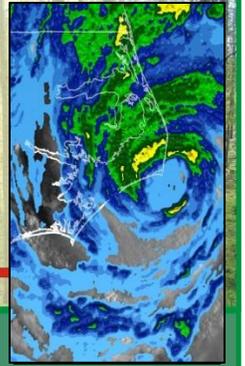




# Forest Health *Notes*



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## Impacts of Hurricane Dorian on Forest Trees in Eastern North Carolina

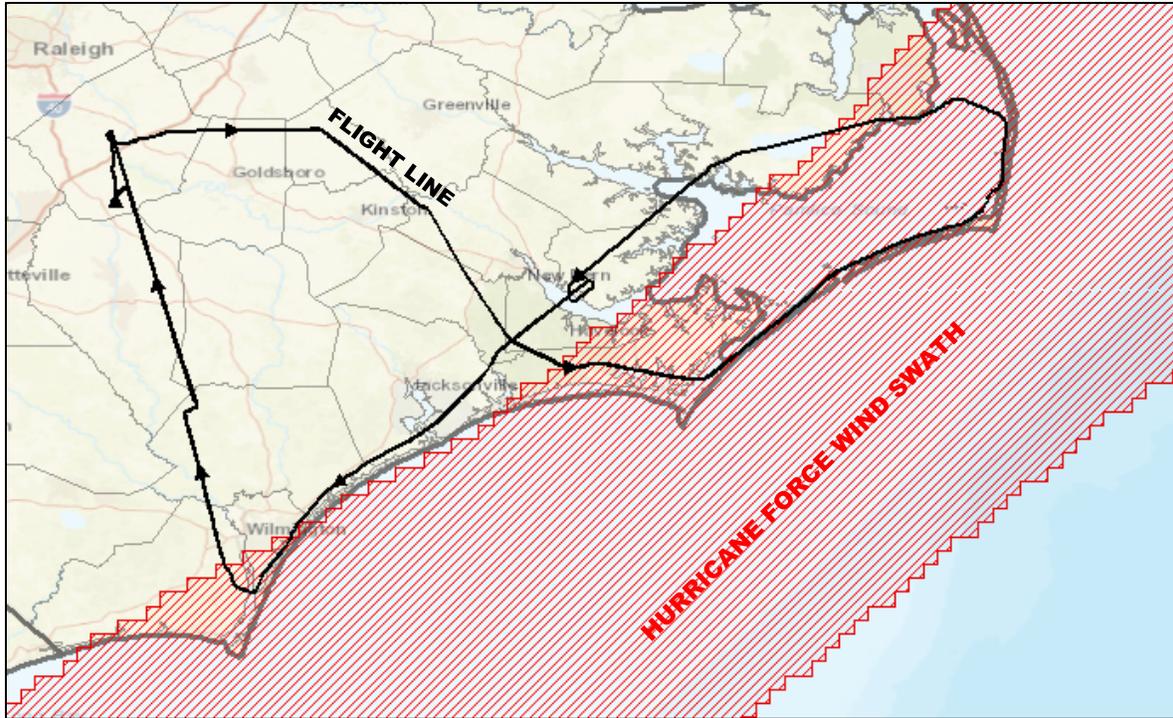
After devastating the Bahamas and other Caribbean Islands before turning north and skirting the eastern U.S. coast, Hurricane Dorian made landfall on Cape Hatteras in North Carolina on September 6, 2019 as a Category 1 storm. The primary impacts were a 4-7-foot storm surge that caused many homes and roadways to flood and wave erosion that reshaped many parts of North Carolina's Outer Banks.

Wind is the primary cause of immediate storm-related tree loss. Two areas within North Carolina fell within the swath of hurricane force winds (greater than 74 mph) caused by Hurricane Dorian. From Ocean Isle Beach north to Sea Breeze, including Southport and Bald Head Island and much of the Outer Banks from Cape Carteret to Nags Head.

**Timber damage recon flight.** On September 7, Wayne Langston and Kelly Oten of the Forest Health Branch flew a recon flight over areas impacted most by the storm. Of greatest interest were the Croatan National Forest and forested and urban areas falling within the hurricane force wind swath. If this recon flight showed extensive damage to forest trees, a thorough and systematized survey would be planned and conducted.



*Erosion from the storm washed out and reshaped beaches on North Carolina's beloved Outer Banks, such as Cape Lookout National Seashore, shown here.*

