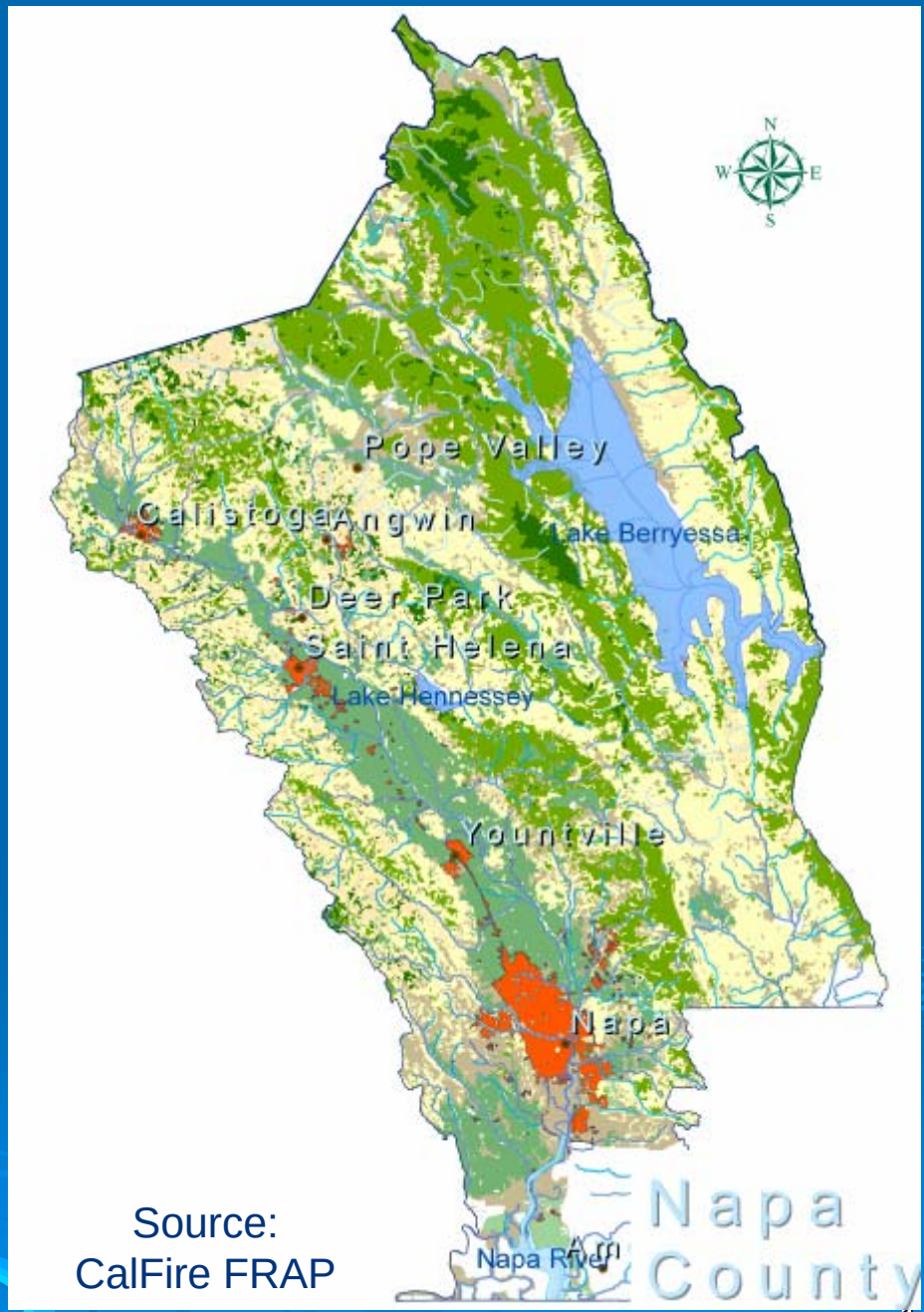
Napa Watershed Symposium

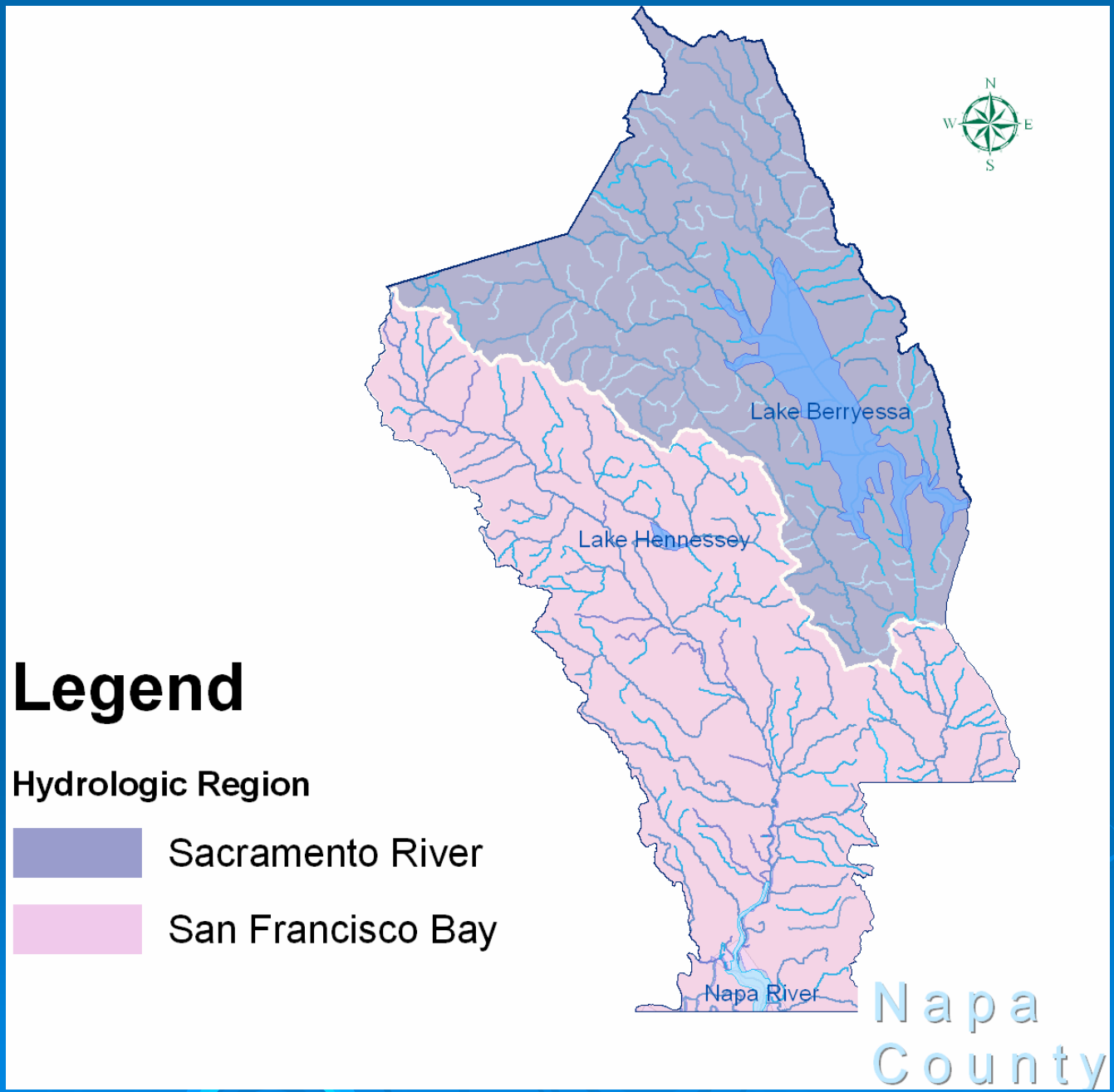
Factors affecting future water quantity and quality in Napa County, and strategies for adaptation

Pierre Stephens
California Department of Water Resources
May 21, 2009

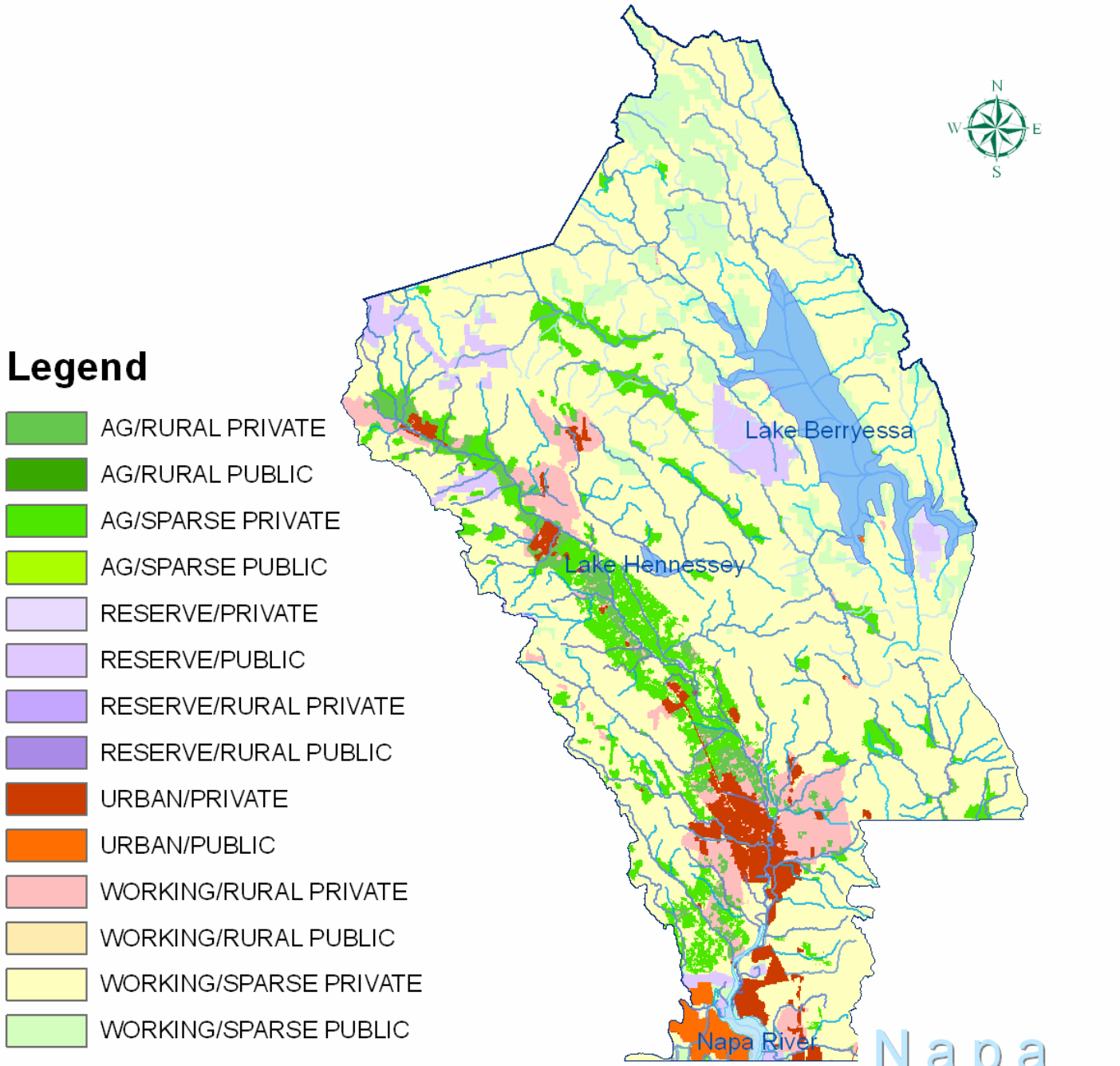


Source:
CalFire FRAP

Napa County Hydrologic Regions

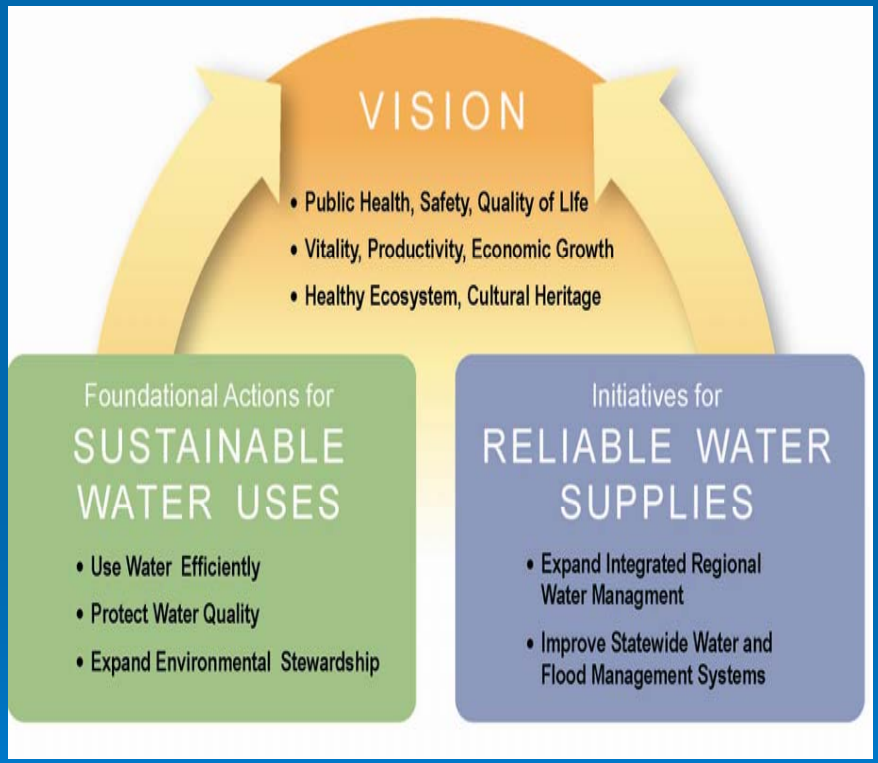


Managed Lands



Source: CalFire FRAP

Imperative to Act to Keep Pace w/ Changes



California Water Plan

- Population growth
- Shift to permanent crops
- Delta & watersheds in decline
- Climate Change profoundly impacting water systems
- Current water & flood systems aging and challenged by legal remedies & regulatory protections
- Growing economic & societal consequences of declining water reliability and degraded quality of surface & groundwater supplies

