Section 5

People and the Environment

As you read, look for:

- **factors that have affected Louisiana's coastline,**
- **the ways in which people have affected the environment, and**
- **vocabulary terms wetlands, subsidence, barrier island, and time zones.**

Below: A sternwheeler tows a string of Navy seaplanes down the Mississippi River at Baton Rouge during the 1927 flood. The planes were brought in to transport food, supplies, and mail to people isolated by the flood.

Growing crops is just one way people change the environment to meet human needs. These modifications often have unplanned results. In the aftermath of the hurricanes of 2005, scientists analyzed these intended and unintended consequences. These include flood control and the loss of wetlands.

For centuries, humans have attempted to control the Mississippi River. The conflicting relationship between people and the river is shown by the words used to describe it. We call it everything from the "father of waters" and the "great artery of the continent" to the "unruly neighbor of the farmers" and the "raging killer of small towns."

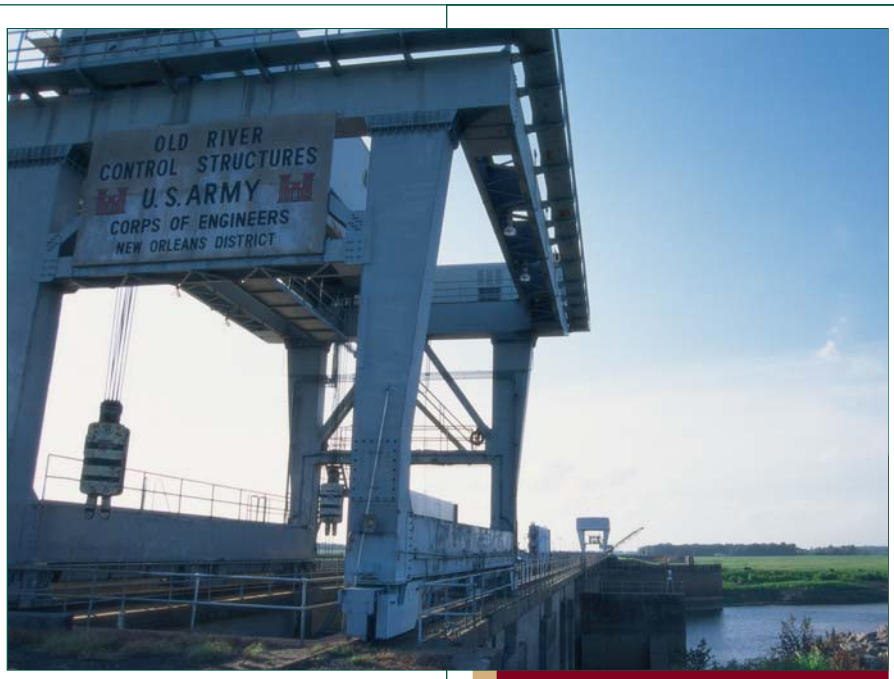
Flood Control

Flood control, a battle between man and nature, began when the French colonized Louisiana. As early as 1719, one advisor warned the French king that the naturally flooding river fed the soil, but he was ignored. The first levees were soon built to protect the people and their crops.

But it was the Great Flood of 1927 that led to the protective system that keeps the river within manmade banks until it reaches the Gulf of Mexico. That frightening flood drove a half million people from their homes along the river, from Illinois to Louisiana. The U.S. Army Corps of Engineers became responsible for stopping the flooding by controlling the huge funnel of the Mississippi River Basin. This system now includes locks, dams, reservoirs, canals, and levees.

An important part of the flood-control system is the Bonnet Carre Spillway, which was built in 1935 to protect the city of New Orleans. This concrete structure is nearly 8,000 feet long; an electric crane opens or closes its 350 bays. The spillway has been opened several times to save the city of New Orleans from flooding.

Another part of the flood-control system is the Old River Structure, completed in 1963. It was built to prevent the Mississippi River from changing course and heading to the Gulf of Mexico through the Atchafalaya River. During the flood of 1973, this massive steel-and-concrete structure was almost swept away. Had that happened, the Mississippi would have changed its course and the future of Louisiana. An additional structure has been added to help hold back the powerful river.



