



Earth Observation based products for urban climate change adaptation

Introduction for session “Urban heat dynamics and soil sealing assessments for resilient planning”

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TECNALIA Research and Innovation

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Earth Observation single products (for risk analysis)

Combined sources (more sophisticated analysis for climate adaptation)

TAT° Thermal Assessment Tool

Home

Welcome to the Heatwaves Service!

This application visualizes the magnitude of extreme heatwave events in Europe based on different risk levels (warning, alert, alarm), which were defined based on the severity of the potential impacts.

The tool provides customized panels to show the number of heatwave days, frequency and intensity for each risk level under current and future climate conditions. The future was characterized considering the intermediate (RCP4.5) and very high (RCP8.5) emissions scenarios.

The information is provided at different regional scales, which is of great use for public health users, urban planning managers, climate change researchers and other stakeholders to visualize the characteristics of past and future heatwave events and to raise awareness about what is going to come.

The data shown in this service is publicly available on Zenodo.

Click a region on the map or go to our REACHOUT city hubs!

TAT° Thermal Assessment Tool

ITC4: Lombardia

Historical Intermediate emissions Very high emissions

This scenario represents the historical period from 1981 to 2021 (41 years) according to the E-OBS dataset of the Copernicus Climate Data Store.

Historical heatwaves (+)

Duration (days) 2 7 12 or longer

Time (°C) 10 15 20 25 30 35

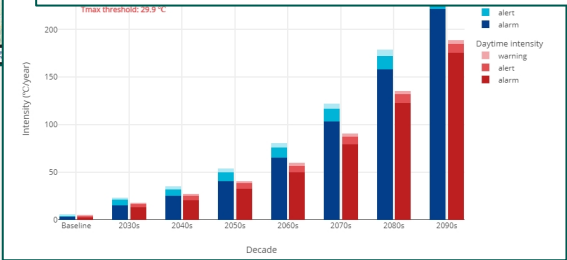
Created using data from the Copernicus Climate Data Store

Javiery María

Los Personajes de Logroño La familia en casa María en la escuela Después de la escuela Hacia casa de los abuelos En casa con los abuelos

Extremely High Very High Relatively High Average Relatively Low Very Low Extremely Low

A la izquierda: La imagen SUHI se crea en base a 7 días de calor extremo (olas de calor) y nos permite ver cómo diferentes áreas urbanas están experimentando la misma ola de calor. A la derecha: Índice de Vulnerabilidad social considerando datos del censo nacional INE (2021) y datos de Copernicus para obtener un índice único de vulnerabilidad social al calor extremo.



CURE PORTAL

Estimation of the maximum green roof potential

The CURE Nature-Based Solutions allows to identify already existing green roofs as well as identifying areas with high roof remediation potential by quantifying potential green roof installation according to specific installation conditions. To accurately quantify the urban assets capabilities, it is crucial to identify firstly which buildings have flat or quasi-flat roofs and which ones present an already vegetated surface, in order to identify the maximum green roof potential.

Nature-Based Solutions service provides map-based results - the maximum green roof potential estimation inventory for each building in a neighbourhood, a city or a region. This is estimated according to physical parameters such as slope computation for each building, based on several parameters aiming at maximizing the impact of the solutions in a determinate area, such as NDVI, Land surface temperature and impermeousness.

See and explore such an estimation of maximum green roof potential on the map left. Use slider to inspect variation, value distribution and local differences in the city.

Prioritization of areas with highest potential/benefit

Although almost all buildings can host a green roof, some specific characteristics may require a complex and expensive design and installation and, as part of the urban initial assessment for greening potential and prioritization, the year of construction is used as an estimation to dismiss buildings which may require extensive rehabilitation.

The identification of buildings with highest greening potential is done according to physical parameters such as slope computation for each building and the identification of buildings with highest greening potential, based on several parameters aiming at maximizing the impact of the solutions in a determinate area, such as NDVI, Land surface temperature (LST) and degree of impermeousness.

The combination of the most beneficial area and the most suitable

Green Roof Potential (2021)

Green Roofs Priority (2021)

