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A MAGICal Look at the Shore

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photo by Suzanne Zack

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Long Island Sound departed from its usual languid lapping of Connecticut's coastline on October 29, 2012, exploding with fury and causing major flooding and destruction to coastal communities. The National Hurricane Center ranked Hurricane Sandy or Superstorm Sandy, as the October event came to be known, as the second costliest U.S. hurricane since 1900, after Katrina in 2005, and the sixth costliest after adjusting for inflation, population, and property values.

In February, the Federal Emergency Management Agency (FEMA) reported that $45.4 million in federal disaster grants and loans were approved for Connecticut survivors of the storm, the lion's share going to some 6,000 property owners from the shoreline.

Sandy sparked considerable political commentary. Many scientists say warming oceans and greater atmospheric moisture are intensifying storms while rising sea levels are worsening coastal effects.

W. Frank Bohlen, professor emeritus of marine sciences at UConn's Avery Point campus has tracked the effect of storms on Connecticut's coastline for decades, and contends a longstanding problem in the management of the shoreline is the lack of recognition of the shoreline's dynamic nature. "We have this vision of permanence. The coastline – particularly the beaches are anything but permanent by design. They're intended to be re-

To see a video on how to use the MAGIC resource, go to:

http://youtu.be/htop3Q4zMvE

silient and they get their resilience from their ability to move. Unfortunately, in too many cases, we've limited that ability to move by putting infrastructure – roads, pipelines, seawalls, houses, buildings —along the inshore edge of the beach. When the beach tries to move with all this armor in place, it erodes and very often the infrastructure is damaged."

The recent erosion caused by Sandy remains visible, but what about weather events that have affected Connecticut in the past? Is there a reliable record of tracking the changes the coastline has experienced over the course of the past several decades? The answer is yes. A new online resource reflecting the state's mutable southern boundary is now available online - the result of a collaboration between the UConn Libraries' Map and Geographic Information Center (MAGIC) and the State's Office of Long Island Sound Programs (OLISP) of the Connecticut Department of Energy and Environmental Protection (DEEP). The website is **http://magic.lib.uconn.edu**.

Aerial color infrared surveys of the state's coastline, taken about every five years since 1974, were used in the tool. Color infrared presents vegetation as shades of red and water in black, making it easier to identify natural resources and the demarcation between water and land. They are widely used for site reviews and assessments that support permitting and planning activities, and to define and delineate the locations of coastal resources and habitats such as tidal wetlands and shorelines, and they provide a valuable time series of environmental and land use conditions. The older aerial photos are spatially indexed to a footprint on the ground, which enables users to find images based on their exact location. Since the debut of the tool in June 2012, the indexes have been viewed more than 1,000 times. The earliest images of the coastline, which are some 40 years old, have generated the most interest and had the most views.

The tool may be useful in tracking changes in the distant past, but what about changes that have happened more recently?

"Hurricane Sandy caused a variety of impacts to both the natural and developed areas of Connecticut's coastline," according to Kevin O'Brien, Environmental Analyst, OLISP. O'Brien says information on the effects of Sandy was gathered by a number of different sources, which will serve to inform his office's operations. "In order to help identify and assess the damages and impacts, a variety of data and information was collected post-Storm by state, federal, and local sources," he says. "Different types of aerial photography helped support structural damage assessments, inundation models were coupled with on-the-ground observations of high-water marks to help understand the extent of flooding impacts, highly detailed elevation data will allow managers, scientists, and engineers to determine changes in elevations and identify areas of beach erosion and accretion."

Response to the coastal changes Mother Nature has caused can be addressed through natural processes. For example, beaches whose sand was washed offshore can often be re-nourished simply by letting normal wind and wave action do the work. Other changes, O'Brien says, may require human intervention.

Before doing any work, he recommends that residents contact OLISP and their local land use office. It may be that work requires permission, and in these cases the appropriate staff can assist in making sure the work is properly authorized.

Since the shoreline is a dynamic environment, there will always be change. "How we try to address this can often impact future successes or failures, and is one of the key reasons why there are standards and regulations in place," he says. "Each instance can have its own unique characteristics and what may seem like an obvious solution may actually have negative impacts to a tidal wetland area or your neighbor down the road. OLISP tries to seek balance between developed and natural systems, and we can often suggest different ways to help repair damages that can minimize future problems."

"There's nothing terribly surprising about the fact that a storm like Sandy caused major alterations in the form of the beach; that's the function of the beach. We're going to see it again, sure as hell," UConn's Bohlen observes.

About the Author: Suzanne Zack is a Marketing & Communications Specialist at the University of Connecticut Libraries and can be found at the Homer Babbidge Library in Storrs.