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## GEOLOGICAL SURVEY OF CANADA OPEN FILE 4938

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# Report on the Beaufort Sea benthic epifauna identified from seabed video collected on board CCGS Nahidik, 4 - 17 August 2004

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2005

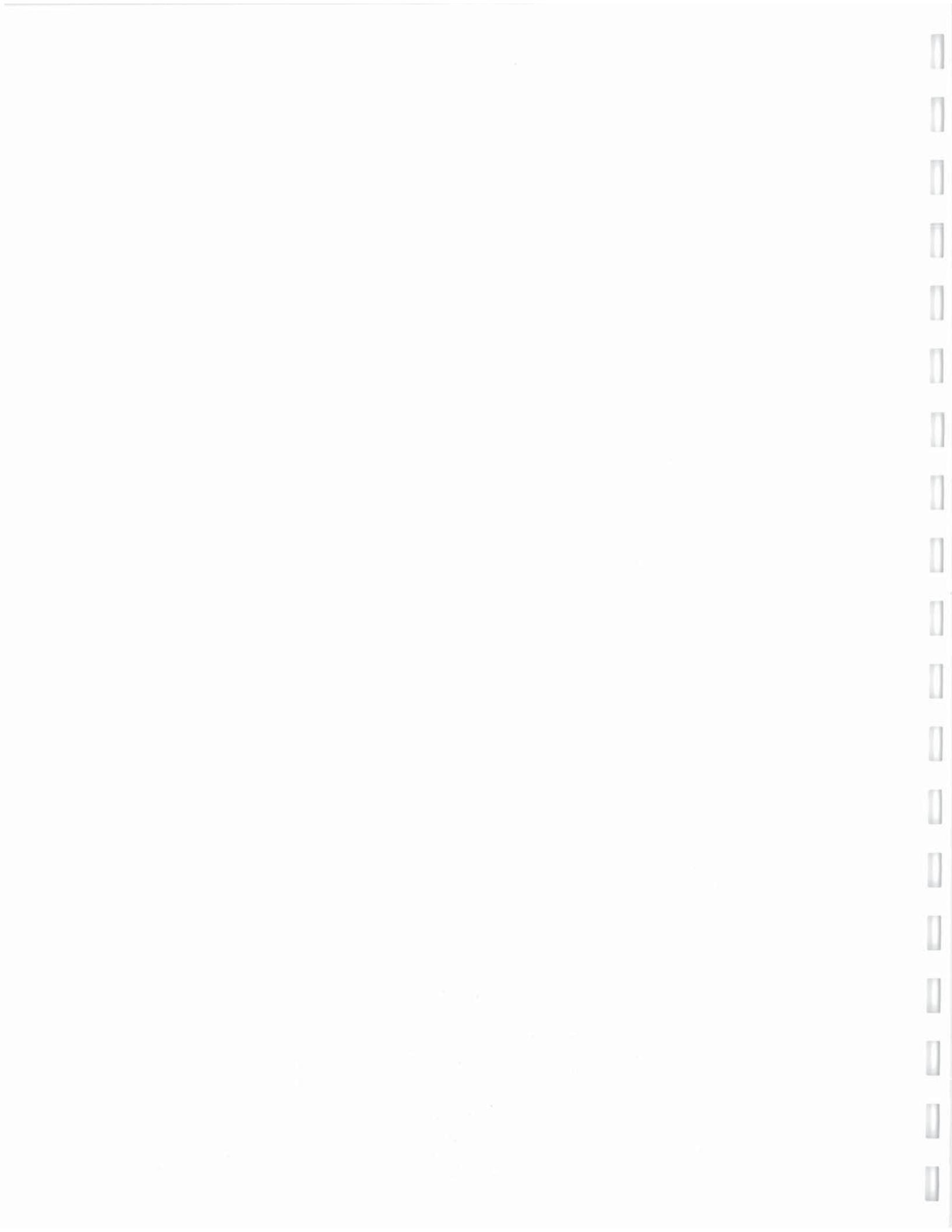
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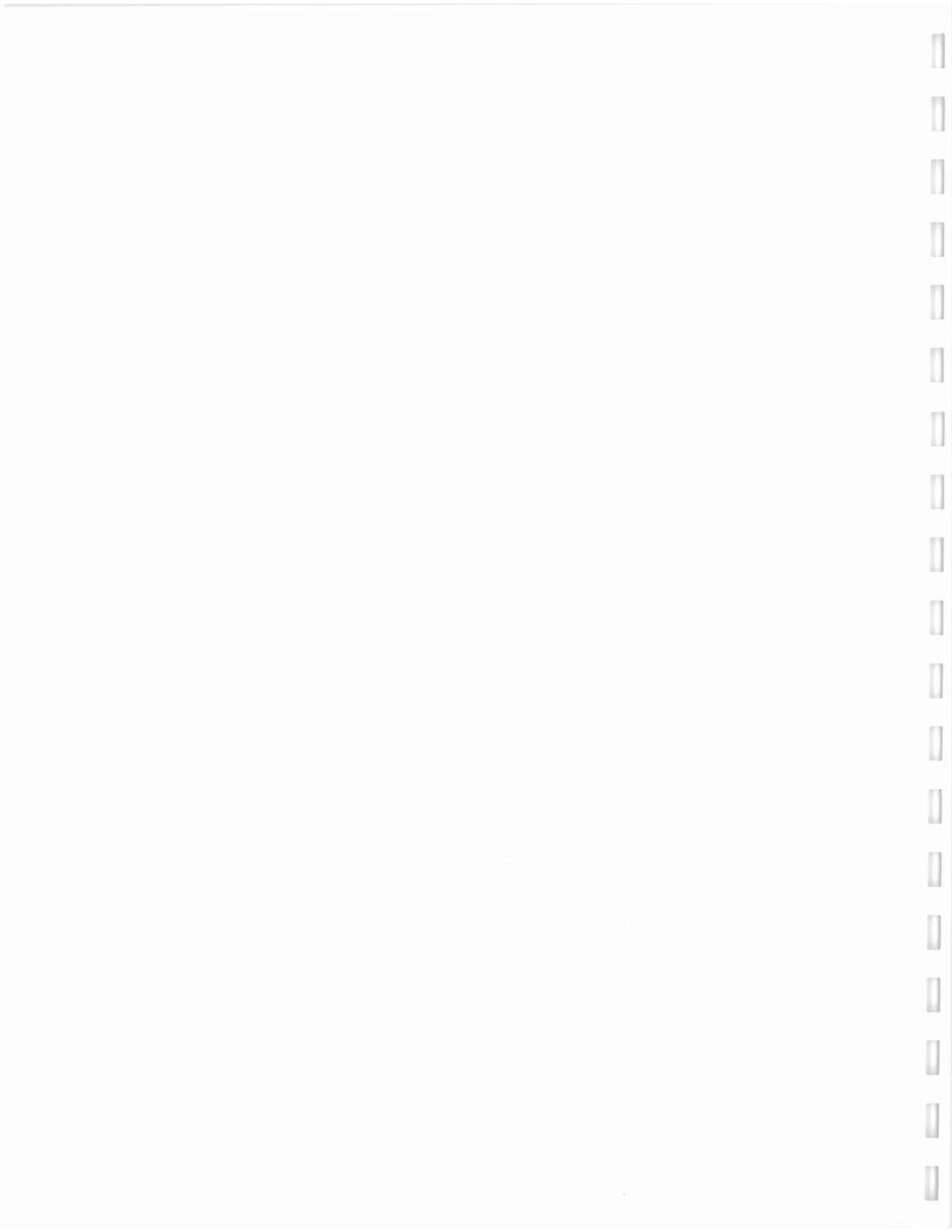
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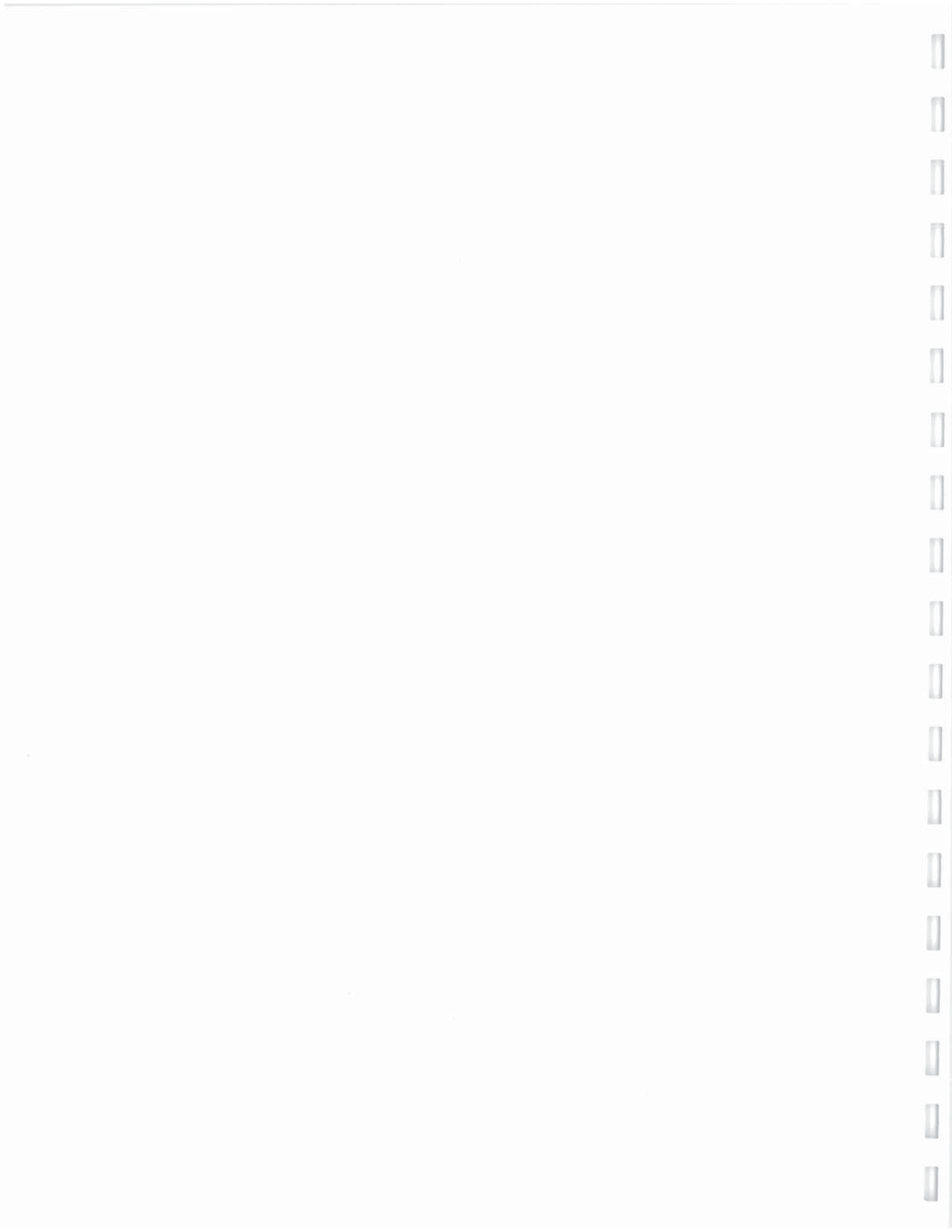
2005: Report on the Beaufort Sea benthic epifauna identified from seabed video  
collected on board CCGS Nahidik, 4-17 August 2004, Geological Survey of Canada Open File 4938, 52 p.

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## TABLE OF CONTENTS

INTRODUCTION	2
SHIPBOARD OPERATIONS	2
Figure 1. Locations of video sampling stations on the Beaufort Sea shelf.	4
IDENTIFICATION AND ANALYSIS OF EPIBENTHOS	5
Table 1. The terminology used in the log files corresponding to the species / genera	5
Table 2. List of identified taxa.	7
Table 3. Total abundances of species identified on seabed from video recordings.	8
Table 4. Standardized abundances of seabed fauna for stations where total transect length was measured.	11
REFERENCES	12
Appendix 1. Detailed description of video transects.	13
Appendix 2. Photographs of identified species.	50





## INTRODUCTION

The Coastguard vessel CCGS Nahidik was used in summer – fall 2004 as a research platform to collect seabed sediment and fauna samples, video footage and to conduct offshore surveys of the Beaufort Seabed. This Beaufort Seabed Mapping Project was designed to assess the environmental impact of offshore hydrocarbon exploration and transportation on the renewable resources of the Beaufort Sea. Knowledge of the location and sensitivity of unique seabed habitats related to sustaining the renewable resources of the Beaufort Sea is required to provide a basis for assessing the impact of proposed offshore pipeline routes and exploration drill sites on the Beaufort ecosystem. This report is on benthic habitats and epifauna identified and quantified from video stations in the Beaufort Sea, taken aboard Nahidik, 4 – 17 August 2004.

## SHIPBOARD OPERATIONS

Equipment used: A camera tripod designed and built by Freshwater institute; SeaView SV-DSP2002 high resolution digital signal processor underwater color video camera (811x508 picture elements, horizontal resolution 450 TV lines, minimum illumination 2 Lux, maximum operational depth 1000 feet) with light; Shark Marine video control console, containing power block, Sea-Track unit for displaying auxiliary information on video screen, and AC/DC Sansui TV/VCR; Sony GV-D1000 Mini Digital Video recorder; Garmin GPS unit; laptop computer; external TV monitor; Com port splitter. Camera was set at 50 cm above the bottom of tripod, which resulted in 70 cm wide view field when camera legs were on seabed. GPS signal from Garmin was split to video control console and laptop computer. The external TV monitor was connected to DV recorder, duplicating the camera view and facing the winch man. This allowed adjusting camera altitude above the seabed faster, resulting in better quality and consistent scale of the obtained images. After the first tests of the system 40 lb led weights were added to each of the tripod legs to make the system more stable on the bottom.

Operation: The camera control console and other equipment were set up on the aft deck, starboard side. In the beginning of each station, a station label was recorded on video for a few seconds. All video stations were numbered sequentially, independent of the ship's log. Station coordinates, date and time, and vessel speed and bearing were recorded automatically on video. Video recording was initialized when the camera was on the bottom. Simultaneously a waypoint was marked in Global Mapper software. Ship tracks during video filming and at the end of the station waypoints were also logged in Global Mapper. Initially the length of recording was variable, reaching 30 minutes, and consequently reduced to an average of 10 minutes when efficient winch operation technique was established and camera could be held at a stable altitude above the bottom. Recording was stopped before the camera was winched up.

In addition to the station number, the following data is recorded for each station: a description of the station location; water depth obtained from the map or winch counter; station coordinates and time tags for the beginning and the end of each station; the number for the video tape on which the recording was made; and total recording time

from the beginning till the end of the station. Time tags on the tapes (UTC) are ahead of the local time by 6 hours. Actual 10.05 pm local time on the 6<sup>th</sup> of August 2004 is 4:05am of the 7<sup>th</sup> of August on the tape. UTC date and time are also shown in this report. Comments to the station are quick field notes and do not represent thorough analysis of benthic habitat and epifauna. To facilitate finding locations of stations in the study area, a general map of the Beaufort Sea, with the current station highlighted in red, is shown. Additionally, a close-up map showing bathymetry and ship track at each station is included. Two screen grabs from video footage taken at each station are included as well. These often represent features of geological or biological interest, or are images with best quality obtainable at the station and are not necessarily representative for the whole of the surveyed track.



