NETWORKING THROUGH FISHLINE: STATE-OF-THE-ART OF LIBRARIANSHIP IN DENMARK

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Danish Institute for Fisheries
and Marine Research

Following a decade of increasing difficulties, the libraries of the Danish Institute for Fisheries and Marine Research together with other Danish fisheries research institutions have engaged in a common project of reorganization and automation. Based upon the fundamental ideas of networking and international standardization, the project has as its main feature a shared online catalog, called FISHLINE. In time this should become an almost complete representation of fisheries science documents located in Denmark. The system is based on a central minicomputer tied up with several local microcomputers, used for input as well as retrieval. Input features Marc-cataloging and ASFIS-indexing. The paper gives a brief outline of some of the achievements and ideas of the reorganization project.

INTRODUCTION

The past decade of Danish fisheries research has been characterized by an increased growth in the traditional areas of investigation as well as an emergence of new areas of scientific research and technological development.

The introduction of exclusive economic zones and quota regulations has increased the need for accurate management of fisheries and fish resources. Futhermore, the need for alternatives to the traditional sea fisheries such as fish and shellfish culture has increased. Thus the economic and political importance of fisheries research has been in focus, which has increased governmental funds and brought onto the scene new sources of finance, such

as The Commission of The European Common Market in charge of fishery regulations of the member states.

The number of research institutes within the fisheries sector has grown as has the size of the old institutes like the Danish Institute for Fisheries and Marine Research(DIFMAR). A brief description of the research sector is given in Appendix 1.

DIFMAR has roots back to the very start of organized Danish fishery investigations in the 1880's, but was formally established by a merger in 1952 of the Danish Biological Station and several laboratories run by the Commission for Danish Fisheries and Marine Research. Thus the present publication series of DIFMAR was initiated in 1904. As they have been subject to extensive title and author changes, a plan of the publication pattern is given in Appendix 2.

The present library collections of DIFMAR likewise date back to the turn of the century and the older stock is characterized by inclusions from the annexed laboratories. Furthermore, large parts of the collections from the Dana Expeditions of the Carlsberg Foundation have been included. Thus the subject and geographical coverage seem to be very fine for older material; and research directories of the early 1960's emphasize the fine library facilities.

But sometime in the late 1960's or early 1970's the library went off the track. Probable factors are the information explosion combined with the fact that the position of librarian at that time was a post of retreat for senior scientists, which for natural reasons produced a series of rather short careers. In any case, things gradually went out of control during the 1970's, and by 1980 the library

service was quite unsatisfactory.

This was (and still is, to some extent) a problem especially for the many younger scientists and those taking up new areas of research; while the well-established scientists research areas managed through their widespread international contacts. The background for these contacts has been the institute's position in areas such as multispecies modelling and the very close ties to the International Council for the Exploration of the Sea (ICES), which has been located in Denmark since the start in 1902 and just recently moved from the castle in Charlottenlund.

However the problem is not only internal. As the fishery sector's largest research library, the DIFMAR Library maintains the position as central library for the fishery sciences in the national system of research libraries.
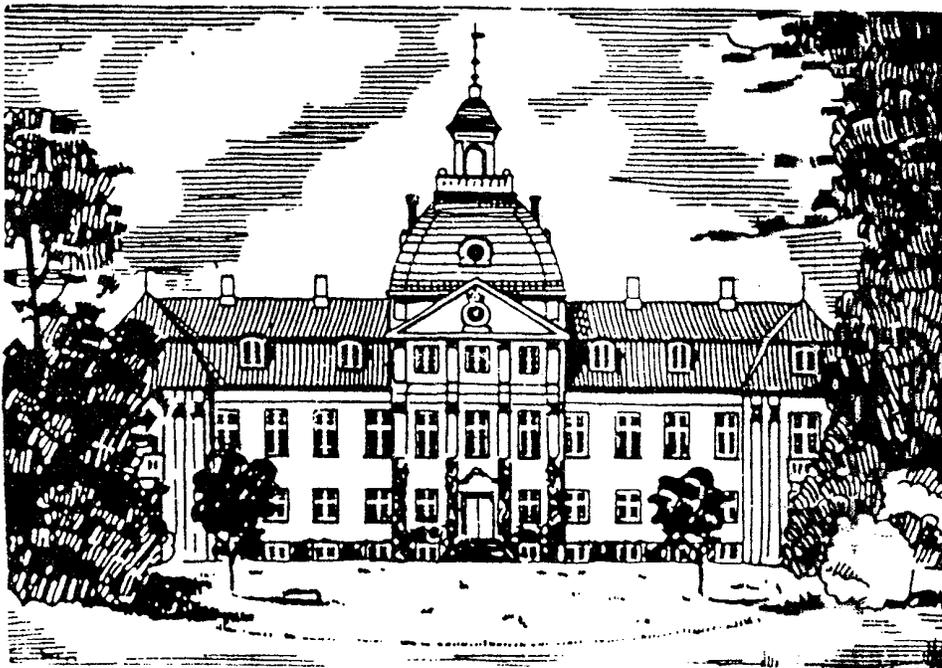
Charlottenlund Castle

