Towards a Global Time Series (1981 - 2020) of Snow Extent based on AVHRR GAC Data - First Results of ESA CCI Snow Project

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Introduction
Seasonal snow cover is a crucial and challenging research issue in climate analysis and modeling. It influences energy, moisture and gas fluxes between the land surface and atmosphere; its high albedo provides a significant feedback effect in a warming climate; and its sensitivity to precipitation and temperature regimes makes it widely recognized as a fundamental indicator of climate variability and change. The Snow CCI project aims to contribute to the understanding of snow in the climate system by generating consistent, high quality long-term data sets that meet the requirements of the Global Climate Observing System (GCOS). University of Bern, Switzerland is responsible for a global time series based on AVHRR data.

Challenges
- cloud masking: overestimation in snow-covered areas; use of available cloud mask uncertainty to improve snow products
- snow cover retrieval: proof of inconsistencies due to change 3B/3A (AVHRR2 / AVHRR3) in the time series from 1981 - 2020
- aggregation: weekly and monthly compositing (max. vs mean)
- geolocation: proof of accuracy in mountains and across track (Sentinel-2, Landsat etc.)

Processing chain for AVHRR GAC data

Schedule and Outlook
Project duration (phase 1): 3 years
Kickoff: Sept. 26, 2018
First global product available (internal): end Sept. 2019

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