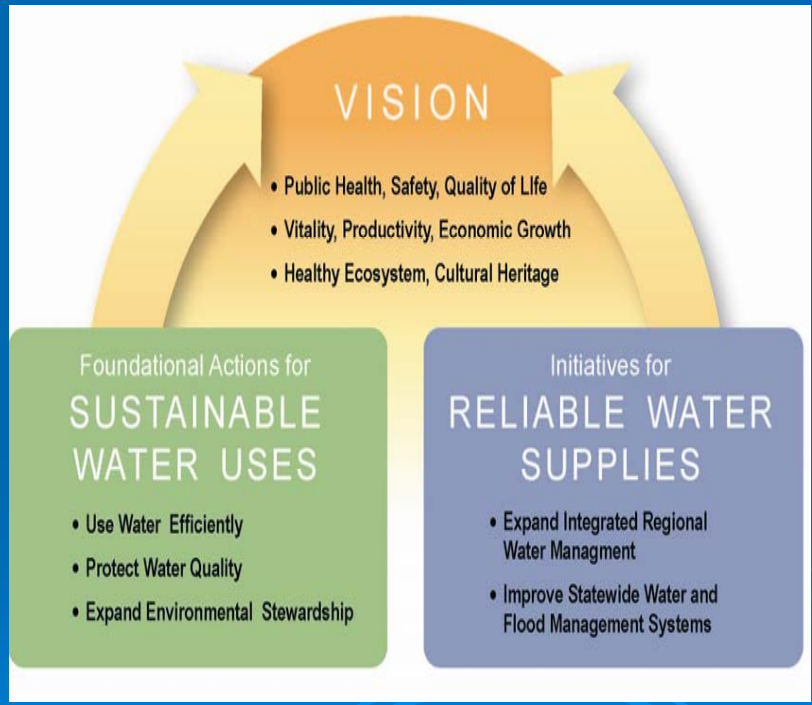
Imperative to Act to Keep Pace w/ Changes

The *Entire* System –

water & flood management, watersheds & ecosystems

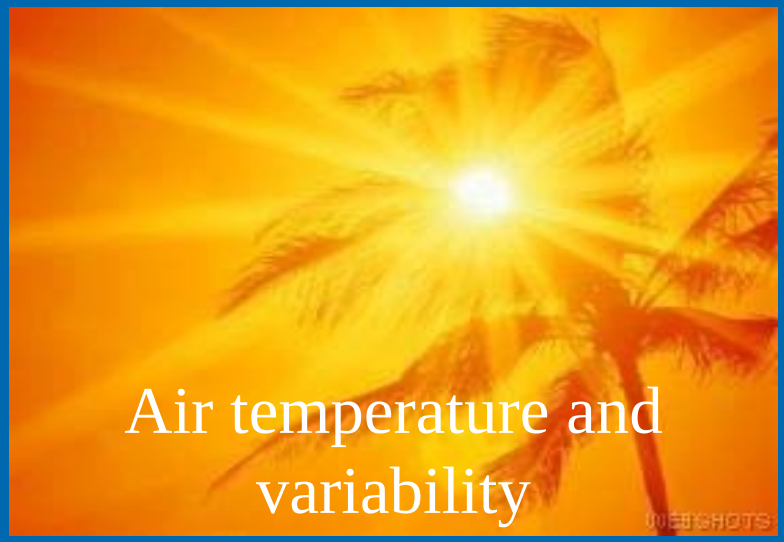
– has lost resilience and is changing in undesirable ways.

All regions are affected by statewide challenges.



Climate Change Increasing Stress on System

Calif. Water Plan Highlights pages 8 - 9



How Climate Change Impacts California's Water Resources

- *Reduced snowpack* impacting water supply, hydropower, and flood operations
- *More variable rainfall & river runoff* increasing flood & drought severity
- *Higher water temperatures* degrading aquatic ecosystems
- *Rising sea level* threatening the Delta, bays, estuaries & coastline
  - destabilizing levees
  - increasing SW/GW salinity
- *Higher water demand* all sectors

Historical Sea Level Rise - San Francisco

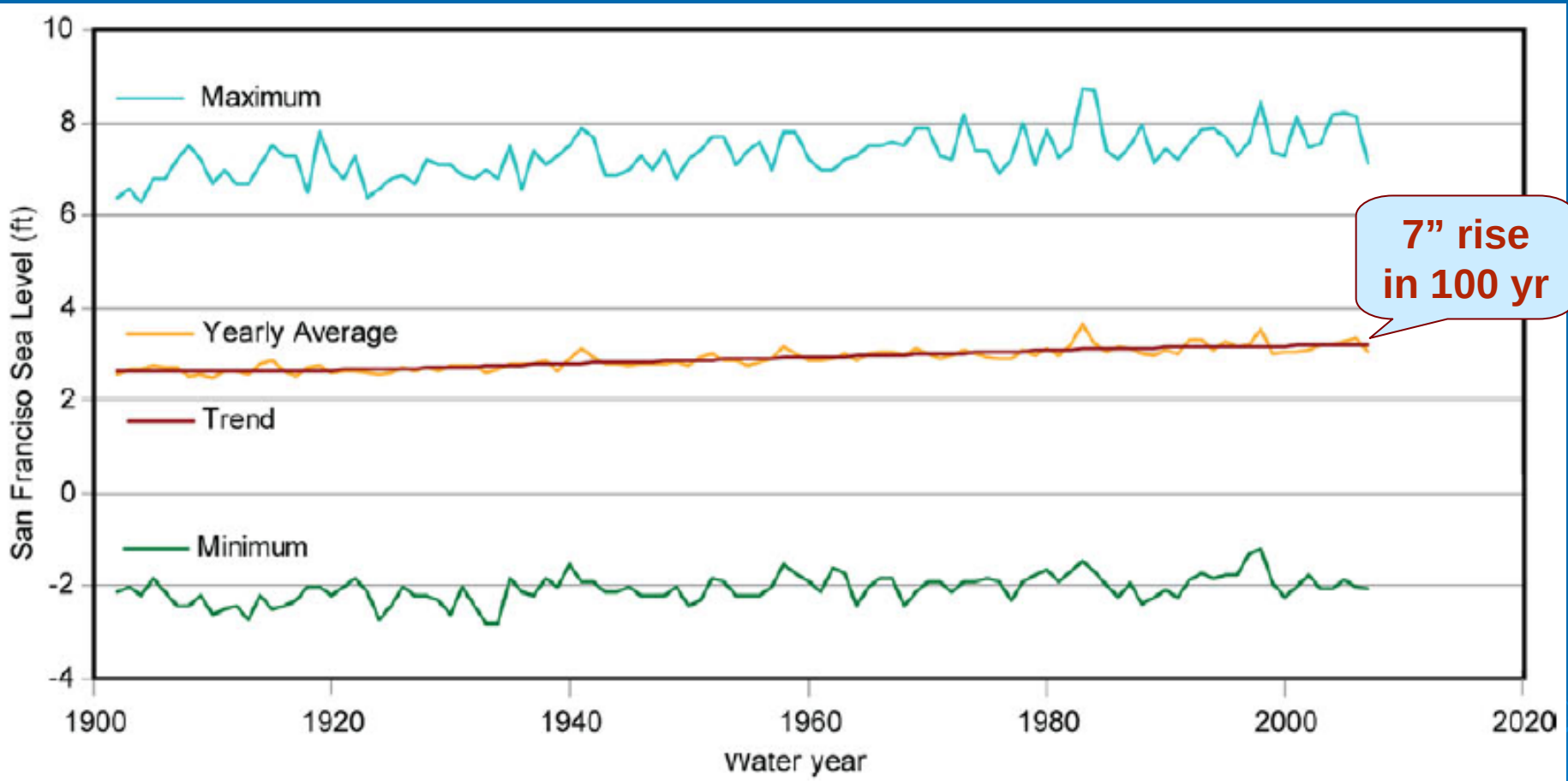
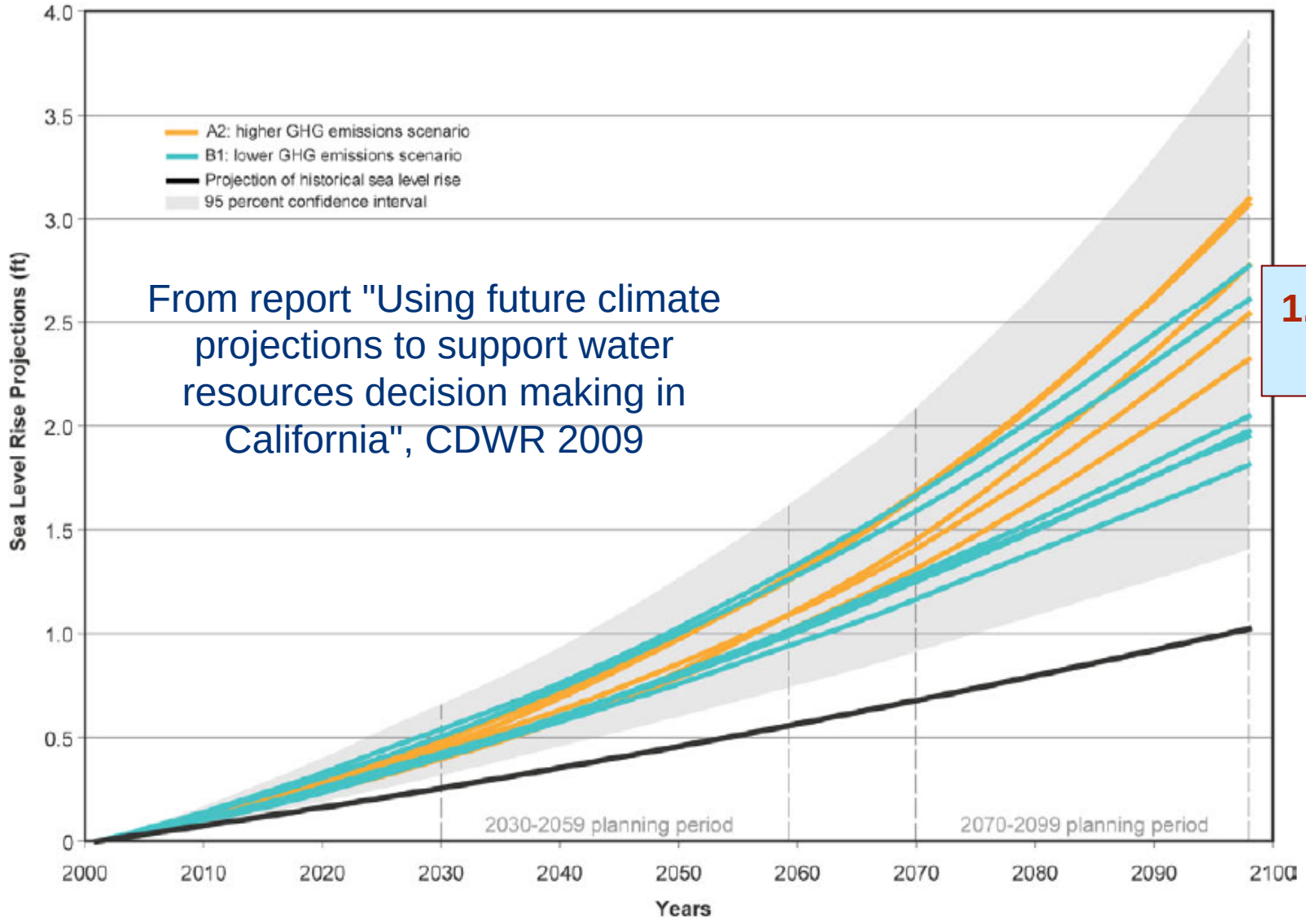


