

Water Available Estimates by the California Department of Water Resources

2016 CWEMF Annual Meeting
Modeling Extremes: Drought to Flood and
In-Betweens

SGM Sustainable Groundwater Management



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Legislation

Water Code Section 10729(c):

The department shall prepare and publish a report by December 31, 2016, on its Internet Web site that presents the department's best estimate, based on available information, of water available for replenishment of groundwater in the state.

Water Code Section 10727.2(d)(5):

A description of surface water supply used or available for use for groundwater recharge or in-lieu use [is required for certain GSAs in their GSPs]

Water Available For Replenishment (WAFR) Concept Overview

➤ **Concept to Implementation (Planning To Projects)**

- **Regional Estimates**
- **Project Level Analysis**
 - **Based Upon Project-Specific Design Constraints**

➤ **WAFR In Two Parts**

For Successful Implementation That Would Replenish Groundwater, GSAs Will Likely Need At Least Two Projects

1. **Water Available project**
2. **For Replenishment project**

Report Outline

Chapter 1: Introduction and Purpose

Chapter 2: How to Use this Report

Chapter 3: Description of Water Available for Replenishment

Chapter 4: Water Available Information and Estimates

Chapter 5: State Water Project and Central Valley Project and Water Available

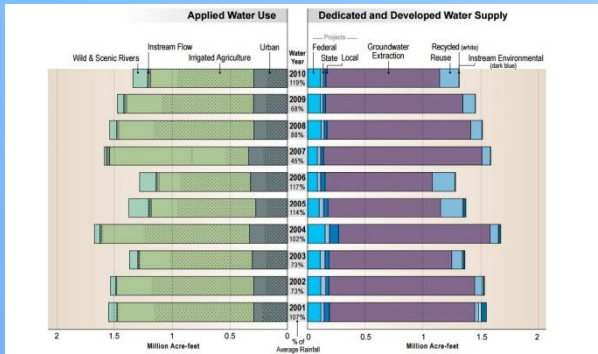
Chapter 6: Water Available Roadmaps, by Method

Chapter 7: Replenishment Roadmaps, by Replenishment Method

Chapter 8: Next Steps

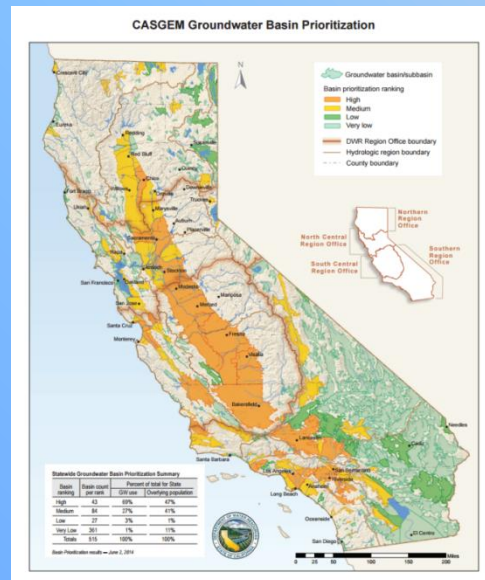
Water Available Information and Estimates by Hydrologic Region

➤ Information Associated with Water Availability



➤ Regional Estimates by Methods of Making Water Available

➤ Regional considerations for Replenishment of Water Available



Technical Approach: Water Available Estimates

Surface Water

- **Water Available Estimates will be developed in a similar way to the SWRCB water rights method but without including all factors (planning estimate vs. project specific estimate)**
- **Water Available = Runoff - Water Use**
 - Where “water use” includes urban, agricultural, environmental, and instream requirements as well as operations, including storage, diversion, and delivery of water
- **Estimates provided by season and water year type (e.g. wet, above normal, below normal, dry and critical year) and long-term average**

Desalination, Conservation, Recycling and Others

- **Use data and information from CA Water Plan Update**

Estimates for Surface Water Available

For the Central Valley, various models are readily available that could help with the estimates:

- **CalSim II**
- **WEAP CVPA model**
- **CALVIN**

How do we tackle the rest of the State?

Estimates for Surface Water Available

$$\text{Surface Water Available} = \text{Runoff} - \text{Water Use/Demands}$$

Gage Data Method

1. Gage Data at Mouth of the River
2. Regression Analysis to Fill in Data Gaps
3. Area Pro-Rations for Ungaged Areas
4. Precipitation Data for Ungaged Areas

