
MONTEREY COUNTY WATER RESOURCES AGENCY
1947

2017 Salinas Valley

Groundwater Level Contours
&
Seawater Intrusion Maps

TODAY'S ACTION

Consider Receiving the
2017 Groundwater Level Contours and
Coastal Salinas Valley
Seawater Intrusion Maps

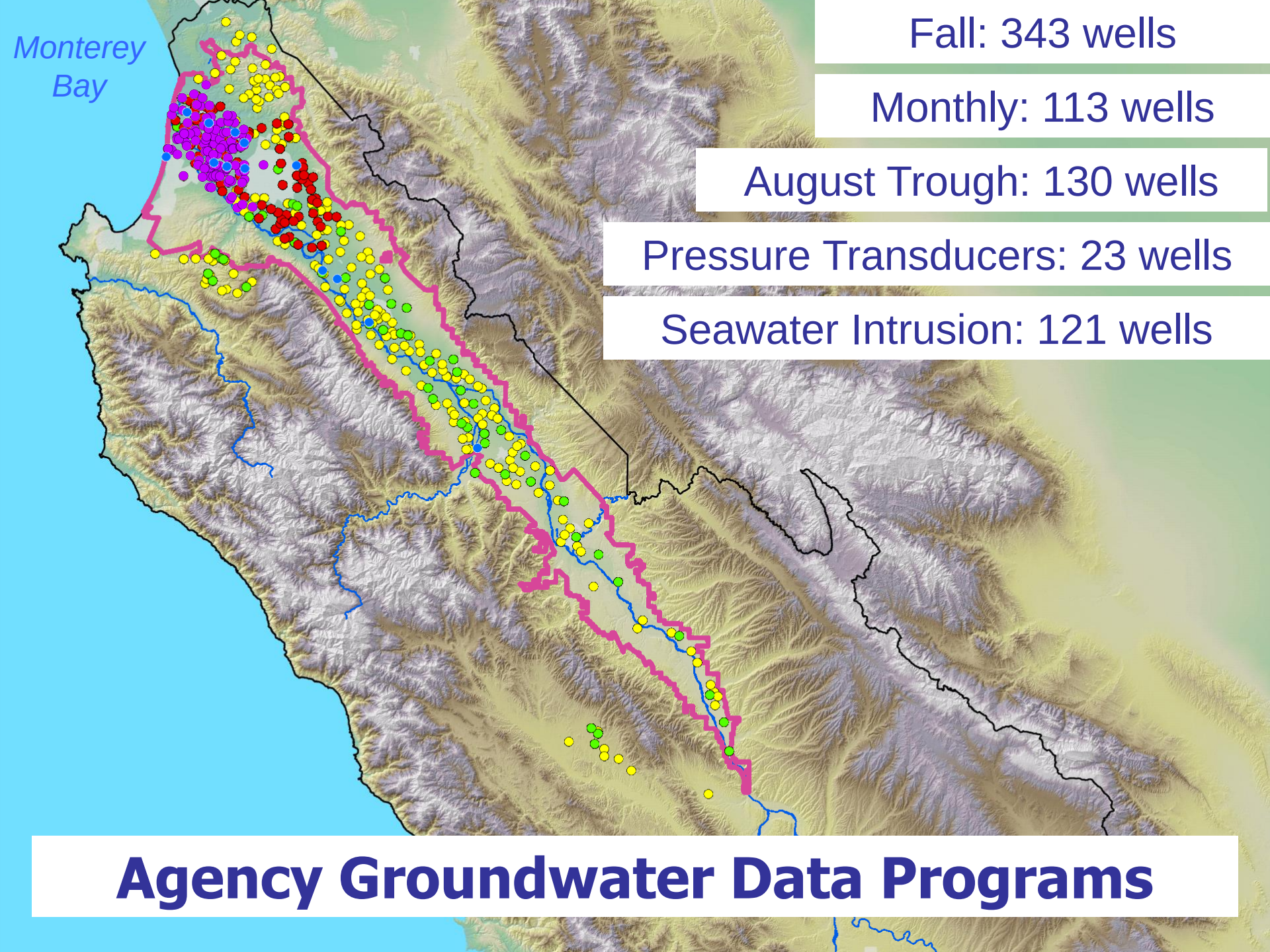
Committee Action/Financial Impact

- No previous committee action
- No financial impact from receiving this report

Agency Groundwater Monitoring Programs

- GWL & WQ data collected & analyzed since 1947

- Purposes:
  - Monitor health of basin
  - Evaluate Agency projects
  - Develop basin management strategies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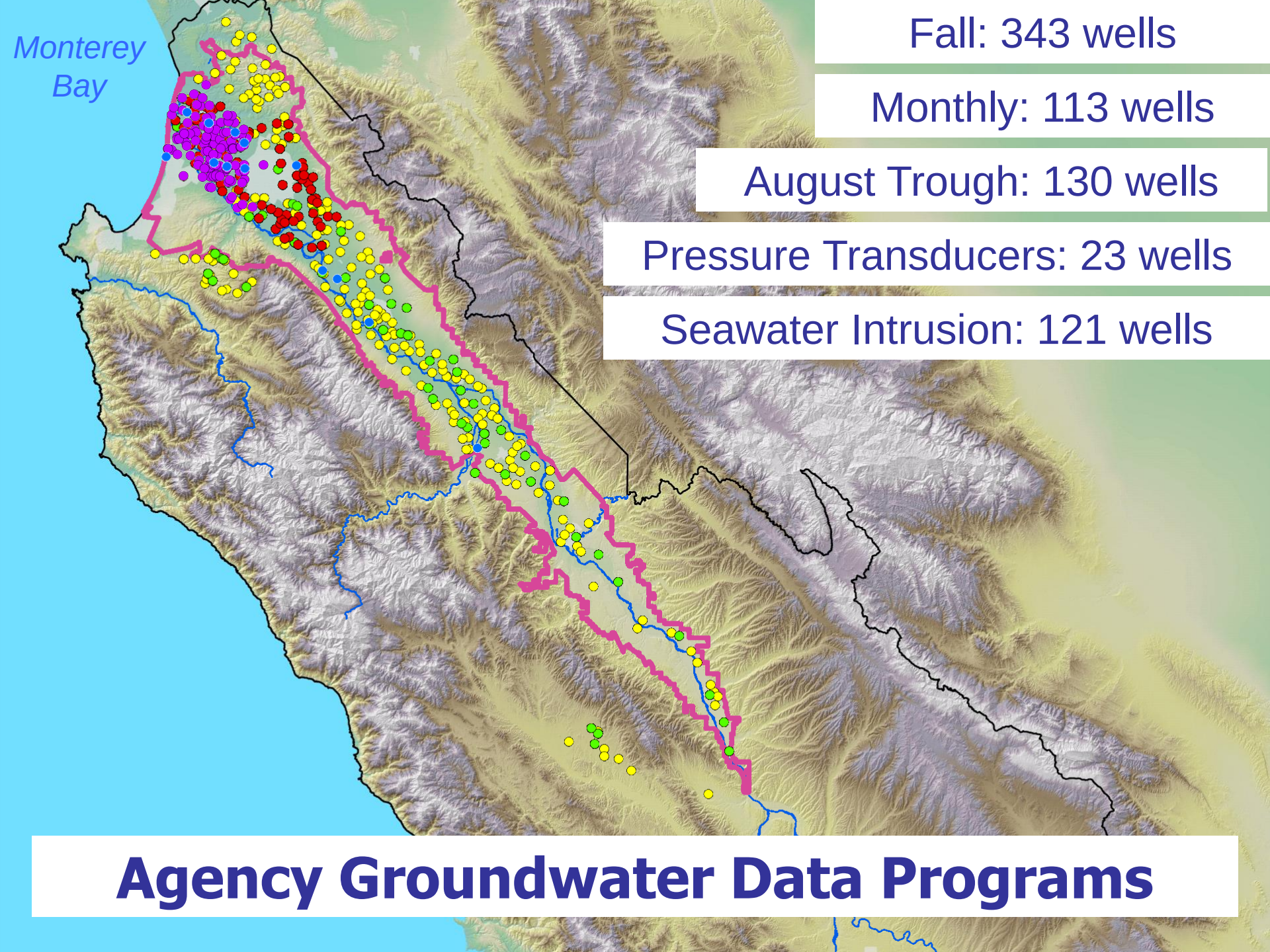
Fall: 343 wells
Monthly: 113 wells
August Trough: 130 wells
Pressure Transducers: 23 wells
Seawater Intrusion: 121 wells
Agency Groundwater Data Programs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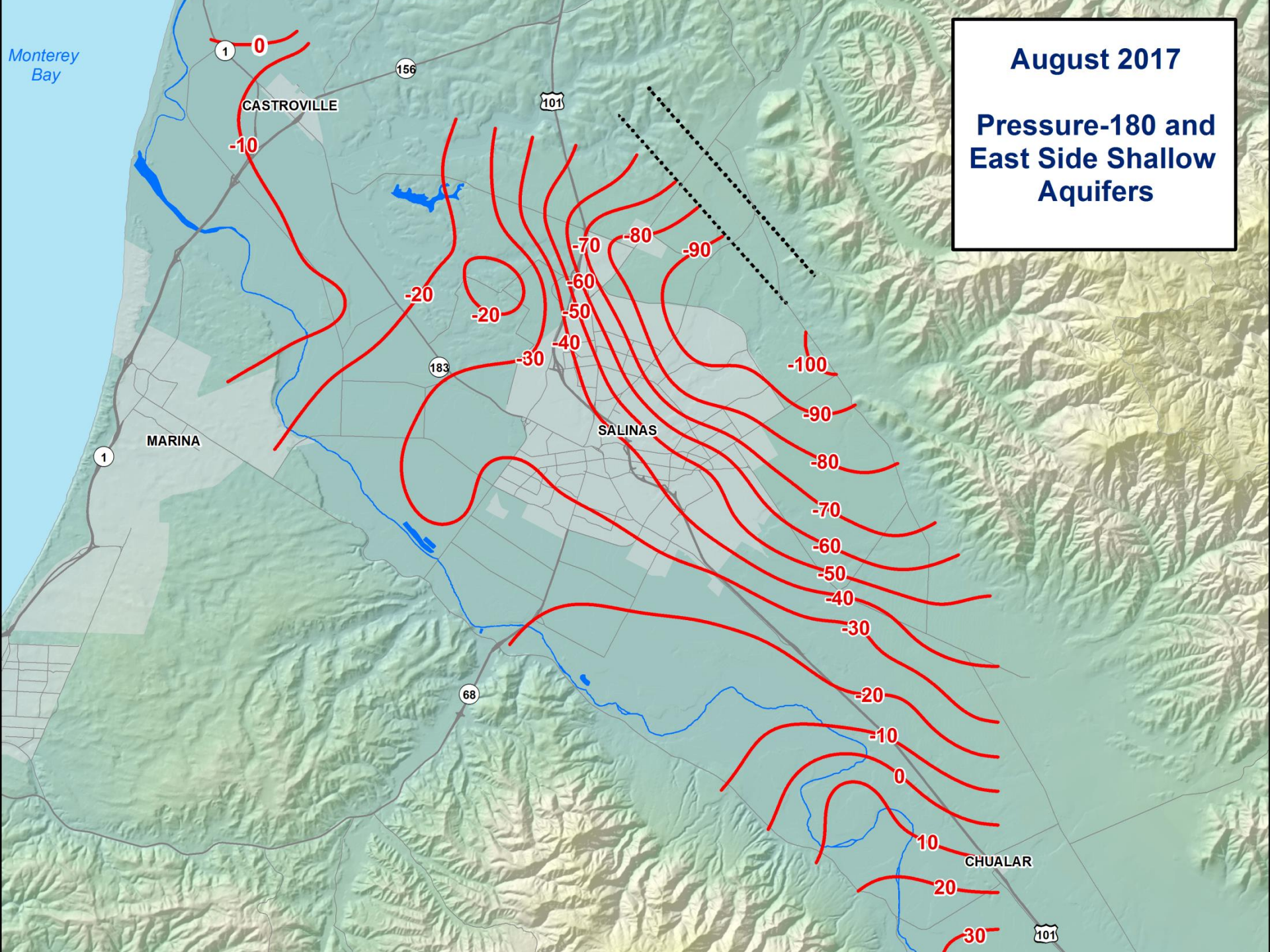
2017 Groundwater Level Contours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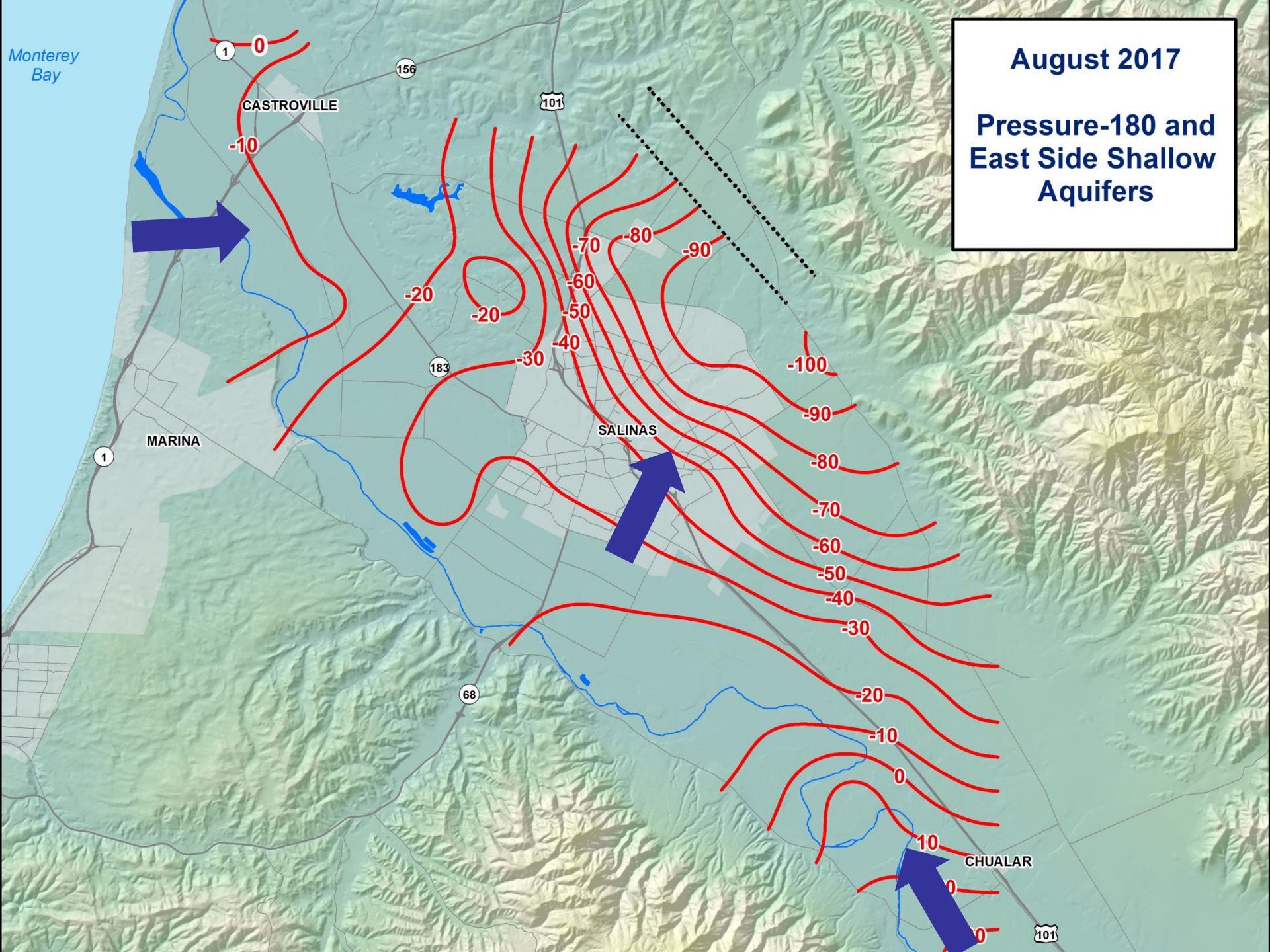
