

Salt Management in the San Joaquin Valley

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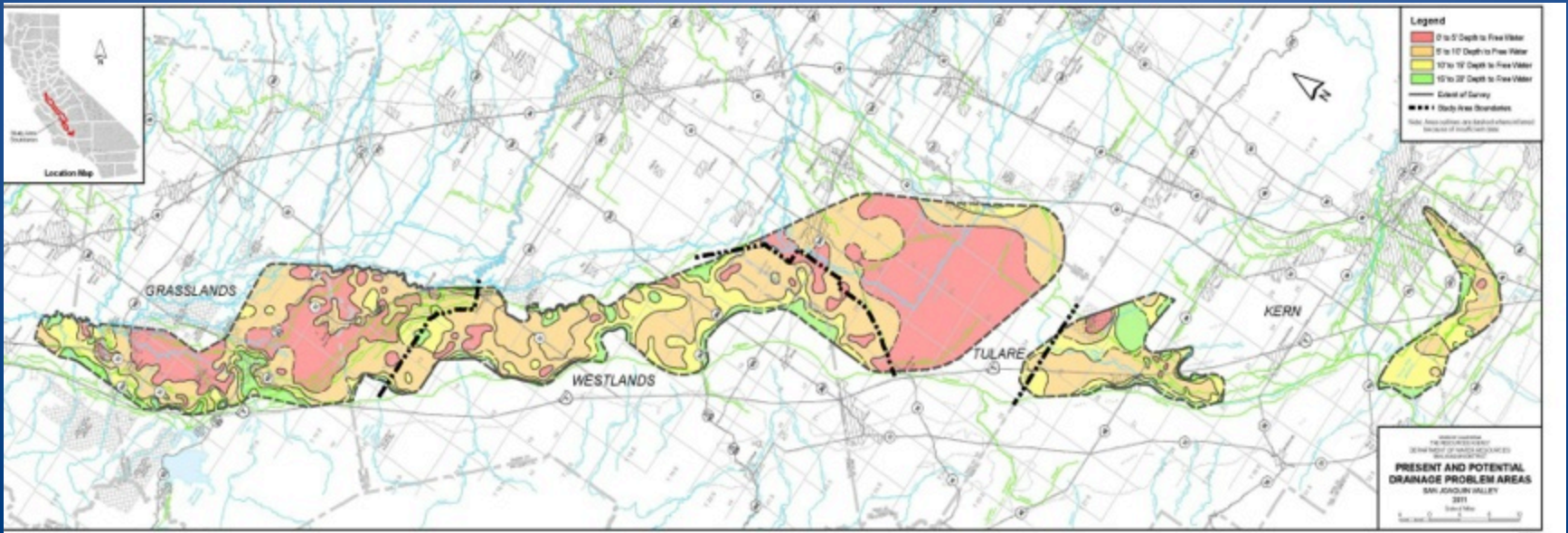
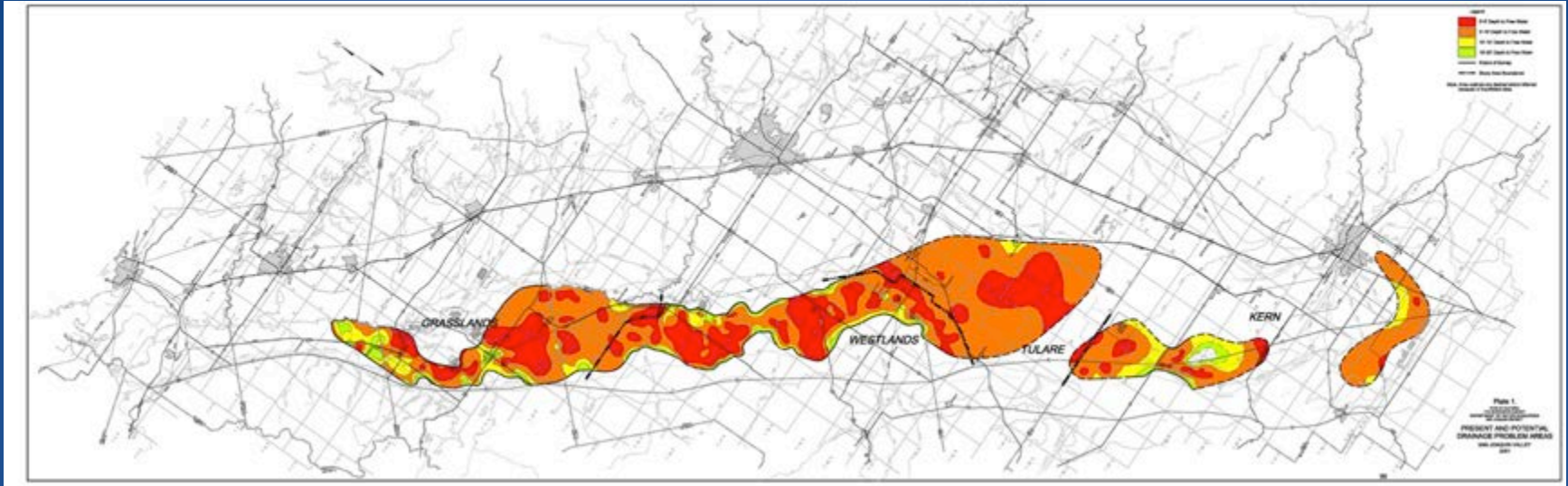
Regional Activities

