



Città
metropolitana
di Milano

**Urban
Environmental
Hazards and Health
Event**

Climate data translated into governance, planning and territorial transformation measures

the example of the Metropolitan City of Milan

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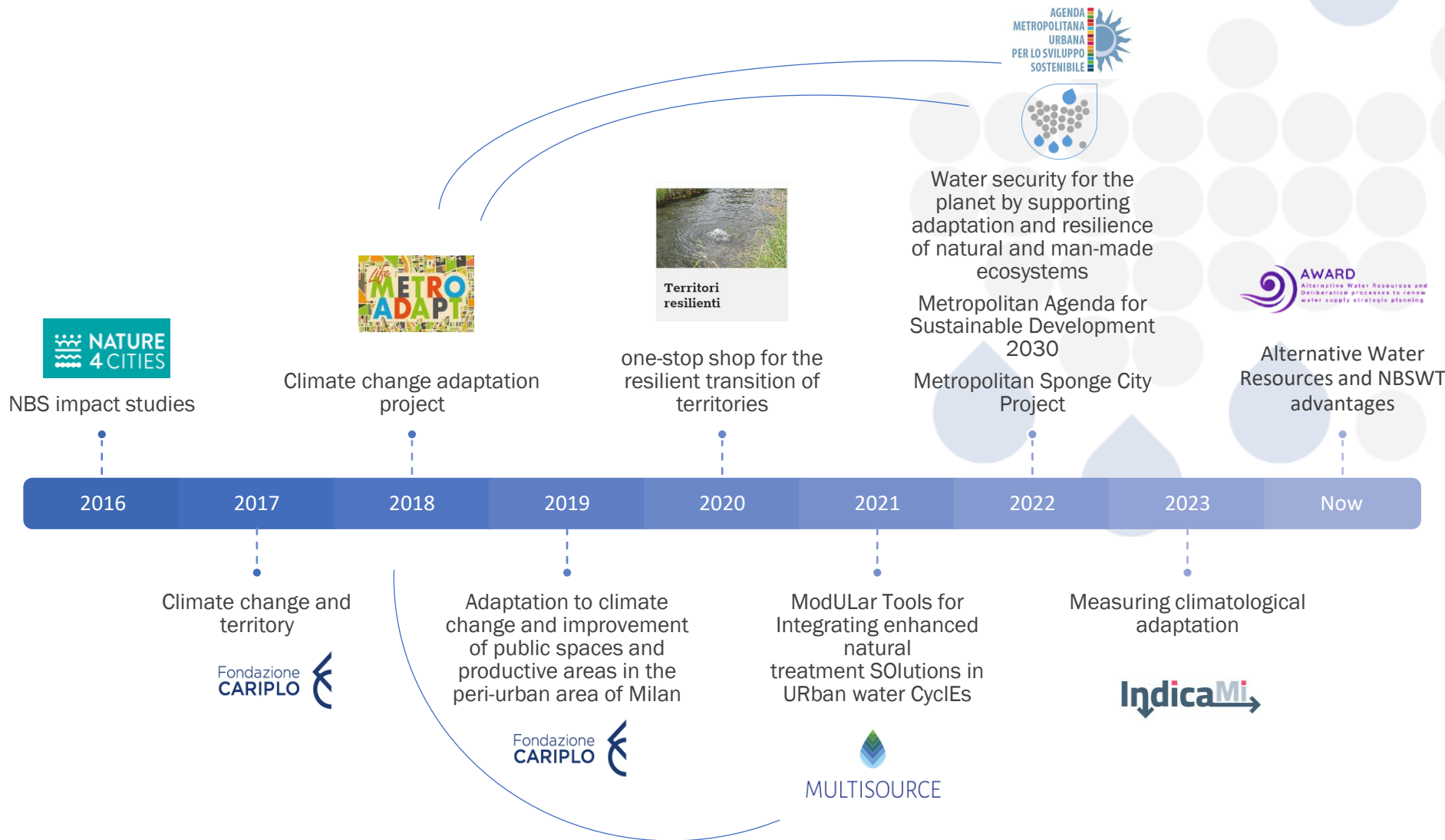
NEW URBAN CHALLENGES

The **CLIMATE CRISIS** requires us to rethink the way we plan and develop the built environment.

