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DISTRIBUTIONS OF THE PACIFIC-ORIGIN WATERS IN THE CHUKCHI BORDERLAND, 2010-2014

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From 2010 to 2014 intensive Arctic summertime cruises were conducted to investigate temporal and spatial distributions of the Pacific-origin waters in the Chukchi Borderland. Five-time expeditions with the icebreaker Araon led us to understand that heat transport from the Pacific-origin waters is one of the primary processes to explain rapid sea ice reduction and changes in water column structure in the Chukchi Borderland. We present recent distributions of the Pacific-origin waters observed from the Arctic cruises with CTD, expendable CTD, lowered-ADCP, and other sensors. It is found that the Pacific Summer Water (PSW) in summer 2012 passed through the vicinity of the Northwind Ridge and extended toward the west of the Ridge. In summer 2014, temperature of PSW in the Chukchi Plateau where the maximum sea ice retreat happened was substantially lower than the surrounding area. Remarkable feature of the Pacific Winter Water (PWW)'s pathway is represented as well. From 2011 to 2013, PWW tends to reach northern Chukchi Sea via the Herald Canyon and turn its direction to the east. In summer 2014, however, PWW was present on the western flank of the Chukchi Plateau, nearly the same pattern as what observed in 2008. This appears to be related with large sea ice motion in the preceding winter. Furthermore, how distribution of surface heat content is correlated with sea ice reduction will be discussed.