

Visualizing the

UHI

In Reggio di Calabria - Italy

Team 36 - Codellera Andina

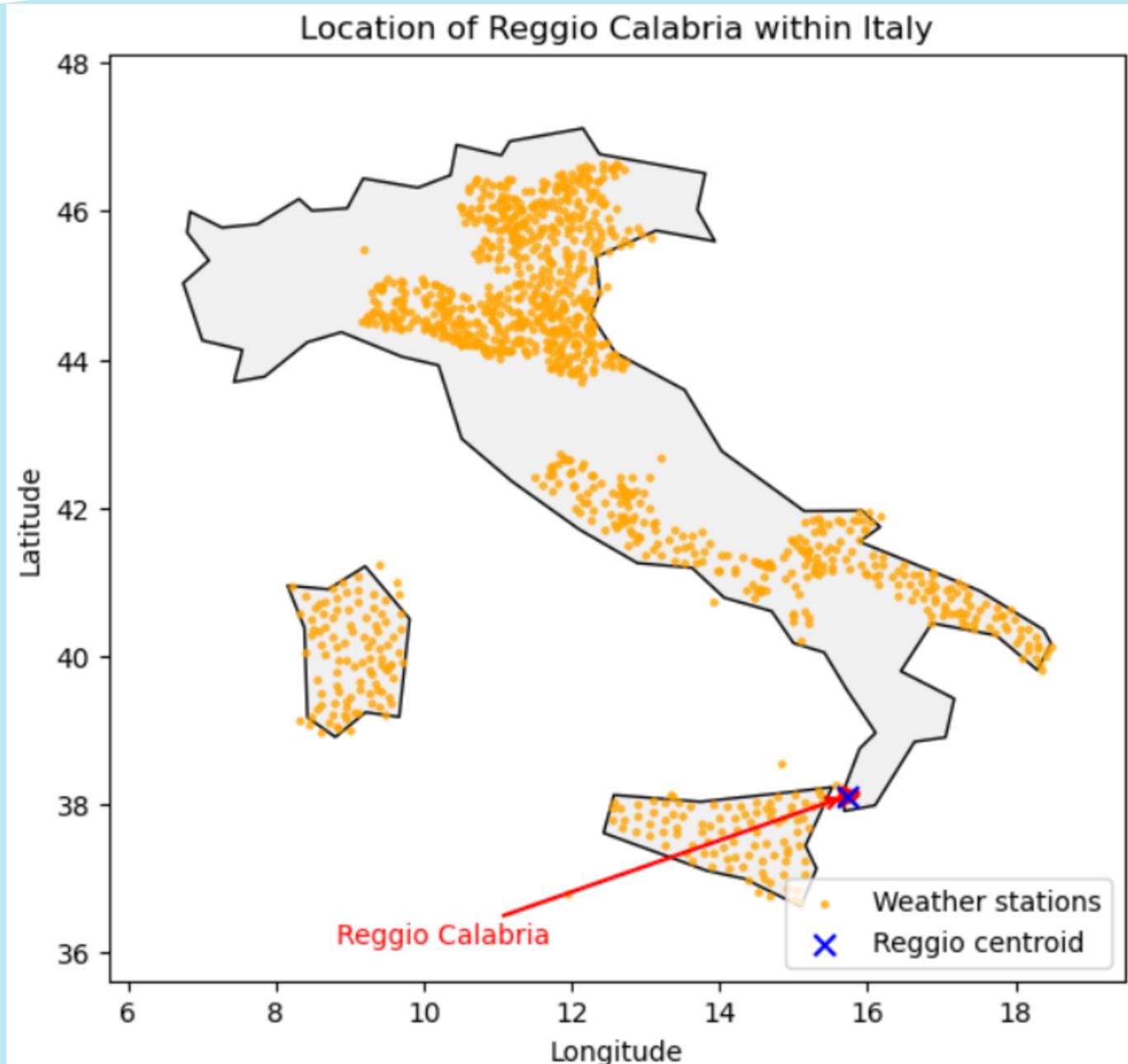
Maria Fernanda Molina

Nataly Sarmiento

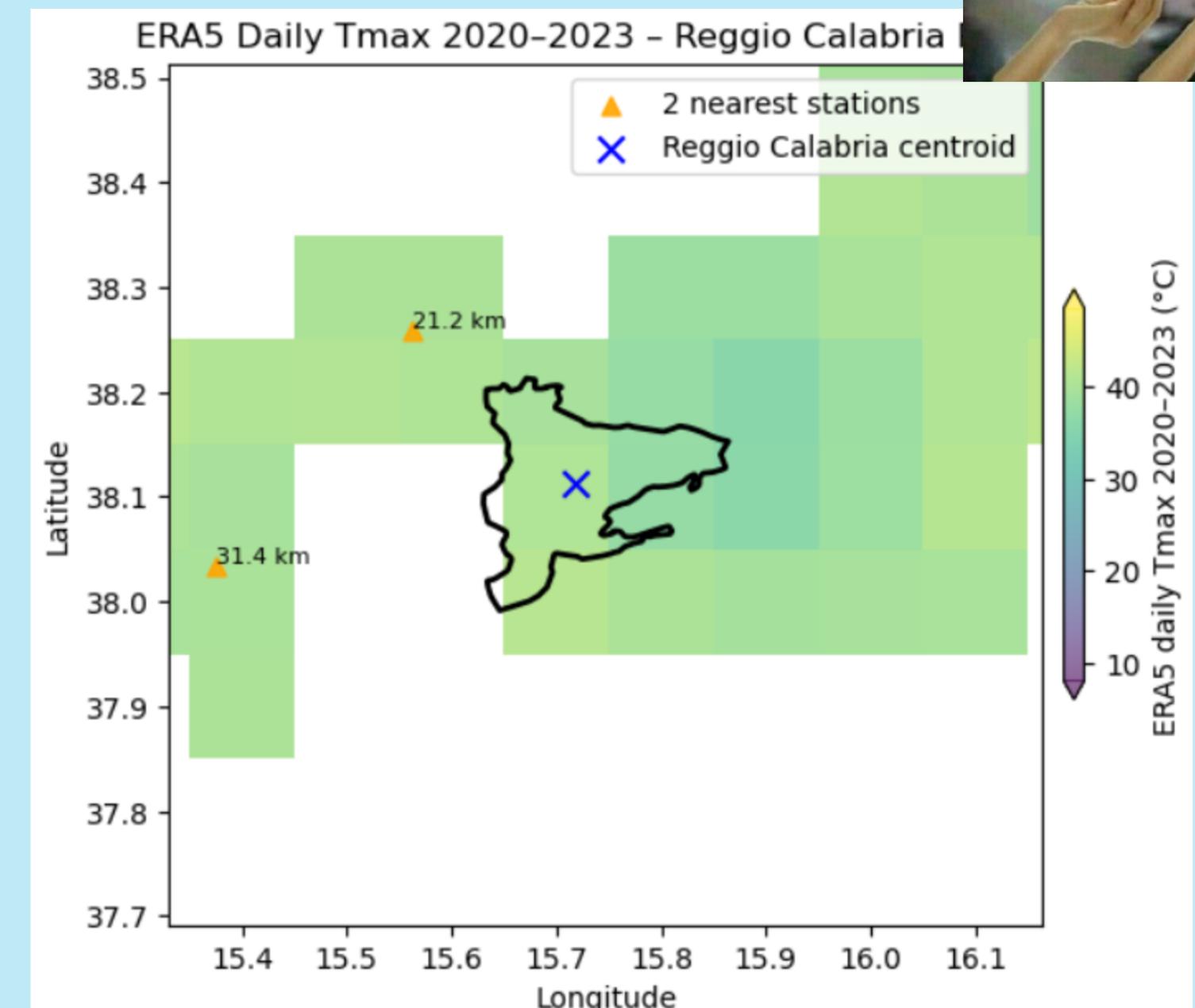
Isabela Saud



Context



Reggio Calabria is located at the very south of mainland Italy, facing the Strait of Messina.



