

# The Torrent



## Tropical Storm Irene

On August 20, 2011, tropical depression Irene formed in the Atlantic Ocean. The storm intensified and reached hurricane status on August 22, becoming the first hurricane of the 2011 hurricane season. Irene moved across Puerto Rico on August 22 and through the Bahamas on August 23-25. Irene then became the first major hurricane (Category III) of the 2011 hurricane season on August 24. Irene then turned north toward the United States east coast and made landfall on the morning of August 27 near Cape Lookout, North Carolina as a Category I hurricane. Irene then moved northeast along the east coast and made a second landfall in the late morning of August 28 east of New York City as a tropical storm. Irene then moved through southeastern New York, western Connecticut, and western Massachusetts before dissipating in northern New England near the Canadian border in the late evening of August 28, 2011.



Clinton shoreline

On September 2, 2011, President Obama issued a presidential disaster declaration for the entire State of Connecticut as a result of Tropical Storm Irene. This declaration included FEMA Public Assistance (PA) for damage to municipal infrastructure and Individual Assistance (IA) for residents for storm and flood damage that occurred between August 27 and September 1, 2011.

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State of Connecticut  
Department of Energy &  
Environmental Protection  
Bureau of Water Protection  
& Land Reuse  
Inland Water Resources Division  
Flood Management Program  
79 Elm Street, 3<sup>rd</sup> floor  
Hartford, CT 06106-5127  
(860) 424-3706  
<http://www.ct.gov/deep>

Editor: Diane Ifkovic

# Tropical Storm Irene . . . continued from page 1



Town Marina, Guilford

08.29.2011

Although Irene was a tropical storm when it made landfall near Connecticut, several factors combined to account for the high degree of damage caused in the state. First, Irene made landfall during a spring high tide. Second, during the month of August soil saturation was high due to higher than average rainfall. Third, a very dense wildland-urban interface lead to significant downed trees across the state. According to the U.S. Department of Agriculture (USDA), Connecticut contains the highest wildland-urban interface (72% of land area) in the nation. Connecticut is the thirteenth most densely forested state. Fourth, the absence of any major wind events since Hurricane Gloria in 1985 lead to a critical overgrowth of trees. Fifth, the large physical size of Irene contributed significantly to both coastal flooding as a result of a large fetch in Long Island Sound and riverine flooding resulting from heavy rainfall in western Connecticut. These factors combined to account for a record number of power outages affecting over half the state. Tropical Storm Irene resulted in total preliminary public assistance damages statewide of 40-50 million dollars.

On the coast, heavy damage to beaches, seawalls and other public and private facilities occurred due to a large wind envelope which pushed water into western Long Island Sound. Comparisons

of still water elevations provided by the National Weather Service (NWS) showed that most of the coast suffered moderate to major flooding that fell between the mean high tide and the worst case category I hurricane level shown on the Sea, Lake, Overland, Surge from Hurricanes (SLOSH) maps published by the U.S. Army Corps of Engineers (USACE). Coastal data stemming from four National Oceanic & Atmospheric Administration (NOAA) tide gauges located in Stamford, Bridgeport, New Haven and New London showed still water elevations at Stamford, Bridgeport and New Haven that fell between the mean high tide and the worst case category I and II hurricane level shown on SLOSH maps. This represents a surge of 3-4 feet above the astronomical high tide. The United States Geologic Survey (USGS) East Hartford office deployed 30 tide gauges before the storm arrived. This USGS data showed that the surge was the result of five factors: sustained wind speed, wind direction, fetch, duration of winds and barometric pressure. These combined factors were nearly ideal for inducing a maximum storm surge of approximately 3.5 feet and very large waves ranging from 5-15 feet. Coastal damage was greatest from Westport to Old Saybrook.

Rainfall for Irene was moderate to heavy in eastern Connecticut (2-5 inches) and very heavy in western

Connecticut (up to 10 inches). Rainfall intensity frequencies ranged from 5 years in eastern Connecticut to over 100 years in western Connecticut. River flood frequencies for selected rivers monitored by the USGS also mirrored this data. The Connecticut, Housatonic, Farmington, Pomperaug and Pequabuck Rivers experienced major flooding which damaged hundreds of structures and caused damage to roads and bridges.

