Overview of California Water Plan Update 2013

Prepared for:

San Diego IRWM Advisory Committee

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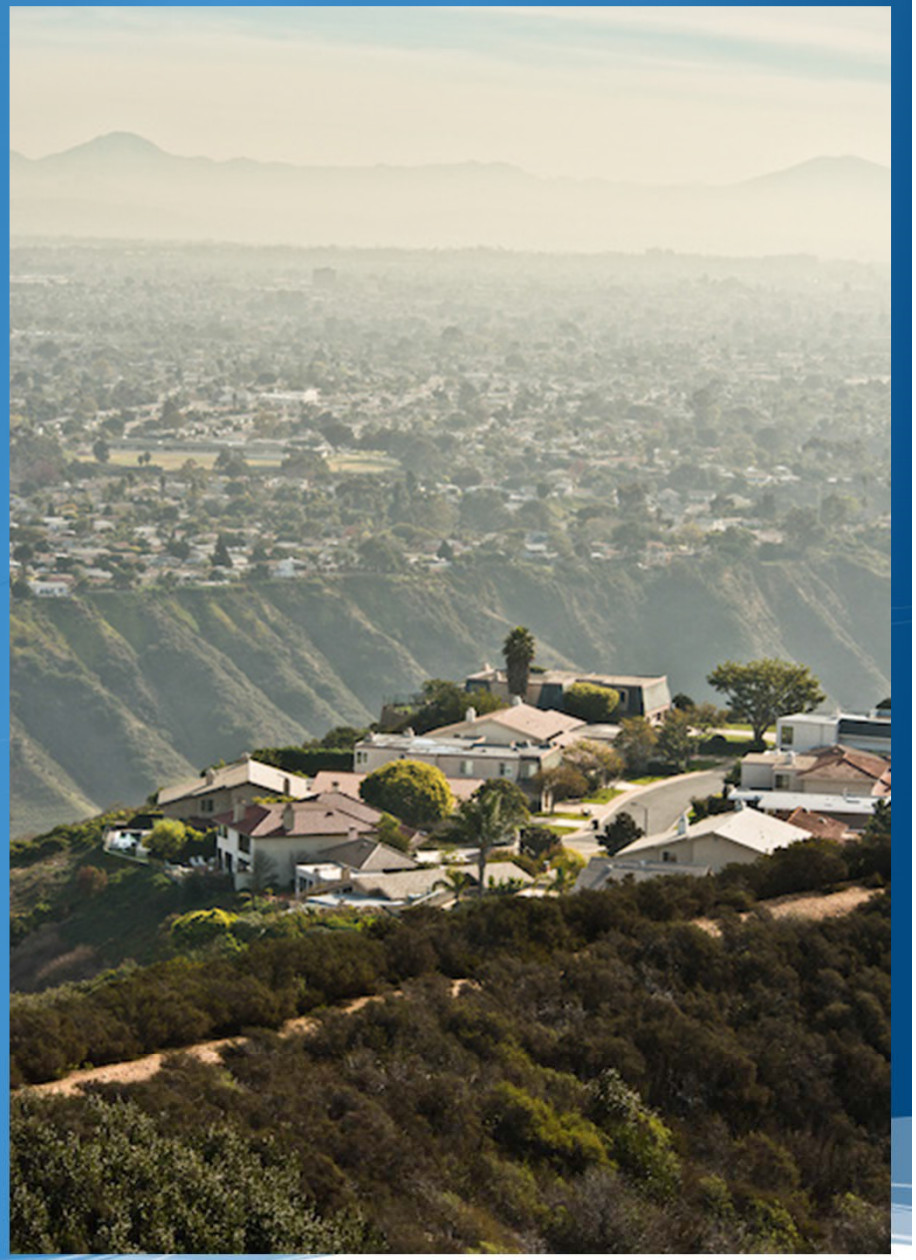
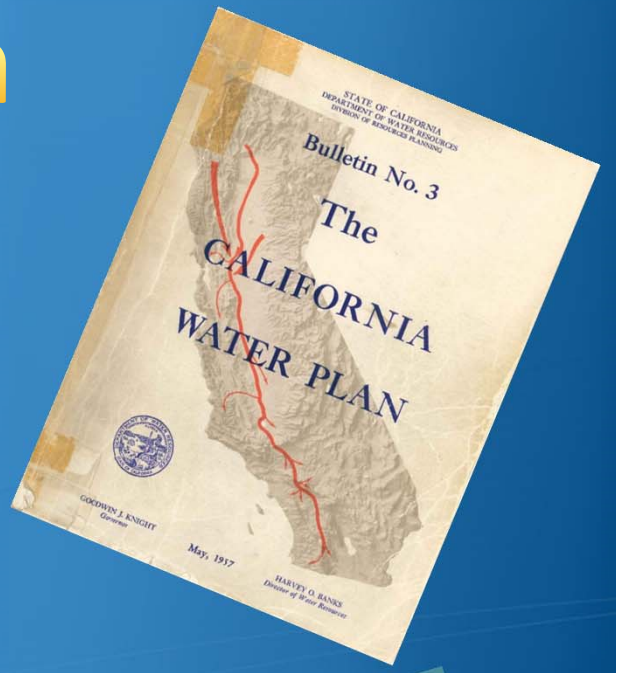
Figure SC-2: **Watersheds in the South Coast Hydrologic Region**

Source: Department of Water Resources, CWP 2013



The California Water Plan

- First published in 1957 as Bulletin 3
- Water Code requires DWR to update Water Plan every 5 years – updated 10 times (Bulletin 160)
- Strong nexus with Governor's Water Action Plan
- Tool for guiding investment priorities and legislative action
- Update 2013 lays out recommendations -- no mandates or appropriations



CALIFORNIA WATER PLAN UPDATE 2013

Water Plan Update 2013 Organization

Strategic Plan Volume 1	• Goals, Objectives and Related Actions • State and Federal Companion Plans • Water Portfolios • Future Scenarios
Regional Reports Volume 2	• Reports for 10 Hydrologic Regions • Reports for 2 areas with common water interests
Resource Management Strategies Volume 3	• Reports for 30 resource management strategies
Reference Guide Volume 4	• Detailed reference material related to information presented in Volumes 1, 2, and 3
Technical Guide Volume 5	• Web portal to document assumptions, data, analytical tools, and methods

Update 2013 Helps Implement the Governor's Water Action Plan

A Resource for Implementing the Governor's Water Action Plan

Water Action Plan's 10 Essential Actions	Make conservation a California way of life	Invest in integrated water management and increase regional self-reliance	Achieve the coequal goals for the Delta	Protect and restore important ecosystems	Manage and prepare for dry periods	Expand water storage capacity	Provide safe drinking water and secure wastewater systems to all communities	Increase flood protection	Improve operational and regulatory efficiency	Identify sustainable and integrated financing opportunities
How the 10 Essential Actions Are Advanced in Update 2013										
Update 2013 Objectives (Volume 1, Chapter 8) *See foldout 11A-11B for an explanation of all Update 2013 Objectives*	#2 – Use and Reuse Water More Efficiently	#1 – Strengthen Integrated Regional Water Management Planning #10 – Improve Data, Analysis, and Decision-Support Tools #17 – Improve Integrated Water Management Finance Strategy and Investments	#7 – Manage the Delta to Achieve the Coequal Goals for California	#4 – Protect and Restore Surface Water and Groundwater Quality #5 – Practice Environmental Stewardship #9 – Reduce the Carbon Footprint of Water Systems and Water Uses #14 – Public Access to Waterways, Lakes, and Beaches	#2 – Use and Reuse Water More Efficiently #3 – Expand Conjunctive Management of Multiple Supplies #7 – Manage the Delta to Achieve the Coequal Goals for California #8 – Prepare Prevention, Response, and Recovery Plans	#3 – Expand Conjunctive Management of Multiple Supplies (includes groundwater and surface storage)	#4 – Protect and Restore Surface Water and Groundwater Quality #12 – Strengthen Tribal/State relations and Natural Resources Management #13 – Ensure Equitable Distribution of Benefits	#6 – Improve Flood Management Using an Integrated Water Management Approach	#3 – Expand Conjunctive Management of Multiple Supplies #16 – Strengthen Alignment of Government Processes and Tools	#17 – Improve Integrated Water Management Finance Strategy and Investments
Resource Management Strategies (Volume 3)	• Ag Water Use Efficiency • Urban Water Use Efficiency • Recycled Municipal Water • Outreach and Engagement • Economic Incentives	All 30+ RMSs can enhance regional self-reliance, depending on where they are implemented and how the benefits are allocated.	All 30+ RMSs have the potential to help meet Delta coequal goals, depending on where they are implemented and how the benefits are allocated.	• Six RMSs pertaining to water quality • Ag Lands Stewardship • Ecosystem Restoration • Forest Mgmt. • Land Use Planning and Mgmt. • Recharge Area Protection • Sediment Mgmt. • Watershed Mgmt.	(Partial list) • Ag Water Use Efficiency • Urban Water Use Efficiency • Recycled Municipal Water • Conjunctive Mgmt. of Surface and Groundwater • CALFED/Local/ Regional Surface Storage	• Conjunctive Mgmt. of Surface and Groundwater • CALFED Surface Storage • Local/Regional Surface Storage • System Reoperation	Nearly all 30+ RMSs can help provide safe water and wastewater to all communities, depending on where they are implemented and how the benefits are allocated.	• Flood Management • Land Use Planning and Management • Sediment Management • Watershed Management • Urban Stormwater Runoff Management • Forest Management	• Conveyance Delta • Conveyance Regional/Local • System Reoperation • Water Transfers	
Cross-Cutting Objectives (Volume 1, Chapter 8)	• #10 – Improve Data, Analysis, and Decision-Support Tools • #11 – Invest in Water Technology and Science • #12 – Strengthen Tribal/State Relations and Natural Resources Management • #13 – Ensure Equitable Distribution of Benefits					• #15 – Strengthen Alignment of Land Use Planning and Integrated Water Management • #16 – Strengthen Alignment of Government Processes and Tools • #17 – Improve Integrated Water Management Finance Strategy and Investments				

Water Plan Highlights

- Core Messages
- Why We Should Care
- What We Should Do
- How We Should Invest in IWM
- What We Must Know
- What Happens If We Delay
- The Path Forward

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Core Messages

- **Water is the Essence of Life for California.**

  Every living thing in the state, as well as our economy, depends on reliable, clean water to thrive. There are greater demands for water in our state than ever before.

- **California's Complex Water System is in Crisis.**

  Our interconnected system of water resources — natural and human made — is severely threatened on many fronts, with significant risks to our health, safety, economic well-being, and quality of life.

- **A Diverse Portfolio Approach is Required.**

  The complexity of our water resources systems and the associated risks demand a diverse set of actions and investment strategies. There is no silver bullet.

- **Solutions Require Integration, Alignment, and Investment.**

  Commitment to the IWM approach, alignment toward a common vision, and stable financing are essential to ensuring future resiliency — the ability to adapt to change.

- **We All Have a Role to Play in Securing Our Future.**

  Decision-makers, resource agencies, water resource managers, interest groups, and water users at the State, federal, tribal, and local levels need to actively engage in the solutions.

