DRAFT Water Shortage Contingency Planning Presentation

Board Meeting
July 18, 2012

Facilitated by:
Lisa Maddaus, P.E.

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Agenda

- Goals
- Schedule
- Standard Definitions
  - Drought Indicators, Triggers, Stages
- Drought Indicators
  - State Provided Resources
  - CSD Tracking Approach
- Water Shortage Contingency Plan Update
  - Triggers
  - Actions by Stage

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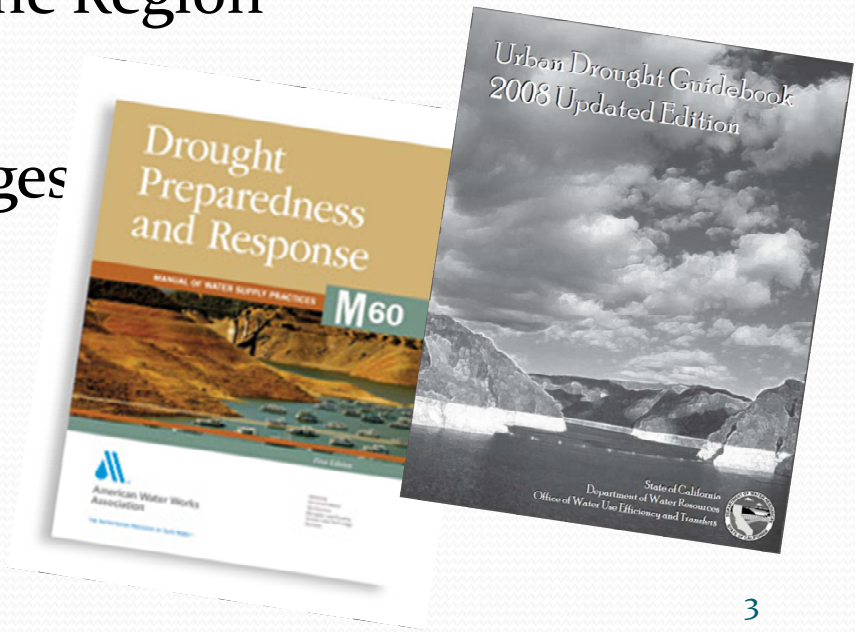
Goals

1. Define proactive drought indicators for CSD to hedge pumping
2. Reset triggers based on new supply alternatives
3. Update the Water Shortage Contingency Plan
   - Align with other agencies in the Region
   - Refine triggers
   - Update actions by various stages
   - Expand on preparedness plan



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Timeline

- Defining appropriate indicators (May-June)
- Review Plan definitions (May-June)
- Design triggers (July-August)
- Updated Draft Plan (August-September)
- Finalize Plan (September-October)
- Update Policy 90-2 (Fall/Winter)

Outcome = Updated WSCP

- According the American Society of Civil Engineers (ASCE) Institute of Water Resources, the following should be considered in a Drought Plan:

Category	Status
Drought indicators	Indices have been analyzed
Drought triggers based on existing conditions	To be revised in Plan
Response actions	Edited
Methods to forecast drought conditions	Rely on State DWR resources
Drought monitoring based on indicators	Basic monitoring spreadsheet tool
Enforcement means	Already added references to District Codes

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Definitions

- Water Shortage Contingency Plan = scoped for any type of shortfall in supplies (operational issues/drought)
- Drought Indicators = climatic data and river flows
- Drought Triggers = metric for when to change CSD operations (supply or demand curtailment)
- Stages = levels of severity with increasing drastic mitigation actions needed

