SOUTHAMPTON OCEANOGRAPHY CENTRE

CRUISE REPORT No. 7

RRS *CHARLES DARWIN* CRUISE 101C LEG 2
14 JUL-20 AUG 1996

Atlantic Margin Environmental Survey: Seabed survey of the shelf edge and slope west of Shetland

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1997

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Southampton Oceanography Centre, Cruise Report No. 7, 127pp. & appendices.

ABSTRACT

This was the second of two cruises, the overall objective of which was to undertake an integrated baseline environmental survey of the continental slope west of Shetland. The primary objective of this cruise was to carry out a large-scale seabed sampling survey of the area to the west of Shetland. In total some 200 seabed stations were sampled using either a Megacorer, Box corer or Day grab, and samples collected for the subsequent analysis of macrobenthos, hydrocarbons, heavy metals, particle size and total organic carbon and nitrogen. Additional survey operations included photographic reconnaissance of the seafloor using the SOC WASP system and the collection of demersal fish using pop up fish traps. Shipboard observation of seabed samples suggests that the survey region is very heterogeneous in terms of both sediments (as observed by TOBI sidescan sonar during the preceding cruise) and benthos. Particular features of note include highly developed epifaunal communities on the numerous ice rafted rocks in the 300 - 600m depth range and an abundant population of, apparently, sediment surface dwelling enteropneusts on a sandy contourite sheet located in the mid to north reaches of the survey at depths of 800 - 1000m.

ACKNOWLEDGEMENTS:

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KEYWORDS

ATLANTIC MARGIN ENVIRONMENTAL SURVEY; BENTHIC COMMUNITIES; BOX CORER; *CHARLES DARWIN*/RRS; CRUISE 101C LEG 2 1996; DAY GRAB; DEMERSAL FISH; FAEROE-SHETLAND CHANNEL; FISH TRAP; HEAVY METALS; HYDROCARBONS; MACROBENTHOS; MEGACORER; NE ATLANTIC; PHOTOGRAPHY; PHOTOSLEDGE; SEDIMENTS; SHETLAND; TRAWL; WASP; WEST SHETLAND SHELF

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3. ITINERARY

Sailed Aberdeen	4 July 1996
Arrived Fairlie	20 August 1996

4. OBJECTIVES

4.1. Primary survey objectives

1. To carry out a large-scale survey of the benthic environment in the region to the West of Shetland based on a stratified random sampling design.

2. To carry out a depth-related transect survey at one location on the West Shetland Slope.

3. To carry out, as part of the transect survey, a sampler / sample intercomparison exercise for the seabed sampling equipment deployed in the course of the survey.

4. To carry out a large-scale photographic survey using the WASP camera system.

5. To carry out a photographic transect survey using a photosledge.

6. To sample demersal fish throughout the region using pop-up fish traps.

7. To recover a Bathysnap camera system previously deployed in the area.

4.2. Secondary survey objectives

8. To expand the large-scale benthic survey by sampling strategically located sites to improve general coverage and / or investigate features revealed by TOBI sidescan data.

9. To similarly expand the large-scale photographic survey using the WASP camera system.

4.3. Post -survey, 'NERC Days' objectives

10. To carry out additional seabed sampling on the transect.

11. To sample megabenthos and fish using otter trawl.

5. NARRATIVE

5.1 Diary

Sunday 14 July

Completed loading and embarkation of scientists. Scientific party given safety instruction and an emergency muster and boat drill carried out. Sailed Aberdeen 2100 BST.

Monday 15 July

On passage to survey area. Science meeting held to familiarise scientific party and ship's senior officers of the purpose and planned conduct of the survey. Scientists unfamiliar with *Charles Darwin* given guided tours of the ship's spaces normally accessible to scientists. SOC, ERT and OPRU representatives meet to discuss sampling protocols.

Tuesday 16 July

Arrived at first survey station 0500 UTC; 10 kHz and 3.5 kHz fish deployed. Successfully worked Megacorer at sites X1, X2, X3, X4, V4 and V3.

Wednesday 17 July

Successfully worked Megacorer at sites X5, V2, and V1. Carried out wire test of acoustic releases. Following two Megacorer failures at site S4, repeated wire test of releases; the first test having failed as a result of a deck unit fault. Switched to Box corer and successfully worked sites S4, S3 and S5.

Thursday 18 July

Continued successful operation of Box corer at sites T1, P1, P2, H1 and H2. After two box corer failures at site H3 switched to Day grab; one useful sample (chemistry) taken in three attempts. Three attempts with no success at site E1. Similarly, no success at site B1 despite three attempts with the grab and two with the Box corer. One of two grabs at site E2 yielded a useful sample (chemistry).

Friday 19 July

Work at E2 continued with three unsuccessful grabs and two unsuccessful box corers. Site H4 was completed with a single drop of the Box corer. At site E3 three Box corers and four grabs yielded only a chemistry sample. Sites H5, L1, L2, P3 and L3 were successfully completed with single drops of the Box corer. In transit from H5 to L1 a fire drill and emergency muster to boat stations were carried out. On recovery of the Box corer at site P3 a rope was fouled round the top of the corer and appeared to be leading aft in to the propeller - this was freed by slowly reversing the propeller for a few revolutions. Two attempts with the box corer and four with the grab produced a full set of samples for site E4. In contrast, only two drops of the grab were required at site E5.

Saturday 20 July

Continued working the grab: four drops at B3 for a full set of samples; seven at B2 for a chemistry sample only; six at B4 and four at B5, both yielding full sample sets. Started working the transect with the grab: six drops at '200m' and five drops at '250m' produced full sample sets, while five drops at '300m' yielded no useful samples. Switched to Box corer and successfully completed '350m', L5 and '450m' with single drops. Continuing with the Box corer, site L4 required two drops but site P4 only one.

Sunday 21 July

Continued successful operation of the Box corer on the transect, sites '550m', '600m', '650m' and S2 completed. Deployed fish trap at '500m'. Successful Box coring continued at sites P5, '800m' and '900m'. Next attempt with the Box corer failed in the 'Black Hole' sandy sediments of the '1000m' site. Returned to the fish trap position and successfully released and recovered the trap after a 9.5 hour soak. Switched to the Megacorer and continued transect sampling, successfully operating the corer at the '550m' and '650m' stations.

Monday 22 July

Continued working the Megacorer on the transect, successfully completing sites S2 and '600m'. Deployed fish trap at '800m'. Successful Megacorer drops at '800m', '900m' and '1000m'. Made second attempt to Box core the '1000m' site, again with no success (it will not work in the 'Black Hole' sand). Box core failed again at site U1, another 'Black Hole' type location. Released and recovered the fish trap after an 11 hour soak. Returned to site U1 and successfully recovered a full suite of sample with the Megacorer. Ship's safety committee convened for a regular meeting (principal scientist is a co-opted member as a head of department). Two items of relevance to the current cruise were raised: a) the need for continued vigilance, and washing down, of mud on the deck; b) with regard to rope round the prop incident, the prompt action of the duty seaman was praised, and a recommendation made (and implemented immediately) that a back-up battery for the deck VHF walkie talkie always be available in the main laboratory.

Tuesday 23 July

Continued working on, and in the vicinity of, the transect. Site S1 successfully completed with the Megacorer, sites N1, K1 and G1 successfully completed with the Box corer. Fish trap deployed at '300m'. Successfully worked Day grab at '350m', L5, '450m' and L4. Following one failed attempt with the grab at '600m' returned to, released and recovered the fish trap after an 11.5 hour soak. Ended day with a revisit to '300m' site, where four grab drops produced a full sample set.

Wednesday 24 July

Begin main operations in the North zone. Successfully sample sites A1 and A2, though both require eight drops of the grab. Site A3 takes only two grabs to complete but A4 a further seven drops. Attempt to switch to Box corer at site D1, but after two failures return to Day grab which requires five drops to produce the full sample suite. At site D2 a single attempt with the Box corer fails and samples are collected with four drops of the grab. Successfully switch to the Box corer and complete sites G2, K2, N2, R1 and K3 with a single drop each.

Thursday 25 July

After four Box corer failures (one of which produced some fragments of dead *Lophelia*) at site D3 switched to grab and collected full set of samples in two drops. Similarly, at site G3 after two Box corer failures switched to grab and completed sampling with five grab deployments (one of which contained fragments of living and dead *Lophelia*). On a second attempt the Box corer worked successfully at site K4. Deployed fish trap at '500m'. Successfully released and recovered Bathysnap (WoS#1) originally deployed 15 September 1995. Completed site N4 with a single drop of the Box corer. A trial deployment of the WASP system was carried out. Completed site N3 with two drops of the Box corer. Sites R4 and R5 were completed with single drops of the Box corer.

Friday 26 July

Continuing operations in the north zone. Box cored sites N5 and K5. After a Box corer failure at site G4 switched to Day grab and completed sampling at G4 (3 drops) and G5 (5 drops). Fish trap successfully released and recovered, and subsequently redeployed at '300m'. Finished the day with a run of three WASPs at '300m', '500m' and '800m'.

Saturday 27 July

Working Day grab in shallower strata of north zone: repeated G5 for better macrobenthos sample (2 drops); completed sites D5 (5 drops), A5 (5 drops) and D4 (5 drops). Fish trap successfully released and recovered, and subsequently redeployed at '800m'. Switched to Megacorer and completed sites U4 and W4.

Sunday 28 July

Working Megacorer in deeper strata of north zone: completed sites W5, U5, R2 and R3. Fish trap successfully released and recovered. Continued with Megacorer, completing sites U3 and U2. Deployed fish trap at '1100m'. Megacored Y3 to finish the day.

Monday 29 July

Continued Megacorer operations in deep strata of north zone; completed sites Y4, W3 and W2. Fish trap successfully released and recovered. Continued with Megacorer, completing sites W1 and Y5.

Tuesday 30 July

Continued Megacorer operations in deep strata of north zone; completed sites Z4, Z5, Z3 and Z2. Subsequent deployment of Megacorer at site Z1 appeared to have landed on its side snapping off three of the bottom closing sliders, likely cause appeared to be strong current running. Switched to Box corer and successfully completed sites Z1 and Y1.

Wednesday 31 July

Completed initial operations in the north zone with successful deployment of Box corer at site Y2. Proceeded to south zone via site V5 (mid-zone), completing that site with a single drop of the Megacorer. Started working the south zone with Box corer: completing stations M1 (significant damage to box), Q1, T2 and Q2. After two Box corer failures at site M2, attributed to strong current, deployed the HORNET camera system in the vicinity of site M2 at '500m'.

Thursday 1 August

Continue working Box corer in south zone; completed sites M2 (current now reduced), M4, Q5 and M5. Subsequent deployment of Box corer at J5 resulted in significant damage to the box and a break at a weld in the corer's support frame. Switched to Day grab and completed site J5 in four drops. Site F5 yielded no samples after seven attempts and was abandoned. Sites C14 (3 drops) and C15 (4 drops) successfully completed. After seven failed attempts site C10 was abandoned. Ten drops of the grab at site C2 yielded only chemistry samples and the site was abandoned. HORNET was deployed in the vicinity of C2 at '100m' to end the day.

Friday 2 August

Working Day grab in shallow strata of south zone: C3 abandoned after eight failures; C4 completed (4 drops); C5 completed (5 drops); C9 abandoned after seven failures; and, C1 completed (4 drops). Emergency drill and muster to boat stations carried out on transit to following site. Continued working the grab, completing sites: C8, C7, F4, F2, F1 and C13, each requiring between two and seven drops of the grab.

Saturday 3 August

Continued operations in the south zone. With Day grab completed sites C6 (2 drops), C11 (9 drops) and C12 (6 drops). Moved to deeper J stratum and switched to Box corer; completed sites J1 and J2, but after three failures at J3 reverted to grab. Completed site J3 with three drops of the grab. Deployed Fishsnack (fish trap with camera system) at '800m'. Ended the day with successful Megacorer operations at site T3.

Sunday 4 August

Worked Megacorer at site T4, completing the site with four drops. Switched to Day grab and completed sites J4 (8 drops) and F3 (5 drops). Switched to Box corer and completed site M3; this

deployment resulted in serious damage to the corer - a weld on the lever arm at the pivot point was sheared through. Relocated to the Fishsnack position and attempted to release the mooring. Although acoustic contact was readily made and the transmission of the release code was acknowledged by received and executed returns the mooring failed to rise. Remote diagnostic checks confirmed that the release unit was fully powered and in a vertical position; i.e. there was no reason for the release to have failed to operate. The symptoms suggested that the release had operated correctly, but that the release link attached to the ballast weight remained (on a knife edge) in the open jaw of the release - possibly as a result of the frame lying at a slight angle from the horizontal. If these assumptions were correct then the mooring was likely to rise either when given a 'tidal nudge' or if dislodged by dragging. *Charles Darwin* therefore remained hove to over the mooring and preparations were made for a dragging attempt (500 m of sacrificial pennant were wound on to the main warp and the wire diverted to the after A-frame).

Monday 5 August

By mid-morning it was clear that conditions would not be suitable for a dragging attempt (force 8 winds), the vessel was therefore re-rigged for coring and survey work recommenced. Successfully worked the Megacorer at sites T5, Q4 and Q3.

Tuesday 6 August

With conditions still unsuitable for dragging proceeded to shallow strata of mid-zone to re-sample sites where no or only partial sample sets had been recovered in previous attempts. Working Day grab completed H3, E1, B1, E2, B2 and E3. With weather conditions now improved planned to make an attempt at dragging mooring at first light next day; for remainder of this day worked Megacorer at AA sites (additional sites located to improve alongslope coverage). Three drops at AA3 produced only a set of chemistry samples, while three drops at AA5 produced a full set of samples. On completing site AA3 *Charles Darwin* set course for the Fishsnack position.

Wednesday 7 August

On route to the FISHSNACK position *Charles Darwin* received a radio communication from the standby vessel *Viking Protector* informing us that they had found and recovered the mooring. A rendezvous was arranged just off the drill rig *Ocean Alliance* and the mooring (intact) was boat transferred from *Viking Protector* to *Charles Darwin*. Worked Day grab at site F1 to improve quality of macrobenthos sample. After three failed attempts with the grab at site AB2 (an additional shelf C site) repositioned the site and obtained a set of chemistry samples from three drops. Broke off sampling to rendezvous with supply boat *Far Grimshader*. Boat transferred WASP camera technician and sundry goods (e.g. wellie boots for those developing trench foot) from *Far Grimshader* to *Charles Darwin*. Completed site AB2 with a final drop of the grab for a macrobenthos sample.

Recommenced operations at AA sites; successfully working the Box corer at sites AA1, AA2, AA3 and AA4.

Thursday 8 August

Continued operations at AA sites; successfully working the Megacorer at sites AA6, AA7, AA8 and AA9. The WASP system was deployed for a short trial. The Megacorer was deployed at '650m' to provide an archive (frozen) sample from this site which was previously noted (53757#1) to be somewhat 'unusual' (a possible temperature anomaly and rich fauna). Commenced sampling AC sites (study local variation in an area of featureless sidescan). Working Box corer, successfully completed sites AC1 to AC4 (note that AC1 was an exploratory deployment and should be discounted from the analysis of other AC sites).

Friday 9 August

The WASP system was deployed for a short trial. Sampling at AC sites was successfully completed with Box corers at AC5 and AC6. Commenced sampling AD sites (study of local variation in an area of varied sidescan - barchan dunes). Worked Box corer successfully at sites AD1 to AD5. Successfully deployed WASP at '300m' and '400m' on the transect. Completed sampling of AA sites with two Megacorer drops at site AA10.

Saturday 10 August

Successfully deployed WASP at '600m' on transect. Worked Day grab in the A stratum; repeating site A1 for a better chemistry sample (6 drops) and successfully sampled AE sites (additional shelf stratum A sites), AE1 (4 drops) and AE2 (3 drops). Deployed WASP at '300m', '500m' and '800m' locations in the north zone.

Sunday 11 August

Continued WASP operations with successful deployments at '1100m', '800m', 500m' and '300m' on the transect. Towed photosledge down transect, '400-600m'; film run through camera, however, flash gun dislodged by contact with solid object (boulder) also other signs of 'crash' damage on sledge. WASP successfully deployed at '400m' on the transect. Initiated sampling of AF sites (additional shelf stratum B sites), successfully worked Day grab at site AF1 (6 drops).

Monday 12 August

Completed work at AF sites with two drops of the grab at site AF2. Successfully deployed Box corer at site AG1 to investigate an area of 'smoothed' iceberg ploughmarks. Initiated sampling of AH sites (study of local variation in an area of varied sidescan - iceberg ploughmarks); working Box corer, completed sites AH1, AH2 and AH3. Broke off sampling to boat transfer WASP camera technician from *Charles Darwin* to supply boat *Far Service* in the vicinity of the drill rig *Stena D.* Recommenced work at AH sites. Successfully sampled AH4, but after two failures abandoned site

AH5, then located and successfully sampled a new site, AH6. Completed investigation of areas of 'smoothed' iceberg ploughmarks with a Box corer deployment at site AG2. Switched to the Day grab to investigate an 'ice margin scour hole', retaining a set of chemistry samples from the first deployment and carrying out a second deployment to confirm the general nature of the ground. Continued working the grab at site F6 (8 drops), a 'new' F stratum site to act as a replacement for the abandoned site F5.

Tuesday 13 August

Completed sampling of AB sites with two successful deployments of the Day grab at site AB1. Commenced sampling 'new' and repeat sites in the C strata with the grab. Completed C18 (4 drops) and C17 (2 drops) but abandoned site C16 after ten failed drops. Finally obtained a macrobenthos sample from site C2 after seven drops. Successfully deployed WASP at '100m', '300m' and '500m' in the south zone.

Wednesday 14 August

Completed WASP operations in the south zone with a successful deployment at '800m'. Moved to the mid-zone and completed a WASP run in the area of canyons. Proceeded to vicinity of Amoco well site 208/17-B (north zone) and commenced a sampling programme with the Megacorer; successfully completing sites AK1 to AK3.

Thursday 15 August

Continued working the Amoco well area, completing sites AK4 to AK9. Successfully deployed WASP in the adjacent 'Amoco coral area' at '570m'. Survey time ends; NERC time begins. Continued WASP operations with a successful deployment in the vicinity of a fault-like feature image by TOBI. Relocated to shallow end of transect. Made two test deployment of Van Veen grab and began an additional sampling programme on the transect working the Megacorer. All deployments at '200m', '250m' and '300m' failed.

Friday 16 August

Continued working Megacorer on the transect, successfully completing sites '350m', L5, '450m', L4, '550m', '600m', '650m', S2, '800m', '900m', '1000m' and '1100m'. Deployed fish trap at '1400m' in the north zone. Successfully deployed WASP at '1400m' (north zone) and '1200m' (transect).

Saturday 17 August

Continued WASP operations with a deployment at '1000m'; however, no film run, a total failure. Fished otter trawl (OTSB14) along the 1400m contour in the north zone - on recovery the net a total write off, though retaining a small catch. Successfully released and recovered the fish trap after a soak time of 23 hours. Day ended with two further WASP deployments at '900m' and '700m' on the transect.

Sunday 18 August

Carried out the final WASP deployment of the cruise in the 'coral area' of the Kingfisher Chart. Completed cruise by sampling a final 'new' C site, C19, obtaining a full set of samples with seven drops of the Day grab. 3.5 kHz and 10 kHz fish recovered and ship set on passage to Fairlie at 1448 UTC.

Monday 19 August

On passage to Fairlie. Scientific party stow gear and samples, and clean vessel in readiness for demobilisation.

Tuesday 20 August

Charles Darwin starboard side to Fairlie NATO pier by 0800 BST, demobilisation commences. Majority of scientific part depart vessel by 1200 BST, remainder by 1700.

5.2. Time allocation record

In port:	Mobilisation, Aberdeen	21 hrs	
	Demobilisation, Fairlie	16 hrs	
At sea:	Outward passage	32 hrs	
	Inward passage	41 hrs	
	Survey	729 hrs	35.0 days
	'NERC days'	73 hrs	3.0 days
Survey:	Active time	700 hrs	96 %
	Down time	29 hrs	4 %
	avoiding siesmic vessels	4 hrs	
	boat transfers	4 hrs	
	repairs	5 hrs	
	fish trap recovery	16 hrs	

5.3. Conclusions

Progress towards objectives

1. *Large-scale survey*. This objective was fully met; five full sample sets were obtained from each of the survey strata.

2. *Transect survey*. This objective was fully met; full sample sets were obtained at approximately 50 m depth intervals from 150 m to 600 m and thereafter at 100 m interval to 1000 m.

3. *Sampler / sample intercomparison*. This objective was well met; samples for the comparison of Day grab and Box corer were obtained from four stations between 350 m and 500 m, samples for the comparison of Box corer and Megacorer were obtained from six stations between 550 m and 900 m.

4. *WASP camera survey*. This objective was fully met; 22 successful WASP deployments were made throughout the region.

5. *Photographic transect*. This objective was only partially attempted; only one of three planned photosledge deployments was made. The first deployment of the photosledge results in substantial damage to the sledge as a result of contact with rocks / boulders.

6. *Fish trapping*. This objective was largely achieved; only eight of the planned ten deployments were attempted. Deployments at 300 and 500 m in the south zone were cut from the programme as a result of the high risk of mooring loss in this intensively trawled area.

7. *Bathysnap recovery*. This objective was fully achieved.

8. *Additional seabed sampling*. This secondary objective was very successful; samples were obtained from some 44 strategically located stations.

9. *Additional WASP surveying*. This secondary objective was achieved; four strategically located WASP deployments were carried out in addition to those of objective 4.

10. *Additional transect sampling*. This objective was achieved; samples were obtained from 12 transect stations between 350 and 1100 m.

11. *Otter trawling*. This objective was attempted; however, the first deployment of the trawl resulted in a total write off of the net and no further trawling was attempted.

In total I believe it is fair to describe this cruise as extremely successful. Clearly, fine weather played a significant role in the success of the cruise. However, it is worth noting that weather and sea conditions were significantly worse than expected / planned for (see Appendix 1). The success of the seabed sampling programme, despite significant swell height for much of the cruise, must be attributed to a combination of the stability of RRS *Charles Darwin* and her purpose build mid-ships gear handling system. This level of success would, in my opinion, not have been possible from a stern gantry. For this, and numerous other reasons, I believe that it is important to record that the level of success achieved during this cruise largely depended on the use of a purpose built multi-role ocean-going research vessel. Equally, it must be noted that the potential of the vessel can only be realised, as in this case, when she is operated by a skilled and experienced crew.

5.4. Acknowledgements

To say I was pleased with this cruise would be a vast understatement. The amount of work done was tremendous. This was a long and busy cruise, yet the atmosphere aboard remained relaxed, friendly and sociable at all times. I could write several pages in praise of numerous individuals aboard; however I don't think that would be entirely fair. My sincerest thanks instead go to every single person aboard, because I'm sure that everyone made efforts beyond the normal call of duty; thank you all. I would also like to thank all those from RVS and IOS at SOC who were lumbered with the preparation and mobilisation of this cruise while I swanned off on the first leg of the survey; all your efforts were very much appreciated.

BRIAN BETT

6. GEAR REPORTS

6.1. Acoustic systems

The 10 kHz sounding and 3.5 kHz profiling systems performed without incident. Acoustic command (deck units) and monitoring (Waterfall displays) systems were similarly reliable. The Nautronix USBL system suffered a limited number of minor problems. The battery pack in one transponder became unreliable and was replaced with a pack made up from batteries available aboard. The hull mounted hydrophone failed / timed out on a few occasions, no cause was determined; this was cured by switching the system off and on (an effective treatment not mentioned in the supplied manual).

6.2. Day grab

A standard 0.1 m² Day grab, supplied by RVS, was employed during the survey, it was rigged and deployed in the conventional manner. A total of 367 Day grab deployments were made during the cruise, of which only 144 produced useful samples (i.e. an overall success rate of 31 %). The failures can be categorised as follows:

Gear failed to trigger	1.8 %
Gear fouled by swivel or warp	2.2 %
Grab fired but empty	10.7 %
Jaw closure obstructed (pebbles or rocks)	66.5 %
Poor and/or small sample only	8.9 %
Sample of gravel or rocks	10.7 %

The high failure rate is very largely attributable to the nature of the ground and is likely to be common to all grab types operated in this region. Other than varying the ballast loading and replacing a kinked activating warp no significant repairs or modifications were necessary.

6.3. Box corer

A modified USNEL-type 0.25 m² spade box corer, supplied by RVS, was used during the survey, it was rigged and deployed in the conventional manner. A total of 118 box corer deployments were made during the cruise, of which 77 produced useful samples (i.e. an overall success rate of 65 %).

The failures can be categorised as follows:

Gear failed to trigger	7.3 %
Warp fouled on lifting eye	12.2 %
Short sample; top water not held	61.0 %
Little or no sample	12.2 %
Other failures	7.3 %

Although the success rate was not particularly high, the Box corer performed very well throughout the cruise. The key problem was the gear's inability to hold short cores when recovered to the deck. Limited sediment penetration and hence short cores mainly occurred in two situations: in the shallow strata of the north zone where the superficial sediment is underlain by stiff boulder clay, and in the 'Black hole' sand of the deeper strata in the north and mid zones. Penetration might be improved by increasing the corer's ballast load; however, with a total deployed weight of approximately one tonne the corer is already a substantial piece of equipment.

Further ballasting would undoubtedly increase the severity of damage of the types encountered during the survey. On a number of occasions the corer's box was badly bent and on one occasion essentially demolished. Contact with the large rocks and boulders that seem to be common on the mid to upper slope also damaged the structure of the corer, with two incidences of welds snapping. Given the nature of the ground, future surveys contemplating using box corers in this area should, in addition to carrying spare boxes and spades, seriously consider carrying a complete second corer. No modifications were made to the corer during the survey; however, several repairs were necessary, both minor and major panel beating to restore damaged boxes, replacement of a kinked activating warp, bolt head of the lifting shackle pin cut down, and two bouts of welding to repair supporting frame and spade lever arm.

6.4. Megacorer

A Bowers and Connelly (Oban) Megacorer equipped with twelve 10 cm internal diameter cores was used during the survey, other than varying the number of coring units on the head (see below and station list) it was rigged and deployed in the conventional manner. A total of 138 Megacorer deployments were made during the cruise, of which 121 produced useful samples (i.e. an overall success rate of 88 %).

The total failures can be categorised as follows:

Hard ground, no samples	58.8 %
Fell over, no samples	11.8 %
Short cores only	17.6 %
Disturbed cores only	11.8 %

Of those deployments yielding useful samples the following tabulation details the number of unusable cores obtained against the number of coring units deployed:

		Unusable cores (%)			
Coring units	Deployments	0	1	2	more
12	18	11.1	33.3	33.3	22.3
10	47	6.4	12.8	80.8	0.0
8	25	0.0	44.0	36.0	20.0
6	4	75.0	25.0	0.0	0.0
4	27	85.2	7.4	7.4	0.0

The Megacorer worked well throughout the survey, although successful operations were more-or-less limited to the mid to deeper slope strata. Of the total failures, lack of penetration into the stiff subsurface sediments of the shallower strata was the most significant cause. To a degree, however, the Megacorer can out perform the Box corer in this respect, e.g the Megacorer was able to collect and successfully retain samples from the 'Black Hole' sand. The ability to easily remove entire coring units, increasing the effective sediment penetrating force, proved to be an unforeseen bonus of the corer's design.

The Megacorer was subject to two forms of significant damage during the survey: (a) main warp fouling on the weight / trigger arm of the bottom closing mechanisms, in one case resulting in the total loss of the entire bottom closing mechanism, in a second severely bending the trigger arm and drop bar; and (b) the gear falling over resulting in bottom closing sliders being snapped off. Both of these problems could easily be avoided by providing the corer with a supporting frame that fully encloses all of the working mechanisms. No modifications were made to the corer during the survey. Fine tuning of the top closing mechanisms was necessary from time to time. Damaged (snapped) bottom sliders were replaced with spares initially and subsequently with plywood cut to the same pattern.

6.5. Hornet

With the WASP system behaving somewhat erratically (see below) a backup system was conceived and constructed aboard. A fish trap frame was modified (crossbars moved to the vertical) to carry the photosledge camera and flash and the WASP altimeter and monitor. The system performed well, but is rather limited by the need to fly the vehicle at an altitude of 3m or less as a result of the limited flash output power.

6.6. WASP

The WASP camera and flash system suffered a number of initial electronic faults and failures. It was possible to replace some suspect integrated circuits with component built circuits made aboard; further replacements were made following the boat transfer of the camera technician. However, the WASP system continued (and continues) to suffer from an untraceable intermittent fault that results in the camera shutting down prematurely. This fault was of little consequence to the survey, where only short deployments were required, however, it may prove to be a significant problem where full duration runs are required.

6.7. Fish trap (and fishsnack)

Functionally the fish traps performed well. The only problem encountered being the failure of the mooring to rise on command on one occasion (see narrative). The catch rate of the traps was, however, rather disappointing: for the first eight deployments the catch averaged less than one fish. Given that the last deployment alone took 34 fish it is clear that the traps 'work'. It is possible that the performance of the traps could be generally improved by modifications to the entrances (some minor changes were made during the survey to no obvious effect). The difficulties in operating towed gear in the survey region (see below) suggest that further development of traps would be useful. One deployment of the fish trap was modified to a Fishsnack (aff. Bathysnack) by the removal of one of the cages and the fitting of the sledge camera and flash in a standard Bathysnap orientation.

6.8. Photosledge and otter trawl

Only one deployment each of the photosledge and otter trawl were attempted as a result of damage sustained to both during these tows. As the WASP photographs will reveal the survey region, particularly the shallower strata, is strewn will ice-rafted rocks and boulders. Although trawling for

demersal fish is evidently a suitable commercial prospect in the area, the use of large diameter rollers on the foot ropes of such demersal trawls is a safety feature not possible where semi-quantitative catches of megabenthos are required. With a redesign or reconfiguration of the (or another) photosledge it may be possible to complete a bottom tow without incurring significant risk; however, quantitative assessment of the megabenthos from photographs would be compromised (with a single camera system) by the varying orientation of the sledge as it rides over obstructions. Off bottom systems, such as WASP, would seem to offer the best option for routine surveys of the megabenthos under these circumstances.

7. SURVEY DESIGN

7.1. Seabed sampling

7.11. Large-scale survey

The large-scale survey was conducted on the basis of a stratified random design. Primary stratification was by depth, with secondary stratification by geography (dividing the region in to north, mid and south zones), additionally the shallowest stratum (< 200 m) of the south zone was subdivided in to three substrata (to improve areal coverage); see figures 1 and 2 and charts 3a-d. Each stratum is designated by a single letter prefix, A - Z (excluding I and O) as follows:

Depth	North	Mid	South
<200m	A	B	C
200-300m	D	E	F
300-400m	G	H	J
400-500m	K	L	M
500-600m	N	P	Q
600-800m	R	S	T
800-1000m	U	V	
1000-1200m	W	X	
1200-1400m	Y		
>1400m	Z		

Sampling effort was allocated on a simple proportional basis of five sites per stratum, e.g. A1-A5, B1-B5 etc, note that sites in the substrata of stratum C are designated C1-5, C6-C10, C11-C15. Sites were located by random co-ordinate selection within strata. Note that four of the originally selected sites could not be sampled: C3, C9, C10 and F5; they were abandoned after 7 or 8 failed attempts

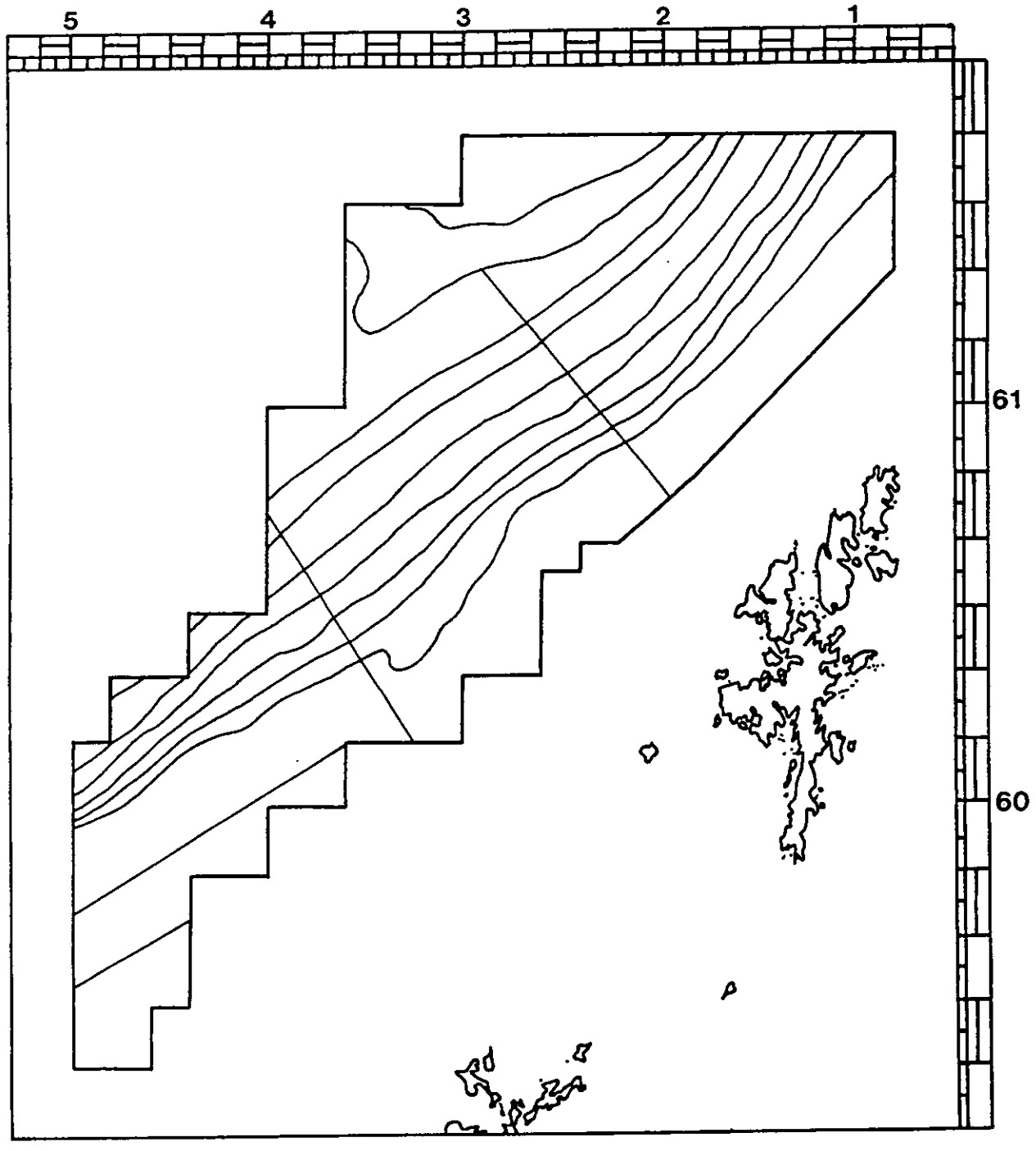


Figure 1. Location of survey area, showing outer boundaries of the survey area and the internal divisions of the area used in the large-scale stratified random sampling programme. (The isobaths shown are: 200, 300, 400, 500, 600, 800, 1000, 1200 and 1400 m, see text for further details.)

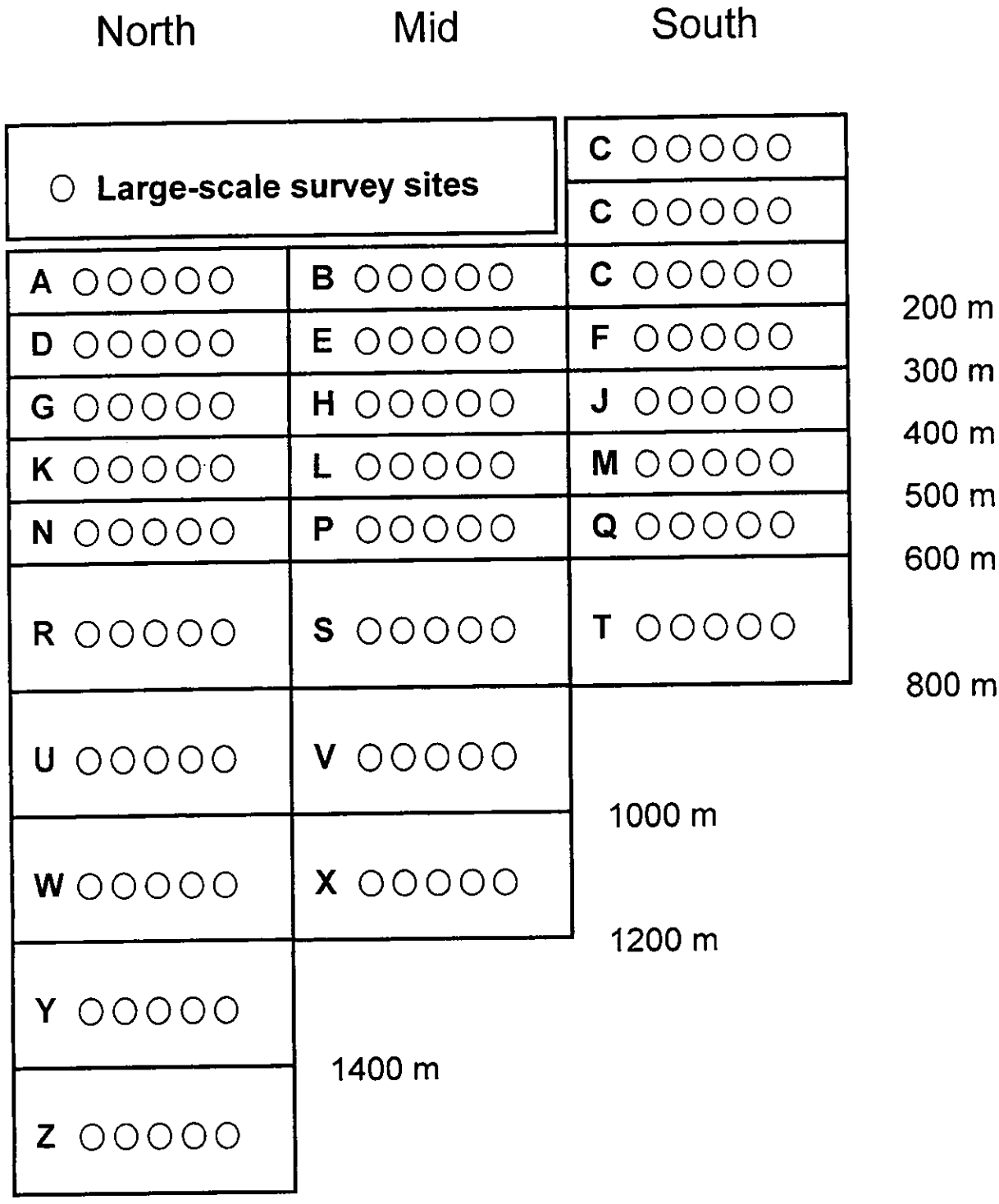


Figure 2. Schematic representation of the stratified survey area showing the disposition of successful sampling sites by strata.

with the Day grab. These failed sites were replaced with additional randomly selected sites as follows:

C19.....replaces C3
C17.....replaces C9
C18.....replaces C10
F6 .....replaces F5

(Note that site C16 was an attempted replacement site that was abandoned after 10 failed grabs.) Five full sample sets were successfully obtained from each stratum or substratum.

In the subsequent analysis of data from strata C and F it will be important to acknowledge and account for the inability to sample the originally selected sites.

7.12. Transect survey

Transect survey sites were located systematically in a near-linear downslope arrangement incorporating four sites from the large-scale survey (B5, L5, L4, and S2) to economise on sampling effort. Transect sites are designated by the prefix 'Tr' and their nominal depth (Tr200, Tr250, Tr300 etc). Full sample sets were obtained from the following sites (see figure 3 and chart 4):

Depth (ucm)	Site
134	B5
202	Tr200
248	Tr250
290	Tr300
346	Tr350
414	L5
454	Tr450
500	L4
552	Tr550
601	Tr600
650	Tr650
709	S2
804	Tr800
917	Tr900
998	Tr1000

7.13. Gear comparison exercise

Sampling for the gear comparison exercise was combined with that of the transect survey to economise on effort. The study was designed for subsequent analysis to be carried out on a paired sample basis; full sample sets for the following pair comparisons were collected (see figure 3 and chart 4):

Day grab vs. Box corer - Tr350, L5, Tr450 and L4

Box corer vs. Megacorer - Tr550, Tr600, Tr650, S2, Tr800 and Tr900

7.14. Additional strategic sampling

In addition to the large-scale survey and work on the transect, other sampling was undertaken for a variety of purposes as outlined below. These additional sites are identified by a two letter prefix AA-AK (excluding AI). The general disposition of these sites relative to those of the large-scale survey is shown schematically in figure 4 (see also charts 3a-d).

Study of alongslope variation. Sites AA1 - AA10 were located strategically to fill 'gaps' in the large-scale survey coverage, principally to investigate alongslope variation.

Additional shelf edge strata sites. Two additional sites were located in each of the three shelf edge strata; i.e. AE1,2 in stratum A, AF1,2 in stratum B, and AB1,2 in stratum C. These sites were located strategically to fill 'gaps' in the alongslope coverage of the large-scale survey.

Studies of local variation. Three locations were strategically selected from the TOBI sidescan record to assess the relative heterogeneity of acoustic fabric against that of corresponding ground-truth samples. The nominal position of AC was located in an area of relatively featureless sidescan, AD in an area interpreted as barchan dunes, and AH in an area of iceberg ploughmarks. At each of these three positions five replicate samples were obtained at random (by random range and bearing) within a circular area centred on the nominal position and having a radius of three cables (approximately 500 m).

Investigation of areas of 'smoothed' iceberg ploughmarks. Sites AG1 and AG2 were strategically located in two separate areas of 'smoothed' iceberg ploughmarks as interpreted from the TOBI sidescan record.

Investigation of an ice margin scour hole. Site AJ1 was strategically located in an area interpreted as an ice margin scour hole on the TOBI sidescan record.

Investigation of AMOCO well site 208/17-B (AK sites). Sites AK1 - AK 9 were strategically located in the vicinity of AMOCO well site 208/17-B, as follows:

Site	Nominal location
AK1	200 m upslope of well site
AK2	200 m upcurrent of well site
AK3	200 m downslope of well site
AK4	200 m downcurrent of well site
AK5	500 m downcurrent of well site
AK6	1400 m downcurrent of well site
AK7	3800 m downcurrent of well site
AK8	10000 m downcurrent of well site
AK9	at the well site

Note that replicate samples (i.e. separate drops) were obtained from each of the nominal site locations.

7.15. Additional transect sampling

Further sampling of the transect sites was carried out during the 'NERC days' as follows:

Depth (ucm)	Site
345	Tr350
415	L5
454	Tr450
498	L4
553	Tr550
600	Tr600
649	Tr650
708	S2
798	Tr800
915	Tr900
998	Tr1000
1088	Tr1100

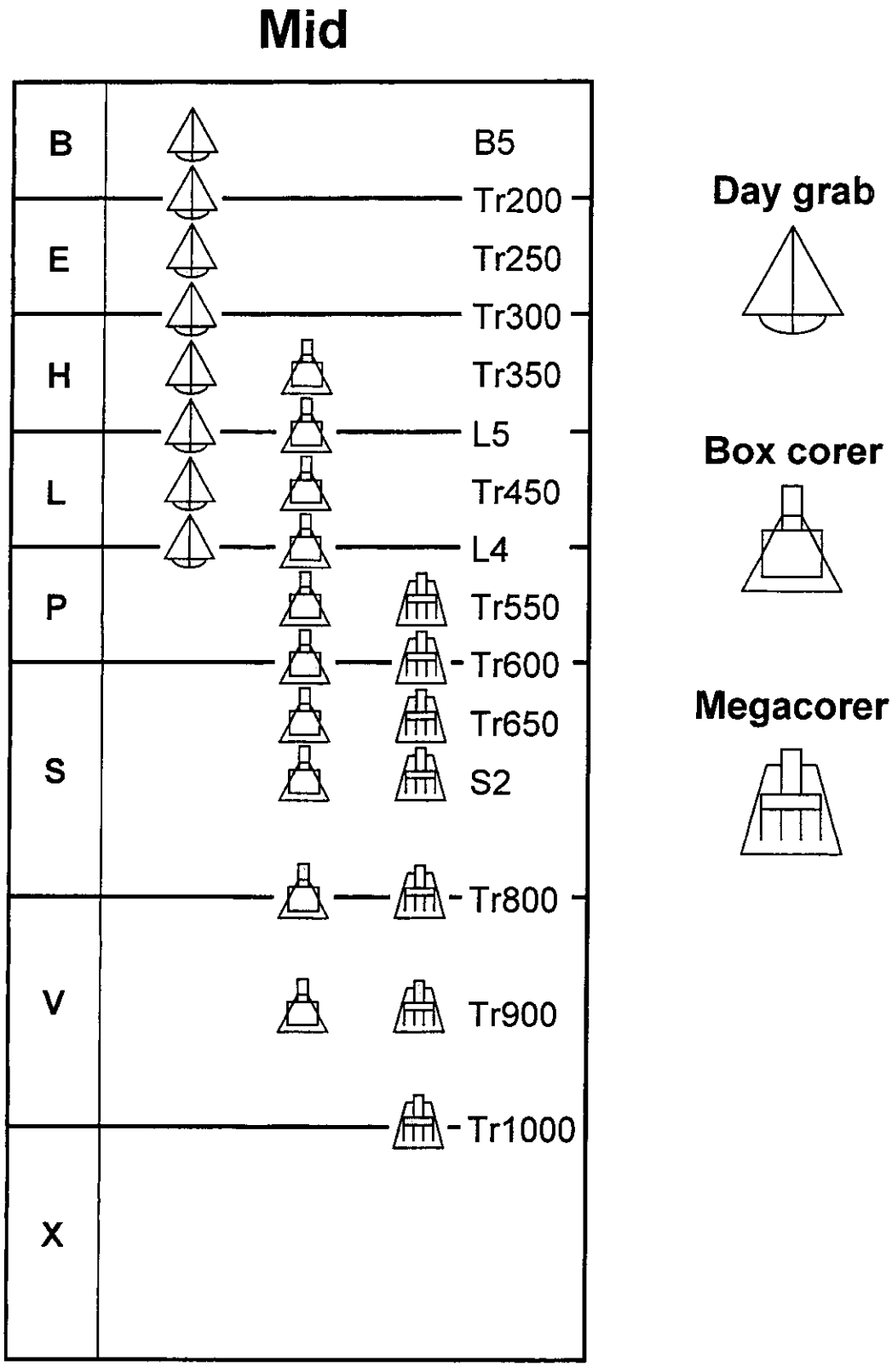


Figure 3. Schematic representation of successful survey sampling operations on the transect.

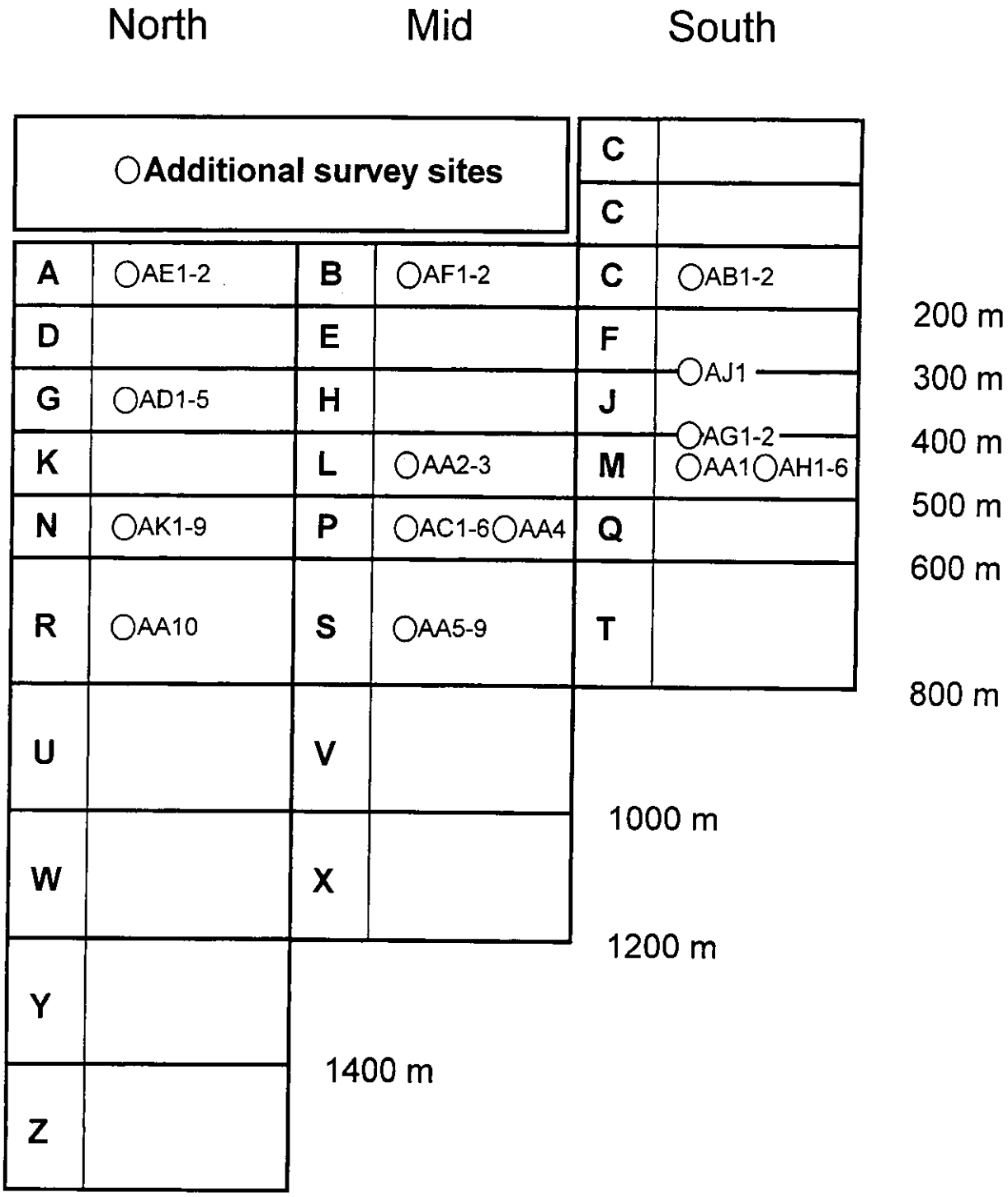


Figure 4. Schematic representation of the stratified survey area showing the disposition of successful additional strategic sampling sites by strata.

