Kick-off Meeting Report

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About this document

Lead author:
Max Planck Institute for Meteorology (MPI-M), Nico Caltabiano

Contacts: aq-watch@mpimet.mpg.de
Visit us on: www.aq-watch.eu

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1. Welcome session and AQ-Watch overview

Prof. Guy Brasseur, AQ-Watch coordinator, welcomed all meeting participants (Appendix 1) and gave a brief overview about the project. He introduced the overall design of the project, objectives, partners and target groups for then products that will be developed by the project. Partners will make use of a variety of datasets (model forecasts, in situ and satellite observations), and together with three international prime users (Unconventional Renewable Energies Trade Association (ACERA) in Chile, the State of Colorado in the USA, and the Municipal Government of Beijing in China), will work on the development of seven products and services:

(1) Global and regional atlases of air quality indices and reports
(2) Daily forecasts of air quality for metropolitan areas
(3) Dust and solar energy forecasts
(4) Wildfire and Visibility Service
(5) Information service about air pollution resulting from fracking operations
(6) Attribution service with focus on agricultural sources
(7) Emission mitigation service

The project will apply the spiral methodology to develop these products, through several interactions with users and partners until products are fully developed for further commercialization.

During the presentation, Prof. Brasseur also explained the Work Packages (WP) interactions, and also introduced the governance of the project, highlighting the tasks and responsibilities of each of the five different boards: five different boards: (1) the General Assembly (GA) that includes all partners; (2) the Project Executive Board (PEB) that is composed by the project core team and the coordinator; (3) the Training and Gender Panel (TGP) taking care of the training activities, capacity building and gender equality within the project; (4) the Stakeholders Network (SN) that consists of potential users that can benefit from the framework existence, and (5) the Project Advisory Board (PAB) that is composed of several external international personalities who have interests in the project goals, will review accomplishments and will advise on the directions of the project.

Monika Kacik, Research Programme Officer of the European Commission's Research Executive Agency, provided details of the call that AQ-Watch was funded, as well as issues that need to be carefully addressed by the funded projects: user engagement, market analysis, business plans, and intellectual property rights (IPR). She stressed that during the evaluation process, the business side of proposals was looked through very throroughly, and this will continue the case in the evaluation process. Also, IPR will need to be fully agreed as soon as possible.

There will be three review periods (M1-M12, M13-M24 and M25-M36), with review meetings (Interim, Technical and Final, respectively) at the end of each period. During these review meetings, the work carried out, the main achievements and the use of the resources should be presented. Regarding the financial reports, it is important to note that the coordinator is responsible to receive the financial reports from partners, check them and correct any mistakes before final reports are submitted to the EC.

Project deliverables that are flagged with the dissemination level 'PUBLIC' will be published on the project's page in CORDIS. In practical terms, once a public deliverable is approved by the Project Officer, the deliverable will be automatically sent to CORDIS for publication.

Details about finance reporting can be found in Monika Kacik's presentation on https://owncloud.gwdg.de/index.php/s/L2tR5uUn3vEOnEE

2. Work Packages Overview

This section will summarise the main issues and discussions for each WP.

2.1. Work Package 1

Work Package 1 (Identification of User's Needs and Service Design) will establish a close collaboration with the prime-users in order to develop products and services, building upon the specific user needs. This WP has the following objectives: (i) Identification of the User's Needs and elaboration of the User Requirement Document; (ii) Identification of Improved Products based on Users' feedbacks; and, (iii) Identification of the final products for commercialisation consistently with the business model. These objectives will be achieved via user consultations, the formation of a Stakeholder Network, and presentation of show cases to this Stakeholder Network.

It is important that all partners contribute in identifying new users that may be part of the Stakeholder Network, and also supporting the process of identifying the user needs. One suggestion was to send out a survey to potential new users but that request may go unnoticed. It is preferable to establish contact first, and then prompt the request to fill in a survey.