The external demand for library service has grown rapidly with the emergence of new institutes, research groups, university courses, industries and general public interest in our area, and so has the external dissatisfaction.

As a result of this, a project of library reorganization, supported by the Ministry of Education, was inititated at DIFMAR in 1982. Through contacts to the University of Aalborg, which was in the process of acquiring an online catalog system and starting up a new educational program for fisheries engineers, the idea of an online union catalog for fisheries libraries emerged and national cooperation became a main feature of the project.

The following gives a brief outline of some achievements and ideas of the reorganization project.
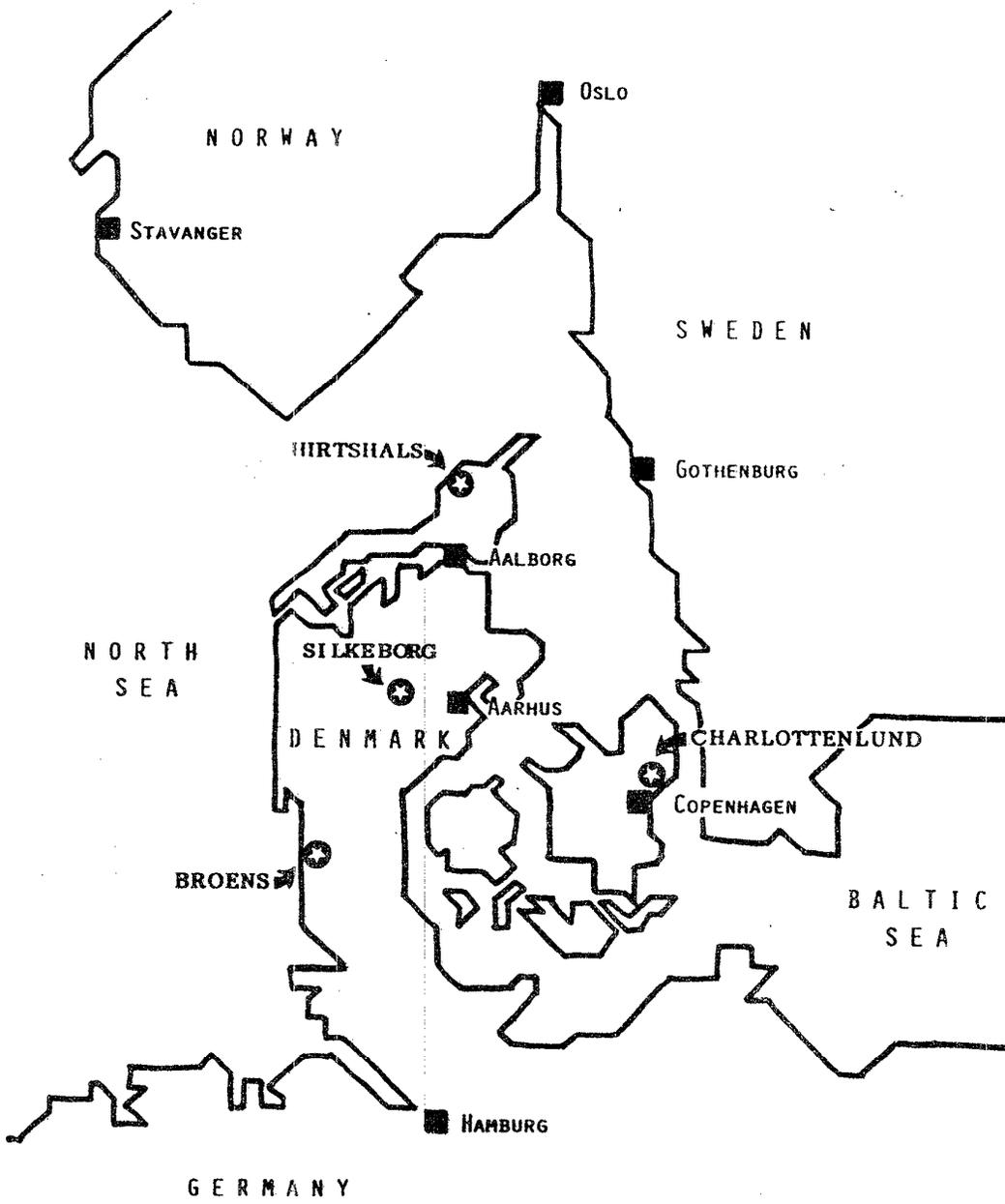
THE ONLINE UNION CATALOG

