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• 2016 Summer Weather Analysis and Forecast

• Presented by:

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- Weather Topics to discuss:
- **2015 Summer Fire Season** – WHAT HAPPENED!
- **2015 - 2016:**
  - Seasonal Snow Pack 2015-2016 and water year.
  - El Nino plus its’ effects.
  - Seasons Past.
  - 2016 Seasonal Forecast for this summer, (the way I see it.)
- Time for questions.
2015 Fire Season, What Happened!

- A very warm record breaking weather pattern was to take shape in early spring. We were already seeing signs of El Nino beginning.
- The Pacific Northwest and the western U.S changing to a warmer pattern.
  - Late spring and Summer monthly soil moisture was below average over much of the western U.S.
  - Lightning storms, across much of the west, were persistent over the entire summer fire season.
• What Happened cont:
• Record breaking heat across entire U.S.
  – Warmest year on record nationally, warmest year globally.
  – Resulting in warmest 12 month period since 1895 when accurate record keeping began.
  – More than 10 million acres burned nationwide due to wildfires throughout the entire fire season of 2015. This total includes 3.1 million ac. in Alaska.
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Winter storms of all types are getting stronger as El Nino continues to keep Pacific Ocean water warmer.

This latest ENSO event is producing warmer air south of the polar jet stream thereby increasing water vapor which allows the atmosphere to retain more heat... thereby producing stronger local storms.

Models are predicting that “global warming” will continue to increase the strength of storms.
Week centered on 25 NOV 2015
SST (°C)
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- **El Nino:**
  - Warm phase of ENSO
  - Measured in the 3.4 region of the Equatorial Pacific.
  - Produces warmer water in the Pacific Ocean off the U.S. west coast.
  - Allows the southern branch of the jet stream to impact southern tier states.
  - Typically lasts from 8-12 months.
  - 9 out of the last 15 El Nino episodes have phased directly into a cold phase (La Nina).
El Nino:

- The El Nino Pattern keeps the southern branch of the jet stream south.
- An upper low in the Gulf of Alaska steers the northern branch well north and east.
- Yields warmer air over Pacific NW and northern tier states.
Some 2015 Wildfire Statistics:

- Nationally in excess of 10 Million acres burned.
- Over 3 million acres was in Alaska, over a million acres in Washington (record), over 600 thousand acres in Oregon, and over 300 thousand acres in California.
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- As the graphic shows, El Nino is a dominating global weather pattern.
- Warm, Dry, Cool, Wet weather over the entire world.
- This El Nino episode of 2015-16 ranks as one of the strongest in history.
How has El Nino affected the US and especially the Western US this winter?
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2015-6 Seasonal Snowpack and Precipitation % of Normal
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- Percent of average Precipitation from Nov. 1, 2015 through Jan 29, 2016.
- Purple and cool colors mark well above avg. Precip.
- Brown and Red are below avg.
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- **Snowpack % of Normal for the western U.S.**
- Wash. – 90-130 mountains
- Oregon – 100-140
- Idaho – 70-90
- Montana – 70-90
- California – 100-150
- Nevada – 135-140
- Colorado – 95-120
- Utah – 90-150
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- Drought Monitor still showing drought conditions across much of the west.
- Southern California and western Nevada still mod-severe drought.
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- **Seasonal Drought Outlook - Through April 30, 2016**
  - Drought conditions over southern CA, NV are showing improvement.
  - Drought conditions persist over the northern Rockies.
Recent and on-going climatologic and hydrologic studies are coming up with basically the same scenario.

- Forests and rangelands especially in the West and Southwest continue to suffer from drought stress.
- Many forests remain under attack from various species of pests. (i.e. bug kill)
- Finally, some studies show that wildfire will remain a problem and increase over the next 25 years.
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Seasonal Long Lead Outlooks and Forecast for the 2016 Summer Fire Season.
- MAM shows a strong Above average temperature anomaly over the Northern tier states, and California.
- The desert Southwest into Texas is Below average.
- Alaska remains Above average.
• MAM precipitation is totally driven by El Nino.
• Above average precipitation across the southern states of the US.
• Below average over the upper mid West.
• AMJ warm temperature anomaly continues across the northern tier states and Alaska.
• Below average anomaly still over east NM and West Texas.
• The below average temperature area is shrinking.
The AMJ precipitation graphic shows drier conditions over the upper Midwest stretching east.

The Pacific NW, east into northern Rockies is EC.

The southwest US is above average. Could be remnants of El Nino.
MJJ Temperature forecast still reflects the warm temperature bias over much of the U.S.

EC over NM and West Texas reflects higher soil moisture from El Nino pattern.
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- MJJ precipitation chart is now showing an Above average anomaly over the desert SW, looks like monsoon moisture.
- Still Below over the Great Lakes region.
- Rest of US is now EC.
The JJA SLLO for temperature now shows most of the U.S. cont. to be Above average.

Highest Above average anomaly is centered over NM, Texas, and Oklahoma.

Good monsoon Trajectory setting up.
The JJA precipitation anomaly now becomes EC as the El Nino precipitation anomalies have disappeared.

All areas of the US are showing up as Equal Chances (EC).

Models trending towards a Neutral phase.
The JAS above average temperature anomaly has now expanded to cover nearly the entire U.S.

The strongest area of Above average is positioned near Las Vegas.
The JAS precipitation graphic is EC over all regions of the US.

The change over to a La Nina weather pattern is under way.
As we move into ASO the Above average temperature anomaly begins to show signs of shrinking away from the Pac NW and Mis West.

The well above average temperature anomaly is over northern Arizona.
• There is no Below or Above average signature for this 3 month period. All areas are EC.
• This is rather usual for a neutral ENSO pattern.
• The Above average anomaly continues during the fall months of SON.

• We still have a strong Above average anomaly over Arizona and New Mexico that includes the intermountain west and southeast US.
The SON precipitation SLLO graphic is now showing Below average anomaly over the 4 corners area.

Remainder of the US and Alaska is still EC.
The OND temperature anomaly shows above average temperature has now expanded across the southern tier of the US.

EC over the northern tier states.

Looks like a La Nina or cold phase is beginning.
The OND precipitation SLLO is again showing a Below average precipitation anomaly over the southern tier states.

We now see an Above average anomaly over the Pacific NW.

EC elsewhere.
Please.. Be safe this coming fire season.

Questions and/or Comments anyone?