



Urbanization of weather forecast, air-quality and climate scenarios for Prague – Project URBI PRAGENSI

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The role of cities is increasing and will continue to increase in future, as the population within urban areas is growing faster and cities themselves are becoming larger. Artificial urban surfaces are specific by many kind of properties and complex structures and geometry give rise to specific processes affecting the urban environment. To assess the impact of cities and urban surfaces on climate and weather, the modelling approach is commonly used and the inclusion of urban parameterization in land-surface interactions is of primary importance to capture all the urban effects properly. This is especially important when going to higher resolution, which is common trend both in operational weather prediction and regional climate modeling and which is necessary for proper assessment of potential impacts within the cities as well as of the effectiveness of adaptation and mitigation options applied. This is extremely important not only in e.g. extreme heat waves impact prediction in urban environment with direct effects on the population, but in air-quality prediction or in long term perspective in connection to climate change impacts as well. Moreover, it is important to assess the uncertainty of these effects, in relation to the climate change scenarios uncertainties. These are main tasks of the new project within Operational Program Prague - The Pole of Growth entitled Urbanization of weather forecast, air-quality and climate scenarios for Prague, with short title URBI PRAGENSI.

There are four main objectives of the project:

- the urbanized weather forecast for Prague in very high resolution of 1 km, using urban parameterization in WRF model, providing potential warning in case of extreme heat stress as well as eventual preparedness for that from health care suppliers
- the urbanized air quality prediction for Prague in very high resolution of 1 km, i.e. air quality prediction using chemistry-transport model coupled to the urbanized weather forecast model.
- climate change and its impacts for Prague in high resolution of 3 km, i.e. climate change impacts via downscaled scenarios runs for Prague region, with coupled air quality model option, to provide not only the information, but as well the tool for efficiency assessment of potential measures City of Prague Municipality can adopt in framework of adaptation and mitigation options within strategic development planning.
- micro-scale studies for hot-spots, using LES for selected location for test of eventual concrete measures to solve critical local problems

In all the tasks, the effort will be given to include as much as possible real adequate local data and characteristics of the urban environment, like local materials, buildings and roads dimensions etc., as well as local emission data, and as much as possible local measurement data where stations and monitoring data available, together with satellite data, will be supported by measurement campaign for models validation.

In addition to the more detailed project presentation, the overview of background and preliminary results from project preparation will be shown, based especially on inter-model comparison study as well as preliminary urbanized weather prediction case studies.