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QUICK BITS

El Niño impacts predicted to influence warm, dry winter in West

As farmers and ranchers are looking toward winter and the promise for moisture to alleviate drought in the coming year, meteorologists and other experts predict a strong to very strong El Niño will hold until at least spring 2016, meaning a warm, dry winter is likely.

"El Niño-Southern Oscillation (ENSO) is a global phenomenon that happens in the tropical Pacific, but it has the potential to affect atmospheric circulation," said Imtiaz Rangwala, researcher with Western Water Assessment, during an update with the North Central Climate Science Center. "Really, a strong El Niño increases the potential for more enhanced extreme weather across the globe, although the impact varies from place to place."

Inside El Niño

The ENSO phenomenon occurs when tropical Pacific waters see increasing temperatures. Connected with the atmosphere, the warming oceans weaken easterly trade winds, even to

*Please see **ENSO** on page 6*

Pollinators

Producers support bee populations

According to a recent

Reclamation efforts

BLM strives to leave no trace after mineral extraction in Wyo

"Our short term goal is to immediately stabilize

"Our state office put together a reclamation policy

ENSO continued from page 1

the point that westerly trade winds occur.

"It is the atmosphere and the ocean working together," said Rangwala. "The center of convection moves from the western Pacific to the central Pacific. This affects circulation at high latitudes. It really affects the jet stream and storm track moves."

ENSO may last anywhere from several months to a year, and the global event releases a tremendous amount of heat from the ocean into the atmosphere, explained Rangwala.

"2015 will likely be the warmest year on record from global warming and El Niño," he added.

Trends

Currently, Rangwala noted that temperatures in the Pacific have been increasing steadily since April, particularly in the central and eastern Pacific.

"What that indicates is a strengthening of El Niño, for our region in particular," he continued, adding that the stronger El Niño makes it much easier to predict the impacts on North America.

Historically, El Niño has been the strongest in 1977-78 and 1982-83 – both categorized as "very strong."

Today's El Niño is moving from moderate to strong or very strong, depending on the index.

Using a series of dynamic and statistical models, Rangwala added, "There is a general consensus that we expect a continued El Niño through the winter and early spring. Most models suggest a strong event at its peak strength."

Implications

Rangwala and others emphasized that any forecasting events are based on typical, past events and cannot be 100 percent certain.

"The most likely impact from this El Niño is warmer weather over the north," Rangwala said. "The second most likely is dryness."

For much of Wyoming, eastern Montana and western Idaho, the forecast for the winter and into spring 2016 is warmer, drier weather. Eastern Montana, North Dakota and South Dakota are predicted to see warmer overall weather, and eastern Colorado, Nebraska and Kansas are likely to be wetter.

"Most of the models show that El Niño will wane by mid-spring, which is also consistent with historic large El Niño events," said Rangwala. "They tend to rebound and come back to normal sometime in the mid- to late spring."

In an El Niño phase, Rangwala explained that the polar jet stream moves northward, allowing warmer air to move into the northern tier of the U.S. At the same time, in the southern U.S., a more amplified storm track appears, keeping the southern tier wet and cool.

"There is also a dry tendency in the Pacific Northwest," he added.

Region-specific data

Rangwala and his team utilized historic data dating back to 1950 to determine likely impacts, as far as both temperature and precipitation, for the winter of 2015-16 in an El Niño.

"For western Montana, what we see in general for January to March, part of the cold season, is very slightly warmer and drier under El Niño," Rangwala said. "We see the same trend in northwest Wyoming. It is not as strong for western Montana, though."

The Dakotas are likely to see warmer, though possibly slightly wetter than average, conditions, and moving south, Nebraska and Kansas are likely to be wetter.

"Again, these are the tendencies," he commented, noting that they are not absolutes. "This is what we see in the record."

Snowpack

From the data on temperature and precipitation, Rangwala noted that Cooperative Institute for Research in Environmental Sciences Researcher Joe Barsugli has worked to gather information on snowpack by using simulated hydrology models, since actual data are limited.

"I'm using a snowpack product simulated by using a hydrology model from high-resolution grids and historic temperature data compiled by Ben Livneh," Barsugli explained. "Though it is simulated, this is probably the best way to get a lot of the elevation data.

"As we look at the broad patterns, the Northwest typically gets hammered, but in El Niño it has below normal snowpack," he continued.

Barsugli added that below normal snowpack can be expected for Montana and Idaho, as well as in the northern Rocky Mountains, Greater Yellowstone and Wind River areas into north-central Colorado.

"We see enhancement of the storm track that comes from the southwest and hits California, Nevada and the four corners area," he said.

Overall, for the coming winter, Rangwala summarized, "We have increased potential for above average temperatures and drier tendencies for the headwaters of the Missouri, Green and North Platte Rivers, but wetter tendencies in eastern Colorado, Nebraska and Kansas. It can also mean increased potential for below average snowpack and snow cover on the ground in much of the North Central U.S."

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"The most likely impact from this El Niño is warmer weather over the north. The second most likely is dryness." **– Imtiaz Rangwala, Western Water Assessment**

For a broad look at the current climate and weather conditions resulting from El Niño, visit **colorado.edu/climate/dashboard2.html**.

Sage grouse plans reviewed

Cheyenne – Governor Matt Mead submitted his comments, through the Governor's consistency review, concerning land use revisions proposed by the Bureau of Land Management (BLM) and the U.S. Forest Service (FS). Plans include the Wyoming Greater Sage-Grouse Amendment, commonly referred to as "the Nine Plan," Utah Greater Sage Grouse Amendment and Bighorn Basin and Buffalo Resource Management Plan Revisions.

The plans include management actions to strengthen Greater sage grouse protections as the federal government considers a potential listing for the grouse under the Endangered Species Act.

The governor's comments are available on his website governor.wyo.gov/documents/executive-orders.