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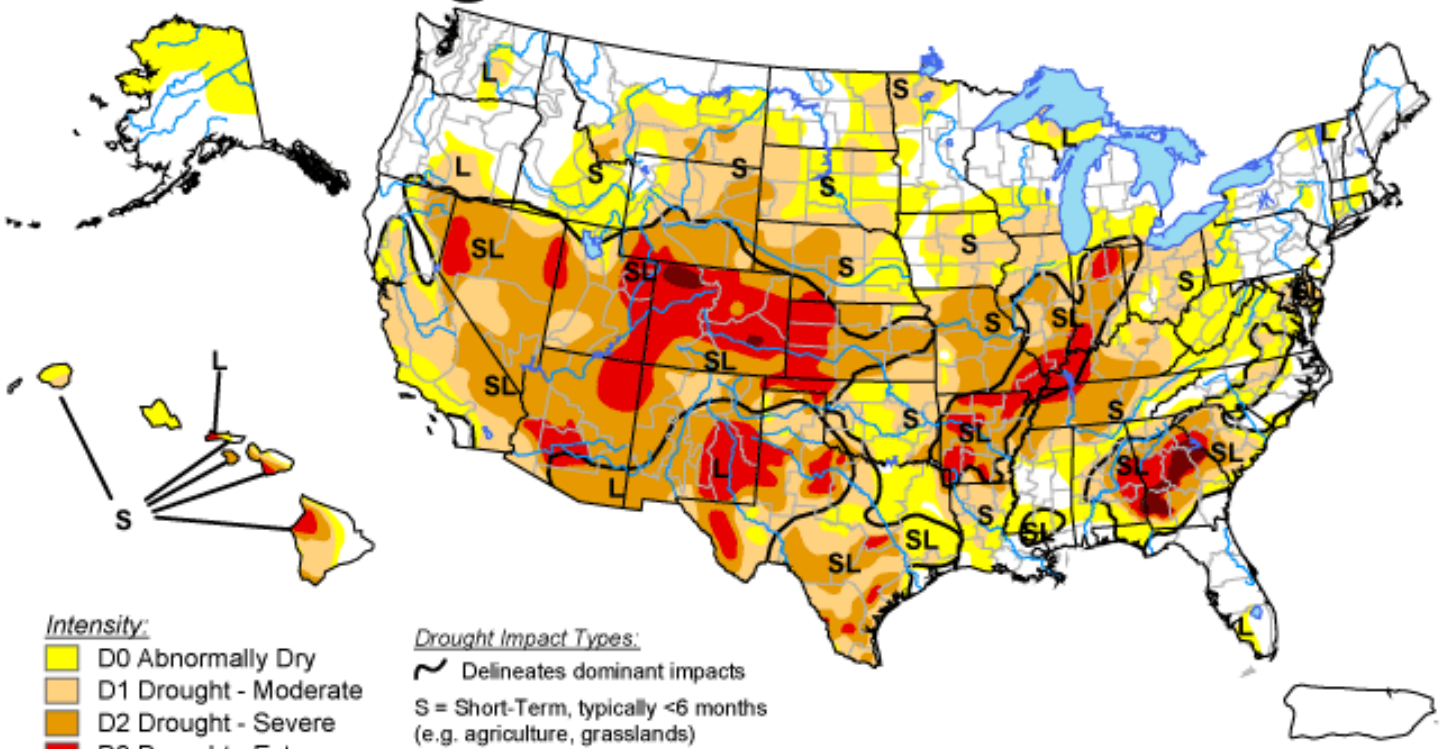
Drought Indices

- Supply side metrics
  - Cosumnes River Flows (Monthly AF)
  - Precipitation
  - Snow Pack Water Content
  - Expected Reservoir Storage levels
- Demand side metrics
  - Production
  - Evapotranspiration (ETo)
  - Expected Demands with drought cutbacks

U.S. Drought Monitor

July 3, 2012
Valid 7 a.m. EDT



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu/

Released Thursday, July 5, 2012
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

State Provided Resources

- National Drought Index Definitions

Percentile	Drought Monitor Category	
0.00 - 0.02	**D4**	Drought - Exceptional
0.02 - 0.05	**D3**	Drought - Extreme
0.05 - 0.10	**D2**	Drought - Severe
0.10 - 0.20	**D1**	Drought - Moderate
0.20 - 0.30	**D0**	Abnormally Dry
0.30 +	**N**	Normal

Source: Department of Water Resources, 2012
http://cdec.water.ca.gov/cdecapp/drought/get5SI.action

