

# 6<sup>th</sup> Student Affairs Workshop



**29 November 2007**

**Cape Town, South Africa**

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## **ORGANIZATION**

*2007 Student Affairs Working Group*  
Amanda Bradford (SMM Student Member-at-Large)  
Nico de Bruyn, Andrea Hindley, Ingrid Peters  
Mduduzi Seakamela, Cheryl Tosh,  
Michelle du Toit, Meredith Thorton

## **FUNDING**

Society for Marine Mammalogy  
College of Ocean and Fishery Sciences, University of Washington  
School of Aquatic and Fishery Sciences, University of Washington

## AGENDA

- I. Sign-in and Forage** **7:00–7:40**
- II. Welcome and Introduction** **7:40–7:45**  
Amanda Bradford, SMM Student Member-at-Large
- III. Keynote Address** **7:45–8:15**  
Bernd Würsig  
*Marine Mammals Need No Visas: Challenges of Research and Conservation in a Global Economy*
- IV. Break** **8:15–8:30**
- V. Small Group Discussions** **8:30–10:00**
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| Acoustics                                  | Evolutionary Biology and Archeology         |
| Anatomy and Physiology                     | Fisheries Interactions and Human Dimensions |
| Behavioral Ecology                         | Foraging Ecology and Nutrition              |
| Biological Oceanography and Marine Ecology | Genetics                                    |
| Cognition                                  | Policy and Management                       |
| Conservation Biology                       | Population Dynamics and Assessment          |
| Distribution, Diving, and Movement         | Toxicology, Pathology, and Vet Medicine     |

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## PARTICIPANT BIOGRAPHIES

### Keynote Speaker

Bernd Würsig, Ph.D.

Dr. Bernd Würsig is currently a Professor of Marine Biology at Texas A&M University. His research interests include learning about foraging and social strategies in dolphins and whales. This interest is so for the pure learning and teaching aspect of it; but he also believe that all research has an onus to help provide answers on how we humans can do better in interacting with our natural environments. Important educational steps in the development of Dr. Würsig's career include receiving a B.S. in Zoology and Germanic Literature at Ohio State University in 1971, and a Ph.D. in a multidisciplinary program of Behavior, Neurobiology, Ecology, Evolution, and Marine Sciences at Stony Brook University, New York, 1978. His dissertation was on aspects of behavior and ecology of bottlenose and dusky dolphins in Patagonia, Argentina, and there he lived with his wife, Melany, for four years, variably in a tent, as well as a cinderblock house built by Roger and Katie Payne. His field advisor was Roger Payne, and Ph.D. adviser was Charlie Walcott ("both wonderful scientists and human beings!"). Important professional steps in the development of Dr. Würsig's career include completing a post-doc with the "great" Ken Norris at the University of California, Santa Cruz (1978-1981), studying Hawaiian spinner dolphins with Ken, Randy Wells, and Melany. He then went "through the ranks" of Assistant to Full Professor at the Moss Landing Marine Laboratories, California (1981-1989), and was then asked to start a Marine Mammal Research Program at Texas A&M, where he is to this day. He has published about 120 peer-reviewed papers and 50 popular ones, but is "most proud" of having mentored over 60 grad students to date. For students pursuing a career involving marine mammal research and conservation, Dr. Würsig advises, "I look for bright, hard-working, dedicated students who have made sure that they are well-informed. So, read voraciously on the things you care most about, know the names and affiliations and projects of people who do work you admire, and know the research and conservation needs in your discipline. Do not ever be afraid to contact a researcher you think you might learn from or admire, but do so after diligently learning all about her or him. The internet makes this 'easy' these days, so take full advantage of what is available, from search engines to personal contacts."

## **Acoustics**

Adam Frankel, Ph.D.

Dr. Adam Frankel is currently an Adjunct Professor of Biology at the University of North Carolina, Wilmington, as well as a founding member of the Hawai'i Marine Mammal Consortium. His research interests include the use of acoustic signals in mating systems, animal responses to anthropogenic sound, and risk assessment. Important educational steps in the development of Dr. Frankel's career include receiving a B.S. in Biology at the College of William and Mary (1984), an M.S. in Zoology at the University of Hawaii at Manoa (1987) entitled "Sound playback experiments with humpback whales *Megaptera novaeangliae* in Hawaiian waters," and a Ph.D. in Oceanography at the University of Hawaii at Manoa (1994) entitled "Acoustic and visual tracking reveals distribution, song variability and social roles of humpback whales in Hawaiian waters." Important professional steps in the development of Dr. Frankel's career include conducting Postdoctoral research at Cornell Bioacoustics (1994-2000) and co-founding the Hawai'i Marine Mammal Consortium (2000). For students pursuing a career in acoustics, Dr. Frankel advises you to take a *lot* of math courses and be comfortable with it.

Paul Nachtigall, Ph.D.

