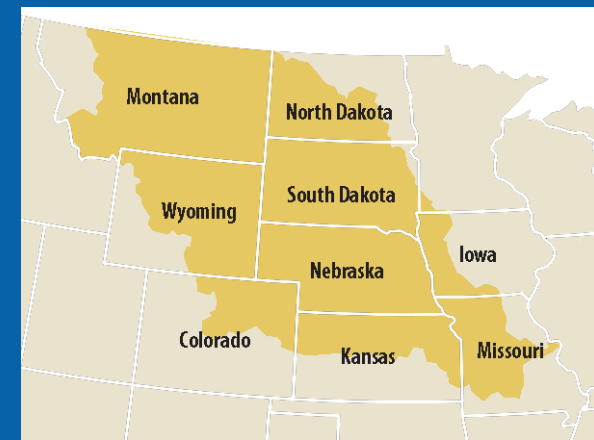
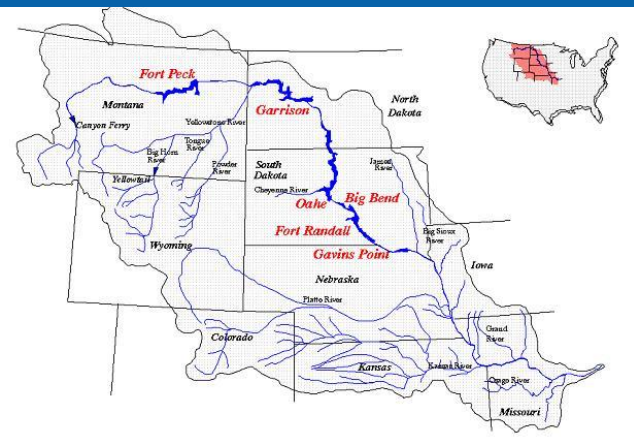


Climate Working Group Update

MRBIR Winter Meeting
February 22nd, 2017

Verlon Barnes (USDA), Doug Epperly
(BOR) and Doug Kluck (NOAA)



