'BUILDING BRIDGES'

PROCEEDINGS OF THE 12TH ANNUAL MEETING SEA GRANT ASSOCIATION

October 23-26, 1979
Orlando Marriott Inn
Orlando, Florida

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HOSTED AND COORDINATED BY:
Florida Sea Grant College

IN COOPERATION WITH:
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INTRODUCTION

All marine and coastal programs build bridges. Federal and state agencies, public and private universities, foundations, and industries all interact, both in planning and coordinating research as well as in disseminating the results. A hallmark of Sea Grant activity nationwide has been to help in furthering the interactions of both "user groups" and service organizations to address applied problems.

The Sea Grant Association brings together not only organizations funded by the National Sea Grant Program, but also many other colleges and businesses that draw support from other sources while also subscribing to what may be called the "sea grant ethic." The 1979 meeting agenda included topics from the national policy level all the way to the local working level in an effort to assist the broad array of America's marine program to maintain, repair, and build new bridges to each other and the public.

KEYNOTE ADDRESS

Dr. E. T. York
Chancellor, State University System of Florida
Tallahassee, Florida

BUILDING BRIDGES FOR MORE EFFECTIVE SEA GRANT PROGRAMS

E.T. York

It is obvious that I come to you without a Sea Grant background--indeed without credentials in the disciplines with which you are primarily concerned. I have spent a professional lifetime, however, intimately involved with Land-Grant institutions. Dr. Popenoe has asked that I discuss some of the linkages which have been developed in the Land-Grant movement--some of the bridges, if you will, which have been built to give greater unity, cohesion, and strength to the Land-Grant movement. There would appear to be many parallels--many similar circumstances--between what has happened in the evolution of Land-Grant programs and what could happen in the fledgling Sea Grant effort.

Sometime ago, I read a statement by a well known British educator to the effect that the most significant contribution which the United States had made in the field of education was the development of the Land-Grant Colleges concept and system of higher education. I am sure that the fathers of the Sea Grant Program were motivated and influenced by what had happpened some one hundred years earlier when the Land-Grant System came into being.

When the Morrill, or Land-Grant, Act was passed in 1862, we were a land richly blessed with physical resources--land, water, minerals, fossil fuels, timber, etc. were sorely lacking however, in the knowledge and the trained manpower needed to develop these resources. Engineers were unknown and agriculture was an art rather than the highly developed science of today. Land-Grant Colleges came into being to give opportunities in higher education to the masses--and to provide training specifically in the fields of agriculture and mechanic arts--not to the exclusion of other subject matter areas.

Now, let me examine for just a moment what has happened in the field of agriculture as a result of the Land-Grant Act.

It soon became apparent after the passage of the Morrill Act that teaching programs in agriculture were rather sterile without a background of basic knowledge of plants and animals and the manner in which they relate to their environment. So, in 1887, the Hatch Act brought into being a nationwide system of agriculture research, and the State Experiment Stations created by this Act became an integral part of Land-Grant Colleges.

As these mission- or problem- oriented research programs were initiated, it was obvious that there was still a missing link. The new knowledge growing out of this research was virtually useless unless it was extended and used by farmers. This situation gave rise to the Cooperative Extension Service, which was established by Congress in 1914 with the passage of the Smith-Lever Act. As in the case of the Agricultural Experiment Stations, the Cooperative Extension Service became a part of Land-Grant Colleges.

During the past half century, Land-Grant Colleges have developed and expanded these closely related programs of resident instruction,

research, and extension. And these programs have been primarily responsible for the great technological revolution in agriculture in the past four decades-- a revolution which has had a tremendous impact upon the lives of the American people.

As a nation, today we enjoy the most abundant supply of the highest quality, most nutritious, and convenient food for the smallest percentage of our income of any people on earth. This is something of the success story of American agriculture and the institutions which have been primarily responsible for making this story possible.

Now let us examine some of the bridges built during the last century which have helped make the Land-Grant movement so meaningful and successful.

I have already alluded to the development of the bridges between three functional areas--teaching, research, and extension. The bridge between research and extension has provided a pathway, not only for the transmission of new knowledge developed through research to the user or consumer of such knowledge, but also for conveying information concerning problems or research needs from the user back to the scientist in the laboratory. Bridges from research and extension back to the classroom have helped to keep teaching programs more up-to-date and relevant from the standpoint of addressing current problems and incorporating the latest management and technological developments.

But there have been many other significant bridges associated with the Land-Grant movement. Farming became less of an art and more of a science as bridges were built between agriculture and the basic sciences-- chemistry, physics, genetics, botany, zoology, and so on. With such bridges, agriculture increasingly involved the application of basic science principles to the production of foood and fiber. There are few, if any, other areas in our society today where science has been applied in a more meaningful and productive manner as in agriculture.

I am sure that those of you in Sea Grant programs are confronted with an opportunity to build similar bridges between the practical areas of your concern and the basic sciences in a manner similar to what has been done in agriculture.

But let us look at another area where bridge building has contributed significantly to the advancement of agriculture through the Land-Grant System. At the time the Land-Grant System came into being, farming was essentially synonymous with agriculture. Most of the early Land-Grant programs were concerned with farming or "production" agriculture. As time went on, it was realized more and more that this was a much too narrow concept of agriculture. Accordingly, agriculture was broadened to encompass research and educational programs in marketing and other areas. At times, supplies of certain farm products exceeded demand, resulting in market gluts and depressed prices. Furthermore, we obviously had the capacity to expand the production of many commodities if we could develop suitable markets. This led to research in the utilization of many farm commodities, including new product development-- aimed at broadening or expanding markets, increasing demand, and strengthening prices.

It was also recognized that consumers were influenced in their buying decisions by how attractively a commodity might be packaged and displayed or how convenient it might be for cooking. Accordingly, Land-Grant institutions built more bridges through the development of programs in these and many other areas of marketing and utilization.

As our knowledge of nutrition increased and as consumers became more concerned about the nutritive value of their food, Land-Grant programs directed increased attention to nutrition problems and how farm commodities might be improved to achieve desired nutrition goals.

As more attention was focused on the consumer, some very meaningful bridges were built between agriculture and the person who makes most consumer decisions with regard to farm products--the homemaker. Home economics programs were developed in Land-Grant colleges--frequently being located in the same administrative and program units as agriculture within the university. Home economists worked with homemakers on matters related to the use of farm commodities including the preservation and use of food products; nutrition; the use of cotton, wool, and other fibers in clothing construction; etc.

As the agricultural profession matured it became, increasingly, a significant business enterprise. And while farmers had earlier been concerned primarily with how to improve production practices, within the past half century, the farmer has had to learn more about management and business. Hence, Land-Grant agricultural programs have devoted ever increasing attention to education and research in business management and economics.

So, significant bridges were built in this area, and, today, some of our nation's best economists and economics programs are found in Land-Grant Colleges of Agriculture.

While in their earlier days, Land-Grant Colleges of Agriculture focused primary attention on the production and marketing of farm commodities, it became increasingly apparent that since agricultural interests owned or controlled a significant part of our nation's natural resources-- forests, fresh water, wildlife, and so on--these colleges should direct more attention to the conservation and use of these resources. This they have done by carrying out major efforts in ecology, soil and water conservation, wildlife management, outdoor recreation, and so on. More bridges!

Initially, the farmer was, in large measure, self sufficient. He grew his own animals which, in turn, produced his power. Home-grown feed produced the energy for this power. Furthermore, farm animals produced most of the fertilizer he used. He produced and saved his own seed. Pest control was very primitive or non-existent. There was little machinery so the farmer and his family provided most of the labor required.

In time, all of this changed. The farmer today buys most of everything he uses. He has become very dependent upon agri-business firms, including those involved with producing the equipment and supplies used in production as well as those concerned with the processing, marketing, and use of farm commodities. As this has occurred, Land-Grant

Colleges of Agriculture have brought many such firms increasingly under their umbrella of concern and interest. Today, these colleges work with a wide array of farm machinery and equipment manufacturers and distributors, seed producers, fertilizer and pesticide companies, and credit sources, as well as marketing and processing firms. This work is directed toward helping these firms better serve the producer so that he, in turn, might have a more efficient and productive enterprise. Still more bridges!

Just as early American agriculture was largely self-sufficient from the standpoint of production practices, the early farmer and rancher was often isolated and little concerned about outside forces which might influence his destiny. In time, however, there was growing concern in agriculture about how government or public policy issues affected the farmer. Hence, Land-Grant Colleges became increasingly concerned with a wide range of public policy issues including foreign trade. Research and educational programs were directed towards these issues, and, through these efforts, farmers became increasingly aware of, and concerned about, many policy issues which impacted their lives and livelihood.

It was recognized that individual farmers acting separately and independently of each other had little clout--either in the political arena, where public policy is made, or in the market place, where they might buy and sell what they used and produced. Land-Grant Colleges were instrumental in helping farmers organize so that they might be able to accomplish, collectively, what they could not do as individuals. These colleges, for example, helped to organize what, today, is the nation's largest general farm organization--the American Farm Bureau Federation--as well as many of the present farm supply and marketing cooperatives which have contributed to greater muscle in the market place. Still more and more bridges!

I should add, in this connection, that, over the years, these farm organizations which came into being through the assistance of Land-Grant Colleges have, in turn, been some of the strongest advocates and supporters of these colleges.

Now, let me mention one other linkage or bridge which has been very meaningful to Land-Grant programs--a bridge which has contributed to the financial support of these programs.

As is evident from what we have said, Land-Grant programs have been concerned primarily with service--with assisting all types of agricultural operations to become more efficient, productive, and profitable. The programs have also involved many business and professional groups which furnish the producers' needs for machinery, equipment, credit, supplies, etc., as well as market and use his products. As indicated earlier, these programs have been the undergoing force in enabling American agriculture in this country to become the most productive and efficient of any in the world. And the users and beneficiaries of these programs know that. Consequently, they have been very supportive of Land-Grant research and education programs--especially in helping these programs secure the public funding necessary for them to do their job.

During the past five years while I have been concerned with the total State University System of Florida, I can say, without any

reservation, that no segment of the University System has had stronger support in the Legislative process than the Land-Grant agricultural programs. The primary reason for this is that there is a strong base of support from the users and beneficiaries of these programs--the farm producers and related business and industry.

Let me cite briefly how that support was organized and used here in Florida. A number of years ago the Florida Agricultural Council was created--with its primary mission being that of supporting agricultural research and education. The Council is made up of a great variety of agriculturally related organizations--producer groups concerned with citrus, vegetables, ornamentals, beef cattle, dairy, swine, horses and so on, as well as various processing and marketing groups and other organizations concerned with credit, farm supplies and equipment, etc.

The Council reviews the budgetary needs of the Land-Grant agricultural programs and develops a concerted effort to secure favorable action on appropriations by the Legislature. Contacts are made with legislators throughout the State at the local level by Council members farm in advance of legislative sessions. Furthermore, Council members appear before appropriations committees in support of these programs--and, in fact, maintain a continuing presence in the legislative process.

The support of the Council is particularly effective in the Legislature because the members represent major business and industry groups which can talk of how these research and education programs contribute directly to a viable and productive industry and a stronger overall economy. They can also speak as taxpayers who believe that these programs represent very effective use of their tax dollars.

So this type of linkage--this kind of bridge--between Land-Grant programs and the many groups with which they work and which they serve has provided an invaluable basis for securing better financial support. It is significant that the state appropriation for the Land-Grant agricultural programs in Florida is larger than those for six of the nine universities in the System. It is exceeded only by the Education and General budget of the University of Florida and budgets of Florida State University and the University of South Florida.

Finally, let me emphasize one other important reason for the success of Land-Grant Colleges. These institutions have traditionally been referred to as "people's colleges." They were established specifically for the purpose of serving the needs of people. Accordingly, administrators of these colleges have made special efforts to secure input from the public to help determine how these institutions can be of greatest assistance to the people whom they were created to serve. This has led to the creation of citizen advisory councils or committees, and, at times, special citizen commissions appointed to help shape the future direction and emphasis of these institutions. We have, in recent years, attempted to apply this philosophy to our total University System. Some three years ago, I appointed a "blue ribbon" Commission on the Future of Florida's Public Universities. This Commission, after some twenty months of intensive work, developed recommendations which have led to a major quality improvement thrust for the State University System as well as the very significant increases in funding by the Florida Legislature

this past year directed towards helping the System achieve some of its quality goals.

I need not spend a lot of time in discussing the parallels between the Land-Grant efforts and your Sea Grant programs. You are faced with many of the same problems and concerns which have confronted Land-Grant programs over the years. There would appear to be the opportunity, if not the need, to develop some of the same types of linkages or bridges with other disciplines and with business, professional, and consumer groups, as Land-Grant programs have done. Certainly, there is the potential for your efforts to be just as successful as those in your sister Land-Grant Programs. We wish you well as you work towards the realization of these potentials.

In parting, let me suggest that, because of the many parallels which exist between these two efforts, there may be great opportunities for some very significant bridges between these two programs themselves. Obviously, some of these bridges are already being built through Cooperative Extension programs, food processing and utilization work, and in other areas. I think you would find your colleagues in the Land-Grant programs very receptive to such linkages and would join hands with you in building the needed bridges between the two groups.

