

## **Collection of Data on Flood and Hydrodynamic Impact on Coastal Infrastructure in the New York City Metropolitan Region during the Hurricane Sandy**

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As Hurricane Sandy impacted metro NYC and caused various damages, it also brought up a valuable opportunity for scientists to study such events and predict future hurricanes and potentially more catastrophic disasters. A most precious part of knowledge Sandy has presented to us is its perishable trace and real field data of wind, flooding, and damage of coastal infrastructures. Collection of its data, which is indeed what we lack of, will provide a solid as well as an indispensable platform for risk study and prediction of future events.

The objective of this NSF RAPID project is to collect data, especially those of perishable, of flooding and infrastructure damage/deformation in the metro New York City (NYC) region due to Hurricane Sandy, and produce a database and a preliminary analysis for future scientific studies and management use. In particular, the tasks will be 1) identification of flood path and area, 2) high water marks at coastal infrastructures, and 3) structure damage and surge load. The research starts with news reports and people interview (experts, field workers, agencies, etc). The data collection effort will proceed with reviews of news reports, assessment of damage through field observations, records of government agencies, and discussion with city officials. A preliminary investigation is also planned on computer modeling of coastal ocean flows using the collected data.

According to flood maps and data measurements provided by USGS and other sources, about 15 zones of NYC have been identified for field measurements, which cover NYC, Long Island, and NJ. A team of students from City College of NY has been formed and trained on field data collections. They went to sites and recorded flood and structure damages. The record includes locations (latitude and longitude) and height of water marks, pictures, and descriptions. We emphasize local and high-resolution data, say 50 m. We have collected many field data at the southern parts of NYC, e.g., Rockaway Park, Long Beach, etc.

This research is important in that it helps us to get prepared for future risk, given the fact the number of category IV and V storms has greatly increased over past 35 years in the northeastern regions, plus that sea-level rise is twice as fast along metro NYC coastline as compared to the global average rate. The project will have a significant broader impact because of a unique opportunity of collecting real life data; the personnel/students participating in the damage data collection will have an excellent experience in effects of hurricane on urban area.