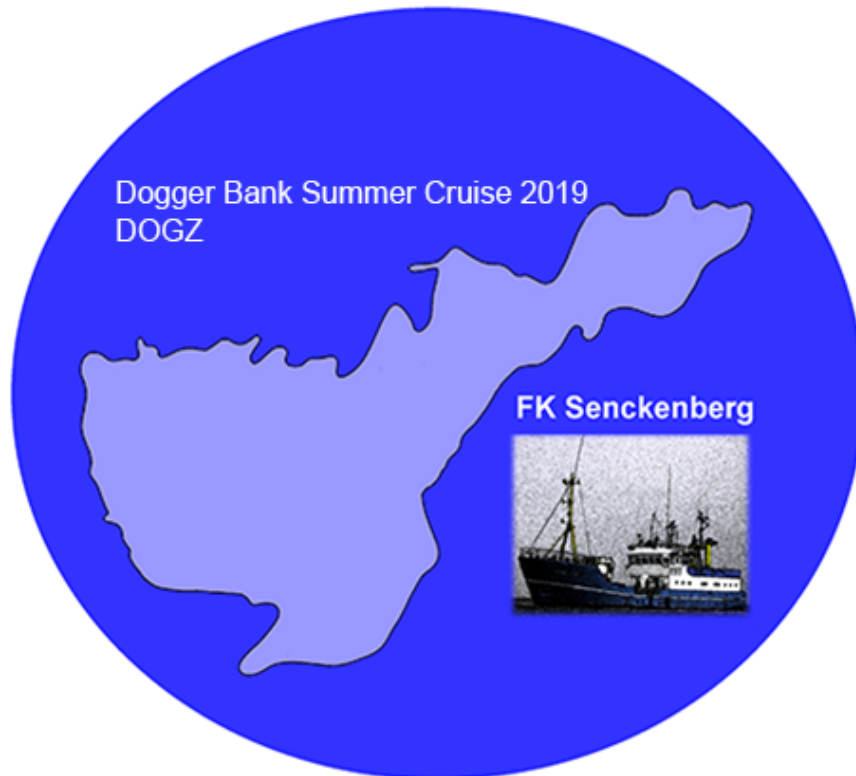


SENCKENBERG

Report on the 2019 Dogger Bank cruise with FK Senckenberg

29.07. – 02. 08. 2019



DR. MORITZ SONNEWALD
Senckenberg Research Institute and Natural History Museum

Contents:

1. Aims and setting
2. Narrative
3. Methods
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1. Aims and setting

The interannual variability of the epibenthic fauna of the Dogger Bank is a long term project of the Senckenberg Research Institute since 1991. This project aims at gathering basic data which is used for understanding presumed environmental changes. Therefore the study refers to 37 stations (see map in Annex) that are, whenever possible, sampled on a yearly basis in the same season with the same gear. The fauna is recorded quantitatively from each sample in order to allow studies on relative abundance. Additionally, temperature and current parameters are recorded to correlate with faunal composition and species abundances.

The present cruise forms the 26th of the series and gets the suffix DOG-Z. All former cruises were labelled after the alphabet with one letter starting with DOG-A in 1992. The first in 1991 was called DOG without any suffix.

This cruise was conducted by the Department for Marine Zoology at the Senckenberg Institute in Frankfurt am Main.

2. Narrative

The cruise started on Monday, 2019-07-29. On 10:45 CEST (UTC+1), the vessel left the shipyard and headed towards the main working area, the Doggerbank.

