

SC Teleconference #3

14 April 2014

Meeting Minutes

1. Introduction

The third SC Meeting was organized in the form of a teleconference on Monday the 14th of April 2014.

The teleconference started at 10h00 and ended at 11h30.

2. Participants

Name		Short name	Role in project	Institute
Martine	De Mazière	MDM	Project Coordinator	BIRA-IASB
Nathalie	Kalb	NK	Project Manager	BIRA-IASB
Bavo	Langerock	BL	Scientist	BIRA-IASB
Klemens	Hocke	KH	WP3 Lead	UBern
Andreas	Richter	AR	WP4 Lead	UBremen
Maud	Pastel	MP	Collaborator in WP6	CNRS
Thomas	Blumenstock	TB	WP7 Lead	KIT
Sander	Niemeijer	SN	WP8 Lead	S&T
Leo	Breebaart	LB	Collaborator in WP8	S&T
Geir	Braathen	GB	Steering Committee	WMO
Oksana	Tarasova	OT	Steering Committee	WMO/GAW
Bojan	Bojkov	BB	Steering Committee	ESA
Jean-Christopher	Lambert	JCL	Steering Committee	BIRA-IASB

Excused:

Name		Short name	Role in project	Institute
Stephan	Henne	SH	WP5 Lead	EMPA
Sophie	Godin-Beckmann	SGB	WP6 Lead	CNRS
Emmanuel	Mahieu	EM	WP9 Lead	ULg
Mette	Müller	HSA	Steering Committee	EEA
Richard	Engelen	RE	Steering Committee	ECMWF/MACC-II
Vincent-Henri	Peuch	VHP	Steering Committee	CNRS

3. Agenda

1. Status of the project and progress of work packages
2. Status of deliverables
3. NORS follow-on
4. NORS Final Workshop
5. Status of action items
6. Interactions between NORS, MACC-II, ESA, GAW and NDACC & Feedback/suggestions from SC members

7. AOB

4. Minutes

MDM welcomes the participants.

4.1. Status of the project and progress of work packages

4.1.1. WP1 Project coordination

All minutes of meetings can be found on the private part of the website (documents). NK will circulate the minutes of this teleconference for correction and load the final version up on the website.

MDM informs the Steering Committee that a four months extension of the project (without additional budget) has been granted to bridge part of the gap between the end of NORS and the start of CAS. The official end of the project is now 30 November 2014. The final workshop will thus take place in November, which is a much more suitable period than the summer period.

4.1.2. WP2 Project outreach

The public part of the website contains publications, presentations and deliverables that are of public nature. The private part of the website contains the deliverables that are of restricted nature and working documents. To access the private part of the website, one needs an account (see bottom of the Login Form to create an account).

Many NORS partners will present NORS material at EGU, especially from WP4. They will be posted on the NORS webpages.

AI-SC3-82: All to send NK their presentations at EGU about NORS

AR mentions that the session at EGU dealing with profiling from UV Vis measurements is almost exclusively about NORS. It is chaired by Stephan Beirle from MPIC and Folkard Wittrock from UBremen.

4.1.3. WP3 Rapid data delivery at 4 NDACC stations

KH says that the data center works well. He would like to make a software in order to visualise who is submitting which data. The goal is to have a good overview on the status of the directory. MDM suggests contacting Jeanette Wild (manager of the NDACC database) to see if she doesn't already have such a tool. GB confirms that she certainly already has such software. LB says that a recursive directory listing with the necessary information is automatically generated on the ftp site of NDACC itself ('ls -r' command). He also adds that, as a VIP user of the validation server, one can see the list of NDACC files that the server knows about, which is basically everything that we generate reports for. This is a nicer interface than the ftp files and allows to quickly drill down to a certain month to see which files are being submitted in the context of NORS (GEOMS template, supported instruments, etc.).

KH estimates that we have achieved about 80% of data submission.

4.1.4. WP4 Advanced characterisation of NORS data products

Data Formats

While the basic definition of the GEOMS data format was done at project start, further refinements were needed to include additional information such as on clouds and to optimise the usability in the validation server. More additions to the format are currently under discussion to account for stations experiencing strongly varying solar zenith angle ranges which is so far not foreseen for UV/Vis instruments and adding information on the spatial volume for which the measurements are representative.

