

Increasing the societal impact of satellite-based observations for air quality monitoring: applications from the Ozone Monitoring Instrument (OMI)

Iolanda Ialongo, Anu-Maija Sundström and Johanna Tamminen
Finnish Meteorological Institute
Helsinki, Finland

Monitoring the effects of human activities on the atmospheric composition is becoming more and more important for protecting both environment and human health. Satellite observations have been extensively used to monitor air quality because of their availability with global coverage, including areas where ground-based measurements are not performed. For example, satellite observations are suitable for monitoring the changes in polluting emissions from different kind of sources, such as car traffic, industry, ships and energy production. Furthermore, satellite observations are currently freely available and offer an opportunity to build financially sustainable services.

This work presents several successful applications of satellite-based data for air quality monitoring to support both public and private sector, with particular focus on Finnish society. The activities are implemented as pilot projects, based on the interaction between researchers and identified users. The results are mostly based on the observations (atmospheric concentrations of NO₂ and SO₂) derived from the Dutch-Finnish Ozone Monitoring Instrument (OMI), flying on NASA's Aura satellite since 2004.

Some of the topics covered in these applications are: (1) Satellite-based air quality monitoring in Helsinki area for local environmental authorities. (2) Satellite-based SO₂ emission monitoring to support Finnish Cleantech companies operating in the metal smelting industry sector. (3) Satellite-based air pollutants time series for oil sector company NESTE Finland. (4) Satellite-based air quality information for improving the communication to the Finnish citizens.

These activities are funded under of the Key project funding by the Academy of Finland "Forging ahead with research" through the ILMApilot project. The goal is to boost the societal impact of research by promoting scientific research and its application. The research activities have been also supported by ESA, via the Living Planet fellowship programme.