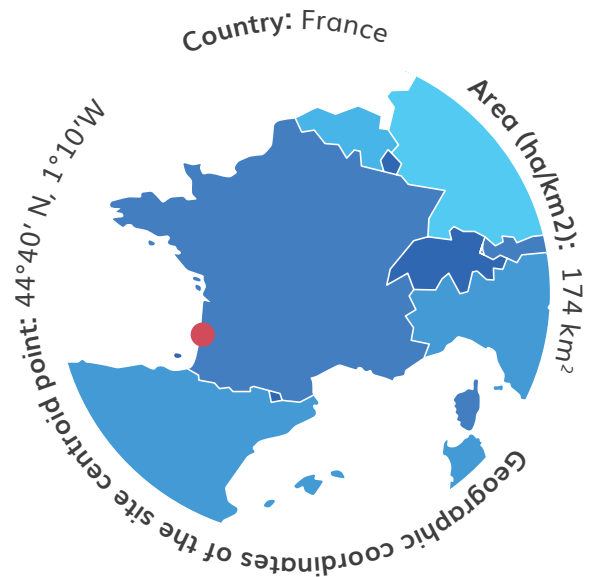




REST-COAST

Arcachon Bay Pilot Fact Sheet

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Ecosystem type

Semi-closed lagoon ecosystem open on Atlantic Ocean and dominated with *Zostera noltei* and *Zostera marina* seagrass meadows

Key habitats

- Marine habitat – 70 km²: *Zostera noltei* meadows, *Zostera marina* meadows, mudflat and sand
- Interface habitats – 7 km²: Numerous slikke and schorre species
- Numerous terrestrial species

Key species

More than five hundred species of bird using the Arcachon Basin for migration, wintering or reproduction,

Important diversity of fauna and flora species

For exhaustive information concerning Arcachon basin species : <https://we.tl/t-pkMCs8VyCm>

Organisation responsible for the pilot

Seaboost

Pressures, threats and issues

Arcachon Basin is one of the larger *Zostera* seagrass meadow in Europa. These seagrass meadows have been regressing for the last decades due to diversives pressures form anthropogenic and environmental causes.

The increasing urbanization, agriculture and the development of the tourism and leisure use of local areas have impaired seagrass, with mechanical degradation (anchoring for instance). There is also an impact of local oyster farming, which is a key activity for local economics, although having impacts on local hydrodynamics and sediment behavior.

With the increase of water temperature related to global change and the increase of water turbidity related to seagrass fragmentation and loss, *Zostera noltei* (fig 1) and *Zostera marina* (fig 2) are progressively disappearing from Arcachon Basin due to positive feedback processes (fig 3).

Expected impact of the project

The project is exploring a new restoration approach focusing on hydrodynamics. It aims at reducing hydrodynamics, and then increasing sediment deposition, reducing bottom shear stress and reducing water turbidity. These will contribute to facilitate seagrass anchoring, hori-



This project receives funding from the European Union's Horizon 2020 Innovation Action under grant agreement No 101037097.

SEABOOST

zontal and vertical growth from near to near, and help large-scale stabilization, then restoration of local seagrass meadows.

At larger scale, it will provide an "ecological restoration" tool for local governance, so that they

can project ecological restoration operation with co-benefits (carbon offset, biodiversity offset, protection against erosion, ...) in Arcachon Basin, replicate and scale that approach up to meet both ecological and economics expectation at regional scale.