MDM comments that the GEOMS format was adopted in NORS. Along the project, we realise that some issues are missing in the data files or are not well reported. We are thus still improving the formats. This is quite inconvenient for the users. But it improves the usefulness and the consistency in the NDACC database. AR adds that NORS is a demonstration.

TB comments that he doesn't fully agree with these changes. He thinks we should limit these to once every 2-3 years. MDM understands his concerns, but says that some files cannot be used without these changes and we should come to a compromise.

Information Content and Harmonization of Networks / Techniques

The spatial representativeness of NORS observations has been evaluated in detail for all measurement techniques and summarised in D4.4. In addition to the vertical resolution issue which has been dealt with in many previous studies, the horizontal aspect was also taken into consideration. One relevant aspect of this is the change of solar zenith angle along the observational light path which is different for the individual observation techniques (occultation and scattered light geometry). By taking this difference into account, comparisons between MAX-DOAS and FTIR NO₂ columns in Izana could be improved.

Comparisons between measurements of the same constituent using different NORS techniques have been continued, focussing on NO₂ (MAX-DOAS and FTIR), HCHO (MAX-DOAS and FTIR) and O₃ (LIDAR, sonde, MW, FTIR). Good consistency can be achieved but only if appropriate a priori profiles are used.

Comparison between CO FTIR retrievals using different settings and spectral regions have been performed and summarised in D 4.6.

Work on better characterisation of clouds in MAX-DOAS observations continued in several groups, aiming at automated classification and flagging as well as appropriate correction in profiling retrievals. It is planned to include this information in the standard data products.

Work on retrievals of tropospheric NO₂ columns from zenith-sky observations continued, as well as retrievals of tropospheric SO₂ from MAX-DOAS observations in China.

Comparison to Satellite Observations

A literature review and summary of all existing information on satellite data consistency with NDACC (NORS) data has been compiled and is currently being finalised. It will be submitted by the end of April as D4.7.

In addition, several groups perform comparisons between various ground-based NORS data sets and satellite products (O₃, NO₂, HCHO, and SO₂).

MDM asks if the SLIMCAT stratospheric NO₂ model problem has an impact on the tool from FH for the calculation of the diurnal validation. AR is not sure but he thinks it only affects certain latitudes and seasons.

4.1.5. WP5 Integration of tropospheric products

MDM summarizes the report received from SH prior to the meeting.

4.1.5.1. Summary

All tasks in WP5 are progressing as envisaged, given the extension of the project. Final results of the WP (comparison of tropospheric remote sensing data with ground based in-situ observations) have been obtained for three years of FTIR observations at Izana and Jungfraujoch and for two years of MAXDOAS NO₂ observations at Jungfraujoch. The results in general confirm the high quality of the ground based remote sensing instruments when comparing lower tropospheric mean values versus surface in-situ observations. The comparability is increased when instead of in-situ observations, extrapolated in-situ observations, which take the given sampling volumes into account, are compared to the remote sensing data sets. To demonstrate the feasibility of such an in-situ extrapolation was one of the main goals of this WP. Uncertainties and some open questions remain in terms of the remotely sensed tropospheric profile shapes. These will be discussed in more detail in the final report. Currently the remaining transport simulations for MAXDOAS observations at Izana and the subsequent comparisons are completed and work on the final cross comparison report (D5.3) has commenced.

4.1.5.2. T5.2 Emission sensitivities

Emission source sensitivities are required by the surface data extrapolation method to compare different sampling volumes (in-situ, remote sensing sub-columns). Sensitivities are calculated by backward Lagrangian dispersion simulations. These have been completed previously for 3 years of FTIR comparison at Jungfraujoch and Izana.

Since the last progress meeting source sensitivities were also completed for 2 years of MAXDOAS NO₂ observations at Jungfraujoch. These simulations take into account the approximated sampling volume of the MAXDOAS instrument as specified by the horizontal viewing distance obtained from the geometric approach.

Simulations for MAXDOAS O₃ and NO₂ observations at Izana are currently ongoing, after the observational data were delivered by INTA at the beginning of March.