7.2. WASP photographic survey

WASP deployments were carried out in a systematic manner to give coverage of 300, 500 and 800 m in each of the three survey zones (north, mid, south), and additionally at 100 m in the south zone. Further deployments were made at 400, 600, 700, 900 and 1100 m on the transect in the mid zone. The transect was effectively extended by two additional deployments; one at 1200 m on the boundary between the north and mid zones, and one at 1400 m in the north zone.

WASP was also deployed on four 'strategic' target areas:
(a) the fault-like feature imaged by TOBI in the K stratum;
(b) in the vicinity of AMOCO well site 208/17-B, where earlier sidescan interpretations had suggested the presence of *Lophelia* (stratum N);
(c) the canyons or channels imaged by TOBI in the southern reaches of stratum V; and
(d) the main 'coral' area identified on the Kingfisher chart (stratum J).

The general disposition of successful WASP deployments relative to the survey strata is shown schematically in figure 5 (see also chart 5).

7.3. Fish trap operations

The fish trap was deployed at 300, 500 and 800 m in the north and mid zones; in the south zone the trap was only deployed at 800 m as result of the perceived risk of gear loss to the intensive commercial trawling activity in the shallower strata of this zone. Additional deployments were carried out at 1100 and 1400 m in the north zone (see figure 6 and chart 6).

7.4. Other operations

Three other gears were deployed during the cruise: HORNET, photosledge and otter trawl. HORNET was deployed on two occasions to trial the system as a potential backup for WASP. Only one deployment each of the photosledge and otter trawl was attempted as both deployments resulted in significant damage to the gear; though both did yield some useful results (see figure 7 and chart 7).

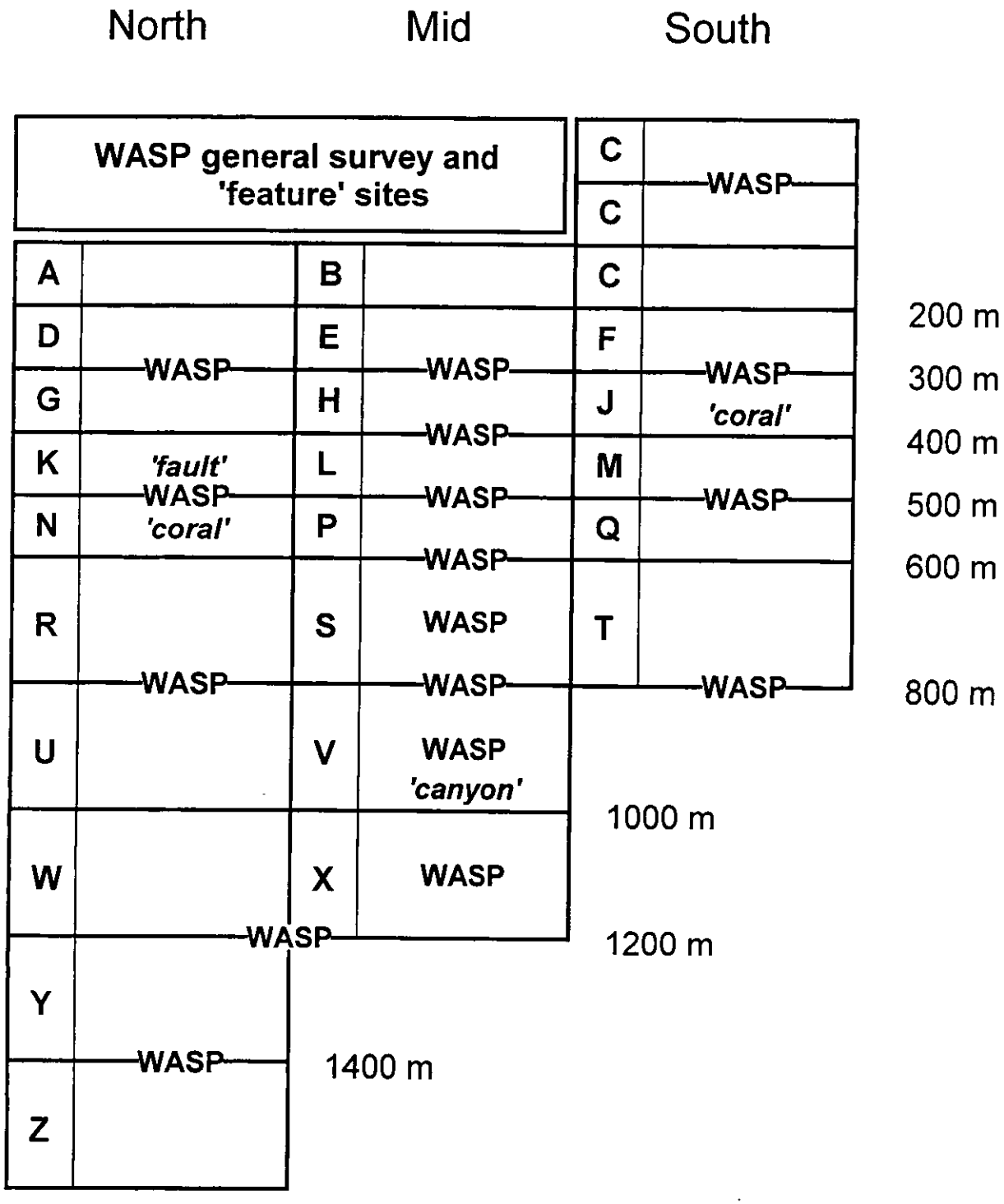


Figure 5. Schematic representation of the stratified survey area showing the disposition of successful WASP deployments by strata.

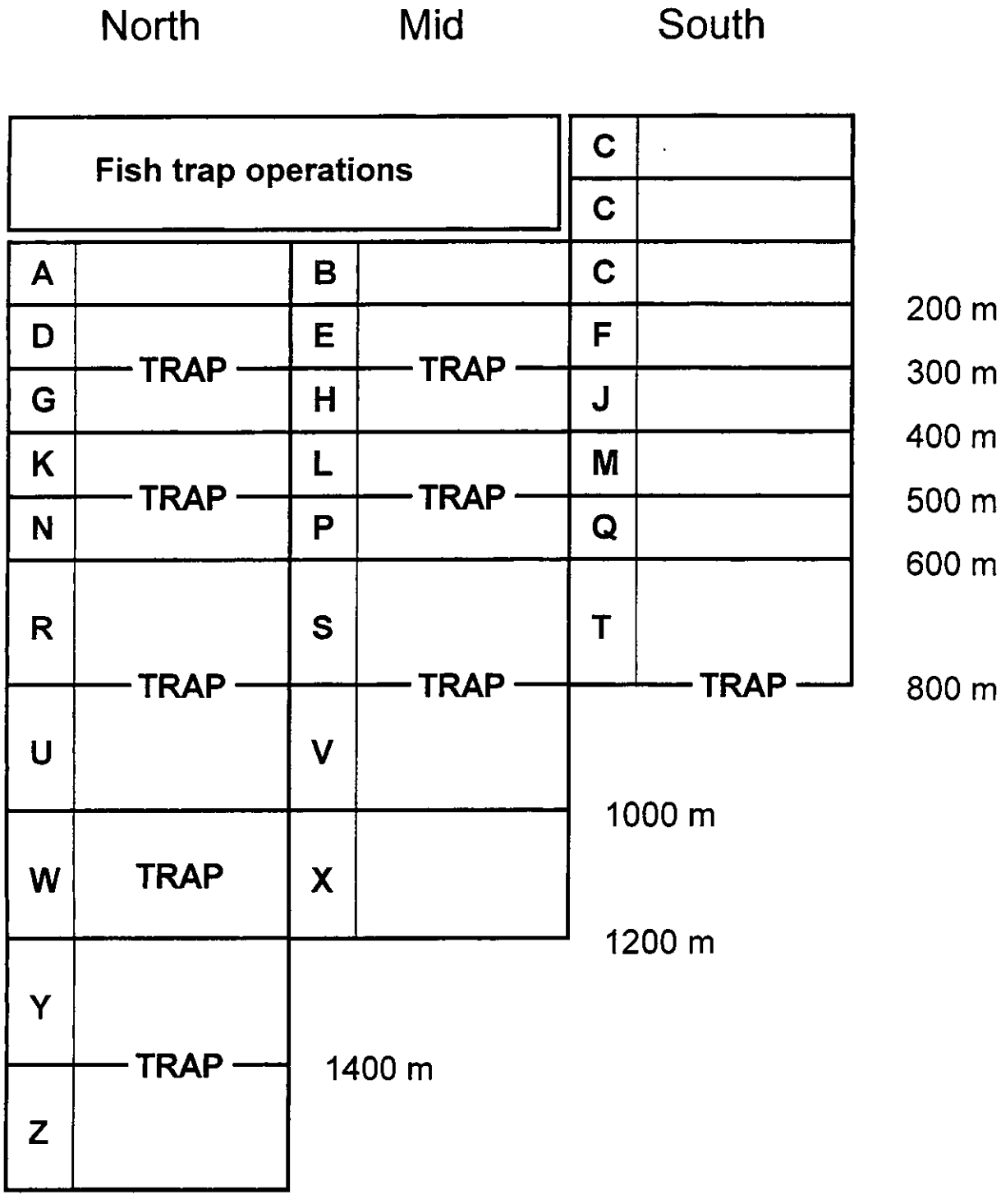


Figure 6. Schematic representation of the stratified survey area showing the disposition of fish trap deployments by strata.

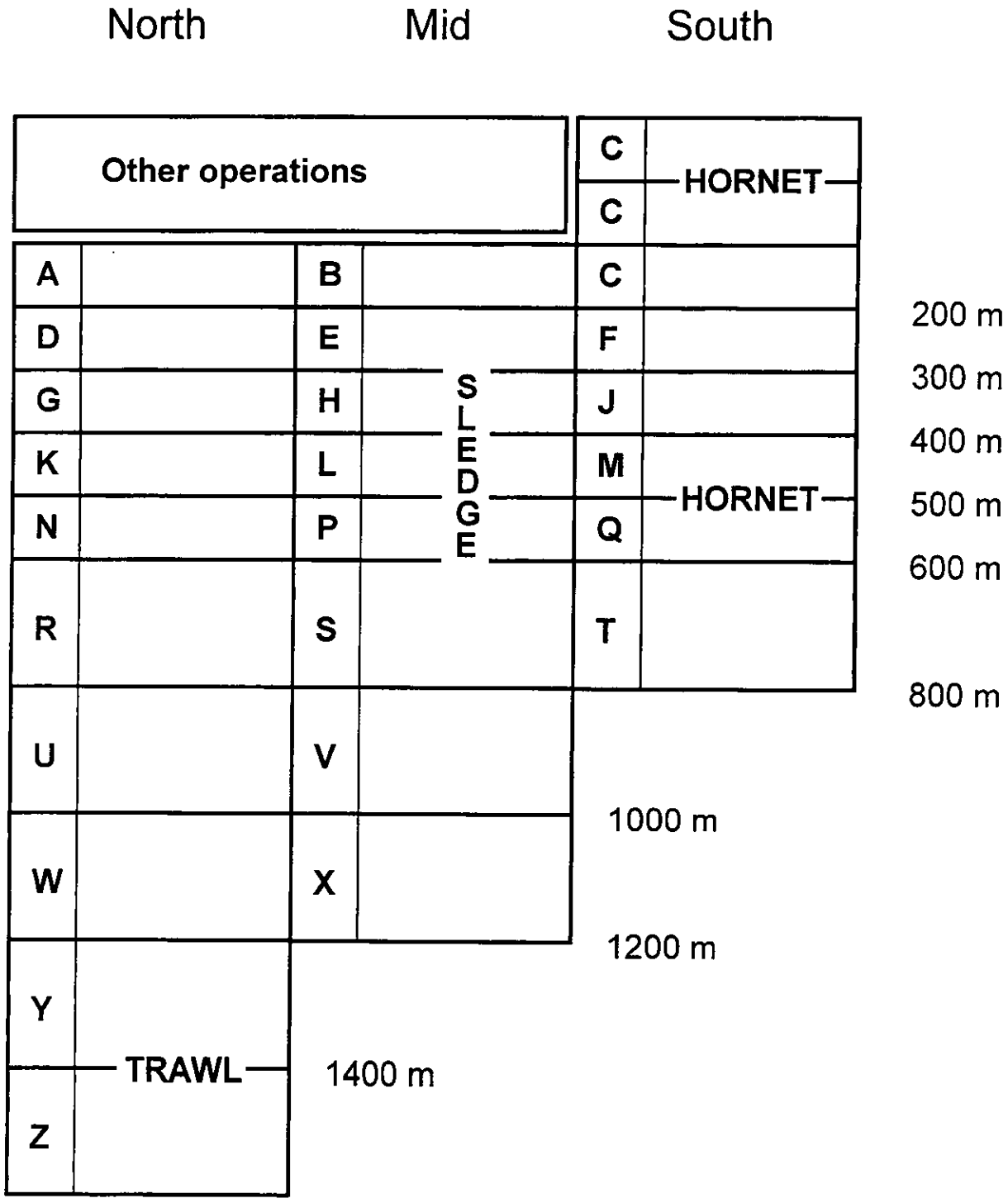


Figure 7. Schematic representation of the stratified survey area showing the disposition of HORNET, photosledge and otter trawl deployments by strata.

8. SAMPLING PROTOCOL

8.1. Standard sampling protocol

The standard protocol, as detailed below, was carried out at the following sites:

Sites	Survey /study
A-Z	large-scale survey
Trxxx	transect and gear comparison
AA	alongslope variation
AB, AE, AF	shelf edge strata
AG	'smoothed' iceberg ploughmarks
AJ1	ice margin scour hole (NB chemistry samples only)

Of necessity, variant protocols were followed for samples from the Megacorer, Box corer and Day grab.

8.11. Megacorer

On recovery of the corer, the function of each coring unit was checked and recorded. Core lengths were measured and recorded and any surface and profile features noted. Sample acceptance was based on the following criteria: cores > 10 cm in length; core surfaces essentially level; and, the sediment-water interface intact. The latter criterion was partly relaxed where localised disturbance had been caused by the dislodgement of gravel during core penetration. Acceptable cores were removed from the corer and transferred to the ship's laboratories for subsequent processing. In all cases, processing began with the careful removal of the supernatant water using a pump siphon and syringe.

For macrobenthos samples, cores were further processed as follows. Cores were extruded (by plunger from below) and sectioned into two horizons, 0-5 cm and 5-10 cm. Corresponding horizons from successive cores were pooled to produce a nominal sample size of eight cores. Where only seven acceptable cores were available (six sites) this was deemed to be an acceptable sample and no further sampling was undertaken. Where less than seven acceptable cores were available from a single drop a further deployment of the corer was undertaken; where the additional deployment failed to yield at least seven cores (5 sites) cores from both deployments were combined to give a sample size of at least seven cores (2 sites). Macrobenthos samples were then elutriated through 0.5 mm and 0.25 mm

sieve meshes. The four resultant residues (0-5 cm - 0.5 mm, 0-5 cm - 0.25 mm, 5-10 cm - 0.5 mm, 5-10 cm - 0.25 mm) were fixed and preserved in 10 % formalin.

Hydrocarbon samples were collected by extruding the cores into a metal collar and sectioning off the 0-2 cm horizon. The samples were preserved, in glass pots, by freezing at -20 °C.

Heavy metal samples were collected by extruding the cores into a polycarbonate collar and sectioning off the 0-2 cm horizon. The samples were preserved, in polycarbonate pots, by freezing at -20 °C.

Particle size samples were collected by extruding the cores into a polycarbonate collar and sectioning off the 0-5 cm horizon. The samples were preserved, in polythene bags, by freezing at -20 °C.

8.12. Box corer

On recovery of the corer, its function was checked and recorded. If, on inspection through the top vents, the core appeared to be acceptable, the box and spade were dismounted and moved to a clear deck space. Sample acceptance was based on the following criteria: cores > 10 cm in length; core surfaces essentially level (excepting relief deemed to be natural); sediment surface covering the full cross-sectional area of the box (excepting limited, 5cm or less, lateral compression); and, essentially clear supernatant water. Processing of acceptable cores started with the division of the core's surface area into macrobenthos and chemistry areas. A metal insert of either 0.1 m^2 or 0.15 m^2 was pushed into the sediment with one of its edges against one side of the box. The open sediment area and that enclosed by the insert were then separately drained of supernatant water using a pump siphon. The overlying water from the 0.1 m^2 area (whether enclosed or open) was drained through a 0.25 mm sieve and any sieve residue subsequently combined with the 0-5 cm sediment layer (see below). The overlying water from the 0.15 m^2 area (whether enclosed or open) was drained to waste (see figure 8). The use of the insert ensured that little or no movement of superficial sediments between areas occurred during the draining process. In the vast majority of cases the 0.15 m^2 insert was used; however, where gravel or cobbles obstructed its use the 0.1 m^2 insert was used. In a few cases neither insert could be used, in this event the core was drained and its surface divided by measuring off a 0.1 m^2 area and marking it with a trowelled line. Once drained, the surface of the core was examined and a record made of any surface features and / or fauna of note; the majority of core tops were also photographed at this point.

For macrobenthos samples, cores were further processed as follows. The front of the box was removed and the sediment underlying the 0.1 m^2 area trowelled out in two horizons: 0-5 and 5-10 cm. Macrobenthos samples were then elutriated through 0.5 mm and 0.25 mm sieve meshes. The four

resultant residues (0-5 cm - 0.5 mm, 0-5 cm - 0.25 mm, 5-10 cm - 0.5 mm, 5-10 cm - 0.25 mm) were fixed and preserved in 10 % formalin.

Hydrocarbon samples were collected from the 0.15 m^2 area using a metal scoop to a nominal depth of 2 cm. The samples were preserved, in glass pots, by freezing at -20 °C.

Heavy metal samples were collected from the 0.15 m^2 area using a plastic scoop to a nominal depth of 2 cm. The samples were preserved, in polycarbonate pots, by freezing at -20 °C.

Particle size samples were collected from the 0.15 m^2 area using a plastic scoop to a nominal depth of 5 cm. The samples were preserved, in polythene bags, by freezing at -20 °C.

8.13. Day grab

On recovery of the grab, its function was checked and recorded. Sample acceptance was based on the following criteria: grab fully closed; grab holding or only slowly leaking supernatant water. In the case of chemistry samples, the sample was taken to be acceptable if it contained sufficient material to generate a full set of samples. In the case of macrobenthos samples, potentially acceptable samples were measured for volume in a calibrated bucket. In the majority of cases (63 %) the finally accepted sample was of 5 litres or more, though at 12 % of sites samples of between 3 and 5 litres were accepted out of practical necessity. At the remaining 25 % of sites it was necessary to pool two, and in one case three, grabs to obtain an acceptable sample size.

Macrobenthos samples were then processed by elutriating the complete contents of one or more grabs though 0.5 mm and 0.25 mm sieve meshes. The two resultant residues were fixed and preserved in 10 % formalin.

Hydrocarbon samples were collected from the chemistry grab using a metal scoop to a nominal depth of 2 cm. The samples were preserved, in glass pots, by freezing at -20 °C.

Heavy metal samples were collected from the chemistry grab using a plastic scoop to a nominal depth of 2 cm. The samples were preserved, in polycarbonate pots, by freezing at -20 °C.

Particle size samples were collected from the chemistry grab using a plastic scoop to a nominal depth of 5 cm. The samples were preserved, in polythene bags, by freezing at -20 °C.

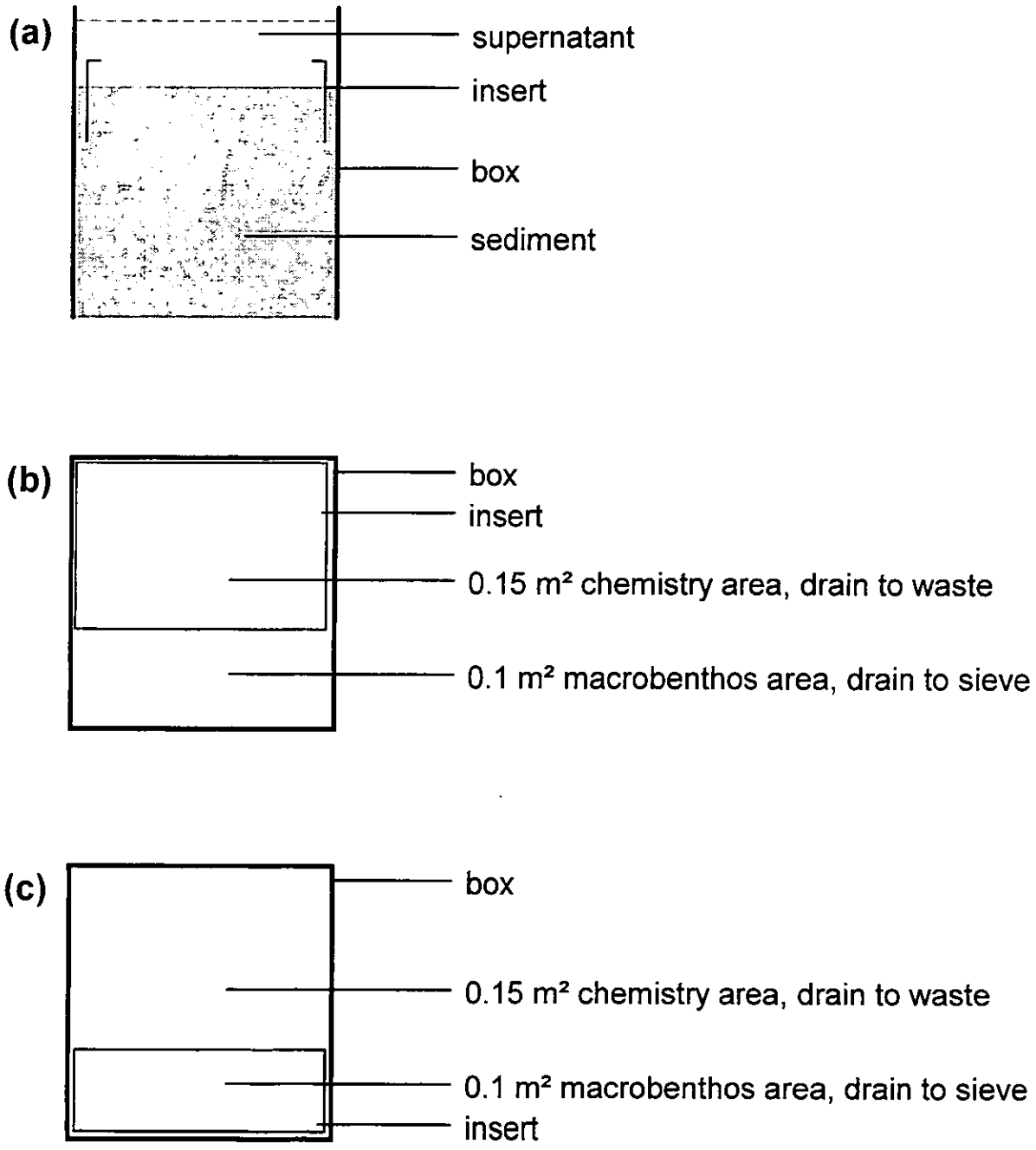


Figure 8. Box corer sampling protocol - use of inserts. (a) Cross-section of box core though insert. (b) Operation of 0.15 m² insert in plan view. (c) Operation of 0.1 m² insert in plan view.

8.2. Reduced sampling protocol

A reduced version of the standard sampling protocol was employed for the studies of local variation (sites AC, AD and AH). At these sites hydrocarbon, heavy metal and particle size samples were collected as per the standard protocol for the Box corer; however, macrobenthos samples were taken as a single 0 - 10 cm horizon and elutriated over a 0.5 mm sieve only.

8.3. AMOCO well site survey sampling protocol

The well site survey (AK sites) was carried out using the Megacorer only. Hydrocarbon, heavy metal and particle size samples were collected as per the standard protocol for the Megacorer. No macrobenthos samples were collected. Meiobenthos samples were collected as follows: two 2.6 cm internal diameter (syringe) subcores were inserted in to a single Megacorer core to a depth in excess of 5 cm, the subcores were dug out, extruded to give a length of 5 cm and fixed jointly in 10 % formalin. The pooled material therefore represents a 10.62 cm^2, 0 - 5 cm horizon sample.

8.4. Additional transect sampling protocol

The 'NERC days' transect sampling was carried out using the Megacorer only. Meiobenthos samples were collected as detailed above in the AMOCO well site survey protocol. Foraminifera samples were collected as follows: supernatant water was carefully removed by siphon and syringe, the core extruded and sectioned in to 1 cm horizons down to 10 cm sediment depth, and the sections fixed separately in 10 % formalin. Archive cores were also retained; the supernatant water was carefully removed, the cores frozen to -20 °C in an upright position, and subsequently extruded and wrapped in tin foil then returned to a -20 °C freezer.

9. SCIENTIFIC OBSERVATIONS

9.1. Seabed sampling

A general synopsis of the seabed sampling in terms of bottom type and obvious fauna follows, a report of corresponding geological observations is given in appendix 2.

< 200 m	Stratum A.	Coarse to fine shelly sand, with pebbles / stones, somewhat difficult ground to work.
	Stratum B.	Fairly coarse sand, some shell debris, with pebbles and stones, quite difficult ground to work. Sea pens and solitary corals noted.
	Stratum C.	Variably coarse sand, gravel and rocks, variation appears to occur over relatively short spatial scale.
200 - 300 m	Stratum D.	Coarser shelly sand over stiff clag. Fragments of dead *Lophelia* recovered.
	Stratum E.	Difficult ground to work; fairly coarse sand, pebbles and stones.
	Stratum F.	Variably coarse sand, gravel and rocks (as per stratum C).
300 - 400 m	Stratum G.	Varied shelly sand over stiff clag, possibly undulating ground. Sand wave like topography in the one box core sample obtained. Tube worms, brachiopods and cerianthids recorded. Some live and dead *Lophelia* recovered.
	Stratum H.	Coarse sediments with stones, one example of a sand wave like feature. Epifauna (sponges and ophiuroids) quite abundant.
	Stratum J.	Coarse-fine shelly sand. Two incidences of sand wave like features, gravel and rocks present. Generally, little obvious encrusting fauna.
400 - 500 m	Stratum K.	A 50:50 mix of sand wave like and flat ground. Some gravel and cobbles with encrusting fauna (sponges and brachiopods, etc.), ophiuroids and worm tubes also noted.
	Stratum L.	A sand wave stratum, with 10 cm scale local relief. Sponges and brachiopods abundant.
	Stratum M.	Generally level ground of coarse-fine shelly sand, with gravel and some cobbles. Relatively little sessile epifauna, though squat lobsters common.

500 - 600 m	Stratum N.	Generally level ground of muddy sand with some gravel. Sponges, brachiopods, ophiuroids and worm tubes noted.
	Stratum P.	Generally level ground, sponges ophiuroids and brachiopods abundant.
	Stratum Q.	Generally level sandy substrate, epifauna better developed than stratum M, though not particularly abundant.
600 - 800 m	Stratum R.	Level muddy sand bottom, ophiuroids may be particularly abundant.
	Stratum S.	Fairly level bottom of softer muddy sand or fine sand. Polychaete tubes may be quite dense.
	Stratum T.	Level ground of medium sand with some gravel, having only a modest encrusting fauna.
800 - 1000 m	Stratum U.	Generally of the 'Black Hole' sand type, some gravel present. Deep burrows noted; sabellids(tube-dwelling polychaetes) and pycnogonids (sea spiders) quite abundant.
	Stratum V.	Ground probably variable across the stratum: soupy muddy sand near the canyons to the south; 'Black Hole' sand to the north. On the sand, enteropneusts (acorn worms) and polychaete tubes may be abundant.
1000 - 1200 m	Stratum W.	Thin (3 cm) muddy-sand veneer over clag. Sabellids / their tubes numerous, deep vertical burrows present, pycnogonids abundant.
	Stratum X.	Fairly muddy ground, pycnogonids abundant.
1200 - 1400 m	Stratum Y.	Thin muddy-sand veneer over clag. Sabellids common, octocorals (soft corals) on gravel, some ophiuroids, stalked tunicates (sea squirts) and deep burrows.
> 1400 m	Stratum Z.	Essentially as per stratum Y, though ophiuroids may be more abundant.

9.2. Fish trap operations

Fish trap catches are summarised in the following table.

ZONE	DEPTH	FISH CATCH	OTHER CATCH
North	300 m	1 Torsk (*Brosme brosme*)	Amphipoda, Isopoda
North	500 m	Nil	Amphipoda, Decapoda
North	800 m	Nil	Amphipoda
North	1100 m	1 Arctic rockling (*Onogadus argentatus*)	Amphipoda
North	1400 m	34 Arctic rockling (*Onogadus argentatus*)	Amphipoda
Mid	300 m	1 Blue ling (*Molva dipterygia*)	Amphipoda, Isopoda, Mollusca
Mid	500 m	4 Torsk (*Brosme brosme*)	Amphipoda, Decapoda
Mid	800 m	Nil	Amphipoda
South	800 m	Nil	Nil

9.3. Otter trawl catch

On recovery of the trawl, the net was found to be very seriously damaged; it was ripped end to end down the starboard wing and the codend was completely detached. A small catch was nevertheless retained, though it is impossible to say whether or not this catch is representative. The fish catch consisted of 11 arctic rockling (*Onogadus argentatus*) and eight eelpouts (Zoarcidae), possibly of more than one species. The remainder of the catch was dominated by small stalked sponges, most having epizoic anemones. Sea spiders (Pycnogonida) were also common, including a number of large specimens (leg span to 30 cm). Other abundant taxa included burrowing anemones (Ceriantharia) and 'gerkin worms' (Priapulida).

10. SAMPLE CATALOGUE

All of the samples retained during the cruise are listed below by major survey component:

Large-scale survey
Additional strategically located sites
Transect survey and gear comparison study
WASP operations
Fish trap operations
Other operations
Additional transect sampling

Abbreviations used in the catalogue:

HC	hydrocarbon sample
HM	heavy metal sample
PS	particle size sample
y	yes / available
MACROB.	macrobenthos sample
0.1 m^2	macrobenthos sample size
8 cores	macrobenthos sample size
MEIOB.	meiobenthos sample
FORAM.	Foraminifera sample
ARCHIVE	archive sample

Note that additional samples (and data) were retained by the BGS representive (Colin Graham): see appendix 2.

10.1. Sample catalogue - large-scale survey

SITE	STATION	DEPTH	GEAR	HC	HM	PS	MACROB.
A1	53785#4	117	Day Grab	y	y	y	
A1	53785#7	117	Day Grab				0.1 m2
A1	53917#4	116	Day Grab	y	y	y	
A1	53917#6	116	Day Grab	y	y		
A2	53786#5	148	Day Grab	y	y	y	
A2	53786#7	146	Day Grab				0.1 m2
A3	53787#1	160	Day Grab	y	y	y	
A3	53787#2	158	Day Grab				0.1 m2
A4	53788#3	133	Day Grab	y	y	y	
A4	53788#7	133	Day Grab				0.1 m2
A5	53815#3	180	Day Grab	y	y	y	
A5	53815#4	180	Day Grab				0.1 m2
A5	53815#5	180	Day Grab				0.1 m2
B1	53883#1	168	Day Grab				0.1 m2
B1	53883#2	168	Day Grab				0.1 m2
B1	53883#3	167	Day Grab	y	y	y	
B2	53744#1	120	Day Grab	y	y	y	
B2	53885#2	120	Day Grab				0.1 m2
B2	53885#5	120	Day Grab				0.1 m2
B3	53743#1	147	Day Grab	y	y	y	
B3	53743#4	148	Day Grab				0.1 m2
B4	53745#5	143	Day Grab	y	y	y	
B4	53745#6	143	Day Grab				0.1 m2
B5	53746#1	134	Day Grab	y	y	y	
B5	53746#4	133	Day Grab				0.1 m2
C1	53859#2	107	Day Grab	y	y	y	
C1	53859#4	108	Day Grab				0.1 m2
C2	53854#4	100	Day Grab	y	y	y	
C2	53946#1	98	Day Grab				0.1 m2
C2	53946#3	96	Day Grab				0.1 m2
C4	53856#3	110	Day Grab	y	y	y	
C4	53856#4	110	Day Grab				0.1 m2
C5	53857#2	127	Day Grab	y	y	y	
C5	53857#4	127	Day Grab				0.1 m2
C5	53857#5	127	Day Grab				0.1 m2
C6	53866#1	123	Day Grab	y	y	y	
C6	53866#2	123	Day Grab				0.1 m2
C7	53861#1	123	Day Grab	y	y	y	
C7	53861#2	123	Day Grab				0.1 m2
C8	53860#4	110	Day Grab	y	y	y	
C8	53860#7	110	Day Grab				0.1 m2
C11	53867#6	140	Day Grab	y	y	y	
C11	53867#8	139	Day Grab				0.1 m2
C11	53867#9	139	Day Grab				0.1 m2
C12	53868#3	181	Day Grab	y	y	y	
C12	53868#5	178	Day Grab				0.1 m2

C12	53868#6	176	Day Grab				0.1 m2
C13	53865#2	170	Day Grab	y	y	y	
C13	53865#4	170	Day Grab				0.1 m2
C14	53851#1	152	Day Grab	y	y	y	
C14	53851#3	152	Day Grab				0.1 m2
C15	53852#2	155	Day Grab				0.1 m2
C15	53852#4	156	Day Grab	y	y	y	
C17	53944#1	122	Day Grab				0.1 m2
C17	53944#2	123	Day Grab	y	y	y	
C18	53943#3	123	Day Grab	y	y	y	
C18	53943#4	123	Day Grab				0.1 m2
C19	53987#3	104	Day Grab				0.1 m2
C19	53987#7	104	Day Grab	y	y	y	
D1	53789#5	226	Day Grab	y	y	y	
D1	53789#7	225	Day Grab				0.1 m2
D2	53790#4	274	Day Grab				0.1 m2
D2	53790#5	274	Day Grab	y	y	y	
D3	53796#5	250	Day Grab				0.1 m2
D3	53796#6	249	Day Grab	y	y	y	
D4	53816#3	235	Day Grab		y	y	
D4	53816#4	235	Day Grab				0.1 m2
D4	53816#5	236	Day Grab	y			
D5	53814#3	247	Day Grab	y	y	y	
D5	53814#5	249	Day Grab				0.1 m2
E1	53882#1	239	Day Grab	y	y	y	
E1	53882#3	240	Day Grab				0.1 m2
E1	53882#5	235	Day Grab				0.1 m2
E2	53733#2	207	Day Grab	y	y	y	
E2	53884#3	211	Day Grab				0.1 m2
E2	53884#4	208	Day Grab				0.1 m2
E2	53884#6	206	Day Grab	y	y	y	
E3	53735#4	224	Day Grab	y	y	y	
E3	53886#2	225	Day Grab				0.1 m2
E4	53741#3	300	Day Grab	y	y	y	
E4	53741#5	299	Day Grab				0.1 m2
E4	53741#6	299	Day Grab				0.1 m2
E5	53742#1	249	Day Grab	y	y	y	
E5	53742#2	249	Day Grab				0.1 m2
F1	53864#1	234	Day Grab	y	y	y	
F1	53864#4	238	Day Grab				0.1 m2
F1	53889#1	235	Day Grab				0.1 m2
F1	53889#2	231	Day Grab				0.1 m2
F2	53863#1	254	Day Grab	y	y	y	
F2	53863#2	245	Day Grab				0.1 m2
F3	53876#1	212	Day Grab	y	y	y	
F3	53876#4	213	Day Grab				0.1 m2
F4	53862#1	226	Day Grab				0.1 m2
F4	53862#5	227	Day Grab	y	y	y	
F6	53941#7	242	Day Grab				0.1 m2

F6	53941#8	242	Day Grab	y	y	y	
G1	53777#1	352	Box Corer	y	y	y	0.1 m2
G2	53791#1	367	Box Corer	y	y	y	0.1 m2
G3	53797#6	324	Day Grab	y	y	y	
G3	53797#7	331	Day Grab				0.1 m2
G4	53807#3	361	Day Grab	y	y	y	
G4	53807#4	368	Day Grab				0.1 m2
G5	53808#2	351	Day Grab	y	y	y	
G5	53808#3	348	Day Grab				0.1 m2
G5	53813#2	352	Day Grab				0.1 m2
H1	53728#1	382	Box Corer	y	y	y	0.1 m2
H2	53729#2	337	Box Corer	y	y	y	0.1 m2
H3	53730#4	315	Day Grab	y	y	y	
H3	53881#2	318	Day Grab				0.1 m2
H3	53881#3	317	Day Grab				0.1 m2
H3	53881#4	314	Day Grab				0.1 m2
H4	53734#1	333	Box Corer	y	y	y	0.1 m2
H5	53736#1	395	Box Corer	y	y	y	0.1 m2
J1	53869#1	390	Box Corer	y	y	y	0.1 m2
J2	53870#2	332	Box Corer	y	y	y	0.1 m2
J3	53871#4	354	Day Grab	y	y	y	
J3	53871#6	340	Day Grab				0.1 m2
J4	53875#4	375	Day Grab	y	y	y	
J4	53875#5	374	Day Grab				0.1 m2
J4	53875#8	380	Day Grab				0.1 m2
J5	53849#2	341	Day Grab	y	y	y	
J5	53849#3	341	Day Grab				0.1 m2
J5	53849#5	342	Day Grab				0.1 m2
K1	53776#1	466	Box Corer	y	y	y	0.1 m2
K2	53792#1	436	Box Corer	y	y	y	0.1 m2
K3	53795#1	489	Box Corer	y	y	y	0.1 m2
K4	53798#2	452	Box Corer	y	y	y	0.1 m2
K5	53806#2	467	Box Corer	y	y	y	see station list comment
L1	53737#1	481	Box Corer	y	y	y	0.1 m2
L2	53738#1	472	Box Corer	y	y	y	0.1 m2
L3	53740#1	462	Box Corer	y	y	y	0.1 m2
L4	53753#2	502	Box Corer	y	y	y	0.1 m2
L5	53751#1	413	Box Corer	y	y	y	0.1 m2
M1	53841#1	481	Box Corer	y	y	y	0.1 m2
M2	53845#4	496	Box Corer	y	y	y	0.1 m2
M3	53877#1	447	Box Corer	y	y	y	0.1 m2
M4	53846#1	467	Box Corer	y	y	y	0.1 m2
M5	53848#1	421	Box Corer	y	y	y	0.1 m2
N1	53775#1	551	Box Corer	y	y	y	0.1 m2

N2	53793#1	563	Box Corer	y	y	y	0.1 m2
N3	53802#2	595	Box Corer	y	y	y	0.1 m2
N4	53800#1	558	Box Corer	y	y	y	0.1 m2
N5	53805#1	580	Box Corer	y	y	y	0.1 m2
P1	53726#1	530	Box Corer	y	y	y	0.1 m2
P2	53727#1	535	Box Corer	y	y	y	0.1 m2
P3	53739#1	567	Box Corer	y	y	y	0.1 m2
P4	53754#1	560	Box Corer	y	y	y	0.1 m2
P5	53760#1	518	Box Corer	y	y	y	0.1 m2
Q1	53842#1	533	Box Corer	y	y	y	0.1 m2
Q2	53844#1	538	Box Corer	y	y	y	0.1 m2
Q3	53880#1	534	Mega Corer	y	y	y	
Q3	53880#2	530	Mega Corer				7 cores
Q4	53879#1	543	Mega Corer				7 cores
Q4	53879#2	542	Mega Corer	y	y	y	
Q5	53847#1	520	Box Corer	y	y	y	0.1 m2
R1	53794#1	657	Box Corer	y	y	y	0.1 m2
R2	53822#1	685	Mega Corer	y	y	y	1 core
R2	53822#2	685	Mega Corer				7 cores
R3	53823#1	738	Mega Corer	y	y	y	
R3	53823#3	735	Mega Corer				8 cores
R4	53803#1	649	Box Corer	y	y	y	0.1 m2
R5	53804#1	683	Box Corer	y	y	y	0.1 m2
S1	53774#1	727	Mega Corer				8 cores
S1	53774#2	729	Mega Corer	y	y	y	
S2	53766#1	709	Mega Corer	y	y	y	
S2	53766#2	709	Mega Corer				8 cores
S3	53723#2	803	Box Corer	y	y	y	0.1 m2
S4	53722#3	778	Box Corer	y	y	y	0.1 m2
S5	53724#1	693	Box Corer	y	y	y	0.1 m2
T1	53725#1	754	Box Corer	y	y	y	0.1 m2
T2	53843#1	601	Box Corer	y	y	y	0.1 m2
T3	53873#1	788	Mega Corer	y	y	y	
T3	53873#2	783	Mega Corer				8 cores
T4	53874#3	721	Mega Corer	y	y	y	2 cores
T4	53874#4	721	Mega Corer				6 cores
T5	53878#1	687	Mega Corer	y	y	y	
T5	53878#2	689	Mega Corer				8 cores
U1	53773#1	939	Mega Corer	y	y	y	
U1	53773#2	940	Mega Corer				8 cores
U2	53825#1	882	Mega Corer				8 cores
U2	53825#2	876	Mega Corer	y	y	y	
U3	53824#1	842	Mega Corer				8 cores
U3	53824#2	840	Mega Corer	y	y	y	
U4	53818#1	955	Mega Corer				7 cores
U4	53818#2	952	Mega Corer	y	y	y	

U5	53821#1	880	Mega Corer	y	y	y	
U5	53821#2	878	Mega Corer				8 cores
V1	53721#1	836	Mega Corer	y	y	y	8 cores
V2	53720#1	846	Mega Corer	y	y	y	
V2	53720#2	845	Mega Corer				8 cores
V3	53718#2	919	Mega Corer	y	y	y	8 cores
V4	53717#1	866	Mega Corer	y	y	y	8 cores
V5	53840#1	985	Mega Corer	y	y	y	8 cores
W1	53831#1	1092	Mega Corer				8 cores
W1	53831#2	1090	Mega Corer	y	y	y	
W2	53830#1	1057	Mega Corer				8 cores
W2	53830#2	1057	Mega Corer	y	y	y	
W3	53829#1	1186	Mega Corer				8 cores
W3	53829#2	1191	Mega Corer	y	y	y	
W4	53819#1	1091	Mega Corer	y	y	y	
W4	53819#3	1094	Mega Corer				8 cores
W5	53820#1	1090	Mega Corer	y	y	y	
W5	53820#2	1093	Mega Corer				8 cores
X1	53713#1	1139	Mega Corer	y	y	y	
X1	53713#2	1135	Mega Corer				8 cores
X2	53714#1	1067	Mega Corer			y	8 cores
X2	53714#2	1068	Mega Corer	y	y		
X3	53715#1	1095	Mega Corer	y	y	y	7 cores
X4	53716#1	1100	Mega Corer	y	y	y	8 cores
X5	53719#1	1101	Mega Corer	y	y	y	7 cores
Y1	53838#1	1355	Box Corer	y	y	y	0.1 m2
Y2	53839#1	1366	Box Corer	y	y	y	0.1 m2
Y3	53827#1	1238	Mega Corer				8 cores
Y3	53827#2	1237	Mega Corer	y	y	y	
Y4	53828#1	1350	Mega Corer				8 cores
Y4	53828#2	1352	Mega Corer	y	y	y	
Y5	53832#1	1388	Mega Corer				8 cores
Y5	53832#2	1389	Mega Corer	y	y	y	
Z1	53837#2	1439	Box Corer	y	y	y	0.1 m2
Z2	53836#2	1416	Mega Corer	y	y	y	7 cores
Z3	53835#1	1517	Mega Corer				8 cores
Z3	53835#2	1517	Mega Corer	y	y	y	
Z4	53833#1	1513	Mega Corer				8 cores
Z4	53833#2	1514	Mega Corer	y	y	y	
Z5	53834#1	1542	Mega Corer				8 cores
Z5	53834#2	1547	Mega Corer	y	y	y	

10.2. Sample catalogue - additional strategically located sites

SITE	STATION	DEPTH	GEAR	HC	HM	PS	MACROB.
AA STATIONS - alongslope variation study							
AA1	53892#1	452	Box Corer	y	y	y	0.1 m2
AA2	53893#1	461	Box Corer	y	y	y	0.1 m2
AA3	53887#1	449	Mega Corer	y	y	y	
AA3	53894#1	445	Box Corer	y	y	y	0.1 m2
AA4	53895#1	538	Box Corer	y	y	y	0.1 m2
AA5	53888#2	627	Mega Corer	y	y	y	2 cores
AA5	53888#3	624	Mega Corer				5 cores
AA6	53896#1	640	Mega Corer	y	y	y	1 core
AA6	53896#2	639	Mega Corer				6 cores
AA7	53897#1	735	Mega Corer				8 cores
AA7	53897#2	738	Mega Corer	y	y	y	
AA8	53898#1	642	Mega Corer				8 cores
AA8	53898#2	641	Mega Corer	y	y	y	
AA9	53899#1	635	Mega Corer				8 cores
AA9	53899#2	636	Mega Corer	y	y	y	
AA10	53915#1	642	Mega Corer				8 cores
AA10	53915#2	639	Mega Corer	y	y	y	
AB STATIONS - extra shelf stratum C stations							
AB1	53942#1	143	Day Grab	y	y	y	
AB1	53942#2	143	Day Grab				0.1 m2
AB2	53891#3	150	Day Grab	y	y	y	
AB2	53891#4	150	Day Grab				0.1 m2
AC STATIONS - local variation study (featureless sidescan)							
AC2	53903#1	548	Box Corer	y	y	y	0.1 m2
AC3	53904#1	541	Box Corer	y	y	y	0.1 m2
AC4	53905#1	546	Box Corer	y	y	y	0.1 m2
AC5	53906#1	546	Box Corer	y	y	y	0.1 m2
AC6	53907#1	546	Box Corer	y	y	y	0.1 m2
AD STATIONS - local variation study (barchan dunes)							
AD1	53908#1	328	Box Corer	y	y	y	0.1 m2
AD2	53909#1	333	Box Corer	y	y	y	0.1 m2
AD3	53910#1	330	Box Corer	y	y	y	0.1 m2
AD4	53911#2	336	Box Corer	y	y	y	0.1 m2
AD5	53912#1	332	Box Corer	y	y	y	0.1 m2
AE STATIONS - extra shelf stratum A stations							
AE1	53918#2	160	Day Grab	y	y	y	
AE1	53918#3	160	Day Grab				0.1 m2
AE1	53918#4	160	Day Grab				0.1 m2
AE2	53919#1	169	Day Grab	y	y	y	
AE2	53919#2	168	Day Grab				0.1 m2
AE2	53919#3	168	Day Grab				0.1 m2

AF STATIONS - extra shelf stratum B stations

AF1	53930#2	153	Day Grab	y	y	y	
AF1	53930#3	152	Day Grab				0.1 m2
AF2	53931#1	144	Day Grab	y	y	y	
AF2	53931#2	144	Day Grab				0.1 m2

AG STATIONS - investigate areas of 'smoothed' iceberg ploughmarks

AG1	53932#1	402	Box Corer	y	y	y	0.1 m2
AG2	53939#1	388	Box Corer	y	y	y	0.1 m2

AH STATIONS - local variation study (iceberg ploughmarks)

AH1	53933#1	416	Box Corer	y	y	y	0.1 m2
AH2	53934#1	417	Box Corer	y	y	y	0.1 m2
AH3	53935#1	418	Box Corer	y	y	y	0.1 m2
AH4	53936#1	416	Box Corer	y	y	y	0.1 m2
AH6	53938#1	416	Box Corer	y	y	y	0.1 m2

AJ STATION - investigate ice margin scour hole

AJ1	53940#1	298	Day Grab	y	y	y	

AK STATIONS - investigate Amoco well site 208/17 - B

AK1	53952#1	556	Mega Corer	y	y	y	Meiob.
AK1	53952#2	556	Mega Corer	y	y	y	Meiob.
AK2	53953#1	557	Mega Corer	y	y	y	Meiob.
AK2	53953#2	557	Mega Corer	y	y	y	Meiob.
AK3	53954#1	561	Mega Corer	y	y	y	Meiob.
AK3	53954#2	562	Mega Corer	y	y	y	Meiob.
AK4	53955#1	559	Mega Corer	y	y	y	Meiob.
AK4	53955#2	558	Mega Corer	y	y	y	Meiob.
AK5	53956#1	560	Mega Corer			y	Meiob.
AK5	53956#2	560	Mega Corer	y	y		Meiob.
AK5	53961#1	562	Mega Corer	y	y	y	Meiob.
AK6	53960#1	563	Mega Corer	y	y	y	Meiob.
AK6	53960#2	563	Mega Corer	y	y	y	Meiob.
AK7	53958#1	560	Mega Corer	y	y	y	Meiob.
AK7	53958#2	560	Mega Corer	y	y	y	Meiob.
AK8	53959#1	562	Mega Corer	y	y	y	Meiob.
AK8	53959#2	563	Mega Corer	y	y	y	Meiob.
AK9	53957#1	557	Mega Corer	y	y	y	Meiob.
AK9	53957#2	558	Mega Corer	y	y	y	Meiob.

