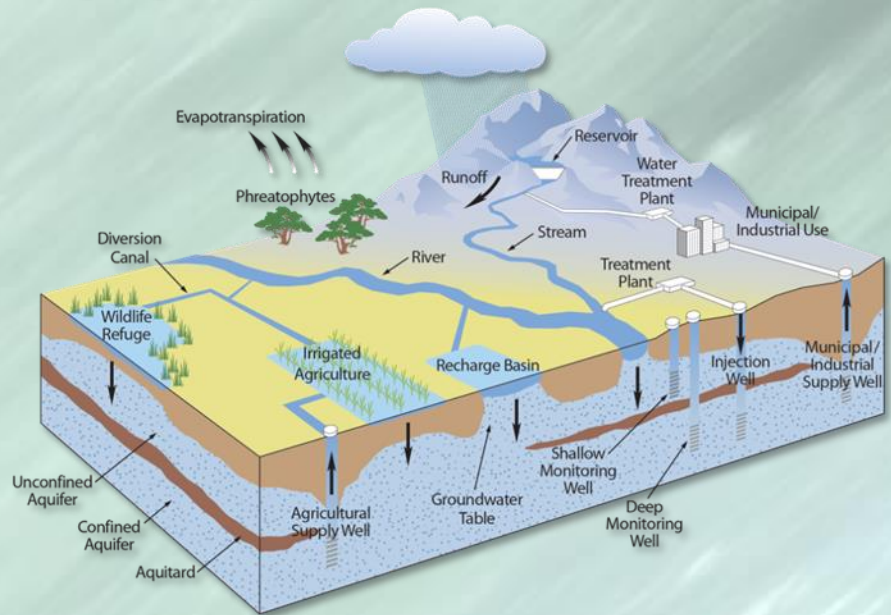
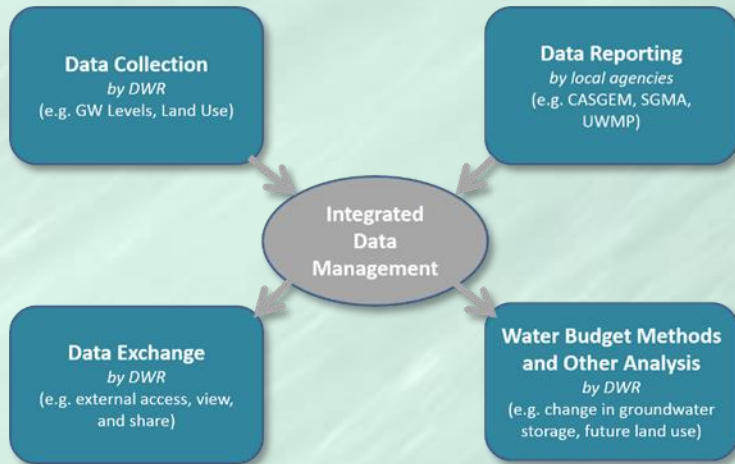


Strategic Vision and Framework for IWM Data and Tools



CWEMF Annual Meeting

Rich Juricich



Project Premise

The current program-focused approach of independent data collection and management will not meet DWR's data collection and reporting requirements of the Sustainable Groundwater Management Act (SGMA) and the goals of the California Water Action Plan (CWAP)



Project Goals and Objectives

- ◆ Goal: Confirm a strategic vision for DWR's data programs
 - Objective 1: Develop a framework for integrated water management data and tools
 - Objective 2: Develop recommendations for data collection, data reporting, data management/exchange, and water budget methods



