snow_cci

a multi-sensor climate data record of
global snow products from satellite data

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ABSTRACT:
snow_cci generates a homogenous, validated, long-term time series of snow parameters (snow extent and snow mass) from multi-sensor satellite data for climate applications. A main motivation is the discrepancy in the climatology, anomalies, and trends in global snow cover time series from different satellite snow products, revealed in the ESA GMES Satellite Snow Product Intercalibration and Evaluation project (SnowEx). The specification of the snow products is driven by the climate research community. We present the first version of the 40 years time series of global daily snow extent products from optical satellite data and of daily northern hemispheric snow water equivalent products from passive microwave data.

Product Specifications

The snow products are specified according to user requirements collected during a workshop on 29 November 2012 in Verona, Austria, and by approaching a wider user community by means of an online survey. The international snow-climate research community, other CCI projects, the members of the snow_cci climate research group provided requirements on snow products for climate applications.

Schedule for Product Generation

In the snow_cci climate data records of daily global snow extent maps are generated from optical satellite data from 1982 onwards, daily northern hemispheric snow water equivalent products are generated from passive microwave satellite data from 1979 onwards.

Climate Use Cases for snow_cci products

The snow_cci Climate Research Group assesses the value and usability of snow_cci products by carrying out climate relevant use cases:

- Regional and Global Snow Cover Trend Analysis (ECCC): Evaluate snow_cci product trends by comparative analyses and contribution to updated estimates of global and regional snow extent and SWE trends from multiple dataset analysis which also includes observationally constrained land surface models.
- Evaluation of the Phase 6 of the Coupled Model Inter-comparison Project (CMIP6) simulations (CNRS):
- Evaluation of CMIP6 simulations (coupled land-atmosphere-ocean, land-atmosphere, land-only) with respect to their capacity to correctly represent historical snow cover evolution on large scales.
- Evaluation of Earth System Model Snow Model Inter-comparison Project (ESM-SnowMIP) simulations using snow_cci products (UEB): The aim of this case study is to evaluate the use of CCI snow products to extend the evaluation of simulations over larger regions and longer times than those for which detailed in situ measurements are available.
- Use of CCI snow products to explain impacts of climate change on the hydrological regime in the pan-arcatic drainage basin of the arctic Ocean (SMHI): Use the snow_cci snow cover fraction and snow water equivalent products to investigate how their temporal and spatial changes contribute to changes on the hydrological regime over the large pan-arctic drainage basin of the Arctic Ocean.
- Multi-decadal comparison between the ECMWF ERA5 climate reanalysis and the snow_cci snow cover data records (ECMWF, external partner): Snow_cci products will be assessed for their potential contribution to ERA5 ERA5 snow runoff, with potential engagement with other operational centres.

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