

# The Atchafalaya Basin--River of Trees

*The U.S. Geological Survey, in cooperation with the U.S. Army Corps of Engineers (USACE), is monitoring the basin to determine environmental effects of flood-management practices.*

The Atchafalaya Basin in south-central Louisiana includes the largest contiguous river swamp in the United States and the largest contiguous wetlands in the Mississippi River Valley. The basin includes 10 distinct aquatic and terrestrial habitats ranging from large rivers to backwater swamps. The basin is most noted for its cypress-tupelo gum swamp habitat and its Cajun heritage.



Water in the Atchafalaya Basin originates from one or more of the distributaries of the Atchafalaya River.

## Facts

- Located between the cities of Baton Rouge to the east and Lafayette to the west.
- More than 1.4 million acres:
  - 885,000 acres of forested wetlands in the Atchafalaya Basin Floodway.
  - 517,000 acres of marshland.
- Home to:
  - 9 Federal and State listed endangered/threatened wildlife species.
  - More than 170 bird species and important wintering grounds for birds of the Mississippi Flyway.
  - 6 endangered/threatened bird species and 29 rookeries.
  - More than 40 mammalian species.
  - More than 40 reptilian and 20 amphibian species.
  - More than 100 finfish and shellfish species.
- One of the last great wildernesses remaining in the conterminous United States (as identified by the USACE).
- Atchafalaya River discharge is among five highest in the Nation:
  - Average annual flow is 229,000 ft<sup>3</sup>/s (cubic feet per second) (1977-2001, USACE records).
  - Maximum project flood flow is 1.5 million ft<sup>3</sup>/s.



*The Atchafalaya Basin offers an opportunity to implement adaptive management practices because of the general support of private, local, State, and national organizations and governmental agencies for the State and Federal Master Plans.*

- Most active-growing delta (land accretion) in the conterminous United States.
- More than 1,000 pounds of finfish per acre in some water bodies in the lower part of the basin.
- 25 percent of Louisiana's commercial forest lands and 51 percent of the State's hardwood forest in the basin.
- Important oil and gas pipelines crossing the basin.
- More than 300 active oil and gas wells in the basin.
- Important port for oil and gas industries in the Gulf of Mexico.
- Substantial annual boat traffic at Morgan City.

## Economics

(C.F. Bryan, Louisiana State University, oral commun., 2001)

- \$123 million annually from recreational activities.
- More than 500,000 user-days of sport fishing activity each year.
- More than 164,000 user-days of hunting activity each year.
- \$5-6 million annually from commercial fish and crayfish.

## Culture

- Important in development of unique cultures of Acadian and Native Americans.
- Several hundred archeological sites, including several prehistoric sites.

## Flood Control

- Important component of the USACE Mississippi River and Tributaries Flood Control Project.
- As part of Project Flood, 1.5 million ft<sup>3</sup>/s of water would be routed down the Atchafalaya Basin Floodway.
- Design flood for the Atchafalaya Basin Floodway would fill the Superdome (stadium) in 1 minute and the City of New Orleans to a depth of 8 ft in less than 12 hours.

## Problems

- Ever-Changing Hydrology--Natural changes and human-induced modifications have resulted in the alteration of the ecology of this resource and will continue to do so.
- Sedimentation--Since 1932, there has been a net accretion of nearly 2.5 billion cubic meters of sediment in the basin floodway, converting much open water and cypress swamps to bottomland forest.



- Water-Quality Issues Related to Agricultural Chemicals Detected in the Mississippi River--Nitrates and atrazine also are the major contaminants in the Atchafalaya River. Backwater swamps may help reduce the nitrate concentrations.
- Hypoxic Conditions--In large areas of the swamps, annual hypoxic conditions are due to human-induced changes in hydrology, which inhibit the natural north-south flow of water.
- Invasive Exotic Plant Species--Massive growth of hydrilla and water hyacinth restricts access to many areas in the basin and exacerbates hypoxic conditions in the swamps.



- Mercury in Fish Tissue--Henderson Swamp, in the northwestern part of the basin, has had a fish-consumption advisory since 1996.
- Massive Fish Kills Following Major Hurricanes--Following Hurricane Andrew in 1992, a lack of dissolved oxygen killed an estimated 182 million fish.



- Land Use/Resource Issues--Diverse and sometimes conflicting activities within the basin occur among flood control, commercial fisheries, navigational, oil and gas, recreational, environmental, and cultural interests.
- Subsidence and Land Loss--Areas within the basin but outside the floodway lack sufficient sediment, resulting in subsidence and land-loss problems.
- Incomplete Master Plans--State and Federal Master Plans for management do not include the entire basin.

## Needs

- Implementation of State and Federal Master Plans for management--The U.S. Department of the Interior will play a key role in the design, implementation, and monitoring of these plans.
- Expanded Coverage of Master Plans--Include the entire basin and area influenced by the waters of the basin. Develop goals and strategies that are inclusive for the entire area. Consider its diverse user community.
- Better Understanding of the Relation Between Hydrology and Diverse Wetland Habitats--This information is critical in designing adaptive management techniques to improve the environmental

health of the basin. As the Master Plans are implemented, research the cause-and-effect relations between hydrologic modifications and habitat response. This research will enable improved adaptive management techniques in the basin.

- Better Understanding of Sediment Accretion Patterns--Evaluation of sediment accretion patterns throughout the basin and their effects on hydrology is needed.
- Better Understanding of the Aquatic and Terrestrial Communities and How They Respond to Changes in Hydrology--Although adaptive management techniques are being implemented to enhance or sustain these communities, expanded and improved information on the distribution of these organisms within the basin is needed.
- Better Understanding of the Mechanisms Involved in Mercury Uptake by Organisms Within the Basin--Some areas have problems and others do not. Data are not available for terrestrial and semi-aquatic species in the basin even though many of these species are important recreational food sources.
- Expanded and Improved Information on the Vegetation Distribution Within the Basin--Endangered/threatened species need to be identified. Also, the extent of invasive exotic plants such as Chinese tallow, hydrilla, and water hyacinth needs to be documented.



*Measuring sediment deposited in a backswamp area after flood season.*

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