ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

ICES Data Centre

Eggs and Larvae Fact Sheet

2022

ICES Eggs and Larvae Data Fact Sheet

1 Background

Fish egg and fish larvae data have been collected in the ICES community for a long time for use in stock assessments and management of stocks and spawning areas. The collection of the data is generally organized by ICES coordinated international survey expert groups. In 2010 WGDIM acknowledged the lack of an international database that would store data collected in ichthyoplankton surveys conducted in the ICES community.
Therefore, an action plan was suggested for the ICES Data Centre for creating such a database. In 2010-2011, a database was developed by ICES Data Centre. The Eggs and Larvae database ensures storage of survey data on an international level, providing an overview of available fish egg and larvae survey data collected and providing a unified portal for scientific access to the ichthyoplankton survey data. Datasets from the surveys were provided to ICES by the responsible expert groups. The final stage of producing an operational database and online system were carried out by the ICES Data Centre.
In 2015, a WKIELD meeting was carried out to support development of the database and to unify the input data format.
In 2017, the new data uploading format, including some quality checks, was implemented.

2 Overview of the Datasets

The Eggs and Larvae database contains mainly data from ICES coordinated international ichthyoplankton surveys. Various ichthyoplankton surveys have different target species and spatial and temporal coverage. The database contains haul information and eggs and larvae measurement data. Some ichthyoplankton gears also catch juveniles and adults of small species (i.e. gobies), data of these juveniles and adults are also included in this database.

The metadata description of the datasets in the Eggs and Larvae database can be found in the ICES Metadata Catalogue.

3 Quality assurance

As outlined in the WGDIM 2011 report, the ichthyoplankton survey groups like WGSINS (formerly WGEGGS2 and WGEGGS), WGMEGS, WGACEGG are responsible for the database content and quality control. WGALES is the overarching ichthyoplankton survey group responsible for the general quality control of the eggs and larvae surveys and as such the general quality control of the eggs and larvae data. Each dataset is quality checked by the responsible ICES expert group.

To increase data quality assurance, new data submissions are passing data validation before being loaded to the database.

Please refer to http://datsu.ices.dk/web/selRep.aspx?Dataset=130 for the format of the data and http://datsu.ices.dk/web/rptChk.aspx?Dataset=130 for the detailed information on the data checks.

4 Dataset and Database notes

4.1 Species name resolution and Stage information

Currently, the WoRMS (World Register of Marine Species: http://www.marinespecies.org) species names are used in the Eggs and Larvae database. WoRMS is the taxonomic backbone of OBIS (Oceanbiogeographic Information System: http://www.iobis.org) and the Aphia IDs provide a mechanism through which it is possible to merge the ICES historical data with other worldwide marine databases. If a taxa could not be resolved to species level, it was resolved to the lowest taxonomic level possible based on the taxonomic group information found in the survey documentation.

Stage information has been provided by the responsible expert groups. This field includes information on which developmental stages were recorded in the dataset. Appendix A provides details of the developmental stages of eggs or larvae recorded in the older datasets.

New submissions are referring to the combination of vocabulary references:

Development scales http://vocab.ices.dk/?ref=1514 and

Development stages http://vocab.ices.dk/?ref=1515

together with ELSampleFlag as EG (egg) or LV (larvae).

4.2 Cod and Plaice Egg Surveys in the North Sea

The North Sea cod and plaice egg surveys were conducted in 2004 and 2009 and continued in a slightly different format in 2013, alongside the MIK herring larvae sampling during the IBTS survey. The surveys were originally directed at cod and plaice, but also supply data of other winter spawning North Sea fish.

The surveys are conducted with Gulf III or VII high-speed plankton samplers, Bongo nets and the Continuous Underway Fish Egg Sampler (CUFES) and recently MIKeyM. With the Gulf's and Bongo's the water column was sampled using double oblique hauls are conducted through the water column (0 - 5m above the sea floor or a maximum of 200m depth). The CUFES sampling is a continues sampling at 5m depth. The mesh size of the sampling equipment varied between 280 and 500 µm. During the sampling temperature and salinity are measured. Flowmeters are used to measure the amount of water filtered while sampling.

The database contains the haul information data, position, time, duration, water volume, depth, temperature and salinity. Eggs and larvae in the samples were counted. All eggs > 1mm were measured and identified to species were possible. Eggs < 1 mm are counted and in 2004 measured and identified as well. There is large overlap in size some gadoids, including cod, and other species, thus visual identification is not possible. For these, genetic analysis was used to identify the species. All eggs that are measured and identified were also staged following the stage descriptions in Appendix A. Larvae in the samples were identified to species, measured and development stage assigned.

WGEGGS and WGEGGS2 were the ICES EG responsible for these surveys and more information and analysis of the results can be found in the EG's reports on the ICES website. Results have also been published in various scientific journals:

Taylor, N., Fox, C. J., Bolle, L., Dickey-Collas, M., Fossum, P., Kraus, G., Munk, P., et al. 2007. Results of the spring 2004 North Sea ichthyoplankton surveys. The distribution of fish eggs and larvae from the international ichthyoplankton survey. 60 pp pp.

