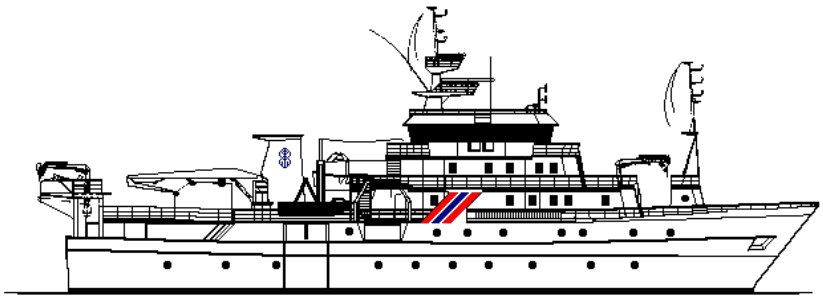


MARINE ENVIRONMENTAL SURVEY OF BOTTOM SEDIMENTS IN GHANA

Central Coast

May 2010

By
B. Serigstad[1], T.M. Ensrud[1] ,
M.Olsen[1], M. Ostrowski[1]

and
Emmanuel Appoh[2]

[1)]Institute of Marine Research
Norway
[2)]EPA
Ghana

Bergen November 2012

THE EAF-NANSEN PROJECT

FAO started the implementation of the project "Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries (EAF-Nansen GCP/INT/003/NOR)" in December 2006 with funding from the Norwegian Agency for Development Cooperation (Norad). The EAF-Nansen project is a follow-up to earlier projects/programmes in a partnership involving FAO, Norad and the Institute of Marine Research (IMR), Bergen, Norway on assessment and management of marine fishery resources in developing countries. The project works in partnership with governments and also GEF-supported Large Marine Ecosystem (LME) projects and other projects that have the potential to contribute to some components of the EAF-Nansen project.

The EAF-Nansen project offers an opportunity to coastal countries in sub-Saharan Africa, working in partnership with the project, to receive technical support from FAO for the development of national and regional frameworks for the implementation of Ecosystem Approach to Fisheries management and to acquire additional knowledge on their marine ecosystems for their use in planning and monitoring. The project contributes to building the capacity of national fisheries management administrations in ecological risk assessment methods to identify critical management issues and in the preparation, operationalization and tracking the progress of implementation of fisheries management plans consistent with the ecosystem approach to fisheries.

LE PROJET EAF-NANSEN

La FAO a initié la mise en oeuvre du projet "Renforcement de la base des connaissances pour mettre en œuvre une approche écosystémique des pêcheries marines dans les pays en développement (EAF-Nansen GCP/INT/003/NOR)" en décembre 2006. Le projet est financé par de l'Agence norvégienne de coopération pour le développement (Norad). Le projet EAF-Nansen fait suite aux précédents projets/ programmes dans le cadre du partenariat entre la FAO, Norad et l'Institut de recherche marine (IMR) de Bergen en Norvège, sur l'évaluation et l'aménagement des ressources halieutiques dans les pays en développement. Le projet est mis en oeuvre en partenariat avec les gouvernements et en collaboration avec les projets grands écosystèmes marins (GEM) soutenus par le Fonds pour l'Environnement Mondial (FEM) et d'autres projets régionaux qui ont le potentiel de contribuer à certains éléments du projet EAF-Nansen.

Le projet EAF-Nansen offre l'opportunité aux pays côtiers de l'Afrique subsaharienne partenaires de recevoir un appui technique de la FAO pour le développement de cadres nationaux et régionaux visant une approche écosystémique de l'aménagement des pêches et la possibilité d'acquérir des connaissances complémentaires sur leurs écosystèmes marins. Ces éléments seront utilisés pour la planification et le suivi des pêcheries et de leurs écosystèmes. Le projet contribue à renforcer les capacités des administrations nationales responsables de l'aménagement des pêches en introduisant des méthodes d'évaluation des risques écologiques pour identifier les questions d'aménagement d'importance majeure ainsi que la préparation, la mise en œuvre et le suivi des progrès de la mise en œuvre de plans d'aménagement des ressources marines conformes à l'approche écosystémique des pêches.

HAVFORSKNINGSINSTITUTTET
INSTITUTE OF MARINE RESEARCH

CDCF Centre for Development and Cooperation in Fisheries
C.Sundtsgate 64, 5008 Bergen
Phone: 55 238500

Title of report: : **MARINE ENVIRONMENTAL SURVEY OF BOTTOM SEDIMENTS IN GHANA. Central Coast**	Date: 20/11-2012
	N.o. pages: 73+115(appendix)
Authors: Tor Ensrud	Project leader: Bjørn Serigstad
	Survey number: 2010403

Client : **Environmental Protection Agency Ghana. (EPA Ghana)**	Accessibility: Open

Abstract: The monitoring in 2010 consisted of three transects and two grids around the Mahogany and Salt Pond oilr rigs. The monitoring consisted of benthic soft bottom analyses, grain size distribution of sediment and chemical analyses of hydrocarbons, heavy metals, PCB and pesticides. Except from an area polluted by Arsene, the levels of heavy metals were low all over the sampling area. Concentrations of hydrocarbons were also low and PCB-levels were below the detection limit for most sites. The detection limit of pesticide was too high to detect elevated levels. The finest sediment was found in the deepest areas, while coarse sediment was detected near shore and by the Volta River outlet. The benthic fauna was diverse with a relatively even distribution and show no sign of disturbance.

Keywords: Marine survey, THC, PAH, NPD, heavy metals, PCB, offshore monitoring, Background concentration.

Responsible for:	**Date:**	**Signature:**
Professional evaluations and interpretations:	20/11-2012	*Bjørn Serigstad*
Project:	2010403	*Tor M. Ensrud*

Participations on the cruise

Sediment sampling onboard *Dr. Fridtjof Nansen*

From Ghana:
First Group:

Emmanuel Appoh	(EPA Ghana)
Abdalla Ibin A. Siddiq	(EPA Ghana)
Lloyd Cyril Allotey	(University of Ghana, Legon)
Dr. Joseph Aggrey-Fynn	(University of Cape Coast)
Ebenezer Lartey -	(Survey Department)
Simon Sovoe -	(EPA Volta Region)

Second Group:

John Kofi Nyante	(EPA Ghana)
Kwame N. Damoah	(Marine Fisheries Research Division)
Ebenezer Fiahagbe	(EPA Ghana)
Emmanuel Kluvi	(University of Ghana Legon)

Shoreline sampling:

Emmanuel Appoh	(EPA Ghana)
George Diavuo	(EPA Ghana western region (where the oil was found))
Peter A	(University of cape coast)
Joshua Odonkor	(EPA Ghana)

From Norway:

Bjørn Serigstad (Cruise leader)	(IMR)
Tor Ensrud (supervisor)	(Uni Research AS)
Martin Junkers Oldich	(Argus Remote Systems)
Magne Olsen	(IMR)
Tore Mørk	(IMR)
Jarle Kristiansen	(IMR)
Marek Ostrowski	(IMR)

We would like to thank the officers and the crew onboard *Dr. Fridtjof Nansen*.

ANALYSIS AND REPORTING

Sorting of biological samples
Uni Research AS

Identification of biological samples
Tom Alvestad, Jon Hestetun and Per Johannessen (Uni Research AS)

Organic chemical analyses
Eurofins Environmental laboratory AS

Metal analyses
Eurofins Environmental laboratory AS

Physical analyses
Helge Grønning (Uni Research AS)

Computer analyses
Kristin Hatlen (Uni Research AS)

Reporting
Kristin Hatlen, Tor Ensrud and Per-Otto Johansen (all from UNI Research), Bjørn Serigstad (IMR), Magne Olsen (IMR).

SAM-Marin is a department under the corporation Uni Research, and is accredited by Norsk Akkreditering for sampling, taxonomic analysis and professional evaluations and interpretations, with the accreditation number Test 157.

The following activities were performed accredited:

Sampling for analyses of: benthos, geology and chemical analyses by Ghana personnel under the supervision of Tor Ensrud.

Sorting of sediment by: Amir Amin, Natalia Korableva and Ragna Tveit.

Identification of marine fauna by: Jon Hestetun, Tom Alvestad and Per Johannessen.

Chemical analyses by: Eurofins Norsk Miljøanalyse **with accreditation number:** 003Accredited: Heavy metals (Ba, As, Pb, Cd, Cu, Cr, Hg, Ni, Zn), Hydrocarbons (THC, PAH 16, NPD), PCB7 and 16 Chlorinated pesticides

Reporting from Uni Research AS by: Kristin Hatlen and Per-Otto Johansen.

Table of Contents

1.INTRODUCTION

The coastal zone of Ghana stretches from the borders with the Republic of Togo in the east to the Republic of Cote d'Ivoire in the West and covers a total distance of 565 km. The coastal stretch may be divided into three geomorphologic zones with various characteristics as below:

- The West Coast covers 95 km and is made up of fine sand, gentle beaches and coastal lagoons
- The Central Coast covers 321 km, and is made up of embayed coast of rocky headlands, rocky shores, littoral sand barriers and coastal lagoons
- The East Coast is 149 km long and has sandy beaches with the deltaic estuary of Volta River situated half way in between.

Ghana's coastal zones cover about 6.5 % of the country's land area, but inhabits about 25 % of the nations population. The current use of the coastal areas in Ghana are fishing; human settlements; tourism; industrial development; mining; sand winning, oil and gas exploration and exploitations. Marine fishing contributes about 4 % to the country's GDP. The living standards of people in the fishing communities in these areas are significantly lower than in the urban centres. Average welfare levels among food farmers in rural coastal areas, estimated by the Ghana Poverty Reduction Strategy, are 12 % below that of large urban centres such as Accra. Lack of healthcare, poverty and environmental degradation contribute to a vicious circle that inhibits human development in the coastal zone.

Consequently, the emerging oil industry poses a challenge to Ghana's coastal population, the majority being fishermen. The effects of the oil industry on other industrial and economical interests are also of concern to Ghana. These groups are concerned about the possible negative impacts of the petroleum activity in several areas, such as:

- Pollution from oil production and oil tankers accidents
- Discharges of untreated wastes from oil tankers and other vessels
- Loss of marine biodiversity due to drilling activity and pollution
- Reduced fish stocks
- Limited access to fishing grounds
- Limitations to settlements and recreational use of the coast line
- Fear of health problems relating to pollution
- Limitations to the emerging tourist industry

The co-existence of the fishing communities and the oil industries among others, is necessary for a sustainable utilisation of marine resources, conservation and protection of the marine environment. An effective Coastal Zone Management must therefore be based on a clear understanding of the complexities in relation to the natural resources of the coastal areas, and the coastal population that subsists on these resources.

An important factor in safeguarding and balancing the relation between different commercial users, the coastal inhabitants and the protection of the marine environment, is the development of legislations, political instruments including policies, the establishment of governmental institutions, NGOs and private institutions. These initiatives are being spearheaded by the Environment Protection Agency (EPA). Previous Ghanaian legislations that have been passed in the area of integrated coastal zone management and sustainable development includes the following:

- Beaches Obstruction Ordinance, 1897 (Cap 240)
- Rivers Ordinance, 1903 (Cap 226)
- Wild Animals Preservation Act, Act 43, 1961
- Oil in Navigable Waters Act, Act 235, 1964
- Towns Ordinance, 1892
- Volta River Development Act, 1961
- Fisheries (Amended) Regulations, 1977 and 1984
- Fisheries Law, PNDC 256, 1991
- Fisheries Act 625, 2002.

The legislation for marine environmental protection, sustainable use, and conservation of marine living resources is contained in *the Biodiversity Strategy and Action Plan* and the Coastal Wetlands Strategy of Ghana. To be prepared to handle the events of operational discharges and accidental spills of hydrocarbons, drill cuttings, drilling mud and chemicals used to control and maintain drilling operations; various legislation have been passed including the Oil Revenue Bill which have been passed by the parliament of Ghana. This will safeguard the nation including the coastal communities' interests regarding environmental issues and also ensure that safety and environmental standards are commensurable with international practices.

To empower the EPA in its mission to co-manage, protect and enhance the country's marine environment, the offshore environmental monitoring plan comprising three regional baseline surveys was planned prior to oil and gas exploration on a larger scale.
The first part of the marine environmental baseline survey was carried out in 2009 prior to oil production covering the western region. In 2010, the second baseline survey on the marine environment within the country's territorial waters was conducted in the central part of Ghana (including the transect starting from Ada Foah).

The problems with pollution and transport of pollutants are complex and transboundary. Petroleum activities are not only limited to the Ghanaian coast but also to our neighbours in the West and East including Cote d'Ivoire and Nigeria, respectively. It is therefore a shared problem between countries in the Guinea Current Large Marine Ecosystems (GCLME).

A detailed overview of the marine resources and the environmental state of the ecosystem is necessary for the management of the marine resources in a way that will benefit Ghana.

The initial surveys conducted at the Ghanaian continental shelf are aimed at providing useful data on the existing marine environment, fish stocks and the benthic fauna, which could help when designing a future monitoring program. Both field-specific monitoring and wider area monitoring has been adopted by the Environmental Protection Agency to ensure holistic environmental quality monitoring of the marine environment.

Consequently, a multisectorial approach for the baseline surveys were facilitated by the Ministries of Environment Science and Technology (MEST), Ministry of Energy (Petroleum), Ministry of Fisheries and the Universities.

The survey of 2009 consisted of a station grid surrounding the Jubilee Petroleum Field and three transects; GW (close to the border to Ivory Coast, GP (along the proposed location for a pipeline from the Jubelee field to shore, GE begins close to the Princes Town

In 2010 the three transects Ghana central GC1, GC2 and GC3 were investigated in addition to the station grids around Mahogany oil field (MA-Deep) and the Salt Pond oil rig (SP).GC1 initiating at the shoreline close to Sekondi, GC2 starting near Saltpond and GC3 stretching out from the outlet of the Volta River. The Mahogany and Salt Pond rigs are positioned off Bonyere and Salt Pond, respectively. Shoreline samples (beach and 5 m) were collected as extensions of the 2009 and 2010 transects.

Sampling the 5m depth in Newtown. (Photo T. Ensrud)

Collecting samples from the beach. (Photo T. Ensrud)

2. MATERIALS AND METHODS

2.1 Survey area

The dominant current flow in this area is north-west to south-east, parallel to the shelf shown in fig 2.1.

2.2 Sampling design

The goal of this survey was to provide increased knowledge about the environmental status of the marine ecosystem in the Coastal Regions of Ghana. To achieve this, 24 grab sites on 3 transects and two stations grids around oil rigs were sampled in the coastal zone of Ghana. The sampling sites were spread out on the three transects at eight predefined depths (approximately 0m (shoreline) 5m, 25 m, 50 m, 100 m, 250 m, 500 m and 1000 m depth) in addition to 5 and 4 sites surrounding the Mahogany and Salt Pond oil rigs, respectively. The 5m depth sites were sampled with a handheld 0.025m^2 Van Veen grab from canoes/boats. Composite samples were collected at the shore (0m) within the tidal zone with the same equipment. From 25 m and deeper, a 0.5m^2 Van Veen grab was utilized. A map of the 2009 sampling stations together with the stations of 2010 is presented in Appendix.

The sediment sampling was executed in accordance with the OSPAR guidelines for sediment monitoring in offshore oil production areas. Duplicate samples were collected for chemical analysis for the purpose of training of local personnel and comparison of analytical results.

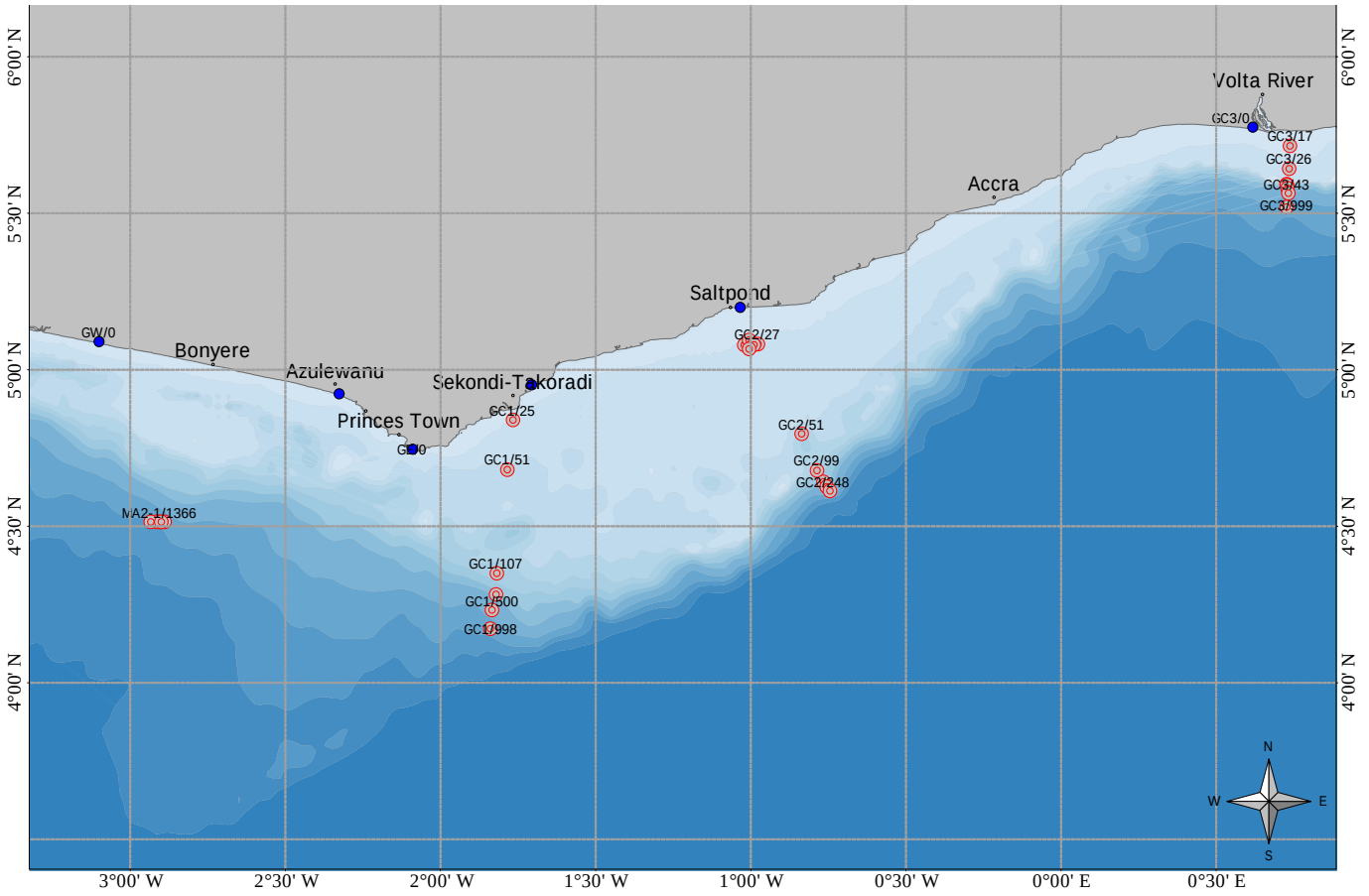


Figure 2.1. Map of sampling stations at the coast of Ghana in 2010.

Table 2.1. Date, position and depth of benthic sampling sites.

Transect/ area	Date	Grab station	Longitude WGS84	Lattitude WGS84	Depth (m)
Ghana central 1	24.04.2011	GC1/0	-1.705906	4.951336	0
	24.04.2011	GC1/5			5
	11.04.2010	GC1/25	-1.766733	4.838567	25
	11.04.2010	GC1/50	-1.783833	4.681367	50
	13.04.2010	GC1/109	-1.819600	4.350950	109
	13.04.2010	GC1/260	-1.833767	4.232883	260
	12.04.2010	GC1/498	-1.839800	4.171767	498
	12.04.2010	GC1/1029	-1.822200	4.281450	1029
Ghana central 2	25.04.2010	GC2/0	-1.034453	5.200192	0
	25.04.2010	GC2/5			5
	15.04.2010	GC2/25	-0.977383	5.081583	25
	15.04.2010	GC2/51	-0.835883	4.794217	51
	18.04.2010	GC2/101	-0.786833	4.678800	101
	18.04.2010	GC2/250	-0.765517	4.640817	250
	18.04.2010	GC2/507	-0.755667	4.625233	507
	19.04.2010	GC2/1055	-0.745617	4.612633	1055
Ghana central 3	26.04.2010	GC3/0	0.617956	5.776344	0
	26.04.2010	GC3/5			5
	07.04.2010	GC3/25	0.733917	5.643500	25
	07.04.2010	GC3/43	0.727633	5.592567	43
	08.04.2010	GC3/88	0.727617	5.589133	88
	08.04.2010	GC3/245	0.729350	5.579417	245
	08.04.2010	GC3/509	0.732033	5.563767	509
	09.04.2010	GC3/999	0.727733	5.520817	999
Salt Pond	21.04.2010	SPW/25	-1.021117	5.079100	25
oil rig	21.04.2010	SPN/24	-1.004317	5.094467	24
	21.04.2010	SPE/26	-0.988683	5.079767	26
	21.04.2010	SPS/27	-1.005733	5.065567	27
Mahogany	22.04.2010	MA DEEP 2-1/1366	-2.904983	4.513483	1366
oil rig	22.04.2010	MA DEEP 2-2/1424	-2.916367	4.513400	1424
	22.04.2010	MA DEEP 2-3/1387	-2.890650	4.513317	1387
	22.04.2010	MA DEEP 2-4/1600	-2.934383	4.513617	1600
	23.04.2010	MA DEEP 2-5/1361	-2.900150	4.513550	1361

2.2.1 Hydrographic sampling

CTD profiles were deployed at selected sediment sampling stations. A Seabird 911 CTD Plus was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. The profiles were taken down to a few metres above the sea floor.

The SBE 21 Seacat thermosalinograph was running continuously during the survey, collecting data for salinity and relative temperature at 5 m depth every 10 seconds. An attached in-line Turner Design SCUFA Fluorometer was used to supplement these data with the underway measurements of Chlorophyll-a levels [RFU].

Meteorological data including wind direction and speed, air temperature and sea surface temperature (SST) were automatically logged into the system using a WIMDA meteorological station and averaged by every nautical mile distance sailed.

2.2.2 Sediment sampling and sample treatment

The sediment samples were collected by Ghanaian scientists under the supervision of experienced Norwegian scientists from accredited institutions that instructed and assisted them with the sampling. The sampling was performed in accordance to the Norwegian guidelines ”Aktivitetsforskriften”, OSPAR guidelines, the Draft “Requirements for Environmental Monitoring of the Petroleum Activities on the Ghanaian Continental Shelf” and International Standards (ISO 5667-19 and ISO 16665).
The positioning of *Dr. Fridtjof Nansen* was done by Differential Global Positioning System (DGPS). The sediment samples were collected using a Van Veen grab with adjustable weights and an opening of 0.1 m². The total volume of the grab was 21 litres.
Ten grab samples were collected at each grab station along the three transects. Five samples were used for biological analysis. The volume of each sample was measured, then the sample was sieved through a 5 mm sieve and a 1 mm mesh sieve placed in a water bath. The material retained in the sieves were placed in 500-1000 ml plastic containers and fixed with 4% formaldehyde in seawater, borax was added to avoid acidity. Each sample was labelled for identification using the station ID, sample no., date etc. and stored on board in transport containers.

Three samples were used for chemical analysis (metals and oil hydrocarbons) and grain size analysis. Chemical samples were taken from 0-1 cm of the samples surface, and the samples for grain size were taken from 0-5 cm. The last two grab samples were sieved through a 0.5 mm mesh sieve in a water bath and fixed with 4% formaldehyde in seawater and the pH stabilised with borax. These two samples were meant for analyzes by The University of Ghana, Legon students.

The sediment samples for hydrocarbons and grain size analyses were taken with a specially designed metal spatula, to avoid contamination the samples for metal analyses were collected with plastic spoons. The spoons were washed with seawater before sampling. The samples for chemical analysis were packed in pre labelled Rilsan plastic bags and immediately frozen to prevent evaporation of labile compounds. The samples were kept frozen for further analysis in the onshore laboratory. Samples for TOM and grain size analyses were taken from the upper

0-5 cm layer of the sediment and put in separate plastic bags, labelled and immediately frozen.

The samples for metal and THC to be analyzed in Ghana, were transported directly to the laboratory of the Environmental Protection Agency. The chemical samples for analyses in Norway, were stored onboard in the freezer, and later shipped frozen to Norway from the Tema port. The biological samples were transported from Walvis bay, Namibia to Uni Research, SAM-Marin`s Taxonomy lab. The chemical samples were later transported to Eurofins Norway, Environmental Laboratory AS.

Deviations

The benthic samples from the stations: GC1/498; GC1/1029; GC2/507; GC2/1055; GC3/88; GC3/245; GC3/509; GC3/999; Ma-Deep 2-1 (1366 m) and Ma-Deep 2-5 (1361 m) were badly preserved. Due to this, animals could not be determined to a low taxonomic level. Benthos that are accustomed to the temperatures in deep areas, are more likely to degrade faster in Ghana air temperature, than the ones that live shallower and thereby also warmer areas. For future sampling at deep stations immediate cooling/preservation, and/or other techniques to avoid degradation, should be evaluated.

The grab samples GC1/0; GC3/999 and SPW/25 contained too much fluid to be compared with dry weight for chemical analysis. While the rest of the concentrations are presented as mg compound / kg dry weight, these three samples are therefore presented in mg compound / kg wet weight. The values do not diverge from other samples in a noteworthy extent, hence all values are treated equally in this report.

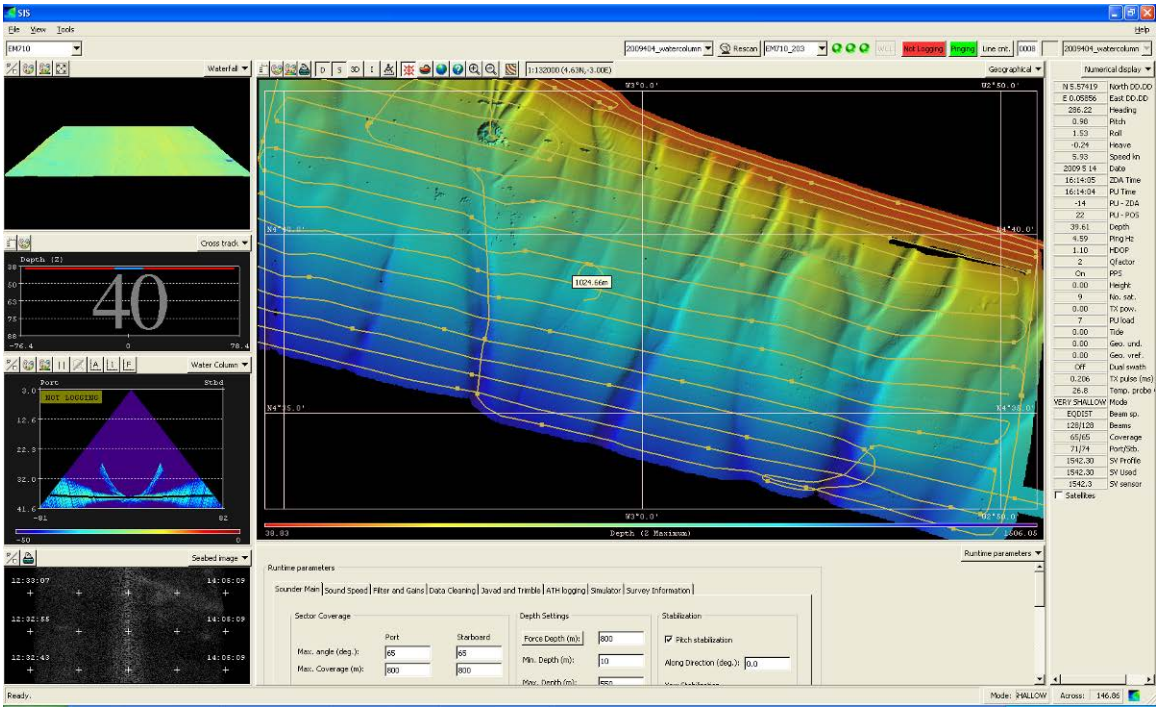
2.2.3 Seabed mapping with multibeam echosounder

Location: Outside the coast of Ghana
Vessel: R/V Dr. Fridtjof Nansen
Period: May 2009

MULTIBEAM SURVEY

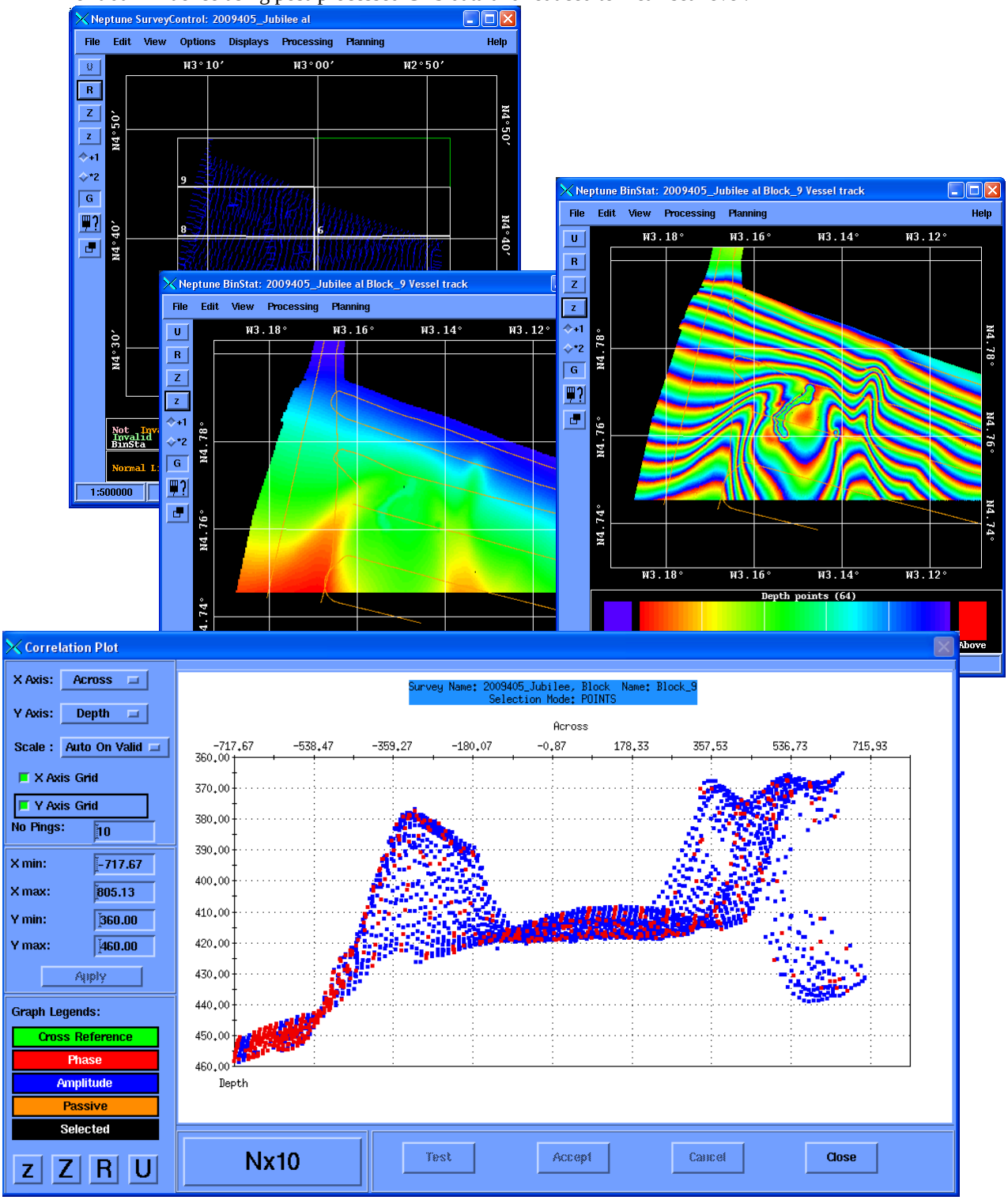
The survey was executed using the Kongsberg Maritime EM710 multibeam echosounder with positioning and motion data from Seapath 200. The positioning system used was Fugro SeaStar. Seabed Information System (SIS) software was used for online logging and echosounder control. Post-processing of data was performed using Neptune, which was also used for the calibration of the EM710.

Seabed Information System (SIS)
SIS is used for the online operation of Kongsberg Maritime multibeam echosounder systems. The application was used by the operator to control all settings and logging during the survey.



NEPTUNE – Post Processing

Prepared raw data from SIS were processed using Neptune post-processing software. All depths were corrected for tidal influence using post-processed GPS data and reduced to mean sea level.



Screenshots from Neptune Post-processing software

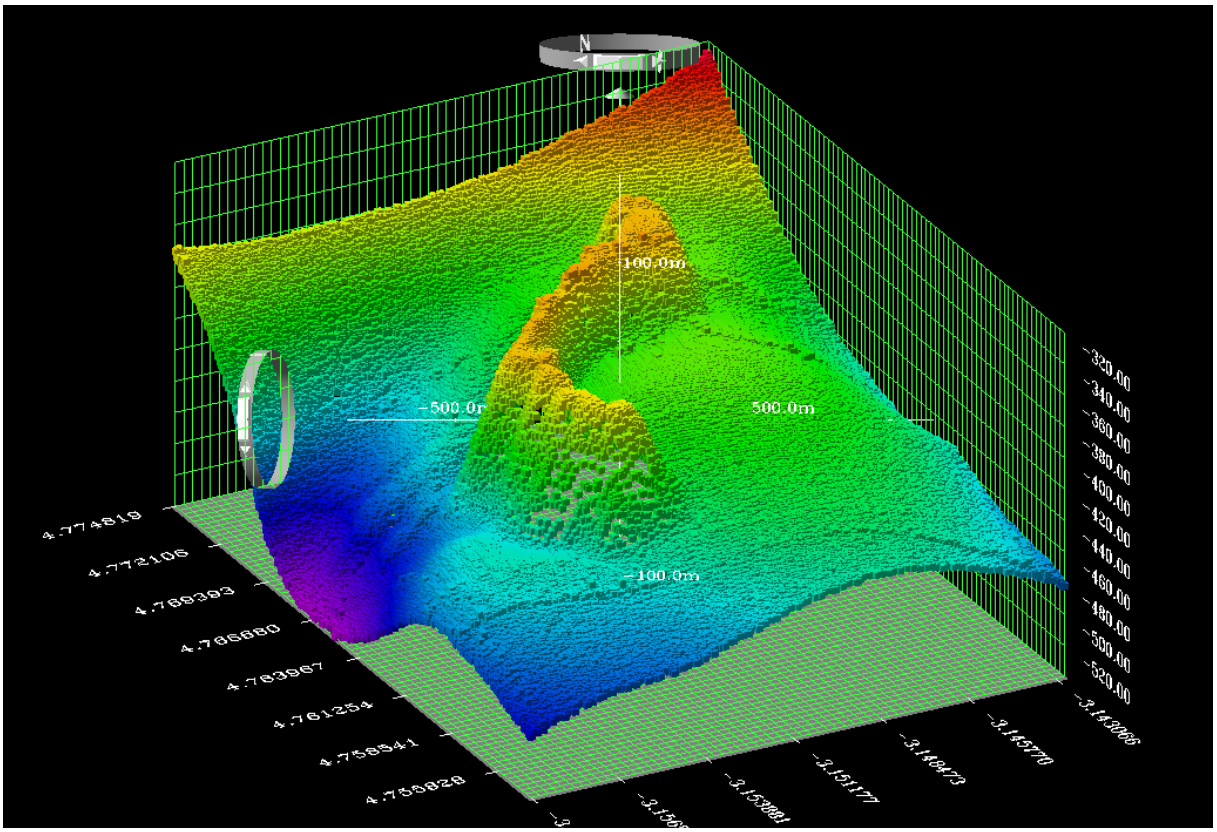
After tide correction, spurious soundings were removed/flagged invalid using the BinStat module.

Cleaned accepted data were exported to ASCII files as formatted as latitude, longitude and depth. In addition, mean depths were exported for each processing cell (30x30m).

The surveyed area is 780km2 containing approx. 14 million soundings ranging from 104m to 1474m.

Fledermaus – Visualization.

Exported ASCII data were imported into Fledermaus visualization and DTM software.



Data deliverable
Exported data were stored on DVD.

2.2.4 Colour, grain size and Total Organic Matter (TOM)

The colour of the sediment was determined using a revised Munsell® Soil Colour Chart System year 2000 (GretagMacbeth, New Windsor, NY, USA). A mixture consisting of sediment from the upper 0-5 cm of three separate grab samples was used for the grain size analysis at each sampling site.

The particle size was analysed in the laboratory by dissolving the sediment in water and then sieving it through a 0,063 mm sieve. Particles larger than 0,063 mm, was then dry sieved trough Endecott sieves. The sieves had square holes with mesh sizes found in table 2.2. The analysis was performed at SAM.

The median diameter and sorting (Table 2.2) were calculated with the formulas below (Buchanan (1984) and Folk & Ward (1957)), and the program GradiStat version 4.01 (Blott & Pye 2001).

Particle diameter: x = Φ-value ($\Phi=-\log_2 x$)

Median particle diameter: Md Φ = Φ50.

Mean diameter $M_z = \frac{\Phi(16) + \Phi(50) + \Phi(84)}{3}$

Sorting: SD $\Phi = \frac{\Phi(84) - \Phi(16)}{4} + \frac{\Phi(95) - \Phi(5)}{6,6}$

Table 2.2. The mesh sizes of the sieves used for grain size analysis.

Size of the sieve (mm)	Phi class Φ	Description
16	-4	Gravel
16-8	-3	Gravel
8-4	-2	Gravel
4-2	-1	Gravel
2-1	0	Sand
1-0,5	1	Sand
0,5-0,25	2	Sand
0,25-0,0125	3	Sand
0,0125-0,063	4	Sand
< 0,063		Pelite

TOM

The total organic matter (TOM) was determined as the weight loss in a 2-3 gram dried sample (dried at 105° C for about 20 hours) after 2 hours of combustion at 480° C.

2.2.5 Chemical Compound Analysis

2.2.5.1 Oil Hydrocarbons Analysis

- Principle

The petroleum hydrocarbon content was determined by GC/FID analysis of the extracts obtained as outlined in Intergovernmental Oceanographic Commission, Manuals & Guides no 11, UNESCO (1982).

The petroleum hydrocarbons were isolated from the sediment sample by saponification with methanolic potassium hydroxide for two hours, followed by extraction with pentane. The pentane phase is reduced using a Rotavapor and is subsequently purified by solid phase extraction. The petroleum hydrocarbon components were eluted (extracted) from the solid phase column with pentane followed by dichloromethane. The extract was reduced using a heating jacket and analyzed using Gas Chromatography with Flame Ionisation Detection (GC/FID). The analyses of PAHs and Decalines were performed by Gas Chromatography with Mass Selective Detection operating in the Single Ion Monitoring mode (GC/MS SIM).

- Procedure

The sediment sample was homogenized by stirring and subsequently centrifuged at 2300 rpm for 5 minutes to remove excess water. The amount of dry matter in the centrifuged sample was determined by the differencial weight of a small part (about 10 g) of the sample before and after drying at 105°C for 16 hours.

- Soxtec extraction

The saponification was carried out using a Soxtec System equipped with glass cups and cellulose thimbles at 150°C. In order to reduce the background level of hydrocarbons in the blank samples, the empty cellulose thimbles were boiled for 1 hour in methanol prior to its use.

About 20 g of the sample was placed in the cellulose thimble and boiled for 1 hour (in the "boiling position" in 50 mL of a solution of potassium hydroxide in methanol (30 g/L). Before boiling, 1.0 mL of a mixture of internal standards is added to the extraction cups. The thimble was lifted to the "rinsing position" for 1 hour while the refluxing methanol extracted hydrocarbons from the sample. For every 20 samples, reference samples of HDF 200 (base oil in drilling fluid; for THC, olefins and decalines) and HS-4B (Harbour Marine Sediment Reference Material; for PAH and NPD) are extracted, purified and analysed according to this method for monitoring the accuracy of the method.

- Pentane extraction

The methanol extract was collected in a Duran bottle. After cooling, 25 mL of pentane was added and the bottle shaken for 10 minutes. The pentane phase was separated from the methanol phase and collected in a conical flask. Another 25 mL of pentane was added to the methanol, shaken, separated and added to the first pentane phase. The pentane was reduced to 1 mL using a Rotavapor with a water bath at 30°C.

- Solid phase clean up

The final clean up was carried out using 200 mg florisil solid phase columns. The columns were conditioned prior to use. The sample was then added to the column which was eluted with 2x2 mL pentane and 2 mL dichloromethane. The elute was reduced to dryness using a heating jacket at 40°C. The residue was redissolved in 1 mL of dichloromethane and analyzed by GC/FID (THC) and GC/MS-SIM (PAH, NPD).

Quantification of components

- THC

The content of THC was quantified in the nC_{12}-nC_{35} boiling point range by using external and internal standards. The external standard was a solution of n-alkanes in dichloromethane (5 mg/L of each component; Restek # 57257). This external standard was also used to establish the retention time window. The internal standards (bromobenzene, *o*-terphenyl and squalane; all 5 mg/L) were added to the sample before boiling as well as to the external standard. The average THC value from blank samples was subtracted before the final quantification of the THC content of the sample. A chromatogram illustrate the presence of specific compounds within the samples (Figure 2.1) while the analytical conditions of the GC/FID system are presented in Table 2.3.

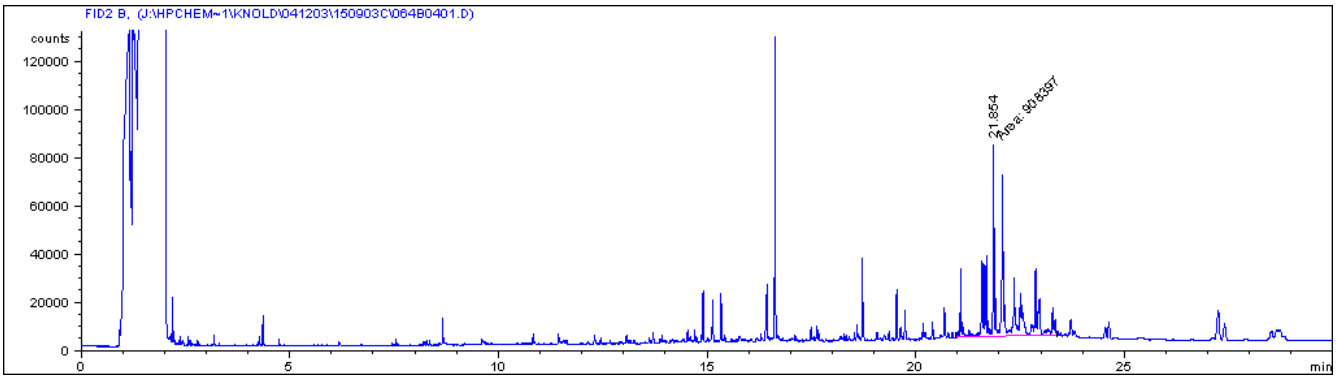


Figure 2.1. Chromatogram showing the subtracted phytosterol fraction of sediment sample.

Table 2.3. GC/FID conditions

GC system	Hewlett-Packard 5890 Series II Gas Chromatograph with split/splitless injector, Flame Ionisation Detector
Column	Agilent DB-5, length: 25 m, ID: 0,2 mm, film: 0,33 µm
Injector temperature	290°C
Detector temperature	300°C
Temperature program	35°C (3 min) - 15°C/min - 315°C (9,5 min)
Carrier gas	H_2, 1,4 mL/min
Injection	1 µL, splitless

- PAH and NPD

The PAHs/NPDs analysis was performed by GC/MS operating in the SIM (single ion monitoring) mode. The analytical conditions of the GC/MS system are shown in Table 2.4.

Table 2.4. GC/MS conditions

GC system	Agilent Technologies 6890N Network GC System
MS	Agilent 5973 Network Mass Selective Detector
Column	Agilent DB-5ms, length: 30 m, ID: 0,25 mm, film: 0,25 μm
Injector temperature	300°C
Temperature program	60°C (2 min) - 12°C/min - 300°C (8 min)
Carrier gas	He, 1,0 mL/min
Injection	1 μL, splitless, purge flow: 40 mL/min in 1 min

The amounts of PAHs and NPDs were quantified using internal deuterium marked standards and calibration curves made from 3 levels of standards containing the 16 EPA PAHs and selected NPDs (Table 2.5). The internal standards were added to the sample before boiling as well as to the external standard. The 16 standard EPA PAHs were obtained in PAH cocktail ampoules from Ehrensdorfer (20952500 PAH Mix 25) and Chemservice (PP-HC6JM). A NPD cocktail containing 1 compound representing each of the NPD clusters was obtained from Chiron (NPD Cocktail 3, S-4046). The NPD compounds in the cocktail were: Dibenzothiophene, 4-methyldibenzothiophene, 2,8-dimethyldibenzothiophene, 2,4,7-trimethyldibenzothiophene, naphthalene, 2-methylnaphthalene, 2,3-dimethylnaphthalene, 2,3,6-trimethylnaphtalene, phenanthrene, 2-methylphenanthrene, 1,6-dimethylphenanthrene and 1,2,8-trimethylphenanthrene. Table 2.3.3 shows target ion, qualifier ion, and the corresponding internal standard for each PAH compound and NPD cluster. Before the final quantification was carried out, the corresponding average concentration of blank samples was subtracted.

Table 2.5 Analyzed PAH compounds and NPD clusters

Compound / cluster	Target ion m/z	Qualifier ion m/z	Corresponding internal standard
Naphthalene	128	102	Naphthalene-d8
C1-naphthalene	142	141	Naphthalene-d8
C2-naphthalene	156	141	Acenaphthylene-d10
Acenaphthylene	152	151	Acenaphthylene-d10
Acenaphthene	153	154	Acenaphthylene-d10
C3-naphthalene	170	155	Acenaphthylene-d10
Flourene	166	165	Acenaphthylene-d10
Dibenzothiophene	139	168	Acenaphthylene-d10
Phenanthrene	178	176	Phenanthrene-d10
Anthracene	178	176	Phenanthrene-d10
C1-dibenzothiophene	198	-	Phenanthrene-d10
C1-phenanthrene	192	191	Phenanthrene-d10
C2-dibenzothiophene	212	-	Phenanthrene-d10
C2-phenanthrene	206	191	Phenanthrene-d10
Fluoranthene	202	101	Fluoranthene-d10
C3-dibenzothiophene	226	-	Fluoranthene-d10
Pyrene	202	101	Pyrene-d10
C3-phenanthrene/antracene	220	-	Pyrene-d10
Benzanthracene	228	114	Pyrene-d10
Chrysene/triphenylene	228	114	Pyrene-d10
Benz[bjk]fluoranthenes	252	250	Benz[a]pyrene-d12
Benz[a]pyrene	252	250	Benz[a]pyrene-d12
Indeno(1,2,3-cd)pyrene	276	274	Benz[a]pyrene-d12
Dibenzo[a,h]anthracene	278	-	Benz[a]pyrene-d12
Benzo(ghi)perylene	276	274	Benzo(ghi)perylene-d12
Internal standards			
Naphthalene-d8	136		
Acenaphthylene-d10	160		
Phenanthrene-d10	188		
Fluoranthene-d10	212		
Pyrene-d10	212		
Benz[a]pyrene-d12	264		
Benzo(ghi)perylene-d12	288		

2.2.5.2 Pesticide analyses

Used for solid matrix, sediment

Basic principal:
The analysis of organochloropesticides (OCP) based on DIN EN ISO 10382

Procedure:
Solid samples were weighted at the state as received. Sediment samples were weighted freeze dried. One aliquot (10 g) of the sample is extracted with 40 ml of an n-hexane/acetone (1:1) mixture and an internal standard (PCB 155) for one hour by shaking. After this time water is added. The organic phase is separated from the water phase and dried. Depending on the amount of OCP, the extract has to be concentrated. Subsequently the analysis is done by GC ECD under following conditions:

Gas chromatograph:	HP 5890 II
Injector:	split/split less
Detector:	ECD
Column:	ZMR 1 (30 m x 0,25 mm x 0,25 μm)
Carrier gas:	Nitrogen

Evaluation:
The internal Standard is quantified by peak area. The result are given in mg/kg with an LOQ of 0,01.

2.2.5.3 Metal Analysis

Principle
The metal content is determined by Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP-AES) except mercury which was determined by Cold Vapour Atomic Emission Spectrometry (CVAAS) after drying, sieving and digestion.

Procedure
The sediment samples were dried at 105°C or 40°C for samples containing mercury. The sample was sieved through a 0.5 mm sieve and the fraction <0.5 mm was digested with nitric acid in accordance with NS4770.

Digestion by nitric acid
Digestion was performed in an autoclave. About 1g of sample was weighed into a sterile PP test tube with 4 mL of nitric acid. The samples were then autoclaved at 120°C for 30 min. After digestion, the samples were filtered and diluted to 50 mL.

Metal analysis by ICP-AES
The metals, except mercury, were analysed by a Varian Vista-PRO ICP-AES method. The analytical conditions are found in Table 2.6.

Table 2.6 ICP-AES analytical conditions

Element	Wavelength	Power (kW)	Background correction
Ba	233.527	1.35	Fitted

Cd	228.802	1.35	One point, left
Cr	267.716	1.35	Fitted
Cu	324.754	1.35	Fitted
Pb	220.353	1.35	Fitted
Zn	213.857	1.35	Fitted

Mercury Analysis by CVAAS
Mercury was analyzed using the mercury analyser instrument, Cetac M6000-A. The mercury in the solution was reduced by $SnCl_2$ to its elementary form Hg^0. Elementary mercury is volatile and was separated from the solution in a gas liquid separator by an argon carrier gas. The absorption at 254 nm was measured to determine the concentration of mercury.

Reference materials
CRM015-050 metals on sediment and CRM031-040 metals on soil (Resource Technology Corporation) was use as a reference.

2.2.6 Biological Analyses

Prior to sorting and species identification, each sample was washed through a 1 mm sieve to remove formalin. Specimens were then sorted out under a dissecting microscope, split into taxonomic groups and fixed on small tubes containing ethanol. The specimens were then identified and enumerated before being returned to the fixation fluid.
.
A complete species list is presented in the appendix. Only the bottom fauna (benthos) was used for further analyses which included:
Total number of species
Total number of specimens standardised to 0.5 m² of sea floor
The ten most abundant species at each site (species name, number of specimens and percent of total number of specimens)
Cumulative species / area graph, for reference sites only (5 samples)
Species diversity as "Shannon Wiener index" on a $\log_2$ base (Shannon & Weaver 1963)
Evenness as Pielous's "J" (Pielou 1966)
Cluster analysis based on "Bray-Curtis dissimilarity index" (Bray & Curtis 1957), followed by "group average sorting" on 4^{th} root transformed data
Ordination by "multidimensional scaling"

All data was analysed using the data program PRIMER, from Plymouth Marine Laboratory in England.

- Univariate analyses:
The mathematical bases for the diversity indices are outlined by (Shannon & Weaver 1949)

Evenness is an estimate of how the individuals are distributed among the species. It varies between 0 and 1, with a value close to 0 if all individuals belong to one or a couple of species and a value closer to 1 if all the individuals are equally distributed between the species.

The species-area curve is produced by the program EstimateS from The University of ticut. (For more information about the method see Colwell & al 2004).

