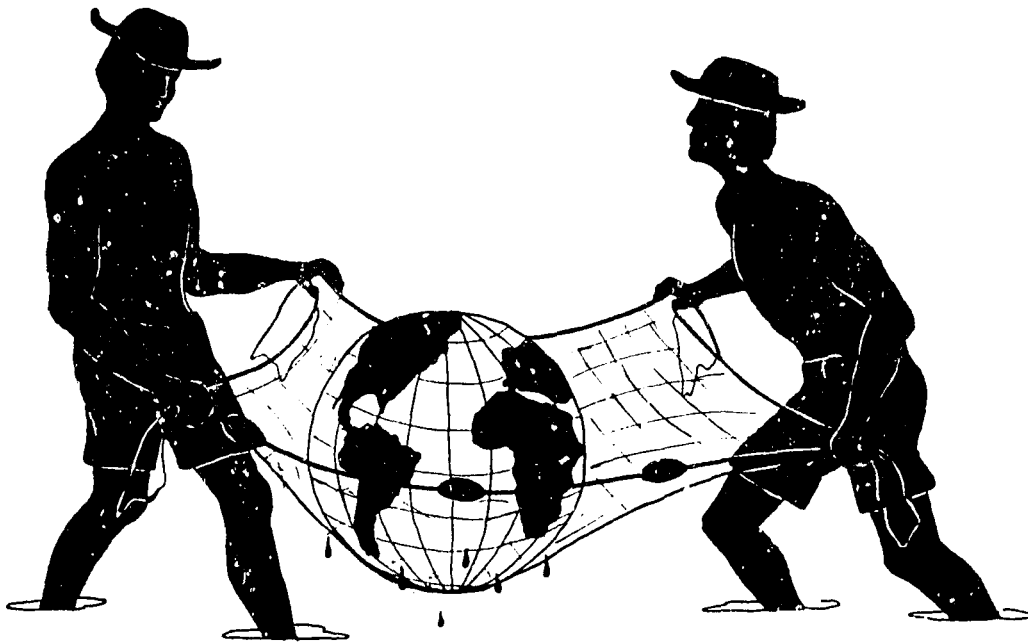


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**TITLE XII  
COLLABORATIVE RESEARCH SUPPORT PROGRAM**

# **POND DYNAMICS/AQUACULTURE**



**Pond Dynamics/Aquaculture CRSP  
Program Management Office  
OREGON STATE UNIVERSITY  
Marine Science Center  
Newport, Oregon 97365  
(503) 867-3011**

CRSP DIRECTORY  
and  
BIO-DATA of CRSP  
PARTICIPANTS

May 1, 1983

This directory, intended to facilitate communications among and between CRSP participants, will be revised twice annually by the Program Management Office. Participants are requested to assist the Program Manager in keeping the Directory current by advising of personnel changes, changes of address, and other necessary changes or corrections.

## COLLABORATIVE RESEARCH SUPPORT PROGRAM, POND DYNAMICS/AQUACULTURE

## DIRECTORY

April 1983

## I. CRSP Participants

## A. Executive Council

Dr. Alfred M. Beeton, Director  
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Dr. E. W. Shell, Head  
Department of Fisheries & Allied Aquaculture  
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(205) 826-4786

## B. Technical Advisory Committee

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Department of Fisheries & Wildlife  
Natural Resources Building  
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C. Management Entity

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Department of Fisheries & Wildlife  
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Newport, Oregon 97365  
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2. Fiscal Officer

William R. Millison  
Office of Business Affairs  
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(503) 754-4711

D. Collaborative Research Support Projects

1. Honduras

a. Principal Investigators

(1) Host Country

Ing. Mario Berrios  
Director of Fisheries  
Ministry of Natural Resources  
Tegucigalpa  
Honduras

(2) U.S. Institution

Dr. Ron Phelps  
Department of Fisheries & Allied Aquaculture  
Auburn University  
Auburn, Alabama 36849  
(205) 826-4786

b. Research Associates

(1) Host Country

To be designated

(2) U.S. Institution

Mr. Bart Green  
Department of Fisheries & Allied Aquaculture  
Auburn University  
Auburn, Alabama 36849  
(205) 826-4786

## 2. Indonesia

### a. Principal Investigators

#### (1) Host Country

Dr. Muhammed Eidman, Dean  
Faculty of Fisheries  
Institut Pertanian Bogor  
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Dr. Cal D. McNabb  
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East Lansing, Michigan 48824  
(517) 353-8698

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#### (2) U.S. Institution

Dr. Bette Premo  
Department of Fisheries and Wildlife  
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Michigan State University  
East Lansing, Michigan 48824  
(517) 353-8698

## 3. Panama

### a. Principal Investigators

#### (1) Host Country

Dr. Richard Pretto M.  
Direccion Nacional de Acuicultura  
Ministerio de Desarrollo Agropecuario  
Santiago de Veraguas  
Republica de Panama  
98-4388 or 98-4251

