

Supplementary Materials

In this document are reported the available schematic plans of UPPER project interventions and a summary description of the project elements for the following sites:

- VIA GOYA
- PIAZZA ILARIA ALPI
- AUTOLINEE (VIA ROMAGNOLI)
- VIA LEGNANO (VIA NEGHELLI and VIA LEPANTO)
- MERCATO (P.LE DEI MERCANTI)

The plans of UPPER sites are shown in Figure S1.

Moreover, the NDBI false color maps on May 20, 2022 (prior NbS interventions) and May 5, 2023 (Figure S2), and the 2015–2023 NDVI and NDWI temporal series for each analyzed UPPER site (Figure S3 and Figure S4, respectively) are reported.

Blueprint of UPPER sites

The blueprint of UPPER sites is shown in Figure S1. A brief description of the interventions is summarized in the following.

VIA GOYA. The area adjacent to Via Goya, in connection with an already regenerated wooded area containing centuries-old trees, is designed for a future food forest. It consists of a pedestrian and cycling path surrounding a catchment area that can be used as a water tank for irrigation. Prioritizing biodiversity, all chosen plant species, ornamental trees, and shrubs are indigenous. Urban amenities utilize eco-friendly materials.

PIAZZA ILARIA ALPI. The redevelopment of Piazza Ilaria Alpi combines efforts to enhance urban quality and ecological connectivity. This location is well-suited for establishing a diverse urban forest composed of native shrubs and trees. These plants will be equipped with an underground irrigation system for their initial growth stages, conserving water and reducing environmental impact. Rainwater harvesting systems will also be implemented. The urban amenities and pergolas are designed with eco-friendly and sustainable materials, with provisions for photovoltaic installations.

VIA ROMAGNOLI. The parking area and adjacent flowerbeds near bus station serve as strategic locations for planting vegetation. This enhances ecological connectivity and counters the urban heat island effect, a phenomenon causing localized overheating in summer. By minimizing impermeable surfaces and introducing new flowerbeds with a variety of trees and shrubs, we can effectively reduce temperatures, capture CO₂, and create a welcoming environment for pollinating insects. The selected plant species, including Elm, Ash, Cork Oak, Turkey Oak, and Judas Tree, are indigenous, promoting biodiversity. They require targeted watering in their initial years, ensuring water conservation and minimizing CO₂ emissions.

VIA NEGHELLI. The Via Neghelli parking area is designated for planting vegetation that improves ecological connectivity and addresses the urban heat island effect, a localized overheating phenomenon in summer. This is achieved by reducing impermeable surfaces and introducing new flowerbeds with native trees and shrubs. These species, including Elm, Ash, Cork Oak, and Field Maple, support biodiversity and require only initial drip irrigation for water conservation and reduced CO₂ emissions.

VIA LEPANTO. The parking area at Via Lepanto is an ideal location for planting vegetation that enhances ecological connectivity and mitigates the urban heat island effect, a phenomenon leading to localized overheating during the summer. Reducing impermeable surfaces and creating new flowerbeds with trees and shrubs is a method to lower temperatures, absorb CO₂, and provide a habitat for pollinating insects. The selected species (Elm, Eucalyptus, and Field Maple) are native and naturalized to promote biodiversity. They only require targeted watering in their initial years, allowing water conservation and limiting CO₂ emissions.

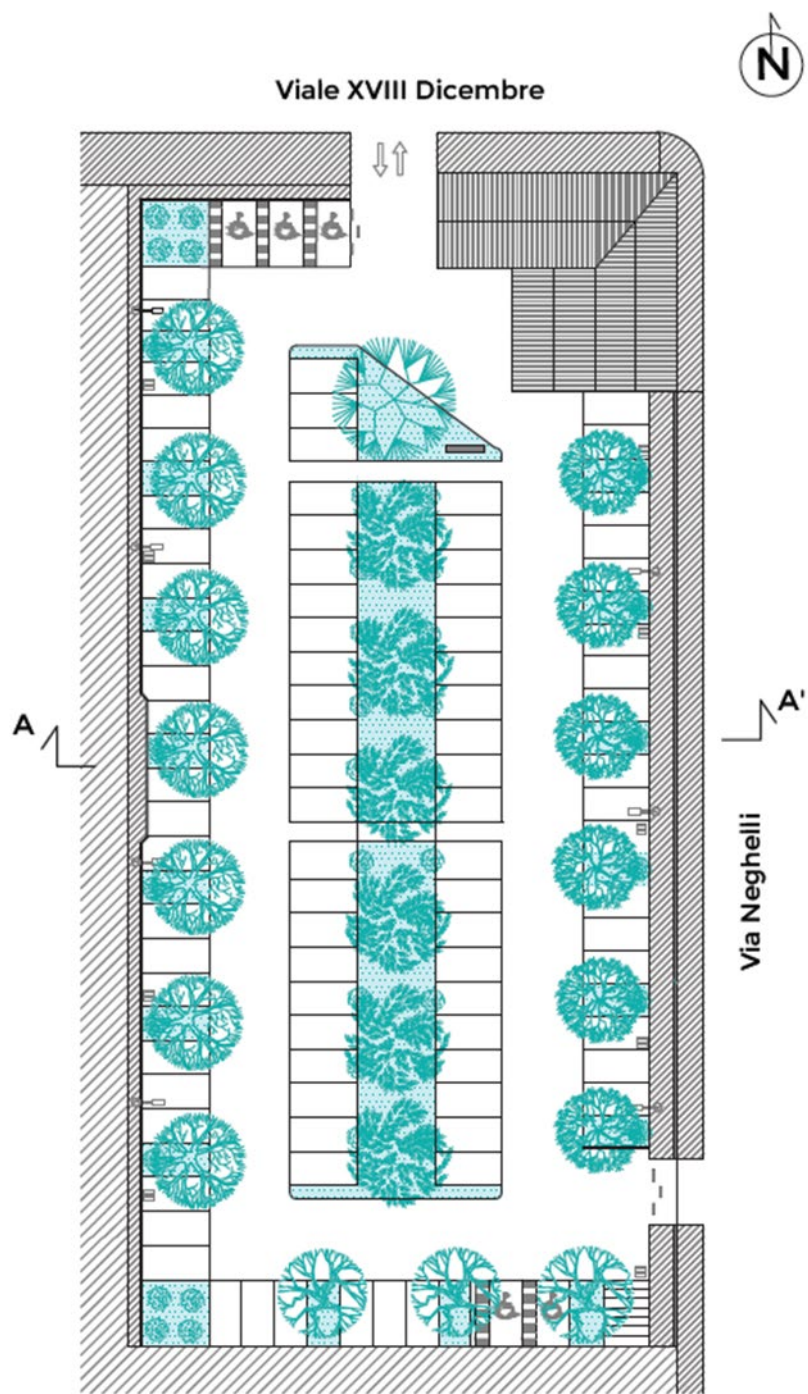
P.LE DEI MERCANTI. The parking area at Piazzale dei Mercanti is a perfect site for planting vegetation, which not only improves ecological connections but also counteracts the urban heat island effect, a situation leading to local overheating in the summer. Through the reduction of impermeable surfaces and the creation of new flowerbeds with a mix of trees and shrubs, we can effectively lower temperatures, capture CO₂, and provide a habitat for pollinating insects. The chosen species, including Ash and Turkey Oak, are native to encourage biodiversity. They require focused drip irrigation during their initial growth stages, thus conserving water and minimizing CO₂ emissions.



