

8th Student Affairs Workshop



19TH BIENNIAL CONFERENCE

ON

THE BIOLOGY OF MARINE MAMMALS

TAMPA, FLORIDA

NOVEMBER 27 - DECEMBER 2, 2011

Organization

2011 SMM Student Affairs Committee

Inez Campbell (SMM Student Member-at-Large)

Noel Takeuchi, Mariana Nery and Courtney Smith

AND with the essential support from

Randy Wells, Laura Engleby, Vicki Cornish, Tara Cox, Cheryl Bonness,

Kim Schauwecker and Michel Fougères

Funding

The conference organizers have gone to great lengths to make the 19th Biennial Conference accessible to as many SMM members and other participants as possible. This conference would not have been possible without your registration - you, the conference attendee, are the primary sponsor of this conference. Through the contributions of a number of sponsors, we have been able to make the conference even more accessible to students. More than \$150,000 was raised to support student travel and other conference expenses. From these funds, we were able to provide travel grants to 259 students, nearly 2.5 times the number of students SMM was able to assist at the previous biennial. (For a full list of donors see the General Conference Program).

Student Affairs Workshop – Wednesday November 30th
Ballroom B
AGENDA

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|---|-----------------------|
| I. Sign-in and Forage | 7:00 – 7:40PM |
| II. Welcome and Introduction
Inez Campbell, SMM Student Member-at-Large | 7:40 – 7:45PM |
| III. Presentation of Student Chapters | 7:45 - 8:15PM |
| IV. Keynote Address
Kathleen M. Dudzinski, Ph.D.
<i>“You have your degree... now what?”</i> | 8:15 – 8:35PM |
| V. Break | 8:35 – 8:45PM |
| VI. Group Discussions
Acoustics and Communication
Genetics
Anatomy/Morphology/Physiology
Pathology and Vet Medicine
Behavioral Ecology and Oceanography
Cognition
Conservation issues
Evolutionary Biology and Systematic
Archeology and Paleontology
Population Dynamics and Assessment
Toxicology
Careers in Marine Mammal Science – Government Jobs
Careers in Marine Mammal Science – Academia
Careers in Marine Mammal Science – Private Sector/Consultancy | 8:45 – 10:00PM |

PARTICIPANT BIOGRAPHIES

KEYNOTE SPEAKER

Kathleen M. Dudzinski, Ph.D.

Dr. Dudzinski is currently the Director of the Dolphin Communication Project, Managing Editor of the Journal of Aquatic Mammals and a Senior Marine Scientist in Acoustics for Geo-Marine, Inc. She is also adjunct faculty at the University of Rhode Island and the University of Southern Mississippi. Her work has been based on the use of marine mammal studies for educating the public about animal behavior and communication, conservation issues and science in general. She has studied the communication and

behavior of dolphins and their inter- and intraspecific interactions, as well as collaborated on understanding the social behavior of vertebrates in relation to environmental pressures. The advice she gives to students in reference to becoming a marine mammal professional is: "Enjoy the journey: If this is truly the field you wish to pursue then do it. Just look at each hurdle as part of the journey. This way the process is more fun than any outlying goal, but also don't be afraid to modify your goals and enjoy the learning process."

ACOUSTICS and COMMUNICATION

David Mann, Ph.D.

Dr. Mann has extensive experience in the field of bioacoustics, starting with undergraduate training at Cornell University where he earned his bachelor's degree in Neurobiology and Behavior. Dr. Mann went on to earn his PhD from the Joint Program in Biological Oceanography at the Massachusetts Institute of Technology and Woods Hole Oceanographic Institution. He performed his doctoral work on sound production by the damselfish *Dascyllus albisella* at Johnston Atoll near Hawaii. For his post-doc he studied hearing in fishes at the University of Maryland with Dr. Arthur Popper. Following his post-doc he spent several years working at Tucker-Davis Technologies (TDT), which manufactures signal processing workstations for hearing and neurophysiology research. He joined the faculty at the University of South Florida in 2000 (<http://www.marine.usf.edu/bio/fishlab/>) where his work continues on hearing and sound production in fishes and marine mammals. He formed Loggerhead Instruments to sell acoustics research instrumentation that had been developed for his research. His advice for students pursuing a career in this field of marine mammal science is: *"Always be open to opportunities. I did not plan on studying marine mammals, but given my background and training, when I started my position at USF I was able to fill a void in marine mammal research in Florida, where there was no one working on hearing in cetaceans. If you are interested in acoustics, you should be interested and capable with math and programming. It is now very easy to collect a lot of data. The challenge is in data analysis. You will spend most of your time sitting in front of a computer. Students who master signal processing tend to be the ones who are successful in finding jobs in the future. Academic jobs are very hard to find. I only considered working in industry after having a difficult time finding an academic position during my post-doc. But, the skills I learned at TDT in both engineering and management were extremely valuable when I did obtain an academic position. Keep an open mind."*

Vincent Janik, Ph.D.

Dr. Janik is an Associate Professor in Biology in the School of Biology at University of St. Andrews. He is a member of the Sea Mammal Research Unit and the Centre for Social Learning and Cognitive Evolution (SLACE) within the university. His research interest is in the evolution and complexity of communication systems and how this complexity affects social interaction. His work takes two different approaches; on the one hand he investigates the environmental constraints that influence the design of vocal communication systems, and on the other hand he studies the underlying cognitive skills required to overcome or circumvent such constraints. Much of this work

concentrates on communication in the bottlenose dolphin (*Tursiops truncatus*) and the grey seal (*Halichoerus grypus*).

Laela S. Sayigh, Ph.D.

Dr. Sayigh is a Research Specialist in the Biology Department at Woods Hole Oceanographic Institution and Adjunct faculty at the University of North Carolina Wilmington and Duke University Marine Laboratory. Her research focuses on odontocete social behavior and communication, in particular on functions of learned, individually specific signature whistles in bottlenose dolphins and of stereotyped calls in pilot whales. She has conducted field work including focal-animal behavioral observations, acoustic recordings, photo-identification, capture-release work, and playback experiments with bottlenose dolphins in Sarasota, Florida and in Wilmington NC. She has also been involved in a variety of oceanographic cruises and small vessel projects working with other species of cetaceans, and has worked with suction-cup attached digital recording tags (DTAGs) and passive acoustic monitors. Advice to students interested in pursuing research on marine mammals is *to pursue volunteer and research opportunities as an undergraduate, either with marine mammals or other species, and to be open to various avenues of research, since opportunities in a given area may be limited.*

GENETICS

Jennifer Jackson, Ph.D.