10.3. Sample catalogue - transect survey and gear comparison study

SITE	STATION	DEPTH	GEAR	HC	HM	PS	MACROB.
B5	53746#4	133	Day Grab				0.1 m2
B5	53746#1	134	Day Grab	y	y	y	
Tr200	53747#4	202	Day Grab	y	y	y	
Tr200	53747#6	202	Day Grab				0.1 m2
Tr250	53748#2	248	Day Grab	y	y	y	
Tr250	53748#5	248	Day Grab				0.1 m2
Tr300	53784#1	289	Day Grab	y	y	y	
Tr300	53784#4	290	Day Grab				0.1 m2
Tr350	53779#1	346	Day Grab	y	y	y	
Tr350	53779#4	346	Day Grab				0.1 m2
Tr350	53750#1	348	Box Corer	y	y	y	0.1 m2
L5	53780#1	414	Day Grab	y	y	y	
L5	53780#2	414	Day Grab				0.1 m2
L5	53751#1	413	Box Corer	y	y	y	0.1 m2
Tr450	53781#2	454	Day Grab				0.1 m2
Tr450	53781#1	455	Day Grab	y	y	y	
Tr450	53752#1	454	Box Corer	y	y	y	0.1 m2
L4	53782#4	498	Day grab	y	y	y	
L4	53782#3	500	Day Grab				0.1 m2
L4	53753#2	502	Box Corer	y	y	y	0.1 m2
Tr550	53755#2	554	Box Corer	y	y	y	0.1 m2
Tr550	53764#1	551	Mega Corer	y	y	y	
Tr550	53764#2	552	Mega Corer				8 cores
Tr600	53756#1	601	Box Corer	y	y	y	0.1 m2
Tr600	53767#1	600	Mega Corer	y	y	y	
Tr600	53767#2	601	Mega Corer				8 cores
Tr650	53757#1	649	Box Corer	y	y	y	0.1 m2
Tr650	53765#1	650	Mega Corer	y	y	y	
Tr650	53765#2	650	Mega Corer				8 cores
S2	53758#1	710	Box Corer	y	y	y	0.1 m2
S2	53766#1	709	Mega Corer	y	y	y	
S2	53766#2	709	Mega Corer				8 cores
Tr800	53761#1	806	Box Corer	y	y	y	0.1 m2
Tr800	53769#2	803	Mega Corer	y	y	y	
Tr800	53769#1	804	Mega Corer				8 cores
Tr900	53762#1	916	Box Corer	y	y	y	0.1 m2
Tr900	53770#1	915	Mega Corer	y	y	y	
Tr900	53770#2	919	Mega Corer				8 cores
Tr1000	53771#2	998	Mega Corer				5 cores
Tr1000	53771#1	999	Mega Corer	y	y	y	3 cores

10.4. Sample catalogue - WASP operations

STATION	AREA	DEPTH	FILM RUN
53920#1	North zone	297-289 m	11 m colour
53810#1	North zone	300-303 m	12 m colour
53921#1	North zone	496-486 m	5 m colour
53811#1	North zone	515-525 m	10 m colour
53812#1	North zone	794-779 m	10 m colour
53922#1	North zone	812-787m	12 m colour
53980#1	North zone	1408-1401 m	12 m colour
53981#1	North / Mid zone	1209-1203 m	10 m colour
53913#1	Mid zone	290-275 m	5 m colour
53926#1	Mid zone	294-278 m	4 m colour
53928#1	Mid zone	390-370m	7 m colour
53914#1	Mid zone	410-397 m	7 m colour
53925#1	Mid zone	507-496 m	12 m colour
53916#1	Mid zone	595-580 m	11 m colour
53985#1	Mid zone	685-672 m	5 m colour
53924#1	Mid zone	798-781 m	10 m colour
53984#1	Mid zone	912-881 m	12 m colour
53923#1	Mid zone	1088 m	12 m colour
53947#1	South zone	101-104 m	12 m colour
53948#1	South zone	304-324 m	9 m colour
53949#1	South zone	512-504 m	3 m colour
53950#1	South zone	816-829 m	13 m colour
53905#2	Test (AC stations)	546 m	B & W test strip only
53801#1	Test (Amoco 'coral' area)	575 m	12 m B & W
53962#1	Amoco 'coral' area	580-575 m	4 m colour
53951#1	Area of canyons	983-969 m	5 m colour
53963#1	Area of 'fault'	488-485 m	12 m colour
53986#1	Kingfisher 'coral' area	390-378 m	5 m colour

10.5. Sample catalogue - fish trap operations

STATION	ZONE	DEPTH	GEAR	SAMPLES
53809#1	North	297	Fish Trap	Fish (frozen), crustacea (formalin)
53799#1	North	516	Fish Trap	Crustacea (formalin)
53817#1	North	789	Fish Trap	Crustacea (formalin)
53826#1	North	1091	Fish Trap	Fish (frozen), crustacea (formalin)
53979#1	North	1424	Fish Trap	Fish (frozen and formalin), crustacea (formalin)
53778#1	Mid	289	Fish Trap	Fish (frozen), crustacea (formalin)
53759#1	Mid	506	Fish Trap	Fish (frozen), crustacea (formalin)
53768#1	Mid	796	Fish Trap	Crustacea (formalin)
53872#1	South	816	Fish Snack	10 m colour film

10.6. Sample catalogue - other operations

STATION	AREA	DEPTH	GEAR	SAMPLES
53983#1	North	1402-1414 m	Otter Trawl	Fish (frozen and formalin) Benthos (formalin)
53927#1	Mid	400-550 m	Photo Sledge	14 m colour
53845#3	South	500-518 m	Hornet	12 m B & W
53854#11	South	100 m	Hornet	5 m B & W

10.7. Sample catalogue - additional transect sampling

SITE	STATION	DEPTH	GEAR	MEIOB.	FORAM.	ARCHIVE
Tr350	53967#1	345	Mega Corer	1	1	2
L5	53968#1	415	Mega Corer	1	1	1
Tr450	53969#1	454	Mega Corer	1	1	2
L4	53970#1	498	Mega Corer	1	1	2
Tr550	53971#1	553	Mega Corer	1	1	1
Tr600	53972#1	600	Mega Corer	1	1	2
Tr650	53973#1	649	Mega Corer	1	1	2
S2	53974#1	708	Mega Corer	1	1	2
Tr800	53975#1	798	Mega Corer	1	1	2
Tr900	53976#1	915	Mega Corer	1	1	2
Tr1000	53977#1	998	Mega Corer	1	1	2
Tr1100	53978#1	1088	Mega Corer	1	1	2

11. STATION LIST

STATION	station and series number; station number increments by one each time the ship moves to another nominal location (note this system continues to operate even where the ship is revisiting a previously sampled station), series number increments by one for each deployment made at a station.
DATE and TIME	date and time of GEAR's first contact with the seafloor (or in the case of WASP, estimated time of first seafloor photograph).
SITE	site name, see survey design section for naming system.
SAMPLES	samples collected y / n (yes / no).
DEPTH (ucm)	sounding, in uncorrected metres (i.e. assuming uniform sound velocity profile of 1500 ms^{-1}) at DATE and TIME.
GEAR	the equipment deployed
SHIP'S POSITION	ship's position at DATE and TIME
GEAR'S POSITION	gear's position estimated from ship's position and ultra short baseline navigation offsets at DATE and TIME
HC and HM and PS	'chemistry' samples HC-hydrocarbon, HM-heavy metal, PS-particle size: y = available.
MACROB.	macrobenthos sample size by area or number of 10 cm ID Megacorer cores
COMMENT	gear performance and sample comments

RRS Charles Darwin cruise 101 C leg 2 station list

STATION	DATE	TIME	SITE	SAMPLES	DEPTH (ucm)	GEAR	SHIP'S POSITION deg.N	min.N	deg.W	min.W	GEAR'S POSITION deg.N	min.N	deg.W	min.W	HC	HM	PS	MACROB.
53713#1	16/07/96	0601	X1	y	1139	Mega Corer	61	12.437	-3	4.127	61	12.453	-3	4.050	y	y	y	
53713#2	16/07/96	0810	X1	y	1135	Mega Corer	61	13.176	-3	1.635	61	13.179	-3	1.640				8 cores
53714#1	16/07/96	1103	X2	y	1067	Mega Corer	61	9.164	-3	0.290	61	9.129	-3	0.305			y	8 cores
53714#2	16/07/96	1236	X2	y	1068	Mega Corer	61	9.131	-3	0.478	61	9.110	-3	0.462	y	y		
53715#1	16/07/96	1518	X3	y	1095	Mega Corer	61	4.977	-3	15.897	61	4.984	-3	16.071	y	y	y	7 cores
53716#1	16/07/96	1734	X4	y	1100	Mega Corer	61	3.464	-3	19.987	61	3.467	-3	20.054	y	y	y	8 cores
53717#1	16/07/96	2011	V4	y	866	Mega Corer	60	56.941	-3	19.387	60	56.946	-3	19.315	y	y	y	8 cores
53718#1	16/07/96	2234	V3	n	919	Mega Corer	60	54.007	-3	29.901	60	54.019	-3	29.833				
53718#2	16/07/96	2351	V3	y	919	Mega Corer	60	54.014	-3	29.906					y	y	y	8 cores
53719#1	17/07/96	0226	X5	y	1101	Mega Corer	60	53.714	-3	49.395	60	53.707	-3	49.422	y	y	y	7 cores
53720#1	17/07/96	0437	V2	y	846	Mega Corer	60	46.538	-3	48.867	60	46.525	-3	48.919	y	y	y	
53720#2	17/07/96	0619	V2	y	845	Mega Corer	60	46.466	-3	48.941	60	46.461	-3	48.920				8 cores
53721#1	17/07/96	0755	V1	y	836	Mega Corer	60	45.485	-3	50.900	60	45.489	-3	50.915	y	y	y	8 cores
53722#1	17/07/96	1215	S4	n	779	Mega Corer	60	46.520	-3	43.766	60	46.525	-3	43.737				
53722#2	17/07/96	1326	S4	n	780	Mega Corer	60	46.488	-3	43.869	60	46.486	-3	43.856				
53722#3	17/07/96	1712	S4	y	778	Box Corer	60	46.451	-3	43.909	60	46.446	-3	43.897	y	y	y	0.1 m2
53723#1	17/07/96	1927	S3	n	803	Box Corer	60	48.968	-3	37.513	60	48.976	-3	37.423				
53723#2	17/07/96	2038	S3	y	803	Box Corer	60	49.024	-3	37.483	60	49.036	-3	37.446	y	y	y	0.1 m2
53724#1	17/07/96	2332	S5	y	693	Box Corer	60	41.011	-3	49.891	60	41.037	-3	49.865	y	y	y	0.1 m2
53725#1	18/07/96	0135	T1	y	754	Box Corer	60	39.535	-3	57.908	60	39.534	-3	57.898	y	y	y	0.1 m2
53726#1	18/07/96	0417	P1	y	530	Box Corer	60	37.412	-3	35.019	60	37.399	-3	34.990	y	y	y	0.1 m2
53727#1	18/07/96	0649	P2	y	535	Box Corer	60	41.409	-3	25.243	60	41.422	-3	25.225	y	y	y	0.1 m2
53728#1	18/07/96	0915	H1	y	382	Box Corer	60	32.913	-3	23.346	60	32.930	-3	23.334	y	y	y	0.1 m2
53729#1	18/07/96	1126	H2	n	336	Box Corer	60	32.453	-3	19.935	60	32.459	-3	19.927				
53729#2	18/07/96	1208	H2	y	337	Box Corer	60	32.460	-3	19.955	60	32.471	-3	19.953	y	y	y	0.1 m2
53730#1	18/07/96	1407	H3	n	314	Box Corer	60	31.960	-3	17.553	60	31.963	-3	17.564				
53730#2	18/07/96	1445	H3	n	313	Box Corer	60	31.977	-3	17.508	60	31.982	-3	17.514				
53730#3	18/07/96	1521	H3	n	315	Day Grab	60	31.983	-3	17.613								
53730#4	18/07/96	1549	H3	y	315	Day Grab	60	31.990	-3	17.584					y	y	y	
53730#5	18/07/96	1619	H3	n	312	Day Grab	60	31.981	-3	17.433								
53731#1	18/07/96	1734	E1	n	238	Day Grab	60	26.581	-3	23.081								
53731#2	18/07/96	1756	E1	n	235	Day Grab	60	26.442	-3	22.992								
53731#3	18/07/96	1813	E1	n	235	Day Grab	60	26.453	-3	23.031								
53732#1	18/07/96	2013	B1	n	168	Day Grab	60	22.567	-2	51.952								
53732#2	18/07/96	2026	B1	n	169	Day Grab	60	22.581	-2	52.051								
53732#3	18/07/96	2044	B1	n	168	Day Grab	60	22.576	-2	51.851								
53732#4	18/07/96	2108	B1	n	169	Box Corer	60	22.562	-2	52.058	60	22.567	-2	52.066				
53732#5	18/07/96	2130	B1	n	169	Box Corer	60	22.586	-2	51.898	60	22.590	-2	51.898				
53733#1	18/07/96	2325	E2	n	209	Day Grab	60	33.558	-2	59.306								
53733#2	18/07/96	2343	E2	y	207	Day Grab	60	33.556	-2	59.484					y	y	y	
53733#3	19/07/96	0012	E2	n	208	Day Grab	60	33.520	-2	59.541								
53733#4	19/07/96	0033	E2	n	209	Day Grab	60	33.539	-2	59.430								

53733#5	19/07/96	0132	E2	n	207	Day Grab	60	33.510	-2	59.631								
53733#6	19/07/96	0201	E2	n	207	Box Corer	60	33.533	-2	59.513	60	33.535	-2	59.530				
53733#7	19/07/96	0225	E2	n	207	Box Corer	60	33.551	-2	59.558	60	33.553	-2	59.562				
53734#1	19/07/96	0341	H4	y	333	Box Corer	60	40.369	-3	3.484	60	40.374	-3	3.500	y	y	y	0.1 m2
53735#1	19/07/96	0547	E3	n	219	Day Grab	60	43.024	-2	49.950								
53735#2	19/07/96	0638	E3	n	220	Box Corer	60	43.092	-2	49.919	60	43.100	-2	49.941				
53735#3	19/07/96	0659	E3	n	221	Box Corer	60	43.064	-2	49.960	60	43.069	-2	49.975				
53735#4	19/07/96	0730	E3	y	224	Day Grab	60	43.104	-2	50.305					y	y	y	
53735#5	19/07/96	0758	E3	n	221	Day Grab	60	43.143	-2	49.862								
53735#6	19/07/96	0816	E3	n	219	Day Grab	60	43.114	-2	49.783								
53735#7	19/07/96	0840	E3	n	221	Box Corer	60	43.087	-2	49.895	60	43.094	-2	49.901				
53736#1	19/07/96	0949	H5	y	395	Box Corer	60	46.421	-2	55.364	60	46.434	-2	55.357	y	y	y	0.1 m2
53737#1	19/07/96	1141	L1	y	481	Box Corer	60	50.074	-2	57.568	60	50.093	-2	57.536	y	y	y	0.1 m2
53738#1	19/07/96	1320	L2	y	472	Box Corer	60	51.088	-2	52.790	60	51.103	-2	52.801	y	y	y	0.1 m2
53739#1	19/07/96	1510	P3	y	567	Box Corer	60	55.351	-2	53.899	60	55.348	-2	53.881	y	y	y	0.1 m2
53740#1	19/07/96	1722	L3	y	462	Box Corer	60	54.196	-2	42.676	60	54.238	-2	42.724	y	y	y	0.1 m2
53741#1	19/07/96	1858	E4	n	296	Box Corer	60	49.373	-2	37.794	60	49.383	-2	37.797				
53741#2	19/07/96	1941	E4	n	302	Box Corer	60	49.678	-2	38.107	60	49.684	-2	38.127				
53741#3	19/07/96	2011	E4	y	300	Day Grab	60	49.559	-2	38.028					y	y	y	
53741#4	19/07/96	2041	E4	n	299	Day Grab	60	49.530	-2	38.006								
53741#5	19/07/96	2105	E4	y	299	Day Grab	60	49.515	-2	37.931								0.1 m2
53741#6	19/07/96	2133	E4	y	299	Day Grab	60	49.508	-2	37.963								0.1 m2
53742#1	19/07/96	2226	E5	y	249	Day Grab	60	49.072	-2	34.453					y	y	y	
53742#2	19/07/96	2249	E5	y	249	Day Grab	60	49.062	-2	34.477								0.1 m2
53743#1	20/07/96	0003	B3	y	147	Day Grab	60	44.026	-2	35.468					y	y	y	
53743#2	20/07/96	0023	B3	n	148	Day Grab	60	44.002	-2	35.504								
53743#3	20/07/96	0038	B3	n	148	Day Grab	60	44.050	-2	35.520								
53743#4	20/07/96	0054	B3	y	148	Day Grab	60	44.031	-2	35.488								0.1 m2
53744#1	20/07/96	0202	B2	y	120	Day Grab	60	38.018	-2	32.995					y	y	y	
53744#2	20/07/96	0221	B2	n	120	Day Grab	60	38.006	-2	32.976								
53744#3	20/07/96	0234	B2	n	120	Day Grab	60	38.014	-2	33.026								
53744#4	20/07/96	0247	B2	n	120	Day Grab	60	38.011	-2	33.095								
53744#5	20/07/96	0257	B2	n	120	Day Grab	60	38.014	-2	33.108								
53744#6	20/07/96	0309	B2	n	120	Day Grab	60	38.019	-2	33.097								
53744#7	20/07/96	0321	B2	n	120	Day Grab	60	38.017	-2	33.094								
53744#8	20/07/96	0332	B2	n	120	Day Grab	60	38.013	-2	33.087								
53745#1	20/07/96	0457	B4	n	138	Day Grab	60	43.589	-2	15.630								
53745#2	20/07/96	0507	B4	n	138	Day Grab	60	43.606	-2	15.561								
53745#3	20/07/96	0516	B4	n	140	Day Grab	60	43.567	-2	15.502								
53745#4	20/07/96	0527	B4	n	140	Day Grab	60	43.566	-2	15.477								
53745#5	20/07/96	0537	B4	y	143	Day Grab	60	43.509	-2	15.388					y	y	y	
53745#6	20/07/96	0551	B4	y	143	Day Grab	60	43.493	-2	15.508								0.1 m2
53746#1	20/07/96	0702	B5	y	134	Day Grab	60	49.564	-2	19.931					y	y	y	
53746#2	20/07/96	0718	B5	n	134	Day Grab	60	49.485	-2	19.986								
53746#3	20/07/96	0730	B5	n	134	Day Grab	60	49.453	-2	20.081								
53746#4	20/07/96	0740	B5	y	133	Day Grab	60	49.451	-2	20.017								0.1 m2
53747#1	20/07/96	0849	Tr200	n	202	Day Grab	60	52.370	-2	19.551								

53747#2	20/07/96	0904	Tr200	n	204	Day Grab	60	52.394	-2	19.651								
53747#3	20/07/96	0918	Tr200	n	202	Day Grab	60	52.376	-2	19.641								
53747#4	20/07/96	0931	Tr200	y	202	Day Grab	60	52.369	-2	19.602					y	y	y	
53747#5	20/07/96	0950	Tr200	n	202	Day Grab	60	52.364	-2	19.629								
53747#6	20/07/96	1006	Tr200	y	202	Day Grab	60	52.365	-2	19.580								0.1 m2
53748#1	20/07/96	1055	Tr250	n	248	Day Grab	60	53.165	-2	20.822								
53748#2	20/07/96	1112	Tr250	y	248	Day Grab	60	53.173	-2	20.816					y	y	y	
53748#3	20/07/96	1138	Tr250	n	247	Day Grab	60	53.159	-2	20.773								
53748#4	20/07/96	1153	Tr250	n	247	Day Grab	60	53.171	-2	20.772								
53748#5	20/07/96	1211	Tr250	y	248	Day Grab	60	53.173	-2	20.795								0.1 m2
53749#1	20/07/96	1300	Tr300	n	292	Day Grab	60	53.975	-2	21.888								
53749#2	20/07/96	1324	Tr300	n	292	Day Grab	60	53.975	-2	21.915								
53749#3	20/07/96	1400	Tr300	n	290	Day Grab	60	53.945	-2	21.933								
53749#4	20/07/96	1422	Tr300	n	290	Day Grab	60	53.947	-2	21.913								
53749#5	20/07/96	1443	Tr300	n	290	Day Grab	60	53.952	-2	21.854								
53750#1	20/07/96	1547	Tr350	y	348	Box Corer	60	55.582	-2	24.193	60	55.589	-2	24.192	y	y	y	0.1 m2
53751#1	20/07/96	1713	L5	y	413	Box Corer	60	57.658	-2	25.087	60	57.666	-2	25.070	y	y	y	0.1 m2
53752#1	20/07/96	1904	Tr450	y	454	Box Corer	60	58.399	-2	28.265	60	58.410	-2	28.259	y	y	y	0.1 m2
53753#1	20/07/96	2040	L4	n	502	Box Corer	60	59.330	-2	29.687	60	59.338	-2	29.675				
53753#2	20/07/96	2122	L4	y	502	Box Corer	60	59.344	-2	29.628	60	59.352	-2	29.613	y	y	y	0.1 m2
53754#1	20/07/96	2310	P4	y	560	Box Corer	60	59.353	-2	39.355	60	59.386	-2	39.307	y	y	y	0.1 m2
53755#1	21/07/96	0119	Tr550	n	553	Box Corer	61	1.004	-2	31.949	61	1.040	-2	31.906				
53755#2	21/07/96	0212	Tr550	y	554	Box Corer	61	1.030	-2	31.926	61	1.052	-2	31.907	y	y	y	0.1 m2
53756#1	21/07/96	0404	Tr600	y	601	Box Corer	61	2.498	-2	34.120	61	2.525	-2	34.109	y	y	y	0.1 m2
53757#1	21/07/96	0559	Tr650	y	649	Box Corer	61	4.477	-2	36.831	61	4.495	-2	36.827	y	y	y	0.1 m2
53758#1	21/07/96	0728	S2	y	710	Box Corer	61	5.570	-2	40.932	61	5.564	-2	40.982	y	y	y	0.1 m2
53759#1	21/07/96	1010	500	y	506	Fish Trap	60	59.492	-2	29.914								
53760#1	21/07/96	1114	P5	y	518	Box Corer	60	59.687	-2	30.988	60	59.705	-2	30.977	y	y	y	0.1 m2
53761#1	21/07/96	1330	Tr800	y	806	Box Corer	61	8.056	-2	41.779	61	8.070	-2	41.767	y	y	y	0.1 m2
53762#1	21/07/96	1516	Tr900	y	916	Box Corer	61	9.557	-2	43.975	61	9.569	-2	43.978	y	y	y	0.1 m2
53763#1	21/07/96	1721	Tr1000	n	998	Box Corer	61	10.497	-2	45.284	61	10.517	-2	45.239				
53764#1	21/07/96	2123	Tr550	y	551	Mega Corer	61	0.967	-2	31.872	61	0.996	-2	31.862	y	y	y	
53764#2	21/07/96	2227	Tr550	y	552	Mega Corer	61	0.958	-2	31.912	61	0.974	-2	31.900				8 cores
53765#1	21/07/96	2350	Tr650	y	650	Mega Corer	61	4.484	-2	36.823	61	4.497	-2	36.822	y	y	y	
53765#2	22/07/96	0056	Tr650	y	650	Mega Corer	61	4.513	-2	36.808	61	4.548	-2	36.799				8 cores
53766#1	22/07/96	0257	S2	y	709	Mega Corer	61	5.551	-2	40.939	61	5.572	-2	40.942	y	y	y	
53766#2	22/07/96	0357	S2	y	709	Mega Corer	61	5.548	-2	40.952	61	5.568	-2	40.957				8 cores
53767#1	22/07/96	0533	Tr600	y	600	Mega Corer	61	2.615	-2	33.993	61	2.635	-2	33.984	y	y	y	
53767#2	22/07/96	0631	Tr600	y	601	Mega Corer	61	2.519	-2	33.941	61	2.553	-2	33.973				8 cores
53768#1	22/07/96	0817	800	y	796	Fish Trap	61	7.726	-2	42.223								
53769#1	22/07/96	0925	Tr800	y	804	Mega Corer	61	8.031	-2	41.750	61	8.021	-2	41.775				8 cores
53769#2	22/07/96	1027	Tr800	y	803	Mega Corer	61	8.019	-2	41.729	61	8.052	-2	41.744	y	y	y	
53770#1	22/07/96	1157	Tr900	y	915	Mega Corer	61	9.532	-2	44.022	61	9.539	-2	44.040	y	y	y	
53770#2	22/07/96	1311	Tr900	y	919	Mega Corer	61	9.588	-2	44.009	61	9.593	-2	44.026				8 cores
53771#1	22/07/96	1448	Tr1000	y	999	Mega Corer	61	10.510	-2	45.306	61	10.522	-2	45.293	y	y	y	3 cores
53771#2	22/07/96	1553	Tr1000	y	998	Mega Corer	61	10.494	-2	45.292	61	10.511	-2	45.288				5 cores
53771#3	22/07/96	1704	Tr1000	n	998	Box Corer	61	10.489	-2	45.326	61	10.513	-2	45.367				

53772#1	22/07/96	1833	U1	n	940	Box Corer	61	12.212	-2	37.053	61	12.226	-2	37.071				
53773#1	22/07/96	2143	U1	y	939	Mega Corer	61	12.211	-2	37.023	61	12.226	-2	37.036	y	y	y	
53773#2	22/07/96	2249	U1	y	940	Mega Corer	61	12.229	-2	36.968	61	12.242	-2	36.979				8 cores
53774#1	23/07/96	0037	S1	y	727	Mega Corer	61	8.063	-2	34.778	61	8.100	-2	34.770				8 cores
53774#2	23/07/96	0134	S1	y	729	Mega Corer	61	8.054	-2	34.927	61	8.082	-2	34.917	y	y	y	
53775#1	23/07/96	0403	N1	y	551	Box Corer	61	3.248	-2	24.105	61	3.262	-2	24.086	y	y	y	0.1 m2
53776#1	23/07/96	0541	K1	y	466	Box Corer	61	2.122	-2	16.213	61	2.131	-2	16.200	y	y	y	0.1 m2
53777#1	23/07/96	0701	G1	y	352	Box Corer	60	59.389	-2	9.403	60	59.396	-2	9.373	y	y	y	0.1 m2
53778#1	23/07/96	0858	300	y	289	Fish Trap	60	53.809	-2	22.097								
53779#1	23/07/96	1005	Tr350	y	346	Day Grab	60	55.519	-2	24.187					y	y	y	
53779#2	23/07/96	1031	Tr350	n	345	Day Grab	60	55.514	-2	24.183								
53779#3	23/07/96	1052	Tr350	n	346	Day Grab	60	55.522	-2	24.184								
53779#4	23/07/96	1114	Tr350	y	346	Day Grab	60	55.528	-2	24.163								0.1 m2
53780#1	23/07/96	1211	L5	y	414	Day Grab	60	57.713	-2	24.980					y	y	y	
53780#2	23/07/96	1252	L5	y	414	Day Grab	60	57.714	-2	24.989								0.1 m2
53781#1	23/07/96	1404	Tr450	y	455	Day Grab	60	58.393	-2	28.240					y	y	y	
53781#2	23/07/96	1448	Tr450	y	454	Day Grab	60	58.390	-2	28.200								0.1 m2
53782#1	23/07/96	1551	L4	n	501	Day Grab	60	59.319	-2	29.635								
53782#2	23/07/96	1631	L4	n	500	Day Grab	60	59.351	-2	29.343								
53782#3	23/07/96	1704	L4	y	500	Day Grab	60	59.345	-2	29.368								0.1 m2
53782#4	23/07/96	1742	L4	y	498	Day grab	60	59.332	-2	29.157					y	y	y	
53783#1	23/07/96	1855	Tr600	n	601	Day Grab	61	2.624	-2	34.163								
53784#1	23/07/96	2150	Tr300	y	289	Day Grab	60	53.915	-2	21.851					y	y	y	
53784#2	23/07/96	2217	Tr300	n	290	Day Grab	60	53.927	-2	21.812								
53784#3	23/07/96	2242	Tr300	n	289	Day Grab	60	53.933	-2	21.947								
53784#4	23/07/96	2304	Tr300	y	290	Day Grab	60	53.947	-2	21.903								0.1 m2
53785#1	24/07/96	0053	A1	n	117	Day Grab	60	52.397	-1	59.518								
53785#2	24/07/96	0106	A1	n	117	Day Grab	60	52.397	-1	59.552								
53785#3	24/07/96	0119	A1	n	117	Day Grab	60	52.384	-1	59.459								
53785#4	24/07/96	0131	A1	y	117	Day Grab	60	52.397	-1	59.522					y	y	y	
53785#5	24/07/96	0143	A1	n	117	Day Grab	60	52.379	-1	59.506								
53785#6	24/07/96	0156	A1	n	117	Day Grab	60	52.418	-1	59.515								
53785#7	24/07/96	0209	A1	y	117	Day Grab	60	52.433	-1	59.450								0.1 m2
53785#8	24/07/96	0223	A1	n	117	Day Grab	60	52.423	-1	59.514								
53786#1	24/07/96	0317	A2	n	147	Day Grab	60	56.564	-2	0.386								
53786#2	24/07/96	0329	A2	n	148	Day Grab	60	56.584	-2	0.444								
53786#3	24/07/96	0342	A2	n	147	Day Grab	60	56.565	-2	0.430								
53786#4	24/07/96	0354	A2	n	148	Day Grab	60	56.574	-2	0.391								
53786#5	24/07/96	0409	A2	y	148	Day Grab	60	56.590	-2	0.413					y	y	y	
53786#6	24/07/96	0425	A2	n	147	Day Grab	60	56.596	-2	0.271								
53786#7	24/07/96	0438	A2	y	146	Day Grab	60	56.573	-2	0.146								0.1 m2
53786#8	24/07/96	0451	A2	n	148	Day Grab	60	56.587	-2	0.420								
53787#1	24/07/96	0523	A3	y	160	Day Grab	60	57.661	-1	58.457					y	y	y	
53787#2	24/07/96	0537	A3	y	158	Day Grab	60	57.558	-1	58.310								0.1 m2
53788#1	24/07/96	0658	A4	n	133	Day Grab	60	57.943	-1	40.035								
53788#2	24/07/96	0711	A4	n	133	Day Grab	60	58.035	-1	40.062								
53788#3	24/07/96	0722	A4	y	133	Day Grab	60	57.982	-1	39.905					y	y	y	

53788#4	24/07/96	0735	A4	n	133	Day Grab	60	58.027	-1	40.115								
53788#5	24/07/96	0746	A4	n	133	Day Grab	60	58.044	-1	40.239								
53788#6	24/07/96	0757	A4	n	133	Day Grab	60	58.060	-1	40.103								
53788#7	24/07/96	0807	A4	y	133	Day Grab	60	58.037	-1	40.017								0.1 m2
53789#1	24/07/96	0931	D1	n	227	Box Corer	61	1.582	-1	54.992	61	1.582	-1	54.977				
53789#2	24/07/96	1003	D1	n	226	Box Corer	61	1.591	-1	54.937	61	1.587	-1	54.926				
53789#3	24/07/96	1028	D1	n	228	Day Grab	61	1.606	-1	54.962								
53789#4	24/07/96	1044	D1	n	227	Day Grab	61	1.592	-1	54.966								
53789#5	24/07/96	1100	D1	y	226	Day Grab	61	1.579	-1	54.929					y	y	y	
53789#6	24/07/96	1127	D1	n	226	Day Grab	61	1.592	-1	54.888								
53789#7	24/07/96	1141	D1	y	225	Day Grab	61	1.601	-1	54.856								0.1 m2
53790#1	24/07/96	1300	D2	n	274	Box Corer	61	6.700	-1	48.328	61	6.708	-1	48.311				
53790#2	24/07/96	1328	D2	n	274	Day Grab	61	6.705	-1	48.316								
53790#3	24/07/96	1349	D2	n	274	Day Grab	61	6.719	-1	48.348								
53790#4	24/07/96	1410	D2	y	274	Day Grab	61	6.713	-1	48.338								0.1 m2
53790#5	24/07/96	1435	D2	y	274	Day Grab	61	6.707	-1	48.306					y	y	y	
53791#1	24/07/96	1544	G2	y	367	Box Corer	61	6.988	-1	53.422	61	6.990	-1	53.400	y	y	y	0.1 m2
53792#1	24/07/96	1729	K2	y	436	Box Corer	61	7.979	-1	55.748	61	7.976	-1	55.720	y	y	y	0.1 m2
53793#1	24/07/96	1910	N2	y	563	Box Corer	61	9.579	-2	8.491	61	9.557	-2	8.417	y	y	y	0.1 m2
53794#1	24/07/96	2049	R1	y	657	Box Corer	61	15.983	-2	4.630	61	15.991	-2	4.613	y	y	y	0.1 m2
53795#1	24/07/96	2253	K3	y	489	Box Corer	61	15.807	-1	47.474	61	15.810	-1	47.460	y	y	y	0.1 m2
53796#1	25/07/96	0043	D3	n	248	Box Corer	61	10.418	-1	38.127	61	10.425	-1	38.120				
53796#2	25/07/96	0113	D3	n	247	Box Corer	61	10.403	-1	38.136	61	10.413	-1	38.136				
53796#3	25/07/96	0144	D3	n	248	Box Corer	61	10.422	-1	38.114	61	10.432	-1	38.115				
53796#4	25/07/96	0208	D3	n	251	Box Corer	61	10.442	-1	38.170	61	10.452	-1	38.162				
53796#5	25/07/96	0247	D3	y	250	Day Grab	61	10.447	-1	38.137								0.1 m2
53796#6	25/07/96	0308	D3	y	249	Day Grab	61	10.472	-1	38.138					y	y	y	
53797#1	25/07/96	0450	G3	n	333	Box Corer	61	18.294	-1	32.160	61	18.301	-1	32.186				
53797#2	25/07/96	0535	G3	n	330	Box Corer	61	18.185	-1	32.161	61	18.196	-1	32.148				
53797#3	25/07/96	0605	G3	n	333	Day Grab	61	18.238	-1	32.261								
53797#4	25/07/96	0624	G3	n	332	Day Grab	61	18.211	-1	32.256								
53797#5	25/07/96	0641	G3	n	331	Day Grab	61	18.230	-1	32.089								
53797#6	25/07/96	0700	G3	y	324	Day Grab	61	18.245	-1	31.653					y	y	y	
53797#7	25/07/96	0728	G3	y	331	Day Grab	61	18.203	-1	32.207								0.1 m2
53798#1	25/07/96	0901	K4	n	453	Box Corer	61	25.859	-1	29.030	61	25.874	-1	29.029				
53798#2	25/07/96	0934	K4	y	452	Box Corer	61	25.849	-1	28.993	61	25.858	-1	28.993	y	y	y	0.1 m2
53799#1	25/07/96	1044	500	y	516	Fish Trap	61	26.653	-1	31.548								
53800#1	25/07/96	1334	N4	y	558	Box Corer	61	27.295	-1	34.007	61	27.306	-1	34.009	y	y	y	0.1 m2
53801#1	25/07/96	1548	570	y	570	Wasp	61	23.555	-1	41.612								
53802#1	25/07/96	1830	N3	n	594	Box Corer	61	27.827	-1	36.887	61	27.837	-1	36.887				
53802#2	25/07/96	1941	N3	y	595	Box Corer	61	27.792	-1	36.952	61	27.808	-1	36.963	y	y	y	0.1 m2
53803#1	25/07/96	2110	R4	y	649	Box Corer	61	28.470	-1	41.146	61	28.474	-1	41.121	y	y	y	0.1 m2
53804#1	25/07/96	2244	R5	y	683	Box Corer	61	30.381	-1	41.536	61	30.377	-1	41.494	y	y	y	0.1 m2
53805#1	26/07/96	0053	N5	y	580	Box Corer	61	36.619	-1	22.892	61	36.631	-1	22.859	y	y	y	0.1 m2
53806#1	26/07/96	0233	K5	n	467	Box Corer	61	34.234	-1	17.513	61	34.254	-1	17.486				
53806#2	26/07/96	0340	K5	y	467	Box Corer	61	34.234	-1	17.504	61	34.253	-1	17.468	y	y	y	see comment
53807#1	26/07/96	0523	G4	n	361	Box Corer	61	32.648	-1	13.231	61	32.675	-1	13.209				

53807#2	26/07/96	0603	G4	n	361	Day Grab	61	32.633	-1	13.292							
53807#3	26/07/96	0624	G4	y	361	Day Grab	61	32.664	-1	13.248					y	y	y	
53807#4	26/07/96	0656	G4	y	368	Day Grab	61	32.629	-1	13.744								0.1 m2
53808#1	26/07/96	0750	G5	n	347	Day Grab	61	34.267	-1	10.194								
53808#2	26/07/96	0816	G5	y	351	Day Grab	61	34.236	-1	10.233					y	y	y	
53808#3	26/07/96	0838	G5	y	348	Day Grab	61	34.253	-1	10.210								0.1 m2
53808#4	26/07/96	0859	G5	n	347	Day Grab	61	34.264	-1	10.181								
53808#5	26/07/96	0923	G5	n	346	Day Grab	61	34.208	-1	10.352								
53809#1	26/07/96	1327	300	y	297	Fish Trap	61	32.392	-1	9.016								
53810#1	26/07/96	1428	300	y	299	Wasp	61	31.498	-1	10.716	61	31.522	-1	10.687				
53811#1	26/07/96	1721	500	y	499	Wasp	61	26.853	-1	31.234	61	26.873	-1	31.190				
53812#1	26/07/96	2022	800	y	794	Wasp	61	24.759	-1	57.495	61	24.783	-1	57.449				
53813#1	27/07/96	0115	G5	n	346	Day Grab	61	34.223	-1	10.191								
53813#2	27/07/96	0140	G5	y	352	Day Grab	61	34.237	-1	10.268								0.1 m2
53814#1	27/07/96	0317	D5	n	248	Day Grab	61	39.730	0	54.380								
53814#2	27/07/96	0338	D5	n	248	Day Grab	61	39.740	0	54.490								
53814#3	27/07/96	0358	D5	y	247	Day Grab	61	39.757	0	54.436					y	y	y	
53814#4	27/07/96	0419	D5	n	248	Day Grab	61	39.815	0	54.419								
53814#5	27/07/96	0434	D5	y	249	Day Grab	61	39.871	0	54.419								0.1 m2
53815#1	27/07/96	0645	A5	n	181	Day Grab	61	25.987	0	49.999								
53815#2	27/07/96	0657	A5	n	181	Day Grab	61	26.041	0	49.981								
53815#3	27/07/96	0732	A5	y	180	Day Grab	61	26.119	0	49.912					y	y	y	
53815#4	27/07/96	0753	A5	y	180	Day Grab	61	26.070	0	49.162								0.1 m2
53815#5	27/07/96	0808	A5	y	180	Day Grab	61	26.108	0	49.145								0.1 m2
53816#1	27/07/96	0945	D4	n	237	Day Grab	61	29.632	-1	7.013								
53816#2	27/07/96	0959	D4	n	237	Day Grab	61	29.589	-1	7.069								
53816#3	27/07/96	1014	D4	y	235	Day Grab	61	29.530	-1	6.862						y	y	
53816#4	27/07/96	1037	D4	y	235	Day Grab	61	29.536	-1	6.879								0.1 m2
53816#5	27/07/96	1057	D4	y	236	Day Grab	61	29.505	-1	7.023					y			
53817#1	27/07/96	1606	800	y	789	Fish Trap	61	24.809	-1	57.177								
53818#1	27/07/96	1734	U4	y	955	Mega Corer	61	25.985	-2	1.676	61	26.000	-2	1.641				7 cores
53818#2	27/07/96	1857	U4	y	952	Mega Corer	61	26.320	-2	0.871	61	26.347	-2	0.827	y	y	y	
53819#1	27/07/96	2123	W4	y	1091	Mega Corer	61	35.376	-1	49.749	61	35.380	-1	49.750	y	y	y	
53819#2	27/07/96	2237	W4	n	1095	Mega Corer	61	35.391	-1	49.887	61	35.396	-1	49.897				
53819#3	27/07/96	2348	W4	y	1094	Mega Corer	61	35.384	-1	49.911	61	35.396	-1	49.844				8 cores
53820#1	28/07/96	0134	W5	y	1090	Mega Corer	61	37.335	-1	47.080	61	37.328	-1	47.076	y	y	y	
53820#2	28/07/96	0254	W5	y	1093	Mega Corer	61	37.333	-1	47.122	61	37.337	-1	47.115				8 cores
53821#1	28/07/96	0432	U5	y	880	Mega Corer	61	38.966	-1	38.994	61	38.972	-1	38.989	y	y	y	
53821#2	28/07/96	0543	U5	y	878	Mega Corer	61	38.962	-1	38.932	61	38.946	-1	38.902				8 cores
53822#1	28/07/96	0831	R2	y	685	Mega Corer	61	23.287	-1	52.947	61	23.294	-1	52.945	y	y	y	1 core
53822#2	28/07/96	0923	R2	y	685	Mega Corer	61	23.323	-1	52.950	61	23.326	-1	52.952				7 cores
53823#1	28/07/96	1038	R3	y	738	Mega Corer	61	24.502	-1	54.913	61	24.503	-1	54.936	y	y	y	
53823#2	28/07/96	1141	R3	n	737	Mega Corer	61	24.482	-1	54.918	61	24.484	-1	54.922				
53823#3	28/07/96	1232	R3	y	735	Mega Corer	61	24.433	-1	54.916	61	24.432	-1	54.947				8 cores
53824#1	28/07/96	1544	U3	y	842	Mega Corer	61	19.960	-2	10.055	61	19.958	-2	10.064				8 cores
53824#2	28/07/96	1649	U3	y	840	Mega Corer	61	19.668	-2	10.651	61	19.676	-2	10.675	y	y	y	
53825#1	28/07/96	1838	U2	y	882	Mega Corer	61	19.395	-2	13.658	61	19.395	-2	13.649				8 cores

53825#2	28/07/96	1949	U2	y	876	Mega Corer	61	19.336	-2	13.473	61	19.336	-2	13.485	y	y	y	
53826#1	28/07/96	2136	1100	y	1091	Fish Trap	61	18.036	-2	29.828								
53827#1	28/07/96	2348	Y3	y	1238	Mega Corer	61	22.375	-2	42.636	61	22.366	-2	42.650				8 cores
53827#2	29/07/96	0116	Y3	y	1237	Mega Corer	61	22.344	-2	42.401	61	22.336	-2	42.464	y	y	y	
53828#1	29/07/96	0322	Y4	y	1350	Mega Corer	61	26.126	-2	37.033	61	26.131	-2	37.048				8 cores
53828#2	29/07/96	0453	Y4	y	1352	Mega Corer	61	26.204	-2	36.916	61	26.216	-2	36.915	y	y	y	
53829#1	29/07/96	0725	W3	y	1186	Mega Corer	61	26.449	-2	15.515	61	26.446	-2	15.527				8 cores
53829#2	29/07/96	0856	W3	y	1191	Mega Corer	61	26.500	-2	15.930	61	26.552	-2	15.895	y	y	y	
53830#1	29/07/96	1127	W2	y	1057	Mega Corer	61	17.795	-2	27.338								8 cores
53830#2	29/07/96	1252	W2	y	1057	Mega Corer	61	17.805	-2	27.344	61	17.791	-2	27.385	y	y	y	
53831#1	29/07/96	1546	W1	y	1092	Mega Corer	61	17.951	-2	30.167	61	17.963	-2	30.166				8 cores
53831#2	29/07/96	1706	W1	y	1090	Mega Corer	61	17.898	-2	30.034	61	17.917	-2	30.070	y	y	y	
53832#1	29/07/96	1953	Y5	y	1388	Mega Corer	61	27.578	-2	36.137	61	27.582	-2	36.223				8 cores
53832#2	29/07/96	2127	Y5	y	1389	Mega Corer	61	27.601	-2	36.387	61	27.625	-2	36.383	y	y	y	
53833#1	30/07/96	0003	Z4	y	1513	Mega Corer	61	36.157	-2	26.562	61	36.158	-2	26.561				8 cores
53833#2	30/07/96	0151	Z4	y	1514	Mega Corer	61	36.218	-2	26.503	61	36.191	-2	26.528	y	y	y	
53834#1	30/07/96	0357	Z5	y	1542	Mega Corer	61	39.498	-2	26.514	61	39.478	-2	26.543				8 cores
53834#2	30/07/96	0546	Z5	y	1547	Mega Corer	61	39.543	-2	26.137	61	39.535	-2	26.209	y	y	y	
53835#1	30/07/96	0846	Z3	y	1517	Mega Corer	61	37.729	-2	51.977	61	37.782	-2	51.943				8 cores
53835#2	30/07/96	1032	Z3	y	1517	Mega Corer	61	37.726	-2	51.982	61	37.772	-2	51.939	y	y	y	
53836#1	30/07/96	1317	Z2	n	1415	Mega Corer	61	27.430	-3	0.239	61	27.359	-3	0.404				
53836#2	30/07/96	1502	Z2	y	1416	Mega Corer	61	27.472	-3	0.189	61	27.410	-3	0.193	y	y	y	7 cores
53837#1	30/07/96	1731	Z1	n	1439	Mega Corer	61	29.851	-3	7.925	61	29.832	-3	7.950				
53837#2	30/07/96	1918	Z1	y	1439	Box Corer	61	29.836	-3	7.854					y	y	y	0.1 m2
53838#1	30/07/96	2219	Y1	y	1355	Box Corer	61	25.996	-3	21.951	61	26.062	-3	21.955	y	y	y	0.1 m2
53839#1	31/07/96	0039	Y2	y	1366	Box Corer	61	24.197	-3	17.301	61	24.201	-3	17.235	y	y	y	o.1 m2
53840#1	31/07/96	0514	V5	y	985	Mega Corer	61	7.070	-2	57.546	61	7.052	-2	57.597	y	y	y	8 cores
53841#1	31/07/96	1313	M1	y	481	Box Corer	60	25.075	-4	6.973					y	y	y	y
53842#1	31/07/96	1503	Q1	y	533	Box Corer	60	24.039	-4	13.349	60	24.049	-4	13.364	y	y	y	0.1 m2
53843#1	31/07/96	1647	T2	y	601	Box Corer	60	24.733	-4	16.942	60	24.732	-4	16.948	y	y	y	0.1 m2
53844#1	31/07/96	1912	Q2	y	538	Box Corer	60	16.497	-4	27.533	60	16.505	-4	27.544	y	y	y	0.1 m2
53845#1	31/07/96	2113	M2	n	492	Box Corer	60	11.767	-4	35.884	60	11.779	-4	35.867				
53845#2	31/07/96	2159	M2	n	493	Box Corer	60	11.750	-4	36.070	60	11.765	-4	36.043				
53845#3	31/07/96	2322	500	y	500	Hornet	60	12.211	-4	35.478								
53845#4	01/08/96	0113	M2	y	496	Box Corer	60	11.936	-4	35.921	60	11.936	-4	35.918	y	y	y	0.1 m2
53846#1	01/08/96	0316	M4	y	467	Box Corer	60	6.750	-4	45.743	60	6.751	-4	45.778	y	y	y	0.1 m2
53847#1	01/08/96	0456	Q5	y	520	Box Corer	60	5.470	-4	53.086	60	5.456	-4	53.089	y	y	y	0.1 m2
53848#1	01/08/96	0652	M5	y	421	Box Corer	60	2.147	-4	54.593	60	2.153	-4	54.564	y	y	y	0.1 m2
53849#1	01/08/96	0815	J5	n	341	Box Corer	60	1.292	-4	50.688	60	1.306	-4	50.639				
53849#2	01/08/96	0907	J5	y	341	Day Grab	60	1.293	-4	50.688					y	y	y	
53849#3	01/08/96	0940	J5	y	341	Day Grab	60	1.276	-4	50.702								0.1 m2
53849#4	01/08/96	1009	J5	n	342	Day Grab	60	1.321	-4	50.737								
53849#5	01/08/96	1030	J5	y	342	Day Grab	60	1.281	-4	50.765								0.1 m2
53850#1	01/08/96	1122	F5	n	267	Day Grab	60	0.596	-4	47.940								
53850#2	01/08/96	1140	F5	n	266	Day Grab	60	0.571	-4	47.970								
53850#3	01/08/96	1156	F5	n	266	Day Grab	60	0.611	-4	47.988								
53850#4	01/08/96	1216	F5	n	265	Day Grab	60	0.572	-4	48.017								

