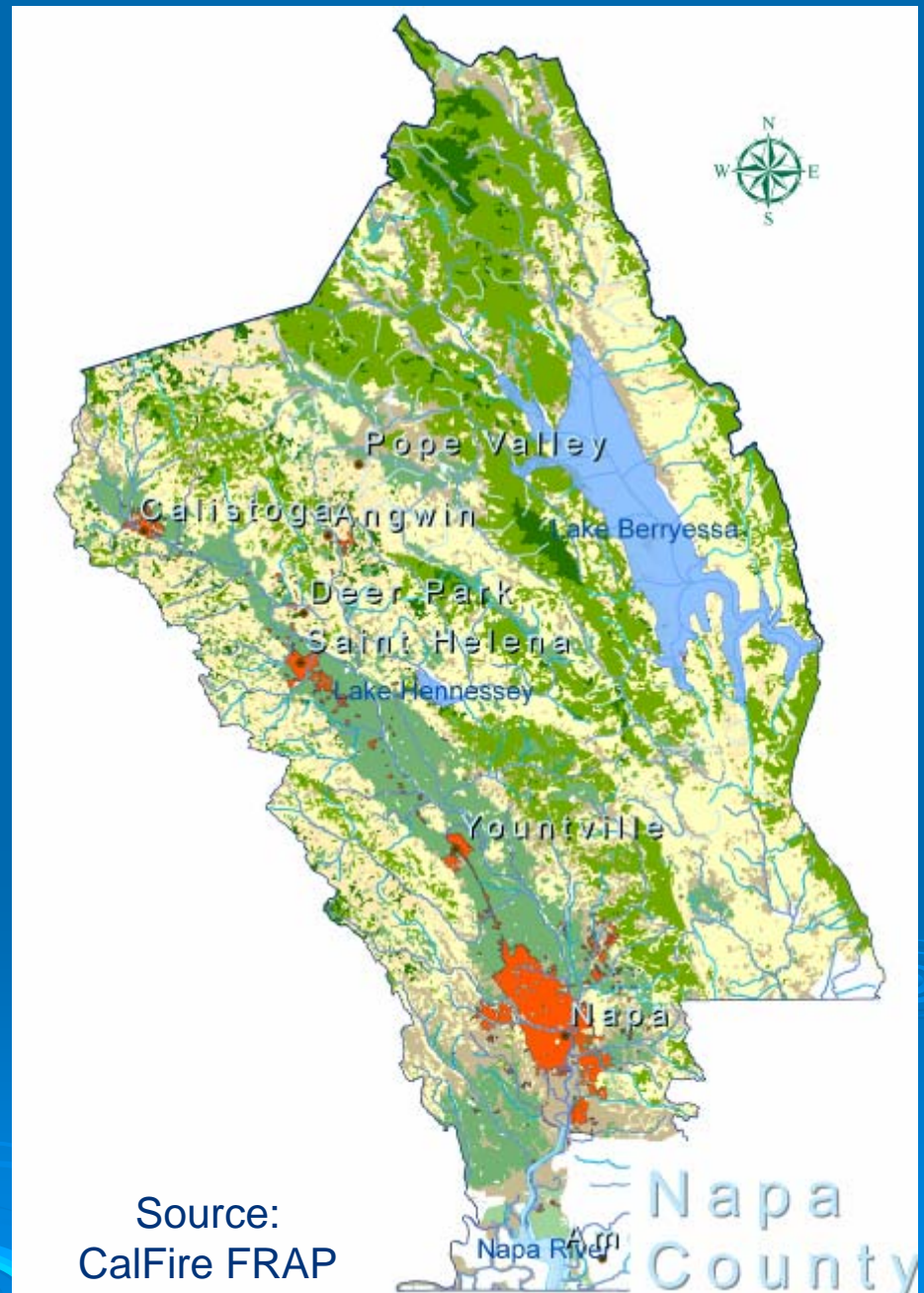


Napa Watershed Symposium

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

Pierre Stephens
California Department of
Water Resources
May 21, 2009



Napa County Hydrologic Regions

Legend

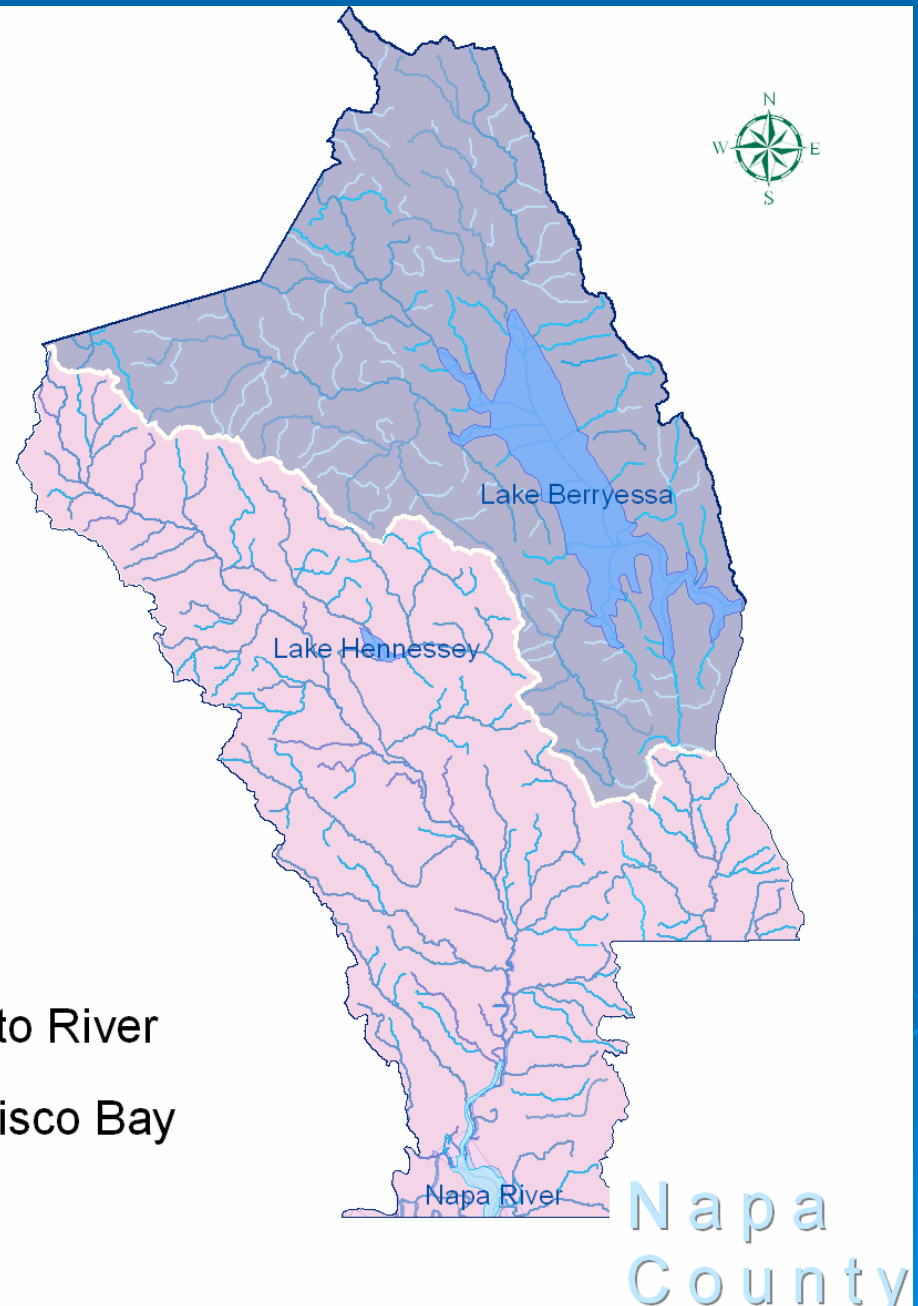
Hydrologic Region



Sacramento River



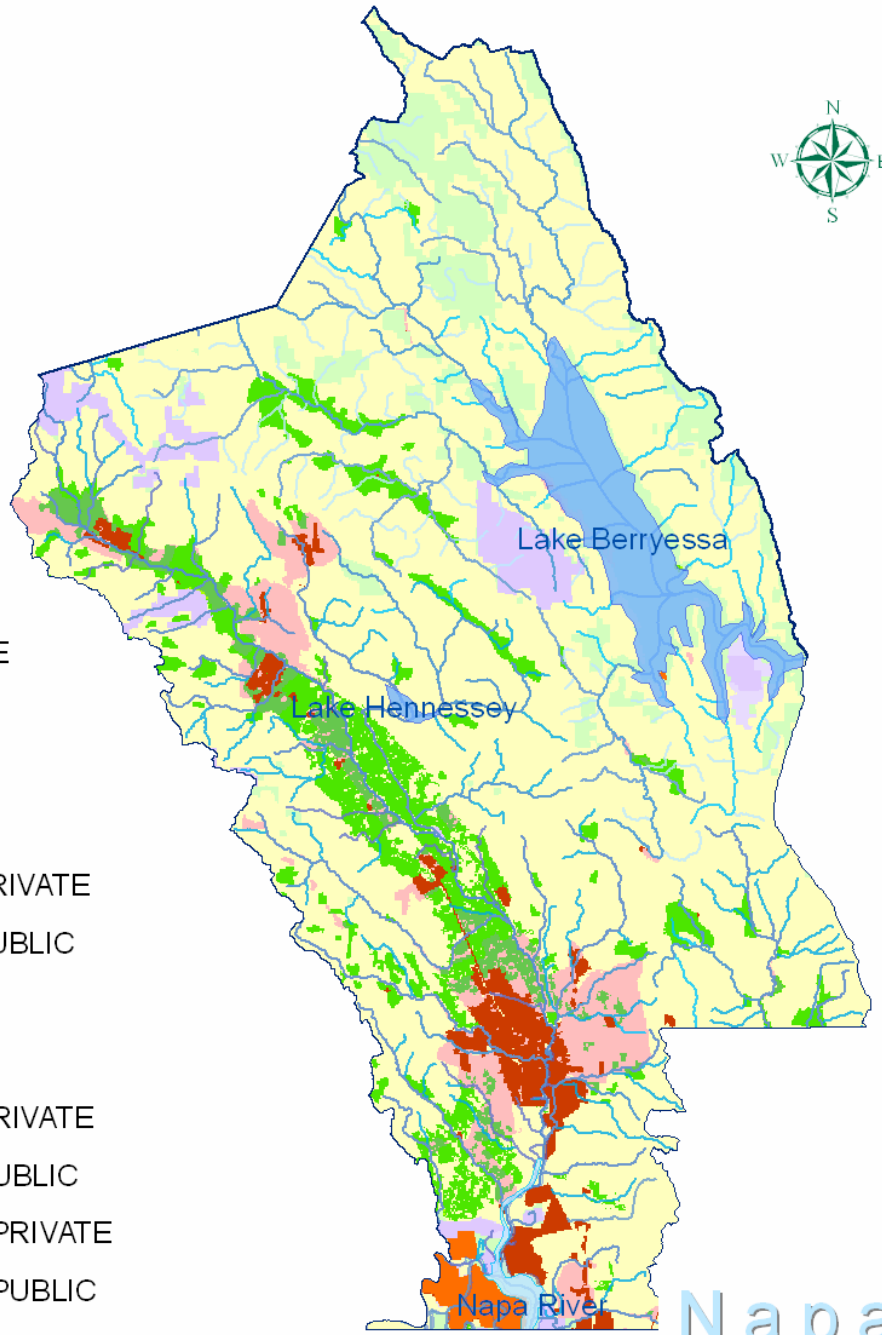
San Francisco Bay



Managed Lands

Legend

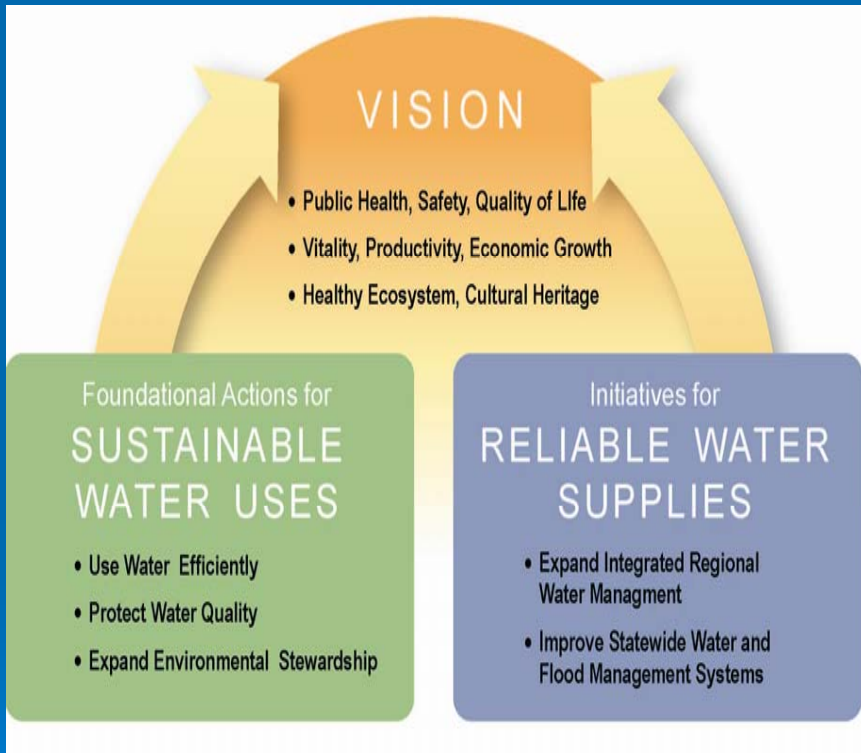
- AG/RURAL PRIVATE
- AG/RURAL PUBLIC
- AG/SPARSE PRIVATE
- AG/SPARSE PUBLIC
- RESERVE/PRIVATE
- RESERVE/PUBLIC
- RESERVE/RURAL PRIVATE
- RESERVE/RURAL PUBLIC
- URBAN/PRIVATE
- URBAN/PUBLIC
- WORKING/RURAL PRIVATE
- WORKING/RURAL PUBLIC
- WORKING/SPARSE PRIVATE
- WORKING/SPARSE PUBLIC



Source: CalFire FRAP

Napa
County

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

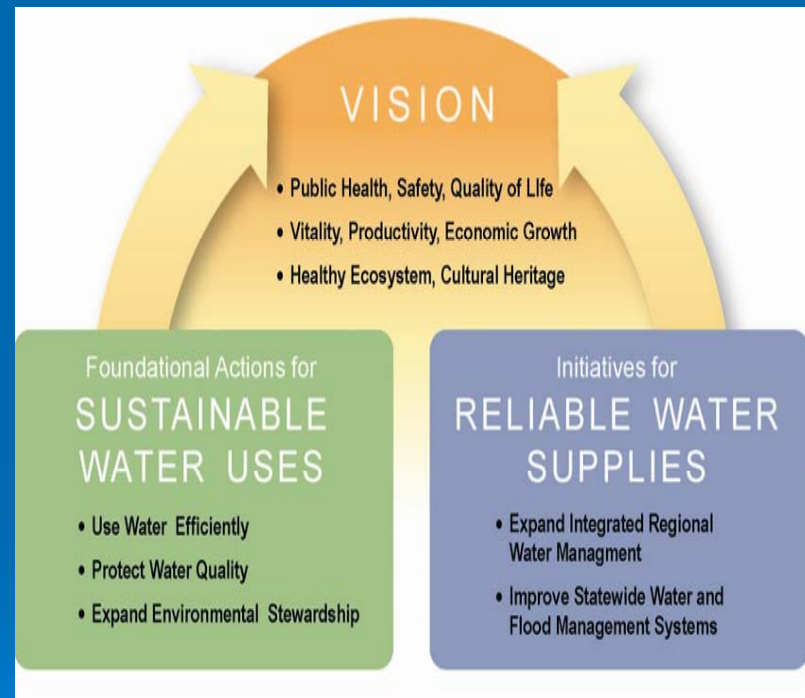
Imperative to Act to Keep Pace w/ Changes

The *Entire System* –

water & flood management,
watersheds & ecosystems

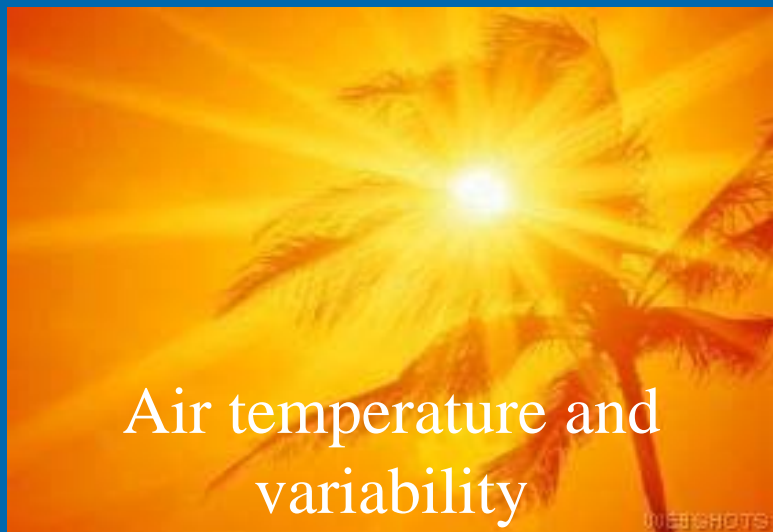
– has lost resilience and is
changing in undesirable ways.

