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USE OF SATELLITE DATA IN ARCTIC REGIONAL CLIMATE REANALYSIS

Abstract

Due to various climate feedback mechanisms, the Arctic is now warming faster than most other areas of the earth's surface, and is considered a hot-spot area for global warming by many. The Copernicus Arctic Regional Re-Analysis (CARRA) is a regional climate reanalysis covering the years 1991 until close to real-time. It is freely available as part of the Copernicus Climate Change Service (C3S). C3S is managed by the European Centre for Medium-Range Weather Forecasts (ECMWF) on behalf of the European Commission. CARRA is coordinated by MET Norway with six international partner institutes. It is produced with a non-hydrostatic mesoscale numerical weather prediction (NWP) model, HARMONIE-AROME, on a grid mesh with 2.5km spacing and upper-air observations are assimilated with a 3D-Var technique.

Satellite data is a key component of the Arctic observing system given the scarceness of conventional ground based observations in the area. CARRA assimilates satellite data from a variety of sources such as microwave radiances from the MSU, AMSU-A, AMSU-B and MHS instruments and infrared radiances from IASI. Data derived from satellite measurements are also used like AMV and Scatterometer as well as bending angles from GNSSRO. Satellite data is also used to better describe surface characteristics such as glacier albedos and snow cover.

This presentation will give an overview of the reanalysis system with an emphasis on its use of satellite data.