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Tropical Storm Irene Delivered a Sunday Punch to Connecticut

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Tropical Storm Irene Delivered a Sunday Punch to Connecticut

...Like Rocky Balboa, we can Train to Fight Back!

by Marybeth Hart

It really wasn't a fair fight. In one corner, packing storm winds ranging from 40 to 50 miles per hour (mph) and gusting to 67 mph, creating waves as high as 8 to 10 feet, was Tropical Storm Irene. In the other corner, sanctioning 200+ years of intensive coastal development patterns and having carried on for 12 years without a major storm event, was the State of Connecticut.

By the time she reached the shores of Connecticut on Sunday August 28, 2011, Irene had been downgraded from a Category 1 Hurricane to a Tropical Storm. In light of the storm's aftermath, the technical difference between "hurricane" and "tropical storm" status seemed insignificant, especially in hard-hit areas like Madison, East Haven, and Fairfield.

Yes, Irene packed quite a punch in Connecticut, as hundreds of homes were destroyed or significantly damaged by the tropical storm. One to two percent of the state's trees were lost to Irene. During the morning high tide cycle, waves rode atop a 3-to-5 foot storm-surge of coastal waters, pushing flood waters much further inland than usual.

At the height of the storm, approximately 30 towns throughout the state had evacuated residents. Each of Connecticut's 169 municipalities experienced some level of power outage, as more than 800,000 power customers reported outages, some requiring 9 days to fully restore. Ultimately, at least 36 local declarations of emergency were reported. According to testimony presented by representatives of the Department of Emergency Services and Public Protection (DESPP) to the Two Storm Panel commissioned by Governor Dannel P. Malloy (formerly known as the S.T.O.R.M. Irene Panel), the total damage caused by Tropical Storm Irene is estimated to be \$200 million dollars. Keep in mind that this is the estimated cost of damage left in the wake of a mere tropical storm, not a Category 1 Hurricane.

Some of the coastal damage that occurred from Tropical Storm Irene resulted from high velocity waves whipped-up by storm winds. Homes in Fairfield and at Cosey Beach in East Haven experienced severe damage, some being ripped from their pilings and smashed to the ground a few feet away.



Beth Stewart-Kelly

This photo was taken during Tropical Storm Irene, in West Haven.



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Wind and wave damage in Fairfield from Tropical Storm Irene.

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Tropical Storm Irene removed a structure from its pilings at Cosey Beach in East Haven,.



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Erosion damage in Branford resulted from Tropical Storm Irene.

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Erosion behind a seawall in Madison due to Tropical Storm Irene

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Tropical Storm Irene caused erosion and seawall damage in Fenwick/Old Saybrook.

Erosion from storm waves also occurred in Branford, Madison, and the Fenwick section of Old Saybrook. Some seawalls built to “protect” homes along the coast functioned just as coastal managers had predicted: they didn’t work. The waves rode up over the seawalls and eroded the area behind them. Some seawalls were themselves destroyed or significantly damaged.

Conversely, the bath house at Hammonasset Beach State Park was relatively unscathed during the storm, but the dune located on its seaward side was obliterated. That’s actually good news: the dune behaved exactly as nature intended, absorbing the impact of the high-velocity waves and protecting the area behind it. The other good news is that restoring the dune will cost substantially less than the expense of repairing or replacing seawalls that were also obliterated by the storm.

Flood water being pushed inland from Long Island Sound was not the only flooding problem associated with Tropical Storm Irene. The heavy rains that accompanied the storm also caused an abnormally high level of stormwater runoff, which caused substantial erosion throughout the Long Island Sound watershed. The eroded sediment and other suspended solids were then carried into the tributaries that ultimately discharge to the Sound, especially in the central and western portions of the state, resulting in plumes of sediment that smothered bottom-dwelling creatures as it settled out of the water column.

Tropical Storm Irene, as well as the subsequent Halloween-canceling snow storm of October 2011, has many valuable lessons to teach. But alas, unless we residents of the “Land of Steady Habits” are willing to break some of our bad habits and learn those lessons, we will be condemned to repeat our mistakes and remain vulnerable to coastal hazards.

