

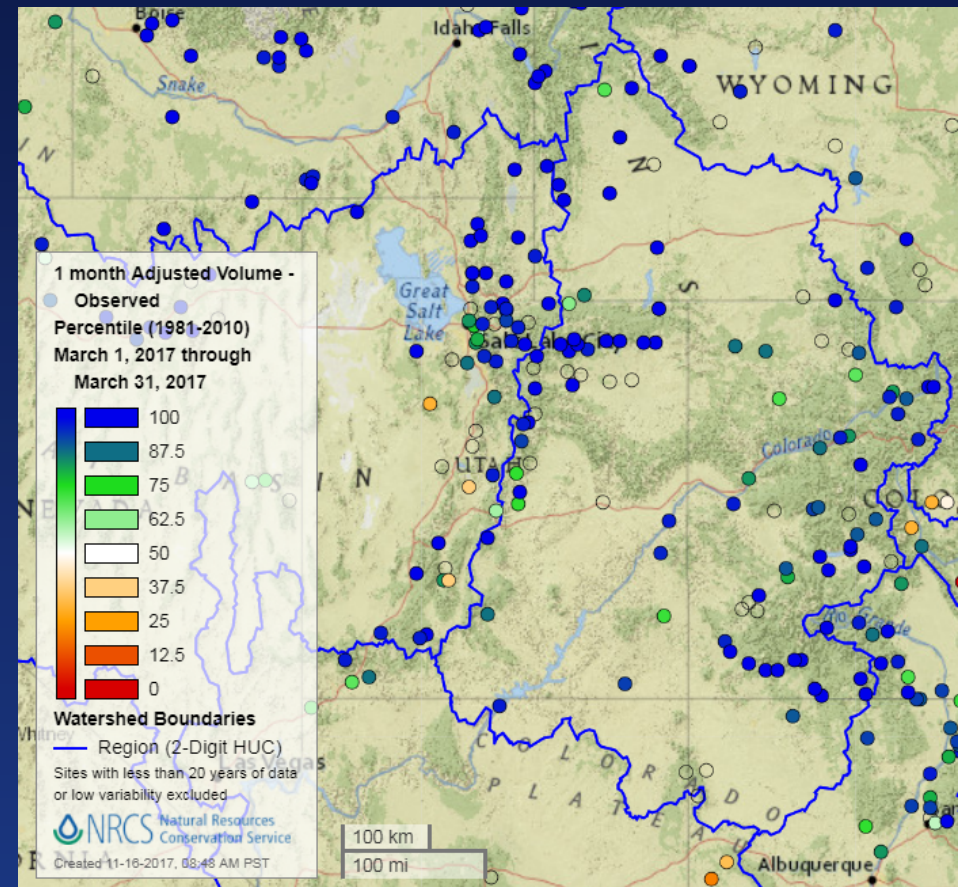
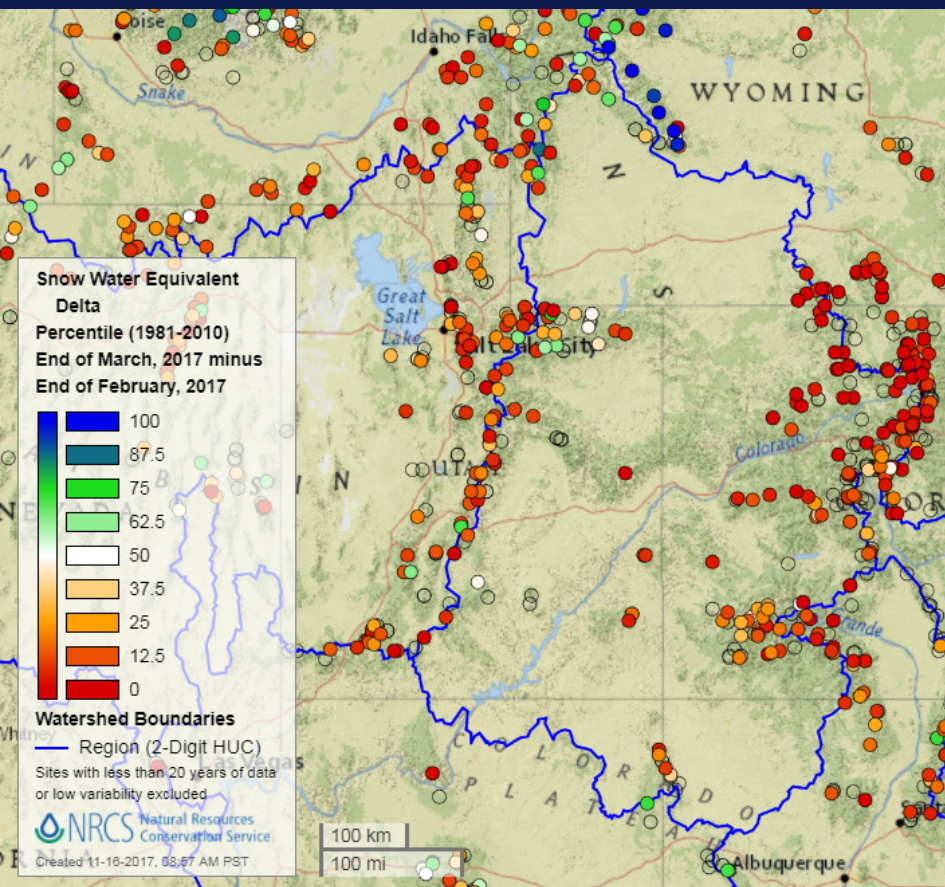
# **Snowpack Conditions, Station Information and Data Acquisition/ Analysis**