ACTION: Prepare table for partners to inform potential users/members of Stakeholder Network (Who: Project Office; When: ASAP)

Milestone 3 (MS3 - First individual meetings with the 3 prime users to discuss their requirements) is supposed to be achieve in Month 3. However, partners agree that this is unrealistic given that the first discussions about product prototypes are taking place only at the kickoff meeting. A more realistic timeframe is for these meetings to be completed by Month 6.

ACTION: Inform EC about the change in MS3 due date (Who: Project Office; When: ASAP)

2.2. Work Package 2

Work Package 2 (Exploitation and Visualization of Satellite and in situ Data) includes five tasks, in order to access the satellite and ground-based observations required for the project, and to build atlases of air quality at the global and regional scale. The objectives for this WP are:

- Preparation of an air quality dataset using data from the Copernicus Data and Information Access Services (DIAS)
- Develop an atlas including the visualization of satellite and in-situ data as well as pollution maps
- Use of satellite and surface observations, as well as of the CAMS reanalysis to provide climatologies of air pollution
- Develop an innovative method to calculate health indices and mortality from outdoor pollution using satellite observations

It is important to note that the Copernicus DIAS should be fully operational by Summer 2019. However, at the time of the AQ-Watch kickoff meeting, the system was still in development phase and not all the functionalities were working or available. Access to Sentinel datasets is available and for the purposes of AQ-Watch, NCAR can provide data from CO/MOPITT and MODIS Aerosol Optical Depth. However, due to the vast volume of satellite data, it is necessary to discuss and define which products will be essential for AQ-Watch.

In terms of ground-based observations, it will be necessary to harmonize (format, units, metadata) the available data for the three target regions. UCAR already is downloading near-realtime surface observations of hourly ozone and PM2.5, and can make the data and necessary code to read and plot data available. For the development of the regional atlas, it will be done in consultation with the prime users.

This product will probably use the same datasets for the global atlas but at a finer resolution for the three target regions, using oversampling techniques to get higher spatial-resolution fields.

2.3. Work Package 3

The overall goal of Work Package 3 (Daily AQ Forecasts at Regional Scales) is to develop and verify a set of high-resolution air quality products for the focus regions by combining the Copernicus data, satellite observations and modelling capability of AQ-Watch. The services to be provided are: (a) Forecasts of Air Quality for metropolitan areas (focus on Beijing, Colorado, Chile); (b) Dust and solar energy Service (focus on Beijing, Colorado, Chile); and, (c) Wildfire and Visibility Service (focus on Colorado, Chile). The three operational services of AQ-Watch and their evaluation will be provided by the 7 different modelling teams, some focusing on specific regions and services, some providing unifying platforms.

Different model approaches (spatial and temporal resolution) will be used and it will be a challenge integrate and evaluate those results. It will also be important to provide uncertainty, probability and predictability of the models. The use of HERMESv3_GR, a customizable emission processing system, will facilitate the combination of multiple up-to-date gridded emission inventories, including local emissions.

2.4. Work Package 4

Work Package 4 (Policy Strategy: Attribution of Air Pollution Sources and Analysis of Emission Reduction Strategies) will support the design of effective mitigation strategies to improve air quality and hence of the health of population in different regions of the world. This will be achieved through the development of a set of tools providing insight in the dominant source sectors and regions responsible for exceedances of air pollution limit values. There will be three main tasks, each one targeted at the development of one pilot services, with specific project deliverables associated with:

(i) source-apportionment service - the service will provide daily source apportionment information for all major cities and monitoring stations in the modelling domains. The emission categories to be traced will be set according to the user requirements. The results of the model calculations will be validated with available observations. In-situ observations, provided by WP2 will be used for evaluating concentrations. These observations will be complemented with satellite observations (from WP2): MODIS AOD, TROPOMI NO_2 and SO_2, MOPITT CO.

(ii) mitigation service - The tool will allow the user to visualize the effect of reducing emissions from different source sectors on the concentrations and on health indicators (using a health impact module following the WHO method). The relevant indicators will be chosen based on user requirements.

(iii) fracking service - the source attribution service will be expanded with a tool specifically targeted at one source sector. It will demonstrate the potential of add-ons to the source attribution service, where specific attention is given to one source sector and its impact on the environment. The proposed add-on in this project is dedicated to fracking.

