

### Project leader



### Contact

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### Partners



ADEME



Agence de l'Environnement  
et de la Maîtrise de l'Énergie

Programmes d'Investissements  
d'avenir



### Location

Languedoc Roussillon:

- Port-La-Nouvelle
- Port Leucate
- St-Cyprien
- Le Barcarès
- Cerbère

Provence Alpes Côte d'Azur:

- Sanary sur Mer

### Duration

15 months (2016-2017)

### Website

[www.ecocean.fr/en](http://www.ecocean.fr/en)

[www.napex.fr/en](http://www.napex.fr/en)

### Context

The field of Coastal Ecology Engineering is rapidly developing and Ecocean and its partners have been involved for many years in setting up R&D projects for the preservation of marine biodiversity and the restoration of coastal habitats, especially focusing on solutions targeting juvenile fish protection. In 2013-2014 Ecocean developed solutions to recreate habitats and facilitate the installation of biodiversity along docks and pontoons in marinas and commercial ports (NAPPEX and GIREL projects). The purpose of the NUAMCE project (2016-2017) was to continue these investigations and meet new needs by developing solutions for other types of marine infrastructure (e.g. breakwaters, pipes, mooring lines etc.). This project involving Ecocean, CDC Biodiversité and the CREM was one of the 13 winners of the first call for project from the program "Investment for the Future" in the category "SME-Biodiversity Initiative" launched by the ADEME in 2015.

### Interests and objectives

The project objective was to finalize three new types of solutions to improve the ecological function and biodiversity of marine infrastructures:

- **The breakwater Biohut®** required a specific work of design optimization and evaluation of the environmental gain. It is composed of wooden sticks of variable length, nested at variable height on a perforated metal plate of modular form, with coconut fiber strands stretched between the wooden sticks. It is fixed by a shallow drilling of the stone surface. 270 breakwater Biohut® were installed as part of NUAMCE.

- **The mooring Biohut®** required an assessment of its environmental gain and technical improvement (fastening system). It consists of a wooden artificial habitat in the form of a "hoop net". Its height and width are adjustable and it is fixed along mooring lines already in place. 20 mooring Biohut® were installed as part of NUANCE.

- **The pipe Biohut®** required technical validation (production, transportation, installation, maintenance over time...). It is composed of a flexible metal plate (arc of a circle) on which are fixed sticks of wood of varying heights and secured to the emissaries without drilling.

### Scientific monitoring

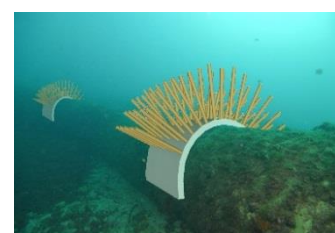
Breakwater and mooring modules have been scientifically monitored in situ during the project year by the laboratory of Perpignan. This study aimed at evaluating the ecological gain from these structures.

### Expected outcomes

NUANCE allowed to consolidate and develop the innovation opened by the first technological break validated during the work of 2014 (nursery in the port area). These new Biohut® will also diversify the activity of Ecocean and aimed at new customers through an extension of the range of targeted coastal infrastructures.

The project has now entered a second year of monitoring funded by the AERMC. The first results have already allowed the commercialization of breakwater Biohut.

Finally, collaboration with the CDC Biodiversity will ultimately contribute to the creation and testing of innovative financial tools to reconcile economic development and preservation of biodiversity.



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