

Variability of Annual Advance and Retreat of Chukchi Sea Ice
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Abstract:

The Chukchi Sea marginal sea-ice zone serves as a conduit between the North Pacific and the Arctic Ocean. On the shallow (~50m), extensive Chukchi Sea shelf, predominantly northward currents, strong winds, and the interplay between various water masses (Bering Sea, locally-formed, upwelled warm Atlantic water) contribute to the annual advance and retreat of sea ice. Year-to-year ice conditions are rapidly changing in this region, influenced by changing atmospheric and oceanographic conditions, and in turn, influencing the ecosystem characteristic of the Chukchi Sea.

Ice draft data have been collected at several locations on the eastern Chukchi Sea shelf from 2010 to the present, using ASL IPS-5 sonar ice profiler instruments. We focus on two stations, C1 and C2, on the Icy Cape mooring line (C1, C2, C3). Multiple years of data allow an examination of ice-wave transition patterns critical to annual ice and ecosystem processes. Some deep ice keel observations, up to 30 meters, are noted. We show satellite data, winds, and transport to examine the timing and variability of the ice advance and retreat seasons.