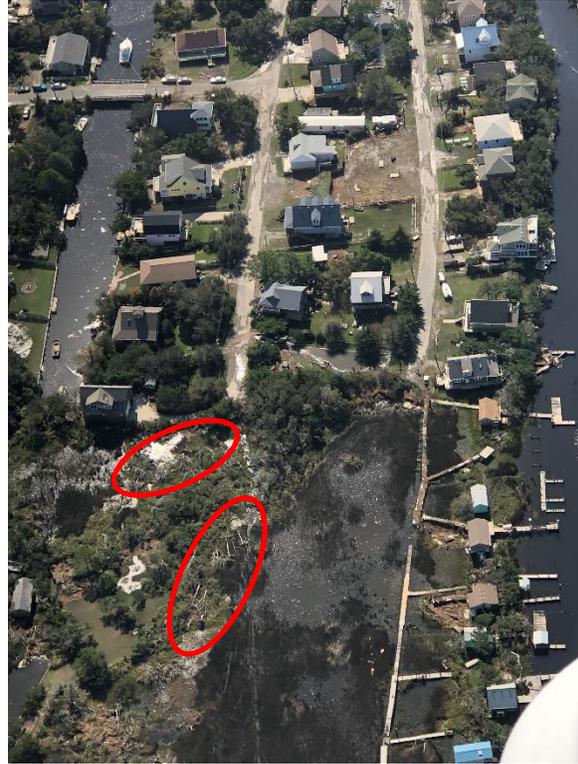


*An aerial survey was conducted on September 7, 2019 to assess timber damage caused by Hurricane Dorian. The flight path took surveyors through the Croatan National Forest and along the greatest-impacted areas in the state.*

**Immediate wind damage.** While sustained winds of 81 mph with a gust of 94 mph were recorded at Cape Lookout, little wind damage to trees was observed. Surveyors noticed many storm-toppled trees that did not occur recently and likely occurred when Hurricane Florence slammed into North Carolina almost a year ago, on September 14, 2018.

**Long-term flooding impacts.** The major effects from this storm will more likely be from flooding. Recorded rainfall amounts were up to 12 inches in some areas (see precipitation map on final page) and aerial surveyors visually documented standing water throughout the region. While these floodwaters will recede and independently may not usually be of concern, the timing of this event will likely increase [ongoing water stress in eastern North Carolina](#). A year ago, on the tail of Hurricane Florence, which garnered 15-35 inches of rain in some areas, an extremely wet fall/winter/early spring followed by a mini-drought in April and May is causing forest tree mortality across the region. This same area is now experiencing standing waters from Hurricane Dorian, further adding to the continuing water stress.

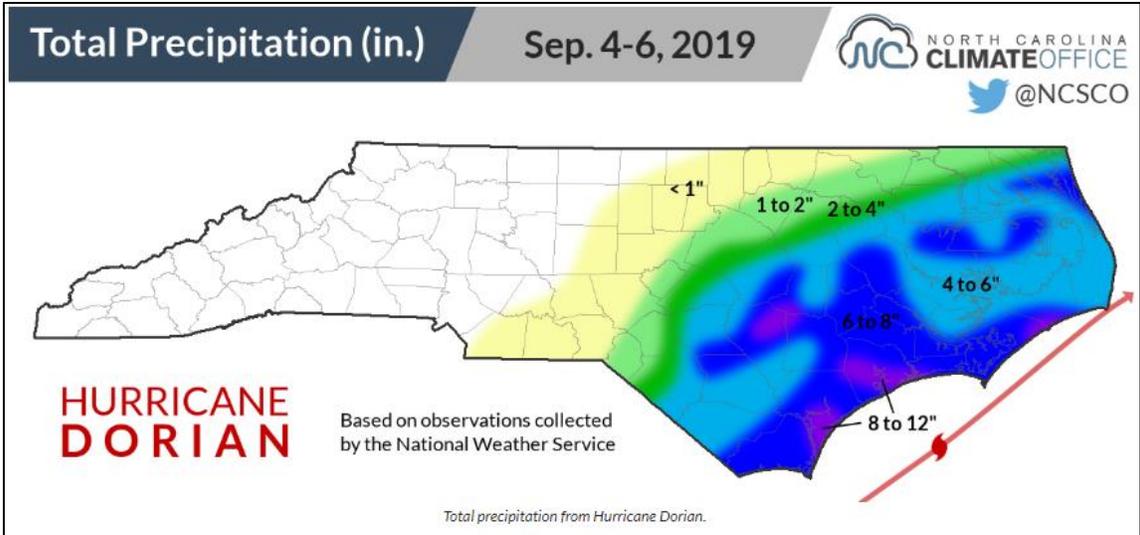
**Management and conclusions.** Forest and landscape trees should be monitored as a routine practice and management recommendations made to maintain tree health. While not much can be done in a forested situation for individual trees experiencing prolonged water stress, landscape trees can be given adequate water and nutrition to aid in their recovery from these conditions. NC Forest Service personnel can aid in these recommendations and can be reached at your local county NC Forest Service Office ([https://www.ncforestservice.gov/contacts/contacts\\_main.htm](https://www.ncforestservice.gov/contacts/contacts_main.htm)).



*Downed trees from Hurricane Dorian were observed sporadically, mostly along the Outer Banks, including Portsmouth (left) and Ocracoke (right). Fallen trees are circled in red.*



*Flooding will likely have significant impacts on trees, primarily because many trees in this area are already stressed from a hurricane-wet season-dry season cycle. Standing water was observed in forest stands (left; Swanquarter) and high water in Lake Mattamuskeet submerged trees along its shore (right).*



*Precipitation from Hurricane Dorian will likely continue to impact already water-stressed trees.*



*Despite the documented damage, most forest trees remained upright and healthy following the storm, such as this stand along the Pamlico River.*

The N.C. Forest Service is a division of the N.C. Department of Agriculture and Consumer Services; Steve Troxler, Commissioner.