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## Interim Report of the Working Group on North Sea cod and plaice egg surveys in the North Sea 2 (WGEGBS2)

25–26 October 2016

Hamburg, Germany



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## **International Council for the Exploration of the Sea Conseil International pour l'Exploration de la Mer**

H. C. Andersens Boulevard 44–46  
DK-1553 Copenhagen V  
Denmark  
Telephone (+45) 33 38 67 00  
Telefax (+45) 33 93 42 15  
[www.ices.dk](http://www.ices.dk)  
[info@ices.dk](mailto:info@ices.dk)

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## Executive Summary

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The Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea 2 (WGEGBS2) met in Hamburg, Germany, on 25 and 26 October 2016. Five participants representing five different countries participated in the meeting, which was chaired by Matthias Kloppmann, Germany. The objectives of the meeting were to address the ToRs for the current year, namely: a) Review results of the 2016 MIKey-M net surveys and plan the 2017 survey; c) Write the MIKey-M net survey manual; d) Prepare WGEGBS2 data for archiving; and e) Review results on molecular identification of fish eggs.

In 2016, sampling of fish eggs was undertaken by Norway, Germany, The Netherlands, Denmark, France, and Scotland during the IBTS using the MIKey-M net as recommended during previous WGEGBS2 meetings. The weather conditions end of January and in February 2016 were atrocious resulting in a relatively poor coverage of the area, especially in the central and northern North Sea but despite the weather the whole North Sea was sampled.

MIKey-M samples from the 2016 survey will be kept at the institutes which undertook the sampling. In 2017, MIKey-M net sampling will be pursued using the same design. The same countries as in 2016 will be involved to cover the whole North Sea and Eastern English Channel.

For 2018, a full MIKey-M net survey with a complete sample analysis, including genetic identification wherever possible is planned. For this survey, Sweden will be invited to participate in order to cover Skagerrak and Kattegat. In preparation of this survey, the MIKey-M net survey manual, which is currently part of the MIK manual, will be published as a stand-alone version for publication in the ICES SISP series.

Data obtained from the MIKey-M net sampling will be progressively uploaded in to the eggs and larvae database.

Although not related to the primary tasks of this working group, a short presentation on marine litter sampling for the Danish MIK survey was presented. The presentation highlighted the usefulness of the MIK survey for research on occurrence of marine litter in the water column. All of the participants of this WGEGBS2 meeting are also the principal investigators of their country's MIK survey and agreed to pursue marine litter observations in the MIK from 2017 onwards.

## 1 Administrative details

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**Working Group name**

Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea 2 (WGEGBS2)

**Year of Appointment within the current cycle**

2015

**Reporting year within the current cycle (1, 2 or 3)**

1

**Chair(s)**

Matthias Kloppmann, Germany

**Meeting venue**

Hamburg, Germany

**Meeting dates**

25–26 October 2016

## 2 Terms of Reference a) – f)

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- a) Review results of the 2016–2018 surveys and plan for the 2017–2019 surveys;
- b) Study the spatio-temporal distribution of winter spawning habitats not addressed in 2016);
- c) Write the MIKey-M Net manual;
- d) Prepare WGEGBS2 data for archiving;
- e) Review results on molecular identification of eggs;
- f) Publish first results of MIKey-M net 2012–2015 surveys.

## 3 Summary of Work plan

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<b>Year 1</b>	Discuss results of the 2016 survey and plan for the 2017 survey and draft a stand-alone version of the MIKey-M net survey.
<b>Year 2</b>	Discuss results of the 2017 survey and plan for the 2018 survey and finalize the stand alone version of the MIKey-M net survey.
<b>Year 3</b>	Discuss results of the 2018 survey and plan for the 2019 survey

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## 4 List of Outcomes and Achievements of the WG in this delivery period

- Carried out MIKey-M net survey for North Sea cod and plaice eggs during the 2016 Q1 IBTS, alongside MIK sampling.
- Planned MIKey-M net survey for North Sea cod and plaice eggs during the 2017 Q1 IBTS, alongside MIK sampling.

