National Drought Summary for 10/2/2018

Summary: Multiple cold fronts, associated with an amplified upper-level trough, resulted in heavy rainfall across the eastern third of the continental U.S. during the final week of September. A widespread area of 2 to 4 inches, locally to 10 inches, was observed from the Tennessee Valley northeast to southern New England. A strong subtropical ridge maintained below normal precipitation and above normal temperatures (6 to 8 degrees F) across the Coastal Plain of Georgia south to the Atlantic coastal areas of Florida during the past week. A pair of strong surface highs shifted south from Canada into the north-central U.S. where below-normal temperatures were observed at the end of September through the beginning of October. Hurricane Rosa, in the East Pacific, turned northeast and made landfall as a tropical depression in the northern Baja Peninsula at the beginning of October. Heavy rainfall associated with Rosa spread northward from northwestern Mexico and triggered flash flooding across southern Arizona during October 1-2.

Northeast: Although widespread rainfall occurred across the mid-Atlantic and New England, the heaviest amounts (2-6 inches) mostly fell across the drought-free areas. The northern extent of rainfall amounts exceeding 2 inches resulted in some reduction of D0-D2 drought across north-central New York, southwestern Vermont, and coastal Maine. The eastern extent of the heavy rain also erased D0 across eastern Long Island, southern Rhode Island, and southern Massachusetts, but some D0 was left in southern Cape Cod, Nantucket Island, and Martha’s Vineyard as totals were lower (less than 1.5 inches) and short-term shortages remained. In addition, since weekly precipitation was lighter (less than an inch), 60-day precipitation deficits increased to more than 2 inches, and USGS 7-day stream flows were still below normal (10-24 percentile), D0 was expanded across north-central Maine.

Southeast: Much of northern Alabama received heavy rainfall (2 to 6 inches), resulting in a 1 to 2 category improvement. Rainfall amounts, in excess of 4 inches, justified a 2-category improvement (D1 to nothing) in northeastern sections of the state. Short-term abnormal dryness and moderate drought continued to increase in coverage across parts of Georgia and adjacent areas of South Carolina based on 30-day precipitation deficits of 2 to 4 inches and a near-record warm September (temperatures averaged 4 to 8 degrees F above normal across Georgia and South Carolina). The lack of rainfall and much above-normal temperatures maintained high evapotranspiration rates, and CPC soil moisture ranked in the lowest 30th percentile across southeast Georgia. Despite 6-month precipitation surpluses, D0 was introduced to extreme northeast Florida and along the Space Coast of Florida where short-term (60-90 days) precipitation deficits continue to increase and CPC soil moisture ranked in the lowest 20th percentile. A sharp cutoff existed between record-breaking rainfall in North Carolina and northeastern South Carolina from Hurricane Florence and the expanding D0 and D1 areas in southern South Carolina and Georgia.

South: Showers and thunderstorms were numerous along the western and central Gulf Coasts and across most of Louisiana, Mississippi, and central Tennessee where 2-4 inches of rain, locally to 8 inches, fell. Lighter amounts (1-2 inches) were recorded from east-central New Mexico eastward into southwestern Oklahoma, across northeastern Texas, central Arkansas, and western Tennessee. Little or no rain was reported in southwestern and central Texas, the Texas and Oklahoma Panhandles, northern and eastern Oklahoma, northwestern and southeastern Arkansas, and northwestern Mississippi. In Texas, after a very wet September (preliminary stats indicated Sep’18 was the second or third wettest month on record statewide), a reassessment using station-based precipitation amounts (CoCoRAHS) and radar-based precipitation estimates (AHPS), along with reported impacts, indicated better (wetter) conditions in central and eastern Texas, and worse (drier) conditions in the far southwest and Panhandle areas. Accordingly, improvements were made in central and eastern Texas, with deteriorations in
far southwestern and Panhandle areas. Southwestern Oklahoma saw some improvement with the 1-2 inches of rain, but northeastern sections were degraded where 30-day deficits were found (similar to the Midwest summary for Missouri). Additional improvements were made in Louisiana, northeastern Mississippi, and south-central Tennessee, although the D1 near the TN-MS-AL borders remained and expanded slightly northward as reflected in the 60-day deficiencies. Most 7-day averaged USGS stream flows have recovered with the recent rains and are at normal to above-normal flows. Likewise, Sep. 30 USDA/NASS pasture and range lands have recovered in Texas and Oklahoma, with only 19% and 15% rated poor or very poor while 47% and 50% were rated good or very good, respectively. Similarly, soil moistures have improved in both states, with a continued decline in the categories of short to very short topsoil (17 and 21%) and subsoil (30 and 26%) moistures using raw statewide proportions.

