

Quantify atmospheric iron over West Antarctic Peninsula

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The Southern Ocean plays an important role in the global carbon cycles and climate change. However, much of it belongs to the category of HNLC waters, where primary production is limited by the micronutrient iron (Fe), in addition to light, temperature and other factors. Some coastal seas of Antarctica are highly productive and receive Fe from Antarctic continental shelf sediments and glacier/ice melt; however, some of the nearby pelagic waters in the Southern Ocean is Fe-limited and thus could receive Fe from other sources, including atmospheric deposition. The properties of atmospheric Fe could be affected by the processes during atmospheric transport and marine biogenic emissions, influencing the input of atmospheric bio-available Fe to the Southern Ocean. To address this issue, ground-based atmospheric measurements were carried out in West Antarctic Peninsula that has warmed faster than other regions of Antarctica. Air sampling was made at the US Palmer Station, one of the three US research bases in Antarctica. This presentation will focus on the discussion of the field results on atmospheric Fe solubility observed at Palmer, particularly how this Fe property varies as a function of aerosol particle-size distributions, an important function associated with modeling atmospheric deposition.