

BUILDING COMMUNITY RESILIENCE TO COASTAL HAZARDS THROUGH TEACHING & RESEARCH



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Bertie County Emergency Operations Plan Assessment and Update

Dr. Anuradha Mukherji's Emergency Management Planning class partnered with the Mid-East Commission and Bertie County Emergency Management in Spring 2020 to work on updating Bertie County's Emergency Operations Plan (EOP). Five groups of students (4 undergraduate and 1 graduate group) worked on select sections of the EOP that were decided beforehand in consultation with Bertie County. The Bertie County EOP had not been updated since 2004, and the Emergency Management department needed help to assess and revise this critical document that would assist the county with preparedness, response, and recovery during disaster events.



Source: Photographs by students. Taken during site visits to emergency shelters and other essential locations in Bertie County. Used with permission.

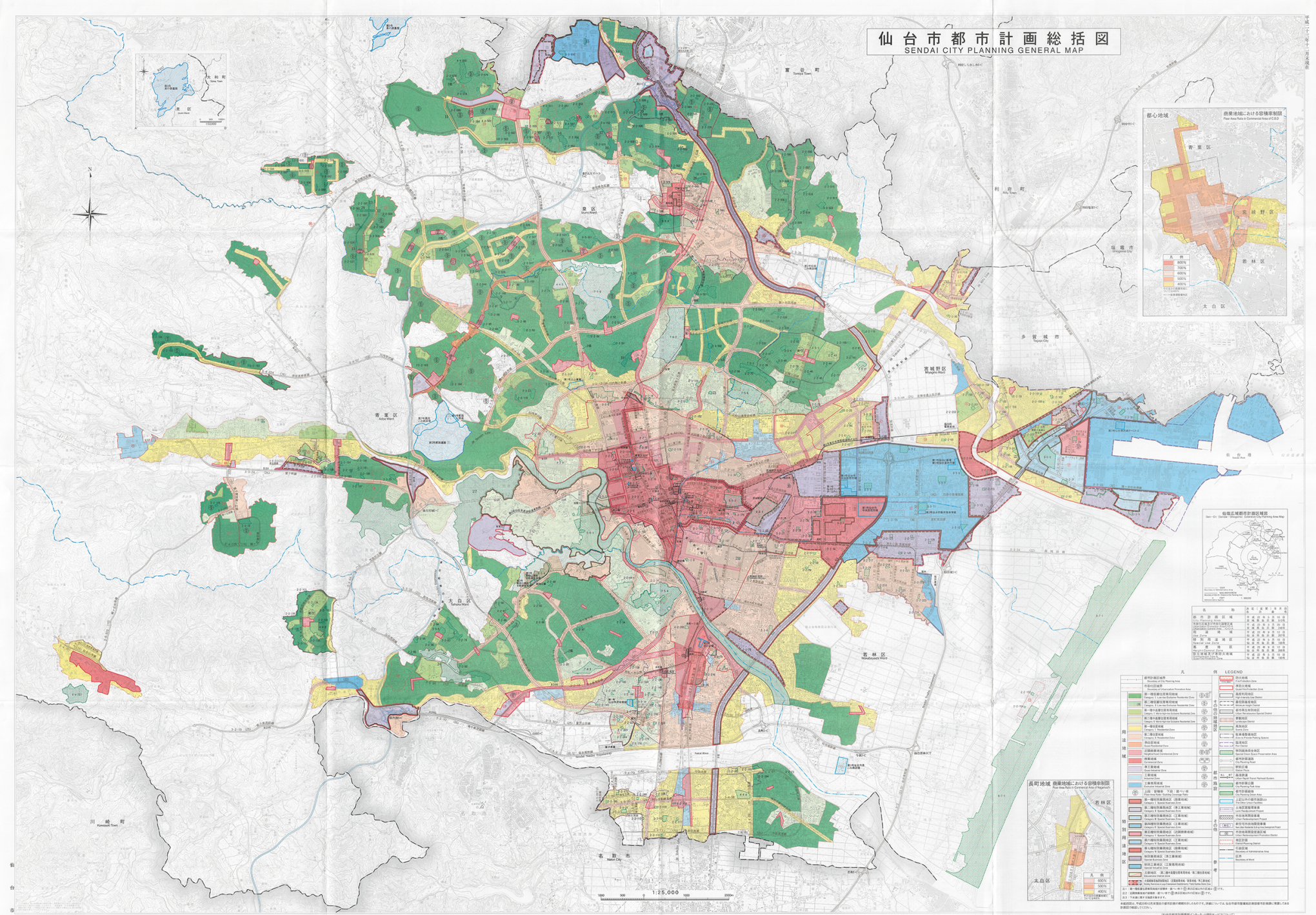
Method

- The student groups worked on five sections of the EOP: Sheltering and Mass Care, Communications, Notifications and Warnings, County Resources and Distribution Pod (CRDP), and Donations Management
