



WSWC/CDWR Workshop

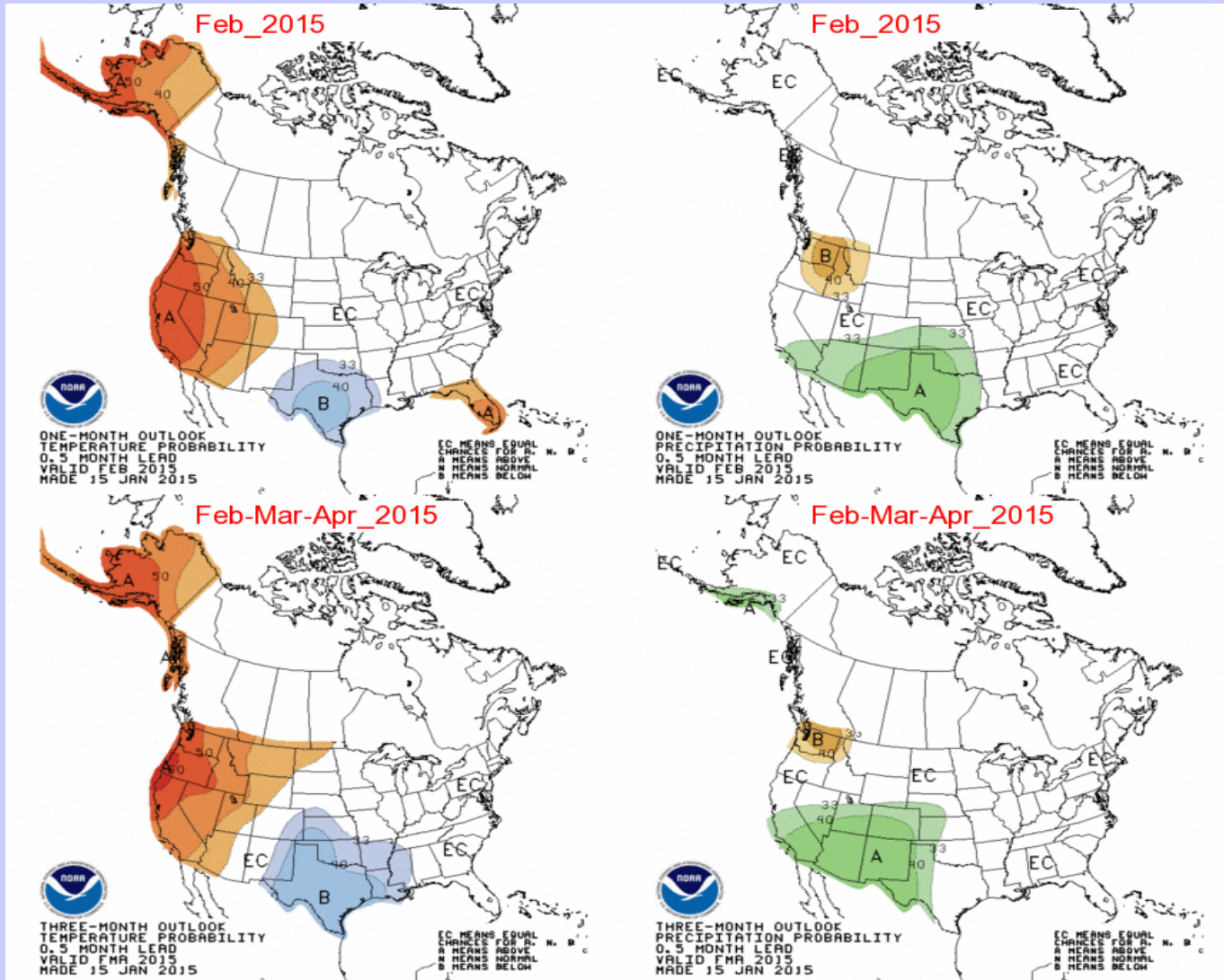
Improving Precipitation Forecasting for Drought Preparedness

