ASFIS : Vehicle for international exchange of scientific information

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The "Aquatic Sciences and Fisheries Information System" (ASFIS) is a computerized modular system for the collection and dissemination of information relevant to the interests of individuals and institutions concerned with aquatic research and the exploitation of the resources of the aquatic environment.

Some of the files on which ASFIS is based have their origins in the formative years of the FAO fisheries program. They were established through sheer necessity: such information services as existed then were totally inadequate to support the emerging program. Thus, the then-mid 1950's Fishery Biology Branch was obliged to dedicate a fair portion of its manpower to the compilation of a running bibliography on fisheries literature. This led, in 1959, to the publication "Current Bibliography for Aquatic Sciences and Fisheries"—forerunner of what is now the ASFIS bibliographic database, monthly up-dates to which are published as "Aquatic Sciences and Fisheries Abstracts." Similarly, the ASFIS Experts Register, a computer-searchable file the contents of which go to press on an *ad hoc* basis in the form of directories, is an extension of a biographical index of fishery scientists built up in FAO during the early 1960's to facilitate recruitment of personnel for field assignments.

As interest in the oceans and their resources mushroomed, the concept of a cooperative approach for the management of the rapidly expanding volume of information being generated, found acceptance. The FAO files were thus augmented in scope and adapted to keep pace with this development. Today, ASFIS covers all aspects of the science, technology and management of the "aquasphere," both marine and freshwater, including socioeconomic and legal aspects. The Ocean Economics and Technology Branch (OETB) of the

UN Department of International Economic and Social Affairs, and the Intergovernmental Oceanographic Commission (IOC) of Unesco co-sponsor the system with FAO. Points of contact throughout the world of OETB, IOC, and FAO are used to collect and validate information for the ASFIS registers.

It is this adaptive evolution of ASFIS which perhaps most distinguishes it from other cooperative information systems, and has led to its general acceptance among participating agencies and institutions. All uses of ocean-space have potential interaction with each other, as do natural phenomena within and over water masses. Thus, the concept of a single information system covering all aspects not only makes good sense scientifically; it is also easier to explain and promote at the administrative/political levels in the governing bodies and regional associations of the UN and its agencies. The generous financial support of the United Nations Environment Programme during the period 1976-1980 accelerated the emergence of ASFIS to its pre-eminent position.

The ASFIS Bibliographic Database

At the end of 1981, this database carried 107,896 references to scientific literature accessioned since January 1978; about 2,400 are added each month. Each record includes an English translation of the title, an English-language abstract and subject, taxonomic and geographic index entries as relevant. Work nearing completion will soon add 44,769 references to literature accessioned between January 1975 and December 1977.
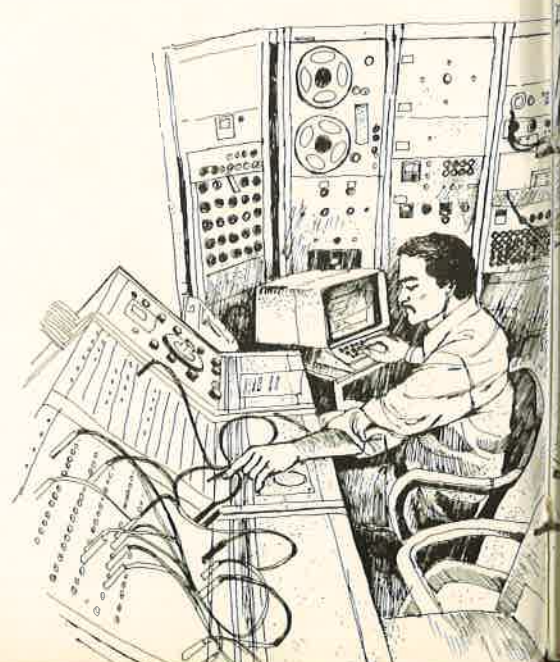
Database entries are published monthly as "Aquatic Sciences and Fisheries Abstracts" (ASFA), each issue of which includes an author index and shunted subject-taxonomic-geographic indexes. All indexes are cumulated annually. There are over 1,000 subscribers to ASFA, about 175 of them in developing countries.

In the USA, the database is loaded in the DIALOG system, in Canada in the Q/L system and (for SDI services) at the

Canadian Institute for Scientific and Technical Information (CISTI). In France, DOCOCEAN hosts the database, and in Germany F.R., DIMDI. Via the telecommunication networks TELENET, TYMNET and EURONET, the database is searched in many other countries, including several developing countries. Because of its broad international coverage and file structure, the database has been well received in development-assistance agencies.

