Air Pollution Modelling for Support to Policy on Health and Environmental Risks in Europe (APMoSPHERE).

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AIRNET
A Thematic Network on Air Pollution and Health

NERAM
Network for Environmental Risk Assessment and Management

Rationale

The policy need:

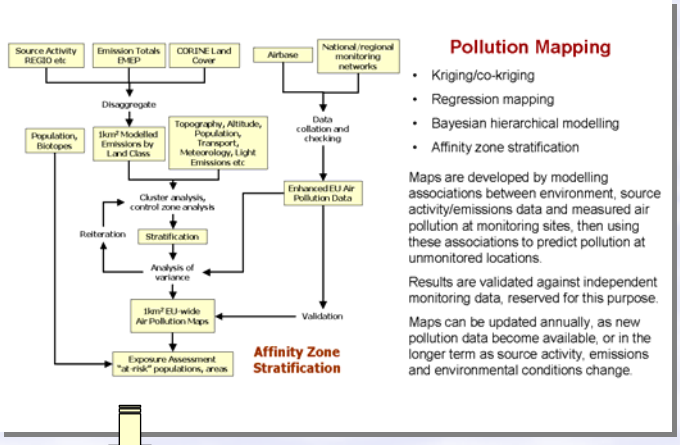
- Proper implementation and monitoring of policies to combat air pollution requires reliable, consistent and detailed information on emissions and air quality. Information is also needed to guide and monitor the effects of the many sectoral policies (e.g. transport, energy, tourism) that affect air quality.

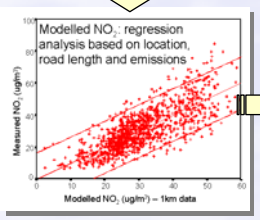
The science need:

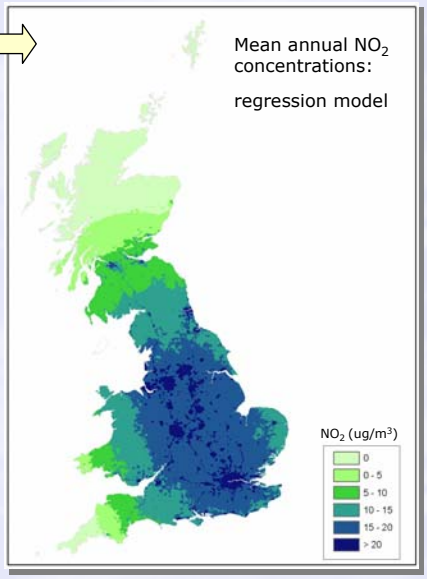
- Many of the impacts of air pollution on human health are complex and, at the local or individual level, small: what makes them important is the large populations at risk. In order to understand and assess these risks it is vital to monitor conditions over the whole EU and to analyse data from different areas in a consistent form.

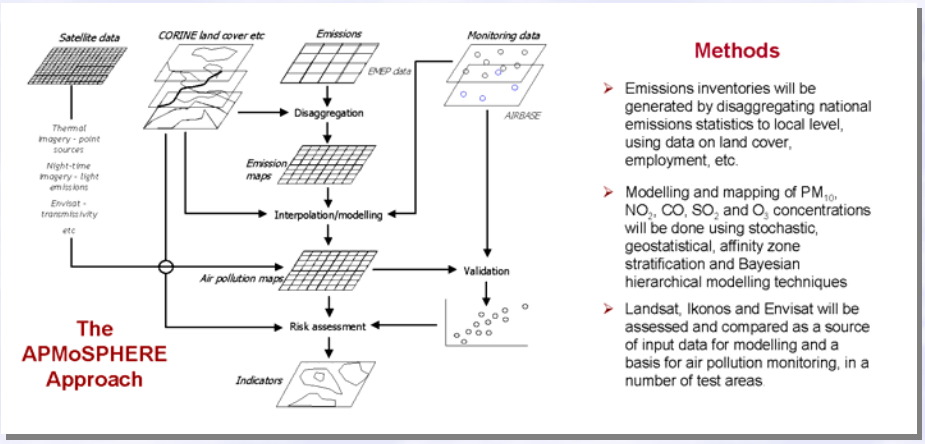
The information need:

- Current air pollution monitoring cannot provide all the data needed to support policy and science. New monitoring technologies, including Earth Observing satellites, offer great potential, but information is needed to help design and use these systems effectively, and methods are needed to extrapolate the monitoring data to areas which cannot be directly monitored.









Methods

- Emissions inventories will be generated by disaggregating national emissions statistics to local level, using data on land cover, employment, etc.
- Modelling and mapping of PM_{10}, NO_2, CO, SO_2 and O_3 concentrations will be done using stochastic, geostatistical, affinity zone stratification and Bayesian hierarchical modelling techniques
- Landsat, Ikonos and Envisat will be assessed and compared as a source of input data for modelling and a basis for air pollution monitoring, in a number of test areas

Air Pollution Information: the Problem

- Ground-level air pollution is highly variable, over both time (hours-days) and space (length-scales of 100 m +)
- Ground-based air pollution monitoring is expensive, so can never resolve these variations adequately, and cannot therefore meet the needs for information in full
- Commitment of member states to provide best available information has not yet been assured – so EU data sources are not optimal
- Existing sources of data on emissions are too coarse to provide reliable information for source attribution or air quality modelling
- EO data are little used – and technologies are not yet able to provide measurements of pollutants of interest

Objectives

- to produce a detailed (1km) inventory of atmospheric emissions (PM_{10}, SO_2, NO_x, CO) by major sector for the EU
- to develop and test a range of different GIS-based methods for mapping air pollution on the basis of these emissions estimates, in combination with other routinely available data sets (including air pollution monitoring data)
- to assess the capability of new generation satellites as a basis for air pollution modelling and monitoring at regional and local scales
- using these various methods and data sets to generate detailed (1km) and updatable maps of air pollution
- Based on the results, to develop a set of policy-related indicators on potential ecological, population exposures and health risks by intersecting pollution maps with population and land cover data
- to provide an assessment of the air pollution situation in the EU, and implications for future air quality monitoring and policy

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