RECLAMATION

Managing Water in the West

NRC Committee Review

Central Valley Project

UC Davis **January 2010**

U.S. Department of the Interior
Bureau of Reclamation

California Water Projects

- Central Valley Project
- State Water Project
- Local Water Projects

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CVP Authorized Purposes

- Flood Control
- River Regulation (Navigation)
- Fish and Wildlife Needs
- Municipal & Agricultural Water Supplies
- Power Generation
- Recreation

CVP Features Summary

- 18 Dams and Reservoirs
- 500 Miles (800 Kilometers) of Canals
- 11 Powerplants
- 10 Pumping Plants
- 20 Percent of State's Developed Water Supply (about 7 million acre-feet, 8.6 billion cu meters)
- 30 Percent of the State's Agricultural Supply (about 3 mil acres of farm land, 1.2 mil hectares)
- 13 Percent of State's M&I Supply (about 2 million people served)

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CVP
Major Storage Facilities

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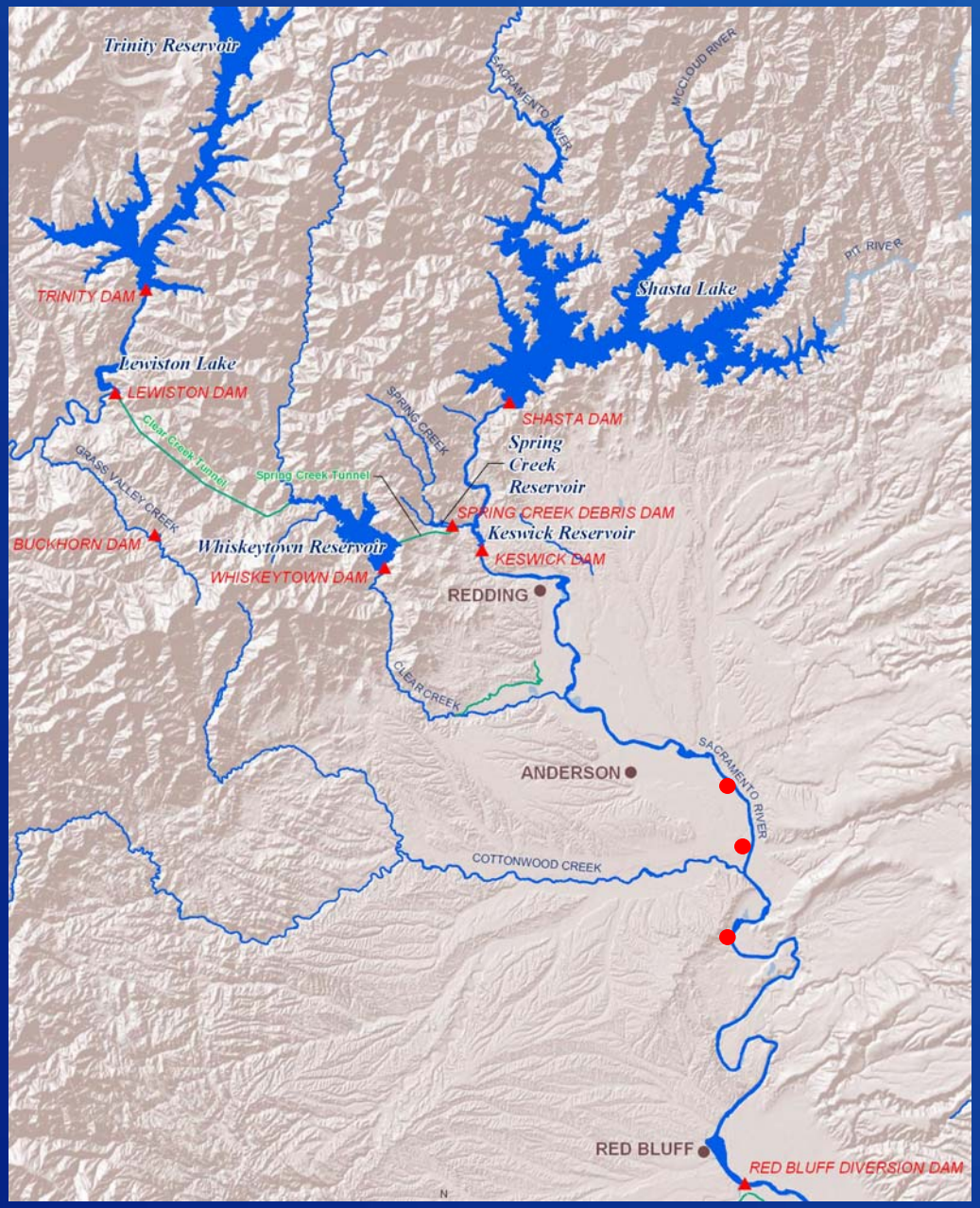

Sacramento River

Shasta – 4.5 maf
Trinity – 2.4 maf
Whiskeytown – 240k af

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Sacramento River ~ Shasta Dam

- Sacramento River Water Temperatures
- Navigation Control Point
- Coordinated Flood Operations
- Red Bluff Operations

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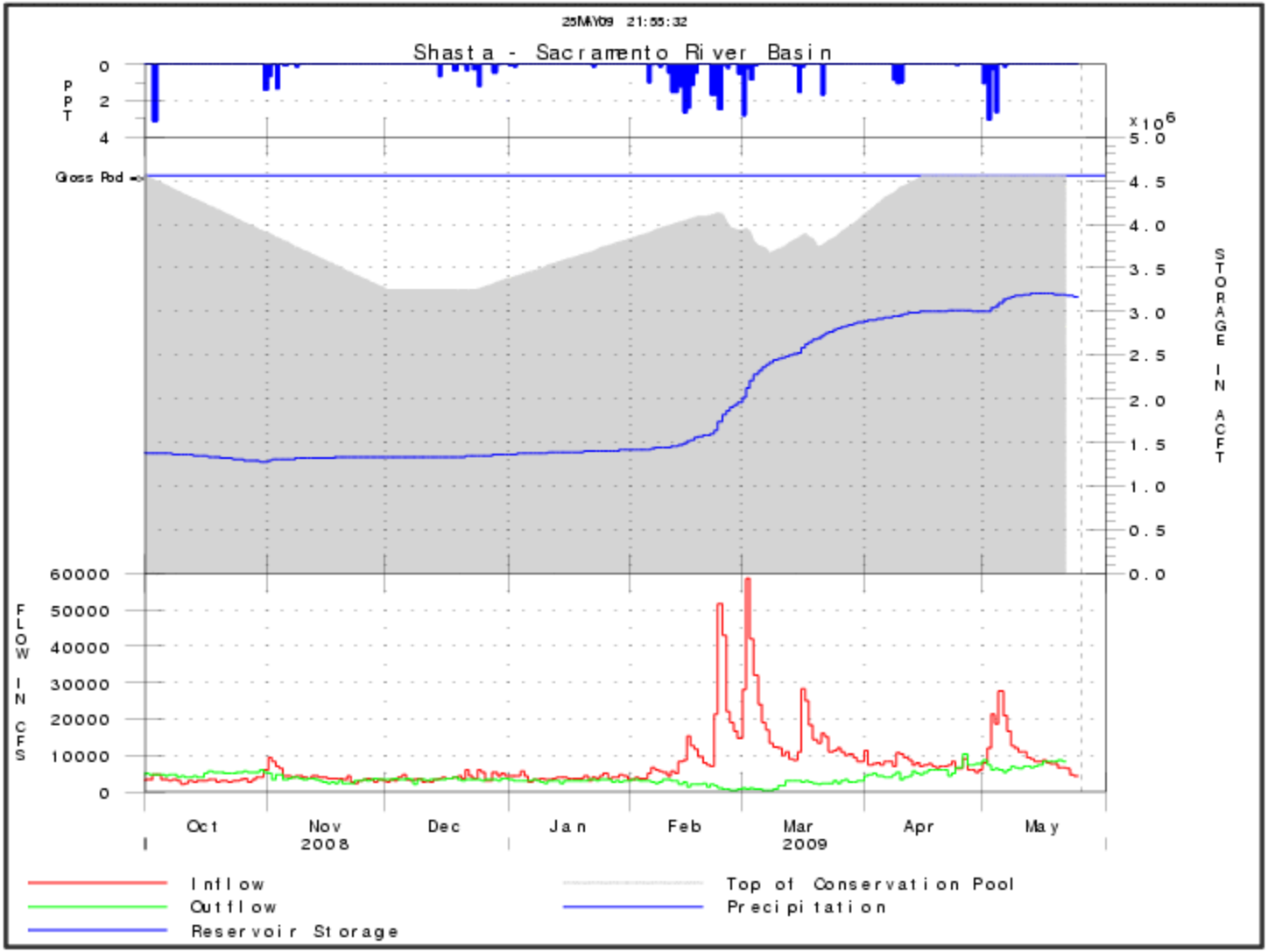