WEAP Modeling

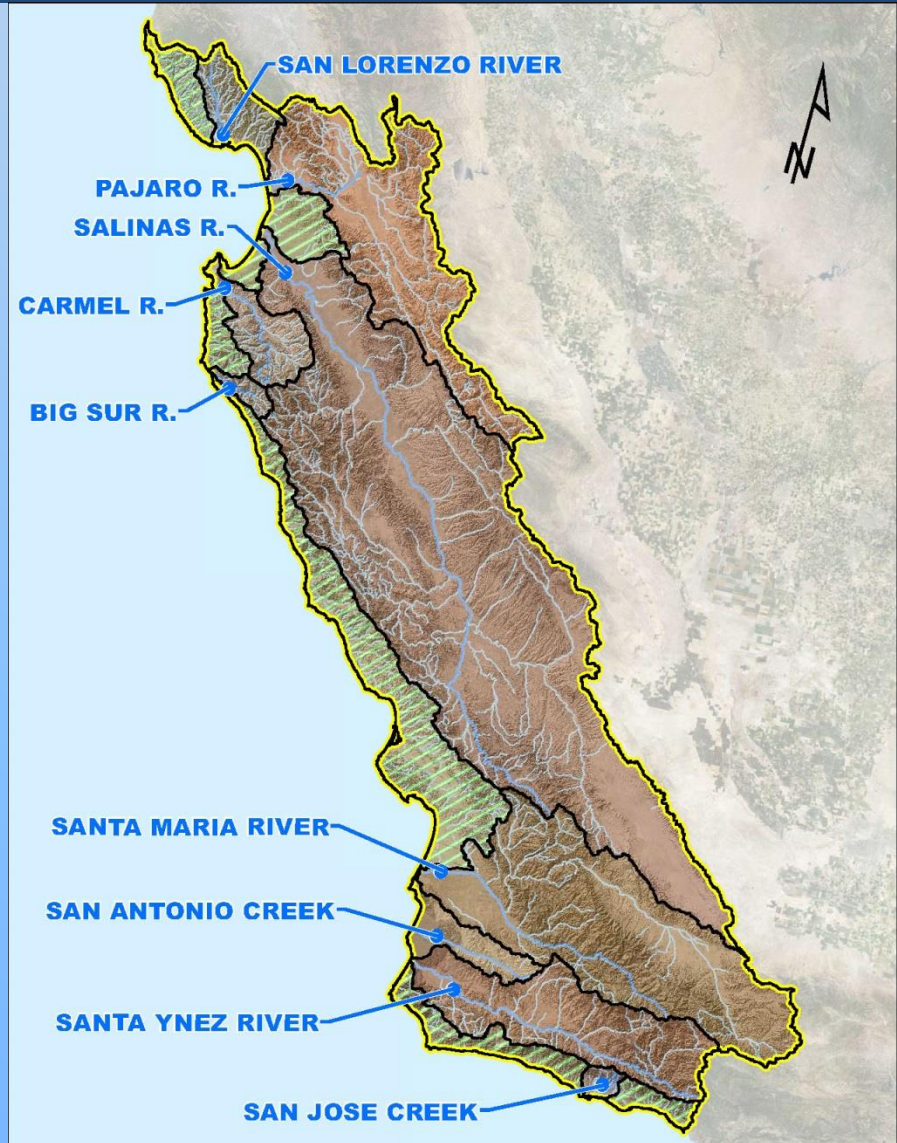
1. Gage Data and Watershed Properties
2. Calibration
3. Use Similar Watershed Properties
4. Subtract Demands

Advantages:

- Simple and Rapid Method
- Applicable for: - GSP
- Water Plan Update
- Scenarios Analysis (e.g. Climate Change)

