

# Innovative Solutions for Disaster Resilient Communities



*“When agencies share data, lives are saved,  
and public offices become more efficient.”*

— David Vice, Former Executive Director of the Indiana Integrated  
Public Safety Commission



Effective and efficient disaster preparedness and response requires getting the right information to the right people at the right time, using a platform suited to the unique needs of each community, and drawing on integrative and collaborative efforts from many areas of expertise.

## **Who We Are**

The Polis Center is a research unit in the IU Luddy School of Informatics, Computing, and Engineering at IUPUI committed to linking university and local knowledge. We are community-oriented, innovative, and resourceful in our approach to problem-solving. We support research and analysis for better decision-making by combining data and information technologies with our expertise across a variety of sectors. To respond meaningfully to change, we analyze, produce actionable information, and develop knowledge platforms.

## What We Do

The Polis Center plays a critical role in solving complex community-centered problems, using spatial data, with a focus on supporting disaster mitigation and responsiveness to climate change and its repercussions. Our strengths are in:

- » Developing multi-hazard mitigation plans (MHMPs)
- » Developing FEMA Risk Mapping, Assessment and Planning (Risk MAP) compliant flood data, maps, and documents
- » Modeling the economic and social effects of natural disasters and planning activities to mitigate them
- » Collaborating with local experts to understand and apply results for place-based community solutions
- » Performing spatial analysis
- » Creating ArcGIS Online dashboards, story maps, and applications to effectively communicate with stakeholders

## How We Do it

While we have extensive expertise, we leverage partnerships that multiply the value of what we offer. Our resources include a community research infrastructure, a large community information system, staff, technical skills, extensive project and project management experience, and a long record of attracting external funding. Geospatial technologies, especially GIS, are our preferred tools because of their unique ability to integrate and visualize information by location.



## Our Approach to Meeting Resiliency Needs

- » *Emergency Preparedness & Mitigation.* Our multi-hazard mitigation planning is a partnership with local communities to enhance their ability to interpret and transform knowledge into effective disaster planning.
- » *Response & Recovery.* Having an up-to-date mitigation plan supports the ability of communities to rapidly respond and recover from disasters.
- » *Building Disaster Resilient Communities.* When communities rebuild, we work with partners to plan and implement more resilient infrastructure to stand the test of time and weather whatever storms lie ahead.

» *Training & Education.* We develop and support standardized as well as customized training and education in the geographic information systems tools and methods that support disaster risk assessment and mitigation planning. We have offered workshops, presentations, and courses in over 100 cities, dozens of states, and multiple countries.

The Polis Center partners with the Federal Emergency Management Agency (FEMA) and the Indiana Department of Homeland Security (IDHS) to determine best practices in helping communities create good plans, develop knowledge platforms and tools, and learn how to apply geographic information systems technology and concepts to map, manage, and analyze information that supports community resiliency, public health, and disaster management. We have produced hundreds of disaster mitigation products including natural hazard risk assessments, multi-hazard mitigation plans and statewide hazard mitigation knowledge portals in 15 states and one territory (Puerto Rico).



## Mitigation benefit by hazard



Overa



Riverine Flood



Hurricane Surge



Wind



Earthquake



Wildland-Urban Interface Fire

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### Hazard mitigation planning

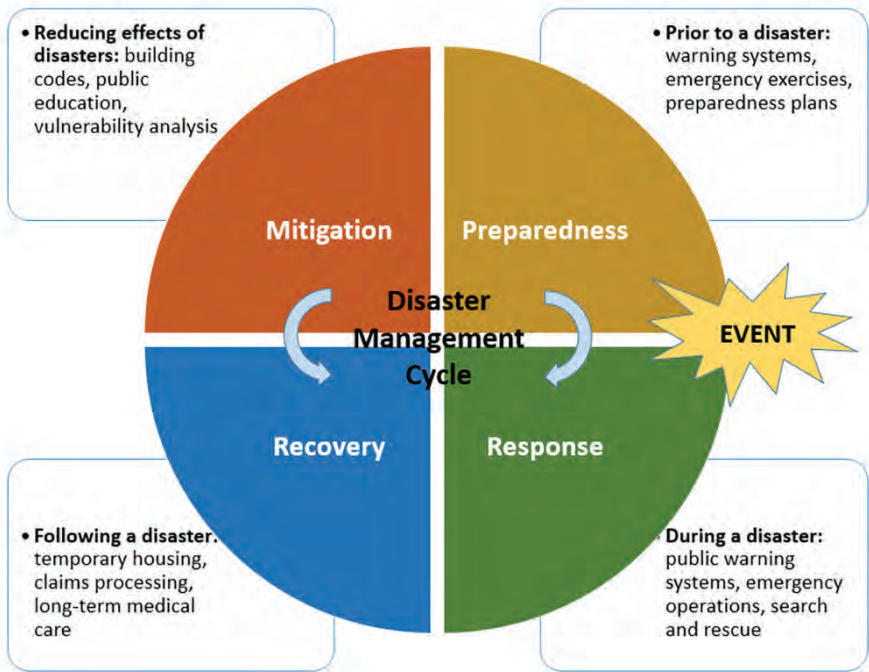
The Federal Disaster Mitigation Act of 2000 requires regions to develop and maintain a multi-hazard mitigation plan to remain eligible for certain federal disaster assistance and hazard mitigation funding programs. Having produced hundreds of multi-hazard mitigation plans, The Polis Center is experienced in helping states, counties,