4.1.5.3. T5.2 Extrapolation of surface in-situ data

As for the source sensitivities this task was previously completed for 3 years of FTIR observations at Jungfraujoch and Izana and for 2 years of MAXDOAS NO₂ observations at Jungfraujoch. The extra-polation method (as described in D5.1) had to be modified to accommodate the specific requirements for NO₂ simulations. In contrast to previously simulated species (CO, CH₄ and O₃) NO₂ could not simply be treated as a passive tracer, but NO₂ lifetimes and simplified NO/NO₂/O₃ chemistry had to be considered to achieve reasonable model performance. However, compared with the transport model performance for the FTIR species the performance for NO₂ is relatively poor, but does not show a significant bias (Figure 1). The extrapolation of the surface in-situ observations adjusts the simulated NO₂ profiles such that these can serve as a reference for the MAXDOAS observations.

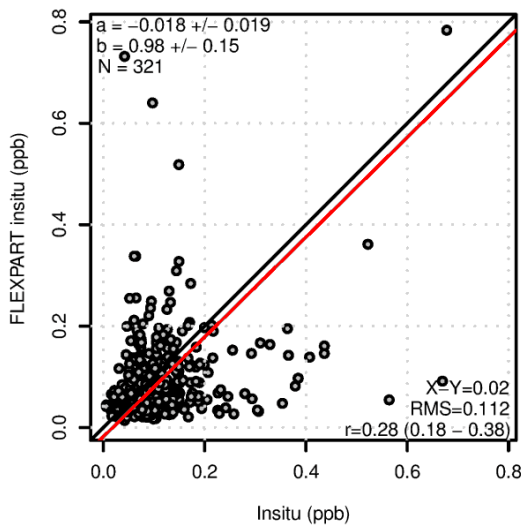


Figure 1: Simulated vs. observed in-situ NO₂ mole fractions at Jungfraujoch for the year 2011.

Extrapolation of in-situ data for Izana MAXDOAS observations will commence once source sensitivity calculations are complete. The task should be completed by the end of May 2014.

4.1.5.4. T5.4 Validation

The validation of remote sensing tropospheric products versus the extrapolated in-situ data sets has been completed for the FTIR observations. These results were already presented at the last progress meeting.

For MAXDOAS NO₂ observations from Jungfraujoch first validation/inter-comparison results are now available. While a direct comparison of the mole fractions observed in the lowest MAXDOAS sub-column and by the in-situ monitor show a clear underestimation of the NO₂ mole fractions by the MAXDOAS (Figure 2 left), the comparison between the MAXDOAS observations and the extrapolated in-situ profiles correspond much better. Especially the large underestimation was removed. This behaviour can be explained by the fact that the Jungfraujoch site is often locally influenced by transport events from the planetary boundary layer, while the MAXDOAS signal presents an average over a much larger volume extending up to 50 km towards the Swiss Plateau and, hence, outside the Alpine area where thermally-induced uplift of pollutants may occur. Therefore, the MAXDOAS sampling volume is more representative for the lower free troposphere. The dedicated transport simulations for the different sampling volumes reproduce this difference and, as a consequence, the mole fractions in the extrapolated in-situ profiles, which are specific for the MAXDOAS sampling volumes, are generally smaller than the in-situ observations. The final comparison of the MAXDOAS NO₂ product underlines the very good performance of the MAXDOAS in terms of absolute mole fractions. This is even more remarkable since the instrument is operated in an environment with generally very small NO₂ mole fractions (<0.2 ppb) often close to the detection limits.