- Each group conducted site visits in Bertie County and spoke with relevant stakeholders, including emergency management, county sheriff, public works, county manager, and community organizations.

Outcome & Recognition

- The students' efforts and the revised EOP sections were well received by our community partners. Because Bertie County is representative of rural North Carolina, the students gained insights on emergency management planning practices in a rural setting. In doing so, the students also contributed valuable planning services to the eastern North Carolina region.
- The project received a highly competitive National Association of Development Organizations (NADO) Impact Award. Nationwide, 79 projects from 48 organizations in 19 states were selected for this award
- The graduate team project on 'Sheltering and Mass Care' was also recognized by a Marvin Collins Graduate Student Project honorable mention from the North Carolina Chapter of the American Planning Association.

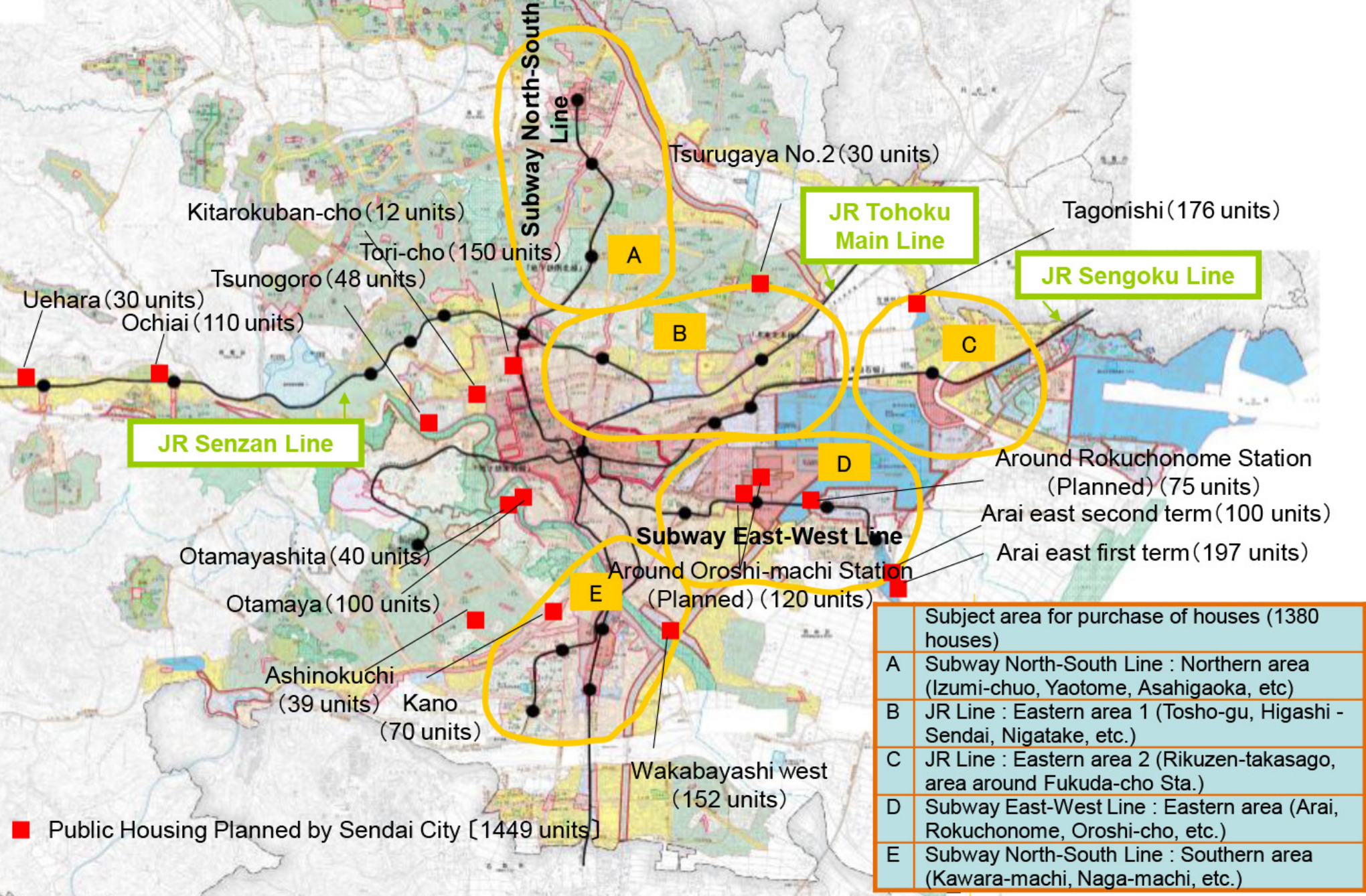
Shifts Beneath: Land Use Reorganization After 3.11 in Japan