The closest gauges to the city are located outside the municipal boundary

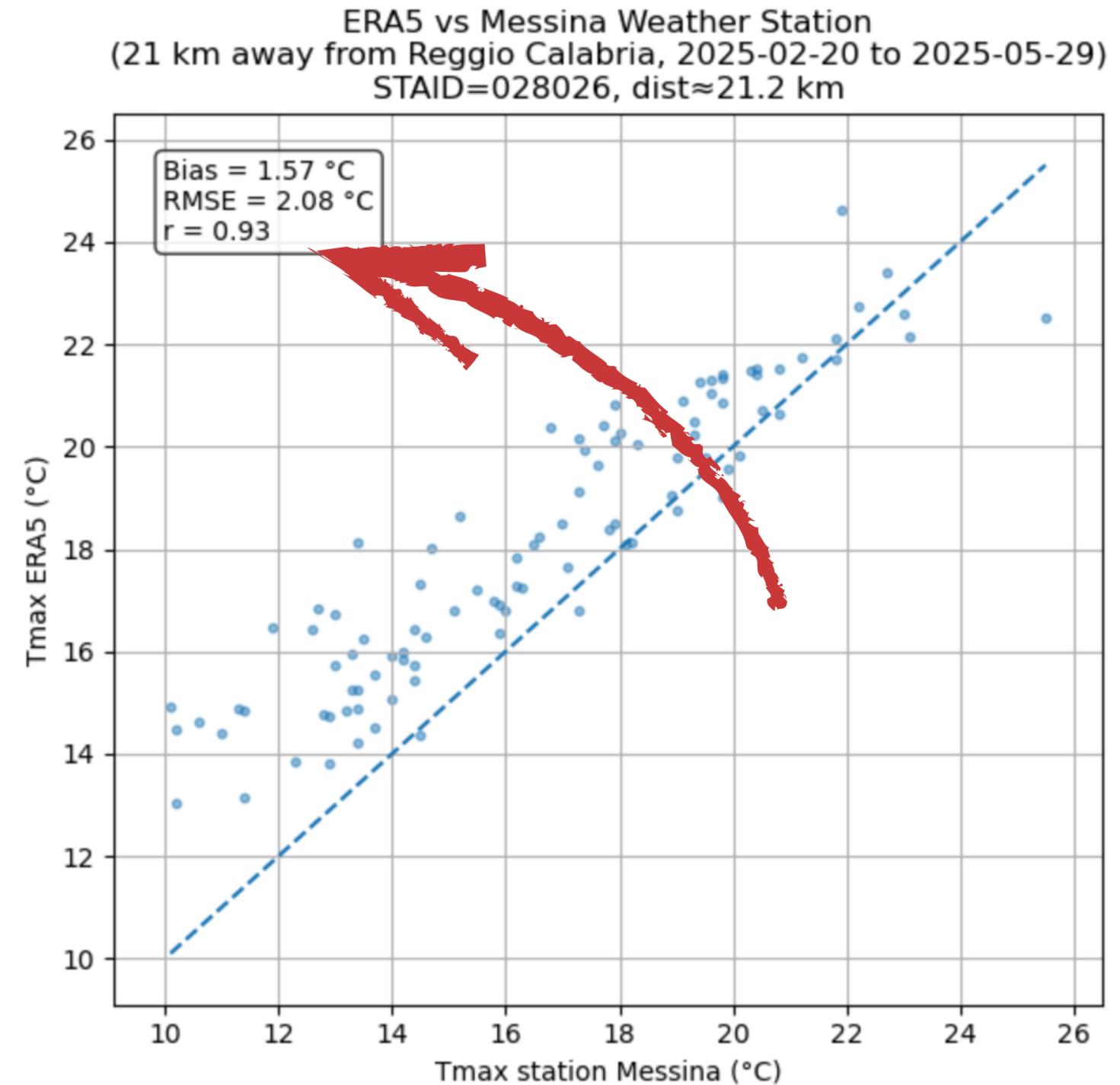


¿IS ERA5 RELIABLE ENOUGH?

