

FACTORS DRIVING PERSISTENT COMPOUND FLOODING IN NORTHWEST FLORIDA: 2018 - 2022

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From 2018 through 2022, persistent compound flooding affected residents across a substantial portion of northwest Florida, with numerous properties impacted. Affected areas included the Sand Hill Lakes region of Washington and Bay counties, the Bear and Bayou George creek basins in Bay County, and the Wetappo Creek basin in Gulf County. Flooding was caused by multiple factors. The region experienced multiple years of above-normal precipitation from 2013 to 2018, followed by six named tropical systems from 2018 to 2022. In October 2018, Hurricane Michael brought intensely destructive winds that devastated forests across the region. National Land Cover data indicate Hurricane Michael caused the loss of nearly 80,000 acres of evergreen forests and 28,000 acres of forested wetlands. Fallen trees and associated debris smothered stream channels and floodplains. This reduced the conveyance capacity of affected streams and elevated the stream stages. Both the magnitude and spatial extent of flooding increased near affected stream channels and floodplains. Following Hurricane Michael, evapotranspiration (ET) rates decreased substantially in impacted areas where forest cover was lost. Rainfall continued above average following Hurricane Michael with the two-year cumulative rainfall exceeding the 90th percentile for much of 2019 through 2022. Declines in ET combined with continued extreme rainfall led to an extended period of flooding conditions. High rainfall and low ET also resulted in higher groundwater levels which further contributed to flooding, particularly in karst closed basins. Mitigation of this type of flooding is challenging, particularly in rural karst closed basins.

PRESENTER BIO: Dr. Coates has 25 years of experience in water resource management, including surface and groundwater hydrology, water supply planning, environmental flows, and hydrologic restoration. She is a Deputy Director in the Resource Management Division at Northwest Florida Water Management District.