

California Water Plan Update 2009

San Francisco Bay Regional Report Overview & Outline

2009 Regional Workshops

California **Water Plan** Update **2009**

INTEGRATED WATER MANAGEMENT



Bulletin 160-09 • Department of Water Resources

Volume
REGIONAL REPORTS

3

Public Review Draft

January 2009

Agenda Item 6

Regional Report

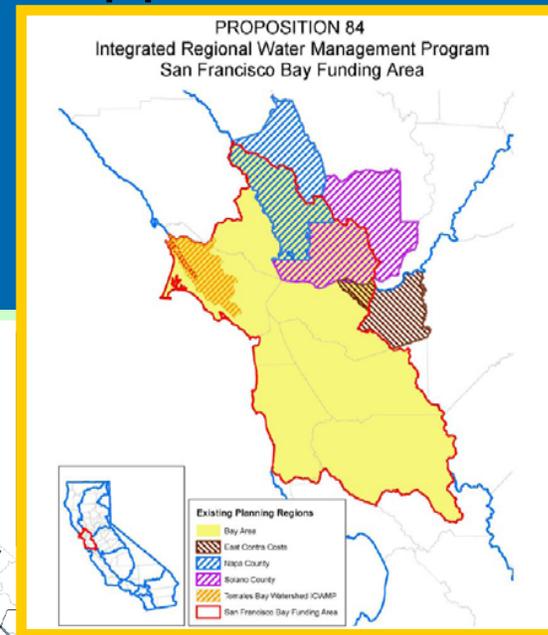
Overview, key issues, water
portfolios

Regional Report Outline - Challenges and Opportunities

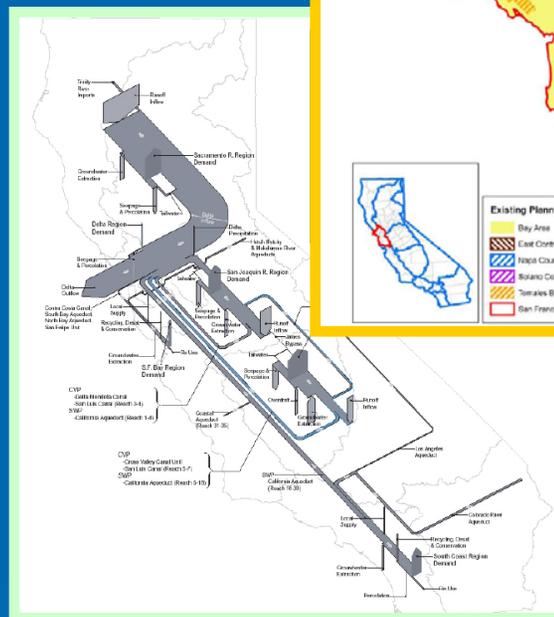
Setting



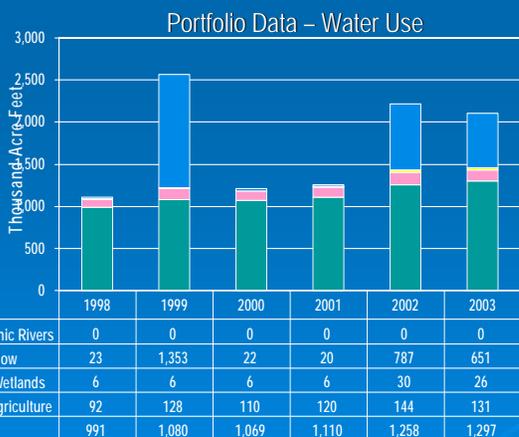
Relationship with other Regions



Regional Planning & Management



Regional Water Conditions



Flood Management



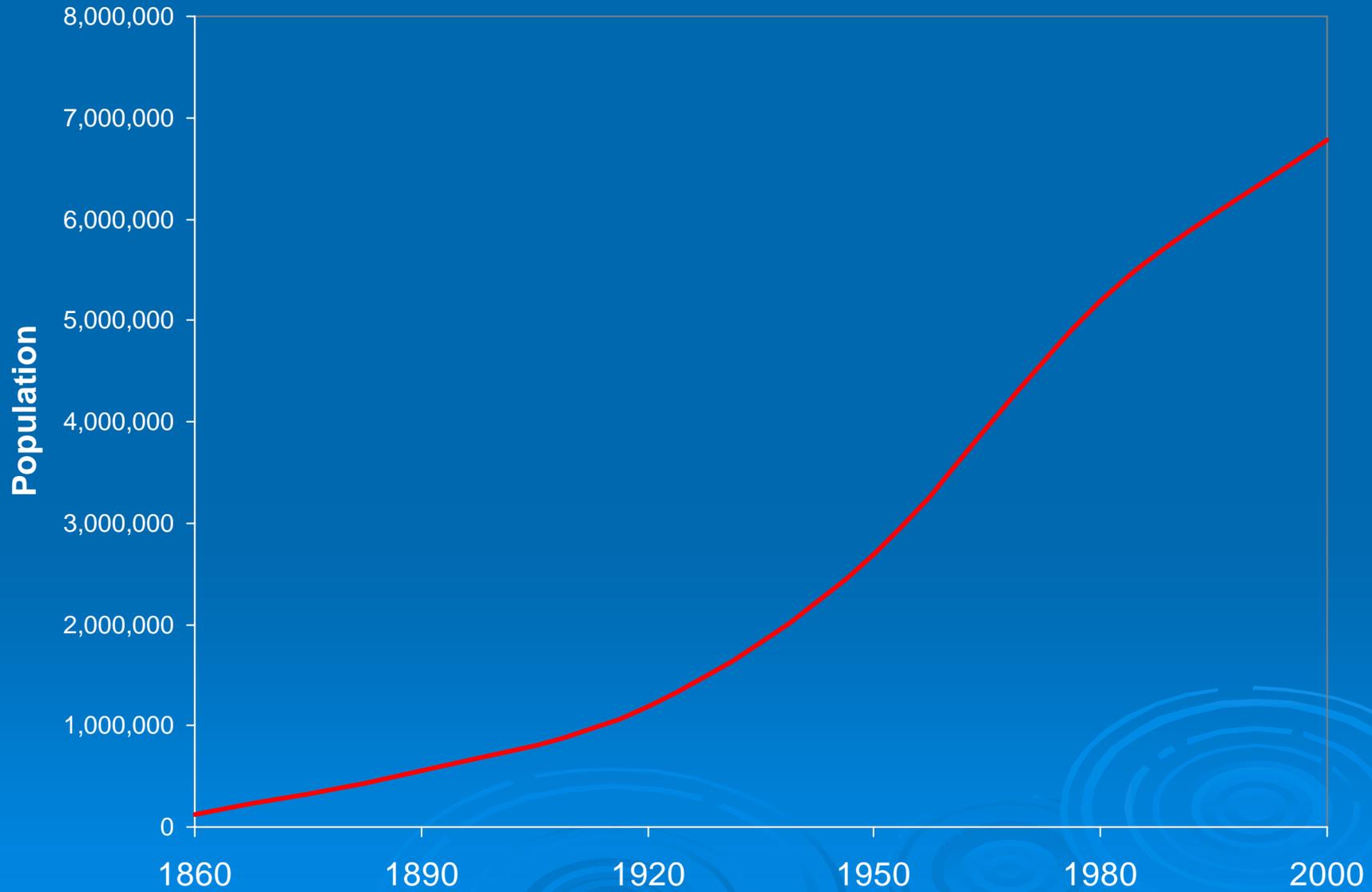
Water Portfolios

Select References

The San Francisco Bay Region

- Home to over 6.3 million people
- 10 Counties
- Imports from 4 Hydrologic Regions and 2 Overlay Regions
- Over 80 cities/towns/municipal authorities – many providing water service
- 13 Cities with populations in excess of 100,000 persons
- A major world seaport – 6 individual ports, 32.3 Billion Metric Tons in 2005
- World leader in microchip and electronic manufacturing
- Renowned wines and vineyards
- A destination for many business and tour travelers
- Known for the high quality of its water supplies
- Complexity - Engineering and Environmental