Approximately 65% of the records refer to papers dealing with biological aspects and the exploitation of living resources, and 35% with oceanographic phenomena, marine geology, non-living resources and their exploitation. Some 65% of current accessions are derived from journal articles published in some 5,500 journal titles which are monitored cover-to-cover, issue-by-issue, plus others less formally identified by various means. About 20% of the records derive from books (including chapters in books), conference proceedings and similar commercially available sources, and the remaining 15% from the nonconventional report literature.

The records are allocated to one or more of the 260 clearly defined subject categories grouped into 44 major subject

areas; this fine division greatly facilitates browsing in both the published abstracts and the database. Subject indexing is based on a hierarchically structured thesaurus of some 5,000 terms, taxonomic indexing on an authority list which permits indexing down to family, genus or species level as needed, and geographic indexing on an authority list from which index entries from major geographic/geophysical areas down to quite minor areas (lakes, rivers, bays, etc.), may be constructed, as relevant to the activity being reported. Thus, even if the database is loaded into a system which does not permit "free-text" searching, or from which the abstracts are excluded altogether, it is possible to run highly selective searches. Similarly, if needed, highly specific retrieval is possible using the printed indexes.

From a relatively humble birth in 1971 when, with the support of two national institutions, ASFA was created by merging FAO's "Current Bibliography for Aquatic Sciences and Fisheries" with the commercially produced "Aquatic Biology Abstracts," input for the database is now submitted by a network of eighteen institutions in eight Member-States (Canada, France, Germany F.R., Mexico, Portugal, United Kingdom, U.S.A. and U.S.S.R.) and the publisher of ASFA (Cambridge Scientific Abstracts, Washington, D.C.). After a brief absence due to budgetary problems, Japan will hopefully soon resume full participation.

The present is a far cry from what is commonly considered as the "ideal"

cooperative system with full participation of all Member-States—particularly developing Member-States—but a combination of circumstances dictates against emphasis on "full" participation as an immediate objective. However, perhaps more than in most areas of potential cooperation, the recently recognized importance of the aquatic environment for economic development is breeding a variety of intergovernmental and/or regional bodies whose function is not simply to "regulate" and to "coordinate," but to conduct relevant research. It is through these bodies that the ASFIS Secretariat seeks to promote broadened participation.

Thus, UNDP's "Aquaculture Development and Coordination Programme" (ADCP) has opted to link its aquaculture information network to ASFIS (see article, p. 9).

On a somewhat different plane, the guidelines developed for the ASFIS bibliographic database are being adopted in a variety of emerging national systems. As an example, the ASFIS thesaurus is used to index Canada's annual bibliography of fisheries publications. The Red Sea Commission is contemplating its use in its documentation center and, in Australia, it has provided the basis for a more specialized thesaurus for an information system on the Great Barrier Reef. In Argentina, its terminology has been independently translated into Spanish and published for local use. Translation of the thesaurus into French is now being examined as a joint undertaking of French and Canadian institutions.

Although these developments are only spin-offs from the ASFIS program, they are nonetheless important because they are paving the way to consistency in national systems. This not only facilitates information transfer; it also facilitates the future growth of ASFIS, for one of the major tasks in taking ASFIS from a developing to an operational system has been the design, adaptation and implementation of the authorities and formats used.

MSCT and FACT

Some years after FAO commenced publication of the "Current Bibliography for Aquatic Sciences and Fisheries" (in 1959), it became apparent that a complementary service to disseminate information rapidly on recent research was

needed. Recognizing that results of such research are published substantially in the "core" journals, in 1966 FAO, with the support of Unesco, commenced publication of "Marine Science Contents Tables" (MSCT), a monthly publication which directly reproduces the contents pages of the "core" journals, issue by issue. In 1966, a sister publication, "Freshwater and Aquaculture Contents Tables" (FACT), made its debut, and now publishes the contents pages of 50 relevant journals. Twenty titles, those which include papers on coastal aquaculture, are covered by both MSCT and FACT. Despite steps taken to eliminate personal copies, the mailing lists grow. MSCT now goes to about 3,800 addresses worldwide, and FACT to 1,800.

World List of Aquatic Sciences and Fisheries Serial Titles

This ASFIS module carries the extended title and its abbreviation (as used in the bibliographic database), the name and address of the issuing body, the language(s) and frequency of publication, and the language(s) of summaries, if any, for these serial publications. Previous titles, or variations of the present title or name of the issuing body, are included where relevant. The traditional librarian's tools of this nature—the comprehensive world lists of all scientific serials—have now become so expensive that they are a severe drain on the budgets of all but the large libraries even in developed countries.

Since the bibliographic database became available online, the previously brisk demand for this ASFIS product has become almost overwhelming. The message seems clear: the fugitive literature which, by document type, now constitutes the fastest growth in the database, is attracting more attention and, as opposed to the conventional journal literature, is difficult to come by without the information disseminated in the World List. The list has now been published in six volumes, the first of which appeared in 1975. Each volume lists titles which have not appeared in previous volumes; some 4,000 core and peripheral serial titles are now covered. Plans to computerize the file are on hand.

