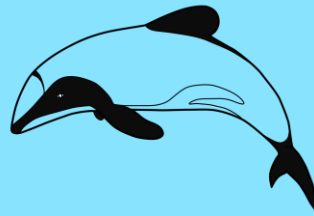


20th BIENNIAL
CONFERENCE

ON THE

BIOLOGY OF
MARINE MAMMALS



2013

Dunedin, New Zealand
December 9-13

9th Student Affairs Workshop

Wednesday 11th December 2013

St David Lecture Theatre Complex

University of Otago

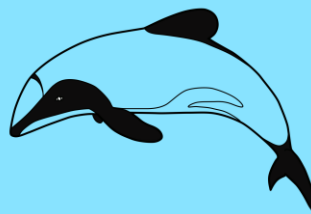
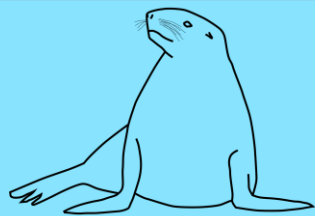
Dunedin, New Zealand

Organisation

Student Affairs Committee

New Zealand: Trudi Webster and Carolina Loch (SMaL)

Australia: Coralie D’Lima (SMaL) and Christophe Cleguer



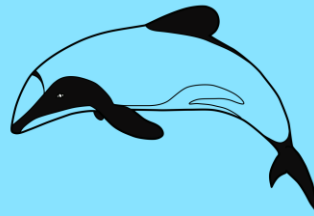
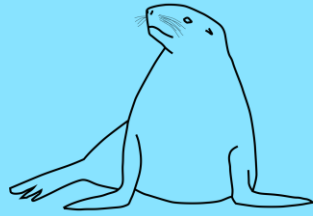
Student Affairs Workshop

- | | | |
|-------------|---|----------------------|
| I. | Sign in and forage | 18:15 - 19:15 |
| II. | Welcome and Introduction
Coralie D’Lima & Carolina Loch (Student members at Large) | 19:15 - 19:20 |
| III. | Presidents address
Helene Marsh | 19:20 - 19:30 |
| IV. | Student chapter presentations | 19:30 - 20:00 |
| V. | Keynote address
Mark Orams
“Marine mammal science: for what purpose and for whose benefit?” | 20:00 - 20:30 |
| VI. | Break and prizes | 20:30 - 20:45 |
| VII. | Group discussions (choice of 3 x 20 minute sessions)
Anatomy, morphology and evolution
Behaviour
Conservation and policy
Distribution, abundance and population biology
Ecology
Education
Health and physiology
Marine mammal sounds
Careers in Marine Mammal Science
Tips for writing papers
Tips for writing grants
Tips for writing CVs | 20:45 - 22:00 |

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FORMAT OF THE EVENING

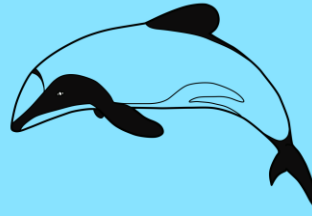
The student affairs workshop evening is a low key, relaxed networking event organized by the student affairs committee. Come and meet up with your fellow students, network with scientists and listen to an inspirational keynote address from Professor Mark Orams.

Please arrive at the St David Lecture Theatre complex between 18:00 and 19:00 where a light supper (pizza and juice) will be served in the foyer. There will also be a cash bar available during this time for you to purchase drinks. Students will need to bring ID with you (18 is the legal drinking age in New Zealand, but if you look under 25 you may be required to show ID). For international students passports will be accepted.

We will then move into the lecture theatre where we will have a series of short introductions from the Student Members at Large (SMaL), Professor Helene Marsh (President of the Society) and the regional student chapters. The main event will be a keynote address by Professor Mark Orams who will make us think about marine mammal science and how we can really make a difference.

Following a short break and some random spot prizes for attendees, we will move into the group discussions. Students will be able to select any three of the 20 minute sessions. Please use your common sense and don't all go to the same group at the same time. The group discussion options are listed above, and the scientists that have generously agreed to participate in the group sessions are listed below. There are nine casual sessions where you can discuss current hot topics relating to a subject area, ask questions of the scientists or find out about their experiences and what they have learned along the way. Please have a think about any questions you may want to ask in advance. There are an additional three groups which are more focused on improving your skills for writing CVs, papers for journals and grant applications. These mini workshops will offer the students some handy tips and then be open to questions.

We will also have a group of local high school students at the workshop. They will join us for Mark Orams' keynote and the group discussions; but will also have a session with Dr Will Rayment about local marine mammal research in New Zealand. Please make them feel welcome.



GROUP DISCUSSION PARTICIPANTS

KEYNOTE SPEAKER

Mark Orams, Ph.D.

Mark Orams is a New Zealander who fell in love with the sea through his involvement in marine recreational activities. He is a surfer, scuba diver, ocean swimmer, paddler, sailor and explorer who has developed a commitment to marine conservation as a consequence of his extended time on the sea. His academic career has been derived from this commitment and he is currently a Professor of Marine Recreation and Tourism at the Auckland University of Technology. He has published over 75 papers and book chapters on marine tourism and conservation and much of his work has focused on the management of marine mammal tourism. He advocates that marine mammal science needs to move beyond expanding knowledge to research that makes a difference. Professor Orams currently serves as co-chair of the International Coastal and Marine Tourism Society, and is a board member of six charities working in the conservation and marine recreation areas.

ANATOMY, MORPHOLOGY AND EVOLUTION

James Mead, Ph.D.