Project Developed Key Documents

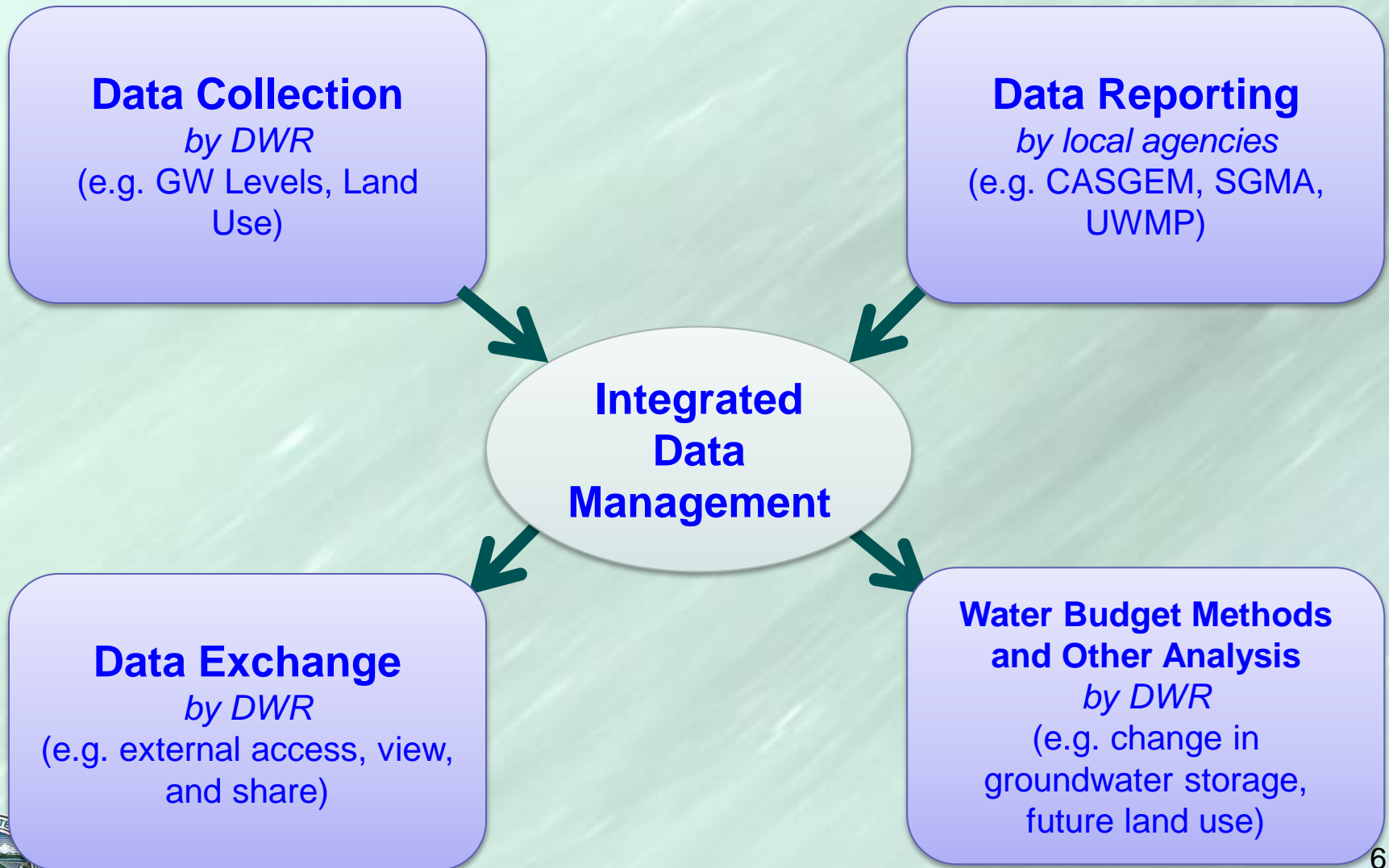
- **Issue Paper** of existing DIRWM/DSIWM data management practices and problems
- **Current Conditions Document** from Subject Matter Expert meetings
- **Strategic Data Framework** with recommendations for DIRWM/DSIWM data collection, data reporting, data management/exchange, and water budget methods
- **PMPs** for data collection, data reporting, data management/exchange, and water budget methods



