

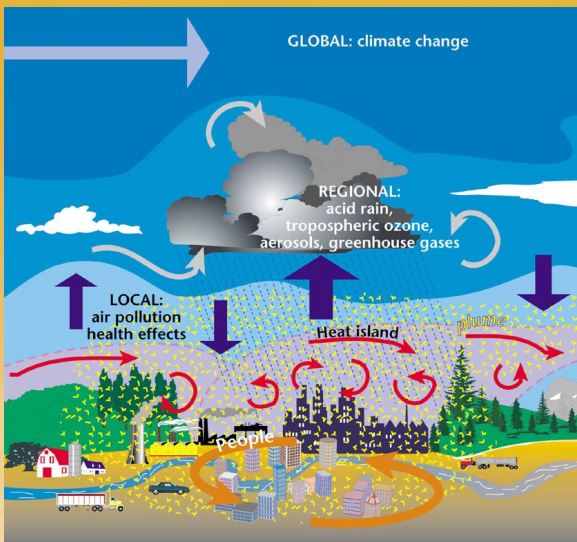
## URBANIZATION AND MEGACITIES: IMPACT BASED FORECASTS AND RISK BASED WARNINGS

### Multiple hazards in urban areas

- Poor air quality,
- extreme heat/cold weather and human thermal stress
- hurricanes, typhoons, extreme local winds
- flooding,
- sea-level rise due to climate change,
- energy and water sustainability,
- public health issues caused by the above, and
- climate change: 70% of greenhouse gas emissions from urban areas

### Integrated Urban Weather, Water, Environment and Climate Services

A priority of WMO is to enhance the capabilities of National Meteorological and Hydrology Services in conducting research and providing services for cities to deal with weather, water, climate and environmental problems.



## GAW Urban Research Meteorology and Environment Project (GURME)

GURME is an integral part of urban research and services, and its activities include:

- defining meteorological and air quality measurements that support urban forecasting
- providing cities access to air quality numerical prediction systems and monitoring information which serve as the basis for health-related prediction services, and
- promoting city pilot projects for different cities to demonstrate successful expansion of MeteoServices for urban environment issues.

Go to <http://mce2.org/wmogurme/> for list of projects.

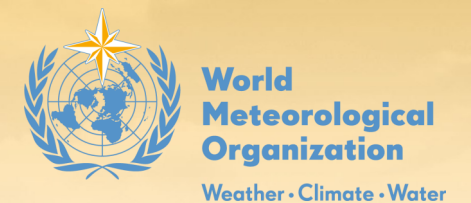
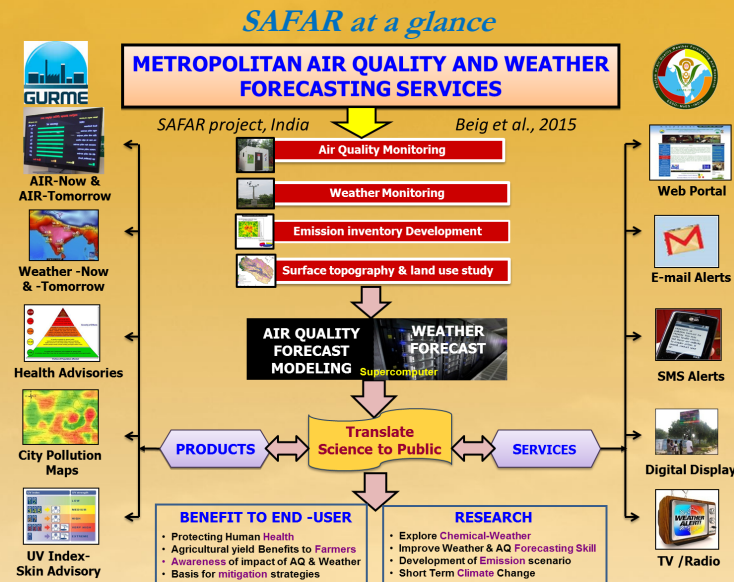
### India Commonwealth Games GURME Pilot Project

The Indian Institute of Tropical Meteorology (IITM), Pune, is spearheading the country's first major initiative named a "System of Air Quality Forecasting and Research (SAFAR)", which was successfully tested during the commonwealth Games 2010 for National Capital Region Delhi. The vision is to spread the SAFAR to other major cities in India. <http://safar.tropmet.res.in/>



