

2017 Hurricanes and Army Corps of Engineers: Background for Flood Response and Recovery

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In addition to damage from high winds, hurricanes can produce damaging storm surge and flooding from rainfall. This Insight summarizes flood-management activities of the U.S. Army Corps of Engineers (USACE, or Corps) related to Hurricanes Harvey, Irma, and Maria. USACE has three roles relevant to hurricanes:

- emergency responder with flood-fighting and post-disaster recovery,
- owner and operator of flood-risk-reduction projects, and
- provider of assistance to repair certain nonfederal flood-control infrastructure.

Congress may have interest in these roles as it responds to hurricane-related flooding and recovery.

Emergency Response to Flooding and Disasters

USACE often plays a prominent role in the federal emergency response to flooding under various authorities. Under its [P.L. 84-99 authorities](#), USACE can assist in flood-fighting to protect life and property, principally when response resources of a state or U.S. territory are overwhelmed.

USACE also may be tasked under the [National Response Framework](#) with a variety of [disaster-related activities](#), including

- providing emergency power;
- repairing public water, wastewater, and solid waste facilities;
- monitoring, stabilizing, and demolishing damaged structures and facilities; and
- providing technical assistance with managing debris from public property.

For assistance for [presidentially declared disasters](#) pursuant to the Stafford Act ([P.L. 93-288](#)), USACE's response

activities are funded through the Disaster Relief Fund, at the direction of the [Federal Emergency Management Agency \(FEMA\) and the President](#) and the request of the governor of a state or territory with an affected area.

USACE is active in the response and recovery to the 2017 hurricanes. It is restoring emergency power and commercial navigation channels, providing temporary roofing, and conducting infrastructure assessments (e.g., assessing dam safety of nonfederal facilities such as Puerto Rico's Guajataca dam). FEMA has tasked USACE with not only managing power restoration in Puerto Rico but also initial elements of rebuilding the territory's electric grid.

USACE Infrastructure Affected by Hurricanes

At Congress's direction, USACE plans, builds, and operates numerous riverine and coastal flood-control projects. Some USACE-operated flood-risk-reduction projects are located in areas damaged by hurricanes in 2017. Information on USACE flood-related infrastructure damaged by Hurricane Maria is not yet available.

Irma-Affected Area

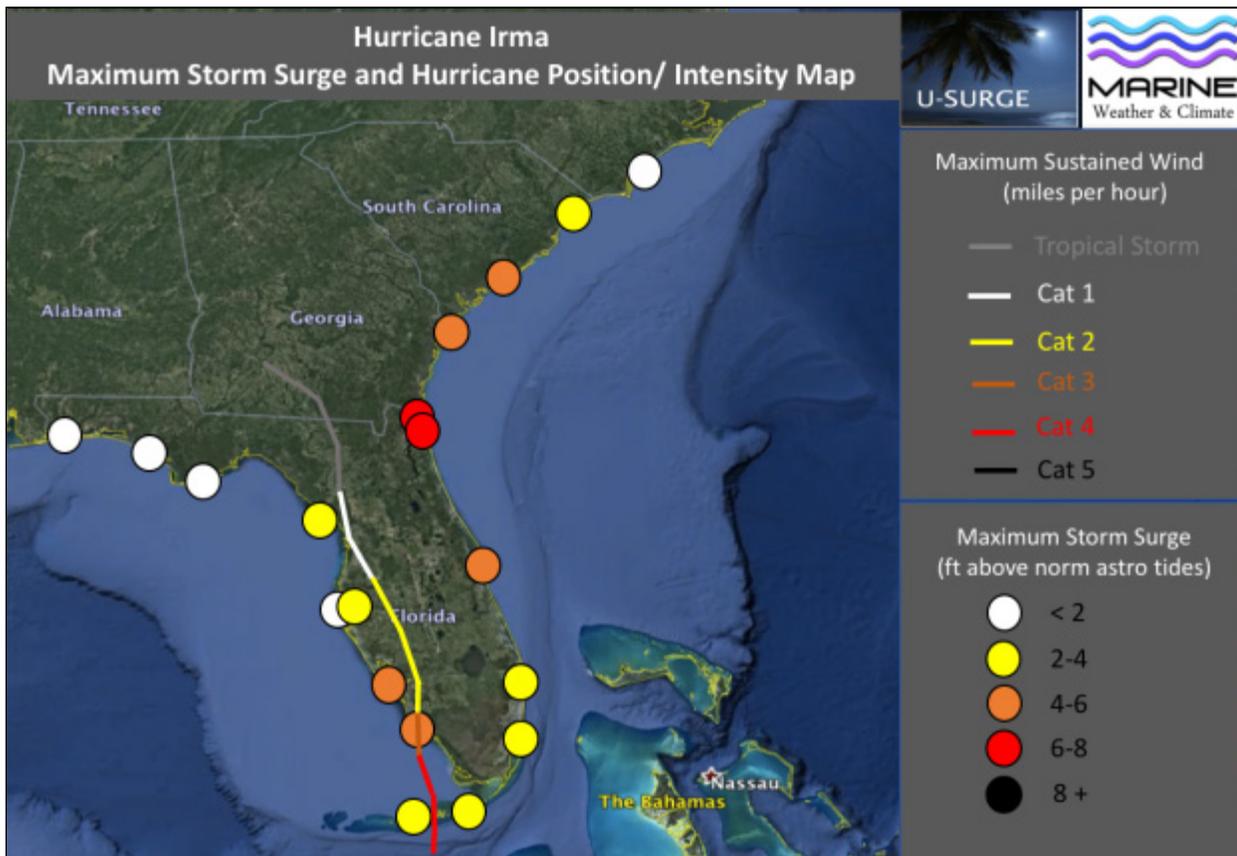
USACE has numerous coastal and inland flood-risk-reduction projects in southeastern states. In preparation for Irma, USACE made [releases from Lake Okeechobee](#) to create storage capacity for the storm's runoff. After the storm, USACE [determined](#) that Herbert Hoover Dike (the flood-control structure around the perimeter of Lake Okeechobee) had no structural-integrity issues resulting from Hurricane Irma.

