



Groundwater Management in California:

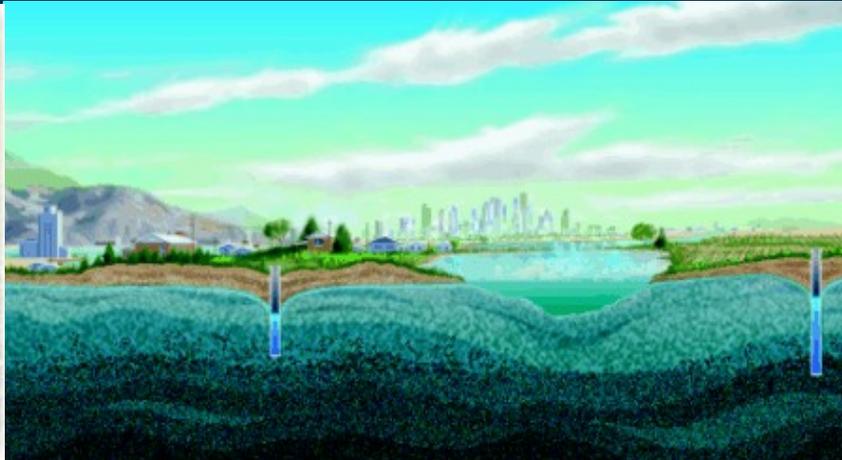
California Water Plan Update 2013 and Groundwater Content Enhancement Summary

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DWR / NCRO – Geology and Groundwater Investigations Section

October 12, 2012

Santa Rosa Plain Groundwater Management Plan Basin Advisory Panel





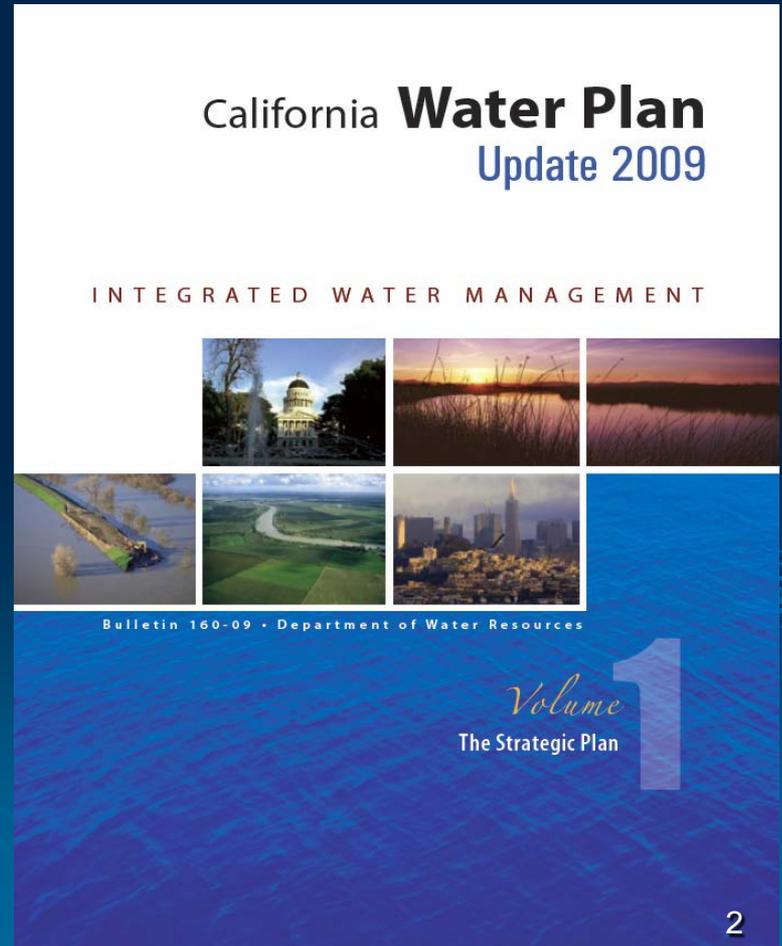
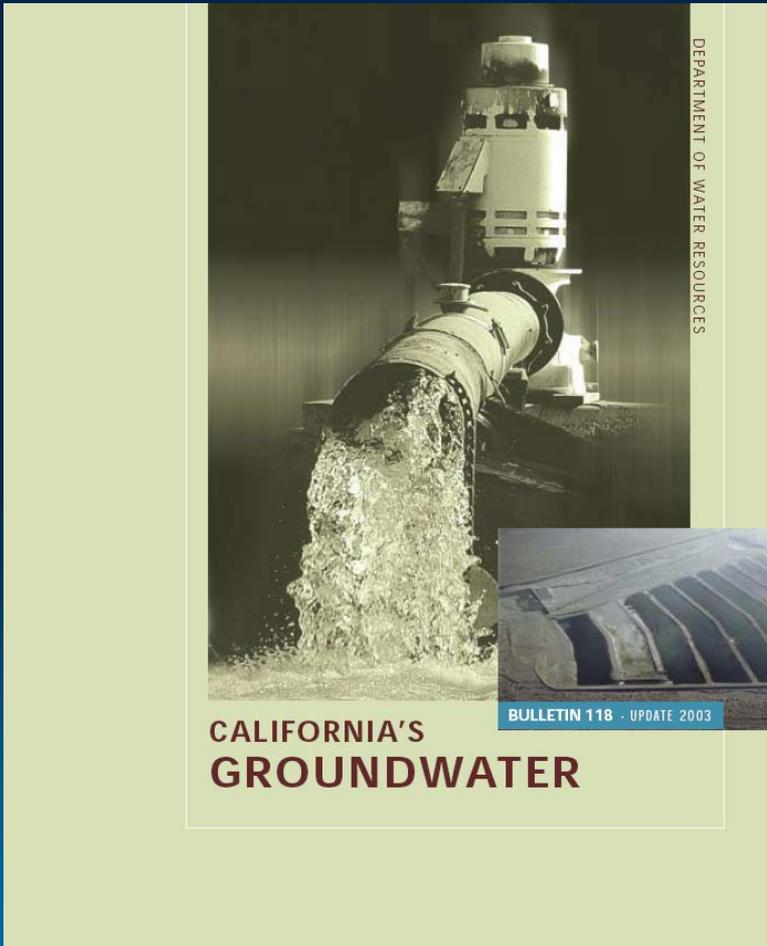
California's Water Plan