**Midwest:** A swath of moderate to heavy rain (1 to 3.5 inches) resulted in a decrease in D0 and D1 across lower Michigan during a favorable time of year for soil moisture recharge as temperatures and evaporation decrease. D0 reduction was also warranted across northeastern Minnesota as recent rains produced 30-day surpluses and increased USGS stream flows (to normal or above-normal). Excessively wet conditions continue to plague northern Iowa and southern Wisconsin where rainfall amounts have exceeded 16 inches during the past 60 days. To the south of this wet region, an area of varying drought intensity continued across parts of Missouri, adjacent eastern Kansas, northeast Oklahoma, and southeastern Iowa. Although major improvements were made in this area due to heavy Midwest rains during late August and early September, D0 and D1 was increased in parts of southwest and east-central Missouri, and D0 returned to western Illinois and southeastern Kansas where 30-day precipitation deficits of 1.5-3 inches occurred. CPC soil moisture ranked in the lowest 10th percentile, and 6-month precipitation deficits exceeded 12 inches near the Kansas City, MO area. According to the Sep. 30 USDA/NASS statewide soil moisture and pasture conditions, Missouri remained a drought outlier as compared to surrounding wetter states as 39% and 53% of topsoil and subsoil moisture, respectively, remained short or very short, while 38% of pastures were rated poor or very poor.

**High Plains:** Light precipitation (0.5-1 inch) and 7-day temperatures averaging 5 to 10 degF below normal was enough to provide some improvements to the drought across the Dakotas as autumn is an ideal time of year for soil moisture recharge due to the lack of evaporation and minimal plant growth. Based upon a combination of various tools, the cool, wet weather warranted improvement in northwestern and southwestern ND and northeastern SD (D2 to D1), central SD (D1 to D0), and east-central and south-central ND, north-central and southwestern SD, and northeastern WY (D0 to nothing). Elsewhere, the light precipitation and subnormal temperatures were enough to keep conditions from deteriorating, but not wet enough for any improvement. Although it has been dry for the past 60-days in western Nebraska and northwestern Kansas, the cool weather delayed the introduction of D0 for now, but rain will be needed soon to prevent deterioration. In addition, as explained in the Midwest and South summaries, D0 was expanded into southeastern Kansas with respect to the large Midwestern drought area as 30-day deficits had accumulated there.

**West:** Remnant moisture and showers from former Hurricane Rosa in the East Pacific began to spread north into the desert Southwest by the end the valid period (12Z Oct. 2). South-central Arizona received 1-3 inches of rainfall, locally to 6 inches, which resulted in a 1 to 2 category improvement and included reports of flash flooding and a dam failure in western Pima County. Since more heavy rainfall with the remnants of Rosa occurred after 12Z Tuesday, additional improvements are anticipated across the Southwest next week. Onshore flow with a Pacific storm brought 0.5 to 2 inches of rainfall to coastal Washington and northwest Oregon where slight improvements were made as USGS 7-day stream flows rose to near-normal levels. Additionally, slight improvements were made in extreme east-central New Mexico due to changes in neighboring west Texas and recent rains (see South summary). However, further expansion of D3 was made in west-central Oregon (Deschutes, Crook, and Jefferson Counties) due to numerous months through September (out to 18-months).
where the Standardized Precipitation Evapotranspiration Index (SPEI) was less than -1.5, along with corresponding drought impact reports that included surface water tributaries used for stock watering that dried up by early August, hay crops were reduced 50%, and remaining forage was of poor quality. Elsewhere, drought coverage and intensity remained unchanged throughout the remainder of the West.

