



# CLIMATE DETECTIVES 2021 – 2022



Climate hounds  
IES Columela

## RESEARCH QUESTION

Do cruise ships pollute the air we breathe?

## SUMMARY OF PROJECT

In recent years Cádiz has become a port where large cruise ships make their stops. This, together with the increase in conventional tourism, has been an economic engine for our city.

These cruise ships, up to 300 meters long, dock a few meters from where most of the students and teachers of our high school live. Sometimes, there are up to three cruise ships docked simultaneously.

Therefore, due to the above, we were concerned that the stay of these cruise ships so close to us and in such numbers, more than 40 per month, would deteriorate the air we breathe on a daily basis.

To address this task, we acquired an atmospheric pollution measurement station through ESERO. This station has made measurements of particles smaller than 2.5 microns, nitrogen dioxide, carbon monoxide, humidity and temperature.

We have installed it in the municipal public library, which is in front of the dock. The station has been collecting data for 2 months; from February 8 to April 8. Once a week, approximately, we have gone to collect the data.

To know the periods of time in which the cruise ships have been docked, we have collected the information in the Cadiz bay port authority.

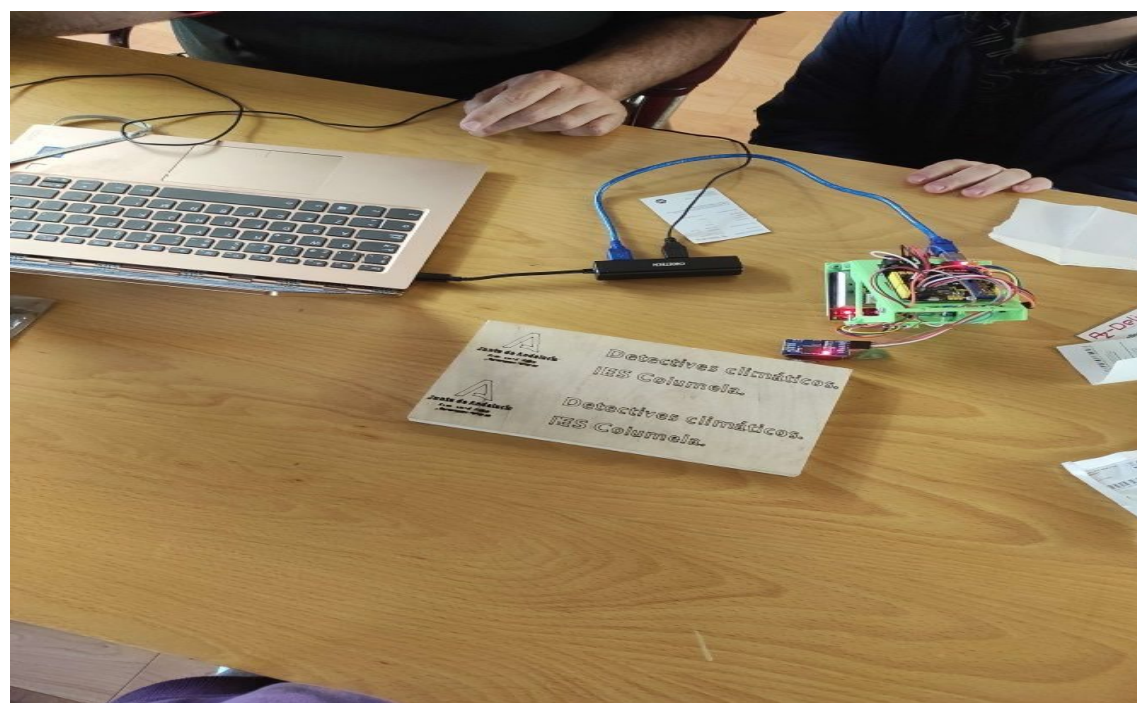


Figure 1: Extracting data from the station in the public library.

## MAIN RESULTS

The results obtained are not conclusive regarding the amount of the different contaminants.

This may be due to these causes:

The height of the chimneys of the ships is higher than many of the buildings in the city, this, together with the continuous prevailing wind, means that our station, which is two meters above the ground, does not register any pollution.

The above is confirmed by the photos of the Sentinel-5 satellite, which did not detect any contamination on those days.