#### (2) U.S. Institution

Dr. Ron Phelps  
Department of Fisheries & Allied Aquaculture  
Auburn University  
Auburn, Alabama 36849  
(205) 826-4786

b. Research Associates

(1) Host Country

To be designated

(2) U.S. Institution

Dr. David G. Hughes  
 Department of Fisheries & Allied Aquaculture  
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 Auburn, Alabama 36849  
 (205) 826-4786

4. Philippines

a. Principal Investigators

(1) Host Country

Dr. Jose A. Carreon, Dean  
 College of Fisheries  
 University of the Philippines in the Visayas  
 Diliman, Quezon City 3004  
 THE PHILIPPINES

(2) U.S. Institution

Dr. Philip Helfrich  
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 University of Hawaii at Manoa  
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 P.O. Box 1346  
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 Kaneohe, Hawaii 96744  
 (808) 247-6631

b. Research Associates

(1) Host Country

Dr. Romeo D. Fortes  
 Faculty of Fisheries  
 University of the Philippines in the Visayas  
 Iloilo City  
 Republic of the Philippines

(2) U.S. Institution

c/o Dr. James Woessner  
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 Hawaii Institute of Marine Biology  
 P.O. Box 1346  
 Coconut Island  
 Kaneohe, Hawaii 96744  
 (808) 247-6631

## 5. Rwanda

## a. Principal Investigators

## (1) Host Country

## (2) U.S. Institution

Dr. Richard A. Tubb, Head  
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Department of Fisheries & Wildlife  
Oregon State University  
Corvallis, Oregon 97331  
(503) 754-4531

## b. Research Associates

## (1) Host Country

To be designated

## (2) U.S. Institution

Dr. Boyd Hansen  
c/o Department of Fisheries & Wildlife  
Oregon State University  
Corvallis, Oregon 97331

## 6. Thailand

## a. Principal Investigators

## (1) Host Country

Dr. Thiraphan Bhukaswan  
Department of Fisheries  
Bangkok  
Thailand

## (2) U.S. Institution

Dr. Carl F. Lagler  
The University of Michigan  
School of Natural Resources  
Samuel Trask Dana Building  
Ann Arbor, Michigan 48109  
(313)

## b. Research Associates

## (1) Host Country

Dr. Vijai Srisuwantach  
National Inland Fisheries Institute  
Bangkok  
Thailand

## (2) U.S. Institution

Dr. Kwei Lin  
Pond Dynamics CRSP - "C"  
c/o USAID/Bangkok  
Agency for International Development  
Washington, D.C. 20523

## II. USAID Offices

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Mr. Norm Pease, S&T/AGR/F  
Bureau for Science & Technology  
Agency for International Development  
Washington, D.C. 20523  
(703) 235-8993

## B. Grant Officer

Mr. Mort Darvin, Grant Officer  
Agriculture and Nutrition Branch  
Central Operations Division  
Office of Contract Management  
U.S. Agency for International Development  
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## C. USAID Missions

## 1. Honduras

USAID/Tegucigalpa  
Agency for International Development  
Washington, D.C. 20523

## 2. Indonesia

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Agency for International Development  
Washington, D.C. 20523

## 3. Panama

USAID/Panama City  
Agency for International Development  
Washington, D.C. 20523

## 4. Philippines

USAID/Manila  
Agency for International Development  
Washington, D.C. 20523



## 5. Rwanda

AID Section  
 United States Embassy/Kigali  
 Agency for International Development  
 Washington, D.C. 20523

## 6. Thailand

USAID/Bangkok  
 Agency for International Development  
 Washington, D.C. 20523

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Mr. William Fred Johnson  
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 Mr. Harvey Moore, Coordinator  
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University of Nebraska  
Lincoln, Nebraska 68583  
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Part II

Curriculum Vitae of CRSP Participants  
(Listed Alphabetically)

## CURRICULUM VITAE

NAME: Alfred M. Beeton

CRSP FUNCTION: Chairman, Executive Council

SOCIAL SECURITY NUMBER: DATE OF BIRTH: August 15,

PRESENT POSITION: Director, Great Lakes and Marine Waters Center and Michigan Sea Grant Program, University of Michigan.

EDUCATION: B.S. University of Michigan, Ann Arbor, MI 1952  
M.S. University of Michigan, Ann Arbor, MI 1954  
Ph.D. University of Michigan, Ann Arbor, MI 1958

EMPLOYMENT: Director, Great Lakes and Marine Waters Center and Michigan Sea Grant Program, 1976-present; Professor of Natural Resources and Professor, Atmospheric and Oceanic Sciences 1976-present; Associate Dean, Research Administration, Graduate School, University of Wisconsin-Milwaukee, 1973-1976.

PUBLICATIONS (examples):

Beeton, A. M. 1983. Study of a large subtropical aquatic system - Lake Skadar. Water Quality Bulletin, Vol. 8, No. 1 pp. 8-11, 50-51.

Karaman, G. S., and A. M. Beeton, (ed.). "The biota and limnology of Lake Skadar." 1982.

Grossnickle, N. E., and A. M. Beeton. 1979. Antennal scale length as a measure of relative size in the opossum shrimp, *Mysis relicta* Loven. Crustaceana 36:141-146.

Morgan, M. D., and A. M. Beeton. 1978. Life history and abundance of *Mysis relicta* in Lake Michigan. J. Fish. Res. Bd. Canada, 35(9):1165-1170.

Gannon, J. E., D. J. Mazur, and A. M. Beeton. 1978. Distribution of glacial relict crustacea in some Michigan inland lakes. Michigan Academician, Volume XI, No. 1, Summer issue.

## CURRICULUM VITAE

NAME: Carl E. Bond

CRSP FUNCTION: Co-Principal Investigator (Rwanda)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: September 11, 1920

PRESENT POSITION: Professor of Fisheries, Oregon State University

EDUCATION: B.S. Oregon State College, Corvallis 1947  
M.S. Oregon State College, Corvallis 1948  
Ph.D. University of Michigan, Ann Arbor 1963

EMPLOYMENT: Professor of Fisheries, Oregon State University, 1964-present.

PUBLICATIONS (examples):

Bond, C. E. and T. Uyeno. 1981. Remarkable changes in the vertebrae of perciform fish *Scombrolabrax* with notes on its anatomy and systematics. Jap. Jour. Ichthyology 28(3):259-262.

Williams, J. E. and C. E. Bond. 1981. A new subspecies of tui chub (Osteichthyes: Cyprinidae) from Guano Basin, Nevada and Oregon. The Southwestern Naturalist 26(3):259-262.

Kan, T. T. and C. E. Bond. 1981. Notes on the biology of the Miller Lake lamprey *Lampetra (Entocheilus) minima*<sup>1</sup>. Northwest Science 55(1):70-74.

Coombs, C. and C. E. Bond. 1981. Status of the Warner sucker. In: Pister, E. P. (ed.), 1981 Proceedings of the Desert Fishes Council. Vol. XII, 175 pp.

Armantrout, N. B. and C. E. Bond. 1981. Basin report, Oregon lakes. In: Pister, E. P. (ed.), 1981 Proceedings of the Desert Fishes Council. Vol. XII, 175 pp.

## CURRICULUM VITAE

NAME: Wallis H. Clark, Jr.

CRSP FUNCTION: Executive Council member

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: December 4, 1937

PRESENT POSITION: Director, Aquaculture Program University of California,  
Davis

EDUCATION: B.S. Loyola University, Los Angeles 1964  
Ph.D. University of California, Riverside 1968

EMPLOYMENT: Director, Aquaculture Program, University of California, Davis,  
Professor, Department of Animal Science, Graduate Professor of Zoology and  
Ecology, 1977-present; Division Chief of Aquaculture, NOAA, NIFS, Galveston,  
Texas, January-March 1977; Graduate Professor of Biology, University of  
Houston, 1974-1977.

PUBLICATIONS (examples):

Lynn, J. W. and W. H. Clark, Jr. 1983. The fine structure of the mature  
sperm of the freshwater prawn *Macrobrachium rosenbergii*. Biol. Bull.  
(in press, June issue).

Lynn, J. W. and W. H. Clark, Jr. 1983. Morphology of sperm-egg interaction  
in the eggs of the freshwater prawn *Macrobrachium rosenbergii*. Biol.  
Bull. (in press, June issue).

Cherr, G. N., and W. H. Clark, Jr. 1982. Fine structure of the envelope  
micropyles in the eggs of the white sturgeon, *Acipenser transmontanus*  
Richardson. Development, Growth and Differentiation. 24(4):351-362.

Clark, W. H., Jr. and T. S. Adams, eds. 1981. Advances in invertebrate  
reproduction. New York: Elsevier/North-Holland. 400 pp.

Clark, W. H., Jr., M. G. Kleve, and A. I. Yudin. 1981. An acrosome reaction  
in natantian sperm. The Journal of Experimental Zoology 218(2):279-291.

## CURRICULUM VITAE

NAME: Arlo W. Fast

CRSP FUNCTION: Principal Investigator (Philippines)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: November 22, 1940

PRESENT POSITION: Aquatic Ecologist, Limnologist, University of Hawaii,  
Hawaii Institute of Marine Biology, Kaneohe, Hawaii.

EDUCATION:

B.S.	Michigan State University	1962
non-degree	Scripps Institution of Oceanography	1963
M.S.	California State University at San Diego	1968
	Organization for Tropical Studies. Spent two months surveying lakes and streams in Guatemala, El Salvador and Costa Rica. Credit given through the Univ. of Costa Rica, 1970.	
Ph.D.	Michigan State University	1971

EMPLOYMENT: Associate Researcher, University of Hawaii, Hawaii Institute of Marine Biology, 1979-present; Principal, Limnological Associates, 1975-1980; Aquatic Ecologist, Union Carbide Corp., 1971-1975.

