





Coastal Salinas Valley Seawater Intrusion Program and Update



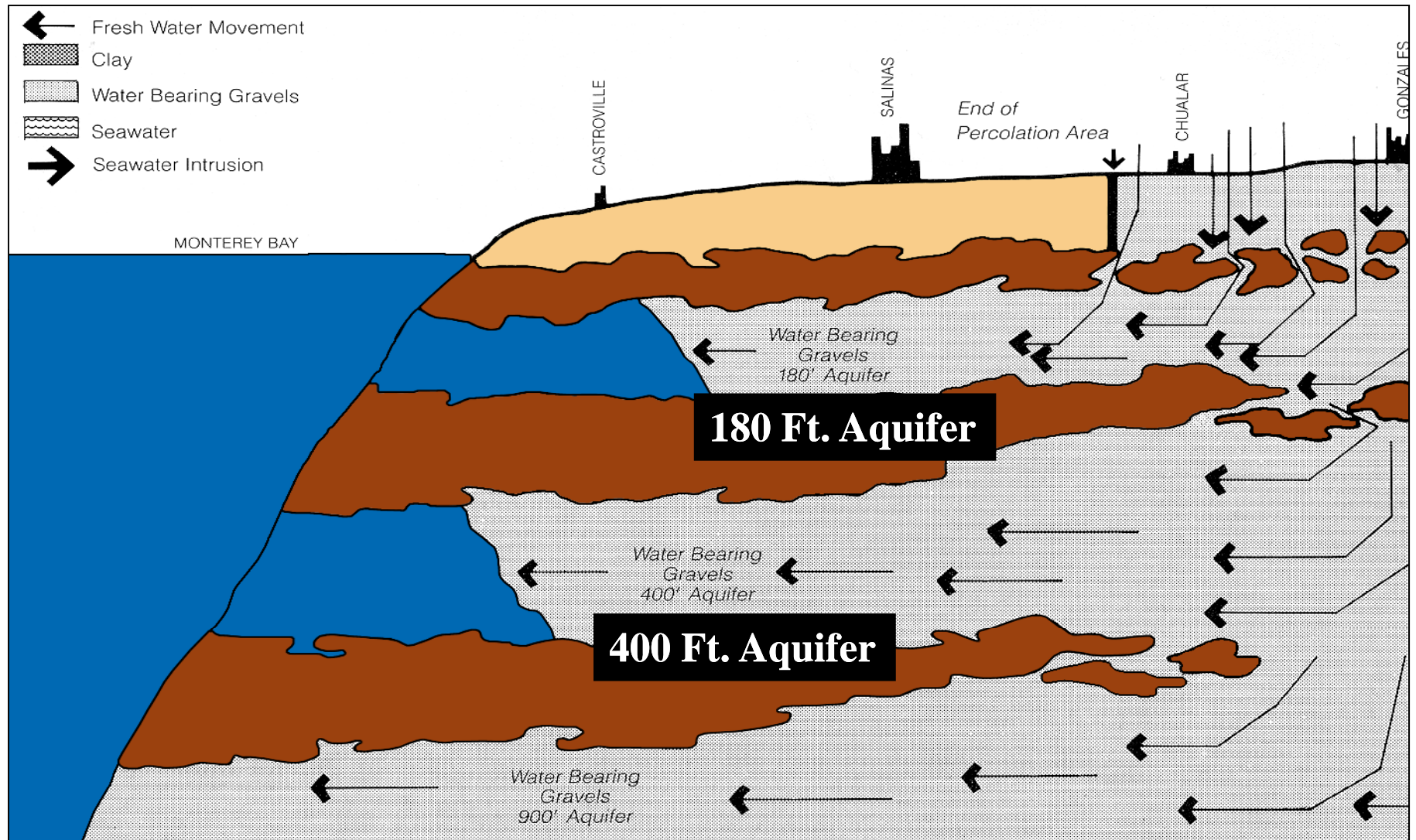


Today's Presentation

- How Seawater Intrusion (SWI) Works
- Agency Projects to Combat SWI
- Coastal Monitoring Program
- 2011 SWI Front Maps
- Questions



Cross Section Near the Coast





Projects to Combat Seawater Intrusion

- Nacimiento Dam (1957)
- San Antonio Dam (1965)
- Castroville Seawater Intrusion Project (CSIP) & SVRP (1997)
 - Recycled water is delivered to intruded areas to reduce ground water pumping
 - Water delivered averages 13,000 acre-feet per year
- Salinas Valley Water Project (SVWP) (2010)
 - Nacimiento Spillway Modification
 - Salinas River Diversion Facility (SRDF)





Lake Nacimiento



- Completed in 1957
- Lake Capacity 377,900 AF





Lake San Antonio



- Completed in 1965
- Lake Capacity 335,000 AF

CSIP & SVRP



- Completed 1997
- Average Delivery – 13,000 AF/Yr



Salinas Valley Water Project



- Nacimiento Spillway Modification
- Salinas River Diversion Facility



Seawater Intrusion Data Monitoring

- Ground Water Wells
 - Sampled annually during peak pumping
 - 90 Agricultural wells sampled 2-3 times
 - 17 Dedicated monitoring wells sampled
 - Analyzed for General Minerals