Outline

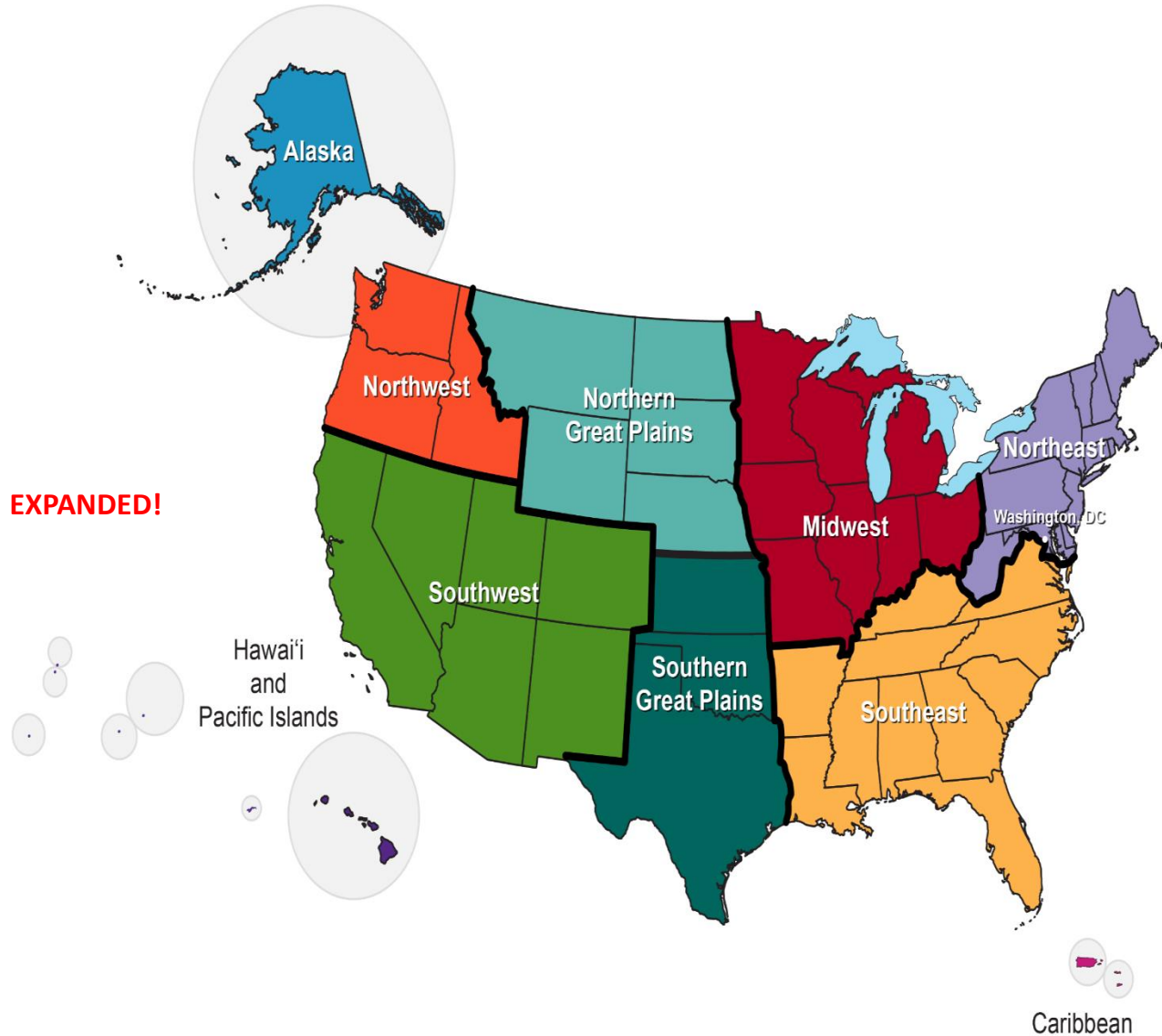
- National Climate Assessment
- National Integrated Drought Information System
- Missouri Basin Federal Climate Collaboration
- BOR – Secure Water Act findings
- Outlook (Climate & Flooding)

National Climate Assessment 4.0

- Congressional Mandate (every 4 years)
- Sectors, Regions, Science
- 13 Agencies
- Late 2018 Published
- Northern Great Plains (MT, WY, ND, SD, NE) = Missouri Basin (mostly)
- Public Listening Session Rapid City, SD (2/22/17)
- Authors: Rich Conant, Lead (CSU), Martha Shulski (UNL), Mike Hayes (UNL), Barb Mayes (NOAA), Ben Livneh (CU), Laura Farris (EPA), Justin Derner (USDA), Shannon McNeeley (CSU), Dannele Peck (USDA), Mark Anderson (ex-USGS), Doug Kluck (Convening Lead Author)

NCA4 Regions

- Northeast
- Southeast
- U.S. Caribbean **NEW!**
- Midwest
- Northern Great Plains
- Southern Great Plains
- Northwest
- Southwest
- Alaska
- Hawai'i and Pacific Islands



National Integrated Drought Information System – MO Basin

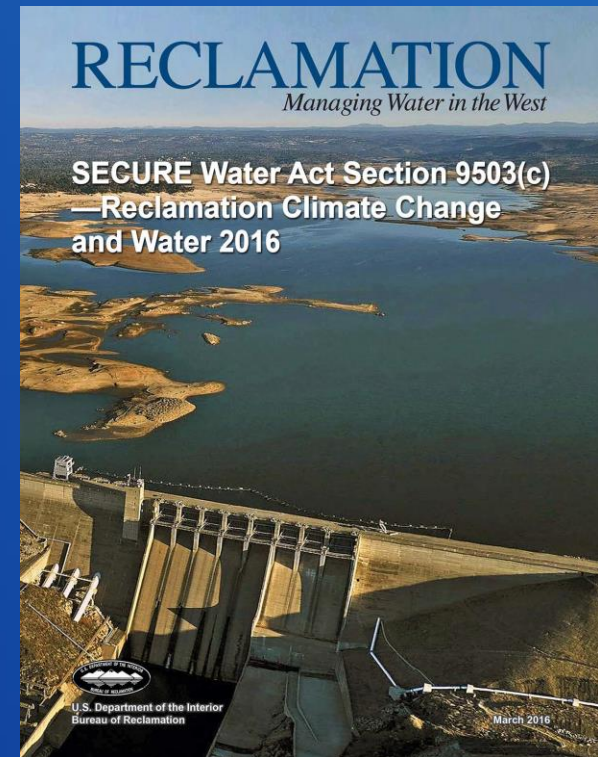
- NIDIS Strategic Plan Update Workshops
 - Nebraska City: 7-9 March
 - Rapid City: 23-25 May?
 - Both meetings will include a drought tools workshop first ½ day
 - Agenda:
 - Accomplishments w/states, tribes, basin, feds, sectors
 - Key gaps (communication, vulnerability analysis, planning, monitoring, prediction)
 - Drought tools workshop

