



# CLIMATE DETECTIVES 2021 – 2022



WB Guardians  
IES Wenceslao Benítez

## RESEARCH QUESTION

Is contamination from the city a risk to local waters?

## SUMMARY OF PROJECT

San Fernando is a town located in the Bahía de Cádiz Natural Park, where you can see different natural ecosystems related to water (marshes, pipes, salt flats and beaches). The water in these ecosystems is affected by human action. The climatic problem that we will investigate is the pollution that the buildings and inhabitants of the city produce, (as we can observe with the restaurants along the coast, shopping centers or even companies dedicated to manufacturing boats) on the local waters. Our town is in the Bay of Cádiz, and the marshes of San Fernando city are a protected area, but with the risk of environmental pollution (plastics, waste, discharges from factories, etc.).For this we have taken samples at three points (clean-point and two possible contaminated points) and analyzed different variables related with water quality; temperature, smell, pH, conductivity, turbidity and dry residue. We used different procedures to get the measurements.

## MAIN RESULTS

Temperature: If there is a lot of human intervention, the water temperature is lower.

Smell: The most contaminated place is Bahía Sur.

pH: The higher the contamination, higher the pH (more basic is the water). Water acidification is fundamental in the development of marine ecosystems.

Conductivity: Measured conductivity is inversely to resistance, so the order of electrical conductivity is: Punta del boquerón, Puente de Hierro and Bahía Sur.

Turbidity: It is related to the waste that is dumped into the water. Water from Puente de Hierro is much more crystalline than the other samples.

Dry residue: There is not a great difference between Bahía Sur and Puente del Hierro areas. This indicates similar contamination in both of them. However, contamination by plastics is observed in Puente del Hierro.

