

Sub-task Number: HE-09-02b

Sub-task Title: Air Quality Observations, Forecasting and Public Information

Overarching Task: Monitoring and Prediction Systems for Health

Area: HEALTH

Related Communities of Practice: Air Quality & Health and Atmospheric Chemistry (former IGACO)

Relevant Committee: (to be determined in 2009)

Related Targets: (to be included in 2009)

Sub-task Definition (as given in the 2009-2011 Work Plan):

Provide near real-time air quality observations and forecasts for the purposes of air quality and public health management, research and public information. Assimilate Earth observations data into weather models and provide reliable 2-3 day forecasts of air quality. Harmonize standards for sharing air quality observations, forecasts, and related indices and maps for public information so authorities can intervene to reduce human health responses to diseases. Relate statistically the frequency and severity of air quality episodes with health outcomes & records to better understand the transmission pathways of human respiratory diseases. Related activities will include: Protocol Monitoring for the GMES Service Element: Atmosphere (PROMOTE); Ozone Web; PREV' AIR; and AIRNow.

Leads (GEO Member or PO, Entity carrying out the work, Contact: e-mail):

USA (EPA), Point of Contact: Phil Dickerson, Dickerson.phil@epa.gov

Motivation/Background

Air quality affects everyone, yet is difficult to evaluate and understand. The goal of this task is to link and build on various programs that inform the public about air quality in near-real time, and forecasts for the near future, in their communities. These programs allow citizens to take action to avoid exposure, and increase awareness of the health effects associated with air pollution. The state of the art at present is hourly real time information provided via the Internet, mobile devices, and through media partners. This is only available in a small portion of the world; in a number of countries, air quality monitoring occurs but observations are not publically available.

Outputs (e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)

Planned: Portable, low-cost (largely open-source), standards-based software to deliver near real-time air quality observations and forecasts to the public. Data can also be exposed to GEOSS registries and community catalogs.

Produced (current status): The AIRNow-International pilot partnership between USEPA and the Shanghai EPB is underway. An MOU between the agencies and a specification document for the software were completed in 2008. Software development is on track for Shanghai AIRNow to be online before the Shanghai World Expo, 2010.

Activities (operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)

Planned: A sustained Air Quality Community of Practice within GEO will be strengthened by a worldwide community built around sharing air quality observations and forecasts. The Air Quality community and AIRNow-International plan to meet and highlight the Shanghai pilot at GEO-VI.

Progress (current status): AIRNow-International has been highlighted during Air Quality Sessions at GEO-IV, GEO-V, and the GEOSS in the Americas symposium.

Resources (indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)

USEPA has contributed the majority of the funding for the USEPA/Shanghai EPB AIRNow implementation. SEMC has added financial resources as well. Both groups have contributed much in the human resources arena, given the number of experts on both sides that remain actively involved.

Capacity Building Component

(capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

AIRNow-International will be largely open-source and will be distributed free-of-charge. It and similar systems will become a part of a larger real-time air quality data and forecast infrastructure, ultimately making air quality information available worldwide. In addition to making air quality observations and forecasts more available, this will contribute to scientific understanding of air pollution and, in the past, has contributed to demand for air quality monitoring. By participating in the ADC's Architecture and Implementation Pilot (AIP), AIRNow-International will explore this infrastructure contribution in more depth.

2) Have any additional CB needs for this Task been identified? Please provide a short description.

Not at this time.

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User Engagement Component

(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

Science and Technology (S&T) Component

1) Please briefly describe the elements of scientific research or technological development contained in this Task

2) In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)

Members and POs' Contributions to Outputs and Activities above:

(Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the outputs and activities outlined above).

Germany

Deutscher Wetterdienst (DWD): DWD, in cooperation with the German Länder, operates the national heat warning system.

Greece

Atmospheric Modeling and Weather Forecasting Group (AM&WFG), University of Athens: Fluxes of gases (e.g. O₃,NO₂,SO₂,PSO₄) are simulated with the aid of CAMx model (<http://forecast.uoa.gr>). Observational data can be assimilated by implementing the high-resolution reanalysis system (based on the LAPS assimilation system) developed by AM&WFG.

Italy

ISPRA: In order to contribute to the sub-task Air Quality Observations, Forecasting and Public Information, the Italian project (BRACE) on air quality monitoring has been made available by publication on GEOSS portal. The database furnishes, daily or in near-real time, data regarding several pollutants. The data, downloadable, are organized by hours, days and historical series.

Norway

Norwegian Institute for Air Research: Involvement in GMES Atmosphere Core Service (MACC) and EEA Topic Centre for Air Quality and Climate Change.

Portugal

The improvement of the human health, namely the thermal comfort and air quality levels that people are subjected in outdoor and indoor environments, is the aim of this work. Evaluation not only of human thermal comfort level, but also of the air quality, caused by external and internal environmental variables, and their influence in the human health will be analysed. In order to evaluate the comfort level, a numerical human thermal and thermo-regulatory philosophy and other empirical models will be used, while the air quality, the CFD and the measuring technics will also be used. Particular attention will be given to schools environments.

USA

NOAA handles air quality forecasting for ozone and PM. Up until last year, NOAA and EPA functioned together via the former NOAA Atmospheric Sciences Modeling Division (ASMD). NOAA has worked diligently to re-establish the research forecasting capability at ARL Headquarters.

CEOS

NOAA: Demonstrate the capability of combining NO₂ data from Aura/OMI and Metop/GOME-2 to support US EPA and European emission inventories for improved air quality forecasting.

ECMWF

Contribution through EC funded project GEMS (see <http://gems.ecmwf.int/>). This EU funded project is developing comprehensive data analysis and modelling systems for monitoring the global distributions of atmospheric constituents important for climate, air quality and UV radiation.

Participation (Table to be filled in 2009):

Type	Member or PO	Representing	Contact Name	EmailAddress
Lead(PoC)	USA	US EPA	Phil Dickerson	Dickerson.phil@epa.gov
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