## 5 Progress report on ToRs and workplan

### 5.1 Review results of the 2016–2018 surveys and plan for the 2017–2019 Survey (ToR a)

#### 5.1.1 Review results of the 2016 survey

In 2012 and 2013 Norway, The Netherlands and France undertook MIKey-M sampling, in 2014, Germany and Denmark also collected MIKey-M samples and in 2015, Scotland also participated, ensuring the first full coverage with MIKey-M sampling of the North Sea. (Table 5.1.1.1)

**Table 5.1.1.1 Countries undertaking MIKey-M sampling during the 1<sup>st</sup> Quarter IBTS in the North Sea**

	YEAR/COUNTRY	NO	GE	SC	DK	NL	FR
Incl. Trials	2012	x				x	x
	2013	x				x	x
	2014	x	x		x	x	x
	2015	x	x	x	x	x	x
	2016	x	x	x	x	x	x

In 2016, again all countries sampling in the Channel and the North Sea during the Q1 International Bottom Trawl Survey participated in sampling with the MIKey-M. Once again a full coverage was achieved. All samples have been stored for later analyses. The distribution of available samples is shown in Figure 5.1.1.1.

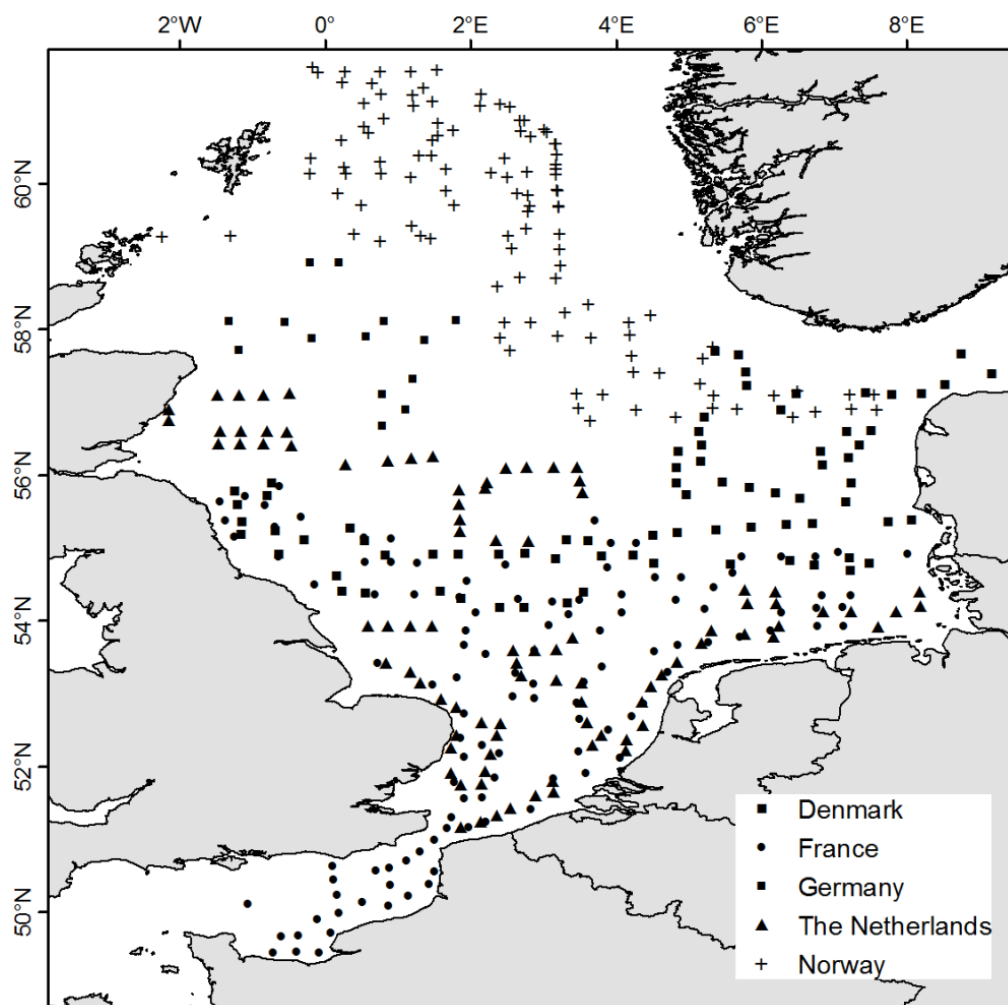


Figure 5.1.1.1 The location of MIKey-M samples taken during the 2016 1<sup>st</sup> Quarter IBTS.

Sampling by Norway started early in January and there were very few eggs in the samples during that period. Norway resampled a number of ICES statistical rectangles in the northern North Sea after about two weeks later in February. In many cases, substantially more fish eggs were found than during the early sampling in January. This illustrates a potential problem egg sampling could have if individual survey participations are shifted too far ahead of the targeted central IBTS Q1 survey month, which is February.

### 5.1.2 Plan for the 2017 survey

As in previous years, MIKey-M net sampling is again planned to be carried out alongside MIK sampling during the Q1 International Bottom Trawl Survey in the North Sea. Participants are asked to carry out at least one MIKey-M net haul per ICES statistical rectangle, but preferably at all MIK-stations. Collected samples shall be stored at the respective institutes.

For 2018, it is planned to conduct another full egg survey in the North Sea with complete sample analysis.



## **5.2 Write the MIKey-M Net manual (ToR c)**

Currently, the manual for the MIKey-M net sampling is part of the latest version of the MIK manual. For the next full MIKey-M survey with complete sample analyses (including genetics), which is planned to take place during the Q1 IBTS in 2018, a stand-alone version for the MIKey-M net survey will be written during the coming year, finalized during the 2017 WGEGBS2 meeting and published in the ICES SISP series.

