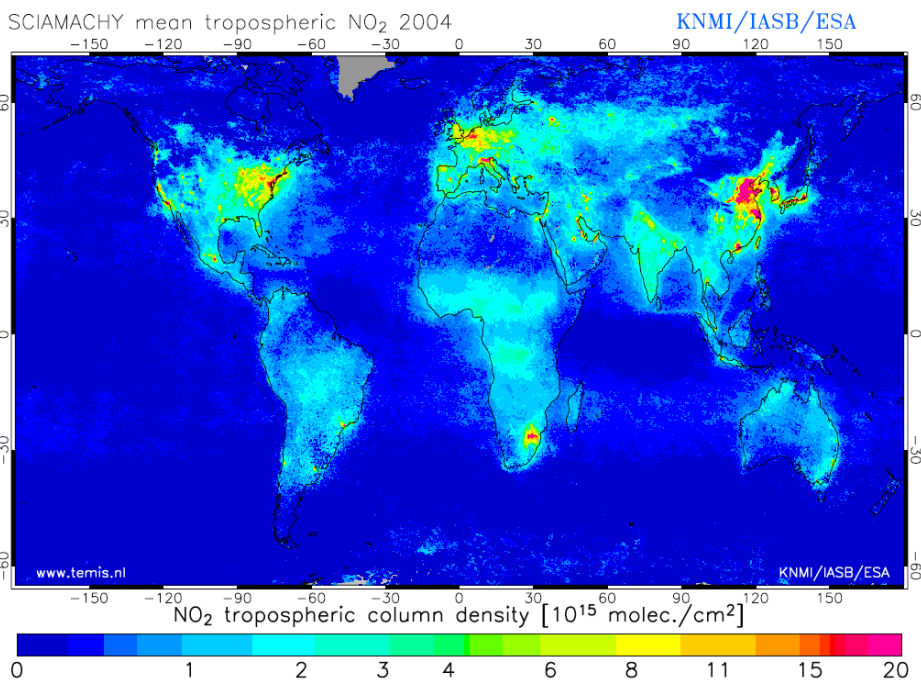


Global, European and Local Air Quality Services

The damaging effects of airborne pollutants to humans and the environment is the primary driver for related national and international legislation. In fact, air pollution and its impact on human health and ecosystems are the exact focus of the United Nations Convention on Long Range Transport of Air Pollution (CLRTAP) and of the European Thematic Strategy on Air Pollution (CAFÉ: Clean Air For Europe). Several protocols and directives implemented under these frameworks have been defined to achieve many related objectives and the PROMOTE services which focus on air quality aim to assist European agencies in performing their regulatory requirements. These services utilize satellite and ground-based data sets of atmospheric constituents in conjunction with meteorological information and chemical transport models.



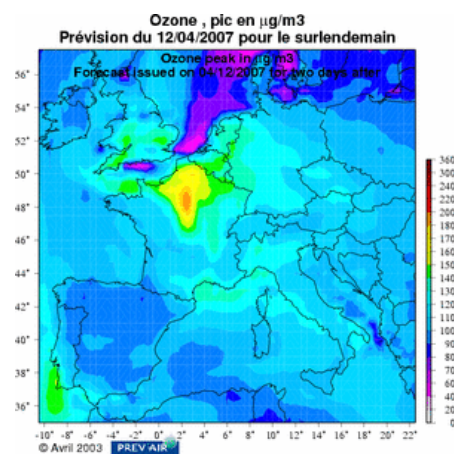
Mean global NO₂ concentration for the year 2004 derived from SCIAMACHY on ENVISAT
Source: KNMI, IASB, ESA

Air Quality Records

Within PROMOTE, two sets of records of daily, monthly, and yearly averaged maps will be delivered. The first set is of global records of tropospheric nitrogen dioxide (NO₂) and formaldehyde (HCHO) for the years 1995-2008. The second set is of near-surface records of NO₂, carbon monoxide (CO), particulate matter of size 10 microns or less (PM10), sulphur dioxide (SO₂) and HCHO for an enlarged European domain for the years 2002-2008. For these records, information is based on satellite data analysis, 3Dvar assimilation of ENVISAT satellite and, for the European datasets, ground-based measurements. The large image above shows the mean global NO₂ concentration for the year 2004.

