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

[A-OS09]Marine ecosystems and biogeochemical cycles: theory, observation and modeling

convener:Shin-ichi Ito(Atmosphere and Ocean Research Institute, The University of Tokyo), Takafumi Hirata(Faculty of Environmental Earth Science, Hokkaido University), Eileen E Hofmann (共同), Enrique N Curchitser (Rutgers University New Brunswick)

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The ocean accounts for about 50% of global net primary production. This production is significant for carbon cycling and ecosystem functioning, and is related directly or indirectly to a variety of climatic and ecological phenomena. The responses to natural and anthropogenic environmental stressors that influence marine production and diversity can cause perturbations to marine ecosystems that alter trophic dependencies and interactions among organisms at a range of space and time scales. Quantification of the principal mechanisms driving spatio-temporal variability of marine ecosystem remains to be done, especially in terms of evaluation of uncertainty in responses. As a result, evaluating vulnerability of marine ecosystems to environmental change requires systematic and holistic approaches that integrate physics to ecology and are based in observations and modelling. This session aims to provide a venue for discussing recent advances in understanding marine biogeochemical cycles, ecosystems and their interactions. Observational and modeling studies that consider linkages between biogeochemical and ecosystem processes, biodiversity and biogeochemistry, and the effects of multiple stressors are especially encouraged.

[AOS09-P05]Fine-scale temporal variation of chlorophyll-a in the Kuroshio waters revealed from the Advanced Himawari Imager onboard the meteorological satellite Himawari-8

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The Kuroshio western boundary current originates from the subtropics in the Western Pacific, and carries a vast thermal energy and oceanic water mass towards the north, including the south coasts and offshore islands of Japan. In spite of the oligotrophy of the origin water, the Kuroshio water is known for spawning and feeding grounds of commercial/non-commercial fish larvae, explaining a higher fisheries production in the region. Thus, it puzzles a link(s) among nutrient fields, standing stock and productivity of lower trophic organisms (e.g. plankton) and of higher trophic organisms (e.g. fish), in terms of a trophic energy transfer within the Kuroshio ecosystems. In order to understand the complex Kuroshio ecosystems, a bottom-up process in the Kuroshio ecosystems, namely phytoplankton dynamics, is investigated for different temporal scales (diurnal, daily, weekly and seasonal variability), using remote sensing. The new meteorological satellite instrument, Advanced Himawari Imager (AHI) onboard Himawari-8, which provides the consecutive ocean colour observation every 2.5/10 minutes around the Kuroshio, exhibits a fine temporal variability of phytoplankton pigment, chlorophyll-a, with 1 km spatial resolution. In this presentation, an analysis of short scale variabilities (< 1 month) of chlorophyll-a concentration of the Kuroshio water is presented to show that a dominant mode of the variability (i.e. the largest variability) within the temporal scales considered results from not only advective waters, but also local oceanographical events.