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AN APPLICATION FOR THE CONTINUED SUPPORT OF THE

INTERNATIONAL CENTER FOR MARINE RESOURCE DEVELOPMENT

(ICMRD)

211(d) Renewal Proposal

from the

University of Rhode Island

Kingston, Rhode Island 02881

24 September 1973

Nelson Marshall

Nelson Marshall, Director, International Center for Marine Resource Development

PROPOSAL FOR SUPPORT UNDER THE

AGENCY FOR INTERNATIONAL DEVELOPMENT

INSTITUTIONAL GRANT PROGRAM

Name of Applicant - University of Rhode Island

Date of Application - 24 September 1973

Duration - Three years from the date established by the grant

Amount of the Grant - $416,017.

Topic - A request for a 211(d) renewal grant to assist the University of Rhode Island in further augmenting its competence related to the development and utilization of marine resources, especially fisheries, in less developed countries.

ABSTRACT

The University of Rhode Island has been a leader in the growth across disciplinary lines of research and education relative to the marine resources. To develop an international outreach of this capability, particularly as applied to LDCs and to fisheries, U.S. AID awarded a 211(d) grant to the University in 1969. With this basic support, the University founded and fostered the International Center for Marine Resources Development. This renewal proposal restates the purposes of the Center and the grant program. The impact of the grant during the first four years is illustrated in a summary of the work shcedule for the present year. A discussion of the multiplier effect of the grant is offered, showing the significance of renewed 211(d) support in a three year projection. This three year plan involves a tapering off of 211(d) support and a shift to increased participation and and support for project activities, particularly as called for in the accompanying proposal for a World-Wide Artisan Fisheries Development Program.

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INTRODUCTION

In the spring of 1969, the University of Rhode Island, with the help of a 211(d) grant from the United States Agency for International Development, established an International Center for Marine Resource Development (hereinafter referred to as ICMRD). The premises on which ICMRD was founded are indicated from the following excerpts from the original proposal:

"The University of Rhode Island proposes to strengthen its research, teaching, consultation, and service capabilities in marine resources, especially fisheries, to expand current University marine resources capabilities to an international dimension. To accomplish this, an International Center for the Development of Marine Resources will be established.

"The Center will allow the University to direct to the problems of less developed nations its existing, planned, and proposed integrated strength in development economics, marine resource economics, marine biology, oceanography, ocean engineering, fisherman training, fishing gear research, food technology, marine resource extension work and supporting social science interest.

"Funds requested in this proposal will be used to engage present faculty to enlarge on their interests in international studies, to hire new faculty with these interests, to support domestic and foreign graduate and special students while they pursue their education or training in programs relevant to the purposes of this grant, to improve library holdings, to help finance visiting lecturers for seminars, courses and symposia and to provide for necessary supplies and travel related to this program."

That the Center has indeed strengthened the University's role and effectiveness in the manner intended is illustrated by the pace of recent accomplishments as presented in the next section.

RECENT ACCOMPLISHMENTS AS SUMMARIZED IN THE ANNUAL REPORT FOR ICMRD 1972/73

This has been a year of transition with the International Center for Marine Resource Development (ICMRD) moving forward under renewed University support, with a revised organization and new leadership, with the re-establishment of interest on the part of the U.S. Agency for International Development in support of fisheries projects, and with broadened support including backing from the National Science Foundation and Resources for the Future.

The present director, Nelson Marshall, took office at the beginning of the year. He serves as chairman of a newly founded executive committee and reports directly to the Provost for Marine Affairs. In addition, the University appointed a body of Center Associates, now numbering 30 (Addendum A), from the ranks of the faculty. As documented in this report, these Associates all are interested in and committed to fostering the growth of the ICMRD program. Administrative and support staff includes an executive assistant, research libratian, overseas support office and editorial services supplied by the University's Marine Advisory Services.

Of the two research projects handled under tha auspices of ICMRD, one, An Evaluation of the Implications of Alternative Ocean Management Schemes for Tuna, was completed; the other, a Research and Development Mariculture-Fisheries Project in Puerto Rico, was recently launched after a year of planning. The tuna study provides the concerned countries

preparing for the upcoming Law of the Sea Conference with background da for deliberations relative to the major high seas stocks. The study authors (Professors Norton and Saila) suggest the alternative of a glob policy combined with regional management.