Fox, C. J., Taylor, M., Dickey-Collas, M., Fossum, P., Kraus, G., Rohlf, N., Munk, P., et al. 2008. Mapping the spawning grounds of North Sea cod (Gadus morhua) by direct and indirect means. Proceedings of the Royal Society B: Biological Sciences, 275: 1543-1548.

Munk, P., Fox, C. J., Bolle, L. J., Damme, C. J. G. v., Fossum, P., and Kraus, G. 2009. Spawning of North Sea fishes linked to hydrographic features. Fisheries Oceanography, 18: 458-469.

Damme, C. J. G. v., Bolle, L. J., Fox, C. J., Fossum, P., Kraus, G., Munk, P., Rohlf, N., et al. 2009. A reanalysis of North Sea plaice spawning-stock biomass using the annual egg production method. ICES Journal Marine Scienc,: 66: 1999-2011.

Nash, R. D. M., Wright, P. J., Matejusova, I., Dimitrov, S. P., O'Sullivan, M., Augley, J., and Höffle, H. 2012. Spawning location of Norway pout (Trisopterus esmarkii Nilsson) in the North Sea. ICES Journal of Marine Science, 69: 1338-1346.

Lelievre, S., Antajan, E., and Vaz, S. 2012. Comparison of traditional microscopy and digitized image analysis to identify and delineate pelagic fish egg spatial distribution. Journal Of Plankton Research, 34(6): 470-483.

Lelievre, S., Vaz, S., Martin C. S., and Loots, C. 2014. Delineating recurrent fish spawning habitats in the North Sea. Journal Of Sea Research, 91: 1-14.

4.3 Atlantic eel (*Anguilla anguilla* and *A. rostrata*) larvae database

In this database you can find data on eel larvae (leptocephalus and glass eel) catches by haul collected at scientific cruises in the North Atlantic including the Sargasso Sea, since 1902. The database contains e.g. the data collected by Johannes Schmidt at his famous expeditions in the 1920s to the Sargasso Sea, revealing that this is the spawning place for eel. Catches are given in number by length and species, *A.anguilla* or *A.rostrata*, often determined by myomer/vertebrae counts, for each haul as well as technical details of the hauls including gear type, mesh size, depth fished, etc.

The data have been collated from the literature in an Excel file by J. D. McCleave, USA. He has kindly allowed ICES to publish the database on the ICES Homepage, for the benefit of ICES' and other scientists. The ICES Data Centre has transferred the Excel data into the ICES database format, which allows a multitude of extraction facilities to be applied to the data.

A technical note on the data from J.D. McCleave can be found in appendix B.

Results have also been published in various scientific journals, see appendix B for a list of references.

4.4 The International Herring Larvae Surveys

The ICES programme of international herring larval surveys in the North Sea and Channel, has been in operation since 1967. The main purpose of this programme is to provide quantitative estimates of herring larval abundance, which are used as a relative index of changes of the herring spawning-stock biomass in the assessment. The larvae surveys are carried out in specific periods and areas, following autumn and winter spawning activity of herring from north to south.

The surveys are carried out with high speed plankton samplers, i.e. Gulf VII and Nackthai. Double oblique hauls are conducted through the water column (0 - 5m above the sea floor). The mesh size of the sampling equipment is 280 µm. During the haul, *in-situ* water temperature and salinity are measured as well as water volume filtered.

The database contains information of the surveys conducted since 1972. The data includes: haul information, position, time, duration, water volume filtered, depth, temperature and salinity, numbers of larvae, and length of larvae.

4.5 The International Mackerel and Horse Mackerel Egg Survey

The working group on mackerel and horse mackerel egg surveys (WGMEGS) coordinates the Mackerel and Horse Mackerel Egg Survey in the Northeast Atlantic and the Mackerel Egg Survey in the North Sea, which are both carried out triennially. Egg data collected from both surveys provide estimates of the spawning stock biomass of both the western and North Sea stocks of Atlantic mackerel (*Scomber scombrus*) in combination with fecundity data, and a relative abundance index of the western horse mackerel (*Trachurus trachurus*) spawning stock in the Northeast Atlantic. The surveys are divided into 3 geographical component areas, the western, southern and the North Sea. In the western area the mackerel egg survey has been running continuously on a triennial basis since 1977 and since 1992 has also sampled the southern spawning component. The survey typically takes place between February and July and aims to cover the entire spawning area from Cadiz (Spain) in the south up to Scotland in the North. Since 2010 the survey has been extended northwards to include the waters around the Faroe Islands and southeast of Iceland. The egg survey in the North Sea has been running since 1968.

A comprehensive description of the survey protocols, analysis techniques together with the methods used for calculating the egg abundance estimates can be found in the WGMEGS survey manual which is published as ”Manual for the mackerel and horse mackerel egg surveys (MEGS): sampling at sea” in the Series of ICES Survey Protocols (SISP 6 - MEGS V1.3, 62 pp.).

