[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG43]Coastal Ecosystems - 2. Coral reefs, seagrass and macroalgal beds, and mangroves

convener:Toshihiro Miyajima(Marine Biogeochemistry Group, Division of Ocean-Earth System Science, Atmosphere and Ocean Research Institute, The University of Tokyo), Yu Umezawa(Tokyo University of Agriculture and Technology), Atsushi Watanabe(東京工業大学　環境・社会理工学院, 共同), Tomihiko Higuchi(Atmosphere and Ocean Research Institute, The University of Tokyo)
Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Coastal marine ecosystems are complex open system interacting with surrounding watersheds, outer ocean, and the atmosphere, providing a wealth of various ecosystem services to human life. Simultaneously, they are also influenced strongly and often negatively by human activities. This session, together with a companion session dedicated for the water cycle and land-ocean interactions [A-CG##], aims to provide a platform for interdisciplinary discussion covering various aspects of frontiers in coastal ecosystem sciences. This session particularly focuses shallow-water benthic communities ranging from temperate to tropical regions, such as coral reefs, seagrass and macroalgal beds, tidal wetlands, and mangroves. All these communities are characterized by intrinsically high primary production, active material cycling, and biodiversity hot spots. However, increasing human demand for coastal marine resources and industrial development concentrating on coastal regions incur the risk of rapid degradation and diminishment. Comprehensive assessment and monitoring of ecosystem functions and development of effective means for conservation and restoration are urgently needed for such communities. This session is dedicated to organizing and promoting such research and management activities by sharing state-of-the-art science and technology among ecologists, geologists, geochemists, biogeographers, etc. Field-based observational, experimental, and modeling studies concerning the following topics are especially welcome: ecosystem functions; elemental cycling; community connectivity; environmental changes such as global warming, ocean acidification, and sea-level rise; ecosystem services such as carbon sequestration, nutrient regulation, and fisheries production; regional- or global-scale comparison; long-term ecological researches.

[ACG43-P02]Response of the eelgrass epifaunal food web to acidified ocean: An experimental approach

*Toshihiro Miyajima[1], Masaaki Sato[2,3], Masakazu Hori[2] (1.Marine Biogeochemistry Group, Division of Ocean-Earth System Science, Atmosphere and Ocean Research Institute, The University of Tokyo, 2.National Research Institute of Fisheries and Environment of Inland Sea, Fisheries Research Agency, 3.National Research Institute of Fisheries Engineering, Fisheries Research Agency)
Keywords:Ocean acidification, Seagrass beds, Food web

For detecting and quantifying influence of acidified ocean on trophic transfer and turnover rates in food webs, a deuterium (^{2}H)-based pulse-and-chase experiment combined with carbon (C) and nitrogen (N) stable isotope mapping was developed and applied to the epifaunal community of eelgrass meadows in outdoor experimental aquaria. At first, primary producers such as seagrass (*Zostera marina*) and epiphytic microalgae were labeled with ^{2}H by a short-term incubation in ^2H_2O-enriched seawater under natural light conditions. Then, the labeled primary producers were washed vigorously with natural seawater, and transferred to mesocosms with running natural seawater preadjusted to various pH. Macrobenthic consumers such as crustaceans and molluscs were introduced in the mesocosms and incubated for 1 month under natural light conditions. Light intensity, pH, temperature, salinity, and dissolved oxygen were continuously monitored throughout incubation. Subsamples of primary producers, consumers, and accumulated detritus were

collected periodically, freeze-dried, and analyzed for hydrogen, C, and N isotopic ratios. Trophic transfer rate was evaluated by comparing the ^{2}H enrichment between the primary producers and the consumers. Because ^{2}H enrichment did not disturb natural abundance of C and N isotopes, the trophic position of each consumer could be assessed by conventional C-N isotope ratio mapping. A preliminary experiment was also performed in which primary producers were labeled with multiple tracers of ^{2}H, ^{13}C, and ^{15}N, to compare uptake and translocation processes within the seagrass and trophic transfer to consumers between these elements. In this presentation, we show results from two different acidification experiments, and discuss appropriate data analysis methods.