- Regional water conditions
- Regional technical solutions in progress and proposed
- Regional policy issues and regulatory activities under way

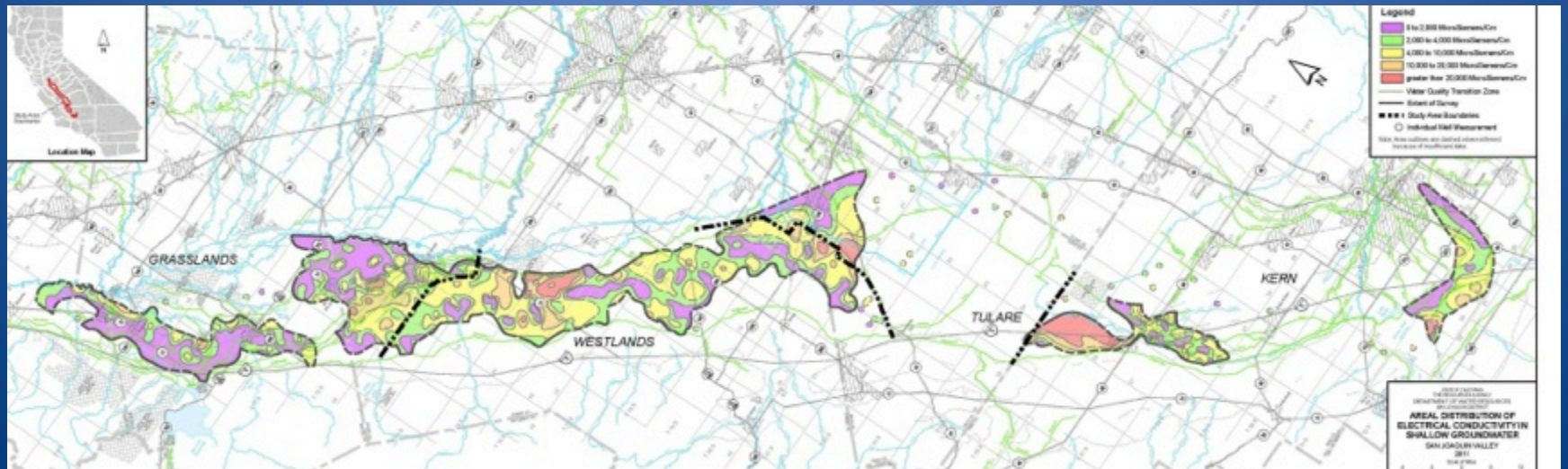
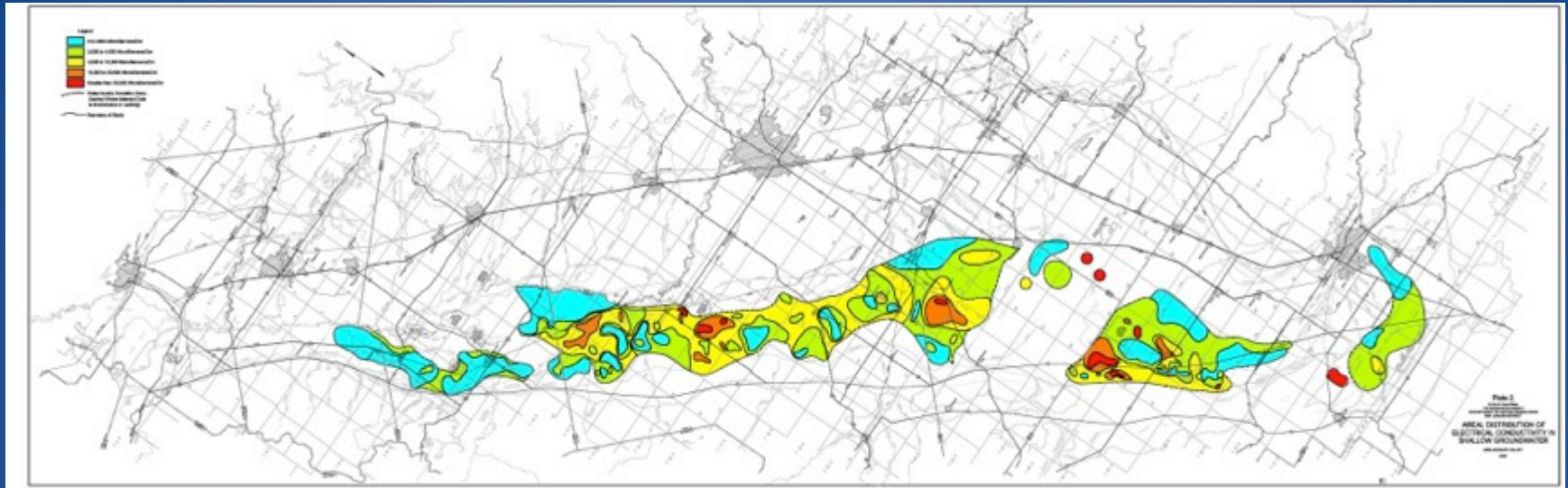
Regional Water Conditions