4.6 Herring larvae surveys of the northern Irish Sea

Herring larvae surveys of the northern Irish Sea (ICES area VIIaN) have been carried out by the Agri-Food and Biosciences Institute (AFBI), formerly the Department of Agriculture and Rural Development for Northern Ireland (DARD), in November each year since 1993. The surveys have been carried out onboard the RV “Corystes” since 2005, and prior to that on the smaller RV “Lough Foyle”. Sampling is carried out on a systematic grid of stations covering the spawning grounds and surrounding regions in the NE and NW Irish Sea. Larvae are sampled using a Gulf-VII high-speed plankton sampler with 280 µm net. Mean catch-rates (nos.m-2) are calculated over stations to give separate indices of abundance for the NE and NW Irish Sea. Larval production rates (standardized to a larva of 6 mm), and birth-date distributions, are computed based on the mean density of larvae by length class. A growth rate of 0.35 mm day-1 and instantaneous mortality of 0.14 day-1 are assumed based on estimates made in 1993–1997.The results of the survey are used in the assessment of Irish Sea herring (VIIaN). The group responsible for the survey is WGIPS.

Dickey-Collas M, Nash RDM, Brown J (2001) The location of spawning of Irish Sea herring (Clupea harengus). J Mar Biol Ass UK 81:713-714

5 GIS Mapping Facility

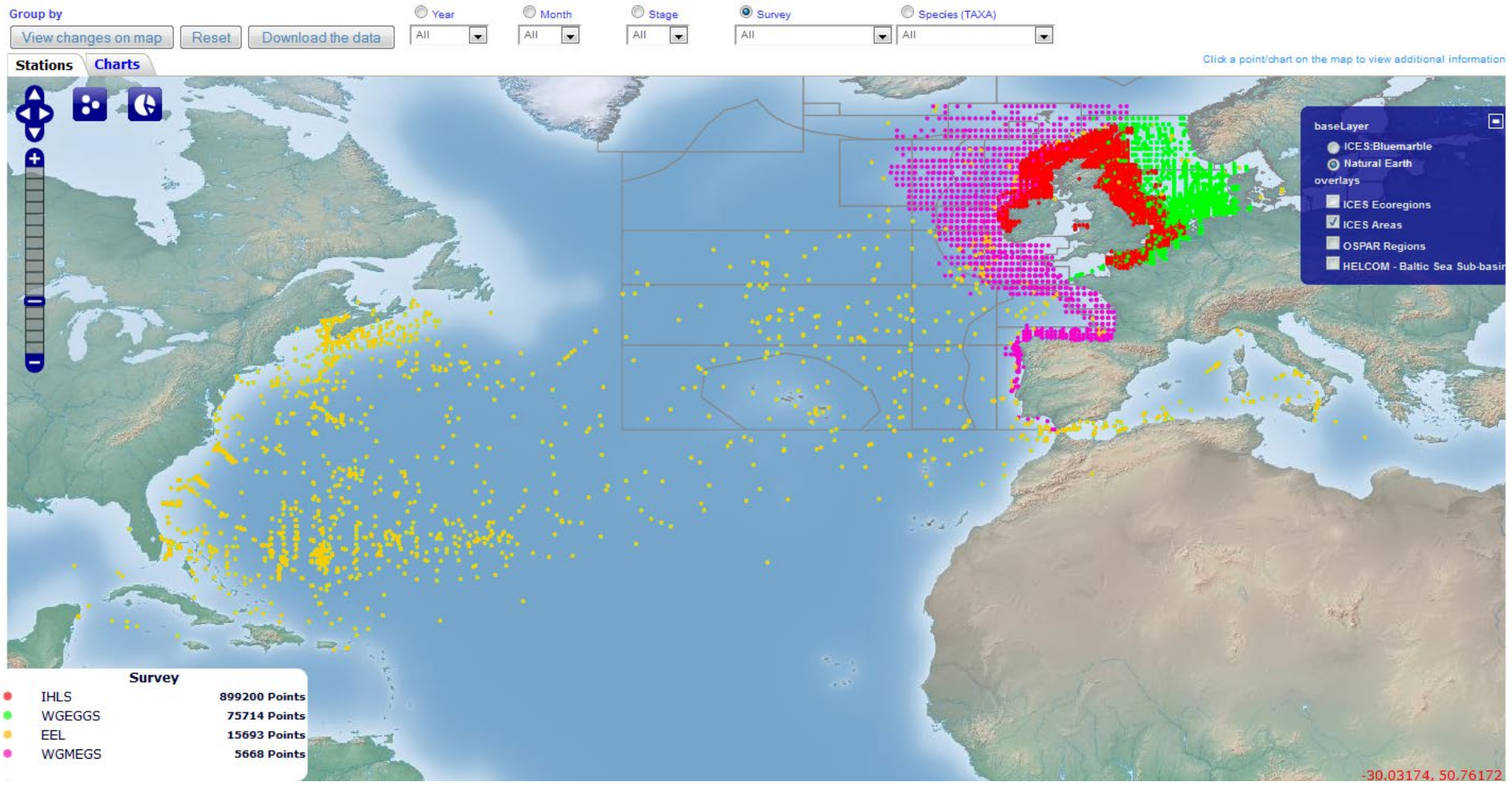

Figure 2 – A screenshot showing measurements collected (Grouped by Survey).