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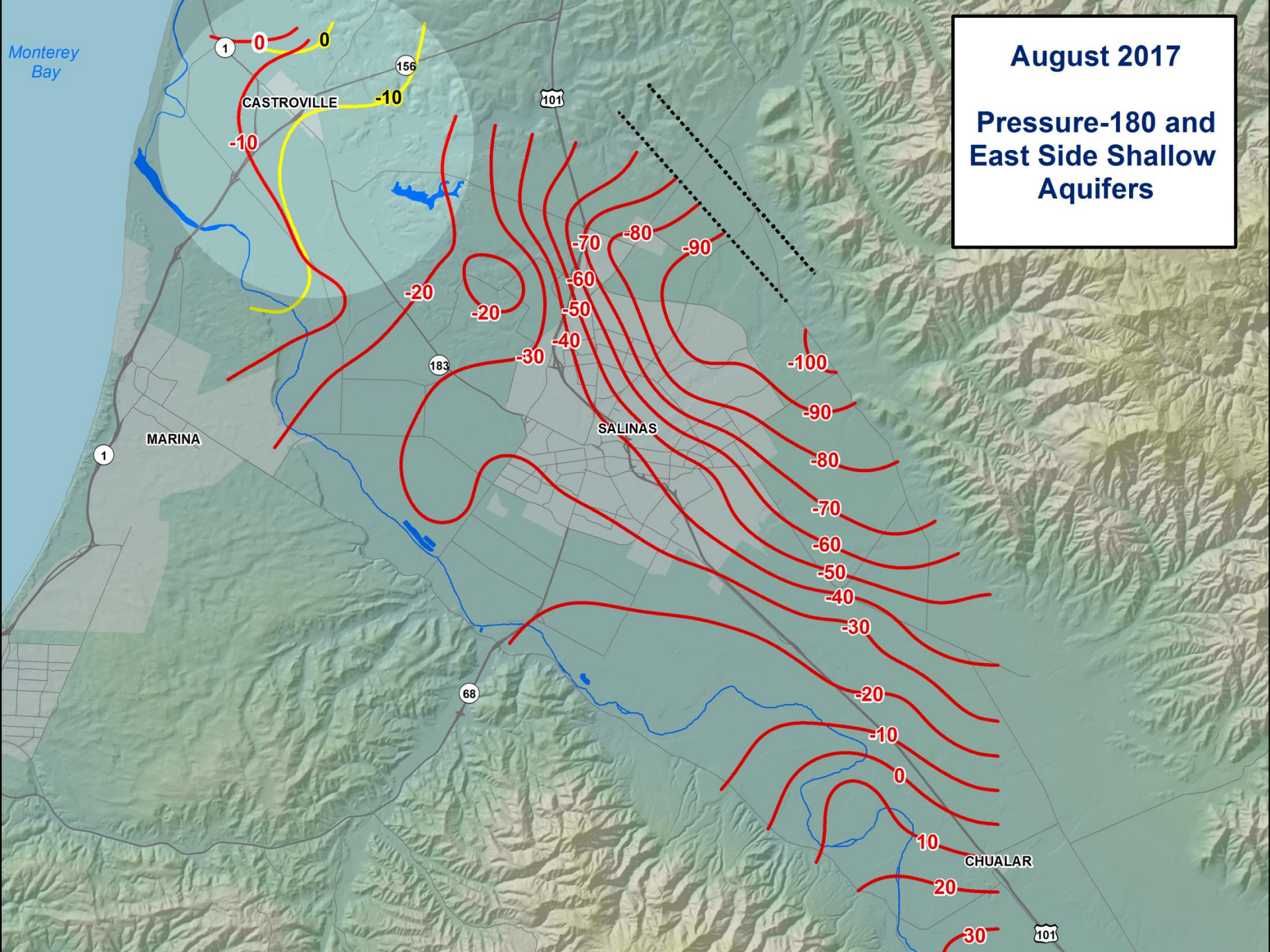
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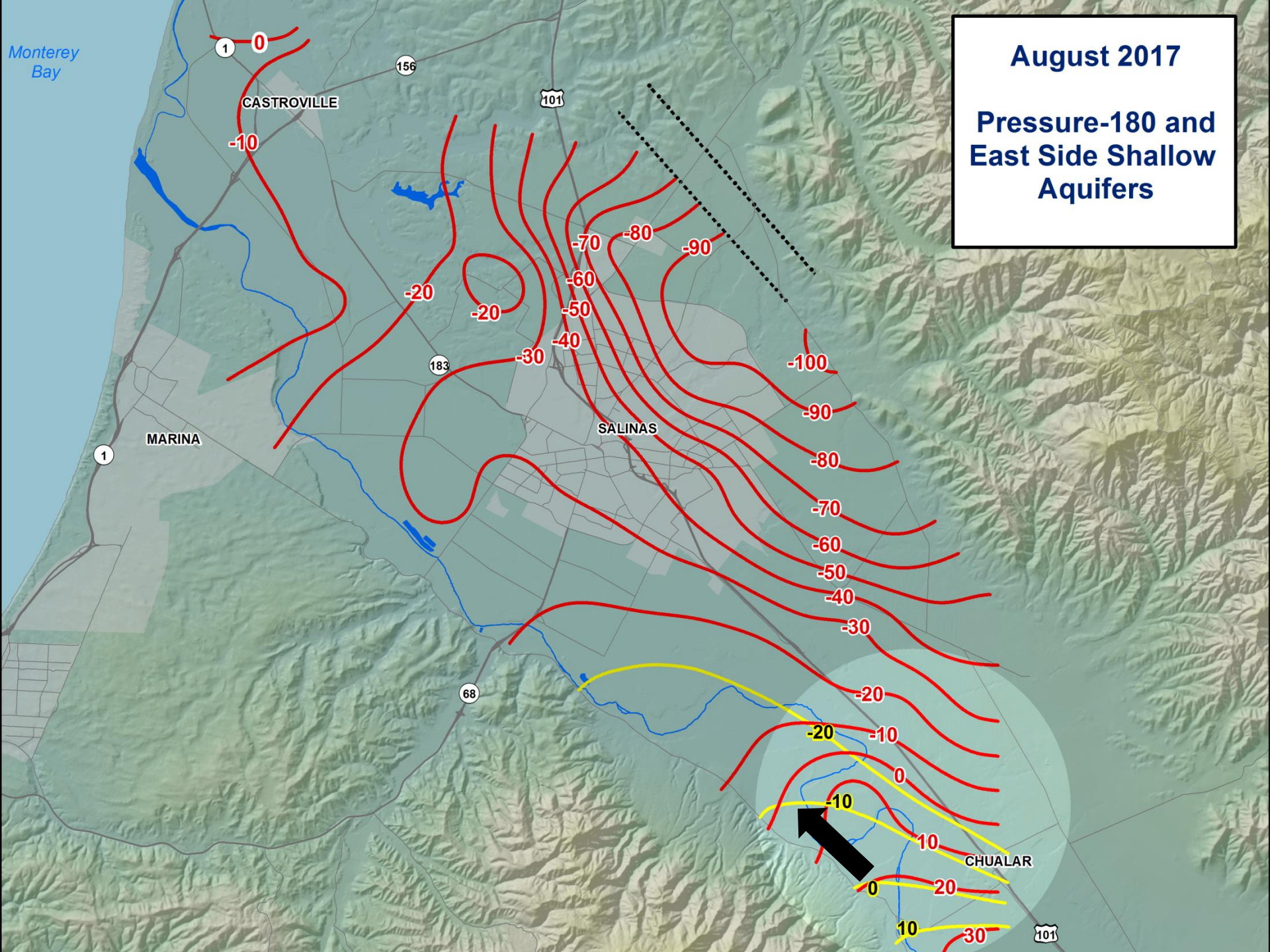
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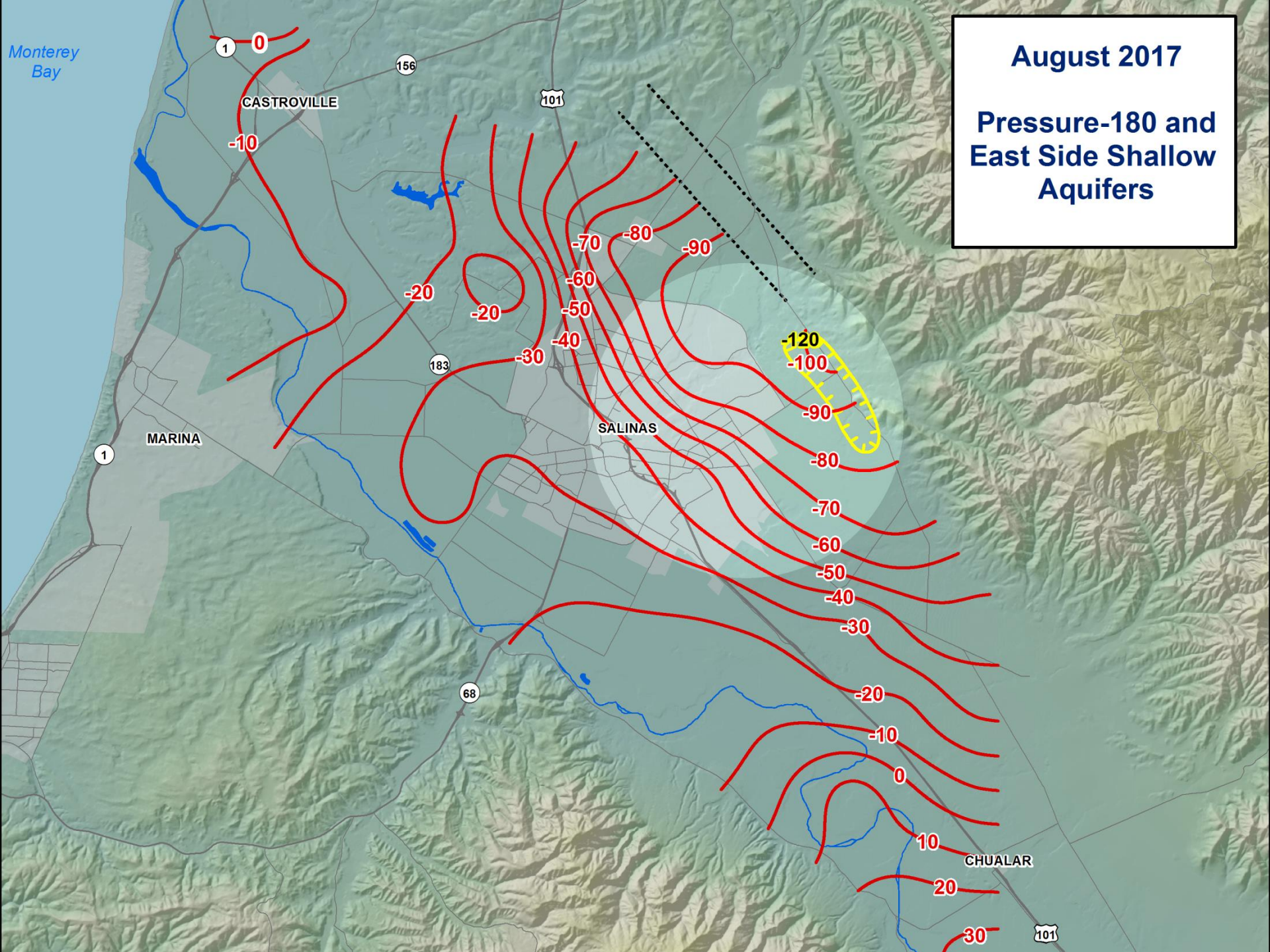
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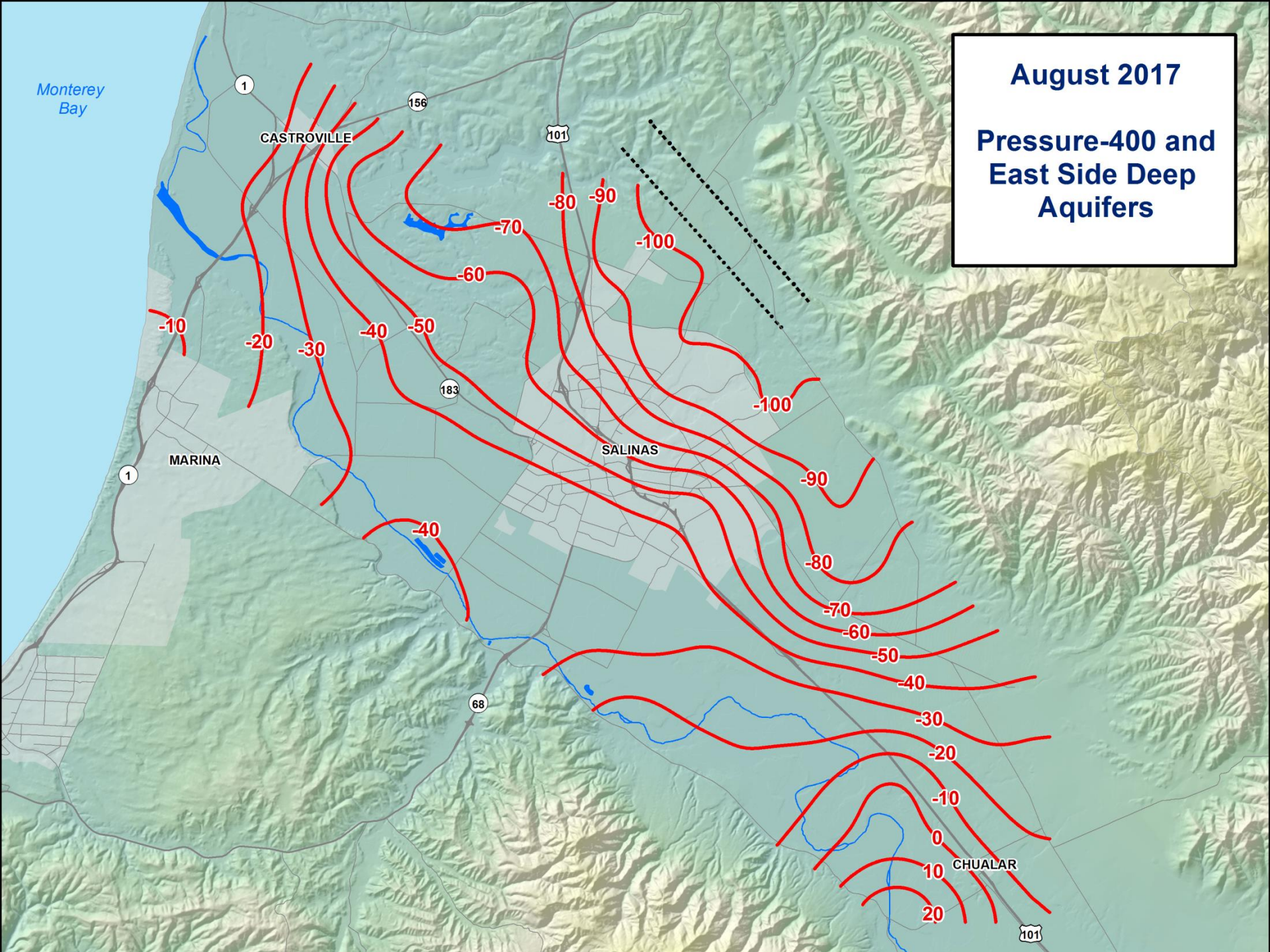
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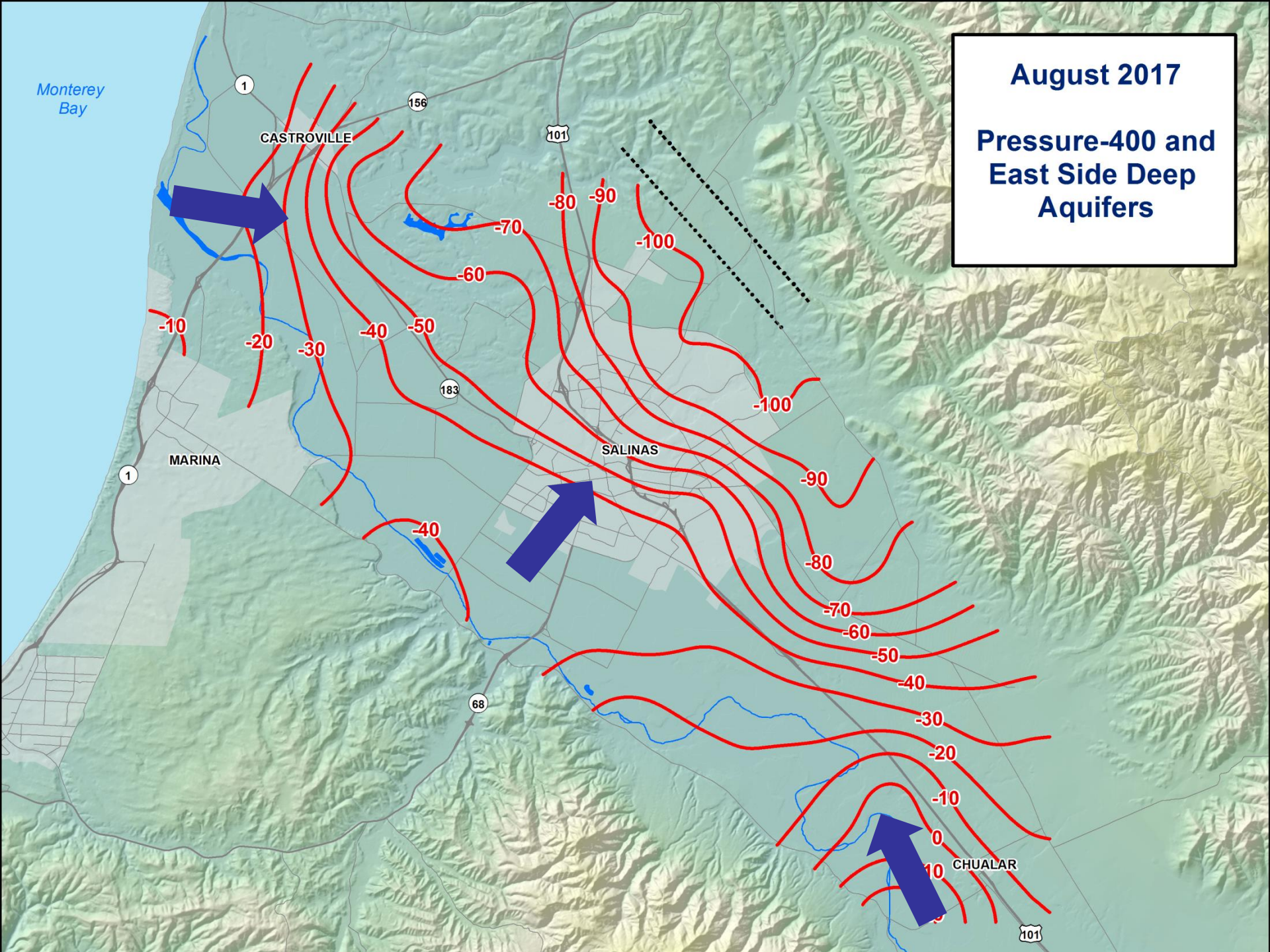
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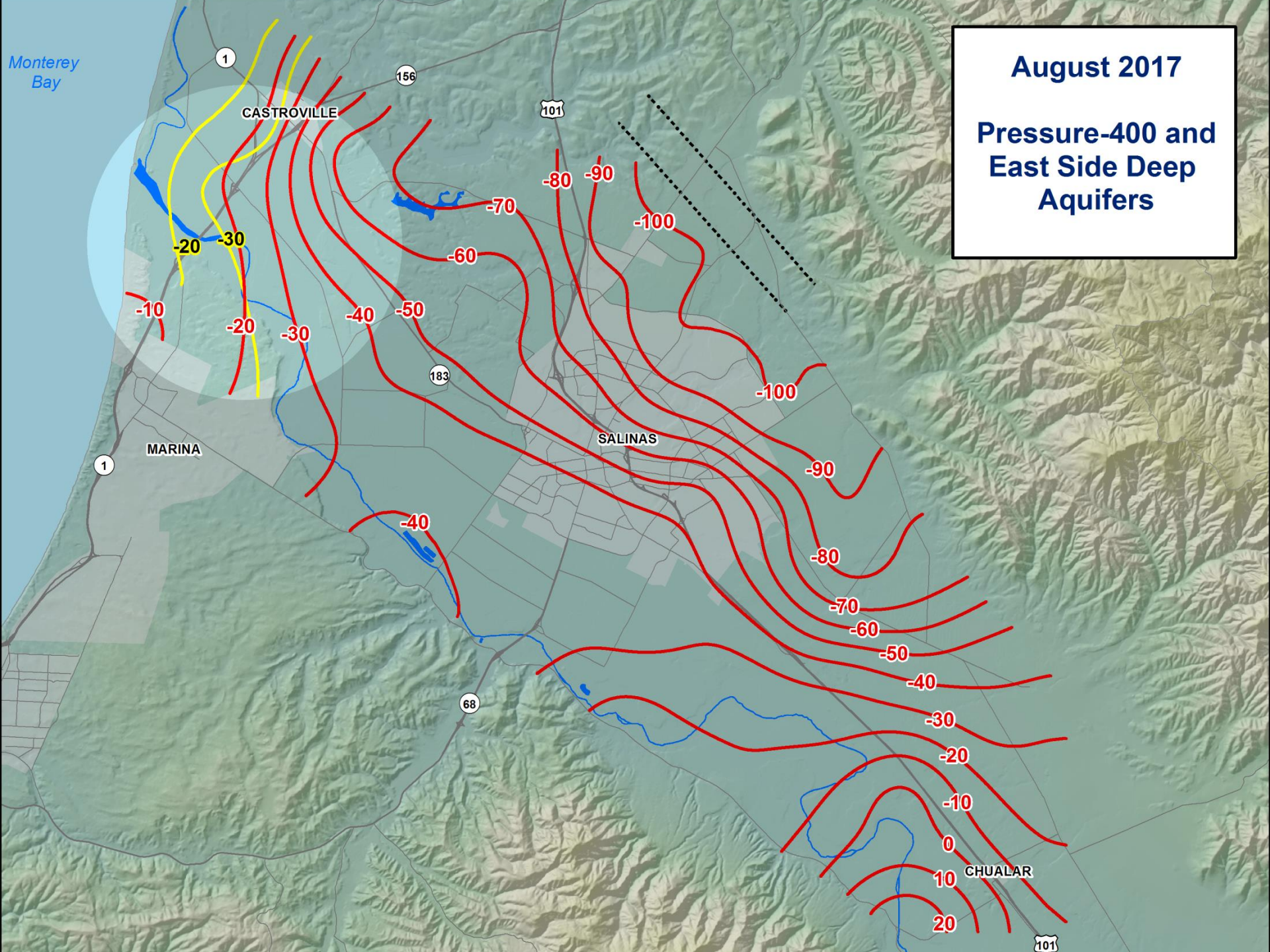
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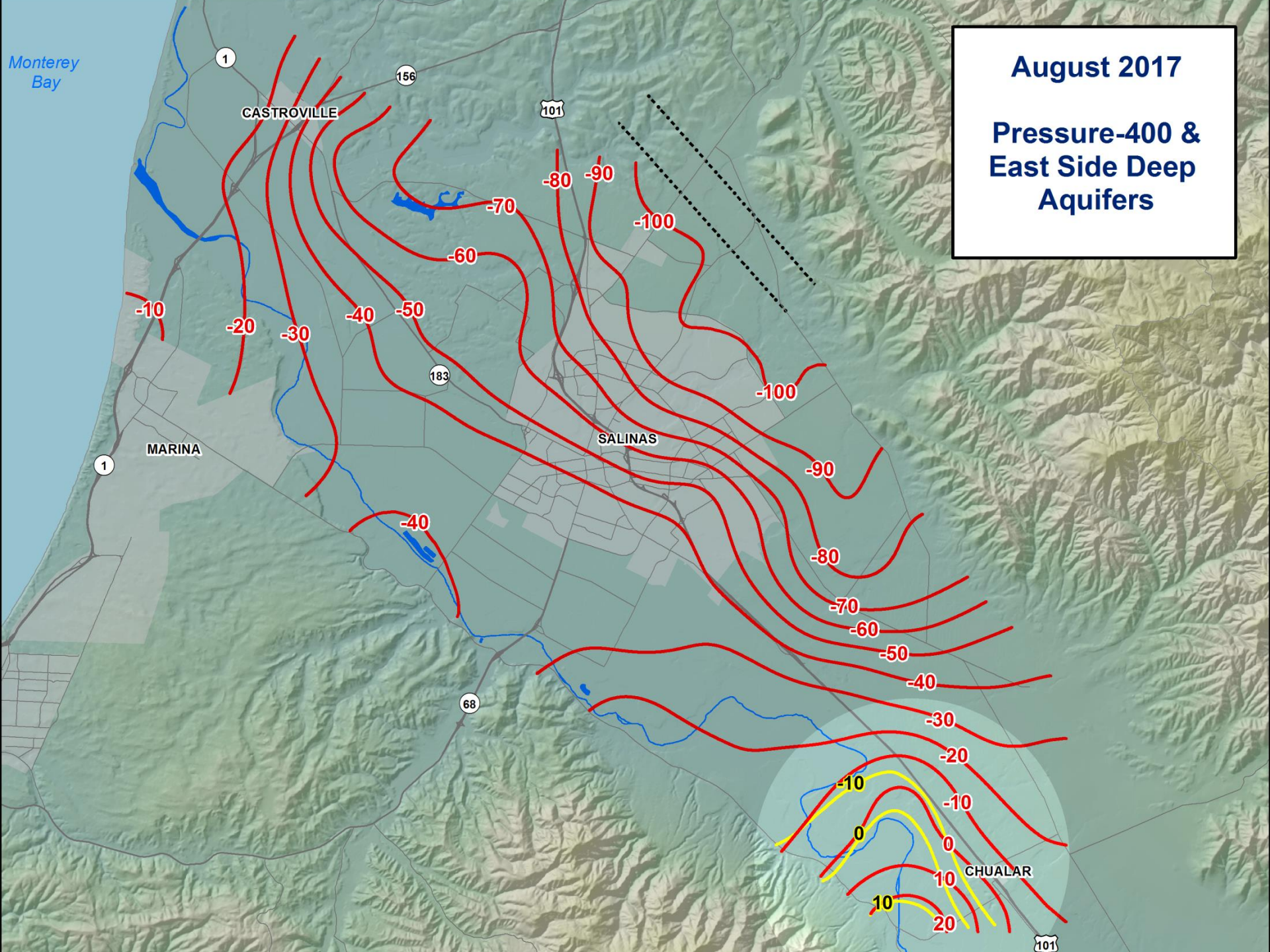
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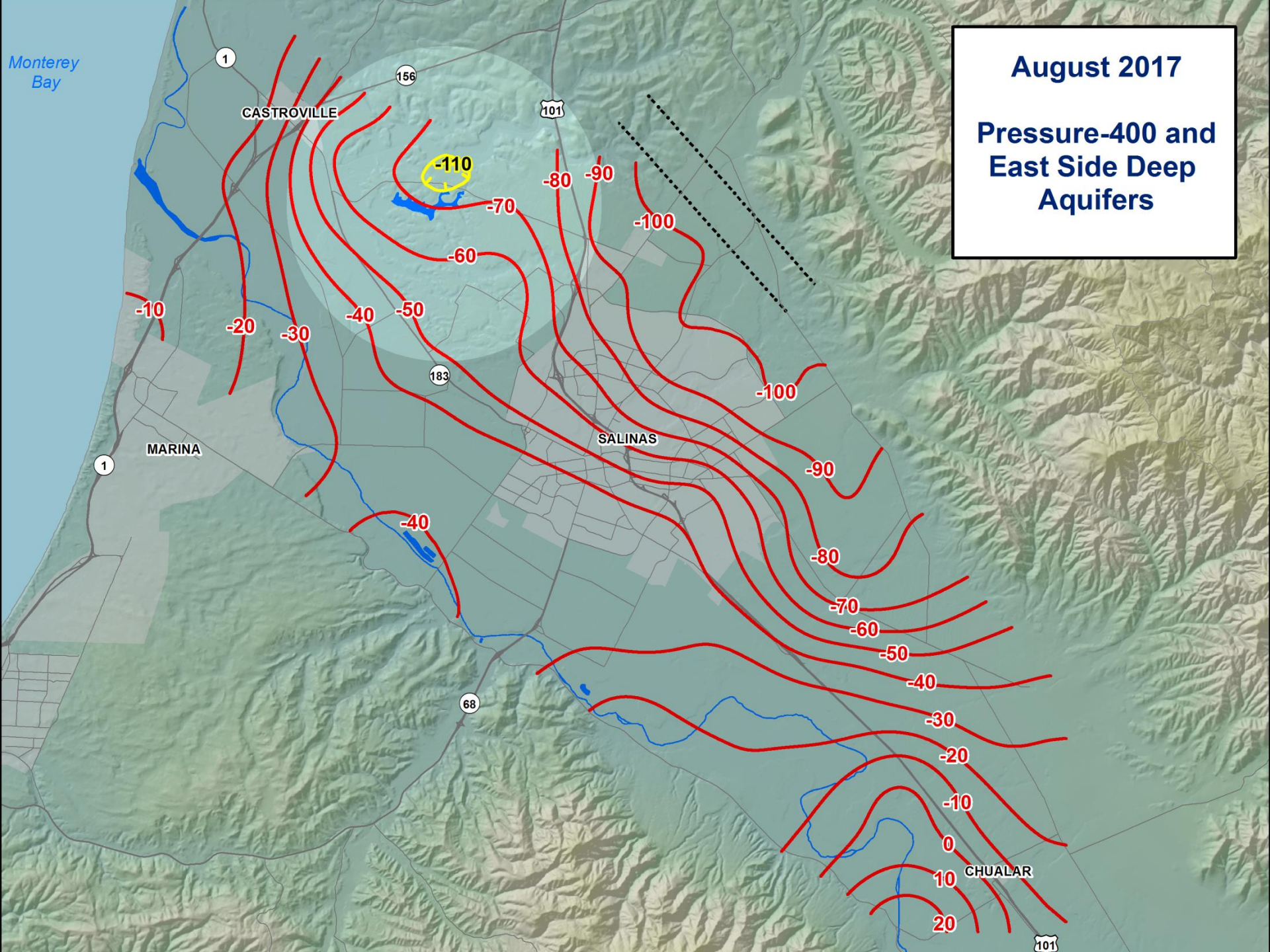
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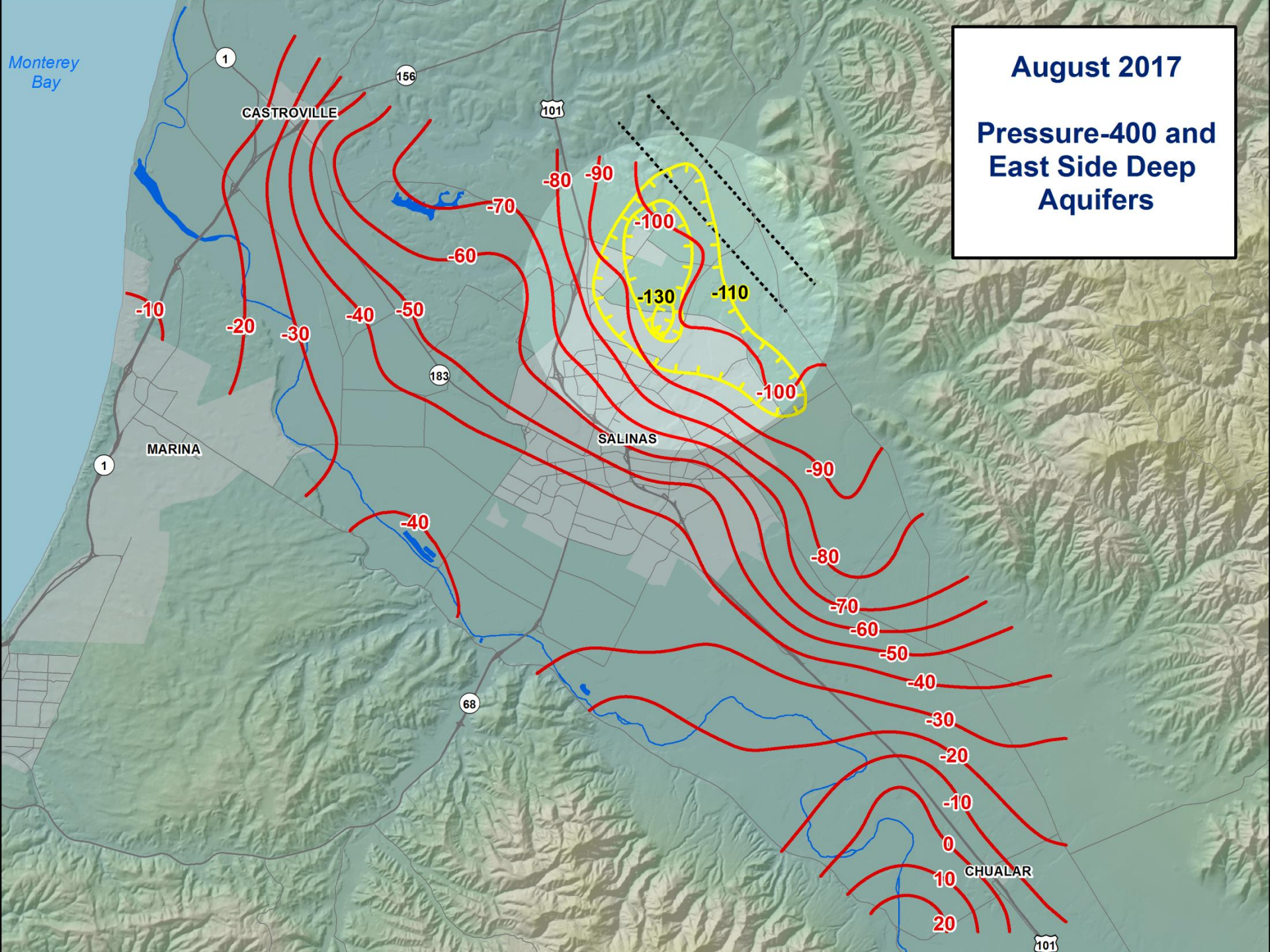
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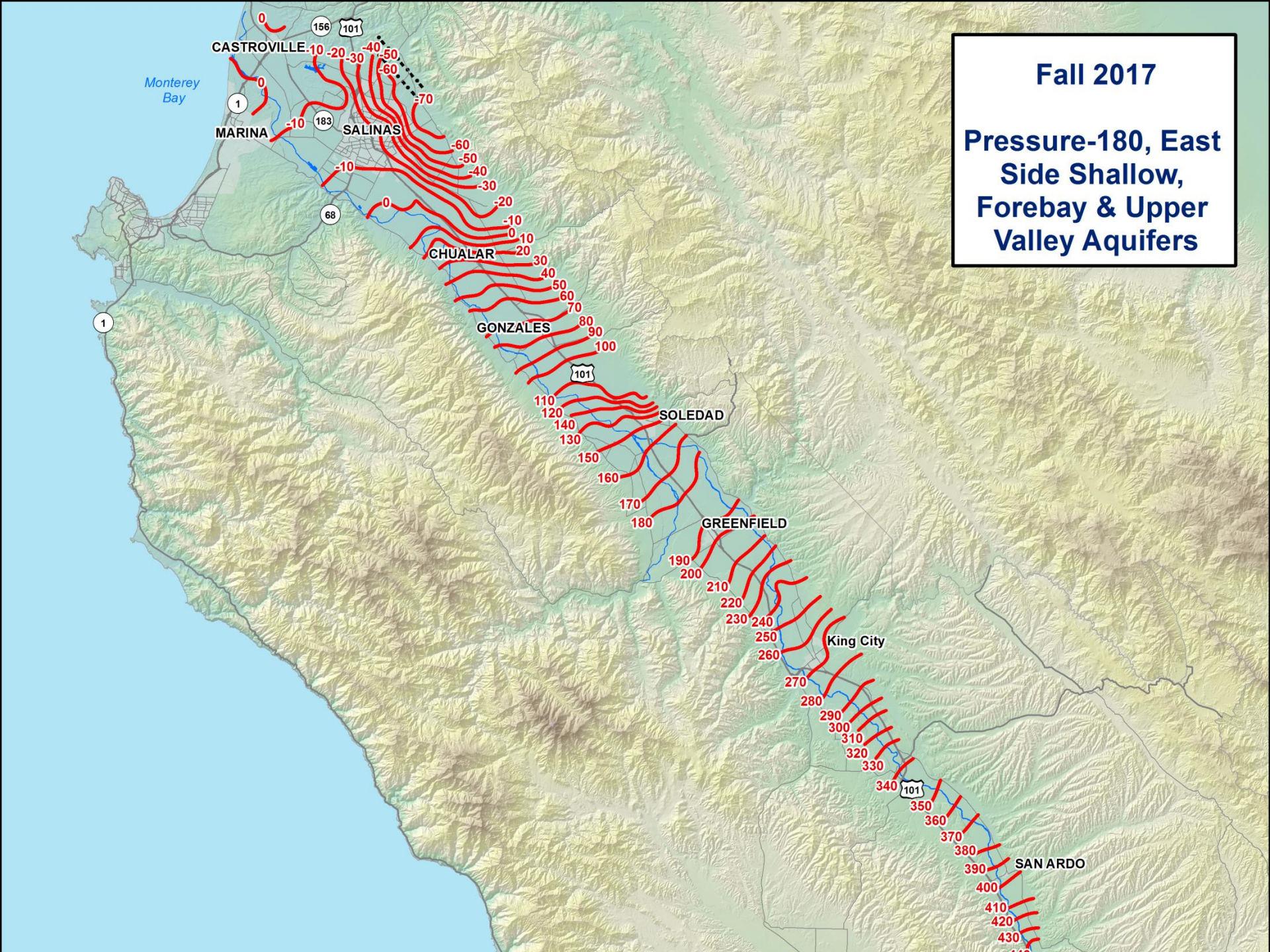
Summary: 2017 August GWL Changes Since 2015