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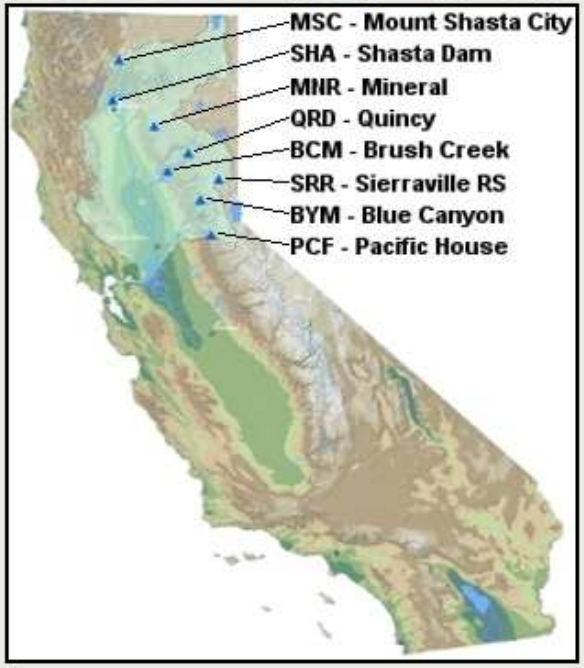
SACRAMENTO RIVER DROUGHT STATUS - BASED ON 8SI PERCENTILES

Data as of: Monday, July 9, 2012



Change Date: 2012 - July Refresh Data

Current 8SI for WY2012:	41.3 inches
Median 8SI to date:	46.9 inches
Current Water Year Percentile:	0.374

8SI Percentiles	As of Jul 1, '12	Projected for Jul 31, '12
Past 24 months (weighted) *	0.557	0.557
Past 12 months	0.371	0.371
Past 24 months	0.739	0.739

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CSD Tracking Approach

- Leading indicators
  - River Flows
    - Source: USGS station at Michigan Bar
  - Precipitation
    - Source: NOAA USBR Folsom Dam station
  - Snow Pack Water Content
    - Source: DWR's California Data Exchange Center
  - Evapotranspiration
    - Source: California Irrigation Management Information System (CIMIS)

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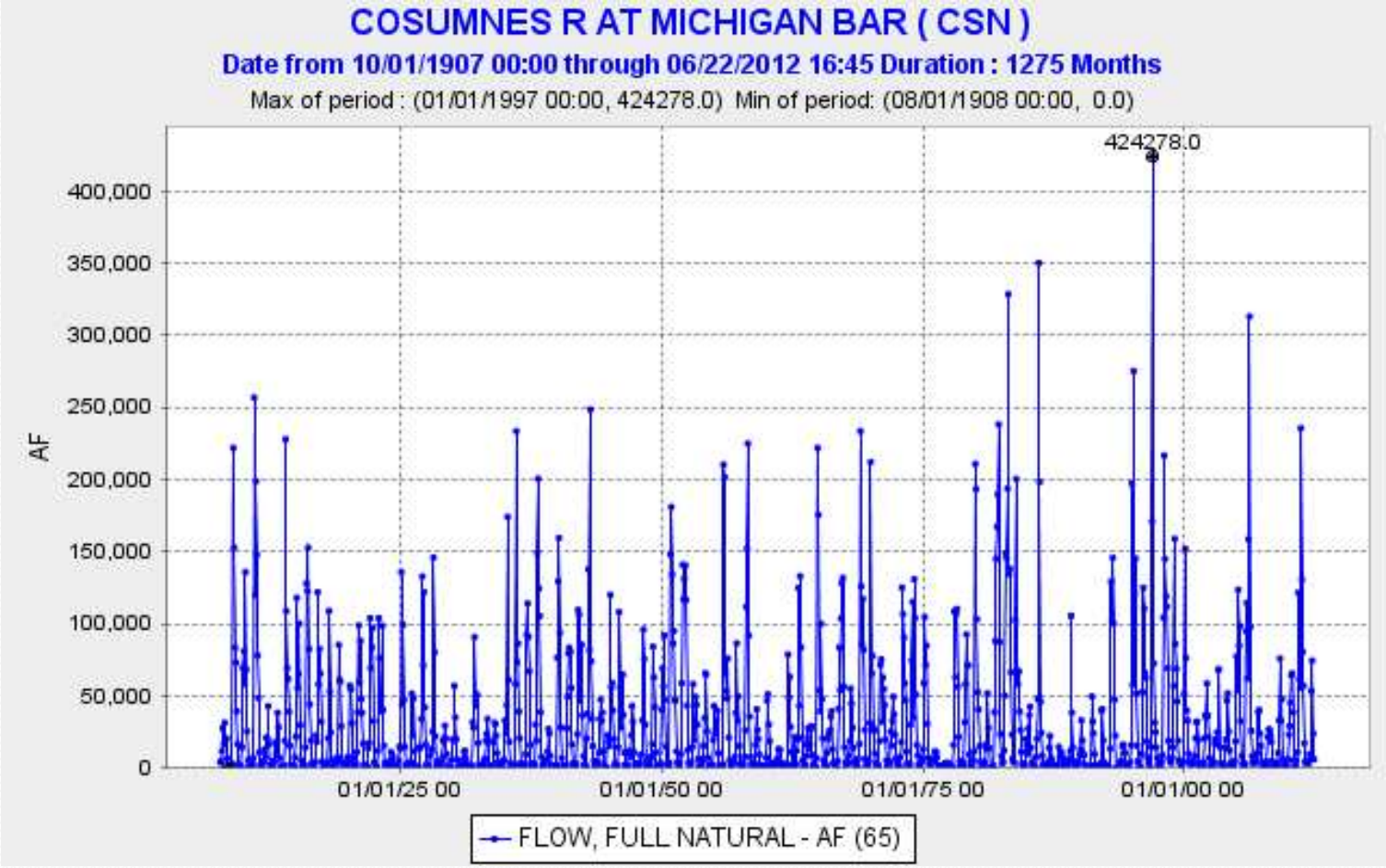
Actual Data for River Flows



