



Monitoring the Urban Thermal Environment

Iphigenia Keramitsoglou | Panagiotis Sismanidis | Chris T. Kiranoudis

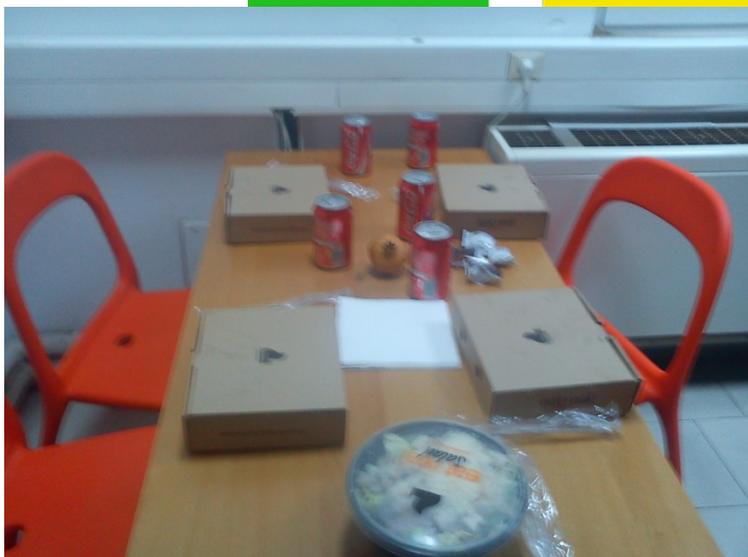
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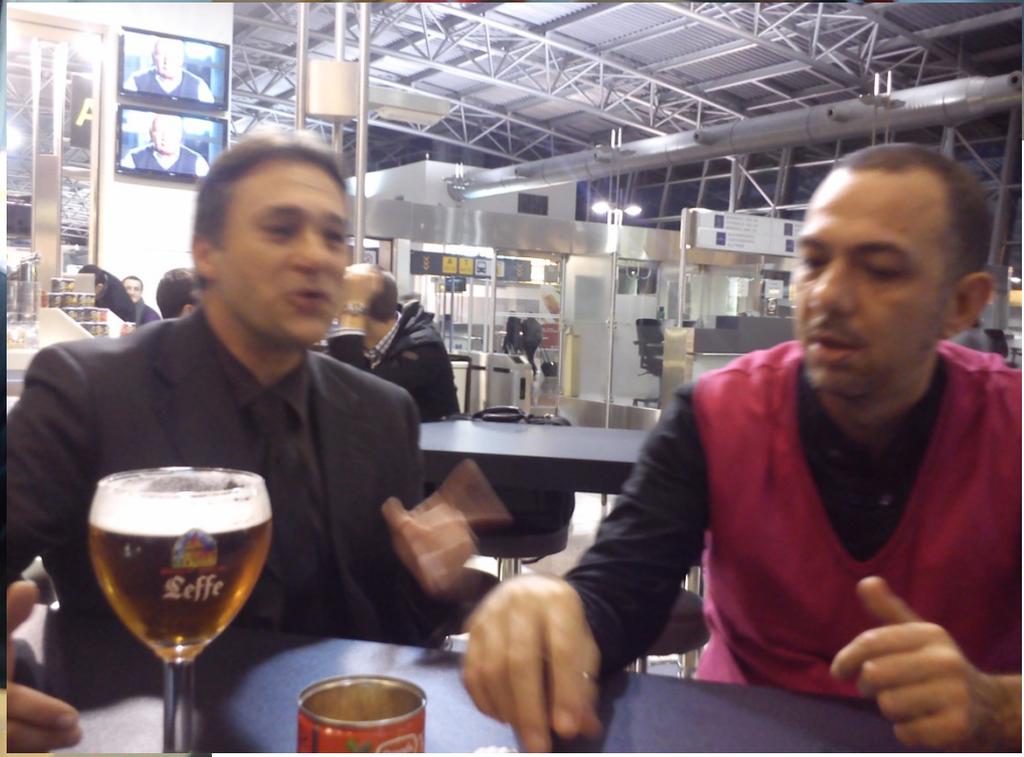
*The final BEYOND workshop, 17 May 2016
Athens, Electra Palace*