Figure 11. Historical sea levels for San Francisco for 1902–2007

From report: "Using future climate projections to support water resources decision making in California", CDWR 2009

Projected Sea Level Rise



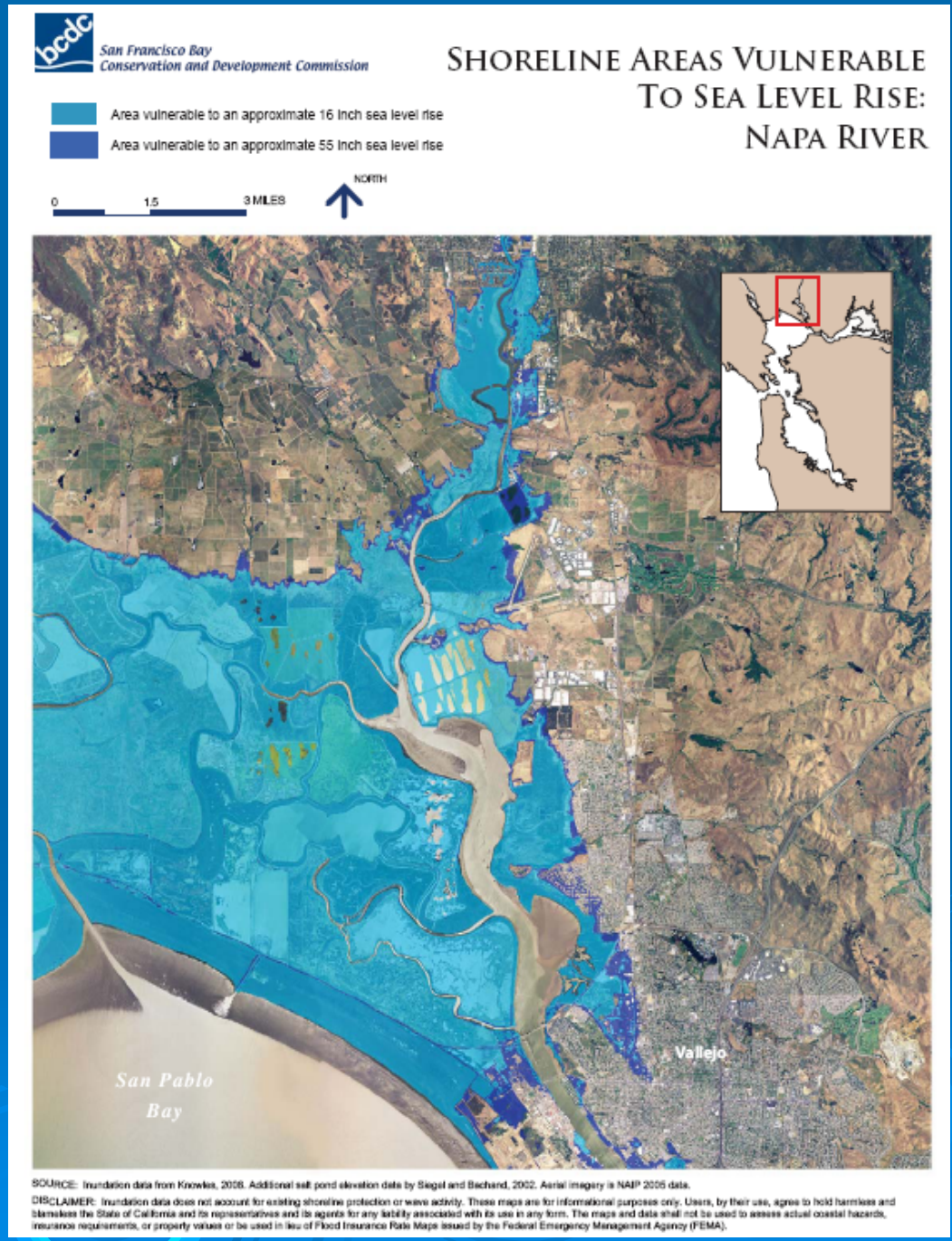
From report "Using future climate projections to support water resources decision making in California", CDWR 2009

1.8 - 3.1 feet

Figure 9. Sea level rise projections based on air temperatures from 12 future climate scenarios

Lower Napa River Area Vulnerable to Sea Level Rise

16” – light blue
55” – dark blue



Projected Salinity Intrusion

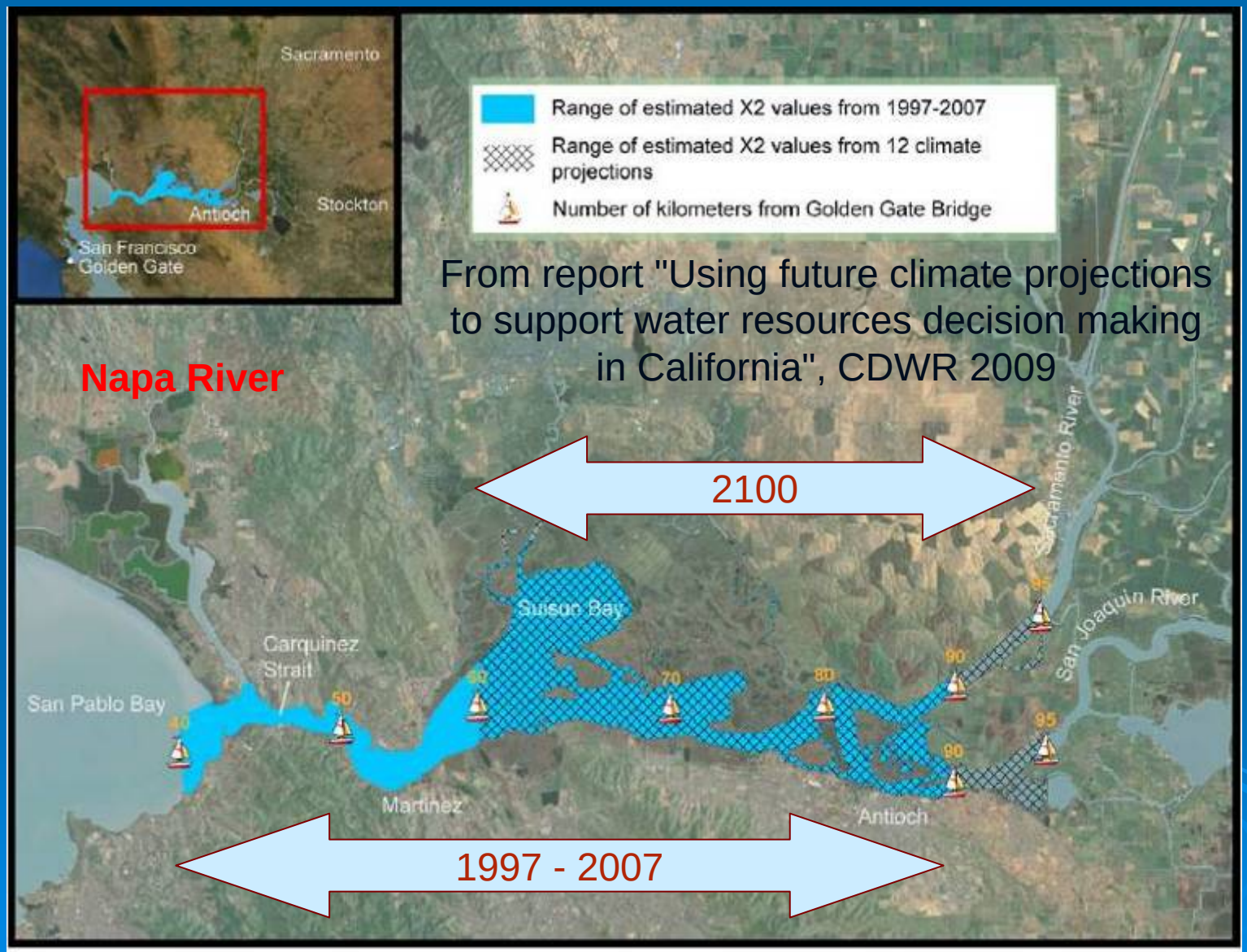
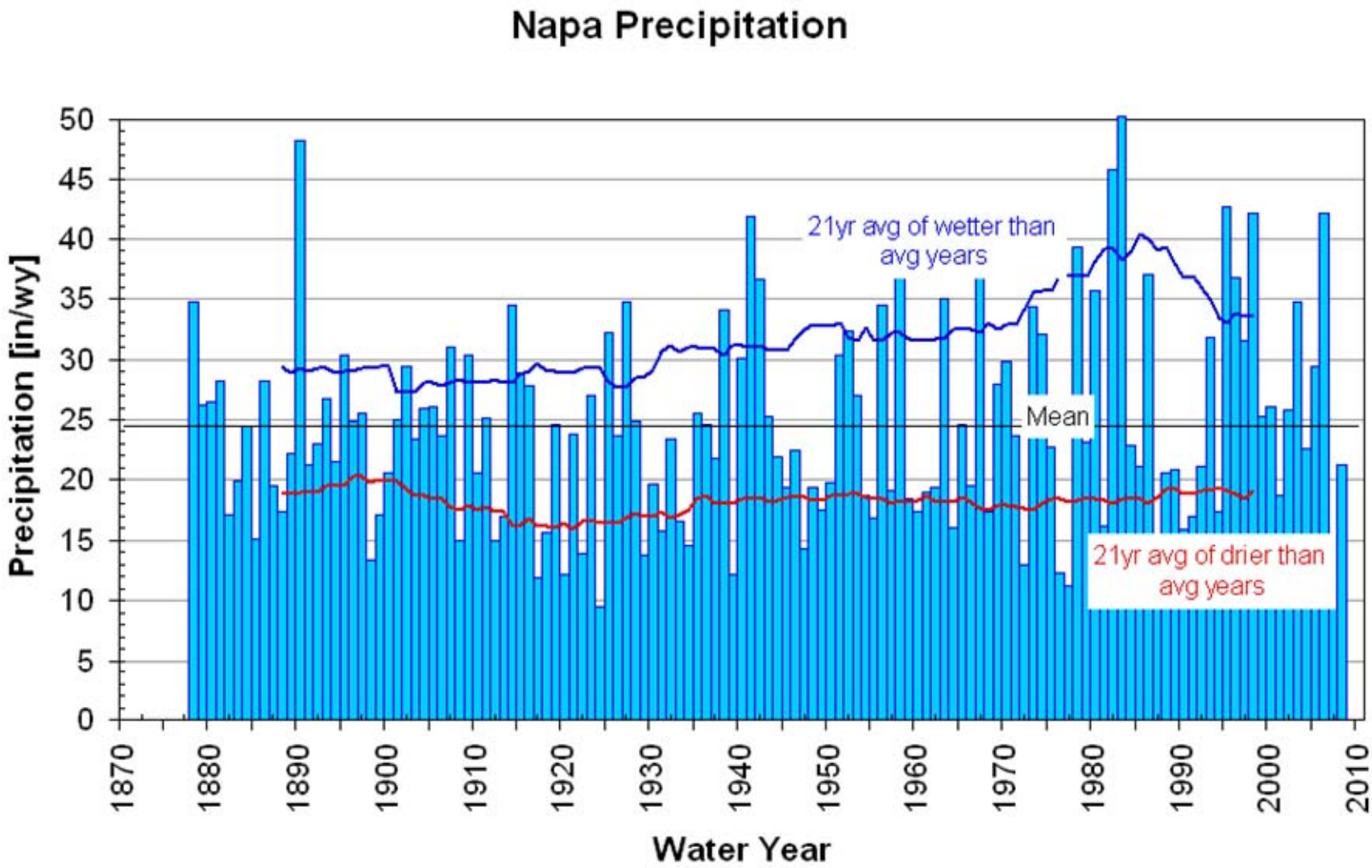
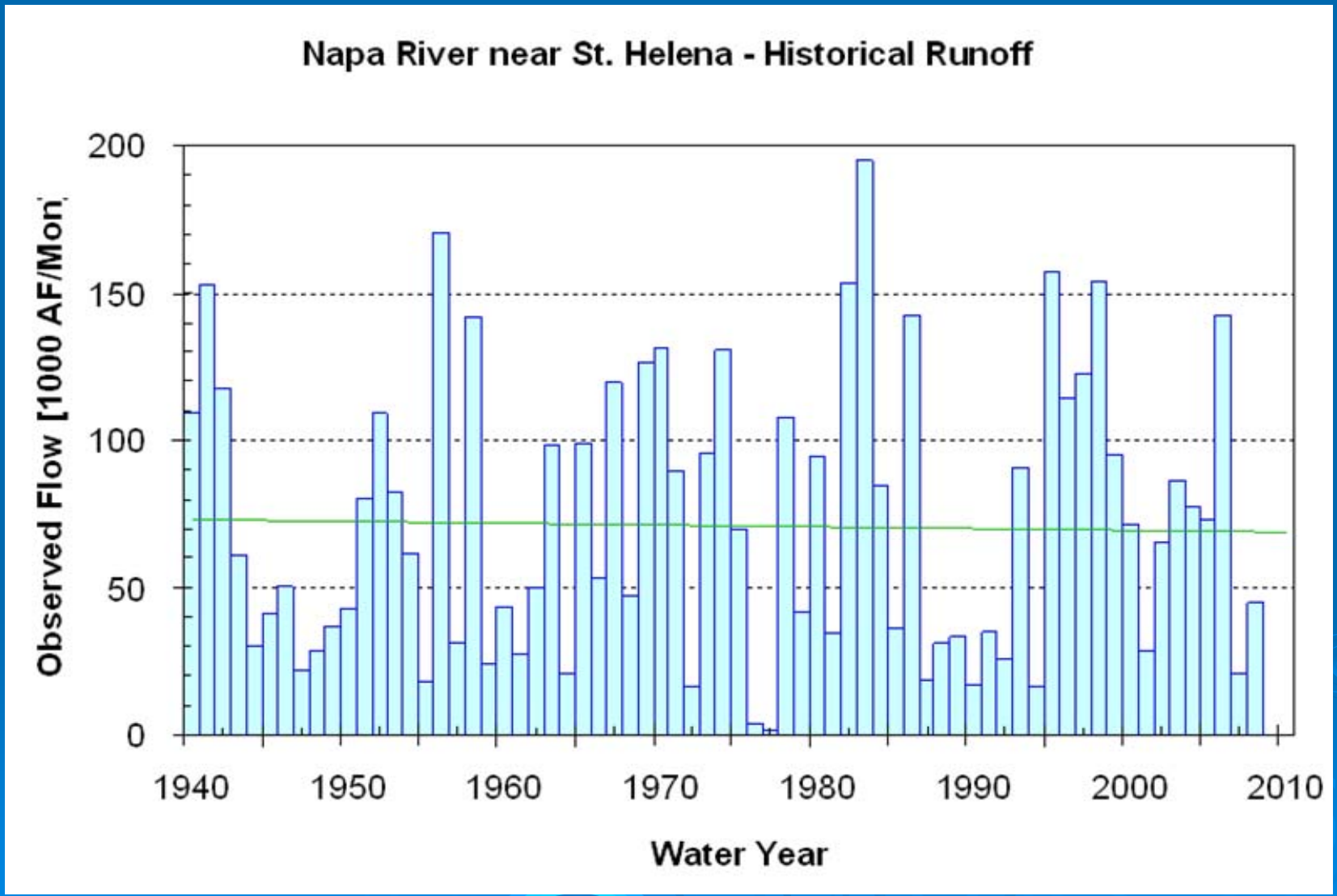


