→ MAPPING URBAN AREAS FROM SPACE CONFERENCE

Continuous Thermal Monitoring of Cities from Space

Iphigenia Keramitsoglou | Panagiotis Sismanidis | Chris T. Kiranoudis

National Observatory of Athens

Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing

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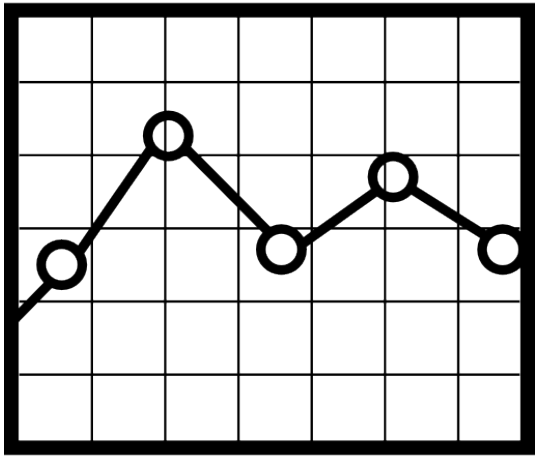
URBAN THERMAL ENVIRONMENT

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

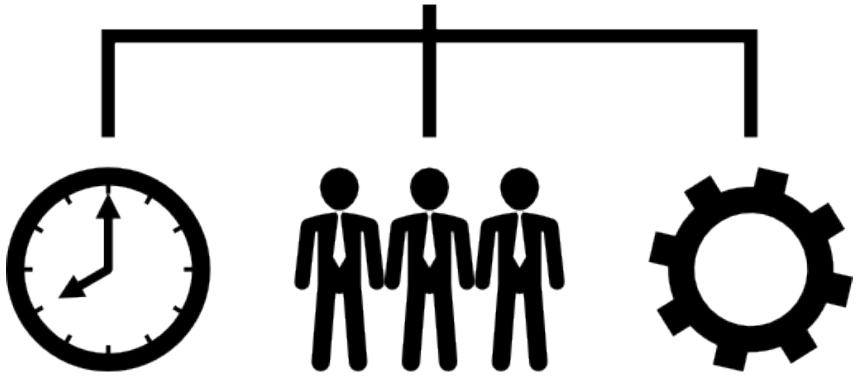
To assess the urban thermal environment we need an urban temperature dataset that can capture the diurnal evolution of a city's hotspots.

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.

IAASARS/NOA SERVICE



IAASARS/NOA IMPLEMENTS SUCH A SERVICE

The goal set is to produce high spatiotemporal urban temperature data for a number of cities around the globe in real-time.

THE DEVELOPED SYSTEM EXPLOITS EO DATA

Thermal Remote Sensing is the only means available that can provide a continuous and simultaneous view of a city's thermal environment.

Summer **2014** – **1 product available** [DOWNSCALED LST (DLST)]
Summer **2015** – **6 products available** [DLST, AIR TEMP, TAPP, HUMIDEX, HEAT WAVE HAZARD, COOLING DEGREES]