FP7-Regpot-2012-23-1



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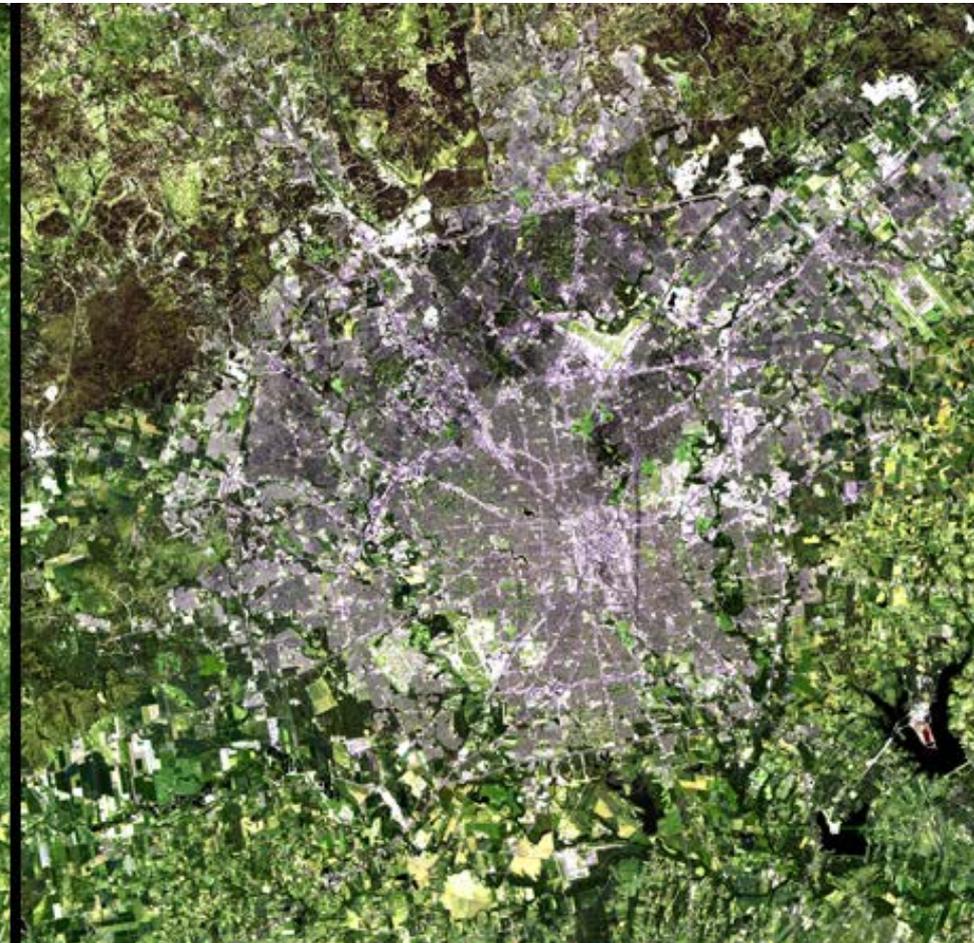
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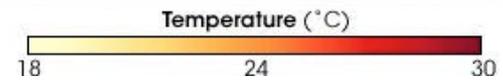
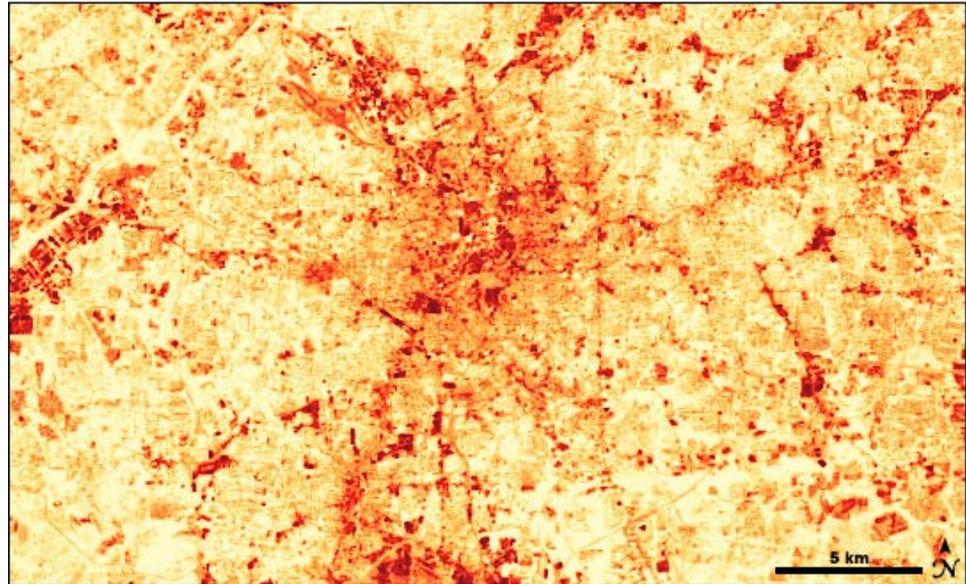
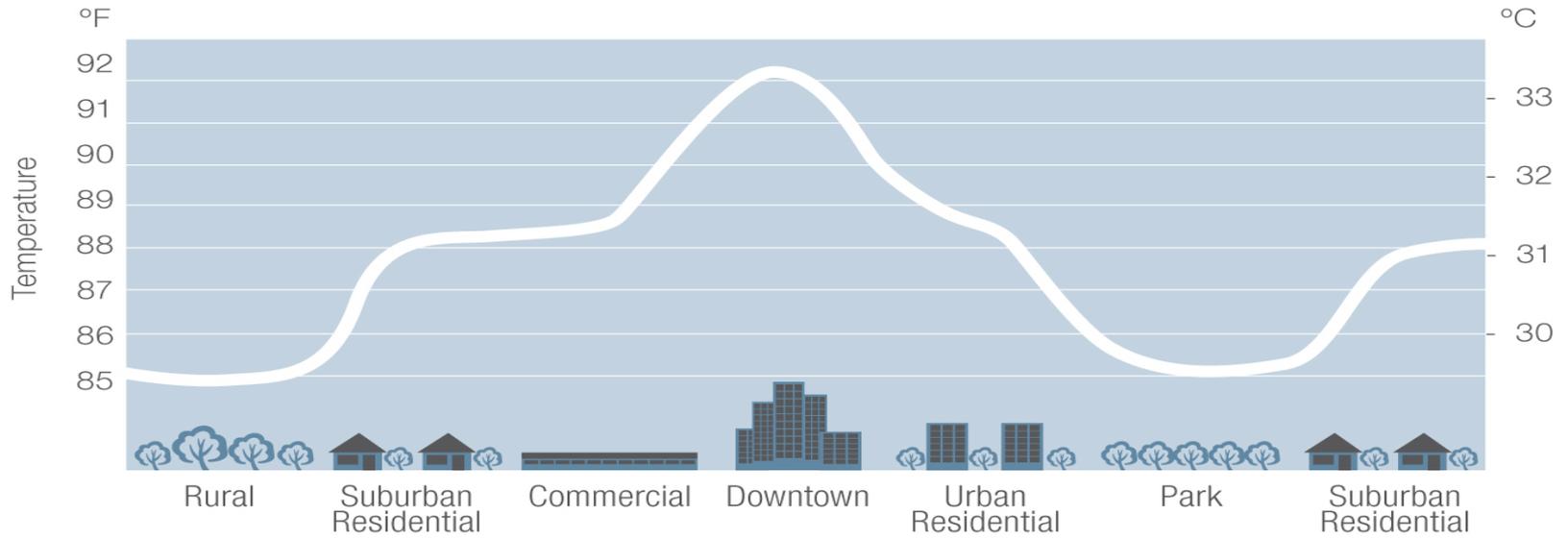
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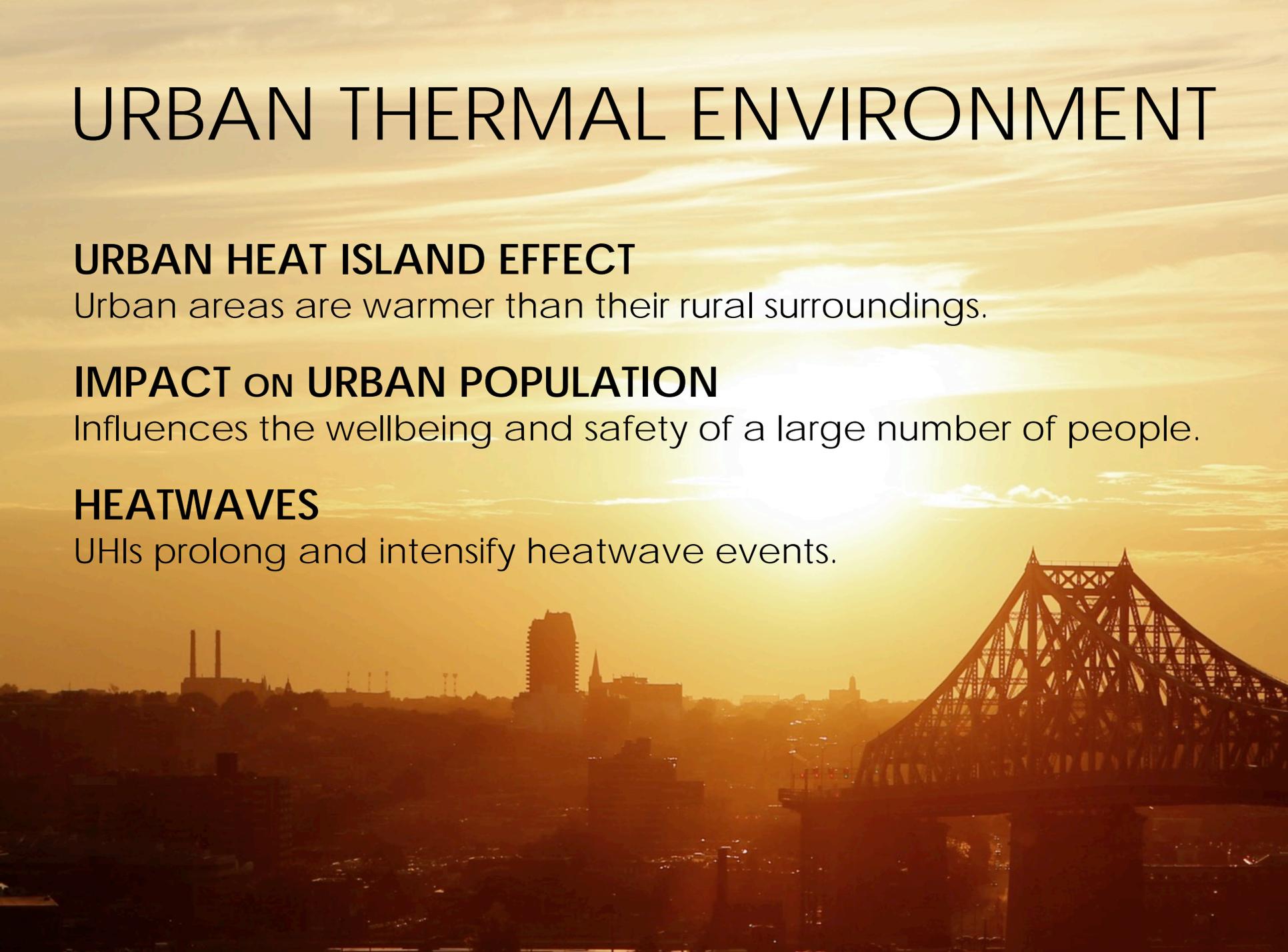
URBANIZATION



