

The National Sea Grant Program— A Progress Report for Fisheries

ROBERT B. ABEL
*Office of Sea Grant Programs
National Science Foundation
Washington, D.C.*

Abstract

Since the first paper on the Sea Grant Program was presented to the Gulf and Caribbean Fisheries Institute 3 years ago, the Program's objectives have become considerably refined. As a result of careful planning and examination of other agencies' programs, aquaculture has emerged as a principal focus of Sea Grant activity.

This is true not only respecting applied research but education and extension services as well. This paper will describe the efforts of the Science Foundation to develop joint extension services with the Departments of Agriculture, Interior and Commerce, relating to living resources of the sea.

Another thrust of the program relates to Sea Grant-sponsored industrial-academic alliances wherein partners contribute manpower, facilities, equipment, etc. to carry out joint ventures in marine technology. These alliances are developing at an increasing rate, showing promise for the future. It is of interest that the first such alliance was formed between the University of Miami, Armour Corporation and United Fruit Co.

Sea Grant-sponsored educational programs now encompass nearly 500 engineers and 400 technicians at the 2-year college level.

IT WAS ALMOST EXACTLY 9 YEARS ago that the first government industry symposium on oceanography was convened by the Interagency Committee on Oceanography. Until that time the Gulf and Caribbean Fisheries Institute was almost the only organization devoted to business in the sea. At our meeting, the climate was enthusiastic, and in retrospect, probably quite naive. We were all quite new to the game, and, therefore, brilliant.

Most of the problems were unrecognized; those that we were aware of were at least minimized. We tended to ignore most of the facts of life, as, for instance: (1) the enormous investment required of an industrial firm who wished to explore this new frontier for fun and for profit; (2) the tortuous route that existed between research and sales; (3) the failure ever to materialize of the large promised program of government expenditures; (4) the obstacles imposed by a hostile environment, simultaneously cold, wet, corrosive and under extremely high pressure; (5) the difficulty of competing for the federal dollar with military requirements, neither the nature nor the dimension of which could even be guessed at, at that time.

After about a hundred such meetings we have become somewhat wiser, considerably sadder but at least aware of the problems. Unfortunately, while we now understand some of them, we are really not much better at arriving at solutions thereto. First of all, there is now general recognition of the need for government assistance in cushioning the blow of high investment for nebu-

lous profit. We now realize that when the test tube is a ship and the laboratory the broad ocean, it costs much money even to open the front door. The trick, however, is to offer government assistance without preempting local initiative which is so important, and without derogating the crucially important role which must be played by private enterprise. This was a principal, if not the crucial, issue faced by the Congress 3 years ago in designing the National Sea Grant Program. Within this Program we try to attack this issue realistically, but at least hopefully, and that is what I should like to discuss briefly.

First of all, while under the National Sea Grant Colleges and Program Act of 1966, the National Science Foundation, as the implementing agency, has authority to make grants to industry, other agencies, public and private instrumentalities, municipalities, universities and colleges. In actuality, the Science Foundation has traditionally dealt with universities and finds some difficulty in dealing directly with industry. Further, there are obvious conflict-of-interest problems attendant upon dealing directly with industry, to the exclusion of possible competitors. For this reason, in order to stimulate industrial participation in the Sea Grant Program, we normally encourage formation of consortia—industrial alliances with universities.

This is not as hard as it sounds. For instance, assume a situation wherein a medium-size industry wishes to explore a possibility for growth with a new product or service relative to ocean development, but encounters a research problem. It may consider that a million dollar investment is necessary to accomplish the research objectives, but this investment is too high in terms of probable pay-off. However, at an investment risk level of one-third of a million the opportunity may sound attractive.

What we do in this case is attempt to arrange affiliation of the industry with a university laboratory with similar interests. We are then able to contribute double the aggregate of funds arranged by all of the rest of the participants. This, you see, renders the research possibilities quite attractive.

The only thing that we ask at the National Science Foundation is that all of the firms be absolutely assured that their rights are protected. This refers to any kind of rights: property rights, leasehold rights, royalty rights, patent rights, copyrights—in short all proprietary rights. We say this not necessarily to be altruistic but because in viewing our responsibility for our small but optimistically growing program we abhor the thought of a disgruntled industrialist haranguing us with his lawyer or congressman, accusing us of violating his rights.

Such alliances as I have described are not brought about overnight. We fully realize the extremely long gestation periods required for accomplishment of such arrangements. In fact, the best industrial-academic proposal we have received to date took nearly 18 months in the planning. Accordingly the last thing I expect is that any of you folks will go home tonight and write a proposal for Sea Grant support.