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

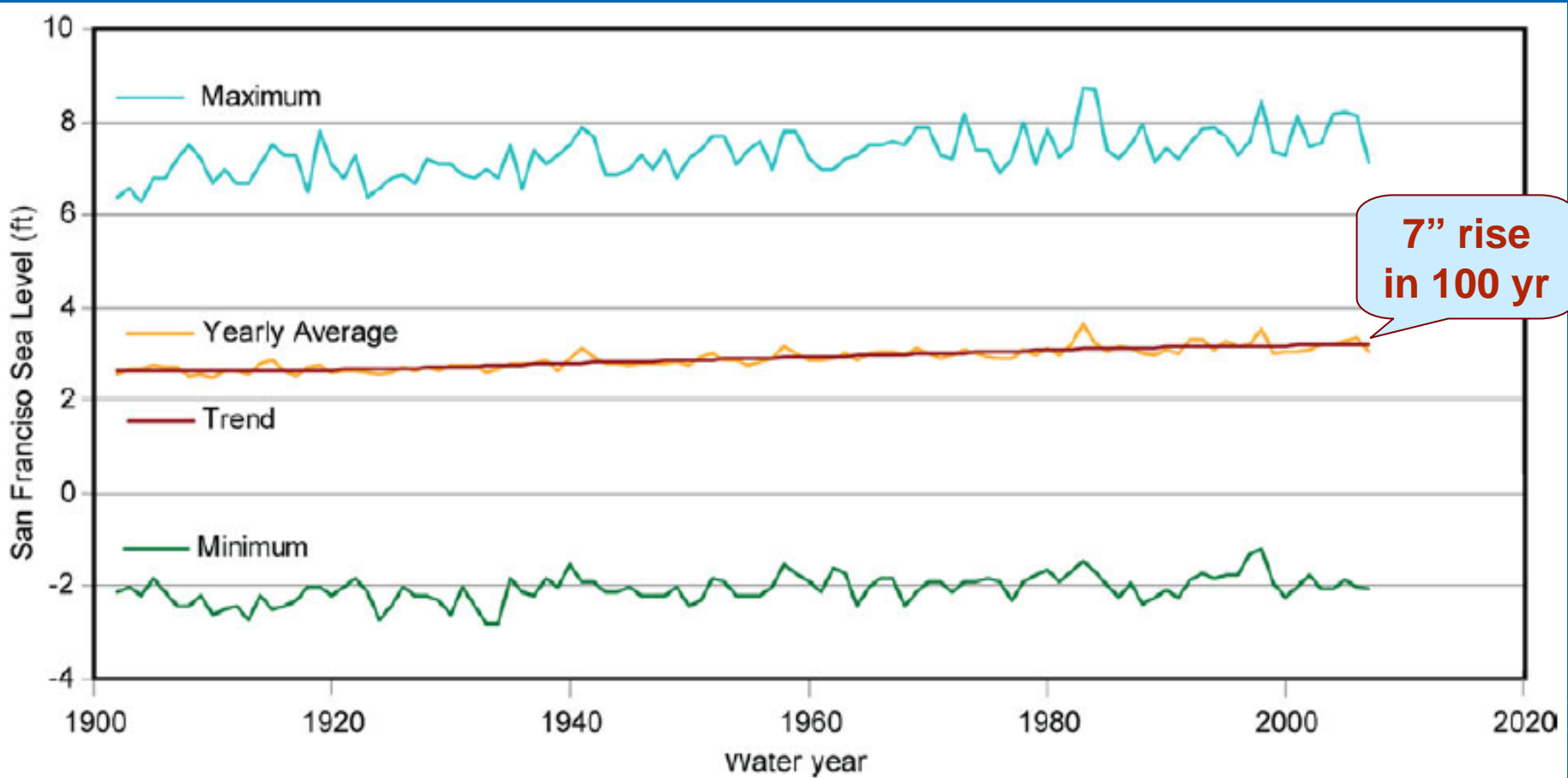


Figure 11. Historical sea levels for San Francisco for 1902–2007

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

Projected Sea Level Rise

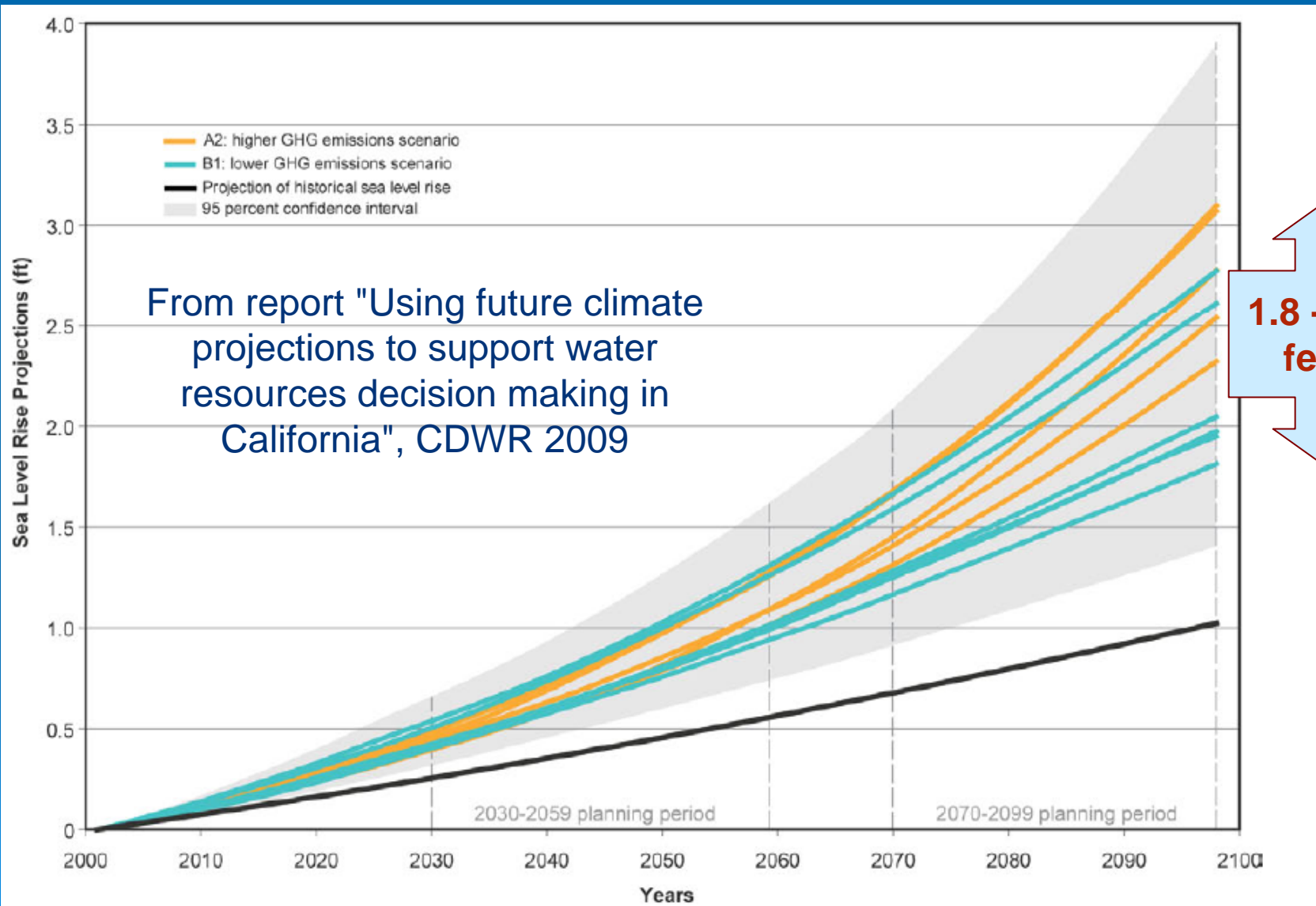
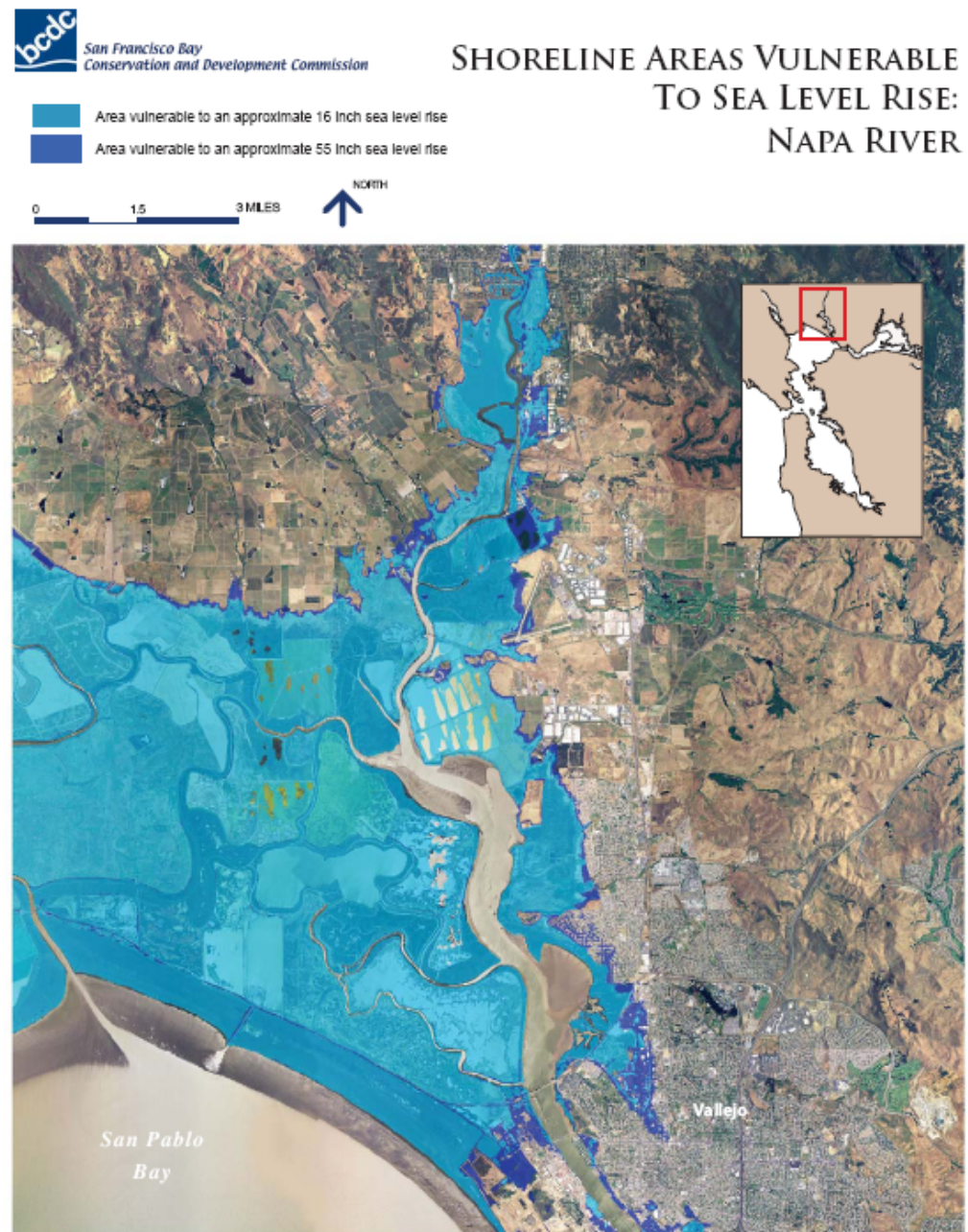


Figure 9. Sea level rise projections based on air temperatures from 12 future climate scenarios

Lower Napa River Area Vulnerable to Sea Level Rise

16" – light blue
55" – dark blue



SOURCE: Inundation data from Knowles, 2008. Additional soil pond elevation data by Siegel and Bechard, 2002. Aerial imagery is NAIP 2005 data.
