

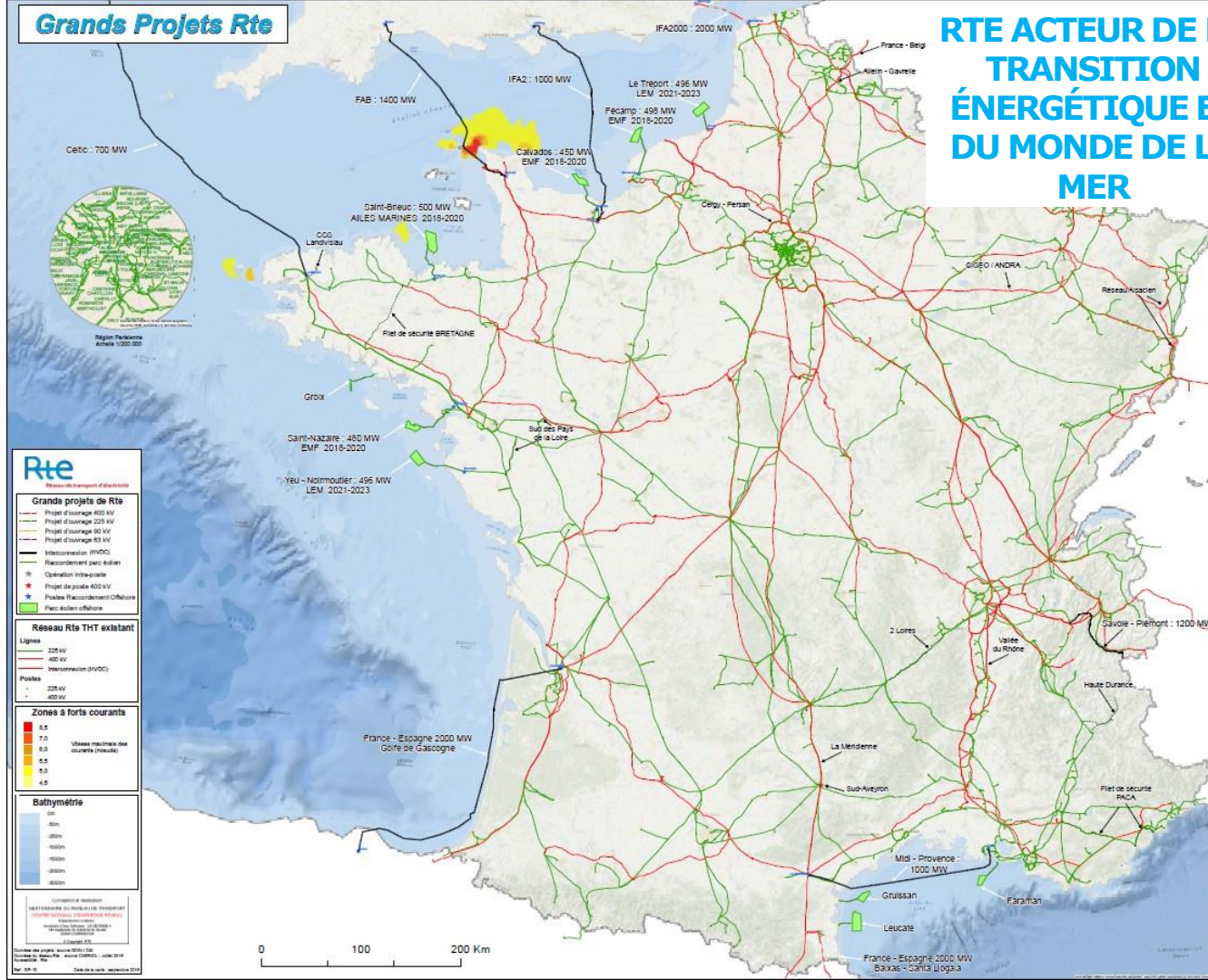


22 january 2019

Environmental impact assessment of submarines cables : IFA2 and other projects

Damien Saffroy

**RTE ACTEUR DE LA
TRANSITION
ÉNERGÉTIQUE ET
DU MONDE DE LA
MER**



[illegible]

Impacts des activités de RTE sur la biodiversité – S5896-06 juin 2018

France - Espagne 2000 MW
Baixas - Santa Llogaia

Grands Projets Rte

- Projet d'ouvrage 400 kV
- Projet d'ouvrage 225 kV
- Projet d'ouvrage 150 kV
- Projet d'ouvrage 93 kV
- Interconnexion (HVDC)
- Recours à l'énergie éolienne
- Opération intégrée
- Projet de pont 400 kV
- Projet de pont 225 kV
- Projet de pont 150 kV
- Projet de pont 93 kV
- Projet de pont 400 kV
- Projet de pont 225 kV
- Projet de pont 150 kV
- Projet de pont 93 kV

Réseau Rte THT existant

- Lignes
- 225 kV
- 400 kV
- Interconnexion (HVDC)
- Postes
- 225 kV
- 400 kV
- Interconnexion (HVDC)

Zones à forts courants

- 5.5
- 7.0
- 8.0
- 9.0
- 10.0
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- 331.0
-

Appels d'Offres (AO) gouvernementaux :

AO2 (2013-2014) : 1 000 MW sur 2 parcs au Tréport, et Noirmoutier

AO3&4 (annonce fin 2016) : projets à Dunkerque et Oléron (dialogue concurrentiel)







Summary

- 1.
BASELINE : KNOW AND UNDERSTAND**
- 2.
MITIGATIONS MESURES : AVOID, MINIMISE AND OFFSET**
- 3.
MONITORING : FOLLOW UP THE RELEVANCE AND EFFECTIVENESS OF MESURES**
- 4.
RESEARCH AND DEVELOPMENT : GO FURTHER**



01

Baseline





1.1

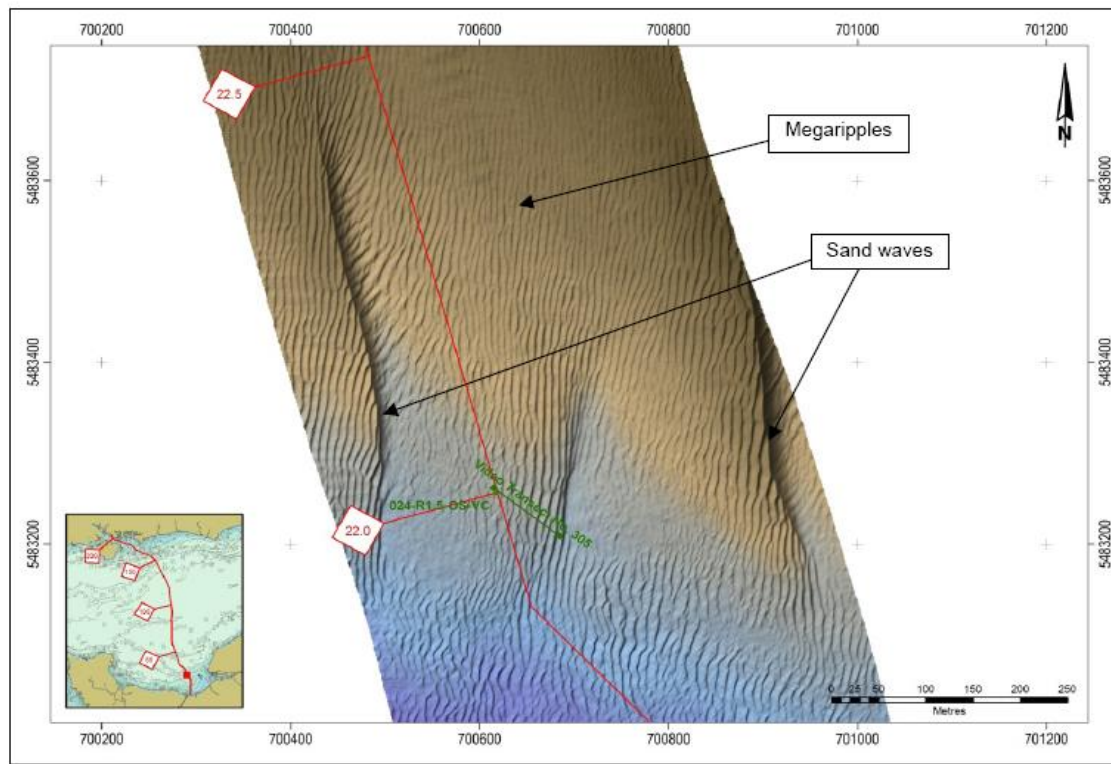
Physical Environment

Physical environment

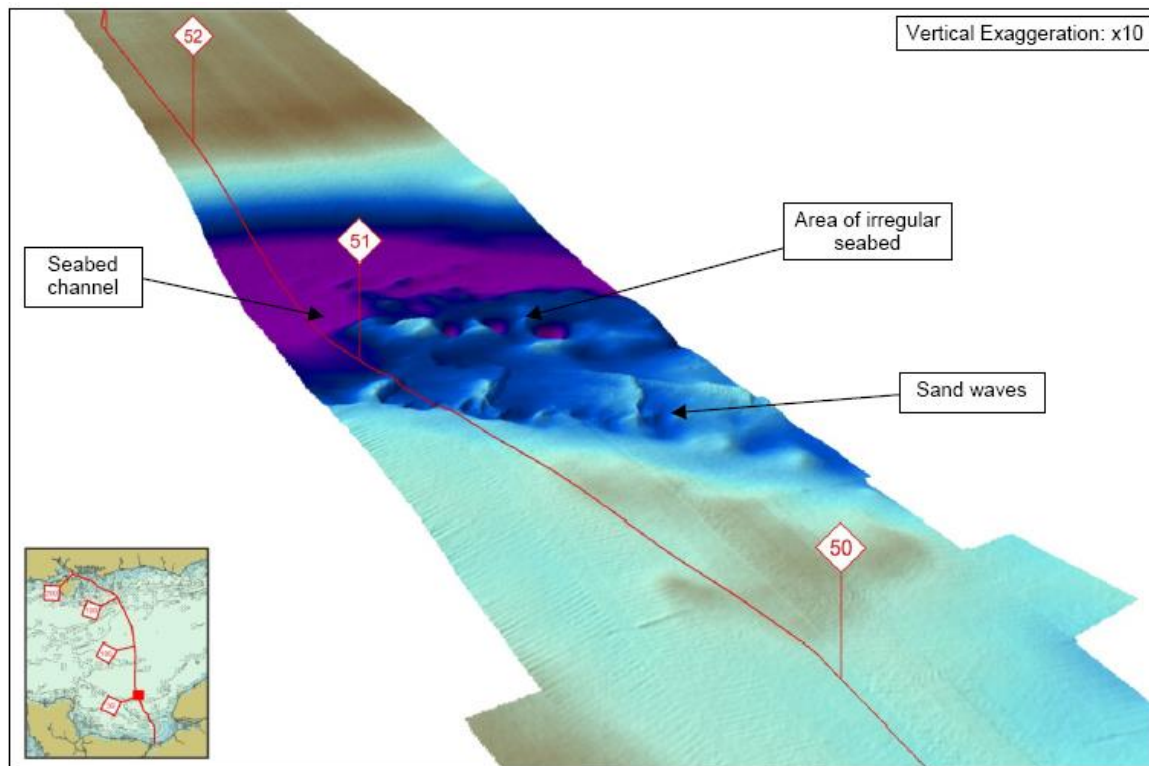
Overview

- Climatology and weather conditions (maregraphy, houlography and courantology)
- Geology and geomorphology
- Morpho-bathymetry
- Sedimentology (particle size and composition, thickness, transport and sedimentary balance, coastline stability)
- Water and sediment quality
- Acoustic Landscape
- Natural hazards

