Contribution for the marine ecosystem at the North East Pacific Ocean by deposition of atmospheric nitrogen compounds

*Fumikazu Taketani[1], Maki Noguchi Aita[1], Kohei Ikeda[2], Kazuyo Yamaji[3], Kosei Sasaoka[1], Kazuhiko Matsumoto[1], Makio Honda[1], Yugo Kanaya[1]

1. Japan Agency for Marine-Earth Science and Technology, 2. National Institute for Environmental Studies, 3. Kobe University

It has become apparent that deposition of atmospheric species emitted from Asian region is one of pathways for the supply of nutrients and inhibitors in the ocean surface layer. However, there have been a few studies to estimate the contribution of marine ecosystem by the deposition of atmospheric species. In this study, we investigated contribution of deposition of atmospheric nitrogen compounds to the marine ecosystem at the North East Pacific Ocean using 3-D marine ecosystem model (NEMURO) combined with atmospheric regional chemical transportation model (WRF-CMAQ). The 3-D marine ecosystem model indicated that surface chlorophyll concentrations at sub-tropical region in North Pacific Ocean in summer was underestimate to those of the satellite observation by MODIS, suggesting rack of nutrient supply processes in summer. The atmospheric regional chemical transport model indicated that there are sufficient depositions for nitrate and ammonia at sub-tropical region in North Pacific Ocean calculated from 2009 to 2013, suggesting that atmospheric contribution as nutrients is potentially high. In the presentation, we are going to report the results for combination analysis by marine ecosystem model, atmospheric regional chemical transportation model, marine monitoring data by buoys, and satellite observation at sub-tropical region in North Pacific Ocean.

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