MSG2-**SEVIRI RSS**

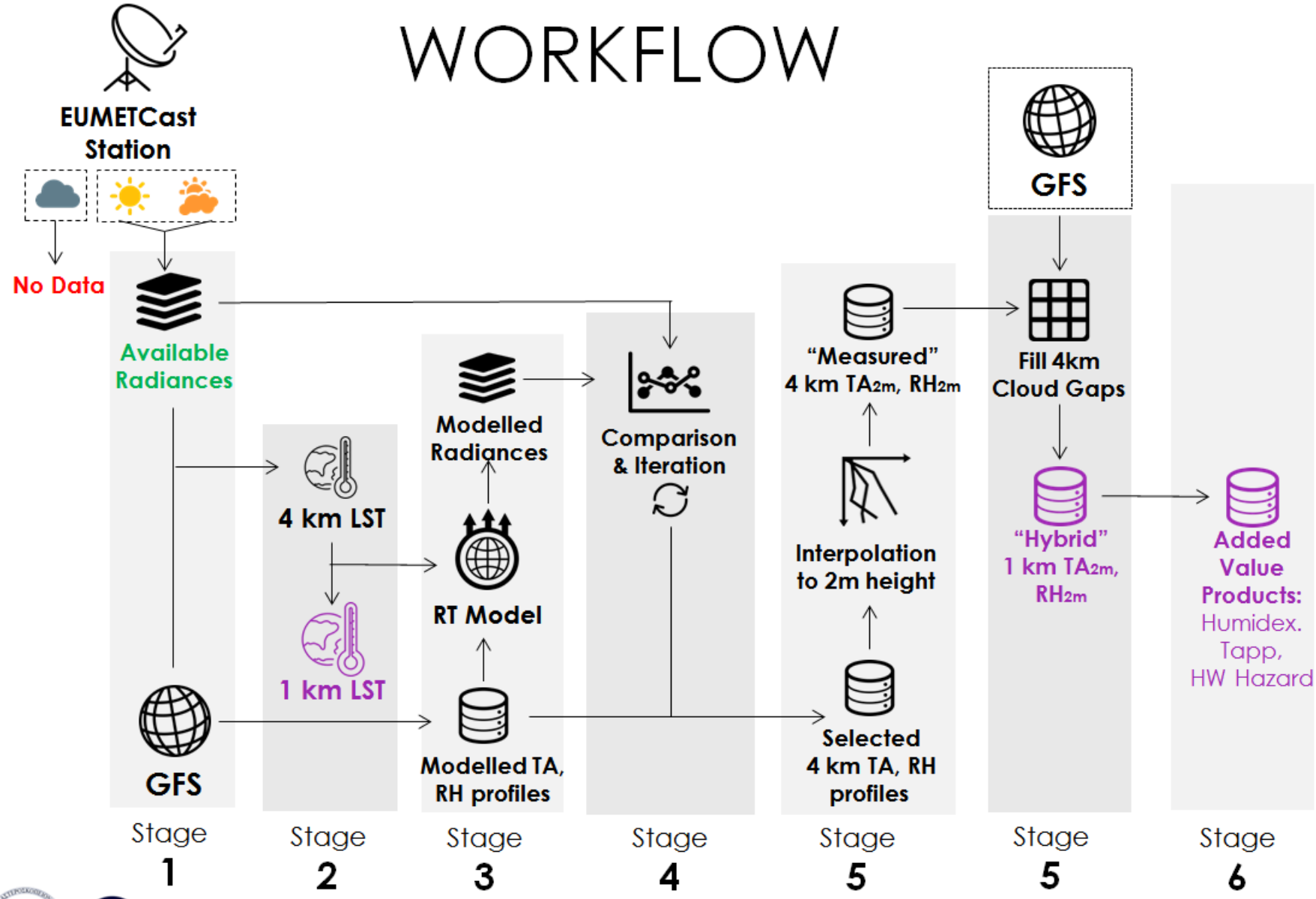
Geostationary Satellite

4 VNIR and **8 IR** Spectral Bands

3-5 km Spatial Resolution

