

Weather and Climate Summary and Forecast Spring 2017

Gregory V. Jones
Southern Oregon University
April 6, 2017

Instead of roaring like a lion, March provided generally warm conditions and variable precipitation amounts for much of the west. The question is whether the rhyme will hold and April will behave like a lamb? The general pattern in temperatures for the western US in March was largely warmer than normal except right along the coast in Northern California and Oregon as well as throughout much of Washington (Figure 1). Temperatures elsewhere were 3-6°F above normal in the Rockies, Four Corners and the southwest. Conditions in California warmed to the point of ushering in spring growth, but more in line with average bud break compared to the past few years. The warm March extended eastward into the Plains, the southeast, and Ohio River valley before giving way to average conditions in the mid-Atlantic then a cooler than average month for New England. The seesaw in the east has wreaked havoc with the spring, including a muting of the cherry blossoms in Washington, DC.

March precipitation amounts shifted northward with wetter than average conditions in Oregon, Washington and northern Idaho (Figure 1) with many areas seeing 150 to 300% of normal for the month. While scattered areas of the Rockies were also wetter than average, the bulk of the rest of the western US saw very dry conditions in March with the southwest seeing less than 25% of normal. Precipitation amounts nationwide were quite variable with drier than normal areas across the Great Plains, central Texas, the southeast, and into the middle Atlantic states, while portions of the Great Lakes, the Ohio River valley and south Texas were much wetter than normal for the month (not shown).

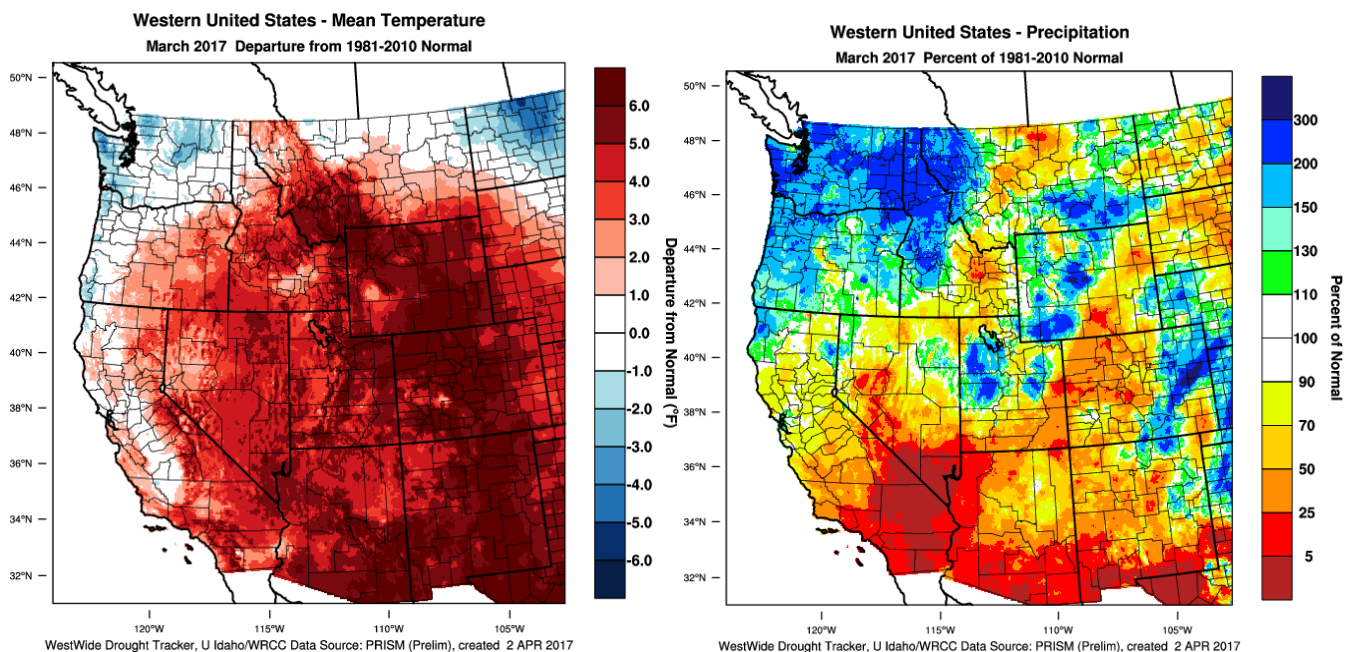


Figure 1 – Western US March 2017 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