Missouri Basin Federal Climate Collaboration

- Fed's only calls/webinars related to climate and Missouri Basin
 - New findings: research, monitoring,
 - Current conditions of the basin
 - Priorities of agencies
 - Meetings of interest
- January 26th Webinar – recorded on MRBIR site with PDF of presentation

SECURE Water Act Report to Congress - 2016

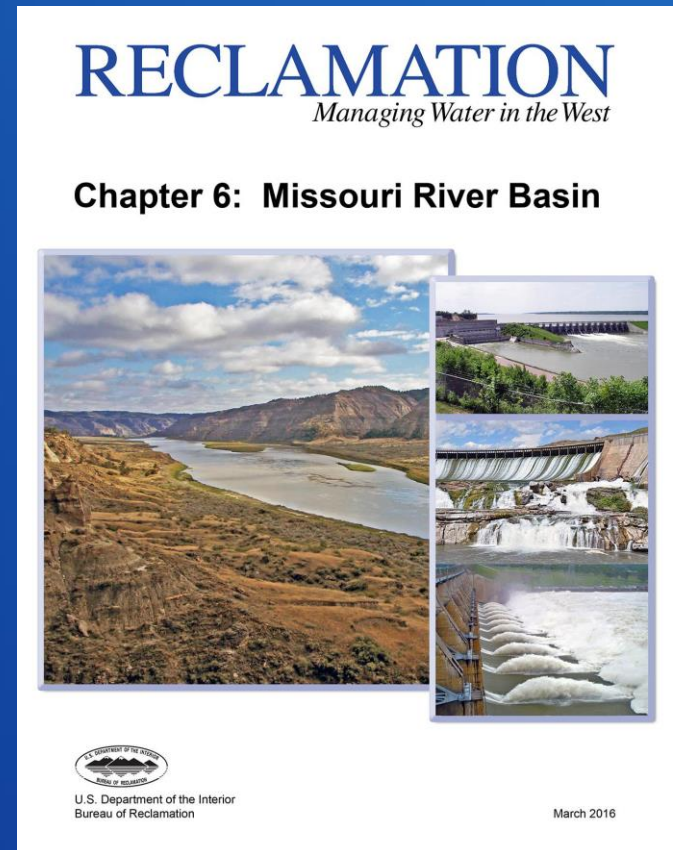
- Published every 5 years
- West-wide Climate Risk Assessments
- Major western basins



RECLAMATION

SECURE Water Act Report to Congress - 2016

- **Missouri River Basin**
 - **Projections (2070)**
 - 5°-6° increase
 - Slight precipitation increase
 - Earlier runoff; decreased summer runoff
 - **Studies**
 - Upper Missouri River Headwaters Impact Assessment
 - Missouri River Basin Headwaters Basin Study
 - St. Mary and Milk River Basin Study
 - Republican River Basin Study
 - Niobrara River Basin Study