www.water.ca.gov/groundwater

www.waterplan.water.ca.gov

Bulletin 118

Bulletin 160





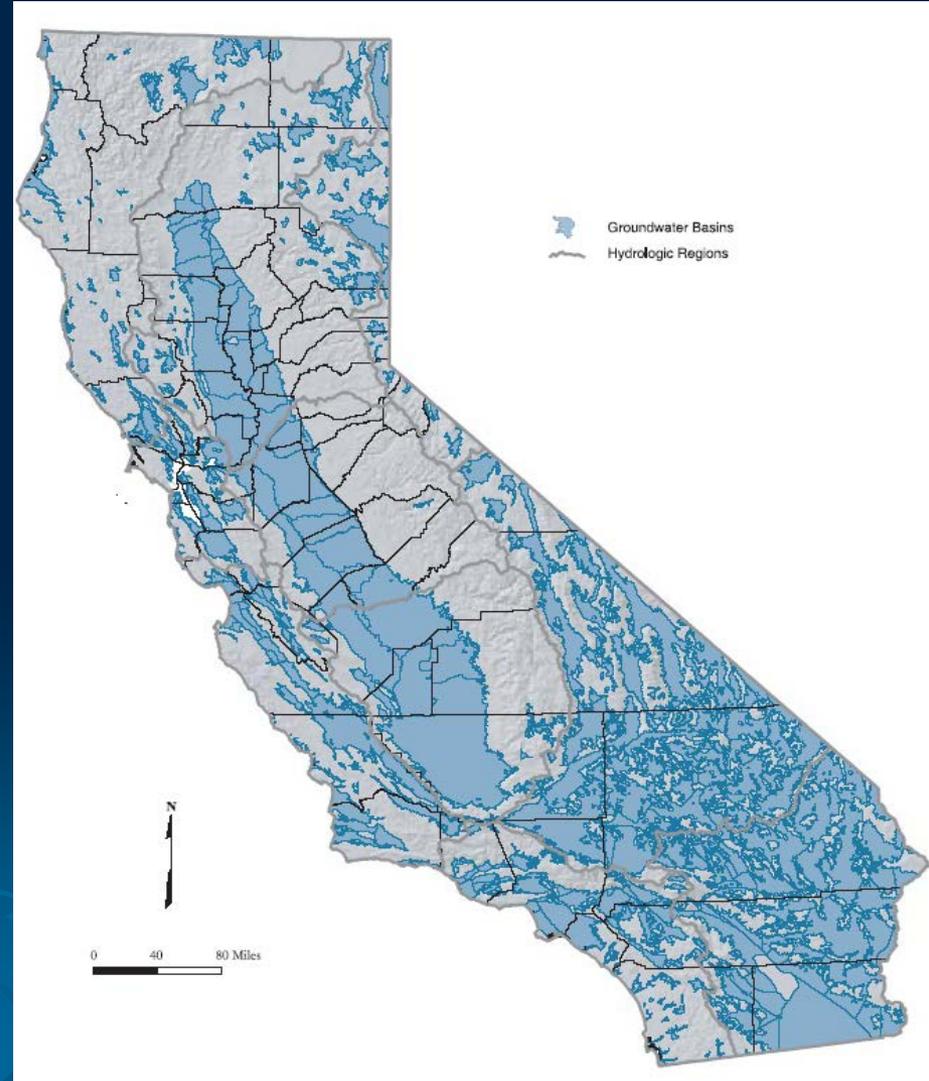
California's Groundwater

Groundwater basins are identified in *Bulletin 118 – Update 2003*

- 515 alluvial basins and subbasins delineated

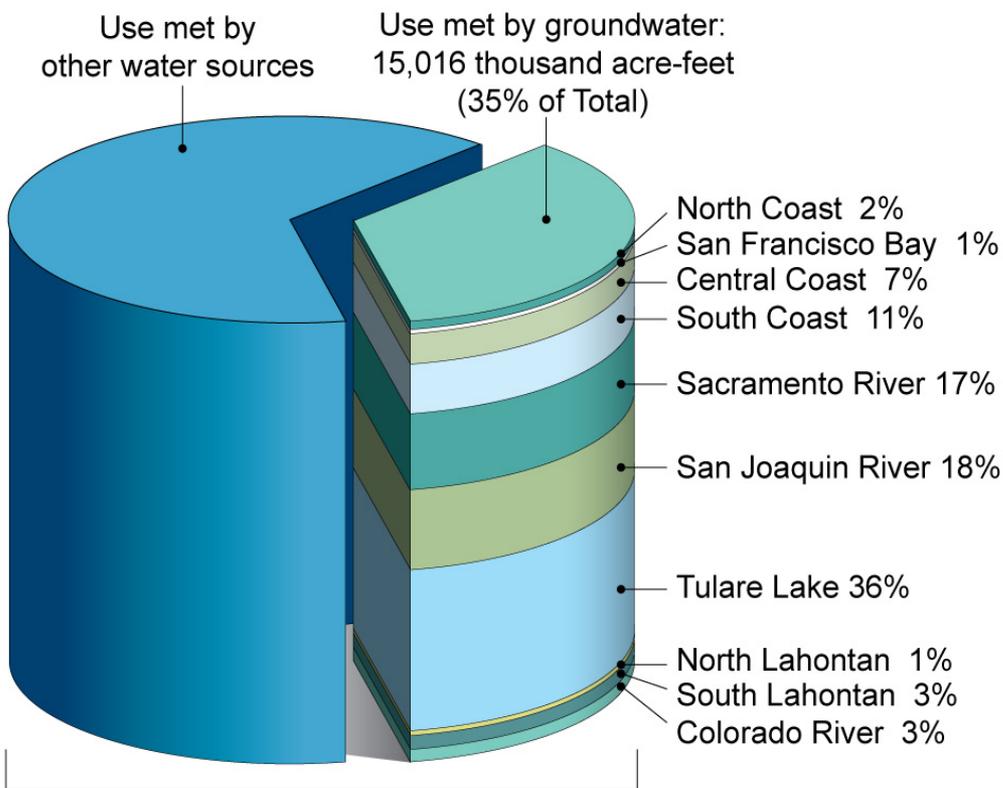
In California, groundwater provides:

- About 30% of water supply in normal years
- More than 40% in dry years



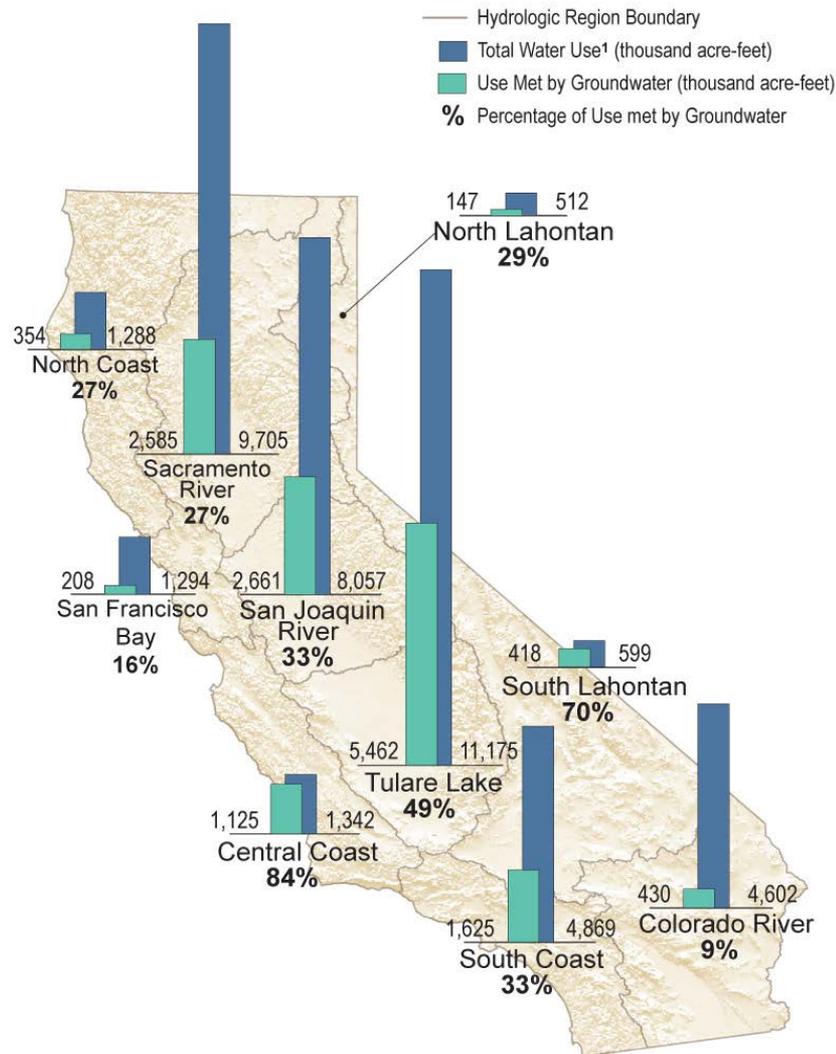


Water Use Met by Groundwater in California: Statewide and by Hydrologic Region



Total Water Use¹ in California:
43,443 thousand acre-feet

1. Total Water Use is defined as the sum of water uses for agricultural, urban, and managed wetlands.



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The California Water Plan – Est. 1957

- First published in 1957
- Updated 9 times; last one in 2009
- DWR required by law (Water Code) to update the Water Plan every 5 years; next one in 2013
- Growing interest by Legislature and stakeholders
- Not a mandate and No appropriation



California Water Plan Update 2013

California Water Plan Update 2013 (Update 2013) is currently being developed by staff from the Department of Water Resources (DWR) and other agencies through rigorous public involvement and State and federal agency coordination processes. It will build on the contents of the previous update — the five-volume *California Water Plan Update 2009*, which provided a strategic plan, a suite of resource management strategies, reports on California's hydrologic regions, and reference and technical guides — and will introduce a number of key additions and enhancements in response to stakeholder recommendations and evolving decision-maker information needs.

Integrated water management is a collection of policies, practices, and tools applied to water resources planning and management to achieve multiple objectives and enhanced outcomes.