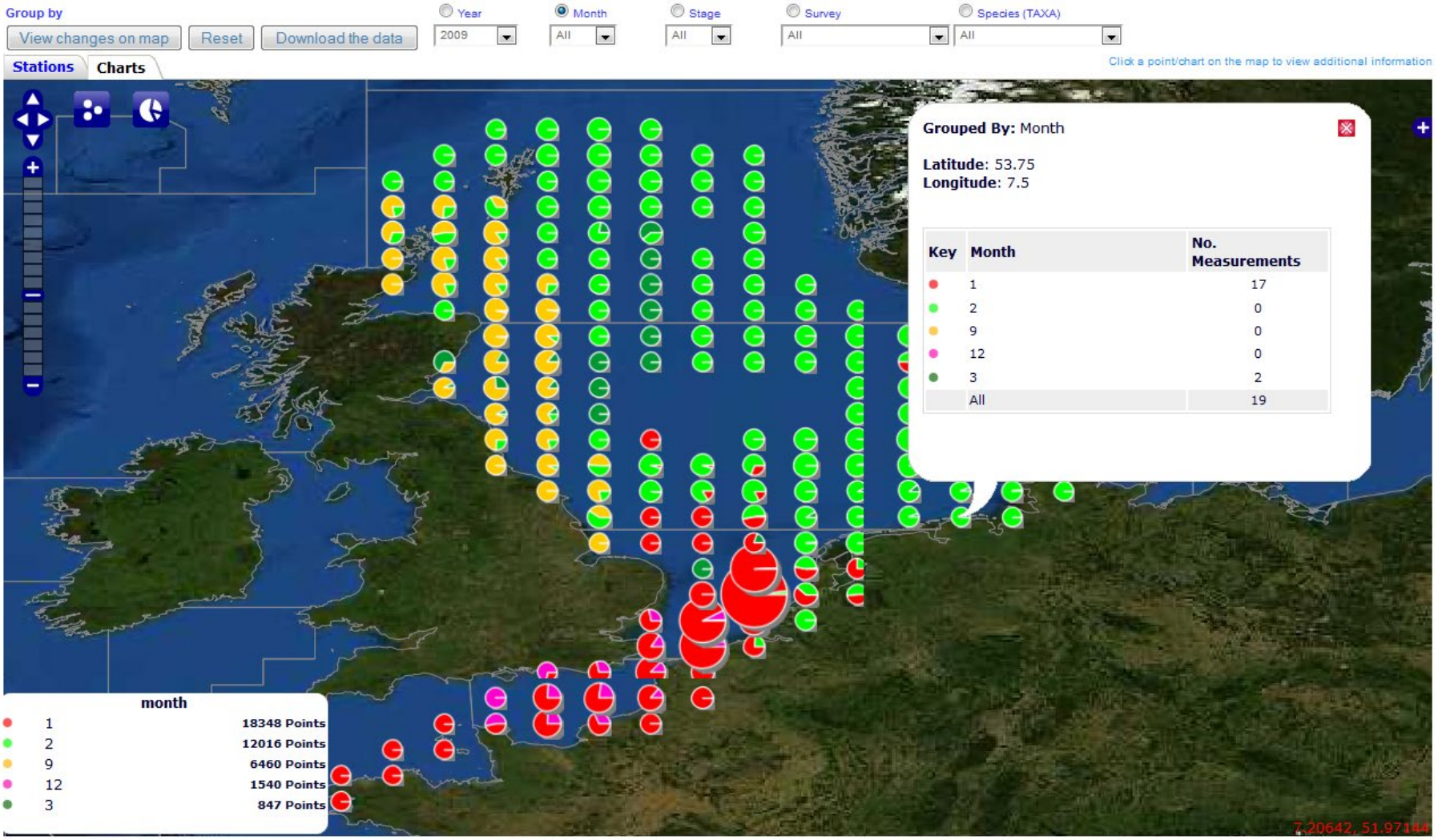

Figure 3 – A screenshot showing measurements collected during 2009 as aggregated Charts (Grouped by Month).

6 Acknowledgments and data citation

6.1 Data Citation

Please acknowledge the "Eggs and larvae dataset" as well as the relevant institute(s) when using the data:

ICES. Eggs and Larvae database. Available online at http://eggsandlarvae.ices.dk. Consulted on yyyy-mm-dd.

