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Hemispheric snow cover extent variability

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A snow cover extent (SCE) climate data record (CDR) has been derived from a thorough reanalyasis of NOAA visible satellite-derived maps of Northern Hemisphere (NH) continental SCE, maps that date back to late 1966. In 1999, the weekly NOAA maps transitioned to Interactive Multisensor Snow and Ice Mapping System (IMS) maps. Comparisons between climatologies of the first 33 years of coarse-scale weekly NOAA maps and the most recent 11 years of finer daily IMS maps, and a two-year overlap of independently-produced weekly products and trial IMS maps were used to generate a consistent, seamless SCE CDR. This included upscaling the finer spatial resolution IMS maps to the older weekly map resolution. The improved SCE CDR and associated products are available for viewing and downloading via the Rutgers Global Snow Lab website (http://snowcover.org) and through the National Snow and Ice Data Center. SCE climatologies, time series and spatial analyses have been generated using the new CDR. One avenue of study has been to better understand SCE extent and variability. For example, notable intra-snow season variations have been noted in a given year. The 2009/10 snow season was one where winter (December-February) snow cover was the second most extensive of the satellite era over North America (NA). This was followed by the least extensive NA spring (March-May) cover. While decadal SCE departures from the long-term average have fluctuated from positive to negative in the fall (September-November) and winter over NH lands, spring SCE has been lower each successive decade since the 1970s. Principal component analysis (PCA) was performed on the annual cycle of NH SCE. Results for the first two compoents explain close to 60% of the vaiance, with the first component dominating the months of February through May and the second October through January. Based on the PCA score time series, snow area composites for years falling either +1 or -1 PC were created. Results for the NH snow composite analysis based on positive PC years displays greater SCE, in excess of 4 million square kilometers. Mid-troposheric geopotential height anomalies based on positive (negative) PC years are indicative of negative (positive) AO/NAO type phases.