cityclim.eu | Factsheet

# UltraHD City Services

# Air Flow

## Administration Services

## City Air Flow Simulation

## What is CityClim?

CityCLIM is a European Union-funded project designed to develop an open platform for climate information and mitigation services. It integrates data from Earth observation sources, ground measurements, and urban weather prediction models to provide detailed weather forecasts for various European cities. The project acknowledges the significant impact of climate change on urban life, particularly the Urban Heat Island (UHI) effect, and addresses these challenges through mitigation and adaptation strategies.

### Generic City Climate Platform (GCCP)

The Generic City Climate Platform (GCCP) is a Software-as-a-Service (SaaS) solution developed as part of the CityCLIM project to provide climate adaptation and mitigation services for cities. **It integrates diverse climate data sources, including ground measurements, airborne and satellite data, to offer an advanced urban weather model.** The platform serves as a one-stop shop for City Climate Services, helping both city administrations and citizens understand, predict, and respond to climate-related challenges.

### Services

- **Citizen Climate Knowledge Services (CCKS):** A public service that informs, warns, and engages citizens on climate change and extreme weather events, encouraging awareness and adaptation.
- **City Administration Services:** A decision-support tool for city planners and policymakers to analyze, simulate, and implement sustainable urban climate strategies.

INFORM CITIZENS ON CLIMATE CHANGE

WARN CITIZENS ON ARISING HAZARDS

ONE-STOP SHOP FOR CITY CLIMATE SERVICES

SUPPORT MITIGATION & ADAPTATION STRATEGIES

ADVANCED URBAN WEATHER MODEL

ADVANCED URBAN WEATHER MODEL

CityCLIM

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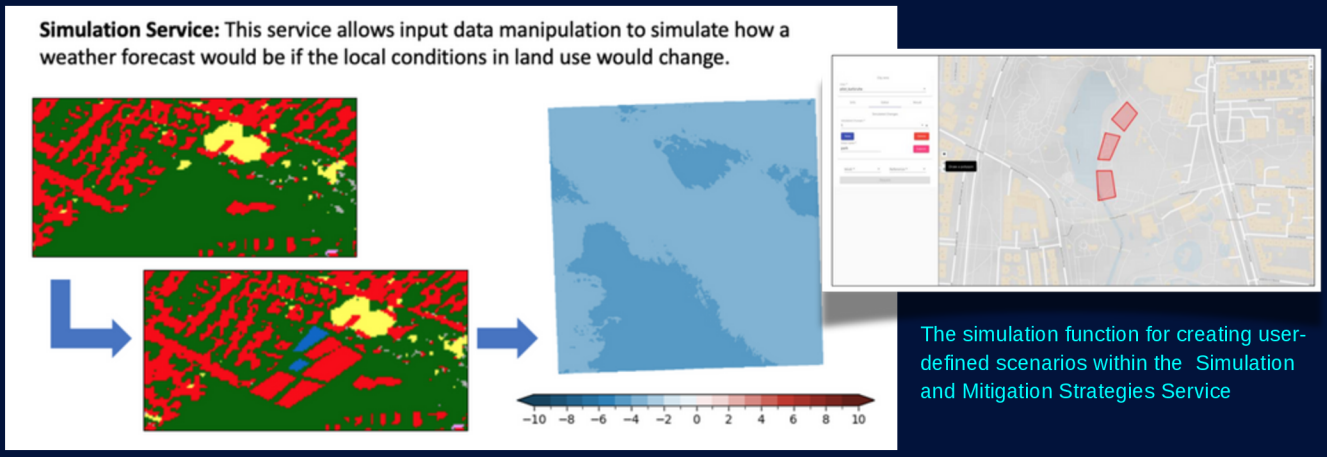
# City Airflow Simulatuon

The CityCLIM solution features a Simulation Editor that enables users to simulate urban characteristics by modifying land cover types and elevation. Users can create simulations by drawing colored polygons on a map, which represent different land cover types, and adding elevation data. All changes are automatically saved and can be reviewed or continued. Users can also request simulated runs for a specified reference period, triggering a simulation engine to generate manipulated EO data. The service calculates differences in parameters across model runs and produces maps to analyze the impact of land use or elevation changes.




The simulation function for creating user-defined scenarios within the Simulation and Mitigation Strategies Service

Schematic overview of the Simulation Service process: It modifies input data (e.g., land use, roughness, elevation) to simulate changes. Future updates will include default scenarios like green roofs. User-defined changes are shown as a difference map.

The City Air Flow Simulation and Mitigation Strategies Service is providing the capacity to investigate the impact of simulated local urban changes to landcover with focus on city air flow parameters like wind speed, direction, and fresh air flow. This service is based on UltraHD model runs and moreover depends on simulated changes to urban characteristics made by the user. These changes can be submitted by the user using a web-based graphical user interface, called the Simulation Editor, and following model input data will be manipulated accordingly.

## Key features:

The main service result of the City Air Flow Simulation and Mitigation Strategies Service is then an analysis of the impact of the simulated changes. More precisely, an UltraHD run is reinitialize with manipulated input data and comparison of this manipulated run with the corresponding model run with non-manipulated input data is performed with focus on city air flow parameters like wind speed, wind direction, and fresh air flow.
The comparison analysis is presented in a visual and numerical manner on a web-based graphical user interface.

## Parameters

The UltraHD outputs several relevant air quality parameters, other parameters can be added.

- **HNO3 -** Nitric Acid
- **NO2 -** Nitrogen dioxide
- **O3 -** Ozone
- **PM10 -** Particulate Matter
- **Air flow (wind)**

## Benefits:

Allows administration to plan how future structural changes in a city changes air flow and accumulation of chemicals.

- The CityCLIM Simulation Service lets urban planners test UHI mitigation strategies by simulating green infrastructure's impact on temperature and air quality.
- It also evaluates the long-term sustainability of these strategies for future urban planning.

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