These **PHENOMENA** have a direct impact on the quality and livability of urban spaces. They must first be understood and then managed.

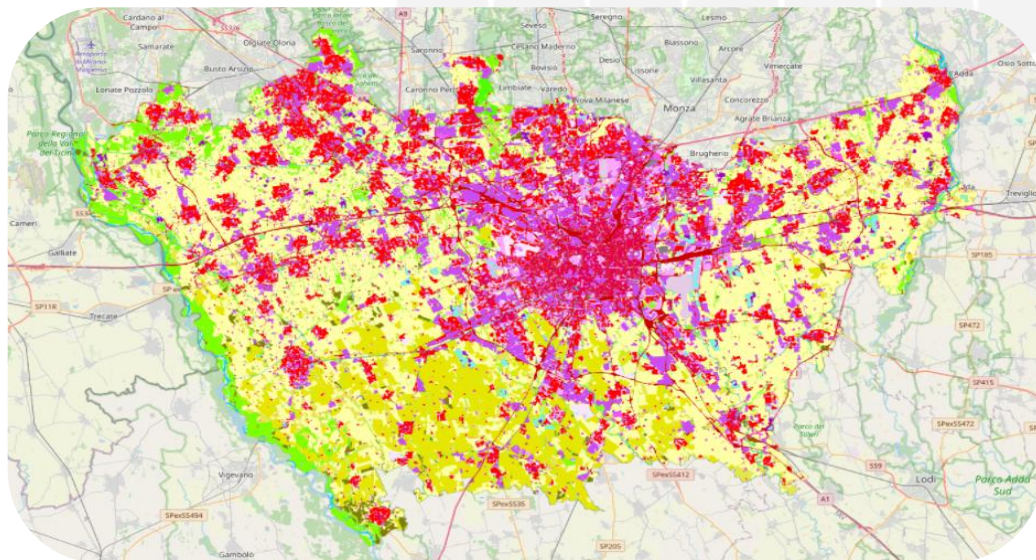
This is why, for the past 10 years, CMM has been embarking on a process of **territorializing knowledge**, shifting the focus from global to local phenomena, and act





THE LOCAL CONTEXT

1 PUBLIC ENTITY
7 HOMOGENEOUS AREAS
133 MUNICIPALITIES



3.284.000

Inhabitants

2.038

Inhabitants/km2

41% Built-up areas
and infrastructure



50% Productive agricultural
areas



8% Wooded areas

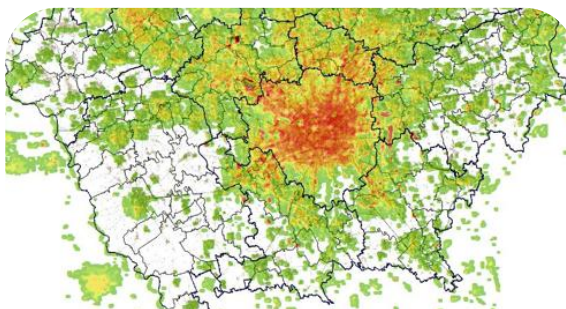


LIFE Metro Adapt Project



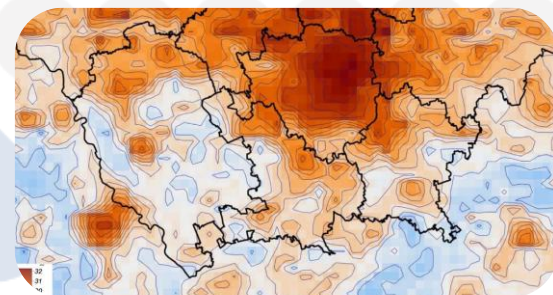
Territory

Basic cartographies
Satellite and aerophotogrammetric
imagery
Land use maps
Environmental and socioeconomic
information
Development over the years frequent
and coordinated



Fenomena

Maps and meteorological and
climatological information (heat,
precipitation, wind, air quality
etc.)



