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Recent results for O_3, BrO and CO_2 Measurements from O-Buoy Deployments around the Arctic Ocean Surface

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The Arctic environment is undergoing dramatic change. As part of the Arctic Observing Network (AON), autonomous, sea ice-tethered buoys ("O-Buoys") are being deployed across the Arctic sea ice for long-term atmospheric measurements, with several O-Buoys having been deployed within the Hudson Bay, Beaufort Sea, and the North Pole region. These buoys provide in-situ measurements of ozone, CO_2 and BrO, as well as meteorological parameters, over the frozen ocean. The O-Buoy has bi-directional communication capabilities and transmits data hourly. The unprecedented long-term O-Buoy data provide new insights into the relationships between halogen activation and ocean ice-cover type, as well as new insights into seasonal cycles of CO_2 and associated fluxes, as the Arctic Ocean surface continues to undergo rapid transition. The O-Buoy network provides the unique opportunity to observe these transition periods in real-time with high temporal resolution, and to compare them with those collected from land-based monitoring stations located around the periphery of the Arctic Ocean, and to compare with satellite data for CO_2 and BrO. Here we report on recent observations across the Arctic Ocean, and discuss what we have learned about the extent to which observed ozone depletion rates are consistent with BrO observations and our understanding of the chemistry, and the relationships between ODE frequency and wind speed, temperature, and remotely-sensed ice-cover type. This network will provide new insights into the environmental factors leading to ODEs, as well as provide a data resource to complement, e.g., future aircraft campaigns and Arctic system-wide modeling efforts.