PUBLICATIONS (examples):

Fast, A. W. (in prep.). Water quality management practices. Chapter in USAID sponsored report on Pond Aquaculture Principles and Practices. Expected publication date (of book): 1983.

Fast, A. W., and R. G. Hulquist. 1982. Nitrogen gas (N<sub>2</sub>) supersaturation in reservoirs caused by artificial aeration. U.S. Army Corps of Engineers. Environmental and Water Quality Studies. Vicksburg, MS. 97 pgs. + Append.

Fast, A. W., L. J. Bottroff and R. L. Miller. 1982. Largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) growth rates associated with threadfin shad (*Dorosoma petenense*) introductions and artificial destratification of El Capitan Reservoir, California. California Fish and Game 67(4):7-15.

Fast, A. W., W. J. Overholtz and R. A. Tubb. 1977. Hyperoxygen concentrations in the hypolimnion produced by injection of liquid oxygen. Water Resources Research 13(2):474-476.

Fast, A. W. 1971. The effects of artificial aeration on lake ecology. U.S. Environmental Protection Agency. Water Poll. Control Research Series 16010 EXE 12/71, Dec. 71, 470 pgs.

## CURRICULUM VITAE

NAME: Donald L. Garling, Jr.

CRSP FUNCTION: Technical Advisory Committee member

SOCIAL SECURITY NUMBER.

DATE OF BIRTH:

PRESENT POSITION: Assistant Professor, Department of Fisheries and Wildlife,  
Michigan State University

EDUCATION: B.S. University of Dayton 1970  
M.D. Eastern Kentucky University 1972  
Ph.D. Mississippi State University 1975

EMPLOYMENT: Assistant Professor, Fisheries and Wildlife, Michigan State University, 1980-present; Assistant Professor, Department of Fisheries and Wildlife, Virginia Tech, Blacksburg, Virginia, 1976-1980; Research Associate, Department of Biochemistry, Mississippi State University, 1975-1976.

PUBLICATIONS (examples):

National Research Council (NRC). 1981. Nutrient requirements of cold water fishes. National Academy of Sciences, Subcommittee on Coldwater Fish Nutrition, Committee on Animal Nutrition. Washington, D.C. (in press).

Garling, D. L., Jr., L. A. Helfrich, and G. D. Hutton. 1978. Educational facilities and programs at state and federal fish hatcheries in the southeastern United States. Proc. S.E. Game and Fish Comm. 32:747-749.

Wilson, R. P., D. E. Harding, and D. L. Garling, Jr. 1977. The effect of dietary pH adjustment and the lysine requirement of channel catfish. J. Nutr. 107:166-170.

Garling, G. L., Jr. and R. P. Wilson. 1977. The effects of dietary carbohydrate to lipid ratios on growth and body composition of fingerling channel catfish. Prog. Fish. Cult. 39:43-47.

Garling, D. L., Jr. and R. P. Wilson. 1976. Optimum dietary protein to energy ratio for channel catfish fingerlings, *Ictalurus punctatus*. J. Nutr. 106:1368-1375.



## CURRICULUM VITAE

NAME: Bartholomew W. Greer

CRSP FUNCTION: Research Associate (Honduras)

SOCIAL SECURITY NUMBER: , . . . . . DATE OF BIRTH: August 5, 1954

PRESENT POSITION: Research Associate, Department of Fisheries, International Center for Aquaculture, Auburn University.

EDUCATION: B.A. Case Western Reserve Univ. 1976  
M.S. Auburn University 1982

EMPLOYMENT: Research Associate, Auburn University, 1983-present; M.S. graduate student, Auburn University, 1981-1982; Marine Aquarist, New England Aquarium, Boston, 1980; Peace Corps volunteer in Costa Rica, 1976-1979; Research Assistant, Case Western Reserve University, 1975.

PUBLICATIONS (examples):

- Green, B. W. and Smitherman, R. O. 1983. Relative growth, survival and harvestability of bighead carp, silver carp and their reciprocal hybrids. Aquaculture. In press.
- Green, B. W. 1979. Practical guide to aquaculture in Costa Rica. National Bank of Costa Rica Technical Bulletin. 16 pp. (in Spanish).
- Green, B. W. 1979. Small scale dairies: design and management. National Bank of Costa Rica Technical Bulletin. 21 pp. (in Spanish).
- Green, B. W. 1978. Intensive rotational pasture grazing system. Costa Rica Ministry of Agriculture and Livestock. Mimeo. 2 pp. (in Spanish).

## CURRICULUM VITAE

NAME: Boyd Jay Hanson

CRSP FUNCTION: Research Associate (Rwanda)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: April 30, 1951

PRESENT POSITION: Graduate Research Assistant, Department of Fisheries and Wildlife, Oregon State University.

EDUCATION: B.S. Brigham Young University 1975  
M.S. Brigham Young University 1977  
M.S. Brigham Young University 1978  
Ph.D. Oregon State University 1983

EMPLOYMENT: Graduate Research Assistant, Department of Fisheries and Wildlife, Oregon State University, 1978-present; Statistical Consultant, Brigham Young University, 1977-1978; Graduate teaching assistant, Brigham Young University, 1975-1977; Student Project Director, 1974; Research Technician, Brigham Young University, 1972-1974.