Sand waves IFA2 - KP22 (Fugro 2012)



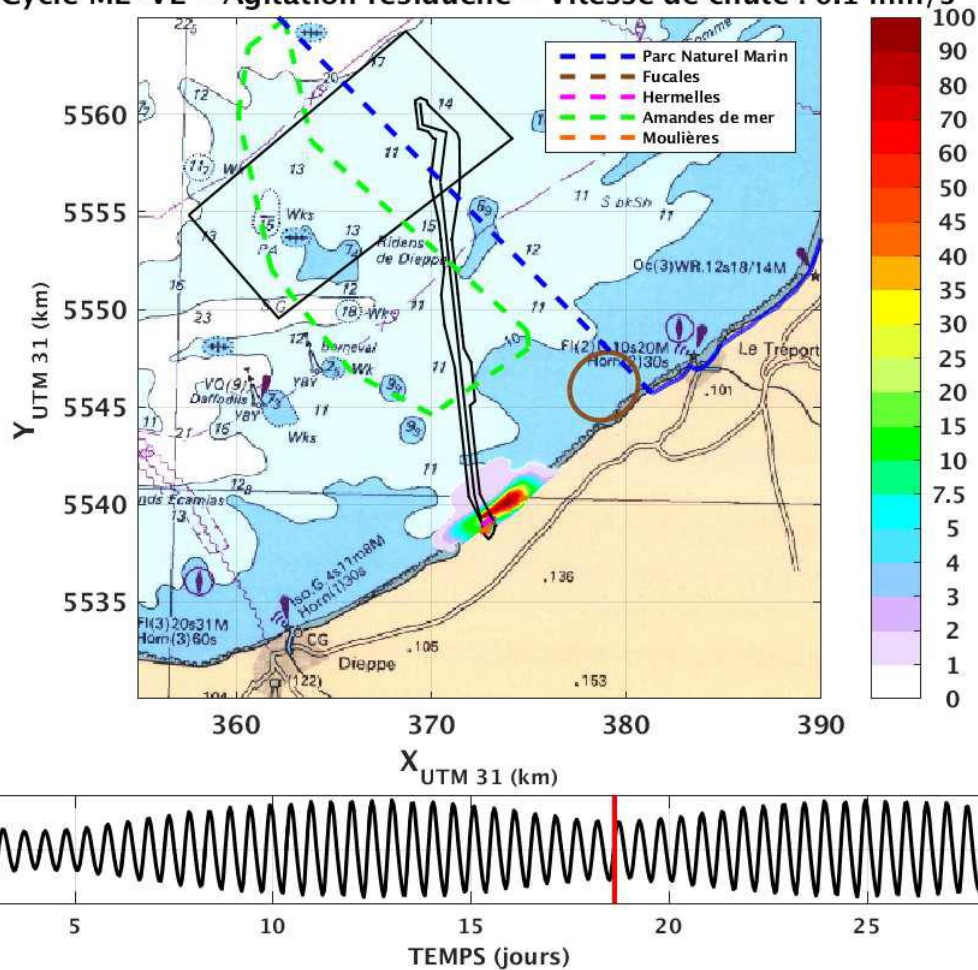
Seabed Channel IFA2 - KP51 (Fugro 2012)



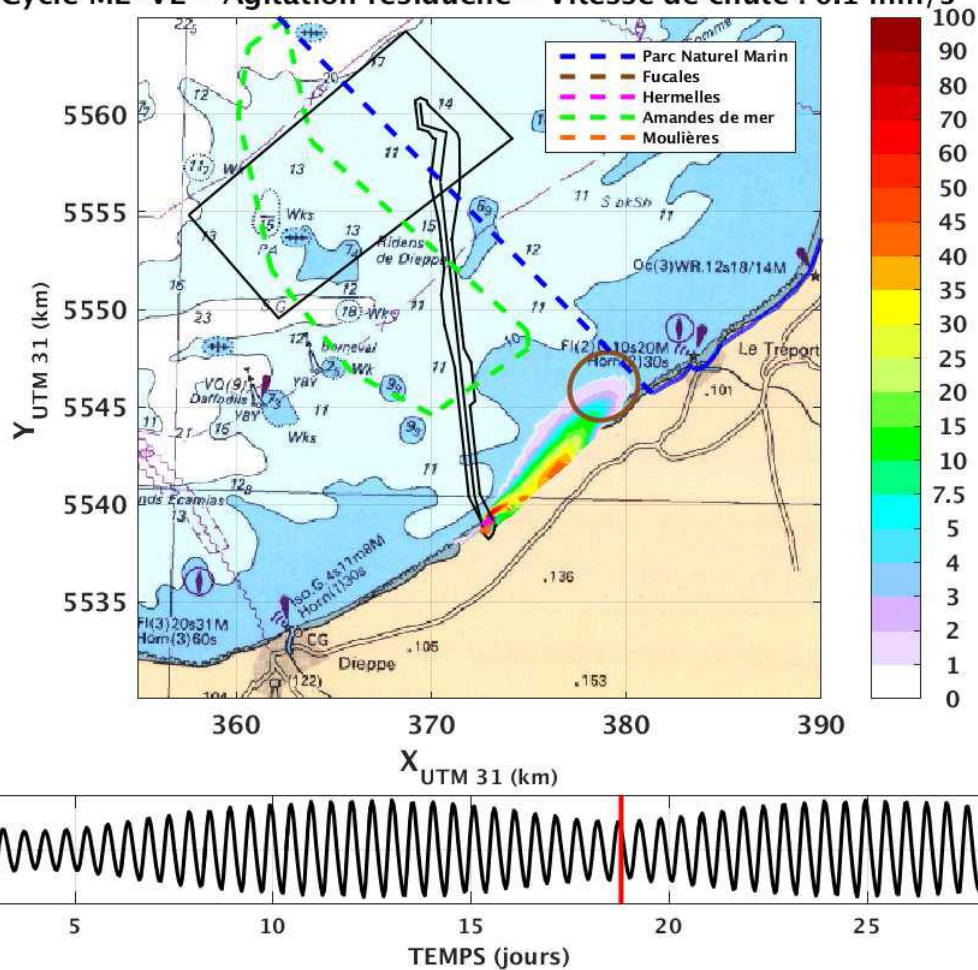
Turbidity numerical modelling

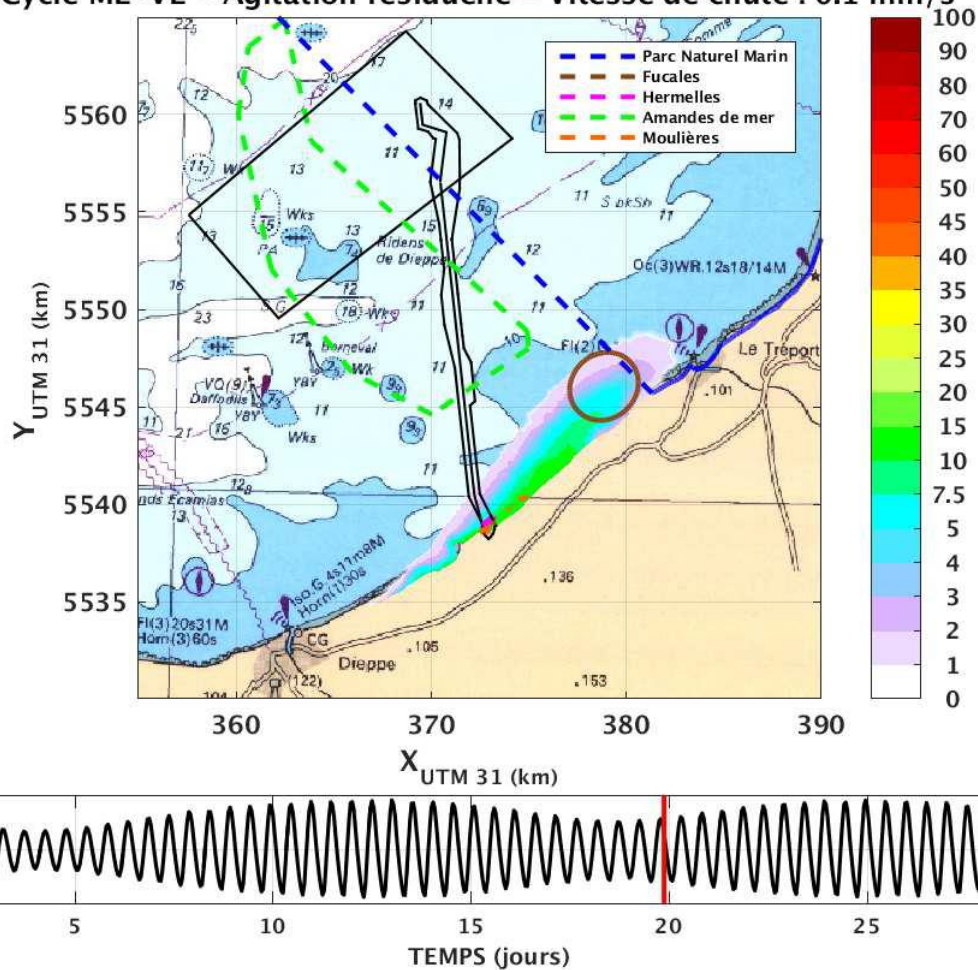
- Nearshore burial work, Dieppe-Le Tréport windfarm connection
- Inputs : water depth, particle size and composition, maregraphy, and courantology

DLT : Impact des travaux d'ensouillage
 Champ de concentration instantanée en MES (mg/l)
 Cycle ME-VE - Agitation résiduelle - Vitesse de chute : 0.1 mm/s