- P180
  - Coastal GWLs remain below sea level
  - East Side GWLs have risen 20 feet
  - Zero line moved two miles down valley
- P400
  - GWLs are recovering nearly everywhere
  - Coastal GWLs remain below sea level
  - “Espinosa Trough” has disappeared
  - East Side Trough has shrunken; GWLs up 10-30ft
  - Zero line has not moved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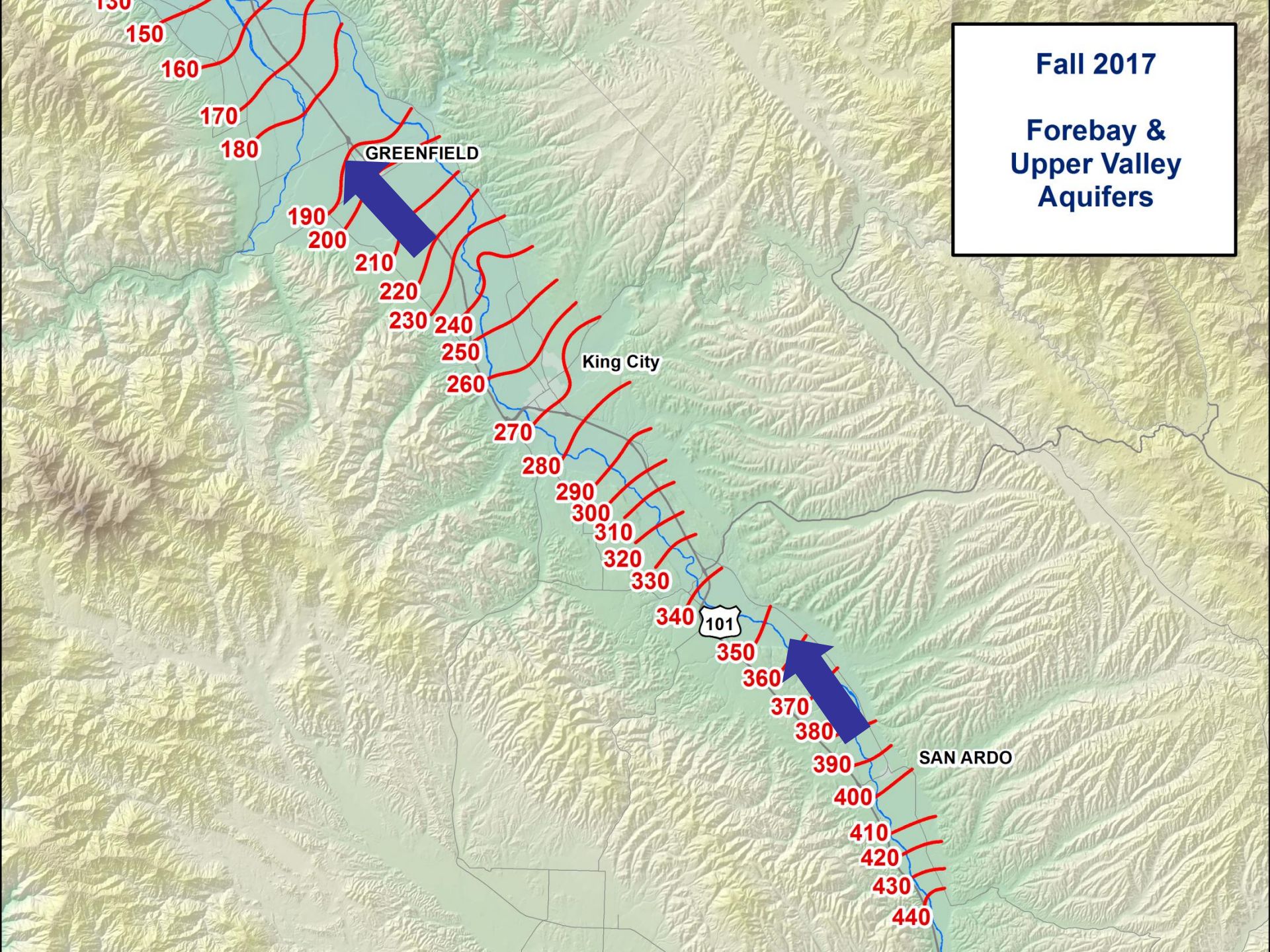
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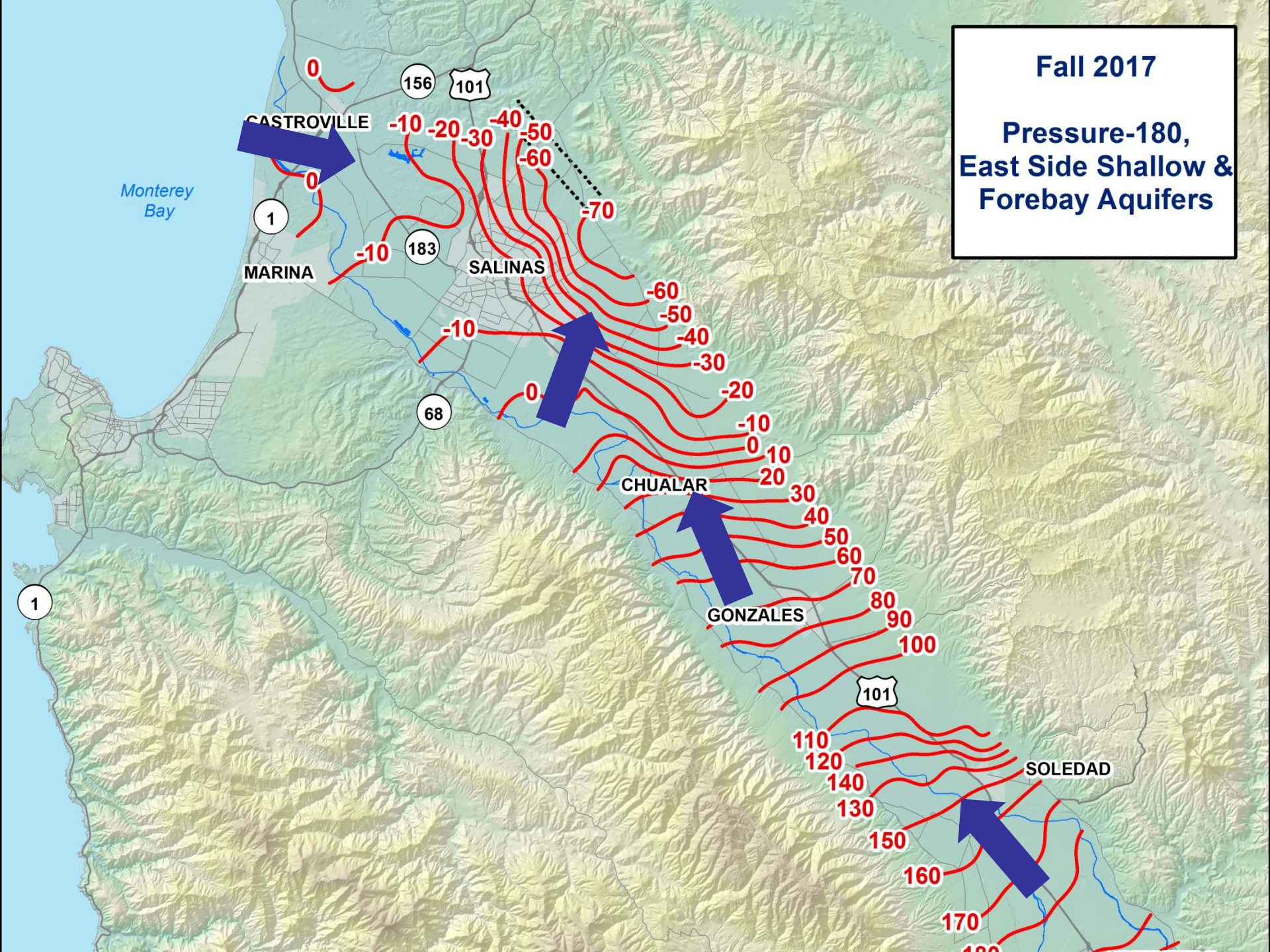
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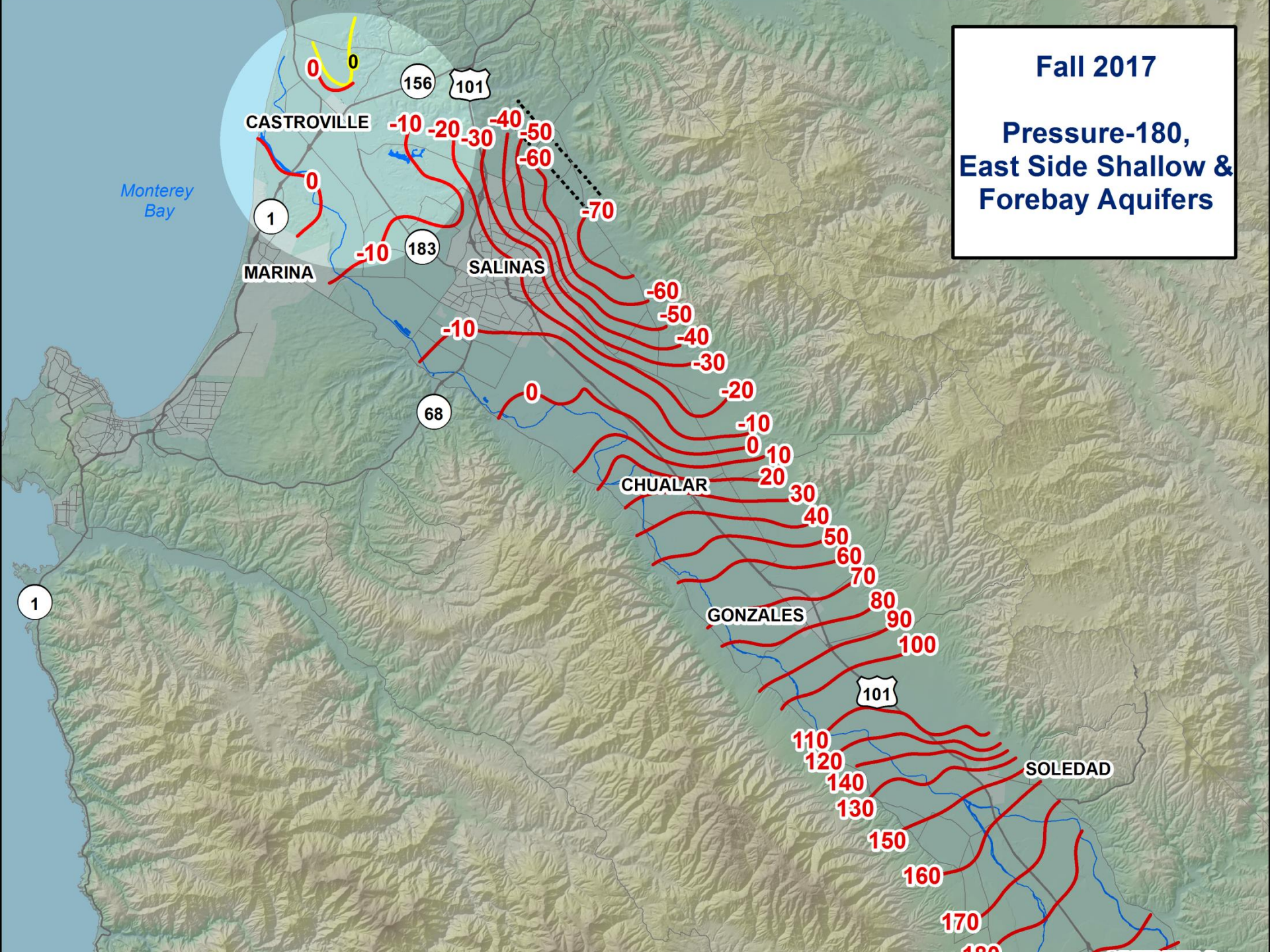