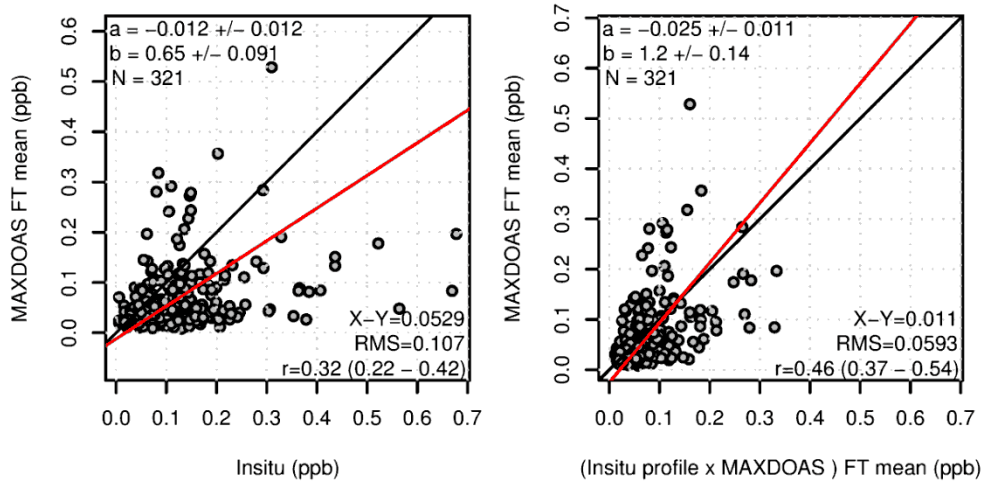


Figure 2: Inter-comparison of NO₂ mole fractions as observed in the lowest MAXDOAS sub-column (y-axis) versus in-situ observations (left) and extrapolated in-situ profiles for the MAXDOAS sampling volume (right).

4.1.6. WP6 Integration of ozone products

The main objective of this work package is to develop a methodology for integrating ground-based data sources to provide consistent ozone vertical distribution time series as well as tropospheric and stratospheric ozone columns at 4 NDACC stations (NyAlesund, Alpine station (OHP), Izaña, La Réunion). The new database is due at the end of April 2014.

The construction of integrated O₃ profiles at the 4 NDACC stations is based on the assumption that O₃ bias between all instruments at each station is linked to instrumental bias except for the Alpine stations where external parameters describing differences in meteorological conditions is required (equivalent latitude)

The database will therefore be built as follow:

For Izaña, La Réunion NyAlesund:

$$O_{3 \text{ new database}}(z) = \sum W_{\text{error}}(z) * A(z) * O_{3 \text{ FTIR,MW,LIDAR}}(z)$$

For the Alpine station:

$$O_{3 \text{ new database}}(z) = \sum (W_{\text{equi.}}(z) * W_{\text{error}}(z) * A(z)) * O_{3 \text{ FTIR,MW,LIDAR}}(z)$$

Where $W_{\text{equi.}}$ stands for the weights given by the neural network analysis, W_{error} the weight corresponding to the measurement error and A the instrument bias correction.

Status for each station:

Alpine stations: Equivalent latitude theta levels used were not high enough. We are currently running our model to retrieve additional levels.

Ny Alesund: For the stratosphere: Comparisons (profiles, column) between FTIR –MW and LIDAR – MW have been done. (There is no coincident data between FTIR and LIDAR measurements). For the troposphere, comparisons (profiles, column) between FTIR -O₃

sondes and LIDAR-O3 sondes have been made. The new database will be available soon. A new MW data will be released by the end of April.

Izaña: Since only the FTIR and the O3 sondes are available, the integration will be simpler. The study should start by the end of the week.

La Reunion: This station is the last of the study. The study will begin during mid-May. The validation of the database will occur during the O3 campaign in June.

In conclusion: Ny-Alesund and Izana station should be finished by the end of April, in any case by the second week of May, should we receive the new MW data. Alpine station will follow shortly after that. La Reunion data will be delivered by the end of June.

MP asks if she should deliver the new product in HDF format. MDM says it would be nice but there is no specific template for this product because it's a merged product. BB says that Ian Boyd will work for ESA for the next year exactly on this issue of supporting NDACC and templates. He suggests MP to contact him. He will be very happy to help her formulating a template for the data submission.

OT says that it seems that there are different methodologies for all stations. MP says that for Ny-Alesund, Izaña and La Reunion it's the same methodology (all instruments are co-located), but for the Alpine station she uses a neural network approach to combine the data from the different instruments that are located at different sites (JFJ, Bern and OHP). OT asks MP if she intends to prepare a guideline on this approach. MP confirms that this is her intention. OT is pleased to hear this.

4.1.7. WP7 Reanalysis of ground-based time series back to 2003

The objective of WP 7 is the re-analysis of ground-based remote sensing data of the four NDACC pilot stations back to 2003. These four stations are Ny-Alesund in the Arctic, Jungfraujoch, OHP and Bern as Alpine sites, Izana (Tenerife Island) in the sub-tropics, and La Reunion in the southern hemisphere. Data from different instruments like DOAS, FTIR, LIDAR and millimetre wave radiometers (MWR) are included as far as available.