URBAN HEAT ISLAND



URBAN THERMAL ENVIRONMENT

A cityscape at sunset with a large bridge in the foreground. The sky is filled with warm, golden light from the setting sun, creating a hazy atmosphere. The bridge's steel structure is silhouetted against the bright sky. In the background, various buildings and industrial structures are visible, including a prominent tall building and several smokestacks.

URBAN HEAT ISLAND EFFECT

Urban areas are warmer than their rural surroundings.

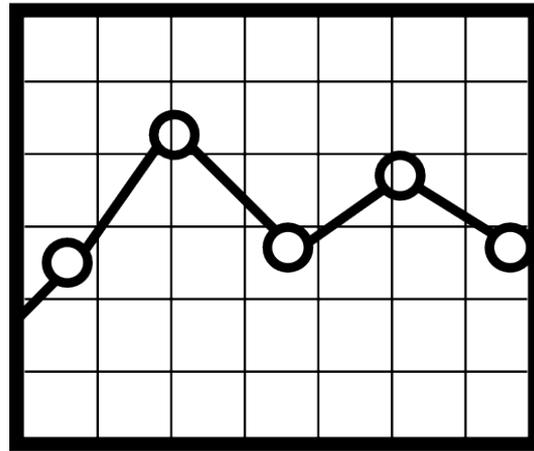
IMPACT ON URBAN POPULATION

Influences the wellbeing and safety of a large number of people.