Station 14 (see station map) at British waters was reached on July 30, 2019 at 12:00 CEST and working started immediately after arrival. At this and the following stations, the following technique was used: First, a CTD probe was used to measure the bottom temperature and salinity. Then, a standardized epi- and endobenthic sampling with the Ring Dredge was performed. Subsequently, one sample with a 2 m beam-trawl was taken, towed for 2 kn of speed on a length of one nautical mile (for more information see methods, chapter 3). On this and the following days these procedures took place on stations 03 to 08 and 13 (see station map, chapter 4). At station 09, we began the same procedure on August 01 at 08:00 CEST, but during beam trawl sampling, a security bracing at the crane broke towards the end of the towed distance. The beam trawl was secured and the catch evaluated. No harm to personnel occurred but the cruise had to be immediately stopped due to security reasons. Thus, sampling at the Dogger Bank had to stop on August 01, 2019 at 08:40 CEST due to the mentioned damage. FK Senckenberg headed back to Wilhelmshaven. The vessel was moored at Wilhelmshaven port on August 02, 2019 at 17:20 CEST.

The exact sequence of stations sampled can be seen at the station list (annex 1).

3. Methods:

For the measurement of the temperature and salinity of the water column, a CTD probe was lowered to the seafloor, recording while being hauled again.

Standard endobenthic sampling was performed with the Ring Dredge, being towed over the ground for approximately three minutes per station. The samples were recorded qualitatively on board ship, only few material was preserved for later analysis.

Epibenthos was collected with a 2m beam trawl with a tickler chain and a chain in the bottom rope. The minimum mesh size in the cod-end was 1 cm², so that animals above that size were collected quantitatively. The trawl was towed for 1 nautical mile at a speed of 2 knots. The sample was secured quantitatively (as far as possible) and washed through a set of sieves with 1 cm maximum and 1 mm minimum mesh size, respectively. The 1 cm-fraction

was identified and counted on board the vessel, organisms not readily identifiable were preserved and taken back to the home laboratory. The smaller fractions were also preserved and taken back for qualitative analysis.

4. Station map



Fig. 1 Station map. Black dots: stations. Yellow line: ship course.

CRUISE SUMMARY REPORT

FOR COLLATING CENTRE USE

Centre:

Is data exchange Yes In part No
restricted

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: Senckenberg

Call Sign: DDAW

Type of ship: Research cutter

CRUISE NO. / NAME DOGZ

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

CRUISE PERIOD start 29/07/2019 to 02/08/2019 end
(set sail) day/ month/ year day/ month/ year (return to port)

PORT OF DEPARTURE (enter name and country) Wilhelmshaven, Germany

PORT OF RETURN (enter name and country) Wilhelmshaven, Germany

RESPONSIBLE LABORATORY enter name and address of the laboratory responsible for coordinating the scientific planning of the cruise

Name: Senckenberg Research Institute

Address: Senckenberganlage 25, 60325 Frankfurt a. M.

Country: Germany

CHIEF SCIENTIST(S) enter name and laboratory of the person(s) in charge of the scientific work (chief of mission) during the cruise.

Dr. Moritz Sonnewald, Senckenberg Research Institute

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.

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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: Dogger Bank epibenthos long term monitoring cruise

Coordinating body: Prof. Dr. Angelika Brandt

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. Dr. Moritz Sonnewald, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany

B. Prof. Dr. Angelika Brandt, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany

C.

D.

E.

MOORINGS, BOTTOM MOUNTED GEAR AND DRIFTING SYSTEMS

None

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/or recovered, dates of deployments and/or recovery, and any identifiers given to the site. |
|------------------------------|----------------------|-----|-----|-----------|-----|--|--|--|---|
| | LATITUDE | | | LONGITUDE | | | | | |
| deg | min | N/S | deg | min | E/W | | | | |
| | | | | | | | | | Please continue on separate sheet if necessary |