Dr. Paul Nachtigall is currently the Director of the Marine Mammal Research Program, Hawaii Institute of Marine Biology, University of Hawaii. His research interests include the sensory systems of marine mammals. Important educational steps in the development of Dr. Nachtigall's career include receiving a B.A. in Experimental Psychology at San Jose State University (1967), an M.A. in Experimental Psychology at San Jose State University (1970), and a Ph.D. in Comparative/Experimental Psychology at the University of Hawaii (1976). Important professional steps in the development of Dr. Nachtigall's career include conducting a Teaching Assistantship in Experimental Psychology, receiving assistance from Ron Schusterman from the Stanford Research Institute, holding a Research Assistantship and then Scientist position at the Navy Laboratory, being Director of the Hawaii Institute of Marine Biology, and serving as the Scientific Program Chair for the 13<sup>th</sup> Biennial Conference on the Biology of Marine Mammals in Maui, Hawaii. For students pursuing a career in acoustics, Dr. Nachtigall encourages, "Follow your opportunities, do what you enjoy, take the Taoist approach of water flowing, go where there are opportunities. If you are stopped, flow in an alternative direction, but keep moving."

Douglas Nowacek, Ph.D.

Dr. Douglas Nowacek is currently an Assistant Professor in the Department of Oceanography at Florida State University, Tallahassee. His research interests include technology development, marine mammal bioacoustics, and behavioral ecology, with experience in marine mammal and noise issues. Important educational steps in the development of Dr. Nowacek's career include receiving a B.A. in Zoology at Ohio Wesleyan University (1991) and a Ph.D. in Biological Oceanography at Woods Hole Oceanographic Institution and Massachusetts Institute of Technology (1999) as an ONR Graduate Research Fellow with research focused on the sound use and behavior of foraging bottlenose dolphins. Important professional steps in the development of Dr. Nowacek's career include serving as a National Research Council Postdoctoral Research Associate (2000-2002) working on North Atlantic right whale bioacoustics and behavior specifically focused on the circumstances surrounding collisions between ships and right whales; as a Staff Scientist at the Mote Marine Laboratory (2002-2003) focused on development of multi-sensor tagging technology; and as an Assistant Professor in the Department of Oceanography at Florida State University (2003-present) continuing bioacoustic and behavioral ecology research of marine mammals with work on right whales, dolphins, and Florida manatees. Dr. Nowacek was also nominated for a University Teaching Award, was selected as one of ten international scientists by the World Conservation Union (IUCN) for the Western Gray Whale Advisory Panel, is on the Society for Marine Mammalogy Board of Governors, and is an Associate Editor for *Marine Mammal Science*.

## **Anatomy and Physiology**

Leslie Cornick, Ph.D.

Dr. Leslie Cornick is currently an Associate Professor and Director of the Marine Biology program at Alaska Pacific University (APU). Dr. Cornick's research interests include using interdisciplinary approaches to

examine the physiological constraints on foraging in marine predators and to investigate the flexibility of foraging behavior in response to natural and anthropogenic changes in the environment. She is very concerned about impacts of human activity on the marine environment, particularly in Alaska, where climate change is already manifesting itself in effects on many species' ability to make a living in the ocean. Dr. Cornick is originally from southern California, where she obtained a B.A. in Biological Anthropology from the University of California, San Diego. Her M.A. in Physiology and Behavioral Biology is from San Francisco State University. She did her Ph.D. at Texas A&M University, studying optimal foraging in Steller sea lions in Alaska. Following her Ph.D., Dr. Cornick remained in Alaska to do Postdoctoral research at the University of Alaska Fairbanks, which took her to the opposite polar regions of Antarctica. After leaving for a year to teach in Connecticut, she returned to Alaska to APU. Despite her California beach-bound upbringing, Dr. Cornick loves Alaska and now calls it home with her husband and two dogs. She also loves teaching at APU, where she gets to know students well during their first year of university, and has the opportunity to watch them grow and mature in their approach to science and the marine environment.