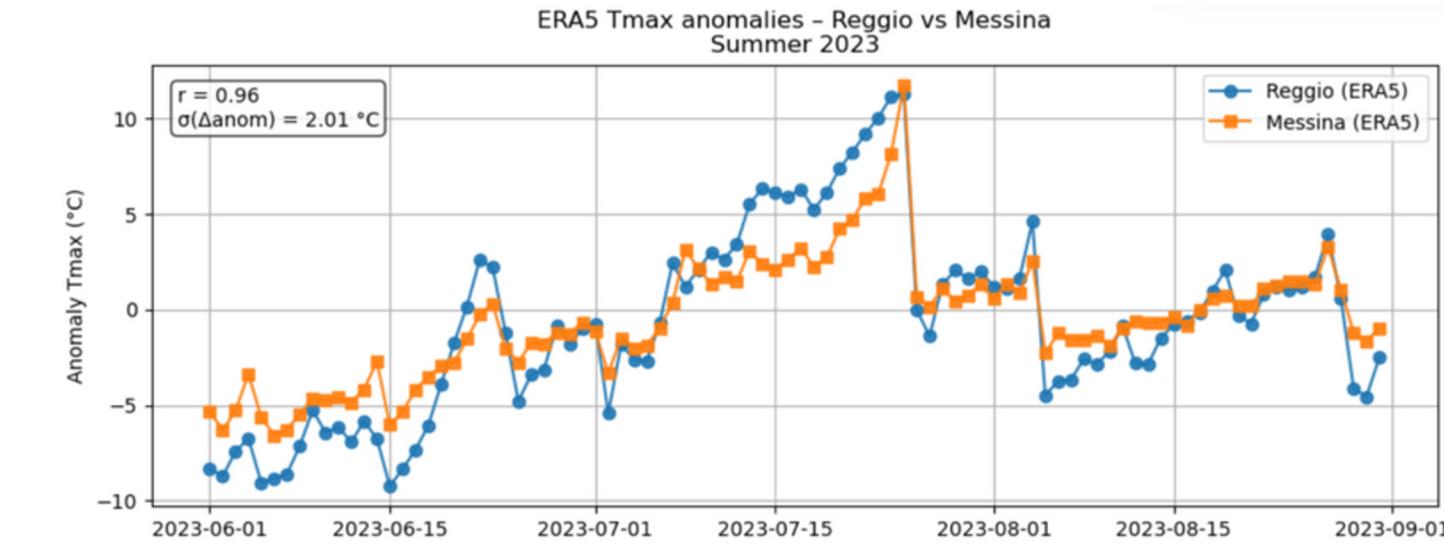
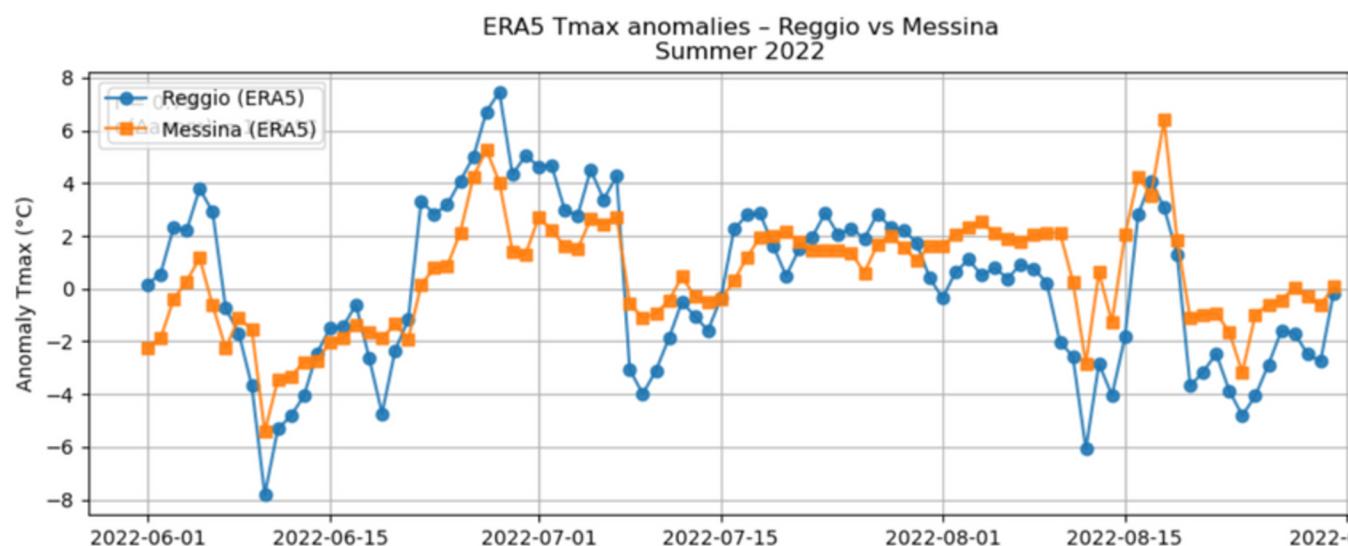
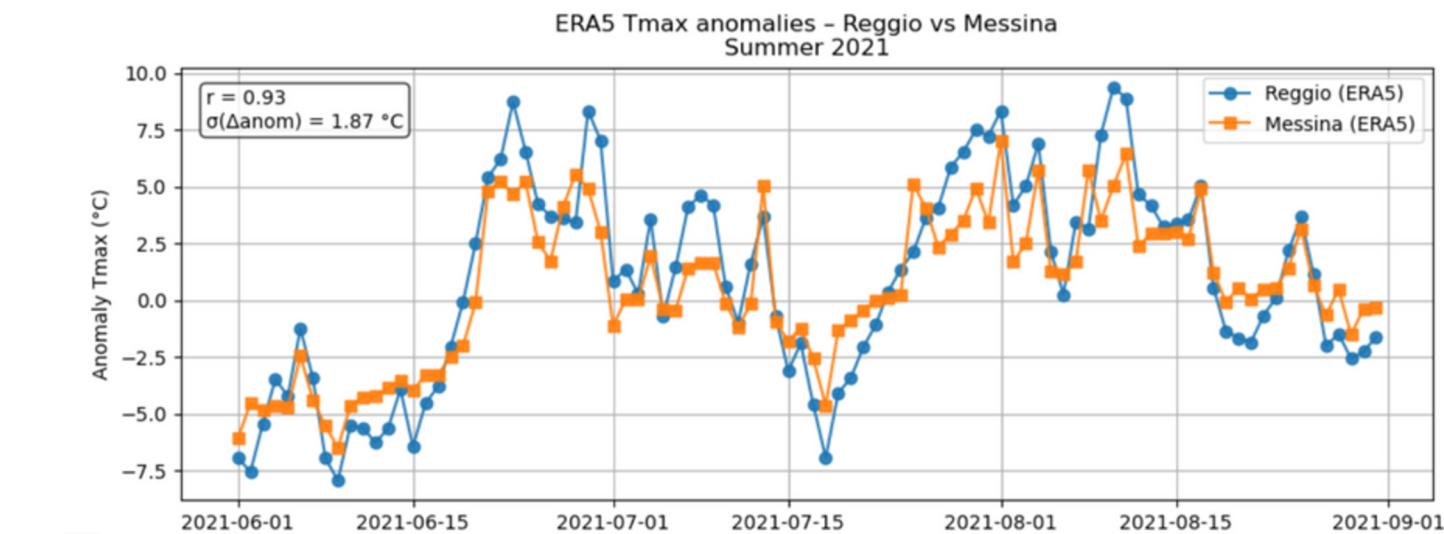
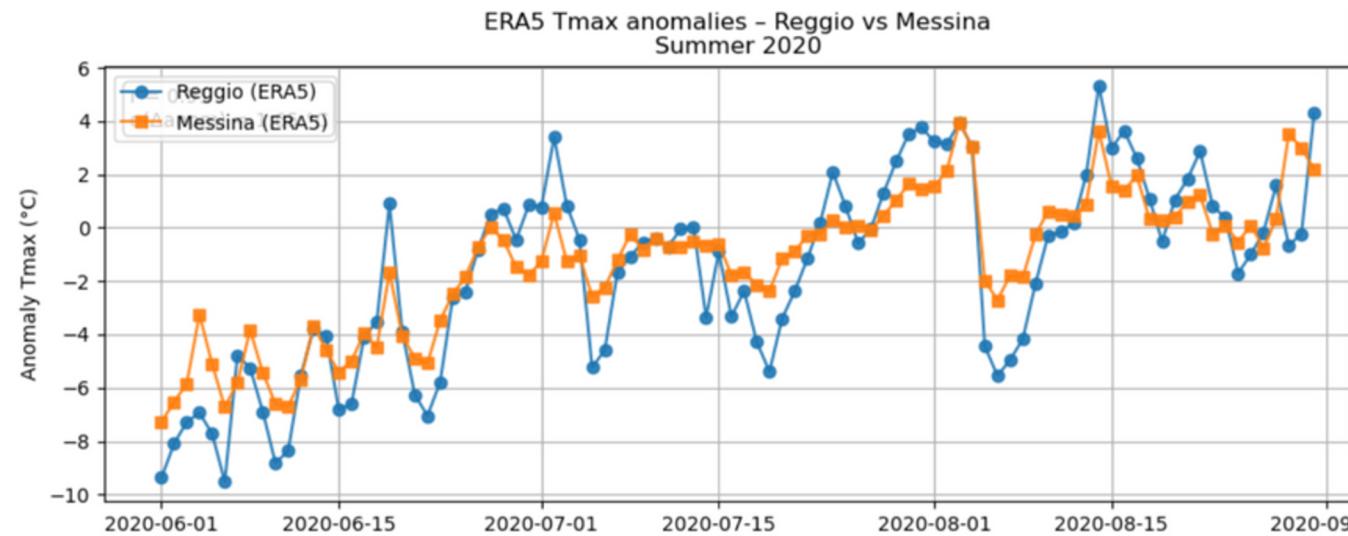
MAYBE



- ERA5 follows the same daily ups and downs as the Messina Weather station (Feb-May data)
- **BUT** No valid summer weather station data in Messina → cannot validate ERA5 during peak UHI months



¿IS ERA5 RELIABLE ENOUGH?