The main object of the catalog project is to provide a fundament for a network of Danish fisheries libraries, where the collected stocks can be exploited easily by any member of the network and duplicate accessions should become almost superfluous.

Participating Libraries

At present the libraries of the following institutions take part in the project: the Technological Laboratory of the Ministry of Fisheries (TLMF), the Danish Institute of Fisheries Technology (DIFT), the North Sea Museum (NSM), Aalborg University and DIFMAR.

As the locations of these libraries are spread all over the country, the online catalog will help to overcome the geographical distance between the libraries and, furthermore, give access to the network from almost any corner of the country. The main locations of the

FIGURE 1

Locations of the DIFMAR Library

NORWAY

■ OSLO

■ STAVANGER

SWEDEN

HIRTSHALS➤✪

■ GOTHENBURG

■AALBORG

NORTH
SEA

SILKEBORG
↘✪

■AARHUS

DENMARK

■CHARLOTTENLUND

✪

■ COPENHAGEN

BALTIC
SEA

✪

BROENS➤

■ HAMBURG

GERMANY

(✪ MAIN LOCATIONS OF THE INSTITUTE)

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DIFMAR Library alone can be seen in Fig. 1.

In the future it would be natural to include what remains of fisheries collections in research institutes, university libraries, etc.

As host of the database the Aalborg University Library has the responsibilities for and the practical task of maintaining the hardware and system.

Structure and Interface to Other Danish Online Catalogs

The catalog database, called FISHLINE, is divided into a number of logical files, one for each of the participating libraries' monographical input, and one for serials cataloging. The computer which is at Aalborg University Library (AUL) also hosts AUBOLINE, which is the catalog of the entire university library. AUBOLINE and FISHLINE can be searched simultaneously extending FISHLINE with references to the collections of a university library.

These two databases are furthermore loaded into SAMKAT/ALBA, the database of the national Danish research libraries common cataloging project. In this context FISHLINE can be searched by any Danish library, although not with the same query facilities as FISHLINE offers, as the object of SAMKAT/ALBA is mutual re-use of catalog records and easy location of books and journals in Danish research libraries. These relations are displayed in Fig. 2.

Together with AUBOLINE it is planned to open FISHLINE for public access on a small scale during 1985 and then gradually build up the capacity for external use. Further on, as the new Danish packet-switched data-communications network is fully implemented, the plans are to link all library systems in Denmark together. This should enable the

