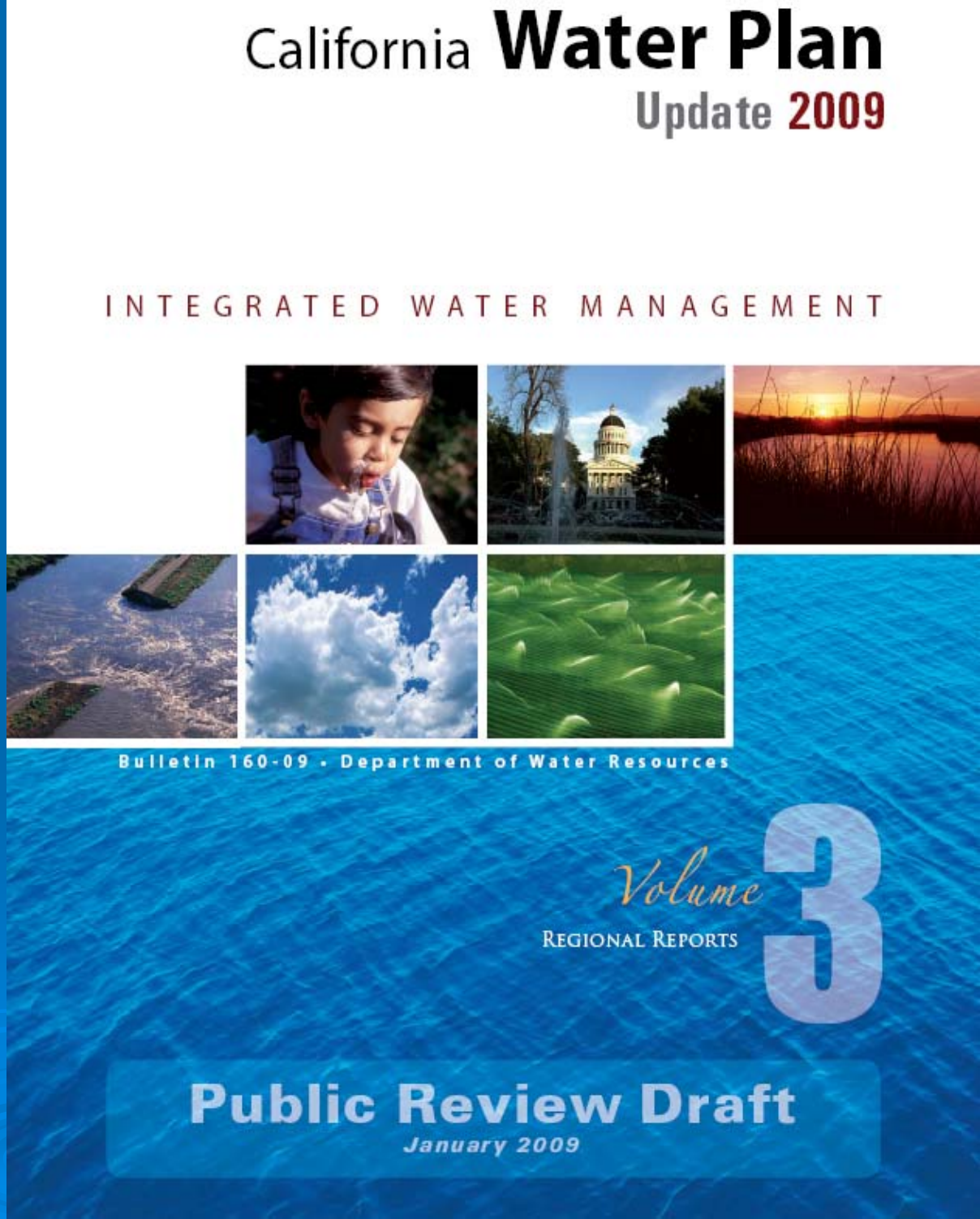
California Water Plan Update 2009

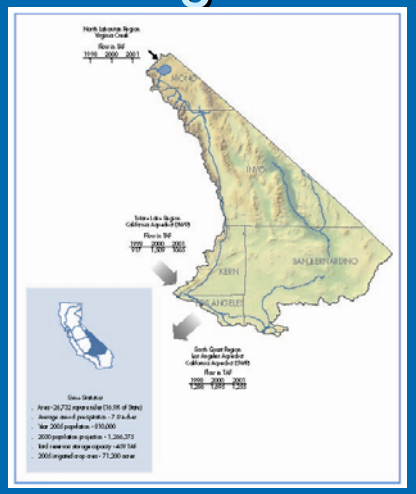
South Lahontan Regional Report Overview & Outline