The first three months of 2017 have brought very cold conditions to the PNW with observations running 1-7°F below normal. The core of the coldest area straddles the Columbia Valley into eastern Washington and eastern Oregon (Figure 2). The majority of California and Nevada have experienced slightly below average to slightly above average temperatures while the Four Corners region has been warmer than average. The general nationwide pattern for the first three months of the year are for a near normal to colder than normal west and PNW, and substantially warmer than average eastern US (3-6°F above normal; not shown). The first quarter of 2017 has brought considerable precipitation to many areas in the west with the bullseye in California and the Sierra Nevada Mountains across into

the Northern Rockies (Figure 2). Extending it back to the start of the water year in October shows nearly the exact same pattern (not shown). Nationwide the wetter than average conditions for the year extend out of the west and across much of the Great Plains into the Great Lakes then south into Texas, while the southeastern US and New England areas were drier than average (not shown), continuing the moderate drought conditions in the region.

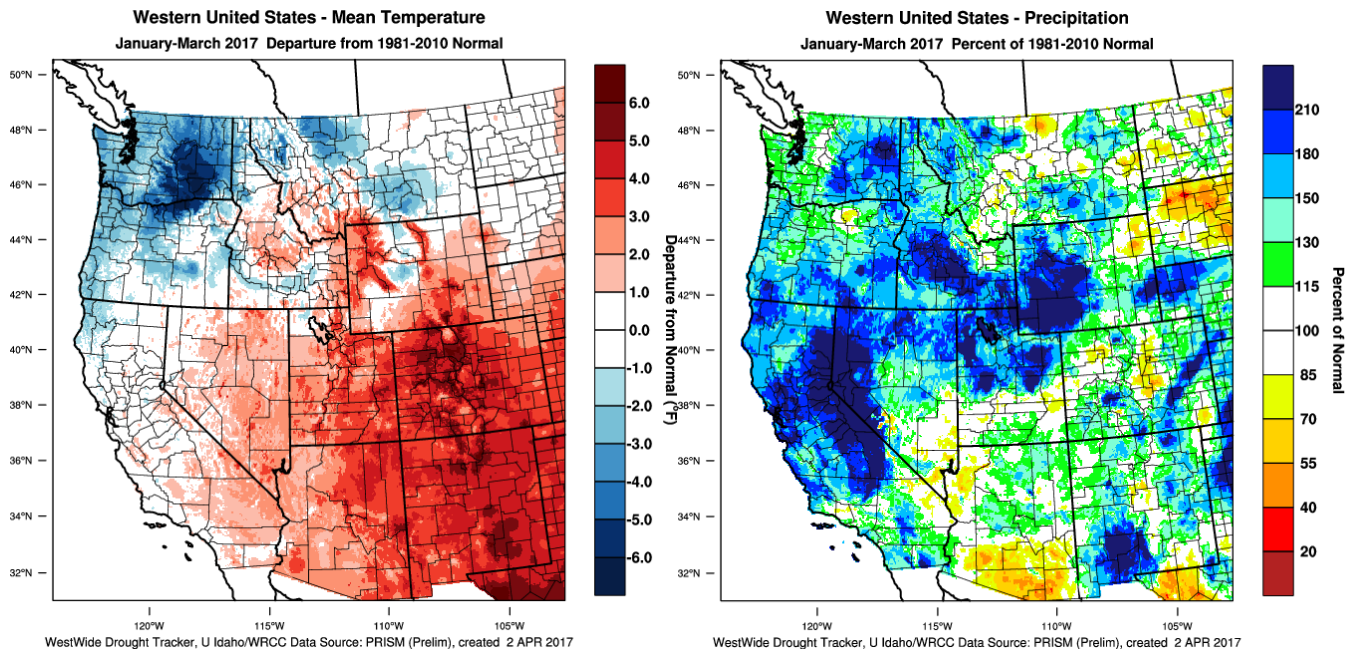


Figure 2 – Western US January-March 2017 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

