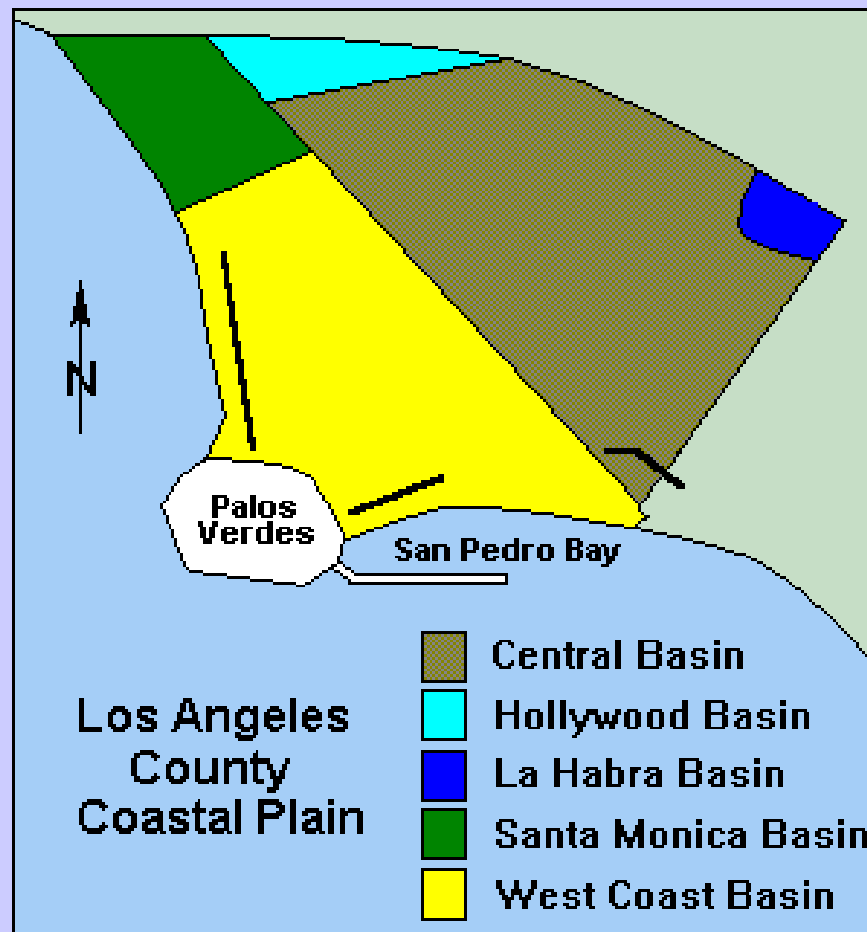
Orange County WD



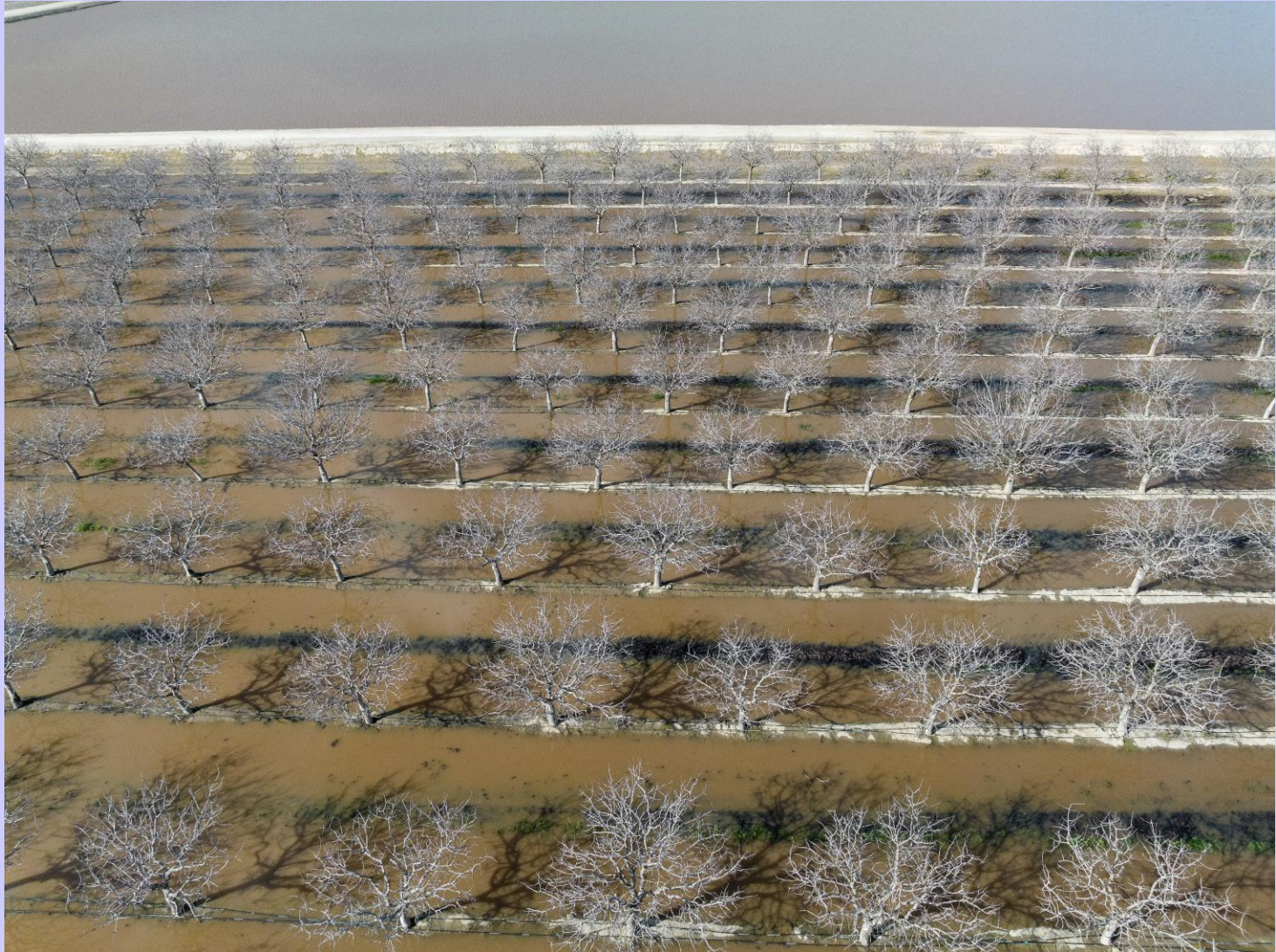
Semitropic WSD



WSWC Fall Meeting in CA – Fieldtrip Includes Seawater Injection Barrier



FloodMAR