PUBLICATIONS (examples):

Hanson, B. J., J. R. Barnes, K. W. Cummins, and M. W. Carter. 1983. Leaf litter processing in aquatic ecosystems: A two-variable model. *Hydrobiologia* (in press).

Hanson, B. J., K. W. Cummins, A. S. Cargill, II, and R. R. Lowry. 1983. Dietary influences on the lipid and fatty acid composition of *Clistoronia magnifica*. *Freshwater Invertebrate Biology* (in press).

Hanson, B. J., K. W. Cummins, A. S. Cargill, II and R. R. Lowry. Polyunsaturated fatty acids in aquatic insects: An adaptation to the cold freshwater environment. Submitted to *Science*.

Hanson, B. J., K. W. Cummins and R. R. Lowry. Lipid content and fatty acid composition of aquatic insects. Submitted to *Comparative Biochemistry and Physiology*.

## CURRICULUM VITAE

NAME: Philip Helfrich

CRSP FUNCTION: Co-Principal Investigator (Philippines)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: June 22, 1927

PRESENT POSITION: Director, Hawaii Institute of Marine Biology and Professor of Zoology, University of Hawaii.

EDUCATION: U.S. Merchant Marine Academy, 1945-1947 (Deck Officer Training)  
 B.S. University of Santa Clara, Santa Clara, California 1951  
 Ph.D. University of Hawaii, Honolulu, Hawaii 1958

EMPLOYMENT: Faculty, Zoology Department, University of Hawaii, 1961-1975;  
 Professor Graduate Faculty, 1977-present.

PUBLICATIONS (examples):

- Helfrich, Philip, Editor. 1982. Proceedings of the Seminar/Workshop on Utilization and Management of Inshore Marine Ecosystems of the Tropical Pacific Islands. IMR, Univ. of So. Pacific and International Sea Grant Program. X + 115 pp.
- Helfrich, Philip. 1977. Necessary adjustments in fishery management in Southeast Asia. In LAW OF THE SEA 1977: PROCEEDINGS OF THE ELEVENTH ANNUAL CONFERENCE, Douglas Johnston, editor. Ballinger Publ. Co., Cambridge, Massachusetts.
- Helfrich, Philip and Paul Allen. 1975. Observations on the spawning of mullet, *Crenimugil crenilabis* (Forskål), at Enewetak, Marshall Islands. Micronesica 11(2):219-225.
- Helfrich, Philip. 1973. A review of the ecology and biota of Kaneohe Bay. In ESTUARINE POLLUTION IN THE STATE OF HAWAII, D. C. Cox, P. Fran, B. Bray, editors. Water Resources Research Center TR-31, Vol. 2.
- Helfrich, P., T. Piyakarnchana and P. Miles. 1968. Ciguatera Fish Poisoning. Part I. The ecology of ciguatera reef fish in the Line Islands. Occasional Papers of B. P. Bishop Museum. 23(14):305-369.

## CURRICULUM VITAE

NAME: David G. Hughes

CRSP FUNCTION: Research Associate (Panama)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: May 31, 1940

PRESENT POSITION: Graduate student (Ph.D.), Department of Fisheries,  
International Center for Aquaculture, Auburn University.

EDUCATION: B.S. University of Washington 1965  
M.S. Oklahoma State University 1972, 1974  
Ph.D. Auburn University 1980-present

EMPLOYMENT: Ph.D. graduate student, Auburn University, 1980-present; Training  
Leader, Peace Corps training program for aquacultural development volunteers,  
Asdela, Quito, Ecuador, 1982; Project leader, El Salvador and Honduras, 1974-  
1979; Graduate student, research and extension on freshwater cage fish culture,  
fish capture methods, Lake Atitlan, Guatemala, 1969-1972, 1974; Production  
manager, Aquarium Farms, Inc., Fremont, Nebraska, 1972-1973.

PUBLICATIONS (examples):

Hughes, D. G. 1981. Progress report on aquaculture development in Honduras.  
February 1977-December 1979 (in preparation).

Hughes, D. G., M. Newman and H. Huevo. 1978. Growth of tilapia fed seven  
practical diets of various energy and protein levels formulated from  
agricultural by-products.

Hughes, D. G., R. Ledgerwood and M. Vargas Ortiz. 1977. Wet and dry season  
comparison of *Tilapia aurea* production in El Salvador in new fertilized and  
unfertilized earthen ponds.

Hughes, D. G. 1977. Progress report on fisheries development in El Salvador.  
August 1974-May 1976.

Hughes, D. G. 1972. La ecologia y la pesca del Lago de Atitlan. Un informe  
preliminar.

## CURRICULUM VITAE

NAME Karl Frank Lagler

CRSP FUNCTION: Principal Investigator (Thailand)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: November 15, 1912

PRESENT POSITION: Distinguished Professor of Natural Resources and Professor of Zoology, University of Michigan.