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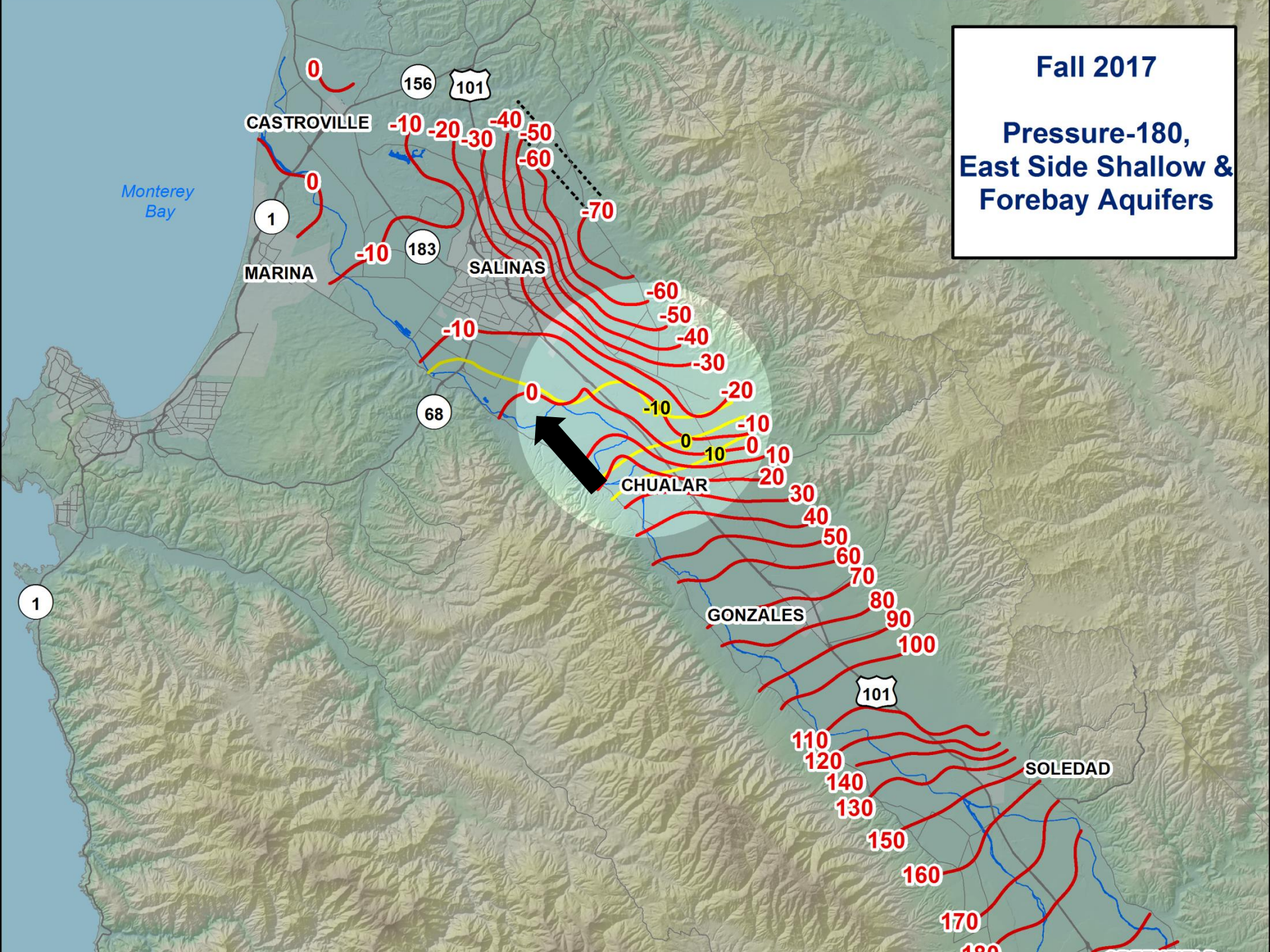
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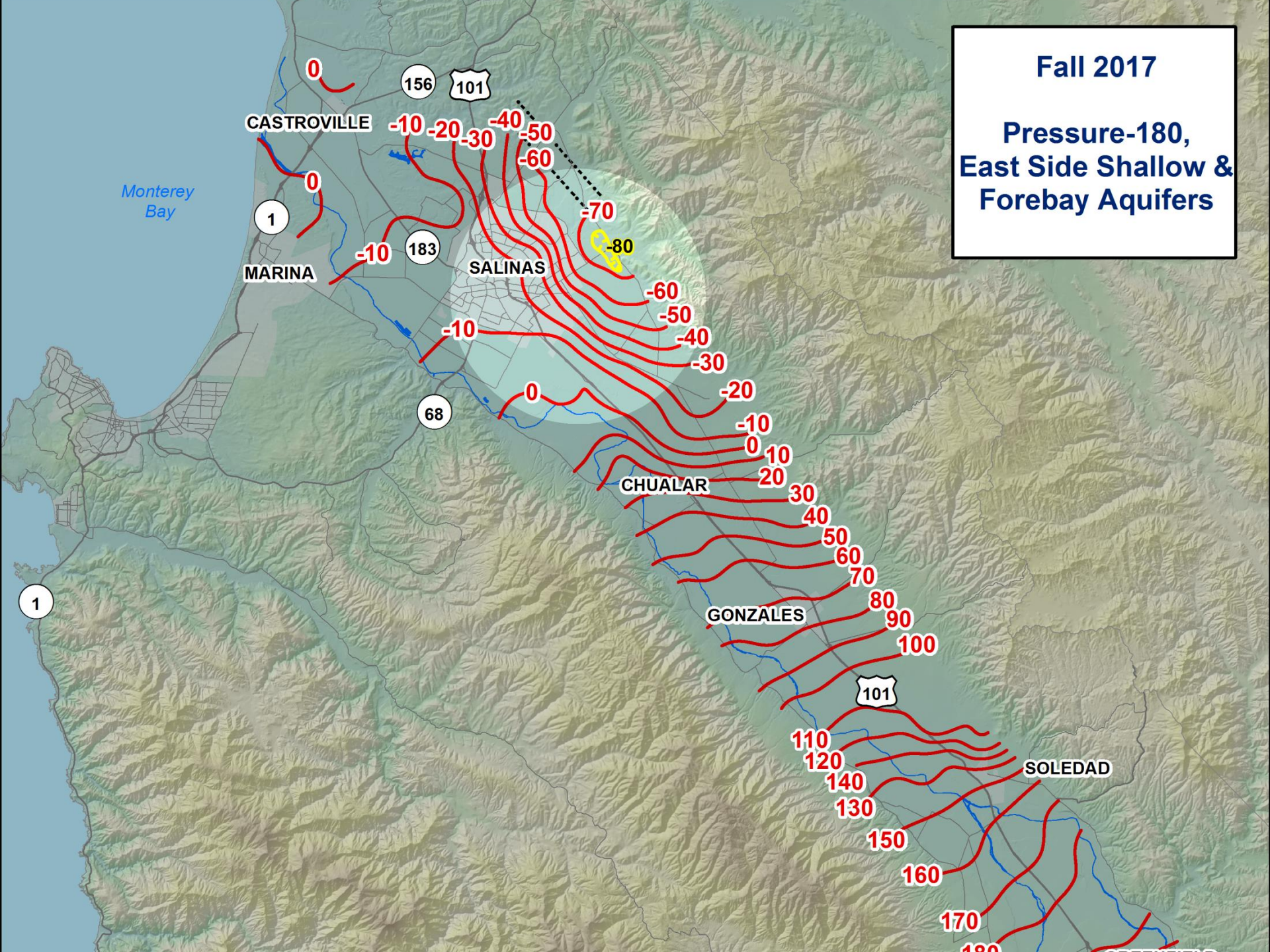
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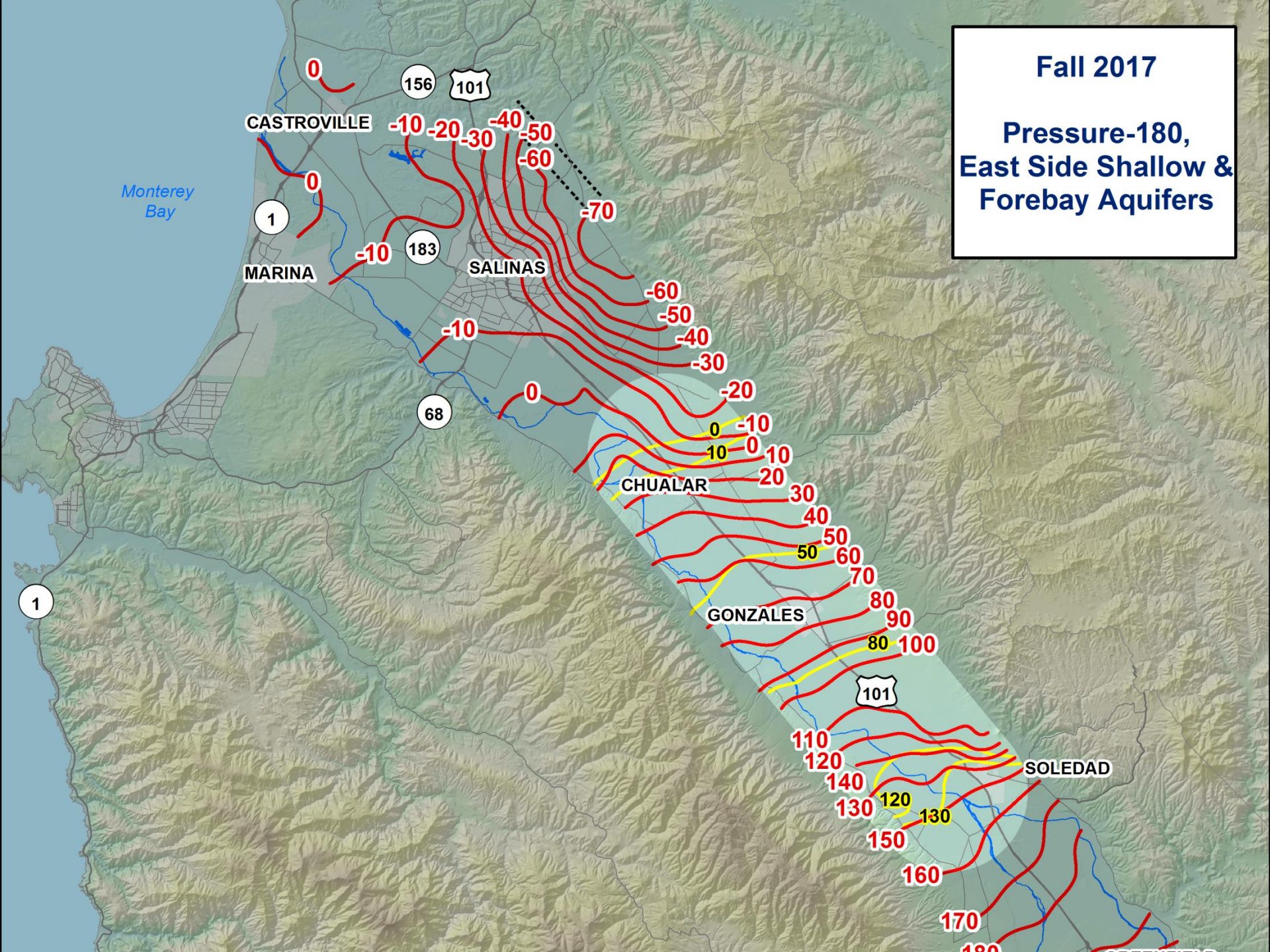
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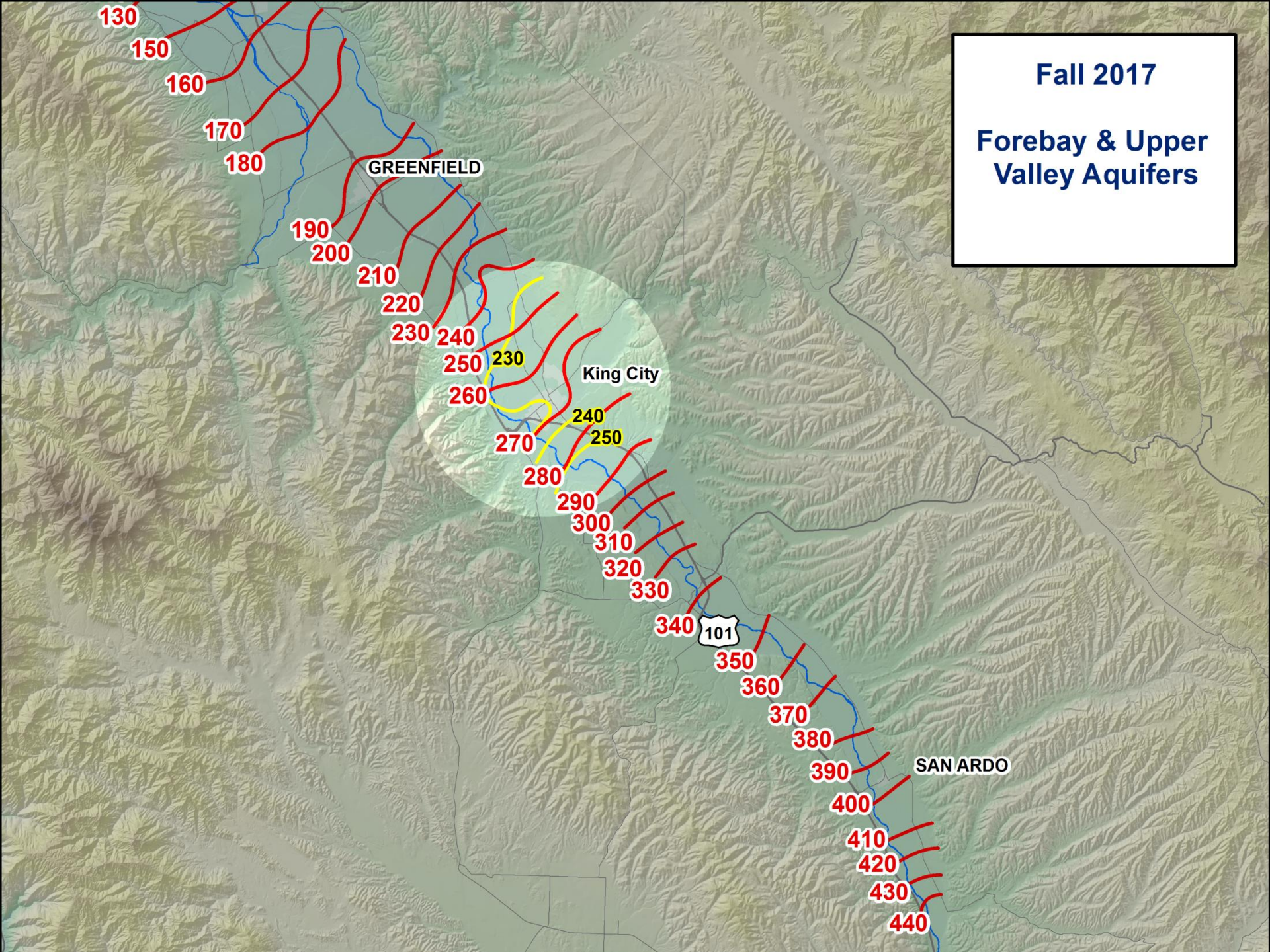
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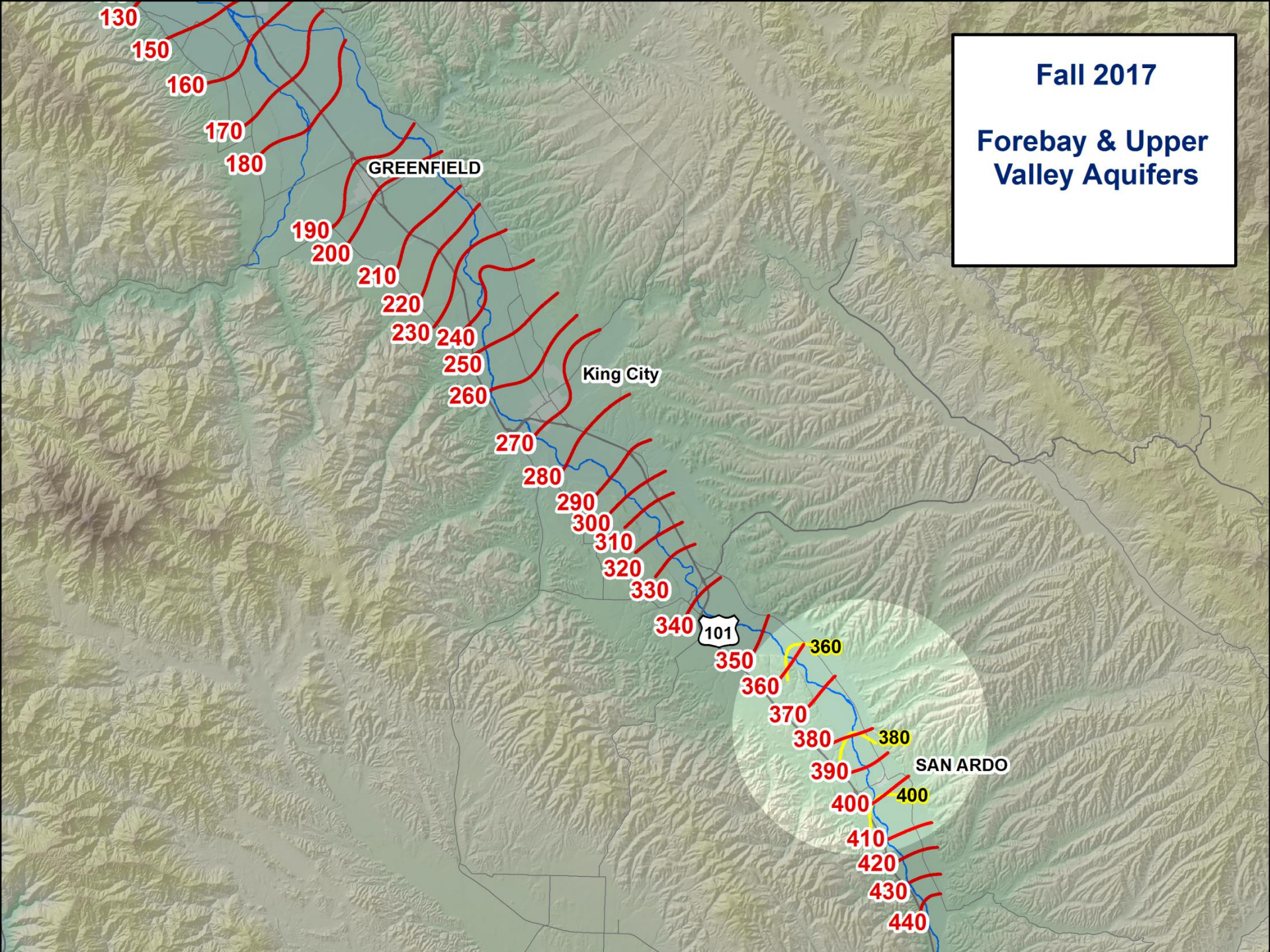
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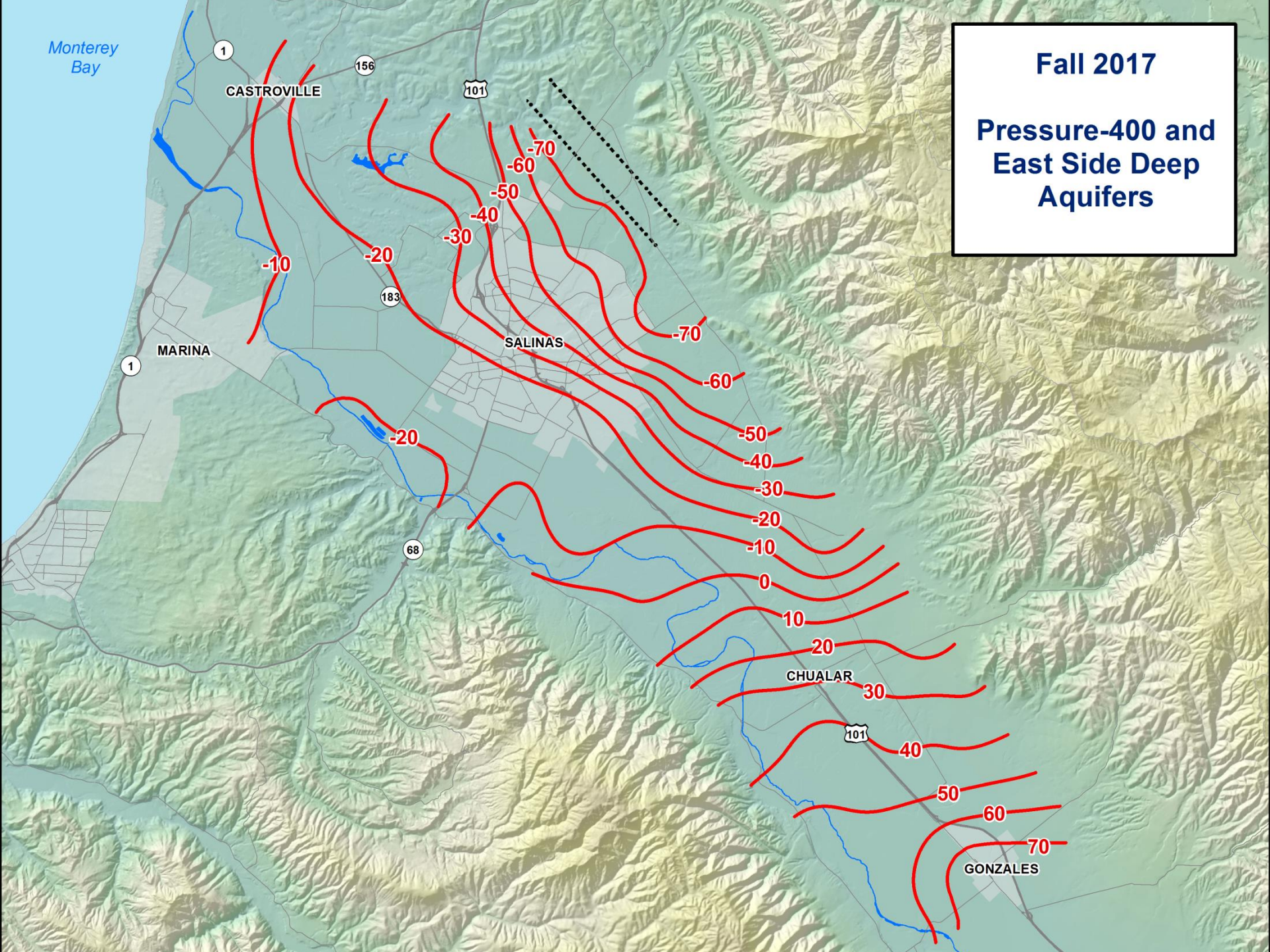
