

## Improvements to the Interactive Multisensor Snow and Ice Mapping System (IMS) and Advantages of IMS over Automated Snow Cover Detection Algorithms

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### ABSTRACT

Accurate initial conditions of snow and ice cover are essential for operational numerical weather prediction (NWP) models. Analysts at the US National Ice Center use the Interactive Multisensor Snow and Ice Mapping System (IMS) software platform to provide twice daily (18Z and 0Z) analyses of snow and ice cover in the Northern Hemisphere. These data are processed at 1-, 4-, and 24-km resolution and are used in many operational weather models as well as in various research efforts.

The IMS has several advantages over automated snow cover detection algorithms. Analysts are not limited by cloud cover (as are many automated satellite-based snow detection algorithms) and can make judgments about snow cover based on a variety of *in situ* data including weather stations, webcams, and public reports. Additionally, many automated algorithms have trouble picking up snow cover in forests due to obstruction by the canopy. Analysts can also use *in situ* observations, weather models, radar, and other meteorological data to provide short-term forecasts ('nowcasts') of snow cover, thus providing accurate initial conditions at a consistent time for NWP models.

Recent data additions to the IMS platform, including visible satellite imagery from GOES 16 and 17, passive microwave data from the Advanced Microwave Scanning Radiometer 2, more timely synthetic aperture radar imagery from the Sentinel-1 and Radarsat satellites, and more frequent updates of WSR-88D radar data, have enhanced analyst ability to determine areas of snow and ice cover. These new data sources for the IMS have improved the accuracy of initial snow and ice conditions input into NWP models.

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