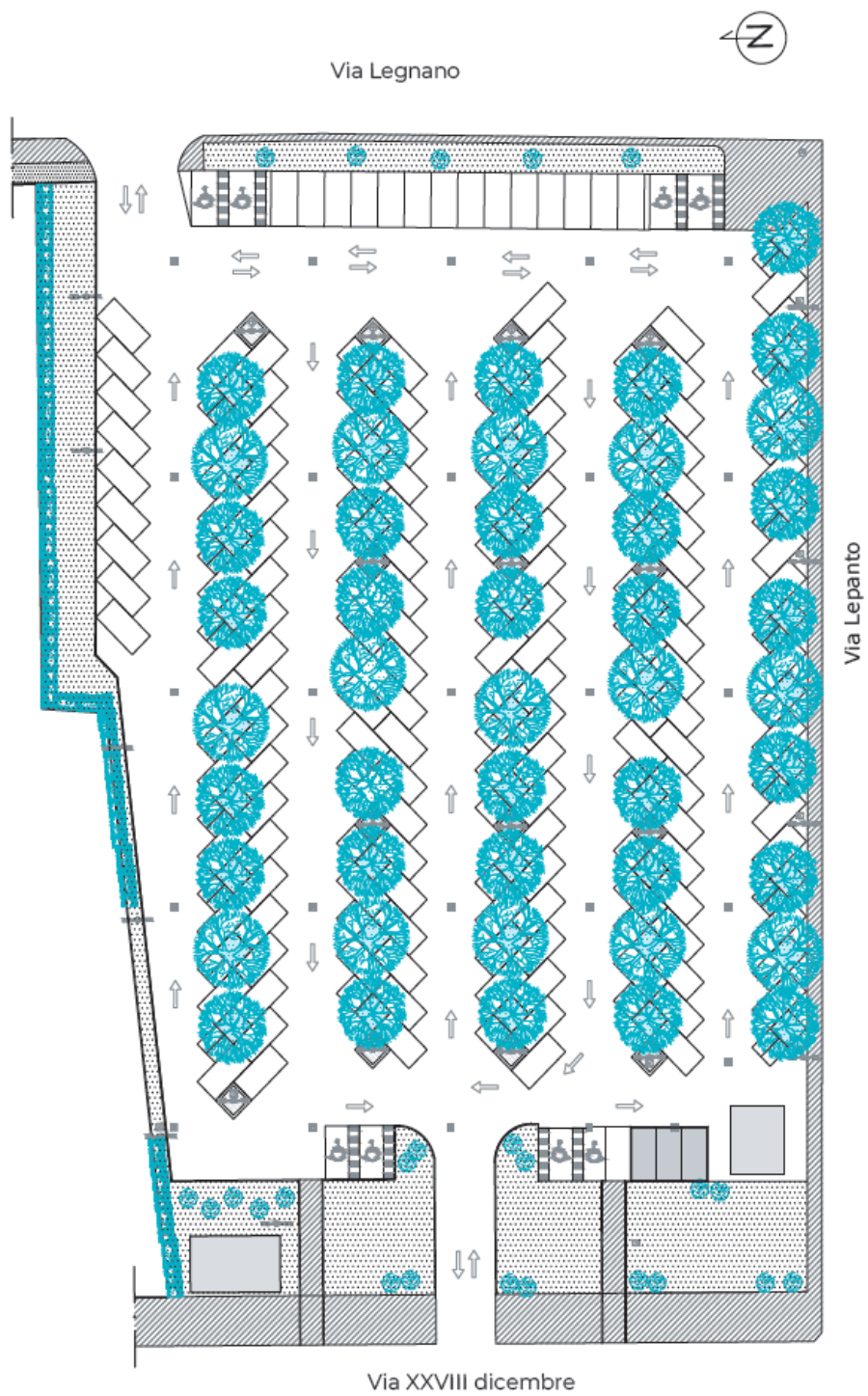
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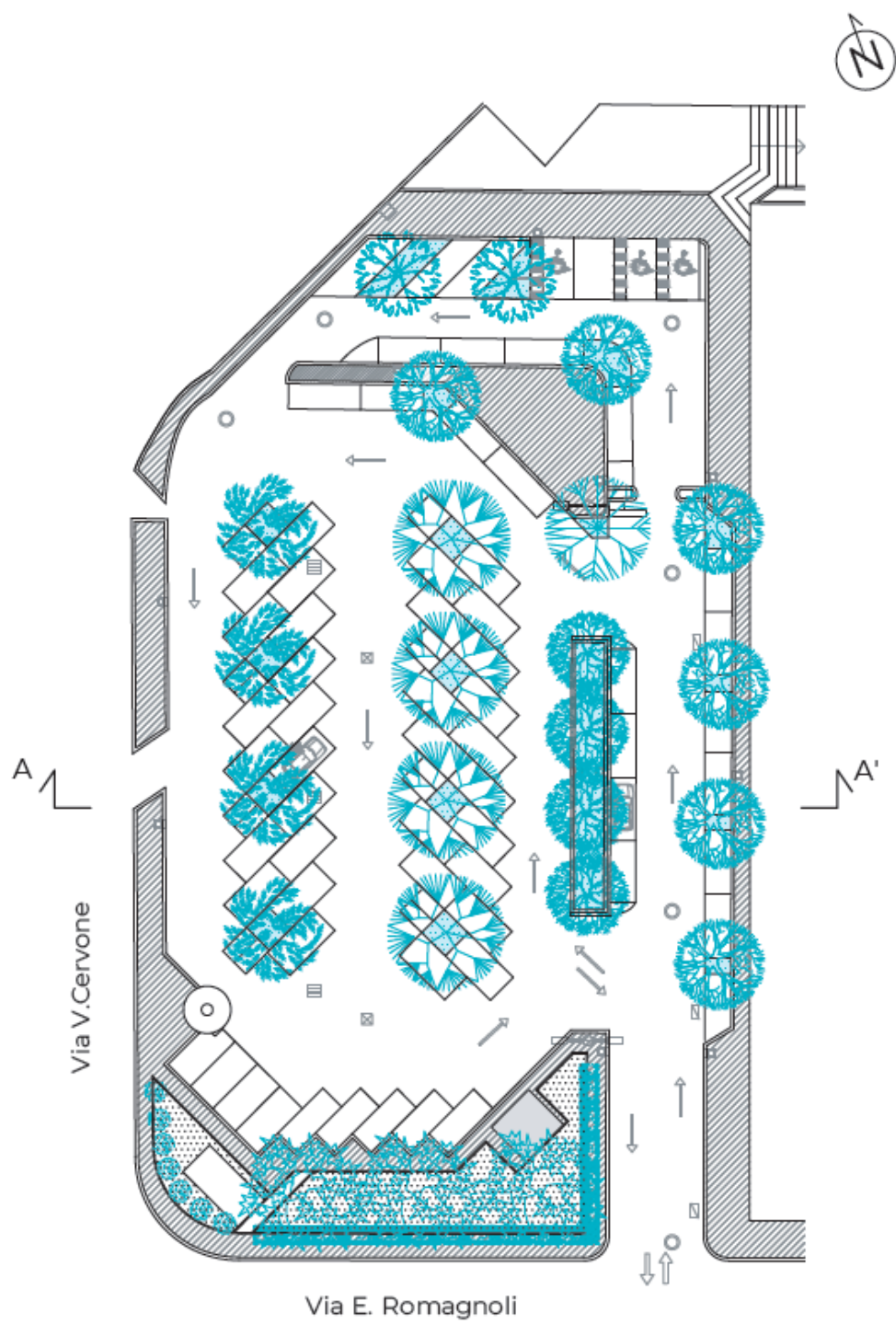
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