A document entitled Assessment of the Marine Fisheries Development Needs of the Latin American Countries in the Organization of American States was prepared by ICMRD in May. In spite of circumstances compelling a rushed compilation, the draft that was prepared has proven useful in subsequent deliberations.

created as a result of 211d grant to URI

The Consortium for the Development of Technology, bringing together food technology and related capabilities of five universities (University of California at Davis, Michigan State University, University of Rhode Island, University of Washington and University of Wisconsin at Madison), is now operating on several fronts:

- The pilot program continues as a major concern and involves collaboration with the Institute for Technological and Industrial Research in Central America to develop food technology expertise.
- CODOT has signed an agreement with Kasetsart University in Thailand to assist in food technology matters.
- A larger food technology project is being initiated in Brazil with the Instituto de Technologica de Alimentos. $5 m. loan

The central administration of CODOT is handled at URI under ICMRD with Professor C.O. Chichester serving as Executive Chairman of the Consortium. The spectrum of food technology development in CODOT programs includes many aspects of marine resource development of interest

with respect to the ICMRD participation.

Other programs at URI which relate to international marine oriented endeavors have continued to be quite active:

The Law of the Sea Institute held its eighth annual conference in Kinsgston in June on the topic The Emerging Regimes of the Oceans. About 190 people representing 35 countries attended. The Institute also held a workshop in May in Nassau on the Hazards of Maritime transit.

The Master of Marine Affairs porgram, an overview curriculum for persons contemplating broad-area marine work, had a class of 18, with two foreign students participating. This marked the beginning of a shift of emphasis to create a multinational thrust in this program with support for foreign students forthcoming from URI, UNESCO, foreign countries and private sources.

The Certificate Program in International Development, a supplementary educational feature available to masters candidates in various fields, enrolled 15 students in its core seminar

Two conferences were convened with ICMRD backing during the year: one on Socio-economic Research Issues in Fisheries Development, brought together 20 invited participants from 12 institutions and three countries in a workshop format; the other, a slightly larger assemblage with an equally diverse representation, was a Symposium on British Commonwealtn Politics. In addition, ICMRD conducted a brief series of seminars featuring the work of URI faculty.

Apart from such programmed activities, several Center Associates and others working individually had been actively engaged in relevant pursuits. Stated by name and subject, these are:

Faculty Member	Asst.	Topic [comments in brackets]
Lewis M. Alexander	2	Marine-related Activities in the Caribbean-Gulf of Mexico Basin
James G. Bergan	1	Stability of Peruvian Anchovetta Oi

*Clinton O. Chichester Tung-Ching Lee	5	Development Program Directed toward Infant Food Based upon Indigenous Proteins
[applied to Chile with counterparts working there; includes uses of marine proteins]		
	-	Carbonyl Accumulation during Browning
James W. Cobble	-	
[completed his second year as Chief of the U.S. AID-funded party on agricultural research in Korea]		
Spiros M. Constantinides	5	Improvements in Marine Food Utilization
[included work in residence at the Universidad Catolica de Valparaiso]		
*Ronald G. Cummings	-	Water Resources Management
[dealt with problems of seawater intrusion into freshwater supplies]		
Howard H. Foster, Jr.	1	Caribbean Resource Development Planning and Administration
[projected a system of planning for resource development in Antigua and St. Kitss, Nevis, Anguilla]		
*Harlan C. Lampe		
[participated in various advisory efforts in fisheries economics in developing countries, also preapred for upcoming study of water management as affecting Mexican lagoons]		
Leif C. W. Landberg	2	A Bibliography for the Anthropological Study of Fishing Industries and Maritime Comminities and an Index of Recent Marine Research
[completed compilation of annotated references and index]		
*Nelson Marshall	2	Food Transfer Studies in Support of Production in Coral Reef Lagoons
[established food chain base for coral lagoon populations, including fisheries stocks]		
	-	Coral Reef and Reef-Lagoon Studies
[mostly devoted to literature review in preparation for study of effects of man-induced stresses on reef and associated environments]		
Scott H. Marston	-	Study of U.S. Oil Interests and Possible International Seabed Controls
[suggested that U.S. oil interests will be served and potential conflict with OPEC will be eased by an international regime for the seabed]		

