



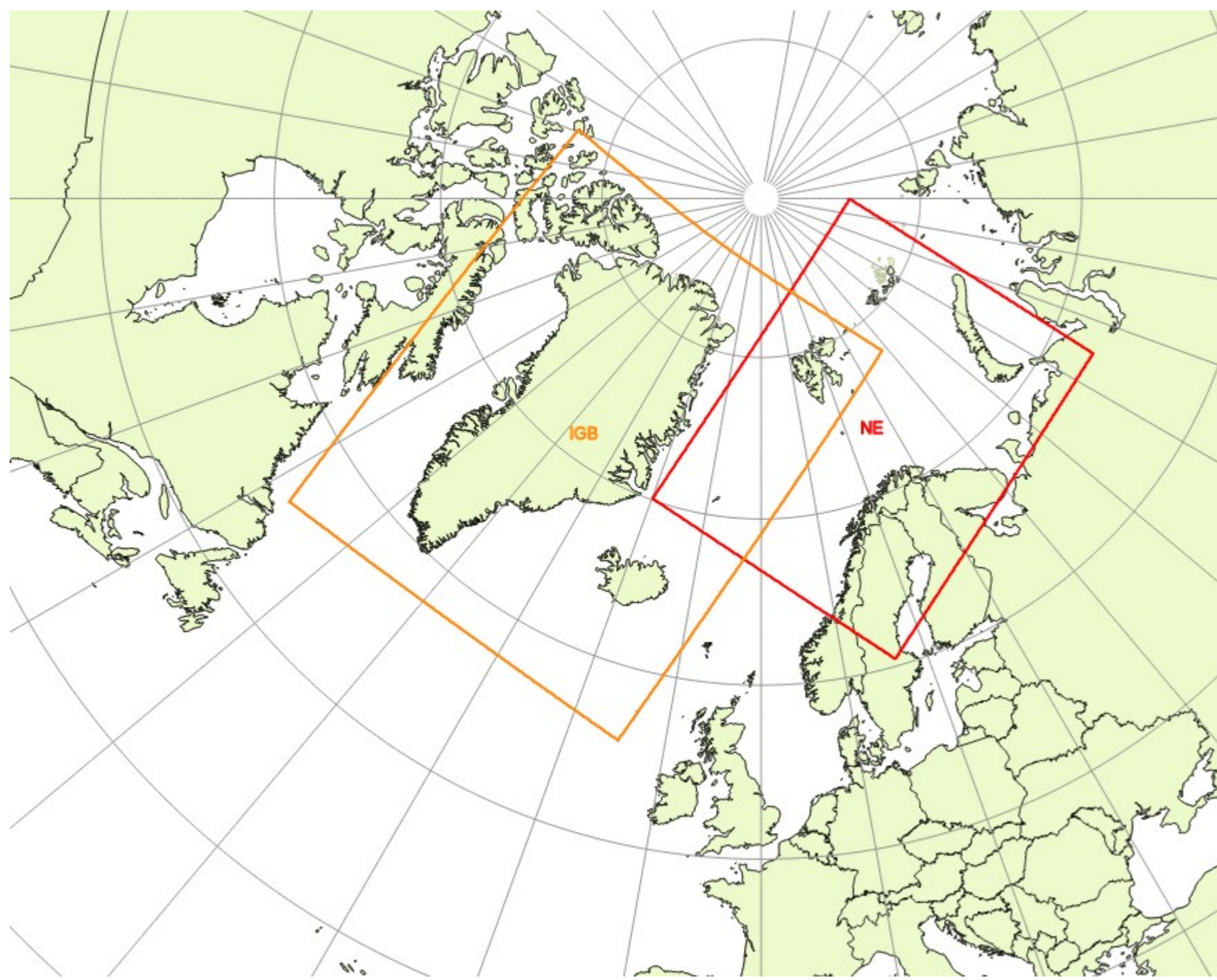
USE OF WIND RETRIEVALS IN REGIONAL REANALYSIS

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The Copernicus Arctic Regional ReAnalysis (CARRA) aims at producing a 24 year, 1997-2021, reanalysis using the mesoscale HARMONIE-AROME NWP system. Work is ongoing to extend the reanalysis back in time to 1990, so the full data set will cover the period 1990-2021. Extensive efforts have been made to include numerous input data sources such as non-GTS surface observations, satellite derived glacier albedo, fine resolution physiography,

Reanalysis system configuration

- Two domains, areas of interest in the European sector of the Arctic
- HARMONIE-AROME NWP model
- 3D-Var upper air analysis
- 3 hour cycling, i.e. an analysis is done every 3:rd hour at:
 - 00, 03, 06, 09, 12, 15, 18 and 21 UTC
- 2.5km horizontal resolution
- Hourly ERA5 analyses as lateral boundary conditions