Water Plan Framework for Integrated Water Management and Sustainability



Investing in Innovation and Infrastructure



Water Plan Update 2013

Groundwater Content Enhancement

Objective



Expand information about statewide and regional groundwater conditions

to

better inform groundwater management actions

through

compilation and summarization of data and analysis



Ways to Provide Input – Multiple Forums

Update 2013 Collaboration Venues





CWP 2009 Resource Management Strategies

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
- Sediment Management * new for 2013

Practice Resource Stewardship

- Agricultural Lands Stewardship
- Economic Incentives
- Ecosystem Restoration
- Forest Management
- Land Use Planning & Management
- Recharge Areas Protection
- Water-Dependent Recreation
- Watershed Management
- Outreach & Education * new for 2013
- Management of Cultural Water Resources & Practices * new for 2013

California Water Plan Update 2013: Groundwater Content Enhancement Deliverables

Task 1: Compile Groundwater Information

GWMP, CASGEM, IRWMP, UWMP, AGWMP, Water Transfer, Modeling Reports

Task 2: Summarize Groundwater Information

Task 3: Identify Groundwater Data Gaps

Task 4: Groundwater Change in Storage

Task 5: Groundwater Case Studies

Task 6: Conjunctive Management Opportunities

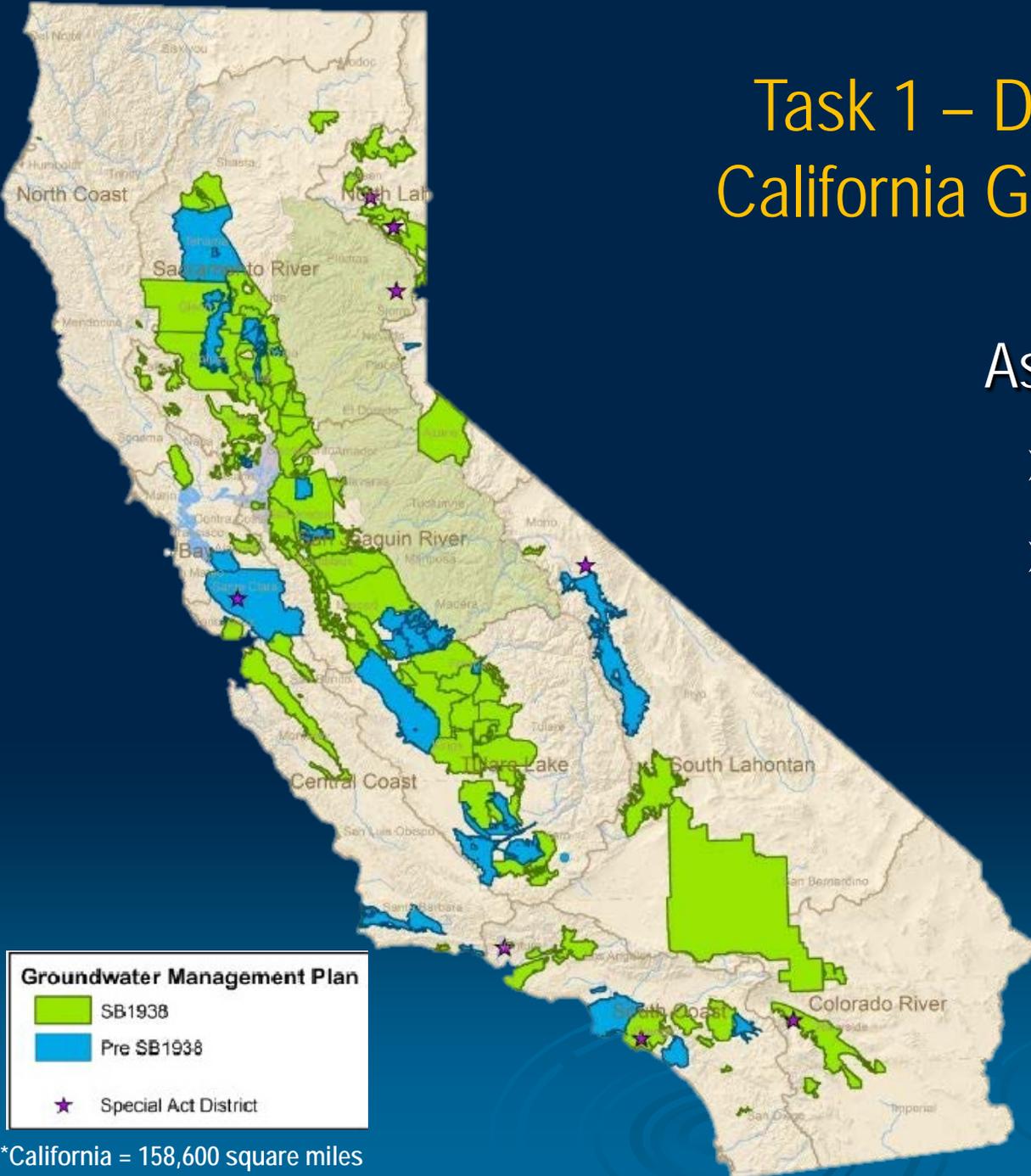
Task 7: Groundwater Banking and Flood Management

Task 8: Groundwater Sustainability Indicators

Task 1 – Data Collection: California GWMP Coverage

As of August 2012:

- 118 Plans
- Plan coverage (All)
 - 31,200 square miles
 - 20% of California*
 - 82 (or 70%) of the plans are post SB 1938 (2002)

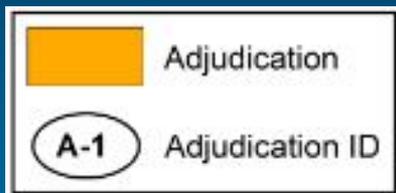
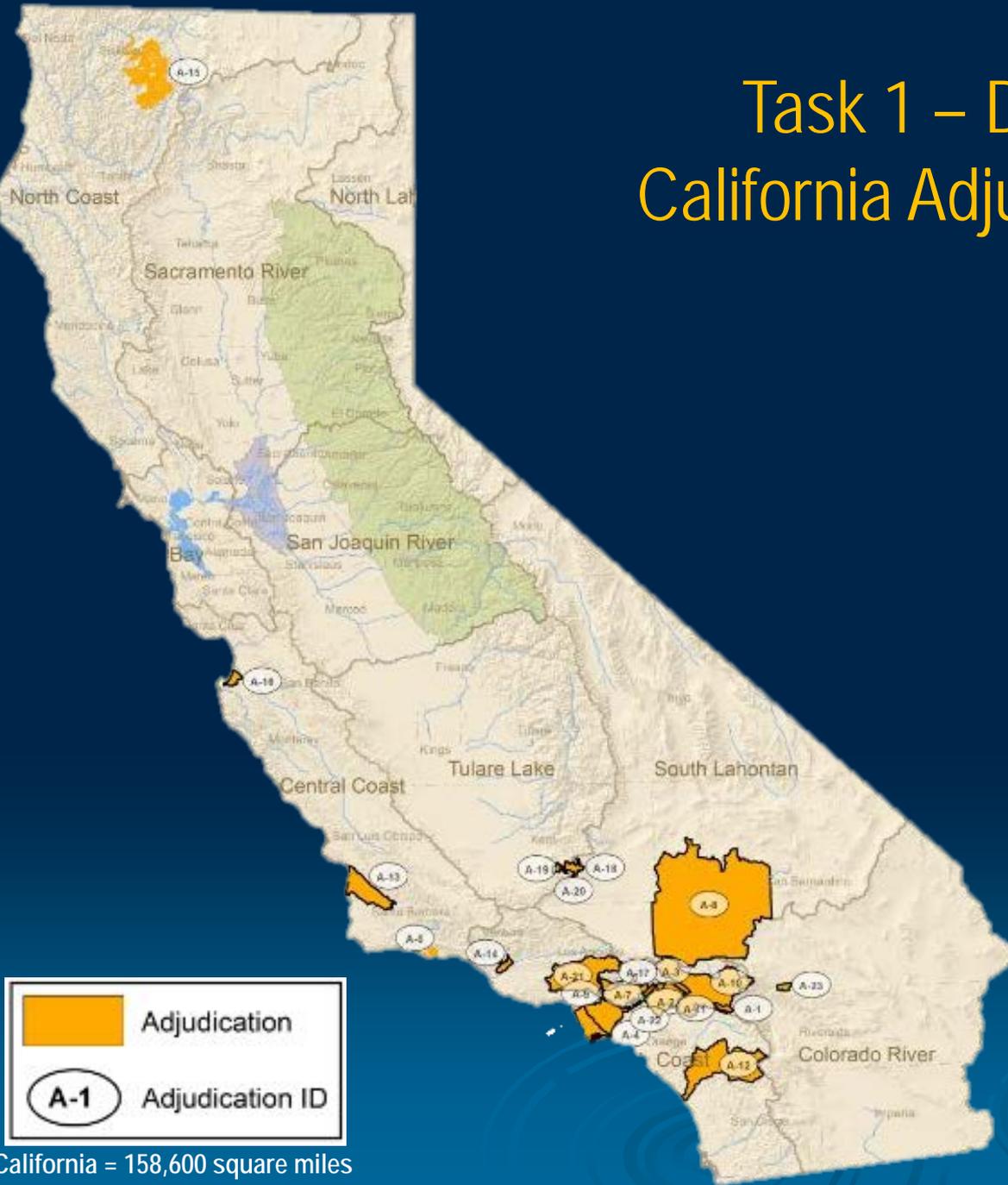


