

A02-O05

INSOLATION CONTROL ON THE BEAUFORT GYRE DYNAMICS DURING THE HOLOCENE

Masanobu Yamamoto (*Faculty of Environmental Earth Science, Hokkaido University, Japan / Graduate School of Environmental Science, Hokkaido University, Japan*)

Seung Il Nam (*Korea Polar Research Institute, Republic of Korea*)

Leonid Polyak (*Byrd Polar Research Center, Ohio State University, USA*)

Daisuke Kobayashi (*Graduate School of Environmental Science, Hokkaido University, Japan*)

Tomohisa Irino (*Faculty of Environmental Earth Science, Hokkaido University, Japan / Graduate School of Environmental Science, Hokkaido University, Japan*)

Koji Shimada (*Tokyo University of Marine Science and Technology, Japan*)

myama@ees.hokudai.ac.jp

The Beaufort Gyre (BG), an important element of the Arctic Ocean circulation system and a major control on the distribution of Arctic sea ice, underwent a dramatic recent change, probably related to sea-ice retreat along the margin of the Canada Basin. We report a record of the quartz/feldspar ratio in two sediment cores from the northern Chukchi Sea to understand the longer-term dynamics of the BG circulation. The quartz/feldspar ratio gradually decreased during the Holocene, suggesting a long-term decline in the BG strength, consistent with orbitally-controlled decrease in summer insolation. We infer that the BG rotation weakened as a result of increasing stability of sea-ice cover at the margins of the Canada Basin, driven by decreasing summer insolation. Millennial to multi-centennial variability in the BG circulation is consistent with fluctuations in solar irradiance, suggesting that solar activity affected the BG strength on these timescales.