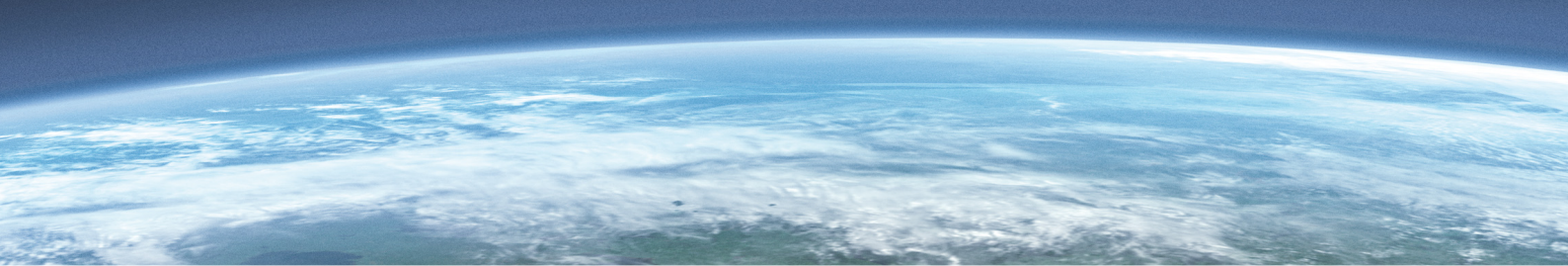
European Air Quality

One focus of PROMOTE in terms of European air quality is on short-term forecasts of air quality, as well as analysis of the recent and current air quality status. The project is developing a harmonized platform to deliver information on various atmospheric constituents from several models, in-situ measurements and from ENVISAT based satellite observations. The air quality parameters include concentrations of ground-level ozone (O₃), NO₂, and PM10 which are of particular importance for human health. Users of this information utilize such data as background conditions for their own local air quality modelling used to provide daily information to citizens and understanding the uncertainties of long-term air quality records. The two smaller images show current separate modelling results from the Prev'Air



Forecast of ground-level ozone concentration for April 12th, 2007

Source: Prev'Air



and the EURAD systems, two of the systems making up this PROMOTE service. The small figure on the previous page illustrates the forecast of ground-level ozone on April 14th 2007, as calculated on April 12th. The figure to the right is a forecast of the Air Quality Index (AQI) over Europe for the April 14th, 2007 as calculated on April 12th. The AQI is a weighted average of several air pollutants.

Local & Urban Air Quality Forecasts

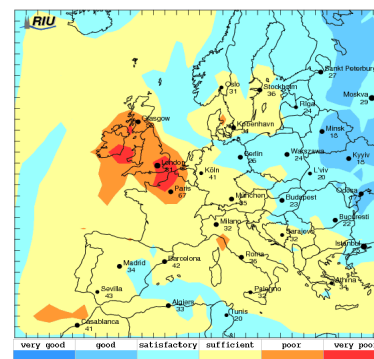
The PROMOTE services which focus on local- and urban-scale air quality aim to assist European agencies in performing their regulatory requirements, especially the communication of information on poor air quality to the general public. These services, which will cover up to 30% of the European population, utilize the European-scale air quality data sets from PROMOTE in conjunction with meteorological information and specialized local information (such as traffic patterns) in their modelling schemes. The provision of air quality forecasts to local and regional authorities allows them to take appropriate action, especially in terms of informing the general public. Additionally, several local agencies are using the forecasts to investigate the potential for alleviation of impacts to their local health services if forecasts of poor air quality are provided directly to citizens with health issues which make them especially sensitive to pollutants. The scale of the forecasts ranges from 5 km² down to street level, depending upon the area being covered. Currently the areas being covered by PROMOTE include: Helsinki, the greater London area, Antwerp, Eastern Mediterranean region, the

Netherlands, two German states, South-Eastern France, Ireland, Austria, and Switzerland. The large image at the bottom illustrates the predicted index for the greater London area related to air pollution and effects on human health.

Scenario Tool for Policy support

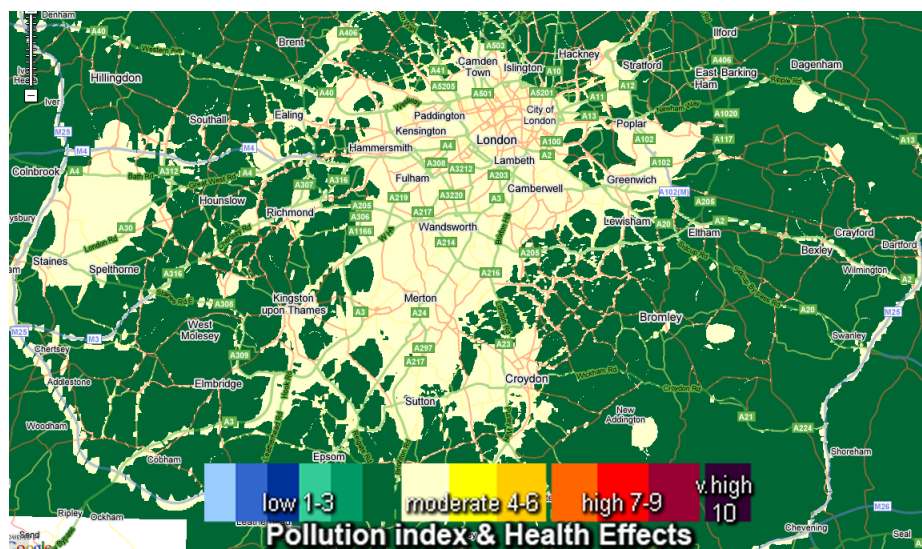
The scenario tool of PROMOTE will allow users to efficiently define emission scenarios and to evaluate their impact in air quality. The initial domain of interest is the Flanders-Holland-Ruhr area - living space of tens of millions of people. Examples for studies using this tool include estimating the effect on ambient air quality of reducing automobile traffic, as well as the potential effects of coordinating the air pollution abatement strategies among different regions. Also, the scenario tool could be very useful for the interpretation of measured pollutant concentrations, such as sudden cases of peaks in PM10 concentration.

Air Quality Index Level 1 14.04.2007 Daily Mean



Air Quality index forecast for April 14th, 2007

Source: RIU



Predicted pollution and health indices for London and surrounding areas
Source: CERC