Why We Should Care

Water is the Essence of Life

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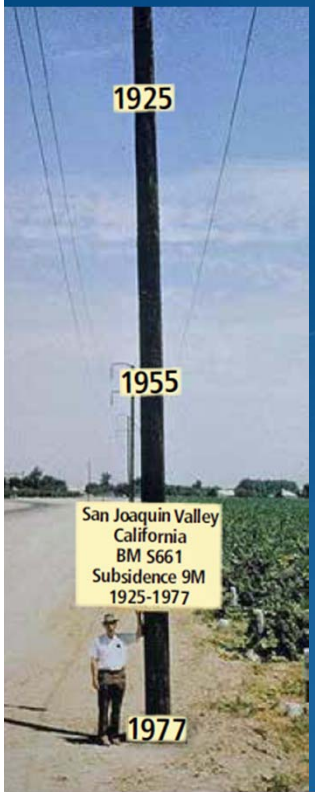
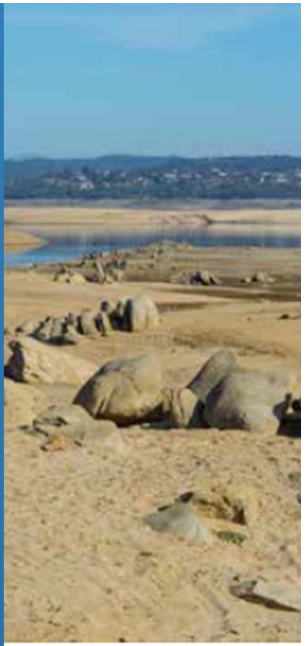
PUBLIC SAFETY ENVIRONMENTAL STEWARDSHIP ECONOMIC STABILITY

A System in Crisis

Reduced Prosperity for Future Generations

- Greater Drought Impacts - Unreliable Water Supplies
- Increasing Flood Risk
- Groundwater Depletion and Subsidence
- Degraded Water Quality
- Declining Environmental Conditions
- Aging Infrastructure

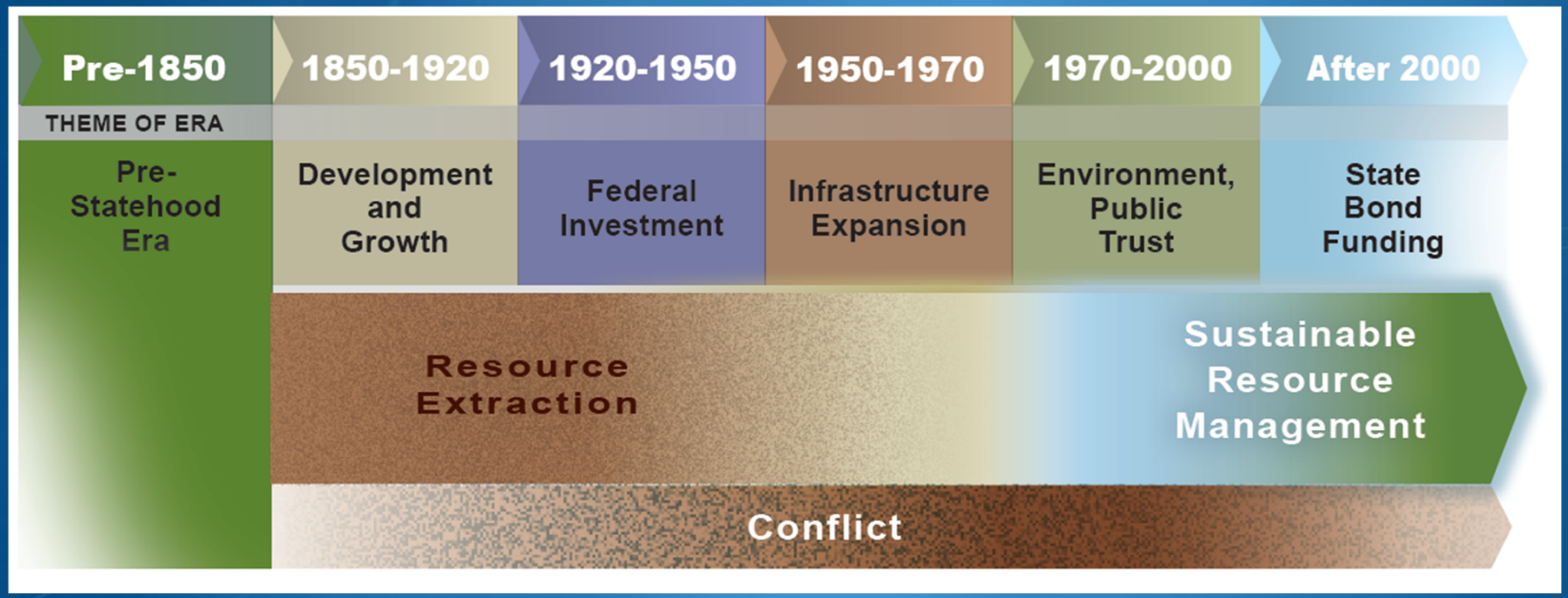




Low water level at Folsom Lake (January 2014)

How We Got Here

Past Choices Shaped Today's Water Challenges



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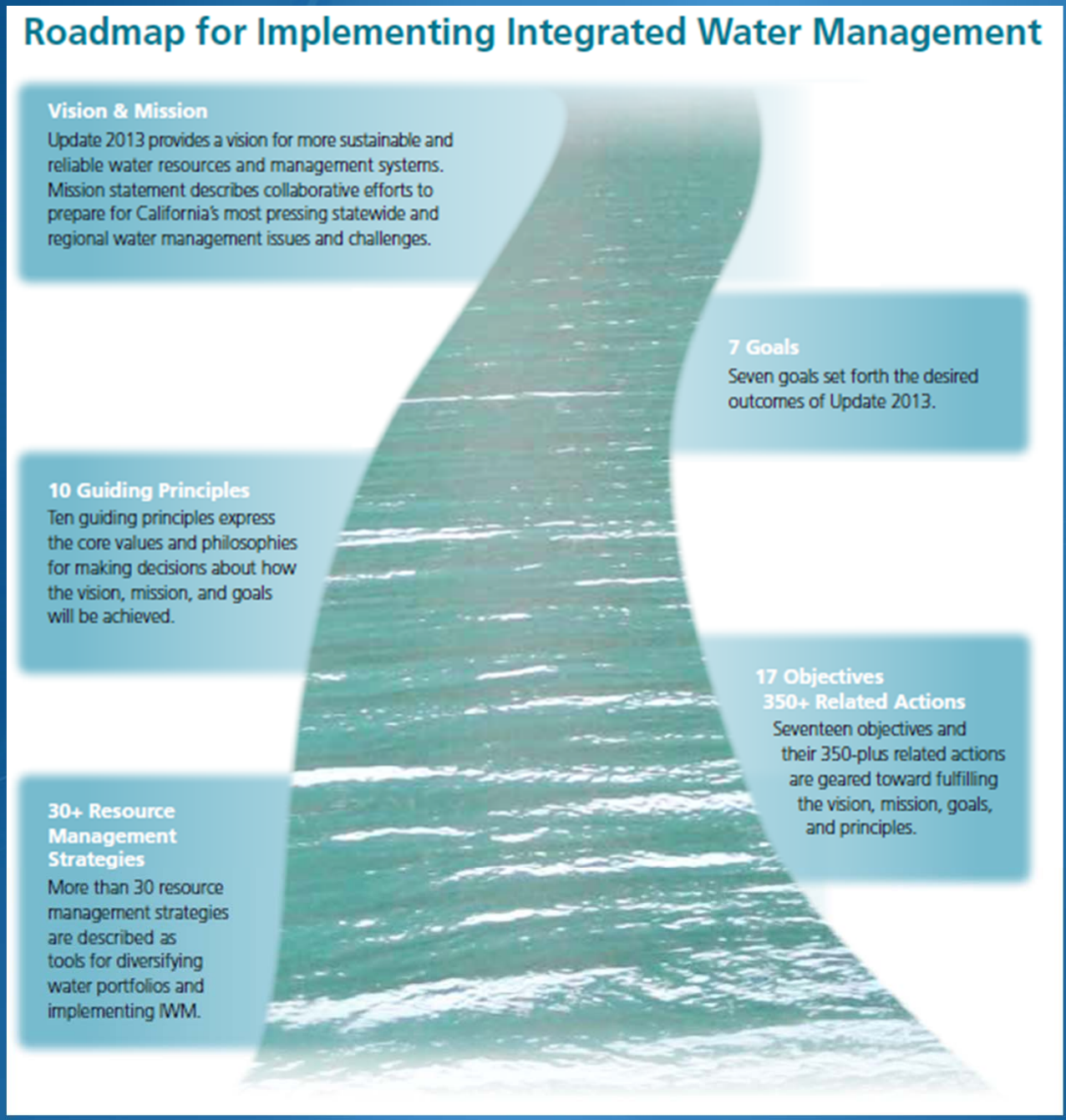
What We Should Do

Roadmap for Implementing Integrated Water Management

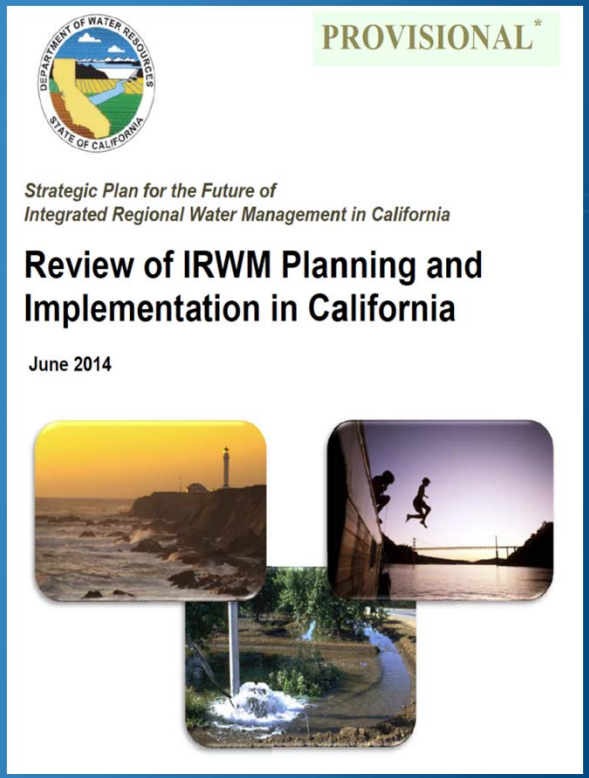


CWP Objectives & Related Actions

- CWP includes 17 objectives and 300+ Related Actions and sub-actions
  - Objective 1 – Strengthen IRWM
  - Objective 2 – Use and Reuse Water More Efficiently
  - Objective 3 – Expand Conjunctive Management of Multiple Supplies
  - Objective 4 – Protect and Restore Surface Water and Groundwater Quality
  - Objective 5 – Practice Environmental Stewardship
  - Objective 6 – Improve Flood Management Using an IWM Approach
  - Objective 7 – Manage the Delta to Achieve the Coequal Goals for California
  - Objective 8 – Prepare Prevention, Response, and Recovery Plans
  - Objective 9 – Reduce the Carbon Footprint of Water Systems and Water Uses
  - Objective 10 – Improve Data, Analysis, and Decision-Support Tools
  - Objective 11 – Invest in Water Technology and Science
  - Objective 12 – Strengthen Tribal/State Relations and Natural Resources Management
  - Objective 13 – Ensure Equitable Distribution of Benefits
  - Objective 14 – Protect and Enhance Public Access to the State's Waterways, Lakes, and Beaches
  - Objective 15 - Strengthen Alignment of Land Use Planning and IWM
  - Objective 16 - Strengthen Alignment of Government Processes and Tools
  - Objective 17 - Improve IWM Finance Strategy and Investments

Objective 1 – Strengthen integrated regional water management to enhance partnerships and improve regional self-reliance.