53850#5	01/08/96	1240	F5	n	268	Day Grab	60	0.558	-4	47.962				
53850#6	01/08/96	1303	F5	n	268	Day Grab	60	0.541	-4	47.984				
53850#7	01/08/96	1325	F5	n	264	Day Grab	60	0.564	-4	48.039				
53851#1	01/08/96	1448	C14	y	152	Day Grab	59	53.201	-4	50.608	y	y	y	
53851#2	01/08/96	1530	C14	n	153	Day Grab	59	53.168	-4	50.516				
53851#3	01/08/96	1544	C14	y	152	Day Grab	59	53.194	-4	50.589				0.1 m2
53852#1	01/08/96	1621	C15	n	154	Day Grab	59	53.009	-4	51.206				
53852#2	01/08/96	1636	C15	y	155	Day Grab	59	53.014	-4	51.210				0.1 m2
53852#3	01/08/96	1649	C15	n	155	Day Grab	59	53.040	-4	51.247				
53852#4	01/08/96	1702	C15	y	156	Day Grab	59	53.015	-4	51.235	y	y	y	
53853#1	01/08/96	1856	C10	n	111	Day Grab	59	43.717	-4	53.507				
53853#2	01/08/96	1905	C10	n	112	Day Grab	59	43.684	-4	53.484				
53853#3	01/08/96	1914	C10	n	112	Day Grab	59	43.721	-4	53.597				
53853#4	01/08/96	1926	C10	n	112	Day Grab	59	43.651	-4	53.453				
53853#5	01/08/96	1936	C10	n	112	Day Grab	59	43.686	-4	53.525				
53853#6	01/08/96	1945	C10	n	112	Day Grab	59	43.673	-4	53.471				
53853#7	01/08/96	1953	C10	n	112	Day Grab	59	43.648	-4	53.473				
53854#1	01/08/96	2125	C2	n	100	Day Grab	59	37.497	-4	37.481				
53854#2	01/08/96	2135	C2	n	99	Day Grab	59	37.457	-4	37.468				
53854#3	01/08/96	2144	C2	n	101	Day Grab	59	37.487	-4	37.564				
53854#4	01/08/96	2152	C2	y	100	Day Grab	59	37.456	-4	37.558	y	y	y	
53854#5	01/08/96	2207	C2	n	100	Day Grab	59	37.397	-4	37.678				
53854#6	01/08/96	2216	C2	n	100	Day Grab	59	37.463	-4	37.610				
53854#7	01/08/96	2226	C2	n	100	Day Grab	59	37.452	-4	37.500				
53854#8	01/08/96	2236	C2	n	100	Day Grab	59	37.473	-4	37.596				
53854#9	01/08/96	2245	C2	n	100	Day Grab	59	37.495	-4	37.600				
53854#10	01/08/96	2254	C2	n	100	Day Grab	59	37.507	-4	37.638				
53854#11	01/08/96	2328	100	y	100	Hornet	59	37.538	-4	37.586				
53855#1	02/08/96	0053	C3	n	106	Day Grab	59	35.797	-4	39.851				
53855#2	02/08/96	0103	C3	n	106	Day Grab	59	35.767	-4	39.860				
53855#3	02/08/96	0116	C3	n	107	Day Grab	59	35.786	-4	39.966				
53855#4	02/08/96	0127	C3	n	106	Day Grab	59	35.792	-4	39.928				
53855#5	02/08/96	0139	C3	n	106	Day Grab	59	35.776	-4	39.946				
53855#6	02/08/96	0151	C3	n	106	Day Grab	59	35.788	-4	39.965				
53855#7	02/08/96	0203	C3	n	106	Day Grab	59	35.759	-4	39.962				
53855#8	02/08/96	0213	C3	n	106	Day Grab	59	35.782	-4	39.996				
53856#1	02/08/96	0312	C4	n	110	Day Grab	59	30.574	-4	41.385				
53856#2	02/08/96	0324	C4	n	111	Day Grab	59	30.571	-4	41.439				
53856#3	02/08/96	0335	C4	y	110	Day Grab	59	30.562	-4	41.460	y	y	y	
53856#4	02/08/96	0352	C4	y	110	Day Grab	59	30.578	-4	41.479				0.1 m2
53857#1	02/08/96	0438	C5	n	128	Day Grab	59	31.438	-4	48.156				
53857#2	02/08/96	0446	C5	y	127	Day Grab	59	31.374	-4	48.152	y	y	y	
53857#3	02/08/96	0503	C5	n	128	Day Grab	59	31.243	-4	48.122				
53857#4	02/08/96	0512	C5	y	127	Day Grab	59	31.165	-4	48.123				0.1 m2
53857#5	02/08/96	0522	C5	y	127	Day Grab	59	31.039	-4	48.201				0.1 m2
53858#1	02/08/96	0646	C9	n	103	Day Grab	59	39.223	-4	41.262				
53858#2	02/08/96	0655	C9	n	103	Day Grab	59	39.188	-4	41.313				

53858#3	02/08/96	0705	C9	n	103	Day Grab	59	39.199	-4	41.373				
53858#4	02/08/96	0713	C9	n	103	Day Grab	59	39.175	-4	41.445				
53858#5	02/08/96	0721	C9	n	104	Day Grab	59	39.173	-4	41.485				
53858#6	02/08/96	0731	C9	n	104	Day Grab	59	39.176	-4	41.485				
53858#7	02/08/96	0736	C9	n	104	Day Grab	59	39.149	-4	41.474				
53859#1	02/08/96	0852	C1	n	108	Day Grab	59	41.908	-4	24.983				
53859#2	02/08/96	0902	C1	y	107	Day Grab	59	41.903	-4	24.940	y	y	y	
53859#3	02/08/96	0916	C1	n	108	Day Grab	59	41.905	-4	25.026				
53859#4	02/08/96	0925	C1	y	108	Day Grab	59	41.913	-4	25.053				0.1 m2
53860#1	02/08/96	1108	C8	n	111	Day Grab	59	47.398	-4	37.054				
53860#2	02/08/96	1116	C8	n	110	Day Grab	59	47.401	-4	37.150				
53860#3	02/08/96	1124	C8	n	110	Day Grab	59	47.427	-4	37.166				
53860#4	02/08/96	1132	C8	y	110	Day Grab	59	47.433	-4	37.255	y	y	y	
53860#5	02/08/96	1144	C8	n	110	Day Grab	59	47.372	-4	37.227				
53860#6	02/08/96	1152	C8	n	109	Day Grab	59	47.398	-4	37.349				
53860#7	02/08/96	1206	C8	y	110	Day Grab	59	47.453	-4	37.234				0.1 m2
53861#1	02/08/96	1333	C7	y	123	Day Grab	59	51.495	-4	22.601	y	y	y	
53861#2	02/08/96	1355	C7	y	123	Day Grab	59	51.469	-4	22.673				0.1 m2
53862#1	02/08/96	1600	F4	y	226	Day Grab	60	4.517	-4	37.312				0.1 m2
53862#2	02/08/96	1620	F4	n	227	Day Grab	60	4.544	-4	37.379				
53862#3	02/08/96	1634	F4	n	224	Day Grab	60	4.509	-4	37.276				
53862#4	02/08/96	1650	F4	n	225	Day Grab	60	4.464	-4	37.379				
53862#5	02/08/96	1706	F4	y	227	Day Grab	60	4.537	-4	37.444	y	y	y	
53863#1	02/08/96	1849	F2	y	254	Day Grab	60	9.838	-4	24.480	y	y	y	
53863#2	02/08/96	1913	F2	y	245	Day Grab	60	9.749	-4	24.220				0.1 m2
53864#1	02/08/96	2036	F1	y	234	Day Grab	60	14.410	-4	8.676	y	y	y	
53864#2	02/08/96	2102	F1	n	235	Day Grab	60	14.400	-4	8.770				
53864#3	02/08/96	2118	F1	n	236	Day Grab	60	14.425	-4	8.729				
53864#4	02/08/96	2132	F1	y	238	Day Grab	60	14.425	-4	8.772				0.1 m2
53864#5	02/08/96	2147	F1	n	236	Day Grab	60	14.459	-4	8.643				
53864#6	02/08/96	2203	F1	n	236	Day Grab	60	14.435	-4	8.720				
53864#7	02/08/96	2215	F1	n	231	Day Grab	60	14.381	-4	8.579				
53865#1	02/08/96	2309	C13	n	169	Day Grab	60	13.231	-4	1.358				
53865#2	02/08/96	2321	C13	y	170	Day Grab	60	13.184	-4	1.356	y	y	y	
53865#3	02/08/96	2341	C13	n	169	Day Grab	60	13.259	-4	1.387				
53865#4	02/08/96	2355	C13	y	170	Day Grab	60	13.210	-4	1.323				0.1 m2
53866#1	03/08/96	0132	C6	y	123	Day Grab	60	2.659	-3	56.736	y	y	y	
53866#2	03/08/96	0149	C6	y	123	Day Grab	60	2.663	-3	56.756				0.1 m2
53867#1	03/08/96	0353	C11	n	134	Day Grab	60	14.143	-3	37.876				
53867#2	03/08/96	0406	C11	n	135	Day Grab	60	14.131	-3	37.910				
53867#3	03/08/96	0417	C11	n	135	Day Grab	60	14.143	-3	38.032				
53867#4	03/08/96	0426	C11	n	135	Day Grab	60	14.102	-3	38.053				
53867#5	03/08/96	0436	C11	n	137	Day Grab	60	14.094	-3	38.313				
53867#6	03/08/96	0448	C11	y	140	Day Grab	60	13.961	-3	38.915	y	y	y	
53867#7	03/08/96	0503	C11	n	138	Day Grab	60	14.130	-3	39.281				
53867#8	03/08/96	0514	C11	y	139	Day Grab	60	14.096	-3	39.379				0.1 m2
53867#9	03/08/96	0526	C11	y	139	Day Grab	60	14.075	-3	39.491				0.1 m2

53868#1	03/08/96	0630	C12	n	180	Day Grab	60	17.258	-3	50.000								
53868#2	03/08/96	0641	C12	n	179	Day Grab	60	17.260	-3	49.831								
53868#3	03/08/96	0654	C12	y	181	Day Grab	60	17.200	-3	49.983					y	y	y	
53868#4	03/08/96	0718	C12	n	181	Day Grab	60	17.208	-3	49.973								
53868#5	03/08/96	0729	C12	y	178	Day Grab	60	17.136	-3	49.788								0.1 m2
53868#6	03/08/96	0745	C12	y	176	Day Grab	60	17.015	-3	49.423								0.1 m2
53869#1	03/08/96	0942	J1	y	390	Box Corer	60	24.775	-3	44.778	60	24.781	-3	44.769	y	y	y	0.1 m2
53870#1	03/08/96	1124	J2	n	335	Box Corer	60	22.090	-3	51.322	60	22.104	-3	51.290				
53870#2	03/08/96	1154	J2	y	332	Box Corer	60	22.036	-3	51.355	60	22.047	-3	51.342	y	y	y	0.1 m2
53871#1	03/08/96	1459	J3	n	355	Box Corer	60	16.376	-4	13.535	60	16.382	-4	13.540				
53871#2	03/08/96	1530	J3	n	356	Box Corer	60	16.357	-4	13.592	60	16.372	-4	13.609				
53871#3	03/08/96	1555	J3	n	358	Box Corer	60	16.322	-4	13.615	60	16.338	-4	13.639				
53871#4	03/08/96	1639	J3	y	354	Day Grab	60	16.397	-4	13.594					y	y	y	
53871#5	03/08/96	1710	J3	n	352	Day Grab	60	16.254	-4	13.343								
53871#6	03/08/96	1733	J3	y	340	Day Grab	60	16.187	-4	13.211								0.1 m2
53872#1	03/08/96	2018	800	y	816	Fish Snack	60	18.676	-4	43.138								
53873#1	03/08/96	2150	T3	y	788	Mega Corer	60	19.403	-4	38.870	60	19.446	-4	38.820	y	y	y	
53873#2	03/08/96	2247	T3	y	783	Mega Corer	60	19.439	-4	38.677	60	19.447	-4	38.656				8 cores
53874#1	04/08/96	0114	T4	n	721	Mega Corer	60	17.150	-4	40.757	60	17.169	-4	40.726				
53874#2	04/08/96	0205	T4	n	719	Mega Corer	60	17.049	-4	40.878	60	17.053	-4	40.883				
53874#3	04/08/96	0306	T4	y	721	Mega Corer	60	17.057	-4	40.977	60	17.063	-4	40.988	y	y	y	2 cores
53874#4	04/08/96	0411	T4	y	721	Mega Corer	60	17.018	-4	41.025	60	17.034	-4	41.036				6 cores
53875#1	04/08/96	0711	J4	n	375	Day Grab	60	15.855	-4	16.783								
53875#2	04/08/96	0733	J4	n	375	Day Grab	60	15.937	-4	16.488								
53875#3	04/08/96	0756	J4	n	375	Day Grab	60	15.916	-4	16.461								
53875#4	04/08/96	0815	J4	y	375	Day Grab	60	15.961	-4	16.370					y	y	y	
53875#5	04/08/96	0845	J4	y	374	Day Grab	60	15.737	-4	16.594								0.1 m2
53875#6	04/08/96	0912	J4	n	377	Day Grab	60	15.709	-4	16.976								
53875#7	04/08/96	0931	J4	n	379	Day Grab	60	15.675	-4	17.141								
53875#8	04/08/96	0948	J4	y	380	Day Grab	60	15.623	-4	17.278								0.1 m2
53876#1	04/08/96	1304	F3	y	212	Day Grab	60	5.474	-4	34.026					y	y	y	
53876#2	04/08/96	1332	F3	n	217	Day Grab	60	5.478	-4	34.164								
53876#3	04/08/96	1349	F3	n	215	Day Grab	60	5.451	-4	34.163								
53876#4	04/08/96	1404	F3	y	213	Day Grab	60	5.409	-4	34.166								0.1 m2
53876#5	04/08/96	1423	F3	n	212	Day Grab	60	5.447	-4	34.086								
53877#1	04/08/96	1550	M3	y	447	Box Corer	60	9.563	-4	37.941	60	9.582	-4	37.920	y	y	y	0.1 m2
53878#1	05/08/96	1142	T5	y	687	Mega Corer	60	14.281	-4	45.773					y	y	y	
53878#2	05/08/96	1249	T5	y	689	Mega Corer	60	14.339	-4	45.833	60	14.362	-4	45.857				8 cores
53879#1	05/08/96	1514	Q4	y	543	Mega Corer	60	14.892	-4	31.741	60	14.900	-4	31.727				7 cores
53879#2	05/08/96	1605	Q4	y	542	Mega Corer	60	14.855	-4	31.833	60	14.860	-4	31.818	y	y	y	
53880#1	05/08/96	1729	Q3	y	534	Mega Corer	60	15.679	-4	29.760	60	15.696	-4	29.775	y	y	y	
53880#2	05/08/96	1818	Q3	y	530	Mega Corer	60	15.627	-4	29.455	60	15.631	-4	29.453				7 cores
53881#1	06/08/96	0007	H3	n	318	Day Grab	60	32.024	-3	17.716								
53881#2	06/08/96	0029	H3	y	318	Day Grab	60	32.027	-3	17.672								0.1 m2
53881#3	06/08/96	0057	H3	y	317	Day Grab	60	32.105	-3	17.572								0.1 m2
53881#4	06/08/96	0122	H3	y	314	Day Grab	60	32.059	-3	17.389								0.1 m2
53882#1	06/08/96	0247	E1	y	239	Day Grab	60	26.572	-3	23.022					y	y	y	

53882#2	06/08/96	0314	E1	n	239	Day Grab	60	26.572	-3	23.071								
53882#3	06/08/96	0333	E1	y	240	Day Grab	60	26.557	-3	23.102								0.1 m2
53882#4	06/08/96	0356	E1	n	239	Day Grab	60	26.539	-3	23.079								
53882#5	06/08/96	0416	E1	y	235	Day Grab	60	26.490	-3	22.833								0.1 m2
53882#6	06/08/96	0433	E1	n	235	Day Grab	60	26.593	-3	22.316								
53882#7	06/08/96	0446	E1	n	235	Day Grab	60	26.702	-3	21.905								
53883#1	06/08/96	0732	B1	y	168	Day Grab	60	22.574	-2	52.036								0.1 m2
53883#2	06/08/96	0748	B1	y	168	Day Grab	60	22.607	-2	51.860								0.1 m2
53883#3	06/08/96	0801	B1	y	167	Day Grab	60	22.551	-2	52.044					y	y	y	
53884#1	06/08/96	0952	E2	n	209	Day Grab	60	33.526	-2	59.452								
53884#2	06/08/96	1004	E2	n	210	Day Grab	60	33.502	-2	59.475								
53884#3	06/08/96	1016	E2	y	211	Day Grab	60	33.531	-2	59.376								0.1 m2
53884#4	06/08/96	1032	E2	y	208	Day Grab	60	33.469	-2	59.329								0.1 m2
53884#5	06/08/96	1048	E2	n	207	Day Grab	60	33.441	-2	59.382								
53884#6	06/08/96	1103	E2	y	206	Day Grab	60	33.428	-2	59.256					y	y	y	
53885#1	06/08/96	1303	B2	n	120	Day Grab	60	38.081	-2	32.927								
53885#2	06/08/96	1314	B2	y	120	Day Grab	60	38.081	-2	32.952								0.1 m2
53885#3	06/08/96	1324	B2	n	120	Day Grab	60	38.076	-2	32.952								
53885#4	06/08/96	1335	B2	n	119	Day Grab	60	38.080	-2	32.905								
53885#5	06/08/96	1345	B2	y	120	Day Grab	60	38.072	-2	32.767								0.1 m2
53886#1	06/08/96	1520	E3	n	225	Day Grab	60	43.187	-2	50.310								
53886#2	06/08/96	1538	E3	y	225	Day Grab	60	43.163	-2	50.179								0.1 m2
53887#1	06/08/96	1728	AA3	y	449	Mega Corer	60	43.421	-3	8.877	60	43.429	-3	8.945	y	y	y	
53887#2	06/08/96	1814	AA3	n	446	Mega Corer	60	43.319	-3	8.568	60	43.310	-3	8.614				
53887#3	06/08/96	1904	AA3	n	445	Mega Corer	60	43.259	-3	9.079	60	43.257	-3	9.092				
53888#1	06/08/96	2045	AA5	n	621	Mega Corer	60	48.654	-3	19.867	60	48.654	-3	19.880				
53888#2	06/08/96	2136	AA5	y	627	Mega Corer	60	48.687	-3	20.230	60	48.693	-3	20.250	y	y	y	2 cores
53888#3	06/08/96	2225	AA5	y	624	Mega Corer	60	48.679	-3	19.945	60	48.674	-3	19.962				5 cores
53889#1	07/08/96	0942	F1	y	235	Day Grab	60	14.437	-4	8.747								0.1 m2
53889#2	07/08/96	0959	F1	y	231	Day Grab	60	14.373	-4	8.719								0.1 m2
53890#1	07/08/96	1120	AB2	n	150	Day Grab	60	7.358	-4	1.357								
53890#2	07/08/96	1130	AB2	n	150	Day Grab	60	7.361	-4	1.358								
53890#3	07/08/96	1138	AB2	n	151	Day Grab	60	7.294	-4	1.333								
53891#1	07/08/96	1157	AB2	n	150	Day Grab	60	7.174	-4	1.221								
53891#2	07/08/96	1210	AB2	n	150	Day Grab	60	7.166	-4	1.211								
53891#3	07/08/96	1222	AB2	y	150	Day Grab	60	7.115	-4	1.177					y	y	y	
53891#4	07/08/96	1506	AB2	y	150	Day Grab	60	7.072	-4	1.372								0.1 m2
53892#1	07/08/96	1824	AA1	y	452	Box Corer	60	29.637	-3	43.887	60	29.644	-3	43.890	y	y	y	0.1 m2
53893#1	07/08/96	2028	AA2	y	461	Box Corer	60	36.565	-3	25.130	60	36.586	-3	25.173	y	y	y	0.1 m2
53894#1	07/08/96	2234	AA3	y	445	Box Corer	60	43.257	-3	9.244	60	43.251	-3	9.262	y	y	y	0.1 m2
53895#1	08/08/96	0004	AA4	y	538	Box Corer	60	46.201	-3	15.085	60	46.199	-3	15.085	y	y	y	0.1 m2
53896#1	08/08/96	0224	AA6	y	640	Mega Corer	60	43.696	-3	35.095	60	43.702	-3	35.086	y	y	y	1 core
53896#2	08/08/96	0316	AA6	y	639	Mega Corer	60	43.651	-3	35.057								6 cores
53897#1	08/08/96	0513	AA7	y	735	Mega Corer	60	51.328	-3	24.704	60	51.321	-3	24.760				8 cores
53897#2	08/08/96	0619	AA7	y	738	Mega Corer	60	51.277	-3	25.105	60	51.256	-3	25.165	y	y	y	
53898#1	08/08/96	0809	AA8	y	642	Mega Corer	60	54.442	-3	6.697	60	54.450	-3	6.681				8 cores
53898#2	08/08/96	0908	AA8	y	641	Mega Corer	60	54.457	-3	6.353	60	54.452	-3	6.341	y	y	y	

53899#1	08/08/96	1101	AA9	y	635	Mega Corer	60	59.561	-2	51.644	60	59.570	-2	51.644				8 cores
53899#2	08/08/96	1159	AA9	y	636	Mega Corer	60	59.626	-2	51.712	60	59.620	-2	51.699	y	y	y	
53900#1	08/08/96	1427	800	n	798	Wasp	61	8.024	-2	41.271	61	8.015	-2	41.407				
53901#1	08/08/96	1621	Tr650	y	645	Mega Corer	61	4.389	-2	36.777	61	4.407	-2	36.796				
53902#1	08/08/96	1905	AC1	y	584	Box Corer	61	1.813	-2	33.312	61	1.836	-2	33.353	y	y	y	0.1 m2
53903#1	08/08/96	2042	AC2	y	548	Box Corer	61	0.532	-2	33.972	61	0.527	-2	34.006	y	y	y	0.1 m2
53904#1	08/08/96	2231	AC3	y	541	Box Corer	61	0.236	-2	34.091	61	0.242	-2	34.119	y	y	y	0.1 m2
53905#1	09/08/96	0004	AC4	y	546	Box Corer	61	0.428	-2	34.038	61	0.436	-2	34.062	y	y	y	0.1 m2
53905#2	09/08/96	0131	550	y	547	Wasp	61	0.471	-2	33.865								
53906#1	09/08/96	0248	AC5	y	546	Box Corer	61	0.440	-2	33.902	61	0.440	-2	33.916	y	y	y	0.1 m2
53907#1	09/08/96	0406	AC6	y	546	Box Corer	61	0.406	-2	34.079	61	0.402	-2	34.086	y	y	y	0.1 m2
53908#1	09/08/96	0612	AD1	y	328	Box Corer	60	57.930	-2	11.539	60	57.930	-2	11.552	y	y	y	0.1 m2
53909#1	09/08/96	0726	AD2	y	333	Box Corer	60	58.092	-2	11.968	60	58.098	-2	11.980	y	y	y	0.1 m2
53910#1	09/08/96	0857	AD3	y	330	Box Corer	60	58.040	-2	11.329	60	58.048	-2	11.346	y	y	y	0.1 m2
53911#1	09/08/96	1006	AD4	n	335	Box Corer	60	58.238	-2	11.484	60	58.239	-2	11.493				
53911#2	09/08/96	1032	AD4	y	336	Box Corer	60	58.268	-2	11.444	60	58.260	-2	11.464	y	y	y	0.1 m2
53912#1	09/08/96	1211	AD5	y	332	Box Corer	60	58.114	-2	11.379	60	58.111	-2	11.393	y	y	y	0.1 m2
53913#1	09/08/96	1413	300	y	290	Wasp	60	53.957	-2	22.057	60	53.959	-2	22.076				
53914#1	09/08/96	1645	400	y	410	Wasp	60	57.736	-2	24.989	60	57.738	-2	24.998				
53915#1	09/08/96	2050	AA10	y	642	Mega Corer	61	9.242	-2	19.555	61	9.247	-2	19.591				8 cores
53915#2	09/08/96	2139	AA10	y	639	Mega Corer	61	9.196	-2	19.402	61	9.209	-2	19.439	y	y	y	
53916#1	10/08/96	0009	600	y	595	Wasp	61	2.493	-2	33.917	61	2.499	-2	33.953				
53917#1	10/08/96	0348	A1	n	116	Day Grab	60	52.429	-1	59.527								
53917#2	10/08/96	0358	A1	n	116	Day Grab	60	52.462	-1	59.512								
53917#3	10/08/96	0408	A1	n	116	Day Grab	60	52.409	-1	59.516								
53917#4	10/08/96	0417	A1	y	116	Day Grab	60	52.365	-1	59.387					y	y	y	
53917#5	10/08/96	0428	A1	n	116	Day Grab	60	52.310	-1	59.148								
53917#6	10/08/96	0437	A1	y	116	Day Grab	60	52.282	-1	59.065					y	y		
53918#1	10/08/96	0728	AE1	n	160	Day Grab	61	8.119	-1	24.715								
53918#2	10/08/96	0739	AE1	y	160	Day Grab	61	8.029	-1	24.719					y	y	y	
53918#3	10/08/96	0759	AE1	y	160	Day Grab	61	8.147	-1	25.071								0.1 m2
53918#4	10/08/96	0815	AE1	y	160	Day Grab	61	8.124	-1	24.817								0.1 m2
53919#1	10/08/96	0959	AE2	y	169	Day Grab	61	17.152	-1	6.438					y	y	y	
53919#2	10/08/96	1018	AE2	y	168	Day Grab	61	17.074	-1	6.515								0.1 m2
53919#3	10/08/96	1033	AE2	y	168	Day Grab	61	17.048	-1	6.477								0.1 m2
53920#1	10/08/96	1241	300	y	296	Wasp	61	17.802	-1	30.356	61	17.805	-1	30.375				
53921#1	10/08/96	1533	500	y	496	Wasp	61	15.966	-1	48.011	61	15.963	-1	48.028				
53922#1	10/08/96	1839	800	y	810	Wasp	61	19.055	-2	10.850	61	19.040	-2	11.009				
53923#1	10/08/96	2313	1100	y	1089	Wasp	61	12.877	-2	49.424	61	12.853	-2	49.410				
53924#1	11/08/96	0237	800	y	799	Wasp	61	7.997	-2	41.843	61	7.993	-2	42.002				
53925#1	11/08/96	0536	500	y	508	Wasp	60	59.559	-2	29.702	60	59.542	-2	29.789				
53926#1	11/08/96	0826	300	y	293	Wasp	60	53.951	-2	22.138	60	53.964	-2	22.150				
53927#1	11/08/96	1108	450-600	y	413	Photo Sledge	60	57.338	-2	26.772								
53928#1	11/08/96	1653	400	y	383	Wasp	60	56.702	-2	25.904	60	56.701	-2	25.911				
53929#1	11/08/96	2141	AF1	n	151	Day Grab	60	31.721	-2	47.393								
53929#2	11/08/96	2157	AF1	n	151	Day Grab	60	31.726	-2	47.442								
53929#3	11/08/96	2211	AF1	n	151	Day Grab	60	31.750	-2	47.474								

53930#1	11/08/96	2231	AF1	n	152	Day Grab	60	31.383	-2	47.323								
53930#2	11/08/96	2242	AF1	y	153	Day Grab	60	31.341	-2	47.432					y	y	y	
53930#3	11/08/96	2300	AF1	y	152	Day Grab	60	31.252	-2	47.284								0.1 m2
53931#1	12/08/96	0130	AF2	y	144	Day Grab	60	16.421	-3	14.146					y	y	y	
53931#2	12/08/96	0149	AF2	y	144	Day Grab	60	16.411	-3	14.112								0.1 m2
53932#1	12/08/96	0518	AG1	y	402	Box Corer	60	28.198	-3	39.899	60	28.207	-3	39.894	y	y	y	0.1 m2
53933#1	12/08/96	0728	AH1	y	416	Box Corer	60	22.999	-4	0.865	60	23.005	-4	0.854	y	y	y	0.1 m2
53934#1	12/08/96	0848	AH2	y	417	Box Corer	60	23.204	-4	1.316	60	23.217	-4	1.323	y	y	y	0.1 m2
53935#1	12/08/96	1012	AH3	y	418	Box Corer	60	23.081	-4	0.855	60	23.092	-4	0.845	y	y	y	0.1 m2
53936#1	12/08/96	1427	AH4	y	416	Box Corer	60	23.030	-4	0.640	60	23.028	-4	0.661	y	y	y	0.1 m2
53937#1	12/08/96	1554	AH5	n	412	Box Corer	60	22.884	-4	1.166	60	22.890	-4	1.149				
53937#2	12/08/96	1626	AH5	n	414	Box Corer	60	22.913	-4	1.009	60	22.916	-4	1.044				
53938#1	12/08/96	1710	AH6	y	416	Box Corer	60	23.071	-4	1.215	60	23.078	-4	1.250	y	y	y	0.1 m2
53939#1	12/08/96	2005	AG2	y	388	Box Corer	60	12.587	-4	25.747	60	12.640	-4	25.688	y	y	y	0.1 m2
53940#1	12/08/96	2120	AJ1	y	298	Day Grab	60	10.013	-4	26.452					y	y	y	
53940#2	12/08/96	2148	AJ1	n	296	Day Grab	60	9.991	-4	26.464								
53941#1	12/08/96	2234	F6	n	245	Day Grab	60	7.636	-4	30.778								
53941#2	12/08/96	2245	F6	n	246	Day Grab	60	7.613	-4	30.724								
53941#3	12/08/96	2258	F6	n	243	Day Grab	60	7.565	-4	30.793								
53941#4	12/08/96	2310	F6	n	245	Day Grab	60	7.591	-4	30.860								
53941#5	12/08/96	2323	F6	n	244	Day Grab	60	7.583	-4	30.753								
53941#6	12/08/96	2339	F6	n	244	Day Grab	60	7.594	-4	30.815								
53941#7	12/08/96	2351	F6	y	242	Day Grab	60	7.567	-4	30.755								0.1 m2
53941#8	13/08/96	0009	F6	y	242	Day Grab	60	7.546	-4	30.802					y	y	y	
53942#1	13/08/96	0245	AB1	y	143	Day Grab	59	58.513	-4	27.558					y	y	y	
53942#2	13/08/96	0302	AB1	y	143	Day Grab	59	58.480	-4	27.553								0.1 m2
53943#1	13/08/96	0450	C18	n	123	Day Grab	59	54.973	-4	8.463								
53943#2	13/08/96	0500	C18	n	123	Day Grab	59	54.979	-4	8.526								
53943#3	13/08/96	0511	C18	y	123	Day Grab	59	54.947	-4	8.448					y	y	y	
53943#4	13/08/96	0525	C18	y	123	Day Grab	59	55.009	-4	8.379								0.1 m2
53944#1	13/08/96	0621	C17	y	122	Day Grab	59	51.686	-4	12.863								0.1 m2
53944#2	13/08/96	0633	C17	y	123	Day Grab	59	51.706	-4	12.910					y	y	y	
53945#1	13/08/96	0852	C16	n	92	Day Grab	59	37.501	-4	31.926								
53945#2	13/08/96	0856	C16	n	92	Day Grab	59	37.489	-4	31.921								
53945#3	13/08/96	0903	C16	n	92	Day Grab	59	37.483	-4	31.962								
53945#4	13/08/96	0908	C16	n	92	Day Grab	59	37.490	-4	31.964								
53945#5	13/08/96	0914	C16	n	92	Day Grab	59	37.506	-4	31.928								
53945#6	13/08/96	0919	C16	n	92	Day Grab	59	37.517	-4	31.942								
53945#7	13/08/96	0924	C16	n	92	Day Grab	59	37.518	-4	31.965								
53945#8	13/08/96	0932	C16	n	92	Day Grab	59	37.526	-4	31.966								
53945#9	13/08/96	0939	C16	n	92	Day Grab	59	37.526	-4	31.951								
53945#10	13/08/96	0945	C16	n	92	Day Grab	59	37.526	-4	31.955								
53946#1	13/08/96	1019	C2	y	98	Day Grab	59	37.412	-4	37.428								0.1 m2
53946#2	13/08/96	1028	C2	n	98	Day Grab	59	37.399	-4	37.433								
53946#3	13/08/96	1034	C2	y	96	Day Grab	59	37.394	-4	37.431								0.1 m2
53946#4	13/08/96	1042	C2	n	98	Day Grab	59	37.381	-4	37.464								
53946#5	13/08/96	1047	C2	n	98	Day Grab	59	37.384	-4	37.493								

53946#6	13/08/96	1053	C2	n	98	Day Grab	59	37.390	-4	37.458								
53946#7	13/08/96	1059	C2	n	98	Day Grab	59	37.397	-4	37.467								
53947#1	13/08/96	1145	100	y	102	Wasp	59	38.041	-4	40.017	59	38.048	-4	40.008				
53948#1	13/08/96	2004	300	y	302	Wasp	60	10.574	-4	25.635	60	10.608	-4	25.577				
53949#1	13/08/96	2248	500	y	512	Wasp	60	12.161	-4	36.706								
53950#1	14/08/96	0157	800	y	816	Wasp	60	18.410	-4	44.105	60	18.420	-4	44.090				
53951#1	14/08/96	1034	1000	y	978	Wasp	60	50.292	-3	45.895	60	50.301	-3	45.873				
53952#1	14/08/96	1953	AK1	y	556	Mega Corer	61	23.937	-1	39.523	61	23.945	-1	39.515	y	y	y	
53952#2	14/08/96	2036	AK1	y	556	Mega Corer	61	23.866	-1	39.675	61	23.875	-1	39.638	y	y	y	
53953#1	14/08/96	2119	AK2	y	557	Mega Corer	61	23.858	-1	40.006	61	23.859	-1	40.017	y	y	y	
53953#2	14/08/96	2157	AK2	y	557	Mega Corer	61	23.838	-1	39.971	61	23.846	-1	39.967	y	y	y	
53954#1	14/08/96	2244	AK3	y	561	Mega Corer	61	24.037	-1	40.033					y	y	y	
53954#2	14/08/96	2324	AK3	y	562	Mega Corer	61	24.047	-1	40.156	61	24.053	-1	40.152	y	y	y	
53955#1	15/08/96	0009	AK4	y	559	Mega Corer	61	24.058	-1	39.742	61	24.079	-1	39.733	y	y	y	
53955#2	15/08/96	0053	AK4	y	558	Mega Corer	61	24.053	-1	39.682	61	24.069	-1	39.686	y	y	y	
53956#1	15/08/96	0144	AK5	y	560	Mega Corer	61	24.170	-1	39.430	61	24.177	-1	39.412			y	
53956#2	15/08/96	0230	AK5	y	560	Mega Corer	61	24.191	-1	39.500	61	24.195	-1	39.514	y	y		
53957#1	15/08/96	0437	AK9	y	557	Mega Corer	61	23.971	-1	39.997	61	23.973	-1	40.015	y	y	y	
53957#2	15/08/96	0519	AK9	y	558	Mega Corer	61	23.993	-1	40.069	61	24.001	-1	40.084	y	y	y	
53958#1	15/08/96	0626	AK7	y	560	Mega Corer	61	25.577	-1	37.292	61	25.565	-1	37.321	y	y	y	
53958#2	15/08/96	0704	AK7	y	560	Mega Corer	61	25.555	-1	37.191	61	25.563	-1	37.222	y	y	y	
53959#1	15/08/96	0816	AK8	y	562	Mega Corer	61	28.194	-1	33.018	61	28.214	-1	33.019	y	y	y	
53959#2	15/08/96	0855	AK8	y	563	Mega Corer	61	28.172	-1	33.056	61	28.178	-1	33.073	y	y	y	
53960#1	15/08/96	1014	AK6	y	563	Mega Corer	61	24.558	-1	38.787	61	24.554	-1	38.765	y	y	y	
53960#2	15/08/96	1051	AK6	y	563	Mega Corer	61	24.556	-1	38.857	61	24.560	-1	38.840	y	y	y	
53961#1	15/08/96	1139	AK5	y	562	Mega Corer	61	24.221	-1	39.605	61	24.240	-1	39.621	y	y	y	
53962#1	15/08/96	1254	570	y	580	Wasp	61	23.760	-1	42.211	61	23.792	-1	42.242				
53963#1	15/08/96	1545	490	y	488	Wasp	61	15.799	-1	46.344	61	15.807	-1	46.351				
53964#1	15/08/96	2045	B5	n	203	Van Veen	60	52.397	-2	19.527								
53964#2	15/08/96	2109	B5	n	204	Mega Corer	60	52.429	-2	19.597	60	52.437	-2	19.598				
53964#3	15/08/96	2128	B5	n	202	Mega Corer	60	52.394	-2	19.529	60	52.399	-2	19.537				
53964#4	15/08/96	2200	B5	n	203	Van Veen	60	52.415	-2	19.577								
53965#1	15/08/96	2238	Tr250	n	250	Mega Corer	60	53.245	-2	20.712	60	53.250	-2	20.722				
53965#2	15/08/96	2258	Tr250	n	250	Mega Corer	60	53.229	-2	20.707	60	53.235	-2	20.713				
53966#1	15/08/96	2336	Tr300	n	290	Mega Corer	60	53.921	-2	21.836	60	53.929	-2	21.846				
53967#1	16/08/96	0022	Tr350	y	345	Mega Corer	60	55.519	-2	24.070	60	55.527	-2	24.079				
53968#1	16/08/96	0121	L5	y	415	Mega Corer	60	57.734	-2	25.040	60	57.738	-2	25.049				
53969#1	16/08/96	0218	Tr450	y	454	Mega Corer	60	58.414	-2	28.204	60	58.424	-2	28.202				
53970#1	16/08/96	0312	L4	y	498	Mega Corer	60	59.328	-2	29.407	60	59.334	-2	29.422				
53971#1	16/08/96	0413	Tr550	y	553	Mega Corer	61	1.045	-2	31.857	61	1.056	-2	31.869				
53972#1	16/08/96	0519	Tr600	y	600	Mega Corer	61	2.563	-2	34.020	61	2.570	-2	34.021				
53973#1	16/08/96	0627	Tr650	y	649	Mega Corer	61	4.525	-2	36.874	61	4.522	-2	36.902				
53974#1	16/08/96	0741	S2	y	708	Mega Corer	61	5.644	-2	40.848	61	5.640	-2	40.895				
53975#1	16/08/96	0858	Tr800	y	798	Mega Corer	61	8.024	-2	41.550	61	8.037	-2	41.565				
53976#1	16/08/96	1017	Tr900	y	915	Mega Corer	61	9.595	-2	43.981	61	9.621	-2	43.953				
53977#1	16/08/96	1147	Tr1000	y	998	Mega Corer	61	10.519	-2	45.429	61	10.533	-2	45.432				
53978#1	16/08/96	1317	Tr1100	y	1088	Mega Corer	61	12.884	-2	50.162	61	12.868	-2	50.184				

53979#1	16/08/96	1550	1400	y	1424	Fish Trap	61	28.719	-2	47.660								
53980#1	16/08/96	1816	1400	y	1407	Wasp	61	26.660	-3	0.070	61	26.650	-3	0.108				
53981#1	16/08/96	2221	1200	y	1208	Wasp	61	19.155	-2	58.302	61	19.200	-2	58.230				
53982#1	17/08/96	0234	1000	n	1001	Wasp	61	10.520	-2	45.588	61	10.524	-2	45.512				
53983#1	17/08/96	1006	OTSB14	y	1401	OTSB14	61	35.620	-2	10.713								
53984#1	17/08/96	1951	900	y	911	Wasp	61	9.572	-2	43.880	61	9.567	-2	43.902				
53985#1	17/08/96	2250	700	y	681	Wasp	61	5.374	-2	38.113	61	5.399	-2	38.121				
53986#1	18/08/96	0715	380	y	389	Wasp	60	22.062	-3	59.911	60	22.067	-3	59.895				
53987#1	18/08/96	1338	C19	n	104	Day Grab	59	41.093	-4	29.039								
53987#2	18/08/96	1346	C19	n	104	Day Grab	59	41.075	-4	28.982								
53987#3	18/08/96	1355	C19	y	104	Day Grab	59	41.080	-4	29.010								0.1 m2
53987#4	18/08/96	1406	C19	n	104	Day Grab	59	41.075	-4	29.018								
53987#5	18/08/96	1416	C19	n	104	Day Grab	59	41.072	-4	29.047								
53987#6	18/08/96	1424	C19	n	104	Day Grab	59	41.085	-4	28.994								
53987#7	18/08/96	1432	C19	y	104	Day Grab	59	41.069	-4	29.002					y	y	y	

RRS Charles Darwin cruise 101 C leg 2 station list

STATION	COMMENT
53713#1	6/12 Good cores
53713#2	10/12 Good cores
53714#1	9/12 Good cores
53714#2	8/8 Good cores
53715#1	11/12 Good cores
53716#1	12/12 Good cores
53717#1	12/12 Good cores
53718#1	0/12 cores; failed; no samples
53718#2	11/12 Good cores
53719#1	10/12 Good cores
53720#1	10/12 Good cores; one lost in handling
53720#2	8/8 Good cores
53721#1	11/12 Good cores
53722#1	0/12 cores; a little gravel in tubes; complete bottom closer unit lost by warp catch
53722#2	0/12 cores; hard ground
53722#3	Good core
53723#1	Short slanting core, top water lost, discarded
53723#2	Good core
53724#1	Good core
53725#1	Good core
53726#1	Good core
53727#1	Good core
53728#1	Good core
53729#1	Failed; a little sand only
53729#2	Good core; note insert could not be used - too many obstructions
53730#1	Failed; not fully fired - ? fouled by warp
53730#2	Box of rocks only
53730#3	Pebble in jaws
53730#4	Surface 6 cm from inner top
53730#5	Stones only
53731#1	Rocks only
53731#2	Pebble in jaws
53731#3	Stone in jaws
53732#1	Pebble in jaws
53732#2	Pebble in jaws
53732#3	Pebble in jaws
53732#4	Short slanted core, top water not held, discarded
53732#5	Short slanted core, top water not held, discarded
53733#1	Pebble in jaws
53733#2	8 cm below inner top, drained on stand
53733#3	Sample too small
53733#4	Rock in jaws

53733#5	Rock in jaws
53733#6	Failed; not triggered
53733#7	Short core, top water lost, discarded
53734#1	Good core
53735#1	Pebbles in jaws
53735#2	Short core, top water not held, discarded
53735#3	Short core, top water not held, discarded
53735#4	9 cm below inner top
53735#5	Grab empty
53735#6	Grab empty
53735#7	Short core, top water not held, discarded
53736#1	Good core
53737#1	Good core
53738#1	Good core
53739#1	Good core. (rope round gear - got caught tin prop.)
53740#1	Good core
53741#1	Short core, top water not held, discarded
53741#2	Short core, top water not held, discarded
53741#3	9 cm below inner top
53741#4	Rock in jaws
53741#5	9.5 cm below inner top; 3 litres
53741#6	5.5 cm below inner top; 5 litre sample
53742#1	5.5 cm below inner top
53742#2	3.5 cm below inner top; approx 5 litres
53743#1	2 cm below inner top
53743#2	Failed
53743#3	Rock in jaws
53743#4	3.5 cm below inner top, 5 litres
53744#1	approx 4 cm below inner top
53744#2	Pebbles in jaws
53744#3	Pebbles in jaws
53744#4	Small sample; discarded
53744#5	Rock in jaws
53744#6	Pebbles in jaws
53744#7	Rock in jaws
53744#8	Grab empty
53745#1	Pebbles in jaws
53745#2	Pebbles in jaws
53745#3	Large rock in jaws
53745#4	Rock in jaws
53745#5	5 cm below inner top
53745#6	4.5 cm below inner top; 5 litres
53746#1	6 cm below inner top
53746#2	Stone in jaws
53746#3	Small sample of gravel only; discarded
53746#4	Sample of 5 litres
53747#1	Small sample only; discarded

53747#2	Rock in jaws
53747#3	Grab empty
53747#4	9 cm below inner top
53747#5	Large rock only
53747#6	Sample of 5 litres
53748#1	Pebbles in jaws
53748#2	7 cm below inner top
53748#3	Small sample; discarded
53748#4	Rock in jaws
53748#5	4.5 cm below inner top, approx 5 litres
53749#1	Failed; swivel hung up on frame
53749#2	Rock in jaws
53749#3	Rock in jaws
53749#4	Rock in jaws
53749#5	Rock in jaws
53750#1	Good core
53751#1	Good core
53752#1	Good core
53753#1	Short core, top water not held; discarded
53753#2	Good core
53754#1	Good core
53755#1	No sample: gear fell over ?
53755#2	Good core
53756#1	Good core
53757#1	Good core
53758#1	Good core
53759#1	Soak time 9:28
53760#1	Good core
53761#1	Good core
53762#1	Good core - with 5 cm lateral compression at door side
53763#1	Short core, top water not held; discarded
53764#1	6/8 good cores
53764#2	8/8 good cores
53765#1	7/8 good cores
53765#2	8/8 good cores
53766#1	7/8 good cores
53766#2	8/8 good cores
53767#1	7/8 good cores
53767#2	8/8 good cores
53768#1	Soak time 11:02
53769#1	8/8 good cores
53769#2	8/8 short but good cores
53770#1	8/8 good cores
53770#2	8/8 good cores
53771#1	8/8 good cores. 3 macrobenthos cores combined with 5 from 53771#2
53771#2	6/8 good cores, one lost on deck. 5 macrobenthos cores combined with 3 from 53771#1
53771#3	Short core, top water not held; discarded

53772#1	Short core, top water not held; discarded
53773#1	7/8 good cores
53773#2	8/8 good cores
53774#1	8/8 good cores
53774#2	8/8 good cores
53775#1	Good core
53776#1	Good core
53777#1	Good core
53778#1	Soak time 11:38
53779#1	5 cm below inner top
53779#2	Pebbles in jaws
53779#3	Rock in jaws
53779#4	2 cm below inner top
53780#1	
53780#2	Full grab, one top flap not fully closed (rock in the way), 15 litres
53781#1	Full grab
53781#2	Full grab
53782#1	Cloudy top water; discarded
53782#2	Small sample, discarded
53782#3	3 cm below inner top
53782#4	
53783#1	Rock in jaws
53784#1	Good sample
53784#2	Pebbles in jaws
53784#3	Grab empty
53784#4	5 cm below inner top, not quite 5 litre sample
53785#1	Pebbles in jaws
53785#2	Pebbles in jaws
53785#3	Pebbles in jaws
53785#4	
53785#5	Rock in jaws
53785#6	Rock in jaws
53785#7	2 cm below inner top, 5 litres
53785#8	Grab empty
53786#1	Pebbles in jaws
53786#2	Rock in jaws
53786#3	Rock in jaws
53786#4	Rock in jaws
53786#5	Good sample
53786#6	Pebbles in jaws
53786#7	Sample of 4.5 litres
53786#8	Pebbles in jaws
53787#1	1 cm below inner top
53787#2	Sample of 6 litres
53788#1	Pebbles in jaws
53788#2	Pebbles in jaws
53788#3	2.5 cm below inner top

53788#4 Pebbles in jaws
53788#5 Pebbles in jaws
53788#6 Pebbles in jaws
53788#7 Sample of 5 litres
53789#1 Short core, top water not held; discarded
53789#2 Short core, top water not held; discarded
53789#3 Pebbles in jaws
53789#4 Rock in jaws
53789#5
53789#6 Pebbles in jaws
53789#7 Sample of 5 litres
53790#1 Short core, top water not held; discarded
53790#2 Pebbles in jaws
53790#3 Rock in jaws
53790#4 7 cm below inner top, sample of 4 litres
53790#5 7 cm below inner top
53791#1 Good core
53792#1 Good core
53793#1 Good core
53794#1 Good core
53795#1 Good core
53796#1 Short core, top water not held; discarded
53796#2 Short core, top water not held; discarded
53796#3 Failed; warp fouled on lifting shackle
53796#4 Short core, top water not held; discarded
53796#5 4 cm below inner top, sample of 4 litres
53796#6 4 cm below inner top
53797#1 Hard ground; damage to door of box
53797#2 Not fired; ground too hard
53797#3 Small sample; discarded
53797#4 Pebbles in jaws
53797#5 Rock in jaws
53797#6 3 cm below inner top
53797#7 Sample of 3 litres
53798#1 Failed; activating warp hung on lifting shackle
53798#2 Good core
53799#1 Soak time 24:14
53800#1 Good core
53801#1 12 m B & W
53802#1 Failed; warp hung up on lifting shackle
53802#2 Good core
53803#1 Good core
53804#1 Good core
53805#1 Good core
53806#1 Sample thought to have artefact topography (unlikely, BJB) - discarded
53806#2 Macrobenthos sample: 0-5 cm 0.08 m2, 5-10 cm 0.1 m2
53807#1 Short core, top water not held; discarded

53807#2	Rock in jaws
53807#3	2.5 cm below inner top
53807#4	2 cm below inner top, sample of 6 litres
53808#1	Cloudy top water; discarded
53808#2	7 cm below inner top
53808#3	Sample of 3 litres
53808#4	Failed to close fully, swivel hung on frame
53808#5	Scallop shell in jaws
53809#1	Soak time 22:12
53810#1	12 m colour
53811#1	10 m colour
53812#1	10 m colour
53813#1	Rock in jaws
53813#2	Sample of 5 litres
53814#1	Rock in jaws
53814#2	No sample
53814#3	9 cm below inner top
53814#4	Water only
53814#5	5 cm below inner top, sample of 4 litres
53815#1	Rocks only
53815#2	Failed, warp hung on grab
53815#3	9 cm below inner top
53815#4	Sample of 3.5 litres, note combined with 53815#5
53815#5	Sample of 3.5 litres, note combined with 53815#4
53816#1	Rock in jaws
53816#2	Pebbles in jaws
53816#3	Hydrocarbon sample taken but lost in lab
53816#4	Sample of 5.5 litres
53816#5	
53817#1	Soak time 20:56
53818#1	8/8 good cores, one then lost on deck
53818#2	8/8 good cores
53819#1	7/8 good cores
53819#2	7/10 short cores
53819#3	9/10 good cores
53820#1	9/10 good cores
53820#2	8/8 good cores
53821#1	7/8 good cores
53821#2	8/8 good cores
53822#1	6/8 good cores; one core tube broken; 1 core combined with 7 from 53822#2 for macrobenthos sample
53822#2	7/8 good cores; 7 cores combined with one from 53822#1 for macrobenthos sample
53823#1	5/8 good cores
53823#2	No samples, water only
53823#3	9/10 good cores
53824#1	9/10 good cores
53824#2	10/10 good cores
53825#1	9/10 good cores

53825#2	10/10 good cores
53826#1	Soak time 15:55
53827#1	9/10 good cores
53827#2	8/8 good cores
53828#1	8/10 good cores
53828#2	8/8 good cores
53829#1	10/10 good cores
53829#2	8/8 good cores
53830#1	10/12 good cores; USBL down
53830#2	8/8 good cores
53831#1	11/12 good cores
53831#2	8/8 good cores
53832#1	10/12 good cores
53832#2	8/8 good cores
53833#1	9/12 good cores
53833#2	8/8 good cores
53834#1	9/12 good cores
53834#2	3/8 good cores, others with cloudy water
53835#1	10/12 good cores
53835#2	8/8 good cores
53836#1	11/12 cores all cloudy or disturbed
53836#2	11/12 good cores
53837#1	All disturbed: three bottom sliders snapped - gear on side or trawled
53837#2	Good core: USBL down
53838#1	Good core, a little resuspension from knock against ship's side
53839#1	Good core, a little resuspension from knock against ship's side
53840#1	11/12 good cores
53841#1	Good core, though the box badly damaged by contact with rock (s); USBL down
53842#1	Good core
53843#1	Good core
53844#1	Good core
53845#1	Failed, no sample, (strong current running)
53845#2	Failed, no sample, (strong current running)
53845#3	12 m B & W
53845#4	Good core
53846#1	Good core
53847#1	Good core
53848#1	Good core
53849#1	Essentially no sample. Box bent and weld on lower frame fractured through
53849#2	
53849#3	Sample of 5 litres - combined with 53849#5
53849#4	Pebbles in jaws
53849#5	Sample of 2 litres - combined with 53849#3
53850#1	Pebbles in jaws
53850#2	Pebbles in jaws
53850#3	Pebbles in jaws
53850#4	Rock in jaws

