Hurricanes

Directions: Analyze the sources and determine how Hurricanes impact the natural environment.

Source 1

How Hurricanes Shape Wetlands in Southern Louisiana

We all know that hurricanes can have destructive effects on human communities and infrastructure—but what about their effects on coastal wetlands? Until Hurricane Katrina, no one had ever mapped hurricane-caused land loss in Louisiana, where a staggering 90 percent of coastal wetland loss in the United States' contiguous 48 states occurs. The first study to do so, published in 2009, found that the almost back-to-back hurricanes of 2005 (Katrina on Aug. 29 and Rita on Sep. 24) and 2008 (Gustav on Sep. 1 and Ike on Sep. 13) caused an estimated 328 square miles (850 square kilometers) of coastal land loss in Louisiana—an area the size of more than 150,000 football fields.

While land's edges on a map seem well-defined and permanent, coastlines are always shifting. Sometimes natural processes or people extend the coastlines. But more troublesome is land loss. As wetlands diminish, ecosystems and human society suffer from the loss of their many benefits. Wetlands are home to a variety of mammals, fish, shellfish and amphibians and a haven for migratory waterfowl. The many fish and shellfish caught in Louisiana fisheries—the second largest in the nation behind Alaska—rely on the state's coastal wetlands for food and habitat. They act as natural pollution filters, and provide storm and flood protection. Without the wetlands in south Louisiana, over two million people would lose their livelihoods and many more organisms would lose their homes.

While hurricanes aren't likely to entirely remove the wetlands, they are able to do significant damage. Their powerful winds, rainfall and rushing floodwater can do enough harm to permanently remove land. The pounding surf can break down marshes' soft sediments and thick mats of dead grass, which are pliable and easily reshaped. Sometimes channels of fast-moving water flow to inland areas, which never again dry up—contributing to permanent land loss. Rushing wind and water can compact or move mats of grass and mud, while carrying smaller clumps of dead marsh plants to interior marshes or shorelines. And when saltwater floods into freshwater marshes, the wetland plants and animals can undergo temporary or long-term changes as the water chemistry changes around them.

Source 2

Excerpt Hurricane Gustav Damage Assessment

Hurricane Gustav smashed into Louisiana three days after the third anniversary of Hurricane Katrina. The Category 2 storm made landfall on September 1st about 9:30 am, just over 70 miles southwest of New Orleans, in Terrebonne Parish. With peak winds of over 90 miles per hour, Gustav was the third major storm to hit the state in three years [Katrina and Rita both came in 2005].

The sediment sludge originated in the bayou and wetlands areas adjacent to La 1 and were swept up and carried onto the ground surfaces by the hurricane storm surge. Contaminants in the sediments of the water bodies have accumulated over the last century due to illegal dumping and now are coating surfaces and available for exposure of humans and animals to the toxic muck. Crabs observed in the oily sediment sludge area could become contaminated with the chemicals in the sediment sludge and bio accumulate the chemicals into their bodies. Residents in the area frequently consume crabs from this area and could become contaminated with the chemicals in the sediment sludge. One-eighth mile below the locks a pair of ducks coated with oil were observed at a bayou side structure used as a rental truck depot prior to Hurricane Gustav.

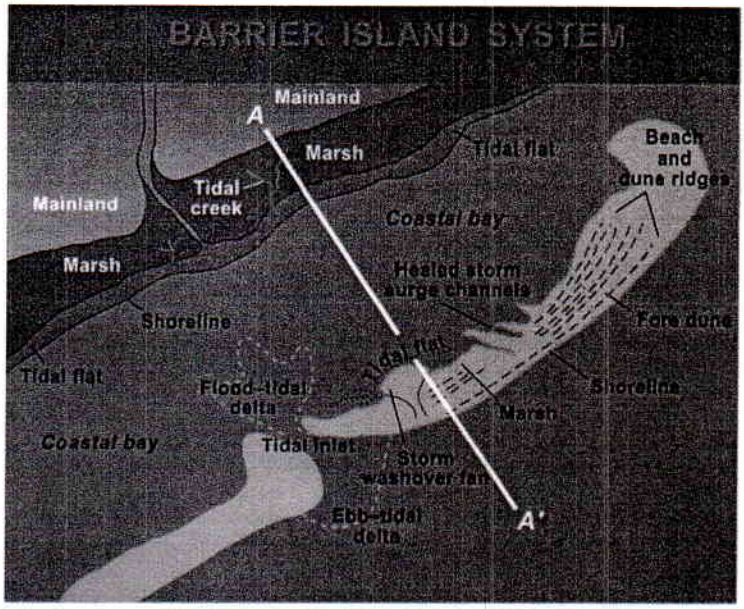
The marsh area on both sides of the highway were littered with debris and broken and mangled power plies and lines. Fishing boats were washed up on the shore of the bayou by Hurricane Gustav.

Hurricane Gustav storm surge at the port was 6 to 7 feet. Debris litters the landscape. Marsh grass coats fence lines and other structures... Large quantities of sand from the sand levee and beach systems were transported by the tidal surge onto LA 1 and the camp sites beyond the highway. La 1 on the island is not navigable. Wind damage to the homes and camps consisted of roof damage, siding damage and in some cases complete destruction of elevated structures... The damage and complete destruction of the levee system is a grave concern due to the potential for Hurricane Ike to impact the Grand Isle area.

Source 3

Louisiana Barrier Islands

The islands of the Louisiana coast were all created as a by-product of the Mississippi River Delta. Most are features associated with an older delta lobe that is no longer growing, and sea level rise is causing a "transgression" or an inland migration of the shoreline. Louisiana barrier islands tend to be low-lying and very vulnerable to inundation during storms. Currently, Grand Isle is the only barrier island on our coast on which there is a permanent settlement. Other settlements have been abandoned in very recent history as erosion has claimed more and more of the island area.



The Importance of Barrier Islands

Protection from Storms Barrier islands take the brunt of impact from an incoming storm, thereby protecting the habitats and structures behind them. This makes barrier islands important in times of hurricanes and tropical storms. For example, the Timbalier Islands and the Isles Dernieres chain offer protection for communities in Terrebonne and Lafourche parishes.

Wildlife Habitat

Barrier islands contain a variety of habitat zones, all of which are valuable to wildlife. They provide a nesting habitat for birds such as brown pelicans, skimmers, and several species of terns and gulls. They also offer the first landfall for migrant neo-tropical birds arriving on the North American mainland after crossing the Gulf of Mexico in the spring. Here the birds refuel before continuing their journeys north. Monarch butterflies feed on the flowering plants of the barrier islands before and after crossing the Gulf of Mexico in the fall and spring. The shallow protected bays and estuaries behind the barrier islands are one of the richest aquatic environments on the planet, providing food resources for humans such as oysters, crabs, shrimp and fish.

Question 1: Using the sources and your knowledge of social studies, describe **two** ways hurricanes impact the natural environment.

Question 2: Describe what nature has created in order to protect the mainland from the impact of hurricanes, and how they work?

Human Impact

Directions: Analyze the sources and determine the reasons for human intervention with the environment and describe how this has both positively and negatively impacted the environment.

Formative Assessment Task:

Using the sources and your knowledge of social studies describe the reasons for human intervention with the Louisiana environment and how this has had a positive and negative impact on it.