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DEEP State Parks and Public Outreach



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Hammonasset Beach dune before Irene (left). Right, some buildings at Hammonasset were relatively unscathed, thanks to the protection of the dunes.

To further complicate matters, Connecticut—the “land of steady weather”—has not been exposed to many extreme, catastrophic weather conditions very often (the last major storm to hit the state was Tropical Storm Floyd on September 18, 1999), but that is likely to change. The state will be challenged to future fights by formidable opponents, including increased hazards and extreme weather events related to climate change. Weather-related hazards will likely become more severe, and areas that are vulnerable now will be hardest hit as sea level rises and precipitation patterns change.

In fact, increases in sea level are certain to exacerbate existing coastal flooding from the Sound, and storm patterns may increase the frequency and severity of hazard events, or create new ones. As of mid-December 2011, Connecticut received over 66 inches of liquid precipitation (rain and snow-melt), making 2011 the wettest year in the state in the 106 years that records have been kept. At a minimum, improved efforts at stormwater management will be critical in dealing with increased runoff, regardless of the degree of sea level rise.

To help better understand coastal hazard-related threats, the Department of Energy and Environmental Protection’s Office of Long Island Sound Programs developed the Coastal Hazards Analysis and Management Project (CHAMP), a series of webpages published on the DEEP’s website to provide information about storms, flooding, and erosion, and the effects that climate change may have on these events. CHAMP also provides an interactive mapping tool to get a glimpse of what coastal hazards (e.g., changes in sea level, storm surge, etc.) may mean to your community. Also included are resources to help property owners determine what they can do to help manage risk for their community or on their property, as well as a list of useful websites, documents, tools and sources of data related to coastal hazards. CHAMP can be found at <http://www.ct.gov/deep/coastalhazards>.

So, how do we meet our Rocky Balboa moment, get into fighting condition, and prepare for the next haymaker storm? By proactively preparing for coastal hazards, both the short-term weather events and the longer-term climate change-related impacts, through proper coastal planning and site design. The information provided by CHAMP is an excellent resource for proactive coastal hazard management and planning. We already know the areas along the shoreline that are most vulnerable to severe damage during



Grzywinski, Michael, CT DEEP

Eroded dune at Hammonasset Beach after Irene.

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Satellite Image of Sediment Plume at the mouth of the Connecticut River. The Thames River didn't experience the same level of sedimentation due to the track of the storm through western and central Connecticut and the smaller size of the Thames River's watershed. (NASA Earth Observatory image by Robert Simmon, using Landsat 5 data from the U.S. Geological Survey Global Visualization Viewer)

a tropical storm or strong winter Nor'easter, and Tropical Storm Irene helped highlight them further.

However, the most formidable opponent we'll have in the future is not likely to be another storm. Our sparring partner will be the steady habits we've accepted and settled into, and our collective unwillingness to ask the hard questions regarding development (and redevelopment) of hazardous coastal areas. These questions include:

Why do local, state, and federal governments allow people to rebuild damaged homes in extremely hazardous areas (some homes are currently built out over the water!)?

Why do local, state, and federal governments allow people to build new residential structures in areas that are already in harm's way, and subsidize their inevitable loss and damage costs?



Sediment Plume at the mouth of the Connecticut River from erosion caused upstream by Tropical Storm Irene (photo credit: DESPP, formerly DEMHS)

What additional steps need to be taken to substantially reduce current stormwater runoff volumes? How can coastal managers change the flawed "steady habit" notion that building seawalls along the coast is always the best defense against coastal hazards and sea level rise, when it's clear that seawalls create more problems than they solve?

Without proper planning, the extent—and cost—of damage could be much more significant during a future tropical storm or hurricane, especially since much of that damage results from factors over which we have no control (e.g., wind speed and direction, whether the storm surge hits during high tide, and whether the high tides are even higher due to a full- or new-moon cycle). For this reason, it's impossible to deal a knockout blow to one of Mother Nature's storms. But, if we can summon the fortitude to confront these tough questions, we'll have a fighting chance of winning a decision against the next one—maybe even unanimously!

About the Author:

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