Gus Goodbody

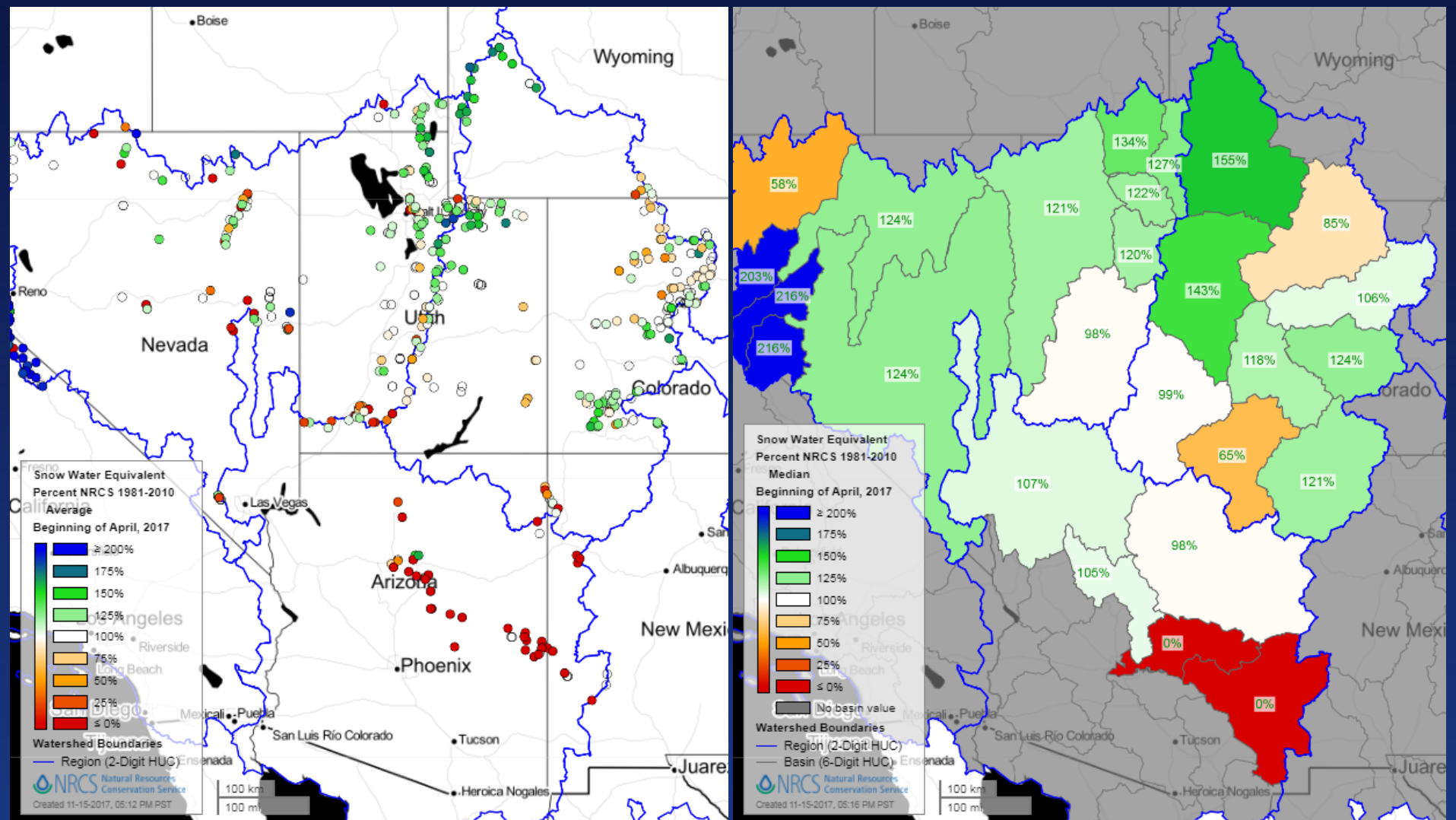
United States Department of Agriculture  
Natural Resources Conservation Service  
National Water and Climate Center  
Portland, Oregon

Presented at  
Colorado River Forecast Service Meeting  
Salt Lake City, UT  
16 November 2017

