

## **Appendix C: Biosketches of Invited Participants**

**Michael Ainslie**

Senior Scientist at TNO- The Hague, Netherlands  
Visiting Professor at ISVR -University of Southampton, UK

Dr. Ainslie graduated in physics from Imperial College (University of London) and in mathematics from the University of Cambridge. He carried out his PhD research at the Institute of Sound and Vibration Research (University of Southampton) on the interaction of underwater sound with the seabed. Dr. Ainslie has 25 years' experience in underwater acoustics, with special interest in its application to sonar performance modeling, the impact of underwater sound on marine life and the international standardization of acoustical terminology. He retains strong ties with ISVR, where he currently holds the position of Visiting Professor. His publications include the book 'Principles of Sonar Performance Modeling' (Springer, 2010) and 32 peer reviewed journal articles. He is a fellow of the Acoustical Society of America and of the UK Institute of Acoustics (IOA), and in 1998 was awarded the IOA's A B Wood medal for his work on seabed interactions and sonar performance modeling.

**Michel André**

Professor at the Technical University of Catalonia (BarcelonaTech, UPC)  
Director of the Laboratory of Applied Bioacoustics (LAB)

Dr. André is an Engineer in Biotechnologies graduated from the Institut National des Sciences Appliquées, INSA, Toulouse, France. He holds a Master degree in Biochemistry, a Master degree in Animal Physiology from the Université Paul Sabatier de Toulouse, France and a PhD on sperm whale acoustics from the University of Las Palmas de Gran Canaria (Spain).

His research involves the development of acoustic technologies for the control of noise pollution in the marine environment; the study of the biological and pathological impact of noise pollution on cetacean acoustic pathways and marine organisms; the mathematical, physical, morpho- and electro-fisiological mechanisms of the cetacean bio-sonar, as well as the extraction of the information from their acoustic signals.

**Thomas Carlson**

Program Manager  
Marine Sciences Laboratory  
Department of Energy Pacific Northwest National Laboratory

D.r. Carlson has over 30 years of experience working in underwater acoustics and risk assessment. Current activities are investigation of the effects of anthropogenic sound on fish and marine mammals and development and application of active and passive acoustic systems for detection, classification, and localization of fish and marine mammals. He is also currently active in the development of models to quantify the exposure and assess the risk of barotrauma and hearing system impacts to fish and marine mammals and laboratory and field studies to obtain data required for risk assessment.

**Brandon M. Casper**

Department of Biology  
University of Maryland

Dr. Brandon M. Casper is a postdoctoral research scientist in the Aquatic Bioacoustics Lab of Dr. Arthur Popper at the University of Maryland, College Park. Dr. Casper's research interests have centered on the structure and function of auditory systems in aquatic vertebrates. He has published a number of peer reviewed scientific papers and has authored several review chapters on the auditory system of sharks, rays, and other aquatic animals. Dr. Casper's recent work at the University of Maryland has been exploring the physiological responses to impulsive pile driving stimuli in fishes. These experiments, currently in the data analysis and manuscript writing stages, will provide some of the first qualitative and quantitative controlled studies of the effects of pile driving on fishes. He has been an invited speaker at several Acoustical Society of America annual meetings and the Second International Conference on the Effects of Noise on Aquatic Life in Cork, Ireland. He also recently returned from an international collaboration focusing on shark hearing abilities in Perth, Australia with labs from University of Western Australia and Dartmouth College. Dr. Casper received his Biology degree from Ohio University, his Master's degree in Marine Biology from Boston University, and his Ph.D. in Biological Oceanography from the University of South Florida.

**John Dalen**

Principal Research Scientist  
Institute of Marine Research, Bergen, Norway

Dr. Dalen conducts a variety of fisheries research including hydro-acoustic abundance estimation and size classification of fish and plankton, developing methods for direct in situ observations of fish, and assessing impact of the behaviour of single fish and shoals on assessment methods. He has specific expertise in long range omni-directional and multibeam sonars, fish behaviour vs. anthropogenic sound, lethal impact on fish vs. seismic investigations, and blasting. Other work interests include total quality management and organizational development.