The NWS reported a maximum wind gust of 66 mph in Thompson. The average maximum wind gust for the state was 52.3 mph from the south southeast. Although significant tree damage resulted from Irene, the amount of tree coverage felled is expected to be replaced by natural growth within 2 to 3 years.

As of October 31, 2011, 3,417 flood insurance claims were filed for Irene damage, with \$8,600,624 in claims paid (average payment \$13,985). Many claims have still not been closed and these are not final claims and figures for Irene.

*Special thanks to municipal staff for providing photographs, and state and federal agencies for the data sources and analysis utilized in this article.*



Red Bird Trail, Old Saybrook

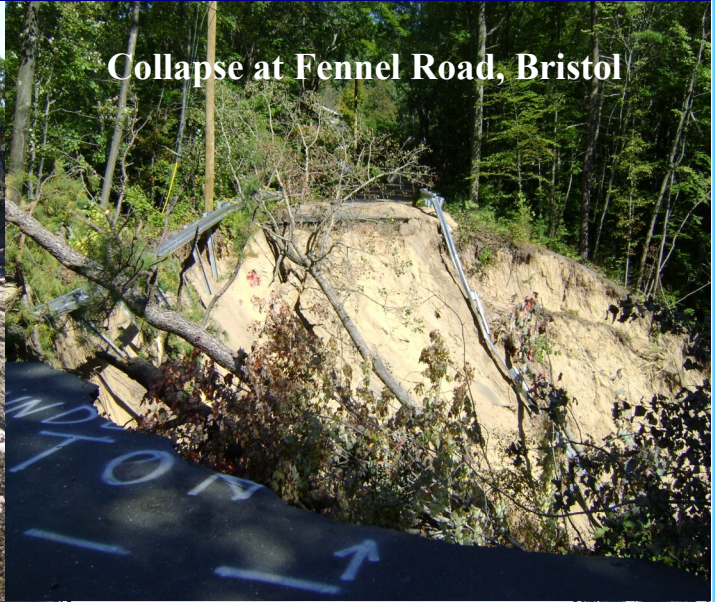


# Tropical Storm Irene . . . continued from page 2



Falcon Road, Guilford

08.29.2011



Collapse at Fennel Road, Bristol



Cosey Beach, East Haven



Cosey Beach, East Haven



Hillside Avenue, Milford



Point Beach Drive, Milford



# Substantial Damage & ICC

The effects of Tropical Storm Irene, have brought the topic of substantial damage to the forefront for many community officials as buildings are severely damaged within the floodplain.

Within a community's floodplain zoning regulations or floodplain ordinance is a definition for substantial damage, defined as damage of **any** origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Local officials in communities that participate in the National Flood Insurance Program (NFIP) must determine whether proposed work qualifies as repair of substantial damage. Structures that are substantially damaged must be brought into compliance with NFIP requirements for new construction in the floodplain, including the requirement that lowest floor be elevated to or above base flood elevation (BFE). For structures located in the floodway of a river or in the VE zone (coastal area), rebuilding or repairing a structure to meet new construction standards can be particularly difficult and costly to achieve.

Market value is the most important criteria in determining substantial damage. The definition of market value can often be found within the definition of "substantial improvement" in a community's regulations, its own stand-alone definition, or defined by policy of the community. Market value is commonly determined by an independent appraisal of the structure by a professional appraiser, tax assessment minus land value, replacement cost minus depreciation of the structure, or actual cash value of the structure. Substantial damage is determined regardless of the actual cost to the owner. The community official must determine the true

cost of bringing the structure back to its pre-damaged condition using qualified labor and materials obtained at market prices.



## Substantial Improvement/ Substantial Damage Desk Reference

FEMA P-758 / May 2010



The FEMA publications *Answers to Questions About Substantially Damaged Buildings* [www.fema.gov/library/viewRecord.do?id=1636](http://www.fema.gov/library/viewRecord.do?id=1636) and *Substantial Improvement/Substantial Damage Desk Reference* [www.fema.gov/library/viewRecord.do?id=4160](http://www.fema.gov/library/viewRecord.do?id=4160) are resources for community officials who have specific questions. *Substantial Damage Estimator (SDE)* is a CD that can help a community official in estimating damage [www.fema.gov/library/viewRecord.do?id=4166](http://www.fema.gov/library/viewRecord.do?id=4166).