## **5.3 Prepare WGEGBS2 data for archiving (ToR d)**

Data from the 2004 and 2009 dedicated cod and plaice egg surveys have been uploaded to the ICES egg and larvae database. The data collected from 2012 onwards will be uploaded to the ICES egg and larvae database as soon as the data are analysed and published. All participants will send their national data to data coordinator, Cindy van Damme, in the ICES database format. The data coordinator will be in contact with the ICES Data Centre to upload the data.

## **5.4 Review results on molecular identification of eggs (ToR e)**

The implementation of molecular techniques in the WGEGBS2 sampling programme did not occur during 2016. This was mainly due to not being able to secure adequate funding to undertake the analyses of samples. Due to the most available standard methodologies not being able to use formalin preserved material there is also an 'at sea' manpower requirement for sample processing which in turn has a further cost implication.

## **5.5 Publish first results of MIKey-M net 2012–2015 surveys (ToR f)**

WGEGBS2 will prepare two manuscripts ready for publication by 2018. One will be a description of the MIKeyM, the sampling during the MIK survey and results of the winter spawning grounds. The second paper will be on the comparison between the various sampling gears used for egg and larvae production sampling, i.e. Gulf VII, MIK and MIKeyM, including also an overview of what the data from each of the gears could be used for.

## **5.6 Cooperation with other working groups**

Since standard sampling for the North Sea Plaice and Cod Egg Survey is currently undertaken simultaneously with MIK sampling, WGEGBS2 cooperates with the International Bottom Trawl Survey Working Group (IBTSWG), which plans and carries out the Q1 International Bottom Trawl Survey. The Working Group on Atlantic Fish Egg and Larvae Surveys (WGALES) coordinates standardization in all ICES ichthyoplankton surveys and the respective working groups. Cooperation is also granted with other ICES working groups dealing with Ecosystem approach to fisheries management (e.g. the Working Group on Integrating Surveys for the Ecosystem Approach (WGISUR)).