Population Trendline

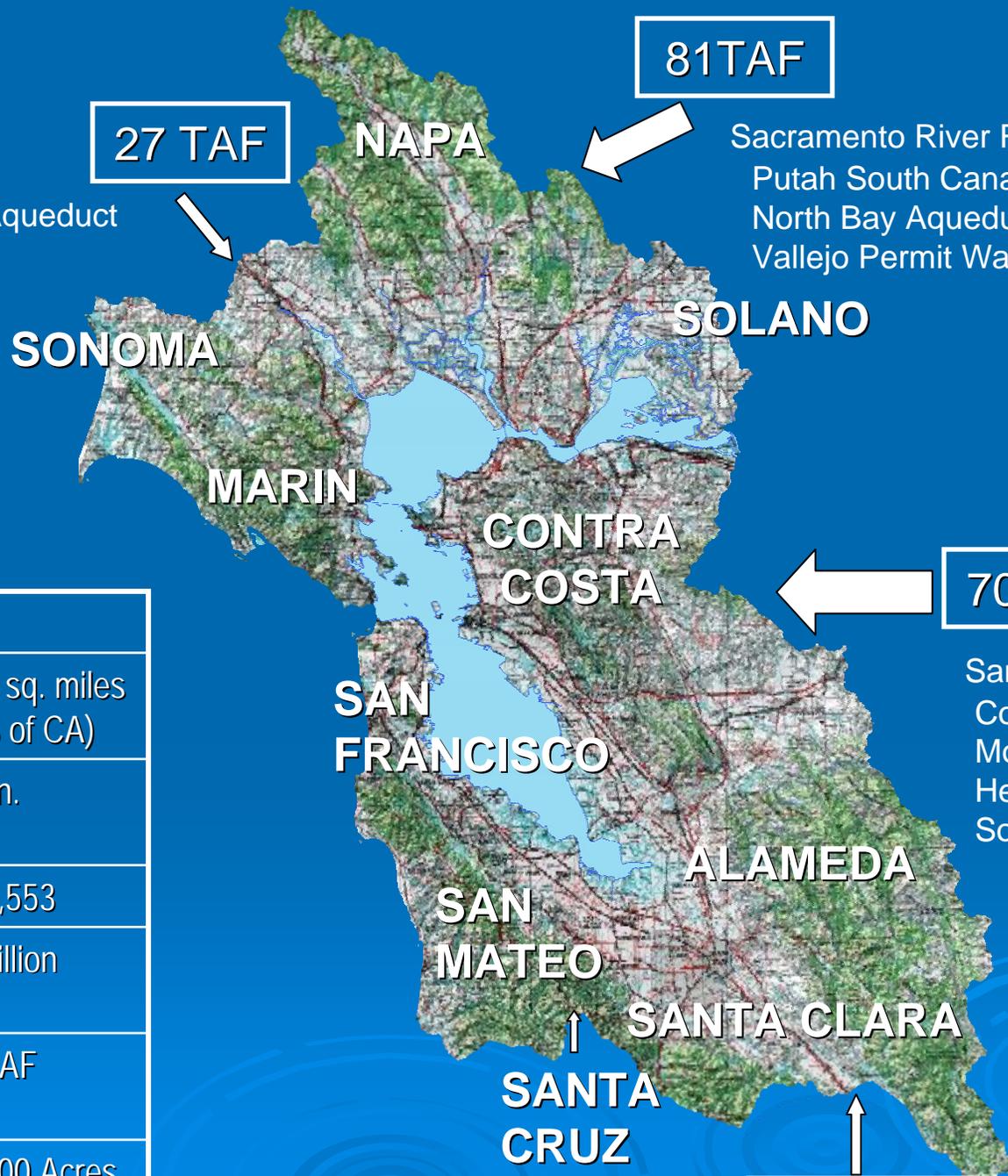
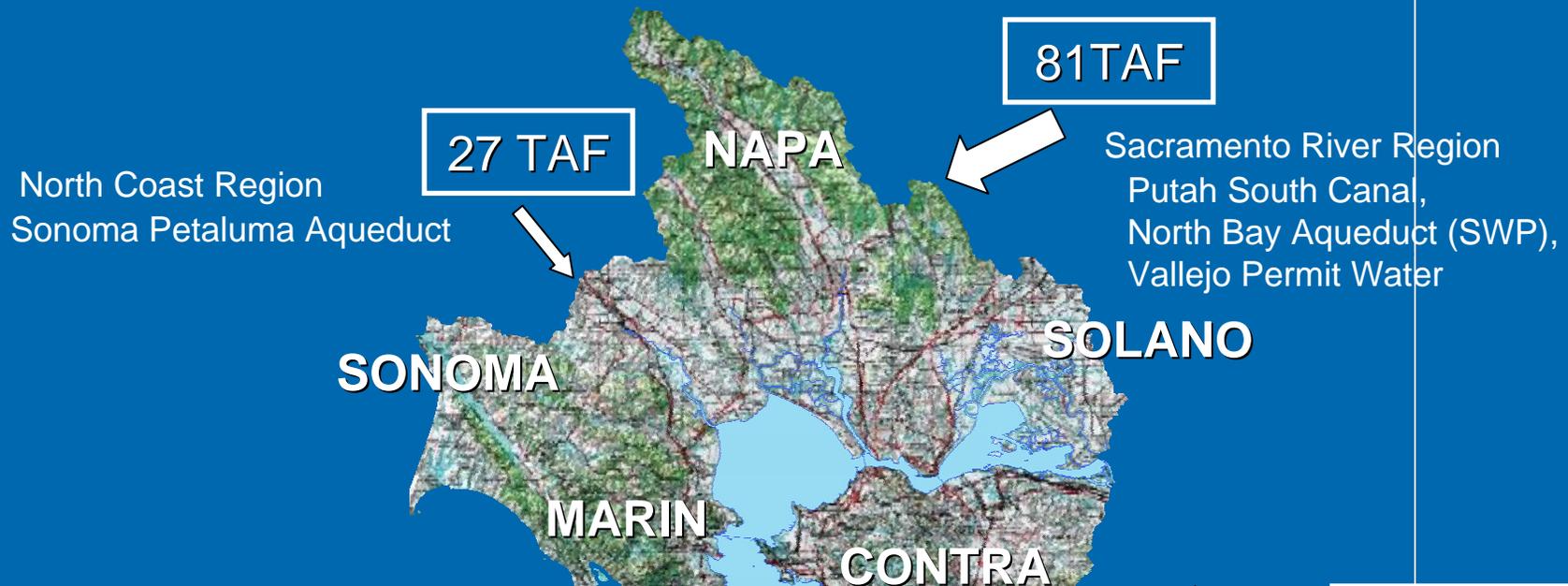


Going Outside the Region

Brief History of Imported Water Supplies

- Imported water supplies (>70% of total supplies) through:
 - Hetch Hetchy Project (Raker Act – 1913); construction began 1914 completed in 1934
 - Mokelumne Aqueduct (1929-1931)
 - Vallejo Delta Supply (Vallejo Permit Water - 1945)
 - Contra Costa Canal (1948)
 - Putah South Canal (1959)
 - San Felipe Project (CVP) – 1979
 - Petaluma Canal (1962)
 - SBA (SWP-1962)
 - NBA (SWP- 1988)
 - Los Vaqueros (1998)
- Urban Water Management Planning Act (1985)
- Water Shortage Contingency Planning Act (1991)
- 20x2020 (20% reduction in water use) (2008)

San Francisco Bay Region 2005 Imported Supply



Statistics	
Area	4,500 sq. miles (2.8% of CA)
Average Annual Precipitation	21.4 in.
2005 Population	6,310,553
2050 Population Projection (DOF)	8.2 Million
Major Reservoir Storage Capacity	746 TAF
2005 Irrigated Crop Area	91,1000 Acres

San Joaquin River Region
Contra Costa Canal,
Mokelumne Aqueduct,
Hetch Hetchy Aqueduct,
South Bay Aqueduct (SWP)

San Francisco Region

<h2>ECOSYSTEM</h2>	<ul style="list-style-type: none">➤ 75% lost wetlands➤ About 500 species fish and wildlife➤ Suisun Marsh 116,000 acres<ul style="list-style-type: none">➤ Tidal Wetlands 7,600 acres➤ Managed Wetlands 50,600 acres➤ Upland 27,700 acres➤ Bays and Sloughs 30,000 acres
<h2>CLIMATE</h2>	<ul style="list-style-type: none">➤ Cool & foggy➤ Mediterranean Flow
<h2>DEMOGRAPHICS</h2>	<ul style="list-style-type: none">➤ San Francisco➤ San Jose➤ Oakland➤ Hydrologic region population density:<ul style="list-style-type: none">➤ 1,561 person/square mile
<h2>LAND USE PATTERN</h2>	<ul style="list-style-type: none">➤ Pilot California Infill Parcel Locator➤ SB 18 requiring consultation with Native Tribes➤ SB 221 / SB 610 relates land use and development to water supplies➤ Resource Management Strategies

