Adapting the Bovisa Campus to Climate Change

Participants: 20 Erasmus Staff Training participants + 28 students in urban planning
Instructors: Eugenio Morello, Doruntina Zendeli, Asef Ayatollahi, Eleonora Perotto, Paola Baglione, Chiara Minerva
Meeting point: La Masa Campus Entrance of EN:Lab, BL 31 at 9:15; from here we move together to the classroom.

- 9:30 – Introduction to Climate Change Adaptation concepts and measures and the POLIMI Adaptation Plan (Prof. Eugenio Morello, Dr. Doruntina Zendeli)
- 10:30 – Introduction to a brief collaborative activity: enhancing adaptation on POLIMI Bovisa Campus – team building: 5 groups composed by about 5 students in urban planning and 4 staff members each
- 10:45 De-waterproofing and de-paving solutions for climate change mitigation and adaptation (Arch. Barbara Vai, Arch. Giuseppe Mondini, POLIMI ATE)
- 11:15 – Coffee break
- 11:45 - Field Survey of Durando Campus (with Arch. Barbara Vai and Arch. Giuseppe Mondini)
- 13:00 – Lunch break (independent)
- 14:30 – Back to BL 31 EN:Lab – Collaborative activity: work activity in 5 groups (with support of instructors and tutors)
- 16:30 – Presentation of outcomes by the 5 groups to the Environmental Sustainability Officers and the Instructors
- 17:30 – Closing

CLIMATE ADAPTATION EXAMPLES & SOLUTIONS

Eugenio Morello & Doruntina Zendeli

Energy Climate & Urban Planning Studio

09.10.2025

Day/Workshop objectives

- **Build knowledge**
  Gain a foundational understanding of climate change adaptation principles, challenges, and opportunities.
- **Learn from a real case**
  Explore how adaptation is addressed within a university campus context, through the case study of the Politecnico di Milano Climate Adaptation Plan.
- **Apply in practice**
  Work collaboratively on the Bovisa Campus to design an adaptation strategy, identifying actionable measures and site-specific solutions for enhancing campus resilience.

Work modality

- In the collaborative activity we will work in teams
- Each team will be composed by:

  5 students in Urban Planning + 4 University Staff Members

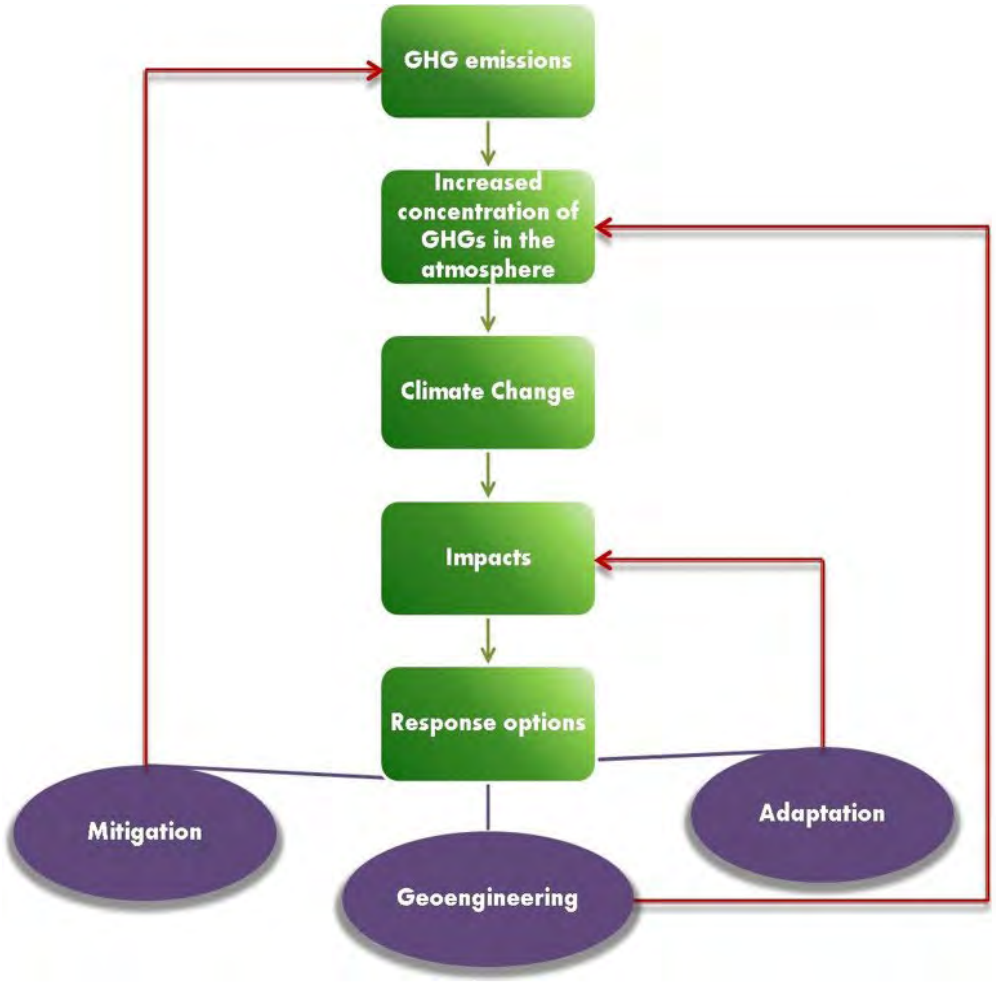
What is climate adaptation?

The difference between mitigation and adaptation...

Mitigation measures are actions taken to **reduce** and **contain greenhouse gas emissions**, while **adaptation** measures are based on **reducing vulnerability** to the effects of climate change.

Mitigation, therefore, **deals with the causes of climate change**. Its goal is to reduce future climate change by slowing down the rate of increase, or by reducing the concentrations of greenhouse gases in the atmosphere.

While **adaptation addresses the impacts of CC**. And it is defined by the IPCC as "Initiatives and measures to reduce the vulnerability of natural and human systems against the effects of actual or expected climate change".



Source: Tom Tietenberg and Lynne Lewis, Environmental & Natural Resource Economics, (Boston, [Mass.]: Pearson, 2015)

Climate Adaptation Plan of Politecnico di Milano

Example of University Climate Adaptation And Action Plans

Vision

The *Climate Adaptation Plan of the Politecnico di Milano (PdA)* was conceived with the goal of **reducing climate-related risks** and **increasing the resilience of the academic community**.

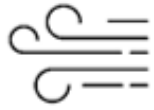
The university positions itself as a **living lab of innovation, research, and experimentation—** capable of integrating climate challenges within its infrastructures, organizational processes, and the daily life of students, faculty, and technical-administrative staff.

Objectives

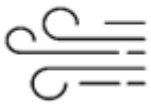
- **O1 /** Identify and map the major climate risks and their corresponding impacts on:
  - the Polytechnic community, particularly concerning activities such as studying and working, commuting, and living;
  - infrastructures;
  - other species—particularly flora and fauna—in order to help preserve biodiversity in a changing climate.
- **O2 /** Propose adaptive solutions to mitigate the impacts of climate change on our community, infrastructures, and other species.
- **O3 /** Promote a culture of climate change adaptation across the entire university, also through “soft” measures related to awareness, knowledge, and capacity building to respond to the challenge—through education, research, and service activities on our campuses, following a *living lab* approach.

Steps

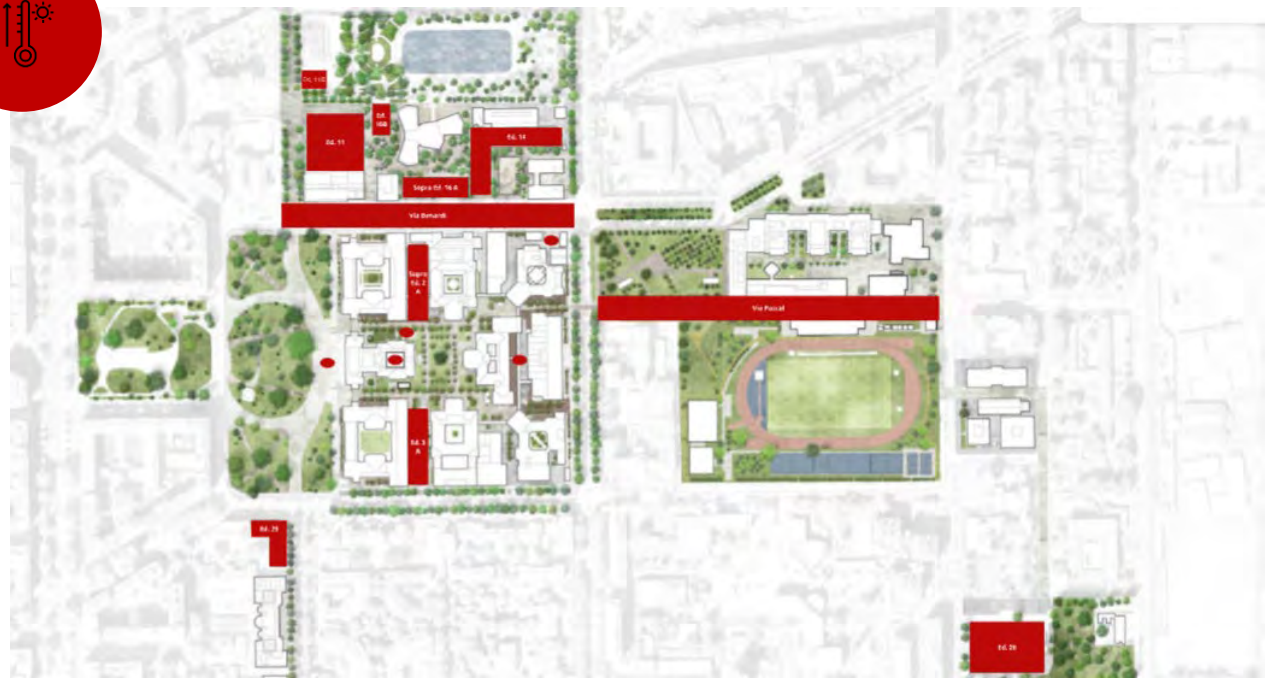

Urban Adaptation Support Tool
Preparing the ground
1
Risk & Vulnerability
2
Identify options
3
Assess & select
4
Implement
5
Monitor & evaluate
6
Covenant of Mayors
for Climate & Energy

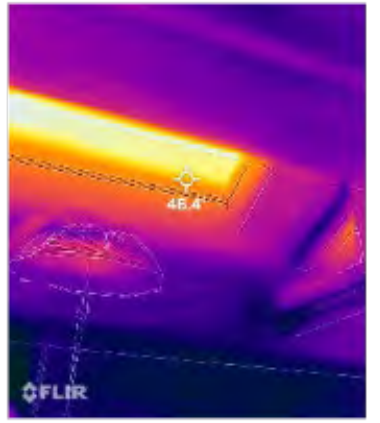
Hazards	Living	Working/Studying	Moving
HEAT 	- Reduced comfort in classrooms and dormitories - Health risks for students and staff - Increased energy for cooling university buildings	- Reduced productivity in classrooms and offices - Increased cooling costs for IT and research labs	- Discomfort on public transport - Rail buckling
FLOODS 	- Damage to facilities such as libraries and dormitories - Health risks from damp/mold - Power outages disrupting campus life	- Restricted access to campus due to flooding - Damage to academic and administrative infrastructure - Delayed operations and services	- Blocked roads and railways affecting commuting to campus
WATER SCARCITY 	- Restrictions on water use in dormitories, kitchens, and green spaces - Health risks due to limited clean water access	- Limited water availability for research and utility systems - Reduced productivity in water-reliant facilities	- Delays in essential supplies such as catering and lab equipment
STORMS 	- Structural damage to buildings and student housing - Increased health and safety risks on campus	- Disruptions to classes, research, and administrative operations - Repair costs for damaged infrastructure	- Blocked roads and public transport disruptions affecting access to campus
HEAVY WIND 	- Damage to campus buildings and green spaces - Safety risks from falling trees - Power outages affecting campus life	- Damage to infrastructure such as solar panels and signs in public spaces - Disruptions to research and IT operations	- Unsafe travel conditions on roads and paths - Public transport route disruptions

Source: Adapted from EEA, 2016

Hazards	People	Infrastructures	Open Spaces / Vegetation
HEAT 	- Reduced comfort in buildings, open spaces, and pathways - Illnesses or heat shock incidents - Decrease in productivity - Activity interruptions	- Deterioration/damage to plants or systems - Increase/peak in energy demand for cooling - Power outages / blackouts - Surge in emergencies to manage - Higher energy consumption/costs for cooling - Increased repair/restoration costs	- Distress/weakening/damage to trees and greenery due to excessive heat - Reduced canopy / vegetation cover - Increase/peak in irrigation water demand - Higher water consumption for irrigation
FLOODS 	- Discomfort/damage to people and personal belongings - Disruptions/delays/interruptions in mobility - Restrictions/delays/interruptions to study and work activities - Health issues linked to humidity/mold	- Deterioration/damage to plants, infrastructures, buildings - Power outages / blackouts - Surge in emergencies to manage - Logistical difficulties in managing routine and emergency activities - Increased repair/restoration costs	- Deterioration/damage to trees and open spaces due to excess water - Root weakening - Increased repair/restoration costs
WATER SCARCITY 	- Reduced water availability in buildings and open spaces - Water limitations/interruptions - Discomfort/health issues due to limited water access - Delays/interruptions in water-dependent activities (labs, bars, catering, etc.)	- Reduced water availability for buildings and systems - Lower functionality of water-dependent infrastructures and systems - Surge in emergencies to manage	- Distress/weakening/damage to trees and greenery due to water scarcity - Reduced canopy / vegetation cover - Tree loss - Increased repair/restoration costs
STORMS 	- Discomfort/damage to people and personal belongings - Disruptions/delays/interruptions in mobility - Restrictions/delays/interruptions in study/work flows and activities	- Deterioration/damage to roofs, solar panels, windows, etc. - Power outages / blackouts - Surge in emergencies to manage - Logistical difficulties in managing routine and emergency activities - Increased repair/restoration costs	- Deterioration/damage to trees and open spaces - Reduced canopy / vegetation cover - Root weakening - Tree loss - Increased repair/restoration costs
HEAVY WIND 	- Discomfort/damage to people and personal belongings - Disruptions/delays/interruptions in mobility - Restrictions/delays/interruptions in study/work flows and activities	- Deterioration/damage to lightweight or protruding elements (canopies, etc.) - Power outages / blackouts - Surge in emergencies to manage - Logistical difficulties in managing routine and emergency activities - Increased repair/restoration costs	- Deterioration/damage to trees and open spaces - Reduced canopy / vegetation cover - Root weakening - Tree loss due to uprooting - Increased repair/restoration costs