53850#5	Pebbles in jaws
53850#6	Rock in jaws
53850#7	Pebbles in jaws
53851#1	
53851#2	Pebbles in jaws
53851#3	4.5 cm below inner top, sample of 6 litres
53852#1	Small samples - discarded
53852#2	4 cm below inner top, sample of 6 litres
53852#3	Small sample - discarded
53852#4	
53853#1	Pebbles in jaws
53853#2	Rock in jaws
53853#3	Pebbles in jaws
53853#4	Rock in jaws
53853#5	Rock in jaws
53853#6	Rock in jaws
53853#7	Rock in jaws
53854#1	Pebbles in jaws
53854#2	Failed, not fired
53854#3	Pebbles in jaws
53854#4	
53854#5	Rock in jaws
53854#6	Grab empty
53854#7	Pebbles in jaws
53854#8	Gravel
53854#9	Rocks only
53854#10	Gravel
53854#11	5 m B & W
53855#1	Rock in jaws
53855#2	Empty
53855#3	Pebbles in jaws
53855#4	Pebbles in jaws
53855#5	Small sample - discarded
53855#6	Rocks only
53855#7	Rocks only
53855#8	Rocks only
53856#1	Pebbles in jaws
53856#2	Pebbles in jaws
53856#3	
53856#4	Sample of 8 litres
53857#1	Grab empty
53857#2	
53857#3	Rock in jaws
53857#4	Small sample of 1.5 litres - combined with 53857#5
53857#5	Sample of 4 litres - combined with 53857#4
53858#1	Stones only
53858#2	Rock in jaws

53858#3	Stones only
53858#4	Grab almost empty
53858#5	Rocks only
53858#6	Failed, grab not closed
53858#7	Stones only
53859#1	Grab empty
53859#2	
53859#3	Grab empty
53859#4	Sample of 6 litres
53860#1	Gravel
53860#2	Small sample - discarded
53860#3	Rock in jaws
53860#4	
53860#5	Pebbles in jaws
53860#6	Small sample - discarded
53860#7	4 cm below inner top, sample of 6 litres
53861#1	
53861#2	1 cm below inner top, sample of 8 litres
53862#1	5 cm below inner top, sample of 7 litres
53862#2	Rock in jaws
53862#3	Pebbles in jaws
53862#4	Pebbles in jaws
53862#5	
53863#1	
53863#2	3 cm below inner top, sample of 8 litres
53864#1	
53864#2	Pebbles in jaws
53864#3	Pebbles in jaws
53864#4	Sample of 3 litres
53864#5	Rock in jaws
53864#6	Rock in jaws
53864#7	Grab empty
53865#1	Pebbles in jaws
53865#2	
53865#3	Rock in jaws
53865#4	Sample of 5 litres
53866#1	
53866#2	Sample of 5 litres
53867#1	Failed, not fired
53867#2	No sample
53867#3	No sample
53867#4	Rock in jaws
53867#5	Rock in jaws
53867#6	
53867#7	No sample
53867#8	Sample of 3 litres - combined with 53867#9
53867#9	Sample of 2.5 litres - combined with 53867#8

53868#1	Grab empty
53868#2	Stones only
53868#3	6 cm below inner top
53868#4	Grab empty
53868#5	Sample of 4 litres - combined with 53868#6
53868#6	Sample of 3 litres - combined with 53868#5
53869#1	Good core
53870#1	Short core, top water not held - discarded
53870#2	Good core
53871#1	Short core, top water not held - discarded
53871#2	Failed, not fired
53871#3	Short core, top water not held - discarded
53871#4	5 cm below inner top
53871#5	Disturbed sample
53871#6	Sample of 5 litres
53872#1	Recovered by rig guard boat, 14 m colour
53873#1	6/8 good cores
53873#2	8/8 cores, two shorter
53874#1	Failed, fell over ?
53874#2	Failed, gravel, no penetration
53874#3	6/8 good cores. Macrobenthos sample combined with six cores from 53874#4
53874#4	6/8 good cores. Macrobenthos sample combined with two cores from 53874#3
53875#1	Pebbles in jaws
53875#2	Pebbles in jaws
53875#3	Rock in jaws
53875#4	
53875#5	Sample of 2.5 litres - combined with 53875#8
53875#6	Failed, did not fire
53875#7	Pebbles in jaws
53875#8	Sample of 2.5 litres - combined with 53875#5
53876#1	
53876#2	Stones only
53876#3	Rock in jaws
53876#4	7 cm below inner top, sample of 6.5 litres
53876#5	Pebbles in jaws
53877#1	Good core. Corer damaged - spade arm split at pivot point
53878#1	6/8 good cores. USBL down
53878#2	8/8 good cores
53879#1	8/8 good cores, one then lost on deck
53879#2	8/8 good cores
53880#1	3/8 good cores
53880#2	7/8 good cores
53881#1	Pebbles in jaws
53881#2	Sample of 1.5 litres - combined with 53881#3 and 4
53881#3	Sample of 2 litres - combined with 53881#2 and 4
53881#4	Sample of 2.5 litres - combined with 53881#2 and 3
53882#1	

53882#2	Small sample - discarded
53882#3	Sample of 2.5 litres - combined with 53882#5
53882#4	Pebbles in jaws
53882#5	Sample of 1 litre - combined with 53882#3
53882#6	Pebbles in jaws
53882#7	Rock in jaws
53883#1	Sample of 2.5 litres - combined with 53883#2
53883#2	Sample of 2.5 litres - combined with 53883#1
53883#3	
53884#1	Rock in jaws
53884#2	Grab empty
53884#3	Sample of 3 litres - combined with 53884#4
53884#4	Sample of 4.5 litres - combined with 53884#3
53884#5	Grab empty
53884#6	
53885#1	Pebbles in jaws
53885#2	Sample of 2.5 litres (kept separate from 53885#5 as different substrate)
53885#3	Pebbles in jaws
53885#4	Rock in jaws
53885#5	Sample of 4 litres (kept separate from 53885#2 as different substrate)
53886#1	Disturbed - discarded
53886#2	Sample of 4 litres
53887#1	4/8 good cores
53887#2	0/8 cores - hard ground
53887#3	0/8 hard ground. Damage to top end of bottom closer, warp bite
53888#1	7/8 cores all more-or-less with cloudy water - discarded
53888#2	6/8 good cores. Macrobenthos cores combined with 5 from 53888#3
53888#3	7/8 good cores, one then lost on deck. Macrobenthos sample combined with 2 cores from 53888#2
53889#1	Sample of 4 litres
53889#2	Sample combined with 53889#1
53890#1	Rock in jaws
53890#2	Rock in jaws
53890#3	Pebbles in jaws
53891#1	Pebbles in jaws
53891#2	Pebbles in jaws
53891#3	
53891#4	Sample of 5 litres
53892#1	Good core
53893#1	Good core
53894#1	Good core
53895#1	Good core
53896#1	5/8 good cores. Macrobenthos sample combined with 6 cores from 53896#2
53896#2	6/8 good cores. Macrobenthos sample combined with one core from 53896#1. USBL down
53897#1	8/10 good cores
53897#2	8/8 good cores
53898#1	8/10 good cores
53898#2	7/8 good cores

53899#1	8/10 good cores
53899#2	7/8 good cores
53900#1	No film run
53901#1	8/8 good cores. One core frozen as archive
53902#1	Good core. Discount from AC group - use as an extra strategic station
53903#1	Good core
53904#1	Good core
53905#1	Good core
53905#2	Test strip (c. 1 m) B & W
53906#1	Good core
53907#1	Good core
53908#1	Good core
53909#1	Good core
53910#1	Good core
53911#1	Failed - main warp hung on corer
53911#2	Good core
53912#1	Good core
53913#1	5 m colour
53914#1	7 m colour
53915#1	8/8 good cores
53915#2	8/8 good cores
53916#1	11 m colour
53917#1	Pebbles in jaws
53917#2	Pebbles in jaws
53917#3	Pebbles in jaws
53917#4	Some slumping at centre; samples taken as backup
53917#5	Pebbles in jaws
53917#6	Good, but small sample, insufficient for PSA
53918#1	Rock in jaws
53918#2	5 cm below inner top
53918#3	Sample of 3.5 litres - combined with 53918#4
53918#4	Sample of 3.5 litres - combined with 53918#3
53919#1	
53919#2	Sample of 3 litres - combined with 53919#3
53919#3	Sample of 3.5 litres - combined with 53919#2
53920#1	11 m colour
53921#1	5 m colour
53922#1	12 m colour
53923#1	12 m colour
53924#1	10 m colour
53925#1	12 m colour
53926#1	4 m colour
53927#1	14 m colour
53928#1	7 m colour
53929#1	Rock in jaws
53929#2	Rocks only
53929#3	Pebbles in jaws

53930#1	Rock in jaws
53930#2	
53930#3	Sample of 6 litres
53931#1	
53931#2	Sample of 6 litres
53932#1	Good core
53933#1	Good core
53934#1	Good core
53935#1	Good core
53936#1	Good core
53937#1	Short core, top water not held - discarded
53937#2	Short core, top water not held - discarded
53938#1	Good core
53939#1	Good core
53940#1	
53940#2	Confirmation of (pea) gravel substrate - no samples taken
53941#1	Failed, not fired
53941#2	Rock in jaws
53941#3	Pebbles in jaws
53941#4	Pebbles in jaws
53941#5	Rock in jaws
53941#6	Rock in jaws
53941#7	Sample of 5 litres
53941#8	
53942#1	
53942#2	Sample of 5 litres
53943#1	Rock in jaws
53943#2	Poor sample - discarded
53943#3	
53943#4	Sample of 5 litres
53944#1	Sample of 6.5 litres
53944#2	
53945#1	Rock in jaws
53945#2	Gravel only
53945#3	Rock in jaws
53945#4	Rock in jaws
53945#5	Rock in jaws
53945#6	Rock in jaws
53945#7	Gravel only
53945#8	Rock in jaws
53945#9	Poor sample - discarded
53945#10	Grab empty
53946#1	Sample of 1 litre - combined with 53946#3
53946#2	Grab empty
53946#3	Sample of 1 litre - combined with 53946#1
53946#4	Rocks only
53946#5	One rock only

53946#6	Rocks only
53946#7	Rocks only
53947#1	12 m colour
53948#1	9 m colour
53949#1	3 m colour. USBL down
53950#1	13 m colour
53951#1	5 m colour
53952#1	4/4 good cores. Meiobenthos sample taken
53952#2	4/4 good cores. Meiobenthos sample taken
53953#1	4/4 good cores. Meiobenthos sample taken
53953#2	4/4 good cores. Meiobenthos sample taken
53954#1	4/4 good cores. meiobenthos sample taken. USBL down
53954#2	4/4 good cores. Meiobenthos sample taken
53955#1	4/4 good cores. Meiobenthos sample taken
53955#2	4/4 good cores. Meiobenthos sample taken
53956#1	2/4 good cores. Meiobenthos sample taken
53956#2	2/4 good cores
53957#1	4/4 good cores. Meiobenthos sample taken
53957#2	4/4 good cores. Meiobenthos sample taken
53958#1	4/4 good cores. Meiobenthos sample taken
53958#2	4/4 good cores. Meiobenthos sample taken
53959#1	4/4 good cores. Meiobenthos sample taken
53959#2	4/4 good cores. Meiobenthos sample taken
53960#1	4/4 good cores. Meiobenthos sample taken
53960#2	4/4 good cores. Meiobenthos sample taken
53961#1	3/4 good cores. Meiobenthos sample taken
53962#1	4 m colour
53963#1	12 m colour
53964#1	Failed.
53964#2	Water only - hard sand ?
53964#3	Water only - hard sand ?
53964#4	Failed
53965#1	Water only - hard sand ?
53965#2	Two very short cores - discarded
53966#1	Two short cores - discarded
53967#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53968#1	4/4 good cores: 1 meiob, 1 foram, 1 geol, 1 frozen
53969#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53970#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53971#1	3/4 good cores: 1 meiob, 1 foram, 1 freeze
53972#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53973#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53974#1	4/4 good cores: 1 meiob, 1 foram, 2 freeze
53975#1	6/6 good cores: 1 meiob, 1 foram, 2 freeze, 1 geol
53976#1	6/6 good cores: 1 meiob, 1 foram, 2 freeze, 1 geol
53977#1	5/6 good cores: 1 meiob, 1 foram, 2 freeze, 1 geol
53978#1	6/6 good cores: 1 meiob, 1 foram, 2 freeze, 1 geol

53979#1 Soak time 23:04
53980#1 12 m colour
53981#1 10 m colour
53982#1 Failed, no film run
53983#1 A catch: but net totally destroyed
53984#1 12 m colour
53985#1 Film run unknown at present
53986#1 Film run unknown at present
53987#1 Pebbles in jaws
53987#2 Pebbles in jaws
53987#3 Sample of 6.5 litres
53987#4 Rock in jaws
53987#5 Rock in jaws
53987#6 Rock in jaws
53987#7 The end of CD 101 c leg 2

12. CHARTS

1.	Passage to and from survey area	
2.	Survey cruise track	
3.	Large-scale survey stations	(a) Full survey area (b) North zone (c) Mid zone (d) South zone
4.	Transect survey stations	
5.	WASP stations	
6.	Fish trap stations	
7.	Other survey stations	
8.	Extra transect stations	
9-40.	Individual towed gear tracks	

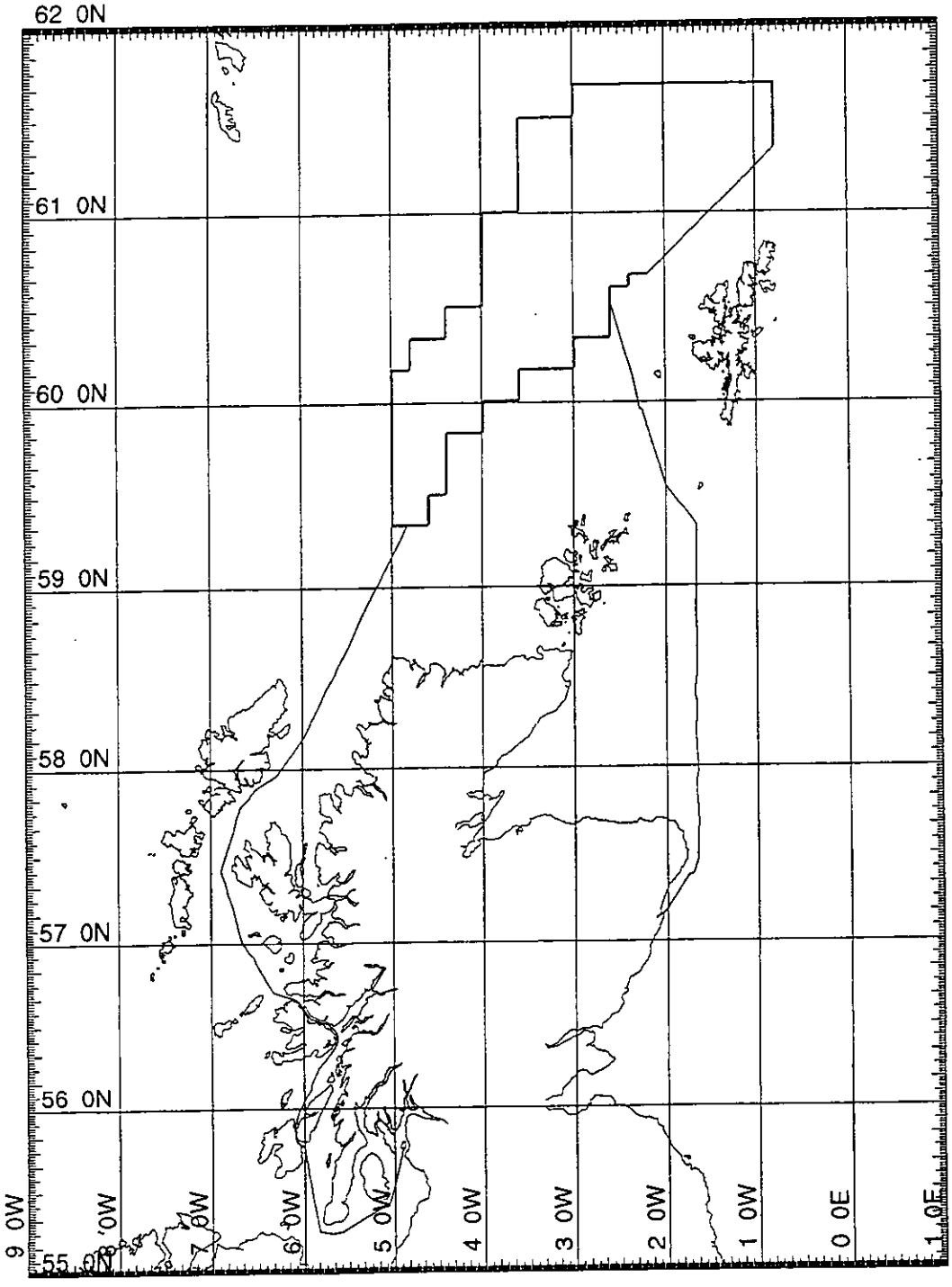


Chart 1. RRS Charles Darwin cruise 101 C (leg 2) cruise track to and from survey area.

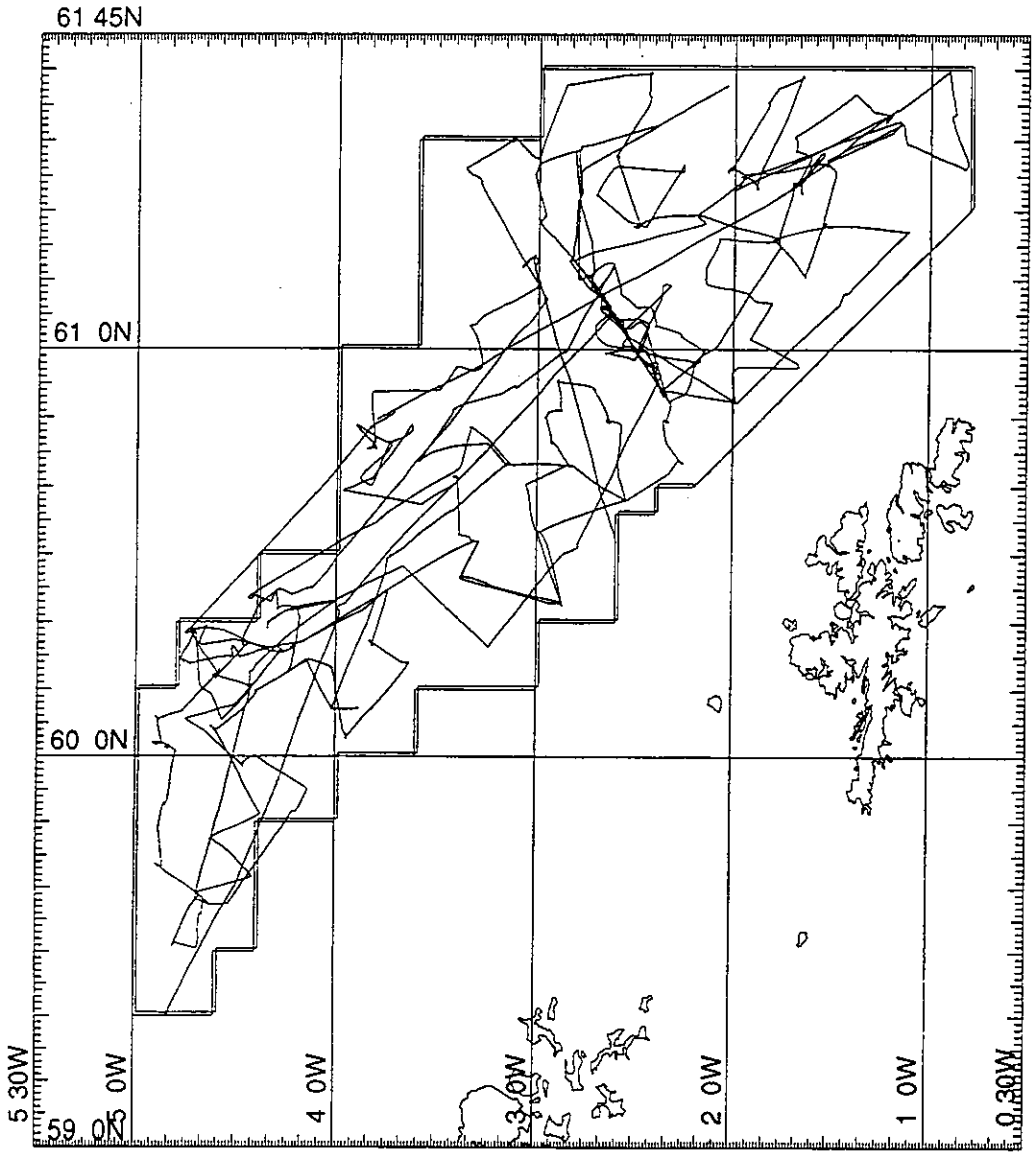


Chart 2. RRS Charles Darwin cruise 101 C (leg 2) cruise track within the survey area.

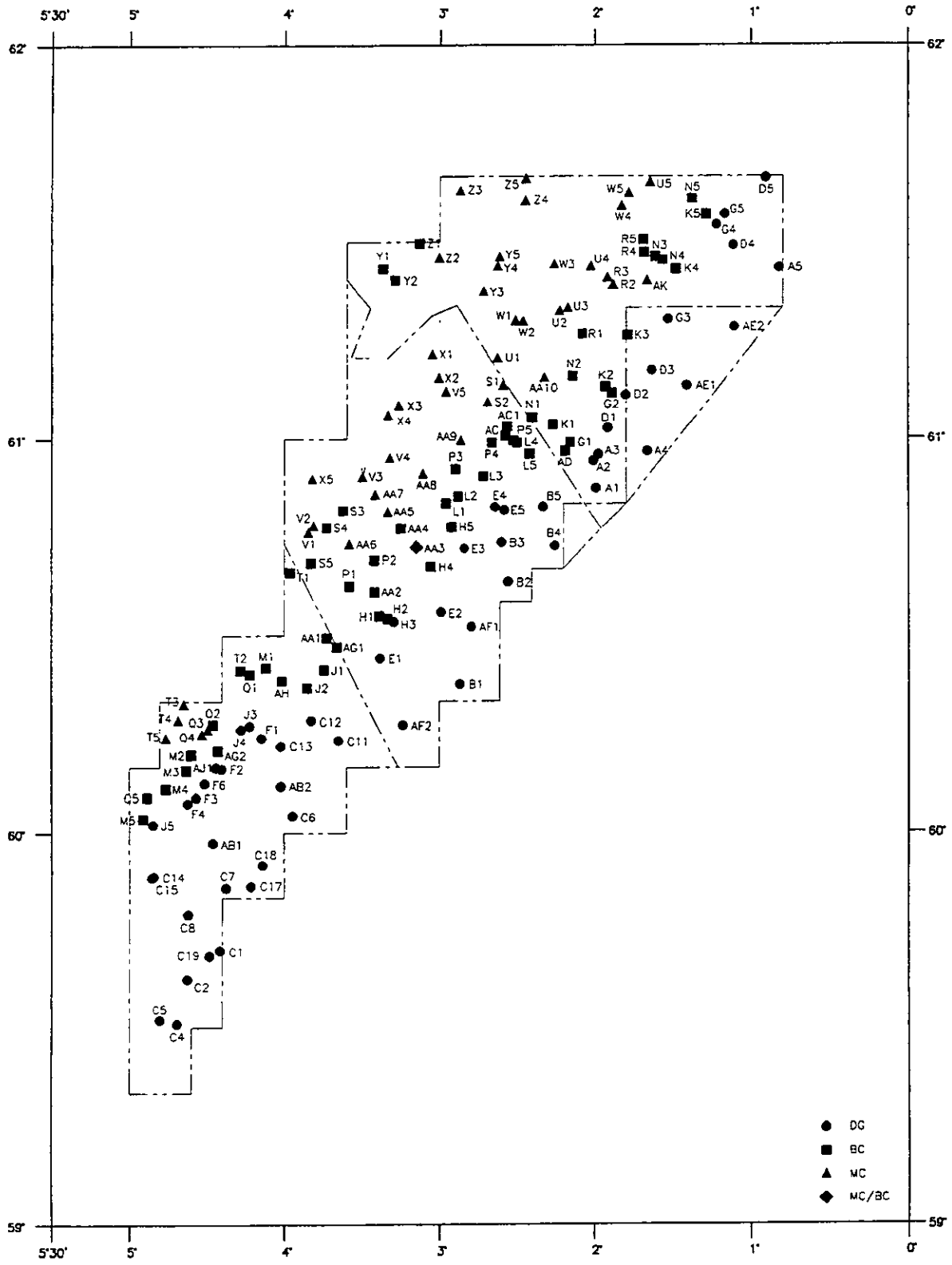


Chart 3(a). Atlantic Margin Environmental Survey: large-scale survey stations - full survey area. (DG Day grab, BC Box corer, MC Megacorer).

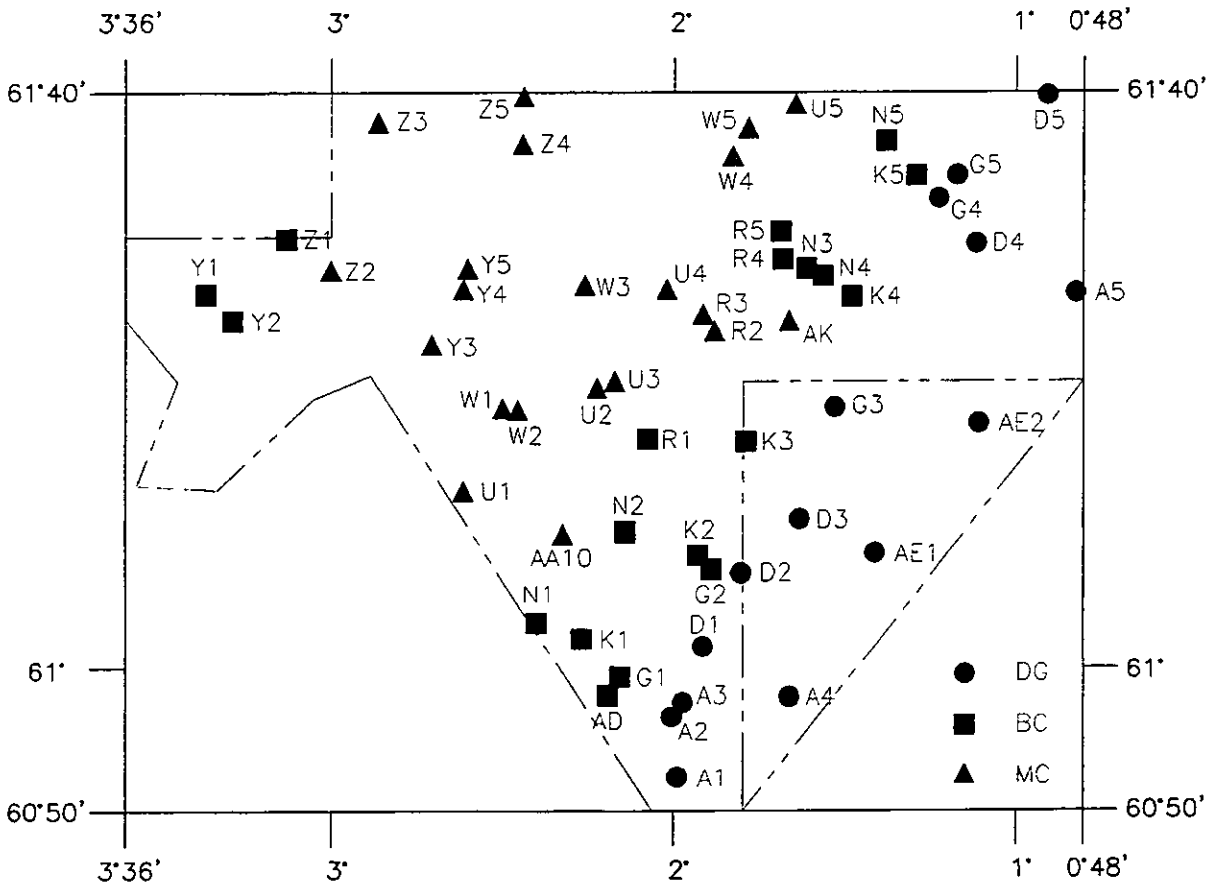


Chart 3(b). Atlantic Margin Environmental Survey: large-scale survey stations - north zone. (DG Day grab, BC Box corer, MC Megacorer).

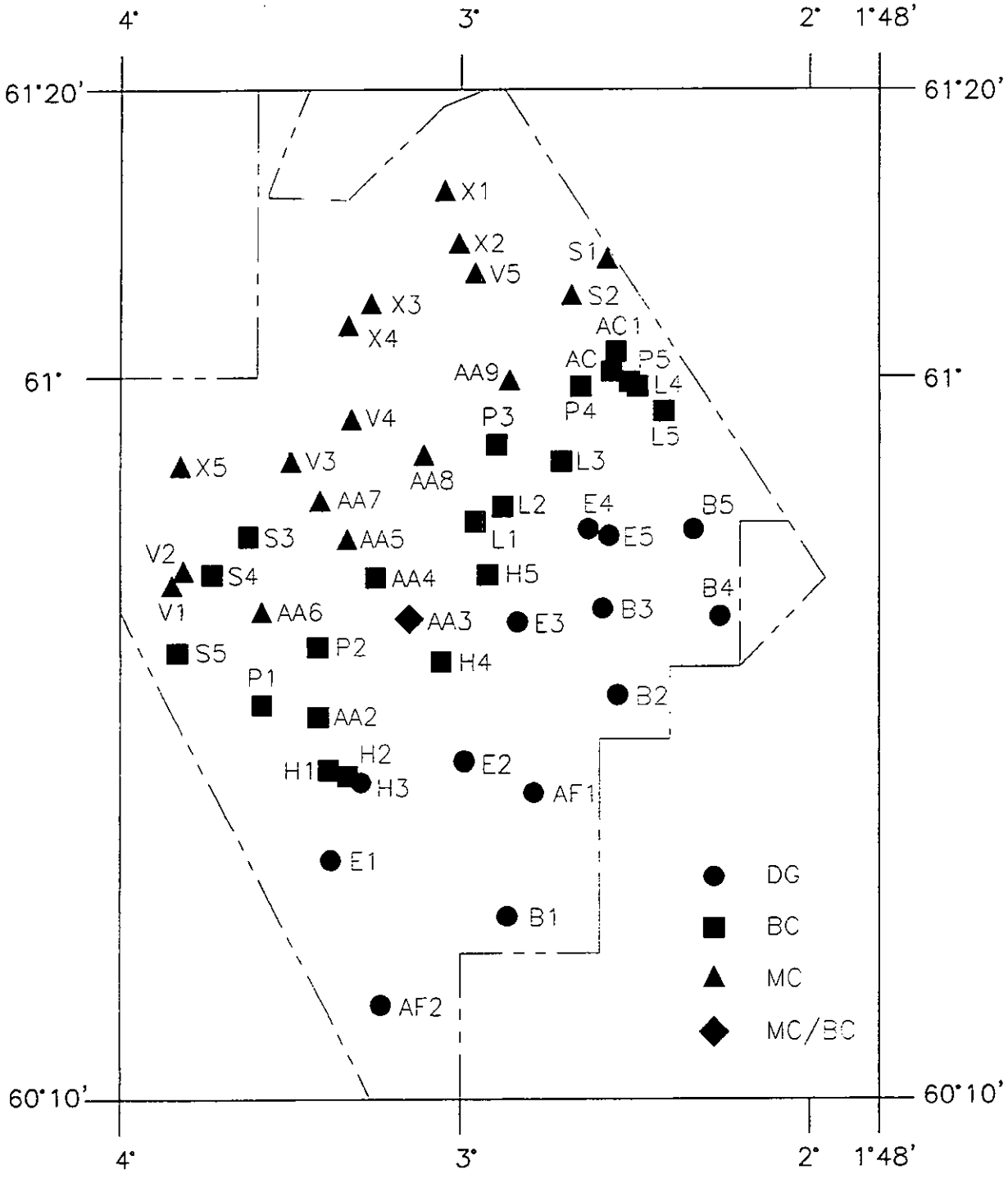


Chart 3(c). Atlantic Margin Environmental Survey: large-scale survey stations - mid zone. (DG Day grab, BC Box corer, MC Megacorer).

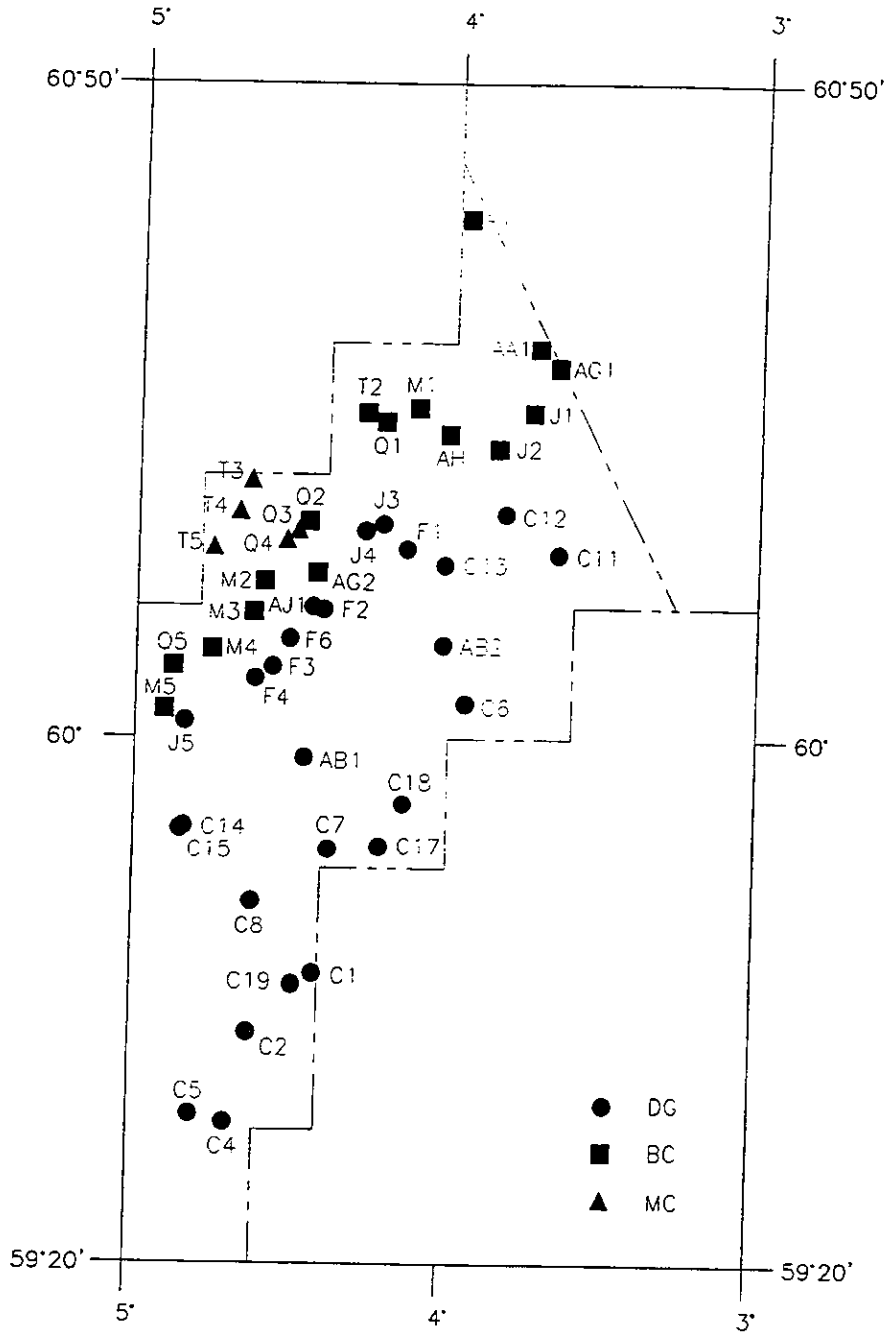


Chart 3(d). Atlantic Margin Environmental Survey: large-scale survey stations - south zone. (DG Day grab, BC Box corer, MC Megacorer).

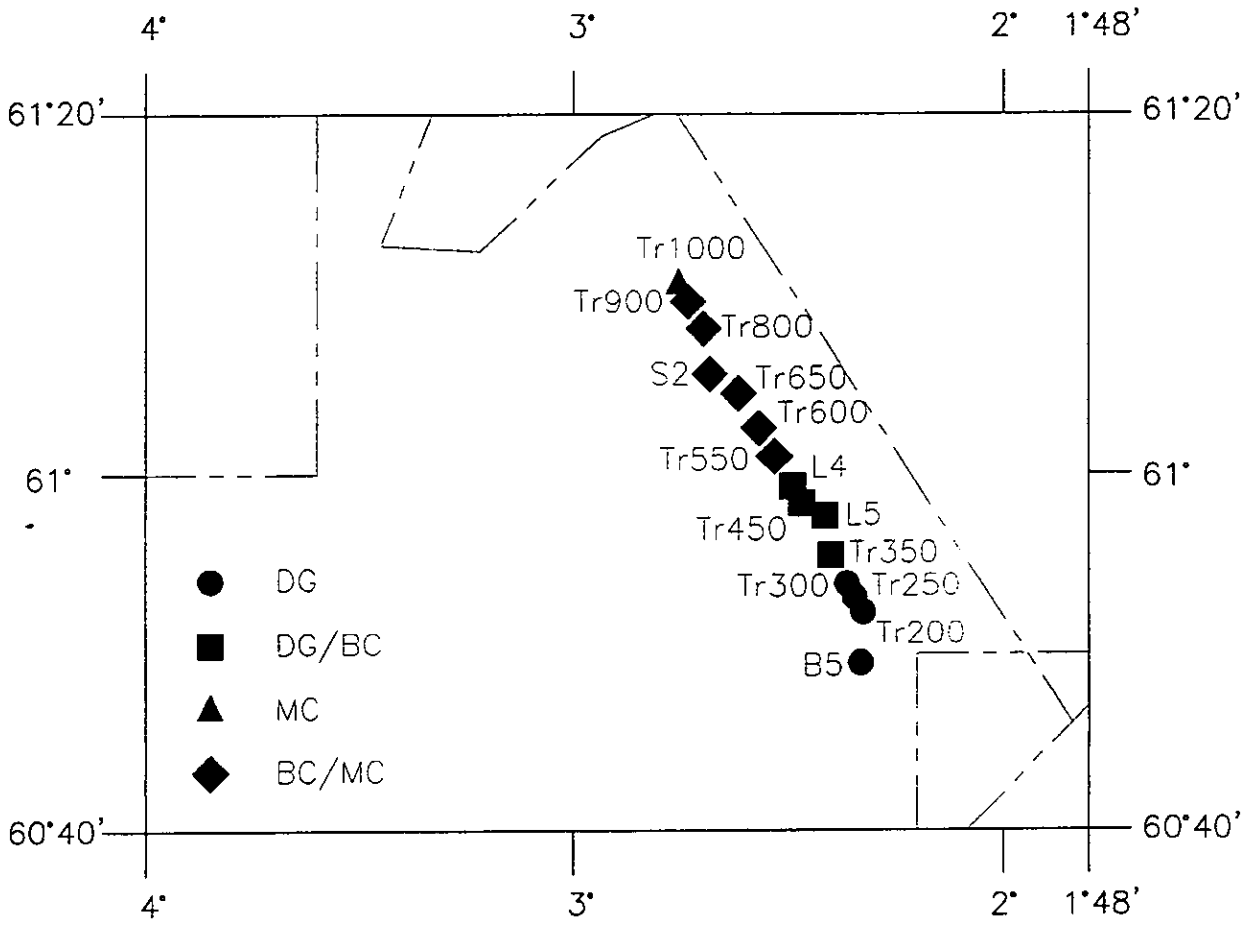


Chart 4. Atlantic Margin Environmental Survey: transect survey stations. (DG Day grab, BC Box corer, MC Megacorer).

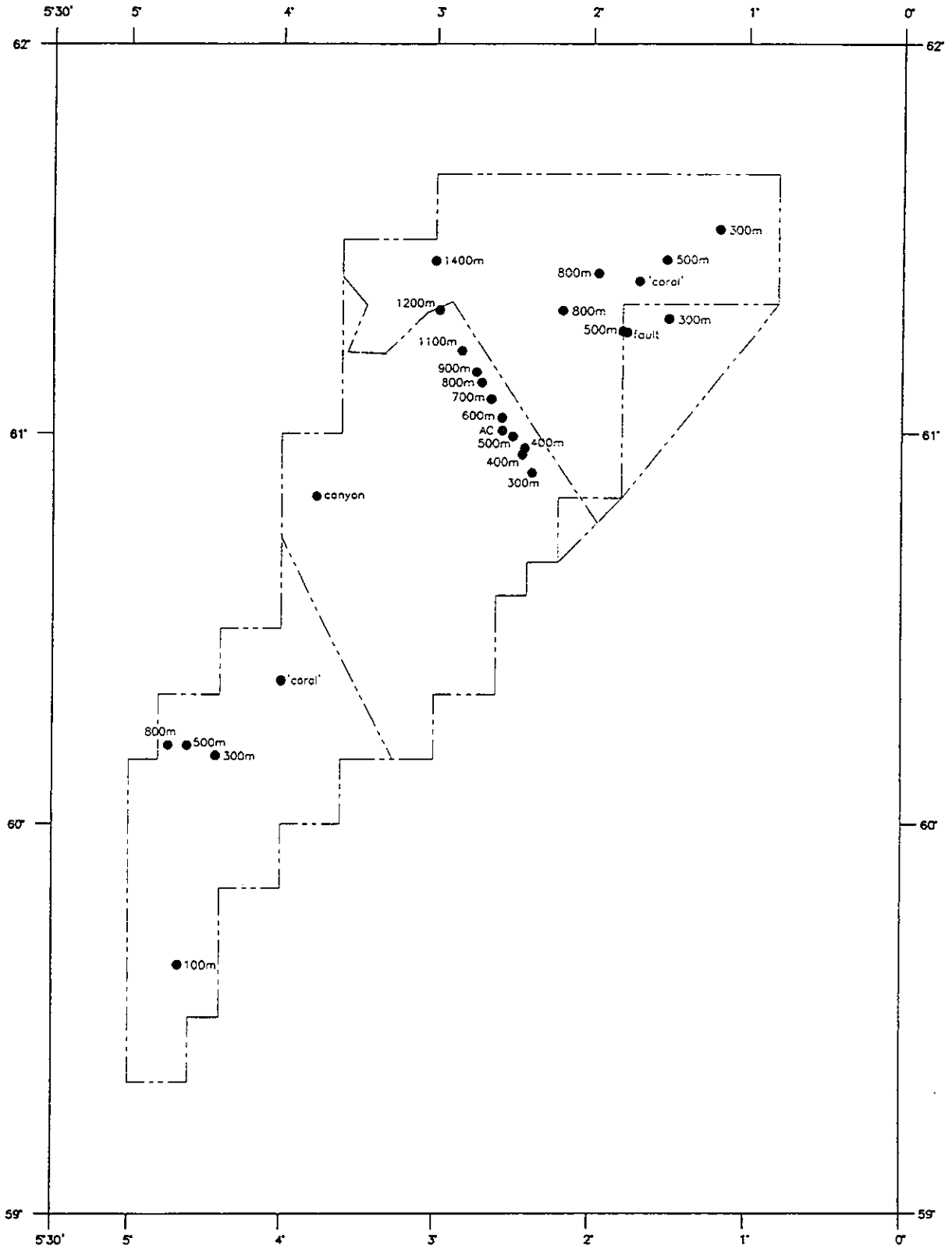


Chart 5. Atlantic Margin Environmental Survey: WASP stations.

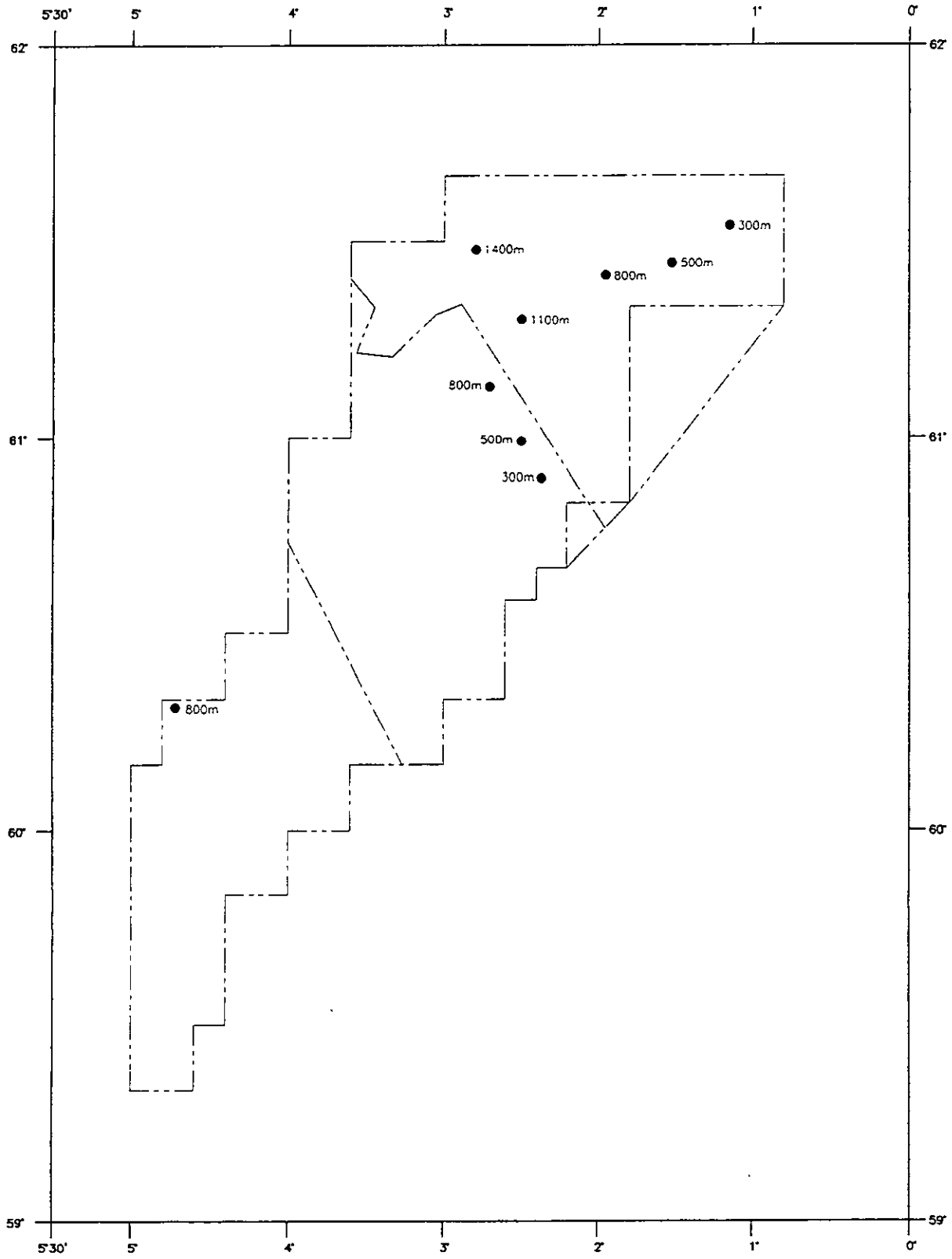


Chart 6. Atlantic Margin Environmental Survey: fish trap stations.

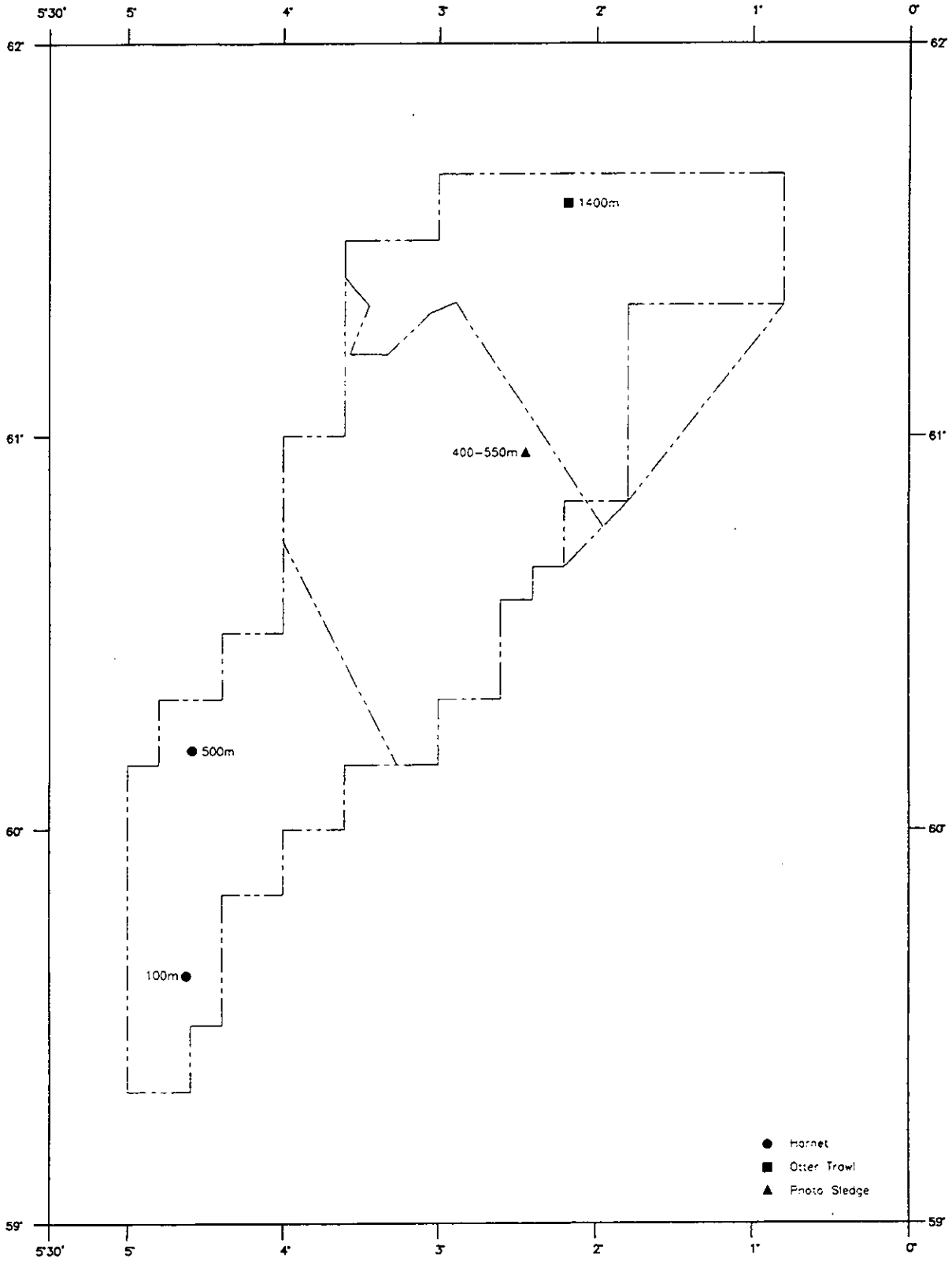


Chart 7. Atlantic Margin Environmental Survey: other survey stations.