*California = 158,600 square miles

Task 1 – Data Collection: California Adjudication Coverage

As of August 2012:

- 23 Adjudicated Basins Statewide
- Plan coverage (All)
 - 6,900 square miles
 - 4% of California*
- GW Basins
 - 4,600 square miles

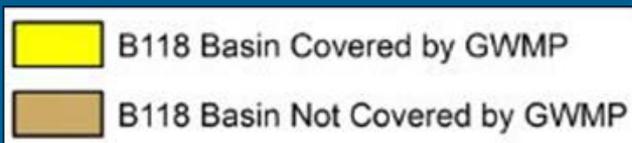


*California = 158,600 square miles

Analysis: California GWMP Coverage

All GWMPs and GW Basins

- Groundwater Basins
 - 61,900 square miles
- GWMP Coverage
 - 118 Plans
- Area Coverage
 - 25,900 square miles
 - 42% of GW Basin area



Analysis: California GWMP Coverage

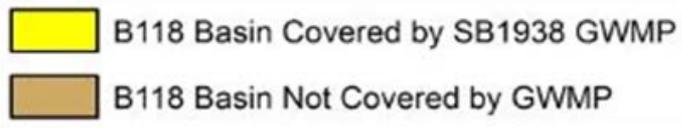
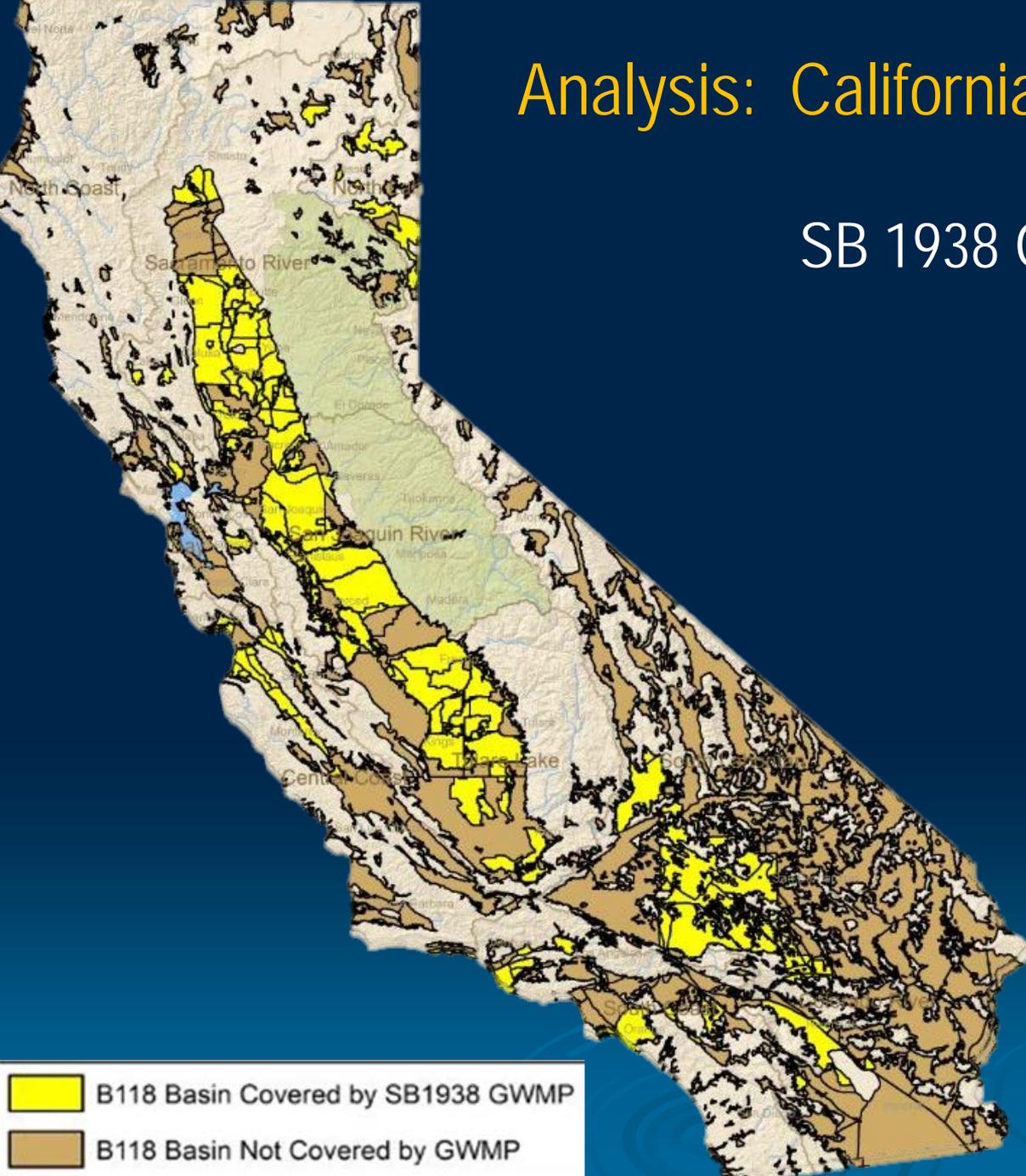
SB 1938 GWMPs and GW Basins

Post SB 1938 Plan (2002)

- GWMPs – 82 (70%)
- Coverage
 - 20,100 square miles
 - 32% of GW Basin area

Post SB 1938 plan with required components fully addressed

- GWMPs – 35 (43%)
- Coverage
 - 10,300 square miles
 - 17% of GW Basin area



GWMPs: SB 1938 Required Components

(CWC § 10753.7.1 - 10753.7.6)

1. Basin Management Objectives

Monitoring/Management Groundwater Levels

Monitoring Groundwater Quality

Inelastic Subsidence

SW/GW Interaction & Affects to Groundwater Levels & Quality

2. Agency Cooperation

3. Map

Groundwater basin area

Area of local agency

Boundaries of other local agencies

4. Recharge Areas (1/1/2013)

5. Monitoring Protocols

Changes in groundwater levels

Changes in groundwater quality

Subsidence

SW/GW Interaction & Affects to Groundwater Levels & Quality

6. Compliance with 1-5 for GWMPs Located Outside B118-03 Basins





GWMPs: Additional Components

Voluntary GWMP Components (CA WC §10753.8)

- 1. Control Saline Intrusion**
- 2. Identify & Manage Wellhead Protection & Recharge Areas**
- 3. Regulate Migration of Groundwater Contamination**
- 4. Administer Well Abandonment & Destruction Programs**
- 5. Mitigate Conditions of Overdraft**
- 6. Groundwater Extraction & Replenishment**
- 7. Monitoring of Groundwater Levels and Storage**
- 8. Facilitate Conjunctive Use Operations**
- 9. Identify Well Construction Policies**
- 10. Construction and Operation by the Local Agency of Groundwater Projects**
- 11. Develop Relationships with State & Federal Regulatory Agencies**
- 12. Coordinate with Land Use Planning to Minimize Risks to GW Supply**

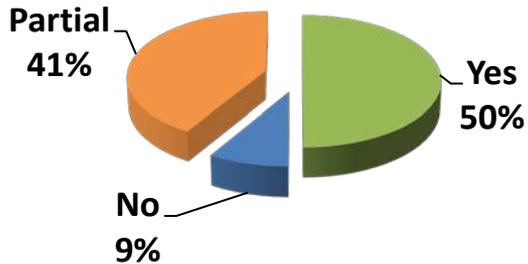
Suggested GWMP Components (B118-03, Appendix C)

- 1. GWMP Guidance: Establish Advisory Committee to Guide GWMP**
- 2. Management Area: Describe Physical Setting, Aquifer Characteristics, Historical Data, Known Issues, Historical Water Supply & Demands**
- 3. BMOs, Goals, & Actions**
- 4. Monitoring Plan Description**
- 5. IRWM Planning Coordination**
- 6. GWMP Implementation: Status Reports of Basin Conditions & Mgmt Actions**
- 7. GWMP Evaluation & Assessment**