The spectra of these NDACC instruments have been reanalysed according to the guidelines as outlined in MS 12: 'Guidelines for re-analysis of time series'. This document was submitted end of June 2013. Following this, the data have been reprocessed. Afterwards the resulting data have been submitted and archived in the NDACC data base. These data is available at the NDACC data archive via <ftp://ftp.cpc.ncep.noaa.gov/ndacc/station/>.

KH comments on the MW data. The Bern data are not consolidated yet¹. It's now in rapid delivery status. It could be used for trend analysis, but he's not confident on submitting to NDACC 'consolidated' yet.

TB comments that the Ny-Alesund MW data are also in rapid delivery status and that they will be submitted in standard mode soon.

¹ There is a jump in the data in 2009 related to a change of spectrometer

4.1.8. WP8 Web-based server for validation of GAS products using NORS data products

After a period of investigating and addressing the feature requests and issues collected during the validation server test phase in deliverable 9.1, on 20 Dec 2013 the NORS validation server went live.

The move from test to ready-to-use server included opening the site to the general Internet (excluding the password-protected VIP-only areas involving e.g. the experimental MACC models); publicising the site's URL; the inclusion of a more complete web site with general information about the validation; and presenting a collection of monthly intercomparison reports going back to February 2013.

A smaller number of issues and features were not yet addressed in the first live release, and these have been worked on in the period since then.

Specifically, for the last two months progress in this work package has involved:

- Improved support for correct ingestion of NORS metadata in the face of NDACC archive updates and deletions, and the subsequent required report regeneration.
- Adding support in the backend for "multiple model comparison" reporting (Taylor plots and time series reporting components)
- Investigating support for MACC models with reanalysis data (fzpr)

In addition, as the server saw more and more use (with e.g. data from new NDACC locations automatically or on request being picked up and added to the system), new issues not covered by 9.1 were identified, discussed, and mostly resolved. Work done here included:

- Discussion and handling of new versions of the UVVIS.DOAS and FTIR GEOMS templates, and subsequent investigation and quality-checking of the generated reports.
- Discussion and handling of intercomparisons with column data only but no profiles (such as now e.g. required by UVVIS.DOAS.ZENITH)
- Identified and reported issues with NDACC data for a number of stations and products.
- Discussion and handling of new intercomparisons not available before (e.g. FTIR.NO2, possibly MWR.H2O)
- Bug fixes and enhancements to web site and back end tool chain.

Remaining issues still outstanding or currently in progress are:

- Resolution of current discussion on algorithmics for zsurf.
- Support for custom user-generated reports.
- Integrating the multiple-model reports into the server and the 'report chain' itself.
- Installation of the server at BIRA.

AI-SC3-83: BIRA-IASB and S&T to plan a telecon about the moving of the server to BIRA.

MDM adds that Henk Eskes from MACC has implemented a link to the NORS server on the MACC webpages.

BB asks to hang on after the telecon with LB and MDM to discuss the implementation of the metadata templates.

4.1.9. WP9 Validation of GAS products for O3, NO2, CO, CH4, H2CO, aerosol

BL summarizes the report received from EM prior to the meeting.

Overall, the WP9 activities are behind schedule. Some issues with the NVS have been identified over the last weeks, in particular with validation report generation. In some instances, only subsets of the archives available in the data base were used to generate validation reports. This was due to metadata on updated or deleted NDACC files not percolating correctly through the system. This has been rapidly and efficiently fixed by S&T, and recent updates to the NDACC database (addition of consolidated or reanalyzed data) have correctly been accounted for by the validation server, demonstrating that this issue is now solved.

The NVS tool has therefore been used to perform validation exercises dealing with stratospheric ozone, and involving FTIR measurements at St Denis (21°S) and Jungfraujoch (47°N), for the period December 2012-December 2013, i.e. including a complete seasonal cycle. MWR measurements were also compared with MACC, for an Arctic station (Ny Alesund) and above Bern. All these results have been included in the last MACC-II validation report (issue nr 9, March 2014; see e.g. Fig. S4 on page 7).

