

 **FACTSHEET | DEMO5 MARSEILLE, FRANCE**

MICRO-FORESTS AND UNSEALED SOILS IN PROVENCE-ALPES-CÔTE D'AZUR



The DEMO5

DEMO5 addresses the pressing issues of urban heat islands and excessive rainwater runoff in Marseille, France—challenges that are intensifying due to global warming. The project is split into two parts both located on campuses of Aix-Marseille University:

sub-DEMO5.1

Is a campus located in the peri-urban area of Saint Jérôme, a bit remote from the city center. The site is 19.4 ha big and welcome 4500 students.

sub-DEMO5.2

Is a campus located in the city center of Marseille at Saint Charles. The site is 4,5 ha big and welcome 6000 students.

The main strategy applied on both site involves deploying Nature-Based Solutions (NbS) to increase unsealing, implement green areas and promote renaturalization. By doing so, the initiative aims to boost soil infiltration rates to reduce sewage overload resulting in sea pollution, and help lower summer temperatures.

The action plan for DEMO5 is comprehensive, beginning with an analysis of existing climate policies, urban planning frameworks, and governance structures. It also emphasizes active engagement with local and regional stakeholders and evaluates how these solutions could be adapted to other regions. The plan specifies a clear timeline for each action and integrates risk management measures to ensure resilience and adaptability throughout the DEMO. This approach not only targets immediate environmental concerns but also supports broader goals of sustainable urban development and climate adaptation.

Both sites are used as study grounds for university students. Hydrology, geology, pedology, biodiversity and climatology are studied during on-site field schools. Many master's and bachelor's students take part in these annual measurements.

CARDIMED's demonstrator campuses are intended to become real showcases for the implementation and effectiveness of SFNs in urban environments.

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Eco-Friendly Campus: Reducing Runoff and Heat with Porous Materials and Green Spaces

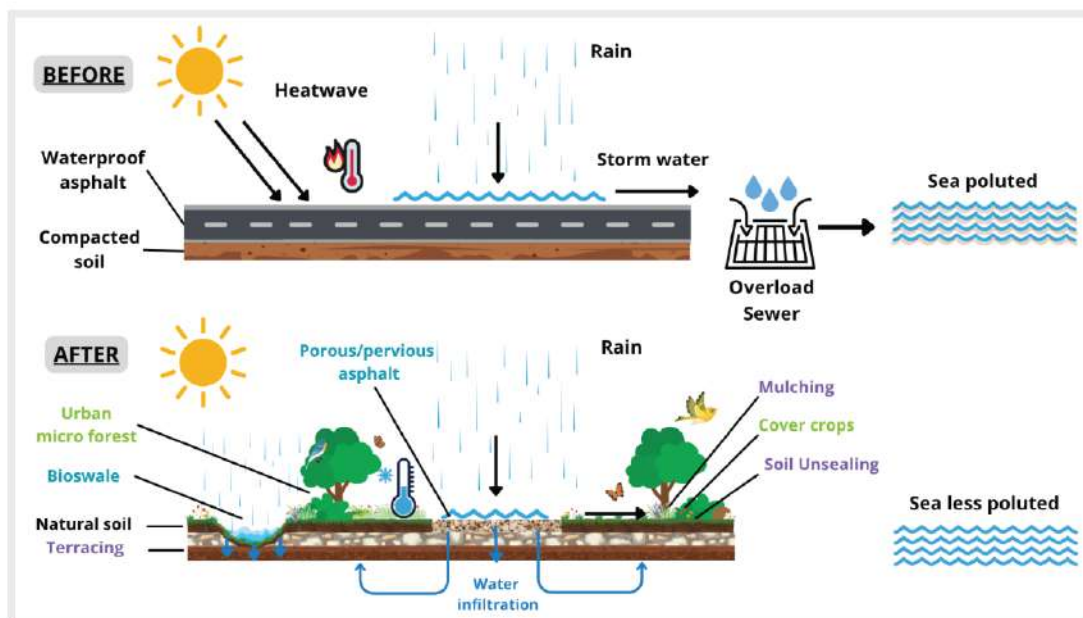


What has been done in sub-DEMO5.1?

In sub-DEMO5.1, impermeable asphalt and concrete surfaces from the university's forecourt, access roads, and parking areas have been removed. The important pedestrian pathway have been replaced by porous asphalt and concrete while most of the area have been terraced and planted to shape a urban micro forest.

This upgrade maintains accessibility while significantly improving rainwater infiltration. The site has also been re-landscaped with terracing to reduce stormwater runoff, and three bioswales planted with cover crops have been established to further manage water flow. An urban micro-forest has been created and supported with biodegradable mulch films to encourage tree growth and boost biodiversity.

These interventions are designed to lower urban heat, manage runoff, enhance air quality, and create habitats for local wildlife. The system is equipped with smart sensors for weather and air quality monitoring, advanced soil health sensors, precision irrigation, and GIS mapping to identify erosion hotspots and guide terracing work. Currently, the project covers 4,500 m² of peri-urban university land, with an additional expansion of plants by 1000 m². Overall, this NBS system aims to mitigate heat island effects, improve water management, enhance air quality, and support urban biodiversity.





Identified Nature-based Solutions



The identified Nature-based Solutions are those mentioned above, specifically:

- Surface unsealing
- Porous asphalt
- Terracing
- Bioswales
- Cover crops
- Urban micro-forest
- Mulching application

Co-benefits

These NbS deliver a wide range of co-benefits across environmental, social, and economic domains.