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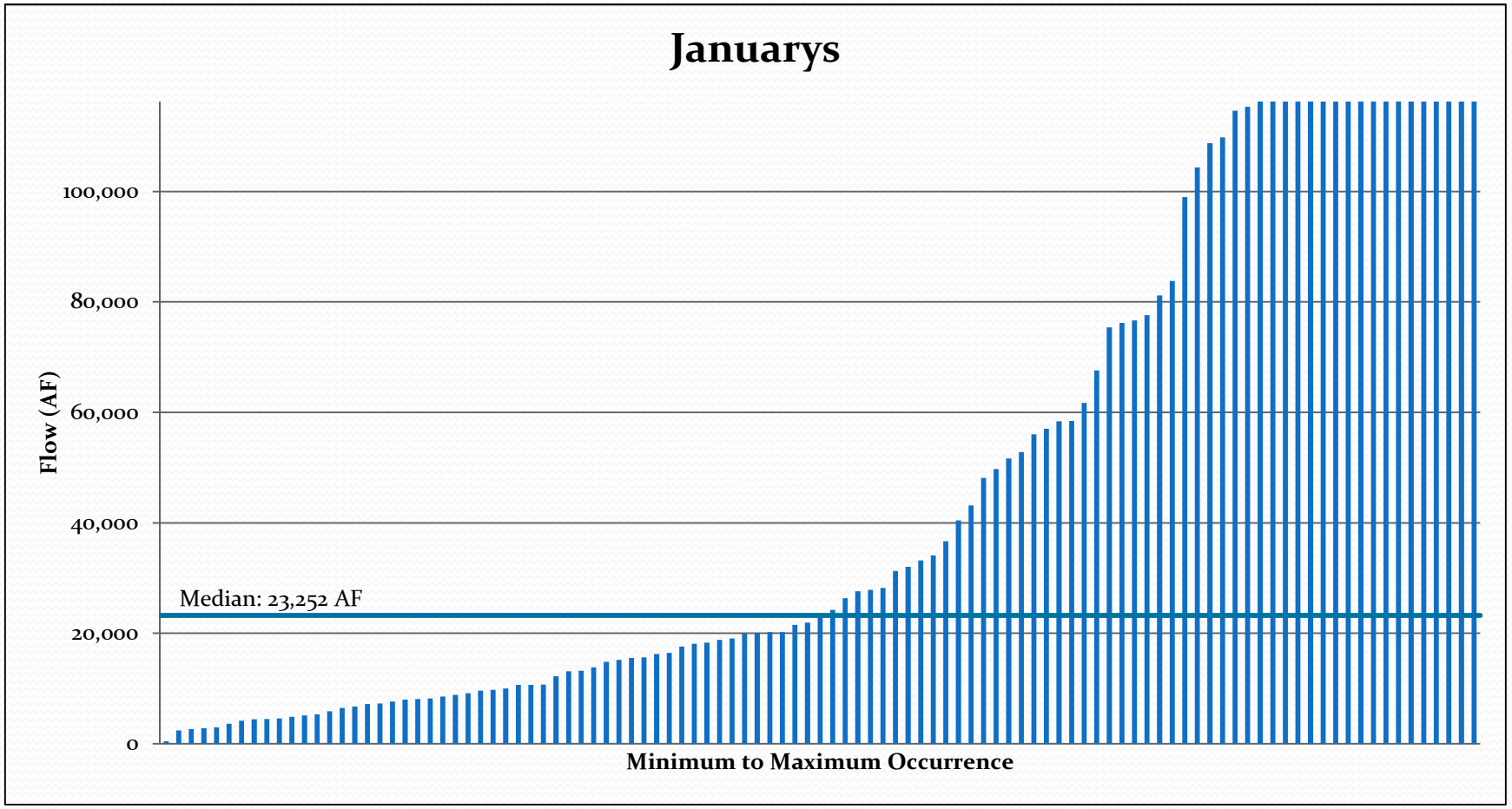