FIGURE 2

Structure of the FISHLINE Database
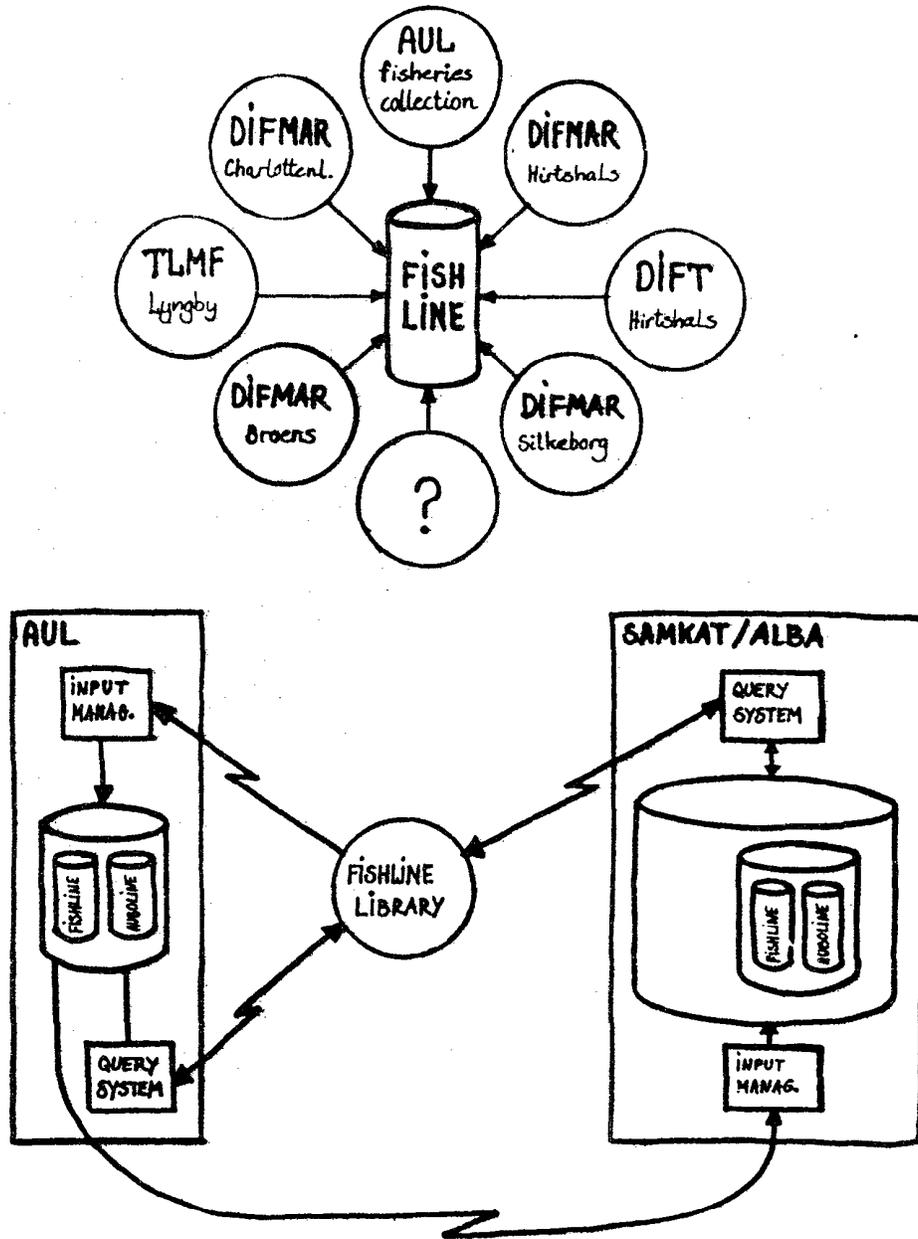
user to search all computers/databases in one operation.

Hardware

The central configuration at AUL consists of an RC-8000 24 bit mini/midi-computer (128 K), two 248 MB disc drives and a tape-station, all furnished by RC Computer of Denmark.

The distributed equipment consists of RC-700 8 bit microcomputers (Z80A-microprocessor, 64 KB RAM) with double 8" floppy drives (2 x 0.9 MB) and OKI Microline 84 matrix-printers with high speed serial interfaces. Presently 5 configurations of this kind are in operation.

At present communications are handled through dial-up connections and 1200 bps modems.

Software

The software is the RC Library System likewise furnished by RC Computer and sold as a turn-key system. However, as we were amongst the first to purchase the system, quite some time was spent waiting for program modules, finding errors, specifying necessary alterations, etc.

The system is basically an information retrieval system (inverted file) with added modules for microcomputer-cataloging, etc. The following modules are still under development: circulation control, accession, periodicals check-in, administration and statistics.

Query Language

The query language is based upon the European Common Command Language (CCL) and is thus very close to being in accordance with the emerging ISO-standard. It features practically the same facilities as well known systems such as Lockheed's Dialog, and for

those familiar with the German database hosts, it behaves much like the GRIPS-DIRS of DIMDI, for example.

