# **Coastal Business Initiatives:** A National Sea Grant Agenda for the '90s





OREGON STATE UNIVERSITY EXTENSION SERVICE

## **COASTAL BUSINESS INITIATIVES**

A National Sea Grant Agenda for the '90s

A Report From The: Coastal Business Initiatives Workshop Chevy Chase, MD, February 28-March 1, 1990

Prepared by the Editorial Committee:

William Cochrane
Margaret Davidson
Bruce DeYoung
Merrill Leffler
Douglas Lipton
Robert Malouf
Fritz Schuler
Robert Shephard
Frederick J. Smith, Chair

## **Coastal Business Initiatives**

# A National Sea Grant Agenda for the '90s

## **Contents**

F	Page
Introduction	1
The Coastal Economy	1
Coastal Businesses: Coping and Adjusting	1
The Sea Grant Program	2
Sea Grant and Coastal Business: A Program for the 90s	2
Sea Grant Program Policy	3
Sea Grant Administration	3
Coastal Business Research and Outreach	6
Expanding Sea Grant Commitment to Coastal Business	9
Appendices	10
Coastal Business Initiatives Workshop Agenda	10
Coastal Business Initiatives Workshop Attendees	11
Sea Grant Coastal Business Initiatives Advisory Committee	13

## **Executive Summary**

Following are fourteen recommendations for implementing a National Sea Grant coastal business program:

## **Sea Grant Program Policy**

- The National Sea Grant College Program should give high priority to research and outreach efforts addressing coastal business issues.
- Individual Sea Grant institutions should evaluate current funds allocation to determine the net benefit from greater research and extension efforts addressing coastal business issues.

#### **Sea Grant Administration**

- Identify coastal business initiatives as a high priority and encourage greater coastal business emphasis at institutional Sea Grant programs.
- o Include more representation from the coastal business community, and from economics, business, and other social science faculty on advisory, review, policy, and executive committees at all levels.
- Communicate Sea Grant's high coastal business research and extension priority to departments and schools of economics, business, and other social sciences.
- Encourage multi-institutional and multi-state research and outreach projects related to coastal businesses.
- Establish a position of coastal business initiatives specialist in the National Sea Grant office.
- Expand the Sea Grant Fellows Program and place qualifying fellows with a coastal businesses or coastal business organizations for up to one year.
- Provide leadership in professionally guiding, retooling, and reprogramming research and extension professionals to meet emerging coastal business needs.

#### **Coastal Business Research and Outreach**

- Expand research and outreach related to coastal community changes, implications for resource use and management, and implications for coastal businesses.
- Expand research and outreach related to the impacts and process of coastal resource management and its' role in coastal business development.
- Support outreach programs that facilitate constructive dialogue among conflicting coastal resource users, resource managers, businesses, and community leaders.
- Provide training, instruction, and professional improvement opportunities for coastal business leaders and public agency staff.
- Broaden the scope of existing marine related curriculum at Sea Grant institutions.

#### Introduction

The purpose of this report is to encourage and guide the development of a new National Sea Grant College Program Initiative for Coastal Businesses. It is the result of a two year National Sea Grant Coastal Business Initiatives committee effort and a February 1990 national workshop where fifty-two Sea Grant people and coastal business entrepreneurs discussed coastal business issues.

This report is intended to accomplish the following:

- 1. provide rationale for allocating more Sea Grant resources towards coastal business needs;
- 2. identify specific opportunities for Sea Grant involvement in meeting coastal business needs;
- 3. determine constraints to increased coastal business and Sea Grant cooperation in research, education, and outreach; and
- 4. suggest means to overcome those constraints.

## The Coastal Economy

The coastal economy accounts for a significant portion of economic activity in the United States. Pontecorvo (1989) estimated that the "ocean economy" contributes approximately \$93 billion annually to the gross national product. Regional studies suggest that local impacts are even greater.

Over the next two decades, the size of the United State's coastal population is expected to increase dramatically. Indications are that over 60% of all population growth since 1980 is taking place in coastal counties (Culliton et al., 1989). By 2010 this may result in more than 151 million additional people moving to coastal counties—with our nation's coastal population climbing by approximately 27% during the period (Edwards, 1989). Thus, coastal economic activity will grow significantly with increases in manufacturing, construction, and especially services.