RECLAMATION

SECURE Water Act Report to Congress - 2016

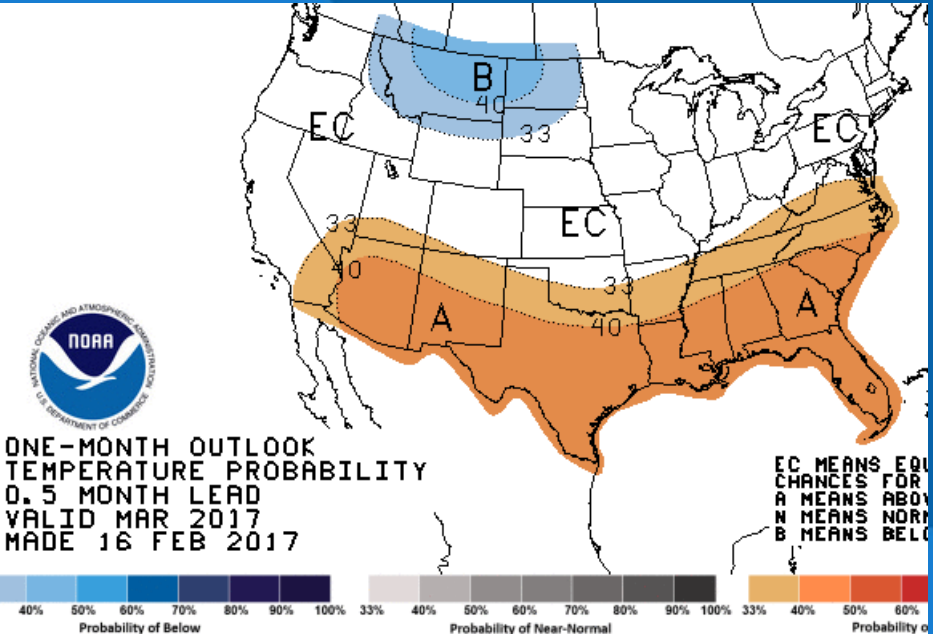
- **Missouri River Basin**
 - **Runoff changes translate to:**
 - ↓ irrigation water supply
 - ↑ wintertime flood control challenges
 - Adverse hydropower operation impacts
 - **Warmer conditions may:**
 - ↑ fishery stress
 - ↑ electricity demand
 - ↑ water demand
 - ↑ potential for invasive species infestations
 - Shrink prairie pothole region