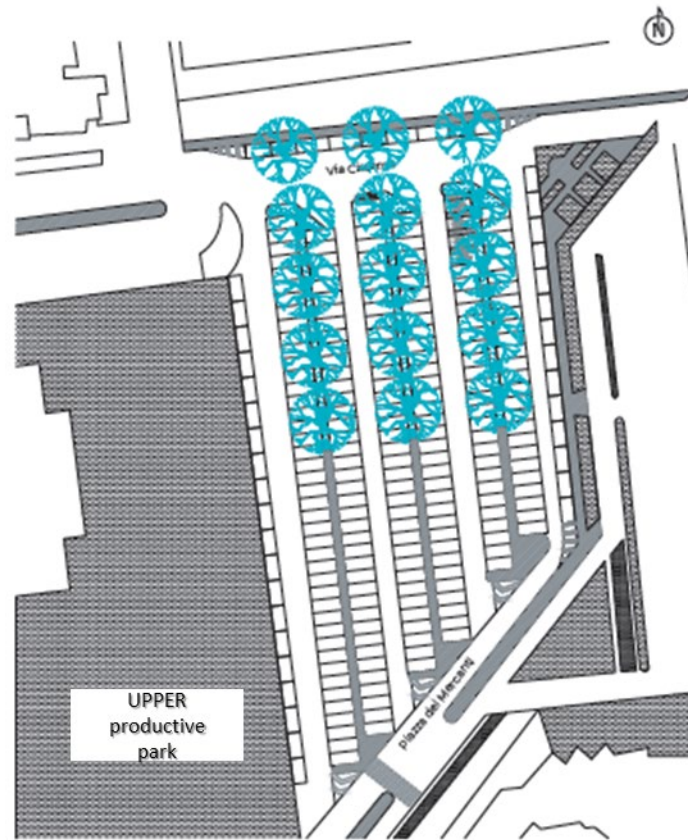
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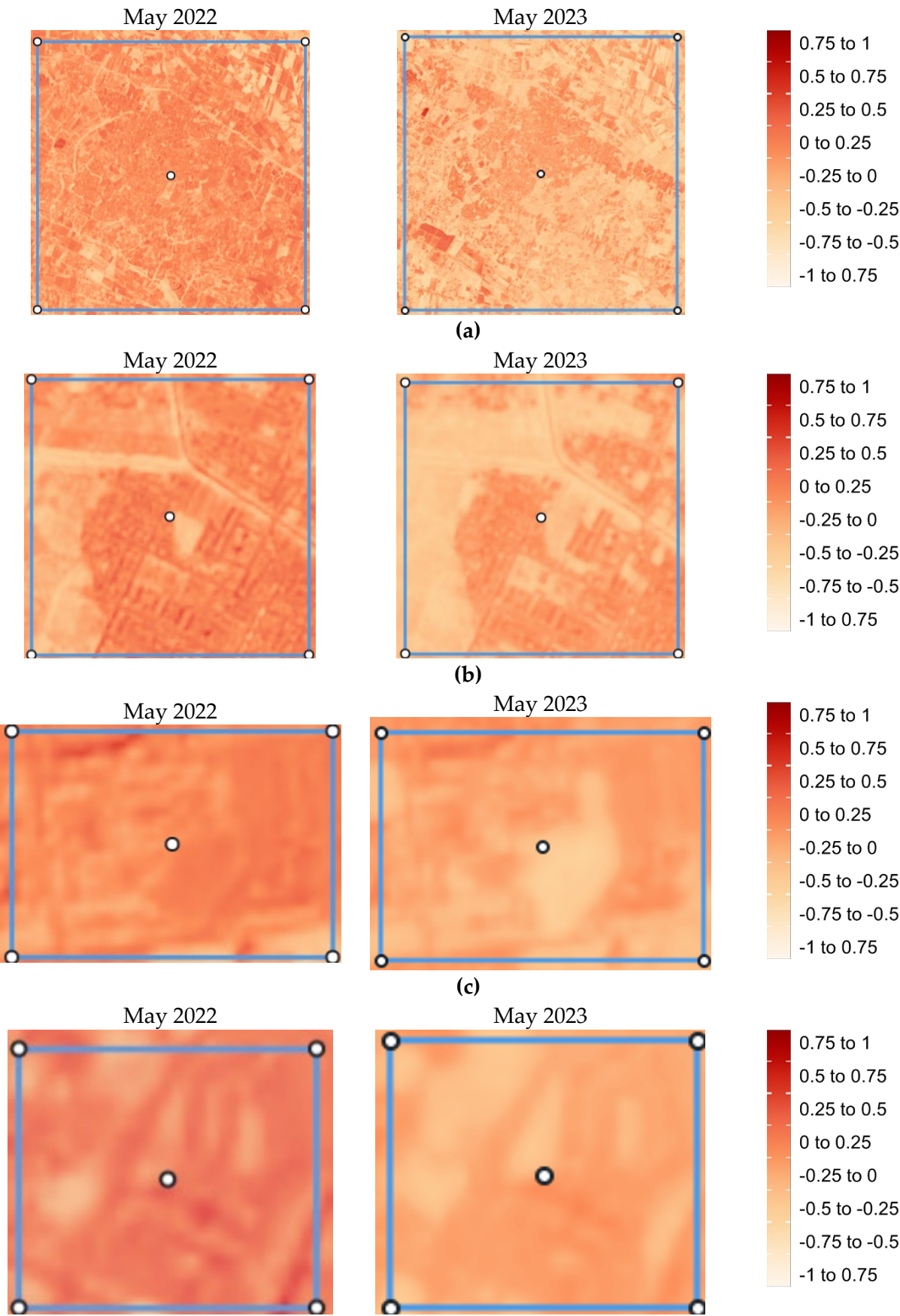
e