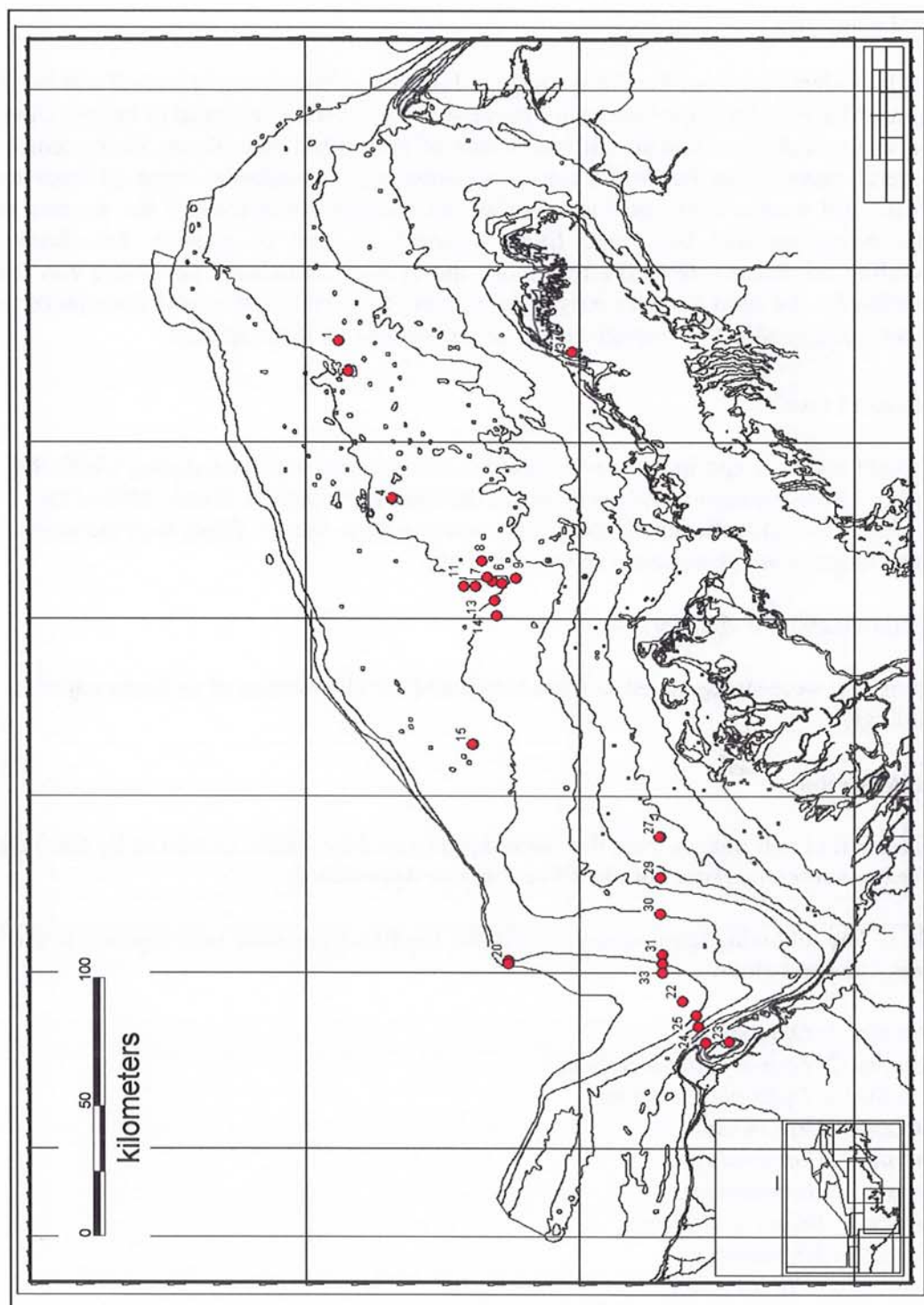


Figure 1. Locations of video sampling stations on the Beaufort Sea shelf.

## IDENTIFICATION AND ANALYSIS OF EPIBENTHOS

### 1. Total abundances

Fauna was identified from the video image to lowest possible taxonomic level and logged using an NRCAN-developed computer program into 'txt.-files' referred to below. Unless fauna was extremely abundant, all individuals of epibenthic macrofauna were recorded. In several cases (often for brittle stars – *Ophiura* sp.), abundances were so large that replicate still counts were used to calculate an average abundance of the species per frame. Assuming that the video frame covered an area of roughly 1m diameter (depending on distance from the sea floor), the average abundance per frame was then multiplied by the total transect length (in metres) to calculate the total abundance per transect – comparable to complete counts of individuals for other species.

### 2. Transect Length

The total transect length in km was adjusted by the proportional time, during which the visibility was sufficient to identify fauna on the tape. For example, if only 50% of the recording time had sufficient visibility (this was logged in the txt. files), then the total transect length was subsequently reduced by half.

### 3. Standardization of abundances

All transects were standardized to 1 km length and the abundances of epifauna adjusted accordingly.

### 4. Identification

A collection of still images from the video tapes (sorted by station as well as by taxa) can be used as a reference base for identification. See Appendix 2.

Table 1. The following terminology used in the log files ('txt.-files') corresponds to the species / genera below:

Brittle Star 1: *Ophiura* sp.  
 Brittle Star 2: *Ophiacantha bidentata*  
 Brittle Star 3: *Ophiocten sericeum*  
 Anemone 1: *Urticina* sp.  
 Anemone 2: *Hormathia* sp.  
 Anemone 3: *Hormathia* sp.  
 Anemone 4: *Bolocera tuediae*  
 Anemone 5: *Metridium* sp.  
 Anemone 6: *Urticina feline*  
 Anemone 9: *Pachycerianthus fimbriatus*  
 Anemone 10: *Halcampa* sp.  
 Moon Snail: *Cryptonatica affinis* (prev. known as '*Natica clausa*')

Whelk 1: Unid. Whelk

Whelk 3: *Buccinum sp.*

Whelk 4: *Colus sp.*

Sea Star 3: *Pteraster militaris*

Table 2. List of identified taxa.

<b>Annelida</b>	Unid. Polychaete	<b>Porifera</b>	Unid. Sponge
<b>Arthropoda: Decapoda</b>	<i>Pagurus sp.</i>	<b>Priapulida</b>	Unid. Priapulid?
	Unid. Decapod Crab	<b>Vertebrata</b>	Unid. Fish
	Unid. Mud Shrimp		
<b>Arthropoda: Isopoda</b>	<i>Saduria entomon</i>		
	<i>Saduria sabini</i>		
<b>Arthropoda: Pycnogonida</b>	<i>Collossendeis sp.</i>		
<b>Coelenterata: Anthozoa</b>	<i>Alcyonium sp.</i>		
	<i>Gersemia rubiformis</i>		
	Soft Coral 3		
	<i>Bolocera tuediae</i>		
	<i>Halcampa sp.</i>		
	<i>Hormathia sp.</i>		
	<i>Metridium sp.</i>		
	<i>Pachycerianthus fimbriatus</i>		
	Unid. Anemone		
	<i>Urticina felina</i>		
	<i>Urticina sp.</i>		
	Unid. Sea Pen		
<b>Echinodermata: Asteroidea</b>	<i>Crossaster papposus</i>		
	<i>Ctenodiscus crispatus</i>		
	<i>Icasterias panopla</i>		
	<i>Leptasteris groenlandica</i>		
	<i>Pteraster militaris</i>		
	<i>Solaster sp.</i>		
	<i>Urasterias lincki</i>		
<b>Echinodermata: Crinoidea</b>	<i>Heliopecten glacialis</i>		
<b>Echinodermata: Echinoidea</b>	<i>Strongylocentrotus droebachiensis</i>		
<b>Echinodermata: Ophiuroidea</b>	<i>Ophiacantha bidentata</i>		
	<i>Ophiocten sericeum</i>		
	<i>Ophiura sp.</i>		
	<i>Gorgonocephalus arcticus</i>		
<b>Mollusca: Gastropoda</b>	<i>Buccinum sp.</i>		
	<i>Colus sp.</i>		
	<i>Cryptonatica affinis</i>		
	Unid. Whelk		
<b>Mollusca: Bivalvia</b>	Unid. Bivalve		
<b>Nemertina</b>	Unid. Nermertean		



Table 3. Total abundances of species identified on seabed from video recordings.

STATION #	Species	2	3	4	5	6	7	8	9	10
Total Recording Time (s)		548	1162	2621	1682	638	645	751	652	725
Total Visibility Time (s)		264	751	1903	1605	638	621	491	652	663
Transect Length (km)			1.390	0.025	1.500	2.140	0.360	0.270	0.290	0.214
Depth (m)			30-60	30		58-60	46	40		
Annelida	Unid. Polychaete									5
Arthropoda: Decapoda	<i>Pagurus sp.</i> Unid. Decapod Crab Unid. Mud Shrimp									
Arthropoda: Isopoda	<i>Saduria entomon</i> <i>Saduria sabini</i>	8	23	58	69	12	62	9	4	1
			1	1	258	6	23	9	12	7
Arthropoda: Pycnogonida	<i>Collossendeis sp.</i>									
Coelenterata: Anthozoa	<i>Alcyonium sp.</i> <i>Gersemia rubiformis</i> Soft Coral 3 <i>Bolocera tuediae</i> <i>Halcampa sp.</i> <i>Hormathia sp.</i> <i>Metridium sp.</i> <i>Pachygerianthus fimbriatus</i> Unid. Anemone <i>Urticina felina</i> <i>Urticina sp.</i> Unid. Sea Pen		1			3 4		5	3	7
		1				3	2			8
					1					1
				2						1
Echinodermata: Asteroidea	<i>Crossaster papposus</i> <i>Ctenodiscus crispatus</i> <i>Icasterias panopla</i> <i>Leptasteris groenlandica</i> <i>Pteraster militaris</i> <i>Solaster sp.</i> <i>Urasterias lincki</i>			2			2	1	1	
						5			6	3
						5	1		3	4
								1		
								1	2	1
Echinodermata: Crinoidea	<i>Heliopecten glacialis</i>									
Echinodermata: Echinoidea	<i>Strongylocentrotus droebachiensis</i>									
Echinodermata: Ophiuroidea	<i>Ophiacantha bidentata</i> <i>Ophiocten sericeum</i> <i>Ophiura sp.</i> <i>Gorgonocephalus arcticus</i>					232		2	504	511
Mollusca: Gastropoda	<i>Buccinum sp.</i> <i>Colus sp.</i> <i>Cryptonatica affinis</i> Unid. Whelk		2 4	2	1	3			1	
				1		3	1			
						13	1	3	2	12
Mollusca: Bivalvia	Unid. Bivalve				1					
Nemertina	Unid. Nermertean									
Porifera	Unid. Sponge									
Priapulida	Unid. Priapulid?									
Vertebrata	Unid. Fish									
	<b>Total species richness</b>	2	5	6	5	11	7	7	10	12



Species	11	12	13	14	15	16	17	18	19	20	21	22
	645	544	636	732	662	731	560	244	493	761	1135	910
	629	544	429	623	646	651	361	225	466	760	1135	861
	0.045	0.072	0.073	0.227	0.087	0.050	0.098	0.221	0.131	0.082	0.186	0.195
	62	64	52	46	50	40	80		40	100	144	136
Unid. Polychaete	1			2			1			2		
<i>Pagurus</i> sp.								1				
Unid. Decapod Crab		1										
Unid. Mud Shrimp												
<i>Saduria entomon</i>			2		10	31	6	25	87			
<i>Saduria sabini</i>		3		1	1	2	6	4	6			1
<i>Collossendeis</i> sp.												
<i>Alcyonium</i> sp.				32	7					17	7	29
<i>Gersemia rubiformis</i>				7	3							2
Soft Coral 3	2	3	5	16	6	1				24	31	44
<i>Bolocera tuediae</i>										11	13	
<i>Halcampa</i> sp.										54	6	1
<i>Hormathia</i> sp.	9	19	13	10	3	1				6	20	4
<i>Metridium</i> sp.												
<i>Pachycerianthus fimbriatus</i>					2					1	1	4
Unid. Anemone												
<i>Urticina felina</i>											4	
<i>Urticina</i> sp.			1							1	11	
Unid. Sea Pen				33	1						13	1
<i>Crossaster papposus</i>						1				2		
<i>Ctenodiscus crispatus</i>												2
<i>Icasterias panopla</i>											2	1
<i>Leptasteris groenlandica</i>	2	4	9	14	1	6		8	31			2
<i>Pteraster militaris</i>										4	2	
<i>Solaster</i> sp.										1		
<i>Urasterias lincki</i>	4	3	2	8		2	1	1	1			1
<i>Heliogetra glacialis</i>										18	32	
<i>Strongylocentrotus droebachiensis</i>										1		
<i>Ophiacantha bidentata</i>										564	373	
<i>Ophiocten sericeum</i>											1	
<i>Ophiura</i> sp.	159	100	203	1550	1					1558	3720	1262
<i>Gorgonocephalus arcticus</i>					1					5	17	
<i>Buccinum</i> sp.	2	3	2	2	3	2		1	5	5	18	5
<i>Colus</i> sp.		1			1	1		3	4	15	9	3
<i>Cryptonatica affinis</i>					3	3		1	4	9	4	5
Unid. Whelk	19	28	19	6	19	8	4	4	2	6	17	36
Unid. Bivalve												
Unid. Nermertean												
Unid. Sponge						1						
Unid. Priapulid?										1	1	3
Unid. Fish												
<b>Total species richness</b>	8	10	9	12	15	12	5	9	8	21	21	18

Species	23	24	25	26	27	28	29	30	31	32	33	34
	659	580	639	620				677	1053	728	1015	603
	575	580	634	620				626	908	676	928	226
	0.357	0.287	0.340	0.546 104-	0.236	0.209	0.296	0.817	0.902	0.400	0.373	
	70	8-12	49	106	5	14	25	50	80	100	135	17
Unid. Polychaete											1	
<i>Pagurus</i> sp.												
Unid. Decapod Crab												1
Unid. Mud Shrimp								1			1	
<i>Saduria entomon</i>	30		2					17				4
<i>Saduria sabini</i>	17			1				28				
<i>Collossendeis</i> sp.										1		
<i>Alcyonium</i> sp.				1					91	61	20	
<i>Gersemia rubiformis</i>		9	7	27						1	1	
Soft Coral 3		6	16	8				2	24	55	111	
<i>Bolocera tuediae</i>			1	4				1				
<i>Halcampa</i> sp.				1						1	3	
<i>Hormathia</i> sp.			14	168				2	13	3	9	
<i>Metridium</i> sp.			25									
<i>Pachycerianthus fimbriatus</i>		1										
Unid. Anemone												
<i>Urticina felina</i>												
<i>Urticina</i> sp.												
Unid. Sea Pen		45	24	35						34	8	
<i>Crossaster papposus</i>				12								
<i>Ctenodiscus crispatus</i>				2								
<i>Icasterias panopla</i>												
<i>Leptasteris groenlandica</i>				23				1	21	5	1	
<i>Pteraster militaris</i>									1		1	
<i>Solaster</i> sp.												
<i>Urasterias lincki</i>												
<i>Heliometra glacialis</i>			4	2					1	9		
<i>Strongylocentrotus droebachiensis</i>												
<i>Ophiacantha bidentata</i>												
<i>Ophiocten sericeum</i>												
<i>Ophiura</i> sp.	93	2	6800	1180					31570	7200	4103	
<i>Gorgonocephalus arcticus</i>								1	13	8	5	
<i>Buccinum</i> sp.	2	2	3					2	4	8	1	
<i>Colus</i> sp.		1	1									
<i>Cryptonatica affinis</i>	3	1	8								1	
Unid. Whelk	16	4	21					3	3	3	9	
Unid. Bivalve										140		
Unid. Nermertean											1	
Unid. Sponge	1											
Unid. Priapulid?												
Unid. Fish		3						1				
<b>Total species richness</b>	7	10	13	13	0	0	0	11	10	14	16	2

Species / Station	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	30	31	32	33	
Unid. Polychaete								26	23			1			16			24											3
Pagurus sp.										14						5													
Unid. Decapod Crab																													
Unid. Mud Shrimp																									1				3
Saduria entomon	26	3222	48	6	179	6	14	5			5		118	689	95	123	72				96		6		23				
Saduria sabini	1	56	18	3	66	6	41	36		42			5	12	44	95	20	48		5	55		2	38					
Colossendeis sp.																											3		
Alcyonium sp.												166	82					27	38	157				2	117	164		59	
Gessemia rubiformis				1								36	35							2		31	3	49			3	3	
Soft Coral 3	1			2		28	1	36	45	42	12	83	8	22			293	167	238	3	47	15	3	4	148	326			
Bolocera tuediae																	134	70				3	7	1					
Halcampa sp.																	659	32	5				2			3	9		
Hormathia sp.	1			1	6			5	25	264	265	52	35	22			73	18	22		42	38	3	17	9	26			
Metridium sp.																							74						
Pachyceranthus fimbriatus													24					12	5	22	3								
Unid. Anemone	1																												
Urticina felina																			22										
Urticina sp.		111									2						12	59											
Unid. Sea Pen													18	12				70	5	157	71	64				92	23		
Crossaster papposus		111				6	6	3						22			24						22						
Ctenodiscus crispatus				2			3	15												2			4						
Icasteria panopla																			2	5									
Leptasteris groenlandica	2			2	3		1	2	45	56	184	73	12	133		39	25		49	2	2			42	1	27	13	3	3
Pteraster militans																										1			
Solaster sp.																		12											
Urasterias lincki						6	7	5	10	42	5	41	44	16	5	9				5									
Heliometra glacilis																	220	172					12	4	1	24			
Strongylocentrotus droebachiensis																	12												
Ophiacantha bidentata																	6878	25											
Ophiocten sericeum																			5										
Ophiura sp.	18				11	1738	267	3614	1389	4143	832	12					19	2	6822	299	7	2178	2161		4578	1948	1232		
Gorgonocephalus arcticus																	7	91							1	17	22	15	
Buccinum sp.	2	111	1	1			3	45	42	5	1	35	44	5	4		7	97	27	6	7	9	3	5	22	3			
Colus sp.	4				3					14			12	22		15	32	183	48	16	3	3							
Cryptonatica affinis		56		1									35	67	5	32	20	22	27	10	3	24						3	3
Unid. Whelk				7	3	17	7	61	432	389	388	32	224	178	63	20	16	73	91	195	51	14	62		4	4	9	26	
Unid. Bivalve				1																							377		
Unid. Nemertean																													3
Unid. Sponge														22							3								
Unid. Priapulid?																													
Unid. Fish																													

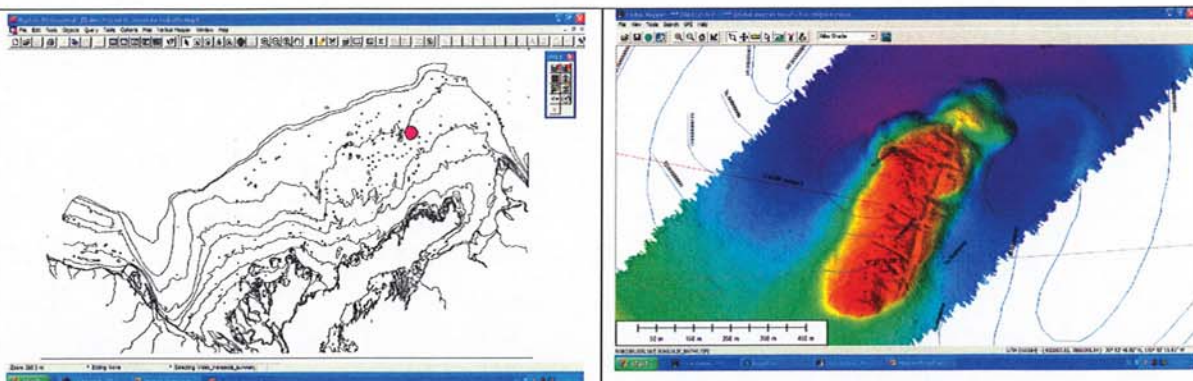

Table 4. Standardized abundances of seabed fauna for stations where total transect length were measured.

