

## **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.***

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| <b>Principal Investigator:</b><br>Stephen Ackley  |
| <b>Project leader onboard ODEN (if other than P.I.):</b><br><b>Brent Nowak</b>  |
| <b>The Sea Ice System in Antarctic Summer, OS0 2010-11</b>  |
| <b>Participants onboard (tentative):</b><br>Total: 5 (+1) persons<br>Name and function:<br>Brent Nowak - Engineer, undersea photography, imaging, and IMB installation<br>Hongjie Xie - Ice Observations<br>Michael Lewis - Geophysics<br>TBN - Geophysicist<br>TBN - Engineer<br>(TBN – Polartrec Teacher) |

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

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| Cruise track region defined within the region described by 71° 30' to 72° 30' S latitude and 115° to 105° W longitude. Six (6) sea ice stations will be created through the deployment of two (2) sea Ice Mass Balance (IMB) buoys and camera masts and four (4) GPS thermistor (SAMS) buoys in a ring at 50km spacing between sites. At each site extensive ice sampling and measurements of thickness and snow depths will be conducted. Underway measurements of sea ice properties will be conducted continuously using cameras and EMI device. |
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Briefly describe sampling methods and major systems and equipment (collection method (i.e standard CTD, plankton nets, MOCness Nets, etc...))

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| (1) Underway measurements employing EMI, ice camera and visual observations.<br>(2) Sea ice stations – ice cores, ice properties and thickness, snow depths and snow properties, and under sea ice photography and imaging. |
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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 |
| Ice cameras               | Automated digital photography of ice conditions                        |
| Electromagnetic induction | Recorded measurements of total snow and ice thickness                  |
| ASPeCt ice observations   | 1 – 2 per hour, bridge observations by observer                        |

Sampling methods and sites from stationary ship

| Sampling site      | Type of sampling, weight/volume of samples and equipment, etc. | Time per station |
|--------------------|--|------------------|
| EMI 31 Calibration | Open water (ice lead) calibration of EM instrument             | 2 hours          |
|                    |  |                  |
|                    |  |                  |

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   |
|---|----------------|---|--|
| 6 site survey for buoy Installations, followed by buoy deployments. | 5              | 2 ice cores, 4 m, 31 kg, snow depths, ice thicknesses, EM transects, snow pits( 5kg snow samples) 2 sleds w/sampling gear | 12hrs x 2 (24h) (IMBsites)<br>9 hours x 4 (36h) (SAMS sites)                         |
| 8 opportunity site surveys (no installed equipment)                 | 5              | 2 ice cores, 4 m, 31 kg, snow depths, ice thicknesses, EM transects, snow pits,(5kg snow samples) 2 sleds                 | 4 hours (time on ice depends on other projects requirements)                         |
| Survey transect (if extra time or people available)                 | 4              | Laser level, 50 kg  | 8 hours (in conjunction with buoy site surveys if extra time or personnel available) |

Deployment/retrieval of equipment

| Site   | Type of equipment, weight/ volume, procedure, etc. | Time per station  |
|--|--|---|
| 2 IMB and 2 camera mast systems (1 each for 2 sites) | Drill 4 holes, install masts, connect h/w          | (within 12 hr site survey stations, 4hr for buoy installation after 8 hr site survey)   |
| 4 SAMS buoys   | Drill holes, install                               | (within 9 hr site survey stations, 1 hour for buoy installation after 8 hr site survey) |
|  |  |   |

Which are the most prioritized sampling areas/methods?

| Site/area  | Method/type of sample   | Other info |
|--|---|------------|
| 6 buoy installations and ice, snow samples, and measurements | Manual labor, augers, storing in containers, EM measurements, bagging snow, etc |            |
| 8 opportunity sites  | Manual labor, augers, storing in containers, EM measurements, bagging snow, etc |            |
| Survey transects at buoy sites                               | Laser level, , 50 kg  |            |
|  |   |            |
|  |   |            |
|  |   |            |
|  |   |            |
|  |   |            |