Environmentally, they improve water quality and availability, enhance groundwater recharge, reduce flood and erosion risks, and restore habitats for plants and animals. They also help regulate climate by sequestering carbon, reducing CO₂ emissions, and providing urban cooling, while supporting biodiversity and soil health. Marseille being a coastal city, reducing the runoff helps to protect the sea against human pollution.

Socially, these solutions promote health and well-being by improving air quality, increasing access to green spaces, and offering recreational, educational, and cultural opportunities. They foster stronger community ties, support environmental awareness, and enhance the aesthetic and cultural value of urban and peri-urban areas.

Economically, NbS can lower costs compared to traditional infrastructure, support local employment and business opportunities, and increase property values. They also enable sustainable food production, water reuse, nutrient recovery, and the production of raw materials and bioenergy, contributing to a greener economy and reduced environmental footprints.

Sustainable Development Goals



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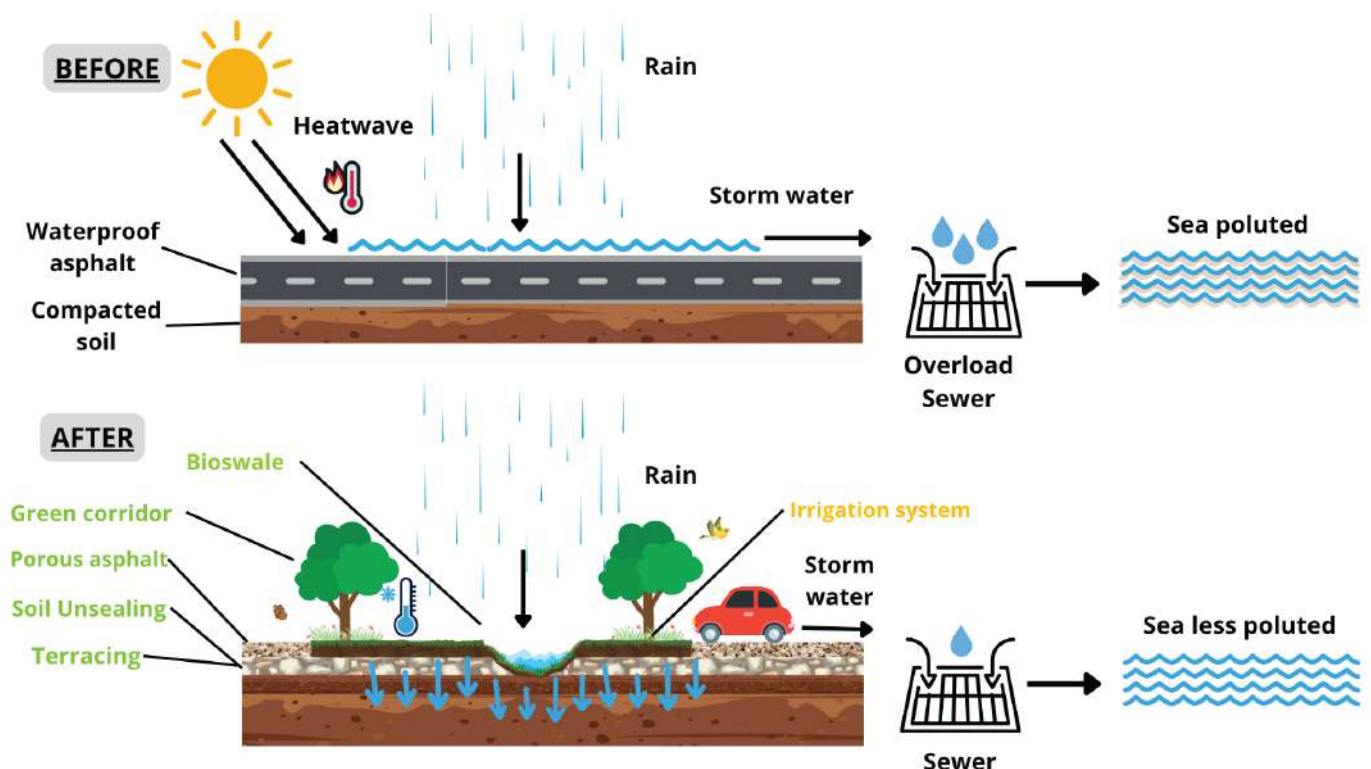
From Concrete to Green: A Natural-Driven Journey Towards Sustainability



What will be done in the sub-DEMO5.2?

The sub-DEMO5.2 will start with surface unsealing and terracing, followed by the installation of porous asphalt and concrete to improve water infiltration. Next, a green corridor will be planted to boost green cover and help cool the urban area, with mulch applied around trees to retain moisture, suppress weeds, and regulate soil temperature.

A bioswale will be added to filter rainwater, reducing sea pollution and easing pressure on the sewer system, while also helping to mitigate heat waves. NbS will use biodegradable mulch films as supportive units. Smart irrigation, remote sensing, computer vision, precision agriculture tools, advanced soil health monitoring, and sensors for air and weather conditions will optimize system management. GIS mapping will support terracing by identifying erosion hotspots and guiding earth-moving activities efficiently.





Identified Nature-based Solutions



The identified Nature-based Solutions are those mentioned above, specifically:

- Surface unsealing
- Porous asphalt
- Terracing
- Green corridor
- Mulching application
- Bioswale

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