Curriculum Vitae James J. Anderson

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Personal

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www.cbr.washington.edu/

Affiliate faculty

Center for Statistics and the Social Sciences (www.csss.washington.edu/index.shtml)
Center for Studies in Demography and Ecology (csde.washington.edu/)
Quantitative Ecology and Resource Management P0pgram (depts.washington.edu/qerm/)

Education

1969	B.S., Oceanography, University of Washington, Seattle, WA
1977	Ph.D., Oceanography, University of Washington, Seattle, WA
	(Graduate Advisor Francis A. Richards)

Employment

2006 -	Research Professor, School of Aquatic and Fishery Sciences, UW, WA
2001-2006	Associate Research Professor, School of Aquatic and Fishery Sciences, UW, WA
1992-2001	Associate Professor, School of Aquatic and Fishery Sciences, UW, WA
1987-1991	Research Associate Professor, College of Ocean and Fishery Sciences, UW, WA
1983-1987	Research Assistant Professor, College of Ocean and Fishery Sciences, UW, WA
1981-1982	Research Associate, College of Ocean and Fishery Sciences, UW, WA
1981	Visiting Scientist, Dept. of Biophysics, University of Kyoto, Japan
1980-1983	Visiting Scientist, National Institute of Oceanology, Ambon, Indonesia
1980	Visiting Scientist, Institute of Oceanographic Sciences, Wormley, England

1977-1980	Adjunct Assistant Professor, Marine Sciences Research Center, State Univ. of New York, NY
1979-1980	Principal Oceanographer, Fisheries Research Institute, UW, WA
1969-1979	Oceanographer, Dept. of Oceanography, UW, WA

Honors and Awards

1997	Research is included in the UW publication *Pathbreakers: A Century of Excellence in Science and Technology at the University of Washington*
1996	College of Ocean and Fishery Sciences Distinguished Research Award
1993	Nomination for Computerworld Smithsonian Awards in programming for the CRiSP computer model of Columbia River salmon passage (www.cbr.washington.edu/crisp/crisp.html)
1990	Special Recognition for participation in the U. S. Fish and Wildlife Service Fish Passageways and Division Structures course
1989	Research Faculty Fellowship, College of Ocean and Fishery Sciences
1985	Research Faculty Fellowship, College of Ocean and Fishery Sciences

University Service

School

1988 - 2007 Computer Committee

College

1995-2002 Member, Computer Committee

University

2009-2014 New Faculty Lecture

International and National Committees and Activities

Public Service

2002-	SWARM Development Group Board of Directors (www.swarm.org)
2000, -1,-08	Speaker on the University of Washington faculty tour
2001-2002	Salmonweb President
1997-2002	Salmonweb Board of Directors: citizen stream monitoring organization
1998	Toured Tri-Cities, Walla Walla and Yakima with President Richard McCormick
1995	Provided analysis to the Snake River Endangered Species Recovery Team

1998-1990	Associate Editor, North American Journal of Fisheries Management
1987	Puget Sound water quality planning committee, ad hoc committee on nutrient
1990-1993	University Task Force on Salmon and the Columbia River System - represent the UW in a group of faculty from the NW universities with interests and expertise relating to the Columbia River system
1995	Ravenna Creek Feasibility Study - joined with representatives of neighborhoods adjacent to Ravenna

Expert Witness

Federal Energy Regulatory Commission Court, 1982

Memberships in Professional Societies

Sigma Xi

American Fisheries Society

Cognitive Society

Population Association of American

Editorial and Review Services

Journal Activities

1988-1989	Associate Editor, North American Journal of Fisheries Management
2010 –2013	Associate Editor, San Francisco Estuary and Watershed Science

Proposal Reviews

US Forest Service, EPA Environmental Biology Review Panel, EPA Environmental STAR Review Panel, NSF Biological Oceanography, Physiological Processes, U.S. Geological Survey, Natural Environmental Research Council, Great Britain, EPA Cooperative Research Programs, NSF Psychobiology, Research and Evaluation Associates, Inc. Bonneville Power Administration Technical Work Group, NSF Physiological Process Section, Oregon Coastal Salmon Restoration Initiative, National Marine Fishery Service, National Science Foundation, Human Frontier Science Program, Hungarian Scientific Research Fund

Journal Reviews

Journal of Marine Research, Limnology and Oceanography. Deep-Sea Research, Continental, Shelf Research, American Naturalist, Mahasagar-the quarterly journal in Oceanography, International Symposium and Educational Workshop on Fish-Marking Techniques, International Association for Great Lakes Research, North American Journal of Fisheries Management, Transaction of the American Fisheries Society, Canadian Journal of Fisheries and Aquatic Sciences, Northwest Environmental Journal (Illahee), Journal of the American Water Resources Association (JAWRA), Journal of Environmental Management, Journal of

Great Lakes Research, Hydrobiologia, Fisheries, Ecological Applications, Ecology, Palaeontologia Electronica, Mathematical Bioscience, Ecological Modelling, Journal of Fish Biology, Theoretical Population Biology, Reviews in Fisheries, Demographic Research, San Francisco Estuary and Watershed Science, Environmental Biology of Fishes, Ecological Engineering, River Research and Applications, Deep Sea Research, New Zealand Journal of Marine and Freshwater Research, Environmental Management Earth Sciences, Demography, African Journal of Biotechnology, Global Change Biology, Nature Interface, Science of the Total Environment.

National Review Panels

EPA Environmental Biology Review Panel, 1987

PATH (Plan to Analyze and Test Hypotheses) sponsored by Northwest Power Planning Council and NMFS to evaluate impacts of dam removal on Snake River salmon 1996-2000

EPA Environmental STAR Review Panel, 2001

CALFED Bay-Delta Restoration Panel, 2002

CALFED Bay-Delta Environmental Water Account Review Panel, 2001-2007

NMFS Salmon and Steelhead Technical Recovery Team for the Central Valley of California 2003-2006

OCAP Technical Review Panel to review National Marine Fisheries Service (NMFS) Fisheries October 2004 Biological Opinion on Long-term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP) 2005

California Bay Delta Conservation Plan (BCDP) Scientific Advisory Panel. 2007.

CALFED- Adaptive Management Planning Team (AMPT) for the ERP Delta Restoration Plan Delta Region al Ecosystem Restoration Implementation Plan (DRERIP). Editor for species models - 2007-2010

NOAA Fisheries Scientific Forum: 2008-2009 Collapse of the Sacramento Fall Chinook Stock and Decline of other West Coast Salmon Stocks.