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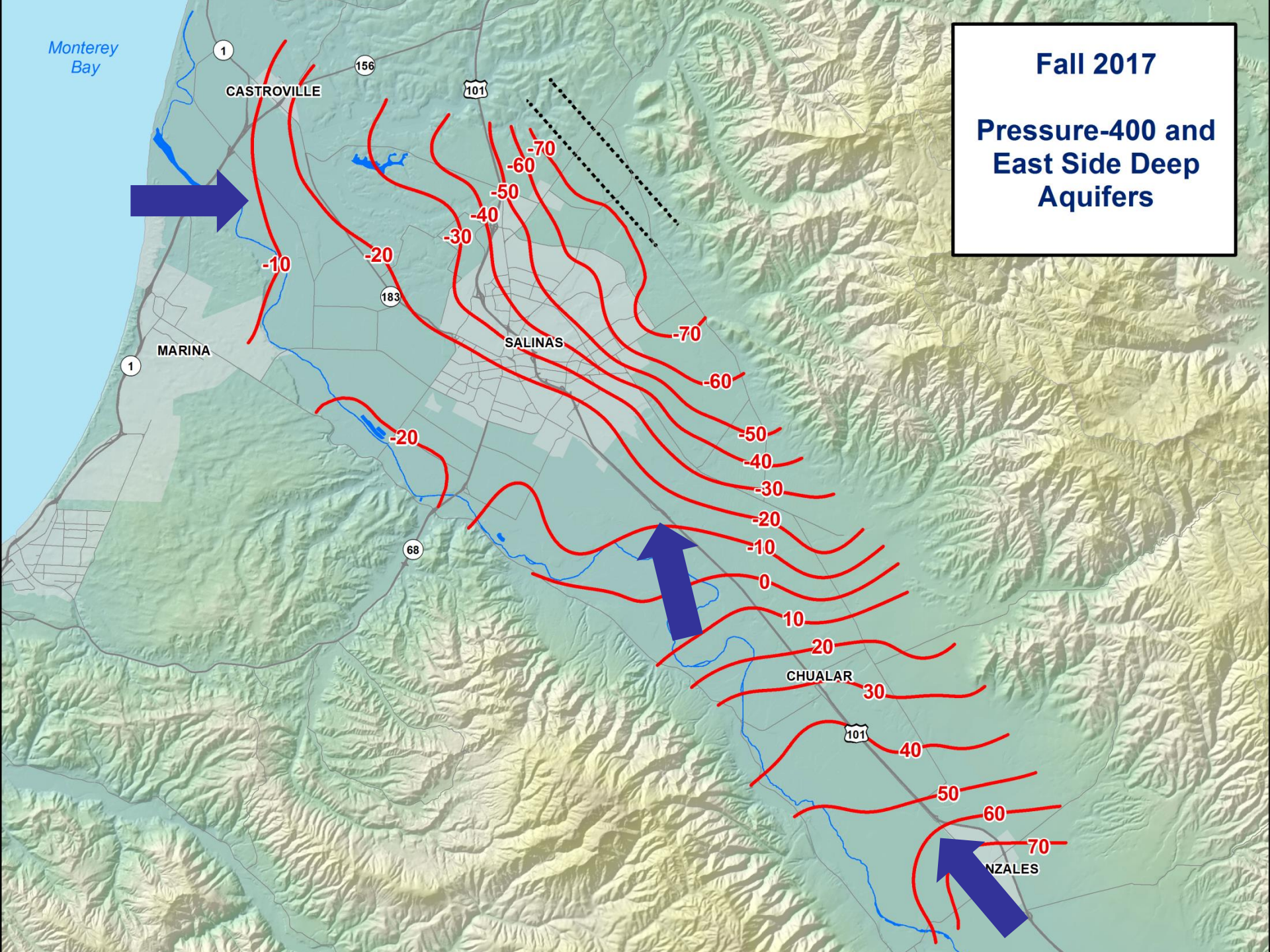
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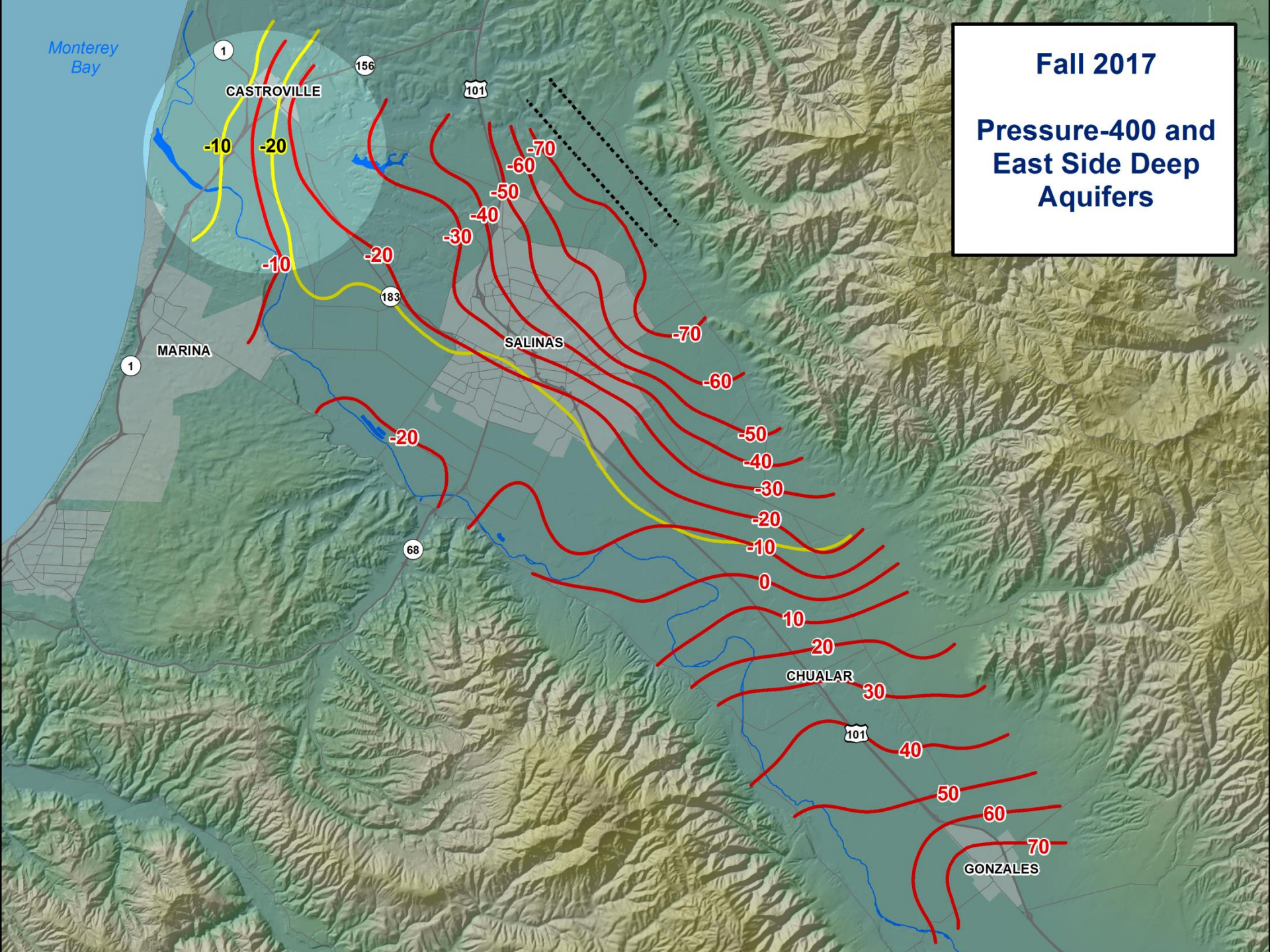
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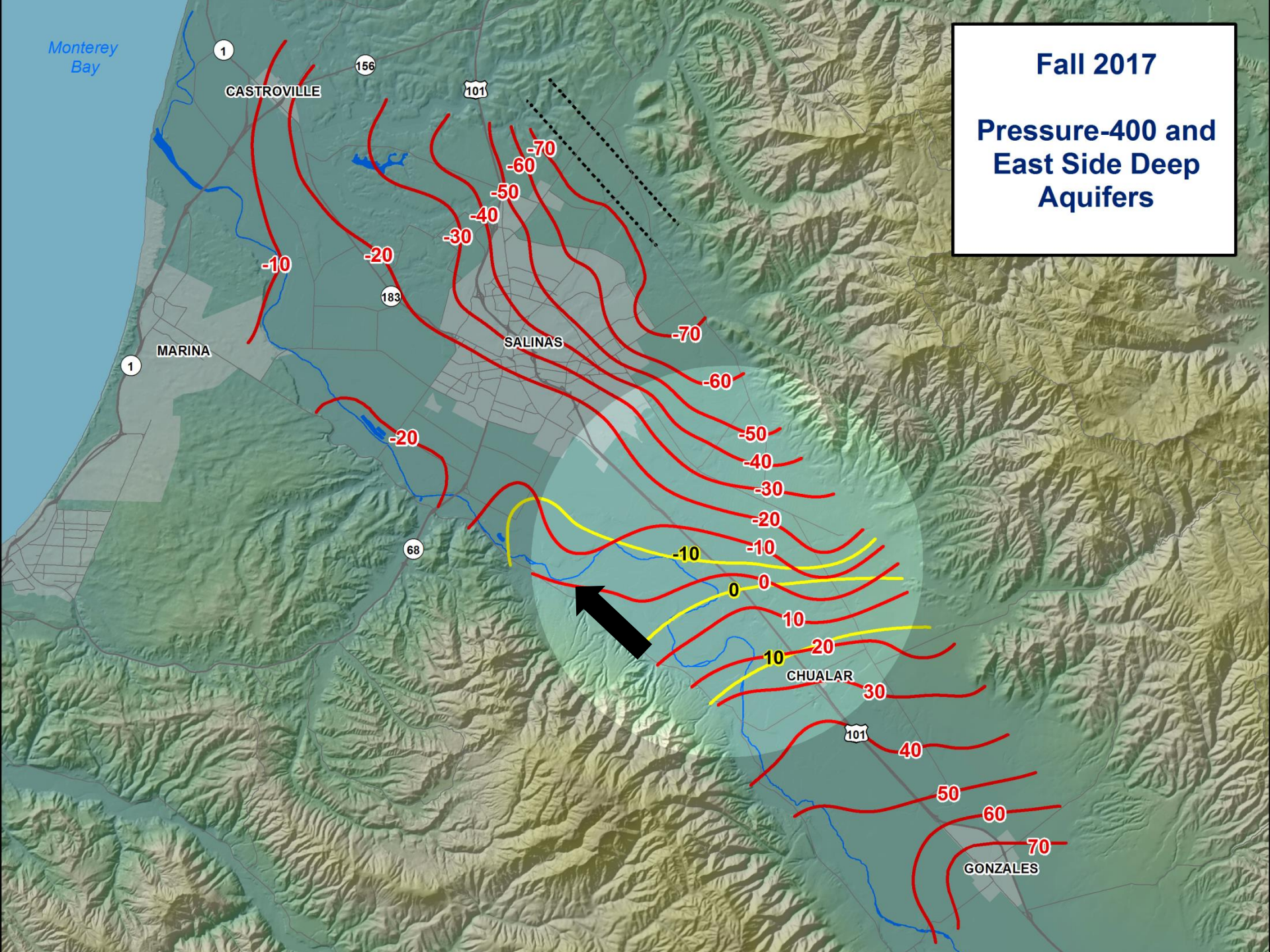
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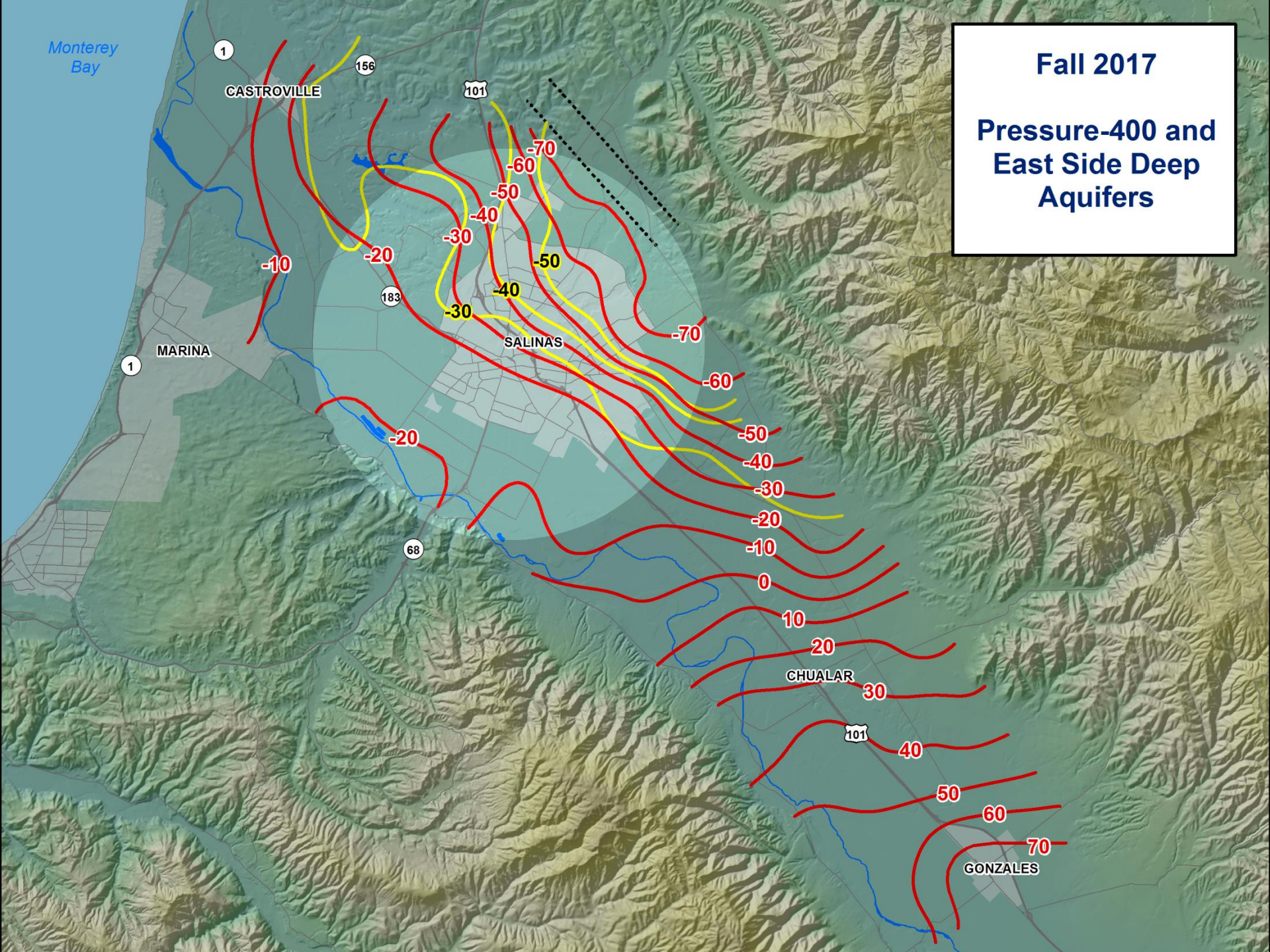
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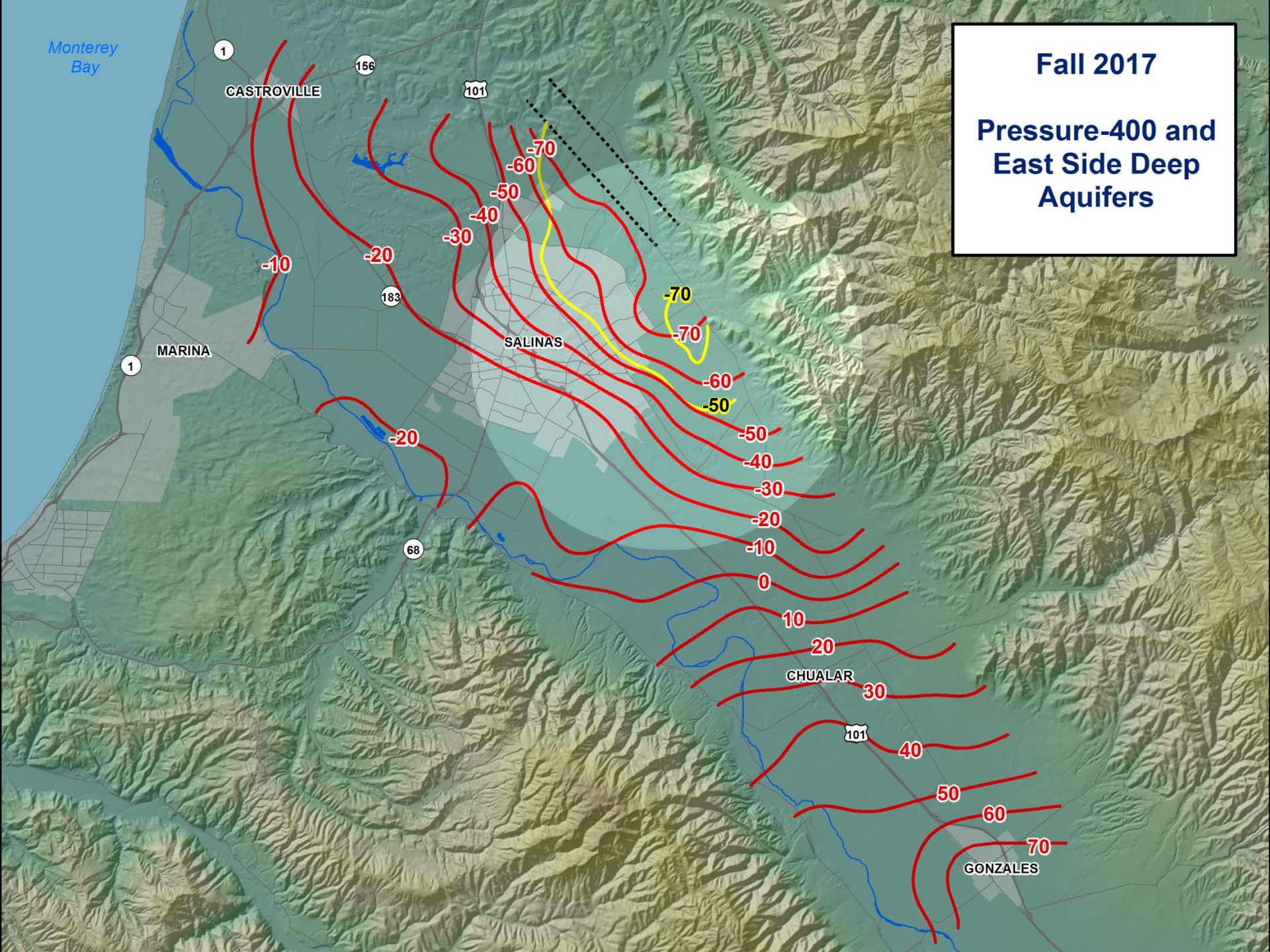
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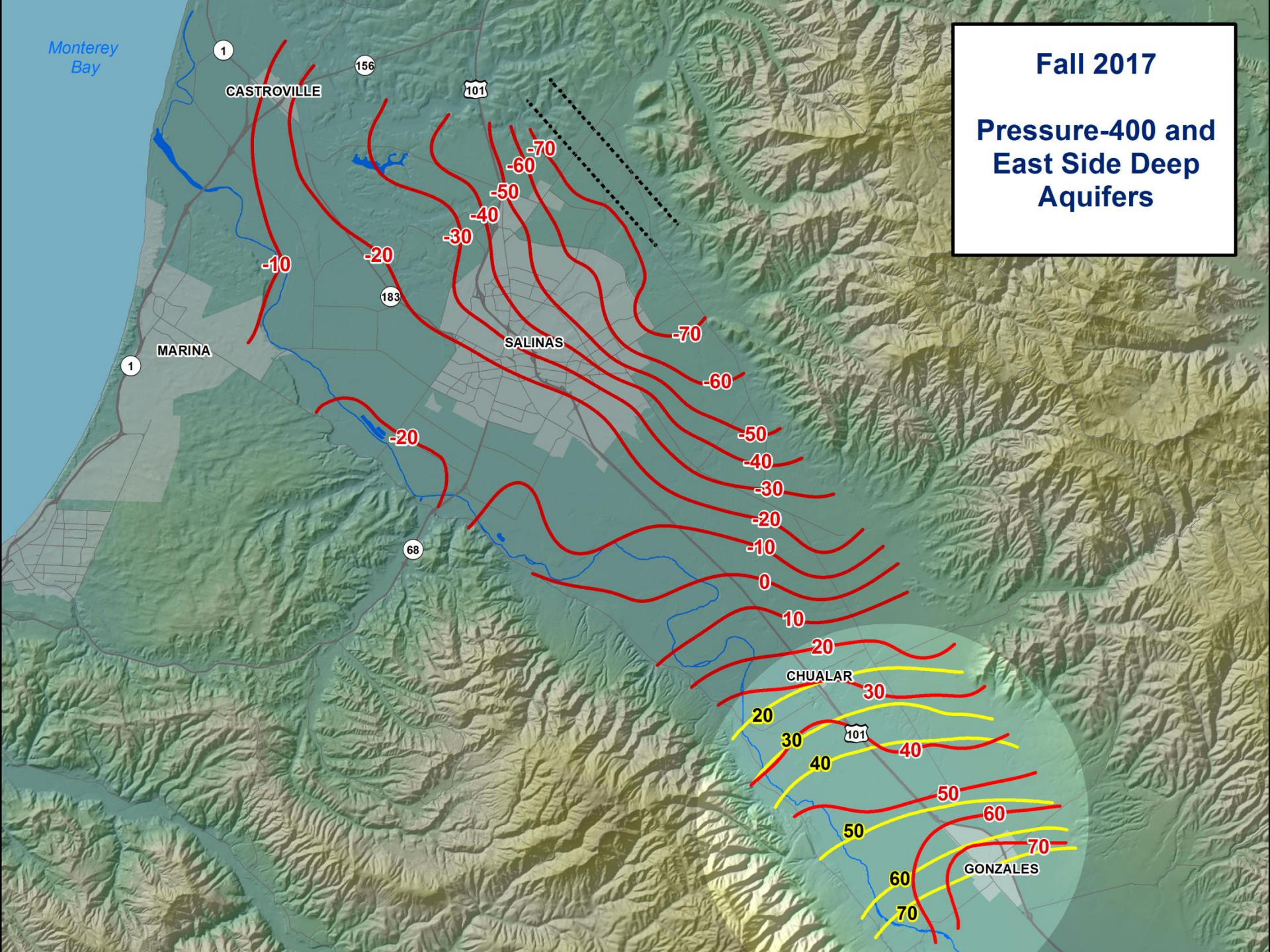
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Pressure-400 and East Side Deep Aquifers