f

Figure S1. Schematic representation of UPPER sites interventions for: VIA GOYA (a), PIAZZA ILARIA ALPI (b), VIA NEGHELLI (c), VIA LEPANTO (d), VIA ROMAGNOLI (e) and (f) P.LE DEI MERCANTI.

NDBI variations (2022-2023)



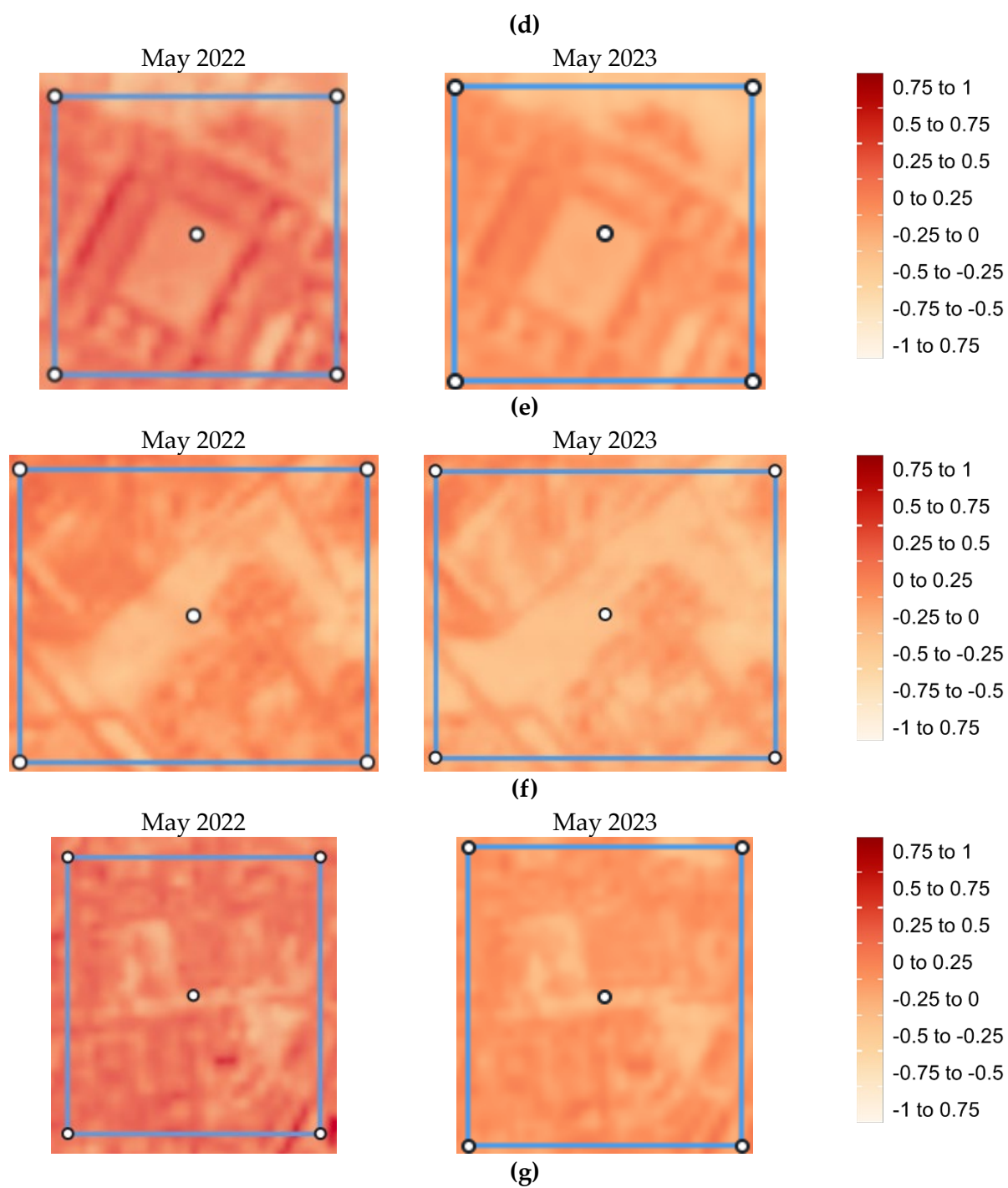
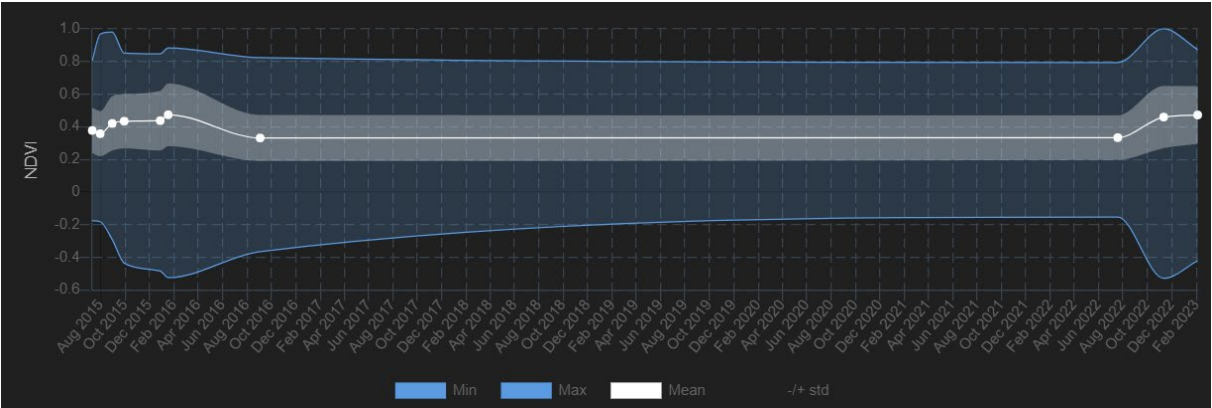
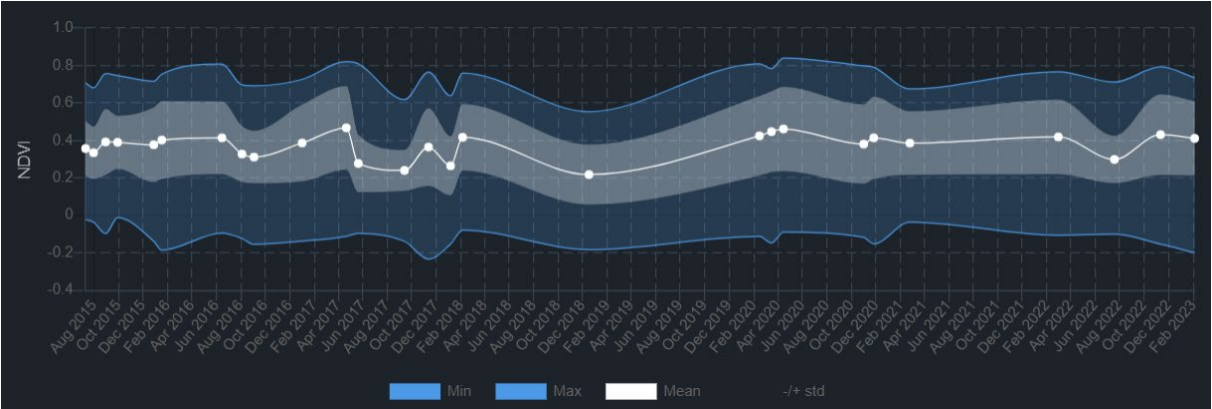