If a home or business is deemed substantially damaged by a flood, repairing or rebuilding the structure will require meeting the NFIP building standards for new construction. This means elevating a home or flood-proofing commercial buildings to or above the base flood elevation (BFE).

To help cover the costs of meeting these requirements, the NFIP includes Increased Cost of Compliance (ICC) coverage for buildings covered under a Standard Flood Insurance Policy (SFIP).

When a community official determines that a structure has been substantially damaged by flood, ICC will help pay for the cost to elevate, flood-proof, demolish, or relocate the building up to \$30,000. The maximum combined ICC and loss payment cannot be greater than the limits of coverage for the type of building. Claims for ICC benefits are filed separately from a flood insurance claim to repair damage to the building or contents. No additional deductible is required for ICC.

An ICC claim can be filed whether or not a community has received a Presidential disaster declaration. An ICC claim payment is only made for flood-related damage. The structure must be located in the 100-year floodplain to receive an ICC claim payment. More information on ICC can be found at: [www.fema.gov/plan/prevent/floodplain/ICC.shtm](http://www.fema.gov/plan/prevent/floodplain/ICC.shtm).

The FEMA publication *Increased Cost of Compliance Coverage: Guidance for State and Local Officials* provides information on ICC coverage and how it relates to communities' administration of floodplain management regulations following a flood, [www.fema.gov/library/viewRecord.do?id=1532](http://www.fema.gov/library/viewRecord.do?id=1532)



## National Flood Insurance Program Increased Cost of Compliance Coverage

Guidance For State and Local Officials  
FEMA 301 / September 2002



# News Briefs

## NFIP Extended Until December 16, 2011

With the National Flood Insurance Program (NFIP) facing expiration on November 18, 2011, Congress passed on November 17, and the President then signed, a short-term funding bill that included an extension of the NFIP. The extension will expire on December 16, 2011.

## Extension for Sending Proof of Loss associated with Hurricane Irene

The Standard Flood Insurance Policy requires a policyholder to send the insurer a complete, signed, and sworn-to proof of loss within sixty (60) days after the date of loss. A number of states experienced catastrophic losses as a result of Hurricane Irene, making the claims process difficult for many policyholders within this time limit. As a result, FEMA has provided a 90-day extension to the normal deadline for filing a proof of loss. With this extension, an NFIP policyholder will now have a total of 150 days after the date of loss to send the proof of loss to the insurer.

This extension applies to all building and contents claims for flood damage arising out of Hurricane Irene in the states of Connecticut, Delaware, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia and Washington, DC with dates of losses between August 26 and September 4, 2011. More information on this extension can be found at: <http://www.nfipiservice.com/stakeholder/pdf/bulletin/w-11122.pdf>

## National Levee Database

In October 2011, the U.S. Army Corps of Engineers (USACE) officially opened the National Levee Database (NLD) to the public. The database contains information relative to the status and safety of the nation's levee systems, including attributes of levees such as design, construction, operations, maintenance, repair and inspections. The NLD includes information on more than 14,000 miles of levee systems in the USACE program. USACE is currently working with FEMA to include information on levees participating in the NFIP. The NLD can be accessed at: [http://www.usace.army.mil/LEVEESAFETY/ACTIVITIES/Pages/act\\_nldb.aspx](http://www.usace.army.mil/LEVEESAFETY/ACTIVITIES/Pages/act_nldb.aspx)

## USACE Coastal Flood Maps White Paper Issued

The U.S. Army Corps of Engineers has recently released a white paper summarizing the differences between FEMA flood insurance rate maps and storm surge inundation maps and how they should be used by community officials. It can be found at: <http://www.iwr.usace.army.mil/nhp/index.cfm?pageid=123&navid=41>

## Updated Coastal Construction Manual

In August 2011, FEMA released the fourth edition of its *Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas* (FEMA P-55). The new manual can be viewed or downloaded at: <http://www.fema.gov/library/viewRecord.do?id=1671>