SUMMARY OF MEASUREMENTS AND SAMPLES TAKEN See station list in report

Except for the data already described on page 2 under 'Moorings, 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 – it's 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 see page 2 | NO see above | UNITS see above | DATA TYPE Enter code(s) from list on cover page | DESCRIPTION |
|------------------------|--------------------|-----------------------|---|---|
| | | | | 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 profiles, depth horizons, continuous recording or discrete samples, etc. For samples taken for later analysis on shore, an indication should be given of the type of analysis planned, i.e. the purpose for which the samples were taken. |
| A | 40 | 14254 | H10 | CTD Data on temperature and salinity in relation to water depth |
| A | 49 | 49 | B18, B53 | Sampling of the epibenthos with the beam trawl |
| A | 49 | 49 | G01, B18 | Benthos sampling by ring dredge |

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 Sea

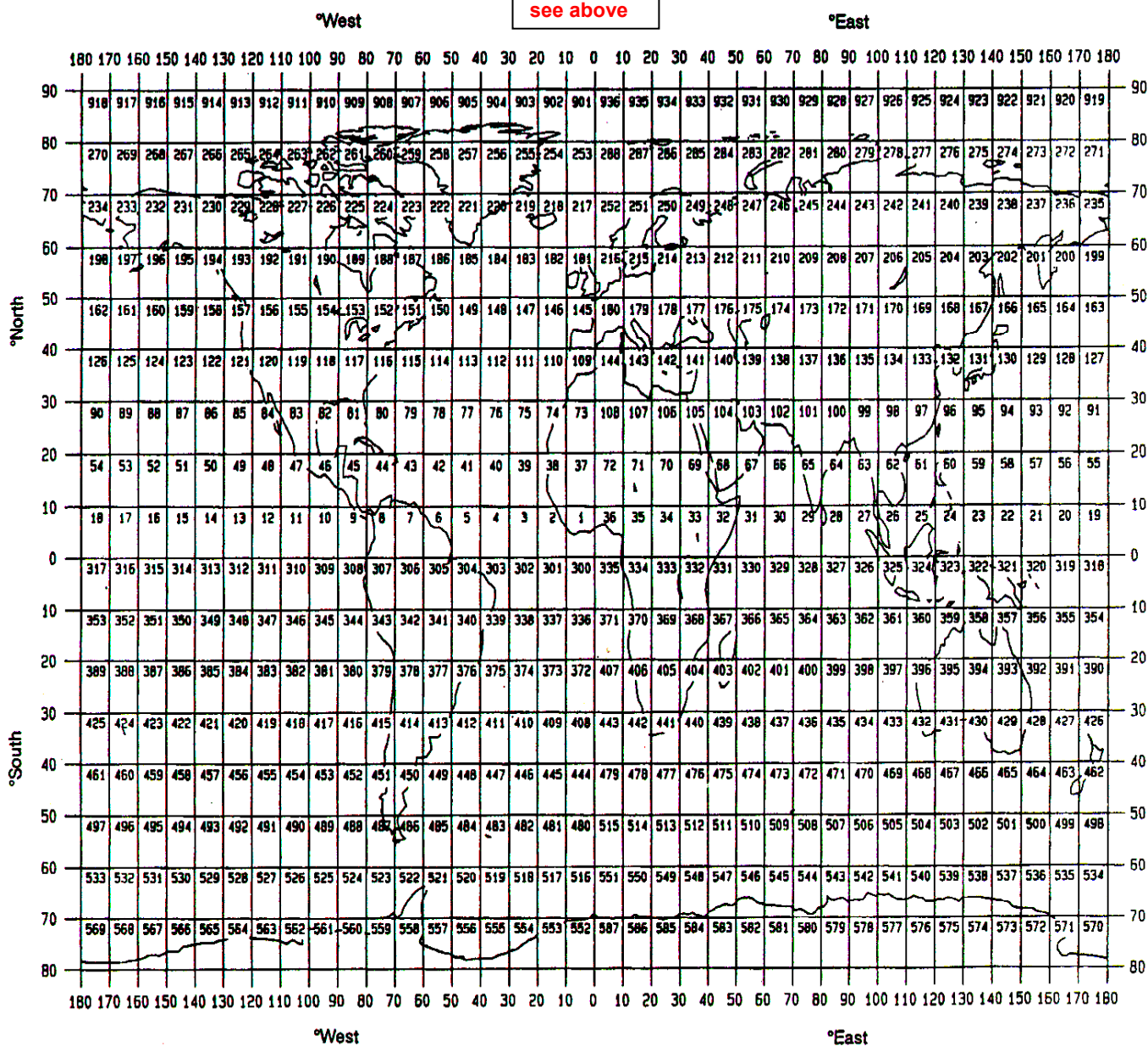
SPECIFIC AREAS: If the cruise activities were concentrated in a specific area(s) of an ocean or sea, then enter a description of the area(s). Such descriptions may include references to local geographic areas, to sea floor features, or to geographic coordinates.

