TRAVAUX EFFECTUES EN MER

B-1. Sondeurs Multifaisceaux (SMF) et sondeur de sédiments (Chirp)

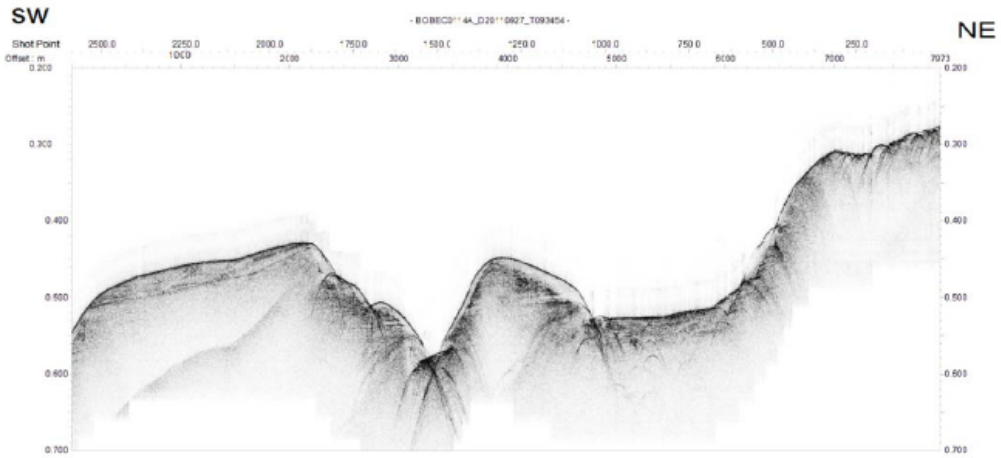
Le sondeur de sédiment Chirp a été utilisé simultanément avec les sondeurs multifaisceaux.

La configuration proposée offrait une cadence de tir optimale et une excellente pénétration. Deux modes de fonctionnement ont été utilisés, un mode « petit fond » et un mode « grand fond ». La limite d'utilisation entre ces deux mode est fixée à 500 m. Le logiciel Subop propose un basculement facile entre ces deux modes, avec par un changement de fichier. Cela s'est avéré très utile compte tenu des rapides et importantes variations bathymétriques rencontrées lors des passages à travers les canyons.

L'utilisation du mode « tir imbriqué » nécessite des calculs complexes réalisés par Subop pour la gestion des fenêtres d'écoute avec l'obligation de disposer automatiquement d'une sonde fiable distribuée par le réseau.

Les données acquises dans de bonnes conditions (sonde de référence correcte basée sur le sondeur monofaisceau 38 Kz EA600) et traitées sous Matlab grâce à une procédure fournie par Anne Pacault ont donné entière satisfaction. La seule modification effectuée est l'ajout d'un gain linéaire à partir du fond, fonction applicable dans la procédure fournie par Anne Pacault mais habituellement non-utilisée. Toutefois, il serait intéressant de pouvoir intégrer les décalages en X et Y du sondeur et de corriger de ces valeurs la navigation exportée.

Exemple de fichier chirp après traitement :



Scale : 1/25 000
Vertical exageretion x10

Liste des Profils chirp BOBECO : *(Liste établie à partir des profils Casino et Chirp)*

Leg 1 : profils 1 à 85
Leg 2 : profils 86 à 147

B-2. ADCP/Piège à particules

To understand the ecological conditions where live the deep coral reefs, **one mooring** with **current meter** and **sediment trap** were deployed **during one year** in the head of the canyon located in the North of the Bay and **an another mooring** with **current meter ADCP** at 20 m above the bottom and a **CTD-current meter Seaguard**. These equipments allow to record information on water and particles and describe the hydrodynamic conditions in the surrounding area of the coral reefs and to measure the particle flux reaching the sediment which can be used as the main food of these organisms. During the BobEco cruise, a **CTD was attached to the ROV** Victor to record the regular parameters (pressure, salinity and temperature) of the water surrounding coral reefs of the Bay of Biscay and water bottles were also regularly sampled during the dive.

Sampling locations for the moorings

One station was particularly chosen at the head of the canyon of Guilvinec located in the North of the Bay of Biscaye (Fig.1). The **mooring trap-current meter** was deployed during the BobGeo 2 cruise (July 2010) and recovered during Bobeco cruise (September 2011) in the canyon du Guilvinec at 765 m depth: N 6° 914, W 05°21.816 (Fig.3) at the same place than during the experiment in 2009-2010. The **ADCP mooring** was deployed at the same place for 9 days in BobEco cruise.

