# Helping Rural Counties to Enhance Flooding and Coastal Disaster Resilience and Adaptation

## Houghton & Baraga County, Michigan

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**Research Partners**
Michigan Technological University
University of Washington

**Civic Partners**
Western Upper Peninsula Planning & Development Region
Keweenaw Bay Indian Community
Natural Resources Department

## Project Challenge

As our climate continues to move to more extremes, an increase in intensity and the frequency of storms are seen. The project challenge is to develop tools that rural communities can use to enhance flooding and coastal disaster resilience and adaptation.

## Impact

The Stage 2 activities will develop methods to use remote sensing data resources and citizen engagement (crowdsourcing) to address current data gaps for improved flood hazard modeling and visualization that is transferable to rural communities. The team believes that improved hazard modeling and geospatial visualization tools will lead to effective hazard mitigation plans and enhanced community resilience and adaptation.

**$100 Million**
Worth of public infrastructure damaged during 2018 floods in Houghton County

**$10 Billion**
Worth of assets and thousands of people can be protected using flood hazard risk assessments through our GeoSpatial Tool

## Research + Practice Questions

- What available remote sensing datasets can be used to address data gaps to improve flood hazard modeling in rural communities?
- How can the coastal hazard issues due to lake level rise be incorporated into the flooding hazard models using HAZUS?
- What is the most appropriate geospatial visualization tool that rural communities can use to communicate hazard information to their citizens?
- How consistent is the mashup flooding hazard delineation (remote sensing + crowdsourcing) and identification of critical infrastructure facilities with FEMA floodplain delineation and HAZUS critical infrastructure database?
- What kind of incentives are likely to result in greater participation and accuracy of the information collected through crowdsourcing?
- What are the critical community resilience indicators that the community residents recommend (crowdsourced) for inclusion in community resilience assessments by the case study communities?

## Stage 1 Accomplishments

The focus of our planning grant was to complete three steps of the co-production approach: identify key actors and build partnerships, build common ground, and co-explore needs. An online survey was conducted to understand the community's needs. The survey indicated that 88% of the respondents resided within 0.25 miles of a possible flood source. At the same time, most respondents (68%) were unaware that their residence was located inside a floodplain. Over the next ten years, 83% of the respondents felt that a flood would likely cause property damage. These results unequivocally highlight the public need for devoting resources to the identification, assessment, and mitigation of flood hazards in this region.

## Stage 2 Priorities

In stage 2 the university partners will be working with the civic partners in the two counties to develop methods that use remote sensing data resources and citizen engagement (crowdsourcing) to address current data gaps for improved flood hazard modeling and visualization that is scalable and transferable to rural communities.

**>50**
Communities with reliable **flood hazard risk assessment** by end of the 12-month grant period

Updated flood risk assessments will result in effective **local hazard mitigation plans, master plans, and zoning ordinances**

State of the art **GeoSpatial tools** based on **data fusion** to ensure continued **realistic assessment of flood risk** in rural communities

**Co-development** of indicators & risk assessment will enhance ability to **anticipate, prepare, and recover**, creating **Resilient Communities**