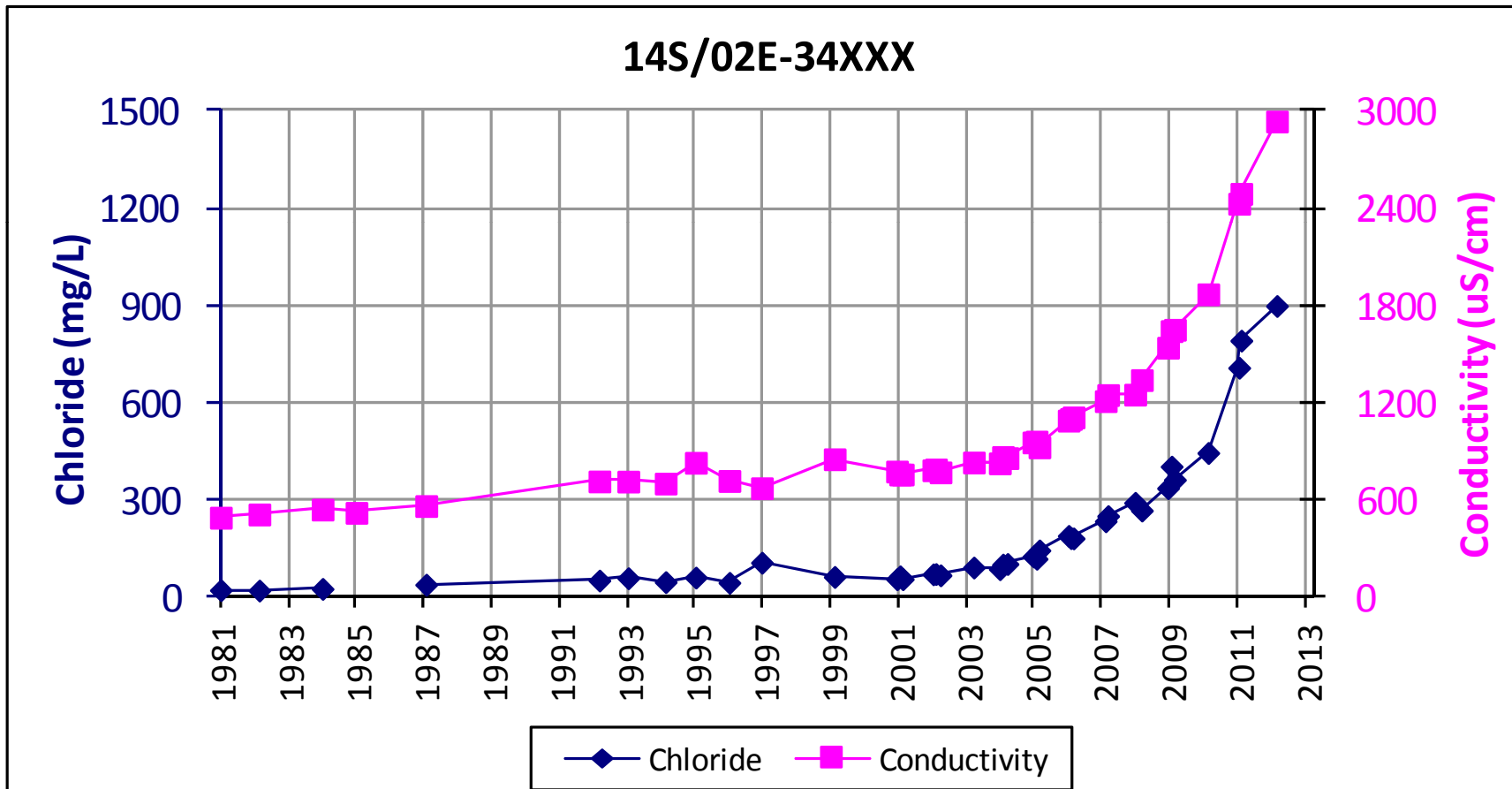


Seawater Intrusion Data (cont.)

- Data Evaluation
 - Historical Chloride & Conductivity Trends
 - Stiff and Piper Diagrams
 - Anion / Cation Shifts
- Data Development Process
 - Water quality
 - Well construction
 - Well pumping
 - Ground water level contours



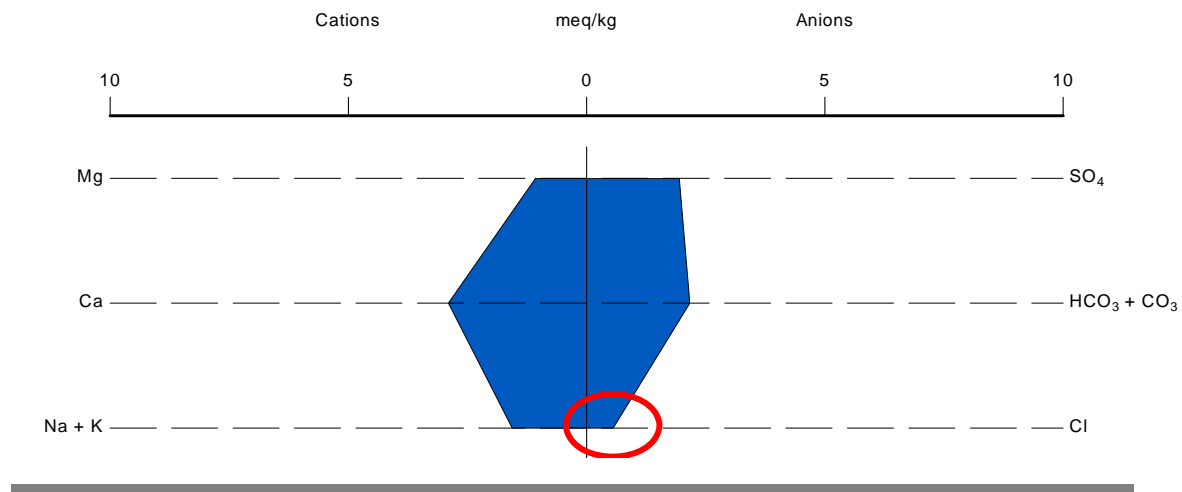
Chloride & Conductivity Time Series Indicating Intrusion



