Vanderbilt Climate Change Initiative (VCCI)
Summary of Capabilities – Disaster Response and Resilience

Overview

2017 was the costliest year on record for extreme weather disaster impacts in the United States, with more than $300 billion of damage. These figures are expected to increase because of climate change, population growth, and continued infrastructure development in exposed areas. VCCI’s advanced capabilities and cutting-edge research in disaster risk management positions us to assist both public and private organizations better understand potential impacts from extreme events and improve decision-making and resource allocation before, during, and after a disaster. Our work is varied and diverse. We pride ourselves on our ability to combine creative thinking with sophisticated analytical tools to develop sound approaches and outcomes that serve the needs of the organizations with whom we work.

Capabilities and example projects

- Develop and demonstrate a state-of-the-art method for using social media to improve disaster response capabilities. By extracting and authenticating relevant information from social media (using keywords, visualization software, and other crowdsourcing and geostatistical techniques), planners can assemble real time disaster information and transmit that information to appropriate responders to deploy response assets based on the local conditions and level of response need.
- In the wake of a major flood disaster and in partnership with a local water management authority, VCCI team members are evaluating the social, ecological, and economic impacts of a city’s implementation of a property “buy-back” program to purchase repeatedly flood-damaged homes.
- VCCI is assisting the City of Nashville (one of the Rockefeller Foundation’s selected “100-Resilient Cities”) develop and pilot innovative methods to increase disaster resilience. These include increasing understanding of how climate change may impact critical resources (defined through stakeholder interaction), the extent of potential impacts with respect to identified thresholds, and the ability to identify and evaluate possible mitigation and adaptation strategies needed for short, mid, and long-term planning decisions and resource allocation.
- Flood scenario impact assessment using HazUS-MH, GIS, and other tools. Through modeling and scenario analysis, we can provide a detailed assessment of the impacts of future flood scenarios that could occur in selected areas.
- Assist local stakeholders near critical ports understand how specific actions and behaviors can impact the resiliency of waterborne commerce during extreme weather scenarios in order to preserve the economic livelihood of the target area and larger network interdependencies. This project represents an innovative disaster resilience approach to facilitate policy and decision making to improve future disaster preparedness and protect critical assets.
- Develop approaches to disaster resilience that focus on the most vulnerable populations through more effective disaster response and mitigation actions, increased disaster awareness, and improved knowledge to inform land use decisions (e.g., use tax parcel data to selectively disaggregate census data to more accurately identify highly vulnerable populations).
- Assess and prioritize risk mitigation investment (e.g., assessing the risks and benefits of home buy-out programs; quantifying the relationship between social and physical variables and impacts to local economic prosperity, health, safety and livability).
- Develop a “library” of resilience indicators that support community goals (e.g., survival, wellness, and sustainable resilience).
- Evaluate and monitor community resilience using resilience “heat maps” and resilience “dashboards” developed using relevant local data and information.
- Developed “Risk Catcher,” an on-line tool to assist organizations with identifying, evaluating, and prioritizing enterprise risks with options for both qualitative and quantitative analysis.