Regional Water Conditions

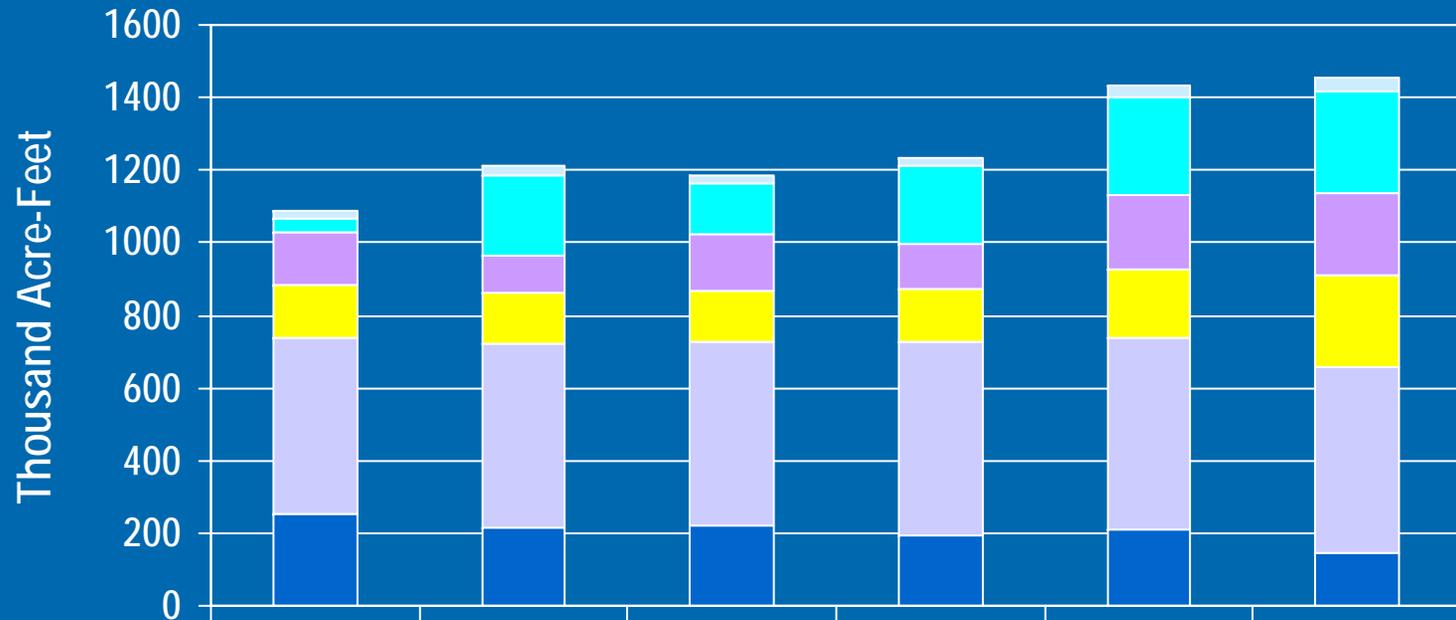
- Majority of water supplies are imported from other hydrologic regions
- Dedicated environmental water use
 - Instream flows required below major dams and diversions
 - No wild and scenic rivers
- Ecosystem Restoration Program (ERP)/HCP-NCCP
- Bay Delta Conservation Plan (BDCP)

San Francisco Bay Regional Water Conditions

Description of Data Sets

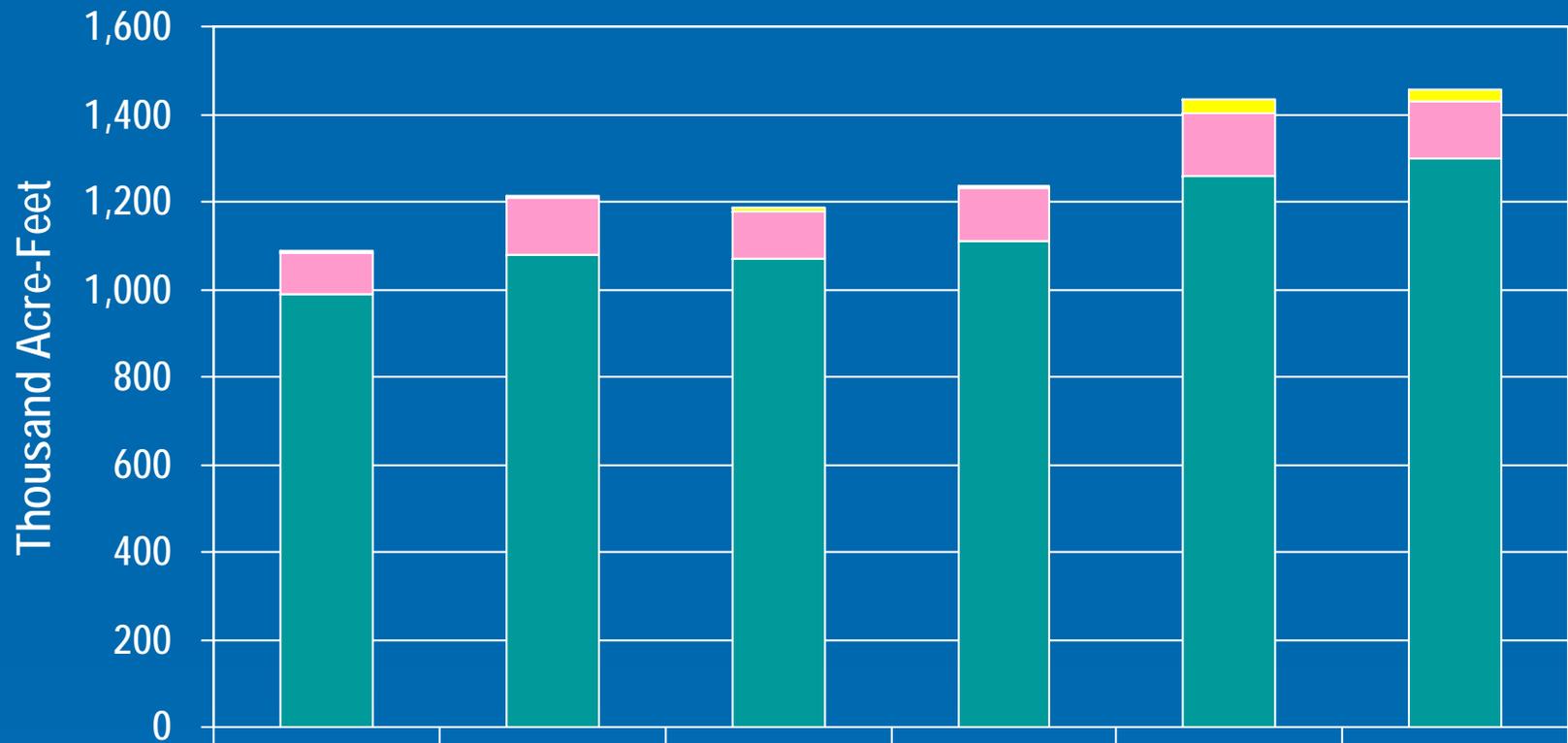
- 12 Detailed Analysis Units; 2 Planning Sub-areas
- 10 Counties
- 57 water purveyor *Public Water Supplier Sheets tracked by DWR over the last 20 years*
- Data Set inclusive of years 1998-2003
- Supplies
 - State Water Project; Central Valley Project; Groundwater; Reuse & Recycle; Locally Developed Surface Water; and other Imported Supplies
- Uses
 - Agriculture, Wild & Scenic, Managed Wetlands, and Urban

Portfolio Data – Water Supply Regional Water Conditions



	1998	1999	2000	2001	2002	2003
■ Reuse & Recycle	22	28	22	22	34	36
■ Ground Water	38	221	139	220	268	279
■ State Project	146	101	155	121	207	227
■ Federal Projects	142	140	143	147	184	253
■ Other Imported Supplies	489	506	503	530	532	512
□ Locally Developed Surface	251	218	222	196	208	146
	WET	WET	ABOVE NORMAL	DRY	DRY	ABOVE NORMAL

Portfolio Data – Applied Water Use



	1998	1999	2000	2001	2002	2003
■ Wild & Scenic Rivers	0	0	0	0	0	0
■ Managed Wetlands	6	6	6	6	30	26
■ Irrigated Agriculture	92	128	110	120	144	131
■ Urban	991	1,080	1,069	1,110	1,258	1,297

