



Economical crisis detected from space: Trends in air quality of Athens in Greece

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Data from three satellite spectrometers (SCIAMACHY, GOME2 and OMI) have been analyzed together with a number of economic metrics to investigate the impact of the economic crisis (from 2008 onward) on air quality over Greece, and Athens in particular. Athens is a heavily polluted city due to the extensive number of registered vehicles, the presence of industrial regions close to the city, the complex topography of the area favouring pollutant accumulation, the intense photochemical processes favoured by high temperature and insolation and the reception of transboundary pollution.

The multiannual analysis shows a significant 30-40% reduction of primary gaseous pollutants in the form of NO₂ tropospheric columnar densities observed over Athens, during the economic recession period, indicating large reductions in pollutant emissions. This decline is further supported by surface measurements of atmospheric NO₂ mixing ratios. Additionally, the declining local concentrations of NO, CO, SO₂ are associated with an increase in ozone due to reduced titration by NO. In particular, regression analysis revealed that the reduction of NO₂ (0.3 ± 0.2 ppbv y⁻¹) and SO₂ (0.2 ± 0.1 ppbv y⁻¹) during the period 2000-2007, significantly accelerated during the economic crisis period (from 2008 onward), reaching 2.3 ± 0.2 ppbv y⁻¹ and 0.7 ± 0.1 ppbv y⁻¹, respectively. The strong correlations between pollutant concentrations and economic indicators show that economic recession has resulted in proportionally lower levels of pollutants not only in Athens but also in large parts of Greece.