HEATWAVES

UHIs prolong and intensify heatwave events.

DATA NEEDED



HIGH SPATIOTEMPORAL URBAN TEMPERATURE DATASETS

To assess the urban thermal environment we need an urban temperature dataset that can capture the diurnal evolution of a city's hotspots.

Ideally: a spatial resolution of 100 m and a temporal of < 1-2 h are required.

LACK OF DATA

Currently, no operational service to provide such datasets exists.

MSG2-SEVIRI RSS



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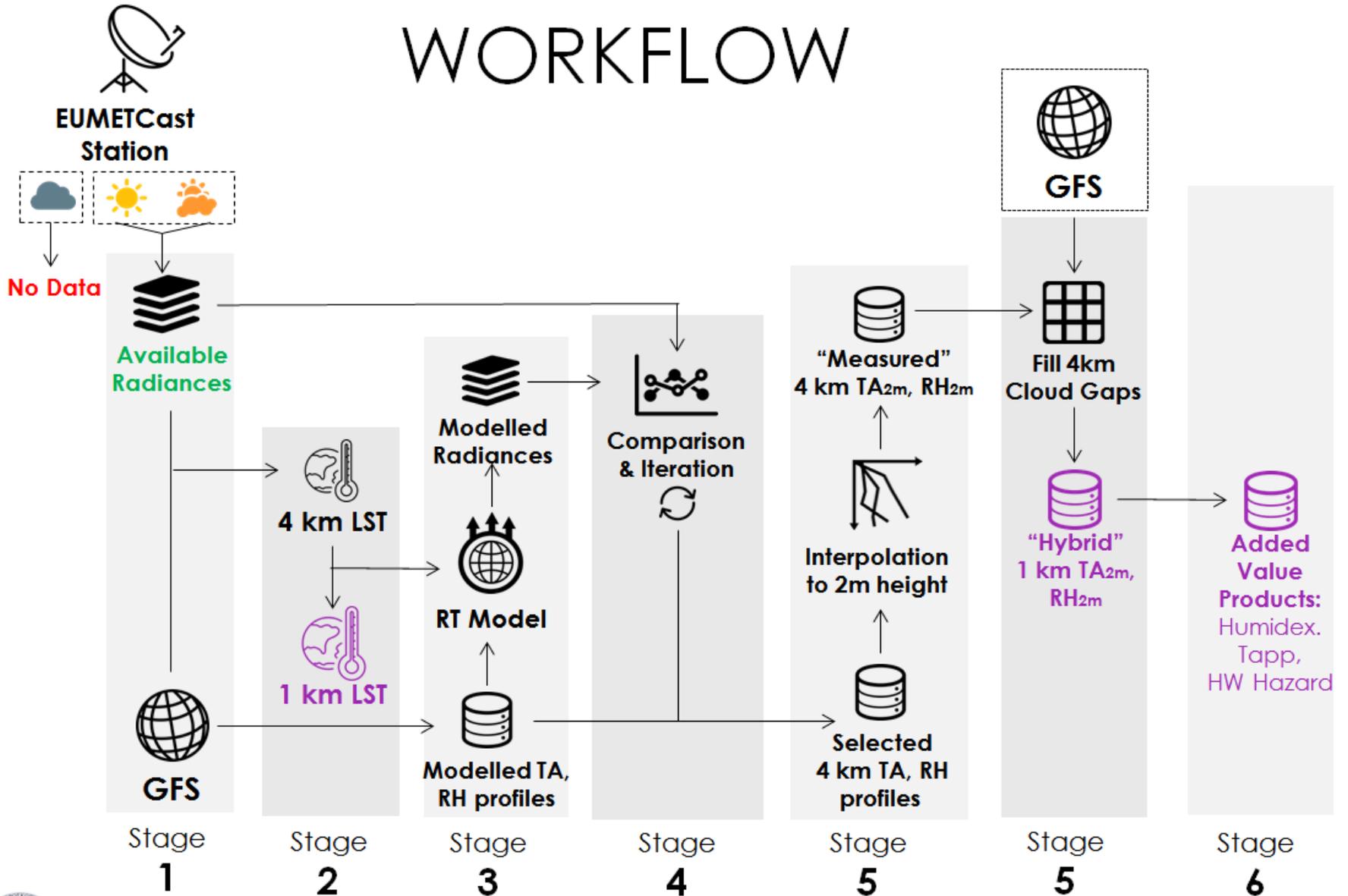
Geostationary Satellite

