

Data sets

Airborne Data

Data sets for CityCLIM

Airborne Data Processor



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

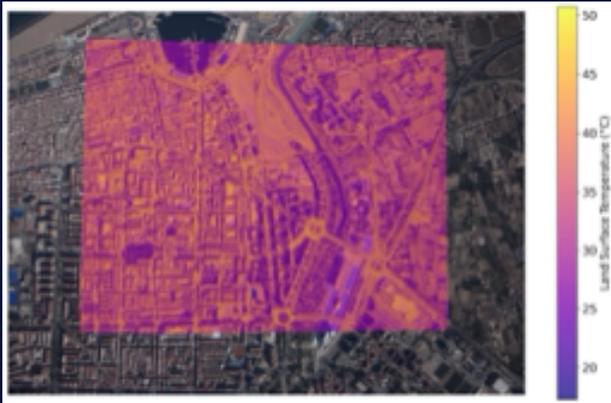
ADVANCED URBAN WEATHER MODEL

ADVANCED URBAN WEATHER MODEL



Airborne Data Processor

The Airborne Data Processor in CityCLIM serves as a crucial tool for enhancing climate data resolution. It bridges the gap between coarse but frequent satellite data and highly localized in-situ measurements by providing high-resolution Land Surface Temperature data. Airborne data is collected using the RAVEN sensor, which operates in the Long-Wave Infrared spectrum, estimating Land Surface Temperature and surface properties from thermal radiation. With resolutions below 4 m, airborne data offers unprecedented insights into the urban thermal environment and can serve as a verification layer for simulations, super-resolution and urban climate scenarios.



Thermal sharpener comparison of results.



The airborne data processor mainly features a thermal infrared processing chain devised to retrieve temperatures from measurements by means of careful radiometric processing and atmospheric compensation. Beyond this it also handles geo-localization of measurements, enabling comparison of airborne data products with spatial data from other sources.

The airborne data processor has been set up to mirror the processing levels utilized in spaceborne data, thereby enabling comparison in a straightforward manner.

Methodology

Example
data set
Valencia:
<https://zenodo.org/records/14204875>

- **Enhances Climate Data Resolution:** Bridges the gap between frequent but coarse satellite data and localized in-situ measurements.
- **High-Resolution Thermal Imaging:** Uses the RAVEN sensor to capture Land Surface Temperature with sub-4m resolution for urban heat analysis.
- **Validates Weather Models:** Serves as a verification layer for simulations and high-definition urban climate models.
- **Geo-Referenced Data Comparison:** Enables direct comparison with other spatial data sources through precise geo-localization.
- **Advanced Thermal Processing:** Uses radiometric processing and atmospheric compensation for accurate temperature retrieval.
- **Supports Super-Resolution Studies:** Helps refine and improve climate models by integrating high-resolution airborne data.
- **Field Applications & Infrastructure Monitoring:** Can be used for routine tasks like inspecting district heating pipes, vegetation health, and water body conditions.
- **Validated Through Flight Campaigns:** Successfully tested in real-world conditions to ensure accuracy and reliability.