FIRST PLENARY SESSION

FOUNDATIONS

Moderator: Dr. Bruce T. Wilkins
President of the Sea Grant Association, 1978-79
and Program Leader, New York Sea Grant Extension
Program

Speakers: "National Marine Science Goals and Objectives"
Dr. William J. Hargis, Jr.
Director, Virginia Institute of Marine Science
Gloucester Point, Virginia

"Passage to India -- Revisited"
William Q. Wick
Director, Oregon State University
Sea Grant College
Corvallis, Oregon

"The National Marine Scene"
John Botzum
Nautilus Press, Inc.
Washington, D.C.

THE HEALTH OF THE NATIONAL OCEAN PROGRAM

William J. Hargis, Jr.

Many public and some private insitutions conduct marine science and engineering activities. Despite the varied ownerships and sponsorships of those marine organizations outside of the federal establishment the bulk of the financial support for non-industrial marine programs is from the federal government. Even a good deal of the industrially managed oceans research and development receives major support from the central government.

As the federal, civilian and military budget for marine science and engineering fares, so fares the entire national (federal and non-federal) program. Without federal funds ocean research and development and even education would be minuscule indeed.

While data could be mustered to support these statements, the facts are so obvious to all informed persons as to require no further substantiation.

Federal interest in marine science and engineering dates to the early days of our Republic and there have been periods of fairly intense activity, especially related to exploration, fisheries research, hydrography, and marine-related military activities for over 150 years. In the early days marine "studies" were mostly voyages of exploration and field surveys. But, the middle and last half of the nineteenth century saw several public and private marine research institutions established. A number of Committees, Commissions, and study groups relating to the government's interest in the oceans have been formed and operated even prior to World War II, but it was during that upheaval that the importance of understanding the oceans came most strongly to the front.

Following the second World War federal and national interest in the oceans continued and, after a period of evaluation and regrouping began to grow. A prime mover was the United State Navy which through its Office of Naval Research and other offices undertook to support many marine science and engineering activities throughout the country. Following its TENOC study, (Department of the Navy, 1961-Ten Year Program in Oceanography (TENOC) 1961-70) the Navy expanded its internal and external efforts.

Civilian interest grew also, especially after the several studies of the National Academy of Sciences/National Research Council. A major landmark of NAS/NRC involvement was its 12-volume report Oceanography 1960 to 1970 (NAS/NRC Committee on Oceanography, 1957). In the intererim, the National Science Foundation was formed and undertook to support certain marine projects. Many other civilian agencies also began to support oceanography.

The '60's saw major legislative interest in the oceans develop and several oceans champions came forward in Congress. Legislation enacting new marine programs increased. The record of hearings of the Subcommittee on Oceanography (1965) of the House Merchant Marine and

Fisheries Committee (Serial No. 89-13, entitled National Oceanographic Program Legislation) lists 19 pieces of marine-related legislation as having been considered between August third and nineteenth in 1965.

During this period the Commission on Marine Science, Engineering and Resources (acronym--COMSER; otherwise known as the Stratton Commission, after its President) was formed, as was the National Council on Marine Resources and Engineering Development (acronym--NCMARED: a cabinet-level group chaired by the Vice-President of the United States). COMSER, The civilian study Commission, examined national ocean science and engineering needs in great detail and issued its 4-volume report, Our Nation and the Sea in 1969. This laid the groundwork for continued growth of the National Ocean Program in the first half of this decade (1970-76). The National Council in the meantime kept track of the federal ocean program and encouraged its growth and development along coordinated lines. To track the status of the federal (and national) ocean program the Council received reports of expenditures for ocean activities from all federal agencies and reviewed proposed programs and budgets for them.

In addition to this Executive initiative, both houses of Congress maintained their keen interests in marine matters. New marine programs such as the National Sea Grant College and Institution program, the International Decade of Ocean Exploration, the National Coastal Zone Management Act, the Fisheries Conservation and Management Act and the National Advisory Committee on Oceans and Atmosphere were initiated by Congress. On the Executive side new programs were undertaken by many federal agencies. The National Oceanic and Atmospheric Administration was established by Executive Order. As marine research and engineering programs and projects grew during the 1960-77 period, new specially-designed ocean going research platforms such as submersibles, support vessels and surface vessels were planned, built, and brought into operation. All in all, the late sixties and early seventies were periods of growth in the national oceanographic program.

Considerable effort in these early years was spent on "blue-water" and world ocean cruises and research activities. Recent developments have focused on the shallower waters of the oceans and their borders. Unfortunately, the closer look at the shallows and estuaries has been accompanied by a withdrawal from the deeps and from the world ocean scene-an "ocean isolationism" movement. To me this withdrawal appears to be part of a larger difficulty--a weakening of the nation's interests in the sea -- a weakening of the National Ocean Program.

My purpose here is not to develop a detailed review of the recent history of oceanography but to lay the groundwork for the main thrust of this thesis which is, essentially, that the health of the National Ocean Program which has flourished for three decades is now on the decline.

It is impossible to quickly develop financial details on an agency by agency basis to examine this thesis since the budget and program data are apparently being kept only by the Office of Management and budget and perhaps not even by them. Formerly the National Council of Marine Resources and Engineering Development, the Interagency Council on Marine Science and Engineering, and NACOA kept such figures but the

first two are no longer in existence and the latter no longer performs this function though it is evidently planning to resume.

Several other indicators, including one's own intuition or seat-of-the-pants feeling, support my thesis. It is well known that the U.S. Navy has, over the last several years, been forced to reduce its support of academic research institutions. Such reduction has inevitably affected the overall national ocean research and engineering capability.

Of course, research vessel operations budgets are affected by those economic inflationary factors which impact the rest of the economy. They have been severely impacted by rising fuel costs. Inflation is part of our present problem. But then everyone must deal with inflation.

Some effects are undoubtedly caused by the focussing of federally-funded programs on coastal waters thus drying up funds for blue-water work, discouraging scientific interests in remote waters and encouraging interest in nearshore U.S. dominated waters.

Additionally, the growing political impediments to working in the coastal waters of other nations seems to be a factor in discouraging development of ship-using projects and programs in foreign dominated waters.

That these and other factors are affecting the marine operations of the national oceanographic program seems clear, but there is yet another and perhaps more powerful factor, general support for oceanic activities seems to be on the wane. In the Congress one meets a "we have led the fight for thirty years (a true statement) and now it is time for the Executive to do something" attitude. While there is interest in some portions of the Executive, unfortunately not enough people in sufficiently high places are concerned to make up for the waning Congressional interest.

There is, however, another indicator that can be used. One which involves numbers, is the status of the national research fleet, civilian and military. Assuming that a decline in support for research vessels can be used as a bellwether and I am reasonably confident that it can, strong indications are developing that we are in trouble.

Consider the plight of the nation's research fleet. Rumors that research vessels of the U.S. Navy are being laid up are rife and indications are that there has been a reduction in force. Much clearer to me is the plight of the civilian fleet.

Apparently, several academic vessels, among them the Alpha Helix (built in 1966) have been voluntarily laid up or sold by their institutions. Because of a projected shortfall of almost four million dollars for FY 1980 in the amount of money allocated by the National Science Foundation for vessel operations of its UNOLS fleet a number of other academic vessles will undoubtedly have to be laid up. As many as five and perhaps ten will be cut. The shortfall is expected to go to six or seven million dollars for the next year. Even more vessels will have to be laid up! Not only are funds for vessel operations short but there

seems to be a reduction in funds to support ship costs for marine research programs and projects. In short, monies to support marine research as judged by these indicators appears to be waning.

That this is more than one observer's opinion is clear. The nine institutions that make up the Joint Oceanographic Institutions Incorporated (JOII) are also convinced of an emergency in support of operations of the academic research fleet. A number of their chief executives also seem to be convinced that part of the cause is a declining National Ocean Program.

My conclusion is that the National Ocean Program is, indeed, falling on hard times!

What can be done? First, there is a clear need for a careful and continuing assessment of the overall status of the "National Ocean Program". Unless we know where we are in relation to the past and to carefully established future needs we cannot establish what needs to be done. We cannot plan for the future well. Someone, probably NACOA, should track and examine the National Ocean Program.

Second, we must make a serious effort, as a community, to get "our act together" and muster greater public interest and support.

Third, we must develop more forceful arguments favoring increased support for ocean science and technology at the national level. The support of Congress and the Executive is vital. In fact, only the Congress can quickly alleviate the current vessel-funding problem with a supplemental appropriation, but for the long-run the interest and support of both Congress and the Executive, at a high level, are critical.

To be sure, the oceanographic community must make a vigorous effort to make its operations more efficient. But, the driving force in all aspects of the National Oceanographic Program is the federal government. As its interest in ocean science and technology goes, so goes the entire National Program. Because the resources and amenities of the oceans are important to the present and future we must take every step possible to encourage a greater interest in the oceans and in ocean science and technology at the federal level.

PASSAGE TO INDIA--REVISITED

William Q. Wick

"Like the Mackinac Bridge, Michigan Sea Grant forms a link, instead of linking real estate, the program links the academic community and the citizens of the state." In these sentences, the Michigan Sea Grant Program espouses the concept of our conference theme "Building Bridges." But how well has Sea Grant Built bridges? Bridges must be external and internal; they go both ways. Bridges may be real or fanciful. Unused and underutilized bridges are wasted architecture.

I believe that Sea Grant is a remarkably successful and tenacious program in concept, but has a long way to go to fulfill what it can be. The unique attributes of partnership funding and planning, and permissive evolution, have led to advances, while developing a system which is both coherent and incoherent. We are at that time in Sea Grant history when we must look at ourselves, rather than have someone look at us, to find ways to make our individual and collective programs and universities more effective for the citizens and marine resources of the United States. As a noted colleague phrases it, Sea Grant is "an academic program that demonstrates the need to change public universities." Whether it has or can is the real question. Can the Sea Grant concept, successfully programmed, become a model to deal with other major societal problems?

In this discussion I will share views of the conceptual history of Sea Grant, provide some examples of bridge building within and outside the Sea Grant Program, and present some challenges on how we might do a better job in the future. Throughout, my strong belief should be evident that Sea Grant is people-oriented and thus unique among ocean programs. Further, the critical nature of maintaining the functional trinity of research, education and advisory services will be amplified.

To refresh our memory, Athelstan Spilhaus, speaking to the 93rd meeting of the American Fisheries Society on September 12, 1963, is credited with bringing the idea of the Sea Grant College to public attention. In October, 1965, a conference at the University of Rhode Island of the "Concept of a Sea Grant University" kicked off much of the enthusiastic rhetoric about the program that we work with today. At this conference, John Knauss spoke of "a design for something quite different-- a consideration of the social as well as technological aspects of marine resources exploitation." Dr. Spilhaus said, "The oceans will offer us military, recreational, economic, artistic and intellectual outlets of unlimited scope. Further, Sea Grant offers to every man in the street the exciting participation of being a man in the sea." On building bridges, Spilhaus said, "Sea Grant will be a welding together of science, art, literature, engineering, medicine, law, public administration, and politics." In a talk at that conference on the lessons of the Land-Grant movement, Harold Knoblauch said, "The Land-Grant College Act led to acceptance of the principle that a university should put emphasis on seeking knowledge as well as teaching it."

The kinship of Sea Grant and Land-Grant has been reviewed almost to the point of dustiness. It may be well, however, to note some points

which W. Robert Parks, of Iowa State University, made in 1955, "It would be inaccurate to picture the free school movement, of which the Land-Grant College was the culmination, as a broad mass movement. It was not until the Land-Grant College had begun producing an educational program which filled popular needs that the common man began to demand its product." And, "In the early days of the Land-Grant College, however, there was real danger that the popular opinion--or at least the views of popular leaders, such as farm politicians, farm group leaders and the editors of farm magazines--would force the colleges into a narrow vocationalism designed to turn out only master farmers, expert mechanics, and model housewives. Out of this conflict of craft versus science, however, the colleges emerged with a strength in program. The Extension Service and the Experiment Station are the institutional products which grew out of the resolution of these earlier conflicting philosophies."

In the second Sea Grant conference held in 1968, the late Dr. Wilbert Chapman said,"The crux of the matter is that we need to construct a better linkage between ocean science and ocean technology." In the same conference, Dave Potter said, "Legal and social matters are at the heart of the U.S. fisheries problem." In this discussion, Dr. Potter made a strong pitch for Sea Grant Colleges to accept 'vertical education column' responsibilities. Dr. Alfred Keil spoke of the need for Sea Grant to develop direct and indirect industrial support. This perhaps has led to the active Midas Program at MIT. At the third Sea Grant conference in 1970, Robert Schoning, then Director of the Fish Commission of Oregon, said, "The Sea Grant Program can rise or fall on its ability to communicate." And, more recently, Congressman John Breaux, at the 1979 Sea Grant Association-Nation Association of State Universities and Land-Grant Colleges seminar on the "Politics of the Budget Process", strongly noted that "Sea Grant needed to provide more information to constituents."

A recounting of history could go on forever and to me is fascinating, but these glimpses perhaps give us a perspective from which to begin examining the bridge-building progress of Sea Grant during the first dozen years or so.

