

Sophisticated computer algorithms mimicking the law of physics are used to forecast global air pollution levels

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Air quality is not a local problem. Like clouds moving through the sky, pollution is transported from one location to another by wind patterns in the atmosphere. With each breath we inhale vital oxygen, but also small amounts of potentially harmful gases and small particles. These components directly affect our health, and can be carcinogenic. Observations, both from satellite and from the ground, can provide a snapshot of the air quality. The trouble is that they have no real predictive capability. Now, thanks to a EU-funded project called MAC-II, it is now possible produce a forecast, analogous to meteorological forecast, but for air pollution.

To achieve this goal, scientists from the European Centre for Medium-Range Weather Forecasts (ECMWF), based in Reading, UK, have partnered with various meteorological and research centres across Europe. Their collaboration led to the development of the largest global air quality forecasting model, which delivers better information than the individual ones.

What makes it truly unique is that it combines global and local information. Indeed, by combining state-of-the-art computer models of the [atmosphere](#), such as used for our daily weather forecasts, with satellite and in-situ observations, they are now providing daily forecasts of the composition of the air around the globe with a special focus on Europe. "The forecast for yesterday is then compared with the

observations for today to produce the forecast for tomorrow," explains Angela Benedetti, senior scientists at ECMWF.

This combination of millions of daily observations and the predictive power of computer models is the real strength of the forecast service, referred to as the Copernicus Atmosphere Services.

The major pollutants are under scrutiny and include ozone, nitrogen dioxide, sulphur dioxide, and carbon monoxide, among others. This information is relevant to asthma sufferers, to authorities susceptible to issue traffic control guidance as a means to decrease pollution, or to government agencies such as the North Rhine-Westphalia State Agency for Nature, Environment, and Consumer Protection (LANUV), in Essen, Germany, to provide local forecasts.

Finally, the information on atmospheric composition stemming from this project does not only benefit [air quality](#) applications, but is key for the monitoring and forecasting of smoke from large wildfires or ash plumes from volcanic eruptions. What is more, greenhouse gases and short-lived climate forcers are also being monitored.

View video at: www.youris.com/Environment/Pollution.kl#ixzz2lBAehLjU

More information: www.copernicus-atmosphere.eu/

Provided by Youris.com

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