2009 Regional Workshops

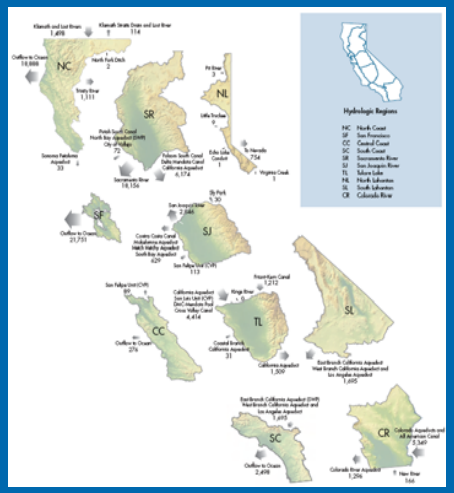


Regional Report Outline

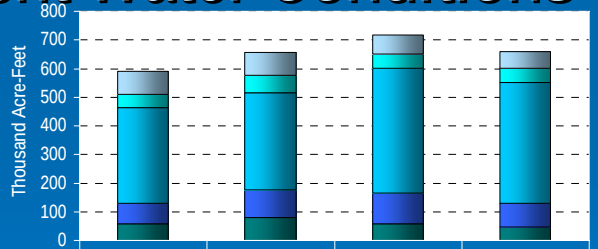
Setting



Relationship with other Regions

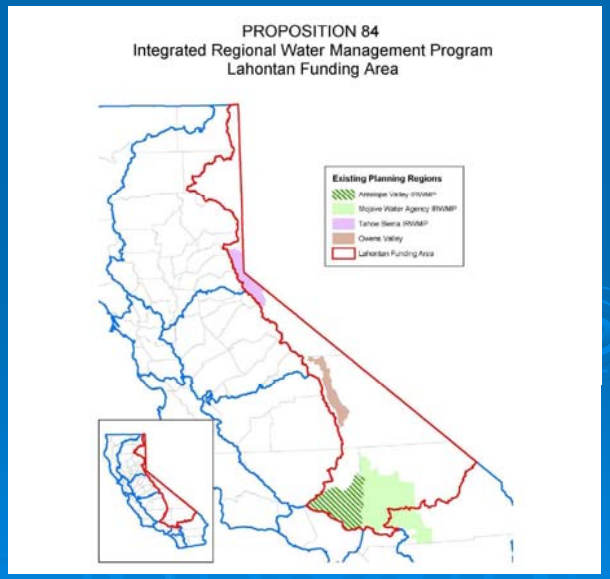


Current Water Conditions



	1998	1999	2000	2001
Dedicated Environment	80	81	67	58
Reuse and Recycled	47	59	50	50
Groundwater	334	341	435	422
State Water Project	73	95	108	82
Federal water Projects	0	0	0	0
Colorado River Project	0	0	0	0
Local water Projects	57	81	58	47