Potential 0 - 273 0 - 254

Priority 0 - 0.2 0 - 0.8

vito URBAN CLIMATE SIMULATOR

Begoña

44,56% 3/8

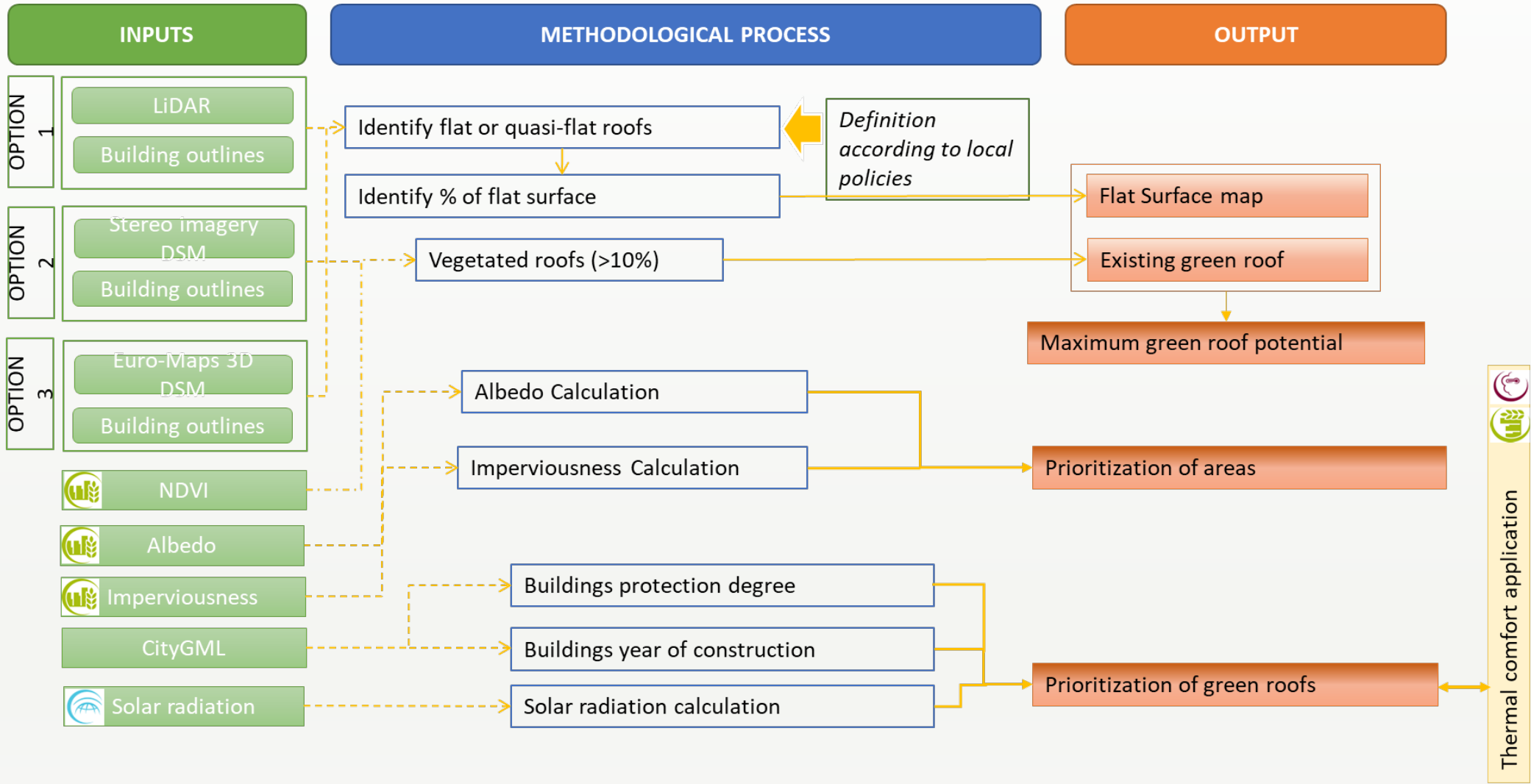
Superficie bajo riesgo en un día caluroso promedio