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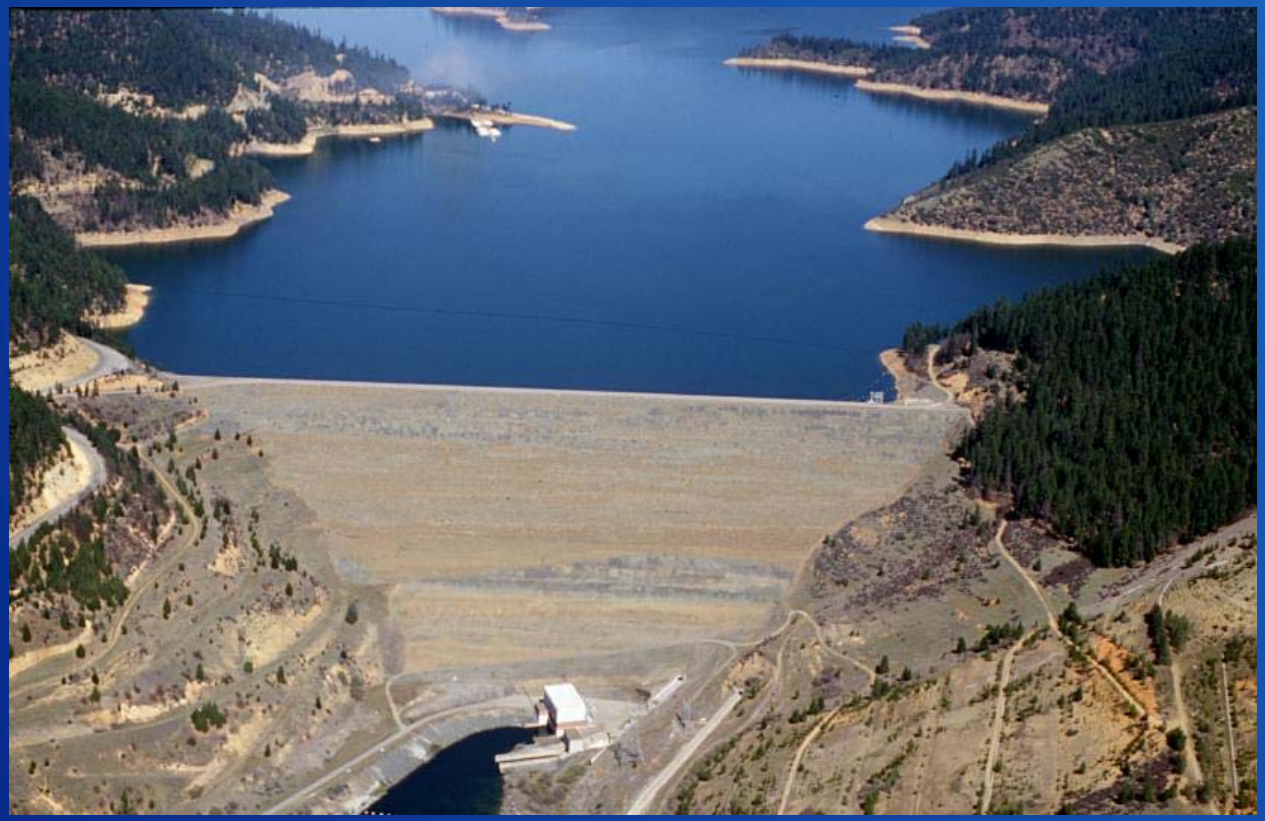
Trinity ~ Operation Constraints



- Trinity River Restoration Flows
- Trinity River Water Temperatures
- Dam Safety Restrictions

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Whiskeytown ~ Operation Constraints

- Clear Creek Flows and Temperatures
- Sacramento River Operations

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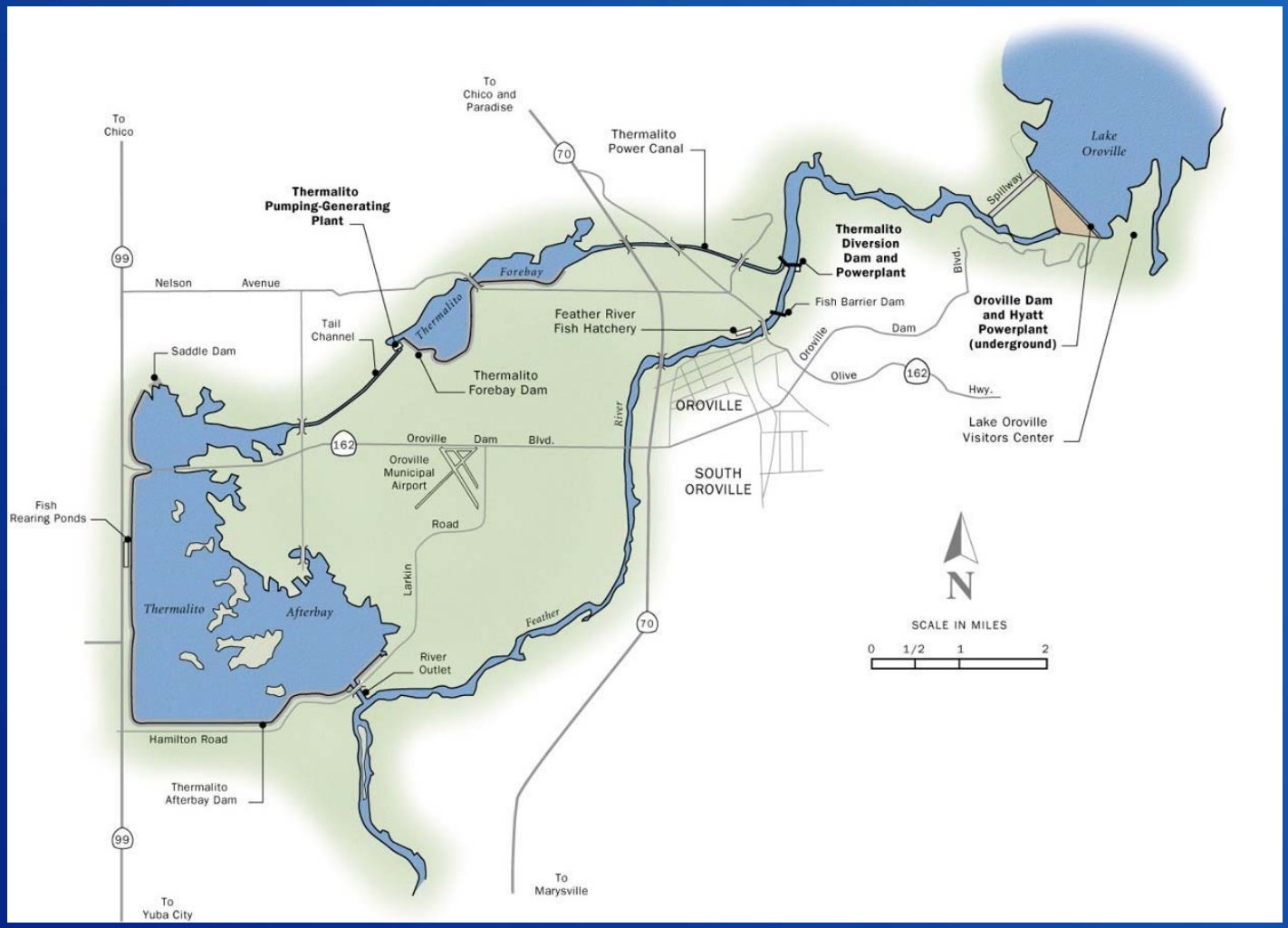
Oroville Facilities ~ Feather River