4 VNIR and **8 IR** Spectral Bands

3-5 km Spatial Resolution

5 min Temporal Resolution

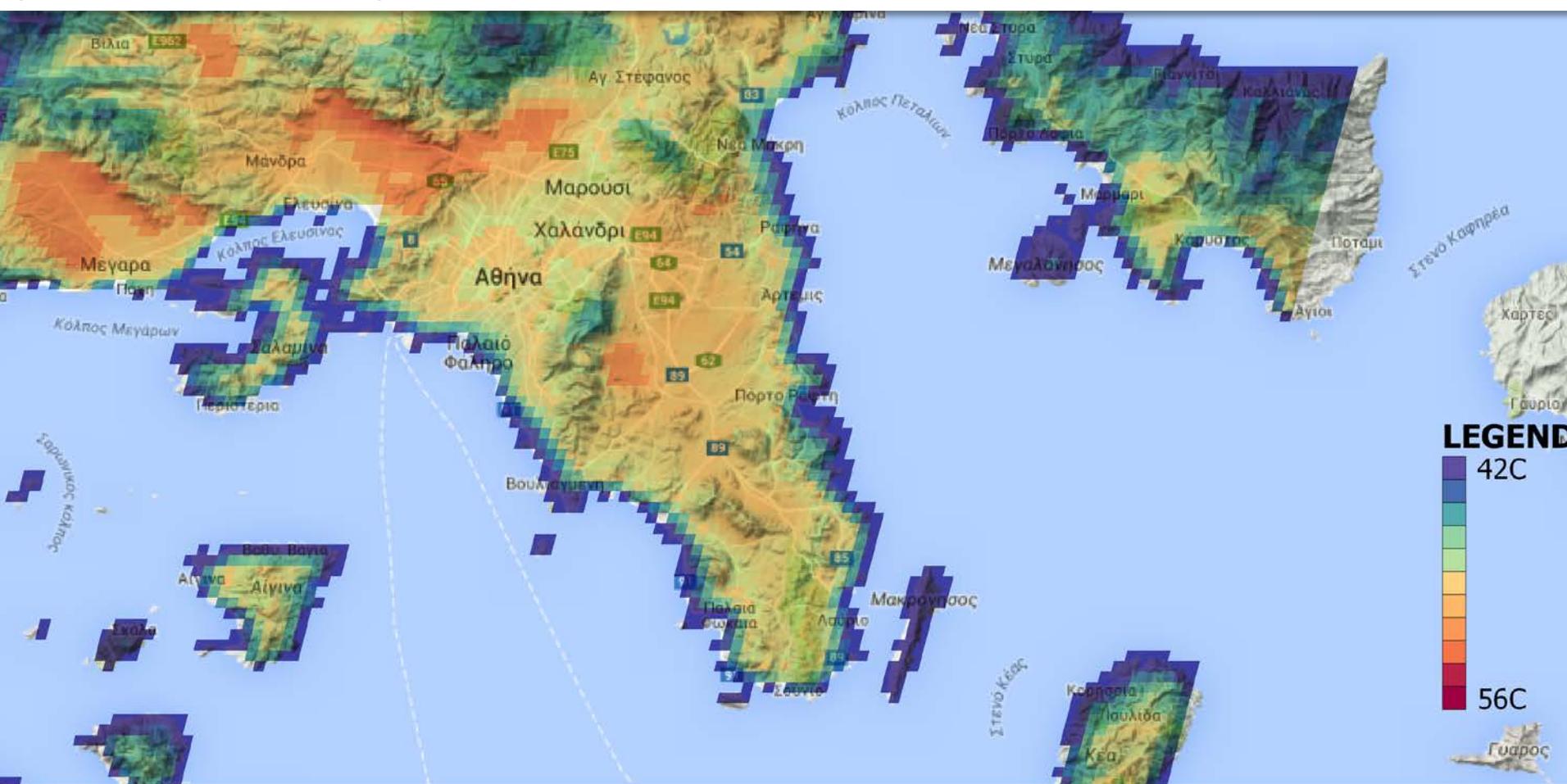
WORKFLOW





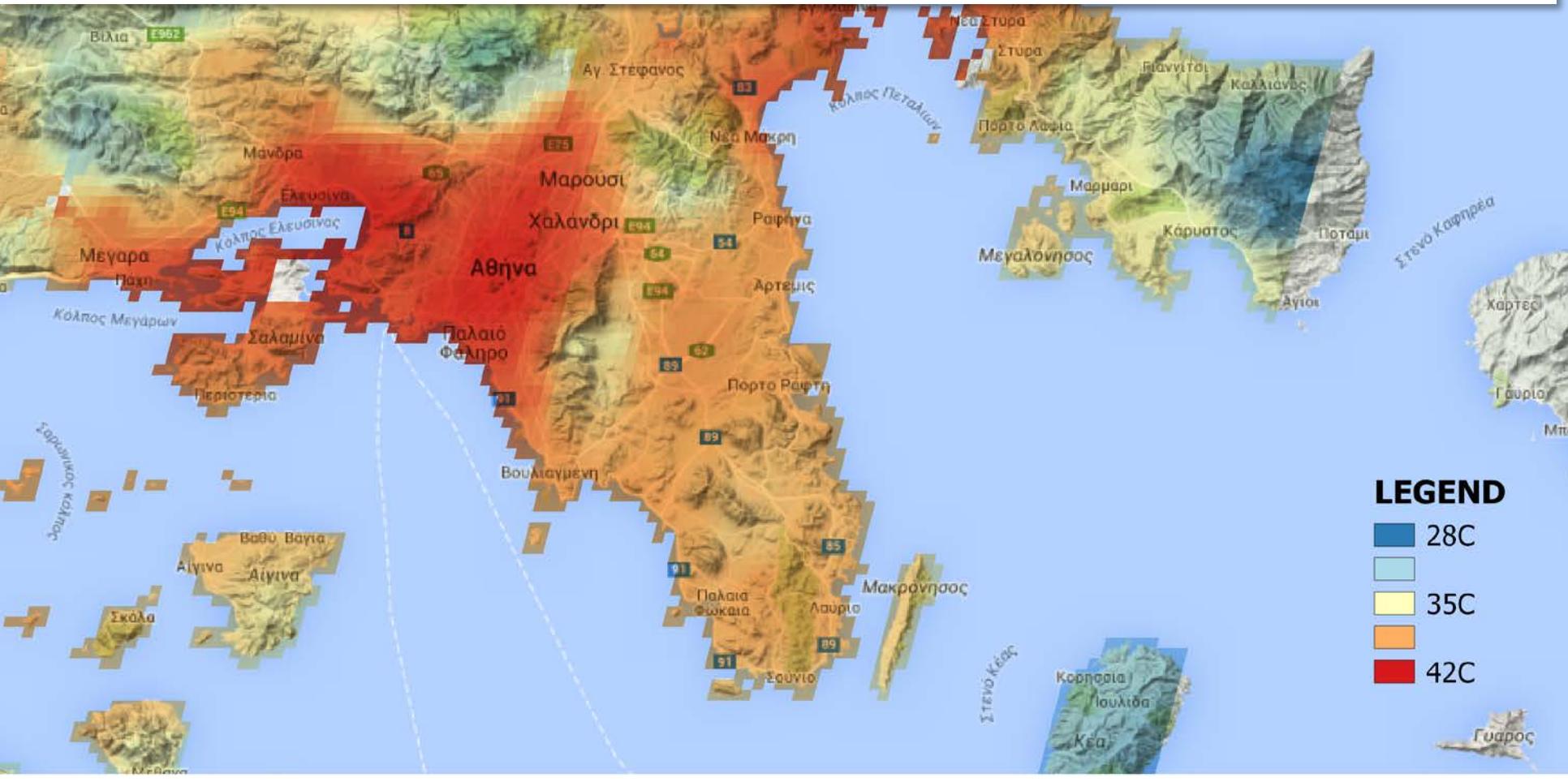
LAND SURFACE TEMPERATURE

Land surface temperature is the radiometric temperature of the surface and an important