

FOR COLLATING CENTRE USE

**CRUISE SUMMARY REPORT**

Centre: DOD Ref. No.:

Is data exchange restricted  Yes  In part  No**SHIP** enter the full name and international radio call sign of the ship from which the data were collected, and indicate the type of ship, for example, research ship; ship of opportunity, naval survey vessel; etc.Name: PolarsternCall Sign: DBLKType of ship: Research VesselCRUISE NO. / NAME PS70/ ARK XXII/1a

enter the unique number, name or acronym assigned to the cruise (or cruise leg, if appropriate).

CRUISE PERIOD start 29/05/2007 to 21/06/2007 end  
(set sail) day/ month/ year day/ month/ year (return to port)PORT OF DEPARTURE (enter name and country) Bremerhaven, GermanyPORT OF RETURN (enter name and country) Tromsø, Norway**RESPONSIBLE LABORATORY** enter name and address of the laboratory responsible for coordinating the scientific planning of the cruiseName: Alfred Wegener Institute (AWI)Address: Am Handelshafen12, 27570 BremerhavenCountry: Germany**CHIEF SCIENTIST(S)** enter name and laboratory of the person(s) in charge of the scientific work (chief of mission) during the cruise.Prof. Dr. Jörn Thiede (AWI)**OBJECTIVES AND BRIEF NARRATIVE OF CRUISE** enter sufficient information about the purpose and nature of the cruise so as to provide the context in which the report data were collected.

RV "Polarstern" cruise PS ARK XXII/1a

**Deep water coral reef and carbonate mound systems**

This cruise leg of RV "Polarstern" was part of the EU funded project HERMES (Hotspot Ecosystem Research on the Margins of European Seas), an integrated project aiming at research on ecosystems lying in the deeper ocean section. At the same time it contributes to the coordinated activities carried out during the International Polar Year (IPY) in 2007. The shipboard scientific party consisted out of participants from Belgium, Germany, Norway, Spain and the United Kingdom.

Major aim was to further improve our understanding of the structure, functioning and dynamics of deep-water coral ecosystems under different trophic regimes and under different climatic settings. The results of the cruise will contribute to investigations on the change of biodiversity which affected deep-water coral ecosystems during the last glacial-interglacial cycle and to forecast how the ecosystem may react to future environmental change. To study the links between deep-water circulation patterns and the likely geosphere-biosphere coupling of deep-water coral ecosystems in hydrocarbon provinces. The overall aim is to analyse and minimise the negative impacts of human activities on deep-water coral ecosystems through provision of mitigation options, risk assessments and recommendations for management and conservation.

Because natural drivers controlling these ecosystems (physical forcing factors) there is a need to:

- identify and define physical processes and local hydrodynamic regimes at coral sites,
- analyse the origin, quality and quantity of organic carbon.

In order to assess the biodiversity, to better understand ecosystem functioning and to develop a model relating coral growth to global change it was intended to:

- map the phenotypic and genotypic diversity (site specific) and gene flow (margin wide) in deep water coral systems,
- to generate GIS-based habitat maps which combine biological, geological and hydrographical data,
- Quantify skeletal growth rates, carbonate production and sedimentary accumulation,
- Establish a time frame model for the evolution of deep-water coral ecosystems related to global change (include documentation of estimate of human impacts and recovery rates from these).

Furthermore; ecosystem functioning and dynamics was one issue being addressed during the cruise. The data which was collected will be used to assess species variety in modern coral ecosystems thriving under contrasting trophic regimes and compare with environmental conditions at the last glacial maximum. Thus, food and nutrient utilisation will be analysed and a food-web model for deep-water coral ecosystems is to be developed. Central study sites were the Sula Reef, the Røst Reef, the Traena Reef, the Floholmen area close to the Lofoten and Sotbakken reef. Among others, studies on species relationships such as symbiosis, parasitism and predator-prey interactions from microbial to vertebrate scales were carried out during the "Polarstern" cruise in 2007. In an integrative manner the results will serve for a deep-water coral system model along trophic gradients to be carried out in conjunction with other workpackages in HERMES.

**PROJECT (IF APPLICABLE)** if the cruise is designated as part of a larger scale cooperative project (or expedition), then enter the name of the project, and of organisation responsible for co-ordinating the project.