Figure S2. NDBI False color maps at May 20, 2022 (prior NbS interventions) and May 5, 2023: City center (a), CAMPO BOARIO (b), MERCATO (c), AUTOLINEE (d), PIAZZA ILARIA ALPI (e), VIA GOYA (f) and VIA LEGNANO (g).

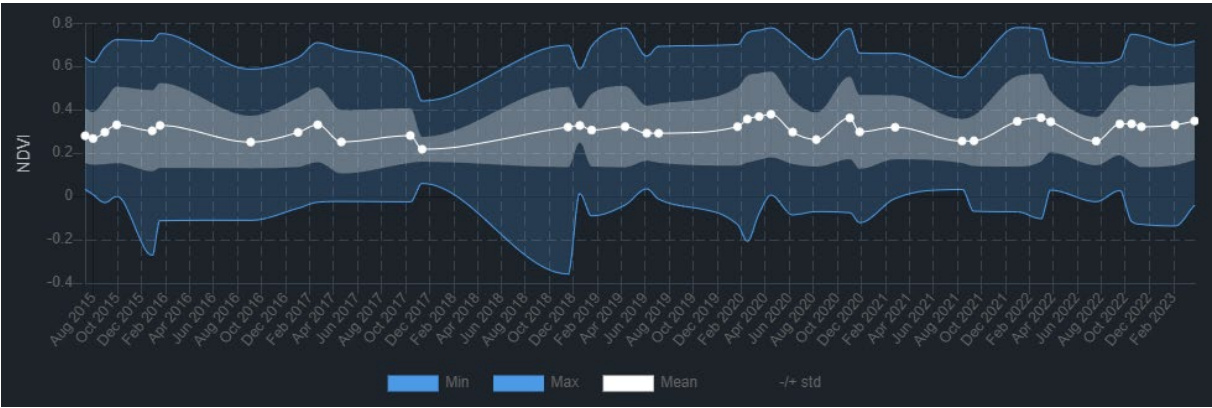
NDVI variations (2015-2023)



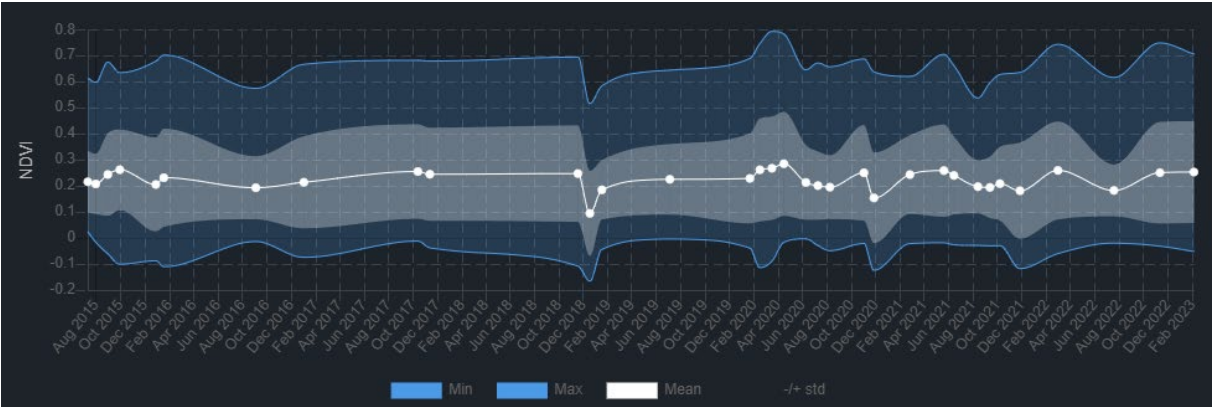
(a)