Summary: 2017 Fall GWL Changes Since 2015

- P180, East Side Shallow, Forebay, Upper Valley Aquifers
  - Coastal GWLs: little to no change
  - East Side: trough 10 feet recovery
  - Zero line moved three miles down valley
  - Largest recoveries near King City (30ft)
  - San Lucas to San Ardo area: little change

Summary: 2017 Fall GWL Changes Since 2015

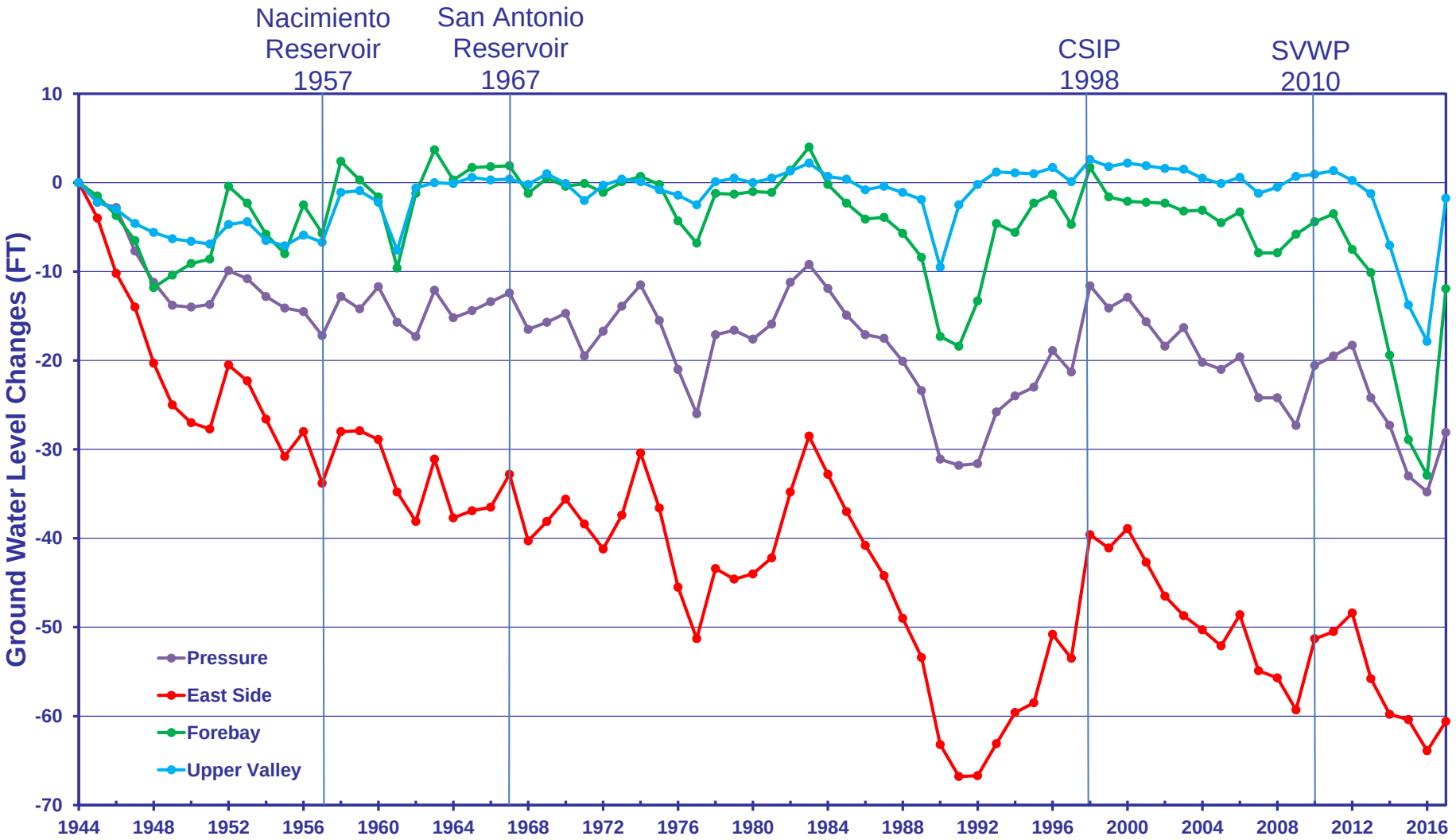
- P400, East Side Deep
  - Coastal GWLs: No change to 5ft higher
  - Salinas area: Little change
  - East Side: little to no change north, up to 10 ft recovery between Chualar & Gonzales
  - Zero line two miles down valley
  - 10 ft recovery near Chualar; little change near Gonzales

GWL Changes Since 1944

Fall data (1944-2017)

- Indicator of change in aquifer storage
- Approximately 400 GWL measurements
- 200-300 used for comparison
- Each Subarea represented by one value

Fall Groundwater Level Changes by Subarea

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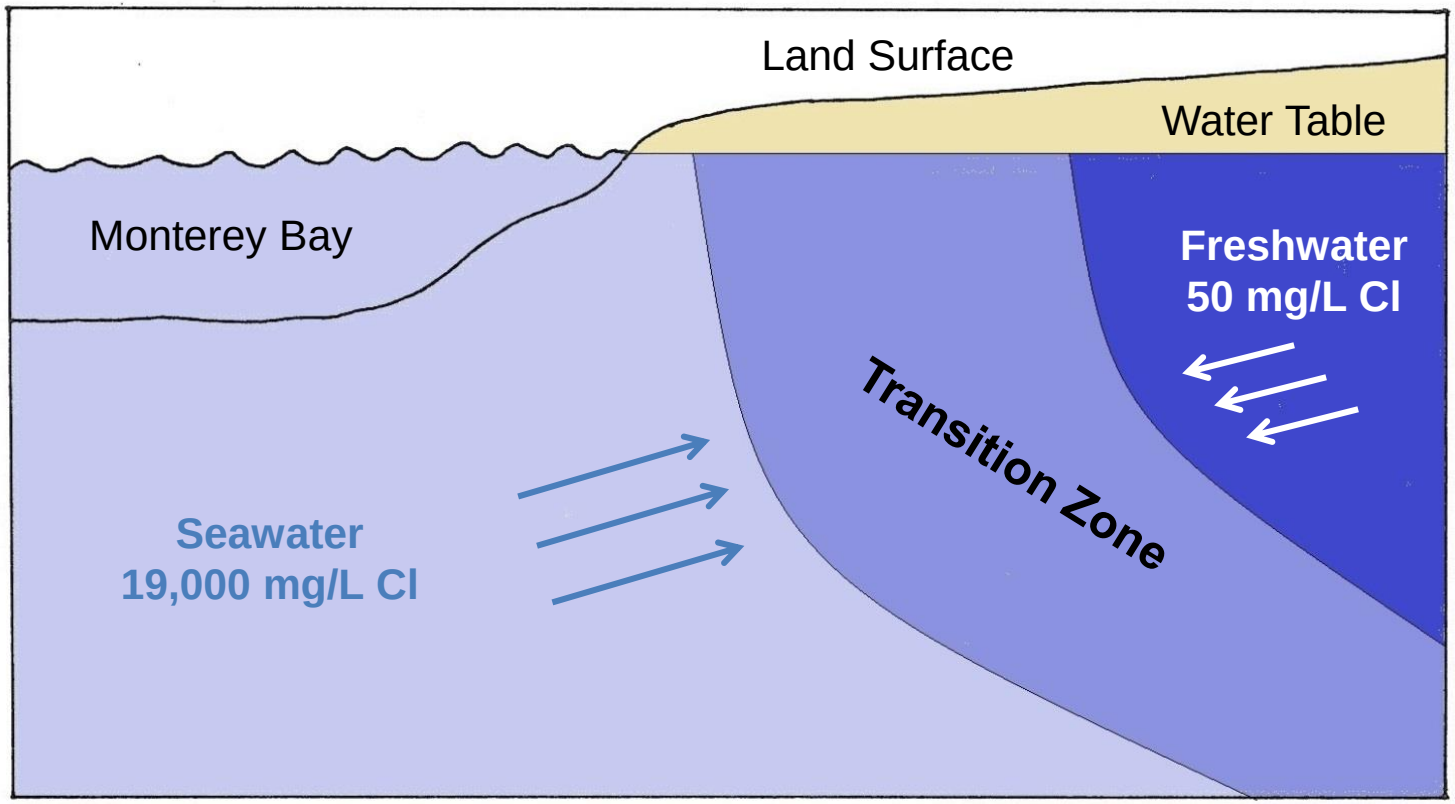
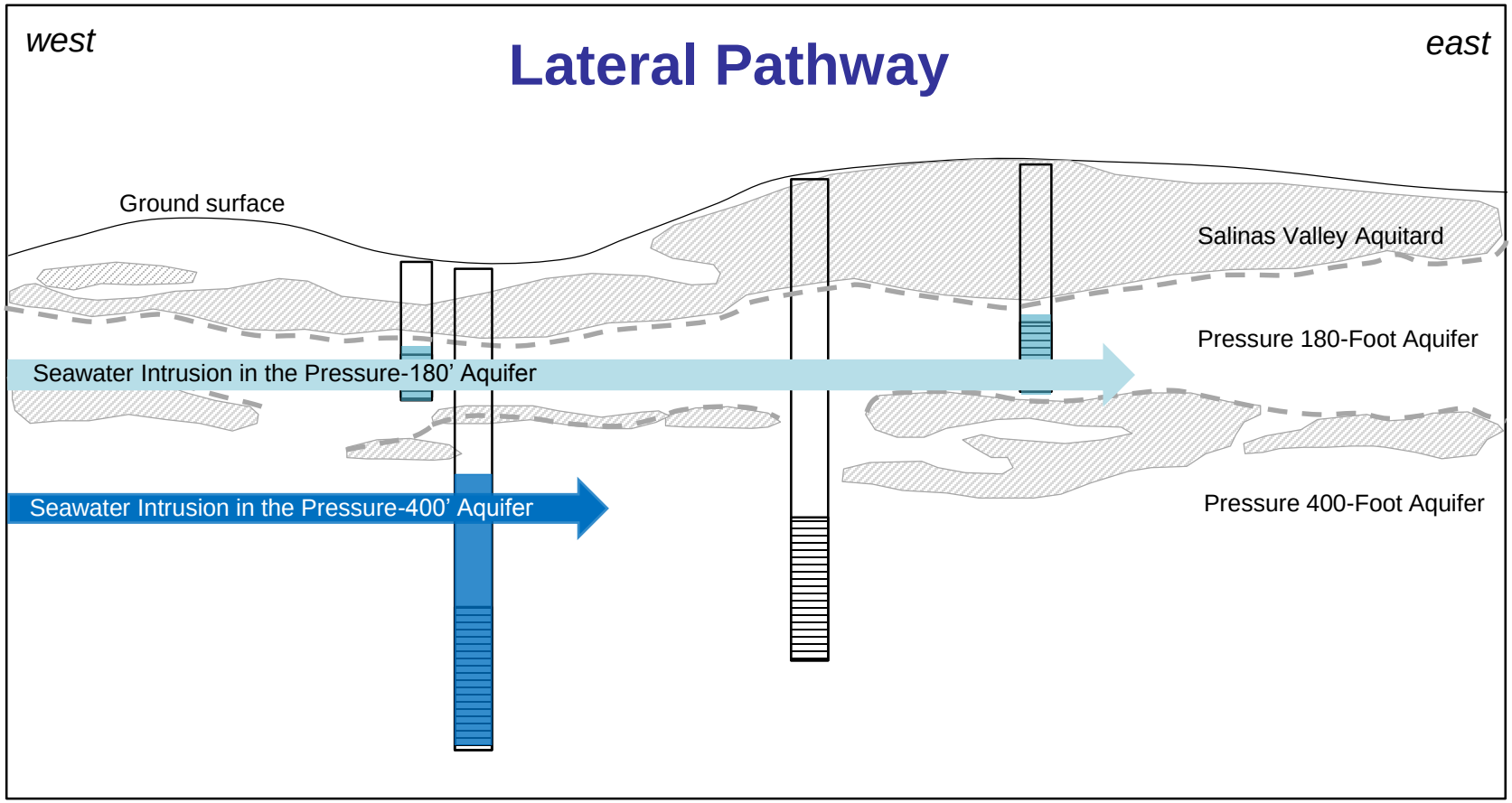
Coastal Salinas Valley Seawater Intrusion Maps