Figure 20. Ranges of historically based and future estimates of X2 locations

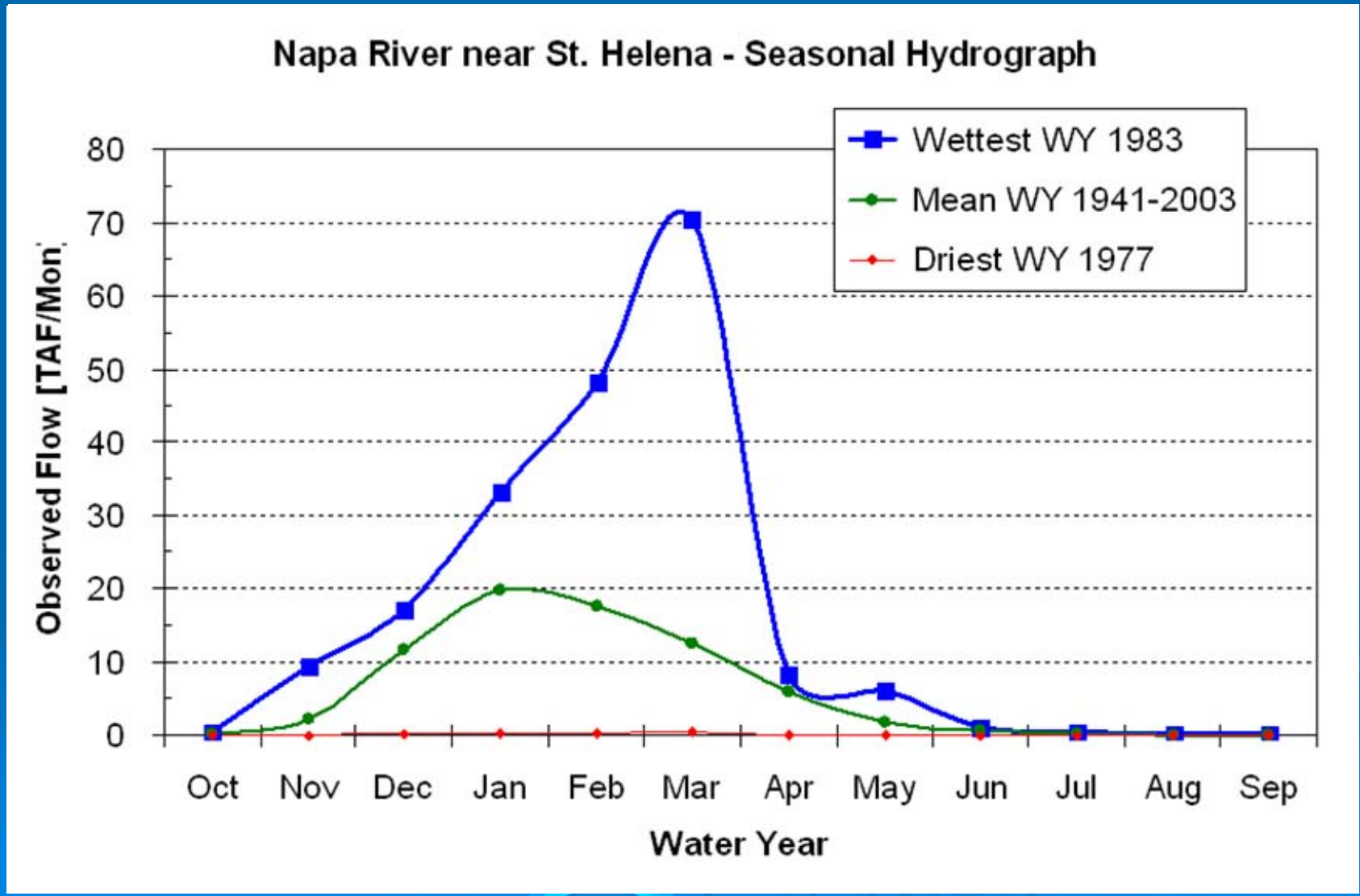
Precipitation Variability



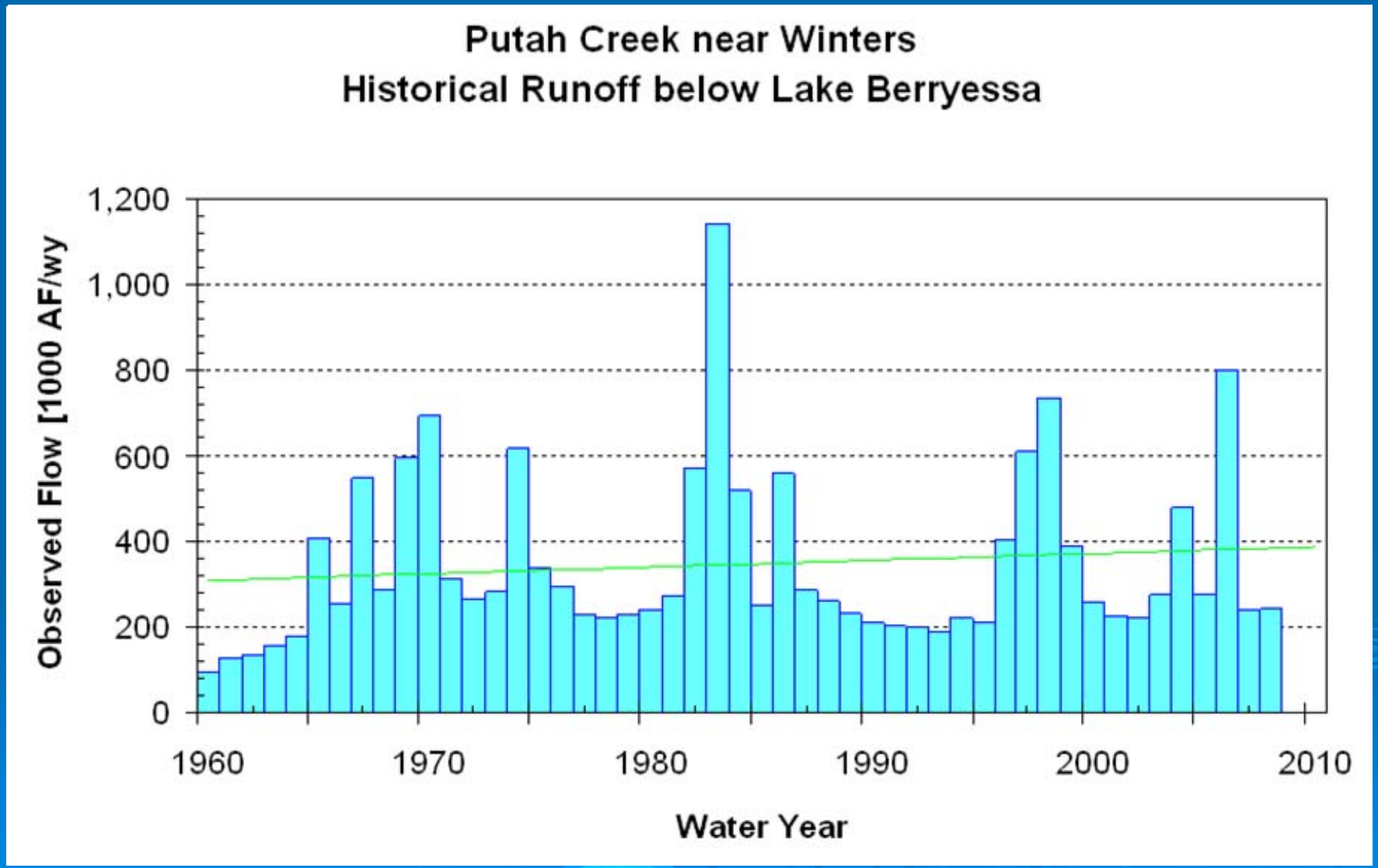
Variation in Annual River Runoff – Napa River