# Warm and drier March 2017 leads to early snowmelt and high flow volumes (outside April-July Target)

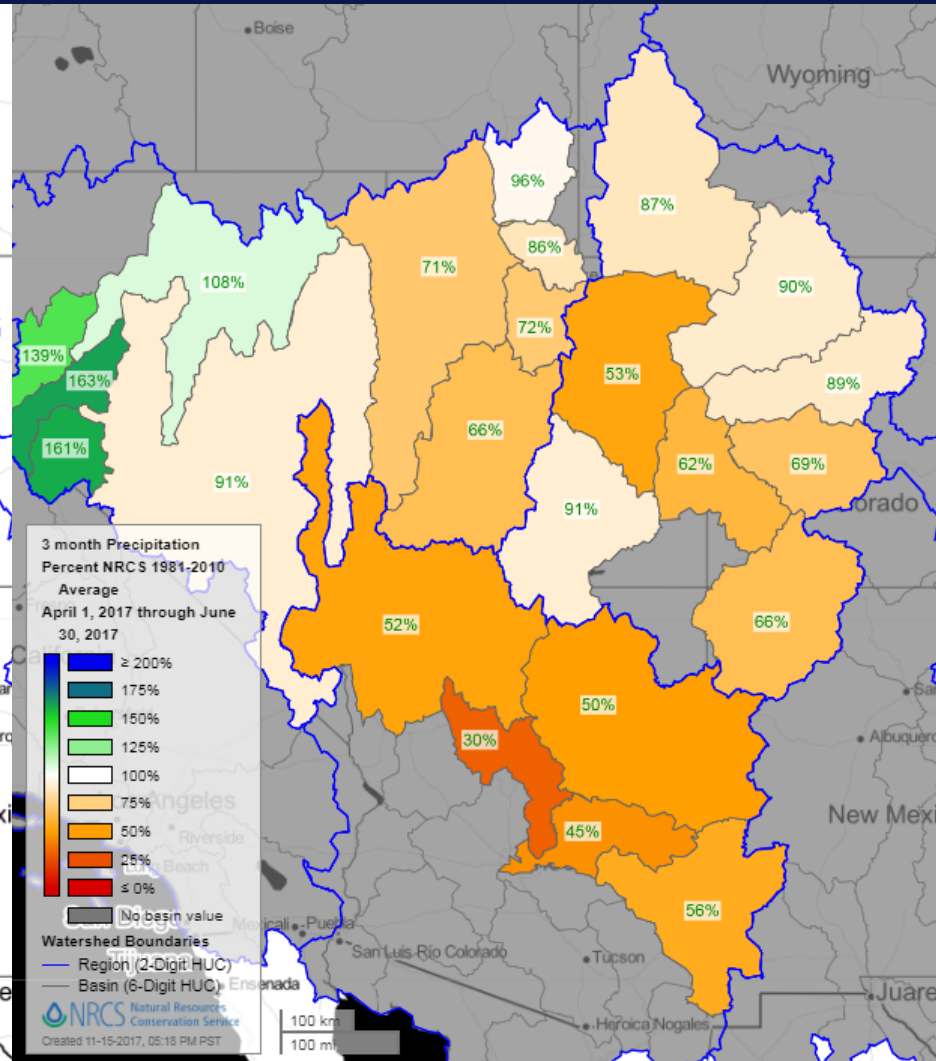
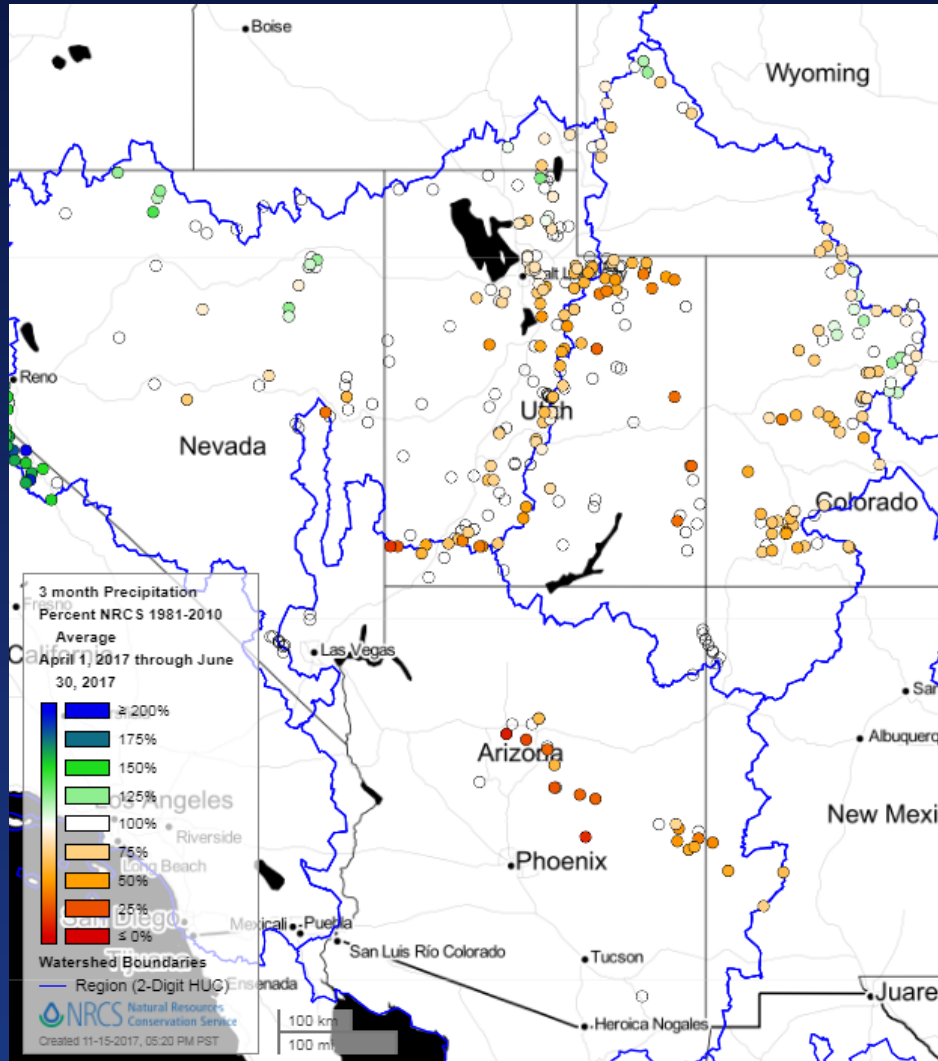


