

Water budget near the intertidal zone of Omae beach

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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. 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 budgets near the intertidal zone of Omae beach will be calculated based on the marine and river observation carried out in Oct. 10 and 11, 2007. CTD observation at 5 stations and ADCP observation on 2 lines (L1 and L2) were carried out in high tide, mean level and low tide during about 24 hours. The water level was measured at offshore of the intertidal zone during about 24 hours.. The water speeds of two rivers were measured in high and low tide. Water budget of the box which is surrounded by ADCP lines and Omae beach is represented by $dV_x = V_q + V_p - V_e + V_g + VL_1 + VL_2$. dV_x is the variation of the box's volume (m³) during a period (dt). V_q is the river discharge. V_p is precipitation volume. V_e is evaporation volume. V_g is submarine ground water discharge. VL_1 and VL_2 are the through water volume of the boundary section. We can estimate dV_x by the observed water level, V_q by the river observation data, V_e by the bulk equation, VL_1 and VL_2 by ADCP data. It is no precipitation in the observation day. Then V_g , which is the sum of the fresh and recycling ground water, is calculated. The budgets were calculated in 8 periods related to observation time, namely tidal change. Results will be shown in the presentation.