

# ANTHONY T. CHARLES

*Pew Fellow in Marine Conservation*

*Fisheries: Sustainability, Resilience, Conservation, Management, Economics, Policy*

*Coastal & Ocean Management / Coastal Communities / Aquaculture / Marine Protected Areas*

Finance, Information Systems & Management Science / Environmental Studies  
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## EDUCATION

B.Sc. (1978) Honours degree, Carleton University (Ottawa); Governor General's Medal.

Ph.D. (1982) University of British Columbia (Vancouver); Natural Sciences and Engineering Research Council's 1967 Science Scholarship. Thesis Supervisor: Colin Clark.

## EMPLOYMENT

1985- Professor of Management Science and Environmental Studies (Cross-Appointment), Saint Mary's University, Halifax, Nova Scotia (Assistant Professor, 1985-88; Associate Professor, 1988-94; Professor, 1994-).

2006 Visiting Scientist, Policy and Planning, Fisheries Department, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.

1982-85 Head Research Scientist, Salmon Stock Assessment, Fisheries Research Branch, Department of Fisheries and Oceans, Vancouver, British Columbia.

1978-82 Instructor, Department of Mathematics, University of British Columbia, Vancouver, British Columbia.

## HONOURARY ACADEMIC POSITIONS

2002- Adjunct Professor, Marine Affairs Program, Dalhousie University, Halifax, Nova Scotia.

1986- Adjunct Professor, School for Resource and Environmental Studies, Dalhousie University, Halifax, Nova Scotia.

1991-92 Visiting Professor, Economic Sciences Research Institute, University of Costa Rica, San Jose, Costa Rica.

1988-92 Research Associate, Biology, Dalhousie University, Halifax, Nova Scotia.

## **PROFESSIONAL AWARDS AND APPOINTMENTS**

### ***International***

International Institute of Fisheries Economics and Trade, President-Elect (2006-).

Pew Fellowship in Marine Conservation, Pew Institute for Marine Science (2001-).

International Advisory Council, University of British Columbia Fisheries Centre (2002-).

Fish and Fisheries (Blackwell Science) – Editorial Board member (2000-).

Resource Modeling Association – Past-President (2002-2003); President (2001-2002) and Member, Board of Directors (1988-1991).

Natural Resource Modeling – Associate Editor (1991-2004).

Fisheries Economics Newsletter – Canadian Correspondent (1985-2001).

Committee on Resource Policy Issues, Resource Modeling Association – Chair (1992-1999).

Socioeconomics Network, International Institute for Fisheries Economics and Trade – Co-Chair (1992-1997).

Organizational Memberships: Internat'l Institute for Fisheries Economics and Trade, Internat'l Society for Ecological Economics, Internat'l Association for the Study of the Commons.

### ***National***

Ocean Management Research Network – Director / Board Chairperson (2001-2005), Board Member (2006-).

DFO Science Advisory Council – Member (2006-).

College of Reviewers, Canada Research Chairs Programme, Government of Canada (2001-).

Renewable Marine and Forest Resources Cluster Group, Environment & Sustainable Development Indicators Initiative, National Round Table on the Environment and the Economy (2001-2003).

Industrial Engineering Reallocation Committee, Natural Sciences and Engineering Research Council of Canada (2000-2002).

Research Management Committee, AquaNet Network of Centres of Excellence (2000-2002).

Oceans Institute of Canada – Board of Directors (1996-98); Member (1991-2002).

Industrial Engineering Grant Selection Committee, Natural Sciences and Engineering Research Council of Canada (NSERC) – Member (1996-1999) and Chairperson (1998-99).

Panel on Change and Canadian Marine Fisheries, Canadian Global Change Program, Royal Society of Canada (1996-1998).

Fisheries Resource Conservation Council – Ministerial Appointment (1993-1998).

### ***Atlantic Canadian***

Advisory Committee on the Sable Gully, Department of Fisheries and Oceans (2003-).  
Fishermen and Scientists Research Society, Nova Scotia (1994-).  
Environmental Studies Committee, Atlantic Provinces Council on the Sciences – Chair (2001-2005), Member (1989-1991).  
Fishery Advisory Committee, Atlantic Policy Congress of First Nations Chiefs (2000-2005).  
Advisory Committee, Bay of Fundy Fisheries Council (1998-2004).  
Research and Advisory Committee, Fundy Fixed Gear Council (1996-2004).  
Indicators Working Group, *Rural Communities Impacting Policy* CURA Project, Dalhousie University and Coastal Communities Network – Chair (2001-2002) and Member (2001-2005).  
Fisheries and Marine Core Group, Voluntary Planning Nova Scotia (1999-2001).  
Steering Committee, *Social Research for Sustainable Fisheries* CURA project, St. Francis Xavier University (1999-2001).  
Environment and Development Committee, Ecology Action Centre (Halifax, N.S.) – Member (1990-2001) and Chairperson (1994-1996).  
Coastal Zone Management Committee, Nova Scotia Round Table on Environment and Economy (1996-1998).

### **PROFESSIONAL AND COMMUNITY SERVICE**

Coordinator, “Fisheries and Coastal Lecture Series” (a series of public lectures and workshops presented to fishers, researchers and the public), Saint Mary’s University, Halifax (1987-).

Conference/Workshop Organizer:

- Ocean Management Research Network, National Conferences: Ottawa (2002, 2003, 2005).
- World Conference on Natural Resource Modelling: Halifax (1999).
- International Workshop on Integrated Fish Farming: Wuxi, China (1994).
- Interdisciplinary Conference on Natural Resource Modelling and Analysis: Halifax (1988).
- Lobster Fishery Forum: Halifax (1988).
- Conference on Economic Democracy in Atlantic Canada: Halifax (1986).
- Coho Salmon Workshop (Department of Fisheries and Oceans): Vancouver, B.C. (1985).

Journals for Which Referee Duties Performed:

Conservation Biology	Marine Resource Economics
Fish and Fisheries	International Journal of Global Environmental Issues
Ecological Economics	Scandinavian Journal of Economics
Ecology and Society	ICES Journal of Marine Science
Land Economics	Canadian Journal of Fisheries and Aquatic Sciences
Ecological Modeling	Journal of Environmental Economics and Management
Natural Resource Modeling	American J. of Mathematical and Management Sciences
Asian Fisheries Science	Canadian Journal of Administrative Sciences
International Economic Review	Bulletin of Mathematical Biology
Mathematical Modelling	Mathematical Biosciences

## **FISHERY AND MARINE MANAGEMENT EXPERIENCE: CANADA**

Coastal CURA Community-University Research Alliance – Principal Investigator (2006-). [This is a 5-year project to support community involvement in both local-level and large-scale integrated management initiatives relating to coastal and ocean management in the Maritimes.]

