

Analysis of a Time Series of Snow-Cover Maps of North America Derived from the Moderate Resolution Imaging Spectroradiometer Instrument

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ABSTRACT

Both daily and 8-day composite snow products have been available from the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument since September 2000. The MODIS instrument is on-board NASA's Terra spacecraft. The advanced capabilities of the MODIS instrument enable snow products to be developed that complement existing operational maps (i.e., Carroll, 1990; Ramsay, 2000). MODIS provides 500-meter spatial resolution, employs several spectral bands to provide a much improved cloud mask, and uses an automated algorithm to improve consistency for mapping of snow in different areas and at different times (Riggs et al., 2000; Hall et al., submitted). Since the MODIS snow maps became available to the public at the beginning of the 2000-2001 snow season, there has been an opportunity to study the snow-cover variability in a winter when the snow cover in parts of North America is unusually large (at least in the early part of the snow season). This is in contrast to the 1999-2000 winter when the snow cover in much of North America was much less than normal. Average snowlines determined by the National Oceanic and Atmospheric Administration (NOAA), based on the weekly National Environmental Satellite and Data Information Service (NESDIS)-derived snow maps, are compared to the MODIS 8-day composite snow maps. These comparisons reveal more extensive snow cover in parts of North America during the early 2000-2001 snow season as compared to the 35-year average. In addition to showing the average monthly, and some 2000-2001 snowlines for North America, the maximum, minimum and average snow cover extents are given for 8-day periods in November and December 2000, and January 2001. These studies are revealing the utility of the MODIS-derived snow maps, and also some of their limitations.

REFERENCES

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