Drought Watch – After numerous winter precipitation records being set across many areas in the west, drought conditions have been almost completely removed for the western US (Figure 3). The most recent Drought Monitor shows some remnant areas of coastal Central to Southern California still experiencing dry conditions, but the category has shifted to moderate or simply abnormally dry. Drought conditions have continued or have started to develop in Oklahoma and the Front Range, the southeast, and into New England, but the overall extent and intensity of the drought conditions as lessened in each area (Figure 3, left panel). The US seasonal drought outlook (Figure 3, right panel) forecasts that some areas in southern California will likely see drought persist. Similar changes are seen for the drought areas of the southeast and New England, while drought conditions in Colorado, Kansas, and Oklahoma are likely to persist and/or intensify.

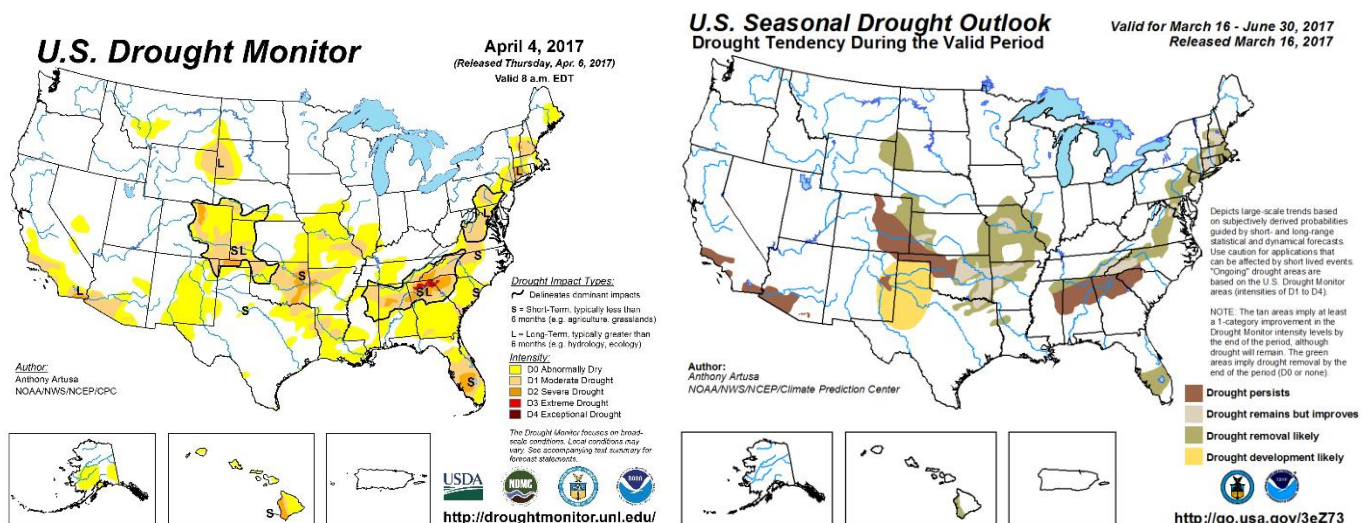


Figure 3 – Current US Drought Monitor and seasonal drought outlook.