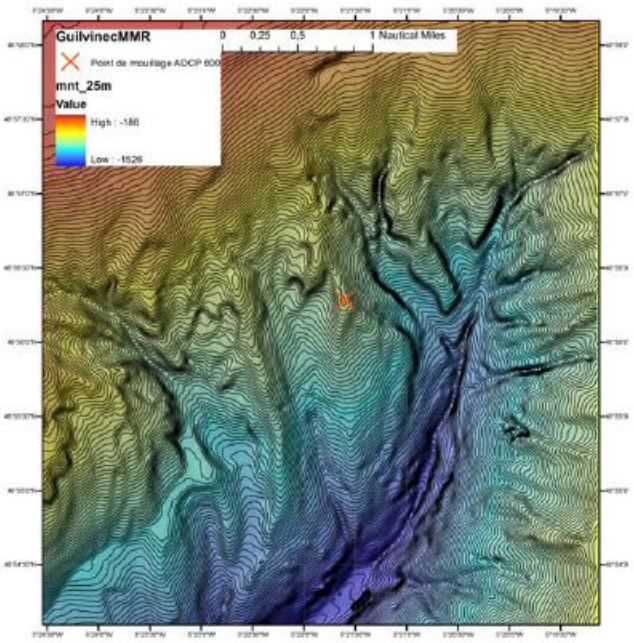


Figure:Location of the two moorings: sediment trap+current-meter and ADCP+CTD

Preliminary results

The mean current speed was equal to18 cm $s^{-1}$with a maximum of 75 cm s^{-1}. The temperature was 9.9 ± 0.6 °C and the mean oxygen concentration was about 230 µmol l^{-1}

The direction of the residual current is parallel to the canyon and the tidal direction adding the effects of each current. The maximum of oxygen concentration is observable when the current direction was from the upper part. Different frequencies of the current is observable at 12h (semi-diurnal tide) and 14 days.

Preliminary conclusions

The hydrodynamism of Guilvinec canyon, close to the bottom, distinguishes by a well-marked of the semidiurnal tide (12h) and lunar frequency (14 days). We observe also others short events which were superposed on these frequencies. The current was always high exceeding often 10 cm s-1. The residual

current was oriented by the topography to the tidal current.

B-3. Carottiers Calypso

Huit carottages Calypso ont été tentés pendant la campagne BobEco. Ils avaient pour but d'échantillonner les séquences sédimentaires au-dessus desquelles se développent les coraux d'eau froide c leur environnement immédiat.

Six carottages ont bien fonctionné avec des taux de récupération

- moyens pour quatre (CS01, CS02, CS05, CS06) qui s'expliquent par la nature même des sédiments (débris pluricentimétriques de coraux ou sédiment surconsolidé)
- très bons pour deux (CS07, CS08).

Le déclenchement reste le point faible du carottage actuel car très mal contrôlé. Au cours de la campagne BobEco, 2 carottages (CS03, CS04) ont été pénalisés par un non-déclenchement ou un déclenchement aprè pose.

B-4. Lander

The Biogenic Reef Ichthyofauna Lander (BRIL) offers an alternative to destructive methods of fish population assessment. Only a very small amount of coral is likely to be impacted, if at all, by the ballast (anchor chain links – about 50cm^2 total area) making the method favourable within sensitive habitats.
The lander is highly selective. Only scavenging species will be attracted to the bait and others may be discouraged by the strobe of the camera. In general about 1/3 of the species that would be found in a trawl survey are found using the lander. It is possible however, to use the lander to compare species composition animal size and local abundance.
Lander studies within the CoralFISH project will supplement other methods of fish population assessments to give a complete picture of what species are making use of cold water coral reefs and what for.
The BRIL will collect new data within the Bay of Biscay and supplement data already collected within Iris waters. The lander takes an image every minute whether there is anything there or not and the SeaGuard takes environmental data every 5 minutes.

BRIL was deployed 7 times; 2 in the 1st leg and 5 in the 2nd.

Table 2; Deployment locations

Deployment	Date	Lat	Long	Depth	Location	Comment
1	11/09/11	46.937240	-5.361832	781	Guilvinec	Camera failed at depth
2	13/09/11	46.381043	-4.680209	882	Croisic	Camera failed at depth
3	25/09/11	48.119911	-8.8116990	912	Sorlingues	Drifted due to tide. Ref drift to coral
4	26/09/11	48.141377	-8.800266	764	Sorlingues	Worked well, over 20hrs
5	29/09/11	51.274641	-14.706933	650	Arc mounds	Camera failed at depth
6	04/10/11	48.140245	-8.804113	629	Petite Sol	Camera failed at depth
7	06/10/11	47.600559	-7.555133	619	Lampaul	Worked well, over 24hrs

A persistent problem with the lander's Burton connectors resulted in only 3 of the 7 lander deployments