## Air Quality Products and Services

### From the Global to Urban Scale



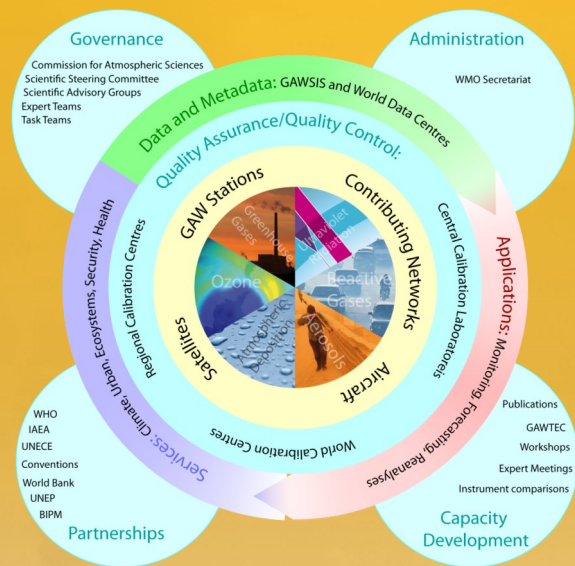
[gaw@wmo.int](mailto:gaw@wmo.int)

# Air Quality Products and Services from the Global to Urban Scales

Global Atmosphere Watch (GAW) is a global programme of the World Meteorological Organization established 27 years ago. GAW coordinates long-term observations and analyses of atmospheric composition (aerosol, greenhouse gases, reactive gases, deposition, ozone and UV radiation) and its changes over space and time, emphasizing quality assurance and quality control. **GAW delivers integrated products and services of relevance to users.**

<http://www.wmo.int/gaw/>

## Elements of the GAW Programme



## GAW's mission

- Reduce environmental risks to society and meet the requirements of environmental conventions,
- Strengthen capabilities to predict climate, weather and air quality, and
- Contribute to scientific assessments in support of environmental policy.

## GLOBAL AND REGIONAL AIR QUALITY FORECASTS AND ASSESSMENTS

Atmospheric composition matters to air quality and human health, ecosystem sustainability and biodiversity, weather and climate, agricultural food production, aviation safety, and much more.

Atmospheric models, constrained by observations from ground-based and mobile platforms (e.g. aircrafts) and satellites, are critical in providing information on global and regional air quality, and on the intercontinental transport of pollutants. Models can also be used to explore the future impact of natural and anthropogenic change on atmospheric pollution to better inform policy-makers, businesses and citizens.

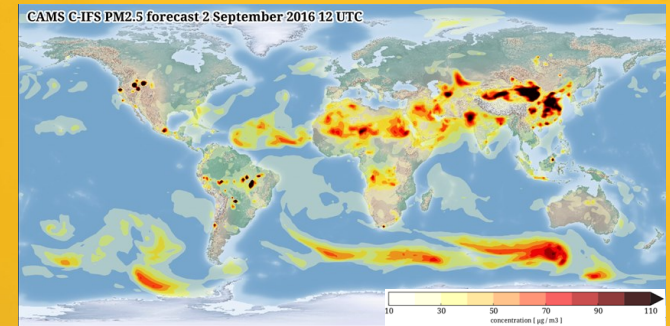
GAW is actively contributing to the development of a portfolio of new products and services, building on years of experience with numerical weather forecasting, integrating knowledge on physical and chemical processes in the atmosphere, cutting-edge computing capabilities, and in-situ and satellite observations. Core tasks include:

- demonstrating the usefulness of exchanging atmospheric composition observations in near real time in support of forecasting and assessment applications related to natural and anthropogenic air pollution, and
- exchanging and facilitating best practices.

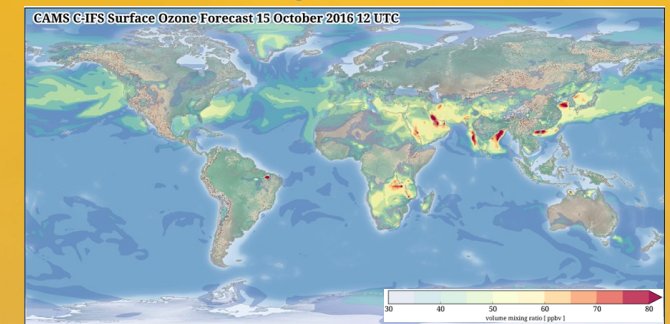
The **Copernicus Atmosphere Monitoring Service (CAM5)** is an important contributor to GAW by providing near-real-time data analyses and forecasts on multiple atmospheric chemical constituents of relevance to air quality and other environmental issues at a global and regional scale.

<https://atmosphere.copernicus.eu/about-cams>

Global forecast of fine particulate matter (PM<sub>2.5</sub>) relevant to human health, weather and climate



Global forecast of ground-level ozone relevant to human health and agricultural food production



## Sand and Dust Storms Warning Advisory and Assessment System (SDS-WAS)

A joint activity of GAW and the World Weather Research Programme designed to provide health-relevant advisories related to sand and dust storms. <http://www.wmo.int/sdswas>