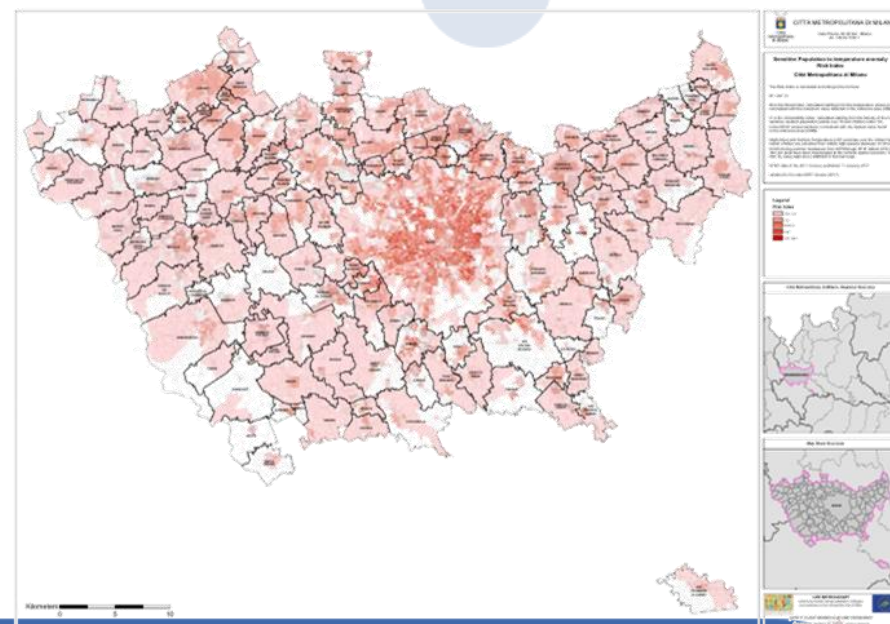
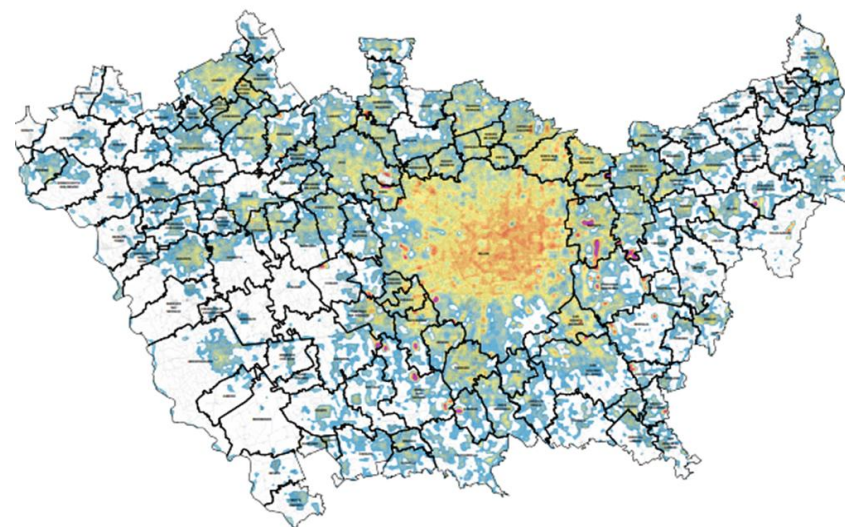
Effects

Thermal anomalies/ Urban
heat islands
Weather event mapping
Population Risk Mapping
Hydraulic Hazard Mapping

HEAT ISLANDS EFFECTS

A single heat map was produced by combining data from various UHI events (2015–2018) showing the temperature differences between urban and rural areas, with the latter being cooler