**Jaclyn Daly**

Fisheries Biologist  
NOAA National Marine Fisheries Service

Jaclyn Daly is a fisheries biologist with NOAA's National Marine Fisheries Service in Charleston, South Carolina. She has extensive experience in assessing impacts to marine mammals from anthropogenic noise under the Marine Mammal Protection Act and currently works within NOAA's Office of Habitat Conservation to protect fisheries and their habitat in a regulatory capacity. Jaclyn specializes in working with action agencies to minimize and mitigate for adverse impacts from coastal construction activities such as pile driving and renewable energy development.

**Alex De Robertis**

Research Fisheries Biologist  
National Marine Fisheries Service's Alaska Fisheries Science Center  
Seattle, Washington

Dr. DeRobertis is a research fisheries biologist with the National Marine Fisheries Service's Alaska Fisheries Science Center in Seattle, Washington. His interests have been slowly increasing in latitude and up the food chain; he started as a zooplankton ecologist working off the west coast and now works primarily on fish in Alaska. His work is focused on fisheries acoustics, and involves the application of sonar to understand the abundance, distribution and behavior of marine organisms. He has a longstanding interest in sensory biology and animal behavior, and has worked extensively on the reactions of fish to approaching research vessels. He enjoys messing around in boats both when at work and play.

**Christine Erbe**

Centre for Marine Science & Technology, Curtin University  
Perth, Western Australia

Dr. Erbe holds an MSc in physics (University of Dortmund, Germany) and a PhD in geophysics (University of British Columbia, Canada). She accidentally landed in marine bioacoustics in 1994 and has never looked back. Having grown up in Germany's coal belt, she relished Canada's sea breeze, yet discovered she got terribly seasick, hence chose to train captive beluga whales for masked hearing experiments. Christine worked for the Canadian Government (Fisheries & Oceans) from 1994-2001 on underwater noise, effects on marine mammals and noise regulation. She worked as a private consultant performing bioacoustic impact assessments until she joined JASCO as Director of Australian Operations in 2006. In 2011 she couldn't resist the temptation to get back into academia, and became Director of the Centre for Marine Science & Technology at Curtin University in Perth, Western Australia. Christine's interests are underwater sound (ambient, anthropogenic & biological), sound propagation and effects on marine fauna. Dr. Erbe was unable to attend the Workshop but was instrumental in preparing the paper presented by Dr. Rob McCauley

**Richard Fay**

Adjunct Scientist  
Marine Biological Laboratory

Richard R. Fay graduated from Bowdoin College with a BA (1966), Connecticut College with an MA (1968), and from Princeton University with a Ph.D (1970), all in experimental Psychology. He held a post-doctoral position with Georg von Békésy at the Laboratory of Sensory Sciences, Honolulu, HI from 1972-1974. Dr. Fay spent one year (1974-1975) as Assistant Professor of Otolaryngology at the Bowman Gray School of Medicine before being appointed Associate Professor of Psychology at Loyola University Chicago in 1975. He stayed at Loyola, reaching the rank of Professor and Distinguished Research Professor, Director of the Interdisciplinary Neuroscience Minor, and Director of the Parmlly Hearing Institute until 2011. He began summer research at the Marine Biological Laboratory, Woods Hole, MA in 1993 where he was a Whitman Investigator until 2010. Dr. Fay was appointed Adjunct Scientist at the MBL in 2011

and retired from Loyola University Chicago with Emeritus status in 2011. His entire academic career has focused on hearing mechanisms in vertebrates, and especially the hearing and sensory behavior of goldfish, oyster toadfish, and plainfin midshipman fish. Dr. Fay's research has been continuously supported by the NIH and the NSF since 1975, and he has over 140 publications in peer-reviewed journals. He is the founding co-editor of the Springer Handbook of Auditory Research, with 43 volumes appearing so far and is an Associate Editor for Animal Bioacoustics for the Journal of the Acoustical Society of America.

