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# NOAA's California Drought Service Assessment

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# Outline



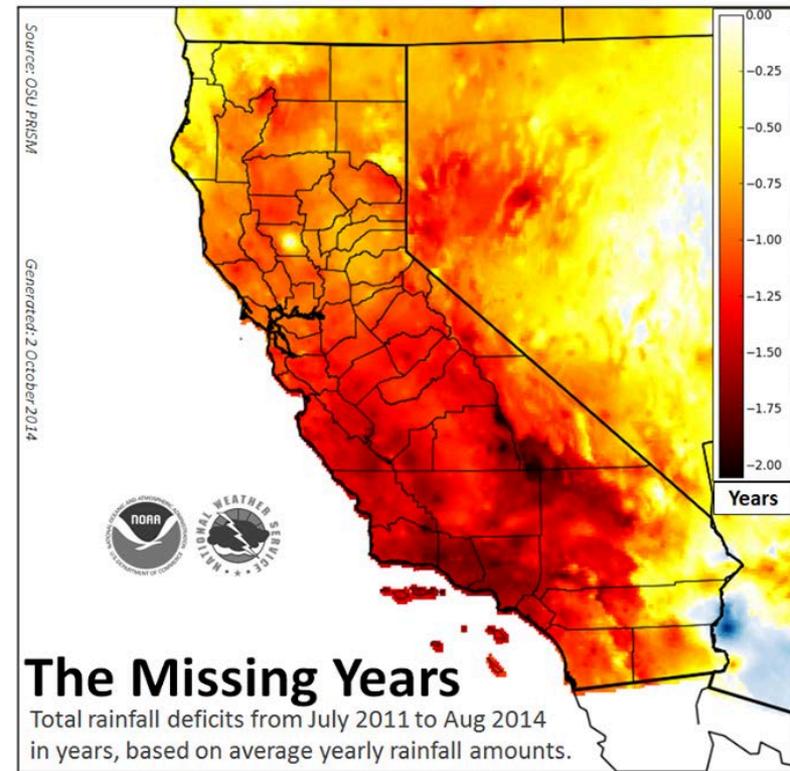
- California Drought
- Assessment Goals
- Assessment Methodology
- Findings
- Questions/Discussion



# 2014 California Drought



- 2012-2014 driest 3 year period on record for much of state
- Key 2014 statistics:
  - Precipitation: Less than 2 years worth of average precipitation over last 3 years
  - Mountain snow: 2014 snow pack was about 1/3 average
  - Rivers: 2014 Runoff volumes 10-50% average
  - Reservoirs: Aug 2014 statewide reservoir storage 57% average and 36% capacity
- California now exceptionally vulnerable to water shortages – will take much above average snow/precip to re-charge reservoirs and groundwater



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# Assessment Goals



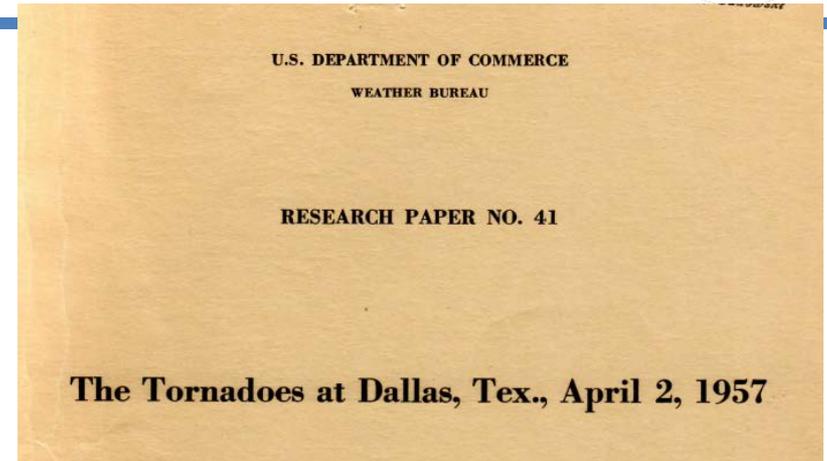
- **Understand drought impacted decisions** – Understand and describe the decisions impacted by the drought in the following sectors: water resources, agriculture, fisheries, and municipal government
- **Assess NOAA effectiveness** - Assess the effectiveness of NOAA data, forecasts, and services provided by NOAA to decision makers in the key sectors impacted by the drought during water year 2014.