Ocean Management Research Network – Director and Board Chairperson (2001-2005), Board Member (2006-). [The OMRN is a Canadian network of researchers and research users with an interest in human uses of the oceans and the management of these uses. I directed the development of the network, and in particular the activities of its National Secretariat, for its initial five years.]

‘Turning the Tide’ – Director (2001-2006). [This project, funded by my Pew Fellowship in Marine Conservation, works with fishery organizations and First Nations in Canada’s Maritimes region to support community-based fishery management and positive collaboration among native and non-native fishery participants, through organizational, research, outreach and educational activities.]

Environmental Studies Committee, Atlantic Provinces Council on the Sciences – Founder and Chair (2001-2005). [APICS is an organization in Atlantic Canada with institutional membership including all the region’s universities and many government research centres. I was invited to establish this new committee of APICS, with a mandate to support environmental and resource management education and student involvement in this field of study.]

Bay of Fundy and First Nations Fisheries – Advisor: Fundy Fixed Gear Council (1996-2005), Bay of Fundy Fisheries Council (1998-2005), Atlantic Policy Congress of First Nations Chiefs (2000-2005). [Provided research support to inshore participants in fishery management planning.]

Renewable Marine and Forest Resources Cluster Group, Environment and Sustainable Development Indicators Initiative, National Round Table on the Environment and the Economy – Member (2001-2003). [Developed fisheries and marine indicators for incorporation in national accounts.]

Board of Directors and Management Committee, Oceans Institute of Canada – Member (1996-98). [Provided strategic and medium-term decision making for this independent NGO focusing on oceans and coastal management and policy.]

Fisheries Resource Conservation Council – Ministerial Appointment (and Chairperson, FRCC Management and Regulations Committee) (1993-1998). [The FRCC advises the Government of Canada on conservation requirements for Atlantic Canadian fisheries, reviewing implementation of resource management decisions and analysing the conservation impacts of various conservation options, such as input (effort) management controls and output (quota) controls.]

Standing Committee on Resource Policy Issues, Resource Modeling Association – Chairperson (1992-1999). [Developed an organizational information base to facilitate application of analytical methods to resource management decisions in government and the private sector.]

Fisheries Research Branch, Department of Fisheries and Oceans – Head Research Scientist, Salmon Stock Assessment Unit, Vancouver, B.C. (1982-85). [Establishment and management of a research unit providing scientific input for senior fishery managers and senior decision makers, analysing policy options for Pacific fisheries, and developing retrospective stock assessment methods.]

Canada-U.S. Salmon Treaty Negotiations – Canadian Technical Advisor, and Chairperson of the Canada-U.S. Coho Salmon Technical Committee (1983-1985). [Involved in drafting treaty language, and advising the Canadian Chief Negotiator on matters concerning coho salmon.]

**FISHERY AND MARINE MANAGEMENT EXPERIENCE: INTERNATIONAL.**

Food and Agriculture Organization of the United Nations – Visiting Scientist, Rome, Italy (2006). [Participated in organizing and implementing Workshops on Ecosystem Approach to Fisheries, and on Marine Protected Areas and Fisheries Management, including background documents.]

“Integrated Coastal Zone Management Education in Cuba” CIDA Tier II project – Canadian Participant (1999-2004). [Developing, implementing and supporting interdisciplinary masters programs on coastal zone management in three Cuban universities.]

International Workshop on International Fisheries Instruments and Factors of Unsustainability and Overexploitation, Food and Agriculture Organization of the United Nations – Invited Participant, (1) Mauritius (2003), (2) Cambodia (2004).

“Fisheries Management Planning”, Oceans Institute of Canada and Organization of Eastern Caribbean States – Coordinator (Canadian) (1997-98). [Implementation of fisheries management plans through stakeholder consultations in nine OECS member states.]

“Aquaculture Economics in Developing Countries”, Food and Agriculture Organization of the United Nations – Coordinator (1996-1997). [Production of regional assessments and annotated bibliographies of state of knowledge in aquaculture economics, by a global team of researchers.]

“Study on the State of Research in Marine Sciences”, a contractual report by Cartis Ltd. for the Costa Rican National Council for Research in Science and Technology – Principal Researcher (1994). [Production of a strategic assessment of marine science research in Costa Rica.]

“Genetic Diversity in Aquaculture: Programme for Economically and Socially Sustainable Conservation and Development”, a project funded by the International Development Research Centre of Canada – Principal Investigator (Economic Research) and Financial Manager (1993-96). [Examined the biological, economic and social aspects of genetic improvement and biodiversity conservation in aquaculture, for China, Thailand, Indonesia and the Philippines.]

“Medium Term Planning Process for Research Programming”, International Centre for Living Aquatic Resources Management (ICLARM), Manila, Philippines – Consultant (1992). [Assessed the research agenda for this lead international fisheries organization.]

Visiting Researcher, Economic Sciences Research Institute, University of Costa Rica; Fisheries Management Section, Faculty of Biological Sciences, National University, Costa Rica (1991-92).

“Global Fisheries Socioeconomics Survey Project”, a project funded by the International Development Research Centre of Canada – Coordinator (1991-1993). [A assembled and analysed research studies on fisheries and aquaculture socio-economics in developing nations worldwide.]

“Fishery Management and Development: A Policy and Strategic Assessment”, a project of the International Centre for Ocean Development – Consultant (1991). [Assessment of programming in fisheries management and development, and preparation of a draft fishery policy.]

“Chinese Integrated Fish Farming”, a project funded by the International Development Research Centre of Canada – Coordinator (Bioeconomic Research) (1989-1994). [Analysis of fish farm survey data, institutional capacity-building and technical training of Chinese counterparts.]

Lecturer, Training Programme for the Management and Conservation of Marine Resources, International Oceans Institute, Halifax (1987-).