Variation in Seasonal Runoff – Napa River

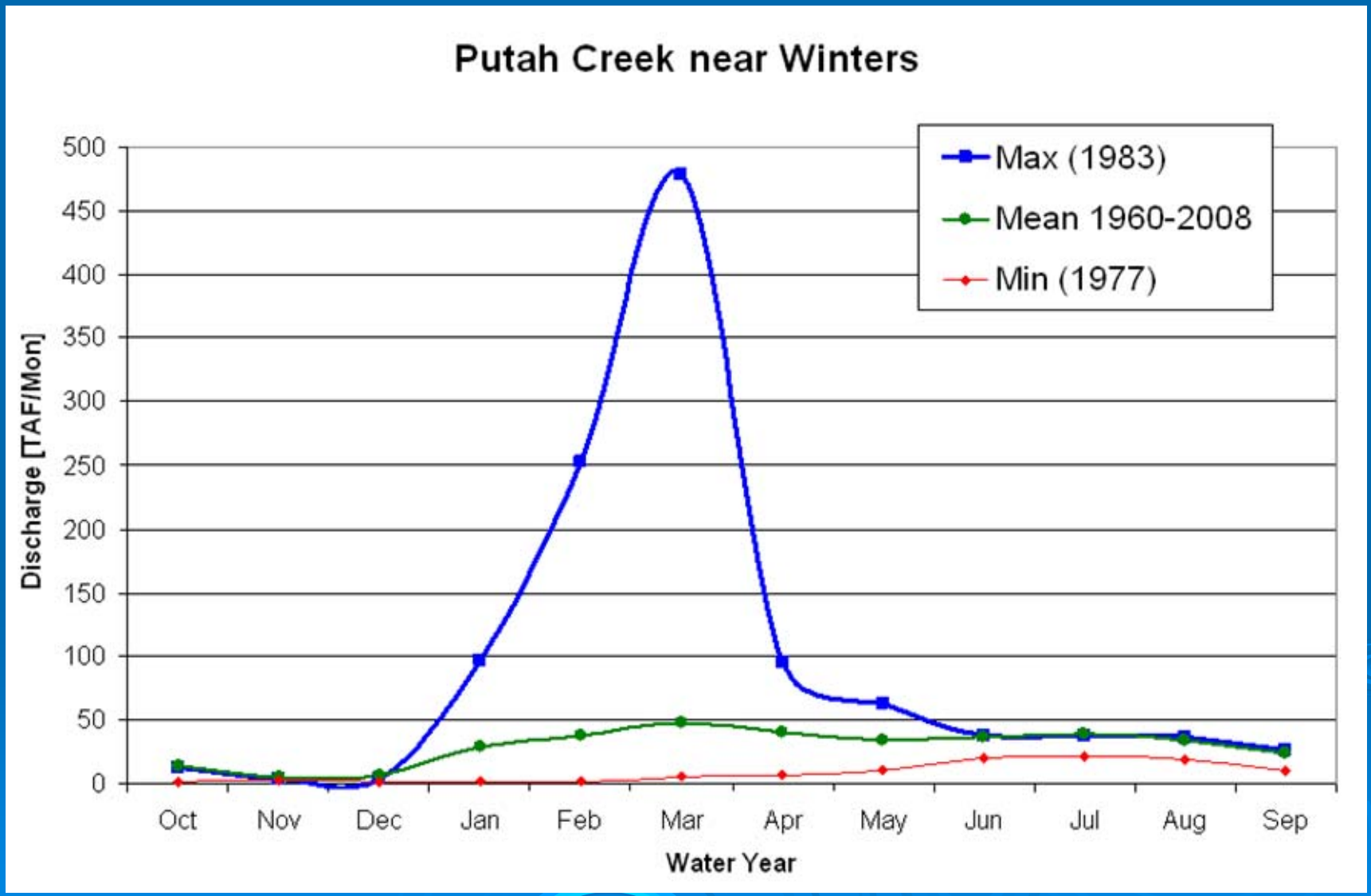


Variation in Annual River Runoff – Putah Creek



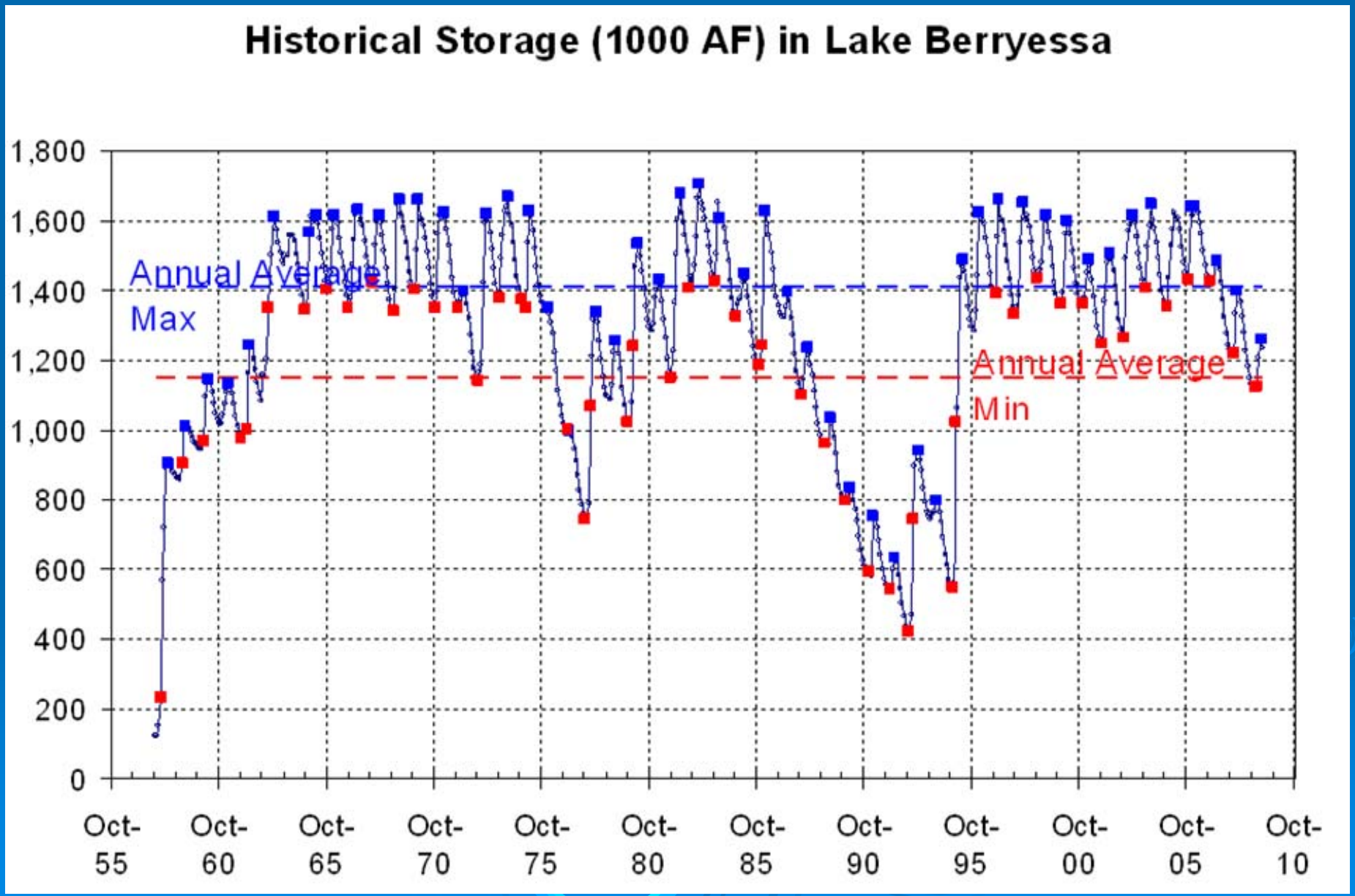
Source: USGS

Variation in Seasonal Runoff – Putah Creek



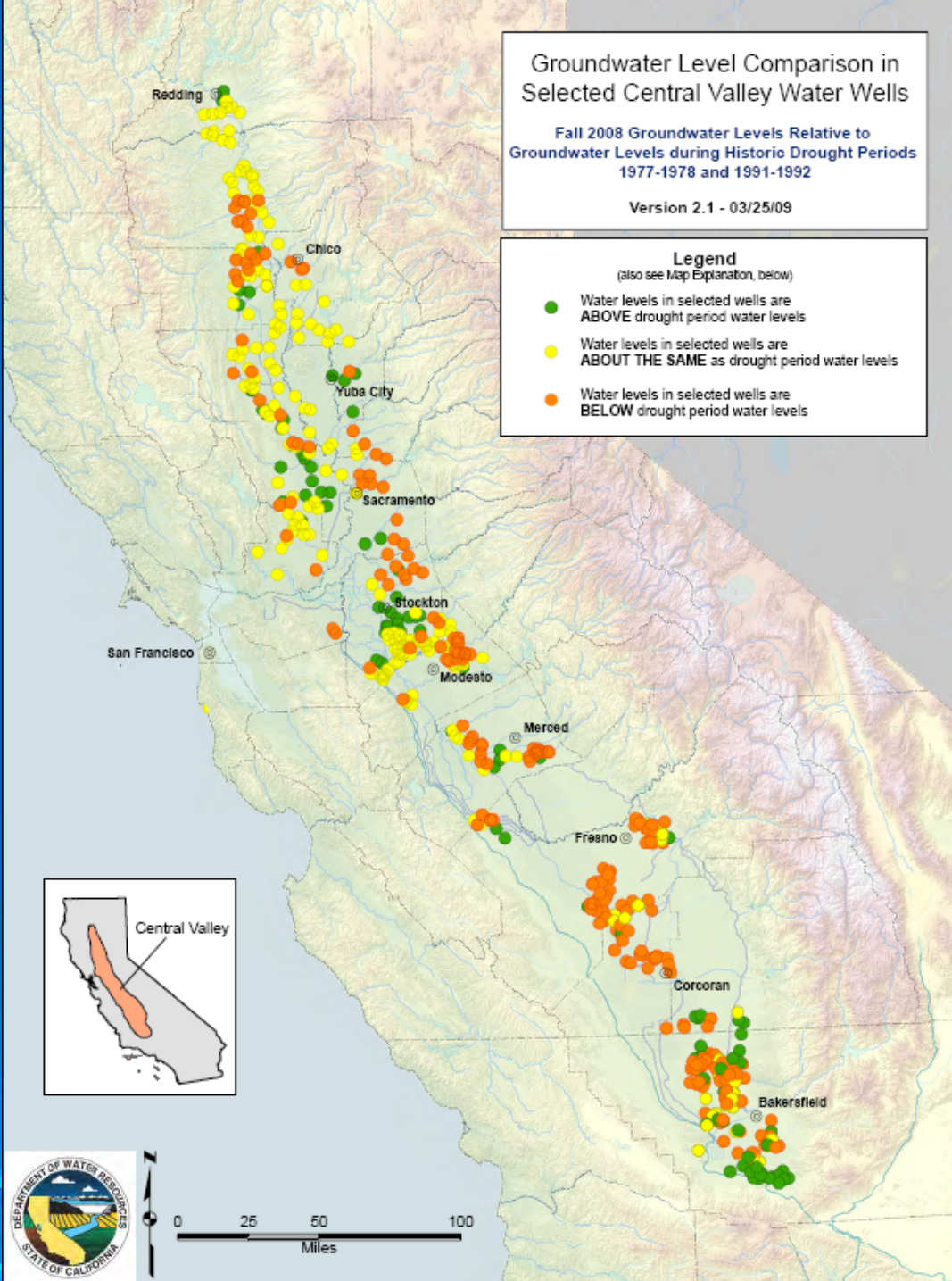
Source: USGS

Lake Berryessa Operation

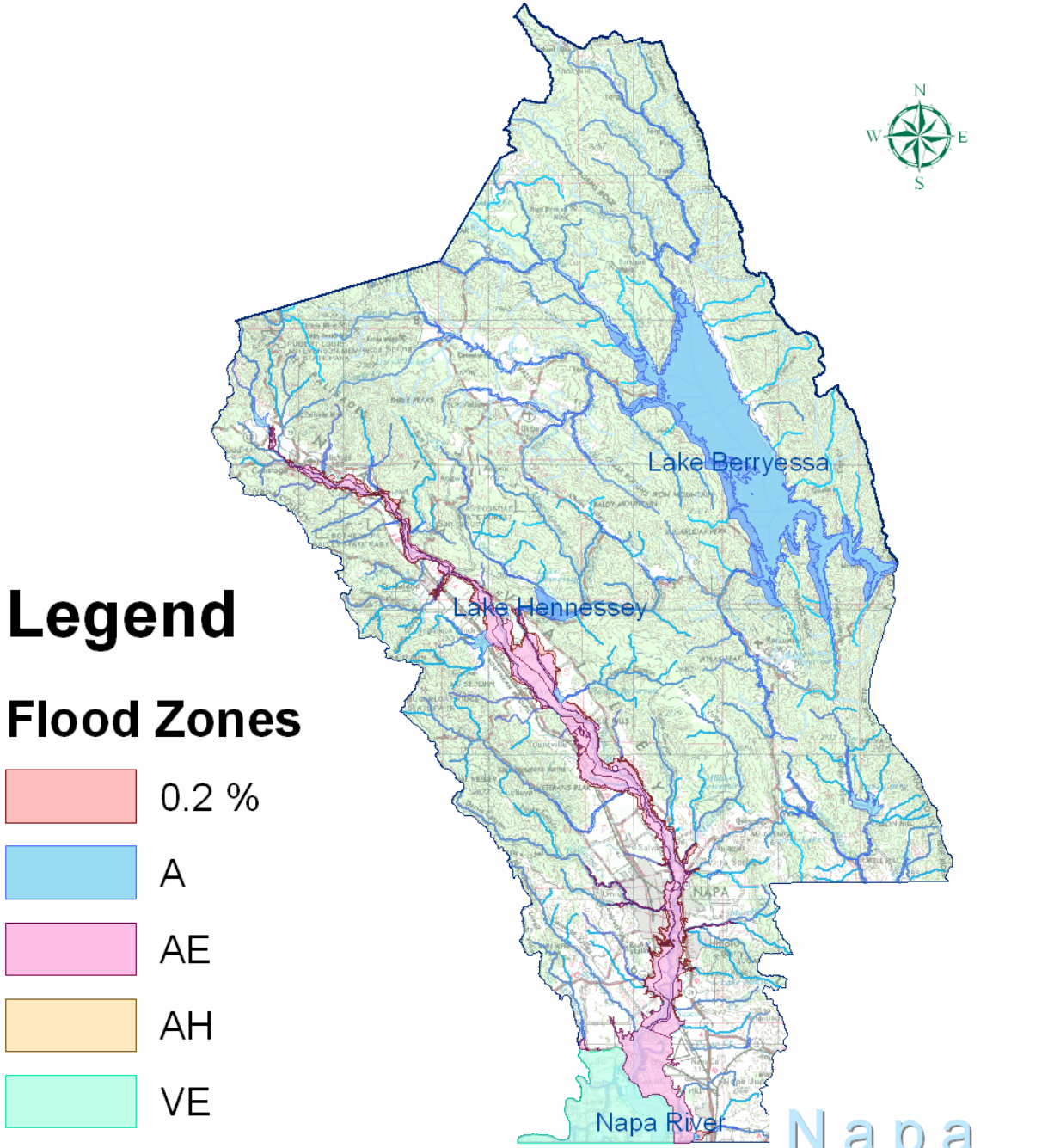


Groundwater Monitoring & Planning

- Water levels **ABOVE** drought period water levels
- Water levels About the **SAME** as drought period water levels
- Water levels **BELOW** drought period water levels