How do our individual institutions view the bridge-building concept? Some of the best Sea Grant prose is found in Volume 1 introductions in the Sea Grant proposals. Let's sample a few:

Louisiana State University: "The Sea Grant Program is novel." It deals with institutions, as holistic enterprises, rather than individual investigators. It is a model for inter and intra-university cooperation, cutting across university and other institutional lines. Bridge-building is occurring with state and federal agencies which have jurisdiction over wetlands and marine resources, providing legal staff aid to state government and aiding with Fishery Conservation and Management Act, ports, waterways, coastal zone, pollution and petroleum questions.

New York: New York is a difficult area for developing a Sea Grant Program. New York Sea Grant has worked to build bridges with universities, government at all levels, and citizens; formed a consortium between Cornell and SUNY; and is now reaching out to other public and private institutions. They are attempting to "institute a coastal consciousness at all levels of the government." Further, Sea Grant Extension activities are conducted all

over the state within an hour's reach of any coastal zone and 85 percent of 15½ million people.

Woods Hole Oceanographic Institution: The Woods Hole program has stimulated contact with public school educators in the Cape Cod area, interacted with several large universities in Boston, cooperated with federal agencies, improved communications among state agencies and citizens, and sponsored workshops on marine aquaculture, geology and physical oceanography.

University of Rhode Island: "The University program has always been close to the users." Sea Grant personnel serve on task forces and advisory councils to state and local groups, marine business, environment, etc.

University of Southern California: The University focuses on the 10 million people and the gross national product influence of 90 billion dollars (1976) in the Southern California region. The program uses a nation-wide advisory panel plus the state panel.

University of Washington: The University points to the Columbia regional Sea Grant projects and the Pacific Sea Grant Advisory Program elements in the bridging concept.

These examples are just that, examples. Every program appears to be making overt efforts toward bridging with other universities, with agencies, and with clients and industries. Thus, we say and we mean that we are using the Sea Grant Program to help build bridges.

Each Sea Grant Program can look to some successes--to problems solved for and with citizens, agencies, and industries. We can also point to effective feedback to focus our programs on priority needs of resources and clientele. Indeed, though some would deny it, Sea Grant has been the lucky middle man. A former tormentor of mine, in a left-handed complimentary way, said that I often seemed to be standing in the right place at the right time. Sea Grant, also has been in the right place at the right time on several occasions. Involvement in coastal zone matters, several years before passage of the Coastal Zone Management Act of 1972, provided a headstart for that program. Certainly, Sea Grant activities in fisheries law, economics, anthropology and advisory services--as well as biology and management helped to build the foundation necessary for implementation of the Fishery Conservation and Management Act of 1976.

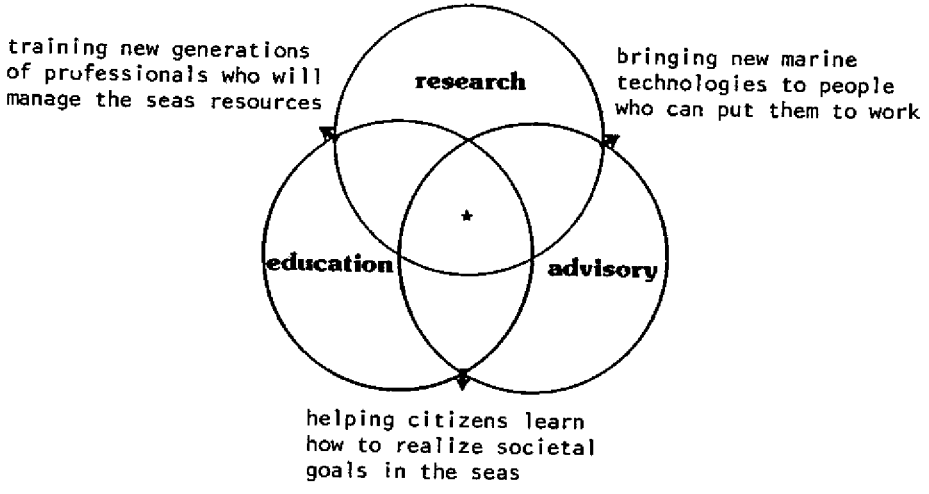
The Sea Grant network has served as an early warning system for economic, energy and environmental problems. A good example of the latter concerns the case of PCB's (Polychlorinated biphenyls) in the Great Lakes, especially Lake Michigan. The University of Wisconsin Sea Grant College Program PCB bridge building efforts began in 1970. The work of Drs. Allen and Veith indicated the long-term nature of the PCB problem. Research results clearly showed that a ban on manufacturing of PCB's was not enough. A further ban on disposal of PCB's was imposed by both the federal government and the State of Wisconsin. As research continued, public information programs were developed to extend results to all citizens. The Sea Grant College-federal-state- partnership

continues. Most recently the legislature increased Wisconsin's state Sea Grant appropriation for additional work on contamination problems, especially on the human health aspects.

Probably each Sea Grant program has several stories to tell of similar successful approaches to local and national problems.

Our programs and our universities are at the same time different and similar. A strength of Sea Grant is the individuality and independence of each program working cooperatively as a network. The national Sea Grant program cannot be more than the sum of its parts and each part must reflect the character and strength of its parent institution.

At the same time, we all operate under a congressional mandate to help put America's oceans to work through a university-based education, research and advisory program. These functions are interrelated and inseparable. The Venntype diagram shows how I view Sea Grant as a functional trinity.



You will note that the common denominator in the diagram is people. This is why humanists and social scientists are finding exciting opportunities in the Sea Grant Program. People also are the core of the advisory programs, where the real goal is to create better citizens through the mechanisms of ocean science and technology.

People can be individuals, families, groups of citizens with common interests or geography, and of all age and income levels. Usually we categorize them into client groups of one kind or another. If a suitable pigeonhole is not evident, we lump people as the general public. One special group of people, is the Congress of the United States. This body is ever changing. More than one-half of the 96th Congress have less than four years in office. The same turnover is true of most state legislatures, county commissions and city councils. The process of bridging with people is continuous.

Agencies are groups of people working to execute the will of the citizens, at all political levels. The mission of the agency tends to define its breadth of concern and dampen innovation. Trespassers are often unwelcome. Fences and gates are carefully tended. Bridging can be difficult. But bridging of Sea Grant with relevant federal, state and local agencies is vital to our success and can often help the agency perform its functions. I've found that genuine personal friendship with agency employees is a key to progress. I have also failed to maintain a beachhead with some crucial marine agencies.

The Sea Grant Program has access, vertically and horizontally, to all of the disciplinary and functional tools of the Sea Grant College system. If Alaska does not have the correct tool maybe Florida does. Good examples of borrowing and sharing can be cited. We need to make better use of the system in our bridge-building and maintenance. Although Ned Ostenso says, and most of us agree, that Sea Grant is not a national ocean "fix-it" shop, we should be mindful that our enabling legislation, and the testimony that moved Sea Grant from an idea to reality, emphasized the training, information dissemination, and applied knowledge needs of the sea people. We must be all three: generators of new knowledge, trainers of minds and effective extenders of ideas.

In the first few "gee-whiz" years, it was easy to draw a crowd and collect accolades. We were new and working with a largely ignored clientele. The fish processor that responded to our first questionnaire was delighted that someone valued his opinion. Now, 102 questionnaires later, he is not quite as cooperative. The same scenario applies to coastal management problems, port development, etc. Agencies have come along whose main thrust covers some of our project thrusts of the past. Some of these agencies have learned from us how to relate to marine publics.

Moreover, we are becoming more sophisticated in focusing our research projects. As we get closer to the centrum, there are bound to be clients who view Sea Grant as a threat. Dr. Chapman, 1968, said, "As a nation we can no longer afford to be dilettantes in the ocean business." Sea Grant has taken this counsel to heart. There are some groups, and will be more, who do not appreciate our zeal!

The Sea Grant network employs some of the best educational communications specialists to be found anywhere. Publications of all types, from

newsletters to technical journal articles, spew forth. Colored slides by the thousands are taken to illustrate the nation's marine activities and Sea Grant's part therein. Experiments with radio, films, video tapes, film strips, etc. show promise. Our graphic design improves each year. Still, our effect is largely internal. We are talking to ourselves. This is not unusual and is not limited to the communicators. When the Sea Grant Directors get together, it sometimes seems that we are saying--what this country needs is a good five-cent cigar.

What would happen if each program decided to hit a mass outlet, Family Circle, for example, with one top feature article a year? Or 60 Minutes? Or a 30-minute film on a national network? Not to tout Sea Grant, although the source would be evident, but to help our citizens understand the ocean world and its resources. How I'd love to be able to offer an alternative to some of the emotional garbage that graces our national media concerning the subjects that we know best. The tragic stranding of 41 sperm whales near Florence, Oregon, in March, 1979, created an opportunity for education. Bruce Mate, Jim Larison, and Charles Jackson did a fine job of using this sad event as a focus for education to the world's press, including People magazine and Geo, Europe's fine geographic pictorial. But do we need a tragedy? Our subjects are among the most interesting. Good information in an attractive package can help our bridge-building.

Earlier I mentioned that the time may be opportune for us to look at ourselves and how we are doing, rather than have someone else look -- as has been done in the past. Examples include several activities already finished or underway. The Sea Grant Director's Council is examining the role of publications with the goal of increasing quality and providing some standardization as to types of printed materials. The recent report "Partners and Parallels" produced by the ECOP (Extension Committee on Organization and Policy) task force on Sea Grant relationships is a completed internal review. The goal of this group".. was to examine the outreach functions of Land-Grant and Sea Grant institutions and the relationships between them. It was to identify problems --existing and potential--and to note solutions to them, where possible."

Recent system-wide workshops on seafood technology, ocean engineering, and marine geology are examples of subject matter planning which should lead to more effective bridge-building both within the Sea Grant system and to our many publics.

Functional workshops on marine education and advisory programs help us to share ideas and stimulate cooperative effort. The sessions which I have attended focus attention on relevant and effective use of academic, human, and financial resources, American citizens will benefit from this approach.

Still, an uncomfortable feeling remains--that Sea Grant, thus far, has not been able to affect much change in the university. Universities, as guardians of truth, are remarkably resistant to change. The reward system stems from far back in history and often works against those faculty concerned with societal problems.

Sea Grant has the potential to be one of the best bridge-builders in American history--as is Land-Grant. We have the marine world as our arena, manifold tools and functions, and a generally positive group of clients with whom to work.

Many effective bridges have been built. Once built, they must be used to two-way traffic and carefully maintained. Sea Grant is now past babyhood, nearly through adolescence and ready for full operation. Although we could easily excuse ourselves and say that with just a little more money we could fulfill more needs, let's emphasize pay-offs from our programs and optimize the future.

Walt Whitman, in the poem "Passage to India" published in 1871, captures some of my feelings.

"Passage, immediately passage! The blood burns in my veins!
Away O soul, hoist instantly the anchor!
Cout the hawsers--haul out--shake out every sail!
Have we not stood here like trees in the ground long enough?
Have we not grovel'd here long enough, eating and drinking
like mere brutes?
Have we not darken'd and dazed ourselves with books long enough?

Sail forth--steer for the deep waters only,
Reckless O soul, exploring, I with thee, and thou with me,
For we are bound where mariner has not yet dared to go,
And we will risk the ship, ourselves and all."

THE NATIONAL MARINE SCENE*

John Botzum

From the perspective of a marine-science news reporter, John Botzum editor of Nautilus Press, told SGA participants that Sea Grant has an opportunity to play a role not being played by anyone else. In fact, Botzum said he sees Sea Grant as the national ombudsman for the oceans.

"Nevertheless, there is a salient needed for a new look at the Sea Grant program," he said. "The 1980's are going to be important. It is time for a review of the original conceptions based on the social science aspects and an identification with national goals."

Botzum made the point that Sea Grant's most effective communication has been largely internal. He reminded the audience that many of Sea Grant's old friends in Congress are gone and that it is time to make new friends. Through academic, industrial and public communities, Botzum said he believes Sea Grant can create an oceans constituency.

Interspersed with Botzum's suggestions for national goals, were a number of provocative questions, such as:

-- How many of you are involved in solid public participation programs?

-- How many go out to see if your programs are more than at the level of, "Gee Whiz, coasts are neat, let's all enjoy 'em?"

-- We may have another oil spill tomorrow. Are we prepared for another Campeche?

-- Can we make a deal with another country to protect the oceans?

Pointing out that the Executive branch of government has shown less interest in the oceans over the past several decades, Botzum encouraged the audience away from parochial attitudes and toward a better understanding of Washington matters.

"Nautilus Press is prepared to help. We want to participate while maintaining some kind of outside point of view," he added.

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*Summary. Original paper not available.