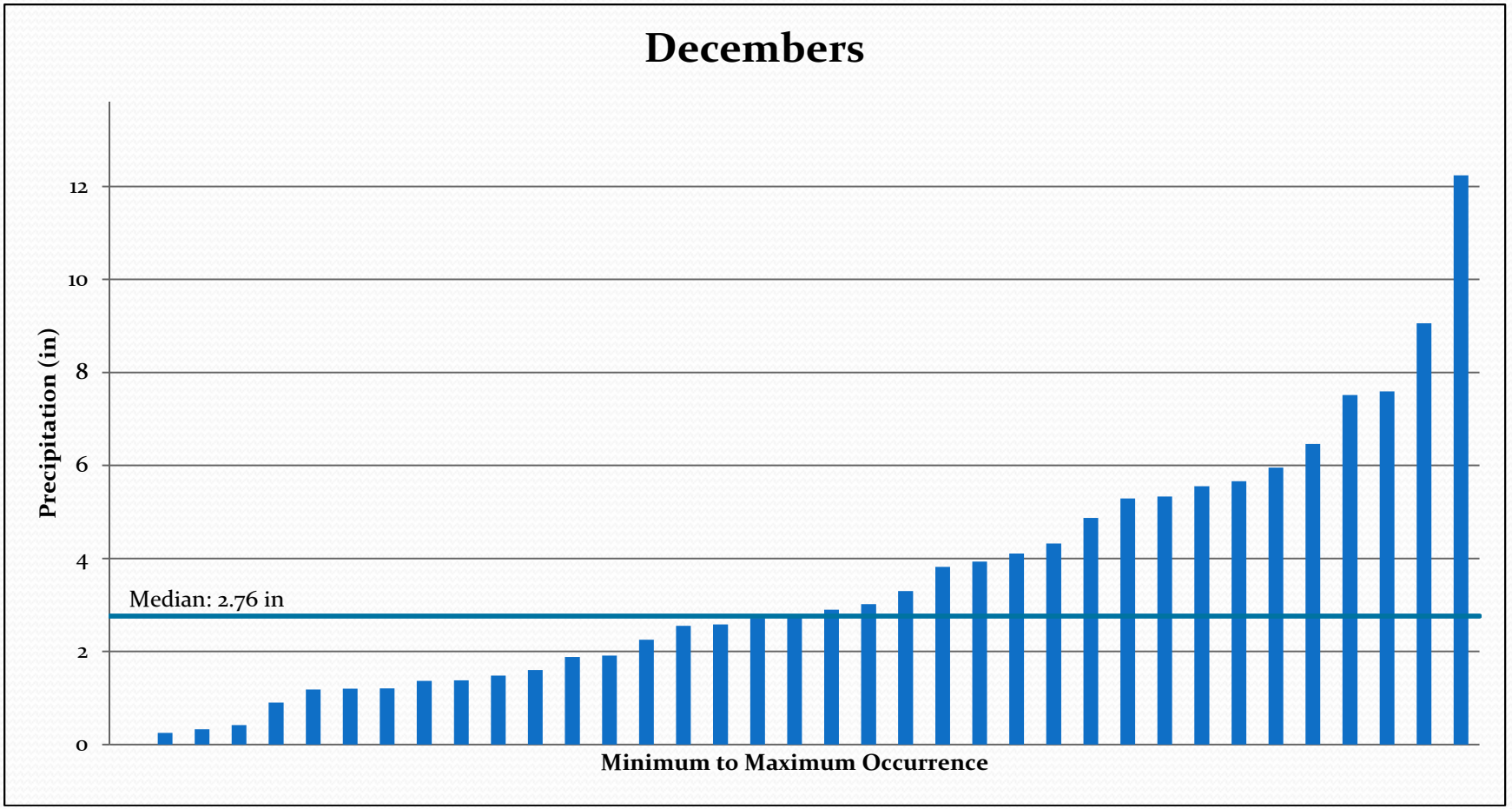
Drought Index for Cosumnes River Flows



