



# CLIMATE DETECTIVES 2021 – 2022



L'Albufera fighters  
Instituto de Educación Secundaria de Massanassa

## RESEARCH QUESTION

**Why the Albufera is getting smaller, saltier and dirtiest due to climatic change effects as droughts, and big storms? Is human activities affecting too? Can it dissappear?**

## SUMMARY OF PROJECT

We have investigated the problems of the Valencian lagoon, called l'Albufera. It is a shallow coastal lagoon located on the Mediterranean coast, south of the city of Valencia, near our town. It occupies an area of 23.94 km<sup>2</sup> and is surrounded by 223 km<sup>2</sup> of rice fields. It is a natural park.

The water in l'Albufera is sweet, since it comes from the rice fields that surround it, which in turn are fed by the Júcar and Turia rivers

Every time the lagoon has less water, suffer large storms and torrential rains, pollution and droughts

We have searched and compared satellite images of the Albufera nowadays and a few years before.

We have studied the contact areas of the Albufera with the sea , to see if that can affect the lagoon in salinity level.

We have studied the droughts, analysing data from weather organizations as AVAMET and data from our school weather station.

In addition to that, we have visited the lagoon to take ground measurements about, salinity and pollution. At that visit we have gone to study the Albufera environment, to the interpretation center Racó de l'Olla, where we have been able to see the problems in vegetation and animals within the Albufera.

All the research have gave us clues to understand how the climate change its affecting this

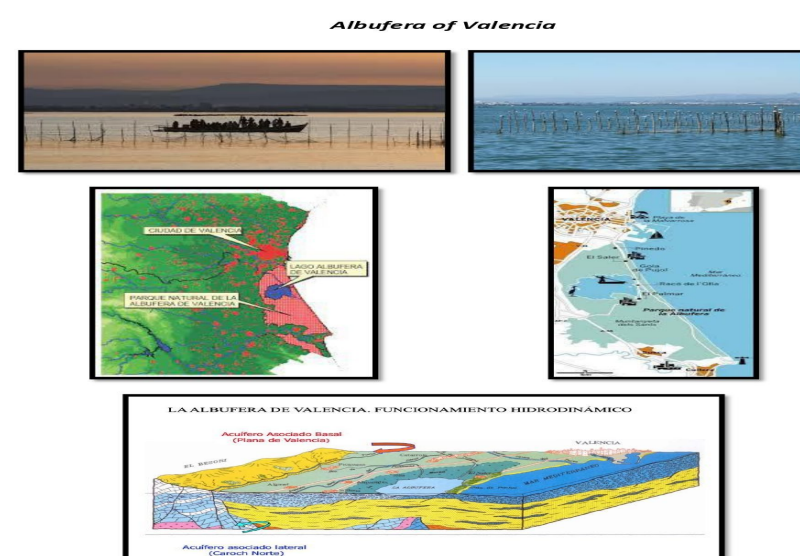


Figure 1: Images from Albufera National Park and its features

## MAIN RESULTS

Along our research we worked in groups to cover different areas. We discover that the towns with boundaries with the natural park of Albufera, produce contamination, from above all, nitrogen and phosphorus, from poor wastewater treatment, industrial discharges and chemical fertilizers used in rice fields, which occupy 14,500 of the 21,000 hectares of the natural park. It carries the risk of eutrophication to the lake.

As field research, we went to visit the Albufera park and lagoon a boat. First we saw how the technicians , from the local administration, made measurements of the transparency, depth, levels of oxygen, conductivity and contaminants with different instruments. We tooked samples of the water from the lake to analized them in the school. Finally we visit the nature center “Racó de l'Olla”, where we were able to see the plants and the animals from the albufera and discover that the birds have been affected by the climatic change by changing their habbits of migration.

Their biologist talked us about the salinity in the Albufera. They explained that sea water and Albufera water are always in contact, through the aquifers. To maintain the sweet character of the Albufera, it is important to keep the “perellona” water (maximum level of winter flooding of rice fields and the lagoon) for a long time, since it exerts pressure on the water in the aquifers.

We tooked images from EO Browser to see the size of the lagoon, and the rice fields, and to analized the effects of the “perellona” in different dates. Albufera’s size is about 21 square kilometers, but the flodding area changes after the perellona.

With the NDWI filter we saw values of 0.2 because the rice plants are still cover by water in february, and In July it looks greener (0.6) because the rice plants vegetation has grown.

We used EO Browser too, to study the coastal erosion through the years, and rihgt before and after big storms, and we didn’t detect any big change in the coast line.

Finally, we analysed the data from Avamet and Aemet (Valencian and Spanish metheorological agencies), it proved the climate change is already going on. The graphics showed us that phenomenon as Droughts, DANA (isolated depression at high levels), and extreme temperatures episodes (which characterize our Mediterranean climatology) in the last 20 years, they have increased and are becoming more extreme.