- Log-normal curve
An indication of the environmental condition is gained by using geometrical classes. Geometrical classes are the relations between the species and the number of individuals. For example, species which are represented by one individual, 2-3 individuals, 4-7 individuals among others are defined as geometrical class I, class II, and class III respectively. Geometrical classes are plotted against number of species for each station. Good environmental conditions are indicated by the presence of many species with few individuals and few species with many individuals. Impoverished environmental conditions are indicated by the presence of only a few species with very many individuals. For further information, see Gray & Mirza (1979) and Pearson & al. 1983.

- Multivariate analyses
Multivariate analyses were done to compare the actual species composition at the sites. Two different types of multivariate analyses where executed, a classification (cluster analysis) and an ordination (non-metric multidimensional scaling). The species abundance data were double square root transformed prior to analysis to reduce the effect of the most abundant species and to include more of the rare species. The calculation was done using the program PRIMER from Plymouth Marine Laboratory in England.

- Cluster analysisThe cluster analysis is a hierarchical agglomerative clustering of stations with the most similar species composition grouped together first at a high similarity level and then grouping the other stations at lower and lower similarity levels together, until all stations are grouped in a single cluster. The comparisons of the fauna at each station were based on Bray-Curtis similarity index (BRAY & CURTIS, 1957), while the linking of the groups is based on group average sorting of the similarity indices.

- Ordination procedure (MDS)
The non-metric multidimensional scaling (MDS) groups the stations with the most similar fauna. This analysis presents the results such that the distance between the stations on the plot reflects the similarity in fauna. Thus the MDS can be used to support the cluster analysis results. More importantly the MDS reveals any existing continuum or gradient in the sampled fauna. The MDS analysis is based on the same similarity matrix as the cluster analysis and the calculation was done using the PRIMER program.

2.2.7 Linking biota to multivariate environmental patterns

The correlation between biological patterns and environmental variables (all combinations of the environmental variables: pelite; TOM; Cu; Ba; Zn; Cd; Cr; Pb and THC) was studies in the computer program Canoco (Braak and Smilauer 1997). Chemical variables were log(x+1) transformed prior to analysis. The statistical significance of each envirnmental variable was determined by using Monte Carlo Permutation Tests.

2.2.8 Quality Control

Eurofins Analyse AS/Ltd is an accredited chemistry laboratory and performed the chemical analysis in accordance with the criteria of Norwegian Accreditation under accreditation-

number Test043. Uni Research, SAM-marin is accreditated by Norwegian Accreditation for sampling and taxonomical analyses, professional assessment and interpretations under accreditation-number Test157. Biological samples were sorted by personnel from Uni Research AS in accordance with the criteria of the Norwegian Accreditation. Analyses of geological samples were not performed accreditated. The species identification was done by the subcontractor 'Marine Bunndyr AS', who is not accreditated. Biological and geological samples were also subject to quality control according to Uni Research AS`s internal routines. Any deviations from the sampling procedures were noted in the sampling journal.

2.2.9 Storage of samples

The biological samples were stored at Uni Research AS in Bergen for later use in this project.

3. OCEANOGRAPHIC CONDITIONS

3.1 Vertical Sections

Hydrographic stations were occupied at locations of grab stations (Figure 2.1). The collected parameters included temperature, conductivity, dissolved oxygen and fluorescence. Salinity and other derived seawater properties were computed according to the standard algorithms (UNESCO 1983). The stations covered the upper portion of the continental slope and shelf

4. SEABED MAPPING

The surveyed part of the continental slope is shown on Figure 4.1. The slope is rather steep, the depths increase from appr. 100m on the shelf to appr. 1500m at the deepest part of the slope. The whole area is characterized by several vertical running trenches or ravines, starting from the shelf. The trenches are most likely created by underwater landslides. In the deeper parts of the area the trenches are fewer but deeper. Figure 4.2 gives a detailed image of some of the trenches in the middle of the survey area. A striking feature is seen in the western part of the area. In figure 4.3, a ridge of about 300m length and 50m elevation exists at about 400m.depth.

The multibeam surveying implies enormous amount of data that need to be postprosessed before they are presented in charts and topographic models. The data management should be taken care of by a relevant national institute. A data management system should be established for taking care of existing and future bathymetric data and other hydrographical data. Further analysis of the multibeam data will also be useful for the classification of the geology of the bentic surface.

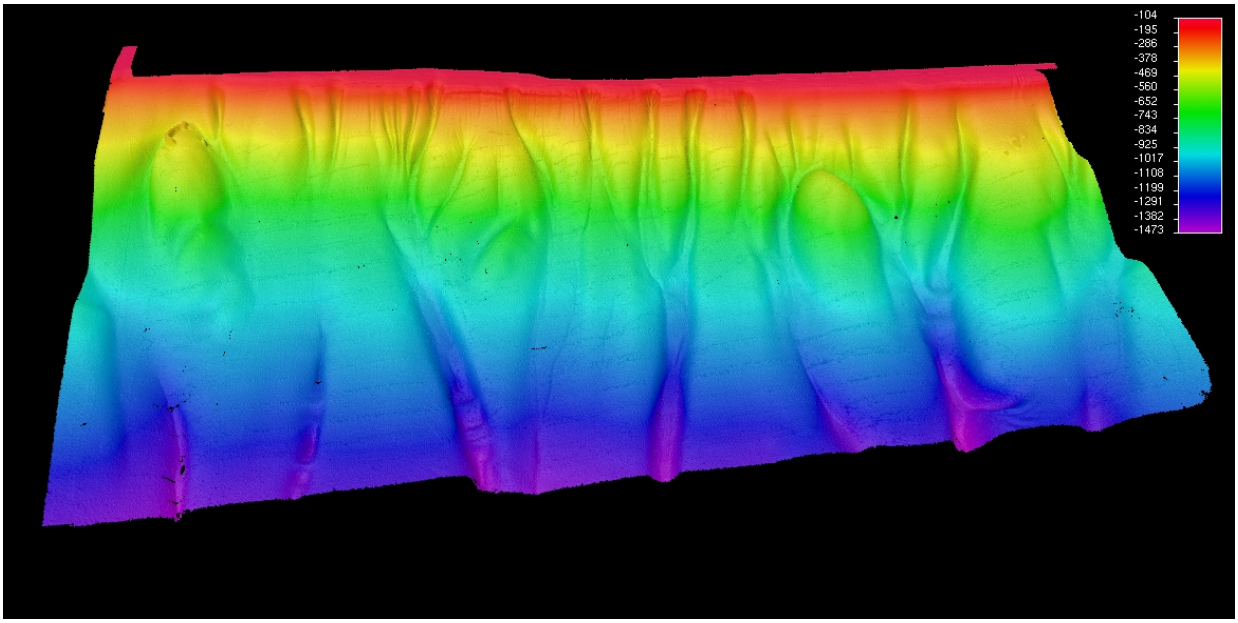


Figure 4.1. Bathymetrical image showing the continental slope from the boarder of the Ivory Coast and eastward to the location of the Jubilee oil field. The colour scale to the right explains the distribution of depths.

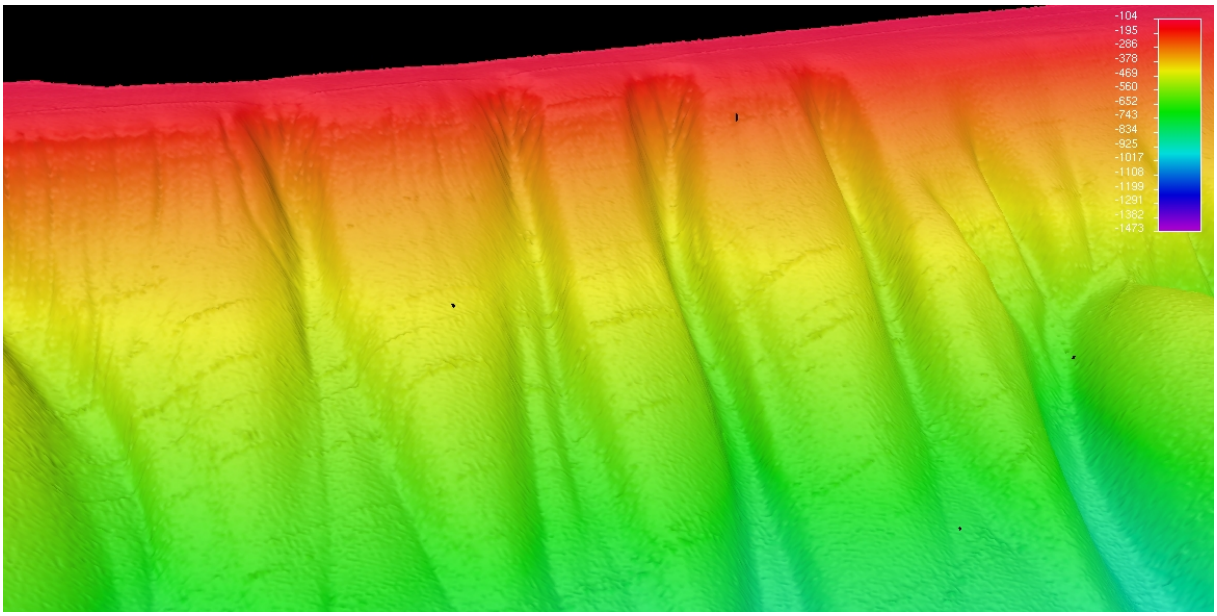


Figure 4.2. The upper part of the slope in the middle of the surveyed area, clearly showing the land sliding starting from the shelf.

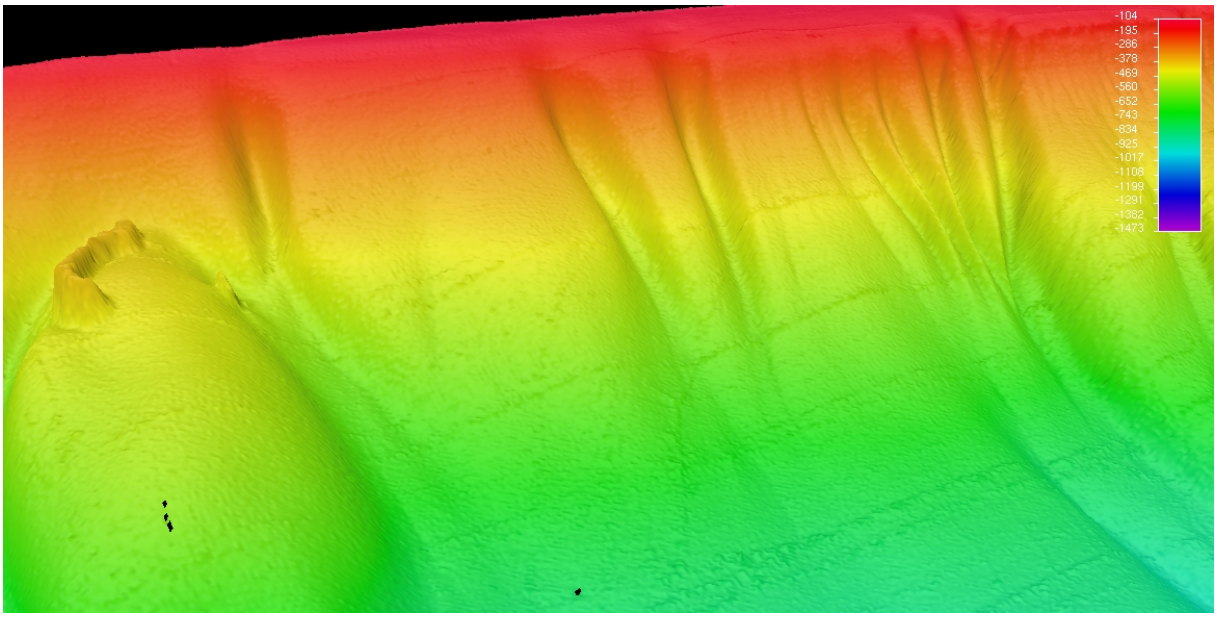
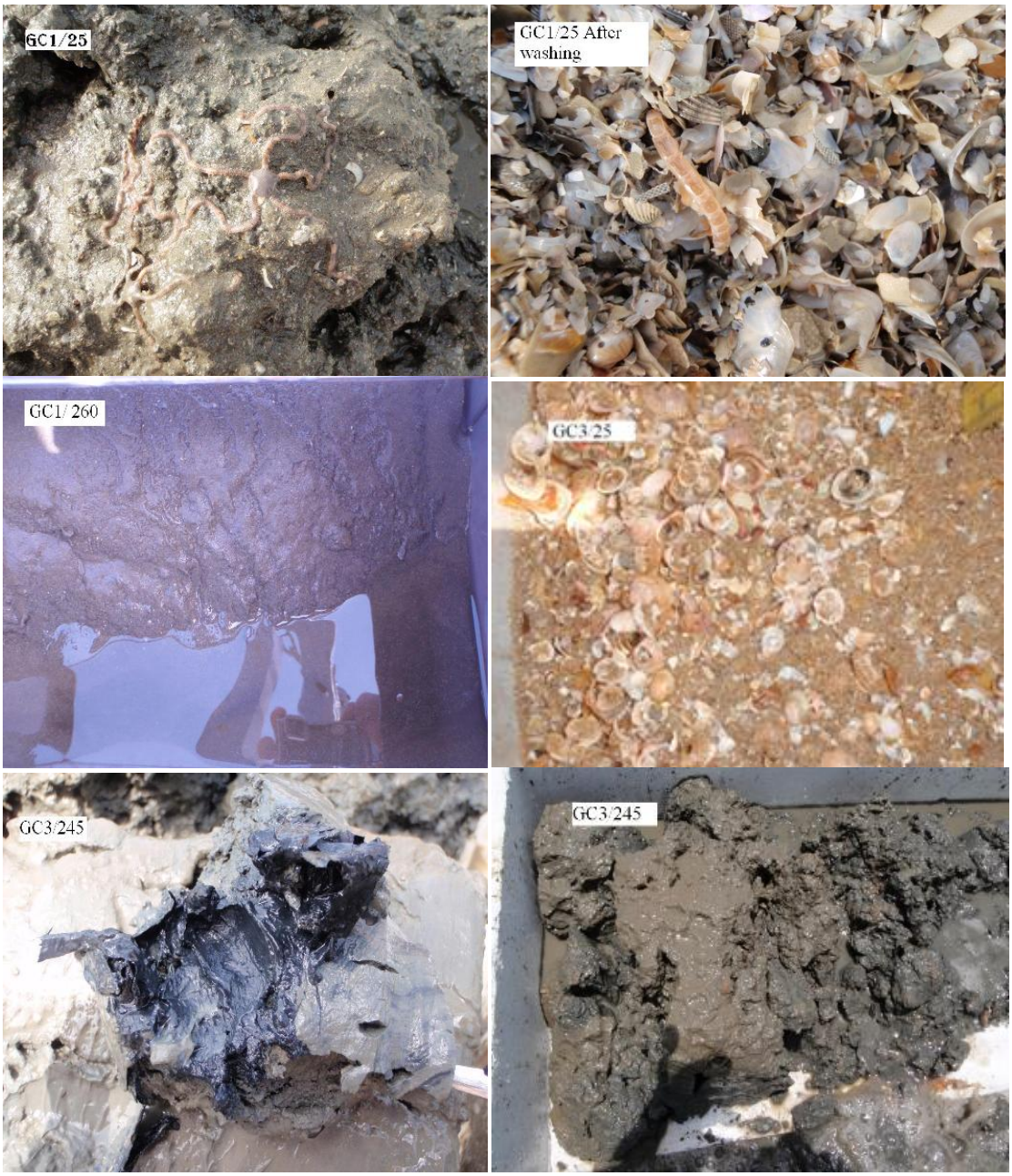


Figure 4.3. The western part of the survey area. A ridge is seen on the left side at about 400m depth

5. SEDIMENT SAMPLING



Selected sediment samples from the survey. (Photo T. Ensrud)

5.1 Sediment characteristics

Total organic matter (TOM), and the amount (%) of gravel, sand, pelite, median (Φ) and sorting in the sediment are presented in Table 5.1.

The sea bed of the deeper parts of the three transects, as well as the deep area around the Mahogany oil rig was dominated by fine sediment (pelite). The shallower areas contained both pelite and sand. Around the outlet of the Volta river (shallow parts of GC3) and around the Salt Pond oil rig, the sediment was coarser and contained a mix of gravel and sand.

The content of total organic matter (TOM) correspond to the content of pelite, with higher TOM content in the deepest part compared to the more shallow part of the investigated area.

Table 5.1 Total organic matter and sediment grain size at sites along the three transects Ghana Central (GC) 1, 2 and 3, and two samples grids around the Mahogany (MA-deep) and Salt Pond (SP) oil rigs. The size of pelite particles are < 0.063 mm.

Station / depth	% Gravel	% Sand	% Pelite	% TOM	D_{50} (ϕ):	Sorting	Skewness	Kurtosis	Mean
GC1/0	1.3	7.5	0.0	0.2	0.87	0.90	0.00	0.99	0.89
GC 1/5	0.8	83.6	4.7	0.7	3.20	0.85	-0.37	1.05	3.05
GC1/25	0.8	43.9	38.9	7.6	3.45	2.15	0.24	0.90	3.90
GC 1/50	0.3	44.8	40.1	6.7	3.53	2.06	0.28	0.85	3.99
GC1/109	5.8	25.2	24.3	6.6	1.97	2.63	0.24	1.01	2.42
GC 1/260	0.4	55.9	16.7	6.5	2.59	1.54	0.32	1.45	2.76
GC1/498	0.0	43.8	27.7	6.0	2.72	1.97	0.45	1.00	3.32
GC1/1029	0.0	16.9	78.4	10.1	5.45	1.92	-0.19	0.92	5.21
Average	1.2	40.2	28.9	5.5	2.97	1.75	0.12	1.02	3.19
Stdv	1.9	24.0	24.7	3.4	1.33	0.62	0.28	0.18	1.27
Min	0.0	7.5	0.0	0.2	0.87	0.85	-0.37	0.85	0.89
Max	5.8	83.6	78.4	10.1	5.45	2.63	0.45	1.45	5.21

Station / depth	% Gravel	% Sand	% Pelite	% TOM	D_{50} (ϕ):	Sorting	Skewness	Kurtosis	Mean
GC 2/0	0.0	78.0	0.1	0.6	2.37	0.54	-0.25	1.08	2.30
GC2/5	0.4	93.1	6.1	2.0	3.48	0.53	0.07	1.55	3.48
GC2/25	0.2	72.3	1.5	1.3	2.38	0.78	-0.18	1.38	2.26
GC2/51	4.7	43.5	16.1	4.7	2.38	2.05	0.03	1.36	2.29
GC2/101	1.1	37.8	38.8	5.6	3.07	2.28	0.30	0.87	3.65
GC2/250	1.9	42.2	12.6	5.9	2.15	1.78	0.13	1.64	2.18
GC2/507	0.0	47.5	48.6	6.8	3.89	1.93	0.31	0.68	4.31
GC2/1055	0.0	4.8	94.7	11.2	5.89	1.29	0.00	0.74	5.89
Average	1.0	52.4	27.3	4.8	3.20	1.40	0.05	1.16	3.30
Stdv	1.6	27.8	32.4	3.5	1.25	0.71	0.20	0.37	1.32
Min	0.0	4.8	0.1	0.6	2.15	0.53	-0.25	0.68	2.18
Max	4.7	93.1	94.7	11.2	5.89	2.28	0.31	1.64	5.89

Station / depth	% Gravel	% Sand	% Pelite	% TOM	D_{50} (ϕ):	Sorting	Skewness	Kurtosis	Mean
GC3/0	0.0	97.7	0.3	1.3	2.69	0.58	0.24	0.94	2.77
GC3/17	12.8	9.3	0.8	0.6	1.24	1.35	-0.46	1.48	0.88
GC3/25	16.0	26.6	24.1	5.0	2.03	3.07	0.05	1.02	2.13
GC3/43	3.8	37.7	24.4	9.0	2.37	2.25	0.32	1.32	2.96
GC3/88	0.1	3.1	96.1	9.0	5.92	1.28	0.00	0.74	5.92
GC3/245	0.0	1.7	98.2	9.4	5.96	1.25	0.00	0.74	5.96
GC3/509	0.0	1.2	98.6	9.0	5.97	1.24	0.00	0.74	5.97
GC3/999	0.0	0.9	99.1	10.4	5.98	1.24	0.00	0.74	5.98
Average	4.1	22.3	55.2	6.7	4.02	1.53	0.02	0.96	4.07
Stdv	6.5	33.4	46.6	3.9	2.11	0.77	0.23	0.29	2.11
Min	0.0	0.9	0.3	0.6	1.24	0.58	-0.46	0.74	0.88
Max	16.0	97.7	99.1	10.4	5.98	3.07	0.32	1.48	5.98

Station / depth	% Gravel	% Sand	% Pelite	% TOM	D_{50} (ϕ):	Sorting	Skewness	Kurtosis	Mean
MA Deep 2-1/1366	0.0	0.7	99.2	14.7	5.98	1.24	0.00	0.74	5.98
MA Deep 2-2/1424	0.0	0.8	99.1	14.3	5.98	1.24	0.00	0.74	5.98
MA Deep 2-3/1387	0.0	1.4	98.5	14.7	5.97	1.24	0.00	0.74	5.97
MA Deep 2-4/1600	0.0	0.6	99.3	14.7	5.99	1.23	0.00	0.74	5.99
MA DEEP 2-5/1361	0.3	0.7	98.8	15.0	5.98	1.24	0.00	0.74	5.98
Average	0.1	0.8	99.0	14.7	5.98	1.24	0.00	0.74	5.98
Stdv	0.1	0.3	0.3	0.3	0.01	0.00	0.00	0.00	0.01
Min	0.0	0.6	98.5	14.3	5.97	1.23	0.00	0.74	5.97
Max	0.3	1.4	99.3	15.0	5.99	1.24	0.00	0.74	5.99

Station / depth	% Gravel	% Sand	% Pelite	% TOM	D_{50} (ϕ):	Sorting	Skewness	Kurtosis	Mean
SPN/24	8.3	51.6	2.4	1.5	2.11	1.58	-0.35	1.14	1.77
SPE/26	16.6	9.1	1.0	0.8	0.62	1.63	-0.26	1.35	0.44
SPW/25	6.1	61.0	2.7	1.5	2.29	1.33	-0.38	1.57	2.06
SPS/27	1.3	81.8	5.6	1.6	2.85	0.92	-0.01	1.16	2.88
Average	8.1	50.8	2.9	1.4	1.97	1.37	-0.25	1.30	1.79
Stdv	6.4	30.6	1.9	0.4	0.95	0.32	0.17	0.20	1.01
Min	1.3	9.1	1.0	0.8	0.62	0.92	-0.38	1.14	0.44
Max	16.6	81.8	5.6	1.6	2.85	1.63	-0.01	1.57	2.88

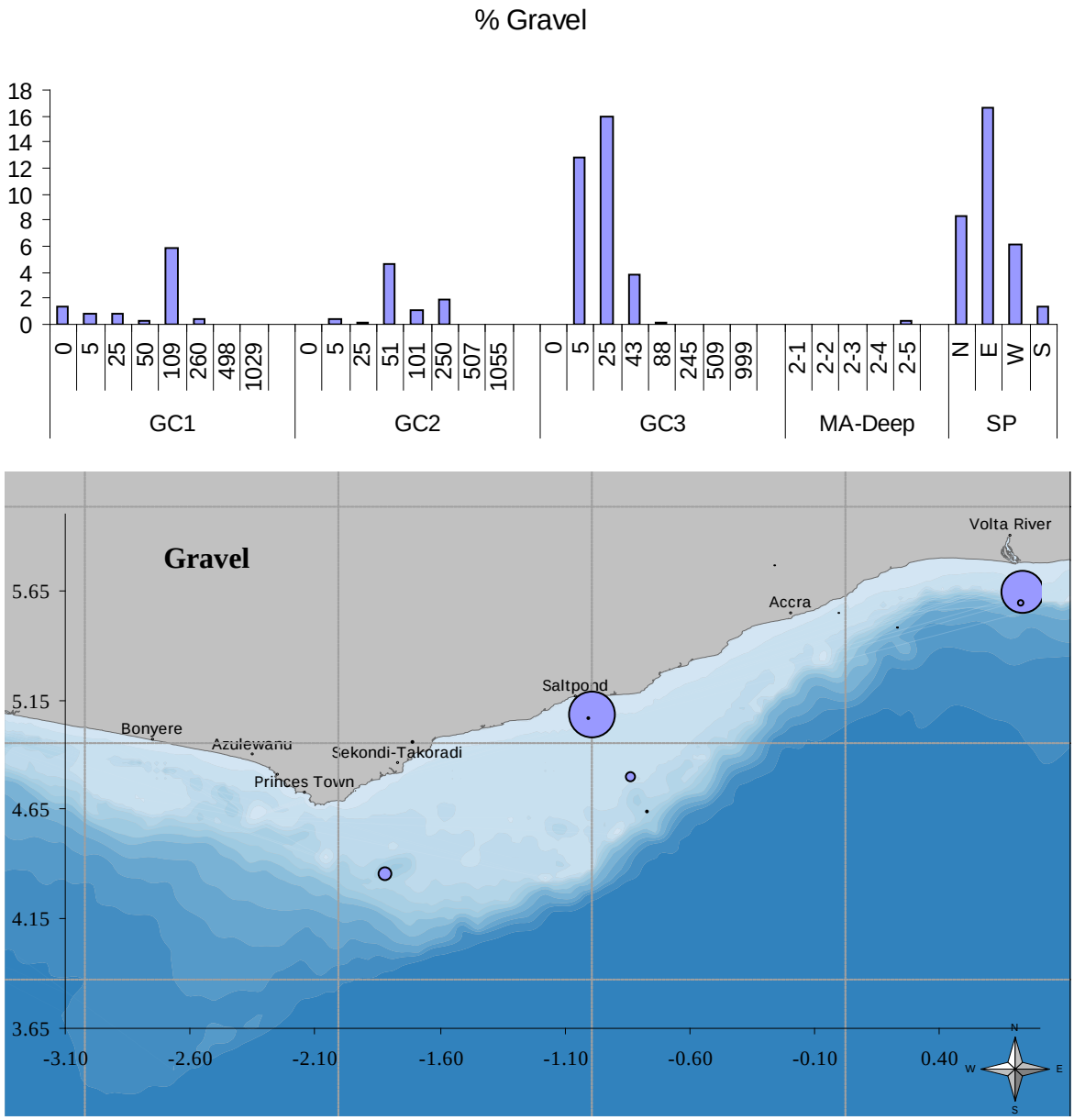


Figure 5.1 Content of gravel along the three transects of Ghana Central (GC), and sample grids around Mahogany (Ma-deep) and Salt Pond (SP) oil rigs. The circle area in the map illustrate the relative amount of gravel at each station.

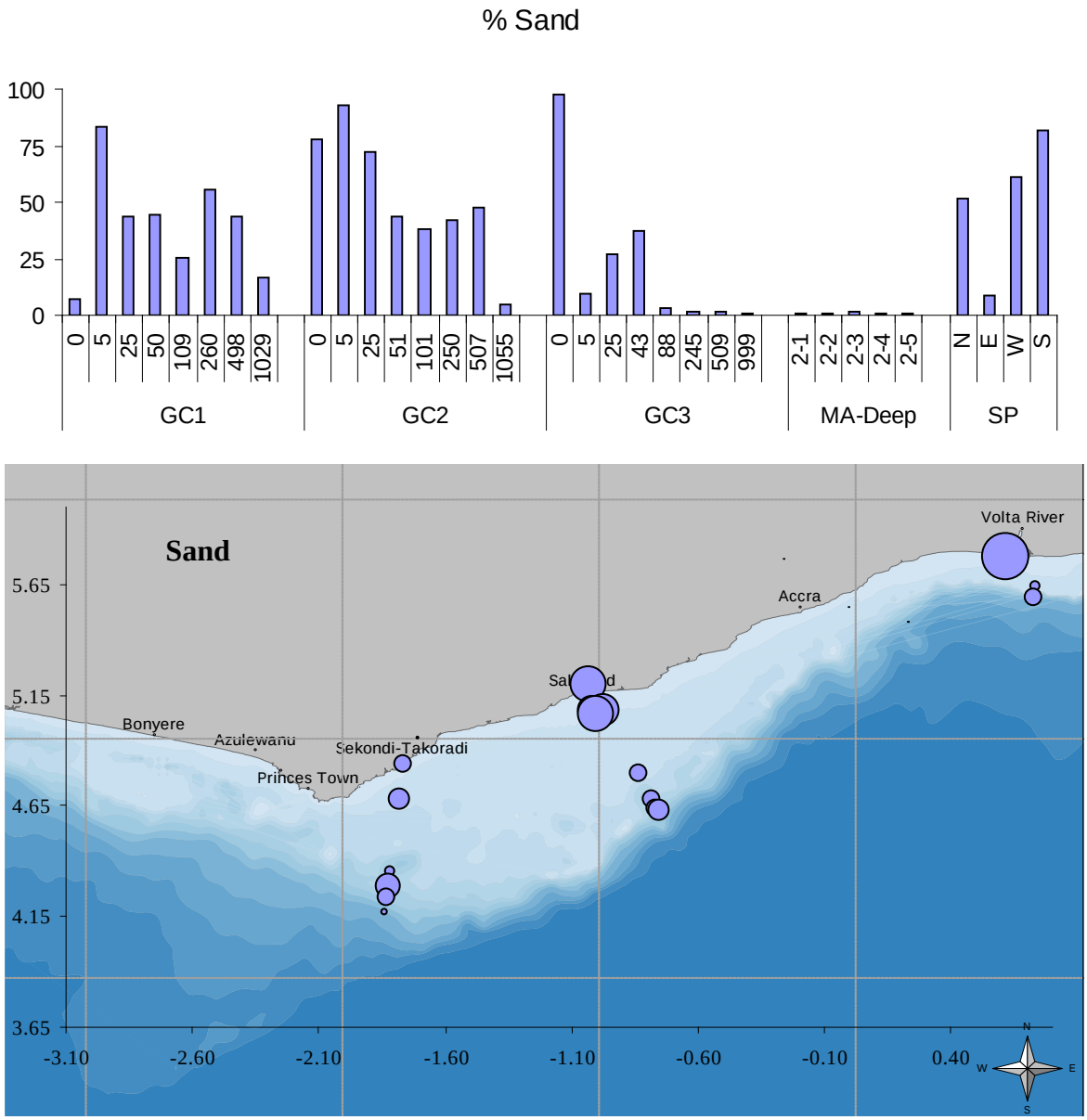


Figure 5.2 Content of sand along the three transects of Ghana Central (GC), and sample grids around Mahogany (Ma-deep) and Salt Pond (SP) oil rigs. The circle area in the map illustrates the relative amount of sand at each station.

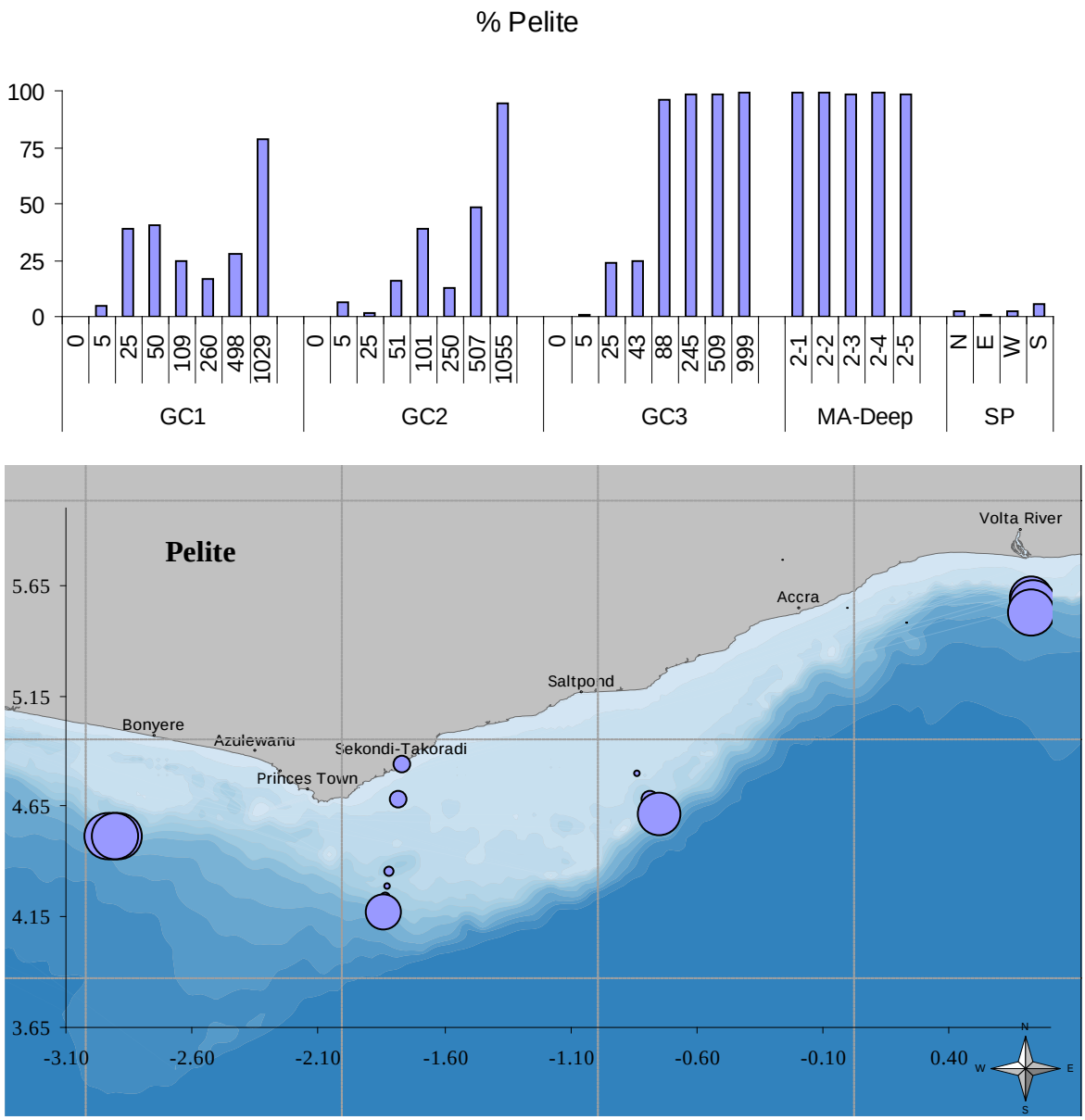


Figure 5.3 Content of pelite along the three transects of Ghana Central (GC), and sample grids around Mahogany (Ma-deep) and Salt Pond (SP) oil rigs. The circle area in the map illustrates the relative amount of pelite at each station.

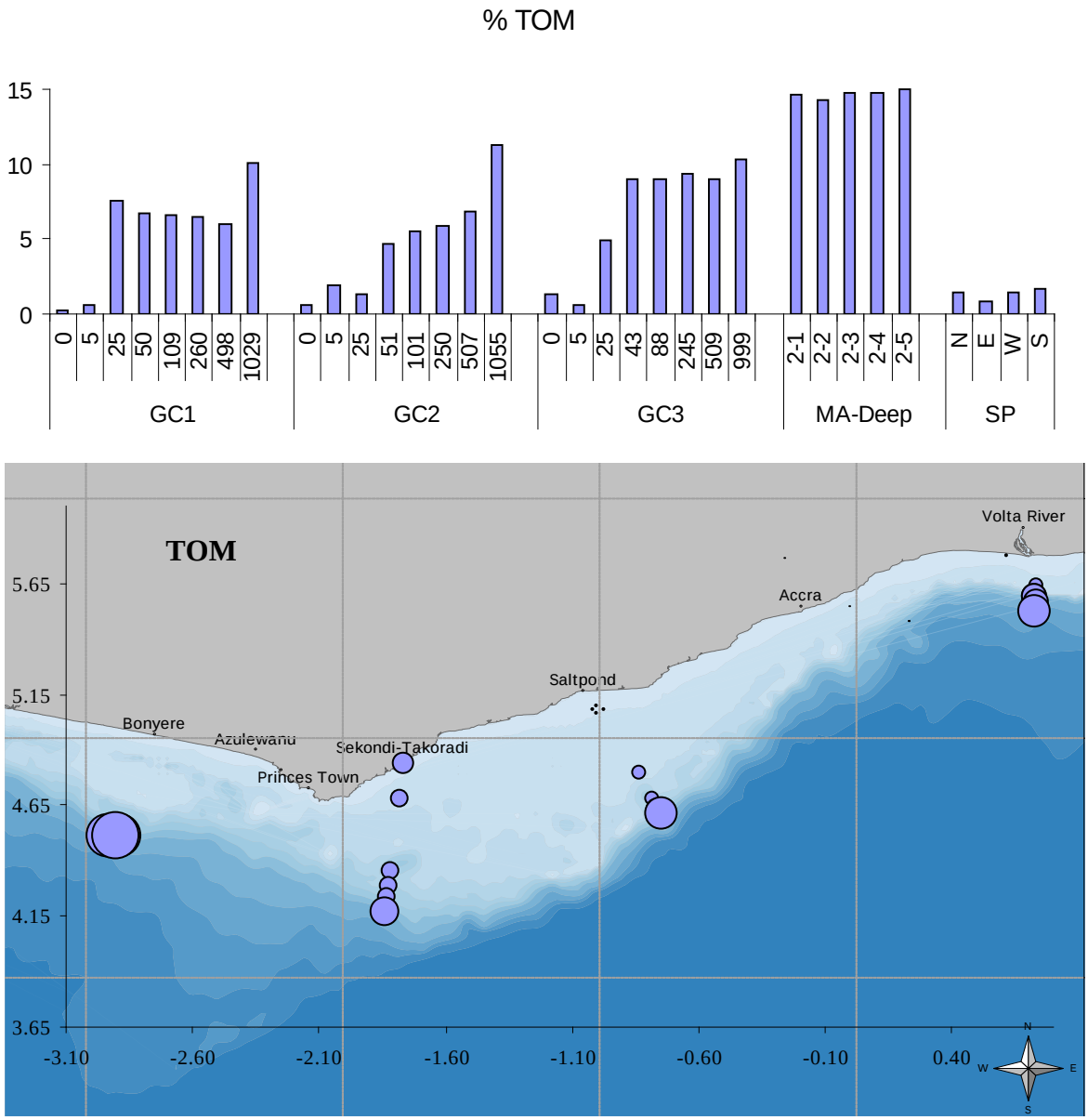


Figure 5.4 Content of Total Organic Matter (TOM) along the three transects of Ghana Central (GC), and sample grids around Mahogany (Ma-deep) and Salt Pond (SP) oil rigs. The circle area in the map illustrates the relative amount of TOM at each station.

5.2 Chemistry

5.2.1 PCB

Table 5.2 shows a summary of the results of the PCB-analysis. GC1 at 5m depth was the only location where PCB values were seen above the detection limit of 0.5 µg/kg dry weight. The whole dataset is presented in the Appendix.

The largest PCB values were found in the first grab of GC1/5, with a level of 1.1 µg/kg dry weight. When being compared to the standard guidelines of the Norwegian Pollution Authorities, the values are well below what is classified as background levels.

Table 5.2: Average concentrations with standard deviation of PCB from three parallel samples (µg/kg dry weight) at the site of 5 m depth in the transect GC1 off Ghana in 2010. All other samples contained concentrations of PCB below the detectable level of 0.5 µg/kg dry weight.

Stasjon	Hugg	Dyp (m)	PCB 101	PCB 118	PCB 138	PCB 153	PCB 180	PCB 28	PCB 52	Sum 7 PCB	DW
GC1	1	5	<0.5	<0.5	0.5	0.6	<0.5	<0.5	<0.5	1.1	55.00
	2		<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	55.00
	3		<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.5	56.00
	Av		**<0.5**	**<0.5**	**0.4**	**0.6**	**<0.5**	**<0.5**	**<0.5**	**0.7**	**55.33**
	Stdv					**0.0**				**0.3**	**0.58**

5.2.2 Pecticides

The following pesticides were analysed: Aldrin; alpha-endosulfane; alpha-HCH; beta-HCH; Dieldrin; gamma-HCH; Hexachlorobenzene; Hexachlorobutadien; Heptachlor; o,p-DDD; o,p-DDE; o,p-DDT; p,p-DDT; p,p-DDD; p,p-DDE and Pentachlorobenzene. Due to a high detection limit of 0.01 mg/kg, most results were below detection limit, except for beta-HCH in the first of three grabs at GC1 25m (0.03 mg/kg) and in the first of three grabs at 1055 m at GC2 (0.02 mg/kg).

5.2.3 Metals

Table 5.3 summarises the results of metal analysis. The complete data set including replicates is given in the Appendix. The bottom sediment samples were analysed for the following heavy metals: arsene (As), cadmium (Cd), copper (Cu), barium (Ba), mercury (Hg), chromium (Cr), lead (Pb), Nickel (Ni) and zink (Zn) (figures 5.5-5.12).
A search in the Ghana Standards Authority did not give any results for metals in marine sediments. Because of this the values were compared to Ospar and Klif (Norwegian Pollution Authority) standards for coastal waters. The background levels for these natural occurring substances however might differ considerably from one area to another depending on geological conditions, and should as such be regarded as guidance levels rather than strict limits (NGU Rapport 2011.035 TA-2683/2011 p: 6). Arsene is often associated with sulphites and Arsene and Cadmium are associated with the type of rock called shales in Europe, an estimate of background levels for these parameters is therefore dependent on knowledge of

geological conditions in this specific geological area including runoffs and possible anthropogenic sources.

The comparison to these standards might therefore not be relevant, nevertheless:
With the exception of high levels of arsene in three sites, the concentrations of heavy metals were low at all stations. When comparing values to the standard made by the Norwegian Pollution Authority (KLIF) for similar bottom types, all metals (barium is not included in the standard) apart from As had concentrations well below what is defined as background levels (Bakke et al 2007).
Most metals had increasing levels with depth. This is probably a result of particle size and affinity to fine grained sediment, which is found in a greater extent in the deep areas (NGU Rapport 2011.035 TA-2683/2011 p: 24).

.
On three stations, the concentrations of arsene were above what is defines as background levels. At the 25 m site of GC1, 68.3 mg/kg arsene was detected, which is defined as moderately polluted by KLIF (Bakke et al 2007). At 25 m and 43 m of GC3 the concentrations of As were, respectively, 106.7 and 120.0 mg/kg, both levels defined as severely polluted by KLIF. The sediment from these three stations consisted of sand and coarse shell sand, shell sand and clay and fine shell sand and mineral sand respectively. None of them were particularly fine grained, compared to other stations. Hence these are actual elevated concentrations, possibly originating from the shell sand. A local source either anthropogenic or natural should also be considered and the stations given special attention when monitored in the future. Apart from these three sites, all concentrations measured were low.
Cadmium, copper, barium, mercury and to some extent chromium and nickel showed a trend of increasing concentration with depth. Cd was found in the range of 0.01 mg/kg in several of the shallow sites of GC1 and GC2, to 0.21 mg/kg in the deep areas of the MA-DEEP sites. Concentrations of Cu ranged from 0.1 mg/kg at the shoreline (0 m) of GC2, to 17.0 mg/kg at the deep site MA-DEEP 2-1. Ba had concentrations up to 193.0 mg/kg in two of the stations at MA-DEEP, while the lowest value (1.7 mg/kg) was found at SPE at 26 m depth. Hg varied between 0.001 mg/kg at several shallow sites, to 0.045 mg/kg around the Mahogany oil rig. Cr does not demonstrate such a clear trend as the above mentioned metals. The highest values were found in the deep areas of the MA-DEEP's and GC2. However, values in the upper range of the measurements were also detected in the more shallow parts of GC1.

Concentrations of Pb were highest in the shallow parts of GC3 as well as at 25 m at GC1/25 (17.0 mg/kg). The lowest values were detected at the shoreline (0 m) at GC1 (0.6 mg/kg) and at SPE. The highest Zn concentrations were found in the shallow parts of GC3 with the highest value (76.0 mg/kg) at 43 m. The lowest value was detected at the shoreline (0 m) of GC1. The sediment in the areas of the highest values of Pb and Zn were not dominated by fine grained material, and can not be used as and explanation of elevated concentrations.

Table 5.3 Average concentrations and standard deviations from three parallel samples (mg/kg dry weight) of metal at eight depths of transects GC1, GC2 and GC3 as well as the sites of MA-DEEP and SP. Samples were collected in 2010. Values in mg/kg dry weight, however some samples contained too much fluid for the concentrations to be compared with dry weight. The depth of these samples are marked with an *.

		Arsene (As)		Lead (Pb)		Cadmium (Cd)		Copper (Cu)		Barium (Ba)	
Transect	**Depth**	**Av**	**Std**	**Av**	**Std**	**Av**	**Std**	**Av**	**Std**	**Av**	**Std**
GC1	0*	1.8	*0.1*	0.6	*0.0*	0.02	*0.00*	0.3	*0.0*	3.5	*3.4*
	5	1.8	*0.2*	2.0	*0.6*	0.01	*0.00*	0.4	*0.1*	5.8	*3.5*
	25	68.3	*3.8*	**17.0**	*1.0*	0.02	*0.00*	1.0	*0.5*	7.1	
	50	7.5	*0.4*	4.4	*0.3*	0.06	*0.00*	2.1	*0.1*	7.9	*0.7*
	109	3.7	*1.3*	1.8	*0.4*	0.13	*0.04*	3.5	*0.4*	13.2	*4.7*
	260	8.9	*1.1*	3.6	*0.4*	0.12	*0.04*	3.7	*0.6*	29.0	*7.9*
	498	9.9	*1.8*	4.7	*0.2*	0.08	*0.01*	3.4	*0.7*	23.4	*15.7*
	1029	3.0	*0.6*	4.3	*0.2*	0.17	*0.05*	10.2	*0.7*	133.3	*5.8*
GC2	0	14.7	*0.6*	4.9	*0.1*	0.01	*0.00*	0.1	-	3.7	*3.4*
	5	9.0	*2.9*	4.9	*0.6*	0.01	*0.00*	0.5	*0.1*	3.6	*0.3*
	25	3.7	*0.6*	0.9	*0.2*	0.01	*0.00*	0.7	*0.1*	2.8	*1.0*
	51	5.1	*0.2*	1.9	*0.2*	0.14	*0.02*	2.9	*0.5*	7.8	*1.5*
	101	4.0	*1.3*	2.5	*0.3*	0.08	*0.00*	3.7	*0.6*	6.9	
	250	8.2	*1.0*	3.5	*0.1*	0.14	*0.01*	2.9	*0.2*	8.6	*3.0*
	507	9.9	*0.1*	6.1	*0.2*	0.10	*0.03*	2.6	*0.3*	14.7	*1.5*
	1055	2.9	*0.6*	5.1	*0.3*	0.20	*0.05*	12.0	*0.0*	130.0	*0.0*
GC3	0	7.0	*0.3*	6.7	*0.8*	0.02	*0.01*	1.9	*0.2*	36.0	*1.0*
	5	13.7	*1.5*	16.0	*1.0*	0.04	*0.00*	10.6	*0.6*	63.0	*2.6*
	25	106.7	*5.8*	11.5	*1.9*	0.02	*0.00*	2.0	*0.9*	6.9	*1.3*
	43	**120.0**	*10.0*	16.7	*1.2*	0.03	*0.00*	2.2	*0.5*	7.8	*0.6*
	88	12.6	*5.5*	9.0	*0.3*	0.04	*0.01*	10.7	*0.6*	19.0	*0.0*
	245	8.4	*1.5*	8.4	*0.3*	0.07	*0.01*	10.9	*1.2*	21.3	*1.2*
	509	8.8	*2.1*	8.6	*0.5*	0.12	*0.01*	9.7	*0.5*	32.3	*2.5*
	*999**	7.4	*2.1*	7.7	*1.1*	0.09	*0.03*	9.7	*0.1*	43.7	*7.2*
MA-DEEP	1361	2.1	*0.2*	5.4	*0.2*	0.21	*0.00*	16.7	*0.6*	**193.3**	*11.5*
MA-DEEP 2-1	1366	2.1	*0.3*	5.4	*0.2*	0.19	*0.02*	**17.0**	*1.0*	**193.3**	*5.8*
MA-DEEP 2-2	1424	2.3	*0.2*	5.3	*0.3*	0.18	*0.06*	16.0	*0.0*	186.7	*5.8*
MA-DEEP 2-3	1387	2.1	*0.3*	4.7	*0.2*	0.21	*0.05*	14.0	*2.0*	163.3	*20.8*
MA-DEEP 2-4	1600	3.8	*1.1*	5.2	*0.7*	0.16	*0.02*	16.3	*2.9*	176.7	*23.1*
SPE	26	4.8	*0.8*	0.7	*0.1*	0.01	*0.00*	0.8	*0.3*	1.7	*0.6*
SPN	24	4.4	*0.7*	1.3	*0.4*	0.01	*0.01*	0.7	*0.2*	10.9	*9.4*
SPS	27	2.8	*0.1*	1.2	*0.3*	0.02	*0.00*	0.8	*0.2*	3.2	*0.4*
SPW	*25**	3.2	*0.5*	1.4	*0.4*	0.02	*0.00*	1.0	*0.5*	12.4	*9.3*

Table 5.3 continued. Average concentrations and standard deviations from three parallel samples (mg/kg dry weight) of metal at eight depths of transects GC1, GC2 and GC3 as well as the sites of MA-DEEP and SP. Samples were collected in 2010. Values in mg/kg dry weight, however some samples contained too much fluid for the concentrations to be compared with dry weight. The depth of these samples are marked with an *.