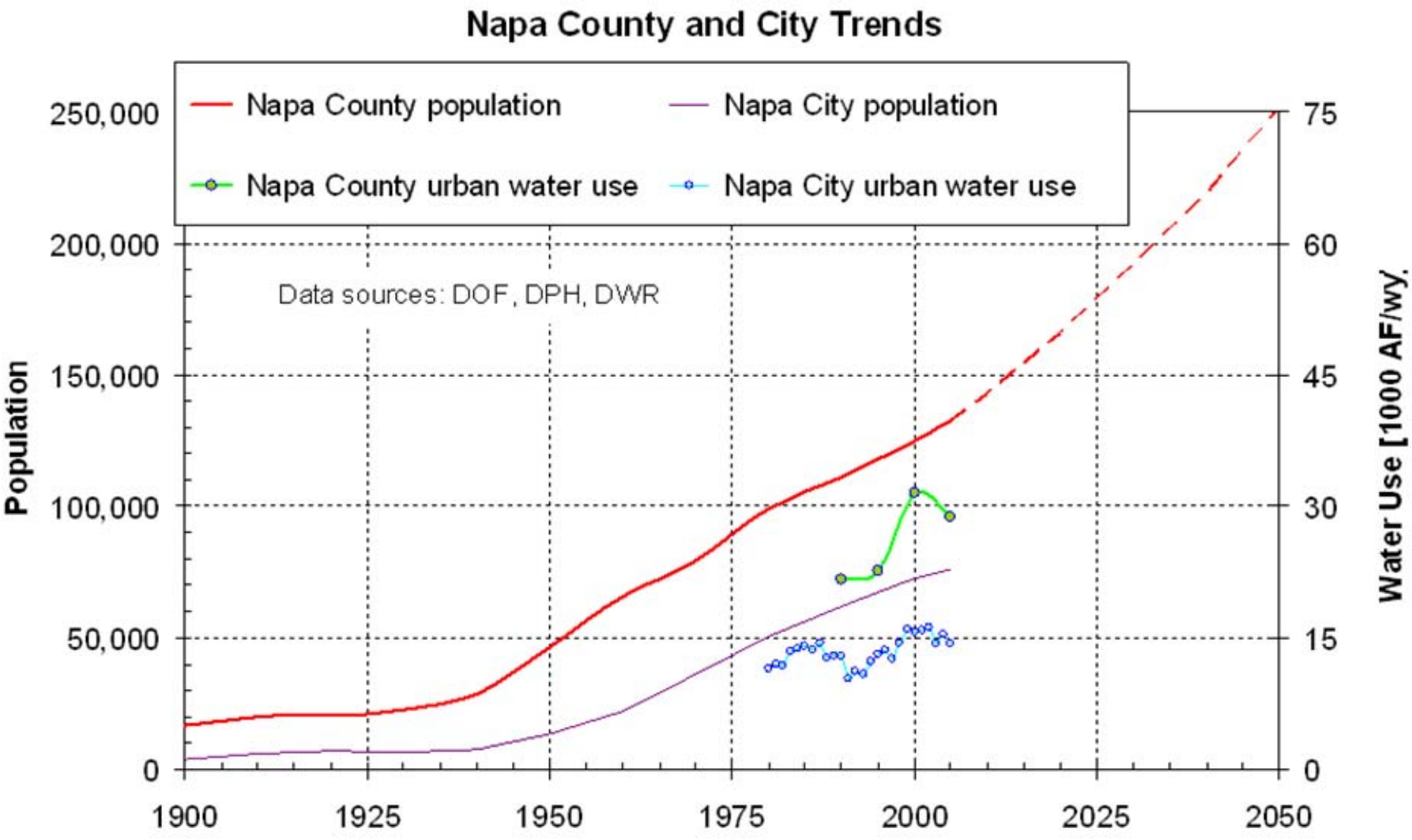
FEMA Flood Zones



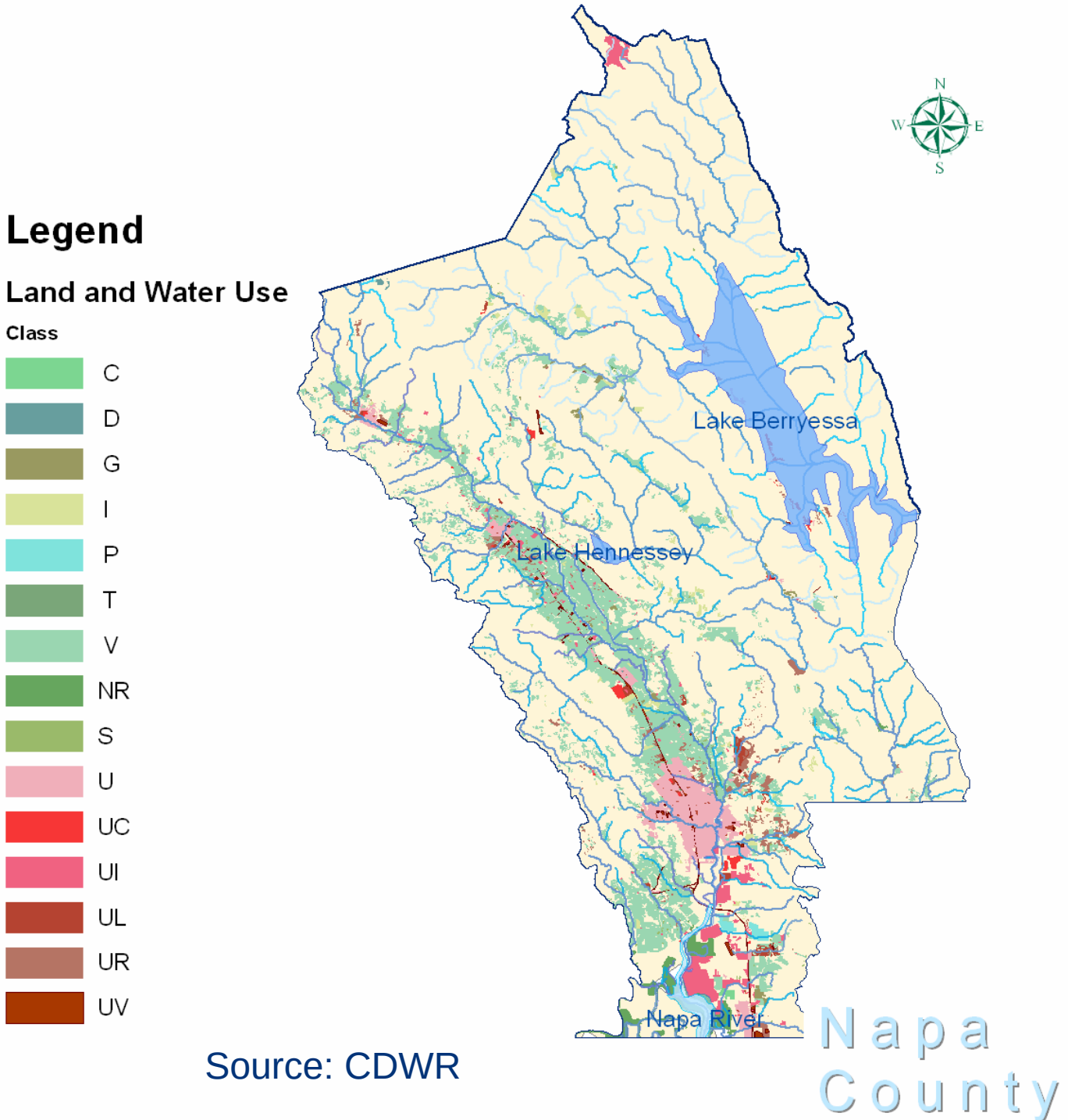
Source: Napa County

Napa County

Population & Water Use



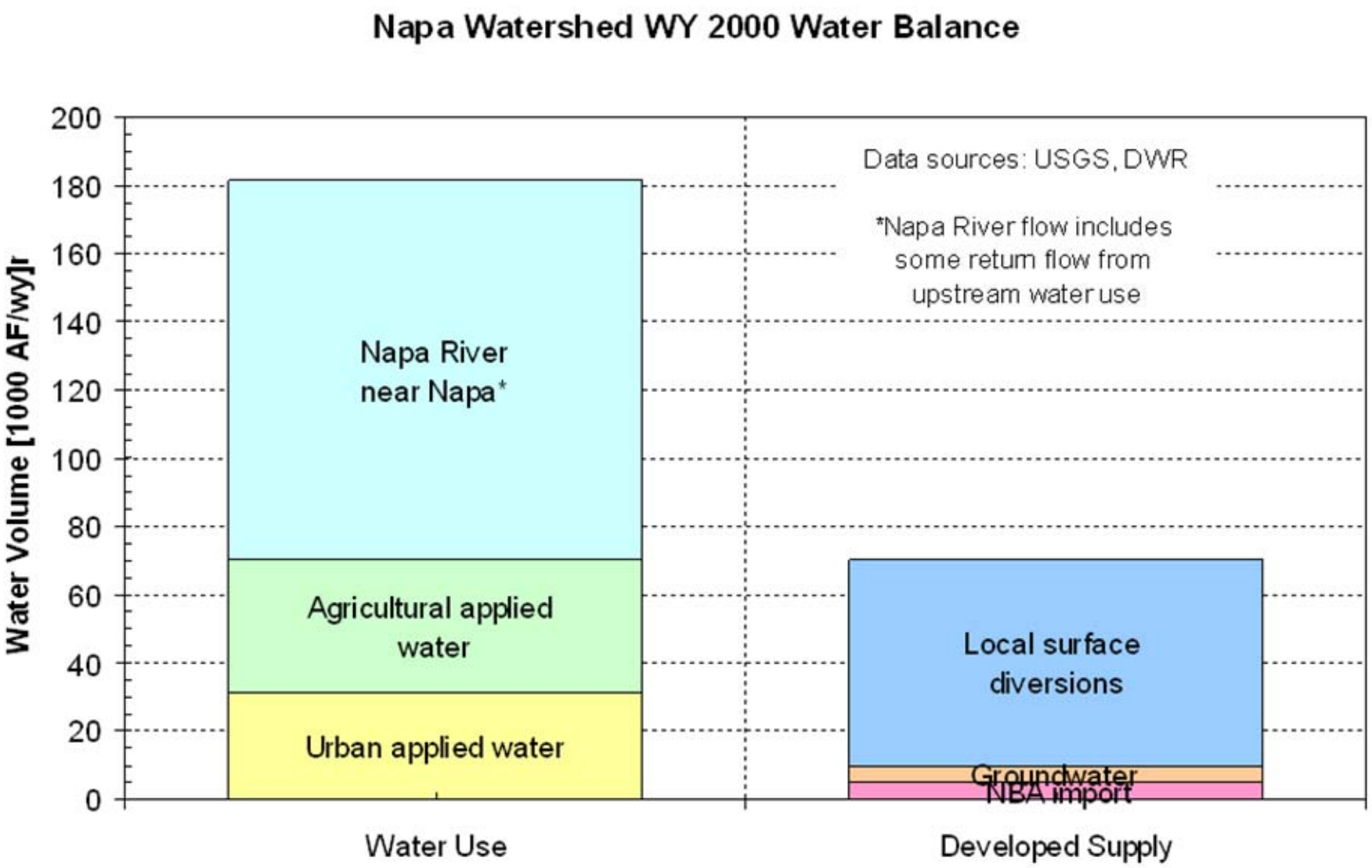
Land & Water Use



Source: CDWR

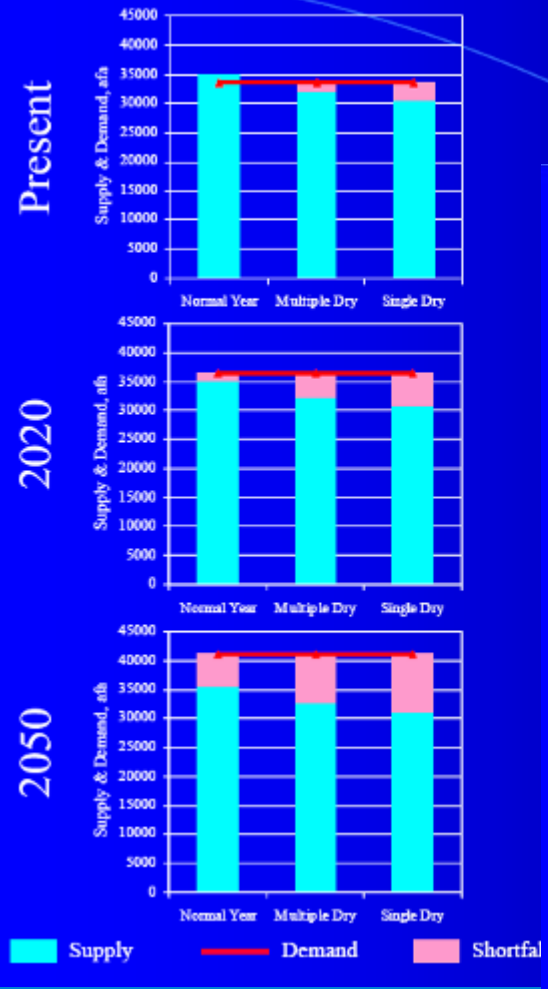
Napa County

Napa River Water Balance

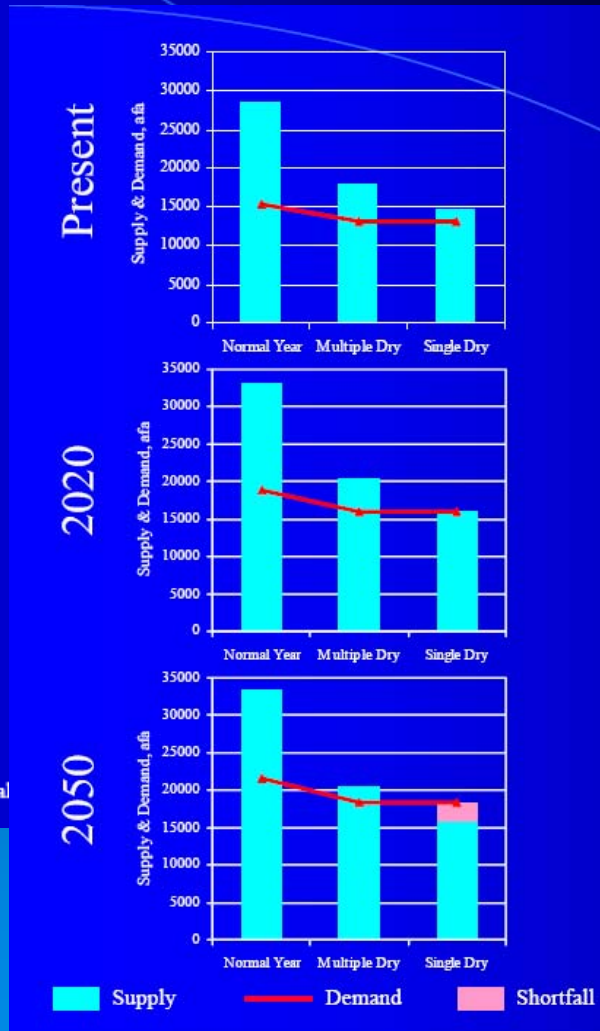


2050 Napa Valley Water Resources Study

Unincorporated Areas



City of Napa



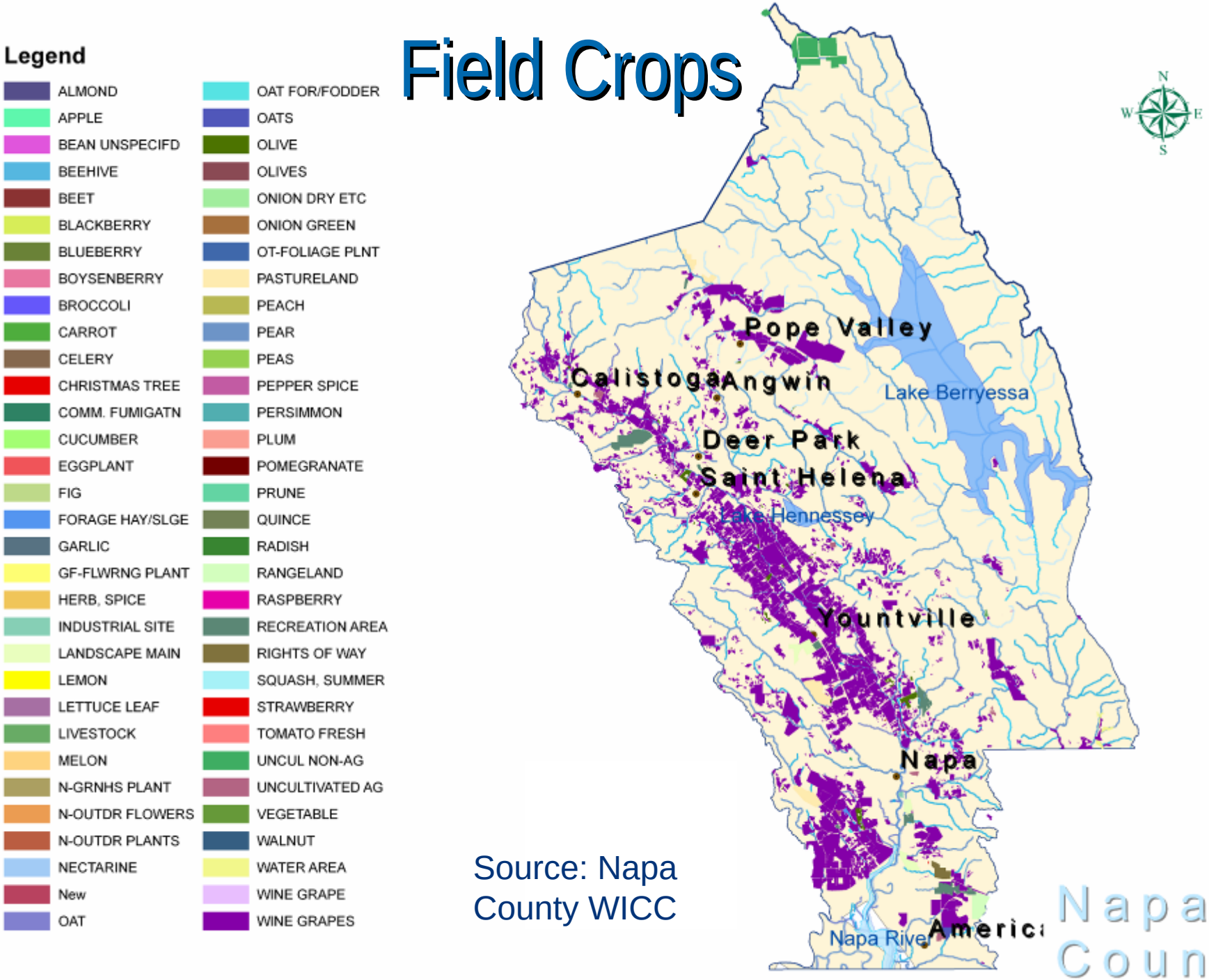
Priority Water Supply Projects:

- Jamieson WTP Improvements
- Dry Year Water
- Purchase Additional SWP Entitlements
- Conjunctive Use
- Municipal Groundwater Well for Dry-Year Supply
- Recycled Water

Other Potential Water Supply Projects:

- Groundwater for Schools/Parks
- Maximize Use of Milliken Reservoir
- Napa Pipe Wells
