Upper Missouri Basin Climate/Drought Early Warning Webinar: El Niño

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Photo taken Feb 19, 2013
Providing climate services to the North Central U.S.

- Collaboration Activity Between:
  - State Climatologists
  - Doug Kluck & John Eise (National Oceanic and Atmospheric Admin.)
  - American Association of State Climatologists (AASC)
  - Midwest and High Plains Regional Climate Centers (RCC)
  - National Drought Mitigation Center (NDMC)
  - US Department of Agriculture (USDA)
  - US Army Corps of Engineers (USACE)

Next Regular North Central U.S. Climate/Drought Outlook Webinar
- August 15, 2015 (1 PM CDT) w/Jim Angel – Illinois State Climatologist

Access to Future Climate Webinars and Information
- http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
- http://mrcc.isws.illinois.edu/webinars.htm
- http://www.hprcc.unl.edu/webinars.php

Open for questions at the end
Agenda

* Current Conditions

* Impact Potential

* Outlooks
  * El Niño
  * Fall-Winter
Warm water progression in Pacific

ENSO Alert System Status: El Niño Advisory

Large amount of warm water sub-surface Likely to continue.

CPC – Strong El Nino

The chance of El Niño is approximately >90% through 2015.

http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/
Recent El Nino events

http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/
El Niño – Generalized Image

Wintertime El Niño pattern

- Low pressure
- Polar Jet Stream
- Warm
- Dry
- Wet

Extended Pacific Jet Stream, amplified storm track

NOAA Climate.gov
El Niño – not a matter of if

* 70% chance strong
* Nearly guarantee El Niño at some level this winter
* Stronger El Nino – more likely impact
* Spring is another topic....

**El Niño Strength**
Winter 2015-16

- El Niño: Weak: 15%
- El Niño: Moderate: 15%
- El Niño: Strong: 70%

Model data courtesy of the Climate Prediction Center and the International Research Institute for Climate and Society.
Impacts Not Guaranteed – 2009-10 El Niño

Departure from Normal Temperature (F)
12/1/2009 - 2/28/2010

Generated 6/18/2012 at HPRCC using provisional data.

Regional Climate Centers

http://www.hprcc.unl.edu/maps/current/
Review/Current Conditions
Mixed conditions – warmer than avg. MT, ND, KS, part SD
Cooler WY, NE

http://www.hprcc.unl.edu/maps/current/

HPRCC – Regional Climate Centers
Also very mixed - spotty very wet areas, large dry area

Year review – Dry – wetter - mixed
http://www.hprcc.unl.edu/maps/current/

HPRCC – Regional Climate Centers
Soil Moisture Anomaly in millimeters

http://www.emc.ncep.noaa.gov/mmb/nldas/drought/

Wet area in the northern Plains deeper soil moisture
Composites/Extremes Potential
El Nino extremes

* Likelihood of extreme events – precip or temp in highest/lowest 20% of years.
* [http://www.esrl.noaa.gov/psd/enso/climaterisks/](http://www.esrl.noaa.gov/psd/enso/climaterisks/)
SON Precipitation Extremes During El Niño
Risk of Extreme Wet or Dry Years

http://www.esrl.noaa.gov/psd/enso/climaterisks/
SON Temperature Extremes During El Nino
Risk of Extreme Warm or Cold Years

http://www.esrl.noaa.gov/psd/enso/climaterisks/

DJF Precipitation Extremes During El Nino
Risk of Extreme Wet or Dry Years

http://www.esrl.noaa.gov/psd/enso/climaterisks/
DJF Temperature Extremes During El Nino
Risk of Extreme Warm or Cold Years

http://www.esrl.noaa.gov/psd/enso/climaterisks/
Impacts
Upper Missouri Basin Impacts

- Water/Missouri River (snowpack, plains & mountains)
- Agriculture
- Fire
- Energy
- Municipal Costs (storm costs)
Impacts

Missouri River/Water
7-Day Average Streamflow

Wednesday, July 29, 2015 10:30ET

http://waterwatch.usgs.gov/?id=ww_current
Potential for below average snowpack and snow cover on the ground in much of the North Central region during El Niño
Impacts
Agriculture
Ag Issues

* Currently no major wetness issues (a few minor ones) – some dryness issues in the Missouri Basin
* Crop development generally OK – rangeland OK
* Fall Wetness could lead to delayed harvest – if very wet
* Warmer winter – winter wheat?
* Rangeland
* Spring – question mark on shift out of El Niño
Impacts

Fire
Fire Issues

- Complicated issues – what is the problem this year?
  - Dry surfaces
  - Less snow
  - Wet fall?
- Affected by fall pcp
- Open winter likely plains quite likely
- Likely location specific
Climate Outlooks

* 8-14 day outlook
* August
* Fall and Winter Outlooks
* Seasonal Drought Outlooks
* Spring – how quickly does El Niño weaken?
Temperature and Precipitation Probabilities for Aug. 6–12, 2015

Temperature

Precipitation

August Temperature and Precipitation Probabilities

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/predictions/30day/
3 Month Temperature and Precipitation Probabilities (Sept. – Nov.)

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1
3 Month Temperature and Precipitation Probabilities
(December - February)

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1
Drought Outlook through Oct 31

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period

Valid for July 16 - October 31, 2015
Released July 16, 2015

Author: Brad Pugh
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).


http://go.usa.gov/hHTe
Summary - Conditions

- El Niño current and strengthening
- Some current impacts
- Very likely to impact winter across nation

- Mixed Temp. and Precip. currently from some places quite wet to fairly dry
- Drought in western MT
- Current ag conditions generally OK
Summary - Outlooks

* Wetter conditions more likely in the fall central and southern plains
* Could extend further north (composites and models)
* Winter likely warmer northern areas of basin
* Dry quite likely MT/parts WY
* Less snow accumulation mountains/plains
Further Information - Partners

- Today’s and Past Recorded Presentations and:
  - http://mrcc.isws.illinois.edu/webinars.htm
  - http://www.hprcc.unl.edu

- NOAA’s National Climatic Data Center: www.ncdc.noaa.gov
  - Monthly climate reports (U.S. & Global):
    - www.ncdc.noaa.gov/sotc/

- NOAA’s Climate Prediction Center: www.cpc.ncep.noaa.gov

- Climate Portal: www.climate.gov


- National Drought Mitigation Center: http://drought.unl.edu/

- State climatologists
  - http://www.stateclimate.org

- Regional climate centers
  - http://mrcc.isws.illinois.edu
  - http://www.hprcc.unl.edu
Thank You and Questions?

* Questions:
  * **Climate:**
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* **Weather:**
  * crhroc@noaa.gov
* Probabilities
* Potential pitfalls