Dr. Jackson works for the British Antarctic Survey in Cambridge. Her research is based on evolutionary history, species identity, population structure and connectivity of marine species; and also in the relationship of genetics to population demography on management relevant timescales for baleen whales. Following an undergraduate degree in biochemistry and genetics, a PhD in evolutionary genetics provided her with the background experience to pursue this field. As an undergraduate and post-graduate she volunteered a few weeks of her time over two summers in order to obtain experience in marine mammal research, and gain contacts. After her PhD she also developed her computer programming skills, which have been extremely helpful in her subsequent research. She had post-doctoral fellowships in New Zealand (Auckland) and the USA (Oregon State) with Professor Scott Baker, focussing on population genetics and demography of humpbacks and southern right whales, gaining experience of a wide variety of other cetaceans in the meantime. Subsequently she did contract work for the US National Marine Mammal Laboratory through her company Marine Research Limited, mostly related to population assessments and mark recapture analysis. She attends the International Whaling Commission yearly as an invited participant, mostly focussed on issues concerning assessment of humpback whales and use of genetics in estimating population connectivity. In her current role at the British Antarctic Survey she works on a variety of Southern Ocean marine species, investigating their evolutionary origins and population connectivity in the waters around Antarctica. Her advice to students is: "*Much of this field relies on the availability of*

genetic data, usually acquired from biopsy samples or samples from strandings, so nurturing and maintaining good collaborative connections is absolutely key, particularly in genetics, where the effort cost per sample is great. Genetics is a fast moving field, and with the advent of genomic high throughput sequencing technologies the possibilities for new studies in the field are still great. Expertise in this area, and familiarity with the computing technology required to process large amounts of genetic data are definite advantages to those entering the field.”

Margaret Hunter, Ph.D.

Dr. Hunter is a research geneticist affiliated with the Sirenia Project, U.S. Geological Survey. Also with the Aquatic Health Program, College of Veterinary Medicine, of the University of Florida, and the Department of Oceanography, Federal University of Pernambuco, Recife, Brazil. Her research focuses on conservation genetics and genomics of manatees and dugongs and population genetics of invasive species. She has an interest in landscape genetics, transcriptomics, and functional genetics to address disease and health in wildlife. Important steps in the development of her career involved publishing early during her dissertation, presenting posters and talks early and often, learning many scientific techniques within and outside her field. Her advice to students pursuing a career in this field is *“publish early in your graduate career; strive to find areas of research that are unique and provide funding opportunities, i.e. considered valuable to society/NGO’s/governments; work to become skilled or knowledgeable in many different disciplines, or collaborate with scientists in different fields since combining two fields of study often leads to novel and useful research.”*

ANATOMY, MORPHOLOGY AND PHYSIOLOGY

Tracy Romano, Ph.D.

Dr. Romano is the Executive Vice President of Research and Zoological Operations at the Mystic Aquarium. Her research interest is focused on Neuroimmunology or the investigation of stressors on the marine mammal immune system. Her predoctoral fellowship enabled her to work at the U.S. Navy’s Marine Mammal Program during her graduate studies. Her involvement in the National Research Council Fellowship enabled her to work at the Navy after receiving her PhD at the Scripps Research Institute, and after her Post doc, she was able to set up a laboratory at the Navy with funding provided. She was offered a position to lead the research department at Mystic Aquarium in 2004 and now oversees the Research and Zoological Operations. Her advice to students is: *“Gain experience in the field of marine mammals – volunteer, carry out internships, apply for jobs, etc.; travel to conferences to network and meet people in the field; follow your passion.”*

Ailsa Hall, Ph.D.

Dr. Hall is a Senior Research Scientist and the Deputy Director of the Sea Mammal Research Unit of the Scottish Oceans Institute at the University of St. Andrews. Her research interest is focused in the physiological adaptations of mammals to a marine existence, particularly at the molecular level; such as the respiratory adaptations and strategies that allow animals to forage at depth and their adaptations to cope with long periods of fasting. Other area of research includes determining the effect that contaminant and pathogen exposure has on the risk of mortality and morbidity in marine mammals, both seals and cetaceans. She is particularly interested in the role of these factors in determining an animals' early survival and reproductive capability and in how they interact with the species immune and endocrine systems. This interest has also led to more fundamental questions about how the immune system may be shaped by the life history strategy of marine mammals. Her advice to students is: *"Be tenacious, enthusiastic and inquisitive. Question everything you read in the literature! Don't be too dogmatic about what you want to do, a bit of flexibility may allow you to continue to work in a related field, whilst pursuing your main interest in marine mammal physiology at the same time. It's going to be hard work, especially early on in your career."*

Ann Pabst, Ph.D.

Dr. Pabst is a Professor in the Department of Biology and Marine Biology of the University of North Carolina, Wilmington. The laboratory she runs investigates how the mammalian body is functionally adapted to the marine environment. They have focused much of their work on musculoskeletal design and thermoregulatory function in cetaceans. They utilize stranded and fisheries by-caught marine mammals in their research, and employ quantitative morphology techniques, image analysis, and tools from the field of biomechanics, to pose hypotheses about animal function. They then test these hypotheses, using non-invasive research methods, with wild and captive marine mammals. The marriage of anatomical and physiological studies has permitted them to gain insight into the evolution of marine mammals by understanding those morphological features required to survive in the aquatic environment. Some of the important steps that have helped her shape her career have been volunteering at the Smithsonian Marine Mammal Program and helping colleagues in their research as the same time she was working on her own at Duke University, in order to broaden her understanding of the biological world. During her post-doctoral studies at the University of British Columbia she was able to enhance the scope of her research tools and gaining the experience of studying in another country which gave her the opportunity of meeting and working with colleagues. This has been the foundation of many collaborative projects undertaken at her lab. Her advice to students: *"I would advise five things – (1) pursue questions that are deeply interesting to you, (2) become as quantitatively competent as you can – it is important, (3) seek out international experiences and collaborations (4) collect at least one long-term data set, and (5) enjoy yourself and keep a good sense of humor!"*

PATHOLOGY AND VETERINARY MEDICINE

Frances Gulland, Ph.D.

Dr. Gulland is a senior scientist for The Marine Mammal Center and also a Commissioner at the Marine Mammal Commission. Dr. Gulland has been actively involved in investigating the health and disease in marine mammals, impacts of disease on population dynamics, pathogenesis of spontaneous disease in marine mammals, especially domoic acid toxicosis, and cancer. She has been a prominent leader in marine mammal veterinary care, rehabilitation, and research since 1994. She has provided medical care for thousands of seals and sea lions, has published over 100 peer-reviewed articles, and is coeditor of the infamous CRC Handbook of Marine Mammal Medicine. She chaired the Working Group on Marine Mammal Unusual Mortality Events for six years, sits on recovery teams for the Hawaiian monk seal and southern sea otter, and is a Commissioner of the Marine Mammal Commission. Dr. Gulland's important educational and professional steps in her career have been completing a PhD in Zoology as a complement to a Veterinary Medicine degree, obtaining experience in a variety of field sites, working with biologists to understand the natural history and ecology of marine mammals as these have important roles in disease development, and working in a busy clinical setting to develop practical clinical skills. Dr. Gulland's advice to those students pursuing a marine mammal career is to *"develop a solid foundation in medicine in domestic animals before specializing in marine mammal medicine, learn about the ecology of the animals as well as their health, and to develop collaborations with specialized human medicine fields to bring advanced technologies to the marine mammal community."*

Carlos Yaipen-Llanos, DVM.