Wind Retrievals

Atmospheric Motion Vectors (AMV)

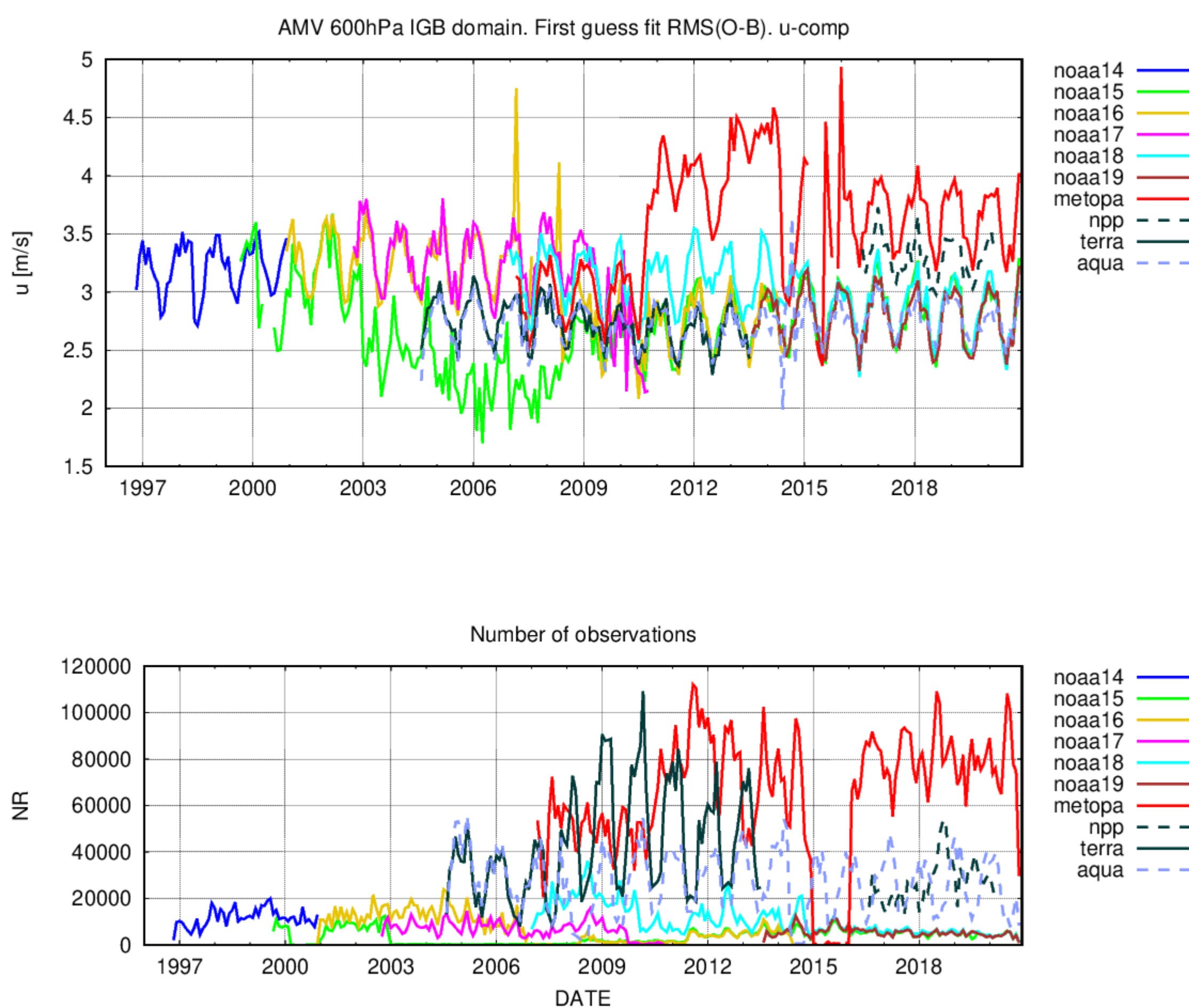
AMV data from polar orbiting satellites are available for the whole reanalysis period. CARRA uses the same data archive as ERA5 which includes reprocessed data sets provided by CIMMS (NOAA satellites) and EUMETSAT (METOP).

