

## Decadal variation of biological settling particle fluxes controlled by physical process in the subarctic western North Pacific.

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The subarctic western North Pacific is one of the most effective area in terms of biogenic pCO<sub>2</sub> draw down in the world (Takahashi et al., 2002). Aquatic resource is also rich there. In order to understand processes linking between physical, chemical and biological production to create the rich productivity and marine ecosystem and effective biogeochemical dynamics in the subarctic western North Pacific, new interdisciplinary study, “Ocean Mixing Processes: Impact on Biogeochemistry, Climate and Ecosystem (OMIX)” is ongoing in Japan. As a part of OMIX study, we have a time-series mooring system at St.K2 (47N, 160E) in the subarctic western North Pacific to observe biogenic fluxes by sediment trap to find missing link between physical processes, nutrient supply and associated biological production there. According to decadal data from 2005 to 2017 at St.K2, total mass fluxes changed ranging from 0.07 to 949.5mg m<sup>-2</sup> day<sup>-1</sup> composed to mainly opal which is the frustules of diatom, silicoflagellate, and radiolaria. There is a seasonal change namely, relatively high in the beginning of summer to autumn and low during winter-spring. The total mass, opal and organic carbon fluxes showed decreasing trend since Jan 2011. On the other hand, alkenone flux which is the biomarker of *Emiliana huxleyi*, coccolithophorid showed increasing trend since Jan 2011. *Emiliana huxleyi* distributes mainly in subtropical and transition area in the western North Pacific (Harada et al., 2006) and thus the increasing of alkenone flux since 2011 implies the north migration of subarctic frontal zone (SAF). We also showed the alkenone/diatom sterol (which is the biomarker of diatom) ratio that relatively high values continue since 2011. What physical mechanism control the decadal variation of biogenic flux and component through the latitudinal migration of SAF? We have compared the decadal variation of the Pacific Decadal Oscillation index and the strength of local jet current with biogenic fluxes. We will discuss the potential physical process to control the decadal variation in the biological responses in the subarctic North Pacific.

Keywords: Biological particle flux, Subarctic in the North Pacific, Pacific Decadal Oscillation, Isoguchi Jet