Continuous upload of RDD files (WP3) and recent addition of the reanalyzed time series (WP7) will allow extending the comparisons. Carbon monoxide will likely be the next target of NVS validation investigations.

For the next three-monthly MACC-II validation report, BL intends to use UV-Vis data for aerosol and NO₂. MDM says that at the last telecon we discussed the CO from FTIR; that could also be an option for the next MACC validation report. MDM suggests BL to contact HE.

4.1.10. WP10 Capacity building and sustainability

BIRA-IASB:

We are involved in WP10 with two MAX-DOAS instruments:

- Xianghe, China: the complete time-series of NO₂, HCHO, and aerosols data covering the March 2010-December 2013 have been re-analysed and submitted to the NORS database, as part of WP7. Due to instrumental issues, the instrument is working in zenith mode only since January 2014. Problems will be fixed by beginning of May.
- Bujumbura, Burundi: instrument (including data transfer to BIRA) is operational since end of November 2013. We are still working on the optimisation of the retrieval settings for NO₂, HCHO, and aerosols. Our plan is to submit data covering the November 2013-May 2014 period to the NORS database by the end of the project. We would like to stress the good collaboration with the University of Burundi regarding the maintenance of the instrument.

KIT:

- Addis: Dr. Gizaw Mengistu Tsidu (Physics Dept of Addis Ababa Univ.) has got a Georg Forster stipendium from Humboldt-Foundation and is visiting us this year. Data analysis of Addis FTIR spectra is ongoing.
- Mexico: FTIR spectrometer (Bruker 125HR) in Altzomoni, close to Mexico City, is in operation. Data analysis is ongoing. NDACC certification is in preparation and will be conducted this year. Michel Grutter from UNAM (University Mexico City) is going to attend EGU and his co-worker Wolfgang Stremme is going to attend the annual NDACC/IRWG meeting this year.
- Tomsk: At Tomsk a Bruker 125M is in operation. Originally dedicated for lab spectroscopy, it is now operated in part time for lab and for atmospheric measurements. A co-worker of Prof. Leonid Sinitsa, University Tomsk, visited us end of last year. Frank Hase provided the latest version of PROFFIT to analyse Tomsk's spectra.

INTA:

IN WP 10, INTA is working within the framework of NORS, in the exporting of expertise to the new NDACC station of Belgrano.

The first period of measurement in 2014 started in January at Belgrano station. Both MAXDOAS spectrometers, UV and Vis, are in proper operation. NDACC recommendations have been applied to NORS products (DOAS stratospheric column of ozone and NO₂), although we are still waiting to be officially included in NDACC UVVIS Working Group.

Work concerning the Belgrano measurements during 2013 will be presented in the next EGU meeting.

IAP-Bern:

Seoul: A small MW-radiometer for stratospheric ozone profiling has been operated from December 2013 to the end of March 2014 at JFJ. It's a portable instrument and doesn't need liquid nitrogen for calibration.

MPIC:

There are no new activities since the last report. We are still working with our Chinese colleagues at the following topics:

- retrieval of SO₂ DSCDs
- retrieval of HCHO DSCDs
- preparing an automatic analysis scheme using the zenith measurements of individual elevation sequences of the MAXDOAS spectrometers.

CNRS:

- From the SAOZ team:
Real time retrieval in version V3 for ozone and NO₂ data of SAOZ at Rio Gallegos has been implemented. The automatic delivery with the new UV-VIS HDF format template is ready and will be implemented next week.
An instrument problem appeared for the February-March 2013 period disabling us to consolidate data. It will be done next month together with other years since SAOZ installation in 2008.
- From the lidar team:
The lidar team at Rio Gallegos has implemented the OHP retrieval algorithm. Tests file have been converted into HDF files by the CNRS lidar team.

We are currently helping them for the conversion and the delivery.

TB asks what the certification conditions before archiving are in the different working groups. MDM answers that there should be some form of formal acceptance before submitting to the consolidated NDACC database. But she doesn't know the procedures precisely for the different groups. AR is surprised that it is even possible to submit data to the NDACC database without NDACC certification. He says we should not use data from non-NDACC certified stations in NORS. MDM says this should be discussed in the individual working groups and maybe with the steering committee.

