Mission Report: Pré-APOLOBIS

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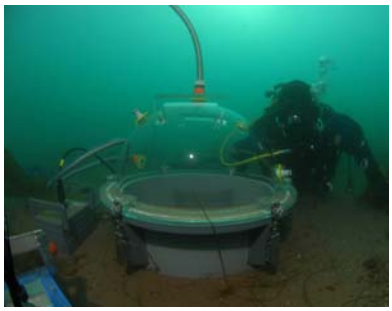
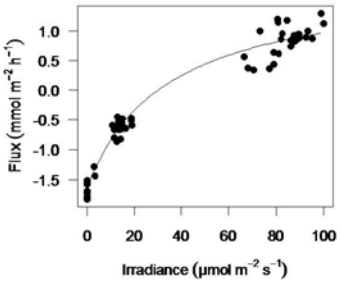
The mission took place from the 17th of August to the 8th of September 2011. The objectives of this mission were:

- SCUBA Diving prospection in Kongsfjorden. Test the SCUBA diving feasibility for a french-norvegian team.
- Sampling of two bivalves species: *Chlamys islandica* and *Serripes groenlandicus*. Feasibility for sampling by dredging and suckling.
- *In situ* calcein shell marking of both species to assess their growth and the increment rythm of the shell rings.
- *In situ* measurement of: 1) respiration/calcification for thee two bivalves species and 2) primary production using benthic chamber.

The first day was used to follow the course for bear's protection and learn how to use the Kings Bay decompression chamber. The AWI procedure was implemented and the SCUBA diving equipment was installed (Compressor, dive locker, diving boat, secutity procedure). During the fifteen following days, 51 dives were realized by the group. This experimental work carried out between 3 and 35m depth allowed the measurement of light (PAR), carbon and oxygen fluxes at the sediment water interface. These data were used to established light/production curves in three sites of Kongsfjorden. These measurements were made in benthic chambers.

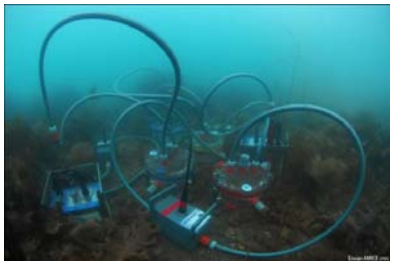


Measurement of the photosynthetic activity in benthic chamber

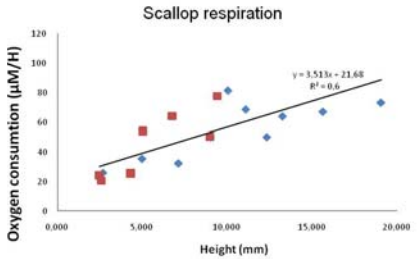


Example of light/production curve

Chlamys islandica, *Astarte sp*. and *Serripes groenlandicus* were also collected whether a group of bivalves which will be subject to preliminary studies at the LEMAR (elementary chemistry). The *Chlamys islandica* collected allow also the first ecophysiological in situ measurement using benthic chambers.



Benthic chambers used to measure *Chlamys islandica* respiration



First results for relationship between respiration and height for *Chlamys islandica* (T= 4°C)

A cartography of the physico-chemical parameters of the seawater surface was realized at the scale of the fjord. Moreover, a first approach to measure the disponibility in light (PAR) in the first 10m was realized; 30 profils were completed. Finally, in agreement with the AWI group (Jürgen Laudien) and the IMR group (Øivind Strand, Bjørn Gulliksen), an Aanderaa probe multiparameters (temperature, salinity, pressure, turbidity, current, oxygen, fluroescence) was immersed for a year. The selected site presents, by 35m depth, a high density of scallops.

At the opening of the fjord (Kongsfjordneset) measurement platform Aanderaa (Seaguard). This equipment records every hour the main hydrological parameters useful for the proxies' calibration. Isotope ratios and other trace elements will be searched (ICPMS) in the shells of *C. islandica* living at 5 m of the platform after collection of individuals next year (coll. ECOTAB).

All the equipment used during this first mission was left on base, stored in boxes in one of th AWIPEV store room. The last day was used to set up a collaboration with the AWI on the ecology of the bivalves in the fjord and on benthic respiration of the sessile fauna of bedrock.

On the 6th of September we held a meeting at UNIS (Longyearbyen) with researchers from UNIS (Jørgen Berge) and Akvaplan-Niva (Michael Carroll, Lionel Camus (Tromsø)) to present the project APOLOBIS. We have obtained the agreement of the two groups for active collaboration both in proxies' calibration and in observation's activity on the benthic fauna.

The 7th of September, we held another meeting in Tromsø at IMR with researchers from IMR (Jan Sundet), UIT (Clara Manno) and Akvaplan-Niva (Paul Renaud, Claudia Halsband) to once again present the project APOLOBIS. A cooperation agreement was also signed with the IMR (2 scientific SCUBA divers).

Back in Brest on the 8th of September.