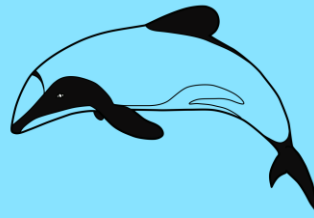
James Glen Mead [Jim] was born in Port Angeles, Washington in 1943. He graduated from Olympia High School and went on to Yale University where he got a bachelors in biology and geology in 1965. Following that he migrated to the University of Texas where he obtained a masters in geology with a thesis on a description of a Permian vertebrate fauna. He then went on to the University of Chicago where he completed a doctorate in 1972 in evolutionary biology with a dissertation on delphinid facial anatomy.

He had worked at a Canadian whaling station in Newfoundland for 3 years when he was hired by the Smithsonian Institution in 1972 as curator of marine mammals. He retired from that position in 2010 and went on to emeritus status at the Smithsonian. His major contributions are in anatomical and systematic studies, particularly of beaked whales and in the lexicography of anatomy.

He feels that anatomy is one of the bases for studying the biology of a species and comparative anatomy is a key to understanding the systematic relations of cetacea.

Ewan Fordyce, Ph.D.

Ewan is a paleontologist teaching at University of Otago. Originally, he trained at University of Canterbury, and held postdoctoral fellowships in USA and Australia. His research covers diverse aspects of the evolutionary history of Cetacea - with the involvement of some excellent PhD students. He works mostly with fossils, but has also necropsied and/or dissected stranded specimens of 17 living cetacean species to understand musculoskeletal systems and other soft tissues. Significant research results include recognising



some new families of extinct Cetacea, and an illustrated dictionary of the dolphin skull (with JG Mead). Evolution is the underlying theme.

We know little about the structure and functional morphology of cetaceans and other aquatic mammals; information is hard-won - generally from stranded animals - but is fundamental to understand the ecology and origins of living species. Marine mammals are the biggest of the vertebrates, yet we know less about them than for most terrestrial small mammal clades. There is huge scope to make advances on musculoskeletal, sensory, and other systems from dedicated work even on a single cadaver. Cetaceans are especially rare, and we owe it to human knowledge to make the most of animals that are cast up. Strandings are gifts to science from the sea. Emerging researchers - strive to get your hands dirty! Phylogenetic studies of marine mammals - which started shortly after Darwin's "Origin" - give us a framework to interpret patterns in a meaningful way. Recent molecular advances give new understanding of relationships, but the diverse range of trees from different molecular studies of the same taxa show that there is far to go. Amongst outstanding issues in structure/ evolution, what if any structural/functional complexes can explain the success (diversity at species level) of groups such as Delphinidae and Balaenopteridae, relative to low-diversity living clades like Platanistidae? What combination of physical and biotic constraints caused drop in diversity and range over geologic time before human influence? Should we specially note these as a reason to conserve at-risk ancient lineages?

BEHAVIOUR

Lars Bejder, Ph.D.

PhD 2005: Dalhousie University, Canada; MSc 1997: University of Otago, New Zealand; BSc 1994: University of Odense (now University of Southern Denmark), Denmark.

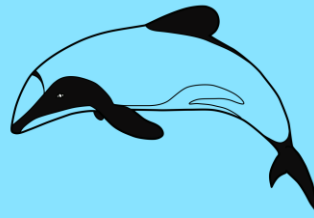
Statement of research interest(s):

Dr Bejder's main research interests fall into two categories: analysing and developing quantitative methods to evaluate complex animal social structures; and evaluating impacts of human activity of cetaceans.

Currently, Dr Bejder is the research leader for MUCRU, where he supervises Honours, MSc and PhD students. The members of MUCRU work on both applied and empirical conservation-based research projects.

The research areas of current MUCRU members fall into six categories: Anthropogenic impacts: fishery interactions, tourism, coastal and port developments, offshore interactions with industry. Population dynamics and behaviour: abundance and demographic parameter estimation, social structure, genetics and population connectivity, population viability. Ecosystem interactions: foraging ecology and trophic interactions, habitat modeling, community engagement, protected areas. Marine mammal health: pathology, eco-toxicology, sentinel species for ecosystem health, parasitology. Passive acoustic monitoring: development of new technology. New approaches: application and development of statistical models, remote methods for abundance estimation; statistical models for the analysis of capture-recapture data that allows for misidentifications.

Advice/insight for students pursuing a career:



Typically, scientists conduct science – but do not get involved in how their science can help in conservation and management. He is a firm believer in working with wildlife managers to optimise management outcomes of science.

Dr Bejder believes a key aspect of my professional development (during undergraduate and graduate degree) has been his involvement with a wide range of national and international scientists with differing research interests and strengths. Specifically, because at an early stage he worked with a number of scientists, he developed: a) a solid overview of the field of marine mammalogy; b) an interest in a specific area; c) good working relationships with colleagues for future collaborations; and d) strong friendships with colleagues. All of these have helped him immensely in his career.

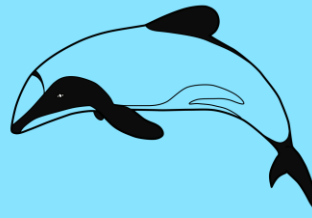
- Spend time figuring out what REALLY interests you. When you have accomplished this, get experience from/with scientists/labs that do this kind of research. Importantly, experience does not necessarily have to be gained in the marine environment.
- Get involved in various projects & research labs before starting grad school.
- Have a solid background in statistics, GIS and modelling.
- Make yourself stand-out: acquire skillset that other want-to-be marine mammal students typically do not have (e.g., engineering, oceanography, organic chemistry).
- Don't kid yourself: you *can't* be an expert at everything, so: build collaborations, networks, friendships – and work together to answer questions. This approach is more fun, productive and insightful.

Janet Mann, Ph.D.