City of Sendai 2010 land use plan (prior to 3.11). Source: City of Sendai, 2010.



Location of Sendai (left image) and tsunami inundation at the coast in Sendai (right image). Source: Left Image, City of Sendai, March 23, 2012a Right Image, Attributed to United States Navy (ID: 110312-N-0000X-003) @ 2011 (March 12) CC-PD



City of Sendai location of public housing units post 3.11. Source: City of Sendai (2013).

References

City of Sendai. 2013. Sendai City Current State of Reconstruction, Keynote Powerpoint by Emiko Okuyama, Mayor, City of Sendai. January 30, 2013. Sendai, Japan: City of Sendai

City of Sendai. 2012a. Moving Forward As One Sendai: The Year Following the 2011 Great East Japan Earthquake. March 23, 2012.

Catastrophic events such as wars and disasters can trigger reorganization in land use systems and modify long-term land use trajectories. Yet, the effects of fast drivers such as disasters on land use transitions are not well understood limiting our ability to anticipate future land use change.

This research looks at land-use change as a short- and long-term disaster risk reduction and climate change adaptation strategy in Sendai and Ishinomaki, cities in northeast Japan that were impacted by the March 2011 Great East Japan Earthquake and Tsunami (also called the 3.11 disaster). The research specifically examines:

- What drives land use change at the municipal level in coastal cities impacted by catastrophic events?
- How does land use policy inform local land use adaptation initiatives after disasters?
- How are decisions on types of local land use adaptation strategies and their implementation made?

Mixed-Methods (Quantitative & Qualitative)

- GIS:** Geographic information system (GIS) based parcel level land use data from before and after the 3.11 disaster, i.e., 2010 and 2017 respectively, was collected from municipal planning offices.
- Interviews:** More than 40 in-depth interviews with people at national, regional, and local governments, as well as with community leaders and academic faculty involved in policy making and planning.
- Documents:** Reconstruction plans, newspaper articles, policy and planning documents.

City of Sendai - Key Findings

- Households (1540) relocated out of coastal areas.
- Thirteen relocation sites (already marked for future development before 3.11) at the urban edge of city designated for housing built by individual households.
- Younger households with the financial resources to rebuild are the dominant group at the relocation sites.
- New public housing units were also built for low-income households.
- Public housing units are not integrated into residential neighborhoods. Most located in commercial areas along transport corridors, such as train lines.

City of Sendai - Conclusions

- Land use changes in Sendai driven by long-term land use development goals that are local in nature.
- Land use changes after 3.11 accelerated the pre-tsunami development trends towards a compact city.
- Land use changes have created inequities in recovery patterns. Elderly households are the dominant group to relocate from coastal areas to public housing units along commercial corridors that concentrate them in high-rise towers, and isolate them from other demographic groups.

Preparing for, Responding to, and Mitigating Compound Coastal Water Hazards in Resilient Rural Communities

Coastal estuarine environments are susceptible to a combination of multiple water hazards that are concurrent or sequential, often storm-related, and contribute to societal, economic, and health risks. These are defined as compound events.