Scientific Review of the Two Gates Project for the CALFED Bay-Delta Program – 2009

National Research Council Committee on Sustainable Water and Environmental Management in the California Bay-Delta – 2010-2012

Review Panel for NOAA National Marine Fisheries Service/ US Fish Wildlife Service review pane on the Central Valley Project Biological Opinion – 2010, 2011, 2012, 2013, 2014

Review Panel for NOAA National Marine Fisheries Service salmon life cycle models – 2011

Review Panel of San Joaquin River fall Chinook life cycle model for California Department of Fish and Game – 2012

Site Visit Committee to review the Natural Sciences and Engineering Research Council of Canada HydroNet Strategic Network Grant proposal – 2014

Review Panel for Biodemography of National Institute of Health – 2014

Review Panel on the Proposed Investigations on Understanding Population Effects and Factors that Affect Entrainment of Delta Smelt at State Water Project and Central Valley Project. Sponsored by Delta Stewardship Council California – 2014

Public Outreach

Public Hearings

Federal

Testimony presented before the Subcommittee on Water and Power of the US House of Representatives Committee on Resources. Washington D.C., June 1995

Testimony before the Subcommittee on Water and Power of the Senate Energy and Natural Resources Committee Washington D.C., June 1995 - Analysis of Snake River Spill

Testimony before the U.S. House of Representatives Subcommittee on Water and Power in Lewiston, Idaho, May 31, 1997

Testimony before the U.S. Senate Subcommittee on Water and Power in Vancouver, Washington, February 17, 1998

Testimony before the U.S. House of Representatives Committee on Resources, Pasco, Washington, September 2, 1998

Testimony before the U.S. Senate Subcommittee on Water and Power in Hood River, Oregon, April 6, 1999

Testimony before the U.S. House of Representatives Committee on Resources Subcommittee on Water and Power and Subcommittee on Fisheries, Conservation, Wildlife and Oceans, Washington D.C., May 27, 1999

Testimony before the Subcommittee on Water and Power of the Senate Energy and Natural Resources Committee, Washington D.C., April 2000 - State of Analysis of Endangered Salmon Stocks

Testimony before the Subcommittee on Fisheries, Wildlife and Water of the Senate Committee on Environment and Public Works, held in Boise, Idaho, November 20, 2000

Testimony before the U.S. House of Representatives Committee on Resources Subcommittee on Water and Power, Washington D.C., May 19, 2001

Testimony before the U.S. House of Representatives Committee on Resources concerning the use of science in the Endangered Species Act, Washington D.C., March 20, 2002

State

Oregon Joint House Senate Committee on Salmon Recovery, 1999

Oregon Department of Fish and Wildlife, 1999

U.S. Senate Committee on Energy and Natural Resources, 1999

Legislative Briefing to the Idaho State Legislature, 1999

Oregon Water Commission, 1998

Idaho Fish and Game Commission, 1998

Washington State House and Senate Subcommittees on the Environment, 1996

Northwest Power Planning Council, 1991, 1994, 1996, 1998, 1999, 2000, 2001, 2002

Oregon Department of Environmental Quality, 1995

Washington State Columbia River Task Force 2005

Oregon Joint House Senate Committee, 2007

Selected Interviews

Newspaper and Magazine Interviews

High country news, 2009

Washington Post, by Blaine Hardin, 2005

Boston Globe by Jessica Kowal, Globe Correspondent: As flow of salmon surges, US moves to cut protections. September 19, 2004

New York Time by Sam Howe Verhovek U.S. Giving a Lift to Salmon, But Future of Aid Is in Doubt. New York Times, May 6, 2000

Science Times-News, by N.S. Nokkentved. Scientists Tackle Salmon April 21, 2000, Twin Falls, Idaho

Charles C. Mann and Mark L. Plummer are the authors of Noah's Choice. *Can Science Rescue Salmon?* Science Magazine, August 4, 2000

Seattle Post-Intelligencer, by Robert McClure. *Snake River Dam Issue Defies Simple Answers.* May 26, 2000

The Idaho Statesman, by Rocky Barker. *Feds Consider Restricting Dams to Help Salmon* April 28, 2000

Tacoma News Tribune Steve Maynard; The News Tribune February 23 2001, Columbia needs care of all: CATHOLIC BISHOPS: Letter calls on people of Northwest to use river for 'common good,' assume responsibility.

Film and TV interviews

2000 – Interview by Washington Stage Farm Bureau on salmon and dams

2000 – CSPAN presentation of testimony before the Senate Power Water subcommittee of the Senate Energy and Natural Resources Committee

1999 – KIRO TV interview on global impacts on fish

1995 – McNeil Lehrer News Hour – Interview for story on Columbia River salmon

Research

Biomathematics, biodemography, ecosystem modeling, ecohydrology, fisheries, animal and human behavior and decision making.

Current Projects

1. ***Columbia River Salmon Passage Model (HYDRO/CBR)***

   Bonneville Power Administration $13,101,050 for 1989-2015 (current year $322,078)

   Develop a management model for Columbia River hydroelectric and fisheries agencies. The work involves building models and analyzing data on the migration and survival of salmon through the Columbia River System, creating and maintaining a computer network throughout the Pacific Northwest for model users.

   Collaborators: 1) Staff: Nick Beer, Christine Muongchanh, Chris Van Holmes, Susannah Iltis; 2) Current Grad. Student(s): Chloe Bracis, and Jeff Rutter.

2. ***Second-Tier Database Support (DART/CBR)***

   Bonneville Power Administration $4,490,014 for 1998-2015 (current year $293,938)

   The second-tier database and web services provide integration and direct and timely public access to Columbia Basin environmental, operational, fishery, administrative and other information essential to sound operational and resource management decisions by the Federal Government.

   Collaborators: 1) Staff: Nick Beer, Susannah Iltis, Christine Muongchanh, Chris Van Holmes,

3. ***Population Dynamics***

   Sea Grant Fellowship for Jeff Rutter $96,249 for 2012-2014 (current year $32,083)

   The project is part of the Ph.D. project of Rutter in which he is developing theory and analyzing data relating the effect of ocean conditions, resource competition, growth and length dependent survival on population regulation of juvenile salmonid during their first year in the ocean.

4. ***Vitality theory for biodemography***

   Department of Health and Human Services National Institutes of Health $334,586 for 2014-2016 (current year $170,154)

   A rigorous and tractable framework of how aging, genetics and environmental stresses shape human and animal mortality and the evolution of longevity remains elusive. In this research a new model synthesizes these processes through the perspective of extrinsic challenges to the individual's vitality.