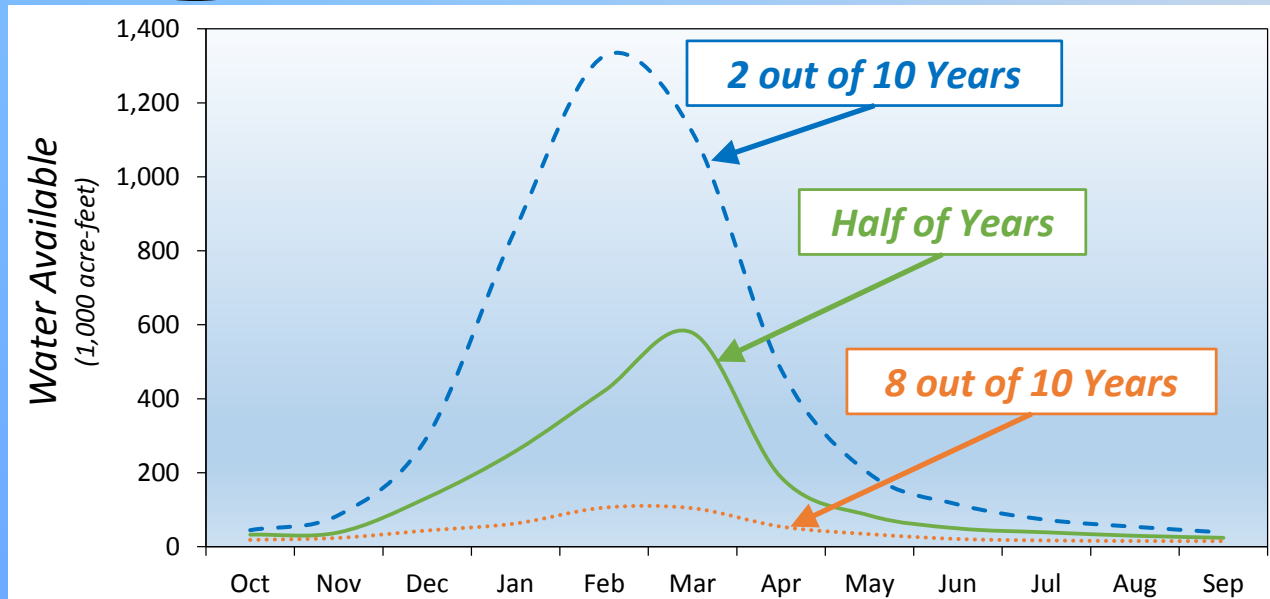
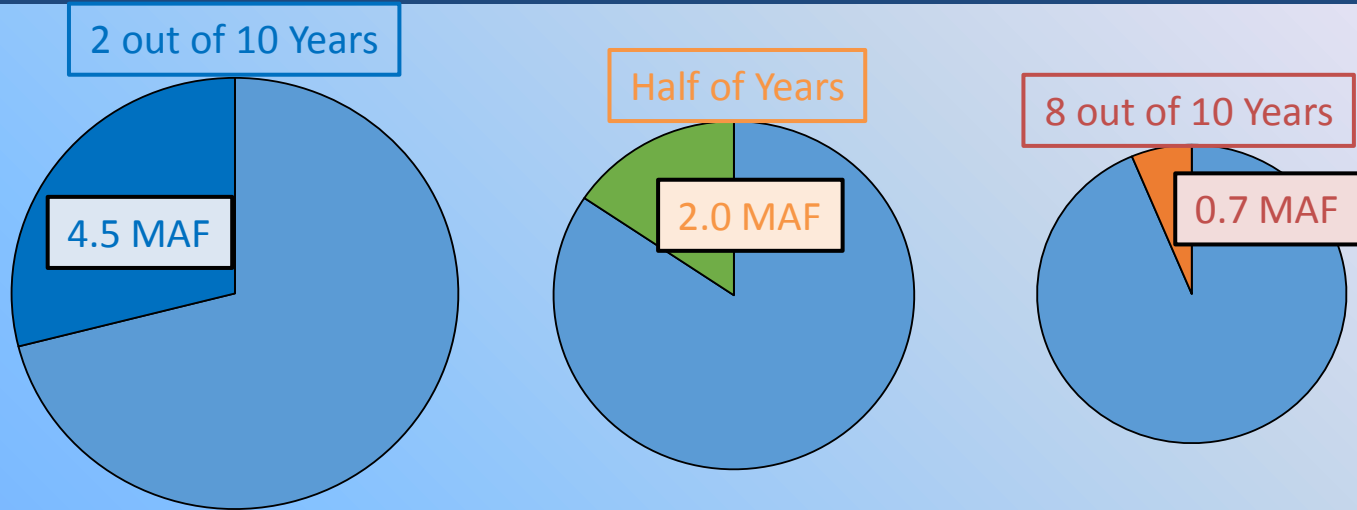
Surface Water Available: Gage Data Method