## TEACHING AND UNIVERSITY SERVICE

Creation and Teaching of the following Environment and Natural Resource Courses:

ENVS4450 Natural Resource Management (also listed as Geography GEOG4424)  
ENVS4460 Methods of Environmental and Natural Resource Analysis (also GEOG4444)  
ECON3361 Fisheries Economics  
ECON6611 Sustainable Resource Management  
MGSC6690 Management Science of Natural Resources  
ACST3302 Fishery Crisis: Past, Present and Future

Teaching of the following Environment and Natural Resource Courses:

ENVS2300 Environmental Science  
ENVS4499 Seminar in Environmental Science  
ECON3362 Economics of Natural Resources and Environmental Management  
MARA5021 Fisheries Management (Marine Affairs / Env'l Studies, Dalhousie University)  
BIOL5846 Topics in Fisheries Management (Biology, Dalhousie University)

Other Courses:

ECON3322 Current Economic Problems: Canada and the World  
MGSC1205 Quantitative Methods for Commerce I: Finite Mathematics  
MGSC1206 Quantitative Methods for Commerce II: Calculus/Probability  
MGSC1207 Introductory Statistics for Commerce  
SMBA506 Introductory Decision Analysis I: Statistics  
SMBA507 Introductory Decision Analysis II: Operations Research  
MGSC402 Operations Research Methods and Application  
SMBA690 Operations Research Methods and Applications

Memberships on University Boards and Committees (Saint Mary's University):

- Faculty of Graduate Studies and Research, Executive (2002-).
- Panel of Full Professors, University Review Committee (2000-2003).
- Environmental Studies Executive Committee (1996-).
- Atlantic Canada Studies Program Committee (1986-).
- International Development Studies Program Committee (1986-2002, 2005-).
- Search Committee, Ph.D. Program Director, Faculty of Commerce (2003).
- University Senate (2000-2002).
- Board of Directors, International Education Centre (1990-93).
- Review Committee, Computer Science & Business Administration Joint Degree (1986).
- Senate Research Committee (1985-88).
- M.B.A. Graduate Council (1985-87).
- Research Chair (1987-88), Chairperson (1988-89) and Board member (1989-91, 1999-2003), Gorsebrook Research Institute for Atlantic Canada Studies.

**RESEARCH GRANTS (SINCE 1990)**

Social Sciences and Humanities Research Council of Canada , Community-University Research Alliance: “Community-based Governance of Coastal Resources: Social, Economic and Policy Linkages in the Canadian Maritimes” (\$990,000: 2006-2011).

Natural Sciences and Engineering Research Council of Canada, Operating Grant: “Decision Support for Fisheries and Ocean Management: Systems Approaches, Integrated Models and Sustainability Indicators” (\$135,000: 2004-2009).

Fisheries and Oceans Canada, and Social Sciences and Humanities Research Council of Canada, Ocean Management National Research Network, Principal Investigator (\$526,500: 2001-2005).

Pew Charitable Trusts, Pew Fellowship in Marine Conservation (\$225,000: 2001-2004).

Natural Sciences and Engineering Research Council of Canada, Operating Grant: “Sustainability Assessment in Natural Resource Systems” (\$135,000: 2000-2004).

Social Sciences and Humanities Research Council of Canada, Research Development Initiative, “Developing an interdisciplinary participatory research methodology to further community-based resource management” (with F. Berkes, J. Kearney and M. Wiber, \$104,000: 2000-2003).

Natural Sciences and Engineering Research Council of Canada, Operating Grant: “Strategic Planning for Sustainable Development in Fisheries and Aquaculture” (\$92,000: 1996-2000).

Royal Society of Canada, Canadian Global Change Program, Grant to Support Participation on “Panel on Change and Canadian Marine Fisheries” (\$4,000: 1996-97).

Social Sciences and Humanities Research Council of Canada, Strategic Research Grant: “Fisheries, Uncertainty, and the Precautionary Approach to Resource Management” (with G.R. Munro and others, \$80,000: 1996-1999).

International Development Research Centre of Canada: “Sustainability Indicators for Aquatic Resource Systems” (\$3,500: 1995-96).

International Development Research Centre of Canada: “Genetic Diversity in Aquaculture: Programme for Economically and Socially Sustainable Conservation and Development” (with R. Doyle, Z. Basiao and J. Leith, \$400,000: 1993-1996).

Natural Sciences and Engineering Research Council of Canada, Operating Grant: “Integrated Bio-Socio-Economic Modelling of Fisheries and Aquaculture Industries” (\$84,000: 1992-1996).

International Development Research Centre of Canada: Coordinator, “Global Fisheries Socioeconomics Project” (\$10,000: 1991-1993).

International Development Research Centre of Canada: “Chinese Integrated Fish Farming” (\$60,000: 1989-1995).

Natural Sciences and Engineering Research Council of Canada, Operating Grant: “Integrated Models of Fishery Systems: Industrial Structure and Dynamics” (\$52,000: 1989-1992).

Department of Fisheries and Oceans Research Grants: “Fisheries and Aquaculture in Atlantic Canada: Bioeconomic Models & Policy Analysis” (\$12,000: 1990-91).

## **CONTRACTUAL RESEARCH**

Organisation for Economic Co-operation and Development (OECD): Keynote Paper and Presentation on “The Human Dimension of Fisheries Adjustment: Overview of Key Issues and Policy Challenges” for the Expert meeting on the Human Side of Fisheries Adjustment, Paris, France (2006).

Organisation for Economic Co-operation and Development (OECD): “The Social Effects of Subsidies to the OECD Fisheries Sector: A Scoping Paper on Key Issues and Analytical Directions” (2003).

Food and Agriculture Organization of the United Nations (FAO): “Use Rights” chapter in Fishery Manager’s Guidebook (1999-2001). [Member of an international team selected by FAO to develop a handbook oriented to fishery managers, particularly in developing countries.]

Food and Agriculture Organization of the United Nations (FAO): “Aquaculture Economics in Developing Countries” (1996-1997). [Coordinator of a project to produce regional assessments and annotated bibliographies of the state of knowledge in aquaculture economics.]

Costa Rican National Council for Research in Science and Technology (CONICIT): “Study on the State of Research in Marine Sciences” (1994). [Principal researcher, strategic assessment of marine science research throughout Costa Rica.]

Department of Fisheries and Oceans: “Analysis of Fixed versus Re-randomized Stations in a Groundfish Trawl Survey” (1991). [Supervision of research on the efficiency of sampling methods for fishery trawl surveys.]

International Centre for Ocean Development: “Fishery Management and Development: A Policy and Strategic Assessment” (1991). [Assessment of programming in fisheries management and development, and preparation of a draft fishery programming policy.]

Department of Fisheries and Oceans: “Fishery Law Enforcement: Applications of Economic Analysis and Operations Research Models” (1990). [Compilation of available research on the economics and operational analysis of law enforcement in fisheries.]

