

B07-P12

DELAYED RESPONSE OF THE OCEANIC BEAUFORT GYRE TO WIND SEA ICE MOTION: INFLUENCES ON RECENT SEA ICE REDUCTION IN THE PACIFIC SECTOR OF THE ARCTIC OCEAN

Eri Yoshizawa (*Tokyo University of Marine Science and Technology, Japan*)

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

Ho Kyung Ha (*Inha University, South Korea*)

Tae Wan Kim (*Korea Polar Research Institute, South Korea*)

Sung Ho Kang (*Korea Polar Research Institute, South Korea*)

Kyung Ho Chung (*Korea Polar Research Institute, South Korea*)

d122018@kaiyodai.ac.jp

The maximum retreat of the sea ice cover was often observed around the Northwind Ridge and the Chukchi Plateau, where the major pathway of the warm Pacific Summer Water (PSW) was identified. This suggests that the subsurface oceanic heat, which inhibits sea ice formations in winter and affects resultant sea ice variations in the following summer, is one of key players to cause the anomalous sea ice reduction in this region. Since PSW is delivered into the basin by the oceanic Beaufort Gyre (OBG) driven by winds and sea ice motions, the volume transport of the OBG is a key parameter associated with oceanic heat contents. The response time scale of the OBG to surface forcing, however, has been still unclear. In the present study, we examined the temporal response of the OBG, using multiple regression models that evaluate relative contributions of curls of winds and sea ice velocities in past years to the ocean dynamic height (ODH) near the stable center of the OBG as a proxy of the northward volume transport (ODHc). As a result, the time scale of the oceanic response in 2006-2012 was estimated to be about three years. The regression models taking account into the time scale of this delayed oceanic response explained most of the variance of the observed ODHc in 2006-2012 ($r = 0.991$ for curl of wind, $r = 0.999$ for curl of sea ice velocities, the degree of freedom = 5).