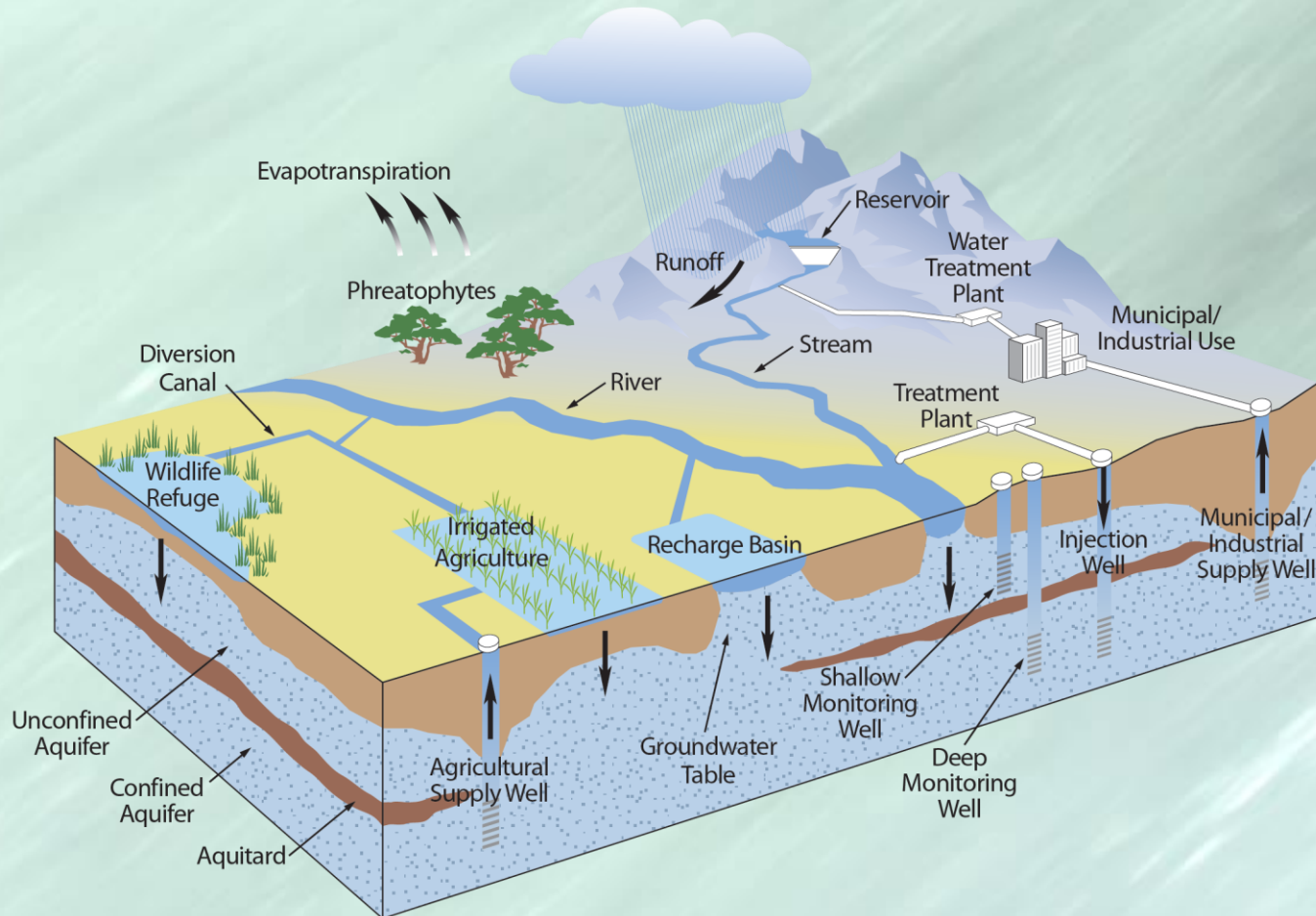
Project process



A function-based data framework and tools needed to support integrated water management



Comprehensive water budgets and water reliability maps needed to support integrated water management



Overview of Strategic Vision and Framework for Integrated Water Management Data and Tools

- 💧 Current conditions for data, tools, and water budget methods.
- 💧 Legislation and other drivers.
- 💧 Intended outputs/outcomes of strategic data framework.
- 💧 Vision, objectives, and actions to implement strategic data framework.
- 💧 Cross-cutting actions.