This research is part of a larger study through the Center for Natural Hazards Research at ECU. A key goal of the study is:

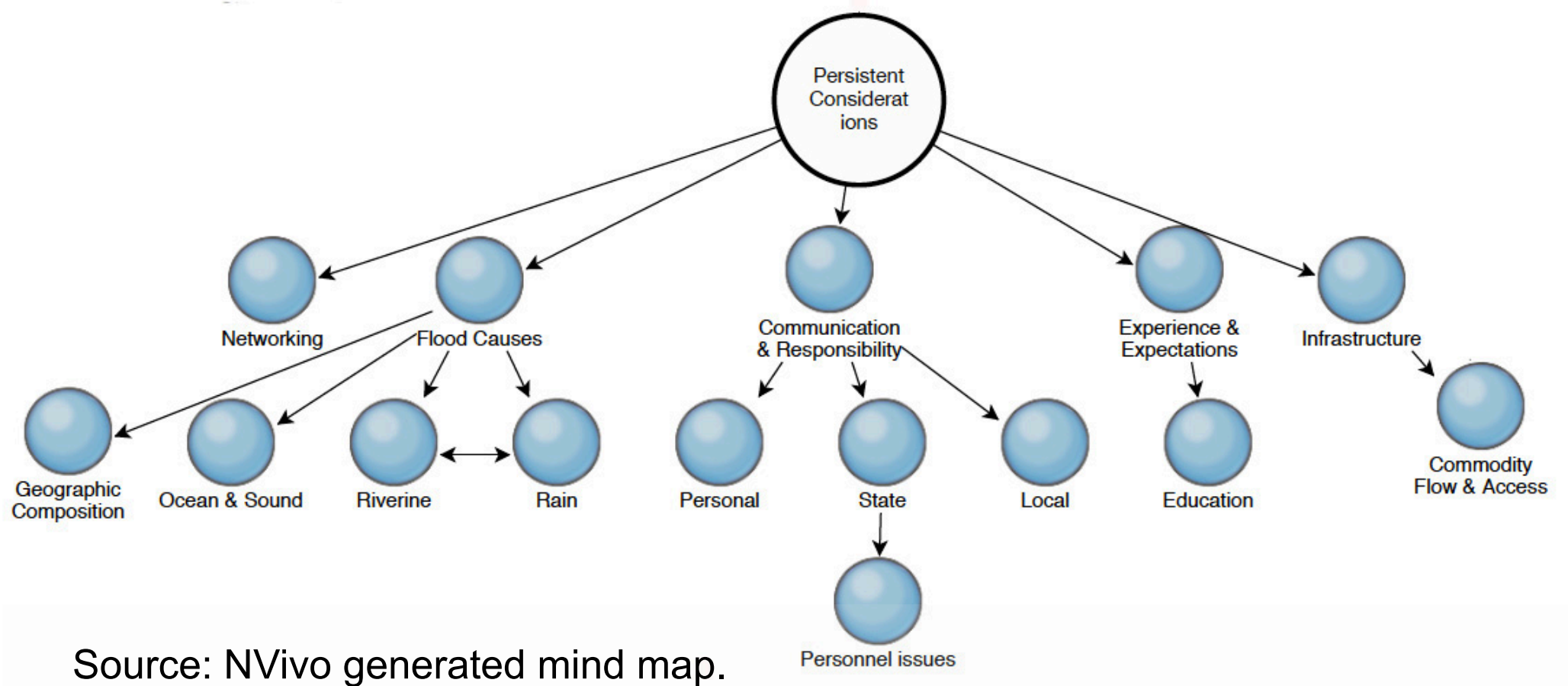
- To assess the perceived risks and needs of the hazard management and planning community in eastern North Carolina through two way communication.



Method - Focus Group Interviews

A Compound Flood Workshop, attended by 41 emergency managers, planners, and elected officials, was held on Feb 26, 2020 at ECU. Interview coding was done in NVivo.

Findings



Frequency & Severity: An increased frequency and severity of localized flooding, heavy rainfall, and rain storms outside of hurricanes.

Flood Causes:

- Intense localized thunderstorms combined with saturated soils
- Riverine flooding as water is pushed up the river combined with storm water issues
- A combination of rain and river driven.

Economic Impacts:

- Damage to physical infrastructure – power, roads, utilities, hospitals, and communications.
- Disruption to healthcare access, travel, commodity flow and access (medicine, food, clean water).
- Financial struggle and displacement for businesses and households.