Saul B. Saila	2	Fishery Potential of the Inshore Tropical Reef Environment

[assessed, in conjunction with N. Marshall, the level and nature of the fisheries potential of coral reef and adjacent environments]

Mathematical Model of Salmonid Rearing Facilities

[high density salmon rearing and American lobster culture, by Professors Meade and Sastry, have also aroused interest, though transferability to developing countries lies in advancing techniques rather than immediate applications]

John C. Sainsbury	-	Advisory Activities in Planning Commercial Fisherman Training Programs

[devoted three months to setting up a commercial fisheries training program in Ecuador and about two months advising in an FAO program similar in nature in Indonesia; Prof. Sainsbury also studied the fishing industry as now operating and being developed in New Zealand and Fiji]

Milton Salomon	-	Improvement in the Technology of Traditional Hot Fish-Smoking in West Africa
C. Robert Shoop	2	Mariculture of Sea Turtles

[developed rare element tag (europium) for use in natural history research of this key aquaculture species]

John McN. Sieburth	1	Seaweed as a Habitat for Yeasts
Peter T. Wadsworth	-	Economic Structure of the Mexican Shrimp Fishing Industry

[project almost completed with many recommendations which should be of use to the industry]

*Thomas F. Weaver	-	

[pursued planning with the Southeast Asian Development Group on inshore fisheries development]

Many of the assistants in the foregoing studies were workers from foreign coutnries; in fact, close to 50 foreign students were working at URI in marine oriented programs during the past year. By countries, the list includes:

* partially financed from grant

foreign students

Bangladesh	1	France	1	Kuwait	1
Belgium	1	Greece	1	New Zealand	2
Brazil	2	India	3	Peru	3
Chile	3	Indonesia	1	South Africa	1
China, Republic of	15	Israel	1	Spain	1
Colombia	2	Japan	1	Sweden	1
Ethiopia	1	Korea	2	Thailand	1

By subject areas:

Food Technology and other Food Science Categories	17
Oceanography	12
Ocean Engineering and other Engineering areas	4
Resource Economics and Business Administration	9
Fisherman Training	1
Marine Affairs	2

The following staff positions were added during the past year: executive assistant, research associate in resource economics, fisheries biologist (established but yet to be filled), research librarian, on-site coordinator for Puerto Rican studies, overseas support officer.

Of the many foreign visitors to URI reviewing marine resources work during the past year, special note is made of the following:

- Delegation of the People's Republic of China to the United Nations Seabed Committee - one day visit hosted by Provost Knauss as an introduction to marine affairs interests at URI

- The Joint Russian-U.S. Working Group on Marine Pollution and its Effects on Marine Organisms held its opening meeting at URI in the spring.

GENERAL DISCUSSION OF REQUEST FOR 211(d) GRANT RENEWAL

Support Interaction and Multiplier Effects

The foregoing Summary of 1972/73 activities helps portray the impact of the 211(d) grant. Such a broad picture is clearly appropriate inasmuch as the 211(d) program should, and certainly does, have a multiplier effect in fostering international interest. From the list of Center Associates (Addendum A), we can, of course, note those who receive at least part salary from grant funds, namely: Professors Chichester, Cummings, Lampe, Lee, Marshall, McFarland, Norton, Pollnac, Spaulding and Weaver. To this list we can add support personnel, also nine others from the faculty who have received program support from 211(d) funds in the past year of growing activity. In this way we approach the identity of direct grant support; however, we miss the overall URI interantional resource development thrust indicated by the Summary.

As an indication of interactions and multiplier effects, we might say that the support for international marine interests at URI falls in categories as follows:

a) supported through 211(d)
b) support gained as a direct consequence of 211(d) funded activity
c) support arising independently of 211(d)
d) university support

Obviously (a) and (b) are highly interdependent but all four categories interrelate to some extent. When the University of Rhode Island accepted the initial 211(d) grant, it anticipated these cumulative interactions and willingly made a commitment to continue the work. As this URI commitment continues, we realize that there should be a shift from (a) to (b) in the next three years, i.e., from 211(d) support to backing conceived for specific

not listed in previous section on work.

 shift as recommended in Team Report

programs or project endeavors. Accordingly, the renewal request made at this time involves phasing 211(d) to lesser support levels over the three year period, while building up project activity and the support thereof. This constitutes an effective interplay of continued capability through base support and contracted activity in response to the growing need to develop assistance activities in the marine resources areas. This is the healthy pattern which we are pursuing.