# Mountain Snowpack Conditions - April 1, 2017

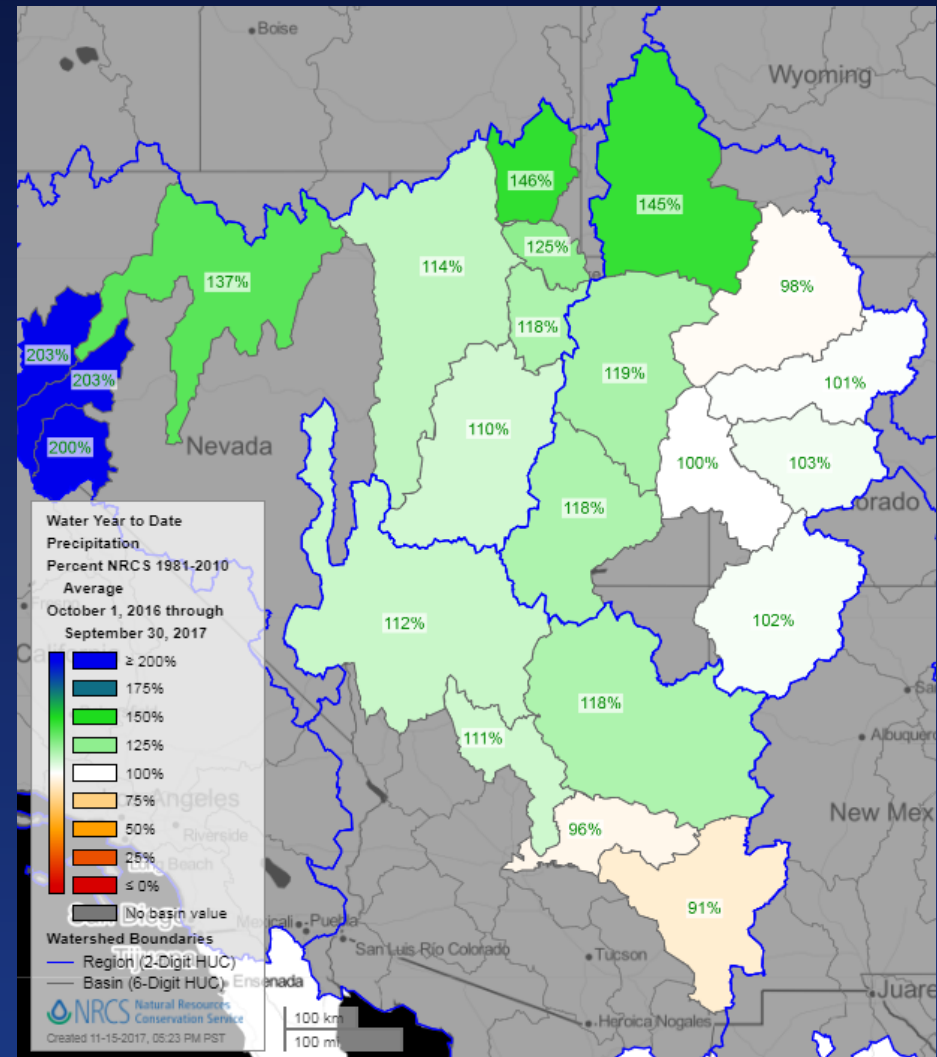
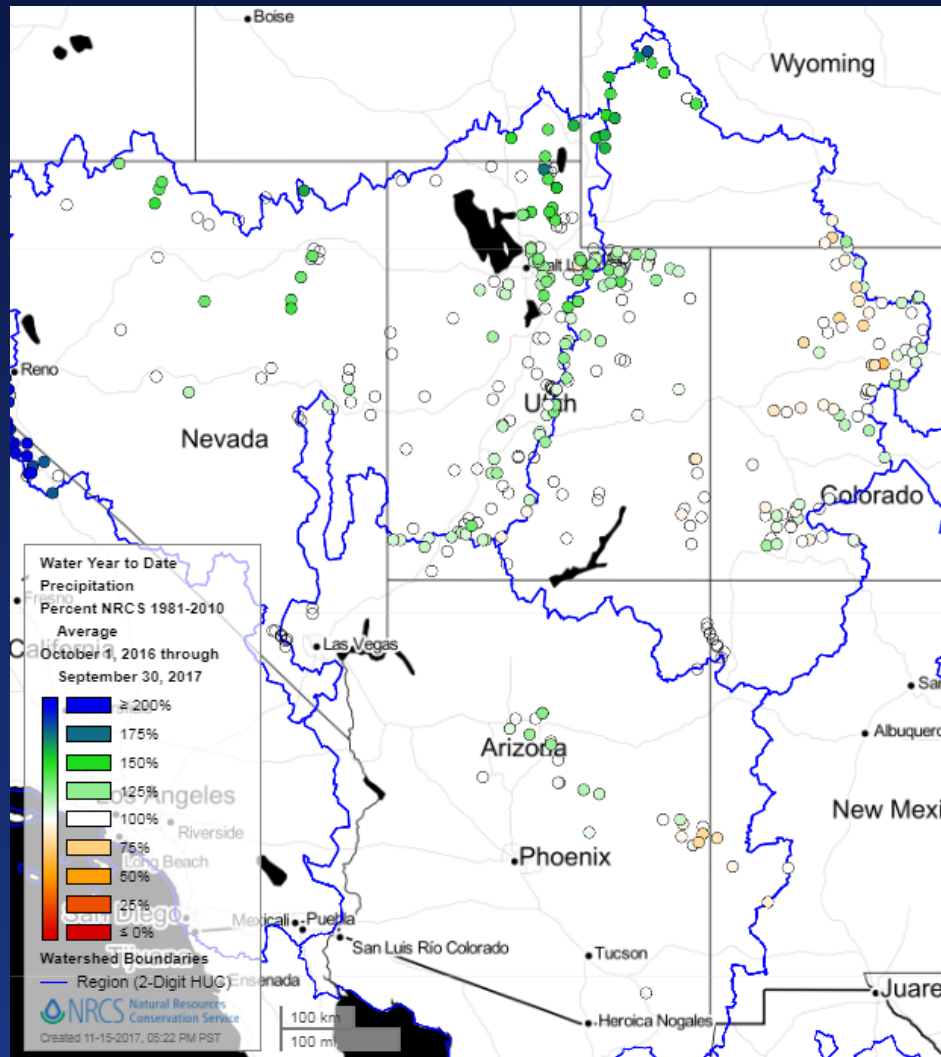