DISCLAIMER: Inundation data does not account for existing shoreline protection or wave activity. These maps are for informational purposes only. Users, by their use, agree to hold harmless and blameless the State of California and its representatives and its agents for any liability associated with its use in any form. The maps and data shall not be used to assess actual coastal hazards, insurance requirements, or property values or be used in lieu of Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA).

Projected Salinity Intrusion

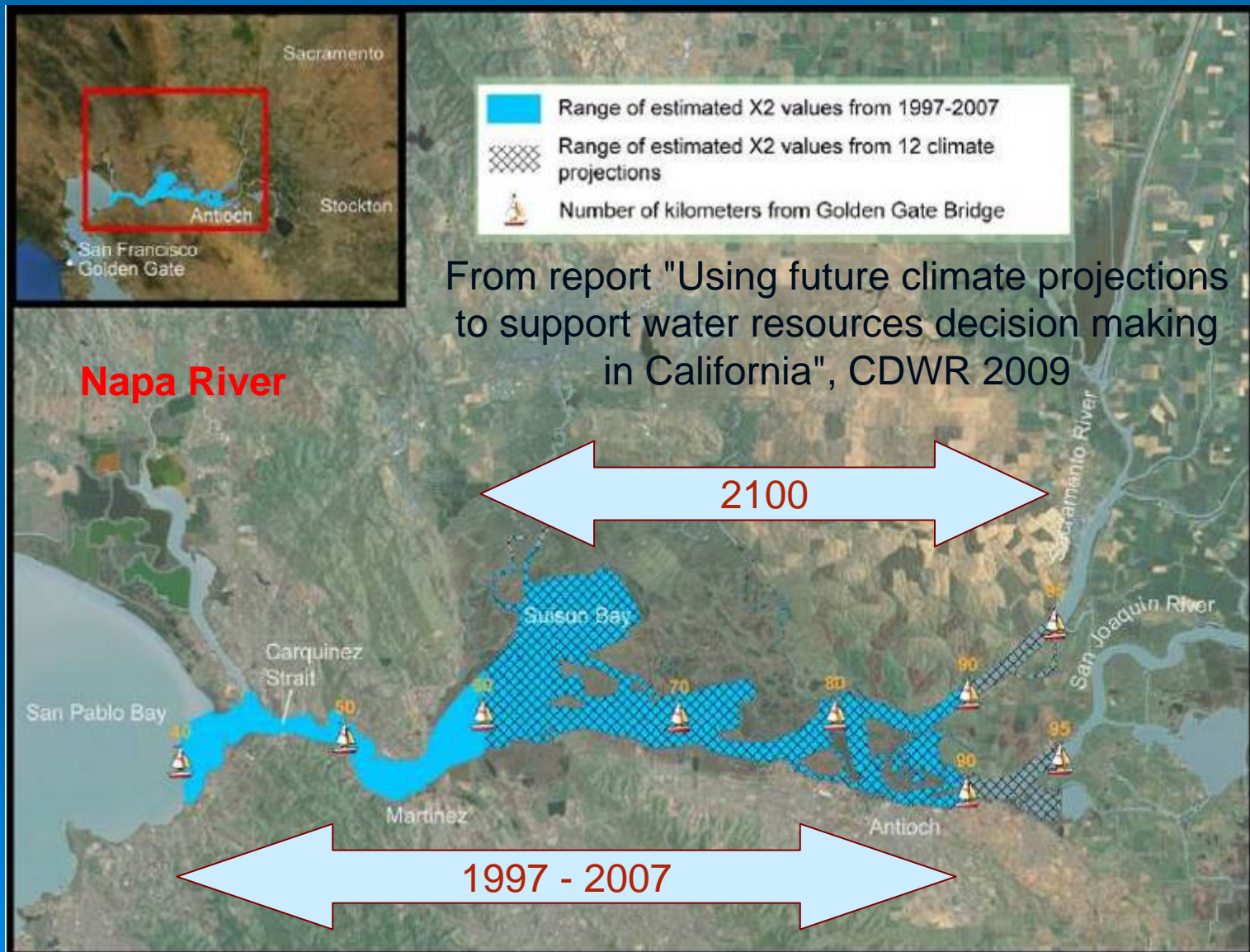
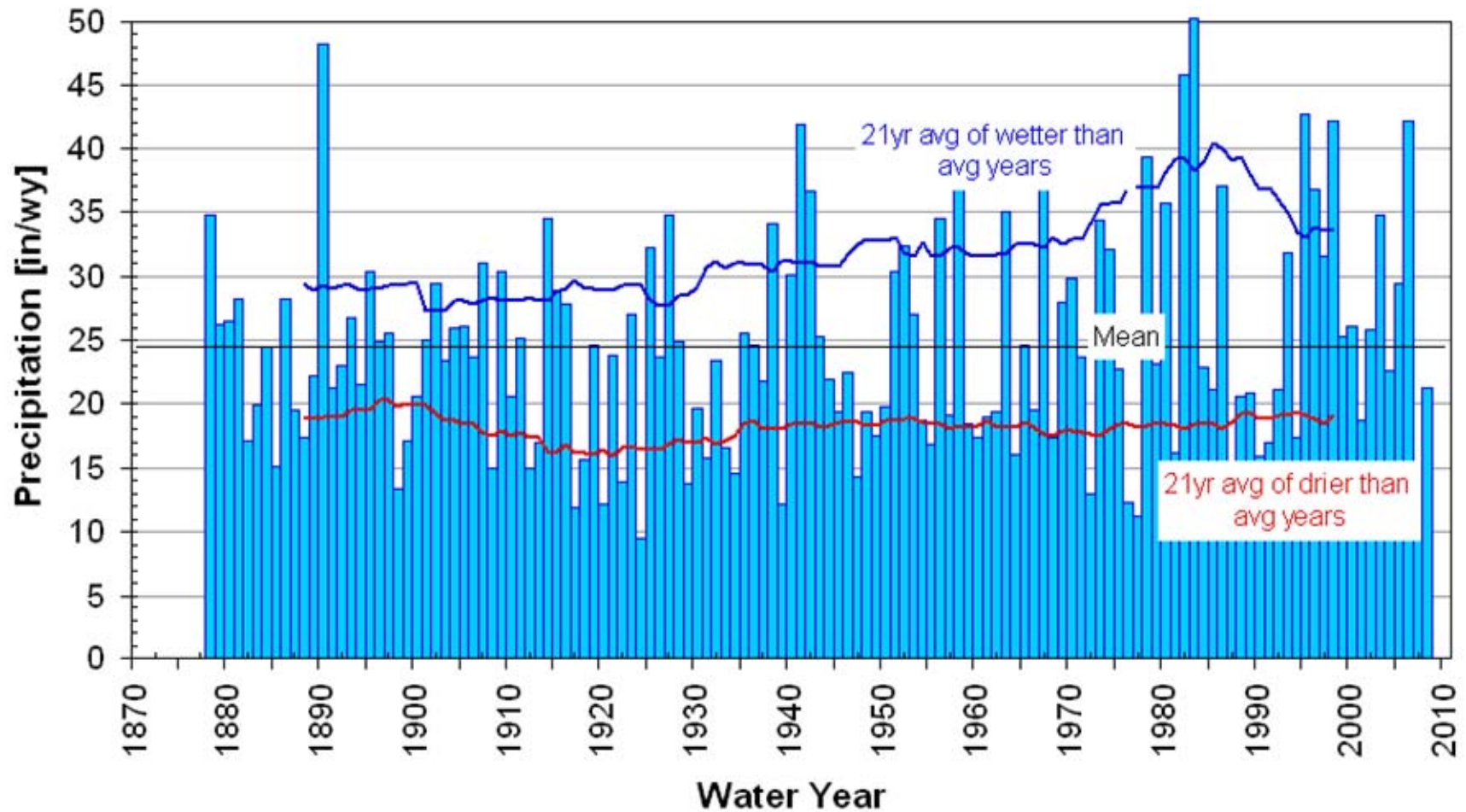