The shift to a service based economy in coastal areas parallels the shift that has taken place in the rest of the United States. This shift will be accelerated in areas with the most rapid population growth and in areas attracting retirees and visitors. Pontecorvo's (1989) data suggest that already 80% of this part of our economy is based on service organizations.

## **Coastal Businesses: Coping and Adjusting**

Changes in coastal populations and economic base have major implications for coastal businesses. These changes will vary, depending upon geographic location and traditional economic base. Also, coastal businesses vary widely in their individual characteristics.

Some coastal businesses such as marinas and seafood producers may be directly dependent upon coastal and ocean resources; others such as hotels and restaurants may benefit indirectly from coastal and ocean resources; and others such as fishing gear manufacturers, boat builders, and surfing instructors may provide goods and services to the above.

Because property rights assigned to coastal and marine resources generally are less well specified than for other resources, and because the public has special interests in these resources, a variety of complex and ever-changing regulations for their use and management have been created. For example, coastal businesses are now faced with limited beach access, water quality controls, fishing limits, and waterfront construction restrictions. Increasing coastal populations are placing more pressure on finite coastal and marine resources and this means more, not fewer rules.

While some of the nation's largest businesses depend upon coastal and marine resources, most coastal businesses tend to be relatively small, family owned and operated. In spite of the potential business impact, these entrepreneurs are not always able to stay abreast with new rules and changes in old rules. They are not alone. Those charged with implementing these rules also have difficulty staying abreast of the changes, and have few resources to assist those being directly impacted.

Demand for housing by relatively affluent new coastal residents and changes in community social structure has made housing and living conditions more difficult for the traditional coastal manufacturing and service labor pool. Beach and water access is being reduced by non-water dependent uses, by habitat protection, by property ownership changes and by other physical factors. Coastal resource utilization is also increasingly controlled by various public agencies. In some areas increased coastal visitation and tourism has destroyed those very attractions that brought the visitors. Rising demand for coastal resources resulting from recent rapid growth in coastal population has been compounded by aggressive purchase of coastal lands and other resources by non-local, including non-United States residents.

## The Sea Grant Program

Federal, state, and local funds are provided to Sea Grant institutions in twenty-seven

states and Puerto Rico. These funds are used to support research, instruct students, and carry out extension programs related to coastal and marine resources. The federal mandate for Sea Grant urges improved use of the nation's coastal and marine resources.

This has been accomplished since 1968 through wide-ranging marine resource and coastal research, by the extension of research information to private and public organizations that can benefit from these research results, and by the instruction of citizens, private entrepreneurs, public agency employees, and on-campus students.

## Sea Grant and Coastal Business: A National Program for the 90s

The Coastal Business Initiatives Committee and participants at the Coastal Business Initiatives Workshop have identified means and methods for encouraging and guiding development of new National Sea Grant College Program initiatives for Coastal Businesses. These means and methods are presented here in the form of recommendations, and rational for those recommendations. These recommendations are organized as follows: (1) Sea Grant program policy, (2) Sea Grant administration, and (3) coastal business research and outreach.

## **Sea Grant Program Policy**

Institutions and National Sea Grant can encourage and assist in the development of a new National Sea Grant College Program Initiative for Coastal Businesses by implementing two changes in program policy:

- The National Sea Grant College Program (NSGP) should give high priority to research and outreach efforts addressing coastal business issues.
- Individual Sea Grant institutions should evaluate current funds allocation to determine the net benefit from greater research and extension efforts addressing coastal business issues.

#### Rationale

The NSGP was mandated in 1968 to provide research, instruction, and extension programs for improving the use of marine and coastal resources in the United States. Historically, the NSGP focus has been on the development and use of marine resources at the primary level. To the extent that new marine based products have been discovered, that the sea and its' resources are better understood and that marine resources policy has been improved, the competitive position of coastal

businesses has also been improved. While few Sea Grant activities have been directed specifically at coastal businesses, there have been some successful programs for marinas, seafood firms and to a more limited extent, tourist, and recreation businesses. This provides an excellent base for expansion.

Unfortunately, the national office of Sea Grant has not placed a high priority on coastal business issues and most of the institutional Sea Grant programs have respected this prioritization. Therefore, in spite of an excellent base for expanding coastal business programs, this expansion has not taken place.

A high priority for research and extension efforts addressing coastal business issues is justified by rapid changes in (1) the social, political, and economic character of the nation's coastal communities, (2) coastal resources use and management, and (3) the coastal business environment.