Central Coast Gaged & Un-gaged Areas



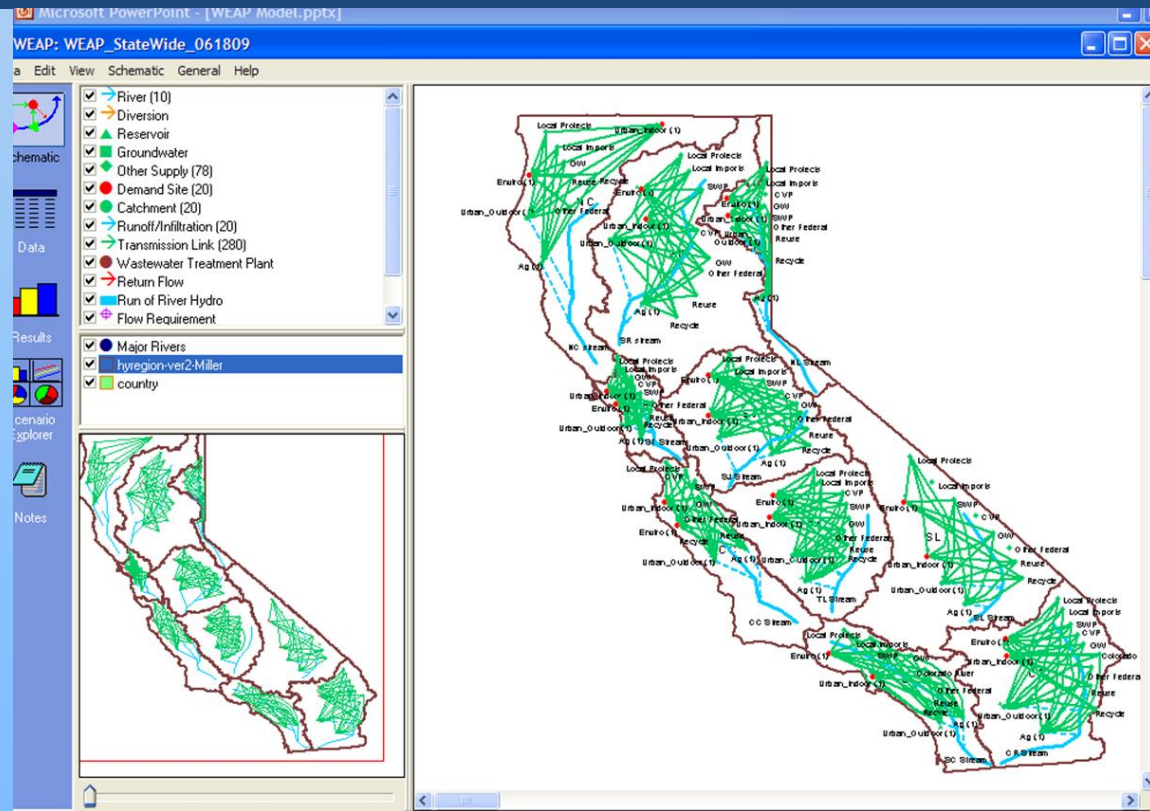
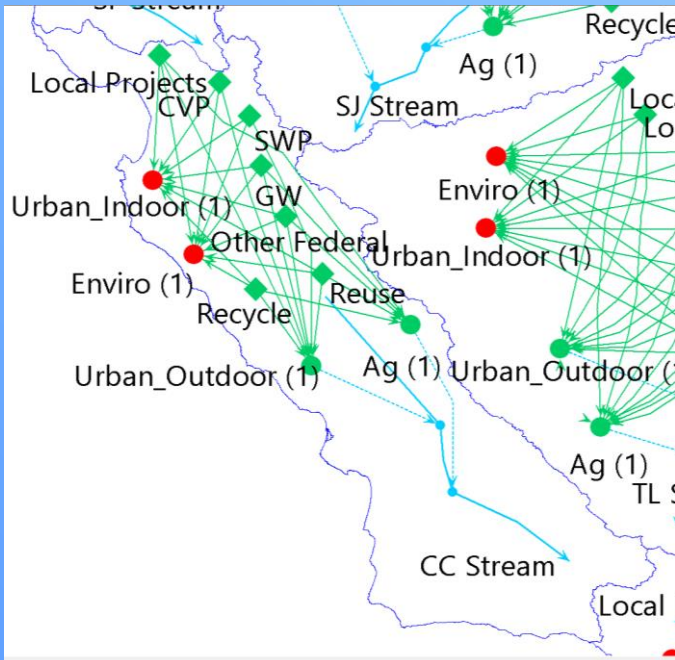
Surface Water Available: Gage Data Method

