



Aerial view of the damage caused by Hurricane Sandy to Casino Pier on the New Jersey coast in October 2012. Photo credit: U.S. Air Force, Master Sgt. Mark C. Olsen



Connecticut, New Jersey and  
New York Sea Grant programs.



<http://nyseagrant.org/csap>

# Coastal Storm Awareness Program

Sea Grant talked to people about Hurricane Sandy to learn how they responded and why. The information will help emergency responders better understand the people they seek to help in order to communicate storm risk effectively.

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## CSAP Research

Despite the accuracy of the forecast for Sandy, too many coastal residents either failed to fully understand the severity of the storm and the dangerous conditions it would produce, or chose not to evacuate in spite of the serious risks of staying in their homes.

The Sea Grant programs of Connecticut, New Jersey and New York awarded funds totaling \$1.4 million to support ten social science research projects to improve community understanding and response to coastal storm hazard information as part of the National Oceanic and Atmospheric Administration (NOAA) Sea Grant Coastal Storm Awareness Program (CSAP).

These ten projects studied community response to disasters by closely examining the coastal storm warning systems, the information conveyed (what to expect, when to expect it, and what to do) and the factors that affect whether recipients of this information decide to act on it.

Research funded through CSAP was guided by a Program Steering Committee drawn from the ranks of the coastal emergency management response and communication communities. Their involvement helped ensure that the program produced results of direct use in preparing for future hazardous coastal storms.



Damage from Tropical Storm Irene at Cosey Beach, East Haven CT.



# KEY FINDINGS OF THE COASTAL STORM AWARENESS PROGRAM

- ▶ **Access to storm information is maximized by using many media platforms**
- ▶ **Evacuation decisions are influenced by many complex factors**
- ▶ **Effective storm warnings use simple terms and visual images for explanation**
- ▶ **People are more likely to heed “mandatory” orders than voluntary ones**
- ▶ **Coastal residents need to know local evacuation/flood zones and routes**
- ▶ **Safer, flood-compliant homes may affect future evacuation decisions**
- ▶ **The rights and needs of disabled people and needs of pets must be included in planning**

## ✓ Adolescent and Family Decision Making In Time of Disaster

**Lead Institution: Columbia University**

Adolescent involvement in evacuation decision-making was significantly higher in families who did evacuate than in those who did not evacuate. Adolescent females generally played a greater role in decision-making than adolescent males.

## ✓ An Audience Segmentation Analysis of Connecticut Coastal Residents to Support Storm Preparedness

**Lead Institution: Yale University**

Researchers found that 70% of coastal residents do not know they live in an evacuation zone, 74% have never seen an evacuation route map, and only 31% believe it would be safer to evacuate than to stay home during a Category 2 hurricane, suggesting that awareness of hurricane risks in general is quite low.

## ✓ Assessment of Social Media Usage during Severe Weather Events and the Development of a Twitter-based Model for Improved Communication of Storm-related Information

**Lead Institution: Mississippi State University**

Television proved to be the most popular source of weather-related information. However, once people lost power, many shifted to radio and face-to-face conversations, as well as using Twitter and other social media platforms to receive storm-related information. Twitter was a highly valuable source of information during the Hurricane and had a considerable increase in the number of users and the messages shared during the peak of the hurricane with weather-specific information and real-time updates of conditions.



Social media has gained in popularity for the real-time exchange of information during extreme weather events.

## ✓ Behaviorally Realistic Communications to Improve the Public’s Response to and Preparedness for High Impact Storm Events

**Lead Institution: Carnegie Mellon University**

Residents expressed the need for tailored information about appropriate and effective mitigation measures as well as improved visualizations to better understand the impact of the risk, which should be provided by trusted sources such as local officials.

## ✓ Best Practices in Coastal Storm Risk Communication

**Lead Institution: Rutgers, The State University of New Jersey**

Researchers found that using the word “voluntary” in evacuation notices may result in fewer evacuations than using other similar messages. Localizing evacuation messages to town level has been shown to be important but drilling down to street level notices may not significantly improve evacuation rates.

## ✓ Evaluating Evacuation Decision-making Processes among Residents of Long Beach, NY before Superstorm Sandy: Lessons for the Role of Authority and Language in Storm Warnings

**Lead Institution: Hofstra University.**

Around 45% of those interviewed describe a comparison to the impact of Hurricane Irene that often negatively impacted their decision to leave, even if that comparison was made using secondhand information from family and neighbors.

## ✓ Forecasting Evacuation Behaviors of Coastal Communities in Response to Storm Hazard Information

**Lead Institution: Cornell University**

The media, including local media and larger outlets such as The Weather Channel, play a larger role in influencing the respondents’ evacuation decisions during Sandy than local authorities, friends, and neighbors did; however, communities at risk rely on official sources to make evacuation decisions for them and expect to be told what to do and when to do so in a very precise, simple and succinct message.

## ✓ Measuring Public Responses to a Surge of Information: How Individuals Understand, React, and Respond to Storm Surge Media Messages

**Lead Institution: Cornell University**

Communication of serious storm warnings can be significantly improved. For example, a photo showing how the results of the storm surge and wind may impact a local neighborhood may be more effective than a radar or storm track map. A false sense of security may develop among those who make storm preparations ahead of time and come to feel that their home and property (and they) are “storm-proof”, even in the face of storms that warrant an evacuation.

## ✓ They Had the Facts, Why Didn’t They Act? Understanding and Improving Public Response to NWS Coastal Flooding Forecasts

**Lead Institution: Nurture Nature Center**

Findings support the use of National Weather Service emergency briefing packages as a preferred method for disseminating storm and flood risk information. However, necessary changes to improve visual clarity, provide more succinct information, and localize messages must be employed for risk communication to be effective.

## ✓ Understanding Responses to Storm Warnings: Learning from Those Who “Rode Out” Hurricane Sandy

**Lead Institution: SUNY College of Environmental Science and Forestry**

In evacuations, transportation must be available to those in need of it, for example the elderly or disabled. People with disabilities (both mobility and sensory) may prefer to shelter in place due to uncertainties related to accessibility to shelters and their ability to accommodate specific needs. Families with pets may not leave unless certain there is shelter for all of their animals.