#### Dawn Noren, Ph.D.

Dr. Dawn Noren is currently with the Marine Mammal Program at the Northwest Fisheries Science Center, U.S. National Marine Fisheries Service. Dr. Noren is a physiological ecologist whose primary research interests include: 1) diving physiology, 2) energetics and metabolism, 3) the assessment of body condition, and 4) how individual variation in condition and physiology impacts animals' abilities to function in their environment. Her current projects include assessing the potential impacts of vessel presence on Southern Resident killer whale behavior and energetics, energetic cost of swimming and daily activity budgets in killer whales, habitat use by Southern Resident killer whales, energetic cost of performing surface active behaviors in bottlenose dolphins, development of myoglobin content and acid buffering capacity in the swimming muscle of harbor porpoise and other cetaceans, dynamics of contaminant (PBDEs, PCBs, DDTs) transfer during lactation in bottlenose dolphins, assessing utilization of specific fatty acids in the blubber and changes in blood metabolites during fasting in northern elephant seal pups, body energy reserve utilization and fasting capabilities of juvenile Steller sea lions, and the potential impact of domoic acid to killer whales consuming salmon during harmful algal blooms. Important educational steps in the development of Dr. Noren's career include receiving an M.S. (1997) and Ph.D. (2002) at the University of California, Santa Cruz (UCSC). Reflecting on her graduate education and subsequent positions, Dr. Noren states, "Going through the process of obtaining an M.S. degree prior to entry into the Ph.D. program was a pivotal decision that enabled me to complete a successful Ph.D. dissertation project with a high level of independence and in a timely manner (4.5 years). Although the M.S. and Ph.D. projects were quite different, including both the focus of the research projects and the study organisms, the two years I spent in the M.S. program helped me to develop my independence as a researcher and also gave me additional time to develop my Ph.D. dissertation project prior to commencing the Ph.D. program. Also, one of the valuable experiences I had while I was a Ph.D. student was to work closely and collaborate with a fellow student (Rudy Ortiz). Together we combined our expertise and samples from northern elephant seals to produce additional papers that were ancillary to our Ph.D. programs. These papers helped bolster my publication list, and this collaboration also provided me with an early experience in collaborating with another researcher, which is a critical skill for all scientists. During my Ph.D. program, I also branched out away from my immediate department (Ecology and Evolutionary Biology) to collaborate with other experts in other departments at UCSC as well as at different institutions so that I could diversify my educational experience. These collaborations gave me new tools and skills, such as analyzing blubber fatty acids and constructing biological models. These skills not only improved my dissertation, but one of the skills I learned (biological modeling) was also the reason why I was hired as a post-doc by the Steller sea lion program at the National Marine Mammal Laboratory in Seattle, Washington. After only one year in the post-doctoral position, I secured the position I currently have at Northwest Fisheries Science Center. Although it is changing somewhat these days, it is still relatively rare for the National Marine Fisheries Service to hire physiologists. I was told that two of the reasons why I was offered the job were because of my diverse skill set and that my past projects demonstrated that I used physiological studies as a tool to better understand how marine mammals survive in their environment and respond to perturbations." For students pursuing a career in anatomy and physiology, Dr. Noren advises, "Anatomy and physiology are very broad areas, and the technology is rapidly changing. In order to be successful, students should try to diversify their skills as much as possible while they are in graduate school. Having experience in both the laboratory and in the field with healthy, live and/or stranded, dead animals will be critical to securing employment and being able to adapt to changing methods and technology. Having said that, it is impossible for one person to learn all the possible techniques and skills that are currently being used in the field of marine mammal physiology. Thus, it is critical that students collaborate with others who have different skill sets in order to successfully conduct studies with a larger impact in the field. Although the field of marine mammal physiology and anatomy is somewhat immature relative to the field of

terrestrial animal anatomy and physiology, scientists who study marine mammals have made great strides in the last several decades. As such, relatively simplistic physiological and/or anatomical studies on marine mammals are becoming increasingly rare in the current scientific literature. Current studies with high impact are using physiological and/or anatomical studies to better understand marine mammal ecology, behavior, and/or impacts from anthropogenic sources.”

## **Behavioral Ecology**

Robin Baird, Ph.D.

Dr. Robin Baird is currently a Research Biologist with the Cascadia Research Collective in Olympia, Washington. His research interests broadly include marine mammal behavior and ecology. In the last 10 years, Dr. Baird’s research has involved studies of foraging behavior and ecology of fish-eating and mammal-eating killer whales, studies of diving behavior and habitat use of a number of species of cetaceans (humpback whales, Cuvier’s and Blainville’s beaked whales, false killer whales, short-finned pilot whales), population estimation using mark-recapture analyses, and population structure using photo-identification, satellite tagging and genetic analyses. Most of his research has direct management and conservation implications, although much of what he works on addresses basic questions of biology, behavior and ecology. Dr. Baird’s start in the field came from volunteering with a non-profit research group. He was then fortunate to be accepted into a graduate program with a supervisor who was (is) a strong scientist studying behavioral ecology (he had no background with marine mammals). Rather than just working on his thesis, Dr. Baird continued involvement with studies of a diversity of species and questions, which was extremely important in terms of gaining flexibility and experience beyond the somewhat narrow topic of his thesis. For students pursuing a career in behavioral ecology, Dr. Baird advises, “1) Do your homework. 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 thinking they are answering questions that have already been answered. 2) 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. 3) 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. 4) Attend and present your work at non-marine mammal conferences, not just taxon-oriented (like the American Society of Mammalogists) or regional meetings, but discipline-oriented meetings (Animal Behaviour Society, Society for Behavioural Ecology, etc). 5) Read question-oriented journals, not just taxon-oriented journals. 6) Focus your work as much as possible on the questions, not on the species. 7) 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. 8) 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.”