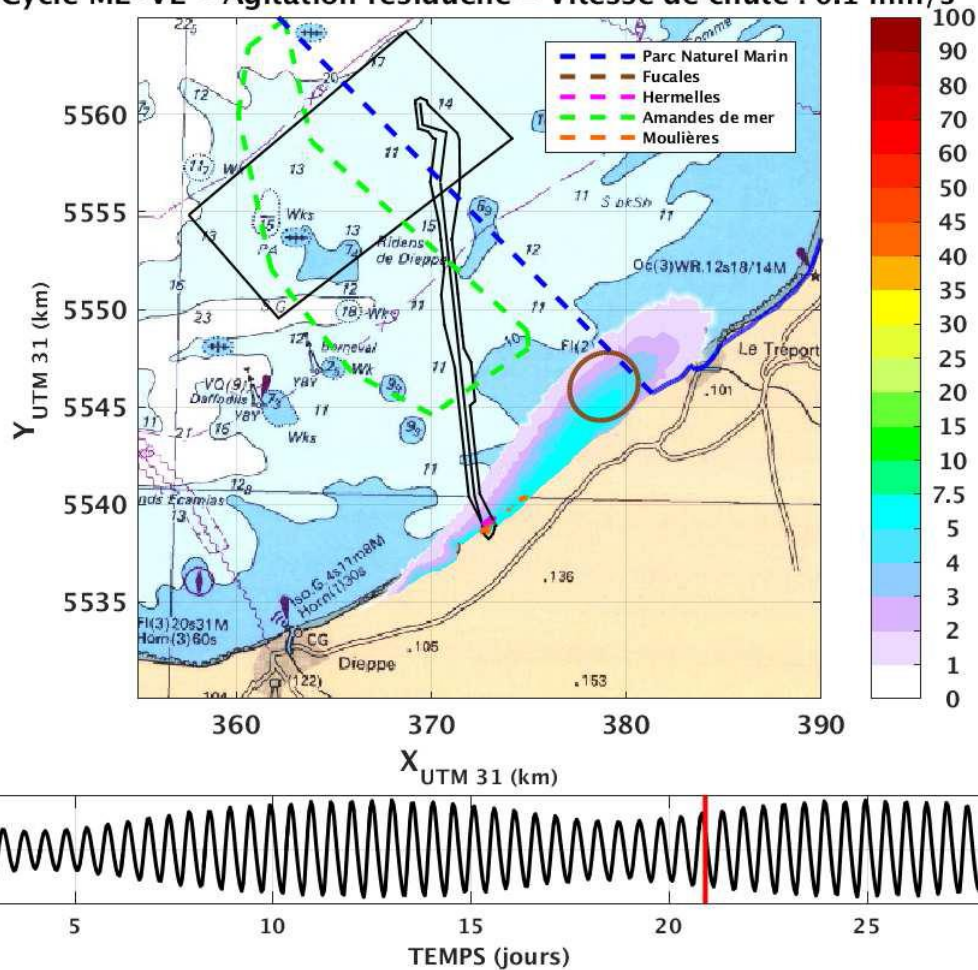


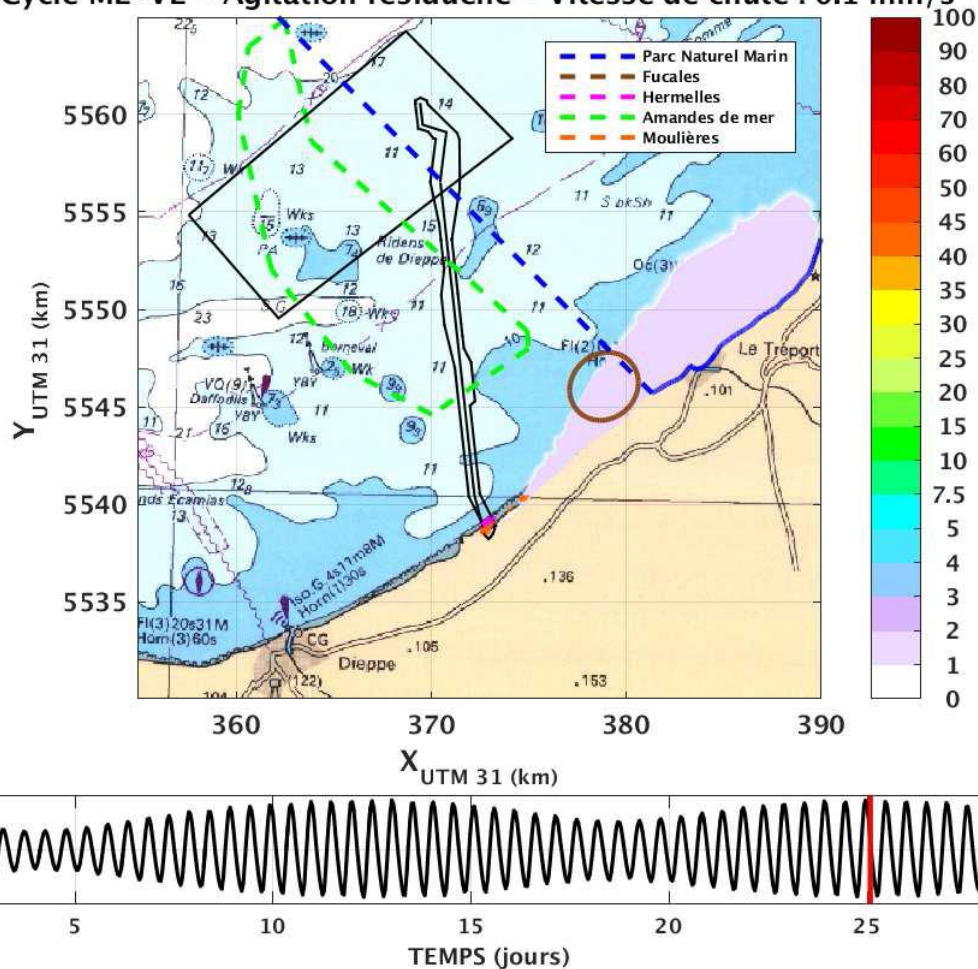
DLT : Impact des travaux d'ensouillage
 Champ de concentration instantanée en MES (mg/l)
 Cycle ME-VE - Agitation résiduelle - Vitesse de chute : 0.1 mm/s



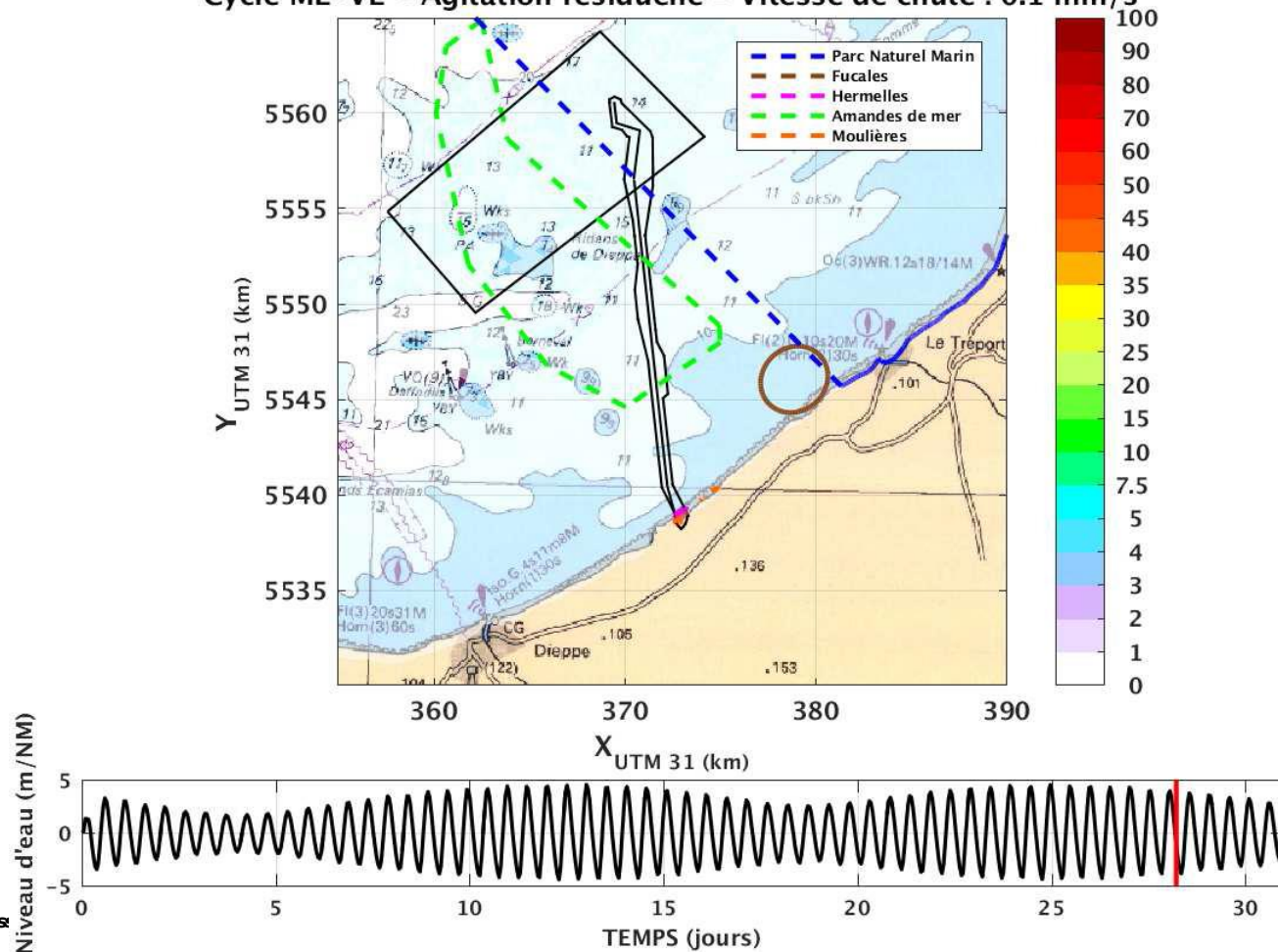


DLT : Impact des travaux d'ensouillage
 Champ de concentration instantanée en MES (mg/l)
 Cycle ME-VE - Agitation résiduelle - Vitesse de chute : 0.1 mm/s





DLT : Impact des travaux d'ensouillage
 Champ de concentration instantanée en MES (mg/l)
 Cycle ME-VE - Agitation résiduelle - Vitesse de chute : 0.1 mm/s