Above: **The Old River Control Structure was built by the U.S. Army Corps of Engineers to control flooding and prevent the Mississippi from changing course.**

All of these structures have had an unplanned impact. This plan to protect people and property throughout the Mississippi River Valley has meant disaster for Louisiana's wetlands. **Wetlands** are swamps, marsh, and other areas that have a natural supply of water and are covered or soaked with water at least part of the year.

Vanishing Coastline

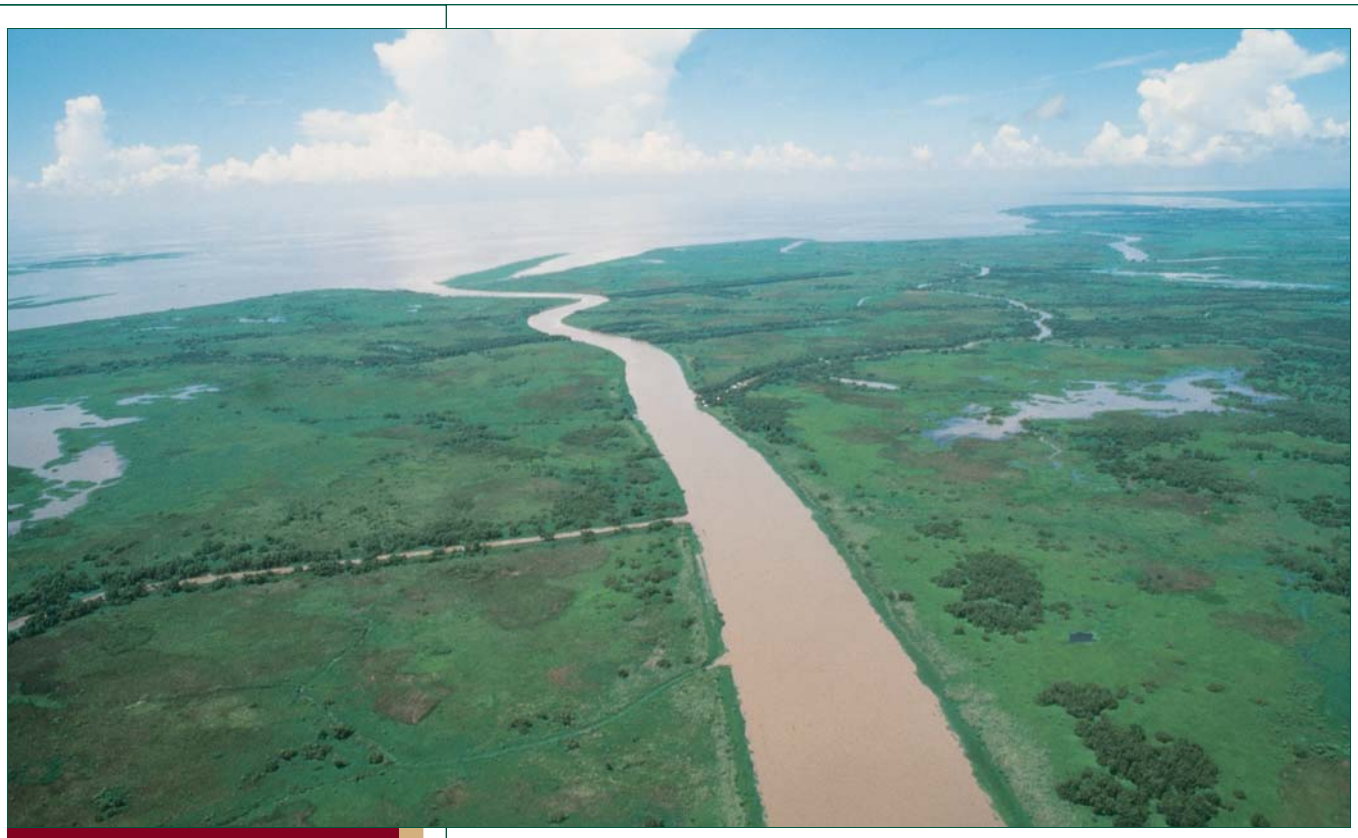
How would the rest of the United States react if the state of Delaware had disappeared? Louisiana struggles to bring national attention to a crisis just that shocking. Louisiana has 30 percent of the U.S. coastline but experiences 90 percent of the country's land loss. Louisiana has lost land equal to the size of the state of Delaware. Larry Handley, a scientist with the National Wetlands Research Center said that even though the rate of loss has been slowed, "The loss of an area the size of Delaware since 1950 is pretty sensational and points to a serious problem." Future loss could equal the size of Rhode Island.

