

National Drought Summary for 9/10/2019

Summary: Fortunately for the Southeast, Category 5 Hurricane Dorian stalled just east of central Florida, slowly weakened, and gradually turned northward, finally accelerating northeastward into Nova Scotia and Newfoundland. Its only U.S. landfall was at Cape Hatteras. Unfortunately, it stalled over the northern Bahamas for 1-2 days, devastating the islands of Great Abaco and Grand Nassau. Rainfall from Dorian was limited to coastal sections of eastern Florida, the Carolinas, Delmarva Peninsula, Cape Cod, and extreme eastern Maine. Between 5-10 inches of rain, locally to 15 inches, fell along coastal northeastern South Carolina and eastern North Carolina, although the totals sharply dropped off to the west. A second tropical system, Tropical Storm Fernand, made landfall in northeastern Mexico, but its outer bands of rain brought welcome rains to southern Texas. Frequent cold fronts raced across the northern tier of States, dropping light to moderate precipitation on the Northwest, northern Rockies and Plains, Midwest, upper Great Lakes region, and northern New England. Monsoonal moisture produced light showers in western Texas, central New Mexico, Colorado, and into Wyoming and Idaho. Dry weather prevailed in western sections of the Southwest, south-central Plains, lower Mississippi Valley, and across much of the Southeast, eastern Ohio Valley, and mid-Atlantic. Temperatures averaged above-normal across the West, southern two-thirds of the Plains, and across the Southeast, with subnormal readings confined to the northern Plains, upper Midwest, Great lakes region, and Northeast.

Northeast: Light showers dropped 0.5-1.5 inches of rain across northern sections of New York, Vermont, New Hampshire, and Maine. Although offshore in the Atlantic Ocean, Dorian came close enough to far eastern Maine that 1.5-4 inches of rain accumulated. Elsewhere, it was mostly dry across the Northeast. The small D0 areas in upstate New York and New England remained unchanged as this week's light rain were not enough for removal, but great enough (including last week's higher rainfall) to prevent expansion. Farther south, however, conditions have recently been drier in the mid-Atlantic and central Appalachians with slightly above-normal temperatures (1-3 degs F). As a result, between 50-75% of normal precipitation has fallen during the past 60-days, accumulating deficits of 2-4 inches. For the week ending Sep. 8, 33, 63 and 74% of the topsoil moisture in West Virginia, Maryland, and Delaware, respectively, was rated short to very short, according to the USDA. Therefore, D0 was added to the Delmarva Peninsula, and expanded in southern West Virginia.

Southeast: With a weakened Hurricane Dorian lurking just off the Carolina coasts and tracking northeastward, a sharp gradient of precipitation amounts was produced. 10-15 inches of rain was dumped on some coastal locations in South Carolina (e.g. Pawleys Island 15.21"; Georgetown 13.38"; North Myrtle Beach 10.44") and North Carolina (Wilmington coop 13.07"; Smith Creek 11.36"; Wilmington NWS 10.80"; Kingston 8.68"), but totals rapidly declined to the west, with no rain at all in central sections of the Carolinas. Several tornadoes were spawned in the eastern Carolinas, and a severe storm surge on Ocracoke Island required numerous rescues. With that stated, D0 and D1 was removed from northeastern South Carolina and southeastern North Carolina (some 2 cat improvements, D1 to nothing), and some D0 was erased in southeastern South Carolina. Further inland, however, a week of no rain, above-normal temperatures, and windy conditions increased 60-day deficits and evapotranspiration rates. The D1 and D2 areas corresponded to 2-month deficits of 3-6 inches, while newly added D0 areas were generally 50-70% of normal for the same time period. USDA statewide short to very short topsoil moisture percentages have also increased across parts of the Southeast: Virginia (77), Georgia (64), Alabama (53), South Carolina (50), and North Carolina (33). USGS 7-day averaged stream flow have also declined across central sections of Alabama and Georgia, with numerous sites in the lower tenth percentile (much below normal), while western and central South Carolina, Florida Panhandle, and southern Virginia were in the 10-24th percentile

(below normal). USDA/NASS pastures for the week ending Sep. 8 were rated very poor to poor in Virginia (50%), North Carolina (26%), South Carolina (22%), Georgia (25%), and Alabama (20%).