**Kevin Friedland**

Researcher, National Marine Fisheries Service at the Narragansett Laboratory  
Rhode Island, USA

Dr. Friedland is a researcher with the National Marine Fisheries Service at the Narragansett Laboratory in Rhode Island, USA. He holds a bachelors degree in ecology from Rutgers College in New Jersey and a doctorate from the College of William and Mary in Virginia. His dissertation research was on the distribution and feeding ecology of Atlantic menhaden. During his professional career he has done research on menhaden, bluefish, sea herring, sturgeon, eel, haddock, and salmon. His publications cover a range of topics including: estuarine ecology of fishes, functional morphology, feeding ecology, recruitment processes, fisheries oceanography, stock identification, ecosystem ecology, and climate change. His current research is on the effects of growth on the early maturation and survival of Atlantic salmon and the factors controlling the recruitment of haddock. He has served as chair of several ICES committees including the North Atlantic Salmon Working Group, the Study Group on Stock Identification, and the ICES standing committee on Anadromous and Catadromous Fishes.

**Roger Gentry**

Special Advisor to the Joint Industry Program  
President, ProScience Consulting LLC

Roger L. Gentry was born in 1938, completed a Master's degree in 1966 in marine mammal acoustics, a Ph. D. in animal behavior at the University of California, Santa Cruz in 1970, and in 1971 a postdoctoral fellowship on fur seals at the University of Adelaide, South Australia. He worked as a field biologist at the National Marine Mammal Laboratory in Seattle from 1974 to 1998 conducting field research on whales, penguins and many species of seals. He helped pioneer Time-Depth recorders, published papers and books on fur seals, and convened an international symposium on fur seal biology. From 1995 through 2005 he created an acoustics program for NOAA in Silver Spring, Maryland that advised regulators on marine acoustic issues including ATOC, low- and mid-frequency sonar, seismic air guns, and explosions. There he convened expert panels to write noise exposure criteria for marine mammals (published 2007) and for fish and turtles (being written). He led workshops on acoustic resonance, rectified diffusion, shipping noise, and monitoring underwater ambient noise. He has also worked on acoustics from legal (Department of Justice) and treaty (Department of State) standpoints. From 2006 to 2009 he was Program Manager for the Joint Industry Program, a London-based consortium of oil companies funding research on the effects of underwater noise on animals to meet the needs of international regulators. Presently he is an advisor to that group, speaks for it in international meetings on acoustics, and continues to publish about marine mammals.

**Christopher Glass**

Research Professor

University of New Hampshire

Dr. Glass is Director of the northeast Consortium and Research professor in the Ocean Process Analysis Laboratory of EOS. A specialist in animal behavior and marine biology, Dr. Glass has a long record of conservation gear research in New England's fisheries. Prior to joining The Northeast Consortium, he served for 9 years as Director of Marine Conservation at Manomet Center for Conservation Sciences where he specialized in the study of fish behavior and applying knowledge of this subject to develop more selective fishing gears directed at reducing bycatch and discard in commercial fisheries. Previously he worked for 14 years at the marine Laboratory in Aberdeen, Scotland and has worked extensively on bycatch reduction and conservation engineering programs throughout Europe and North America. Dr. Glass has been a featured lecturer on sustainable fisheries topics at numerous international conferences and has published extensively in scientific journals. His education includes a B.Sc in Zoology (Marine Biology and Animal Behavior) from The Queens University, Belfast and a Ph.D. from The University of Glasgow.

**Michele B. Halvorsen**

Senior Scientist

Battelle – Pacific Northwest National Laboratory

Sequim, WA

Dr. Halvorsen has been conducting research in neuroethology and neurophysiology of mammals and fish since 1997. Since 2004 she has studied the impacts of anthropogenic underwater noise on marine animals. Her current research focus involves the effects of anthropogenic sound on the physiology and behavior of freshwater and marine fish and development of the tools needed to assess the environment and the animals. Dr. Halvorsen has been PI and Co-PI for projects involving the effects of noise on fish, these projects were funded by Naval Operations (ERD), BOEMRE, CALTRANS, NCHRP, Snohomish PUD, and DOE. Recent research completions include assessment of the barotrauma response of juvenile salmon to high energy impulsive sounds generated by pile driving and the effect of the US Navy's low- and mid- frequency sonar on the hearing of several fish species. Current research underway addresses the barotrauma and hearing response of marine fish species to noise generated by tidal power electric power generators, and development of analysis models to obtain response metrics from diverse physiological observations of animal condition. Additionally, she is involved with oversight of a team on the development of sound recording tools and software (called aquatic acoustic metrics interface- AAMI), along with the development of a passive acoustic tetrahedral array system for monitoring areas around tidal turbine power generators.