WET

WET

ABOVE
NORMAL

DRY

DRY

ABOVE
NORMAL

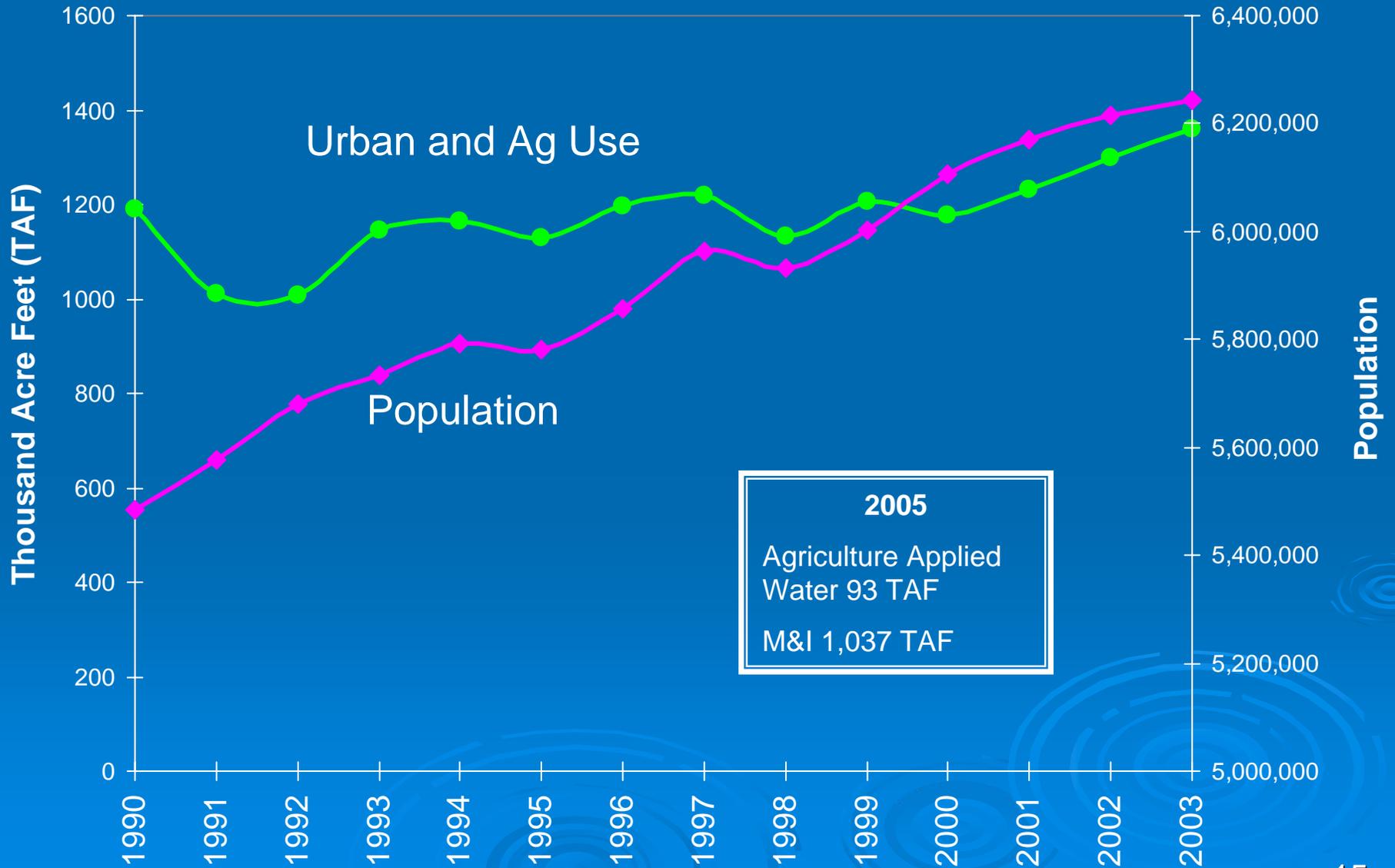
Groundwater

- Groundwater: 15% of total supply
- Imported supply >70%
- 40% of area supply from the Tuolumne and Mokelumne Rivers
- S.F. Region includes 6 major groundwater basins and 28 identified basins
- 3 major water agencies with groundwater replenishment/conjunctive use programs
- Land subsidence previous problem in Santa Clara Valley groundwater basin (0.01 ft control)

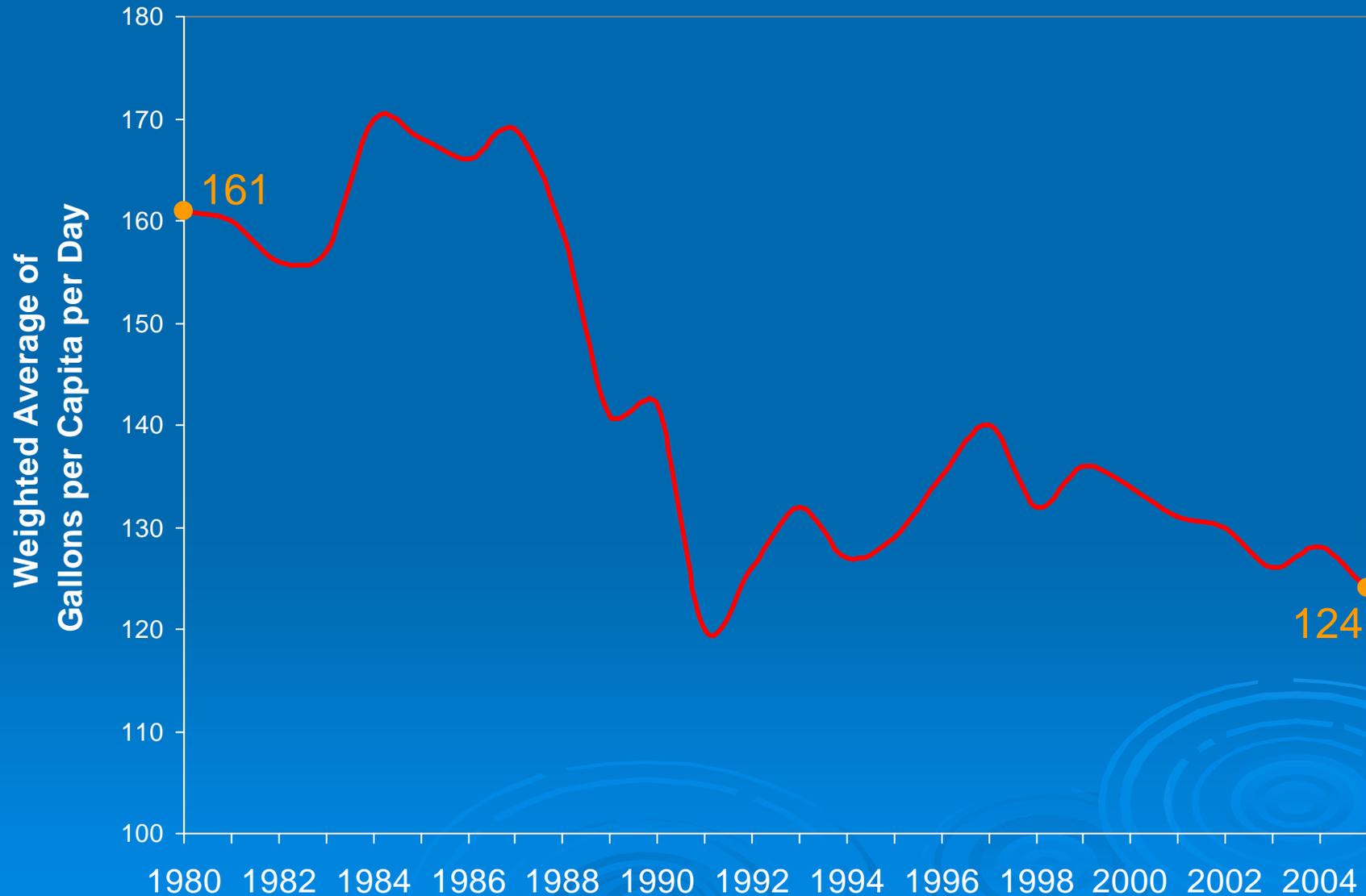
Recycled Water

- Recycled water in S.F. Region used in full spectrum of applications
 - Landscape irrigation, agricultural, wetlands supply
- Large potential for recycled water
 - 125,000 AF/year by 2010
 - 240,000 AF/year by 2025
- Bay Area Water Supply and Conservation Agency
- Bay Area Stormwater Management Agencies Association
- Bay Area Pollution Prevention Group
- Bay Area Dischargers Association

San Francisco Bay Water Use & Population Comparison



San Francisco Bay Multi-Agency Water Use Trend



Water Quality

- High quality from imported water
- Good quality from alluvial groundwater basin
- Delta water quality
- Several watershed management programs to address
 - Critical coastal areas
 - Wetlands and stream protection
 - nonpoint source runoff
 - Legacy pollutants

Flood Management is Incorporated in the CWP Update 2009

TYPICAL FLOOD



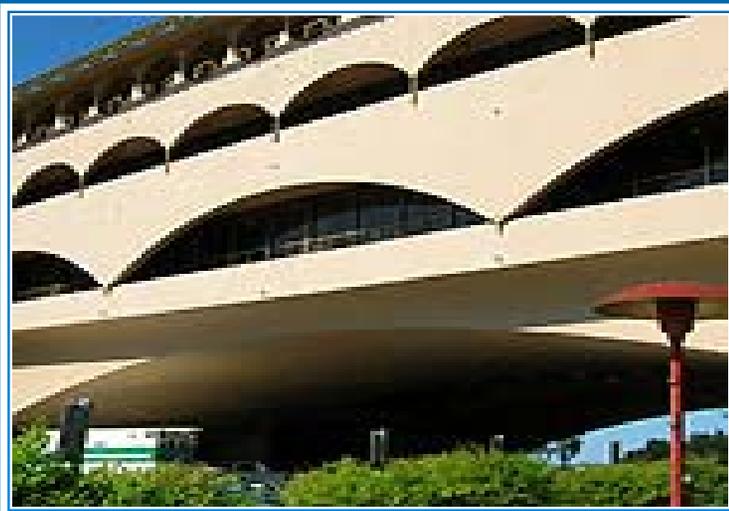
SUISUN BAY



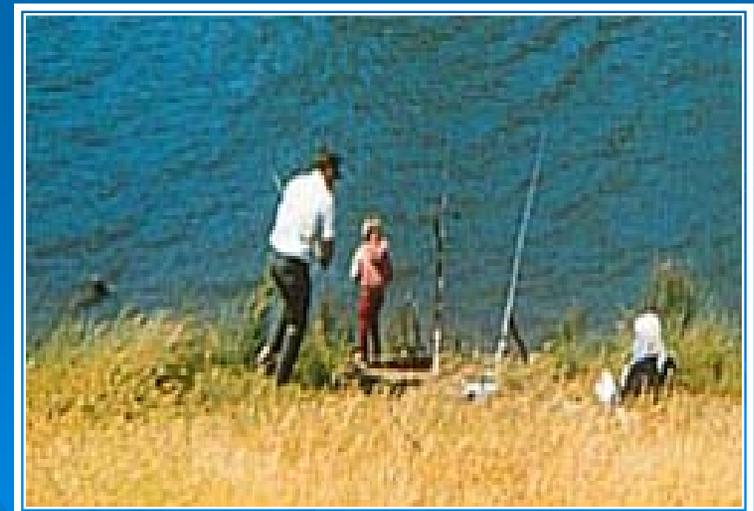
Historic Floods
Flood Hazards
Governance