Far less reassuring, despite the intentions of URI to foster the interest in international development problems, would be a pattern which lacked base support from 211(d) and as a consequence would be subject to erosion in all categories of the international effort.

Responsiveness to Needs

In presenting this renewal request, which provides for phasing our original objectives into a new thrust involving project endeavors, we are responsive to certain general needs and objectives relative to international marine resources development.

KPA's

1) We sense the paramount objective of U.S. AID to move vigorously toward meeting the need for food and for improving work opportunities and living and health standards in developing countries. In a paper titled Resource Potential and Economic Considerations Relating to Development Assistance in Fisheries (Lampe, Marshall and Vidaeus, in prep.) we are assessing the justification for bolstering such assistance in the fisheries sector.

2) Concurrently the developing countries, looking at the trends un-

folding in preparatory sessions for the Law of the Sea Conferences, are becoming aware of the assets of their coastlines and of their rights to these assets. Also the United States, like most developed countries interested in marine resources, senses its obligations to work with the LDCs toward the resolution of problems of mutual interest in the coastal waters.

3) The two foregoing needs cannot be realized, either immediately or on a durable basis, without the growth of competence within the developing countries. The LDCs realize this and the United States does as well. In fact, a strong commitment to serve in this respect was made by U.S. Ambassador Donald L. McKernan on August 11, 1972, in a speech to the prepatory session for the upcoming Law of the Sea Conference. Also, with funding from the Department of State, the International Affairs Center of the Johns Hopkins University is holding a Marine Science Workshop in Bologna, October 15-19, bringing together 30 leaders from Africa, Asia and Latin America to consider how to attain an increased capability in the marine fields in developing countries. Our contention is that the U.S. university system is bound to be important in effecting this growth of competence or technological transfer as it is often called. Right now, URI, using both direct university and 211(d) support, is working closely with two universities undertaking planning workshops to lay the groundwork for the development of their marine resources programs. These planning sessions, with the University of Dar es Salaam (Tanzania) and the Universidad Catolica de Valparaiso (Chile)*, may very well lead to linkages

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* The effort is, of course, suffering what we hope is but a temporary setback in view of the present overthrow of the government.

inter-university collaboration programs in the future.

Requests from Developing Countries

Not only the Summary of recent activities as presented above, but the requests for assistance coming to us from developing countries indicat the impact of the ICMRD programs. We note the following requests:

result of my trip?

Utilization

from Ecuador - a request for assistance in developing a training program for commercial fishermen at the Escuela Superior Politecnica de Litoral (see note under Professor Sainsbury in Summary from the Annual Report)

from the Instituto Centro Americano de Investigacion y Tecnologia Industrial (ICAITI) - a request for advice on the feasibility of developing a training program for artisan fishermen in Guatemala

from the Republic of Tanzania - a request from the University of Dar es Salaam to plan for education and research and possible inter-university development in support of fisheries and other marine resources (see reference to scheduled Planning Workshops under Advisory Services in next section)

from the Universidad Catolica de Valparaiso, Chile - a request to collaborate on an inter-university basis with respect to their marine resources programs, particularly with respect to fisheries (see reference to scheduled Planning Workshops under Advisory Services in next section)

from the government of Sao Miguel in the Azores - a request for cooperation with the University of Rhode Island with respect to the development of the island agriculture and fisheries (see note on the Azores under Advisory Services in next section)

from the Organization of American States - a request for a bibliographic search on fisheries topics (see note under Advisory Services in next section)

Scheduled Activities for the Coming Year

One added indication of the growth of the ICMRD program and the momentum gathered, largely through the stimulus of 211(d) support, comes

from a briefing as to activities scheduled directly under the aegis of the Center for the coming year. Except for CODOT activities covered in the Annual Report Summary, these undertakings include:

Major Institutional Programs

small "farmer"

A plan is being formulated for a coherent, topical program in World-Wide Artisan Fisheries Development, bringing together existing ICMRD work in this area, adding relevant units, relating to the work of the other groups contributing to the upgrading of subsistence fisheries to artisan levels, and supporting conferences and advisory work in the artisan fisheries area. This is being presented to ~~U.S.~~ AID concurrently with the present 211(d) renewal request as a major program for project support.