- Unaccounted for Water

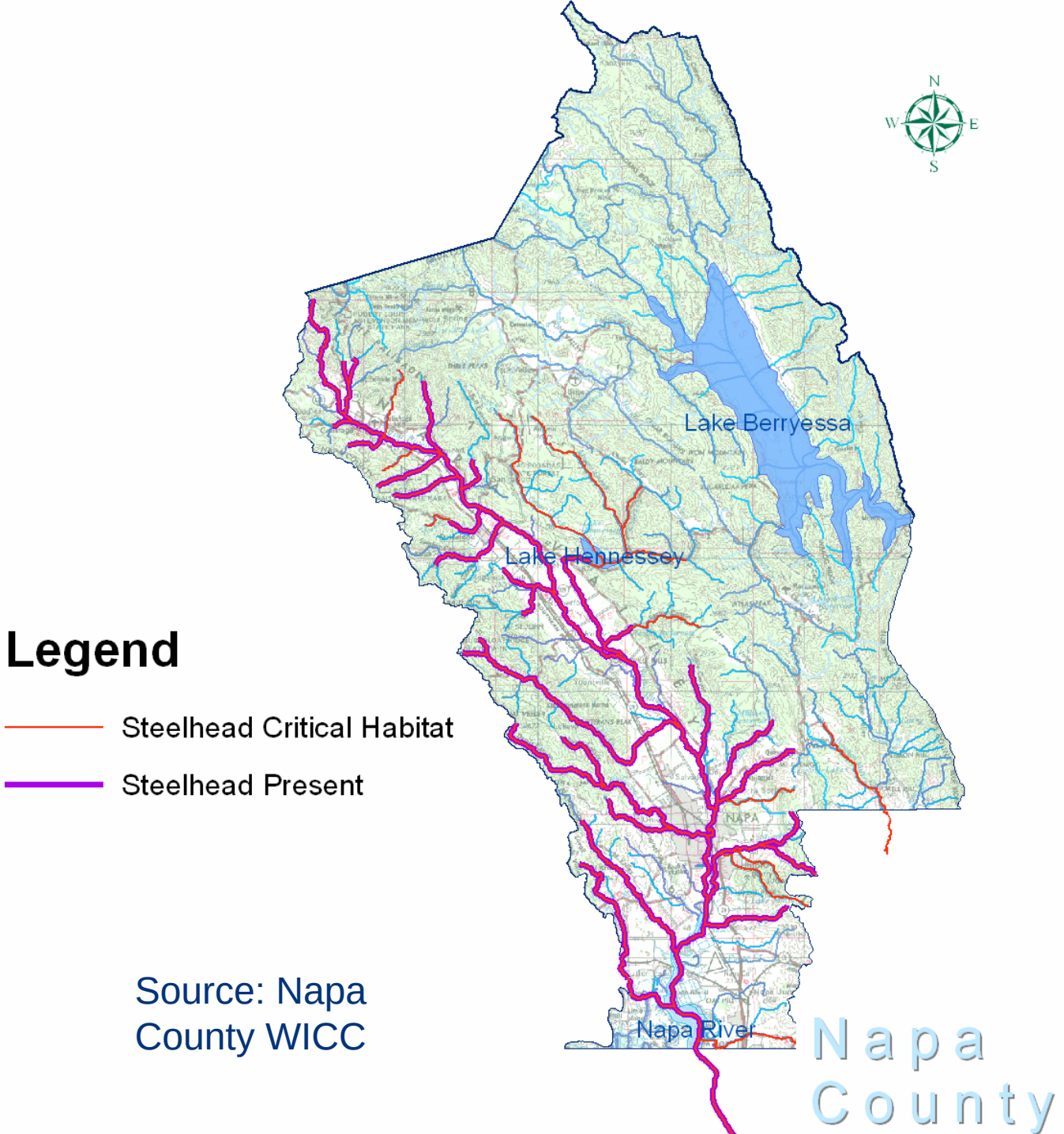
Field Crops



Source: Napa County WICC

Napa County

Steelhead Trout Habitat



Napa River Basin Limiting Factors Analysis

- Napa River put on 303d list as impaired by sediment in 1990
- Prompted RWQCB to prepare a sediment Total Maximum Daily Load (TMDL)
- Napa River Basin Limiting Factors Analysis Initiated
  - Evaluate factors limiting populations of steelhead, Chinook salmon, and CA fresh water shrimp (rare or threatened native fish) in the Napa River watershed
  - Designed to help the RWQCB refine the TMDL problem statement and facilitate the Coastal Conservancy's restoration planning and project implementation.
  - Developed several recommended interim priorities for management actions and additional research.