ENSO Watch – The tropical Pacific remains in ENSO-neutral conditions where the equatorial sea surface temperatures (SSTs) are near average across the central and east-central Pacific. However, above-average SST in the eastern Pacific Ocean (near Central and South America) have continued to develop slowly. ENSO-neutral conditions are favored to continue through at least the Northern Hemisphere spring 2017, with increasing chances for El Niño development into the fall. Neutral conditions tend to mean that there is little tropical influence in mid-latitude weather, however neutral periods can mean other things to the overall flow of the atmosphere (see North Pacific Watch below). Statistically, neutral conditions in the tropics would slightly favor the next few months to be warm and dry across the southern half of the US; wet and cool to cold in the north (see forecast periods below and Appendix Figure 1). Numerous models and forecast agencies are increasing their call for El Niño conditions (warmer than average tropical SSTs) to develop by summer or early fall. Will have to watch these models over the next month or two to get a read on potential influences to ripening periods across the west.

North Pacific Watch – The large pool of cooler than average ocean temperatures across the North Pacific has contracted slightly, moved to the north, and is now centered over the Gulf of Alaska (Figure 4). Sea surface temperatures (SST) in this area are running 4-5°F cooler than average and 7-10°F cooler than last year at this time (note figure is in °C). The interesting development from last month is the extension of warmer than average SST toward the west coast. The north-south pattern of cold and warm surface waters is likely adding to the energy of the atmospheric circulation over the North Pacific, enhancing and extending the trough conditions further south and later into the spring. The overall pattern of SST in the North Pacific is not exactly showing a positive or negative phase structure of the Pacific Decadal Oscillation or PDO (a large-scale, long-term climate variability mechanism in the North Pacific Ocean that is closely associated with El Niño-La Niña cycles). However, the recent shift of the cold pool and the extension of the warmer waters toward the west coast could result in shift that will help define the summer into fall conditions. At this point I feel confident enough to say that the current PDO-ENSO conditions would continue to favor a relatively cool to cold and wet PNW into Northern California and a moderately dry and slightly warmer than normal southern California extending across the desert southwest. The cooler SST off the west coast and into the Gulf of Alaska would point to a greater chance for a cooler and later spring than we have experienced in a while. As mentioned last month, the statistical and dynamical analogs have this year currently looking like what we experienced in 2012.