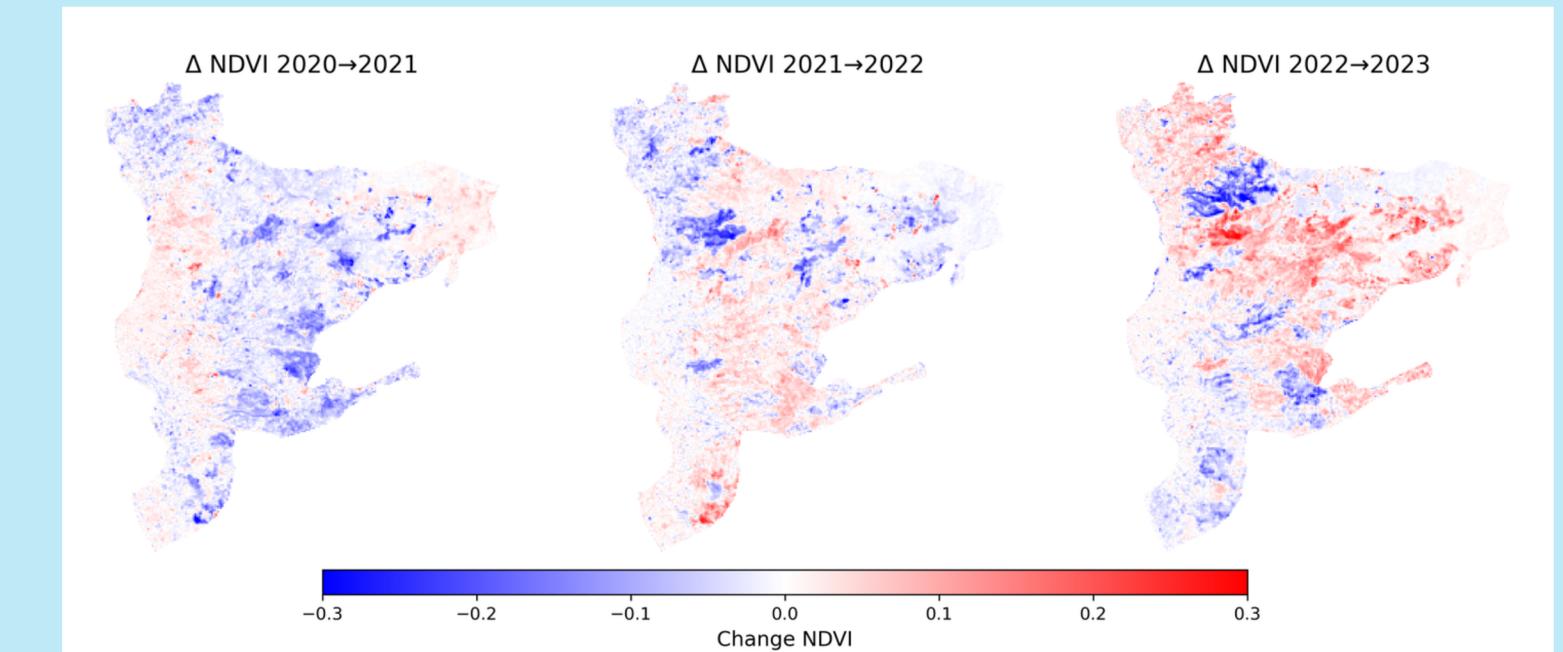
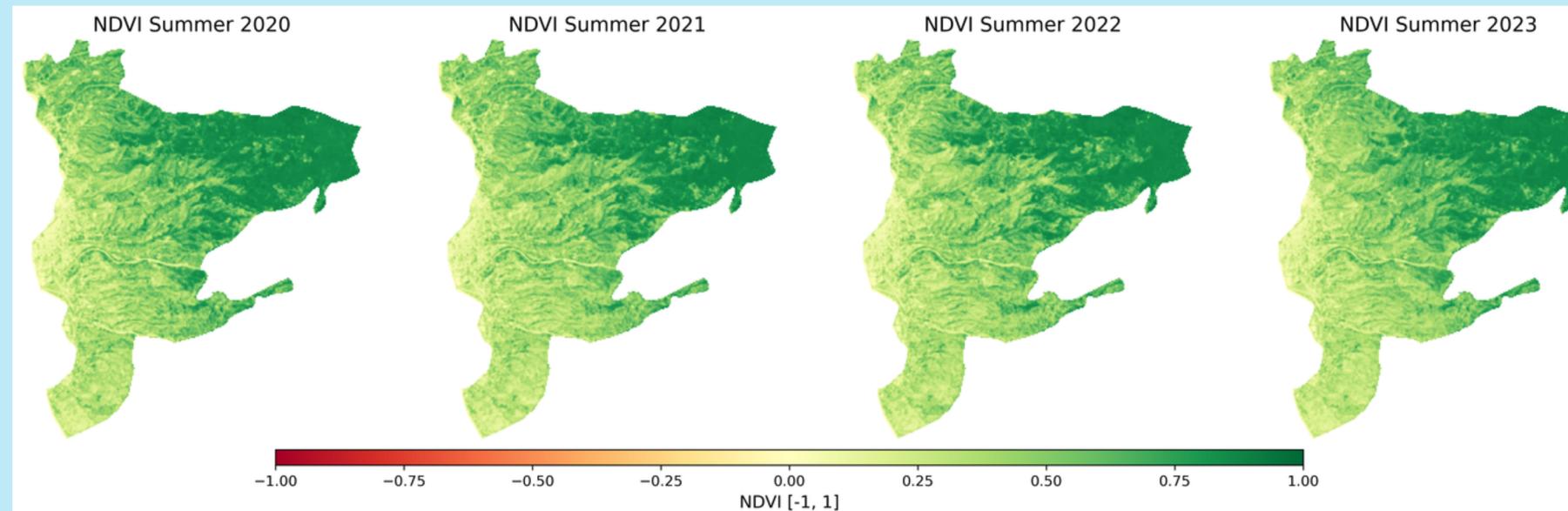
- ERA5 Reggio vs ERA5 Messina show almost identical day-to-day behavior along the 4 summers ($r \approx 0.9$)
- But daily values differ by $\pm 1.5\text{--}2 \text{ } ^{\circ}\text{C} \rightarrow$ representativity uncertainty