Regional Planning & Management



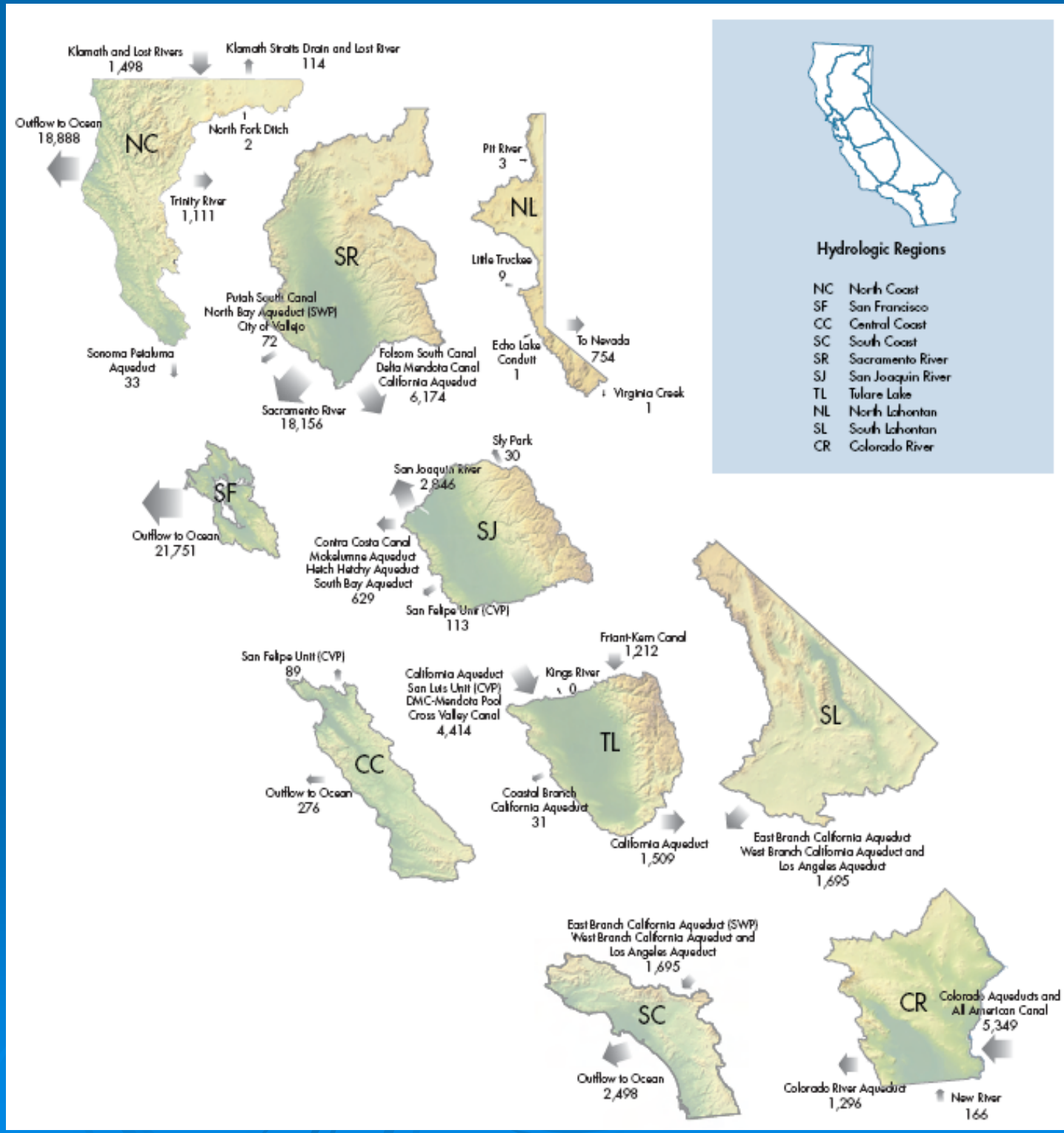
Water Portfolios

Selected References

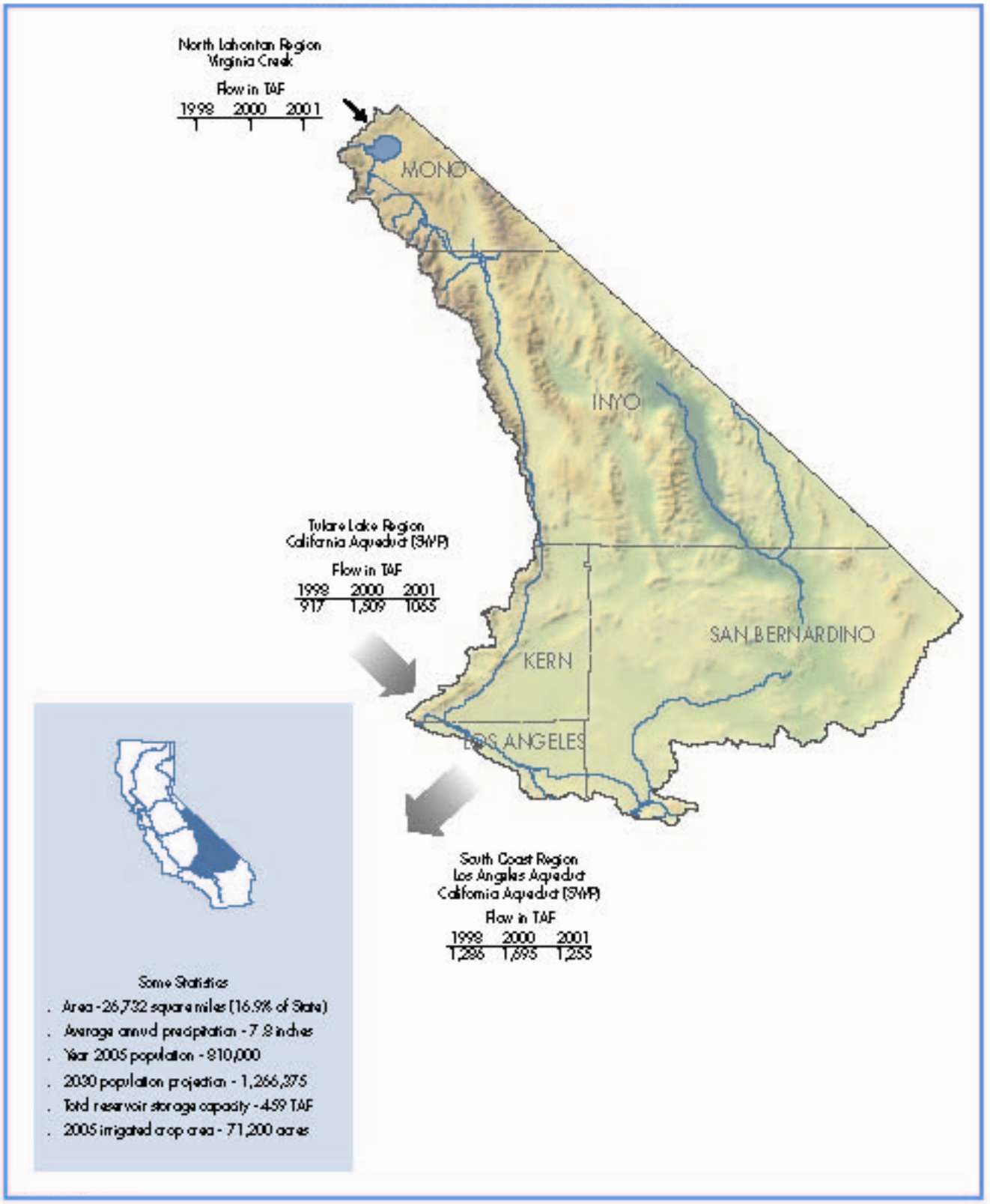
Looking to the Future

Relationship with other Regions

- Los Angeles Aqueduct
- State Water Project



South Lahontan Region Setting



South Lahontan Hydrologic Region Setting

- Hydrologic Boundary
  - Drainage divide to the north of Mono Lake (includes Bodie Hills and Cowtrack Mountain)
  - Crests of the Sierra Nevada, San Gabriel, and San Bernardino Mountains
  - California-Nevada Border
- Counties
  - All of Inyo, portions of Mono, San Bernardino, Kern, and Los Angeles

South Lahontan Hydrologic Region Setting

- Total Area
  - 26,732 square miles (About 17 percent of the State)
- Planning Areas and Detailed Analysis Units
  - Five Planning Areas – Owens-Mono, Death Valley, Indian Wells, Antelope Valley, and Mojave River
  - Detailed Analysis Units - 45

South Lahontan Hydrologic Region Setting

- Major Features
  - Three mountain ranges – Sierra Nevada, San Bernardino and San Gabriel
  - Owens River
  - Mojave Desert and River
  - Death Valley
- Lakes and Reservoirs
  - Mono Lake, Grant Lake, Lake Crowley, Lake Arrowhead, Silverwood Lake, and Mojave Forks Dam
- Major Rivers
  - Owens River and Mojave River