Past Projects (1975-2014)

2006-2014. Juvenile Passage Model Development (Compass/NMFS) National Marine Fisheries Service for 2006-2014 ($440,000)

2011-2014	Integrated Cognitive Model of Movement Behaviors U.S. Army Corps of Engineers ($175,000)
2011	Vitality Study. Seed Grant from University of Washington Center for the Study of Social Sciences and Statistics ($25,000)
2007-2009	Adaptive Ecological Networks (AdEconet) U.S. Army Engineering Research and Development Center (NOAA) ($280,000)
2007-2008	Determine mechanisms of latent mortality: National Marine fisheries Service ($72,300).
2000-2006	Combined NMFS projects; funding to support graduate students ($294,562)
1989-2001	Subcontract to assist in developing Chinook Technical Committee model through ESSA Technologies, Ltd ($33,993)
1996-2000	Modeling Support for the Army Corps of Engineers ($1,243,028)
1996-2000	Plan for Analysis & Testing Hypotheses (PATH), Bonneville Power Administration ($852,317)
1999	EPA habitat assessment grant through University of California, Davis ($12,672)
1996-1999	Pacific Salmon Conservation, National Marine Fisheries Service ($559,259)
1995-1998	Smolt Mortality Data Analysis, National Marine Fisheries Service ($50,315).
1991	Monitoring fish behavior during pile driving. Port of Seattle ($10,000)
1990-1993	Estuarine turbidity maxima (ETM) in land margin ecosystems: model (Co-PI , C. Simenstad), National Science Foundation ($173,175).
1990	Sound generated by pile driving activities in the Puget Sound Area (PI), Manson Construction and Engineering ($85,308).
1990	Sound generated by pile-driving activity in Puget Sound and its effect on juvenile salmonids, State and Industry funding ($142,308).
1989-1990	Review and design criteria of behavioral fish guidance systems (PI), Army Corps of Engineers ($30,097).
1989	Columbia River Juvenile Salmon Survival and Predation Workshops (PI), Bonneville Power Administration ($62,139).
1989	Research Faculty Fellowship, College of Ocean and Fishery Sciences, UW ($10,000).
1989	Fish behavior modification using piezoelectric neural implants (PI), UW Graduate School ($2,500).
1988	Low frequency sound measurements at Bonneville Dam (PI), Army Corps of Engineers ($65,235).
1987-1988	Downstream migrant light response (PI), Stone and Webster Engineering Corp. ($62,950)
1987	Ecological risk assessment through a tripartite decision method (PI), Environmental Protection Agency ($30,100).

1986	Literature survey of mathematical models of tumor growth (PI), UW Marine/Freshwater Biomedical Research Center ($4,901).
1986-1987	Studies on fish behavior to improve fish guidance efficiency at hydroelectric projects (PI), Chelan Public Utility ($151,000)
1985	Research Faculty Fellowship, College of Ocean and Fishery Sciences, UW ($8,100).
1984-1987	Competitive disadvantage of organisms exposed to toxic substances as embryos (Co-PI), Environmental Protection Agency ($300,000). (PIs Landolt and Kocan).
1982-1984	Seahurst Baseline Study (project leader), Metro of Seattle ($600,000) (PI Stober)
1977-1978	Multidisciplinary Eastern Tropical Experiment (PI), Office of Naval Research ($175,000). (R.A. Richards was Co-PI)
1975-1977	Deep Ocean Mining Study (Co-PI), National Oceanic and Atmospheric Administration ($300,000). (R.A. Richards was Co-PI)

Courses

Course#	Course Title (quarter credits)	Date	Enrollment	Assessment (0-5)
QSCI 551	Organism Dynamics (3)[1]	Winter 1992	4	4.18
		Winter 1994	10	4.25
		Winter 1996	5	4.07
QSCI 550	Ecosystem Modeling,			
	2 lectures Stochastic Modeling	Autumn 1989		
	3 lectures Stochastic Modeling	Spring 1993		
	Team w Drs. Francis & Leschine	Spring 1995		
CQSCI 597	Behavioral Ecology Seminar (S)	Winter 1996	6	
CQSCI 597	Behavioral Ecology Seminar (S)	Summer 1993	3	
CQSCI 597	Seminar Disease in Ecology (2)	Winter 1993	11	
	with J. Murray of Applied Math			
CQSCI 598A	Columbia River Seminar	Autumn1988	13	
		Winter 1989	8	
		Spring 1989	7	
		Summer 1991	7	
CQSCI 598A	Scientific Writing Seminar (2)			
	1992, Summer		5	
	1993, Summer		3	
QERM 597	Graduate Seminar	Autumn 2009	13	
		Autumn 2010	7	
		Autumn 2011	12	
		Autumn 2012	8	
		Autumn 2013	5	

[1] Organism dynamics and individual based ecological models. Individual based models (IBMs) were used to model complex ecological systems by linking a series of smaller models defining aspects of organism performance or dynamics. Surveyed approaches to model organisms and their interactions including both physiological and behavioral dynamics over a range of scales from cells to complete organisms. Several approaches relating organism dynamics to their population were explored.

Graduate Students and Staff

Student Programs Completed that I chaired

Brett Dumbauld - M.S. Fisheries, 1985

The distributional ecology and zooplankton in east passage and the main basin of Puget Sound

Richard Nemeth - M.S. Fisheries, 1989

The photobehavior responses of juvenile chinook and coho salmon to strobe and mercury lights

Blake Feist - M.S. Fisheries, 1991

Potential impacts of pile driving on juvenile pink (Oncorhynchus gorbuscha) and chum (O. keta) salmon behavior and distribution

Richard Hinrichsen - Ph.D., Quantitative Ecology and Resource Management, 1994

Optimization models for understanding migration patterns of juvenile chinook salmon

Richard Zabel - Ph.D Quantitative Ecology and Resource Management, 1994

Spatial and temporal models of migrating juvenile salmonids with applications

Saang-Yoon Hyun - M.S. Fisheries, 1996

Ocean distribution of the Columbia River Hanford Reach and Snake River fall chinook salmon (Oncorhynchus tschawytscha) stocks and the effect of interannual ocean conditions on their survival

W. Nicholas Beer, M.S. Quantitative Ecology and Resource Management, 1996

A growth model for larval salmon with application to field and laboratory observations of chinook salmon (Oncorhynchus tschawytscha)

Susan Lubetkin - M.S. Quantitative Ecology and Resource Management, 1997

Multi-source mixing models: food web determinations using stable isotope tracers

Ashley Steel – Ph.D. Quantitative Ecology and Resource Management, 2000

In-stream factors affecting juvenile Chinook salmon migration (Co-chair P. Gutorp)

Owen Hamel - Ph.D. Quantitative Ecology and Resource Management, 2001

The Dynamics and Effects of Disease in Columbia and Snake River Salmon Populations

Saang-Yoon Hyun - Ph.D. Quantitative Ecology and Resource Management, 2002.

Bristol Bay salmon run timing prediction (Co-chair R. Hilborn)

Kevin Brinck – M.S. Quantitative Ecology and Resource Management, 2002

Comparing method for inferring site biological condition from a sample of site biota (Co-chair J. Karr)

Molly Cobleigh – M.S. Aquatic and Fishery Sciences, 2003

Stress, Growth and Survival of Juvenile Chinook salmon

Nathan Zorich – M.S. Aquatic and Fishery Sciences, 2004

Foraging behavior and swimming speed of the northern pikeminnow (Ptychocheilus oregonensis) in the Columbia River.