Figure 2: The cruise height is higher than the buildings.

## ACTIONS TO HELP LESSEN TO THE PROBLEM

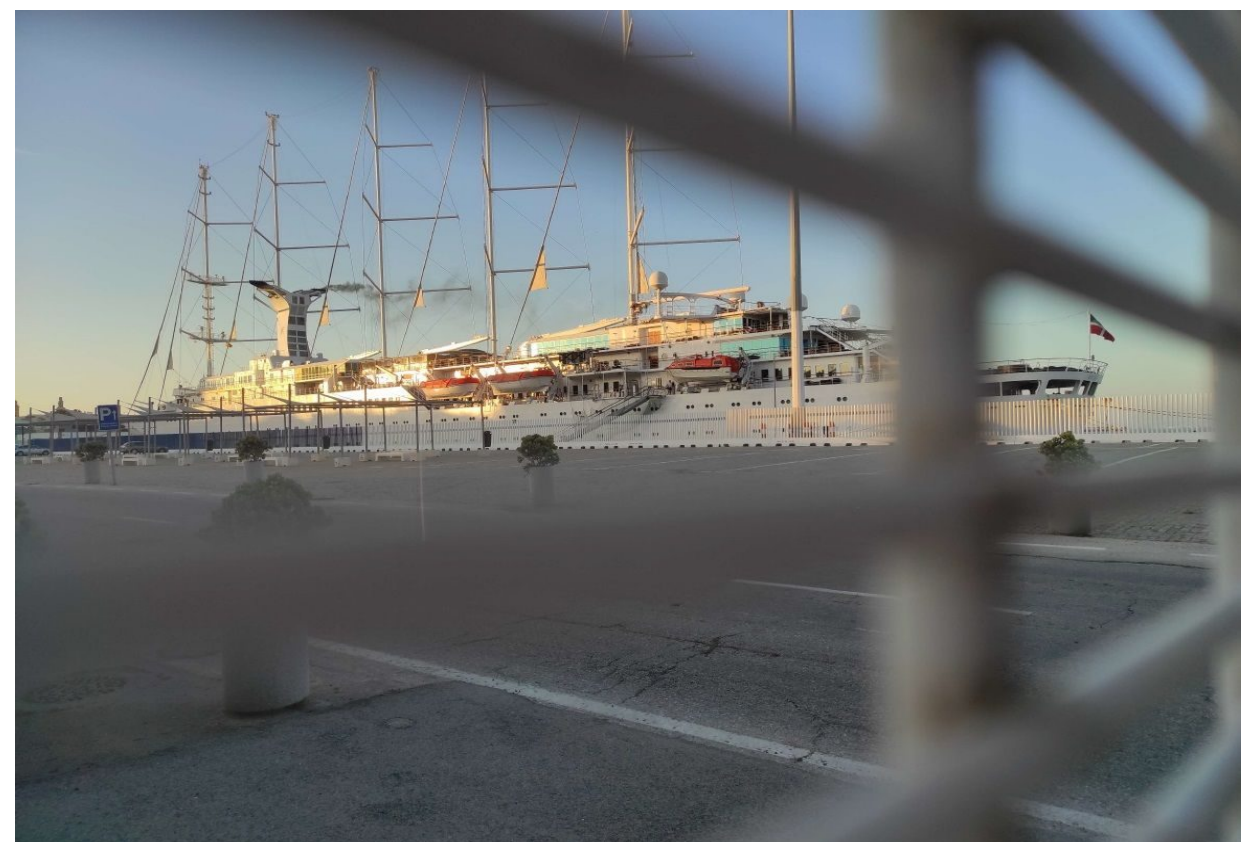


Figure 3: Polluting cruise ships must give way to non-polluting cruise ships

We believe that measures to reduce pollution from cruise ships while in port can be one of the following:

- Refineries should supply ships with a new low-sulfur fuel.
- Prohibit gas treatment plants (scrubbers) on cruise ships, since their waste ends up in the sea.
- Construction of cruise ships powered by renewable energy sources, for example, the wind (norsepower rotor sail).
- While in port, cruise ships can switch their power source from diesel to electricity.
- Implement new fuels that are more respectful of the environment.