



Office of Infrastructure Protection Hurricane Analysis and Response

The National Infrastructure Simulation and Analysis Center (NISAC) is the Nation's premiere intradepartmental and interagency modeling, simulation, and analysis program focused on the protection of America's critical infrastructure and key resources (CI/KR).

The 2007 Homeland Security Appropriations Act directed that NISAC serve as a "source of national expertise to address critical infrastructure protection."

In support of this mission, NISAC prepares & shares analyses of CI/KR including examination of interdependencies, vulnerabilities, consequences, and other complexities under the **Office of Infrastructure Protection, Infrastructure Analysis and Strategy Division.**

NISAC integrates a broad range of research expertise from Los Alamos and Sandia National Laboratories in engineering, sciences, economics, computer technologies, spatial analysis, and other specialties. NISAC develops modeling and simulation capabilities that involve the 17 CI/KR sectors described in the National Infrastructure Protection Plan (NIPP) and NISAC collaborates with many public and private sector NIPP partners.

2007 Hurricane Analysis Plan

NISAC uses a 5-phase approach to model & analyze hurricane damage to CI/KR:

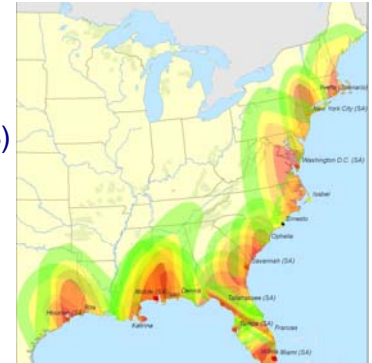
- 1) Off-season preparation
- 2) Immediate pre-season preparation
- 3) Imminent pre-storm activities
- 4) Post-hurricane landfall analysis
- 5) Post-hurricane season lessons learned

1) Off-season preparation

Includes refining models, updating databases of CI/KR assets, and re-examining the library of in-depth studies.

NIPP partners may find the hurricane studies below through the DHS Homeland Security Information Network (HSIN):

- New York (Cat 3)
- Miami (Cat 5)
- Mobile (Cat 5)
- New England (Cat 3)
- Savannah (Cat 4)
- Mid-Atlantic (Cat 4)
- Tampa Bay (Cat 4)
- Houston (Cat 4)
- Tallahassee (Cat 4)



2) Immediate pre-season preparation

NISAC participates in exercises and refines both models & information sharing procedures.

Hurricane Yvette Scenario Highlight Report
April 9, 2007

Storm Characteristics

- Category 3 hurricane scenario for an exercise support
- Maximum sustained winds of 125 mph
- Estimated storm surge of 12 feet
- Landfall in Rhode Island
- Major cities most impacted: Providence, RI & Boston, MA

	11+ feet	Population
Population within Potential Surge Zones (depth of water estimated in residential areas)	5-10 feet	114,000
	6-8 feet	100,000
	4-6 feet	140,000
Population Impacted by Potential Power Outages (encompasses power outages expected in CT, RI and MA; includes outages expected in the rest of New England)	Affected	> 5,000,000
	1st 24 hrs	30% restored
	15-20 days	fully restored

	Estimated Economic Impacts
Direct costs for business interruptions	\$0.12 billion
Property damage	\$0.1 billion
	> \$1 billion

Facilities of Interest

- Plum Island Animal Disease Research Center; Long Island, NY
 - o DHS operated Biosafety Level 3 facility
 - o Potential catastrophic consequence of accidental release (GAO estimate)
- Logan I-17 (Boston, MA)
- TF Green I-17; Providence, RI
- Bradley Int'l; Hartford, CT
- East Branch Dam; Worcester, MA
- Wausville Dam; Worcester, MA
- West Thompson Dam; Windham, CT
- Bridgeport West Inc.; Bridgeport, CT
- Bay Park Sewage Plant; East Rockaway, NY
- New Bedford Facility; New Bedford, MA
- Stamford Plant; Stamford, CT

L-48 Hour 2-Page Summary Report

3) Imminent pre-storm activities

NISAC monitors, forecasts, and creates analyses for storms predicted to make landfall with more than Category 2 strength. NISAC reports findings to the National Operations Center, National Infrastructure Coordinating Center (NICC), Federal Emergency Management Agency National Incident Management System Integration Center, and Joint Field Offices upon activation of the National Response Plan.





Office of Infrastructure Protection Hurricane Analysis & Response Continued

As a hurricane moves toward shore, the **NISAC Damage Forecast Team** begins damage impact analyses. 2 days before landfall, the **NISAC Damage Analysis Team** begins creating longer-term projections of storm effects—perhaps 1 week, 1 month, 6 months, and/or 1 year after landfall. These provide both public and private sector decision makers with important estimates and model-derived predictions to assist in immediate recovery and longer-term enhanced infrastructure planning efforts.

4) Post-hurricane landfall analysis

After hurricane landfall, the **NISAC Damage Forecast Team** moves to the next hurricane or folds into the **NISAC Damage Analysis Team**. This team transitions to using actual damage information to refine post-hurricane assessments and create tailored infrastructure recovery projections.

5) Post-hurricane season lessons

Following a hurricane season, the analysis teams conduct in-depth analyses of hurricanes/significant storms to:

- Implement lessons learned
- Improve infrastructure data & models
- Improve economic impact analyses
- Identify requirements for new tools
- Improve communications, decision support, and analysis tools

For access to NISAC Hurricane Analysis Products, please contact:

NICC Tactical Portal
nicc@dhs.gov 202-282-9201

NISAC Timeline for Hurricane Support (L=Landfall)

L-7 to L-4 Days (Pre-landfall)

Storm Monitoring

Category 2 or above:

Activate NISAC Damage Forecast Team

L-4 to L-3 Days

Category 3 or above:

L-96 Hour Preliminary Forecast Report

L-72 Hour Preliminary Forecast Report

L-2 Days

L-48 Hour Pre-landfall Hurricane Analysis Report

2-Page Summary Report

Activate NISAC Damage Analysis Team

L-2 to L-1 Days

Updates to 48-Hour Pre-landfall Analysis Report

Post-landfall

Monitor/analyze damage effects on critical infrastructure and key resources

Hurricane Analysis Library

2003: Isabel

2004: Frances

Ivan

2005: Dennis

Emily

Katrina

Rita

Ophelia

Wilma

2006: NYC Scenario

Mid-Atlantic Scenario

Miami Scenario

Tampa Scenario

Mobile Scenario

Houston Scenario

Ernesto

2007: New England Scenario

Savannah Scenario

Tallahassee Scenario

Actual Hurricane

Preplanned Study
available through
HSIN