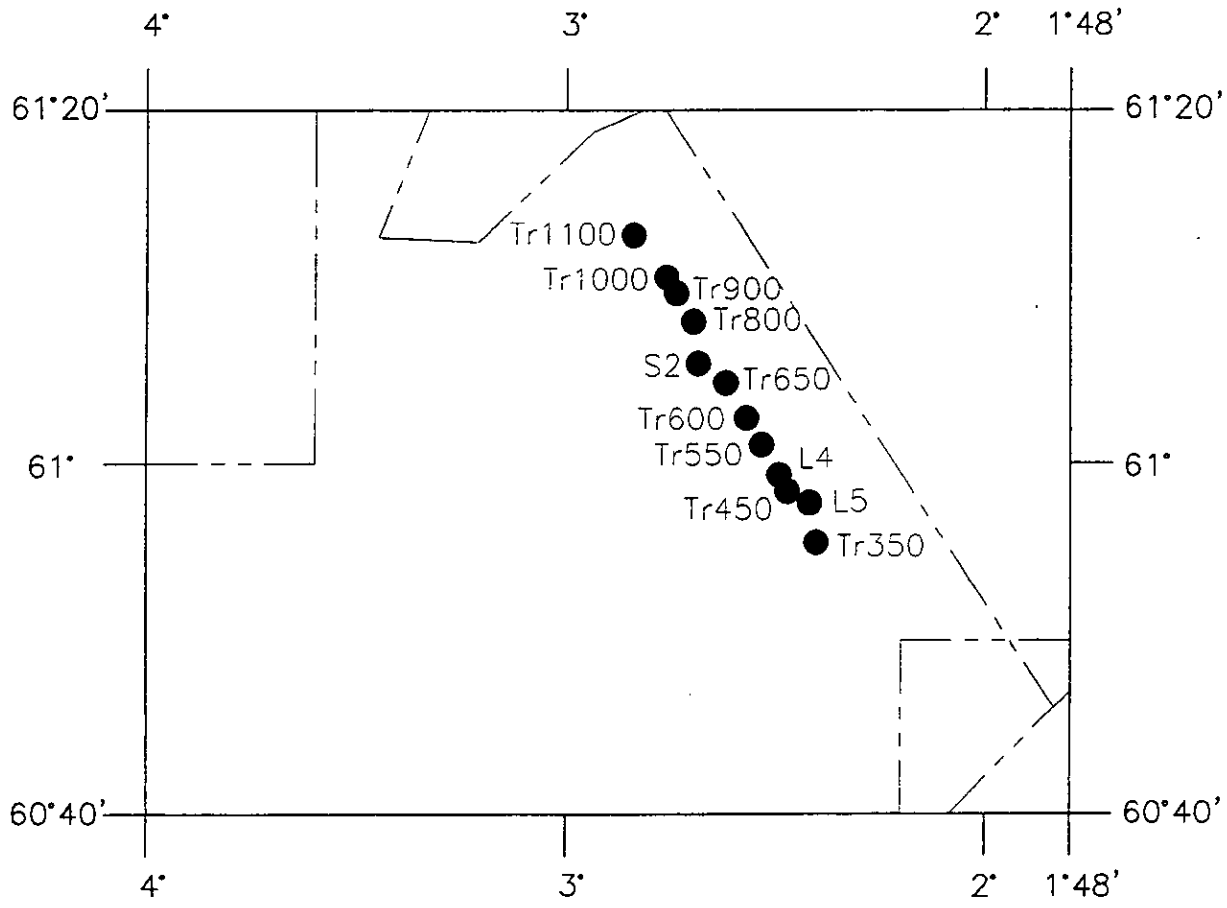


Chart 8. Atlantic Margin Environmental Survey: extra transect stations.

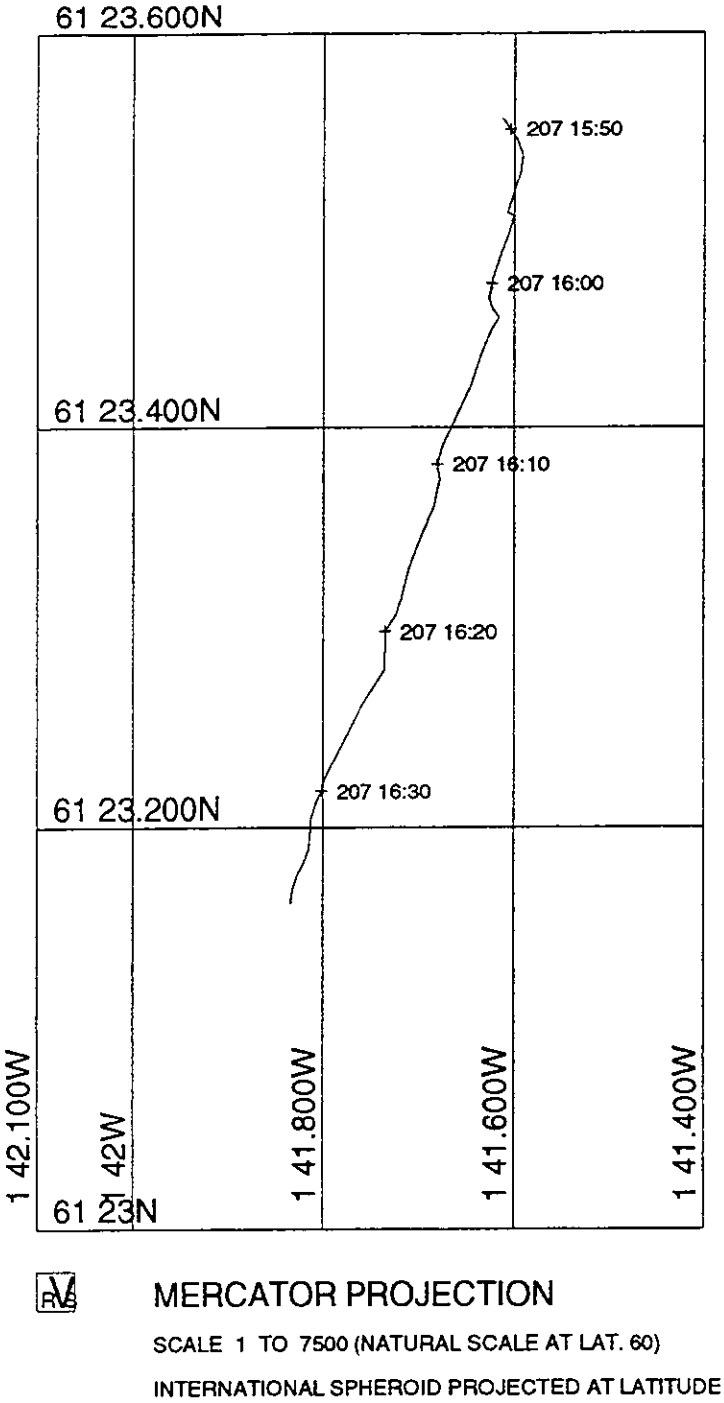


Chart 9. WASP track, station 53801#1

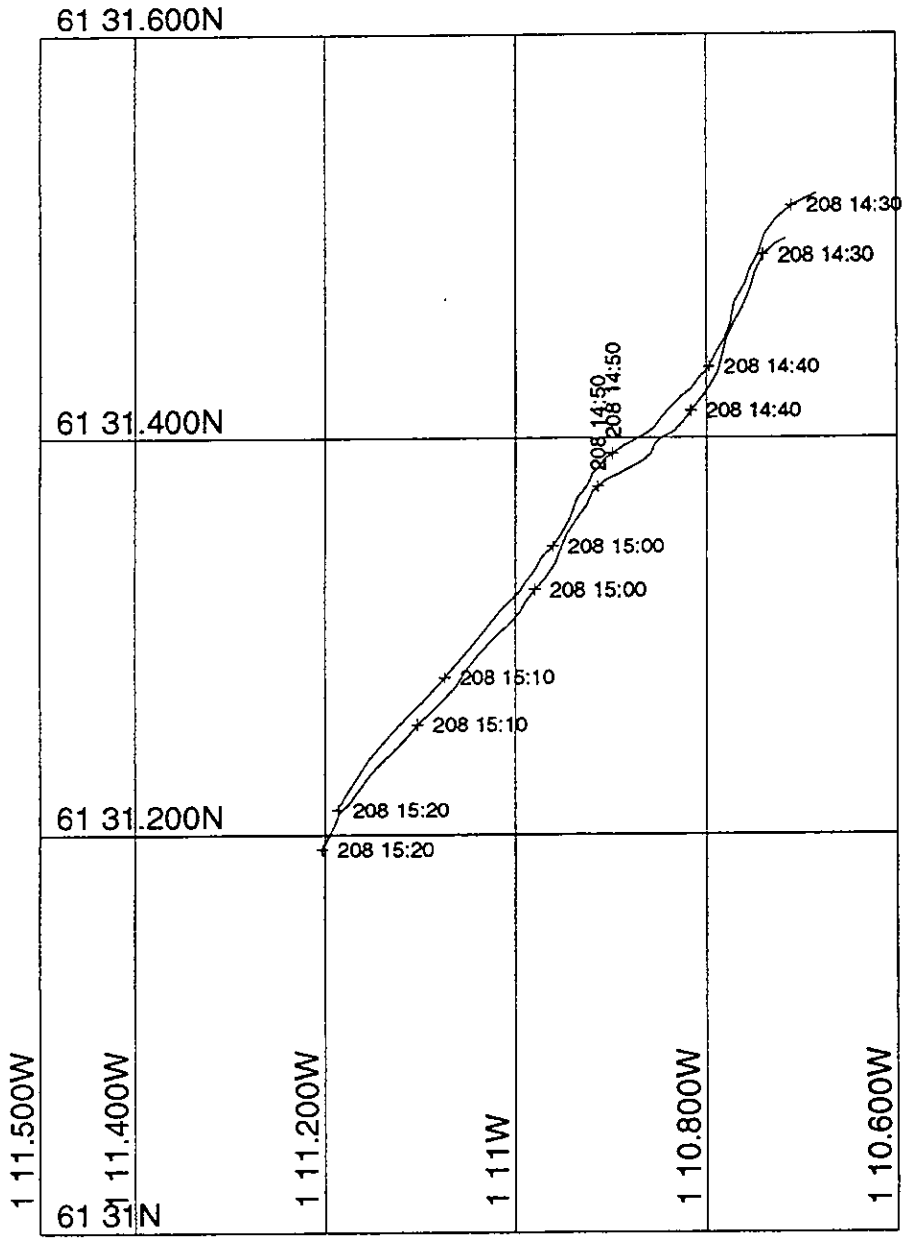


Chart 10. WASP track, station 53810#1

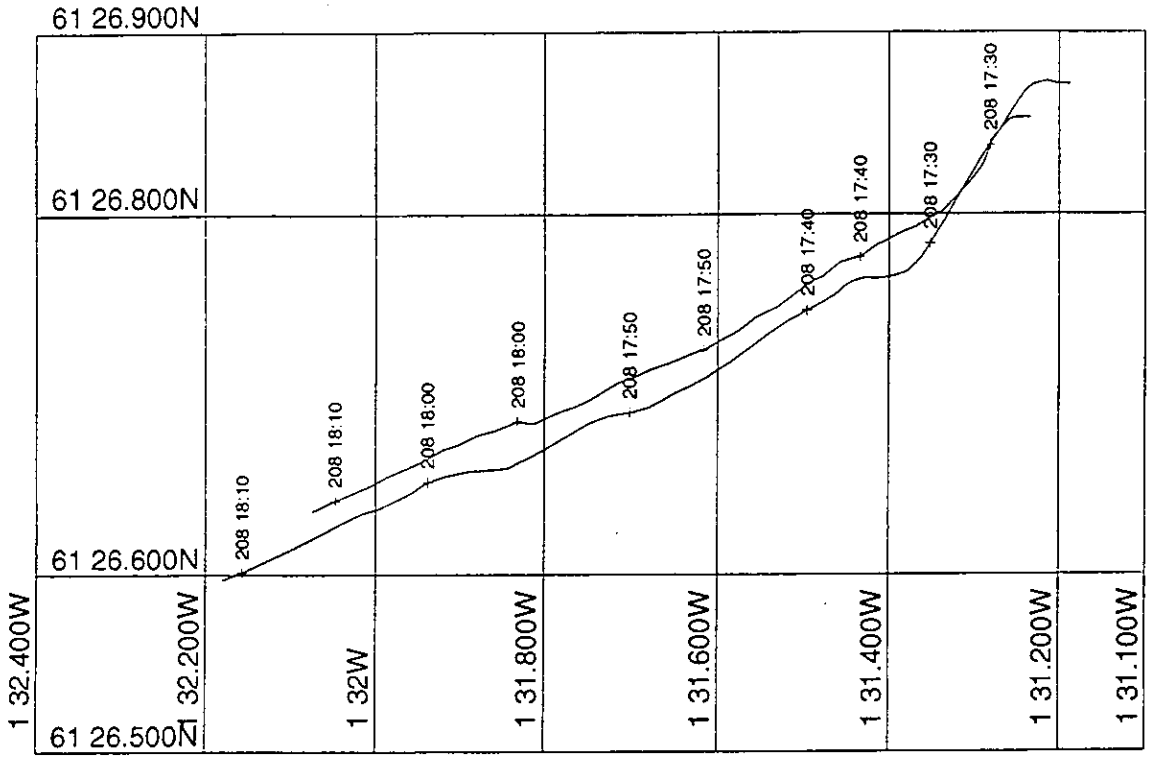


Chart 11. WASP track, station 53811#1

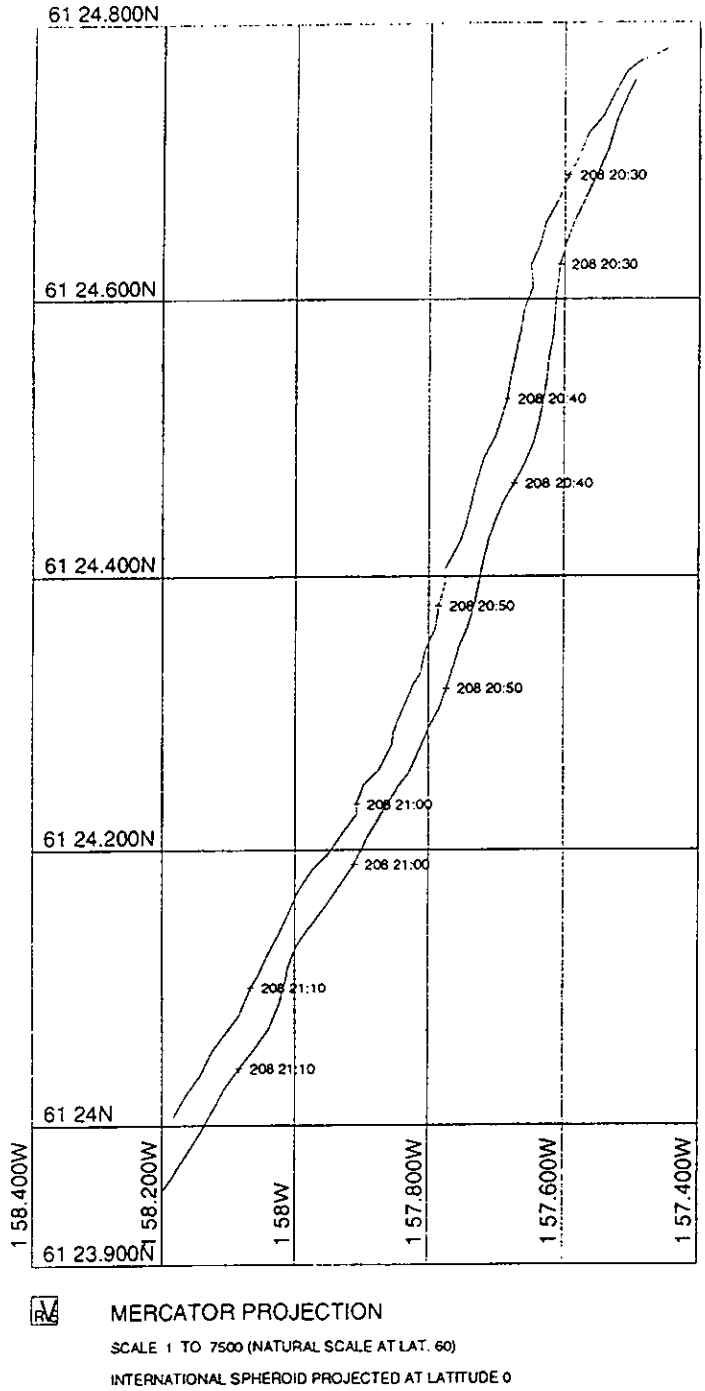
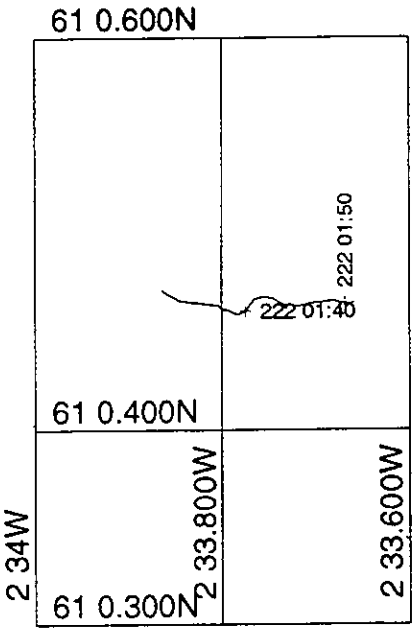


Chart 12. WASP track, station 53812#1

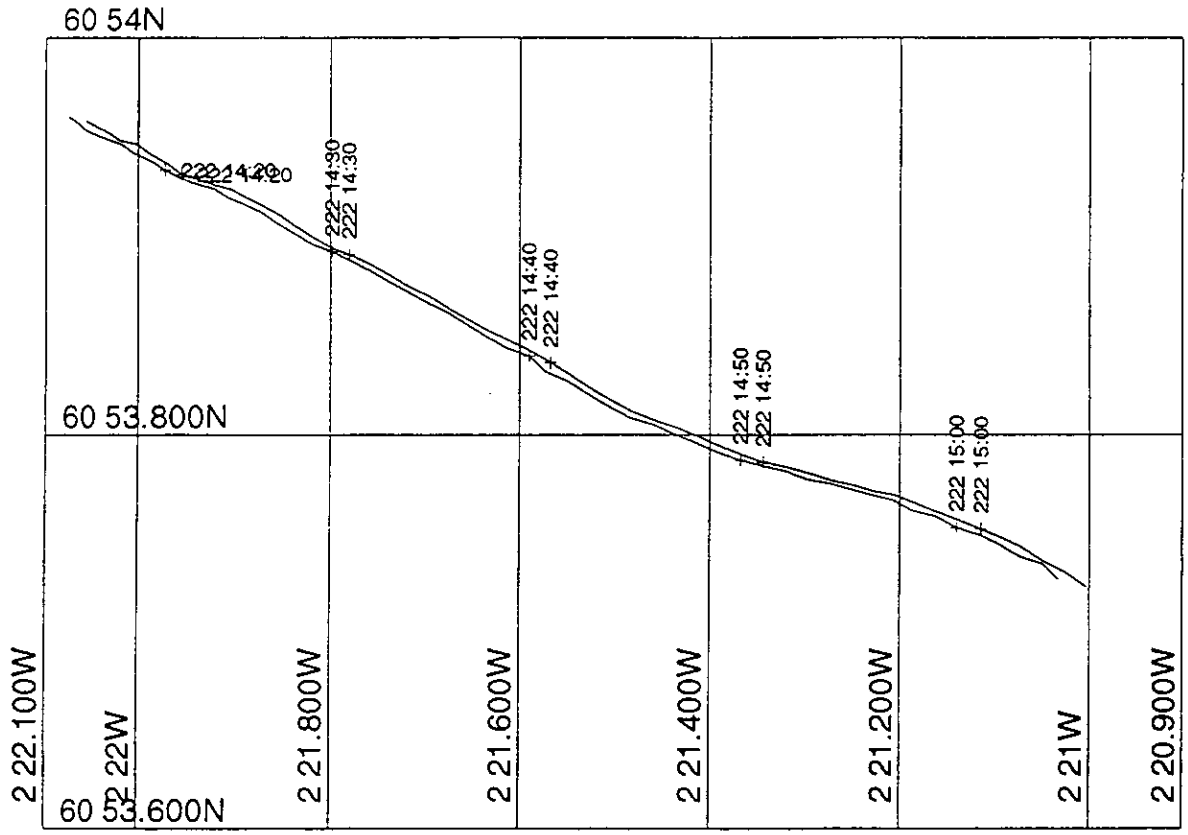


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 13. WASP track, station 53905#2

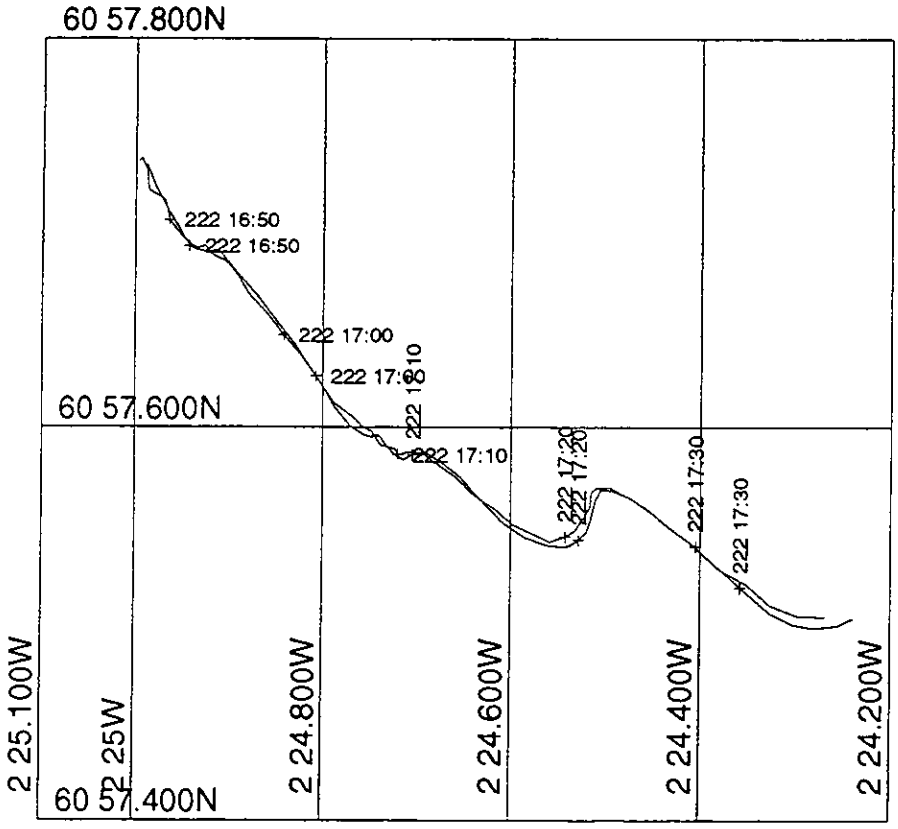


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 14. WASP track, station 53913#1



MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 15. WASP track, station 53914#1

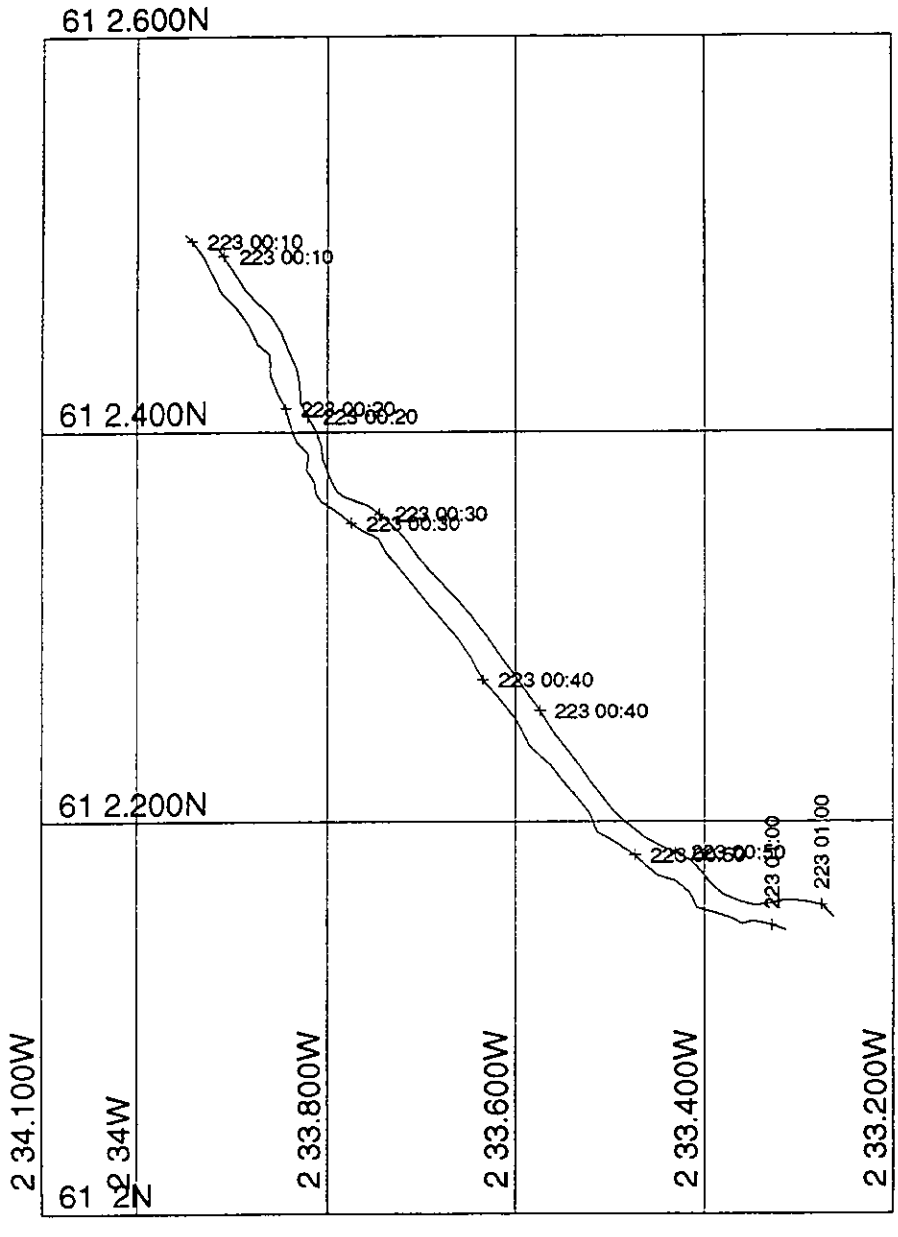
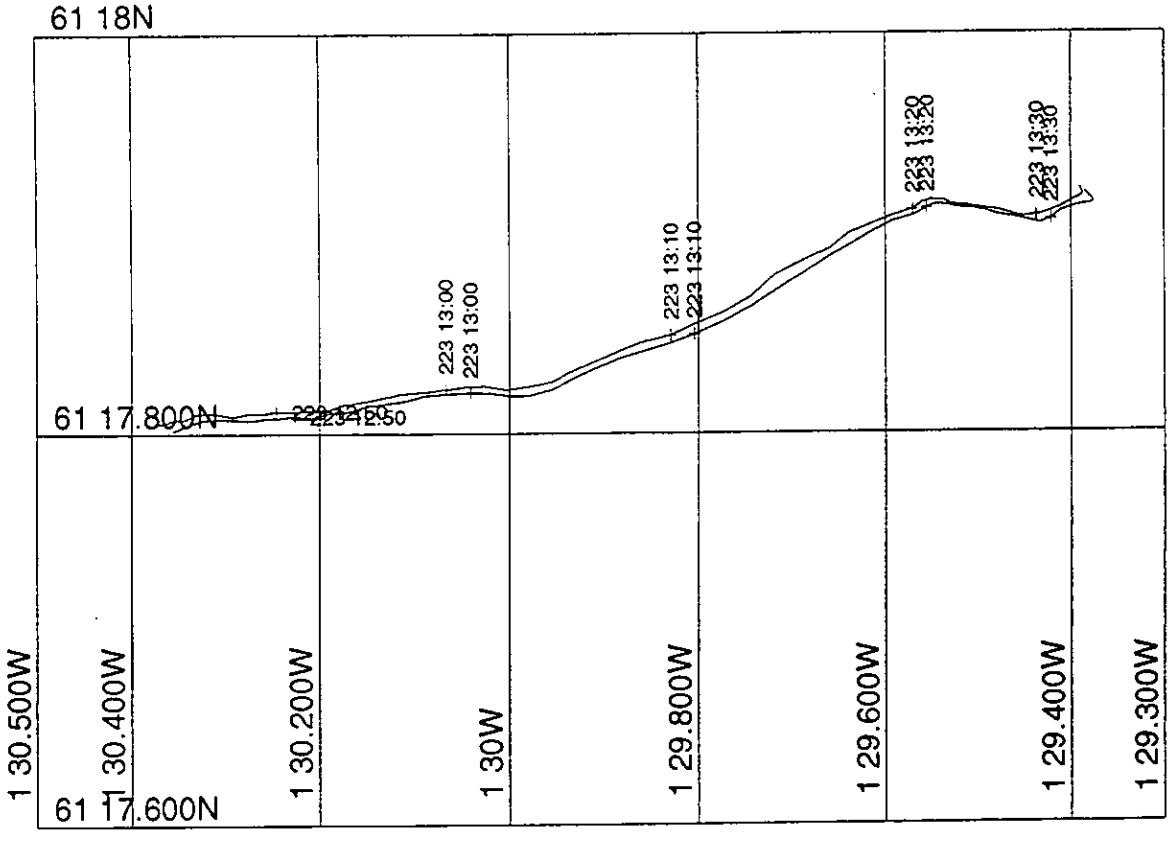


Chart 16. WASP track, station 53916#1



MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 17. WASP track, station 53920#1

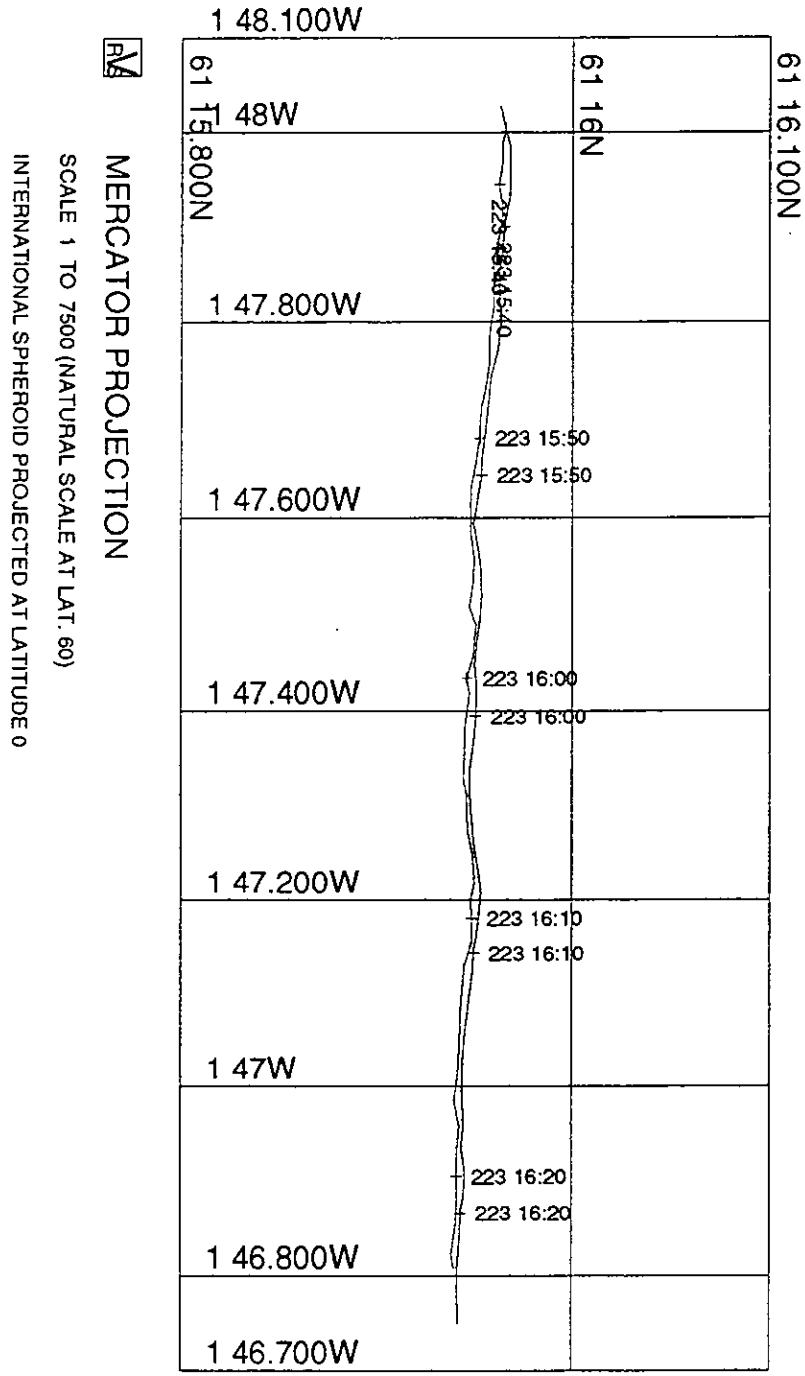


Chart 18. WASP track, station 53921#1

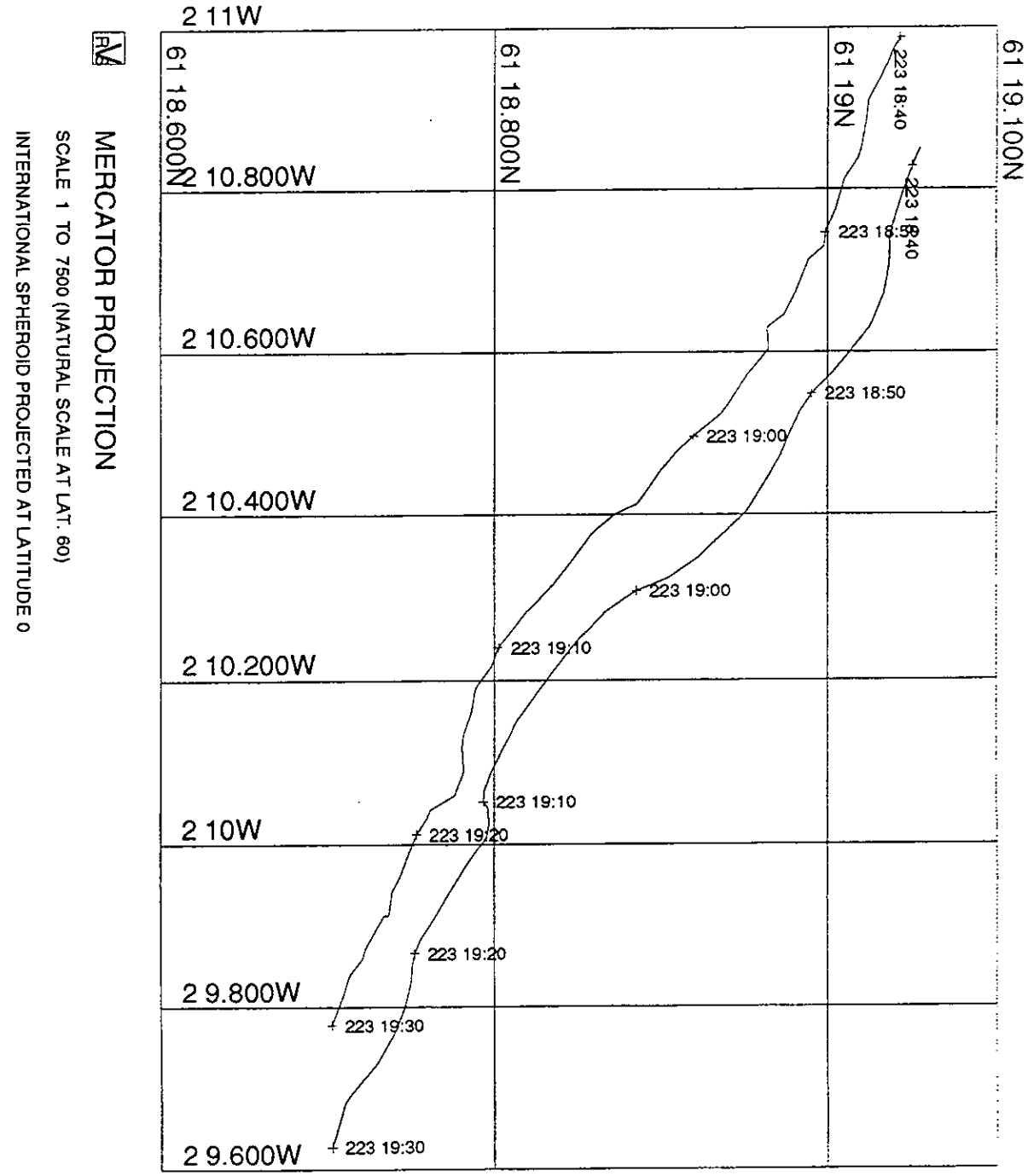
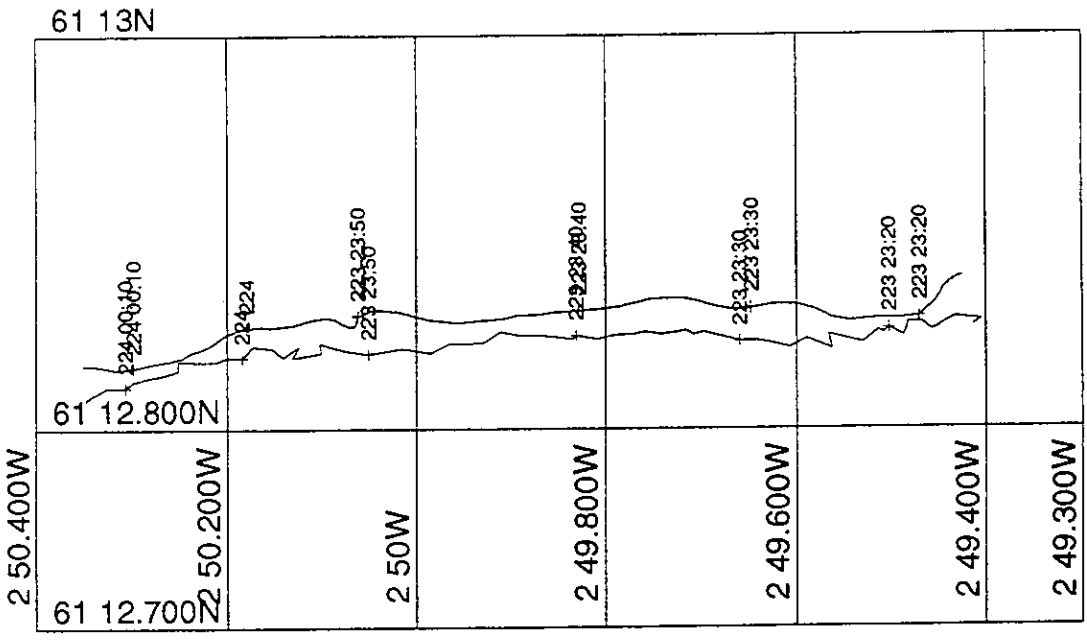


Chart 19. WASP track, station 53922#1



MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 20. WASP track, station 53923#1