Abran Steel-Feldman – M.S. Quantitative Ecology and Resource Management – 2006

Learning models and animal behavior: exploring the dynamics of simple models

Ting Li – M.S. Quantitative Ecology and Resource Management – 2008

The Extension of the Vitality Model and Its Application

Eli Gurarie – Ph.D. Quantitative Ecology and Resource Management – 2008

Models of movement and migration: from individual tracks to mass dispersal

James Murphy – Ph.D. Aquatic and Fishery Sciences – 2010

Modeled movement and mating behavior of Alaska snow crab

Chloe Bracis – M.S. Quantitative Ecology and Resource Management – 2010

Modeled the high seas homing migration of Columbia River sprint Chinook

Ting Li – Ph.D. Quantitative Ecology and Resource Management – 2011

Visualize the Intrinsic and Extrinsic Processes that Determine the Patterns of Human Mortality

Jennifer Gosselin – Ph.D. Aquatic and Fishery Sciences – 2011

The Importance of Cumulative Experiences and Heterogeneity on Fish Survival: Examples from a model species (Poecilia reticulata) and juvenile salmonid species (Oncorhynchus spp.)

Daniel Widener – MS Aquatic and Fishery Sciences – 2012

Migration and bioenergetics of juvenile Snake River fall Chinook salmon

Gregor Passolt – M.S. Quantitative Ecology and Resource Management – 2012

A Predator Susceptibility Model of Juvenile Salmon Survival and a Voronoi Tessellation-based Approach for Generating Hypothetical Forest Landscapes.

Brian Burke – Ph.D. Aquatic and Fishery Sciences – 2014

Yearling Chinook salmon ecology and behavior during early-ocean migration

Kelsey Vitense – *Modeling hare-lynx dynamics of in southern Canada*. M.S. Quantitative Ecology and Resource Management – 2014 (chair)

Chloe Bracis – *Incorporating cognition into models of animal movement and predator-prey interaction* Ph.D. Quantitative Ecology and Resource Management – 2014 (chair)

Student Programs Completed on which I was a committee member

Syed Wajih Amad Naqui – Ph.D. National Institute of Oceanography Dona Puala, Goa India

Relationships between nutrients and dissolved oxygen and nitrate reduction in the Arabian Sea – 1986

Patrick J. Sullivan – Ph.D . Biostatistics University of Washington

A Kalman filter approach to catch-at-length analysis 1994

Thomas Keith Iverson – M.S. Aquatic and Fishery Sciences

Development of a subsidized commercial longline fishery for squawfish predation control in the Columbia River – 1994

Tomas C. Wainright – Ph.D . School of Fisheries University of Washington

Individual growth and population size structure in Cancer magister – 1994

Brian Houle – Ph.D. Department of Social Sciences University of Washington

Bio-Social Determinants of Child and Adult Mortality in South Africa. 2011

John Plumb – Ph.D. College of Natural Resources Department of Fish & Wildlife University of Idaho 2012 *Evaluation of Models and the Factors Affecting the Migration and Growth of Naturally-Produced Subyearling Fall Chinook Salmon (Oncorhynchus tshawytscha) in the Lower Snake River.*

Mark Wheldon – *Development of statistical methods for demography* . PhD. Department of Statistics Sciences, University of Washington – 2010 (committee member)

Menglin Wang– *Understanding Activity Location Choice with Mobile Phone Data*. PhD. Department of Civil & Environmental Engineering, University of Washington – 2014 (committee member)

Post docs

J. Hayes – 1995-1997

R. Zabel – 1995-1997

B. Lemasson – 2007-2009

J. Gosselin – 2012-2013

D. Sharrow – 2014-2016

Student programs in progress

Edward Zapel – *A Model for Analyzing the Effects of Changes in Outflow Distribution on Predation Rates in the Tailraces of Hydropower Dams* Ph.D. Aquatic and Fishery Sciences – 2004 (chair)

Jeff Rutter – *Exploring mechanisms of mortality in the first ocean year of Chinook salmon (Oncorhynchus tshawytscha)* Ph.D. Quantitative Ecology and Resource Management – 2011 (chair)

Brian Leo – Feline predator management on Roda Island (tentative title). M.S. Aquatic and Fishery Sciences – 2004 (chair)

Hanna Kinmouth-Schultz – *To understand the molecular mechanisms by which plants sense variations in temperature*. Department of Biology –2010 (committee member)

Elizabeth Phillips –*Document trends in seasonal species abundance and demonstrate the importance of the Columbia River plume habitat to marine predators*. Ph.D. Aquatic and Fishery Sciences – 2012 (committee member)

Justin Dellinger – *Influence of recolonizing gray wolves on mule and white-tailed deer behavior in north-central Washington* Ph.D. School of Environment and Forest Sciences – 2012 (committee member)

Lauren Wiesebron – *Evaluating the risk of environmental impacts in biological monitoring programs for tidal energy installations through an extreme value approach*. M.S. Aquatic and Fishery Sciences – 2014 (committee member)

Exu A. Mates – *Language of Crows*. Ph.D. Psychology – 2014 (committee member)

Staff (current)

N. Beer - Research Consultant

S. Iltis - Public Information Specialist

C. Van Holmes - System Analyst Programmer III

Publications

Manuscripts in revision/review/preparation

Anderson, JJ, C Bracis, A Steele-Feldman, and RA Goodwin (in revision). Merging decision-making perspectives from neuroscience and ecology to explain Pavlovian conditioning phenomena. *PLOS One*

Anderson, JJ, and T. Li. (in review). A two-process mortality model with extensions to juvenile mortality. Theoretical Population Biology

Sharrow, D, JJ Anderson (in review) Quantifying Intrinsic and Extrinsic Contributions to Human Longevity: Application of a Two-Process Vitality Model to the Human Mortality Database. Demography

Sharrow, D and JJ Anderson (in review) Danish Twin Survival from a Two-Process Mortality Perspective. *PLOS One*

Anderson, JJ, J Rutter and G. Passolt (in preparation). Effects of juvenile salmon size and growth on adult returns.

Anderson, JJ, (in preparation). A first principles framework for the evolution of longevity and body mass.

Anderson, JJ and J. Gosselin (in preparation) Differential latent mortality of salmon.

Gosselin, J, JJ Anderson, C. Van Holmes (in preparation). The influence of run-of-river and barge passage experience on relative post-hydropower-system survival of Chinook salmon in the Columbia River Basin throughout the season.