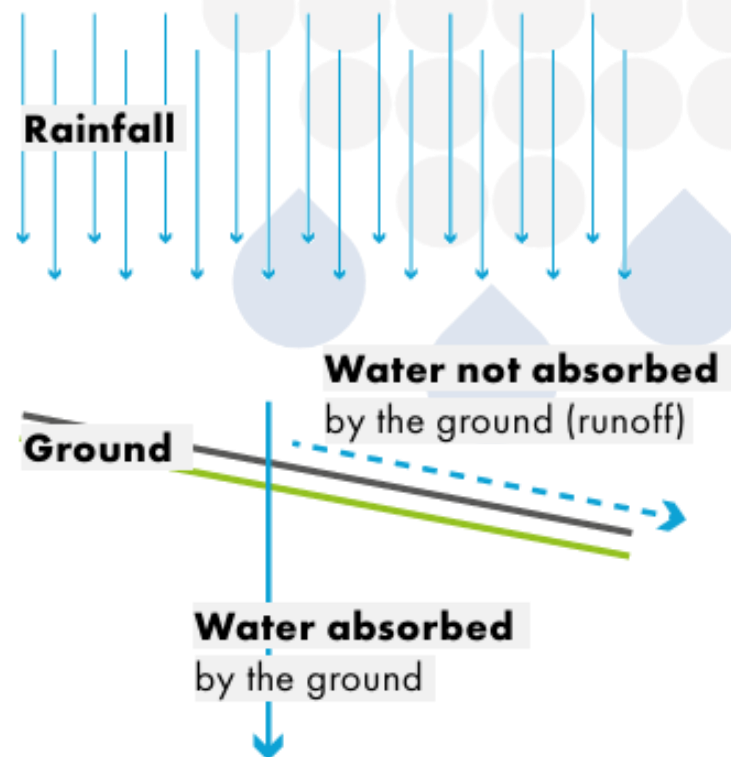
- The difference is calculated between night-time temperatures in the urban area and a reference minimum night-time temperature measured in the surrounding rural areas. It can be categorised into classes with a 0.5-degree (°C) range. This map represents the RISK LEVEL.
- Using ISTAT data (2011 census, published in 2017), the vulnerability index was calculated based on the vulnerable resident population (adults over 70 and children under 10). The density of the vulnerable population is based on ISTAT census sections and is normalised against the maximum value identified in the reference area (the municipality).
- By combining the two sets of data above (hazard and vulnerability index), the risk index for the population vulnerable to temperature anomalies was calculated



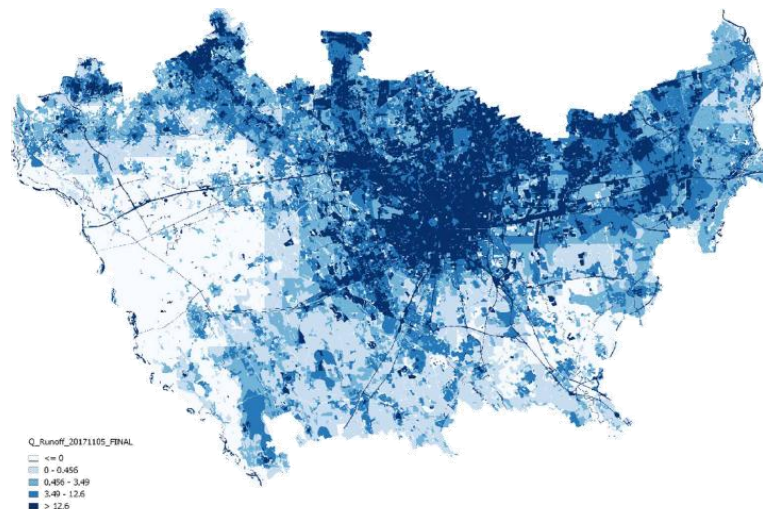
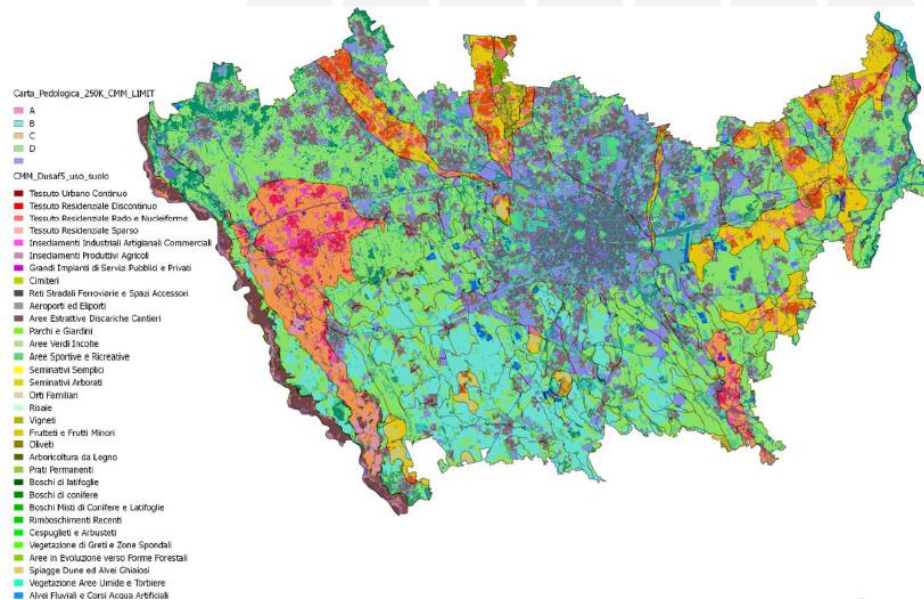
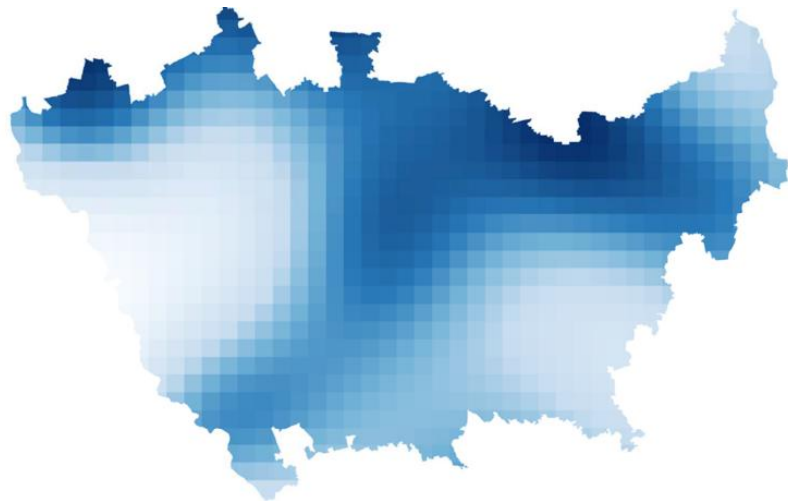
WATER RUN-OFF