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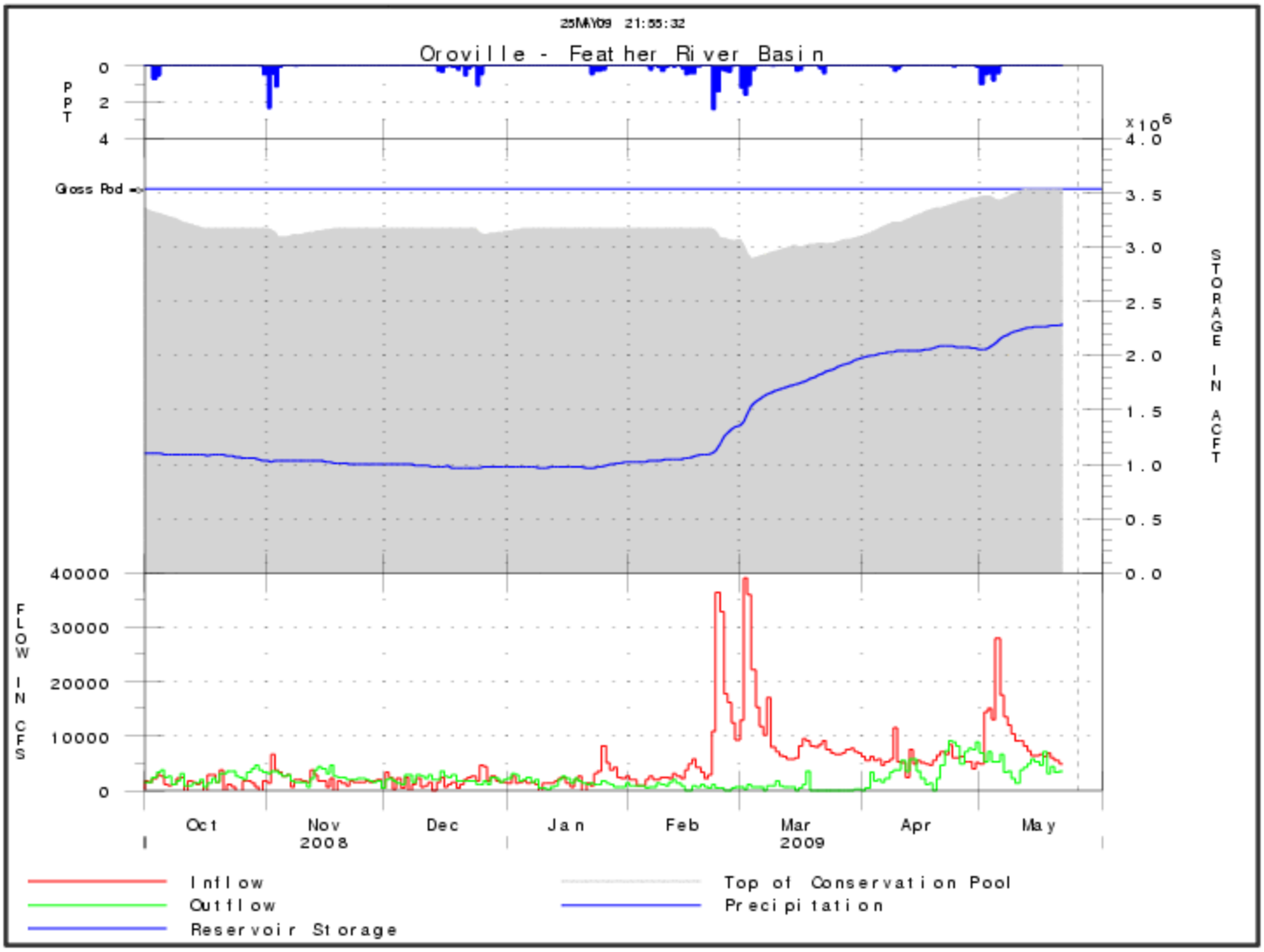

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American River ~ Operation Constraints

- Water Temperatures and Flows (steelhead v. fall-run)
- SAFCA Flood Control Diagram
- High Visibility Project

~ 1 maf capacity

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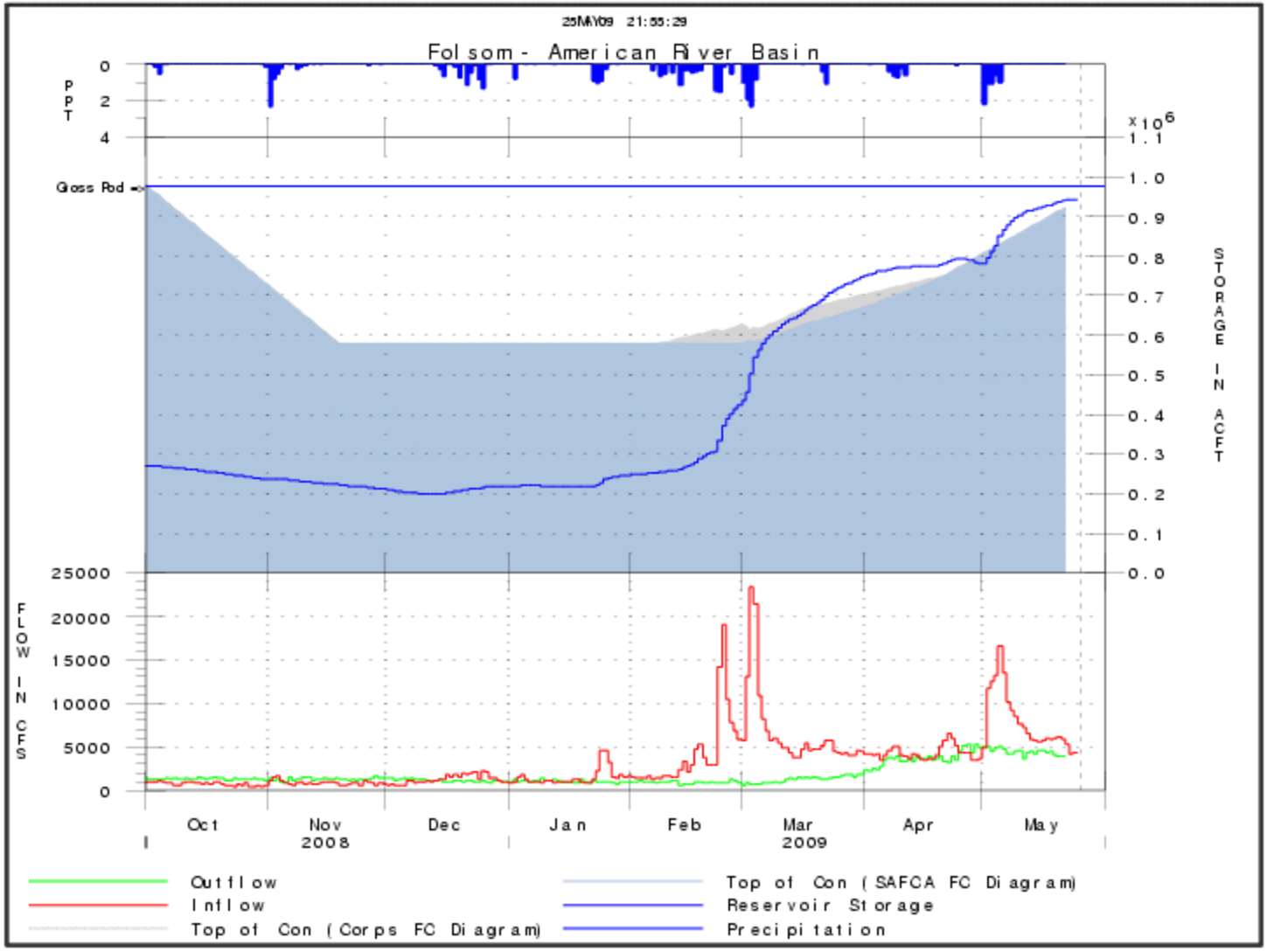