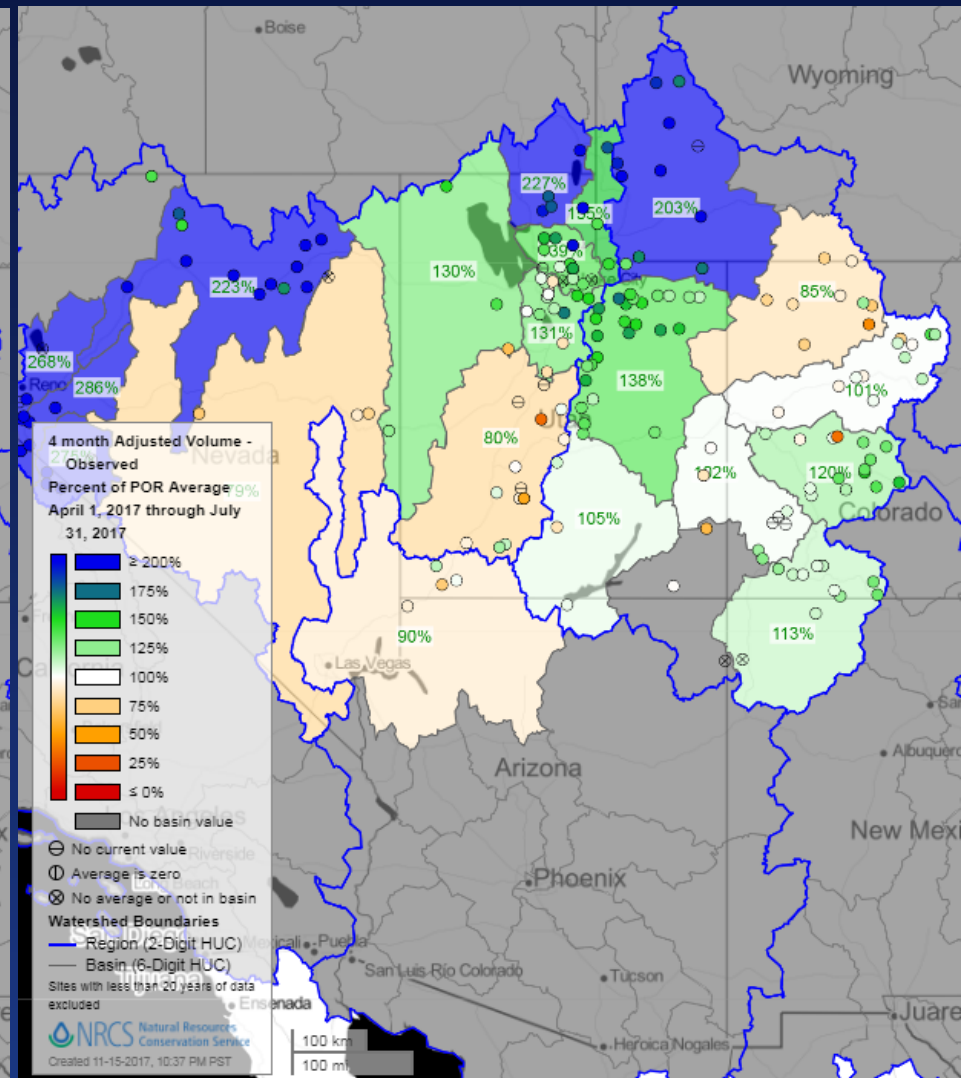
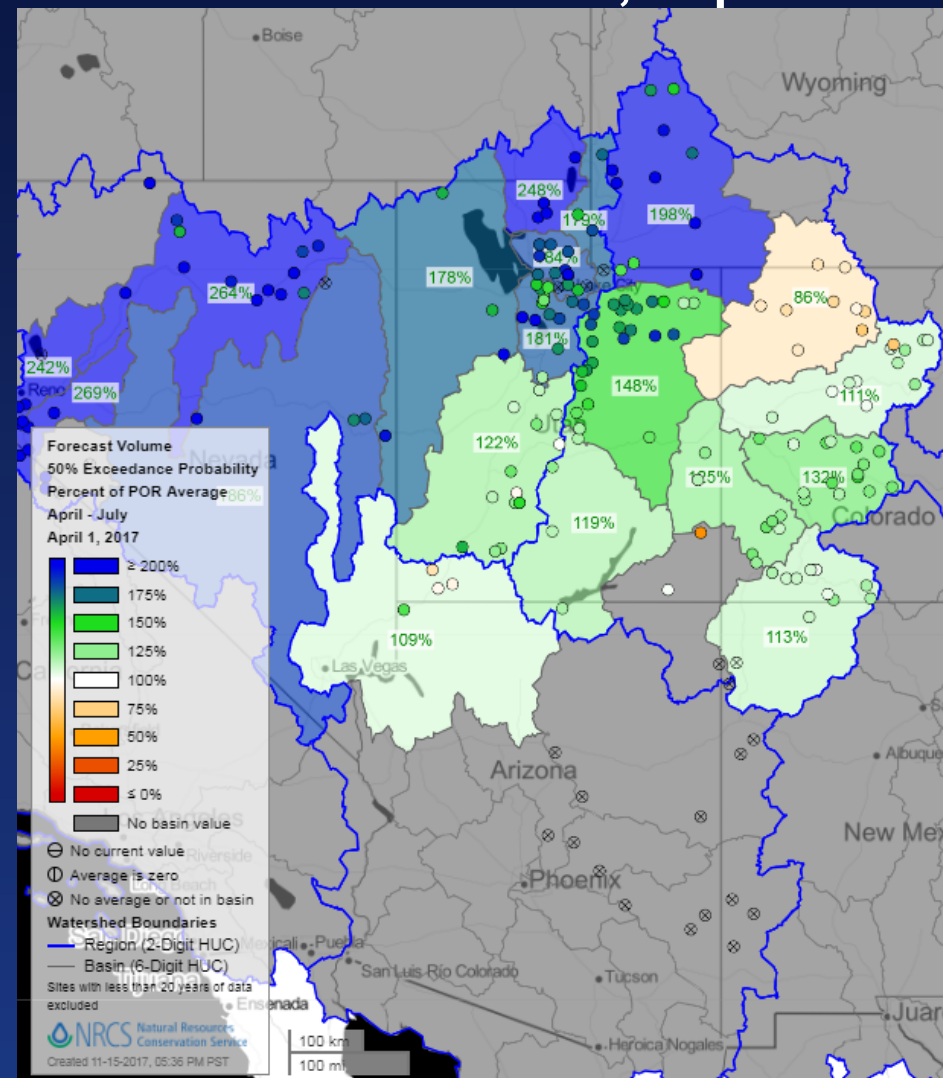
# Spring Mountain Precipitation, 2017