Risk Management

MARIN CIVIC CENTER



LAKE CHESBRO



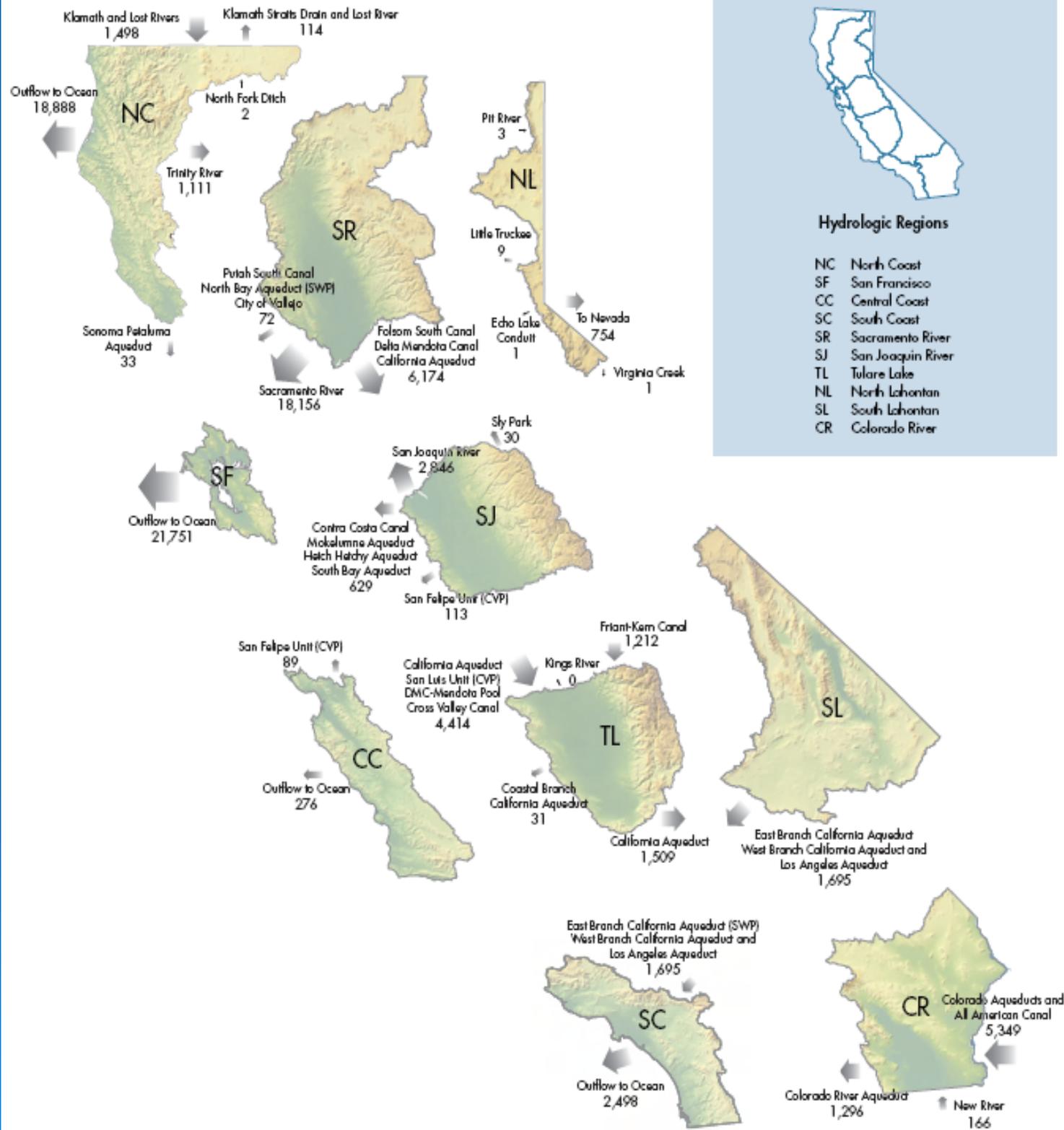
Flood Management

- Flood Management - NFIP, Statewide, Suisun Marsh, Subventions, CWP, IRWM Plan
- Relationship with other regions—INTERREGIONAL FLOOD FLOWS (for some regions)
- Regional water and flood plan/mgmt
 - *IRWM*—FLOOD CONTENT OF IRWM PLANS
 - *Accomplishments*—INTEGRATED WITH SPECIFIC ITEMS
 - *Challenges*—INTEGRATED WITH SPECIFIC ITEMS
 - *Drought and Flood Planning*—FloodSAFE, HMPs, OTHER

Flood-Related Challenges

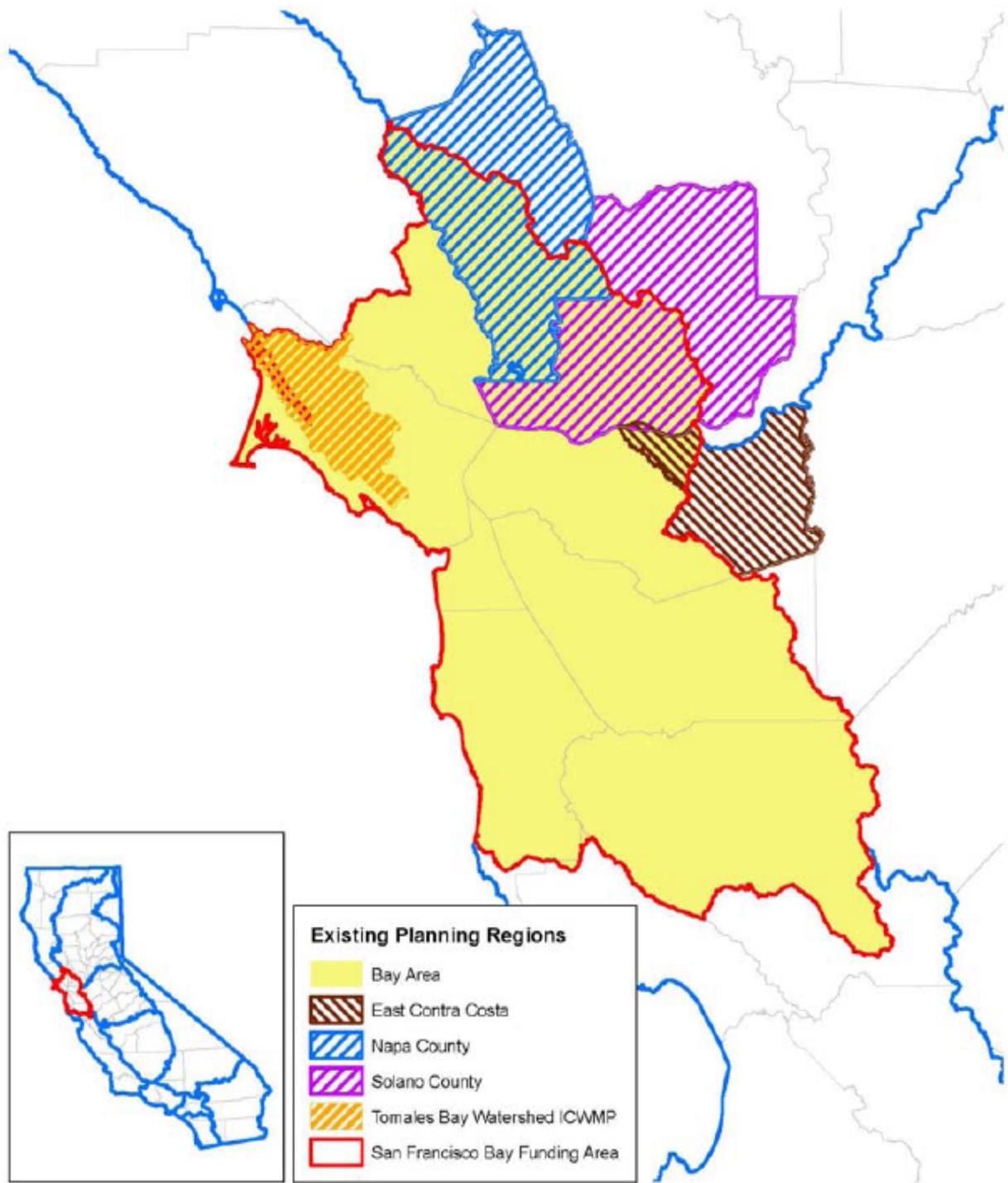
- Inadequate funding and rising costs
 - Limitations imposed by Props 218 and 13
 - Need for new environmentally sound projects
 - Increasing maintenance environmental costs
- New or improved facilities
 - Bridges at Bay stream and river tributary mouths
 - Lack of capacity to handle flows of 1% probability
 - Reservoir siltation
 - Protection of waterside infrastructure
- Coordination among agencies
 - Shared watershed responsibilities (Bay Area Flood Protection Agencies Association)
 - State and local planning

