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Title: *Deterioration of the sea-ice cover in the Canada Basin and impact on the freshwater cycle from ice draft observations between 2003 to 2012*

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Arctic sea-ice extent in September 2012 was over 650,000 km^2 (or 15%) less than the previous record minimum in September 2007 due, predominantly, to anomalous ice reduction in the Beaufort Gyre (BG) region of the Canada Basin. A significant storm in early August 2012 may have contributed by enhancing the exchange of heat in the mixed layer to the ice bottom. However, long term measurements of the ice pack from moored upward looking sonar at 3-4 locations show that the ice thickness in the BG region peaked in 2006 and has been deteriorating since, preconditioning the region for enhanced ice reduction. Nearly a decade of time series of ice draft from these bottom-tethered moorings located in the deep Canada Basin indicate that the northern stations in the array included significant multiyear ice categories (defined between 2 and 4 m) that persisted throughout summer prior to 2007. Since 2007, the thicker categories evident at the northern stations are absent, and most of the differences in ice characteristics between all of the stations are gone, indicating that the ice cover throughout the region became largely uniform. Negative trends in median ice drafts, multiyear and ridged (greater than 4 m) ice fractions are observed, attesting to the removal of the thickest sea-ice over the nine year period, leaving seasonal sea-ice throughout the BG region. When the ~2 m annual cycle of growth and ablation is removed, computed anomalies of multiyear and thicker ice contributions indicate a large reduction after the ice minimum in 2007. Maximum keel depths are also proportionally lower, but vary greatly. Months prior to the 2012 summer storm, a significant amount of the remaining multiyear ice in the region was released from the gyre circulation westward into the East Siberian Sea where it either entered the Transpolar Drift current or eventually melted in the warmer shelf water. Hence, in the absence of the multiyear ice, only seasonal ice remained by summer in the northern BG that would likely have ablated away by the September minimum even without the influence of the storm. Fresh water (FW) changes are computed from the mooring sites, extrapolated over the BG region and compared to liquid FW determined from hydrographic station data. With reduced ice thickness, the annual FW exchange with the ocean has been reduced. Furthermore, while the solid volume continues to decrease, the liquid volume (which was steadily increasing) has stabilized or reduced slightly indicating a net export of FW from the region over the past several years.