

Marine Science Information Throughout the World.  
(eds) Winn, Burkhart & Burkhart, IAMSLIC. 1988

## The Current State and Future of the Aquatic Sciences and Fisheries Information System (ASFIS)

**Robert R. Freeman**  
Chief, Fishery Information Data and Statistics Service  
Fisheries Department  
Food and Agriculture Organization of the United Nations  
Rome, Italy

### ABSTRACT

The paper explains the four major goals of the international Aquatic Sciences and Fisheries Information System (ASFIS) in relation to its origins and development. It then discusses the efforts currently under way in the sponsor agencies of ASFIS to respond to the increasing needs of countries for information on aquatic resources and the aquatic environment by adapting the system for a greater level of participation. Finally, some ideas are presented on how associations such as IAMSLIC and their members can play a role in defining the requirements for new products and services and providing expertise to assist in building new information centres and networks.

### INTRODUCTION

The Aquatic Sciences and Fisheries Information System (ASFIS) has been discussed in IAMSLIC meetings, but the number of questions that arise leads me to the conclusion that the very people I would like to see involved in it would like to know more about what it is and what directions it is taking. To one who is closely involved in it, it is easy to see that some of its products are well known, but its purpose and concepts remain elusive.

#### How and Why ASFIS Came to Be

Whether it is a government programme, a style of music, a philosophy, or an information system, it is enlightening to begin to understand it by examining the forces that created it and changed it. The roots of ASFIS can be recognized in the reports of the conferences that created the Food and Agriculture Organization (FAO) at Hot Springs, Virginia in 1943 and Quebec City in 1945. The need for a clearinghouse on fisheries and fish processing information and for improvements in the collection, organization and dissemination of fisheries information were stated clearly.<sup>1,2</sup> Even before the acronym ASFIS was invented, the first two parts of its mission were set:

1. To serve as a single, global clearinghouse.
2. To encourage the exchange of fisheries information among countries.

By the 1950's an extensive concept had been elaborated for an Intelligence System for Aquatic Sciences and Fisheries at FAO.<sup>3</sup>

This concept is readily comparable with the ASFIS of today, although many of the parts conceived in those optimistic early days were never implemented. Using computers to ease the process of organizing and retrieving information did enter the picture quite early, and by 1960 the University of Rhode Island in the U.S. was assisting FAO by operating an Aquatic Sciences Information Retrieval Center.<sup>4</sup> Also in that

period FAO was publishing the *Current Bibliography of Aquatic Sciences and Fisheries* (CBASF) and *World Fisheries Abstracts*, the former emphasizing fishery science and the latter fishery technology and fish processing.

Even as early as 1960, then, the first two elements of the mission of ASFIS were already established: to serve as an intelligence source for FAO's own experts who were responsible for interpreting the situation and outlook in world fisheries, and to organize and disseminate information on fisheries to users throughout the world. To serve the first goal, the bibliographic services were augmented by the development of directories of organizations, experts and vessels. Although not a part of ASFIS per se, FAO's fishery statistical system also served the same goals.

The next stage of development of ASFIS came with two events in the early 1970s. First, the realization that cooperation among a number of organizations would permit a better bibliographic service to be produced led FAO to foster an agreement with fisheries institutions in France and Germany and a private British publisher, Information Retrieval, Ltd., which had begun to publish *Aquatic Biology Abstracts*. As a result, *Aquatic Sciences and Fisheries Abstracts*, (ASFA), the major product of ASFIS, began publication in 1971 as a joint effort of the four organizations.

The following year the United Nations Conference on the Human Environment took place in Stockholm. Noting that FAO had already taken the lead in coordinating the dissemination of information on living aquatic resources and their environment, the Conference called on other international agencies and national governments to support the ASFIS programme. It also called on the Intergovernmental Oceanographic Commission (IOC) of UNESCO to take action to improve the dissemination of marine information, emphasizing marine pollution. As a direct follow-on, the United Nations Economic and Social Council in 1973 called for strengthening the collection of economic and technical information relating to the resources and uses of the sea.