- 8 Related Actions to:
  - Develop Strategic Plan for IRWM
  - Encourage & support RWM groups
  - Improve IRWM processes to encourage broad participation



30 Resource Management Strategies

Tools for Diversifying Regional Water Portfolios

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 & Sea Water)
- Precipitation Enhancement
- Municipal Recycled Water
- Surface Storage – CALFED
- Surface Storage – Regional / Local

Improve Flood Management

- Flood Management

** New for Update 2013

Improve Water Quality

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

Practice Resource Stewardship

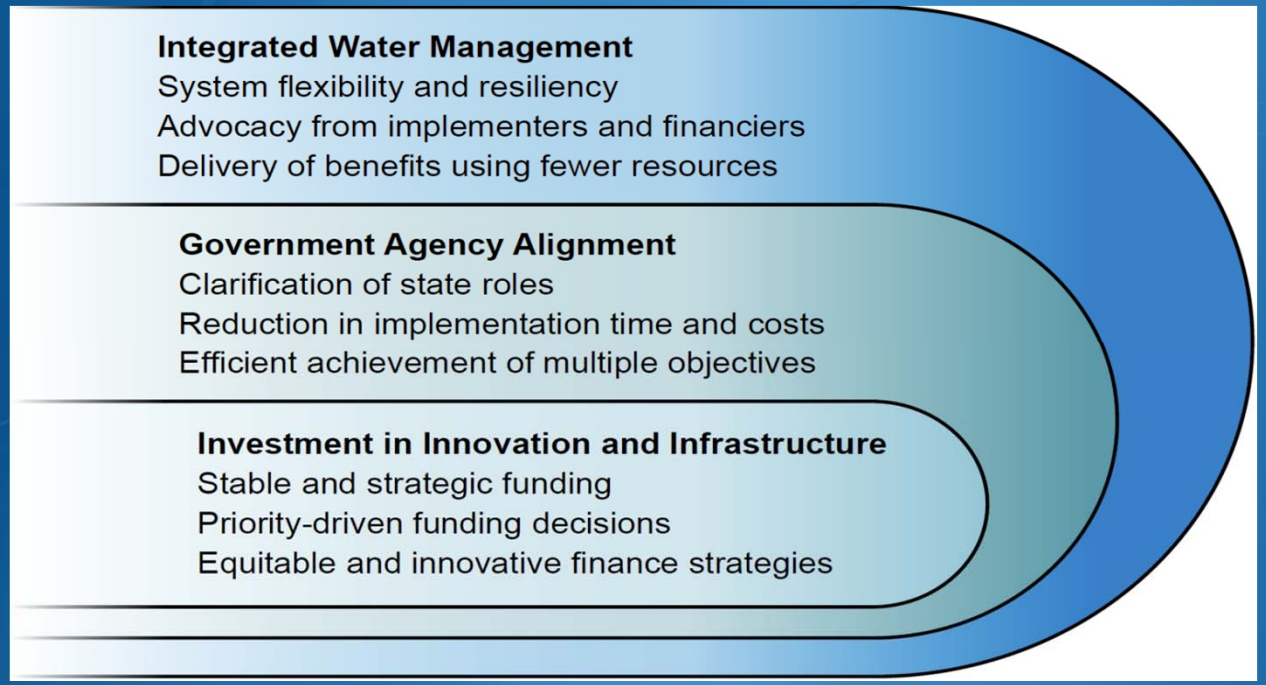
- Agricultural Land Stewardship
- Ecosystem Restoration
- Forest Management
- Land Use Planning & Management
- Recharge Area Protection
- Sediment Management **
- Watershed Management

People & Water

- Economic Incentives (Loans, Grants & Water Pricing)
- Outreach & Engagement **
- Water & Culture **

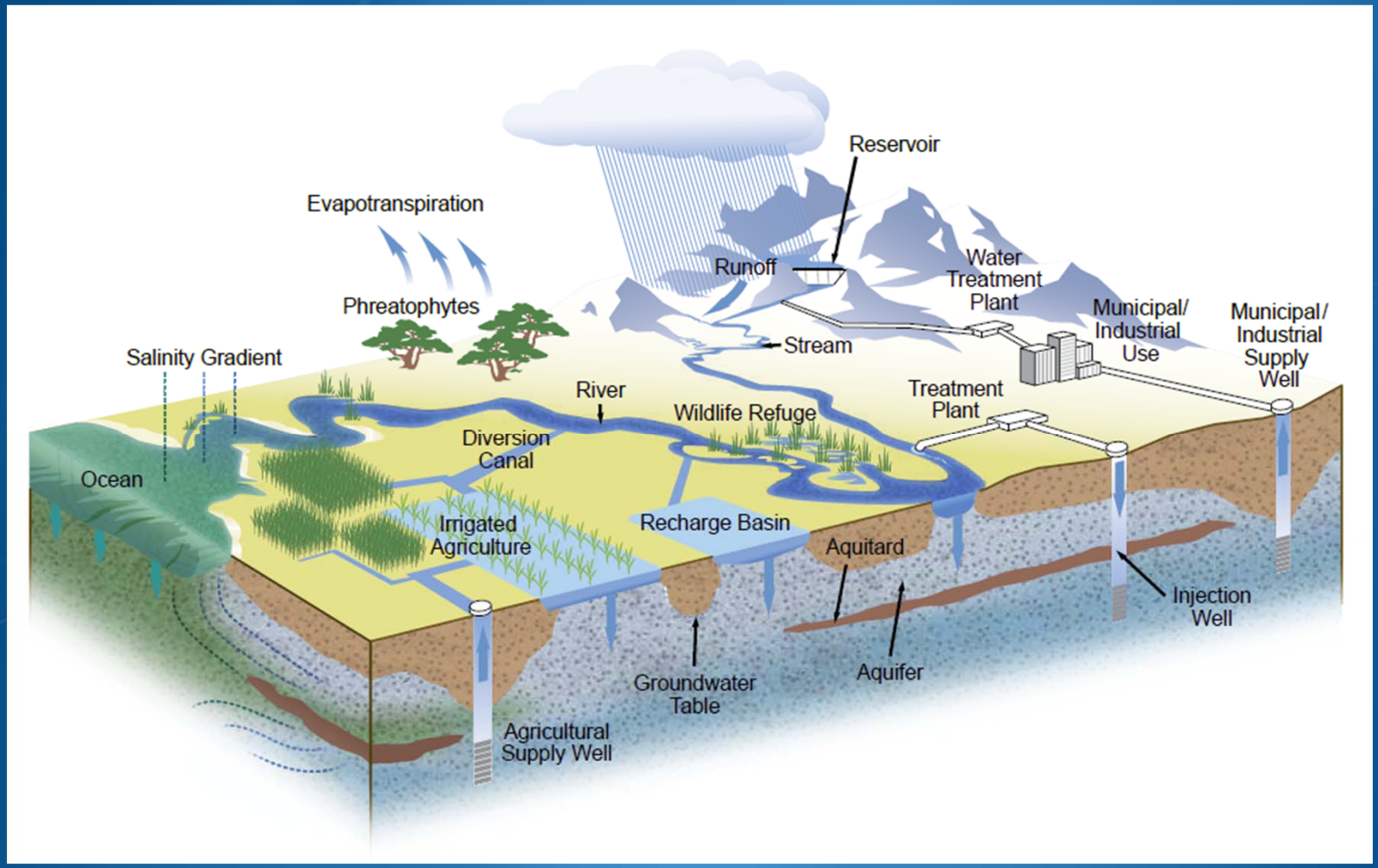
Three Themes of Update 2013

- Commit to Integrated Water Management
- Strengthen Government Agency Alignment
- Invest in Innovation and Infrastructure

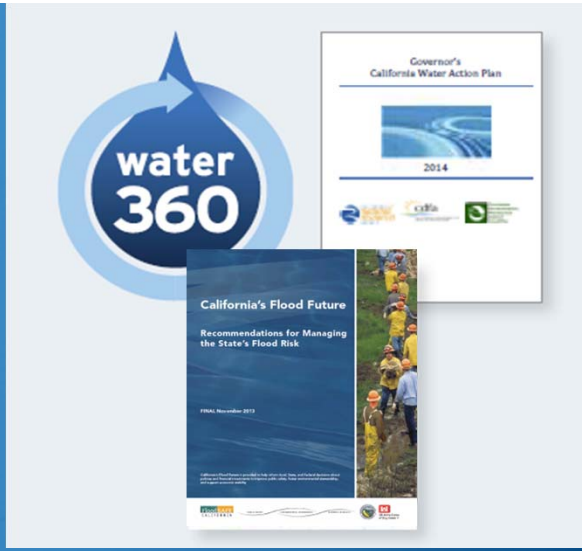


A Call to Integrate

Interconnected Systems Require Integrated Solutions



A Call to Align
Agency Alignment Is Critical

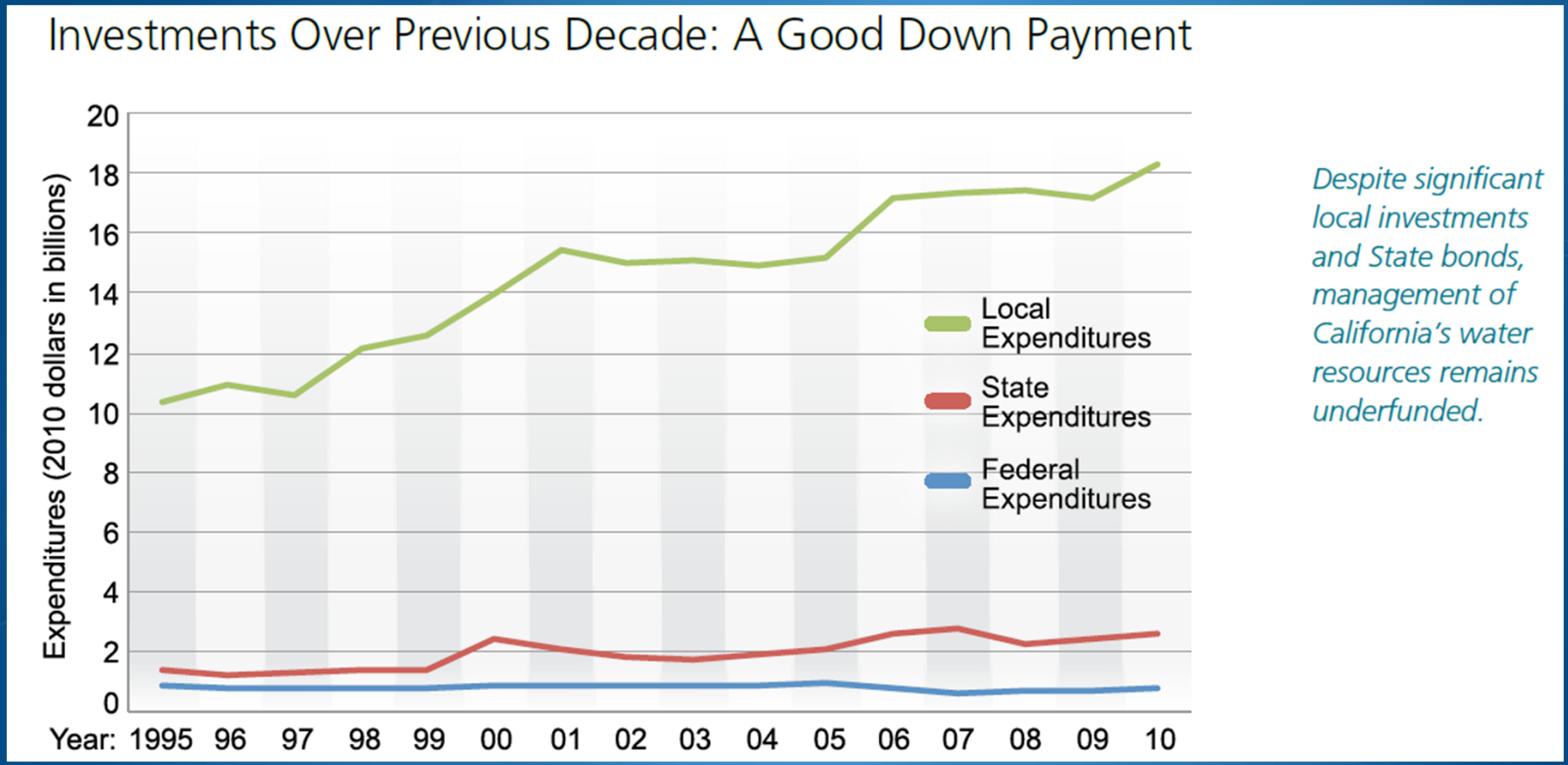


Expediting and reducing the cost of implementation through:

- Principles for improving alignment
- Actions for Aligning Government Agencies

A Call to Invest

Resiliency Requires Sustained Investment



Despite significant local investments and State bonds, management of California's water resources remains underfunded.