South: Mostly dry and warm weather enveloped much of the South, contributing to a rapid decline in short-term moisture conditions across most of Texas, southwest and southeast Oklahoma, southwest Arkansas, and northwest Louisiana. Even a few pockets of D0 were introduced in formerly wet central and northeastern sections of Tennessee. The few exceptions to this were outer bands of rain across southern Texas from Tropical Storm Fernand (which made landfall in northeastern Mexico), some light monsoonal showers in southwestern Texas and the northern Texas and Oklahoma Panhandles, and Day7 thundershowers in northern Louisiana and central Arkansas. A general 1-category improvement was made across southern Texas in response to 1-3 inches (locally 5 inches) of rain, while some slight improvements were made around the Midland area, Trans Pecos region, and in extreme northern Louisiana. In contrast, September's climatologically higher rainfall totals for Texas and Oklahoma make degradation faster, and temperatures have remained high. Where little or no rain fell, a 0.5-1 category downgrade was made, especially in central Texas, but also in southwest and southeast Oklahoma, and bordering sections of Arkansas and Louisiana. According to USDA, percentages for both topsoil and subsoil moisture for Texas stood at 85 and 79%, respectively, as of Sep. 8, while topsoil moisture grew increasingly short to very short in Arkansas (67%), Louisiana (60%), Mississippi (66%), and Tennessee (52%). Even with the USDA topsoil moisture figure, Mississippi remained D0-D4 free as the entire state still had 60-day precipitation surpluses. Texas pasture and range conditions have been affected by the warmth and dryness, with 48% rated poor or very poor according to the Sep. 8 USDA/NASS report.

Midwest: Widespread light to moderate rains (0.5-2 inches) fell across the western and northern sections of the Midwest as several frontal systems dove southeastward out of Canada. The heaviest rains (1.5-3.5 inches) were reported across western and northern Minnesota, while bands of scattered thunderstorms moved across parts of Iowa, southern Wisconsin, northern Illinois, and the UP of Michigan. In contrast, little or no rain fell across southern and eastern portions of the Midwest (southern Missouri and Illinois, most of Indiana, southern lower Michigan, and much of Ohio and Kentucky). Not surprisingly, some improvement was made where the greatest totals occurred that greatly reduced or alleviated short-term deficits. This included around Duluth, MN; southwestern, central, and northeastern Iowa; northern Illinois; and the eastern UP of Michigan. Dry weather meant deterioration, and this occurred in northwestern Indiana and southern lower Michigan (D1 expansion); new D1 areas in southwest Ohio, southern Indiana, and central Kentucky; and D0 increase across central and eastern Kentucky. 60-day shortages reached 3-6 inches in the new D1 areas, while most of the D0 areas only received 50-70% of normal precipitation. Kentucky had the highest percent short to very short topsoil moisture value (61%), with Iowa, Michigan, Illinois, Indiana, and Ohio not far behind (between 30-42%). Although the dry weather is good for crop maturation and corn dry down, the wet spring delayed planting, so some crops may be behind schedule and could use rain for filling (mainly soybeans).

High Plains: Unsettled weather brought widespread light precipitation to much of the High Plains, especially Montana and the Dakotas, while monsoonal moisture produced scattered showers in Colorado, western Nebraska, and parts of Kansas and Wyoming. With much of the region drought-free, the rains fell on top soils with adequate to surplus moisture. The few areas with D0 or D1 did receive precipitation, and some improvements were made. In northwestern Montana, 2-3 inches of rain in the Mission Mountains and widespread 1-2 inches across Lake and Flathead counties have produced near record maximum stream flows for this time of year. With 60- and 90-day totals now at normal or surplus, D0 was removed, and D1 shrunk to just include Lincoln County where weekly amounts were somewhat lower, and short-term deficits still remained. In North Dakota, another week of rain (0.5-1.5 inches) continued to reduce short and medium-term deficiencies, with D1 removed and the D0 shrunk to better fit dwindling 60-day deficits. In central Colorado, 1-2 inches of rain south of Denver eliminated short-term deficiencies, thus D0 was erased. Farther to the southwest and southeast, however, dry and warm weather

increased 90-day deficiencies as the southwest monsoon has been weak and spotty, generating SPIs less than -1.5 on a 30-, 60-, and 90-day time scales. The wet winter and spring is fast becoming a faded memory as the summer heat and dryness continued to assert itself with impacts. Accordingly, D0 expanded into Gunnison, Pitkin, and Saguache counties in the southwest, while D0 increased in Las Animas and Otero counties in the southeast. D1 also slightly crept northward in southwestern Colorado.