500 mg/L Chloride Contours
2017

Seawater Intrusion – Transition Zone



Seawater Intrusion – Pathways

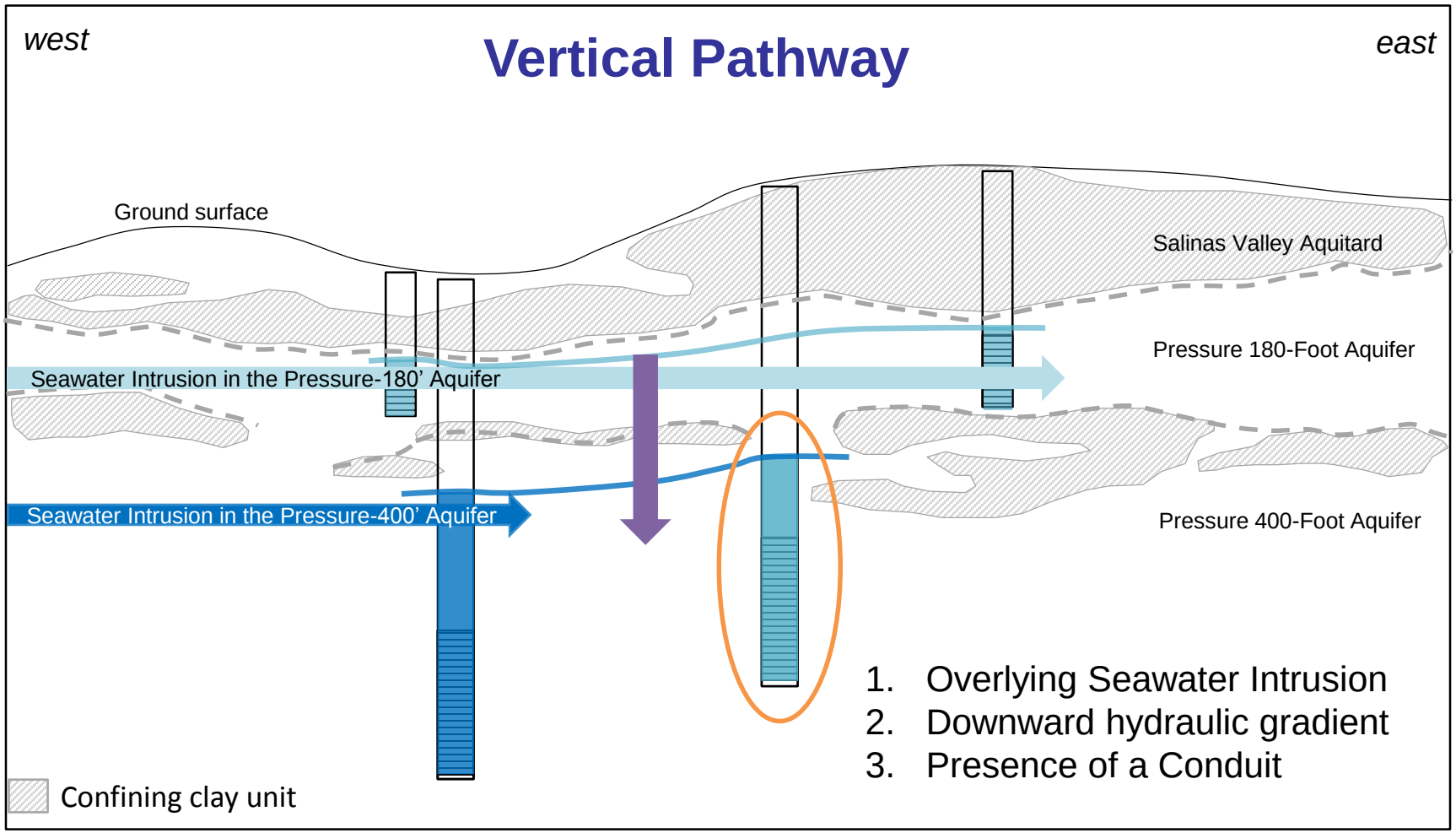


Confining clay unit

Water Level in Pressure 180-Foot Aquifer

Water Level in Pressure 400-Foot Aquifer

Seawater Intrusion – Pathways



Seawater Intrusion – Monitoring Program

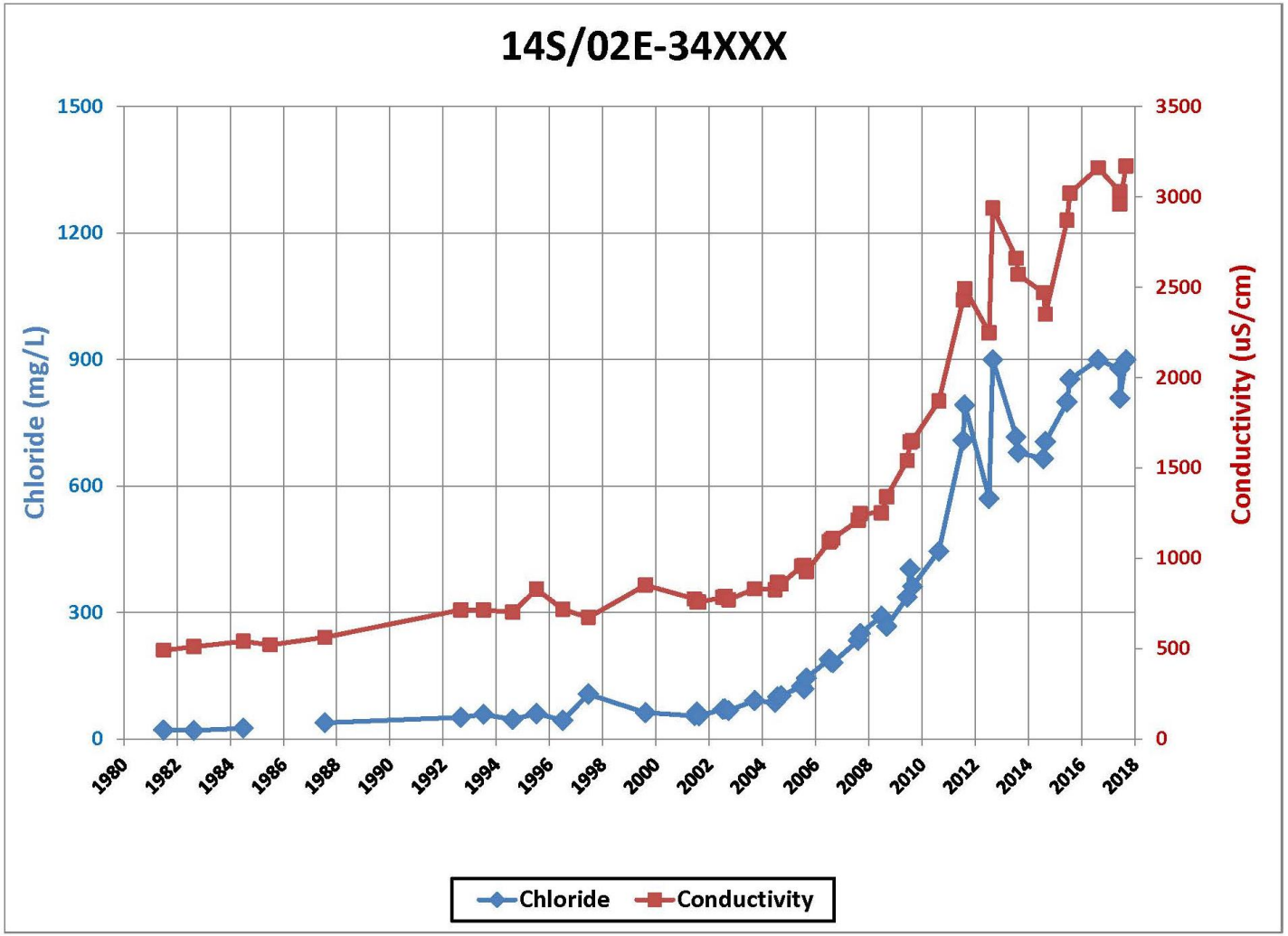
- Groundwater Wells
  - ➢ Sampled annually during peak pumping
  - ➢ 96 Agricultural wells sampled twice (Jun & Aug)
  - ➢ 25 Dedicated monitoring wells sampled
    - ❖ Agency's wells and MPWSP wells
  - ➢ Analyzed for General Minerals

Seawater Intrusion – Analysis

- Data Evaluation
  - ➢Historical Chloride & Conductivity Trends
  - ➢Stiff and Piper Diagrams
  - ➢Chloride Concentration vs. Na/Cl Molar Ratio Trends

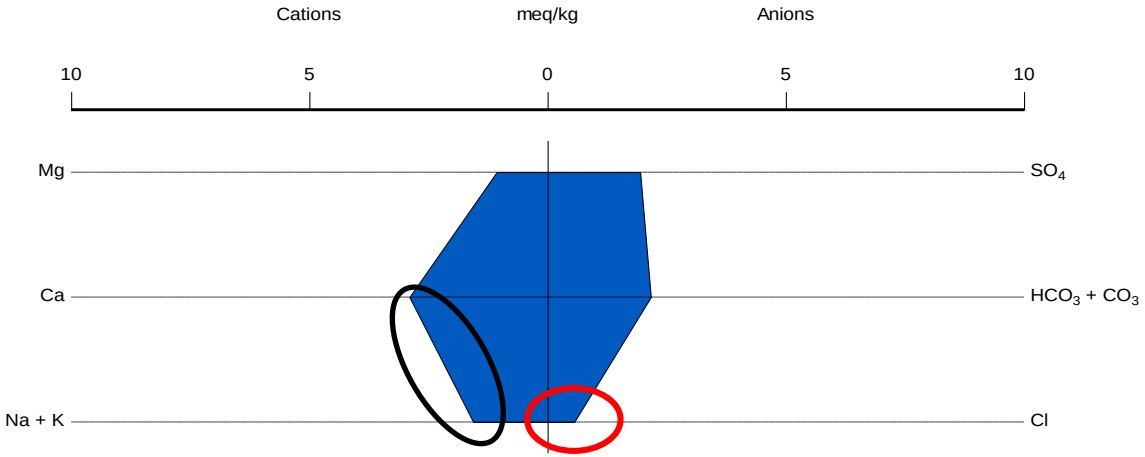
- Data Development Process
  - ➢Water Quality
  - ➢Well Construction
  - ➢Well Pumping Data
  - ➢Ground Water Level Contours

