9th September 2019

Visit to the Toruños Natural Reserve:

Is it sustainable to have an industry near a natural park?

Aims:

- Visit to the "Toruños Natural Reserve".
- Reflection on the consequences of the existence of a Polygon with Industries near a Natural Park.
- Knowledge of the autocton natural fauna and flora.
- Quality analysis of water, sand and air.

You are in the Natural Park of "Los Toruños" which has an area of 10 km^2 (about 1400 football pitches). It is located in Cádiz Bay, near the cities of Cádiz (116.979 inhabitants), Puerto Real (41.650 inhabitants) and El Puerto de Santa María (88.364 inhabitants). It is 1,5 km from the shipyard which you can see just looking west. However, is it sustainable to have an industry near a natural park? This is what you are going to find out today and next Thursday.

1. What you have to do today is fill in the table that you have in this document. In it, you will have to make measurements regarding several environmental indicators. Keep this sheet of paper for Thursday.
2. Next Thursday you will see if it is sustainable or not to have this industry analyzing the data collected today.

Materials:	• Smartphones with internet. • pH-meter or indicator paper strips. • Thermometer. • AquaVial Test Kit E. Coli and Coliforms.

Literature: http://www.bsc.es/caliope/es?language=es; https://theberkey.com

Co-funded by the Erasmus+ Programme of the European Union

9th September 2019

Environmental Diagnosis			
Environmental factors			Measured value
Water quality	1	Odour. From 0-10 (0 no odour, 10 strong smell of chemicals).	
	2	pH	
	3	Water temperature (°C)	
	4	*Escherichia coli* and coliforms (1 UFC/ ml) **DIRECTIONS FOR USE:** **SNAP OPEN VIAL:** Hold AquaVial™ E. coli vial into your hand **firmly** in a vertical position with the tip of the cap just above your index finger. Apply side pressure with your thumb to snap the cap open. **FILL AQUAVIAL™:** Fill AquaVial™ E. coli vial with sample water using the plastic syringe provided. Sample water should not exceed the fill line; or stop filling water in the vial after this line. Close AquaVial™ E. coli vial using one of the two plug caps provided. **DO NOT LEAVE THE VIAL OPEN.** **SHAKE:** Shake the vial well to dissolve the dry media deposited on the side wall of the vial. **Tip:** Take a picture of the vial against a white background. **INCUBATE:** Let the AquaVial™ E. coli vial incubate in an upright position for 24 hours at 35 - 40°C (95 - 104°F) or 48 hours at 20-25°C (68 – 77°F) and check for changes in colour. Compare the color of the reagent in the test vial against the colour diagram below:  	
	5	Tar, glass, plastic, rubber or wood waste. Floating materials, surfactants, organic remains or any other residue. From 0 to 10 (0 nothing-10 all of them or some in noteworthy quantity)	
Sand quality	6	Tar, glass, plastic, rubber or wood waste. Floating materials, surfactants, organic remains or any other residue. From 0 to 10 (0 nothing-10 all of them or some in noteworthy quantity)	
Air quality Caliope System: http://www.bsc.es/caliope/en/forecasts?default_model=0&default_domain=1&language=en&lr=lang_es Click in Andalusia and take the highest	7	Industrial noise pollution. From 0 to 10. (0 no noise pollution)	
	8	Ozone (µg/m^3)	
	9	Nitrogen Dioxide (µg/m^3)	
	10	Carbon Monoxide (mg/m^3)	

Co-funded by the Erasmus+ Programme of the European Union

measure on the day (all pollutants except noise pollution)	11	Sulphur Dioxide (µg/m^3)	
	12	Particulate Matter PM10 (µg/m^3)	
	13	Particulate Matter PM25 (µg/m^3)	
Flora	14	Look for different kind of flora species in the area (Here you have some examples in case you want to use google to identify them): ● *Zostera noltii* ● *Elymus farctus* ● *Ammophila arenaria* ● *Salsola kali* ● *Eryngium maritimum* ● *Lotus creticus* ● *Spartina maritima* ● *Sarcocornia fruticosa* ● *Limoniastrum monopetalum* ● *Inula crithmoides*	Number of species found/km^2:
Fauna	15	Look for different kind of flora species in the area (Here you have some examples in case you want to use google to identify them): ● *Bufo bufo* ● *Triturus marmoratus* ● *Acanthodactylus erythrurus* ● *Malpolon monspessulanus* ● *Chamaeleo chamaeleon* ● *Bubulcus ibis* ● *Egretta garzetta* ● *Himantopus himantopus* ● *Larus fuscus* ● *Recurcirostra avosetta*	Number of species found/km^2:
Landscape value	16	Va: Subjective direct assessment from contemplation of the landscape, you have to bear in mind: vegetation, colours, water, buildings, factories...). ● Spectacular: 16-25 ● Superb: 8-16 ● Distinguished: 4-8 ● Nice: 2-4 ● Vulgar: 1-2 ● Ugly: 0-1	Va:

Co-funded by the Erasmus+ Programme of the European Union