**Draft
Results**

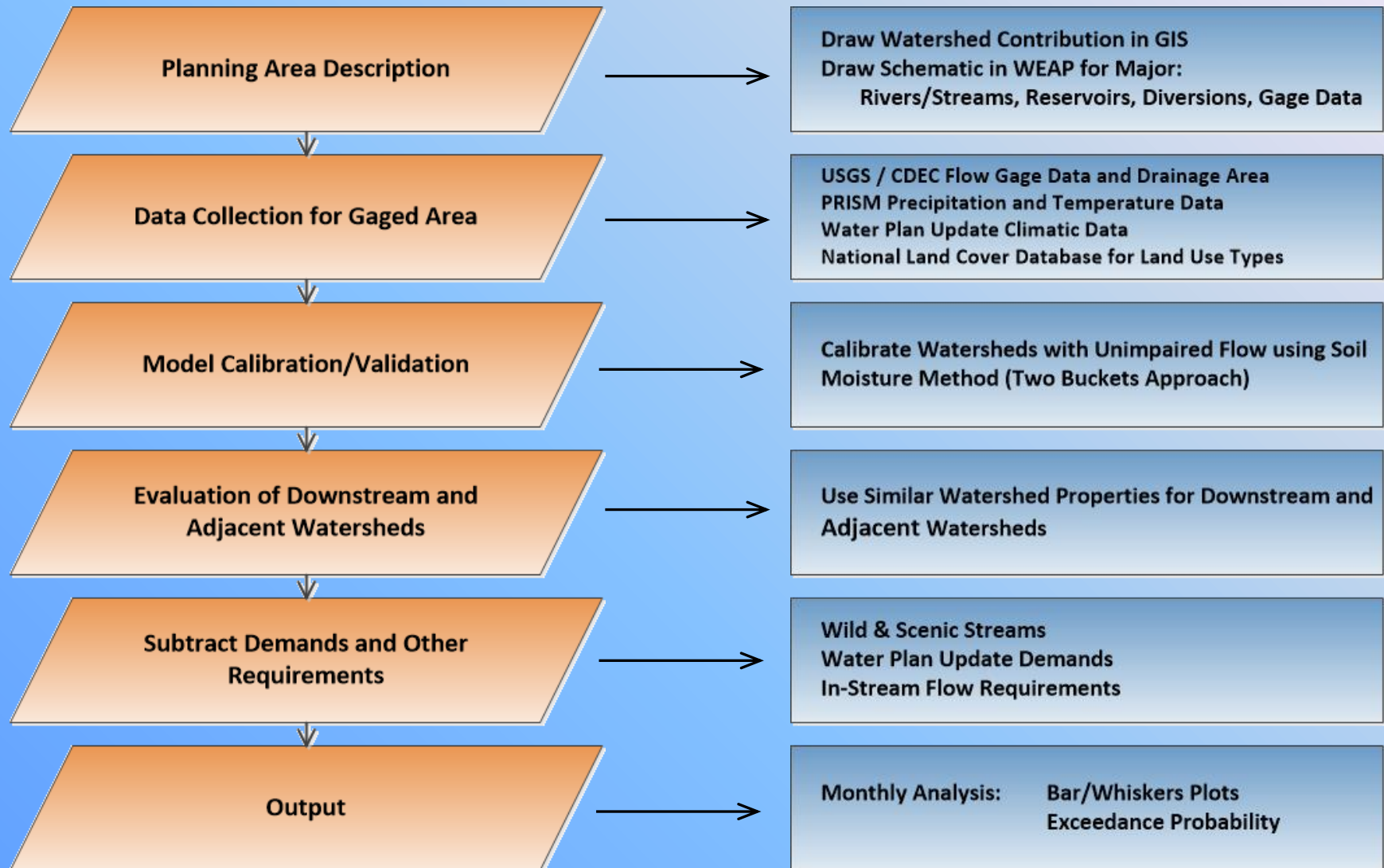


Surface Water Available: WEAP Model

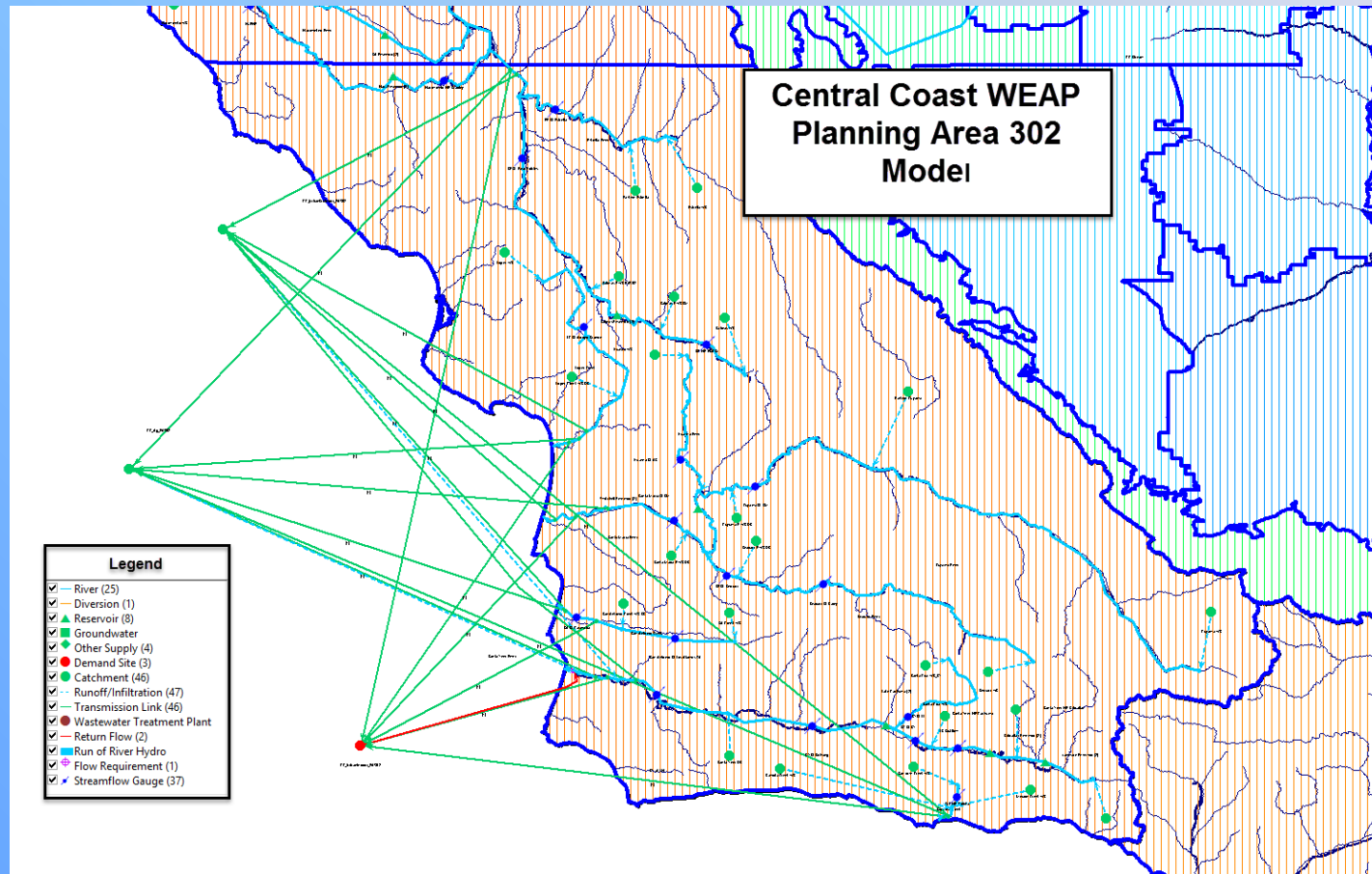
CA Water Plan Hydrologic Region WEAP Model