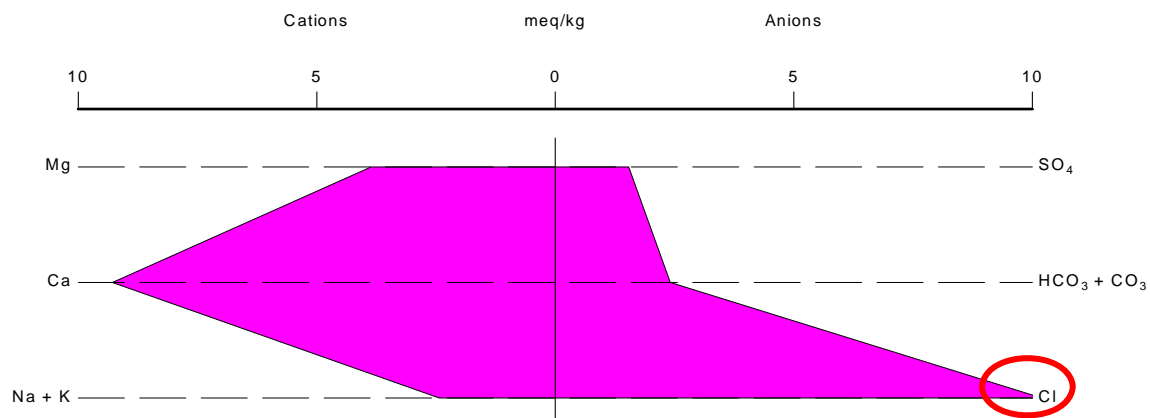


Stiff Diagrams

No Intrusion - 1982

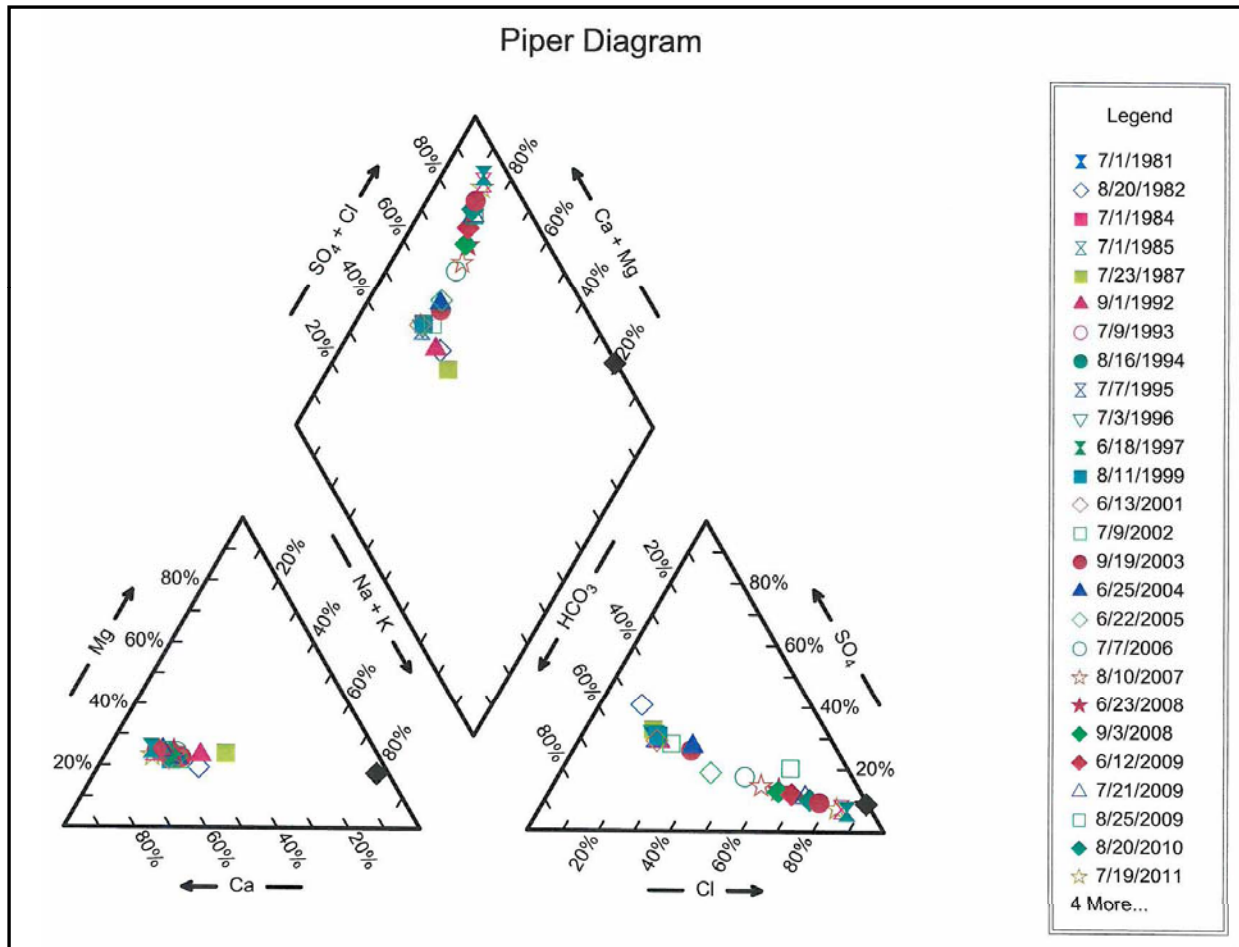


Early Intrusion - 2009

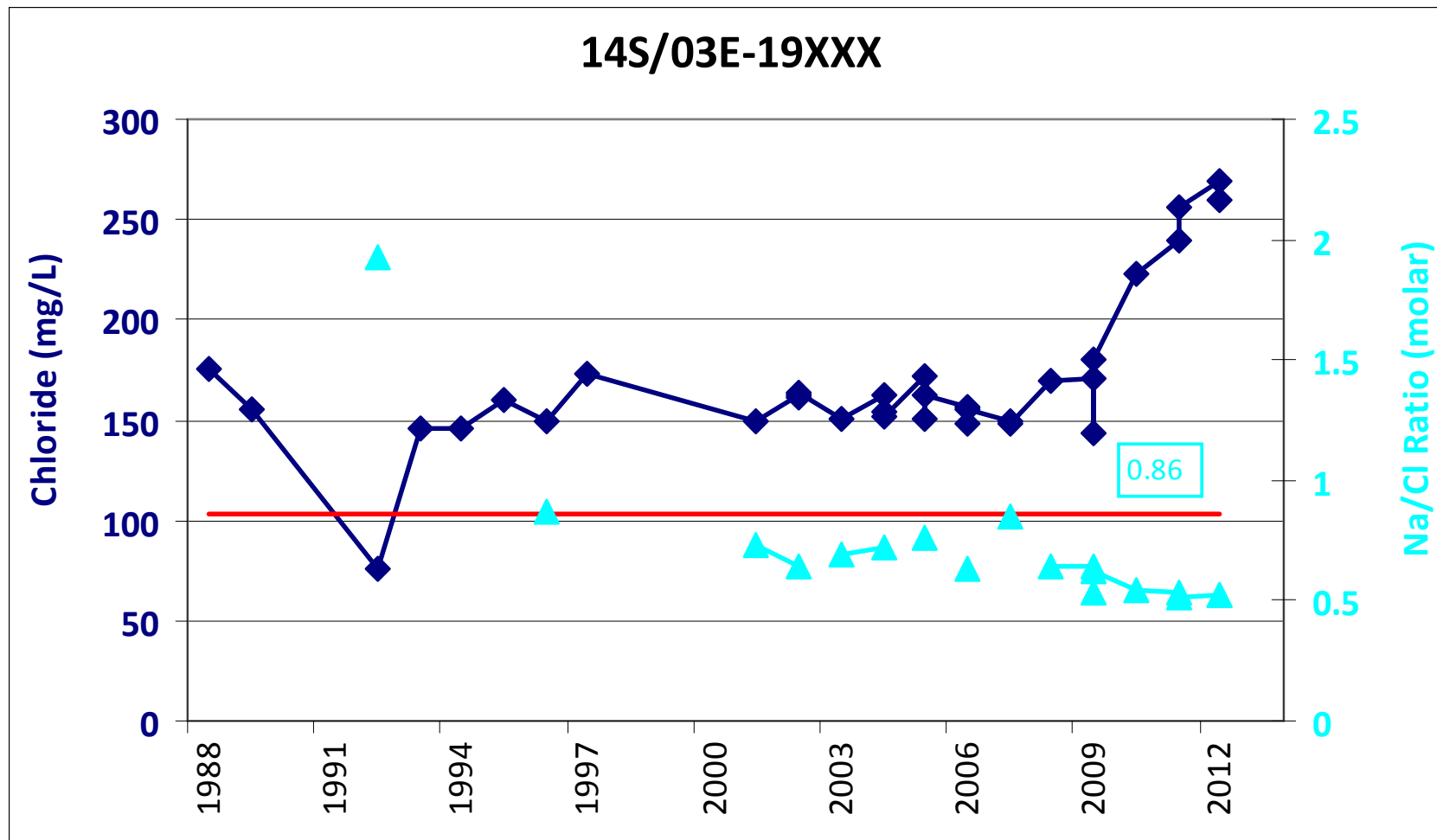


Piper Diagram

Indicating Phase-I Intrusion



Chloride vs. Na/Cl Molar Ratio