Louise Chilvers, Ph.D.

Dr. Louise Chilvers is currently with the Marine Conservation Unit, Department of Conservation, New Zealand. Dr. Chilver’s research interests include marine mammals, fisheries/marine mammal interactions, behavioral ecology, foraging behavior, social/mating systems, growth, reproduction and survival, and population ecology. Important educational steps in the development of Dr. Chilver’s career include receiving a B.Sc. at Lincoln University, Christchurch, New Zealand; a Ph.D. at James Cook University, Townsville, Australia, entitled, “Behavioural ecology of bottlenose dolphins (*Tursiops aduncus*) in S.E. Queensland, Australia: Adaptations to ecological and anthropogenic influences; and a Postgraduate Certificate of Geographical Information Systems (GIS) Science. For student pursuing a career in behavioral ecology, Dr. Chilver’s advises, “Have as many skills in as many areas of life as you can including biology, statistics, carpentry, electrician, boat and drivers licenses, people management, finance and self confidence.”

Shannon Gowans, Ph.D.

Dr. Shannon Gowans is currently an Assistant Professor at Eckerd College, St. Petersburg, Florida. Dr. Gowan's research interests include the evolution of sociality, specifically what drives some individuals/communities/species to be in large or small groups, have long or short term associations, fixed or fluid group memberships. She studies this question by looking at the social structure of cetaceans. She has directly worked on northern bottlenose whales, Atlantic white-sided dolphins, white-beaked dolphins, and bottlenose dolphins. She has been involved in studies on sperm whales, pilot whales, and dusky dolphins. In order to understand social structure, Dr. Gowans has also looked at population size and structure and tried to gain an understanding of the animals' ecology. Regarding important educational and professional steps in the development of her career, Dr. Gowan's describes, "I fortunately chose Dalhousie University for my undergraduate degree - without knowing who Hal Whitehead was. However, once at Dalhousie I was able to conduct research with Hal during my undergraduate degree and then move directly in to a Ph.D. program. Towards the end of my Ph.D., my husband and I began research on coastal cetaceans off Halifax which became the basis of my post-doc work in Galveston with Bernd Würsig. I then got a tenure track job at Eckerd College where I now teach and conduct research on bottlenose dolphins." For students pursuing a career in behavioral ecology, Dr. Gowan's advises, "First off, I would say you must be committed to this work. It is so competitive that if you are not willing to work hard and make things happen for yourself they will not happen. You need to find your own opportunities and make them work for you. You need to find a way of making yourself stand out from the sea of other candidates for a job or grad school. If you are applying to work with someone - make sure you have read their work and show your interest in their work. You need to highlight any additional skills you have - some of the most sought out skills are quantitative - take upper level math or stats courses or take computer programming. Sometimes you need to be willing to be flexible. I initially had troubles getting funding for grad school and quickly began looking into other opportunities and was willing to do an M.S. on birds if it involved either genetics or acoustics because I knew these would be transferable skills that I could use later on for a cetacean-based Ph.D. The funding worked out, but that flexibility is important. I would also encourage graduate students to take any opportunity to teach during grad school. I have been on a number of search committees for jobs at Eckerd and often the first thing we look for is teaching experience. You will set yourself apart from other candidates if you have taught anything."

Leszek Karczmarski, Ph.D.

Dr. Leszek Karczmarski currently holds a Research Faculty position at the Mammal Research Institute (MRI) of University of Pretoria, South Africa, and is a newly appointed Head of the Cape Town based Whale Unit of MRI. He is also an Associate Research Faculty at the Institute of Marine Life Sciences, Department of Marine Biology at Texas A&M University at Galveston; an adjunct Research Scientist at Mote Marine Laboratory, Florida; and a Visiting Researcher at Kyoto University with the Japan Society for the Promotion of Science. His research interests include: 1) cetacean behavioral ecology, especially habitat relationships, odontocete group dynamics, and social strategies; 2) evolutionary processes that shape population structure and mating systems of delphinid cetaceans, and how they relate to other known mammalian systems; and 3) conservation concepts that recognize the importance of marine mammals in the integrated management of aquatic ecosystems. In his past and present work, Dr. Karczmarski puts emphasis on the ecology of group living, population structure, and animal-habitat interactions on a population level. He is interested in understanding how environmental variability, both natural and anthropogenic, and intrinsic factors influence aggregation patterns, population structure, and social behaviors. From the applied ecology standpoint, such an approach provides a means for understanding how environmental pressures, either natural or human-induced, influence daily lives of free-ranging animals. Several of Dr. Karczmarski's research projects address questions related to conservation planning for marine populations, contributing to issues such as the principles of the design and management of marine protected areas, and designation of stock structure in pelagic animals. His geographic regions of interest encompass semi-pelagic and coastal habitats throughout the tropics and subtropics, particularly the atoll systems of the central and south Pacific and Indian Oceans, and coastal systems of South and East Africa, as well as the Caribbean. In previous years, Dr. Karczmarski's research took him to South Africa, Mozambique, Tanzania, Kenya, Zanzibar, Madagascar, Mayotte, the Bahamas, Belize, Hawai'i, Cook Islands, Maldives, Japan, Korea, and the Peruvian Amazon. He was also a Visiting Lecturer at the Department of Marine Sciences at University of Hawai'i at Hilo. Important educational and professional steps in the development of Dr. Karczmarski's career include completing an M.Sc. in Oceanography and Sea Fisheries and the University of Gdansk and the Agricultural University of Szczecin, Poland (1989); receiving a Ph.D. in Zoology at the University of Port Elizabeth, South Africa (1997); conducting Postdoctoral research with the Marine Mammal Research Program of Texas A&M at Galveston (1998-2000) and with the Texas Institute of