		Chrromium (Cr)		Mercury (Hg)		Nickel (Ni)		Zink (Zn)	
Transect	**Depth**	**Av**	**Std**	**Av**	**Std**	**Av**	**Std**	**Av**	**Std**
GC1	0*	2.2	*0.1*	0.001	-	0.5	*0.0*	6.1	*4.2*
	5	7.3	*1.0*	0.001	-	1.4	*0.4*	8.1	*0.9*
	25	55.7	*4.2*	0.012	*0.002*	11.3	*1.2*	56.7	*4.5*
	50	43.3	*1.2*	0.009	*0.000*	9.0	*0.3*	36.3	*1.5*
	109	18.3	*4.6*	0.012	*0.003*	6.7	*1.6*	22.3	*5.5*
	260	45.0	*2.0*	0.013	*0.002*	11.0	*1.0*	62.0	*1.7*
	498	54.3	*5.7*	0.016	*0.002*	10.2	*0.8*	43.0	*1.0*
	1029	40.3	*1.2*	0.029	*0.003*	18.0	*1.0*	46.7	*1.5*
GC2	0	11.3	*0.6*	0.001	-	2.5	*0.1*	21.0	*1.0*
	5	27.0	*1.0*	0.002	*0.001*	4.4	*0.2*	35.3	*1.5*
	25	12.7	*0.6*	0.001	*0.000*	1.5	*0.2*	7.5	*1.0*
	51	19.0	*3.5*	0.005	*0.001*	5.2	*1.0*	17.7	*2.3*
	101	28.7	*0.6*	0.010	*0.002*	9.3	*0.9*	29.7	*0.6*
	250	44.7	*1.5*	0.009	*0.000*	9.2	*0.3*	55.0	*2.0*
	507	**64.3**	*1.5*	0.013	*0.000*	11.7	*0.6*	49.0	*1.0*
	1055	36.7	*1.2*	0.029	*0.001*	**28.3**	*11.8*	44.0	*0.0*
GC3	0	9.9	*0.2*	0.004	*0.000*	2.8	*0.1*	35.3	*1.2*
	5	26.0	*3.5*	0.034	*0.009*	8.9	*0.6*	67.0	*3.5*
	25	20.7	*7.0*	0.004	*0.001*	10.3	*2.1*	61.3	*10.0*
	43	33.3	*1.5*	0.005	*0.000*	15.3	*0.6*	**76.0**	*2.6*
	88	36.0	*1.7*	0.014	*0.002*	16.0	*0.0*	35.0	*1.7*
	245	35.3	*2.1*	0.016	*0.001*	16.7	*1.5*	34.0	*2.6*
	509	34.3	*2.9*	0.022	*0.001*	16.3	*1.2*	34.0	*2.6*
	*999**	28.5	*2.1*	0.025	*0.004*	15.5	*0.7*	31.0	*2.8*
MA-DEEP 2-1	1366	44.3	*1.5*	0.045	*0.001*	27.0	*1.0*	53.0	*1.7*
MA-DEEP 2-2	1424	42.0	*0.0*	0.042	*0.005*	25.3	*0.6*	51.7	*2.1*
MA-DEEP 2-3	1387	37.3	*5.0*	0.041	*0.002*	22.3	*3.1*	45.0	*6.6*
MA-DEEP 2-4	1600	40.7	*7.6*	0.042	*0.007*	26.0	*4.4*	49.7	*8.4*
MA-DEEP 2-5	1361	45.0	*1.7*	0.041	*0.001*	27.0	*1.0*	53.7	*1.5*
SPE	26	7.6	*1.1*	0.001	-	1.0	*0.2*	5.3	*1.7*
SPN	24	14.0	*4.4*	0.002	*0.001*	1.9	*0.6*	9.3	*3.2*
SPS	27	18.0	*1.7*	0.002	*0.000*	2.7	*0.4*	13.7	*2.3*
SPW	*25**	13.0	*2.7*	0.002	*0.001*	2.1	*0.6*	10.8	*3.3*

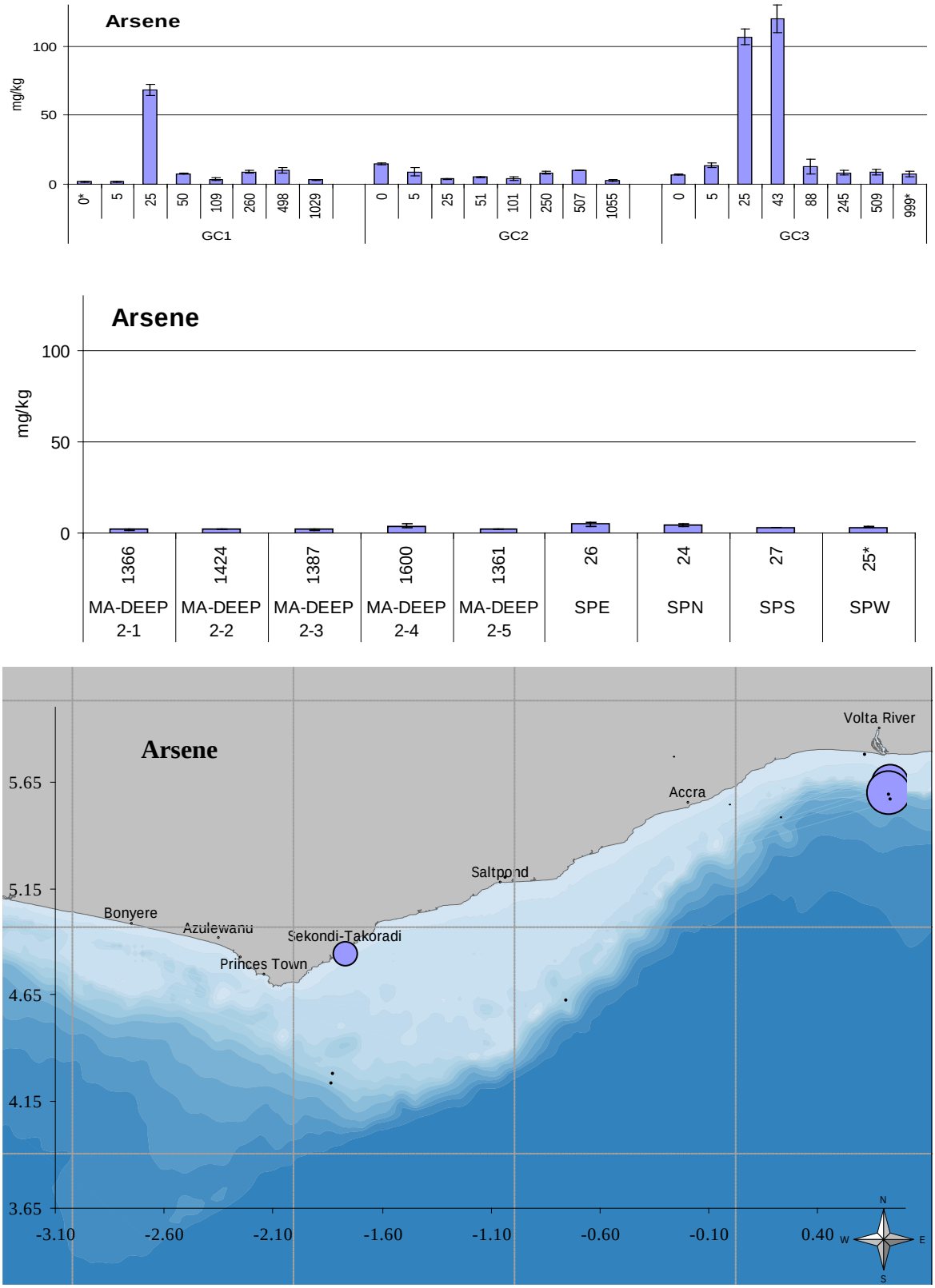


Figure 5.5 Distribution of Arsene (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of arsen at each station.

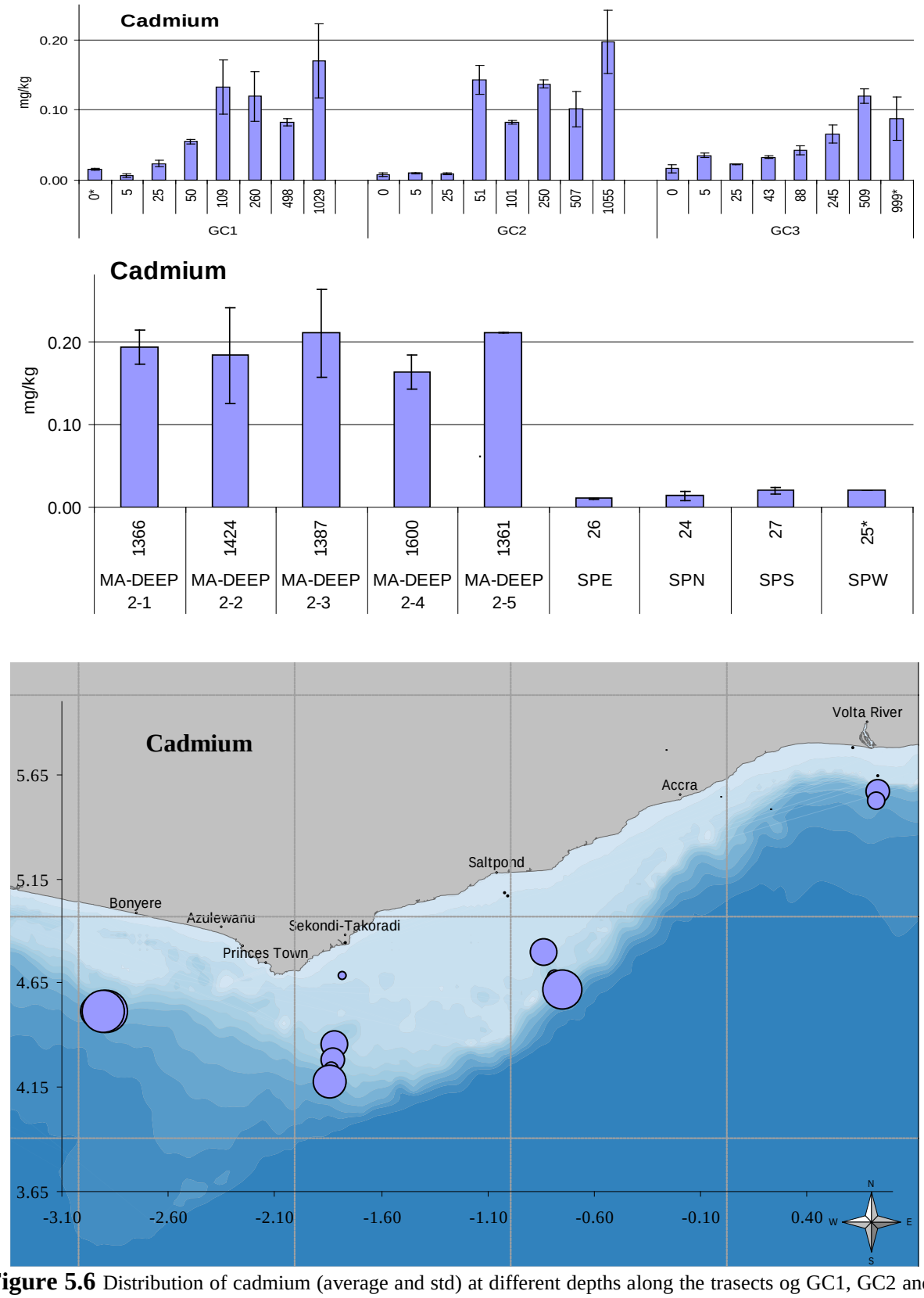


Figure 5.6 Distribution of cadmium (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content.The sizes of the circles in the map illustrates the relative concentration of cadmium at each station.

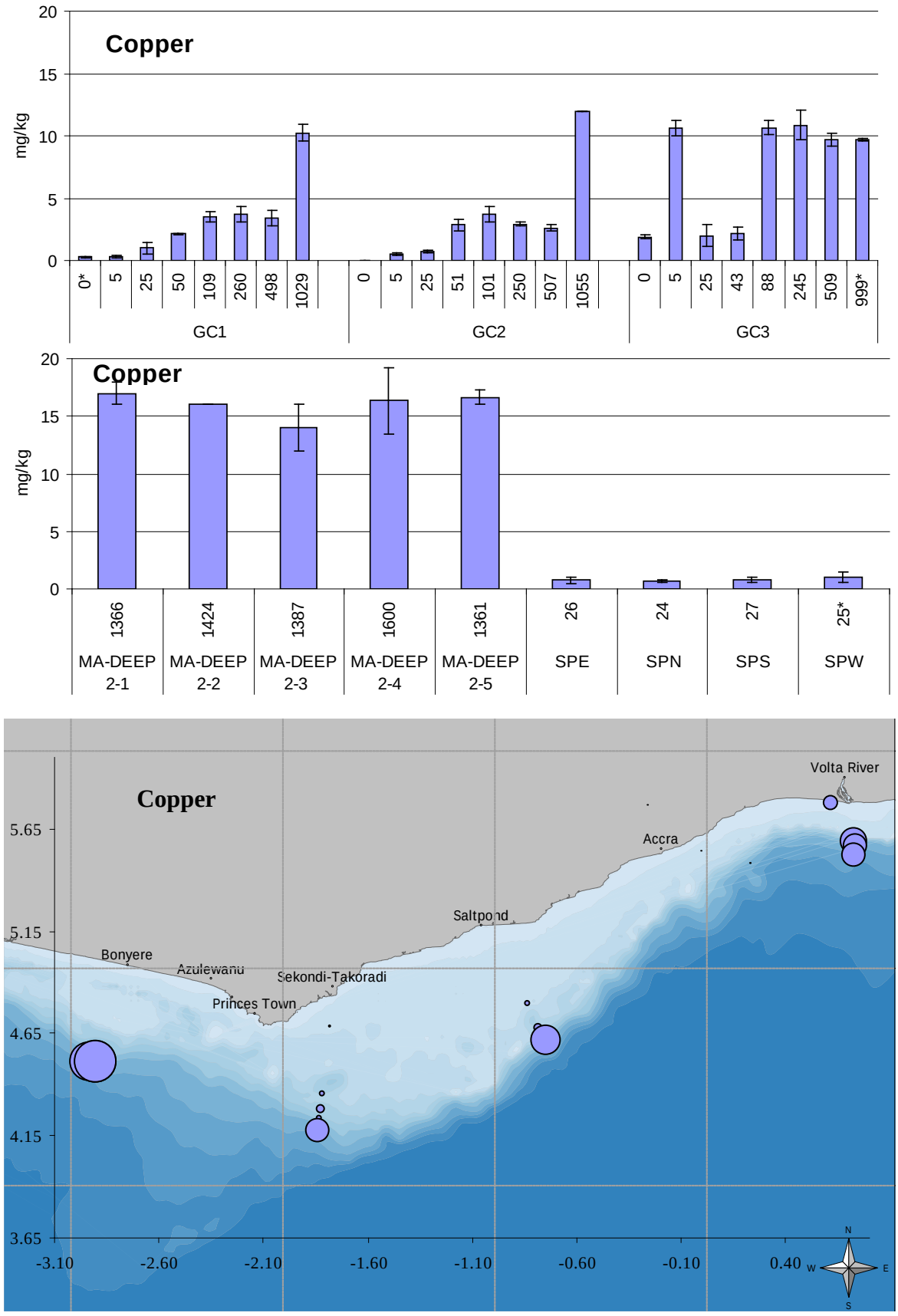


Figure 5.7 Distribution of copper (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not becompared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of copper at each station.

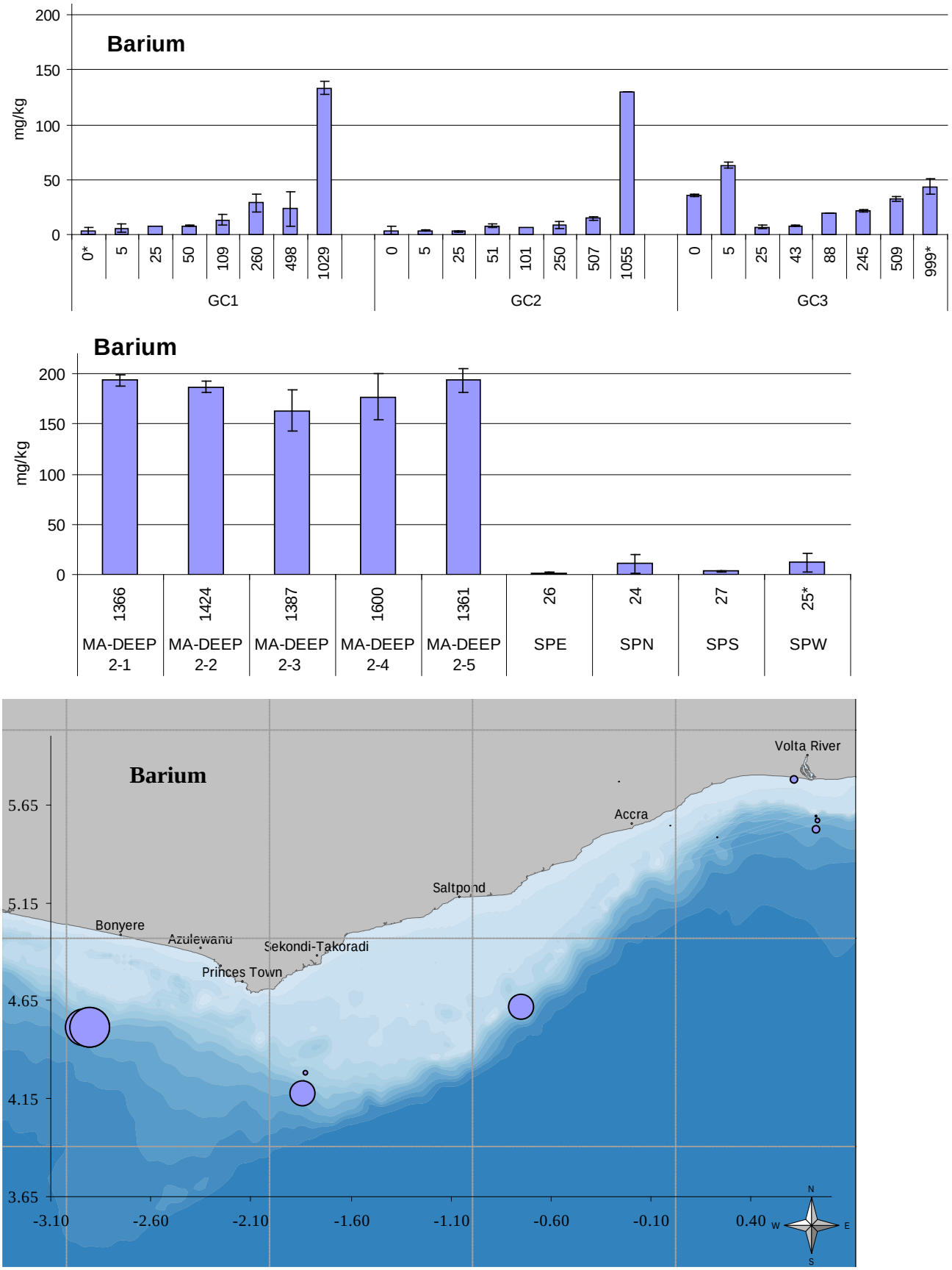
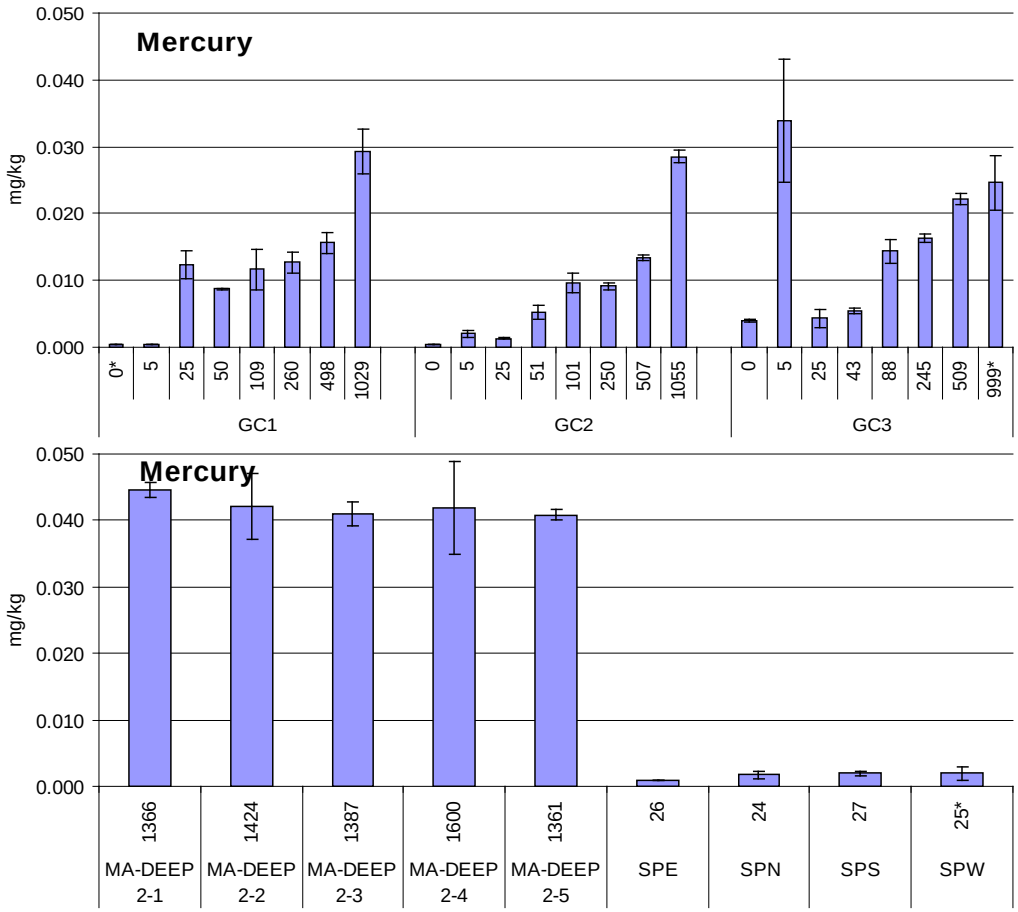


Figure 5.8 Distribution of Barium (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of barium at each station.



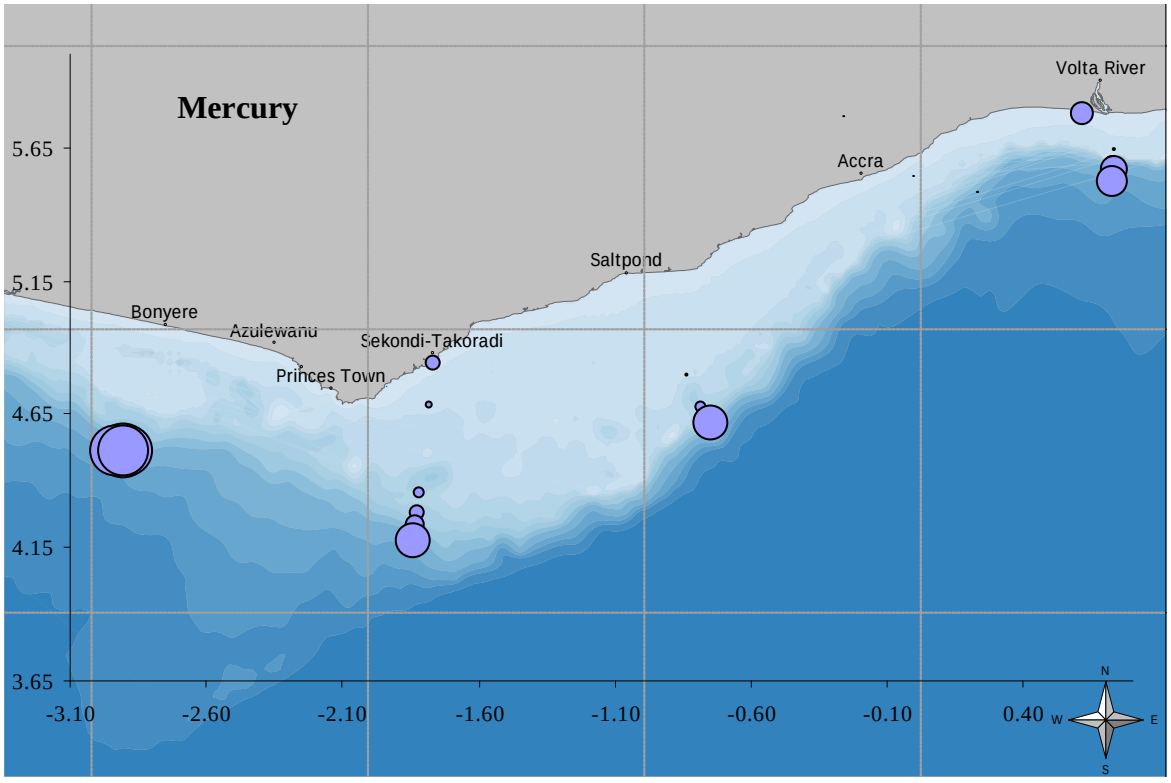


Figure 5.9 Distribution of mercury (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of mercury at each station.

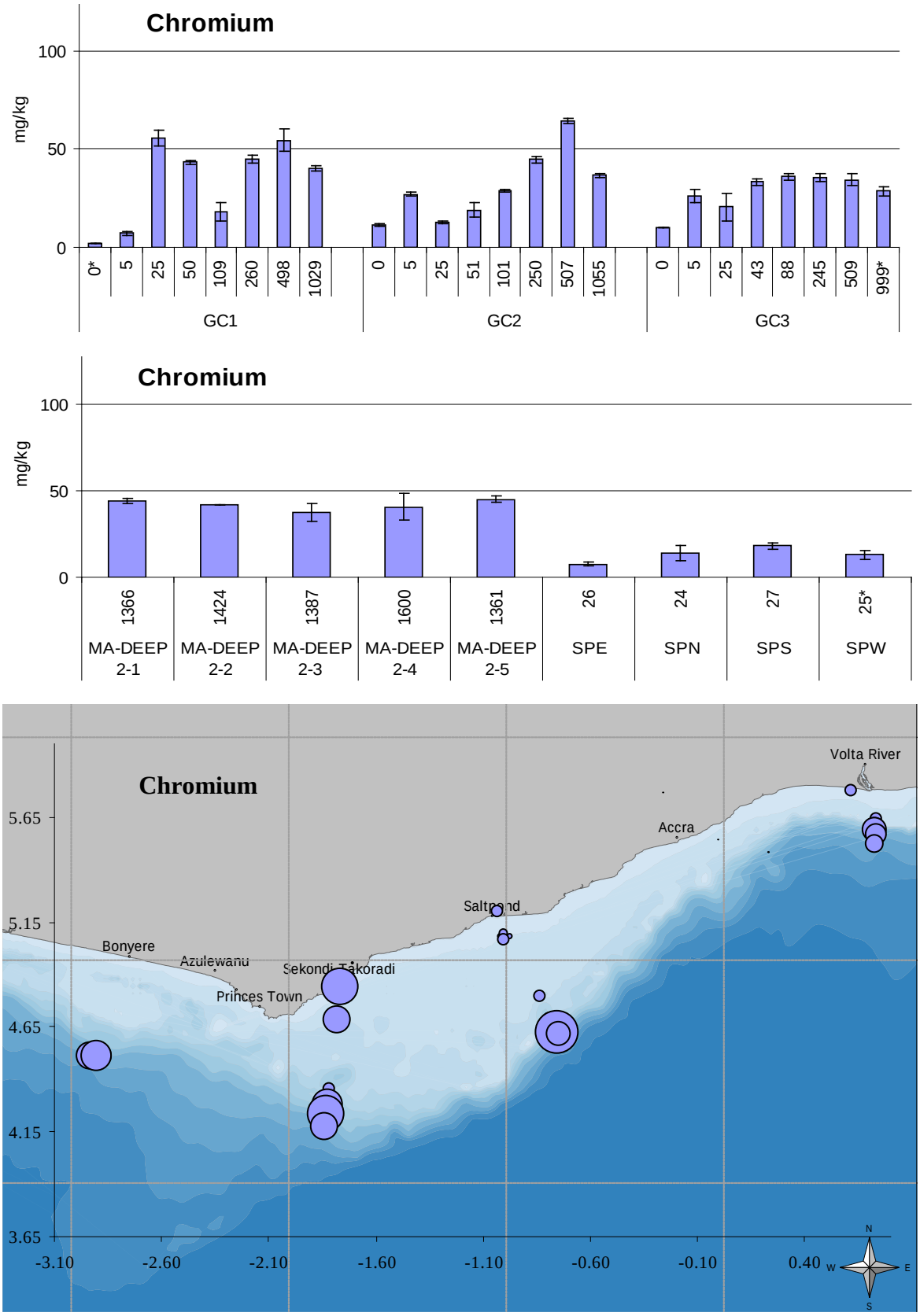


Figure 5.10 Distribution of chromium (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of chromium at each station.

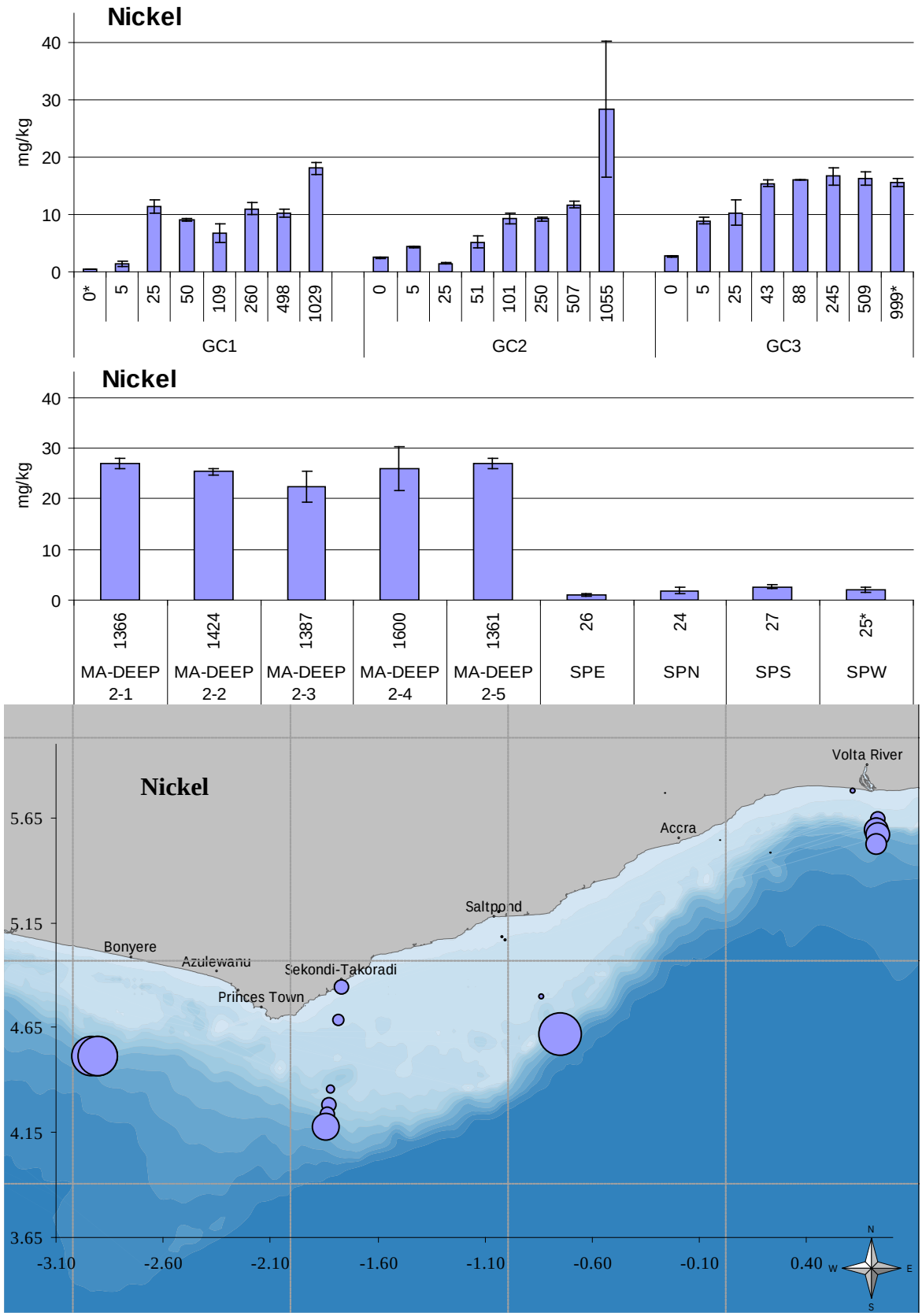


Figure 5.11 Distribution of nickel (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of nickel at each station.

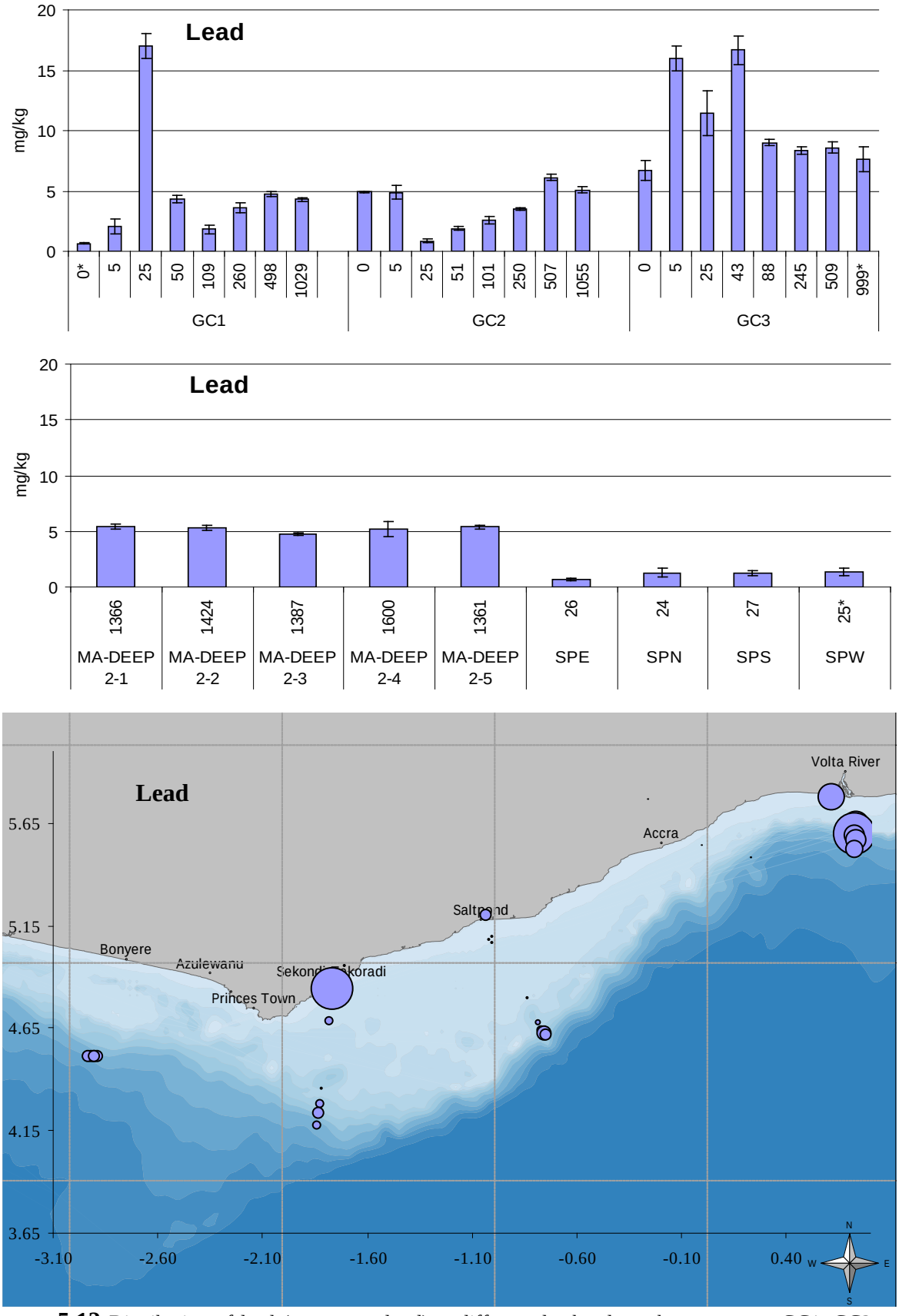


Figure 5.12 Distribution of lead (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of lead at each station.

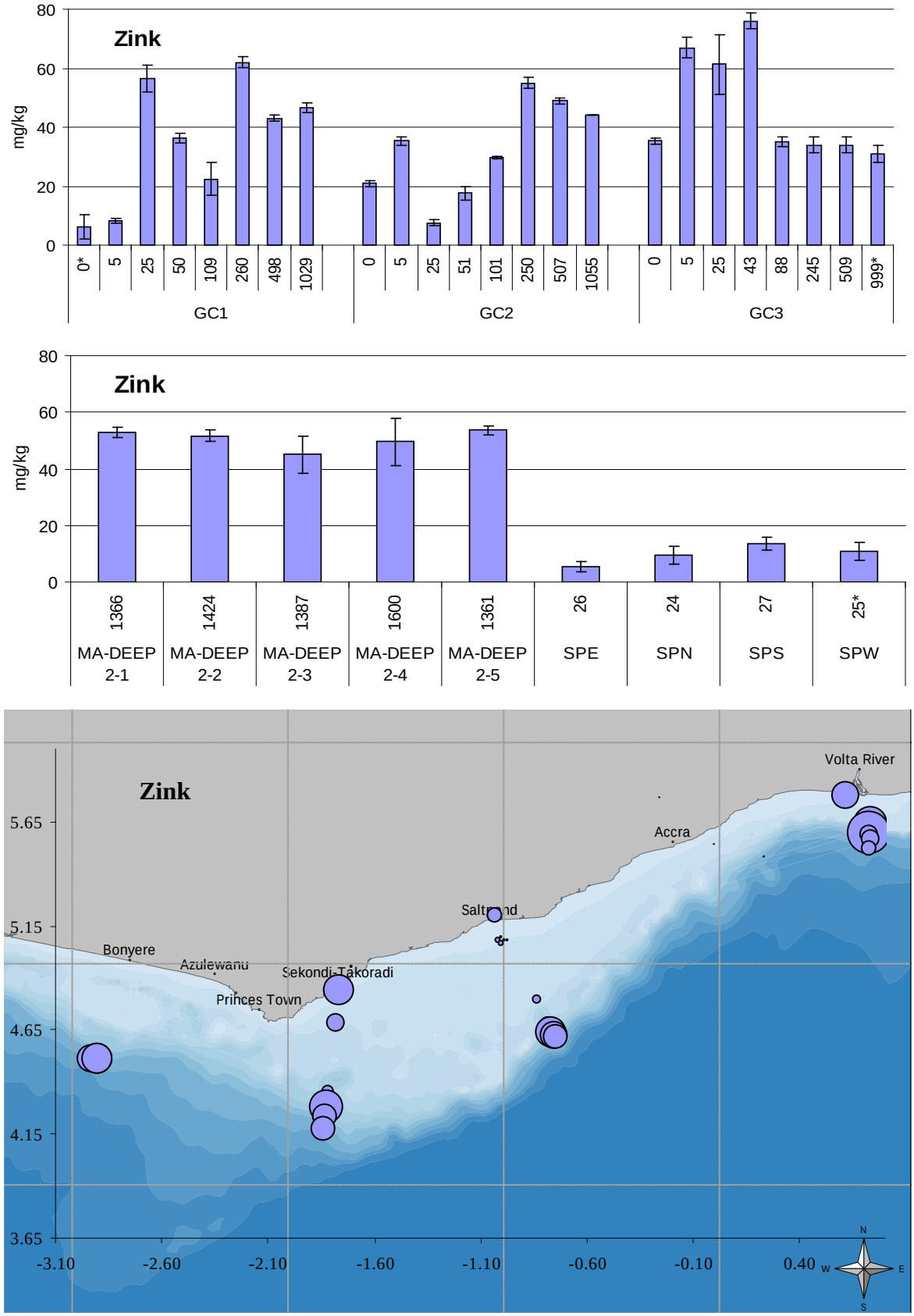


Figure 5.13 Distribution of zinc (average and std) at different depths along the trasects og GC1, GC2 and GC3 as well as the area MA-DEEP and SP in 2010. Asterisk indikate that one or more grab samples could not be compared to dry weight due to a large water content. The sizes of the circles in the map illustrates the relative concentration of zink at each station.

5.2.2 Hydrocarbons

Table 5.4 summarises the results of the hydrocarbon analysis. The complete data set including replicates is presented in Appendix.

The concentrations of hydrocarbons were low at all sites and several compounds of PAH (polyaromatic hydrocarbons) and NPD (naphthalene, phenanthrene and dibenzothiophene) were below the detection limits.

The highest concentrations of total hydrocarbon (THC) (13.8 mg/kg), NPD (435.1 µg/kg) and PAH (1224.95 µg/kg) were found at the station at 5 m depth along transect GC3, which indicates the Volta river as a source for hydrocarbons. The stations around the Salt Pond oil rig marked SP had generally lower concentrations of hydrocarbons compared to the other areas.

Table 5.4: Average concentrations and standard deviations of THC (C12-35), PAH16 and NPD (mg/kg dw) at eight stations with different depths along the transects GC1, GC2, GC3 and sample grids around Mahogany (Ma-deep) and Salt Pond (SP) oil rigs. The largest values are marked with bold letters.

Transect	Depth	SUM NPD µg/kg TS		16 EPA-PAH µg/kg TS		THC mg/kg TS	
		Av	*Std*	Av	*Std*	Av	*Std*
GC1	0	<18.6		<3.81		0.2	*0.1*
	5	<18.6		<3.81		0.6	*0.3*
	25	40.8	*2.9*	82.37	*6.19*	6.1	*1.4*
	50	23.6	*1.1*	9.95	*0.79*	4.0	*0.4*
	109	16.6	*6.3*	8.40	*0.55*	2.7	*0.7*
	260	23.8	*1.9*	9.99	*1.32*	3.2	*1.0*
	498	20.8	*0.4*	13.62	*2.04*	2.9	*0.7*
	1029	28.2	*1.2*	41.59	*1.62*	2.1	*0.3*
GC2	0	<18.6		8.23	*0.24*	0.7	*0.2*
	5	19.4	*0.6*	24.46	*4.61*	2.1	*0.5*
	25	<18.6		<3.81		1.6	*0.5*
	51	13.5	*7.3*	6.86	*1.20*	3.1	*0.5*
	101	20.7	*1.0*	11.46	*2.48*	2.4	*0.3*
	250	17.0	*6.7*	7.90	*0.45*	2.7	*0.6*
	507	22.5	*1.7*	13.46	*3.38*	3.8	*0.2*
	1055	39.4	*4.8*	41.80	*2.74*	6.3	*3.0*
GC3	0	41.5	*10.5*	135.20	*37.47*	6.9	*3.0*
	5	**435.1**	*163.9*	**1224.95**	*546.85*	**13.8**	*7.2*
	25	18.5	*9.0*	17.70	*9.80*	4.1	*3.2*
	43	18.8	*0.0*	16.74	*0.20*	3.7	*0.7*
	88	38.7	*15.7*	74.98	*27.60*	1.0	*0.1*
	245	36.9	*7.5*	71.39	*5.46*	1.9	*0.9*
	509	61.5	*1.7*	99.03	*8.20*	5.7	*1.6*
	999	51.2	8.1	96.53	10.00	1.9	0.9
SPW	25	<18.6		3.88	1.84	2.5	0.4
SPN	24	<18.6		3.54	2.83	1.6	0.8
SPE	26	<18.6		<3.81		1.2	0.3
SPS	27	<18.6		2.59	1.17	2.1	0.7
MA-DEEP 2-1	1366	44.4	9.2	73.44	21.91	3.6	1.9
MA-DEEP 2-2	1424	46.2	3.2	71.79	6.48	3.5	0.7
MA-DEEP 2-3	1387	53.5	1.2	87.47	3.97	3.2	1.0
MA-DEEP 2-4	1600	45.8	6.9	71.91	3.74	4.4	4.8
MA-DEEP	1361	55.2	1.6	86.87	8.41	5.6	3.4

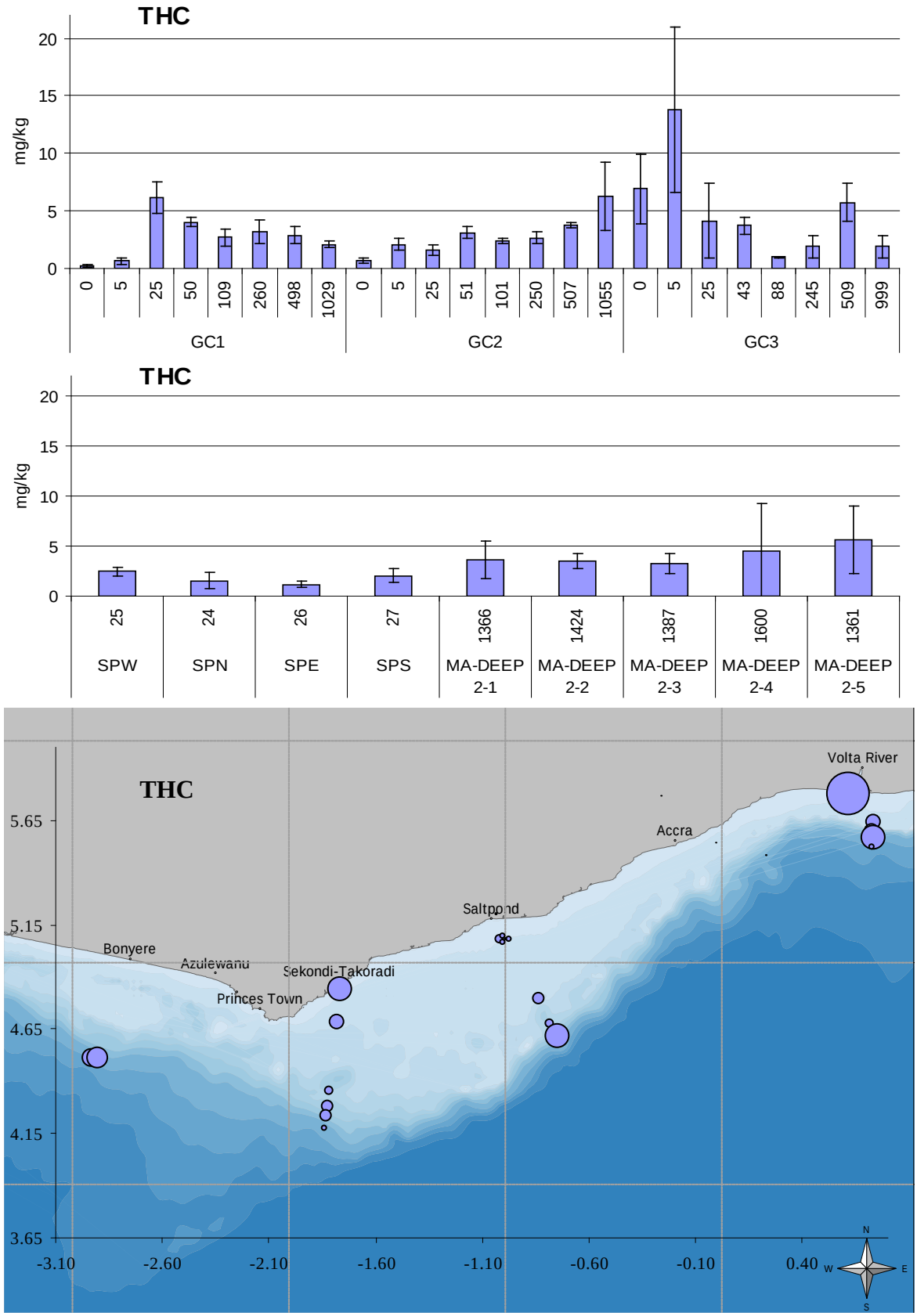


Figure 5.13. Distribution of THC (C12-35) (average and standard deviation) along the transects GC1, GC2, GC3, SP's and MA-DEEP's. Data lower than the detection limit are presented as half the detection limit. The sizes of the circles in the map illustrates the relative concentration of THC at each station.

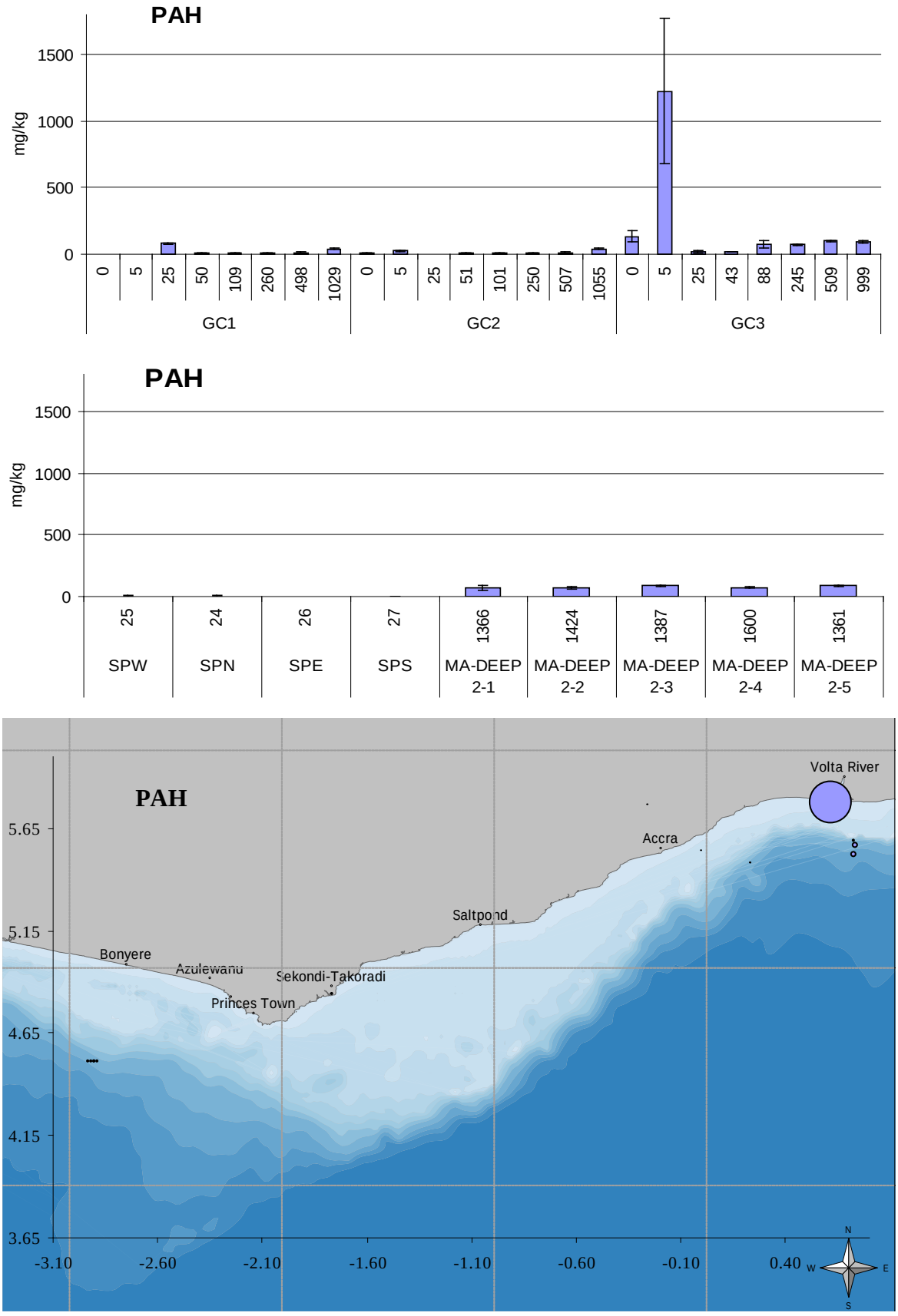


Figure 5.14. Distribution of the 16 EPA PAH (average and standard deviation) along the transects GC1, GC2, GC3, SP's and MA-DEEP's. Data lower than the detection limit are presented as half the detection limit. The sizes of the circles in the map illustrates the relative concentration of PAH at each station.