Jeanine Jones, CDWR

Prediction Capabilities & Challenges

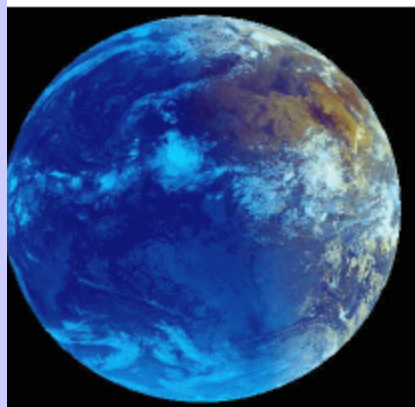
- Sub-seasonal to seasonal (S2S) precipitation forecasting is scientifically difficult, but skillful forecasting would be hugely useful
- National Weather Service operational weather forecasts – out to about 2 week.
- NOAA NWS Climate Prediction Center outlooks for temperature & precipitation (30 days – 1 year)

Example CPC Outlook



Recent Assessment of Seasonal Climate Forecasts

*Quoting from the
Journal Science,
Vol. 321, 15th
August 2008*



- *“ of the dozens of forecast techniques proffered by government, academic, private-sector climatologists, all but two are virtually useless, according to a new study” Livezey & Timofeyeva - BAMS, June 2008.*
- *“About the only time forecasts had any success predicting precipitation was for winters with an El Nino or a La Nina”*



Center for Hydrometeorology and Remote Sensing, University of California, Irvine

A stylized map of California is positioned in the upper left background, showing the state's outline in a light green color against a dark teal background.

CALIFORNIA DROUGHT



2014 SERVICE ASSESSMENT



Workshop Goals

- Developing Western vision for improving S2S precipitation forecasting beyond the 2-week weather time domain
- Identifying potential joint activities with NWS Western Region office
- Identifying next steps/roadmap

Follow-up Activities

- WSWC workshop report
- Series of four workshops for NOAA engagement on S2S forecasting
 - Tentatively Oct 2015 in Salt Lake
 - Dec 2015 at Colorado River Water Users in Las Vegas
 - Spring 2016 in San Diego
 - Spring 2016 in DC



21ST CENTURY
Western Observing System
for Extreme Precipitation

Assessment of Interseasonal to Interannual Climate Prediction and Predictability (National Research Council, 2010)

- No silver bullet
- Improve building blocks of forecast system (statistical & dynamical models, multi-model ensembles, data assimilation systems)
- Research on sources of predictability – MJO, stratosphere interactions, ocean-atmosphere interactions, unexpected events (e.g. volcanoes), long-term changes in climate system

