Spatiotemporal high-resolution behavior of ocean acidification in Southern Ocean and other regions

Y Cai[1], BF Li[2], XL Pan[2] and YW Watanabe[2]

[1] *Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan*
[2] *Faculty of Environmental Earth Science, Hokkaido University, Sapporo, Japan*

The global ocean is estimated to absorb about one quarter of the CO_2 from anthropogenic emissions, which could lead to ocean acidification manifested as a gradual decrease in seawater pH [*Le Quéré et al.*, 2015]. Anthropogenic CO_2 is inferred to be absorbed by 40% in the Southern Ocean (SO, south of 30°S) [*Khatiwala et. al.*, 2013], where intensive acidification is occurring. To achieve a clear understanding of the influence of increasing CO_2 emission to the ocean, clarifying the contribution of anthropogenic factors to ocean carbon chemistry becomes necessary. The ocean carbon chemistry may not only be affected by anthropogenic influences, but also changes with internal and external natural processes. Therefore, it is essential to distinguish between natural and anthropogenic components from the observed data in order to clarify the current status of ocean acidification of the entire ocean from the surface to the seafloor. We here tried to distinguish the natural and anthropogenic components of ocean acidification in the Southern Ocean and other oceans, using new hybrid parameterization method which consists of Multiple Linear Regression (MLR) to find appropriate parameters and Neural Network (NN) to predict oceanic pH with high-resolution gridded data based on the ship-based observed datasets (GLODAPv2.2022) following the approach of *Watanabe et al.* [2018]and *Pan et al.* [2020]. On the day of the presentation, we will discuss quantitatively the natural and anthropogenic components of ocean acidification in each ocean.

References

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