

Deep marine sedimentation off the “huge-dam free” Shimanto river mouth, SW Japan: comparison with other Japanese rivers

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It has been well known that dam construction on rivers can cause a decrease in sediment supply and serious coastal erosion (e.g., Stanley and Warne 1998), while influence of dams on the sedimentary environment beyond the coastal area has not been well known. Decrease in mass accumulation rate (MAR) during the middle 20th century based on excess Pb-210 activity were reported from the hemipelagic environment off Kumano (Shirai and Omura, 2016) and off Niigata (Shirai et al., 2017), central Japan, and these decreases in MAR were inferred to have been caused by entrapment of silt-clay grains in the huge dam reservoir.

MARs since middle 20th century of core samples obtained from off the Shimanto river mouth, SW Shikoku region, which does not have huge dam, were examined based on excess Pb-210 activity. The core samples were obtained with multiple corer (core length < 60 cm) during the R/V Hakuho-maru KH-15-2 cruise (Leg. 3).

Subsamples sliced with 1 cm thick were dried, crushed and measured by an ORTEC High Purity Ge gamma spectrometer housed in the Department of Geography, Tokyo Metropolitan University with a 48 hours counting. MAR was estimated from Pb-210 radioactivity concentration and mass depth of the core samples based on dry bulk density of other subsamples measured with the Accupyc 130 gas pycnometer housed in Atmosphere and Ocean Research Institute, the University of Tokyo.

In the off SW Shikoku region, MARs of investigated cores are almost constant during the upper half of the cores corresponding to mid to upper 20th century. Distinct contrast between the constant MAR off the huge-dam-free Shimanto River with decrease in MAR off the rivers blocked by huge dams (Shirai and Omura, 2016; Shirai et al., 2017) agrees well with the inference that deposition in dam-reservoir decrease in riverine sediment supply to deep marine hemipelagic environments. It is also necessary to be aware of the influence that dam construction and other human activities have not only on riverine to coastal environments but also on the unseen deep marine environment.

References

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