

Dust in the Subarctic North Pacific: Improving proxies of eolian dust fluxes

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Abstract

Eolian dust deposition from the extensive desert areas in East Asia has traditionally been considered to be the dominant source of iron to the Subarctic North Pacific (SNP). Since the SNP is one of the three principal High Nutrient Low Chlorophyll regions of the modern ocean where phytoplankton growth is limited by iron, dust deposition there should have an important control on ocean productivity. Good modern dust flux records from the SNP have just been obtained through sediment trap studies. Reliable dust flux records from marine sediments from this region are lacking, primarily due to uncertainties about the impact of sediment input other than dust, namely hemipelagic and volcanic material as well as ice-rafted debris (IRD). We propose to measure two independent proxies of eolian dust fluxes (^{230}Th -normalized ^{232}Th and ^4He fluxes) from 37 multicores across the SNP, map the spatial pattern of dust proxy fluxes and compare the results to the modern pattern of dust deposition to test the validity of our methods. Then we will compare downcore records of dust deposition to proxies of biological productivity to **test the traditional hypothesis that iron delivered by atmospheric transport of dust from the East Asian desert areas is the primary factor controlling biological productivity in the region**. This proposal requests funds for materials and analytical services needed to accomplish the initial step of the overall proposed work.