
AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE
Albuquerque, New Mexico

November 7-10, 2011

Copyright © 2011 AWRA

**REGIONAL SEDIMENT BUDGET ANALYSIS AND MANAGEMENT
PLAN IN THE ATCHAFALAYA RIVER BASIN IN LOUISIANA**

Shan Zou, Hugh Roberts, Jeffrey Barry, Anu Acharya*, Robert Daoust

ABSTRACT: The Atchafalaya River presently carries approximately 30% of the Mississippi River's flow with the basin well defined by a system of levees. . The entire basin serves as a major floodway for Mississippi River floodwaters. It encompasses approximately 1,806 square miles and is predominantly wooded lowland and cypress-tupelo swamp with fresh water marshes in the lower distributary area. As the only portion of Louisiana's coastal region where land mass is being created, this resource needs to be carefully managed. Estimates suggest that as much as 88 million tons of sediment is delivered annually into Atchafalaya Bay. Consequently, it is critical to understand the conditions that transport this quantity of sediment and to manage sediments within the system in order to maintain open channels and preserve habitat, while simultaneously minimizing the cost of maintenance. Understanding the timing, quantity, and caliber of sediment load being delivered to, and exiting from, the Atchafalaya Basin. The transport and depositional patterns within the Basin is critical to developing an informed management plan. The basin constitutes the largest contiguous fresh water swamp in the United States, providing essential wildlife habitat. In order to understand the sediment loading, transport pattern and identify the deposition/erosion area in the system, an extensive literature review and data inventory is compiled. The historical patterns and trends of the Atchafalaya River Basin are collected to describe the natural and anthropogenic changes over the past 100 years. The 2-D hydrodynamic model of ADCIRC SL17 is used to simulate high and low flow conditions. In particular, the model output combined with sediment loading and sediment size characteristics will be useful for understanding the sediment transport dynamics within the Atchafalaya River and will provide the hydrodynamic features and fundamentals for the sediment budget and sediment management study for the Atchafalaya Basin. A comprehensive sediment management plan will be developed to mitigate issues based on the sediment budget analysis. The potential management technologies and best management practices will be evaluated in the future. The Atchafalaya River Basin Sediment Management Plan should be integrated with Louisiana Sediments Management Plan and coastal processes.