Cataloging Rules

In order to follow international standards and for the FISHLINE-records to be compatible with the AUBOLINE-records and also be acceptable for the SAMKAT/ALBA system, we chose to follow the Danish version of the Anglo-American Cataloging Rules (AACR) and the International Standard Book Description (ISBD). This has furthermore given us the possiblility of reusing other libraries' catalog-records as they can be retrieved, downloaded, edited and transmitted for input into FISHLINE. This aspect is even more interesting as the catalog-records of the Library of Congress and the British National Bibliography (LC-Marc and BNB-Marc) are loaded into the SAMKAT/ALBA database. On the other hand, AACR certainly is not ideal for online catalogs because of the mass production of redundant data and the time-consuming but utterly irrelevant rules for choice of heading.

Indexing

For description of the subject content of the recorded documents, we chose to use the ASFIS indexing system and not the Universal Decimal Classification System (UDC), which would have been the traditional choice for a Danish science and technology library. The systems had in common that they were international and that the use of the systems was well documented. However, we found that ASFIS indexing had several advantages:
- It was tailored for online retrieval systems in direct contradiction to UDC, which only in part would allow us to exploit the advan-

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tages of online subject searching.
- It was naturally much better in the area of fisheries science.
- It was also the indexing system of what had become our most popular external database, ASFA. This would allow us to use the same search profile without reformulating in ASFA as well as FISHLINE.
- The experience we would gain by using the ASFIS indexing system would improve our search strategies when searching ASFA.
- This experience would also be an advantage if we were to start as a Danish input center to ASFA.

Although it probably is too early to draw any conclusions, certain difficulties have already shown. One, for instance, is the problem of establishing a uniform and satisfactory indexing level for books, as they normally represent broader and more numerous concepts than articles and reports. Furthermore, we have had to amend the system of Subject Category Codes with codes for our general literature (i.e., whatever falls outside the scope of ASFA).

Input format

For choice of format, the same considerations apply as mentioned in choice of cataloging rules.

The chosen format is the Danish version of the international Marc-format, called Dan-Marc. This format, however, is far too complex for our purposes as it, like AACR, mainly is aimed at extremely refined book- or card-catalogs.

What we have done, then, is to restrict our usage of the format facilities and to define fields for the ASFIS indexing terms. As it can be seen in Fig. 3, we chose the fields 631-636 for the 6 categories of indexing terms:

FIGURE 3

Input Format

```
*001 00 *a0126040508:DHU1-aub
*008 00 *as1976*bgb*leng
*021 00 *a 0-12-604050-8
*088 00 *a 597
*096 00 *a HIRT *b 01 *d Fast lån: Paul Degnbol *m DANA
*100 10 *a Russell *h F. S.
*245 14 *a The eggs and planktonic stages of British marine
             fishes *d F.S. Russell
*260 00 *a London *b Academic Press *c 1976
*300 00 *a xv, 524 s. *b ill.
*631 00 *a 1461 *b Rus
*631 90 *a 1344
*631 90 *a 1420
*631 90 *a 1342
*632 00 *a marine
*633 00 *a ANE, British Isles
*634 00 *a Pisces
*635 00 *a fish eggs *a fish larvae *a ichthyoplankton
             *a juveniles *a vertical distribution
             *a horizontal distribution *a feeding behaviour
             *a spawning seasons
*636 00 < empty in this case >
*999 00 *a MS
```

Primary subject code
Secondary subject code
Environmental descriptor
Geographic descriptor   ASFIS indexing
Taxonomic descriptor
Subject descriptors
Identifiers

subject category codes, environmental descriptors, geographic descriptors, taxonomic descriptors, subject descriptors and uncontrolled terms (identifiers).

When assigning identifiers in areas like fishing vessel construction and food science, we use the Ship Abstracts Thesaurus and the Food Science and Technology Abstracts Thesaurus, respectively.

How It All Works

In order to provide some idea of the practical side of the system, an example of the input routine is given:

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1) The microcomputer is loaded with the cataloging software, providing communication facilities as well as stand-alone editing and syntax control.

2) Connection is made to the SAMKAT/ALBA database, which is searched in order to find already existing catalog-records (from other Danish research libraries, the Danish National Bibliography, LC or BNB). If this is successful, the most suitable record is chosen and downloaded in the Marc-format.

