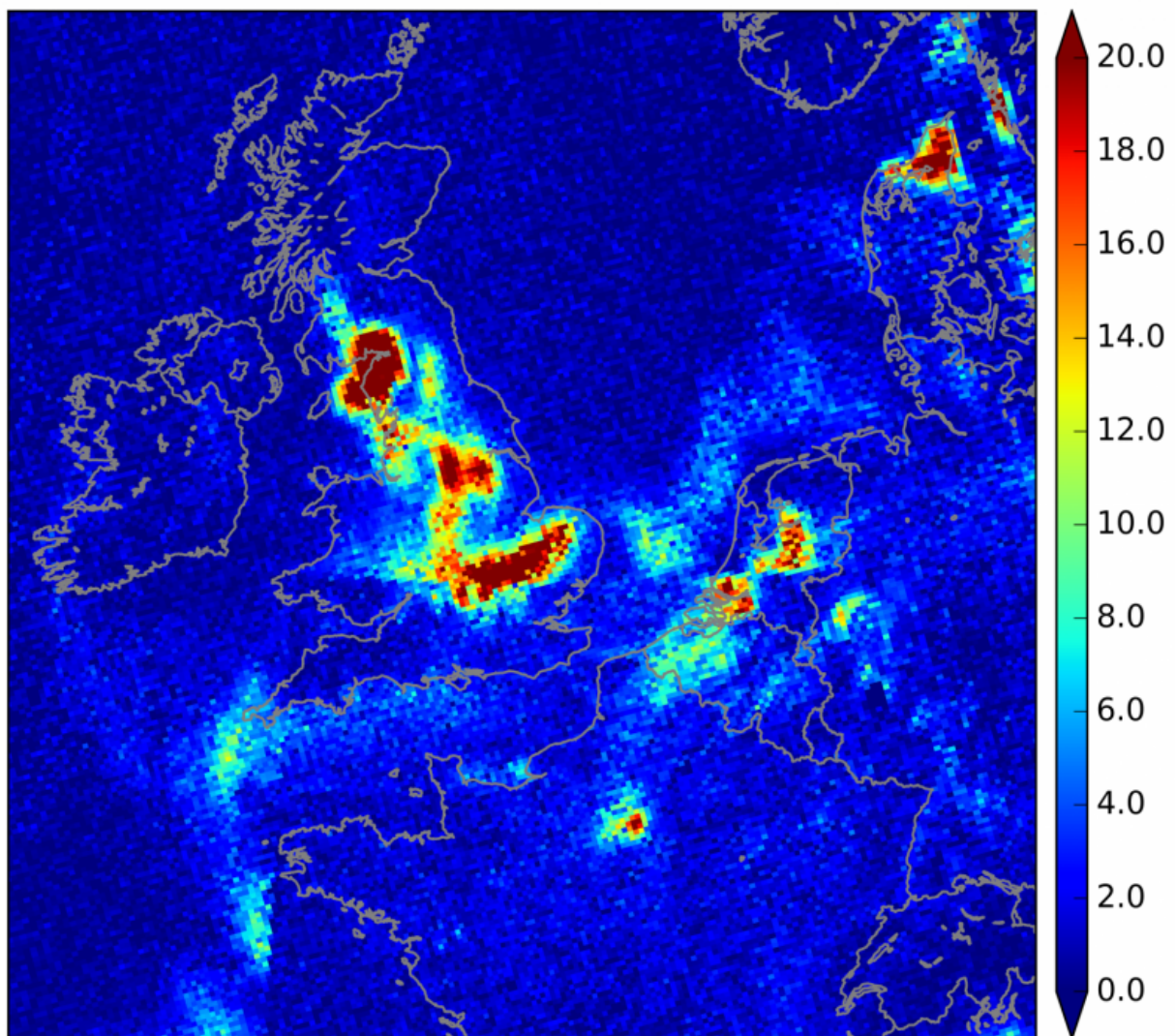


Image: Simulating Tropomi data for improved air-quality forecasts

May 16 2016



Credit: KNMI

Air quality and climate change are important challenges for society. As part of Europe's environmental monitoring Copernicus programme, the Sentinel-5 Precursor satellite will be launched towards the end of the year. It carries the Tropomi tropospheric monitoring instrument to measure atmospheric trace gases such as nitrogen dioxide, ozone, carbon monoxide and methane. It will provide daily worldwide measurements for the next seven years. The Copernicus Atmosphere Monitoring Service will use these data to forecast air quality.

Developed by the Netherlands and ESA, Tropomi is particularly innovative. It observes sunlight that is scattered back to space by Earth's surface and atmosphere, detecting the unique fingerprints of each trace gas in different parts of the spectrum.

As a significant improvement on earlier such instruments, Tropomi has a resolution of 7 km x 7 km – six times higher than the ozone monitor on NASA's current Aura satellite. In addition, the sensitivity of individual ground pixels is also significantly higher. High spatial resolution and sensitivity are very important for identifying small emission sources and for making observations in between clouds.

ESA has assessed how Tropomi-type observations will improve air-quality forecasts, computing the concentrations of trace gases for the summer of 2003. Europe was suffering a severe heatwave and high air pollution at the time. From the modelled concentrations, simulated satellite observations with realistic uncertainties have been created. This is shown in the image above and was presented at the Living Planet Symposium in Prague in May 2016. The study showed that Tropomi's [observations](#) of [nitrogen dioxide](#) and other gases will greatly improve [air-quality](#) forecasts.

Provided by European Space Agency

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