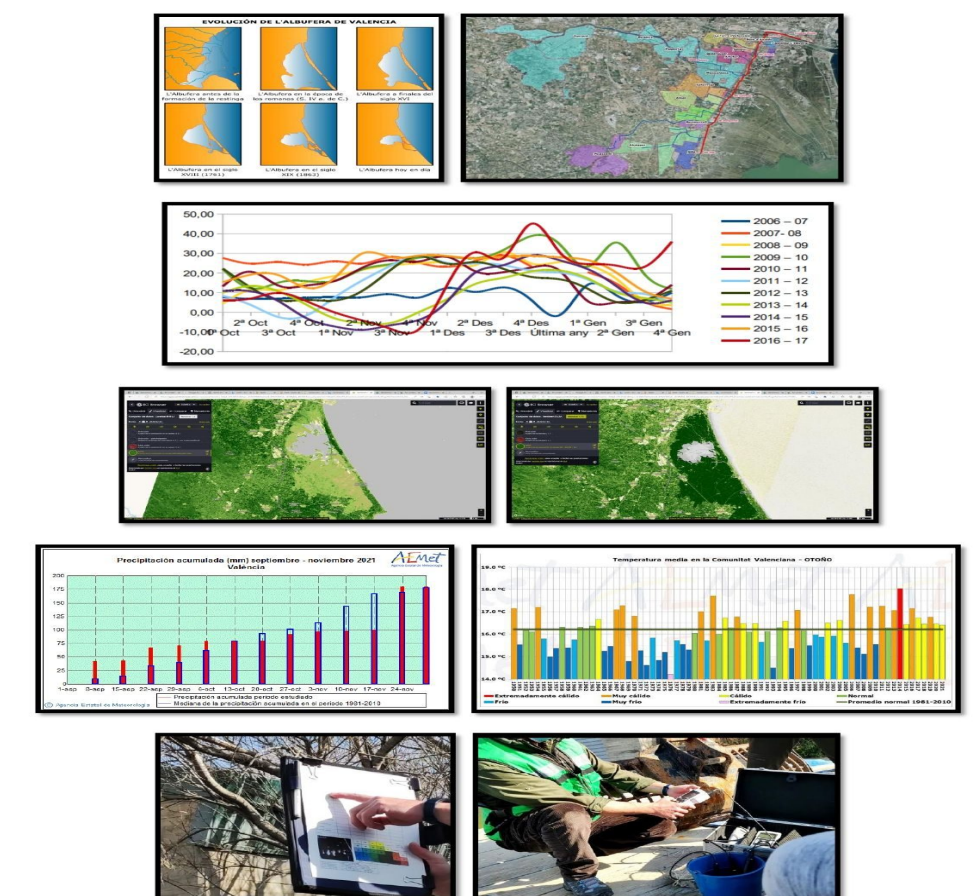


Figure 2: Formation and boundaries of Albufera. Graphs and EO Browser images of the project

## ACTIONS TO HELP LESSEN TO THE PROBLEM

Actions to make a difference and help lessen the problem

As we said before, the main problems of the Albufera are contamination, salinity and climatic change.

On the one hand, the consequences of the climatic change for the Albufera are something we can’t avoid. The only action that can be done, for that and the salinity problem, is the correct management of the “Perellonà” process and the floodgates of the Albufera. If they failed, the Albufera would be saltier and the fauna and flora would adapt creating another type of natural area, while farmers would not be able to cultivate rice.

On the other hand, the quality of the water in the Albufera has improved by installing new treatment plants since the end of the 1960s and 80s, which was the worst period, although it still has room for improvement.

The two administrations in charge of the Natural Park are the Technical Management Office of the Albufera Natural Park (belonging to the regional government of the Generalitat Valenciana) and the Devesa-Albufera Service (of the Valencia City Council).

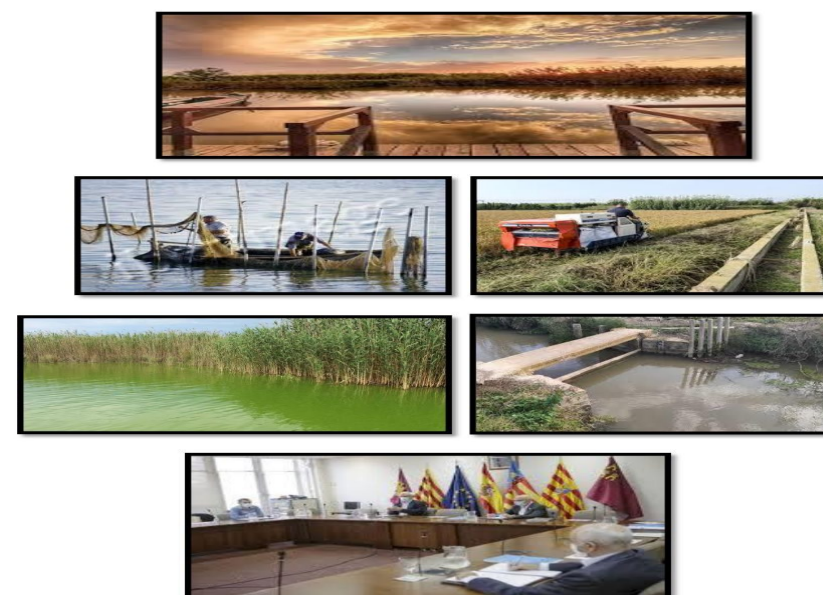


Figure 3: An exhibition of the Albufera’s problems