



# CLIMATE DETECTIVES 2020 – 2021



## VEGETATION CHANGES AROUND OUR CITY SEEN FROM SPACE

Vaccina  
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### RESEARCH QUESTION

What's the air we breathe like?

### SUMMARY OF PROJECT

By air we commonly mean the gas mixture present in the lower layer of the earth's atmosphere, called the troposphere, and more precisely its part in direct contact with the earth's surface.

The air is polluted when there are substances in it that alter its natural composition, to an extent that constitutes a risk factor for human health, altering biological resources and ecosystems.

In this project we therefore examined the topic relating to air pollution in the city of Andria by carrying out a careful analysis of the concentration of pollutants with the use of the "Sentinel 5" satellite and making a classification of the various types of pollution.

The other topic we have covered concern the vegetation in our city.

The city is located on the lower slope of the "Murge" plateau, 10 km from the Adriatic Sea. The climate is Mediterranean, with almost mild winters and hot, dry summers. The vegetation includes numerous wild species which are contrasted by endless olive groves and vineyards.

We conducted the study by carrying out an analysis on the concentration of chlorophyll detected by the "Sentinel-2" satellite.



Figure 1: Environmental protection is a key element for our city characterized by a famous castle and a National

### MAIN RESULTS

The study carried out showed that in the air there is methane attributable to human activity; there is also nitrogen dioxide NO<sub>2</sub> and carbon monoxide CO.

We used:

Normalized Difference Vegetation Index (NDVI) that measures the health of vegetation based on how plants reflect light at certain wavelengths;

Urban Composite in false colors, to visualize urbanized areas more clearly.

Normalized Difference Moisture Index (NDMI) to determine the water content of vegetation and monitor drought

Short-wave infrared (SWIR) composite, to estimate how much water is present in plants and soil.

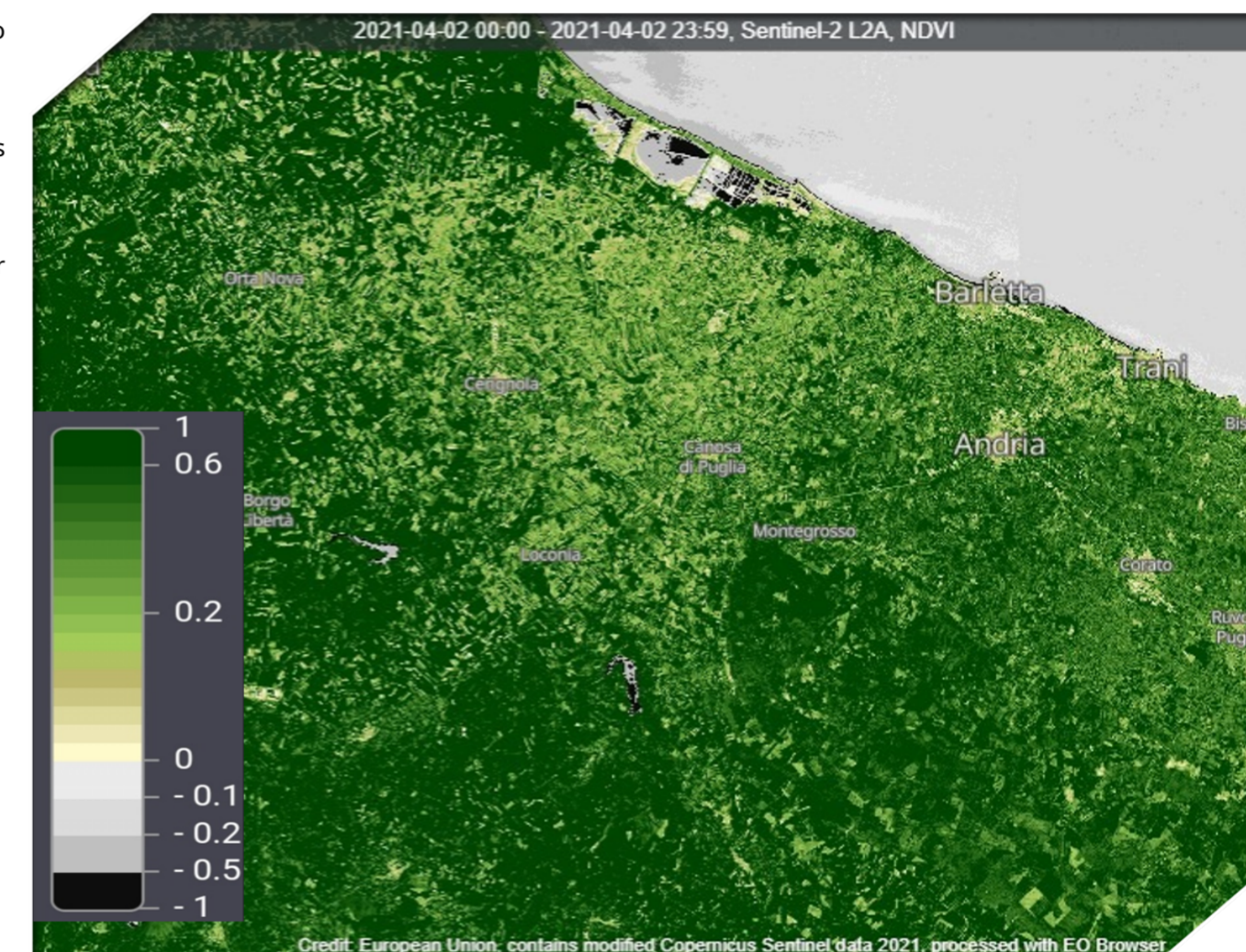


Figure 2: Normalized Difference Vegetation Index (NDVI) - Image of the territory around the city

### ACTIONS TO HELP LESSEN TO THE PROBLEM

A contribution to improving the quality of the air we breathe would be to adopt more considerable and correct behaviors: for example, using public transport to the detriment of one's car, using low-sulfur fuels, preferring electric cars, diesel and petrol vehicles.

It is important for each individual to improve and pay attention to these problems because it affects our health and also that of the environment to avoid or limit the phenomenon of the greenhouse effect with the consequent climate change in progress.

The work was published on our school website to spread greater environmental awareness.

In addition, to raise awareness and attract the attention of children, we created an educational comic that explains with simple words the importance of recycling.

Figure 3: