

## Environmental Changes based on the variations of the grain size distributions of MD179 cores, off Joetsu, Sea of Japan

TAKIZAWA, Michiru<sup>1\*</sup> ; SUGAI, Toshihiko<sup>2</sup> ; MATSUMOTO, Ryo<sup>3</sup>

<sup>1</sup>Graduate School of Frontier Sciences, University of Tokyo (current PASCO Corporation ), <sup>2</sup>Graduate School of Frontier Sciences, University of Tokyo, <sup>3</sup>Gas Hydrate Research Laboratory, Organization for the strategic Coordination ,Meiji University

### 1.Introduction

Climate change during the Quaternary period experienced a 10,000year<sup>2</sup>glacial<sup>1</sup>interglacial cycle. This cycle has an influence on land formation. In Japan, the sea level changes, in coastal areas, and the variations of precipitations, at up stream and middle stream areas, change the riverbeds. Thus the marks from climate changes are expected to be archived around the rivers. However, the long term and continuous records hardly remain on the land, due to weathering and erosion. On the other hand, owing to the more stable environment, the continuous records are expected to remain on the seafloor(Tada et al., 1999). In this study, to reconstruct the correlation between the land formations and climate changes, the variations of the grain size distributions during past 130 ka on the East marginal area of Sea of Japan was revealed.

### 2.Study Area and Methods

There are a lot of Paleoenvironmental records concerning the Sea of Japan. In this study, 3 cores, which were sampled during the MD179 cruise in the Umitaka Spur and the Unnamed ridge off Joetsu, are used and the variations of grain size distributions of these cores were revealed. The Umitaka Spur is located in the continental slope. Moreover the sedimentation rate off Joetsu is very rapid (Nakamura et al., 2013; Ishihama, et al., in press) and the supply from the island arc is active (Freire et al., 2009). The supply from the Tateyama Mountains has the highest amount in Japan. So the of these supply are speculated to contribute to the sediment off Joetsu.

In this study the age models of these cores are constructed by using tephrochronology, radiocarbon dating, oxygen isotope ratio of foraminifer (Ishihama et al., in press) and additional data from tephra and radiocarbon dating. The organic matters in 485 samples from the 3 cores were removed by 10% $H_2O_2$ . Then the grain size distributions of these are analyzed by using SALD3000S (Laser diffraction particle size analyzer).

### 3.Result

The sediments off Joetsu are composed mainly of suspended load. The coarser sediments that contain little fine sand existed during the interglacial age. The variations of the median grain sizes off Joetsu have a similar pattern to the glacial cycles.

In general, it is assumed that the grain sizes of seafloor sediments become smaller as it gets farther from the land. Nevertheless, in this area, the variations in the size of the sediment supplied from land driven by the glacial cycles, have a large influence on the grain sizes of sediments in the study area, because of (1) the active supply from the rivers and (2) the narrow continental shelf.

However, in the case of the rapid rise in sea level, for example after LGM, the formation of alluviums in coastal zone is speculated to have an influence on the size of the sediment in study area.

### References

- Freire, A. F. M. et al. (2009) Journal of the Sedimentological Society of Japan, 68:117-128.
- Ishihama, et al. (in press) Journal of Asian Earth Sciences.
- Kashiwaya (1989) Journal of Geography, 98:725-730.
- Nakamura, Y. et al. (2013) Journal of the Japanese Association for Petroleum Technology, 78:79-91.
- Tada, R. et al. (1999) Paleocyanography, 14:236-247.

Keywords: Seafloor cores on MD179, Umitaka Spur, grain size analysis, Last Interglacial Age