**Project name:** HERMES - IPY : The Northern Margins

**Coordinating body:** AWI

**PRINCIPAL INVESTIGATORS:** Enter the name and address of the Principal Investigators responsible for the data collected on the cruise and who may be contacted for further information about the data. (The letter assigned below against each Principal Investigator is used on pages 2 and 3, under the column heading 'PI', to identify the data sets for which he/she is responsible)

**A. Prof. Dr. Jörn Thiede, Alfred-Wegener-Institut (AWI), Am Handelshafen 12, 27570 Bremerhaven, Germany**

**B. Prof. Dr. Laurenz Thomsen, Jacobs University Bremen, Campusring 1, 28759 Bremen, Germany**

**C. Dr. Friederike Hoffmann, Max Planck Institut, Celsiusstr. 1, 28359 Bremen, Germany**

**D. Dr. Jason Hall-Spencer, University of Plymouth, Devon, PL4 8AA, United Kingdom**

**E. Dr. Sascha Flögel, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany**

**F. Dr. Karen Hissmann, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany**

**G. Dr. Christiane Todt, University of Bergen, HIB – Thormøhlensgt. 55, N – 5020 Bergen, Norway**

## MOORINGS, BOTTOM MOUNTED GEAR AND DRIFTING SYSTEMS

This section should be used for reporting moorings, bottom mounted gear and drifting systems (both surface and deep) deployed and/or recovered during the cruise. Separate entries should be made for each location (only deployment positions need be given for drifting systems). This section may also be used to report data collected at fixed locations which are returned to routinely in order to construct 'long time series'.

PI See top of page.	APPROXIMATE POSITION						DATA TYPE enter code(s) from list on cover page.	DESCRIPTION Identify, as appropriate, the nature of the instrumentation the parameters (to be measured, the number of instruments and their depths, whether deployed and recovered, dates of deployments and/or recovery, and any identifiers given to the site.
	LATITUDE			LONGITUDE				
deg	min	N/S	deg	min	E/W			
B	67	31.75	N	009	31.06	E	G71	<b>ParticleDynamics Sensor system (sediment trap, particle sizer, ADCP, CTD, turbidity)</b>
B	66	58.10	N	011	08.06	E	G71	<b>ParticleDynamics Sensor system (sediment trap, particle sizer, ADCP, CTD, turbidity)</b>
B	67	30.03	N	009	24.53	E	G71	<b>ParticleDynamics Sensor system (sediment trap, particle sizer, ADCP, CTD, turbidity)</b>

Please continue on separate sheet if necessary

## SUMMARY OF MEASUREMENTS AND SAMPLES TAKEN

Except for the data already described on page 2 under 'Mooring, Bottom Mounted Gear and Drifting Systems', this section should include a summary of all data collected on the cruise whether they be measurements (e.g. temperature, salinity values) or samples (e.g. cores, net hauls).

Separate entries should be made for each distinct and coherent set of measurements or samples. Different modes of data collection (e.g. vertical profiles as opposed to underway measurements) should be clearly distinguished, as should measurements/sampling techniques that imply distinctly different accuracy's or spatial/temporal resolutions. Thus, for example, separate entries would be created for i) BT drops, ii) water bottle stations, iii) CTD casts, iv) towed CTD, v) towed undulating CTD profiler, vi) surface water intake measurements, etc.

Each data set entry should start on a new line – its description may extend over several lines if necessary.

NO, UNITS : for each data set, enter the estimated amount of data collected expressed in terms of the number of 'stations'; miles' of track; 'days' of recording; 'cores' taken; net 'hauls'; balloon 'ascents'; or whatever unit is most appropriate to the data. The amount should be entered under 'NO' and the counting unit should be identified in plain text under 'UNITS'.

PI	NO	UNITS	DATA TYPE	DESCRIPTION
see page 2	see above	see above	Enter code(s) from list on cover page	Identify, as appropriate, the nature of the data and of the instrumentation/sampling gear and list the parameters measured. Include any supplementary information that may be appropriate, e. g. vertical or horizontal profile, depth horizons, continuous recording or discrete samples, etc. For samples taken for later analysis on shore, indication should be given of the type of analysis planned, i.e. the purpose for which the samples were taken.
A	20	days	H71	Water temperature and salinity with hull mounted sensors of the ship
E	36	stations	H09	Rosette water sampler
E	36	stations	H10	CTD casts for conductivity, temperature and depth measurements
C	3	dives	B16	Cold water corals and associated bacteria sampled <i>en route</i> with submersible
D	20	dives	B18	Zoobenthos sampling with manned submersible during dives
D	42	stations	G02	Macrozoobenthos sampling with Van Veen grab
C, G	16	stations	G04	Macrozoobenthos sampling with large box corer (50x50 cm)
C, G	33	stations	G04	Sediment core sampling with gravity corer (17 without recovery)
A, B	3	nm	G08	Bottom photography with towed video sled
F	20	dives	G71	Manned submersible JAGO
A	52	nm	G73	Calibration of hard- and software of new installed sediment profiling Parasound sonar
A	603	nm	G74	Seafloor mapping with Hydrosweep

**TRACK CHART:** You are strongly encouraged to submit, with the completed report, an annotated track chart illustrating the route followed and the points where measurements were taken.