Names of the surveys to cite can be found on the Eggs and Larvae page, upon download, or in this document.

e.g "North Sea cod and plaice egg surveys"

Please refer to the ICES Data policy for terms and conditions of data usage and rights. http://info.ices.dk/datacentre/datapolicy.asp

6.2 Acknowledgements

ICES is very grateful to the following Expert groups and institutes for their participation in this project:

ICES WGDIG
ICES WGEEL
ICES WGEGGS
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ICES WGIPS
ICES WGMEGS
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AZTI, Spain
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DTU Aqua, Denmark
EMI, Estonia
HAFRO, Faroese
IEO, Spain
IFREMER, France
IMARES, The Netherlands
IMR, Norway
IPMA, Portugal
MI, Ireland
MRI, Iceland
MSS, Scotland
Thünen Institute, Germany
University of Maine, USA

7 Appendices

Appendix A

Code	Description	CodeGroup
EG	Egg	STAGE
EL-EG_1	E&L surveys: egg - combination of stages 1A and 1B	STAGE
EL-EG_1A	E&L surveys: egg from fertilization until cleavage produces a cell bundle where ind.cells are invisible	STAGE
EL-EG_1B	E&L surveys: egg formation of blastodisc and subsequent thickening at one pole	STAGE
EL-EG_2	E&L surveys: egg from the first sign of primitive streak until closure of blastopore	STAGE
EL-EG_3	E&L surveys: egg growth of embryo from 1/2 to 3/4 around egg circumference	STAGE
EL-EG_4	E&L surveys: egg growth of embryo from 3/4 to full egg circumference	STAGE
EL-EG_5	E&L surveys: egg growth of embryo until the tail touches the nose or beyond	STAGE
EL-EG_U	E&L surveys: egg stage unknown	STAGE
EL-LV_1	E&L surveys: nephrops larvae rudimentary pleopods present but no supra-orbital spines	STAGE
EL-LV_2	E&L surveys: nephrops larvae supra-orbital spines appear but no uropods	STAGE
EL-LV_GE	E&L surveys: glass eels (eels)	STAGE
EL-LV_LC	E&L surveys: leptocephalus (eels)	STAGE
IM	Sexually immature/sub-adult	STAGE
JV	Juvenile	STAGE
LV	Larvae	STAGE

Appendix B

Explanation of Atlantic *Anguilla* database (metadata)

Prepared by J. D. McCleave, March 2011

I. Organization of the Excel workbook "Atlantic *Anguilla* database;" the workbook database contains four Excel spreadsheets.

A. *Anguilla anguilla* leptocephali.

1. This sheet contains all leptocephali with ≥112 myomeres or assumed to have ≥112 myomeres and considered to be *A. anguilla*, records of 22,612 specimens.

a) J. Schmidt labeled specimens with 112 myomeres as *Anguilla* sp. (cited in Boëtius and Harding (1985a,b).

b) Boëtius and Harding (1985a) and other recent authors also included specimens with ≥112 myomeres as *A. anguilla* in their tabulations.

B. *Anguilla anguilla* glass eels, records of 63 specimens.

1. The intent was to include glass eels captured at sea, but no attempt was made to verify that the positions recorded are in fact in the sea as opposed to in estuaries.

C. *Anguilla rostrata* leptocephali.

1. This sheet contains all leptocephali with ≤110 myomeres or assumed to have ≤110 myomeres and considered by all authors to be *A. rostrata*, 9633 records of specimens.

2. This sheet also contains all leptocephali with 111 myomeres and considered to be intermediate and determined only as *Anguilla* sp., records of 101 specimens.

a) Boëtius and Harding (1985a) (and J. Schmidt) considered leptocephali with 111 myomeres to be *A. rostrata*.

b) Smith (1968) listed the myomere range for *A. rostrata* as 104-111 and that for *A. anguilla* as 111-119, indicating ambiguity at 111 myomeres. His list of 298 *A. rostrata* with myomeres counted contained no specimens with 111 myomeres.

c) Smith (1989) described *A. rostrata* as having "ca 103-111" myomeres and *A. anguilla* as having "112-119."

d) However, Schoth and Tesch (1982), Kleckner et al. (1985), Kleckner and McCleave (1985), and Tesch and Wegner (1990) all considered leptocephali with 111 myomeres to be intermediate, i.e., *Anguilla* sp. designated as "I." That convention is used in this database.

3. This sheet also contains all leptocephali whose identity could not be established, usually because of specimen damage, i.e., *Anguilla* sp. designated as "U," records of 184 specimens.

D. *Anguilla rostrata* glass eels, records of 285 specimens.

1. The intent was to include glass eels captured at sea, but no attempt was made to verify that the positions recorded are in fact in the sea as opposed to in estuaries.

II. Explanation of spreadsheet column headings and column data.

A. AGENCY/PERSON (col. A).

1. When known, the name of the collector or holder of collections appears in this column.

2. The designation "Danish" is applied to data tabulated in Boëtius and Harding (1985a) before the time of involvement Johannes Schmidt and after Schmidt's last research cruise.

3. "NMFS" refers to collections made by the U.S. National Marine Fisheries Service.