**References:**

1. Atkinson, E. G. & Wacasey, J. W., 1989: Benthic invertebrates collected from the western Canadian Arctic, 1951 to 1985. Can. Tech. Rep. Fish. Aquat. Sci. 745., 132 pp.
2. Gulliksen, B. & Svensen, E. 2004: Svalbard and Life in the Polar Oceans. Aquapress, Oslo, 276 pp.
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4. Siferd, T. D., 2001: Sachs Harbour Benthic Community Survey. Summary of Results 1999-2000. Can. Tech. Rep. Fish. Aquat. Sci. 2366: vii + 47 pp.

## Appendix 1. Detailed description of video transects.

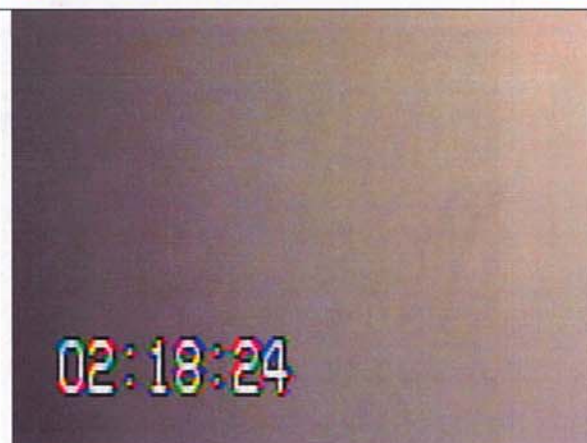
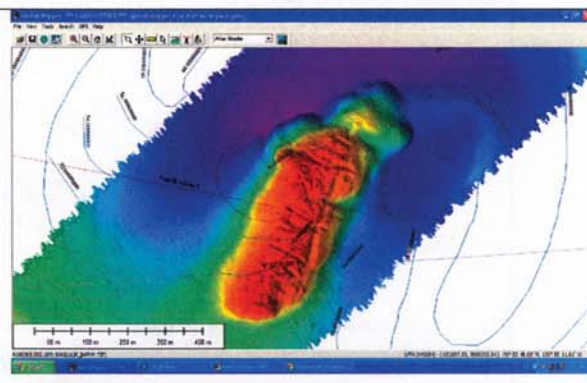
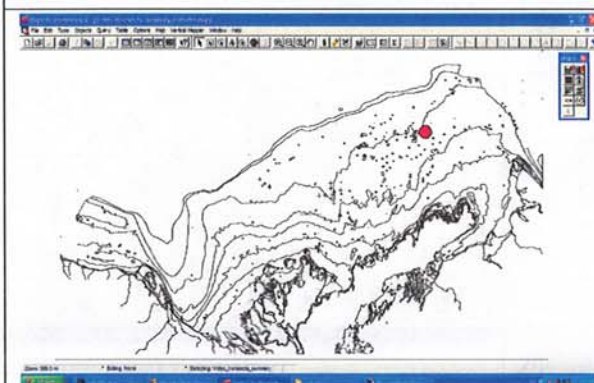
### Station 1

Description	Kaglulik mud volcano.		
Depth			
Date UTC	6 August 2004.		
	Longitude	Latitude	Time
Start	130°50.350	70°52.617	12:16:45
End	130°50.454	70°52.558	12:55:53
Tape#	1		
Recording time:			
Comment:	Test over Kaglulik mud volcano. 2 deployments. No success in filming the seabed. Drifting speed up to 1.5 knots. Light flooded on the second attempt.		
	Fauna not quantifiable; no logged abundance data		
			
			



## Station 2

Description	Kaglulik		
Depth			
Date UTC	7 August 2004.		
	Longitude	Latitude	Time
Start	130°50.602	70°52.790	1:42:30
End			
Tape#	1		
Recording time:	9:08		
Comment:	<p>Lost GPS connection. Successful camera deployment. Good shots of seabed, with some interference from swells and suspended mud. Muddy bottom, some large isopods, an anemone. Start at the top of the pingo, continues into the deep trough surrounding it with 60 m water depths. *Get GPS data from bridge and mach them with time tags on the video.*</p> <p>Fauna logged (LOG 2.TXT)</p> <p>Species recorded:</p> <p><i>Bolocera tuediae</i></p> <p><i>Saduria entomon</i></p>		



## Station 3

Description	Pingo 7 miles west off Kaglulik		
Depth	30 – 60 m.		
Date UTC	7 August 2004		
	Longitude	Latitude	Time
Start	131°10.983	70°50.698	4:20:05
End	131°12.604	70°50.982	4:39:22
Tape#	1		
Recording time:	19:22		

Comment: On the way to the 88 m wire paid out. Starting on the top of a bank ending in a trough. Going through shallow area, probably less than 30 meters, because the blue surface light was visible. The top of the bank is sandy mud with some shell hash. GPS log and start and end waypoints saved in Global Mapper. Almost straight transect. Drift up to 2 knots.  
Fauna logged (LOG 3.TXT)  
Species recorded:  
*Buccinum* sp.  
*Colus* sp.  
*Saduria entomon*  
Soft Coral 3

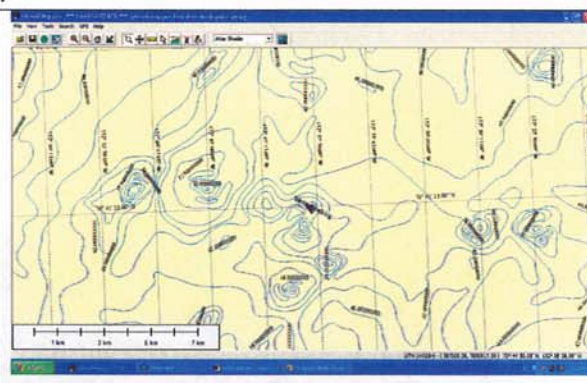
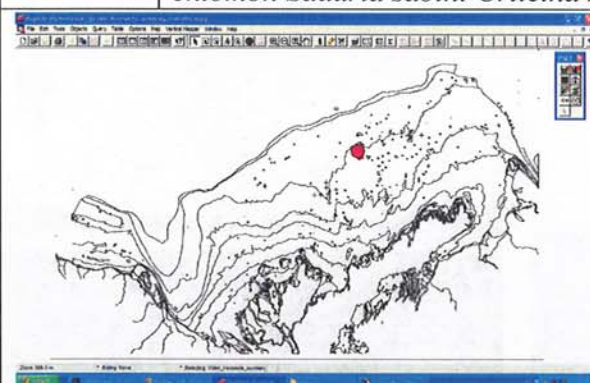




# Station 4

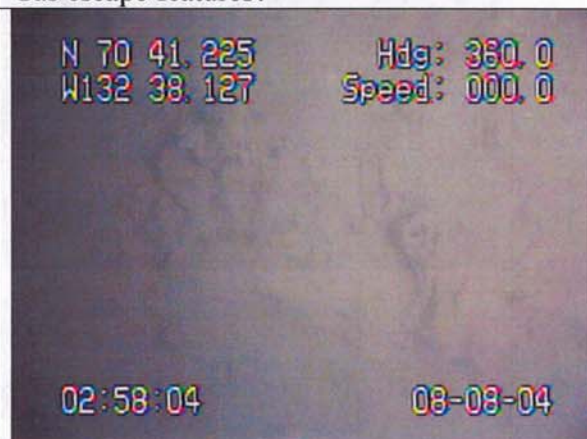
Description	Admiral finger volcano. On the side of the feature.		
Depth	30m.		
Date UTC	8 August 2004		
	Longitude	Latitude	Time
Start	132°38.130	70°41.225	02:42:47
End	132°38.135	70°41.223	03:26:29
Tape#			
Recording time:	11:22:28 until the end of tape 1. 30:39:26 on tape 2.		

Comment: A suspected mud volcano, with gas seepage over it. Ice was found in box cores. Tied on anchor, so drift was very restricted. Circling around within 20 meters diameter. Station label was not filmed in the beginning of the video footage. A lot of amphipods, probably *Ampelisca* suspended into water by camera legs. A different, smaller grayish species also common. 2:51:03 good image of large *Saduria* walking though the field of view. Camera was often brought up and then put down, in yo-yo fashion, in order to obtain a clear view of unsampled seabed. Many small infaunal burrows (amphipods?), semi-stable polychaete tubes, Appendicularia bloom in plankton. Fauna logged (LOG 4 .TXT)  
Species recorded: *Buccinum* sp. *Crossaster papposus* *Cryptonatica affinis* *Saduria entomon* *Saduria sabini* *Urticina* sp.



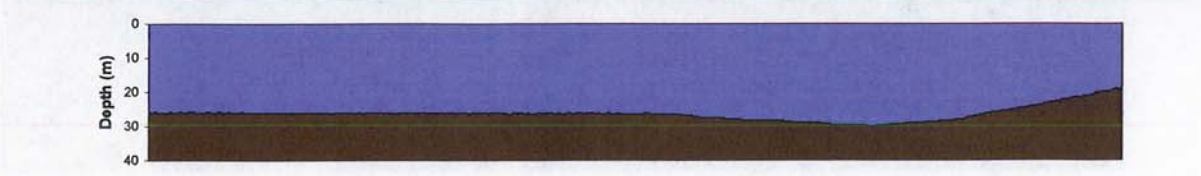


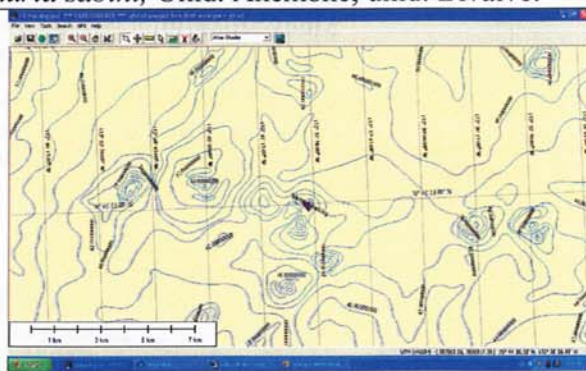
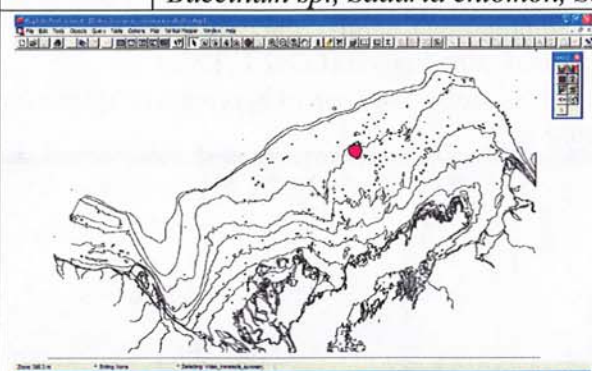
*Crossaster papposus*.

Gas escape features?



## Station 5

Description	Admiral volcano, top		
Depth	17 m water depth		
Date UTC	8 August 2004		
	Longitude	Latitude	Time
Start	132°37.985	70°41.203	14:09:30
End	132°37.986	70°41.204	14:54:35
Tape#	2		
Recording time:	28:47		
Comment	Good, very slow drift. Mostly clear shots of seabed, starting at about 2 m altitude above seabed, lower later on. Depth increases gradually to 25 m. Long clear footage. Some slumps and gas escape features. Isopods common. Sandy mud on the top, no water current. Some rippled features in deeper parts of the pingo. Timer stuck, hence logging in two parts: Fauna logged (LOG 5 – part 1 from 14:09:30-14:21:40, LOG5 – part 2 from 14:38:43 – 14:54:35). Large numbers of isopods (including juveniles), many small and large infaunal burrows. Species recorded: <i>Buccinum</i> sp., <i>Saduria entomon</i> , <i>Saduria sabini</i> , Unid. Anemone, unid. Bivalve.		

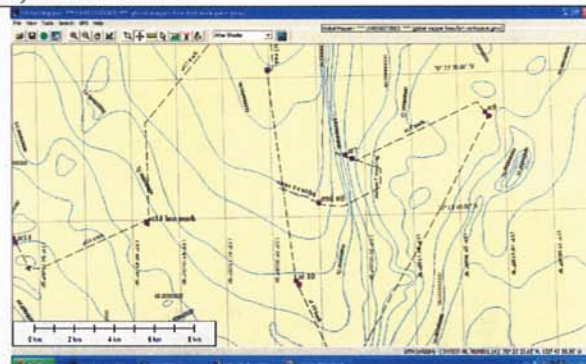
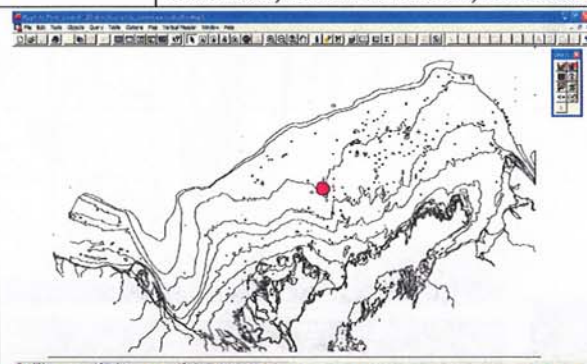




# Station 6

Description	Kugmallit canyon.		
Depth	58 – 60 meters.		
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133°34.283	70°19.174	02:34:39
End	133°33.762	70°19.095	02:45:19
Tape#	3		
Recording time:	10:38		