Relation with Other Regions (Funding + Overlay)



SF Bay
Regional
Water
Planning &
Flood
Management
Funding Area
Allocation

PROPOSITION 84
Integrated Regional Water Management Program
San Francisco Bay Funding Area



Regional Acceptance Process & Integrated Regional Water Management Process

RAP and IWRM provide a vehicle for funding of management strategies

- Prop 50, Prop 84, Prop 1E
- Bay Area has 5 of 47 Statewide IRWM Groups
- Expedited Prop 84 Implementation Grant Round
 - RAP – Submittals due April 29th
 - RAP Approval – Fall 2009
 - Expedited Implementation Grants – winter 2009/winter 2010
 - Long Term Prop 84 IRWM Process – 2010 - 2012
 - Two implementation cycles \$350 million each
 - Two planning cycles \$15 million each
 - Proposition 1E
 - One cycle appropriated - \$150 million

Challenges

- Invasive Species (mitten crab, Asian clams)
- Quagga and zebra mussel are not currently in the Bay or Delta, but are in our south state reservoirs and California has programs in place to prevent their introduction
- Striped bass and large mouth bass are introduced, non-native species, and threaten native species
- Water hyacinth, Egeria, Microcystis (Algal blooms), Arundo donax (giant reed)
- Significant change of benthic organisms
- Alignment-CWP, strategies, IRWMP, FloodSafe, BDCP, Climate Change, Drought, Organizations

Key Issues/ Challenges

- Region Acceptance Process
- Integrated Regional Water Management Planning
- FloodSAFE
- Bay Delta Conservation Plan
- Vulnerability of Imported Supply (Drought, Delta, Earthquakes)
- Governor's Drought Proclamation
 - Groundwater
 - CIMIS
- Water Shortage Contingency Plans – 20/20
- Portfolio/ Scenario planning
- Climate change – sea level effect on shore, supply



Climate Change

- Bay Delta Conservation Plan
 - Historical data reveals a 7 inch sea level rise
 - Future estimates predict 4 to 33 inches sea level rise by 2100



Sea-Level Rise

- Bay Delta Conservation Plan
 - 1 meter (3.28 ft.) rise has the potential to flood over 200 sq. miles of land and development around San Francisco Bay

Agenda Item 10

Management Strategies

Resource Management Strategies

Resource Management strategy is a project, program or policy that helps local agencies and governments manage their water and related resources.

- County and City General Plans
- Water Agency Planning Documents
- Urban Water Urban Water Management Plans
- Groundwater Management Plans
- Integrated Regional Water Management Plans
- Flood Organizations – NFIP, Bay Area Flood Protection Agencies
- Suisun Marsh
- Planning Organizations – BAWF, BCDC, ABAG-CALFED, et. al
- Institutional Challenges – Wanger Decision, Monterrey Accord
- Interties to address AB 11 and other major transmission projects

27 Resource Management Strategies

A Range of Choices

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

San Francisco PUC

New Crystal Springs Bypass Tunnel

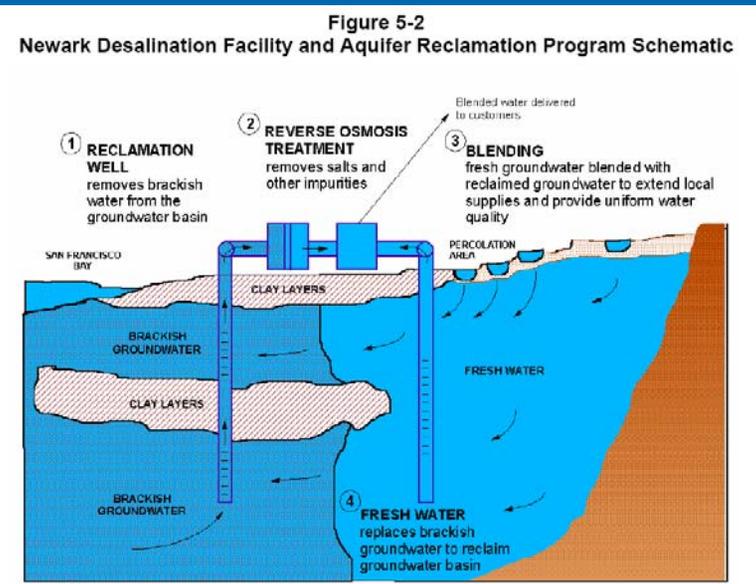


Source: http://sfwater.org/Project.cfm/MC_ID/35/MSD_ID/393/MTO_ID/649/PRJ_ID/124

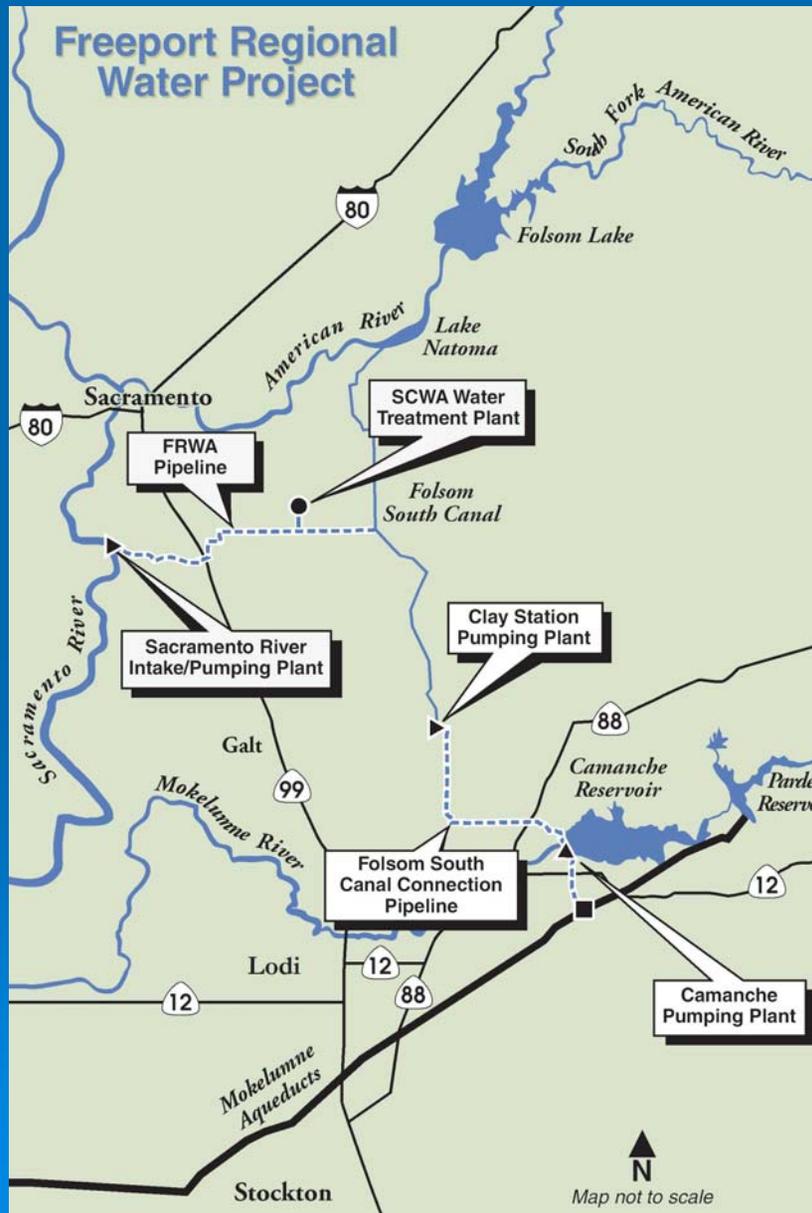
- \$96 Million Project – critical for water supplies to the Peninsula and City of San Francisco.
- Existing pipeline will remain to provide redundancy
- Southern shaft – connects existing Crystal Springs Bypass Pipeline near north end of existing Bypass Tunnel
- Northern shaft – ties southern ends of Crystal Springs Pipeline 2 and Sunset Supply Line
- 4,200-foot-long tunnel, new isolation valves, valve vaults and standby power facility
- Construction began December 2008
- Completion est. September 2011

Alameda County Water District Newark Desalination Facility

- Newark Facility – 1st brackish desalination facility in northern California (Sep 2003)
- Phase I Complete – Current capacity >5 mgd
- Phase II – Additional capacity > 5 mgd (est. summer 2009)
- Providing >10% of District's water supply