4. "Misc MCZ" refers to miscellaneous specimens housed at the Museum of Comparative Zoology at Harvard University (Cambridge, Massachusetts, USA).

5. "Huntsman/ARC" refers to collections held at the Atlantic Reference Centre a collaboration between the Canadian Department of Fisheries and Oceans and the Huntsman Marine Science Centre (St. Andrews, New Brunswick, Canada).

6. "WHOI" refers to collections not attributable to a person but made by scientists at the Woods Hole Oceanographic Institution (Woods Hole, Massachusetts, USA).

B. SHIP/(Person) (Col. B).

1. If known, the ship on which the specimens were collected is given.

2. If a person collected specimens and transferred them to a collection identified in Col. A, the collector's name appears in parentheses. For example, G. Trombetta collected many specimens of *Anguilla anguilla* from shore and transferred these to J. Schmidt.

C. CRUISE NUMBER (Col. C).

1. If known, the ship's designated cruise number is given.

D. STATION OR COLLECTION MUMBER (Col. D).

1. If known, the ship's station number is included.

2. Alternatively, the repository's collection number is included.
3. For the HUNTSMAN/ARC collections, the ARC catalog number (x) and the Huntsman field collection number (y) are given in the format xxxx/yyyy. Partial information is given as xxxx/ or /yyyy.

E. LATITUDE and LONGITUDE (Cols E-J).
1. Latitude in degrees, latitude in minutes, North latitude, longitude in degrees, longitude in minutes, and East or West longitude of a tow's starting position are given in consecutive columns.
2. If positions are approximate or estimated, that is noted in the COMMENTS (Col. AB).

F. START DATE (Col. K).
1. The starting date of a tow, if known, is given in the format yyyy-mm-dd.
2. If start date is known only to month or year, Col. K is left blank and partial date information is noted in the COMMENTS (Col. AB).

G. START TIME (Col. L).
1. The starting time of a tow, if known, is given in 24-hour format hh:mm.

H. LOC/UTC (Col. M).
1. Start time is designated as local time where the collection was made (LOC) or as Coordinated Universal Time (UTC), essentially equivalent to Greenwich Mean Time.
2. In many cases, times recorded were not readily identified as LOC or UTC and the column is left blank.

I. DURATION (Col. N).
1. Duration of a tow, if known, is given in minutes.

J. SERIES NUMBER (Col. O).
1. If multiple tows were made at a station or if multiple nets were used on a single tow, series numbers may have been assigned to designate the multiplicity.
2. Most, but not all, series numbers are attributable to the collections of J. Schmidt.

K. MAX WIRE OUT (Col. P).
1. The maximum length of towing wire spooled out on a tow is given in meters if known from station data.
2. If tows were stepped to fish at different depths, the maximum wire out is recorded in Col. P.
3. Most, but not all, records of wire out are attributable to the collections of J. Schmidt and to other Danish collections.

L. MAX DEPTH (Col. Q).

1. The maximum depth of a tow is given in meters if known from station data.
2. If tows were stepped to fish at different depths, the maximum depth is recorded in Col. Q.

M. GEAR TYPE (Col. R).
1. Abbreviations for the types of collecting gear used are in this column.
2. Insofar as possible, original designations by the collectors are used even though similar gear may have been designated differently by different collectors. For example, Schoth and Tesch (1982) described the Hamburger Planktonnetz (HP) as a modified Isaacs-Kidd Midwater Trawl (IKMT).
3. Descriptions of the gear types are in section III of this document.

N. SPECIES CODE (Col. S).
1. "A" designates *A. anguilla*.
2. "R" designates *A. rostrata*.
3. "I" designates *Anguilla* with 111 myomeres, here considered intermediate and included in the *A. rostrata* spreadsheet.
4. "U" designates *Anguilla* that could not be identified to species, usually because of damage to the specimen and included in the *A. rostrata* spreadsheet.

O. TOTAL LENGTH (Col. T).
1. Total length, if known, is given in millimeters.

P. FREQ (Col. U).
1. The number (frequency) of individuals of the same total length (and the same number of myomeres (Col. W), if applicable) in a tow or other collection.

Q. META (Col. V).
1. "m" designates a specimen described by the collector as metamorphosing from leptocephalus to glass eel.

R. NUMBER OF MYOMERES (Col. W).
1. The total number of myomeres is given if known.
2. In many cases, especially those attributable to J. Schmidt, the myomeres were only counted sufficiently to determine the species, i.e., myomeres were not counted exactly. Discussion of this point is in Boëtius and Harding (1985b).

S. SURFACE TEMPERATURE (Col. X).
1. Surface temperature in degrees Celsius is given if known.

T. SURFACE SALINITY (Col. Y).
1. Surface salinity is given if known.

U. PRIMARY REFERENCE (Col. Z).
1. The primary reference is the main source of the data pertaining to the leptocephali.

2. The primary reference may also contain that data pertaining to the station.

V. SECONDARY REFERENCES (Col. AA).

1. The secondary references may be the main source of the data pertaining to the station.

a) For example, J. Schmidt published separate papers with great detail on the stations sampled on his major cruises.

b) For example, Tesch (1982) published the station data accompanying Schoth and Tesch (1982) and other papers on the distribution of leptocephali.