factor for the determination of several biophysical parameters and processes.



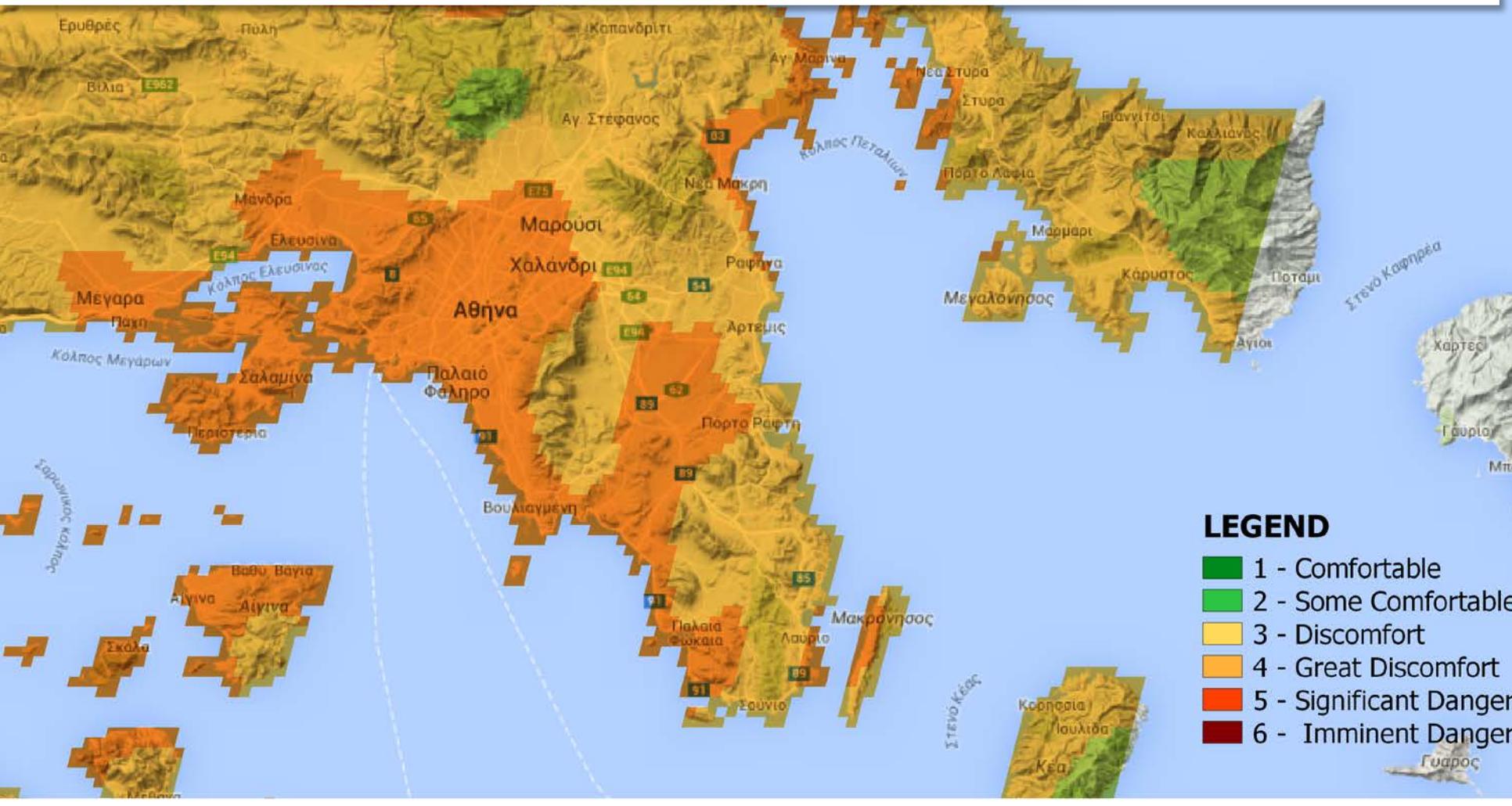
AIR TEMPERATURE (2m height)

Air temperature is a key parameter for monitoring urban heat islands, assessing heat related risks, and estimating building energy consumption.