East Bay Municipal Utility District Freeport Regional Project



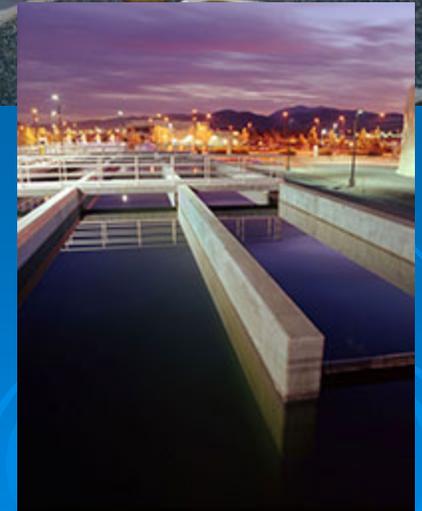
- New 185 MGD water intake structure and pumping plant on the Sacramento River North of Freeport
 - Sacramento County Water Agency > 85 MGD supplemental groundwater
 - 300,000 customers - Sacramento
 - SCWA shared cost \$386M
 - EBMUD >100 MGD for dry years only
 - 1.3 million customers – Alameda and Contra Costa
 - EBMUD shared cost \$517M
- New pipeline from new SCWA water treatment plant and existing Folsom Canal
- New "Vineyard Surface Water Treatment Plant" in central Sacramento County
- 2 new pumping plants / pipeline to transport water
- Construction began summer 2008
- Completion of 60% by 2009 & Vineyard SWTP by 2010

Pittsburg / Delta Diablo Sanitation District Recycled Water Project

- Recycled Water – Provides >8,600 acre-ft/year
 - 2 power plants
 - 20 acres of parks and landscaped areas.
- Facilities include; 2.5 miles piping, 1.2 MG storage tank, pumping station
- Estimated Cost \$5.4M
- Completed construction late Spring 2009
- DDSD Recycled Water Facility is one of the largest industrial recycled water projects in California.



Source: www.wef.org



Source: <http://www.ddsd.org/recycled.html>

City of Oakland Conservation Projects

- Oakland Creek / Watershed Improvement Program – Protecting 15 main creeks, >30 tributaries, > 40 miles of open creeks
- Watershed Awareness Programs
- Collaborative Creek Improvement Programs



Source: <http://www.oaklandnet.com/>





Source: <http://www.cimis.water.ca.gov/cimis/welcome.jsp>



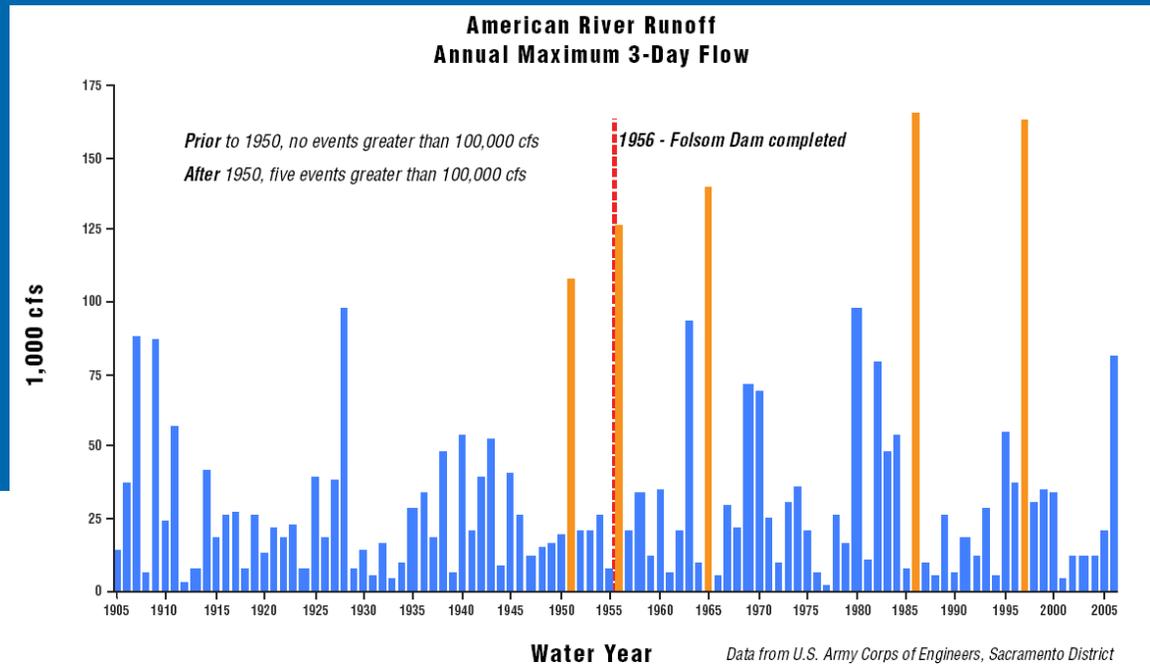
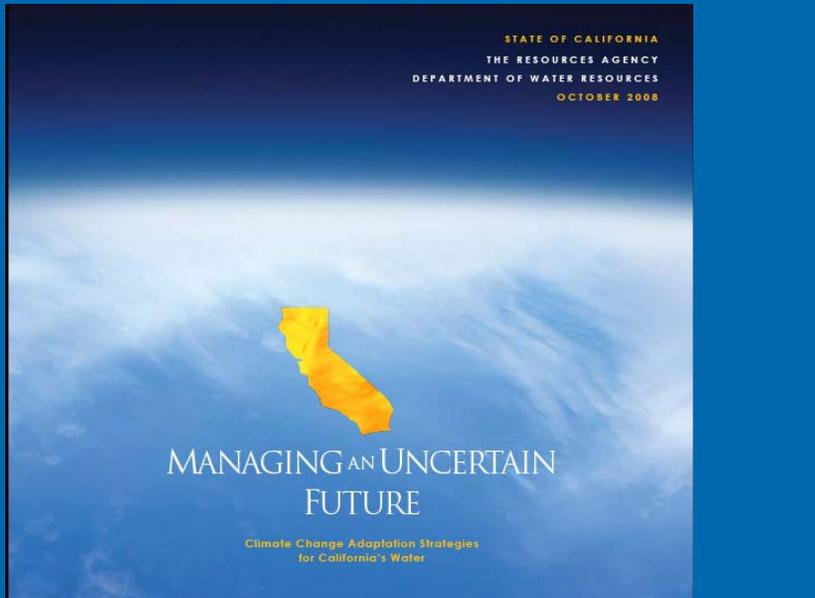
- CIMIS began operations in 1982
- Network of automated / computerized weather stations - \$6k per station
- No cost crop irrigation data to over 6,000 registered user statewide
- 7 CIMIS stations within SF Bay Region
- 2 New station will be added - Spring 2009 and Fall 2009

Questions & Discussion C

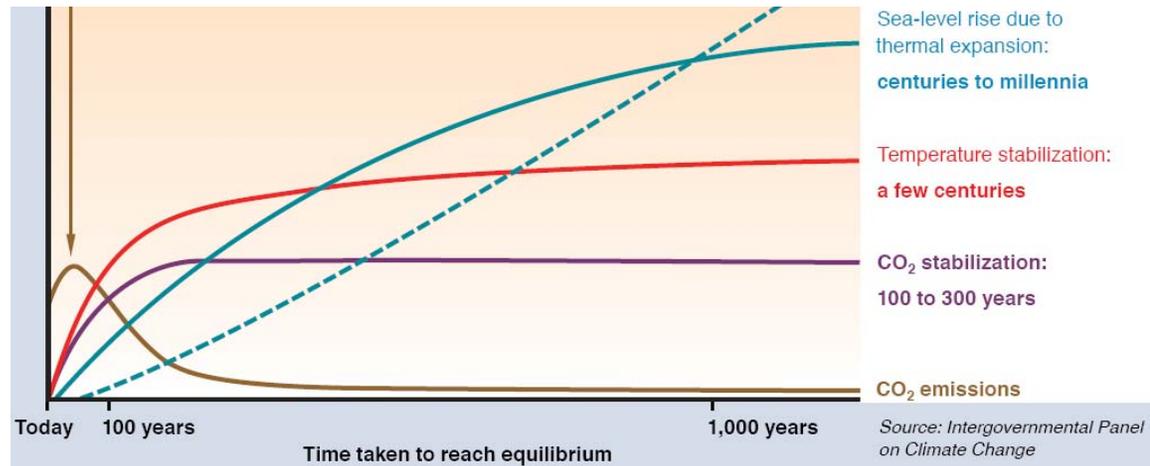
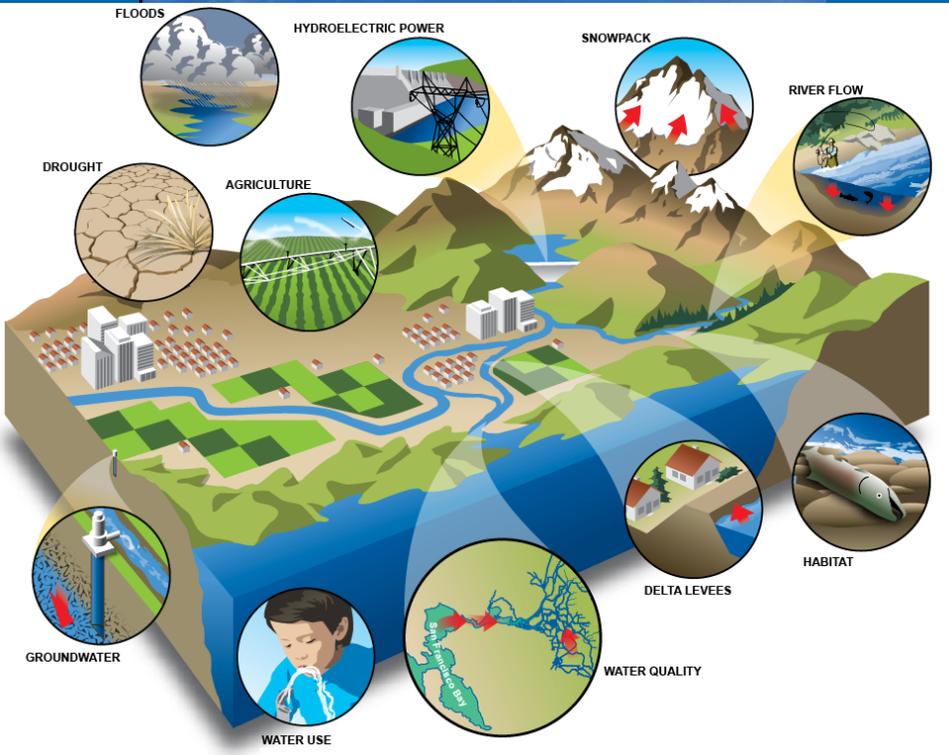