South Lahontan Hydrologic Region Setting

- Climate
  - Hot Desert to Semiarid to High Sierra
    - Hot summers and mild winters in the valleys
      - Maximum of 10 inches of rainfall annually,
      - Eastern Mojave Desert averages about 4 inches and Death Valley about 2 inches
    - Mild summers and cold winters in the mountains
      - Between 10 and 40 inches of rainfall annually with snow

South Lahontan Hydrologic Region Setting

- Major Watersheds & Ecosystems
  - Mono Basin
  - Owens River
  - Mojave River
  - Antelope Valley

South Lahontan Hydrologic Region Setting

- Population
  - 721,700 for 2000
  - 810,000 for 2005; increase of 12 percent
- Major Cities
  - North – Mammoth Lakes and Bishop
  - South – Lancaster, Palmdale, Victorville, and Barstow
  - Major urban land use is concentrated in the Antelope and Victor valleys. Smaller cities and communities in the north.

South Lahontan Hydrologic Region Setting

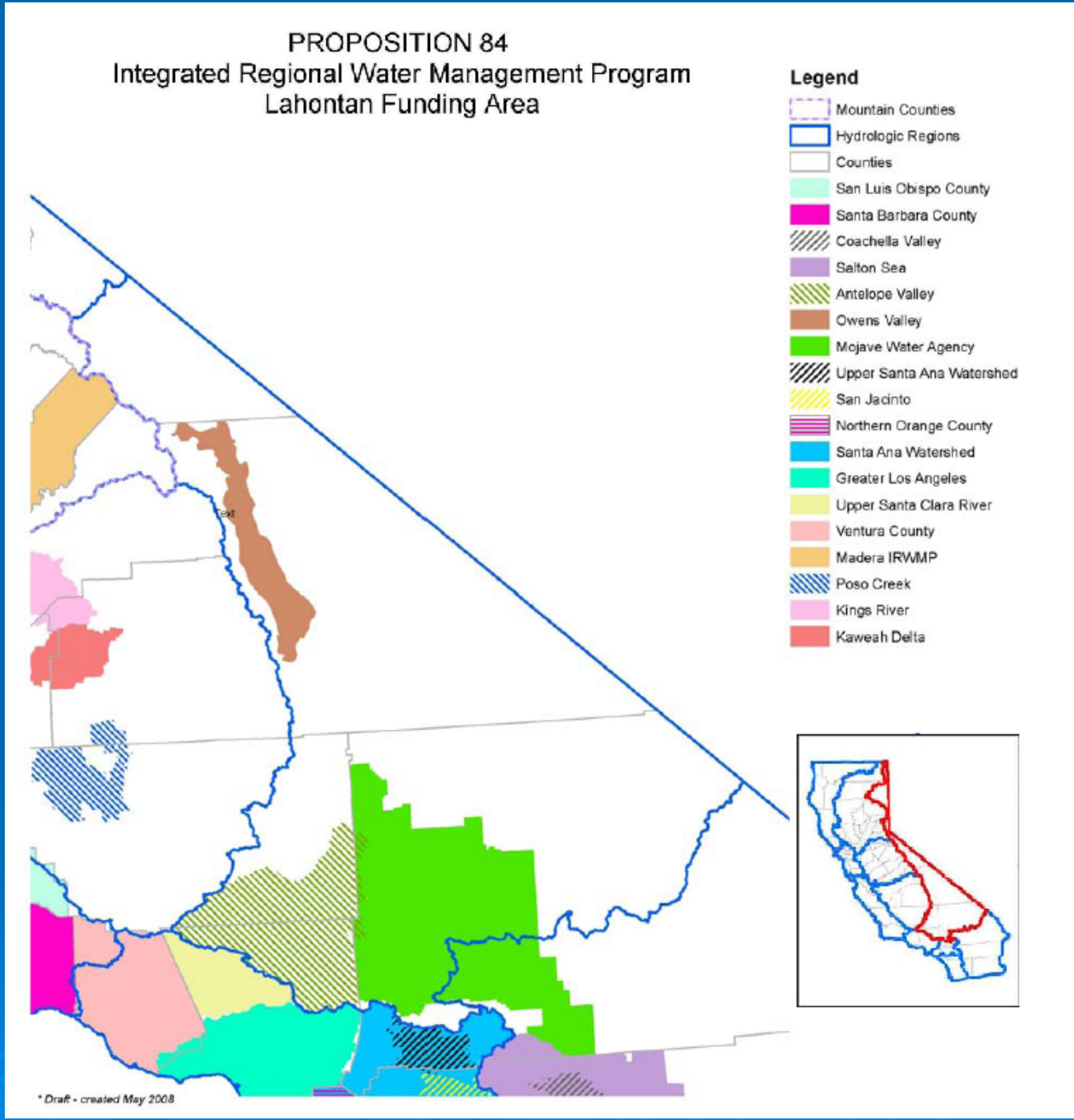
- Agricultural Land Use
  - Total Irrigated Crop Acres in 2005 – 65,800
  - Slight increase since 1990; about 8 percent
  - Major areas are the Owens Valley, Mojave River, and Antelope Valley
  - Alfalfa and pasture are the major crops; deciduous fruit and vegetables in the Antelope Valley

