WHAT'S STORM SURGE?

A storm surge is an abnormal rise in water level that accompanies an intense storm. When combined with the tide, these water levels can present a flooding risk to local communities. Understanding storm surge impacts is a current priority for many communities in coastal Maine, as well as for local, state and federal agencies with local interests.

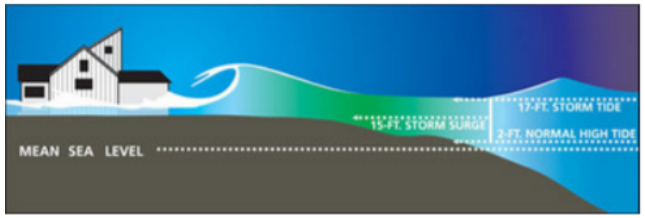

Image credit: NOAA

WHAT WE DO

This research aims to empower citizens to become and remain integral in the discussion of environmental change adaptation in their communities. Citizen scientists involved in the project observe and document storm surge events in three Maine estuaries (Penobscot River, Bagaduce River and Bass Harbor and Southwest Harbor) by maintaining water level loggers at waterfront fieldsites. Citizen scientists visit the sites monthly to download the data and upload to the project website. Data is then processed by University of Maine researchers and shared with community members and organizations in each estuary

GET IN TOUCH

PARTICIPATION INQUIRIES,
DATA UPDATES,
GENERAL INFORMATION.

sensingsurge@gmail.com
http://sensingstormsurge.acg.maine.edu

SEANET NSF MAINE EPSCoR

1865 THE UNIVERSITY OF MAINE

SENSING STORM SURGE

A Community-Based Citizen Scientist Effort in Maine

"BOMB CYCLONE"

On October 30th, 2017, atmospheric pressure dropped relatively quickly throughout New England, creating a meteorological event sometimes referred to as a "bomb cyclone". The data below, collected in part by area citizen scientists, is from the October 2017 "bomb cyclone" weather event.

PENOBSCOT RIVER

The October 30th "bomb cyclone" produced externally generated (wind-driven) surge that propagated into Penobscot Bay and River. The storm hit during the flood phase (water coming into the estuary). The storm surge levels doubled from Rockport to Bangor due to the narrowness of the river near Bangor. It took over two hours for the peak storm surge levels to travel from Rockport to Bangor, indicating that the surge traveled toward Bangor at an average speed of 9.8 m/s (approximately 22 miles per hour).

Figure 1. October 30th, 2017 storm surge map for the Penobscot River. Site locations are in Rockport and Bangor. Blue text values are peak storm tide (tides + storm surge), red text values are peak storm surge, grey values denote time for surge to travel from Rockport to Bangor.

BAGADUCE RIVER

During the October 30th storm event the Bagaduce River surge values increased from B1 to B2 (see Figure 2) due to the narrow channel between Castine and Penobscot. Surge values then decrease from B2 to B3 due to the shallowness of the system. Storm surge values are reduced by over half from B3 to B4 and B5 due to the existence of the 175 bridge, which acts as a constriction and restricts storm surge from propagating upstream.

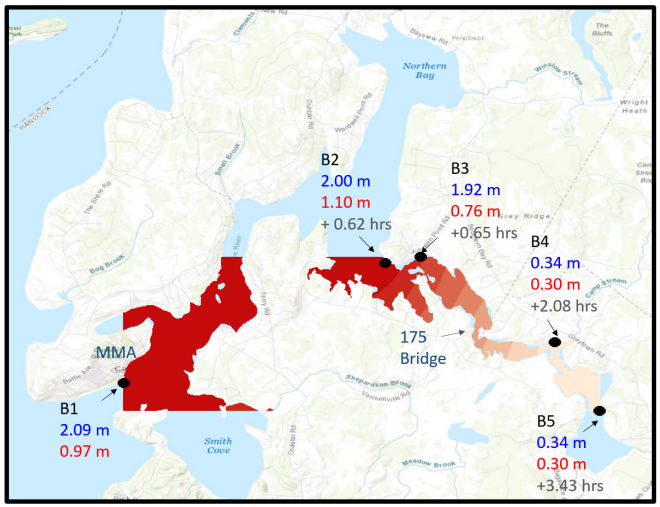

Figure 2. October 30th, 2017 storm surge map for the Bagaduce River. Site locations are denoted by B1-B5 labels. The contours denotes storm surge levels, warmer hues indicate larger values and blonder hues indicate smaller values. Blue text values are peak storm tide (tides + storm surge), red text values are peak storm surge, grey values denote time for surge to travel from B1 to each location.

BASS HARBOR & SOUTHWEST HARBOR

Within Bass Harbor, storm surge levels are relatively analogous due to the smaller size of the system (see Figure 3). However, slightly larger values are observed at Thurston's Lobster Pound, which is likely due to its location north of a small headland that causes local amplification. Storm surge levels are decreased by 8% north of the 102 Bridge. Comparatively, surge values are larger in Southwest Harbor compared to Bass Harbor, likely due to the narrowness of the Western Way channel between Great Cranberry Island and Manset.

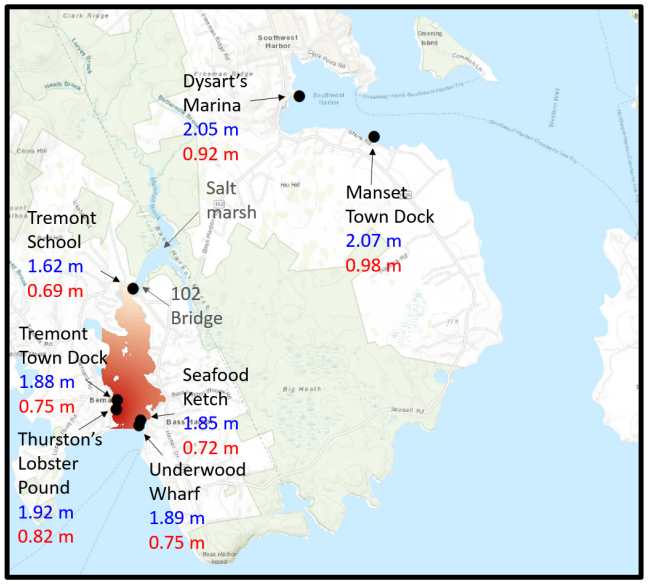

Figure 3. October 30th, 2017 storm surge map for Bass Harbor and Southwest Harbor. The contours denotes storm surge levels, warmer hues are larger and blonder hues are smaller. Blue text values are peak storm tide (tides + storm surge), red text values are peak storm surge.