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

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

see above



THANK YOU FOR YOUR COOPERATION

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

**Annex 1: Stations of Dogger Bank Summer Cruise, August 2019 (DOGZ)
with R.V. SENCKENBERG. All times UTC+1.**

Abbreviations:

Ku = 2 m beam trawl

Rd = ring dredge

CTD = CTD probe

| Date | Station | Device | Time | Event | Lat | Long | Depth [m] |
|------------|---------|--------|-------|------------|-------------|------------|-----------|
| 30.07.2019 | DOGZ-14 | CTD | 12:02 | on ground | 54°30,934'N | 2°40,096'E | 23,2 |
| 30.07.2019 | DOGZ-14 | Rd | 12:09 | on ground | 54°31,068'N | 2°40,093'E | 23,3 |
| 30.07.2019 | DOGZ-14 | Rd | 12:13 | off ground | 54°31,139'N | 2°40,155'E | 23,3 |
| 30.07.2019 | DOGZ-14 | Ku | 12:27 | on ground | 54°31,055'N | 2°40,287'E | 23,2 |
| 30.07.2019 | DOGZ-14 | Ku | 12:52 | off ground | 54°41,757'N | 2°41,560'E | 24,5 |
| 30.07.2019 | DOGZ-13 | Rd | 14:46 | on ground | 54°27,256'N | 2°15,826'E | 18,2 |
| 30.07.2019 | DOGZ-13 | Rd | 14:48 | off ground | 54°27,332'N | 2°15,883'E | 18,1 |
| 30.07.2019 | DOGZ-13 | CTD | 14:55 | on ground | 54°27,499'N | 2°15,932'E | 18,3 |
| 30.07.2019 | DOGZ-13 | Ku | 15:11 | on ground | 54°27,284'N | 2°16,040'E | 18,4 |
| 30.07.2019 | DOGZ-13 | Ku | 15:39 | off ground | 54°28,041'N | 2°17,233'E | 19 |
| 30.07.2019 | DOGZ-04 | CTD | 17:28 | on ground | 54°29,041'N | 1°51,806'E | 21 |
| 30.07.2019 | DOGZ-04 | Rd | 17:34 | on ground | 54°29,127'N | 1°52,036'E | 21,2 |
| 30.07.2019 | DOGZ-04 | Rd | 17:38 | off ground | 54°29,194'N | 1°52,237'E | 21 |
| 30.07.2019 | DOGZ-04 | Ku | 17:54 | on ground | 54°29,191'N | 1°51,935'E | 21 |
| 30.07.2019 | DOGZ-04 | Ku | 18:20 | off ground | 54°29,713'N | 1°53,415'E | 22 |
| 31.07.2019 | DOGZ-03 | CTD | 08:02 | on ground | 54°36,368'N | 1°54,620'E | 24 |
| 31.07.2019 | DOGZ-03 | Rd | 08:09 | on ground | 54°36,309'N | 1°54,899'E | 24 |
| 31.07.2019 | DOGZ-03 | Rd | 08:12 | off ground | 54°36,293'N | 1°55,036'E | 24,5 |
| 31.07.2019 | DOGZ-03 | Ku | 08:27 | on ground | 54°36,288'N | 1°54,714'E | 24 |
| 31.07.2019 | DOGZ-03 | Ku | 08:52 | off ground | 54°35,675'N | 1°56,075'E | 23 |
| 31.07.2019 | DOGZ-05 | CTD | 10:05 | on ground | 54°37,087'N | 1°41,650'E | 25,5 |
| 31.07.2019 | DOGZ-05 | Rd | 10:11 | on ground | 54°37,110'N | 1°41,730'E | 24 |
| 31.07.2019 | DOGZ-05 | Rd | 10:14 | off ground | 54°37,078'E | 1°41,844'E | 24 |
| 31.07.2019 | DOGZ-05 | Ku | 10:30 | on ground | 54°37,150'N | 1°41,630'E | 25 |
| 31.07.2019 | DOGZ-05 | Ku | 11:00 | off ground | 54°36,606'N | 1°43,070'E | 22 |
| 31.07.2019 | DOGZ-06 | CTD | 12:18 | on ground | 54°45,525'N | 1°43,451'E | 25,8 |
| 31.07.2019 | DOGZ-06 | Rd | 12:23 | on ground | 54°45,473'N | 1°43,535'E | 26,1 |
| 31.07.2019 | DOGZ-06 | Rd | 12:28 | off ground | 54°45,337'N | 1°43,703'E | 26 |
| 31.07.2019 | DOGZ-06 | Ku | 12:45 | on ground | 54°45,868'N | 1°43,396'E | 25,8 |
| 31.07.2019 | DOGZ-06 | Ku | 13:13 | off ground | 54°45,129'N | 1°44,745'E | 29,1 |
| 31.07.2019 | DOGZ-07 | CTD | 14:57 | on ground | 54°48,191'N | 1°25,959'E | 28,2 |
| 31.07.2019 | DOGZ-07 | Rd | 15:03 | on ground | 54°48,105'N | 1°26,117'E | 28,5 |
| 31.07.2019 | DOGZ-07 | Rd | 15:08 | off ground | 54°47,972'N | 1°26,353'E | 28,9 |
| 31.07.2019 | DOGZ-07 | Ku | 15:27 | on ground | 54°48,271'N | 1°25,077'E | 24,8 |
| 31.07.2019 | DOGZ-07 | Ku | 15:54 | off ground | 54°47,703'N | 1°26,521'E | 26,2 |