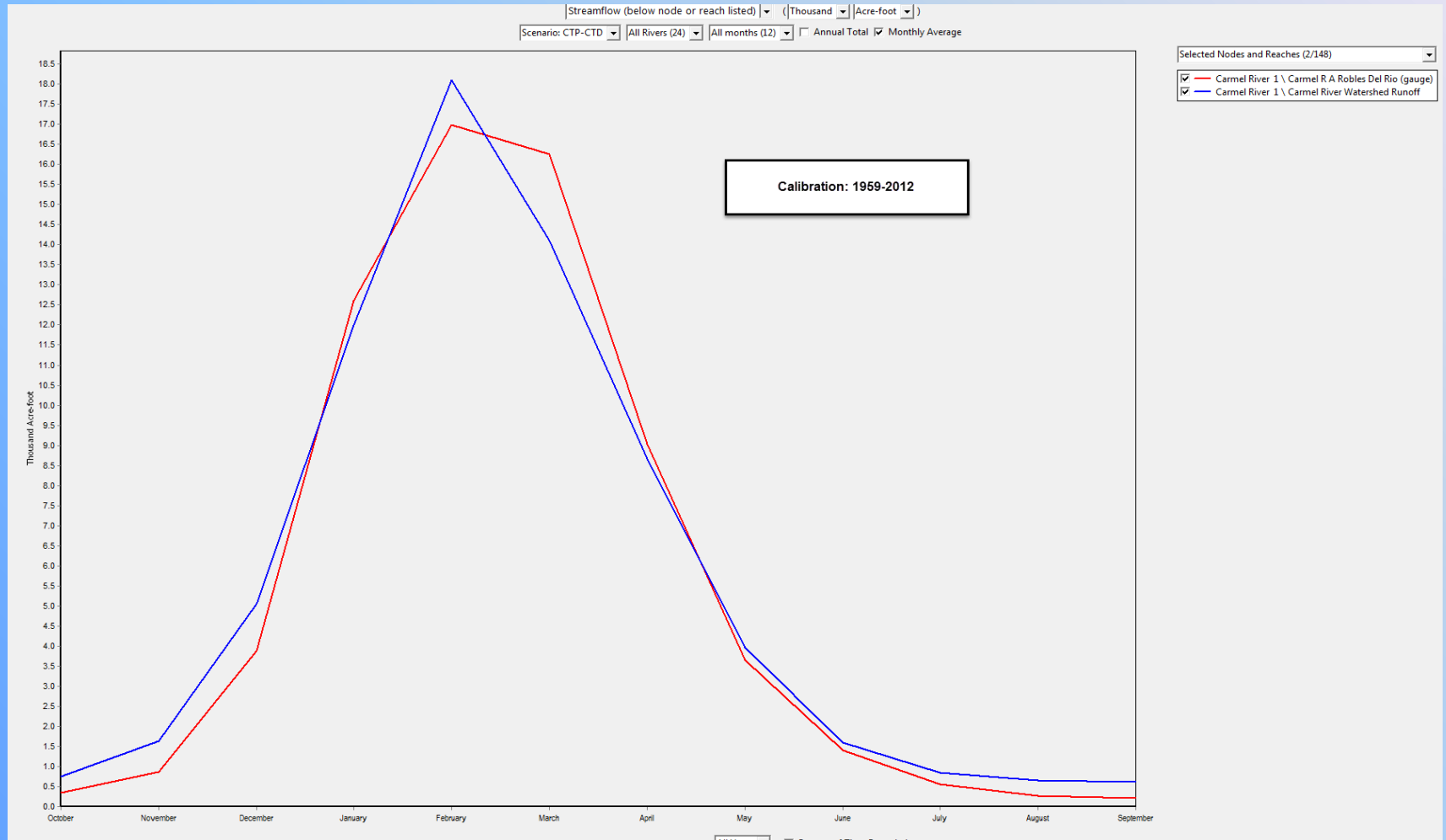
Surface Water Available: WEAP Model Procedures