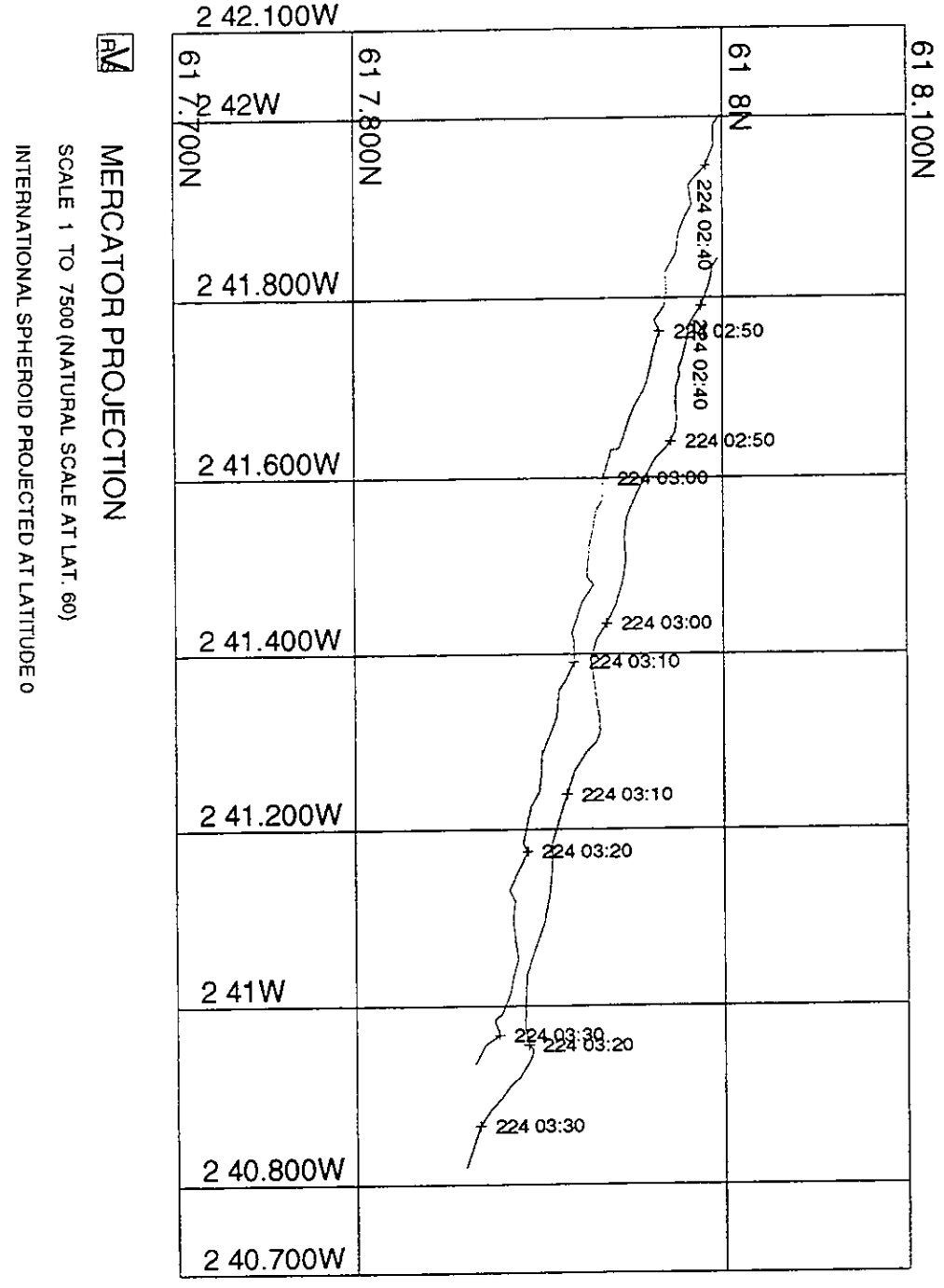


Chart 21. WASP track, station 53924#1

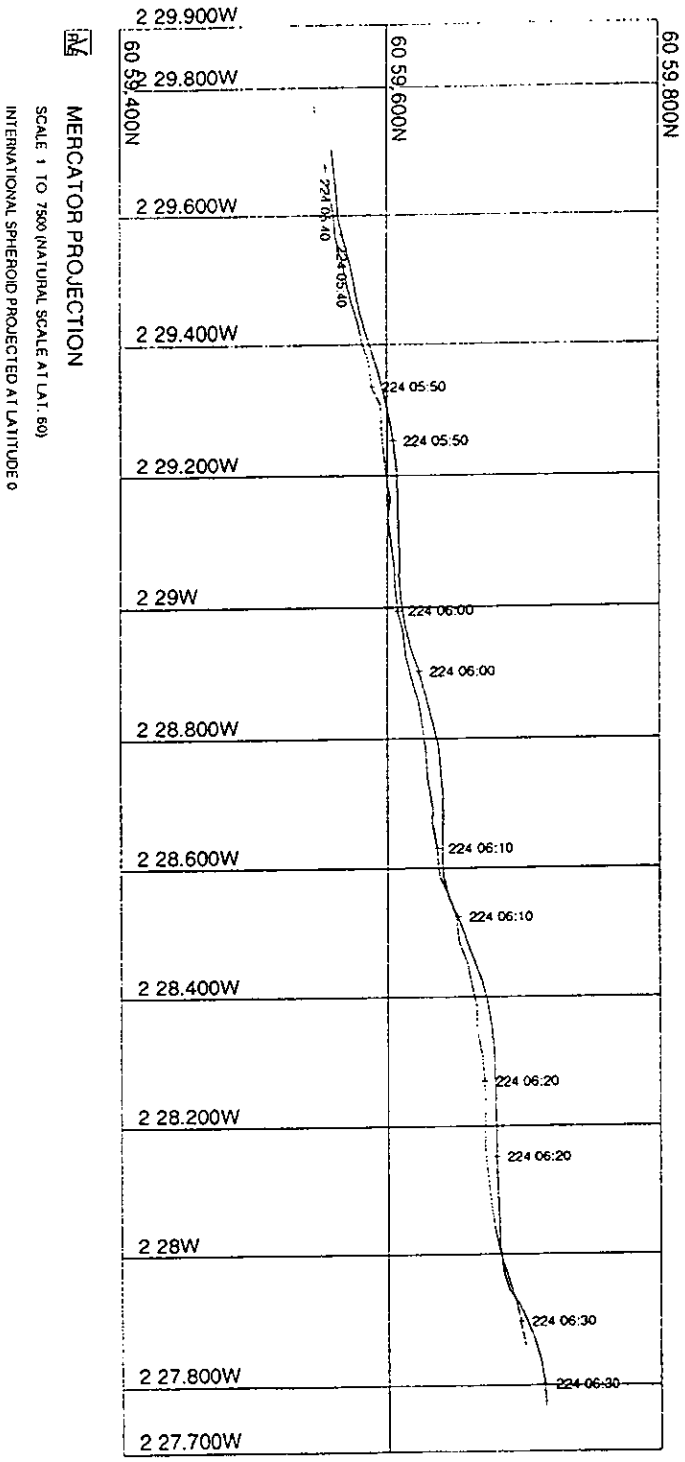


Chart 22. WASP track, station 53925#1

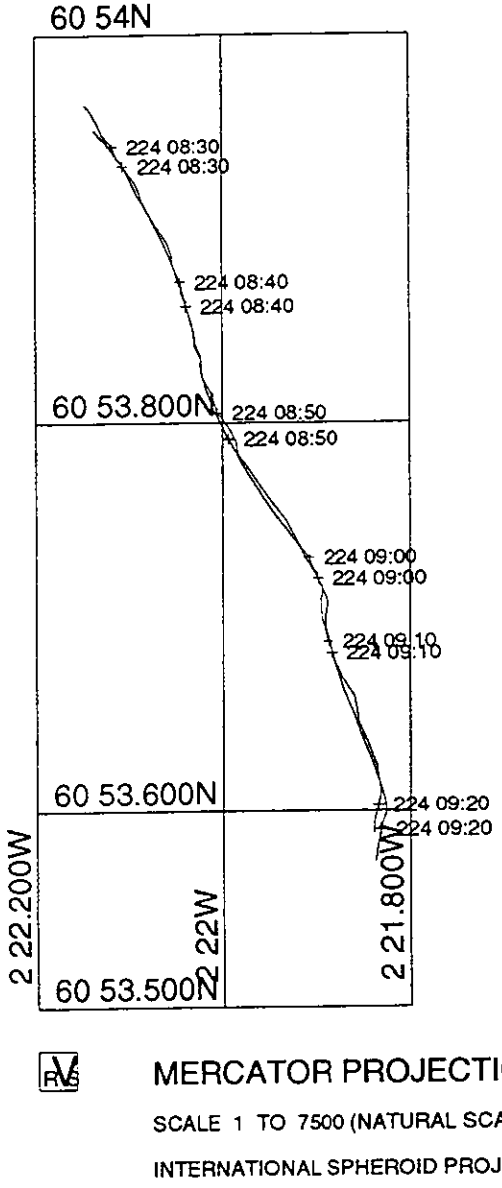


Chart 23. WASP track, station 53926#1

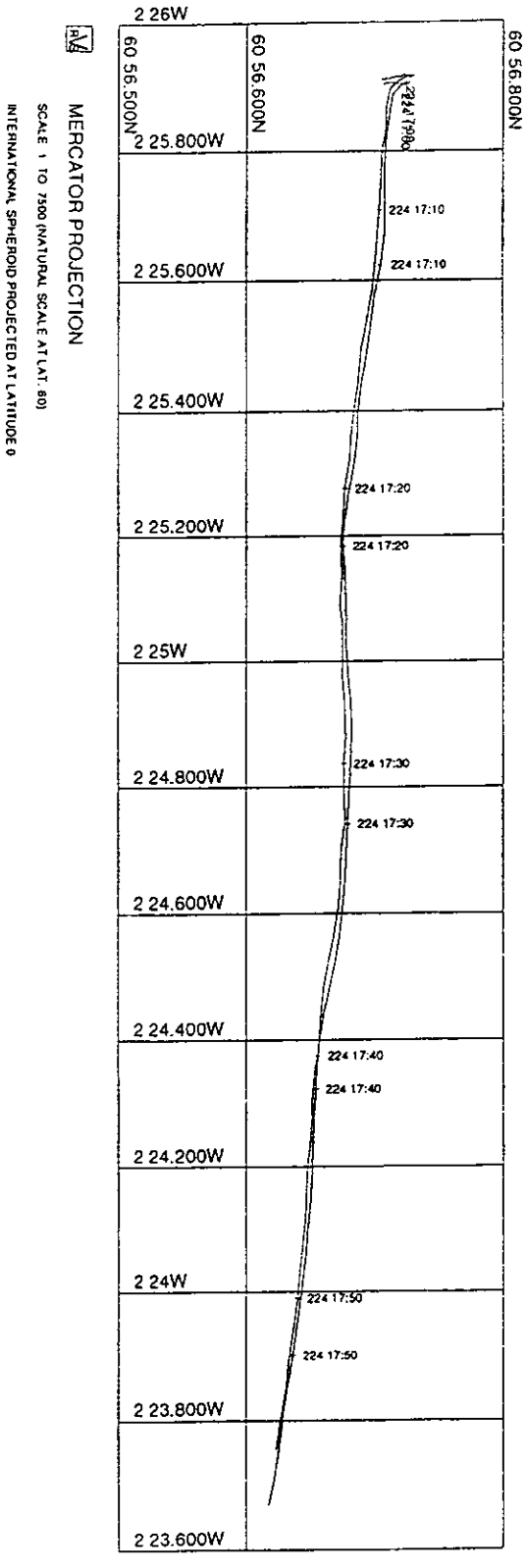


Chart 24. WASP track, station 53928#1

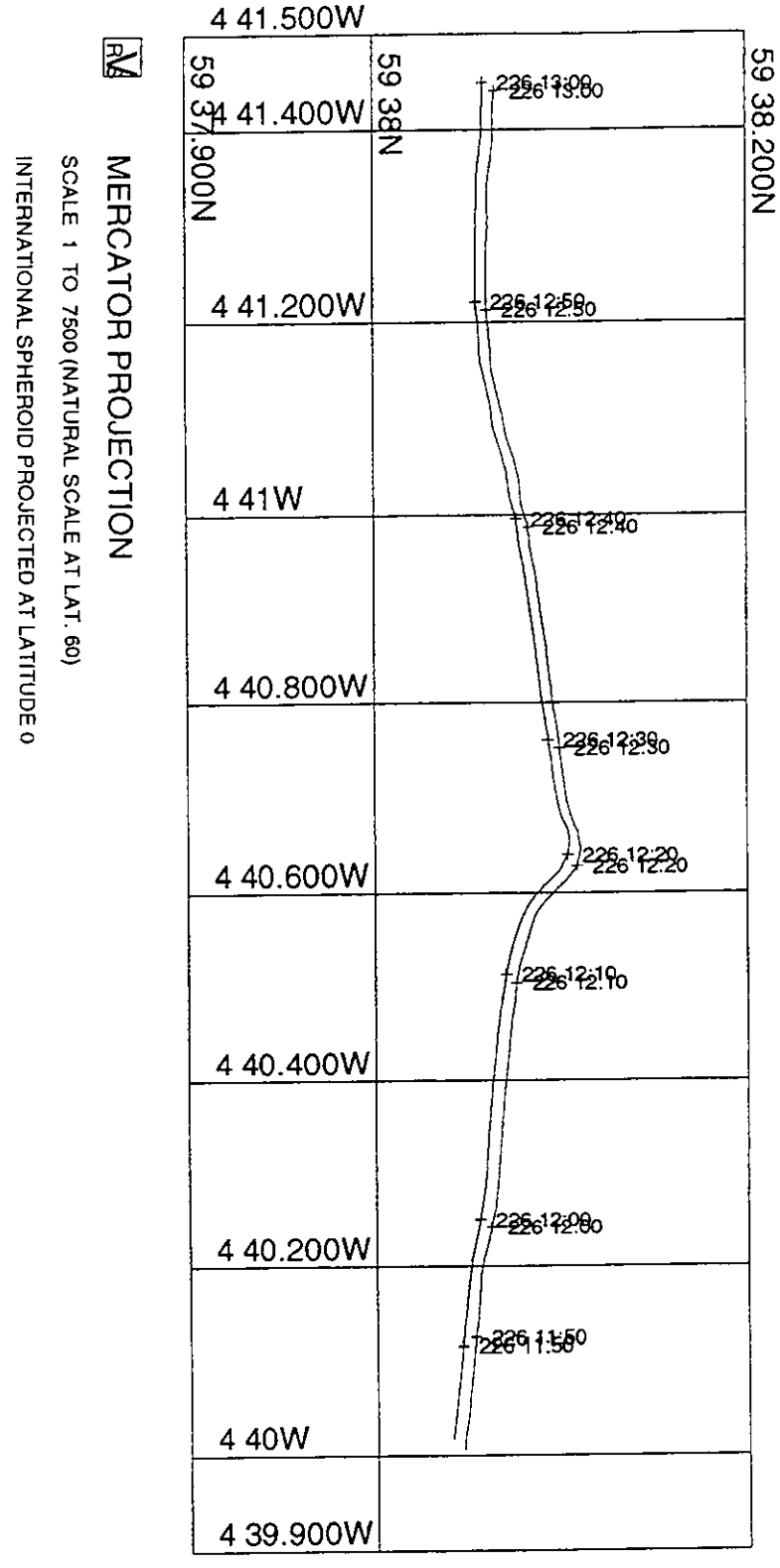
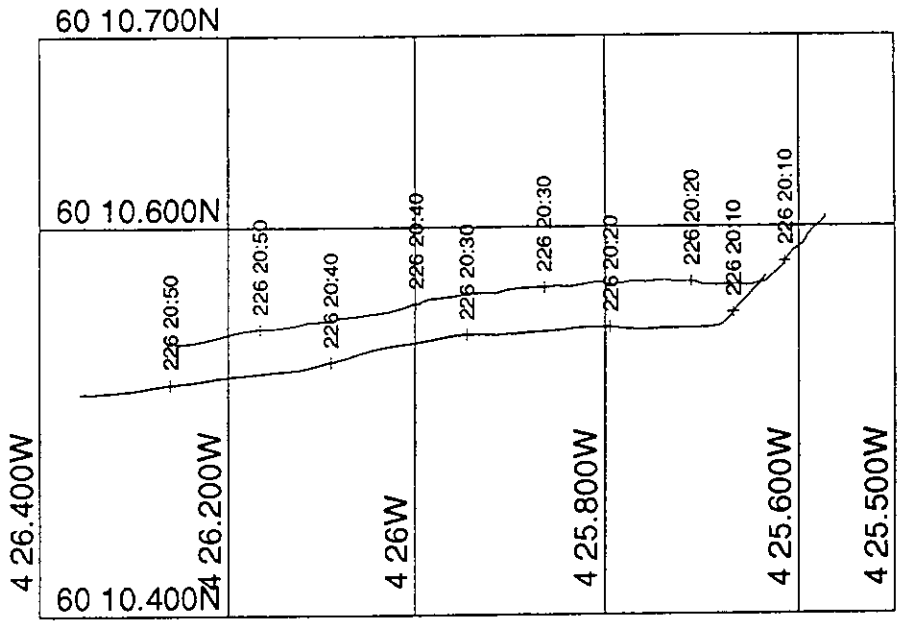


Chart 25. WASP track, station 53947#1

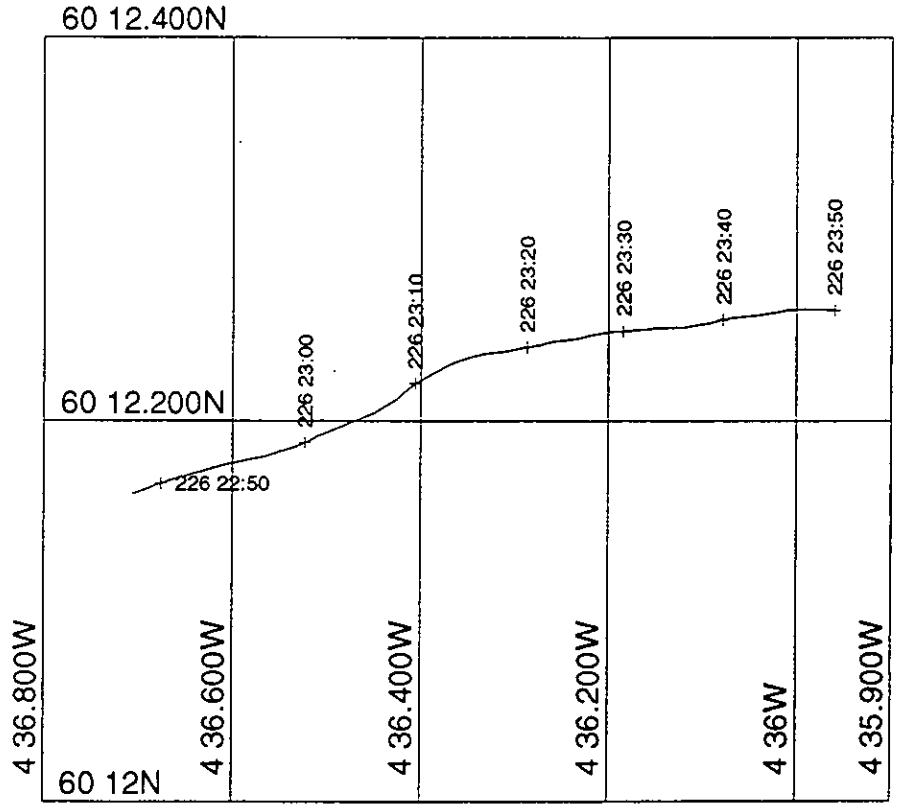


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 26. WASP track, station 53948#1

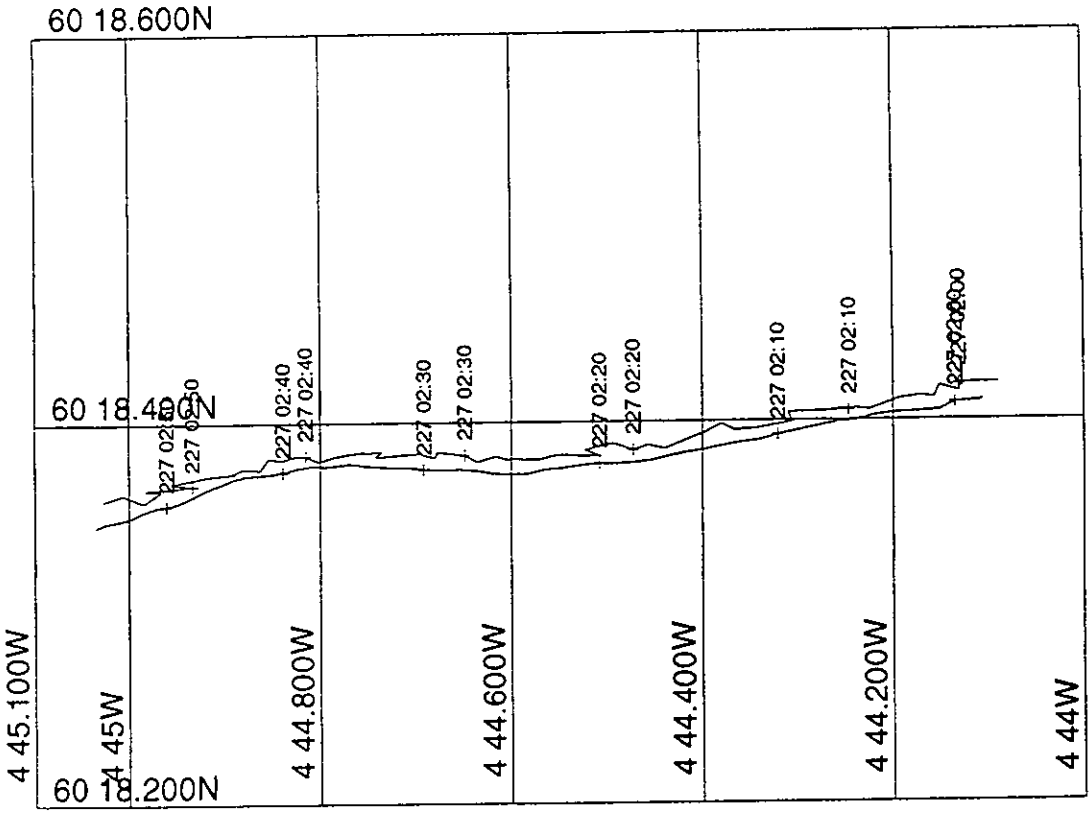


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 27. WASP track, station 53949#1

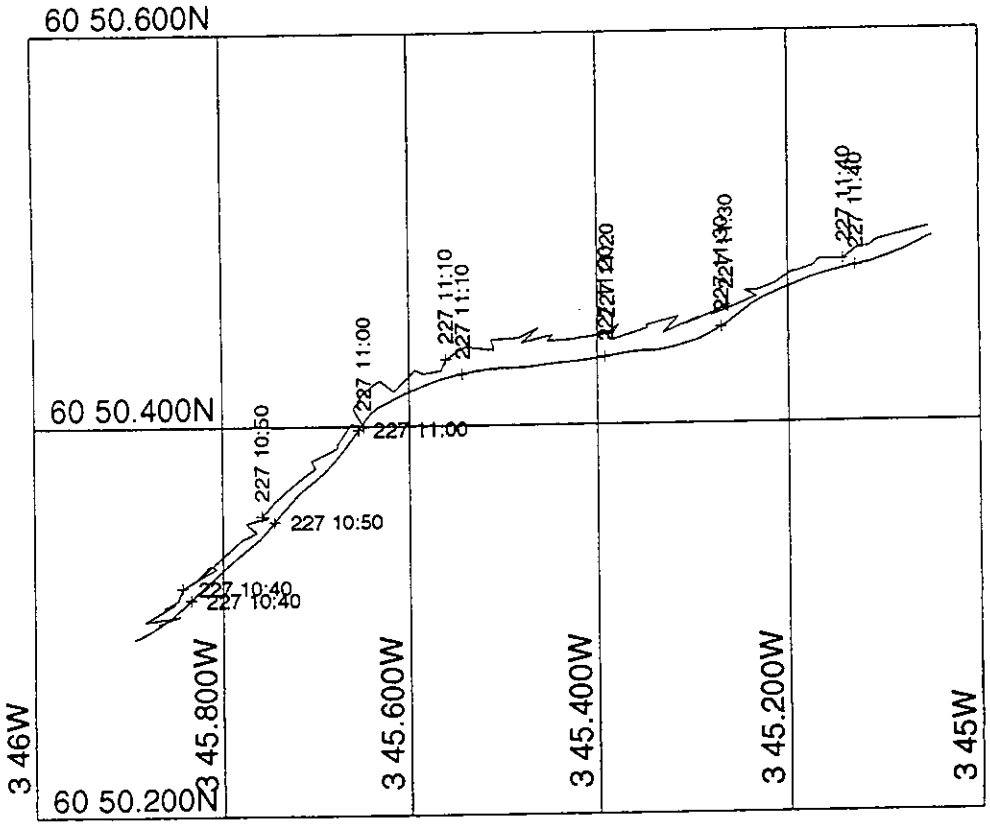


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 28. WASP track, station 53950#1



MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 29. WASP track, station 53951#1

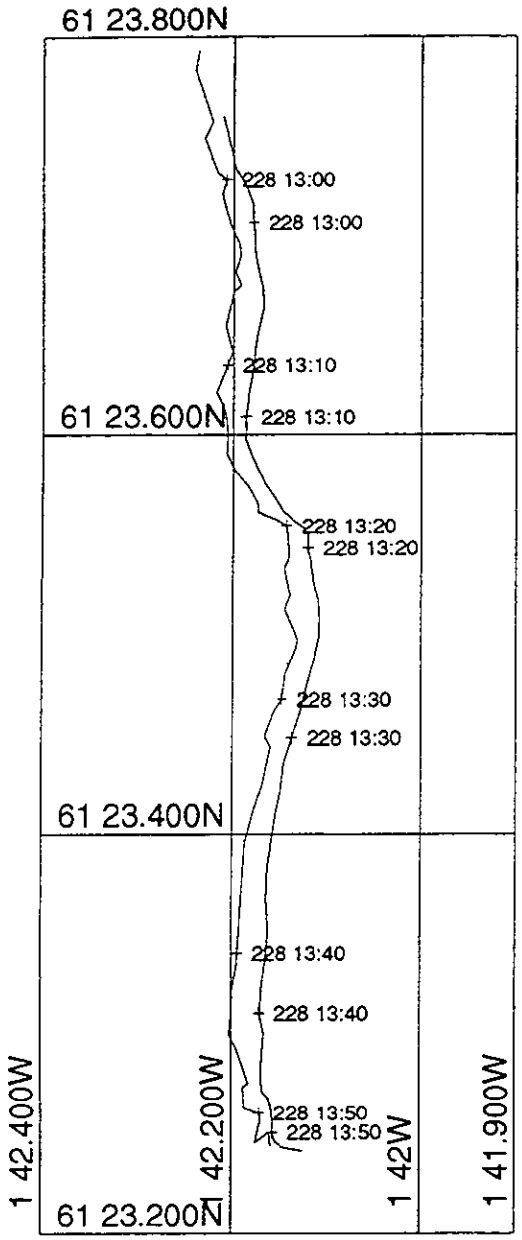


Chart 30. WASP track, station 53962#1

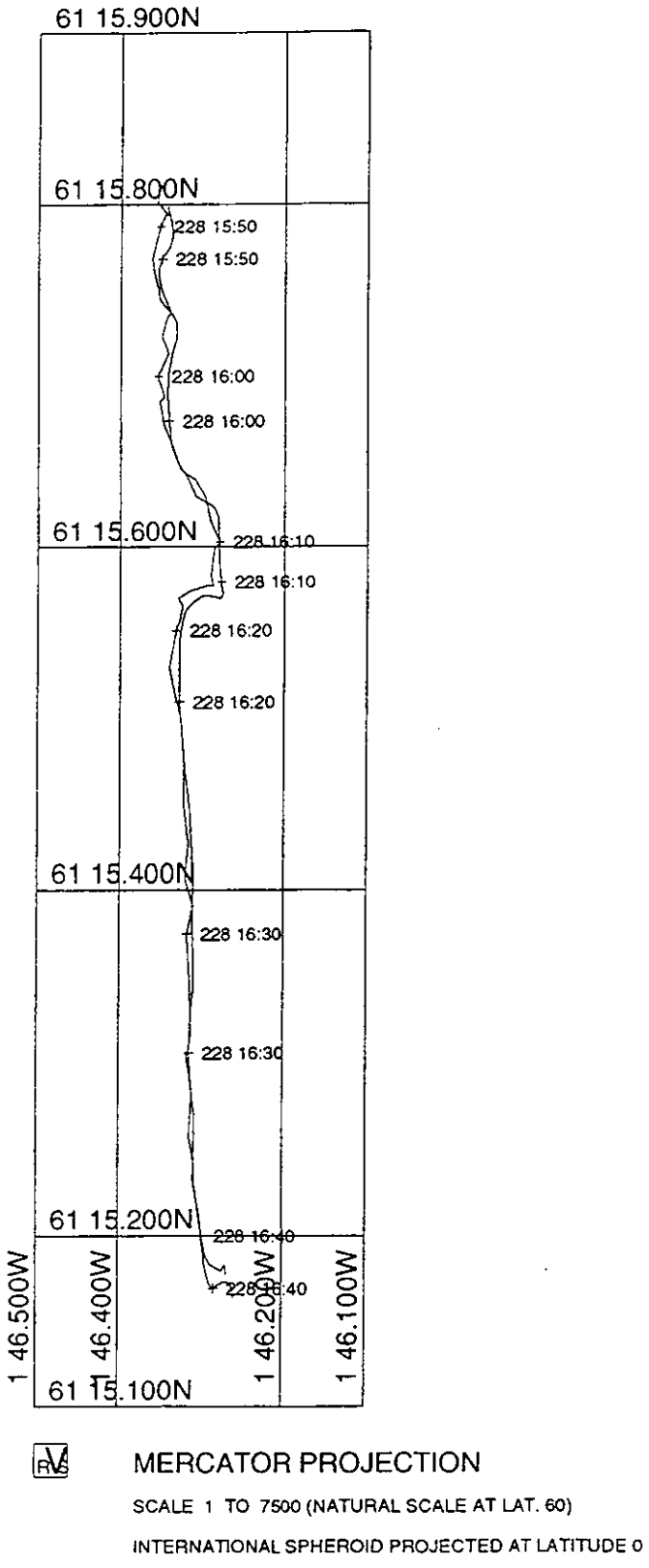


Chart 31. WASP track, station 53963#1

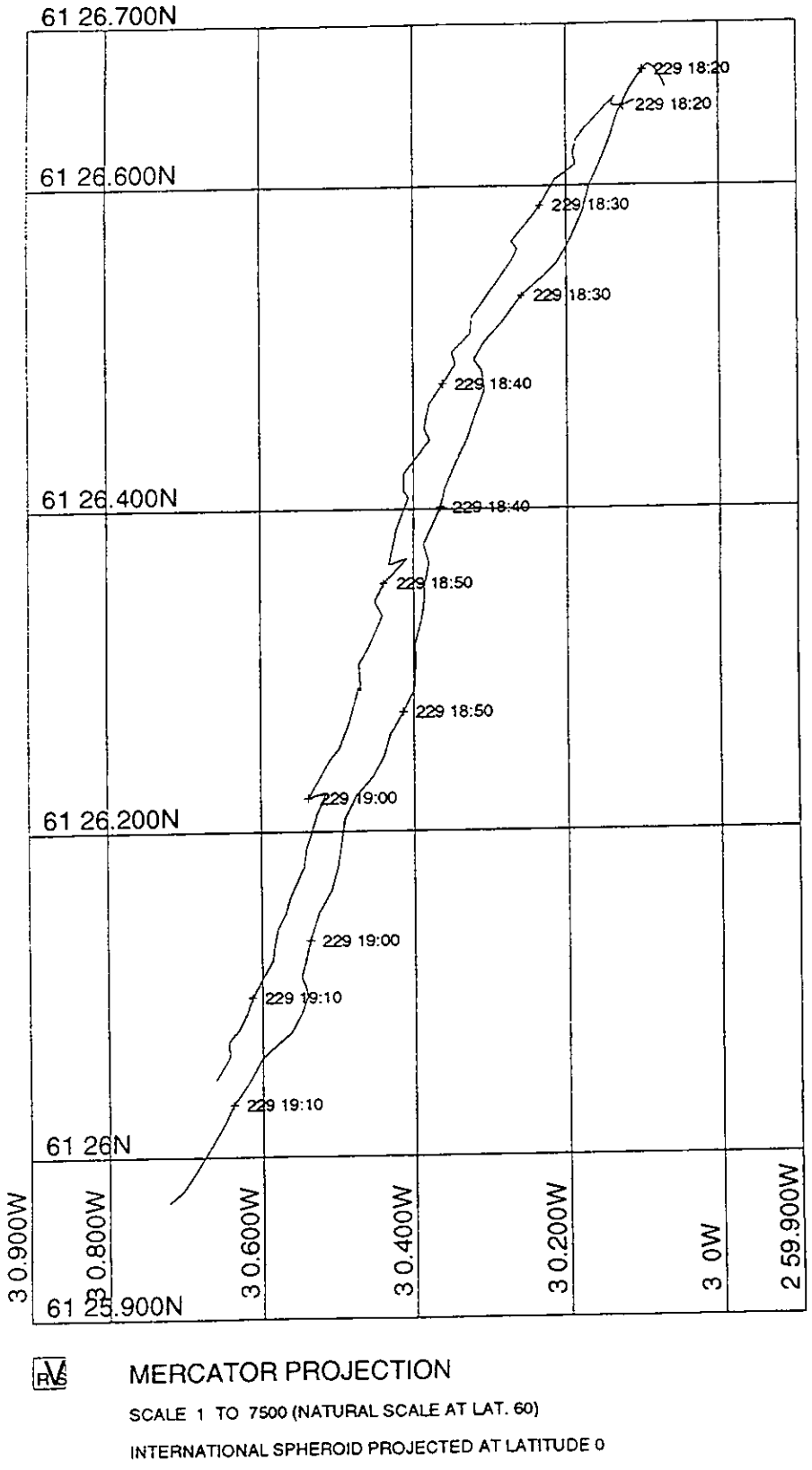
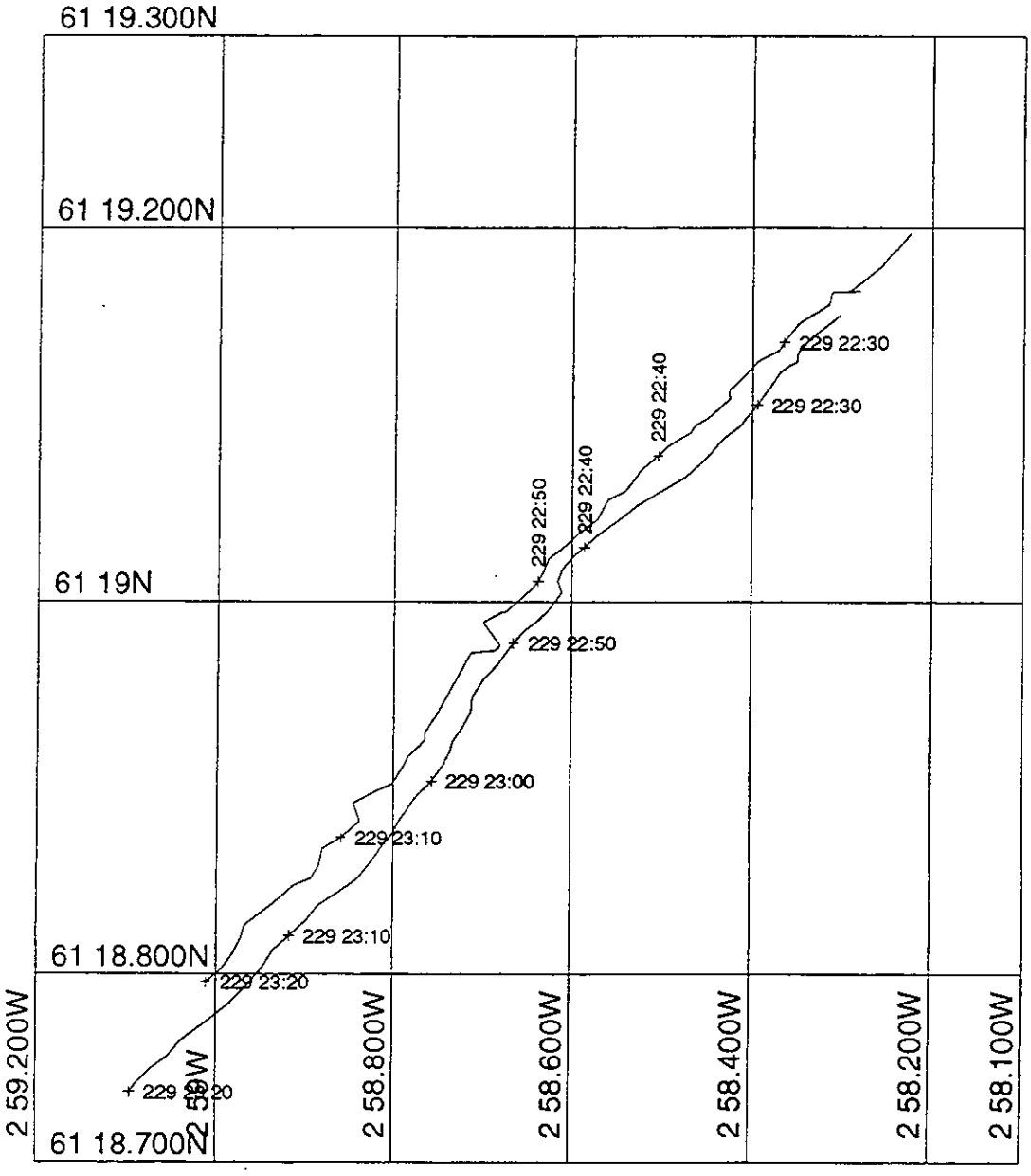


Chart 32. WASP track, station 53980#1

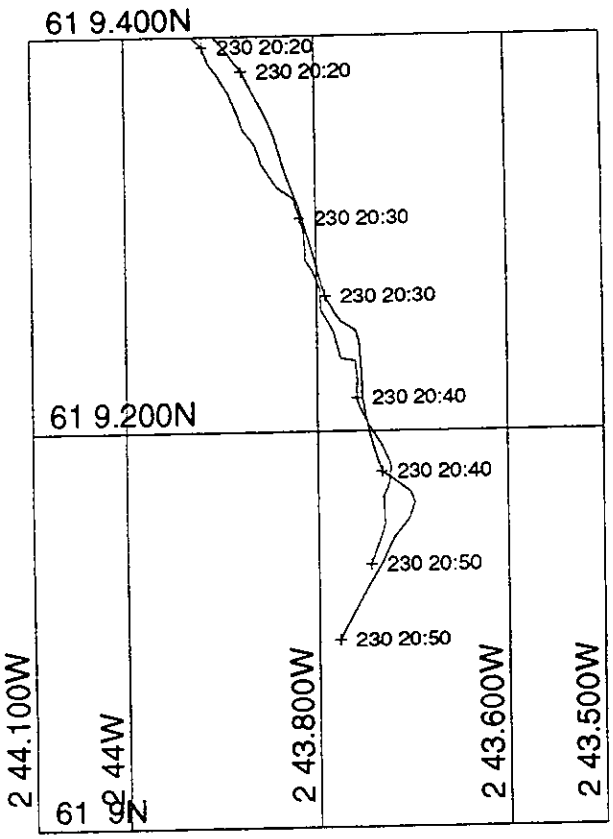


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 33. WASP track, station 53981#1



MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 34. WASP track, station 53984#1

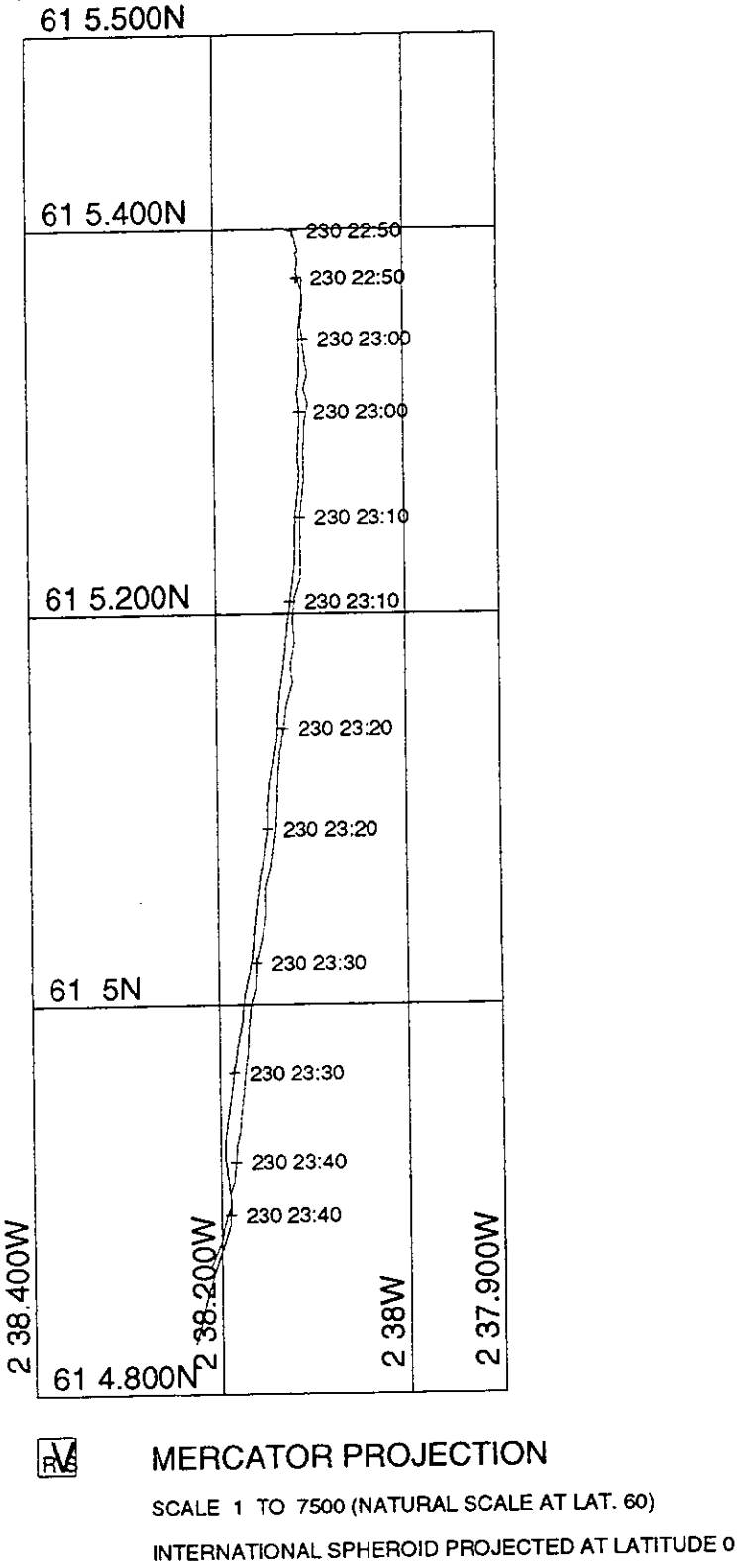


Chart 35. WASP track, station 53985#1

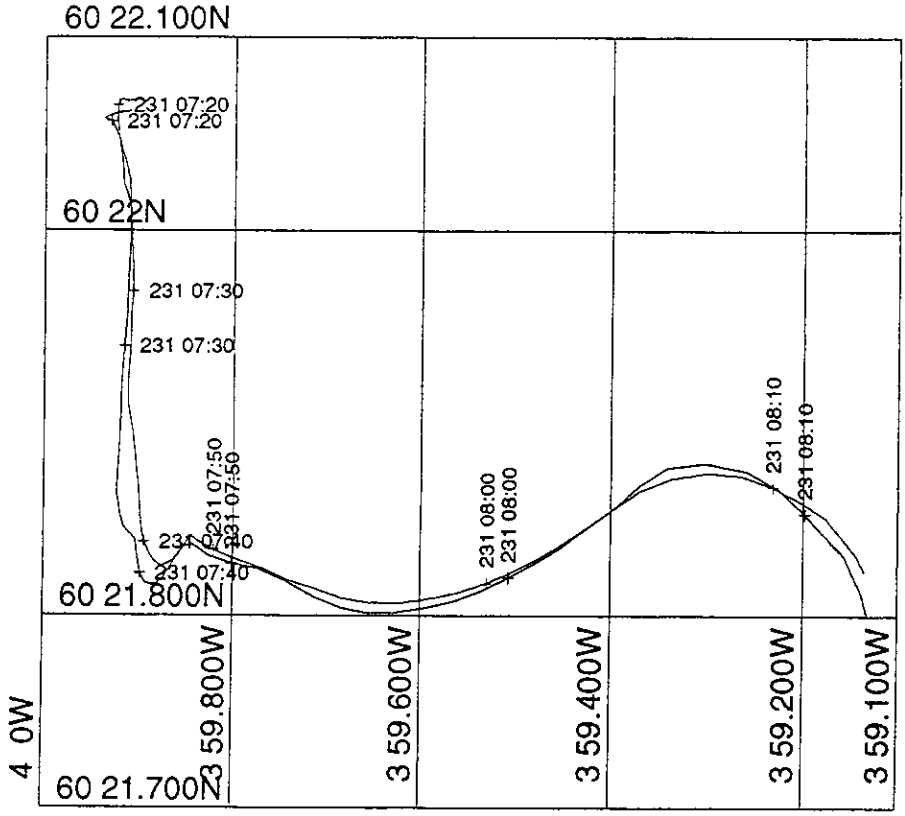


Chart 36. WASP track, station 53986#1

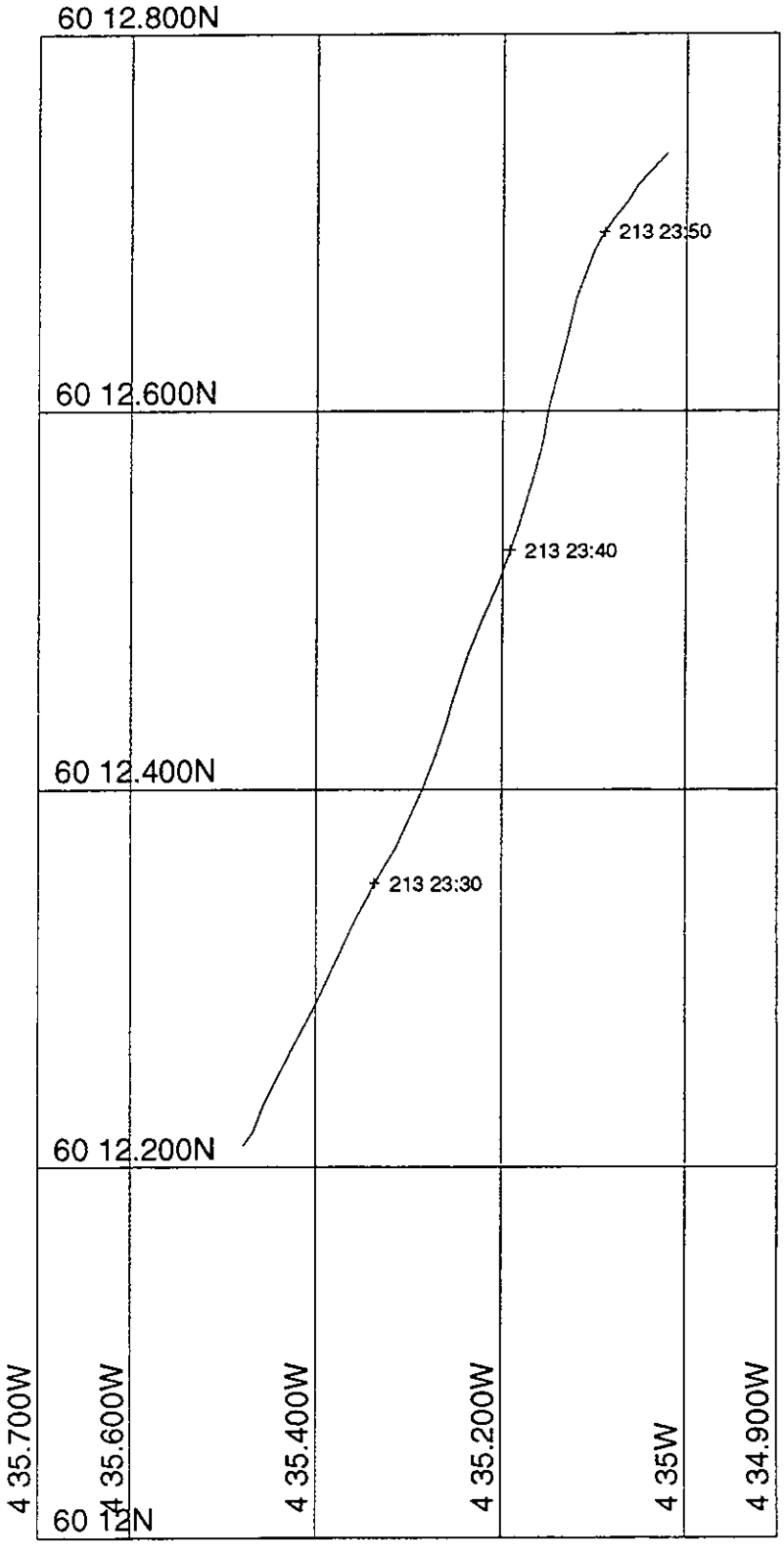
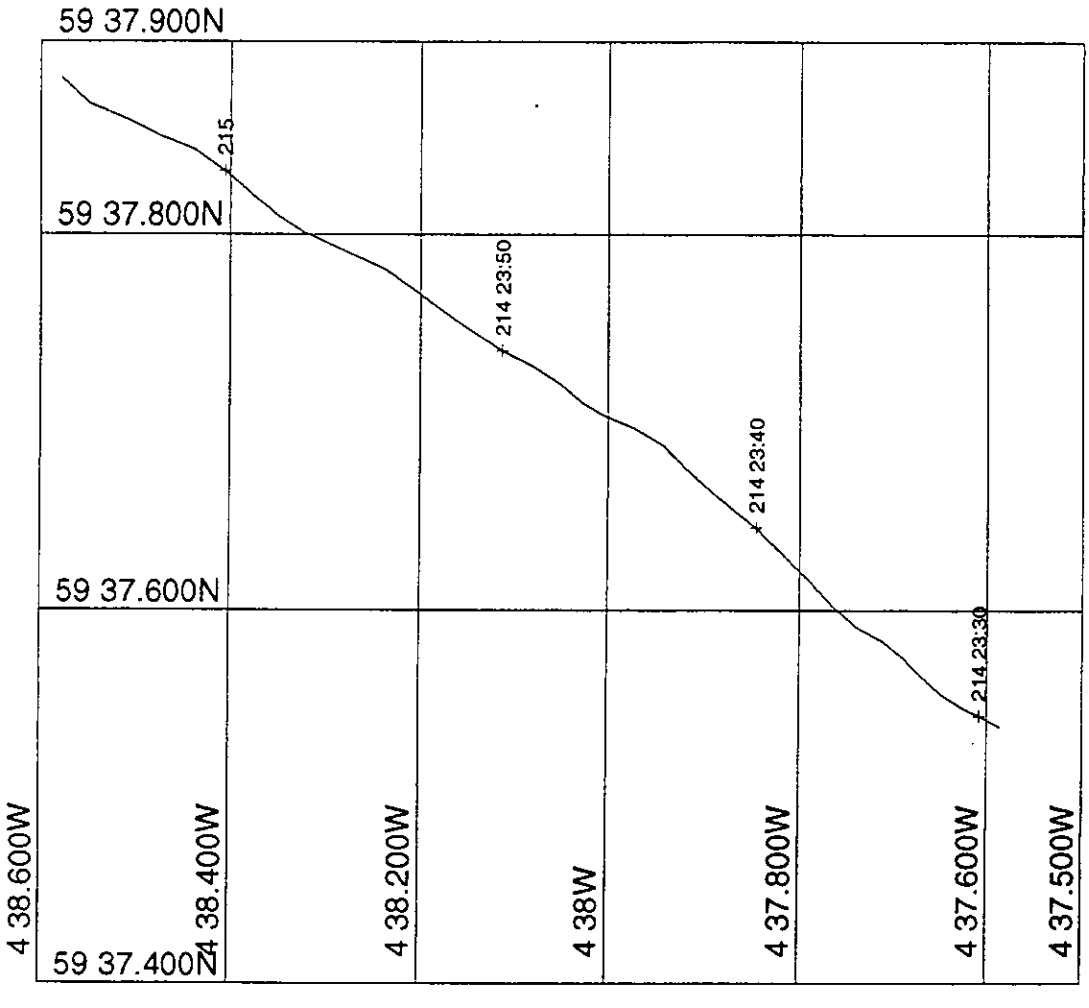


Chart 37. Hornet track, station 53845#3

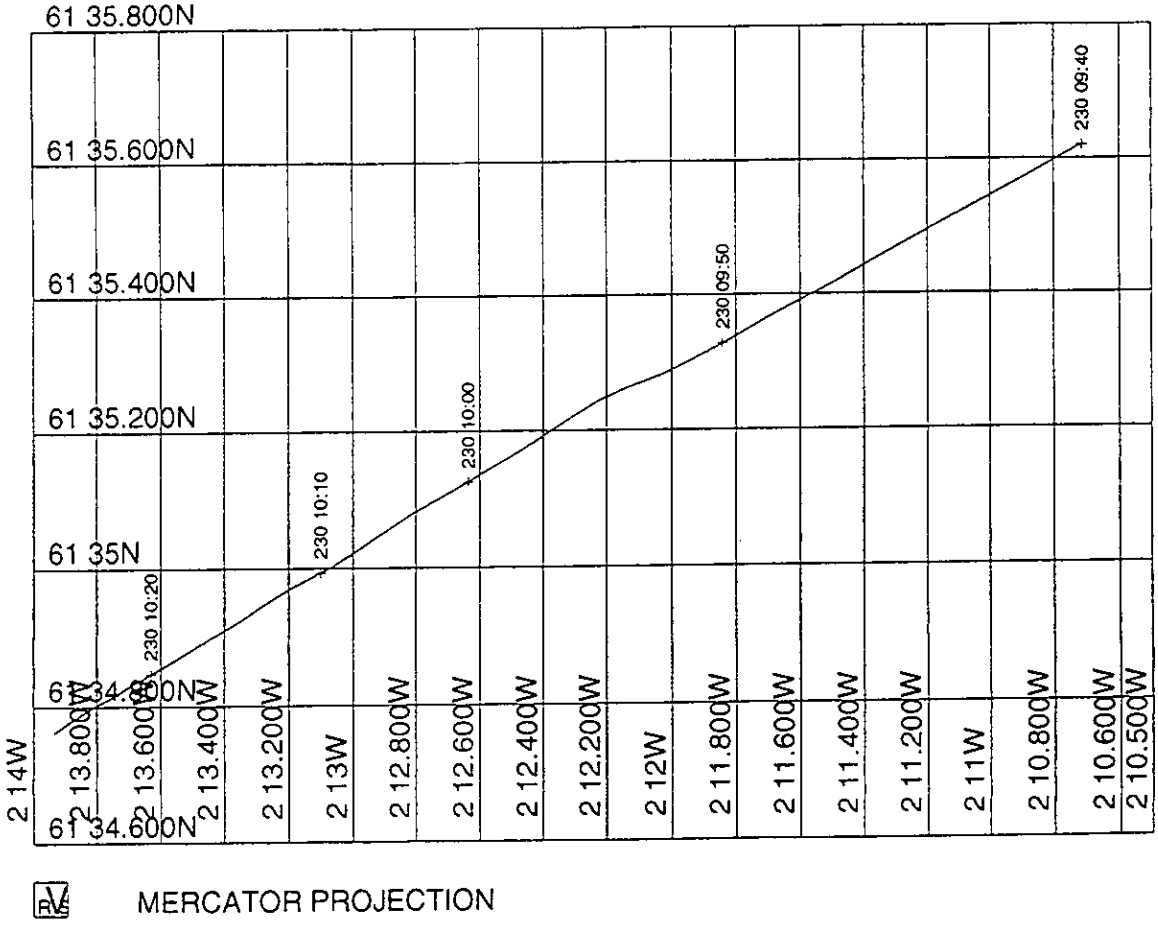


MERCATOR PROJECTION

SCALE 1 TO 7500 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 38. Hornet track, station 53854#11



MERCATOR PROJECTION

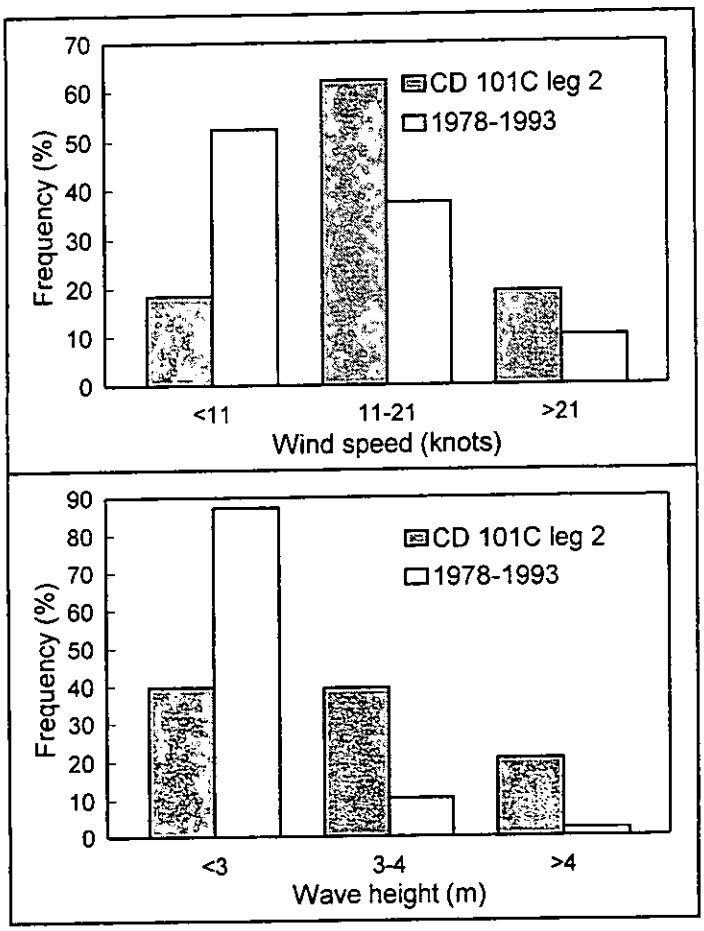
SCALE 1 TO 20000 (NATURAL SCALE AT LAT. 60)

INTERNATIONAL SPHEROID PROJECTED AT LATITUDE 0

Chart 39. Otter trawl (OTSB14) track, station 53983#1

13. APPENDIX 1.

Summary of wind speed and swell height during RRS *Charles Darwin* cruise 101 C (leg 2) compared with corresponding averaged values for the month of August over the years 1978-1993. Report prepared by Robin Plumley (Master RRS *Charles Darwin*).



14. APPENDIX 2.

Report of geological observations made during RRS *Charles Darwin* cruise 101 C (leg 2). Report prepared by Colin Graham (British Geological Survey, Edinburgh).

Geological Observations - Charles Darwin Cruise 101C

1. Introduction

The following geological descriptions are based on visual examination of cores collected using either a Multicorer or a Box Corer, and grab samples collected using a Day Grab.

