

**Post-Disaster Risk Redefinition In Small New Jersey Municipalities During
The Initial Recovery Period Following Super Storm Sandy
An NSF-RAPID Research project (December 2012-February 2014)**

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SUMMARY

This research identifies arrangements for bringing together expert and vernacular information about storm surge risks in the wake of a major disaster under conditions of high uncertainty, compressed time scales and multipurpose intentions. It examines the extent to which the technical and experiential knowledge of expert communities, including – among others - Emergency Managers and Floodplain Managers, is employed by local leaders and disaster-impacted individuals in support of decisions about community rebuilding and the reciprocal use of vernacular information from the local leaders and residents by the expert community. The intent is to detect the emergence, and chart the functions, of hybrid information streams as adaptive innovations that can also be used expeditiously.

Investigation began with an electronic questionnaire survey of risk experts about the use of conventional and unconventional information support tools in a post-disaster setting. Responses were solicited from approximately 40 state, county and local emergency managers with responsibilities for the areas affected by storm surge floods during Sandy and approximately 200 members of the New Jersey Association for Floodplain Management (NJAFM), the state's premier organization with floodplain management expertise. Informants were queried about the use of risk decision support tools including, among others, risk and vulnerability maps, emergency operations documents, hazard mitigation plans, land use zoning maps and plans, post-disaster aerial imagery, cloud-sourced crisis-mapping systems and other kinds of information supplied by affected publics. Sources employed by risk specialists were canvassed as well the targets, timing and utility of information provided by specialists to storm impacted communities and other users. The main purpose of this survey were to determine the extent to which risk experts were involved in redefining risks in the wake of disaster, and the tools that they employed.

The second stage of the inquiry included in-depth study of three communities that were affected by storm surge floods during Sandy. They were broadly representative of different degrees of exposure to Sandy's surge. One community was exposed to the direct effects of ocean flooding (Manasquan); another was located on Raritan Bay (Union Beach); and the third on a river partially sheltered from the ocean behind a barrier beach (Oceanport). All of these are Boroughs with populations of approximately 6,000. The study team collected background information about the impact of Sandy on each community, paying particular attention to patterns of damage and differential effects of the storm on resident populations. In each of these places two (2) local leaders (e.g. mayors, councilors) and two (2) government personnel with responsibilities for storm surge risk management (e.g. engineers, planners, emergency managers etc.) were interviewed about the sources, nature and use of flood risk information that they employed before, during, and after, Sandy impacted the community, with emphasis on information intended to affect the process of recovery and preparedness for future floods. Within this context the interviews were wide ranging, covering topics that included ongoing or planned

changes in the nature and availability of flood risk information; special problems that have arisen in connection with the use of this information; unmet information needs; awareness of risk information innovations; experience with and receptivity to involvement by non-experts in the risk redefinition process; information gaps and barriers between specialized risk governance personnel and the wider public during the recovery process; and suggestions about ways in which risk information could be employed most effectively in support of decisions about the future use of flood affected areas.

In the third stage of investigation, researchers met with two focus groups per case study community, each composed of 8 local residents (a total of 48 individuals) to identify their flood risk information usage and needs. Using leads provided by municipal officials and flood risk experts, as well as other local leaders and the mass media, a snowball procedure was employed to contact residents who remain in the case study communities after Sandy. The purpose of including local residents was: to identify the kinds of evidence about flood risks that residents employ in support of their views about future development plans; to provide an estimate of the public demand for inclusion in local decision-making that exists in the wake of disasters; to identify the preferred avenues by which affected publics seek to make their views known; and to assess the perceived value of these interventions by lay users. The inclusion of risk information in community redevelopment plans and programs received special attention.

A fourth component of investigation, not anticipated at the outset, was a fortuitous opportunity to include questions about statewide recognition of Sandy's flood risks and responses in the Eagleton opinion poll conducted by Rutgers University. This permitted investigators to extend the analysis to include lay populations outside of the disaster-affected area as well as those in impacted communities.

At the time of writing (April 29, 2013), fieldwork has been largely completed and investigators are beginning to analyze the resulting data. A few preliminary findings are currently available for the flood risk expert community, some focus groups and one statewide public opinion poll. Detailed analysis of data for local public officials and examination of information exchanges and lacunae among the four main interest groups that shape public policy (i.e. experts, local officials, Sandy-impacted coastal residents, and little-impacted statewide populations) have yet to begin.

Flood risk experts: there is a high degree of concurrence about the kinds of flood risk information that are deemed important for present hazard recovery and future mitigation purposes, combined with a tight focus on a small number of information sources relative to the total range of available data. The great majority of experts expect future floods to be significantly more severe and/or more frequent than heretofore. It is also expected that worsening risks will eventually force much improved hazard responses but fully effective implementation may be delayed, possibly by up to two more decades. A major improvement in public information and education about future flood risks is the most frequently identified need for the realization of improved protection goals. Federal agencies are the primary information sources for flood risk experts and local residents are the primary population that receives information from flood risk experts. Experts gather information first and foremost from institutional (federal agency) web pages and preponderantly disseminate information to local users via email. While social media are recognized as a useful supplementary source of flood risk information, they are mainly employed to disseminate information to residents rather than as sources of local (vernacular) flood information consulted by experts.

Local public officials: Analysis pending.

Flood-impacted residents: It is evident that heavy reliance on an interrelated trio of newly introduced Advisory Base Flood Elevations, flood risk maps and prospective changes to flood insurance rates has strongly affected the process of recovery and its likely outcomes. Residents have responded to the ABFE/risk map/insurance mix of alternatives by differentiating into three groups: (a) those that will rebuild, irrespective of costs and uncertainties about regulations, reimbursements and insurance; (b) those that are waiting for the resolution of information, reimbursement and regulatory uncertainties (the vast majority); and (c) those that are walking away from their damaged residences (the smallest group). This trio of measures tends to divert attention away from other flood risk measures and slows recovery rates. In the case study communities the scope of recovery plans is narrow, with few efforts directed at economic rejuvenation, ecosystem resilience and the reduction of social vulnerabilities. This undercuts the potential for adoption of holistic recovery strategies.

Broad New Jersey public: The least popular alternative policy goal is restoration of damaged communities to the status quo ante; fewer than half of Eagleton Poll respondents favor this policy. Abandonment of places that are difficult or costly to protect is the second least favored alternative (c. 55%). Between two-thirds and 87% of respondents prefer one or more of the following active interventions in descending order: elevation of buildings; construction of dunes and/or seawalls; rebuilding further from the shoreline; publically financed beach nourishment; and conversion of high risk properties to parks, wetlands and other low intensity uses.