



Urban
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Integrated Framework for Urban Climate Adaptation Tool (Urban-CAT)

Cities have an opportunity to become more resilient to future climate change through investments made in urban infrastructure today. Provision of scientifically-based tools for evaluating local climate change impacts will be critical to the development of adaptation strategies designed to avoid the increasing socio-economic costs of severe weather-related damages to urban landscapes. In particular, mid-sized cities, which are home to nearly half the world's urban dwellers, lack access to the credible high resolution climate change projection information needed to assess and address key vulnerabilities arising from future climate variability in conjunction with growing population.

With its recognized strengths in earth system and infrastructure modeling as well as its scalable computing resources, Oak Ridge National Laboratory (ORNL) is developing a unique web-based decision support tool—the Integrated Framework for Urban Climate Adaptation Tool (Urban-CAT)—in response to the U.S. President's call to leverage open government data resources to build tools that will make America's communities more resilient to climate change. We are currently developing a prototype of Urban-CAT through collaboration with the City of Knoxville in Tennessee, with an initial focus on strategic and informed emplacement of green infrastructure (GI) to alleviate urban flooding and costly stormwater management (Figure). Ultimately, Urban-CAT will help urban governments to: (1) understand climate change impacts on urban infrastructure; (2) identify and prioritize adaption options for minimizing projected impacts; and (3) explore potential benefits of the adaptation options under different scenarios related to urban growth and infrastructure evolution.

The *capabilities* developed in Urban-CAT will provide a platform to: (i) facilitate communication among urban policy decision makers; (ii) promote science-driven policies and regulations for updating urban infrastructure; (iii) help to quickly identify, adapt for, and mitigate emerging environmental problems; and (iv) provide guidance for planning judicious urban development.

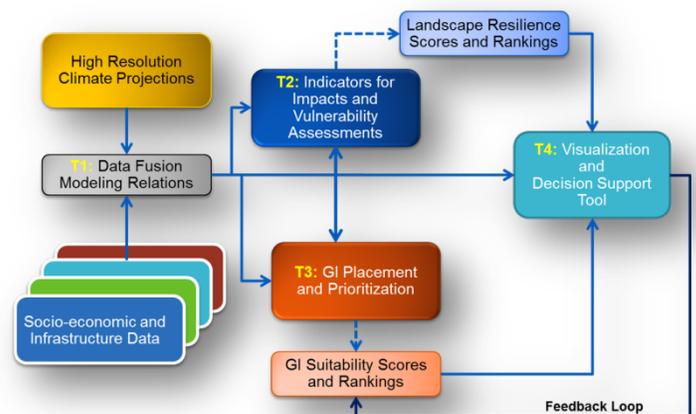
These capabilities will be achieved by:

(a) Coupling climate projections with socio-economic and infrastructure data using a spatial grid of finer resolution; (b) Assessing urban resilience using a system of indicators; and (c) Monitoring and evaluating the effectiveness of selected adaptation actions in reducing risk.

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