LARISSA Planning Meeting 6 May 2008

LDEO

Attendees:

E. Domack, A. Gordon, B. Huber, A. Leventer, M. Vernet

Goals for the meeting:

Finalize site selection criteria (to the extent possible); develop plans for each mooring so we can begin the detailed design process and start acquiring equipment and materials

Establish CTD site selection criteria (primary/secondary/opportunity); finalize instrument needs for SIP submission

Clarify requirements for underway data collection; establish calibration and data quality control requirements and responsibilities.

Preliminary mooring sites and proposed CTD sections are summarized on the attached figure.

Moorings

Eleven sites were identified (listed in order of final discussion)

1.	65 30 S	61 30 W	Cold seep Traps, T/S	Possibly do a short term deployment of 2 moorings: one with 2 traps at mid- and bottom, second with near surface trap and surface float for recovery (no release) then redeploy single 2-trap mooring for 2 year deployment
2.	65 30 S	60 00 W	Traps, T/S	Part of shelf flux trap array – positions to be determined to pick up outer shelf mooring
3.	66 00 S	58 00W	Traps, T/S	Part of flux array - pos to be determined as above
4.	66 45 S	56 00W	Traps, T/S U/V	Outer shelf – traps plus temperature, salinity, currents Located at sill
5.	66 30 S	55 00 W	T/S, U/V	mid slope, approx 1200 m isobath
6.	68 00 S	60 W	Traps, T/S U/V	In front of Larsen C in trough

7.	65 30 S	57 00 W	Traps, T/S U/V	Pending multibeam survey and CTD section to determine possible outflow path from Larsen B
8.	65 10 S	61 30 W	Hektoria Basin	
9.	65 26 S	62 03 W	Crane Glacier	mid or outer basin
10.	65 45 S	61 30 W	SCAR inlet	
11.	64 22 S	57 46 W	Swift Gl	Has established record – baseline measurements; as time allows

Mooring site selection – guiding principles

General – most sites will be selected only after completing a multibeam/CTD-LADCP/ADCP survey of the general area

Larsen C shelf-slope moorings (4,5 and 6) - placed to capture any outflow of deep and bottom waters exiting the Larsen C system along the purported ridge near 66 30 S. Mooring 5 site and depth TBD pending CTD/LADCP survey. Mooring 6 to be placed in trough in front of ice shelf at about 68 S (but need to confirm trough characteristics, and carry out full along-trough survey before mooring site is selected.

Biogenic particulate flux array – trap mooring positioned to create a cross-shelf array of sites, using cold seep mooring and Larsen C outer shelf mooring as endpoints (thus the position/spacing of these moorings will be determined after site selection of the Larsen C endpoint)

Larsen B outlet – pending more complete multibeam and CTD survey of shelf-sill- shelfbreak region near 65 30S – mooring placed to capture possible outflow of water exiting Larsen B via Robertson Trough.

8-10 – sited as needed for best resolution of sedimentological processes

Swift Glacier - as time allows

Resources and design considerations

All trap moorings will carry two traps at mid and near bottom depths. Bruce will explore a design using a negatively buoyant pickup line from the top of the mooring, attached at its distal end to an anchor and buoyant CART release. The mooring can be picked up vertically by triggering the release which will float the pickup line to the surface for recovery. In the event the CART fails to release, the mooring will be recovered by dragging the pickup line. Mooring 5 on the slope will be a standard design without pickup line, and using a deep 8242 release.

There are 3 traps at LDEO, and money to construct an additional 15. Mooring 5 (1200 m on slope) is likely to experience energetic flows and will not carry a trap.

Mooring line will be hollow braid polyester (eg Samson Tenex). This is easy to splice in the field, lightweight and robust, and less expensive per unit length than wire rope.

Bruce will experiment with the traps available at LDEO to devise an appropriate bridle. We also discussed the possibility of constructing fiberglass frames for the traps which could help keep the traps upright.

Other action items – After this document is circulated and comments received, Bruce will produce a budget estimate for the desired moorings to see if we fit within the OPP-provided "not to exceed" amounts.

CTD sites/surveys

CTD/LADCP/multibeam surveys will precede the mooring site selections. Additional CTD/LADCP (multibeam/ hull adcp) sections are needed to close off the basins and across the shelf/slope at 3 crossings (near Robertson Trough, along approximately 66 S, and in Larsen C trough). Nominal station spacing will be not more than 10 km, but water sampling need not be carried out at all stations.

The potential for exchange between Larsen A and B basins will be explored with sections along the north and south sides of the peninsula formed by Seal Nunataks and Robertson Is.

Cross-shelf sections will be carried out from, for example, the front of Crane Glacier out to one of the shelf/slope sections (perhaps along the line defined by the biogenic flux mooring array?)

In addition to the sections, a course grid should be occupied within Larsen B, with repeated or time series stations at a sub grid to capture tidal characteristics. These can be done as time allows during flight ops for example (one of the "opportunistic" measurements we discussed briefly during the Feb meeting).

Instrumentation:

Fluorometer, transmissometer, PAR (new instrument good to 2000 m – must confirm). Can newly-acquired RPSC camera be mounted on the CTD/Rosette frame? Maria will inquire about methane sensors for CTD.

At present, no one has been identified to perform Winkler titrations for oxygen or to run salinity samples. We will request the titrator and chemicals in the SIP anyway and try to identify person or persons to conduct the analyses.

Underway sampling

Still to be resolved – calibration protocol for underway fluorometer. RPSC is in the process of integrating a new fluorometer (Wetlabs?) in the TSG stream, so calibration procedure will depend upon the success of that installation. This can probably be handled on the fly during the cruise.

Figure 1. Map of LARISSA region showing preliminary mooring sites (blue squares) and proposed CTD/LADCP sections (light blue lines). Potential time series sites are identified by light red squares. These areas were derived from the sample time line presented by Gene at the February meeting, identifying regions in which flight ops would likely constrain ship movement for a day or more.

CTD stations occupied during the Ice Station Weddell program of 1992 are shown as green diamonds, with the bottom depth measured at selected stations in parentheses. Mercatur projection. Bathymetry is Sandwell-Smith v9.1, 1 minute resolution.