

GOES-R ABI Snow Depth Algorithm and Product: Development and Performance Assessment

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Information on the depth of the snow pack is a critical parameter for many practical applications, including in particular, agriculture, hydrology transportation and recreation. The traditional source of information on the snow depth is observations from ground-based meteorological stations. These observations however are not available in many parts of the world. Even in populated areas, the network of stations reporting snow depth may be too sparse to provide detailed enough information on the snow cover characteristics for meteorological, hydrological and climate applications.

Snow depth is one of cryosphere products that will be generated from observations of Advanced Baseline Imager (ABI) onboard GOES-R satellite. The retrieval technique involves, first estimation of the fractional snow cover using ABI reflective bands data and, second conversion of the derived snow fraction into the snow depth using an empirically established relationship. The retrievals of snow depth require clear sky conditions and are limited to forest-free flat areas.

In the poster we present the technique to derive snow depth from GOES-R ABI data. The developed technique has been tested with observations of the Imager instrument onboard current operational GOES satellites. Surface observations of snow depth were used to validate GOES-based snow depth retrievals. The accuracy of satellite snow depth estimates was about 30% for snow depths within 30-40 cm.