As a result of this remarkable sequence of events, ASFIS developed from a single agency's effort in 1970 to a cooperative system involving three international agencies (FAO, IOC, the UN Ocean Economics and Technology Office - now the Office of Ocean Affairs and the Law of the Sea) and six developed countries by 1977. Five additional countries and a regional organization joined the collaboration later. The growth of ASFIS was given an important boost by the financial support of the United Nations Environment Programme (UNEP), another consequence of the Stockholm Conference.

This stage of development represented the third segment of the mission of ASFIS: to provide a vehicle for cooperation among countries and regional and international agencies, in order to produce information services covering all aspects of aquatic resources and the aquatic environment. Both the expansion of scope and the model of cooperation to achieve results that no single agency could do alone were new in this period. The larger scope resulted in the division of the ASFA publication into two sections in 1978 in order to provide subscribers with useful options. Finally, during this same period the initial demonstration of ASFA as an on-line database took place.

The next stage of development of ASFIS centered around the negotiation of the United Nations Convention on the Law of the Sea (UNCLOS), culminating in 1982. Although the Convention itself was not concerned with specific existing organizations or systems, it repeatedly emphasized the requirement for exchange of marine scientific and technical information and for cooperation among states or through competent international organizations to promote the exchange of information on fisheries, marine pollution, protection of the marine environment and the results of marine scientific research programmes in general. In addition, a resolution of the Third UN Conference on the Law of the Sea called on international agencies to coordinate "in a system-wide way" their aid to the development of national marine science, technology, and ocean service structures in developing countries.<sup>5</sup> Similarly, the FAO World Conference on Fisheries Management and Development in 1984 repeatedly stressed the importance of information services and the need to build up the capabilities of developing countries to assimilate and use fisheries information as a tool for management.

Once again major international conferences and agreements pointed the way for the future development of ASFIS. UNCLOS and the World Fisheries Conference were the key to the fourth segment of the mission

of ASFIS: to assist in improving the capabilities of developing countries to use information on aquatic resources and the aquatic environment. There are two facets to these improved capabilities: developing or upgrading of national information centres and networks, and providing a vehicle through which countries can participate in deciding which products and services are needed and how they should be produced.

This new aspect of the mission of ASFIS is by far the most complex and challenging it has yet faced. In contrast to the past, when much of the work of ASFIS took place as a result of voluntary, informal cooperation, future development depends on cooperation among many more countries and agencies, as well as on new resources to assist countries that are not yet able to be self-sufficient in marine information. Greater complexity and more resources mean that the informality of the past no longer can work, and the sponsor agencies of ASFIS are currently expending a great deal of effort in trying to design an appropriate structure that would allow greater participation.

To recapitulate, then, the goals of ASFIS as I view them are

1. To provide an organizational vehicle for cooperation among international and regional agencies and countries to produce information services on aquatic resources and the aquatic environment.
2. To provide a strategy and resources for improving the capabilities of developing countries to acquire, manage, and use aquatic resources and environmental information.
3. To encourage the exchange of information on these topics among producers and users throughout the world through useful products and services.
4. To serve as a global clearinghouse to aid the international agency sponsors to carry out their mission of reporting on the situation and outlook for aquatic resources and the aquatic environment.

#### **Current Status and Recent Developments**

After thirty or more years of slow development through the stages described above, ASFIS has achieved some successes. The best known product, ASFA, has now published about 300,000 abstracts and the vast majority of these are now in computer-searchable form. ASFA is an on-line database on host systems in Canada, France, Germany (F.R.), Mexico, the United States and the European Space Agency. ASFA has benefited from the initiative of private industry as exemplified by its being one of the first bibliographic databases to become available in the compact disk medium, produced by Cambridge Scientific Abstracts.

Other products are *Marine Science Contents Tables* (partially supported by the UNESCO Division of Marine Sciences), *Freshwater and Aquaculture Contents Tables*, a growing series of directories and bibliographies on marine environmental topics produced by a joint project of FAO and UNEP, the ASFIS Reference Series, the *International Directory of Marine Scientists* produced by IOC, and the *International Marine Science (IMS) Newsletter* of UNESCO.