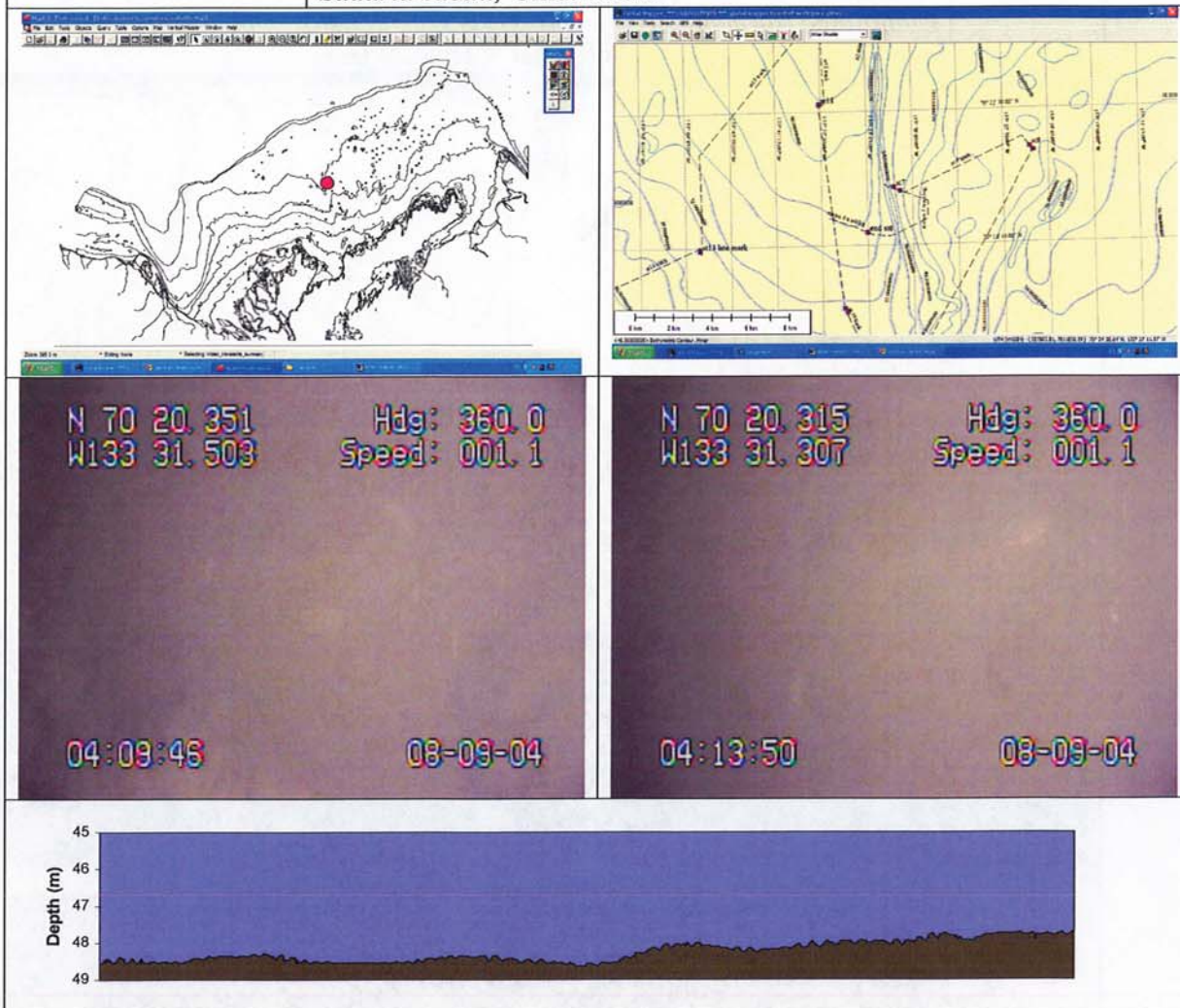
Comment: Sea stars, brittle stars abundant, some red soft corals (*Gersemia rubiformis*?) and sea pens. A mud star. Undetermined fish. Drifting speed approximately 1.1 knot. Visibility average. Fauna logged separately for taxa groups because of high drifting speed. (LOG 6 – part 1.TXT: brittle stars only, LOG6 – part 2.TXT: Asteroidea and Isopoda, LOG6 – part 3.TXT: Cnidaria, Molluska and infaunal burrows). Species recorded: *Buccinum* sp, *Cryptonatica affinis*, *Ctenodiscus crispatus*, *Gersemia rubiformis*, *Hormathia* sp., *Leptasterias groenlandica*, *Ophiura* sp., *Saduria entomon*, *Saduria sabini*, Soft coral 3, Unid. Whelk



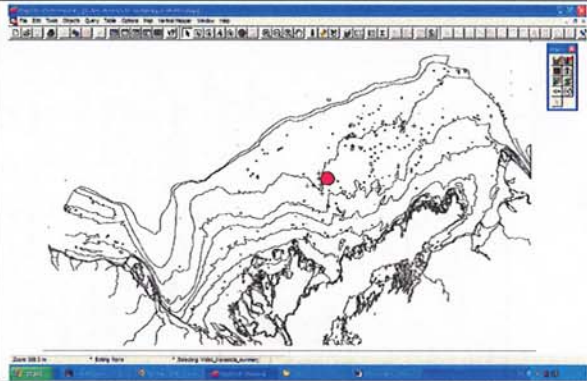

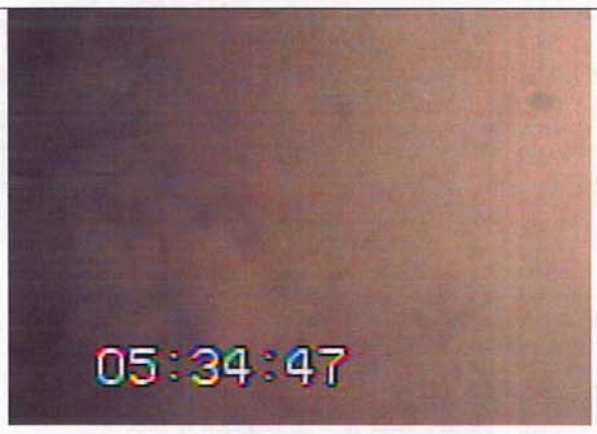

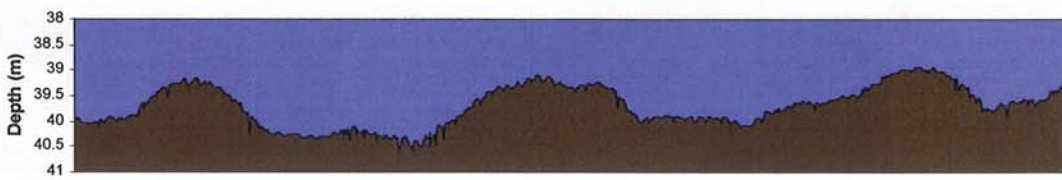


## Station 7

Description	Kugmalit canyon. Eastern slope, 4 km from the middle station.		
Depth	46m		
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133.31.517	70 20.353	04:09:26
End	133 31.012	70 20.261	04:20:12
Tape#	3		
Recording time:	10:45		
Comment:	Fauna less abundant, brittle stars are not present. <i>Mesidotea</i> more common than in the trough. Some anemones. Drift 1.1 knots. Fauna logged (LOG 7.TXT). Species recorded: <i>Colus</i> sp., <i>Hormathia</i> sp., <i>Crossaster papposus</i> , <i>Leptasterias groenlandica</i> , <i>Saduria entomon</i> , <i>Saduria sabini</i> , Unid. whelk		



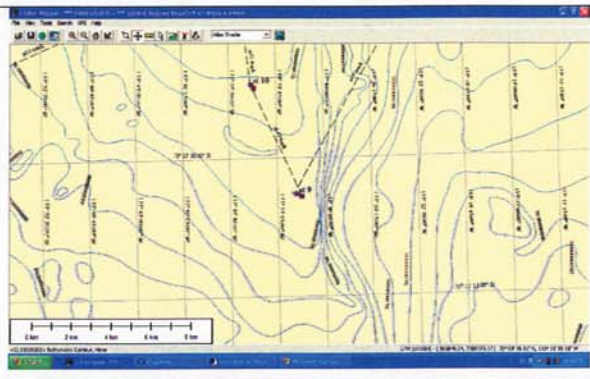
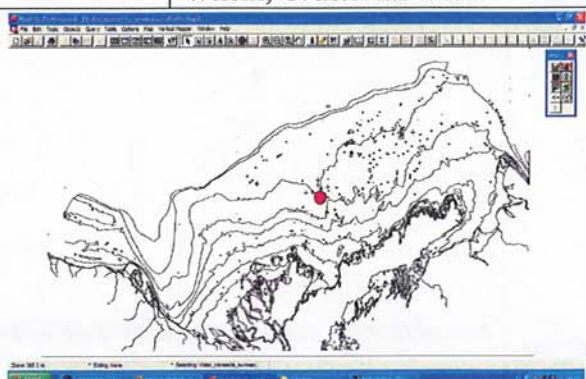
## Station 8

Description	East of Kugmalit canyon		
Depth	40 m		
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133 20.327	70 21.440	05:26:57
End	133 19.995	70 21.308	05:41:02
Tape#	3		
Recording time:	12:31		
Comment:	Fast drift – mud, little fauna; timer stuck. Fauna logged (LOG8-part1.TXT: 05:26:57-05:27:17, LOG8-part2.TXT: 05:29:11-05:41:02) Species recorded: Crossaster papposus, <i>Ophiura</i> sp., Saduria entomon, Saduria sabini, Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i>		
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## Station 9

Description	Southernmost station along the axis of Kugmalit canyon		
Depth			
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133*32.188	70*14.017	07:08:55
End	133*31.820	70*13.945	07:19:41
Tape#	3		
Recording time:	10:52		
Comment:	Fast drift, poor visibility. Brittlestars common, some sea stars. Fauna logged (LOG9 – part 1.TXT: Ophiuroidea, LOG9 – part 2.TXT: Asteroidea, Isopoda and Molluska, LOG9 – part 3.TXT: Cnidaria). Species recorded: <i>Buccinum</i> sp., <i>Crossaster papposus</i> , <i>Ctenodiscus crispatus</i> , <i>Leptasteris groenlandica</i> , <i>Ophiura</i> sp., <i>Saduria entomon</i> , <i>Saduria sabini</i> , Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i>		



N 70 14.000  
W133 32.098

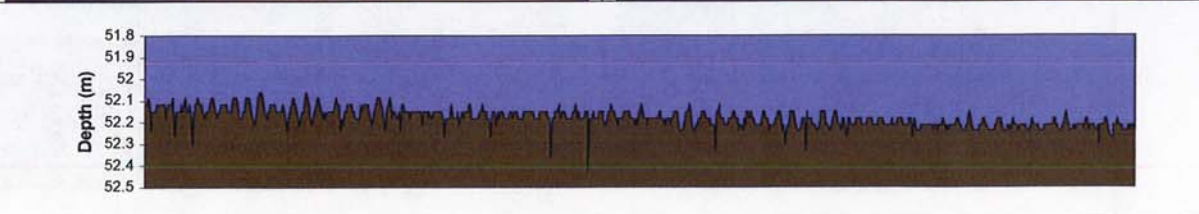
Hdg: 148.1  
Speed: 000.9

07:11:3508-09-04

N 70 14.013  
W133 32.169

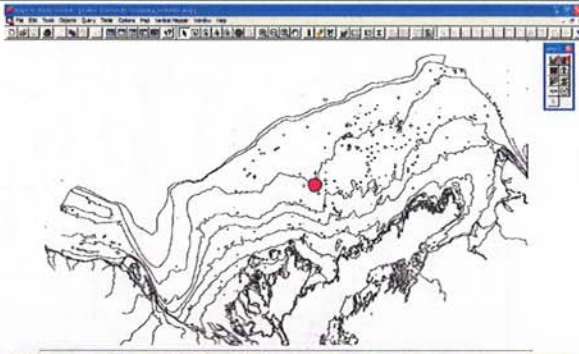
Hdg: 148.1  
Speed: 000.0

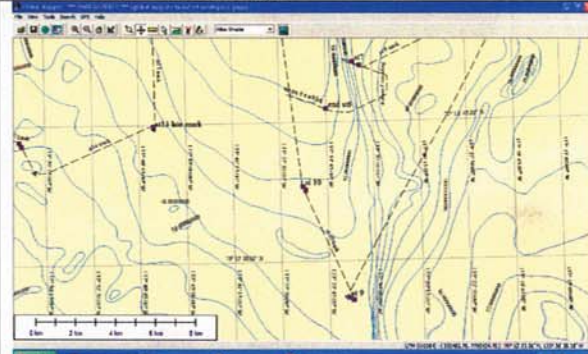
07:09:2908-09-04



# Station 10

Description	Second southernmost station along the axis of Kugmalit canyon		
Depth			
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133*35.708	70*17.002	08:08:55
End	133*35.484	70*16.92	08:20:55
Tape#	3		
Recording time:	12:05		
Comment:	Soft corals, anemones, brittle stars in low abundances. Fast drift, poor visibility. High abundance of brittle stars and large infaunal burrows, one <i>Cryptonatica affinis</i> egg case. Fauna logged (LOG 10 – part 1.TXT: Ophiuridea, LOG10 – part 2.TXT: Asteroidea, Cnidaria, Isopoda, Molluska, Polychaeta). Species recorded: <i>Ctenodiscus crispatus</i> , <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., <i>Pachycerianthus fimbriatus</i> , Polychaete unid., <i>Saduria entomon</i> , <i>Saduria sabini</i> , Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i> , <i>Urticina</i> sp.		





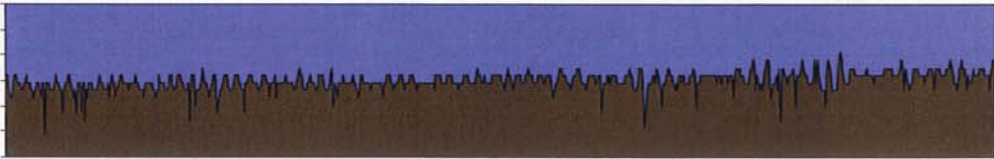
N 70 16.993      Hdg: 087.8  
W133 35.697      Speed: 000.0

08:10:09      08-09-04

N 70 16.987      Hdg: 087.8  
W133 35.686      Speed: 000.0

08:11:01      08-09-04

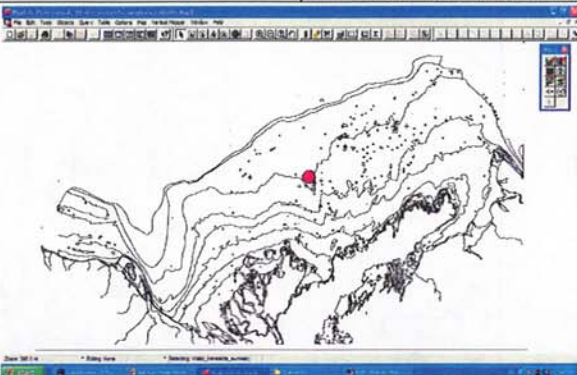
Depth (m)

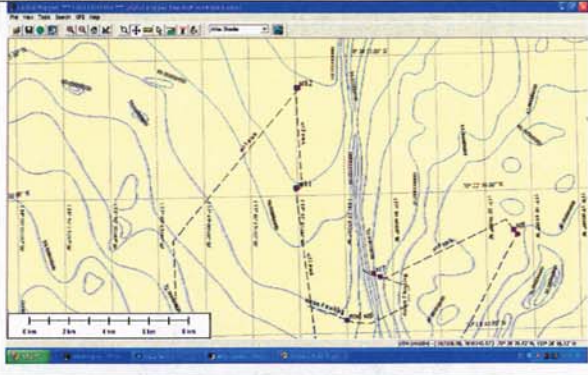




# Station 11

Description	Second northernmost station along the axis of Kugmalit canyon		
Depth	62m		
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133*37.604	70*22.697	09:29:20
End	133*37.537	70*22.709	09:39:56
Tape#	4		
Recording time:	10:45		
Comment:	Muddy seafloor, reduced visibility because of 'marine snow', brittle stars common, also anemones, no isopods, numerous large infaunal burrows, one <i>Cryptonatica affinis</i> egg case. Fauna logged (LOG11.TXT). Species recorded: <i>Buccinum</i> sp., <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., Unid. Polychaete , Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i>		