Dr. Yaipen-Llanos is President and Science Director of the Organization for Research and Conservation of Aquatic Animals in ORCA-Peru. He currently leads the only authorized organization for rescue and release of marine mammals in the wild after rehabilitation. He has been affiliated with the Society for Marine Mammalogy and with the Veterinary Medicine Association of Peru for many years and he is also a founder member of the civic committee of the Police for Protection of the Environment in Peru. His research interest is based in marine mammal sciences with main focus in pathology and clinical veterinary medicine, rehabilitation protocols for animal care, and field research on morphoanatomy, biology, etology and applied veterinary medicine for the conservation of free ranging marine mammals. Important steps that Dr. Yaipen-Llanos has taken along his career include achieving to develop a fully operational Stranding Network for rescue and medical attention of marine mammals, he has performed thousands of forensic medicine research and clinical work on live cases of marine mammals. He says to students: *"My advice to any student pursuing a career in pathology and veterinary sciences applied to marine mammals is to be determined, passionate and bold, since there is a lot to be discovered and solved in this field of marine mammal science for the welfare of these species."*

Dr. Cynthia Smith, DVM

While earning a Doctorate of Veterinary Medicine at Tufts University (V'99), she conducted a veterinary thesis project on marine invertebrate neurotoxicology at the Marine Biological Laboratory in Woods Hole, MA. After graduation in 1999, she accepted an aquatic medicine internship at the New England Aquarium in Boston, MA.

Clinical research during the internship focused on sea turtle diagnostics and imaging.

Next was a research associateship with the National Research Council, focusing on dolphin morbillivirus and preventive medicine options for the Navy's marine mammals in San Diego, CA. After the associateship, she began working as a clinical veterinarian for the US Navy Marine Mammal Program, providing care at home and abroad. In 2007, Dr. Sam Ridgway led a group of Navy veterinarians, researchers, and scientists to form a nonprofit organization focusing on expanding our mission of service to the nation, which is now the National Marine Mammal Foundation based in San Diego, CA. Since 2007, she has served as the Director of Medicine and in 2010 became Executive Director.

Her advice to students... Dedication, an open mind, and a strong work ethic will help you find your way. Although the field is small, it is full of scientists and veterinarians that are passionate about doing something significant for the species they study. Realize that everyone along your path had something to teach; listen and study to build your own foundation of knowledge. As a marine mammal vet, you may find inspiration in the fact that, relative to other fields of medicine, so little is known. Every day brings an opportunity to learn something new and explore ideas on how to best care for an individual or group of animals, which can be then turned into critical information for the care and protection of all marine mammals and species conservation.

BEHAVIORAL ECOLOGY AND OCEANOGRAPHY

Michael Fedak, Professor Emeritus, Ph.D.

Dr. Fedak is Professor Emeritus for the School of Biological Sciences in the University of St. Andrews. He established and supervises a team of biologists and engineers that develops tags for marine animals and associated software in the University of St. Andrews, within the Sea Mammal Research Unit. This technique has revolutionised research on the foraging distribution and behaviour of marine mammals while simultaneously collecting in situ ocean observations. He has published extensively on the energetics, reproduction, distribution, foraging and diving physiology of marine mammals. The animal-borne technology benefits the sensor-carrying animals themselves by examining the sensitivity of top predators to global and regional-scale climate variability. Successful projects include SEaOS, SAVEX and MEOP. He works closely together with the British Oceanographic Data Centre to make animal-borne data freely available to the broad ocean observation community in near real-time.

Ari S. Friedlaender, Ph.D., Research Assistant

Dr. Friedlaender works at the Duke University Marine laboratory of the Nicholas School of the Environment in Beaufort, North Carolina. His research interest revolves around understanding the foraging ecology of marine mammals, and how these behaviors are affected by changes in their environment. He is particularly interested in using tag technology and visualization tools to better understand the unique and complex foraging behaviors that marine mammals use in relation to the behavior of their prey. On a broader scale, he is interested in modeling how climate warming and environmental variability affect the ecological interactions between marine mammals, their prey, and their ecological niches particularly in Polar Regions.

Many of the most important educational steps in the development of his career have come from learning ecological and oceanographic principles and analytical techniques that can then be applied to specific marine mammal populations or research questions. Having a strong foundation in ecology, oceanography, and spatially explicit analytical techniques are critical to being able to pursue research collaborations.

Advising students, he says: "One of the best pieces of advice I was given as a graduate student was to become an expert in a particular discipline and *pigeon-hole yourself*. By this I mean try to become an expert in a particular technique, methodology, or discipline that can then be applied across a broad range of scientific endeavors. This will then allow you to be able to expand your value and introduce you to a wide-variety of projects and ideas where you can be part of a larger team and eventually gain the knowledge to be able to generate your own research programs that are integrative and focused. It is critical to *become an expert in an academic discipline that you then apply to marine mammals*, rather than trying to simply be a 'marine mammal person'.

Become an ecologist that studies marine mammals, or a physiologist that studies marine mammals, or an oceanographer that is interested in marine mammals. Many of the most compelling and interesting research programs are collaborative efforts that cross a variety of disciplines and learn to integrate knowledge from each of these to better understand marine mammals, and these are where many of the breakthroughs in our understanding of marine mammals are happening.

Elliot Hazen, Ph.D.

Dr. Hazen is a Research oceanographer at UH-JIMAR/NOAA-ERD and a faculty member at Duke University. His research focuses on understanding spatial ecology of top predators relative to oceanographic features and prey resources. The most important educational and professional steps in the development of his career involved finding a good mentor that helped him be directed towards appropriate research opportunities, networking with other researchers and helping improve his scientific skillset. His advice to students is: "It is never too early to start writing grants - it is good experience and will give you independence early in your career. Science is moving towards a more interdisciplinary, collaborative environment but many academic positions are still hiring pure science positions (e.g. physiologist, geneticist, microbiologist) - if you can choose a primary field as a wrapper for your research, it will make you more marketable. Also, academia is not the end-all be all; there are a lot of good careers out there and limiting your search will limit your options."

COGNITION

Stanley A. Kuczaj, Ph.D.

