

Water and material budgets in the semi-enclosed sea of the coast of Omae Beach, Japan.

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A coastal sea takes the influence of the material load from the land area directly. Especially the northeastern part of Osaka Bay adjoins the urban area, Osaka, Kobe and so on, and eutrophication because there are many material loads and a few seawater exchanges due to the reclamation and the breakwater. Omae Beach is natural beach and located in the Shuku River mouth, Hyogo Prefecture Nishinomiya City Japan. The coastline is about 1.2 km and the length of the inter-tidal zone is about 150m. And it is surrounded by reclaimed land (the analyzed area is about 850 x 103 m). Groundwater in the seaside part of Nishinomiya City is abundant. Therefore, it is considered that the submarine fresh groundwater (SFG) is discharged from the sea bottom of the coastal zone of the Omae Beach. In this study, water and material budgets in the semi-enclosed sea of the coast of Omae Beach will be calculated based on the marine and river observation carried out in August 22 and 23, 2006. And SFG discharge will be estimated and be compared with the observation data.

The Shuku River flows into the northern side of the analyzed area which is connected with the Osaka Bay by the waterway on the southern side of the area. The eastern side of the area is connected with the adjacent area by the narrow waterway, and the western side of the area is closed. The water depth of the observed region is 2 to 8 m. The observation of the vertical distribution of water temperature, salinity, fluorescence, photon in the water, dissolved oxygen concentration and turbidity and the water sampling in the two layers, the sea surface and the bottom, were carried out on the two points in the analyzed area and on the three points in the waterway. The vertical distribution of the current speed and direction were observed on the boundary line of the southern and eastern part. These observations were enforced in the high and low tide and the average water level during the one and half tidal cycle. And current speed measurement and the water sampling in the Shuku River were done in the low tide.