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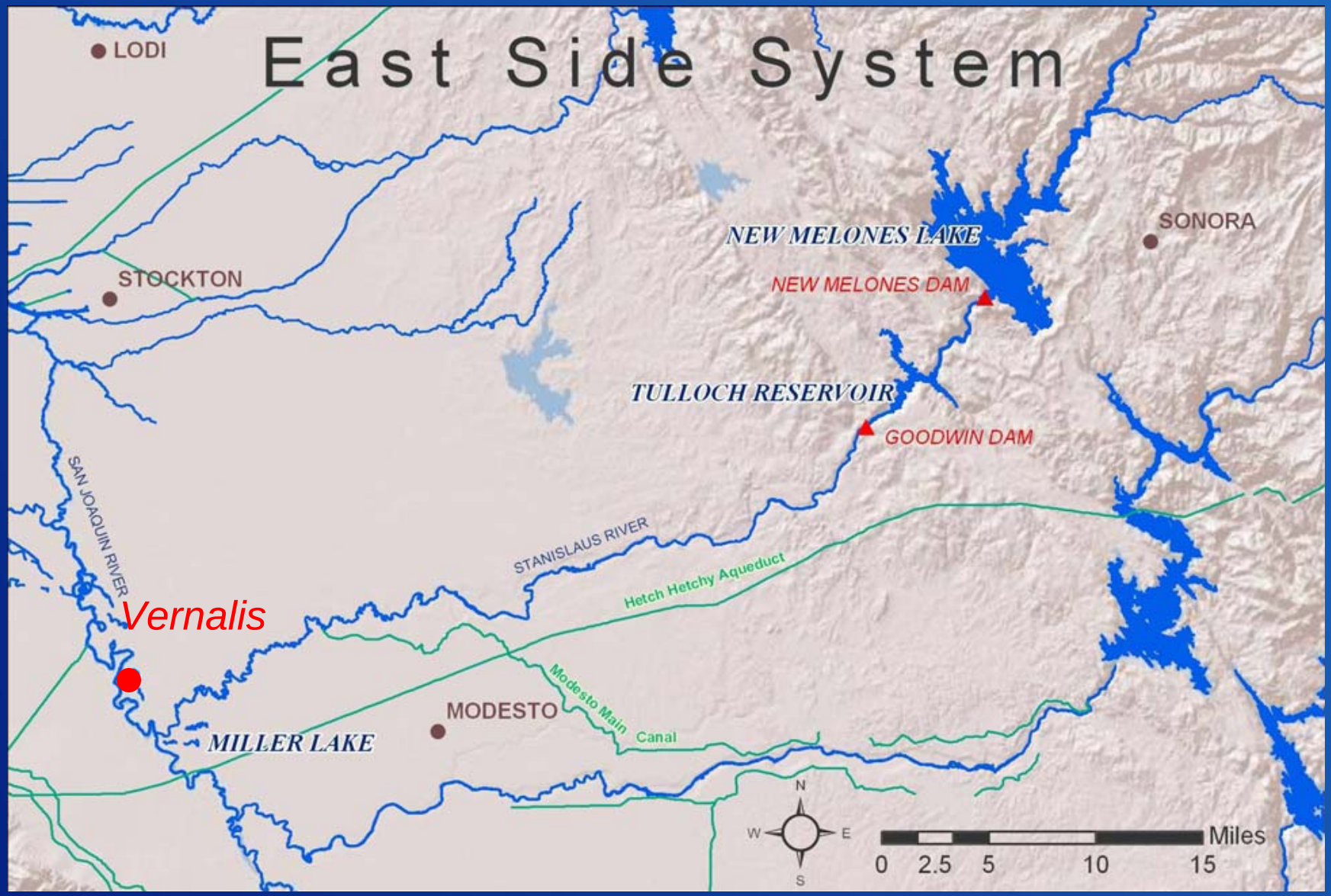

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New Melones ~ Operation Constraints

- Vernalis Water Quality (salinity)
- In-stream Fishery Flows
- Over-allocated basin – Multi-year Strategy

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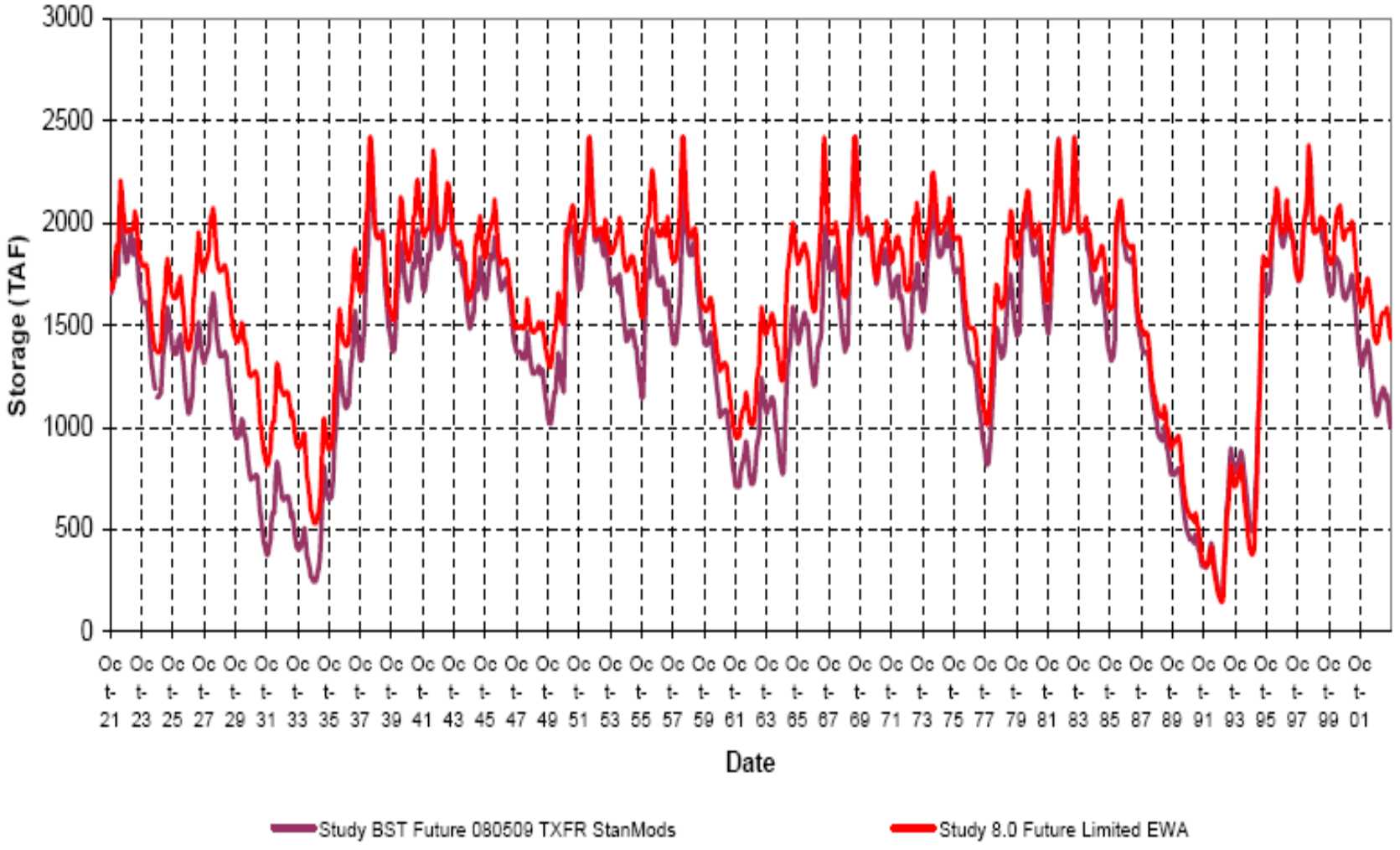
New Melones Reservoir



