

Comparison of annual foraminiferal fluxes between the western and eastern sites in the northern North Pacific during 1998-2002

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Planktonic foraminiferal assemblage and chemical composition of their shells reflect the upper ocean environmental conditions such as seawater temperature, salinity, thermal structure in the water column, light intensity, and food availability. In order to examine the seasonal and annual distribution of planktonic foraminifera and their relation to oceanographical situation, we conducted sediment trap experiments at three sites (Site 50N (50 01' N, 165 02' E), Site KNOT (43 58' N, 155 03' E), and Site 40N (39 60' N, 165 00' E)) in the northwestern North Pacific during 1998-2002.

The strongest El Nino were observed from spring 1997 to summer 1998 with peaked in winter 1997/1998. During this period, the Aleutian low moved eastward and it caused the weak winter wind from Siberia and warm winter in the northwestern North Pacific. Annual assemblage and fluxes of foraminifera also showed significant differences in 1998, El Nino year.

On the other hand, detailed annual foraminiferal fluxes from 1982 to 1986 are also available at Station PAPA (Ocean Station P) (50 N, 145 W) in the northeastern North Pacific. Station PAPA is situated within the subarctic water mass near the boundary.

The period of trap experiments at Station PAPA included normal 'cold' mode (AA1) in September 1982 to August 1984 and anomalous 'warm' mode (AA5) in 1985 (November 1984 to February 1986). The SST varied from 5.9-13.5 C during the normal 'cold' mode and showed anomalously high values during the 'warm' mode.

A comparison of annual mean foraminifera fluxes at 50N between the northwestern (Site 50N) and the northeastern North Pacific (Station PAPA) during the normal 'cold' mode demonstrated higher fluxes of foraminifera at Site 50N due to higher nutrient concentrations. The results also showed that *Globigerina bulloides* is not always a proxy for upwelling and that *Neogloboquadrina pachyderma* is not solely controlled by seawater temperature in the northwestern Pacific, where the surface water is enriched in nutrients.

In 1998, an El Nino year, foraminiferal assemblage at Site KNOT was comparable to that in a 'warm' mode year at Station PAPA. It suggested that a large area of the northern Pacific from Site KNOT to Station PAPA could have similar environments during El Nino period.