Horas durante el día por encima del nivel de riesgo

155

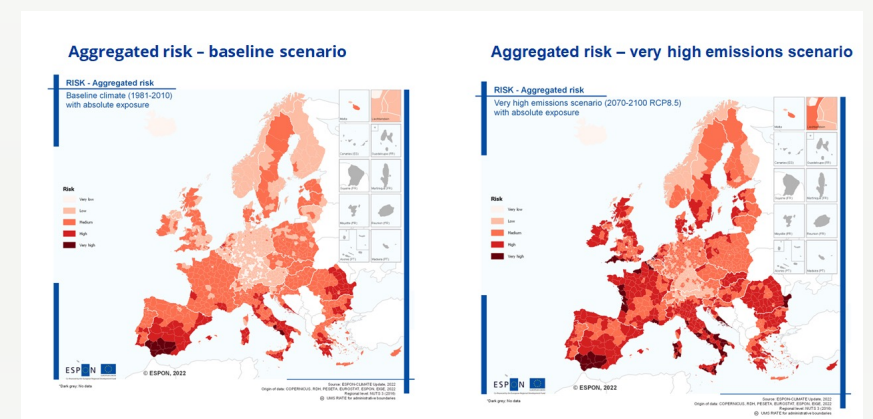
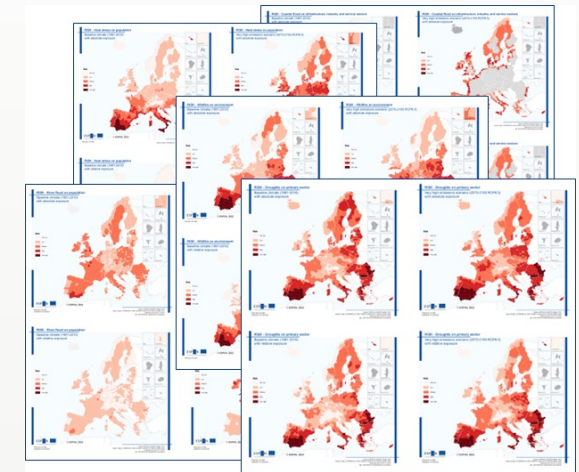
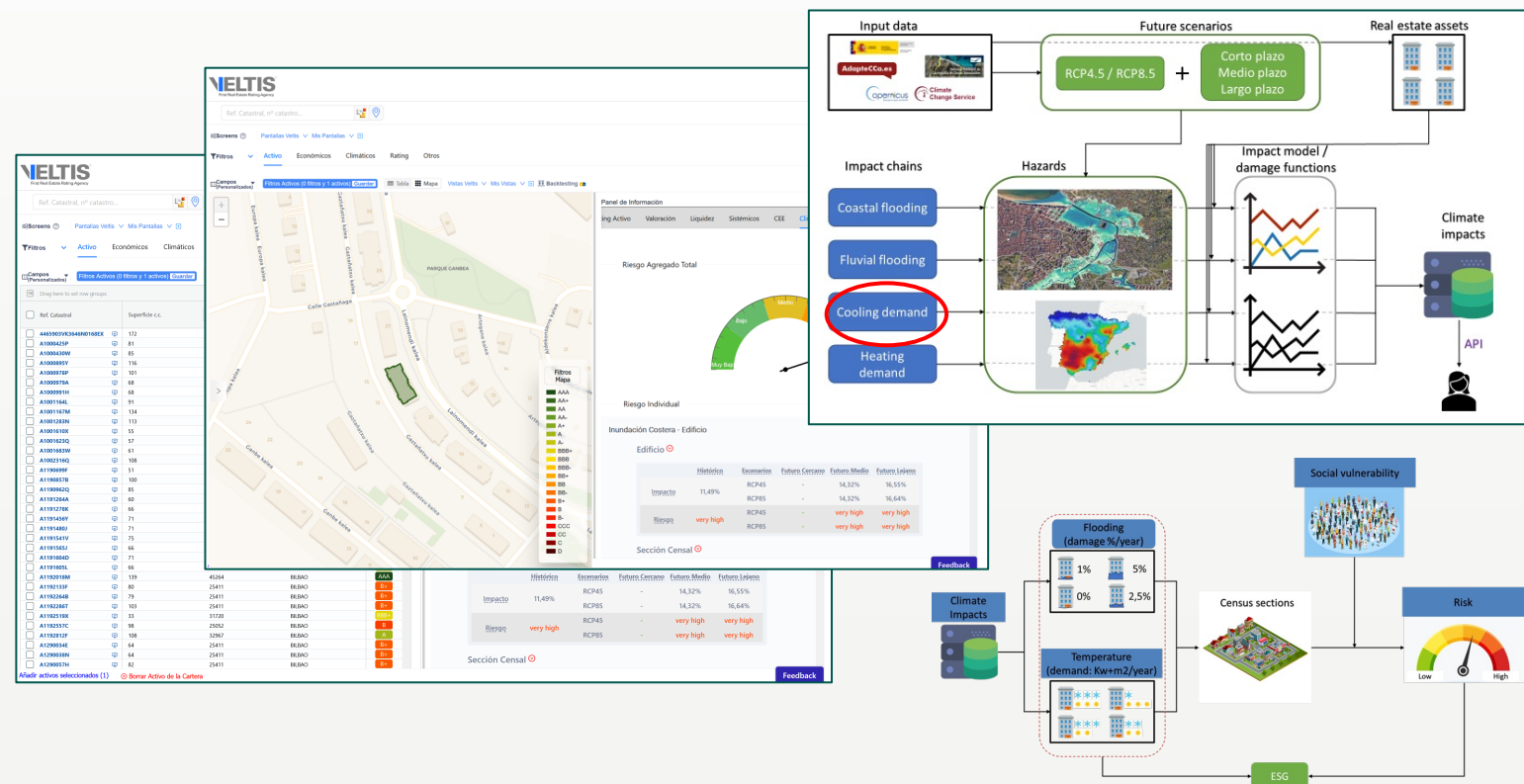
Índice de superficie (100)fué la superficie fuera de riesgo





National products (ES)

and potential scalability with input data from Copernicus, Eursostat, etc.



- ❑ Main challenges related to integration of earth observation with local/private data and interoperability across Copernicus services
- ❑ Generating transferable-scalable workflows and applications which could allow combining different data sources (EU-local), for sophisticated informed decision making (scenarios, effectiveness, AI, etc.), with different resolution-qualities and complementary information
- ❑ Need of authoritative data sources allowing benchmarking across Europe while providing the required local analysis granularity

Thanks!

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