

megaCITY - Zoom for the ENvironment

Reporting

Project Information

CITYZEN

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Status
Closed project

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1 September 2008

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EU contribution
€ 2 915 000

Coordinated by
METEOROLOGISK INSTITUTT
 Norway

This project is featured in...

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Final Report Summary - CITYZEN (megaCITY - Zoom for the ENvironment)

The majority of the world's population is now living in urban areas. In particular the number of megacities

(with populations over 10 million) is increasing. Megacities and regional hot spots have developed with anthropogenic emissions and changes in land usage that are likely to have large environmental implications, in terms of air pollution and climate change, both in the regional hot spots themselves and on larger scales.

The CityZen project (megaCITY - Zoom for the ENvironment), funded through the European Union's 7th Framework Programme, involved researchers from 17 institutes in Europe, Africa and Asia, and investigated the air pollution in and around selected megacities and emission hotspots for the last decade and during the 3-year project period using satellite and in-situ observations. Furthermore, a series of different scale models (local-regional-global) was employed to analyze the impacts of emission hot spots on regional and global air quality, the interactions between climate change and air pollution, as well as future scenarios and potential mitigation options. The Eastern Mediterranean, the Po Valley (Italy), the BeNeLux region, and the Pearl River Delta (China) were chosen for intensive case studies. The project was coordinated by the Norwegian Meteorological Institute.

A scientific challenge in this field of research is the multi-scale character of the issue. As megacities have the potential to impact both their local environment but also the regional to global scales, scale-bridging data sets and model systems have to be used.

Observations. CityZen has created extensive sets of satellite observations of gaseous air pollutants, aerosols, and greenhouse gases. Analyses of satellite data for the last 10 to 15 years have revealed different trends for the different regions of the world. Focused ground-based measurements in the selected CityZen regions have been collected and used for air pollution trend analyses, source attribution calculations, and to evaluate regional atmospheric models.

Emission inventories. CityZen has compiled the global MACCity emission data, which provides a two-decade long set of emission data with interannual variability, including anthropogenic and natural sources. Furthermore, fine scale emission data sets have been created for selected hot spots. These include, among others, a recent compilation of Istanbul emissions. Emission scenarios for the future, including various mitigation options, have been provided based on the Global Energy Assessment coordinated at IIASA.

Modelling. The capabilities of modeling different spatial scales in a consistent manner have been improved in CityZen through, e.g. nudging and grid zooming techniques. Numerous model studies have been performed to calculate emission dispersion, chemical transformations, and interactions between air pollution and climate change. Two coordinated model studies using the new emission data sets have specifically looked at 10-year trends (1998-2007) and future development of air pollution, respectively. The goal of the CityZen project has been to quantify the influence of megacities on air quality and climate, to assess future change under different emission and climate scenarios, and to make suggestions to policy makers as to which mitigation options exist to reduce environmental problems. The results of the project, which have been published through its website, peer-reviewed articles, brochures, and other dissemination channels, should be useful for scientists as a basis for further research and for policy makers as a scientific basis for air quality legislation and city planning beyond the duration of the project.

Related documents



[final1-final-report-v24nov2011.pdf](#)

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