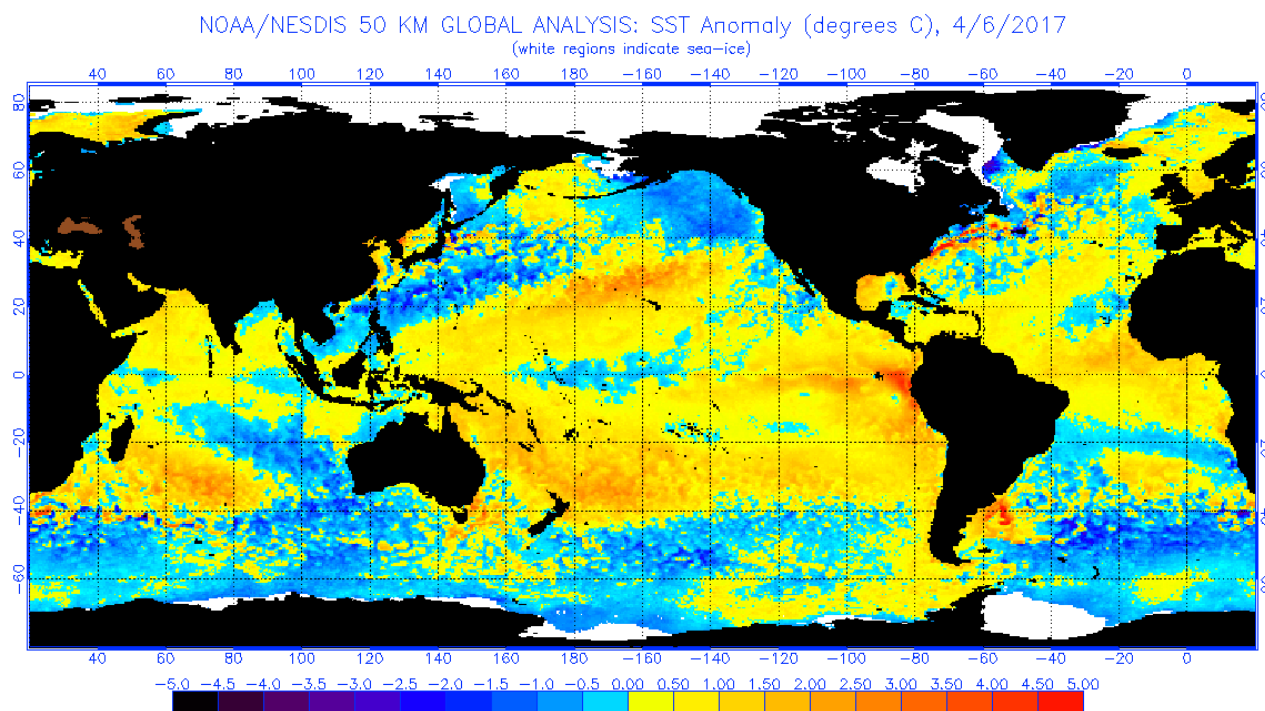


Figure 4 – Global sea surface temperatures (°C) for the period ending April 6, 2017 (image from NOAA/NESDIS).

Forecast Periods:

6-10 Day (valid Apr 14-18): Cool and unsettled over the west through mid-month. Entire west coast is forecast to have a greater than average chance for cool conditions including frost potential in many areas. The rest of the US has a high likelihood of much warmer than average conditions over this same period. In term of precipitation, the west coast is likely to see wetter than normal conditions through mid-month with the Rockies likely to be drier than normal. The central plains to the Great Lakes is likely to be wetter than average, while the southeast and Mid-Atlantic states remain drier than average.