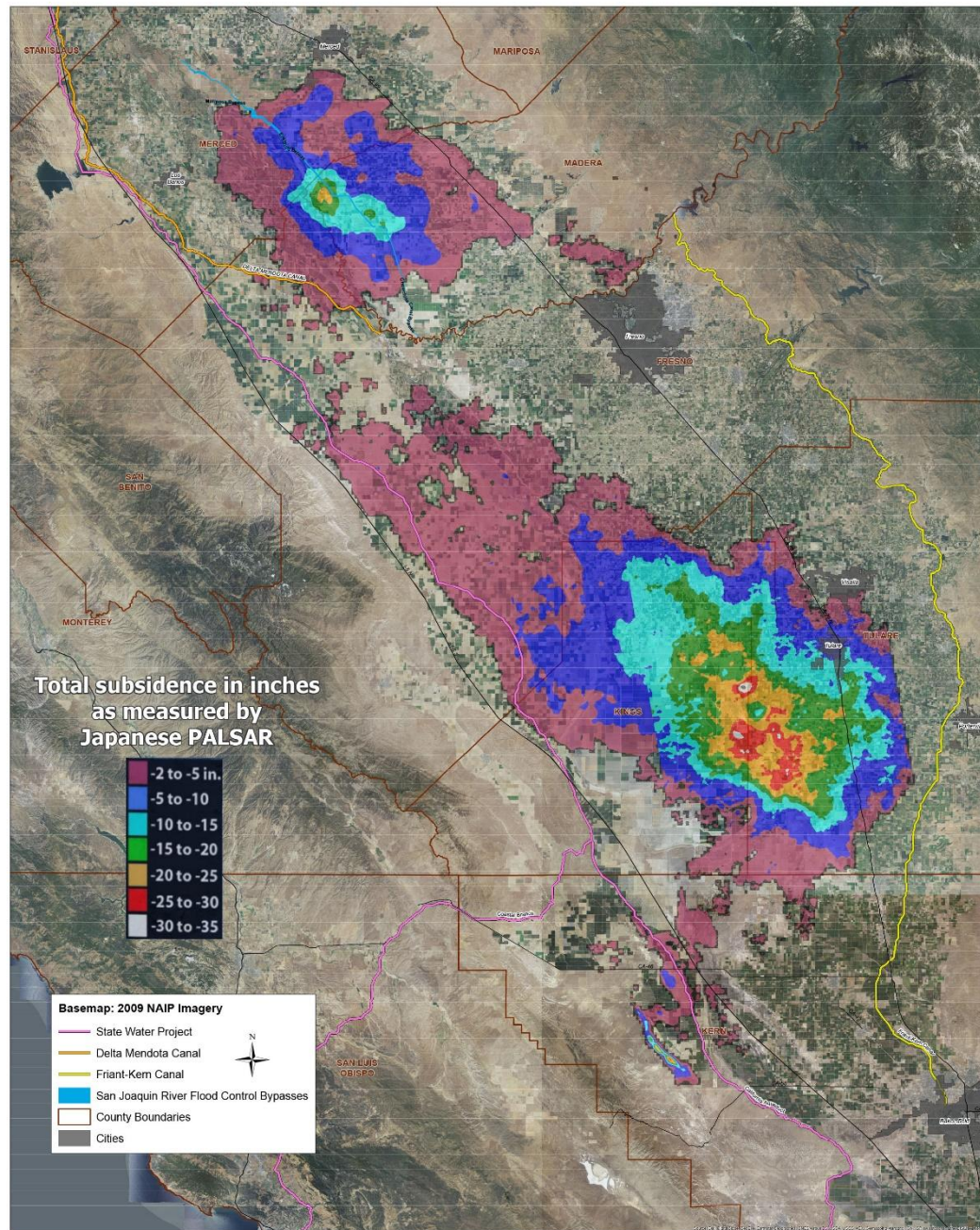
Temporary diversion equipment provided by CDWR is deployed by Fresno Irrigation District to divert excess water from Kings River to reduce flood risk and expand groundwater recharge