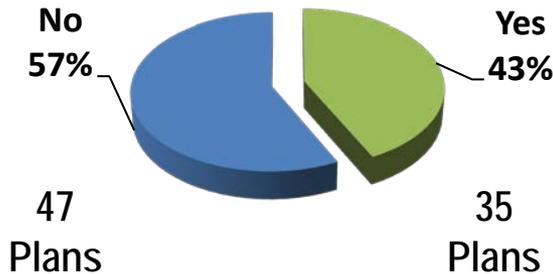


Task 2 – Analysis: Preliminary Results of Statewide GWMP Assessment

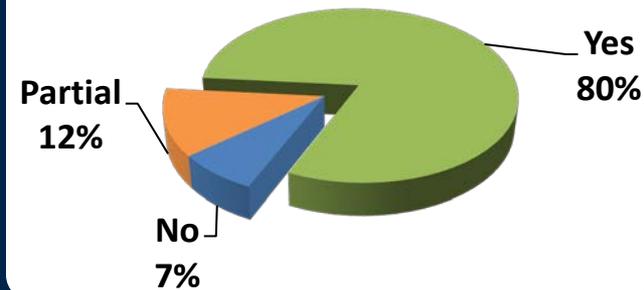
Basin Management Objectives



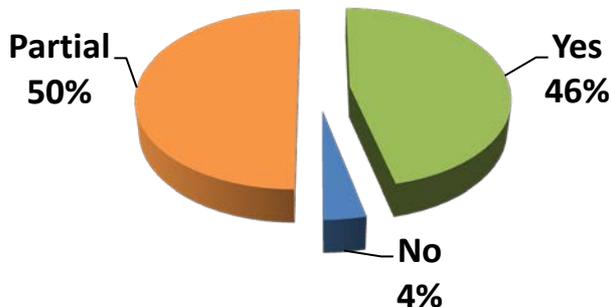
ALL SB 1938 Requirements Addressed



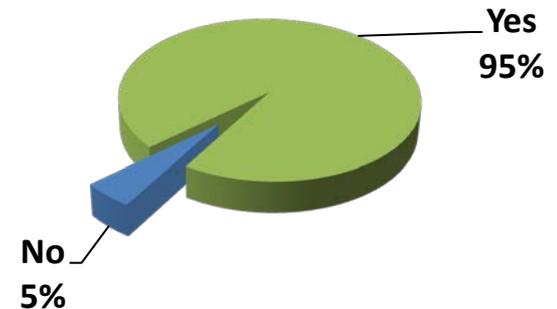
Map



Monitoring Protocols



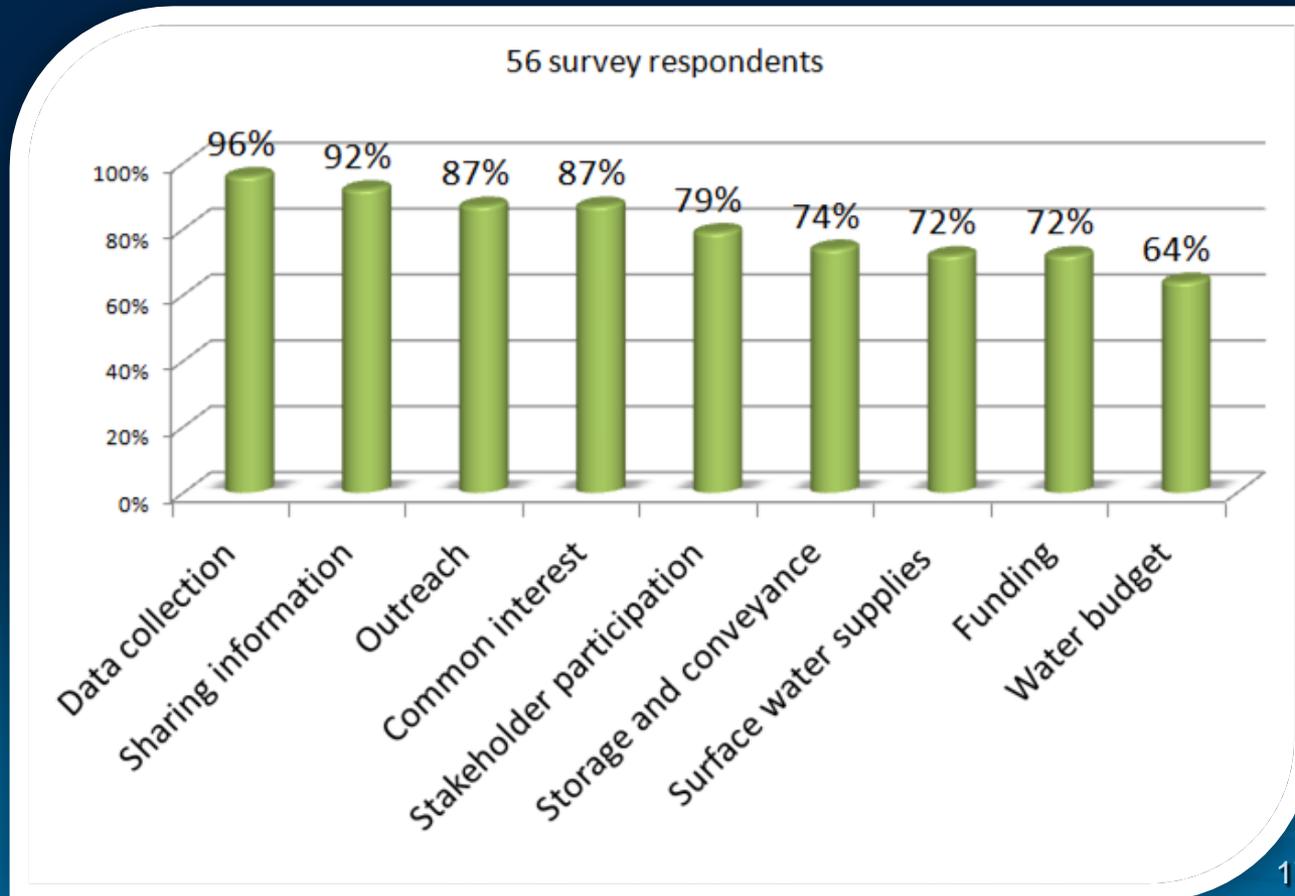
Agency Cooperation





DWR / ACWA Survey: Key Components for Success

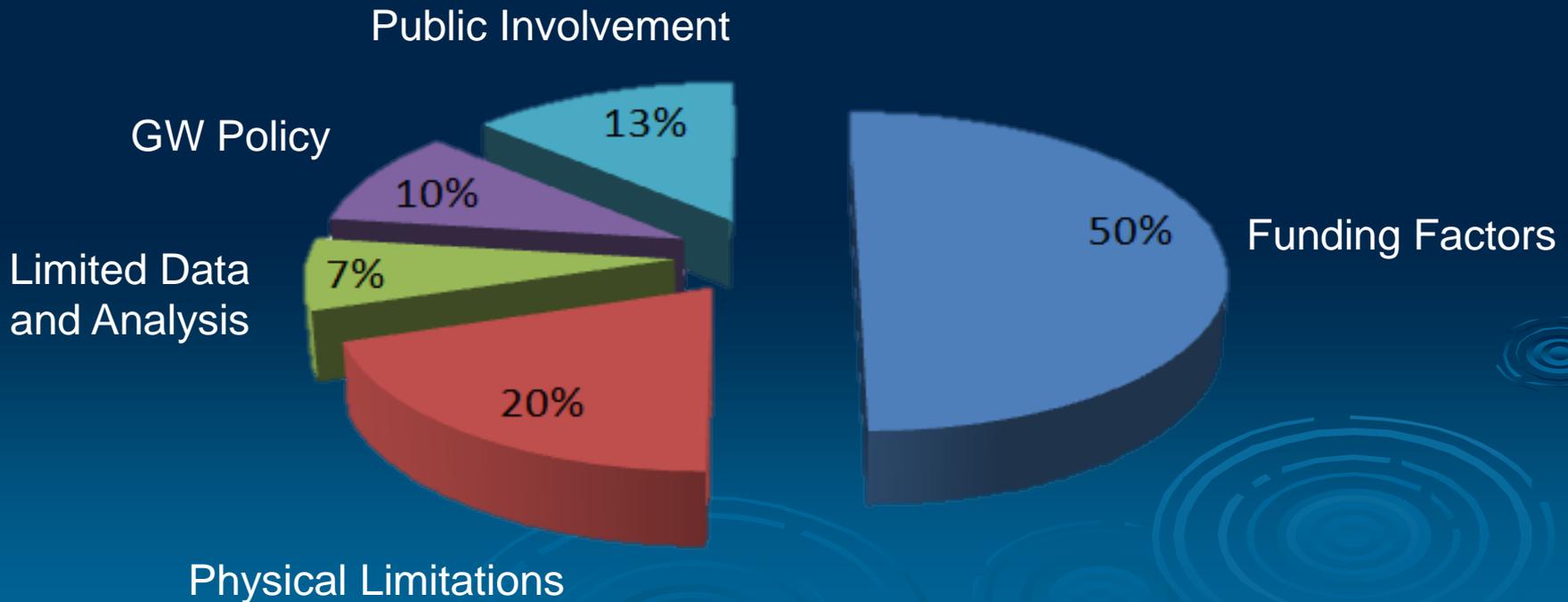
QUESTION: Which key components for the successful implementation of local groundwater management are being implemented by your agency? (check all that apply)





