Millennial-scale paleocenographic variations in southwestern part of the Sea of Okhotsk: Results from IMAGES core MD01-2412

Tatsuhiko Sakamoto[1]; Koichi Iijima[2]; Minoru Ikehara[3]; Masao Uchida[1]; Kaori Aoki[4]; Naomi Harada[5]; Sakamoto Tatsuhiko Research group of paleoceanography of the Sea of Okhotsk for IMAGES-MD01-2412 core[6]

[1] JAMSTEC; [2] Earth and Planetary Sci., Hokkaido Univ; [3] Center Adv. Marine Core Res., Kochi Univ.; [4] GSJ,AIST; [5] JAMSTEC, MIO; [6] -

Expansion of seasonal sea-ice cover in the Sea of Okhotsk has corresponded sensitively to global and regional climatic changes. In addition, the sea-ice has a significant influence on thermohaline circulation since dense and saline water (brain water) forms temporally with the sea-ice formation. It has been proposed that the water mass in the Sea of Okhotsk is a possible source of the North Pacific Intermediate Water (NPIW). However, the variation of sea-ice and Okhotsk Sea Intermediate Water (OSIW) in long time scale is less understanding. In order to evaluate sea-ice and OSIW formation through time, it is necessary to reconstruct formation rate of each water-mass component to form OSIW, i.e. Dense Shelf Water (DSW), Soya Warm Cirrent (SWC), and Western Subarctic Water (WSAW). We focused on paleoceanographic changes during 100 ka off Hokkaido Islands in the southwestern part of the Sea Okhotsk, where seasonal changes of surface and intermediate currents are definitely obvious in the present ocean conditions. We are analyzing IMAGES-MD01-2412 core, which is recovered (58.11m) by the R/V Marione France. Age of bottom of core was estimated at about 100 ka by AMS radiocarbon dating, tephra chronology, and oxygen isotope stratigraphy. Time resolution of the record will be expected very high as 52 cm / kyr. Sea-ice reconstructed by ice rafted debris has expanded and retreated in millennial-time scale. DSF formation reconstructed by radiolaria Cyclodofora davisiana has varied with sea-ice expansion but it was not in phase during extreme cold duration. Carbon isotope ratio of benthic foraminifer Uvigerina akitaensis has shifted negatively and suddenly several times during cold durations. Inflow of SWC should stop during low sea-level stand but varied with Tsushima Warm Current intensities concerning with summer monsoon. Sea-ice and relating water mass formation has changes drastically during 100 kys.