ASFIS Meetings Register

During any twelve-month period, up to about 100 meetings dealing with some aspects of marine and freshwater affairs,

and of international interest, are held, and perhaps twice as many are in the planning stage—sometimes as much as 2 to 3 years ahead of the date the meeting will be held. Information about these meetings is collected from a wide variety of sources as it becomes available and an entry is made in the computerized ASFIS Meetings Register. Information from the register is then disseminated through MSCT and FACT, a greatly appreciated feature of these publications.

ASFIS Institutions and Experts Register

This file has its roots in a biographical index of fishery scientists established by FAO to facilitate recruitment of experts for field assignments. Following recommendations in 1967 of the Executive Committee of the Scientific Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions (ICSU), the scope of the information collected was broadened in order to provide a reference list of scientists involved in oceanographic work, and an indication of the activities in various laboratories and organizations. Thus, in 1970, the first "International Directory of Marine Scientists" was published by FAO with the financial support of Unesco/IOC. A revised, greatly enlarged directory was published in 1977 and a second up-date, which will include the names of about 19,000 scientists working in over 4,000 institutions world-wide, will be published later this year. Indexes will enable users to identify registrants by name, by institution within country, and by specialties and activities.

When work on the directory is completed, the register will be re-formatted for online interrogation. The register will then be responsive to greatly augmented search criteria such as nationality, languages spoken, educational qualifications and more detailed specialties and activities.

ASFIS Register of International Marine Affairs Activities

This is the youngest in the ASFIS family of databases. Indeed, it is still very much in the embryonic stage, and at present carries information on 149 UN-agency activities—status, subject, geographic areas, title and statement of objectives, prior activities and funding—as a pilot operation.

As a result of many expressions of in-

The author *(center)* at the ASFIS editorial meeting in Lisbon last year. On his left, Dr. Elda Fagetti, ASFA editor; Dr. U. Brüll, Bundesforschungsanstalt für Fischerei, Germany. To his right are Mr. D. Moulder, Marine Biological Association of the U.K. and Mrs. C. Quarini, International Retrieval Ltd., U.K.

terest, over many years, the ASFIS Secretariat examined the feasibility of creating a database which would cover relevant on-going research in or relevant to developing countries. This examination suggested that the scope of the database should initially be restricted to projects operated under international agreement—bilateral, multinational cooperative and international (UN agency) projects. The reason for this is that nationally funded projects are, at present, too volatile for them to be reliably included in such a database. Notwithstanding the growing importance of ocean resources for economic development, marine science research is relatively expensive and is therefore very susceptible to changing political and economic considerations. All too often, national projects and programs are mutilated or even terminated long before they have run their anticipated course, and the chances of maintaining a *useful* file on a global basis for such projects then become extremely tenuous.

Publications in the ASFIS Reference Series

Publications so far issued by FAO in the ASFIS Reference Series are:

- ASFIS—1 List of Periodicals Monitored for the ASFIS Bibliographic Database
- ASFIS—2 ASFIS Subject Categories and Scope Descriptions
- ASFIS—3 ASFIS Guidelines for Bibliographic Description
- ASFIS—4 ASFIS Abstracting Guidelines
- ASFIS—5 ASFIS Guidelines for Subject Categorization and Indexing
- ASFIS—6 ASFIS Thesaurus (revised and enlarged version in preparation)
- ASFIS—7 ASFIS Geographic Authority List
- ASFIS—8 ASFIS Taxonomic Authority List (enlarged version in preparation)
- ASFIS—9 ASFIS Database User Guide
- ASFIS—10 ASFIS Authority List for Corporate Names and Acronyms (final version in preparation)
- ASFIS—11 ASFIS Magnetic Tape Specifications and Record Format

Although the ASFIS Reference Series was published as a set of guidelines for those preparing inputs to the system to promote the high degree of consistency necessary for effective manipulation of computerized files, these publications are in great demand from institutions worldwide. As indicated above, the thesaurus has found wide acceptance for indexing relevant literature in several institutions, and as a point of departure for the development of specialized "micro-thesauri." Similarly, the guidelines for indexing and subject categorization, the geographic authority list, and the draft-guidelines themselves have been through several revisions. The thesaurus has recently been fully computerized with the cooperation of Unesco/IOC using the Unesco SPINES software; already, inquiries are being received concerning its availability on magnetic tape. To promote their wider distribution, FAO has waived copyright and many of these publications have been reprinted in the U.S.A. and Canada, sometimes with two publications in the series combined into a single document. ⊞