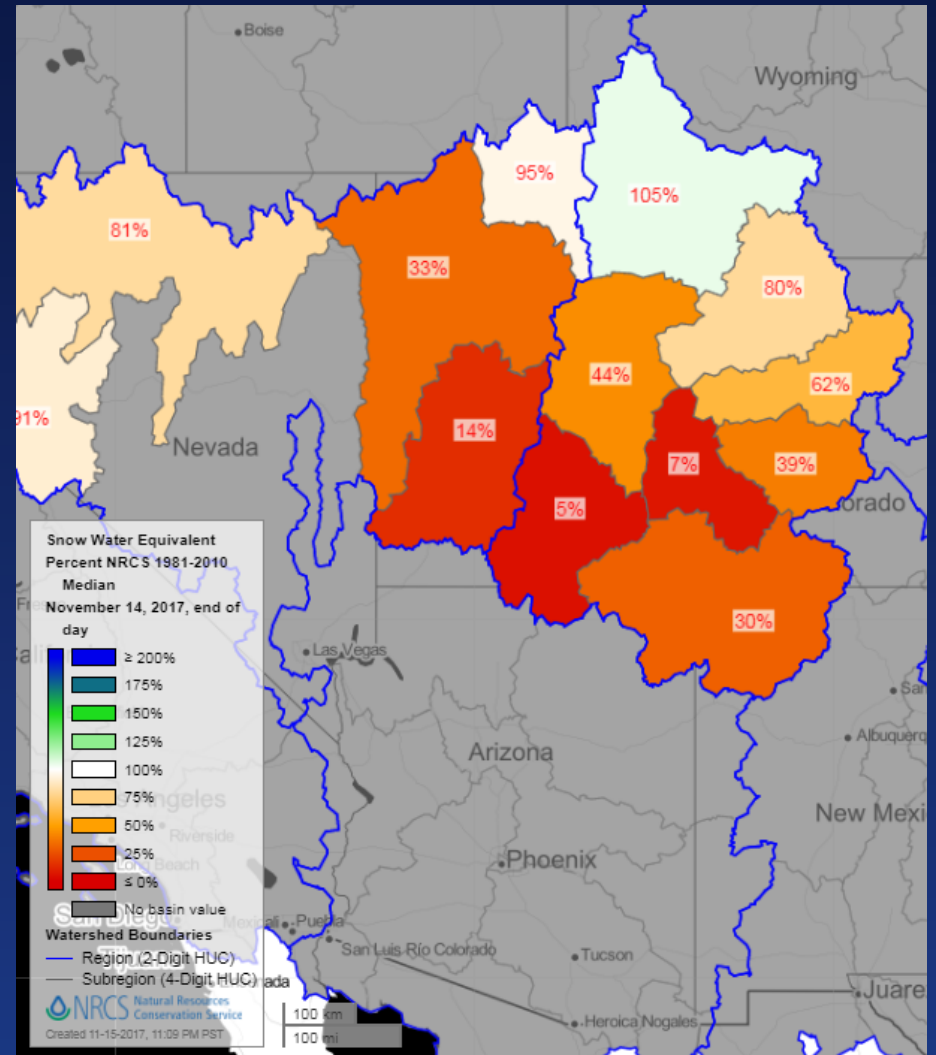
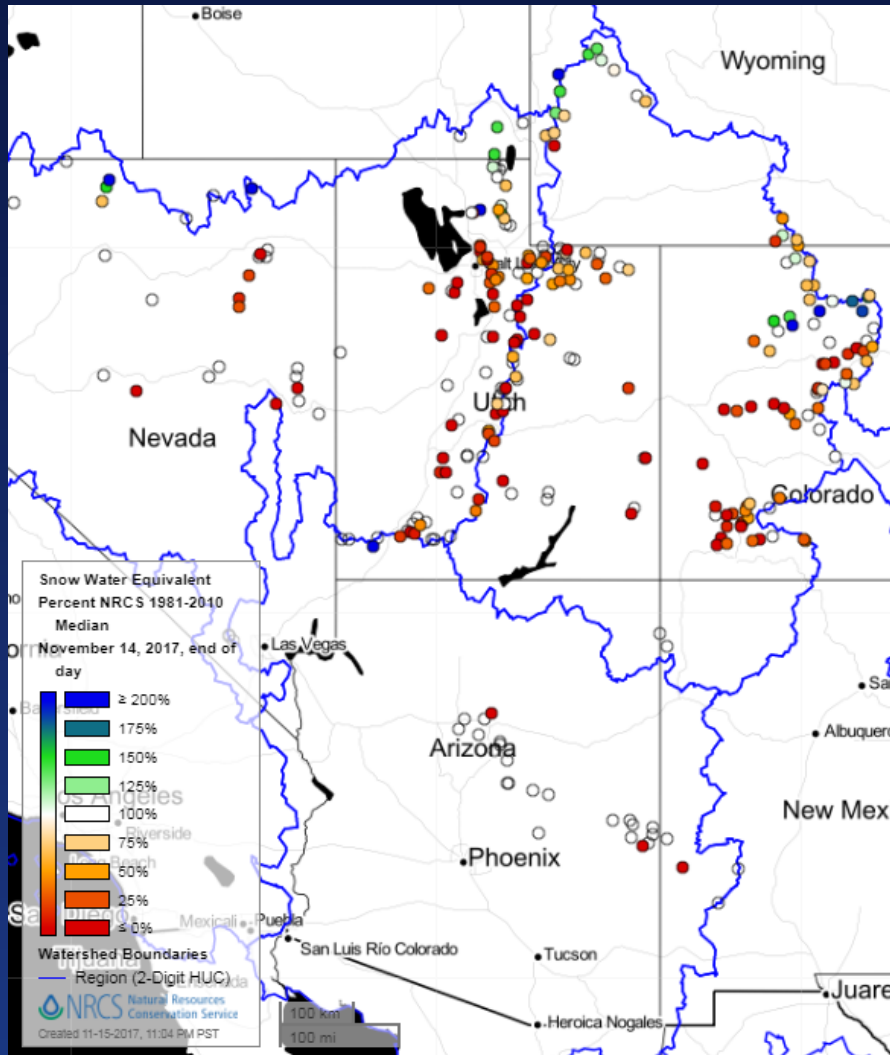
# Water Year Mountain Precipitation, 2017