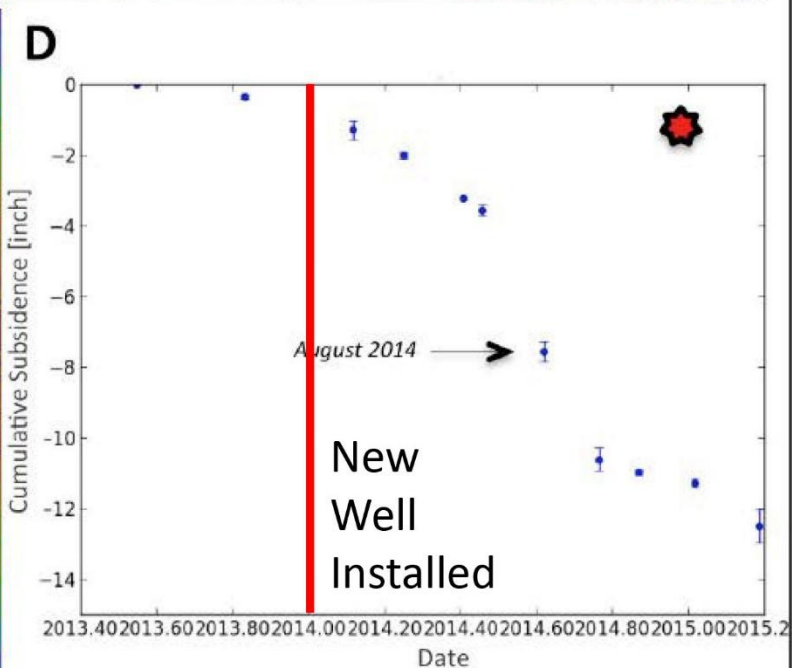
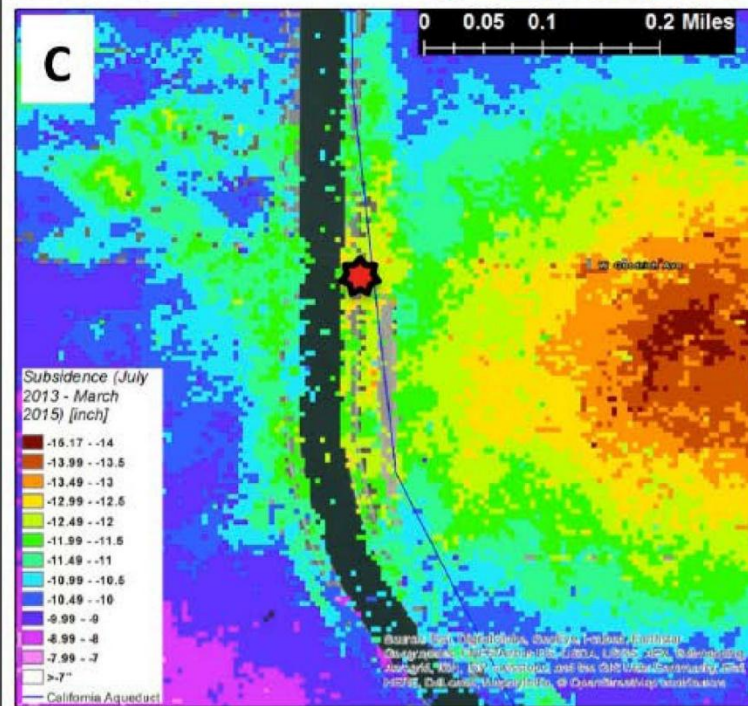