<https://www.usbr.gov/climate/secure/index.html>

RECLAMATION

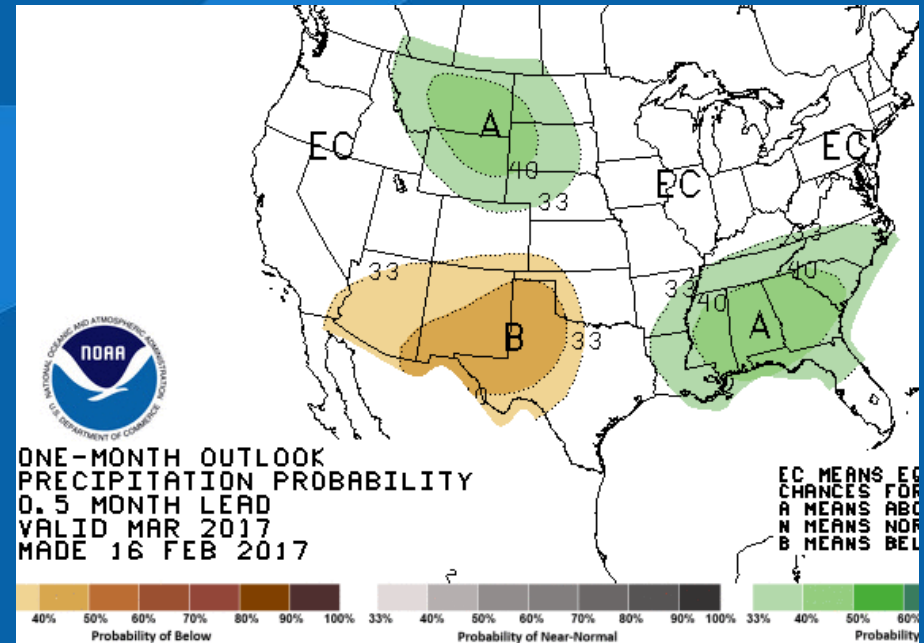
Outlooks & Flood Potential

March 2017 Probabilities

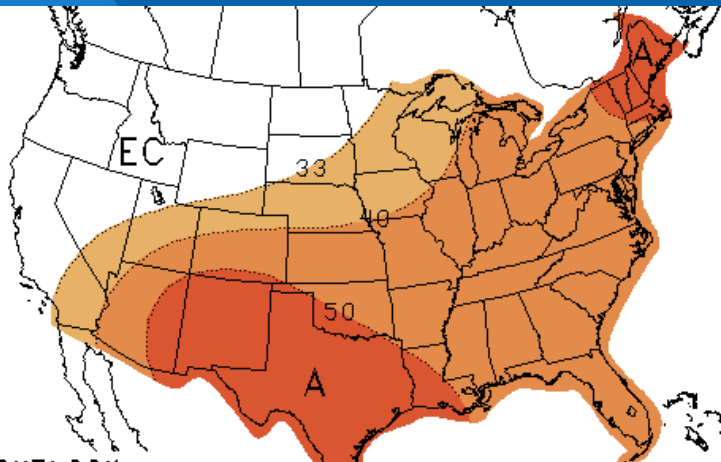


Temperatures

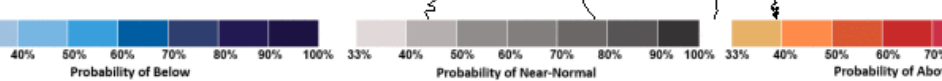
Precipitation



March – May Probabilities



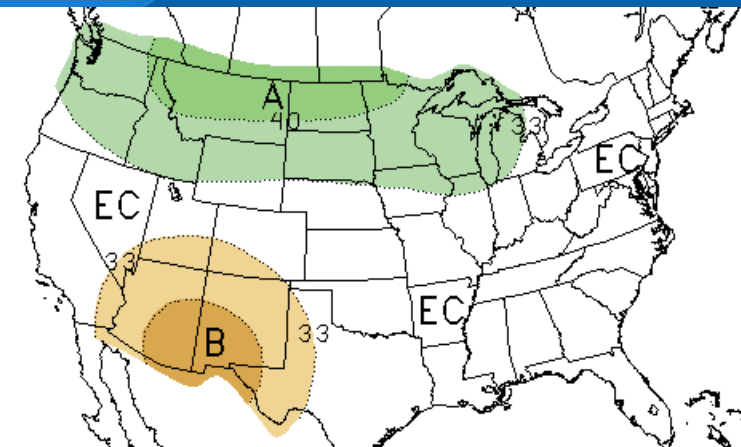
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID MAM 2017
MADE 16 FEB 2017



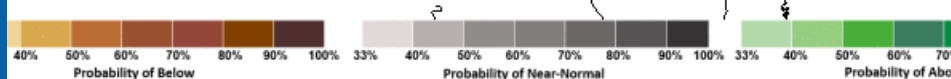
EC MEANS EQUAL CHANCES FOR A, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Temperatures