For this last service, the project deliverable D4.3 (Assessment report with description of fracking service and impact of fracking emissions) is due in month 33. However, the task is supposed to run from month 1 to month 24. A suggestion was made to change the total time for the task until M33 to be aligned with the associated deliverable.

ACTION: Request EC to approve change of length of T4.23 from M1-M24 to M1-M33 (Who: Project Office; When: ASAP)

2.5. Work Package 5

Work Package 5 (Development of a prototype Operational Service) will develop a toolkit that contains the different prototype products and services developed in WP2, 3 and 4 and prepare the documentation associated with them. WP5 will also support the evaluation of the prototypes by the prime users by developing Key performance indices, and will also hold internal discussions among partners about data, visualization so that there is a full integration among partners.

Product specification will be done jointly by all partners, and communicated to prime users for interaction as part of the spiral process. Breezometer will develop mockups for the products, which are likely to be modular. Initial discussions will take place during the break-out sessions.

2.6. Work Package 6

Work Package 6 (Regional Co-Production and pilot implementation) will work with prime users on development and implementation of prototype products and services, in close collaboration with WP5. The three focus regions and the prime users are listed below:

1. Focus region: Colorado Front Range
Prime user: Colorado Department of Public Health and Environment (CDPHE)
Major air pollution issues: Summertime ozone, wildfire $PM_{2.5}$ and ozone, wintertime $PM_{2.5}$ (inversions)
Major emission sources: Traffic, oil & gas, urban, industrial, biogenic, wildfires (summer mostly), stratospheric intrusions (spring)
Challenges: Complex topography – modeling correct meteorology and transport is crucial
Valuable information: Next days pollution levels, inflow versus local contribution, anthropogenic versus wildfire contribution, stratospheric intrusions, burn/no-burn products. Note – for all of them meteorological information is also essential

2. Focus region: Northern Chile
Prime user: Solar Power Plants (through ACERA)
Major air pollution issues: Emission of natural Dust potentially impacting the production of electricity and efficiency of solar panels (soiling)
Major emission sources: Atacama Desert, intense mining activity (copper) and anthropogenic activity.

3. Focus region: Taoranting Street, Beijing & Cangzhou, Hebei Province
Prime user: Environmental department of Taoranting Street and Cangzhou
Major air pollution issues: Summertime ozone, wintertime $PM_{2.5}$
Major emission sources: Traffic, industrial, dust (anthropogenic and natural), urban residential (e.g. cooking, solvent use…), secondary transformation of PM from precursors, biogenic
Challenges: Regional+street coupled model, complex street level topography and real time traffic data

Users in those countries will have different requirements and needs. In the USA, the prime users may make the products available for free to public as a research product, but some companies may need some independent products and assessment for policy scenario. In Chile, forecast is necessary for some mine industries. Therefore, it is important to clearly identify who the customers are but likely that there will no single solution on how the products will be made available.

2.7. Work Package 7

Work Package 7 (Dissemination and Exploitation, Business Model and Market Development) covers the outreach activities that will be implemented during the project to present the project results and reach the targeted communities. It also provides the exploitation planning for its results and its link to standardization.

AQ-Watch will target several groups with the development of the products: international communities consisting of public services (including public authorities) and the private sector, policy and decision makers in regional government departments, NGOs and wider industries, scientific and research community applying Copernicus facilities, and society and general public at large.

In order to communicate with these groups, several dissemination and communication tools and activities will be developed. WP7 will also be responsible for developing a business case, which will be the mechanism to inform whether the project and the results are desirable, viable and achievable in relation with the investment required.

3. Break-out sessions

Participants of the meeting have split into three break-out sessions in order to further discuss specific topics.

3.1. Break-out 1: Management: observations, databases, dissemination, visualization

The group discussed the use of which satellite data would be available for the global atlas. AQ-watch will focus on TROPOMI and OMI NO_2, Ammonia from IASI and Moppit (CO with different levels). Ozone will be discussed during the second year. For regional climatology of species, a combination of all satellite, and perhaps model data. Higher resolution dataset could be useful for cities/state managers. AQ-Watch would provide the best product available, with some statistics, including trends.