Janet Mann, Vice Provost of Research and Professor of Biology and Psychology at Georgetown University, earned her PhD at The University of Michigan with expertise in the field of animal behavior. Since 1988 her work has focused on social networks, female reproduction, calf development, life history, conservation, tool-use, social learning and culture among bottlenose dolphins in Shark Bay, Australia. Her long-term study "The Shark Bay Dolphin Research Project", tracks over 1600 dolphins throughout their lives and includes an international team on three continents where each group studies different aspects of delphinid biology. Since 2005, Professor Mann has collaborated with Professor Lisa Singh (Computer Science, Georgetown), to both develop a relational database and conduct high-level computational research. Mann has published over 80 scientific papers in journals such as *Nature Communications*, *Philosophical Transactions of the Royal Society*, *Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society*, *Biological Conservation*, and *Animal Behaviour* and in books such as *The Question Animal Culture*, *The Biology of Traditions*, *Rational Animals*, and *Primates and Cetaceans: Field Research and Conservation of Complex Mammalian Societies* (forthcoming). Her edited volume, *Cetacean Societies* (University of Chicago Press, 2000), received several awards. Twice she was a fellow at *The Center for Advanced Study in the Behavioral Sciences* at Stanford University. In 2012 she spoke at the *The Royal Society* and gave a plenary lecture at *The American Psychological Association* meeting. Since 1997 her research has been supported continuously by the National Science Foundation, but she has also received funding from a range of foundations and government agencies nationally and internationally.

Words of advice:

- Learn to accomplish something in 15 minutes. That means, you can write a few sentences for a manuscript or format a figure. You don't need another cup of tea before you write something.
- Close your email/facebook and silence your mobile phone. Unless you are a firefighter or a doctor/veterinarian on call- whatever it is can wait.



- Gain diverse skills, especially quantitative and technological skills, but also become really good at one or two things.
- Be comparative and not too taxa-centric.
- Don't be discouraged or take rejection too personally. If that isn't in your nature, then academia is not the career for you. Rejection by peer review is part of the process.
- Collect the highest quality data possible. You can re-analyze a dataset, but you cannot undo bad data collection.
- Government dollars are the taxpayers' money. It isn't for you to waste or to enhance your personal knowledge. That is why you need to publish.

CONSERVATION AND POLICY

Andy Read, Ph.D.

Dr. Andy Read is the Stephen Toth Professor of Marine Biology at Duke University. His research interests focus on the conservation biology 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 Committee of Scientific Advisors of for the Marine Mammal Commission, the Scientific Committee of the International Whaling Commission and the Cetacean Specialist Group of the World Conservation Union. Andy is a charter member of the SMM and served as President of the Society from 2008 to 2010.

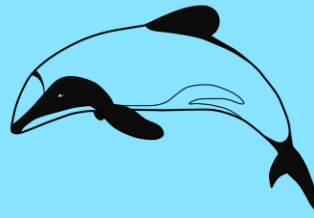
Barbara Taylor, Ph.D.

Dr. Barbara Taylor has been researching marine mammals for over 30 years. She works at the Southwest Fisheries Science Center in La Jolla, California USA. Barbara was one of the researchers that designed the current system in the US (under the Marine Mammal Protection Act) to limit the number of animals that can be accidentally killed in fishing operations. Most of her research has been in the North Pacific ranging from Alaska to the equator. She now leads a group of scientists identifying units to conserve using genetic data and has promoted developing guidelines and standards to facilitate naming new taxa of cetaceans using primarily genetic data. She also specializes in estimating risk of extinction and has worked with some of the most endangered species. She is member of several endangered species recovery teams, and has served on many status reviews of species petitioned for listing, chairs the Conservation Committee of the Society for Marine Mammalogy, and serves as the Listing Authority for the Cetacean Specialist Group of the International Union for the Conservation of Nature (IUCN). Her research has focused on developing the scientific background and tools to allow quantitative listing standards to be developed for the U.S. Endangered Species Act similar to the redlist criteria used by the IUCN. In 2006 she participated in the survey that failed to find any baiji, the Chinese river dolphin, portending the first human-caused extinction of a dolphin or whale (cetacean). As a result, she is actively working with other conservation scientists to prevent the extinction of what now becomes the most critically endangered cetacean: the vaquita, or Gulf

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of California porpoise, in Mexico. In the past she was a scientific advisor to the US Marine Mammal Commission and a delegate to the International Whaling Commission.

Marine mammal conservation biologists cover the full spectrum in our field from taxonomists to acousticians and from veterinarians to population modelers so giving advice to students needs equal breadth. Working with endangered species requires passion, persistence and optimism. There are very few quick fixes. Because conservation problem solving always requires changing the behavior of people who are in some way causing the threats to the species, developing communication skills is important. Conservation scientists need to communicate their science to other scientists and also those with no scientific training. Read "Don't be such a scientist" by Randy Olson. Take some good writing courses.

Getting quantitative skills will always put you ahead of the pack in conducting solid science and getting employment. Even if your work does not directly involve population dynamics, understanding the magnitude of a threat to a population almost always involves knowing what that population can withstand. A good course in demography (not easy to find!) will be a lifelong aide in understanding risk and putting your work in context. Add statistics and programming to a demographic understanding and you have a really solid toolbox to solve conservation problems.

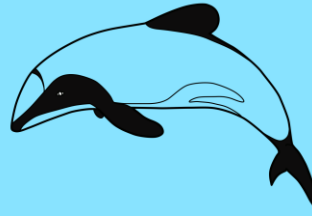
Lorenzo Rojas-Bracho, Ph.D.

Dr. Rojas-Bracho is Coordinator of Marine Mammal Research and Conservation at the National Institute of Ecology, in Ensenada, BC., Mexico. He strongly believes that it is through international cooperation that endangered species have the best chance for recovery. He has promoted the integration of researchers from different countries into joint researches focused on understanding better the marine mammals of Mexico. He has combined demographic and genetic aspects to evaluate the vaquita risk factors, as well as to estimate the population size and habitat use. These works have been done jointly with researchers from USA, Canada and Europe. He was one of the two cruise leaders in the joint cruise with the Southwest Fisheries Science Center (SWFSC) de La Jolla, California, EUA, to estimate the vaquita population size in 1997. Among the conservation actions to recover the vaquita, he established and Chairs the vaquita recovery team (International Committee for the Recovery of Vaquita/Comité Internacional para la Recuperación de la Vaquita; CIRVA). This Committee is constituted by well known marine mammal specialist from Canada, Norway, United Kingdom the US and Mexico. The works by CIRVA have been recognized by different scientific bodies.