3) The micro is switched to stand-alone mode, and the record is edited in accordance with FISHLINE conventions. In case the search in SAMKAT/ALBA was unsuccessful, the item is cataloged from scratch. As editing/cataloging is concluded, the record is saved on disc and printed out to enter the indexing routine.

4) The item is indexed according to ASFIS rules, indexing terms being noted on the print-out. This step might include an ASFA-search normally using the host DIMDI in Cologne.

5) Still with the micro in the stand-alone editing mode, the indexing terms are entered and saved on disk. By now, the record should be complete and correct as the micro-software takes care of quite a lot of the validation. The micro is then switched to online mode, connection to FISHLINE is established, and the record is transmitted to the FISHLINE host computer at AUL. This concludes the FISHLINE-library input routine.

6) At AUL the record is run through the various input management routines (validation, indexing, etc.) and at least by the next day, the record is fully searchable for any FISHLINE library.

7) Approximately once a week the new, cor-

rected or deleted FISHLINE records are transmitted and loaded into the SAMKAT/ALBA system. As connections are still dial-up and terminal capacity is limited, we receive, for the time being, weekly catalog card printouts from SAMKAT/ALBA for trivial catalog use, such as finding the shelf mark of a well known book, etc.

Provisional Conclusions

The union catalog aspect of the online project has initiated a much needed cooperation between Danish fisheries libraries that was completely lacking just two years ago. This together with the indisputable advantages of a union catalog itself should be viewed in context with the effort it takes to reach the necessary compromises, the time-consuming traveling to and from innumerous meetings, the mountains of paper, etc.

If the project were to be evaluated merely as a means of cataloging the collections of DIFMAR or any of the other fisheries institutions, I am not sure that we could not have done it quicker and more rationally in some other way. However, we have now become a member of an emerging fisheries network and also a member of the Danish research library community; thus the importance of this extends beyond cataloging.

The RC Library System, or the parts of it we know today, is a very capable and flexible software package for this task. All kinds of parameters can be trimmed in order to make the system suitable for the demands of the medium sized institute library or the largest university or national libraries. However, it is necessary for the library to have at least one computer-trained employee even though the furnisher sometimes provides sufficient documentation.

What we didn't know, was that we were to play a role in the development of the system, which, of course, has taken a lot of time, but also has given us lots of experience in configuring information retrieval systems. The system is also used by other Danish research libraries like the University Library of Aarhus and others are to come.

OTHER ACTIVITIES

The reorganization of the DIFMAR Library has, of course, other aspects than union cataloging. These are, however, mostly of a more trivial nature such as setting up new accession and exchange procedures and generally cleaning up and rearranging the stacks, etc.

It could be of interest, however, to mention our library at the newly established North Sea Centre in Hirtshals. All the participating institutions of FISHLINE are represented in the center and rather than having several small libraries on the premises it was agreed to run a common library function. This can be seen as one of the indirect accomplishments of the union cataloging project.

As the library is no older than the union catalog, all materials can be searched online. The library features another interesting use of the ASFIS system as the books are shelved according to the primary Subject Category Code of the ASFIS indexing. Thus the shelving is analogous to the way the entries are arranged in the printed version of ASFA.

The codes 0-999 are used for our general literature (the part that falls outside the scope of ASFA) and have been inspired by the main divisions of UDC. 1000-1999 cover the scope of ASFA1 and 2000-2999 the scope of ASFA2.

As literature becomes more abundant in

Hirtshals, this solution can be evaluated thoroughly, although it already seems that in comparison to the ASFA database consistency is much more critical in our case.

THE MAJOR DANISH FISHERY RESEARCH INSTITUTIONS

The Danish Institute for Fisheries and Marine Research
(Danmarks Fiskeri - og Havundersøgelser, DF&H)

The national agency for research in the field of fishery biology including fish pathology and aquaculture and with special reference to fish stock assessment. The institute was founded in 1889 and acts as the Danish national agency for governmental expertise in fishery biology. Fish stock assessment in marine waters is generally carried out in international cooperation normally coordinated through the International Council for the Exploration of the Sea (ICES). This organization also coordinates the activities in hydrography, etc. Research vessels are Dana, Havfisken, Havkatten and Havmusen.

Personnel: 150

Main location: Copenhagen (Charlottenlund Castle)

Secondary locations: Hirtshals (North Sea Centre), Silkeborg, Brøns, and several smaller laboratories.