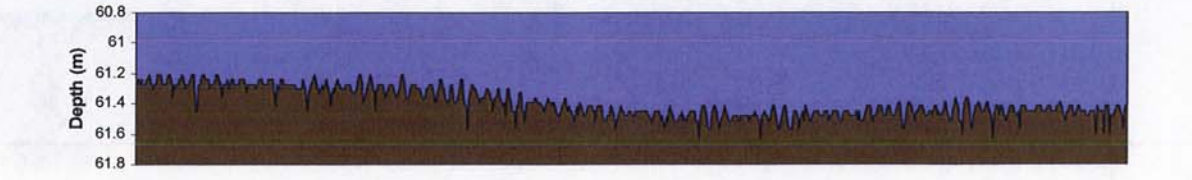


N 70 22.705Hdg: 281.5  
W133 37.559Speed: 000.0

09:37:1208-09-04

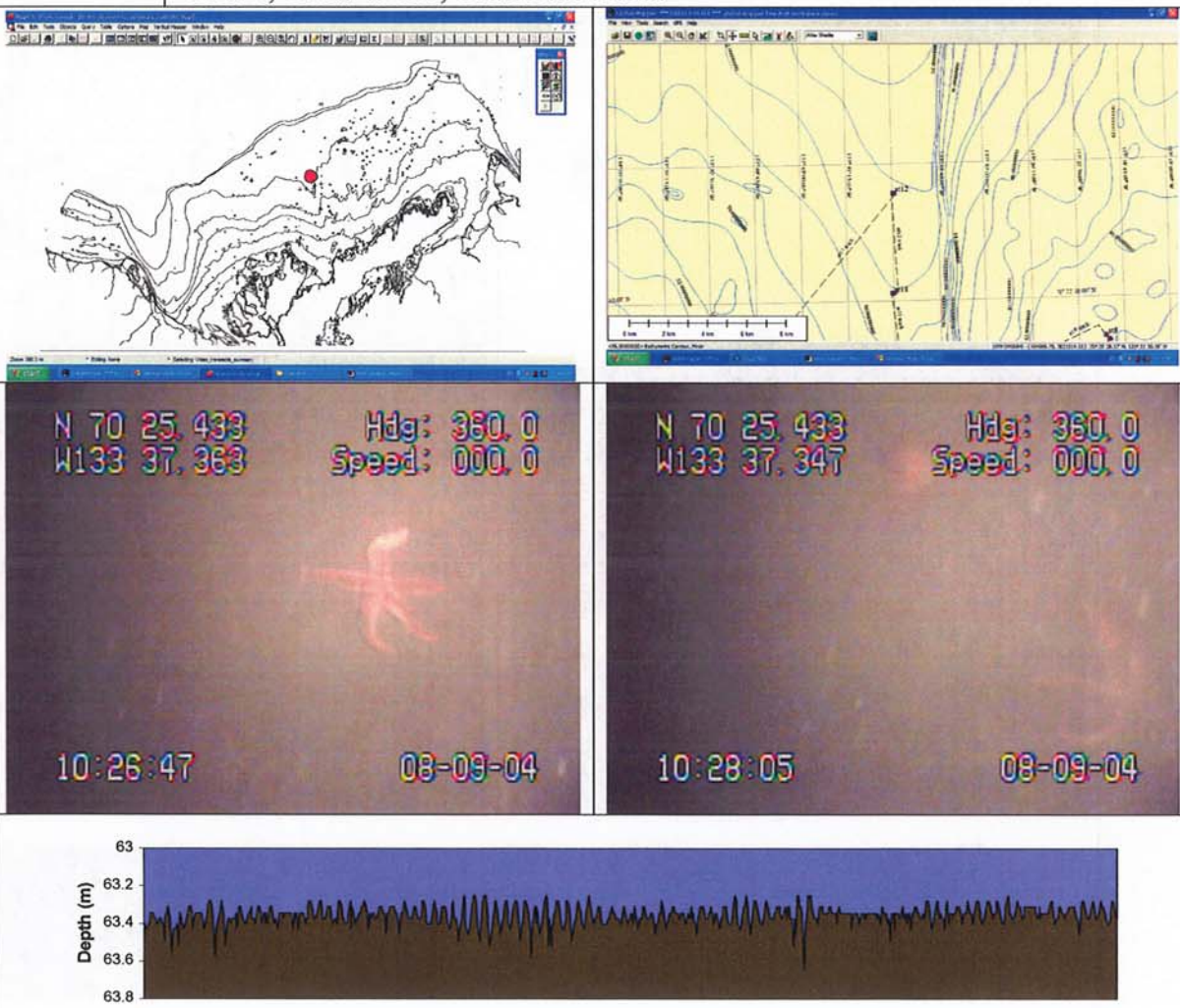
N 70 22.707Hdg: 281.5  
W133 37.543Speed: 000.0

09:39:0808-09-04



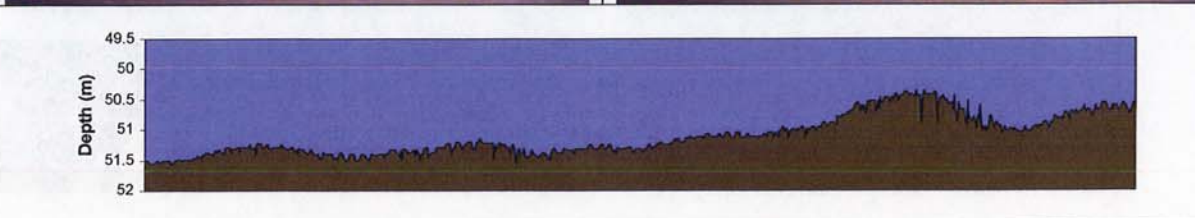
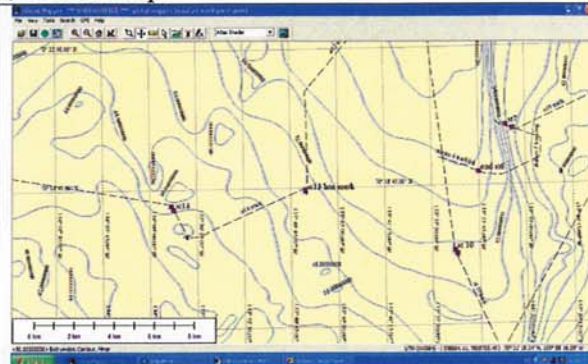
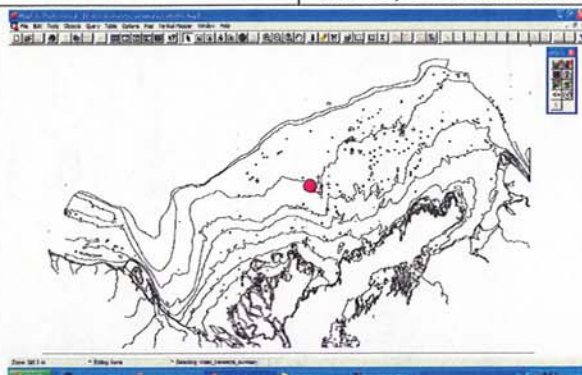


## Station 12

Description	Northernmost station along the axis of Kugmalit canyon		
Depth	64m		
Date	9 August 2004.		
	Longitude	Latitude	Time
Start	133*37.437	70*25.437	10:21:01
End	133*37.321	70*25.431	10:30:01
Tape#	4		
Recording time	09.04		
Comment:	Muddy substratum, numerous large infaunal burrows, brittle stars common, other echinoderms ( <i>Leptasterias groenlandica</i> ), <i>Hormathia nodosa</i> , many whelks (mud whelks?), few isopds. Reduced visibility due to 'marine snow'. Fauna logged (LOG12.TXT). Species recorded: <i>Buccinum</i> sp., <i>Colus</i> sp., <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., Polychaete unid., <i>Saduria sabini</i> , Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i> .		
			

### Station 13

Description	Second westernmost station in Kugmallit trough		
Depth	52m		
Date UTC	9 August 2004		
	Longitude	Latitude	Time
Start	133°47.540	70°18.624	11:52:33
End	133°47.564	70°18.698	12:03:51
Tape#	4		
Recording time:	10:36		
Comment:	Mud, limited visibility because of 'marine snow', brittle stars abundant, anemones. Timer was temporarily stuck. Fauna logged (LOG13 – part 1.TXT: 11:52:33-11:53:35, LOG13 – part2. TXT: 11:54:17 – 12:03:51) Species recorded. <i>Buccinum</i> sp., <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., <i>Saduria entomon</i> , Soft Coral 3, Unid. Whelk, <i>Urasterias lincki</i> , <i>Urticina</i> sp.		

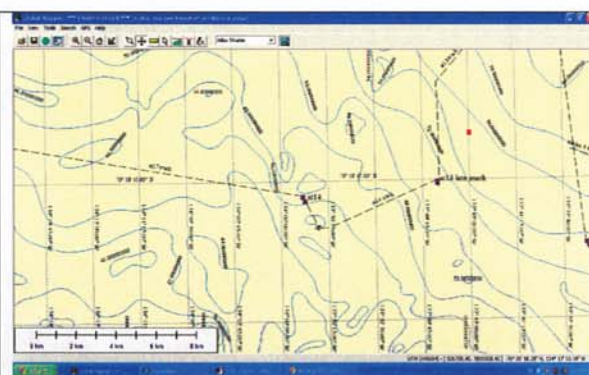
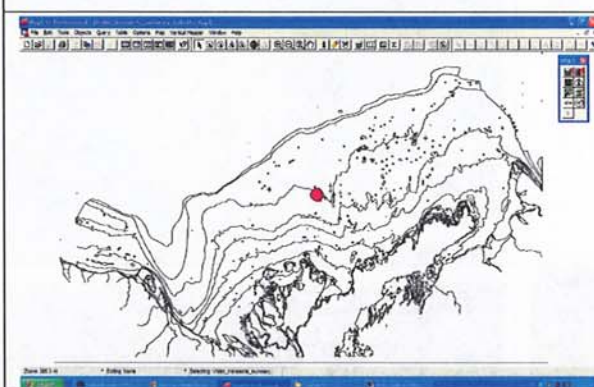




# Station 14

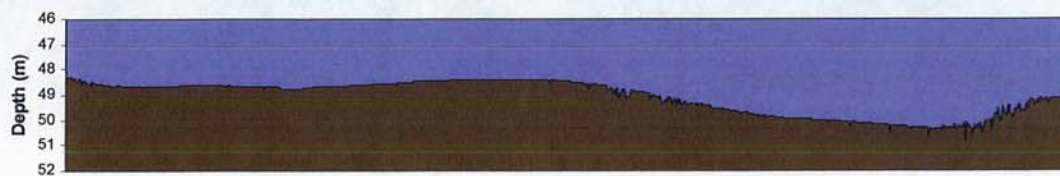
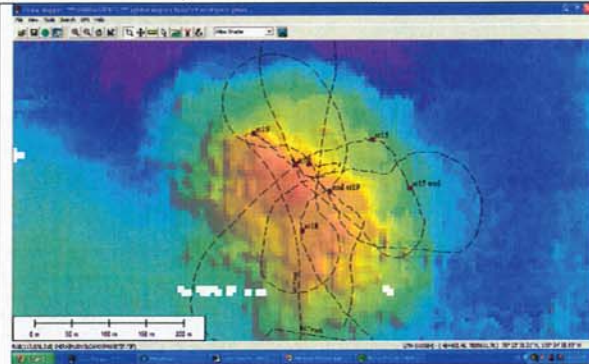
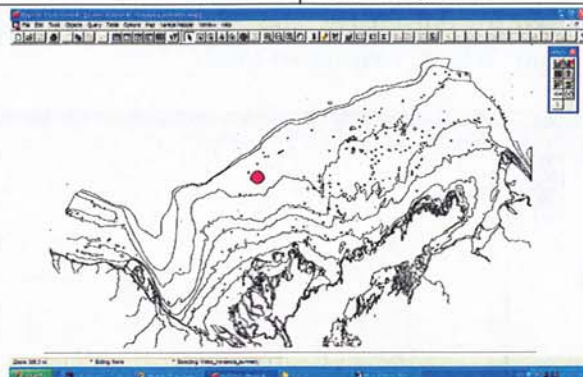
Description	Westernmost station in Kugmallit trough		
Depth	46m		
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	133*58.116	70 18.218	00:20:24
End	133*58.272	70*18.314	00:32:35
Tape#	4		
Recording time:	12:12		

Comment: Soft corals common, *Leptasterias groenlandica* abundant. Brittlestars abundant, sea pens common. Fauna logged (LOG14 – part1.TXT: 2 minute sample of brittle stars – extrapolated to full time period, LOG14 – part 2.TXT: all other fauna). Species recorded: *Alcyonium* sp., *Buccinum* sp., *Gersemia rubiformis*, *Hormathia* sp., *Leptasterias groenlandica*, *Ophiura* sp., Polychaete unid., *Saduria sabini*, Soft coral 3, Unid. Sea Pen, Unid. Whelk, *Urasterias lincki*



## Station 15

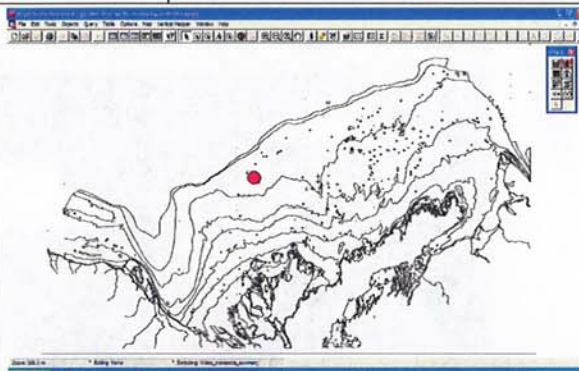
Description	Kopanor volcano, eastern side.		
Depth	~50m		
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	135*24.930	70*23.432	05:08:53
End	135*24.847	70*23.397	05:19:45
Tape#	4		
Recording time:	11:02		
Comment:	Low abundance of fauna in general. Few Gersemia, some unidentified globular objects, urchins or egg cases, numerous mollusks – whelks and <i>Cryptonatica affinis</i> . Fauna logged (LOG15.TXT). Species recorded: <i>Alcyonium</i> sp., <i>Buccinum</i> sp., <i>Colus</i> sp., <i>Cryptonatica affinis</i> , <i>Gersemia rubiformis</i> , <i>Gorgonocephalus arcticus</i> , <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., <i>Pachycerianthus fimbriatus</i> , <i>Saduria entomon</i> , <i>Saduria sabini</i> , Soft Coral 3, Unid. Sea Pen, Unid. Whelk.		

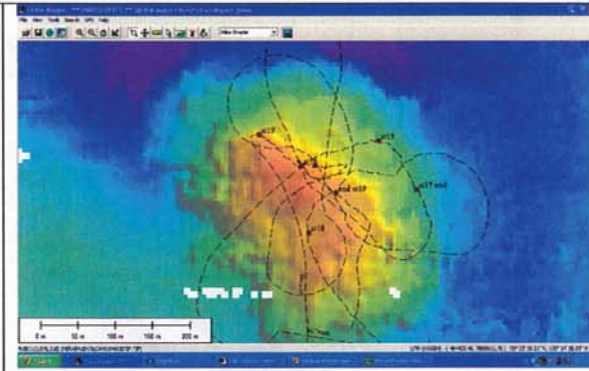





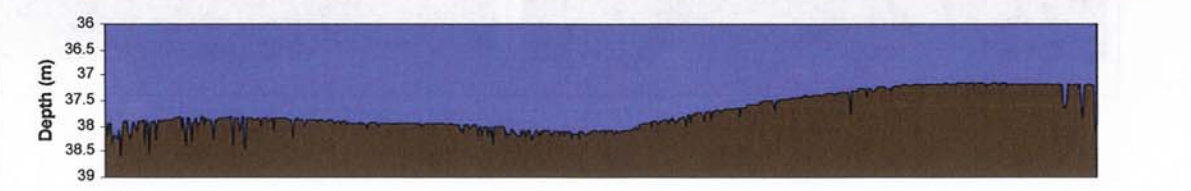
# Station 16

Description	Kopanor volcano, top.		
Depth	~40m		
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	135*25.093	70*23.415	05:29:14
End	135*25.077	70*23.414	05:37:22
Restart after tape chg			05:42:15
	135*25.018	70*23.414	05:46:11
Tape#	4, 5		
Recording time:	08:15 on tape 4 and 3:56 on tape 5.		
Comment:	Top of the Kopanor volcano. Slow drift, good visibility. Few Leptasterias, possibly brooding. Few isopods. Many small burrows in sediment, some gravel and /or clay concretions. Many small (polychaete?) burrows in gravelly muddy first section of station tape. Fauna logged (LOG16 – part1.TXT: 05:29:14 – 05:37:29, LOG16 – part 2.TXT: 05:42:15 – 05: 46:11). Species recorded: <i>Buccinum</i> sp., <i>Colus</i> sp., <i>Crossaster papposus</i> , <i>Cryptonatica affinis</i> , <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Saduria entomon</i> , <i>Saduria sabini</i> , Soft Coral 3, Unid. Sponge, Unid. Whelk, <i>Urasterias lincki</i>		



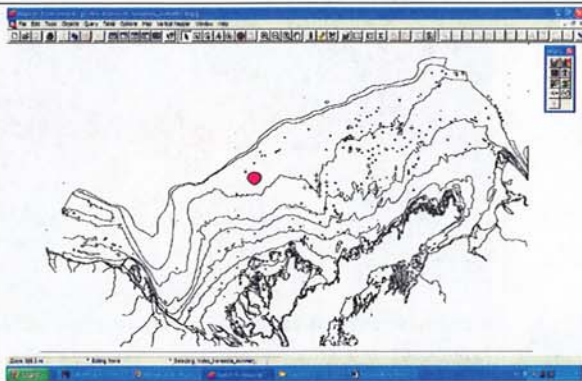
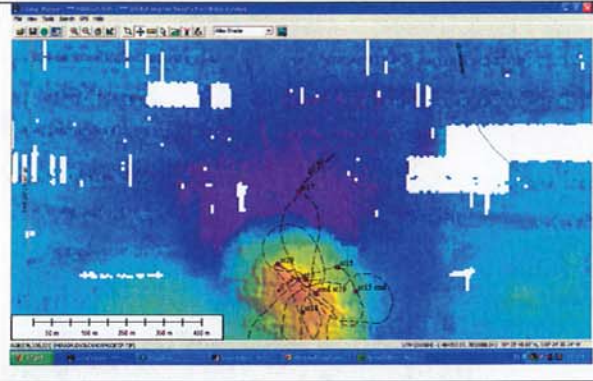