Key Findings on Current Business Practices

- Standardization
- Consistency
- Quality Control
- Data and Data Coverage
- Programmatic
- Tools



Outcomes of Strategic Data Framework

- 💧 Sustainable water management through increased transparency, credibility and acceptance.
- 💧 Reduced redundancy and duplicative efforts.
- 💧 Increased efficiency and reduced costs of reconciliation.
- 💧 Increased access, usability, and consistency.
- 💧 Meets legislative mandates and policy provisions (e.g., SGMA and CWAP).

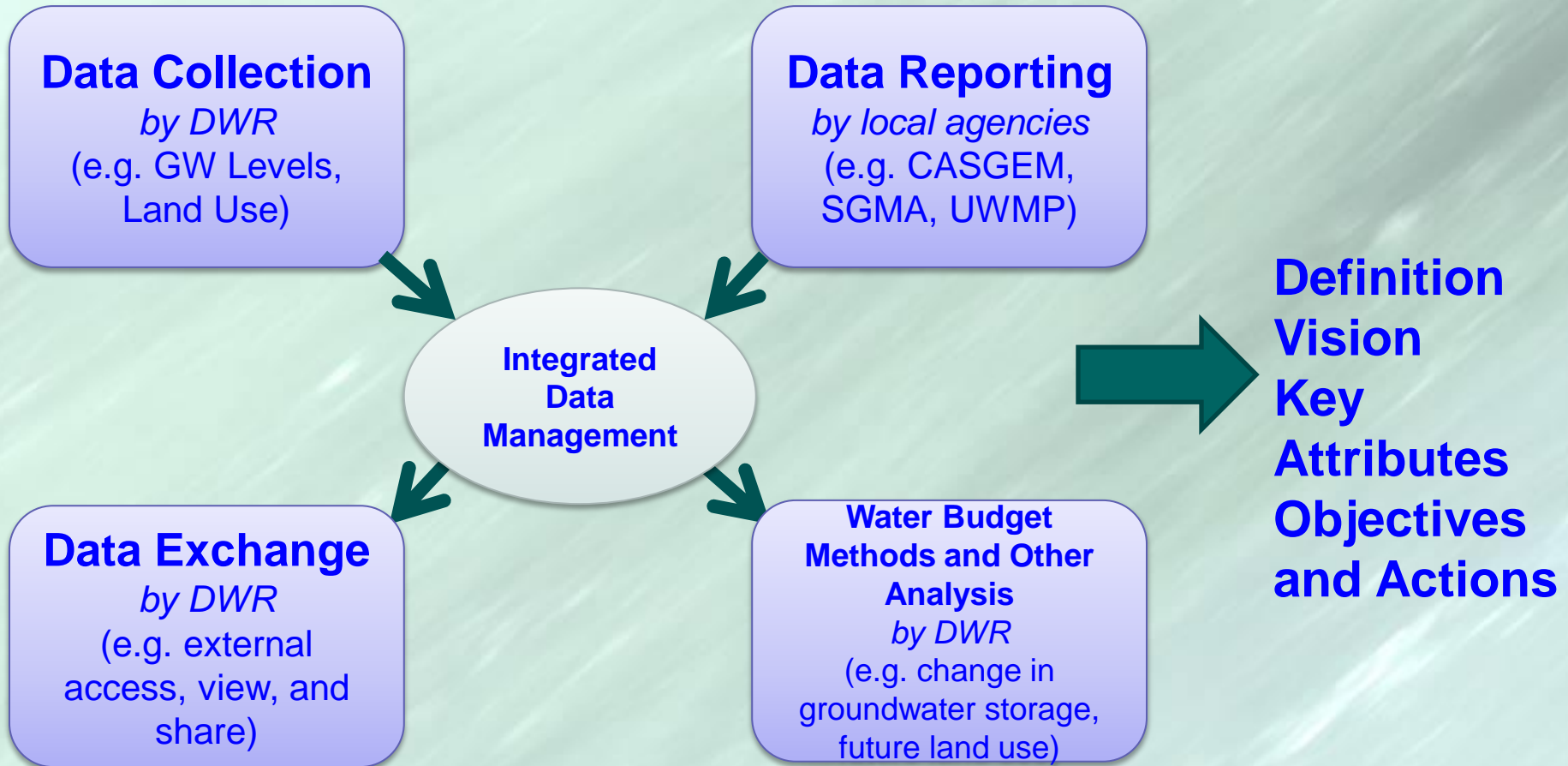


Overarching Strategic Vision

DWR's water information is organized and integrated in such a manner that it is universally accessible and supports watershed-based water budgets for integrated water management



Strategic Action Plan for Each Organizing Element



Data Collection (by DWR)

Definition

- Data collection includes business practices associated with the collection of data by DWR. This may include collection of monitoring data or land use information.