# Background: Service Assessments



- NOAA/NWS history of service assessments dates to 1957
- Focus on services provided for short duration weather events including tornadoes, floods, hurricanes, and storms
- Identify recommendations for NOAA/NWS to improve services for future events
- Recommendations tracked
- No assessment to date on drought
- Sandy assessment was a NOAA wide assessment



## *Service Assessment*

### **The Missouri/Souris River Floods of May – August 2011**





# Assessment Scope



- Focus on NOAA data, forecasts, and science provided to decision makers in key sectors
- Identify improvements implementable within six months of report
- Will not assess NOAA/NMFS regulatory or management actions



# Field Work Overview



- Team divided into sector focused sub-teams: **Water Resources**, **Agriculture**, and **Fisheries**
- Each sub-team prioritized and organized stakeholder interviews for diversity of perspective and experience
- Over 100 stakeholders interviewed for this report include:
  - **Internal NOAA**
  - **Federal Government**
  - **State/Local Government**
  - **Academia**
  - **NGO/Industry Associations**
  - **Media**



# Team Members



- Lead: Kevin Werner (NESDIS)
- Vice Lead: Roger Pierce (NWS)
- Vice Lead: Chad McNutt (OAR)
- Ryan Wulff (NMFS)
- Jawed Hameedi (NOS)
- John Ewald (NOAA HQ Communications)
- Chris Smallcomb (NWS)
- Karin Gleason (NESDIS/NCDC)
- Mike Anderson (CA DWR and CA state climatologist)
- Chris Stachelski (NWS and NRAP Detailee)

Executive Sponsor: NOAA DUS-O VADM Devany



# Findings



- Agriculture (chapter 3)
- Fisheries and Coastal Ecosystems (chapter 4)
- Water Resources (chapter 5)
- Major and Cross Cutting Themes (chapter 6):
  - Matching NOAA investments in science, data, and forecasts to stakeholder needs
    - Improved Seasonal prediction for water resources
  - Improving NOAA collaboration with partner agencies and organizations
    - Develop full natural flow modeling and forecasting
  - Improving NOAA internal coordination



# Improved Seasonal Prediction for Water Resources



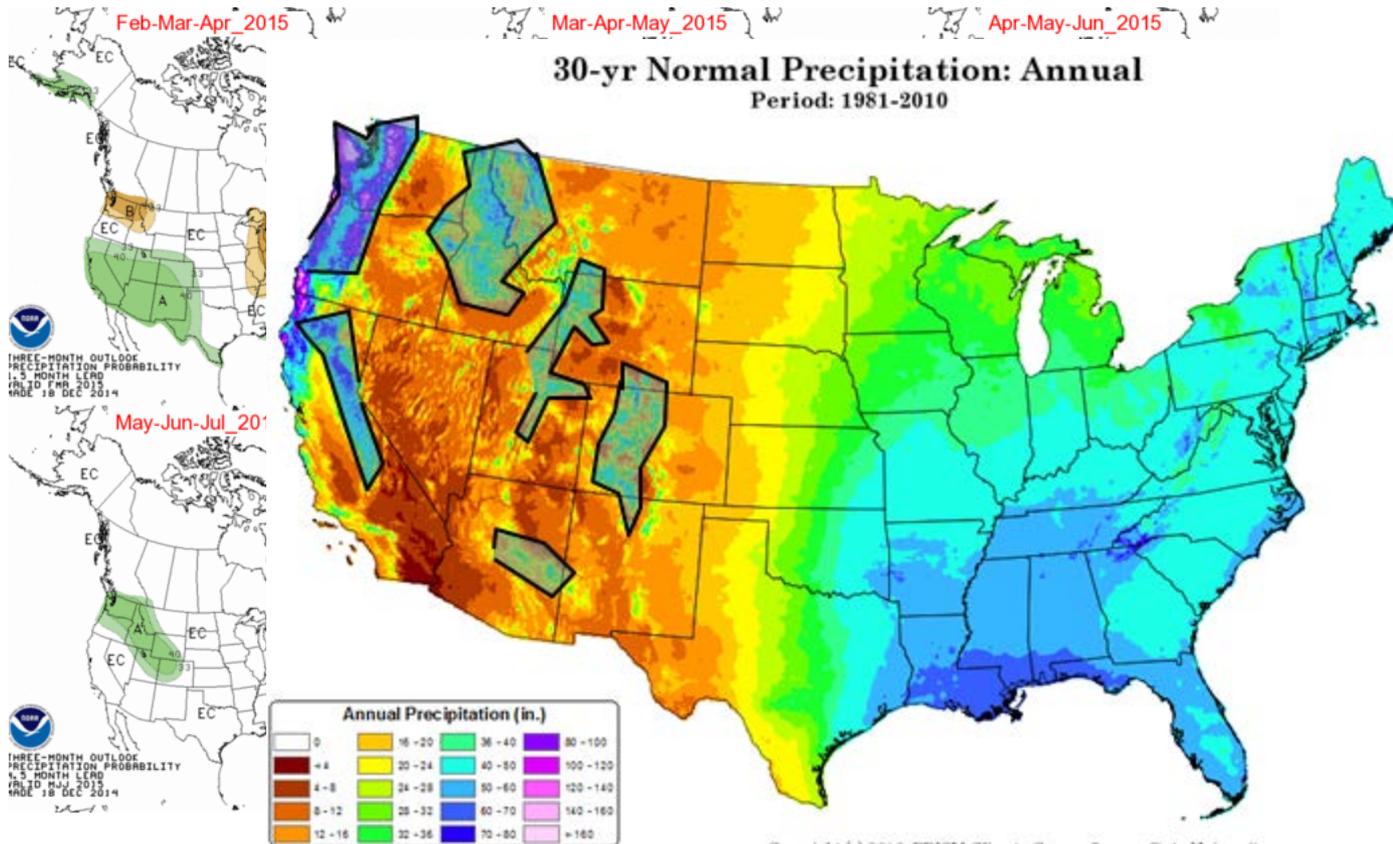
- Matching NOAA investments in science, data, and forecasts to stakeholder needs
  - Improve cool season precipitation forecasts and their application
- Improving NOAA collaboration with partner agencies and organizations
  - Best practices: Russian River Habitat Blueprint and Hydromet Testbed
  - Partner with other agencies to develop capabilities for full natural flow modeling and forecasting



# Improved Seasonal Prediction for Water Resources



- #1 Stakeholder request: What is the forecast for the upcoming winter's precipitation?