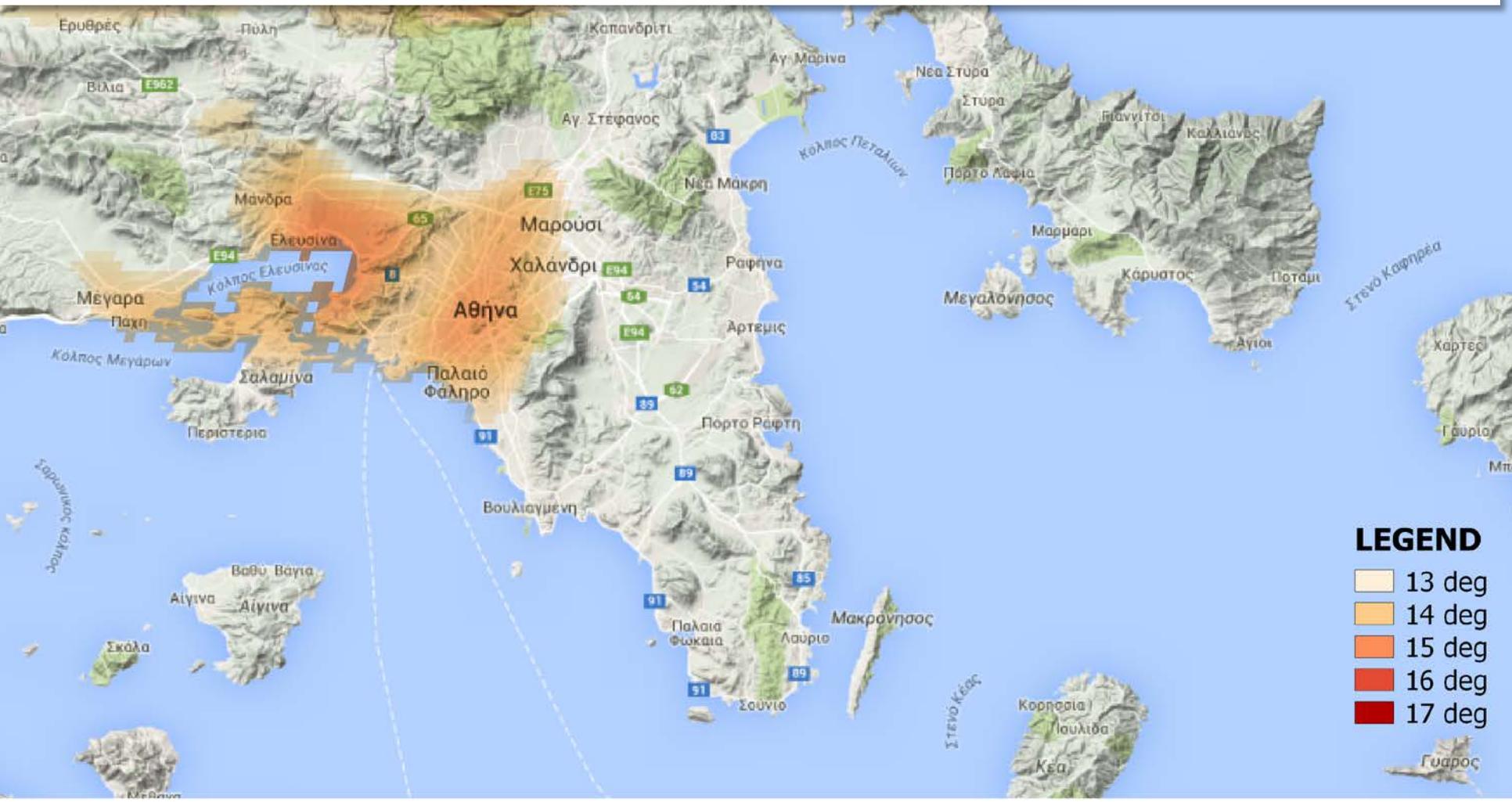
HUMIDEX

HUMIDEX is applied in warm periods and describes the temperature felt by an individual exposed to heat and humidity