GTA Fisheries Consultants: “Economic Analysis of Inshore Atlantic Groundfish Fleets” (1987-1988). [Statistical analysis of aggregate fisher cost and earnings data.]

## **POST-GRADUATE FELLOWS AND VISITING FACULTY/RESEARCHERS**

- Silvia Salas, Ph.D. Post-doctoral Fellow (2000-2001). Research topic: Bioeconomic Models of Lobster Fisheries in Canada and Mexico.
- Xiongzhi Xue, Ph.D. Post-doctoral Fellow (1999-2000). Research topic: Comparative Analysis of Coastal Zone Management in China and Canada.
- D. Rajasenani, Ph.D. Shastri Scholar (1996). Employment: Department of Applied Economics, Cochin University of Science and Technology, India.
- Carsten Lynge Jensen Visiting Researcher (1995). Danish Institute of Fisheries Economics Research, Esbjerg, Denmark.
- Chiwen Yang, Ph.D. Post-doctoral Fellow (1990-1992). Employment: financial analyst, Bank of Nova Scotia, New York.
- Trevor Kenchington, Ph.D. Post-doctoral Fellow (1988-1990). Employment: fishery consultant, Gadus Associates, Halifax, Nova Scotia.
- Moustapha Deme, M.S. International Centre for Ocean Development, Trainee (1989). Employment: Centre de Recherches Oceanographiques, Senegal.

## **SUPERVISION / EXAMINATION OF GRADUATE STUDENTS**

- Kate Bigney, Interdisciplinary Ph.D. (In Progress).  
Dalhousie University (Supervisor).  
“Interactions and Linkages of Community-Based Management and Ecosystem-Based Management for Fisheries and other Coastal Resources”
- Minerva Arce, Interdisciplinary Ph.D. (2007).  
Dalhousie University (Supervisor).  
“Livelihoods, Aquatic Resources and Non-Monetary Values of Local Natural Resources in Mexico’s Lowland Maya Area”
- Carolyn Hedley, Master of Environmental Studies (2006).  
School for Resource & Environmental Studies, Dalhousie University (Thesis Committee).  
“An Assessment of the Eastern Scotian Shelf Integrated Management Initiative”
- Jorge Angulo, Ph.D. (2005).  
Interdisciplinary Studies, Dalhousie University (Thesis Committee)  
“Marine Protected Area Development in Cuba”
- Laura Loucks, Ph.D. (2005).  
Resource and Environmental Management, Simon Fraser University (Thesis Committee)  
“The Evolution of the Area 19 Snow Crab Co-Management Agreement: Understanding the Interrelationship Between Transaction Costs, Credible Commitment & Collective Action”
- Kate Bigney, Master of Environmental Studies (2005).  
School for Resource & Environmental Studies, Dalhousie University (Thesis Committee).  
“Community-Based Quota Management of the Scotia-Fundy Groundfish Fishery”

- Pramod Ganapathiraju, Master of Marine Management (2005).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“The Trawl Fishery of India’s Northeast Coast: An Analysis of catches, seasonal changes and ecological impacts”
- Merlina Andalecio, Ph.D. (2004).  
Department of Biology, Dalhousie University (Thesis Committee).  
“Assessment of Fishery Management Systems in Selected Bay Areas in the Philippines”
- Angel Herrera, Ph.D. (2004).  
Northwest Center for Biological Research (CIBNor, Mexico). (Thesis Committee)  
“Environmental Indicators for Sustainable Development of the Tourism Industry in La Paz and Los Cabos, Baja California Sur: Comparison and Recommendations”
- Gina Funicelli, M.B.A. (2004).  
Faculty of Commerce, Saint Mary’s University (Supervisor).  
“Innovation in the Fisheries Industry: How Will Acadian Communities in Southwest Nova Scotia Plan Their Future?”
- Peter Hayes, M.A. (2004).  
International Development Studies, Saint Mary's University. (Thesis Committee)  
“Participatory Micro-Integration of Vulnerable Coastal Communities into Climate Change Adaptation Strategies for Sustainable Livelihoods: A Case Study of Dominica”
- Kofi Ankamah, Master of Marine Management (2004).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“Modern Approaches to Fisheries Monitoring, Control and Surveillance: An Assessment of their Relevance to Developing Countries”
- Lucia Fanning, Ph.D. (2003).  
Interdisciplinary Studies, Dalhousie University (Thesis Committee)  
“Influence Analysis of Policy Network Actors on Decisions Affecting Ocean Use and Space in Atlantic Canada”
- Tavis Potts, Ph.D. (2003).  
University of Tasmania (External Examiner).  
“Sustainability Indicators in Marine Capture Fisheries”.
- Jennifer Hatt, Master of Atlantic Canada Studies (2002). Saint Mary’s University (Supervisor).  
“On the Shoreline of Success: A Grower-Centred Examination into Definitions of and Impacts on Success in Aquaculture Ventures in Nova Scotia”.
- Heather Boyd, Master of Environmental Studies (2002).  
School for Resource & Environmental Studies, Dalhousie University (Supervisor).  
“Fisheries Indicators: Development and Evaluation of Indicators to Monitor Fisheries Sustainability at the Community Level”.
- Erin Breen, Master of Marine Management (2002).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“A Brief Exploration of Community Priorities in Three Newfoundland Fishing Communities and their Relationship with Indicators to Monitor Fisheries Sustainability”.