Dr. Kuczaj is Professor and Director of the Marine Mammal Behaviour and Cognition laboratory of the Department of Psychology at the University of Southern Mississippi. He runs a lab of graduate students, undergraduate students, interns and volunteers conducting research on the behavioural and cognitive abilities of marine mammals and other animals as a means of increasing both the scientific understanding and the ability to conserve other species. Species that are currently being studied include bottlenose dolphins, sperm whales, beaked whales, African and Asian elephants, killer whales, rough toothed dolphins, walruses and hippopotamuses. Current fields of interest include animal personality and emotions, communication, the ontogeny of play and social behaviour, planning and problem solving, social behaviour in a variety of contexts, and the effects of anthropogenic activities on animals.

Denise Herzing, Ph.D.

Dr. Denise Herzing, Research Director of the Wild Dolphin Project has completed 26 years of her long-term study of the Atlantic spotted dolphins inhabiting Bahamian waters. She received her B.S. in Marine Zoology in 1979; her M.A. in Behavioral Biology in 1988; and her Ph.D. in Behavioral Biology/Environmental Studies in 1993. She is an Affiliate Assistant Professor in Biological Sciences and in the Dept. of Psychology at Florida Atlantic University, Boca Raton, Florida. In 2008 Dr. Herzing received a Guggenheim Fellowship. She is also a fellow with the Explorers Club, a scientific advisor for the Lifeboat Foundation and the American Cetacean Society, and on the board of Schoolyard Films. In addition to many scientific articles, she is the author of the new book "*Dolphin Diaries: My 25 years with Spotted Dolphins in the Bahamas*" and "*The Wild Dolphin Project (2002)*".

Dr. Herzing has authored and co-authored many papers in the fields of whale biology, animal communication, and human consciousness. Coverage of her work with the spotted dolphins has appeared in *National Geographic*, *BBC Wildlife*, *Ocean Realm* and *Sonar* magazines. Her work has been featured on Nature, Discovery Channel, PBS, ABC network television, BBC in England and NHK in Japan.

Her fields of interest are animal consciousness, behavior and communication of cetaceans, and environmental ethics. She has given presentations and lectures to the following research, education and conservation organizations: Society for Marine Mammalogy, European Cetacean Society, International Fund for Animal Welfare, and American Cetacean Society.

Dr. Heidi Lyn, Ph.D.

Dr. Lyn is an assistant professor in the Department of Psychology of the University of Southern Mississippi. She also consults with the Institute for Marine Mammal Studies and has collaborative relationships with Georgia State University, Great Ape Trust of Iowa and UCLA among others. She belongs to the American Psychological Association, the Comparative Cognition Society, the Society of Marine Mammalogy, the International Marine Animal Trainers Association, the International Primatological Society and the American Society of Primatologists. Her main research interest is in the evolution of communication and cognition. One of the ways to study the possible routes of evolution is to look at the capacity for underlying abilities in both our closest evolutionary relatives (primates) and in distant species (cetaceans) that have nevertheless developed these abilities. Other research she has begun recently is in the field of Cognitive Neuroscience. One of her main research interests is the possible effect of different environments on the cognition of nonhumans.

She explains the important steps in the development of her career: *“When I was a Linguistics and Computer Science major at the University of Pennsylvania I took an internship at the Kewalo Basin Marine Mammal Laboratory studying under Dr. Louis Herman. During this internship, I was exposed to the work of Dr. Sue Savage-Rumbaugh who was doing the most advanced language research with nonhumans in the world. I decided that, although Dr. Savage-Rumbaugh worked with apes, and apes were not my species of interest, I would apply to work with her for graduate school. After graduating, very few full-time positions were available, so I took several part-time and short-term post-doctoral positions, to keep me in the field. Some of those post-docs were with cetaceans and some were with primates. Finally, I got my current tenure-track position, which gives me the platform from which to work with any species I care to.”*

Her main pieces of advice are 1) Persistence, if this is what you really want to do, it may require quite a lot of time investment before you are successful. 2) Don't be tied down to specific species, comparisons are the wave of the future. 3) look to what is being funded, I moved into neuroscience because there are many more openings and funding opportunities in that field, and it is wide open for comparative work. And 4) make connections and friendships, not just in your field, but in academia in general. These are the people who will be deciding your future.

CONSERVATION ISSUES

Jennifer Miksis Olds, Ph.D.

Dr. Miksis is a research associate in the Applied Research laboratory at Pennsylvania State University and an assistant Professor in the graduate program in Acoustics. Dr. Miksis-Olds' research employs acoustic methodologies to answer biological questions in both the marine and terrestrial environments. Her primary interests include animal behavior 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.

Barbara Taylor, Ph.D.

Dr. Taylor is affiliated to the Southwest Fisheries Science Center, the US National Marine Fisheries Service; she is the chair of the SMM Conservation Committee and a member of the IUCN Cetacean Specialist group. Her research focuses on risk assessment, genetics in identifying units to conserve with a recent emphasis on improving cetacean taxonomy using genetics. As an important step in her career, she spent initial 10 years in the field (grounding in a range of species' behaviors as well as an overview of what data are feasible to gather in a timely fashion). Undertaking on university training was essential (most important being statistics and modeling), and developing strong professional relationships both domestic and international through work contacts and being a delegate at the International Whaling Commission scientific committee. Her advice to students: *“Conservation science can always use scientists with quantitative skills. Other very important skills are an ability to clearly communicate with a variety of people from fishermen to politicians, an ability to be a good listener, and an ability to think strategically and prioritize both science and needed actions.”*

Andy Read, Ph.D.

Dr. Andy Read is currently an Associate Professor of Marine Conservation Biology of the Division of Marine Science and Conservation at Duke University. His research interests focus on the conservation and ecology of marine mammals, sea turtles and seabirds. He has conducted field research in North and South America, the Antarctic and Europe. Dr. Read received a B.Sc. in Marine Biology (1983), a M.Sc. in Zoology (1983), and a Ph.D. in Zoology (1990) from the University of Guelph in Ontario, Canada. His dissertation research examined the ecology, life history and conservation of harbour porpoises in the Bay of Fundy. After receiving his Ph.D. he worked as a Postdoctoral Investigator at the Woods Hole Oceanographic Institution from before moving to Duke University in 1995. He is particularly interested in the development and application of policy approaches to conservation and, as a result he has served on several Take Reduction Teams, the Scientific Advisors of the Marine Mammal Commission and the Cetacean Specialist Group of the World Conservation Union.

EVOLUTIONARY BIOLOGY AND SYSTEMATICS

John Gatesy, Ph.D.

Dr. Gatesy is an Assistant Professor of Biology at University of California, Riverside. His research study has been in biodiversity and the evolutionary processes that produce this diversity. His research has centered on phylogenetic reconstruction, the inferences that can be made using modern systematic techniques, and development of new methods for the analysis of comparative data. Because most species are extinct, relying solely on the extant fauna can lead to spurious inferences about the history of life, thus focusing on building comprehensive phylogenetic hypotheses of all species in a particular evolutionary lineage. This entails merging paleontological and genomic data in large-scale phylogenetic analyses. Given the detailed historical information in comprehensive evolutionary trees, it is possible to test specific transformational hypotheses and to assess competing models of evolution at different hierarchical

scales. Recent work includes phylogenetic studies of whale origins, an examination of the gene duplications that led to the evolution of mammalian milk proteins, and tests for selection on egg-specific proteins that are critical in fertilization.