Precipitation



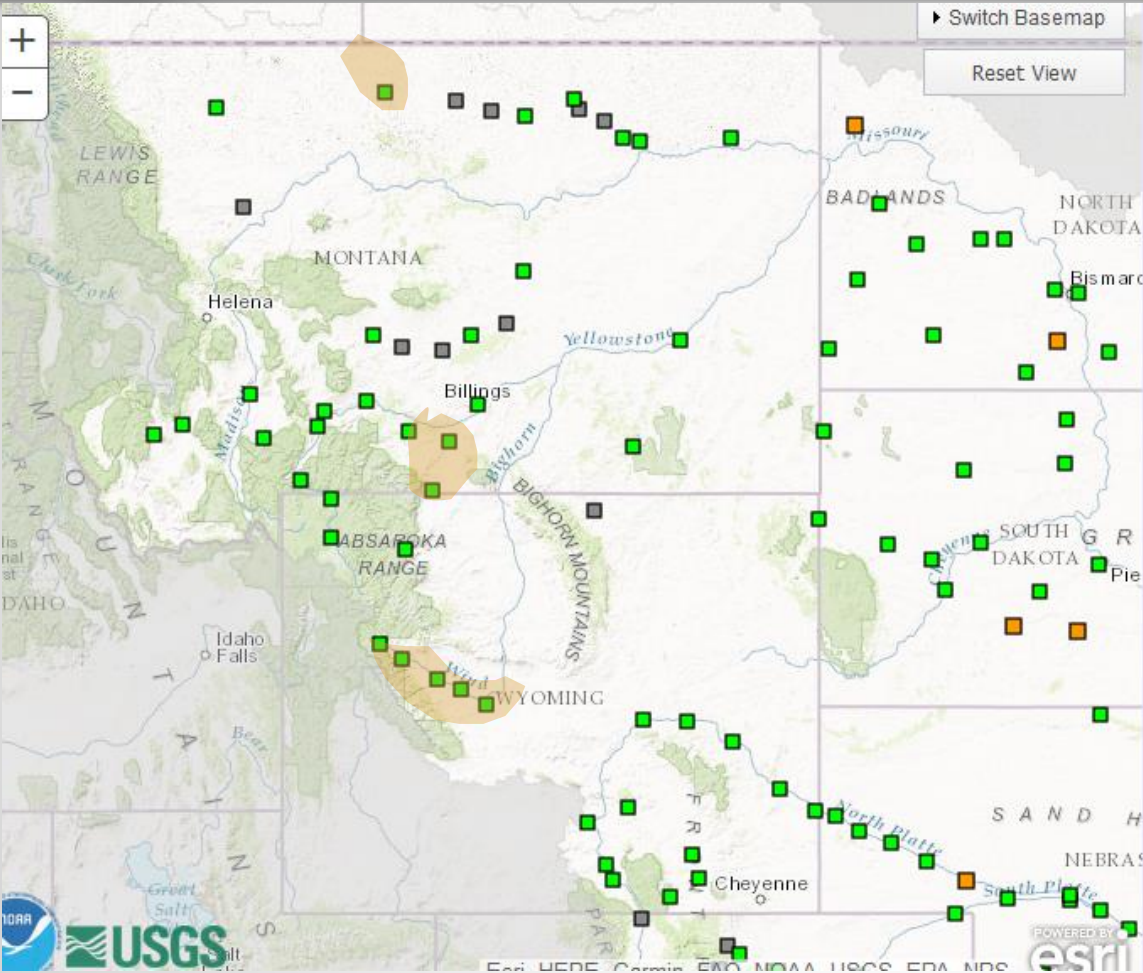
THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID MAM 2017
MADE 16 FEB 2017



EC MEANS EQUAL CHANCES FOR A, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW



MISSOURI BASIN FLOOD POTENTIAL OUTLOOK



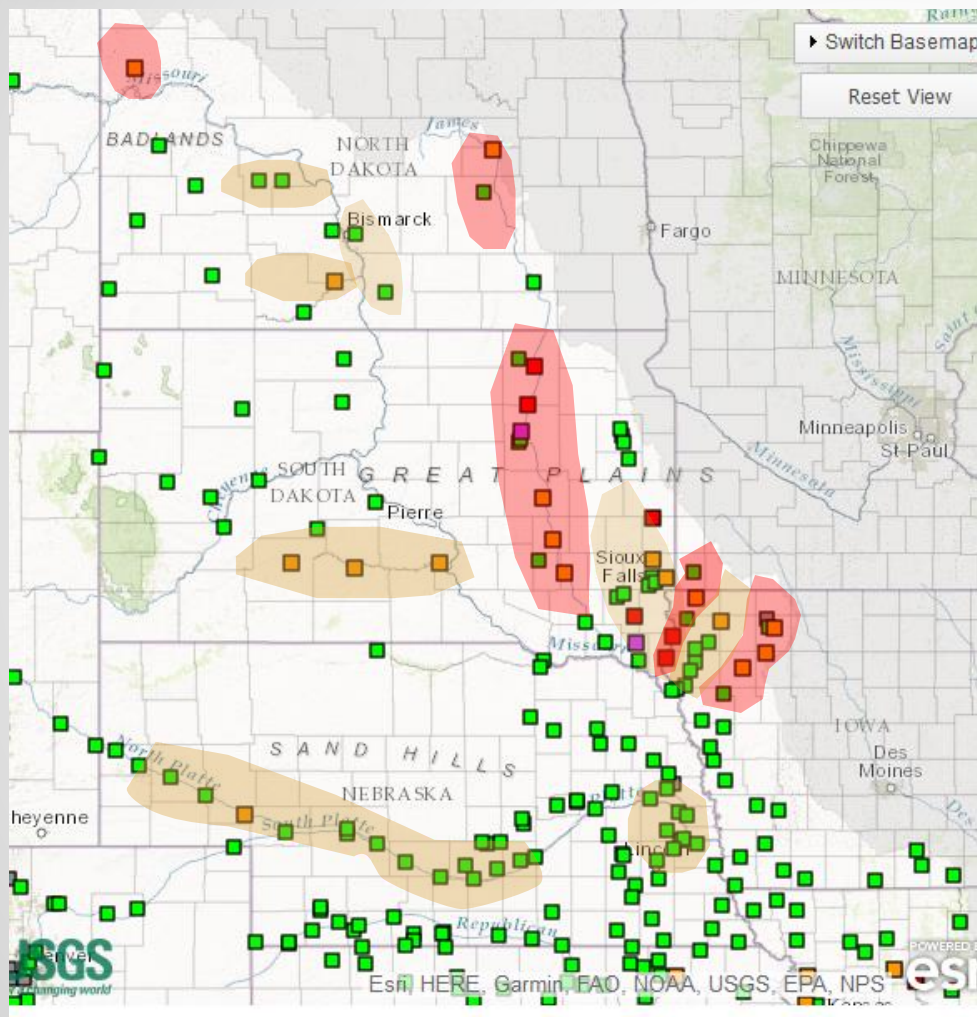
In Montana: Minor flooding possible along some tributaries to the Milk and Yellowstone.

In Wyoming: Minor flooding possible in the Wind River basins.





MISSOURI BASIN FLOOD POTENTIAL OUTLOOK



In North Dakota: Minor flooding possible along the Cannonball, Beaver Creek, Apple Creek, and the Knife. Moderate flooding possible along the James and Little Muddy.

In South Dakota: Minor flooding possible along the White, Big Sioux, and Vermillion Rivers, with moderate flooding possible along the James River.

