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Title: MOSAiC - the largest polar expedition in history: Oceanographic results.

Abstract: The Multidisciplinary drifting Observatory for the Study of the Arctic Climate (MOSAiC, 2019/2020), a year-long drift with the Arctic sea ice, has provided the scientific community with an unprecedented, multidisciplinary dataset from the Eurasian Arctic Ocean, covering high atmosphere to deep ocean across all seasons. The heterogeneity of data from different sources, as well as the superposition of spatial and temporal variability intrinsic to a drift campaign, complicate the interpretation of observations. Therefore, we compiled and published a quality-controlled hydrographic dataset with best spatio-temporal coverage, and provide a comprehensive overview of the ocean conditions encountered along the MOSAiC drift, along with a discussion of their interdisciplinary implications.
Our results indicate that - for the most parts - ocean variability was dominated by regional, rather than seasonal signals, with potentially strong implications for ocean biogeochemistry, ecology, sea ice, and even atmospheric conditions. Near-surface ocean properties are strongly influenced by the relative position of sampling within or outside the river-water influenced Transpolar Drift, and seasonal warming and meltwater input. Ventilation down to the Atlantic Water layer in the Nansen Basin allows for a stronger connectivity to both sea ice and surface ocean, including elevated upward heat fluxes. The Yermak Plateau and Fram Strait region are characterized by variable conditions, strong ocean currents, a stronger influence of Atlantic Water, and substantial lateral gradients in surface water properties in frontal regions. Along with the presented results, we offer context for interdisciplinary research, fostering an improved understanding of the complex, coupled Arctic System.