- Pierre Clement, Master of Marine Management (2001).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“The Role of Scientific Advice in the Management of Salmon Mariculture Development in Southwest new Brunswick”
- Bertrand LeGallic, Ph.D. (2001).  
Universite de Bretagne Occidentale, Brest, France (External Examiner).  
“Bioeconomic Modelling and Sustainable Management of a Complex System of Common Renewable Resources. Application to the Case of English Channel Fisheries”.
- Carolyn Moore, Master of Environmental Studies (2001).  
School for Resource & Environmental Studies, Dalhousie University (External Examiner).  
“The Application of an Environmental Management Strategy to Fisheries: A Case Study of the Fishery of the Chippewas of Nawash First Nation”.
- Tara Barnable, Master of Environmental Studies (1999).  
School for Resource & Environmental Studies, Dalhousie University (Supervisor).  
“Use Rights & ‘Community’ Management: Case Studies of a Scotia-Fundy Experiment”.
- Jennifer Graham, Master of Environmental Studies (1998).  
School for Resource & Environmental Studies, Dalhousie University (Thesis Committee)  
“Making Links: Participation in Community Fisheries Management in Nova Scotia and the Philippines”.
- Laura Ferriera, Master of Marine Management (1998).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“Economic Analysis of the Shrimp Trawl Fisheries of Trinidad”.
- Clarrie MacKinnon, Master of Marine Management (1997).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“The Northwest Atlantic Fisheries Organization: An Objective, Internal View”.
- Andre Kong, Master of Marine Management (1997).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“A Critical Review of the Jamaica Conch Management Plan: Management Recommendations for the Artisanal Conch Fishery”.
- Michael Honeth, Master of Marine Management (1997).  
Marine Affairs Program, Dalhousie University (Supervisor).  
“Individual Transferable Quotas: Nova Scotian Fishing Communities in a Closed Ocean”.
- Blair Richards, M.B.A. (1997).  
Faculty of Commerce, Saint Mary’s University (Supervisor).  
“Halterm Gatehouse Research Project”.
- Aggrey Ambali, Ph.D. (1996).  
Biology, Dalhousie University (Thesis Committee).  
“The Relationship Between Domestication and Genetic Diversity of Tilapias in Malawi”.
- Maureen Connolly, M.B.A. (1996).  
Faculty of Commerce, Saint Mary’s University (Supervisor).  
“A Survey-Based Analysis of Nova Scotian Fishermen Investment Behaviour”.

- Sean McDonnell, M.D.E. (1996).  
Economics, Dalhousie University (Thesis Committee).  
“An Integrated Bioeconomic Analysis of Atlantic Salmon Aquaculture”.
- Ian Joyce, Ph.D. (1996).  
Interdisciplinary, Simon Fraser University (External Examiner).  
“Fisheries of the Cuban Insular Shelf: Culture History and Revolutionary Performance”.
- Narendra Jain, M. Applied Science (1994).  
Industrial Engineering, Technical University of Nova Scotia (Thesis Committee).  
“A Multi-Scenario Decision Model for the Engineering Economics of Capital Intensive Projects”.
- Cherdsak Virapat, Ph.D. (1993).  
Biology, Dalhousie University (Thesis Committee).  
“Bionomics of Fish Stocking in Two Thai Reservoirs: Biological, Management and Development Perspectives”.
- Hisafumi Kusuda, Ph.D. (1993).  
Economics, University of British Columbia (External Examiner).  
“Individual Transferable Fishery Quotas Under Uncertainty”.
- Veronika Brzeski, M.Sc. (1993).  
Biology, Dalhousie University (External Examiner).  
“Artisanal Broodstock Improvement in Indonesian Aquaculture: An On-the-Farm Experiment in Genetics”.
- Mary Gregory, M.A. (1992).  
Economics, Dalhousie University (Thesis Committee).  
“The Structure of Property Rights and Fisheries Management Options”.
- Christopher Wright, Ph.D. (1991).  
Interdisciplinary, Simon Fraser University (External Examiner).  
“A Systems Approach to Fisheries Management”.
- Rohkmin Dahuri, Ph.D. (1991).  
Resource and Environmental Studies, Dalhousie University (Thesis Committee).  
“Optimization Model of Coastal Resource Utilization: The Nature and Role of Sustainable Development in East Kalimantan Coastal Zone”.
- Richard McGarvey, Ph.D. (1991).  
Biology, Dalhousie University (Thesis Committee).  
“The Dynamics of the Georges Bank Scallop Fishery”.
- Olu Olojede, Master of Environmental Studies (1991).  
Resource and Environmental Studies, Dalhousie University (Thesis Committee).  
“Fisheries and Joint Ventures in West Africa: Sustainable Economic Development”.
- Chiwen Yang, Ph.D. (1990).  
Biology, Dalhousie University (Supervisor). “Description and Prediction of Multispecies Dynamics: A Transition Probability Approach”.

Harvey Millar, Ph.D. (1990).

Industrial Engineering, Technical University of Nova Scotia (Thesis Committee).  
“A Hierarchical Production Planning Approach for Integrated Fishing Firms  
Under an Enterprise Allocation System”.

Derek Wallace, M.B.A. (1990).

Saint Mary’s University (Supervisor).  
“Economic Value of the Nova Scotia Recreational Salmon Fishery”.

Lolita Villareal, Master of Development Economics (1988).

Economics, Dalhousie University (Supervisory Committee).  
“The Philippines in the International Shrimp Market: 1970-1985”.

Scott Flewelling, M.B.A. (1987).

Saint Mary’s University (Supervisory Committee). “Determining the Economic Feasibility  
of Operating a Salmon Farm in Nova Scotia”.

James Duncan, M.B.A. (1986).

Saint Mary’s University (Supervisor). “Economic Evaluation of Reforestation Methods: A  
Cost/Success Model with a Black Spruce Case Study”.

## PUBLICATIONS

A.T. Charles, "Turning the Tide: Toward Community-Based Fishery Management in Canada's Maritimes". *Proceedings of the 4th World Fisheries Congress*. American Fisheries Society and University of British Columbia Fisheries Centre. Vancouver, B.C. (to appear, 2007).

M. Wiber, F. Berkes, A.T. Charles and J. Kearney. "A Participatory Approach to Identifying Research Needs for Community-Based Fishery Management" *Proceedings of the 4th World Fisheries Congress*. American Fisheries Society and University of British Columbia Fisheries Centre. Vancouver, B.C. (to appear, 2007).

A.T. Charles and C. De Young, "Benefits and Costs of Implementing the Ecosystem Approach to Fisheries". *Proceedings of the Bergen Conference on Implementing the Ecosystem Approach to Fisheries*, September 2006 (to appear, 2007).

A.T. Charles, "Adaptive Co-Management for Resilient Resource Systems: Some Ingredients and the Implications of their Absence". In: *Adaptive Co-Management* (D. Armitage, F. Berkes and N. Doubleday (editors). UBC Press. Vancouver, Canada. (to appear, 2007).

S.M. Garcia and A.T. Charles, "Fishery Systems and Linkages: From Clockwork to Soft Watches" *ICES Journal of Marine Science* 64:580-587 (2007).

J. Kearney, F. Berkes, A.T. Charles, E. Pinkerton and M. Wiber. "The Role of Participatory Governance and Community-Based Management in Integrated Coastal and Ocean Management in Canada". *Coastal Management* 35:79-104 (2007).

A.T. Charles, A. Bull, J. Kearney and C. Milley, "Community-Based Fisheries in the Canadian Maritimes". p.274-301 in *Fisheries Management: Progress toward Sustainability* (T. McClanahan and J.C. Castilla, editors). Blackwell Publishing, Oxford, UK (2007).