Napa River Sediment Reduction and Habitat Enhancement Plan

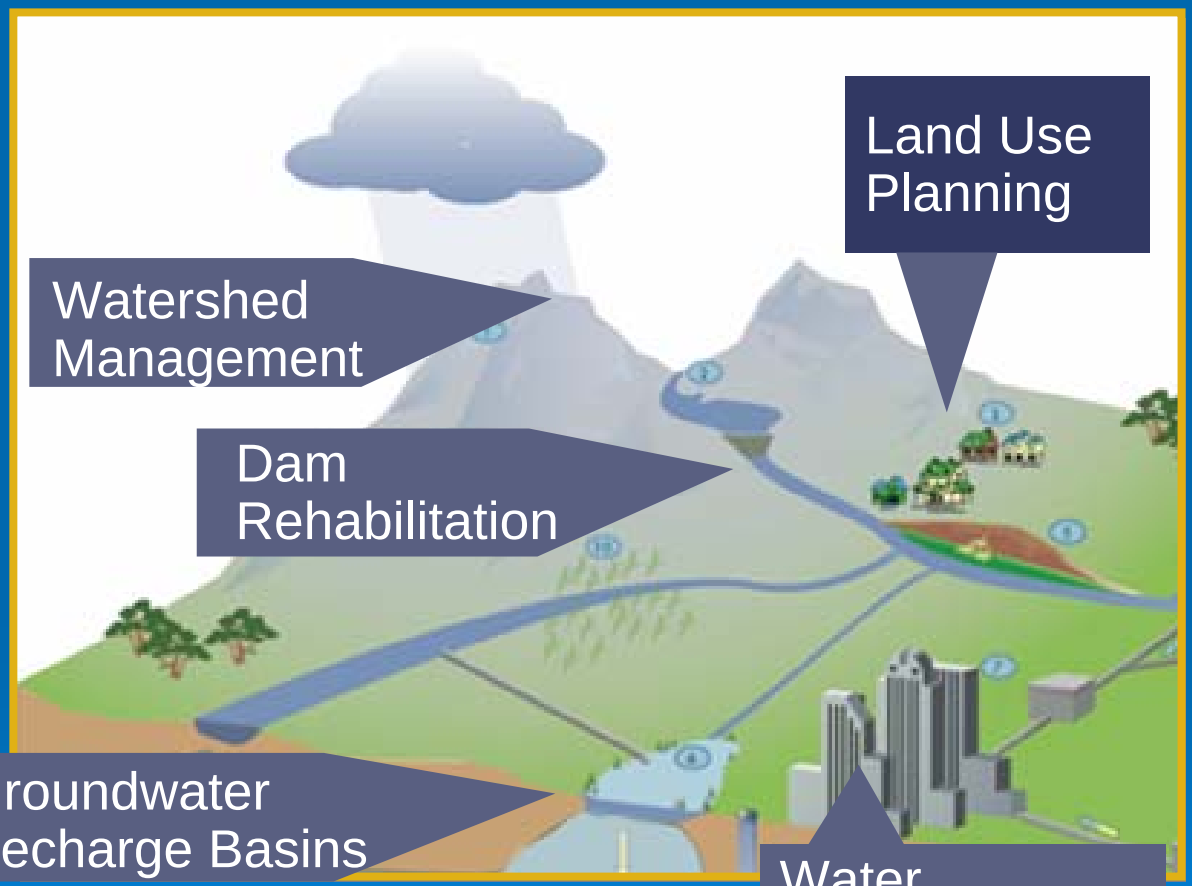
- Goals
  - Conserve the steelhead trout population
  - Establish a self-sustaining Chinook salmon population
  - Enhance the overall health of the native fish community
  - Enhance the aesthetic and recreational values of the river and its tributaries
- Sediment TMDL defining the allowable amount of sediment that can be discharged into the Napa River, expressed as a percentage of the natural background sediment delivery rates to channels
- Implementation plan to achieve the TMDL and related habitat enhancement goals

IWM Adaptation Strategies
provide guidance for Actions, Funding, & Regulations

- Integrated Regional Water Management (IRWM) Planning & Implementation
- California Water Plan Resource Management Strategies & RWQCB Basin Plans
- Urban Water Management Planning & General Plan Water Element linked to Land Use Planning
- Groundwater Management Planning & Monitoring
- Agricultural Water Management Planning

Update 2009 – State's Blueprint
Integrated Water Management & Sustainability

Integrated Regional Water Management



Watershed Management
- Reduced Siltation
- Water Quality
- Habitat

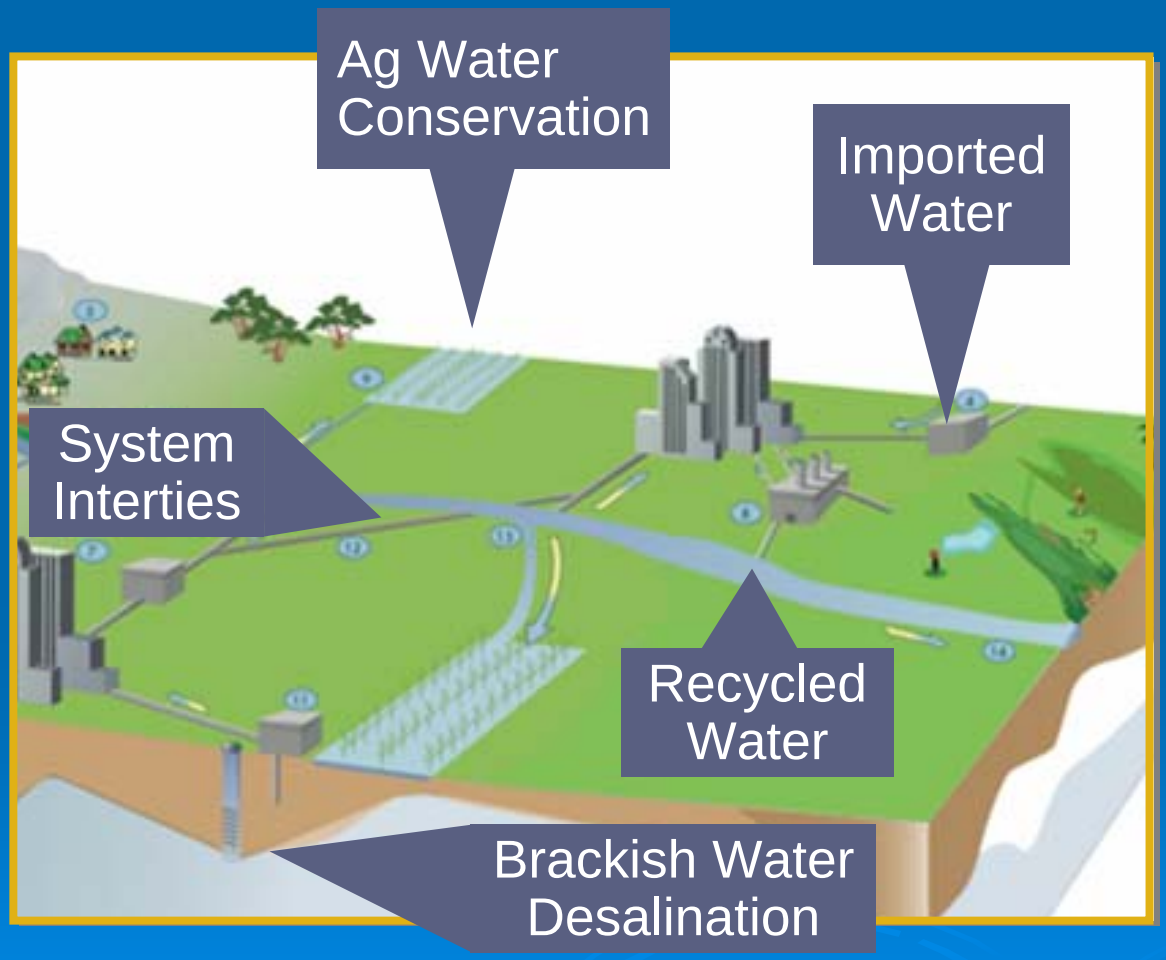
Dam Rehabilitation
- Flood Protection
- Water Supply
- Fish Passage

Land Use Planning
- Protect Groundwater Recharge Areas

Recharge Basins
- Water Supply & Quality
- Pumping Lifts

Water Conservation
- Reduced demand

Integrated Regional Water Management



Ag Water Conservation
- Reduced Demand
- Reduced Ag Runoff

Imported Water
- Reduced Dependence
- Use when available

System Interties
- Mutual Reliability
- Emergency Readiness

Recycled Water
- Water Supply
- Reduced Discharge

Desalination
- Water Supply
- Groundwater Quality

27 Resource Management Strategies
from the California Water Plan

Reduce Water Demand
- Agricultural Water Use Efficiency
- Urban Water Use Efficiency

Improve Operational Efficiency & Transfers
- Conveyance – Delta
- Conveyance – Regional/Local
- System Reoperation
- Water Transfers

Increase Water Supply
- Conjunctive Management & Groundwater Storage
- Desalination –Brackish & Seawater
- Precipitation Enhancement
- Recycled Municipal Water
- Surface Storage – CALFED
- Surface Storage - Regional/Local

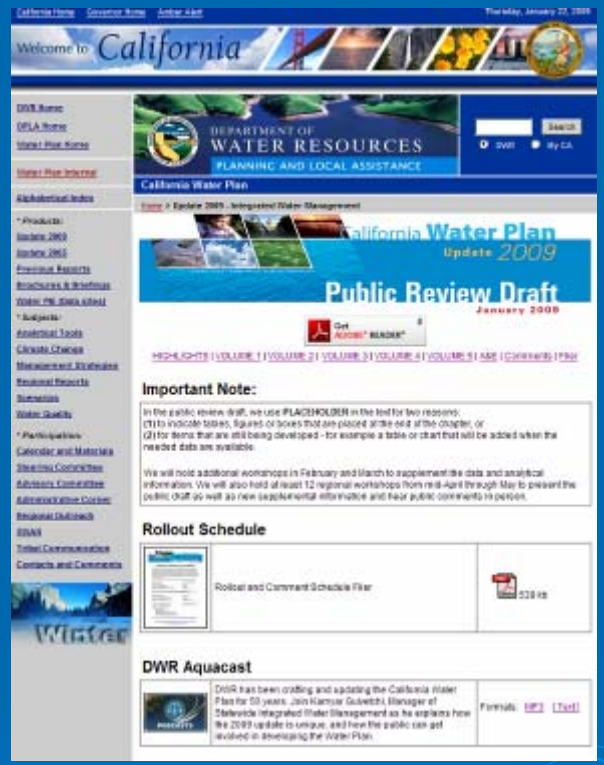
Improve Flood Management
- Flood Risk Management

Improve Water Quality
- Drinking Water Treatment and Distribution
- Groundwater/Aquifer Remediation
- Matching Quality to Use
- Pollution Prevention
- Salt & Salinity Management
- Urban Runoff Management

Practice Resource Stewardship
- Agricultural Lands Stewardship
- Economic Incentives (Loans, Grants, and Water Pricing)
- Ecosystem Restoration
- Forest Management
- Land Use Planning & Management
- Recharge Areas Protection
- Water-Dependent Recreation
- Watershed Management

Ways to Access Water Plan Information

- Visit the Water Plan Web Portal
  www.waterplan.water.ca.gov



- Subscribe to Water Plan eNews
  a weekly electronic newsletter
  www.waterplan.water.ca.gov/enews

Questions?