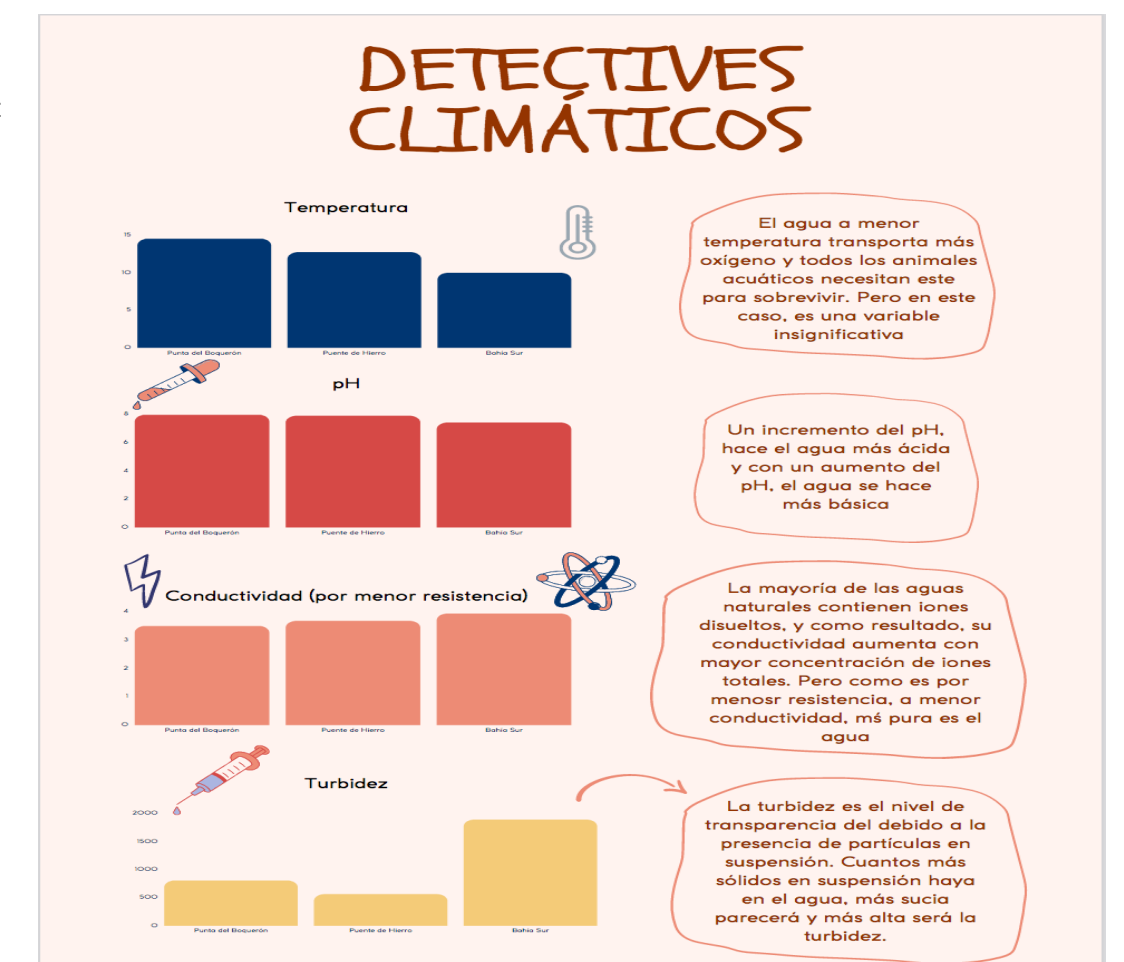


Figure 2: Three location samples water quality results

## ACTIONS TO HELP LESSEN TO THE PROBLEM

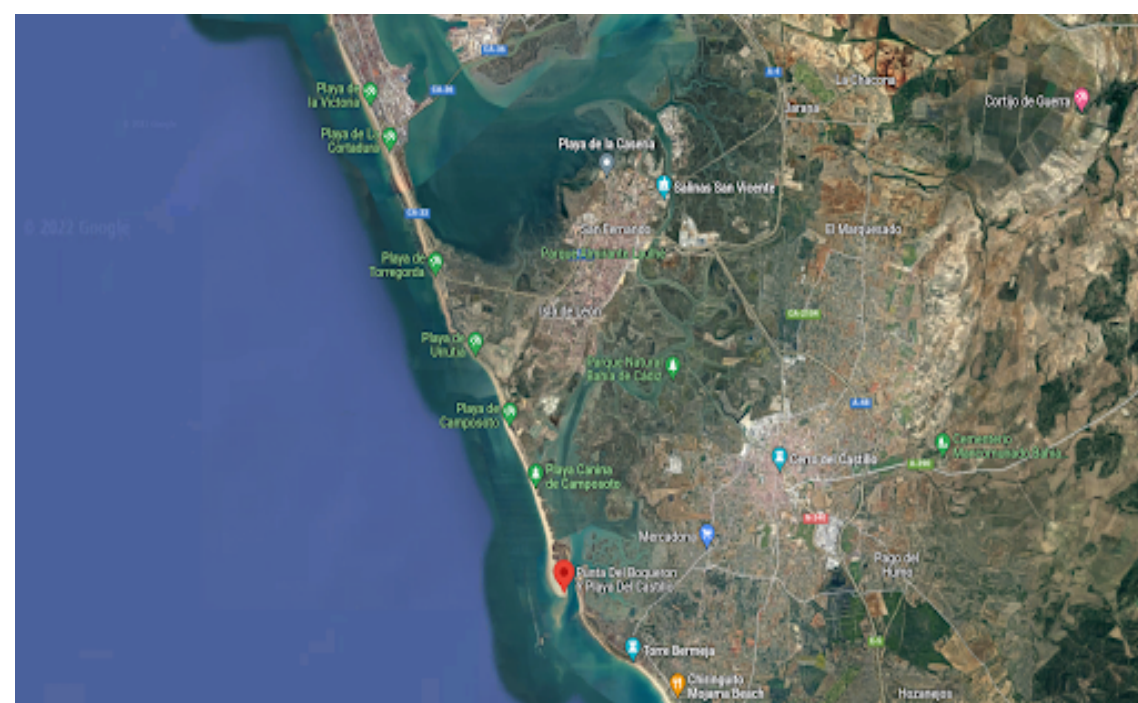


Figure 1: San Fernando, location of research

**DETECTIVES CLIMÁTICOS**

El agua no sólo es parte esencial del ser humano, sin la cual no podría sobrevivir, sino que es fuente de vida y desarrollo del resto de los seres vivos, contribuyendo así al bienestar general en todas las actividades esenciales de vida. Más del 70% de la Tierra es agua, pero solo tenemos disponible un 1%. Como podemos observar, es muy poca el agua que tenemos a nuestro servicio, así que es importante mantenerla limpia. Está en nuestras manos evitar gran parte de esta contaminación y contribuir al cuidado del medio ambiente y entorno que nos rodea, con el fin de preservarlo lo mejor posible y que futuras generaciones puedan disfrutar del planeta en óptimas condiciones.

Algunas alternativas para que no se produzca la contaminación del agua son:

- **Evitar productos de limpieza tóxicos.** En caso de hacerlo, almacenarlos y desecharlos correctamente.
- **Nunca echar los sobrantes de aceite por el fregadero,** sino desecharlos en los contenedores especiales.
- **Clasificar los residuos adecuadamente.**
- **Abstenerse de arrojar basura en playas, ríos...**
- **Tratar de utilizar pesticidas y fertilizantes naturales**

Figure 3: Consequences of contamination and measures

The local authorities should be informed of the results obtained.

It would be interesting to include filters in some relevant points in order to take data about the variables stated before on a regular basis. That information could be used to control the variables into acceptable levels.

Last but not least, an awareness campaign could be carried out in areas near the water points, to avoid spills, informing nearby businesses to use detergents and chemical products that are not aggressive to the environment.