For Multicorer samples, the core was extruded from the core tube into a length of plastic pipe, while for Box Core samples, the plastic pipe was pushed vertically into the Box Corer box. The length of pipe containing the core consisted of two split lengths held together with tape. This allowed the core to be split vertically using a thin wire and opened for examination and testing (although for muddy sediments, this tended to smear the fine detail). The maximum length obtained for cores by these methods was about 0.43m. For Day Grab samples, a subsample was collected from the grab on recovery. Subsamples of the superficial sediment from the Multicorer were taken from a separate sample tube, and from the Box Corer, from the top surface of the open box.

For each core, one half of the split sample was transferred to an open length of guttering, sealed in polythene tubing and transferred to cardboard boxes for storage. These core have been retained for further examination and testing onshore. In a small number of cases, however, it was not possible to transfer the core to the guttering due to the physical properties of the core which caused too much damage to the core. In these cases, no core material has been retained (apart from moisture content subsamples). For grab samples, a small amount of the sample was used for examination, while the remainder was retained in polythene bags for further examination and analysis onshore.

The visual examination, using a microscope in most cases, included the following for each interval:

- Folk classification (modified version with trace gravel put at 1%)
- colour (using a Munsell Colour chart)
- range of grain size (using a standard for comparison)
- sorting (using a standard for comparison)
- foraminfera content (subjective assessment)
- carbonate content (using a standard for comparison)
- depth of any oxidation band
- evidence for bioturbation
- thickness
- any sedimentary or other features visible in the interval.

The resulting descriptions based on the visual examination are preliminary. Each sample was examined at the time of collection (not more than 12hours after collection) and where possible a standard was used for comparison. However, it is likely that variations in assessment have occurred over the five weeks of the sampling operations. Also, coarse-grained sandy sediments are easier to describe than fine-grained muddy sediments. Each sample was examined only once. No attempt has been made to re-examine samples collected earlier in the cruise. With hindsight, a useful parameter not recorded on a regular basis was the predominant grain size of the sand fraction.

The following test were conducted:

- compressive strength of muds (using a hand-held penetrometer)
- shear strength of muds (using a hand-held shear vane)
- temperature of the base of the core (by insertion of a thermometer into the base of the core).

In some cases the above tests were conducted on the horizontal or vertical surfaces of the Box Core sample while still in the box.

In addition, subsamples were collected using bulk density rings to determine bulk density and moisture content. These were sealed in taped, air tight metal tins for analysis onshore.

In total, 55 Day Grab samples and 131 cores were examined. Most of these have been retained for further examination and analysis. In addition, moisture contents subsamples were collected from 110 cores, and 177 superficial samples were collected from the cores and grabs.

2. Summary of Geology

Shelf and shelf margin sea-bed sediments from the survey area consist of pebbly shelly sands and sandy gravels. These have not been penetrated by the sampling equipment on board although a scraping from a failed box core attempt proved to be a stiff glaciomarine diamicton. Slope and basin sediments are mainly a thin veneer of pebbly sands with increasing mud content and decreasing carbonate content with increasing water depth. These are underlain generally by very soft, massive muds with dropstones. In a few areas of the slope, layering and/or coarsening-upwards of superficial sandy deposits indicate possible current activity and may be associated with bedforms. In some areas, especially towards the lower part of the slope, the subsurface muds are subject to bioturbation, with sand-filled burrows to depths of over 0.40m locally. Additionally, some of the mud contained 1-2mm diameter open burrows to a depth of over 0.40m. Some cores from the lower slope contained intervals of very disturbed deposits consisting of a mixture of superficial sandy sediment and subsurface mud. The cause of the disturbance is uncertain at present, however, it may result from intense bioturbation or some form of slope failure.

3. Sea-bed Sediments

a) Sediment type

North Region: Sands occur on the outer shelf and upper slope to a depth of about 350m (A, D and part of G). Mixed sands and slightly pebbly sands extend down to about 650m (G, K, N and part R). Below this the sediments generally contain a significant mud fraction and consist of muddy sands and slightly pebbly muddy sands down to about 1000m (R and U). Between 1000m and 1200m the samples are all muddy sands (W). Below 1200m muddy sands and slightly pebbly muds occur down to 1400m (Y). Below 1400m the sediments are sandy muds (Z).

Mid Region: Sands and slightly pebbly to pebbly sands occur on the shelf and slope to a depth of about 800m (B, E, H, L, P and S) with occasional patches of muddy sands and slightly pebbly to pebbly muddy sand. Below this, the sediments are a mixture of muddy sands and slightly pebbly to pebbly muddy sands to beyond 1200m (V and X) with occasional patches of sand between 800 and 900m (S).

South Region: Sands, slightly pebbly sands and sandy gravels occur on the shelf (C, C1 and C2). Sands and slightly pebbly to pebbly sands also extend downslope to beyond 800m (F, J, M, Q and T) with rare muddy sediments.

b) Sorting

North Region: All the sediments are generally moderate to well sorted from the shelf to the base of the slope (A, D, G, K, N, R, U, W, Y, Z). Occasional patches of poorly sorted sediment, however, occur down to about 1000m (A, D, G, K, N, R and U)

Mid Region: Sediments above 200m are moderate to well sorted (B). Below this, to a depth of 500m (E, H and L), the sorting is very mixed, ranging from poor to well sorted with no obvious trend. At greater depths (P, S, V and X), the sediments are generally well sorted with occasional patches of moderately sorted sediment. Patches of poorly sorted sediment, however, occur bewteen 800 and 1000m (V).

South Region: Sediments are generally moderate to well sorted above 400m (C, and F) then moderate to poor to beyond 800m (J, M, Q and T). Significant amounts poorly sorted sediment occurs between 400 and 500m (M).

c) Grain size of the sand fraction

North region: Although there is a general decrease in grain size with increasing depth, the range of grain size in the samples is very variable at all depths. Further analysis is required to determine the median grain size of the samples to quantify the change.

Mid Region: Although there is a general decrease in grain size with increasing depth, the range of grain size in the samples is very variable at all depths. Further analysis is required to determine the median grain size of the samples to quantify the change.

South Region: Sands are medium to very coarse above 300m (C to F). Below this, although there is a general decrease in grain size with increasing depth, the range of grain size in the samples is very variable at all depths. Further analysis is required to determine the median grain size of the samples to quantify the change.

d) Colour

North Region: The sediments above 200m (A) are a mixture of light yellowish brown and light live brown. Below this, the sediments are mainly light olive brown to about 1400m (D, G, K, N, R, U, W and Y), then olive brown (Z). Rare patches of yellowish brown sediment occurs below 900m (U, Y and Z).

Mid Region: The sediments are light olive brown apart from: i) patches of light yellowish brown at the southern end, ii) patches of light yellowish brown at the northern end in depths above 500m (B to L), iii) patches of olive between 500 and 800m (P to S).

South Region: Above 400m (C and F), the sediments are generally light yellowish to yellowish brown with some light olive brown patches. Some of the sediments have no overall colour and are described as speckled. Below this, the sediments are generally light olive brown with patches of light yellowish brown and rare, olive and olive greys.

e) Thickness

The thickness is very variable in all regions although in general is about 10cm, and is about 5cm below 1200m (Y to Z). Maximum thicknesses of greater than 20cm occur in water depths of between 800 and 1200m (U, W and V).

f) Carbonate content

North Region: Maximum values are about 75% on the shelf (A) with average values of about 50%. The average decreases from over 50% to less then 10% below 800m (U, W, Y and Z).

Mid Region: Maximum values are about 98% on the shelf (B) although the average value is about 50%. The average decreases downslope to less than 10% below 800-1200m (V and X).

South Region: Maximum values of greater than 90% occur in depths down to 300m (C and F) with averaged values above 70%. The average remains at about 50% down to 500m (J and M), then decreases to 20% at greater depth (T).

g) Forminiferal content

Forams. are ubiquitous in the sand fraction. Foram. rich sediments occur in water depths of 300 to 600m in the north (N, K and N), 300 to 800m in the mid region (H, L, P and S) and 300 to 500m in the south (J to M).

Foram poor sediments are retricted to water depths of 800 to 1200m in the mid region (V and X) and local patches in depths of 400 to 800m in the north region (K and R).

3. Subsurface sediments

a) Sediment type

Generally the sediments are massive muds and fine sandy muds with dropstones. At a few locations, sandy layers occur above the muds and at one location there are interbedded sands and muds.

b) Colour

North Region: Sediments are greyish brown down to 600m (Ato N), then are olive grey to 1200m (Y) and grey/dark grey to below 1400m (Y to Z).

Mid Region: Sediments are greyish brown to below 500m (L), then olive grey to 1200m (X). Grey/dark grey sediments occur below 1200m (X) and as a lobe extending upslope to about 400m (H) in part of the region.

South Region: Greyish brown sediments occur downslope to 600m (C to Q) then are olive grey to below 800m (Q to T).

c) Oxidation

North Region: A brown colour band occurs at the top of the mud in water depths greater than 800m (R) and extends to beyond 1400m (Z). The thickness of the band increases with increasing water depths. One of the cores from Z was multi-banded.

Mid Region: The colour band occurs locally below 800m (S).

South Region: The banding occurs below 400m down to below 800m (M, Q and T).

d) Sediment temperature

North Region: Temperatures range from greater than 10C above 300m (A and D), 4 to 8C between 300 and 500m (G and K), and are mostly less than 4C to below 1400m (N to Z). The lowest temperature recorded, so far, was 0C at 1360m (Y).

Mid Region: Temperatures range from greater than 8C above 400m (F and H), 4 to 8C between 400 and 600m (L and P), and less than 4C to below 1200m (S to X). The second lowest temperature recorded, so far, was 0.5C at 650m (S).

South Region: Temperatures range from greater than 8C above 300m (C to F), then are 4 to 8C down to below 800m (J to T).

e) Bioturbation (mostly sand-filled burrows)

North Region: The deepest burrowing occurs above 600m (D to N) then decreases towards 1200m (Y). Burrows are absent from the cores below 1200m.

Mid Region: Burrowing occurs at the northern and southern ends of the region. The deepest burrowing occurs at about 600-700m (S).

South Region: The deepest burrows occur above 600m (F to Q) with a decrease in depth down to below 600m (Q to T). They are absent below 600m (T).

Colin Graham
18th August, 1996

Downslope Transect #1

Five grabs and twenty cores were examined from the main transect line. This extends downslope from a water depth of 200m to over 1000m. Due to the nature of the geology, no core samples were collected above 350m.

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)
53747	203	Shell sand	Lt.Yellowish brown	Moderate	Fine-v.coarse	50	-
53748	248	Sl. pebbly shell sand	Lt.Yellowish brown	Poor	Fine-v.coarse	60	-
53784	290	Sl. pebbly shelly sand	Lt.Olive brown	Moderate	Fine-v.coarse	40	-
53779	346	Sl. pebbly sand	Lt.Olive brown	Poor	Fine-v.coarse	20	-
53750	348	Sl. pebbly shelly sand	Lt.Olive brown	Poor	Fine-v.coarse	50	0.08
53751	413	Sl. pebbly sand	Olive	Moderate	Fine-coarse	40	0.33
53780	414	Sl. pebbly sand	Lt.olive brown	Moderate	Fine-v.coarse	40	-
53968	415	Sl. pebbly sand	Lt.olive brown	Moderate	Medium-v.coarse	40	0.13
53752	454	Sl. pebbly sand	Lt.yellowish brown	Moderate	Fine-medium	40	0.03
53753	502	Sl. pebbly sand	Lt. yellowish brown	Well	Fine-medium	3	0.13
53760	519	Sand	Olive	Well	V.fine--fine	15	0.30
53755	553	Sl. pebbly sand	Lt.yellowish brown	Well	Fine-medium	15	0.09
53756	600	Sl. pebbly sand	Olive	Well	V.fine-medium	20	0.06
53767	600	Sl. pebbly sand	Lt.olive brown	Moderate	V.fine-medium	5	0.06
53901	645	Sand	Lt. olive brown	Well	V.fine-medium	40	0.07
53757	650	Sl muddy sand	Olive	Well	V.fine-medium	10	0.05
53765	650	Sl. muddy sand	Olive brown	Well	V.fine-medium	20	0.10
53766	709	Sand	Lt. yellowish brown	Well	V.fine-medium	10	0.10
53975	798	Muddy sand	Olive	Well	V.fine-fine	20	0.30
53769	805	Sand	Olive	Well	V.fine-fine	5	-
53761	807	Sand	Olive brown	Moderate	V.fine-coarse	25	0.10
53762	916	Sand	Olive brown	Well	V.fine-medium	10	0.15
53976	916	Muddy sand	Olive	Well	V.fine-medium	20	0.17
53977	998	Muddy sand	Lt. olive brown	Well	V.fine-medium	20	>0.33
53978	1089	Sandy mud	Lt.olive brown	Poor	V.fine-v.coarse	2	0.01

Shelly sands and slightly pebbly sands extend downslope from the top end of the transect to about 650m. Below this, mixed sands and muddy sands occur down to about 1000m, with sandy mud at the deepest end of the transect. Above 450m, the sediments are mainly moderate to poorly sorted, have an upper sand-grain size of coarse/v.coarse and a biogenic carbonate content of 40-60%. Below this, they are mainly well sorted, have an upper sand-grain size of medium/fine (decreasing with increasing depth) and a low but variable biogenic carbonate content.

The thickness is very variable, however, the sediments tend to be thicker on the upper and lower parts of the slope (upwards of 0.1m) and thinnest between about 500 and 650m. The maximum and minimum thicknesses of >0.33 and 0.01m respectively occur at adjacent sites at the lower end of the transect in water depths of 1000-1100m.

Colour varies from light yellowish brown at the top of the transect, in water depths above 250m, to light olive brown, olive brown and olive at greater depths. The only sedimentary features of note were an anomalous 0.30m thick interval of coarsening upwards sand at 519m on the mid slope and finely bedded sands from 998m at the base of the slope. An oxidised band was visible in several cores from various depths.

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
53747	-	-	-	-	-	-	-	
53748	-	-	-	-	-	-	-	
53784	-	-	-	-	-	-	-	
53779	-	-	-	-	-	-	-	
53750	Mud	Brown	V. soft	0	No	0.0	-	
53751	-	-	-	-	-	-	-	
53780	-	-	-	-	-	-	-	
53968	Sandy mud	Greyish brown	V.soft	0.32	N	0.0	9	
53752	Mud	Greyish brown	V.soft	0	No	0.0	9	
53753	Sandy mud	Greyish brown	V.soft	0	No	0.0	7	
53760	Mud	Grey	V. soft	0.04	No	0.0	7	
53755	Mud	Olive brown	V.soft	0	No	0.0	5	
53756	Sandy mud	Grey	V.soft	0.30	No	0.0	3	
53767	Sandy mud	Dark grey	V.soft	0.26	No	0.0	5	
53901	Sandy mud	Dark grey	V. soft	>0.34	Yes	0.04	5	
53757	Sandy mud	Dark grey	V.soft	0.25	No	0.0	0.5	
53765	Mud	Olive grey	V.soft	0.29	Yes	0.0	6	
53766	Bioturbated	Olive grey	V.soft	>0.37	Yes	0.04	3.5	
53975	Mud	Olive grey	V. soft	>0.40	Yes	0.04	1.5	
53769	-	-	-	-	-	-	-	
53761	Mud	Dark grey	V.soft	0.0	No	0.0	4	
53762	Bioturbated	-	V.soft	>0.29	Yes	0.0	2	
53976	Mud	Greyish brown	V. soft	>0.34	No	0.04	2	
53977	-	-	-	0	-	-	3	
53978	Mud	Grey	V. soft	0.07	N	0.8	3	

All the sediments are essentially very soft, olive/brownish grey glaciomarine, massive muds with dropstones.

Evidence of bioturbation in the form of sand-filled burrows was visible in a number of cores from 414 to 1089m and was best developed below 600m where the depth to the base of the burrowing was greater than 0.40m below the sea bed. About half the cores below this depth also had intervals of heavily disturbed material, consisting partly of superficial sands and underlying muds. This could be the result of intense bioturbation. The temperature of the muds varied from about 9C at the top end of the transect to 2-3 degrees at the base. The coldest temperatures of 0.5C was recorded at 650m.

Downslope Transect #2 (AF1, H4, AA3, AA4, AA5, AA7, V3)

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)
AF1 (53930)	153	Sand	Lt. olive brown	Poor	Medium-v.coarse	25	-
H4(53734)	333	Pebbly sand	Lt. yellowish brown	Moderate	V.fine-coarse	15	0.09
AA3 (53894)	445	Muddy sand	Yellowish brown	Well	Fine-medium	25	0.02
AA4 (53895)	538	Pebbly,shelly muddy sand	Lt. olive brown	Poor	Fine-v.coarse	50	0.10
AA5 (53888)	622	Sand	Olive brown	Well	Fine-medium	5	0.05
AA7 (53897)	738	Sand	Olive brown	Well	V.fine-medium	10	0.05
V3 (53718)	919	Sl. pebbly muddy sand	Lt. olive brown	Poor	V.fine-v.coarse	2	0.08

All the sediments are essentially sands, the majority of which also contain minor amounts of mud and gravel grade material. They vary in thickness from 2-10cm with both the maximum and minimum occuring between 400-600m. The sediments in depths of 300-500m are yellowish brown while the rest are olive brown.

At the top of the slope, current activity would appear to decrease sufficiently below about 400m to prevent the winnowing of mud grade material. This results in a zone of muddy sediment extending down to about 600m. Below this, well sorted fine sands occur down to about 800m. This may indicate that, although in general there is an overall decrease in the mean grain size with depth, increased current activity in the 600-900m zone, prevents the deposition of mud grade material, compared with shallower depths.

Biogenic carbonate content rises to a peak of about 50% at about 500m before falling sharply at greater depths. This may be related to greater production on the upper slope and outer shelf compared to the lower slope. However, the fact that the peak concentration consists mainly of medium/fine grain size foraminifera suggests that the distribution may be related to current activity. On the slope above about 600m, low current strengths allow the settling of foraminifera, with the peak deposition occurring at the greatest depth. At greater depths, the increase in current activity reduces significantly carbonate deposition

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
H4	Mud	Greyish brown	V. soft	0.0	No	0.0	-	
AA3	Sandy mud	Greyish brown	V. soft	0.3	No	0.08	9	
AA4	Sandy mud	Greyish brown	V. soft	>0.43	No	0.0	6	
AA5	Sl.gravelly sandy mud	Grey	V. soft	0.23	No	0.0	9	Sand layers above
AA7	Sandy mud	Greyish brown	V. soft	>0.37	Yes	0.03	0.5	
V3	Sandy mud	Olive grey	V. soft	0.0	No	0.0	-	

All the sediments are essentially very soft, greyish-brown, glaciomarine, massive muds with dropstones. The majority show evidence of bioturbation in the form of sand-filled burrows which reach maximum depths beneath the surface of at least 20cm and extend to greater than 43cm locally. Sand burrows, however, are absent in the cores from the shallowest and deepest sites. Most of the core sections appeared very similar visually, however, the two cores from the 600-900m zone described above showed significant differences from the rest and from each other.

The upper core from the 600-900m zone (AA5) has three distinct sand layers above the mud (including the sea-bed sediment), each between 3-5cm thick. The lower pair suggest a fining upwards sequence from poor to well sorted, very coarse/fine to medium/fine and sand to muddy sand. It is possible that the modern sea-bed sediments are the winnowed top of the upper sand layer as they are very similar in the composition of the sand fraction. This winnowing may mark the onset of the modern pattern of along slope current activity in this zone as noted in the sea-bed sediments. It is also possible that these sand layers form a sandy contourite or a mobile sand bedform related to either the modern or relict sedimentary environment.

A sharp drop in temperature was noted in lower core from the 600-900m zone (AA7), which may reflect the influence in the pore water of the cold, deep-water current environment. This core also showed significant disturbance. A 19cm thick section of mixed sands and muds beneath the surface sediment and above the glaciomarine mud. It is possible that this has resulted from particularly intense bioturbation.

Detailed Sampling Areas

1. AC1-AC6

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)
AC1	584	Sand	Lt. olive brown	Moderate	Fine-coarse	30	0.1
AC2	549	Sand	Lt. olive brown	Well	V. fine -medium	30	0.05
AC4	546	Muddy sand	Lt. olive brown	Moderate	V.fine-coarse	25	0.09
AC5	547	Sl. pebbly sand	Lt. olive brown	Moderate	Fine-coarse	25	0.06
AC6	547	Sand	Lt. olive brown	Well	Fine-coarse	40	0.07

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
AC1	Mud	Greyish brown	V. soft	>0.36	No	0.0	7.0	Muddy sand layer above
AC2	Sandy mud	Grey	V. soft	0.38	No	0.0	8.0	
AC4	Sandy mud	Greyish brown	V. soft	>0.42	No	0.0	6.0	
AC5	Sandy mud	Greyish brown	V. soft	0.35	No	0.04	5.0	
AC6	Mud	Grey	V. soft	0.37	No	0.0	5.5	

2. AD1-AD5

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)
AD1	329	Sand	Lt. yellowish brown	Poor	Fine-v.coarse	50	0.22
AD2	334	Sand	Lt. olive brown	Moderate	Medium-coarse	25	0.09
AD3	330	Sand	Lt. yellowish brown	Poor	Fine-v.coarse	50	0.18
AD4	336	Sand	Lt. yellowish brown	Poor	Medium-coarse	40	0.10
AD5	332	Sand	Lt. olive brown	Moderate	Fine-v.coarse	10	0.06

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
AD1	Sandy mud	Greyish brown	V. soft	0.26	No	0.0	9.0	Bedded sand unit above
AD2	Sandy mud	Greyish brown	V. soft	0.32	Yes	0.0	9.0	
AD3	Mud	Greyish brown	V. soft	0.35	No	0.0	9.0	Sand fines downwards
AD4	Sandy mud	Greyish brown	V. soft	0.19	No	0.0	9.5	Shelly gravel under the sand
AD5	Mud	Greyish brown	V. soft	0.20	No	0.0	10	

3. AH1-AH6

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)
AH1	417	Sl. pebbly sand	Lt. yellowish brown	Moderate	Medium-coarse	60	0.07
AH2	418	Pebbly sand	Lt. yellowish brown	Poor	Medium-v.coarse	75	0.07
AH3	417	Sl. pebbly sand	Lt. yellowish brown	Moderate	Fine-v.coarse	60	0.08
AH4	417	Sl. pebbly sand	Lt. yellowish brown	Poor	Fine-v.coarse	75	0.09
AH6	416	Sl. pebbly sand	Lt. yellowish brown	Poor	Fine-v.coarse	50	0.07

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
AH1	Mud	Greyish brown	V. soft	0.12	No	0.11	9.0	
AH2	Mud	Greyish brown	V. soft	0.2	No	0.13	9.0	
AH3	Mud	Greyish brown	V. soft-soft	0.2	No	0.10	9.5	Soft,dk.grey sandy mud at td
AH4	Sandy mud	Greyish brown	V. soft	-	No	0.08	10	
AH6	Mud	Greyish brown	V. soft	0	No	0.13	10	

Alongslope Transect (AA6, AA5, AA8, AA9, ST AA10)

Sea-bed sediments

Sample No	Water Depth (m)	Sediment type	Colour	Sorting	Grain size	Carbonate Content (%)	Thickness (m)	
AA6 (53896)	640	Sl. pebbly muddy sand	Lt. olive brown	Moderate	Fine-medium	20	0.1	South
AA5 (53888)	622	Sand	Olive brown	Well	Fine-medium	5	0.05	
AA8 (53898)	641	Sl. pebbly sand	Olive brown	Well	Fine-medium	5	0.12	
AA9 (53899)	637	Sand	Olive brown	Well	Fine	40	0.15	
ST1 (53901)	645	Sand	Lt. olive brown	Well	Fine	40	0.07	
ST2 (53757)	650	Sl. muddy sand	Olive	Well	Very fine-fine	20	0.05	
ST3 (53765)	650	Sl. muddy sand	Lt. olive brown	Well	Very-fine medium	10	0.1	
AA10 (53915)	640	Sand	Olive brown	Well	Fine-medium	10	0.06	North

Samples ST1-ST3 are from the same area and are included to show the amount of local variation.

The sediments along this part of the slope in water depths of 620-650m are very similar in character. All are essentially sands, the majority of which also contain minor amounts of mud and gravel grade material. They are olive brown in colour and vary in thickness from 5-15cm. They are mostly well sorted, with a grain size ranging from very fine/fine to fine/medium. The sediments at these depths coincide with the 600-900m zone of well sorted fine sands described from Downslope Transect #2. The sample at the extreme souther end (AA6) differs, however in terms of grain size and sorting.

Biogenic carbonate content is very variable. At these depths the most common constituent are foraminifera and the variations in overall content are due to changes in their abundance. While some variation may be due to errors in the visual estimation, the differences are large enough to suggest that significant variation does occur. Most of the concentrations are typical for the 600-900m zone, however, apart form the two samples from the centre of the transect (AA9 and ST1). The amount of local variation from the ST (10-40%) area suggests that these high value may be due to local variability rather than any regional pattern.

Subsurface sediments

Sample No.	Sediment type	Colour	Hardness	Bioturbation Depth (m)	Disturbance	Oxidation Depth (m)	Temperature (C)	Comments
AA6	Sl. pebbly sandy mud	Grey	V. soft	0.25	Yes	0.0	4.5	
AA5	Sl. pebbly sandy mud	Grey	V. soft	0.23	No	0.0	9	Sand layers above
AA8	Sandy mud	Greyish brown	V. soft	0.25	No	0.15	2	
AA9	Sandy mud	Olive grey	V. soft	>0.38	Yes	0.0	6	
ST 1	Sandy mud	Olive grey	V. soft	>0.34	Yes	0.04	5	
ST2	Sandy mud	Dark grey	V. soft	0.25	No	0..0	0.5	
ST3	Mud	Olive grey	V.soft	0.29	Yes	0.0	6	
AA10	Sandy mud	Grey	V.soft	0.17	Yes	0.0	6.5	

All the sediments are essentially very soft, olive/brownish grey, glaciomarine, massive muds with dropstones.

The majority show evidence of bioturbation in the form of sand-filled burrows which reach maximum depths beneath the surface of almost 20cm and extend to greater than 38cm in the central part of the transect. The majority of the cores show significant disturbance of the sediments underlying the surface sediment and overlying the glaciomarine mud. It is possible that this has resulted from particularly intense bioturbation as the disturbed sediment overlies sand filled burrows. However, it could also signify some form of slope failure. In general, sediment disturbance is common from this part of the slope (Middle Sector, Strata S) compared with other areas and depths.

Core AA5 was the only core with sand layering above the mud, with three layers (including the sea-bed sediment) each between 3-5cm thick. This core has been described in the Downslope Transect #2. A coarsening upwards sandy sequence similar to that in AA5 was identified in core AA9 further along the slope to the north, suggesting that bedforms may extend along this section of the slope.

Core temperatures are very variable ranging from 0.5 up to 9. The reasons for these large differences are unexplained at present, although it could be that much of the variability is caused by differences in the time taken to recover and process core material. The temperature data are being examined in more detail. Also, the presence or absence and the thickness of an oxidised band layer within the upper section of the sediment is unexplained at present.

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Geological Description Sheet

Sector:	North
Stratum:	A
Samples examined:	A1-A5, AE1, AE2 (Day Grabs)
Water depths:	117 - 179m

Sea-bed sediments

Sediment type:	Shell sands/slightly pebbly shell sands/sandy gravel
Sorting:	Poor to well sorted
Grain size:	Fine/medium to coarse/very coarse
Colour:	Light yellowish to light olive brown
Carbonate content:	40 - 75% Average 59% (7)
Foram. content:	Common
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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18th August, 1996

Charles Darwin Cruise 101C

Geological Description Sheet

Sector:	North
Stratum:	D
Samples examined:	D2-D5 (Day Grabs)
Water depths:	236 - 275m

Sea-bed sediments

Sediment type:	Sands
Sorting:	Moderate
Grain size:	Fine/medium to coarse/very coarse
Colour:	Light olive brown
Carbonate content:	20 - 40% Average 27.5% (4)
Foram. content:	Poor to abundant
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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Geological Description Sheet

Sector:	North
Stratum:	G
Samples examined:	G1-G5, AD1-5 (Day Grabs except Box Cores at G1, G2 and AD1-5)
Water depths:	329 - 373m

Sea-bed sediments

Sediment type:	Sand/shell sand/slightly pebbly shelly sands	
Sorting:	Moderate/poor	
Grain size:	Very fine/medium to coarse/very coarse	
Colour:	Light olive brown/light yellowish brown	
Carbonate content:	10 - 60%	Average 41.5% (10)
Foram. content:	Poor/common/abundant	
Sediment thickness:	0.06 - 0.22m	Average 0.11m (7)

Subsurface sediments

Sediment type:	Mud/sandy mud	
Colour:	Greyish brown	
Hardness:	Very soft	
Oxidation depth:	None	
Bioturbation depth:	0.19 - 0.35m	Average 0.26m (7)
Soil Disturbance:	0.16m in G2 and 0.03m in AD2	
Temperature:	9 - 10C	Average 9.3C (7)
Comments:	Box Core failed at G3. Scraping of stiff, pebbly diamicton recovered. Superficial bedded sands in the AD cores	

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Geological Description Sheet

Sector:	North
Stratum:	K
Samples examined:	K1-K5 (Box Cores)
Water depths:	436 - 489m

Sea-bed sediments

Sediment type:	Sands/slightly pebbly sands	
Sorting:	Mostly moderate to well sorted but K5 poorly sorted	
Grain size:	Mostly fine to coarse/very coarse	
Colour:	Light olive brown	
Carbonate content:	15 - 50%	Average 37% (5)
Foram. content:	Mostly abundant	
Sediment thickness:	0.06 - 0.09m	Average 0.08m (5)

Subsurface sediments

Sediment type:	Muds	
Colour:	Greyish to dark greyish brown	
Hardness:	Mostly very soft but K5 soft	
Oxidation depth:	None	
Bioturbation depth:	0.19 - 0.26m	Average 0.23m (5)
Soil Disturbance:	None	
Temperature:	8 - 10C	Average 8.8C (5)

Comments:

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Geological Description Sheet

Sector:	North
Stratum:	N
Samples examined:	N1-N5 (Box Cores)
Water depths:	555 - 595m

Sea-bed sediments

Sediment type:	Sand/slightly pebbly to pebbly sands	
Sorting:	Mostly moderate to well sorted	
Grain size:	Very fine/fine to medium/very coarse	
Colour:	Light olive brown/olive	
Carbonate content:	10 - 30%	Average 24% (5)
Foram. content:	Abundant	
Sediment thickness:	0.03 - 0.09m	Average 0.06m (5)

Subsurface sediments

Sediment type:	Muds	
Colour:	Grey to dark greyish brown/grey/olive grey	
Hardness:	Very soft	
Oxidation depth:	None	
Bioturbation depth:	0.18 - 0.27m	Average 0.22m (5)
Soil Disturbance:	None	
Temperature:	4 - 8C	Average 5.8C (5)

Comments:

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Geological Description Sheet

Sector:	North
Stratum:	R
Samples examined:	R1-R5, AA10 (Box Cores except multicores at R2, R3 and AA10)
Water depths:	640 - 738m

Sea-bed sediments

Sediment type:	Sands/slightly pebbly sands/slightly pebbly muddy sand	
Sorting:	Predominantly well sorted but R4 poorly sorted	
Grain size:	Very fine/fine to medium	
Colour:	Light olive brown	
Carbonate content:	3 - 12%	Average 11.8% (6)
Foram. content:	Abundant	
Sediment thickness:	0.02 - 0.12m	Average 0.07m (6)

Subsurface sediments

Sediment type:	Sands/slightly pebbly sands/slightly pebbly muddy sands	
Colour:	Olive grey/grey/dark grey	
Hardness:	Very soft	
Oxidation depth:	0.00 - 0.05m	Average 0.04m (2)
Bioturbation depth:	0.18 - 0.30m	Average 0.22 (4)
Soil Disturbance:	0.09m in R3 and 0.11m in AA10	
Temperature:	1 - 7C	Average 4.8C (6)
Comments:	R2 contains interbedded sandy muds and muddy sands	

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Geological Description Sheet

Sector:	North
Stratum:	U
Samples examined:	U1-U5 (Multicores)
Water depths:	842 - 952m

Sea-bed sediments

Sediment type:	Muddy sands/slightly pebbly muddy sand	
Sorting:	Mostly well sorted	
Grain size:	Very fine to medium/coarse	
Colour:	Light olive brown/olive brown	
Carbonate content:	3 - 10%	Average 6.2% (5)
Foram. content:	Common	
Sediment thickness:	0.06 - 0.09m	Average 0.075m (4)

Subsurface sediments

Sediment type:	Sandy muds/muds	
Colour:	Olive grey	
Hardness:	Very soft. U4 very soft to soft.	
Oxidation depth:	0.00 - 0.12m	Average 0.10m (2)
Bioturbation depth:	0.3m	Average 0.21m (4)
Soil Disturbance:	0.09 in U2, 0.08m in U3 and 0.11m in U5	
Temperature:	4 - 9C	Average 7.25C (4)
Comments:	U1 core was logged	

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Geological Description Sheet

Sector:	North
Stratum:	W
Samples examined:	W1-W5 (Multicores)
Water depths:	1090 - 1192m

Sea-bed sediments

Sediment type:	Muddy sands	
Sorting:	Moderate to well sorted	
Grain size:	Very fine to medium	
Colour:	Light olive brown/olive brown/dark grey	
Carbonate content:	2 - 15%	Average 7% (5)
Foram. content:	Common	
Sediment thickness:	0.03 - 0.24m	Average 0.075m (5)

Subsurface sediments

Sediment type:	Sandy muds/muds	
Colour:	Olive grey/grey	
Hardness:	Very soft	
Oxidation depth:	0.00 - 0.18m	Average 0.12m (4)
Bioturbation depth:	0.13m in W4	
Soil Disturbance:	None	
Temperature:	4 - 9C	Average 6.5C (5)
Comments:	Superficial, 0.18m thick layer of fining downwards sand in W2	

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Geological Description Sheet

Sector:	North
Stratum:	Y
Samples examined:	Y1-Y5 (Multicores except Box Cores at Y1 and Y2)
Water depths:	1238 - 1953m

Sea-bed sediments

Sediment type:	Muddy and slightly pebbly muddy sands	
Sorting:	Moderate to well sorted but Y3 poorly sorted	
Grain size:	Very fine to medium but in Y3 to very coarse	
Colour:	Light olive brown, dark greyish brown, yellowish brown	
Carbonate content:	3 - 10%	Average 4.8% (5)
Foram. content:	Common	
Sediment thickness:	0.02 - 0.04m	Average 0.032m (5)

Subsurface sediments

Sediment type:	Muds/sandy muds	
Colour:	Olive grey/grey	
Hardness:	Very soft but soft in oxidised bands	
Oxidation depth:	0.1 - 0.21m	Average 0.15m (5)
Bioturbation depth:	None	
Soil Disturbance:	None	
Temperature:	0 - 6C	Average 3.8C (5)

Comments:

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Geological Description Sheet

Sector:	North
Stratum:	Z
Samples examined:	Z1- Z5 (Multicores except Box Core at Z1)
Water depths:	1416 - 1548m

Sea-bed sediments

Sediment type:	Sandy muds/mud	
Sorting:	Mostly moderate but Z2 well sorted	
Grain size:	Very fine to fine/medium	
Colour:	Light olive brown, light yellowish brown, yellowish brown	
Carbonate content:	3 - 10%	Average 5.2% (5)
Foram. content:	Common	
Sediment thickness:	0.02 - 0.09m	Average 0.06m (5)

Subsurface sediments

Sediment type:	Muds/sandy mud	
Colour:	Dark grey/very dark grey	
Hardness:	Very soft	
Oxidation depth:	0.13 - 0.21m	Average 0.176m (5)
Bioturbation depth:	None	
Soil Disturbance:	None	
Temperature:	1.5 - 6C	Average 3.0C (5)
Comments:	Multiple colour banding in the mud in Z5	

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Geological Description Sheet

Sector:	Mid
Stratum:	B
Samples examined:	B1-B5, AF1, AF2 (All are Day Grabs)
Water depths:	124 - 168m

Sea-bed sediments

Sediment type:	Shelly sand/slightly pebbly shelly sands to sands/slightly pebbly sands
Sorting:	Mostly moderate to well sorted
Grain size:	Fine/medium to coarse/very coarse
Colour:	Light olive brown/olive/light yellowish brown
Carbonate content:	10 - 98% Average 41.1% (7)
Foram. content:	Common. Abundant in B1 and AF2
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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18th August, 1996

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Geological Description Sheet

Sector:	Mid
Stratum:	E
Samples examined:	E1, E2 plus 3 Transect samples (Day Grabs)
Water depths:	203 - 290m

Sea-bed sediments

Sediment type:	Shelly slightly pebbly sands/sands
Sorting:	Poorly/moderately sorted
Grain size:	Fine to coarse/very coarse
Colour:	Light olive brown/olive brown/light yellowish brown
Carbonate content:	40-60% Average 48.0% (5)
Foram. content:	Common/abundant
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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18th August, 1996

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Geological Description Sheet

Sector:	Mid
Stratum:	H
Samples examined:	H1-H5 plus 2 Transect cores (Box Cores except Day Grab at H3 and 1 of the Transect sites)
Water depths:	

Sea-bed sediments

Sediment type:	Pebbly sands to slightly pebbly shelly sands/sands	
Sorting:	Poor to moderate	
Grain size:	Very fine/fine to very coarse	
Colour:	Light yellowish brown/light olive brown	
Carbonate content:	15 - 50%	Average 30.7% (7)
Foram. content:	Common. Abundant in H5	
Sediment thickness:	0.08 - 0.1m	Average 0.09m (5)

Subsurface sediments

Sediment type:	Muds/slightly pebbly mud
Colour:	Brown/light yellowish brown/greyish brown/olive grey/grey
Hardness:	Very soft
Oxidation depth:	None
Bioturbation depth:	0.19m in (H2)
Soil Disturbance:	None
Temperature:	10 - 11C Average 10.3C (3)
Comments:	Two overlying superficial sand layers

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Geological Description Sheet

Sector:	Mid
Stratum:	L
Samples examined:	L1-L5, AA2, AA3 plus 2 Transect Sites (Box Cores except Day Grab and Multicore at L5)
Water depths:	413 - 502m

Sea-bed sediments

Sediment type:	Slightly pebbly shelly sands/muddy sand
Sorting:	Mostly moderate to well
Grain size:	Fine/medium to medium/coarse/very coarse
Colour:	Light olive brown/light yellowish brown/olive
Carbonate content:	3 - 50% Average 36.1% (7)
Foram. content:	Common to abundant but rare in L4
Sediment thickness:	0.02 - 0.13m Average 0.09m (9)

Subsurface sediments

Sediment type:	Muds/sandy mud
Colour:	Olive/olive grey/greyish brown
Hardness:	Very soft
Oxidation depth:	0.08 - 0.11m Average 0.095m (2)
Bioturbation depth:	0.23 - 0.32m Average 0.28m (3)
Soil Disturbance:	None
Temperature:	7 - 10C Average 8.8C (9)

Comments:

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Geological Description Sheet

Sector:	Mid
Stratum:	P
Samples examined:	P1-P5, AC1-AC6, AA4 plus 3 Transect sites (Box cores except Multicores at P5 and one of the Transect sites)
Water depths:	530 - 600m

Sea-bed sediments

Sediment type:	Pebbly muddy sand/muddy sand to slightly pebbly sands/sands	
Sorting:	Mostly moderate to well sorted	
Grain size:	Very fine/fine to medium/coarse/very coarse	
Colour:	Olive/olive brown/light olive brown/light yellowish brown	
Carbonate content:	5 - 50%	Average 23.0 (14)
Foram. content:	Mostly common to abundant	
Sediment thickness:	0.05 - 0.3m	Average 0.08m (14)

Subsurface sediments

Sediment type:	Muds/slightly pebbly muds/sandy muds	
Colour:	Dark greyish brown/greyish brown/light olive brown/grey/olive grey/dark grey	
Hardness:	Very soft	
Oxidation depth:	0.01 - 0.04	Average 0.03m (3)
Bioturbation depth:	0.06 - >0.43	Average >0.32m (10)
Soil Disturbance:	None	
Temperature:	3 - 9C	Average 6.0C (13)
Comments:	Fining downwards superficial sands in P2, P5 and AC1. Sand horizon interbedded with the muds in P2	

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18th August, 1996

Charles Darwin Cruise 101C

Geological Description Sheet

Sector:	Mid
Stratum:	S
Samples examined:	S1, S2, S5, AA5-AA9, plus 5 Transect sites (Multicores except Box Cores at S2, S5 and 1 of the Transect sites)

Sea-bed sediments

Sediment type:	Sands/pebbly sand to muddy sands/pebbly muddy sands	
Sorting:	Mostly well sorted	
Grain size:	Very fine/fine to fine/medium/very coarse	
Colour:	Light olive brown/olive brown/olive/light brownish grey	
Carbonate content:	1 - 40%	Average 17.9% (14)
Foram. content:	Common to abundant	
Sediment thickness:	0.03 - 0.15m	Average 0.11m (14)

Subsurface sediments

Sediment type:	Mud/sandy mud/slightly pebbly sandy mud	
Colour:	Greyish brown/Olive grey/grey/dark grey	
Hardness:	Very soft	
Oxidation depth:	0.03 - 0.15m	Average 0.06m (5)
Bioturbation depth:	0.23 - >0.40m	Average >0.30m (13)
Soil Disturbance:	0.15m in AA6, 0.19m in AA7, >0.23m in AA9, 0.10 - >0.27m in 4 Transect sites	
Temperature:	0.5 - 9C	Average 3.5C (13)
Comments:	Bedded superficial sands above the muds in AA5. Entire sequence in the 700m Transect site bioturbated	

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18th August, 1996

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Geological Description Sheet

Sector:	Mid
Stratum:	V
Samples examined:	V1-V5, plus 5 Transect sites (Multicores except Box Cores at 2 Transect Sites)
Water depths:	805 - 919m

Sea-bed sediments

Sediment type:	Sands/muddy sands/pebbly muddy sands
Sorting:	Poor to well sorted
Grain size:	Very fine/fine to fine/medium/coarse/very coarse
Colour:	Light olive brown/olive brown/olive
Carbonate content:	1 - 25% Average 8.4% (10)
Foram. content:	Poor to abundant
Sediment thickness:	0.06 - >0.33m Average >0.14m (7)

Subsurface sediments

Sediment type:	Mud/muddy sand/slightly pebbly to pebbly mud
Colour:	Greyish brown/olive grey/grey/dark grey
Hardness:	Very soft
Oxidation depth:	0.04m - 0.15m Average 0.10m (4)
Bioturbation depth:	>0.29 - >0.34m Average >0.31m (2)
Soil Disturbance:	>0.14m in the 800m Transect site
Temperature:	2.0 - 4.0C Average 2.9C (5)
Comments:	>0.33m of superficial, thinly bedded sands in the 1000m Transect site

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18th August, 1996

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Geological Description Sheet

Sector:	Mid
Stratum:	X
Samples examined:	X1-X5 plus 1 Transect site (Multicores)
Water depths:	1067 - 1102m

Sea-bed sediments

Sediment type:	Slightly pebbly sand/slightly pebbly muddy sand/muddy sand/sandy mud
Sorting:	Mostly moderate to well sorted
Grain size:	Very fine to fine/medium/very coarse
Colour:	Light olive brown/olive brown
Carbonate content:	2 - 15% Average 9.25% (4)
Foram. content:	Poor to abundant
Sediment thickness:	0.01 - 0.08m Average 0.0475m (4)

Subsurface sediments

Sediment type:	Muds
Colour:	Olive grey/grey/dark grey
Hardness:	Very soft
Oxidation depth:	0.11 - 0.13m Average 0.12 (2)
Bioturbation depth:	0.07 - 0.25m Average 0.16m (2)
Soil Disturbance:	None
Temperature:	3 - 12C Average 7.5C (2)
Comments:	Planolites trace fossil in the Transect site sample

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Charles Darwin Cruise 101C

Geological Description Sheet

Sector:	South
Stratum:	Inner Shelf 1
Samples examined:	C1, C2, C4, C5 (Day Grabs)
Water depths:	98 - 128m

Sea-bed sediments

Sediment type:	Sand/sandy gravels
Sorting:	Poor to well sorted
Grain size:	Medium to coarse/very coarse
Colour:	Speckled/light olive brown
Carbonate content:	15 - 50% Average 35.0% (4)
Foram. content:	Common to poor
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No Data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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Geological Description Sheet

Sector:	South
Stratum:	Inner Shelf 2
Samples examined:	C6-C8 (Day Grabs)
Water depths:	110 -124m

Sea-bed sediments

Sediment type:	Sands
Sorting:	Moderate to well sorted
Grain size:	Medium to coarse/very coarse
Colour:	Yellowish brown/light yellowish brown
Carbonate content:	70 - 97% Average 85.6% (3)
Foram. content:	Common
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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Geological Description Sheet

Sector:	South
Stratum:	C
Samples examined:	C11-C18, AB1, AB2 (Day Grabs)
Water depths:	93 - 181m

Sea-bed sediments

Sediment type:	Shell sands/slightly pebbly sand/pebly shelly sand, sandy gravel
Sorting:	Poor to well sorted
Grain size:	Medium to coarse/very coarse
Colour:	Light olive brown/light yellowish brown
Carbonate content:	5 - 95% Average 71.3% (10)
Foram. content:	Common
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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Geological Description Sheet

Sector:	South
Stratum:	F
Samples examined:	F1-F4, F6, AJ1 (Day Grabs)
Water depths:	212 - 295m

Sea-bed sediments

Sediment type:	Shell sands/slightly pebbly sand/pebbly sand
Sorting:	Moderately to poorly sorted
Grain size:	Medium/coarse to very coarse
Colour:	Light yellowish brown/speckled
Carbonate content:	75 - 98% Average 77.2% (6)
Foram. content:	Abundant/common
Sediment thickness:	Unknown

Subsurface sediments

Sediment type:	No data
Colour:	
Hardness:	
Oxidation depth:	
Bioturbation depth:	
Soil Disturbance:	
Temperature:	
Comments:	

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18th August, 1996

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Geological Description Sheet

Sector:	South
Stratum:	J
Samples examined:	J1-J5, AG1, AG2 (Day Grabs except Box Cores at J1, J2, AG1 and AG2)
Water depths:	332 - 408m

Sea-bed sediments

Sediment type:	Shelly sand/pebbly sands/pebbly muddy sand	
Sorting:	Moderate/poorly sorted	
Grain size:	Very fine/fine to coarse/very coarse	
Colour:	Light olive brown/light yellowish brown	
Carbonate content:	50 - 70%	Average 57.1% (7)
Foram. content:	Abundant	
Sediment thickness:	0.09 - 0.18m	Average 0.12m (4)

Subsurface sediments

Sediment type:	Mud/sandy mud	
Colour:	Greyish brown/dark greyish brown	
Hardness:	Very soft	
Oxidation depth:	None	
Bioturbation depth:	>0.30m - > 0.33m (3)	
Soil Disturbance:	None	
Temperature:	9 - 10C	Average 9.5C (4)

Comments:

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Geological Description Sheet

Sector:	South
Stratum:	M
Samples examined:	M1-M5, AA1 (Box Cores)
Water depths:	422 - 497m

Sea-bed sediments

Sediment type:	Sands/pebbly sands	
Sorting:	Poorly sorted	
Grain size:	Very fine/fine to coarse/very coarse	
Colour:	Light olive brown	
Carbonate content:	50 - 60%	Average 53.3% (6)
Foram. content:	Abundant	
Sediment thickness:	0.07 - 0.19m	Average 0.11m (6)

Subsurface sediments

Sediment type:	Muds/sandy muds	
Colour:	Greyish brown	
Hardness:	Very soft	
Oxidation depth:	0.13 - 0.15m	Average 0.14m (5)
Bioturbation depth:	0.12 - >0.35m	Average >0.26m (5)
Soil Disturbance:	None	
Temperature:	7 - 10C	Average 8.4C (5)

Comments:

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Geological Description Sheet

Sector:	South
Stratum:	Q
Samples examined:	Q1, Q2, Q4, Q5 (Box Cores except Multicore at Q4)
Water depth:	521 - 539m

Sea-bed sediments

Sediment type:	Sands/slightly pebbly sands	
Sorting:	Poor/moderately sorted	
Grain size:	Very fine/fine to coarse/very coarse	
Colour:	Light olive brown/olive	
Carbonate content:	10 - 50%	Average 31.2% (4)
Foram. content:	Abundant	
Sediment thickness:	0.06 - 0.14m	Average 0.09m (4)

Subsurface sediments

Sediment type:	Sandy muds	
Colour:	Light olive brown	
Hardness:	Very soft	
Oxidation depth:	0.15 - 0.2m	Average 0.175m (2)
Bioturbation depth:	0 - >0.24m	Average >0.23m (3)
Soil Disturbance:	None	
Temperature:	6 - 10C	Average 7.75C (4)
Comments:	Buried brachiopod layer in the mud in Q5	

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Geological Description Sheet

Sector:	South
Stratum:	T
Samples examined:	T1-T5 (Multicores except Box Cores at T1 and T2)
Water depths:	602 - 784m

Sea-bed sediments

Sediment type:	Sands/slightly pebbly sand
Sorting:	Poor to well sorted
Grain size:	Fine/medium to coarse/very coarse
Colour:	Light yellowish brown/light olive brown/olive
Carbonate content:	1 - 40% Average 20.2% (5)
Foram. content:	Common/abundant
Sediment thickness:	0.03 - 0.14m Average 0.09m (5)

Subsurface sediments

Sediment type:	Mud/sandy mud/slightly pebbly mud
Colour:	Olive grey/greyish brown
Hardness:	Very soft
Oxidation depth:	0.09m in T2
Bioturbation depth:	0.09 - 0.3m Average 0.22m (3)
Soil Disturbance:	Yes in T4 (?bioturbation)
Temperature:	3 - 11C Average 7.25C (4)
Comments:	Muddy sandy layer above the muds in T3 and T4

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