U.R. Sumaila, A.T. Charles and G. Sylvia (Editors), "Topical Problems in Fisheries Economics". Special Issue of *Marine Resource Economics*, Volume 21(4) (2007).

U.R. Sumaila, A.T. Charles, and G. Sylvia, "Topical Problems in Fisheries Economics: An Introduction". *Marine Resource Economics* 21:337-340 (2007).

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## **INVITED CONFERENCE PRESENTATIONS**

2006. “The Human Dimension of Fisheries Adjustment: An Overview of Key Issues and Policy Challenges”, Expert meeting on the Human Side of Fisheries Adjustment, OECD. Paris, France.

2005. “Bioethics of the Sea: How do we responsibly manage and regulate fishery resources?”, Workshop on Bioethics of the Sea, Nordic Committee on Bioethics, Bergen, Norway.

2005. “The Big Picture: Fishery Management, Ocean Management and Biodiversity”, Workshop on Biodiversity Challenges for Fisheries Management, International Conference on Biodiversity Science and Governance, Paris, France.

2004. “Policy and Management for Sustainable and Resilient Coastal Fisheries”, COASTFISH Conference on Coastal Fisheries in Latin America and the Caribbean, Merida, Mexico.

2004. “Toward Sustainable and Resilient Fisheries: A Fishery-System Approach to Overcoming the Factors of Unsustainability”, International Workshop on Factors of Unsustainability in Fisheries: Addressing Management Challenges, Siem Reap, Cambodia.

2004. “A Socioeconomic Analysis of Individual Transferable Quotas and Community-Based Fishery Management”, 2004 Annual Meeting, Northeastern Agricultural and Resource Economics Association, Halifax, Nova Scotia.

2004. "Learning from Coastal Management to Improve Fisheries Management", Coastal Zone Canada 2004 Symposium on *Innovative Integration of Fisheries and Coastal Management*, St. John's, Newfoundland.

2003. "Climate Change and Fisheries: A Socioeconomic Perspective on Impacts and Adaptation", Workshop on Impact and Adaptation Responses of Fish and Fisheries to Climate Change, Canadian Climate Impacts and Adaptation Research Network (C-CIARN), Ottawa, Ontario.

2002. "Turning the Tide: Community Management of Fisheries and Coastal Resources", Aboriginal Policy Research Conference, Indian and Northern Affairs Canada, Ottawa Ontario.

2001. "Mi'Kmaq Fisheries in Atlantic Canada: Traditions, Legal Decisions and Community Management" (with C. Milley), *People and the Sea: Maritime Research in the Social Sciences: An Agenda for the 21st Century*. University of Amsterdam and SISWO (Netherlands Institute for the Social Sciences), Amsterdam, The Netherlands.

2001 "Marine Conservation Challenges: The Human Angle", Conference of the Canadian Council on Ecological Areas, Charlottetown PEI.

2001. "Facilitating Community-Based Management in the Canadian Maritimes through Participatory Research: Defining the Research Issues" (with M. Wiber, J. Kearney, F. Berkes), *People and the Sea: Maritime Research in the Social Sciences: An Agenda for the 21st Century*. University of Amsterdam and SISWO (Netherlands Institute for the Social Sciences), Amsterdam.

2000 "Designing and Implementing Marine Protected Areas: Coping with Complexity", Marine Exclusion Zones in Europe: A Facilitated Multidisciplinary Conference, Southampton U.K.

2000 "Use Rights: Overview and Multi-Objective Analysis", Property Rights Session, 10th Conference of the International Institute for Fisheries Economics and Trade, Corvallis U.S.A.

1998 "Managing Ocean Resources for Sustainability: The Case of the Fishery", International Conference on the Economics of the Oceans, Lisbon Portugal.

1997 "Living with Uncertainty", Fisheries Management under Uncertainty Symposium: Objectives and Uncertainties in Fisheries Management with Emphasis on Three North Atlantic Ecosystems, Bergen, Norway.

1997 "Marine Conservation Areas", Workshop on Marine Conservation Areas for Newfoundland, Summit of the Sea Conference, St. John's, Newfoundland.

1996 "Property Rights and Use Rights in Fisheries" (Commentary on Presentation by Francis T. Christy), 8th Conference, International Institute for Fisheries Economics and Trade", Marrakech, Morocco.

1995 "Bio-Socio-Economic Modelling of Management Options in Invertebrate Fisheries", North Pacific Symposium on Invertebrate Stock Assessment and Management, Department of Fisheries and Oceans, Nanaimo, Canada (1995).

1995 "People and Fish: Sustainable Development of Aquatic Ecosystems", Canadian Society of Zoologists, 1995 Meeting, Rimouski Quebec.

1995 “The Path to Sustainable Fisheries”, XXIII Pacem in Maribus Conference, International Ocean Institute, Puntarenas, Costa Rica.

1995 Discussant, “Sustaining the Fisheries Resources: Implications for Industrial Structure and the Labor Market”, Conference on Sustainable Development and the Labour Market, Canadian Employment Research Forum, Ottawa, Ontario.

1993 “From Fishing to Farming: Bio-Socio-Economic Models of Occupational Transformation”, Fourth Annual Common Property Conference, Manila, Philippines.

1993 “Conflict in the Coastal Commons: Canada and Costa Rica”, Fourth Annual Common Property Conference, Manila, Philippines.

1992 “Sustainable Development and Resource Analysis: Developing World Challenges”, Fifth Interdisciplinary Conference on Natural Resource Modelling and Analysis, St. John’s.

1991 “Aquaculture and Fishery Models: Applications in the Developing World”, 10th Pacific Coast Conference on the Mathematical Modeling of Renewable Natural Resources, Resource Modeling Association, Arcata CA.

1991 “Sustainability Lessons from the Fishery Sector”, International Conference on Economic Policies for Sustainable Development in Central America, San Jose, Costa Rica.

1989 “Small-Scale Fisheries in North America: Research Perspectives”, Conference on Research in Small-Scale Fisheries, IFREMER/ORSTOM, Montpellier, France.

1988 “Bioeconomic Modelling in Fisheries and Aquaculture”, International Workshop on Statistical Ecology and Its Application in Fisheries, Wuxi, China.

1987 “Fish, Capital and Information: A Bayesian Simulation Model”, Canadian Operations Research Conference, Calgary, Alberta.

1982 “Fisheries, Dynamics and Uncertainty: Major Developments in the Economics of Fisheries Management”, Programme in Natural Resource Economics Conference, University of British Columbia, Vancouver, British Columbia (with C.W. Clark and G.R. Munro).