DWR / ACWA Survey: Factors That Limit Success

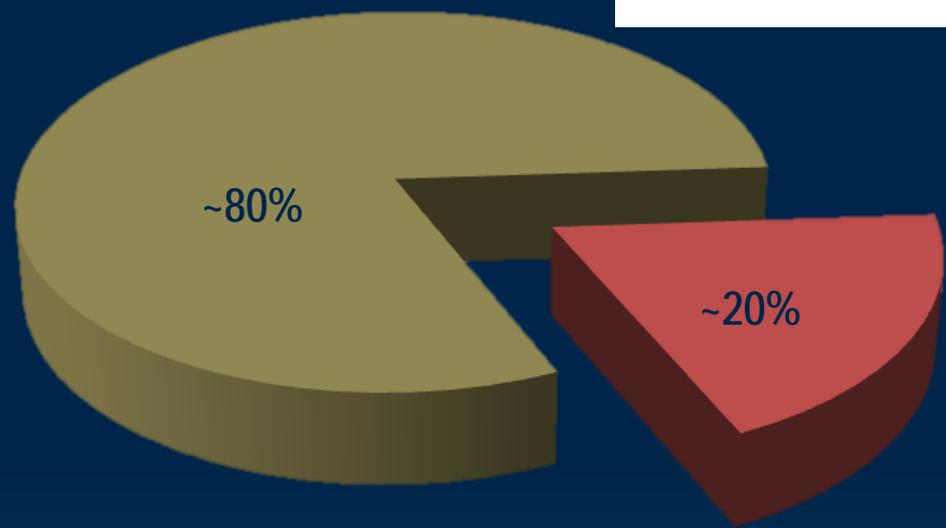
QUESTION: If you feel there are factors that limit the successful development and implementation of sustainable groundwater management in your area, please indicate them (check all that apply, or N/A)





Integrated Regional Water Management Plans and Groundwater Management

■ IRWMPs Reliant on GMPs to Manage Groundwater
 ■ IRWMPs Managing Groundwater



Of the 31 Active IRWM Plans:

- ~ 80% are reliant on local Groundwater Management Plans to manage groundwater
- ~ 20% take an active role in managing groundwater

48 IRWM Regions
 31 Active IRWM Plans
 17 in Development





Deliverable #6:

Purpose of the 2013 Conjunctive Management Inventory

CWP Update 2009 recommended a statewide inventory

- There is no comprehensive data monitoring network for conjunctive use or groundwater recharge programs
- Collect information to enable an informed decision making process for legislators and policy makers
- Identify areas where local agencies may need technical or financial assistance from state or local agencies
- To achieve better coordination among existing and future planning activities and to avoid potential conflict



Deliverable #6: Conjunctive Management and Groundwater Storage

Three Main Goals of Update 2013 Survey:

1. Inventory existing conjunctive use, recharge and groundwater banking projects
2. Determine future conjunctive management potential
3. Define program constraints





Deliverable #6: Conjunctive Management and Groundwater Storage

ACWA Survey Questions

1. Location of project
2. Year project developed
3. Capital costs to develop project
4. Annual operating costs (O&M)
5. Administrator/Operator of the project
6. Capacity of the project in acre-feet

DWR Supplemental Questions

1. Water received
2. Put and take capacity of the groundwater storage project
3. Type of groundwater recharge method
4. Program goals and objectives
5. Constraints on development of conjunctive management program



Inventory of Conjunctive Management Programs in California

Hydrologic Region	# Active Conjunctive Management Programs
North Coast	0
San Francisco Bay	4
Central Coast	5
South Coast	32
Sacramento River	3
San Joaquin River	5
Tulare Lake	37
North Lahontan	0
South Lahontan	2
Colorado River	1
TOTAL PROGRAMS	89



Note: List may not be complete

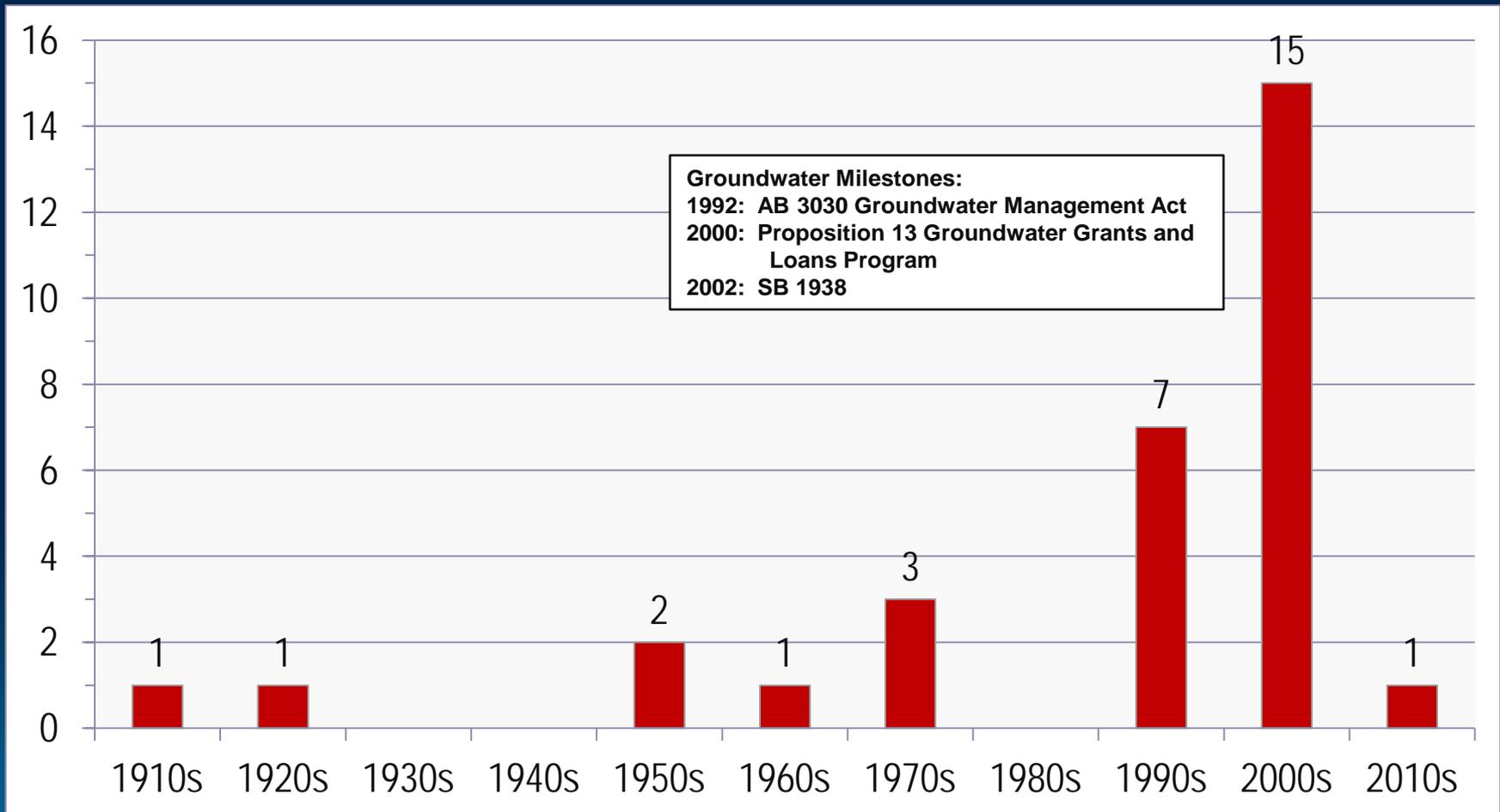


Summary of Conjunctive Management Survey Responses

Survey Question Topic	# of Conjunctive Management Survey Responses per Hydrologic Region										
	North Coast	San Francisco Bay	Central Coast	South Coast	Sacramento River	San Joaquin River	Tulare Lake	North Lahontan	South Lahontan	Colorado River	TOTAL # Responses
TOTAL PROGRAMS	0	4	5	32	3	5	37	0	2	1	89
Location	--	4	1	24	3	2	3	--	1	1	39
Year Developed	--	4	1	18	3	1	2	--	1	1	31
Capital Cost	--	0	1	12	1	0	2	--	0	0	16
Annual Cost	--	2	1	12	0	0	2	--	1	1	19
Administrator	--	4	1	18	3	3	6	--	1	1	37
Project Capacity	--	4	1	16	3	2	6	--	1	1	34
Water Received	--	2	2	19	3	1	9	--	1	1	38
Put/Take Capacity	--	2	2	16	2	4	18	--	1	1	46
Recharge Method	--	3	2	19	3	5	18	--	1	1	52
Goals/Objectives	--	0	2	18	2	2	11	--	1	1	37
Constraints	--	0	0	13	1	1	8	--	1	1	25