Burke, B. J., J. J. Anderson, J. Miller, L. Tomaro, D. Teel, N. Banas, and A. M. Baptista (in preparation) Estimating behavior in a black box: How coastal oceanographic dynamics influence yearling Chinook salmon marine migration behaviors

Steel, A. E. D Smith, B Mulvey J, Anderson (in preparation) Exploration of fine-scale survival of juvenile salmon using the mean free-path length mode

Refereed Publications

Li, T and JJ Anderson (2015) The Strehler-Mildvan Correlation from the Perspective of a Two-process Vitality Model. *Population Studies.* 91-104 10.1080/00324728.2014.992358

Vowles, AS., JJ Anderson, MH Gessel, JG Williams, PS. Kemp. (2014) Effects of avoidance behaviour on downstream fish passage through areas of accelerating flow when light and dark. *Animal Behaviour* 92(0): 101-109

Goodwin, R.A., M. Politano, J.W. Garvin, J.M. Nestler, D. Hay, J.J. Anderson, L.J. Weber, E. Dimperio, D.L. Smith, and M. Timko. (2014). "Fish navigation of large dams emerges from their modulation of flow field experience." *Proceedings of the National Academy of Sciences* 111(14):5277-5282.

Burke, B., Anderson, J. & Baptista, A. (2014) Evidence for multiple navigational sensory capabilities of Chinook salmon. *Aquatic Biology,* **20,** 77-90.

Burke, B.J., Liermann, M.C., Teel, D.J. & Anderson, J.J. (2013) Environmental and geospatial factors drive juvenile Chinook salmon distribution during early ocean migration. *Canadian Journal of Fisheries and Aquatic Sciences,* **70,** 1167-1177.

Beer, W.N. & Anderson, J.J. (2013) Sensitivity of salmonid freshwater life history in western US streams to future climate conditions. *Global Change Biology,* **19,** 2547-2556.

Steele-Feldman, A, and JJ Anderson (2012). Simple learning models can illuminate biased results from titration experiments. ARXIVE

Anderson, J.J., Gurarie, E., Bracis, C., Burke, B.J. & Laidre, K.L. (2013) Modeling climate change impacts on phenology and population dynamics of migratory marine species. *Ecological Modelling,* **264,** 83-97.

Bracis, C. & Anderson, J.J. (2013) Inferring the Relative Oceanic Distribution of Salmon from Patterns in Age-Specific Arrival Timing. *Transactions of the American Fisheries Society,* **142,** 556-567.

Gosselin, J. & Anderson, J. (2013) Resource competition induces heterogeneity and can increase cohort survivorship: selection-event duration matters. *Oecologia,* **173,** 1321-1331.

Li, T., Yang, Y. & Anderson, J. (2013) Mortality Increase in Late-Middle and Early-Old Age: Heterogeneity in Death Processes as a New Explanation. *Demography***,** 1-29.

Li, T and JJ Anderson (2013) Shaping human mortality patterns through intrinsic and extrinsic vitality processes. *Demographic Research.* 28(12): 341-372

Lemasson, BH, Anderson, JJ, and Goodwin, RA (2013) Motion-guided attention promotes adaptive communications during social navigation. *Proceedings of the Royal Society B*. 280: 174.

Committee on Sustainable Water Environmental Management in the California Bay-Delta Water Science Technology Board Ocean Studies Board Division on Earth Life Studies National Research Council (2012). Sustainable Water and Environmental Management in the California Bay-Delta, *The National Academies Press*. (JJ Anderson was committee member)

Enders EC, MH Gessel, JJ Anderson, and JG Williams. (2012) Effects of decelerating and accelerating flows on juvenile salmonid behavior. *Transaction of the American Fisheries Society 141: 357-364.*

Kemp, P, Anderson, JJ and Voles, A. (2012) Quantifying behaviour of migratory fish: application of Signal Detection Theory to fisheries engineering. *Ecological Engineering.* 41, 22-31.

Bracis, C and JJ Anderson. (2012) An investigation of the geomagnetic imprinting hypothesis for salmon. *Fisheries Oceanography. 21:170-181*

Beer, WN and JJ Anderson (2011). Sensitivity of juvenile salmonid growth to future climate trends. *River Research and Application*. 27(5): 663-669.

Murphy, JT., AB Hollowed and JJ Anderson (2010). Snow crab spatial distributions: examination of density-dependent and independent processes. *Wakefield Proceedings*

Biology and Management of Exploited Crab Populations under Climate Change. Alaska Sea Grant College Program University of Alaska Fairbanks AK-SG-10-01 49-80.

National Academy of Sciences. 2010. A scientific assessment of alternatives for reducing water management effects on threatened and endangered fishes in the California's Bay Delta. Committee on Sustainable Water and Environmental Management in the California Bay-Delta. *The National Academies Press; National Research Council, Washington, D.C.* http://wwWNap.edu/catalog/12881.html

Anderson, JJ 2010. Ratio− and Predator−Dependent Functional Forms for Predators Optimally Foraging in Patches. *American Naturalist*, 175:240-249.

Lemasson, BH, JJ Anderson, and RA Goodwin. 2009. Collective motion in animal groups from a neurobiological perspective. *Journal of Theoretical Biology*, 261:501-510.

Anderson, JJ and WN Beer. 2009. Oceanic, riverine and genetic influences on spring Chinook salmon migratory timing. *Ecological Applications*, 19(8):1989-2003.

Li, T and JJ Anderson. 2009. The vitality model: A way to understand population survival and demographic heterogeneity. *Theoretical Population Biology*, 76:118-131.

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Anderson, JJ 1988. A computer model for fish trajectories at Rocky Reach Dam: Indications that fish avoid low frequency sound made by the submersible traveling screen. Proceedings of the Electric Power Research Institute Conference on Fish Protection at Steam and Hydro Plants. San Francisco, CA. Oct. 28-30, 1987. EPRI CS/EA/AP-5663-SR, March.

Puckett, K and JJ Anderson. 1988. Conditions under which light attracts juvenile salmon. Proceedings of the Electric Power Research Institute Conference on Fish Protection at

Steam and Hydro Plants. San Francisco, CA. Oct. 28-30, 1987. EPRI CS/EA/AP-5663-SR, March.

Anderson, JJ, J Emlen, R Morison, G Swartzman, and R Park. 1988. Risk regulation through a tripartite decision method relating risk and uncertainty assessments to legal standards. EPA report.

Anderson, JJ, K Puckett and R Nemeth. 1988. Studies on the effect of behavior on fish guidance efficiency at Rocky Reach Dam: Avoidance to strobe light and other stimuli. Fisheries Research Institute Technical Report FRI-UW 8801.

Anderson, JJ and N Schumaker. 1988. A model to predict smolt migrations rate. Proceedings of the 1988 Workshop on Chinook and Coho. Bellingham, Washington.

Park, R, JJ Anderson, G Swartzman, R Morison and J Emlen. 1987. Assessment of risk of toxic pollutants to aquatic organisms and ecosystems using a sequential modeling approach. USA-USSR Symposium Fate and effects of pollution on aquatic organisms and ecosystems. U.S. Environmental Protection Agency. Athens, Georgia. Oct 19-21, 1987.

Puckett, K and JJ Anderson. 1987. Behavioral responses of juvenile salmonids to strobe and mercury light. Fisheries Research Institute Technical Report FRI-UW-8717.