## **5.7 Cooperation with advisory structures**

Up until recently, there was no direct cooperation with ICES advisory structures. However, abundance data on recently hatched sandeel larvae may become useful for assessment and advice on North Sea sandeel stocks. The Benchmark Workshop on Sandeel (WKSand) requests the sandeel data to investigate their usefulness in assessment by sandeel management area. The according data, however, still need to be collated.

## 5.8 Collection of Pelagic Marine Litter Data from MIK samples

DTU AQUA (Denmark) has been collecting data of marine litter from MIK samples during 2014–2016, and first results were presented at the 2016 WGECCS2.

Marine litter was sorted from the MIK samples and classified in different categories. As far as possible the size of the different litter items was measured, or estimated in cases of very irregularly shaped items such as pieces of plastic foil etc. Furthermore, the colour was noted, as this can give important information about the source of the litter. For each litter item, station ID, litter category, size, colour, and if necessary additional comments describing the item were noted on protocol sheets. In 2015 and 2016, the litter items were also collected in plastic bags by station and taken ashore for potential and more specific laboratory analyses.

The most frequently occurring litter items were plastic filaments, probably originating from fishing gear, which occurred in ca. 40–45% of all hauls. The second most frequently occurring items were pieces of plastic foils. In addition, various small to medium sized plastic pieces were found, e.g. fragments of larger plastic items, plastic ribbons, industrial plastic pellets etc.

The Danish survey area consists of a broadband across the central North Sea. In all 3 years sampled, the spatial distribution of plastic filaments showed a similar, distinct pattern, with few items along the UK coast, virtually no items in the central part of the survey area but very frequent occurrences along the west coast of Denmark. Based on this distinct spatial distribution and the prevailing circulation in the area, as well as available literature from Danish beach surveys, “dolly ropes” seems to be one of the main sources of this type of litter. The colour of the plastic filaments points to this source as well, as dolly ropes are usually orange or blue, and ca. 50% of all plastic filaments in the samples were also either orange or blue.

Preliminary attempts to estimate the number of filaments per area suggest that the 13 most affected ICES squares along the Danish coast contain on average 54 million filaments per ICES square. Furthermore, based on a length-weight relationship estimated from a small subsample of filaments, preliminary estimates suggest that these 13 most affected ICES squares contain a total of about 20 tonnes of filaments. However, these estimates are still preliminary and need to be further corroborated. The majority of filaments had a length of 1–5 cm, but also filaments of 5–25 cm length were frequently observed, as well as some larger ones up to 180 cm, occasionally.

In contrast to many other studies on marine litter, which are usually based on either beach surveys, bottom trawling or sampling in surface waters, the MIK net samples the entire water column, filtering large volumes of water. The sampling of marine litter from the MIK does not require additional vessel time, and also post-processing requires relatively little additional effort as many samples in offshore areas contain no or only few items. Furthermore, the amount of litter can be quantified as flowmeter data are available, whereas many other marine litter studies are qualitative or semi-quantitative. Also, the MIK survey covers a large area. Thus, the MIK survey has a high potential to provide a holistic view of the occurrence, distribution and abundance, as well as potential sources and transport pathways, of free-floating marine litter in the entire North Sea area.

## 6 Revisions to the work plan and justification

Revisions to the work were not necessary.

## 7 Next meetings

The Working Group 2 on North Sea Cod and Plaice Egg Surveys in the North Sea (WGEGBS2), chaired by Matthias Kloppmann, Germany, will meet in Boulogne sur Mer, France, 10 and 11 October 2017, to work on ToRs and generate deliverables as listed in the Table below. Interim Report is due by 17 November 2017.