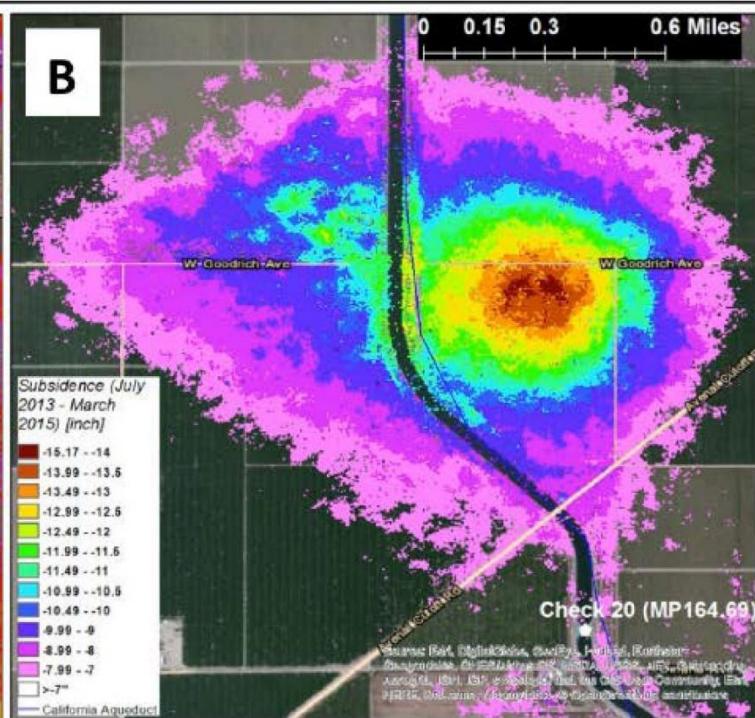
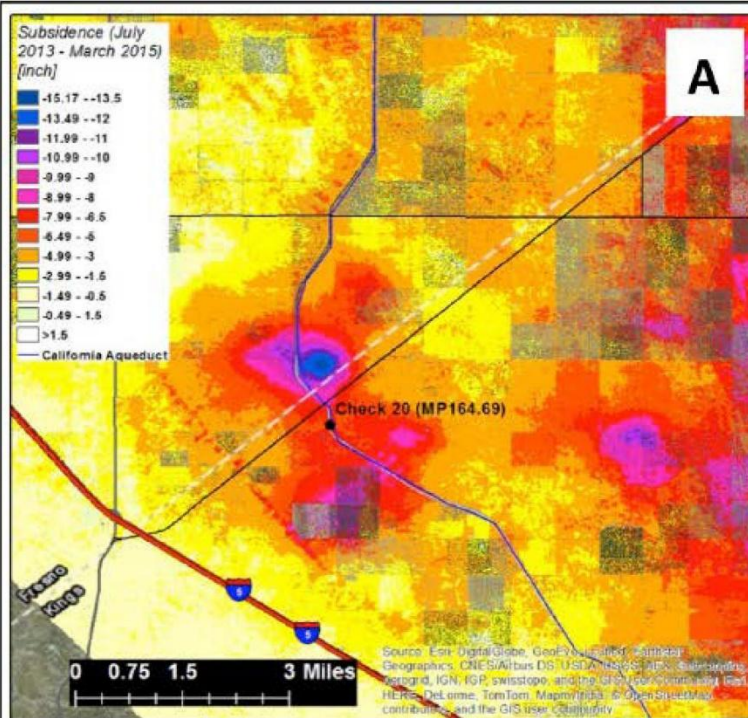
Land Subsidence Background