Oceanography at Texas A&M University (2000-2003); and establishing a fruitful research partnership with the Institute of Human Evolution Studies at Kyoto University, Japan.

Juichi Yamagiwa, Ph.D.

Prof. Juichi Yamagiwa is currently the Head of the Institute of Human Evolution Studies, Graduate School of Natural Sciences at Kyoto University, Japan, and President of the Primate Society of Japan. Prof. Yamagiwa's research interest encompasses broadly the social evolution of human and non-human primates. He has conducted a broad range of primatological studies, of which the most notable are studies of Japanese macaques in Yakushima Island, Japan, and his long-term research of gorillas and chimpanzees across various research sites in Africa. His studies of sympatric populations of gorillas and chimpanzees have currently established him among the most prominent primatologists. In his many works, he puts emphasis on socioecology, life history tactics, and behavioral traits of female-philopatry and female-dispersal species, and conducts comparative analyses of how social and ecological factors shape intra- and inter-specific variations. His broad interests in comparative and evolutionary ecology go beyond primates, including other social mammals such as cetaceans. He is currently working with Dr. Leszek Karczmarski on two large edited volumes that will provide comparative synthesis of the social ecology of simian primates and delphinids. He is also a dedicated educator and conservationist, and puts a lot of energy toward supporting local community-based projects to protect endangered gorilla populations in central Africa.

### **Biological Oceanography and Marine Ecology**

Lisa Ballance, Ph.D.

Dr. Lisa Ballance is currently the Director of the Protected Resources Division of the Southwest Fisheries Science Center, U.S. National Marine Fisheries Service, as well as a Professor of Biological Oceanography at the Scripps Institution of Oceanography. Dr. Ballance's research interests include the ecology of seabirds and cetaceans, species diversity patterns and trends in space and time (interannual to regime shift scales), and ecosystem-based approaches to management. Important educational steps in the development of Dr. Ballance's career include receiving a B.A. in Biology at University of California, San Diego (1981), an M.S. in Marine Science at Moss Landing Marine Laboratories (1987), and a Ph.D. in Biology at the University of California, Los Angeles (1993). Important professional steps in the development of Dr. Ballance's career include serving as a Postdoctoral Fellow for the National Research Council and as a Marine Ecologist for the Southwest Fisheries Science Center, as well as accruing vast field experience studying the ecology of seabirds and cetaceans, particularly during ship-based surveys.

Mark Hindell, Ph.D.

Dr. Mark Hindell is currently an Associate Professor and Director of the Antarctic Wildlife Research Unit (AWRU) at the University of Tasmania. Dr. Hindell's research interests concern the role of the marine environment on the population performance of top predators (such as seals). His team in the AWRU study a wide range of physiological, ecological, and behavioral questions. Dr. Hindell has been studying Antarctic seals since 1984, and has made numerous visits to the Antarctic and the Arctic since that time. Important educational steps in the development of Dr. Hindell's career include receiving a B.Sc. at Monash University and a Ph.D. at the University of Queensland.

Joel Ortega-Ortiz, Ph.D.

Dr. Joel Ortega-Ortiz is currently a Research Associate with the Oregon State University Marine Mammal Institute. Dr. Ortega-Ortiz's research interests include cetacean distribution and habitat preferences, specifically how oceanographic processes affect cetacean distribution and habitat use, as well the movement patterns of large whales, specifically migration, home range, and foraging patterns. Important educational steps in the development of Dr. Ortega-Ortiz's career include receiving a B.Sc. in Biology (1994) and an M.Sc. in Oceanography (1996) from the Universidad Nacional Autónoma de México and a Ph.D. in Wildlife and Fisheries Sciences from Texas A&M University (2002). Important professional steps in the development of Dr. Ortega-Ortiz's career include participating in multidisciplinary projects interacting with biologists, oceanographers (physical, chemical and biological), acousticians, and quantitative ecologists. For students pursuing a career in biological oceanography and marine ecology, Dr. Ortega-Ortiz advises, "A career in science is an infinite quest for information: researchers are lifelong learners. Technological advances are

constantly providing new data and analysis tools to answer questions about biological oceanography and marine mammal ecology. Today we have access to amazing data from satellite imagery, echo sounders and side scan sonars. We also have great analysis tools like GIS, statistical packages, and programming languages. You need to learn the tools of the trade and stay up to date. The more tools you have under your belt, the more chances you have to succeed.”

