CLIMATE DETECTIVES 2021 – 2022

Pylaia' s Stream Investigators
Isminis 4

RESEARCH QUESTION

The main topic of our research is whether the sparsely populated suburb Pylaia, which is located near a stream, has a lower average temperature than the nearby urban areas.

SUMMARY OF PROJECT

Our purpose was to study whether the stream that flows through the area of Pylaia and the existence of open vegetated spaces have a beneficial effect on the local climate, and in turn, on the health of residents.
This stream, which in the past received a lot of water from many torrents from the present-day areas of Panorama and Eleones, is artificial, and it was built in 1956 to collect the water of other torrents that crossed the city and caused floods.
The study was realized using:
a) soil data using meteorological proxies from 5 meteorological stations in nearby areas with different local landscapes (urban, semi-urban, coastal, mountainous). We compared the average temperatures by each area, we recorded the minimum and maximum temperatures as well as the hot days and hours. Finally, we recorded the degree of discomfort (DI), as in 2021 there were long periods of heat. The data processed on Excel.
b)satellite data, taken by the EO Browser, in order to locate the route of the stream, its springs, as well as the mountain that supplied water to the various streams.
c)historical data, from scientific papers and narratives of elder people.
We collaborated with the following scientists:
a)a Meteorologist associate of AUTh who provided us with the meteorological data
b)a Biologist, researcher, and author on ecological and historical data concerning city's streams; and
c)a Geologist teacher who provided us stories from the lives of the citizens and their relationship with the stream during the past decades.

Figure 1: Pylaia stream area, "Anahoma", EO Browser, Dataset: Sentinel-2 L2A, Show L1C, Date: 2022-04-08

MAIN RESULTS

The Pylaia meteorological station, which we were interested in, as it is close to the stream, was installed this very year. Therefore, we tried to draw a conclusion using data from nearby meteorological stations.
The meteorological station that simulates the Pylaia station is the one in Panorama. However, Pylaia is at a lower altitude (80-150m) than the station of Panorama (250m). Considering that the temperature decreases by about 0.5oC every 100 meters, we tried to make a reduction to simulate the Pylaia's climate.
Doing the reduction, the obtained results did not provide much-supporting evidence to our original research question.
Our main problems were:
a)The lack of data from a meteorological station in Pylaia.
b)The complex landscape of the city.
c)The study was done with data from only one year, 2021. In-depth research would be necessary for safer results.
Nevertheless, we have some interesting conclusions:
The data showed that the average temperature during the summer months from the Panorama station is significantly lower than in corresponding less-vegetated (Kifissia) or no vegetated (Toumba) urban areas. The rural area of Tagarades demonstrates slightly higher or about the same temperatures and the sea breeze (White Tower station) has a beneficial effect, especially on very hot days.
These data are available in the Padlet (link attached).
Also, the degree of discomfort "DI", as it results from the Panorama station data, for the summer months, is significantly lower than the other surrounding areas.
The satellite images (EO Browser) helped us to describe the course of the river and to locate its springs and where it flows into the sea. Urban expansion erased the traces of the various streams gathered by the artificial stream of Pylaia.
Chortiatis, a mountain located near the suburb of Panorama, used to have a much colder climate. The ice caps were permanent all year round on top of the mountain, whereas today they do not last more than a month. This dramatic reduction in ice caps in recent decades impacts the reduction of torrents flowing from the mountain's slopes and is probably the result of climate change.
Project link : https://padlet.com/1gympyl/climateDetectives

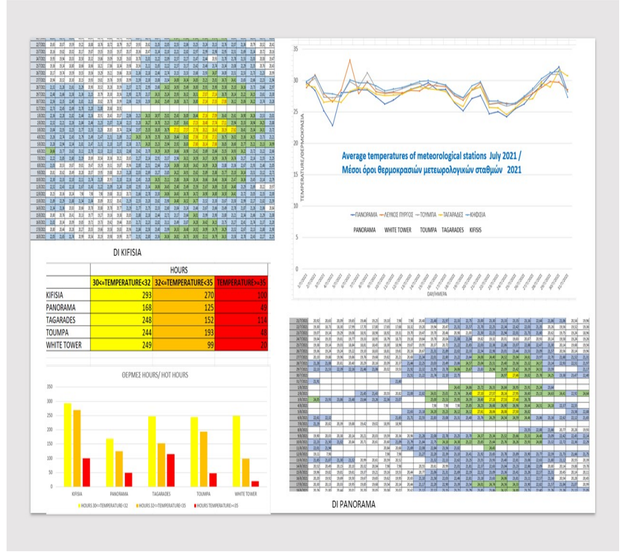

Figure 2: Results. (Average temperature, hot hours, Discomfort contitions (DI range oC) Panorama, kifisia : yellow 27 <=DI <29 , green 24<=DI<27, blue 21<=DI<24))

ACTIONS TO HELP LESSEN TO THE PROBLEM

Figure 3: Various aspects of the Pylaia stream area

We will continue the program in the next school year, including as well the meteorological station of Pylaia in the study of the data.
We will practice more in the study of satellite data to see if urban expansion in recent decades has affected s, oil temperature.
We will try to find resources to build a meteorological station in our school in order to involve not only more students but also to use it in various courses (Geology, Mathematics, History, Physics, Geography, Biology, Informatics)
We will also raise awareness so that this beautiful landscape, which is a promenade, can be protected to expand and join other promenades.
From our research, it seems that areas sparsely populated and with vegetation, have lower temperatures and therefore better-living conditions. We will try to include this outcome in our future research and actions for the dissemination of the proposal, that a city with more parks provides better living conditions.
We may also research the different types of vegetation that can ensure the long-term survival of this area.