# Full Natural Flow Modeling and Forecasting



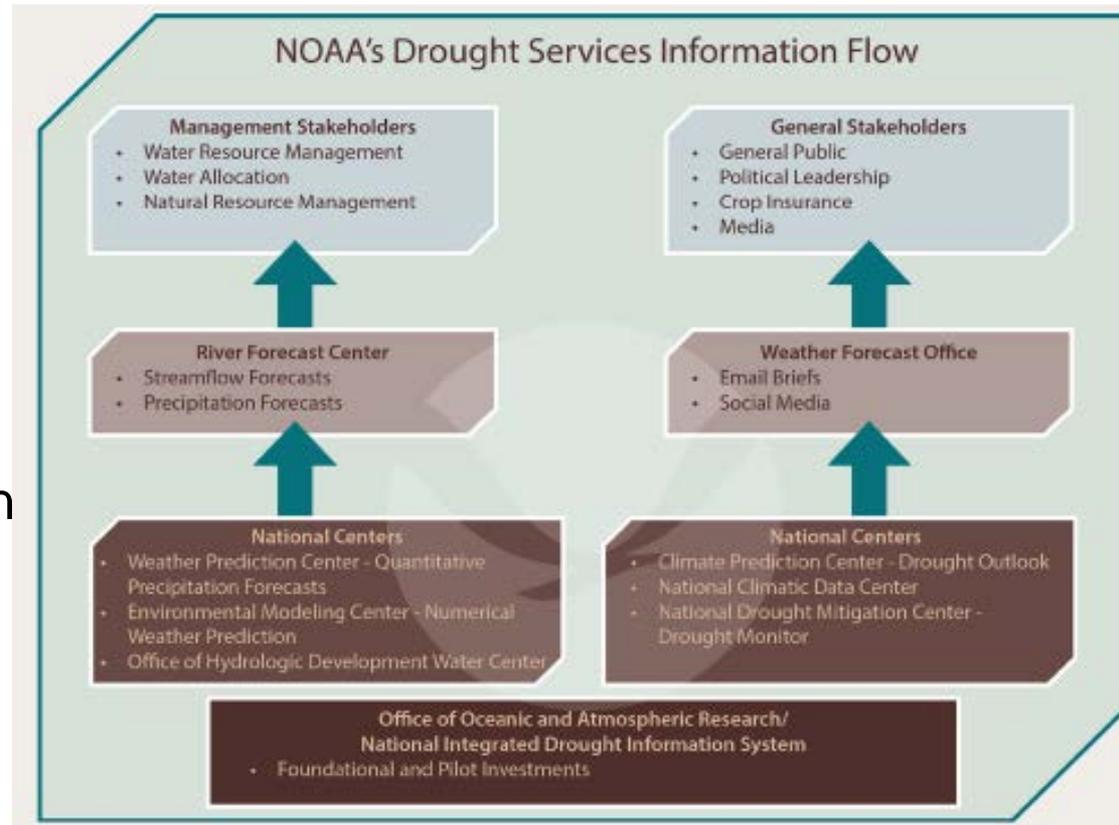
- **Finding:** Many water decision makers—water boards, fisheries managers, coastal ecosystem planners, and recreational water users in particular—require a "whole" view of water system environments (physical and biological elements).
- **Recommendation:** NOAA should initiate (or expand through existing Integrated Water Resources Services and Science MOU) a partnership among other federal and state agencies (particularly USGS and DWR) and other stakeholders for scoping modeling and monitoring activities needed to estimate and forecast full natural flows (FNFs) in streams and rivers in California.



# Improved NOAA Coordination



- NOAA expertise on drought and water resources dispersed through agency and geography
- NWS WFOs and RFCs are the de facto “front line” for most services
- National centers contain significant expertise
- Challenge: Effectively leverage strengths of agency’s components for stakeholders





# Questions/Dicussion

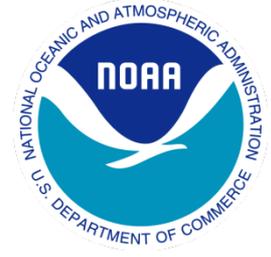
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# Back-up

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# Agriculture (chapter 3)



- Agriculture sector desires more NOAA collaboration
  - Explore enhanced ag weather services
- Mixed reactions and perceptions on El Nino and seasonal prediction
- Agriculture generally not relying on NOAA seasonal predictions
- NOAA's drought information not always accessible or relevant
- Role for NOAA research



# Fish and Coasts (Chapt 4)



- Opportunities for improved water modeling and forecasting targeted at key decision makers:
  - Full natural flow of surface water
  - Water quality for surface and Bay Delta water
  - Water temperature forecasting
- Improving localized NOAA information and application



# Water Resources (chapt 5)



- Opportunities abound to improve application of water resource forecasts
- Improved cool season precipitation forecasts for mountains is a major opportunity
- Forecast improvements desired by stakeholders:
  - Importance of weather and climate reforecasts for water resources forecasting
  - Online forecast verification capabilities
  - Greater usage of NCDC's data expertise