MDM says that although we have made it clear that rapid delivery data are not consolidated NDACC data through a readme file in the rapid delivery database and through a note on the main page of the NDACC website, it is maybe not enough highlighted. GB says that as long as it is clear that rapid delivery data are of lesser quality than the NDACC data, he sees no objection in non-NDACC certified stations delivering data to the rapid delivery data centre.

4.1.11. WP11 Project management

As mentioned earlier, a four months extension of the project (without additional budget) has been granted. The official end of the project is now 30 November 2014.

4.2. Status of deliverables

4.2.1. D7.1 Re-analysed time series (M27 > M28)

submitted

4.2.2. D4.7 Consistency with satellite data (M30)

A draft will be circulated between the partners in April.

4.2.3. D6.2 Integrated Ozone profile data (M30)

MP says that the Reunion data will only be delivered in June. So we need a delay for this deliverable until end of June. MP notes that the Ny-Alesund, Izana and OHP data will be delivered before.

4.2.4. D6.3 Integrated Ozone tropo- and stratospheric column data (M30)

Same issue as for D6.2.

4.2.5. D5.3 Cross comparisons report (M37)

The drafting for this report has been started. Results for FTIR are already available and are incorporated. MAXDOAS results for both sites will be available by the end of May. In parallel to the deliverable report a publication covering the deliverable reports D5.1 and D5.3 is planned to be submitted by the end of the project.

4.2.6. Other deliverables due at the end of the project (M33>M37)

D2.3 Publications / Communications (NK)

D2.4 Final NORS Workshop & report (MDM/NK)

D3.3 Final documentation of data delivery system (KH)

D9.2 Assessment of GAS products (EM)

D10.1 NDACC Capacity report (MDM)

- D10.2 NDACC status report (MDM)
- D10.3 NORS capacity and sustainability (MDM)
- D10.4 NORS as an in-situ GAS (CAS) component (MDM)

4.3. NORS follow-on

MDM summarizes the recent evolutions in terms of follow-on. BIRA will continue some NORS activities (maintain server and fix bugs) to bridge the gap between the end of MACC-II and the operational phase of CAS. Hopefully the situation will get better once we will enter the operational phase of CAS. MDM says that ECMWF has been chosen by the EC to be the coordinator of CAS. Around the end of February 2014, they have issued a sort of vision paper about how they see CAS. MDM reads an extract:

“The second is the technical activity allowing suitable provision of in situ observations from key providers, networks and research infrastructures addressing air quality, radiation and atmospheric composition. Such activities would not actually fund the acquisition of the in situ data, but merely allow their processing (quality control, format and dissemination aspects, etc.) to meet the needs of an operational Service.”

ECMWF has budgeted 1M€ per year for the in-situ component on a total of 13M€ per year for the whole service. In the next few months ECMWF will start the negotiation with the EC. They hope to be able to issue an open call by the end of October 2014 to address all the tasks that are foreseen in the CAS.

MDM says that we should continue to work on trying to include NORS into CAS.

MDM mentions that she has an appointment with Stijn Vermoote and with the coordinator of DG Enterprise at the EC on the 28th of April to discuss the NORS white paper and the continuation of NORS in CAS.

4.4. NORS meetings schedule

Month	Meeting Name	Venue	Date	Time
M2	Kick Off Meeting	BIRA-IASB	Wednesday, 14 December 2011	9:30 AM
M4	PMT Teleconference 1		Thursday, 9 February 2012	10:00 AM
M6	SC Teleconference 1		Thursday, 12 April 2012	10:00 AM
M8	PMT Teleconference 2		Tuesday, 26 June 2012	2:00 PM
M11	PMT Teleconference 3		Thursday, 13 September 2012	10:00 AM
M13	First Progress Review/Meeting	BIRA-IASB	Tuesday 20 & Wednesday 21 November 2012	
M14	PMT Teleconference 4		Thursday, 13 December 2012	10:00 AM
M16	PMT Teleconference 5		Thursday, 26 February 2013	10:00 AM
M18	SC Teleconference 2		Thursday, 18 April 2013	10:00 AM
M20	PMT Teleconference 6		Thursday, 20 June 2013	2:00 PM
M22	PMT Teleconference 7		20 August 2013	3:00 PM
M24	Second Progress Review/Meeting	BIRA-IASB	Thursday 17 & Friday 18 October 2013	9:00 AM
M26	PMT Teleconference 8		Thursday, 12 December 2013	10:00 AM
M28	PMT Teleconference 9		Thursday, 13 February 2014	10:00 AM
M30	SC Teleconference 3		Monday, 14 April 2014	10:00 AM
M32	PMT Teleconference 10		Thursday, 12 June 2014 (TBC)	10:00 AM
M34	PMT Teleconference 11		Thursday, 4 September 2014 (TBC)	10:00 AM
M37	Final Project Review/Meeting/Workshop	BIRA-IASB	November 2014 (TBD)	9:00 AM