SECOND PLENARY SESSION

BRIDGING PROCEDURES

Chairman: Robert J. Shephard
Associate Director, and Head of Human Resources
Division, Office of Sea Grant, NOAA

Speakers: "One Industry's Approach"
Roy E. Martin
Director, Science and Technology
National Fisheries Institute

"A Regional Approach"
John K. Hutchinson
Director, New England Marine Advisory Service

"A University Approach"
Dr. Hugh Popenoe
Director, Florida Sea Grant College

"A Foundation's Approach"
Dr. Roger D. Anderson
Executive Director
Gulf and South Atlantic Fisheries Development
Foundation

"A Government Agency's Approach"
Dallas Miner
Office of Policy Evaluation and External Relations
Office of Coastal Zone Management, NOAA

ONE INDUSTRY'S APPROACH

Roy E. Martin

Building bridges for effective communication is always a good theme and easy to say but usually difficult to implement.

What kind of bridge-builders are each of you? Have you built a framed, truss, beam or suspension bridge? Is your program framed or all trussed up? Does it beam or is it in suspension? It is silly to build a bridge if you don't know where you are going.

Let's develop my first mini-theme and call it "who is my audience?" Who do I want to reach with my bridge? Many times well built bridges lead to swamps because the target was not clear, or planning was not adequate.

Industry today is faced with unexpected higher rates of inflation, reduced profitability, rapid rises in energy costs, shifting politics and over government regulation. All these factors are having a profound influence on U.S. business and their investment in future technological opportunities.

Some of industry's goals that Sea Grant talent could begin bridging:

1. Demonstration projects with their accompanying economic analysis.
2. New species use and anticipated higher volumes to process.
3. Efficient analysis of present processing procedures for cost cutting and energy savings.
4. Diet, health, nutrition and their relationship to increased seafood consumption.
5. Resource centers for product and processing problem solving.
6. New product development into convenience and engineered seafood products.
7. A conduit to the vessels on how to bring in the highest quality of catch along with proper vessel sanitation.
8. A thorough investigation into the possible by-products that could be utilized from what the industry discards.
9. Studies on the effect of seafood effluents on the marine environment.

You in Sea Grant have an unusual opportunity to assist in easing some of this pressure. Program directors have a multi-gap effect to bridge. There is a bridge between you and the National Office -- between the Director's Office and the Researcher -- between the Researcher and Extension and between Extension and Industry. And what about that bridge over to the Sea Grant Association itself?

Carefully, very carefully, define who you want to reach in these various disciplines and evaluate, from time to time, that bridge to see if it's still intact. The best of bridges occassionally need repair.

My second mini-theme deals with the tools necessary to build the bridge with. Your printed work often does not reach industry properly or at all. Specific bulletins, reports and research results must be properly directed to be used. Do not clutter before industry's eyes Sea Grant results that have no interest to us. The "handbook for beach strollers," "Japanese fish printing," or "Fort Fisher is falling into the the ocean" were nice, but that's a different audience. Why open yourself up for sharp criticism when you don't need to? Direct your efforts to the right targets.

Let me propose 5 concepts that you might consider in the future to satisfy the scientific professionalism that Sea Grant is so aptly supporting:

(1) Create a Journal of Sea Grant Research as a ranking scientific publication.

(2) Present annually "National Forums in Marine Science" patterned after ACS or IFT symposiums.

(3) Structure within Sea Grant a review process that would take local development results of interest to industry and reprint them for national distribution. Call this service the "Technological Watch."

(4) Create from "Sea Grant 70's" a bulletin of abstract cards that could be cut out and filed by users for future reference.

(5) We need a basic set of key reference books for fisheries. Have Sea Grant evaluate what's available and present 10 of the best.

My third mini-theme deals with the material that the bridge is made from. Is your program made of wood and stone, steel, reinforced concrete or pre-stressed concrete? In your language, this is called the extension technologist or agent. In your language, he's called Sea Grant and friend. This, in our opinion, is your most potent weapon. Arm him properly, and fund him adequately.

I have a few suggestions to leave with you that deserve strengthening:

(1) When attempting to reach your user group, use facilities convenient to your constituents. High school and junior college facilities, local fishermen halls, etc.

(2) That word agent can be spelled "help," but not if he cannot be reached. He must be urged to leave word of his whereabouts. He must have cards or other techniques to use for access to him.

(3) He also should be that interface that helps interpret for industry federal and state regulations and assist coordination between different governmental agencies.

Liaison and communication -- let's list who's in the picture, now that tremendous opportunities have been opened to us through the 200 mile economic zone.

1. Sea Grant of course
2. NMFS
3. Regional management councils
4. Local fishermens organizations
5. Newly developing regional foundations
6. Local and national trade associations
7. Professional scientific organizations
8. Individual state fisheries and marine departments.

Has your Sea Grant program been structured to work and plan with the above mentioned groups? If not, I strongly urge you to give careful consideration for doing so. We all have grown, and communication tends to become more complex and overwhelming. We seem to have doubled the number of meetings that are available to attend but I doubt if your communication skills have also doubled.

Let me digress a moment before I address my concluding mini-theme.

I would be a strong advocate of three-year funding of major Sea Grant programs instead of this two-year business we have to deal with now. Let industry know where to help you in this regard.

Also, I would like to see set in motion within the Sea Grant system some means of obtaining special grants for equipment for pilot plants. Equipment is very costly today and prevents some projects from being properly funded.

We also must coordinate meeting calendars, as there are just too many demands on our time.

Proper care must be given to site visit team selection. Rather than judgments of merit, I sometimes see judgments based on the narrow experience or background of the reviewers. Some research duplication in new areas may not be all bad, and a thorough study of the projects' site review book should be made before the visit if a proper evaluation is to be made.

Let me conclude with a last mini-theme called the "other side of the bridge." Industry is vitally interested in your survival. How many of your sea grant directors have been down on the docks with your agents?

How many directors have visited my plants? How many of you directors know me personally? I represent 847 seafood oriented businesses, the largest element in any of your constituencies. We really can help your efforts. How many of my people have you taken back over the bridge to testify before the various Congressional committees that control your funding?

The final thought I want to leave with you is this; of the small 6% of funds and projects in the research area that you devote to seafood technology, how does that add up to the support we give you on Capitol Hill? Processing and seafood technology concerns must be balanced with the other disciplines for their share of the budget.

We don't see "beach strollers" and "wave counters" support before Congress.

Don't let the paint rust and chip on that bridge.

A REGIONAL APPROACH

John K. Hutchinson

Earlier this year after I had agreed to represent "a regional approach" in this panel discussion, I began to consider exactly what I should discuss with you. Sometimes we write these presentations in something of a vacuum, not certain how our comments will fit into the overall pattern of a conference. And despite the excellent coordination by the Florida Sea Grant people, I wasn't convinced that my approach was pertinent. Not until I saw the formal program, and noted that the word "communications" is used in four of the five workshop themes for tomorrow, was I positive that I am right on target.

Frankly, I hope to avoid the litany of "this-is-who-we-are-and-this-is-what-we-do-and-why." For those who want that approach, I'd be pleased to send you an Annual Report! I do need to state that we are a 14-member association of advisory and marine-oriented continuing education programs in the northeast, half of which are Sea Grant. The other half are at least as important as Sea Grant, and sometimes are more important, depending upon the specific projects on which we're working. They include the National Marine Fisheries Service, the New England Aquarium, the New England Center for Continuing Education, and the Maine and Massachusetts Marine Resource Agencies' Extension elements. The region includes the five coastal New England states and the Long Island area of New York. But, given that brief description and one more to follow, I think we can do something a little different. Focusing on the bridges we have built among ourselves in the northeast, I'd like to describe a few of the underlying strategies that have helped us to build a successful, regional program. I'd like to talk in a slightly theoretical context, but it is one with very practical applications, and I would hope that some of my comments may be useful to others with whatever programs they may be affiliated.

We all know so well that communication in our daily professional activities is vital. But we also tend to take it for granted. Fine, right, we gotta communicate. Communicating well takes time and it takes paying attention to detail with the commitment of our personal time that entails if a program is to be built successfully. Miscommunication is frustrating and can be irritating too.

The noted management specialist Peter Drucker gives us the insight that "structure follows strategy."[1] He simply means that persons building an organization must clearly identify a strategy or strategies for accomplishing organizational purpose and proceed from that point to develop their organizational structure. All the subtleties, the details of interpersonal working relationships will evolve despite anything we plan; alliances will be forged, feelings be bruised, friendships and hostilities will develop. But if there is clear identification and an emerging understanding of 'what it is we're all about,' and if that understanding has been developed mutually by all participants in the process, we have a reasonable chance to succeed.

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[1]Peter Drucker - Management: Tasks, Practices, Responsibilities.

The problem is that such a clear identification may not be easily forthcoming. It takes time to evolve it and we have a tendency to become at best impatient and at worst antagonistic during the evolutionary process. The essential purpose of the New England Marine Advisory Service, as stated in the original by-laws written in 1973, is "to explore and develop ways by which the existing state and university marine advisory and information services can be coordinated, to encourage the sharing of marine information and research of general use along the New England seaboard, and to recommend new methods of improving regional marine advisory services...." Rather broad statement, isn't it? It certainly doesn't give any indication of the kinds of activities we would eventually be undertaking cooperatively. It isn't a primer for day-to-day action. But as an initial strategy for building an organization and cooperative working relationships based on mutual trust, it was exactly what was needed. The initial strategy then was to explore. And obviously we would have to communicate clearly for the exploration process to be worthwhile.

You remember that I mentioned human tendencies toward impatience and antagonism... What do those responses have to do with communication? Carl Rogers, writing in the Harvard Business Review in the early'50s, suggests the following hypothesis: "The major barrier to mutual interpersonal communications is our very natural tendency to judge, to evaluate, to approve (or disapprove) the statement of the other person or the other group. Let me illustrate my meaning with some very simple examples. Suppose someone, commenting on this discussion, makes the statement, 'I didn't like what that man said.' What will you respond? Almost invariably your reply will be either approval or disapproval of the attitude expressed. Either you respond, 'I didn't either; I thought it was terrible,' or else you tend to reply, 'Oh, I thought it was really good.' In other words, your primary reaction is to evaluate it from your own point of view, your own frame of reference."[2] That was Rogers' example. Another, more specific to our own experience and interests might be: "All Sea Grant Programs should direct 90% of their funds to advisory activities, and 10% of their funds to research projects" Whether you agree or disagree with that, I'll wager that not too many people who are connected with Sea Grant are neutral on that statement!

How does this all tie together? Rogers suggests that "...although the tendency to make evaluations is common in almost all interchange of language, it is very much heightened in those situations where feelings and emotions are deeply involved. So the stronger our feelings the more likely it is that there will be no mutual element in the communication. There will be just two ideas, two feelings, two judgments missing each other in psychological space."[3] It has been my experience, and perhaps yours also, that in our professional relationships, we each have a strong tie to the institution for which we work, and, even more, to programs and projects that we have created and nurtured. We tend not to be nearly so interested in what is your project, as in what is our own project. And we don't particularly care to see others undertaking projects that we view to be our bailiwick - in fact, we can get rather upset about

[2]Carl B. Rogers, Harvard Business Review, July-August, 1952.

[3]Carl B. Rogers, Op. Cit.

that. This tendency, the territorial prerogative otherwise known as "turf," is a big obstacle to the building of any cooperative effort. It is certainly an obstacle to a regional advisory program such as NEMAS. And I believe that the leaders of the programs that developed NEMAS recognized right from the beginning that we would have to deal with that as a fact of life. In short, enlightened self-interest was never going to disappear, but perhaps we could temper it somewhat. A second strategy therefore was to provide regular forums for discussion and dissent (I'm being charitable with the use of that word dissent) in which viewpoints could be exchanged openly. They agreed, then, to listen. I mean listen! To listen to the point of really understanding where the other guy was coming from, so that responses could be based on knowledge. These forums initially were Board meetings - more recently they have also included the deliberations of some active committees tasked with organizational responsibilities (e.g., long range planning) or actual regional advisory projects (e.g., Fisheries Committee working on communications problems with fisheries management in New England). Yet a third strategy also relates to "turf". The leadership agreed that NEMAS was to strengthen the member programs' ability to reach users by 1) providing back-up resources when programs wished to work together on projects of regional scope, 2) by pulling groups of field specialists together to jointly define pressing problems and to undertake solutions, and 3) to serve as a clearing house for information. The structure of the organization and the way it conducts projects reflect that strategy. NEMAS has no advisory staff working from the central office, and it never undertakes a project as a separate entity: problems are jointly identified with industry help, descriptive brochures and other marketing devices always emphasize the participating organizations, with whom NEMAS is a co-sponsor. I should probably mention one other strategy we've employed. We try very hard -- sometimes it takes great effort -- not to take ourselves too seriously.

The long process of developing specific activities -- and of course planned activities must be more specific than the general purpose for the organization which I quoted from the by-laws -- has been an interesting, innovative, at times frustrating, but frequently rewarding experiment in regional bridge-building. We have had some false starts -- have had some joint projects simply not get off the ground, others not meet the standards we had set for them, still others spark controversies to the point where it has been difficult to sustain them. But, the successes so far seem to outnumber the failures. For example, considerable regional advisory resources have recently been directed toward assisting in the development of new communications program and techniques, to deliver to the fishing industry in a timely manner information on regional fisheries management council issues and decisions. Details on that program are included as a feature written by Chris Duerr of URI in the current Sea Grant '70s. Because the activities to be udertaken must be educational and advisory in nature, and not public relations, and because we must maintain non-advocacy amidst highly concerned advocates, I'm sure you can understand that it has taken time to define what we might accomplish, much less to accomplish anything! The definition process itself, which resulted in a Statement of Perspective for our own use as a guideline, took nearly a year to complete. But when we were finished, we had committed to paper a precise explanation of what we feel the council, the NMFS, and Sea Grant should do cooperatively in the fisheries management arena. We have an educational radio series about

to be aired, a new fisheries communication specialist in the NH/Maine program working on the problems full-time, and though it is too early to evaluate results, we have high hopes for this collective effort.