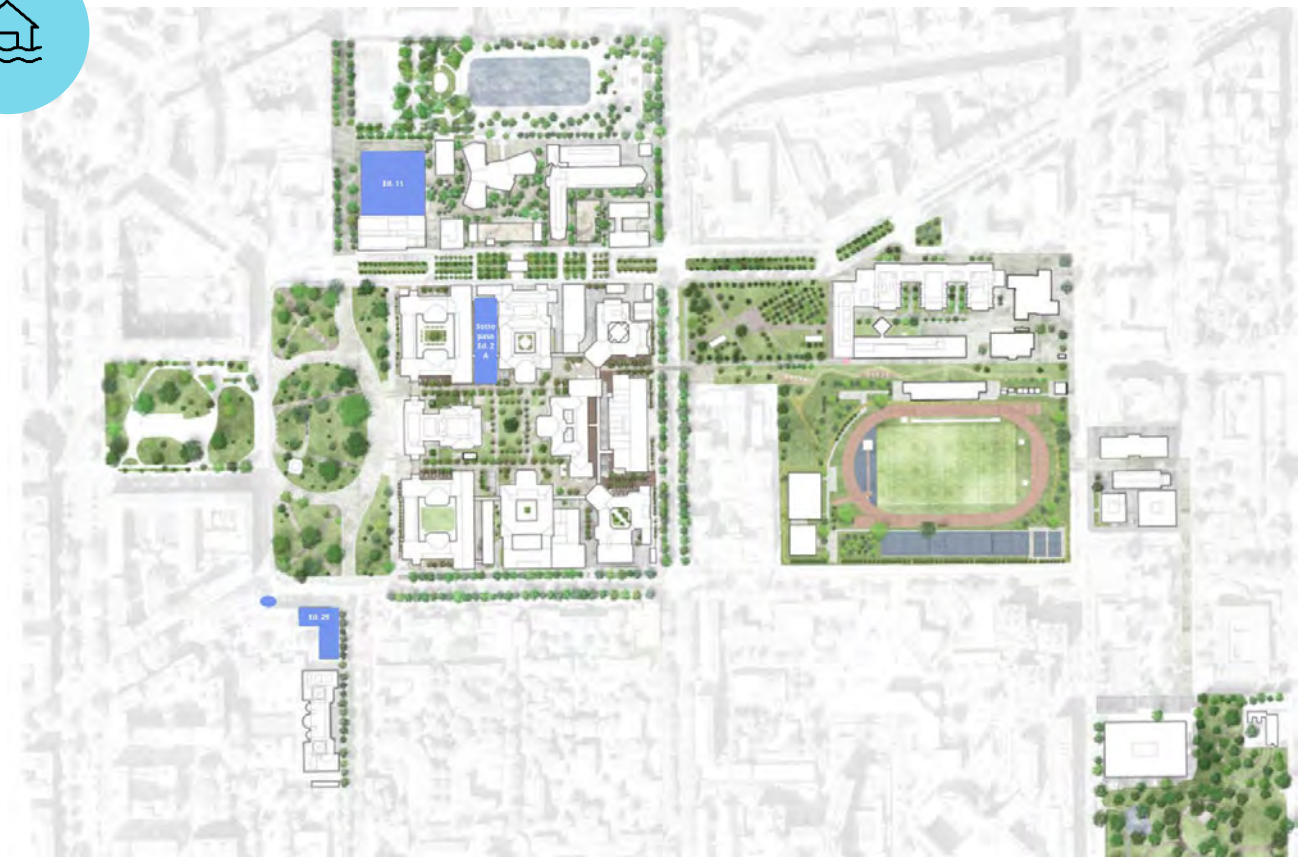
Extreme heat



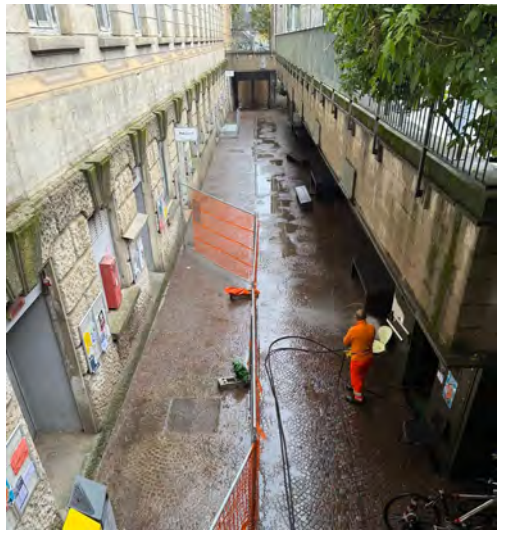

46.4
FLIR

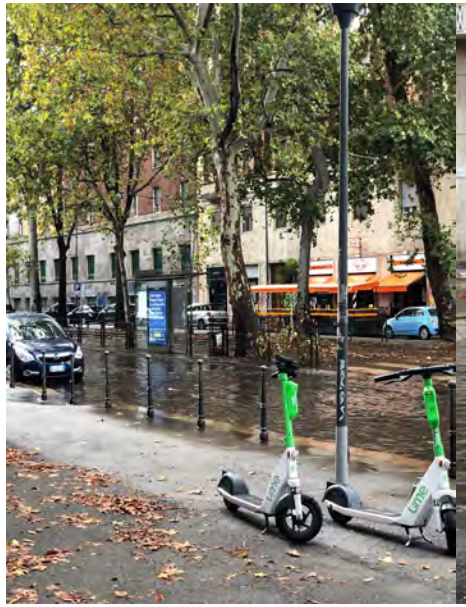

29.5 °C

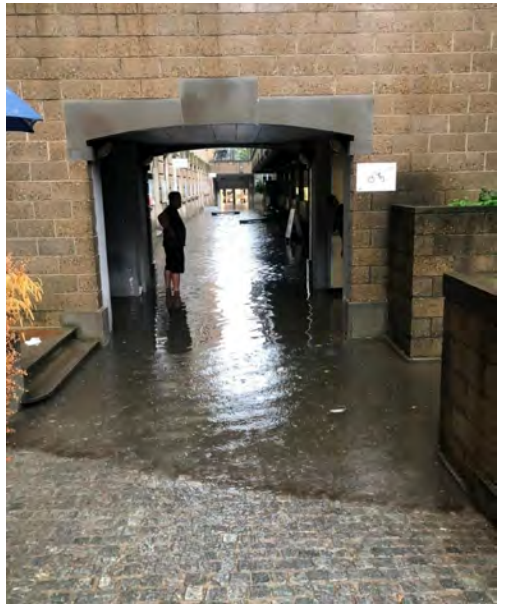
Flooding



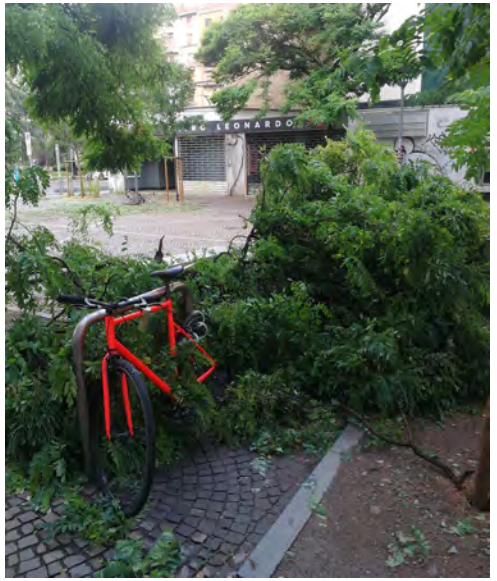




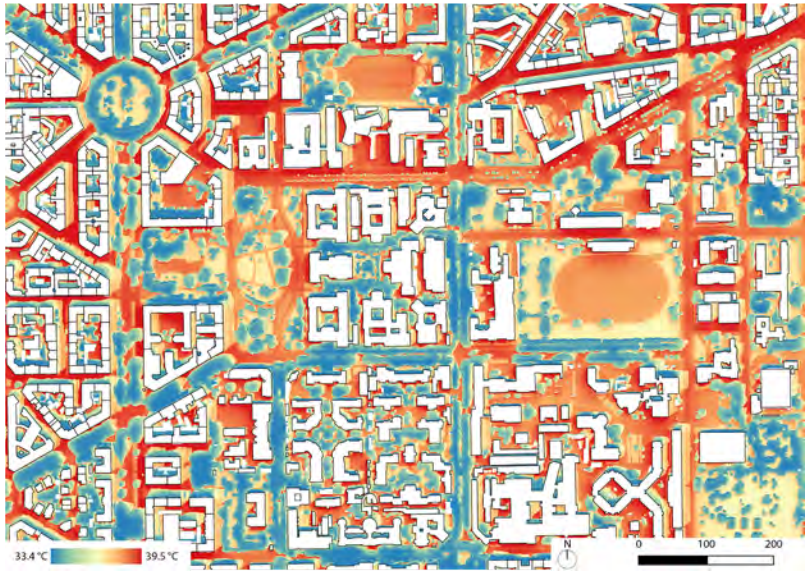



Heavy wind

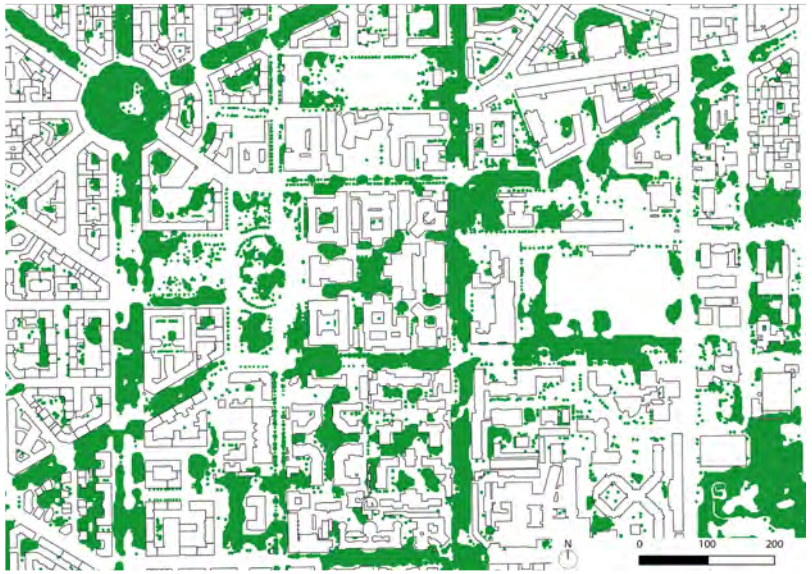


Mapping

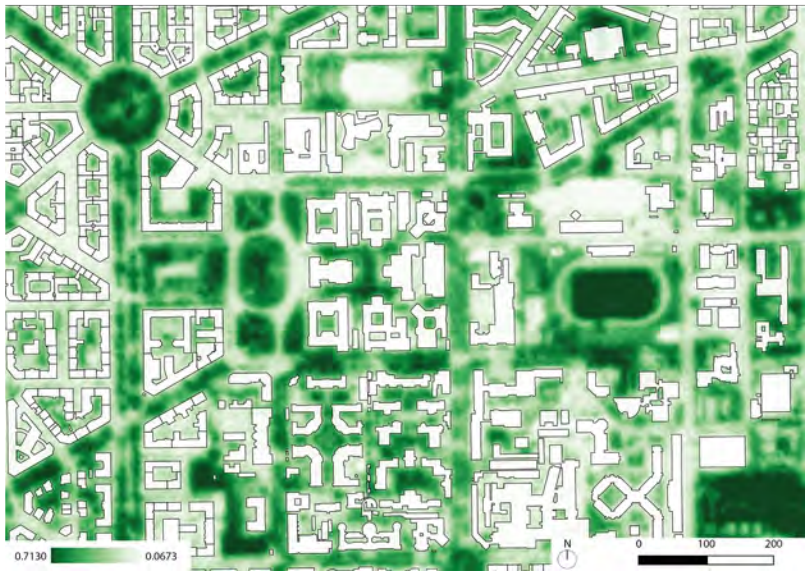
Universal Thermal Climate Index (UTCI)
Resolution: 1m pixel



Tree canopy
Resolution: 1m pixel

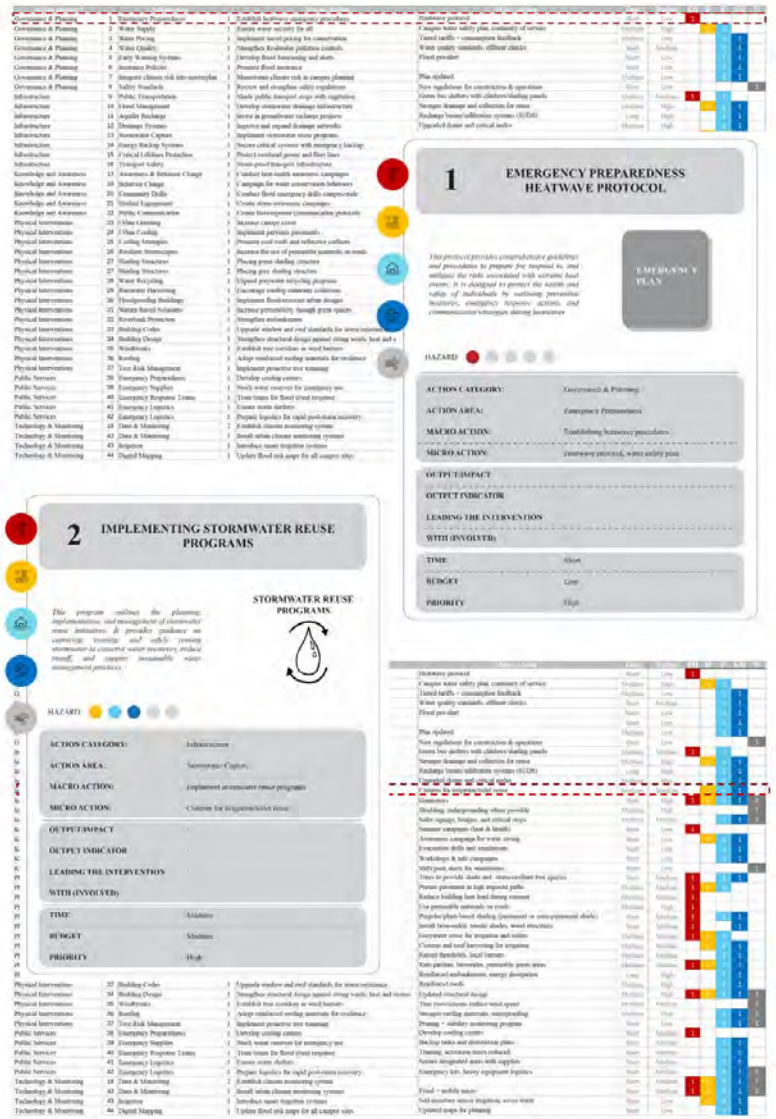


Normalized Difference Vegetation Index(NDVI)
Resolution: 3m pixel



Source: MultiCAST
https://multicast.netbistrot.com/about/


Climate Change Challenges
Objectives
Strategies
Measures
Green + Blue
Gray
Soft



1 EMERGENCY PREPAREDNESS HEATWAVE PROTOCOL

This protocol provides comprehensive guidelines and procedures to prepare for, respond to, and mitigate the risks associated with extreme heat events. It is designed to protect the health and safety of individuals by outlining preventive measures, emergency response actions, and communication strategies during heatwaves.

EMERGENCY PLAN

HAZARD:

ACTION CATEGORY:	Governance & Planning
ACTION AREA:	Emergency Preparedness
MACRO ACTION:	Establishing heatwave procedures
MICRO ACTION:	Heatwave protocol, water safety plan
OUTPUT/IMPACT	
OUTPUT INDICATOR	
LEADING THE INTERVENTION	
WITH (INVOLVED):	
TIME	Short
BUDGET	Low
PRIORITY	High

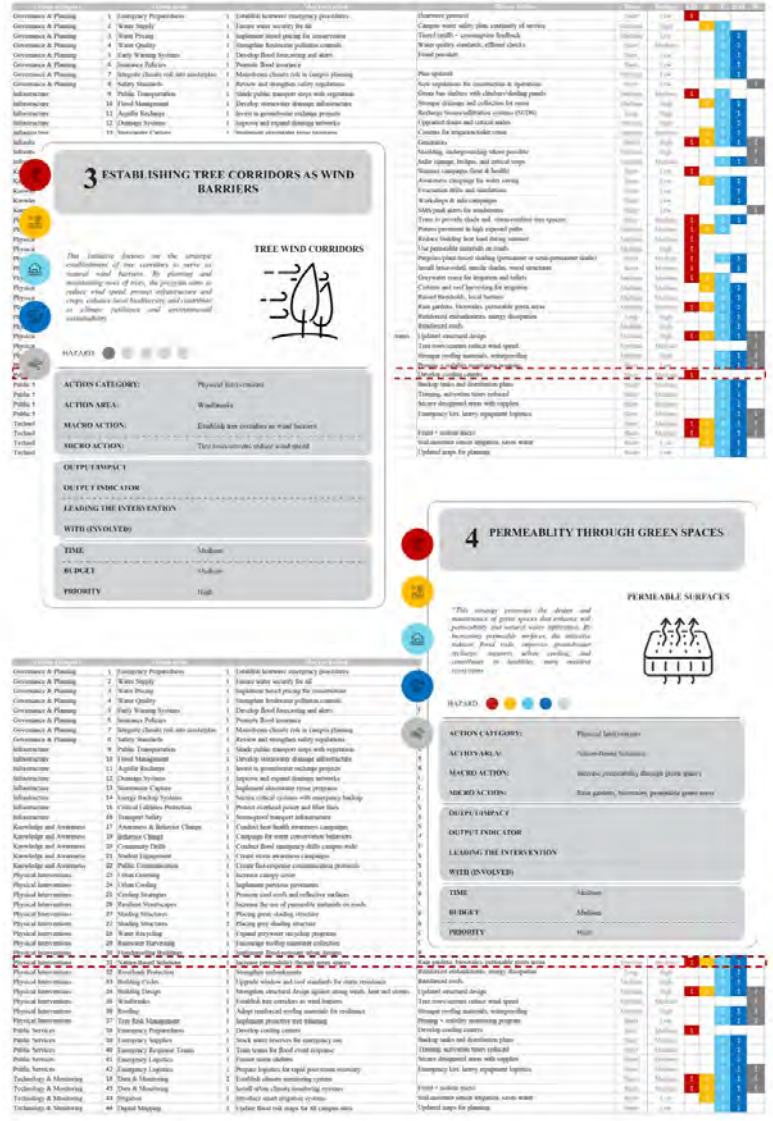
2 IMPLEMENTING STORMWATER REUSE PROGRAMS

This program outlines the planning, implementation, and management of stormwater reuse initiatives. It provides guidance on capturing, treating, and safely reusing stormwater to conserve water resources, reduce runoff, and support sustainable water management practices.

STORMWATER REUSE PROGRAMS

HAZARD:

ACTION CATEGORY:	Infrastructure
ACTION AREA:	Stormwater Capture
MACRO ACTION:	Implement stormwater reuse programs
MICRO ACTION:	Cisterns for irrigation/toilet reuse
OUTPUT/IMPACT	
OUTPUT INDICATOR	
LEADING THE INTERVENTION	
WITH (INVOLVED):	
TIME:	Medium
BUDGET:	Medium
PRIORITY	High



3 ESTABLISHING TREE CORRIDORS AS WIND BARRIERS

This initiative focuses on the strategic establishment of corridors to serve as natural wind barriers. By planting and maintaining rows of trees, the program aims to reduce wind speed, protect infrastructure and crops, enhance local biodiversity, and contribute to climate resilience and environmental sustainability.

TREE WIND CORRIDORS

HAZARD:

ACTION CATEGORY:	Physical Interventions
ACTION AREA:	Windbreaks
MACRO ACTION:	Establish tree corridors as wind barriers
MICRO ACTION:	Tree rows/canopies reduce wind speed
OUTPUT/IMPACT	
OUTPUT INDICATOR	
LEADING THE INTERVENTION	
WITH (INVOLVED):	
TIME	Medium
BUDGET	Medium
PRIORITY	High

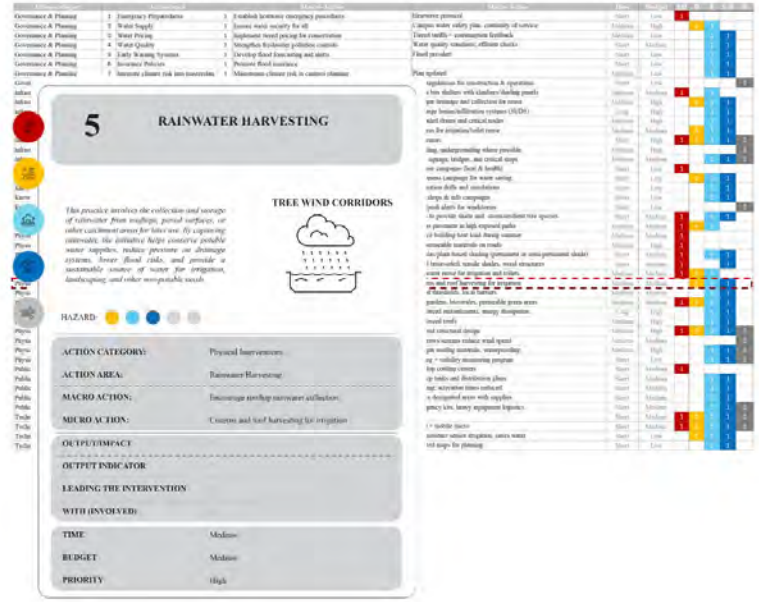
4 PERMEABILITY THROUGH GREEN SPACES

"This strategy promotes the design and maintenance of green spaces that enhance soil permeability and natural water infiltration. By increasing permeable surfaces, this initiative reduces flood risks, improves groundwater recharge, supports urban cooling, and contributes to healthier, more resilient ecosystems.

PERMEABLE SURFACES

HAZARD:

ACTION CATEGORY:	Physical Interventions
ACTION AREA:	Nature-Based Solutions
MACRO ACTION:	Increase permeability through green spaces
MICRO ACTION:	Rain gardens, bioswales, permeable green areas
OUTPUT/IMPACT	
OUTPUT INDICATOR	
LEADING THE INTERVENTION	
WITH (INVOLVED):	
TIME	Medium
BUDGET	Medium
PRIORITY	High



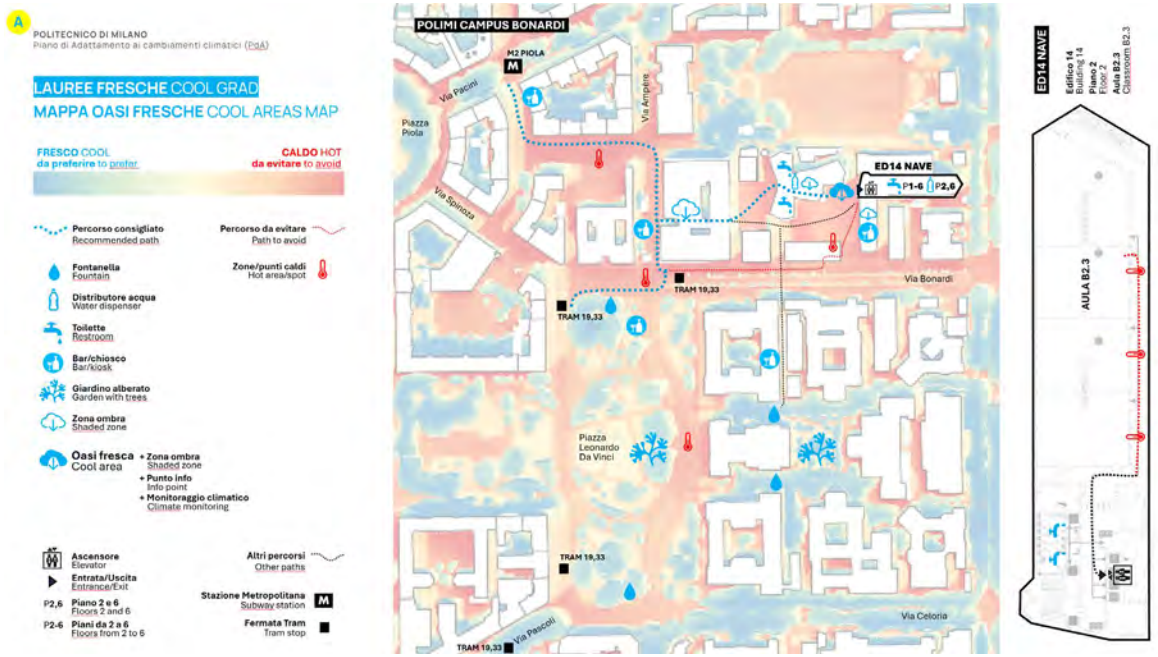
5 RAINWATER HARVESTING

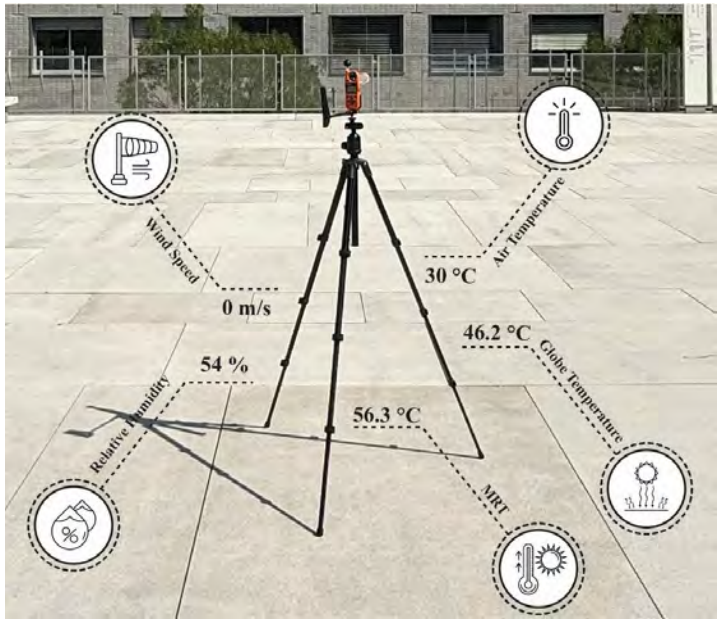
This practice involves the collection and storage of rainwater from rooftops, paved surfaces, or other catchment areas for later use. By capturing rainwater, this initiative helps conserve potable water supplies, reduces pressure on drainage systems, lower flood risks, and provide a sustainable source of water for irrigation, landscaping, and other non-potable needs.