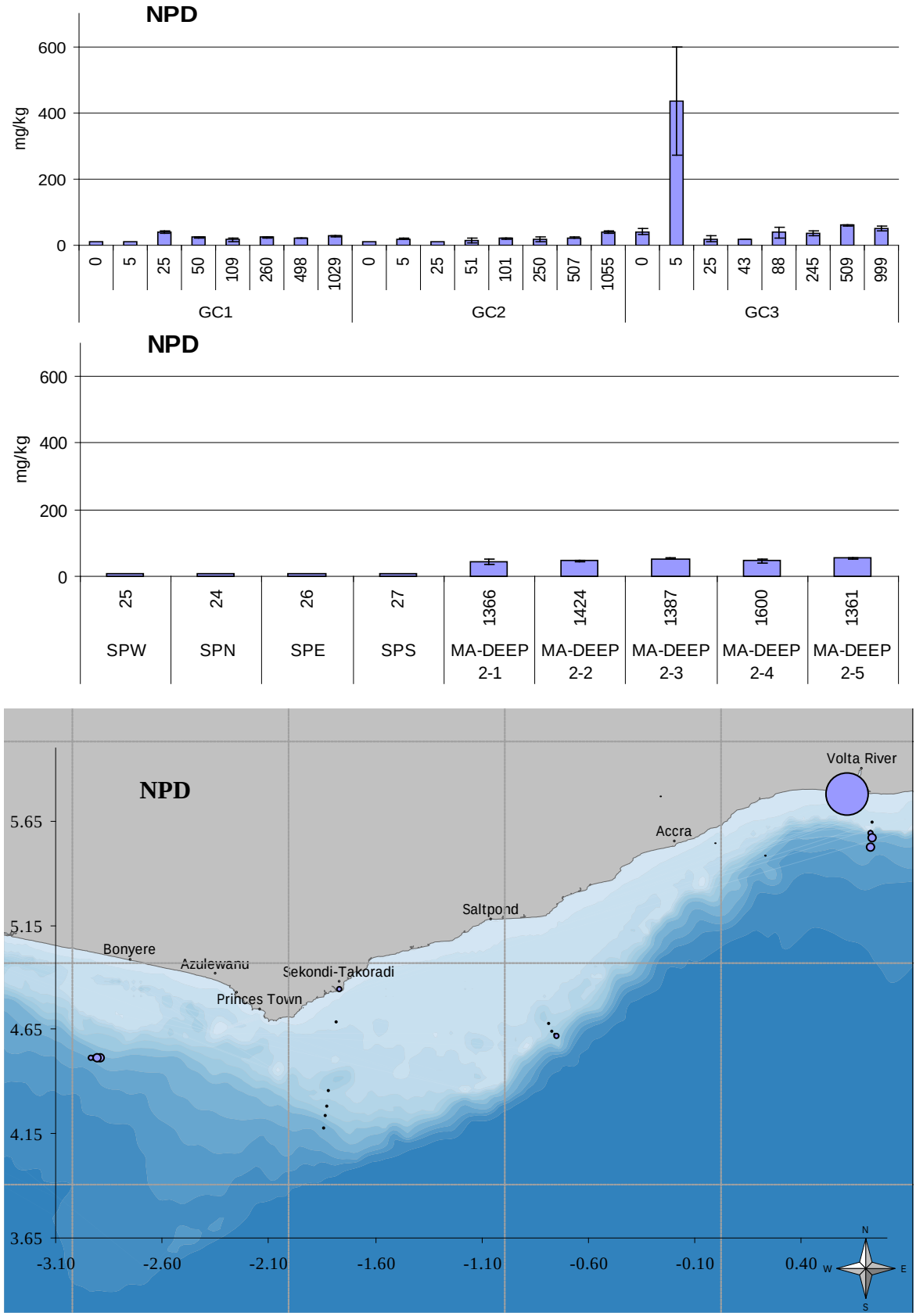


Figure 5.15. Distribution of NPD (sum Naphtalene, Phenanthren and Dibenzothiophene) (average and standard deviation) along the transects GC1, GC2, GC3, SP's and MA-DEEP's. Data lower than the detection limit are presented as half the detection limit. The sizes of the circles in the map illustrates the relative concentration of NPD at each station.

5.3 Biology

Benthic fauna from selected samples. (Photo T. Ensrud)

Benthic fauna was sampled at eight depths of each of three transects, four stations surrounding the Salt Pond oil rig and two stations near the Mahogany oil rig. One of the latter (Ma-Deep 2-1) consisted of only two grabs, while the rest consisted of five grab samples. A complete species list is available in the Appendix.

A summary of number of individuals and taxa within the main taxonomic groups is presented in Table 5.5. Annelida was the main taxonomic group in the samples, contributing with 60-70 % of the total amount of individuals in each sampling area. The second greatest taxonomical group was Mollusca (7-15 %).

Number of individuals and species, diversity and evenness is presented in Table 5.6 and Figure 5.16-5.19. The largest aggregations of benthic animals were found in shallow parts of the transects and at the northern station of Salt Pond oil rig. An elevated number of individuals is expected at these depths due to relatively nutrient rich water near the coast and high primary production in the photic zone. At 5 m on the other hand, the number of individuals dropped drastically at GC1 and GC2, maybe as a result of disturbance by wave activity. GC3/5m near the outlet of the Volta river had more than twice the species and 7-9 times the individuals, input of nutrients from the Volta river is likely to explain this variation. The highest number of individuals (1009 /0.5m^2) found at 25 m depth on the same transect near the delta of The Volta river also supports this assumption.

Although the depths of the stations around the Salt Pond oil rig varied with less than 3 m, there was a large variation in number of individuals between the four stations (453-951).
There was also a large variation along the 500 m stations with GC2/507 accounting for twice the species and 7-10 times individuals compared to GC1 and 3.
Very few individuals were found around the Mahogany oil rig (8 and 7), this is probably due to the selection towards generally smaller and fewer (exponentially) individuals with increasing water depth (1361 m and 1366 m), combined with relatively large mesh size in the sampling equipment and a relatively large temperature gradient.

The amount of different taxa follow the same trend as for number of individuals, as more challenging habitats results in fewer and more specialized species. The area with the highest amount of species, was the northern station of Salt Pond (SPN) with 114 species in 0.5 m^2, while the lowest amount was found in the deep areas of Ma-Deep 2-1 (6 species per 0.2 m^2) and Ma-Deep 2-5 (5 species per 0.5 m^2). The species diversity waried with depth showing reduced diversity at the 5 m stations of the transects and the very deep stations around the Mahogany oil rig.

The ten most abundant species/groups for each site are presented in Table 5.7-5.10. No species or group dominate to a great extent, except for Sipuncula at GC2/5 (64 %) and *Spiophanes* sp. at GC2/507 (58 %). This indicates a good benthic environment, which can also be seen in the graphs of geometrical classes, where the curves indicate a good distribution of species (Figure 5.20).

Results of the multivariate analyses are given in the dendrogram (Figure 5.21) and the MDS plot (Figure 5.22). A more detailed presentation of each sampling area is given in Appendix. In the cluster analyses, all sampling sites were linked together at 8.2 % similarity. Depth is the main factor determining the fauna composition and based on this, the stations group together in two clear groups. The deepest stations of the transects group together with around 27% similarity and the shallowest stations, together with the stations of the Salt Pond oil rig, are grouped with just below 40% similarity. The deep stations at Mahogany oil rig are different from all the rest, but share an intern similarity of around 35 %. The shallowest station at each of the three transects do not compare with one another or any of the other stations sampled. The distinctness of Ma-Deep and the shallow stations of the transects is also seen in the results of the MDS analysis. The shallow and deep groups of stations in the transects and the stations around SP, are found in two groups partly melted together.

The correlation between distribution of bottom fauna and the chemical and geological data was tested with a DCA-analysis, in the program Canoco. A pre-treatment indicated a non-linear distribution of the data and a CCA analysis with Monte Carlo forward selection was therefore utilized. The results indicated that depth, total organic matter (TOM) and the two hydrocarbons C1-anthracene/phenantrene and Indeno(1,2,3cd)pyrene, had significant impact on the distribution of the bottom fauna (p-value: 0.002 for all parameters mentioned) (Figure 5.23).

The bottom fauna in the sampled areas at the coast of Ghana is rich and diverse. Results of several analyses indicate that depth, sediment type, wave activity and proximity to the Volta River determine much of the fauna composition. One analysis also mentions two hydrocarbons as a potential influence on the fauna composition, at particularly two stations near shore, however chemical analyses indicate relatively low values.

Table 5.5 Number of individuals and taxa of the main taxonomic groups for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010.

GC1				**Area sampled: 0.5 m^2**
Large taxonomic groups	**N.o. individuals**	**%**	**N.o. taxa**	**%**
Annelida	1343	66	102	46
Arthropoda	204	10	28	13
Mollusca	208	10	70	31
Echinodermata	139	7	15	7
Miscellaneous groups	144	7	8	4
Total	**2038**	**100**	**223**	**100**

GC2				**Area sampled: 0.5 m^2**
Large taxonomic groups	**N.o. individuals**	**%**	**N.o. taxa**	**%**
Annelida	1769	69	111	46
Arthropoda	216	8	35	15
Mollusca	176	7	66	28
Echinodermata	74	3	19	8
Miscellaneous groups	347	13	8	3
Total	**2582**	**100**	**239**	**100**

GC3				**Area sampled: 0.5 m^2**
Large taxonomic groups	**N.o. individuals**	**%**	**N.o. taxa**	**%**
Annelida	1982	70	106	48
Arthropoda	247	9	38	17
Mollusca	371	13	60	27
Echinodermata	213	7	13	6
Miscellaneous groups	35	1	4	2
Total	**2848**	**100**	**221**	**100**

Ma-Deep				**Area sampled: 0.2 m^2 for Ma-Deep 2-1 and 0,5 m^2 for Ma-Deep 2-5**
Large taxonomic groups	**N.o. individuals**	**%**	**N.o. taxa**	**%**
Annelida	9	60	6	67
Arthropoda	0	0	0	0
Mollusca	2	13	2	22
Echinodermata	0	0	0	0
Miscellaneous groups	4	27	1	11
Total	**15**	**100**	**9**	**100**

SP				**Area sampled: 0.5 m^2**
Large taxonomic groups	**N.o. individuals**	**%**	**N.o. taxa**	**%**
Annelida	1795	70	90	43
Arthropoda	252	10	33	16
Mollusca	379	15	67	32
Echinodermata	70	3	14	7
Miscellaneous groups	67	3	5	2
Total	**2563**	**100**	**209**	**100**

Table 5.6 Number of individuals, species, diversity (H'), evenness (J) and max. diversity (H'max) for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010.

Transect / depth	Individs	Species	Diverity (H')	Evenness (J)	H'-max
GC1/5	52	13	2.95	0.80	3.70
GC1/25	705	91	5.45	0.84	6.51
GC1/50	402	96	5.97	0.91	6.58
GC1/109	343	72	5.46	0.89	6.17
GC1/260	306	62	4.83	0.81	5.95
GC1/498	178	27	3.57	0.75	4.75
GC1/1029	52	26	4.38	0.93	4.70
Av	*291*	*55*	*4.66*	*0.85*	*5.48*
Stdv	*212*	*31*	*1.01*	*0.06*	*1.02*
GC2/5	64	18	2.35	0.56	4.17
GC2/25	469	103	5.22	0.78	6.69
GC2/51	610	103	5.62	0.84	6.69
GC2/101	374	88	5.61	0.87	6.46
GC2/250	467	68	4.47	0.73	6.09
GC2/507	497	54	3.04	0.53	5.75
GC2/1055	101	34	4.45	0.87	5.09
Av	*369*	*67*	*4.40*	*0.74*	*5.85*
Stdv	*192*	*31*	*1.18*	*0.13*	*0.87*
GC3/5	454	44	3.82	0.70	5.46
GC3/25	1009	93	5.26	0.80	6.54
GC3/43	768	106	4.91	0.73	6.73
GC3/88	151	48	4.98	0.89	5.58
GC3/245	293	45	4.55	0.83	5.49
GC3/509	74	24	4.16	0.91	4.58
GC3/999	99	33	4.50	0.89	5.04
Av	*407*	*56*	*4.60*	*0.82*	*5.63*
Stdv	*334*	*29*	*0.46*	*0.08*	*0.71*
Ma-Deep 2-1	8	6	2.41	0.93	2.58
Ma-Deep 2-5	7	5	2.24	0.96	2.32
Av	*8*	*6*	*2.32*	*0.95*	*2.45*
Stdv	*1*	*1*	*0.12*	*0.02*	*0.19*
SPN/24	951	114	5.56	0.81	6.83
SPW/25	572	100	5.16	0.78	6.64
SPE/26	453	93	5.25	0.80	6.54
SPS/27	587	86	4.87	0.76	6.43
Av	*641*	*98*	*5.21*	*0.79*	*6.61*
Stdv	*186*	*10*	*0.25*	*0.02*	*0.15*

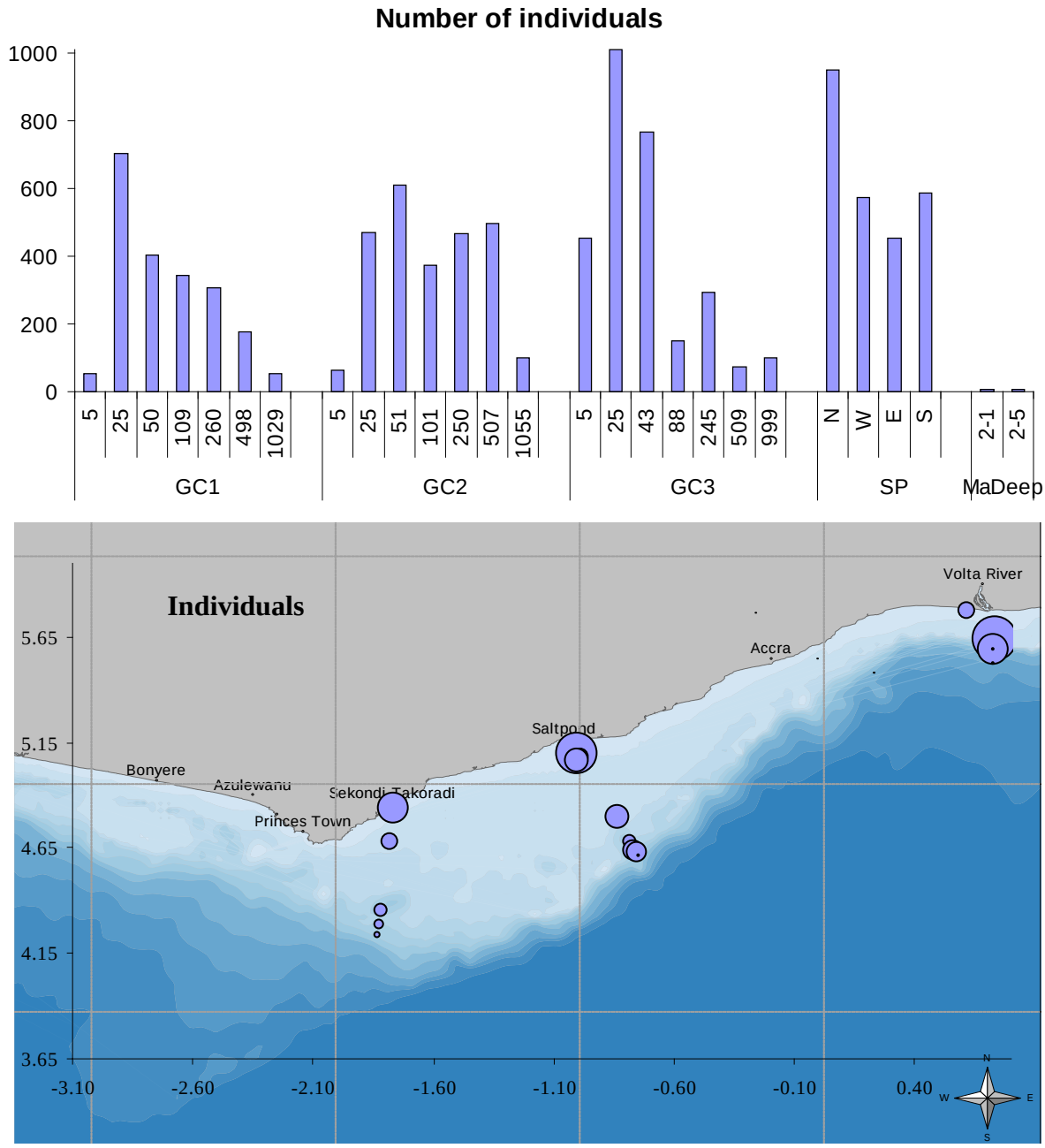


Figure 5.16 Number of individuals for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010. The size of the circles illustrates the relative abundance of individuals at each station.

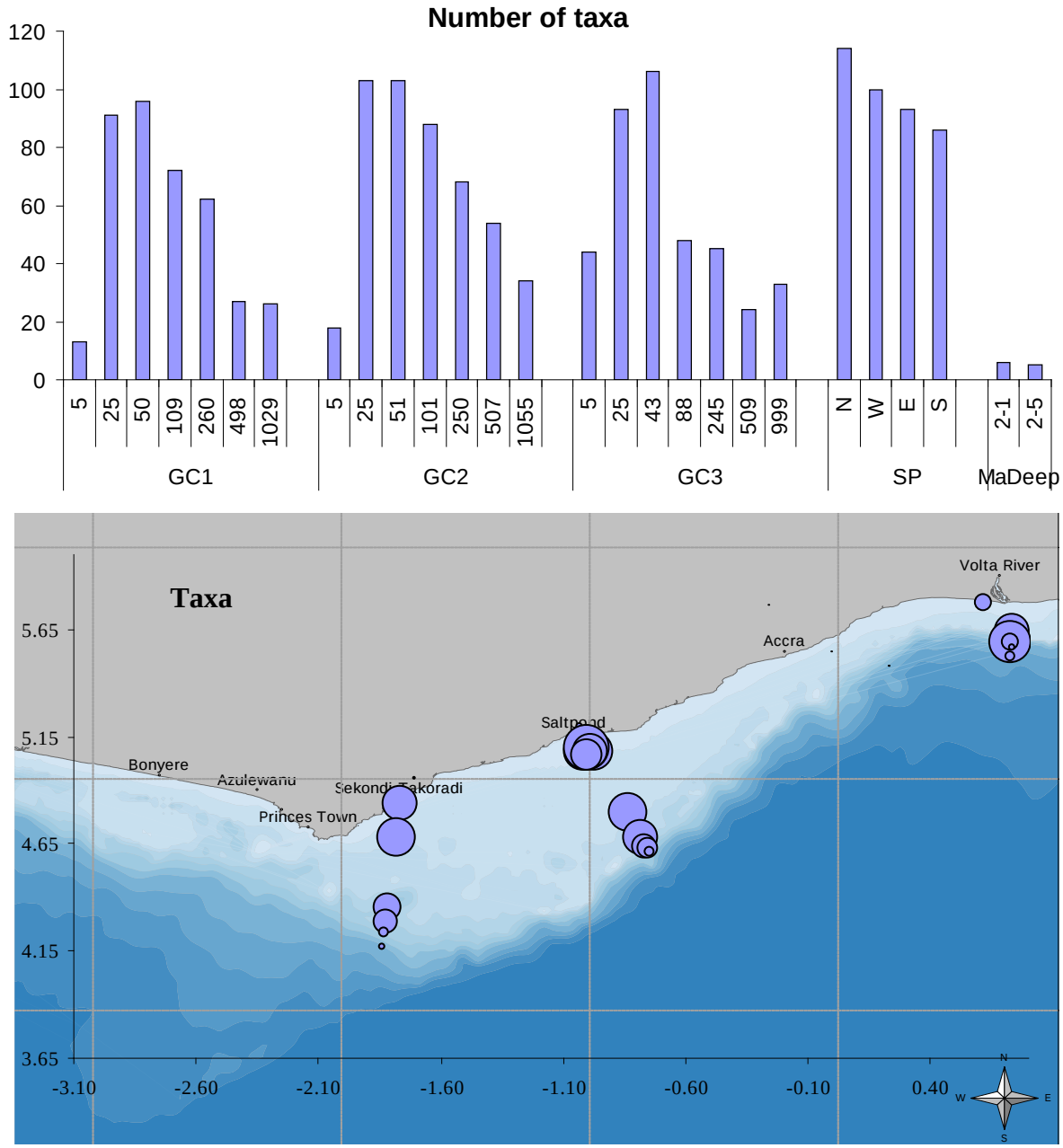


Figure 5.17 Number of species for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010. The size of the circles illustrates the relative amount of taxa at each station.

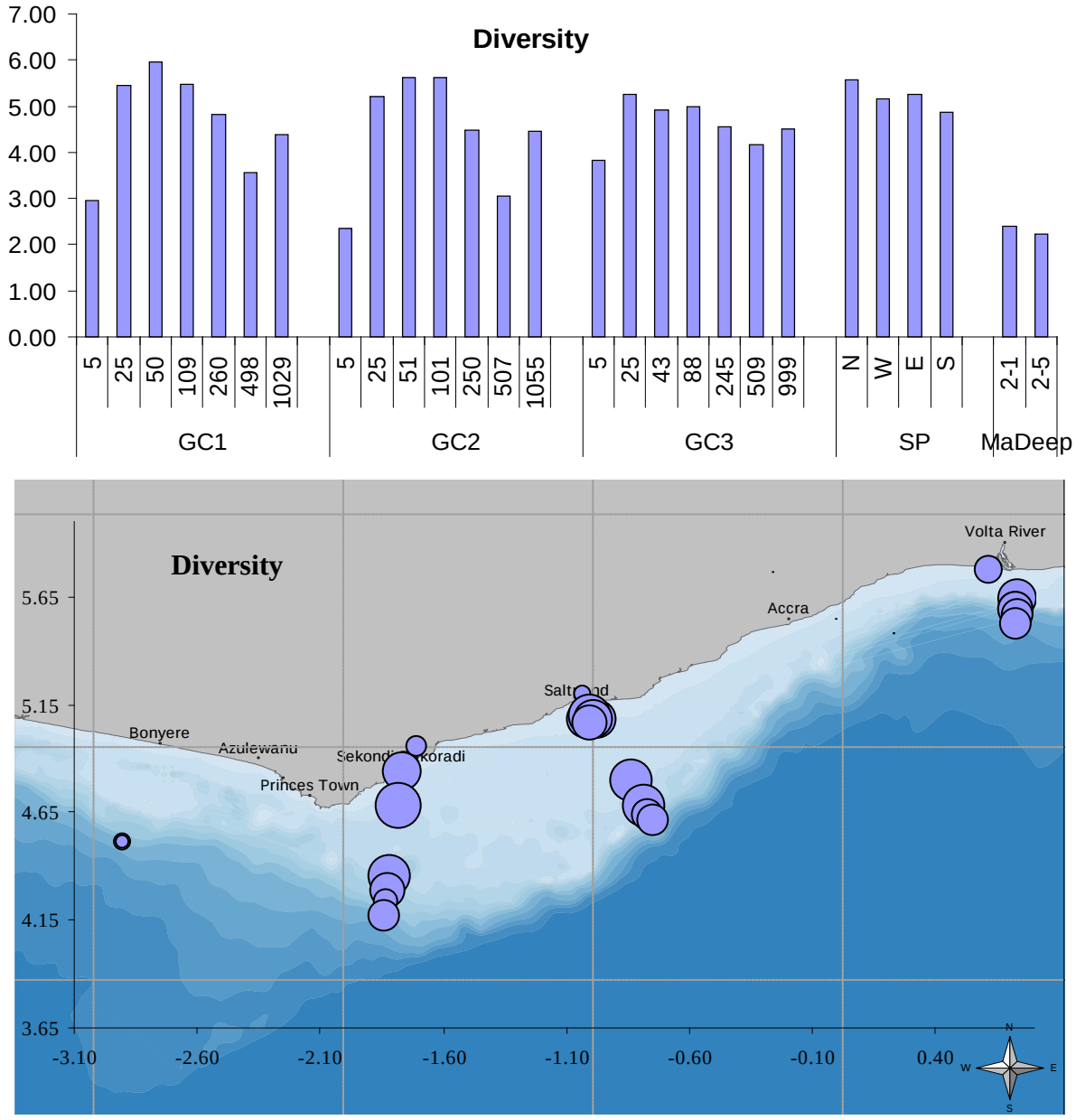


Figure 5.18 Diversity (H') for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010. The size of the circles illustrates the relative diversity at each station.

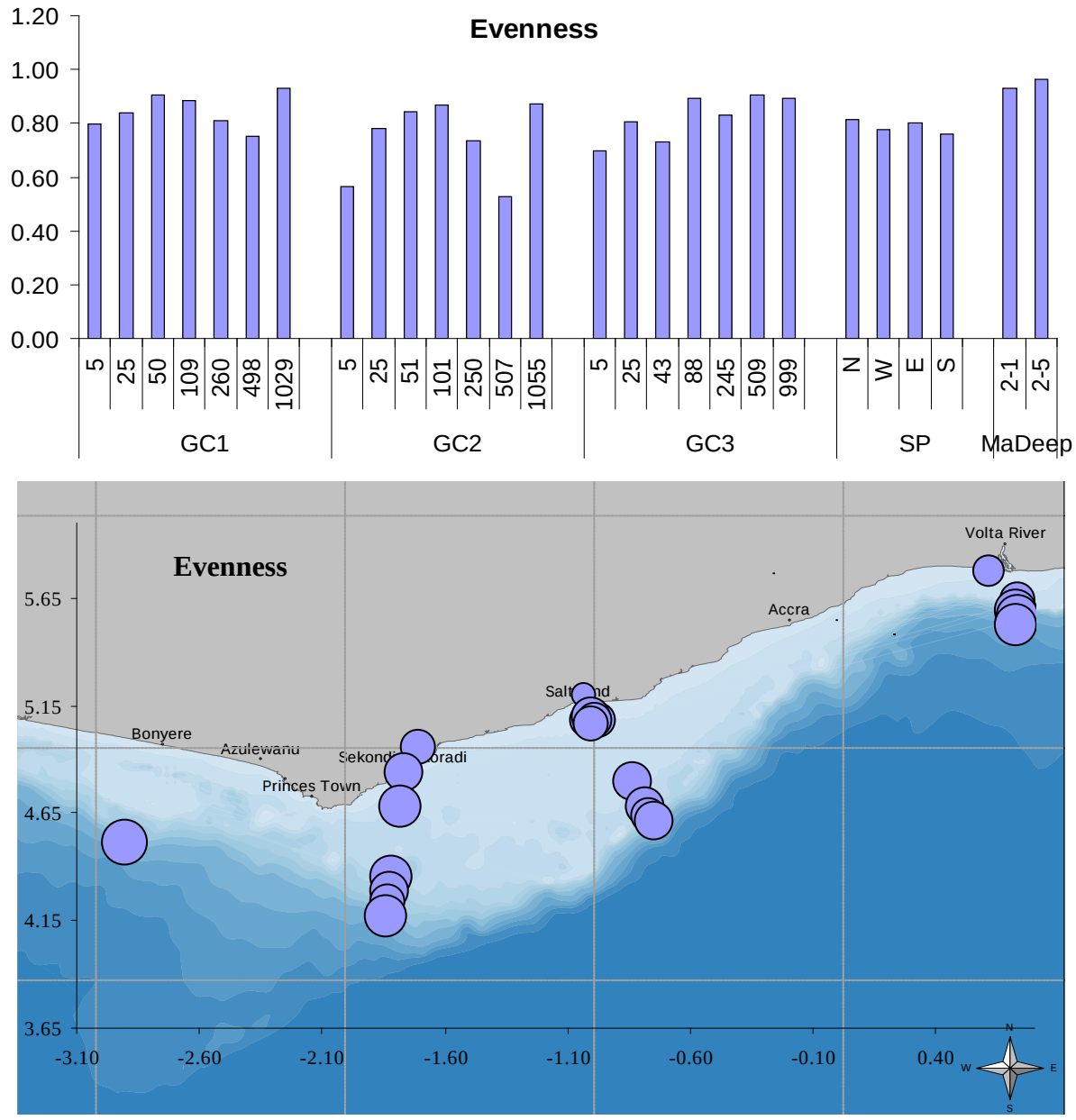


Figure 5.19 Evenness (J) for each station along the transects of Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond and Mahogany oil rigs in 2010. The size of the circles illustrates the relative evenness at each station.

Table 5.7 Distribution of taxa in geometric groups for stations along the transect GC1 2010.

GC1/5	N.o. individuals	%	Cum. %
Paguridae indet.	17	32.7	32.7
Cardiocardita cf. gabonensis	12	23.1	55.8
Rotula sp	5	9.6	65.4
Isolda sp	4	7.7	73.1
Sigalion sp	3	5.8	78.8
cf. Nassariidae indet. I	2	3.8	82.7
Eulimella sp. I	2	3.8	86.5
Bivalvia indet.	2	3.8	90.4
Orbiniidae indet.I	1	1.9	92.3
Magelona sp.	1	1.9	94.2
Polyplacophora indet. I	1	1.9	96.2
Bornia balalaika	1	1.9	98.1
Sipuncula indet	1	1.9	100.0

GC1/25	N.o. individuals	%	Cum. %
Diopatra sp	78	11.1	11.1
Onchnesoma cf. steenstrupi	56	7.9	19.0
Pterolysippe bipennata	51	7.2	26.2
Paraonidae indet.	39	5.5	31.8
Amphipholis cf. nudipora	34	4.8	36.6
Orbiniidae indet.I	28	4.0	40.6
Thalassinoidea indet I	22	3.1	43.7
Aricidea spp.	20	2.8	46.5
Pilargidae indet II	19	2.7	49.2
Euclymene sp.	18	2.6	51.8

GC1/50	N.o. individuals	%	Cum. %
Amphioplus sp	19	4.7	4.7
Aphelochaeta sp.	17	4.2	9.0
Pterolysippe bipennata	16	4.0	12.9
Amphipholis cf. nudipora	16	4.0	16.9
Aglaophamus lyrochaeta	14	3.5	20.4
Thalassinoidea indet I	13	3.2	23.6
Brachyura indet. V	13	3.2	26.9
Paralacydonia sp	13	3.2	30.1
Ophiura spp	12	3.0	33.1
Prionospio spp.	10	2.5	35.6
Notomastus sp	10	2.5	38.1
Sternaspis scutata	10	2.5	40.5

GC1/109	N.o. individuals	%	Cum. %
Eunice sp.	30	8.7	8.7
Aphelochaeta sp.	25	7.3	16.0
Thyasira obsoleta	18	5.2	21.3
Onchnesoma cf. steenstrupi	17	5.0	26.2
Prionospio spp.	15	4.4	30.6
Paralacydonia sp	12	3.5	34.1
Mendicula cf. ferruginosa	12	3.5	37.6
Euclymeninae	11	3.2	40.8
Myriochele spp	10	2.9	43.7
Nematonereis sp	10	2.9	46.6

GC1/260	N.o. individuals	%	Cum. %
Paradiopatra sp.	49	16.0	16.0
Magelona sp.	29	9.5	25.5
Onchnesoma cf. steenstrupi	23	7.5	33.0
Spiophanes sp.	20	6.5	39.5
Capitellidae indet.	17	5.6	45.1
Aricidea spp.	16	5.2	50.3
Aphelochaeta sp.	15	4.9	55.2
Prionospio spp.	13	4.2	59.5
Thalassinoidea indet I	10	3.3	62.7
Ampharetidae indet	10	3.3	66.0

GC1/498	N.o. individuals	%	Cum. %
Spiophanes sp.	63	35.4	35.4
Lumbriclymene sp.	19	10.7	46.1
Prionospio spp.	15	8.4	54.5
Magelona sp.	11	6.2	60.7
Paradiopatra sp.	10	5.6	66.3
Pista sp.	9	5.1	71.3
Myriochele spp	6	3.4	74.7
Laonice sp.	6	3.4	78.1
Thalassinoidea indet I	5	2.8	80.9
Spiochaetopterus sp.	4	2.2	83.1
Axinulus croulinensis	4	2.2	85.4

GC1/1029	N.o. individuals	%	Cum. %
Paraonidae indet.	5	9.6	9.6
Spionidae indet.	5	9.6	19.2
Notoproctis sp.	5	9.6	28.8
Spiochaetopterus sp.	4	7.7	36.5
Mendicula cf. ferruginosa	4	7.7	44.2
Apseudes sp	4	7.7	51.9
Prionospio spp.	2	3.8	55.8
Myriochele spp	2	3.8	59.6
Sipuncula indet	2	3.8	63.5
Heterospio sp.	2	3.8	67.3
Spatangoida juv indet	2	3.8	71.2

Table 5.8 Distribution of taxa in geometric groups for stations along the transect GC2 2010.

GC2/5	N.o. individuals	%	Cum. %
Sipuncula indet	41	64.1	64.1
Nephtys spp.	4	6.3	70.3
Prionospio spp.	2	3.1	73.4
Sthenelais cf. limicola	2	3.1	76.6
Rotula sp	2	3.1	79.7
Paraonidae indet.	1	1.6	81.3
Aphelochaeta sp.	1	1.6	82.8
Lumbrineridae indet.	1	1.6	84.4
Magelona sp.	1	1.6	85.9
Capitellidae indet.	1	1.6	87.5
Diopatra sp	1	1.6	89.1
Ostracoda indet	1	1.6	90.6
Brachyura indet	1	1.6	92.2
Orbiniidae indet.	1	1.6	93.8
Pusionella cf. aculeiformis	1	1.6	95.3
Tomopleura spiralissima	1	1.6	96.9
Donax phariformis	1	1.6	98.4
Ophiuroidea indet	1	1.6	100.0

GC2/25	N.o. individuals	%	Cum. %
Eunice sp.	125	26.7	26.7
Onuphis sp	23	4.9	31.6
Glycera sp.	18	3.8	35.4
Ostracoda indet. III	18	3.8	39.2
Timoclea cf. ovata	15	3.2	42.4
Apseudes sp	13	2.8	45.2
Ampharetidae indet	13	2.8	48.0
Lumbrineridae indet.	12	2.6	50.5
Magelona sp.	11	2.3	52.9
Myriochele spp	10	2.1	55.0

GC2/51	N.o. individuals	%	Cum. %
Eunice sp.	99	16.2	16.2
Lumbrineridae indet.	30	4.9	21.1
Ampharetidae indet	24	3.9	25.1
Capitellidae indet.	21	3.4	28.5
Sabellidae indet.	21	3.4	32.0
Goniadidae indet.	19	3.1	35.1
Apseudes sp	18	3.0	38.0
Paralacydonia sp	18	3.0	41.0
Aglaophamus lyrochaeta	17	2.8	43.8
Aphelochaeta sp.	15	2.5	46.2
Onchnesoma cf. steenstrupi	15	2.5	48.7

GC2/101	N.o. individuals	%	Cum. %
Onchnesoma cf. steenstrupi	37	9.9	9.9
Eunice sp.	23	6.1	16.0
Paradiopatra sp.	23	6.1	22.2
Prionospio spp.	20	5.3	27.5
Cirratulidae indet.	18	4.8	32.4
Paralacydonia sp	16	4.3	36.6
Aphelochaeta sp.	11	2.9	39.6
Lumbrineridae indet.	9	2.4	42.0
Ampharetidae indet	9	2.4	44.4
Euphrosinidae indet	9	2.4	46.8

GC2/250	N.o. individuals	%	Cum. %
Onchnesoma cf. steenstrupi	149	31.9	31.9
Aphelochaeta sp.	29	6.2	38.1
Magelona sp.	27	5.8	43.9
Capitellidae indet.	26	5.6	49.5
Ampharetidae indet	22	4.7	54.2
Spiophanes sp.	13	2.8	57.0
Paradiopatra sp.	11	2.4	59.3
Cirratulidae indet.	10	2.1	61.5
Sabellidae indet.	10	2.1	63.6
Prionospio spp.	9	1.9	65.5
Lumbrineridae indet.	9	1.9	67.5
Euphrosinidae indet	9	1.9	69.4
Ostracoda indet I	9	1.9	71.3

GC2/507	N.o. individuals	%	Cum. %
Spiophanes sp.	286	57.5	57.5
Sipuncula indet	30	6.0	63.6
Aspidosiphon sp	26	5.2	68.8
Magelona sp.	13	2.6	71.4
Ampharetidae indet	12	2.4	73.8
Aphelochaeta sp.	10	2.0	75.9
Paradiopatra sp.	10	2.0	77.9
Notomastus sp	10	2.0	79.9
Nothria sp.	10	2.0	81.9
Mendicula cf. ferruginosa	6	1.2	83.1
Lumbriclymene sp.	6	1.2	84.3

Table 5.8 continued. Distribution of taxa in geometric groups for stations along the transect GC2 2010.

GC2/1055	N.o. individuals	%	Cum. %
Aphelochaeta sp.	22	4.8	4.8
Mendicula cf. ferruginosa	9	2.0	6.8
Lumbrineridae indet.	6	1.3	8.1
Axinulus cf. eumyarius	6	1.3	9.5
Prionospio spp.	4	0.9	10.4
Myriochele spp	4	0.9	11.2
Orbiniidae indet.III	4	0.9	12.1
Spiophanes sp.	3	0.7	12.8
Amphinomidae indet.	3	0.7	13.4
Terebellides sp.	3	0.7	14.1
Spatangoida juv indet	3	0.7	14.8
Clymenura sp.A	3	0.7	15.4

Table 5.9 Distribution of taxa in geometric groups for stations along the transect GC3 2010.

GC3/5	N.o. individuals	%	Cum. %
Dosinia gabonensis	141	14.0	14.0
Diopatra sp	50	5.0	18.9
Paguridae indet.	36	3.6	22.5
Cultellus cf. tenuis	35	3.5	26.0
Cardiocardita cf. gabonensis	34	3.4	29.3
Anthuridea indet I T	23	2.3	31.6
Amphioplus sp	18	1.8	33.4
Isolda sp	15	1.5	34.9
Amphipholis cf. nudipora	15	1.5	36.4
Maldane decorata	8	0.8	37.2

GC3/25	N.o. individuals	%	Cum. %
Pterolysippe bipennata	100	22.0	22.0
Eunice sp.	83	18.3	40.3
Synaptidae indet	75	16.5	56.8
Ampharetidae indet	64	14.1	70.9
Apseudes sp	60	13.2	84.1
Diopatra sp	44	9.7	93.8
Lumbrineridae indet.	44	9.7	103.5
Ophiuroidea indet. I T	32	7.0	110.6
Aphelochaeta sp.	28	6.2	116.7
Glycera sp.	28	6.2	122.9

GC3/43	N.o. individuals	%	Cum. %
Aponuphis sp	192	25.0	25.0
Lumbrineridae indet.	83	10.8	35.8
Magelona sp.	64	8.3	44.1
Capitellidae indet.	29	3.8	47.9
Thalassinoidea indet I	22	2.9	50.8
Polynoidae indet.	20	2.6	53.4
Nematonereis sp	20	2.6	56.0
Aglaophamus lyrochaeta	19	2.5	58.5
Eunice sp.	17	2.2	60.7
Amphioplus cf congensis	16	2.1	62.8

GC3/88	N.o. individuals	%	Cum. %
Aglaophamus lyrochaeta	19	12.6	12.6
Lumbrineridae indet.	14	9.3	21.9
Myriochele spp	9	6.0	27.8
Apseudes sp	8	5.3	33.1
Sternaspis scutata	7	4.6	37.7
Skeneinae indet. I	7	4.6	42.4
Glycera sp.	5	3.3	45.7
Caudofoveata indet.	5	3.3	49.0
Marphysa sp	5	3.3	52.3
Aphelochaeta sp.	4	2.6	55.0
Prionospio spp.	4	2.6	57.6
Amphioplus sp	4	2.6	60.3
Amphinomidae indet.	4	2.6	62.9
Ophiura spp	4	2.6	65.6

GC3/245	N.o. individuals	%	Cum. %
Paradiopatra sp.	34	11.6	11.6
Anobothrus sp.	31	10.6	22.2
Prionospio spp.	28	9.6	31.7
Nereidae indet	27	9.2	41.0
Euclymeninae	25	8.5	49.5
Myriochele spp	15	5.1	54.6
Aricidea spp.	15	5.1	59.7
Glycera sp.	9	3.1	62.8
Afrolucina discontinua	9	3.1	65.9
Amphinomidae indet.	8	2.7	68.6

GC3/509	N.o. individuals	%	Cum. %
Maldane sp. II	10	13.5	13.5
Ledella sp. I	8	10.8	24.3
Adontorhina sp. I	6	8.1	32.4
Maldane sp. I	6	8.1	40.5
Prionospio spp.	5	6.8	47.3
Nereidae indet	5	6.8	54.1
Caudofoveata indet.	5	6.8	60.8
Aricidea spp.	4	5.4	66.2
Lumbrineridae indet.	4	5.4	71.6
Thyasira cf. obsoleta	3	4.1	75.7

GC3/999	N.o. individuals	%	Cum. %

Aricidea spp.	11	11.1	11.1
Mendicula cf. *ferruginosa*	11	11.1	22.2
Myriochele spp	8	8.1	30.3
Spiophanes sp.	8	8.1	38.4
Maldane sp. II	7	7.1	45.5
Aphelochaeta sp.	6	6.1	51.5
Lumbrineridae indet.	5	5.1	56.6
Goniada sp.	4	4.0	60.6
Laonice sp.	4	4.0	64.6
Terebellides sp.	3	3.0	67.7
Apseudes sp	3	3.0	70.7

Table 5.10 Distribution of taxa in geometric groups for stations around the Salt Pond (SP) and Mahogany (MaDeep) oil rigs in 2010.

Ma-Deep 2-1	N.o. individuals	%	Cum. %
Sipuncula indet	3	37.5	37.5
Aricidea spp.	1	12.5	50.0
Mendicula cf. *ferruginosa*	1	12.5	62.5
Laonice sp.	1	12.5	75.0
Sternaspis scutata	1	12.5	87.5
Ennucula sp. III	1	12.5	100.0

Ma-Deep 2-5	N.o. individuals	%	Cum. %
Aricidea spp.	2	28.6	28.6
Spiochaetopterus sp.	2	28.6	57.1
Sipuncula indet	1	14.3	71.4
Ophelina sp	1	14.3	85.7
Paraonidae indet.	1	14.3	100.0

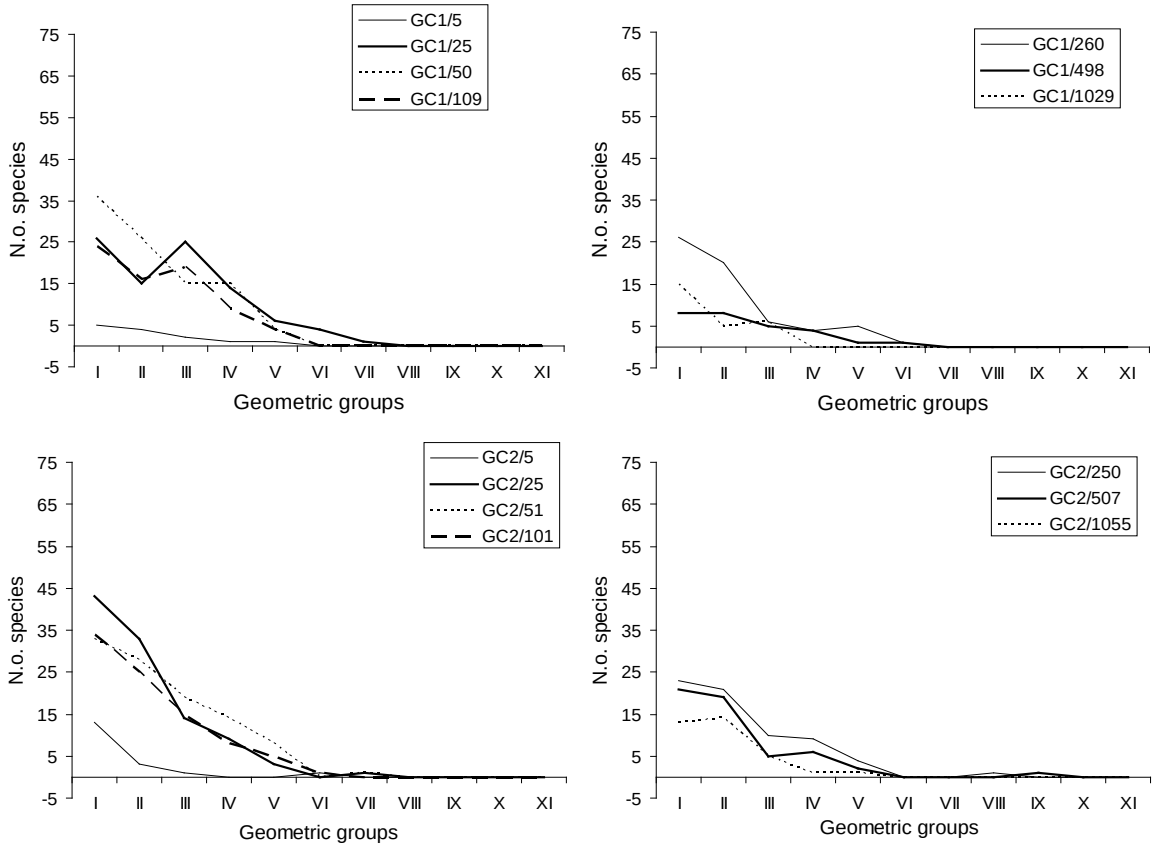
SPN/24	N.o. individuals	%	Cum. %
Eunice sp.	161	16.9	16.9
Onuphis sp	78	8.2	25.1
Euclymene sp.	46	4.8	30.0
Diopatra sp	30	3.2	33.1
Lumbrineridae indet.	29	3.0	36.2
Pterolysippe bipennata	26	2.7	38.9
cf. *Pterampharete luderitzi*	26	2.7	41.6
Capitellidae indet.	25	2.6	44.3
Polygordius sp	24	2.5	46.8
Prionospio spp.	21	2.2	49.0

SPW/25	N.o. individuals	%	Cum. %
Eunice sp.	142	24.8	24.8
Onuphis sp	50	8.7	33.6
Lumbrineridae indet.	25	4.4	37.9
Apseudes sp	16	2.8	40.7
Aphelochaeta sp.	15	2.6	43.4
Armandia intermedia Fauvel	15	2.6	46.0
Glycera sp.	13	2.3	48.3
Sigalion sp	13	2.3	50.5
Isolda sp	11	1.9	52.4
Prionospio spp.	10	1.7	54.2
Scoloplos spp.	10	1.7	55.9
Aricidea spp.	10	1.7	57.7
Magelona sp.	10	1.7	59.4

SPE/26	N.o. individuals	%	Cum. %
Eunice sp.	80	17.7	17.7
Onuphis sp	50	11.0	28.7
Glycera sp.	38	8.4	37.1

SPS/27	N.o. individuals	%	Cum. %
Timoclea cf. *ovata*	158	26.9	26.9
Onuphis sp	35	6.0	32.9
Aphelochaeta sp.	28	4.8	37.6

Aphelochaeta sp.	16	3.5	40.6	*Anthuridea* indet I T	24	4.1	41.7
Aricidea spp.	16	3.5	44.2	*Lumbrineridae* indet.	20	3.4	45.1
Ophelia sp. B	13	2.9	47.0	*Onchnesoma* cf. *steenstrupi*	20	3.4	48.6
Polygordius sp	11	2.4	49.4	*Aricidea* spp.	18	3.1	51.6
Prionospio spp.	10	2.2	51.7	*Capitellidae indet.*	18	3.1	54.7
Aonides sp.	10	2.2	53.9	*Diopatra* sp	17	2.9	57.6
Sigalion sp	9	2.0	55.8	*Pterolysippe bipennata*	17	2.9	60.5



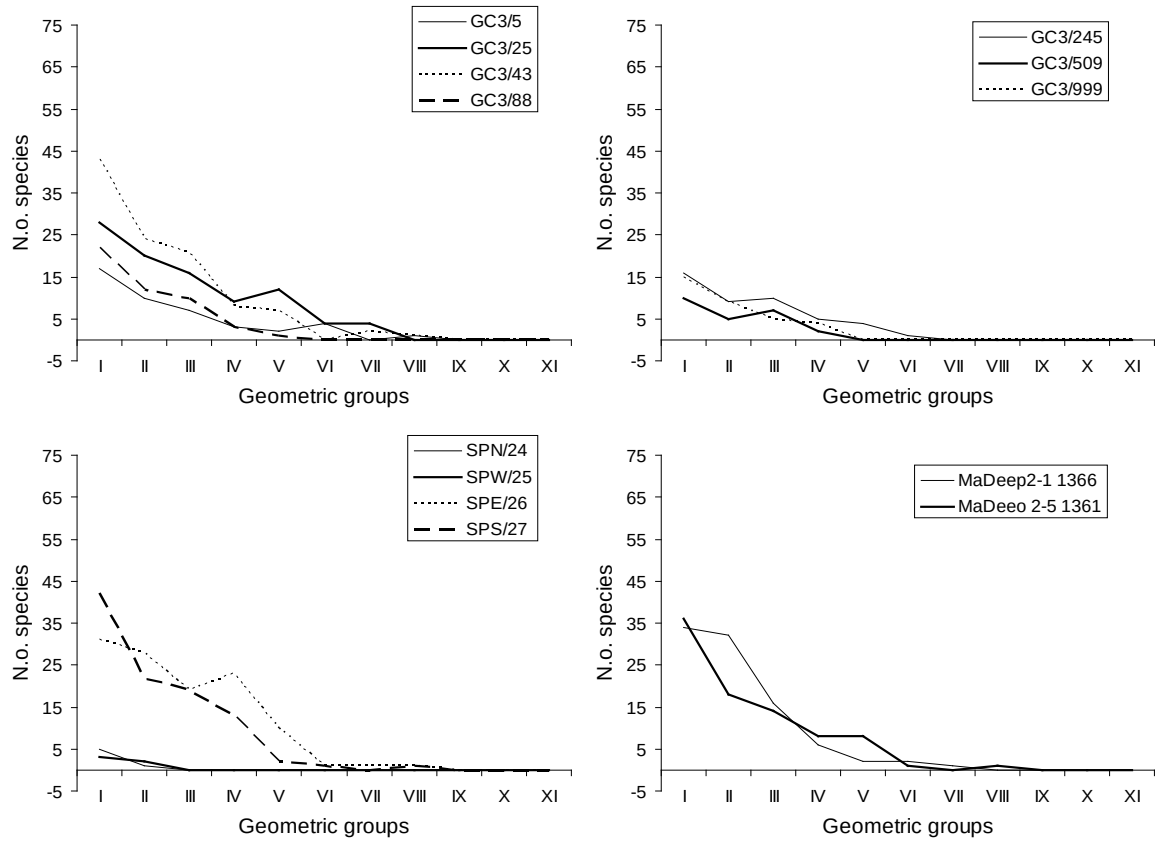


Figure 5.20 Distribution of taxa in geometric groups for the sites along the transects og Ghana Central 1 (GC1), GC2 and GC3, and around the Salt Pond (SP) and Mahogany (MaDeep) oil rigs in 2010.

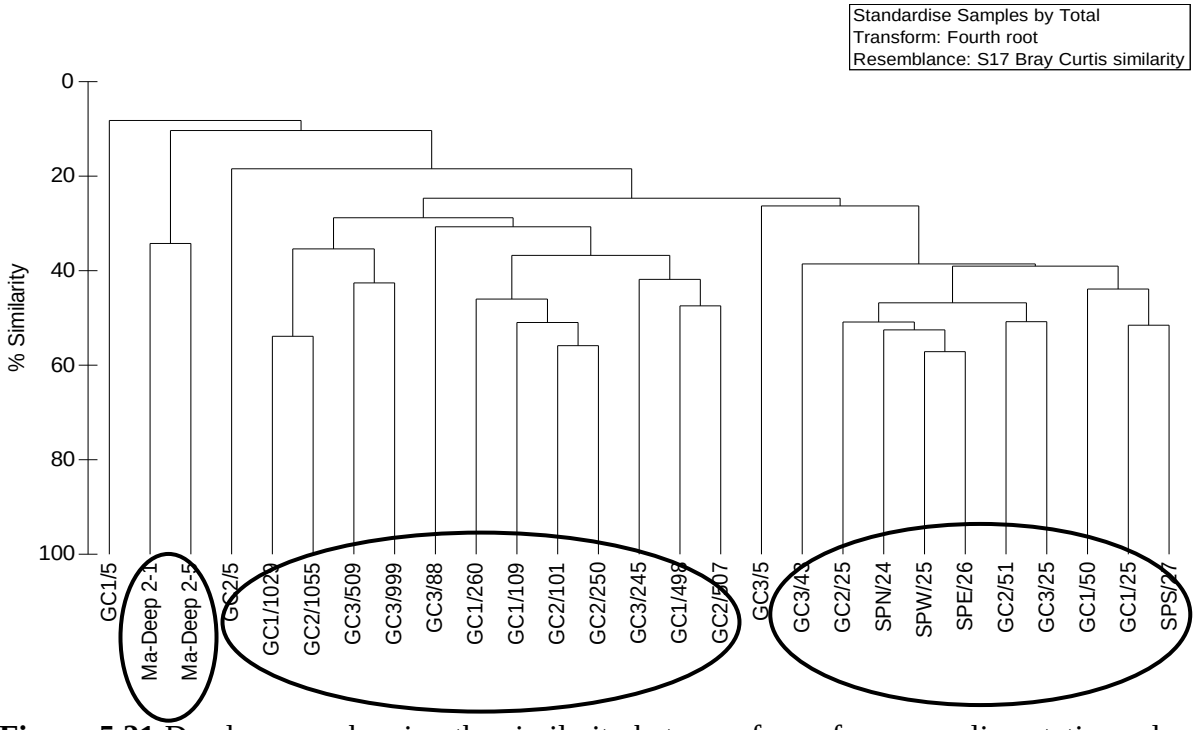


Figure 5.21 Dendrogram showing the similarity between fauna from sampling stations along the transects of Ghana Central (GC1; GC2 and GC3) and around the Salt Pond (SP) and Mahogany (Ma-Deep) oil rigs. The dataset was standardised and fourth root transformed.