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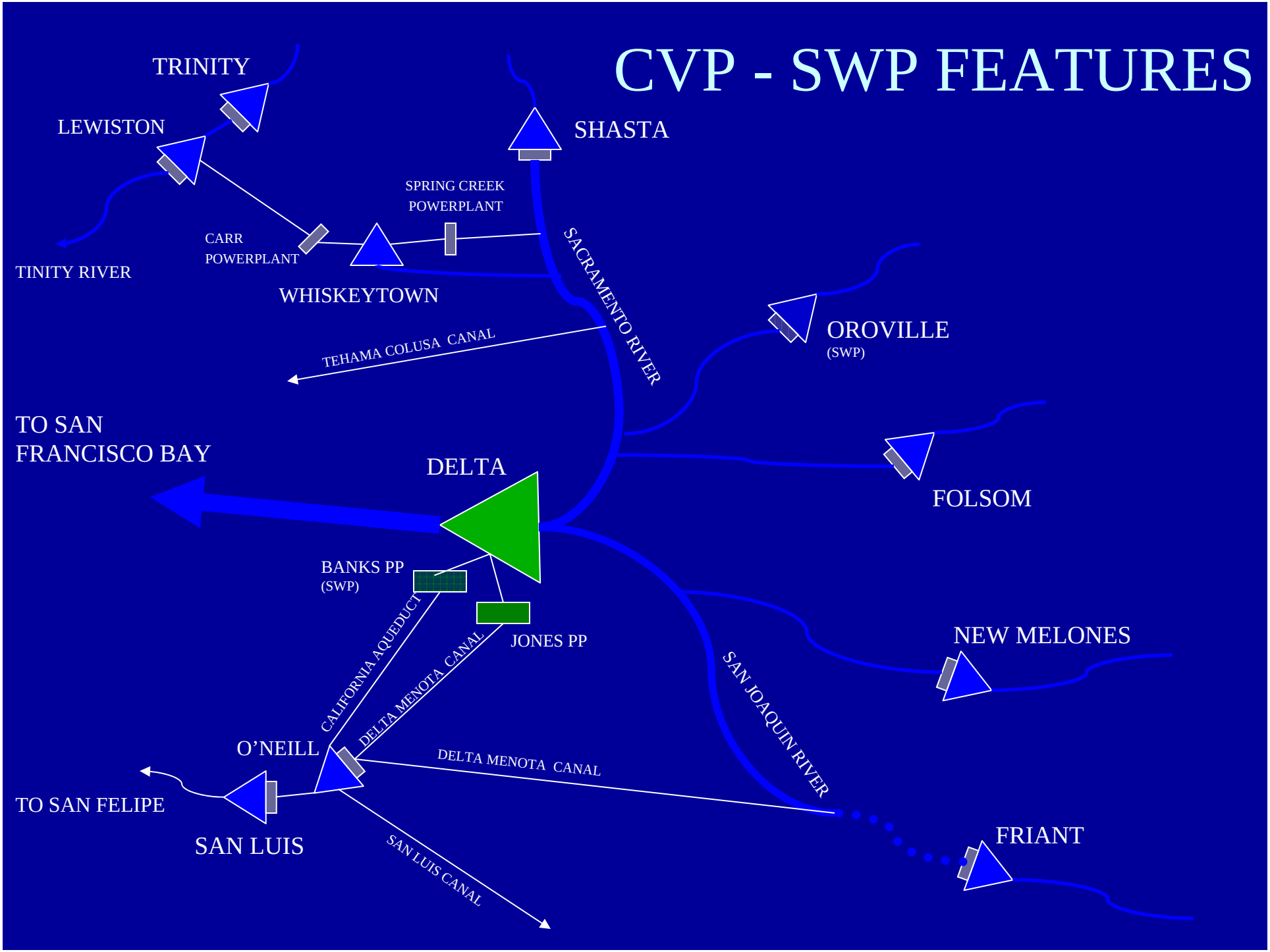
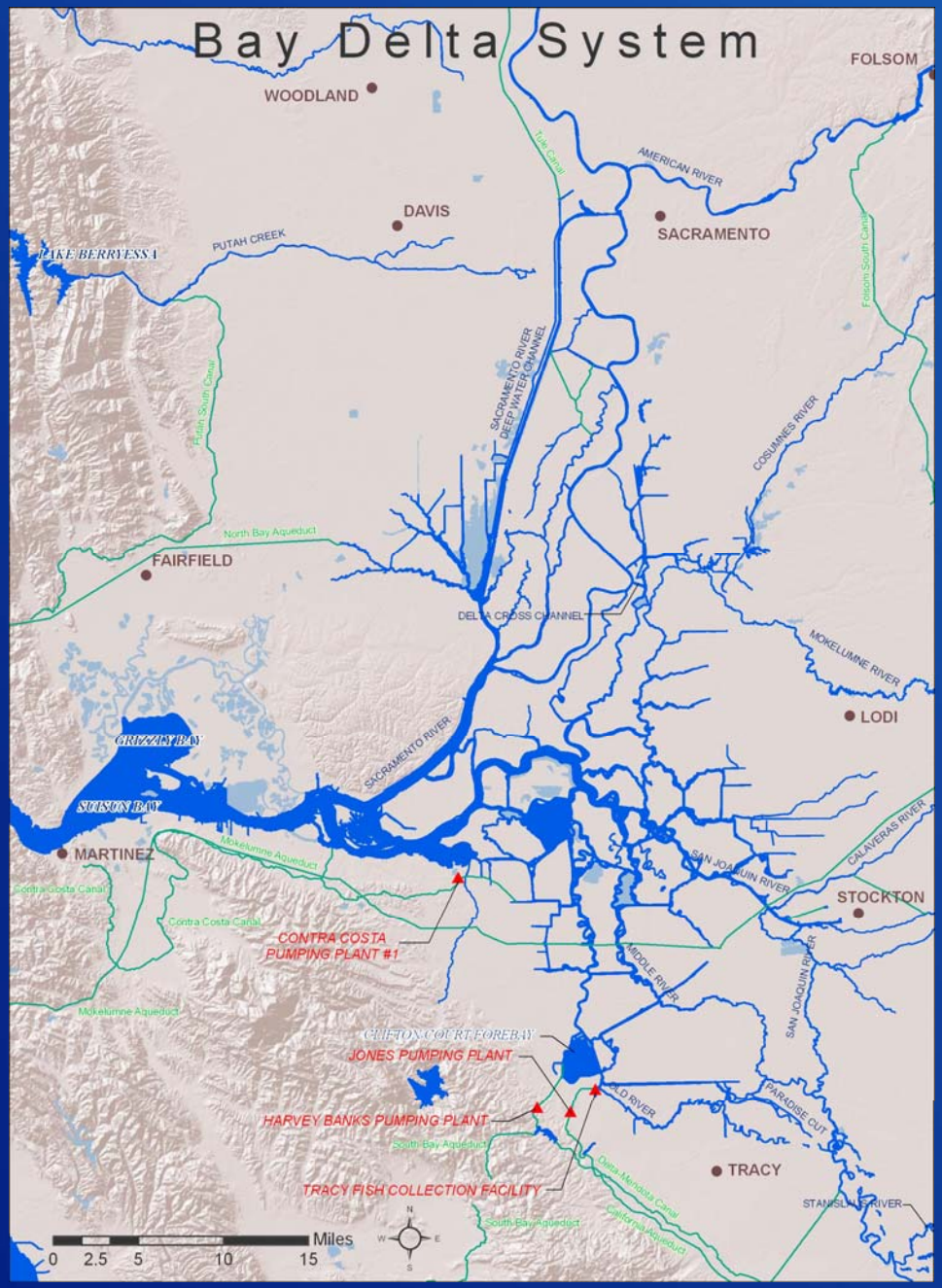

CVP - SWP FEATURES
TRINITY
LEWISTON
SHASTA
SPRING CREEK
POWERPLANT
CARR
POWERPLANT
TINITY RIVER
WHISKEYTOWN
SACRAMENTO RIVER
TEHAMA COLUSA CANAL
OROVILLE
(SWP)
TO SAN
FRANCISCO BAY
DELTA
FOLSOM
BANKS PP
(SWP)
JONES PP
CALIFORNIA AQUEDUCT
DELTA MENOTA CANAL
NEW MELONES
SAN JOAQUIN RIVER
O'NEILL
DELTA MENOTA CANAL
TO SAN FELIPE
SAN LUIS
SAN LUIS CANAL
FRIANT