For the regional atlas, in the first year the prototype should focus on the three pilot regions so that the visualization of forecasts can be tested. Using CAMS reanalysis to constrain a regional model, it would be a good idea but need to check which chemistry the CAMS reanalysis have, otherwise runs could be unbalanced. FMI can do assimilation for all regions, with CAMS reanalysis (for China is done already), for two years.

Important points to be considered: DIAS is not ready yet, and the use of those tools might be expensive. For the global atlas the storage is not a problem for now but it can be an issue for the regional and for visualization. For public data sets, perhaps it should be considered the use of Google or Amazon's cloud systems.

3.2. Break-out 2: Multi-model development/forecasts and dissemination

The group discussion refined the availability of the model runs and their specific resolution. Partners will provide the model outputs with a distributed production for the ensemble and evaluation. For the latter, observational data will be necessary, either from satellite or in situ. For China, partners need to investigate about the availability and reliability of the data from the official Chinese network.

Regarding tailored products, for dust and fires, as they may affect cities, it may be necessary to include the sources in the model domain, and this information may come from local partners and prime users. Evaluation of models should also be part of the toolkit/prototype, in order to provide confidence of the products that we are providing. If not possible, statistics will be extremely important to be included. Also, models will use the best available setup instead of similar setup for all models. The project will not perform an intercomparison of models. For emission inventories, user will dictate which one they will require. As an example, in the USA, for legal issues they only can use the EPA model, any other inventory used can be challenged in the court of law.

Regarding the reginal products, models will use the following domains:

- Colorado:
  - AQ: 36N – 42N, 101W – 110W, tropopause, CAMS global
  - dust: US west coast till Colorado
  - fires: US west coast till Colorado
- Beijing:
  - AQ: 38N – 42N, 113E – 119E, TP, up to models (AirQast)
  - dust: MarcoPolo domain
  - fires: MarcoPolo domain
- Chile
  - AQ 32S-35S, 69W-72W, Santiago dedicated inventory
  - dust: two options: 20S-25S desert+panels area or Santiago as above

3.3. Break-out 3: Management of the project, stakeholder interactions, business plan development

The group focused the discussions on AQ-Watch business plan and how to effectively communicate with users and the wider community. It will be essential to identify the requirements of the users and tell them the opportunities, perhaps through the production of mock-ups to explain what AQ-Watch can develop. From potential customers, it will be important to what are the gaps in existing systems and why those missing features are important. It is likely that most of AQ-Watch customers will be mainly public services so it is important to identify their needs.

Contact with stakeholders will be made via social media channels. Contact with AQ-Watch prime user will be done by partners in China, Chile and the USA. AQ-Watch partners will also help in identifying stakeholders for the several target groups which have been discussed by the consortium.

TG1: International client communities consisting of public services (including public authorities) and the private sector – the dedicated end-users from the 3 pilot regions and potential end-users;

TG2: Policy and decision makers in regional government departments (strategic support or prescribers to potential end-users);

TG3: NGOs and wider industries (potential users);

TG4: The specific scientific community applying Copernicus facilities and beyond, as well as the future research community (research users and capacity building);

TG5: Society at large, general public: e.g. journalists and the interested public

4. Other Business

Participants have approved the Project Executive Board (PEB) membership as below:

Guy Brasseur	Coordinator, WP1 and WP8 leader
Nico Caltabiano	Project Manager
Chenbo Guo	Grant Manager (ex-officio)
Gabriela Adler	Deputy Coordinator
Claire Granier	WP2 leader
Mikhail Sofiev	WP3 leader
Renske Timmermans	WP4 leader
Yair Giwnewer	WP5 leader

Gabriele Pfister	WP6 leader
Olivier Salvi	WP7 leader

Participants have approved the creation of the Training and Gender Panel which will be composed by Gabriele Pfister (UCAR), Renske Timmermans (TNO), Nicolás Huneeus (UChile) and Nico Caltabiano (MPI-M).