## USACE Report on Wood Vegetation & Levees

The U.S. Army Corps of Engineers (USACE) has released the results of a study on the impacts of trees on levees. The report, "Initial Research into the Effects of Woody Vegetation on Levees", concludes that the presence of trees on a levee increases the uncertainty of levee integrity and performance. The study can be found at: [http://wri.usace.army.mil/woody\\_vegetation\\_research.html](http://wri.usace.army.mil/woody_vegetation_research.html)

## Preliminary revised CT coastal flood maps issued

Due to restudy of coastal areas in Connecticut by FEMA, revised preliminary flood insurance rate maps were issued for Middlesex County on September 22, 2011, Fairfield and New Haven Counties on October 30, 2011, and New London County on November 15, 2011. These revised coastal map panels should become effective in late 2012 or early 2013. Preliminary flood maps can be viewed in the town hall for each community.

## NOAA releases Vertical Datum Tool

The National Oceanic & Atmospheric Administration (NOAA) has released the first edition of a free vertical datum transformation (VDatum) tool that allows users to produce a set of consistent geospatial data over coastal and interior areas of the contiguous U.S., removing the differences between the vertical reference systems of land- and water-based data. VDatum was jointly developed by NOAA's National Geodetic Survey, Center for Operational Oceanographic Products and Services, and Office of Coast Survey. For more info, go to: <http://vdatum.noaa.gov>.

## UPCOMING CONFERENCES & WORKSHOPS

**May 9, 2012.** National Flood Conference, Austin, Texas. [http://www.fema.gov/business/nfip/natl\\_fldconf.shtm](http://www.fema.gov/business/nfip/natl_fldconf.shtm).

**May 20-25, 2012.** Association of State Floodplain Managers (ASFPM) Annual Conference, San Antonio, Texas. [www.floods.org](http://www.floods.org).

**August 19-23, 2012.** StormCon, Denver, Colorado. [www.stormcon.com](http://www.stormcon.com)

**October 20-24, 2012.** Restore America's Estuaries 6th National Conference on Coastal and Estuarine Habitat Restorations, Tampa, Florida. [www.estuaries.org](http://www.estuaries.org)

## UPCOMING EMERGENCY MANAGEMENT INSTITUTE COURSES

The Emergency Management Institute (EMI) is located at the Federal Emergency Management Agency (FEMA) National Emergency Training Center (NETC) in Emmitsburg, Maryland. EMI serves as the national center for emergency management training of federal, state, and local government officials. Tuition, housing, and all books and materials are provided at no cost. Participants are responsible for the cost of a meal pass (approximately \$100). The following is a list of upcoming EMI courses through September 2012. To apply, call Diane Ifkovic, CTDEEP, (860) 424-3537 or email at [diane.ifkovic@ct.gov](mailto:diane.ifkovic@ct.gov). For more information on the courses listed, visit the EMI website: <http://training.fema.gov>.

E170 HAZUS-MH for Hurricane—January 9-12, 2012

E172 HAZUS-MH for Flood—July 16-19, 2012

E176 HAZUS-MH for NFIP—April 23-26, August 6-9, 2012

E179 Application of HAZUS-MH for Disaster Operations—February 13-16, 2012

E190 ArcGIS for Emergency Managers— April 30-May 3, 2012

E194 Advanced Floodplain Management Concepts—February 13-16, August 27-30, 2012

E202 Debris Management Planning for State, Tribal & Local Officials— February 6-9, 2012

E264 Hydrologic Engineering Center –Riverine Analysis System—May 7-10, 2012

E273 Managing Floodplain Development through the NFIP— March 19-22, April 23-26, June 11-14, September 24-27, 2012

E276 Benefit Cost Analysis: Entry Level Training— November 14-16, 2011, April 10-12, 2012

E278 NFIP/Community Rating System (CRS)— February 27—March 1, August 6-9, Sept. 17-20, 2012

E279 Retrofitting Floodprone Residential Buildings— June 25-28, 2012

E284 Advanced Floodplain Management Concepts III—July 9-12, 2012

E296 Application of HAZUS MH for Risk Assessment—January 16-19, September 17-20, 2012

E313 Basic HAZUS Multi-Hazards— April 2-5, 2012

E317 Comprehensive Data Management for HAZUS-MH—June 18-21, 2012

E386 Residential Coastal Construction—August 13-16, 2012

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