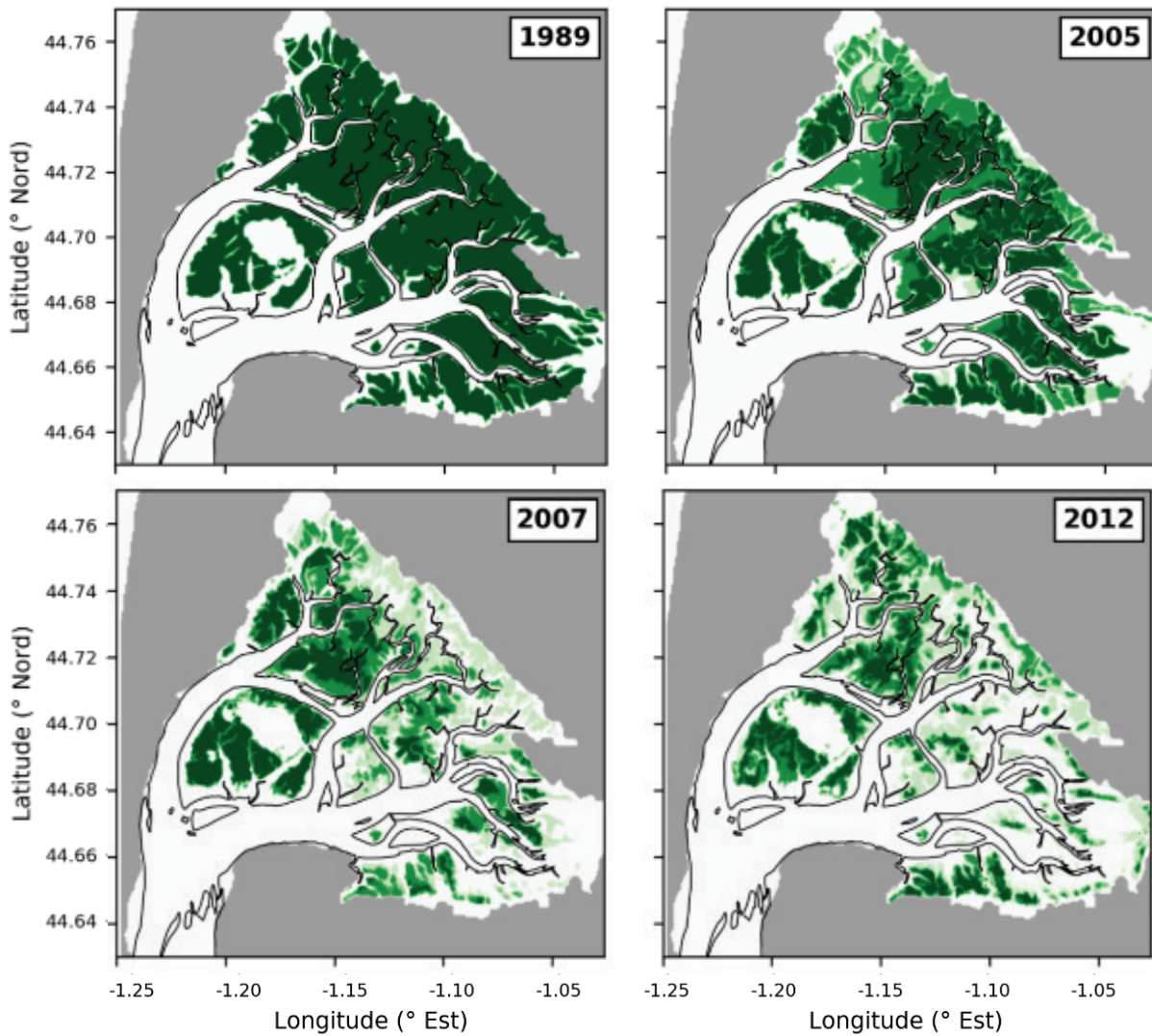


Figure 1: Spatial evolution of *Zostera noltei* bed

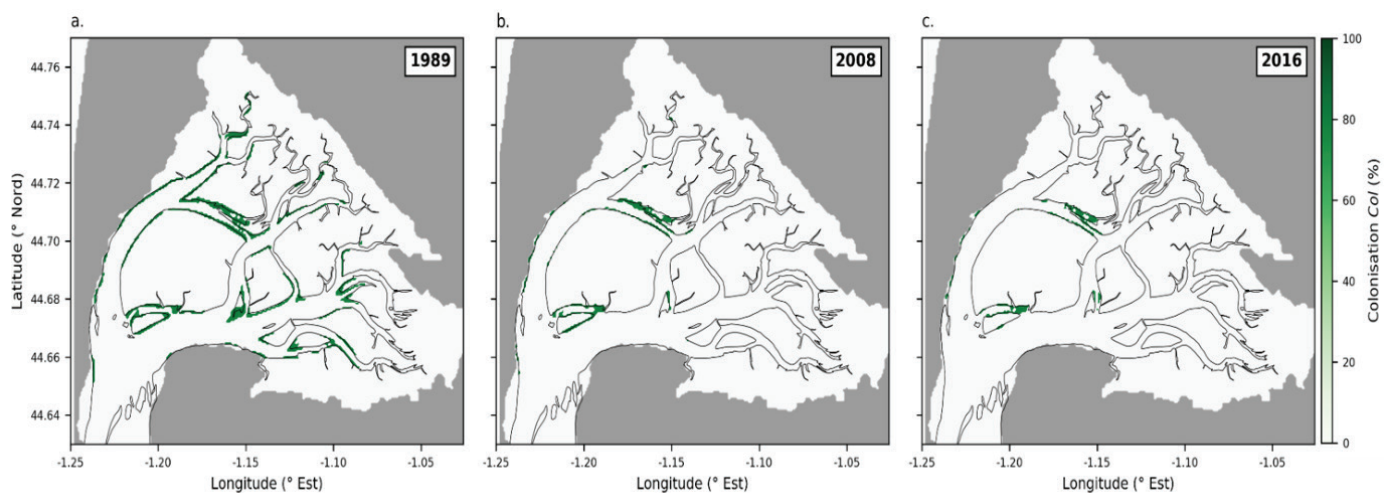


Figure 2: Spatial evolution of *Zostera marina* bed

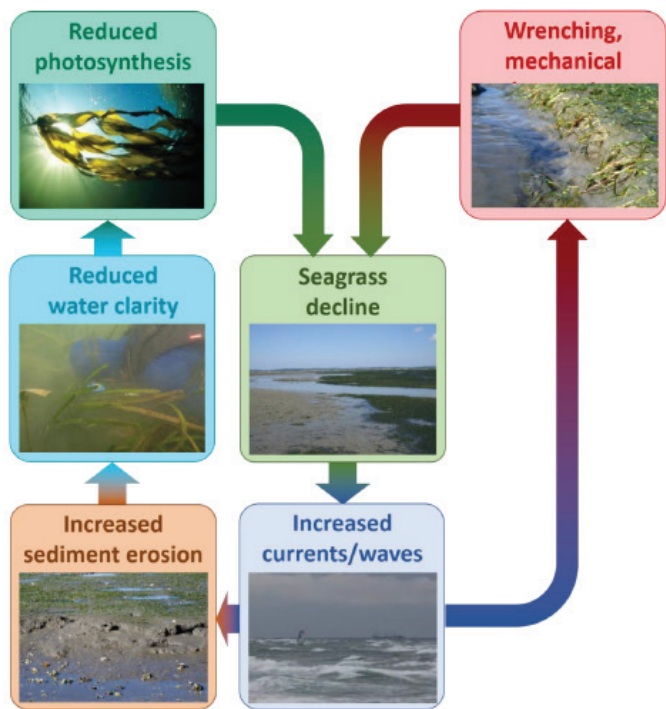


Figure 3: Sketch of assumed feedback processes

This project mainly targets key habitat restoration to support local functionalities (habitat, nursery, substrate, food, ...) that are essential for the whole local ecosystem health and development. It will also deal with coastal protection through erosion protection, as seagrass meadows play a key role for wave and flow attenuation and protection of coastal infrastructures or beaches for instance. Then, it is also a matter of water quality, as seagrasses also help keeping a clear water.

Stakeholders

Project relies on multiple local stakeholders.

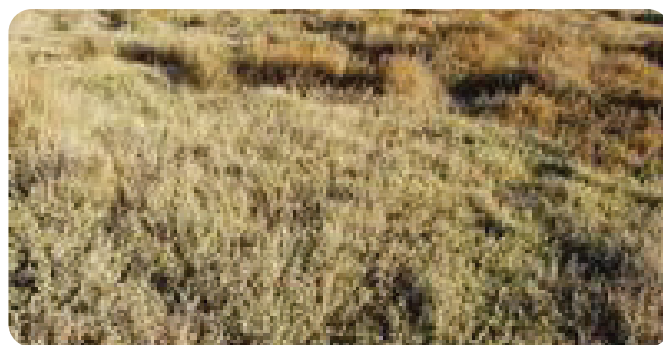
First of all, it involves local area manager, which are the MPA manager (Parc Marin du Bassin d’Arcachon), which is a branch of the French Office of Biodiversity, but also local governance units through the SIBA (Syndicat Intercommunal du Bassin d’Arcachon).

Then, the project involves local representative stakeholders as the CRC (Regionnal Comitee for oyster farming) that supports one of the key socio-economic local activity. There are finally scientific stakeholders, as for instance Ifremer, which has been leading studies on Arcachon Basin and local seagrass for decades, and Gladys Institute that brings a specific hydrodynamics knowledge.

These stakeholders are involved in the project design, and the settlement pattern of our approach



Spartina



Obiones



Salicornne



Seahorse



Goose



Photo of the pilot

so that it fits as close as possible to multiple local strategies and needs, and in the monitoring of the action to ensure that the results are shared and well understood.

Key variables of relevance to REST-COAST