The Sacramento-San Joaquin Delta

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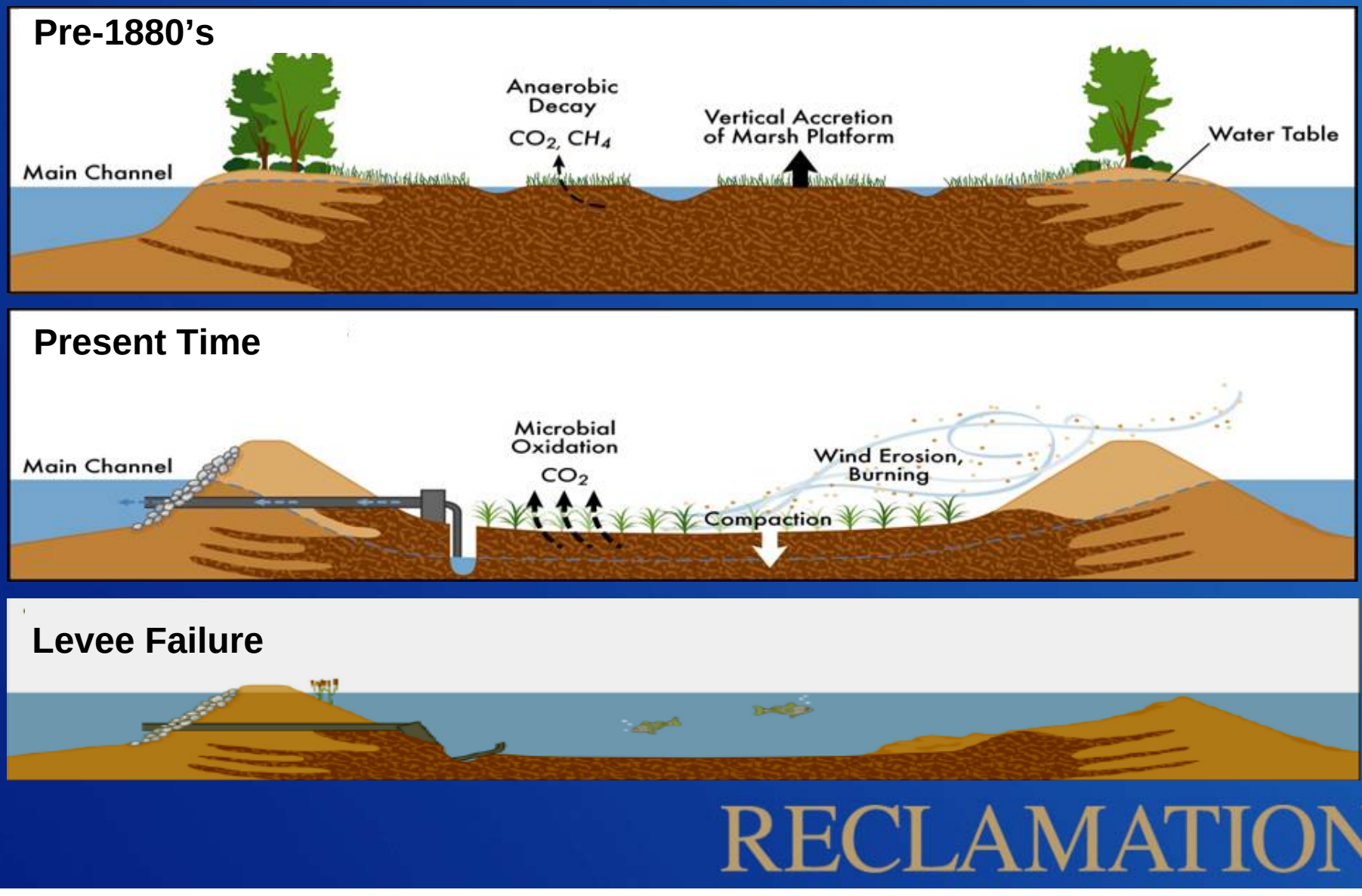
Land Subsidence – Failure Risk



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Delta ~ Operation Constraints

- Water Rights Decision 1641
- Biological Opinions
- Coordination with State Water Project

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Permits and Agreements

Key Operating Agreements and Standards

- Water Right Permits
- Water Rights Decision 1641
- Biological Opinions
- Flood Control Manuals
- Central Valley Project Improvement Act
- Coordinated Operations Agreement

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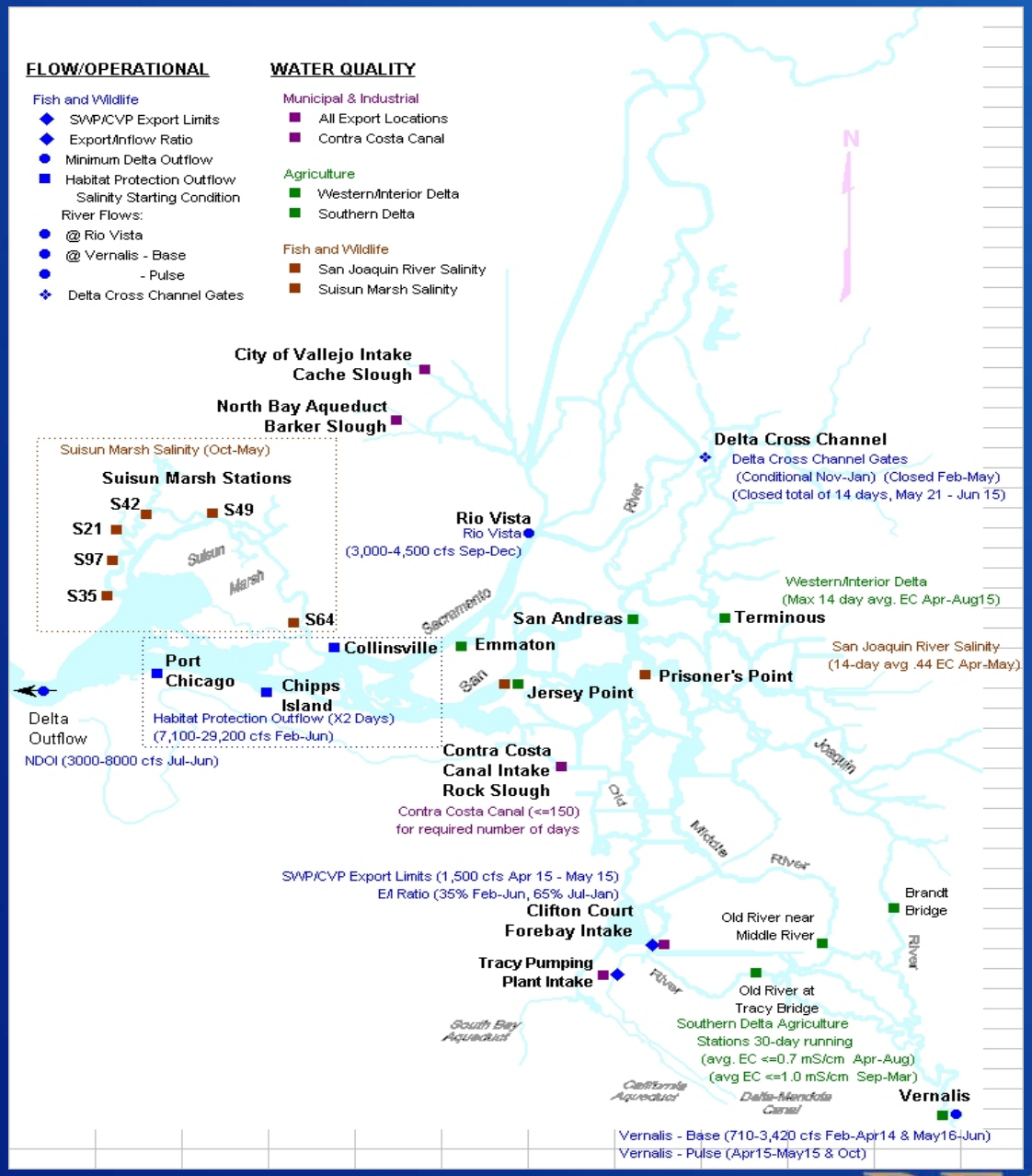
Delta Water Quality Standards