He has authored or co-authored over 40 scholarly articles, book chapters and technical reports on marine mammals. He has been invited to chair, participate and be part of different international committees, workshops and working groups related to the management and conservation of marine mammals, among them International Whaling Commission (IWC)'s Scientific Committee Environmental Concerns Standing Working Group; he is a member of IUCN's Cetacean Specialist Group, *the CMS Scientific Council's Aquatic Mammals Working Group*, (AMWG), The Red List Authority, and the Committee of Scientific Advisors and Nominations and Elections Committee from the Society for Marine Mammalogy (SMM). He was Mexico's Commissioner to the International Whaling Commission from 2004-2013.

Mark Orams, Ph.D.

See Keynote speaker.



DISTRIBUTION, ABUNDANCE AND POPULATION BIOLOGY

Helene Marsh, Ph.D.

Helene Marsh, President of the Society of Marine Mammalogy, is Professor of Environmental Science and Dean of Graduate Research Studies at James Cook University, in North Queensland Australia. She is a conservation biologist with strong commitments to informing cross-disciplinary solutions to the conservation of coastal marine mammals and has provided advice to the government and NGOs in 10 countries.

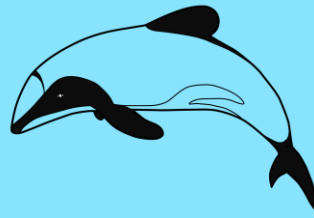
Helene is also committed to the education of the next generation of marine mammal scientists. Her 51st PhD student graduated earlier this year!

A fellow of the Australian Academy of Technological Sciences and Engineering, Helene has received international awards for her research and conservation from the Pew Charitable Trust, the Society of Conservation Biology and the American Society of Mammalogists.

The skills you learn during your PhD in marine mammal science will prepare you for a range of jobs. In her address of welcome, Helene will stress the importance of starting to plan now for the first five years of your post-doctoral career including: (1) deciding what sort of job you aspire to; (2) building a strong track record, (3) becoming externally competitive, (4) managing your time; and (5) learning to say no-something- she is very bad at.

Will Rayment, Ph.D.

Will is a lecturer in the Marine Science Department at Otago University in Dunedin, New Zealand. He uses established and innovative survey methods and analysis techniques to address questions on abundance and distribution of cetaceans, applying the answers to conservation management issues. He gained a PhD from Otago University, studying distribution and movements of the endemic and endangered Hector's dolphin, and the implications for design of Marine Protected Areas. He has been involved in aerial and boat-based line-transect surveys of abundance and distribution of a range of species from Hector's dolphins to southern right whales, and uses photo-ID mark-recapture data to estimate population parameters. The most important thing to consider when designing surveys of abundance and distribution is the ecology of the animals in question. For example, cryptic species, or populations at very low densities, might be better studied using passive acoustics rather than visual surveys. Photo-ID might be appropriate for naturally marked animals, but knowledge of their range and residency patterns is essential for interpretation of the results. Understanding the biases resulting from different survey methods and analysis techniques is important to place your results in context. In some situations, for example if attempting to detect change in threatened populations, maximising precision might be more important than minimising bias.



ECOLOGY

Emer Rogan, Ph.D.

Dr Rogan is a lecturer in the School of Biological, Earth and Environmental Sciences at University College Cork, Ireland. Her research interests are in marine mammal conservation biology and ecology, life history and population dynamics, interactions with fisheries, including bycatch mitigation, with a focus on odontocetes. Having come late(ish) to working on marine mammals, she obtained a BSc in Zoology from University College Dublin and did her PhD on the influences of water quality and food availability on the settlement of the European flat oyster (*Ostrea edulis*). Her PhD involved a lot of field work, a lot of water chemistry and hours of microscope work for zooplankton and phytoplankton identification! From there she worked on fish biology and finally obtained funding to establish and maintain a cetacean stranding programme and examine issues relating to bycatch, which continue today. Developing practical solutions and policies are important elements of this work.

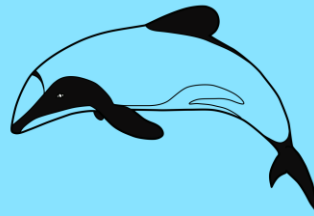
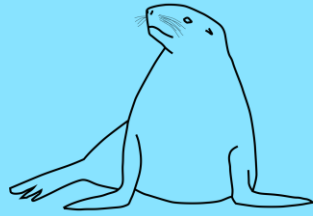
For students pursuing a career in this field she thinks that students should:

- i. develop a broad range of scientific skills, including good experimental design, field skills and data analysis, learn how to frame good research questions
- ii. publish – it is important in any scientific discipline to publish your work, and the experience of preparing drafts for publication, going through the review process, being rejected (sometimes!) and re-submitting is very important in the development of a scientific career,
- iii. have patience and follow your dreams!

Ari Friedlaender, Ph.D.

Ari S. Friedlaender received his M.S. in Marine Biology from UNC Wilmington, and his PhD in Ecology from Duke University. Ari's research focuses on understanding the underwater behavior of cetaceans. Specifically, he uses multi-sensor tags to visualize and analyze the feeding behavior of cetaceans in relation to their prey and changes in their environment (natural or anthropogenic). Currently, Ari studies a number of species including both baleen and toothed whales and dolphins in a variety of environments. However, Ari's passion is studying cetacean ecology in Antarctica where he has worked since 1997 deploying both suction cup and satellite tags on whales to better understand how their distribution, movement, and behavior relate to seasonal changes in both sea ice and krill. Ari uses a variety of analytical tools including customized visualization software to understand the fine-scale kinematics of feeding and spatially-explicit habitat modeling using GIS software. Ari is currently an Associate Professor in the Marine Mammal Institute at Oregon State University.