**Anthony Hawkins**

Loughine Limited and University of Aberdeen UK

Dr. Anthony Hawkins is currently the Managing Director of Loughine Limited, a small company carrying our research and providing advice for a variety of clients including the UK

government, the Scottish Government, and the European Commission. His interests include marine fisheries and their management; underwater acoustics, including the sounds made by marine organisms and the impact of man-made sounds on aquatic organisms; fish behavior and fish migrations; and the marine environment and its evaluation and conservation. His 46-year research career has focused on the behavior of fish, including the sensory abilities of fish, fish migrations and movements, the response of fish to pollutants, and the management of marine and freshwater fisheries. He is the author of a series of key papers on the hearing abilities of fish – conducted on an acoustic range in the sea. He is a member of the Advisory Board of the sound and Marine Life Joint Industry Programme (JIP) run by the International Association of Oil and Gas producers (funding research into the impact of underwater noise).

**Mike Jenkerson**

Geophysical Advisor

ExxonMobil Exploration Company

Mike Jenkerson has worked in geophysical operations for the past 33 years; for the last 15 years he has specialized in the environmental evaluation, acoustic analysis and mitigation of sound generated by oil and gas exploration and production operations. Mike Jenkerson has worked on the environmental program for western gray whales offshore Sakhalin Island since 2001. Mike Jenkerson has also been the research category chair for the category on sound source generation and propagation for the OGP sound and marine life JIP. Mike Jenkerson has been researching alternative marine sources for over 15 years and has been evaluating marine vibrator seismic sources. He has been the ExxonMobil representative on the marine vibroseis JIP project for the last 4 years.

**Craig Johnson**

Fishery Biologist

National Marine Fisheries Service

Endangered Species Division

Mr. Johnson has worked on fish and wildlife conservation issues for the past 34 years, specializing in assessing the effects of human activity on endangered and threatened species. Mr. Johnson has studied bowhead whales in the Beaufort Sea, fur seals in the Bering Sea, anadromous fish throughout coastal Alaska, wolves in northern Canada, and wetlands throughout North America. Mr. Johnson supervised the U.S. Fish and Wildlife Service's endangered species program in the Great Lakes Region and Upper Mississippi River; was an advisor to the Assistant Secretary for Fish and Wildlife and Parks in the Department of the Interior on endangered species, marine mammals, and biodiversity; and supervised the U.S. Fish and Wildlife Service's South Florida Office, which was responsible for fish and wildlife protection associated with the effort to restore the Everglades. Since 1998, Mr. Johnson has overseen the National Marine Fisheries Service's interagency consultation program.

**Svein Løkkeborg**

Principal Scientist

Research Group Fish Capture

Institute of Marine Research, Bergen, Norway

Dr. Løkkeborg obtained his PhD at the University of Bergen in 1990. He has conducted many behavioural field investigations using underwater camera and telemetry technology to study swimming pattern, activity rhythms and foraging strategies in fishes and crabs. Dr. Løkkeborg has been involved in numerous fishing-gear related studies including most fishing gears, and he has studied problems such as methods for fish abundance estimation, harvest strategies, selectivity and bycatch. He has been working on three aspects related to ecosystem effects of fishing activities: mitigation measures to reduce bycatch of seabirds in longline fisheries, impacts of trawling on benthic communities and lost fishing gears (ghost fishing). Dr. Løkkeborg has also been working with issues related to interactions between fishing activities and the oil industry, in particular effects of seismic activity on fish behaviour and fisheries. Dr. Løkkeborg has published 50 peer-review papers based on his scientific research activities. During his two sabbaticals, he worked as visiting scientist at Hatfield Marine Science Center in Newport (Oregon, USA) and at the Fishing Technology Service (FIIT) of the Fisheries Department of FAO (Rome, Italy). He is member of ASA Standards Working Group on Effects of Sound on Fishes and Sea Turtles, ICES-FAO Working Group on Fishing Technology and Fish Behaviour, ACAP Seabird Bycatch Working Group, and Referral Group of Southern Seabird Solutions Trust.