Surface Water Available: WEAP Model



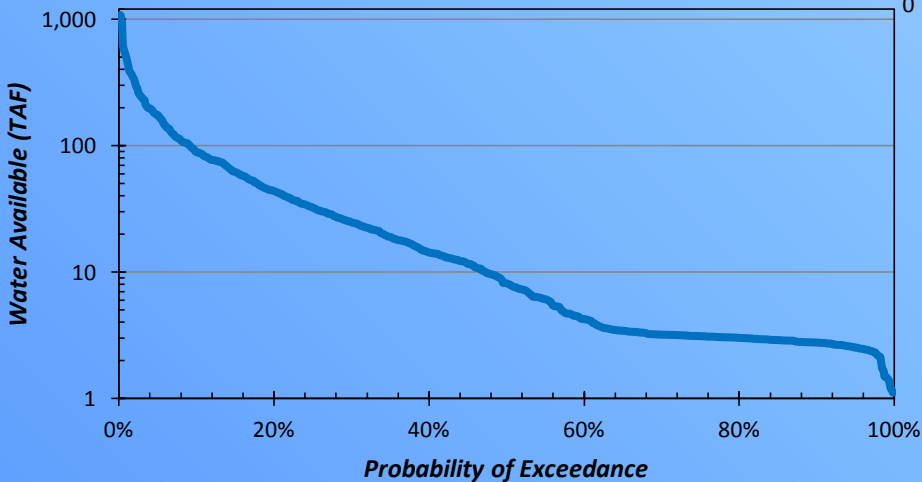
Surface Water Available: WEAP Model Calibration



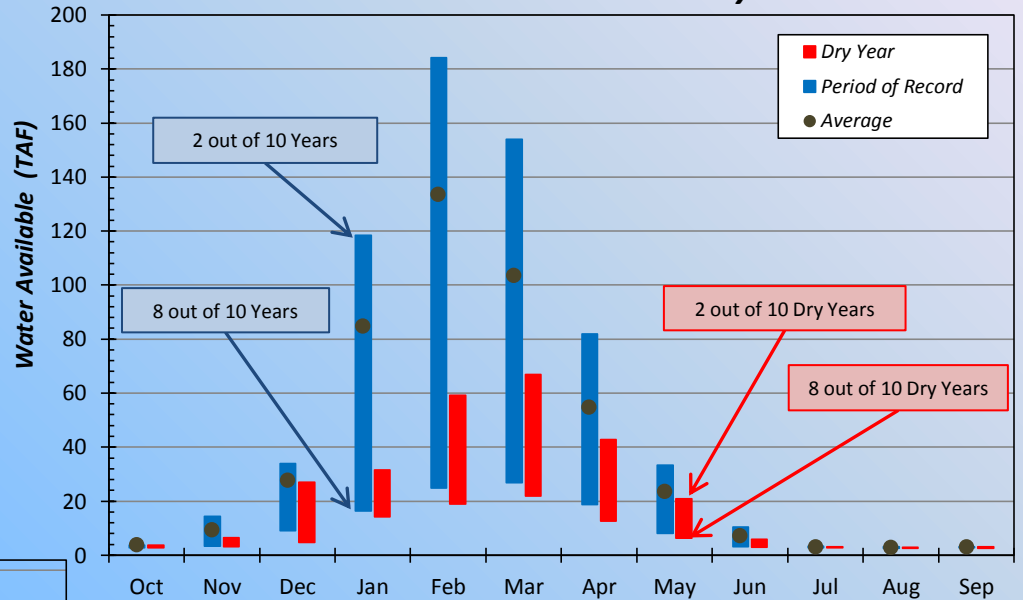
Surface Water Available: WEAP Model

**Draft
Results**

**Water Available Estimate – Yearly Exceedance
Probability – PA 302**



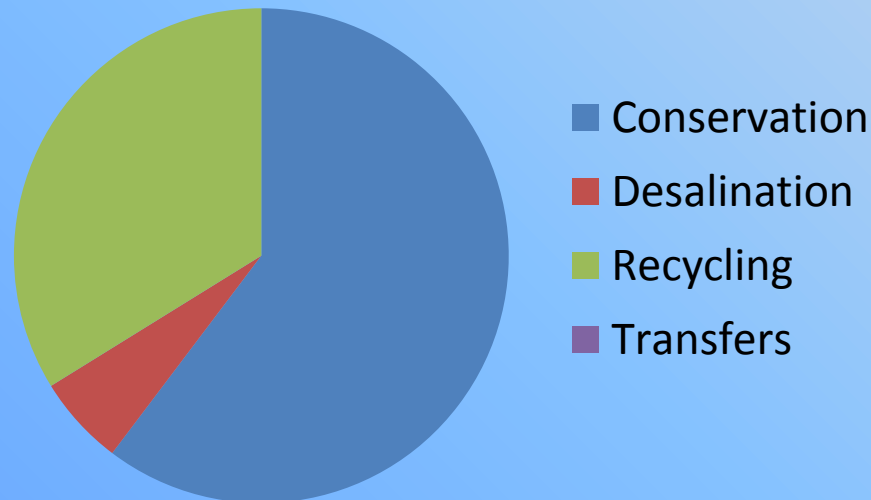
Water Available Estimate - Monthly Results - PA 302