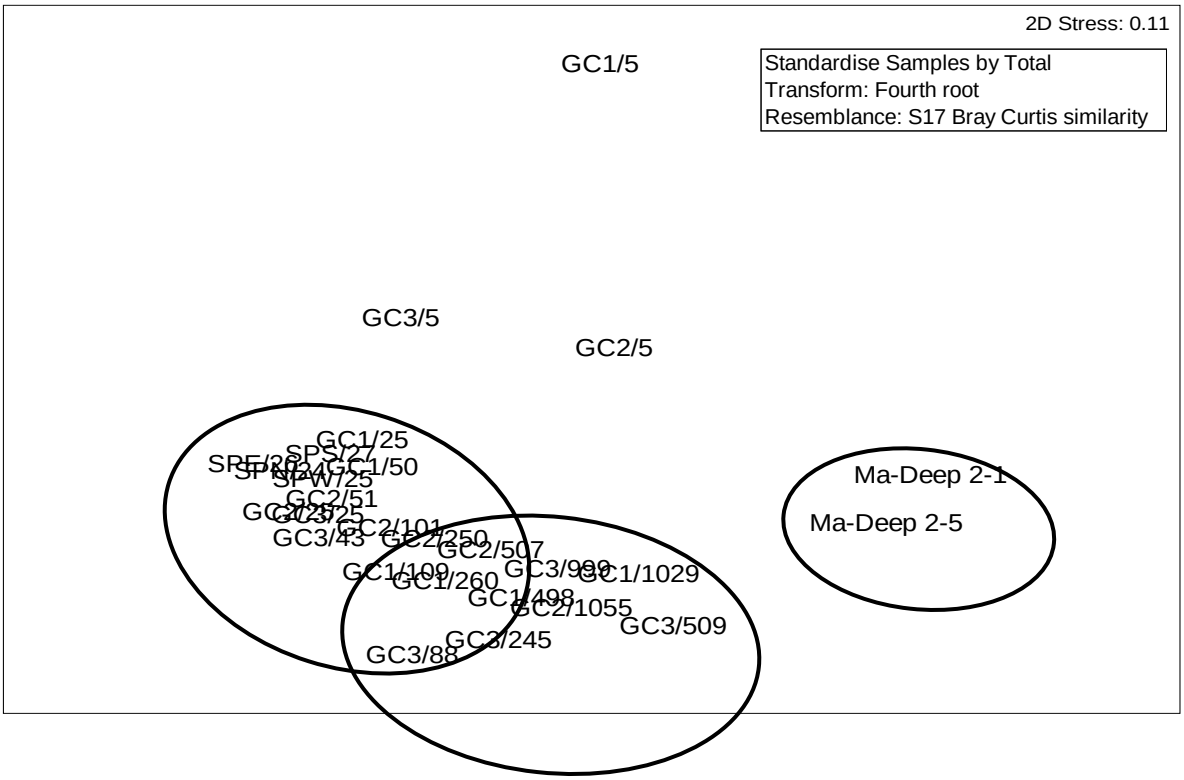


Figure 5.22 A two-dimensional plot of the MDS analyses of the transects of Ghana Central (GC1; GC2 and GC3) and around the Salt Pond (SP) and Mahogany (Ma-Deep) oil rigs. The dataset was standardised and fourth root transformed.

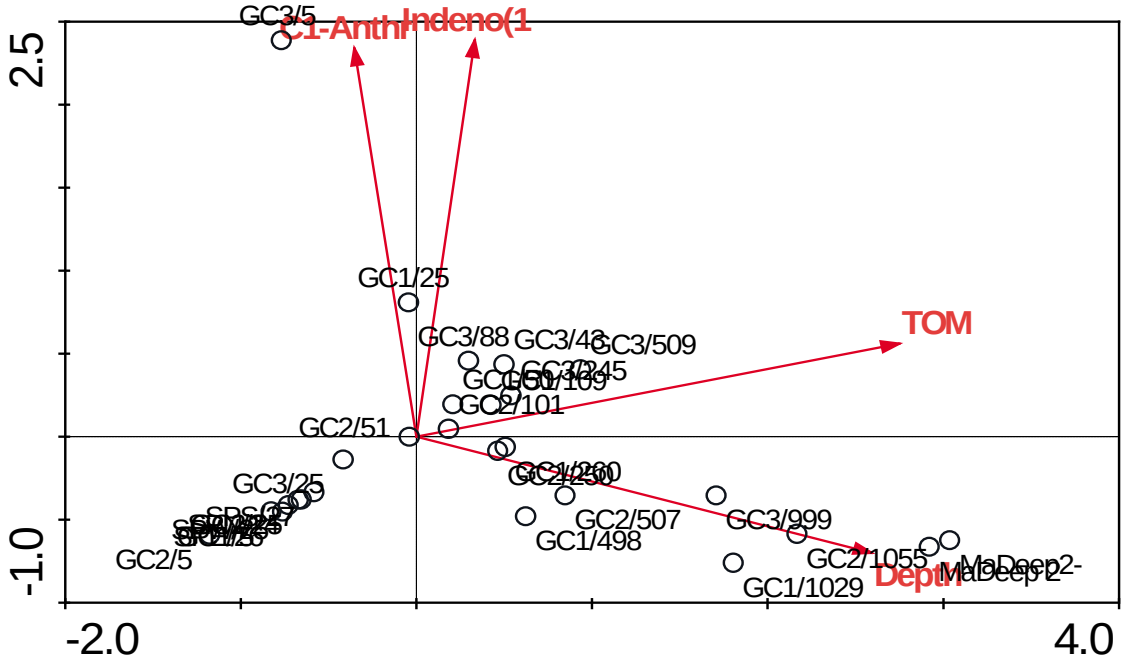


Figure 5.23 CCA analyses of the fauna along the transects Ghana Central (GC1, GC2 and GC3) in addition to station grids around the Salt Pond and Mahogany oil rigs. The x-axis explains 32.3 % of the variation in faunal distribution, while 22.9 % is explained by the y-axis.

6. SUMMARY

The sampling in 2010 consisted of three transects of 8 stations ranging from 0 m (shoreline) to around 1000 m depth. Two transects were located in the central parts of the Ghana coast, while the last one was placed in the east, near the delta of Volta River. In addition, a sample grid around the Mahogany and Salt Pond oil rigs, containing five and four stations respectively, were sampled. The stations around the Salt Pond rig were shallow (24 - 27 m), while the Mahogany stations were deep (1361 – 1600). These sites may be used as a reference stations in future surveys.

The investigation included sediment sampling for analysis of grain size, chemical content and benthic fauna. The sampling was executed according to the OSPAR guidelines for sediment monitoring in offshore oil production areas. The sediment sampling was carried out by the crew from Ghana under the supervision of the accredited laboratory Section of Applied Environmental Research at UNI Research.

Analyses of metal concentration was conducted both by the Norwegian laboratory Eurofins Norsk Miljøanalyse AS and Ghana Environmental Protection Agency Training and intercalibration shows a need for closer cooperation and capacity building.

CTD profiles were deployed at selected sediment sampling stations. The determined parameters include temperature, conductivity, dissolved oxygen and fluorescence. The investigation also include multibeam seabed mapping. The multibeam survey covered an area between the border of the Ivory Coast and the Jubilee field. During the survey, local scientists were trained in the sampling methodology and equipment operation.

The deepest areas of the transects and the stations around the Mahogany oil rig contained mostly fine grained sediments, while coarser sand and gravel was detected in the Salt Pond area and near the Volta River outlet. The total organic matter of the sediment corresponded mostly with were the fine grained material was found.

PCB-levels were low in all areas sampled. Five meters depth of the westernmost transect, was the only station with concentrations above the detection limit. This was anyhow well below what is considered as low levels.

The detection limit for the chemical analyses of pesticides were too high to detect any elevated values.

All concentrations of heavy metals were low. An exception was a shallow station of the westernmost transect and two shallow and intermediate stations at the easternmost transect, which were considered as moderately to severely polluted by arsene. The source of this contamination is unclear, but is most likely from activity at the shoreline or from the Volta River. Most of the metals had increasing concentrations with depth, while zink and lead were found in higher concentrations near shore and near the outlet of Volta River.
Hydrocarbon levels were low at all stations. The highest values were detected at 5 m depth near the Volta River, however these concentrations correspond to a good sediment quality.
The bottom fauna show no signs of disturbance by human activity. Shallow areas were generally rich in both species and individuals, while few were detected in the deepest sites.

Altogether, the results indicate a benthic environment of good quality and that this survey is well suited as background material for future comparisons.

7. REFERENCES

Henriksen K.S. Investigation of crustaceans from shelf areas in the gulf of guinea, with special emphasis on Brachyura. Thesis University of Bergen.

Anon 2009. Requirements for Environmental Monitoring of the Petroleum Activities on the Ghanaian Continental Shelf. Second Draft December 2009.

Blott SJ, Pye K. 2001. Gradistat: a grain size distribution and statistics package for the analysis of unconsolidated sediments. *Earth Surface Processes and Landforms* 26, 1237-1248.

Bray JR, Curtis JT. 1957. An ordination of the upland forest communities of Southern Wisconsin. - *Ecological Monographs* 27:325-349.

Buchanan JB. 1984. Sediment analysis. Pp. 41-65 in: N.A. Holme & A.D. McIntyre (eds). *Methods for the study of marine benthos*. Blackwell Scientific Publications, Oxford.

ter Braak C.F., Smilauer P. 1997. Canoco for Windows 4.5. Biometrics – Plant Research International, Wageningen, Netherlands.

Field, JG., KR. Clarke, & R.M. Warwick 1982. A practical strategy for analysing multispecies distribution patterns. - *Marine Ecology Progress Series* 8:37-52.

Folk RL, Ward WC. 1957. Brazos river bar: A study in the significance of grain size parameters. *Journal of sedimentary petrology* 27: 3-26.

Gray JS, Mirza FB. 1979. A possible method for the detection of pollution-induced disturbance on marine benthic communities. - *Marine Pollution Bulletin* 10:142-146.

OSPAR 2006. OSPAR convention for the protection of the marine environment of the north-east atlantic. Harmonised reporting format to compile environmental monitoring data and information related to offshore oil and gas activities. Reference number 2006-07.

Pearson TH, Gray JS, Johannessen PJ. 1983. Objective selection of sensitive species indicative of pollution-induced change in bentic communities. 2. Data analyses. - *Marine Ecology Progress Series* 12:237-255.

Petroleumstilsynet (Ptil), Statens forurensningstilsyn (SFT), Sosial- og helsedirektoratet (SHdir), 2006. Forskrift om utføring av aktiviteter i petroleumsvirksomheten (Aktivitetsforskriften). Vedlegg 1: Krav til miljøovervåking av petroleumsvirksomheten på norsk kontinentalsokkel 2: Sedimentovervåkning.

Pielou EC. 1966. The measurement of species diversity in different types of biological collections. - *Journal of Theoretical Biology* 13:131-144.

Shannon CE, Weaver W. 1949. *The mathematical theory of communication.* - University of Illinois Press, Urbana. 117 s.

Renaud PE, Jensen T, Wassbotten I, Mannvik HP, Botnen H. 2008. Offshore sediment monitoring on the Norwegian shelf. A regional approach 1996-2006. Akvaplan-niva report no 3487-003. 95 s.

8. LIST OF ABBREVIATIONS

Ba	Barium
Cd	Cadmium
Cu	Copper
CTD	Conductivity, Temperature and Density
DGPS	Differential Global Positioning System
ES_{100}	Expected number of species in a 100 specimens sample
Fe	Iron
GC/FID	Gas chromatography with flame ionization detector
GC/MS	Gas chromatography with mass selective detector
GPS	Global Positioning System
H'	Shannon-Wiener diversity
Hg	Mercury
IMR	Institute of Marine Research
J	Pielou's measure of evenness
MDS	Multidimensional scaling
NPD	Naphthalene, Phenathrene/Anthracene, Dibenzothiophene and their C_1-C_3 homologues
NS	Norwegian Standard
PAH	Polycyclic Aromatic Hydrocarbons, including NPDs and 3-6 ring aromatics
Pb	Lead
SAM	Section of applied environmental research
THC	Total Hydrocarbon Content
TOM	Total Organic Material
UCC	University of Cape Coast
Uni Reseach	University Science of Bergen
Zn	Zinc

9. APPENDIX

Content off Appendix

Akkreditation dokument SAM-Marin

Akkreditations dokument Eurofins

Map of sampling stations in 2009 and 2010

Biology

- Species list
- Table of geometrical groups

Dendrograms in Primer

Chemistry

- Metals
- Barium
- Hydrocarbons
- PCB
- Pesticides

Sediment characteristics

Cruise journal Part I

Cruise journal Part II

9. APPENDIX

Index

Chart 1 Frontpage of Accreditation documents of Uni Research AS, SAM-Marin and Eurofins Norsk Miljøanalyse AS. Chapter 2.3.10 in this report describes which activities and analyses were accredited in accordance with these certificates.

Side 1 av 4

NORSK
AKKREDITERING

AKKREDITERINGSDOKUMENT

TEST 157

UNI Research AS, Uni Miljø, SAM-Marin
Høyteknologisenteret i Bergen
5008 BERGEN

Akkrediteringen omfatter P21 Taksonomi, P3003 Prøvetaking bunnsediment og P32 Faglige vurderinger og fortolkninger i henhold til de neste sidene i dette dokumentet.

Akkreditering er første gang innvilget 21.02.2000, og er gitt i overensstemmelse med Stortingsprop. nr. 106 (1989/90), og Norsk Akkrediterings statutter fastsatt i Kgl. resolusjon 7. oktober 1993. Organisasjonen tilfredsstiller kravene i NS-EN ISO/IEC 17025 (2005)

Akkrediteringen forutsetter regelmessig oppfølging, og er gyldig til 23.10.2013.

Akkrediteringsbeslutningen innebærer at Norsk Akkreditering har funnet at organisasjonen oppfyller kravene for akkreditert virksomhet innenfor de aktuelle akkrediteringsområder. Organisasjonen står selv ansvarlig for resultatene av utførte målinger.

NORSK AKKREDITERING

06.04.2011
Dato

Norsk Akkreditering

NORSK
AKKREDITERING

AKKREDITERINGSDOKUMENT

TEST 003

Eurofins Norsk Miljøanalyse AS
Postboks 3055 Kambo
1506 MOSS

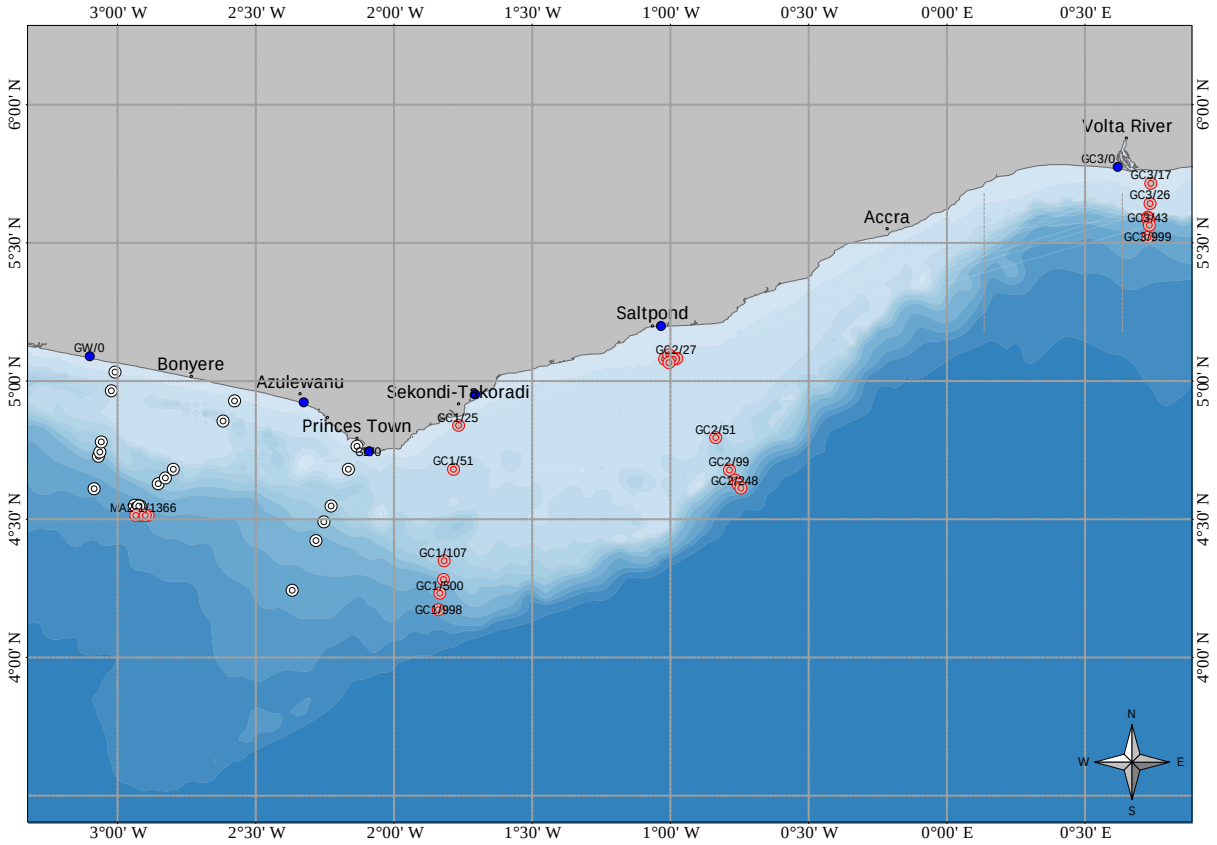
Akkrediteringen omfatter P12 Kjemisk analyse, P16 Mikrobiologisk analyse, P24 Molekylærbiologi og P31 Fleksibelt akkrediteringsomfang i henhold til de neste sidene i dette dokumentet.
Akkreditering er første gang innvilget 01.03.1993, og er gitt i overensstemmelse med Stortingsprop. nr. 106 (1989/90), og Norsk Akkrediterings statutter fastsatt i Kgl. resolusjon 7. oktober 1993.
Organisasjonen tilfredsstiller kravene i NS-EN ISO/IEC 17025 (2005)

Akkrediteringen forutsetter regelmessig oppfølging, og er gyldig til 14.12.2014.
Akkrediteringsbeslutningen innebærer at Norsk Akkreditering har funnet at organisasjonen oppfyller kravene for akkreditert virksomhet innenfor de aktuelle akkrediteringsområder.
Organisasjonen står selv ansvarlig for resultatene av utførte målinger.

NORSK AKKREDITERING

23/9-10
Dato

Norsk Akkreditering



Figur 1 Map of sampling stations in 2009 (white) and 2010 (red and blue).

Table 1 Species list from the transects GC1, GC2 and GC3 and the Salt Pond and Mahogany oil rigs in 2010.

Vedlegg SF-SAM-505.4 **BENTHOS SPECIES LIST** SAM-Marin

uni Research

SAM-Marin
Thormøhlensgate 55, 5008 Bergen
Phone: +47 55 58 43 41

Test 157

Contractor: Institute of Marine Research, Bergen Norway
Project nr.: 8046647
Sampling site: Ghana
Date of sampling: 7/4-2011 – 26/4-2011
Responsible for sampling: SAM-Marin
Deviations:
Species are identified by: Tom Alvestad (trainee) and Per Johannessen

Method: The procedures followed are described by NS-EN ISO 16665 and interne standards. The material is sorted and identified acording to the accreditation by Norsk Akkreditering (Accreditation number: Test 157).

Species list information:
The grab numbers are given at all stations. Animals found in each grab sample are presented below.

+ in the table, sets that animals were present bu tare not quanitatively analysed.

/ in the table, sets a partition between adults and juveniles individuals (ex: 4/2 means 4 adults and 2 juveniles).

cf. between family and species name means that the family identification is correct, while the species identification is uncertain.

* by species or groups of species, sets species or groups of species that are excluded from analyses.

* by grab number indicates a deviation connected to the sample.

Other information:
The table start on the next page and containes:32 pages.

The species list must not be copied in an incmplete kind, without a written approval from SAM-Marin.

Per-Otto Johannessen

Signature:.....
Approved taxonomist

Godkjent av: KH Gyldig fra: 22.3.11 Side 1 av 1

	Date	26.04.2010					11.04.2010				
	Stations/depht	GC1/5					GC1/25				
	Sample number	4	5	6	7	8	4	5	6	7	8
	HYDROZOA										
*	Hydrozoa indet						+			+	+
*	**ANTHOZOA**										
*	Actinaria indet						2				1
*	Pennatulacea indet						2			1	
*	**PLATYHELMINTHES**										
*	**NEMERTINI**										
*	Nemertini indet.		+				5	4	2	2	3
*	**NEMATODA**										
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet.		+								
	Polychaeta indet I						1	3	1	3	2
	Amphinomidae indet.						4	4	1		
	Polynoidae indet.						4	1		1	2
	Sigalion sp	1			1	1					
	Sthenelais cf. limicola									1	
	Phyllodoce spp.										1
	Pilargidae indet I							1	1	1	2
	Pilargidae indet II						3	8	4	1	3
	Pilargidae indet III									1	1
	Nereidae indet						1	1	2	3	8
	Nephtys spp.						1	2		2	1
	Aglaophamus lyrochaeta										9
	Glycera sp.							2	2	1	1
	Goniadidae indet.						3	1	2	2	
	Drilonereis sp.							1	1	1	
	Diopatra sp						17	10	28	13	10
	Eunice sp.										1
	Lumbrineridae indet.						2	2	3	4	2
	Protodorvillea sp									2	
	Orbiniidae indet.I	1					8	6	3	5	6
	Scoloplos spp.						3	1		4	1
	Spionidae indet.							1			
	Malacoseros sp						1	1	7		
	Polydora sp.						1			1	1
	Prionospio spp.						4	2	3	1	2
	Trochochaeta sp						2	2			
	Chaetopterus sp.									1	
	Magelona sp.	1					1	1	1	1	
	Euclymene sp.						8	3	2	2	3
	Euclymeninae									3	1
	Sabaco attentideus								1	1	
	Sabaco dorsofilo									2	
	Paraonidae indet.						7	7	6	8	11
	Aricidea spp.						5	3	1	2	9
	Aphelochaeta sp.						2	1	1		
	Cossura sp									1	
	Flabelligeridae indet.									1	
	Capitellidae indet.						6	3		6	1
	Myriochele spp						+		4		
	Pectinaria sp.							1			
	Isolda sp	3			1					1	
	Pterolysippe bipennata						9	13	12	4	13
	Phyllamphicteis collaribranchis							3	3	1	
	Zatsepinia sp.									4	
	Terebellidae indet.								1		

	Date	26.04.2010					11.04.2010				
	Stations/depht	GC1/5					GC1/25				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Streblosoma sp							1			
	Lanice cf. conchylega							1	1		
	ECHIURA										
	Echiuroidea indet						2		+		
	SIPUNCULA										
	Sipuncula indet				1				1	2	
	Aspidosiphon sp						2	1	1		1
	Onchnesoma cf. steenstrupi						9	17	12	6	12
	ARTHROPODA										
	CRUSTACEA										
	Ostracoda indet I									2	
	Ostracoda indet. III						1				
	Cumacea indet III						1	3	1	1	
	Eocuma sp.										1
	Tanaidacea indet.									1	
	Anthuridea indet I T						1	2	5	1	
	Anthuridea indet II T						1	1	2		1
	Arcturidae indet						1				
*	Amphipoda indet.						75	53	52	70	68
	Manningia posteli								1		
*	Decapoda juv indet (larve)									0/1	0/1
	Brachyura indet									1	
	Brachyura indet II						1	2	1		
	Brachyura indet. IV									1	
	Brachyura indet. V								1	1	2
	Ebalia sp						2		1	1	1
*	Caridea indet						3	2		2	
*	Alpheus sp										1
*	Crangonidae indet									1	
	Paguridae indet.		1	1	9	6	6	1	1	3	
	Thalassinoidea indet I						6	6	2		8
	Thalassinoidea indet II								1		
	PYCNOGONIDA										
	MOLLUSCA										
	Polyplacophora indet. I	0/1									
	Skeneinae indet. II						1				
	Natica sp. I						1		2	1	
	Tectonatica filosa						1/2			1	
	cf. Nassariidae indet. I				0/1	0/1					
	Eulimella sp. I				1	1					
	Bivalvia indet.	1			1			5			
	Nucula crassidens						1	1	1	1	
	Nuculana sp. I							1			
	Nuculana gruveli									1	
	Anadara sp. I							0/1			
	Noetia congoensis							3		1	1
	Pectinidae indet.									2	
	Linga cf. adansoni								0/1		
	Thyasiridae indet. I							3			
	Cardiocardita cf. gabonensis	1/1	3	3/2	1/2	2					
	Bornia balalaika					1					
	Erycinacea indet I									1/3	
	Scissodesma cf. acutissima							1	1/2	1/1	
	Macoma sp. I							1	1		
	Tellina boucheti						2/3				
	Tellina bertrandi						1				
	Tellina crosnieri						1				
	Abra sp.						1/2	1/3	3/3	1	
	Pitar sp. I						1	2			

	Date	26.04.2010					11.04.2010				
	Stations/depht	GC1/5					GC1/25				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Cultellus cf. tenuis								2	0/3	
	Corbula dautzenbergi										2
	BRACHIOPODA										
*	**PHORONIDA**										
*	Phoronida indet.							1			
*	**BRYOZOA**										
	ECHINODERMATA										
	ASTEROIDEA										
	Ophiuroidea indet					+					
	Amphipholis cf. nudipora						3	4	5	19	3
	Amphioplus cf congensis						2	2	1		3
	Rotula sp		2	1	2						
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
	ASCIDIACEA										
*	**CHORDATA**										
*	Varia						+	+			+

	Date	11.04.2010					13.04.2010				
	Stations/depht	GC1/ 50					GC1 /109				
	Sample number	4	5	6	7	8	4	5	6	7	8
	PORIFERA										
*	Porifera indet							+		+	
	HYDROZOA										
*	Hydrozoa indet	+			+						
*	**ANTHOZOA**										
*	Actinaria indet			1							
*	Pennatulacea indet									1	
*	**NEMERTINI**										
*	Nemertini indet.	1	1	3	2	+		+	2	2	3
*	**NEMATODA**										
*	Nematoda indet			1							
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet I				1			3			
	Euphrosinidae indet									1	3
	Panthalis sp		1								
	Polynoidae indet.	1			1						
	Polynoidae indet. I						1			2	1
	Pholoe sp										1
	Sigalionidae indet							1			
	Sthenelais cf. limicola			1							
	Neoleanira sp	1									
	Phyllodoce spp.					1	1	1	1	1	
	Eumidia sp	1									
	Paranaitis sp.			1							
	Pilargidae indet I		1		1						
	Pilargidae indet II	1									
	Paralacydonia sp	4		5	4		3	3	3	1	2
	Hesionidae indet	3			1		1	1			
	Syllidae indet.	1	3	1					1		
	Nephtys spp.	2									
	Aglaophamus lyrochaeta	2	3	1	5	3					
	Glycera sp.								1		1
	Goniadidae indet.	3		3				1			
	Drilonereis sp.						1				
	Diopatra sp	1	3	2	2	1	2				

	Date	11.04.2010					13.04.2010				
	Stations/depht	GC1/ 50					GC1 /109				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Paradiopatra sp.				2	1	5	1	1	1	1
	Eunice sp.	2	2	1	1	2	4	11	7	5	3
	Nematonereis sp						1	2	2	4	1
	Lumbrineridae indet.	2	1		2				1	2	3
	Orbiniidae indet.II	1									
	Scoloplos spp.	3			1	1					
	Heterospio sp.	1		1		1					
	Laonice sp.	1		1				1			1
	Polydora sp.					1					
	Prionospio spp.	3	2	2	1	2	6	3		1	5
	Spiophanes sp.							1			
	Spiochaetopterus sp.	1			2	1	3	1		1	1
	Magelona sp.	1			2						
	Euclymene sp.				1						
	Euclymene wolffi	1			1						
	Euclymeninae						1		4	2	4
	Euclymenihae indet		1	3	2						
	Ophelidae indet								1		
	Maldane sp						1				
	Petalopoctris sp.							1	1		
	Praxillella sp.A				1						
	Praxillella sp.B										1
	Sabaco attentideus				1						
	Paraonidae indet.	3	1	1		1	1		4		
	Aricidea spp.	3	1	2	2	1	3			1	1
	Paraonis sp.						5	1	1	1	1
	Cirratulidae indet.	3		2			1	1	4		1
	Aphelochaeta sp.	3	8	5		1	5	4	9	1	6
	Chaetozone sp.						1				
	Cossura sp	1	1	3	3						
	Flabelligeridae indet.		1			2					
	Brada sp		1				1				
	Pherusa sp.									1	
	Notomastus sp	1	2	3	3	1	2	1	1		1
	Capitellidae indet.							3	1		
	Myriochele spp	1		1	1		2	5	2		1
	Owenia sp.		1		1						
	Sternaspis scutata	1	1	1	4	3					
	Amphicteis sp		2				2				
	Ampharete sp								1		
	Anobothrus sp.						3	5	1		
	Isolda sp				2						
	Eclysippe sp							2	1	1	1
	Pterolysippe bipennata	4	9	1	1	1	1				
	Sabellidae indet.		2				1	2			1
	Sabellariidae indet		3								
	Lanice cf. conchylega			1							
	Eupolymnia sp	2				1					
	Terebellides sp.									1	
	ECHIURA										
	Echiura indet.								1		
	SIPUNCULA										
	Sipuncula indet I									2	
	Sipuncula indet		6		1		2	1	3	1	
	Aspidosiphon sp					3					
	Onchnesoma cf. steenstrupi				1		5	5	5	1	1
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.								1		1

	Date	11.04.2010					13.04.2010				
	Stations/depht	GC1/ 50					GC1 /109				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Ostracoda indet							1			
	Ostracoda indet I		1	1	1	1				1	
	Ostracoda indet.II										1
	Cumacea indet I								1	1	
	Diastylis spp.	1									
	Eocuma sp.							1	1		
	Apseudes sp	1	1		1						
	Anthuridea indet I T				1						
	Anthuridea indet II T				1						
	Anthuridea indet III T						2	1			
*	Amphipoda indet.	6	15	13	16	13	6	7	7	3	2
	Brachyura indet	0/1				0/1					
	Brachyura indet. V	5	2	2	3	1					
	Raninoides sp.				1						
	Ebalia sp	1					1			1	
*	Caridea indet				1						
*	Alpheus sp		3		4	2					
*	Processa sp.			1		1	2	2		1	
*	Crangonidae indet		1								
*	Palaemonidae indet		1								
	Galathea sp	3	2		3						
	Paguridae indet.					1	2		2	2	1
	Thalassinoidea indet I	4	1	1	6	1	2	2		1	
	Thalassinoidea indet II	2	1	2	1	2				1	
	PYCNOGONIDA										
	MOLLUSCA										
	Tectonatica filosa		1								
	Turritella sp. I	1									
	Nassarius elatus	1									
	Eulima glabra					0/1					
	Volvarina sp. I		1								
	Cylichna cylindracea		1			1					
	Roxania utriculus									1	
	Philine scabra	1	0/1			1					
	Ennucula sp. I								0/1		1
	Nucula nicklesi					3					
	Modiolus sp. I	1		2/1		1					
	Similipecten similis								1		1
	Linga cf. adansoni				1						
	Myrtea sp I						1		1		
	Axinulus croulinensis									1	
	Mendicula cf. ferruginosa						3		5	1	2/1
	Thyasira obsoleta						6	1	2	7	2
	Thyasira cf. flexuosa						1				
	Erycinacea indet I			0/2	0/5	0/1					
	Tellina densestriata		1								
	Tellina cf. rubicincta			1	1						
	Abra cf. nitida				0/1						
	Pitar sp. II							3	1		
	Corbula granum	1									
	cf. Pandora sp. II		1								
	Spheniopsis senegalensis									1	
	Fustiarius rubescens					1					
	BRACHIOPODA										
*	**PHORONIDA**										
*	**BRYOZOA**							+			
*	Bryozoa indet. grenet		+								
	ECHINODERMATA										
	Ophiothrix sp.	2	1	1	3						

	Date	11.04.2010					13.04.2010				
	Stations/depht	GC1/ 50					GC1 /109				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Amphipholis cf. nudipora	1	1	1	4/1	8					
	Ophiura spp	2	0/2	0/1	0/2	0/5			0/1	2/3	0/1
	Amphioplus sp	2	5	2	4	6					
	Amphioplus cf congensis		1	1	1	2					
	Amphiura sp.					1				1/2	1
	Amphiura cf. filiformis						1	1	0/1	1	
	Echinoidea indet.	3	1		2						
	Cf. Thyone sp.					1					
	Cucumariidae indet II	1									
	Holothuroidea indet.				1	1					
	ENTEROPNEUSTA										
	Enteropneusta indet.	2		1		+					
*	**CHAETOGNATHA**										
	ASCIDIACEA										
	Ascidiacea indet.		1		1	1			2	1	
*	**CHORDATA**										
*	Pisces indet.			1							
*	Gobiidae indet	1									
*	Varia				+	+		+	+	+	+

	Date	13.04.2010					12.04.2010				
	Stations/depht	GC1 /260					GC1/498				
	Sample number	**4**	**5**	**6**	**7**	**8**	**4**	**5**	**6**	**7**	**8**
*	**ANTHOZOA**										
*	Actinaria indet				1						
*	**NEMERTINI**										
*	Nemertini indet.	4			+	1	1			1	
	ANNELIDA										
	POLYCHAETA										
	Amphinomidae indet.		1								
	Acoetidae indet			1							
	Polynoidae indet.				2						
	Pholoe sp			1							
	Phyllodocidae indet. I	1	1								
	Pilargidae indet I	1	1								
	Paralacydonia sp				1						
	Nephtys spp.	1	2		2	1					
	Glycera sp.	2								1	
	Goniada sp.						1				
	Paradiopatra sp.	12	15	12	3	7	3	1	4	1	1
	Marphysa sp				1						
	Lumbrineridae indet.	1				1			1	1	
	Scoloplos spp.					1					
	Laonice sp.						1	1	2		2
	Polydora sp.									1	
	Prionospio spp.	5	3	2	2	1	4		2	6	3
	Spiophanes sp.	7	3	5	3	2	4		18	24	17
	Spiochaetopterus sp.	2		2	1		1			3	
	Magelona sp.	7		10	5	7	4	2	3	2	
	Hetoroclymere sp.	1	1			1					
	Euclymeninae				1	5	1				
	Praxillura sp.									1	2
	Lumbriclymene sp.						4	4	2	5	4
	Paraonidae indet.		1								
	Aricidea spp.	2	3	5	4	2		1			1
	Aphelochaeta sp.	3	2	1	3	6		2			
	Cossura sp				1	1					

	Date	13.04.2010					12.04.2010				
	Stations/depht	GC1 /260					GC1/498				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Notomastus sp	1					1			1	
	Capitellidae indet.	3	5	3	5	1				1	
	Myriochele spp	1		2				3	1	2	
	Ampharetidae indet	2	3	5			2				
	Sosane cf sulcata		1								
	Ampharete sp							1		1	1
	Anobothrus sp.	1	1	2	1	2					
	Eclysippe sp		1								
	Pterolysippe bipennata		1		1						
	Melinna sp			1		1					
	Sabellidae indet.	2		2	1						
	Pista sp.	2		1			2		2	3	2
	Terebellides sp.	3			1					1	
	ECHIURA										
	Echiuroidea indet								1	1	
	SIPUNCULA										
	Sipuncula indet		1	1						1	
	Onchnesoma cf. steenstrupi	3	4	5	6	5					
	ARTHROPODA										
	CRUSTACEA										
	Ostracoda indet I	1									
	Cumacea indet			1	1						
	Cf. Leucon sp.					1					
	Diastylis spp.	1				1					
	Eocuma sp.					1					
	Tanaidacea indet.					1					
*	Amphipoda indet.	6	5	3	7	6					
*	Euphausiacea indet					1					1
*	Penaeidea indet									1	
*	Caridea indet						1				
	Thalassinoidea indet I	2	1		4	3		1	1	2	1
	PYCNOGONIDA										
	MOLLUSCA										
	Euspira sp. I		0/1								
	Buccinidae indet. III			1							
	Saccella commutata					1					
	Bathyarca sp. I	0/1									
	Lucinidae indet. I		0/1								
	Axinulus croulinensis					1		1/1		2	
	Mendicula cf. ferruginosa	1									
	Thyasiridae indet. II							1			
	Thyasira cf. obsoleta	2			0/1						
	Thyasira cf. granulosa			1							
	Tellina sp. II	2				1					
	Lyonsiella sp. I					1					
	Cardiomya costellata		1								
	Cuspidaria cf. rostrata					0/2					
	Tropidomya abbreviata	0/1									
	Dentaliidae indet.	1		0/1							
	Entalina tetragona			0/1							
	BRACHIOPODA										
*	**PHORONIDA**										
*	Phoronida indet.	1	2	3	1	+					
*	**BRYOZOA**										
	ECHINODERMATA										
	Ophiuroidea indet		+								
	Amphiura cf. filiformis				0/1	1					
	Cucumariidae indet		2								
	ENTEROPNEUSTA										

	Date	13.04.2010					12.04.2010				
	Stations/depht	GC1 /260					GC1/498				
	Sample number	4	5	6	7	8	4	5	6	7	8
*	**CHAETOGNATHA**										
	ASCIDIACEA										
*	**CHORDATA**										
*	Varia	+									

	Date	12.04.2010					25.04.2010				
	Stations/depht	GC1/1029					GC2/5				
	Sample number	4	5	6	7	8	4	5	6	7	8
*	**NEMERTINI**										
*	Nemertini indet.	+	2			+		1	1		
	ANNELIDA										
	POLYCHAETA										
	Sthenelais cf. limicola									2	
	Pilargidae indet I		1								
	Nephtys spp.							3			1
	Glycera sp.	1				+					
	Onuphidae indet.	1									
	Diopatra sp								1		
	Lumbrineridae indet.			1							1
	Orbiniidae indet.							1			
	Heterospio sp.		1		1						
	Spionidae indet.		2		2	1					
	Prionospio spp.		2				1	1			
	Spiochaetopterus sp.		1	2	1						
	Magelona sp.						1				
	Euclymeninae sp.		1								
	Notoproctis sp.			1		4					
	Paraonidae indet.		3			2				1	
	Aricidea spp.	1									
	Aphelochaeta sp.			1				1			
	Capitellidae indet.									1	
	Myriochele spp	+		1	1						
	Terebellidae indet.				1	+					
	SIPUNCULA										
	Sipuncula indet		1	1			9		7	19	6
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.			1							
	Ostracoda indet									1	
	Ostracoda indet I					1					
*	Mysida indet										1
	Apseudes sp	1		1		2					
*	Isopoda indet.						1				
	Parasellidae indet		1								
*	Amphipoda indet.		2	2	7	2		1			
	Brachyura indet									1	
	MOLLUSCA										
	Pusionella cf. aculeiformis								1		
	Tomopleura spiralissima						1				
	Ennucula sp. II				1						
	Adontorhina sp. I					1					
	Axinulus cf. eumyarius			1							
	Mendicula cf. ferruginosa			2	1	1					
	Donax phariformis						1				
	Dentalium sp. I	1									
	ECHINODERMATA										
	Ophiuroidea indet						1	+			

Date	12.04.2010					25.04.2010				
Stations/depht	GC1/1029					GC2/5				
Sample number	4	5	6	7	8	4	5	6	7	8
Ophiuroidea indet. Juv			0/1							
Rotula sp									1	1
Spatangoida juv indet	0/1				0/1					

	Date	15.04.2010					15.04.2010				
	Stations/depht	GC2/25					GC2/51				
	Sample number	4	5	6	7	8	4	5	6	7	8
	PORIFERA										
*	Porifera indet									+	
*	Cliona sp.				+	+					
	HYDROZOA										
*	Hydrozoa indet	+	+	+	+	+				+	+
*	**ANTHOZOA**										
*	Cf. Sphenotrochus sp.	1									
*	Alcyonacea indet			1							
*	Actinaria indet										3
*	Pennatulacea indet					1					
*	Cerianthidae indet							1	1		
*	**PLATYHELMINTHES**										
*	Platyhelminthes indet					1					
*	**NEMERTINI**										
*	Nemertini indet.	+		2		3	1	1	2	3	1
*	**NEMATODA**										
*	Nematoda indet			1						1	
	ANNELIDA										
	POLYCHAETA										
	Amphinomidae indet.			1		2				1	
	Euphrosinidae indet				1				2	4	1
	Polynoidae indet.			1					1		1
	Sigalion sp	1				2					1
	Psammolyce sp				1						
	Pisione sp.				2						
	Phyllodocidae indet.					1					
	Phyllodoce spp.					1	1		2		
	Eumidia sp				1						
	Paranaitis sp.								1	1	1
	Cf. Paranaitis sp.					1					
	Eteone spp					2					
	Chrysopetalidae indet.									1	
	Pilargidae indet I			1	1	1					1
	Paralacydonia sp						1	3	4	2	8
	Hesionidae indet				3				1	1	
	Syllidae indet.			1	1	3	3	2	1	3	1
	Exogone sp			1							
	Nereidae indet					1		1	1	1	1
	Nephtys spp.	4	1	2	2			1			1
	Aglaophamus lyrochaeta						4	1	3	5	4
	Glycera sp.		1	2	8	7				5	
	Goniadidae	1	1		1						
	Goniadidae indet.						2	4	3	8	2
	Goniada sp.			1							
	Drilonereis sp.	1								2	
	Diopatra sp	1		3			1	2			2
	Paradiopatra sp.						2	1	1		
	Onuphis sp	4	2	14	2	1					1
	Eunice sp.	1	6	23	51	44	7	10	34	30	18
	Lumbrineridae indet.	1		7	1	3	1	5	5	15	4

Date	15.04.2010					15.04.2010				
Stations/depht	GC2/25					GC2/51				
Sample number	4	5	6	7	8	4	5	6	7	8
Naineris sp										1
Scoloplos spp.	2	2		1	2				1	
Spionidae indet.	1		1							
Aonides sp.				1	3					
Laonice sp.								1		2
Polydora sp.			1			2	5	2		
Prionospio spp.					1					
Scolelepis sp.					1					
Spiophanes cf. bombyx					1	1				1
Spiophanes sp.			1	1						
Poecilochaetus sp.						1				
Mesochaetopterus sp.					2					1
Spiochaetopterus sp.						1	2	1	2	3
Magelona sp.	9			1	1	1			1	2
Euclymene sp.						1	3	1	6	1
Euclymene wolffi						5	4	2		2
Euclymeninae			2	3						
Petalopoctris sp.					2					
Paraonidae indet.	3		3	1	1				2	
Aricidea spp.					1	1				1
Cirratulidae indet.										2
Cf. Cirratulus sp.					1					
Aphelochaeta sp.				3		4	2	6		3
Flabelligeridae indet.								1	4	2
Ophelia sp. B					2					
Armandia intermedia Fauvel			1		1		1			
Capitellidae indet.				3		6	5	4	5	1
Myriochele spp		1	1	5	3	2	1	4	2	
Owenia sp.										1
Pectinaria sp.	1		3	1						
Ampharetidae indet			11	2		1	8	3	6	6
Sosane cf sulcata								1		
Amphicteis sp										2
Ampharete sp						1			1	2
Isolda sp	2	1	1			1		1	1	5
Pterolysippe bipennata						1	1			6
Sabellides sp.								1	2	3
Sabellidae indet.						2		4	8	7
Streblosoma sp										1
Pista sp.				1	3			1	1	1
Amaeana sp.						1				1
Trichobranchus sp.					1					
Terebellides sp.	2		1	1		1				
Cf Vermiliopsis sp.				1						
Polygordius sp				2	2					
Fauvelopsidae indet ?							1			
Oligochaeta indet.				1						
ECHIURA										
Echiura indet.									1	
SIPUNCULA										
Sipuncula indet				2					3	4
Aspidosiphon sp	6								1	2
Onchnesoma cf. steenstrupi			1			1		7	1	6
ARTHROPODA										
CRUSTACEA										
Ostracoda indet									2	1
Ostracoda indet I				1						
Ostracoda indet.II			1	5	2	5			1	1
Ostracoda indet. III		3	8	3	4		1	4	2	

	Date	15.04.2010					15.04.2010				
	Stations/depht	GC2/25					GC2/51				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Ostracoda indet.IV					1					
	Leptostraca indet.										1
*	Mysidacea indet.			1	2						
	Cumacea indet		1	2							
	Cumacea indet II					1				2	
	Bodotriidae indet	2				1			2	1	1
	cf. Bodotira sp.				1	1			3		
	Cf. Leucon sp.									2	
	Eocuma sp.	2									1
	Tanaidacea indet.								2	1	2
	Apseudes sp		3	7	1	2	2	4	4		8
	Valvifera indet				1			1		1	1
*	Flabellifera indet.						1				
	Cf. Anthura sp.			1							1
	Anthuridea indet	1		1	1	1					
	Anthuridea indet I T						1	1	1		2
	Anthuridea indet II T						4				1
	Anthuridea indet III T									2	
*	Amphipoda indet.	10	8	14	15	10	22	17	35	32	29
*	Caprellidae indet.				2			1			1
*	Hyperiidae indet			1							
*	Euphausiacea indet								1		
*	Decapoda indet.								1		
*	Decapoda juv indet (larve)	0/1									0/1
	Brachyura indet III			2	1						
*	Brachyura juv indet		0/1				0/1				
	Brachyura indet. VI								1		
	Inachidae indet								1		
	Cf. Heterocrypta sp.					2					
*	Portunidae indet	1									
*	Caridea indet			2				2		1	
*	Philocheras sp.								1		
*	Alpheus sp				2	1					1
	Galathea sp				2	1				1	
	Paguridae indet.				2			3	2	1	2
	PYCNOGONIDA										
	Pycnogonida indet.	3						1	1		
	MOLLUSCA										
	cf. Leptochiton scabridus		1			0/1					
	cf. Solariella sp. I		1								
	Natica sp. IV	1									
	Melanella sp. I				1						
	Agaronia acuminata								0/2	0/1	
	Ringicula auriculata	1									
	Acteocina knockeri	1									
	Atys jeffreysi							2			
	Atys macandrewi										0/2
	Bivalvia indet.			4						1	
	Nucula sp. I		1	1							
	Nuculana gruveli			1						1	
	Glycymerididae indet. I	0/1									
	Mytilidae indet.I		2								
	Modiolus sp. I									1	
	Lucinidae indet. II	0/1	1								
	Lucinoma borealis				0/1						
	Cardiocardita cf. gabonensis	0/1									
	Crassatina cf. alba							1			
	Erycinacea indet I										0/1
	Erycinacea indet II	0/2		0/2							

	Date	15.04.2010					15.04.2010				
	Stations/depht	GC2/25					GC2/51				
	Sample number	**4**	**5**	**6**	**7**	**8**	**4**	**5**	**6**	**7**	**8**
	Montacutidae indet. II						2			1	
	Chama cf. fragum				1	1					
	Tellina densestriata	0/1				0/1				0/4	3
	Tellina distorta							1			
	Donacidae indet. I	1									
	Gari jousseaumeana				1						
	Abra sp. II						2	1	1		4
	cf. Pitar sp. III			1							
	Timoclea cf. ovata	0/5	1	5/4							1
	Corbula laticosta				1						
	Pandora sp. I	0/1									
	Thraciidae indet. I									0/1	1
	Cadulus sp. II	0/1									
	BRACHIOPODA										
*	**PHORONIDA**										
*	**BRYOZOA**										
*	Bryozoa indet. skorpe			+	+	+			+	+	+
*	Bryozoa indet. grenet		+				+	+	+	+	+
	ECHINODERMATA										
	Ophiuroidea indet	+			1	0/2					
	Amphipholis cf. nudipora						1	2	3	1	2
	Ophiura spp							0/1	3		0/1
	Amphioplus cf congensis							1	1		2
	Echinoidea indet.								0/1		
	cf. Echinocyamus sp		2								
	Spatangoida juv indet							0/1			
	Spatangus sp.						1			1	
	Holothuroidea indet.				1	+			+		1
	ENTEROPNEUSTA										
	Enteropneusta indet.								1		
*	**CHAETOGNATHA**										
*	Chaetognatha indet.	1									
	ASCIDIACEA										
	Ascidiacea indet.			1			2	1			6
*	**CHORDATA**							+	+	+	+
*	Varia							+	+	+	+

	Date	18.04.2010					18.04.2010				
	Stations/depht	GC2/101					GC2/250				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	PORIFERA										
*	Porifera indet	+	+	+							
*	**ANTHOZOA**										
*	Alcyonacea indet		1								
*	Edwardsiidae indet.									1	
*	**NEMERTINI**										
*	Nemertini indet.	1	1	2	1	1	2	+	1	1	+
*	**NEMATODA**										
*	Nematoda indet					1					
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet I					1					
	Amphinomidae indet.					1				1	1
	Euphrosinidae indet	3	1		2	3		2	3	4	
	Polynoidae indet.	1		2	1						
	Polynoidae indet. I		2	1	1						
	Phyllodoce spp.		2						2		