The project fits in REST COAST scope as it deals with most of the biodiversity and ecosystem services expectation.

First of all, it focuses on seagrass large scale restoration. The pilot experiment will target 1ha of seagrass restoration, trying to help spontaneous resettlement of seagrass on site through hydrodynamics stress reduction. This will be monitored through several metrics, as cover rate, fragmentation, recovery speed, ... *Zostera* seagrass meadows are key to support local ecological functionalities, and thus the base line for the whole ecological restoration of local ecosystem.

Then, several ecosystem services will be provided then assessed. We can for instance underline the



Typical ecosystem



Typical ecosystem

capture and sequestration of carbon, which will be monitored all along the project, so that we can get an assessment of the local contribution of *Zostera* seagrasses and associated species (especially local microbiome) to greenhouse gas reduction. We will also estimate the benefits from seagrass restoration in terms of coastal protection against erosion, as seagrass helps reducing local flows and waves. This will be performed through both numerical models and in situ monitoring of the effects of our approach on hydrodynamics. The effects on food production will equally be one of the expected benefits, through the biomass that can be created with this habitat, but also with its contribution to water quality, which may improve oyster farming capabilities.

Finally, numerical model will help us to project our approach at larger scale, supporting local governance and strategy through upscaling. It clearly aims to propose a new tool for local area management, with possible biodiversity and carbon offset, and to promote large scale ecological restoration through seagrass restoration as a keystone of the global strategy and management plans of the Basin for the next coming years.



Oyster farming