Marine mammals are some of the largest and most efficient ocean predators to have ever existed. In order to understand how and why these animals are so successful, it is necessary to understand both the animals as well as the environment of which they are a part. Ari believes in multi-disciplinary research, collaborating with a wide range of scientists with diverse skills, from engineering to anatomy to oceanography. Most importantly, Ari is committed to using these findings to educate the broadest audience as possible about the remarkable abilities of marine mammals as well as the threats that they face from human activities.



EDUCATION

Shane Gero, Ph.D.

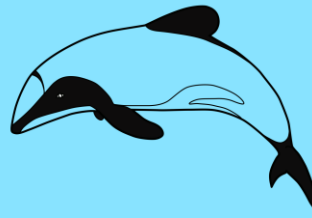
Shane mentored under Hal Whitehead through his masters and doctoral work at Dalhousie University in Halifax, Canada. The Dominica Sperm Whale Project, a long-term behavioral study of sperm whale families, grew from this partnership and though both personal and collaborative research has made advances in our understanding of sperm whale social networks, babysitting, diet, movement, habitat use vocal communication, and population dynamics. Shane is currently a Research Fellow at Aarhus University in Demark where he works with Peter Madsen. He splits his time between his scientific partners in Denmark, his human family in Canada, and the whale families which so patiently let him share in their lives off the island of Dominica in the Caribbean. Connect with Shane on LinkedIn or Twitter and meet the whale families at www.thespermwhaleproject.org.

While upcoming science students must be skilled researchers, with scientific denialism at epidemic levels in today's society, contributing to public awareness is crucial for scientists now more than ever. Students need to be proficient in the use of the tools available to them. These include social media platforms, directed mobile device applications, building relationships with popular media outlets, and actively seeking public speaking opportunities. Next generation scientists will connect people to their research and the major conservation issues to which it relates as a central part of their careers. I have always felt strongly that the public needs to be connected to biologists undertaking research and my seat as Chair of the Education Committee of the Society for Marine Mammalogy allows me to mold an academic culture which encourages others to do the same.

Carla Curran, Ph.D.

Carla Curran obtained her Ph.D. in Biological Oceanography from the Joint Program in 1993 after completing a Fulbright fellowship in New Zealand. Upon completing her degree, she obtained an NSF/NATO fellowship to study sex-changing fish in Italy. She subsequently completed a postdoctoral fellowship at Rutgers University where she investigated flounder ecology. Carla has spent 17 years teaching at the university level—most recently at Savannah State University where she helped start the Master of Science in Marine Sciences Program. She has mentored many undergraduate students and has advised 20 Master's students. Her current research interests are in the areas of marsh ecology, fish biology, and parasite-host interactions. She also actively encourages students to remain interested in science careers and has published her research not only in scientific journals, but as peer-reviewed K-12 activities – three of which are related to marine mammalogy.

"I thought that perseverance was the most important trait of a successful student, as that is what got me through various challenges in my career. After much reflection and discussion with other faculty, I am coming to believe that it may not be the most important characteristic. Perhaps we can discuss as a group the traits that make us most successful, whatever that means to you. Some of the best but toughest advice I've received is the importance of developing a line of research that results in becoming an expert in a specific discipline even though my research interests are much broader. That of course requires publishing the research in peer-reviewed journals. The best advice I can offer is to suggest that you develop a solid skill set that can be applied to multiple organisms/systems. You will be able to creatively contribute to new areas of research if your skill set is strong and applicable to a variety of topics."



HEALTH AND PHYSIOLOGY

Michael Moore, Ph.D.

Michael Moore trained as a veterinarian at the University of Cambridge in the UK, and has a PhD from the Woods Hole Oceanographic Institution (WHOI) and MIT Joint Program in Biological Oceanography. He is a Senior Research Specialist at WHOI. He provides veterinary support to the International Fund for Animal Welfare stranding work on Cape Cod, Massachusetts USA. His research includes the interfaces between humans and marine mammals in the context of vessel strike, entanglement and research tools such as suction cup and implantable tags, with goals of enhancing their conservation and welfare. He has had some success at grant writing to federal, quasi governmental and philanthropic sources. Key features include: careful selection of targets through thoughtful initial and subsequent interaction with program managers and other funders; targeting sources that want to fund what you want to do as opposed to adapting your goals to fit what you think the source wants to fund; defining aims, goals and methods carefully; crafting text that flows and elaborates sufficiently that the reviewer understands that the project is novel, practical and achievable, generating a viable, published product; with a budget that is lean and defensible, and well justified. Balancing the value versus cost of collaborations is an endless challenge.

Ailsa Hall, Ph.D.

Ailsa Hall is the Acting Director of the Sea Mammal Research Unit at the University of St Andrews and is also affiliated with the Scottish Oceans Institute. Her interests lie in the physiological adaptations of mammals to a marine existence, particularly at the molecular level; such as the respiratory and osmoregulatory adaptations and strategies that allow animals to forage at depth and their adaptations to cope with long periods of fasting. Her other research interests are all aimed at 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.

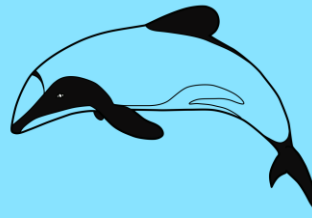
Ailsa's advice for students pursuing a career in this field of marine mammal science, given its present and future direction:

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.

MARINE MAMMAL SOUNDS

Adam Frankel, Ph.D.