Andrew Foote, Ph.D.

Dr. Foote is a post-doctoral fellow at The Centre for GeoGenetics, in the Natural History Museum of Denmark, Copenhagen Denmark. His research is emphasized in Evolutionary biology, in particular speciation. Mostly working on killer whales and working towards understanding the different underlying mechanisms that drive speciation and divergence of ecotypes. He is using genomic approaches and ancient DNA to achieve this. The ancient DNA approach combined with stable isotope analysis is allowing tracking changes in diet and population structure over 10,000 years to monitor if speciation can occur in sympatry. The genomic approach allows investigating adaptive genetic change between ecotypes. He also conducts applied conservation and genetics work including work on other marine mammal species such as bowhead whales and harbour porpoise, as well as helping out on projects on non-marine mammal species, such as a genomic study on giant squid. Dr. Foote has had a combination of steps that have led him to the place where he is in his career. This includes taking time off at the beginning of his studies to realize that by working hard and staying focused he would be able to accomplish a lot more. He started working as a volunteer at Orcalab through the WDCS and there he started coming up with different questions regarding killer whales which have been the base of his research up until now. His three-year master was on killer whale vocal behavior at Durham University. Then he carried on doing a PhD and now he is a post-doc on his own project. In this regard he suggests: "The benefit of working on an existing project a professor already has, is that it will often have funding in place, there may already be data you can work with and your supervisor will be very familiar with the subject and so will be able to help you a lot more. Doing your own project also has benefits; you often have to be very independent and this teaches you a lot of project management skills, but it can also be very challenging and it normally means you have to find the funding yourself." Dr. Foote advises students pursuing a career in this field: *"I'd suggest to anyone interested in pursuing a career in this field, that unless you already have a very strong feeling for what subject area you'd like to focus on, to try a few internships (lab based as well as field based) ... The students who stand out and get the projects are those who write and suggest an idea. It shows they have done the background reading and are able to focus on a particular question, and are not just enamoured with killer whales. Lastly, don't limit your reading and studies down to just marine mammals. The best ideas come from looking at a broader range of studies on a range of taxa. When you start publishing your work you'll also want your audience to be as wide as possible, not just restricted to marine mammal scientists. So by being able to cite the wider literature and putting your own work into that broader biological context you find a way to reach that wider audience."*

Phillip A. Morin, PhD.

Dr. Morin is a Research Molecular Geneticist at the Southwest Fisheries Science Center, U.S. NOAA. He is also affiliated to Scripps Institution of Oceanography, University of California, San Diego as an adjunct professor. The research his group conducts is primarily focused in using genetics technologies to understand cetacean population structure and taxonomy. They use traditional population and evolutionary genetics methods (mitochondrial DNA locus sequencing, microsatellite genotyping), as well as single nucleotide polymorphism genotyping and next-generation sequencing methods to sequence whole mitochondrial genomes and nuclear loci. They use computer models and novel analytical methods to help interpret the genetic data for conservation and management. One of the most important steps in his career was stressing laboratory methods in the early stages of his undergraduate and graduate degrees, in addition to application of genetics to infer structure and demography of populations. He has worked in a broad range of research areas, including primate and cetacean social structure, population structure, evolutionary genetics, and human genomics, which helps him to make unique collaborations that bridge disciplines to bring together varying ideas and methods. His advice to students: *“Genetics methods (laboratory and analytical) are changing rapidly, and require a whole new set of skills. Basic laboratory skills are still necessary, but the ability to program (R recommended), use bioinformatics tools, use and/or write population models, and apply Bayesian methods for analysis are the main skills that will be necessary as genomic data are produced at ever increasing rates.”*

ARCHEOLOGY AND PALEONTOLOGY

Annalisa Berta, Ph.D.

Dr. Berta, is a Professor of Biology in San Diego State University and a Research Associate at the San Diego Natural History Museum of the Smithsonian Institution. She is an evolutionary biologist using morphologic data to investigate the systematics, functional anatomy, evolution, and biogeography of various marine mammals, especially pinnipeds and cetaceans. Projects currently being pursued include ear anatomy and the evolution of hearing in mysticetes, comparative anatomy and evolution of baleen, balaenopterid evolution and divergence times and comparative anatomy and feeding evolution in phocid pinnipeds. Dr. Berta received her Ph.D. in Paleontology in 1979 from UC Berkeley and a B.A. *magna cum laude* in 1974 from the University of Washington. Her undergraduate and graduate training in geology and biology gave her a broad understanding of mammalian systematics and evolution. She found this area to be of considerable interest and little studied among marine mammalogists. She has pursued research on the systematics and evolution of marine mammals for the last 25 years with NSF support. Advice for students:

“Select a potential graduate advisor and communicate with them about your background and research interests in marine mammals and thesis topics well in advance of applying for admission. Also it is important to indicate why you have chosen a particular mentor to work with. Be flexible! Your advisor has experience in the field and may suggest a slightly different project that is more tractable than the one you propose. In the course of pursuing your research project develop an expertise using a particular tool—e.g. CT

imaging, geometric morphometrics, molecular techniques. Find a mentor(s) to provide guidance, support and encouragement as you progress through a program. Attend professional meetings and present your research. Emphasize the broader aspects of your research when communicating its significance to others. PUBLISH your research!"

Daryl Domning, Ph.D.

Dr. Domning is current Professor of Anatomy in the College of Medicine at Howard University and also affiliated as a Research Associate to the Department of Paleobiology in the National Museum of Natural History at the Smithsonian Institution. His research interests are in systematics, paleoecology and evolution of Sirenia and Desmostylia. Important steps in the development of Dr. Domning's career involved: a B.S. in Geology & Biology; M.A. & Ph.D. in Paleontology; 2 years following doctorate studying living manatees in Amazon region of Brazil; subsequently teaching human anatomy in a medical school. Dr. Domning advises students: *"This is a great time (indeed, the Golden Age) for marine mammal paleontology, because all over the world, new animals are coming out of the ground faster than we can study them. There are warehouses and storerooms full of fossils already collected that need to be prepared and studied, many of them new to science – and also lots of places around the world that are still unexplored for fossils! Get at least some training (if possible, a degree) in soft-rock geology in addition to your biology courses; learn all the evolutionary biology and anatomy you can, especially by dissecting modern marine mammals whenever possible (plus human anatomy if courses are available to you, to make you more employable!); molecular genetics is useful these days, as is statistics; and spend as much time as possible with the living members of the groups of animals you want to study, both alive and dead. Get well acquainted with the literature on ALL aspects of their biology, going back to the earliest centuries that wrote about them, including interactions with humans. And pick up at least a reading knowledge of as many foreign languages as you can!"*

POPULATION DYNAMICS AND ASSESSMENT

Alexandre Zerbini, Ph.D.