- Traditional agricultural shallow water table area has shrunk substantially
 - Land retirement and precision water application are the major changes
- Difficult water quality conditions in some areas include selenium, arsenic and uranium
- Nitrogen is now a major issue in many groundwater areas of the Valley
 - Drinking water impairments are extent

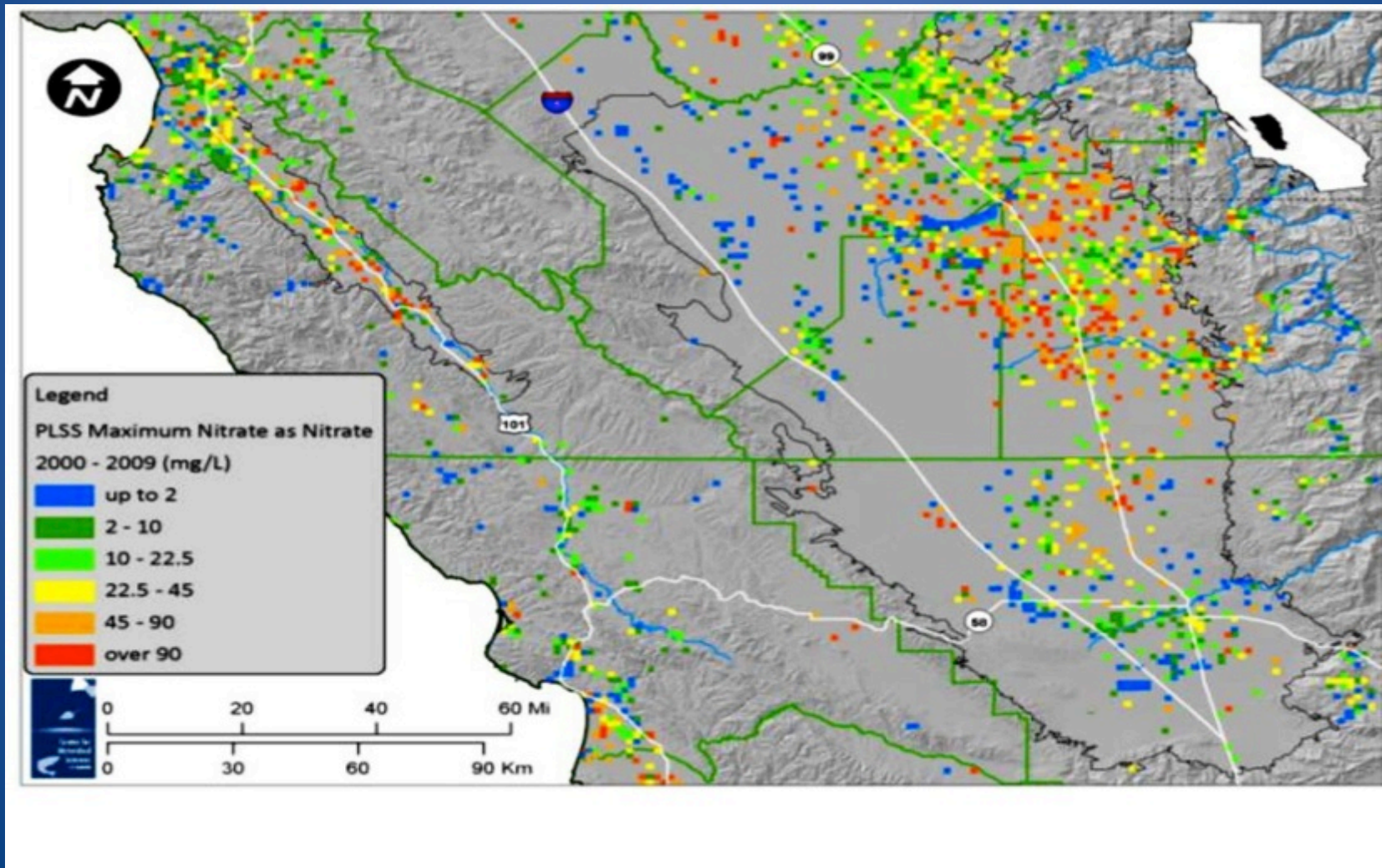
Depth 2001 vs. 2011



Salinity 2001 vs. 2011



Nitrates, from Harter et al



Groundwater System

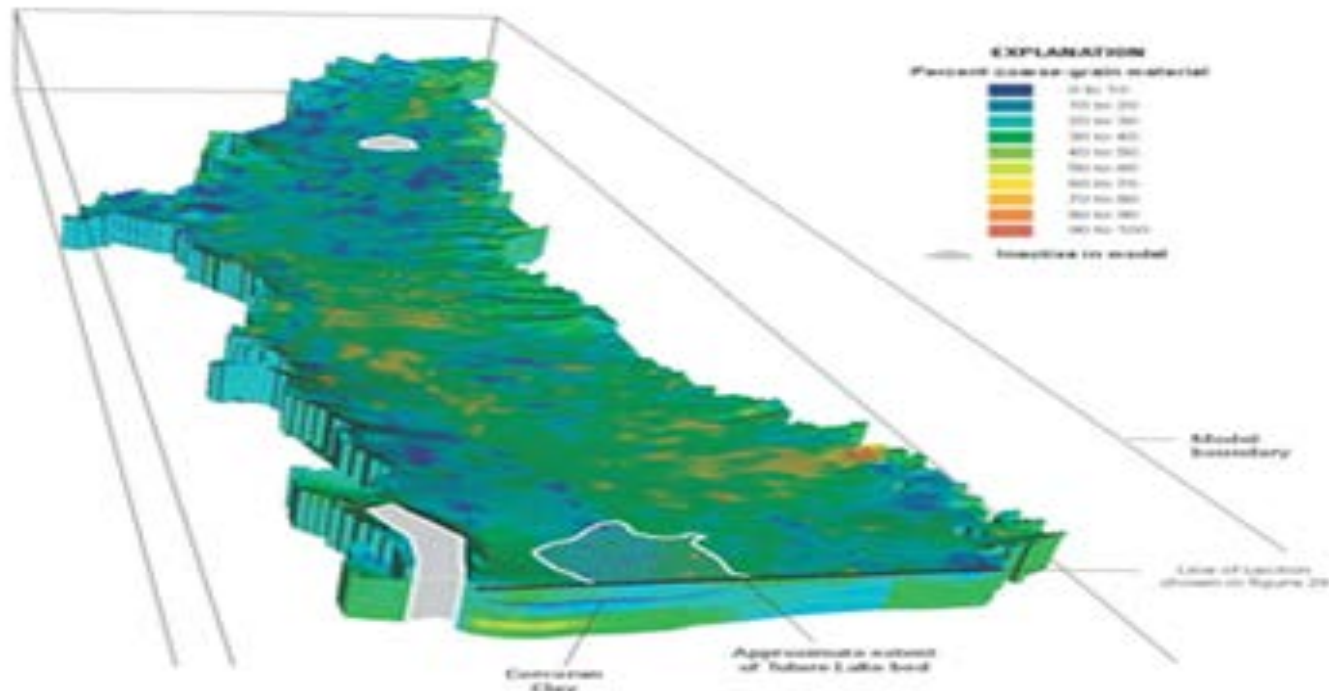


Figure 30. Block diagram of fracture model for the Central Valley aquifer from Claudia C. Faust, U.S. Geological Survey, written consultation, 2007.

Regional Technical Solutions

- Numerous salt and nitrate management systems are active or being tested
- The range includes:
 - RO, distillation, distillation w/membranes, ix, biological (NO_3), and selective membrane re-formulation
 - Recycling and reuse are increasing as well
 - Improved recharge strategies could be employed

Technologies

- UCLA RO – computer control system to optimize treatment and costs