As a Senior Scientist for Marine Acoustics, Inc. (<http://www.marineacoustics.com>), Dr. Adam Frankel is primarily responsible for bioacoustic research, modeling and marine environmental compliance on a wide variety of private and government funded projects. These projects include at-sea acoustic monitoring and



mitigation, modeling and predicting acoustic exposure of marine animals to a variety of sound sources, and describing whistle characteristics of wild dolphins. As a founding member of the Hawai'i Marine Mammal Consortium (<http://www.hmmc.org>), Dr. Frankel continues his long-term research on humpback and melon-headed whale behavior and bioacoustics off Hawai'i Island, an interest that developed from conducting humpback whale-sound playback experiments at the University of Hawai'i in the mid 1980s. His UH dissertation used both passive acoustic and visual tracking methods to learn more about humpback whale distribution, behavior and bioacoustics. Post-doctoral work at Cornell University involved diverse aspects of marine animal behavior and bioacoustics, including the response of marine mammals to anthropogenic sound. Over the years, Dr. Frankel has collaborated with others in different parts of the world, for example, using passive acoustic tracking to census bowhead whales on the North Slope of Alaska, examining the response of eastern Pacific gray whales to active sonar, and studying sperm whale behavior off Kaikoura, New Zealand. Over the years, his responsibilities have ranged from field equipment repair, data collection, acoustic and statistical analyses, to project direction and oversight. Dr. Frankel continues his strong commitment to teaching, mentoring and citizen science. During graduate school he worked with Earthwatch volunteers. From 1996 to present, he has taught for Cornell University's Bioacoustical Oceanography workshops and field courses on Hawai'i Island and San Juan Island. He has served on graduate committees for students at Texas A&M, University of North Carolina at Wilmington, North Carolina State University and Georgetown University.

Ricardo Antunes, Ph.D.

Ricardo is a Research Fellow at the University of St. Andrews, Scotland. Over the past 12 years he has been involved in numerous field research projects in Chile, Congo, throughout the North Atlantic Ocean, in the Arctic, Gulf of Mexico and Mediterranean Sea, targeting a wide range of cetacean species. This experience included working from platforms as varied as helicopters, large oceanographic research vessels, small zodiacs and sailing yachts, and using techniques such as photo-identification, acoustics and tagging. His scientific interests include social organization in mammals, particularly its variation and interplay with ecological factors, foraging ecology of cetaceans including movement, echolocation and acoustic communication. In later years his interests have also expanded into the effects of sound pollution in the marine environment, particularly on cetaceans, and the problems of interactions between marine mammals and fisheries and shipping. During his PhD at the University of St. Andrews, he studied variation in sperm whale vocal communication and social structure in the North Atlantic. This study found patterns of variation that were different than previously described in the Pacific, which indicated that they might be shaped by ecological constraints such as predation and resource availability. Ricardo has also discovered individual specific acoustic signals within sperm whale social units, a feature previously undescribed. Following his PhD, Ricardo has been involved in a study investigating the effects of sonar exposure on sperm, killer and pilot whales which among other things, aimed at producing the first dose-response relationships for these species.

CAREERS IN MARINE MAMMAL SCIENCE

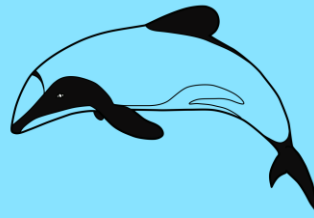
Gordon Hastie, Ph.D.

Dr. Hastie is a Research Fellow at the Sea Mammal Research Unit, in the University of St. Andrews. His research interest interests focus on understanding the relationships between foraging mechanisms and vocal communication, the functional aspects of marine predator distribution patterns, and the behavioural

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responses of marine mammals to anthropogenic activities. He leads a wide range of research projects on the responses by marine mammals to anthropogenic sources; in particular his current work focuses on the effects of emerging technologies such as marine renewable energy devices on marine mammals. 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 Senior Research Scientist at an environmental research consultancy (SMRU Ltd). As advice 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 core scientific skills – good experimental design is the key in any field of science;

Publish your work – it’s your scientific currency; funding is becoming harder to secure – ask yourself how your scientific interests might be of relevance to a wider audience.”

Brandon Southall, Ph.D.

Dr. Brandon Southall is President and Senior Scientist for Southall Environmental Associates (SEA), Inc., a Research Associate with the University of California, Santa Cruz (UCSC), and an Adjunct Assistant Professor at Duke University. He obtained Masters and Ph.D. degrees from UCSC, studying marine mammal communication and hearing. From 2004-09, Dr. Southall directed the U.S. National Oceanic and Atmospheric Administration (NOAA) Ocean Acoustics Program.

In 2009, Dr. Southall founded SEA, a research and consulting firm conducting science to support management and environmentally-responsible development (www.sea-inc.net). Dr Southall has extensive technical expertise in leading laboratory and field research programs (www.socal-brs.org) and applying science in national and international policies. He serves as a technical advisor to international corporations and environmental organizations regarding offshore energy development and commercial shipping. He has published nearly 50 peer-reviewed scientific papers and technical reports, and has given hundreds of presentations to scientific, regulatory, Congressional, and general audiences around the world.

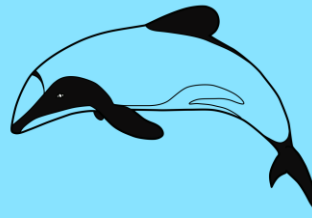
Karen Stockin, Ph.D.

