BIOMARKS SAMPLING PROTOCOLS

CHEMISTRY

Pigments by HPLC

I- Introduction
Assess the quality and quantity of Chlorophyll-*a* and accessory pigments in sampled water.

II – Major Peculiarities
If possible do not work under direct sun light, which degrades the pigments.
Filter as quickly as possible when water is available
Freeze samples quickly after filtration

III – Material and Instruments
GF/F Filters 25 mm (porosity 0.7µm)
2 L bottles
Filtration device and holder (full system)
Funnels
Tubing

IV – Chemicals and buffers

V – Material preparation
Prepare filtration devices: Holders and funnels have to be cleaned with distilled water and protected with aluminium foil until filtration. GF/F filters should be placed with clean tweezers and always with the same side up. Make sure the filter is correctly placed by turning on the pump before to put the top of the filtration holder system.

VI – Sampling and conditioning
<u>Sub-surface and DCM - 0.6-3 µm; Sub-surface and DCM – 3-20 µm; Sub-surface and DCM – 20-1000 µm</u>

For each sample pour up to 2 Liters of size fractionnated SW (depending on the water load) on 25 mm GF/F filter. The exact final volume is reported (this is a quantitative measurement).
As it can be a long process, use 2L bottles with a cap adapted to fit a tube. Turn around the bottle to let the water flow in the filtration unit. Turn on the vacuum pump (max 0.02 cm Hg). Make sure the filter never gets dry during the filtration process. At the end of the filtration, when the filter gets dry, fold the filter in 2 (color inside) and press it in clean absorbing paper to remove remaining water. Put it in a cryotube. Label the tube. 2 replicates/water depth.

VII – Storage and shipping conditions
Cryotubes have to be frozen in liquid nitrogen and subsequently transferred to -80°C. Ship on dry-ice.

VIII – Chemicals and buffers preparation
IX – Disposal of trials and waste
X - Bibliography
XI - Annexes
Analysis will be performed at Villefranche by Hervé Claustre

Nutrients

I- Introduction
The sea water (SW) sampled will be used to measure a range of chemical parameters and particularly macronutrients (nitrate, nitrite, phosphate, silicate)

II – Major Peculiarities
Use gloves and fill the vials directly from the Niskin bottles to avoid contamination by products on hands and other containers. Do not fill the flask too much (volume increase when frozen).
Freeze bottle in upright position.

III – Material and Instruments
VWR Scintillation Vials, Polyethylene, with Screw Cap VW58500 20 Tray Packed Vials, or similar 20 mL polyethylene scintillations vials with screw cap.

IV – Chemicals and buffers
None

V – Material preparation
Mark the vials with BIOMARKS, day and depth.

VI – Sampling and conditioning
Rinse the vials 3 times with the sample. Fill up the vial with approximately 20 mL.
Take 2 replicates from each depth.

VII – Storage and shipping conditions
Store vials at -20°C in upright position to avoid liquid on the cap.
Ship on dry ice to the University of Oslo for analysis.
Delivery address: Tom Andersen
Innkjøpskontoret, room 4422 (phone: 48272123)
University of Oslo
Department of Biology, Kristine Bonnevies hus
Blindernveien 31, NO-0316 Oslo, NORWAY

VIII – Chemicals and buffers preparation
IX – Disposal of trials and waste

X - Bibliography
John E. Dore, Terrence Houlihan, Dale V. Hebel, Georgia Tien, Luis Tupas and David M. Karl. 1996. Freezing as a method of sample preservation for the analysis of dissolved inorganic nutrients in seawater. Marine Chemistry, Volume 53, Issues 3-4, August 1996, Pages 173-185.

XI – Annexes
The nutrient analyses will be performed at University of Oslo, Department of Biology, by Tom Andersen lab using a Bran + Luebbe - AutoAnalyzer 3. For description of the system see:
http://www.labochema.ee/documents/seadmed/seal_analytical/AutoAnalyzer%203%20brochure.pdf

Pesticides and metals

I- Introduction
e.g. Aims of the Analysis

II – Major Peculiarities

III – Material and Instruments

IV – Chemicals and buffers

V – Material preparation

VI – Sampling and conditioning
At least 2.5 liters for the water samples should be collected on glass that has been sterilized. Perrier bottles are fine.

VII – Storage and shipping conditions
Under discussion to be performed by Veolia lab, France.

VIII – Chemicals and buffers preparation

IX – Disposal of trials and waste

X - Bibliography

XI - Annexes
Prices for analyzes at NIVA?

PAH and pesticids (PCB and clorated pesticids) in sediments	346 Euros
PAH and pesticids (PCB and clorated pesticids) in sea water	337 Euros
DDT in sea water	24 Euros
DDT in sediments	24 Euros
IPC sea water (Cd, Co, Cu, Ni, Pb, Zn)	228 Euros
IPC sediments (21-30 metals)	158 Euros

BIOMARKS SAMPLING PROTOCOLS

PHYSICAL MEASUREMENTS

AND

BIOMARKS SAMPLING PROTOCOLS

WATER COLLECTION

Hydrography

Conductivity, temperature, depth and fluorescence is determined continuously from the surface to the bottom or down to100 m depth by a CTD. Salinity and density by depth is then obtained from these data.

Irradiance and Secchi depth

Photosynthetically available radiation (PAR) is measured with a cosinus underwater sensor and a light meter (e.g. Licore A-250) in each meter to below the 1% light depth. The values should be normalised with simultaneous measurements from a similar deck sensor.

Secchi depth

Secchi depth is determined with a white 25 cm disk connected to a rope. The depth where the disk no longer can be seen on the shadow side of the boat is determined.

Water collection

Water is collected either with

a) Niskin bottles attached to the CTD rosette. The Niskin bottles are emptied by opening them in the bottom and pouring the content into 10L buckets. The content in the buckets is then poured into carboyes (2 per depth), either directly or through a nylon plankton tissue with 20 µm mesh size stretched over a large (diameter approx. 30 cm) plastic funnel to obtain the <20 µm size fraction. The <3 µm size fraction is obtained by filtering the <20 µm size fraction through polycarbonate filters.

Or

b) The water is collected by a peristaltic pump and size fractioned as above.