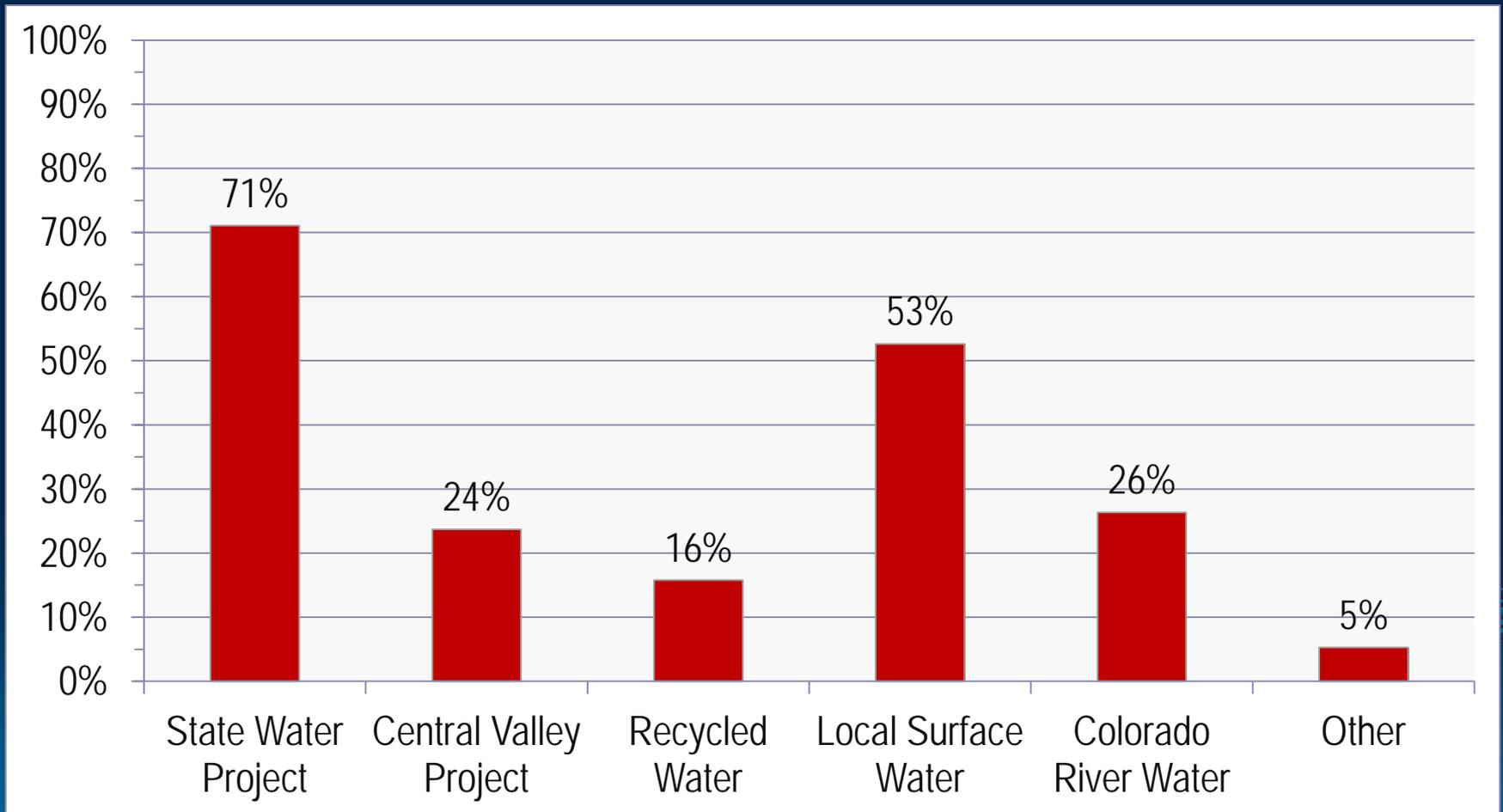
Statewide Summary: Number of Conjunctive Management Projects Developed per Decade



Note: 31 out of 89 programs reporting data



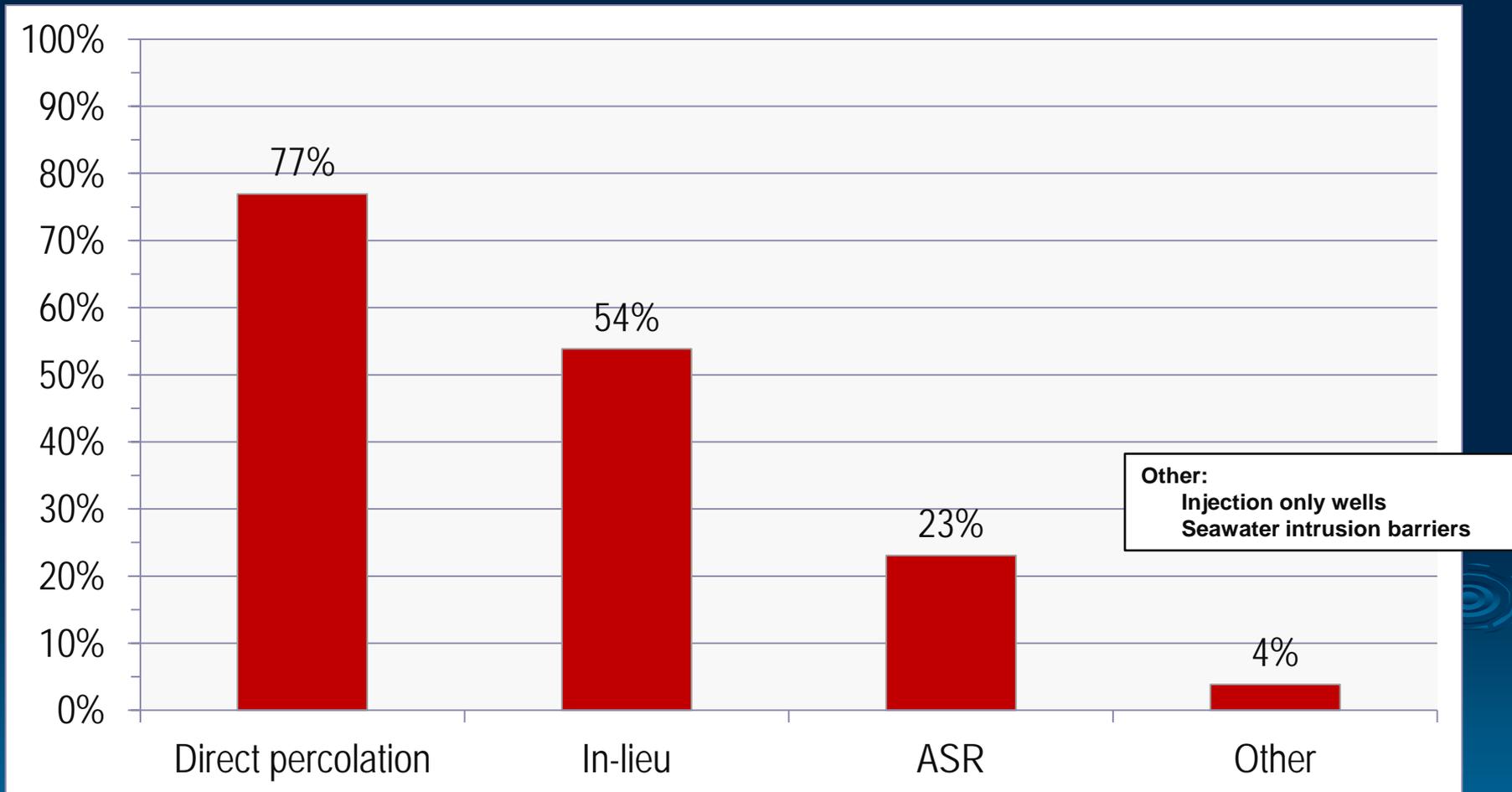
Statewide Summary: Source of Recharge Water