The new complexity that faces ASFIS does not mean that the expansion of ASFIS into developing nations has come to a halt while the designers are at the drawing boards. At the beginning of the 1980's, Mexico joined the ASFIS collaborative effort and China soon followed. Both of these countries now make outstanding contributions to ASFIS and actively use the ASFIS products. A project of the Southeast Asian Fisheries Development Centre (SEAFDEC), still under development, aims at bringing the countries of that area into ASFIS under a regional arrangement. This year Cuba became the second country in the Latin America-Caribbean region to join ASFIS.

At the sponsor agencies, a major effort is being made to answer the most important questions about ASFIS for the future:

1. How can nations and regional agencies participate in ASFIS?
2. What are the most important products and services that are needed?
3. How can several global agencies with shared interests work as a decentralized secretariat for ASFIS without duplicating each other's efforts?
4. How should ASFIS receive technical and policy advice to keep it in tune with worldwide needs and the latest methods for meeting those needs?
5. How can the needed resources be found to advance the development of ASFIS at the national, regional and global levels?

Three of the most significant and often asked questions are the following:

1. Who can participate in ASFIS?
2. How does a marine or freshwater information centre go about becoming a participant?
3. What does a centre do after it does become affiliated?

In common with other international cooperative information systems, ASFIS looks to each country to designate one organization as its focal point or "lead centre." Normally this centre would be a part of a government agency in that country, but as long as the centre can speak authoritatively for the country, there is no reason that it could not be outside the government per se. For example, the ASFIS Centre in Mexico is organizationally under the Autonomous National University of Mexico.

Beyond the requirement for a single focal point for decision-making and communication with the ASFIS Secretariat, it is perfectly acceptable and even encouraged for countries to develop their own internal national network of ASFIS centres. The United Kingdom and France already have extensive national networks and the People's Republic of China has begun to develop one. This is an ideal arrangement for countries that have numerous organizations that are active in marine and freshwater science and information activities.

Whether there is a single ASFIS centre or a national network, the question of which organization should be designated is probably the most sensitive. This is especially true in ASFIS because the overall community interested in aquatic resources and environment is very diverse and often represented at the governmental level by several different ministries. Likewise, at the international level there are different focal points for fisheries, oceanography, marine pollution, coastal management, marine minerals, and law-of-the-sea.

In the past, the resolution of this problem was usually left to the initiative of national governments, but the international network of personal professional relationships also played an important role in bringing countries into ASFIS. At the Expert Consultation on Marine Information Management convened by IOC in Paris in October 1987 and again at an Inter-UN Agency meeting in February 1988 it was recognized that future expansion of ASFIS will have to proceed in a more orderly fashion. As a result, the ASFIS sponsor agencies are now working on guidelines on how the joint secretariat should operate and how best to achieve full participation of the diverse communities whose information needs can be represented by ASFIS. This does not mean dictating to any country, but instead having orderly ways of responding to requests from those countries and of advising countries that request assistance on how to go about affiliating with ASFIS and establishing national networks or regional networks of collaborating countries.

The responsibilities of a centre affiliated with ASFIS are changing with the times and the new goals of ASFIS; the ASFIS sponsor agencies are wrestling with this subject too, so my answer doesn't yet reflect a set policy. In the past, a centre's responsibilities were quite clear: to monitor some mutually agreed body of literature within the scope of ASFA; prepare bibliographic descriptions, abstracts, and indexing terms; and submit these for publication in ASFA. In some cases, centres also contributed technical expertise or other resources needed for the development of ASFA or other products. In return, the centres received copies of the various ASFIS products.

As ASFIS expands, both into new countries and through the formation of national networks, these original responsibilities will continue, but their relative importance is likely to change for two reasons. First, the marginal increment in coverage of ASFA by each new centre will get smaller and smaller. Our best guess is that around 80% of the literature relevant to ASFA's scope is covered already. The value of the additional 20% may be very high, but the total numbers of documents probably are not.

Second, and more important, new centres in developing countries may have a greater need to build up basic information products and services, as well as trained staff and better facilities, before they can take on the classical role of an ASFIS centre. For example, the newly developing regional centre at the Southeast Asian Fisheries Centre, with funding from the International Development Research Centre (IDRC), has been working on bringing together the retrospective fisheries bibliography of the region, beginning with Thailand. (A variety of perspectives on developing country marine information services were explored at the 1985 IAMSLIC Conference.<sup>6</sup>) This means that ASFIS will have to take a much more flexible view of the responsibilities of a centre. In my view, this is as it should be if it means that ASFIS is a reflection of both the collective and the local needs of the users.

