



Satellite remote sensing observations of snow accumulation in the Yukon Territory, Canada, during the International Polar Year

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Monitoring snow accumulation in remote mountain terrain is very challenging. At northern latitudes in Canada, operational in situ snow course measurements of snow accumulation are sparse and spatially undermeasure snow accumulation. In these regions, remote sensing offers a potential solution to detecting snow and estimating snow accumulation. This paper describes efforts to characterize snow accumulation in the Yukon Territory, Canada, during the IPY winter seasons of 2007-2008 and 2008-2009 using observations from NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) and Advanced Microwave Scanning Radiometer – EOS (AMSR-E). MODIS observations are used to detect the presence of snow when the polar darkness is not prevalent. AMSR-E observations are used to test the instrument's sensitivity to snow accumulation and persistence during the entire winter periods. While there is sensitivity to snow cover in both cases, the uncertainty in each is controlled by the complex terrain in these regions, specifically with respect to topography and vegetation. Field measurement data, collected towards the end of each accumulation season, are used to develop an independent spatially extensive verification data set to test the satellite observations from both MODIS and AMSR-E. The paper reports on the sensitivity of MODIS and AMSR-E observations to snow accumulation and provides a means of testing the uncertainty of these instrument observations in a high latitude mountain region.