

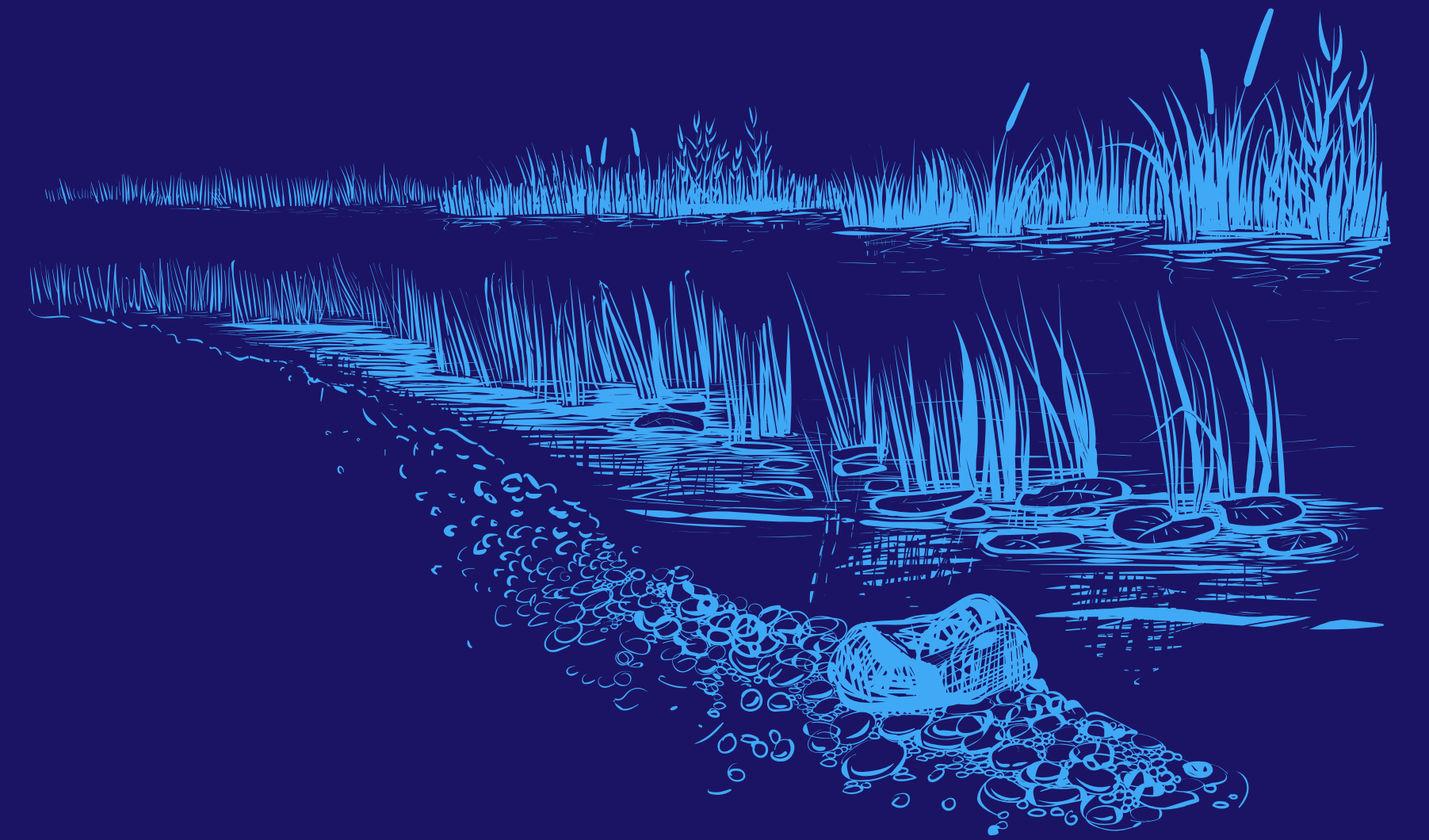


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# SANTANDER CASE STUDY

## NBS: IMPLEMENTING A CONSTRUCTED WETLAND & PERMEABLE CAR PARK



### CHALLENGE

In Las Llamas, hybrid NBS systems and traditional structures coexist.

The major challenge is the integration of new IoT sensors that will enable valuable data gathering and understanding of emerging contaminants (CECs).

### SCIENTIFIC LEAD

University of  
Cantabria & AQUALIA

### LOCATION

Santander, Spain

Santander, in Cantabria, Spain, features a warm, temperate climate with comfortable, dry summers and long, cold, wet, and windy winters, averaging 13.8°C. It receives significant rainfall, around 1198 mm annually, even in the driest months.

Covering 36 km<sup>2</sup>, Santander comprises four watersheds linked to the city's main sewage systems: Sanitation of Santander Bay, Sanitation of Las Llamas, Main collector Cueto – Monte, and General collector San Martín neighborhood – 1º de Mayo – Ría de Raos.

