Centre for Environment Fisheries & Aquaculture Science

Cefas

C7010

MEDIN – Data Legacy Rescue

Historic Fishing Effort

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Cefas Document Control

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Introduction

Cefas is one of the world's longest-established marine research organisations and, since 1902, has advised Government on sustainable exploitation of marine living resources, in support of a healthy environment and profitable fishing industry. Cefas is at the forefront of marine science aided, to a great extent, through retention of our long-term datasets. Many of our historical datasets, however, pre-date the computer age and in spite of recent efforts to digitise historical data, potentially important datasets have yet to be converted to electronic format. This project aimed to create a dataset on UK historical fishing effort in the North Sea (formerly produced by the Directorate of Fisheries Research, DFR), spatially detailed by ICES rectangle, between the years 1913 and 1980 (excluding both World Wars). These data will be available to support policy and science questions related to the past and future of UK fishing fleets, the dynamics of commercially exploited fish stocks, and the environmental impact of trawling.

This project has enabled a single, accessible, dataset containing the actual data on trawl fishing effort to be produced. More specifically, the data include long-term, spatially-detailed information on UK trawl and seine fishing effort in the North Sea, by year and by ICES rectangle. Effort data (number of hours fishing) are shown separately for each of the major historical demersal trawling and seining fleets of the UK: sailing trawlers (pre-WWII only), steam trawlers (until the 1970s), motor trawlers, steam seiners (pre-WWII only) and motor seiners.

In addition to annual effort data, we have also collated effort data by month, for single years at 10-year intervals (1927, 1937, 1947, 1957, 1967, 1977).

Approach

Data entry

The data were compiled from historical paper-format 'Statistical Charts' (see Figure 1 for an example). All charts had been scanned as image files, but the actual handwritten data had only been entered for smaller sets of charts on fish landings (and formed the basis for several research papers).

For each chart, the data were entered into Excel workbooks, with a protected spreadsheet that had been prepared so that it closely resembled the paper chart (facilitating data entry), and a linked second spreadsheet which held the variable names in the first row and the effort data by rectangle in the following 213 rows. Data from these second spreadsheets were then saved as *.csv files.

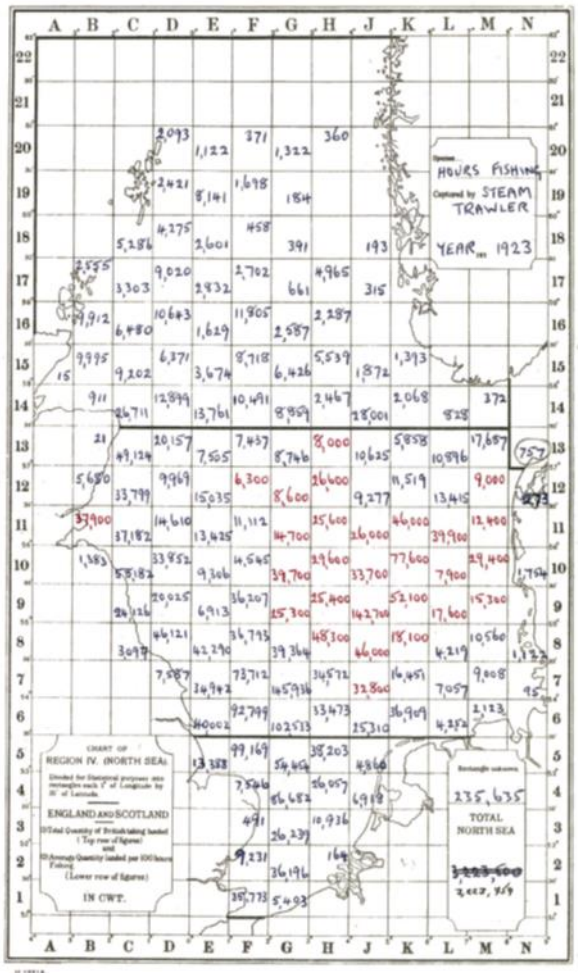

Figure 1: Example of a Statistical Chart showing number of hours fishing by rectangle, for steam trawlers during 1923.

Collating data from spreadsheets into flat file format

Each csv file contained effort data for one year or month, and one fleet segment (steam, sailing or motor trawlers; or steam or motor seiners). The total number of annual csv files containing effort data was 124; the total number of monthly csv files was 168. Each file contained effort data for up to 212 ICES rectangles (and in some cases, effort data where the rectangle was unknown).

An R script (R Statistical Software, CRAN) was written to extract data from the individual files and collate into two csv files that contain all effort data. One file contains all annual data, and the other all monthly data.

In order to QA the raw data, we used a variety of queries in R, that allow tabulation or plotting of the data. Any errors were communicated with the data entry team, corrected in the raw Excel and csv files, thereafter re-loaded into the R script, and updated ‘total’ csv files (all annual and monthly data) created.

Permanent data storage

The final two datasets were uploaded to the Cefas Data Repository (CDR) with associated metadata files being created and loaded into the Cefas Metadata Repository (MDR). The data will be 'published' on the Cefas Data Hub (external data portal) and will be accessible through MEDIN.

DOIs have been assigned to the two datasets.

http://doi.org/10.14466/CefasDataHub.23

http://doi.org/10.14466/CefasDataHub.24

Supporting information

In addition to the metadata a short paper is being written to provide additional information to end users of this effort dataset. This paper will be available via the data access portal. Details will include: a description of the dataset, explaination of the variable names, references to key documents of potential relevance to the data source and the potential usage of the data. The document will briefly highlight the relevance of these data for understanding: the long-term impact of fishing pressure on the marine environment; fishing fleet dynamics; and (if linked with climatic data) how climate change might impact fish stocks and, potentially, the fishing fleets dependent on these, in UK waters.

Acknowledgements

Cefas would like to thank MEDIN for the funding to enable Cefas to provide quality-assured data for use in further scientific studies.

We would also like to thank JDP contractors who undertook the majority of the data entry tasks.

Centre for Environment Fisheries & Aquaculture Science

Cefas

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We advise UK government and private sector customers on the environmental impact of their policies, programmes and activities through our scientific evidence and impartial expert advice.

Our environmental monitoring and assessment programmes are fundamental to the sustainable development of marine and freshwater industries.

Through the application of our science and technology, we play a major role in growing the marine and freshwater economy, creating jobs, and safeguarding public health and the health of our seas and aquatic resources

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- industries across a range of sectors including offshore renewable energy, oil and gas emergency response, marine surveying, fishing and aquaculture.
- other scientists from research councils, universities and EU research programmes.
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