1981 “Irreversible Investment and Optimal Fisheries Management: A Stochastic Analysis”, Workshop on Uncertainty and Fisheries Economics, University of Rhode Island, Providence R.I. (with G.R. Munro).

### **CONFERENCE PRESENTATIONS (Contributed)**

(For published conference papers, see under “Publications” above.)

2006. “Marine Protected Areas and Fisheries Management: A Framework for Decision-making”. Coastal Zone Canada 2006, Tuktoyaktuk, Canada.

2006. "Benefits and Costs of Implementing the Ecosystem Approach to Fisheries", Bergen Conference on Implementing the Ecosystem Approach to Fisheries, 26–28 September 2006. Bergen, Norway.

2006. "Community Fishery Rights: Issues, Approaches and Atlantic Canadian Case Studies", 13th biennial conference, International Institute of Fisheries Economics and Trade. Portsmouth, UK.

2005. "Community Fishery Rights in Canada's Atlantic Region", Workshop on New Developments in Rights-Based Fisheries Management: Community Fishing Rights. 29-30 August 2005. University of Southern Denmark. Esbjerg, Denmark.

2004. "Designing Integrated Indicator Systems: A Case Study of Nova Scotia Fishery and Marine Environment Accounts", 8th Biennial Conference, International Society for Ecological Economics, Montreal, Quebec.

2004. "Turning the Tide: Community Management of Fisheries and Coastal Resources", 4th World Fisheries Congress, Vancouver B.C.

2004. "Participatory Research Supporting Community-Based Fishery Management", 4th World Fisheries Congress, Vancouver B.C.

2002 "Community-Based Fisheries Management", Ocean Management Research Network National Conference, Ottawa, Ontario.

2001 "Distributional Impacts of Marine Protected Areas: A Bioeconomic Analysis", World Conference on Natural Resource Modeling, Logan, Utah, USA.

2000 "Sustainability Indicators for Natural Resource Systems: An Integrated Framework and a Fishery Application", EcoSummit 2000, Halifax, N.S.

1999 "Marine protected areas, uncertain stock structure and biodiversity conservation", World Conference on Natural Resource Modeling, Halifax, Nova Scotia.

1998 "Atlantic Canada's Fisheries Resource Conservation Council", Coastal Zone Canada, Victoria, B.C.

1998 "Coping with Uncertainty: Canada's Fisheries Resource Conservation Council", Symposium on Confronting Uncertainty in Evaluation & Implementation of Fishery Management Systems, International Council for the Exploration of the Sea (ICES), Cape Town, South Africa.

1996 "Beyond the Status Quo: Re-thinking Fishery Management", Symposium on Reinventing Fisheries Management, University of British Columbia, Vancouver, B.C.

1995 "A Predictive Model of Illegal Fishing", World Conference on Natural Resource Modelling, Pietermaritzburg, South Africa (with R.L. Mazany and M.L. Cross).

1994 "Sustainable Fisheries: People and Resources", American Fisheries Society 124th Annual Meeting, Halifax, N.S.

1994 "Bio-Socio-Economic Modelling and Sustainability Analysis", Seventh Interdisciplinary

Conference on Natural Resource Modelling and Analysis, London, England.

1994 “Costa Rican Coastlines: Mangroves, Reefs, Fisheries and People”, Coastal Zone Canada, Halifax, N.S.

1994 “Chinese Integrated Fish Farming: Estimation of Production Functions”, International Workshop on Integrated Fish Farming, Wuxi, China (with H. Chen and B. Hu).

1993 “Bioeconomic Models of Fishery/Aquaculture Interactions”, International Conference on Fisheries Economics, Bergen, Norway.

1992 “Of Mangroves, Coral Reefs and Sustainable Communities: Costa Rica’s Common Property Fisheries”, Third Annual Common Property Conference, Washington, D.C.

1990 “Sustainable Fisheries: Management Paradigms and Bio-Socio-Economic Models”, (First) Conference on the Ecological Economics of Sustainability, Washington, D.C.

1990 “Natural Resource Investment Models”, 3rd Interdisciplinary Conference on Natural Resource Modelling and Analysis, Cornell University, Ithaca, N.Y.

1989 “Fisheries Regulation and Investment Behaviour”, Annual Meeting, Canadian Economics Association, Laval University, Quebec (with Leigh Mazany and Melvin Cross).

1989 “Behavioral Models of Illegal Fishing”, 2nd Interdisciplinary Conference on Natural Resource Modelling and Analysis, Tallahassee, Florida.

1988 “Fisheries Regulation, Investment and Institutional Arrangements in Nova Scotia”, Annual Meeting, Canadian Economics Assoc., Windsor, Ontario (with Leigh Mazany & Melvin Cross).

1988 “Bioeconomic Models of Fishery Development”, International Conference on Biomathematics, Xi’an, China.

1988 “Bio-Socio-Economic Resource Models: Labour Dynamics & Multiobjective Management”, Interdisciplinary Conference on Natural Resource Modelling and Analysis, Halifax, N.S.

1988 “The Truncated Lognormal, Bayesian Updating and Optimal In-Season Fishery Management”, Canadian Operations Research Society Conference.

1987 “Socioeconomic Fishery Models: The Role of Labour and Community Dynamics”, Canadian Economics Association Meeting, Hamilton, Ontario.

1987 “A Bioeconomic Simulation Model of Fleet Dynamics and Fishery Development”, Sixth Pacific Coast Resource Modelling Conference, Vancouver, B.C.

1987 “Adaptive Management of an Uncertain Natural Resource: An Optimization Model with Bayesian Updating”, 1<sup>st</sup> International Conf. on Industrial & Applied Mathematics, Paris, France.

1986 “In-season Fisheries Management: A Bayesian Model”, Fifth Pacific Coast Resource Modelling Conference, Newport, Oregon.

1986 “Fishery Development and Foreign Fleets: An Economic Optimization Model”, Canadian Economics Association Meeting, Winnipeg, Manitoba.

1985 “Inshore vs. Offshore: Bioeconomic Analysis of Sequential Fisheries”, Fourth Pacific Coast Resource Modelling Conference, San Louis Obispo, CA.

1985 “The Value of Information to Electricity Investment Planners”, Atlantic Schools of Business Conference, Acadia University, Wolfville, N.S.

1984 “Computational and Numerical Methods in Renewable Resource Management”, Society for Industrial and Applied Mathematics Meeting, University of Washington, Seattle WA.