### WHAT MAKES PARQUE LIAMAS SPECIAL?

- It is the main green area of the city.
- It is characterised by rich biodiversity, fauna and flora.
- Historically, it was a marshy lake area used for agricultural activities which has been transformed into an urban park.
- It is already a hybrid system with a section of 7.3 km<sup>2</sup> that includes two Nature-Based-Solutions (a wetland and a permeable car park) and two conventional systems (a pumping station and a treatment plant).



Funded by  
the European Union

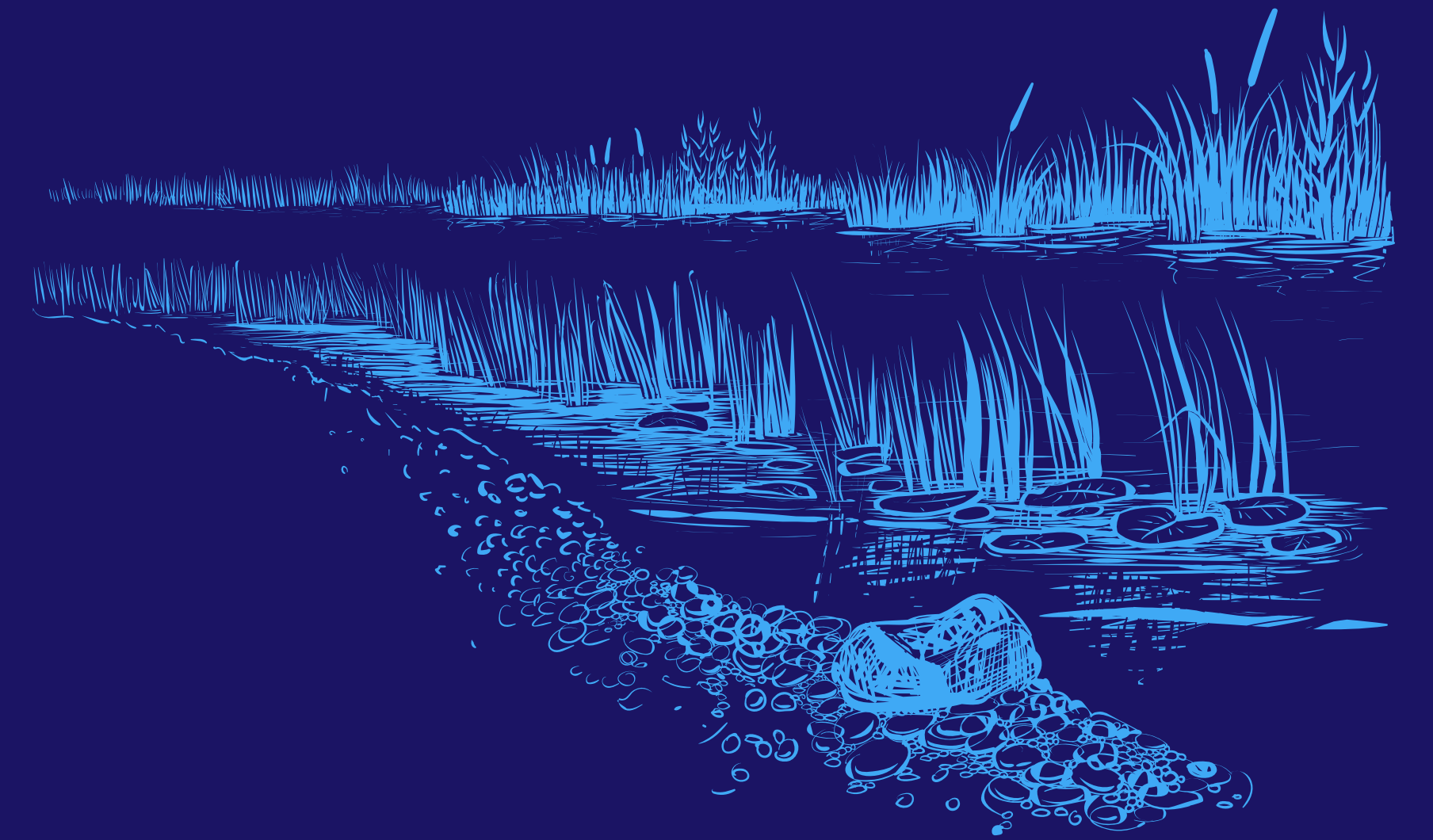


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## NBS: IMPLEMENTING A CONSTRUCTED WETLAND & PERMEABLE CAR PARK



### LOCAL STAKEHOLDERS

Seo / Birdlife, Ciudad de Santander, IH Cantabria, Mare

### NBS SOLUTION

Constructed wetland & permeable carpark

### WATER MANAGEMENT SYSTEM

Combined drainage system

### MAIN ACTIVITIES

- Impact assessment of Nature Based Solutions (NBS) in the traditional urban drainage system and pollutants treatment
- Water sampling in the inlet and outlet of the wetland to control water quality and ecosystem well-being, and at the car park to identify the presence of Contaminants of emerging concern (CECs)
- Study of two traditional sites connected to the sewer system: pumping station and treatment plant
- Characterisation of the whole urban drainage system and modelling of positive consequences from the connection of new NBS
- Development of IoT sensors and AI platform for decision making process in real time
- Validation of the project's results and their potential replicability