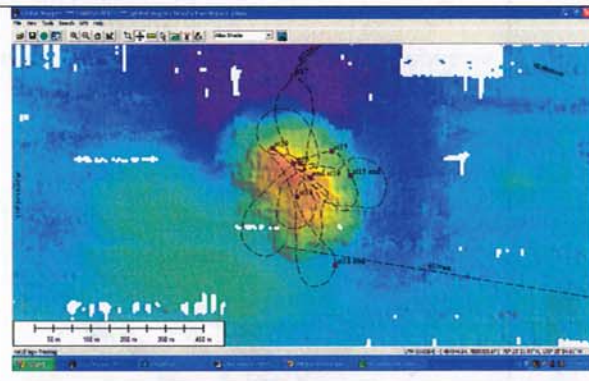
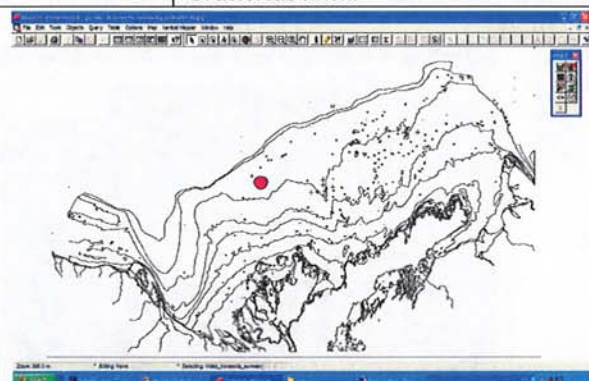
# Station 17

Description	Koponor volcano. Deep current scour North of it.		
Depth	80m		
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	135*25.095	70*23.541	05:59:00
End	135*25.007	70*23.580	06:08:20
Tape#	5		
Recording time:	9:20		
Comment:	Featureless mud easily resuspended by tripod legs. Mostly barren. Few isopods. Fauna logged (LOG 17.TXT) Species recorded: <i>Saduria entomon</i> , <i>Saduria sabini</i> , Unid. Polychaete, Unid. Whelk, <i>Urasterias lincki</i>		
<div><div></div><div></div></div>			
<div>N 70 23.542 W135 25.094</div>		<div>Hdg: 007.5 Speed: 000.0</div>	
<div>05:59:10</div>		<div>08-10-04</div>	
<div>N 70 23.557 W135 25.065</div>		<div>Hdg: 007.5 Speed: 000.0</div>	
<div>06:02:02</div>		<div>08-10-04</div>	

# Station 18

Description	Koponor volcano.Top.		
Depth			
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	135 25.078	70 23.359	7.19.14
End	135 25.040	70 23.332	7.23.15
Tape#	5		
Recording time:	04:04		

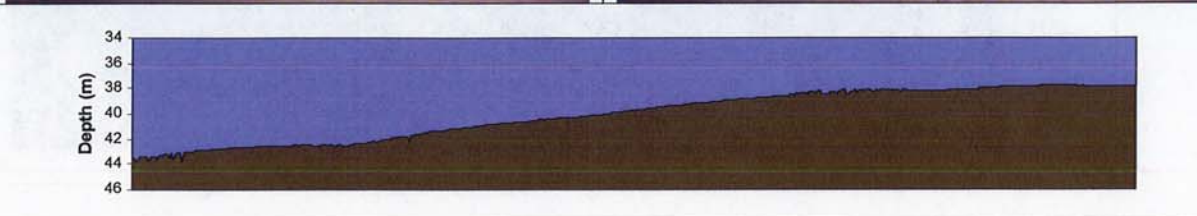


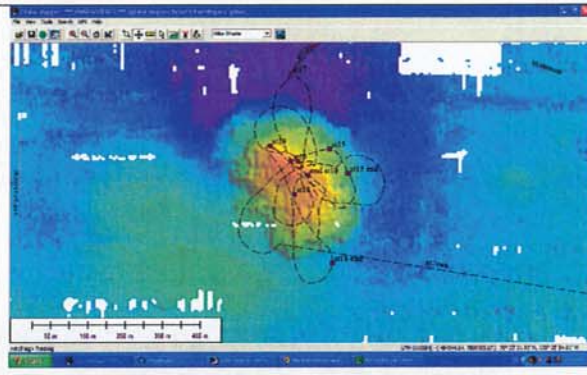

Comment: Station label was not recorded on camera as usually done before taping. An attempt to record gas seepage, which was observed from the surface during station 16. Sediment is highly porous, with increasing depth its character changes, more clay concretions appear. Few large isopods. Many large (bivalve) infaunal burrows. Large isopods (both *S. entomon* and *sabini*) common, one hermit crab. Fauna logged (LOG18.TXT). Species recorded: *Buccinum* sp., *Cohus* sp., *Cryptonatica affinis*, *Leptasterias groenlandica*, *Pagurus* sp., *Saduria entomon*, *Saduria sabini*, Unid. Whelk, *Urasterias lincki*





# Station 19

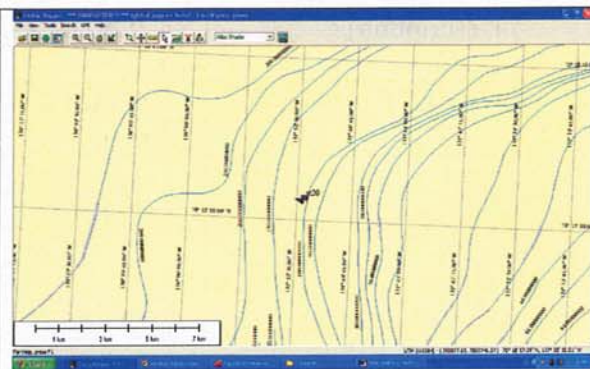
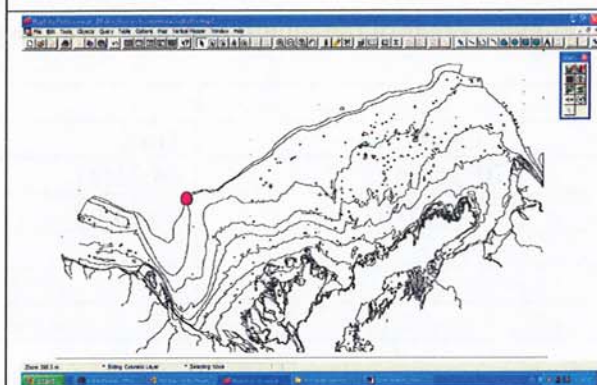
Description	Koponor volcano. Top, drifting south.		
Depth	40 and increasing.		
Date UTC	10 August 2004		
	Longitude	Latitude	Time
Start	135 25.181	70 23.436	07:37:33
End	135 25.034	70 23.389	07:45:46
Tape#	5		
Recording time:	08:13		
Comment:	Similar to previous station, many burrows/gas escape holes in sediment. Patches of gravel/clay concretions. Isopods common. Some shell fragments. <i>Leptasterias</i> common – brooding, various sizes. Large infaunal burrows (bivalves?) throughout. Fauna logged (LOG19.TXT). Species recorded: <i>Buccinum</i> sp., <i>Colus</i> sp., <i>Cryptonatica affinis</i> , <i>Leptasterias groenlandica</i> , <i>Saduria entomon</i> , <i>Saduria sabini</i> , Unid. Whelk, <i>Urasterias lincki</i>		





# Station 20

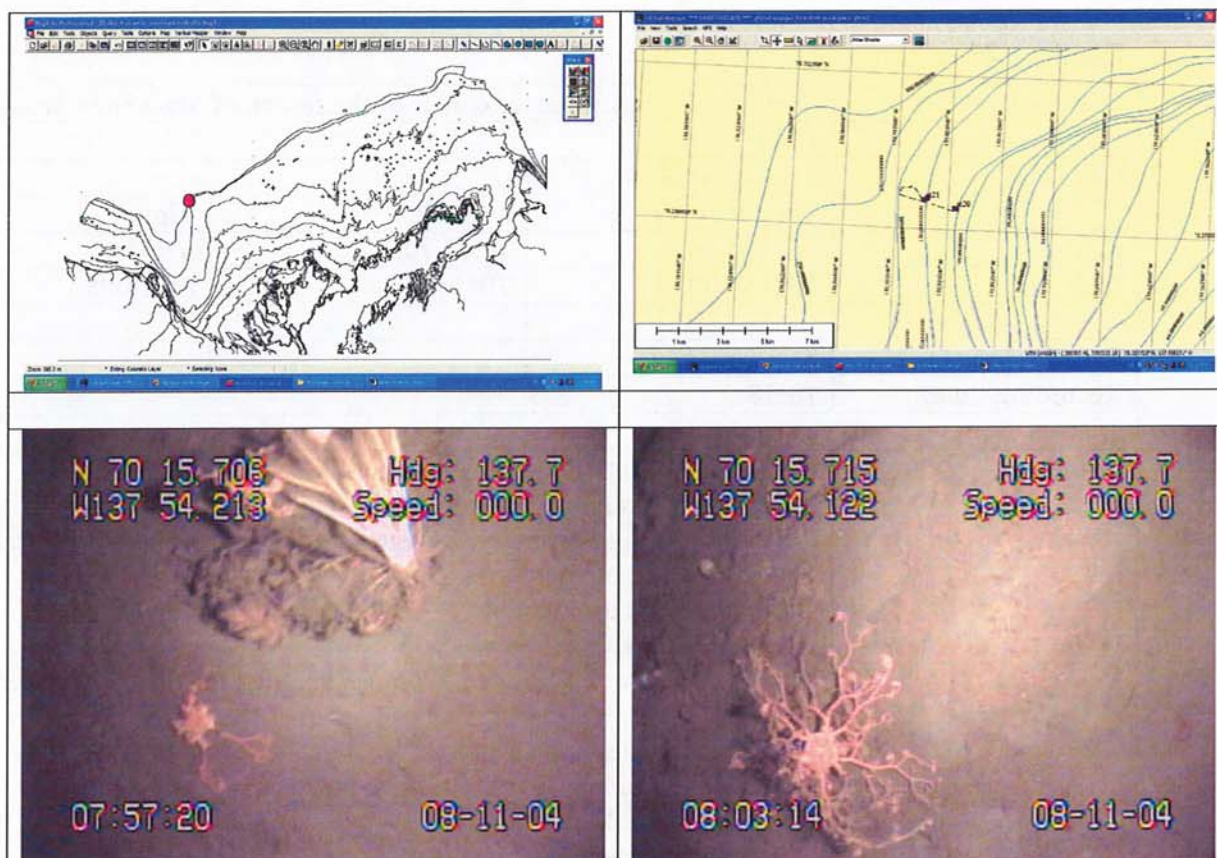
Description	Shelf break, eastern upper corner of the mouth of Mackenzie trough.		
Depth	100m		
Date UTC	11 August 2004		
	Longitude	Latitude	Time
Start	137*52.184	70*15.551	06:21:27
End	137*51.922	70*15.516	06:43:00
Tape#	5		
Recording time:	12:45:02		
Comment:	<p>High diversity of epifauna. Clear water, slow drift. Corals, anemones, brittle stars. Actinauge-type anemones. Small burrowing anemones (Edwardsia type). Some slumping, gravel patches.</p> <p>Fauna logged (LOG20 –  Part 1: 6:21:27 – 6:21:46 – Cnidarians only  Part 2: 6:30:38 – 6:43:00 – Cnidarians only  Part 3: 6:21:27 – 6:21:46 – Brittle stars 2 only  Part 4: 6:30:38 – 6:43:00 – Brittle stars 2 only  Part 5: 6:21:27 – 6:21:46 – all other fauna  Part 6: 6:30:38 – 6:43:00 – all other fauna  Part 7: 6:30:38 – 6:43:00 – <i>Ophiura</i> sp. counts from still frames  Part 8: 6:30:38 – 6:43:00 – <i>Urticina</i> sp.)</p> <p>Species recorded:</p> <p><i>Alcyonium</i> sp.  <i>Bolocera tuediae</i>  <i>Buccinum</i> sp.  <i>Colus</i> sp.  <i>Croassaster papposus</i>  <i>Cryptonatica affinis</i>  <i>Gorgonocephalus arcticus</i>  <i>Halcompa</i> sp.  <i>Heliometra glacialis</i>  <i>Hormathia</i> sp.  <i>Ophiacantha bidentata</i>  <i>Ophiura</i> sp.  <i>Pachycerianthus fimbriatus</i>  Unid. Polychaete  Unid Priapulid?  <i>Pteraster militaris</i>  Soft Coral 3  <i>Solaster</i> sp.  <i>Strongylocentrotus droebachiensis</i>  Unid. Whelk</p>		

*Urticina sp.*

## Station 21

Description	Shelf break, eastern upper corner of the mouth of Mackenzie trough.		
Depth	144m		
Date UTC	11 August 2004		
	Longitude	Latitude	Time
Start	137*54.261	70.15.706	07:55:19
End	137*54.009	70*15.754	08:14:05
Tape#	5		
Recording time:	18:55		
Comment:	<p>Patches of ice rafted gravel, some borrows, crinoids, abundant brittlestars, slumping and bedding. Strong current on the bottom, but drift is slow. High diversity. Unusual burrows/openings in substrate. Several species of anemones. <i>Gorgonocephalus</i> common.</p> <p>Clay accretions throughout</p> <p>Fauna logged (LOG21 –</p> <p>Part 1: <i>Ophiacantha</i> counted, <i>Ophiura</i> counted in still frames every 1 min</p> <p>Part 2: Anemones and Crinoids</p> <p>Part 3: all remaining fauna and large burrows)</p> <p>Species recorded:</p> <p><i>Alcyonium</i> sp.</p> <p><i>Bolocera tuediae</i></p> <p><i>Buccinum</i> sp.</p> <p><i>Colus</i> sp.</p> <p><i>Cryptonatica affinis</i></p> <p><i>Gorgonocephalus arcticus</i></p> <p><i>Halcampa</i> sp.</p> <p><i>Heliometra glacialis</i></p> <p><i>Hormathia</i> sp.</p> <p><i>Icasterias panopla</i></p> <p><i>Ophiacantha bidentata</i></p> <p><i>Ophiocten sericeum</i></p> <p><i>Ophiura</i> sp.</p> <p><i>Pachycerianthus fimbriatus</i></p> <p><i>Pteraster militaris</i></p> <p>Soft Coral 3</p> <p>Unid. Priapulid</p> <p>Unid. Sea Pen</p> <p>Unid. whelk</p> <p><i>Urticina felina</i></p> <p><i>Urticina</i> sp.</p>		





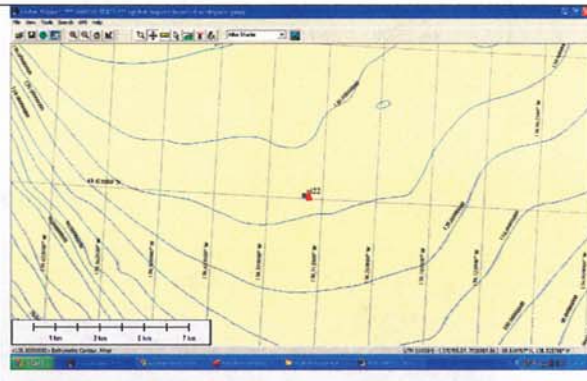
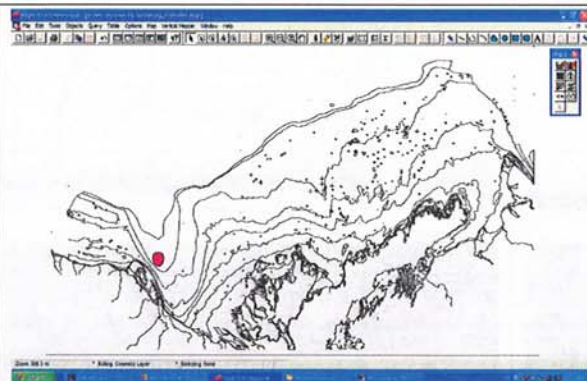
## Station 22

Description	Middle of Mackenzie canyon.		
Depth	136m.		
Date UTC	11 August 2004		
	Longitude	Latitude	Time
Start	138*19.954	69*37.567	12:50:18
End	138*19.871	69*37.534	13:05:27
Tape#	6		
Recording time:	15:10		

### Comment:

Clear water, little suspension. Muddy seabed with abundant and actively moving brittle stars. Soft corals (*Alcyonacea*) present, light color, a different species from the previous stations.