COOLING DEGREES

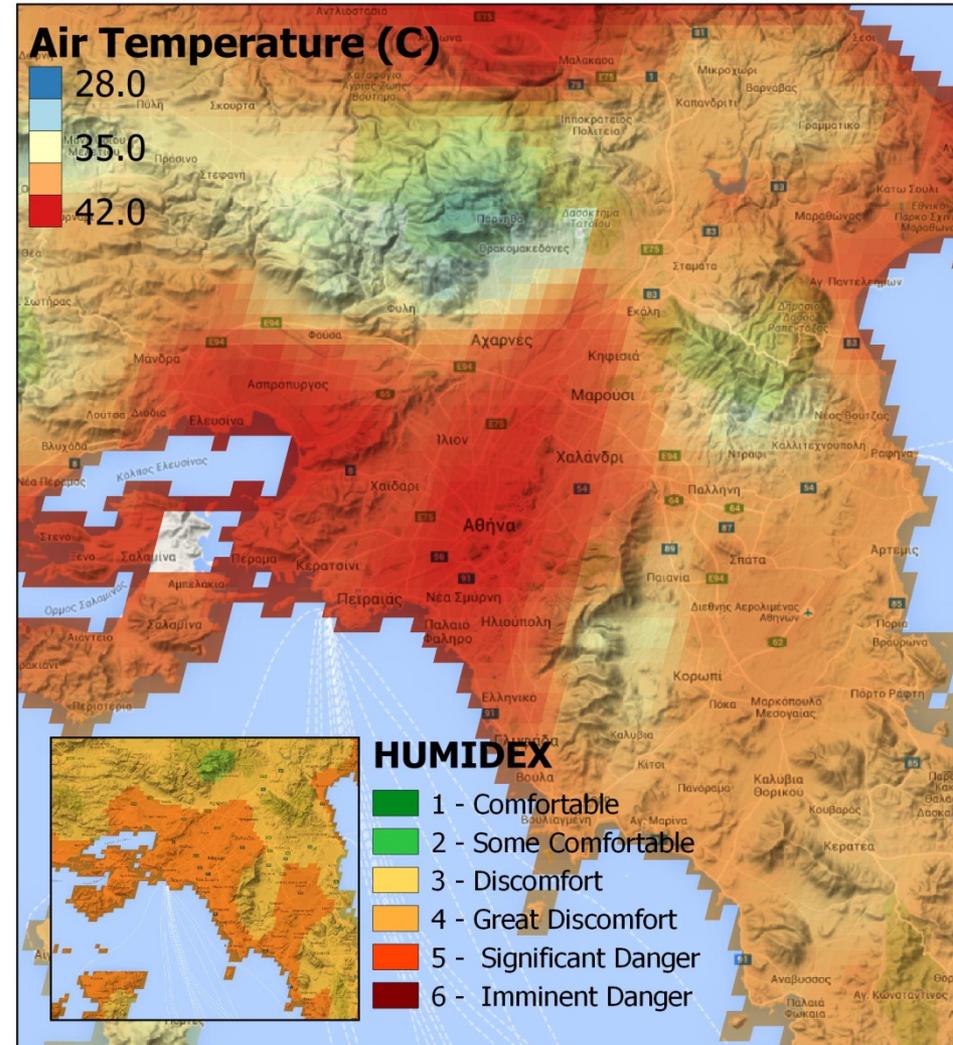
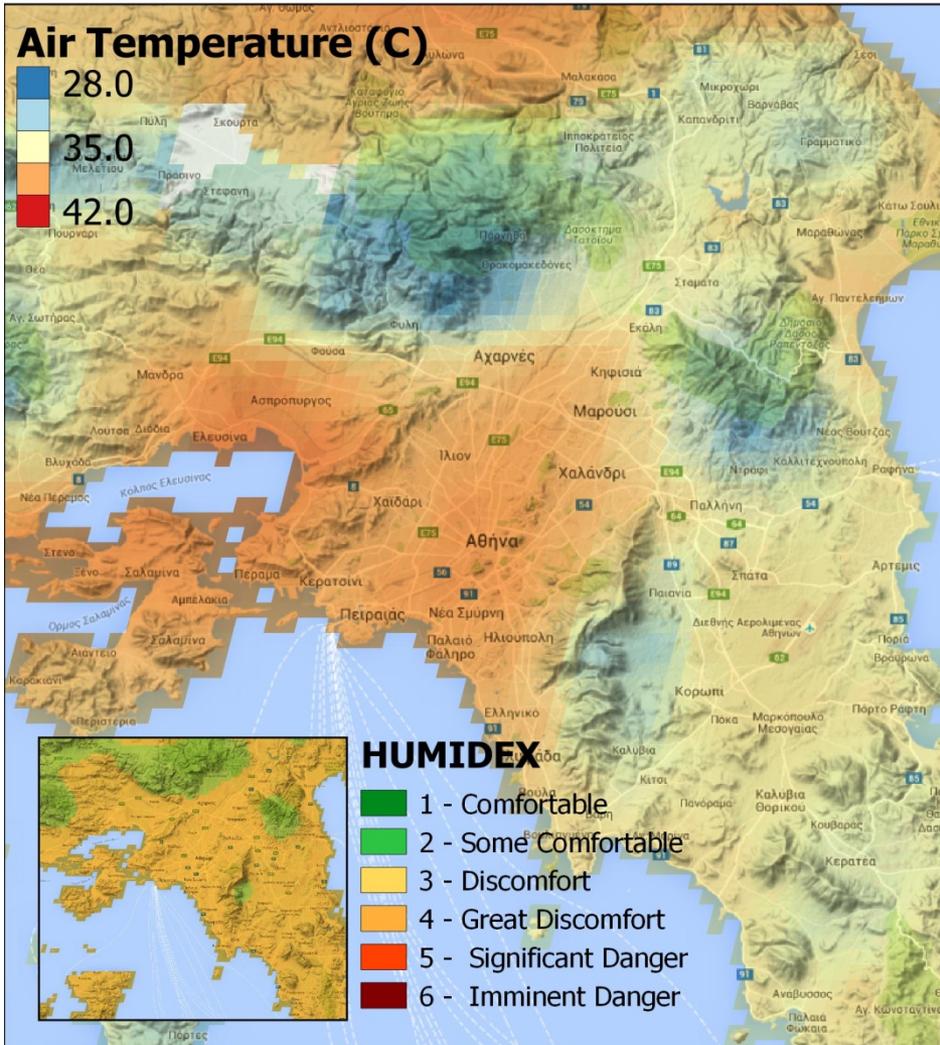
CD is a measurement designed to reflect the demand for energy needed to cool a building.



ATHENS SEPTEMBER 2015 HEATWAVE

September 5th, 2015 | 12:00 UTC

September 6th, 2015 | 12:00 UTC





Urban Planning



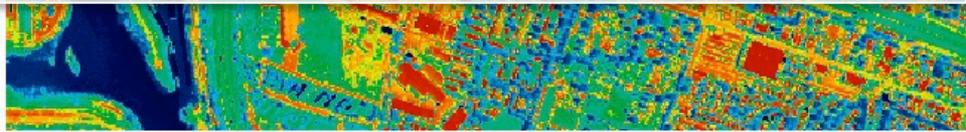
Urban Climate



Human Health



Energy Demand



System Presentation

<http://snf-652558.vm.okeanos.grnet.gr/treasure/portal/>

