[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

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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-P10]A challenge to evaluate effect of climate change on Japanese anchovy (*Engraulis japonicus*) in the East China Sea IV

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We have evaluated climate change (global warming) effects on Japanese anchovy (*Engraulis japonicus*) larvae in the East China Sea by integrating a fish-migration and growth model using environmental conditions derived from simulations of a coupled ocean circulation and ecosystem model with contemporary and future climate forcing. For the ocean circulation model, a high resolution (1/10 deg.) FRA-ROMS (Fisheries Research Agency - Regional Ocean Modeling System) was used. For the marine ecosystem model, eNEMURO, an extended version of NEMURO (North Pacific Ecosystem Model for Understanding Regional Oceanography) was used. For contemporary and future climate forcing, the output of MRI-CGCM3 with the Representative Concentration Pathways (RCP) scenarios (RCP2.6, RCP6.0 and RCP8.5) were averaged during 2011-2020, 2051-2060 and 2091-2100, the FRA-ROMS-eNEMURO was integrated with those climatological forcing for 26 years and the simulated results in the last year were used to integrate the fish-migration and growth model (FRA-ROMS-eNEMURO.FISH). The initial spawning grounds were estimated based on the sea surface temperature (SST) and day length with limitation of ocean depth less than 1000 m. The spawning grounds shifted to northward under warming conditions however because of day length limitation, the available eggs decreased by the northward shift. The larvae transported to southern part of Kyushu Island in Japan (current main fisheries ground for anchovy larvae) were projected to decrease under warming

conditions and the peak timing of larvae supply was shifted earlier. The projected results indicate severe conditions of local fisheries in the southern part of Kyushu Island.