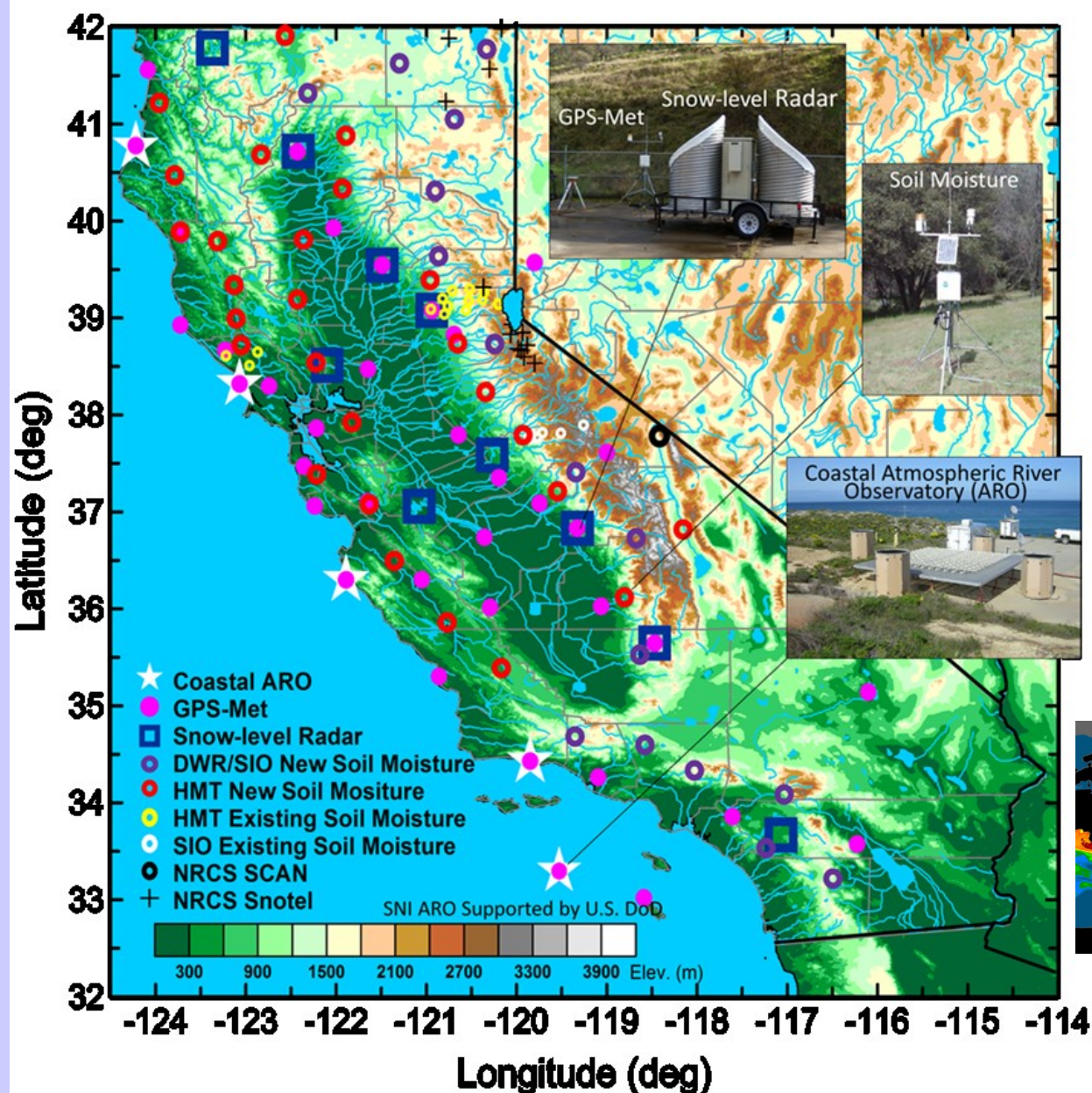
Developing a U.S. Research Agenda to Advance Subseasonal to Seasonal Forecasting (NRC, in progress)

Statement of Task

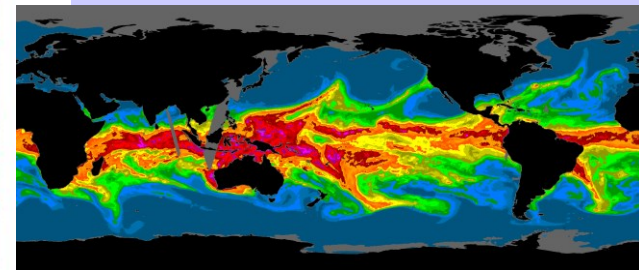
An ad hoc committee will conduct a study that will identify opportunities to increase forecasting skill on subseasonal to seasonal (S2S) timescales based on the 2010 NRC report Assessment of Intraseasonal to Interannual Climate Prediction and Predictability and progress since. The report will describe a strategy to increase the nation's scientific capacity for research on S2S forecasting. The committee will develop a 10-year scientific research agenda to accelerate progress on extending prediction skill for weather and ocean forecasts at spatial and temporal resolutions to aid in decision making. The committee's report will cover:

- * Identification of potential sources of predictability and assessment of their relative value for advancing predictive skill;
- * Identification of process studies for incorporating new sources of predictability into models;
- * Application and advancement of ocean-atmosphere-ice-land coupled models;
- * Key observations needed for model initialization and verification of S2S forecasts;
- * Uncertainty quantification and verification of probabilistic products;
- * Approaches to communicating this type of prediction in a way that is useful to and understandable by decision makers; and