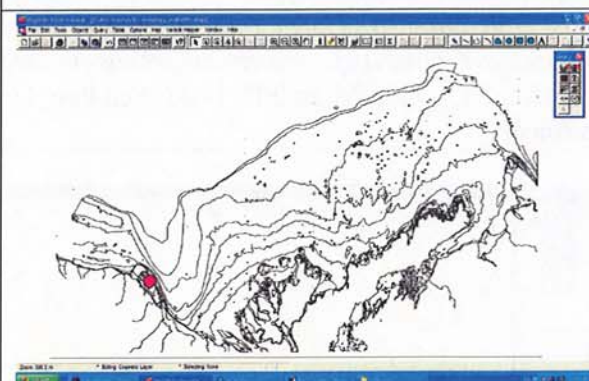
Fauna logged (LOG22 – part 1: all fauna except *Ophiura* sp., LOG22 – part 2: *Ophiura* sp.). Species recorded: *Alcyonium* sp., *Buccinum* sp., *Colus* sp., *Cryptonatica affinis*, *Ctenodiscus crispatus*, *Gersemia rubiformis*, *Halcampa* sp., *Hormathia* sp., *Icasterias panopla*, *Leptasterias groenlandica*, *Ophiura* sp., *Pachycerianthus fimbriatus*, *Saduria sabini*, Soft Coral 3, Unid. Priapulid?, Unid. Sea Pen, Unid. Whelk, *Urasterias lincki*





# Station 23

Description	Trough next to Hershel island.		
Depth	70m		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	138*47.582	69*27.471	05:35:33
End	138*47.674	69*27.610	05:46:28
Tape#	6		
Recording time:	10.59		
Comment:	Drift 1kn. Some isopods and brittlestars, muddy bottom, easily resuspended sediment. Low abundance of fauna. Fauna logged (LOG 23.TXT). Species recorded: <i>Buccinum</i> sp., <i>Cryptonatica affinis</i> , <i>Ophiura</i> sp., <i>Saduria entomon</i> , <i>Saduria sabini</i> , Unid. Sponge, Unid. Whelk.		

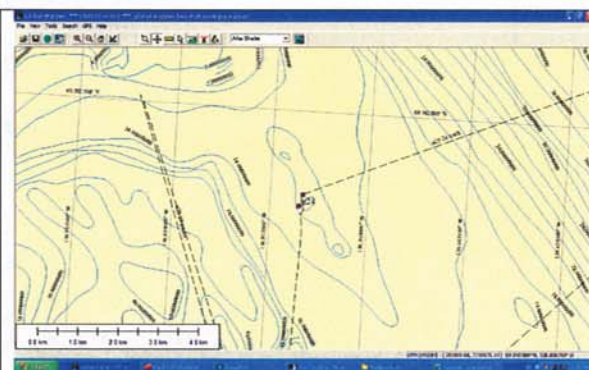
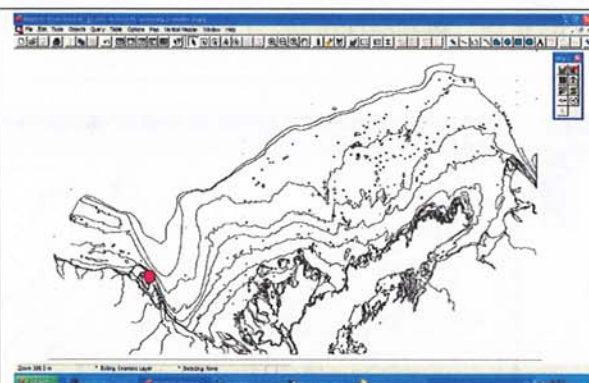




# Station 24

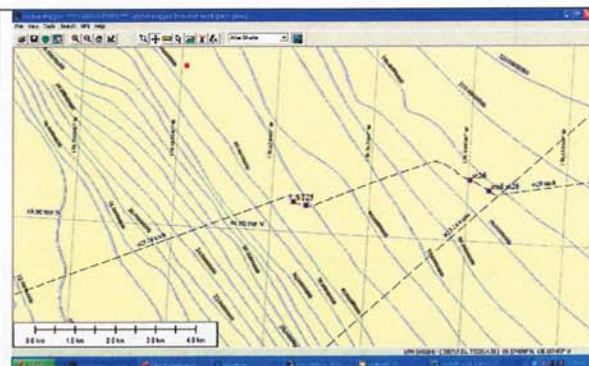
Description	Ridge next to Hershel island.		
Depth	8 – 12 m		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	138*47.627	69*32.479	06:33:32
End	138*47.512	69*32.628	06:43:11
Tape#	6		
Recording time:	09:40		

Comment: Gravel in sand. Good visibility, fauna is scarce. An unidentified fish!  
Fauna logged (LOG24.TXT).  
Species recorded: *Buccinum* sp., *Colus* sp., *Cryptonatica affinis*,  
*Gersemia rubiformis*, *Ophiura* sp., *Pachycerianthus fimbriatus*, Soft  
Coral 3, Unid. Fish, Unid. Sea pen, Unid. Whelk



# Station 25

Description	Hershel transect 50 m		
Depth	49m		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	138*36.658	69*34.156	07:29:39
End	138*36.157	69*34.115	07:40:17
Tape#	6		
Recording time:	10:39		
Comment:	<p>Very high abundance of brittle stars. Drift 1.1 kn. Some erratic cobbles. Muddy sediment. <i>Metridium</i> type anemone common.</p> <p>Fauna logged (LOG 25a – part 1.TXT: all fauna except <i>Ophiura</i> sp., LOG 25 – part 2: still counts of <i>Ophiura</i> sp. every 1 min). Species recorded: <i>Bolocera tuediae</i>, <i>Buccinum</i> sp., <i>Colus</i> sp., <i>Cryptonatica affinis</i>, <i>Gersemia rubiformis</i>, <i>Heliometra glacialis</i>, <i>Hormathia</i> sp., <i>Metridium</i> sp., <i>Ophiura</i> sp., <i>Saduria entomon</i>, Soft Coral 3, Unid. Sea Pen, Unid. Whelk</p>		





# Station 26

Description	Mackenzie trough, 100m station Hershel transect.		
Depth	104 -106m		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	138*29.397	69*34.574	08:16:05
End	138*29.197	69*34.442	08:26:26
Tape#	6		
Recording time:	10:20		

## Comment:

1.7kn drift. Drifting speed too fast to let good identification of fauna or get high quality screen grabs. *Crossaster*-type sea stars common, along with *Leptasterias groenlandicus* / *Asterias vulgaris*. A hard coral??? Quantification / ID of mollusks not possible.

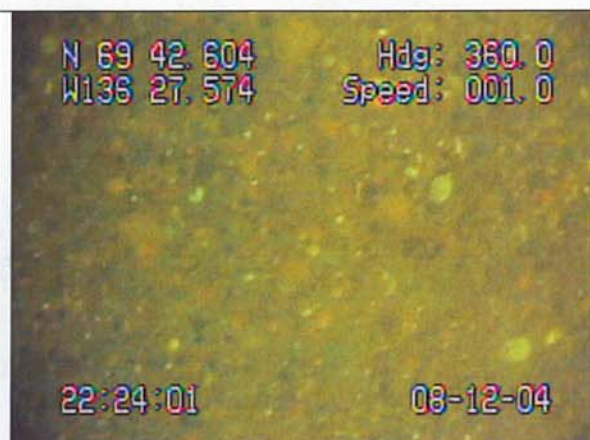
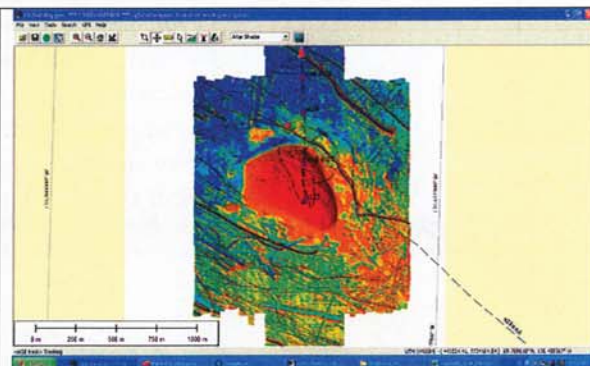
Fauna logged (LOG26 – part 1.TXT: *Leptasterias groenlandica* and *Hormathia nodosa* only, LOG26 – part 2.TXT: all other fauna, LOG26 – part 3: still counts of *Ophiura sp.* every 1 min.). Species recorded: *Alcyonium sp.*, *Bolocera tuediae*, *Crossaster papposus*, *Ctenodiscus crispatus*, *Gersemia rubiformis*, *Halcampa sp.*, *Heliogetra glacialis*, *Hormathia sp.*, *Leptasterias groenlandica*, *Ophiura sp.*, *Saduria sabini*, Soft Coral 3, Unid. Sea Pen





# Station 27

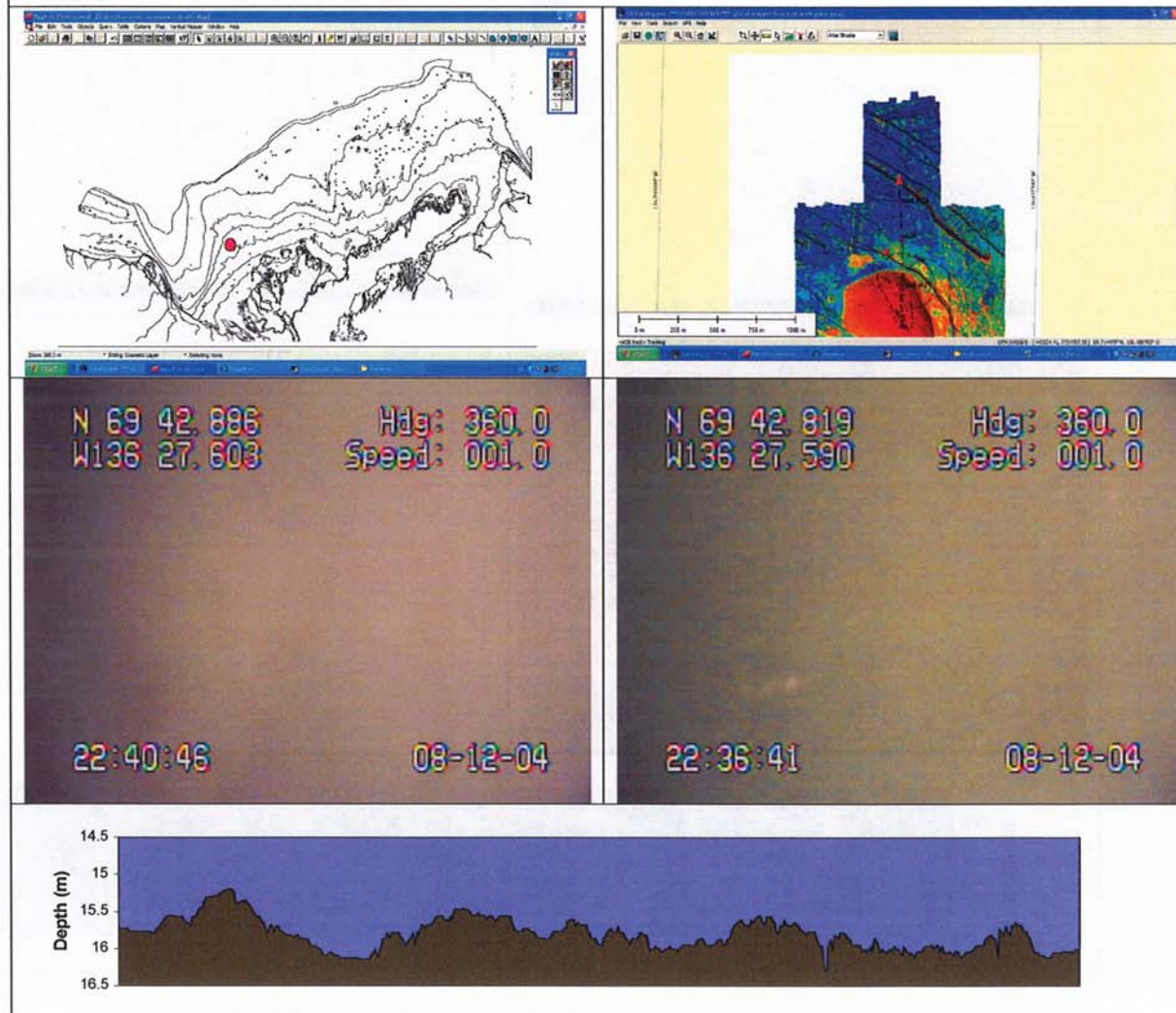
Description	Artificial island Minuk, top.		
Depth	5m		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	136*27.561	69*42.510	22:16:25
End	136*27.571	69*42.644	22:26:25
Tape#	7		
Recording time:	09:54		
Comment:	Clear water, 1 kn drift. Good visibility. Symmetrical, slightly undulating, sharp, likely wave-generated sand ripples. Scattered gravel, becoming more abundant with the increase in water depth. No fauna.		



# Station 28

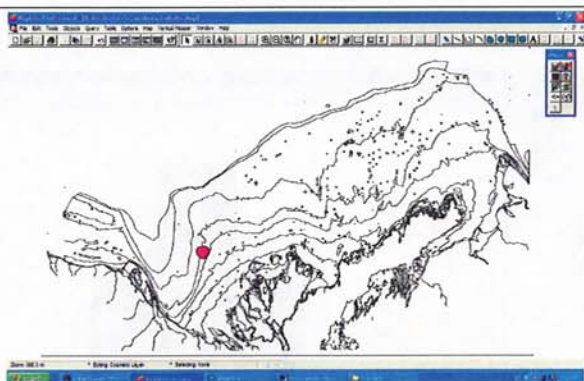
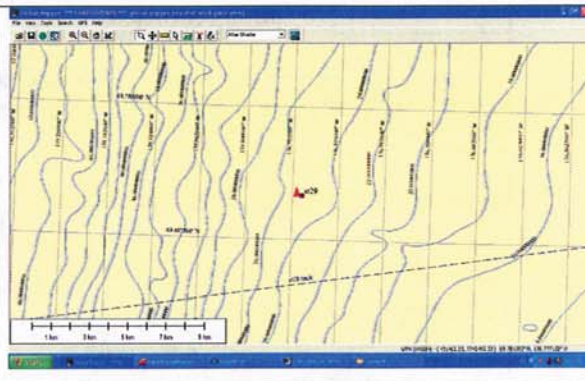

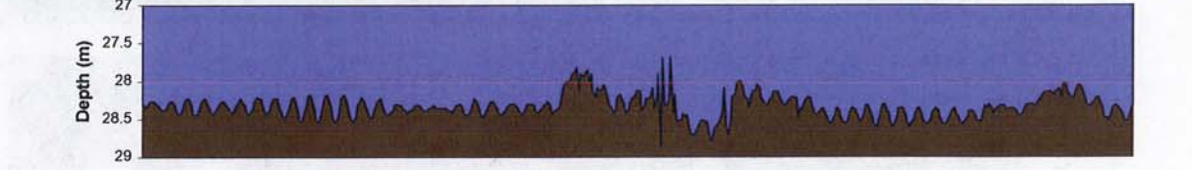
Description	Off Minuk, in deeper water.		
Depth	~14 meters.		
Date UTC	12 August 2004		
	Longitude	Latitude	Time
Start	136*27.591	69*42.814	22:36:25
End	136*27.611	69*42.934	22:43:51
Tape#	7		
Recording time:	07:26		

Comment: Station label was not filmed in the beginning of the recording because camera was left in the water during a short drift from previous station. Mud, turbid layer over the bottom, very poor visibility. Camera legs re-suspending the mud.  
No fauna recorded.