Dr. Alexandre Zerbini is a research associate with Cascadia Research Collective (Olympia, WA, USA) and with the Cetacean Assessment and Ecology Program of the National Marine Mammal Laboratory (Seattle, WA). He holds a B.S. degree in Biological Oceanography from Universidade Federal do Rio Grande and a M.Sc. in Zoology from the Universidade de Sao Paulo, both in Brazil. He has a Ph.D. in Fisheries and Aquatic Sciences at the University of Washington in Seattle. Dr. Zerbini has worked as a marine mammal researcher at the Oceanographic Museum of Universidade do Rio Grande and as an associate professor of marine mammalogy at the Universidade do Vale do Itajai (Brazil). Dr. Zerbini research interests include population ecology, population assessment, and whale conservation. In recent years, he has been involved in the development of satellite tagging methods for large whales. Dr. Zerbini has published nearly 50 scientific articles and book chapters in peer-reviewed journals and is currently a member of the IWC Scientific Committee and the IUCN Cetacean Specialist Group.

He also acts in the Board of Editors of the Latin American Journal of Aquatic Mammals and of the journal Biology Letters and is a referee for various high-standard journals including the society for marine mammalogy's journal, Marine Mammal Science. He advises students as follows: *“First of all pursue a higher level degree. A M.Sc. or a Ph.D. are critical to teach you skills that will be valuable throughout your career. A quantitative background is also important as well as computing skills. If possible, learn a programming language such as R or C. Second, get involved. Look for opportunities to work in the field or as a data-analyst in projects that involve marine mammal research. Hands-on experience is often very important for someone early in their career, especially when you are looking into graduate school. Marine mammalogy is a broad field and some subjects are developing quickly with quite a bit of opportunities for creative and innovative thinkers. For example, an open field is the integration of technology with marine mammal studies. Last, but not least, a diverse educational background is important. Getting your BS, MS and PhD in different institutions will likely give you a broader perspective of science than getting all your degrees in the same organization.”*

Robin Baird, Ph.D.

Dr. Baird is a research biologist in the Cascadia Research Collective; an affiliate faculty in the Hawaii Pacific University and adjunct faculty in Portland State University. Most of his research in the last 12 years has focused on population assessment (e.g., stock structure, abundance), behavior and ecology of Hawaiian odontocetes. Important educational and professional steps: First stated volunteering with a non-profit education and research organization while an undergraduate (in 1983); first paid job working with marine mammals, as a research assistant with a Ph.D. student (in a Geography Department) studying killer whales (in 1986); co-founded an all-volunteer cetacean stranding network in British Columbia (in 1987); volunteered with a whale watching company as a driver in exchange for vessel use (in 1987); entered graduate school studying killer whale foraging ecology (in 1988). Advice to students: “Volunteer to gain experience, but choose the volunteer opportunity not based on an exotic field site or charismatic study species, but on the type and quality of the science being undertaken. If you are interested in observational studies of behavior, become a birder. Why is this relevant? Birders are good observers, and learning to spot and identify birds will help hone your observational skills. Read everything published (yes, everything) on the species you are interested in, and on the questions you are interested in. Too many prospective students (and current students) are not familiar with the work that has been undertaken on the same topic/species, and spend a lot of time thinking they are answering questions that have already been answered, or end up taking credit for "discoveries" that have already been discovered. When you are trying to find a supervisor for your graduate work, consider working with someone who does not study marine mammals, but instead studies the questions you are interested in (see below). Then find collaborators/advisors to help out with the marine mammal side of things. Develop your quantitative skills, even if it is a painful and unpleasant experience. Not just statistics, but experimental design, modeling, sampling, etc. Too many people in the field do not understand sampling biases and basic principles underlying statistical analyses. Focus your work as much as possible on the questions, not on the species. Publish your work, and do not wait until you have answered all the questions. Publish

notes on unusual behaviors or observations, or new techniques, or what you've learned after a year or two on a particular field project. The process of having to defend your work in a peer-reviewed journal will make you a better scientist and help you realize what types of data you should have been collecting the previous year or two. Aim for the best general (question-oriented) journals, and do not be discouraged when your papers are rejected - learn from the reviews and re-submit to a new journal quickly. The next day if possible! Publishing gets easier with experience, and having one or more publications by the time you finish your graduate work is going to greatly increase your chances of getting scholarships, post-docs, jobs, etc. Plus if one of your thesis chapters is published before you defend, it is harder for your examining committee to criticize it.

Robert Williams, PhD.

Dr. Williams is a Marie Curie research fellow and he is associated currently with the Sea Mammal Research Unit, University of St. Andrews, and co-founder of Oceans Initiative, a small research NGO based in the Pacific Northwest. His main research is based on two broad themes: estimating wildlife abundance and distribution; and assessing impacts of human activities on behavior and energetics of marine mammals. His work on abundance estimation has a strong emphasis on practical field and analytical methods to provide statistically robust estimates of marine predator abundance when financial resources are modest. These include systematic line-transect or photo-ID surveys from small boats, or the use of spatial modelling methods to account for bias in data collected from platforms of opportunity. He then uses abundance data to conduct quantitative assessments of the risk to marine mammal populations of many anthropogenic activities, such as bycatch in commercial fisheries, ship strikes, ingestion of and entanglement in floating marine debris, and modelling population-level consequences of ocean noise for whales. Important steps in the development of his career involved working at UBC for his MSc conducting experiments to measure behavioural responses of killer whales to boat traffic. He considers this gave him a great start because, it required him to learn how to manage field work and crews; it forced him to become quantitative to deal with messy behavioural data; it taught him the power of good experimental design; and the contentious management applications taught him the value of peer review and publishing. After his MSc, he went to the University of St Andrews to do a PhD where he learned the basics of designing and conducting surveys to estimate cetacean abundance. His ongoing collaborations with these three scientists vastly improved the quantity and quality of science I produce. His advice to students: *“Scientists like students with skills. It’s important to get clear on your strengths and weaknesses, as well as what you like to do. Build a strong skill set that will support the kind of work you want to do. Statistical training is important. As funding dollars are getting scarcer, it will become increasingly important to take responsibility for raising funds to support your work and learn how to write grant proposals, talk about your work, and publish results. The sooner you can start acting independent – from idea to funding to doing the work to publishing the results – the better for your career. And on that note, try not to hinder your career with student loans before it even starts. If you have the choice between the PhD project of your dreams that requires massive student loans and a boring, funded one, I’d encourage you to gain credentials and training on a funded project, and then do the project of your dreams when you’re established. Of*

course, it's a tradeoff: you have to love your project enough to see it through to completion."