2. The secondary references may also contain original sources of data, where a better tabulation is cited as the primary reference.

W. COMMENTS (Col. AB).

1. Comments are used sparingly to provide explanation of situations not easily accommodated in the formats of other columns, e.g., incomplete collection dates and non-ship collections.

III. Key to gear types abbreviated in column R of the database.

Gear symbol	Gear name	Mesh size(s), cm	Example literature source(s)
Bongo	Bongo zooplankton sampler	0.05	Schnack et al. (1994)
EMT	Engel midwater trawl		Kleckner et al. (1985)
SmHP	Hamburger Planktonnetz, 2.1 m^2, a modified IKMT	0.085	Schoth and Tesch (1982)
HP	Hamburger Planktonnetz, 6.2 m^2, a modified IKMT	0.05	Schoth and Tesch (1982)
1.8MIKMT	Isaacs-Kidd midwater trawl, 1.8 m		L. Van Guelpen (pers. com.)
2MIKMT	Isaacs-Kidd midwater trawl, 2 m		D. G. Smith (pers. com.)
3MIKMT	Isaacs-Kidd midwater trawl, 3 m	6.4, 1.3, 0.075	Backus et al. (1969) Kleckner et al. (1983)

		0.05 0.165	McCleave and Kleckner (1987)
IKMT6	Isaacs-Kidd midwater trawl, 6 m^2	0.03	Schnack et al. (1994)
MMT	Marinovich midwater trawl	1.3, 0.38, 0.075	Backus et al. (1969)
MKTN	Modified krill trawl net, 15.7 m^2	Cod end = 0.45	Bast and Strehlow (1990)
MOC	Multiple opening-closing net, 1.4 m^2		Schoth and Tesch (1982)
10MMOC	Multiple opening-closing net, 10 m^2	0.3	Wiebe et al. (1976) Ring Group (1981)
1MNN	Neuston net, 1 m^2		Kleckner et al. (1985)
PELIK	Pelagic trawl with an IKMT mounted within		van Utrecht and Holleboom (1985)
PPT	Pelagic trawl, Peterson		Boëtius and Harding (1985a)
RMT1+8	Rectangular midwater trawl, opening and closing, 1 m^2 and 8m^2	1 m^2 = 0.032 8 m^2 = 0.45, 0.1	van der Spoel (1981)
10MRMT	Rectangular midwater trawl, 10 m^2		Kleckner et al. (1985)
C130	Ring net, 1.3-m diam.		Boëtius and Harding (1985a)
0.3MRN	Ring net, 0.3-m diam.		Eldred (1968)
0.5MRN	Ring net, 0.5-m diam.	0.0175	Eldred (1968)
1MRN	Ring net, 1-m diam.		Kleckner et al. (1985)
2MRN	Ring net, 2 m diam.	0.05 or 0.165	Castonguay and McCleave (1987)
MIK2	Ring net, 3.5-m diam.	0.056	Munk et al. (2010)

3MRN	Ring net, 3-m diam.		Boëtius and Harding (1985a)
E300	Ring net, 3-m diam.		Schmidt (1929)
1MCC	Ring net, cheese cloth, 1-m diam.		Bowman (1913)
PS150	Ring net, silk and stramin, 1.5-m diam.		Schmidt (1919)
P150	Ring net, silk, 1.5-m diam.		Schmidt (1919, 1929)
P100	Ring net, silk, 1-m diam.[a]		Schmidt (1929)
S150	Ring net, stramin, 1.5-m diam.		Schmidt (1919, 1929)
S100	Ring net, stramin, 1-m diam.[b]		Schmidt (1919, 1929)
S200	Ring net, stramin, 2-m diam.		Schmidt (1919, 1929)
0.5MS	Silk net, 0.5-m diam.		Lea (1913)
0.75MS	Silk net, 0.75-m diam.		Lea (1913)
1MS	Silk net, 1-m diam.		Lea (1913)
12FS	Silk net, 30.5-cm diam. fine		Bowman (1913)
ST	Small trawl		Bowman (1913)
1.8MTT	Tucker trawl, 1.8 m		Kleckner et al. (1985)
TT22	Tucker trawl, 2 m x 2 m		Ross et al. (2007)
YFT	Young fish trawl		Bowman (1913), Lea (1913)
Y200	Young fish trawl, 2-m diam.		Schmidt (1929) Boëtius and Harding (1985a)
Y330	Young fish trawl, 3.3-m diam.		Boëtius and Harding (1985a)

PYFT	Young fish trawl, Peterson		Bowman (1913)
6ftx1in	(uncertain)		Boëtius and Harding (1985a)
1.5ftx1in	(uncertain)		Boëtius and Harding (1985a)