Dr. Karen Stockin is the Director of the Coastal-Marine Research Group (CMRG) at the Institution of Natural and Mathematical Sciences, Massey University in Auckland, New Zealand. A faculty member since 2009, she has supervised to successful completion 2 PhDs and 3 MSc students, and currently supervises a further 6 PhD and 4 MSc students as primary supervisor. As Major Leader for Marine Ecology and Senior Lecturer, Dr Stockin also oversees undergraduate interests in marine biology and marine ecology within Massey. Members of CMRG work primarily on applied conservation-based research projects including assessment of abundance and habitat use of dolphin populations and anthropogenic impacts on cetaceans, particularly tourism, fisheries bycatch and pollution. Dr. Stockin says, “While the value of theoretical science is undeniable, I am a firm advocate of applied research which can be used directly by conservation managers to make a difference.” Key educational steps in the development of her career include receiving a BSc (Hons) in Marine Biology with Ecology from Plymouth University, England (1998); an MSc in Marine & Fisheries Science from the University of Aberdeen, Scotland (1999) and a PhD in Zoology from Massey

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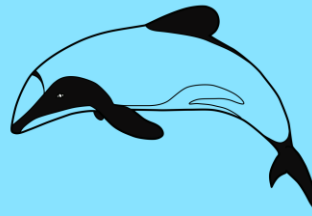
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University, New Zealand (2008). In terms of important professional steps in the development of her career, Dr. Stockin says, "Being exposed to good mentors who can teach you varied and invaluable skills and qualities had a massive impact on me. No one person has it all, so collaborating across many fields and with different experts gave me a taste of how exciting research really is when working together. Collegiality is a must in any science so to learn this as a student is important. Students all too often believe there is emphasis on them to know the answers or learn all the skill sets themselves yet this is in my view, incorrect. Instead, a good student should work diligently to study their discipline and build their own capability and strengths, while simultaneously, acknowledging their weaknesses and forming good collaborations to bridge those skill/knowledge gaps. Dr Stockin believes exposure to international conferences and meetings such as the International Whaling Commission played a significant role her professional development. "My philosophy can be summed up as the 'Triple Ps – Passion, Persistence, Publish!!!' First, know your passion and chase it – do not be talked into (or indeed out of) anything other than what you truly believe. I am not saying ignore the advice of learned, experienced professors around you, but I am saying have courage to follow your gut when need be. Of course, belief alone is never enough. Persistence is a vital key to success in any career. Be persistent in finding the correct project/supervisor (remember, this may not always be the first option to present itself). Be persistent in your every day mindset when it comes to the study of your discipline. Do not expect things to be straightforward, even if your topic is from a field you are familiar with. Postgraduate research is about learning, as you go and often from your own mistakes. There is of course, no excuse from poor preparation or planning, but even the best laid plans can and often will falter through the convoluted journey known as postgraduate research! What matters is not how often you fall down but more importantly, with what speed and resilience you get back up! With every fall comes progress so long as you apply what was learnt from each mistake going forward. How students handle 'failure', is often the best indication of the calibre of researcher that will become. Finally – Publish! For some publishing is a painful process, for others a necessary evil. Students should try to avoid both these outlooks but instead focus of publishing as the best independent, invaluable scrutiny of their work available. The peer review process, while not without its limitations, has the potential to be an invaluable tool to any postgraduate student preparing for thesis submission/examination. Using peer review to strengthen your research and its communication is an important part of science – it needs to be viewed as a positive tool rather than a painful or negative process. Last but by no means least...enjoy. If you find yourself physically and emotionally rung out, with the weight of the world on your shoulders, yet still there is nothing else you would rather be doing, congratulations - you will do just fine!

TIPS FOR WRITING PAPERS

Daryl J. Boness, Ph.D.

Dr Daryl J. Boness is a behavioral ecologist, who received a master's degree in human psychophysiology from Hollins College (Virginia, USA) in 1973 and a Ph.D. in animal behavior/behavioral ecology from Dalhousie University (Halifax, Nova Scotia, Canada) in 1979. He began working at the Smithsonian Institution's National Zoological Park in 1978 as a Curator of Mammals (with a focus on seals, polar bears and other large carnivores) and became a full-time Research Zoologist in 1985. He headed the Department of Conservation Biology at the Smithsonian's Conservation and Research Center for his last seven years there. He retired from the Smithsonian in 2004 and is now living in Hartford, Maine. He maintains an Affiliate Professorship with the School of Marine Sciences at the University of Maine at Orono, and with the Marine Science Center at the University of New England, and has Emeritus status at the Smithsonian.



Daryl became a member of the U.S. Marine Mammal Commission's Committee of Scientific Advisors on Marine Mammals in 1993 while at the Smithsonian and served for 17 years, including chairing the Committee for several years. In 2010 he was nominated by President Obama to become Chairman of the Marine Mammal Commission and was confirmed by the U.S. Senate in June of 2010. He continues to serve in that position. At the end of 2007 Daryl was appointed by the Society of Marine Mammalogy President and Board of Governors to be the Editor-in-Chief of Marine Mammal Science. During his career, Daryl has focused his research on reproductive strategies of pinnipeds and studied nearly half of the pinniped species. He has authored or co-authored over 100 peer-reviewed articles, book chapters, popular articles, and conservation and policy-related reports.

Brief advice regarding publishing:

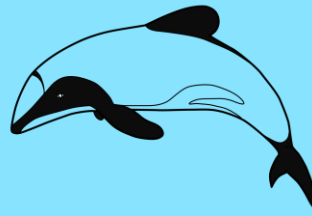
Believe it or not, writing papers can actually be fun and it is rewarding when they are published. As the Editor-in-Chief of Marine Mammal Science, Daryl sees about 200 original manuscripts per year and there is a large range in quality of papers submitted to the journal. Below, Daryl briefly provides a few points that he thinks are key to producing a good paper for publishing. While they apply especially to young scientists just starting to publish, there are many older scientists who could benefit from this advice as well. We will have an opportunity to discuss other points or expand on these during the discussion session at the workshop.