## and mitigation measure

	ADOPT CODE	ABOVE CODE	BUILDING RETROFIT	LIFELINE RETROFIT	FEDERAL GRANTS
<b>All Benefit-Cost Ratio</b>	<b>11:1</b>	<b>4:1</b>	<b>4:1</b>	<b>4:1</b>	<b>6:1</b>
<b>Cost (\$ billion)</b>	<b>\$1/year</b>	<b>\$4/year</b>	<b>\$520</b>	<b>\$0.6</b>	<b>\$27</b>
<b>Benefit (\$ billion)</b>	<b>\$13/year</b>	<b>\$16/year</b>	<b>\$2200</b>	<b>\$2.5</b>	<b>\$160</b>
	<b>6:1</b>	<b>5:1</b>	<b>6:1</b>	<b>8:1</b>	<b>7:1</b>
	not applicable	<b>7:1</b>	not applicable	not applicable	not applicable
	<b>10:1</b>	<b>5:1</b>	<b>6:1</b>	<b>7:1</b>	<b>5:1</b>
	<b>12:1</b>	<b>4:1</b>	<b>13:1</b>	<b>3:1</b>	<b>3:1</b>
	not applicable	<b>4:1</b>	<b>2:1</b>	not applicable	<b>3:1</b>

Institute of Building Sciences

and communities meet federal requirements to receive disaster mitigation funds. Our multi-hazard mitigation plans incorporate geospatial analysis and modeling to address hazard-related issues in economic development, emergency management, and land use planning.



## Key Initiatives

- » *The Polis Center is a Cooperating Technical Partner (CTP) with FEMA, thereby allowing us to collaborate with it, regional, state, and tribal agencies, and others to maintain up-to-date flood hazard maps and other flood hazard information. Under this program, we work closely with the Indiana Department of Natural Resources (IDNR) to update Indiana's flood hazard maps and data.*
- » *Risk MAP. We have a decade-long partnership with (IDNR) to expand the geographic extent of the FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) program, which is aimed at assisting local communities with their mitigation efforts.*



- » *State of Indiana Hazard Mitigation Plan.* We work with the Indiana Department of Homeland Security (IDHS) to develop the State Hazard Mitigation Plan. The plan outlines the natural hazard risks faced by the state's citizens, infrastructure, and economy as well as opportunities for making communities resilient to those risks. The Indiana Geographic Information Council recognized The Polis Center and IDHS in 2019 for Special Achievement in GIS for creating "an outstanding information resource." We also work in partnership with many Indiana counties to prepare local mitigation plans. Polis is also performing the 2024 State Hazard Mitigation update.
  
- » *The National Institute of Building Sciences.* Polis played a significant role in developing the *2017 Natural Hazard Mitigation Saves* study by serving as lead investigators on the riverine flood hazard. The report involved over 90 subject matter experts, stakeholders, and reviewers. It identified an overall average 6:1 cost effectiveness of federal mitigation grant programs as well as an average overall 4:1 benefit for exceeding building code requirements.
  
- » *State of Georgia.* We have done much data development, collaboration, and research work with Georgia. For example, in collaboration with the Space Science and Engineering Center at the University of Wisconsin, we developed a detailed inventory of buildings and conducted sophisticated modeling of current and future climate conditions for selected Georgia coastal communities. These were leveraged to analyze 118 different scenarios to assess the risk from coastal and

riverine flood hazards as well as hurricane winds. The study also assessed the benefits that green infrastructure might have on reducing those impacts.

- » *The Association of State Floodplain Managers (ASFPM)*. We worked with the University of Wisconsin Space Science and Engineering Center to develop a Flood Recovery Index identifying at-risk populations that have a higher likelihood for longer recovery times after a flood disaster. The study was one component of a project conducted by the ASFPM to develop a capital improvement planning strategy within Toledo, OH.



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