South Lahontan Hydrologic Region Setting

- Most of the Hydrologic Region is publicly managed
  - Parks, reserves, and recreation areas
    - Death Valley National Park,
    - Mojave Natural Preserve
    - Angeles, Inyo and San Bernardino National Forests
  - Military Bases
    - Edwards Air force Base
    - China Lake Naval Base

South Lahontan Regional Water Planning & Management

- Presently represented by 3 planning regions
  - AVEK
  - MWA
  - Mono-Inyo underway
- Inter-agency cooperation:
  - GW modelling – (Indian Wells Valley WD, Navy, Searles Valley Minerals)
  - Water Banking – Rosamond–Semitropic Water Bank



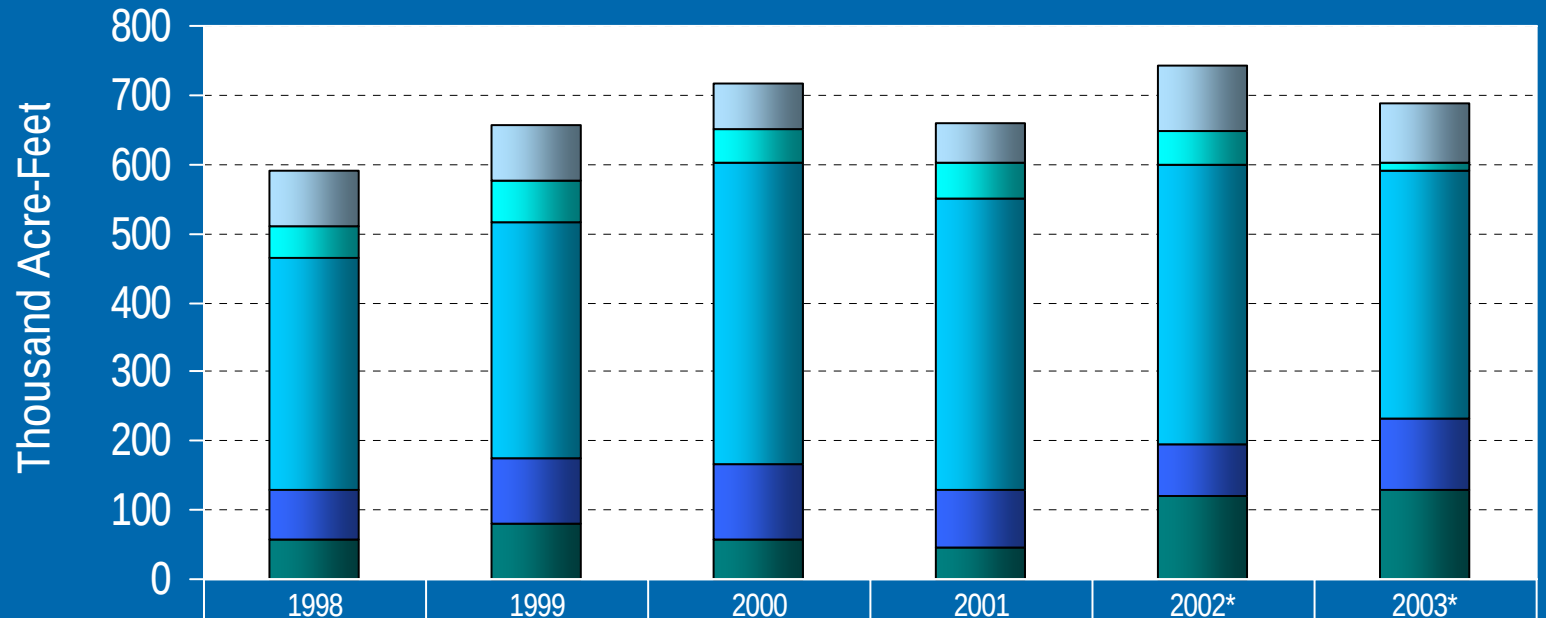
South Lahontan Hydrologic Region Water Supply

