

## **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.***

<b>Principal Investigator:</b> Per Moksnes
<b>Project leader onboard <u>NBP</u> (if other than P.I.):</b>
<b>Project title:</b> Climate Change and predatory invasion of the Antarctic Marine Environment
<b>Participants onboard (tentative):</b> Total: 2 persons Name and function: Dr. Per Moksnes or Jon Havenhand (cruise project leader) Unnamed field assistant

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

The marine fauna of Antarctica currently lacks the durophagous predators that structure benthic food webs in nearshore habitats elsewhere. Sea temperatures are now rising rapidly and the physiological barriers to predatory reinvasion are coming down. Adult and juvenile anomuran king (lithodid) crabs have been discovered recently on the continental slope off the Antarctic Peninsula, where water temperatures are slightly warmer than on the shelf. In addition, larvae of brachyuran and anomuran crabs are entering Antarctic waters entrained in warm-core rings (mesoscale eddies) from the Antarctic Circumpolar Current. In collaboration with Richard Aronson, James McClintock, Sven Thatje and Hanumant Singh (US partners) we will assess the extent and consequences of the ongoing invasion by: (1) sampling the water column for larvae; and (2) sampling bottom water for demersal larvae and surveying the benthos for juveniles and adults, and for localized changes in community structure.

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

The collaborative project will deploy a number of sampling techniques including a benthic sampling with SeaBED AUV and an epibenthic sledge, and plankton sampling with multineets. All project partners will participate in all components, but the Swedish PI will primarily be responsible for the plankton sampling, which is planned to be carried out **on NBP** using the MOCNESS-1, 333  $\mu$ m mesh, 8 net multinet available on the ship.

- Using the multinet, seven discrete depths set initially at 500-400 m, 400-300 m, 300-200 m, 200-100 m, 100-50 m, 50-20 m, and 20 m to the surface will be sampled by towing the nets behind the boat at 2 knots for approximately 5 min per net. This sampling will primarily be carried out on open water. The first net will be open while lowering the multinet to target depth. Since this sample will not be used by our project it could

provide Dr. Dickhut's project with a plankton sample per station.

- Water salinity, temperature, and chlorophyll concentration will be continuously measured during sampling with the integrated CTD on the MOCNESS.

Sampling methods and sites when ship in motion

Site/area/transect	Type of sampling to be performed, volume of H <sub>2</sub> O collected
Three sites will be sampled around Marguerite Bay, west of the Antarctic Peninsula. These will be the same sites used by our American partners for the benthic studies.	Multinet plankton net tows at 2 knots, approximately 5 min per net; in total 1-2 h per site. Approximately 300 m <sup>3</sup> per net will be sampled. If time permits, 2 replicate tows will be carried out at each site.
Up to 8 sites will be sampled within the polynya of the Amundsen sea. This sampling will be carried out in collaboration with Dr. Yager's group, and follow her planned schedule and sites. Our project will extract meroplankton from the samples and provide Dr. Yager's group with the holoplankton.	Multinet plankton net tows at 2 knots, approximately 5 min per net; in total approximately 1 h per site. Approximately 300 m <sup>3</sup> per net will be sampled.
If time permits, we would also like to sample 3 opportunistic sites in the Ross Sea.	Multinet plankton net tows at 2 knots, approximately 5 min per net; in total approximately 1 h per site.

Sampling methods and sites from stationary ship

Sampling site	Type of sampling, weight/volume of samples and equipment, etc.	Time per station

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			

Deployment/retrieval of equipment

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

Which are the most prioritized sampling areas/methods?

Site/area	Method/type of sample	Other info
Marguerite Bay	Multinet	n/a
Amundsen Sea	Multinet	n/a
Ross Sea	Multinet	n/a

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

Standard electricity supply to all lab benches.
MOCNESS-1, 8 nets with 333 µm mesh, CTD and data cable (approximately 2000 m).
Winch for MOCNESS

Lab space	Wet lab	Dry lab	Other / specify
Meters of bench space	5m	5m	
Power needs (VA) 220/380 V	yes	yes	
Cold water (yes/no)	yes	yes	
Hot water (yes/no)	yes	yes	
Sewage (yes/no)	yes	no	
Compressed air (yes/no)	no	no	
Gas (yes/no)	no	no	
Fume hood (yes/no)	yes	yes	
Sea water intake (yes/no)	yes	no	
Other (specify)	n/a	n/a	

Special lab areas needed:

Clean air room	n/a
Other (specify)	

Storage of equipment and samples:

	Space needed (m <sup>2</sup> /m <sup>3</sup> )
Container	2 containers/lab units for AUV
Cold +2°C	n/a
Freezer -20°C	50-L
Other (specify)	

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:
Ethanol (70%)	30-L	Animal fixation
Formalin (40%)	20-L	Animal fixation

Hazardous waste:

Substance	Weight/vol.	Comments
n/a		

Disturbance to or sampling of organisms:

1. Species (scientific and English name)	All planktonic invertebrate and fish larvae occurring in sample area.
2. Handling/sampling method	Sampling by means of plankton nets
3. Storage or handling onboard	Fixation in 4% formalin or 70% ethanol
4. Possible risks to health or environment	Limited if Risk Assessment in place for handling formalin (protective gloves, coat)
5. Consideration required from the ship/other researchers	Fume hood in labs

Cargo to be taken onboard the ship:

Type, handling/storage	Weight (kg)	Volume (m3)
Lab equipment (microscopes, containers, consumables)	100	1
Personal items (4 boxes)	200	1
Sample boxes	50	1
Scientific gear (spare plankton nets)	50	1

Cargo and samples to be taken off the ship:

Type, handling/storage	Weight (kg)	Volume (m3)
Fixed (ethanol) samples in boxes	60	0.5
Fixed (formalin) samples in boxes	40	0.5
Personal items (4 boxes)	200	1
Scientific gear (spare plankton nets)	50	1
Lab equipment (microscopes, containers, consumables)	100	1

Other support needed onboard Palmer, or in preparation phase:

For Palmer: If possible, we would like to borrow two stereomicroscopes with measuring oculars. We would also like to borrow a digital camera that fit with the microscopes to take photos of selected part of the samples (if possible).