1.2

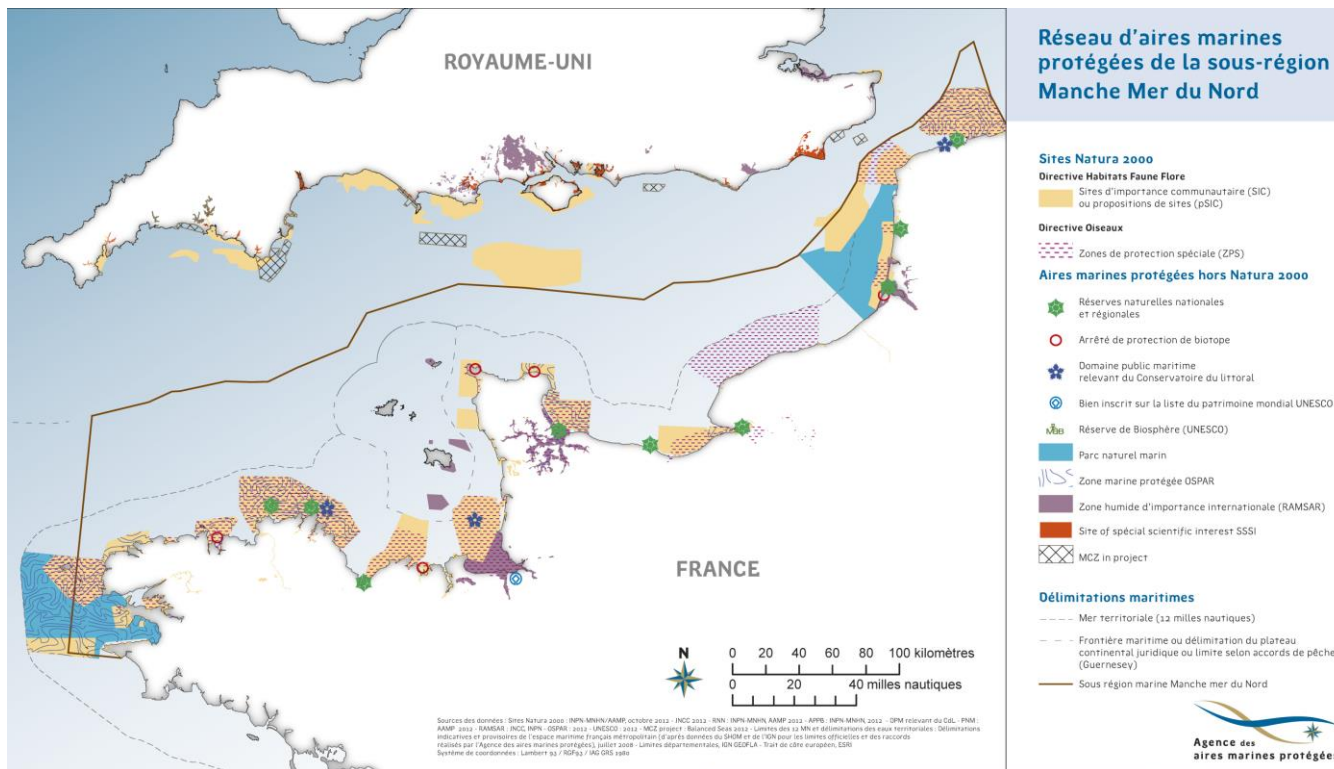
Biological Environment

Biological environment

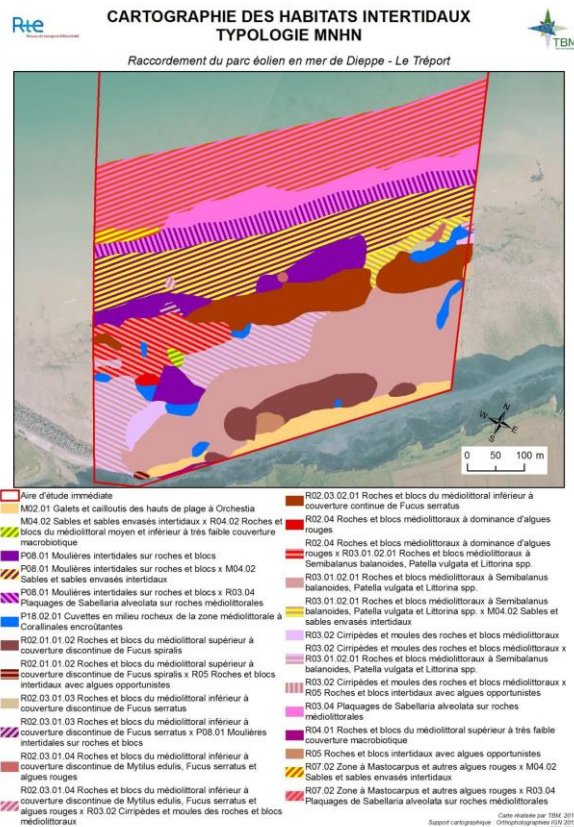
Overview

- Marine Protected Areas
- Planktonic biocenosis
- Benthic Habitat
- Pelagic habitat : fish and species of fisheries interests
- Marine Mammals
- Avifauna and bats

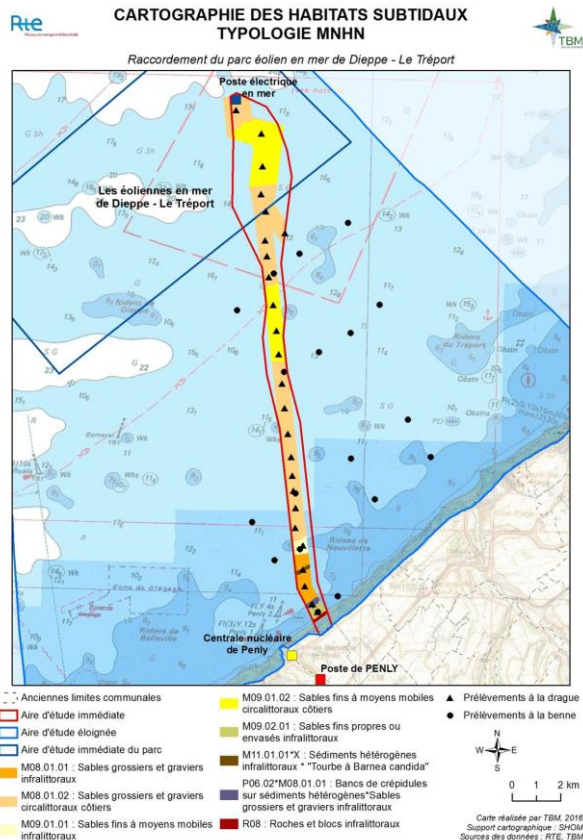
Marine protected areas, english channel (2012)



Intertidal benthic habitat mapping



Subtidal benthic habitat mapping



Nearshore habitats



Les massifs d'hermelles (*Sabellaria alveolata*)



Herbier de phanérogames



1.3

Human activities

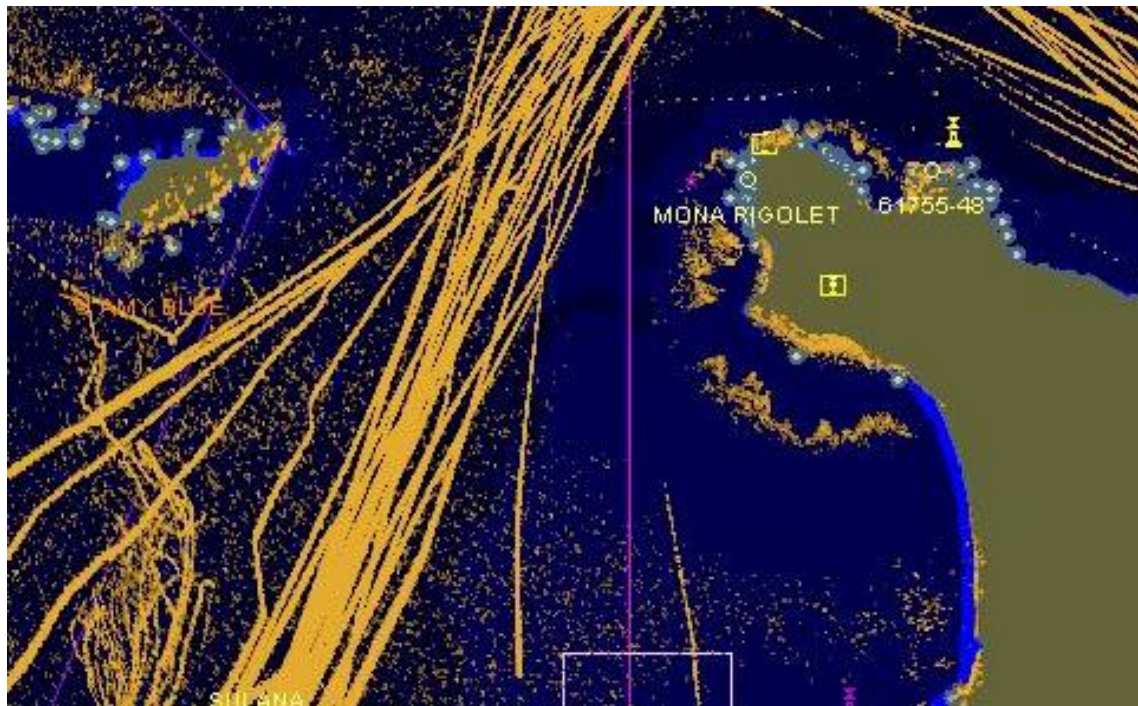
Human activities

Overview

- Regulated Marine Areas
- Harbour activities
- Maritime traffic
- Fisheries
- Aquaculture (including shellfish)
- Tourism activities
- Unexploded objects
- Archaeology

Maritime traffic, FAB (CROSS Jobourg)

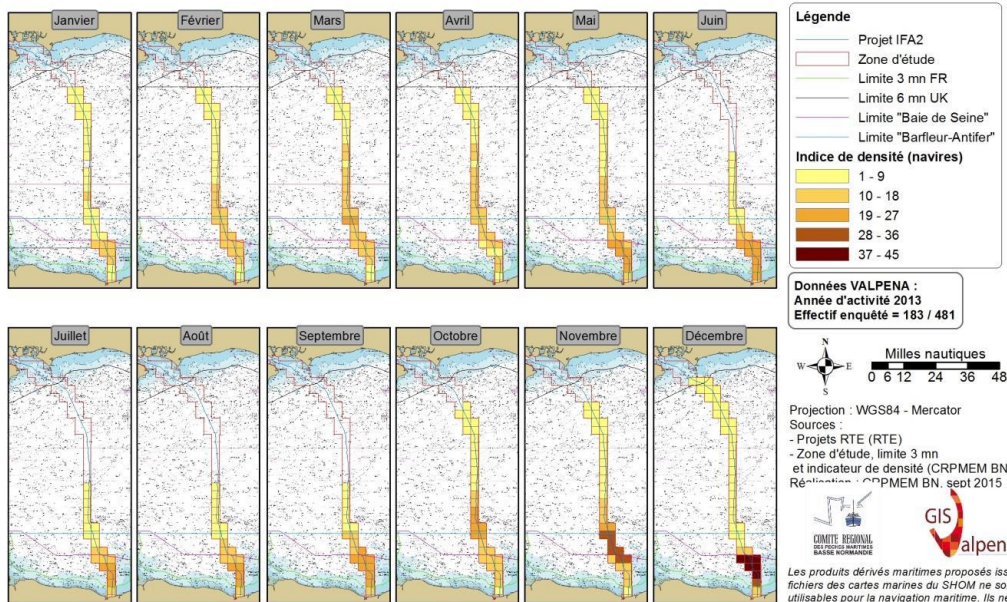
Radar image from the 12 december 2015



Fishing activities : VALPENA mapping

IFA2, 2013

Indicateur de densité mensuelle de l'activité 2013 de l'échantillon de la flotte bas-normande enquêté
Zone d'étude du projet RTE "IFA2"