- Surface water
  - Primary source in north region
- Groundwater
  - Primary source in south region
  - Gradually becoming more prevalent in north region
- State Water Project
  - Antelope Valley East Kern Water Agency
  - Palmdale Water District
  - Mojave Water Agency
- Recycled Water

South Lahontan Hydrologic Region Groundwater Adjudication

- Warren Valley Judgment (1977)
- Mojave Basin Area Judgment (1996)
- Antelope Valley (pending)

South Lahontan Hydrologic Region Portfolio Data – Water Supply



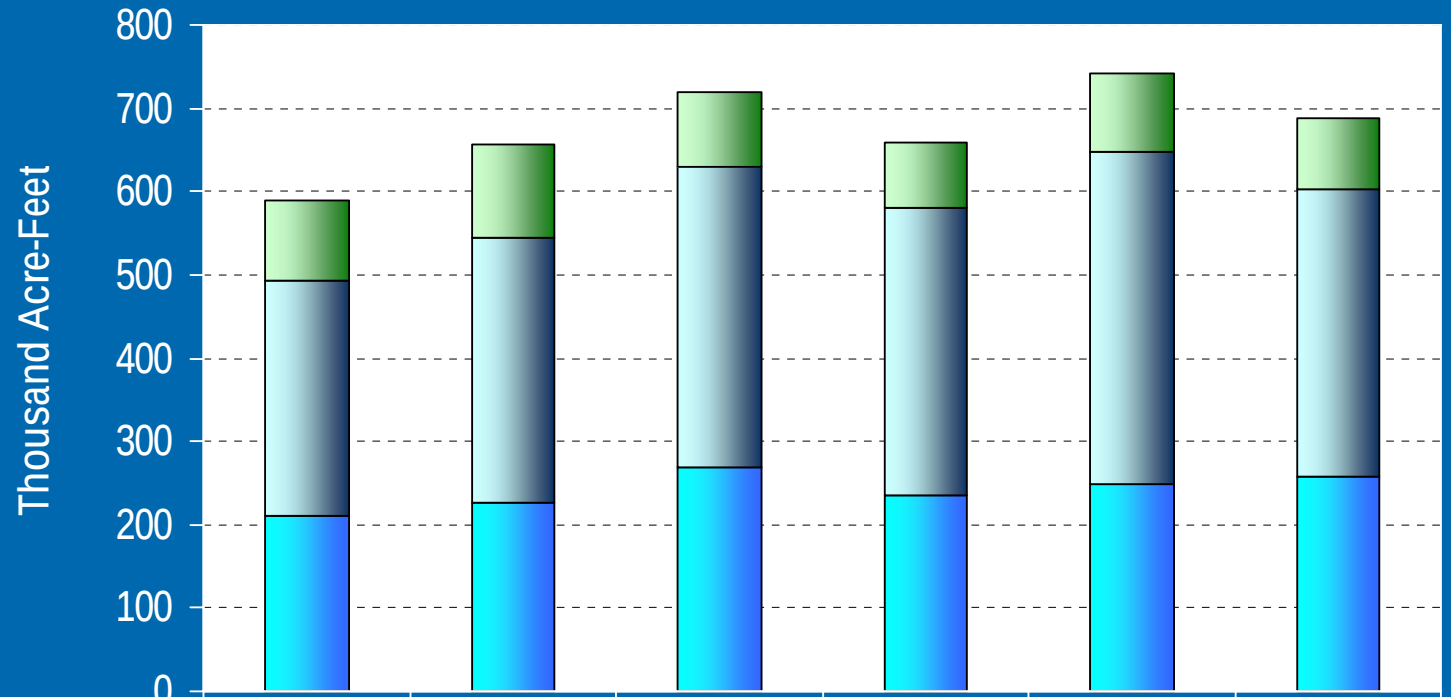
	1998	1999	2000	2001	2002*	2003*
Dedicated Environment	80	81	67	58	95	87
Reuse and Recycled	47	59	50	50	48	12
Groundwater	334	341	435	422	403	359
State Water Project	73	95	108	82	75	103
Federal water Projects	0	0	0	0	0	0
Colorado River Project	0	0	0	0	0	0
Local water Projects	57	81	58	47	121	128
Total	**591**	**657**	**718**	**659**	**742**	**689**
Water Year Classification	**Wet**	**Average**	**Average**	**Dry**	**Average**	**Average**