IV. Literature cited in Atlantic *Anguilla* database and in this document.

Backus, R. H., and J. E. Craddock. 1977. Data report for Atlantic pelagic zoogeography. Report number WHOI-77-4. Pp. 1-87. Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

Backus, R. H., and J. E. Craddock. 1980. Midwater fish data report: Cold core rings time series cruises Knorr 62, 65, and 71 and Endeavor 11. Report number WHOI-80-18. Pp. 1-187. Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

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Appendix C

Download field description

RecordType	Record Type The reporting formats comprise a number of different record types, each containing different data fields. RecordType field consists of a 2-character code, which defines the record type and thus the layout of the data fields included on that record.
Survey	Survey code
Country	Country ISO 3166 country code
Institute	EDMO code of the institute performing the monitoring
Campaign	National campaign (survey) name For the international survey, the survey code can be combined with the country code and eventually year
SurveyPeriod	Survey period Division of the survey in a certain year into different periods, numbered from 1 to 99 Temporal sampling period of which the exact duration is determined by the realized start and finish of sampling within the predetermined dates. The egg production methods require that the whole spawning area is sampled within one Survey Period.
Ship	Ship code from SHIPC
Gear	Sampling gear code
GearDeployment	Gear deployment or sampling method applied in the survey
MeshSize	Mesh size in microns
MeshType	Mesh type
CodendMesh	Codend mesh size in microns
StationNumber	Station number
HaulID	Haul ID
ELHaulFlag	Eggs and Larvae haul flag U if the haul is untrusted, write in the notes why. Leave blank if the haul is trusted
NationalHaulID	Haul reference in the national database, if different from the HaulID
Day	Start day of the haul in UTC (DD)
Month	Start month of the haul in UTC (MM)
Year	Start year of the haul in UTC (YYYY)
Hour	Start time of the haul in UTC, whole hours as HH
Minute	Start time of the haul in UTC, whole minutes as MM
StartLatitude	Haul start latitude in decimal degrees
StartLongitude	Haul start longitude in decimal degrees
HaulDurationMinutes	Haul duration in minutes
HaulDurationSeconds	Haul duration in seconds
Distance	Distance towed in metres
WireAngle	Wire angle The angle (in degrees) of the wire measured as

	deviation from the vertical as specified in Smith, P.E.; Richardson, S.L. 1977: Standard Techniques for Pelagic Fish Egg and Larva Surveys. FAO Fisheries Technical Paper 175, 100 pp
WireLength	Maximum length of the wire shot in metres
Netopening	Netopening - inner diameter in metres
NetopeningArea	Netopening area in square metres
FlowEfficiency	Flow efficiency factor (scaled to 1)
NetClogging	Net clogging - qualitative estimate of clogging of the net
FlowmeterType	Flowmeter type
FlowmeterBrand	Flowmeter brand free text
FlowIntRevs	Internal flowmeter revolutions
FlowIntCalibr	Calibration factor of the internal flowmeter in Revs/m
FlowExtRevs	External flowmeter revolutions
FlowExtCalibr	Calibration factor of the external flowmeter in Revs/m
VolumeFiltInt	Internal volume filtered in m^3
ELVolFlag	Eggs and Larvae flag for filtered volume calculation base
DepthUpper	Upper depth Minimum sampling depth in metres
DepthLower	Lower depth Maximum sampling depth in metres
DepthBottom	Bottom depth in metres
SurTemp	Water temperature at surface or 5 m depth in degrees Celsius
Temp20m	Water temperature at 20m depth in degrees Celsius
Temp50m	Water temperature at 50m depth in degrees Celsius
Temp100m	Water temperature at 100m depth in degrees Celsius
BotTemp	Bottom temperature in degrees Celsius
SurSal	Water salinity at surface or 5m depth
Sal20m	Salinity at 20m depth
BotSal	Bottom salinity
StatRec	
Species	Species valid Latin name, as in WoRMS
ELSampleFlag	Eggs and Larvae sample flag With use of the valid codes EG or LV specify whether the measurements are for eggs or larvae
IndividualNumber	Identification number of the individual egg or larvae measured
Length	Length
DevScale	Developmental staging scale used to identify the developmental stages
DevStage	Developmental stage of eggs and larvae based on the scale applied
Number	Counted number Number of individuals (eggs or larvae) of the same species in the sample from a haul, with the same length and/or developmental stage. If Individual number is reported, value in this field would be 1.
SubFactor	Subsampling factor Report 1 if the whole catch was analyzed, or report a raising factor if only a part of the catch was analyzed.
SpecIdentMethod	Method of species identification See METOA for the valid options, recommended values are: IMA; IMA-SW; IMA-ZS; MIC-

	EM; MIC-FL; MIC-LM; MIT-TM; RIA
OilGlobulesFlag	Flag for presence of oil globules
OilGlobulesNumber	Number of oil globules Possible values 1, 2 or many
OilGlobulesDiam	Average diameter of oil globules in microns
PreservationMethod	Preservation/storage method at the time of measurement