Vision

- DWR has comprehensive data collection protocols with consistent vocabulary, complete metadata, standardized methods, and data quality assurance and control procedures among DWR programs.

Key Attributes

- Reliable
- Definition dictionary
- Validation and QA/QC features
- Automated data transfer
- Easy-to-understand
- Accessible
- Data security
- Tracking features
- Data maintenance
- Geo-referenced and time-stamped
- Transparent



Objectives for Data Collection

- Develop and implement comprehensive data collection protocols
- Establish authoritative sources for water related boundary spatial data
- Collaborate with other agencies on statewide data collection
- Fill data collection gaps to support implementation of SGMA, improve CWP analysis, and facilitate program integration
- Expand utilization of land-based and remote sensing technologies to improve data collection
- Secure long-term funding for implementing vision and strategies for data collection



Recommended Data Collection Responsibilities

Data	Recommended Data Collection Responsibilities		
	DWR and other State Agencies	State	GSA, IRWM Groups, and Local Agencies
Aquifer characterization and properties	✓		
Change in groundwater in storage	✓		
Climate/climate change data	✓		
Evapotranspiration	✓		
Groundwater elevation	✓		✓
Groundwater extraction			✓
Land subsidence	✓		
Land surface elevation	✓		✓
Land use (crop type and acreage)	✓		
Recycled/reused water			✓
Socioeconomic data	✓		
Streamflow	✓		
Surface water supply			✓
Sustainable yield			✓
Water budget	✓		✓
Water reliability maps	✓		✓
Water use			✓
Well test data			✓



Data Linkage to DWR Programs

Data Category	Water Use	CWP	Land Use	AWMPs	Drought Response	BDO	Ground-water	Others
Climate and Hydrology	4	14			6	6	10	42
Land Use		9	9		2	2	4	5
Crop Water Use Parameters	3	12			1	1	0	1
Soil	2	11			4	4	1	10
Data Provider Information	3			2			6	10
Well Information					9	1	29	9
Groundwater	4	8		4	21	4	31	36
Surface Water Supply	4	18		3	6	6	1	52
Imports and Exports	4	5		5	3	2	0	9
Recycled Water	4	9		2		1	0	8
Agricultural Water Use	6	6		1			0	7
Urban and Industrial Water Use	8	16			2	2	0	0
Wetlands Water Use		8					0	5
Habitat		9					0	2
Demographic	2	2			1	1	0	1
GIS and Maps	2	18			11	9	0	4
Miscellaneous						3	0	17
Total Data Elements	46	145	9	17	66	42	84	162 218



Data Reporting (to DWR)

Definition

- Data reporting includes submission of data and reports by local agencies, federal, or state agencies to DWR.

Vision

- DWR has an enterprise scale data reporting system for local agencies to submit data for all DWR programs in a secure, easy, standardized, and transparent manner.

Key Attributes

- Web-based
- GIS-based
- Easy-to-learn and understand
- Reliable
- Data security
- Submission tracking
- Validation and QA/QC features
- One-stop-shop for data submittal
- Easy-to-use
- Easy-to-access
- Flexible
- Well-documented with metadata
- Fast system performance
- Version control



Objectives for Data Reporting

- ◆ Design a comprehensive data reporting system to support DWR programs
- ◆ Collaborate with GSAs, IRWM groups, and local agencies
- ◆ Test and evaluate data reporting system through pilot projects
- ◆ Develop a full scale data reporting system
- ◆ Secure long-term funding for implementing vision and strategies for data reporting



Data Management and Exchange

Definition

- Data management and exchange includes storing and managing data by DWR as well as sharing the data with the public and other agencies.