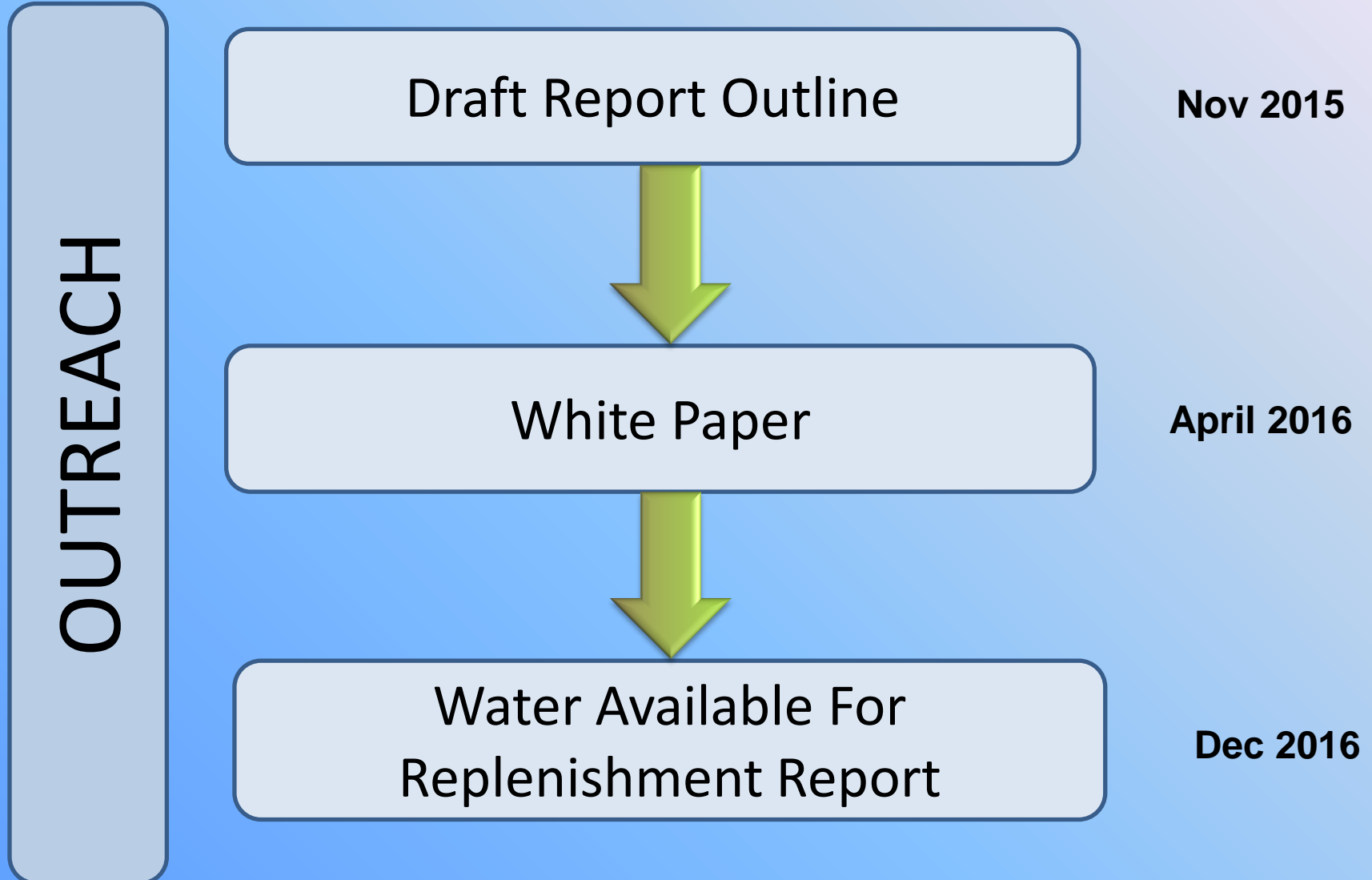
WA Estimates by WA method (excluding Surface Water)

Water Available Method	Estimate (TAF, Statewide)
Conservation	1,300 - 4,100
Desalination	300 - 400
Recycling	1,800 - 2,300
Transfers	?

Water Available



Timeline: Water Available For Replenishment



Questions

SGM Sustainable Groundwater Management