* *Preliminary, subject to revision*

South Lahontan Hydrologic Region Regional Water Conditions

- Flow Diagrams
- Water Balances
- Supplemental Data Tables
- Narratives
- Water Quality

South Lahontan Region Water Conditions: Portfolio Data – Water Use



	1998	1999	2000	2001	2002*	2003*
Wild and Scenic River	0	0	0	0	0	0
Instream Flow	98	111	89	78	95	87
Required Delta Flow	0	0	0	0	0	0
Managed Wetlands	0	0	0	0	0	0
Irrigated Agriculture	281	318	361	344	398	345
Urban	211	227	269	236	249	257
Total	**590**	**656**	**719**	**658**	**742**	**689**
Water Year Classification	**Wet**	**Average**	**Average**	**Dry**	**Average**	**Average**

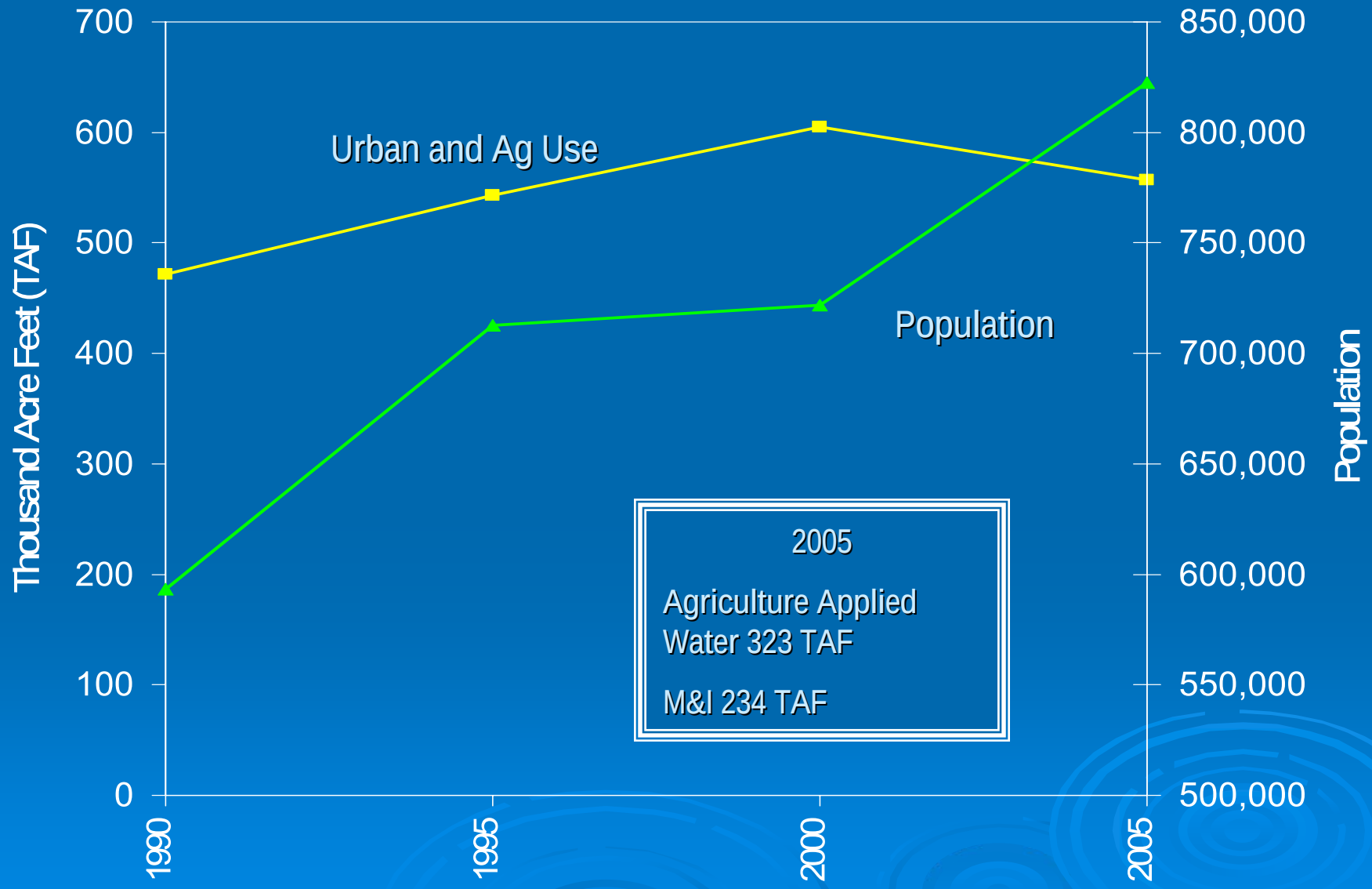
* *Preliminary, subject to revision*

South Lahontan Hydrologic Region Water use

- Urban
  - Moderate to high per capita water use in the Antelope and Victor valleys. High exterior demands for landscaping due to high temperatures
  - Moderate to high per capita water use in the Owens-Mono Planning Area due, in part, to recreation and tourism
- Agriculture
  - Crop water demands reflective of climate
  - Alfalfa is the highest water using crop
  - Farmers are attempting to use water efficiency
    - Saving water and reducing power costs

