Supplementary

Sensitivity tests of HTF with NWS minor flooding thresholds. In the main text, we are using the NOS minor flooding thresholds (**Extended Data Fig. 1**) to assess the changes in HTF and contribtions of their components. This choice agrees with the NOAA report of *Global and Regional Sea Level Rise Scenarios for the United States*[7] and focuses on the broader vulnerabilities of U.S. coasts to HTF. The NOAA National Weather Service (NWS) also has a system of flooding thresholds to communicate with the public about ongoing or expected coastal flooding hazards. These NWS minor flooding thresholds are often specified with local features and vary more strongly along the coastline (**Extended Data Fig. 1**).

The difference between selected flooding thresholds will essentially affect the detection of HTF events and result in different flooding days, as the HTF, by definition, is the exceedance of observed water levels above a single given height, i.e., the flooding threshold. As excepted, along the coasts of the CONUS and Pacific islands, the increase of HTF days shows different patterns resulting from the NWS minor flooding thresholds (**Supplementary Fig. 1**) compared to those detected with NOW thresholds (**Fig. 2**). Based on the NWS thresholds, the most vulnerable locations to HTF due to RMSL changes are in the South-Atlantic Bight, where the HTF occurs annually for an average of 55 days in Wilmington from the control period. The Mid-Atlantic Bight is another hotspot with a fast-growing number of HTF days, but it shows very heterogeneous spatial patterns. In Sandy Hook, Atlantic City, Lewes, and Washington D.C., we find more than 17 days of HTF increase, but less than seven days are detected in Sewell's Point and Baltimore. The Islands of Hawaii also show a notable growth in HTF from 18 to 28 days, except Nawiliwili where only an increase of two days is found. Although the absolute days of increase in HTF are different, the RMSL rise is still the primary driver for the increase in HTF frequencies at most sites of the CONUS and Pacific Islands (30 out of 37 gauges with more than 90% increases in HTF days induced by RMSL changes).

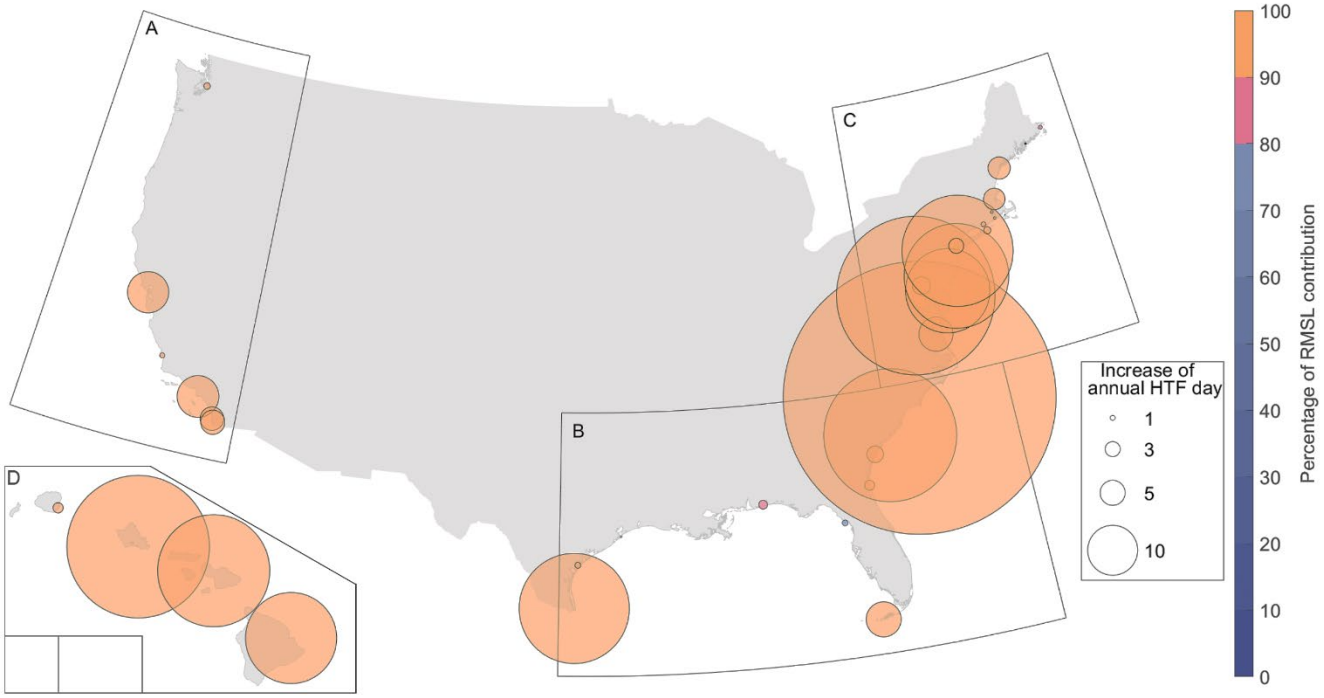
The decomposed HTF days also change with different choices of flooding thresholds. However, the percentage contributions of individual processes to HTF changes are similar using NWS thresholds (**Supplementary Fig. 2**) or NOS thresholds (**Extended Data Fig. 7**). Although the percentages contributions of these components are similar, the results are not identical because the components' water-level fractions vary in the HTF events.