TREE WIND CORRIDORS

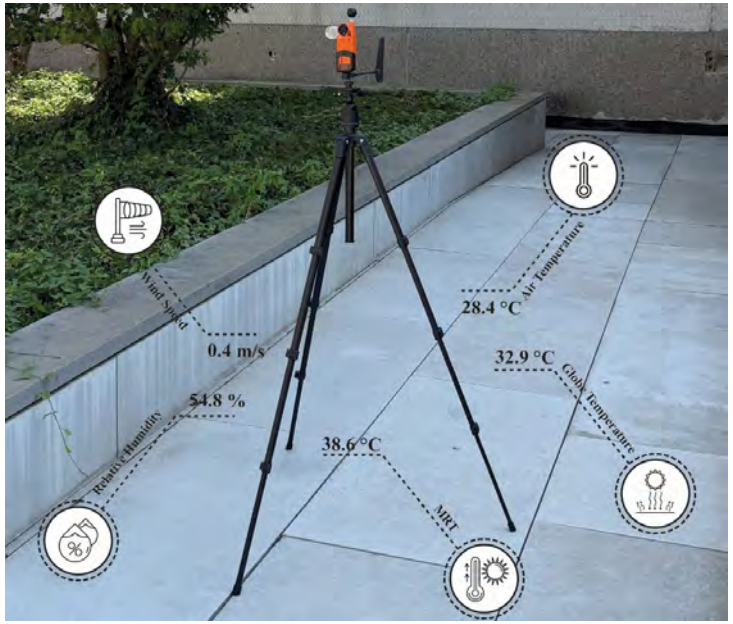
HAZARD:

ACTION CATEGORY:	Physical Interventions
ACTION AREA:	Rainwater Harvesting
MACRO ACTION:	Encourage rooftop rainwater collection
MICRO ACTION:	Cisterns and roof harvesting for irrigation
OUTPUT/IMPACT	
OUTPUT INDICATOR	
LEADING THE INTERVENTION	
WITH (INVOLVED):	
TIME	Medium
BUDGET	Medium
PRIORITY	High


A
POLITECNICO DI MILANO
Piano di Adattamento ai cambiamenti climatici (PdA)
LAUREE FRESCHE COOL GRAD
MAPPA OASI FRESCHE COOL AREAS MAP
FRESCO COOL
da preferire to prefer
CALDO HOT
da evitare to avoid
Percorso consigliato
Recommended path
Percorso da evitare
Path to avoid
Fontanella
Fountain
Zone/punti caldi
Hot area/spot
Distributore acqua
Water dispenser
Toilette
Restroom
Bar/chiosco
Bar/kiosk
Giardino alberato
Garden with trees
Zona ombra
Shaded zone
Oasi fresca
Cool area
+ Zona ombra
Shaded zone
+ Punto info
Info point
+ Monitoraggio climatico
Climate monitoring
Ascensore
Elevator
Entrata/Uscita
Entrance/Exit
P2,6
Piano 2 e 6
Floors 2 and 6
P2-6
Piani da 2 a 6
Floors from 2 to 6
Altri percorsi
Other paths
Stazione Metropolitana
Subway station
M
Fermata Tram
Tram stop
POLIMI CAMPUS BONARDI
M2 PIOLA
Via Pacini
Via Ampère
Piazza Piola
Via Spinoza
ED14 NAVE
P1-6
P2,6
Via Bonardi
TRAM 19,33
Piazza Leonardo Da Vinci
Via Celoria
Via Pascoli
ED14 NAVE
Edificio 14
Building 14
Piano 2
Floor 2
Aula B2.3
Classroom B2.3
AULA B2.3


Wind Speed
0 m/s
Air Temperature
30 °C
46.2 °C
Globe Temperature
54 %
Relative Humidity
56.3 °C
MRT


B
POLITECNICO DI MILANO
LAUREE FRESCHE COOL GRAD
DECALOGO FRESCO COOL DECALOGUE
FRESCO COOL
da preferire to prefer
CALDO HOT
da evitare to avoid
Usa i percorsi più freschi per raggiungere l'aula della laurea
Use the cooler paths to reach the graduation classroom
Rinfrescati e dissetati presso punti ristoro/acqua
Refresh yourself and drink at the water dispenser/fountains
Fai caso allo Staff LAUREE FRESCHE (t-shirt azzurra) che si trovano all'ingresso dell'edificio, nel corridoio, nell'aula
Look out for the COOL GRAD Staff (blue t-shirts) at the building entrance, in the hallway, in the classroom
Aiuta i tuoi famigliari e amici a orientarsi nell'edificio, nel campus
Help your family and friends find their way around the building and campus
Se vogliono riposarsi o devono aspettare, indirizzali verso la zona fresca più vicina
if they need to rest or wait, direct them to the nearest cool area
Vestiti comodo, leggero, con colori chiari e invita i docenti, i tuoi famigliari e amici a fare lo stesso
Wear comfortable, light clothing, with light colors and encourage your teachersm family and friends to do the same
Consulta See
MAPPA OASI FRESCHE COOL AREAS MAP
Non rimanere troppo tempo senza bere acqua
Don't go too long without drinking water
Non sostare nelle zone più calde
Don't linger in hot areas
Non sottovalutare la tua salute, in caso di problemi/malori chiama o fai chiamare lo Staff LAUREE FRESCHE (t-shirt azzurra)
Don't underestimate your health, in case of problems or illness, call the COOL GRAD Staff (blue t-shirt)
Consulta See
MAPPA OASI FRESCHE COOL AREAS MAP


Wind Speed
0.4 m/s
Air Temperature
28.4 °C
32.9 °C
Globe Temperature
54.8 %
Relative Humidity
38.6 °C
MRT

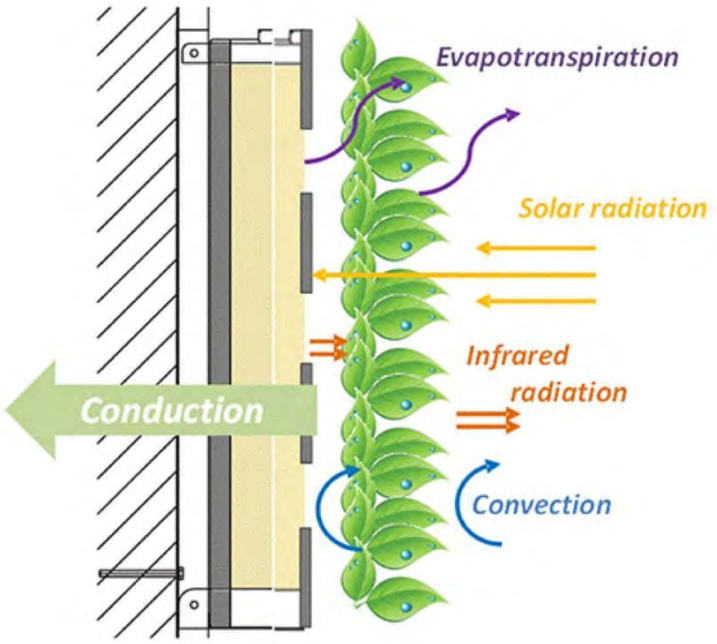
Different climate adaptation measures

Green Roofs

Milano

Green walls

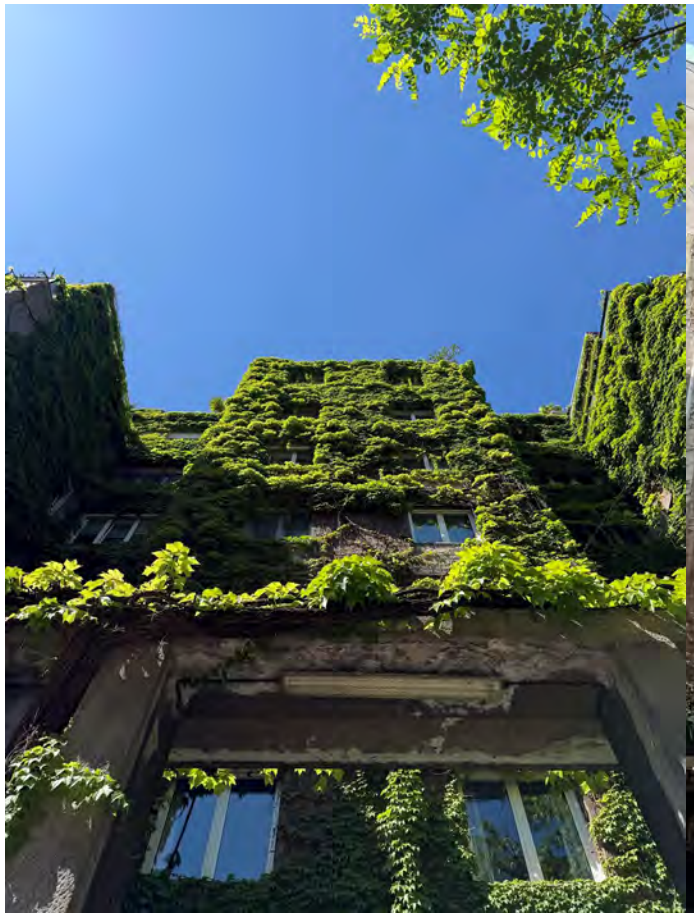
https://citygreen.com/can-living-green-walls-help-alleviate-the-impacts-of-climate-change/



Green walls

Milano

Green walls



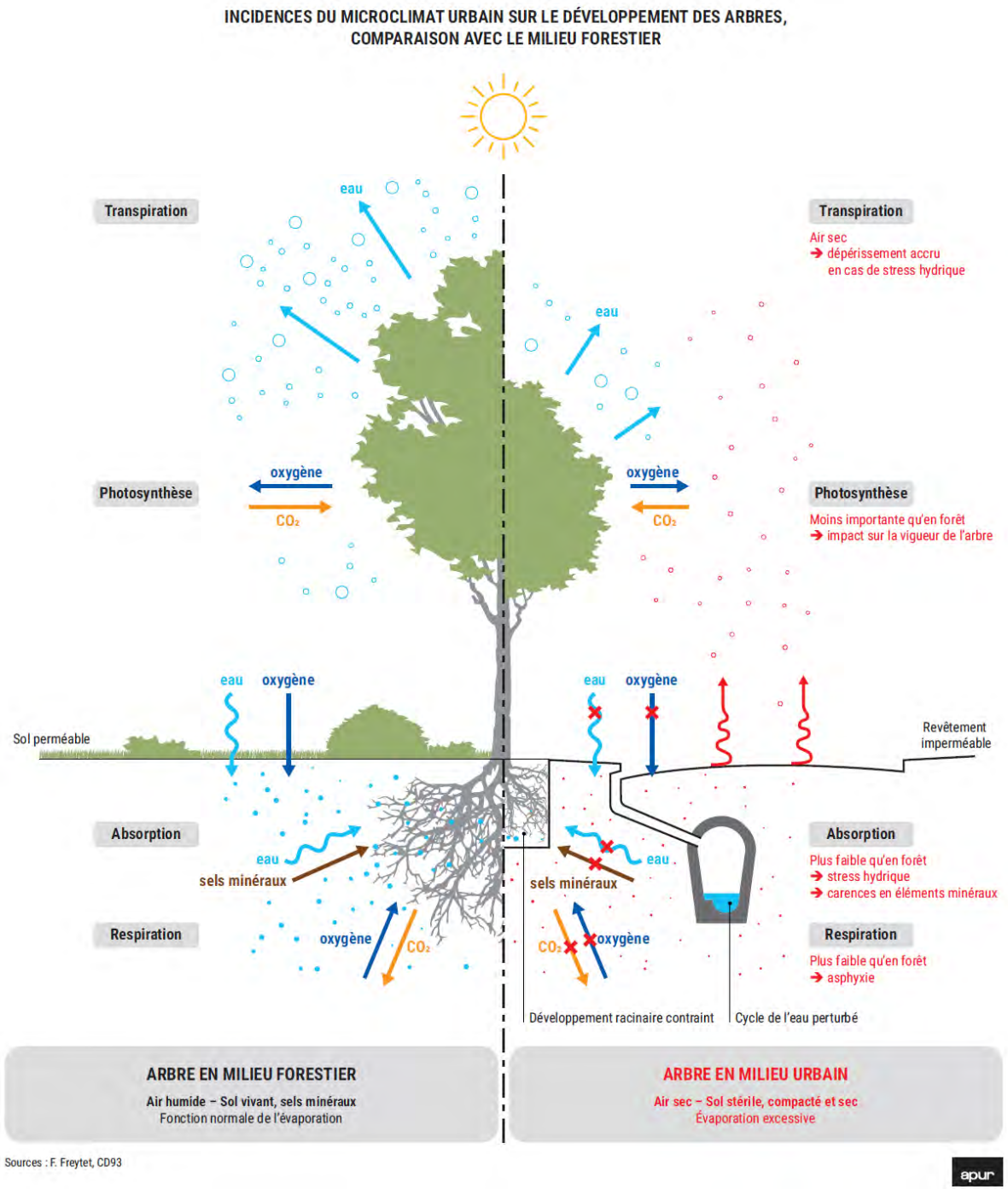
Milano

‘Green balconies’

Milano

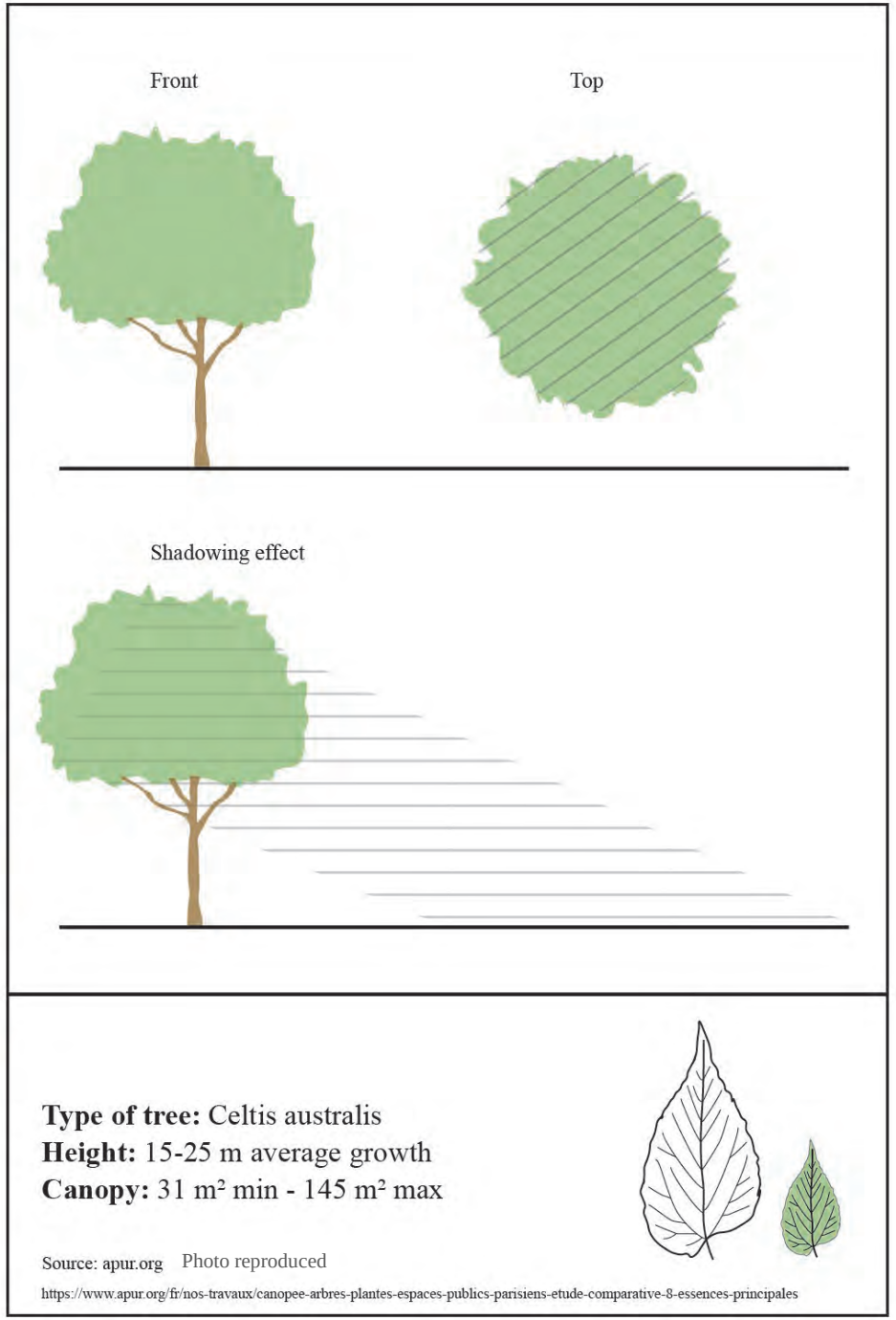
Seasonal change

Trees


INCIDENCES DU MICROCLIMAT URBAIN SUR LE DÉVELOPPEMENT DES ARBRES,
COMPARAISON AVEC LE MILIEU FORESTIER
Transpiration
eau
Transpiration
Air sec
➔ dépérissement accru
en cas de stress hydrique
Photosynthèse
oxygène
CO₂
Photosynthèse
Moins importante qu'en forêt
➔ impact sur la vigueur de l'arbre
Sol perméable
Revêtement imperméable
Absorption
sels minéraux
Absorption
Plus faible qu'en forêt
➔ stress hydrique
➔ carences en éléments minéraux
Respiration
Respiration
Plus faible qu'en forêt
➔ asphyxie
Développement racinaire contraint
Cycle de l'eau perturbé
ARBRE EN MILIEU FORESTIER
Air humide – Sol vivant, sels minéraux
Fonction normale de l'évaporation
ARBRE EN MILIEU URBAIN
Air sec – Sol stérile, compacté et sec
Évaporation excessive
Sources : F. Freytet, CD93
apur