#### **Sea Grant Administration**

The national office of Sea Grant and the institutional programs can encourage and assist in the development of new NGSP Initiatives for Coastal Businesses by implementing seven changes in program and project administration:

- Identify coastal business initiatives as a high priority, and encourage greater coastal business emphasis at institutional Sea Grant programs.
- Include more representation from the coastal business community, and from economics, business, and other social science faculty on advisory, review, policy, and executive committees at all levels.
- Communicate Sea Grant's high coastal business research and extension priority to departments and schools of economics, business, and other social sciences.
- Encourage, multi-institutional and multi-state research and outreach projects related to coastal businesses.
- Establish a position of coastal business initiatives specialist in the National Sea Grant office.
- Expand the Sea Grant Fellows Program and place qualifying fellows with a coastal businesses or coastal business organizations for up to one year.
- Provide leadership in professionally guiding, retooling, and reprogramming research and extension professionals to meet emerging coastal business needs.

#### Rationale

Expanding coastal business related Sea Grant activity will take personnel and funding away from other marine constituencies, unless the overall Sea Grant budget is improved. Further, Sea Grant must compete with other funding sources, other academic activities and with non-academic activities for investigators' time and interest.

For many, Sea Grant proposal preparation requires more effort than can be justified by the available funding. Also, the research and publication format desired by Sea Grant often does not support faculty promotion and tenure. Untenured faculty will logically allocate time and energy towards those activities that enhance promotion and tenure.

Historically, the Sea Grant evaluation process has emphasized natural sciences and is dominated by evaluators with natural science interests. Social science disciplines have not been well represented in the institutional or national Sea Grant evaluation process. Without greater social science representation, proposals addressing coastal business needs cannot be appropriately evaluated, and improved.

The researcher who becomes involved in Sea Grant sponsored business or economics research may feel isolated from colleagues who, for example, are working on non-marine economics and business issues. While marine related issues are important to those few Sea Grant funded economics and business investigators, they are peripheral to the wide range of issues being investigated by economics and business colleagues.

Also, there needs to be a critical mass of investigators and money (both in amount and over time) to have continuing and fruitful research and extension programs in any one area, such as coastal business. Given the limited National Sea Grant funding, this may not be possible at a single Sea Grant institution.

The traditions of most business schools may preclude business school faculty participation in Sea Grant projects. For example, business faculty have traditionally focussed on large corporate entities and manufacturing enterprises. Sea Grant, with several notable exceptions, tends to focus on smaller family businesses. Also, coastal businesses are becoming much more service oriented, following the general national trend. Therefore, it is difficult to obtain the interest of business faculty that have already established strong programs with large corporate manufacturing entities.

The general perception of Sea Grant as a "fish" program still prevails among business faculty (and others as well!). This, combined with the absence of business related issues on national or even local Sea Grant priority lists greatly discourages submission of proposals by business or economics faculty.

As recently as ten years ago, a researcher or extension professional could concentrate on one specific subject area or clientele group for their entire working life and always be relevant. As we approach the 21st century, the rate of societal change makes such life long specialization less appropriate. The needs of society require new specializations and the attention of experienced researchers and extension professionals.

This is the case for coastal businesses. Research and extension faculty that have established a reputation in fisheries, marine science, aquaculture, etc, find it hard to change the direction of a long and productive career and address new issues and needs.

The solution to many of these difficulties can be found in specific and general changes in Sea Grant policy and institutional Sea Grant administration. For example, changing the composition of the various Sea Grant related committees will increase the probability of success for coastal business proposals and will enhance economics, business, and other social science faculty participation. This will help overcome historic barriers to participation and encourage top quality proposal submissions. Promotion of Sea Grant opportunities among economics, business and other social science faculty will help them understand the contributions Sea Grant can make to their professional development and advancement. A National Sea Grant office Coastal Business initiatives specialist will help local Sea Grant administrators carry out these various recommendations.

Also, a coastal business and economics multi-institutional/regional approach will overcome the isolation and synergy problems currently inhibiting individual researchers and extension professionals. Logically, one institution would take the lead, but such funding should allow for increased communication costs of having principal investigators at widely dispersed locations working on the same project. Multi-institutional and multi-state activities should include workshops, seminars and other professional improvement and research development activities. Joint funding of researchers and extension faculty should also be considered.