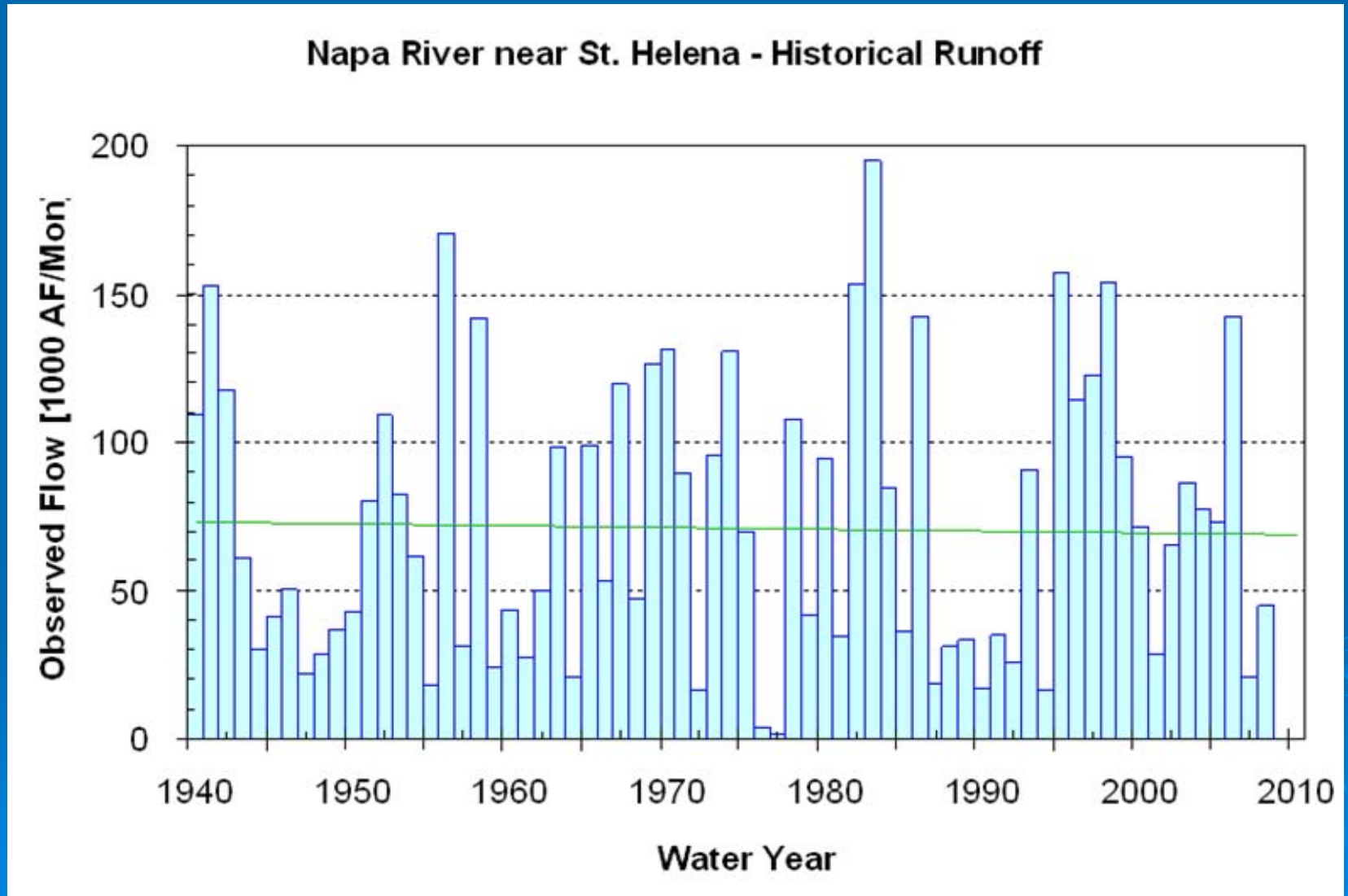
Figure 20. Ranges of historically based and future estimates of X2 locations