In one coastal Louisiana town, children swim where their parents played baseball. This is not happening because the town built a swimming pool at the site of a baseball field but because what was once dry land is now covered by water. Trees, telephone poles, roads, and even cemeteries are now under water. Stories like these are told all along the coast of Louisiana and need to be heard throughout the nation.

The impact of Hurricanes Katrina and Rita reminded the nation of the value of the Gulf Coast wetlands. The shutdown of the offshore oil industry pushed gas prices up and pointed to the connection between Louisiana and America's

Lagniappe

A recent survey by the U.S. Geological Survey indicates that over the past twenty years, Louisiana has lost about 24 square miles of coastal land and wetlands a year.



Above: Louisiana's coastal marsh serves as the nursery grounds for much of the nation's seafood.

energy supply. But awareness alone is not enough. This expensive problem must be seen as a national issue.

Causes

The natural process for sustaining the marsh depends on rivers and water runoff to add freshwater and silt. The silt builds up the land in the marsh. Vegetation then grows from the soil and helps trap more silt, continuing the process. The freshwater also helps keep saltwater out of the marsh.

The silt is needed because the soil along the coast sinks slowly in a process called **subsidence**. Flood-control efforts have greatly reduced the amount of silt that reaches the marsh. Without regular deposits of silt, the land slowly sinks and is not rebuilt.

***Subsidence* has a long *i*.**

Geology provides another reason why Louisiana's coastline is sinking. Underground faults cause the land above them to shift and sink. Geologists say this natural sinking is about 3-5 feet each century, although the rate may be much faster in some places. One scientist suggests that the removal of groundwater and oil and gas from underground supplies may have speeded up this process.

A drought impacts the marsh. Without enough freshwater, marsh grasses die, creating a condition called *brown marsh*. The severe drought of 1999-2000 created brown marsh; as much as 10,000 acres will not recover. The hardest hit area lies between the Atchafalaya and Mississippi Rivers.

Wind also damages the marsh. Severe winter winds can cause major damage; a category 5 hurricane would result in a catastrophic loss of marsh. Hur-

ricanes Katrina and Rita destroyed more than one hundred square miles of wetlands in 2005.

Human activities also damage the marsh. The demand for oil has led to coastal erosion. More than 10,000 miles of canals have been cut to reach drilling sites. As these canals got wider and deeper, they allowed saltwater to enter the freshwater marsh. The freshwater vegetation died, leaving open water.

Brine is used during the oil well drilling process. When the early wells were drilled in the marshes, leftover brine was dumped directly into the surrounding marsh. It was years before people realized the damage the brine did to the freshwater marsh vegetation.

While technology has had a negative impact on the coast, it has also made it impossible to ignore the disappearing land. Satellites produce images of shocking changes and continue to document the disturbing land loss. Scientific research not only has identified the results of past decisions but also is searching for solutions.

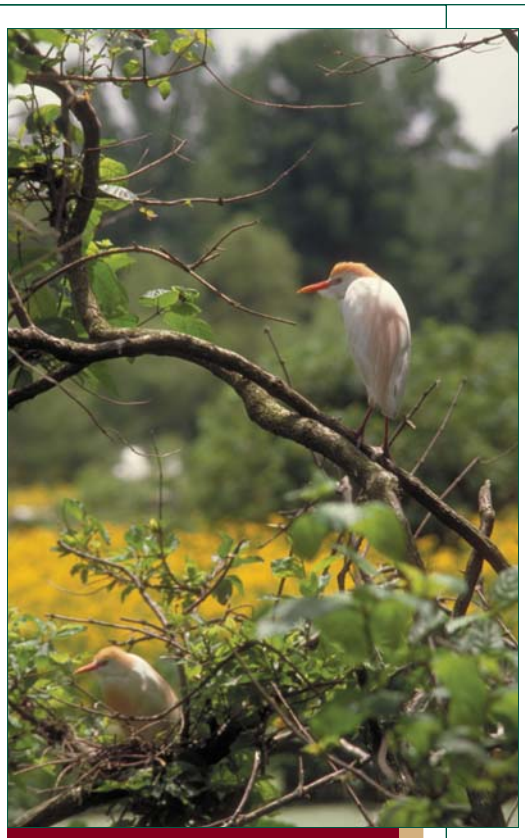
Above: **The Atchafalaya Basin is about 20 miles wide and 150 miles long. It is a popular area for canoeing.**

