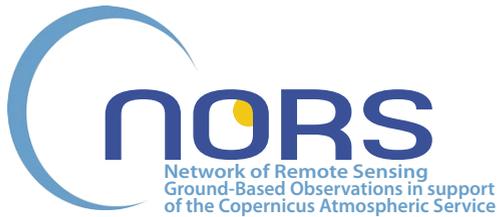


NDACC Relevant Projects



NORS: a contribution to the quality assessment and improvement of the Copernicus¹ Atmosphere Service

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NORS (<http://nors.aeronomie.be>) stands for “Demonstration Network Of ground-based Remote Sensing Observations in support of the Copernicus Atmosphere Service (CAS)”. It is an EU FP7 project (grant agreement 284421) that started in November 2011 and will last until mid-2014. It aims at demonstrating the value of ground – based remote sensing data from the Network for the Detection of Atmospheric Composition Change (NDACC, <http://www.ndacc.org>) for quality assessment and improvement of the Copernicus¹ Atmosphere Service (CAS) products. The CAS should become operational by the end of 2014. Today, it is embodied by the prototype project MACC-II (<http://www.copernicus-atmosphere.eu/>) and therefore NORS is cooperating closely with the MACC-II community, and in particular with the MACC-II Validation subproject.

NORS is a demonstration project: it relies on 4 European NDACC stations that are Ny-Ålesund, the Alpine station, Izaña and île

¹Formerly known as GMES, Global Monitoring for Environment and Security

de La Réunion, and it involves the 4 major NDACC measurement techniques: Ozone DIAL, microwave radiometry, UV-Visible spectrometry (DOAS and MAXDOAS instruments) and infrared spectrometry (the Fourier-transform infrared spectrometers). Several research and developments activities are carried out in order to optimise the quality, the characterization and the rapid availability of the NDACC data products, using these stations datasets as typical representatives for the global NDACC.

The research and development activities are described hereinafter.

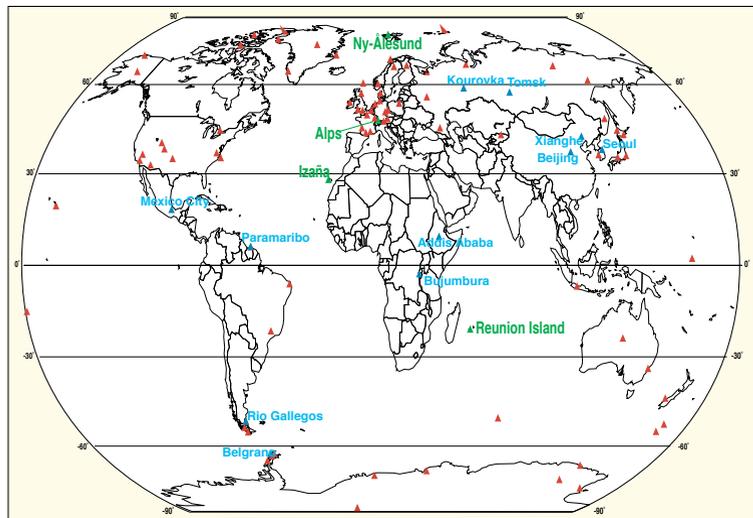
First, the data submission to the NDACC Data Host Facility will be accelerated: data will be available in the database at latest one month after acquisition, in the GEOMS HDF format. It has been decided to separate the ‘rapid delivery’ data from the fully consolidated NDACC data in the database, by submitting them in two distinct sections of the database, and by having a DATA_QUALITY indicator in the data file. This will avoid misuse of the data. The GEOMS HDF templates are being optimised for each technique in order to contain all the necessary information for a data user like MACC-II, and to be compliant with ISO and INSPIRE guidelines, e.g. for uncertainty reporting.

Next, major efforts will concern the better harmonization of the data, especially in the MAXDOAS and FTIR communities, and a better characterization.

A data documentation and a user guide will be delivered in order to clarify for a data user the information content and the representativeness of the data, and their uncertainties.

Since many techniques deliver O₃ data, NORS will also develop an integrated ozone product, that covers the whole altitude range from the ground to the upper atmosphere, integrating the infor-

NDACC Sites



▲ Operational NDACC stations ▲ NDACC stations selected as pilot stations in NORS
 ▲ Stations to be developed in NORS to potentially become NDACC stations

Map of stations taking part in the NORS project. The red triangles show operational NDACC stations. The green triangles are stations that already are operational in NDACC and that have been selected as pilot stations in NORS. The blue triangles denote stations that have an active measurement programme and that are capable of NRT data delivery, but they are not part of the NDACC Network.

mation from the various observations.

In addition, integrated tropospheric column data will be developed, based on surface in-situ data, representativeness information and model profiles, in order to validate the ground-based remote sensing tropospheric data, and to trace them back to international standards.

Last but not least, NORS data products will be used for the validation of MACC-II products, on a regular basis, via a Web-based server. The server will on the one hand deliver standard comparisons between NORS and MACC-II products on a fully automatic basis, and on the other hand provide an interface to let the user make customized comparisons. The system is designed in a modular way: it will be possible to ingest additional NDACC data beyond the NORS demonstration dataset, and model data different from MACC-II, for evaluation purposes. The validations and quality assessments will cover the MACC-II forecast data as well as the reanalysis data. In support of the interpretation of the MACC-II product validations, NORS will also deliver a compilation of validation results of the satellite data that are assimilated in MACC-II.

As said before, NORS is a demonstrator. In NORS, work is going on for the development of additional sites outside Western Europe: by making them benefit of the experience and tools developed in NORS, we hope to bring them up to speed to become fully operational NDACC sites that support the CAS. The ultimate goal is that NDACC as a whole contributes to the quality assessment and improvement of the CAS as soon as possible.

Even if NDACC has been conceived as a research network, and even if it should continue to play this role, NDACC should also commit itself to provide the necessary data to support the Copernicus Atmosphere Service and GEOSS.

It must be stressed that sustainable support to a NORS-type activity is required to guarantee reliable high-quality information about the atmosphere and its impact on air-quality, ozone and ultraviolet radiation, and climate, on the long-term and global scale, in the Copernicus Atmosphere Service beyond 2014.