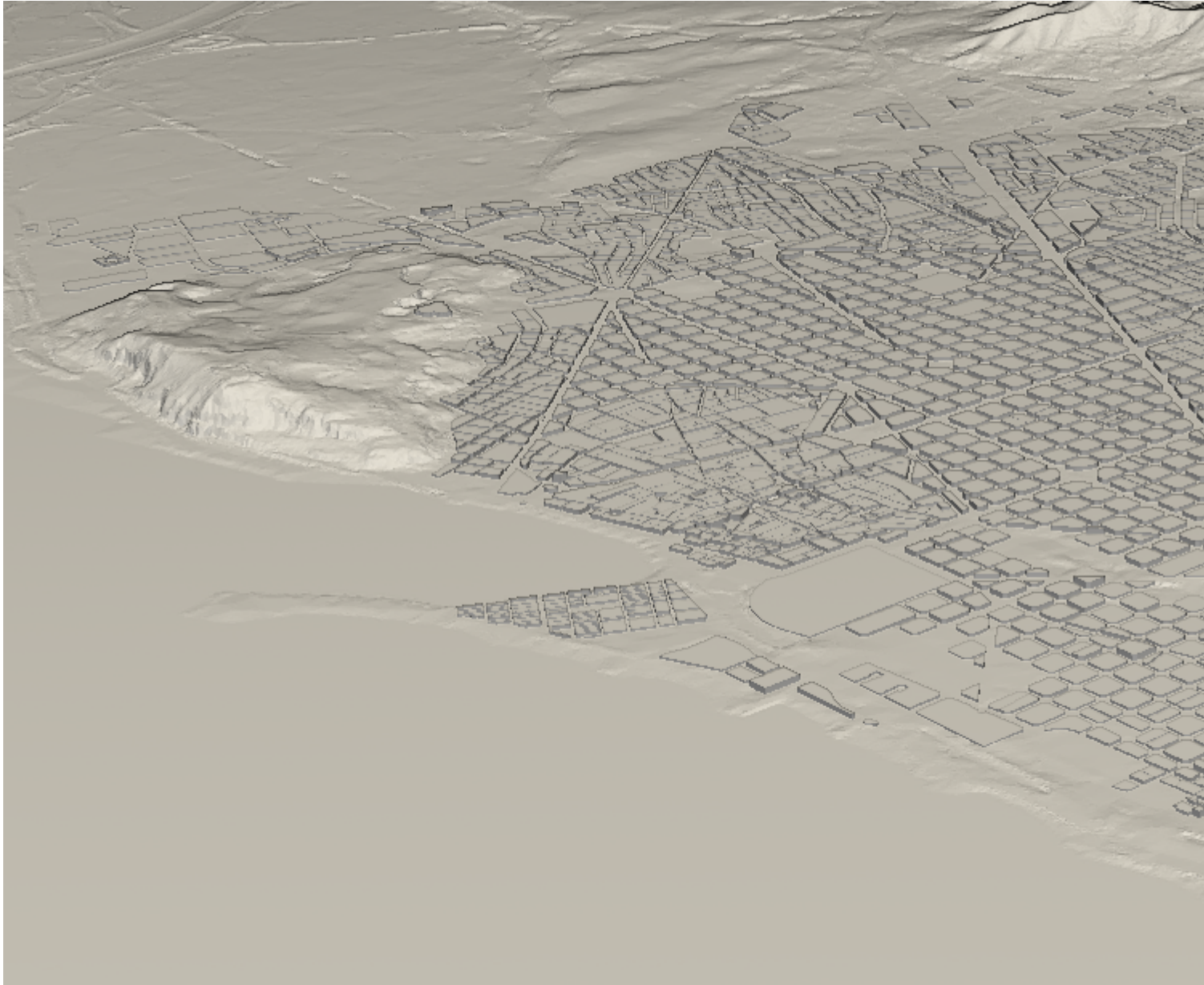


## Urban-scale Atmospheric Dispersal Modeling



Urban-scale wind and atmospheric dispersal modeling using CFD and mass-consistent approaches. Automatic city meshing including buildings and underlying terrain. Air quality mapping based on sensor deployment and linearized CFDs at city scale.

### **Summary**

The increase in computational resources has allowed to couple mesoscale numerical weather prediction models (WRF), having typical grid resolutions of kilometric size, with microscale mass-consistent or Computational Fluid Dynamics (CFD) codes solving for wind over complex terrains and/or at building scales. Urban-scale wind and atmospheric dispersal simulations require of accurate geometric descriptions of buildings and underlying terrain. For this, we combine Digital Elevation Models (DEM) for the underlying terrain, a cadastre of the target city (or metropolitan area) to limit the city blocks/buildings and LiDAR data to retrieve building elevation above terrain. The automatic procedure allows for a high-resolution computational mesh of a city used to solve for hourly winds and pollutant dispersion.

## Objectives

1. Monitoring of urban air quality parameters through numerical simulation.
2. Traffic information specification, the traffic and air quality visualization and the information delivery.

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