Finally, assistance and guidance in Sea Grant faculty professional improvement will help maintain relevance to emerging coastal business needs.

More Sea Grant resources will be allocated to coastal business research and extension when more high quality proposals: (1) are submitted to Sea Grant directors, (2) are reviewed by qualified social scientists, and (3) receive high priority among the various panels, advisory committees, and national office staff. High quality proposals will be submitted when the best research and extension professionals in each Sea Grant institution prepare and submit those proposals, or at least assist those with less experience. The best research and extension professionals will become more interested when Sea Grant's image is improved, a critical mass of funding is promised,

and social science peer evaluation is assured.

When these improvements are implemented there will be an opportunity to obtain the attention of top quality economics and business faculty by meeting with school and college administrators and advertising in professional journals.

#### **Coastal Business Research and Outreach**

Institutions and the NSGP can encourage and assist in the development of new Program Initiatives for Coastal Businesses by implementing six opportunities for research and outreach:

- Expand research and outreach related to coastal community changes, implications for resource use and management, and implications for coastal businesses.
- Expand research and outreach related to the impacts and process of coastal resource management and its role in coastal business development.
- Support outreach programs that facilitate constructive dialogue among conflicting coastal resource users, resource managers, coastal businesses, and community leaders.
- Provide training, instruction, and professional improvement opportunities for coastal business leaders and public agency staff.
- Broaden the scope of existing marine related curriculum at Sea Grant institutions.

#### Rationale

With the constant and rapid change in coastal populations, demands on coastal resources, regulatory requirements, and character of coastal business much new information is needed. An improved understanding of the direction and magnitude of these changes will assist community leaders, planners and entrepreneurs. Also, a better understanding of the social, political, and economic relationships inherent in the coastal community will lead to more rational private decisions as well as public policies.

For example, little is known about the relationship between marine resource quality and coastal business success or failure, between coastal businesses and the rapidly changing coastal populations, between coastal businesses and the rapidly shifting demand and supply functions for coastal space and resources. More specifically, what are the implications of existing and anticipated coastal resource management

policies, especially as they might impact coastal business? This suggests research on decision implementation impacts <u>and</u> public decision making process impacts (uncertainty). Will new policies generate major changes in coastal business composition and in basic community characteristics?

There is also a need to predict coastal business activity impacts on coastal resources. For example, new fishery or seafood product development could greatly increase seafood processing plant effluent and impact estuary water quality. This is likely to lead to new regulations on those same seafood processing plants. Conversion of coastal residences into high density tourist facilities may threaten fragile dune grasses and result in restricted dune access. Port facility development in a congested waterway may result in water polluting vessel collisions and tighter waterway traffic control.

There is high regulatory agency (e.g., local planners, environmental commissions, safety administration) personnel turnover and responsibilities often outstrip regulatory implementation capabilities. While this is often due to inadequate funding relative to responsibilities, there is also inadequate factual data and personnel skills.

The international market is no longer the private domain of large business. Foreign visitors are arriving in the smallest of coastal communities seeking services and experiences unique to those communities, and challenging the traditional ways of doing business there. Small, highly specialized coastal manufacturers are finding foreign markets more accessible to their products. Increasing internationalization of the United States economy, eastern European democratization, western European union, southeast Asian growth and Latin American democratization all have significant implications for coastal businesses and communities. This presents many new research and extension opportunities.

Economically stable growth is still a high priority for coastal communities. Many have active business promotion, economic development and export expansion programs. However, these programs are often based on assumptions about the economic structure of the community and the international as well as the national economic situation.

Sea Grant can expand research on coastal community economic structure; changes in populations and implications for resource management; changes in coastal populations and implications for coastal businesses; and the relationship between national/international events and the local community. There is also an opportunity to assist in the development of basic economic data for local decision makers. Much of the needed data exists and is current, but guidance is needed in making this data available in an appropriate form, especially to community leaders.

Sea Grant can also help upgrade available coastal business data and information.

This includes data on coastal resources, numbers and types of coastal businesses, coastal demography, and demand characteristics.

Sea Grant's educational, non-adversarial position gives it the integrity to serve as "facilitator" on contentious coastal issues which impact the business community. Business leaders can be brought together with selected community leaders such as elected officials, public administrators and local planners. Sea Grant scientists, and scholars can participate and bring current factual information to the proceedings.