Precipitation Variability

Napa Precipitation

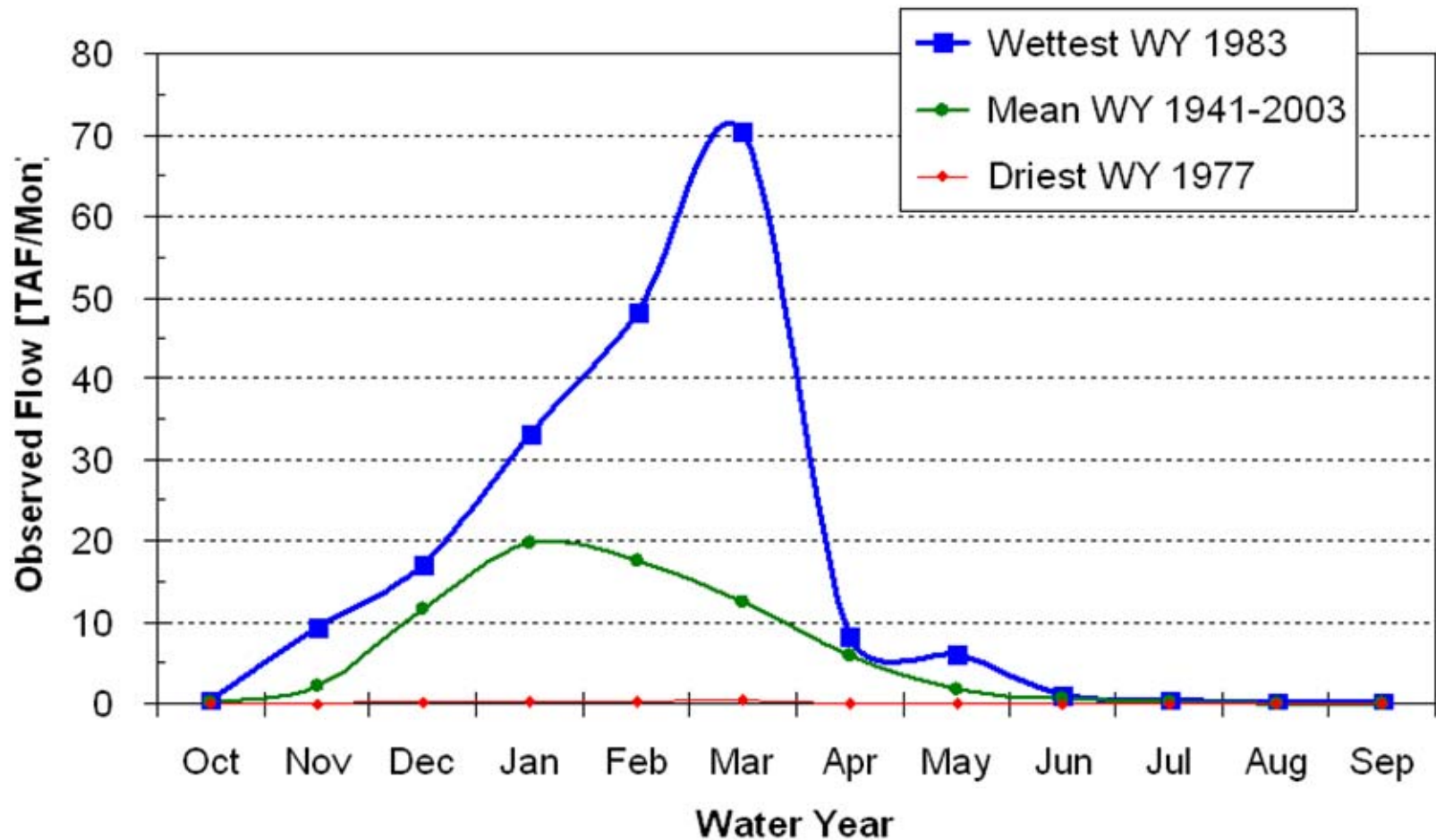


Variation in Annual River Runoff – Napa River

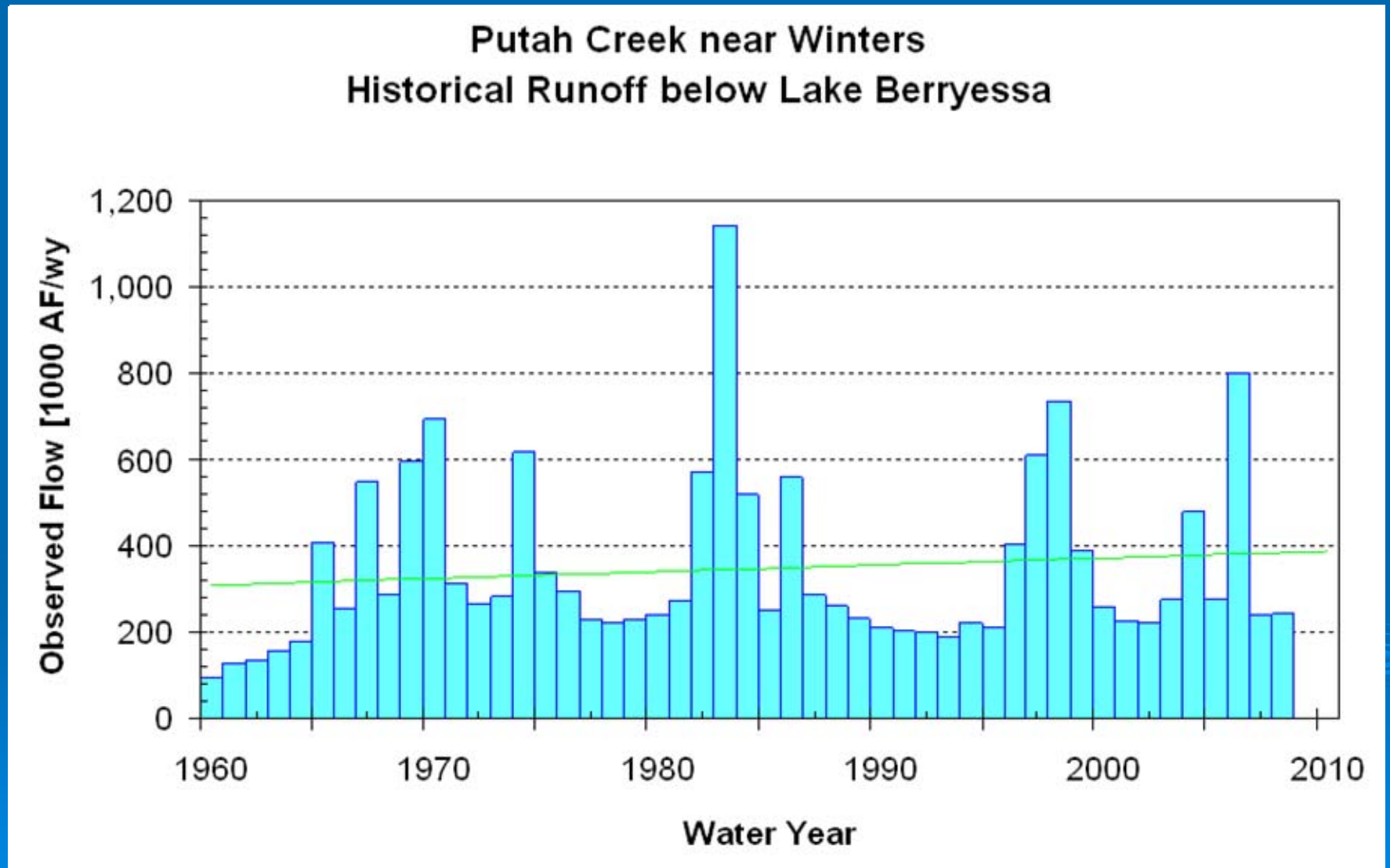


Variation in Seasonal Runoff – Napa River

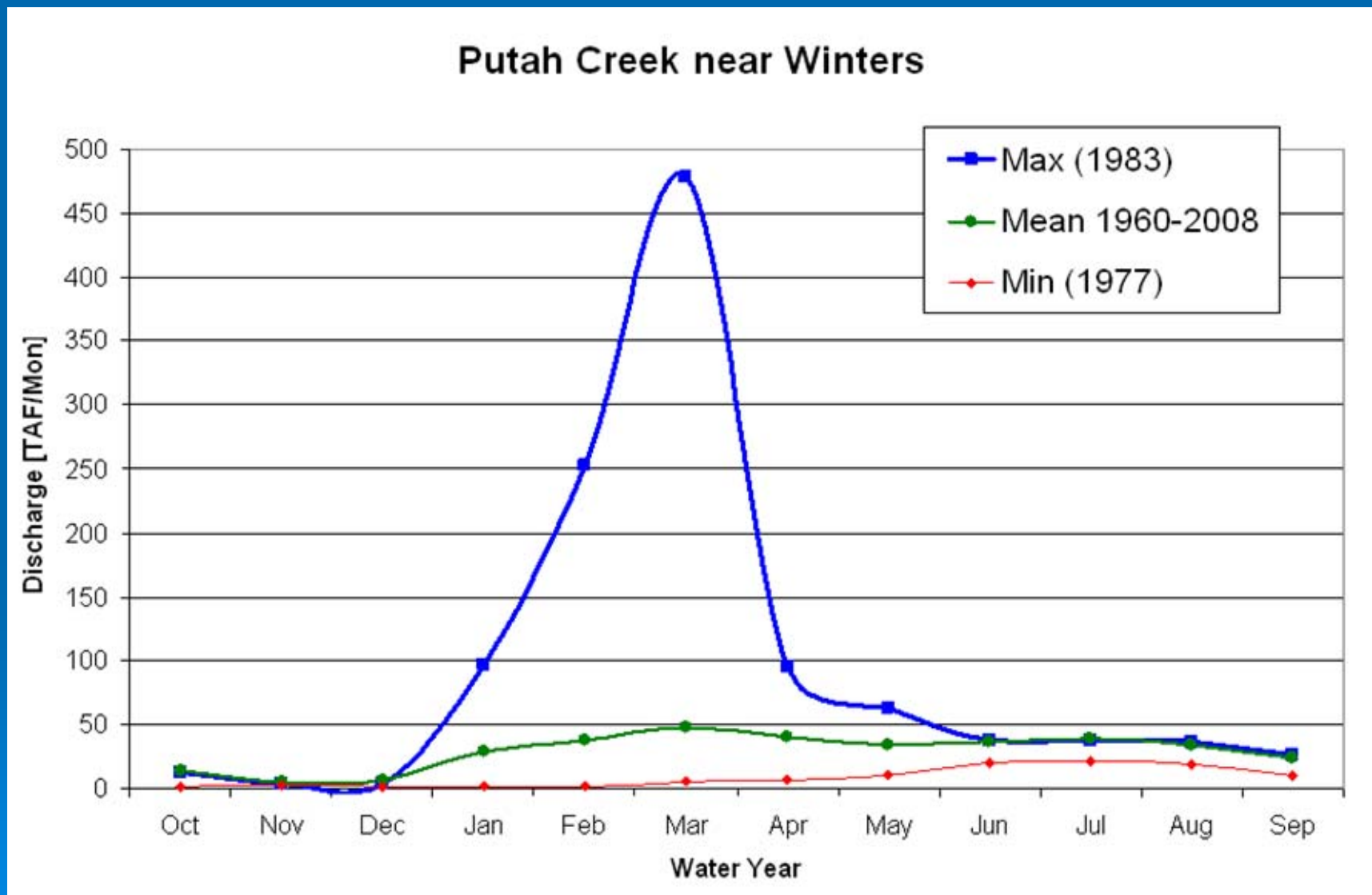
Napa River near St. Helena - Seasonal Hydrograph



Variation in Annual River Runoff – Putah Creek



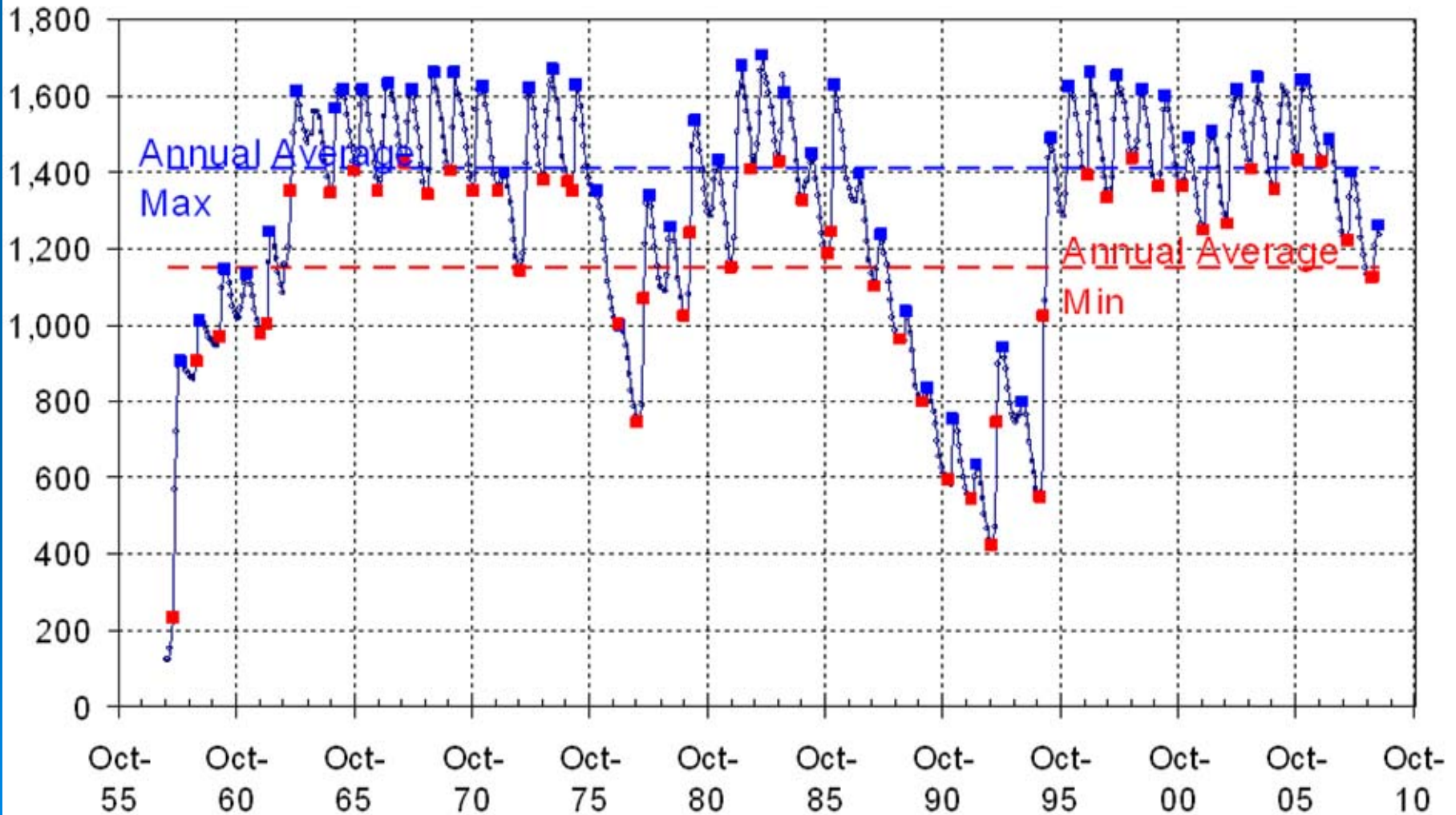
Variation in Seasonal Runoff – Putah Creek



