

MACC

Monitoring Atmospheric Composition and Climate

SOMETHING IS IN THE AIR

Viewed from space, the atmosphere takes the form of a thin layer, a protective and sustaining mantle without which life on our planet would not be possible. Both essential to life and vulnerable to mankind's influence, the atmosphere is at the heart of climatic change. Helping Europe to understand and respond better to the consequences of an evolving climate, MACC is designed to be the pilot project for the future GMES/Kopernikus Atmospheric Service.



Leonid Nyshko © Fotolia

Atmospheric composition is an essential part of the Earth System, as gases and aerosols directly affect our well-being and interact with the radiation that drives our climate. Paving the way for the future GMES/Kopernikus Atmospheric Service, MACC combines computer model simulations with world-wide observations to **monitor the**

composition of the Earth's atmosphere and predict regional air quality. From 2009 to 2011, MACC will establish the pilot GMES/Kopernikus Atmospheric Service.

MACC will monitor the distributions and long-range transport of greenhouse gases such as carbon dioxide and methane, aerosols that result from both natural processes and human activities, and reactive gases such as tropospheric ozone and nitrogen dioxide.

MACC's products and services will provide information that will support development and implementation of European environmental policy and wider international programmes. They will provide data that are critical to the understanding of climate and to the improvement and validation of the computer models that are used to predict climate change.

They will provide information important for the protection of health and for the efficient exploitation of sources of renewable energy. They will provide data that can be used in future downstream services that provide information targeted locally and at specific sectors of the user community. Development and operation of these services will provide opportunities and benefits to both public institutions and private companies.



ADRIAN SIMMONS
IS PROJECT COORDINATOR

QUESTIONS & ANSWERS

What do you want to achieve with this project?

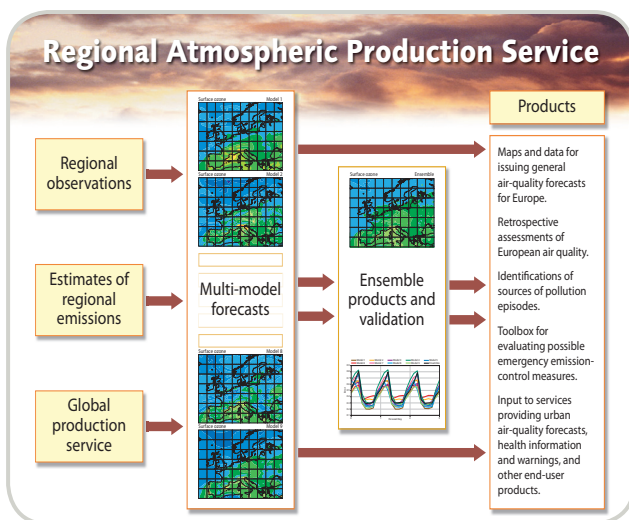
We aim for sustained operation and refinement of data analysis and modelling systems that monitor variations in atmospheric constituents important for climate, assess and predict air quality, UV radiation and solar-energy resources, and thereby meet the needs of Europe's community of users.

Why is this GMES/Kopernikus service important for Europe?

MACC and the ensuing operational service will provide Europe with the vital information needed to formulate, implement and evaluate its policy responses to the effects of climate change and poor air quality, and will strengthen the foundation of Europe's global advocacy on such issues.

How does your work benefit European citizens?

Citizens will benefit in the longer term from the policy improvements that MACC will support, and in the shorter term from better advisory and warning services, many delivered by specialist intermediate service providers, in areas such as health, transport and leisure activities.



Example of regional product supply chain.
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LIST OF PARTNERS

- European Centre for Medium-Range Weather Forecasts (ECMWF), United Kingdom
- Met Office, United Kingdom
- Centre national de la recherche scientifique (CNRS), France
- Commissariat à l'Énergie Atomique (CEA), France
- Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany
- Max-Planck-Gesellschaft zur Förderung der Wissenschaften (MPG), Germany
- Koninklijk Nederlands Meteorologisch Instituut (KNMI), The Netherlands
- Institut d'Aéronomie Spatiale de Belgique (BIRA-IASB), Belgium
- Ilmatieteen laitos (FMI), Finland
- Danmarks Meteorologiske Institut (DMI), Denmark
- Deutscher Wetterdienst (DWD), Germany
- Universität Bremen (IUP-UB), Germany
- Université Pierre et Marie Curie - Paris 6 (UPMC), France
- Ethniko kai kapodistriako panepistimio athinon (NKUA), Greece
- Météo-France (MF-CNRM), France
- National University of Ireland (NUIG), Ireland
- Sveriges meteorologiska och hydrologiska institut (SMHI), Sweden
- Agenzia Regionale Prevenzione e Ambiente dell'Emilia Romagna (ARPA-ER), Italy
- Agencia Estatal de Meteorología (AEMET), Spain
- Meteorologisk institutt (MET.NO), Norway
- Förderverein des Rheinischen Institutes für Umweltforschung an der Universität zu Köln (FRIUUK), Germany
- Commission of the European Communities - Directorate General Joint Research Centre (DG JRC)
- Institut National de l'Environnement Industriel et des Risques (INERIS), France
- Český hydrometeorologický ústav (CHMI), Czech Republic
- Administrația Națională de Meteorologie r.a. (NMA), Romania
- Instytut Ochrony Srodowiska (PIEP), Poland
- Imperial College of Science, Technology and Medicine (IMPERIAL), United Kingdom
- Forschungszentrum Jülich GmbH (FZJ), Germany
- Environmental Agency of the Republic of Slovenia (ARSO), Slovenia
- Association pour la Recherche et le Développement des Méthodes et Processus Industriels (ARMINES), France
- Nederlandse Organisatie voor Wetenschappelijk Onderzoek (SRON), The Netherlands
- University of Leeds, United Kingdom
- King's College London (KCL), United Kingdom
- Vereniging voor christelijk hoger onderwijs, wetenschappelijk onderzoek en patiëntenzorg (VUA), The Netherlands
- Umweltbundesamt GmbH (UBA), Austria
- Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (TNO), The Netherlands
- Cambridge Environmental Research Consultants Ltd. (CERC), United Kingdom
- Carlo Gavazzi Space SpA (CGS), Italy
- Flyby s.r.l., Italy
- Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique (CERFACS), France
- Centre National d'Etudes Spatiales (CNES), France
- Norsk institutt for luftforskning (NILU), Norway
- Consiglio Nazionale delle Ricerche (CNR), Italy
- The National Environmental Protection Agency (NEPA), Romania
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PROJECT INFORMATION

MACC: Monitoring Atmospheric Composition and Climate

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<http://macc.ecmwf.int>