Sea Grant has an opportunity to help improve individual regulatory agency personnel performance and the performance of other individuals or groups involved in coastal business issues. Sea Grant can apply both traditional and non-traditional approaches.

Sea Grant can strengthen existing university and college coastal business related curriculums. For example, Sea Grant could provide seed money for development of a multi-disciplinary coastal issues curriculum and help develop training programs (workshops, courses, etc.) for non-degree seeking public agency personnel. With assistance from Sea Grant, environmental regulators and resource managers can better understand the relationship between their policy decisions and impacts on coastal businesses and resources.

With new research on international relationships and the international economy, Sea Grant can help coastal businesses better understand international market opportunities and the relationship between their coastal community and the national and international economic situation. This can contribute to the stable economic growth of coastal communities as well as decreasing some of the cultural conflicts now impacting coastal communities.

Sea Grant can take greater advantage of existing coastal business oriented organizations (for example, Chambers of Commerce, Kiwanis, SCORE, trade groups, marketing groups, and regional economic development corporations) to reach more coastal businesses with fewer Sea Grant personnel. Equally important is strengthening the useful work of these organizations.

Sea Grant can take advantage of new communications and educational technology as well, technology that many coastal businesses already utilize. This includes computer networking, video disk technology and dedicated television satellite channels.

## **Expanding Sea Grant Commitment to Coastal Business**

These recommendations provide a foundation for a formal National Initiative on Coastal Business and for development of an action plan. Such an action plan should

be put together by the Sea Grant Directors in conjunction with the National Sea Grant office and should include a time table and additional funding requirements.

Many of the recommendations do not require additional funding and can be implemented immediately by the national office of Sea Grant and by institutional Sea Grant administrators. Coastal business leader participation is especially important.

Once the coastal business leaders become involved, activities must be undertaken and accomplishments realized quickly. Failing this, the coastal business community will lose interest. In addition to their advice, coastal business leaders can directly help increase total resources available to Sea Grant, at the local and state as well as national level.

## **Appendices**

## **Coastal Business Initiatives Workshop Agenda**

Chevy Chase, MD, February 28-March 1, 1990

## Wednesday, February 28

8:00 A.M. Welcome

8:15 A.M. Coastal Businesses in the U.S. Economy

The Need for Research and Extension in the Coastal Business Arena

The Economic Significance of Coastal Enterprises

The Community Economic Impact of Coastal Businesses

Economic Significance from the Industry Perspective

10:15 A.M. The Economic, Regulatory, and Political Environment

The Economic Environment for Coastal Enterprises

Survival-the View from Inside

The Regulatory Environment

The Political Environment

1:15 P.M. Coastal Business Initiatives Committee

Expanding Sea Grant's Coastal Business Initiatives: Forging an

Agenda for the 90s

2:30 P.M. Small Working Groups for White Paper Development

#### Thursday, March 1

8:00 A.M. Small Working Groups for White Paper Development

10:15 A.M. Reports from Working Group Rapporteurs and Discussion

12:00 Adjourn

## Coastal Business Initiatives Workshop Attendees

Charles Adams **Economist** 

University of Florida

Richard Allen

Sea Grant Review Panel

Wakefield, RI

Roland Barnaby

Sea Grant Extension Educator

NH

Semoon Chang

Col. Business & Mgt. Studies

So. Alabama

William Cochrane

Chair Sea Grant Nat'l Review Panel

Beaufort, SC

Chris De'Elia

Dir. Sea Grant Col. Program

University of Maryland

Margaret Davidson

Dir. Sea Grant Consortium

Charleston, SC

**Bob Espeseth** 

Rec. & Park Res.

Champaign, IL

**Bob Goodwin** 

Sea Grant Col. Program

University of Washington

Dewayne Hollin

Sea Grant Marine Adv. Serv.

Texas A&M University

Ralph Adkins

Sea Grant Director

University of Maryland

Marilyn Altobello

**Economist** 

University of Connecticut

Mick Blackistone

Marine Trades Assn. Exec. Epping,

Director

Annapolis, MD

Jim Clinton

Pres. LA Part. Tech. & University of

Innovation

Baton Rouge, LA

Wesley Copeland

Int'l Sci. & Tech. Co.