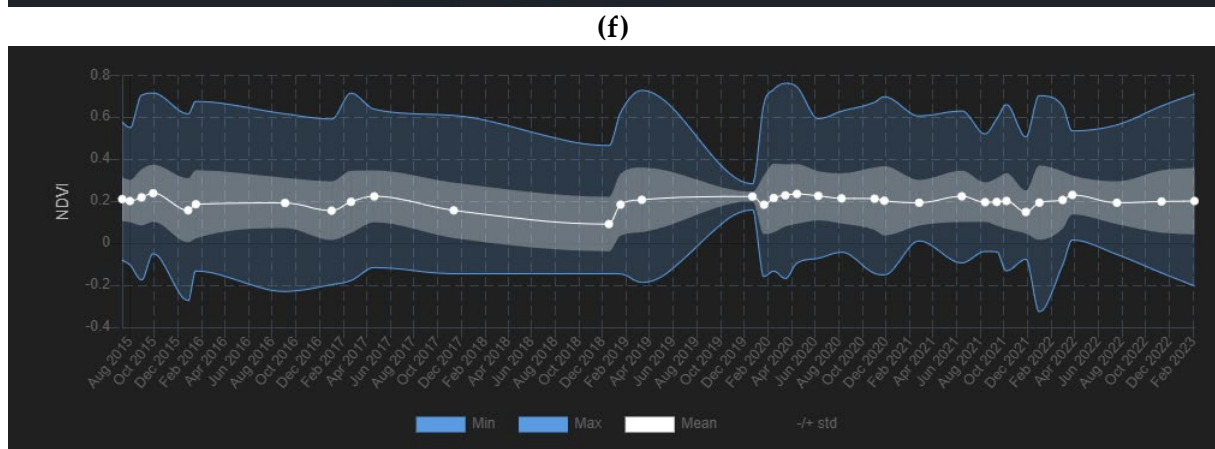
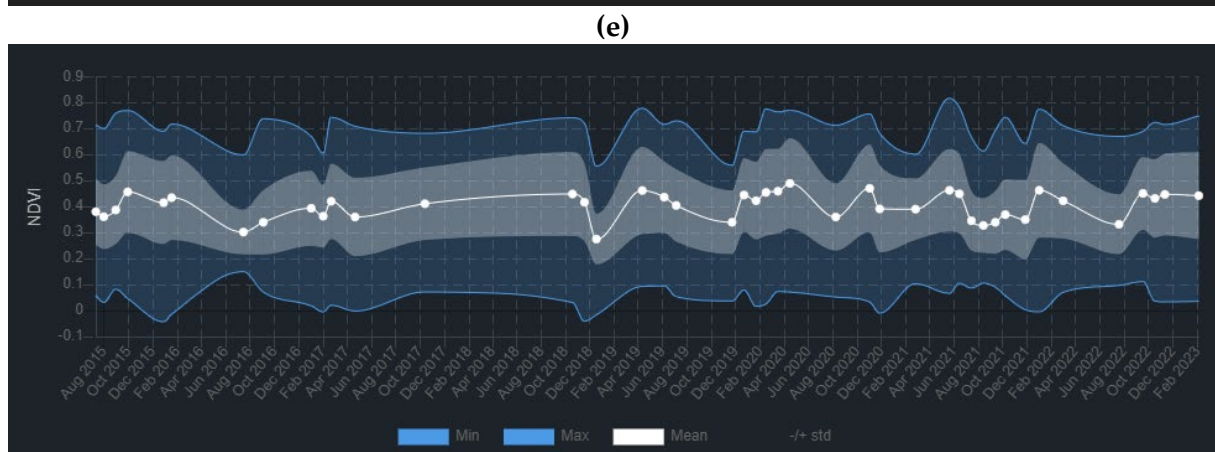
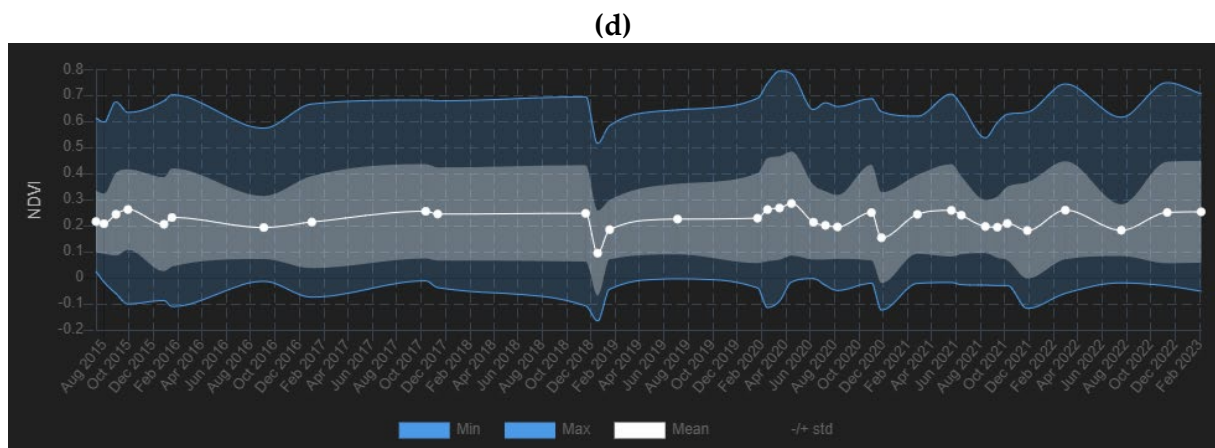