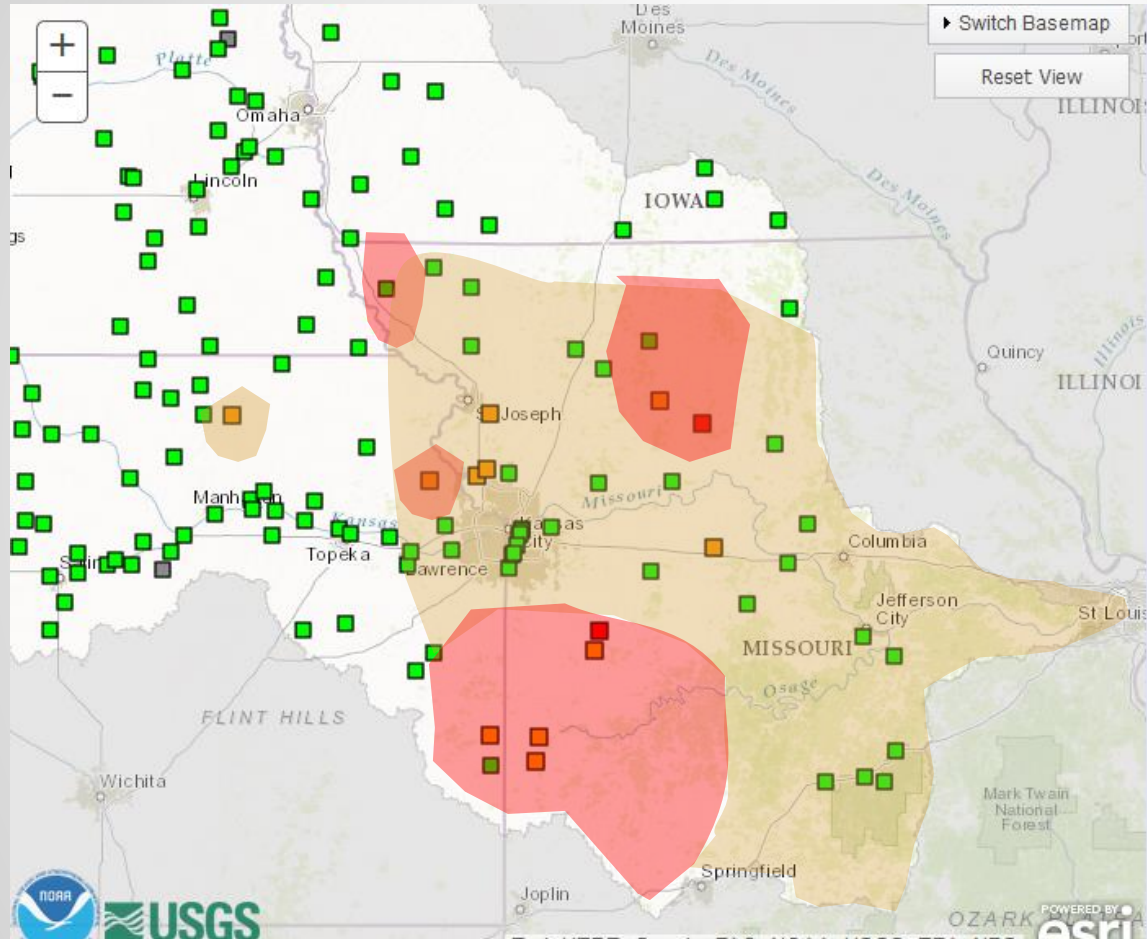
In Nebraska: Minor flooding possible along the lower reach of the North Platte and along some of the smaller tributaries in the southeastern portion of the state. Some concern over Platte River in central Nebraska.

In Iowa: Minor flooding possible along the Floyd and Rock Rivers. Moderate flooding along the Little and Big Siouxs.





MISSOURI BASIN FLOOD POTENTIAL OUTLOOK



In Kansas: Minor flooding possible within the lower Big Blue River basin. Moderate flooding along Stranger Creek and in the Osage-Marais des Cygnes River basin.

In Missouri: Minor flooding possible within the Platte River basin, and along several of the smaller tributaries to the Missouri River. Moderate flooding possible in the Grand and Osage River basins, and along the 102 and Tarkio Rivers.





MISSOURI BASIN SPRING FLOOD SUMMARY



- **Near to above average mountain snowpack....roughly 30% of snow accumulation period remains....Things could still change!**
- **Appreciable plains snowpack in North Dakota and northcentral South Dakota.**
- **Soils wet in Montana, North Dakota, eastern South Dakota, and Iowa.**
- **Ice jam flooding has already occurred, and will continue to be likely.**
- **Significant flooding due to mountain snow runoff alone is not likely.**
- **Minor-to-moderate flooding likely in eastern portion of the basin. Convection drives springtime flooding in lower third of the basin.**



Take-Aways &/or Needs

- National Climate Assessment - Opportunity to provide input through your agency rep or to Doug Kluck.
- National Integrated Drought Information System - Upcomings meetings to be aware of.
- Missouri Basin Federal Climate Collaboration - Opportunity for all MRBIR agencies to participate. Contact Doug Kluck if interested. Last webinar had 10 agencies participate (BIA, BOR, COE, EPA, FEMA, GS, NOAA, NPS, NRCS, USDA Climate Hubs)
- BOR – Secure Water Act findings - Climate Studies & Projections available.
- Outlook (Climate & Flooding) - Current climate and 3 month outlook, incl potential areas for flooding.