

Material transport processes around Sagami Bay and Suruga Bay using a particle tracking model

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In this study, material transport and diffusion processes in Sagami Bay and Suruga Bay were evaluated using the ROMS model with a 3-D Lagrangian particle tracking model. The model was run for summer and winter seasons performed with long term averaged climatological reanalyzed data. A half of the total particles was outflowed from the bay within two (three) weeks in summer (winter) for both bays. The tidal forcing suppressed the outflow from the bays with a time scale of approximately two days. The particle outflow rate from the Sagami Bay mouth was higher than that for Suruga Bay. The Kuroshio Current inflowed into the inner part of Sagami Bay with a horizontal velocity of 1.5 m s^{-1} when the Kuroshio Current passed near the coast. On the other hand, for Suruga Bay, the Kuroshio Current influenced only around the bay mouth. Model results for the both seasons showed that particles that flowed out from Sagami Bay were mainly transported to the east (70%) caused by the Kuroshio Current. For Suruga Bay, particles were mainly outflowed on the west side of the bay mouth (75%). The westward particle transport in Suruga Bay were induced by a cyclonic eddy located off the bay (Enshu-nada). Both for Sagami Bay and Suruga Bay, horizontal particle transport were stronger in summer than winter, since the Kuroshio Current passes near to the coast in summer. Material transport in vertically were stronger in winter than summer probably due to intensified winter convections or eddy motions.

Keywords: ROMS, Sagami Bay, Suruga Bay