| | | | | | | | |
|------------|---------|-----|-------|------------|-------------|------------|------|
| 31.07.2019 | DOGZ-08 | CTD | 17:00 | on ground | 54°54,313'N | 1°18,076'E | 33,1 |
| 31.07.2019 | DOGZ-08 | Rd | 17:09 | on ground | 54°54,038'N | 1°18,076'E | 33,1 |
| 31.07.2019 | DOGZ-08 | Rd | 17:12 | off ground | 54°53,038'N | 1°18,315'E | 32,5 |
| 31.07.2019 | DOGZ-08 | Ku | 17:31 | on ground | 54°53,582'N | 1°19,330'E | 31,2 |
| 31.07.2019 | DOGZ-08 | Ku | 17:58 | off ground | 54°52,881'N | 1°18,465'E | 31,2 |
| 01.08.2019 | DOGZ-09 | CTD | 07:54 | on ground | 54°59,654'N | 1°37,923'E | 31 |
| 01.08.2019 | DOGZ-09 | Rd | 08:00 | on ground | 54°59,506'N | 1°37,923'E | 31,5 |
| 01.08.2019 | DOGZ-09 | Rd | 08:04 | off ground | 54°59,506'N | 1°37,694'E | 31,2 |
| 01.08.2019 | DOGZ-09 | Ku | 08:19 | on ground | 54°59,189'N | 1°37,586'E | 31 |
| 01.08.2019 | DOGZ-09 | Ku | 08:42 | off ground | 54°58,775'N | 1°36,452'E | 30 |