5 min Temporal Resolution

WORKFLOW

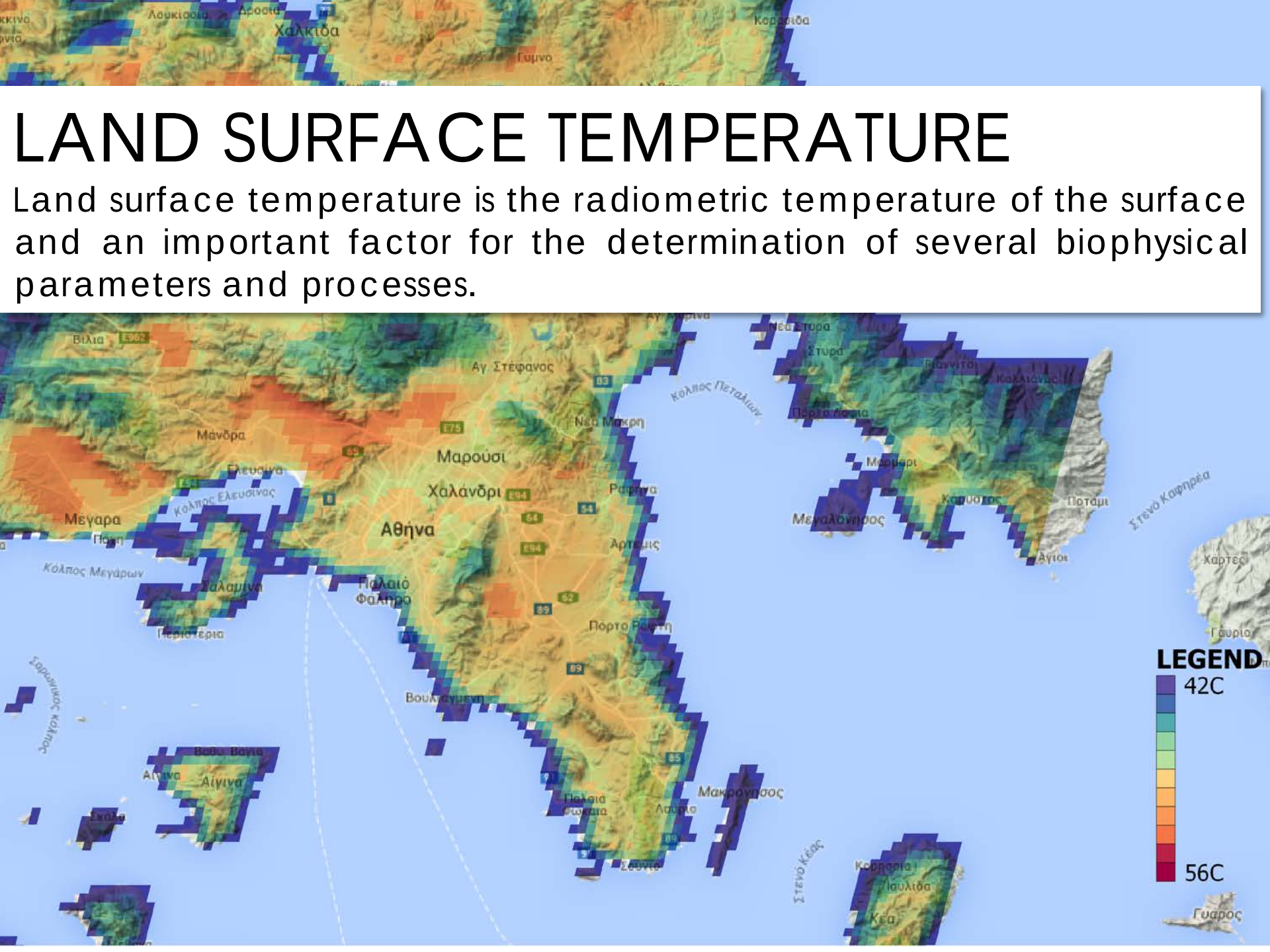


IAASARS

Icons were retrieved from flaticon.com

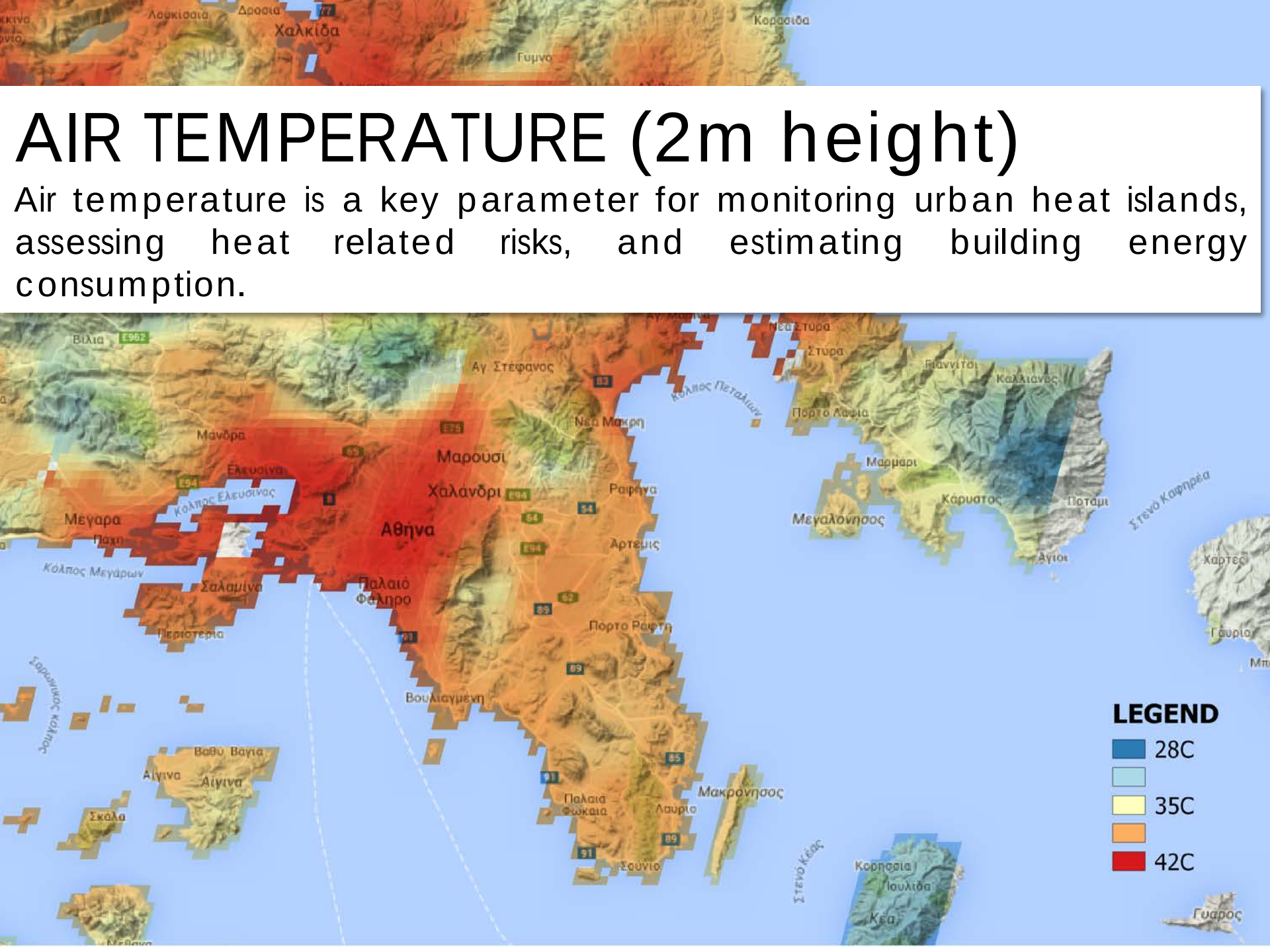