TOXICOLOGY

Patricia Fair, PhD.

Dr. Fair has over twenty-five years' experience working for NOAA and conducts marine mammal research at the Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC. She holds academic affiliations as Associate/Adjunct Professor at the College of Charleston, Medical University of South Carolina, Texas Tech University and Florida A&M. Her current research emphasis is on the effects of environmental stressors/contaminants on health and disease in marine mammals; development and application of tools and methods for diagnosing marine mammal health, multi-disciplinary health assessment studies, emerging and reemerging threats to health of marine mammals, predictive models and risk assessment; potential toxic effects and endocrine disruption of contaminants on marine mammals and surrogate models. Steps in her career progression involved becoming interested in mammalian physiology and also related to marine animals which influenced her directions in obtaining a Masters Degree in physiology followed by a Ph.D. related to omega-3 fatty acids in aquacultured fish. The range of diverse projects was extremely important in terms of gaining flexibility and experience. Some of the advice she gives to students: *"Focus your educational degree on a solid scientific discipline (physiology, pathology, molecular biology, toxicology, etc.) rather than a specific species and general marine biology. That way when you are done you will have a specific skill which can then be applied to any specie as well as humans, thus, opening up a greater array of potential opportunities and you can then collaborate on marine mammal research. Volunteer and intern positions are very useful and should be selected for the science being done vs. exotic locations and species - this can also help you in assessing where your passion may be. Read up on the subject you are interested in and get involved so you will be able to speak knowledgeably and ask questions.... Ask questions.... did I say ask questions – can't emphasize this enough! Employment outlook in this field is highly competitive and the economic situation may not get better for a while. The more you can do to excel and stand out by gaining additional skills, taking advantage of opportunities and being part of a research team and contributing will help you in securing a position."*

Spencer E. Fire, M.S., PhD

Biologist, Marine Biotoxins Program, NOAA National Ocean Service, Center for Coastal Environmental Health and Biomolecular Research, Charleston, South Carolina, USA
Dr. Fire specializes in HAB toxin analysis and the impacts of marine algal toxins on the food web. After attending the Brigham Young University, he began his graduate career at the University of California at Santa Cruz (UCSC). After teaching positions at UCSC and Manatee Community College, he worked for Mote Marine Laboratory and is currently working for NOAA as an expert in HABs.

Todd M. O'Hara, M.S., PhD, DVM, Dipl ABVT

Associate Professor, Wildlife Toxicology, University of Alaska - Fairbanks, Institute of Arctic Biology, Fairbanks, Alaska, USA

Dr. O'Hara specializes in wildlife conservation and medicine with a focus on environmental and wildlife toxicology of marine mammals, terrestrial mammals and fish in relation to subsistence use and human health. He began his career as a wildlife toxicologist at the Wisconsin Department of Natural Resources in Madison, Wisconsin and then as an Assistant Professor at the College of Veterinary Medicine at Mississippi State University for two years. He then worked as a Research Biologist for the Department of Wildlife Management in Barrow, Alaska for 8 years until his current position at the University of Alaska-Fairbanks. With a number of publications and a member of graduate advising committees, Dr. O'Hara has been a prominent leader in wildlife toxicology.

CAREERS IN MARINE MAMMAL SCIENCE – GOVERNMENT JOBS

Robert K. Bonde, PhD

Research Wildlife Biologist, United States Geological Survey, Sirenia Project, Gainesville, Florida, USA

Dr. Bonde has been studying manatees for more than 32 years. His current duties include life history monitoring of manatee populations, consulting with the NOAA-Fisheries Working Group for Unusual Marine Mammal Mortality Events on issues related to necropsy assessment of the stranded marine mammals, participation in the USFWS Manatee Rescue, Rehabilitation, and Release Program, field radio telemetry and tracking studies, supervising manatee genetic studies and biomedical health assessment, and involvement with international research projects and study design. Dr. Bonde currently chairs the Florida Manatee Genetics Research Working Group and is a graduate from the University of Florida. In addition to over 75 scientific publications, in 2006, Bob coauthored a book with Dr. Roger Reep, entitled, *The Florida Manatee: Biology and Conservation*. Dr. Bonde's advice for students pursuing a marine mammal career is to "*follow your dreams and pursuits and attend graduate school.*"

Jonathan Scordino, M.Sc.

Mgstr. Scordino is a Marine Mammal Biologist working with the Makah Fisheries Management. His interest is the sustainable use of marine mammals for cultural and subsistence purposes. He researches gray whales primarily as they are of interest for future hunts by the Makah Tribe. He also focuses on other marine mammals in the usual and accustomed fishing and hunting locations of the Makah Tribe. Some of his work is purely to increase knowledge on the species (i.e. food habit studies) while other parts of his work are more geared to the management of species (i.e. attending the International Whaling Commission). Important educational and professional steps in the development of his career, included earning his B.S. from the University of Washington and then working for NOAA's National Marine Mammal Laboratory for two years. He then went back to school at Oregon State University to earn his Master's Degree while studying Steller sea lions. He has worked for the past

four plus years as the Makah Tribe's Marine Mammal Biologist.

Advice for students: *“My best advice is to increase your ability to understand math, statistics, and computer programming. The ability to observe behaviours of animals is not unique; the ability to analyze a data set and understand the status of a population is. The more you can stand out and show skills your competitors do not have the greater the chance you will be selected for a job.”*

Robert Pitman, Ph.D.

Dr. Pitman is a Marine Ecologist for NOAA Southwest Fisheries Science Center. He has participated in over 89 marine mammal research cruises in all oceans of the world. He is an authority in marine mammal survey techniques, species identification, and cetacean biology. His research interest lies in cetacean systematics, ecology, abundance and distribution, especially on killer whales. Important educational and professional steps in the development of his career involved spending three decades at sea conducting marine mammal surveys. The advice he gives to students is: *“Spend lots of time in the field, get to know your animals; learn to write; find good mentors.”*

CAREERS IN MARINE MAMMAL SCIENCE – ACADEMIA

John Reynolds, Ph.D.