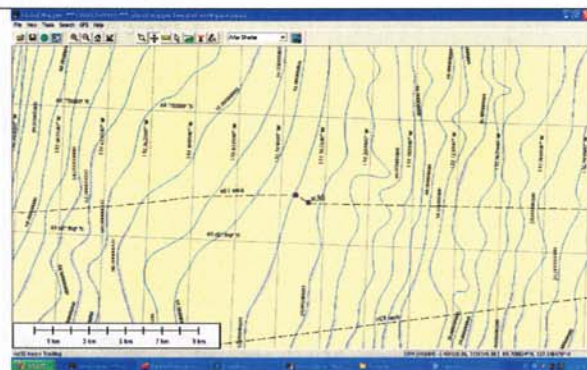
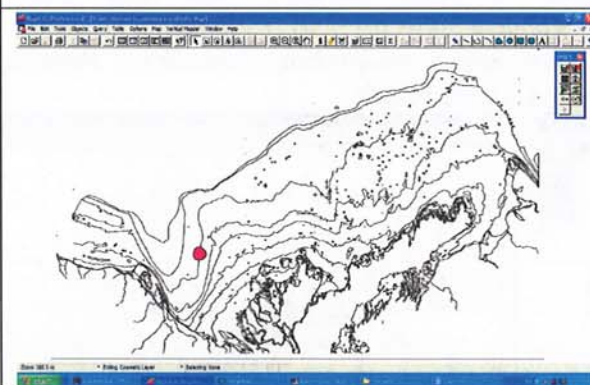
# Station 29

Description	Station at 25m isobath on the second Mackenzie transect, going west towards the centre of the trough.		
Depth	25m		
Date UTC	13 August 2004		
	Longitude	Latitude	Time
Start	136*55.542	69*42.503	02:12:54
End	136*55.881	69*42.562	02:18:06
Tape#	7		
Recording time:	05:13		
Comment:	Drifting 1.7 knots. Poor visibility because of speed and re-suspended mud. One sea star. Quantification of fauna not possible		
<div><div></div><div></div></div>			
<div><div></div><div></div></div>			
<div></div>			



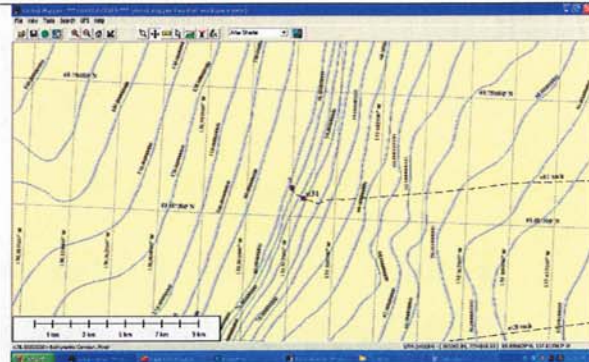
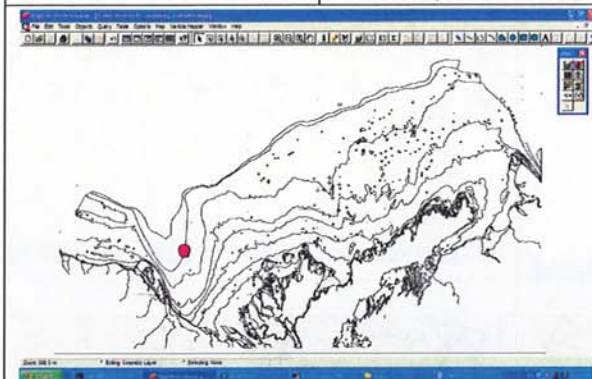
### Station 30

Description	50m isobath on the second Mackenzie transect.		
Depth	13 August 2004		
Date UTC	50m.		
	Longitude	Latitude	Time
Start	137*20.086	69*42.465	03:33:58
End	137*20.649	62*42.581	03:45:13
Tape#	7		
Recording time:	11:17		
Comment:	<p>Secchi disk depth 7m. Some <i>Saduria</i>, muddy featureless bottom with some burrows. Few anemones and soft corals (Alcyonacea). <i>Gorgonocephalus</i>. Drift 1.3kn. Water clarity is above average. Fauna logged (LOG30.TXT). Species recorded: <i>Bolocera tuediae</i>, <i>Buccinum</i> sp., <i>Gorgonocephalus arcticus</i>, <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i>, <i>Saduria entomon</i>, <i>Saduria sabini</i>, Soft Coral 3, Unid. Fish, Unid. Mud Shrimp, Unid. Whelk</p>		



### Station 31

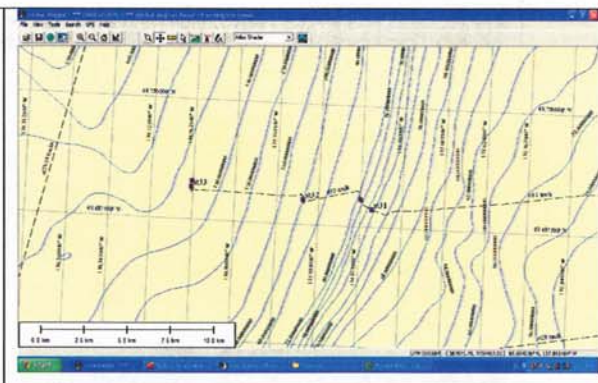
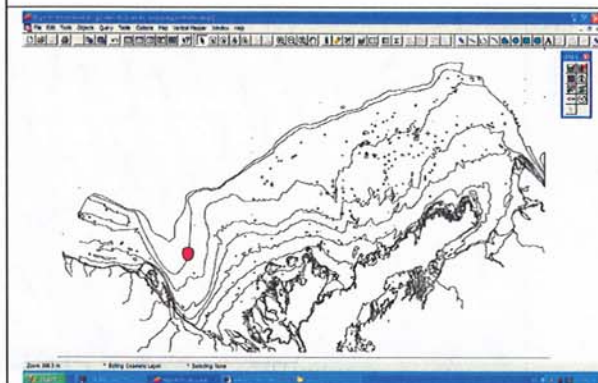
Description	75m isobath on the second Mackenzie transect.		
Depth	72m, 89 m on thee winch, bad cable angle.		
Date UTC	13 August 2004		
	Longitude	Latitude	Time
Start	137°47.700	69°41.797	05:06:06
End	137°48.824	69°42.179	05:23:37
Tape#	7, 8		
Recording time:	17:33		
Comment:	Drift 1.7 – 2.2 knots, swells. High abundance of brittlestars. Soft corals, typical canyon fauna. Recording continued a bit longer than usual because the camera was at many times too high above the bottom to produce useful images. Recording started on tape 7, continued on tape 8 (VHS). Many large infaunal burrows throughout (bivalves and polychaetes?). Fauna logged (LOG31 – part1.TXT: 05:06:06 – 05:12:13 – all fauna, LOG31 – part2.TXT: 05:06:06 – 05:23:39 – <i>Ophiura</i> sp. still counts every 1 min, LOG31 – part 3: 05:12:06 – 05:23:39 – all fauna). Species recorded: <i>Alcyonium</i> sp., <i>Buccinum</i> sp., <i>Gorgonocephalus arcticus</i> , <i>Heliometra glacialis</i> , <i>Hormathia</i> sp., <i>Leptasterias groenlandica</i> , <i>Ophiura</i> sp., <i>Pteraster militaris</i> , Soft Coral 3, Unid. Whelk.		





### Station 32

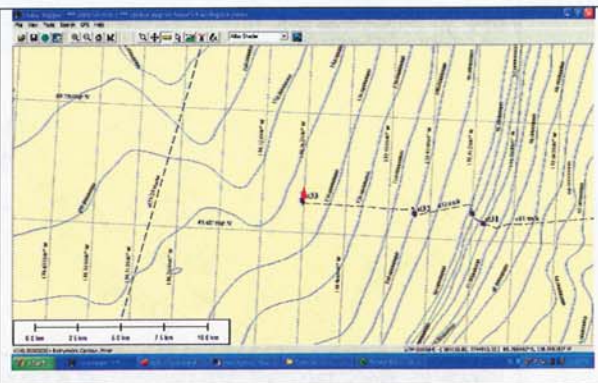
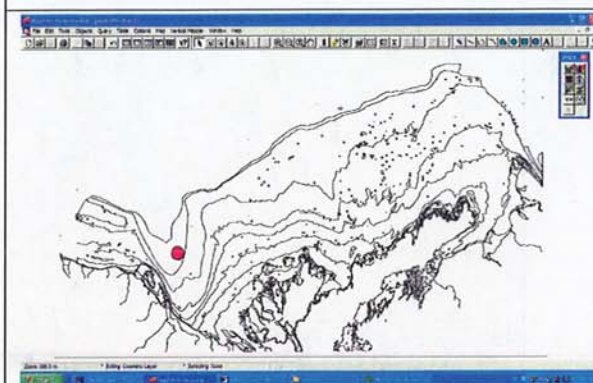
Description	100m isobath on the second Mackenzie transect.		
Depth	Around 100m		
Date UTC	13 August 2004		
	Longitude	Latitude	Time
Start	137*53.847	69*42.022	06:03:24
End	137*53.939	69*42.140	06:15:32
Tape#	8 (VHS)		
Recording time:	12:08		
Comment:	<p>Drift 0.9 kn. High abundance of brittlestars, some soft corals, a lot of "sea snow" in the water column. Polychaete tubes and mound shaped burrows are common. Anomya-like shells common: Scallops??? Shells not quantified.</p> <p>Fauna logged (LOG32 – part 1.TXT: all fauna except <i>Ophiura</i> sp., LOG 32 – part 2.TXT: unid. Shell, sample count over 2.5 min, LOG 32 – part 3.TXT: <i>Ophiura</i> sp. count – roughly 1 frame / min)</p> <p>Species recorded:</p> <p><i>Alcyonium</i> sp.  <i>Buccinum</i> sp.  <i>Collossendeis</i> sp.  <i>Gersemia rubiformis</i>  <i>Gorgonocephalus arcticus</i>  <i>Heliometra glacialis</i>  <i>Halcanpa</i>  <i>Hormathia</i> sp.  <i>Leptasterias groenlandica</i>  <i>Ophiura</i> sp.  Soft Coral 3  Unid. Bivalve  Unid. Sea Pen  Unid. Whelk</p>		



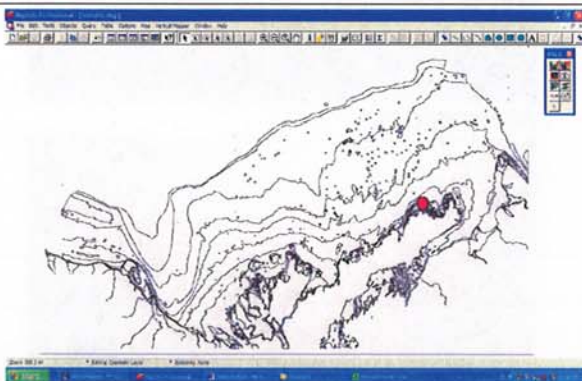

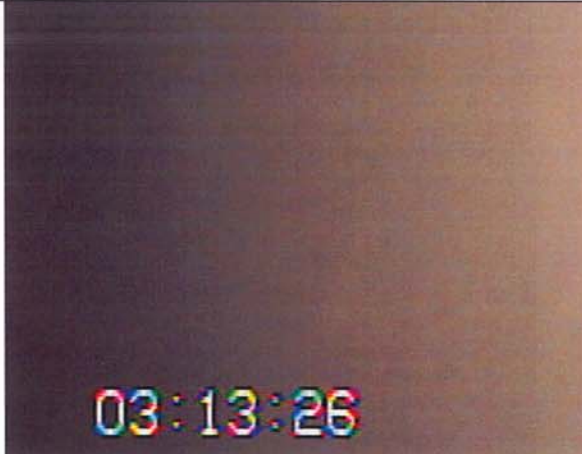



### Station 33

Description	140m isobath on the second Mackenzie transect.		
Depth	135		
Date UTC	13 August 2004		
	Longitude	Latitude	Time
Start	138*03.918	69*42.259	07:03:42
End	138*03.863	69*42.447	07:20:37
Tape#	8 (VHS)		
Recording time:	16:55		
Comment:	<p>Brittlestars abundant, mud star, shrimp. Soft corals. No snow and no current on the bottom. Some small amphipods, almost no burrows, few small ones. Featureless mud. Drift 1 – 1.3 kn.</p> <p>Fauna logged (LOG33 – part 1.TXT: all fauna except <i>Ophiura</i> sp., LOG33 – part 2.TXT: <i>Ophiura</i> sp.)</p> <p>Species recorded:</p> <p><i>Alcyonium</i> sp.  <i>Buccinum</i> sp.  <i>Cryptonatica affinis</i>  <i>Gersemia rubiformis</i>  <i>Gorgonocephalus arcticus</i>  <i>Halcampa</i> sp.  <i>Hormathia</i> sp.  <i>Leptasteris groenlandica</i>  <i>Ophiura</i> sp.  <i>Pteraster militaris</i>  Soft Coral 3  Unid. Nermertean  Unid. Polychaete  Unid. Sea Pen  Unid. shrimp  Unid. Whelk</p>		

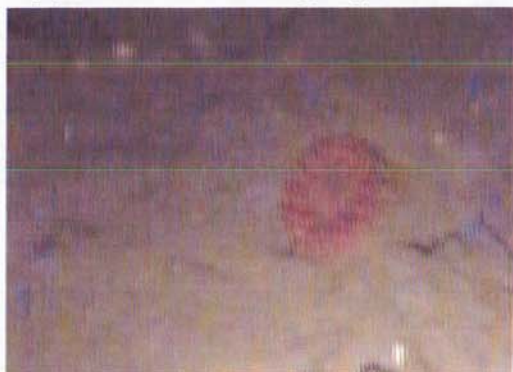


### Station 34

Description	Ice Scour 6854		
Depth	17		
Date UTC	19 August 2004		
	Longitude	Latitude	Time
Start	130°57.513	70°17.979	03:05:29
End	130°57.730	70°18.043	03:20:16
Tape#	9		
Recording time:	11:03		
Comment:	<p>Bottom bounces. Scour at 03:16:12 – 03:17:06. Timer was stuck initially. Starts again at 03:12:29. Very muddy substratum, easily re-suspended; little fauna, few isopods, one unidentified decapod crab, some bivalve debris. Large sections with camera too far from bottom to have good visibility. Fauna logged (LOG 34 – part 1.TXT, LOG 34 – part 2.TXT) Species recorded: <i>Saduria entomon</i>, Unid. Decapod Crab.</p>		
			
			



## Appendix 2. Photographs of identified species.



Anemone 1



Anemone 5



Anemone 2



Anemone 6



Anemnone 3



Anemone 9



Anemone 4

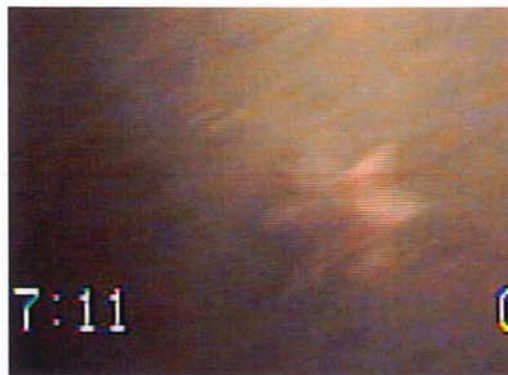


Anemone 10





*Crossaster* sp.



*Ctenodiscus* sp.



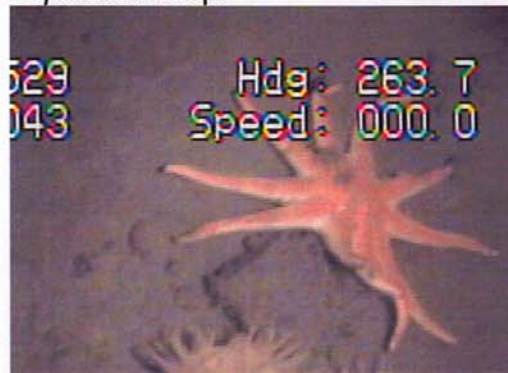
*Hippasteria* sp.



*Leptasterias* sp.



*Pteraster* sp.



*Solaster* sp.



*Icasterias panopla*



*Urasterias lincki*



*Alcyonium* sp.



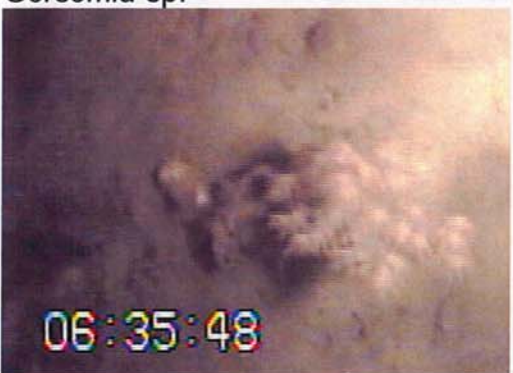
*Pagurus* sp.



*Gersemia* sp.



*Strongylocentrotus* sp.



Soft coral 3



*Saduria entomon*



*Heliometra glacialis*



*Saduria sabini*





Moon snail



Brittle star 2



Whelk



Brittle star 3

*Gorgonocephalus* sp.

Brittle star 1