Note: 38 out of 89 programs reporting data



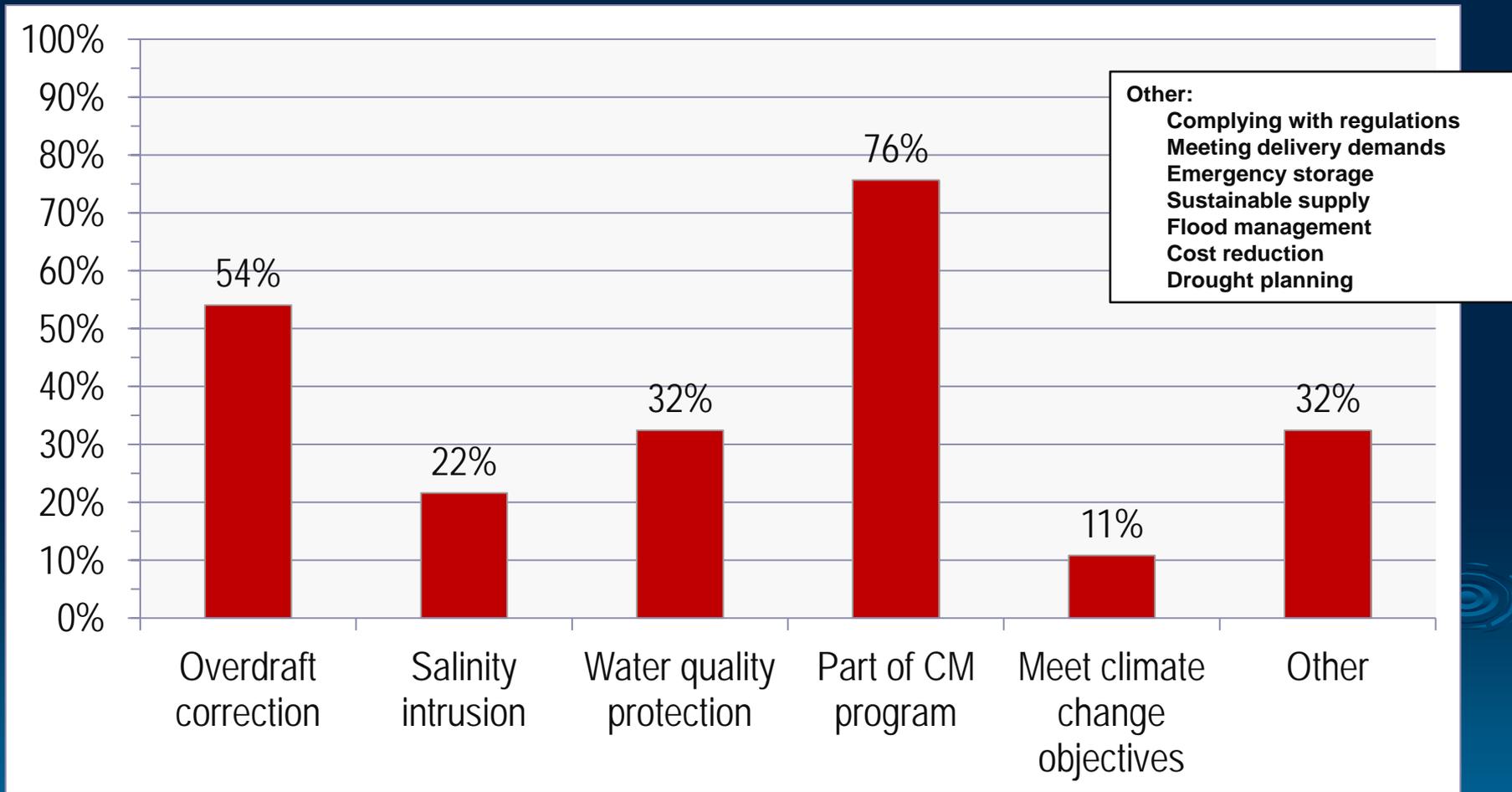
Statewide Summary: Method of Groundwater Recharge



Note: 52 out of 89 programs reporting data



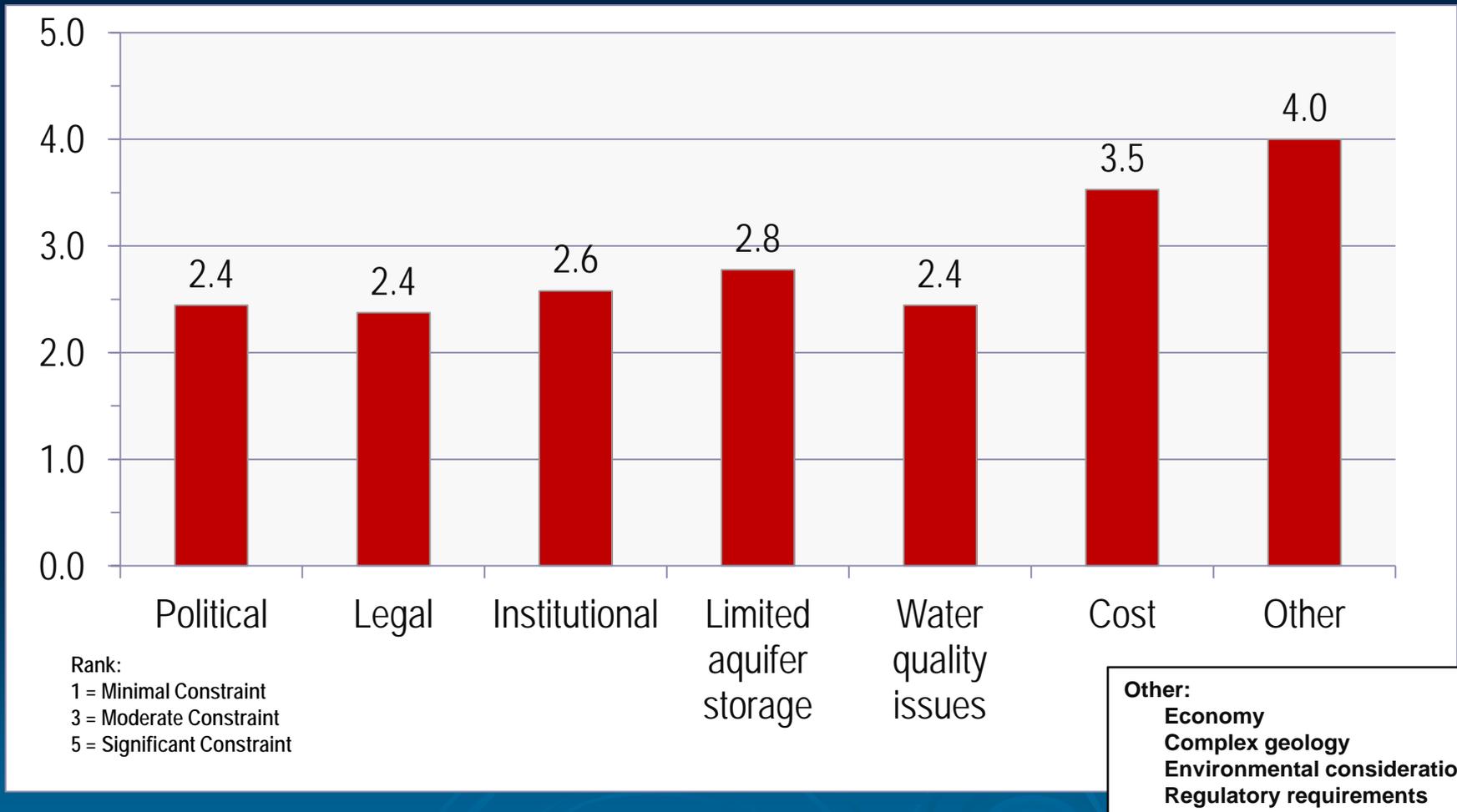
Statewide Summary: Program Goals and Objectives



Note: 37 out of 89 programs reporting data



Statewide Summary: Program Constraints



Note: 25 out of 89 programs reporting data



Questions and Comments?

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