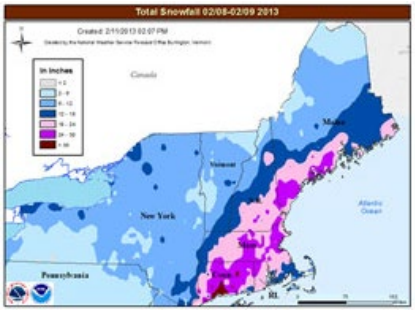
Improving Coastal Flooding Forecasts in New England

On February 8-9, 2013, New England experienced a blizzard that ranked among the top 5 worst ever to hit the region. The storm produced record-setting snow totals, high winds, and almost lost in all the attention – significant coastal flooding.



The storm included very strong northeasterly winds that created 30-35 foot waves offshore and drove water ashore from New York to Maine. The Massachusetts and New Hampshire coastlines were hardest hit with many roads and some neighborhoods inundated with several feet of water. This storm caused severe erosion and some damage to shoreline structures by the large waves.

As bad as the February 2013 Blizzard was, it could have been even worse. Had the storm been only about six hours slower, the storm surge would have been nearly 2 feet higher and the impact more comparable to the infamous Blizzard of 1978. The 1978 blizzard established the modern day high water mark for downtown Boston and generated a combination of storm surge and waves that decimated many shore-side homes.

One of the reasons we can so accurately predict coastal inundation is by verifying past predictions against real-world observations. Often obtaining these quantitative measurements is as simple as having strategically placed tools near the shoreline and someone to read them.

In 2010, the North Atlantic Regional Team (NART) leveraged the power of partnerships to help gain more of these data at a modest cost. We pulled together several NOAA and external entities including the National Weather Service, Center for Operational Oceanographic Products and Services (CO-OPS), NOAA's National Geodetic Survey, Massachusetts's Coastal Zone Management program, and the Town of Scituate, MA to obtain and install 10 staff gages in locations prone to coastal flooding.

This effort followed another successful NART project that engaged NOAA's National Weather Service, Stellwagen Bank National Marine Sanctuary and cutting edge technological expertise from UMASS at Boston for installation of a real time tide gage at Scituate Harbor.

These new gages complement the existing CO-OPS water level network to provide real-world measurements of moderate and major coastal flood events like this past February's blizzard. More broadly, the data are used to improve storm surge models and reference inundation visualization maps. This ensures that future storm predictions are more accurate and our coastal communities are better prepared and more resilient to extreme weather.

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