Source: USGS

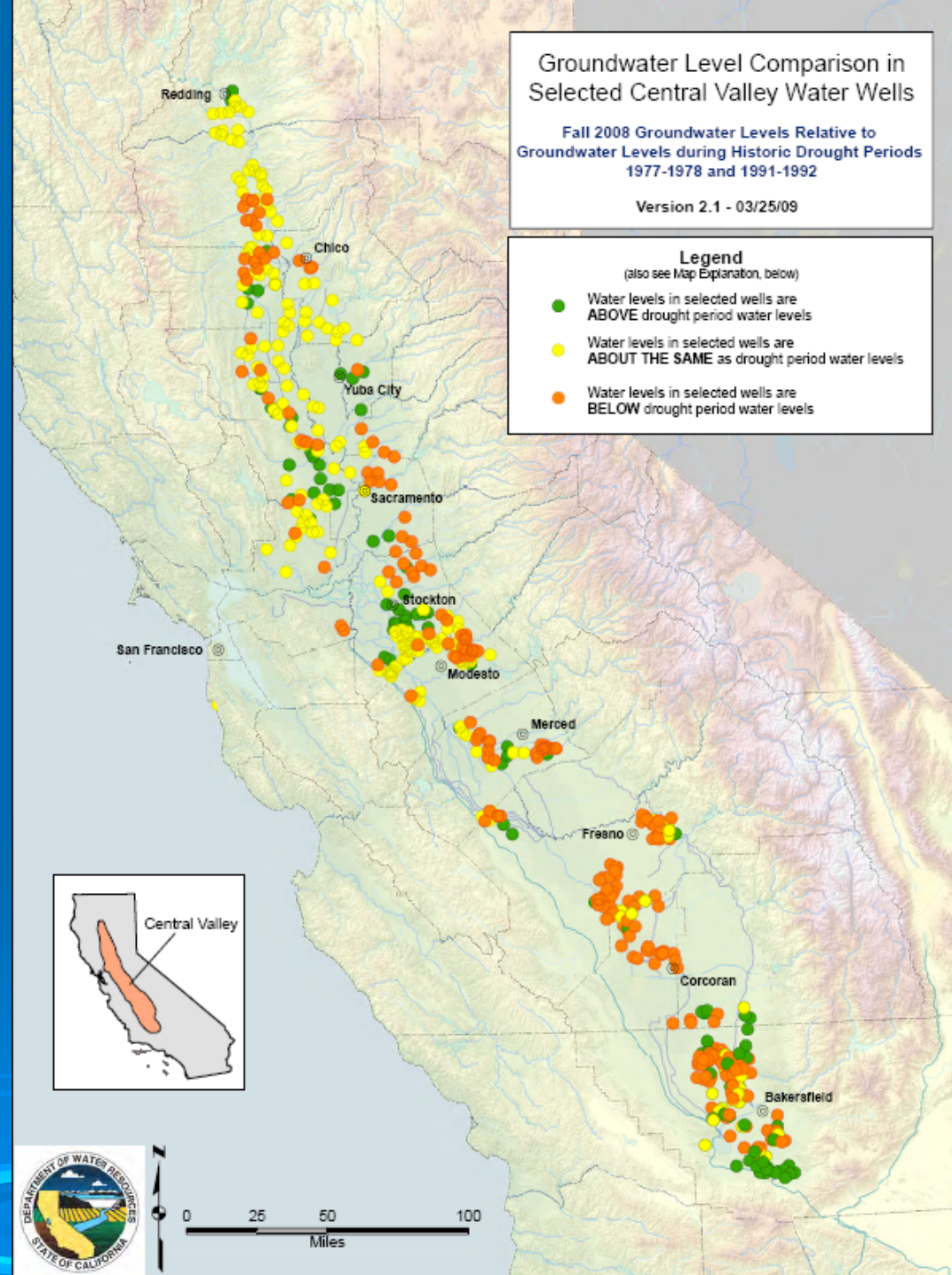
Lake Berryessa Operation

Historical Storage (1000 AF) in Lake Berryessa



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



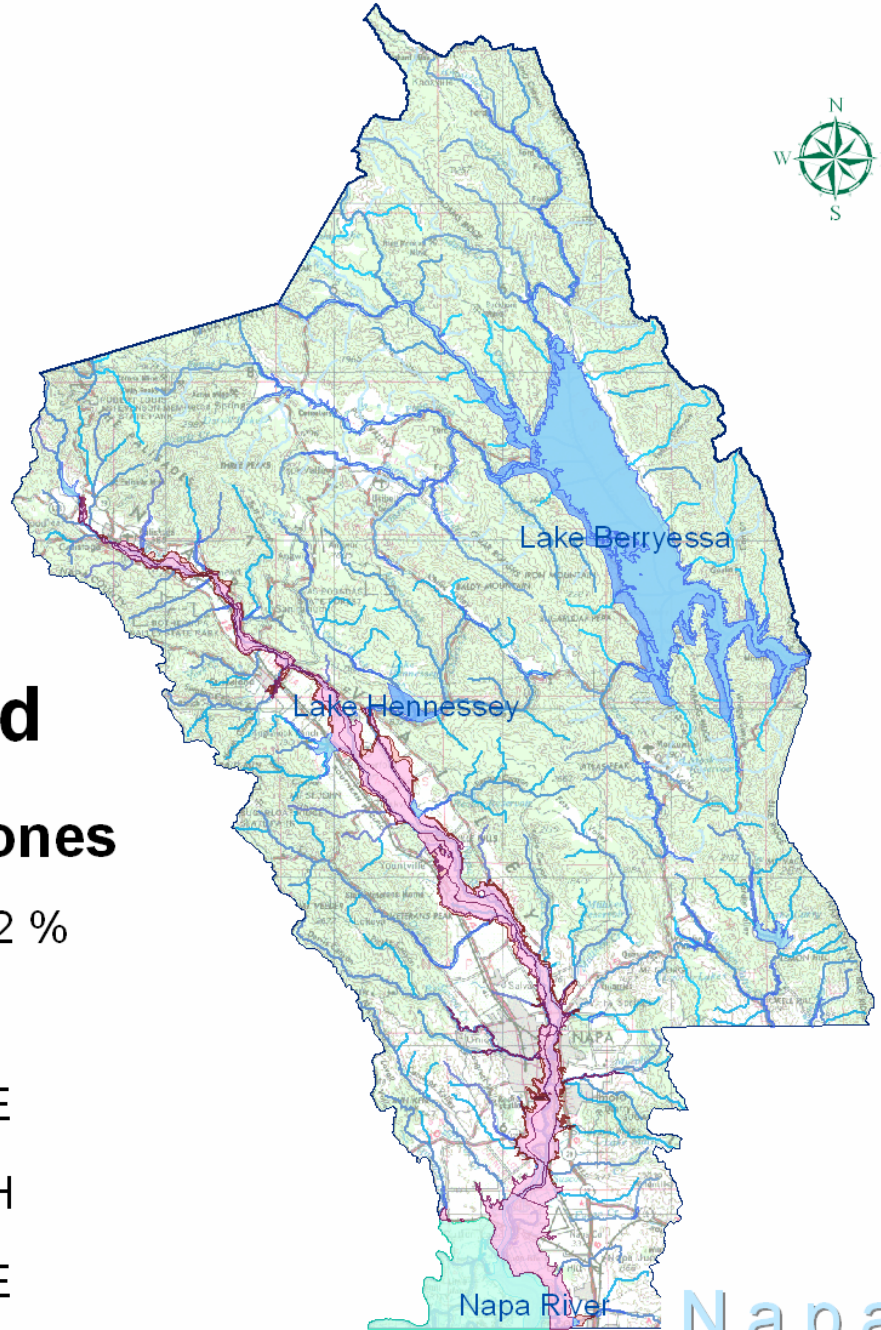
FEMA Flood Zones

Legend

Flood Zones



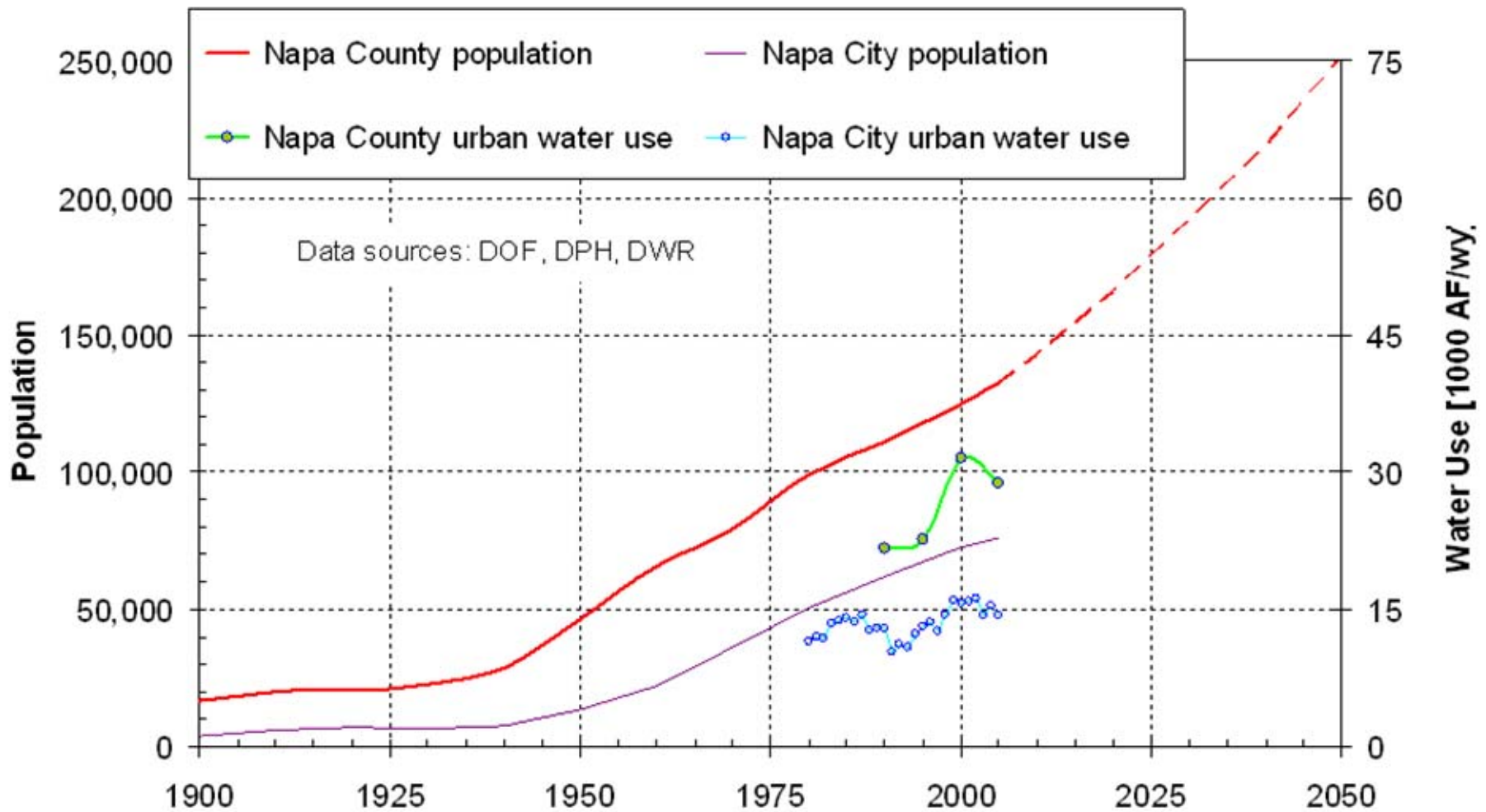
Source: Napa County



Napa
County

Population & Water Use

Napa County and City Trends



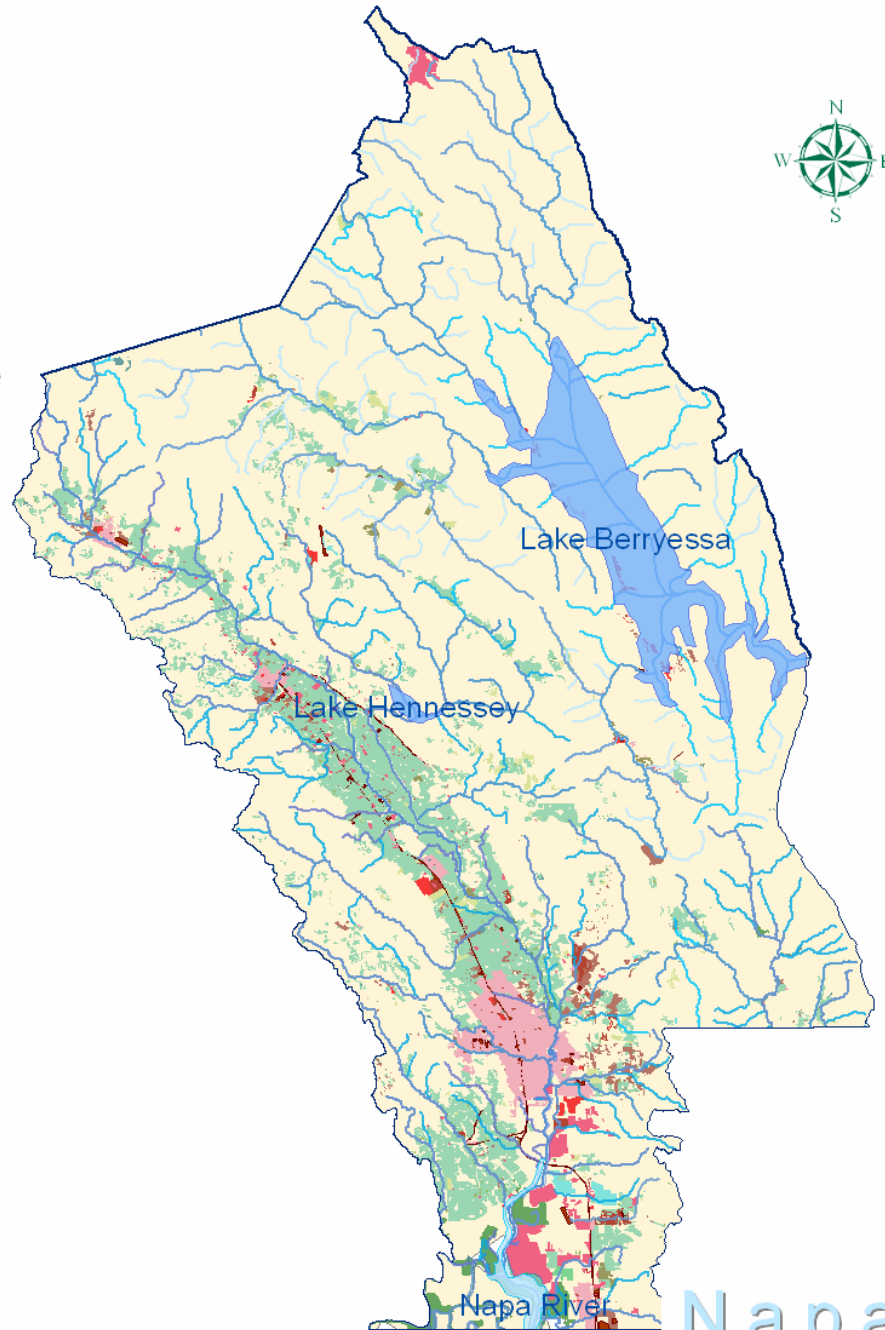
Land & Water Use

Legend

Land and Water Use

Class

	C
	D
	G
	I
	P
	T
	V
	NR
	S
	U
	UC
	UI
	UL
	UR
	UV

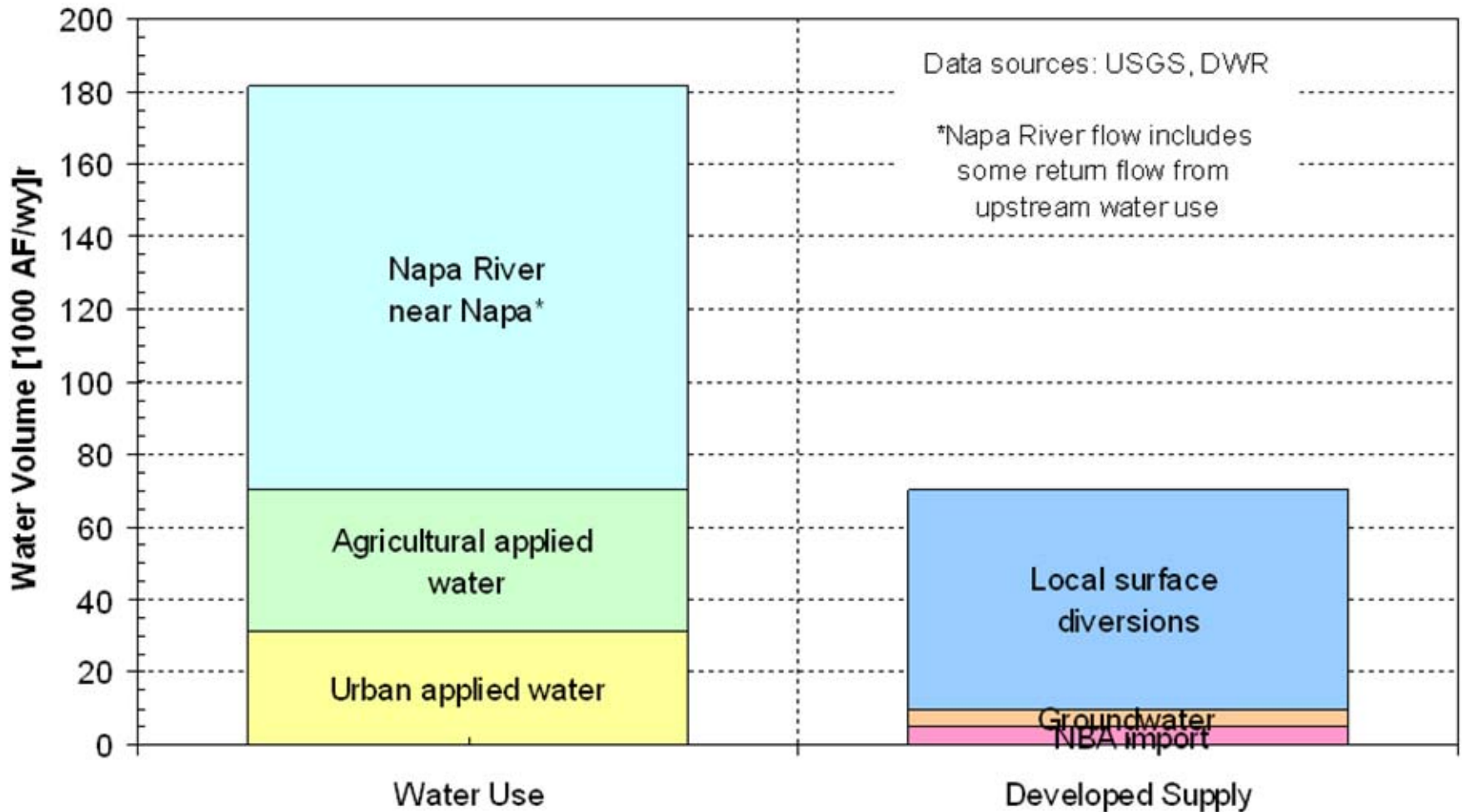


Source: CDWR

Napa
County

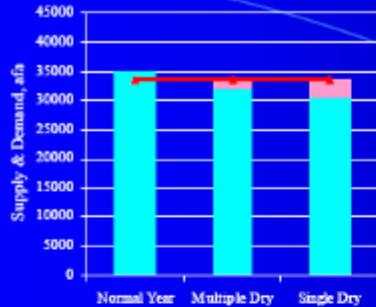
Napa River Water Balance

Napa Watershed WY 2000 Water Balance

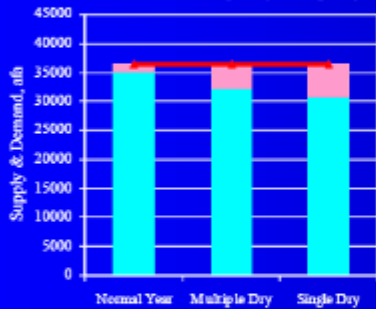


2050 Napa Valley Water Resources Study

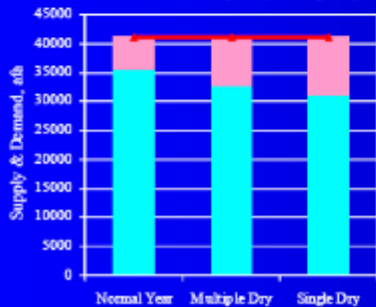
Present



2020



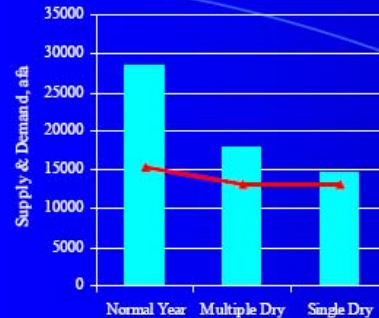
2050



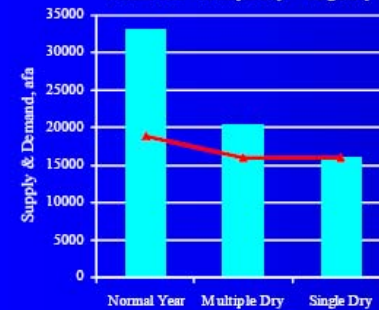
Supply Demand Shortfall

Unincorporated Areas