Anderson, JJ, A Copping, T Jagielo, J Postel, W Peterson, B Dumbauld, G Haron, R Hood, M. Strom. 1984. Water column ecology. Vol. III Section 4 in Renton Sewage treatment plant project, Seahurst Baseline Study FRI- UW-8413, 316 pp.

Anderson, JJ 1984. The oxic-anoxic interface in Saanich Inlet. Proceedings of a multidisciplinary symposium on Saanich Inlet, Feb. 2, 1983. Canadian Tech. Report of Hydrography and Ocean Sciences No. 38, pp.17-23.

Anderson, JJ and D Sauplette. 1981. Deep water renewal in Ambon Bay, Indonesia. Proceedings of the Fourth International Coral Reef Symposium. Manila, 1981, 1:369-374.

Bell, MC, EP Richey, JJ Anderson, and ZE Parkhurst II. 1980. Design considerations of passing fish upstream around dams. Analysis of environmental issues related to small scale hydro-electric development. Edited by S.G. Hildebrand. Oak Ridge, National Laboratory, Environmental Sciences Division, Pub. No. 1567. Oak ridge, Tennessee.

Anderson, JJ 1978. Deep ocean mining and the ecology of the tropical North Pacific, University of Washington Dept. of Oceanography. Special Report, No. 83, 123 pp.

Anderson, JJ and FA Richards. 1977. Chemical and biochemical observations from the DOMES study area in the equatorial North Pacific, Univ. of Washington Dept. of Oceanography. Special Report, No. 79, 95 pp.

Anderson, JJ and FA Richards. 1977. Continuous profiles of chemical properties in the euphotic zone of the DOMES study area in the equatorial North Pacific, University of Washington Dept. of Oceanography. Special Report No. 78, 97 pp.

Anderson, JJ 1976. An experiment to evaluate the processes contributing to the development, maintenance, and decay of the oxygen minimum zone of the eastern tropical North Pacific. Proceedings of the V Congreso Nacional de Oceanografia. Guymas Sonaora, Mexico. Oct. 1974.

Kuntz, D, T Packard, A Devol, and JJ Anderson. 1975. Chemical, physical and biological observations in the vicinity of the Costa Rica Dome (Jan-Feb., 1973) Technical Report No. 321, Ref M 75-1.

Planck, WS, JJ Anderson, and H Pak. 1973. Hydrographic and optical observations from legs 4 and 5 YALOC- 71. Oregon State University. School of Oceanography. Data Report No. 54, Ref. 73-7, 381 pp.

Meeting and Conferences

Seminars, Workshops and Conferences Presentations

2015 *A Two-Process Mortality Model with Extensions to Juvenile Mortality, Population Dynamics and Evolution,* Population Association of America Meeting, 2015

2014 *A first principles framework for the evolution of longevity and body mass* Annual meeting of the Society of Evolutionary Demography, Stanford University.

2012 *Shaping Human Mortality Patterns Through Intrinsic and Extrinsic Vitality Processes* Center for Studies in Demography and Ecology Seminar Series, University of Washington.

2012 *Principles and Recommendations for Life Cycle Models* Bay-Delta Science Conference, Sacramento, CA.

2011 *Reflections on decision-making around dams/energy/natural resource management*. Workshop on Integrative Dam Assessment Modeling, Decision making around Dams: Data, Discussion, and Decision Theater, Washington DC.

2011 *Snake River Basin Differential Delayed Mortality Synthesis.* Anadromous Fish Evaluation Program Annual Review. Walla Walla, Washington December 2011.

2011 *Cognitive Psychology Discovers Secret Rules and Principles of Fish Behavior, or Why Did I Return to This Patch*? American Fisheries Society, Seattle, WA (September 2011)

2011 *Reflections on decision-making around dams/energy/natural resource management*. Workshop on Integrative Dam Assessment Modeling, Decision making around Dams: Data, Discussion, and Decision Theater. Woodrow Wilson Center WA DC. July 2011

2011 *Snake River Differential Delayed Mortality Synthesis Report*. USACE Differential Delayed Mortality Workshop Portland OR. May 2011

2010 Society for Mathematical Psychology Annual meeting, Portland, OR, August 2010.

2010 *Modeling complex by looking inside the individual*. Forum on the Future of Complex Systems Research and Applications Complex Systems Institute. The University of North Carolina at Charlotte (September 2010)

2010 *Seeking principles for modeling fish migratory behavior - a cross discipline approach*. North Pacific Marine Science Organization Portland, OR. October 2010

2010 *Cognition in Fish passage*. Leverhulme International fish passage workshop. Winnipeg, CA (2010).

2010 Leverhulme International Fish Passage Workshop. Winnipeg, CA, September 2010.

2010 *The value of neural-based swarm rules* Swarmfest, Swarm Development Group annual meeting 2010, Santa Fe, NM.

2010 *Pavlovian conditioning from a foraging perspective*. Annual meeting of the Cognitive Science Society, Portland, OR, August 2010.

2009 *Towards a comprehensive model of latent mortality.* Anadromous Fish Evaluation Program Annual Review. Walla Walla, Washington December 2009.

2009 *Advantages of a retinal-based model for studying swarm cognition.* Swarm Cognition Workshop at 31st Annual Meeting of the Cognitive Science Society. Amsterdam, July 2009.

2009 *Advantages of a retinal-based model for studying swarm cognition.* Swarm Cognition Workshop at 31st Annual Meeting of the Cognitive Science Society. Amsterdam, July 2009.

2009 *Oceanic, riverine and genetic influences on spring Chinook salmon migratory timing.* American Fisheries Society Portland, May 2008

2008 *Characterizing system failure curves with vitality*. Army 26th Science Conference, Orlando Florida

2007 *The boiling frog syndrome: Navigating by weak and oscillatory cues* American Fisheries Society, San Francisco, September 2007

2007 GEAR UP speaker at Summer Institute (a college awareness program)

2006 *Linking mortality and maturation age through vitality*. Biodemography workshop, Berkeley CA

2005 *Pacific Decadal Oscillation, Climate Change and Northwest Salmon; Climate Change* Forum, Maryhurst University Portland October 8.

2005 *Practical Paths to Salmon Recovery*, Part II. Workshop sponsored by Northwest Power Planning council and Idaho council on Industry and the Environment. October 5, Boise ID.

2005 *Columbia River water management and fish*. Washington State Columbia River Taskforce. Olympia, WA June 28.

2005 *Linking mortality and maturation age through vitality*. Workshop on Mathematical and Statistical Models in the Biodemography of Aging. University of California at Berkeley June 5-8.

2005 *Hydrodynamic and Fish Behavior Models to Forecast Fish Passage Through Rivers and Dams*. Quantitative ecology and resource management spring seminar UW. May 25. (Lecture).