**Joseph Luczkovich**

Associate Professor of Biology and an Associate Scientist

Institute for Coastal Science and Policy

East Carolina University

Joseph Luczkovich is an Associate Professor of Biology and an Associate Scientist in the Institute for Coastal Science and Policy at East Carolina University. He was educated at Lehigh University (B.S. Biology), Rutgers University (M.S. Ecology), The Florida State University (PhD Biological Sciences), and completed post-doctoral fellowship at the Harbor Branch Oceanographic Institute, in Ft. Pierce, Florida. It was at Harbor Branch that he was introduced to the sound production of drums and croakers (Family Sciaenidae) by R. Grant Gilmore. After this post-doc, he worked at Humboldt State University and NC State University, and then joined the faculty at East Carolina University. He has published extensively on the use of passive acoustics in monitoring sound-producing fishes. Dr. Luczkovich has used the passive acoustic approach to determining spawning areas of Sciaenidae, which make sounds during their spawning activities, with males making the sounds as advertisement calls to attract females. By recording sounds of captive specimens of each of the four species (silver perch, *Bairdiella chrysoura*, weakfish, *Cynoscion regalis*, spotted seatrout, *C. nebulosus*, and red drum, *Sciaenops ocellatus*), Dr. Luczkovich and colleagues were able to identify the species making the calls simply by listening to captive fish and comparing these sounds to field recordings. These recordings were analyzed for their spectral properties and correlated with plankton samples, which lead to the maps of spawning areas for each species. One sound recorded in this study was difficult to identify: “the chatter” sound. Previous researchers had misidentified it as being

produced by weakfish, but the ECU group realized that it was produced instead by striped cusk eels (*Ophididon marginatum*). From these recordings, Luczkovich and the ECU Sciaenid Acoustics Research Team (SART) discovered that silver perch became acoustically inactive when bottlenose dolphins (*Tursiops truncatus*) making signature whistles were in the area. He has recently been using acoustic data loggers to monitor the impact of anthropogenic noises from vessels on fish sound production and is interested in the role the species-specific sounds may play in reproductive isolation of the Sciaenidae, which could lead to speciation events within this group. Dr. Luczkovich continues to study the sound production of fishes and marine mammals in Pamlico Sound, Atlantic Ocean and the Caribbean Sea.

**Steve A. MacLean**

Protected Species Coordinator/Fishery Analyst  
North Pacific Fishery Management Council

Stephen Ahgeak MacLean is the Protected Species Coordinator and Fishery Analyst for the North Pacific Fishery Management Council. Mr. MacLean joined the Council staff in May, 2011. Before joining the Council staff, he spent six years as the Bering Sea and Polar Marine Program Director for The Nature Conservancy where he worked closely with Bering Sea commercial fishing interests to reduce potential impacts to protected species and habitat. Mr. MacLean has also worked for a private ecological consulting firm and State and University wildlife management departments. He has extensive experience living and working in rural Alaska. Mr. MacLean received a Bachelor of Arts degree in Biology from Whitman College in Walla Walla, Washington and a Master of Science degree in Wildlife and Fisheries Sciences from Texas A&M University. His MS thesis concerned the occurrence, behavior, and genetic diversity of bowhead whales in the Sea of Okhotsk in the Russian far east.

**David Mann**

Associate Professor  
University of South Florida

Dr. Mann is Associate Professor of Biological Oceanography at the University of South Florida. His laboratory studies marine bioacoustics with a focus on hearing and sound production in fishes and marine mammals. Laboratory studies utilize neurophysiological techniques to investigate the neural mechanisms of hearing and sound production. His lab also uses SCUBA diving with underwater video to identify and study sounds produced by fishes during courtship and spawning. Recent work has focused on sound production by sciaenids (croakers and drums) in the estuaries of Florida. New research is aimed at studies on spawning aggregations of groupers. One major thrust over the next few years is the deployment of a large, sparse passive acoustic array on the West Florida Shelf to track the locations of cetaceans relative to physical oceanography. His lab is also involved in studies of the hearing abilities of manatees and dolphins with both captive trained marine mammals, and wild and stranded cetaceans. Dr. Mann received his Ph.D. from MIT/Woods Hole Oceanographic Institution.

