
 [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)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

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.

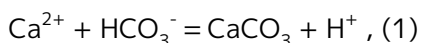
[AOS09-P07] True nature and reversal of coral reefs and foraminifera habitats through temporal dependence of surface oceans

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Keywords: surface ocean, reversal of pH, acid dissociation reaction, calcification/decalcification reaction, coral reefs, foraminifera habitats

Surface ocean has shown weak base under atmosphere, but fresh waters are acidic at less than pH 7 under atmosphere. The reversible reaction of calcification and decalcification balanced reversible acid dissociation reaction. The calcifying reaction in coral reefs and foraminiferal habitats, and salty waters was carried out through acid dissociation reaction. (Ichikawa, Chemistry, Euro. J, 2007, **13**, 10176).

Reversible reaction between calcification and decalcification in no homogeneous phase,



is acid dissociation reaction through temporal and spatial dimensions in weakly basic states of $\sim 8.0 < \text{pH} < \sim 8.4$ at $\text{PCO}_2 < \sim 290 \text{ ppm}$ under no anthropogenic contribution; coral reefs may be oasis for their fishes. All the coordinates pointed out by atmospheric PCO_2 and surface ocean pH were irregularly scattered at $\text{PCO}_2 > 290 \text{ ppm}$ under anthropogenic effect on surface ocean pH. The accidental fluctuation in individual coordinates of (PCO_2 , pH) was observed between $\sim 1950 \text{ yr}$ and $\sim 2000 \text{ yr}$ for coral reefs. It is uncertain that oversaturation of carbonate ion concentration was observed instead of mineral saturation, since the sustainable proton homeostasis in surface oceans is controlled by reversible acid dissociation reaction e.g. eqn. (1).