West: While precipitation returned to the Pacific Northwest and conditions improved, the Southwest continued to have a disappointing summer monsoon as only scattered light showers fell across central New Mexico and central Colorado. Rains also fell on most of Idaho and western Wyoming as cold fronts squeezed out moisture from the Pacific Ocean and the southwest monsoon. With June-August completed, the precipitation rankings for the Four Corner States were a disappointment. According to NCEI, Arizona had the driest (1) JJA on record, followed by Utah (8), New Mexico (10), and Nevada (12), with records going back to 1895. Combined with much above normal JJA temperatures (New Mexico 6th and Arizona 12th warmest), the beneficial impacts from a snowy winter and cool and wet spring have faded, and have been replaced by summer's heat, dryness, and negative impacts. The SPEI, which combines precipitation and temperature effects, was the lowest on record for Arizona in August, July-August, and June-August. With this sudden downturn during the past 3 months, impacts have rapidly surfaced, and as a result, a widespread, 1-category deterioration was made to most of Arizona (D1 and D2 expansion) and bordering areas (e.g. southern Utah, southwest Colorado, and western New Mexico). Southeastern New Mexico has also been dry at 60-days, thus D1 expanded there from west Texas. USDA/NASS pasture and range conditions rated poor or very poor have risen to 41% in Arizona and 46% in New Mexico. In sharp contrast, welcome beneficial rains fell across the Northwest, signaling an uptick in precipitation in the region during the past 30-60 days. With locally heavy amounts (2-4 inches) in western Oregon and Washington and USGS stream flows responding, D2 was reduced in the Olympic Peninsula and northern Cascades of Washington; D1 shrunk in northwestern Oregon, southwestern and northeastern Washington and around the Puget Sound; and D0 removed in west-central Oregon. Hopefully the increase in precipitation normally seen during the late summer and fall months will continue to ease the drought.

Alaska, Hawaii, and Puerto Rico: Light to moderate precipitation (1-3 inches, locally to 5) fell along the western, southwestern, and southeastern Alaskan coasts. Although the increased precipitation was welcome, June 1 to date rainfall was still at near-record low levels in south-central Alaska. The 1- and 10-hour fire fuels are significantly moister, but the 100- to 1000-hours and duff layer are still very dry. There has been little or no recovery in soil moisture, even at a 2 inch depth. Several communities continue to have no water remaining, or are very close to running out. The primary concern of the communities is whether they can fill their water storage before winter sets in next month. Therefore, until a longer stretch of wet weather becomes established, no improvements were made. However, the lower Alaskan Peninsula D0 area was erased with the recent wet weather as Cold Bay is back to near normal precipitation since May 1.

In Hawaii, light showers frequented the windward sides of the eastern islands, continuing a recent increase in showers in this area. With the full August statistics available, along with updated NDVI data, surplus rainfall and improved NDVI conditions over portions of the windward slopes in Maui County and the Big Island allowed for some reduction in Dx coverage. On the Big Island, windward slopes of the Kohala Mountains improved from D1 to D0; windward slopes of the Hamakua District went from D2 to D1; D0 area on the leeward slopes of Mauna Kea were reduced in upper and middle elevations; and a 1-category improvement was made near South Point. In Maui County, reduced D0 coverage was favored along the windward slopes of Maui and Molokai. Elsewhere, no other changes were made.

Heavy rains (3-6 inches, locally to a foot) fell along the northwestern, north-central, and far northeastern sections of Puerto Rico, but these areas were mostly drought free. A few areas that observed heavy rains, however, were in

D0 or D1 (northeastern and central sections of the island), and a 1-category improvement was made there. 7-day averaged near-record low USGS stream flows were confined to a few sites along the southwestern coast, while the rest of the island was normal or above-normal.

Looking Ahead:

During the next 5 days (September 12-16, 2019), the possible development of a tropical system in the western Caribbean and eastern Gulf of Mexico brings enhanced rainfall to the central and eastern Gulf and southern Atlantic Coasts. Elsewhere, the Pacific Northwest should see continued precipitation (0.5-2 inches), while more systems bring rainfall (1-3 inches) to the northern Plains, upper Midwest, and Great Lakes region. Some monsoonal showers should develop in New Mexico and west Texas, with this moisture merging with a cold front that should produce thunderstorms across the south-central Plains. Little or no rain is expected in California, Nevada, most of Arizona, southern Utah, from northeastern Texas eastward to South Carolina, and along coastal New England. Most of the lower 48 States should record above-normal temperatures.

The CPC 6-10 day outlook (September 17-21, 2019) favors above-normal precipitation chances for most of the contiguous U.S. and Alaska, with below-normal odds limited to States along the Northeast Coast. Temperatures are likely to be subnormal from the Rockies westward, while above-normal readings are expected east of the Rockies, especially in the northeastern quarter of the Nation.

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