Insert a tick(✓) in this box if a track chart is supplied



**GENERAL OCEAN AREA(S):** Enter the names of the oceans and/or seas in which data were collected during the cruise – please use commonly recognised names (see, for example, International Hydrographic Bureau Special Publication No. 23, 'Limits of Oceans and Seas').

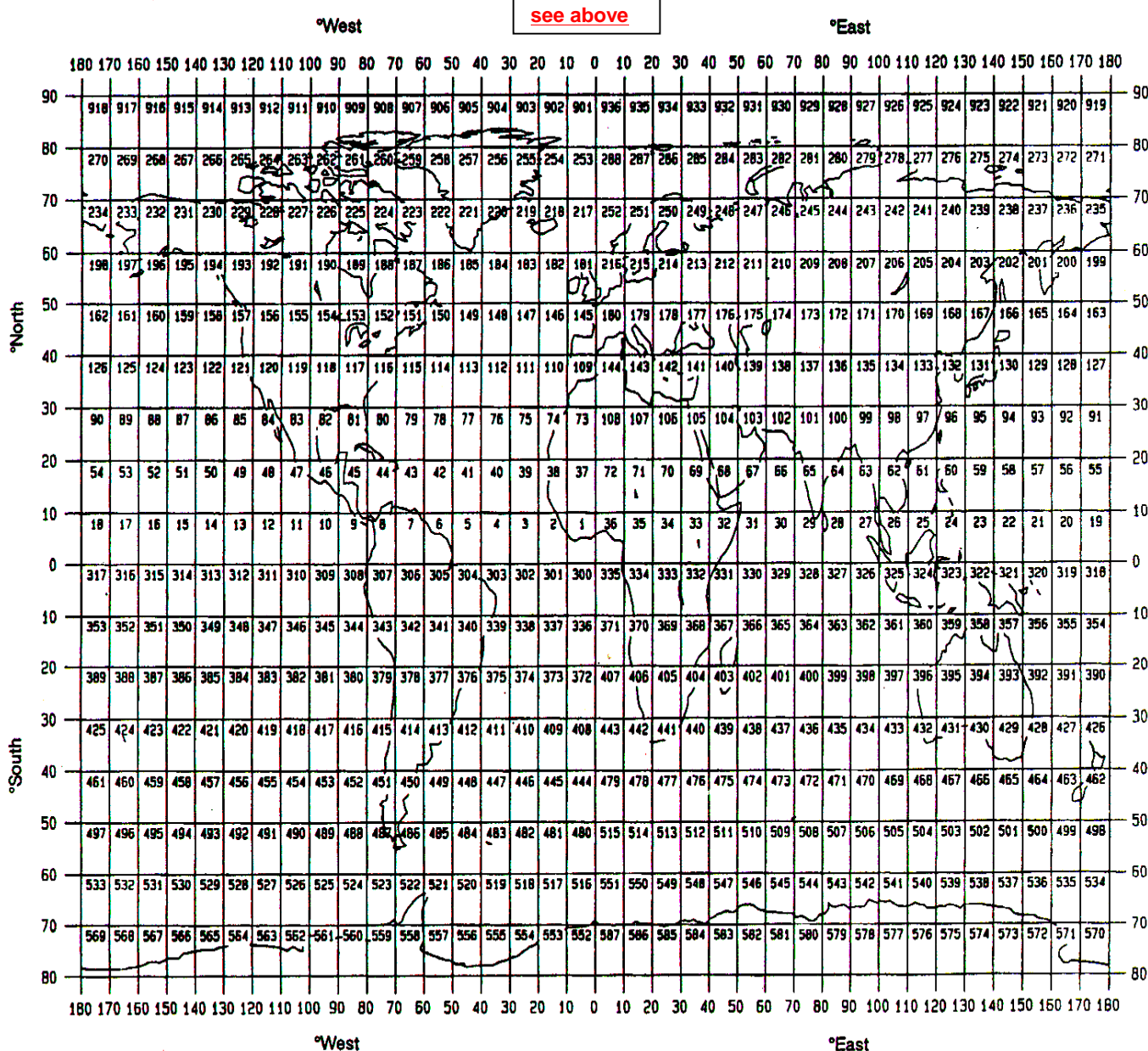
North Atlantic, Norwegian Sea

**SPECIFIC AREAS:** If the cruise activities were concentrated in a specific area(s) of an ocean or sea, then enter a description of the area(s). Such descriptions may include references to local geographic areas, to sea floor features, or to geographic coordinates.

**Please insert here the number of each square in which data were collected from the below given chart**

251, 252, 287

**GEOGRAPHIC COVERAGE - INSERT 'X' IN EACH SQUARE IN WHICH DATA WERE COLLECTED**



**THANK YOU FOR YOUR COOPERATION**

Please send your completed report without delay to the collating centre indicated on the cover page

