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What can bromine in ice cores tell us about Arctic sea ice in the past?

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Bromine is of interest as a potential sea ice proxy due to its role in polar atmospheric chemistry, particularly the photochemical "bromine explosion" events which occur over the seasonal sea ice surface. A growing body of literature has demonstrated that bromine is reliably deposited and preserved in polar ice caps and can be used to investigate variability over timescales varying from seasonal to multimillenial. For sea ice reconstructions, bromine and sodium are usually evaluated with respect to their relative abundances in seawater. Competing processes of bromine enrichment due to the bromine explosion, and bromine depletion due to scavenging and deposition, must be taken into account when comparing results from coastal and inland sampling sites. We will review existing bromine-based sea ice reconstructions and present new data for locations from Svalbard, Severnaya Zemlya, Northwest Greenland (NEEM ice core) and central East Greenland (Renland ice core).