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Suspended sediment yield from continents into the World Ocean: Spatial and temporal changeability

Dedkov A., Gusarov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Attempts have been made to determine the suspended sediment yield from rivers of the various continents and islands into the World Ocean. Its differentiation into natural and anthropogenic components, and analysis of its contemporary trend variability were undertaken. The total global suspended sediment yield into the World Ocean equals 15.5 × 109 t year-1. The main suppliers are continental Asia and the islands of the west and southwest parts of the Pacific (their contribution to the total global suspended sediment yield into the World Ocean is 73.4%). The least sediment is supplied by Australia (1.1%). Recent human activity has increased suspended sediment yield into the World Ocean by 2.6 times. The largest anthropogenic increase of suspended sediment yield found is on the islands of the west and southwest parts of the Pacific (by 3.7 times) and in Europe (by 3.4 times); the least intensification characterizes South America (by 1.2 times). The analysis of long-term time series of suspended sediment yield shows that during the second half of the 20th century a rising trend of erosion intensity and suspended sediment yield prevailed in South and Central America, East Africa, West Europe, South and South-East Asia and Australia. A reduction of suspended sediment yield took place in East Europe, northwest and eastcentral parts of Asia and west part of North America. The main factor determining these global scale changes is diverse human activity.

Keywords

Anthropogenic factor, Changeability, Continent, Erosion, River basin, Suspended sediment yield, Trend, World Ocean