- Long history of subsidence due to groundwater extraction
- Observed in San Joaquin Valley (SJV) since 1920s; considered in design of largest water supply projects. Observed in South Bay (San Jose) area circa 1930s, along with seawater intrusion.
- SJV subsidence was uncontrolled until SGMA enactment provided tools, \$100sM of damage to major water supply and flood control infrastructure.
- SJV subsidence in California droughts helped enactment of SGMA.

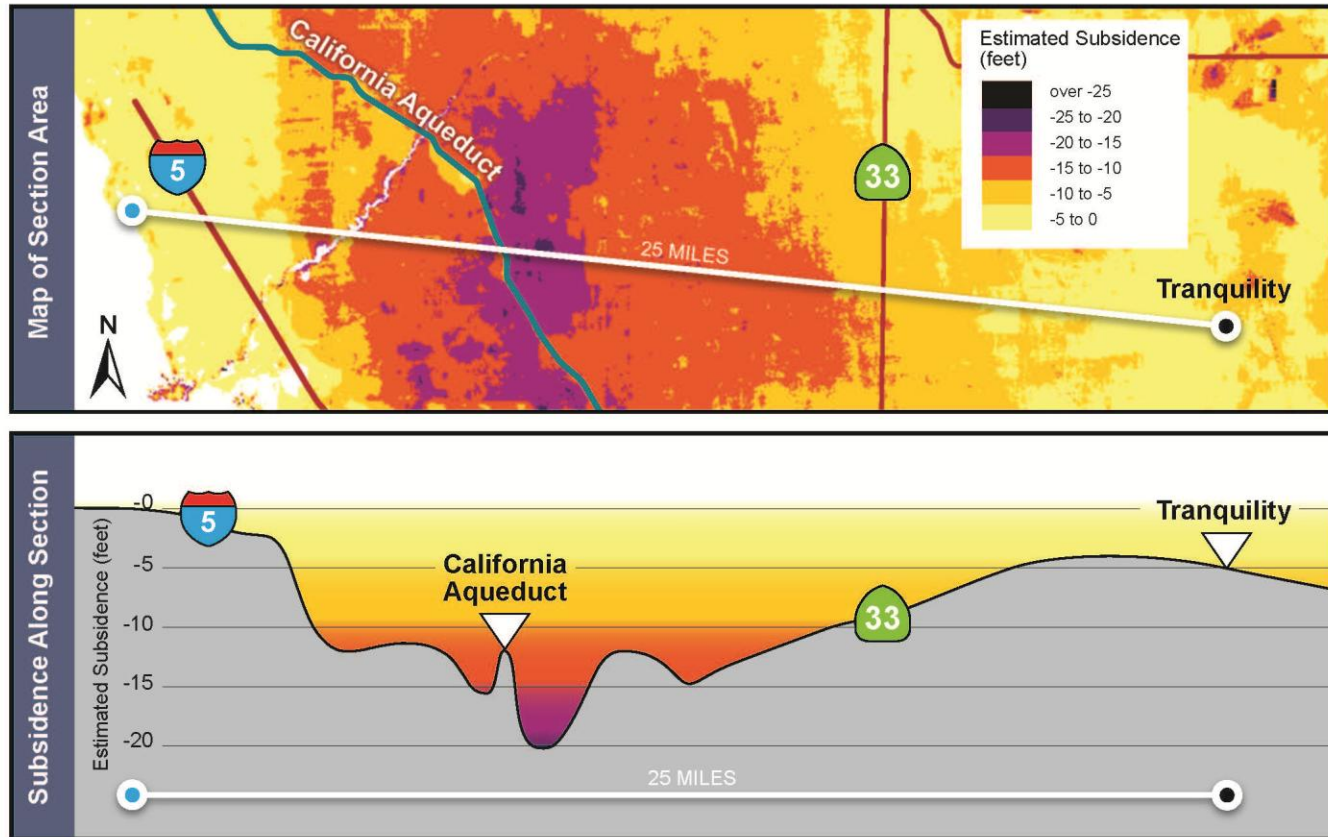
San Joaquin Valley Subsidence

June 2007 to December 2010





Estimated Historical Subsidence from 1949 - 2005, cross-section from I-5 to Tranquility



Note: Construction of these portions of the Aqueduct and of Interstate 5 was completed in 1967 and 1972, respectively.

Subsidence – con't.

- DWR's use of InSAR for large-scale subsidence monitoring in the 2012-16 drought was a game-changer; DWR continues to use InSAR to support SGMA compliance.
- In the 2020-2022 drought subsidence continued unabated at historical high rates (~1 ft per year) in critically overdrafted basins

SGMA \$\$\$

- State has spent almost \$1B for SGMA implementation over past 10 years, more than \$500M of that in DWR grants to local agencies for planning and implementation.
- SGMA funding has provided major increase for DWR groundwater data funding, including drilling monitoring wells, InSAR data acquisition, other geophysical data collection