Vision

- DWR has an enterprise data management and exchange system that uses a clear and consistent vocabulary, has complete metadata, is accessible within and outside DWR with appropriate levels of permissions, has standard operating procedures, and facilitates the collection, submittal, sharing, and use of data.

Key Attributes

- | | |
|--|-------------------------------|
| ➤ Web-based | GIS-based |
| ➤ Easy-to-use and understand | Easy-to-train |
| ➤ Easy-to-access | Reliable |
| ➤ Secure | Well-documented with metadata |
| ➤ Flexible and extensible | Query library |
| ➤ Fast system performance | Validation and QA/QC features |
| ➤ Aggregation, disaggregation, and summarization capabilities across different spatial and temporal scales | |



Objectives for Data Management and Exchange

- Develop preliminary design for enterprise data management system
- Build in-house DWR capacity for data management
- Develop preliminary design for data exchange system
- Test and evaluate the preliminary design through pilot projects
- Develop and implement modular components of enterprise data management and exchange system
- Secure long-term funding for implementing vision and strategies for data management and exchange



Water Budget Methods

Definition

- Water budget methods include analysis and modeling performed by DWR to develop water budgets by computing/ estimating various components of the water budgets.

Vision

- DWR has a defensible method for estimating watershed based water budgets that allows for flexible spatial and temporal scales, can be utilized by GSAs and local agencies, and leads the way towards consistent water budgets developed by local, state, and federal agencies, and tribal entities.

Key Attributes

- Well-documented with a definition dictionary
- SGMA compliant and consistent with CWP and other DWR programs
- Scientifically sound
- Inclusive of regions with sparse data
- Hydrologically robust (i.e., accounts for water year types and regional variability)
- Includes movement of water between and within basins and both short-term and long-term stream-aquifer interaction

Transparent (i.e., all data sources and analysis methods are documented) ²¹



Objectives for Water Budget Analysis

- Develop a defensible framework for water budget
- Collaborate with and support GSAs, IRWM groups, and local agencies
- Test and evaluate the water budget and water reliability mapping framework through pilot projects
- Develop water budget for state of California
- Secure long-term funding for implementing vision and strategies for water budget



Cross Cutting Actions

Cross-Cutting Actions	Data Collection	Data Reporting	Data Management and Exchange	Water Budget Methods
<p>Actions Related to Standards and Protocols</p>	<p>DC 1.1: Establish consistent vocabulary and define appropriate and complete metadata standards.</p> <p>DC 2.1: Implement consistent vocabulary, metadata standards, and standardized methods and processes.</p>	<p>DR1.2: Develop a comprehensive data reporting process.</p>	<p>DME 1.2: Establish a data catalogue and data dictionary and develop standards and protocols.</p> <p>DME 3.2: Establish data exchange protocols.</p>	<p>WB 1.1: Define the temporal and spatial data components needed for estimating water budgets and establish common vocabulary.</p>
<p>Actions Related to Communication and Outreach</p>	<p>DC 4.1: Collect and share water data including groundwater data.</p> <p>DC 4.2: Coordinate streamflow gaging measurement sites.</p> <p>DC 4.4: Establish program to develop data sets with other levels of government.</p>	<p>DR 1.4: Coordinate with SWRCB for alignment and consistency under SGMA.</p> <p>DR 2.1: Develop an outreach plan for GSAs, IRWM groups, and/or local agencies.</p> <p>DR 2.2: Work with GSAs to establish "best practices."</p> <p>DR 2.3: Establish feedback process with GSAs, IRWM groups, and local agencies.</p>	<p>DME 3.3: Collaborate with agencies for data exchange.</p>	<p>WB 2.1: Form partnerships with GSAs, IRWM groups, and/or local agencies to conduct pilot water budget studies.</p>
<p>Actions Related to Long-term Funding</p>	<p>DC 7.1: Secure long-term funding for data collection.</p>	<p>DR 5.1: Secure long-term funding for data reporting.</p> <p>DR 5.2: Utilize grant funding incentives.</p>	<p>DME 6.1: Secure long-term funding for data management and exchange.</p>	<p>WB 5.1: Secure long-term funding for water budget methods and other analytical tools.</p>



Thank you!

➤ Questions?

➤ Contact:

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