USACE has a number of cost-shared [shore-protection projects](#) and inland flood-control projects in Florida and the Southeast, which were tested by [Hurricane Irma's storm surge](#). USACE has begun inspecting these projects to determine whether repairs, such as sand placement, may be required to restore their role in reducing flood damages.

Hurricane Irma's flooding in northeastern Florida where USACE has shore-protection projects and elsewhere (e.g., Savannah, GA and Charleston, SC) illustrated that

- the sites of peak storm surge from a hurricane can differ from where peak winds are experienced (see [Figure 1](#)), and
- coastal areas can face "compound flood" risks (i.e., simultaneous flooding from inland rainfall and coastal surge).

Figure 1. Wind and Storm Surge from Hurricane Irma



Source: Marine Weather and Climate/ U-Surge with data from NOAA.

Harvey-Affected Area: Addicks and Barker Dams and Reservoirs

Two USACE-operated dams—[Addicks and Barker dams](#)—were of particular concern with Hurricane Harvey's rainfall. The dams are operated to reduce flooding downstream in Buffalo Bayou, which traverses the city of Houston. USACE completed the dams in the 1940s. In the late 2000s, USACE began addressing deficiencies at the two dams, which are rated as Dam Safety Action Classification I dams (i.e., high urgency due to the risk and/or consequences of failure). Since FY2015, USACE has had a rehabilitation project under way. When a rain event occurs, the Addicks and Barker dams' gates are closed to reduce flooding downstream. Typically, the gates are reopened after downstream runoff recedes. During Hurricane Harvey, [USACE increased releases starting on August 28, 2017](#), while high water levels downstream continued. The releases were made because of the rapid inflow into the reservoirs and to protect the dams' structural integrity. As the rains continued, USACE made additional [unexpected releases](#) due to rising water levels at the reservoirs. USACE had acquired lands within the reservoirs' 100-year flood pool as part of the Addicks and Barker projects. Lands above that elevation were not acquired; some neighborhoods that were constructed above the 100-year flood pool were flooded as the reservoirs' water rose with the storm's rainfall.

Nonfederal Infrastructure Affected by Hurricanes

In recent decades, Congress generally authorizes USACE to participate in the construction of cost-shared flood-risk-reduction projects in U.S. states and territories that are turned over to local entities for operation and maintenance. Nonfederal entities also construct flood-control works without USACE participation.

The condition of some nonfederal infrastructure in hurricane-stricken areas has been a concern in 2017. According to the [National Levee Database](#) prior to the 2017 hurricanes, several of the affected states and territories had nonfederal flood-control infrastructure whose condition was classified as "unacceptable" by USACE's Rehabilitation and Inspection Program (RIP). USACE is authorized to fund the repair of nonfederal flood-control works (e.g., levees, dams, engineered beaches) that are damaged by natural events. To be eligible for RIP assistance, damaged flood-control

works must be active in RIP (i.e., subject to regular inspections) and in an acceptable condition at the time of damage. The repairs eligible for RIP assistance as a result of the 2017 hurricanes will be determined in coming weeks.

2017 Hurricanes and USACE Issues for Congress

A common issue for Congress after a disaster is whether to provide additional funds to USACE and, if so, how much funding and for which USACE activities, and what nonfederal cost-share applies to those activities. In recent years, Congress has used [supplemental appropriations](#) to fund much of USACE's construction and repair of flood-risk-reduction projects in flood-damaged areas. Oversight issues for Congress related to the 2017 hurricane season may include not only the performance of USACE and local levees, shore protections, and dams, but also local and federal actions that exacerbate or alleviate flood risk.

Additional Reading

CRS Insight IN10763, [Congressional Considerations Related to Hurricanes Harvey and Irma](#), coordinated by Jared T. Brown.

CRS Report R42841, [Army Corps Supplemental Appropriations: Recent History, Trends, and Policy Issues](#), by Charles V. Stern and Nicole T. Carter.

CRS In Focus IF10606, [Dam Safety: Federal Programs and Authorities](#), by Charles V. Stern et al.