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Title: *Synoptic Activity Associated with Sea Ice Variability in the Arctic*

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Relationships between synoptic activity and sea ice variability in the Arctic are studied using self-organizing maps (SOMs) to categorize weather patterns. Sea-level pressures from 1979 – 2010 are analyzed and evaluated using the European Centre for Medium-Range Weather Forecasts (ECMWF) Re-Analysis (ERA-interim dataset). Time series of frequencies and durations of synoptic weather patterns are correlated with sea ice metrics, such as Fram Strait outflow and year-to-year changes in September sea ice extent. Some synoptic patterns correlate better to sea ice metrics than do time series of the Arctic Oscillation (AO) or the North Atlantic Oscillation (NAO). Subtle spatial shifts of Icelandic Low patterns appear important for ice loss or gain. There is a general increase (decrease) in frequencies of patterns conducive to ice loss (gain). Characterization of patterns relevant to ice variability can augment other predictive approaches and be of use to community planners and stakeholders.