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Suspended-sediment concentrations and loads in the Lower Mississippi and Atchafalaya Rivers decreased by half between 1980 and 2015

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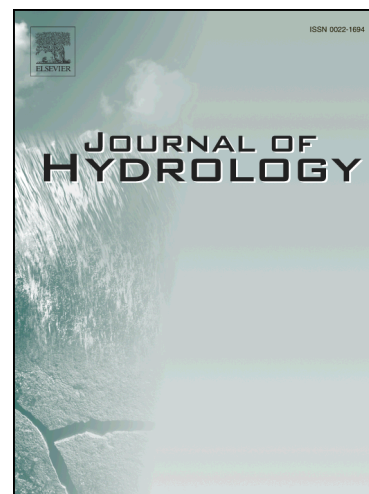
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Suspended-sediment concentrations and loads in the Lower Mississippi and Atchafalaya Rivers decreased by half between 1980 and 2015

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ABSTRACT

The Weighted Regressions on Time, Discharge, and Season (WRTDS) model was used to derive estimates of suspended-sediment concentration (SSC) and suspended-sediment load (SSL), their dependence on discharge, and their trends with confidence intervals, for one site each on the lowermost Mississippi and Atchafalaya Rivers. The WRTDS model reduces uncertainty in SSCs related to variable streamflow conditions. Flow-normalized SSCs in each river were similar, and decreased from about 260 mg/L to 130 mg/L from 1980 through 2015; combined annual SSL in the two rivers decreased from about 200 Megatons per year (MT/y) to about 100 MT/y. Declines in SSC and SSL were more gradual from 2005 through 2015 and show signs of stabilizing. Our estimates of SSL in 2015 differ markedly from several recently published estimates of current and projected future Mississippi River SSLs, which were generally around 200 MT/y. However, these values came mostly from a different site upstream on the Mississippi River. The relationship between SSC and streamflow differed in an important way between the two rivers. SSC increased as streamflow increased for the entire range of observed streamflow in the Atchafalaya River. In the Mississippi River, SSC followed the same pattern during low and moderate streamflow but decreased at the highest streamflow that tended to occur between January and July.

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