Groundwater inflows and associated material fluxes in the estuarine ecosystem modified by the 2011 Tohoku earthquake

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The 2011 Tohoku earthquake and subsequent Tsunami affected significant damage to the coastal environment along the Sanriku coast of Japan. In Moune Bay, the land subsidence resulted in the loss of tidal flat at the bay head and the creation of saltmarsh as "new" ecosystem. In the present, the saltmarsh is connected to Moune Bay via the river and materials transport occurs at each other via the river. In these ecosystems, groundwater is thought to be an important pathway as well as the rivers, yet this process has not been evaluated. In this study, we evaluated groundwater discharge and associated materials fluxes of nutrients and carbon into the estuarine ecosystem from the saltmarsh to Moune Bay. To quantify groundwater inflows, we measured ^{222}Rn and Ra isotopes (^{223}Ra, ^{224}Ra, and ^{226}Ra) in June and November 2018. In addition, we measured nutrients, dissolved inorganic carbon (DIC). Total groundwater discharge rates estimated by ^{222}Rn mass balance model were < 5.0 cm d^{-1} in saltmarsh and > 15 cm d^{-1} in Moune Bay, respectively. Using the baysian mixing model of Ra activity and salinity in each source (river, fresh groundwater, recirculated groundwater and offshore seawater), the fraction of fresh components in total groundwater discharge were estimated to be about 80% in saltmarsh and about 20% in Moune Bay. In the presentation, we will show the fluxes of nutrients and DIC through groundwater discharge.