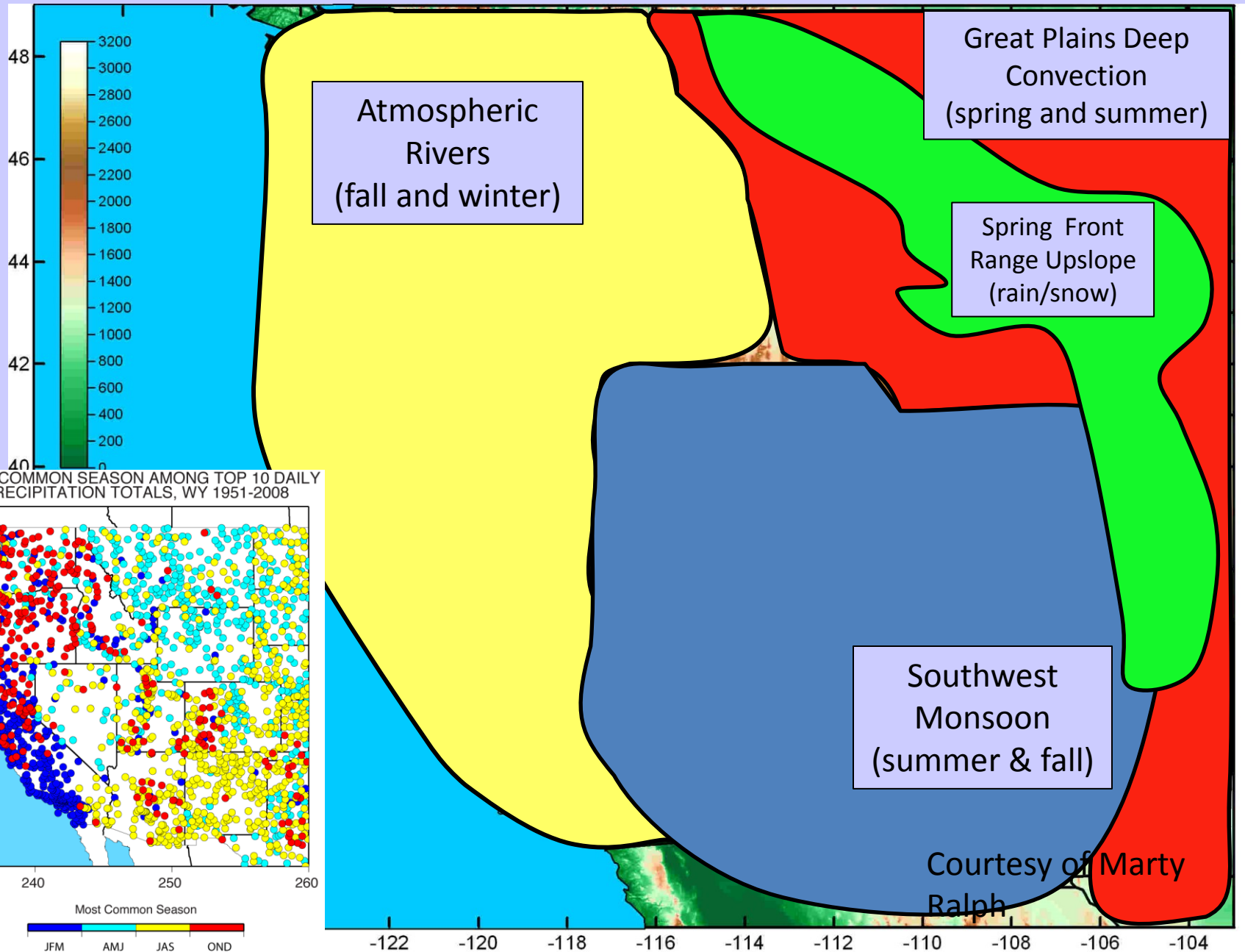
Observing System for Extreme Precipitation



Jointly funded by NOAA & DWR (from Prop. 1E bond funds), investment of about \$25M to date.



Schematic illustration of regional variations in the primary weather phenomena that lead to extreme precipitation, flooding and contribute to water supply in the Western U.S.



Questions To Be Asking

- What factors may provide prediction skill at a regional (Western) scale?
- How do we follow up on them?
- What's the schedule and workplan?
- Where do we go from here?