You have noted the interpersonal theme, the kind of people-to-people work that Bill Wick discussed this morning, throughout my talk. I have some real concerns about how we're going to be able to maintain that in the future. Travel is ever more difficult due to energy costs; the pace is ever more frenetic. Although we don't have time to consider it now, we obviously will have to do some careful planning to be sure that we stay personal and communicate well in our working contacts with each other.

A UNIVERSITY APPROACH

Hugh Popenoe

In Florida we have many challenges facing our program, some of them common to all Sea Grant programs and others unique to Florida. We are experiencing the pressures of heavy coastal population concentrations as are the other coastal states and we also have extensive industrial and recreational activity--perhaps more of the latter in view of Florida's burgeoning tourist industry. Compounding these more or less common problems in Florida is the State's extensive coastline which extends for 1350 miles, nearly equal to the 1500 miles of coastline along the rest of the 13 Atlantic states, longer than the 1300 miles shared by the three contiguous Pacific states, and considerably longer than the 850 miles of Gulf coast bordering the other four Gulf states.

Also in Florida we are dealing with a number of educational institutions. In addition to nine state universities there are numerous private institutions and research installations plus multiple state and federal agencies involved in various forms of marine research, management, and regulation.

It is necessary to not only bridge the gaps between the multiplicity of institutions and agencies but between the universities in the state system themselves.

To meet this challenge, we placed early emphasis on establishing a Marine Advisory Program (MAP) under the admininstrative umbrella of the Florida Cooperative Extension Service. We also arranged for the appointment of a Sea Grant Coordinator at each of the state universities to act as a liaison between the Sea Grant Administration at the University of Florida and scientists at the other universities and to assist in identifying areas of research and principal investigators to undertake approved projects.

Bridges to industry and government have been extended through appointment of an 18-member industry advisory panel and a 15-member government agency liaison committee which support Florida Sea Grant by facilitating communication and coordination with citizen's, environmental groups, industry, researchers and agencies.

This bridging effort was extended to local levels through marine advisory agents who service each of the state's 38 coastal counties. Through their one-on-one effort and through organization of local marine advisory committees, feedback is provided to the research and administrative teams.

Response mechanisms provided by both MAP agents and MAP specialists include conferences and workshops for special interest groups such as marina operators, citizens interested in hazard awareness, artificial reefs, beach preservation, or seafood preparation, and fisherman who need training in business management and tax matters.

Supporting these programs is the publications effort which has initiated statewide and local newsletters, research reports, advisory bulletins and fact sheets as well as regular news releases and weekly

newspaper columns. To date more than 200 publications of all types have been published, and the bimonthly MAP newsletter is being sent to 8500 users.

Bridges have been built regionally and nationally as well. Last month, Florida Sea Grant coordinated a regional conference on artificial reefs. We have cooperated with Georgia on shrimp trawl expertise, and with Alabama-Mississippi on tax workshops. As evidence of national cooperation, a transfer in 1977 under the Intergovernmental Personnel Act brought an employee of the National Weather Service to a position as a specialist in hazard awareness with the Marine Advisory Program.

But caution has to be exercised. There are not only bridges to be built but bridges to be avoided. Florida Sea Grant has steered clear of building bridges by advocating a certain position, attempting instead to insure that both sides on a controversial question receive as much factual information as possible.

Florida Sea Grant has also steered clear of such "bridges" as biological monitoring, seafood marketing and beach restoration. These are areas in which other agencies have primary responsibility.

We are in a constantly evolving structure. It is exciting and we are getting excellent response from user groups. Other programs, I'm sure have similar devices or other proven methods. What is important is that we are constantly searching for ways to improve our existing bridges or to develop new ones.

A FOUNDATION'S APPROACH

Roger D. Anderson

Interest in domestic fisheries has rapidly increased in recent years. In large part, this has resulted as fishery resources have been appreciated as a source of strategic food and income and, at the same time, as a means of creating substantial new opportunities in economic development. The ensuing political, technical, economic and social issues have, however, added immense new burdens on government. As a result, it is still unclear as to how development opportunities will be responded to. In the interim, however, there has been an evolution of agencies and organizations, endeavoring to respond to the challenges posed.

As part of expanded fisheries interest, there has been a detailed recognition of resource assessment, conservation, management, statistics and data compilation. Generally, these items are focused within a national fisheries program. In fulfilling these responsibilities, government has sought, and generally given serious consideration to, the views of the industry. In conserving and managing our fishery resources, it has been necessary for government to draw up regulations and then police, enforce and adopt other management options to control the level of effort, to establish quotas, as well as to control selected fishing methods. Government, however, has not directly delegated equal attention to resource use potentials. In part, therefore there have emerged, parastatal bodies, responding to the development challenges. Both the emergence of the Sea Grant community, and the newly created fisheries development organizations, reflect this trend.

As pointed out, while management has received considerable attention, development often has gone seemingly unnoticed. Indeed, many fishery development initiatives remain unanswered. For example, there has been a smattering of proposals addressed at: (a)loans to purchase and repair vessels; (b)loans and grants for economic disasters; (c)manpower training programs; (d)market reports and information; (e)seafood sanitation programs; (f)market promotions; (g)technical assistance; and (h)support of fishermen's cooperatives (Curlin, 1978). Though many of these actions have been favorably pursued, the piecemeal approach under which they have arisen, may be symptomatic of a failure to recognize respective roles. The industry, of course, shares in the responsibility for such problems, particularly when not well documenting its needs or not using existing development vehicles. Fortunately, the commercial fishing sector has become more responsive to these problems, seeking assistance in capital formation, export and trade expansion, tax treatment, etc. (Curlin, 1978; Campbell, 1978). In turn, government programs are becoming more directed and responsive.

By the same token, the commercial fishing industry still suffers from a lack of imagination and perspective. For example, with the exceptionof the industrial fish processors, canners and some larger companies, much of the industry is no more than an array of harvesters, processors and marketers, pursuing independent economic and business goals (Curlin, 1978). There is, however, a shift toward greater vertical and horizontal integration. This trend will occur at different rates,

depending on the species, markets, economic forces, labor and sociological factors.

Many government departments exercise influence on the industry's growth and prosperity. For example, they impact:

(a) operations of trade and customs departments, affecting the content of imports and exports, trade practices, prices and tariffs;

(b) vessel safety rules, surveys and equipment specifications;

(c) communications, especially ship-to-shore and ship-to-ship radio transmission activities; and

(d) health departments which control hygiene and seafood quality standards.

Each of these units of government exert control, and thus the industry's present and future status. Additional departments affect:

(e) industrial relations, training and enforcement of safety;

(f) credit conditions, financial controls, interest rates, grants, subsidies and incentives;

(g) negotiations with foreign governments;

(h) defense and surveillance; and

(i) environment (Campbell, 1978).

In addition to the principal agencies, quasi-government bodies impact the industry. These organizations include:

(a) finance corporations and banks;

(b) port and harbor authorities;

(c) urban and rural planning boards;

(d) insurance companies;

(e) import/export corporations; and

(f) regional fishery management councils (Campbell, 1978).

With this labyrinth of government rules and regulations, the industry's effort to operate, let alone expand, has been difficult. While fishermen have received the attention of regulators, they have not been afforded similar attention on development initiatives.

Responding to this widening gap, as well as a host of related issues, the congress enacted the Sea Grant Program. This has proven to be a welcome addition. However, while this legislation has played an important role in generating assistance, the fishing sector has recognized that this is not the sole answer. In fact, the seafood community has recently established a network of its own development organizations, regionally

located and committed to economic development. Directed towards both short and long-term fisheries work, their mode of operation can be readily equated to the Sea Grant mission. In essence, these organizations are platforms from which industry interests can be coordinated among public and private sector groups.

Though some foresaw competition arising when industry organized its own research and development sector, this has not proven to be the case. Indeed, the new organizations have sought out the expertise of the Sea Grant investigators, as well as used the linkages already created. The fundamental difference, perhaps, is that the fisheries development organizations are focused on a clearly identified audience. Their resources are not diluted, nor is their coverage interrupted by county and state boundaries. Indeed, the development organizations, their members and the commercial fishing industry as a whole, provide an even stronger Sea Grant constituency. After all, Sea Grant's mission has been notably heralded by coastal fishermen, with many success stories centered around fisheries related extension and research activities.

Both Sea Grant and the industry organizations recognize that while the world's fisheries catch has continued to rise, our own domestic production has grown slowly. Indeed, our nation has not used many of its potential stocks, but rather focused on traditional harvests. In part, this has resulted in the dependence on imported seafood products. However, since the passage of the Fishery Conservation and Management Act, the industry has shown great interest in reasserting itself. Specifically, commercial fishermen, and these parastatal bodies which support their efforts, must address the following (Anderson, 1977):

(a) The seafood industry if fragmented, i.e. the industry is composed almost entirely of small business. The majority of these enterprises are unable to easily acquire the financial, technical and managerial support needed for major expansion.

(b) Over half of domestic processing plants employ fewer than 20 people, with annual sales of less than $350,000. By comparison, the average for other food-related industries approaches 56 employees, with four million dollars in annual sales.

(c) American vessels have limited harvesting capacities, with the average vessel employing three crewmen, or less, with annual gross earnings of less than $100,000.

(d) Industry-wide capital requirements are substantial. To replace foreign participation, and achieve additional growth over the next 10 years, an investment of over five billion dollars may be needed to modernize and construct needed vessels and processing facilities. At present, the domestic fleet appears capable of harvesting only one-fifth of the available finfish resources.

(e) Domestic fleets and processing facilities are tradition bound. For example, harvesting and production are concentrated on a limited number of species, with only a few species accounting for 60% of volume and 70% of value. Additionally, 80% of the industrial fish catch is concentrated on a single species,

i.e. menhaden. Expansion will require considerable product diversification, with significant market development, both here and abroad.

(f) Seafood transportation and marketing networks are poorly established. Most processing, storage and transportation facilities, as well as marketing support services, are undeveloped. Considerable modernization and technical input, reflecting the experiences of other food-related industries, are required.

However, responding to these challenges, particularly through coordinated efforts, govenment, academia and industry can generate:

(a) Greater cash flow and capital accumulation;
(b) Enhanced interest by the investment community;
(c) Expanded opportunity for export market development;
(d) Improved quality control and consumer protection; and
(e) Increased variety of product selection (Anderson, 1977).

While commercial fisheries development poses major challenges to government, academia and industry, the opportunities and rewards are great, offering both public and private benefits. To meet and fulfill these opportunities will, however, require the insight to understand and appreciate user needs. By cooperatively pursuing the challenges posed, Sea Grant can continue to be an important player in responding to our nations' fishery development needs.

A GOVERNMENT AGENCY'S APPROACH

Dallas Miner

Today's theme of building bridges is very appropriate because, in many ways, building bridges between various sectors of government, industry and the public is a basic thrust of the Coastal Zone Management Program. The biggest reason we must build bridges is that while Congress expects substantive results from Coastal Zone Management (CZM), we have very little direct regulatory authority over the coast. Our program operates as a voluntary partnership between the federal and state governments who carry out coastal management on a day to day basis. To a great degree, this partnership is only as strong as the bridges we build.

Not only do we build bridges between state and federal government our program seeks to resolve conflicts among coastal resource users, coordinate the actions of other federal agencies operating in the coastal zone with state coastal programs through the so called federal agency consistency process, and perhaps most importantly, stay in touch with public needs by maintaining significant public participation in the coastal management process.

In looking at what we regard as CZM's bridges to success, let's start off with the bridge between coastal management and the public. For our program to succeed we must have a public aware of and sensitive to coastal management issues. Sometimes this public awareness occurs spontaneously when a person has trouble getting on to the beach much less finding it or experiences damage from natural disasters such as storms or erosion. In Alabama, we've recently seen an upsurge in interest in CZM caused, I am rather sorry to say, by Hurricane Frederic.

Another means of stimulating public interest in CZM lies in education. We see Sea Grant playing a major role both in terms of direct public education and public discussion arising indirectly from some of the more technical Sea Grant sponsored research projects. OCZM is involved in this too, through selected support of research directly related to coastal management needs. Some of our current areas of interest include studies on the possibility of restoring and enhancing wetlands, carrying capacities of barrier islands, and the movement of toxic substances through the coastal environment.

While we remain interested in the dividends these projects pay in terms of public awareness, their primary purpose is to increase the ability of government to handle coastal issues. This implies the need for government institutions capable of intelligently using this technical information. Sea Grant, in its relationships between Sea Grant institutions and governments is very involved in this information transfer process.

