Advanced Observing Systems and S2S Forecasting – California Investments

Dr. Michael Anderson, CA State Climatologist
WSWC S2S Workshop
May 14, 2018
Talk Overview

- Motivation
- History of the Past Decade
- Current and Future Investments
Motivation

- Atmospheric Rivers are a key component to California’s water supply and flood risk. The character, size, number, and timing of atmospheric rivers play a key role in seasonal hydrologic outcomes for California including the size and distribution of the snowpack.

- Improved observations and forecasting are key elements for enabling more options for integrated water management in California.

- As the world warms, capabilities in observations and forecasts must adapt for water management to keep up with changing conditions.
California’s topography affects our weather and climate.

Observations play a critical role in and resource management. Complex terrain can be challenging to observations on many fronts.

Time is a key element to water management – more time offers more alternatives to be employed. Forecasts can play a role.
A warming world challenges current forecasting practices

Source: NOAA Climate Division 6 Water Year Data
CLIMATE DIVISION 5 WATER YEAR DATA

Annual Average Temperature (°F)

- 1896-2000
- 21st Century
- Period of Record Average

Year:
- 2017
- 2014
- 2015

Period of Record Average
Variability at multiple scales

Northern Sierra Precipitation: 8-Station Index

16.8”
404 Days

8.4” in 14 days
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Opportunity Knocks 2005 to Present

- HMT, EFREP and FloodSafe Investments
- CW3E Formation, the 2012-2016 Drought, and Collaboration Expansion with ASO, WWAO, and FIRO
- AQPI, The Events of WY 2017 & WY2018
California’s Advanced Observing System for Atmospheric Rivers
ASO April 2018
Surveys

Slide from Dr. Thomas Painter, JPL
Goal: Integrated Observing Systems for Integrated Water Management
Forecast Tools from the Center for Western Weather and Water Extremes (CW3E)

AR Outlook Tool
Lake Mendocino Guide Curve – A Tale of 2 Water Years

About the same total rainfall WY2012 ≈ WY2013
Timing very different
Different storage outcomes
Can we save some of this water? To prevent low storage?
Lake Mendocino FIRO Timeline

First FIRO workshop
August 2014

Second FIRO workshop
July 2015

Third FIRO workshop
June 2016

PVA review complete
May 2017

Fourth FIRO workshop
August 2017

Draft work plan developed
June 2015

Work plan finalized
September 2015

Draft PVA released
December 2016

PVA finalized
July 2017

Steering Committee formed
June 2014
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Federal State and Local Alignment

• DWR plays a key role in facilitating the transition of new science in observations and forecasting from research to operations for water management.

• Relationships with federal partners have been built over the past decade with the availability of resources on a project-by-project basis.

• Continued engagement with the science community is key to adapting to a warming world.
Next Steps

• Embarking on new partnership with Climate Prediction Center and furthering partnership with Earth Systems Research Lab

• FIRO comes to Southern California with Orange County Water District and Prado Dam

• Data Curation, Management, and Implementation

• The Next Great Collaboration and Finding Funding
Questions?

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