I should like to face squarely a rumor that I have heard mentioned over the last few weeks, to the effect that I am personally giving apparent emphasis to industry only to create a red herring by which I may acquire more funds for my universities. Since I have also heard similar accusations but in the opposite direction, made by universities, I feel that our Program is on the road to success—it is merely a matter of balancing the criticism from both directions!

The question asked of us most often relates naturally to our budget. Our

budget for fiscal year 1969 was \$6 million. The President's budget request for Sea Grant for fiscal year 1970 is \$10 million. Owing to the uncertainties of Congressional appropriation at this time, we really have no idea what our budget will be, but of course we have to be hopeful.

Owing to the enormous scope of our Program, which permits us to sponsor education, research and development and extension services, we have attempted to define our limitations wherever possible. Accordingly, on the research and development spectrum we have chosen applied research as the area in which the Sea Grant Program can make the greatest contribution. Similarly, with respect to education, we have tried to be consistent and limited ourselves to the support of education for ocean engineers and training of ocean technicians. Further, we have sponsored to a lesser extent aspects of education of social scientists including lawyers interested in law of the sea and economists interested in the economics of resource development.

The only industrial areas in which we are not interested have to do with military affairs and, to a lesser extent, pollution. In each of these cases we recognize the authority exercised by agencies established specifically for this purpose. With respect to fisheries we coordinate extremely closely with the Bureau of Commercial Fisheries and in fact no proposals relating to food from the sea are processed by this Office without having first passed through the Department of Interior Sea Grant Committee chaired by a representative of the Bureau of Commercial Fisheries. By an arrangement with that Agency, our coverage of food from the sea is limited to aquaculture, social problems and extension services.

We are encouraged to look to big science and to explore possibilities involving relatively high risks (by comparison with the missions of most agencies which are considerably more conservative). This is not to say that we deliberately go out seeking nuts and screwballs, but, at the same time, we try to emphasize innovation and imagination in the projects which we consider for Sea Grant support. For instance, the new Director of the National Science Foundation, Dr. William McElroy, is encouraging our office to take a broad look at the Chesapeake Bay problem and to explore such possibilities as using biological mechanisms to accomplish the restoration our engineers have so far been unable to bring about. Obviously the solutions are interdisciplinary in nature. For your possible guidance I have available lists of all of our grants with brief descriptions; these can be made available upon request.

Again, with respect to our dealings with the Bureau of Commercial Fisheries, if there is a representative here of the *National Fisherman* let there be peace between us. I refer, of course, to the derogatory article in the September issue of the *National Fisherman* which identified the Office of Sea Grant Programs as operating in fisheries without a fisheries man on its staff. All I can say is that when you are trying to run a program of national dimensions with an army consisting of precisely four people you cannot afford the luxury of specialization. Further, in addition to the use made by ourselves of the expertise of the Bureau of Commercial Fisheries, our site visits are never carried out without at least one representative of a BCF laboratory participating as a full voting member.

Relating again to the size of our staff, what this means in practical terms is that while we have probably accomplished our planning, coordination and program execution phases in fairly good shape, we are still sadly deficient in

the fourth administrative phase—that of program control and dissemination. We have yet to bring about a well standardized, effective program of information transfer having to do with rapid dissemination of reports of Sea Grant programs and projects. We haven't yet established a network which would permit us to give the most pertinent information to the users who have the most obvious need and to bring into contact with us the people who can give us the best advice and to whom in turn we can furnish the most pragmatic information and data. This is naturally the phase of the program to which we desire to give the most attention over the months ahead.

I will be happy to answer your questions and indeed anticipate several relating to the nature of industrial-academic partnerships. I will tell you right now that I intend deliberately to be vague in my responses. The fact is that our Program is still in the formative stages; we don't even recognize some of the questions, let alone having evolved the answers. We further recognize that bureaucracy is a one way street—it is easy to increase it, considerably more difficult to retard it. Accordingly, rather than sink ourselves into concrete with strong formularization of specific assignment of rights and priorities between grantor and grantee, we prefer to tackle each case on its own merits. The wisdom of this decision has been borne out by the fact that thus far no industrialist has backed out of a Sea Grant Program once he has started negotiations with the Foundation. We try to maintain maximum program flexibility for the same reason. If any of you have any suggestions to offer us for change in Program philosophy or direction, we will be certainly delighted to listen to them and we will either adopt them or come up with a reason that we can both buy.