LAND SURFACE TEMPERATURE

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



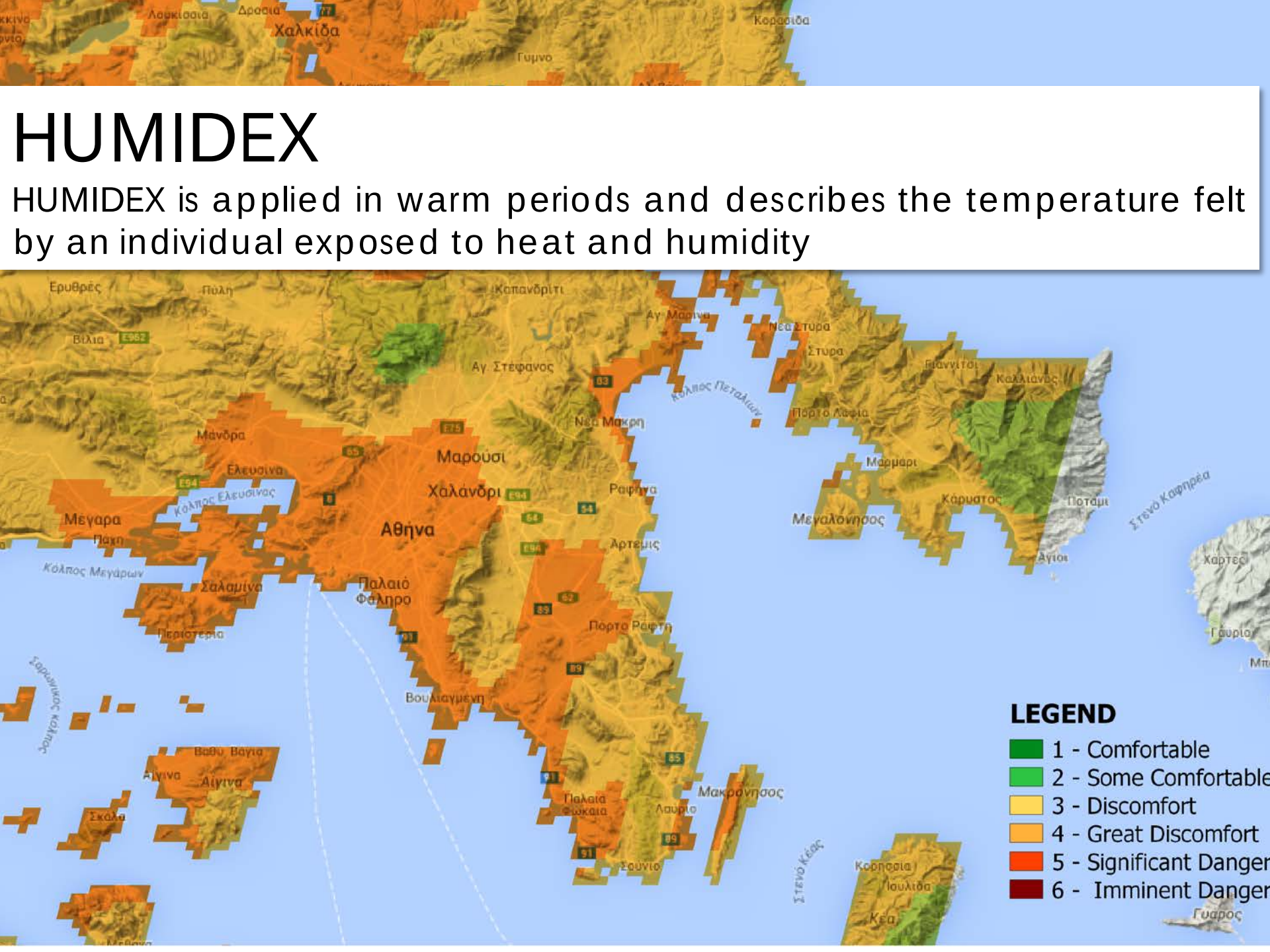
AIR TEMPERATURE (2m height)