Chloride & Conductivity Time Series Indicating Intrusion

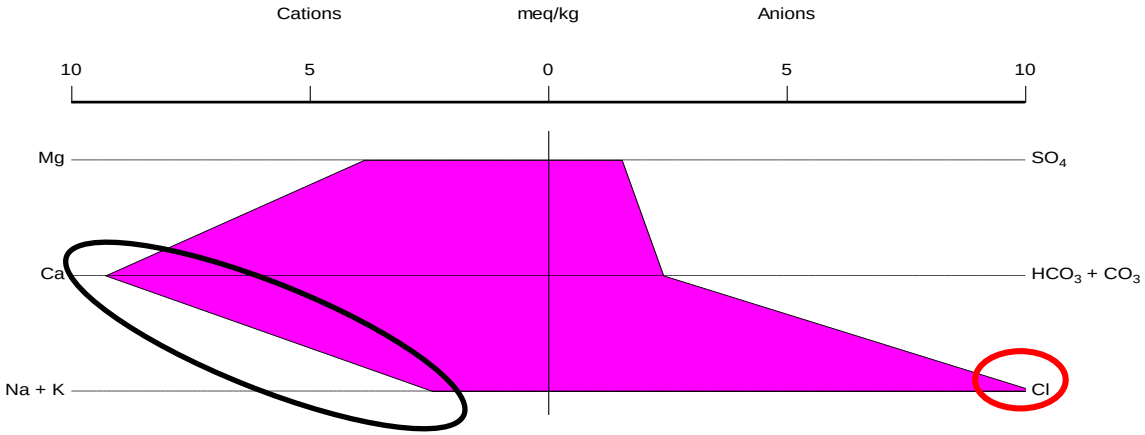


Stiff Diagrams

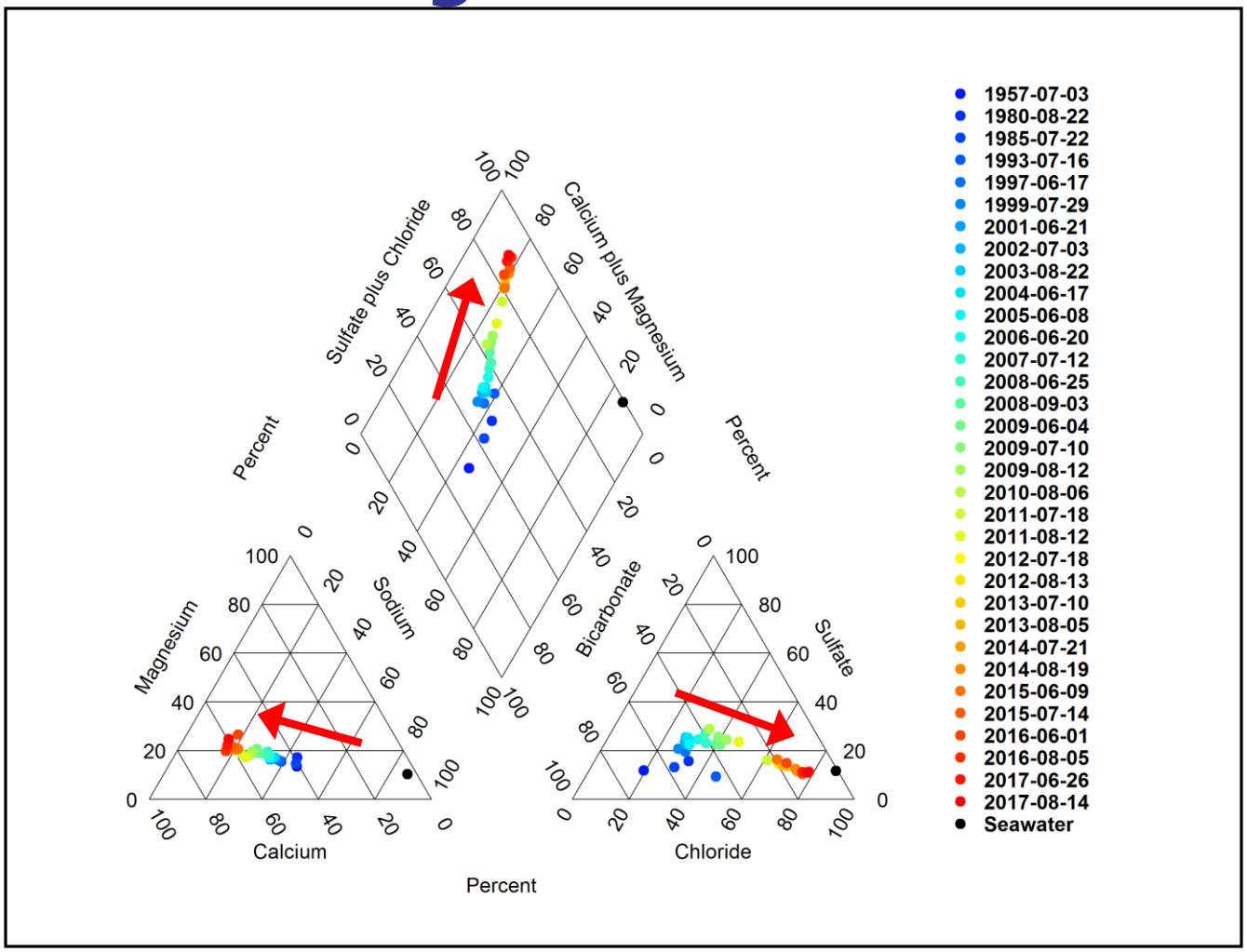
No Intrusion - 1982



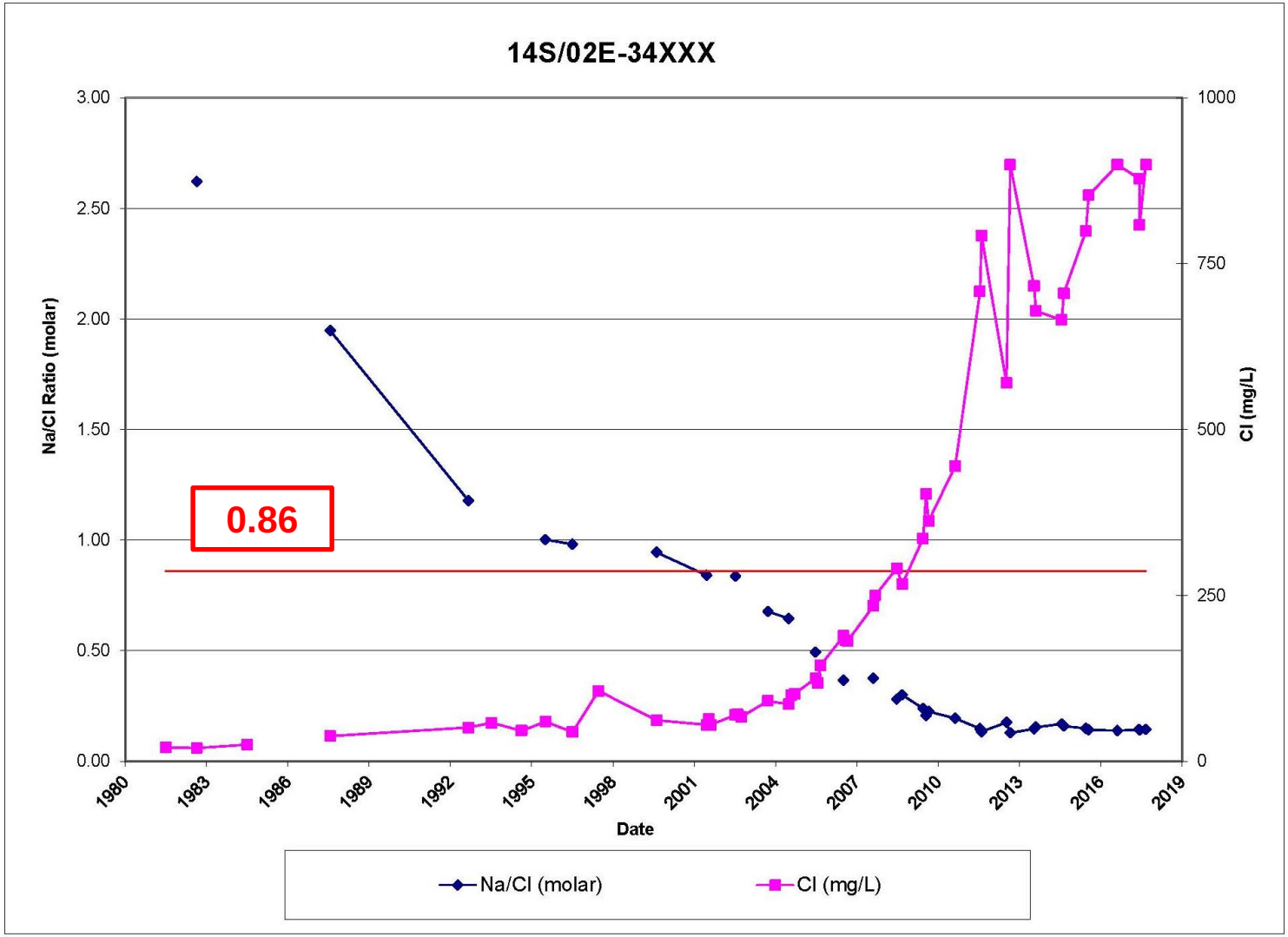
Early Intrusion - 2009



Piper Diagram
Indicating Phase-I Intrusion



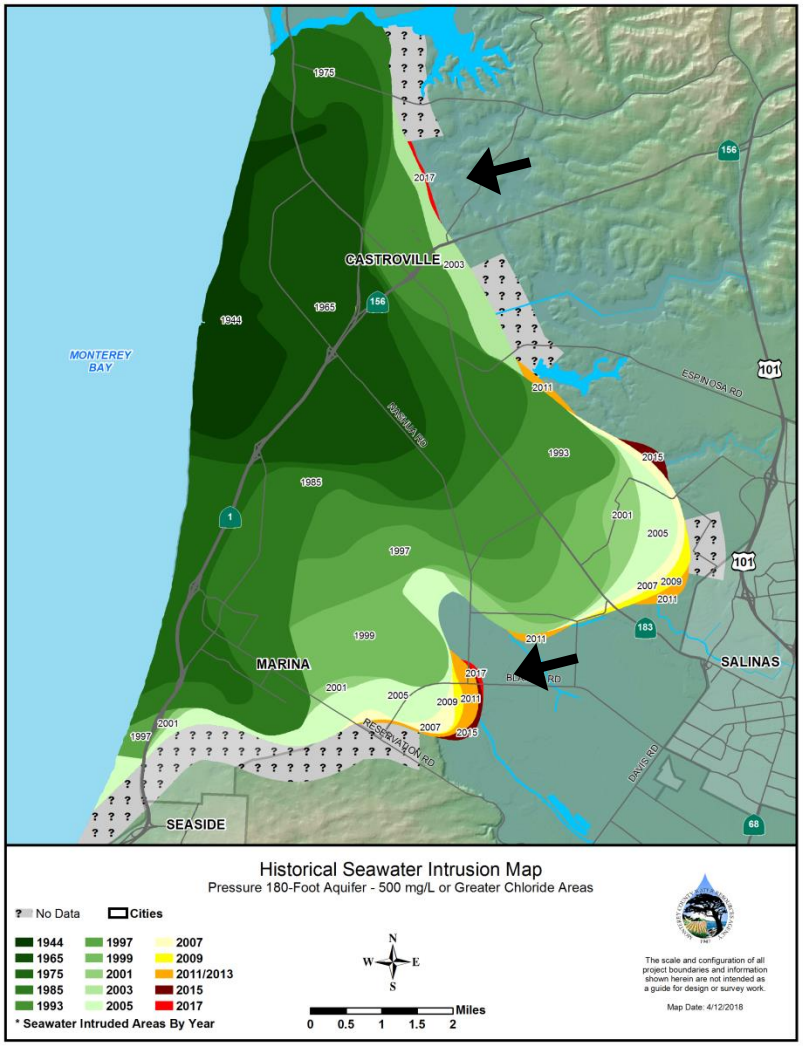
Chloride vs. Na/Cl Molar Ratio



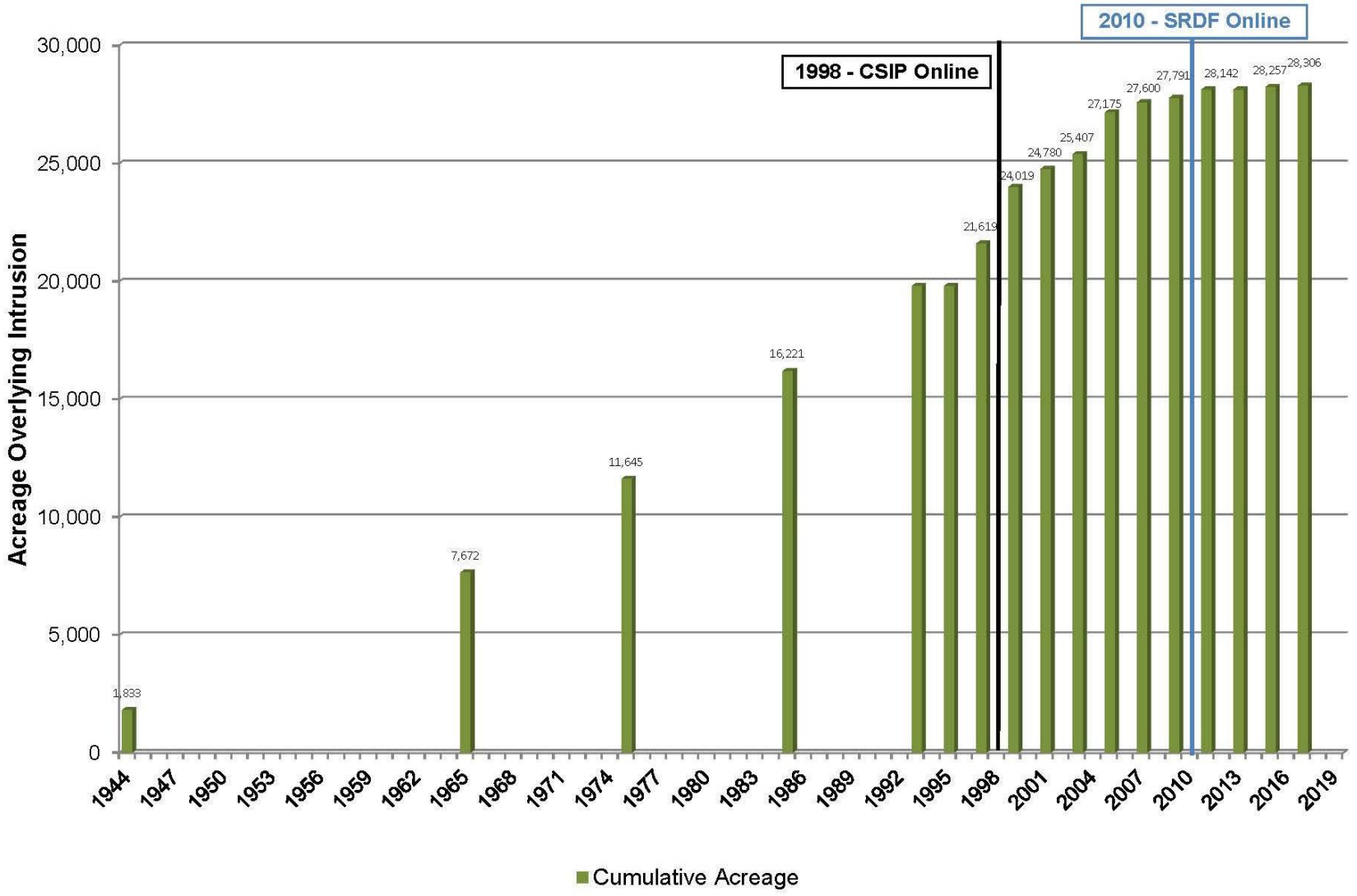
Seawater Intrusion – Data Processing

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

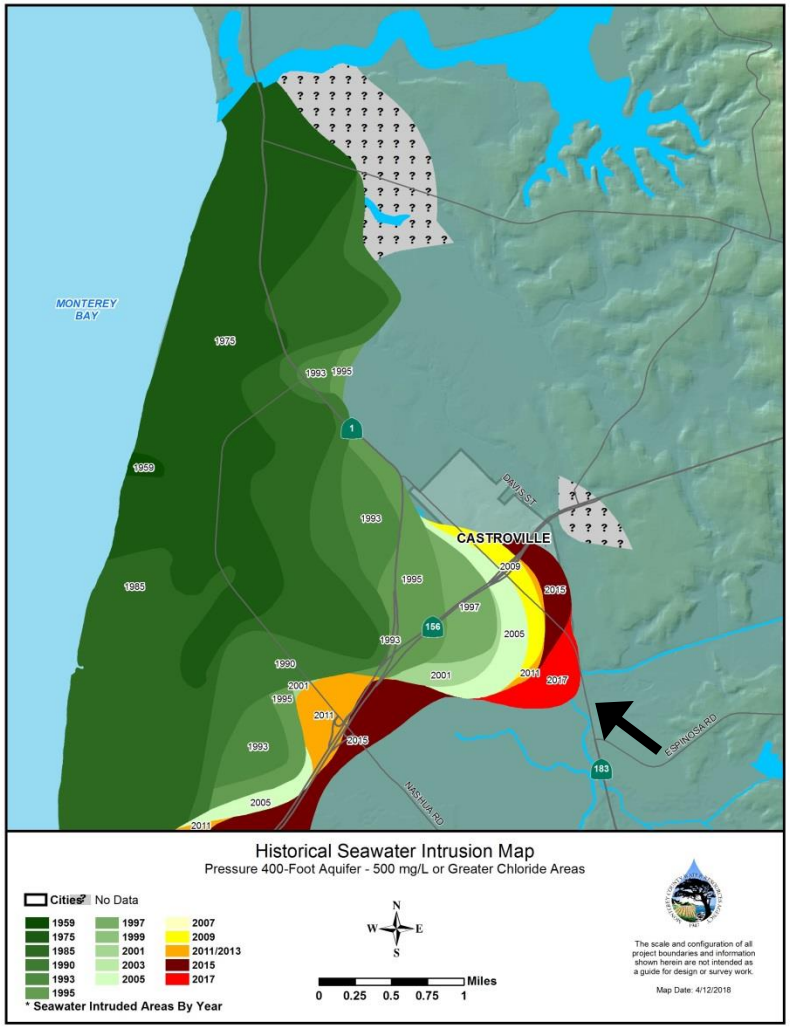
2017 Pressure 180-Foot Aquifer 500 mg/L Chloride Areas



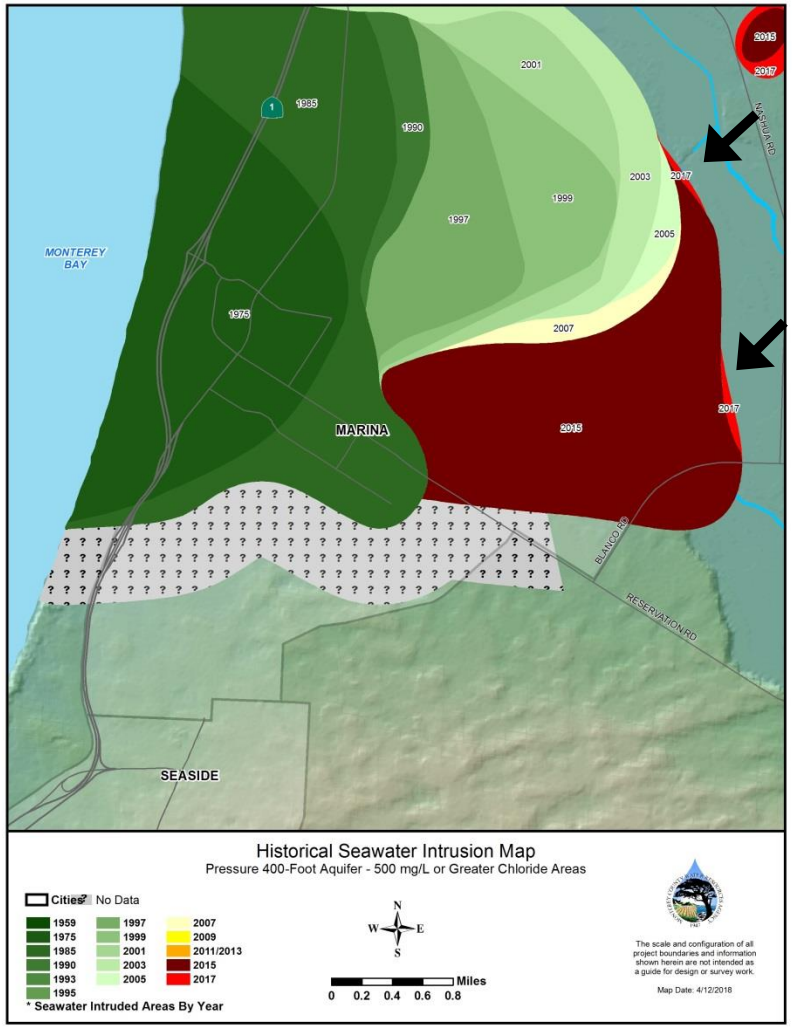
Acreage Overlying the 500 mg/L Chloride Contour
Pressure 180-Foot Aquifer



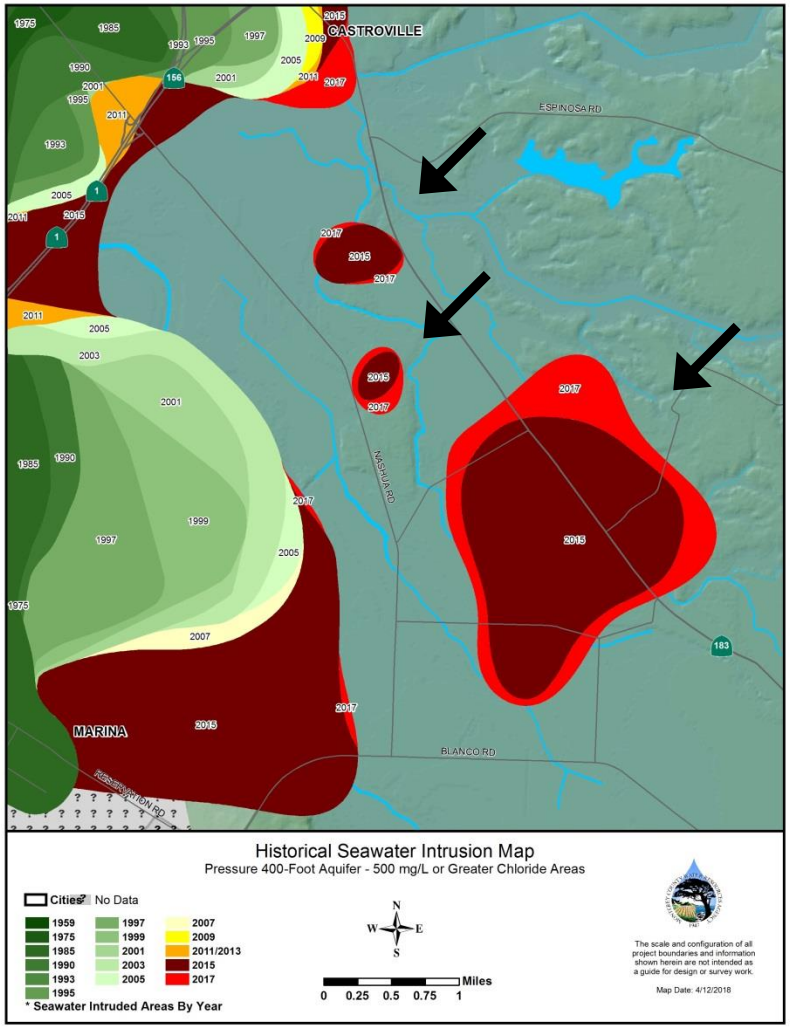
2017 Pressure 400-Foot Aquifer 500 mg/L Chloride Areas



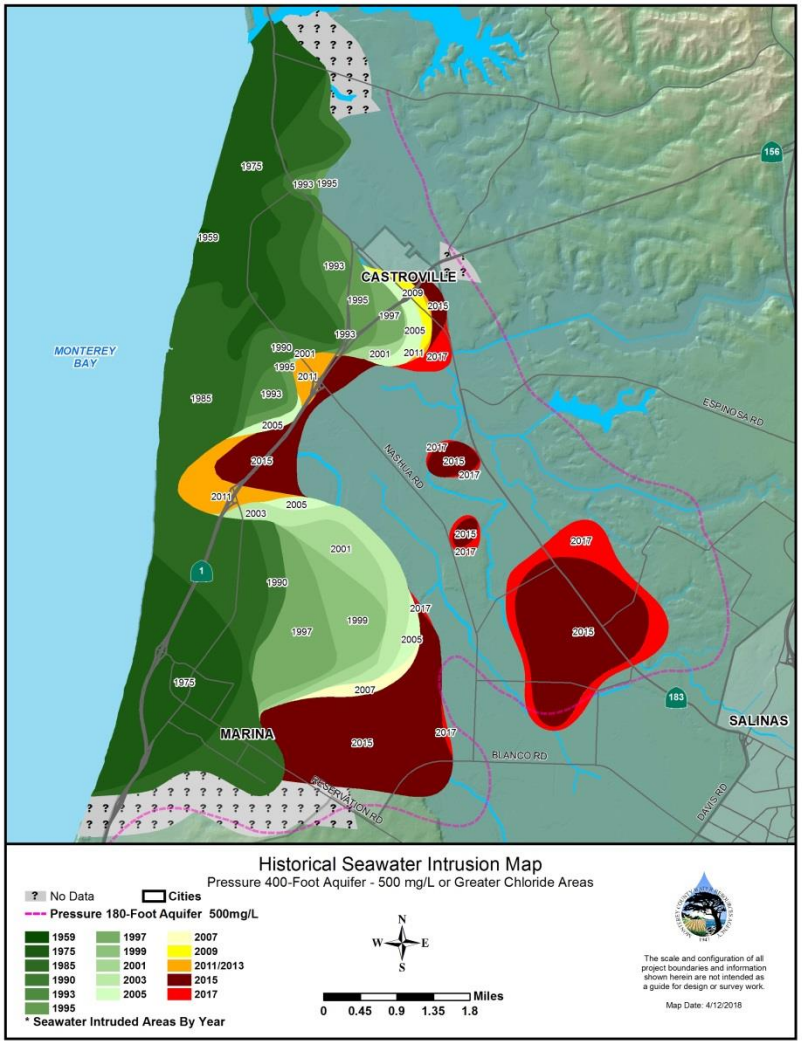
2017 Pressure 400-Foot Aquifer 500 mg/L Chloride Areas



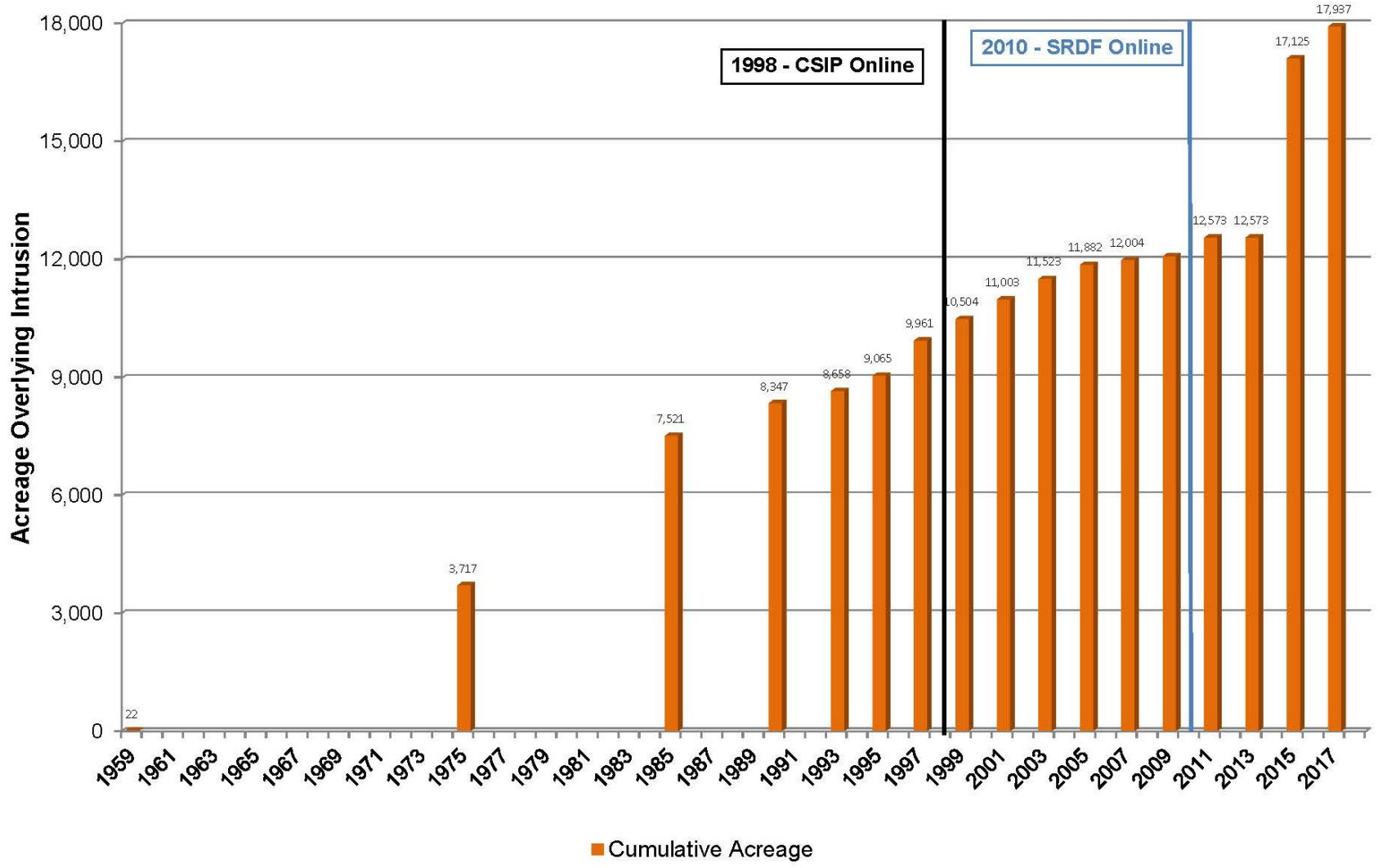
2017 Pressure 400-Foot Aquifer 500 mg/L Chloride Areas



2017 Pressure 400-Foot Aquifer 500 mg/L Chloride Areas



Acreage Overlying the 500 mg/L Chloride Contour
Pressure 400-Foot Aquifer



Conclusion

Pressure 180-Ft Contours

- Rate of SWI Continues to Decrease
- Minimal Advancement
- Minimal Lobe Broadening

Pressure 400-Ft Contours

- Continued Lobe Broadening
- Expansion of the Intruded WQ in Front of the 500 mg/L Contour (“Islands)
- Minimal Advancement

TODAY'S ACTION

Consider Receiving the
2017 Groundwater Level Contours and
Coastal Salinas Valley
Seawater Intrusion Maps


MONTEREY COUNTY WATER RESOURCES AGENCY
1947