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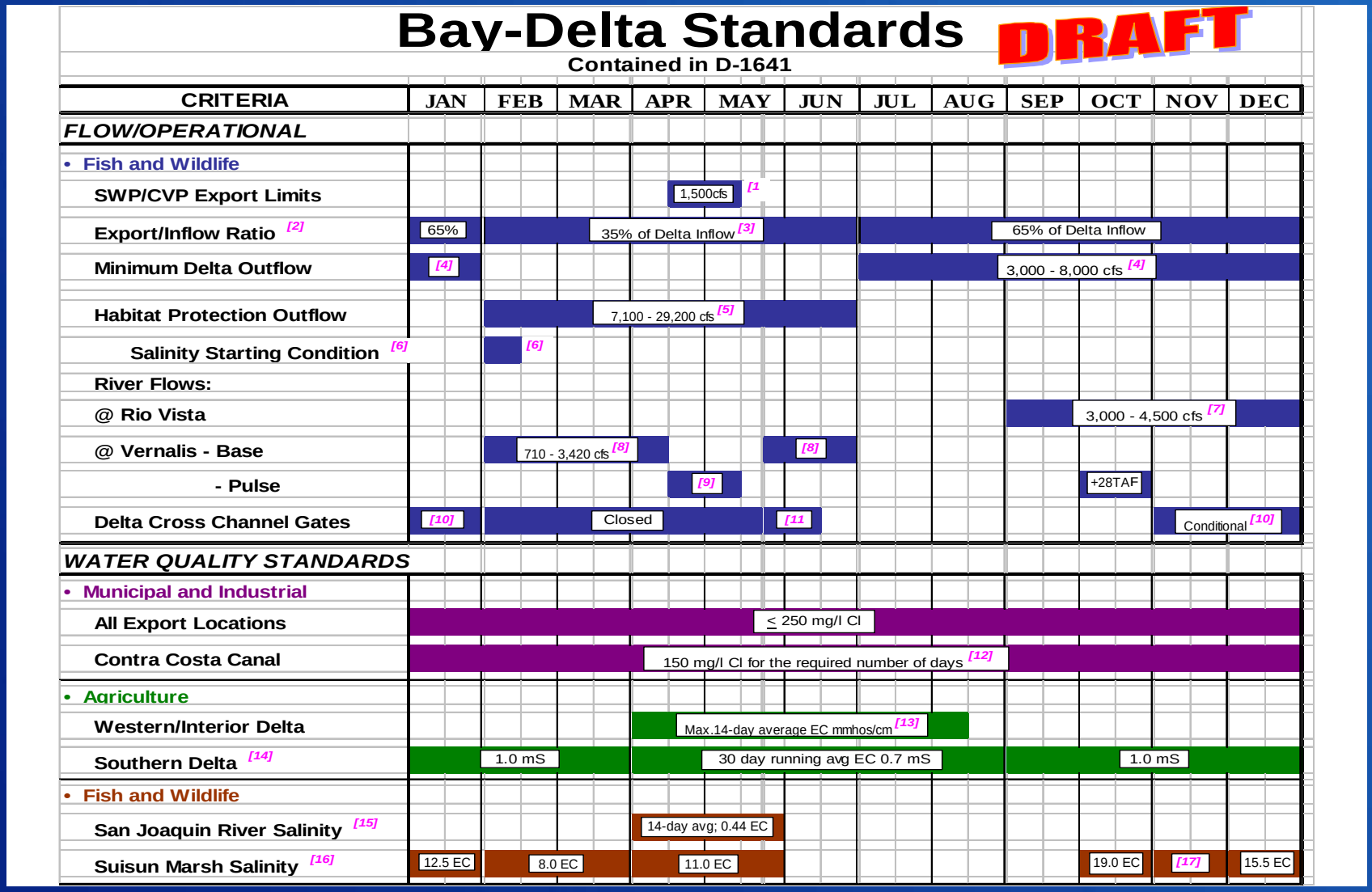
Water Quality Standards



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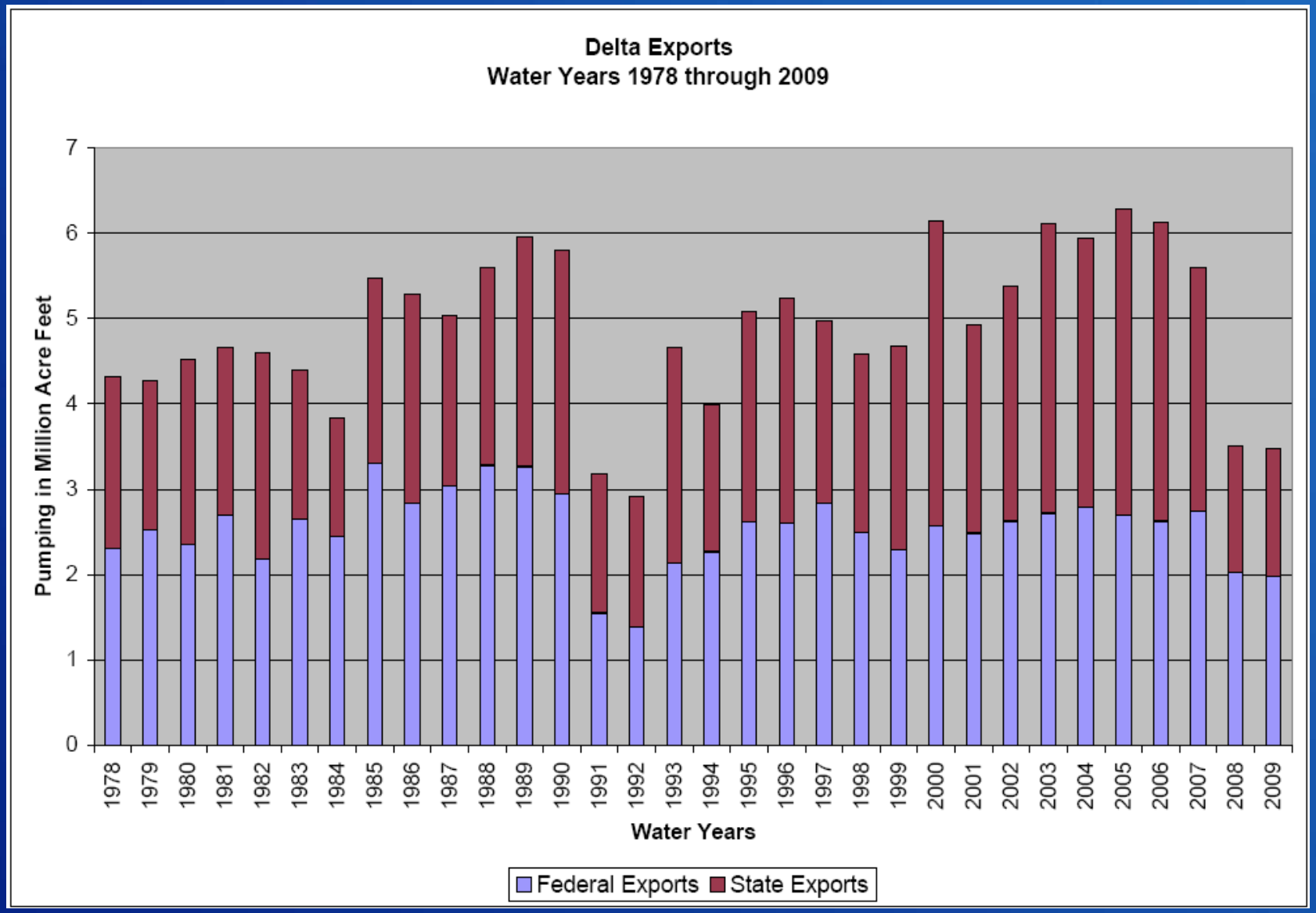