Date	18.04.2010					18.04.2010				
Stations/depht	GC2/101					GC2/250				
Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
Chrysopetalidae indet.			1							
Pilargidae indet II				1			1			
Paralacydonia sp	4		4	7	1	1				
Hesionidae indet										1
Syllidae indet.	1				1					
Nereidae indet									1	
Nephtys spp.						1	1			1
Aglaophamus lyrochaeta	1									
Glycera sp.			2			1		1		
Goniadidae indet.						1				
Goniada sp.		1		1		1	1			
Drilonereis sp.			1	1		2				
Aponuphis sp		1	2		5					
Diopatra sp				1						
Hyalinoecia sp			2						1	
Nothria sp.								1		
Paradiopatra sp.	1	2	1	7	12	2	1	3	3	2
Eunice sp.	1	4	7	8	3		2		1	1
Nematonereis sp			1			1				
Lumbrineridae indet.	2	2	1	3	1	1	2	3		3
Schistomeringos sp						1			2	
Orbinia sp.	2	1								
Phylo sp				1	1					
Laonice sp.			1					1		
Prionospio spp.	6	4	1	6	3	2	1	3	2	1
Spiophanes sp.			1		1	5		2	3	3
Poecilochaetus sp.				1						
Spiochaetopterus sp.	2		2		1	1	1	3	1	
Magelona sp.				2		2	9	2		14
Euclymeninae indet						2	1	2	1	1
Euclymenihae indet			2	3	1					
Maldanihae indet		1		1						
Praxillura sp. A			4							
Paraonidae indet.			1		1		1	3		2
Aricidea spp.	2	1	3	2		2	1	1	1	3
Cirratulidae indet.	2	1	2	7	6	1	3	2	1	3
Aphelochaeta sp.	3	3	4		1	5	3	6	5	10
Chaetozone sp.		1				1	1	2		
Cossura sp						4	1		1	1
Flabelligeridae indet.				1						
Flabelligera sp				1						
Ophelina sp								1		
Scalibregma sp		2		2						
Notomastus sp				2		1			1	
Capitellidae indet.	1	2	2	1	1	6	4	6	8	2
Myriochele spp	1		2	2	1		1		1	
Ampharetidae indet	1	2	5	1		8	1	5	6	2
Amphicteis sp		1								
Ampharete sp		2	2	1						
Anobothrus sp.				2						
Isolda sp			1					1		
Pterolysippe bipennata	2	1	3	2						
Sabellidae indet.					1	1	2	2	4	1
Streblosoma sp			1						1	
Pista sp.	1		1				1	2	1	
Amaeana sp.	1	1							1	
Terebellides sp.				1			1			1
ECHIURA										
SIPUNCULA										

	Date	18.04.2010					18.04.2010				
	Stations/depht	GC2/101					GC2/250				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	Sipuncula indet I	1									
	Sipuncula indet		1		5			2	2	2	
	Onchnesoma cf. steenstrupi	3	3	13	4	14	24	39	34	26	26
	ARTHROPODA										
	CRUSTACEA										
*	Crustacea indet										1
*	Copepoda indet.	1								1	
	Ostracoda indet I										9
	Ostracoda indet. III	1	2								
	Leptostraca indet.								1		1
*	Lophogaster sp.		1								
	Cumacea indet								1		
	Cumacea indet III	2		1							
	Cf. Leucon sp.								1	1	
	Diastylis spp.				1		1		1	2	2
	Eocuma sp.							1			
	Tanaidacea indet.		1		1			1	1		
*	Flabellifera indet.			1							
	Anthuridea indet I T					1					
*	Gnathia sp.			1		1					
*	Amphipoda indet.	8	3	8	5	12	9	9	11	19	4
*	Decapoda juv indet (larve)	0/1			0/1						
	Inachidae indet			1							
	Ebalia sp	1			2	3	2			1	
*	Caridea indet	1		1							1
*	Caridea indet IV T		1			1					
*	Alpheus sp						1				
*	Processa sp.				1						
	Paguridae indet.	3		1	1						
	Thalassinoidea indet I				1				1		
	Thalassinoidea indet II	1	2								
	PYCNOGONIDA										
	MOLLUSCA										
	Solenogastres indet.								1		
	Anatoma crispata								1		
	Tectonatica filosa		1		0/2						
	Buccinidae indet. II		1								
	Cylichna cylindracea								1		
	Saccella commutata				1		1	1	1		
	Similipecten similis			2			1		1		
	Afrolucina discontinua								0/2		
	Mendicula cf. ferruginosa		1	1	1	1		1	1		
	Thyasira cf. obsoleta	2	2	4			1		1/1	0/2	0/1
	Erycinacea indet I				0/2						
	Tellina sp. II				1						
	Lyonsiella sp. II								1	1	
	Cuspidariidae indet.			0/1							
	Cuspidaria sp.								1		
	Cuspidaria cf. rostrata									0/2	
	Dentaliidae indet. I							0/1			
	Dentalium cf. katchekense								0/1		
	BRACHIOPODA										
*	**PHORONIDA**										
*	Phoronida indet.						1				
*	**BRYOZOA**										
*	Bryozoa indet. grenet			+							
	ECHINODERMATA										
	Astropecten sp.		0/1								
	Ophiuroidea indet					0/1					

	Date	18.04.2010					18.04.2010				
	Stations/depht	GC2/101					GC2/250				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	Amphipholis cf. nudipora	1	1		0/2	0/2					
	Ophiura spp			6				0/2	0/1		
	Ophiura cf. carnea					2					
	Amphioplus sp				1						
	Amphiura sp.	1									
	Amphiura cf. filiformis		1		1				1		
	Echinocyamus sp			1							
	Synaptidae indet				1						
	ENTEROPNEUSTA										
	Enteropneusta indet.				1						
*	**CHAETOGNATHA**										
	ASCIDIACEA										
	Ascidiacea indet.				1						
*	**CHORDATA**										
*	Varia	+					+				+

	Date	18.04.2010					19.04.2010				
	Stations/depht	GC2/507					GC2/1055				
	Sample number	**4**	**5**	**6**	**7**	**8**	**4**	**5**	**6**	**7**	**8**
*	**NEMERTINI**										
*	Nemertini indet.	+		1	2	1				1	1
	ANNELIDA										
	POLYCHAETA										
	Amphinomidae indet.					3	2	1			
	Panthalis cf. oerstedi						1				
	Phyllodoce spp.			1		1					
	Pilargidae indet I			1							1
	Pilargidae indet II	1									
	Syllidae indet.	1									
	Glycera sp.								2		
	Drilonereis sp.						1				
	Onuphidae indet.								1		1
	Nothria sp.	+	7	3							
	Paradiopatra sp.	3		2	2	3					
	Eunice sp.	1									
	Marphysa sp	1		1							
	Lumbrineridae indet.			1		2			2		4
	Orbiniidae indet.III							2	1	1	
	Spionidae indet.						1				1
	Laonice sp.	1		1	1	1		1			
	Prionospio spp.			2		1			3		1
	Spiophanes sp.			23	101	162			2	+	1
	Trochochaeta sp								1		
	Spiochaetopterus sp.	1						1		+	1
	Magelona sp.	6	2	5							
	Clymenura sp.A						1		1		1
	Euclymeninae				1	2					
	Praxillella sp.A										1
	Rhodine sp.									1	
	Lumbriclymene sp.			5		1				1	1
	Paraonidae indet.				1	1	1		1		
	Aricidea spp.	1	2		1		1				1
	Aphelochaeta sp.	1	1	8			4	2	5	1	10
	Scalibregma sp	1									
	Notomastus sp			4	1	5					
	Capitellidae indet.					1					

	Date	18.04.2010					19.04.2010				
	Stations/depht	GC2/507					GC2/1055				
	Sample number	**4**	**5**	**6**	**7**	**8**	**4**	**5**	**6**	**7**	**8**
	Myriochele spp		1	1		1		1	2		1
	Ampharetidae indet	1	6	1	1	3					
	Sabellidae indet.					3					
	Pista sp.					2					
	Polycirrus sp	1									
	Terebellides sp.			2					1		2
	Siboglinum sp	+	+				+	+	+	+	+
	ECHIURA										
	SIPUNCULA										
	Sipuncula indet	11	8	5	4	2	1			1	
	Aspidosiphon sp	1	25								
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.	1	1		1						
*	Scalpellum sp	1					1				
	Ostracoda indet		1								
	Cumacea indet. V						1				
	Cumacea indet.VI								1		1
	Diastylis spp.										1
	Apseudes sp										1
*	Amphipoda indet.	4	1		2	3	1	1	1	+	
	Brachyura indet			1							
	Galathea sp	1									
	PYCNOGONIDA										
	MOLLUSCA										
	Caudofoveata indet.				1					1	
	Solenogastres indet.	1									
	Nassarius frigens	1									
	Nassarius wolffi			1							
	Eulima sp. I	1									
	Muricidae indet. I			0/2							
	Cylichna cylindracea					1					
	Bivalvia indet.				2						
	Ennucula sp. II							1			
	Yoldiella sp. I			1							
	Delectopecten vitreus	1									
	Axinulus croulinensis	1			1						
	Axinulus cf. eumyarius						3		2		1
	Mendicula cf. ferruginosa		1	1	1	3	3	1	4		1
	Thyasiridae indet.			1		1					
	Kurtiella cf. bidentata					2					
	BRACHIOPODA										
	Brachiopoda indet	1									
*	**PHORONIDA**										
*	**BRYOZOA**										
	ECHINODERMATA										
	Ophiura spp				0/2	0/2					
	Amphiura sp.	3									1
	Amphiura cf. filiformis					1					
	Spatangoida juv indet						0/1		0/1		0/1
	Apodida indet					2					
	Pseudothyone sp ?					2					
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
	ASCIDIACEA										
*	**CHORDATA**										
*	Varia		+	+				+			

	Date	24.04.2010					07.04.2010				
	Stations/depht	GC3/5					GC3/25				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	PORIFERA										
*	Porifera indet						+		+	+	
	CNIDARIA										
	HYDROZOA										
*	Hydrozoa indet								+	+	
*	**ANTHOZOA**										
*	Actinaria indet						1			2	3
*	**PLATYHELMINTHES**								2		
*	**NEMERTINI**										
*	Nemertini indet.			1			7	5	7	2	4
*	**NEMATODA**										
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet I									1	
	Amphinomidae indet.						2	1	2	3	
	Panthalis sp									1	
	Polynoidae indet.		1				1	22	1		3
	Sigalion sp									2	
	Sthenelais cf. limicola								1		
	Pisione sp.						8	10			
	Eteone spp							1			
	Chrysopetalidae indet.								1		
	Pilargidae indet I								6	1	3
	Pilargidae indet II						2		2	1	5
	Paralacydonia sp										1
	Hesionidae indet							1			3
	Syllidae indet.						1	1			
	Nephtys spp.	1	3	1		1		2	2	1	1
	Aglaophamus lyrochaeta								3	2	1
	Glycera sp.		1	1			3	8	9	4	4
	Goniadidae indet.						1	9	4	7	2
	Drilonereis sp.								1		
	Aponuphis sp									1	1
	Diopatra sp	10	19	10	4	7	10	7	15	5	7
	Nothria sp.										1
	Eunice sp.						10	11	38	15	9
	Lumbrineridae indet.	1	2	1			13	9	8	6	8
	Schistomeringos sp								13		3
	Scoloplos spp.						1		1	1	
	Aonides sp.							1			
	Polydora sp.						9	4			
	Prionospio spp.						7	4	8	1	4
	Spiophanes cf. bombyx						1	1			1
	Spiophanes sp.						1				1
	Spiochaetopterus sp.									1	3
	Euclymene sp.						4	3	1	5	4
	Euclymeninae	1	4	1	1						
	Maldane decorata	1	5	1		1					
	Sabaco sp.								2		
	Sabaco attentideus		3								
	Paraonidae indet.			1			2		1	3	7
	Aricidea spp.	3	2			1	1	1	2		3
	Aphelochaeta sp.			1		1	5	7	4	4	8
	Cossura sp		1								
	Flabelligeridae indet.						3		4		2
	Ophelia sp. A						9	5	1	1	1
	Armandia intermedia Fauvel						1			2	1
	Capitellidae indet.	1			1			2	2		
	Myriochele spp	2	1				10	5	5	5	2

	Date	24.04.2010					07.04.2010				
	Stations/depht	GC3/5					GC3/25				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	Owenia sp.		1								
	Pectinaria sp.		1					1	6		2
	Ampharetidae indet	1					3	10	23	6	22
	Amphicteis sp								2		
	Isolda sp	1	1	12	1			1	2	1	
	Pterolysippe bipennata						33	16	34	4	13
	Phyllamphicteis collaribranchis		1								
	Zatsepinia sp.									2	
	Sabellidae indet.						2	2	3	1	
	Euchone sp						2		3		
	Pista sp.							1	2		
	Lanice cf. conchylega	1									
	Amaeana sp.							1		1	
	Trichobranchus sp.						1	3	8		8
	Terebellides sp.						1	2	1		
	Polygordius sp						2	3	6		6
	ECHIURA										
	SIPUNCULA										
	Sipuncula indet					1					
	Aspidosiphon sp	1	1								
	Onchnesoma cf. steenstrupi									1	
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.								1	2	
	Ostracoda indet									3	
	Ostracoda indet I						1				
	Ostracoda indet.II								2		
	Ostracoda indet. III		1								
*	Mysidacea indet.							1			
	Cumacea indet III						1			2	
	Bodotriidae indet									2	
	Iphinoe sp								1	1	
	Eocuma sp.							1			
	Apseudes sp						10	6	8	32	4
	Valvifera indet						1				
	Anthuridea indet I T	2	7	8	6				3		1
	Anthuridea indet II T		1								
*	Amphipoda indet.	13	6	6	7	1	35	45	27	18	29
	Lysiosquillidae indet									1	
*	Brachyura juv indet	0/1					0/1				
	Brachyura indet. VII								5		1
	Brachyura indet.VIII										1
	Inachidae indet								1		
*	Portunidae indet							1		1	1
*	Caridea indet III T										1
*	Alpheus sp							1			
*	Processa sp.						1	2		1	1
*	Crangonidae indet										1
	Galathea sp						1	1			
	Paguridae indet.		32			4	4	1	3	3	
	Thalassinoidea indet III							1	1		
	PYCNOGONIDA										
	Pycnogonida indet.								1		
	MOLLUSCA										
	cf. Leptochiton scabridus							0/1			
	cf. Muricopsis sp. I									1	
	Fusiturris sp. I					1					
	Tomellana lineata	1			1						
	Bivalvia indet.								+		

	Date	24.04.2010					07.04.2010				
	Stations/depht	GC3/5					GC3/25				
	Sample number	4	5	6	7	8	**4**	**5**	**6**	**7**	**8**
	Nucula sp. I	1			1						
	Nucula crassicostata						1			0/2	
	Nuculana sp. I		0/2	0/3		0/1					
	Anadara cf. subglobosa		1								
	Limaria loscombi							1			
	Linga cf. adansoni									1	
	Lucinidae indet. II		0/1								
	Cardiocardita sp. I									0/1	
	Cardiocardita cf. gabonensis	3	2/11	2/10	1/2	1/2					
	cf. Diplodonta sp. I									1	
	Erycinacea indet I	0/2	0/1			1					
	Montacutidae indet. I									1	
	Scissodesma cf. acutissima				1						
	Tellina bertrandi		2/1								
	Tellina cf. densestriata									1	
	Tellina distorta						1				
	Abra sp. I		1					1			
	Dosinia gabonensis	0/39	2/46	4/16	0/1	0/33					
	Pitar sp. I		2	2	1	1					
	Pitar cf. elatus		1	1							
	Timoclea cf. ovata									1/4	
	Cultellus cf. tenuis	3	15	11	5	1					
	Corbula dautzenbergi									1	
	BRACHIOPODA										
*	**PHORONIDA**										
*	**BRYOZOA**										
*	Bryozoa indet. skorpe						+			+	
*	Bryozoa indet. grenet								+		
	ECHINODERMATA										
	Ophiuroidea indet						1	1			2
	Ophiuroidea indet. I T								29	2	1
	Amphipholis cf. nudipora	4	8	1		2			1	6	
	Ophiura spp								6		
	Amphioplus sp	7	5	2	1	3					
	Amphioplus cf congensis		1								
	Cucumariidae indet								2		
	Synaptidae indet						33	6	20	2	14
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
	ASCIDIACEA										
*	**CHORDATA**										
*	Branchiostoma sp.							10	1		
*	Varia			+			+	+	+	+	

	Date	07.04.2010					08.04.2010				
	Stations/depht	GC3/43					GC3/88				
	Sample number	**4**	**5**	**6**	**7**	**8**	4	5	6	7	8
	PORIFERA										
*	Porifera indet	+									
*	Cliona sp.					+					
	HYDROZOA										
*	Hydrozoa indet	+	+	+	+	+					
*	**ANTHOZOA**										
*	Actinaria indet			2			1				
*	Pennatulacea indet	1	1	3	3	1					
*	Edwardsiidae indet.							1			
*	**NEMERTINI**										

	Date	07.04.2010					08.04.2010				
	Stations/depht	GC3/43					GC3/88				
	Sample number	**4**	**5**	**6**	**7**	**8**	4	5	6	7	8
*	Nemertini indet.	5	2	+	3	1	9	2			3
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet I						1				
	Amphinomidae indet.				1			1		2	1
	Eupanthalis sp.	2	1								
	Panthalis sp		1								
	Polynoidae indet.		2	1	11	6	2			1	
	Pholoe sp					1	1				
	Sigalionidae indet							2			
	Psammolyce sp	1			1						
	Sthenelais cf. limicola		1	1							
	Phyllodocidae indet.										1
	Phyllodoce spp.		1	1	1	1					
	Eteone spp	1									
	Pilargidae indet I	1						1			
	Pilargidae indet II		2	2	3			1			
	Pilargidae indet IV			1							
	Paralacydonia sp	1	1	1	1	2					
	Hesionidae indet			1							
	Syllidae indet.		2	1	1	1					
	Nereidae indet	1		1							
	Aglaophamus lyrochaeta	1	2	3	4	9	7	2		3	7
	Sphaerodoridae indet.		1								
	Glycera sp.			1	1	1	3		1		1
	Goniadidae indet.		3		2						
	Goniada sp.		1								
	Drilonereis sp.	1	2	2	1	2					
	Aponuphis sp	44	39	45	21	43					
	Paradiopatra sp.							1	1		
	Eunice sp.	2	3	2	7	3	3				
	Nematonereis sp	4	5	3		8					
	Marphysa sp						2	1			2
	Lumbrineridae indet.	23	22	15	9	14	5	4		3	2
	Schistomeringos sp				1						
	Orbiniidae indet.I		3			1					
	Scoloplos spp.	2	1			2					
	Heterospio sp.			1			1				
	Spionidae indet.									1	
	Laonice sp.	2	3	5	1						
	Prionospio spp.	2				1	1	1		2	
	Scolelepis sp.			1		1					
	Spiophanes cf. bombyx	2						1			
	Spiophanes sp.		1								
	Chaetopterus sp.	2								1	
	Spiochaetopterus sp.	3			1	1	1				
	Magelona sp.	8	26	20	2	8					
	Euclymene sp.	2		2	2						
	Euclymene wolffi	2	5	1							
	Euclymeninae							1		1	
	Maldane sp	1		1							
	Petalopoctris sp.		1								
	Praxillella sp.A						1				
	Paraonidae indet.		1	1	2						
	Aricidea spp.				1						
	Cirratulidae indet.		1								
	Aphelochaeta sp.	2		1	1	1	4				
	Flabelligeridae indet.	8		3	1						
	cf. Brada sp	1									

	Date	07.04.2010					08.04.2010				
	Stations/depht	GC3/43					GC3/88				
	Sample number	**4**	**5**	**6**	**7**	**8**	4	5	6	7	8
	Ophelia sp. B				4						
	Ophelia sp. A				1						
	Armandia intermedia Fauvel				1	1					
	Capitellidae indet.	5	8	3	7	6	3				
	Myriochele spp	2	1	2	1	1	7	1	1		
	Owenia sp.		1	1							
	Sternaspis scutata						2	1		2	2
	Ampharetidae indet			1	1	1		1			
	Ampharete sp	3			1						
	Anobothrus sp.						2				
	Isolda sp		2		1	1					
	Pterolysippe bipennata		1								
	Melinna sp								1		
	Zatsepinia sp.				1						
	Sabellidae indet.		1		2						
	Euchone sp	1									
	Lygdamis sp.	1									
	Terebellidae indet.			1		1					
	Lanice cf. conchylega		1								
	Amaeana sp.	1	1								
	Polycirrus sp					1					
	Terebellides sp.	7		1	4	2	1			2	
	Hydroides sp						1				
	ECHIURA										
	Echiura indet.				1						
	SIPUNCULA										
	Sipuncula indet	4	+		1	4	1			1	
	Aspidosiphon sp	3			1		1				
	Onchnesoma cf. steenstrupi	4	1	1		4					
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.					2					
	Ostracoda indet I	1									
	Iphinoe sp				1	2					
	Apseudes sp						3	2		2	1
*	Flabellifera indet.				1						
	Anthuridea III	1			1	1					
*	Amphipoda indet.	8	3	6	10	8	1			1	
	Stomatopoda indet			1		1					
	Squillidae indet			1							
*	Decapoda juv indet (larve)					0/2					
	Porcellanidae indet					1					
	Brachyura indet I						2				
*	Brachyura juv indet	0/1				0/1	0/1				
	Brachyura indet. IV	2			1	3					
	Brachyura indet X	1									
	Brachyura indet XI	3									
	Calappa pelii			1							
	Majoidea indet					1					
	Inachidae indet				1						
	Cf. Heterocrypta sp.					1					
	Herbstia sp									1	
*	Caridea indet						1			2	
*	Caridea indet I T						1				
*	Caridea indet III T							1		1	
*	Alpheus sp		1					2			
*	Processa sp.	1			1			1			
	Paguridae indet.	1		1	2	2					
	Thalassinoidea indet						1				

	Date	07.04.2010					08.04.2010				
	Stations/depht	GC3/43					GC3/88				
	Sample number	**4**	**5**	**6**	**7**	**8**	4	5	6	7	8
	Thalassinoidea indet I	2	5	7	3	5					
	Thalassinoidea indet II				2						
	PYCNOGONIDA										
	MOLLUSCA										
	Caudofoveata indet.						2		1	2	
	Skeneinae indet. I						5/2				
	Buccinidae indet. I						1				
	Eulima glabra						1				
	Raphitoma sp. I	1									
	Weinkauffia turgidula					1					
	Noetia congoensis						1/1		1		
	Crenella sp. I	1									
	Pectinidae indet. II					0/1					
	Limidae indet.			0/1							
	Diplodonta cf. circularis	1/2				1/1					
	Montacutidae indet.								1		
	Montacutidae indet. I					1					
	Macoma inexpectata	1	2		2/1						
	Abra cf. nitida						3				
	Pitar sp.	1									
	Timoclea cf. ovata	2			1/1						
	Corbula sulcata		1								
	Pandoracea indet I	0/1									
	Cadulus sp.							1			
	BRACHIOPODA										
*	**PHORONIDA**										
*	Phoronida indet.					1					
*	**BRYOZOA**										
*	Bryozoa indet. skorpe	+		+		+	+		+		
*	Bryozoa indet. grenet			+	+	+					
	ECHINODERMATA										
	Asteroidea indet.				1						
	Ophiuroidea indet		0/1								1
	Ophiopsila sp.		1			1					
	Amphipholis cf. nudipora	4	2	2							
	Ophiura spp						0/3			0/1	
	Amphioplus sp	3					1	1	1	1	
	Amphioplus cf congensis		3		4	9					
	Holothuroidea indet.	2									
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
*	Chaetognatha indet.				1						
	ASCIDIACEA										
*	**CHORDATA**										
*	Pisces indet.				1				1	2	
*	Gobiidae indet		1								
*	Varia	+	+	+		+	+				

Date	08.04.2010	08.04.2010
Stations/depht	GC3/245	GC3/509

	Sample number	4	5	6	7	8	4	5	6	7	8
*	**NEMERTINI**										
*	Nemertini indet.	1	2	2	1	1		1			
	ANNELIDA										
	POLYCHAETA										
	Amphinomidae indet.	4	3	1							
	Polynoidae indet.		3							1	
	Phyllodocidae indet.	1	1								
	Nereidae indet	9	10	2	6				1	4	
	Nephtyidae indet									+	
	Glycera sp.	2	4		3				1		
	Goniada sp.	1						+	+		2
	Nothria sp.						1				
	Paradiopatra sp.	25	7	1	1						
	Lumbrineridae indet.		1		2	3	3			1	
	Heterospio sp.					1					
	Spionidae indet.	1									
	Laonice sp.				2						
	Polydora sp.	1									
	Prionospio spp.	6	11	4		7			1	3	1
	Spiophanes sp.	4									
	Spiochaetopterus sp.	1	3			2					
	Euclymeninae	12	5	4	1	3				2	
	Maldane sp				1						
	Maldane sp. I						2	1		2	1
	Maldane sp. II						5	3	1	1	
	Rhodine sp.	2	4	1							
	Paraonidae indet.	2	2			2		1			
	Aricidea spp.	6	4	2	2	1	2			2	
	Aphelochaeta sp.	3	2								
	Cossura sp			1							
	Cf Pycnoderma sp						1				
	Ophelina sp									2	
	Scalibregmatidae indet									1	
	Capitellidae indet.		2								
	Myriochele spp	5	5	2	2	1					
	Ampharetidae indet		3			2					
	Amphicteis sp		3	1							
	Anobothrus sp.	12	13	2	2	2					
	Melinna sp	1									
	Terebellidae indet.		1								
	Terebellides sp.	1									
	ECHIURA										
	SIPUNCULA										
	Sipuncula indet						2				
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.						1				
*	Mysidacea indet.	1									
	Cumacea indet								1		
*	Flabellifera indet.		1								
	Anthuridea indet I T									1	
*	Amphipoda indet.	2		1	1	1			1		
	Brachyura indet I	1	1								
	Brachyura indet II	1		1	1						
*	Caridea indet		1								
	Thalassinoidea indet				+						
	PYCNOGONIDA										
	MOLLUSCA										
	Caudofoveata indet.		1			1	+		1	3	1
	Nassarius wolffi		1								
	Acteon tornatilis			0/1							

	Date	08.04.2010					08.04.2010				
	Stations/depht	GC3/245					GC3/509				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Bivalvia indet.		1								
	Ennucula sp. II								1		
	Nucula sulcata				1						
	Ledella sp. I									6	2
	Afrolucina discontinua	0/2	0/2	0/2	0/3						
	Adontorhina sp. I						4			2	
	Axinulus croulinensis	1		1							
	Thyasira cf. obsoleta									0/3	
	Kurtiella cf. bidentata		1								
	Macoma cf. candida			1							
	Macoma inexpectata		1								
	Periploma camerunensis	1	1/3	0/1							
	BRACHIOPODA										
*	**PHORONIDA**										
*	**BRYOZOA**										
	ECHINODERMATA										
	Amphiura sp.		0/1	1					1		
	Apodida indet	2	1	1	1	2					

	Date	09.04.2010					23.04.2010	
	Stations/depht	GC3/999					Ma deep 2-1 1366m	
	Sample number	4	5	6	7	8	4	5
*	**NEMERTINI**							
*	Nemertini indet.	1		+	1			1
	ANNELIDA							
	POLYCHAETA							
	Polychaeta indet.		1					
	Amphinomidae indet.		1					
	Phyllodocidae indet. I			1	1			
	Nereidae indet		1			1		
	Glycera sp.	1						
	Goniada sp.	1		1	2			
	Paradiopatra sp.	1						
	Lumbrineridae indet.	1		3	1			
	Laonice sp.		1	1	2		1	+
	Prionospio spp.	1						
	Spiophanes sp.	3		4		1		
	Spiochaetopterus sp.		1		1			
	Clymenura sp.		1					
	Maldane sp. II	2	1	1	2	1		
	Aricidea spp.		1	4	1	5		1
	Aphelochaeta sp.	1		4	1			
	Flabelligeridae indet.	1						
	Capitellidae indet.	1						
	Myriochele spp	1	1	2	2	2	+	+
	Sternaspis scutata	1					1	
	Terebellides sp.	1		1		1		
	Siboglinum sp	+	+	+		+		
	ECHIURA							
	SIPUNCULA							
	Sipuncula indet	1		1			2	1
	ARTHROPODA							
	CRUSTACEA							
*	Copepoda indet.		1		1			
	Ostracoda indet I	1						
	Cumacea indet			1				
	Tanaidacea indet.	1				1		

	Date	09.04.2010					23.04.2010	
	Stations/depht	GC3/999					Ma deep 2-1 1366m	
	Sample number	4	5	6	7	8	4	5
	Apseudes sp			2		1		
	Anthuridea indet I T			1				
*	Amphipoda indet.		1	1			1	
*	Penaeidea indet			1				
	PYCNOGONIDA							
	MOLLUSCA							
	Caudofoveata indet.	1	1					
	Haliella cf. stenostoma	1						
	Bivalvia indet.	2						
	Ennucula sp. III						1	
	Adontorhina sp. I	1						
	Mendicula cf. ferruginosa	5		4		2	1	
	BRACHIOPODA							
	ECHINODERMATA							
	Amphiura sp.			1				

	Date	23.04.2010					21.04.2010				
	Stations/depht	Ma deep 2-5 1361m					SPN/24				
	Sample number	4	5	6	7	8	4	5	6	7	8
	PORIFERA										
*	Porifera indet									+	
*	Cliona sp.						+		+	+	+
	HYDROZOA										
*	Hydrozoa indet							+	+		+
*	**ANTHOZOA**										
*	Actinaria indet								1		
*	Pennatulacea indet										1
*	Edwardsiidae indet.									1	
*	**PLATYHELMINTHES**										
*	Platyhelminthes indet						1				
*	**NEMERTINI**										
*	Nemertini indet.				1		1	5	5	8	1
*	**NEMATODA**										
*	Nematoda indet								2		
	ANNELIDA										
	POLYCHAETA										
	Polychaeta indet.			+							
	Amphinomidae indet.						1	2	4	2	1
	Euphrosinidae indet									1	
	Polynoidae indet.								4	4	
	Sigalion sp										4
	Eumidia sp									1	
	Eteone spp									5	
	Pilargidae indet I							1	3	5	
	Hesionidae indet								3	1	6
	Syllidae indet.								5	4	4
	Aglaophamus lyrochaeta							1			
	Glycera sp.						1	1	3	6	9
	Goniadidae indet.						3	4	2	3	
	Diopatra sp						8	18	2	2	
	Nothria sp.						1				1
	Onuphis sp						22	55			1
	Eunice sp.						4	1	39	115	2
	Lumbrineridae indet.						4	6	8	6	5
	Schistomeringos sp								2		
	Orbiniidae indet.I						1	7			
	Scoloplos spp.						5	10			

	Date	23.04.2010					21.04.2010				
	Stations/depht	Ma deep 2-5 1361m					SPN/24				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Aonides sp.								3	4	
	Polydora sp.									2	
	Prionospio spp.						5	9	1	6	
	Spiophanes cf. bombyx						1			2	2
	Mesochaetopterus sp.									1	
	Spiochaetopterus sp.		1		1			1			
	Magelona sp.							4		1	1
	Euclymene sp.						11	6	14	15	
	Euclymene wolffi							1		1	
	Euclymeninae								1		
	Rhodine sp.								1	1	
	Paraonidae indet.		1					1	1	6	1
	Aricidea spp.				1	1	1	5	1	1	
	Cirratulidae indet.							1			
	Aphelochaeta sp.						2	3		3	2
	Flabelligeridae indet.						1	3			
	Ophelia sp. B										1
	Armandia sp.							1	5	11	
	Ophelina sp				1						
	Scalibregmatidae indet								1		
	Capitellidae indet.						6	9	3	6	1
	Myriochele spp						1	1		3	
	Owenia sp.							2			
	Pectinaria sp.							1	1	2	
	Isolda sp						2	5		1	1
	Pterolysippe bipennata						7	18		1	
	cf. Pterampharete luderitzi						10	14		2	
	Sabellidae indet.							1			1
	Streblosoma sp						1			2	
	Pista sp.									2	2
	Polycirrus sp									1	
	Trichobranchus sp.									2	
	Cf Vermiliopsis sp.								2	1	6
	Polygordius sp								15	4	5
	Siboglinidae indet										+
	ECHIURA										
	SIPUNCULA										
	Sipuncula indet					1					
	Aspidosiphon sp								7	1	
	Onchnesoma cf. steenstrupi						10	2		1	1
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.	+					1				
	Ostracoda indet I									2	
	Ostracoda indet.II										1
	Ostracoda indet. III						3	4			2
	Ostracoda indet.IV						1				
	Ostracoda indet.V									2	
*	Mysidacea indet.								1		
	Cumacea indet										1
	Cumacea indet III							1			
	Cumacea indet VII									3	
	Cumacea indet.VIII						1				
	Bodotriidae indet										1
	Cf. Leucon sp.							1			
	Eocuma sp.						1	1			1
	Apseudes sp								4	8	
*	Flabellifera indet.										2
	Anthuridea indet I T						1	1	1		

	Date	23.04.2010					21.04.2010				
	Stations/depht	Ma deep 2-5 1361m					SPN/24				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Arcturidae indet						4	4			
*	Gnathia sp.								1	1	
*	Amphipoda indet.						16	16	42	4	10
*	Caprellidae indet.								1		
	Anomura indet.								6	1	
	Brachyura indet. V								2	1	
*	Portunidae indet										1
	Ebalia sp						1				
*	Caridea indet I T								2		
*	Alpheus sp								4	5	
	Galathea sp								6		
	Paguridae indet.						2		4	1	
	Thalassinoidea indet I						1	1		1	
	PYCNOGONIDA										
	Pycnogonida indet.							1			
	MOLLUSCA										
	Polyplacophora indet. I								0/1	2	
	cf. Leptochiton scabridus									1/5	1
	Solariella sp. II						15/2				
	cf. Barleeia sp. I								1	1	
	Natica sp. VI										1
	Nassariidae indet. I							1			
	Epitonium sp. I									1	
	Agaronia acuminata							1			1
	Diaphanidae indet.								1		
	Bivalvia indet.						3			1	+
	Nuculana gruveli						1				
	Nuculana tuberculata						1				
	Mytilidae indet.I									3	
	Pectinidae indet. III							0/1			
	Limidae indet.								3		
	Lucinidae indet. II						0/3	1			
	Erycinacea indet I						0/7	1			
	Chama cf. fragum								6/1	6/1	1
	Tellina boucheti						1				
	Tellina densestriata						2/6	1/2			
	Pitar sp. I							1	1		
	Timoclea cf. ovata						3/1	3	0/1	0/3	
	Cultellus cf. tenuis						1/1				
	Corbula cf. dautzenbergi								0/2		
	Corbula virginae							1			
	Hiatella sp. I								1		
	Pholadicea indet. I								2	3	
	Pholadicea indet. II								4		
	Dentaliidae indet.										1
	Dischides leloeuffi						4	4			
	BRACHIOPODA										
*	**PHORONIDA**										
*	Phoronida indet.						2				
*	**BRYOZOA**										
*	Bryozoa indet. skorpe							+	+	+	+
*	Bryozoa indet. grenet								+		+
	ECHINODERMATA										
	Ophiuroidea indet										1
	Ophiura spp						1		0/1	0/4	
	Ophiactis sp.								1	1	
	Amphioplus cf nudipora						2	2		1	
	Cidaroida indet								1	2	
	Cucumariidae indet						1				1

	Date	23.04.2010					21.04.2010				
	Stations/depht	Ma deep 2-5 1361m					SPN/24				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Synaptidae indet								+	+	
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
*	Chaetognatha indet.						1				
	ASCIDIACEA										
	Ascidiacea indet.								1	1	1
*	**CHORDATA**										
*	Branchiostoma sp.										1
*	Pisces indet.								1	1	
*	**VARIA**					+					
*	Varia						+	+	+		

	Date	21.04.2010					21.04.2010				
	Stations/depht	SPW/25					SPE/26				
	Sample number	4	5	6	7	8	4	5	6	7	8
	PORIFERA										
*	Porifera indet						+		+		+
*	Cliona sp.			+							
	CNIDARIA										
	HYDROZOA										
*	Hydrozoa indet	+	+	+	+	+	+	+	+	+	+
*	**ANTHOZOA**										
*	Alcyonacea indet					1					
*	Actinaria indet			6							
*	Pennatulacea indet	1	1	2		1	1	1			
*	**PLATYHELMINTHES**										
*	Platyhelminthes indet		1								1
*	**NEMERTINI**										
*	Nemertini indet.	1	5	3	1	1	1	1	1	3	2
*	**NEMATODA**										
*	Nematoda indet			2		1			4	2	
	ANNELIDA										
	POLYCHAETA										
	Amphinomidae indet.		1		1	2					
	Polynoidae indet.	2		2		1					
	Polynoidae indet. I										1
	Sigalion sp	1	5	1	1	5	3	1			5
	Sigalionidae sp. II	1									
	Psammolyce sp						1		1		
	Sthenelais cf. limicola		1		1	1	1	1			
	Pisione sp.									1	
	Phyllodocidae indet.	1									
	Phyllodoce spp.					1					
	Paranaitis sp.			1							
	Eteone spp			3						2	
	Chrysopetalidae indet.			1				1	1		
	Pilargidae indet I					1			2		
	Hesionidae indet		2	1		1				1	
	Syllidae indet.	1		6		2	1	2		2	1
	Nereidae indet					1		1			
	Nephtys spp.			1	1			1		1	
	Glycera sp.	4		8	1		4	15	6	7	6
	Goniadidae indet.		1	2	1	1			1		
	Diopatra sp	1	2		2	2		1			2
	Nothria sp.		6								
	Onuphis sp	6	15	7	12	10	2	3	15	10	20
	Eunice sp.	4	3	122	1	12	6	17	32	22	3

	Date	21.04.2010					21.04.2010				
	Stations/depht	SPW/25					SPE/26				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Nematonereis sp							1			
	Lumbrineridae indet.	2	1	7	8	7			3		
	Dorvillidae indet			1							
	Schistomeringos sp								2	1	
	Orbiniidae indet.I				2	1					2
	Naineris sp					1		1			
	Scoloplos spp.		2	4	3	1	1	1	1	2	
	Spionidae indet.					1					
	Aonides sp.	1	1	1		3	2		5	1	2
	Laonice sp.		1								
	Polydora sp.			1							2
	Prionospio spp.		1		2	7	1	1	1	2	5
	Scolelepis sp.		1								
	Spiophanes cf. bombyx	1	1	2	1		2		1	2	2
	Poecilochaetus sp		1								
	Magelona sp.	2	4	1	3					2	1
	Axiothella sp.			1							
	Clymenura sp.			1							
	Polyohthalmus sp.									1	
	Euclymene sp.								5	1	
	Paraonidae indet.		2	4	2	1			4	2	
	Aricidea spp.			4	2	4			5	11	
	Cirratulidae indet.										1
	Aphelochaeta sp.	2	4	2	5	2	2	2	5	1	6
	Ophelia sp. B	4					1	5		1	6
	Ophelia sp. A									1	
	Armandia intermedia Fauvel	1	2	5	4	3			5	3	
	Opelina sp. A										1
	Scalibregmidae indet								1		
	Notomastus sp			2		1	2	1			1
	Capitellidae indet.	1				2					
	Myriochele spp		1	3	1	1	1	1	2	1	2
	Owenia sp.								1		
	Ampharetidae indet		1	1	2						
	Isolda sp	7	1	1	2		1	1			1
	Pterolysippe bipennata			1							
	cf. Pterampharete luderitzi			1							
	Pista sp.			2			1	3	1		1
	Amaeana sp.			1							
	Polycirrus sp			1				1			1
	Trichobranchus sp.	5							1	2	
	Cf Vermiliopsis sp.	2		2							
	Hydroides sp						1				
	Polygordius sp							6	2	3	
	Siboglinum sp			+							
	Oligochaeta indet.					1				2	
	ECHIURA										
	SIPUNCULA										
	Sipuncula indet		1								
	Aspidosiphon sp		2	1							
	Onchnesoma cf. steenstrupi		2		5			1			
	ARTHROPODA										
	CRUSTACEA										
*	Copepoda indet.			1	1		1				
*	Cirripedia indet.						10/2			9	
	Ostracoda indet I	1		2				1		1	
	Ostracoda indet.II	1				1		1			3
	Ostracoda indet. III	2	1				1	1	2	2	
	Cumacea indet III								1		

	Date	21.04.2010					21.04.2010				
	Stations/depht	SPW/25					SPE/26				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Cumacea indet VII			2		1			3	1	
	Bodotriidae indet	1	4		1	2		1			2
	Iphinoe sp						1				
	Apseudes sp		1	4	8	3				2	
*	Epicaridea indet			1							
	Valvifera indet	1		3	1						
*	Flabellifera indet.							1			
	Anthuridea indet I T		3	1	4	1	2				
	Anthuridea indet II T	1									
	Arcturidae indet								3		1
*	Amphipoda indet.	11	11	27	8	15	8	13	19	16	5
*	Caprellidae indet.									5	
	Lysiosquillidae indet										1
	Brachyura indet			1						1	
	Brachyura indet. V					2				2	
	Majoidea indet			1					1	2	
*	Portunidae indet							1			
*	Caridea indet			1	1						
*	Caridea indet III T					1					
*	Alpheus sp									1	
*	Crangonidae indet	1									
	Galathea sp						1			1	
	Paguridae indet.		1	1	1				1		
	Thalassinoidea indet I								2		
	PYCNOGONIDA										
	Pycnogonida indet.			1	2	1					
	MOLLUSCA										
	cf. Leptochiton scabridus	1					0/1		2/3	1	
	Gibbula sp. I								2		
	Barleeia sp. I								1	1	
	Caecum sp. I								1		
	Natica sp. V			0/1							
	Melanella sp. I			2							
	Agaronia acuminata			0/1	1						
	Marginella sp. I								1		
	Bivalvia indet.									1	
	Nucula sp. I		1								
	Nuculana tuberculata				1						
	Glycymeris formosus							1			1
	Mytilidae indet.II									0/1	
	Pectinidae indet. I					1					
	Aequipecten flabellum						2			1	
	Linga cf. adansoni			1							
	Lucinidae indet. II		0/1	0/1							
	Lucinidae indet. III			0/1							
	Bornia balalaika										0/1
	cf. Diplodonta sp. I	1									
	Montacutidae indet. I									1	
	Bucardium ringens				1						
	Cardiidae indet. I		1								
	Tellina sp. I							0/2			
	Tellina densestriata		0/3								
	Tellina cf. densestriata								2		
	Tellina distorta	1									
	Donacidae indet. I			0/1							
	Donacidae indet. II							1			
	Callista floridella								1		
	Dosinia sp.		0/1								
	Timoclea cf. ovata		0/1						1/1		

	Date	21.04.2010					21.04.2010				
	Stations/depht	SPW/25					SPE/26				
	Sample number	4	5	6	7	8	4	5	6	7	8
	Phaxas cf. pellucidus					1					
	Dentaliidae indet.		0/1								
	Dischides leloeuffi				2						
	BRACHIOPODA										
	Lingulida indet							1			
*	**PHORONIDA**										
*	**BRYOZOA**										
*	Bryozoa indet. skorpe	+	+	+			+		+	+	+
*	Bryozoa indet. grenet		+					+		+	
*	Bryozoa indet.						+				
	ECHINODERMATA										
	Asteroidea indet.					1					
	Ophiuroidea indet		3							2	
	Ophiophragmus acutispina								1		
	Ophiura spp			1	1				1		
	Amphiura sp.			2							
	Amphiura cf. ungulata								1		3
	Cidaroida indet									1	
	Echinocyamus sp	3	3	1			1	1			3
	Spatangoida juv indet						0/1				
	Synaptidae indet		4	2		1		2	1	1	
	ENTEROPNEUSTA										
*	**CHAETOGNATHA**										
	ASCIDIACEA										
	Ascidiacea indet.		1		2	1				1	
*	**CHORDATA**										
*	Branchiostoma sp.				1						1
*	Varia		+					+	+	+	

	Date	21.04.2010				
	Stations/depht	SPS/27				
	Sample number	4	5	6	7	8
	HYDROZOA					
*	Hydrozoa indet	+	+			+
*	**ANTHOZOA**					
*	Alcyonacea indet	2	1	3	1	
*	**PLATYHELMINTHES**					
*	Platyhelminthes indet	1				
*	**NEMERTINI**					
*	Nemertini indet.		4	2		2
*	**NEMATODA**					
	ANNELIDA					
	POLYCHAETA					
	Polychaeta indet I			1		
	Polynoidae indet.	1				
	Polynoidae indet. I			1	2	2
	Sthenelais cf. limicola			1	1	1
	Phyllodoce spp.		1			
	Pilargidae indet I	1				
	Syllidae indet.	1				
	Nereidae indet		1	2		
	Nephtys spp.	1				
	Goniadidae indet.	2	1	1	1	5
	Goniada sp.					1
	Drilonereis sp.		1			
	Diopatra sp	4	4	2	2	5
	Onuphis sp	7	6	9	4	9

	Date	21.04.2010				
	Stations/depht	SPS/27				
	Sample number	**4**	**5**	**6**	**7**	**8**
	Eunice sp.	3	5	3	1	2
	Lumbrineridae indet.		9	3	4	4
	Orbiniidae indet.I	3		3	3	2
	Scoloplos spp.		1	2		
	Aonides sp.			1		
	Polydora sp.		1			1
	Prionospio spp.	1	1	2		
	Magelona sp.	1		1		3
	Euclymene sp.		2			
	Rhodine sp.		1			
	Sabaco dorsofilo	1	1			2
	Paraonidae indet.	1		1	1	7
	Aricidea spp.		3	5	1	9
	Aphelochaeta sp.	5	6	6	4	7
	Flabelligeridae indet.	2				1
	Notomastus sp			1		
	Capitellidae indet.	3	2	8	2	3
	Myriochele spp		1			1
	Sternaspis scutata		2	2	2	
	Pectinaria sp.			2		
	Ampharetidae indet		3		1	
	Amphicteis sp		1			
	Isolda sp	1				1
	Pterolysippe bipennata	1	9	3		4
	cf. Pterampharete luderitzi			2		2
	Zatsepinia sp.	2	4			4
	Sabellidae indet.	1	5	1		
	Polygordius sp				1	
	ECHIURA					
	SIPUNCULA					
	Aspidosiphon sp				1	3
	Onchnesoma cf. steenstrupi	3	7	4	5	1
	ARTHROPODA					
	CRUSTACEA					
	Ostracoda indet		1			1
	Ostracoda indet I	1	4			1
	Leptostraca indet.	1				
	Cumacea indet III	1			1	
	Cf. Leucon sp.	1				
	Eocuma sp.	1	1	1		
	Apseudes sp	3	1	2	4	
	Valvifera indet					1
	Anthuridea indet I T	6	4	9	2	3
	Arcturidae indet		1			
*	Amphipoda indet.	42	23	25	37	30
	Brachyura indet	1				
	Brachyura indet IX	1				
	Raninoides sp.			1		
	Ebalia sp		1		1	
*	Caridea indet		2			
*	cf. Latreutes sp			1		
	Paguridae indet.		2	3		3
	Thalassinoidea indet I				1	
	Thalassinoidea indet II			3		2
	PYCNOGONIDA					
	Pycnogonida indet.	1	2			
	MOLLUSCA					
	Tectonatica filosa				2	0/1
	Buccinidae indet. I				1	

	Date	21.04.2010				
	Stations/depht	SPS/27				
	Sample number	**4**	**5**	**6**	**7**	**8**
	Eulima glabra				1	
	Clavatula sp. I					1
	Bivalvia indet.			1	1	1
	Nuculana gruveli		1			1
	Solemya cf. togata			1	2/1	
	Lamylucina gaini		1			
	Lucinidae indet. II			0/1		
	Erycinacea indet I			1		
	Anatina cf. Inconstans					0/1
	Tellina sp.	0/1				
	Tellina cf. densestriata		2	0/4	1	2
	Tellina cf. modica		1			
	Abra sp.		1			
	Pitar sp. I	2	0/4			
	Timoclea cf. ovata	72/11	11	11/5	12/1	29/6
	Cultellus cf. tenuis		1			
	Corbula sulcata			1		
	Dischides leloeuffi					1
*	**PHORONIDA**					
*	Phoronida indet.		1			
*	**BRYOZOA**					
*	Bryozoa indet. skorpe					+
*	Bryozoa indet. grenet	+				
	ECHINODERMATA					
	Ophiuroidea indet	+				
	Ophiophragmus acutispina				1	2
	Amphipholis cf. nudipora			1		
	Ophiura spp		4	1		
	Cucumariidae indet					1
*	**CHORDATA**					
*	Varia		+			

Table 2 Species in geometrical groups

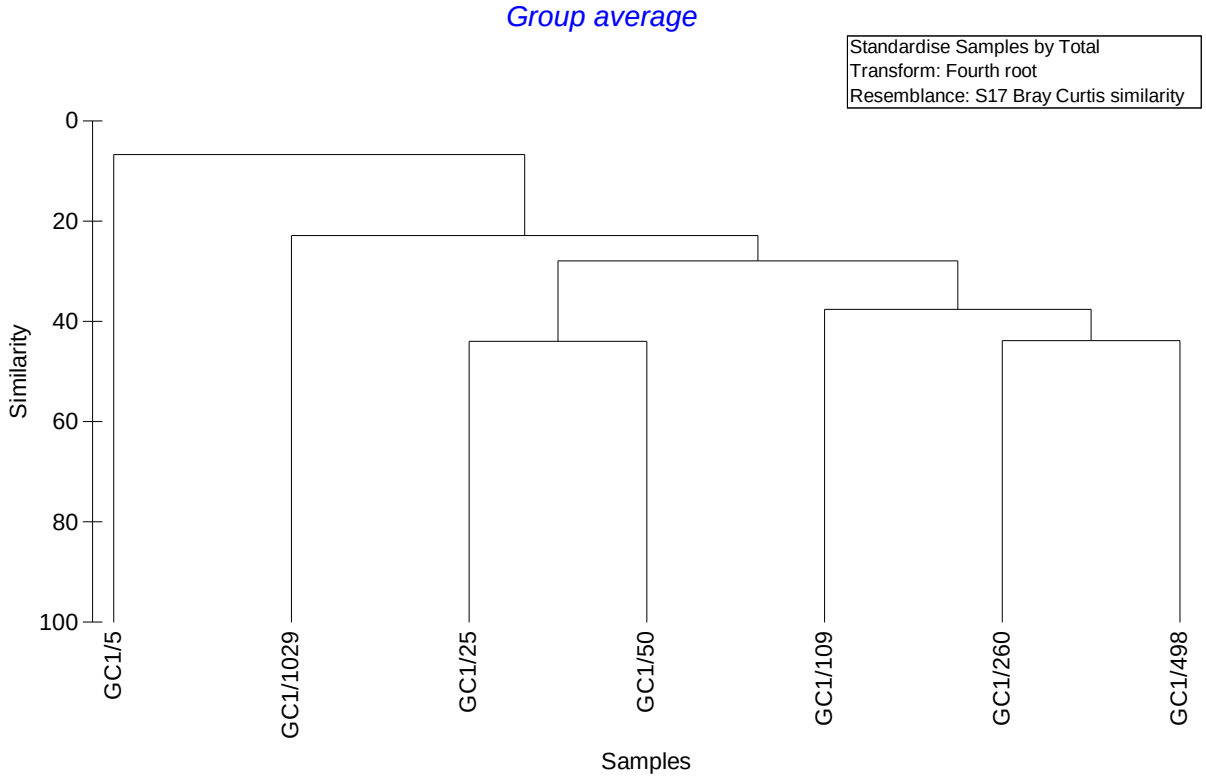
Geometric groups	GC1/5	GC1/25	GC1/50	GC1/109	GC1/260	GC1/498	GC1/1029
I	5	26	36	24	26	8	15
II	4	15	26	16	20	8	5
III	2	25	15	19	6	5	6
IV	1	14	15	9	4	4	0
V	1	6	4	4	5	1	0
VI	0	4	0	0	1	1	0
VII	0	1	0	0	0	0	0
VIII	0	0	0	0	0	0	0
IX	0	0	0	0	0	0	0
X	0	0	0	0	0	0	0
XI	0	0	0	0	0	0	0

