

Protecting Nature Protects People

A natural line of defense—barrier islands, wetlands, forests and floodplains—protects our families, communities and property from hurricanes, high winds and water. But the development and destruction of this significant and potentially sustainable natural buffer system has left us vulnerable to storm surges, wind wave action and flooding. Protecting, restoring and strengthening this natural defense system—designed to sap and divert storm energy and absorb floodwaters and lower flood heights—will reduce risk, cut losses and save lives.

Barrier Islands

- Found in the United States primarily in the Gulf of Mexico and off the Atlantic coast, barrier islands act as “speed bumps,” slowing hurricanes and reducing their wave energy, surge field and impact. The barrier islands also protect wetlands. They absorb incoming wave energy and protect interior wetlands from erosion. (EPA)
- Many ocean shores are currently eroding 1 to 4 feet per year. (EPA)



Coastal forests, like the cypress swamps of Louisiana above, can blunt the effects of hurricanes. According to a Southeastern Louisiana University study, a cypress swamp the width of a football field can sap 90 percent of the storm surge out of a hurricane.

PHOTO BY JEFFERY DUBINSKY

Wetlands

- Wetlands act as sponges to soak up excess water. Coastal marshes serve as storm surge protectors and help reduce storm damage when hurricanes or tropi-

cal storms come ashore. Inland wetlands function like natural tubs, storing flood waters that over-flood riverbanks and surface areas and protecting adjacent and downstream property. (EPA)

- A one-acre wetland can typically store about three-acre feet of water, or one million gallons. An acre-foot is one acre of land, about three-quarters the size of a football field, covered one foot deep in water. Three acre-feet describes the same area of land covered by three feet of water. (EPA)

- Over half of America’s original wetlands have been drained and converted to other uses. (EPA)

Nature has created a defense system designed to buffer and blunt the impacts of hurricanes and other storms—barriers islands, wetlands, forests, and floodplains—but to reduce risk, cut losses, and save lives, we need to make the right zoning, building and infrastructure decisions to protect and restore this defense system.

Forests

■ Forests and tree roots provide a protective cover of vegetation that anchors soils and slows and soaks up water runoff. Deforestation worsens the impacts of hurricanes and other storms, increasing the likelihood of mudslides and flooding. In 1998, Hurricane Mitch killed over 18,000 people in Central America, most of whom were killed in mudslides or swept away by floods. After the storm, aerial surveys revealed that the majority of landslides occurred on hillsides that had been cleared of vegetation. In forested areas, few landslides occurred. (FAO)

■ Studies show that coastal forests like mangroves and cypress stands shield the coastlines by reducing wave height and energy. Areas buffered by mangroves were less damaged by the 2004 tsunami than areas without tree vegetation. (Danielson, et al) On the Gulf Coast, research into the benefits of cypress stands in blunting the effects of hurricanes show that cypress swamps the width of a football field can sap 90 percent of the storm surge out of a hurricane. (Shaffer, Southeastern Louisiana University)

■ More than half of the world's mangrove forests have been destroyed. (FAO)

Floodplains

■ A floodplain is an area next to a river, stream or creek that may be covered with water following a storm. The plain holds excess water allowing it to be slowly released into the river system and seep into groundwater aquifers.

■ The natural plants and prairie grasses which grow in flood plains have long root systems that can reach up to 20 feet below the surface and help soak up excess water that enters the soil. (Ladd, Purdue University)

■ A study by the Wetlands Initiative revealed that restoring the 100-year flood zone of the Upper Mississippi five-state watershed could store 39 million acre-feet of floodwater, the volume that caused the Great Flood of 1993, and save over \$16 billion in projected flood damage costs. (EPA)



Clearly, nature has created a defense system designed to buffer and blunt the impacts of hurricanes and other storms. The decisions we make about land use and development today directly affect our ability to protect our families, communities, and businesses. Zoning, building and infrastructure decisions made at local, municipal, county and state levels will determine our vulnerability to winds, storm surges and floods.

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