Conclusion: ERA5 is reliable for patterns & contrasts, not for exact temperatures
(which is enough for UHI visualization)

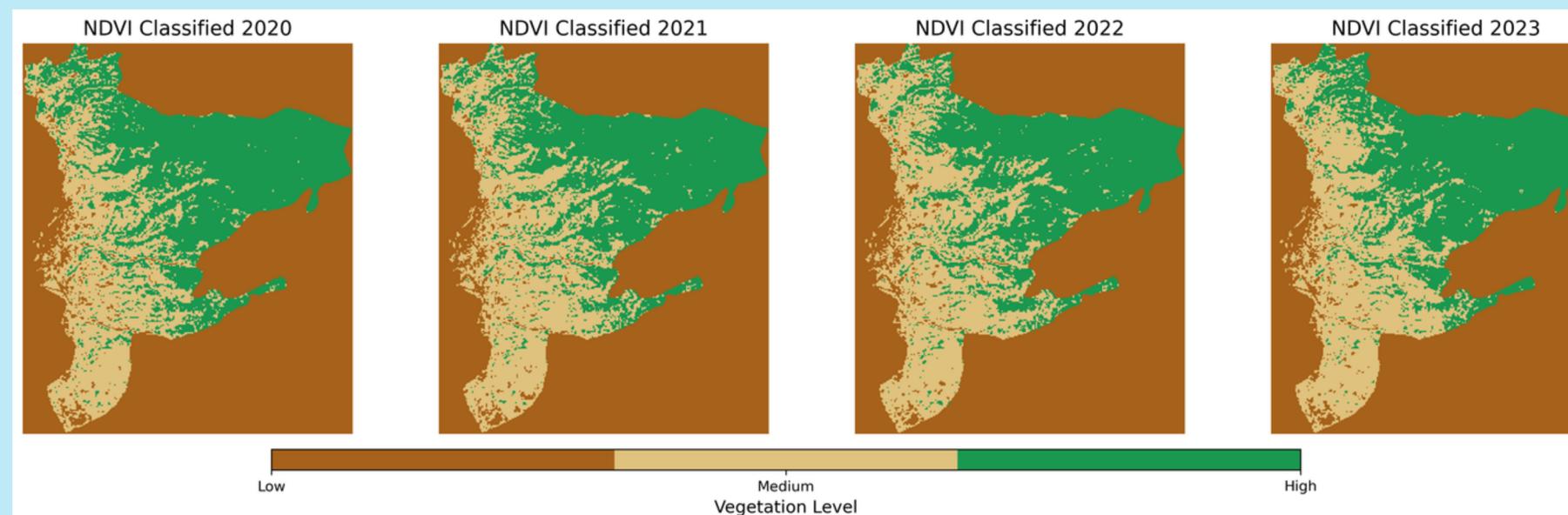
Jupyter Notebook Script



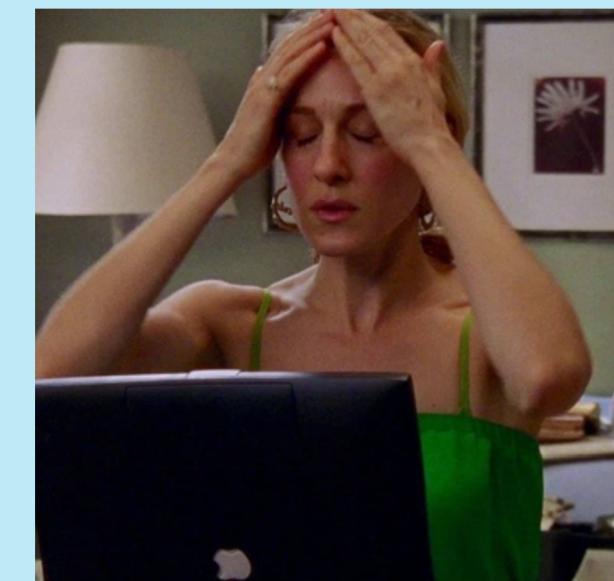
WHAT ABOUT THE NDVI IN SUMMER?