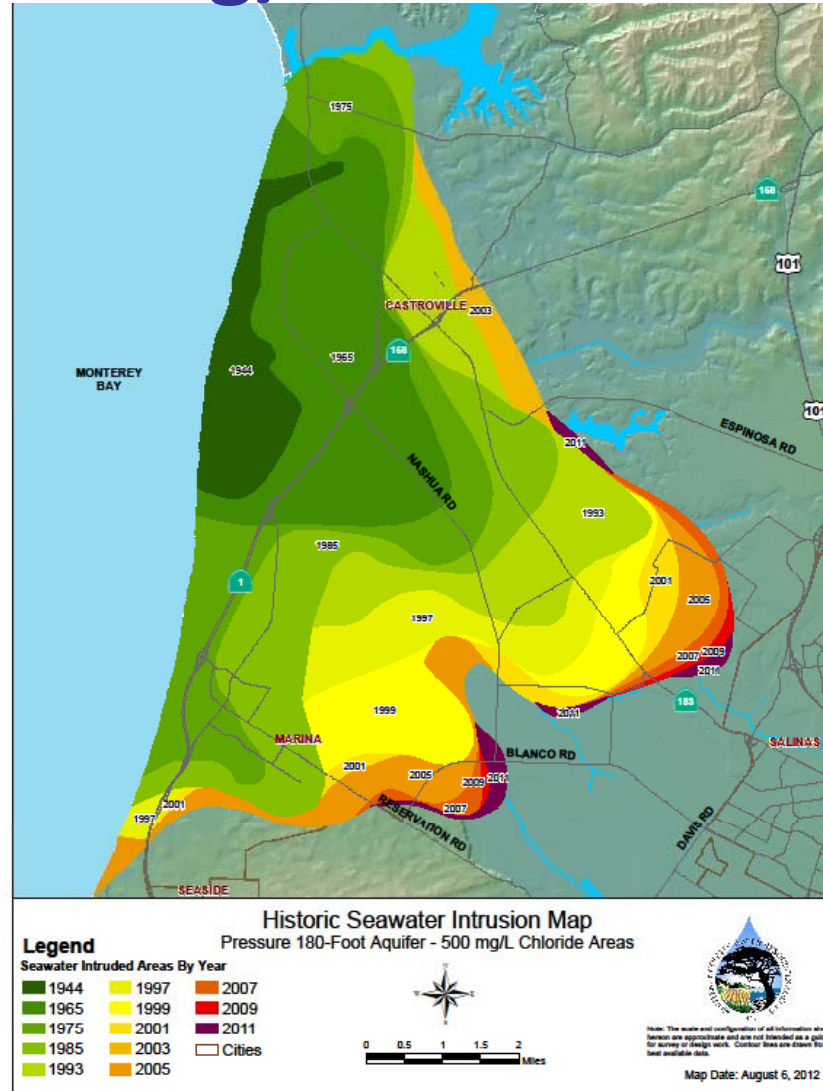


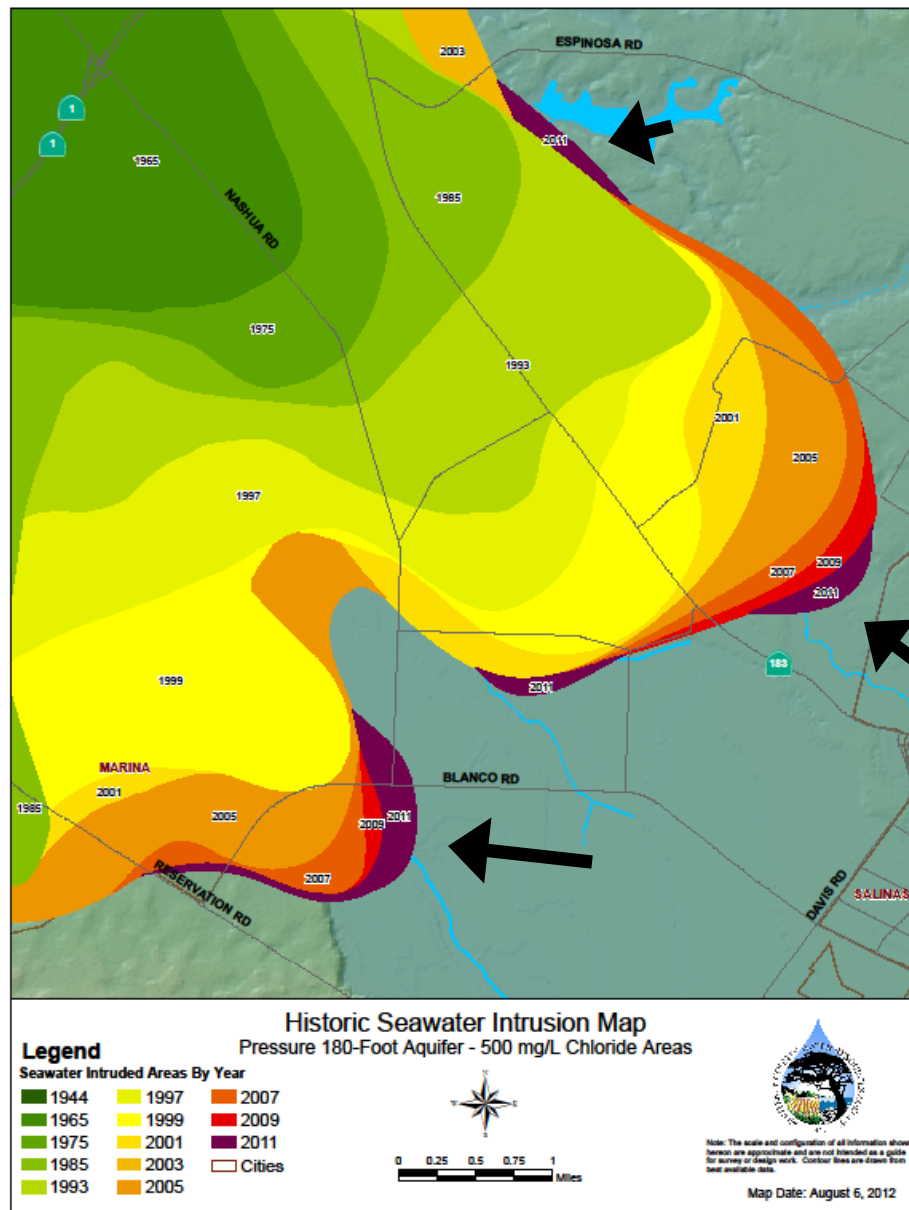
Seawater Intrusion Data (cont.)

- Lab Results are Evaluated & Uploaded into WRAIMS database annually
- 500 mg/L Contours are Developed from the Odd Year Data & Added to the Historic SWI Maps