2005 *Managing stream flows for fish*. March 8 lecture to Tuesday morning Seminar Series of the Center for Water and Watershed Studies seminar series (Lecture)

2004 *Quantifying passage stress affects on long-term fish survival* Presented at American Fisheries Society – 134th Annual Meeting, Madison, Wisconsin, August 2004. (Conference presentation)

2004 *Vitality as a measure of ecosystem health*. Presented at the U.S. Army Corps of Engineers Waterways Experimental Research Station. Vicksburg Mississippi April 2004. (Lecture)

2004 *Can a single process link lifespan and maturation?* Presented to Fisheries Quantitative Seminar February 2004. (Lecture)

2004 *Effects of flow on juvenile salmon survival in the Columbia River*. Presented Ecological Society of America Annual meeting in Portland Oregon. August 2004.

2004 *Effects of Columbia River flow on salmon.* Presentation to Snake Columbia River Irrigators Association Annual meeting July 22 2004. (Lecture)

2004 *Use of models in salmon recovery planning in Oregon and Washington*. Presented at the Joint CWEMF / Central Valley Technical Recovery Team Technical Workshop on Using Models in Endangered Species Act Recovery Planning September 7, 2004 Sacramento California. (Lecture).

2003 *The Restoration of Central Valley Chinook Salmon and Steelhead - Advice to California.*" San Francisco Estuary Project's Biennial State of the Estuary Conference in Oakland California October 2003 (Conference presentation)

2003 *Sustaining salmon: an ecological perspective*. Presented to Civil Engineering Graduate Seminar September 2003. (Lecture)

2003 "*The science of flow augmentation: will draining Idaho save salmon*. 20th Annual Water Law and Resource Issues Seminar. Idaho Water Users Association. November 20 2003. (Conference presentation)

2003 *Effects of flow on survival Flow and survival*. Presented at the Idaho Water Users Association 20th Annual Water Law & Resource Issues Seminar. Boise Idaho, November 2003 (Lecture)

2003 "*Fish swim a gauntlet of predators: theory of molecular collisions path lengths gives a new look of predator prey interactions*" *A*pplied computational Sciences Seminar Series. University of Washington. November 2003. (Lecture)

2003 *The Restoration of Central Valley Chinook Salmon and Steelhead - Advice to California*." Biennial State of the Estuary Conference.Oakland CA, October. (Conference presentation)

2002 "*Computer-based decision-making for Columbia River salmon: A fifteen-year perspective of success and failure*, Beaverton, Oregon Graduate School. OR, October (Lecture)

2002 "*The effect of decadal scale climate cycles on salmon recovery*," Seattle Business Council, Seattle, October (Lecture)

2002 *Dealing with conflicting science.* Environmental Journalism Academy 2002. Seattle University August (Workshop presentation)

2002 *Use of vitality in understanding delayed mortality* at the ACOE Transportation and Delayed mortality workshop. Skamania Lodge Stevenson, WA

2002 *An Agent-based event-driven foraging model*. National Center for Caribbean Coral Reef Research (NCORE) NCORE-hosted workshop, The Future of Decision Support for Coral

Reef Management: Agent-based Models and Interdisciplinary Research. Miami, July (Conference presentation)

2002 *Columbia River salmon*. Pasco-Kennewick Rotary, Kennewick WA May 1. (Keynote Talk)

2002 *Challenges in science-based salmon management: Lessons from the Northwest.* CALFED Science workshop. April 22-23 Sacramento (Workshop presentation)

2002 *Computer models and resource management* presented March 8 to The Science & Technology Roundtable (STRT), which is a group of Washington State technology business and community leaders dedicated to increasing their understanding of contemporary topics in science and technology. (Keynote Talk)

2002 *A decision algorithm with memory and learning:* Swarmfest 2002. University of Washington (Conference presentation)

2001 *An Agent-Based Model of Fish Behavior: Part III* Swarmfest 2001 Santa Fe New Mexico.

2001 Regional Water and Power Policy: Making Changes. Sponsored by the Columbia-Snake River Irrigators Association, Eastern Oregon Irrigators Association and Columbia Section of the American Society of Civil Engineers, Pasco Washington, July 23 2001. (Panel member speaker)

2001 *The Salmon Story,* Keynote speaker to the Seattle City Council on their visit to Ice Harbor Dam, June, June 29 in Pasco.

2001 Panel Speaker at Regional Water and Power Policy: Making Changes. Annual meeting of the Columbia-Snake River Irrigators Association, Eastern Oregon Irrigators Association and Columbia Section-American Society of Civil Engineers. July 23. Pasco. (Conference presentation)

2001 *Flow Augmentation Review*, Presentation to the NPPC Independent Scientific Advisory Board, February.

2001 *Interactions of Models and Data in the PNW Salmon Recovery Actions*: the NMFS Biological Opinion. CEWA 520 Seminar. January 25, Palmer, instructor. (Invited Lecture)

2001 *Columbia River salmon*. Lecture presented to the University of Washington Environmental Law Seminar. 2001.

2001 *Recovering Endangered Salmon*, Invited speaker at the Horizon Men's Club April 19

2000 *Multidisciplinary approaches to environmental Management.* Science Politics and Modeling Snake River Salmon survival. at the CEWA 520 Seminar. R. Palmer instructor

2000 *Advancing the Individual-based Modeling Approach: New Tools and Concepts*. Sponsor/organizer of symposium #27 at the Ecological Society of America 2000 Annual Meeting. "" Railsback, S. J., Anderson and R. Lamberson.

1999 *Modeling the Northwest Dams and the Effect on Salmon.* Evans School of Public Affairs and the Northwest Forum Lecture series presentation. December

1999 *Dam - Removal Wild is Wooly: the Case Against.* Pacific Fishery Biologist." annual Meeting Astoria Or., Oct 1999

1999 *The effects of Oceans on Salmon survival*. Washington State University Tri -City. Lecture on. Pasco, WA. Oct.

1998 "*Salmon Management Models*". Santa Fe Institute Workshop on Integrating GIS and Multi-Agent Modeling Techniques

1998 *Columbia River salmon restoration*. University of Washington Environmental Law Forum

1998 *Salmon and Society*. American Society of Chemical Engineers Chemical Engineers Annual Meeting Northwest Division, University of Washington

1997 *Merging Toxicology & Population Ecology: A vitality model to extrapolate laboratory studies to the field*. Northwest Biological Science Center, Seattle, Washington.

1996 Towards Sustainable Fisheries Conference, Victoria B.C., April 1996.

1996 Estuarine and Ocean Survival of Pacific Salmonids. National Marine Fisheries Workshop held in Newport, Oregon, March 1996.

1996 *Is it the dam, the river or the ocean?* Columbia River Association Salmon symposium.

1996 *The Art of Modeling*. Natural Resource Societies Science Day in Washington D.C. June.

1996 American Fisheries Society Portland Chapter Annual Meeting. Plenary Panel on Columbia/Snake River and Regional Salmon Conservation Plans.