It is evident that there has been a decrease on NDVI.



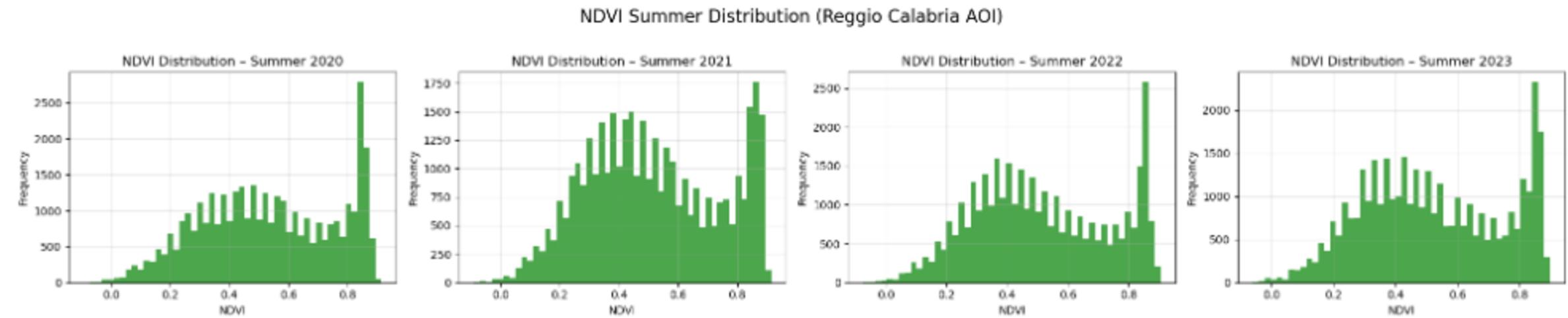
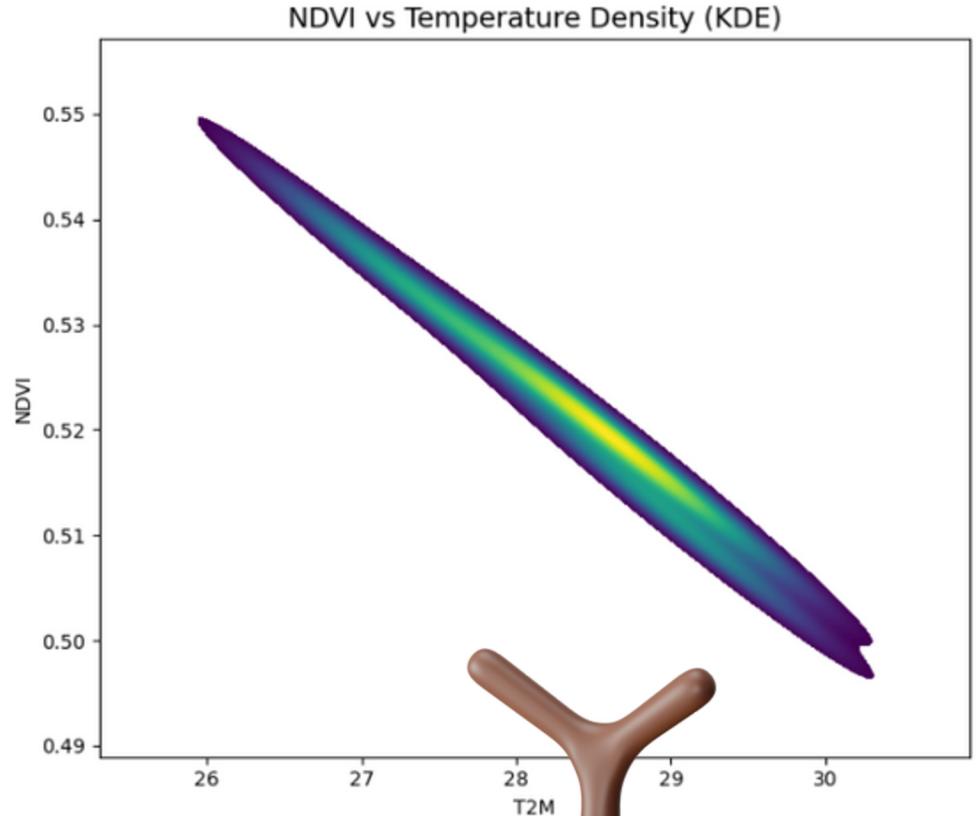
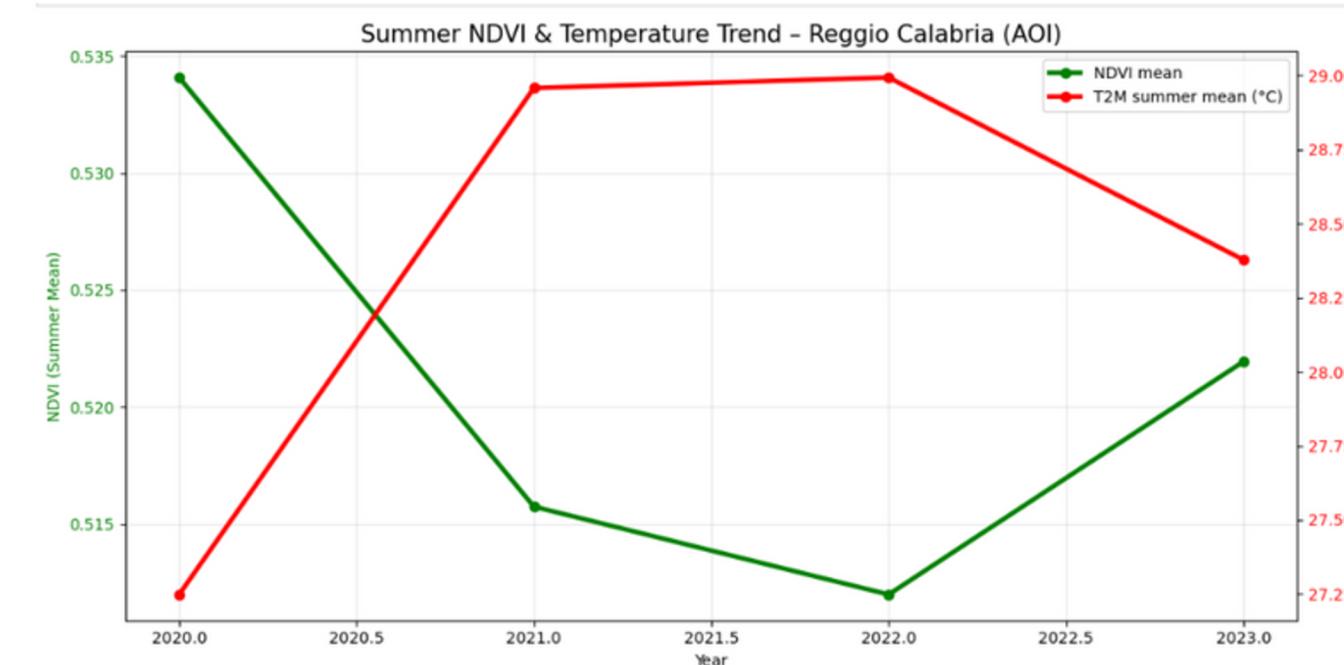
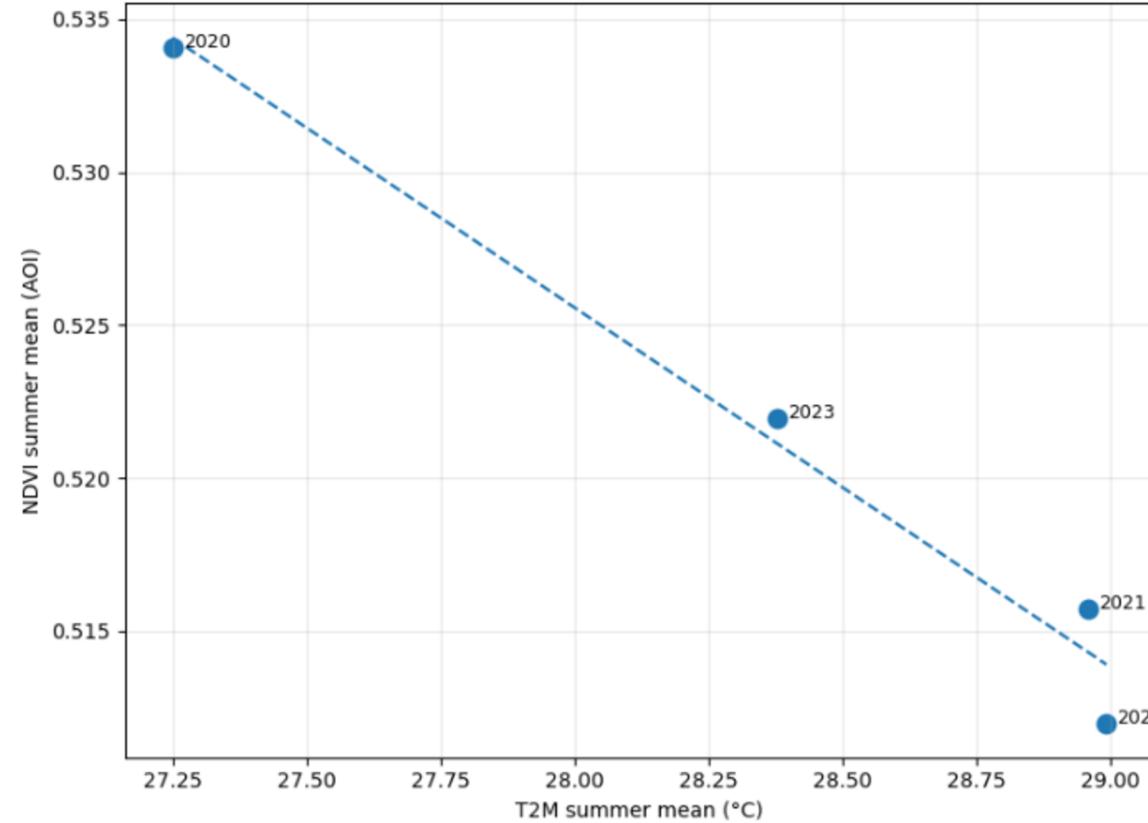
Assuming a direct correlation between NDVI and Temperature, we should expect an increase in temperature in the same areas shown.



WHAT ABOUT THE NDVI IN SUMMER ?

Years used: [2020, 2021, 2022, 2023]
Correlation NDVI vs T2M (summer means, AOI): -0.9884510281587852

Summer Mean NDVI vs T2M - Reggio Calabria ($R = -0.99$)



There is an extremely strong negative relationship between summer temperature and vegetation health (NDVI) in Reggio Calabria.