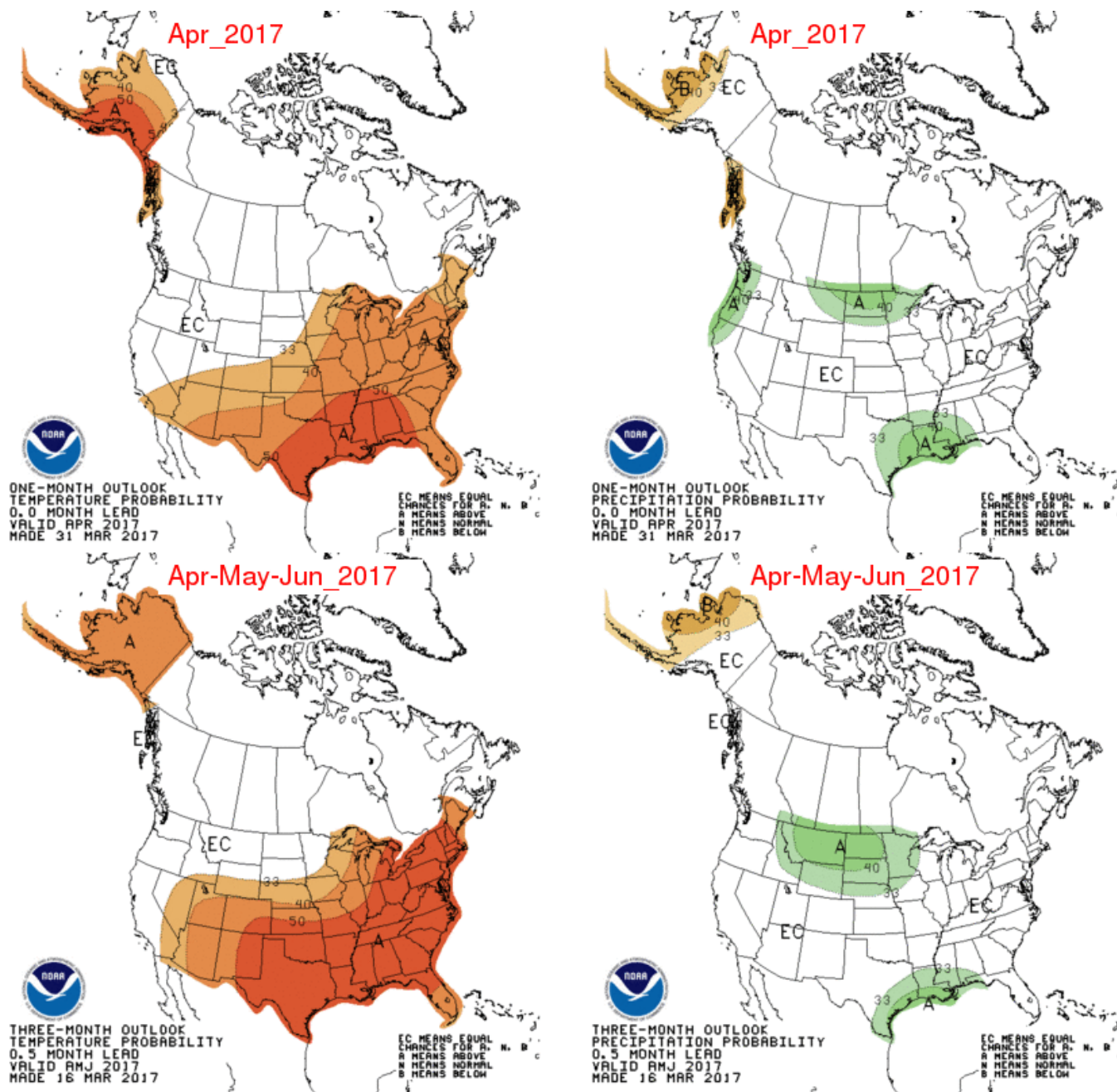
8-14 Day (valid Apr 16-22): Broad cool pattern in the forecast does not change much from the 6-10 day period. The PNW is likely to continue the cooler than average conditions with scattered frost likely. From the Rockies eastward the bulk of the rest of the country will likely see much warmer than average conditions. Favorable conditions for a wetter than average period extend across most of the country including the west coast where continued southerly trough flow over the North Pacific will likely add to the already record amounts in many places.

30 Day (valid Apr 1-30): The forecast for the month April (see Appendix Figure 1) is pointing to average conditions for much of the west. California, the PNW and northern Rockies are forecast to have an equal chance of being slightly above to slightly below normal temperatures by the time the month is over. The rest of the country has an above average chance of continuing to be warmer than normal this spring. The precipitation forecast for April is largely calling for near normal conditions nationwide, although the coastal zone from Northern California to Western Washington along with the northern Plains and Gulf Coast do have a higher likelihood for a wetter than average month (see Appendix Figure 1).

90 Day (valid Apr-May-June): The long lead forecast for April-May-June (AMJ) from the CPC continues the general conditions from the previous 90 day forecast. The California, the PNW, and northern Rockies are forecast to have an equal chance of seeing slightly above to slightly below average temperatures (NOAA's Climate Prediction Center, see Appendix Figure 1). In other words, this region will likely see close to normal spring temperatures with a continuation of a normal spring frost season. The rest of the country is forecast to continue to have a warmer than normal spring. The AMJ precipitation forecast is holding to a likely higher than average precipitation amounts across the northern Rockies and Gulf Coast while the rest of the country has no clear signal and is forecast for an equal chance to be slightly above average, normal, or slightly below average precipitation (see Appendix Figure 1).

Gregory V. Jones, PhD
Environmental Science and Policy
Southern Oregon University
1250 Siskiyou Blvd
Ashland, OR 97520
541-552-6758
gjones@sou.edu





Appendix Figure 1 – Temperature (left panel) and precipitation (right panel) outlooks for the month of April (top panel) and April, May, and June (bottom panel) (Climate Prediction Center, climate.gov).