1984 “Bayesian Fisheries: Investment and Management Strategies with Imperfect Information”, Canadian Applied Mathematics Society, University of British Columbia, Vancouver, B.C.

1982 “A Stochastic Two-State Two-Control Model of Optimal Fisheries Investment”, Society for Industrial and Applied Mathematics 30th Anniversary Meeting, Stanford Univ., Stanford CA.

1981 “Bioeconomic Fisheries Management”, Western Regional Meetings, The Institute of Mathematical Statistics and Biometric Society, University of Victoria, Victoria, B.C.

#### **INVITED PRESENTATIONS: SEMINARS, WORKSHOP AND PUBLIC LECTURES**

2006. “Benefits and Costs of Implementing the Ecosystem Approach to Fisheries”, Norwegian College of Fishery Science, University of Tromsø, Tromsø, Norway.

2006. “Benefits and Costs of Implementing the Ecosystem Approach to Fisheries”, University of Brest, Brest, France.

2006. “Ecosystem Approaches, MPAs, Fisheries and People”, Bedford Institute of Oceanography, Halifax, Canada.

2006. “People and Fish: Policy and Management for Sustainable Coastal Fisheries”, Fisheries Department, Food and Agriculture Organization of the United Nations. Rome, Italy.

2006. “Fishery Ecosystems and Ocean Space”, Fisheries Department, Food and Agriculture Organization of the United Nations. Rome, Italy.

2004. “Success Stories in Saving the Seas”, Saint Mary’s University, Halifax Canada.

2004. “Past and Future Directions in Fishery Management”, AquaLink Workshop on Innovation and Outlook in Fisheries, Vancouver Canada.

2004. “Sustainability and Resilience in Resource Systems: Indicator Frameworks and Policy Directions”, (a) CINVESTAV, Merida, Mexico, and (b) EcoSur, Chetumal, Mexico.

2002. “Developing Indicators for Fisheries and Oceans Management”, Oceans Branch, Fisheries and Oceans Canada, Ottawa Canada.

2002. “Fisheries and Oceans Indicators”, Harvest Fisheries Seminar Series, Bedford Institute of

Oceanography, Fisheries and Oceans Canada (Marine Fish Division / Invertebrate Division / Anadromous Fish Division), Dartmouth Canada.

2002. "Fishery Indicators: Conceptual Approaches and a Canadian Application", Imperial College, London U.K.

2000 "Uncertainty and Risk: Implications for Forecasting and Management", Climate Change and Adaptations Science Workshop, Department of Fisheries and Oceans, Halifax Canada.

2000 "Living with Uncertainty: The Precautionary Approach", Workshop on the Precautionary Approach, Department of Fisheries and Oceans, Halifax Canada.

1998 "Atlantic Canada's Groundfishery and the Fisheries Resource Conservation Council", Department of Biology, Dalhousie University, Halifax, N.S.

1997 "Sustainable Coastal Fisheries: Policy Directions for Improved Resource Management", Study Group on the Economic Uses of the Oceans, Independent World Commission on the Oceans, Lisbon, Portugal.

1995 "The Economics of Gear Technologies", Panel on Harvesting Technology, Coastal Communities Network, Cornwallis, N.S.

1995 "Fisheries Economics", Workshop of the Fishermen and Scientists Research Society, Antigonish, N.S.

1993 "Impacts of Uncertainty and Stochasticity on Industry Investment Strategies", Department of Industrial Engineering, Technical University of Nova Scotia, Halifax, N.S.

1993 "International Development Agencies and Their Response to UNCED", public lecture, Dartmouth Regional Library, Dartmouth, N.S.

1993 "Natural Resources and Sustainable Development: Micro Projects and Macro Environments", International Development Studies, Saint Mary's University, Halifax, N.S.

1993 "Crisis in the Atlantic Fishery", member of multidisciplinary panel, Department of Economics, Dalhousie University, Halifax, N.S.

1992 "Sustainable Development in Costa Rica", International Education Centre, Saint Mary's University, Halifax, N.S.

1991 "Environment and Economics", Symposium on Nova Scotia's Sustainable Development Strategy, Biology Department, Dalhousie University, Halifax, N.S.

1991 "The Canadian Atlantic Groundfish Fishery", Institute of Fisheries Analysis, Simon Fraser University, Burnaby, B.C.

1991 "Integrated Fish Farming in China", Aquaculture Program, Faculty of Biological Sciences, National University, Heredia, Costa Rica.

1990 "The Real World of Atlantic Fisheries: Interdisciplinary Perspectives", Department of Oceanography, Dalhousie University, Halifax, N.S.

1990 “Fish and Ships: Challenges to the Atlantic Fishery”, Halifax Field Naturalists, Spring Lecture Programme, Halifax, N.S.

1990 “The Structure of the Fishing Industry”, Training Programme for the Management and Conservation of Marine Resources, International Ocean Institute, Halifax, N.S.

1989 “Management of Coastal Fisheries”, Coastal Zone Management graduate course, School for Resource and Environmental Studies, Dalhousie University, Halifax, N.S.

1988 “Fisheries Economics”, Training Programme for the Management and Conservation of Marine Resources, International Ocean Institute, Halifax, N.S.

1987 “Fisheries Investment with Imperfect Information”, Workshop on Using Bioeconomics in Setting Quotas, Department of Fisheries and Oceans CAFSAC Marine Environment and Ecosystems Subcommittee, Dartmouth, N.S.

1987 “Fisheries Economics”, Training Programme for the Management and Conservation of Marine Resources, International Ocean Institute, Halifax.

1987 “Cost/Benefit Analysis in Fish Finding Technology”, Seminar on Fish Finding Technology, Technical University of Nova Scotia, Halifax, N.S.

1987 “Fishery Development”, International Development Studies program, Saint Mary’s University, Halifax, N.S.

1986 “Fisheries Bioeconomics”, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, St. John’s, Newfoundland.

1986 “Fisheries Investment with Imperfect Information”, Canadian Atlantic Fisheries Scientific Advisory Committee, Department of Fisheries and Oceans, Dartmouth, N.S.

1986 “Bioeconomics and Fisheries Modelling”, Gulf Fisheries Centre, Department of Fisheries and Oceans, Moncton, New Brunswick.

1984 “Fishery Management Models”, Peruvian Marine Institute, Callao, Peru.

1983 “An Economic Analysis of Inshore vs. Offshore Fisheries”, Program in Natural Resource Economics, University of British Columbia, Vancouver, B.C.