

AMFIC

Air Quality Monitoring & Forecasting in China

HELPING MONITORING AIR POLLUTION IN CHINA

AMFIC addresses one of the most urgent issues of China today, increasing atmospheric pollution. The aim of the project is to develop an integrated information system for monitoring and forecasting tropospheric pollutants in the country. The system uses satellite and in situ air quality measurements and modelling to generate consistent air quality information. The data cover recent years and actual situation including air quality forecast for several days ahead. Air pollutants included in the analysis are ozone, nitrogen dioxide, sulphur dioxide, formaldehyde, carbon monoxide, methane and aerosol/particulate matter.

The proposed system will supplement and broaden the existing ground-level monitoring and air quality assessment activities in China. Satellite data will cover regions where no ground-based stations are available. Air quality models will fill-in the sparse temporal and spatial sampling of the measurements and connect them in a physically consistent manner.

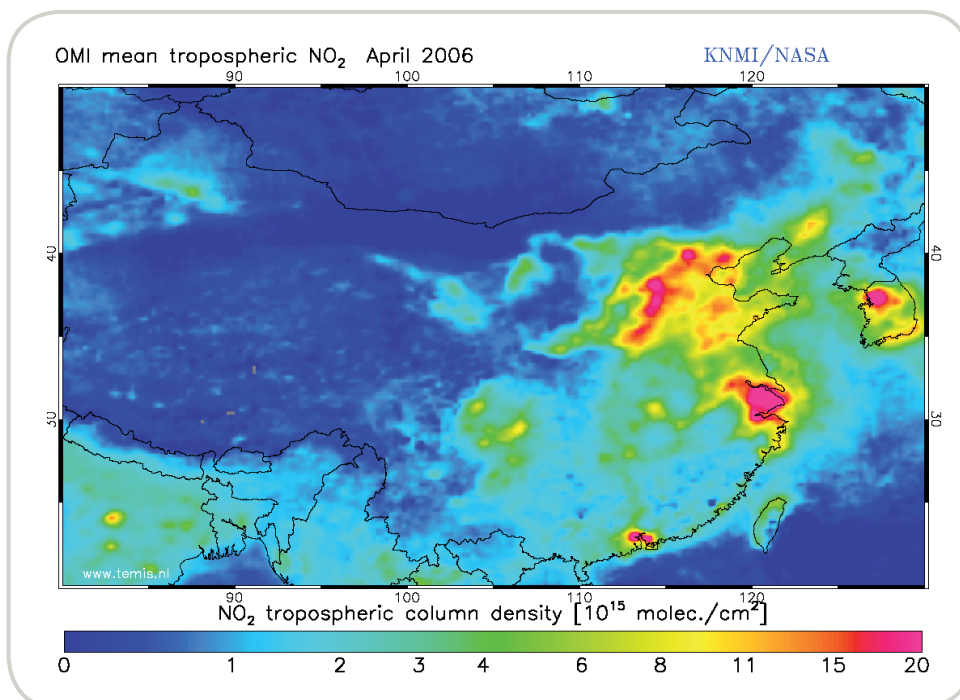
The system targets environmental agencies in China, some of whom are participating in AMFIC, and assists them in their reporting duties on air quality. A case study for the city of Shenyang will be performed. The project will also improve the understanding of the transport of air pollution within, from and to China.

AMFIC builds on aspects of the ESA GMES Atmosphere Service Element PROMOTE which has a strong potential for providing the European atmospheric monitoring contribution to GEOSS (Global Earth Observation System of Systems).

LARGE INCREASE OF NO₂ OVER SHANGHAI

The NO₂ concentration in the troposphere of China is one of the trace gases monitored by AMFIC using satellite measurements. The combined measurement series of the satellite instruments GOME and SCIAMACHY span almost over a decade, which allows for a trend analysis of NO₂ concentrations. It can be concluded that the 10-year long NO₂ dataset can be used for significant trend analysis in most parts of China. The largest trend is found in Eastern China, where the economic growth is one of the fastest of the world.

The fastest growing city with respect to economy is Shanghai and it shows the largest increase in tropospheric NO₂ with a yearly increase of about 29% since 1996. It is interesting to note that the growth in the region around Hong Kong is less than for other regions with a high economical activity. This is probably due to the already high level of economic activity in 1996 when the AMFIC trend study started, and to a package of measures to combat air pollution in Hong Kong adopted over the last years.



NO₂ concentration in China, April 2006, Source: KNMI

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LIST OF PARTNERS

- Royal Netherlands Meteorological Institute (KNMI), The Netherlands
- Belgian Institute for Space Aeronomy (BIRA-IASB), Belgium
- Demokritus University of Thrace (DUTH), Greece
- Finnish Meteorological Institute (FMI), Finland
- National Satellite Meteorological Center (NSMC), China
- Institute of Atmospheric Physics (IAP-CAS), China
- Flemish Institute for Technological Research (VITO), Belgium
- Institute of Environmental Physics (IFE), Germany
- National Observatory of Athens (NOA), Greece
- Laboratory of Atmospheric Physics (LAP-AUTH), Greece

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PROJECT INFORMATION

AMFIC: Air Quality Monitoring and Forecasting in China
Specific Targeted Research Project
Contract No: SST5-CT-2006-030940
Starting date: 01/09/2007
Duration: 24 months
EU Contribution: € 1.132.978.00
Estimated total cost: € 1.652.538