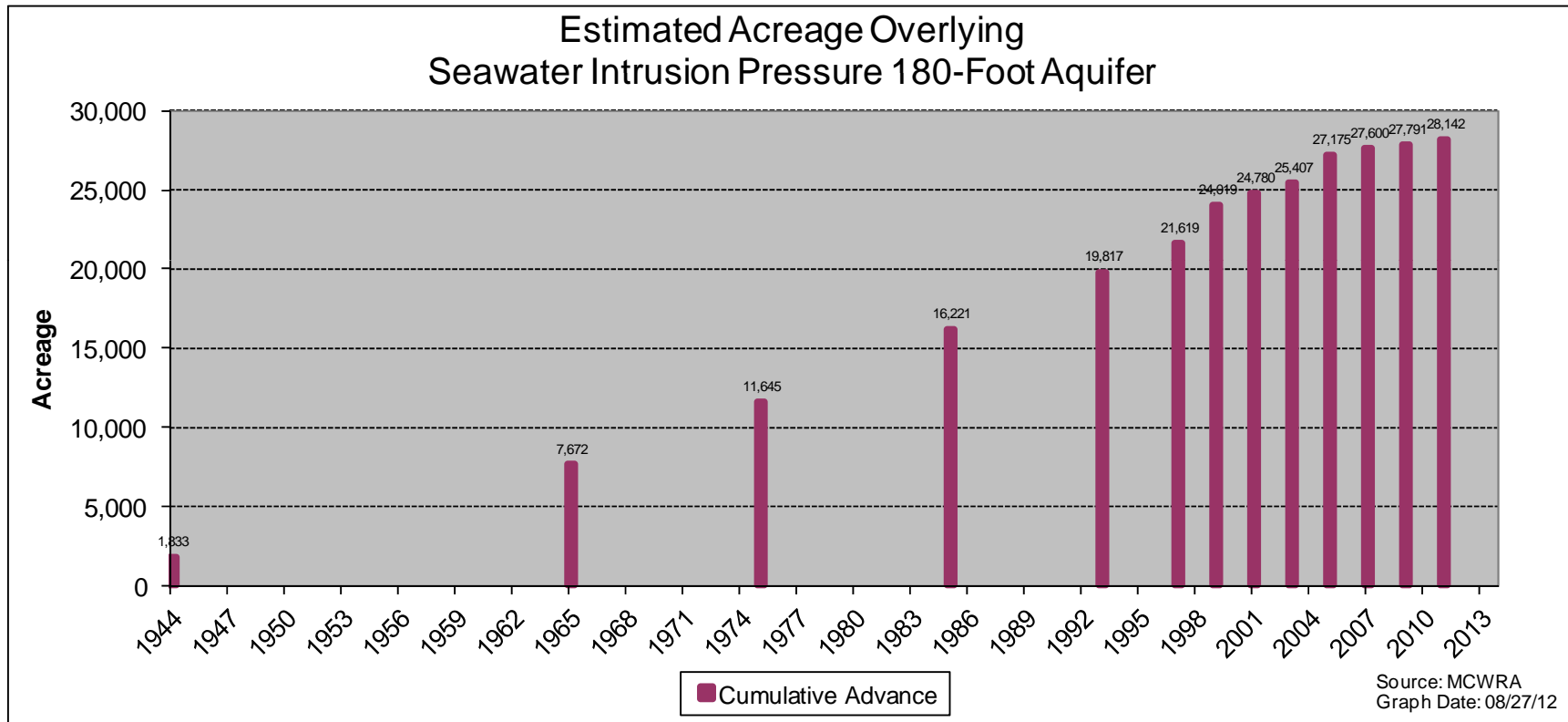


2011 Pressure 180-Foot Aquifer 500 mg/L Chloride Areas

