
[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-OS Ocean Sciences & Ocean Environment

[A-OS14] Freshwater discharge from rivers and estuaries to the ocean

convener: Shinichiro Kida (Research Institute for Applied Mechanics, Kyushu University), Dai Yamazaki (Institute of Industrial Sciences, The University of Tokyo), Humio Mitsudera (北海道大学低温科学研究所, 共同), Yosuke Alexandre Yamashiki (Earth & Planetary Water Resources Assessment Laboratory Graduate School of Advanced Integrated Studies in Human Survivability Kyoto University)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The water cycle from land to the ocean involves complex dynamics of rivers and buoyancy driven flows in estuaries and the ocean. Recent progress in satellite observations and numerical models are beginning to illuminate how this water cycle occurs on various time scales globally and regionally. This session welcomes various process studies that investigate the dynamics and material circulation related to the freshwater cycle from land to the ocean such as surface runoff, river transport, estuarine circulation, and coastal river plumes based on numerical, observational, or theoretical studies.

[AOS14-P02] Validation of the MRI's Seto Inland Sea model using the high-resolution SSS dataset based on satellite observation

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Meteorological Research Institute (MRI) has been developing a coastal ocean model system around Japan with 2km horizontal resolution in order to provide more precise information about coastal disaster prevention and state of ocean around Japan. Freshwater input from rivers is one of important components for such a high-resolution coastal ocean modeling. We are considering the use of a hydrological model output (JMA Runoff Index) as the river runoff boundary condition for our model. This index is utilized by Japan Meteorological Agency as a criterion to decide to issue a flood alert. It enables us to include freshwater inputs from minor rivers whose discharge rates are seldom measured or at least not published. In this presentation, we focus on the sea surface salinity (SSS) distribution after the strong precipitation event caused by the typhoon Roke in 2011. Our model reproduces extremely low salinity surface waters around mouths of the major rivers in Japan. Relatively low SSS waters flow southward along the eastern coast of the Shikoku Island, creating a balloon-like structure and a strong salinity front with saline Pacific waters. We also find low SSS signals around some mouths of minor rivers such as Mihara river, Hidaka river, and Aizu river. It had been difficult to validate the SSS distribution reproduced in such a high-resolution coastal ocean model due to lack of observational data. On the other hand, Kobe University has recently developed a high-resolution SSS dataset based on geostationary ocean color satellite observation. This dataset covers the Seto Inland Sea now and will eventually covers whole coastal areas of Japan. This dataset also represents the same characteristics of SSS distribution as our simulation result mentioned above. These results reveal the usefulness of the hydrological model output and this satellite-based dataset in a coastal ocean simulation around Japan and its validation, and the importance of taking into account the freshwater inputs from minor rivers in Japan.