How We Should Invest in IWM

How We Should Invest

Recommended Financing Strategies

- Shared Values For Guiding State Investment
- Attributes of Future Finance Strategies
- Actions for Developing State Finance Strategies
- Menu of Funding and Finance Alternatives

CALIFORNIA WATER PLAN UPDATE 2013

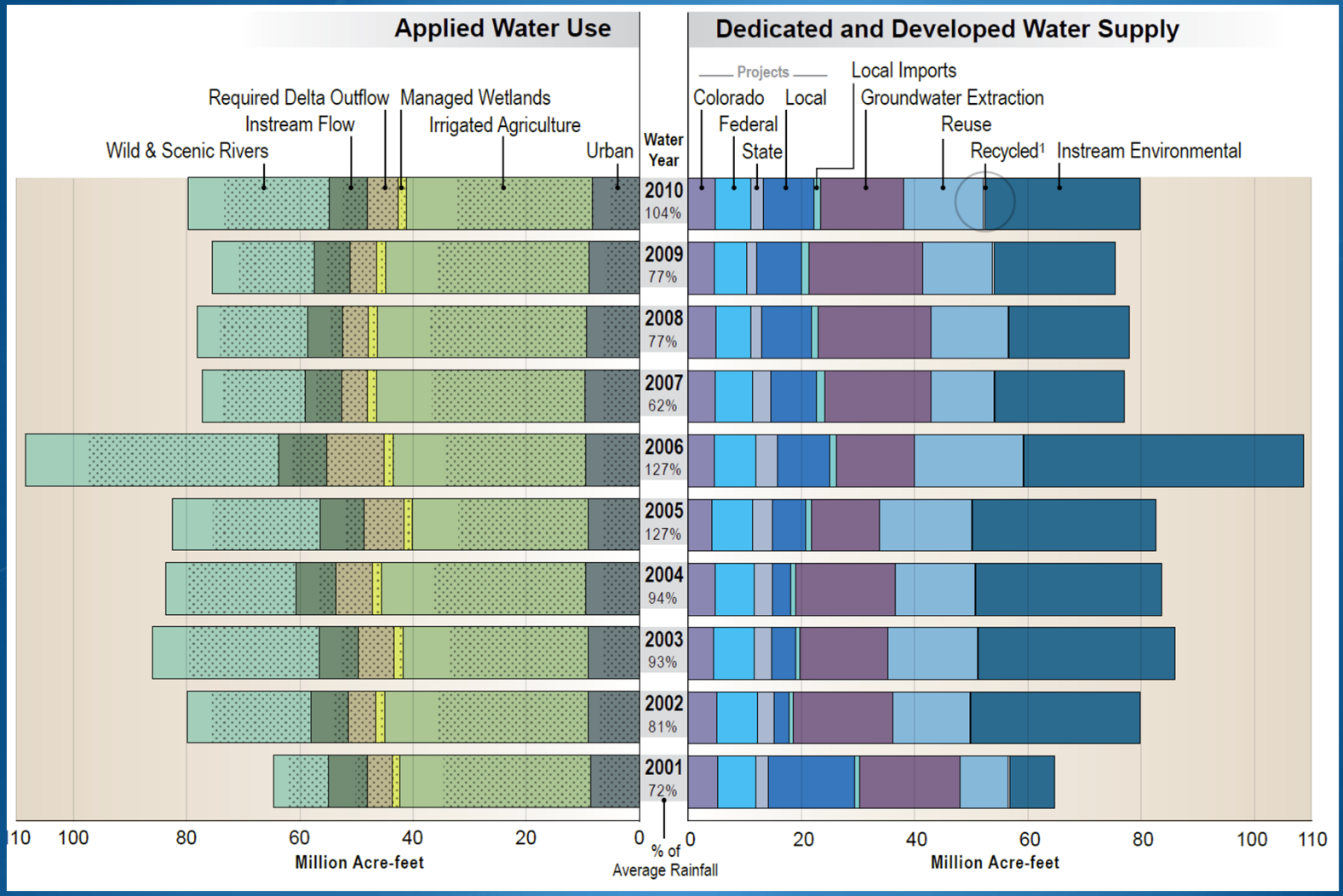
Existing and Potential New Revenue Sources

Table 7-2 State and Local Water Management Revenue Sources

Revenue Source	Appropriate Uses	Feasibility	Key Tradeoffs	Application in California
General Fund	Activities that benefit the general public	Available each year, but subject to competing uses	Funds are limited	A common source of funding
General Obligation Bonds	Projects that benefit the general public	Commonly used	Subject to voter approval	Commonly used over the decade, but polls have shown reduced public support for large water bonds
Revenue Bonds	Projects where a dependable revenue stream is available	A standard method of financing	None	A typical method of financing for local and State projects
User Fees (includes contractually negotiated commodity charges)	Projects where direct beneficiaries are easily identified.	Potentially works well with clearly defined beneficiaries, less likely to work for projects with significant public benefits	Will focus projects to those with local scope which may undermine IWM efforts. May limit State's ability to increase fees and taxes to support other projects	State Water Project is an excellent example as over 90% of project cost will be repaid by direct beneficiaries (contractors).

What We Must Know

Understanding How We Use and Supply Water



Understanding Regional Diversity

WY 2010

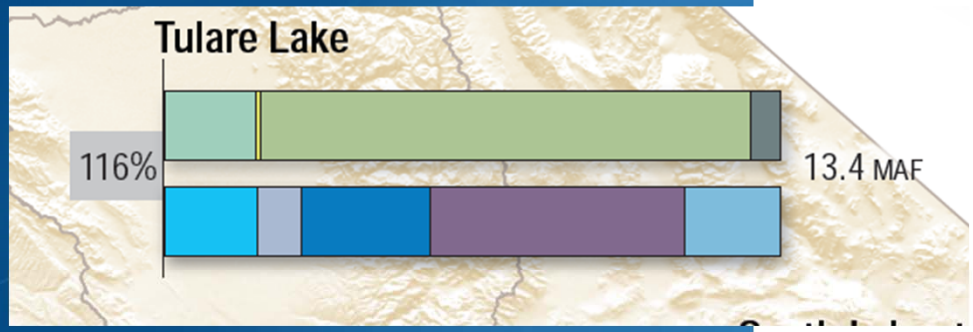
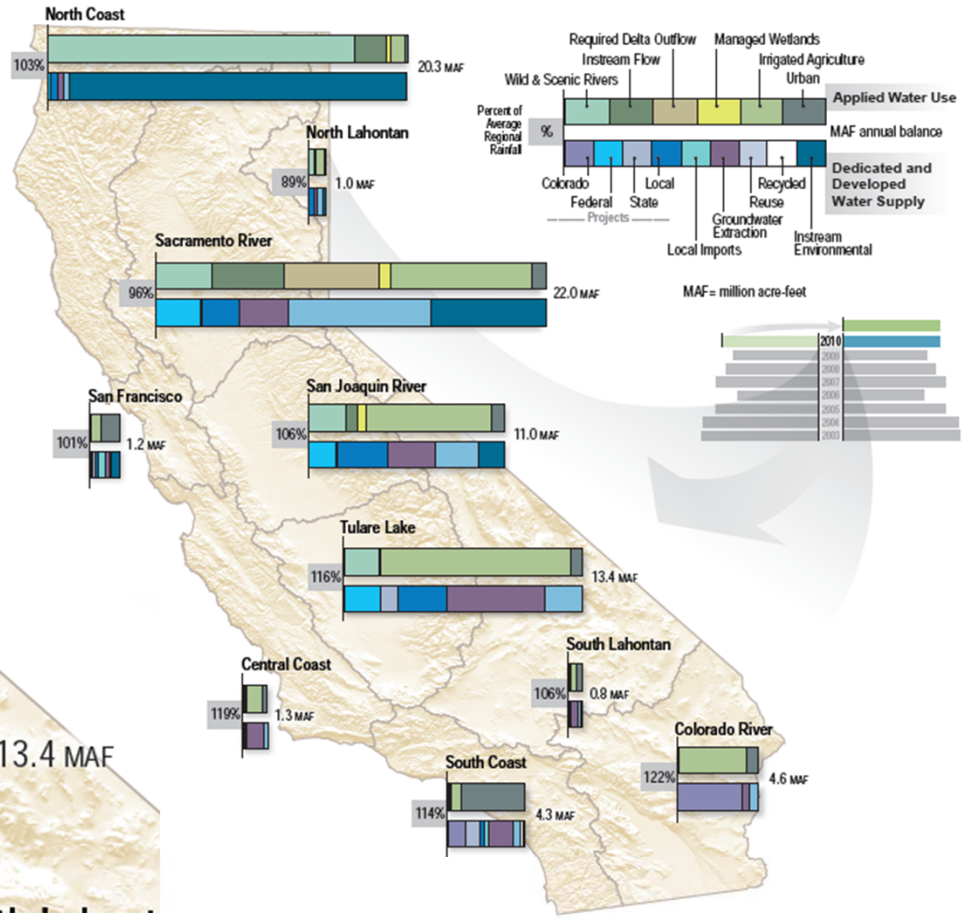


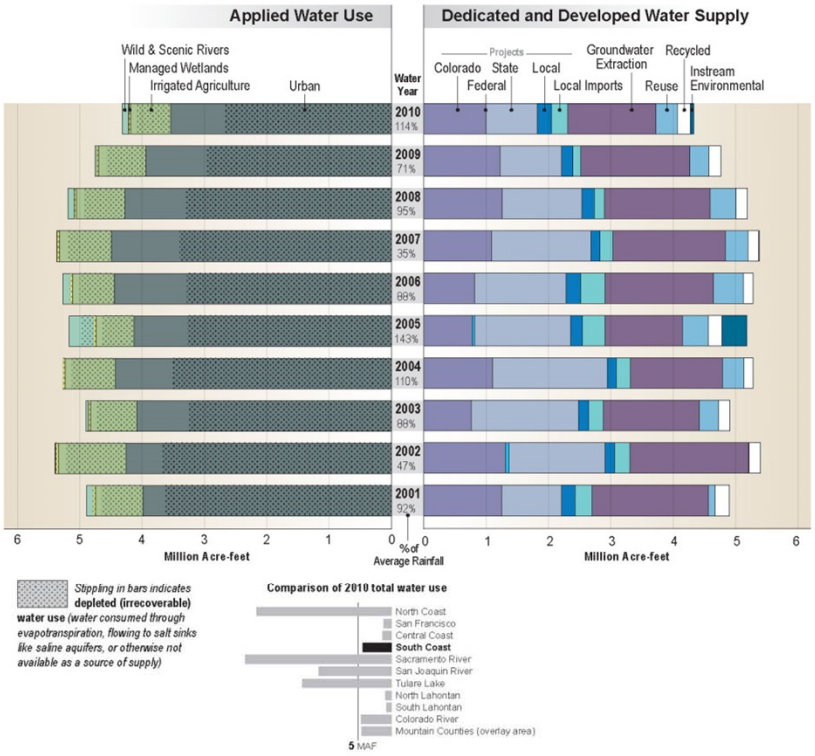
Figure 3-11 Water Balance by Region for Water Year 2010



Note: Regional water portfolios provide information about annual Water Supply and Water Use balances for California's 10 hydrologic regions. The regional water balances depicted at the right of each bar show conditions for water year 2010. Update 2013 presents regional and statewide water balances for years 2001 through 2010. Water balances can be used to compare how water supplies and uses can vary between wet, average, and dry hydrologic conditions throughout the regions and how each region's water balance can vary from year to year. For more information, see Volume 2, *Regional Reports*.