1. Write clearly and in as simple language as possible so those who are not experts in your area can follow and understand the paper. Along with this avoid jargon as much as possible. You know what you have done, what your results are, and the implications of them. Your job is to interest others (especially reviewers), convince them that you have done things correctly and interpreted your results appropriately for the data presented. You want to inspire others to follow on your work and advance the knowledge you have already advanced.
2. Be concise!! Probably the biggest mistake students finishing a thesis and trying to publish make is to include in papers everything they did and read. This is fine in writing a traditional thesis but not when publishing a paper. Focus your paper and include only those analyses and results critical to the objectives and aims, which should be stated clearly early on. Think of the job of a journal editor as keeping papers and journal's cost-effective. The way to do this is to make sure there is no extraneous material in a paper. Editors will always be looking to cut material from your manuscript – don't give them the opportunity.
3. No one is perfect, so always use your co-authors and colleagues to provide constructive feedback before you submit a paper. They should be reading the paper for substantive content and proper analyses, clarity of writing, use of appropriate logic, and details of spelling, grammar, and organization. If you are a non-native English speaker, you should probably have someone check the quality of your English. Insofar as a paper has lots of issues with any of these more technical or mundane aspects, it sets editors and reviewers in a wrong frame of mind at the outset of considering your paper.
4. When you get your paper back with a decision letter and reviewer comments. Keep an open mind and don't get defensive. Look at the comments and evaluate them one by one and decide if you agree with recommendations or not. Change those things that you agree improve your paper. It is okay to disagree and say so. However, when you do be sure to provide a good explanation as to why. In the end the journal editor will be the arbiter and decide what is necessary to change and

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what is okay to leave based on your rationale and that of a reviewer who holds a contrary perspective.

TIPS FOR WRITING GRANTS

Doug Wartztok, Ph.D.

Douglas Wartzok is Provost, Executive Vice President, Chief Operating Officer, and Professor of Biology at Florida International University. He received a B.A. in Physics and Mathematics from Andrews University, a M.S. in Physics from the University of Illinois, and a Ph.D. in Biophysics (Neurophysiology) from the Johns Hopkins University. He has been a faculty member and academic administrator at Johns Hopkins University, Purdue University, University of Missouri-St. Louis, and Florida International University.

His research on marine mammals has taken him from the Arctic Ocean to Antarctica to study seals, whales and walrus. He, along with his colleagues and graduate students have developed acoustic tracking systems for studying polar seals under the ice, and radio and satellite tracking systems for studying whales. His research focuses on behavioral and physiological ecology of marine mammals; sensory systems involved in under-ice navigation by seals; and psychophysiological studies of captive marine mammals. For the past decade he has been involved in the issue of the effects of naval anti-submarine warfare sonar on marine mammals, in particular beaked whales.

For eight years he edited *Marine Mammal Science* and is now Editor Emeritus. He has just finished a term as Chairman of the Committee of Scientific Advisors, U.S. Marine Mammal Commission. He was a member of the National Academy of Sciences Committee on "Assessing Ambient Noise in the Ocean with Regard to Potential Impacts on Marine Mammals," and chaired the National Academy of Sciences Committee on "Determining Biological Significance of Marine Mammal Responses to Ocean Noise."

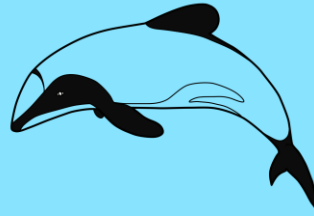
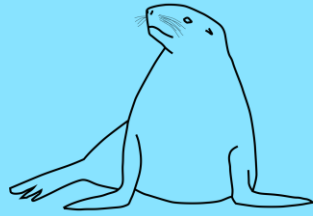
Suggestions for Writing Successful Research Proposals:

The most important prerequisite for writing a successful grant is having an idea worth pursuing. The idea needs to be more significant than merely expanding an already well known data set or adding yet another example to a well known phenomenon. At a minimum, the idea needs to be one that will move the discussion in one subset of a discipline forward by bringing a new dimension or challenging an established conception. In order to demonstrate that this is the case, you need to show good familiarity with the work that has already been published in this field. After defining the idea and placing it within the context of disciplinary intellectual dialogue, the next step is an experimental design that will unambiguously test the idea. If the experimental design is not rigorous and focused, the results of the experiment can be alternate interpretations that end up not advancing science. Obviously as science moves forward the outcome of one experiment leads to new questions for future experiments, but it is important to have an experimental design that addresses the question you are asking in an unambiguous manner so that the result will indeed be new questions not a return to the same question you were trying to answer. None of the above will convince an evaluator of your proposal if the proposal is not well written. The ability to express your ideas cogently, clearly and concisely is essential. Finally, the budget needs to tie closely to the experimental design and reflect what is needed to accomplish the project without being excessive. Either too high or too low a budget will call into question your understanding of the project you have described in the proposal.

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TIPS FOR WRITING CVS

Heidi Pearson

Heidi Pearson is an Assistant Professor in Marine Biology at the University of Alaska Southeast (UAS). She was born and raised in Iowa and earned her B.S. in Biological Anthropology and Anatomy, and Biology, from Duke University. She then completed her Ph.D. in Wildlife and Fisheries Sciences at Texas A&M University. Before joining the UAS faculty in 2011, Heidi worked at the University of Texas Medical Branch, the Whale Center of New England, and Stony Brook University. Heidi's research focuses on applying behavioral ecological theory towards: 1) understanding the evolution of social, mating, and maternal strategies in marine mammals; 2) examining the social intelligence hypothesis in cetaceans and primates; and 3) understanding the role of marine mammals in maintaining healthy ecosystems. She currently studies dusky dolphins, humpback whales, and sea otters. Three pieces of advice she wishes to pass on to students are: 1) to take advantage of opportunities that come your way because you never know which one will end up being, or leading to, a life-changing event; 2) to be open-minded and flexible about career choices; and 3) to realize that succeeding in the field of marine mammal science requires a tremendous amount of hard work, fortitude, patience, persistence, and at times, sacrifice, but it is worth it in the end.