The Research and Development-Fisheries Project in Puerto Rico is continuing with eight participating investigators from URI an the Puerto Rico Nuclear Center of the University of Puerto Rico, the efforts being aimed at formulating a substantive fisheries development plan. This is supported by the National Science Foundation.

Smaller Institutional Projects

A study is being launched, titled Surface Water Management for Irrigation and Lagoon Environmental Modification concerned with conditions affecting lagoon areas in Mexico which are important in the harvest fisheries and aquaculture. This is supported by Resources for the Future.

Green Turtle Mariculture is continuing, probing the natural history of the species using a rare element (europium) tag developed here and exploring problems obstructing successful in-hatchery reproduction. At present, 211(d) funds are used to support this work. In addition to projecting future funding under the Artisan proposal now being formulated, a request is being made to the Commonwealth of Puerto Rico (Public Law 88-309) for support of an effort to assess ideas for low-cost turtle rearing in small cages.

Advisory Services

Two Planning Workshops, one at the Universidad Catolica de Valparaiso, Chile, and one at the University of Dar es Salaam, Tanzania, are

scheduled to help universities in developing countries to upgrade their research and education bearing on the marine resources These workshops are being funded in part by the host countries, in part by existing 211(d) funds, and in part through direct support from the university.

A paper on the Resource Potential and Economic Considerations Relating to Development Assistance in Fisheries is being completed. This is supported in part by the existing 211(d) finds and in part through direct support from URI.

A Fisheries Bibliographic Search is scheduled in behalf of OAS. To support this, we are seeking funds under a Basic Ordering Agreement to the existing 211(d) grant.

At least introductory advisory work will be done on techniques for Upgrading the Azores Fisheries. This is funded in part by the existing 211(d) grant, in part from direct university support and, as pursued further, will hopefully get initial backing under a Basic Ordering Agreement linked to the existing 211(d) grant.

Consulting

An assessment of the Potential for Coastal Aquaculture in British Honduras is scheduled for early fall. This is funded through the University of Illinois.

Further advisory services will be provided on Curriculums for Fishermans Training Schools, probably starting in Ecuador at the Escuela Superior Politecnica de Litoral. In the past year funds for such work have come from the Organization of American States and from the Food and Agriculture Organization of the United Nations. Except for backing from existing 211(d) funds, the support sources to be used during the current year have not been identified as yet.

Conferences and Workshops

A Seminar and Workshop on Coastal Artisan Fisheries is planned for Central America in mid-winter. It is expected that AID/Washington will fund this; however, some support will be needed from existing 211(d) funds.

A workshop on the possible Role of the U.S. Sea Grant in the International Field is to be held in Newport, Rhode Island this winter. This reflects the interest in the feasibility of such a role as

noted in HR 5452. This will be a self-supporting workshop, although inevitably both existing 211(d) support and URI backing will be involved.

In October a one week program will be held at URI for Foreign Students Participating in the National Oceanographic Data Center Training Program. This is done under a contract with NODC.

Individual Pursuits

These are not detailed herein but are destined to be even more diverse and comprehensive that the projects listed for the past year. A wide range of support is involved.

ICMRD ATTAINMENTS PROJECTED UNDER A RENEWAL GRANT

1) The original objective of ICMRD, to develop an international development outreach capability with respect to the marine resources interests of the University of Rhode Island, will prevail. These objectives are quoted in the introduction (page 1) of this renewal proposal.

2) The expanded and improved faculty, assembled through the first years of the grant and totalling 5 3/4 full equivalents presently, will be sustained.

3) The associated support of curriculums and of students in international development programs will continue in the fields of food technology, food science, ocean engineering, resource economics, business administration, fisherman training and marine affairs.

4) The multiplier impact of the grant on associated interests in the University will continue.

5) The Center's activities, directing the capabilities of the University to assistance to LDCs, will include: U71612

- Overseeing marine resources development projects
- Offering advisory and consulting services
- Organizing and conducting educational conferences and workshops
- Sponsoring individual faculty pursuits relative to marine resource development
- Participating in the programs of the Consortium for the Development of Technology

These and associated activities are illustrated in sections of this proposal titled Recent Accomplishments as Summarized in the Annual Report for ICMRD, 1972/73 (page 4) and Scheduled Activities for the Coming Year (pages 13 through 16).