Washington, DC

Jack Davidson

Dir Sea Grant Col. Program

University of Hawaii

Bruce DeYoung

Head, OR Sea Grant Extension

Oregon State University

Joe Farrell

Sea Grant Program

University of Delaware

William Gordon

Dir. NJ Sea Grant Program

Ft. Hancock, NJ

Harvey Hoven

University of Wisconsin

Superior, WI

Leroy J. Hushak Dept. of Ag. Eco. Ohio State University

Glenn Kreag Sea Grant Extension Program University of Minnesota @ Duluth

Hugh Lane
Pres. Bank of So. Carolina
Charleston, SC

Douglas Lipton Marine Eco. Spec. College Park, MD

John McKinney
Dist. Sea Grant Agent
Traverse City, MI

John Moore MIT Sea Grant Cambridge, MA

Richard Novak NC Marine Res. Center Manteo, NC

Tom Potts
PRTM
Clemson University

Jeffrey M. Reutter Sea Grant Program Ohio State University

Fritz Schuler Nat'l Sea Grant Col. Program Rockville, MD

Ruperto Chaparro Serrano UPR Sea Grant PR James Kirkley Dept. of Adv. Serv. Virginia Institute of Marine Sci.

Jerry Lamb Pres. Ship Analytics, Inc. North Stonington, CT

Merrill Leffler Sea Grant Col. Program University of Maryland

Robert Malouf
Dir. Sea Grant Institute
State University of New York

Bill R. Miller Dept. of Ag. Eco. University of Georgia

Don Morden Alameda Pl. Astoria, OR

Joe O'Leary Dept. of Forestry Purdue University

Benjamin F. Rathbun, Jr. Sea Grant Nat'l Review Panel Noank, CT

Neil Ross Pres. Int'l Marina Institute Wickford, RI

Dave Schaper White Cap Fish Co. Islip, NY

Robert Shephard Dir. Nat'l Sea Grant Col. Mayaquez, Program Rockville, MD Fred Smith
Dept. of Ag. & Rec. Eco.
Oregon State University

Dick True Empire State Mar. Trades Assn. Northville, NY

Craig Wiese Marine Adv. Program Anchorage, AK Greg Switlik Switlik Parachute Co. Trenton, NJ

Jack. R. Van Lopik Dir. Sea Grant Col. Program Louisiana State University

Alex Wypyszinski NJ Marine Adv. Serv. New Brunswick, NJ

## Sea Grant Coastal Business Initiatives Advisory Committee

Richard Allen, National Review Panel

James Cato, Director, Florida Sea Grant Program

Maumus Claverie, National Review Panel

William Cochrane, National Review Panel

Wesley Copeland, President, International Science and Technology

Jack Davidson, Director, Hawaii Sea Grant Program

Margaret Davidson, Director, South Carolina Sea Grant Consortium

Bruce DeYoung, Program Leader, Oregon Sea Grant Extension Program

William Gordon, Director, New Jersey Marine Science Consortium

Dewayne Hollin, Specialist, Texas A&M Sea Grant Advisory Service

Jerry Lamb, President, Ship Analytics, Inc.

Robert Malouf, Director, New York Sea Grant Program

James Murray, Program Leader, North Carolina Sea Grant Advisory Service

Robert Ragotzkie, Director, Wisconsin Sea Grant Program

Ben Rathbun, National Review Panel

Jeff Reutter, Director, Ohio Sea Grant Program

Robert Shephard, Acting Deputy Director, National Sea Grant Office

Jack Van Lopik, Director, Louisiana Sea Grant Program

William Wick, Director, Oregon Sea Grant Program

#### References

- Culliton, Tom, et al., "Selected Characteristics in Coastal States, 1980-2000" in NOAA's Coastal Trends Series: Report 1, NOAA, Rockville, MD, 1989.
- Edwards, S.F., "What Percent of the Population Will Live in the Coastal Zone?" in

  Coastal Zone 89, Proceedings of the Sixth Symposium on Coastal and Ocean

  Management, American Society of Civil Engineers, New York, 114-126, 1989.
- Pontecorvo, Giulio, "Contribution of the Ocean Sector to the United States Economy:

  Estimated Values for 1987 -- A technical Note," *Marine Technology Society*Journal, Vol. 23, No. 2, June 1989.

Extension Service, Oregon State University, Corvallis, O.E. Smith, director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.



Oregon State University Extension Service offers educational programs, activities, and materials—without regard to race, color, national origin, sex, age, or disability—as required by Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University Extension Service is an Equal Opportunity Employer.