(b)



(c)

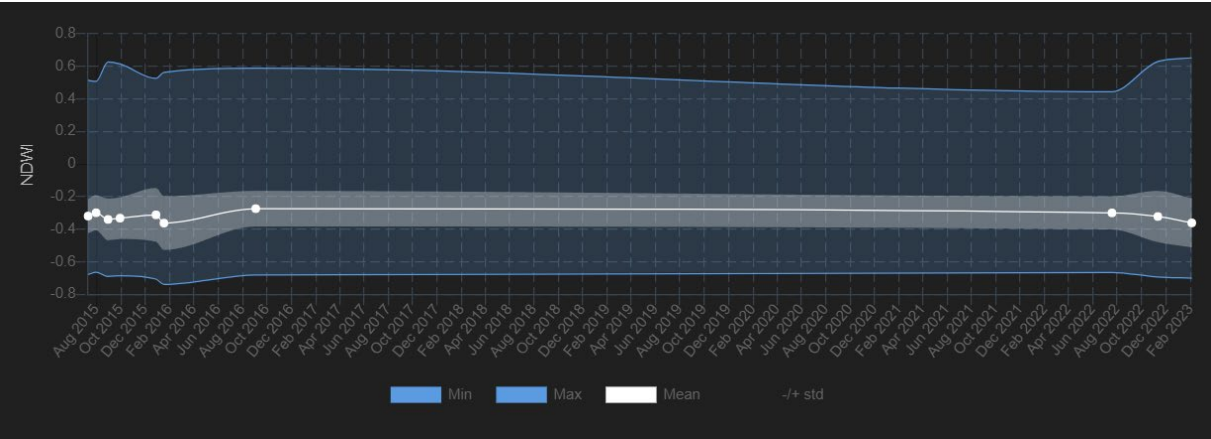




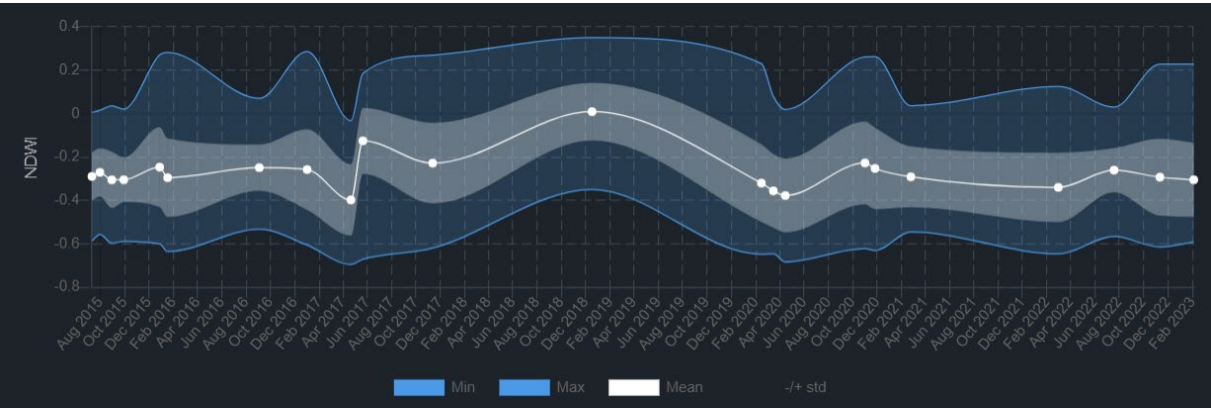
(g)

Figure S3. NDVI temporal series (2013-2023) of City center (a), CAMPO BOARIO (b), MERCATO (c), AUTOLINEE (d), PIAZZA ILARIA ALPI (e), VIA GOYA (f) and VIA LEGNANO (g).

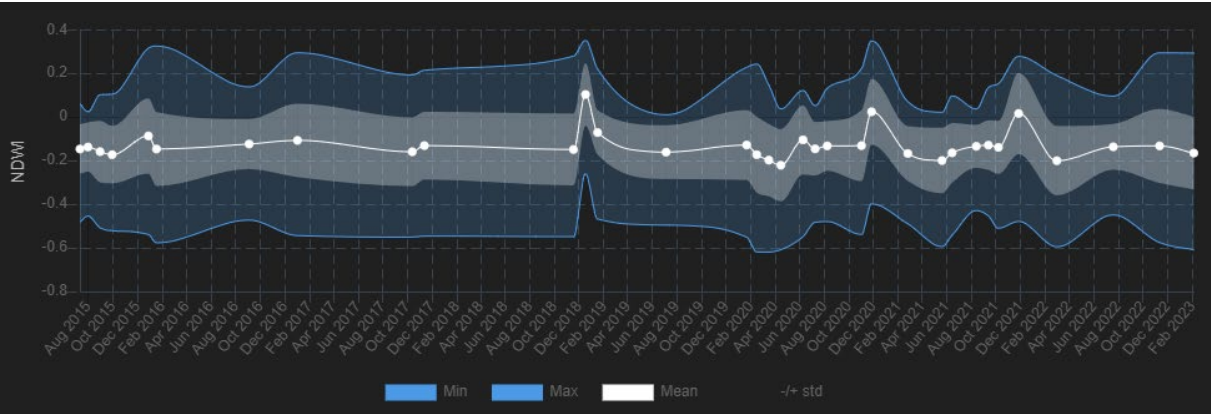
NDWI variations (2015-2023)



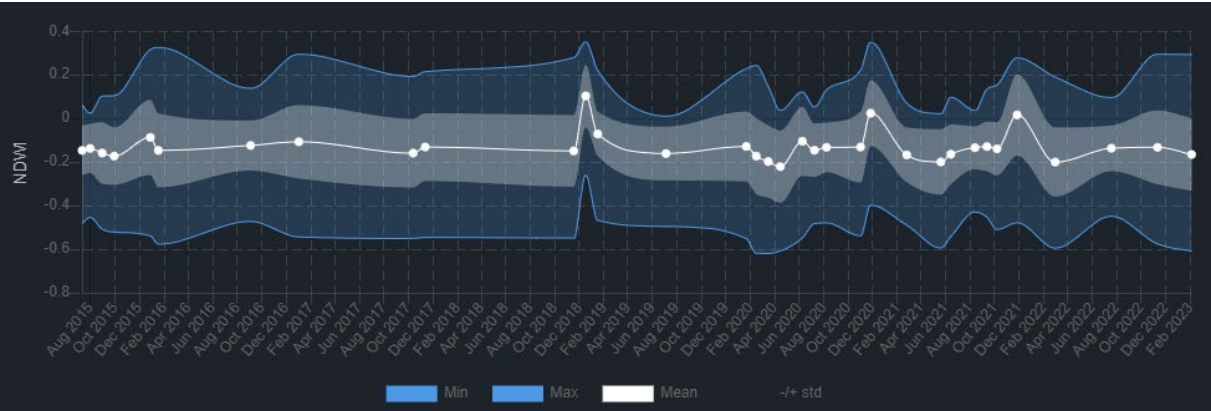
(a)



