Post-Aswan Dam Sedimentation Rate of Lagoons of the Nile Delta, Egypt

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This study uses short sediment cores and high-resolution (1-cm sampling interval) radiometric analysis (^{210}Pb and ^{137}Cs) to trace sedimentation rates in Nile Delta lagoons, particularly since completion of the Aswan High Dam in 1964. A declining trend in ex^{210}Pb is clearly identified in about 10 cm of the upper-core sediments in the cores M-1 and E-1, accompanied by two spikes of ^{137}Cs in B-4. These findings, together with sediment records from other short cores (B-1, B-2 and B-3), illustrate post-dam sedimentation rates ranging from 0.7 mm a^{-1} to 2.7 mm a^{-1} in the lagoons. Our findings that contrast with those found previously with low-resolution sampling, are the first to report post-dam sedimentation rates and associated chronology. The lower sedimentation rates in the lagoons are a consequence of a dramatic reduction in riverine sediment load to the coastal area as a result of the damming. Although widespread erosion occurs along the open estuarine coast, the lagoon setting remains calmer than it was before the dam due to coastal diking and freshwater regulation in the delta plain in the past decades. This provides the possibility of continuously preserved radiometric records in the less-bioturbated lagoon sediments. Our findings would shed light on the environmental conservation and socioeconomic development in the Nile Delta region.

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