Impact of the Land Loss

Louisiana's ports are vital to the U.S. economy, handling 20 percent of all imports. Port Fourchon is the offloading site for supertankers filled with imported oil. Tanker trucks transport this valuable resource on the only road from the port. That highway is in danger of being covered with water because of coastal land loss.

Oil and gas taken from Louisiana waters in the Gulf of Mexico provide more than one-third of U.S. needs. Land loss around existing wells leads to oil spills. The system of pipelines that moves oil and gas to the rest of the country may also be damaged as the marsh changes.

Louisiana's coastal marshes are the nurseries for more than 75 percent of the Gulf of Mexico's fish. The state's seafood industry helps feed the United



Above: Cattle egrets are a common sight in Louisiana's coastal marsh, including the bird sanctuary on Avery Island.

Lagniappe

The migratory bird path passing through Louisiana is known as the Mississippi Flyway.

States. Commercial and recreational fishing brings more than a billion dollars a year to the U.S. economy. But the changing marsh is leaving fish without a place to spawn.

These coastal changes have also affected Louisiana's barrier islands. **Barrier islands** are islands off the coast that protect the wetlands, estuaries, and bays from the direct impact of ocean waves. The barrier islands, along with the marsh, provide protection from hurricanes. Every four miles of marsh reduces the storm surge by one foot, which can save lives and property. The hurricane season of 2005 showed just what this means. The hits from Hurricanes Katrina and Rita were even harder because of the earlier loss of barrier islands and coastal marsh.

Coastal erosion is a serious problem for Louisiana. Environmental activists were the first to warn of the danger, but the economic impact has awakened others to this threat.

Response

Some human damage to the marsh occurred because no one realized the harm being done. But today we know. However, Louisiana cannot afford to correct the problem without help. The crisis is an economic and environmental threat to the entire United States. Billions of dollars will be needed to stop coastal erosion.

In 1990, Senator John Breaux led Congress to pass legislation to save the wetlands. The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) provides federal funds for wetlands projects each year. The Breaux Act, as it is known, requires government agencies to work together to tackle this national problem.

One of these agencies, the Army Corps of Engineers, spent years trying to totally contain the river, but it now agrees that new approaches are required. Scientists have many proposals for this massive rescue effort. Manmade, controlled crevasses (breaks in the levee) could send river water into the delta to deposit vital silt. Dredging will help direct the river water. Terraces may be built to protect the marsh from erosion. Vegetation is being planted in the marsh and on the barrier islands.

The most expensive plan would create a new manmade river channel to direct part of the Mississippi River through the marsh. The carefully controlled flow of water and sediment would help rebuild the wetlands, imitating the natural process that built the marsh in the first place.

In the aftermath of Hurricanes Katrina and Rita, teams of scientists studied plans for flood control and wetlands protection. After these storms, the voices urging protection for Louisiana's coast became louder. Advocates for wetlands protection pointed to the lessons learned and urged action. The campaign describing the Gulf Coast as "America's Wetland" had new meaning for storm-damaged Louisiana.