Scatterometer

HARMONIE-AROME assimilates scatterometer data from the OSI-SAF products. Reprocessed data are used by CARRA and include the following satellites:

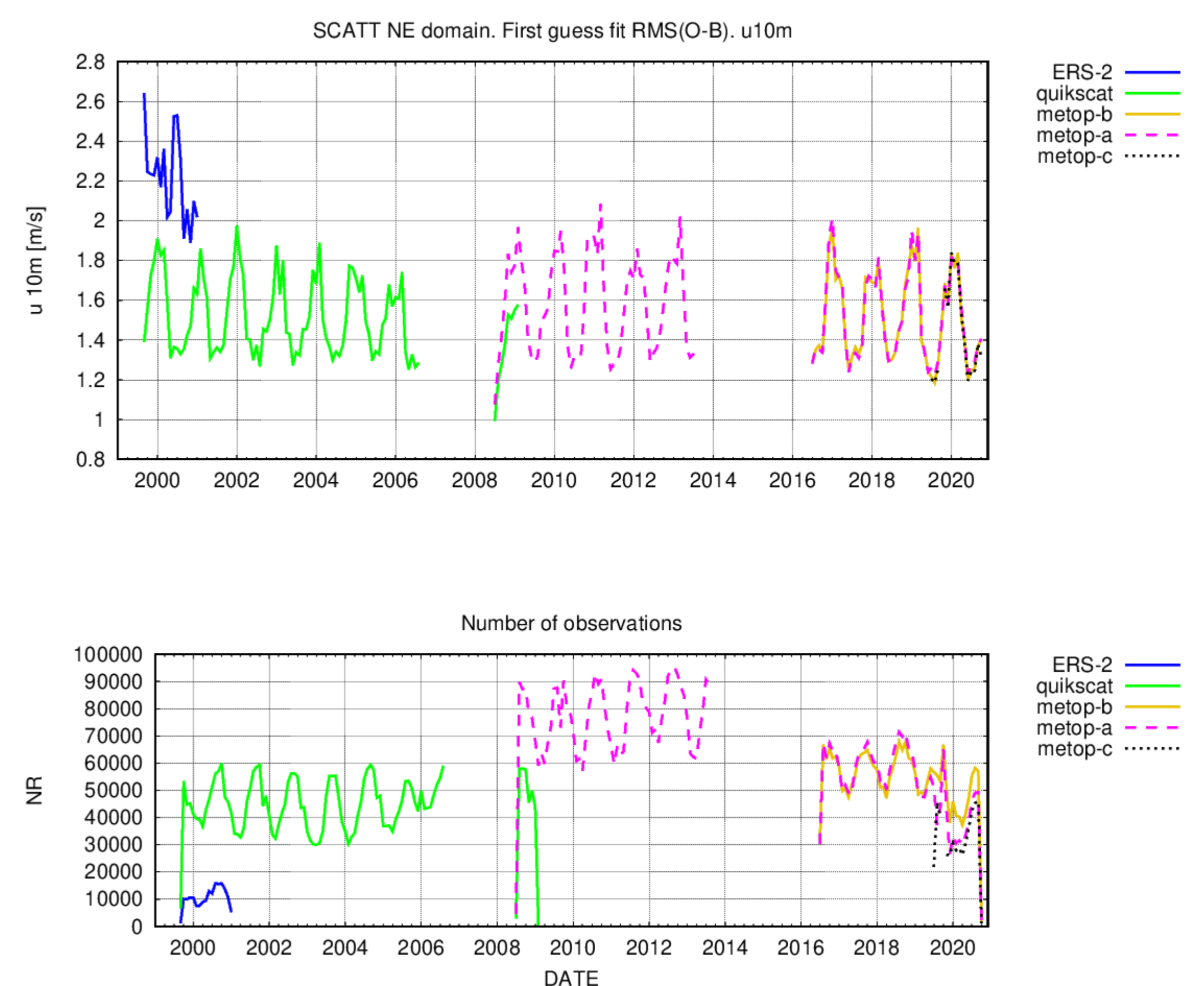
Satellite	Instrument	Years available	Reprocessed
ERS-2	Scatterometer	1997-2001	Yes
QuikSCAT	SeaWinds	1999-2009	Yes
METOP-A	ASCAT	2007-2014	Yes
Oceansat-2	OSCAT	2009-2014	Yes
METOP-A,B,C	ASCAT	2014-	No

AMV



AMV u-wind component fit to the first guess over the west CARRA domain (IGB). First guess departures (top) are averaged per calendar month to produce less noisy time series. Number of observations (bottom) are the monthly total. Statistics show the data actively assimilated.

Scatterometer



Scatterometer u-wind component actively assimilated over the east CARRA domain (NE). As for the AMV plot, data shows monthly averages (top) and sums (bottom). The data gaps around 2007 and 2015 have been investigated and scatterometer data has been used in the reanalysis in those periods. These gaps are due to an error in the statistics extraction part of reanalysis system and will be corrected

The project team

The project is led by the Norwegian Meteorological Institute. Partners are the meteorological services in the Nordic countries (DMI from Denmark, FMI from Finland, IMO from Iceland and SMHI from Sweden) and Météo-France.

