Impact of atmospheric iron inputs on marine primary productivity and nutrient cycling

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A micronutrient iron regulates marine primary productivity roughly one-third of the global ocean. Change in atmospheric iron deposition has been regarded as a factor controlling past climate changes through changing CO_2 uptake by the ocean. Current global-scale marine biogeochemical models are using different iron deposition products derived from various atmospheric transport models. The total amounts of bioavailable iron supplied to the ocean vary 1.4–32.7 Gmol yr^{-1} among the models, being a large uncertainty to project future oceanic CO_2 uptake. The variation of the iron supply rates can be attributed to 1) difference in the total iron deposition rate, 2) treatment of atmospheric processing determining the solubility and 3) treatment of consecutive dissolution of iron from sinking particles in the ocean. In this talk, we will address impact of atmospheric iron inputs on marine primary productivity and nutrient cycles by reviewing previous studies and results from some idealized experiments.

Keywords: Iron, Nutrients, Numerical simulation