EDUCATION:

B.A.	University of Rochester	1934
M.S.	Cornell University	1936
Ph.D.	University of Michigan	1940

EMPLOYMENT: University of Michigan, 1937-present; Professor of Natural Resources and Professor of Zoology, Res. Scientist, GLMWC, '82.

PUBLICATIONS (examples):

More than 150 scientific publications, including 5 books.  
Educational television programs numbering more than 100.  
Weekly radio show "Conservation Report", 1963-1970.

## CURRICULUM VITAE

NAM E: James E. Lannan, Jr.

CRSP FUNCTION: Program Manager

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: May 17, 1935

PRESENT POSITION: Program Manager (Executive Director), Title XII CRSP in Aquaculture, and Associate Professor of Fisheries, Oregon State University, 1980-present; Assistant Professor of Fisheries, Oregon State University, 1973-1980.

EDUCATION: B.A. University of California 1967  
M.A. University of California 1969  
Ph.D. Oregon State University 1972

PUBLICATIONS (examples):

Kapuscinski, A.R.D., and J. E. Lannan. 1983. On density of chum salmon (*Oncorhynchus keta*) eggs in shallow matrix substrate incubators. Can. Jour. Fish. and Aquatic Sci. 40:185-191.

Lannan, J. E. 1980. Salmon ranching in Oregon, USA. Chapter 4 In: J. Thorpe (ed). Salmon Ranching. Academic Press, London.

Lannan, J. E. 1980. Broodstock management of *Crassostrea gigas*: I. Genetic and environmental variation in survival in the larval rearing system. Aquaculture. 21:323-336.

Lannan, J. E., A. Robinson, and W. P. Breese. 1980. Broodstock management of *Crassostrea gigas*: II. Conditioning to maximize larval survival. Aquaculture. 21:337-345.

Lannan, J. E. 1980. Broodstock management of *Crassostrea gigas*: III. Selective breeding for improved larval survival. Aquaculture. 21:347-351.

## CURRICULUM VITAE

NAME: C. Kwei Lin

CRSP FUNCTION: Research Associate (Thailand)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: September 11, 1941

PRESENT POSITION: Associate Research Limnologist, Great Lakes Research Division, University of Michigan.

EDUCATION:

B.S.	Chung Hsing University, Republic of China	1964
M.S.	University of Alberta, Edmonton, Canada	1969
Ph.D.	University of Wisconsin, Milwaukee	1973
Diploma	U.S. Fisheries and Wildlife Service	1982

EMPLOYMENT: Associate Research Limnologist, Great Lakes Research Division, University of Michigan, 1980-present; Assistant Research Limnologist, University of Michigan, 1977-1980; Research Investigator, University of Michigan, 1974-1976; Assistant Curator of Limnology, Academy of Natural Sciences of Philadelphia, 1972-1974.

PUBLICATIONS (examples):

- Lin, C. K., M. S. Simmons. 1981. Effects of pentachlorobiphenyl on growth of nutrient enriched phytoplankton from Lake Michigan. *J. Great Lakes Res.* 7:481-485.
- Lin, C. K. and C. L. Schelske. 1981. Seasonal variation of potential nutrient limitation to phytoplankton growth in southern Lake Huron. *Can. J. Fish. Aquatic Sci.* 28:1-9.
- Lin, C. K. and J. L. Blum. 1977. Recent invasion of a red alga (*Bangia atropurpurea*) in Lake Michigan. *J. Fish. Res. Bd. Can.* 34:2413-2416.
- Lin, C. K. 1977. Accumulation of water soluble phosphorus and hydrolysis of polyphosphates by *Cladophora glomerata*. *J. Phycol.* 13:46-51.
- Lin, C. K. 1977. Continuous flow culture of benthic diatoms and its application to bioassay. *J. Phycol.* 13:267-271.

## CURRICULUM VITAE

NAME: Clarence D. McNabb

CRSP FUNCTION: Principal Investigator (Indonesia)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: July 7, 1928

PRESENT POSITION: Professor, Department of Fisheries and Wildlife, Michigan State University

EDUCATION: B.A. Loras College 1951  
M.S. University of Wisconsin, Madison 1956  
Ph.D. University of Wisconsin, Madison 1960

EMPLOYMENT: Associate Professor-Professor of Limnology, Michigan State University, 1968-present.

PUBLICATIONS (examples):

Batterson, T. R. and C. D. McNabb. 1983. Arsenic in Lake Lansing, Michigan. Environ. Toxicol. and Chem. 2: (in press).

McNabb, C. D. 1981. Aspects of higher education program in fisheries in Indonesia. Rep. No. 79 MUCIA-AID-Indonesia Higher Agricultural Education Project, International Programs, University of Wisconsin, Madison. 116 pp.