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



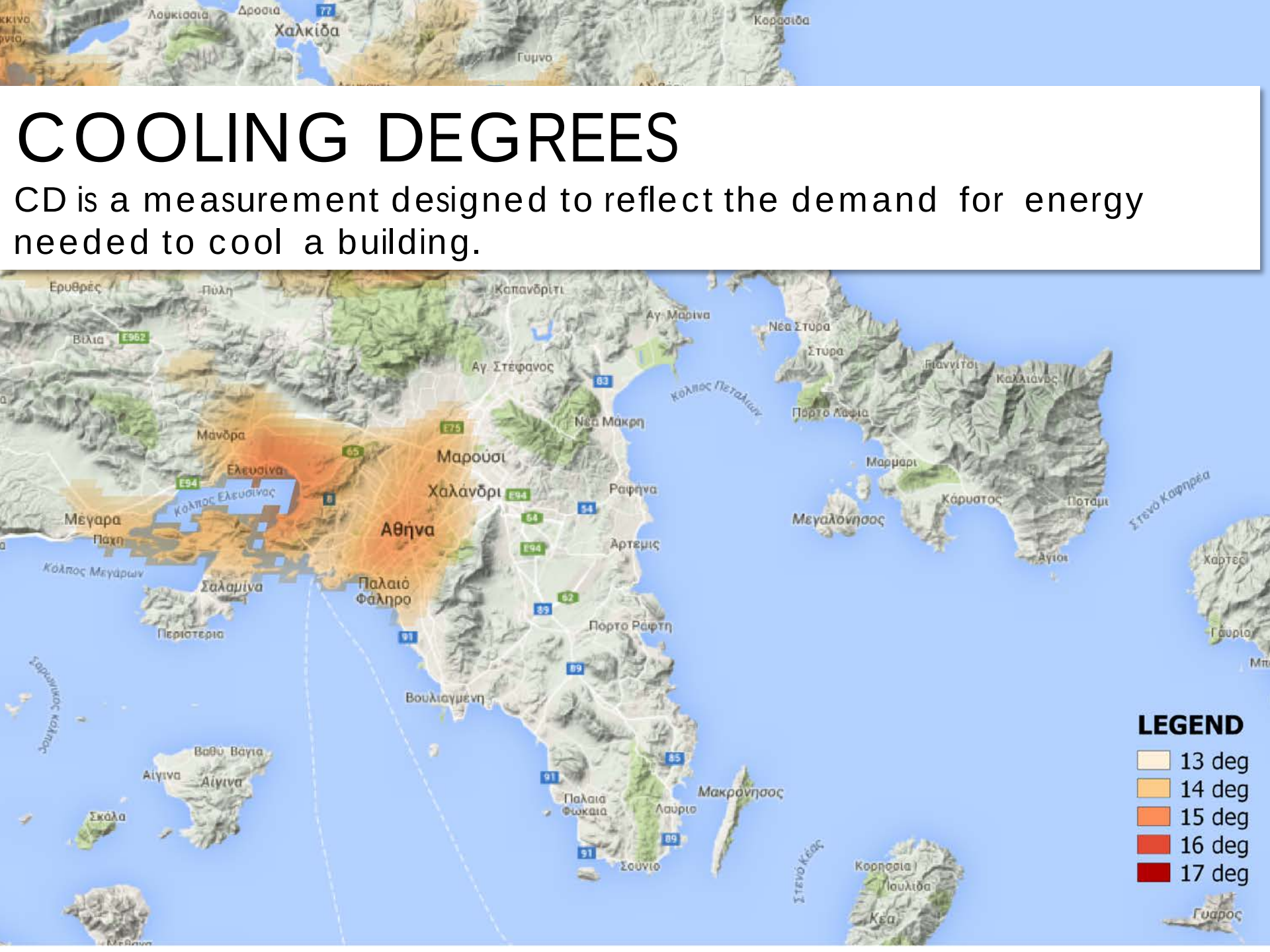
HUMIDEX

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



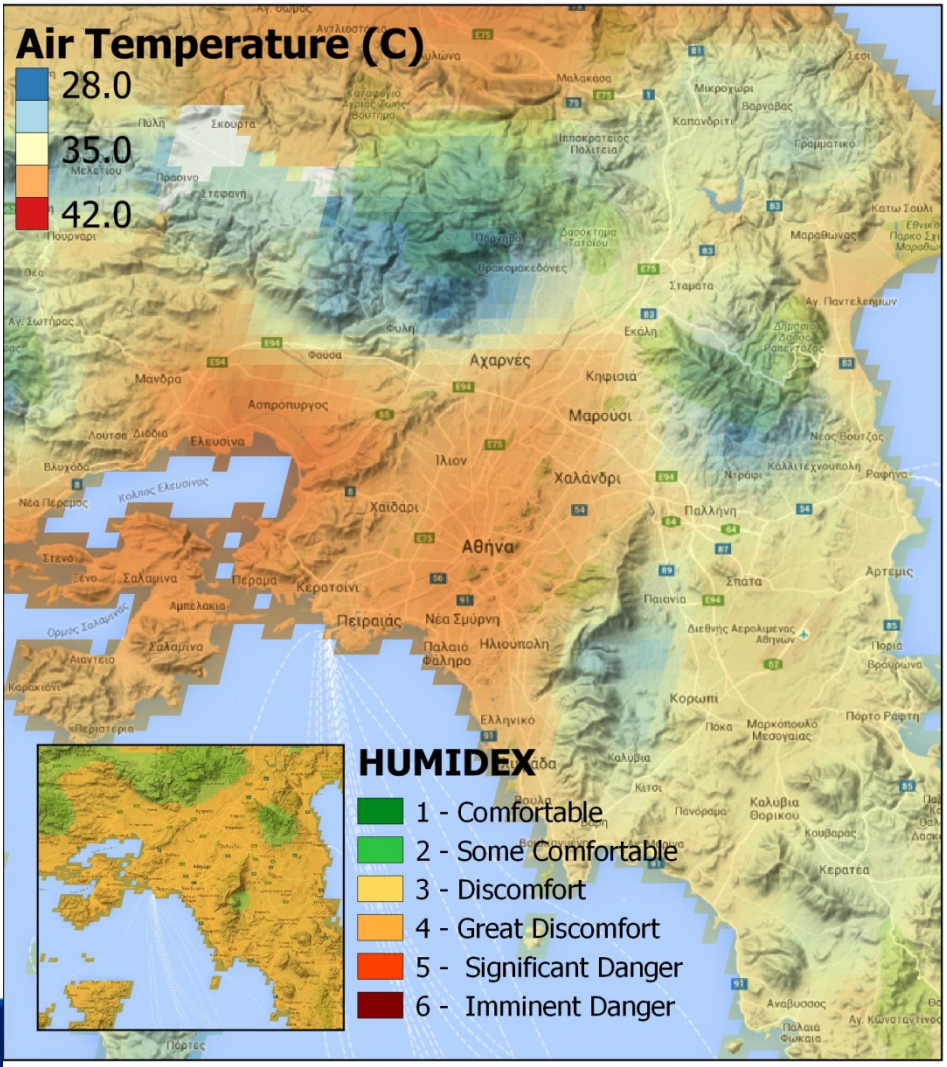
COOLING DEGREES

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

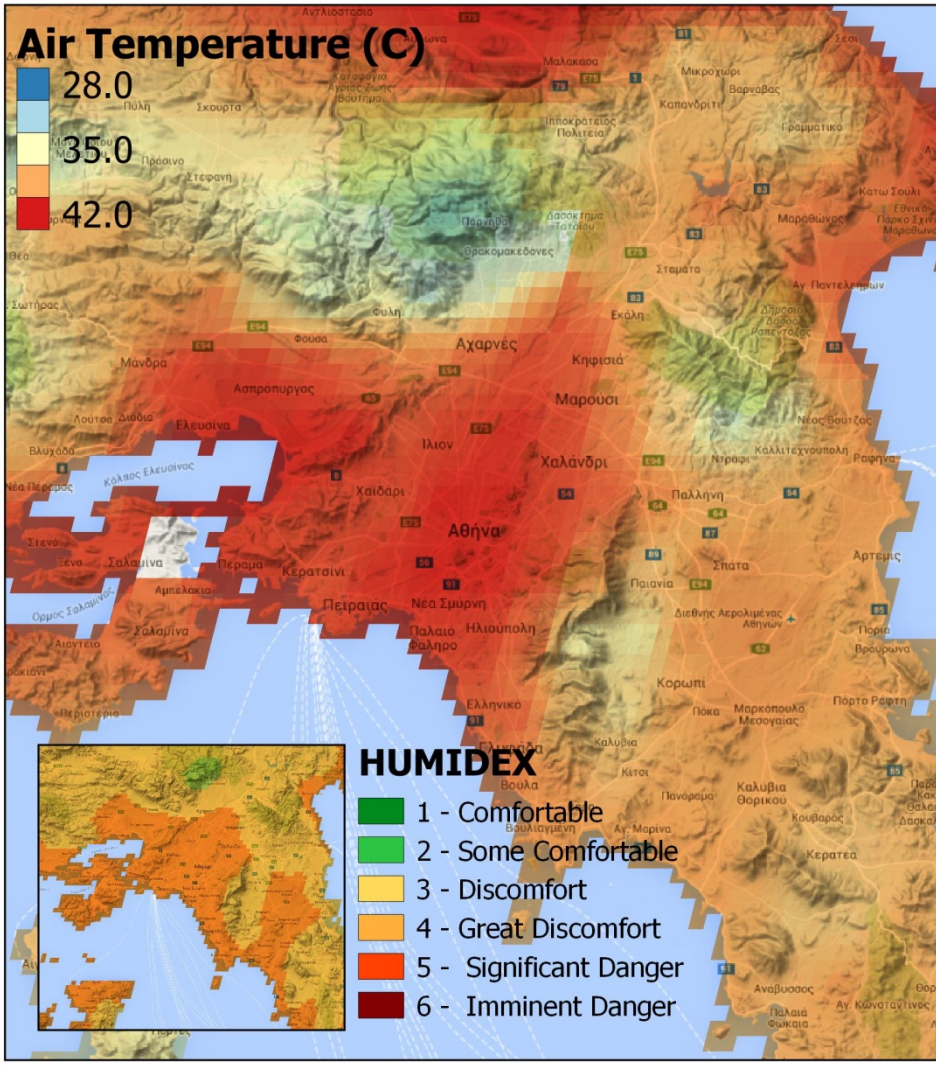


ATHENS SEPT. 2015 HEATWAVE

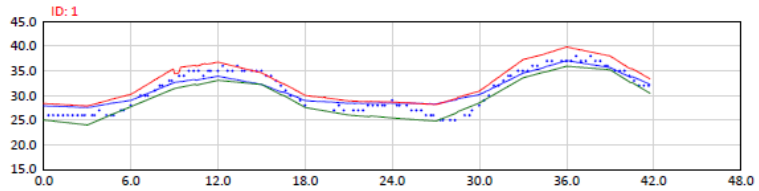
September 5th, 2015 | 12:00 UTC

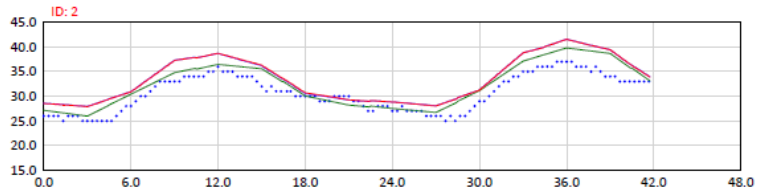


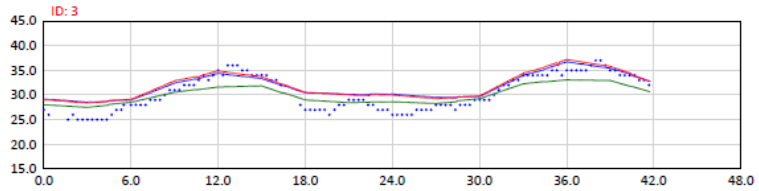
September 6th, 2015 | 12:00 UTC

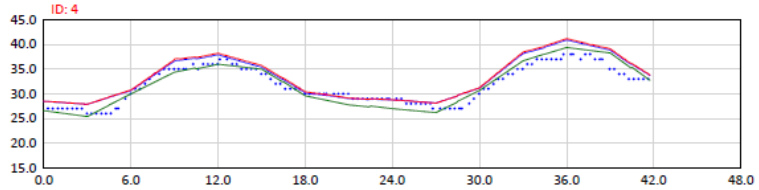


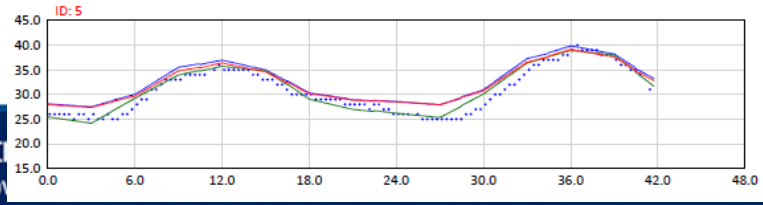