1996 Congressional Staff Public Power Tour to Eastern Washington. Hosted by Washington State Public Power Association.

1995 Congressional Staff Public Power Tour. Hosted by Washington State Public Power Association.

1994. Workshop on Defining Flow Survival Relationships in the Columbia River. Sponsored by the Northwest Power Planning Council.

1994 Lamprey Barrier Research Workshop. Minnesota, Feb 1994.

1994 *Declining Salmon Fisheries.* Presented at the 1994 Ecosystem Management in Western Interior Forests. May 1994. Spokane, Washington. Science Team leader in session on Strategies for Resolving Major Ecosystem Issues.

1994 First Nations Conference of Fisheries. Vancouver BC. January 1994.

1993 *Software for Sustainability: A Columbia River Example.* Lecture in the Institute for Environmental Studies Seminar Attaining a Sustainable Society.

1993 *Integration of Salmon Life Cycle Models - Habitat to Harvest*. University of Washington Center for Streamside Studies Seminar

1992 *Mainstem passage models.* Bonneville Power Administration Projects Review. presentation in Vancouver, WA.

1992 *A vitality based model for organism survival*. Pacific Northwest workshop on Mathematical Biology. University of Washington, April 4.

1992 *What we know and don't know about reservoir survival of juvenile salmonids*. Presented at Chinook Smolt Survival Workshop. University of Idaho. February 26-28, 1992.

1992 *Fish behavior considerations in fish diversion systems*. Lecture for the U.S. Fish and Wildlife Service short course on Fish Diversion Systems. Yakima, WA, April.

1992 *History and status of Columbia River Fisheries Models*. Oregon Graduate Institute. April 14.

1992 *Observations and models of the behavior of fish to sound*. Acoustic workshop sponsored by Army Corps of Engineers and the Bureau of Reclamation, Sacramento, March 17.

1991 *The History and Restoration of Columbia River Salmon: The Problem of an Endangered Species*. Presented at Earth Day `91 Workshops, Center House, Seattle Center.

1991 *Computer Models and Columbia River Management: "An exercise in Fact or Fantasy?*" at the American Institute of Fishery Research Biologist, Northwest Meeting, January.

1990 *Fish behavior considerations in fish diversion systems*. Lecture for the U.S. Fish and Wildlife Service, short course on Fish Diversion Systems. Portland, OR, October 22.

1990 *Design criteria of behavioral fish guidance systems*. Corps of Engineers Fish Passage Development and Evaluations Program, 1990 Annual Review. Portland, OR. Oct. 19.

1990 *Assessment of the risk of pile driving to juvenile fish*. Presented at the 15th annual members meeting and seminar of the Deep Foundations Institute. October 10-12, 1990, Seattle.

1990 Symposium/workshop populations, community, and ecosystem: an individual perspective. Knoxville, Tennessee, May 16-19. (Invited participant)

1989 *Fish Reservoir Interactions*. North American Lake Management Society, Seattle, Sept.

1989 *Rebuilding Fish Populations on the Columbia River*. UW Alumni Seminar, Oct 14, 1989.

1988 Panel member for discussion on uncertainty at ecological modeling in a regulatory framework, sponsored by the International Society for Ecological Modeling, U. of California at Davis. August.

1988 *The relationship of uncertainty and probability in ecological risk analysis models* (with R. Morison), Ecological Modeling in a Regulatory Framework, sponsored by the International Society for Ecological Modeling, University of California at Davis, August.

1987 *A mathematical model for startle response in fish*. International Ethology Conference XX, University of Wisconsin, August.

1987 *Strategies for a five year work plan on reservoir mortality and water budget effectiveness evaluation*. Presentation to Pacific Northwest Power Planning Council: December.

1987 *Risk Assessment: Its context, theory and application*, Fish Habitat Short Course, Colorado State University. Nov. 18.

1987 *Is uncertainty in risk assessment predictable?* (with R. Morison). Environmetrics 87, Washington D.C., November.

1987 *A dose-response model based on a stochastic equation of organism health*. Environmetrics 87, Washington D.C., November.

1987 *Mortality and survivorship based on a stochastic model of organism health*. Workshop on theoretical ecology: Ecodynamics. Oct 19-20, Julich, Germany.

1987 *Graphical representation of model uncertainty for risk assessment* (with R. Morison). Workshop on theoretical ecology: Ecodynamics. Oct 19-20 1987, Julich, Germany.

1986 Ecological Risk Assessment Colloquium, Environmental Effects branch of the U.S. Environmental Protection Agency, Baltimore. Nov 10-14.

1985 NITROP-85 Workshop. Bigelow Laboratory for Ocean Sciences, Booth Bay Maine, July 8-11.

1985 *Seasonal distributions of nutrients and chlorophyll in Puget Sound*. University of Washington, Chemical Oceanography Lunch seminar.

1985 *Mathematical model of fish feeding behavior*. Behavioral Ecology seminar, Simon Fraser University, March 6. (Invited participant)

1985 *Model of fish feeding behavior*. Marine Sciences Research Center, State University of New York, Stony Brook, N.Y., February 5.

1985 *A fish feeding model based on game and catastrophe theories*. CQS/Biomath 597, Seminar Center for Quantitative Science, University of Washington.

1984 *A relationship between attitude change and groups size*. 17th annual Mathematical Psychology meeting at the University of Chicago, August.

1984 *Temporal patterns of chlorophyll and nitrogen species in a Puget Sound intertidal zone*. American Society of Limnology and Oceanography Meeting, University of British Columbia.

1984 *Zooplankton probability distributions: everything coming up gamma* (with A. Okubo), Ocean Science meeting, New Orleans.

1984 *Mathematical models for zooplankton swarms: their formation and maintenance* (with A. Okubo), Ocean Science meeting, New Orleans.

1984 *A predator-prey behavior model based on catastrophe and game theories*. GUTSHOP'84. Fourth workshop on fish food habits at Pacific Grove, California, Dec 2-6.

1984 *The limitations and uses of microcomputers.* Psychiatry Grand Rounds, St. Vincent's Hospital, New York. (Invited lecture)

1984 *Fish Schooling*, New York City Sea Gypsies. (Invited lecture)

1984 *A look at why and how animals form groups*. Littoral Society of New York.

1984 *Probability models*. Marine Sciences Research Center, State University of New York at Stony Brook.

1984 *Probability distributions in biology*. Estuaries Class 507, winter quarter.

1983 *An underway water sampling system* (with A. Copping), American Society of Limnology and Oceanography Meeting, San Francisco.

1983 Saanich Inlet Conference, Institute of Ocean Sciences, Sydney, British Columbia.

1982 *A stochastic model for the size of fish schools*. Dept. of Biophysics, Kyoto University.

1982 NSF/Indonesia Seminar on Marine Science, Jakarta, Indonesia.

1978 *Water masses of the eastern tropical North Pacific*. Dept. of Oceanography, Oregon State University.

1976 *A model for the chlorophyll maximum*. Joint Oceanography Assembly, Edinburgh.