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

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|--|
| Camera – mount on bridge rail, requiring electric power and data cables, 2 <sup>nd</sup> camera to be mounted on ice tower rail of NB Palmer, requiring electric power and data cables |
| EMI – suspend from ship (frame, boom – TBD), requiring electricity, GPS feed, and data cables  |
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|  |
|  |

| Lab space                      | Wet lab | Dry lab  | Other / specify                             |
|--------------------------------|---------|--|---|
| Meters of bench space          |         | 1 sq. meter for EM, data acquisition.<br>3 sq. meter for filtration, sampling, salinity measurements | Band saw and polarized light box in freezer |
| Power needs (VA)<br>220/380 V  |         |  |   |
| Cold water ( <b>yes</b> )      |         | Deionized  |   |
| Hot water ( <b>no</b> )        |         | Deionized  |   |
| Sewage ( <b>no</b> )           |         |  |   |
| Compressed air ( <b>no</b> )   |         |  |   |
| Gas ( <b>no</b> )              |         |  |   |
| Fume hood ( <b>no</b> )        |         |  |   |
| Sea water intake ( <b>no</b> ) |         |  |   |
| Other (specify)                |         | Digital scales on cold room bench or table   |   |

Special lab areas needed:

|                 |  |
|-----------------|--|
| Clean air room  |  |
| Other (specify) | Freezer/ Cold room / lab at -20 C w/ power outlets and bench for light table, band saw |
|                 |  |

Storage of equipment and samples:

|                 | Space needed (m <sup>2</sup> /m <sup>3</sup> )                                |
|-----------------|---|
| Container       | IMBs, SIMBAs, field gear, cameras, quarter to half of one container)          |
| Cold +2°C       |   |
| Freezer -20°C   | 48 – 1 m ice cores in four core boxes (4m <sup>2</sup> or 3.5m <sup>3</sup> ) |
| 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: |
|----------------------------------|-------------|-----------------|
| Lithium Sulfur Dioxide Batteries | 200 kg      | buoys           |
| Fuels for Ice Augers             | 10 kg       | site surveys    |
|                                  |             |                 |
|                                  |             |                 |
|                                  |             |                 |
|                                  |             |                 |

Hazardous waste:

| Substance | Weight/vol. | Comments |
|-----------|-------------|----------|
| n/a       |             |          |
|           |             |          |
|           |             |          |
|           |             |          |

Disturbance to or sampling of organisms:

|   |     |
|---|-----|
| 1. Species (scientific and English name)                  | n/a |
| 2. Handling/sampling method                               |     |
| 3. Storage or handling onboard                            |     |
| 4. Possible risks to health or environment                |     |
| 5. Consideration required from the ship/other researchers |     |

Cargo to be taken onboard the ship:

| Type, handling/storage  | Weight (kg) | Volume (m3) |
|---|-------------|-------------|
| Akio sleds (2)  | 30          | 1.0         |
| Auger motor, 3.5kw generator, survey pallet   | 120         | 1.0         |
| Isotope sample bottles (10 cases)   | 15          | 0.2         |
| Ice Auger Pallet (coring/thickness)   | 50          | 1.5         |
| 2 IMB buoys (plus 2 camera masts in 4 core boxes)   | 140         | 2.5         |
| 4 SAMS buoys  | 100         | 1.0         |
| Batteries (LiSO <sub>2</sub> )  | 200         | 2           |
| Kayak (3 m x 0.3 m x 0.3 m)   | 30          | 1.5         |
| EM31  | 30          | 0.3         |
| Peripheral Geophysics gear  | 20          | 0.5         |
| Cameras and peripheral gear   | 30          | 0.75        |
| 3 – under sea photography systems   | 30          | 3.3         |
| Misc gear, digital thermometer, filtering manifold w/vacuum pump, bench salinity meter, core tubing, filters, tapes, rulers, snow density kit, tools, etc | 50          | 1.5         |

Cargo and samples to be taken off the ship:

| Type, handling/storage   | Weight (kg) | Volume (m3) |
|--|-------------|-------------|
| 3 core boxes (frozen)  | 200         | 1.5         |
| 1 core box (water samples)   | 100         | 1.5         |
| 1 small frozen samples (filters)   | 15          | 0.4         |
| Return equipment (EMI, Cameras, Sampling Gear, Kayak, all of above except 6 buoys deployed w batteries masts, etc) | 400         | 11.5        |
|  |             |             |
|  |             |             |
|  |             |             |

Other support needed onboard Oden, or in preparation phase:

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| Deploy frame for underway EMI measurements |
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