Glenn VanBlaricom, Ph.D.

Dr. Glenn VanBlaricom is currently a Professor of Marine Mammal Studies at the College of Ocean and Fishery Sciences and Associate Professor at the School of Aquatic and Fishery Sciences, both at the University of Washington. He is also the Assistant Unit Leader, Wildlife, for the Washington Cooperative Fish and Wildlife Research Unit, Biological Resources Division, U.S. Geological Survey. Dr. VanBlaricom’s research interests include community ecology and conservation biology of nearshore marine environments, population and community ecology and conservation biology of marine mammals, and ecological consequences of offshore oil development and transport in the north Pacific region. Important educational steps in the development of Dr. VanBlaricom’s career include receiving a B.S. in both Oceanography and Zoology at the University of Washington (1972) and a Ph.D. in Oceanography at the Scripps Institution of Oceanography (1978). Important professional steps in the development of Dr. VanBlaricom’s career include serving as a Wildlife Biologist for the California Sea Otter Project of the National Ecology Research Center, Fish and Wildlife Service (1977-1993); conducting a population monitoring study of black abalone on San Nicolas Island, California, for over 20 years; and participating as a member of the Western Gray Whale Advisory Panel convened by the World Conservation Union (IUCN).

## **Cognition**

Louis Herman, Ph.D.

Dr. Louis Herman is currently Emeritus Professor of Psychology at the University of Hawaii and President of The Dolphin Institute. Dr. Herman’s research interests include cognition and communication in bottlenose dolphins, animal cognition, and behavior and social organization of humpback whales, and he has published over 120 scientific papers on these topics. Important educational and professional steps in the development of Dr. Herman’s career include founding the Kewalo Basin Marine Mammal Laboratory to study dolphin cognition in 1970, receiving a Ph.D. at Pennsylvania State University in 1972, serving as a Sanctuary Advisory Council for the Hawaiian Islands Humpback Whale National Marine Sanctuary, and co-founding The Dolphin Institute with Dr. Adam Pack in 1993. For students pursuing a career in cognition, Dr. Herman advises you to pursue your dreams. Specifically, he states, “The marine mammal field is a vital and rapidly growing specialization with many opportunities. However, opportunities for laboratory studies of cognitive abilities and specializations of dolphins are hard to find. There is a growing interest, however, in such studies in the wild, be it in the context of vocal communication, or social organization and social strategies, or cultural transmission of learning. A degree in biology with an emphasis in animal behavior, or a biopsychology degree is a good path to such study.”

Stan Kuczaj, Ph.D.

Dr. Stan Kuczaj is currently a Professor in the Department of Psychology and heads the Marine Mammal Behavior and Cognition Laboratory at the University of Southern Mississippi. Dr. Kuczaj’s research interests include marine mammal behavior and cognition, with a special interest in the ontogeny of communication systems. As a result, his research in recent years has focused on the behavioral development and social interactions of dolphins, with particular emphasis on the comparison of cetacean behavior with that of other species, including humans. As Dr. Kuczaj states, “This work has led to two realizations. First, one must understand the nature of the adult communication system and the nature of adult social interactions if one wishes to understand ontogeny. Second, work with both captive and wild animals is necessary to obtain insights into the processes and products that characterize cetacean cognition. Important steps in the development of Dr. Kuczaj’s career include receiving a B.A. in Psychology at the University of Texas, Austin (1972) and a Ph.D. in Child Psychology at the University of Minnesota (1976). Important professional steps in the development of Dr. Kuczaj’s career include holding academic positions at Oxford University, Southern Methodist University, the University of Hawaii, and the University of Minnesota. For students pursuing a career in cognition, Dr. Kuczaj advises, “First, it is difficult to study cognition, particularly in a species other than your own. Second, answers to most questions will require both field research and more controlled research in a captive setting.



However, there are limited opportunities to do cognitive research with captive animals, so plan to do cognitive research in the field and hope to do work with captive animals (unless you wish to focus on field research). Third, approach the study of marine mammal cognition from a comparative perspective. It is important to understand the ways in which species are different and the ways in which they are similar. Fourth, plan on working hard if you choose this path. Cognitive research is difficult, but rewarding. Besides, if it was easy, everyone would do it.”

Adam Pack, Ph.D.