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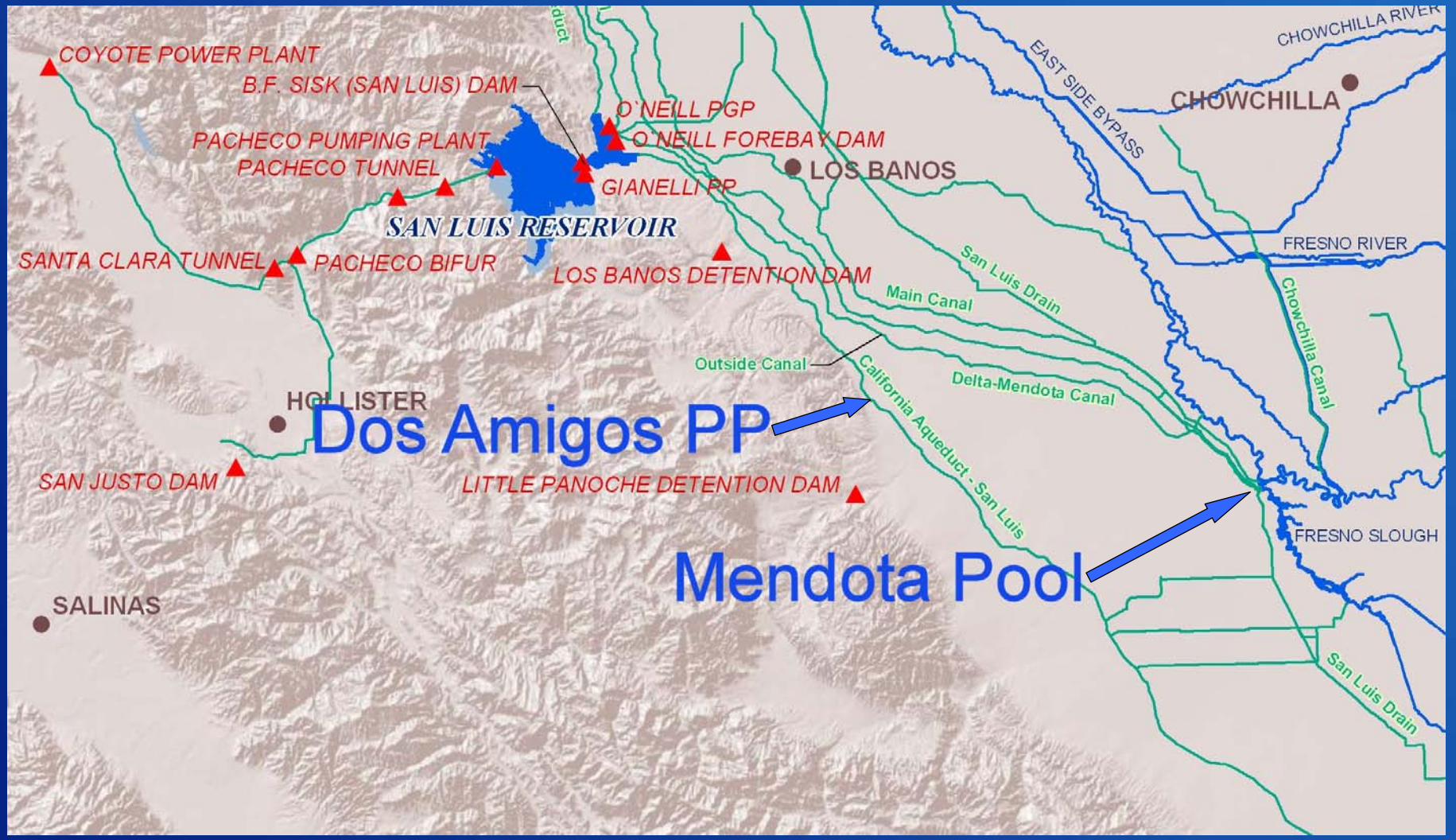
CVP Westside System



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San Luis ~ Operation Constraints

- San Luis Low Point
- Two Foot Drawdown Per Day

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Friant ~ Operation Constraints

- Limited Downstream Channel Capacities
- Complex Flood Control Diagram

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System Constraints

- Maximize contractual water supply deliveries given the constraints of the system:
  - Geographic
  - Hydrologic
  - Physical Capacity
  - Flood Control requirements
  - Environmental (i.e. water quality, outflow)
  - Contractual and Water Rights Requirements
  - Economic
  - Demand Patterns

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CalSim II Modeling Runs

Model Scenarios

- Empirical
- Study 7.0 – present day
- Study 7.1 – near future

Near future

- Study 8.0 – future (2030 development)
- Study 9.0 – future (2030 development)

Far future

- Study 9.1 – 0.33-meter sea level rise
- Study 9.2 – wetter and warmer
- Study 9.3 – wetter and warmer still
- Study 9.4 – drier and warmer
- Study 9.5 – drier and warmer still

Climate change

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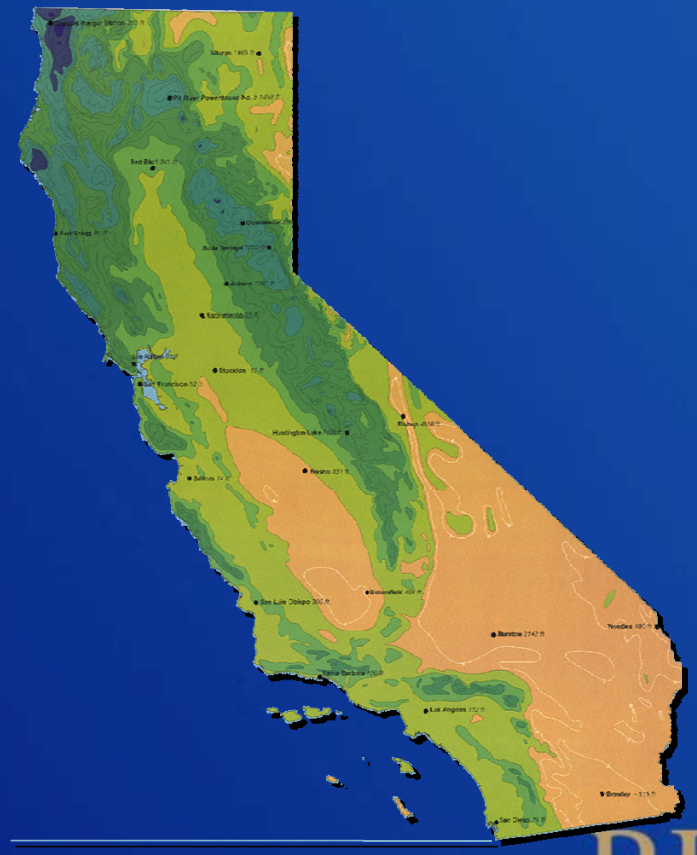
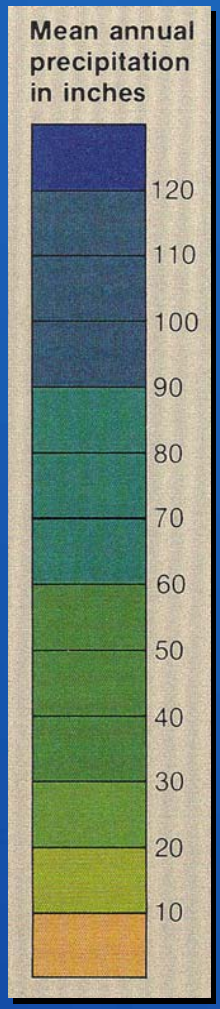
Geographic Constraints

- Majority of water supply in the north.
- Majority of demand in the south.





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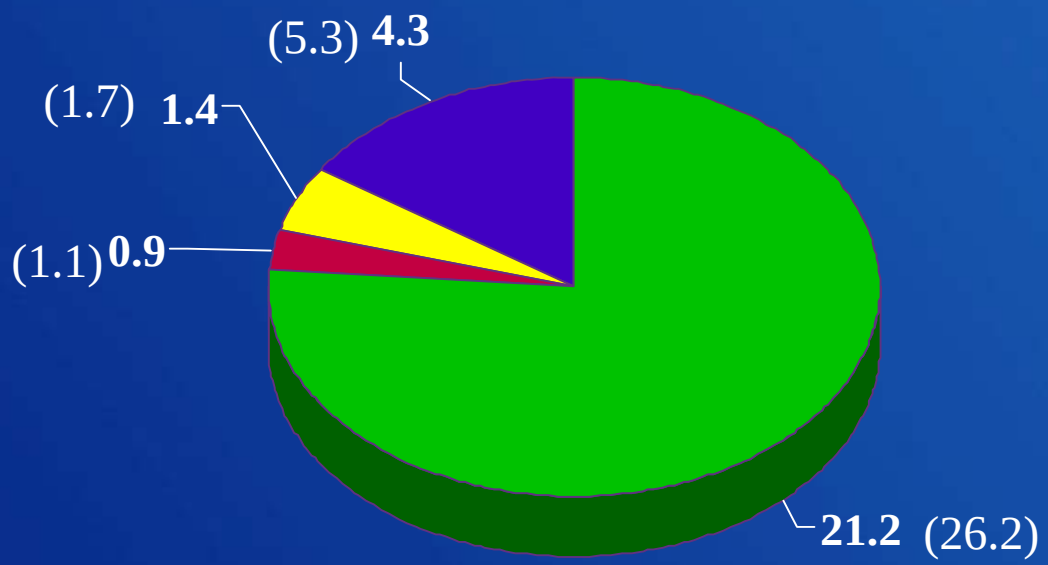
Geographic Constraints

Sacramento/San Joaquin Delta

Avg Annual Inflow in MAF (Billion Cu Meters)



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Questions ?

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