TO R	DESCRIPTION	BACKGROUND	SCIENCE PLAN TOPICS ADDRESSED	DURATION	EXPECTED DELIVERABLES
a	Review results of the 2016–2018 surveys and plan for the 2017–2019 Survey	In 2017–2019, the MIKey-M net sampling will be conducted during the IBTS-MIK sampling	4.28, 4.30	Year1,2,3	Report: reviewing survey results, need for improvement and plan for potential collaborative publications
b	Study the spatio-temporal distribution of winter spawning habitats	Spawning grounds are of primary relevance for fish stock renewal. They experienced interannual and long-time spatial variations that need to be quantified and related to environmental/biotic variations.	1.1, 4.28, 4.30	Year 3: Samples will be collected every year, but will be analysed every three years	Report: review current and past spatial distribution of winter spawning grounds in the North Sea.
c	Write the MIKey-M Net manual	In 2012, a new net called the MIKey-M net was developed to collect fish eggs alongside the MIK sampling during the IBTS. Since 2012 it has been used each year, there is a need for a standard manual as recommended by ICES.	4.28, 4.30	Year 1	SISP: describe the MIKey-M Net, its implementation during the IBTS since 2012 and instructions for sampling
d	Prepare WGEGBS2 data for archiving	WGEGBS2 data need to be prepared and uploaded in the ICES Eggs and Larvae database	4.28, 4.30	Yearly, once the data are published	Data uploaded to the ICES Eggs and Larvae database by the ICES data centre and WGEGBS2 coordinator

<b>TOR</b>	<b>DESCRIPTION</b>	<b>BACKGROUND</b>	<b>SCIENCE PLAN TOPICS ADDRESSED</b>	<b>DURATION</b>	<b>EXPECTED DELIVERABLES</b>
e	Review results on molecular identification of eggs	There is a potential problem in visual identification of stage I gadoid eggs and in some areas it will be necessary to utilize genetic techniques for species identifications where spawning locations of gadoids exist. The means to undertake genetic identifications should be sought were possible	4.28, 4.30	Year1,2,3	Report : review methods for genetically identifying eggs
f	Publish first results of MIKey-M net 2012–2015 surveys	MIKey-M net samples represent a huge amount of data and scientific insights on winter fish spawning grounds in the North Sea that need to be published.	4.28, 4.30	Year 3	Report : list of scientific publications based on 2012–2015 surveys

## Annex 1: List of participants

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Name	Address	E-mail
Matthias Kloppmann	Thuenen Institute of Sea Fisheries Palmaille 9 22767 Hamburg Germany	matthias.kloppmann@thuenen.de
Cindy van Damme	Wageningen Marine Research PO Box 68 1970 AB IJmuiden The Netherlands	Cindy.vandamme@wur.nl
Christophe Loots	Ifremer 150 Quai Gambetta. 62200 Boulogne sur Mer France	Christophe.Loots@ifremer.fr
Richard D.M. Nash	Institute of Marine Research PO Box 1870 Nordnes 5817 Bergen Norway	Richard.Nash@imr.no
Bastian Huwer	DTU AQUA Jægersborg Allé 1D 2920 Charlottenlund Denmark	bhu@aqua.dtu.dk

## Annex 2: Recommendations

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RECOMMENDATION	ADDRESSED TO
1. All participants of the Q1 IBTS should carry out MIKeyM sampling in conjunction with the MIK sampling. All future surveys should include North Sea, Channel, Skagerrak and Kattegatt.	IBTSWG

### **Annex 3: Agenda**

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#### **Tuesday 25 October**

10:00 Welcome and general announcements

10:30 Results of the 2016 egg survey in the North Sea

11:00 Planning of the 2017 egg survey in the North Sea

12:00 Lunch break

13:00 Fish egg and larvae database: preparation of data for archiving

15:00 Coffee break

15:30 Molecular ID of fish eggs: results from previous surveys and updates

17:00 End of day 1

#### **Wednesday 26 October**

09:00 MIKey M net manual for the IBTS

10:30 coffee break

11:00 WGEGBS2: future of the working group, work plan for this 3 year reporting period

12:00 Lunch break

13:00 report writing

17:00 End of WGEGBS2 meeting