Geometric groups	GC2/5	GC2/25	GC2/51	GC2/101	GC2/250	GC2/507	GC2/1055
I	13	43	33	34	23	21	13
II	3	33	28	25	21	19	14
III	1	14	19	15	10	5	5
IV	0	9	14	8	9	6	1
V	0	3	8	5	4	2	1
VI	1	0	0	1	0	0	0
VII	0	1	1	0	0	0	0
VIII	0	0	0	0	1	0	0
IX	0	0	0	0	0	1	0
X	0	0	0	0	0	0	0
XI	0	0	0	0	0	0	0

Geometric groups	GC3/5	GC3/25	GC3/43	GC3/88	GC3/245	GC3/509	GC3/999
I	17	28	43	22	16	10	15
II	10	20	24	12	9	5	9
III	7	16	21	10	10	7	5
IV	3	9	8	3	5	2	4
V	2	12	7	1	4	0	0
VI	4	4	0	0	1	0	0
VII	0	4	2	0	0	0	0
VIII	1	0	1	0	0	0	0
IX	0	0	0	0	0	0	0
X	0	0	0	0	0	0	0
XI	0	0	0	0	0	0	0

Geometric groups	SPN/24	SPW/25	SPE/26	SPS/27	MaDeep2-1 1366	MaDeep 2-5 1361

I	5	3	31	42	34	36
II	1	2	28	22	32	18
III	0	0	19	19	16	14
IV	0	0	23	13	6	8
V	0	0	10	2	2	8
VI	0	0	1	1	2	1
VII	0	0	1	0	1	0
VIII	0	0	1	1	0	1
IX	0	0	0	0	0	0
X	0	0	0	0	0	0
XI	0	0	0	0	0	0



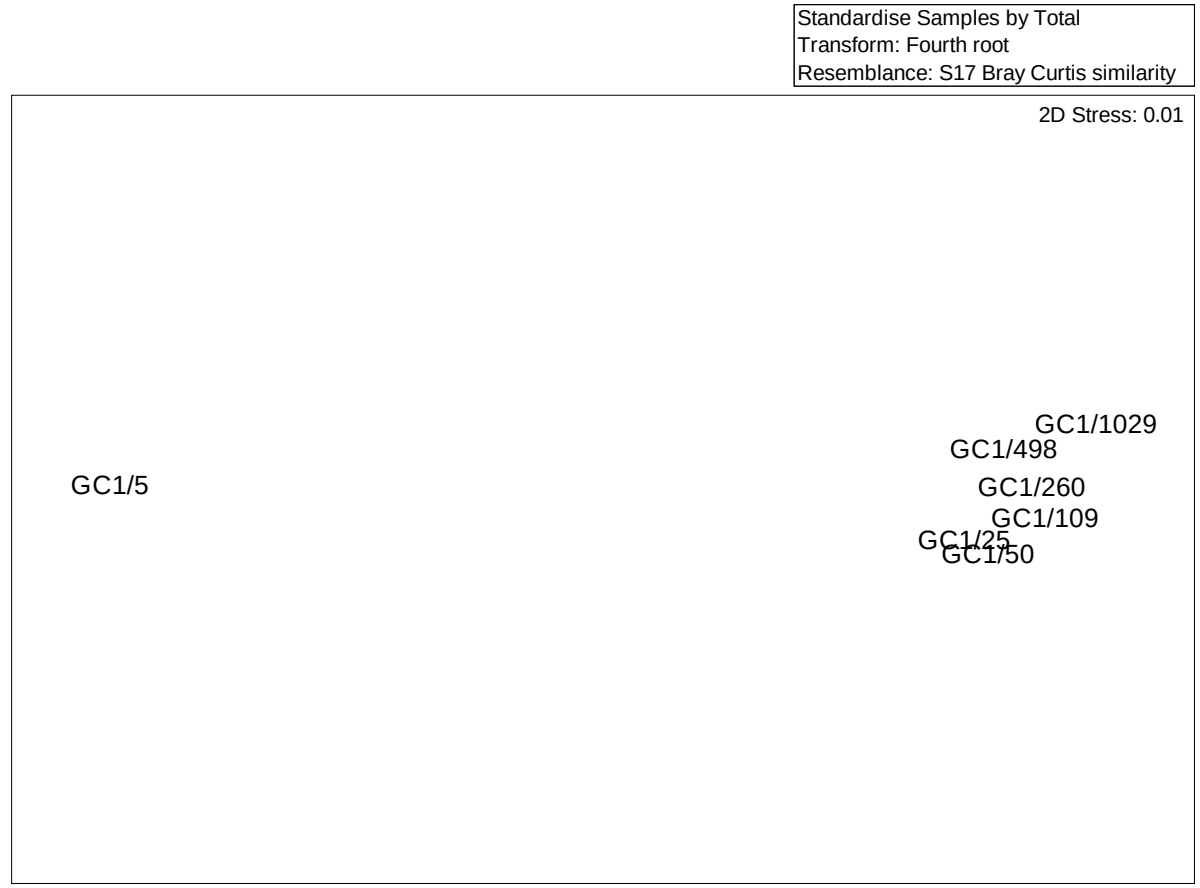
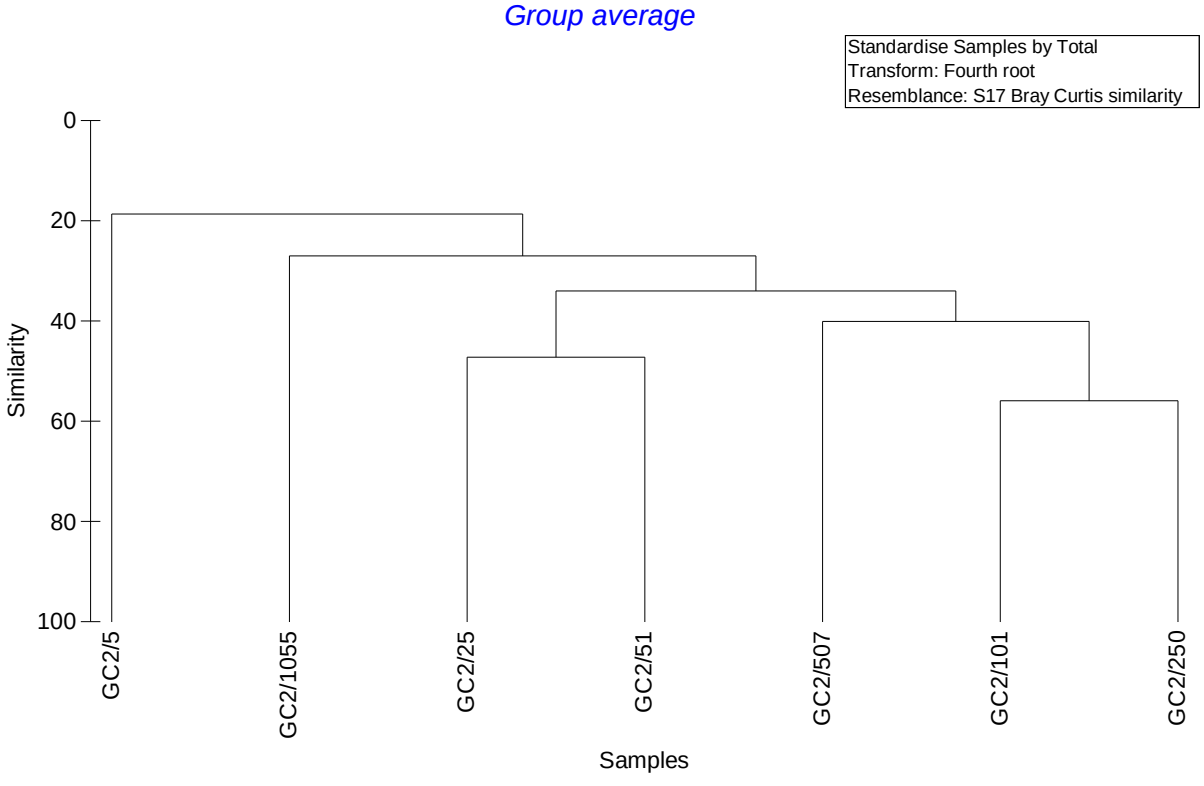


Figure 1 Dendrogram of cluster analyses and two-dimensional plot of the MDS analyses showing the similarity between fauna from sampling stations along the transect of Ghana Central 1. The dataset was standardised and fourth root transformed.



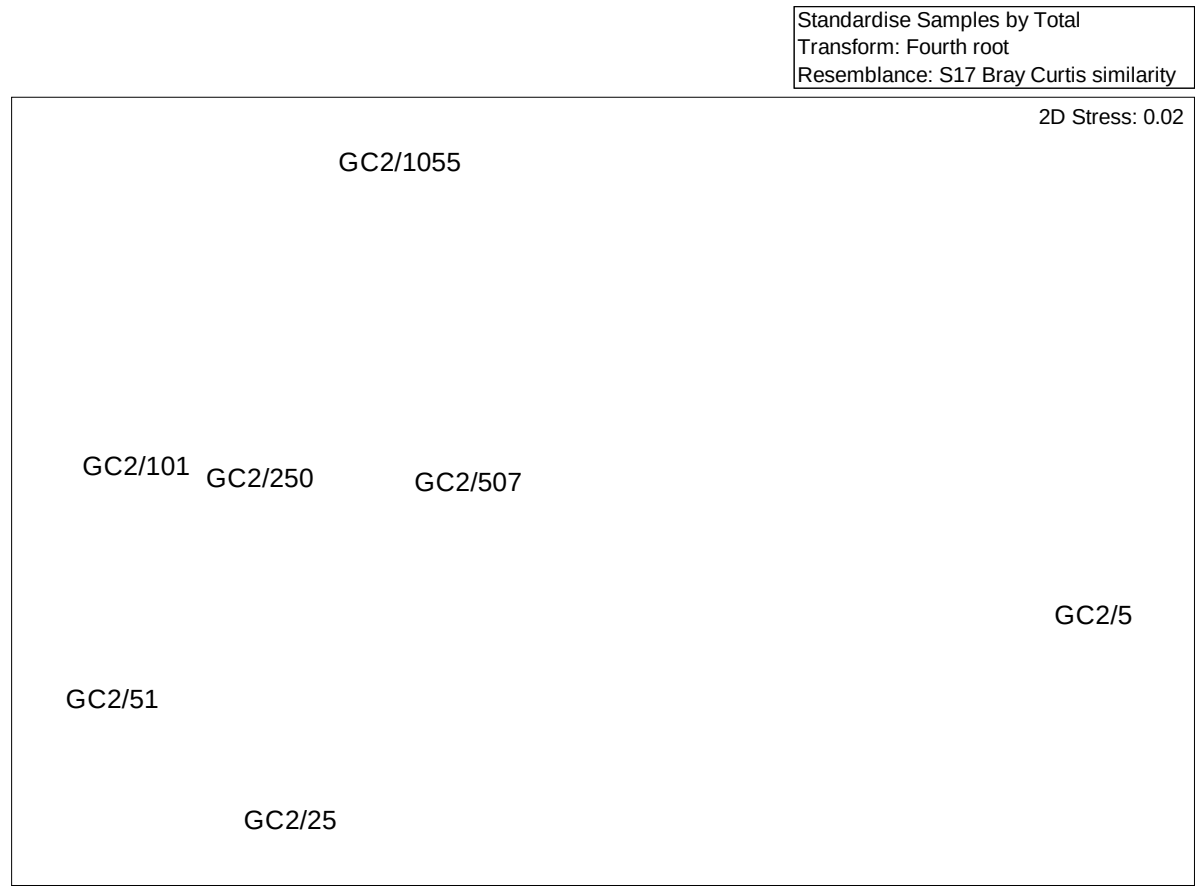
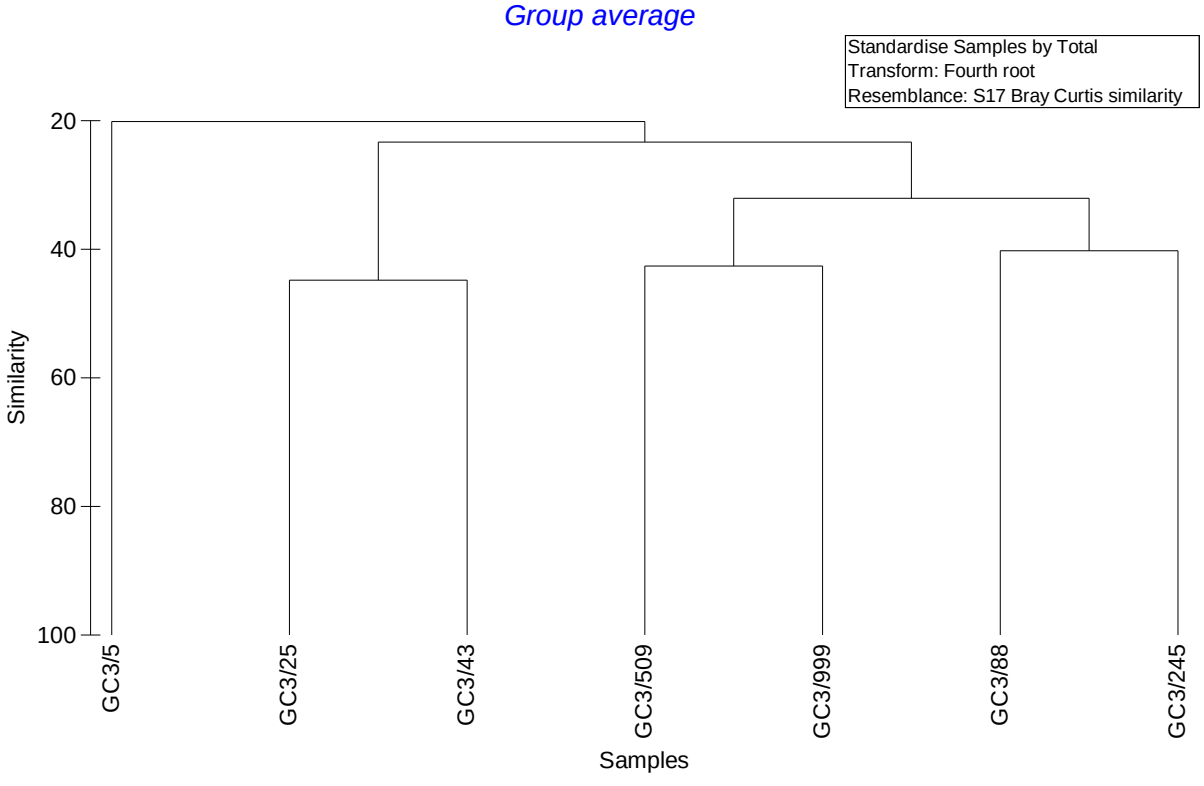


Figure 2 Dendrogram of cluster analyses and two-dimensional plot of the MDS analyses showing the similarity between fauna from sampling stations along the transect of Ghana Central 2. The dataset was standardised and fourth root transformed.



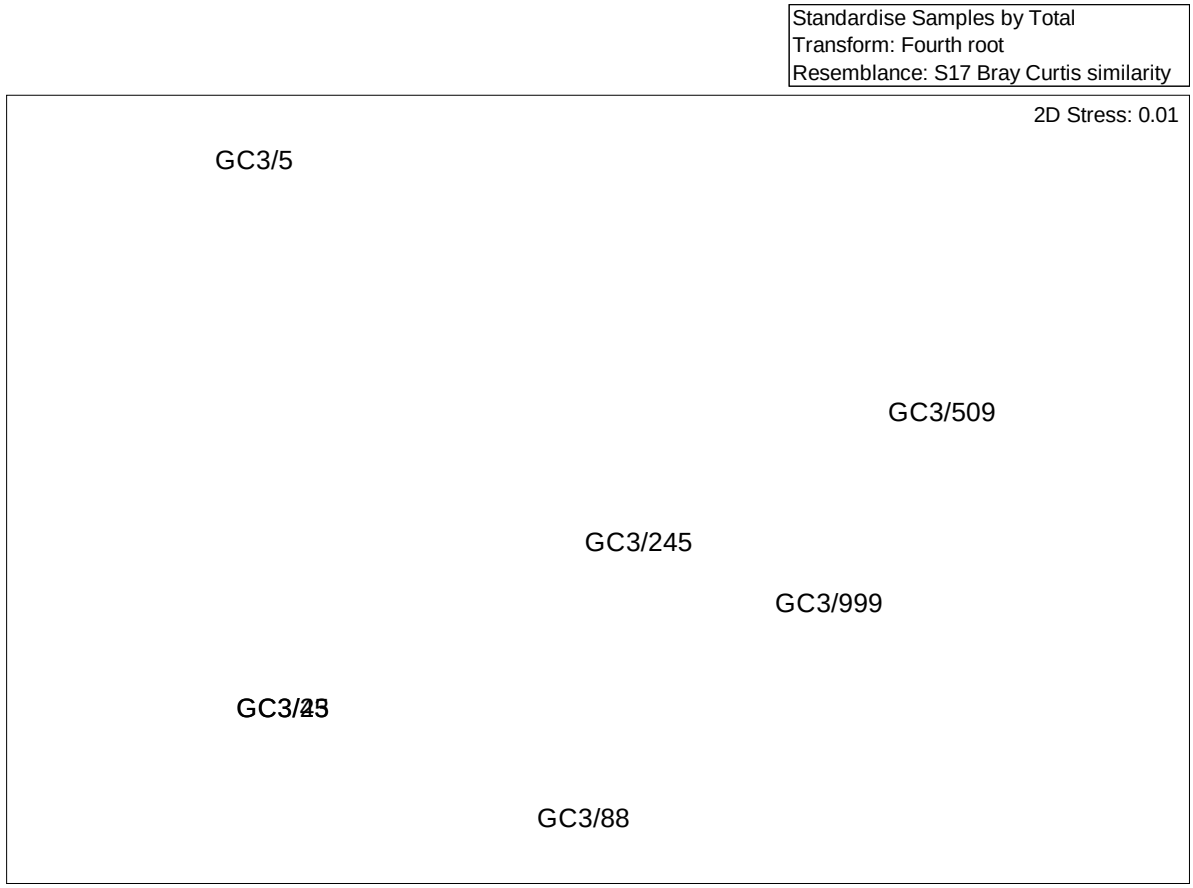
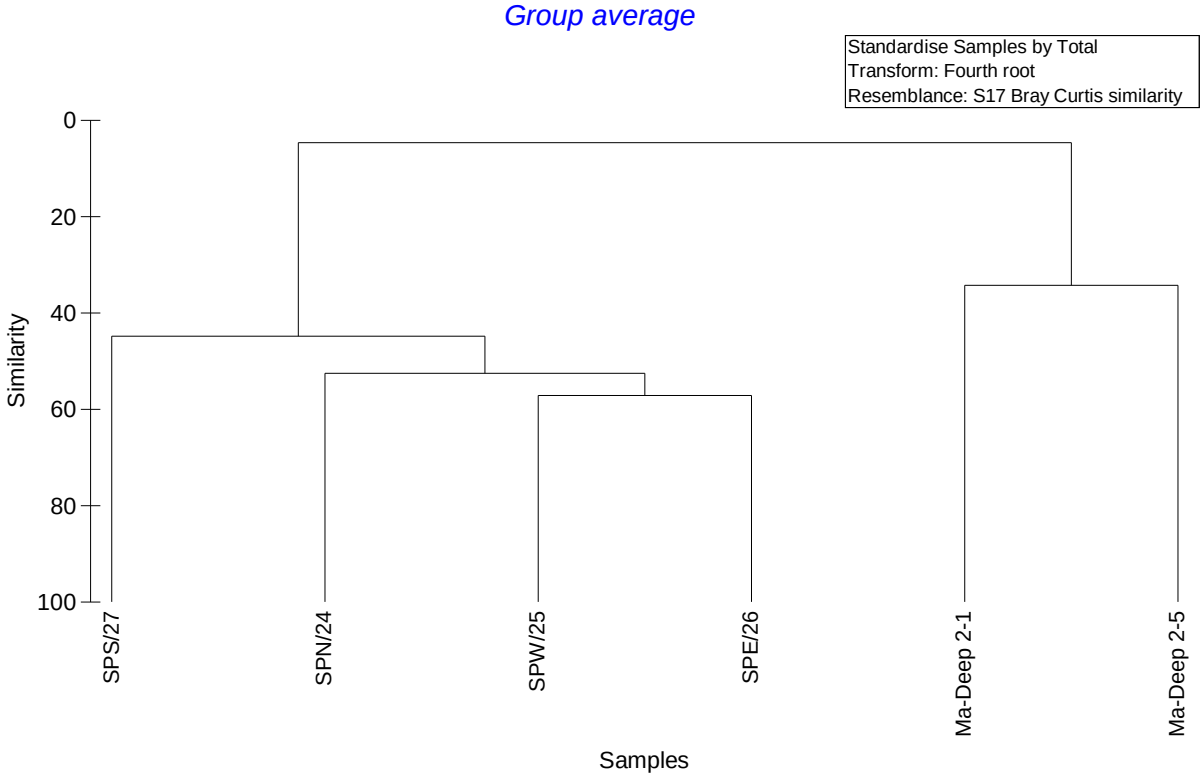


Figure 3 Dendrogram of cluster analyses and two-dimensional plot of the MDS analyses showing the similarity between fauna from sampling stations along the transect of Ghana Central 3. The dataset was standardised and fourth root transformed.



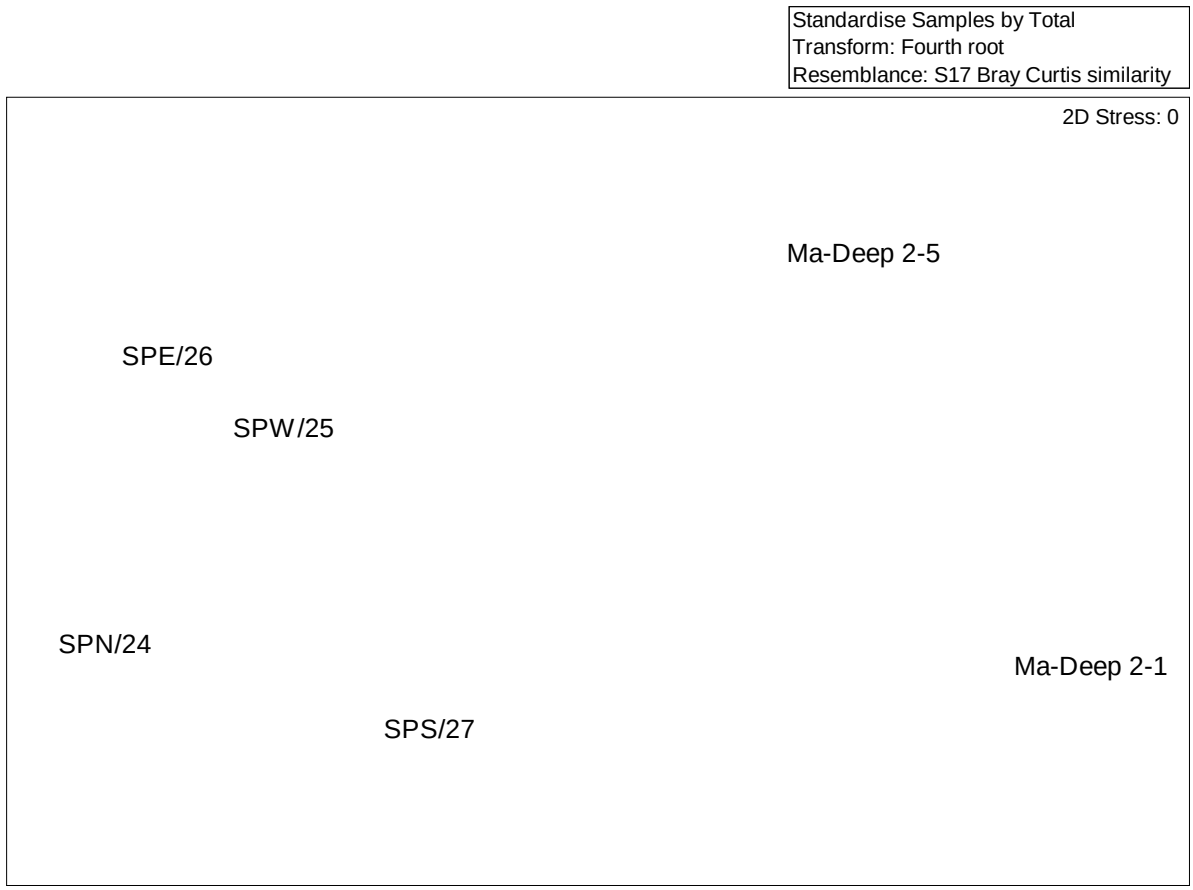


Figure 4 Dendrogram of cluster analyses and two-dimensional plot of the MDS analyses showing the similarity between fauna from sampling stations around the Salt Pond (SP) and Mahogany (Ma-Deep) oil rigs. The dataset was standardised and fourth root transformed.

Table 3 Concentrations of metals (in mg/kg d.w.) and dry weight (%) from all samples at the transects GC1, GC2, GC3, as well as the Saltpond and Mahogany oil rigs, 2010. Italic values are values presented in mg compound / wet weight.

Transect/Area	Grabb	Depth	Arsene (mg/kg DW)	Lead (mg/kg DW)	Cadmium (mg/kg DW)	Copper (mg/kg DW)	Chrome (mg/kg DW)	Mercury (mg/kg DW)
GC1	1	25	70.00	16.00	0,019	0,45	51.00	0,0100
	2		71.00	18.00	0,028	1,4	57.00	0,0141
	3		64.00	17.00	0,023	1,1	59.00	0,0128
	1	50	8.00	4,5	0,053	2,1	44.00	0,00869
	2		7,3	4,6	0,059	2,1	44.00	0,00884
	3		7,3	4.00	0,053	2,2	42.00	0,00855
	1	*0*	*1,3*	*0,64*	*0,024*	*0,27*	*1,9*	*<0,001*
	2		1,7	0,61	0,016	0,30	2,3	<0,001
	3		1,9	0,66	0,014	0,25	2,1	<0,001
	1	1029	3,1	4,5	0,19	11.00	41.00	0,0309
	2		2,4	4,2	0,21	9,7	39.00	0,0254
	3		3,6	4,2	0,11	10.00	41.00	0,0314
	1	109	4,4	2.00	0,15	3,7	21.00	0,0132
	2		4,4	2,1	0,16	3,7	21.00	0,0137
	3		2,2	1,4	0,088	3.00	13.00	0,00817
	1	260	7,8	3,5	0,16	4,4	43.00	0,0145
	2		10.00	4.00	0,10	3,6	47.00	0,0118
	3		8,9	3,2	0,098	3,2	45.00	0,0117
	1	498	8,6	4,7	0,083	4.00	48.00	0,0174
	2		9,1	4,5	0,088	3,5	56.00	0,0151
	3		12.00	4,9	0,077	2,7	59.00	0,0143
	1	5	2.00	1,5	0,0040	0,47	8.00	<0,001
	2		1,7	2,7	0,0080	0,27	7,8	<0,001
	3		1,6	1,9	0,0070	0,31	6,1	<0,001
GC2	1	0	15.00	5.00	0,0090	<0,05	12.00	<0,001
	2		14.00	4,8	0,0050	<0,05	11.00	<0,001
	3		15.00	4,9	0,0090	0,050	11.00	<0,001
	1	101	3,3	2,2	0,080	4,2	29.00	0,0108
	2		3,1	2,8	0,081	4.00	28.00	0,0102
	3		5,5	2,6	0,085	3.00	29.00	0,00790
	1	1055	3,3	4,8	0,20	12.00	36.00	0,0276
	2		2,2	5,1	0,24	12.00	38.00	0,0284
	3		3,2	5,3	0,15	12.00	36.00	0,0295
	1	25	3,1	0,69	0,0070	0,60	12.00	0,00121
	2		3,8	0,91	0,010	0,66	13.00	0,00134
	3		4,2	1.00	0,010	0,84	13.00	0,00145
	1	250	8,2	3,6	0,14	3,1	46.00	0,00969
	2		9,2	3,6	0,13	2,8	45.00	0,00906
	3		7,3	3,4	0,14	2,9	43.00	0,00872
	1	5	12.00	5,4	0,010	0,39	27.00	0,00151
	2		8,7	4,9	0,0090	0,57	26.00	0,00201
	3		6,3	4,3	0,010	0,58	28.00	0,00254
	1	507	10.00	6,2	0,13	2,7	66.00	0,0132
	2		9,8	6,3	0,084	2,3	63.00	0,0130
	3		10.00	5,9	0,090	2,8	64.00	0,0139
	1	51	5,3	1,7	0,12	2,4	15.00	0,00404
	2		4,9	2.00	0,15	2,9	21.00	0,00588
	3		5,1	2.00	0,16	3,3	21.00	0,00592
GC3	1	0	7.00	7,6	0,020	1,8	10.00	0,00406
	2		7,2	6,2	0,010	2,1	10.00	0,00413
	3		6,7	6,2	0,020	1,8	9,7	0,00375
	1	245	10.00	8,1	0,064	9,6	33.00	0,0157
	2		8.00	8,3	0,080	11.00	36.00	0,0168

Transect/Area	Grabb	Depth	Arsene (mg/kg DW)	Lead (mg/kg DW)	Cadmium (mg/kg DW)	Copper (mg/kg DW)	Chrome (mg/kg DW)	Mercury (mg/kg DW)
	3		7,1	8,7	0,054	12.00	37.00	0,0165
	1	25	110.00	12.00	0,023	2,9	28.00	0,00575
	2		110.00	13.00	0,023	2.00	20.00	0,00421
	3		100.00	9,4	0,022	1,1	14.00	0,00295
	1	43	110.00	16.00	0,034	2,7	33.00	0,00583
	2		120.00	16.00	0,031	2.00	32.00	0,00500
	3		130.00	18.00	0,033	1,8	35.00	0,00532
	1	5	12.00	17.00	0,038	11.00	30.00	0,0441
	2		15.00	16.00	0,036	9,9	24.00	0,0315
	3		14.00	15.00	0,032	11.00	24.00	0,0260
	1	509	11.00	9,1	0,12	10.00	36.00	0,0219
	2		8,6	8,6	0,13	10.00	36.00	0,0232
	3		6,9	8,1	0,11	9,1	31.00	0,0215
	1	88	19.00	9,3	0,036	11.00	34.00	0,0125
	2		9,6	8,8	0,044	11.00	37.00	0,0148
	3		9,2	8,9	0,049	10.00	37.00	0,0160
	1	999	8,9	8,4	0,11	9,8	30.00	0,0275
	2		5,9	6,9	0,066	9,6	27.00	0,0217
	3		*5,9*	*7,9*	*0,092*	*8,3*	*25.00*	*0,0252*
MA-DEEP	1	1361	2,3	5,6	0,21	17.00	46.00	0,0411
	2		2,1	5,3	0,21	17.00	46.00	0,0415
	3		1,9	5,3	0,21	16.00	43.00	0,0399
MA-DEEP 2-1	1	1366	1,8	5,6	0,21	17.00	44.00	0,0432
	2		2,1	5,4	0,17	16.00	43.00	0,0450
	3		2,3	5,2	0,20	18.00	46.00	0,0454
MA-DEEP 2-2	1	1424	2,2	5,2	0,15	16.00	42.00	0,0372
	2		2,5	5,6	0,15	16.00	42.00	0,0470
	3		2,1	5,1	0,25	16.00	42.00	0,0423
MA-DEEP 2-3	1	1387	1,8	4,6	0,17	12.00	32.00	0,0430
	2		2,4	4,9	0,27	16.00	42.00	0,0403
	3		2,1	4,7	0,19	14.00	38.00	0,0396
MA-DEEP 2-4	1	1600	3,3	4,4	0,14	13.00	32.00	0,0374
	2		3.00	5,8	0,17	18.00	44.00	0,0499
	3		5.00	5,4	0,18	18.00	46.00	0,0384
SPE	1	26	4,6	0,81	0,012	1,1	8,3	0,00147
	2		4,1	0,55	0,010	0,55	6,3	<0,001
	3		5,7	0,60	0,010	0,71	8,1	0,00106
SPN	1	24	4,8	1,6	0,014	0,58	16.00	0,00180
	2		3,6	1,4	0,019	0,86	17.00	0,00224
	3		4,7	0,83	0,0080	0,61	8,9	0,00113
SPS	1	27	2,8	1.00	0,016	0,63	16.00	0,00175
	2		2,8	1,2	0,021	0,72	19.00	0,00183
	3		2,9	1,5	0,023	1,1	19.00	0,00234
SPW	*1*	*25*	*3,2*	*1,1*	*0,014*	*1,1*	*11.00*	*0,00216*
	2		*3,6*	*1,2*	*0,011*	*0,52*	*12.00*	*0,00125*
	3		2,7	1,8	0,020	1,4	16.00	0,00268

Transect/Area	Grabb	Depth	Nickel (mg/kg DW)	Zink (mg/kg DW)
GC1	1	25	10.00	52.00
	2		12.00	57.00
	3		12.00	61.00
	1	50	8,9	35.00
	2		9,4	38.00
	3		8,8	36.00
	1	*0*	*0,37*	*4,2*
	2		0,46	9.00
	3		0,49	3,1
	1	1029	19.00	48.00
	2		17.00	45.00
	3		18.00	47.00
	1	109	7,6	25.00
	2		7,6	26.00
	3		4,9	16.00
	1	260	12.00	60.00
	2		11.00	63.00
	3		10.00	63.00
	1	498	11.00	42.00
	2		10.00	43.00
	3		9,5	44.00
	1	5	1,8	9,1
	2		1,2	7,5
	3		1,1	7,8
GC2	1	0	2,6	21.00
	2		2,4	20.00
	3		2,5	22.00
	1	101	10.00	30.00
	2		9,5	29.00
	3		8,3	30.00
	1	1055	21.00	44.00
	2		42.00	44.00
	3		22.00	44.00
	1	25	1,3	6,4
	2		1,6	7,6
	3		1,6	8,4
	1	250	9,4	57.00
	2		9,2	55.00
	3		8,9	53.00
	1	5	4,5	37.00
	2		4,2	35.00
	3		4,4	34.00
	1	507	12.00	50.00
	2		11.00	48.00
	3		12.00	49.00
	1	51	4.00	15.00
	2		5,6	19.00
	3		5,9	19.00
GC3	1	0	2,7	36.00
	2		2,9	36.00
	3		2,7	34.00
	1	245	15.00	31.00
	2		17.00	35.00

Transect/Area	Grabb	Depth	Nickel (mg/kg DW)	Zink (mg/kg DW)
	3		18.00	36.00
	1	25	12.00	69.00
	2		11.00	65.00
	3		7,9	50.00
	1	43	15.00	74.00
	2		15.00	75.00
	3		16.00	79.00
	1	5	9,6	71.00
	2		8,5	65.00
	3		8,6	65.00
	1	509	17.00	35.00
	2		17.00	36.00
	3		15.00	31.00
	1	88	16.00	37.00
	2		16.00	34.00
	3		16.00	34.00
	1	999	16.00	33.00
	2		15.00	29.00
	3		*14.00*	*27.00*
MA-DEEP	1	1361	28.00	55.00
	2		27.00	54.00
	3		26.00	52.00
MA-DEEP 2-1	1	1366	27.00	52.00
	2		26.00	52.00
	3		28.00	55.00
MA-DEEP 2-2	1	1424	25.00	50.00
	2		26.00	51.00
	3		25.00	54.00
MA-DEEP 2-3	1	1387	19.00	38.00
	2		25.00	51.00
	3		23.00	46.00
MA-DEEP 2-4	1	1600	21.00	40.00
	2		28.00	54.00
	3		29.00	55.00
SPE	1	26	1,2	4,9
	2		0,81	7,2
	3		0,92	3,8
SPN	1	24	2,2	10.00
	2		2,2	12.00
	3		1,2	5,8
SPS	1	27	2,3	11.00
	2		2,7	15.00
	3		3.00	15.00
SPW	*1*	*25*	*1,8*	*7,5*
	2		*1,7*	*11.00*
	3		2,7	14.00

Table 4 Concentrations of Barium (in mg/kg d.w.) and dry weight (%) from all samples at the transects GC1, GC2, GC3, as well as the Saltpond and Mahogany oil rigs, 2010. Italic values are values presented in mg compound / wet weight.

Station	Depth	mg Ba/kg DW
GC1	0	*3.5*
	5	5.8
	25	*7.1*
	50	7.9
	260	13.2
	498	29.0
	109	23.4
	1029	133.3
GC2	0	3.7
	5	3.6
	25	2.8
	51	7.8
	101	*6.9*
	250	8.6
	507	14.7
	1055	130.0
GC3	0	36.0
	5	63.0
	25	6.9
	43	7.8
	88	*19.0*
	245	21.3
	509	32.3
	999	43.7
MA-DEEP 2-1	1366	193.3
MA-DEEP 2-2	1424	186.7
MA-DEEP 2-3	1387	163.3
MA-DEEP 2-4	1600	176.7
MA-DEEP	1361	193.3
SPE	26	1.7
SPN	24	10.9
SPS	27	3.2
SPW	25	12.4

Table 5 Concentrations of PAH, NPD and THC 12-35 **(**in mg/kg d.w.) and dry weight (%) from all samples at the transects GC1, GC2, GC3, as well as the Saltpond and Mahogany oil rigs, 2010.

Transect/ Area	Depth	Grab	Naphthalene	C1-Naphthalene	C2-Naphthalene	C3-Naphthalene	Acen-aphthylene	Acen-aphthene	Fluorene	Phenan-threne
GC1	0	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
	5	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
	25	1	2.63	< 5,03	< 3,39	< 11,9	0.242	< 0,59	< 0,33	3.57
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.230	< 0,59	< 0,33	4.56
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.266	< 0,59	< 0,33	3.81
	50	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.056	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.057	< 0,59	< 0,33	< 1,01
	498	1	< 1,44	< 5,03	< 3,39	< 11,9	0.220	< 0,59	< 0,33	1.06
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.231	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.171	< 0,59	< 0,33	< 1,01
	1029	1	5.19	< 5,03	< 3,39	< 11,9	1.032	< 0,59	< 0,33	2.70
		2	3.96	< 5,03	< 3,39	< 11,9	0.723	< 0,59	< 0,33	1.99
		3	4.96	< 5,03	< 3,39	< 11,9	0.958	< 0,59	< 0,33	2.49
	260	1	< 1,44	< 5,03	< 3,39	< 11,9	0.147	< 0,59	< 0,33	< 1,01
		2	1.50	< 5,03	< 3,39	< 11,9	0.085	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.088	< 0,59	< 0,33	< 1,01
	109	1	< 1,44	< 5,03	< 3,39	< 11,9	0.058	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.063	< 0,59	< 0,33	< 1,01
GC2	0	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
	5	1	< 1,44	< 5,03	< 3,39	< 11,9	0.087	< 0,59	< 0,33	1.52
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.137	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.072	< 0,59	< 0,33	1.27
	25	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
	51	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01

Transect/ Area	Depth	Grab	Naphthalene	C1-Naphthalene	C2-Naphthalene	C3-Naphthalene	Acen-aphthylene	Acen-aphthene	Fluorene	Phenan-threne
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
	101	1	< 1,44	< 5,03	< 3,39	< 11,9	0.064	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.089	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.083	< 0,59	< 0,33	< 1,01
	250	1	< 1,44	< 5,03	< 3,39	< 11,9	0.068	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.074	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.090	< 0,59	< 0,33	< 1,01
	507	1	< 1,44	< 5,03	< 3,39	< 11,9	0.186	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.112	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.182	< 0,59	< 0,33	< 1,01
	1055	1	5.96	< 5,03	3.52	< 11,9	1.195	< 0,59	< 0,33	2.78
		2	5.00	< 5,03	< 3,39	< 11,9	0.980	< 0,59	< 0,33	2.44
		3	7.31	< 5,03	3.44	< 11,9	1.326	< 0,59	< 0,33	3.28
GC3	0	1	< 1,44	< 5,03	< 3,39	< 11,9	0.709	< 0,59	< 0,33	6.04
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.321	< 0,59	< 0,33	3.09
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.334	< 0,59	< 0,33	2.21
	5	1	9.62	5.35	14.26	40.9	1.956	2.31	1.5	39.47
		2	3.70	< 5,03	10.95	29.0	0.812	1.69	1.0	31.80
		3	13.67	7.13	18.69	56.5	2.037	5.44	3.1	68.86
	25	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.137	< 0,59	< 0,33	< 1,01
		3	1.77	< 5,03	< 3,39	< 11,9	0.164	< 0,59	< 0,33	1.18
	43	1	< 1,44	< 5,03	< 3,39	< 11,9	0.104	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	0.091	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	0.094	< 0,59	< 0,33	< 1,01
	88	1	2.70	< 5,03	< 3,39	< 11,9	0.567	0.70	0.5	3.44
		2	1.46	< 5,03	< 3,39	< 11,9	0.430	< 0,59	< 0,33	1.64
		3	2.75	< 5,03	< 3,39	< 11,9	0.557	< 0,59	0.6	3.37
	245	1	2.53	< 5,03	< 3,39	< 11,9	0.588	< 0,59	0.4	2.74
		2	2.90	< 5,03	< 3,39	< 11,9	0.665	< 0,59	0.5	2.99
		3	3.05	< 5,03	< 3,39	< 11,9	0.785	< 0,59	0.5	2.94
	509	1	5.32	< 5,03	4.68	< 11,9	1.255	< 0,59	0.7	4.83
		2	3.71	< 5,03	3.80	< 11,9	0.822	< 0,59	0.5	3.81

Transect/ Area	Depth	Grab	Naphthalene	C1-Naphthalene	C2-Naphthalene	C3-Naphthalene	Acen-aphthylene	Acen-aphthene	Fluorene	Phenan-threne
		3	3.92	< 5,03	< 3,39	< 11,9	0.866	< 0,59	0.6	4.18
	999	1	9.49	< 5,03	< 3,39	< 11,9	2.343	< 0,59	0.7	5.22
		2	11.66	< 5,03	< 3,39	< 11,9	3.094	< 0,59	0.8	5.16
		3	8.53	< 5,03	< 3,39	< 11,9	2.086	< 0,59	0.7	4.82
SPW	25	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
SPN	24	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
SPE	26	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
SPS	27	1	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		2	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
		3	< 1,44	< 5,03	< 3,39	< 11,9	< 0,053	< 0,59	< 0,33	< 1,01
MA-DEEP 2-1	1366	1	12.71	< 5,03	< 3,39	< 11,9	2.958	< 0,59	0.5	4.68
		2	9.56	< 5,03	< 3,39	< 11,9	1.892	< 0,59	0.4	3.50
		3	14.74	< 5,03	< 3,39	< 11,9	2.800	< 0,59	0.5	5.04
MA-DEEP 2-2	1424	1	12.90	< 5,03	< 3,39	< 11,9	2.507	< 0,59	0.5	4.68
		2	12.63	< 5,03	< 3,39	< 11,9	2.368	< 0,59	0.4	3.91
		3	16.65	< 5,03	3.48	< 11,9	2.658	< 0,59	0.4	4.67
MA-DEEP 2-3	1387	1	14.93	< 5,03	< 3,39	< 11,9	2.847	< 0,59	0.4	5.11
		2	15.38	< 5,03	4.16	< 11,9	2.812	< 0,59	0.4	4.91
		3	14.88	< 5,03	< 3,39	< 11,9	2.758	< 0,59	0.5	5.65
MA-DEEP 2-4	1600	1	15.95	< 5,03	3.72	< 11,9	3.308	< 0,59	0.5	5.11
		2	11.00	< 5,03	< 3,39	< 11,9	2.250	< 0,59	0.3	3.75
		3	12.50	< 5,03	< 3,39	< 11,9	2.406	< 0,59	0.3	3.75
MA-DEEP	1361	1	14.25	< 5,03	< 3,39	< 11,9	2.796	< 0,59	0.4	5.23
		2	15.58	< 5,03	3.99	< 11,9	2.763	< 0,59	0.3	5.18
		3	14.58	< 5,03	< 3,39	< 11,9	2.844	< 0,59	0.4	5.15

Transect/ Area	Depth	Grab	Dibenzo-thiophene	Phenanthrene	C1-Dibenzo-thiophene	Antracene	C2-dibenzo-thiophene	Phenanthrene	Anthr/Phenanthrene	C3-dibenzo-thiophene
GC1	0	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
	5	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
	25	1	0.33	4.14	0.69	1.12	2.4	8.72	4.99	4.11
		2	0.40	4.31	0.76	1.15	2.4	8.88	4.80	3.93
		3	0.38	4.28	0.78	1.09	2.3	4.96	5.26	3.75
	50	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	4.32	3.03	2.65
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	4.03	2.80	2.51
		3	< 0,18	< 3,14	< 0,66	0.22	< 2,1	< 3,98	3.13	2.62
	498	1	< 0,18	< 3,14	< 0,66	0.32	< 2,1	< 3,98	3.03	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.31	< 2,1	< 3,98	3.20	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.26	< 2,1	< 3,98	2.86	< 1,77
	1029	1	< 0,18	< 3,14	< 0,66	0.73	< 2,1	< 3,98	4.72	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.58	< 2,1	< 3,98	4.39	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.56	< 2,1	< 3,98	4.25	< 1,77
	260	1	< 0,18	< 3,14	< 0,66	0.23	< 2,1	4.61	4.12	2.59
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	3.37	2.14
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	3.91	2.15
	109	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	2.85	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.22	< 2,1	< 3,98	2.68	< 1,77
GC2	0	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
	5	1	< 0,18	< 3,14	< 0,66	0.40	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.31	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.33	< 2,1	< 3,98	< 2,32	< 1,77
	25	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
	51	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77

Transect/ Area	Depth	Grab	Dibenzo-thiophene	Phenanthrene	C1-Dibenzo-thiophene	Antracene	C2-dibenzo-thiophene	Phenanthrene	Anthr/Phenanthrene	C3-dibenzo-thiophene
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	2.95	2.44
	101	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	2.35	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.24	< 2,1	< 3,98	3.20	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.26	< 2,1	< 3,98	3.16	1.88
	250	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	2.77	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	2.84	2.21
	507	1	< 0,18	< 3,14	< 0,66	0.37	< 2,1	< 3,98	4.22	1.89
		2	< 0,18	< 3,14	< 0,66	0.25	< 2,1	< 3,98	3.08	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.33	< 2,1	< 3,98	4.14	3.00
	1055	1	< 0,18	< 3,14	< 0,66	0.81	< 2,1	5.00	9.39	2.85
		2	< 0,18	< 3,14	< 0,66	0.83	< 2,1	< 3,98	7.67	2.73
		3	0.19	< 3,14	< 0,66	0.87	< 2,1	5.28	8.08	2.78
GC3	0	1	0.46	5.91	0.94	1.64	2.6	12.71	8.59	3.80
		2	0.22	4.78	0.70	1.15	< 2,1	5.53	6.05	2.85
		3	0.19	3.21	< 0,66	1.23	< 2,1	7.92	4.95	2.70
	5	1	3.35	47.60	8.76	10.64	31.7	110.49	71.10	52.71
		2	2.21	39.85	5.37	9.68	12.8	67.87	38.59	11.64
		3	5.57	62.31	11.12	19.45	37.4	132.02	96.84	63.81
	25	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.44	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.55	< 2,1	5.21	2.94	2.36
	43	1	< 0,18	< 3,14	< 0,66	0.32	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.29	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	0.33	< 2,1	< 3,98	< 2,32	< 1,77
	88	1	0.50	< 3,14	0.72	1.40	4.1	7.80	4.61	6.78
		2	< 0,18	< 3,14	< 0,66	0.83	< 2,1	< 3,98	< 2,32	< 1,77
		3	0.46	3.61	0.74	1.48	4.4	12.27	6.39	5.62
	245	1	0.29	3.16	< 0,66	1.15	2.6	8.92	4.76	4.90
		2	0.36	< 3,14	< 0,66	1.22	2.8	8.26	4.75	5.43
		3	0.24	< 3,14	< 0,66	1.25	< 2,1	4.71	< 2,32	1.80
	509	1	0.57	4.31	1.03	1.81	4.2	12.30	7.33	8.60
		2	0.48	3.55	1.20	1.61	4.2	12.42	8.89	8.45

Transect/ Area	Depth	Grab	Dibenzo-thiophene	Phenanthrene	C1-Dibenzo-thiophene	Antracene	C2-dibenzo-thiophene	Phenanthrene	Anthr/Phenanthrene	C3-dibenzo-thiophene
		3	0.55	4.39	1.02	1.58	4.4	15.29	7.23	7.67
	999	1	0.47	3.68	0.78	1.70	3.6	10.42	5.93	6.77
		2	0.31	< 3,14	< 0,66	1.79	< 2,1	5.82	2.42	2.14
		3	0.43	3.54	0.70	1.69	3.0	8.57	4.91	6.48
SPW	25	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
SPN	24	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
SPE	26	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
SPS	27	1	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		2	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
		3	< 0,18	< 3,14	< 0,66	< 0,21	< 2,1	< 3,98	< 2,32	< 1,77
MA-DEEP 2-1	1366	1	0.20	< 3,14	< 0,66	1.17	< 2,1	< 3,98	5.02	1.86
		2	< 0,18	< 3,14	< 0,66	0.91	< 2,1	< 3,98	6.31	2.16
		3	0.22	< 3,14	< 0,66	1.22	2.7	5.29	10.64	2.94
MA-DEEP 2-2	1424	1	< 0,18	< 3,14	< 0,66	1.33	< 2,1	4.59	7.89	< 1,77
		2	< 0,18	< 3,14	< 0,66	0.91	< 2,1	< 3,98	8.92	1.86
		3	< 0,18	< 3,14	< 0,66	1.16	< 2,1	< 3,98	8.06	2.13
MA-DEEP 2-3	1387	1	0.19	< 3,14	< 0,66	1.29	< 2,1	6.18	8.85	2.50
		2	0.22	< 3,14	< 0,66	1.22	< 2,1	6.09	7.98	2.53
		3	0.28	< 3,14	< 0,66	1.20	2.4	6.61	8.16	3.23
MA-DEEP 2-4	1600	1	< 0,18	< 3,14	< 0,66	1.33	< 2,1	4.40	9.53	2.21
		2	< 0,18	< 3,14	< 0,66	1.04	< 2,1	4.56	4.89	2.64
		3	< 0,18	< 3,14	< 0,66	1.00	< 2,1	4.49	5.62	1.94
MA-DEEP	1361	1	0.21	< 3,14	< 0,66	1.30	2.1	7.22	9.77	3.19
		2	0.22	< 3,14	< 0,66	1.30	2.2	5.18	8.98	3.71
		3	0.21	< 3,14	< 0,66	1.28	2.6	7.14	7.24	3.25