NORS final Workshop

MDM summarizes the aim of the workshop for the steering committee.

The NORS final WS will be held in concert with the 2014 NDACC Steering Committee meeting in the week of Nov. 3 in Brussels.

Monday 3/11 - Wednesday 5/11 midday: NDACC SC Meeting
Wednesday 5/11 midday - Friday 7/11: NORS WS

We will benefit of the facilities of Belspo (Belgian Science Policy), located quite centrally in Brussels and easily accessible from the main railway stations and airport. To broaden the interest, we intend to make it a common NORS, NDACC and GAW workshop. We also want to link with ACTRIS through a session on “Aerosols, Clouds and Trace Gases”

MDM asks all and in particular GB to contact her about suggestions for keynote speakers and people to invite.

OT says it would be nice to distribute the information about the workshop to the scientific advisory group of GAW. OT would be happy to do that. OT suggests MDM to present the interactions between GAW and NORS at a GAW conference the end of September in Brazil in the frame of the 25 years anniversary of GAW. OT and GB suggest Gelsomina Pappalardo as a speaker at the NORS workshop to connect NORS with GAW and ACTRIS.

Practical information on the workshop will be sent after EGU.

Draft agenda with suggestions for key-note speakers:

NORS/NDACC/GAW Workshop on ground-based data for the Copernicus Atmosphere Service

Sessions

1. Satellite calibration and validation
Keynote talk by B. Bojkov
2. Validation of Copernicus Atmosphere Service products
Keynote talk by H. Eskes (TBC)
3. Decadal time series for trend and climate studies
Keynote talk by J.-P. Van Ypersele (TBC)

Suggestion from KH at PMT telecon 9: “The daily cycle in stratospheric ozone derived from NORS observations, MACC reanalysis and WACCM simulation data” by Ansgar Schanz (IAP-Bern)

4. Ozone and the Montreal Protocol
Keynote talk by Wolfgang Steinbrecht / N. Harris / B. Hassler (TBC)
5. Aerosols, Clouds and Trace Gases

Keynote talks by Paolo Laj or G. Pappalardo and M. Schulz (GAW reactive gases) (TBC)

Timing: plus/minus 20 talks per day
 Plus/minus 10 papers / session ⇔ 50 papers ⇔ 2.5 days
 No posters

Suggestion for Schedule:
 start Day 1 afternoon, Day 2 am + pm + Dinner, Day 3 am;
 Day 3 pm: NORS Steering Committee + project review

4.5. Status of action items

AI #	Description	Assigned to	Status
AI-PMT6-55	AR to check the reporting about the uncertainties in the files.	Andreas Richter	Open
AI-PMT9-79	AR to make INTA and FH coordinate about the photochemical correction tool.	Andreas Richter	Open
AI-PMT9-80	MDM to send the minutes of the GEOMS Metadata Board telecon and request feedback.	Martine De Mazière	Open
AI-PMT9-81	BL to send around the algorithm document to discuss the opportunity to provide the airmass profile calculation in the files.	Bavo Langerock	Open
AI-SC3-82	All to send NK their presentations about NORS at EGU.	All	Open
AI-SC3-83	BIRA-IASB and S&T to plan a telecon about the moving of the server to BIRA.	BL and LB	Open
AI-SC3-84	NK to rearrange the NORS website and make information easier to find.	NK	Open

4.6. Interactions between NORS, MACC-II, ESA, GAW and NDACC & Feedback/suggestions from SC members

GB suggests reviewing the NORS website and adding a map of the stations.

AI-SC3-84 NK will take action to rearrange the website and make information easier to find.

MDM thanks all participants and the members of the SC and closes the meeting.