

Collecting and Synthesizing Existing Data about Hurricane Michael

Highlights

Hurricane Michael devastated Florida Panhandle communities.

Several data sources were available to measure the extensive damage to physical infrastructure, including homes and businesses, as well as to some ecosystems, including beaches, dunes, and forests.

Data on impacts to marshes and sheltered shorelines were lacking. Marshes, other nature-based features, and residential shorelines were important gaps in post-storm assessment data.

OVERVIEW

Hurricanes are one of the costliest and most devastating hazards that impact the United States on a yearly basis. Because of this, many different agencies and organizations are focused on documenting and understanding impacts caused by storms. These efforts include rapid damage assessments of natural and built environments, as well as coastal communities and economies. In the early aftermath of Hurricane Michael in October 2018, we researched and gathered available data and reports to understand the broader landscape of impacts and ongoing assessments. This type of synthesis is important not only for minimizing redundancy and optimizing synergies with other studies, but for promoting a deeper understanding of human–environment interactions. Such syntheses ultimately provide a knowledge base that can be used to advise decision-makers tasked with implementing storm recovery and restoration actions.

RESEARCH OBJECTIVES

1. Identify, review, and synthesize the post-storm assessments, data, and models for understanding impacts on nature and people.
2. Identify potential gaps and synergies in ongoing reconnaissance efforts.

METHODS

We researched, acquired, and synthesized available data sets and reports from federal and state agencies, academic institutions, disaster-related organizations (e.g., FEMA, StEER networks), local newspapers, and other entities focused on assessing or describing the damage caused by Hurricane Michael (Table 1). We repeated our searches monthly for the first six months following the storm to identify new information released. All spatially explicit data were mapped using ArcGIS.

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FINDINGS

Hurricane Michael was responsible for about \$25 billion damages in the United States and 16 direct deaths. Environmental and structural damage were greatest in Bay County, toward Mexico Beach near the point of landfall (Figure 1). Inland counties within the path had high structural damage, reported by FEMA, and high damage to acres of forestry, reported by the Florida Forest Service (Figure 1). Along the coast, inundation and shoreline change were greatest along Mexico Beach, Island Pass, St Joseph’s Peninsula, Cape San Blas, and St. George Island. These areas were reported to have the most critical post-storm erosion conditions by Florida’s Department of Environmental Protection. However, structural and insurance damages showed higher percentages of damages within Bay and Gulf Counties. Impacts on marshes and other nature-based features, sheltered coasts, and private residential shorelines were notable gaps in post-storm assessment data. Therefore, these topics were a focus of our subsequent studies and high-resolution damage assessments.

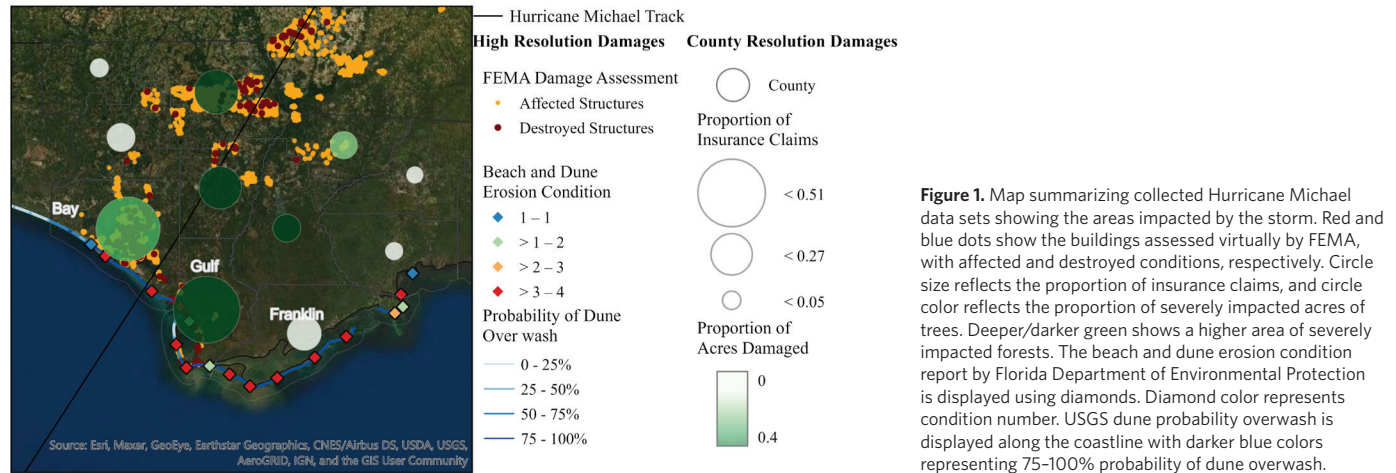


Table 1. Summary of various data sources associated with Hurricane Michael impact assessments in the Florida Panhandle.

CATEGORY	OUTCOME	ORGANIZATION*	SHORT TITLE / DATA COLLECTED	SCALE/RESOLUTION
ENVIRONMENTAL	Beaches	Florida DEP	Post-Storm Beach Conditions and Coastal Impact Report	County
	Aerial Imagery	NASA	Multiple satellite imagery	Towns
	Aerial Imagery	ESRI	Before and after imagery of select locations	Neighborhood
	Beaches	USGS	Before and After: Coastal Change post-Hurricane Michael	Neighborhood
	Beaches	USGS	USGS Coastal Change Hazard Portal	Counties
	Land Change	NOAA	Aerial Imagery	Towns
SOCIOECONOMIC	Infrastructure	FEMA	Hurricane Michael Debris Detection	Streets
	Forest	Florida Forest Service	Value Estimate of Timber	County
	Structures	StEER	Early Access Reconnaissance Report	Buildings
	Structures	StEER	Preliminary Virtual Assessment Team Report	Buildings
	Infrastructure	FEMA	Historical Damage Assessment Database	Buildings
	Claims	FEMA	Application and approval tracking	County
Claims	Florida OIR	Application and approval of insurance claims	County	

* DEP = Department of Environmental Protection | NASA = National Aeronautics and Space Administration | ESRI = GIS company | USGS = U.S. Geological Survey | NOAA = National Oceanic and Atmospheric Administration
 FEMA = Federal Emergency Management Authority | StEER = Structural Extreme Event Reconnaissance Network | OIR = Office of Insurance Regulation