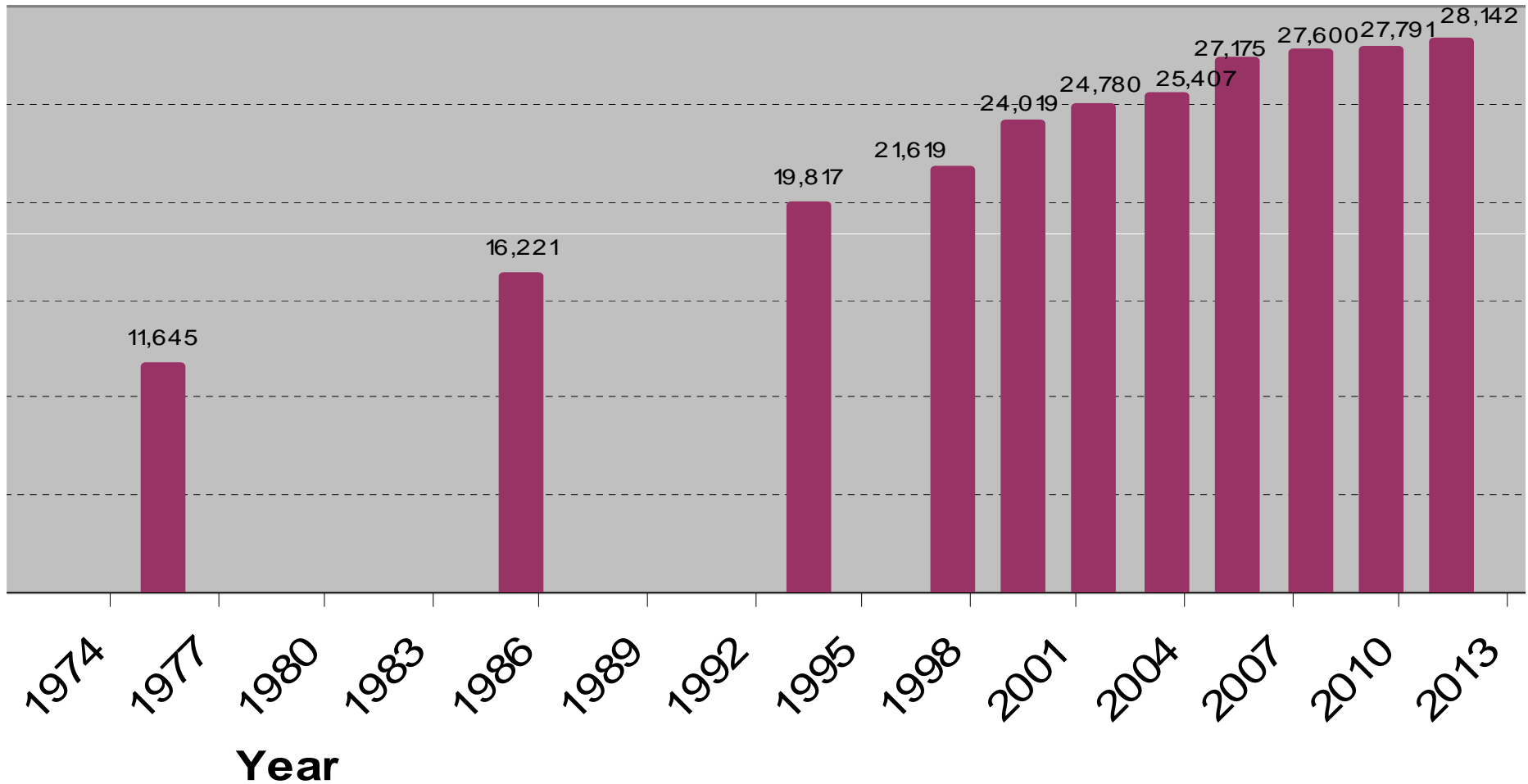




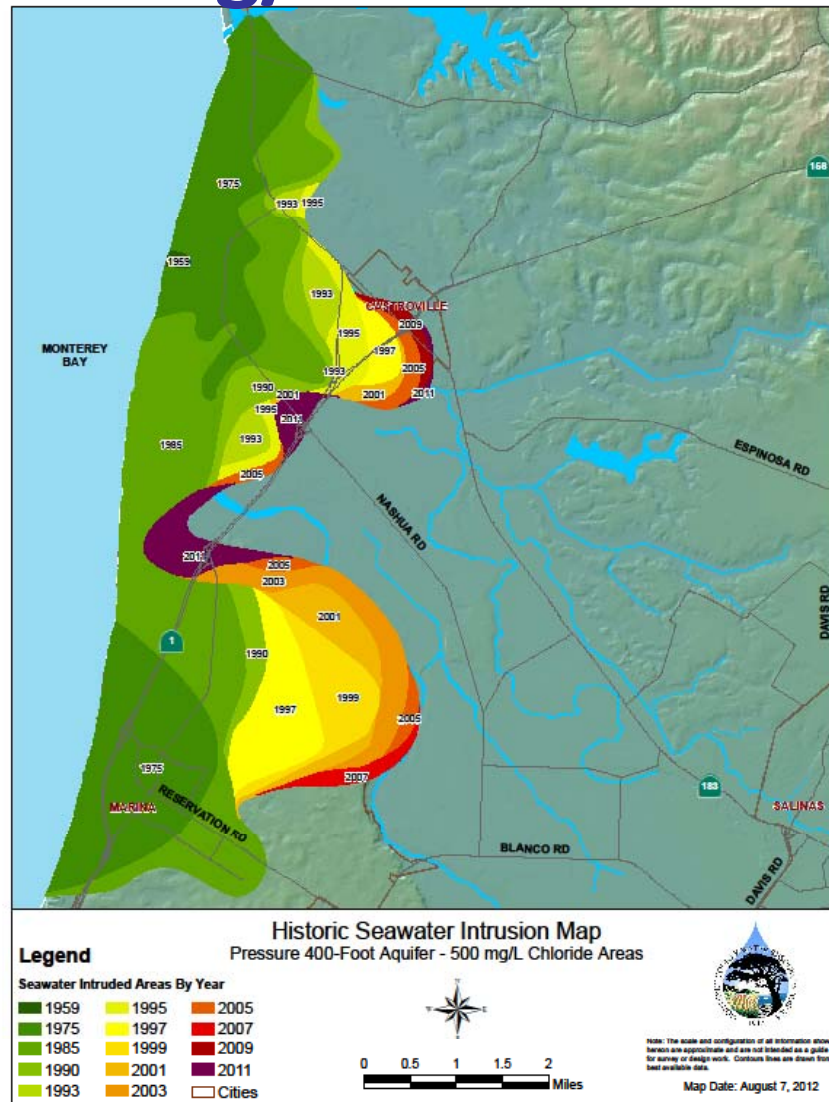
Pressure 180-Foot Aquifer Historical Advancement