South Lahontan Hydrologic Region

Water Use & Population Comparison



Flood Management is Incorporated in the CWP Update 2009

INDEPENDENCE FLOOD ON OAK CREEK

Historic Floods

EASTERN SIERRA THUNDERSTORM

Flood Hazards

INYO COUNTY COURTHOUSE

Governance

MOJAVE RIVER DAM

Risk Management

South Lahontan Hydrologic Region Flood Management

- Setting
  - Flooding from winter storms and summer thunderstorms have the potential to cause property damage and impact public safety
  - Many streams have steep channel slopes and little vegetation
  - Sediment loads are often dominated by coarse-grain material
  - A combination of these factors can result in flash flooding and dangerous debris flows
- Historic Floods— Significant events occurred in 1938, 1943, 1959, 1969, 1989, and 2008
  - 1938 – 100 Year Flood in Deep Creek near Hesperia, West Fork of the Mojave River, Big Rock Canyon near Valyermo, and Little Rock Creek near Littlerock

South Lahontan Hydrologic Region Flood Management

- 2008 – Strong thunderstorm on the eastern slopes of Sierra Nevada caused debris flows which damaged public and private property near Independence including the structures in the Mt. Whitney Fish Hatchery and property on Tribal Reservation

Flood Governance

- Major agencies involved in the planning and response to flood disasters include the Federal Emergency Management Agency, U. S. Army Corps of Engineers, Department of Water Resources, Office of Emergency Services, and select County Departments

South Lahontan Hydrologic Region Flood Management

- Flood Risk Management
  - *Structural Approaches—Construction of Oro Grande Wash channel Project (1969) and Mojave River Dam (1971)*
  - *Land Use Management—Los Angeles County Dept. of Public Works Comprehensive Plan for the Antelope Valley*
  - *Disaster Preparedness, Response, and Recovery—*
    - *State, federal, and local agencies are responsible for the preparation, response, and recovery from natural disasters.*
    - *Local agencies are the first responders to flood events. When their resources are exhausted, the State (DWR, OES) can provide assistance, followed by federal agencies (USACE, FEMA)*
    - *Collaboration among federal, state, and communities through the National Flood Insurance Program*

South Lahontan Hydrologic Region Flood-Related Challenges

- Facilities and maintenance
  - Sand deposits in Mojave River through Victorville
  - Increased sediment loads caused by Victor Valley urbanization
  - Lack of funds for Antelope Valley Flood Control Plan
- Coordination among agencies
  - Need for area-wide flood management in Antelope Valley
  - Conflicting demands for flood control and groundwater management
  - Need for sediment in dry lakes on Edwards AFB
- Environmental considerations
  - Loss of floodplain on the Mojave River
  - Mitigation of flood-related impacts due to climate change

South Lahontan Hydrologic Region Key Issues, Challenges

- Water Quality
  - Elevated nitrates and TDS levels from agricultural fields
- Water Supply
  - Reliability of SWP supplies
  - Pending adjudication of Antelope Valley Groundwater Basin
  - Potential impacts of climate change
  - Continued urbanization may create deficit
  - Lowering of groundwater table leading to subsidence and loss of riparian habitat in some areas
- Drought Contingency Plans
- Quagga Mussels

(California Water Plan Update 2009, Vol. 3, Regional Reports Pgs 10-23 to 10-25)

Agenda Item 10
Part 1
Scenarios

Agenda Item 10
Part 2
Resource Strategies

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

South Lahontan Hydrologic Region Water Management Responses

- A mix of 25 Strategies being implemented in this region (Table 10.4, Pg10-19 of Regional Report)

- Some examples of strategies being used today
  - Solutions to the overuse of the Mojave River Groundwater Basin
  - Changes to Water Diversions from the Owens River/Mono Basin
  - Owens River Gorge Project
  - Morongo Basin Project
  - Lower Owens River River Project

South Lahontan Hydrologic Region Water Management Responses

- Some examples of strategies being used today, cont.
  - Mojave Water Agency Groundwater Banking and Exchange Agreement with Solano County Water Agency
  - Regional Water Conservation Incentive program
  - Hi-Desert Water District Groundwater Recharge and Reuse Project
  - IRWM and Urban Water Management Plans
  - Aquifer Storage and Recovery Project
  - Groundwater Banking Project

South Lahontan Hydrologic Region Planning for the Future

- Agencies adopting proactive approach to water reliability problems
  - Water conservation programs
  - Water recycling projects
  - Water exchanges and recovery
  - Water marketing
- Agriculture practices and water uses
  - Anticipated to remain at current levels for the near future
- Major Projects underway
  - Mojave River Well Field and Water Supply Pipeline Project
  - MWA – Alliance for Urban Water Conservation and Awareness Urban Water Conservation Plan
  - SWP Water Exchange Program
  - Oro Grande Wash Recharge
  - Upgrades of Lancaster and Palmdale Water Reclamation Plants

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