### **What Should ASFIS Be and How Do We Find Out?**

So far, I have reviewed the background and goals of ASFIS and given you a picture of how ASFIS is undergoing a process of adaptation to changing times. The success of this adaptation is crucial, but getting the best possible advice on how to do it is a challenge of the first order for an international information system. The solution has to be both politically and technically feasible and supported by adequate resources. It has to balance the interests of diverse regions and countries. It has to overcome the "turf" consciousness of agencies and of different constituencies among the users of aquatic resources and environmental information. Somehow it must end up serving the users with what they need, while being operated by managers, librarians, information specialists, computer scientists, and bureaucrats who are for the users but not quite part of the users.

Limited resources mean the solutions never meet the ideal of taking heed of every voice with a good idea. In practice, ASFIS has followed the model of many other international agency processes: the political and technical representatives of national governments give guidance and direction to the agencies, panels of experts are called in to give more detailed advice, and agency secretariats do their best to interpret the needs and the options and find resources to make something happen, in our case ASFIS.

Here it seems to me that there is an outstanding opportunity for a role for associations like IAMSLIC, its new European counterpart, and other similar professional organizations, as well as others that are more populated by scientists, engineers, and administrators. As a member of IAMSLIC, I have been following with interest the debate over the degree of international activity the Association wants to undertake. I noted that some members value the simplicity and personal contact that comes with IAMSLIC's small size, while others state that IAMSLIC's membership is a neglected resource that could contribute greatly to meeting some of the very same goals I listed earlier for ASFIS.

I believe that the formation of our Committee on International Cooperation and activities such as linking libraries in various countries via electronic mail are steps in the right direction. IAMSLIC's membership can play a valuable role internationally without losing the "small is beautiful" virtues that many appreciate.

What should that role be with respect to ASFIS? As I indicated earlier, two of the urgent needs for ASFIS are (1) advice from the users, and (2) experts to go out and assist in building up new centres, especially in developing countries. Another need, which I am sure you will do even without my mentioning it, is to improve products and services by forming intra-national networks.

ASFIS will need continuing sources of advice and constructive criticism on all aspects: user needs, products and services, standards and tools (such as the ASFIS Thesaurus). IAMSLIC and similar associations can be a sounding board for user needs that augments that of UN expert panels. As an example, I recall that every expert panel up to and including that called by IOC to Paris a year ago has identified document delivery as a major problem for developing countries.

What ideas do you have on how you and ASFIS should attack that issue? IAMSLIC can aid the development of ASFIS by taking positions resulting from its deliberations.

It has been my intention in this paper to give you a picture of what ASFIS is, but at the same time, show you that ASFIS is like an image visible on a computer-aided design system screen: partly real and partly a way of visualizing what it could be. ASFIS undoubtedly will continue to work through national focal points, but we will listen to the voices of the users and the professionals who want to be heard. Tell us what you would like ASFIS to be.

### References

1. United Nations Interim Commission on Food and Agriculture. 1945. *The work of FAO*. Washington. Pages 26 and 36.
2. Food and Agriculture Organization of the United Nations. 1946. *Report of the First Session of the Conference*, Quebec City, Canada, 18 October to 1 November 1945. Washington. page 33.
3. S. J. Holt 1960. "The Intelligence Service for Aquatic Sciences and Fisheries Provided by the Food and Agriculture Organization of the UN." *Revue de Documentation*, 27(3), 108-118.
4. S. B. Salla, J. S. O'Connor, and R. A. Shappy. 1962. "An International Service for Retrieving Aquatic Science Literature". *FAO Fisheries Biology Technical Paper No. 28*. FAO, Rome.
5. United Nations. 1983. *The Law of the Sea: Official Text of the United Nations Convention on the Law of the Sea with Annexes and Index*. New York. Pages 20, 38, 72, 86, and Annex VI, pages 185-6.
6. R. L. Grundy, R. T. Ford, and M. J. Beardsley (eds.). 1986. *Marine Science Information: An International Commodity*. Port Aransas, Texas, IAMSLIC.