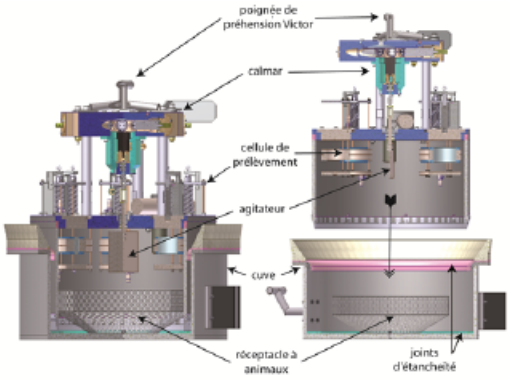
acquiring photographic data. The environmental data (RCM and CTD) was successful at all deployments and since the data is taken 2.5m above the seabed it will be useful to other aspects of the CoralFISH project.
We got a 1,368 images from deployment 3 and 1,117 images from Deployment 4 and 1,323 images from Deployment 7.
On deployments where the camera operated correctly it did so for long periods of time, capturing the total consumption of the bait and even the arrival of slow moving detritivores (Echinoids and Gastropods).
Deployment 3 may show reduced visitation due to the lander moving however this data will still be processed and may be usable.
It is unfortunate that so many opportunities were missed due to the camera failing however good quality environmental data was collected at all deployments. Since the recorder is just 2.5m above the seabed this data may prove very useful to our partners.
The images will now be assessed and a species list and fish counts taken. Differences in on and off coral abundance can be inferred from the rate of arrival and peak numbers. Good quality images will be used to measure the fish and compare size on and off reef.

B-5. Chambre benthique CALMAR (chargé dans le rov)

The comprehensive analysis of carbon cycling and food-web dynamics in a cold coral reef community integrates the knowledge of the respiration rate of the dominant species. The quantitative data were obtained by dedicated sampling of the coral community at two sites: Croisic and Guilvinec canyons. The food-web structure reveals important carbon sources and transfer pathways in the food web. Two dominant species of corals were studied: *Lophelia pertusa* and *Madrepora oculata*

Sampling locations for incubations
The first incubation was made in the Croisic canyon using the Calmar chamber with the tank. About 1 litre of Madrepora was put inside the tank before the start of incubation.
The second and third incubation were in the Guilvinec canyon. Lophelia was choose in the second experiment (about 0.7 l) and Madrepora during the last incubation (0.5 l).

Description of Calmar with tank



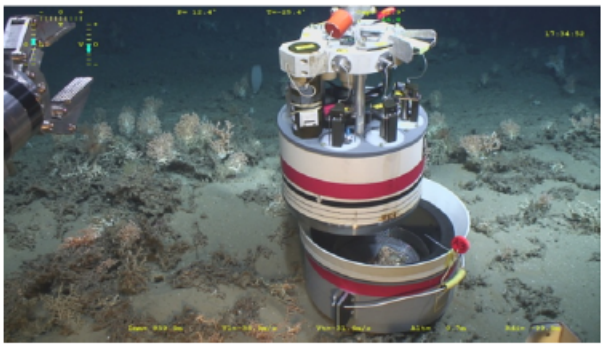


Figure: Scheme of Calmar use Calmar above the tank surrounded with coral

Calmar is a benthic chamber with 5 water cells of 100cm3 which sample during the time. In addition, a oxygen optode probe allows to record oxygen concentration each minute inside the chamber. Analysis of CO2 and nutriments is planed at the laboratory.

Calmar results: Respiration rate measurements

The 3 incubations were run with success, two with Madrepora sampled in two different canyons and one with Lophelia. Without the knowledge of the biomass inside the tank, we can't estimate the respiration rate of each species. But, according our estimations, no significant difference is observable between the two species or according the geographical situation.

Chemistry part

Our aims of the first part of the cruise were the characterization of the water surrounding the corals and some deployment CALMAR for chemical measurements (oxygen, pH, CO2 and nutriments) and also temperature and oxygen measurements by autonomous sensors.

The tools used manipulated by ROV were principally PEP (prèleveur d'eau par pompage) and CALMAR (autonomous chamber)

Some parameters oxygen, pH and alkalinity were measured on board and some samples for laboratory measurements (total CO2 and nutriments) were collected.

A system based on oxygen sensors was also installed in the cold room for ex situ corals respiration

During the dives the following samples were collected:

N° dive	PEP samples	Calmar	Ex situ O2	Temperature	Optode (O2)
PL1	-	-	-	1	1
PL2	3	-	-	1	1
PL3	6	-	-	1	1
PL4	6	-	-	1	1
PL5	6	-	-	1	1
PL6	8	1	3	4	1
PL7	10	2	1	1	1
PL8	-	-	-	-	-

B-6. ROV Victor (parler de CTD rov pas d'extraction casino)

18 plongées ROV ont été effectuées (Cf. Fiches Formulaire 8)

B-7. Benne Hamon

La Benne Hamon est un engin qui permet d'effectuer des prélèvements de sédiment et de faune associée pour une description qualitative de la composition du sédiment et des communautés associées. Il est réputé, à juste titre, pouvoir travailler dans des fonds sableux et grossiers.

1 Plongée réalisée : le 14/09/2011 (N 45° 38,82421' W 3° 32,21591') sur la zone Rochebonne

1 sachet (tamisé à 1 mm).

Sampling started following **dive 465-3**. From the Grab sampler (Benne Hanon) 3 coral fragments were taken (one well preserved fossil *Lophelia pertusa* and two very small fragments of heavily bioeroded and remineralized corals of species L.pertusa and likely Dendrophyllia).

BOBECO BH-01- Lp and Lp/DE