**Alaska, Hawaii, and Puerto Rico:** In Hawaii, dryness and drought was limited to two small leeward areas on Maui and the Big Island. During Sep. 26-29, showers brought beneficial moisture to western Maui, dropping 3.23 inches on Lahiainaluna (near the D0-D1 area) while 0.5-4 inches fell on other leeward locations of Maui. No changes were made this week in west Maui as assessments of ground conditions will not be ready until next week. Elsewhere, lighter showers (less than 1 inch) fell on the western Big Island, but it was not enough to make any improvements there. Moderate to heavy showers also fell on the remaining islands, assuring that no dryness will develop anytime soon.

In Puerto Rico, widespread, moderate to heavy showers (1-4 inches) fell across much of the island, allowing for some trimming of the northern and eastern D0 border in central sections of Puerto Rico. USGS 7-day averaged stream flows were all in the normal percentiles, with a few in the above-normal flows.

In the southeastern Alaskan Panhandle, the areas of D0 was expanded westward to near Yakutat in response to a below normal 2017-18 Water Year (WY; Oct. 1 – Sep. 30). Yakutat received 116.39 inches of precipitation, but that was only 75% of normal. Farther to the southeast, Haines recorded its driest WY with 30.14 inches, or 63% of normal, as did Petersburg (65.89"; 67%) and Klawock (54.53; 60%). Skagway, Ketchikan, Sitka, and Snettisham Power Plant all had a near-record dry WY. 7-day averaged USGS stream flows are also in the lower tenth percentiles (much below to record low) which will greatly impact hydroelectric power plants if the wet season (autumn and winter) fails to ramp up soon.

**Looking Ahead:** During the next 5 days (October 4-8), a highly amplified upper-level pattern is likely to become established across the middle latitudes of the North Pacific and North America. A highly amplified upper-level trough are forecast to result in widespread above-normal precipitation throughout the Great Basin and north-central Rockies. The first major snowfall of the season is likely to blanket the Rocky Mountains with the higher elevations forecast to receive more than a foot. Accumulating snow, with locally high amounts, is probable for parts of the northern and central high Plains. As the upper-level trough amplifies over the West, maximum temperatures are forecast to average as much as 20 to 30 degrees F below normal across the north-central Rockies and adjacent high Plains on Oct 7 and 8. Multiple waves of low pressure are likely to emerge from the upper-level trough over the western U.S. and bring widespread heavy to excessive rainfall (3 to 7 inches, locally more) from the southern Great Plains northeast to the upper Mississippi Valley. The strong ridge aloft is likely to result in little to no rainfall along with much above-normal temperatures across the increasingly dry areas of Georgia.

For the CPC 6-10 day extended range outlook (October 9-13), indicates that the high amplitude pattern is likely to persist, resulting in a high confidence forecast with very high odds (above 80 percent) of below normal temperatures forecast for the northern Great Plains, northern/central Rockies, and Great Basin. Very high odds (above 80 percent) of above normal temperatures are forecast across the eastern third of the continental U.S. (CONUS). Above-normal precipitation is favored for much of the CONUS with the highest odds across the north-central Rockies, Great Plains, and middle to upper Mississippi Valley. Above-normal temperatures are likely throughout Alaska except for the Alaska Panhandle. Enhanced odds for above-normal precipitation are forecast for the Aleutians and mainland Alaska, while below-normal precipitation is favored to continue across the Alaska Panhandle.

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