Figure SC-14 South Coast Hydrologic Region Water Balance by Water Year (2001-2010)

California's water resources vary significantly from year to year. Ten recent years show this variability for water use and water supply. Applied Water Use shows how water is applied to urban and agricultural sectors and dedicated to the environment and the Dedicated and Developed Water Supply shows where the water came from each year to meet those uses. Dedicated and Developed Water Supply does not include the approximately 125 million acre-feet (MAF) of statewide precipitation and inflow in an average year that either evaporates, are used by native vegetation, provides rainfall for agriculture and managed wetlands, or flow out of the state or to salt sinks like saline aquifers (see Table SC-16). Groundwater extraction includes annually about 2 MAF more groundwater used statewide than what naturally recharges – called groundwater overdraft. Overdraft is characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years.



For further details, refer to Volume 5, *Technical Guide*, and the Volume 4 article, "California's Groundwater Update 2013."

Key Water Supply and Water Use Definitions

Applied water. The total amount of water that is diverted from any source to meet the demands of water users without adjusting for water that is depleted, returned to the developed supply or considered irrecoverable (see water balance figure).

Consumptive use is the amount of applied water used and no longer available as a source of supply. Applied water is greater than consumptive use because it includes consumptive use, reuse, and outflows.

Instream environmental. Instream flows used only for environmental purposes.

Instream flow. The use of water within its natural watercourse as specified in an agreement, water rights permit, court order, FERC license, etc.

Groundwater Extraction. An annual estimate of water withdrawn from banked, adjudicated, and unadjudicated groundwater basins.

Recycled water. Municipal water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

Reused water. The application of previously used water to meet a beneficial use, whether treated or not prior to the subsequent use.

Urban water use. The use of water for urban purposes, including residential, commercial, industrial, recreation, energy production, military, and institutional classes. The term is applied in the sense that it is a kind of use rather than a place of use.

Water balance. An analysis of the total developed/dedicated supplies, uses, and operational characteristics for a region. It shows what water was applied to actual uses so that use equals supply.

South Coast Water Balance by Water Year Data Table (TAF)

	2001 (92%)	2002 (47%)	2003 (88%)	2004 (110%)	2005 (143%)	2006 (88%)	2007 (35%)	2008 (95%)	2009 (71%)	2010 (114%)
APPLIED WATER USE										
Urban	3,990	4,264	4,091	4,433	4,131	4,447	4,497	4,279	3,945	3,541
Irrigated Agriculture	758	1,086	739	807	613	676	834	774	754	645
Managed Wetlands	37	36	31	31	32	31	32	32	32	32
Req Delta Outflow	0	0	0	0	0	0	0	0	0	0
Instream Flow	4	4	4	4	4	6	4	4	4	4
Wild & Scenic R.	108	8	40	0	395	114	10	102	23	104
Total Uses	**4,897**	**5,397**	**4,905**	**5,275**	**5,175**	**5,273**	**5,376**	**5,191**	**4,757**	**4,326**
DEPLETED WATER USE (STIPPLING)										
Urban	3,621	3,679	3,248	3,520	3,268	3,283	3,397	3,299	2,971	2,663
Irrigated Agriculture	665	946	631	695	506	556	693	638	621	540
Managed Wetlands	37	36	31	31	32	31	32	32	32	32
Req Delta Outflow	0	0	0	0	0	0	0	0	0	0
Instream Flow	0	0	0	0	0	0	0	0	0	0
Wild & Scenic R.	0	0	0	0	202	0	0	0	0	0
Total Uses	**4,323**	**4,660**	**3,911**	**4,246**	**4,008**	**3,870**	**4,122**	**3,969**	**3,625**	**3,236**
DEDICATED AND DEVELOPED WATER SUPPLY										
Instream	0	0	0	0	395	0	10	0	0	54
Local Projects	217	153	162	142	190	231	141	202	180	220
Local Imported Deliveries	272	249	238	228	366	393	213	165	126	269
Colorado Project	1,251	1,313	760	1,100	773	808	1,082	1,257	1,219	990
Federal Projects	0	54	1	0	42	0	0	0	1	1
State Project	959	1,536	1,715	1,840	1,533	1,473	1,599	1,272	989	830
Groundwater Extraction	1,862	1,898	1,543	1,476	1,238	1,740	1,802	1,697	1,745	1,408
Inflow & Storage	0	0	0	0	0	0	0	0	0	0
Reuse & Seepage	112	12	308	343	417	477	357	415	307	349
Recycled Water	225	184	179	146	222	152	172	183	192	204
Total Supplies	**4,897**	**5,397**	**4,905**	**5,275**	**5,175**	**5,273**	**5,376**	**5,191**	**4,757**	**4,326**

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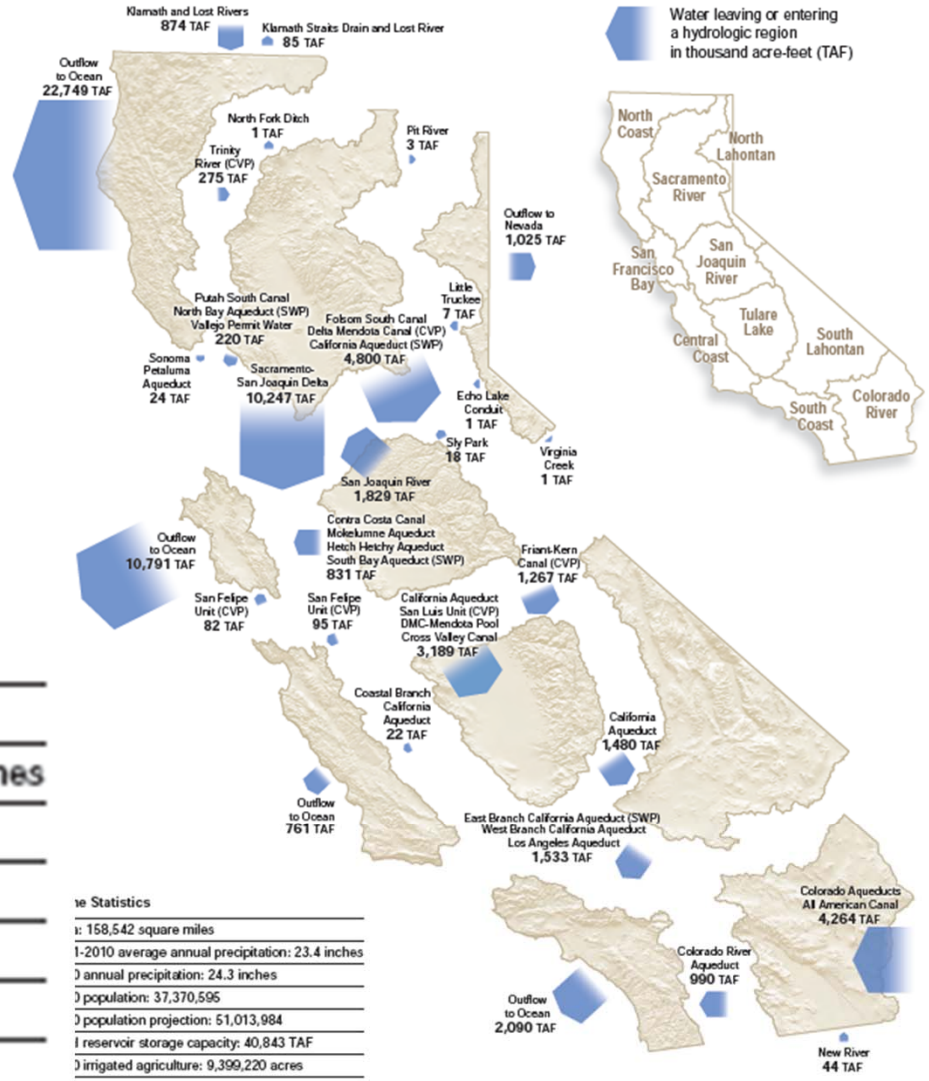
Regional Inflows and Outflows and some statistics