Glandon, R. P., F. C. Payne, C. D. McNabb, and T. R. Batterson. 1981. Rain induced phosphorus and nitrogen loading from urban, wetland, and agricultural sources. Water Research 15:881-887.

da Costa, R. S., C. D. McNabb, J. E. da Silva, and P. I. Tack. 1977. Aspects of higher education in fisheries in Brazil. Rep. No. 36 MSU Brazil-MEC Project, International Programs, Michigan State University, East Lansing. 61 pp.

McNabb, C. D. 1977. The potential of submersed vascular plants for reclamation of wastewater in temperate zone ponds. In J. Tourbier and R. W. Pierson, Jr., Eds., Biological Control of Water Pollution, Philadelphia, The University Press, pp. 123-132.



## CURRICULUM VITAE

NAME: Ronald Paul Phelps

CRSP FUNCTION: Principal Investigator (Honduras and Panama)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: October 30, 1947

PRESENT POSITION: Associate Professor, Department of Fisheries, International Center for Aquaculture, Auburn University.

EDUCATION: B.S. Auburn University 1969  
Ph.D. Auburn University 1975

EMPLOYMENT: (Overseas work experience) Evaluation of aquaculture and fisheries programs in Peru, and designed socio-economic evaluation of aquaculture extension program in Dominican Republic, 1982; Evaluated USAID sponsored aquaculture project in Sierra Leone, Identified areas for aquaculture development in Ecuador, Presented aquaculture training program in Dominican Republic and Mexico, 1981; Established environmental impact guidelines in Jamaica, 1980; Aquaculture development in Colombia, 1976-1980.

PUBLICATIONS (examples):

Phelps, R. P., and T. J. Popma. 1980. Final Report-Freshwater Aquaculture Development in Colombia. Department of Fisheries and Allied Aquacultures, Auburn University.

Valencia, R. O., and R. P. Phelps. 1979. Reproduccion inducida del cuatro ojos (*Leporinus muyscorum* Steindechner), INDERENA.

Rodriguez, G. D., R. Amaya C. and R. P. Phelps. 1977. Monocultivo de bocachico con tres variantes de tratamiento alimenticio, INDERENA.

Phelps, R. P., J. Plumb, C. W. Harris. 1977. Control of external bacterial infections of bluegill with potassium permanganate. Progress. Fish. Cult., Vol. 39, No. 3. 142 p.

Phelps, R. P., and E. W. Shell. 1975. Inventory of the Inland Aquacultural Industry of the United States, Department of Fisheries and Allied Aquacultures, Auburn University.

## CURRICULUM VITAE

NAME: Bette Premo

CRSP FUNCTION: Research Associate (Indonesia)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: December 31, 1955

PRESENT POSITION: Research Associate, Department of Fisheries and Wildlife,  
Michigan State University.

EDUCATION: B.S. Michigan State University 1978  
M.S. Michigan State University 1980  
Ph.D. Michigan State University 1982

EMPLOYMENT: Research Associate, Department of Fisheries and Wildlife,  
Michigan State University, January 1983-present; Graduate Research Assistant,  
Michigan State University, 1980-1982; Teaching Assistant, Michigan State  
University, 1978-1980; Student teacher at Union High School, Grand Rapids,  
Michigan and Librarian, Michigan State University, 1978; Biological Laboratory  
Assistant, 1976.

PUBLICATIONS (examples):

Premo, Bette. 1982. A model for phosphorus and chlorophyll a in a small,  
eutrophic lake. Ph.D. Dissertation, Department of Fisheries and  
Wildlife, MSU. Also in review by Canadian Journal of Fisheries and  
Aquatic Sciences.

Premo, Bette. 1982. The effectiveness of land treatment in reducing the  
trophic state of Skinner Lake, Indiana. Project Report to the Board of  
Noble County Soil and Water Conservation District, Albion, Indiana,  
July 1982.

Premo, Bette. 1980. Seasonal succession of cladoceran species in three  
temporary ponds in Southwest Michigan. M.S. Thesis, Department of  
Zoology, MSU.

## CURRICULUM VITAE

NAME: Edward Wayne Shell

CRSP FUNCTION: Executive Council member

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: June 16, 1930

PRESENT POSITION: Director, International Center for Aquaculture and Head, Department of Fisheries and Allied Aquacultures, Auburn University.

EDUCATION: B.S. Alabama Polytechnic Inst. 1952  
M.S. Alabama Polytechnic Inst. 1954  
Ph.D. Cornell 1959

EMPLOYMENT: Head, Department of Fisheries and Allied Aquacultures; Director, International Center for Aquaculture, Auburn University, 1973-present.

PUBLICATIONS (examples):

Lovell, R. T., R. O. Smitherman and E. W. Shell. 1978. Progress and prospects in fish farming. In New Protein Foods. Academic Press, New York.

Shell, E. W. 1975. A fish story pans out, and the world is better fed. In the 1975 Yearbook of Agriculture, "That We May Eat". U.S. Department of Agriculture. 149-156.

Shell, E. W., E. E. Prather and N. B. Jeffrey. 1968. Third report of short term survey of Perira de Miranda and Araros reservoirs to establish criteria for improved freshwater fisheries and intensive fishculture management. 71 p.