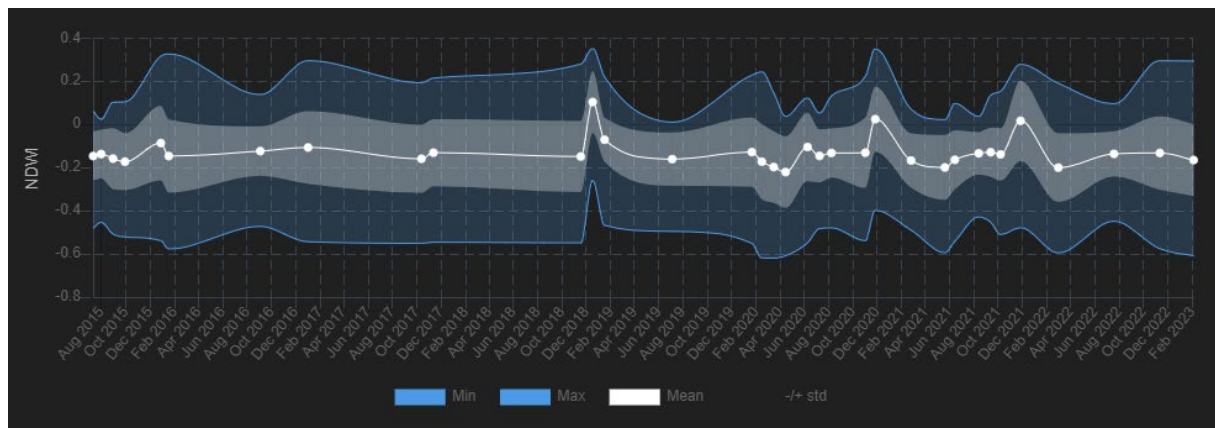
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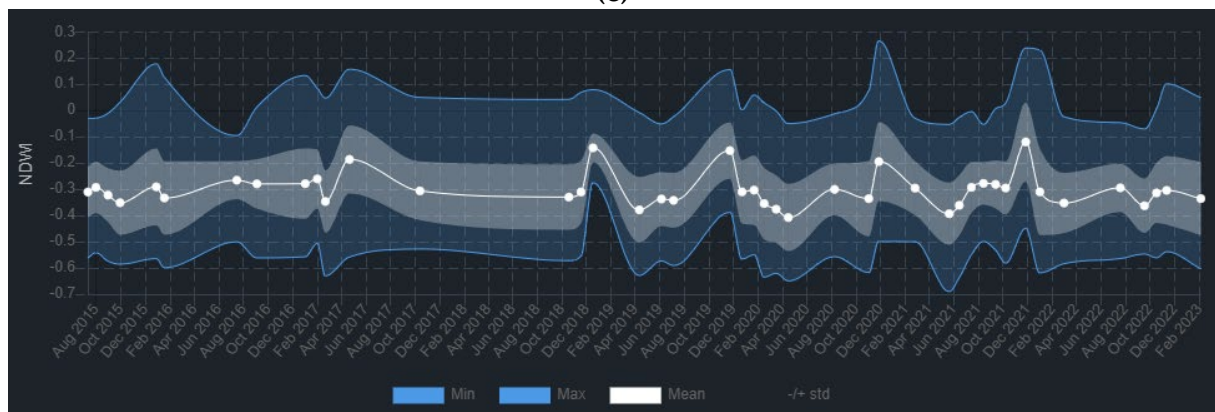
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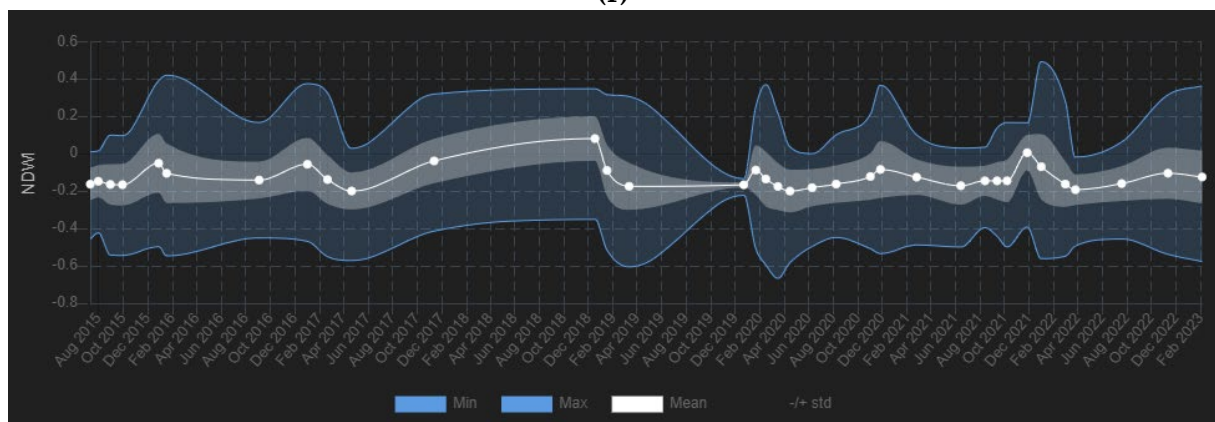
(d)



(e)



(f)



(g)

Figure S4. NDWI temporal series (2013-2023) of City center (a), CAMPO BOARIO (b), MERCATO (c), AUTOLINEE (d), PIAZZA ILARIA ALPI (e), VIA GOYA (f) and VIA LEGNANO (g).