Dr. Adam Pack is currently Vice President and Manager of Research and Education Programs at The Dolphin Institute, Affiliate Graduate Faculty at the University of Hawaii, and Associate Director of the Kewalo Basin Marine Mammal Laboratory. For 24 years, Dr. Pack has conducted research and produced scientific publications on the behavior, ecology, and comparative cognition of dolphins, whales, and sea lions, including: sea lion learning and memory; dolphin sensory capabilities, learning, cognition, intelligence, and communication; humpback whale social organization and behavior, mating strategies, migration, and communication; wild spotted, spinner, and bottlenose dolphin ecology and communication. Important educational steps in the development of Dr. Pack’s career include receiving a B.A. in Biology at Brandeis University (1985) and an M.A. (1988) and Ph.D. (1994) in Psychology at the University of Hawaii. That is, he obtained degrees in biology, as well as human and animal cognition focusing on marine mammals. Important professional steps in the development of Dr. Pack’s career include participating in an internship at the Kewalo Basin Marine Mammal Laboratory in 1983, co-founding The Dolphin Institute with Dr. Louis Herman in 1993, and conducting numerous studies covering a broad spectrum of topics in cognition and behavior. For students pursuing a career in cognition, Dr. Pack advises, “Become well acquainted with the comparative literature in cognition, including human cognitive development. Have a solid working knowledge of findings from field studies of the biology and behavior of the species you are interested in studying.”

## **Conservation Biology**

Steve Dawson, Ph.D.

Dr. Steve Dawson is currently an Associate Professor in the Marine Science Department at Otago University, New Zealand. Dr. Dawson’s research interests include the conservation biology of marine mammals, incidental catch of marine mammals in fisheries, acoustic behavior and communication in marine mammals, field methods for studying cetaceans at sea, and survey design especially line-transect surveys. Important educational steps in the development of Dr. Dawson’s career include receiving a B.Sc. (1980) and M.Sc. (1982) in Zoology at the University of Auckland and a Ph.D. in Zoology at the University of Canterbury (1990). Reflecting on his graduate studies and subsequent research, Dr. Dawson describes “While I was doing my M.Sc. (on bird song!) at Auckland University, three remarkable lecturers (Howard Choat, Dave Lambert, and Brian McArdle) fostered an intellectual climate of questioning everything, while emphasizing solid sampling design and robust quantitative analysis. Scientifically, these were my formative years and I remain enormously grateful to these three talented iconoclasts. My partner (Dr. Liz Slooten) and I were both fascinated by cetaceans, and noted that New Zealand had an endemic dolphin (Hector’s dolphin) that no-one knew much about. So, after finishing our M.Sc. degrees, we started our research with a 4,500 n. mi. small boat survey of distribution and abundance, which in New Zealand’s current safety climate would not be permitted. We survived, and settled down at Banks Peninsula to begin more detailed studies. We had virtually no money, and for the first two years no university backing or supervision. The need to find our own solutions provided hugely valuable experience. Our Ph.D. studies were rather pointy-headed at first, having little to do with conservation science. This changed when we found out that many dolphins were being killed in gillnets. Effectively, we morphed into conservation biologists. That focus has remained. Much of my work and that of my students is focused on quantifying conservation problems affecting marine mammals, or on evaluating the effectiveness of management. This work is difficult, and because it frequently impinges on what people should be allowed to do, it is often contentious. The best part is that, on occasion, it is hugely rewarding.” For students pursuing a career in conservation biology, Dr. Dawson advises, “Work hard to gain a both field and quantitative skills. In my experience, there are quite a few folks who are good in the field, some who have good analytical skills, but very few who have both skill sets. Folks who do will be snapped up. Quantitative skills are especially important in conservation biology because working with rare animals inevitably results in small sample sizes. Good analytical skills help maximize what we can say from limited data. Also, I’d counsel any aspiring cetologist to retain flexibility, and be question-focused rather than technique focused. The questions should

dictate the techniques (and therefore the skills you need to acquire), not the other way around.” Lastly, Dr. Dawson encourages, “Grow a thick skin. Learn how to sail. Eat your greens.”

Helene Marsh, Ph.D.