Transect/ Area	Depth	Grab	Fluoranthene	Pyrene	Benzo(a)-anthracene	Chrysene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)pyrene
GC1	0	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
	5	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
	25	1	12.70	12.04	6.98	5.70	8.88	4.39	7.63	4.11
		2	15.27	13.27	10.07	8.92	10.36	5.14	8.56	4.09
		3	13.95	12.02	9.59	8.07	10.13	4.89	7.71	3.92
	50	1	1.30	< 1,23	0.76	0.95	1.29	0.56	0.66	0.47
		2	1.29	< 1,23	0.93	1.21	1.47	0.65	0.71	0.52
		3	1.23	< 1,23	1.05	1.39	1.73	0.68	0.75	0.53
	498	1	1.42	1.95	1.33	2.53	2.22	0.77	0.53	0.51
		2	1.03	2.38	1.64	2.80	2.20	0.85	0.55	0.52
		3	1.11	1.74	0.92	1.62	1.77	0.68	0.44	0.41
	1029	1	4.20	4.94	3.62	9.26	5.97	1.80	1.00	1.13
		2	3.30	4.93	4.19	9.57	6.10	1.88	1.10	1.06
		3	3.63	4.86	3.38	9.48	5.01	1.38	0.93	0.95
	260	1	1.18	1.39	0.80	1.73	1.52	0.54	0.52	0.48
		2	0.95	1.30	0.84	1.70	1.37	0.44	0.41	0.41
		3	0.86	< 1,23	0.75	1.63	1.13	0.43	0.41	0.33
	109	1	0.96	< 1,23	0.64	1.49	1.02	0.38	0.31	0.29
		2	1.01	< 1,23	0.72	1.53	1.10	0.43	0.34	0.30
		3	0.98	< 1,23	0.75	1.62	1.19	0.49	0.49	0.41
GC2	0	1	1.07	< 1,23	0.57	0.67	0.93	0.52	0.88	0.57
		2	1.21	< 1,23	0.66	0.70	0.80	0.48	0.95	0.46
		3	1.22	< 1,23	0.62	0.67	0.75	0.40	0.86	0.40
	5	1	5.68	1.49	2.95	2.15	3.00	1.55	3.39	1.62
		2	4.32	3.87	3.02	2.69	3.57	1.86	3.03	1.07
		3	4.06	3.42	2.10	1.81	2.23	< 0,13	2.35	<0,24
	25	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
	51	1	< 0,77	< 1,23	0.35	0.52	0.70	0.28	0.33	<0,24

Transect/ Area	Depth	Grab	Fluoranthene	Pyrene	Benzo(a)-anthracene	Chrysene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)pyrene
		2	0.85	< 1,23	0.46	0.75	1.07	0.41	0.50	0.36
		3	0.96	< 1,23	0.50	0.72	1.17	0.44	0.56	0.37
	101	1	0.80	< 1,23	0.91	1.61	1.37	0.58	0.41	0.25
		2	1.42	1.35	1.02	1.69	1.81	0.65	0.66	0.38
		3	1.22	1.48	1.60	2.98	2.25	0.81	0.81	0.30
	250	1	0.85	< 1,23	0.93	1.65	0.88	0.31	0.50	0.30
		2	0.78	< 1,23	0.74	1.31	1.06	0.41	0.44	0.30
		3	0.83	< 1,23	0.54	1.04	1.06	0.39	0.39	0.27
	507	1	1.32	1.88	1.87	3.35	2.40	0.90	0.70	0.47
		2	0.98	< 1,23	1.01	1.74	1.43	0.52	0.43	0.36
		3	1.26	1.72	1.68	3.18	2.18	0.91	0.72	0.47
	1055	1	4.68	4.45	4.31	8.56	5.60	1.88	1.24	0.95
		2	4.00	3.78	4.02	7.39	5.32	1.54	1.01	0.80
		3	4.88	4.56	3.02	5.74	5.75	1.83	1.24	1.01
GC3	0	1	29.46	25.69	16.95	14.28	16.73	9.14	20.34	14.16
		2	21.93	19.45	11.62	9.68	14.00	7.48	16.86	11.34
		3	15.45	13.97	10.49	9.47	10.84	5.75	12.34	7.37
	5	1	196.53	166.73	190.75	100.32	112.42	59.40	110.23	27.36
		2	160.06	139.73	89.48	69.48	64.82	38.48	81.82	31.13
		3	295.59	299.05	298.10	226.10	194.10	104.08	183.07	48.50
	25	1	0.94	< 1,23	0.59	0.58	0.98	0.41	0.68	0.41
		2	1.59	1.48	1.55	1.58	2.29	0.92	1.31	0.64
		3	2.34	2.08	3.06	3.52	4.09	1.93	2.18	1.38
	43	1	1.46	1.49	1.77	2.12	2.63	1.04	1.15	0.81
		2	1.51	1.53	1.50	1.68	2.76	1.14	1.46	0.81
		3	1.54	1.58	1.60	1.81	2.89	1.16	1.48	0.82
	88	1	8.74	7.08	13.51	16.95	15.90	6.72	6.69	1.84
		2	3.62	3.57	4.95	6.71	8.15	3.22	3.46	1.56
		3	9.59	7.67	12.40	15.24	16.89	6.24	6.85	2.56
	245	1	7.52	8.03	7.59	9.05	10.79	4.18	4.95	2.03
		2	9.62	8.93	9.26	11.08	13.03	4.75	5.01	2.26
		3	8.97	10.77	8.63	10.10	11.67	4.58	4.81	1.38
	509	1	11.91	9.50	14.29	16.43	17.81	7.34	7.98	2.87
		2	10.95	5.17	13.30	14.27	17.47	5.72	6.53	4.17

Transect/ Area	Depth	Grab	Fluoranthene	Pyrene	Benzo(a)-anthracene	Chrysene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)pyrene
		3	12.12	8.48	10.25	11.35	14.93	5.72	7.14	3.64
	999	1	12.83	10.10	11.90	13.08	14.94	5.77	6.70	3.36
		2	12.50	9.93	7.72	9.69	10.04	3.80	3.97	1.82
		3	12.30	9.69	12.10	13.90	14.79	5.91	6.05	2.85
SPW	25	1	0.80	< 1,23	0.27	< 0,42	0.55	0.26	0.41	0.27
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	0.13	<0,25	0.28
SPN	24	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	0.95	< 1,23	0.64	0.57	0.61	0.32	0.59	0.31
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
SPE	26	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
SPS	27	1	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		2	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
		3	< 0,77	< 1,23	< 0,27	< 0,42	< 0,40	< 0,13	<0,25	<0,24
MA-DEEP 2-1	1366	1	7.97	7.84	5.68	15.40	8.29	2.92	1.40	1.20
		2	5.43	5.70	3.51	8.07	6.49	1.82	1.05	1.18
		3	7.66	8.73	8.36	22.53	12.73	3.91	2.09	1.87
MA-DEEP 2-2	1424	1	9.00	7.42	5.75	14.34	11.07	2.88	1.54	1.66
		2	6.61	6.39	4.87	11.55	8.17	2.50	1.40	1.40
		3	6.24	7.84	4.78	9.51	10.82	3.06	1.17	1.47
MA-DEEP 2-3	1387	1	8.51	8.33	7.75	21.23	12.28	3.81	1.56	0.69
		2	8.17	7.96	7.57	20.80	10.04	3.57	1.76	1.52
		3	8.95	8.24	5.79	14.17	11.09	3.98	1.89	1.69
MA-DEEP 2-4	1600	1	8.53	8.94	7.08	5.27	12.20	3.27	1.53	0.98
		2	6.61	6.39	6.90	18.16	7.63	2.69	1.26	1.79
		3	6.41	6.51	5.42	15.21	8.19	2.58	1.00	1.08
MA-DEEP	1361	1	10.19	9.02	6.87	16.96	11.08	3.68	1.70	1.68
		2	7.63	8.56	4.71	10.73	11.37	3.94	1.73	1.97
		3	10.79	9.00	8.53	21.43	11.36	3.90	1.73	1.72

Transect/ Area	Depth	Grab	Benzo(ghi)-perylene	Dibenzo(a,h) anthracene	SUM NPD, µg/kg DW:	PAH, µg/kg DW:	THC, mg/kg DW
GC1	0	1	< 0,21	< 0,09	< 18,6	< 3,81	0.21
		2	< 0,21	< 0,09	< 18,6	< 3,81	0.17
		3	< 0,21	< 0,09	< 18,6	< 3,81	0.29
	5	1	< 0,21	< 0,09	< 18,6	< 3,81	0.97
		2	< 0,21	< 0,09	< 18,6	< 3,81	0.58
		3	< 0,21	< 0,09	< 18,6	< 3,81	0.36
	25	1	4.87	0.70	42.9	76.03	7.58
		2	4.85	0.75	42.1	88.40	4.86
		3	5.33	0.73	37.5	82.68	5.89
	50	1	0.67	< 0,09	24.5	9.13	4.51
		2	0.67	0.09	23.9	10.01	3.75
		3	0.68	0.10	22.4	10.71	3.86
	498	1	0.62	0.09	21.2	14.75	3.69
		2	0.57	0.09	20.8	14.84	2.63
		3	0.43	< 0,09	20.4	11.26	2.34
	1029	1	1.13	0.21	29.4	43.38	2.34
		2	1.13	0.20	27.0	41.16	1.78
		3	1.02	0.16	28.3	40.22	2.06
	260	1	0.61	< 0,09	26.0	10.88	4.15
		2	0.50	< 0,09	22.8	10.63	3.18
		3	0.39	< 0,09	22.6	8.47	2.14
	109	1	0.33	< 0,09	20.3	7.93	2.54
		2	0.36	< 0,09	< 18,6	8.26	2.07
		3	0.44	< 0,09	20.2	9.00	3.46
GC2	0	1	0.68	< 0,09	< 18,6	8.37	0.85
		2	0.64	< 0,09	< 18,6	8.37	0.40
		3	0.56	< 0,09	< 18,6	7.95	0.71
	5	1	2.03	0.22	19.9	27.28	1.86
		2	1.28	0.12	18.8	26.97	2.66
		3	< 0,21	< 0,09	19.5	19.14	1.79
	25	1	< 0,21	< 0,09	< 18,6	< 3,81	1.69
		2	< 0,21	< 0,09	< 18,6	< 3,81	1.06
		3	< 0,21	< 0,09	< 18,6	< 3,81	2.00
	51	1	0.31	< 0,09	< 18,6	5.48	2.59

Transect/ Area	Depth	Grab	Benzo(ghi)-perylene	Dibenzo(a,h) anthracene	SUM NPD, µg/kg DW:	PAH, µg/kg DW:	THC, mg/kg DW
		2	0.49	< 0,09	< 18,6	7.37	3.11
		3	0.48	0.09	21.9	7.72	3.67
	101	1	0.50	< 0,09	19.8	8.94	2.53
		2	0.48	0.09	20.7	11.55	2.07
		3	0.39	< 0,09	21.7	13.90	2.50
	250	1	0.39	< 0,09	< 18,6	8.33	2.02
		2	0.38	< 0,09	20.2	7.93	3.05
		3	0.38	< 0,09	21.6	7.43	2.95
	507	1	0.66	< 0,09	22.9	15.82	4.03
		2	0.41	< 0,09	20.6	9.59	3.79
		3	0.62	< 0,09	23.9	14.98	3.55
	1055	1	1.10	0.14	41.8	44.12	4.15
		2	1.04	0.14	33.9	38.77	5.01
		3	1.11	0.12	42.6	42.51	9.64
GC3	0	1	16.39	1.28	53.5	173.98	10.34
		2	13.33	0.98	36.3	132.42	4.57
		3	8.03	0.54	34.6	99.20	5.90
	5	1	48.82	4.45	446.0	1082.47	18.12
		2	35.30	4.46	266.0	763.45	5.56
		3	61.32	6.52	593.4	1828.94	17.81
	25	1	0.78	< 0,09	< 18,6	7.85	1.88
		2	4.12	< 0,09	18.9	17.79	2.67
		3	2.54	0.21	27.2	27.45	7.85
	43	1	2.26	0.11	18.8	16.96	2.94
		2	2.01	0.09	18.8	16.57	4.29
		3	1.66	< 0,09	18.8	16.68	3.94
	88	1	3.65	0.29	43.8	90.71	0.92
		2	2.82	0.22	21.2	43.11	1.05
		3	4.33	0.36	51.3	91.13	1.05
	245	1	3.45	0.32	41.5	65.65	2.57
		2	3.69	0.34	40.8	76.51	2.27
		3	2.08	0.20	28.3	72.02	0.80
	509	1	5.16	0.56	63.5	108.06	4.09
		2	7.92	0.68	60.6	96.97	7.37

Transect/ Area	Depth	Grab	Benzo(ghi)-perylene	Dibenzo(a,h) anthracene	SUM NPD, µg/kg DW:	PAH, µg/kg DW:	THC, mg/kg DW
		3	6.30	0.65	60.4	92.04	5.75
	999	1	4.95	0.63	58.3	103.99	2.96
		2	2.58	0.30	42.4	85.18	1.35
		3	4.20	0.53	52.8	100.43	1.35
SPW	25	1	0.31	< 0,09	< 18,6	5.56	2.86
		2	< 0,21	< 0,09	< 18,6	< 3,81	2.01
		3	0.22	< 0,09	< 18,6	4.16	2.62
SPN	24	1	< 0,21	< 0,09	< 18,6	< 3,81	1.50
		2	0.35	< 0,09	< 18,6	6.81	2.41
		3	< 0,21	< 0,09	< 18,6	< 3,81	0.77
SPE	26	1	< 0,21	< 0,09	< 18,6	< 3,81	1.47
		2	< 0,21	< 0,09	< 18,6	< 3,81	0.91
		3	< 0,21	< 0,09	< 18,6	< 3,81	1.13
SPS	27	1	< 0,21	< 0,09	< 18,6	< 3,81	1.79
		2	< 0,21	< 0,09	< 18,6	< 3,81	1.53
		3	0.23	< 0,09	< 18,6	3.94	2.86
MA-DEEP 2-1	1366	1	1.24	0.21	40.7	74.44	1.50
		2	1.11	0.19	37.6	51.04	4.98
		3	2.03	0.33	54.8	94.82	4.34
MA-DEEP 2-2	1424	1	1.77	0.32	45.5	77.92	3.84
		2	1.46	0.20	43.4	65.02	4.04
		3	1.44	0.25	49.6	72.44	2.69
MA-DEEP 2-3	1387	1	1.71	0.11	52.2	90.85	3.54
		2	1.80	0.26	53.9	88.48	4.06
		3	1.77	0.29	54.5	83.09	2.08
MA-DEEP 2-4	1600	1	1.14	0.12	53.8	75.51	9.98
		2	1.84	0.25	41.1	72.19	1.67
		3	1.16	0.18	42.5	68.04	1.69
MA-DEEP	1361	1	1.39	0.26	55.4	87.10	4.47
		2	1.97	0.30	56.7	78.35	9.48
		3	1.85	0.28	53.5	95.16	2.99

Table 6 Concentrations of PCB **(**mg/kg d.w.) and dry weight (%) from all samples at the transects GC1, GC2, GC3, as well as the Saltpond and Mahogany oil rigs, 2010.

Transect/Area	Depth	Grab	PCB 101 (mg/kg DW)	PCB 118 (mg/kg DW)	PCB 138 (mg/kg DW)	PCB 153 (mg/kg DW)	PCB 180 (mg/kg DW)	PCB 28 (mg/kg DW)	PCB 52 (mg/kg DW)	Sum 7 PCB (mg/kg DW)	% DW
GC1	0	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	83.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	83.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	83.00
	1029	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	50.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	45.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	48.00
	109	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	64.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	66.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	67.00
	25	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	66.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	67.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	64.00
	260	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	58.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	54.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	59.00
	498	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	57.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	58.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	61.00
	5	1	<0.0005	<0.0005	0.0005	0.0006	<0.0005	<0.0005	<0.0005	0.0011	55.00
		2	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	0.0006	55.00
		3	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.0005	56.00
	50	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	61.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	63.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	62.00
GC2	0	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	80.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	80.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	82.00
	101	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	60.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	58.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	65.00
	1055	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	40.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	40.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	47.00
	25	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	77.00

Transect/Area	Depth	Grab	PCB 101 (mg/kg DW)	PCB 118 (mg/kg DW)	PCB 138 (mg/kg DW)	PCB 153 (mg/kg DW)	PCB 180 (mg/kg DW)	PCB 28 (mg/kg DW)	PCB 52 (mg/kg DW)	Sum 7 PCB (mg/kg DW)	% DW
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	76.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
	250	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	62.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	61.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	62.00
	5	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	75.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	76.00
	507	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	53.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	57.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	54.00
	51	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	70.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	69.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	67.00
GC3	0	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	79.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
	245	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	50.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	49.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	45.00
	25	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	64.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	61.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	69.00
	43	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	68.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	64.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	70.00
	5	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	86.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	82.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	81.00
	509	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	46.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	38.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	40.00
	88	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	47.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	43.00

Transect/Area	Depth	Grab	PCB 101 (mg/kg DW)	PCB 118 (mg/kg DW)	PCB 138 (mg/kg DW)	PCB 153 (mg/kg DW)	PCB 180 (mg/kg DW)	PCB 28 (mg/kg DW)	PCB 52 (mg/kg DW)	Sum 7 PCB (mg/kg DW)	% DW
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	39.00
	999	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	46.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	42.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	43.00
MA-DEEP 2-1	1366	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	34.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	32.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	32.00
MA-DEEP 2-2	1424	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	36.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	35.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	33.00
MA-DEEP 2-3	1387	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	45.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	35.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	31.00
MA-DEEP 2-4	1600	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	35.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	31.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	38.00
MA-DEEP	1361	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	36.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	33.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	38.00
SPE	26	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	80.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	79.00
SPN	24	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	79.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	79.00
SPS	27	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00

Transect/Area	Depth	Grab	PCB 101 (mg/kg DW)	PCB 118 (mg/kg DW)	PCB 138 (mg/kg DW)	PCB 153 (mg/kg DW)	PCB 180 (mg/kg DW)	PCB 28 (mg/kg DW)	PCB 52 (mg/kg DW)	Sum 7 PCB (mg/kg DW)	% DW
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	77.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	77.00
SPW	25	1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	79.00
		2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	78.00
		3	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	nd	73.00

Table 7 Concentrations of Pesticides (in mg/kg d.w.) and dry weight (%) from all samples at the transects GC1, GC2, GC3, as well as the Saltpond and Mahogany oil rigs, 2010. Italic values are values presented in mg compound / wet weight.

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	alfa-endosulfan (mg/kg DW)	alfa-HCH (mg/kg DW)	beta-HCH (mg/kg DW)	Dieldrin (mg/kg DW)
GC1	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	1029	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	*109*	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	0,03	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	260	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	498	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	50	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
GC2	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	101	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	1055	<0,01	<0,01	<0,01	0,02	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	250	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	507	<0,01	<0,01	<0,01	0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	51	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	0,05	<0,01
GC3	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	245	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	alfa-endosulfan (mg/kg DW)	alfa-HCH (mg/kg DW)	beta-HCH (mg/kg DW)	Dieldrin (mg/kg DW)
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	43	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
GC3	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	3	509	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2	88	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2	999	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	*2*	*1366*	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	2	1424	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-3	1	1387	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-4	2	1600	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP	1	1361	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPE	1	26	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPN	3	24	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
SPS	1	27	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPW	*1*	*25*	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	gamma-HCH (lindan) (mg/kg DW)	Heksaklorbenzen (mg/kg DW)	Heksaklorbutadien (mg/kg DW)	Heptaklor (mg/kg DW)
GC1	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	1029	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	*109*	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	260	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	498	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	50	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
GC2	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	101	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	1055	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	250	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	507	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	51	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
GC3	1	0	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	245	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	gamma-HCH (lindan) (mg/kg DW)	Heksaklorbenzen (mg/kg DW)	Heksaklorbutadien (mg/kg DW)	Heptaklor (mg/kg DW)
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	43	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
GC3	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	3	509	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2	88	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2	999	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	2	1366	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	2	1424	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-3	1	1387	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-4	2	1600	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP	1	1361	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPE	1	26	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPN	3	24	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
SPS	1	27	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01
SPW	1	25	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	o,p-DDD (mg/kg DW)	o,p-DDE (mg/kg DW)	p,p-DDD (mg/kg DW)	p,p-DDE (mg/kg DW)	p,p-DDT (mg/kg DW)
GC1	1	0	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	1029	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	*109*	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	260	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	498	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	50	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
GC2	1	0	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	101	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	1055	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	250	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	507	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	51	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
GC3	1	0	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	245	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	o,p-DDD (mg/kg DW)	o,p-DDE (mg/kg DW)	p,p-DDD (mg/kg DW)	p,p-DDE (mg/kg DW)	p,p-DDT (mg/kg DW)
	1	25	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	43	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
GC3	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1	5	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3	509	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2	88	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2	999	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	2	1366	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-1	2	1424	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-3	1	1387	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP 2-4	2	1600	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
MA-DEEP	1	1361	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
SPE	1	26	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
SPN	3	24	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	1		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
SPS	1	27	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
SPW	1	25	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	2		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
	3		<0,01	<0,01	<0,01	<0,01	<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	Pentaklorbenzen (mg/kg DW)
GC1	1	0	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	1029	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	*109*	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	25	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	260	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	498	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	5	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	50	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
GC2	1	0	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	101	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	1055	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	25	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	250	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	5	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	507	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	51	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
GC3	1	0	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	245	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01

Transect/Area	Grabb	Depth	Aldrin (mg/kg DW)	Pentaklorbenzen (mg/kg DW)
	1	25	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
	1	43	<0,01	<0,01
	2		<0,01	<0,01
GC3	3		<0,01	<0,01
	1	5	<0,01	<0,01
	3		<0,01	<0,01
	2		<0,01	<0,01
	1		<0,01	<0,01
	3	509	<0,01	<0,01
	2		<0,01	<0,01
	1		<0,01	<0,01
	2	88	<0,01	<0,01
	3		<0,01	<0,01
	1		<0,01	<0,01
	2	999	<0,01	<0,01
	3		<0,01	<0,01
MA-DEEP 2-1	2	1366	<0,01	<0,01
	3		<0,01	<0,01
MA-DEEP 2-1	2	1424	<0,01	<0,01
	1		<0,01	<0,01
	3		<0,01	<0,01
MA-DEEP 2-3	1	1387	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
MA-DEEP 2-4	2	1600	<0,01	<0,01
	3		<0,01	<0,01
MA-DEEP	1	1361	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
SPE	1	26	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
SPN	3	24	<0,01	<0,01
	1		<0,01	<0,01
	2		<0,01	<0,01
SPS	1	27	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01
SPW	1	25	<0,01	<0,01
	2		<0,01	<0,01
	3		<0,01	<0,01

Table 8 Sediment characteristics the transects GC1, 2 and 3 and around the Salt Pond and Mahogany oil rigs in 2010.

Transect/ area	Date	Grab station	Depth (m)	Sediment description
Ghana central 1	24.04.2011	GC1/0	0	Light grey sand
	24.04.2011	GC1/5	5	Dark grey clay and sand
	11.04.2010	GC1/25	25	Sand and shell sand
	11.04.2010	GC1/50	50	Dark grey clay and silt
	13.04.2010	GC1/109	109	Dark brown sand and shellsand
	13.04.2010	GC1/260	260	Dark grey fine sand and silt
	12.04.2010	GC1/498	498	Grayish black fine sand and silt
	12.04.2010	GC1/1029	1029	Dark gray clay/pelitt
Ghana central 2	25.04.2010	GC2/0	0	Light grey sand
	25.04.2010	GC2/5	5	Grey sand and clay
	15.04.2010	GC2/25	25	Dark grey fine sand
	15.04.2010	GC2/51	51	Olive grey sand with clay
	18.04.2010	GC2/101	101	Dark brown sand/silt
	18.04.2010	GC2/250	250	Dark grey sand/silt
	18.04.2010	GC2/507	507	Dark grey fine sand/silt
	19.04.2010	GC2/1055	1055	Dark grey clay/silt
Ghana central 3	26.04.2010	GC3/0	0	Light brown coarse sand
	26.04.2010	GC3/5	5	Dark grey silt and sand.
	07.04.2010	GC3/25	25	Grey shell sand and clay.
	07.04.2010	GC3/43	43	Dark grey fine shell sand and mineral sand.
	08.04.2010	GC3/88	88	Dark grey clay
	08.04.2010	GC3/245	245	Dark grey clay
	08.04.2010	GC3/509	509	Dark grey to greenish grey.
	09.04.2010	GC3/999	999	Gray clay
Salt Pond	21.04.2010	SPW/25	25	Olive grey shell sand
oil rig	21.04.2010	SPN/24	24	Dark grey fine sand
	21.04.2010	SPE/26	26	Dark brown coarse sand/shell sand
	21.04.2010	SPS/27	27	Dark grey fine sand
Mahogany	22.04.2010	MA DEEP 2-1/1366	1366	Dark gray clay
oil rig	22.04.2010	MA DEEP 2-2/1424	1424	Dark gray clay/silt
	22.04.2010	MA DEEP 2-3/1387	1387	Dark gray clay
	22.04.2010	MA DEEP 2-4/1600	1600	Dark grey clay
	23.04.2010	MA DEEP 2-5/1361	1361	Dark gray clay

Table 9 Sampling journal shore line

SAMPLING JOURNAL **Page nr: 1 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana west	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Newtown	Date	Position		Depth (m)
		Latitude	Longitude	
GW (Shore)	20.04.2010	4º55`22,84 N	2º19`33,02 W	Shoreline 0 m

Weather: Overcast	Wind: Windy	Wave hight (m):
Time Start: 15:54	Time Finish: 18:45	Duration: 2 hr 51 min.
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: Fine sand	
Color: Light grey	Odor: -
Observation of animals: Amphipods	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)		Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1			1	1	1	1	1	1	1 No	1 GH	1	1	Directly from the beach
2			1	1	1	1	1	1			1	1	15 m off high tide.
3			1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs	1	
5	4 full grabs	2	
6	4 full grabs	1	
7	4 full grabs	1	
8	4 full grabs	1	

SAMPLING JOURNAL **Page nr: 2 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana west	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Newtown	Date	Position		Depth (m)
		Latitude	Longitude	
GW/5	21.04.2010	5º03`56,27 N	3º06`03,04 W	5 m

Weather: Sunny	Wind: Breeze	Wave hight (m):
Time Start: 10:30	Time Finish: 15:48	Duration: 5 hr 18 min.
Sample equipment used (name, bite area, weight): 0,025m^2 Van Veen Grab short (4 Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: Fine Sand	
Color: Light grey	Odor:
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)		Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	f	f	1	1	1	1	1	1	1 No	1 Gh	1	1	Samples from several grabs
2	f	f	1	1	1	1	1	1			1	1	
3	f	f	1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Appr. 2 l	1	Only 3 samples due to difficult conditions .
5	Appr. 2 l	1	
6	Appr. 2 l	1	
7			
8			Taken on 5 m depth outside the shore position

SAMPLING JOURNAL **Page nr: 3 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana west	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Esiama / Kikam	Date	Position		Depth (m)
		Latitude	Longitude	
GP (Shore)	22.04.2010	4º55`22,84 N	2º19`33,02 W	0 m

Weather:	Wind:	Wave hight (m):
Time Start:	Time Finish:	Duration:
Sample equipment used (name, bite area, weight): 0,025m^2 Van Veen Grab short (4 Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand less than 1mm grain size	
Color: Light brownish grey	Odor:
Observation of animals: Amphipods	
Observation of oil, waste etc: None but possible runoff from land	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Directly from the beach
2		1	1	1	1	1	1			1	1	10 m off high tide.
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs	1	Less animals than at Newtown. 10 m off high tide.
5	4 full grabs	1	
6	4 full grabs	1	
7	4 full grabs	1	
8	4 full grabs	1	

SAMPLING JOURNAL **Page nr: 4 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana west	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Esiama / Kikam	Date	Position		Depth (m)
		Latitude	Longitude	
GP/5	22.04.2010			5 m

Weather:	Wind:	Wave hight (m):
Time Start: 12:01	Time Finish: 15:05	Duration: 3 hr 4 min
Sample equipment used (name, bite area, weight): 0,025m^2 Van Veen Grab short (4 Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand	
Color: Light Grey	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1		1		1		1 NO		1		Samples from several grabs
2		1		1		1				1		
3		1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Appr. 3,5 l	1	0,5 mm 1 bottle GH
5	Appr. 3,5 l	1	0,5 mm 1 bottle GH
6	Appr. 3,5 l	1	0,5 mm 1 bottle NO
7	Appr. 3,5 l	1	
8	Appr. 3,5 l	1	Taken on 5 m depth outside the shore position

SAMPLING JOURNAL **Page nr: 5 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana west	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Cape three points	Date	Position		Depth (m)
		Latitude	Longitude	
GE (Shore)	23.04.2010	4º44`43,43 N	2º05`26,78 W	Shore 0 m

Weather: Sunny	Wind:	Wave hight (m):
Time Start: 11:50	Time Finish: 13:18 /18:12	Duration: 6 hr 22 min
Sample equipment used (name, bite area, weight): 0,025m^2 Van Veen Grab short (4 Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: Sand Small bay west of the lighthouse	
Color: light grey	Odor: -
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Directly from the beach
2		1	1	1	1	1	1			1	1	15 m off high tide.
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs		15 m off high tide.
5	4 full grabs		
6	4 full grabs		
7	4 full grabs		
8	4 full grabs		

SAMPLING JOURNAL **Page nr: 6 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Cape three points	Date	Position		Depth (m)
		Latitude	Longitude	
GE/5	23.04.2010			5 m

Weather: Sunny then Rain thunder	Wind: Breeze	Wave hight (m):
Time Start: 13:18	Time Finish: 18:12	Duration: 4 hr 54 min
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: sand	
Color: Light brown	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Samples from several grabs
2		1	1	1	1	1	1			1	1	
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	9l	1	0,5 mm in 1 separate bottle GH
5	8l	1	0,5 mm in 1 separate bottle GH
6	8l	1	
7	9l	1	
8	9l	1	Taken on 5 m depth outside the shore position

SAMPLING JOURNAL **Page nr: 7 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Sekondy east of	Date molo	Position		Depth (m)
		Latitude	Longitude	
GC1/ Shore	24.04.2010	4º57`04,81 N	1º42`21,26 W	0 m

Weather: Sunny	Wind:	Wave hight (m):
Time Start: 09:41	Time Finish: 13:32	Duration: 3 hr 53 min
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: Sand	
Color: light grey	Odor: Sewer
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Directly from the beach
2		1	1	1	1	1	1			1	1	10 m off high tide.
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs	1	
5	4 full grabs	1	
6	4 full grabs	1	
7	4 full grabs	1	
8	4 full grabs	1	

SAMPLING JOURNAL **Page nr: 8 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Sekondy east of molo	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/5	24.04.2010			5 m

Weather:	Wind:	Wave hight (m):
Time Start:	Time Finish:	Duration:
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: Clay and sand	
Color: Dark grey	Odor: Sewer
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1		1		1	1	1 NO		1	1	Samples from several grabs
2		1		1		1	1			1	1	
3		1		1		1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 l	1	
5	4 l	1	
6	4 l	1	
7	4 l	1	
8	4 l	1	Taken on 5 m depth outside the shore position

SAMPLING JOURNAL **Page nr: 9 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Saltpond	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/Shore	25.04.2010	5º12`00,69 N	1º02`04,03 W	0 m

Weather:	Wind:	Wave hight (m):
Time Start: 09:10	Time Finish: 11:18 /13:10	Duration: 4 hr
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: Sand	
Color: Light grey	Odor: -
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Directly from the beach
2		1	1	1	1	1	1			1	1	10 m off high tide.
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs	1	
5	4 full grabs	1	
6	4 full grabs	1	
7	4 full grabs	1	
8	4 full grabs	1	

SAMPLING JOURNAL **Page nr: 10 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Saltpond	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/5	25.04.2010			5 m

Weather: Sunny	Wind:	Wave hight (m):
Time Start: 09:58	Time Finish: 13:10	Duration: 3 hr 12 min
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment:	
Color:	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1		1		1		1 NO		1		Samples from several grabs
2		1		1		1				1		
3		1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4		1	0,5 mm GH
5		1	0,5 mm UIB
6		1	
7		1	
8		1	Taken on 5 m depth outside the shore position

SAMPLING JOURNAL **Page nr: 11 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Adah Foah	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/Shore	26.04.2010	4º57`04,81 N	1º42`21,26 W	0 m

Weather: Sunny	Wind:	Wave hight (m):
Time Start: 08:05	Time Finish: 09:09 /	Duration:
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: coarse sand	
Color: Light brown	Odor:
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1	1	1 NO	1 GH	1	1	Directly from the beach
2		1	1	1	1	1	1			1	1	10 m off high tide.
3		1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4 full grabs	1	
5	4 full grabs	1	
6	4 full grabs	1	
7	4 full grabs	1	
8	4 full grabs	1	

SAMPLING JOURNAL **Page nr: 12 of 12**

R/V Dr. Fridtjof Nansen / Shore	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr. Adah Foah	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/5	26.04.2010			5 m

Weather:	Wind:	Wave hight (m):
Time Start:	Time Finish:	Duration:
Sample equipment used (name, bite area, weight): 0,025 m2 Van Veen Grab short (4 Extra weights) and 1mm sieve (square holes)		

Type of bottom sediment: Silt and sand	
Color: Dark grey	Odor:
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1		1		1		1 NO		1		Samples from several grabs
2		1		1		1				1		
3		1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	4,5 l	1	
5	4,5 l	1	
6	2 l	1	
7	2 l	1	
8	4,5 l	1	Taken on 5 m depth outside the shore position

Table 10 Sampling journal cruise stations

SAMPLING JOURNAL **Page nr: 1 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/25	7/4-2010	5,6435	0,733917	25 m

Weather: Sunny	Wind:	Wave height (m):
Time Start: 14:15	Time Finish: 19:20	Duration: 5 hr 5 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab Long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Shell sand and clay	
Color: Clay: gley 1 4/5GY Sand:	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1 NO	1 GH	1	1	Sample for pesticides
2		1	1	1	1			1	1	
3		1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	13	15	
5	7	14	
6	9	10	
7	10	8	0,5 mm 2 bottles
8	11	11	

SAMPLING JOURNAL **Page nr: 2 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/43	07.04.10	5,592567	0,727633	43 m

Weather: Clear 35°C	Wind:	Wave height (m):
Time Start: 19:45	Time Finish: 22:00	Duration: 2Hr 15 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Fine shell sand and mineral sand	
Color: 2,5Y 4/1 Dark grey	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1		1	1	1	1	1 No	1 Gh	1	1	Short arm grab
2		1	1	1	1			1	1	Short arm grab
3		1	1	1	1			1	1	Short arm grab

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	5	long
5	Full	6	long
6	Full	8	long
7	10	5	Short arm grab
8	6	3	Short arm grab (0,5 mm fraction)

SAMPLING JOURNAL **Page nr: of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/88	8/4-10	5,589133	0,727617	88 m

Weather: Sunny	Wind:	Wave height (m):
Time Start: 08:15	Time Finish: 11:40	Duration: 3hr 25 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab Short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay	
Color: 5Y 4/2 Dark gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples: 4 misses

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	Full	1	1	1	1	1 No	1 Gh	1	1	Long arm grab full broken surface
2	Full	1	1	1	1			1	1	Long arm grab full broken surface
3	Full	1	1	1	1			1	1	Long arm grab full broken surface

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	short arm grab changed after 4 misses
5	Full	1	Long arm grab
6	Full	1	Long arm grab
7	Full	1	Long arm grab
8	Full	1	Long arm grab (0,5mm 1 container)

SAMPLING JOURNAL **Page nr: 4 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/245	8/4-10	5,579417	0,72935	245 m

Weather: Sunny 36°C	Wind:	Wave height (m):
Time Start: 12:00	Time Finish: 15:10	Duration: 3 hr 10 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay	
Color: Surface: 5Y 4/1 Dark gray Bottom Gley 1 3/10Y	Odor: -
Observation of animals: Bivalves, Ophiuroidea, Polychaeta	
Observation of oil, waste etc: Spots of oil pollution	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	Full	1	1	1	1	1 No	1Gh	1	1	
2	Full	1	1	1	1			1	1	No. 2 N Oil pollution
3	Full	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	3	1	
5	Full	1	
6	Full	1	
7	Full	1	
8	Full	1	0,5mm (1 container)

SAMPLING JOURNAL **Page nr: 5 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/509	8/4-10	5,563767	0,732033	509 m

Weather: Sunny	Wind: Light breeze	Wave height (m):
Time Start: 15:20	Time Finish: 20 :30	Duration: 5 hr. 10 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay	
Color: Top: 10YR 4/1 Dark grey bottom: Gley 1 2,5/10Y Greenish black	Odor: -
Observation of animals: Polychaeta	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	7	1	1	1	1	1 NO	1 GH	1	1	
2	Full	1	1	1	1			1	1	
3	Full/ 9,5	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	
5	Full	2	
6	4	1	
7	3	1	
8	Full	1	1 bottle from 0,5 mm sieve

SAMPLING JOURNAL **Page nr: 6 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/999	09.04.2010	5,520817	0,727733	999 m

Weather: Sunny 32^{0}C	Wind: Light Breeze	Wave height (m):
Time Start: 06:00	Time Finish: 11:35	Duration: 5 hr. 35 min.
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay	
Color: Surface : Gley 1 4/10Y Greenish grey. Bottom : Gley 1 3/10Y very dark gr.gr	Odor: -
Observation of animals:	
Observation of oil, waste etc:	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	Full	1	1	1	1	1 NO	1 GH	1	1	Broken surface long Arm
2	Full	1	1	1	1			1	1	Broken surface
3	Full	1	1	1	1			1	1	Broken surface

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	Long arm
5	Full	1	
6	Full	1	
7	Full	1	
8	Full	1	0,5 mm 1 bottle?

SAMPLING JOURNAL **Page nr: 7 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC3/17	09.04.2010	5,715767	0,737733	17 m

Weather: Sunny	Wind:	Wave height (m):
Time Start: 13:05	Time Finish: 15:41	Duration: 2hr. 36 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: sand and coarse shell sand	
Color: 4, 7,5 yr brown	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples: 1 miss

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	10	1	1	1	1	1 NO	1 GH ?	1	1	Long arm
2	11	1	1	1	1			1	1	
3	9	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	12	7	0,5mm 4 bottles
5	14	6	
6	11	9	
7	11.25	11	
8	9,5	5	

SAMPLING JOURNAL **Page nr: 8 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/25	11.04.2010	4,838567	-1,766733	25 m

Weather: sunny	Wind:	Wave height (m):
Time Start: 15:10	Time Finish: 18:59	Duration: 3hr 49 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab short (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Sand and coarse shell sand	
Color:	Odor: -
Observation of animals: Poychaeta, crabs and ophiuroidea	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	1	1	1	1	1	1	1	1 NO	1 GH	1	1	Org. short no extra weight
2/10	3	1	1	1	1	1	1			1	1	short no extra weight
3/11	4	1	1	1	1	1	1			1	1	short no extra weight

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	full	4	Short +extra weight
5	full	5	Short +extra weight
6	full	3	Short +extra weight
7	full	4	Short +extra weight
8	full	4	Short +extra weight

SAMPLING JOURNAL **Page nr: 9 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/50	11.04.2010	4,681367	-1,783833	50 m

Weather:	Wind:	Wave height (m):
Time Start: 19:25	Time Finish: 22:00	Duration: 2hr 35 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay and silt	
Color: 5Y 4 Dark grey	Odor: -
Observation of animals: Poychaetes	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	4/2	1	1	1	1	1	1	1 NO	1 GH	1	1	Org.
2/10	Full/4	1	1	1	1	1	1			1	1	
3/11	0,5/4,5	1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	3	1	
5	2	2	
6	3,5	2	
7	1,6	2	
8	1,5	3	

SAMPLING JOURNAL **Page nr: 10 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/498	12.04.2010	4,232883	-1,833767	498 m

Weather: sunny 33^0C	Wind: light breeze	Wave height (m):
Time Start: 08:00	Time Finish: 14:28	Duration: 6 hr 28 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand and silt (pellite)	
Color: Gley 1 2,55/10Y Greenish black	Odor:
Observation of animals: polychaetes	
Observation of oil, waste etc:	No. rejected samples: 2 misses

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	4/9	1	1	1	1	1	1	1 NO	1 GH	1	1	short
2/10	9/9	1	1	1	1	1	1			1	1	Long armed Van Veen grab
3/11	6/9	1	1	1	1	1	1			1	1	Long armed Van Veen grab

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	10	1	short
5	9	1	Long armed Van Veen grab
6	10	1	Long armed Van Veen grab
7	10,5	1	Long armed Van Veen grab
8	8,5	1	Long armed Van Veen grab

SAMPLING JOURNAL **Sign. In :** **Page nr: 11 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/1029	12.04.2010	4,171767	-1,8398	1029 m

Weather: overcast	Wind:	Wave height (m):
Time Start: 16:00	Time Finish: 01:00	Duration: 9 hr
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: Clay, pellite	
Color: 5Y 4/1 Dark grey	Odor: -
Observation of animals: Ophiuroids	
Observation of oil, waste etc: -	No. rejected samples: 2 missed

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	9/10	1	1	1	1	1	1	1 NO	1 GH	1	1	Organic
2/10	11/6	1	1	1	1	1	1			1	1	
3/11	Full/full	1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	Long arm Van Veen grab extra weight
5	Full	1	1 missed with no extra weight
6	Full	1	
7	9	1	
8	Full	1	

SAMPLING JOURNAL **Sign. In :** **Page nr: 12 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/260	13.04.2010			260 m

Weather: Sunny 35^{0}C	Wind:	Wave height (m):
Time Start: 09:35	Time Finish: 14:20	Duration: 4 hr 45 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand and silt	
Color: 5Y 3 Dark olive grey	Odor: -
Observation of animals: Ophiuroidea	
Observation of oil, waste etc: -	No. rejected samples: 1 miss

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	7/8	1	1	1	1	1	1	1 NO	1 GH	1	1	1 Organic
2/10	10,25/11	1	1	1	1	1	1			1	1	
3/11	12,5/9	1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	10,5	1	Short arm Van Veen
5	12	1	
6	9	1	
7	10	1	
8	10	1	

SAMPLING JOURNAL **Sign. In :** **Page nr: 13 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC1/109	13.04.2010	4,35095	-1,8196	109 m

Weather: Sunny 36^{0}C	Wind: Breeze	Wave height (m):
Time Start: 15:00	Time Finish: 17:45	Duration: 2 hr 45 min
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand and shell sand	
Color: 2,5Y 4/2 dark grayish brown	Odor: -
Observation of animals: Ophiuroidea and polychaeta	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/12	10/12	1	1	1	1	1	1	1 NO	1 GH	1	1	
2/13	11/11	1	1	1	1	1	1			1	1	
3/14	12/10	1	1	1	1	1	1			1	1	organic

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	11	2	
5	11	3	
6	11	3	
7	9	3	
8	12	3	

SAMPLING JOURNAL **Page nr: 14 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/25	15.04.2010	5,081583	-0,977383	25 m

Weather: sunny	Wind: Light breeze	Wave height (m):
Time Start: 16:50	Time Finish: 19:30	Duration: 2 hr 40 min
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: fine sand	
Color: 2.5Y 4/1 Dark grey	Odor: -
Observation of animals: Poychaeta	
Observation of oil, waste etc: -	No. rejected samples: 2 empty(no extra w)

Sample nr	Volume (cm)		Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9			1	1	1	1	1	1	1 NO	1 GH	1	1	Short arms + extra weights
2/10			1	1	1	1	1	1			1	1	Org.
3/11			1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	12	2	Extra weights
5	15,5	1	
6	15,5	4	0,5 mm 2 bottles
7	12,5	5	
8	13	5	

SAMPLING JOURNAL **Page nr: 15 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/51	15.04.2010	4,794217	-0,835883	51 m

Weather:	Wind:	Wave height (m):
Time Start:	Time Finish:	Duration:
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab short (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Fine sand and clay	
Color: 5Y 4/2 olive gray	Odor: -
Observation of animals: Ophiuroids	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/12	12/10	1	1	1	1	1	1	1 NO	1 GH	1	1	
2/13	11/14	1	1	1	1	1	1			1	1	
3/14	10/9	1	1	1	1	1	1			1	1	

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	11	2	
5	15	1	
6	15	2	
7	7,5	5	0,5 mm 1 bottle long arm extra weight
8	8	4	0,5 mm 1 bottle long arm extra weight

SAMPLING JOURNAL **Page nr: 16 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/101	18.04.2010	4,6788	-0,786833	101 m

Weather: sunny, some clouds	Wind:	Wave height (m):
Time Start: 18.15	Time Finish: 11.30	Duration: 3hr 15 min
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: sand/silt	
Color: 2.5Y 4/2 dark grayish brown	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	11	1		1		1		1		1		
2	full	1		1		1				1		
3	full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	full	2	Long arm grab, extra weight
5	full	2	
6	full	3	Long arm grab, no extra weight
7	full	2	
8	2	2	

SAMPLING JOURNAL **Page nr: 17 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/250	18.04.2010	4,640817	-0,765517	250 m

Weather: sunny, some clouds	Wind:	Wave height (m):
Time Start: 12.05	Time Finish: 16.45	Duration:
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: sand/silt	
Color: 5Y 3/2 dark olive gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples: 0, Miss: 3

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1/9	8	1		1		1				1		
2/10	9	1		1		1		1		1		
3/11	5.5	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	9	3	Long arm grab, no extra weight
5	9	2	
6	7	2	
7	7.5	3	
8	8	2	

SAMPLING JOURNAL **Page nr: 18 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/507	18/19.04.2010	4,625233	-0,755667	507 m

Weather: sunny, some clouds	Wind:	Wave height (m):
Time Start: 16.45/08.35	Time Finish: 19.20/14.50	Duration: 8 hr50 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (Extra weights) and 1mm sieve (round holes)		

Type of bottom sediment: fine sand/silt	
Color: 5Y 3/2 dark olive gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples: 6, miss: 4

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	14	1		1		1				1		
2	12	1		1		1		1		1		
3	full	1		1		1				1		Surface partly broken

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	full	2	Long arm grab, extra weight
5	7	1	First attempt without extra weights had one miss the rest were
6	4	1	with extra weights 6 samples contained only coral fragments and /
7	15	1	or small amounts of sediments and was therefore rejected.
8	4	1	

SAMPLING JOURNAL **Page nr: 19 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
GC2/1055	19/20.04.2010	4,612633	-0,745617	1055 m

Weather: sunny	Wind:	Wave height (m):
Time Start: 15.10/09.20	Time Finish: 19.25/13.45	Duration:
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: clay/silt	
Color: 5Y 4/1 dark gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples: 0, miss: 2

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	4	1		1		1				1		Chemical without extra weight
2	full	1		1		1		1		1		
3	10	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	Long arm grab, biologi with extra weights
5	Full	1	
6	Full	1	
7	Full	1	
8	Full	1	

SAMPLING JOURNAL **Page nr: 20 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
SPW/25	21.04.2010	5,0791	-1,021117	25 m

Weather: sunny, some clouds	Wind:	Wave height (m):
Time Start: 18.00	Time Finish: 18.45	Duration:
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: sand with shells	
Color: 5Y 4/2, olive gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	10,5	1		1		1		1		1		
2	8,5	1		1		1				1		
3	12	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, no extra weight
4	7,5	8	
5	7,5	3	
6	11	6	
7	10	2	
8	10	4	

SAMPLING JOURNAL **Page nr: 21 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
SPN/24	21.04.2010	5,094467	-1,004317	24 m

Weather: no rain calm4	Wind:	Wave height (m):
Time Start: 19.05	Time Finish: 19.47	Duration: 42 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: fine sand	
Color: 2,5Y 3/1, very dark gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	10	1		1		1		1		1		
2	11	1		1		1				1		
3	8,5	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, no extra weight
4	9	2	
5	10	3	
6	9	8	
7	10,5	6	
8	7,5	15	

SAMPLING JOURNAL **Page nr: 22 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
SPE/26	21.04.2010	5,079767	-0,988683	26 m

Weather: no rain	Wind:	Wave height (m):
Time Start: 20.10	Time Finish: 21.10	Duration: 1 hr
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: coarse sand with shell	
Color: 2,5Y 4/2, dark grayish brown	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	9	1		1		1				1		
2	8	1		1		1		1		1		
3	6,5	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, no extra weight
4	9,5	11	
5	8	22	
6	10	8	
7	7,5	15	
8	8	15	

SAMPLING JOURNAL **Page nr: 23 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
SPS/27	21.04.2010	5,065567	-1,005733	27 m

Weather: no rain	Wind:	Wave height (m):
Time Start: 22.00	Time Finish: 22.40	Duration: 40 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: fine sand	
Color: 5Y 3/2, dark olive gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	15	1		1		1		1		1		
2	11	1		1		1				1		
3	10	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, no extra weight
4	10,5	1	
5	7,5	2	
6	6,5	1	
7	9	1	
8	9	1	

SAMPLING JOURNAL **Page nr: 24 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
MA Deep 2-1/1366	22,23.04.2010	4,513483	-2,904983	1366 m

Weather:	Wind:	Wave height (m):
Time Start: 12:10 / 08:15	Time Finish: 14:40 / 09:00	Duration: 3 hr 15 min
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: Clay	
Color: 5 GY / 4 Dark greenish gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	full	1		1		1		1 No		1		
2	full	1		1		1				1		
3	full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	full	1	Long arm grab + extra weights
5	full	1	
6			
7			
8			

SAMPLING JOURNAL **Page nr: 25 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
MA Deep 2-2/1424	22.04.2010	4,5134	-2,916367	1424 m

Weather: sunny	Wind:	Wave height (m):
Time Start: 14.50	Time Finish: 17.30	Duration: 2 hr 40 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab short (no Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: clay/silt	
Color: GLEY1 3/5GY, very dark greenish gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	14	1		1		1				1		
2	Full	1		1		1		1		1		
3	Full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks:
4	Full	1	Long arm grab, extra weight
5	Full	1	
6			
7			
8			

SAMPLING JOURNAL **Page nr: 26 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
MA Deep 2-3/1387	22.04.2010	4,513317	-2,89065	1387 m

Weather: sunny	Wind:	Wave height (m):
Time Start: 18.00	Time Finish: 20.35	Duration: 2 hr 35 min
Sample equipment used (name, bite area, weight): 0,1m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: clay	
Color: GLEY1 4/5GY, dark greenish gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	Full	1		1		1		1		1		Broken surface on all chem.
2	Full	1		1		1				1		
3	Full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, extra weight
4			
5			
6			
7			
8			

SAMPLING JOURNAL **Page nr: 27 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
MA Deep 2-4/1600	22.04.2010	4,513617	-2,934383	1600 m

Weather: no rain	Wind:	Wave height (m):
Time Start: 21.00	Time Finish: 00.00	Duration: 3 hr
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: clay	
Color: GLEY1 4/5GY, dark greenish gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	Full	1		1		1				1		Broken surface on all chem.
2	Full	1		1		1		1		1		
3	Full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, extra weight SPS
4			
5			
6			
7			
8			

SAMPLING JOURNAL **Page nr: 28 of**

Vessel: R/V Dr. Fridtjof Nansen	Area: Ghana central	Project code: 11596-39	Survey nr: 2010403

Grab station nr.	Date	Position		Depth (m)
		Latitude	Longitude	
MA Deep 2-5/1361	23.04.2010	4,51355	-2,90015	1361 m

Weather: no rain	Wind:	Wave height (m):
Time Start: 00.20	Time Finish: 07.45	Duration: 7 hr 25 min
Sample equipment used (name, bite area, weight): 01m^2 Van Veen Grab long (Extra weight) and 1mm sieve (round holes)		

Type of bottom sediment: clay	
Color: GLEY1 4/5GY, dark greenish gray	Odor: -
Observation of animals:	
Observation of oil, waste etc: -	No. rejected samples:

Sample nr	Volume (cm)	Hydrocarbons Norway/Ghana		Heavy metal Norway/Ghana		PCB Norway/Ghana		Sediment granulometry		Pesticides Nor/Ghana		Remarks:
1	full	1		1		1		1		1		Broken surface on all chem.
2	full	1		1		1				1		
3	full	1		1		1				1		

Sample nr	Volume (cm)	No containers bottom fauna	Remarks: long arm grab, extra weight
4	full	1	
5	full	1	
6	full	1	
7	full	1	
8	full	1	