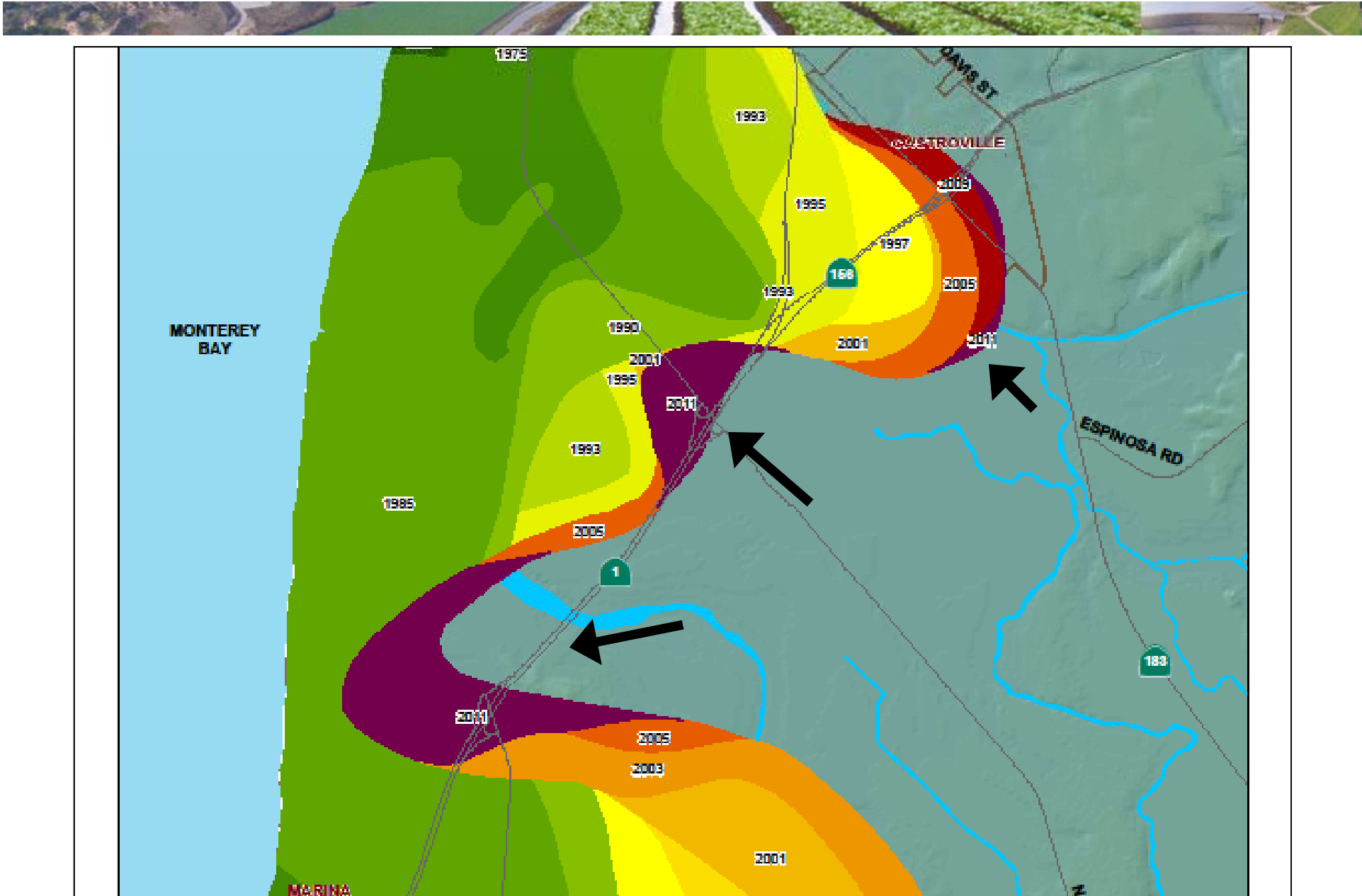


Pressure 180-Foot Aquifer Historical Advancement

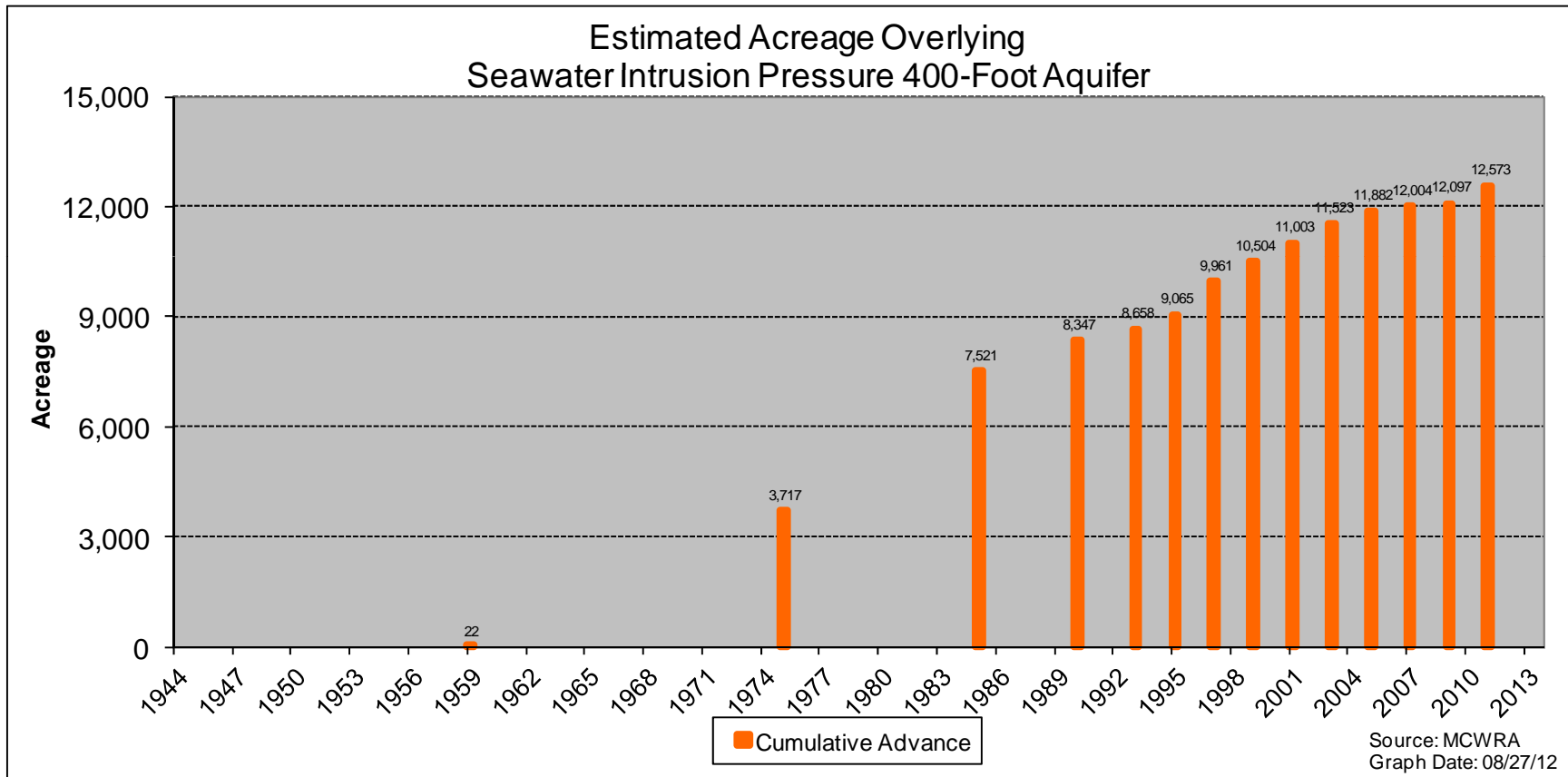


2011 Pressure 400-Foot Aquifer 500 mg/L Chloride Areas



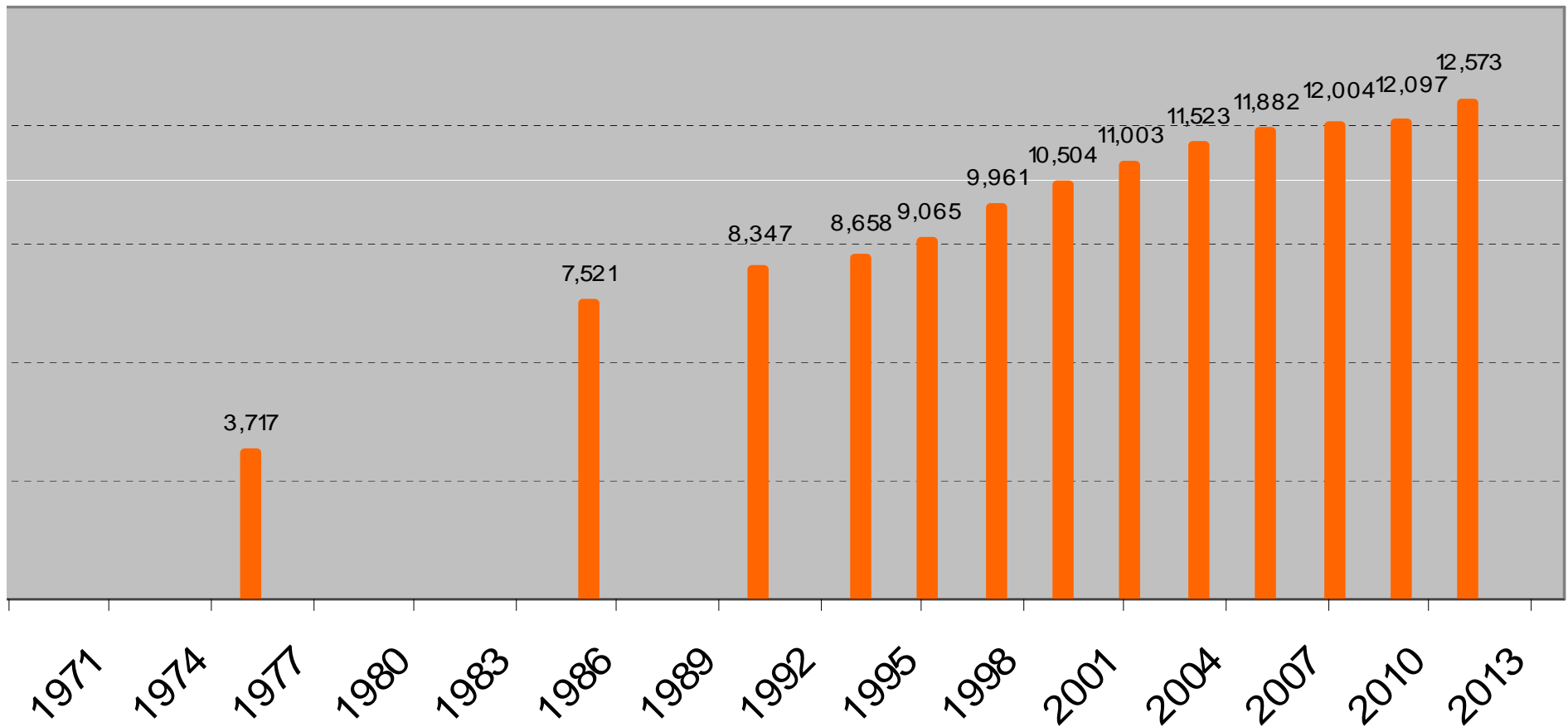


Pressure 400-Foot Aquifer Historical Advancement





Pressure 400-Foot Aquifer Historical Advancement





Summary

- How Seawater Intrusion (SWI) Works
- Agency Projects to Combat SWI
- Coastal Monitoring Program
- 2011 SWI Front Maps





Conclusion

- Seawater Intrusion (2009 to 2011)
 - Rate of SWI continues to decrease
 - Advancement minimal, lobes are broadening
 - Complex mechanism for SWI persists





“The water came in a thirty-year cycle. There would be five to six wet and wonderful years when there might be nineteen to twenty-five inches of rain, and the land would shout with grass. Then would come six or seven pretty good years of twelve to sixteen inches of rain. And then the dry years would come ...”

“And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

John Steinbeck, East of Eden





Question ?