In getting the public to identify coastal issues worthy of their attention and action, state coastal programs derive their political support. Without public acceptance, state coastal management programs have little chance of carrying out their mission of substantively improving the management of coastal resources. From this, it is easy

to see that meaningful public participation is crucial to coastal management. Public participation has got to be built on real issues and two-way communication. Empty bureaucratic exercises just don't cut it.

Participation must begin early in the program or else the CZM ship may sail off to a destination that the passengers have no desire to visit. To bring people in late in the process as an afterthought only turns them off and destroys any chance for public support for coastal management.

The form public participation takes must be diversified as well. You can't rely on hearings alone. We encourage the state CZM programs to reach the prople in many ways such as through citizen advisory groups, the media, and the public events and so on.

Ninteen-hundred-eighty's Year of the Coast (YOTC) celebrations can be seen as a year long, grass roots, public awareness campaign. While a collection of mostly environmental groups have organized themselves into the Coast Alliance to carry out the event, OCZM also will sponsor some YOTC activities and our State programs will be very active in YOTC. In this regard, we would like to get Sea Grant involved in building stronger links with state coastal management programs and we hope to work with Ned Ostenso and Bob Shephard to bring this about.

It's also very important that we build bridges between OCZM and major coastal resource user groups. Constant communication between ourselves and these groups can prevent us from having to mend fences that should never have been broken. Keeping communications lines open is the key to preventive problem solving. For example, we are attempting to refine the relationship between ourselves and the port industry. To identify opportunities for coordination we sat down with the American Association of Port Authorities over a number of months and let them list their key problems. We in turn, gave them our proposed responses to their problems. Together, we reduced our conflicts and brought state CZM program managers and local port officials closer together.

While the Coastal Zone Management Act designates state governments as the lead actors in implementing CZM out in the field, we are also very interested in building bridges to local governments. Local governments are often closest to the issues and will have intimate acquaintance with the actual results on coastal management. To help them, we have concentrated on enhancing their decision making capability through state CZM programs, by providing coastal management staff at the local level and supplying local government with technical data in the form of reports, mapping and so on. The key to this effort is to extend the tools to local government for more enlightened and rational decision making.

From the very beginning, we have been building bridges to the states although sometimes we get the feeling that they are more interested in rowing over us, taking the money, and rowing back over to the other side. Our state programs staff works with state program managers on a daily basis and for more formal guidance we work with the states through the program grant cycle and program review process. By these

means, we guide the state programs towards substantive fulfillment of the Coastal Zone Management Act (CZMA).

As far as our bridges to other federal agencies go, I would have to say that the CZMA's Section 307 consistency provisions form the bricks and mortar of our relationships with our brother and sister agencies.

Beyond this, we are always looking for opportunities to join with other agencies to advance mutual interests. For example, we have been quite close to the Interior Department's Heritage Conservation and Recreation Service in coordinating our shared efforts to provide more recreational access to beaches.

Of most immediate interest in the federal agency area is our conduct of the Federal Coastal Programs Review which President Carter ordered in his most recent environmental message. This review will look at all federal agency programs affecting the coastal zone and will provide an extraordinary opportunity to bring about coherent and consistent federal activities along the National Oceanic and Atmospheric Administration and we certainly welcome Sea Grant participation into this vital effort.

The last point I will make is that people build bridges. All the studies, research projects, meetings, regulations and so on don't do a bit of good unless people work with people. I'm pleased to see this going on here this afternoon, because when it comes down to the bottom line, to build bridges, you have to know your constituency and learn to work with them, whoever they are.

THIRD PLENARY SESSION

BLUE PRINTS

Moderator: Dr. Harris B. Stewart, Jr. (Ret.)
Former Director, Atlantic Oceanographic and Meteorological Laboratory, NOAA

Speakers: "The Land-Grant Experience"
Dr. Russell C. McGregor
Director, Governmental Relations for Agriculture and Natural Resources, National Association of State Universities and Land Grant Colleges

"The Sea Grant Ethic"
Dr. Ned A. Ostenso
Director, National Sea Grant Program and Deputy Assistant Administrator for Research and Development, NOAA

WORKSHOPS: BUILDING BETTER BRIDGES

Moderator: Dr. Harris B. Stewart

Participants: Meeting registrants

THE LAND-GRANT EXPERIENCE

Russell C. McGregor

You've heard a lot about the land-grant experience already, and I'm not going to bore you, I hope, by any repetitions. I thought it might be useful to try to classify the experience for you; to organize my thoughts in a structured way that might be useful to you.

One thing I noticed listening yesterday morning; many of your leaders are already taking advantage of that experience; they are thoroughly familiar with it. There are already many connections - many bridges have already been built.

I'd like to classify the land-grant experience, the experience of these universities, into these dimensions: (1)historial, (2)philosophical, (3)organizational and structural, (4)social, (5)economic and (6)political. The political dimension is the one I'd like to emphasize as I think that experience may have some useful insights for you. I'll now consider each of these dimensions in turn.

In terms of the historical dimension, Bill Wick noted a significant fact-- the three functions of the land-grant university arose in different generations. I am referring to the teaching function, that is the establishment of the college, later on the establishment of the experiment station, and finally the extension service. It was 1914, before the three functions were all in place. Another key point to note is how long it took to get the impact. Production agriculture didn't really feel the impacts of this institutional arrangement until World War II. That's when production really took off - when transition from the "art", as E.T. York called it, into a scientific agriculture was complete.

Secondly, there is a philosophical dimension. You know that land-grant isn't about land, and it isn't about grants. At heart, it is a philosophical idea. The phrase "land-grant" is a symbolic phrase. "Land-grant" is an ethic. That ethic has to do with education for all the members of this society. It is that ethic that is understood and admired overseas. The land-grant university is a "can do" institution. It gets things done. It's purpose is to solve the real world problems of people through science and education. Historically, that is an American idea - a relatively new idea in the history of the world. These days its hard to tell many state universities from land-grant universities. Even some of the private institutions have adopted this ethic of service to the society.

You are all familiar with the organizational structural arrangements in the land-grant university for teaching, research and extension. Bill Wick dealt with the interactions among these structures yesterday morning. I believe that each land-grant university has its own unique and special way of handling these functions, and yet they all fit the general model. There's one aspect of that model I would like to comment on and that's the extension function. I think it is terribly important to the development of your Sea Grant program. The term "advisory" captures part of it but I hope no one thinks that is all of it. There are a many things that extension is not. It's not simply technology

transfer. It's not just advice. It's not only the outreach function of the university. It appears to be those things at one time or another. But it's something more fundamental -- it's education. I think that has often been forgotten. An important characteristic of extension is its feed-back mechanism - bring back to the university the real world situation. This helps to keep the university relevant, and keeping the university relevant is crucial in a society that believes there are already too many unresponsive publicly-financed institutions.

The social dimension, involves the relationship of the university to the society around it. We have some notable examples of attention given to that society by land-grant, for example: family living, child development, 4-H youth programs. These are all parts of the land-grant experience in a social dimension. These are all parts of the land-grant experience in a social dimension. They haven't been as widely recognized as some of the economic phenomena but they are certainly important. Many university people have been focusing on the farm family in addition to the family farm. They are concerned about the wellbeing of the family as a basic social unit, and not simply about the farm as an economic unit. During the last two decades there has been increasing attention by land-grant universities to the family and to the community. Rural development efforts have a separate statute and separate funding. There are four regional rural development centers in the country - one headed by an anthropologist, another led by a sociologist. As the Department of Agriculture works toward a new M81 farm bill, Secretary Bergland is expressing concerns about farm "structure." And this includes the whole question of the future of the farm family.

In the economic dimension, these universities have served as "engines of development." The results of R & D flowed into the private sector, and were adopted. The U.S. became a leading agricultural power. In fact, the leading agricultural power, with a greater monopoly on food production than OPEC has on oil.

Now we come to the dimension that I want to speak most about - and that is the political and public policy experience. I'm sure that you're all conscious that your colleagues in agriculture and many of your presidents are deeply involved in the public policy process in your states as well as in the national capitol. Perhaps you have wondered, why all that involvement? What's going on?

To put it differently; what have the land-grant universities learned about the public policy process at the national level? What is it that they are doing? One thing that land-grant universities have learned is how the process works. In the Washington, D.C. policy-making process there is an iron triangle of power, no matter what the particular policy matter. This is the secret. The iron triangle of power has at its three points, the executive branch, the Congress, and at the third point, the world of interest groups or associations. That's you, that's us, That's what we are all a part of.

In any issue of public policy, if all three of those parties agree on the matter, then it shall be done. If any one of the groups at the points of the triangle disagree -- if the Congress disagrees with the executive, or the interest groups disagree with either party - then

it will not go, it will fail. That seems kind of elementary, but operationally how do you make it work? Part of the secret to making it work is the finite number of decision makers. Whatever your interest, you will find a relatively small number of people making the decisions at each point of the triangle. In agriculture, for example, the executive branch agency is the Department of Agriculture and we know who the leaders are there, and we know how to communicate with them. In the Congress there are only four major committees involved. The two authorizing committees, one in the House and one in the Senate, and the two appropriations committees. Again the leadership of these Committees is easy to identify, that's where the power is, and that's where the decisions are made.

The interest group world may seem quite unstructured and scattered. It may appear that there is a miscellaneous collection of associations around the country, and they don't seem to have any collective way of doing business, yet this is not the case. On K Street in Washington is a hidden "government." There are thousands of associations, that's true. But there are structures. These associations have ways of doing business together. They meet in various formal and informal ways and they make their collective will felt in the process.

While I'm on the subject of the federal process, let me diverge to a couple of points that Dr. Hargis inspired me to think about yesterday morning. That was an excellent discussion - probing for the reality of where we are in the marine policy area and in the Sea Grant program. I have two hypotheses to offer you.

The first, is that there has been a major shift of power from the executive to the Congress in the last decade. The golden era of the executive was the Kennedy/Johnson period. Your program was founded in the 60's in a time when the flow of legislation and new programs was the largest in history. It was a program-building era. The imperial presidency destroyed Congressional willingness to give authority to that branch, and also weakened the confidence of the American people in that office. In fact, ever since, it seems that the executive branch has had limited capacity to formulate constructive policies and programs. Some of the best things that have happened in the recent time period have been growing out of the Congress. In our land-grant experience we've passed two major pieces of legislation in the last five years. Title XII, with its mandate for agricultural development, was a Congressional initiative. The executive acquiessed, and went along with us. Secondly, we passed Title XIV, which reinforced the Department of Agriculture's role in food and agricultural science, and provided authority for competitive grants. I'm certain that you all heard that issue. This, too, was a Congressional initiative. Where we are at this moment is not quite so clear, but I expect the Executive to reassert itself.

Developing a science policy in this government is very difficult. The diffusion of power in the federal government means that each agency, and the Congressional committees, and the interest groups work very closely together. This tends to fragment any overall effort at science policy.

I believe that our national R & D system is in trouble. It isn't just Sea Grant that's got problems. The nation's R & D is sagging. And the Carter administration is rather helpless because they don't have the money to put it back in shape. The national agenda is dominated by inflation and energy and anything else is taking second place, including R & D. The Carter administration seems to be concentrating on basic research. However, this doesn't help your program particularly.

Although the Congress seems relatively more powerful these days, the recent Congressional reform has weakened that body. There had been a diffusion of power in the Congress, so that when you try to relate there, you become frustrated. There seems to be no locus for action. There are now 18,000 staff members in the Congress and several hundred subcommittees. The old system of powerful committee chairman, who made things work, has fallen into decline. However, it's beginning to reassert itself, because members of the Congress are recognizing that they're losing some opportunities.

These are some thoughts in reaction to yesterday morning. They may be true, they may not. Assessing reality is very difficult especially in Washington, D.C.

It seems to me that it might be helpful to suggest some rules that come from the land-grant experience, that may lead to success. These are rules that administrators in the university can use to participate in the public policy process. Such participation, I believe, is a responsibility.

Rule 1 - Establish a national organization that's dedicated to collective action. You won't get very far as an individual citizen.

Rule 2 - Develop a willingness by individual university administrators to participate in that organization, to delegate responsibility to the elected leaders, and to cooperate fully with that leadership. Rule 2 is often violated. Operating in collegial fashion is important when you're deciding what it is you want to do. But at some stage it's necessary to give a mandate to selected individuals and send them to Washington to negotiate. You can't decide you want it one way, send your leadership in to try to help you get that, and then everybody else tells a different story. The result will be that Congress or the executive, hearing many voices, will decide that the university community does not really know what it wants. You'll get nothing.

Rule 3 - Finance, maintain, and support a first rate staff in Washington, D.C. I won't comment on that, it would be self serving.

Rule 4 - Recognize that effective participation in the public policy process requires knowledge and skill. There's no necessary relationship between the skills and talents that enabled you to become a university administrator and the skills required in the public policy process. You may have some of these skills, or you may not. We try to help you on that by conducting schools, or seminars on public policy - dealing with the institutions and its processes. Congressional staff, and officials in the executive branch welcome the opportunity to work with you because they want more effective information from you.

Governmental relations is a job done by our university administration. The staff is there to teach, to coach, and to help coordinate.