Other Environmental Problems

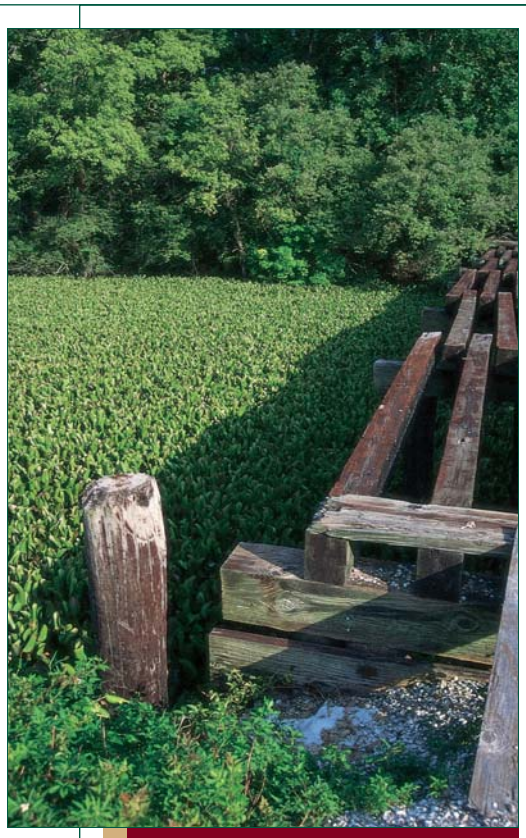
Along with the tremendous effort to save Louisiana's coast, environmental groups work to solve other conflicts between man and nature. Organizations such as the Nature Conservancy have worked to protect the Honey Island Swamp, 70,000 acres between the East and West Pearl Rivers. The swamp is one of the least-altered river swamps in the country.

Human mistakes and accidents have created environmental problems. One expensive and frustrating example is the water hyacinth. It was brought to the 1884 Cotton Exposition in New Orleans from South America because it was a beautiful, exotic plant. It quickly spread, depriving fish of needed oxygen and clogging the state's waterways.

Another import is the nutria, a rodent that lives near water. Nutria were brought to Louisiana from South America in the 1930s. People in St. Tammany and St. Bernard parishes planned to raise nutria for its fur. Some of them released nutria into the marsh when the money-making plan did not work out. Nutria were also brought to Avery Island and later released into the marsh. The intention was to improve the fur-trapping industry by adding this fur-bearing animal to the environment. Folklore says the Avery Island nutria escaped during a hurricane but recent research shows that is not correct.

These animals have now spread across the southern part of the state, creating many problems. The nutria eat the vegetation that protects the freshwater marsh. As much as 15 percent of the marsh in Barataria Bay is lost each year because of nutria. Even regular trapping has not brought the nutria under control. They have invaded urban areas like Jefferson Parish, where they eat the vegetation along drainage ditches, causing erosion.

State biologists have recently identified another example of an unintended negative impact to Louisiana's rivers. Several species of Asian carp have spread to Louisiana's waterways after escaping from fish farms in Mississippi and Arkansas. The fish were originally imported to keep the fish ponds clean by eating algae and snails. They may crowd out native fish.



Above: Some waterways, like this small bayou, have been completely clogged by the water hyacinth.

Check for Understanding

1. How did flood control change after the flood of 1927?
2. How does silt help the marsh?
3. What are two ways Louisiana's economy is helped by the marsh?
4. What is the Breaux Act?
5. What imported animal has created environmental problems?

Lagniappe

The Louisiana Department of Wildlife and Fisheries estimates that over 63,000 acres of coastal wetlands have been demolished, or *chomped,* by the nutria with their big orange teeth.

Meeting Expectations

Time Zones

Until the 1860s, most places in the United States—and the world—had their own local "sun" time. But with the coming of the railroads, it became necessary to have a standard time system rather than hundreds of local times. On November 18, 1883, the nation's railroads synchronized their watches and followed a worldwide "standard time" plan.

The world is divided into twenty-four **time zones**. The United States spans seven time zones. Moving from east to west, those zones are Atlantic Standard Time (Puerto Rico and the Virgin Islands), Eastern Standard Time, Central Standard Time, Mountain Standard Time, Pacific Standard Time, Alaskan Standard Time, and Hawaii-Aleutian Standard Time.

1. What is the time zone of Louisiana?
2. When it is 8:00 p.m. in Louisiana, what time is it in California?
3. Suppose some students from Shreveport fly to Washington, D.C. They leave at 7 a.m. and travel for 3 hours and 45 minutes. What time do they arrive in Washington?
4. A company manager in New Orleans telephones a business in London at 1 p.m. London time. What time was the call placed in Louisiana?

Map 12 World Time Zones