**Rob McCauley**

Associate Professor

Centre Marine Science and Technology, Curtin University, Western Australia

Dr. McCauley has been studying sound in the ocean since 1987, having amassed an extensive and strategic collection of Australian ambient sea noise. His primary research interest is the study of the production, reception and use of sound and of the impacts of sound on marine fauna. Dr. McCauley has long term sampling regimes using passive acoustic technology developed at Curtin, spread between north Western Australia, around the southern Australian coast to the central NSW coast. Since 1994 he has carried out research projects studying the impacts of vessel and oil exploration noise (seismic) on humpback whales, on impacts of seismic on turtles, fish and invertebrates and in elaborating marine fauna habits, migratory routes and abundance using passive acoustics.

**Jennifer Miksis-Olds**

Research Associate and Assistant Professor

Penn State University

Dr. Miksis-Olds is a Research Associate, Applied Research Laboratory; Assistant Professor, Graduate Program in Acoustics, College of Engineering; and Assistant Professor, Wildlife and Fisheries Sciences, College of Agriculture at Penn State University. In terms of current research, Dr. Miksis-Olds' research employs acoustic methodologies to answer biological questions in both the marine and terrestrial environments. Her primary interests include animal behaviour and communication, the effect of anthropogenic activities on animals and their environment, and the development of technology to observe animals in their natural environment. Aspects of acoustics, biology, oceanography, ecology, and engineering are combined to create the interdisciplinary approach necessary to extend the study of animals in their natural environment beyond where it is today. Dr. Miksis-Olds received her Ph.D. from the University of Rhode Island, Graduate School of Oceanography.

**James H. Miller**

NATO Undersea Research Centre

University of Rhode Island

James H. Miller earned his BSEE in 1979 from Worcester Polytechnic Institute, his MSEE in 1981 from Stanford University, and his Doctor of Science in Oceanographic Engineering in 1987 from Massachusetts Institute of Technology and Woods Hole Oceanographic Institution. Dr. Miller was on the faculty of the Department of Electrical and Computer Engineering at the Naval Postgraduate School from 1987 through 1995. Since 1995 he has been on the faculty of The University of Rhode Island where he holds the rank of Professor of Ocean Engineering and Oceanography. Dr. Miller is currently on leave from URI at the NATO Undersea Research Centre in La Spezia, Italy. He has more than 100 publications in the area of sonar, acoustical oceanography, signal processing and marine bioacoustics. In 2003, Dr. Miller was elected Fellow of the Acoustical Society of America.

**Steven Murawski**

Professor, St. Petersburg Downtown- Peter Betzer Endowed Chair  
University of South Florida

Dr. Steven Murawski is a Population Dynamics/Marine Ecosystem Analysis Professor and the St. Petersburg Downtown - Peter Betzer Endowed Chair in Biological Oceanography at the University of South Florida's College of Marine Science. Dr. Murawski is currently engaged in research contributing to improved understanding of the impacts of human activities on the sustainability of ocean ecosystems. He serves as Director and Principal Investigator of the Center for Integrated Modeling and Analysis of Gulf Ecosystems (C-IMAGE), which is a 13 institution consortium investigating the Gulf oil spill impacts. His current areas of interest include understanding the Gulf of Mexico Large Marine Ecosystem in terms of multiple, simultaneous stressors through the application of integrated ecosystem assessments. Specific research includes understanding the prevalence of fish diseases in relation to the Deepwater Horizon spill, and work on new assessment techniques for Gulf reef fishes.

From 2005 to 2010, Dr. Murawski served as the Director of Scientific Programs and Chief Science Advisor for NOAA Fisheries Service. In addition to these duties, he was also the NOAA Ecosystem Goal Team Lead. As Goal Team Lead, he was responsible for out-year strategic planning and budget development for all of NOAA's ecosystem activities which amount to \$1.2 billion in 2008. Prior to this, he was the Director of the NOAA Fisheries Office of Science and Technology and served as Chief Stock Assessment Scientist for the Northeast Fisheries Science Center in Woods Hole, Massachusetts (1990-2004).

During his career, Dr. Murawski has been a key representative on several national and international committees and councils. His roles included: official U.S. delegate to the International Council for the Exploration of the Sea, NOAA representative and co-chair of the White House interagency Joint Sub-Committee on Science and Technology, and member of the US steering committee for the International Institute for Applied Systems Analysis. He received his Ph.D. from the University of Massachusetts-Amherst in 1984.