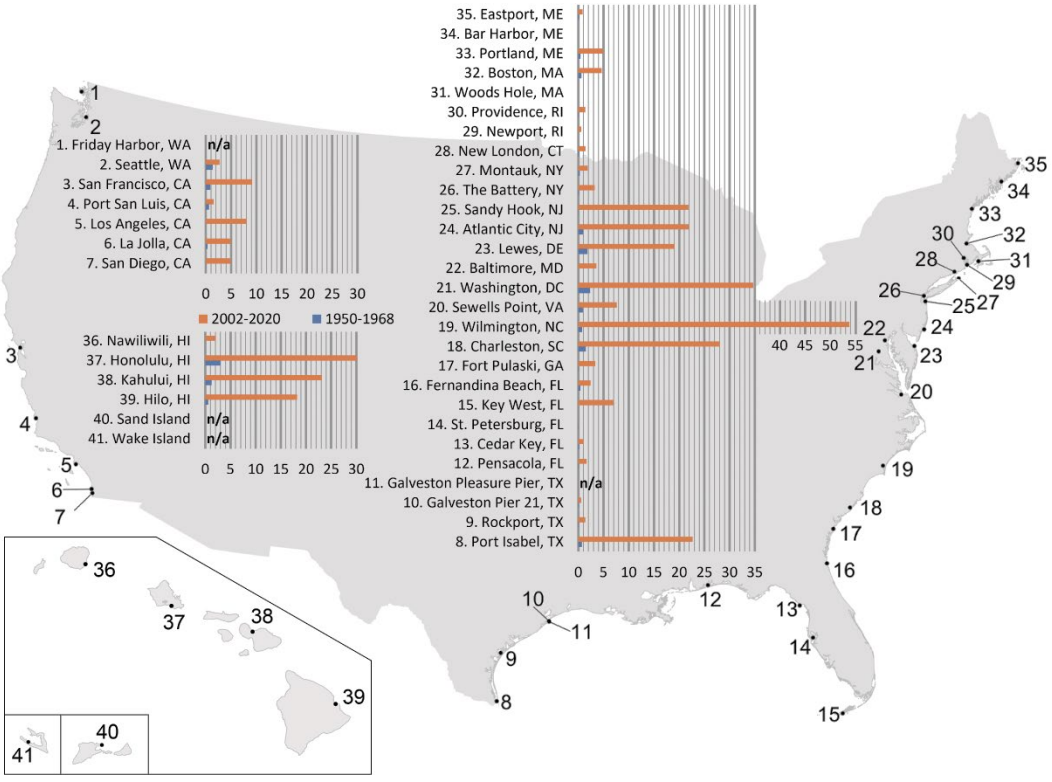
Supplementary Figure Captions

Supplementary Fig. 1 | Increase of annual HTF days and RMSL contributions detected with NWS flooding thresholds. Similar to **Fig. 2** but representing the HTF days detected with the NWS minor flooding thresholds. The sites without NWS flooding thresholds are not shown in (a) and are labeled with n/a in (b).

Supplementary Fig. 2 | The percentage contributions of individual processes in the annual HTF detected with NWS flooding thresholds. Similar to **Extended Data Fig. 7** but representing the results detected with the NWS minor flooding thresholds. The sites without NWS flooding thresholds are not shown.

Supplementary Figures





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