西部北太平洋域での東アジア由来大気窒素化合物沈着による海洋低次生態 系への寄与

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

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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 (HNO₃ and NH₃) and aerosol particles (NO₃⁻ and NH₄⁺) 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/m3. Similarly, gross primary productivity integrated over sea depths of 0–200 m increased from 85 to 147 mg C/m2/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.

キーワード:窒素化合物、沈着、エアロゾル、海洋生態系、数値計算

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