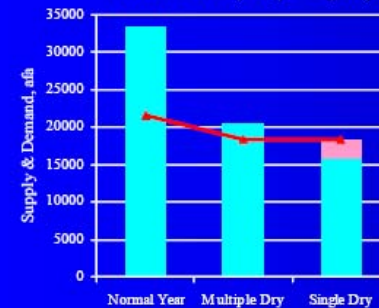
Present



2020



2050



Supply Demand Shortfall

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:

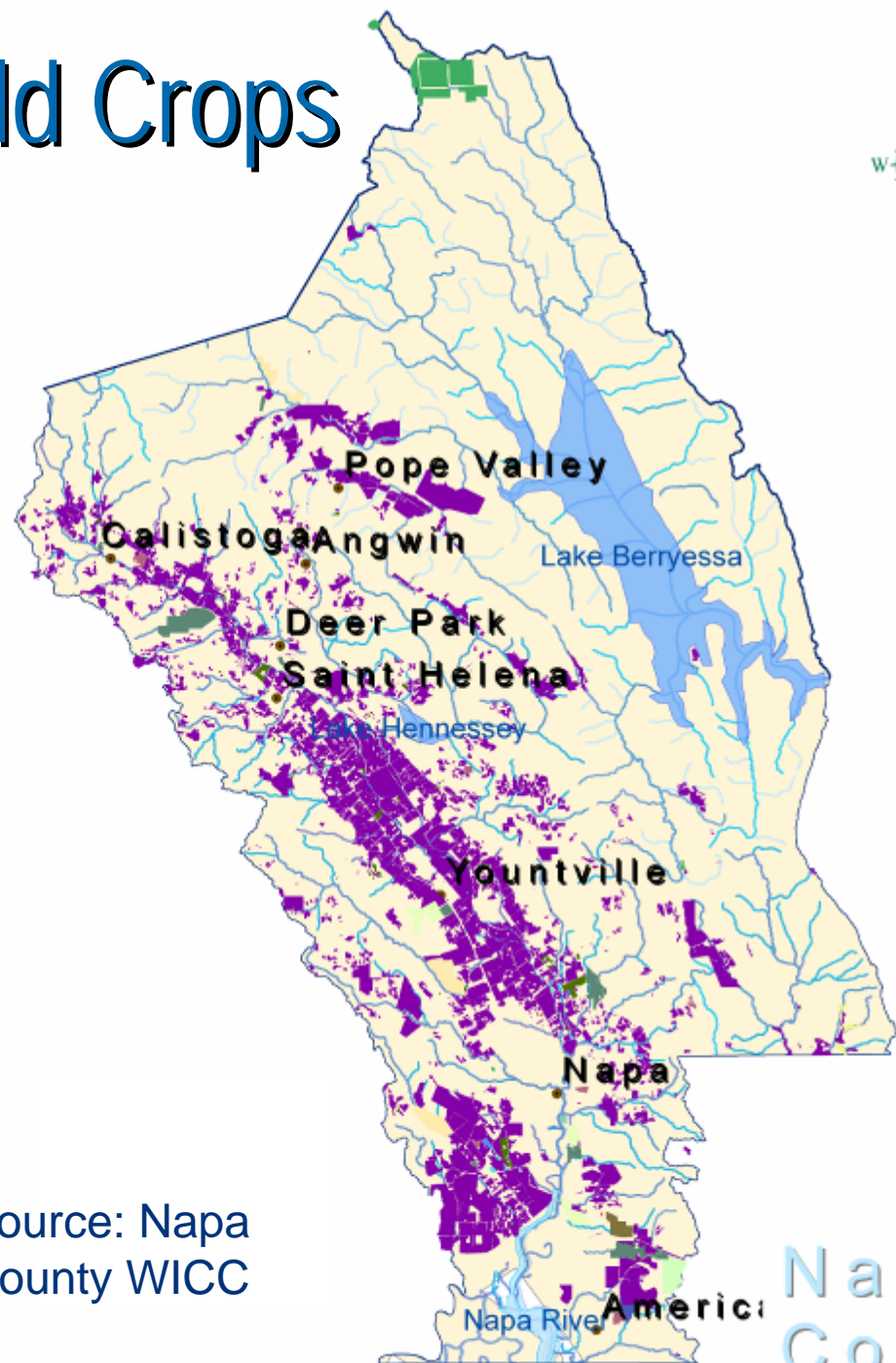
- Groundwater for Schools/Parks
- Maximize Use of Milliken Reservoir
- Napa Pipe Wells
- Unaccounted for Water

Field Crops



Legend

ALMOND	OAT FOR/FODDER
APPLE	OATS
BEAN UNSPECIFD	OLIVE
BEEHIVE	OLIVES
BEET	ONION DRY ETC
BLACKBERRY	ONION GREEN
BLUEBERRY	OT-FOLIAGE PLNT
BOYSENBERRY	PASTURELAND
BROCCOLI	PEACH
CARROT	PEAR
CELERY	PEAS
CHRISTMAS TREE	PEPPER SPICE
COMM. FUMIGATN	PERSIMMON
CUCUMBER	PLUM
EGGPLANT	POMEGRANATE
FIG	PRUNE
FORAGE HAY/SLGE	QUINCE
GARLIC	RADISH
GF-FLWRNG PLANT	RANGELAND
HERB, SPICE	RASPBERRY
INDUSTRIAL SITE	RECREATION AREA
LANDSCAPE MAIN	RIGHTS OF WAY
LEMON	SQUASH, SUMMER
LETTUCE LEAF	STRAWBERRY
LIVESTOCK	TOMATO FRESH
MELON	UNCUL NON-AG
N-GRNHS PLANT	UNCULTIVATED AG
N-OUTDR FLOWERS	VEGETABLE
N-OUTDR PLANTS	WALNUT
NECTARINE	WATER AREA
New	WINE GRAPE
OAT	WINE GRAPES