- Panoche – USBR selenium and RO
- Panoche – solar distillation
- Red Rock – distillation
- Lost Hills Water District – IFDM
- Andrews Ag – IFDM
- New Jerusalem – reuse, IFDM, treatment?

Technologies, cont'd

- New Sky – separation membrane
- MemSys – vacuum, distillation, membrane
- Cogenra – solar PV and thermal combined for energy sources
- Solar PV is becoming huge, targeting westside especially poor quality land

Panoche Projects

Panoche Drainage District

Desalination Plant Pilot Project

Complementary to the efforts of the Grassland Bypass Project (GBP), Panoche Drainage District (PDD) is in process of constructing a pilot scale water treatment facility. The pilot plant will test the efficiency of collecting solar heat to evaporate and condense drain water to determine if it will be a viable, cost-effective method for desalination and reuse.



RECLAMATION

Managing Water in the West



Workers begin construction of a pilot plant that will treat agricultural drainwater.

Reclamation Builds Plant to Test Selenium Removal from Irrigation Drainage in West San Joaquin Valley

Industrial DeSal

The Tracy Musco Desalinization Project



CST – “Steamboy”

Regional Policy Considerations

- IFDM – available for farm drainage or Districts
- CV-Salts – considering de-designation of MUN in qualified Valley areas
- Export
- Residuals Management

San Joaquin Valley Summary

- Shallow farm drainage water is likely to continue to decrease
- Nitrates can be treated or displaced (recharge and better nitrogen management), treatment is unaffordable for some small communities
- Deeper moderately saline groundwater (2500 TDS?) is now becoming a viable water supply alternative if brackish water treatment and salt product development and/or disposal costs can continue to be driven lower

San Joaquin Valley Summary

- Investments in technology will continue
 - Treatment options will strive for cost effective strategies that will encompass energy costs to residuals management
 - Agricultural crop tolerance will also be a technology investment, new cultivars or new crops will be developed to adapt to existing salt levels
 - Small drinking water systems will be an especially large challenge in the Valley = “affordability”