02

Mitigations mesures

•



2.1

Avoid

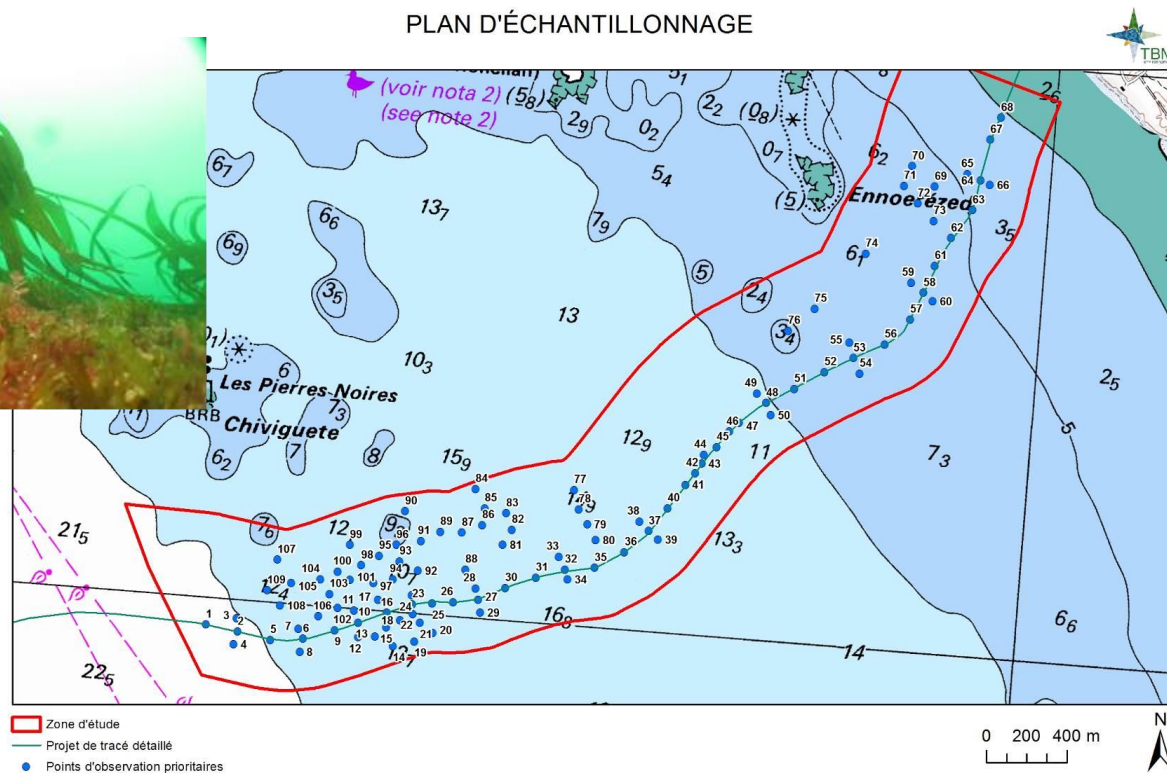
Examples of avoidance measures

Spatial, temporal and technical

- Choice of cable routing, in particular landing:
- Consider areas and habitats classified as marine conservation and localization of slow-growing species (or low resilience);
- Promote passage through soft rather than rocky areas.
- Avoid breeding season of sensitive species;
- Use inert materials for protection of structures

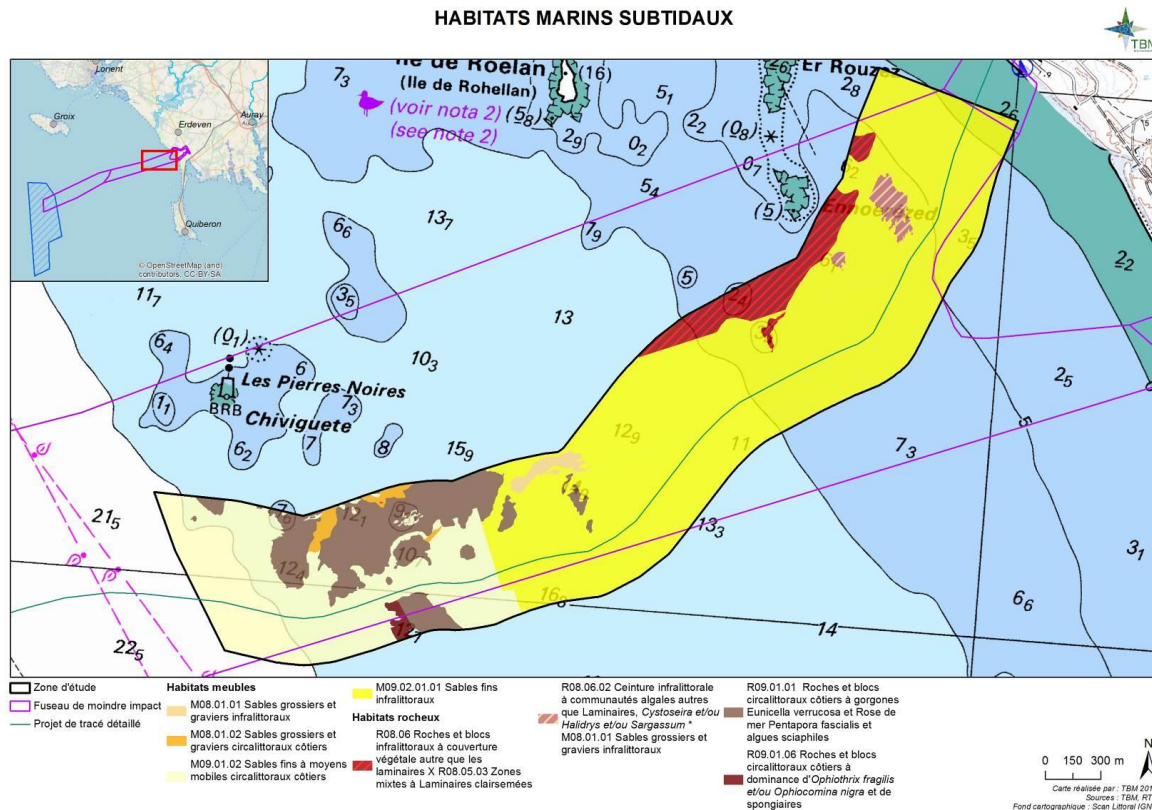
Cable routing

PLAN D'ÉCHANTILLONNAGE



Cable routing

HABITATS MARINS SUBTIDEAUX





2.2

Reduce

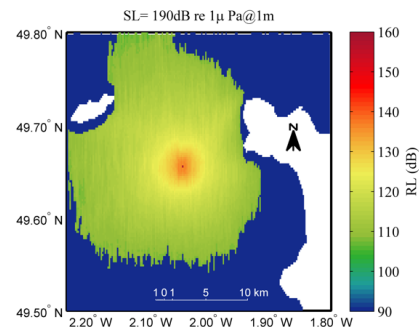
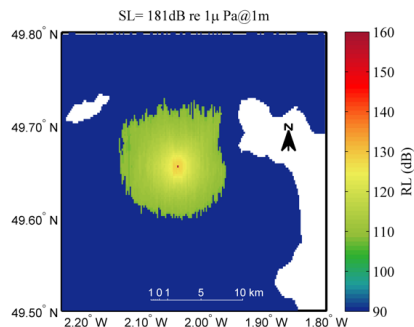
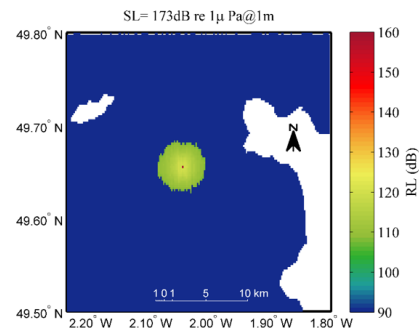
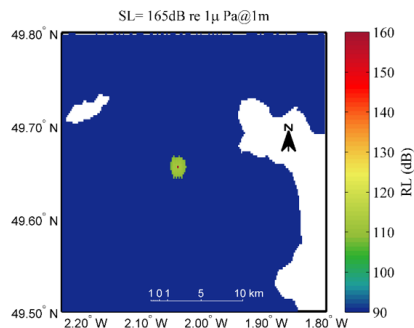
Examples of reduction measures

Spatial, temporal and technical

- Privilege the burial of the cables;
- land in urbanised areas and/or on existing infrastructure;
- Minimize the duration of the operation at sea;
- Choose the less impacting tools between jetting, slicing, and wagging;
- Monitor the level of sediment and water contamination;
- Monitor the sound pressure ;
- Monitor the presence of marine mammals (MMO)
- Soft and start : gradually increase the intensity of work ;

Choose the less impacting tool

Ambient noise : 108 dB re.1 μ Pa@1m





2.3

Offset

Examples of offset

Realistic at sea ?

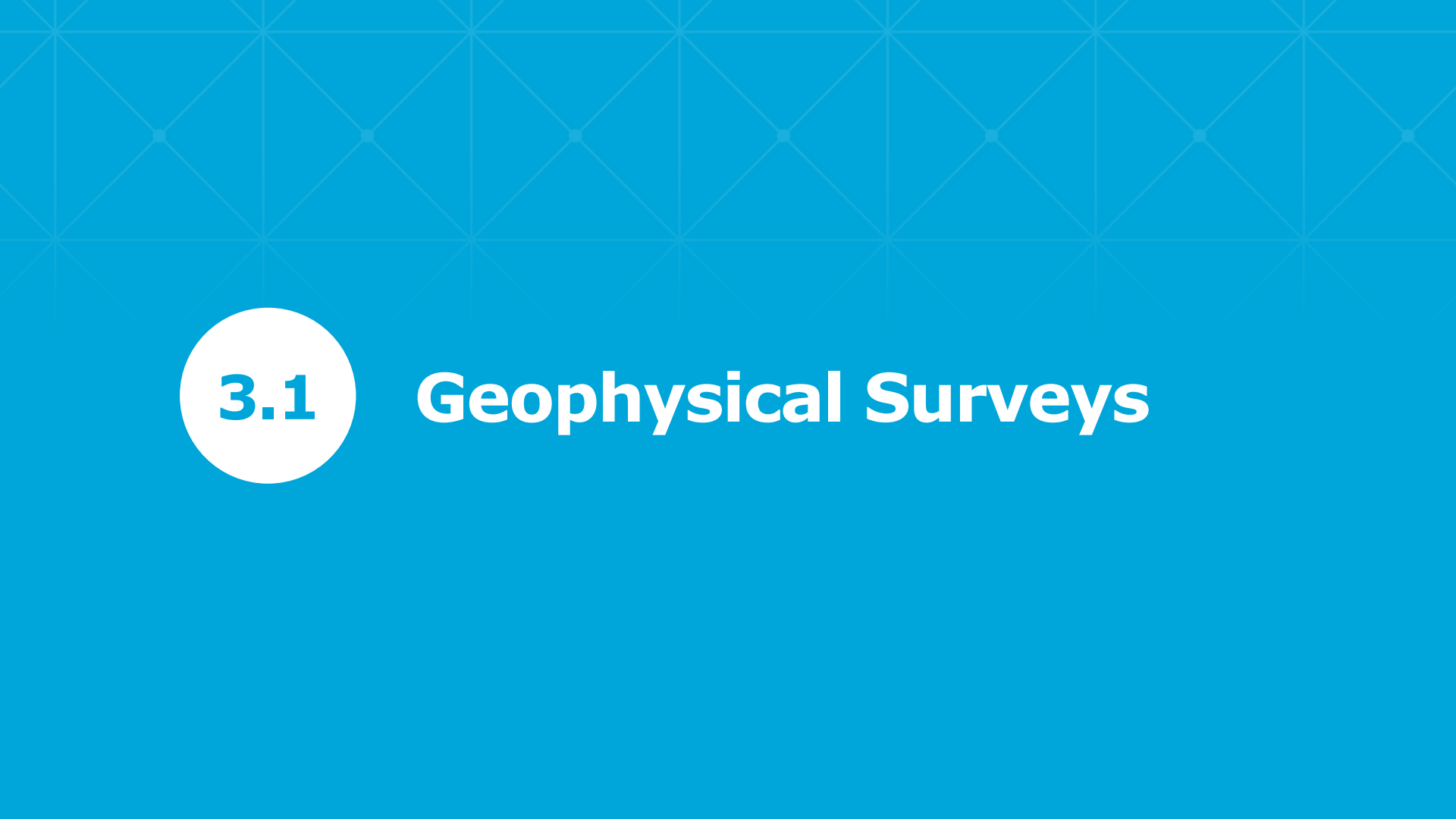
- Marine protected areas ?
- Artificial reef ??
- Meadows transplantation ???
- ????



