
Is Mississippi River Sediment Supply Adequate to Save the Delta Parishes of Southeast Louisiana?

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ABSTRACT

The issue of subsidence and land loss in the Louisiana Gulf Coast region has been the focus of many studies. A subset of these studies has included consideration of solutions to solve this problem. One, solution is to reverse some of the man-made changes to the Mississippi River and allow the river to return closer to its original hydraulic conditions. This can be achieved by breaching levees and/or allowing frequent flooding to add necessary sediment to reduce the effects of eustatic sea level rise and/or subsidence. However, is the sediment load in the Mississippi River adequate to meet this need?

A number scenarios of subsidence and eustatic sea level rise are considered in this study to see if the Mississippi River's sediment load is adequate to mitigate the impact of subsidence and or eustatic sea level rise in a ten parish region (Ascension, Assumption, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, and Terrebonne) that covers an approximately 5500 mi² (14,400 km²) portion of southeastern Louisiana. These scenarios include considering combinations of the rate of current eustatic sea level rise, predicted eustatic sea level rise, and median subsidence determined from two existing datasets. In the first dataset, subsidence used was determined from analysis of historical surveying results, and in the second dataset subsidence used was determined for larger time intervals during the Pleistocene from analysis of radiometric-stratigraphic data. Based on these scenarios adequacy of sediment load depends on management of the upstream portion of the river and rate of subsidence plus sea level rise considered.