Vol. 1, Ch. 3 and Vol. 3, Regional Reports

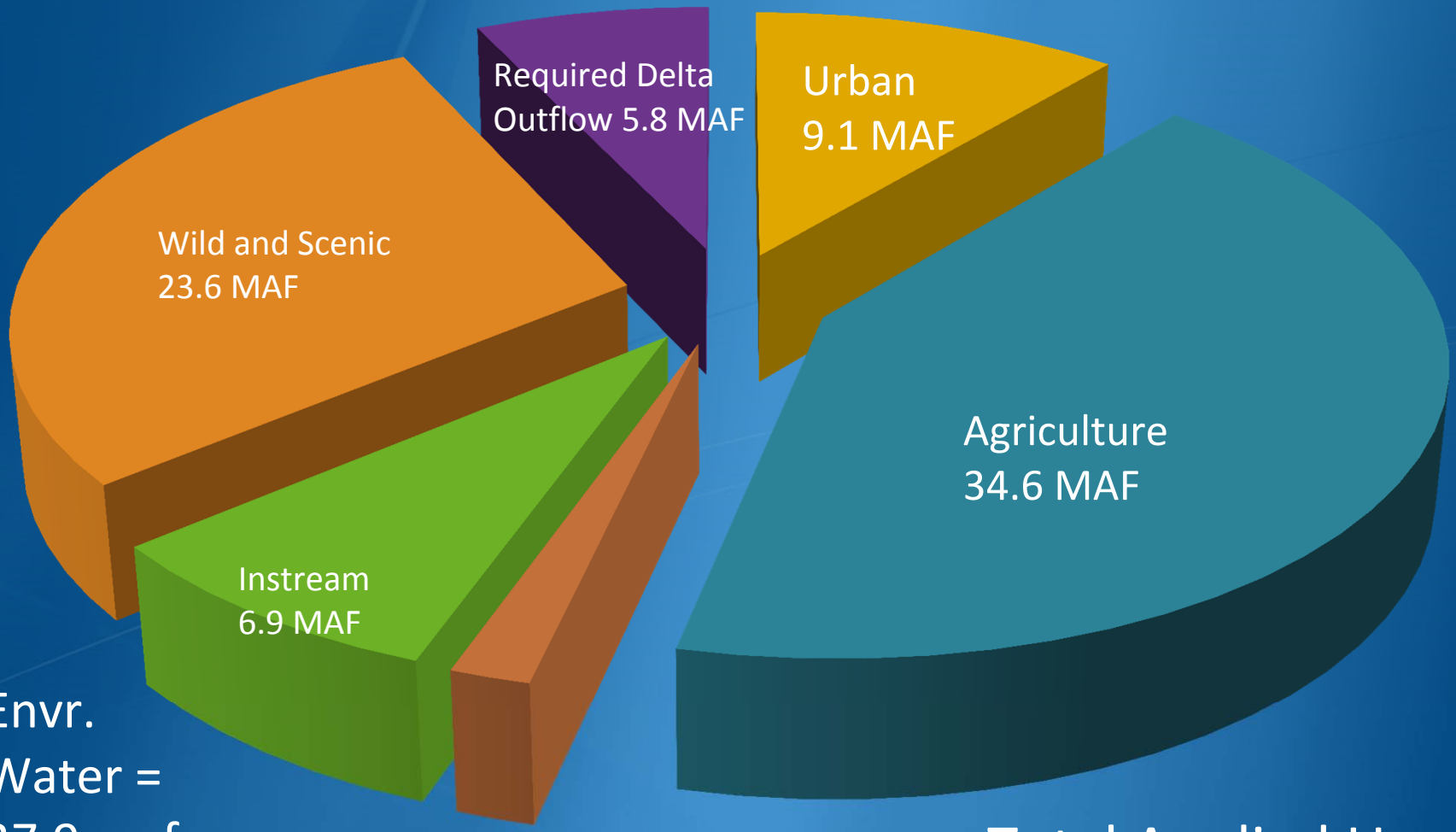
Figure 3-12 Regional Inflows and Outflows, Water Year 2010



Some Statistics

- Area: 158,542 square miles
- 1981-2010 average annual precipitation: 23.4 inches
- 2010 annual precipitation: 24.3 inches
- 2010 population: 37,370,595
- 2050 population projection: 51,013,984
- Total reservoir storage capacity: 40,843 TAF
- 2010 irrigated agriculture: 9,399,220 acres

2001-2010 Average Applied Water



Envr. Water = 37.9 maf

Total Applied Use and Outflow = 81.5

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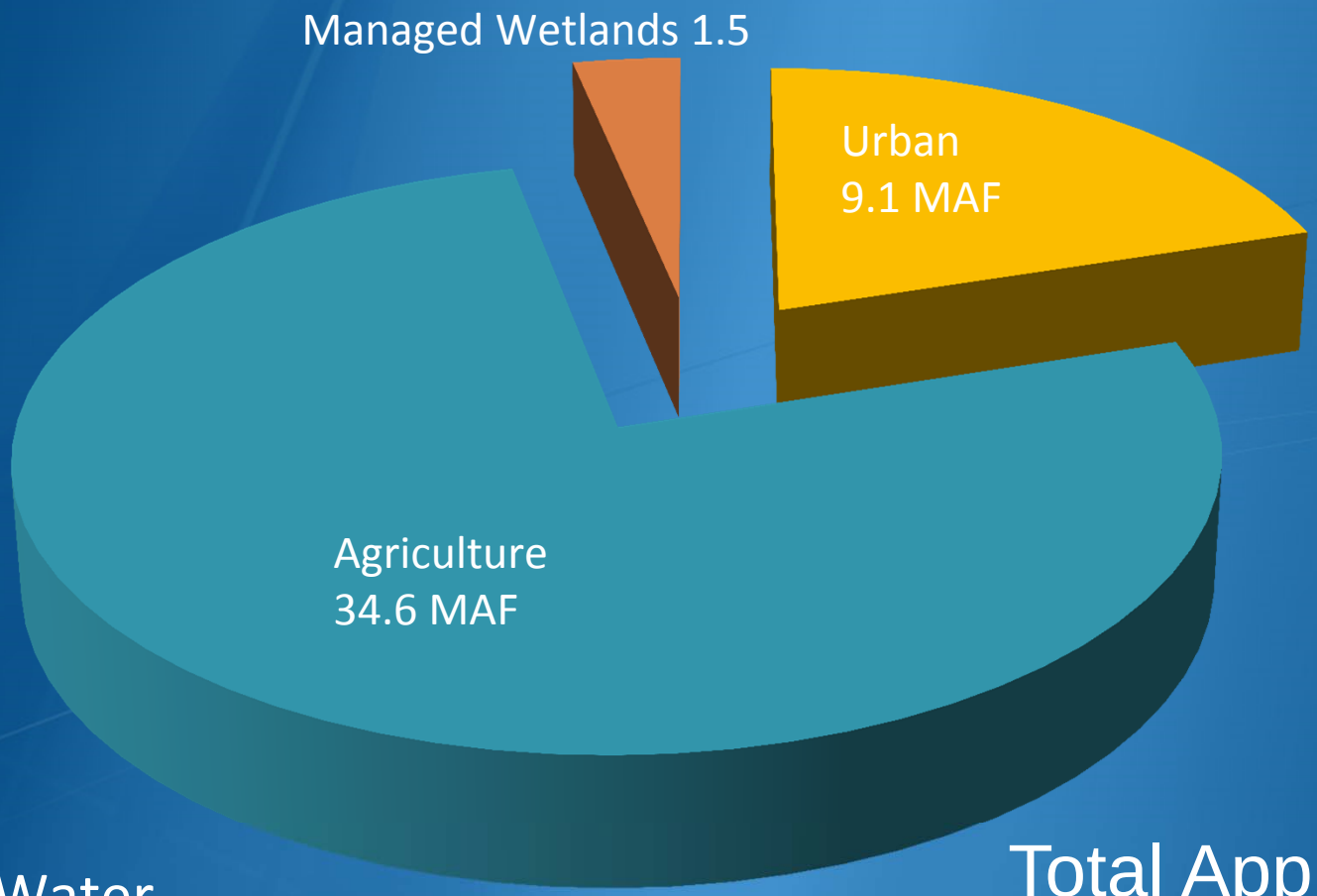
2001-2010 Average Applied Water Use



Envr. Water
Use = 1.5 maf

Total Applied
Water Use and
Outflow = 45.2 maf

w/o instream envr. water

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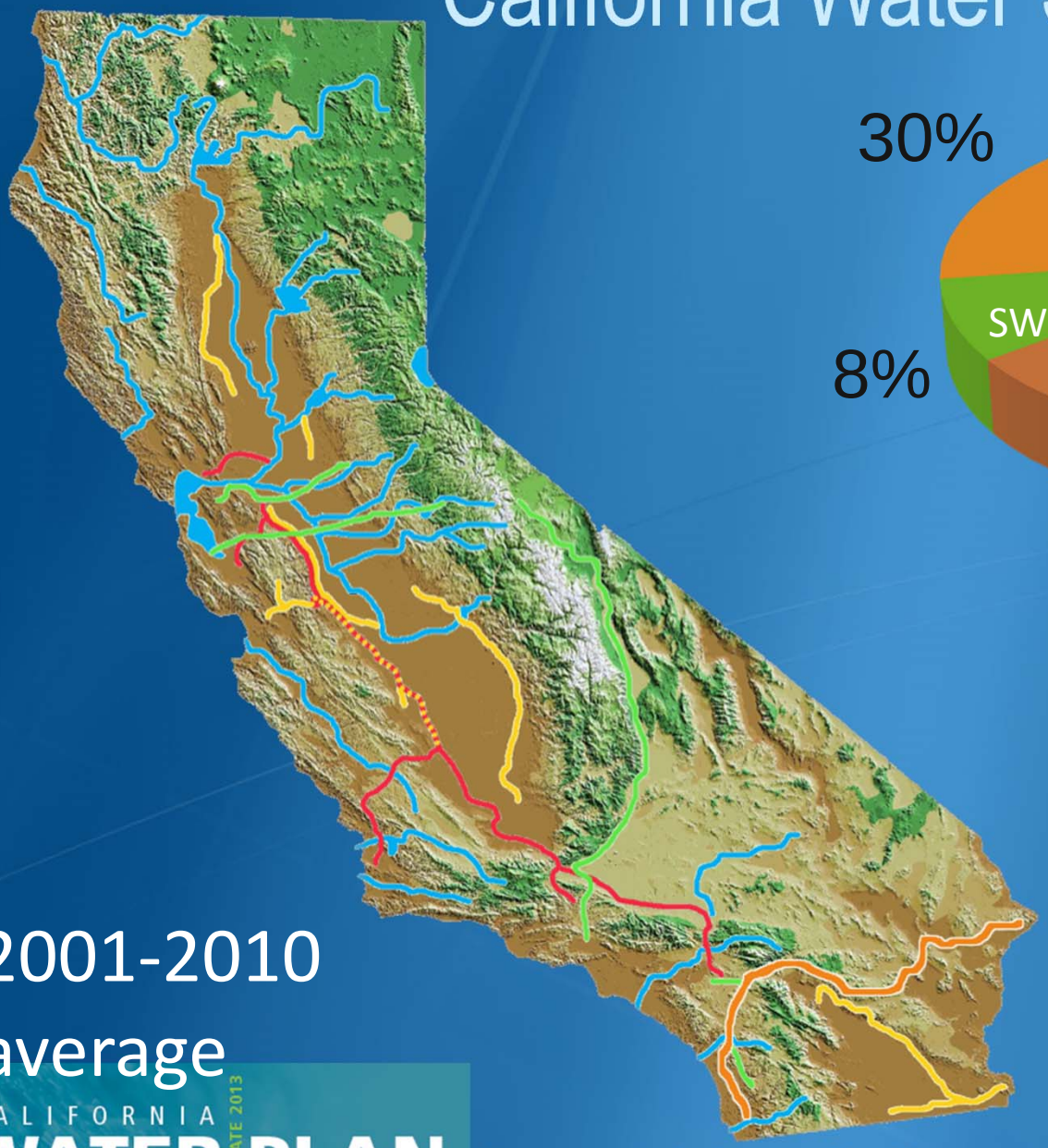
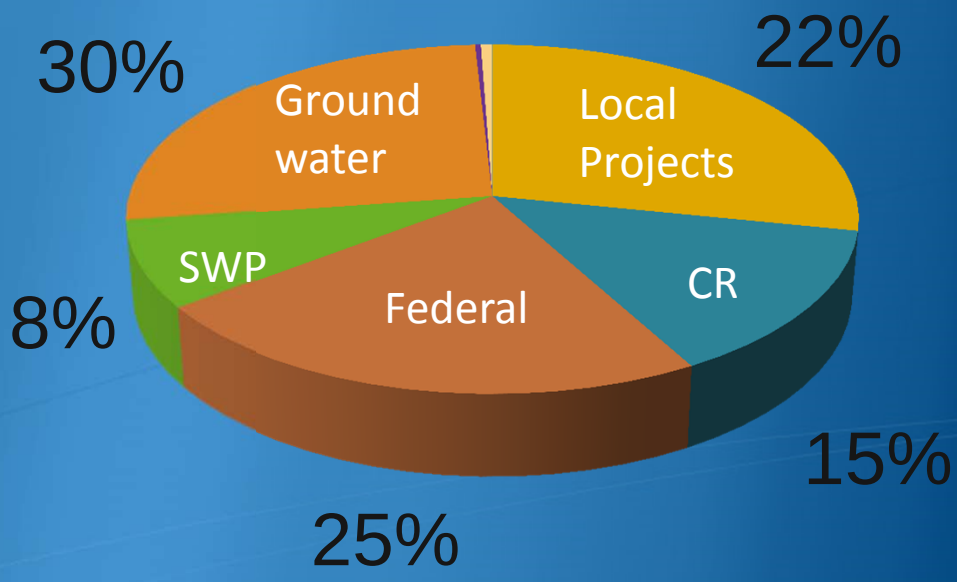
California Water Supply Systems