03

Monitoring

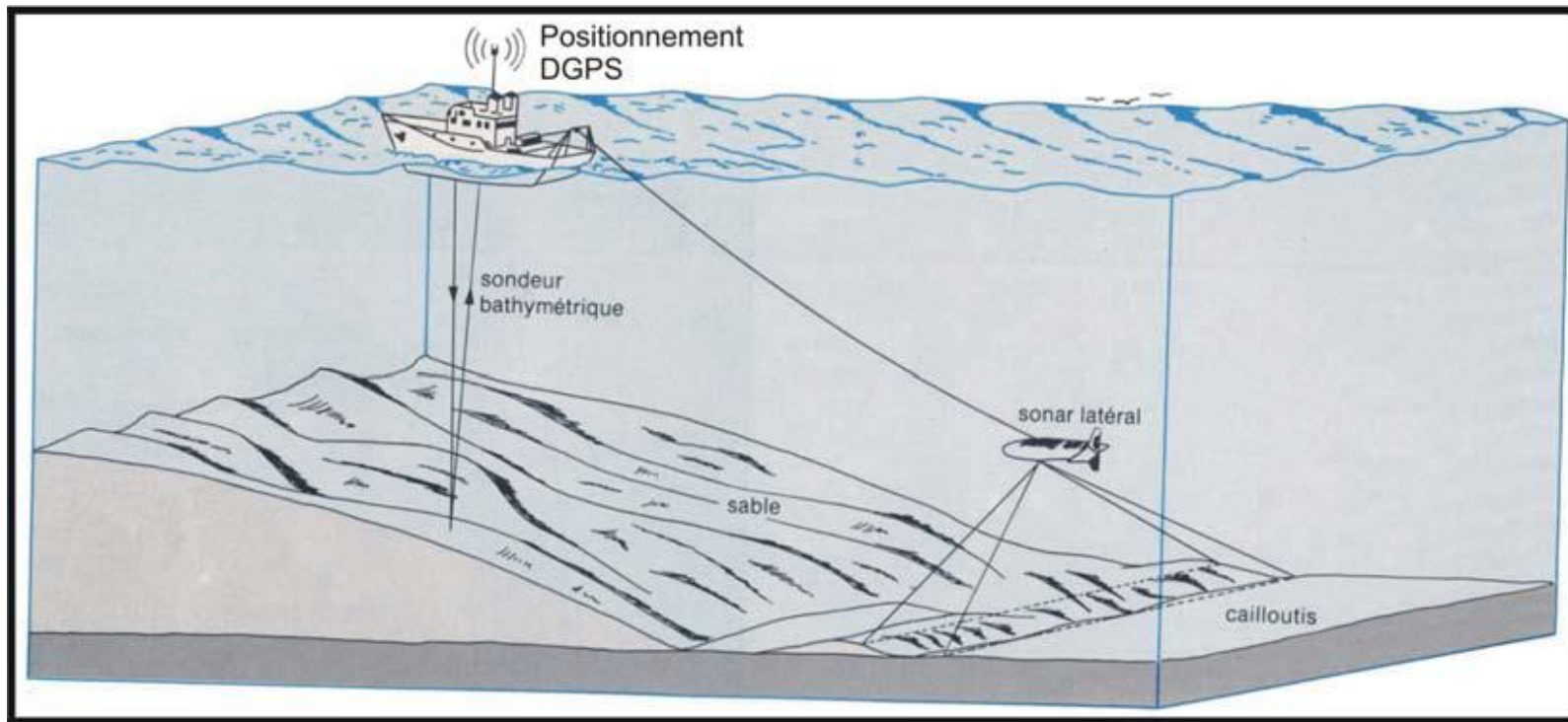




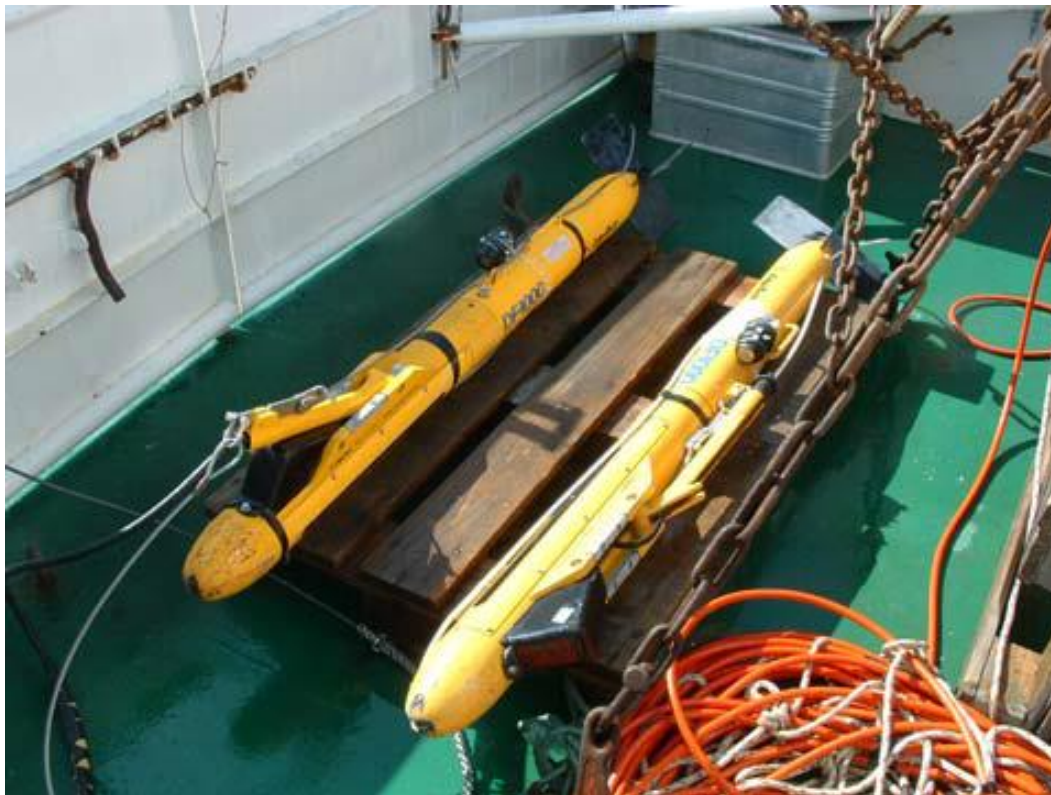
3.1

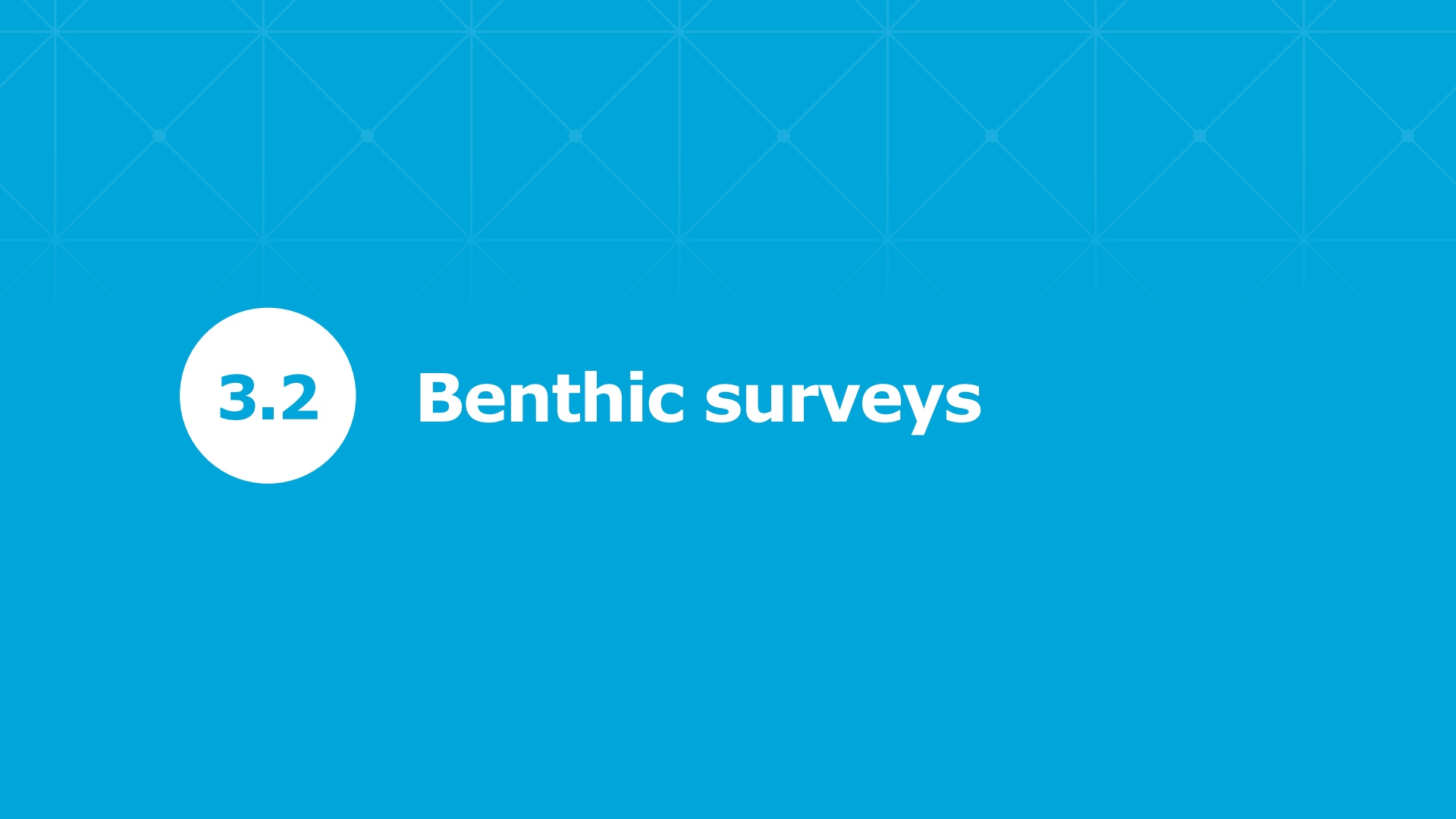
Geophysical Surveys

Monitoring of the cable stability



Side scan sonar

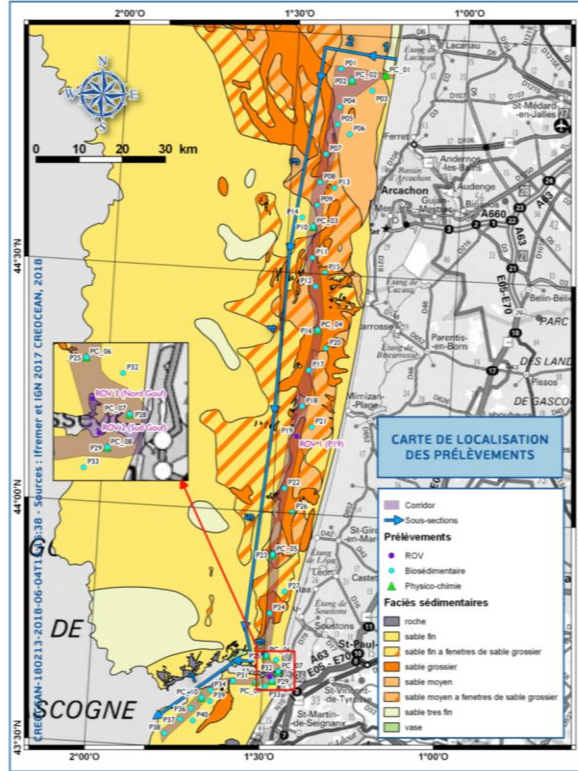




3.2

Benthic surveys

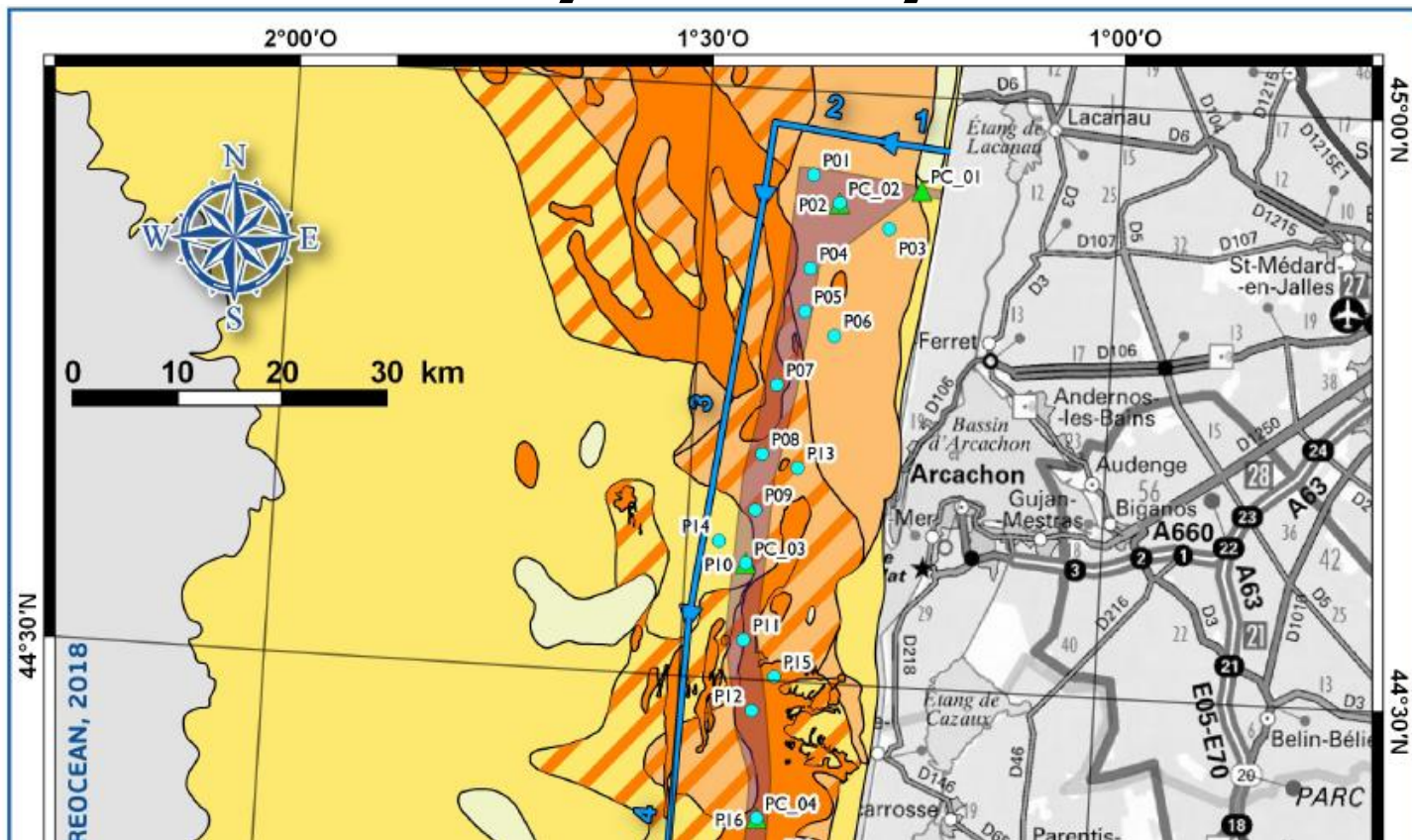
Bay of Biscay



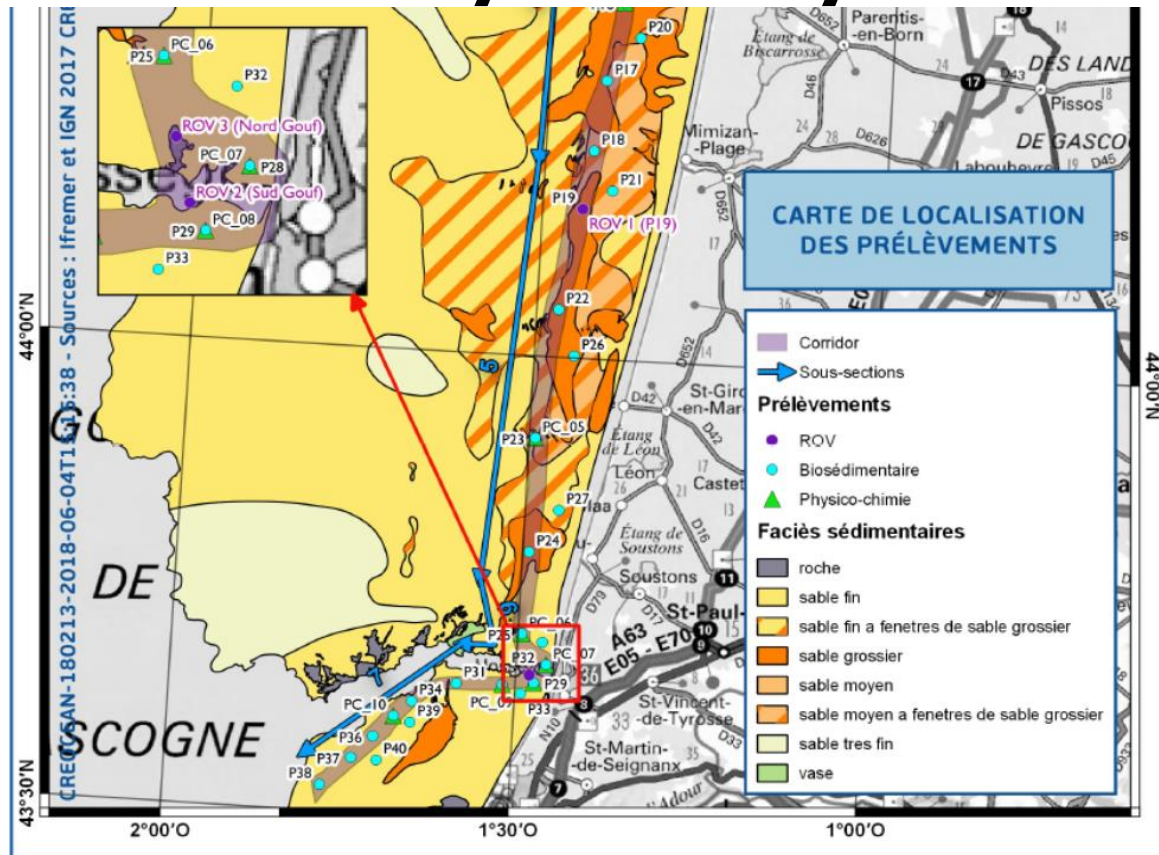
Bay of Biscay

Prélèvements

- ROV
- Biosédimentaire
- ▲ Physico-chimie



Bay of Biscay



Sampling tools