**Jeremy Nedwell**

Director  
Subacoustech Ltd.

Dr. Jeremy Nedwell was from 1984 the Admiralty Research Lecturer in Underwater Acoustics at The Institute of Sound and Vibration Research, Southampton University, setting up the A B Wood laboratory. In 1993 he left to set up Subacoustech Ltd, a specialist consultancy in underwater acoustics. For the last 30 years, he has been interested in underwater bioacoustics, from the subtle behavioural effects of noise on the environment up to the effects of blast on divers. He has first-hand experience of underwater sound, having acted as an investigator and diving experimental subject for many military trials. In 1998 he proposed the dB<sub>nt</sub> metric, which has become the chief means by which the environmental effects of windfarms are estimated and regulated in the UK.

**Jerry Payne**

Department of Fisheries and Oceans  
Newfoundland, Canada

Jerry Payne has considerable experience in ecotoxicology and has carried out a variety of sub-lethal effect studies on issues related to oil and gas as well as pulp-mill and mining effluents. More recent work has involved pilot studies on the sublethal effects of sound. He has received awards for his contribution to environmental science.

**Ann Pembroke**

Vice President  
Normandeau Associates, Inc.

A graduate from the University of Delaware's College of Marine Studies, Ann Pembroke has studied marine resources and impacts on coastal and OCS ecosystems for over 30 years. Her role as an environmental consultant supporting impact assessment and permitting for offshore projects brings the applied research perspective to this workshop. Ann has recent and on-going experience with deepwater port and offshore wind development projects in Maine, Massachusetts, Rhode Island, New York, New Jersey, and Delaware. Permitting for these projects required an understanding of the activities during site exploration, development, construction, and operation that affect marine resources. Ann's background is in marine benthic and plankton ecology, specializing in impact assessment. She has managed environmental impact assessments for major coastal and offshore projects, with a particular emphasis on energy, dredging, dredged material disposal, port development, and offshore wind. Ann also recently completed an evaluation of the effects of EMF from underwater cables on marine species for BOEM.

**Arthur N. Popper**

Professor  
University of Maryland

Associate Dean of the Graduate School and a Professor of Biology, Dr. Popper's work for many years has been directed towards understanding basic structure and function of the auditory system in vertebrates, with particular interest in the ear of fishes and its sensory hair cells. These investigations frequently involved a wide number of teleost species (e.g., goldfish, zebrafish, cichlids, American shad, sleeper gobies) and the use of the comparative approach in order to understand the function of the ear as well as its evolution. More recently, the focus of his work has become redirected to apply our expertise on fish bioacoustics to more applied questions that examine the effects of human-generated (anthropogenic) sound on fish. Dr. Popper received his Ph.D. from the City University of New York and his undergraduate degree from New York University.

**Roger Pugliese**

Senior Fishery Biologist  
South Atlantic Fishery Management Council

**Roberto Racca**

President  
JASCO Applied Science

Dr. Roberto Racca has been for many years at the senior management level of JASCO Research (V.P. for Research and Development since 1992 and President since 2000), and has extensive experience in the coordination and running of complex research projects. Dr. Racca's communication and leadership abilities have been formed and demonstrated in years of scientific work both in academia and in the private sector, including active participation in many scientific symposia. Although his current professional activities are primarily in acoustics, he has worked with distinction in other fields including medical physics and electro-optics. In 1994 Dr. Racca was awarded the Hubert Schardin Gold Medal of the German Physical Institute in recognition, among other work, of his innovative use of CCD imagers in high-speed videography applications. In his long professional relationship with JASCO Research Dr. Racca has played a major role in many acoustics-related projects. His research interests, along with acoustic source detection and localization, include propagation modeling and monitoring of underwater and airborne sound. He is active in the development of methods and standards for assessment of acoustic impact on marine species. Dr. Racca received his Ph.D. (Physics – Electro-Optics) from the University of Victoria.

**James A. Reyff**

Project Scientist  
Illingworth & Rodkin, Inc.