The planning and budgeting (next section and Addendum B) are so conceived as to effect a transition from base 211(d) support (tapering off) to project support (increasing) over the next three years. Under this plan the faculty would be sustained and overall interest, including the multiplier impact of support for international programs, would continue. As the briefing of Scheduled Activities (pages 13 through 16) shows, much of the ICMRD effort is already shifting to project activities with some of the work pursued on the basis of outside funding but the key to a full transition rests in coupling this renewal proposal with the accompanying proposal to AID for support of a World-Wide Artisan Fisheries Development Program.

A sustaining model: $100,000

PROPOSED BUDGET[1/]

211(d) RENEWAL

University of Rhode Island

	% Time	First year	% Time	Second year	% Time	Third year
Director, ICMRD and Prof. of Oceanography	75	$24,668	50	$17,267	50	$18,130
Executive Assistant	75	12,601	50	8,821	50	9,262
Secretary	75	6,004	50	4,203	50	4,413
Research Librarian	20	2,310	20	2,426	20	2,547
2 Prof. Resource Economics - ea.	75	32,780	50	22,946	25	12,048
Prof. Sociology/Anthropology	75	10,725	50	7,508	25	3,941
Prof. Food Technology	50	17,835	37½	14,045	25	9,831
Prof. Fisheries Biology	75	10,672	50	7,470	25	3,922
Graduate Fellowships	(6)	33,600	(4)	22,400	(2)	11,200
Total Salaries:		$151,195		$107,086		$75,294
Fringe Benefits @ 8.5%		12,852		9,102		6,400
Total Salaries & Fringe:		$164,047		$116,188		$81,694
Travel		$ 11,466		$ 8,760		$ 7,304
Library Acquisitions		200		300		300
Publication		1,000		1,000		1,000
Miscellaneous[2/]		9,555		7,227		5,976
TOTAL COSTS:		$186,268		$133,475		$96,274

[1/] Note the declining budgets over the successive years relate to the increase in requested project supports (see accompanying proposal for a World-Wide Artisan Fisheries Development Program).

[2/] Communications, Equipment, Computer services, Conferences and Meetings, Repair services, Freight, etc.

ADDENDUM

ADDENDUM A

Roster of Center Associates

Lewis M. Alexander, Professor of Geography and Director, Master of Marine Affairs Program

Clinton O. Chichester, Professor of Food and Resource Chemistry and Executive Chairman, Consortium for the Development of Technology (CODOT)

James W. Cobble, Professor of Animal Science

Spiros M. Constantinides, Assoc. Professor of Food and Nutritional Science and Biochemistry

Ronald G. Cummings, Professor of Resource Economics and Chairman of the Department

Joel B. Dirlam, Professor of Economics

Howard H. Foster, Jr., Asst. Professor of Community Planning and Area Development

John K. Gamble, Asst. Professor of Marine Affairs and Director, Law of the Sea Institute

John M. Gates, Asst. Professor of Resource Economics

James J. Griffin, Executive Assistant to the Director, ICMRD

Andreas A. Holmsen, Professor of Resource Economics

Sidney J. Holt, Adjunct Professor of Oceanography and U.N. Senior Regional Scientific Advisor, International Ocean Institute, Royal University of Malta

John A. Knauss, Professor of Oceanography and Provost for Marine Affairs

Harlan C. Lampe, Professor of Resource Economics

Tung-Ching Lee, Asst. Professor of Food and Resource Chemistry

Nelson Marshall, Professor of Oceanography and Director, ICMRD

James F. McFarland, Asst. Professor of Resource Economics

Aloys A. Michel, Professor of Geography and Acting Vice-President for Academic Affairs

Foster H. Middleton, Professor of Ocean Engineering

Virgil J. Norton, Professor of Resource Economics

Candace A. Oviatt, Research Associate, Graduate School of Oceanography

John J. Poggie, Assoc. Professor of Anthropology and Chairman, Department of Sociology and Anthropology

Richard B. Pollnac, Asst. Professor of Anthropology

William R. Rosengren, Professor of Sociology

Saul B. Saila, Professor of Oceanography and Zoology and Director, Marine Experiment Station

