



ICOE 2018

INTERNATIONAL CONFERENCE
ON OCEAN ENERGY

A NATURAL HIGHTECH : THE GREAT SCALLOP AS A SENSOR

Transmission cables from offshore wind farms in coastal areas are expected:

- to grow rapidly in the coming years
- increase potential environmental impacts.

Very little research has been conducted **on the role of increased turbidity, noise and electro-magnetic fields** linked to the installation of transmission cables on the seabed. Most studies have focused on faunistic compositions, species census and rates of recolonisation after seabed installations.

Our project called **OASICE** evaluates the disturbances linked to turbidity and noise produced during and after seabed installations with a natural sensor : *Pecten maximus*, the great scallop. This organism naturally present in shallow coastal marine areas is a potential indicator of ecosystem perturbations linked to installation of transmission cables.

Bivalve shells are constructed through daily accretion of small stripes of calcium carbonate (CaCO_3) mineral along the outer valve edges. The widths of these stripes, which are visible at the shell surface, are apparently sensitive to variations in the environment of the individual scallop. **We are studying if this record of growth and associated changes in elemental composition of the carbonate mineral in the stripes can be used to estimate an impact.** To achieve this, a revised methodology is under development. The primary goal is to provide fast, quantified, repeatable measurements of the growth record kept by individual shells suitable for comparison. This is a critical step to testing biological "archives" as a tool for impact assessment, since this level of statistical rigor has not been conducted by the scientific community up to now.

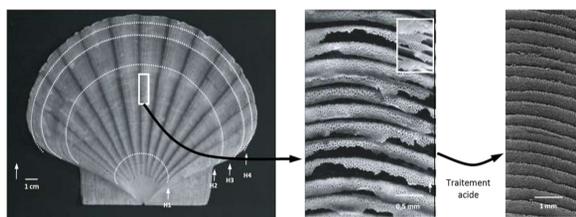
Bibliography

Chauvaud L, Patry Y, Jolivet A, Cam E, Le Goff C, et al., 2012. Variation in Size and Growth of the Great Scallop *Pecten maximus* along a Latitudinal Gradient. *PLoS ONE* 7(5): e37717.
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Thébault, J. and Chauvaud, L., 2013. *Li/Ca* enrichments in great scallop shells (*Pecten maximus*) and their relationship with phytoplankton blooms. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 373, pp.108-122

Planning

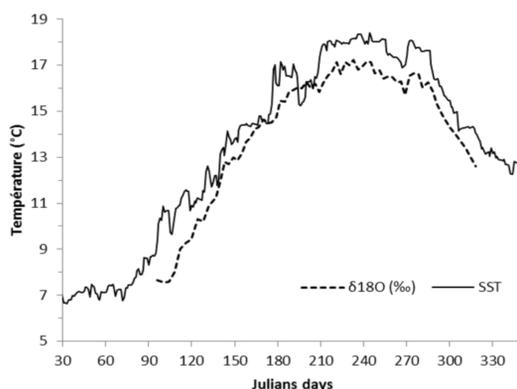


Evaluation of Scallop shell's annual and daily growth



Trace elements and isotopic markers

detection to study potential anomalies in the daily growth rate linked to environmental conditions changes (toxic diatom blooms and/or anaerobic conditions)



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Pecten maximus, the great scallop © Christophe Quintin_Flickr-Creative commons

Partners



On site :

- ✓ 2 study sites: Courseulles sur Mer (EMR connection) and IFA2 (interconnection with UK)
- ✓ 6 experimental stations (4 for monitoring and 2 for reference)
- ✓ 72 scallops studied in each site and each year

Main objectives

- ✓ Enhancing knowledge of environmental impacts of seabed transmission cables installation
- ✓ Developing innovative monitoring tools
- ✓ Meeting the regulatory requirements of impacts monitoring
- ✓ Participating to international research