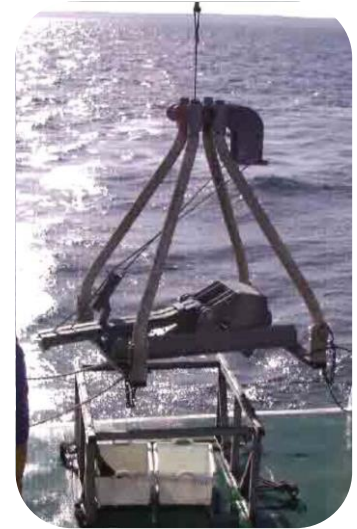
Sous-titre



Van Veen grab

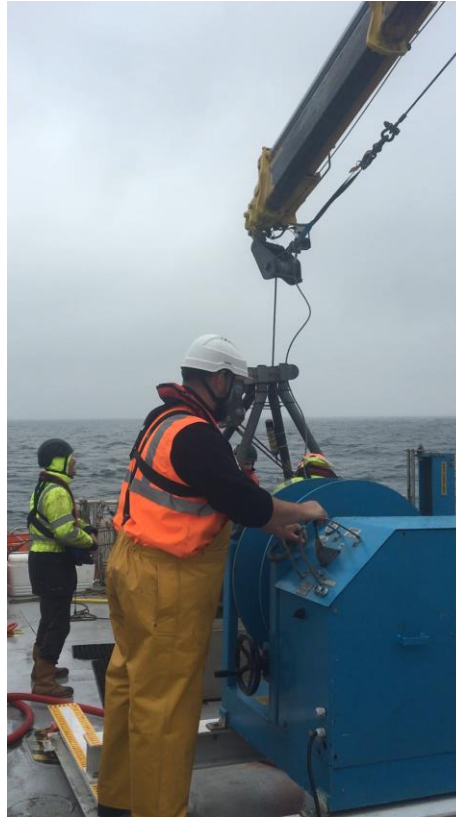


Smith McIntyre grab



Hamon grab

Hamon grab launching



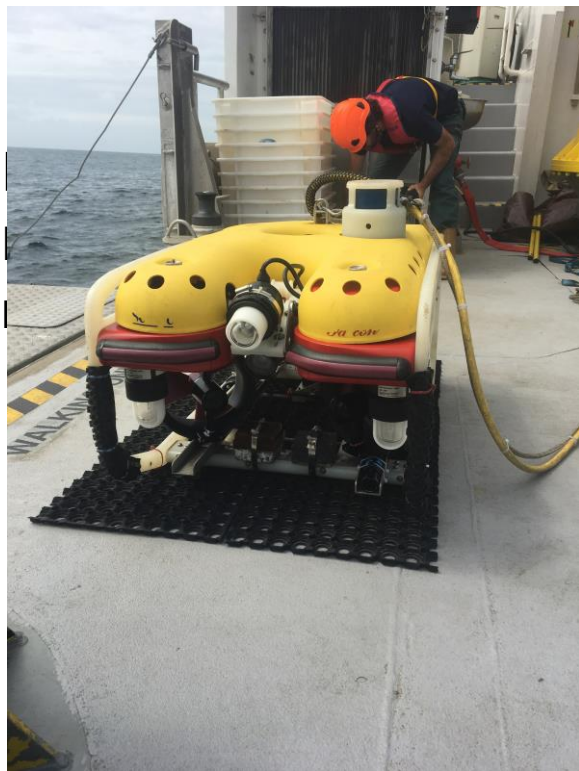
The sampling



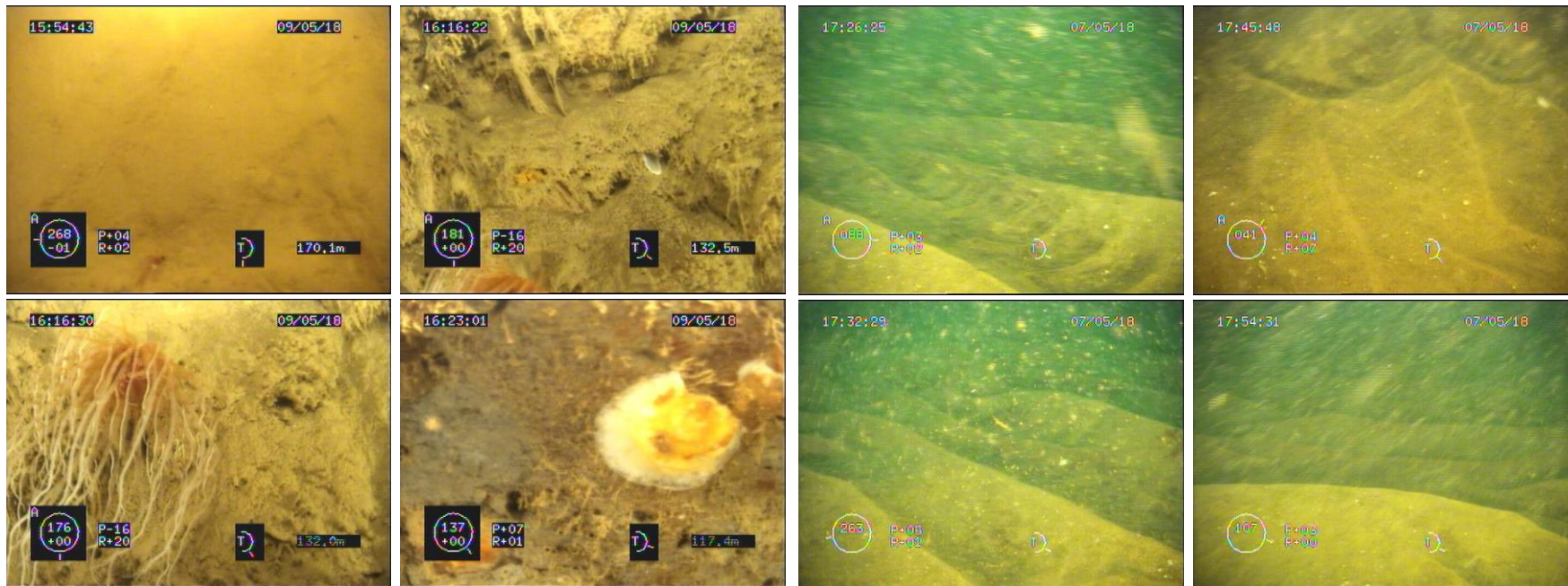
Physical parameters



Remoted operated vehicle



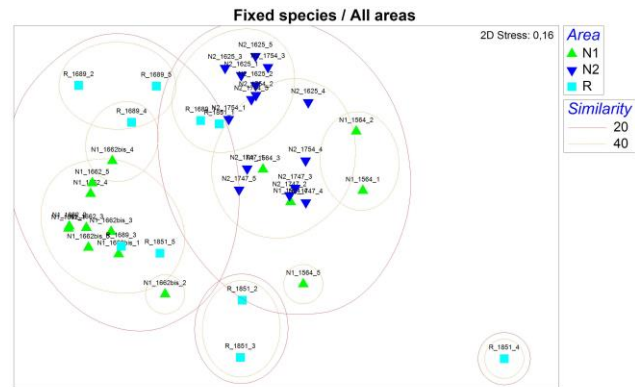
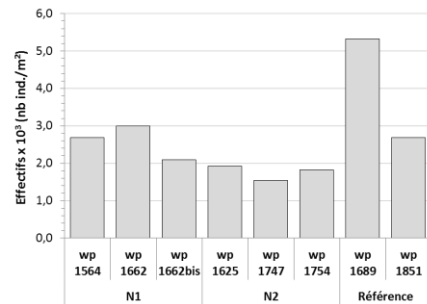
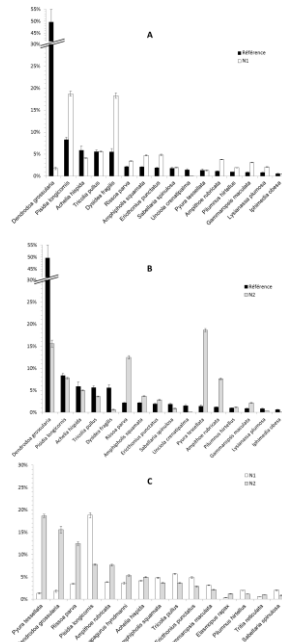
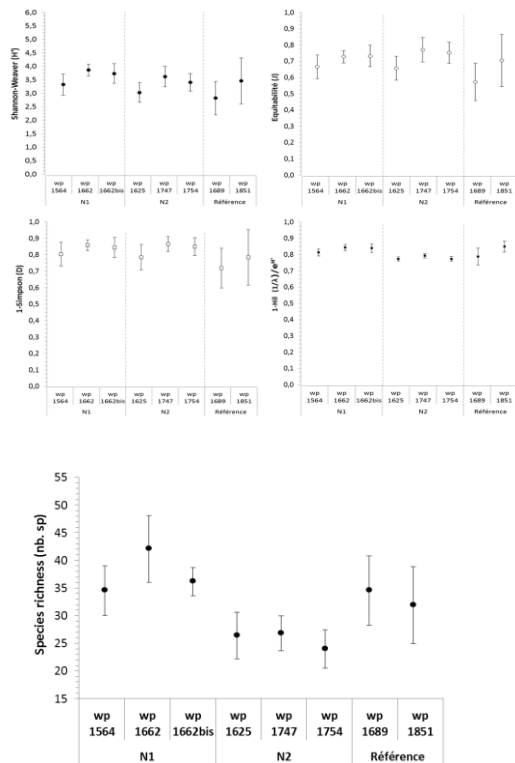
