Status of the GOES-R Fractional Snow Cover Product

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ABSTRACT

The global coverage of polar-orbiting satellites and the high temporal frequency of geostationary satellites allow for the robust characterization of the Earth’s snow cover. Unlike binary snow maps that provide only a snow/no-snow labelling, satellite-derived Fractional Snow Cover (FSC) products provide estimates of the area fraction of a sensor field-of-view covered by snow. For U.S. coverage, snow cover products based on a single reflective channel of the Geostationary Operational Environmental Satellite (GOES) Imager have been available for many years. Now, with the enhanced spectral sampling and higher spatial resolution that the GOES-R Advanced Baseline Imager (ABI) provides, we can expect improvements in the level of detail and accuracy of geostationary snow products.

The algorithm used for GOES-R FSC is based on the Moderate Resolution Imaging Spectroradiometer (MODIS) “MODSCAG” method developed by T. Painter. For ABI it is known as the GOES-R Snow Cover And Grain size (GOESRSCAG) algorithm. The product includes not only fractional snow cover but also snow grain size. It employs an optimized spectral mixture analysis using atmospherically-corrected, surface spectral reflectance in two visible, five near-visible, and one thermal wavelengths. Though the GOES-R ABI surface reflectance product is still under development, the GOESRSCAG product that is routinely generated using reflectances at the top of atmosphere is giving promising results. In this presentation, we will provide more detail on the current status of the GOES-R FSC and future calibration/validation plans. NOAA’s goal to select a single “enterprise” snow algorithm for use with multiple satellite instruments will also be discussed.

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