ATHENS SEPT. 2015 HEATWAVE

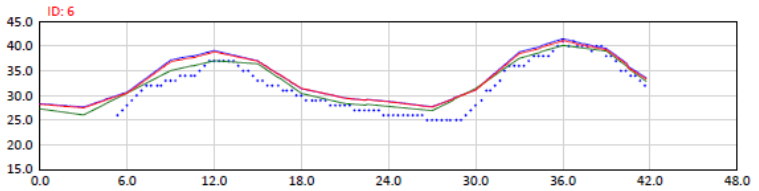


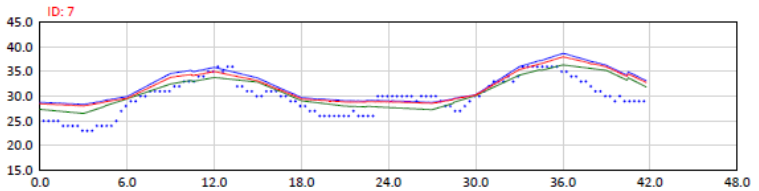


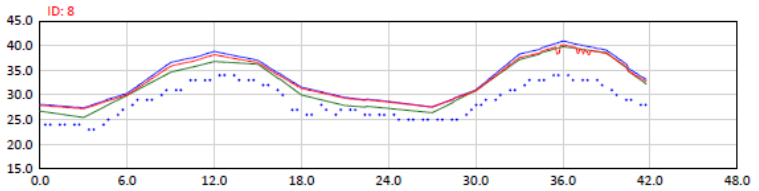


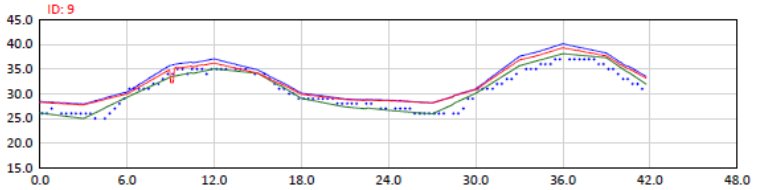


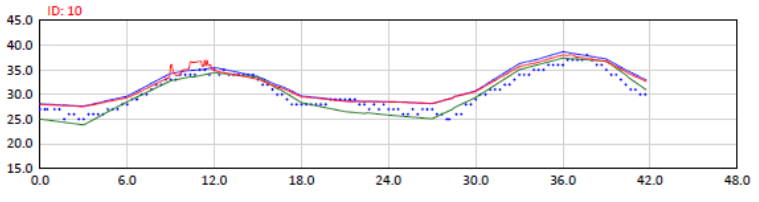










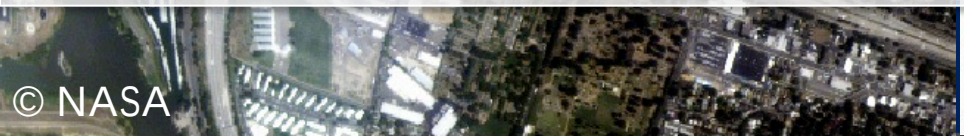


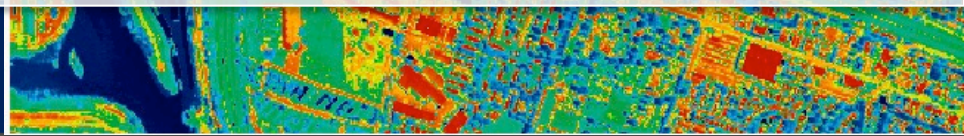
Urban Planning

Urban Climate

Human Health

Energy Demand





remote sensing

- Monthly open-access journal
- IF: **3.180** (2014); 5-Year IF: 2.729 (2014)
- Rapid Publication: First decision: **34** days/Publication: **11** days
- Rigorous Reviews: **3** qualified review reports

Special Issue: **The Application of Thermal Urban Remote Sensing to Understand and Monitor Urban Climates**

By: Benjamin Bechtel, Iphigenia Keramitsoglou, Simone Kotthaus, James A. Voogt, Klemen Zakšek

http://www.mdpi.com/journal/remotesensing/special_issues/tirurbcli

We invite you to submit articles concerning your recent research on the following topics:

- Validation of UEB models via remote sensing LST;
- Assimilation and other possible uses of satellite-derived LST in urban canopy schemes;
- Downscaling / disaggregation of LST data over urban areas;
- Parametrization of urban air temperatures from remote sensing data;
- Application of the LCZ concept in remote sensing SUHI studies;
- Derivation of surface parameters for urban canopy models;
- Urban surface structure and its linkage to thermal anisotropy and emissivity;
- Multi-temporal SUHI analysis that use large datasets;
- Diurnal and / or seasonal evolution of the SUHI;
- Operational retrieval of urban temperatures and high-level services;
- Derivation of surface energy fluxes in cities based on LST observations.

PORTAL

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

ik@noa.gr @iphigenia_k