To calculate potential runoff, the soil's capacity to retain rainwater was taken into account, based on land use/land cover characteristics and soil properties.

The calculated and mapped value estimates the volume of rainwater rejected per territorial unit, following a rainfall event. In practice, for each territorial unit – represented by a square cell (pixel) measuring 30 metres on a given raster – the quantity of water not absorbed by the soil is estimated.



WATER RUN-OFF



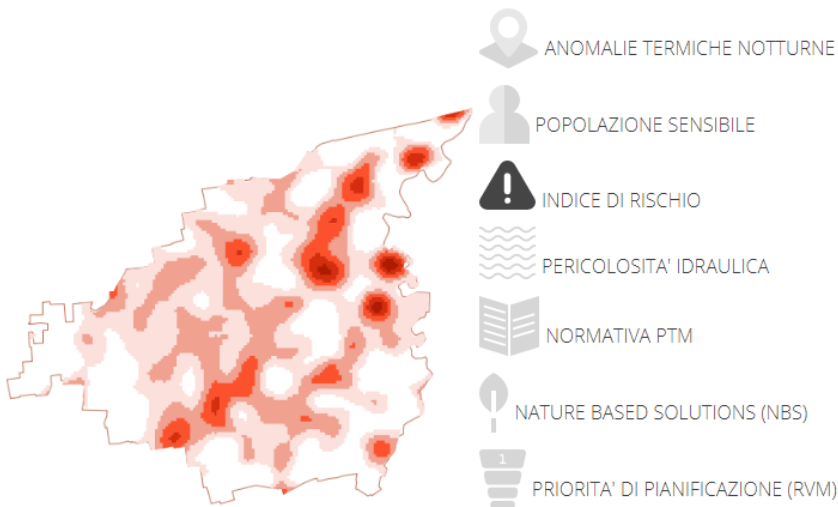
Q_Runoff_20171105_FBNAL

- <= 0
- 0 - 0.455
- 0.456 - 3.49
- 3.49 - 12.6
- > 12.6

SESTO SAN GIOVANNI

Zona Omogenea:
Nord Milano

Esempio di area critica
nella zona omogenea



La tavola rappresenta le anomalie termiche notturne studiate mediante l'analisi dei dati del satellite MODIS AQUA, utilizzando le informazioni relative alle notti maggiormente calde dal 2015 al 2018. Il tasso di anomalia termica è stato calcolato a partire dal valore minimo medio specifico per il territorio di ciascun comune e per l'intero territorio di Città metropolitana di Milano.