Dr. Helene Marsh is currently with James Cook University in Townsville, Australia. Dr. Marsh’s research interests include conservation biology and population ecology of marine mammals especially dugongs with an emphasis on life history, reproductive ecology, population dynamics, diet, distribution, abundance and movements; indigenous resource management; methodological problems associated with monitoring threatened species; interactions between people and their environments; issues of scale; and establishing conservation priorities in a risk assessment framework. Important educational and professional steps in the development of Dr. Marsh’s career include obtaining a Ph.D. in marine science (on venomous cone shells and their venoms); getting an opportunity to study dugongs as a post-doc; gaining experience in indigenous communities and learning different ways of knowing; attending marine mammal workshops in Canada, Japan (six times), Malaysia, New Caledonia, Papua New Guinea, Philippines, Saudi Arabia, Netherlands, Thailand, United Arab Emirates, the United States (six times), and Vietnam; serving as a consultant to assess the status of sirenians in various countries, including India, Japan, Malaysia, New Caledonia, Palau, Papua New Guinea, Saudi Arabia, Bahrain, and Vietnam, as well as in the Northern Territory, Queensland, and Western Australia; advising 50 Ph.D. students, 20 Masters students, and 10 Honours students; holding memberships on boards and advisory committees resulting in exposure to stakeholders with different priorities and values; and acquiring experience as a program leader conducting stakeholder driven research. For students pursuing a career in conservation biology, Dr. Marsh advises you to: 1) Establish your academic credential by getting good grades; 2) Read widely and critically throughout your candidature; 3) Put effort into developing your research questions, remember that the purpose of a Ph.D. is to make a significant contribution to knowledge; 3) Be realistic about your choice of Ph.D. topic: remember it is a Ph.D. and not a Nobel Prize; 4) Assemble a supervisory committee that will support all aspects of your Ph.D. led by an enthusiastic advisor who believes in you; 5) Conceptualize your research question at temporal and spatial scales relevant to conservation; 6) Complete your Ph.D. in a timely manner; remember every year you take after a threshold time (which varies in different countries) is a career minus; 7) Give polished talks at conferences; 8) Network to become a member of the international community of scholars; 9) Publish your Ph.D. in high impact journals (but be realistic in your choice of journal), preferably as you go (write through your Ph.D., not up at the end); 10) Learn to collaborate effectively with researchers in other disciplines; remember conservation biology is an interdisciplinary science; 11) Make an effort to understand the perspectives of key stakeholders in the conservation problem that interests you; 12) Consider taking a work placement with an NGO or a management agency *after* you have finished your Ph.D.; 13) Do not take a job before you finish your Ph.D.; 14) Aim to get a post-doc away for your home university to widen your perspective; and 15) Get international experience.

Andy Read, Ph.D.

Dr. Andy Read is an Associate Professor and the Rachel Carson Chair of Marine Conservation Biology at the Duke University Marine Laboratory, in Beaufort, North Carolina. Dr. Read’s research interests are reflected in the topics of his numerous scientific publications, which focus on the life history, fisheries interactions and bycatch, and conservation of small cetaceans, most notably the harbor porpoise. He has conducted field research on marine mammals, sea birds, and sea turtles in Canada, Mexico, the United States, South America, and Europe. Important educational steps in the development of Dr. Read’s career include receiving a B.Sc. in Marine Biology (1983), an M.Sc. in Zoology (1983), and a Ph.D. in Zoology (1990) from the University of Guelph, Ontario, Canada. Important professional steps in the development of Dr. Read’s career include conducting research as a Postdoctoral and then Visiting Investigator with the Woods Hole Oceanographic Institution (1990-1995) and serving on numerous cetacean Take Reduction Teams, the Scientific Committee of the International Whaling Commission, the Cetacean Specialist group of the World Conservation Union (IUCN), and the Editorial Boards of *Marine Mammal Science* and the *Journal of Cetacean Research and Management*.

### **Distribution, Diving, and Movement**

Mads Peter Heide-Jørgensen, Ph.D.

Dr. Mad Peter Heide-Jørgensen is currently with the Greenland Institute of Natural Resources. His research interests include the ecology of marine mammals, including issues around population identity.

Important educational steps in the development of Dr. Heide-Jørgensen's career include receiving an M.Sc. (1986) and Ph.D. (1996) from the University of Copenhagen, Denmark. Important professional steps in the development of Dr. Heide-Jørgensen's career include pioneering several new techniques for instrumentation and tracking of seal, walrus, and whales, methods that also include the collection of behavioral and environmental data. For students pursuing a career in distribution, diving, and movement, Dr. Heide-Jørgensen advises you to find a place where you can learn modern and useful techniques and avoid the politics around marine mammals.

Mary-Anne Lea, Ph.D.

Dr. Mary-Anne Lea is currently a Postdoctoral Researcher with the National Marine Mammal Laboratory of the Alaska Fisheries Science Center, U.S. National Marine Fisheries Service in Seattle, Washington, and with the Antarctic Wildlife Research Unit at the School of Zoology, University of Tasmania. Dr. Lea's research interests include the behavioral dynamics of marine predators, particularly their response to environmental change and prey dynamics. Important educational steps in the development of Dr. Lea's career include receiving a B.Sc. at the University of Sydney, Australia, and a B.Sc. Hons. and Ph.D. at the University of Tasmania. Important professional steps in the development of Dr. Lea's career include volunteering for research projects on humpback whales off Queensland and crested penguins in the sub-Antarctic and conducting Postdoctoral research at the Marine Mammal Research Unit at the University of British Columbia, Canada. For students pursuing a career in distribution, diving, and movement, