

## Project AFI 4-13

### Biogeochemical particle flux Study in Marguerite Bay, Antarctic peninsula

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#### *General Overview*

The overall aim of this AFI project is to calculate a salt, heat and nutrient budget for Marguerite Bay – the embayment which is adjacent to Rothera research station. This is achieved by a combination of long-term moorings deployed from research ships in Marguerite and Ryder Bay and small boat work which was carried out during the previous season (2005-06) at the Rothera biogeochemical Time Series (RaTS) site in the centre of Ryder Bay.

#### *Cruise work*

Cruises were undertaken at both the start and the end of the 2006-07 season using the RRS *James Clark Ross* on cruises JR155 (15-17/12/2006) and JR 174 (9/4/2007) and for further details on these cruise please refer to the appropriate cruise reports. On both cruises CTD casts were made at two mooring/study sites. The mooring sites are shown in figure 1 and were at the relatively shallow Rothera biogeochemical Time Series site (Site A; 500m depth) in Ryder Bay and also at a deeper site further west in Marguerite Bay (Site B; 800m depth).

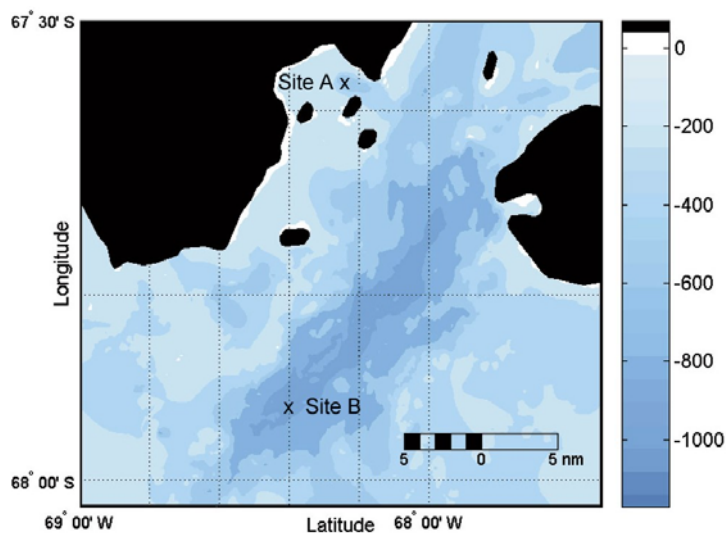
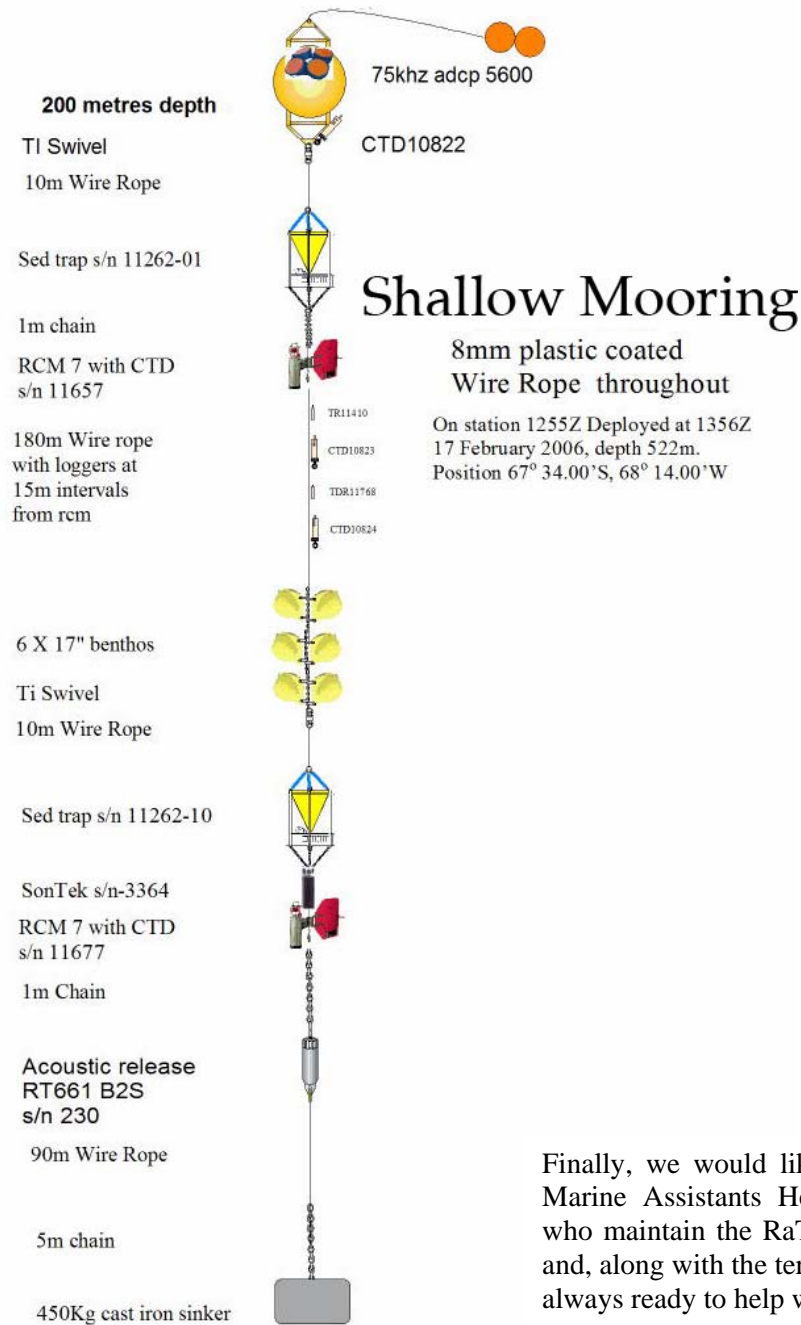


Figure 1 Location of moorings in Marguerite Bay

At the deep mooring site, unfortunately the deep mooring which had been deployed there at the end of the previous season on cruise JR137 (15-17/2/06) was unable to be recovered. Initially the cause of failure was most likely to have due to the failure of the mooring release. When the mooring location was later investigated by the ROV Isis the whole mooring had gone, most likely due to an iceberg collision. Therefore on this occasion and on the later JR174 cruise a CTD cast only was made at this site.

At the RaTS site the mooring was successfully recovered and redeployed on JR155 and successfully recovered finally on JR 174. The mooring was not redeployed since this was the end of the fieldwork. The mooring had an array of oceanographic instrumentation to measure water properties such as salinity, temperature and current velocities at various depths throughout the year (see figure 2). In addition there were two sediment traps on each mooring to measure biogenic flux from surface waters to the seafloor and quantify changes down the water column as described in the previous field report. These samples will be used to help calculate the mass balance of the region and also used for palaeoclimatic proxies by other AFI projects.

The CTD cast at each site was made at a range of depths from the bottom to the surface waters with samples collected for macronutrients, particulate biogenic silica, carbon and nitrogen for later analysis.



**Figure 2.**  
The shallow mooring schematic from the RaTS site showing the instruments and construct, and detailing the location, times, depth and serial numbers

Finally, we would like to especially thank the Rothera Marine Assistants Helen Rossetti and Alison Massey, who maintain the RaTS sampling in winter and summer and, along with the terrestrial assistant Richard Hall, were always ready to help with this project.