

Logistics Planning Outline for the 2010/2011 NBP/ODEN 2-boat Operation

In an attempt to coordinate the science between the ODEN and the NBP for next year's 2-boat operation, the information below will be compiled and passed out during the planning meeting in November.

Principal Investigator: Stefan Bertilsson
Project leader onboard NBP/ODEN (if other than P.I.): Lasse Riemann
Project title: Amundsen Sea Polynya International Research Expedition (ASPIRE): Patchiness and significance of microbial communities controlling the Southern Ocean carbon cycle
Participants onboard (tentative): Total: 3 persons Name and function: Lasse Riemann, Assoc. Professor Lorena Grubisic, PhD student Johanna Andersson, PhD student

Please give a brief cruise synopsis. Include the following: research objectives and proposed cruise track.

Our research objectives are to address: 1) The importance of “the viral shunt” where viral cell lysis transforms biomass to dissolved detritus, increase pelagic respiration, and decrease the vertical carbon export, 2) bacterial uptake and turn-over of key carbon substrates, 3) chemoautotrophic carbon fixation, which may complement photosynthesis, particularly in low-light conditions. For selected stations we will examine how these processes relate to microbial community composition.

Our program and requested sampling stations are integrated in and falls in line with the objectives and plans for the ASPIRE project and requires only pelagic sampling.

We request to be onboard the NBP due to the pelagic sampling and our planned use of radio-isotope tracers for rate measurements.

Briefly describe sampling methods and major systems and equipment (collection method (i.e standard CTD, plankton nets, MOCness Nets, etc...))

Standard CTD, Rosette water sampler, 5-10 L required per sample

Sampling methods and sites when ship in motion

Site/area/transect	Type of sampling to be performed, volume of H ₂ O collected

Sampling methods and sites from stationary ship

Sampling site	Type of sampling, weight/volume of samples and equipment, etc.	Time per station
Transects	Water, ~ 5-10L	1-2 hrs
Drifter station	Repeated surface water samples ~2L	>24 hrs

Sampling method and sites away from the ship, on ice

Sampling site	No. of persons	Type of sampling, weight/volume of samples and equipment, etc.	Time per station
n.a			
n.a			
n.a			

Deployment/retrieval of equipment

Site	Type of equipment, weight/ volume, procedure, etc.	Time per station
n.a		
n.a		
n.a		

Which are the most prioritized sampling areas/methods?

Site/area	Method/type of sample	Other info
Amundsen Sea Polynya	High resolution transects	From selected stations: Surface water for deck experiments
Amundsen Sea Polynya drifter stations	Surface water samples	For in situ observations of diurnal variation in microbial processes

The following equipment needs to be installed onboard (describe in detail, also needed connections to electricity, water, gas etc):

We will need access to 220V for 2 pumps
We will need access to 220V for an incubator
-80C freezer space (see below)
-20C freezer space (see below)

Lab space	Wet lab	Dry lab	Other / specify
Meters of bench space	2	2	2 (radioactivity lab)
Power needs (VA) 220/380 V	Yes (220V)	Yes (220V)	Yes (220V)
Cold water (yes/no)	Yes	No	Yes
Hot water (yes/no)	No	No	No
Sewage (yes/no)	Yes	Yes	Yes
Compressed air (yes/no)	Yes	No	Yes
Gas (yes/no)	No	No	No
Fume hood (yes/no)	No	Yes	Yes
Sea water intake (yes/no)	No	No	No
Incubator space			Yes

Special lab areas needed:

Clean air room	No
Access to radioactivity van for small-scale incubations and filtrations (¹⁴ C and ³ H)	Yes
Space for deck incubations under natural solar radiation regime (minimal shading) with seawater intake flow-through	Yes

Storage of equipment and samples:

	Space needed (m ² /m ³)
Container	2 m ³
Cold +2°C	0.2 m ³
Freezer -20°C	0.3 m ³
Other (specify)	0.1 m ³ space in a -80C freezer.

The following chemicals, gases or other hazardous substances will be used, including radioisotopes or other substances which may constitute a threat of contamination for sensitive analyses:

Substance	Weight/vol.	To be used for:
Sodium ¹⁴ C bicarbonate (~2 mCi)	10 g	MAR-CARDFISH
Glutaraldehyde	200 ml	Bacterial/Viral fixations
¹⁴ C/ ³ H-N-acetylglucosamine	Trace amount	Uptake assay
¹⁴ C/ ³ H-mixed amino acids	Trace amount	Uptake assay

Hazardous waste:

Substance	Weight/vol.	Comments
Seawater with ¹⁴ C/ ³ H residuals	20 L	filtrates

Disturbance to or sampling of organisms:

1. Species (scientific and English name)	Bacteria
2. Handling/sampling method	Freezing and fixation
3. Storage or handling onboard	frozen
4. Possible risks to health or environment	No risk
5. Consideration required from the ship/other researchers	No

Cargo to be taken onboard the ship:

Type, handling/storage	Weight (kg)	Volume (m3)
5 metal boxes	250	2

Cargo and samples to be taken off the ship:

Type, handling/storage	Weight (kg)	Volume (m3)
5 metal boxes	200	2
Seawater samples	100	0.3

Other support needed onboard Oden, or in preparation phase:

Establishment of a flow-through water bath on deck. This will ensure a stable temperature for our incubations. Needs to be placed in minimal shading.