Rule 5 - Develop agreement on the federal authorities and the federal funds that you need to carry out your public responsibility. To be effective you've got to decide how many bucks you want, for what purpose, in what priority, and what you think impacts will be. This is a difficult task that will require time, patience and a lot of judgment. The shape and form of your program is going to change. Therefore you will have to return to the government time and again to shape and mold you basic legislation.

Rule 6 - Be constantly alert to offer your scientific and technical expertise to assist both the Congress and the executive in their public decisions. This is not something you do on behalf of your institution, you do it because you have skills, knowledge, insights, and opinions about a particular issue. You should make those views known. I'll give you a recent example. Three subcommittees in the House went on a "fishing expedition." That is, there was no legislative or budgetary decision before them. But they wanted to know more about the relationship between agricultural production and environmental pollution. There were many questions bothering members of the staff and the subcommittees. They have decided to have a set of hearings. In order to assist them, we obtained a list of questions. Then we selected individual scientists from all over the country representing about eight universities. A paper was requested on each of the key questions. Then the papers were put together and delivered in a hearing before the committee. We believe that such an effort builds friends and credibility for our scientists, our universities and our association.

Rule 7 - Take the responsibility to help educate individual political office holders, concentrating on your own state Congressional delegation, in what is known about the problems today and the possibilities for the public university to make contributions to the solution of those problems. One of the best places to do this is on your campus, when the office holders are available and interested, and you can set up an educational opportunity. Education is the fundamental business of our universities and elected office holders should be key targets.

Rule 8 - Work with other interest groups in coalitions to encourage appropriate national decisions. You will need the help of the interest groups that are concerned with marine matters. Particularly, those who have economic power. They should understand you, they should understand what you want, why you need it and how it will benefit them. Often they will be the most effective spokesman to the Congress on your behalf.

Rule 9 - Maintain an early warning system to prevent government incursion into university affairs that may unduly handicap or interfere with our purposes and organize the political forces to oppose such incursions with the utmost vigor. Unfortunately the land-grant community spends a lot of its time doing exactly that. In many agencies and on the hill the nature of the university is not well understood.

Rules 10 and 11 have to do with federal agencies. There are two sides to this coin. We keep hearing about the land-grant experience

and what a great system that has been. But it never could have happened without the United States Department of Agriculture.

Rule 10 - Remember that a set of universities can't effectively pursue their mission without a federal partner. A focal point for leadership in the Executive branch is needed. Since the federal agency needs an in-house research capability it is necessary to sit down as peers and partners and articulate the role of each party. The university has a comparative advantage in the way it does research. So does the federal agency. The federal agency in-house laboratory has some opportunities and a way around barriers, that the university does not. There is also a third partner - the private sector corporate world of research. In the ideal world, we would find some means of sitting down together and reaching agreement on who is going to do what pieces of research, so as to insure maximum effectiveness in this mixed society.

Rule 11 - Never surrender to a federal agency the responsibility given to you as administrators of public universities to take directly to public officials your concerns and your proposals for the solution of national problems. Do not be seduced into going along with a direction that the department wanted if it is not going to be in your own best interest as universities.

If you will consider these rules, I think you will agree that the Sea Grant Associaiont, to which you belong, has come a good ways down the track. I believe that the bridge has been built, the experiments have been tried, and I believe that we are now ready for traffic. Thank you for your attention.

THE SEA GRANT ETHIC*

by

N. A. Ostenso

The ideal situation, as far as building communication bridges is concerned, is to create a bridge that becomes an ingrained and natural part of its setting; in other words -- almost organic. Sea Grant has been successful in its endeavors to build such a bridge -- a multidisciplinary bridge that stretches across such gaps as research to application, law to aquaculture, and social science to hard science.

Until a few years ago, Sea Grant had been sole tender of the bridge, controlling both access and flow of traffic, but a number of things has changed that picture over the past few years. Some of those changes have been more successful than others.

At one time, Sea Grant projects and programs were viewed primarily as a cementing of relationships between the National Sea Grant Office and the participating institution. As time passed, however, access to the bridge became more controlled, with such legislative actions as the Oceans Policy Act, the Climate Act, and the Aquaculture Bill having both explicit and implicit effects on Sea Grant colleges.

Because of these interesting constraints, Sea Grant had to face up, in a very formal way, to what legally constitutes a Sea Grant College. Coming up with such a definition took two years of work, but the one finally promulgated was relatively simple and straightforward, and identified who should have access to the bridge.

Today we face the more difficult problem of controlling the flow of traffic over the bridge. The major issues are philosophical and there are no correct answers.

The Sea Grant ethic has two important essentials -- both implying vital bridges. The first and most fundamental is the sense of partnership between the National Office and the institution. The traditional government way of doing business is an agency-to-individual approach; the government dealing directly with the investigator. By contrast, Sea Grant is an agency with institutional relationships, and this doesn't happen very often.

We have a partnership with academia. We look to the institution to set its own management structure, identify its own problems, develop its own protocol, marshal its own human resources. This is the critical element of Sea Grant.

A second essential element of the Sea Grant ethic is the tripartite approach -- the close intercoupling of education, research, and advisory services.

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*Summary. Original paper not available.

The year 1976 was a frenetic period, when the idea of marine advisory services as part of the Sea Grant program was seriously questioned by those who believed it would be more effective as a separate program. However, the whole drill was a useful reaffirmation ...that this was the right way.

Put another way, the Sea Grant ethic is a whole mix of disciplined talents to solve a problem. While other government programs have tended to organize around a very narrow perception of problems, Sea Grant tries to solve the problem and not simply develop a perception of it.

With relation to the Sea Grant ethic as a bridge to the institution, look at increased traffic and ask yourselves the following question: To what extent are we going to try to channel it through precisely that lane of the bridge that preserves for the institution institutional autonomy or wholeness? That preserves for the institution the opportunity to manage its own resources around its own problems?

There are no pat answers, and solutions will vary from state to state. But, we would feel very bad if we shut our doors... and severely limited flow.

Institutional strength and state-level support for the Sea Grant program makes the future ours. But we've got to think about it and define our future. This must be done on an individual basis. There will be no right answer for everyone.

WORKSHOP SESSIONS

This group exercise addressed the following categories and associated questions. Although no formal reports were expected from the five randomly separated groups, the workshops were designed to encourage individual participation and involvement in the general theme "Building Bridges."

I. STATE OF REPAIR -- Effectiveness of Marine Science Bridges

Marine programs, universities, and laboratories interact with business, regulatory, and public interest in the marine and coastal environment. Information on problems and solutions to enhance knowledge and profits or to make sound decisions flows between them. This flow may originate anywhere from the organization-wide level all the way down to the level of individuals on the water front.

A. What communication bridges are open to the marine community?

B. How effective are the bridges and how do they work?

C. Are there critical gaps in the communication processes of marine programs and how can they be bridged?

D. Who is responsible for initiating different kinds of communication?

E. Do headquarters of the bridge-building organizations adequately anticipate and support communication needs?

II. SHORING UP - Improvement of Marine Bridges

As the 4-H program says, aim to "make the best better." Taking into account the current level of effectiveness of the various marine bridges identified and evaluated previously, how can they be either repaired modernized, or expanded? For example, are there emerging or overlooked interests on the coast or at sea that universities or other public service organizations need to address? Is bigger better, or what is optimum size?

A. Who is responsible for initiating actions to make improvements?

B. What new bridging procedures would work best at the organizational versus the individual levels?

C. What channels are open to newcomers to existing bridges, and how can they most efficiently get involved?

D. Does regional cooperation or conduct of joint programs make for more effective bridges?

E. How can we more effectively and realistically counsel students as to the role of overall marine community in building bridges, and the career opportunities available?

III. ONE ALTERNATE ROUTE -- The Sea Grant Association

The Sea Grant Association has weathered 12 years of bridging the gaps between universities and allied marine programs, and a myriad of "user groups" and funding or other governmental entities. How does SGA figure in the bridge-building of its member organizations?

A. How effective are present SGA communication bridges?

B. What does SGA do for its members, both (1) those receiving federal Sea Grant funding, and (2) those who don't?

C. Is "Sea Grant Association" the proper name for an organization that aspires to the sorts of bridges discussed here?

SPECIAL ADDRESS

A BRIDGE TO NEW HORIZONS

Congressman Don Fuqua

Democrat, Florida (2nd District), Altha, Florida
Chairman, Committee on Science and Technology;
Member, House Government Operations Committee

A BRIDGE TO NEW HORIZONS

Don Fuqua

I am very pleased to be here this evening as I am particularly interested in the Sea Grant Program as a representative from the State of Florida and as Chairman of the Science and Technology Committee. The theme of this annual meeting is "Building Bridges", bridges of knowledge and communication about the oceans in particular. However, on a more fundamental level, the sea itself has been a bridge throughout the history of mankind. It has provided a food chain of marine animals and plants for coastal populations; it has been the major avenue for exploration of the globe; it has served as a connection between nations and cultures - a pathway over which spices, treasures and ideas have travelled and it has been an unravelling thread through man's creativity and imagination into great works of art and literature.

Despite these contributions and influences historically, we have ignored so much of the potential of our oceans through both lack of information and limited communication of the data that does exist. To use a pun, we have just floated on the surface.

The Sea Grant Association has, in the last 10 years, pioneered to change all this. You are building a bridge of recognition to make us all aware that we are literally surrounded by a treasure trove of nutrition, energy, minerals, water supply and much more. You are building a body of marine research to show us how to best develop and utilize our oceans as well as how to preserve them.

That research cannot merely stand as an increasing body of knowledge but must be made known to all researchers and to all potential users. A bridge connotes two-way traffic and in your case the bridge will serve to stimulate new ideas for marine research application in solving diverse national problems and producing new products and industries, as well as convey to all users of the oceans and their natural products the most efficient and environmentally sagacious manner to use coastal waters.

One of the most significant characteristics of Sea Grant is that it accommodates all types of oceanographic problems and possibilities. Sea Grant institutions span our entire coastline, thus we are not just learning about the coastal waters of California or Massachusetts but the waters that trace every mile of America's vast coastline. Sea Grant institutions form a network so that funding and projects can cover the broadest spectrum. This structure is particularly adaptable to the application of Sea Grant funds in areas as diverse as marine mining and marine biomedicinals.

The Sea Grant Program has established a structurally sound bridge between government and the universities for cooperation, but there is another important bridge of relationship whose structure seems to be little more than a design concept at this stage and awaits actual construction. That bridge is the one between the local Sea Grant institutions and industry. Let me be more specific. The Sea Grant Act mandates that for every $2 the federal government puts up, at least one-dollar must be provided from outside the federal sector. This matching

money has for the most part come from state and local governments. The potential for industry to provide these matching funds has not been adequately explored. Greater industrial participation would promote not only increased diversity but it would seem to me to encourage the development of projects and information with very specific and immediate application. Industry can provide a great deal of expertise and technical know-how that is specifically oriented to their particular marketplace. Interaction between specialists in industry and researchers at our Sea Grant universities can lead to the application of a single concept or specific technological process in many unrelated fields.

American industry has a broad and growing interest in our ocean resources for energy development, food production, mineral extraction, recreational activity and the possibilities of constructing offshore facilities to lessen the impact on land.

I want to take a moment to elaborate on some of these. In the area of food production, aquaculture is extremely promising as a method for providing new sources of high-protein foods. In addition, aquaculture offers expanding opportunities for jobs and venture capital investment. America has long been the world's leader in agriculture, however, our marine farming development in plants as well as animals is still in a formative stage. With Sea Grant's support we can eventually bring aqua-culture to advanced development and the level of excellence that we have come to expect in U.S. agriculture. For example, the United States presently supplies only about one-half of the seafood consumed by Americans. It is estimated that the import bill to make up the difference is some $2 billion a year. A working goal might be to reverse this import position to an eventual export status.

Regarding our mined resources, we know that varied and abundant supplies of minerals have been a significant factor in America's industrial growth and a continuing domestic supply of these resources will help assure the health of our industrial base. This supply has become increasingly important because many third world nations are recognizing the political pressure of withdrawing a particularly scarce mineral from the world market, thus rendering vulnerable any nation with limited domestic supplies.

The sea offers an attractive alternative as our landside reserves of important minerals continue to be drawn down and both environmental and political constraints limit access to those that do remain.

Just as mineral deposits vary with geographical location on land, so do they also at sea. Thus a major strength of Sea Grant in supporting marine minerals research is the broad geographical spread of Sea Grant institutions. Likewise, different institutions have special skills and strengths in dealing with specific minerals. The breadth of the Sea Grant Program allows us to take advantage of all this expertise.

In the area of energy, the oceans show great promise. Although one's first thought might be in the realm of Outer Continental Shelf oil and natural gas, there is considerable and growing interest in the concept of Ocean Thermal Energy Conversion, or OTEC as it is often called.

The OTEC concept, which utilizes the temperature difference between

warm surface waters and cold water from the depths to operate a heat cycle and to generate electricity, could be employed in one of two approaches. OTEC platforms could either be moored nearshore to supply electricity to shore via submarine transmission cable, or platforms could float in search of the warmest surface waters and generate energy for on-board use to produce certain energy intensive products.