Local	**--**	**7.0 maf**
Colorado	**--**	**4.7 maf**
Federal	**--**	**8.1 maf**
State	**--**	**2.8 maf**
Groundwater	**--**	**9.8 maf**
Recycle Water	**--**	**0.2 maf**

2001-2010 average

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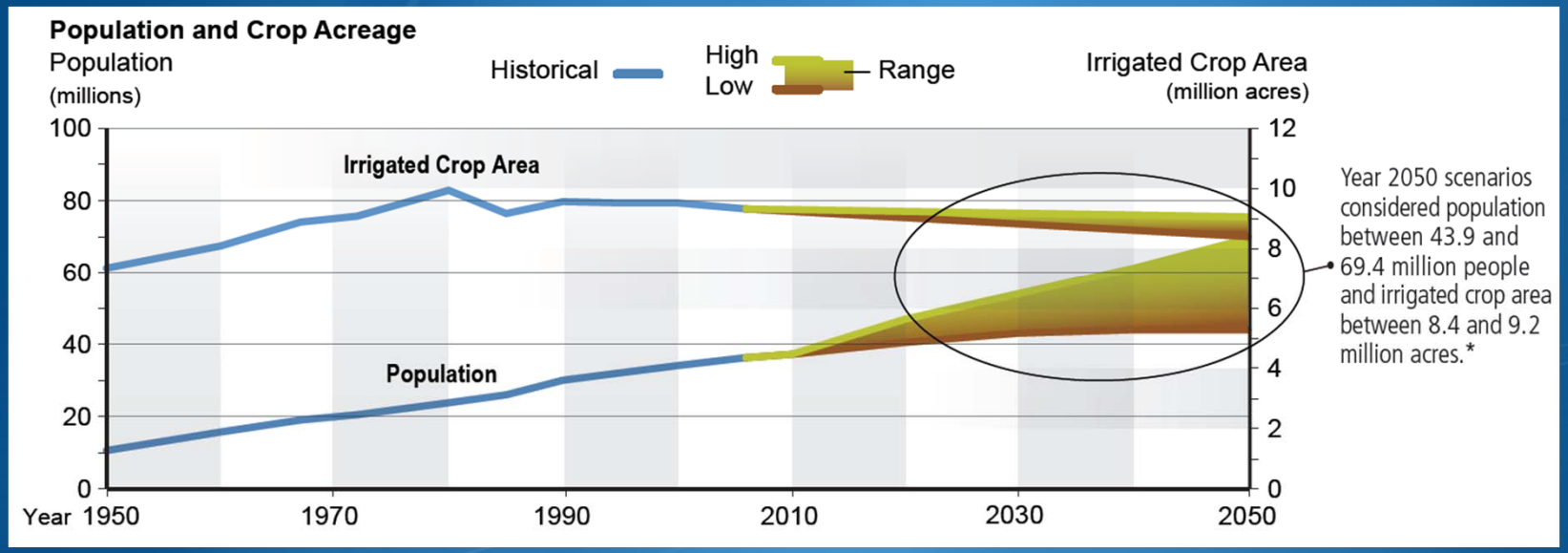
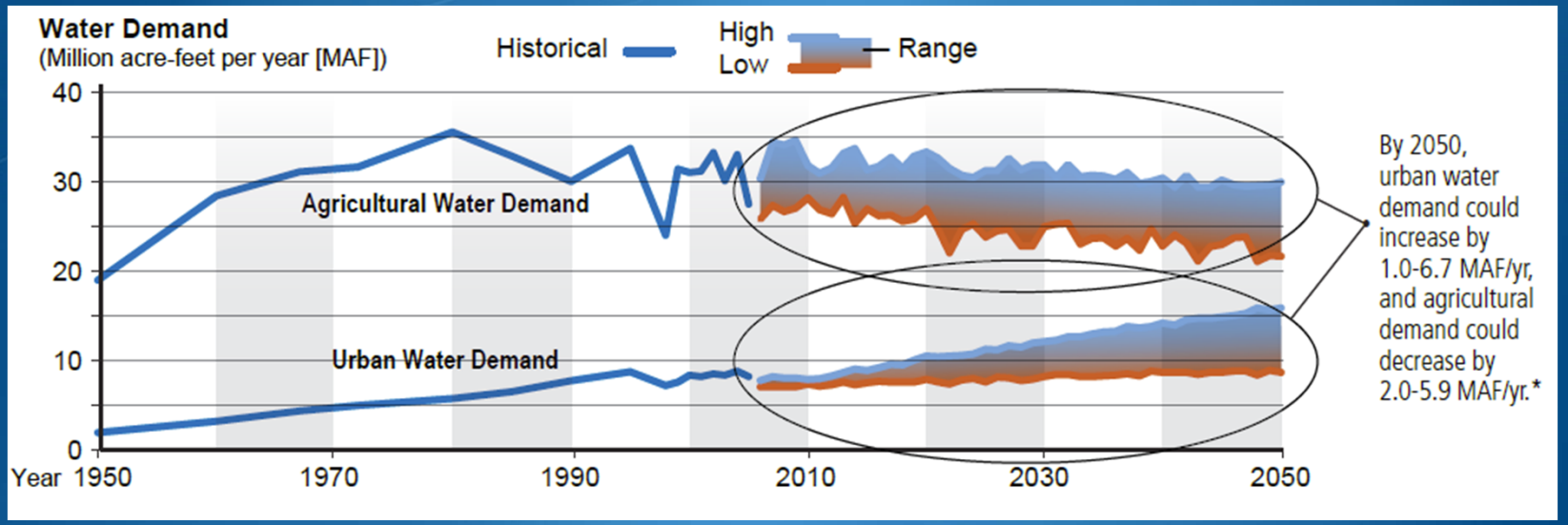
Net water Includes recycling. No reuse or instream flows. Quantities vary by year.