Shell, E. W., and R. T. Lovell. 1972. Inland fisheries progress in Thailand. 110 p.

Shell, E. W. 1971. Status of trout culture in Peru. 49 p.

## CURRICULUM VITAE

NAME: R. Oneal Smitherman

CRSP FUNCTION: Technical Advisory Committee member

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: August 26, 1937

PRESENT POSITION: Professor of Aquaculture, Fisheries Department and International Center for Aquaculture, Auburn University.

EDUCATION: B.S. Auburn University 1959  
M.S. N.C. State University 1961  
Ph.D. Auburn University 1964

EMPLOYMENT: Professor of Aquaculture, Fisheries Department and International Center for Aquaculture, Auburn University, 1977-present; Associate Professor, Aquaculture, Auburn University, Department of Fisheries, 1973-1977.

PUBLICATIONS (examples):

- Smitherman, R. O. (with H. El-Ibiary and R. E. Reagan). 1978. Genetics and breeding of channel catfish. Southern Cooperative Series 223. Alabama Agricultural Experiment Station. 39 pp.
- Smitherman, R. O. 1975. Experimental species associations of basses in Alabama ponds. Pages 76-84 In Black bass biology and management. Sport Fishing Institute, Washington, D.C.
- Smitherman, R. O. (with C. E. Boyd). 1974. Intensive management of water for fish production. Pages 152-166 In Water resources utilization and conservation in the environment. Ft. Valley State College, Ft. Valley, Ga.
- Smitherman, R. O. (with D. D. Moss). 1970. Fishculture survey report for Panama. International Center for Aquaculture, Auburn University, Auburn, AL 64 pp.
- Smitherman, R. O. (with H. S. Swingle). 1969. Extension and research at the fisheries stations of Thailand. International Center for Aquaculture, Auburn University, Auburn, Alabama 45 p.

## CURRICULUM VITAE

NAME: George Tchobanoglous

CRSP FUNCTION: Technical Advisory Committee member

SOCIAL SECURITY NUMBER:

DATE OF BIRTH: May 24, 1935

PRESENT POSITION: Professor, University of California, Davis, California.

EDUCATION: B.S. University of Pacific, Stockton, California 1958  
M.S. University of California, Berkeley, California 1960  
Ph.D. Stanford University, Stanford, California 1969

EMPLOYMENT: Professor, University of California, Davis, California, 1976-present; Consultant, State Water Resources Control Board, Sacramento, 1973-present; Associate Professor, University of California, Davis, California, 1971-1976.

PUBLICATIONS (examples):

Author or co-author of over 70 reports and articles and three text books on various subjects in Sanitary and Environmental Engineering. Listings supplied on request.



## CURRICULUM VITAE

NAME: James Woessner

CRSP FUNCTION: Research Associate (Philippines)

SOCIAL SECURITY NUMBER:

DATE OF BIRTH:

PRESENT POSITION: Research Associate, University of Hawaii at Manoa,  
Hawaii Institute of Marine Biology.

EDUCATION: B.S. Cornell University 1972  
M.A. University of California 1978  
PhD. University of California 1981

EMPLOYMENT: Director of Research at Aquaculture Associates, Inc., 1982;  
Research Director at Neushul Mariculture Inc., 1981-1982; Southern California  
Edison's Southern California Bight Kelp-bed Mapping Project Manager, 1980-1981;  
Botany Instructor at UCSB, 1979; NSF Research Assistant, 1978; NSF Research  
Assistant, 1977; Marine Colloids Inc. Consultant, 1976; Japanese Dept. of  
Education Fellowship Recipient - studied macroalgal industries in Japan while  
perfecting Japanese language skills, 1974-1976; NSF Research Assistant,  
1973-1974.

PUBLICATIONS (examples):

Mencher, F. M., R. B. Spencer, J. W. Woessner, S. Katase and D. K. Barclay.  
1982. Growth of nori (*Porphyra tenera*) in an experimental OTEC aqua-  
culture system in Hawaii. Journal of the World Mariculture Society.  
(Submitted).

Woessner, J. W., R. B. Spencer and F. M. Mencher. 1982. World markets and  
the feasibility of commercial cultivation of Nori in Hawaii. (Manuscript  
distributed to Sea Grant and Hawaii State Officials.)

Woessner, J. W. 1981. The domestication of macroalgae. University of  
California, Santa Barbara, California. Ph.D. Dissertation. 287 pp.

Neushul, M., B.W.W. Harger and J. W. Woessner. 1981. Laboratory and near-  
shore field studies of the giant California kelp as an energy crop plant.  
Proc. Intl. Gas Research Conf. 10 pp.

Flowers, A., A. J. Bryce, B. Harger, J. T. McVickar, M. Neushul and J. Woessner.  
1981. Survey of commercial seaweed production for the marine biomass  
program. Gas Research Institute, Chicago and Solar Energy Research  
Institute, Chicago and Solar Energy Research Institute, Golden, Colorado.  
30 + 78 pp.