Water mass characteristics and their temporal changes in a biological hotspot in the southern Chukchi Sea

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We analysed mooring and ship-based hydrographic and biogeochemical data obtained from a Hope Valley biological hotspot in the southern Chukchi Sea. The moorings were deployed from 16 July 2012 to 19 July 2014, and data were captured during spring and fall blooms with high chlorophyll *a* concentrations. Turbidity increased and dissolved oxygen decreased in the bottom water at the mooring site before the fall bloom, suggesting an accumulation of particulate organic matter and its decomposition (nutrient regeneration) at the bottom. This event may have been a trigger for the fall bloom at this site. The bloom was maintained for 1 month in 2012 and for 2 months in 2013. The maintenance mechanism for the fall bloom was also studied by hydrographic and biogeochemical surveys in late summer to fall 2012 and 2013. Nutrient-rich water from the Bering Sea supplied nutrients to Hope Valley, although a reduction in nutrients may have occurred in 2012 by mixing of lower-nutrient water that would have remained on the Chukchi Sea shelf. In addition, nutrient regeneration at the bottom of Hope Valley could have increased nutrient concentrations and explained 60% of its nutrient content in the bottom water in fall 2012. The high nutrient content with the dome-like structure of the bottom water may have maintained the high primary productivity via the vertical nutrient supply from the bottom water, which is likely caused by wind-induced mixing at this site during the fall bloom. Primary productivity was 0.3 g C m^{-2} d^{-1} in September 2012 and 1.6 g C m^{-2} d^{-1} in September 2013. The lower productivity in 2012 was related to strong stratification caused by the high fraction of surface sea ice meltwater.