

## Potential of Deposition of Atmospheric Inorganic Nitrogen Compounds Produced at East Asia to Marine Ecosystem at North Western Pacific Ocean

\*Fumikazu Taketani<sup>1</sup>, Maki Noguchi Aita<sup>1</sup>, Kazuyo Yamaji<sup>1,2</sup>, Takashi Sekiya<sup>1</sup>, Kohei Ikeda<sup>3,1</sup>, Kosei Sasaoka<sup>1</sup>, Taketo Hashioka<sup>1</sup>, Makio Honda<sup>1</sup>, Kazuhiko Matsumoto<sup>1</sup>, Yugo Kanaya<sup>1</sup>

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

To investigate the influence for the deposition of inorganic nitrogen compounds derived from the East Asian continent on the marine ecosystem in the North Western Pacific Ocean (NWPO), we performed numerical simulations with and without atmospheric deposition of inorganic nitrogen compounds, using a 3-D lower trophic-marine ecosystem model (COCO-NEMURO), coupled with an atmospheric regional chemical transport model (WRF-CMAQ). The monthly mean data of wet and dry deposition data of inorganic nitrogen compounds consisted of gases ( $\text{HNO}_3$  and  $\text{NH}_3$ ) and aerosol particles ( $\text{NO}_3^-$  and  $\text{NH}_4^+$ ) at NWPO region in 2009–2016 produced by WRF-CMAQ were inputted to the COCO-NEMURO as a new nitrogen nutrients supplying process from the atmosphere. The results indicated that the annual average chlorophyll mass concentration at the surface in the subtropical region (20N–30N, 125E–150E) of the NWPO increased from 0.04 to 0.10 mg/m<sup>3</sup>. Similarly, gross primary productivity integrated over sea depths of 0–200 m increased from 85 to 147 mg C/m<sup>2</sup>/day, related to this deposition. This study indicates that the supply of atmospheric inorganic nitrogen compounds from East Asia to the NWPO could lead to a high nutrient impact on the marine ecosystem within the subtropical region.

Keywords: nitrogen compounds, deposition, aerosol, marine ecosystem, numerical calculation