Publishes: **Dana** (English language scientific journal)
Fisk og Hav (Danish language popular journal)
DF&H-rapport (Mixed language report series)
Arsberetning (Danish language annual report)
Occasional papers

In the national system of research libraries, DF&H maintains the function as central library

for the fishery sciences. Thus it is the lar-
gest library in this field in Denmark. Adminis-
tration and main collection in Copenhagen and
secondary collections in Hirtshals and Silkeborg.
The entire library, information and documentation
function is presently in the process of reorgani-
zation.

Library
Danish Institute for Fisheries and Marine
        Research
Charlottenlund Castle
DK-2920 Charlottenlund
DENMARK

Tel: (01) 62 85 50   Telex: 19960 dfh dk

Contact: **Mogens Sandfaer**

The Technological Laboratory of the Ministry of Fisheries
(Fiskeriministeriets Forsøgslaboratorium, FF)

The national agency for research in the
fields of fish handling, storage and processing
of fish products. Furthermore, the institute
is responsible for education at the Technical
University of Denmark in the institute's research
fields.

Personnel: 40

Main location: Lyngby (on the premises of the
Technical University of Denmark)

Secondary location: Hirtshals (North Sea Centre)

Publishes: **Arsberetning** (Danish language annual
                report)
           Occasional papers

Within the working area of the laboratory,
the library holds the most comprehensive col-
lection in Denmark.

Library
Technological Laboratory of the Ministry
    of Fisheries
Technological University of Denmark
Building 221
DK-2800 Lyngby
DENMARK

Tel: (02) 88 40 60 ext. 3521

The Danish Institute of Fisheries Technology
(Fiskeriteknologisk Institut, FTI)

Performs research on a commercial basis in the field of catch technology. The institute was founded in 1981 and became operational late in 1982. The main activities are centered around a flume test tank for fishing gears.

Personnel: 14

Location: Hirtshals (North Sea Centre)

Publishes: **Occasional papers**

Operates a Documentation Department that functions as a private information broker. The library is building up a collection of catch technology literature with emphasis on grey literature. The library is run in cooperation with DF&H.

Documentation Department
Danish Institute of Fisheries Technology
North Sea Centre
DK-9850 Hirtshals
DENMARK

Tel: (08) 94 43 00

Aalborg University

A relative newcomer in the field of fishery research, with a recently established program in fisheries engineering.

Thus the library (Aalborg Universitetsbibliotek, AUB) is building up a core collection of fishery science literature. Apart from that, AUB is one of the largest and most modern research libraries in Denmark. As AUB acquired their online catalog system collaboration with the fishery research institutions was initiated. Within this system the FISHLINE database functions as the common online catalog of the above mentioned libraries.

Aalborg University Library
Langagervej 4
Postbox 8200
DK-9220 Aalborg Øst
DENMARK

Tel: (08) 15 91 11 Telex: 69790 aub dk

PLAN OF THE PUBLICATIONS OF THE DANISH INSTITUTE FOR FISHERIES AND MARINE RESEARCH AND ITS PREDECESSORS

1890   1952

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BERETNING FRA DEN DANSKE BIOLOGISKE STATION
REPORT OF THE DANISH BIOLOGICAL STATION
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1904   1952

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MEDD.FRA DANM.FISK.OG HAVUND.★ -  SERIE: FISKERI

MEDD.FRA DANM.FISK.OG HAVUND.★ -  SERIE: PLANKTON

MEDD.FRA DANM.FISK.OG HAVUND.★ -  SERIE: HYDROGRAFI

MEDD.FRA DANM.FISK.OG HAVUND.★ -  SERIE: FISKERI —
                                          STATISTIK
```

                                                                        1980

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MEDD.FRA DANM.FISK.OG HAVUND.    DANA
NY SERIE
```

1904

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SKRIFTER FRA DANMARKS FISKERI- OG HAVUNDERSØGELSER
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1972

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FISK OG HAV
```
```
ÅRSBERETNING
FRA D.F.& H.
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★

The name of the publisher has varied somewhat through the years.
From 1904: Kommissionen for Havundersøgelser.
From 1926: Kommissionen for Danmarks Fiskeri- og Havundersøgelser.
From 1952: Danmarks Fiskeri- og Havundersøgelser.

1973   1984

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INTERN  D.F.& H.
RAPPORT RAPPORT
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