Appendix 1

AQ-Watch Kick-off meeting

11 – 12 February 2020

Venue
Max Planck Institute for Comparative and International Private Law
Mittelweg 187, 20148, Hamburg, Germany

Room
Ernst-Rabel-Saal, 3rd floor (new building)

Final agenda (v. 04 Feb)

DAY 1
Tuesday, 11th February

09:00 – Welcome and introduction of participants

09:20 – Overview of AQ-Watch (Guy Brasseur, MPI-M)

09:40 – AQ-Watch: the EC perspective (Monika Kacik, EC)

Session: Work Packages Overview

10:00h – WP8 – Management and coordination (Lead: MPI-M)

10:15 – Coffee Break

10:45 – WP1 – Identification of user needs and service design (Lead: MPI-M)

11:15 – WP2 - Exploitation and Visualization of Satellite and in situ Data (Lead: CNRS)

11:45 – WP3 - Daily AQ Forecasts at Regional Scales (Lead: FMI)

12:15 – WP4 - Policy Strategy: Attribution of Air Pollution Sources and Scenarios for Mitigation (Lead: TNO)

12:45 – Lunch

13:45 - WP5 - Development of a Prototype Operational Service (Lead: Breezometer)

14:15 - WP6 - Regional co-production and pilot implementation (Lead: UCAR)

14:45 - WP7- Dissemination and Exploitation, Business Model and Market Development (Lead: INEDEV)

15:15 – Coffee Break

15:35 – Charge to Break-out groups (Guy Brasseur, MPI-M)

15:45 – Break-out groups

Proposed break-out groups

1. Data Management: observations, databases, dissemination, visualization (8)
   - Lead: Gabriela Adler and Claire Granier

2. Multi-model development/forecasts and dissemination (6)
   - Lead: Mikhail Sofiev and Marc Guevara

3. Management of the project, stakeholder interactions, business plan development (5)
   - Lead: Nico Caltabiano and Olivier Salvi

18:00 – End of day

19:00 - Event dinner

Restaurant Brodersen
Rothenbaumchaussee 46 (corner of Johnsallee)
20148 Hamburg

DAY 2
Wednesday, 12th February

09:00 – Break-out groups summary

10:30 – Coffee Break

11:00 – Discussions (Guy Brasseur and Nico Caltabiano, MPI-M)

13:00 – Lunch

14:00 – Conclusions (Nico Caltabiano, MPI-M)

14:30 - Summary of meeting decisions with remote partners

15:00 – End of formal meeting

15:00 – 17:00: opportunity for partner business and collaborative meetings

Participants list

Name	Institution	Country
Anu-Maija Sundström	FMI	Finland
Chenbo Guo	MPI-M	Germany
Claire Granier	CNRS	France
Gabi Pfister	UCAR	USA
Gabriela Adler	BreezoMeter	Israel
Guy Brasseur	MPI-M	Germany
Hervé Petetin	BSC	Spain
Idir Bouarar	MPI-M	Germany
Larisa Sogacheva	FMI	Finland
Marc Guevara	BSC	Spain
Martijn Schaap	TNO	The Netherlands
Mikhail Sofiev	FMI	Finland
Mo Dan *(remotely)*	BMILP	China
Monika Kacik	EC	Belgium
Nellie Elguindi	CNRS	France
Nico Caltabiano	MPI-M	Germany
Nicolás Huneeus	UCl	Chile
Olivier Salvi	INEDEV	France
Petr Pridal	OctoGeo	Czech Republic
Renske Timmermans	TNO	The Netherlands
Richard Kranenburg	TNO	The Netherlands
Solange Commelin	MPI-M	Germany
Tong Liu *(remotely)*	BCC	China
Uri Hellerman	BreezoMeter	Israel
Xiaohui Ji *(remotely)*	BMILP	China
Yair Giwnewer	BreezoMeter	Israel
Yanyan Guo *(remotely)*	BCC	China