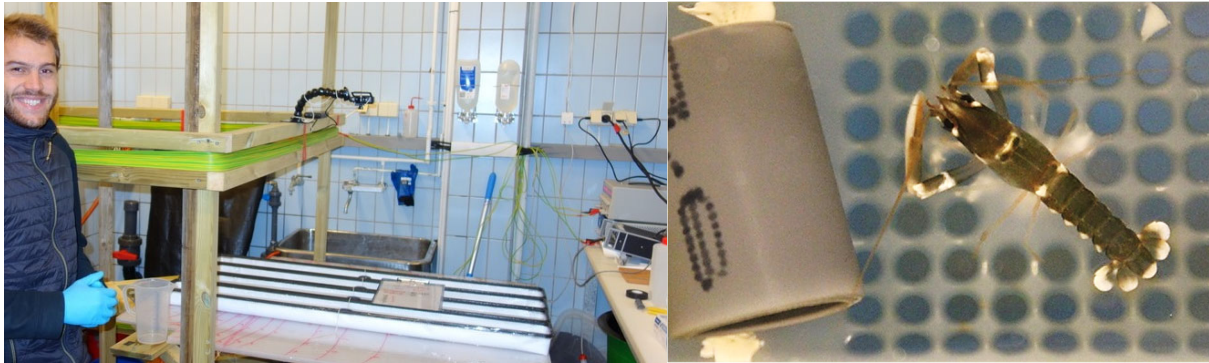


Is lobster sensitive to the electromagnetic field of underwater power cables?

Among the potential impacts of offshore renewable energies, one question frequently arises: what can be the effect of the electromagnetic field, produced by the export cable, on organisms living on the seabed? To clarify this question, an extremely innovative experiment, with a device designed by MAPPEM Geophysics, has just been carried out by France Energies Marines and Ifremer, in collaboration with the Institute of Marine Research of Norway. It is one of the world's first in this field.



Left: Bastien Taormina, PhD student at France Energies Marines and Ifremer, in front of the experimentation set-up (© Institute of Marine Research) - Right: Juvenile lobster near his shelter (© Institute of Marine Research))

When acceptability rhymes with applied science

In a context where the first commercial offshore wind farms will soon be launched in France, impact studies are more than ever at the heart of concerns. As legal obligations, they are also at the heart of the acceptability of these new energy production methods. Among the potential environmental impacts is the question of the effect of the electromagnetic field, produced by the export cable, on organisms living on the seabed. To answer this question, an innovative experiment has just been carried out by Breton scientists, in collaboration with the Institute of Marine Research in Norway. At the helm in the laboratory, Bastien Taormina, PhD student at France Energies Marines and Ifremer.

2 hypotheses: indifferent or sensitive?

The animal chosen for this study is the European lobster, a benthic species with a high economic and ecological stake. Several scientific follow-ups have shown that it frequents the corridors of the electrical connections of several marine renewable energy projects. The experiment was conducted on juveniles at growth stage 5, i. e. 3 weeks old and about 1 cm in size. The response of these young lobsters, which are at a sensitive stage in their life cycle, had never been studied before. The electromagnetic field generated by the export cables was reproduced using two 600 m coils of electrical wires allowing the passage of alternating or direct current. The field value used, 200 μ T, was chosen to best match the actual conditions. It is equivalent to 4 times that of the Earth's natural magnetic field.

In the first phase of experimentation, the aim was to determine whether juveniles are attracted or repelled by the electromagnetic field, or whether they remain indifferent. In the second phase, the objective was to study the effects of 7-day exposure to an electromagnetic field on mortality and on the animal's natural behaviour, including its ability to find shelter. The analysis of the video recordings is in progress. The results of this study, which will be published at the end of the year, will provide the first objective knowledge in terms of the impacts of electromagnetic fields from underwater power cables on juvenile lobster.

A scientifically and technically rich context

This experiment was conducted in the facilities of the Institute of Marine Research, in close collaboration with several researchers from this Norwegian research entity. It is part of the SPECIES collaborative R&D project. This project aims to improve knowledge of the potential interactions between the electrical connection cables of marine renewable energy projects and benthic organisms. Coordinated by France Energies Marines and scientifically managed by Ifremer, the project brings together a consortium of 9 academic and private partners with complementary skills and contributions.

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Main information about SPECIES project

Subject: Submarine Power Cables Interactions with Environment & associated Surveys

Duration: 3 years (2017-2020)

Financial support: this project receives financial support from the French State, managed by the National Research Agency (ANR) as part of the Investments for the Future Programme (ANR-10-IEED-0006-17) and from France Energies Marines. The PhD carried out within the framework of this project is 50% funded by the Brittany Region.

Coordinator: France Energies Marines

Scientific management: Ifremer

Partners of consortium:



France Energies Marines in short

Identity: Institute for Energy Transition dedicated to offshore renewable energies supported by Investments for the Future Programme

4 scientific and technical programmes:

- Tools and methods for site characterization
- Technology conception tools for offshore renewable energies applications
- Environmental and socio-economic impacts
- Array architecture and network integration

Labelling: 26 projects approved by the competitiveness clusters Mer Bretagne Atlantique and Mer Méditerranée

Staff: 35 employees (27 FTEs)

Annual budget: €3 million

Creation: 15 March 2012

Headquarters: Bâtiment Cap Océan - 525, avenue Alexis de Rochon - 29280 Plouzané - France