Remoted operated vehicle



Laboratory analysis



Biodiversity indices





04

Research and Development





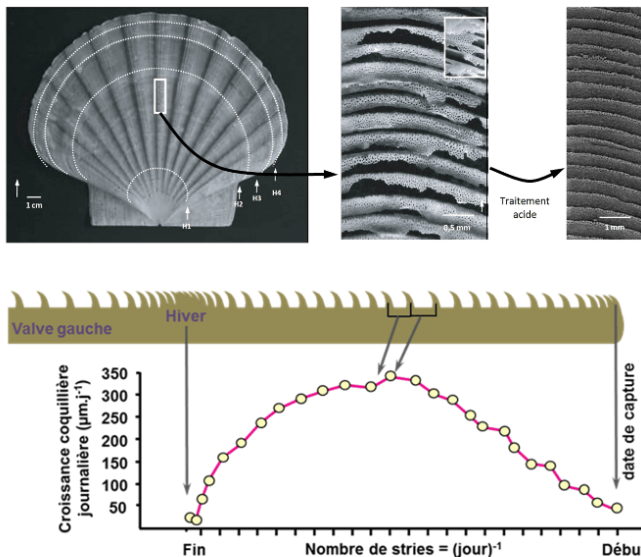
4.1

OASICE

La cOquille Saint-JAcques, outil de Surveillance de l'Impact des Câbles

Use the great scallop as a natural sensor

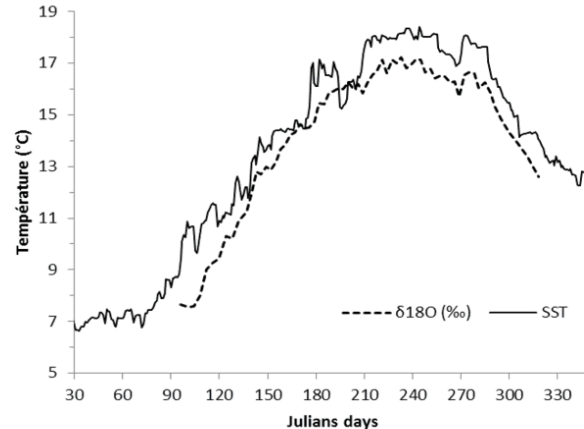
Evaluation of Scallop shell's annual and daily growth



© TBM Environnement

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)



Thank you for your attention !

Questions