Water Scenarios 2050

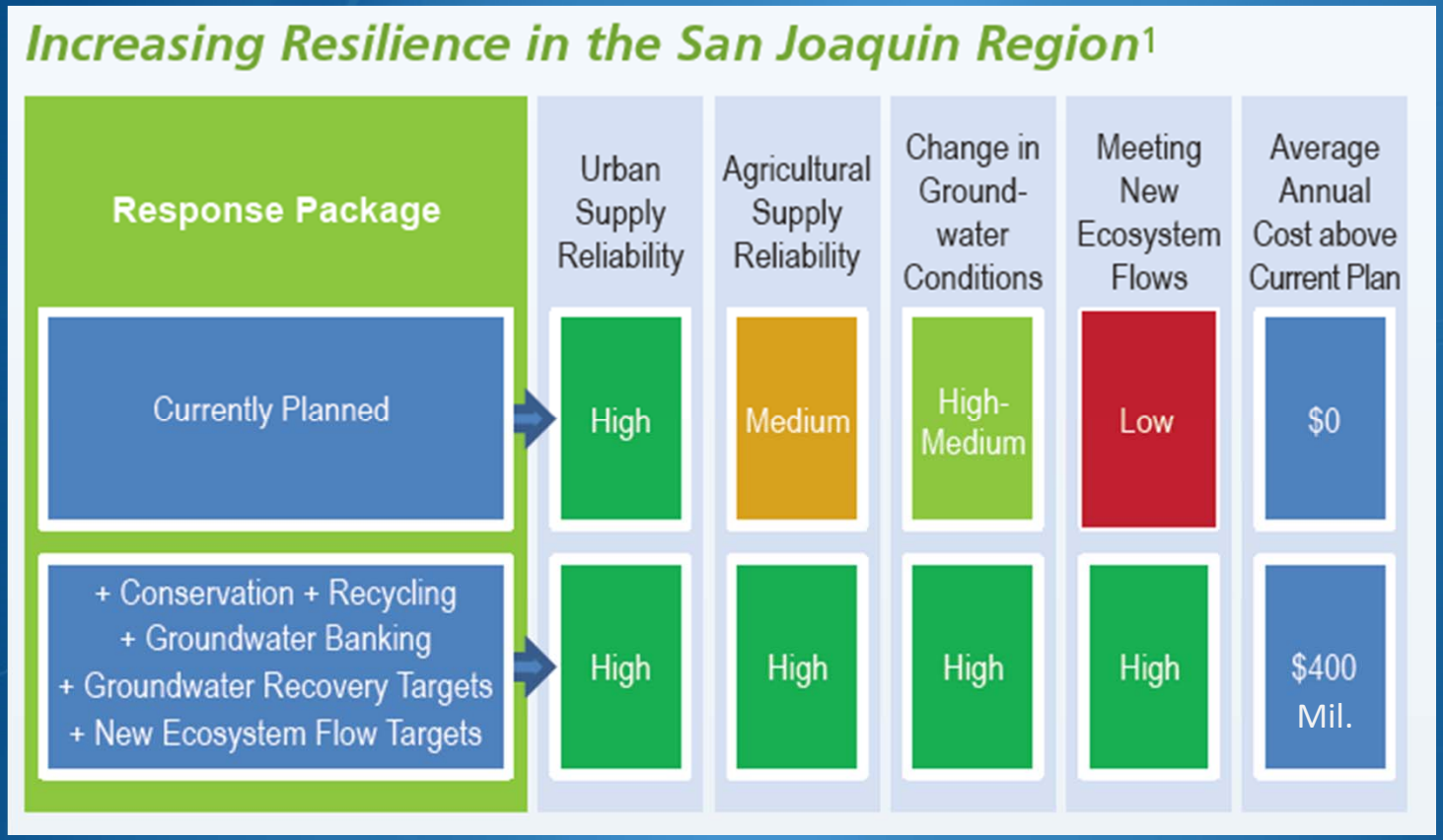
Extreme Uncertainty in Future Demands





Value of Public Investment

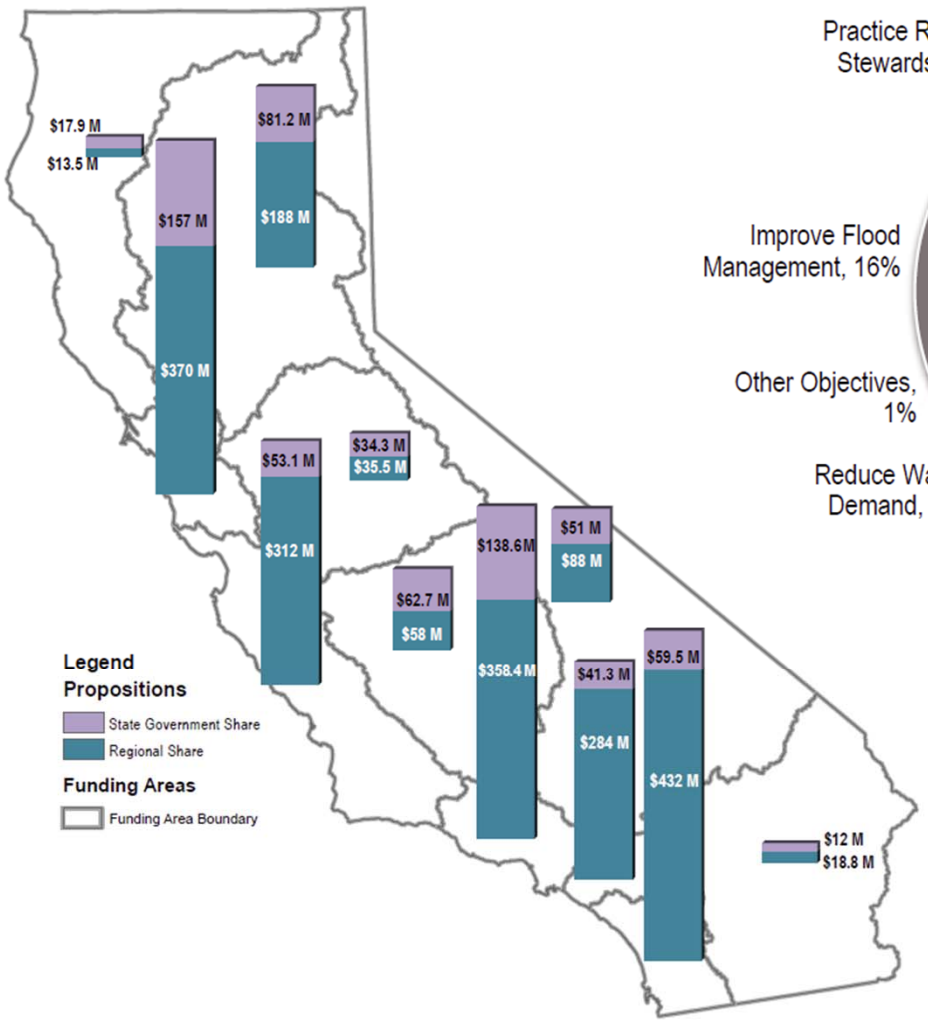
Using Data and Tools to Evaluate Performance



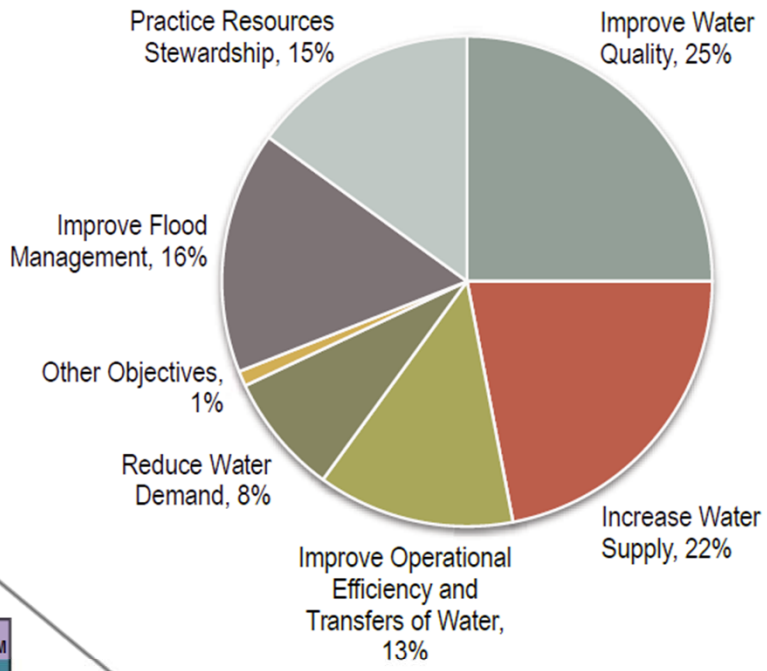
A Decade of Regional Investment

Regional Diversity Requires Regional Solutions

Investing in California's Regions

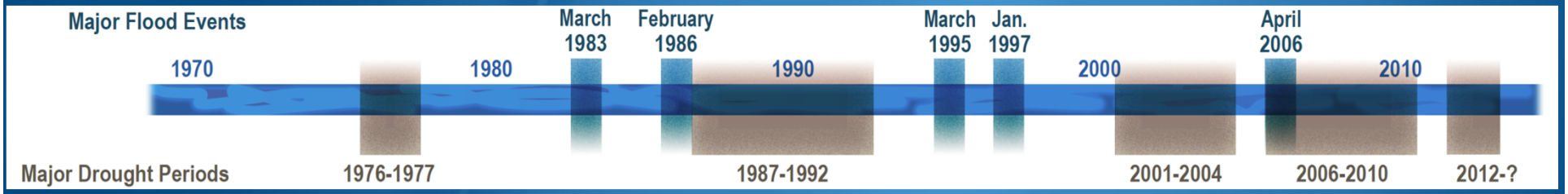


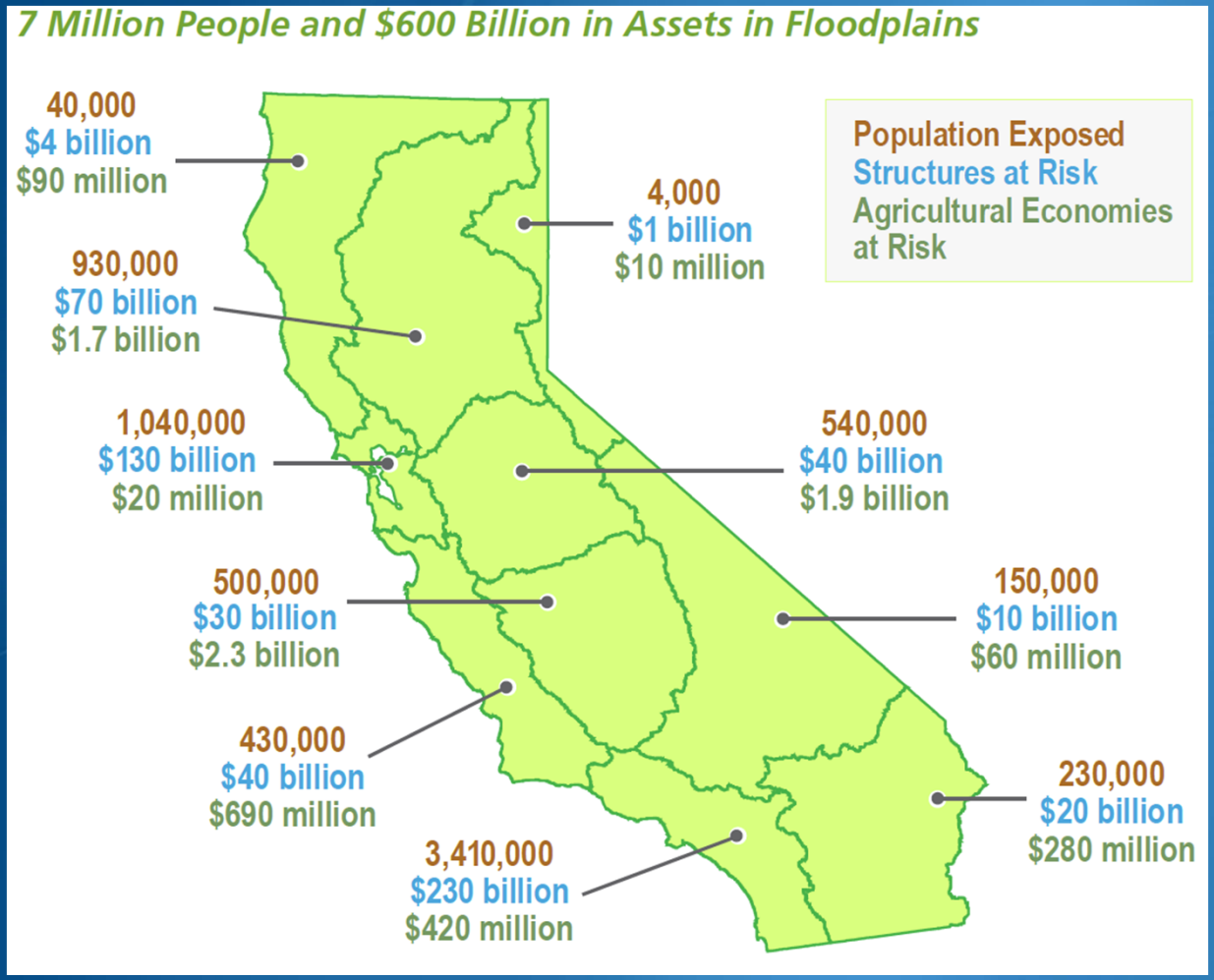
Achieving Multi-Benefits



What Happens if We Delay

Delay At Our Own Peril





Droughts and floods are inevitable in California, but drought and flood impacts don't have to be.

Conclusion - The Path Forward

Update 2013 provides a full description of California's water resources and planning, a call for action, and a recommended path toward sustainable water management.

Core Messages

- **Water is the Essence of Life for California.**

  Every living thing in the state, as well as our economy, depends on reliable, clean water to thrive. There are greater demands for water in our state than ever before.

- **California's Complex Water System is in Crisis.**

  Our interconnected system of water resources — natural and human made — is severely threatened on many fronts, with significant risks to our health, safety, economic well-being, and quality of life.

- **A Diverse Portfolio Approach is Required.**

  The complexity of our water resources systems and the associated risks demand a diverse set of actions and investment strategies. There is no silver bullet.

- **Solutions Require Integration, Alignment, and Investment.**

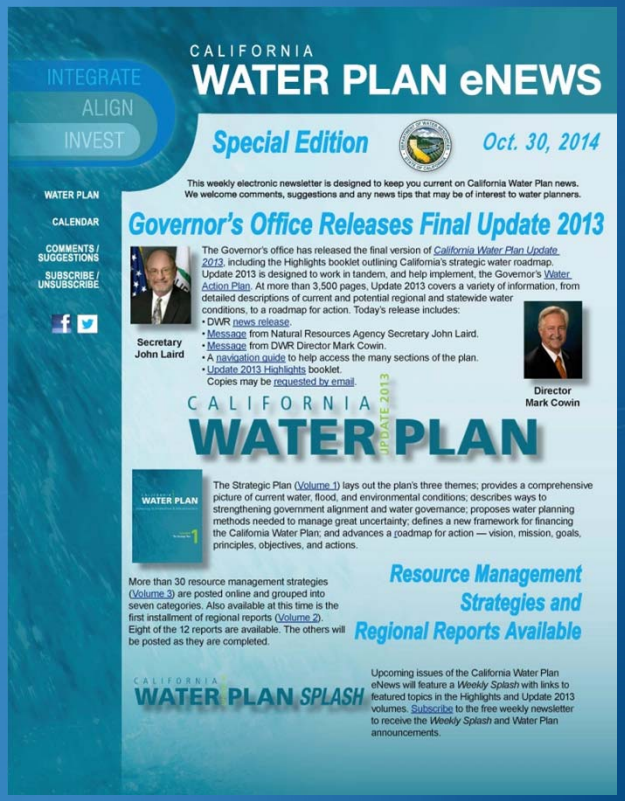
  Commitment to the IWM approach, alignment toward a common vision, and stable financing are essential to ensuring future resiliency — the ability to adapt to change.

- **We All Have a Role to Play in Securing Our Future.**

  Decision-makers, resource agencies, water resource managers, interest groups, and water users at the State, federal, tribal, and local levels need to actively engage in the solutions.

Ways to Access Water Plan Information

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



- Subscribe to *Water Plan eNews*
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