Dr. Reynolds graduated Cum Laude with Departmental Honors in Biology from Western Maryland College (now McDaniel College) in 1974. He received his M.S. and Ph. D. degrees in Biological Oceanography from University of Miami's Rosenstiel School of Marine and Atmospheric Sciences in 1977 and 1980, respectively. Following graduation he was employed at Eckerd College, St. Petersburg, FL from 1980-2001, where he served as Professor of Marine Science and Biology and Chairman of the Natural Sciences Collegium; he was integral in establishing the college's renowned marine science major and remains the only Eckerd faculty member to receive all three of the College's awards for faculty excellence for teaching, leadership, and scholarship. He also taught Marine Mammalogy for nearly a decade in the 1990s at the Duke University Marine Laboratory. In 1989, Reynolds became a member of the Committee of Scientific Advisors on Marine Mammals for the U.S. Marine Mammal Commission, the federal agency with oversight for all research and management of marine mammals in the United States. In 1990, he became Chairman of the Committee of Scientific Advisors, and in 1991, he was appointed by President George H. W. Bush to serve as Chairman of the Marine Mammal Commission. Eventually he led that agency through mid-2010 under four different administrations, and in 2010, the Commission's accomplishments were recognized by a distinguished service award by the international Society for Conservation Biology. In 2001, Reynolds began working for Mote Marine Laboratory, Sarasota, FL, where he serves as Senior Scientist and Director of the Center for Marine Mammal and Sea Turtle Research. That same year, he became co-Chair of the IUCN Sirenian Specialist Group through 2008. For the period 2006-2008, Reynolds was elected to serve as President of the international Society for Marine Mammalogy, and he concurrently served on the Board of the International Federation of Mammalogists. Recently he has worked closely with the United Nations Environment

Programme to develop and implement a Caribbean-wide Marine Mammal Action Plan, and he co-authored and is co-chair of an international implementation team for a revised Caribbean-wide Manatee Action Plan. Reynolds is a member of Phi Beta Kappa; has been nominated for international awards for his accomplishments in conservation and science; and has published approximately 285 books, papers, and abstracts.

Phil Hammond, Ph.D.

Dr. Hammond is Professor of Biology at the Sea Mammal Research Unit of the University of St. Andrews, within the Scottish Oceans Institute. He is a member of the IWC Scientific Committee, a member of the IUCN Cetacean Specialist Group and Red List Authority, he is also in the editorial board of Journal of Cetacean Research and Management and in the editorial board of Marine Mammal Science. His research interests are in population dynamics and ecology, in particular the applied aspects of how seals and cetaceans interact with humans. His research activities focus on three main areas: (a) studies of the habitat usage, foraging ecology and diet of marine mammals; (b) the estimation of abundance, survival and reproductive rates, and the modelling of marine mammal populations; and (c) studies of the management of whaling, cetacean bycatch in fisheries, seal-fishery interactions, and the conservation of vulnerable species. His advices to students are: "Having a passion for what you want to do is crucial but not sufficient for pursuing a career in marine mammal science; there are many more passionate candidates than PhD places or jobs. Employers/advisors are more likely to take on people who can demonstrate they can actually do things and do them well or have the potential to do so.

- Focus on a discipline; the need is for people who are experts in their field not general "marine mammal biologists".
- Become competent in specialist practical skills that relate to your interests.
- For environmental research, become analytically competent. Learn how to program.
- Volunteer or take short term positions that give you a skill and add something concrete to your CV.
- Find the right balance between being focused on your specific interests and being sufficiently flexible to take advantage of all relevant opportunities.
- Develop additional personal and people skills such as communication, organisation, independent and team working.

Roger L. Reep, PhD

Professor, Department of Physiological Sciences, College of Veterinary Medicine, University of Florida, Gainesville, Florida, USA

Dr. Reep has a number of research interests which include manatee tactile somatosensory systems, manatee brain and body growth, and studying the population of the West Indian manatee. In addition to a number of marine mammal publications, Dr. Reep is also involved in the rodent model for hemispatial neglect in humans after a stroke in collaboration with Northern Illinois University. After countless advice to a number of graduate students at the University of Florida and graduate coordinator of the Marine Mammal Health Program, Dr. Reep's advice to those students pursuing a marine mammal career is to "know your scientific passion, be ready to do whatever it takes, and know where your lines are drawn."

Dr. Reep's important educational and professional steps in his career are:

"The single most important thing I have done is to keep going when things got difficult. Close collaborative ties and friendships with colleagues have often seen me through. There have been times when I was a graduate student that I put my head on my desk and moaned; when I was a postdoc that I thought I would never get a job and should quit research and go to med school; when I was a faculty member that I thought I would never get another grant. Many times I have spent my own funds to attend meetings or to support my research. I even used the name of my beloved golden retriever to identify this source of revenue in the acknowledgment section of manuscripts: the Maxwell Fund. I have enjoyed many successes and celebrate these well. The source of my professional fulfillment has been sticking to my scientific desires and trusting my instincts."

CAREERS IN MARINE MAMMAL SCIENCE – PRIVATE SECTOR/CONSULTANCY

Brandon Southall, Ph.D.

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). Here he leads SEA on research and scientific consulting services related to measurements of the effects of noise and other human activities on marine life. He completed Master and Ph.D. degrees at UCSC in 1998-2002, studying communication and hearing in seals and sea lions. Dr. Southall has an extensive technical background in laboratory and field research, as well as in the application of science in national and international policies and collaborations.

In addition to leading a variety of ongoing field and laboratory research projects, he also serves as a technical advisor and scientific partner to international organizations regarding environmental impacts of commercial shipping and conventional and alternative offshore energy development. He has published over 40 peer-reviewed technical papers and reports, and has given hundreds of presentations on related subjects to scientific, regulatory, Congressional, and general public audiences internationally.

Gordon Hastie, Ph.D.

Dr. Hastie is a Senior Research Scientist working at SMRU Ltd, in the University of St. Andrews. His current research interests focus on understanding the relationships between foraging mechanisms and vocal communication, the functional aspects of marine predator distribution patterns, and the behavioural responses of marine mammals to anthropogenic activities. He leads a wide range of research projects on the responses by marine mammals to anthropogenic sources including studies of the impacts of Navy sonar on deep diving odontocetes and the behavioural responses of marine mammals to marine renewable energy devices. His PhD was a behavioural study of bottlenose dolphins which evaluated the functional mechanisms underlying their habitat selection. Spatial patterns of use and behaviour of dolphins were modeled with respect to habitat variables in a core region of the dolphins range, and localisation of context-specific vocal communication was used to understand their

diving and foraging mechanisms. As important steps in his career, he obtained a BSc in Marine and Fisheries Biology in the University of Aberdeen, a PhD in Zoology in University of Aberdeen, he was a Research Fellow in the University of British Columbia and a Research Fellowship at the Sea Mammal Research Unit in the University of St. Andrews. As advices for students pursuing a career in this field, he says: “If you are trying to gain research skills – identify the biological questions you’re interested in rather than the species; develop your quantitative skills – experimental design and statistical modelling have become essential tools in the field of marine mammal science; Publish – it’s your scientific currency; funding is becoming harder and harder to secure – ask yourself how your scientific interests might be of relevance to a wider audience.”

WE ALSO COUNTED WITH THE ESSENTIAL SUPPORT THAT NIGHT OF:

Dr. Heather Koopman

Associate Professor, Biology and Marine biology, UNCWashington

Dr. Helene Marsh

Dean of Graduate Research Studies, James Cook University, Australia