In one of the last conversations that I had with Werner Von Braun, he talked about the OTEC concept as one of consequence and promise. A great deal of exploratory work has been done since then in America as well as in France and Japan. The problems associated with an OTEC facility's impact on the ocean environment have been of concern since the beginning and seem soluble. In fact, at a recent series of workshops on OTEC, the group of marine environmentalists addressing the issues of ocean perturbation by the facility concluded that the difficulties presented by build-up of microbiological slime, in particular, were manageable if they were considered and planned for in the beginning of the design stage. However, I realize there are still many other technical and economic uncertainties to be addressed.

In view of all this, I am preparing legislation to be introduced that would expand substantially the present Department of Energy program for OTEC by setting specific goals for technology demonstration and electrical capacity. The Ocean Thermal Energy Conversion Research, Development and Demonstration Act sets a national goal of 10,000 megawatts of electrical capacity from OTEC systems by 1999, with average cost at a competitive level for the energy produced.

It seems to me that we are just beginning to understand and explore the potential of the oceans. The more we learn, the greater and more diverse the possibilities appear.

Nevertheless, in terms of broad based knowledge, practical applications and opportunities available, there is a great deal of work to be done. That work is very much one of building the bridges over which ideas and information can travel. Industry and commercial enterprises need better ways to make and market products and provide services, as well as to understand the short and long-term impact of their work. Researchers need to be aware of specific problems that confront industry and business in order to direct their research towards finding solutions.

Your Marine Advisory Services (MAS) are an excellent mechanism for this communication between the users and producers of knowledge. However, I think the key is not to just build the bridge but to insure that it becomes a well-worn passageway between two points.

And of all the many bridges to build, I consider the one to American youth as all important because it is to these people that we shall pass the rich legacy of our coastal waters. It is to them that we offer the realm of the oceans for new careers and horizons. It is to young Americans that we pass the responsibility to promote and protect this legacy for future generations.

I wish you success in your endeavors for they will bring the bounty of the sea into all our lives.

SEA GRANT ASSOCIATION AWARDS

1979 SEA GRANT ASSOCIATION AWARD

Recipient: Dr. Lewis A. Alexander
Chairman, Department of Geography and
Marine Affairs and Director of the
Master of Marine Affairs Program,
University of Rhode Island.

STUDENT AWARDS

Committee
Chairman: William S. Gaither
Dean, College of Marine Studies
University of Delaware

1979 SEA GRANT ASSOCIATION AWARD

Dr. Lewis M. Alexander's accomplishments for which he is honored exemplify the academic leadership which is so vital to the realization of the Sea Grant philosophy and achievement of Sea Grant objectives of wise use, conservation, and development of the nation's coastal and marine resources.

The Master of Marine Affairs Program at the University of Rhode Island, which Dr. Alexander still heads, was the first such program in the United States and typifies Sea Grant's mandate in manpower training. This is a middle-management program with nearly 200 graduates now at work in business, academe, and government where they fill various roles in policy formation and execution. The Law of the Sea Institute which Dr. Alexander established in 1965 and which he directed during its formative years until 1973, became internationally known and respected as a neutral forum where ideas and issues could be discussed in depth. Interest in the Law of the Sea began to grow in the late sixties culminating in the UN Law of the Sea Conference in 1974. Most of the concepts now enshrined in the present negotiating text were first tried at one or another Law of the Sea Institute conference.

Dr. Alexander, who holds an A.B. degree from Middlebury College and a M.A. and Ph.D. from Clark University, is also active as a consultant to the National Sea Grant Program, and as a member of the U.S. Delegation to the Third Law of the Sea Conference, the Advisory Committee on the Law of the Sea, the State Department Ocean Affairs Advisory Committee, and the Law of the Sea Executive Board.

ACCEPTANCE OF THE AWARD

Dr. Lewis M. Alexander

In accepting this award, I should like first to acknowledge the input I have received over the past decade from both faculty and students at the University of Rhode Island, who have helped me to modify and enlarge my own frame of reference of the subject matter of marine affairs. In a related context, I also want to pay tribute to several of the giants of American marine science who, in the mid-1960's lent their support to the founding and early activities of the Law of the Sea Institute. Such men included Wib Chapman, Benny Schaefer, Bill Terry, Ed Allen, Bill Herrington, and Don McKernan. Not only did they make possible the Institute's ultimate success, but through contact with them I, myself, learned a great deal about the basic aspects of ocean policy and of ocean politics.

Tonight I would like to make a few brief remarks on marine affairs as an educational concept. The Sea Grant community is replete with experts in coastal zone management, commercial fisheries, offshore technology, marine recreation, and the law of the sea. But these experts are in large measure practitioners, not educators. Even if they teach, it generally is in some specific discipline. Marine affairs, by contrast, is an interdisciplinary subject which borrows from a wide variety of disciplines, including political science, international law, economics, sociology, geography, oceanography, and ocean engineering. Its focus, so far as I am concerned, is on marine policy formulation and implementation at various geographical levels - local, regional, national, and international.

The University of Rhode Island's graduate Marine Affairs Program was inaugurated at the end of the 1960's by John Knauss and myself. We both had been associated with the Stratton Commission, and had been impressed with the comprehensive approach to the marine sciences adopted by the Commission. We saw in this approach a chance to bring together the various marine-related disciplines in a new educational format. In Our Nation and the Sea, The Commission recommended that the National Sea Grant Program "aid selected universities in organizing graduate-level education in the application of social sciences to marine affairs," and over the past ten years Sea Grant has been generous in its support of our Program.

The field of marine affairs has existed as a discrete unit for only a little more than a decade. It has grown quickly; new programs have been inaugurated and existing ones have expanded their curricula and the size of their student bodies. Indications are that these expansions will accelerate over the next few years. For these reasons it would seem opportune at this time to review the directions in which marine affairs is moving, and to identify some of its needs and opportunities in the decade of the 1980's.

I do not propose to attempt such a review this evening, although I would suggest that Sea Grant might consider convening one or more workshops within the next few years at which the future of marine affairs could be assessed. But at this time I should note what I feel to be an important problem, namely, the need for greater "quality control" in marine affairs educational efforts.

What I refer to as "quality control" has several facets. One is that marine affairs curricula be well designed and that they conform with tested and proven methodologies and concepts. Another facet is that teachers in marine affairs be well trained, and be conscious of basic objectives of the field. It is relatively easy for a person with imagination and a smattering of knowledge of the social sciences to put together a course in "oceans policy" or "maritime issues" which is virtually devoid of substance or conceptual meaning. Students of marine affairs should be acquainted with the growing body of literature in the field and in allied disciplines. Some thought should be given to the establishment of accreditation procedures to be applied both to existing programs and to prospective ones. Only through such means can a viable subject area be developed.

What are some of the opportunities for marine affairs? It can expand into undergraduate curricula, formed perhaps around the general nexus of "marine environmental management." There also might be developed a series of mini-courses in marine affairs, to be offered with or without credit to non-matriculated students. Again I emphasize here the need for quality control. Sea Grant might underwrite the preparation of some sort of textual materials to be used in such courses.

At the other end of the educational spectrum, increased emphasis could be placed on Ph.D. programs in marine affairs, with focus on specific topical areas. One such area might be concerned with international ocean management issues in the era to come after the Third Law of the Sea Conference. How will countries then organize themselves with respect to the new ocean regime? What roles will regional or subregional organizations play in the management process? What policies and practices will developing countries adopt with respect to coastal area planning and management programs?

These topics have implications for curricula at the Masters level, as well as for the Ph.D. In this connection I feel it important that Sea Grant recognize the opportunities for educating foreign students at U.S. universities, as well as students from the United States. There is here the potential for an important "outreach" program, associated with marine affairs. Viable marine management programs overseas, resulting in part from the effective training of foreign administrators in U.S. universities, would represent a wide utilization of resources, created through Sea Grant funding.

The United States has come a long way in the years since the late 1960's in defining and assessing our national needs and interests with respect to the sea, and in identifying policy issues effectively addressing these needs and interests. A generalized body of knowledge is gradually evolving concerning such issues and Sea Grant has been wise to maintain continuing support for educational efforts in marine affairs. At all costs, care must be taken now to guard against mediocrity and the proliferation of second-rate projects, so that attention may be focussed on further refining, and on finding new uses for, quality education within the marine affairs framework.

SEA GRANT ASSOCIATION STUDENT AWARDS PRESENTATION

William S. Gaither

It has been a real privilege to chair the Student Awards Committee and to work with Dr. Jack Davidson of the University of Hawaii and Dr. Niles Kevern of Michigan State University. The excitement of this committee's work comes from seeing the scope and quality of student research conducted through the Sea Grant Program.

Let me tell you briefly how our committee operated. The first step, of course, was to agree upon procedures with Dr. Bruce Wilkins, President of the Association. This included interpretation of our guidelines and methods to insure confidentiality of authors and impartiality in the judging process. Next, in the Spring of 1979, all Sea Grant Association delegates were invited to encourage their institution's students to submit abstracts of their research. This call resulted in the submission of 24 abstracts at the master's level and 20 abstracts at the doctoral level. Abstracts were sent directly to the Association President's office at Cornell so that author and institution names could be removed and an identifying number be assigned.

Next, a full set of abstracts was sent to each committee member for review and preliminary ranking according to the following criteria:

1. Quality of research counted 50%.

2. Ability to show how the work is important to man's use of the Seas or Great Lakes counted 30%.

3. Clarity of presentation counted 20%.

The committee then met for two days at the University of Delaware's Marine Studies Complex at Lewes to compare preliminary selections. I was pleased to find that we were in surprisingly close agreement. Our informal, though not rigid, guideline was that we would select approximately 10% of abstracts submitted for awards.

As you might imagine, knowing the broad range of research carried out through Sea Grant Programs, a number of abstracts described research which was outside the direct expertise of any of the three of us on the committee. Here we turned to faculty in residence at Lewes to supply overnight, supplementary review and assessment of the quality of the research.

On the second day, with supplementary reviews in hand, our committee met again and reached its final decisions. Winning paper numbers and abstract titles were then returned to association President Bruce Wilkins who in turn notified the five winners who we will honor here tornight.

In addition to the recognition and honor which accompanies these awards, the National Ocean Industries Association has again provided $100 prizes for each student winner. We in the Sea Grant Association are particularly pleased that an organization of corporations whose livelihood comes from ocean enterprises recognizes and values research done through the National Sea Grant Program.

Now to the awards. In the masters degree research category the committee originally planned to give only two awards which would have represented 8 1/3% of the abstracts submitted. We agreed, however, that three abstracts were of sufficiently high and equal quality that to omit any one would have been inequitable. Accordingly, the Awards Committee recommended to President Wilkins that three awards be given in this category. He agreed, as did the National Ocean Industries Association. In alphabetical order, our masters research award winners were:

1. Mr. DAVID ERDAHL of the Department of Animal Physiology in the School of Veterinary Medicine at the University of Minnesota in St. Paul. His research is titled: "Preservation of Gametes of Freshwater Fish". His faculty advisor is Dr. E.F. Graham. The award will be received tonight by Mr. Erdahl.

2. Mr. DOUGLAS R. GREGORY JR. of the School of Forest Resources and Conservation at the University of Florida for his research titled: "Reproductive Dynamics of the Spiny Lobster, Panulirus argus (LATREILLE), in South Florida". His faculty advisory is Dr. Ronald Labisky. The award will be received tonight by Mr. Gregory.

3. Mr. DOUGLAS C. HICKS of the ocean engineering group in the College of Marine Studies at the University of Delaware for his research titled: "Physical and Numerical Modeling of a Seawave Powered Desalination Unit". Doug's faculty advisor is Dr. C. Michael Pleass. The award will be received tonight by Dr. Carolyn Thoroughgood, Executive Director of the Delaware Sea Grant Program.

Next I want to turn to the doctoral research awards, again in alphabetical order:

1. Mr. TIM AHERN of the Physical Sciences Division of the College of Forest Resources of the University of Washington for his research titled: "Bromoperoxidases from Marine Organisms". His faculty advisor is Dr. G. Graham Allan. The award will be received tonight by Mr. Ahern.

2. Mr. G. DANIEL TEMPLETON, III, of the Department of Chemistry/Inorganic Chemistry/Earth Sciences of the University of New Hampshire for his research titled "Trace Metal-Organic Matter Interactions in Anoxic Marine Sediments During Early Diagenesis". His faculty advisor is Professor N. Dennis Chasteen. Tonight the award will be received by Mr. Templeton.

I want to congratulate each of the winners we have honored here tonight as well as their advisors and their institutions. While these awards reflect academic accomplishment they contribute to the total state of honor, respect, and stature of each individual recipient and to the stature of the National Sea Grant Program. Each person who has been honored becomes the standard, a leader by peer acclaim, and thus both consciously and unconsciously exerts influence over others.

DISPLAYS

An inovative feature of the 1979 meeting was a series of educational displays sponsored by 32 Sea Grant Association member institutions and other groups with allied interests. Groups sponsoring displays were:

Alaska Sea Grant
Delaware Sea Grant
Dauphin Island Sea Lab Alabama
Environmental Data Information Services
Environmental Protection Agency
Florida Department of Natural Resources
Florida Department of Environmental Regulation
Florida 4-H Marine Program
Florida Institute of Technology
Florida Harbor Branch Foundation
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