Source Data: USGS Gauge Station, Michigan Bar, Monthly Flow Data 1907-2012

Index for Precipitation (1955-2012)



Source Data: NOAA Climatic Data Center, Folsom Dam Station

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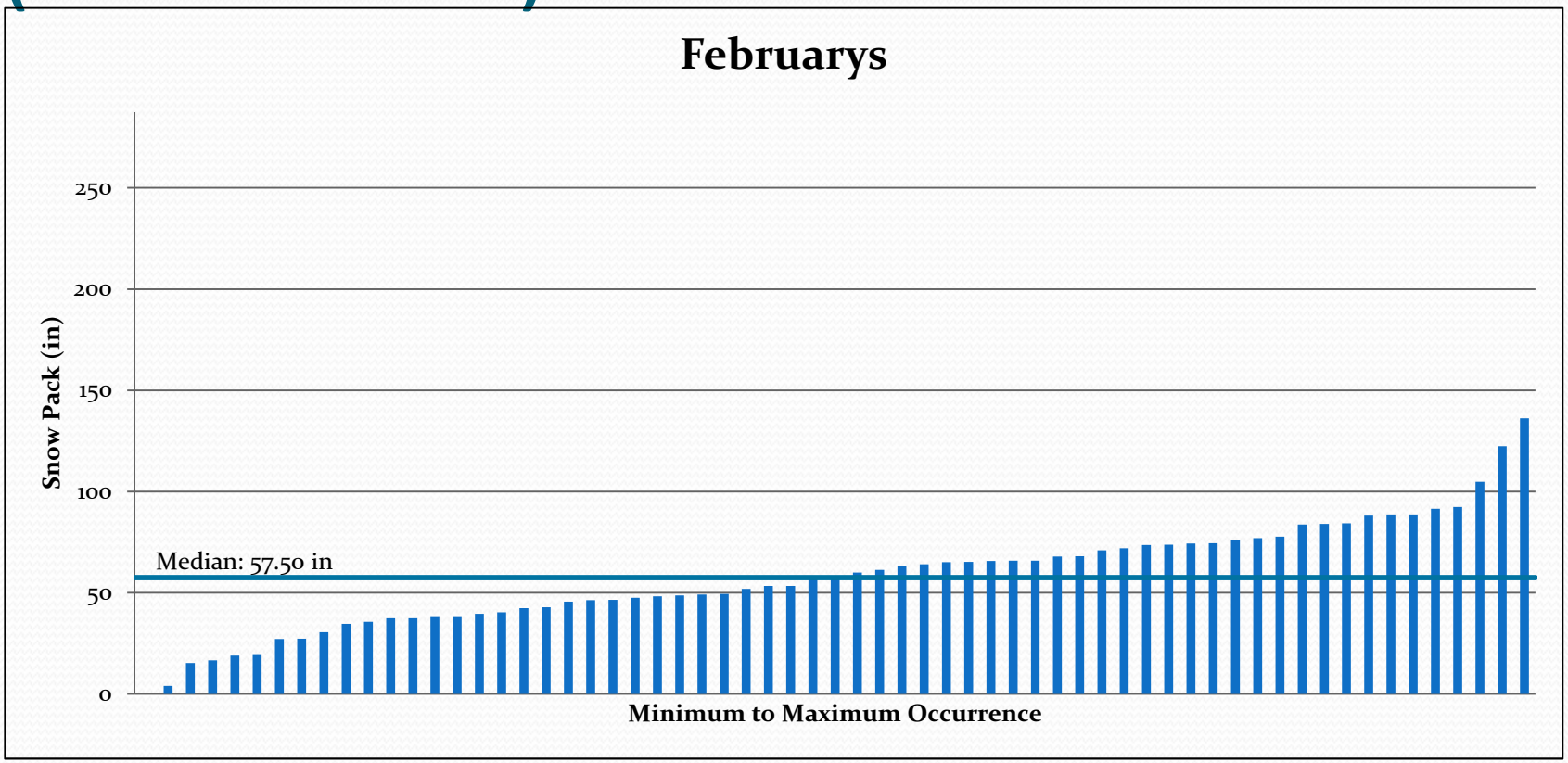
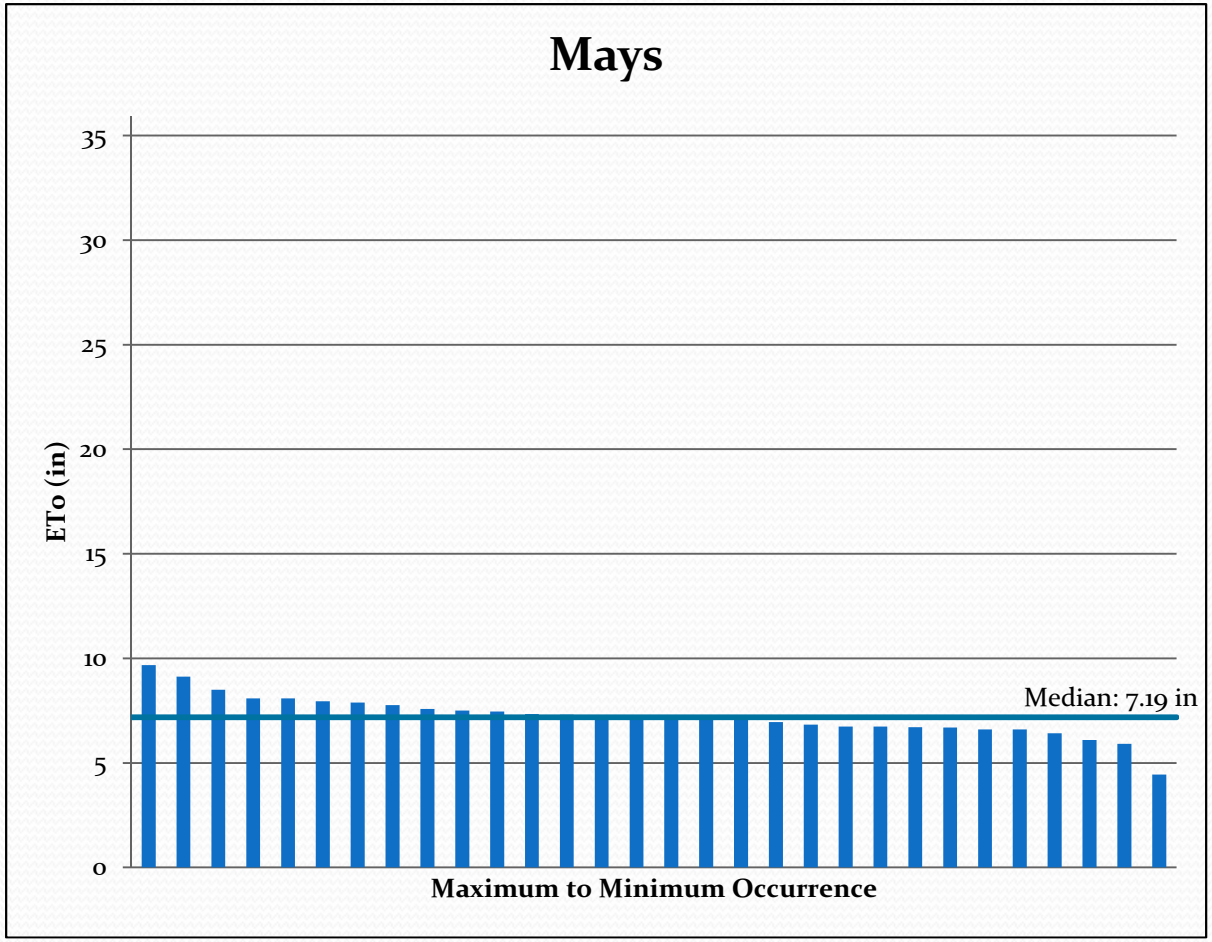
Index for Snow Pack Water Content (1939-2012)