TERRITORIO COMUNALE SOGGETTO AD ANOMALIE TERMICHE NOTTURNE

Percentuale di superficie del territorio notturna superiore di almeno 2 gradi al valore medio minimo rilevato in Città Metropolitana di Milano
Superficie totale **Sesto san giovanni: 7.8 km²**

* SUPERIORI ALLA MEDIA DI CITTÀ METROPOLITANA		TERRITORIO COINVOLTO
+2.1 - 2.5		33.8%
+2.6 - 3.0		23.4%
+3.1 - 3.5		6.7%
+3.6 - 4.0		1.8%
+4.1 - 4.5		0.4%
+4.6 - 5.0		0.0%

Totale territorio soggetto ad anomalie termiche notturne

66.1%

7.8 KM²

ADAPTING TO THE NEW CONDITIONS – TERRITORIAL POLICY

The Metropolitan City of Milan is a second-level local authority that was established in 2015 to replace the Province of Milan, with the aim of better managing the area's shared interests and allocating resources more swiftly and efficiently

MAIN TASKS:

- Spatial and strategic planning
- Mobility and transport
- Land and environmental protection
- Economic and social development



Potentially

Which goals and targets can CMM influence?

74 : AGENDA 2030 TARGETS
OF 169 : THAT FALL WITHIN THE
ORGANISATION'S REMIT



OF WHICH : RELEVANT
72 : TO CMM

ADAPTING TO THE NEW CONDITIONS – TERRITORIAL POLICY



Development of policy strategies consistent with the goal at the level of the home institution

AGENDA
METROPOLITANA
URBANA
PER LO SVILUPPO
SOSTENIBILE

A stylized sun icon with rays, positioned to the right of the text.

ADAPTING TO THE NEW CONDITIONS – TERRITORIAL POLICY



Resilient trajectory

Ecological trajectory

Energy trajectory



Mission 2 - green revolution
and ecological transition
X

Sustainability and
attractiveness

Mission 3 - sustainable mobility
infrastructure
X

Sustainability, connectivity,
proximity and attractiveness



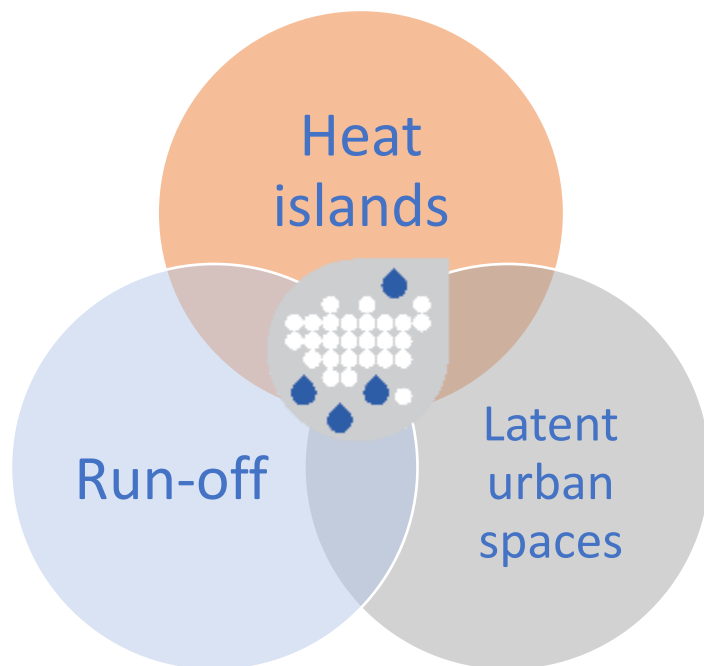
Provides local authorities with guidance on possible measures to be adopted in their General Town Plans (PGT) to reduce both daytime and night-time heat anomalies. Similarly, on the subject of hydraulic invariance, the PTM sets out guidelines and actions

ADAPTING TO THE NEW CONDITIONS - ACT

Città Metropolitana Spugna is an **URBAN REGENERATION** strategy which, through **NATURE-BASED SOLUTIONS** for **SUSTAINABLE URBAN DRAINAGE**, aims to **IMPROVE QUALITY OF LIFE** and **REDUCE THE RISK OF FLOODING** in urban public spaces, addressing the challenges posed by climate change.



ADAPTING TO THE NEW CONDITIONS - ACT



STRATEGY THE 'SPONGE' METROPOLITAN CITY



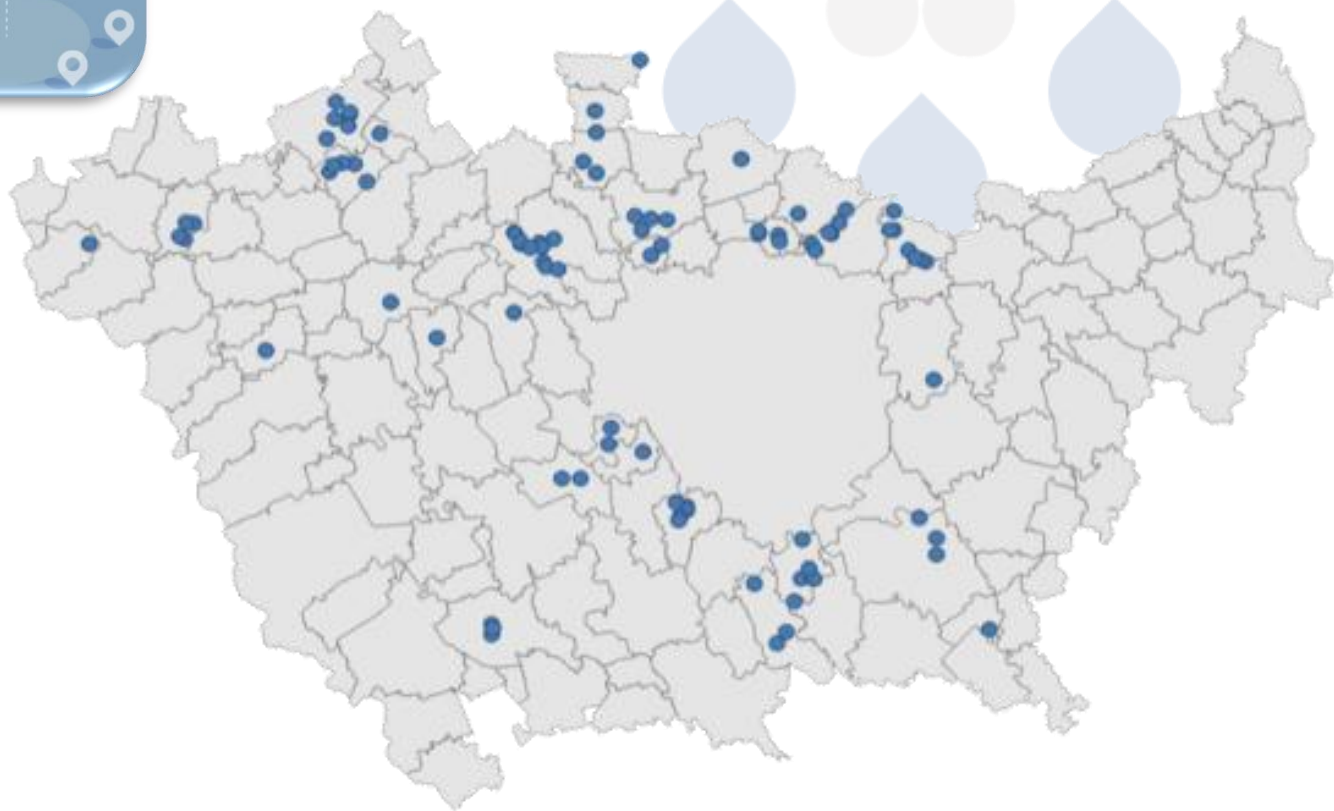
AGENDA
METROPOLITANA
URBANA
PER LO SVILUPPO
SOSTENIBILE



WHAT'S CHANGING IN THE 'SPONGE CITY'?



TERRITORI E SUPERFICI TRASFORMATE



WHERE WE HAVE CARRIED OUT PROJECTS

PARKING



SQUARE



GREEN AREA



STREET



SPORT AREA





Città
metropolitana
di Milano

THANK YOU!

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