Source: Napa County WICC

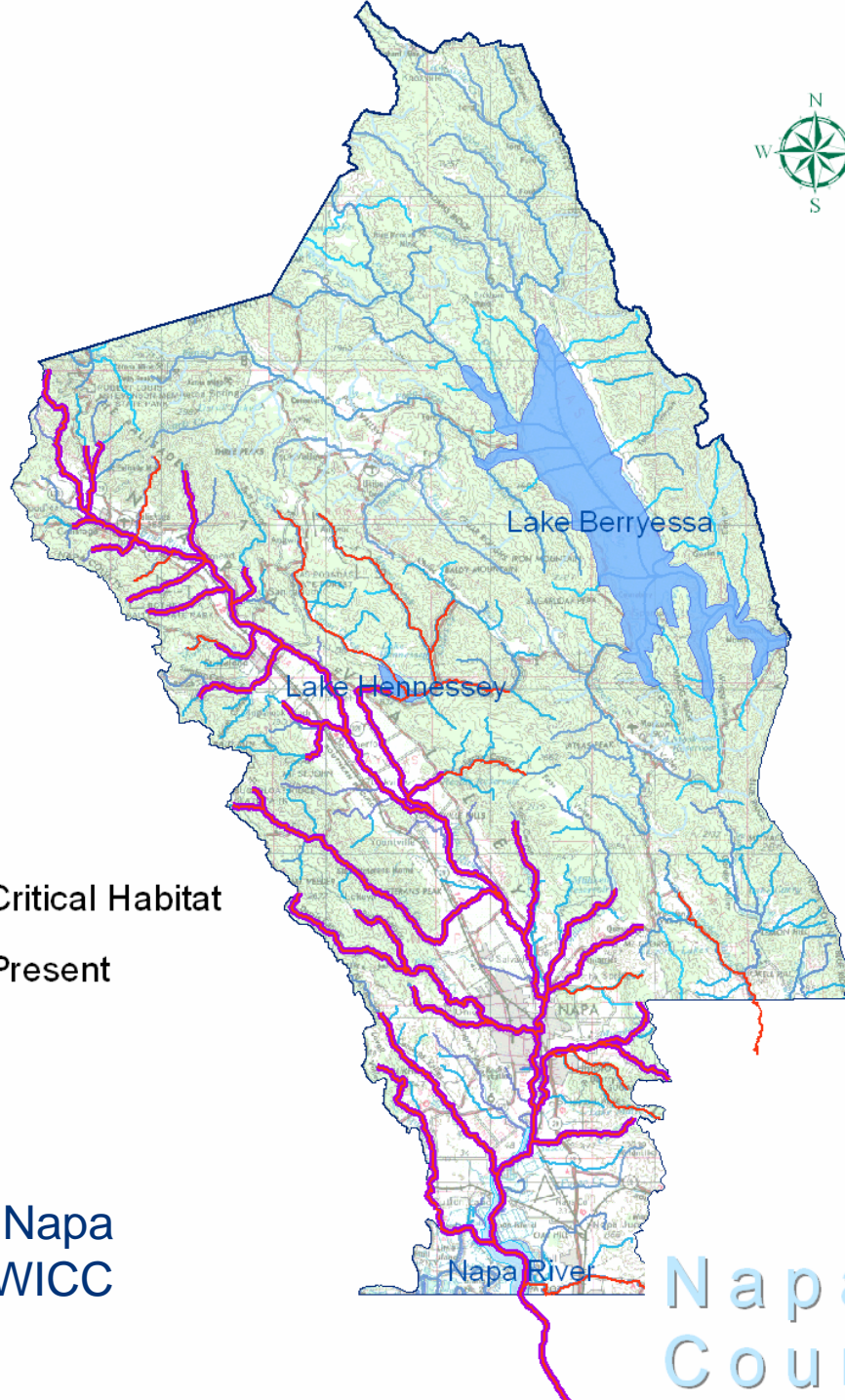
Napa County

Steelhead Trout Habitat

Legend

- Steelhead Critical Habitat
- Steelhead Present

Source: Napa
County WICC



Napa
County

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

VISION

- Public Health, Safety, Quality of Life
- Vitality, Productivity, Economic Growth
- Healthy Ecosystem, Cultural Heritage

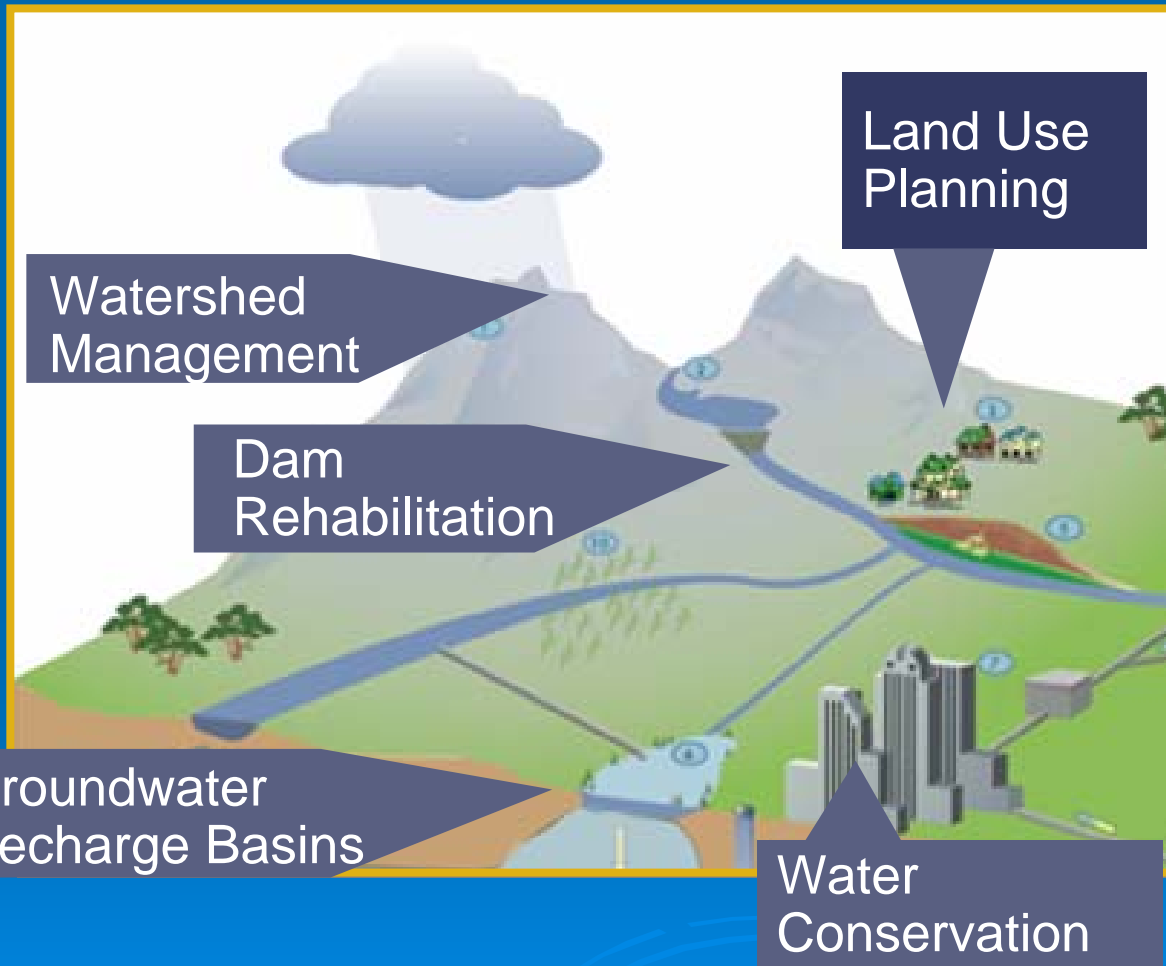
Foundational Actions for SUSTAINABLE WATER USES

- Use Water Efficiently
- Protect Water Quality
- Expand Environmental Stewardship

Initiatives for RELIABLE WATER SUPPLIES

- Expand Integrated Regional Water Management
- Improve Statewide Water and Flood Management Systems

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

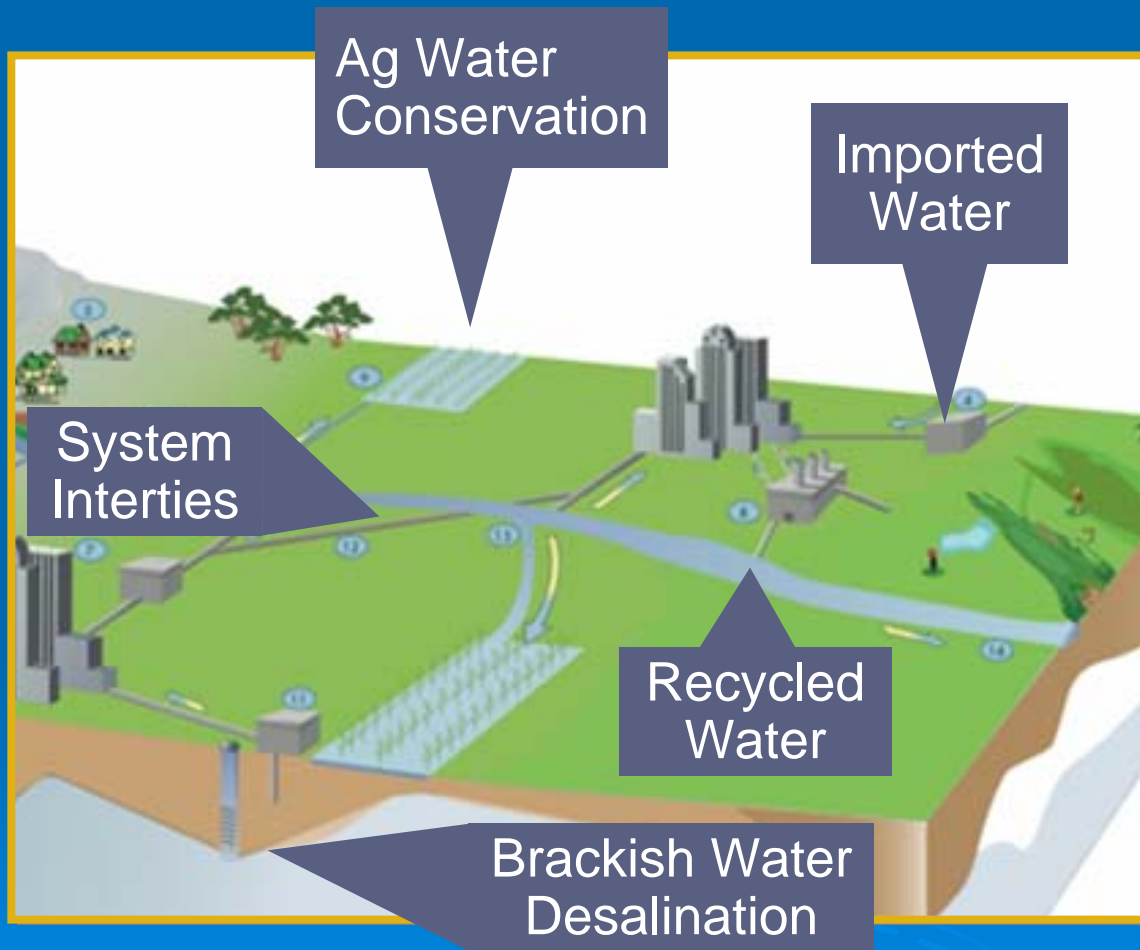
Recharge Basins

- 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

California Water Plan 2009
Wednesday's Update Feb. 27, 2008

Regional Workshops get under way next week in Southern California
The first three of this year's Water Plan Regional Workshops will be held next week in Southern California to allow the public to comment on an initial draft of their respective Regional Report. ...

Free Delta Vision workshop to be held in Salton City
The Delta Education Foundation is offering a free Delta Vision workshop in Friday, March 7, in Salton City. The free workshop will run from 6-8:30 a.m. to 5 p.m. and will outline the Delta Vision plan's water management and what they mean to you. ...

DV Nine Billion panel will meet tomorrow and Friday
The Delta Vision Nine Billion Task Force will meet tomorrow and Friday in West Sacramento to continue developing a strategic plan to implement the vision for the California Delta. ...

RAND releases two water management studies
The RAND Corporation has released two studies detailing uncertainties about future water management. The first is "Assessing Uncertainty About Climate Change in Water Resource Strategies: A Summary of Workshops with the Island Ecosystem Utilities Agency." ...



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

Welcome to California

DEPARTMENT OF WATER RESOURCES
PLANNING AND LOCAL ASSISTANCE

California Water Plan
Update 2009
Public Review Draft
January 2009

Important Note:
In the public review draft, we use PLACEHOLDER in the text for two reasons: (1) to indicate tables, figures or icons that are placed in the next draft, or (2) for items that are still being developed - for example a table or chart that will be added when the needed data are available.

Rollout Schedule
Rollout and Comment Schedule Plan

DWR Aquacast
DWR has been drafting and updating the California Water Plan for 50 years. Join Kamour Gubewski, Manager of Strategic Integrated Water Management as he explains how the 2009 update is unique, and how the public can get involved in developing the Water Plan.

Questions?