Supporting Documents

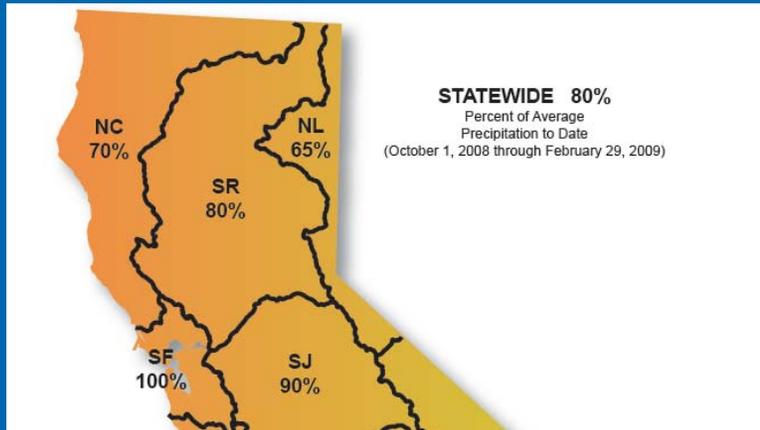
Climate Change



The five highest floods of record on the American River have occurred since 1950.



DWR Response to Governor's Proclamation



Northern Sierra Precipitation: 8-Station Index, March 20, 2009

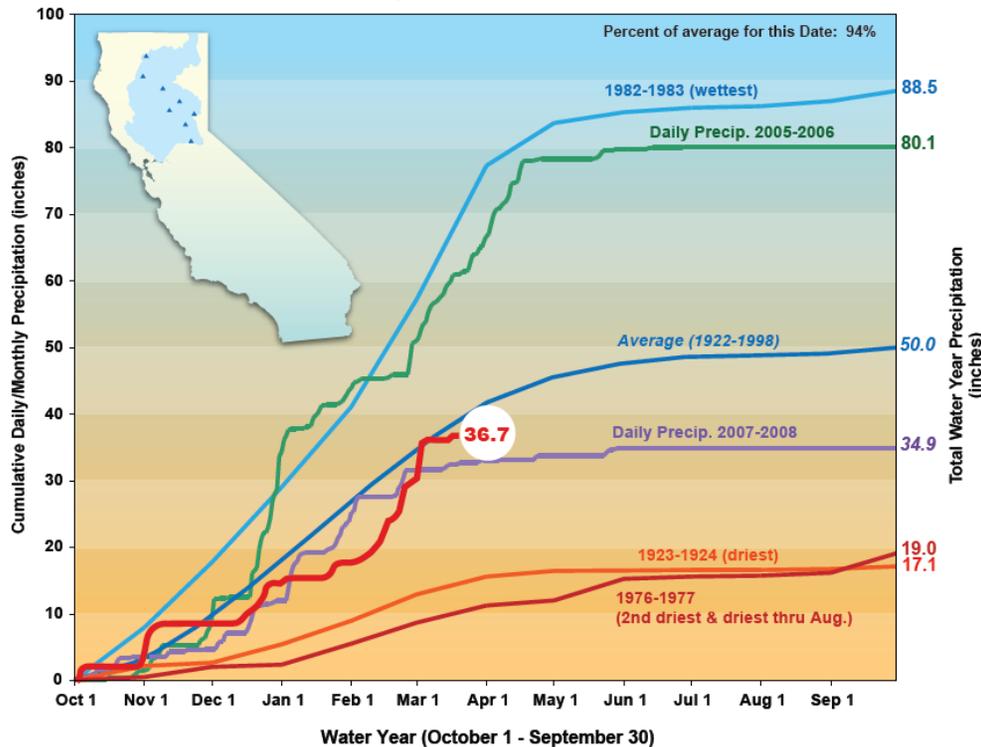


Figure 1. Northern Precipitation: 8 Station Index, March 20, 2009

Department of Water Resources
Department of Food and Agriculture

CALIFORNIA'S DROUGHT
WATER CONDITIONS & STRATEGIES
TO REDUCE IMPACTS

Statewide Runoff

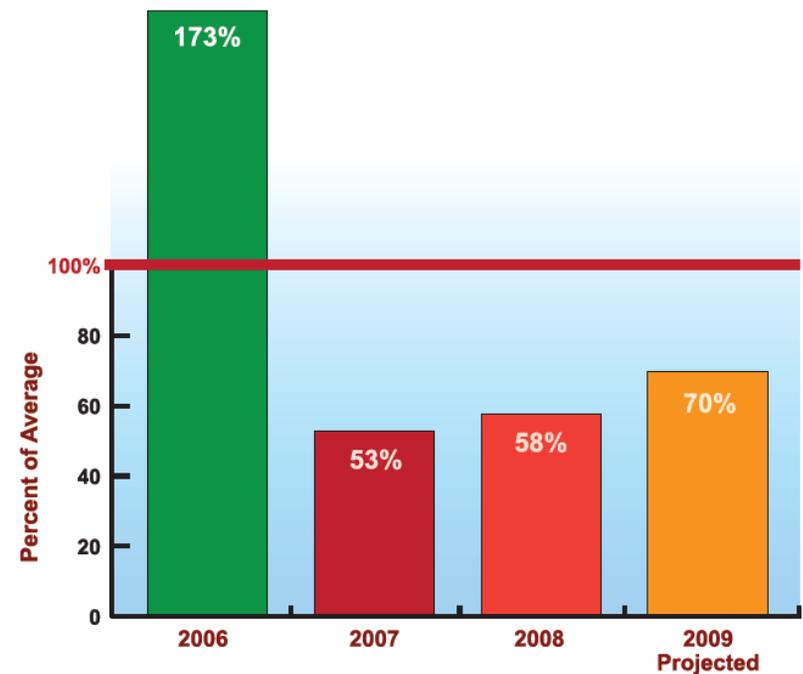


Figure 4. Statewide runoff for water years 2006, 2007, 2008, and projection as of March 27, 2009

Governor's Drought Declaration



Office of the Governor

ARNOLD SCHWARZENEGGER
THE PEOPLE'S GOVERNOR

Proclamation

02/27/2009

State of Emergency - Water Shortage

PROCLAMATION

by the
Governor of the State of California

WHEREAS the State of California is now in its third consecutive year of drought; and

WHEREAS in each year of the current drought, annual rainfall and the water content in the Sierra snowpack have been significantly below the amounts needed to fill California's reservoir system; and

WHEREAS the rainfall and snowpack deficits in each year of the current drought have put California further and further behind in meeting its essential water needs; and

WHEREAS statewide, 2008 was the driest spring and summer on record, with rainfall 76 percent below average; and

WHEREAS the Sacramento and San Joaquin River systems, which provide much of the state's reservoir inflow, were classified as Critically Dry for the 2008 water year; and

WHEREAS in the second year of this continuous drought, on June 4, 2008, I issued an Executive Order proclaiming a statewide drought, and I ordered my administration to begin taking action to address the water shortage; and

WHEREAS because emergency conditions existed in the Central Valley in the second year of the drought, I issued an Emergency Proclamation on June 12, 2008, finding that conditions of extreme peril to the safety of persons and property existed in the counties of Sacramento, San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern caused by severe drought conditions, and I ordered my administration to take emergency action to assist the Central Valley; and

WHEREAS the drought conditions and water delivery limitations identified in my prior Executive Order and Emergency Proclamation still exist, and have become worse in this third year of drought, creating emergency conditions not just in the Central Valley, but throughout the State of California, as the adverse environmental, economic, and social impacts of the drought cause widespread harm to people, businesses, property, communities, wildlife and recreation; and

WHEREAS despite the recent rain and snow, the three year cumulative water deficit is so large there is only a 15 percent chance that California will replenish its water supply this year; and