Oral | Symbol B (Biogeosciences) | B-BG Biogeosciences & Geosphere-Biosphere Interactions

[B-BG21_1AM1]Material cycles in tropical- subtropical coastal ecosystems

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Coral reefs, seagrass meadows, and mangroves characterize tropical-subtropical coastal ecosystems, and possess high biological productivities and resultant active cycling of materials. Recently, these ecosystems have also been recognized as important reservoirs of so-called "blue carbon". However, degradation due to development of adjacent watersheds, reclamations of the waterfront, intensive aquaculture, and the threats of global warming and ocean acidification have been diminishing ecosystem functions rapidly. These ecosystems are in constant interaction, and an understanding of the relevant material cycles requires discussions among researchers studying these ecosystems from different points of view. Therefore, the main objectives of this session are (i) to provide opportunities for discussion among researchers working on coral reefs, seagrass meadows, and mangroves, (ii) to understand the characteristics of the ecosystem functions and their interactions, and (iii) to discuss guidelines for future research areas and for the conservation and management of these ecosystems. Specifically, the session targets studies on material cycles such as those for C, N, P, and other trace elements, freshwater and seawater cycles, and environmental records in sediments and organisms. Researchers and students from various fields such as geochemistry, ecology, oceanography, limnology, geology, and other related fields are expected to participate.

10:15 AM - 10:30 AM

[BBG21-P01_PG]Field investigation and the path analysis of air-sea CO2 flux in shallow waters of Ishigaki Island

3-min talk in an oral session

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Keywords:blue carbon, coastal vegetation, air-sea CO2 flux, path analysis

The Blue Carbon, which is carbon captured by marine living organism, is recently focused as an important option for climate change mitigation initiatives. The Blue Carbon is equivalent to approximately 55% of carbon fixed by photosynthesis activity of the earth. In particular, vegetated shallow waters have been recognized as significant carbon stocks due to the high burial rates and long term sequestration. However, the contribution of Blue Carbon sequestration to atmospheric CO_2 in subtropical shallow waters is unclear, because the investigation and analysis technologies are unmatured.In this study, using an approach combining field investigations and path analysis, we examined the mechanisms by which environmental factors directly and indirectly affecting air-sea CO_2 flux. Field investigations were performed to examine air-sea CO_2 flux and environmental factors (e.g., wind speed, water temperature,

salinity, total alkalinity (TA), dissolved inorganic carbon (DIC)) in shallow waters (Fukido, Shiraho, Nagura, and Kabira) of Ishigaki Island, July 2013. In addition, we implemented the path analysis to infer important environmental factors and interactions affecting the air-sea CO_2 flux.