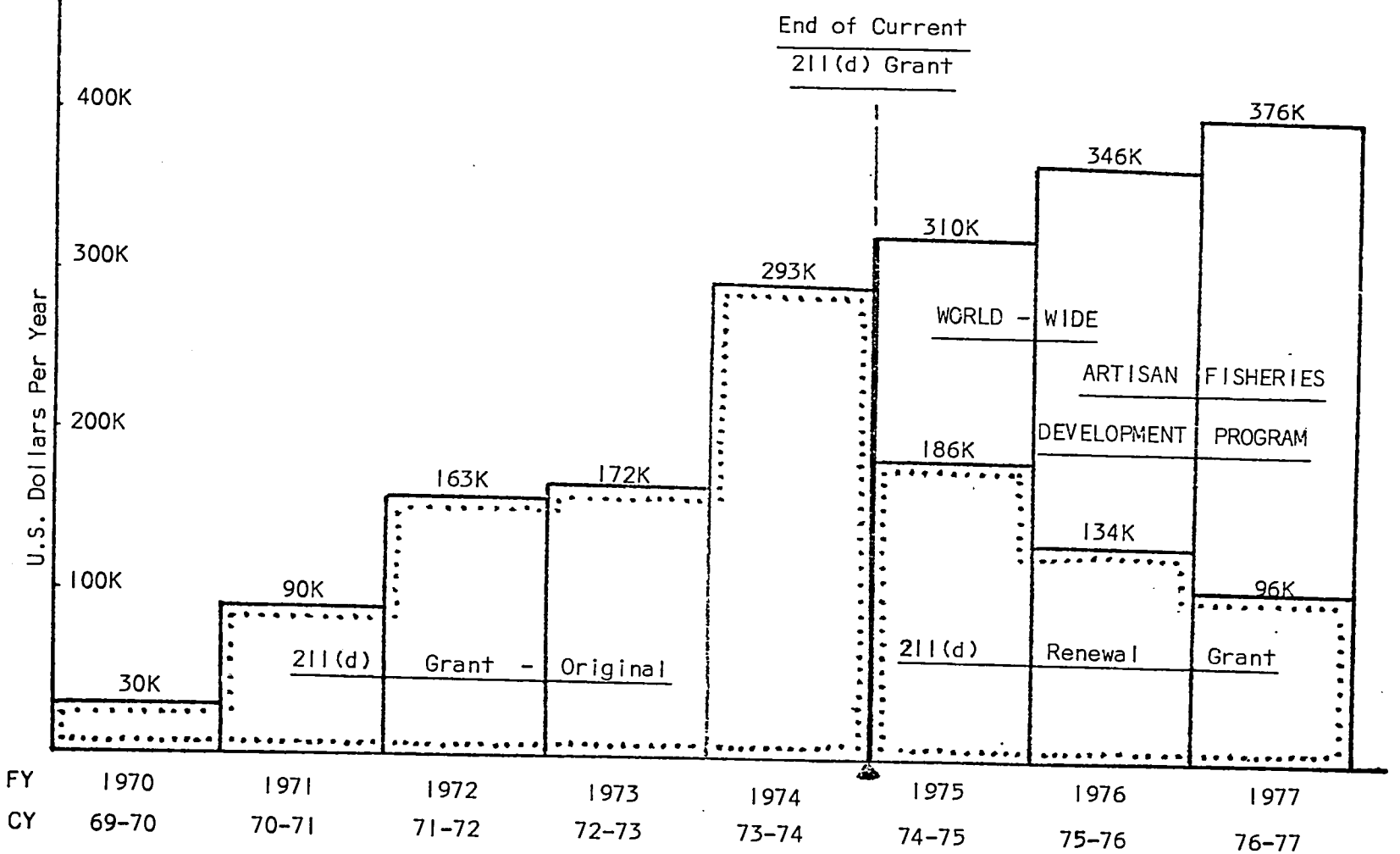
John C. Sainsbury, Assoc. Professor of Fisheries and Marine Technology and Chairman of the Department

Milton Salomon, Professor of Food and Resource Chemistry

C. Robert Shoop, Assoc. Professor of Zoology

Irving A. Spaulding, Professor of Resource Economics and Sociology

Thomas F. Weaver, Asst. Professor of Resource Economics

ADDENDUM B

GRAPHIC REPRESENTATION OF THE HISTORY AND PROJECTION OF 211(d) AND THE FOLLOW-ON WORLD-WIDE ARTISAN FISHERIES DEVELOPMENT PROGRAM AT THE UNIVERSITY OF RHODE ISLAND.