

SHORE PROTECTION ASSESSMENT



When a hurricane strikes, how do shore protection projects perform?

After an unusual hurricane season in 2004 – when four hurricanes made landfall in the southeastern United States in just six weeks – the U.S. Army Corps of Engineers was presented with a unique opportunity to assess shore protection project performance.

The Corps of Engineers and others will use these findings to improve future projects by better predicting how storms move sediment, change shores, and cause damage.

Shore Protection Assessment is an initiative to evaluate how federal shore protection projects performed in the wake of hurricanes Charley, Frances, Ivan, and Jeanne in 2004.

Shore Protection Assessment will answer three questions:

1. How did existing projects perform?
2. How can future projects be improved?
3. Can we better predict how hurricanes change shores?

SIGNIFICANCE

There have been few opportunities to determine how shore protection projects respond to a series of hurricanes affecting the same geographic region within a short time. Shore Protection Assessment is a unique opportunity for a **comprehensive and coordinated technical evaluation**. Lessons learned will be applied in developing future projects. Shore Protection Assessment will ensure **stewardship of federal tax dollars** by improving the way shore protection projects are planned, designed, constructed, and maintained.

A **multidisciplinary team** of experts from the Corps and other federal agencies, state governments, local partners, and contractors are collaborating on this initiative. The Corps is working closely with representatives of the Coastal Engineering Research Board, National Shoreline Management Study, Planning Center of Expertise for Hurricane and Storm Damage Prevention, and other partners on this program.



2004:

Four hurricanes make landfall in the southeastern United States

Hurricane **Charley**, a Category 4 storm, struck the southwest Florida coast on Aug. 13, 2004.

Hurricane **Frances**, a Category 2 storm, hit the central east coast of Florida on Sept. 5, 2004.

On the heels of Frances came Hurricane **Ivan** on Sept. 16, 2004, a Category 3 storm near Gulf Shores, Alabama.

By the time Hurricane **Jeanne**, a Category 3 storm, made landfall on the central east coast of Florida on Sept. 25, 2004, it marked the first time since 1886 that a state had been affected by four hurricanes in one tropical storm season.

All four hurricanes caused wind, wave, flooding, and erosion damage, affecting federal shore protection projects in the region. Shore Protection Assessment will evaluate data collected from the 2004 storms.

SHORE PROTECTION ASSESSMENT: THREE FOCUS AREAS

I. Performance Assessment

How did existing projects perform?

The Corps and its partners are studying the affected shore protection projects and conducting an objective **performance assessment** to:

- Quantify the **damages prevented** to structures and infrastructure; and
- Identify and link the **economic, environmental, and social effects** and **benefits** of these projects.

The Corps and its partners will evaluate the effects on the national and regional **economies, the ecosystem, the community, and individuals.**

Because hurricanes cause flooding, influence water quality, and move sediment – and since inland changes may have **immediate** and **long-term effects** on the coastal system – the team also will study the overall **watershed.**

2. Planning and Design Improvements

How can future projects be improved?

The Corps and its partners will recommend ways to plan, design, construct, monitor, and maintain future shore protection projects so that each project provides **maximum protection throughout its life cycle.** The Corps is

collaborating with partners involved in **related national efforts** such as the:

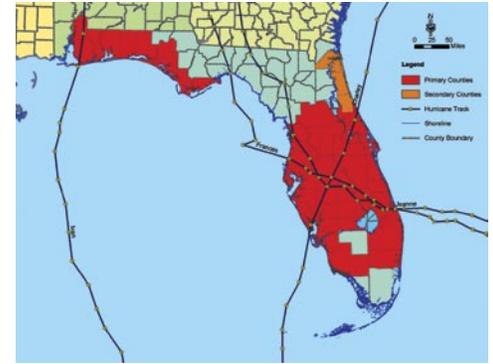
- Coastal Storm Damage Reduction Economic Model development;
- National Shoreline Management Study; and
- Regional Sediment Management Demonstration Program.

3. MORPHOS 3-D Development

Can we better predict how hurricanes change shores?

A team has begun initial development of a **physics-based, hydrodynamic-sediment transport model** called MORPHOS 3-D. The protocol will be developed by modeling how the 2004 hurricanes changed selected locations on the Florida coastline. Ultimately, this model will simulate and more accurately predict how hurricanes change shores by moving sediment. MORPHOS 3-D will allow the Corps to better predict outcomes and assess damage from storms.

As a **community model**, MORPHOS 3-D will be accessible to anyone planning and designing coastal storm damage reduction projects or related applications. The Corps is coordinating with the Office of Naval Research, U.S. Geological Survey, Federal Emergency Management Agency, and the National Oceanic and Atmospheric Administration on MORPHOS 3-D development.



Many counties in Florida were affected by hurricanes Charley, Frances, Ivan, and Jeanne in 2004.



Findings from Shore Protection Assessment will help the Corps and others better predict how hurricanes move sediment, change shores, and cause damage.

ADDITIONAL PROGRAM COMPONENTS

Shore Protection Assessment will accomplish:

- **Data collection and management** for developing an integrated network of coastal data, information, and analysis tools for the Corps and the nation's coastal management and engineering communities.
- **Communications and outreach** for:
 - Involving and informing a wide range of stakeholders;
 - Collaborating with other federal agencies and integrating their work;
 - Improving the public's understanding of shore protection projects and how they work; and
 - Interpreting and sharing the findings and conclusions of this program.

AUTHORITY

This work was **authorized by Congress** as part of the Military Construction Appropriations and Emergency Hurricane Supplemental Appropriations Act, 2005 (Public Law 108-324). This act, which provided \$11 million for Shore Protection Assessment, also authorized repairing and restoring hurricane shore protection projects to pre-storm conditions.

OUTCOMES

Shore Protection Assessment supports related efforts by the Corps in coastal management, including shore protection. Shore Protection Assessment is **not evaluating policy.** However, outcomes from this program may affect future policy related to shore protection. Work will be completed in 2007.



FOR MORE INFORMATION

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