Mr. Reyff is a nationally known expert in the measurement and evaluation of underwater sounds from marine construction projects. He has led investigations on numerous projects that involved underwater sound impacts. He has been the lead acoustical investigator on numerous projects studying impacts to marine mammals and fish. He provided testimony to the national Fisheries and Hydroacoustic Working Group, as well as resource agencies and blue ribbon commissions investigating these issues. His work in this field has been recognized by the Federal Highway Administration, California Department of Transportation and the American Association of State Highway and Transportation Officials. More importantly, his expertise, flexibility and timely efficient work have assisted projects in sensitive agency consultations regarding underwater noise impacts to aquatic species. His expertise in this area includes the measurement of underwater sound, evaluation of methods to reduce underwater construction sounds, and prediction of underwater sound levels from marine pile driving. Mr. Reyff has authored several papers on this subject and submitted many papers at national and international scientific conferences.

**Kimberly Skrupky**

Marine Biologist  
BOEM

Ms. Skrupky holds a Bachelor of Science degree in Environmental Science with a concentration in Wildlife Conservation and Resource Management from the University of Maryland. She has been working on issues involving protected species and acoustics for 13 years- working at NOAA for over five years, Marine Acoustics, Inc. for over four years, the last three years spent at the Bureau of Ocean Energy Management.

**Brandon Southall**

President and Senior Scientist  
Southall Environmental Associates

Dr. Brandon Southall is President and Senior Scientist for Southall Environmental Associates (SEA), Inc. based in Santa Cruz, CA and a Research Associate with the University of California, Santa Cruz (UCSC). He completed Master and Ph.D. degrees at UCSC in 1998-2002, studying communication and hearing in seals and sea lions. From 2004 to 2009, Dr. Southall directed the U.S. National Oceanic and Atmospheric Administration (NOAA) Ocean Acoustics Program, within the National Marine Fisheries Service, Office of Science and Technology. In 2009, Dr. Southall founded SEA, a research and consulting small business focusing primarily, but not exclusively, on noise impacts on marine life (see: [www.sea-inc.net](http://www.sea-inc.net)). Brandon has an extensive technical background in leading laboratory and field research programs, as well as applying science in national and international policies. He also serves as a technical advisor and to international organizations regarding environmental impacts of conventional and alternative offshore energy development, as well as commercial shipping. He has published nearly 50 peer-reviewed scientific papers and technical reports, and has given hundreds of presentations on related subjects to scientific, regulatory, Congressional, and general public audiences internationally.

**John H. Stadler**

Marine Habitat Coordinator, Habitat Conservation Division, Northwest Region  
National Marine Fisheries Service, Portland, OR

Dr. Stadler has a B.S. in Biology from the University of Washington, a M.S. in Fishery Sciences from the School of Fishery, University of Washington, and a Ph.D. in marine biology from the Rosenstiel School of Marine and Atmospheric Sciences at the University of Miami. He was introduced to the world of acoustics during his Ph.D. research, which examined species recognition by the notchtongue goby, *Bathygobius curacao*. He joined the National Marine Fisheries Service in 2000, where he has worked on ESA-listed salmon and essential fish habitat issues. He is the staff lead for acoustic issues, primarily relating to pile driving, for the Habitat Conservation Division, and participated in a multi-agency work group that established interim criteria for assessing the risk of pile driving to fishes along the U.S. West Coast.

**Alan Thornhill**

Chief Environmental Officer  
BOEM

Dr. Alan Thornhill was named as the first Chief Environmental Officer (CEO) in November 2011, transitioning into the new Bureau from his previous tenure as Science Advisor to the Director (both MMS and BOEMRE) which he began in March 2010. Previously (2001-2010), Dr. Thornhill was the first Executive Director of the Society for Conservation Biology, where he launched the executive office, oversaw the development of a professional staff, and initiated programs that saw the global membership triple in seven years. Other experience includes, the Director of Learning and Communications for the Science Division at The Nature Conservancy, and Professor of Ecology and Evolutionary Biology at Rice University in Houston, Texas. For the past six years, Dr. Thornhill has taught in the Masters Program in the College of Natural Resources at Virginia Polytechnic Institute and State University. Dr. Thornhill earned his Bachelors and Ph.D. degrees in Ecology from the University of California, Irvine.