Source Data: California Department of Water Resources, CA Data Exchange Center, Snow Survey Data, Tamarack Flat Station (near Kyburz, CA)

Index for Reference Evapotranspiration (ETo) (1982-2012)



Source Data: California Irrigation Information Management System (CIMIS) Station, Davis

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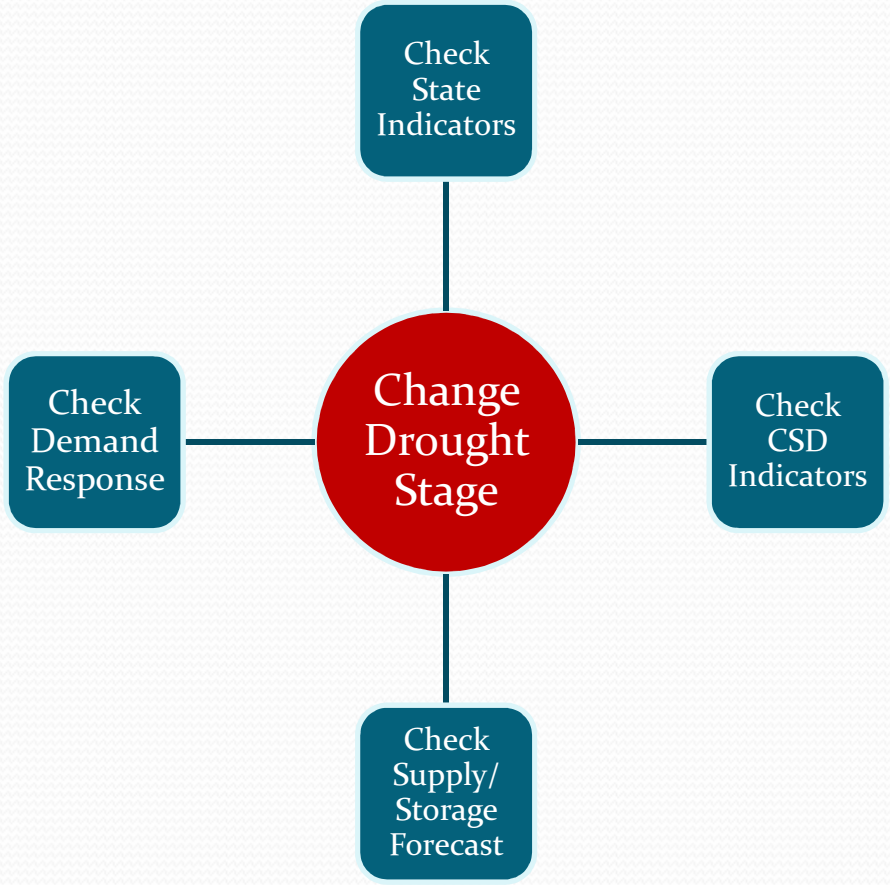
Designing Triggers for CSD system (with new well online)



Scenarios Using IWMP Model

- In Fall 2011, tested two scenarios: Today and Buildout (2030)
  - Tested hedging scenarios – no direct benefit leading into extreme conditions on Cosumnes River
    - River flows too low to pump to reservoirs using 1977 hydrology under any scenario
    - Well would be pumping full time in second year and additional years of drought
    - Potential for earlier pumping to storage or well use possible in first year

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IWMP Model
2011 Results Summary Table

Scenario	Approx. Minimum Supply Remaining (1977 Hydrology)	Maximum Drought Stage Reached
Current Conditions	1,200	Stage 5
Current Conditions with Hedging	1,200	Stage 5
Current Conditions with Hedging & Early Pumping	1,500	Stage 4/5
Buildout Conditions	700	Stage 5
Buildout Conditions with Hedging	700	Stage 5
Buildout Conditions with Hedging & Early Pumping	1,000	Stage 5

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Current WSCP Response Actions

- Currently triggers based on drawdown levels of usable storage in the reservoirs
  - Stage 1 = Normal Supply – Full storage in all Lakes
  - Stage 2 = 90-95% Supply as of June 1st
  - Stage 3 = 89-75% Supply as of May 1st
  - Stage 4 = 74-50% Supply as of April 1st
  - Stage 5 = <50% Supply as of January 1st

Proposed New Changes to Drought Stage Titles and Percentages

- RWA recommends shifting to 4-Stage Drought plan and revising titles to match others in the region

Stage	Title	Water Savings Range
Stage 0	Normal	1-2% per year
Stage 1	Water Alert	Up to 10%
Stage 2	Water Warning	Up to 25%
Stage 3	Water Crisis	Up to 50%
Stage 4	Water Emergency(Health and Safety Only)	<50%

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Next Steps

- Finalize analysis
- Finish Draft Water Shortage Contingency Plan
- Adopt WSCP
- Update Policy 90-2

More Questions?
Comments on Next Steps?