# WY 2017, April 1 Forecast Verification

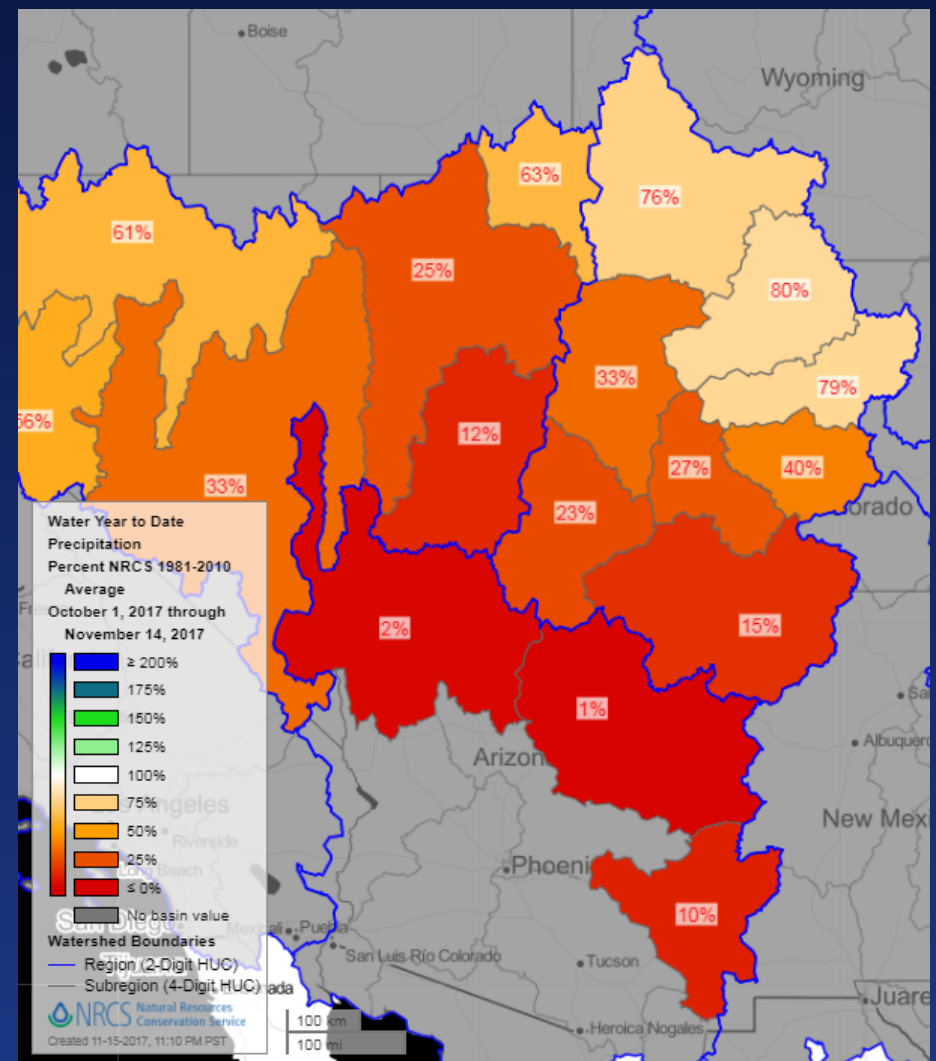
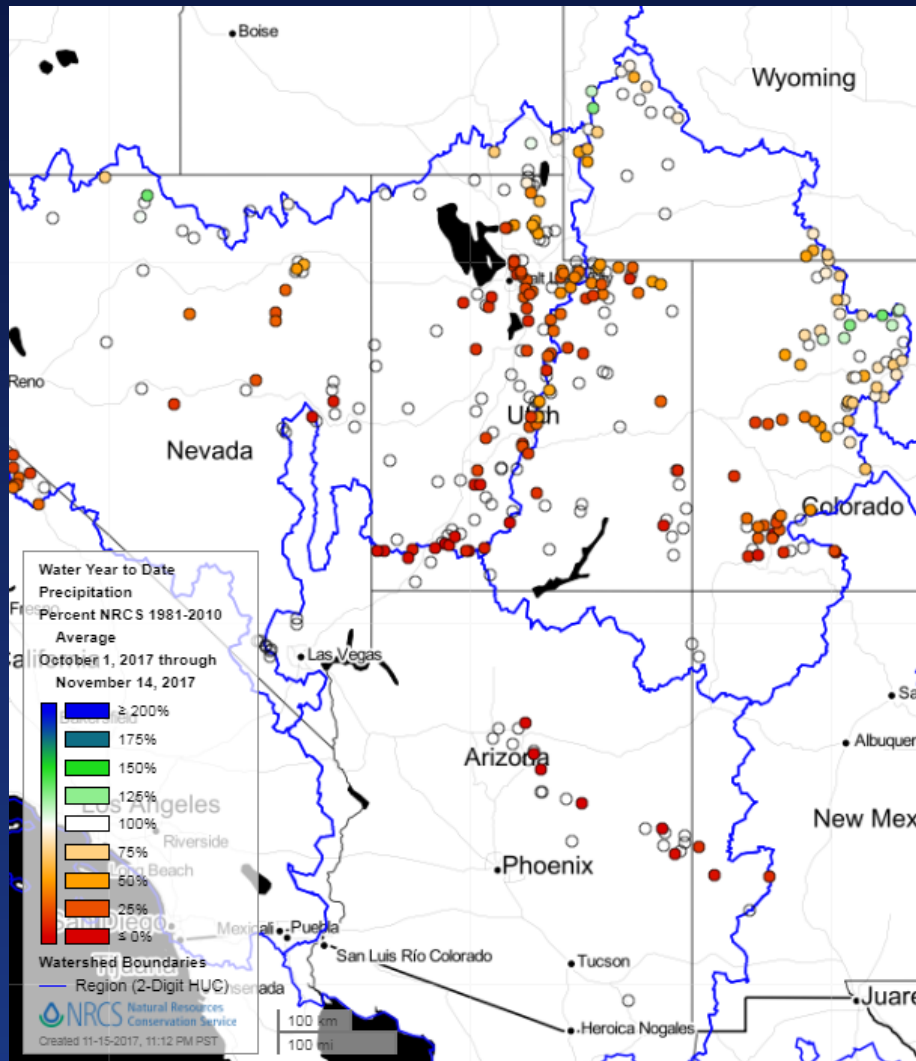


# Snowpack Conditions – November 15, 2017





# October 1-November 14 Precipitation, 2017







# SNOTEL Network Updates, WY 2018 Colorado Basin and Great Basin

- Impacted Site – Yankee Reservoir, Great Basin, burned and rebuilt. Normals removed.



## Red Mountain Pass Snotel – Land Ownership Issue

- Site is on private land and landowner wants it removed
- Red Mountain Pass Snotel is a long term, high elevation site
- Critical for water supply forecasting in the Dolores, Gunnison and San Juan River Basins
- Option to purchase land and preserve site actively being negotiated. More news by February.



# Slumgullion Snotel – Forest Disturbance, 2016. Stationarity impact unknown



# Trapper Lake Snotel, White River Basin, Colorado

Burned in 2002 – obvious impact to data stream noticed in 2016 (windy winter?). Normals removed.



## Snotel Air Temperature Bias

- Warm bias in historic record detected associated with sensor change in 1990's-2000's
- Efforts to correct the recent bias through use of new conversion equation
- Other less quantifiable biases in early air temperature record associated with radiation shield and sensor placement issues
- Efforts to identify a better sensor and shield combination going forward



## SNOTEL and AWDB Data Access

- Report Generator

<http://wcc.sc.egov.usda.gov/reportGenerator/>

- AWDB Web Service:

[http://www.wcc.nrcs.usda.gov/web\\_service/  
awdb\\_web\\_service\\_landing.htm](http://www.wcc.nrcs.usda.gov/web_service/awdb_web_service_landing.htm)

## Data Analysis and Mapping

- Interactive Map:  
[http://www.wcc.nrcs.usda.gov/snow/snow\\_map.html](http://www.wcc.nrcs.usda.gov/snow/snow_map.html)
- Snotel Update Report:  
<http://wcc.sc.egov.usda.gov/reports/SelectUpdateReport.html>

# Contact NRCS Snow Survey and Water Supply Forecasting Program

- <http://www.wcc.nrcs.usda.gov/contact/index.html>
- The Contact Help Center offers comprehensive contact choices based on subject matter
- And of course, you can always contact me directly:  
[angus.goodbody@por.usda.gov](mailto:angus.goodbody@por.usda.gov)