Trees


Source: apur.org

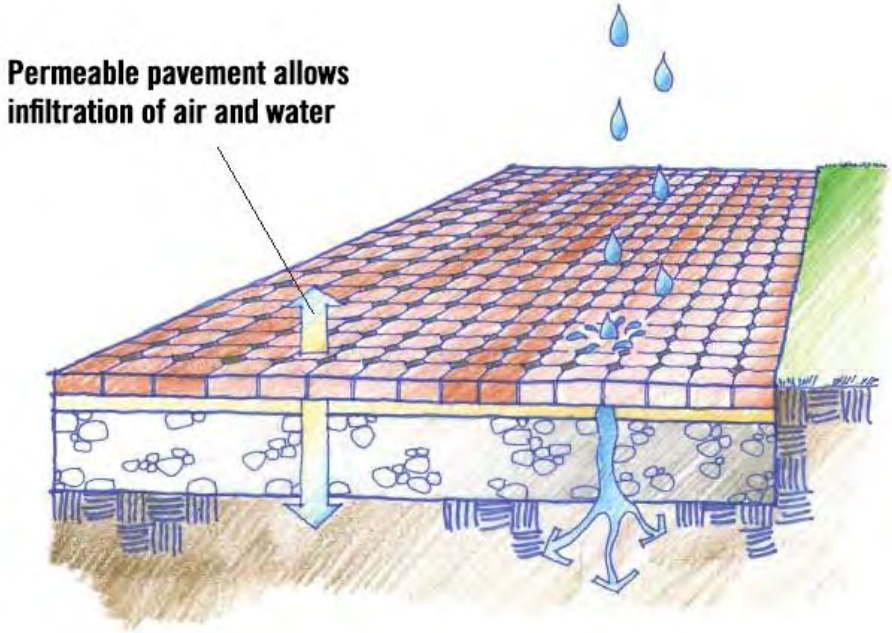

Front
Top
Shadowing effect
Type of tree: Celtis australis
Height: 15-25 m average growth
Canopy: 31 m² min - 145 m² max
Source: apur.org
Photo reproduced
https://www.apur.org/fr/nos-travaux/canopee-arbres-plantes-espaces-publics-parisiens-etude-comparative-8-essences-principales

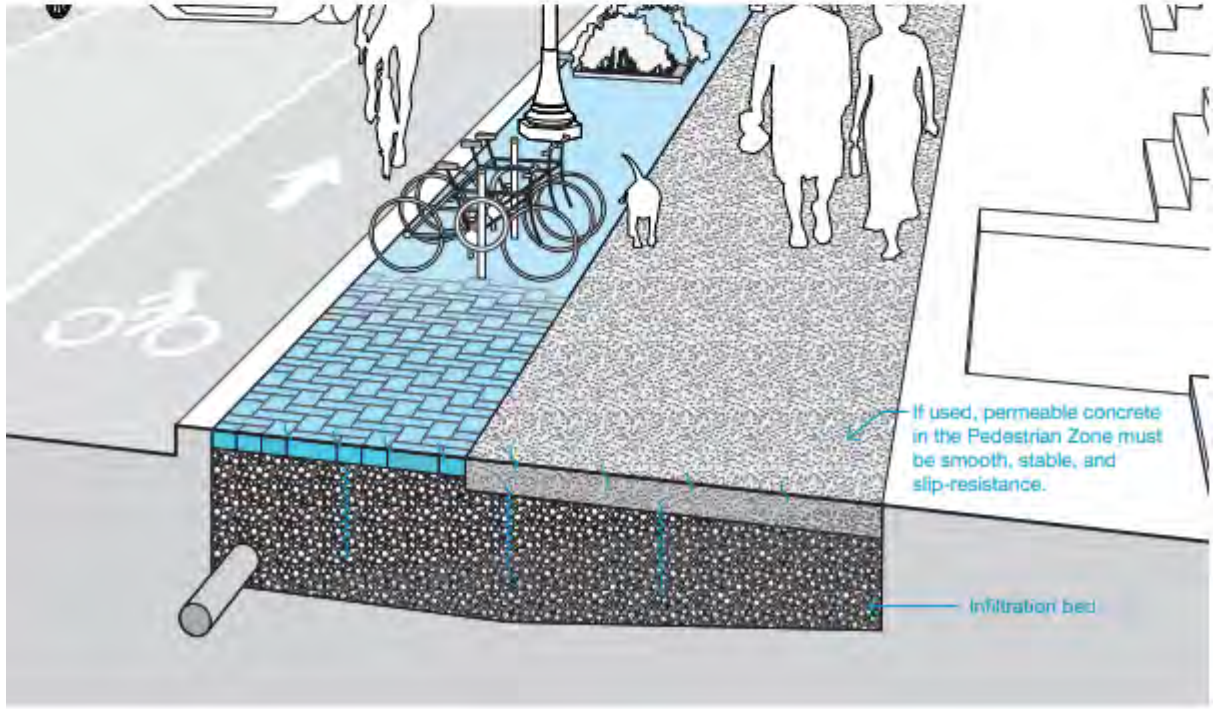
Use

- Permeable paving can be used in a broad variety of settings. All designs must consider the drainage characteristics of the underlying soils, the depth of the water table, and the slope of adjacent land.
- Permeable pavements can be used in sidewalks, plazas, cafés, parking areas, alleys, and other low-traffic areas.
- Soft paving materials are only appropriate for the Greenscape/Furnishing Zone or Frontage Zone, typically around trees, planters, and enclosed greenscape elements.
- Permeable concrete pavement can be piloted for use in the Pedestrian Zone as long as the resulting surface is durable, smooth, stable, slip resistant, and meets all other accessibility guidelines.
- Porous unit pavers are most appropriate in the Greenscape/Furnishing Zone or the Frontage Zone, except where there is active pedestrian use such as at bus stops or at crossings. They may also be used in small plazas offset from the sidewalk Pedestrian Zone.
- In specific locations where infiltration is not desired, such as adjacent to building foundations, engineered geotextile liners can be used to redirect the water to an appropriate location.

Considerations

- Compared to traditional impermeable pavements, permeable pavements can provide increased traction when wet because water tends not to pool, and the need for salt, sand, and plowing can be reduced during winter due to low or no black ice development.
- Designs should include methods to convey larger storms to the storm drain system
- Long-term maintenance costs may be reduced because permeable pavements resist cracking and buckling in freeze-thaw conditions.
- Regular maintenance of permeable pavements include:
  - Annual inspection of unit pavers and permeable concrete for deterioration
  - Periodic replacement of sand, gravel, and vegetation where applicable
  - Annual vacuuming of pavements may be required to unclog sand and debris (Note: The use of sand in ice prevention should be avoided because it will clog pavement pores.)





https://www.utiledesign.com/work/boston-complete-streets-design-guidelines/

SUDS - Bioswales

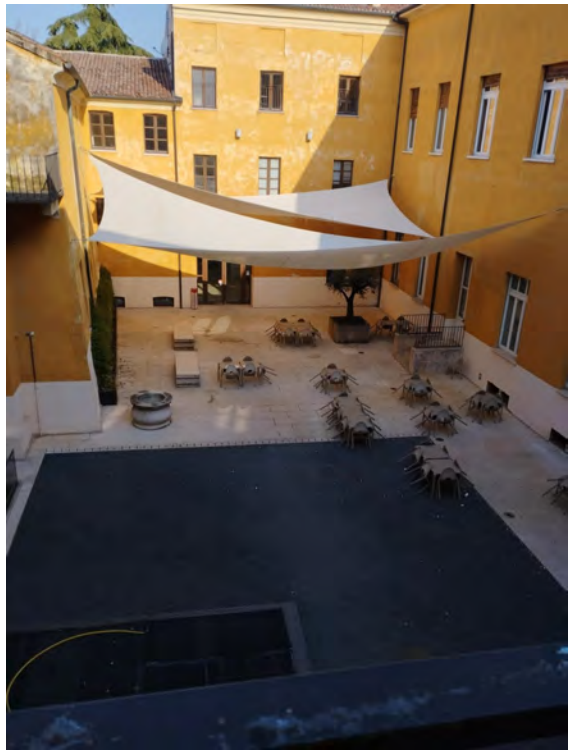
SUDS – Ground infiltration

SUDS – Water squares

SUDS - Gutters

Urban Shading

Cairo, 2025.



Polimi Campus, Mantova, 2025.

Skopje, Old Bazaar, 2024.

Urban furniture

Lausanne

https://fr.wikipedia.org/wiki/Place_des_Pionni%C3%A8res

https://www.lausanne.ch/apps/actualites/index.php?actu_id=77510

Wind towers and urban cooling devices

Water bodies and fountains

https://phys.org/news/2020-05-montreal-temperature-heatwave-canada.html

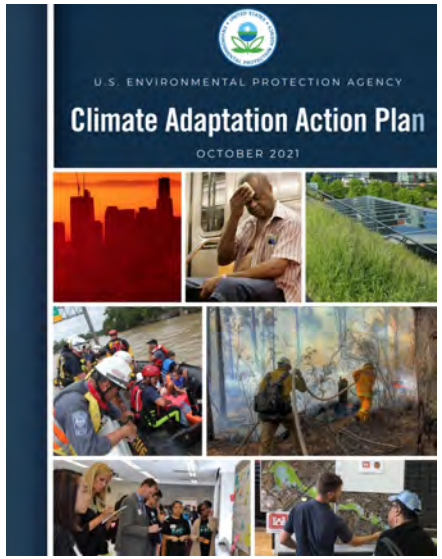
https://www.politico.eu/article/italy-uptick-hospitalization-heat-wave-sweep-eu-continent/

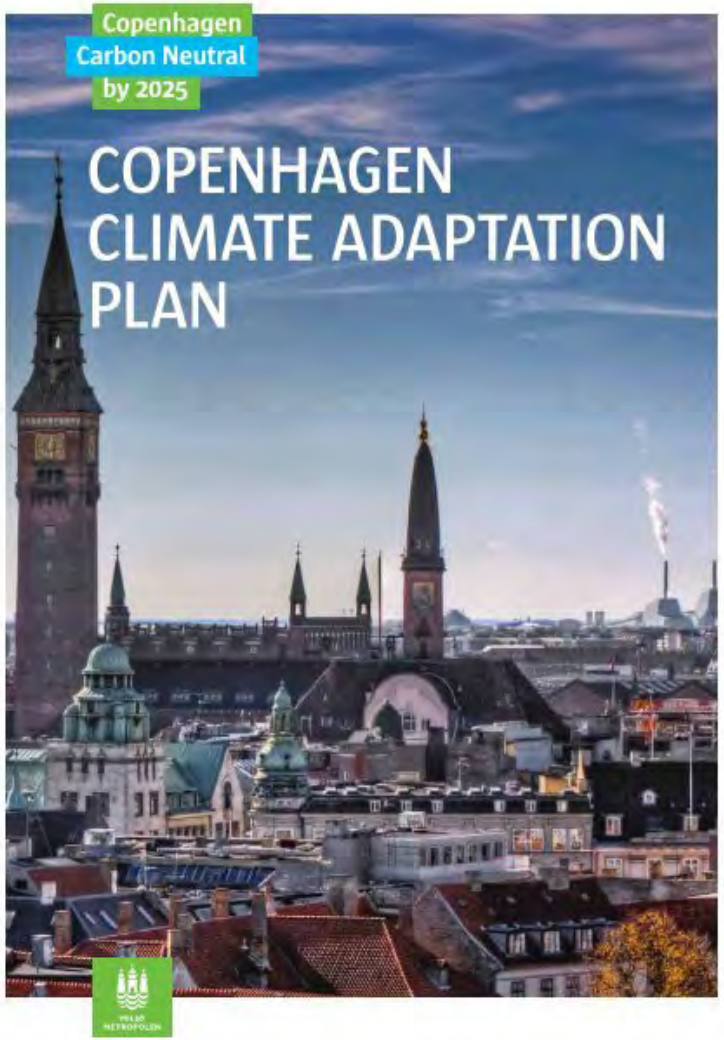
Misting Cooling System

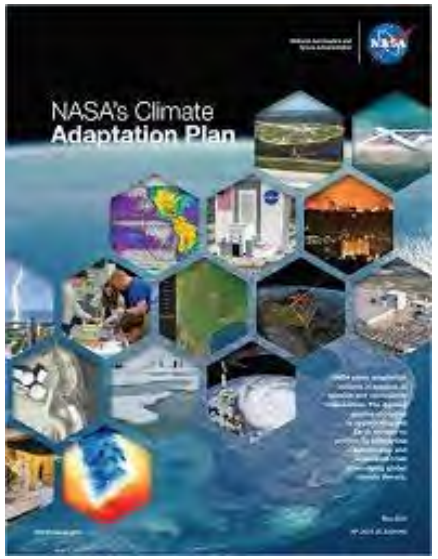
https://aermist.com/blog/using-misting-to-cope-with-heat-waves

https://www.newsnationnow.com/science/ap-health-officials-issue-warnings-as-uk-bakes-in-the-first-heat-wave-of-2025/

Examples of adaptation projects

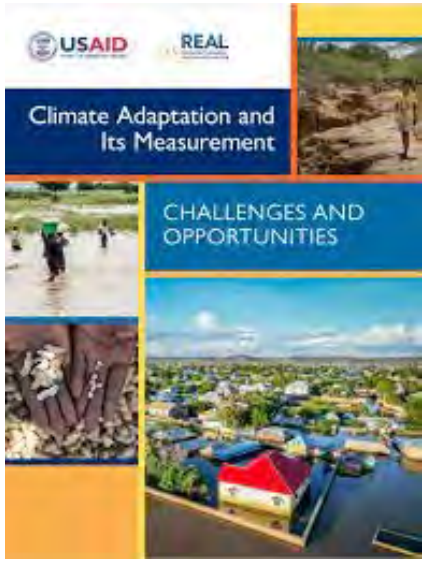






Life METRO ADAPT

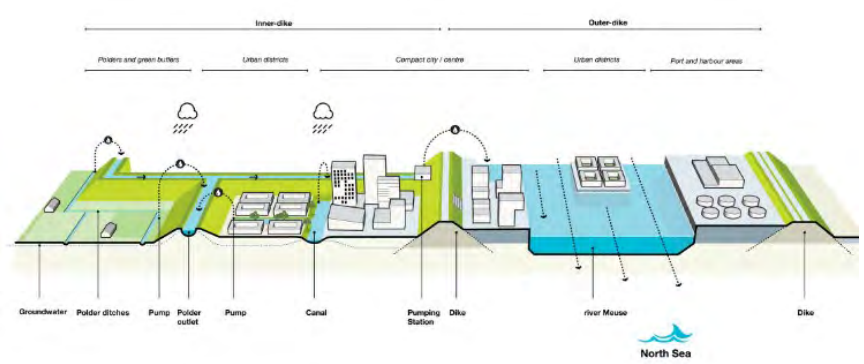
Enhancing climate change adaptation strategies and measures in the Metropolitan City of Milan

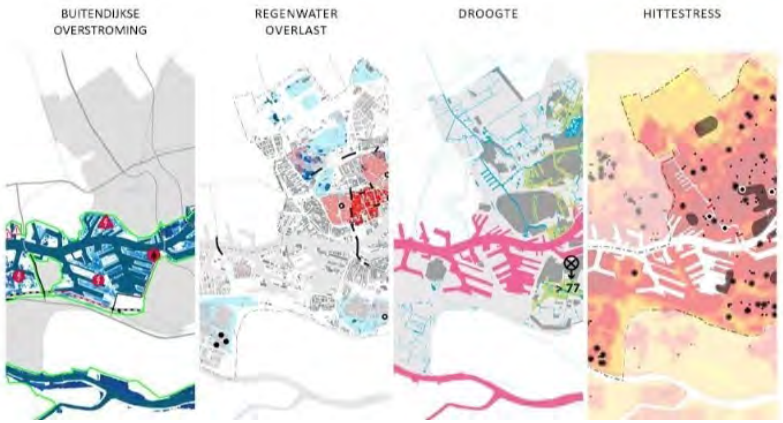


NY Climate Resilience Plan

https://www.nyc.gov/site/lmcr/progress/financial-district-and-seaport-climate-resilience-master-plan.page

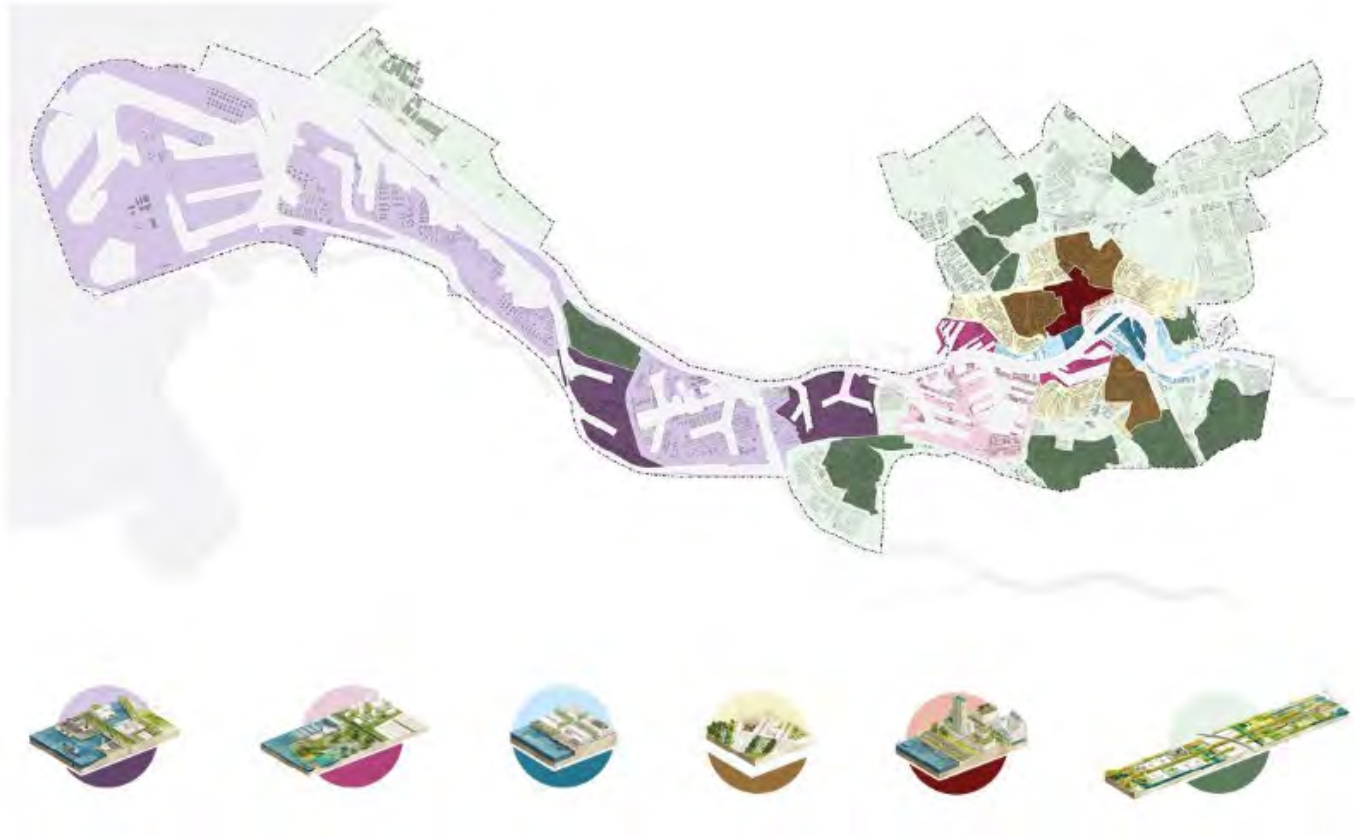
Rotterdam Adaptation Strategy





https://www.urbanisten.nl/work/rotterdam-adaptation-strategy

Rotterdam Adaptation Strategy



ROTTERDAM.CLIMATE.INITIATIVE
Climate Proof

https://sdr.gdos.gov.pl/Documents/Wizyty/Belgia%20i%20Holandia/Program%20adaptacji%20do%20zmian%20klimatu%20w%20Rotterdamie.pdf

PLAZA DE LA ENCARNACIÓN DE SEVILLA

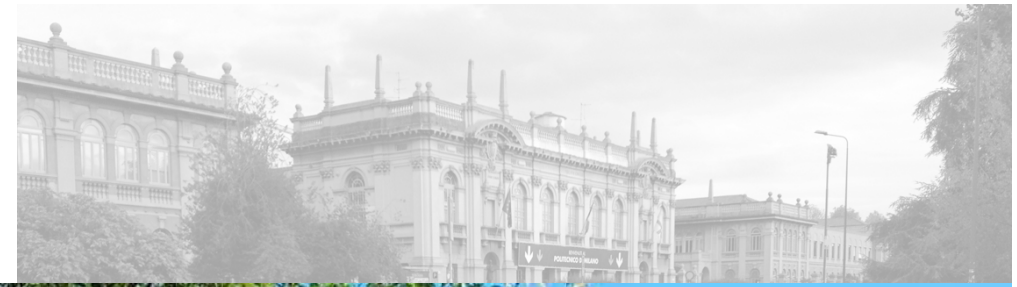
mid-20th century

90s

Now

PLAZA DE LA ENCARNACIÓN DE SEVILLA

PIAZZA LEONARDO, POLIMI



PIAZZA LEONARDO, POLIMI

Walking’ forest of 1,000 trees transforms Dutch city

https://dirt.asla.org/2022/08/22/a-walking-forest-in-the-netherlands/

Thermally sensitive design of public spaces: some examples

Requena-Ruiz, I., Siret, D., Stavropulos-Laffaille, X., & Leduc, T. (2022). Designing thermally sensitive public spaces: an analysis through urban design media. Journal of Urban Design, 28(1), 44–65. https://doi.org/10.1080/13574809.2022.2062312https://doi.org/10.1080/13574809.2022.2062312

https://www.urbancanopee.com/nos-projets-urban-canopee/

Provence-Alpes-Côte d'Azur

Lorraine

Île-de-France

Occitanie

Île-de-France

Auvergne-Rhône-Alpes

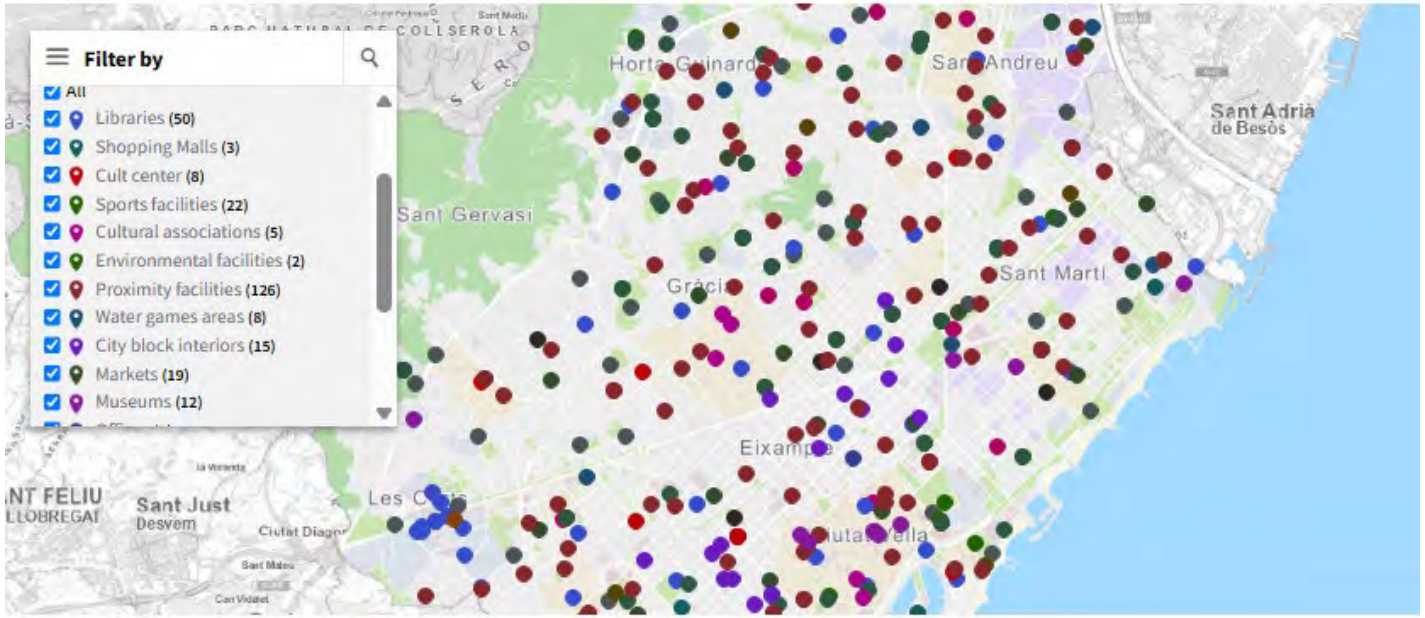
Île-de-France

Centre-Val de Loire

Île-de-France

Auverge-Rhône-Alpes

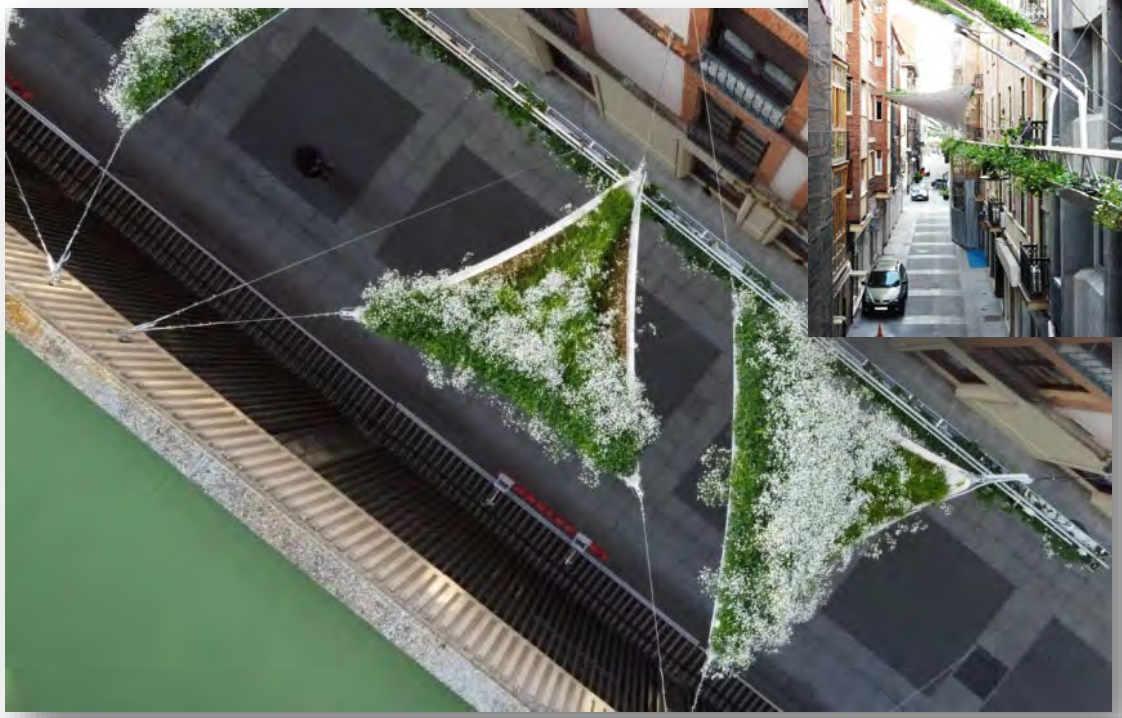
Climate Shelters Barcelona

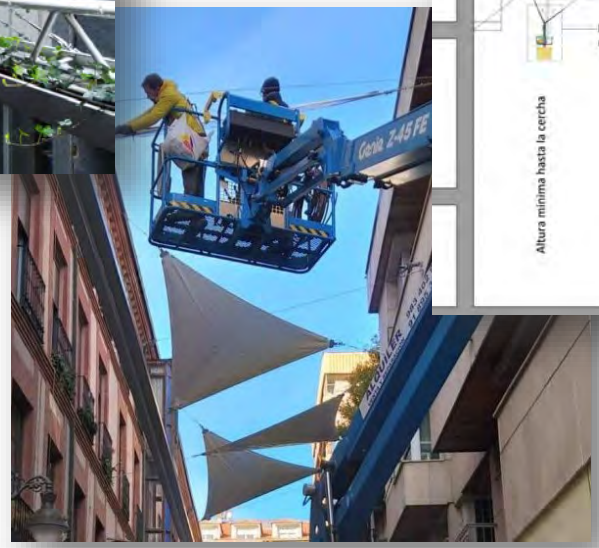


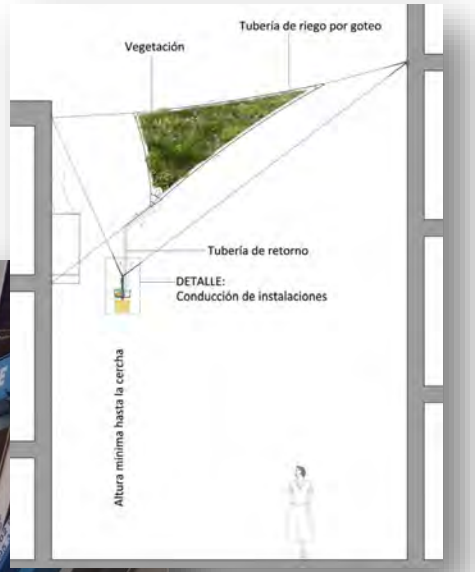
https://www.barcelona.cat/barcelona-pel-clima/en/specific-actions/climate-shelters-network

Pla Clima

Green canopy







https://www.singulargreen.com/en/green-shades-valladolid/

High albedo, the example of mediterranean towns

'Heritage-based solutions', learning from traditional Mediterranean, Middle Eastern, and desert architecture for sustainable urban design. For both summer and winter adaptation

Alberobello

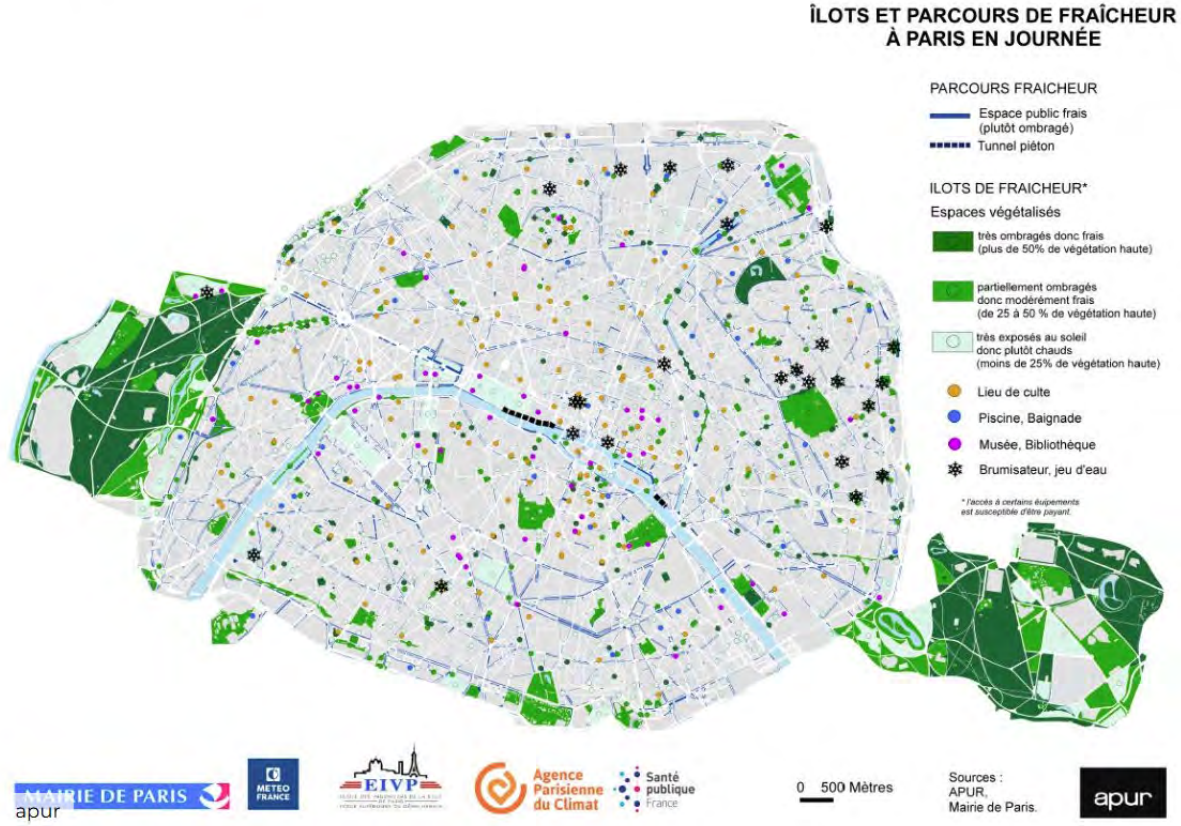
https://fearlessfemaletravels.com/alberobello-travel-guide/

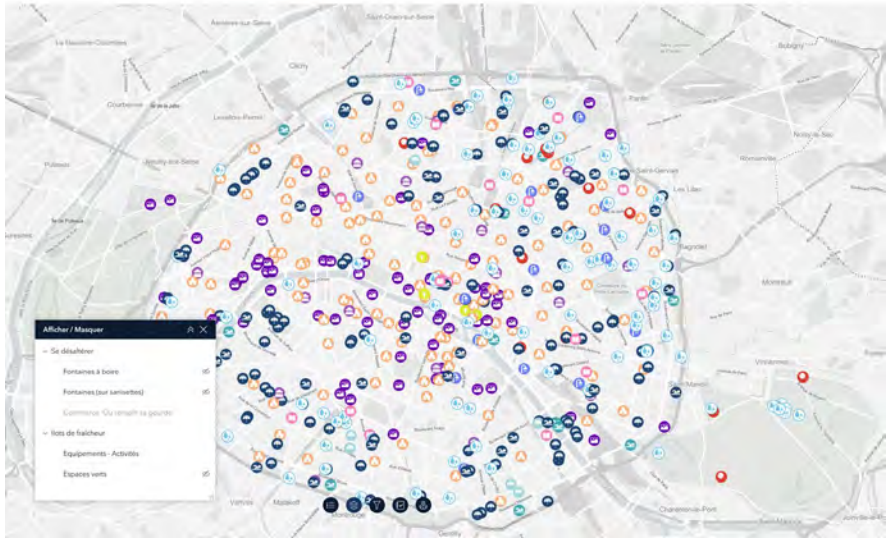
Frigiliana

https://www.ruralidays.co.uk/travel/city-guide/what-to-see-in-frigiliana/

Cool islands in Paris

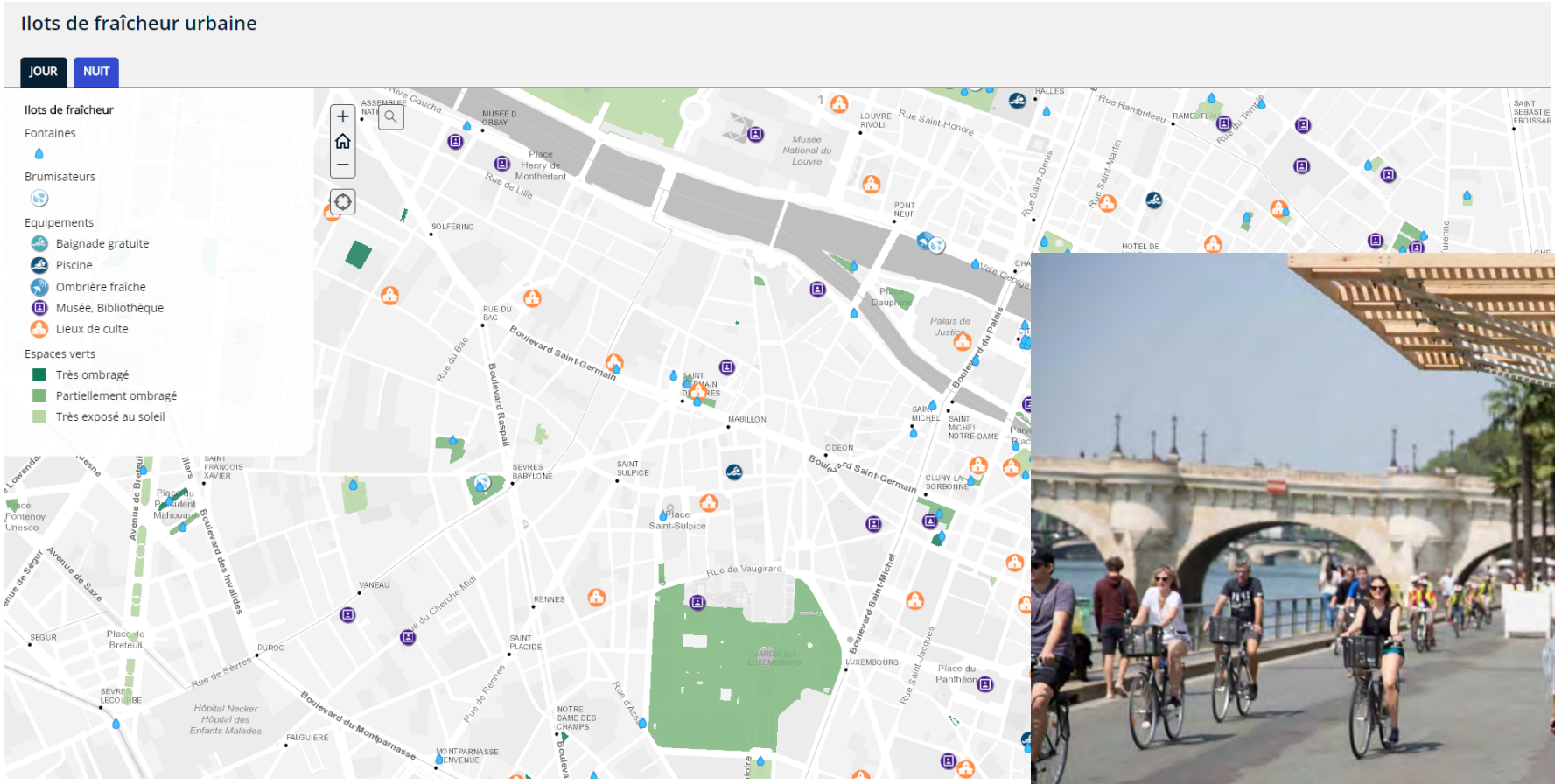
Shaded green spaces, swimming pools, misted areas...
Ultra-cool places!





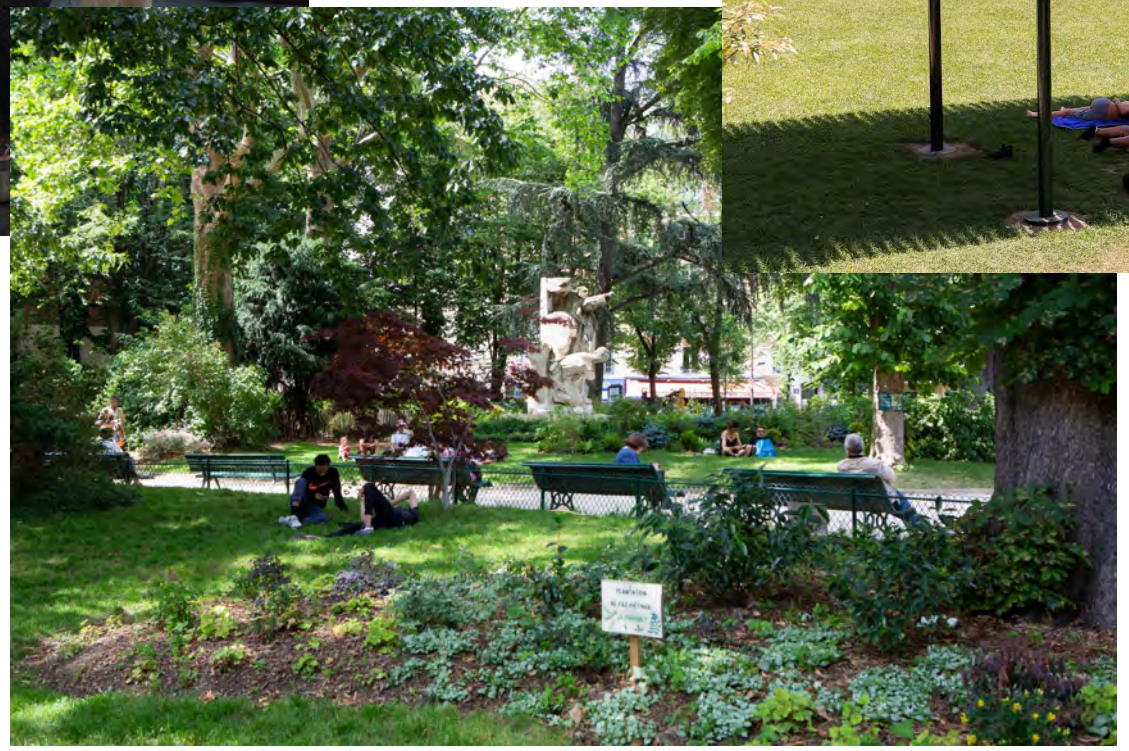
https://experience.arcgis.com/experience/97a1ee11f50e4c36afb48b93007b4fb8/page/Version-Fran%C3%A7aise

Cool islands in Paris



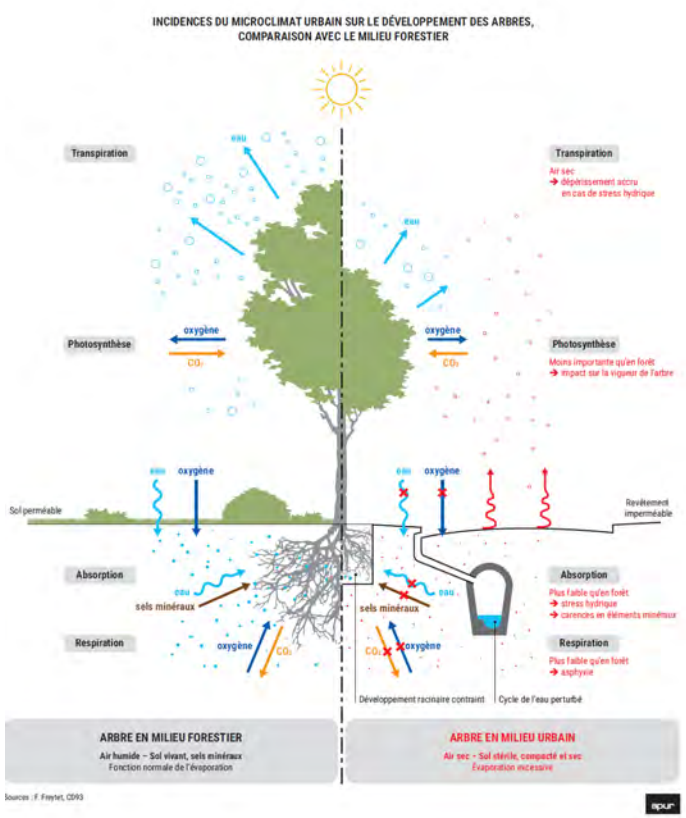
https://experience.arcgis.com/experience/97a1ee11f50e4c36afb48b93007b4fb8/page/Version-Fran%C3%A7aise

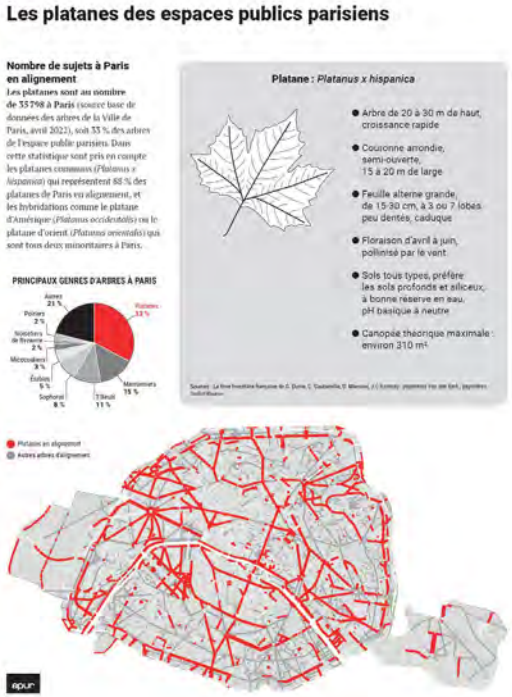
Cool islands in Paris



https://www.paris.fr/en/pages/where-to-cool-off-in-paris-when-it-s-hot-28052

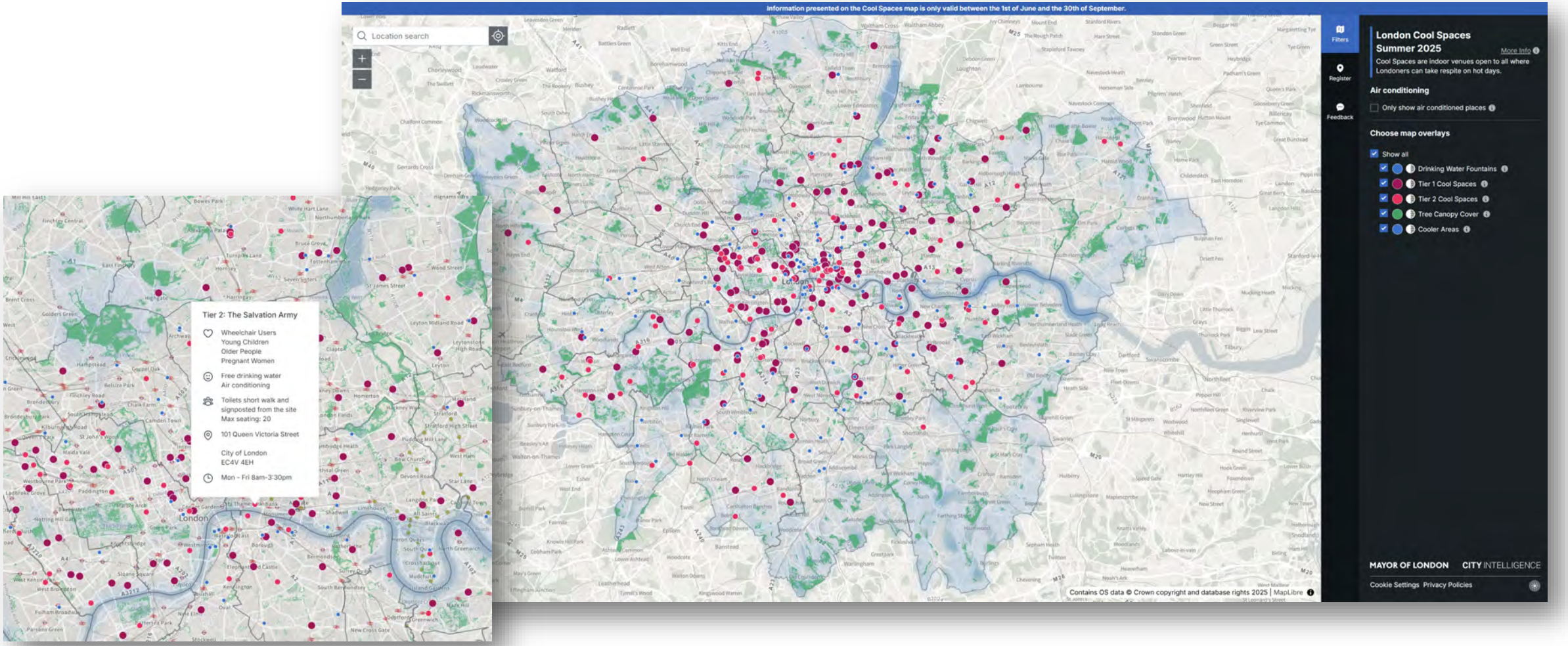
Trees in Paris’ public space in 2022





https://www.apur.org/en/climate-environment/nature/trees-paris-public-space-2022#:~:text=The%208%20most%20represented%20species,hazel%20and%20the%20pear%20tree.

Cooling spaces and centres in London



https://apps.london.gov.uk/cool-spaces/

Green tram lines of Bordeaux

https://www.themayor.eu/en/a/view/bordeaux-launches-study-for-the-construction-of-metro-12082

https://www.istockphoto.com/it/search/2/image-film?page=2&phrase=modern+tram+in+bordeaux

Green tram lines of Milan

‘Cooling-Park’ in Vienna

https://www.raintime.at/en/cooling-park-vienna-mariahilf-with-raintime-mist-showers/

https://www.troepferlbad.at/das-tr%C3%B6pferlbad-2-0-1/coolspot-mariahilf/

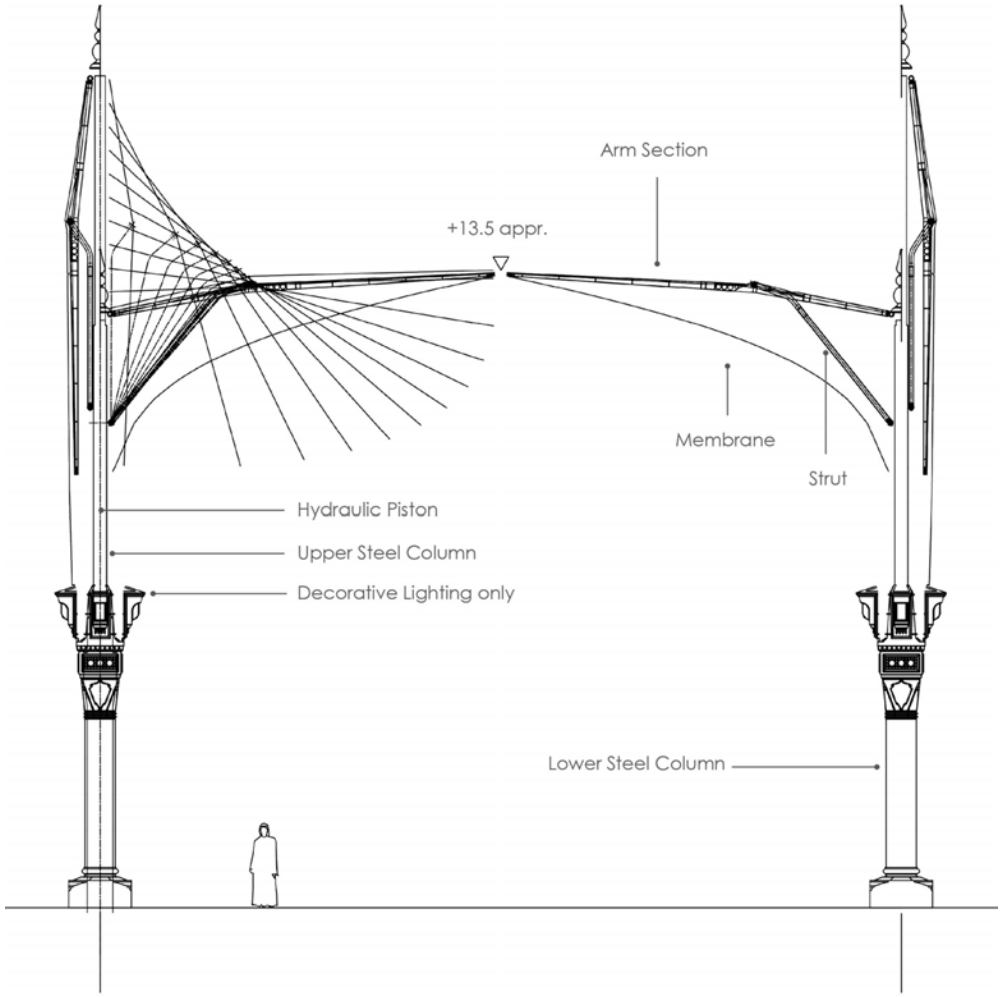
https://www.raintime.at/en/climate-resilient-cities-with-water-fog/

Colorful shading strategy in Malaga

https://www.demilked.com/crocheted-canopy-malaga-eva-pacheco/

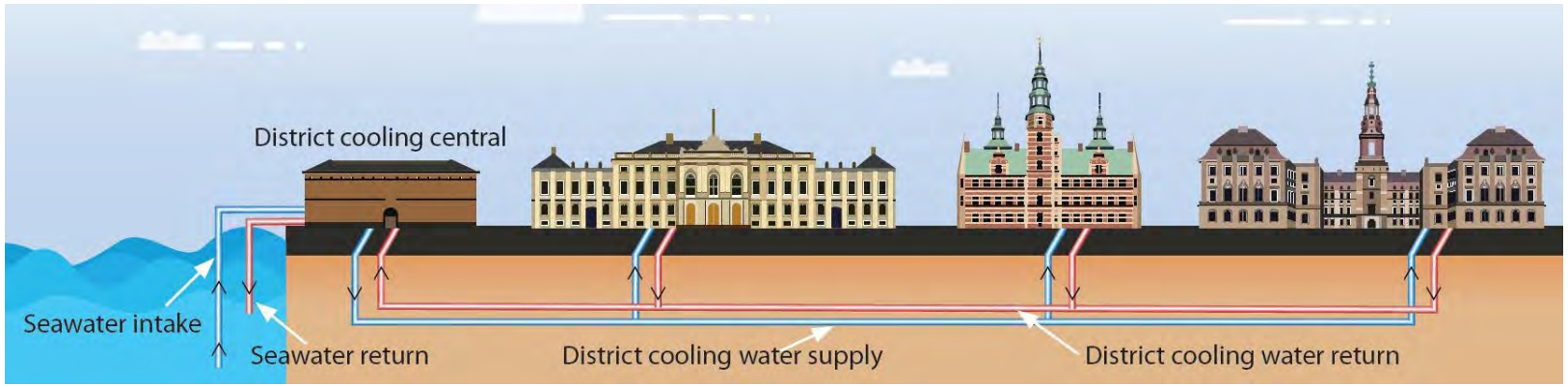
https://luvinland.com/handmade-shades-in-the-streets-of-alhaurin-de-la-torre/

Responsive shading in Medina



https://www.sl-rasch.com/en/projects/courtyard/

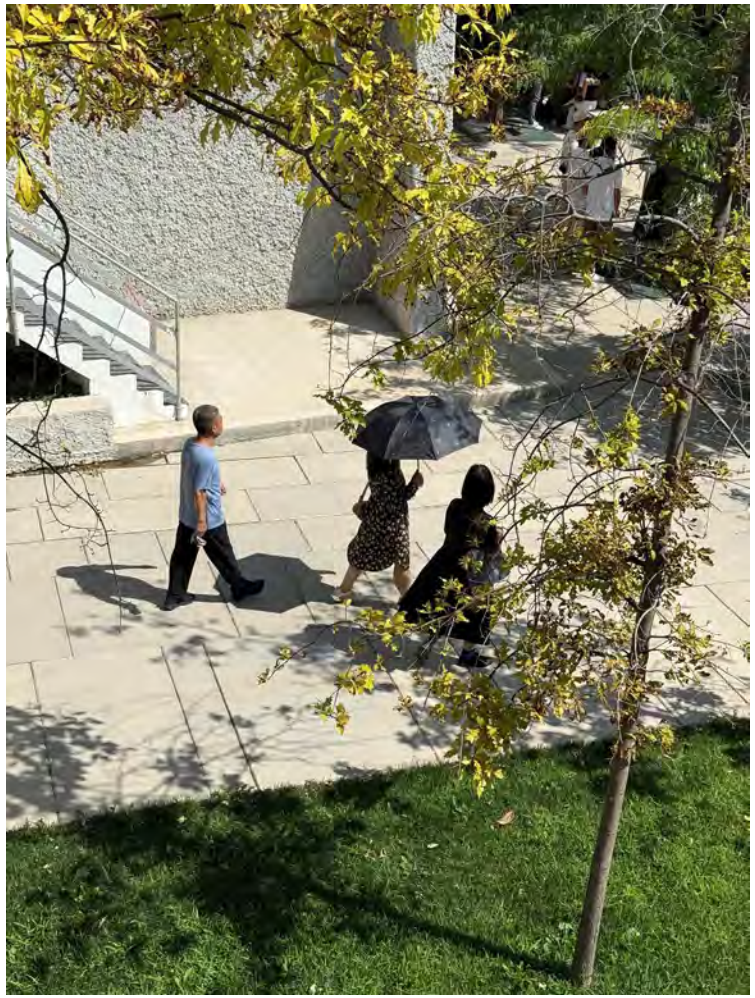
Cooling strategy with sea water in Copenhagen

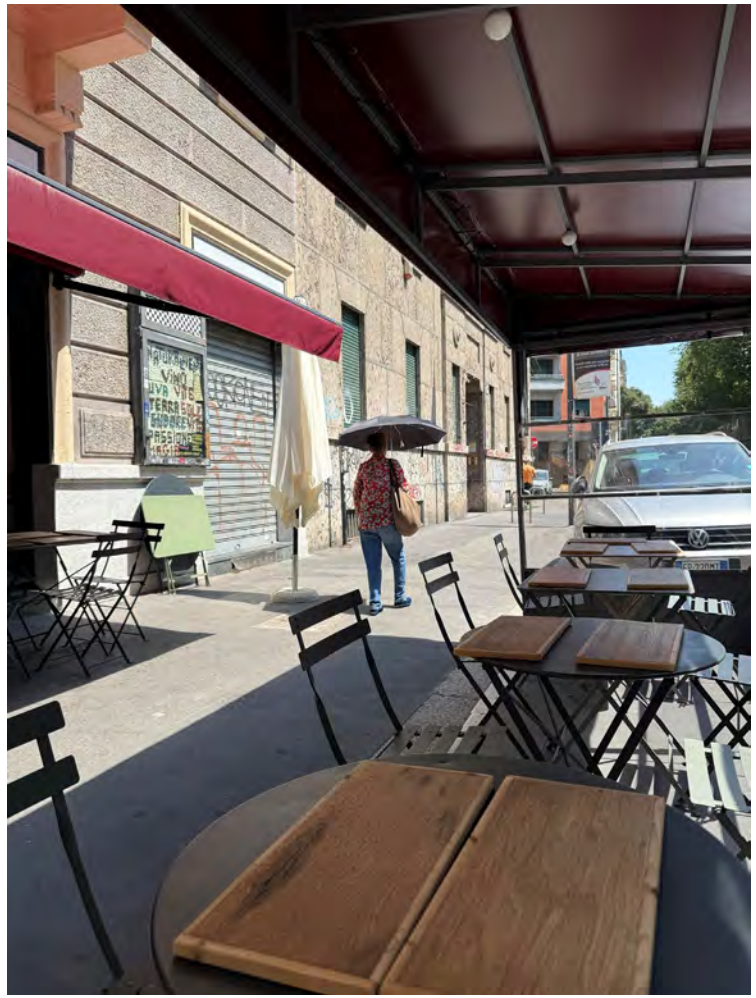


chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assets.danfoss.com/documents/latest/241427/AE446253894285en-000101.pdf

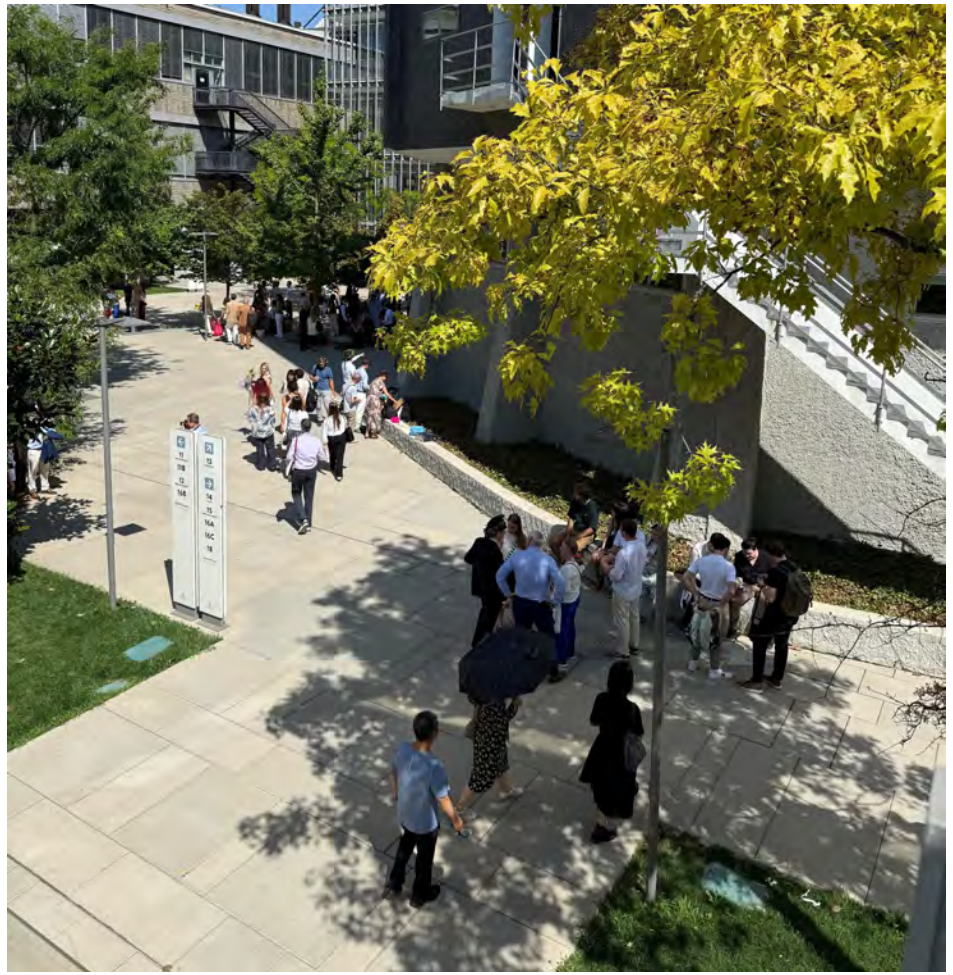
People’s adaptation behaviours during heatwaves

In Italy





In Italy



In Italy

In Netherlands

Credits: Broei Kas ©, 2022

In Netherlands

Credits: Broei Kas ©, 2022

In Netherlands

Credits: Broei Kas ©, 2022

...and more!

Stay Hydrated

Wear Appropriate Clothing

Stay Indoors

Avoid Strenuous Activities

Take Cool Showers

Eat Light Food

https://www.ckbhospital.com/blogs/how-to-stay-safe-during-heat-wave

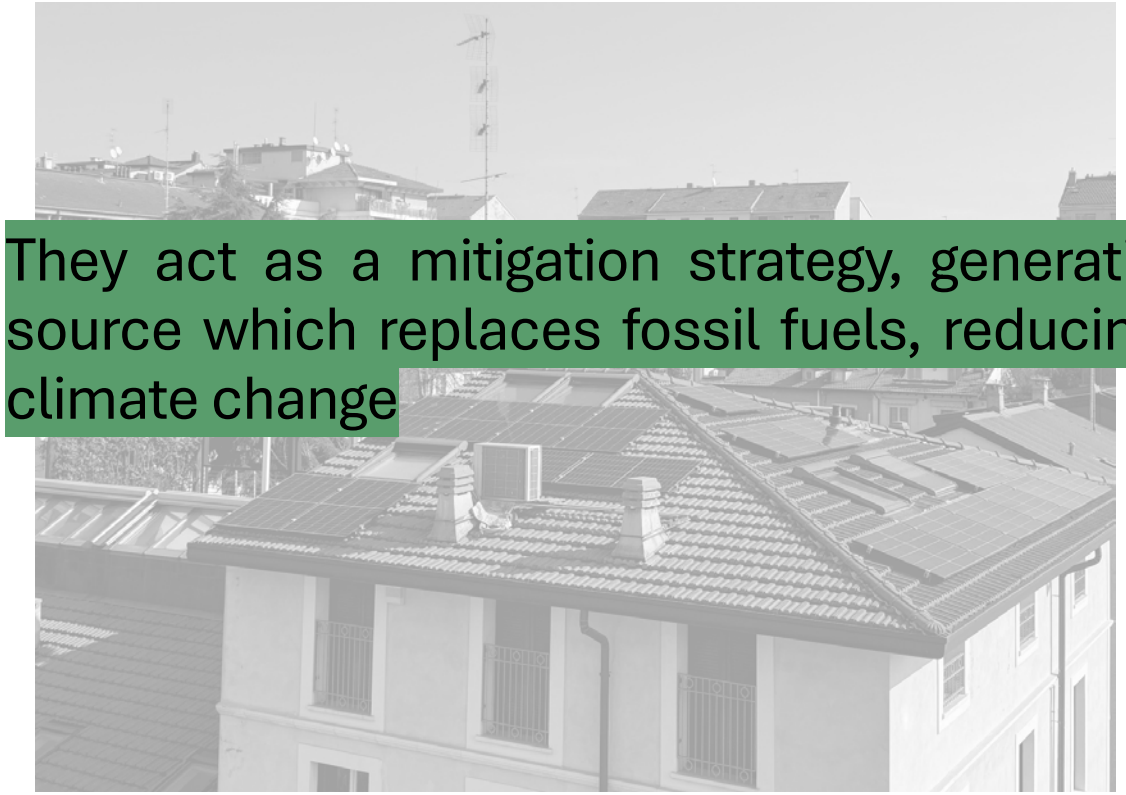
Ready for a quick test?
Let’s give this a try!

Mitigation or Adaptation?

Solar Panels

Primary Mitigation

Solar Panels



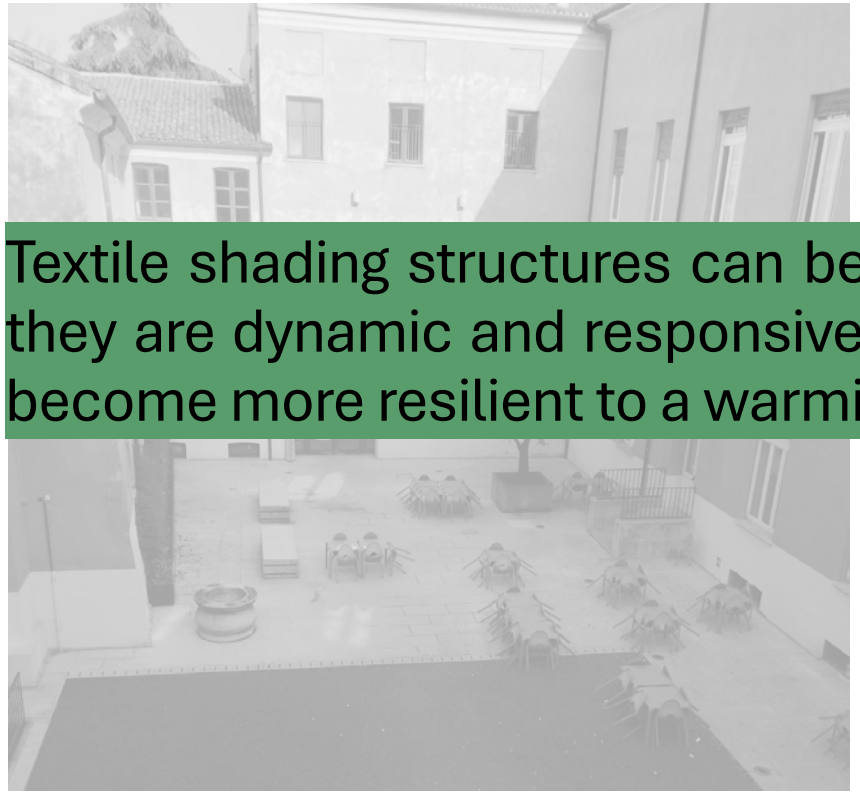
They act as a mitigation strategy, generating electricity from sunlight, a renewable source which replaces fossil fuels, reducing greenhouse gas emissions, and slowing climate change

Mitigation or Adaptation?

Textile shading

Primary Adaptation

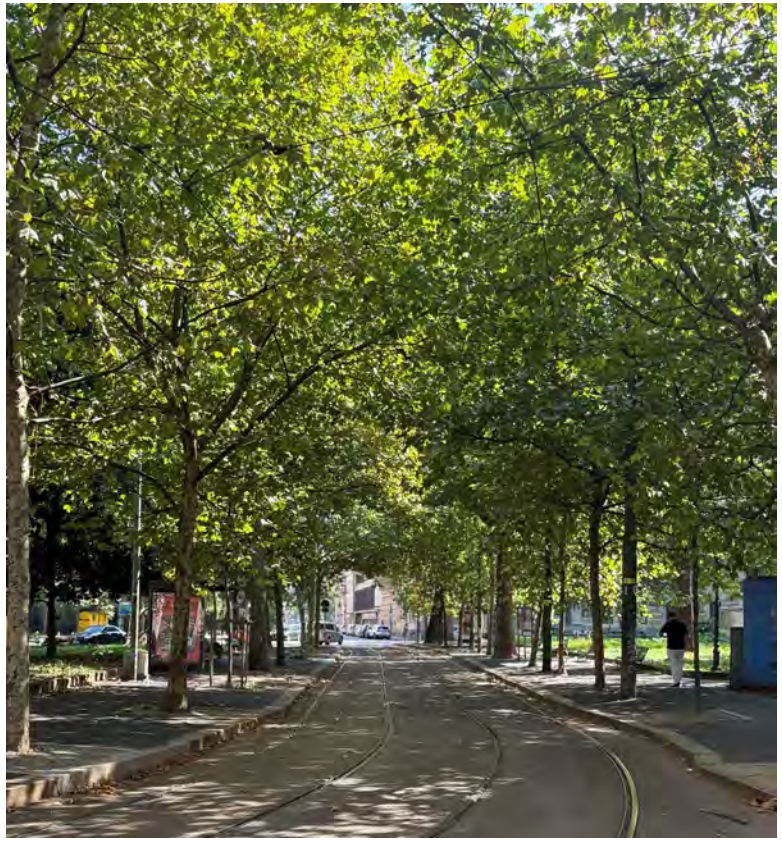
Textile shading



Textile shading structures can be considered an adaptation strategy, especially when they are dynamic and responsive to changing environmental conditions, helping cities become more resilient to a warming climate

Mitigation or Adaptation?

Trees



Both Mitigation and Adaptation

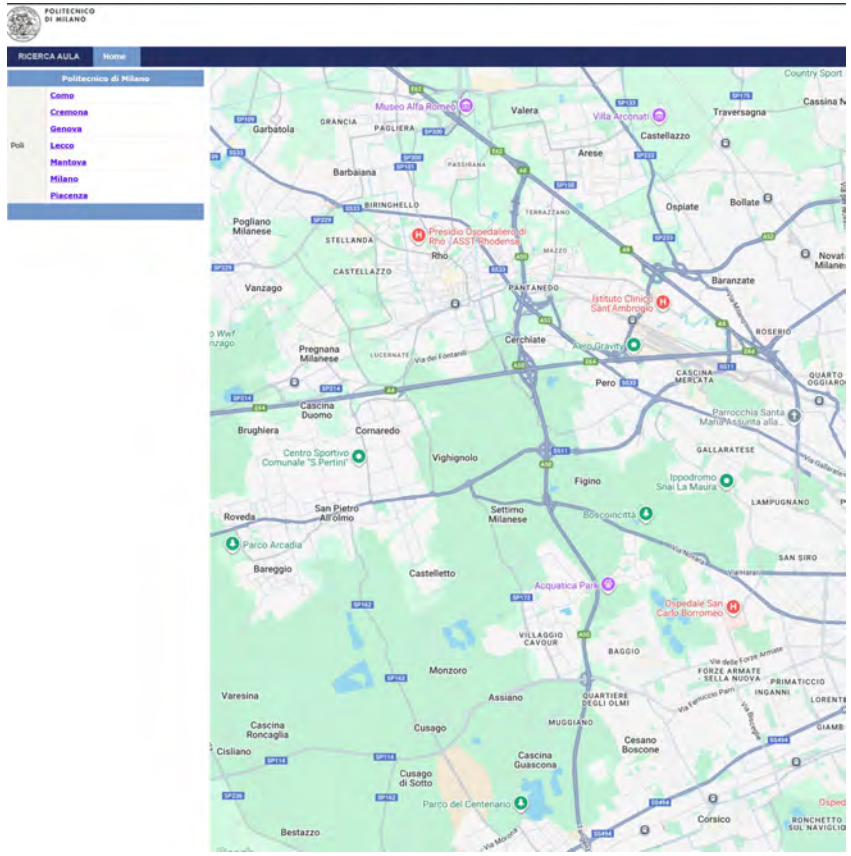
Trees

They mitigate by reducing urban temperatures and greenhouse gases and adapt by helping people and ecosystems cope with climate impacts.

Ready for the exercise?

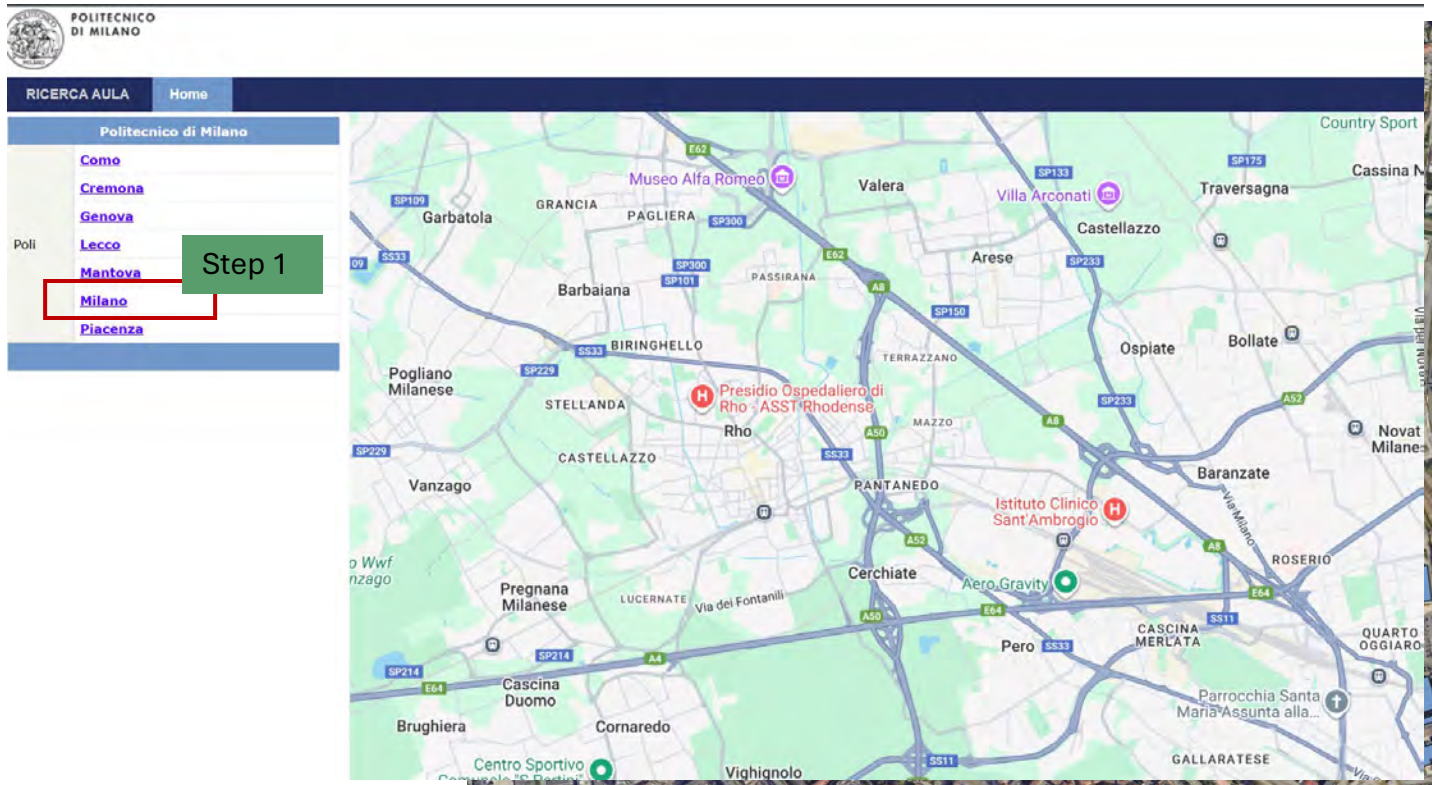
Let’s jump in!

The study area – Bovisa Campus



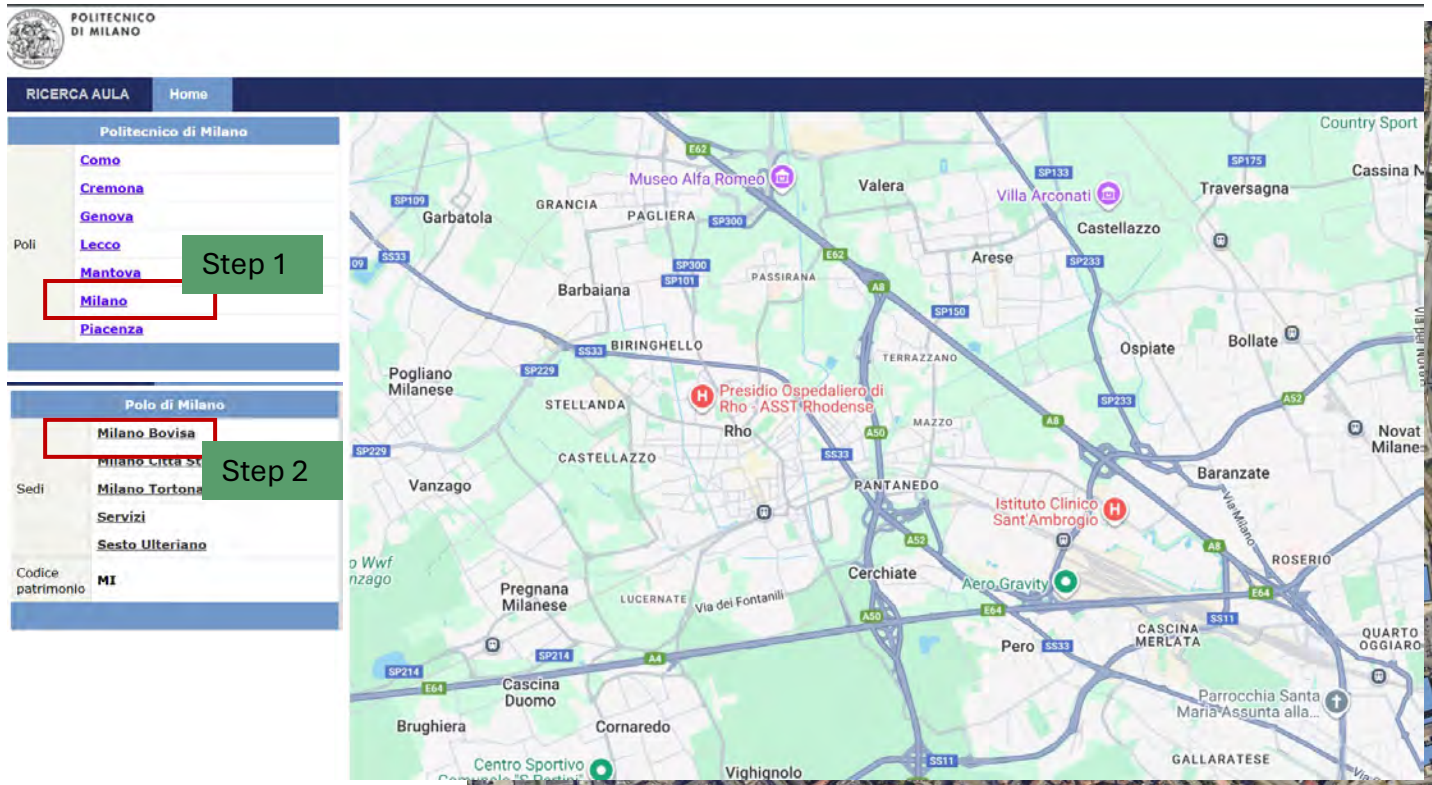
https://maps.polimi.it/maps/

The study area



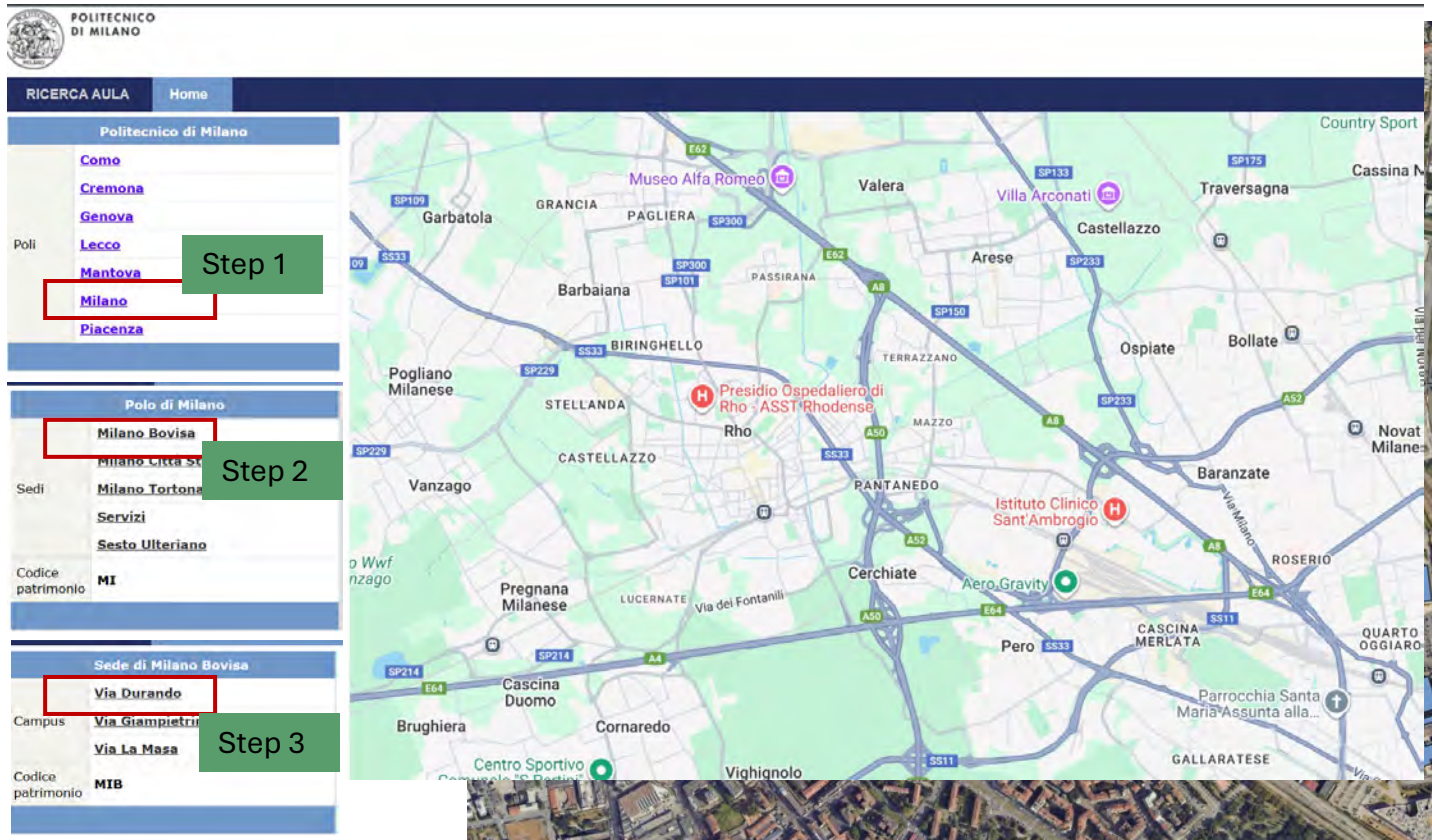
https://maps.polimi.it/maps/

The study area



https://maps.polimi.it/maps/

The study area

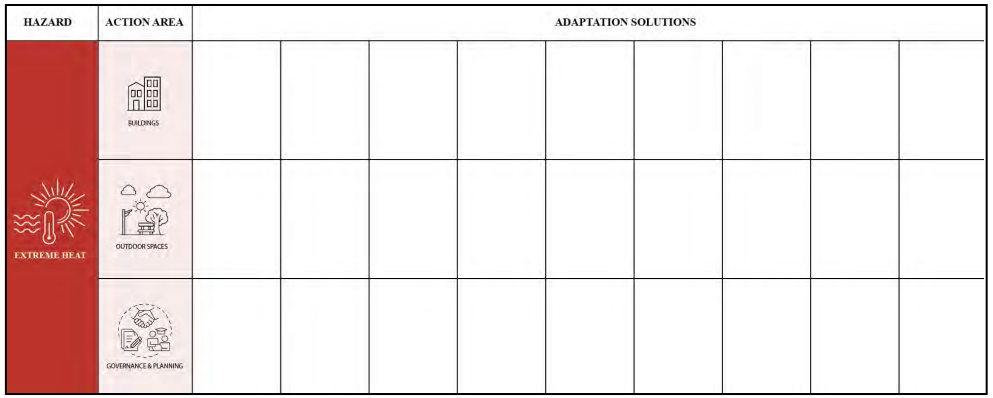


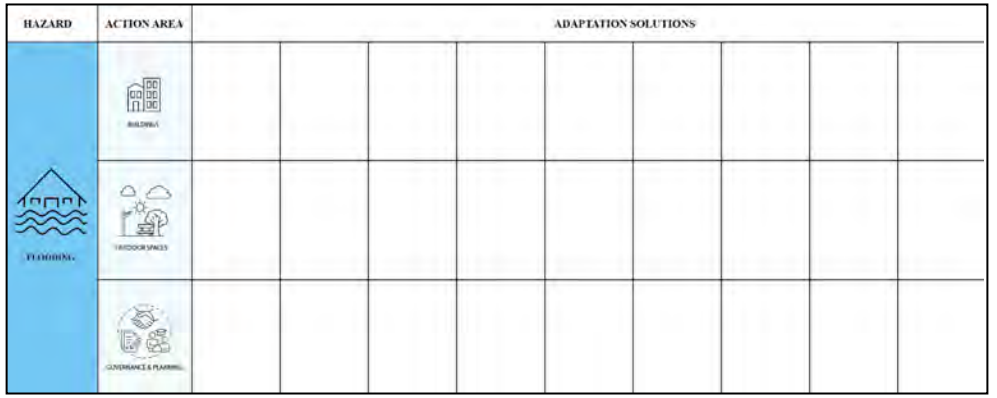
https://maps.polimi.it/maps/

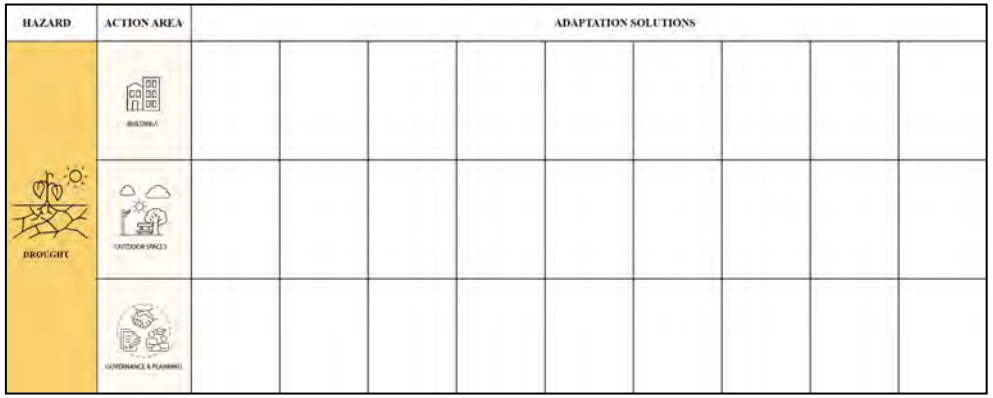
Exercise in Miro

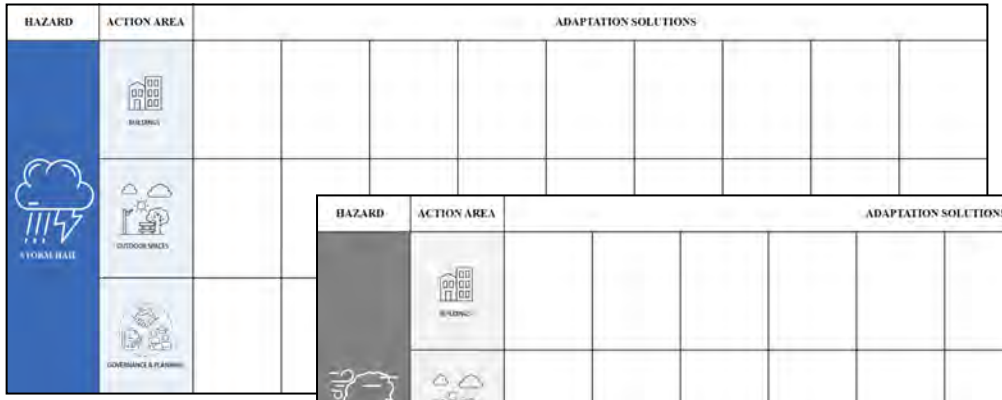
https://miro.com/app/board/uXjVJG4G4ll= /

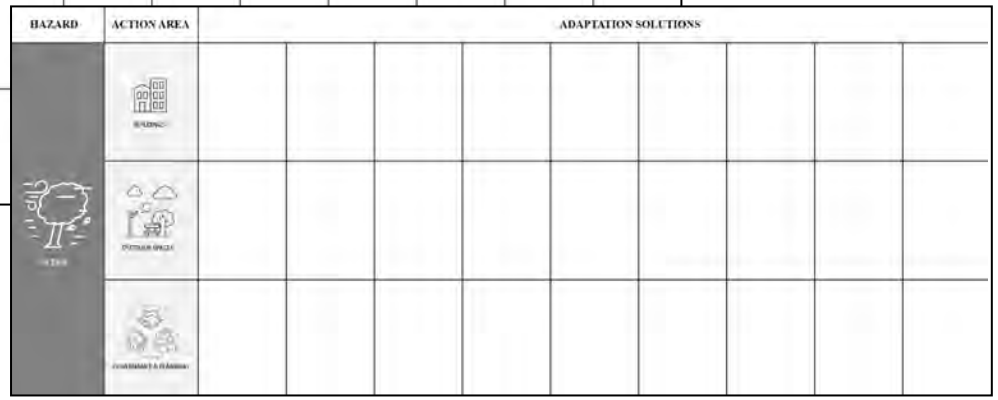
Climate Adaptation Exercise











You will have to work on 5 focused hazards presented

Climate Adaptation Exercise

HAZARD	ACTION AREA	ADAPTATION SOLUTIONS								
EXTREME HEAT	BUILDINGS									
	OUTDOOR SPACES									
	GOVERNANCE & PLANNING									

You will have to fill all the boxes one by one with an adaptation example solution per action area

Climate Adaptation Exercise

HAZARD	ACTION AREA	ADAPTATION SOLUTIONS								
EXTREME HEAT	BUILDINGS	 Green wall								
	OUTDOOR SPACES									
	GOVERNANCE & PLANNING									

For instance, here we pun an example for the building adaptation solution

Climate Adaptation Exercise

HAZARD	ACTION AREA	ADAPTATION SOLUTIONS									
EXTREME HEAT	BUILDINGS	 Green wall									
	OUTDOOR SPACES	 Green shaded structure									
	GOVERNANCE & PLANNING										

For instance, here we pun an example for outdoor spaces, a shaded structure grey or green

Climate Adaptation Exercise

HAZARD	ACTION AREA	ADAPTATION SOLUTIONS									
EXTREME HEAT	BUILDINGS	 Green wall									
	OUTDOOR SPACES	 Green shaded structure									
	GOVERNANCE & PLANNING	 Heat emergency plan									

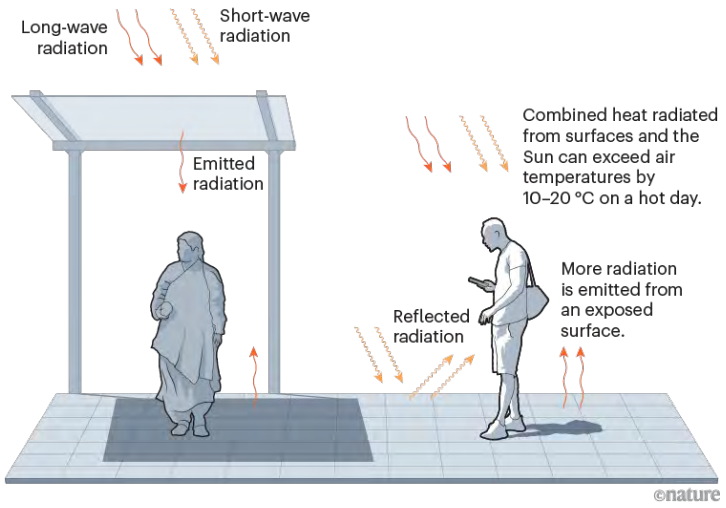
For instance, here we pun an example for governance and planning, a heat emergency plan

Climate Adaptation Exercise

HAZARD	ACTION AREA	ADAPTATION SOLUTIONS									
EXTREME HEAT	BUILDINGS	 Green wall									
	OUTDOOR SPACES	 Green shaded structure	 Textile shaded structure								
	GOVERNANCE & PLANNING	 Heat emergency plan									

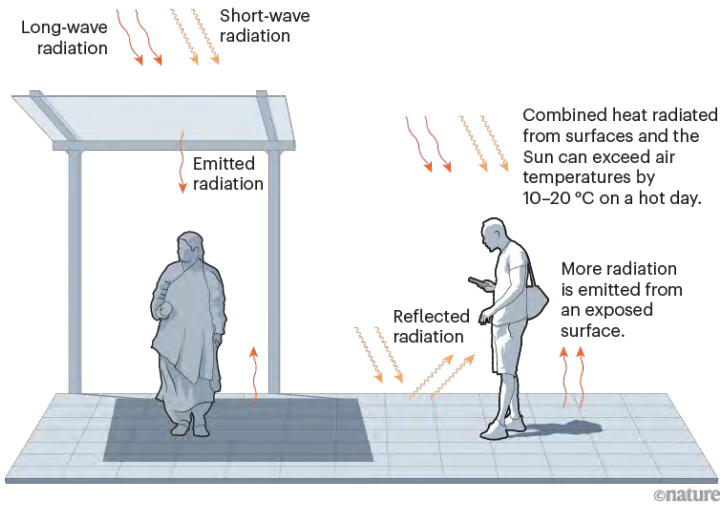
For instance, here we pun an example for governance and planning, a heat emergency plan

Climate Adaptation Exercise

	Brief description	Scheme explaining the effect of the shaded structure solution
 Temporary shelters	Trees and other structures prevent people from getting too hot because they block the sun's light and heat, and the ground below also gives off less heat…	
Adaptation target hazard:		
Adaptation target area:	Outdoor space	
Examples:   		

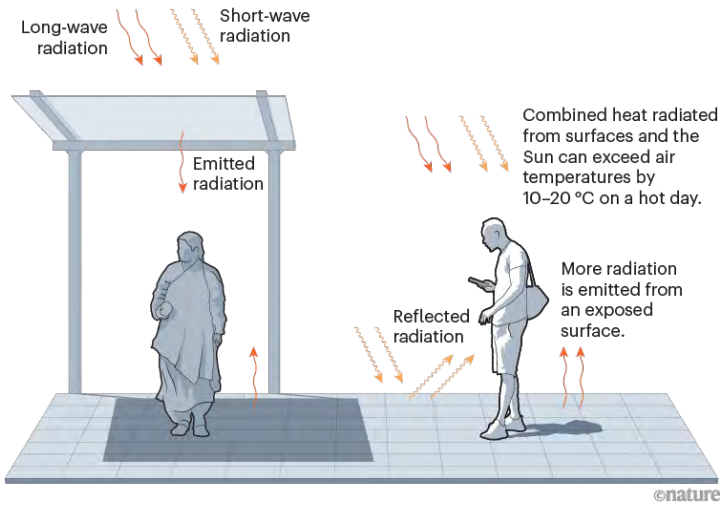
Then you will choose at least 1 solution per action area for each hazard to explain in detail like in this example

Climate Adaptation Exercise

	Brief description	Scheme explaining the effect of the shaded structure solution
 Temporary shelters	Trees and other structures prevent people from getting too hot because they block the sun's light and heat, and the ground below also gives off less heat…	
Adaptation target hazard:		
Adaptation target area:	Outdoor space	
Examples:   		

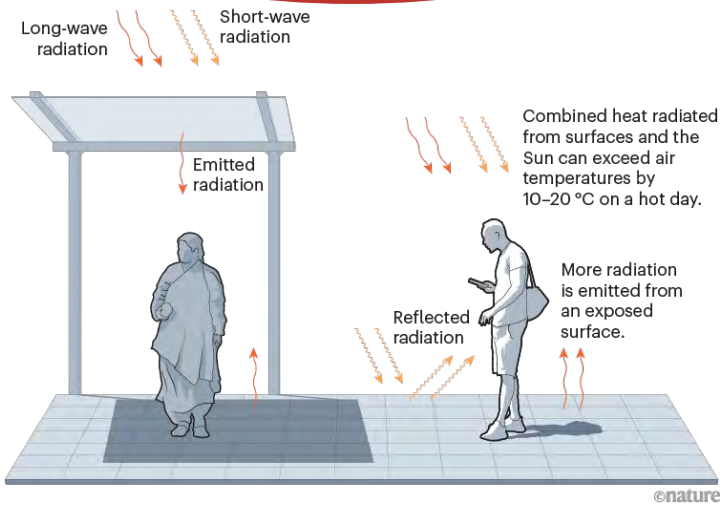
Then you will choose at least 1 solution per action area for each hazard to explain in detail like in this example

Climate Adaptation Exercise

	Brief description	Scheme explaining the effect of the shaded structure solution
 Temporary shelters	Trees and other structures prevent people from getting too hot because they block the sun's light and heat, and the ground below also gives off less heat...	
Adaptation target hazard:		
Adaptation target area:	Outdoor space	
Examples:   		

Then you will choose at least 1 solution per action area for each hazard to explain in detail like in this example

Climate Adaptation Exercise

	Brief description	Scheme explaining the effect of the shaded structure solution
 Temporary shelters	Trees and other structures prevent people from getting too hot because they block the sun's light and heat, and the ground below also gives off less heat…	
Adaptation target hazard:		
Adaptation target area:	Outdoor space	
Examples:   		

Then you will choose at least 1 solution per action area for each hazard to explain in detail like in this example


THANK
YOU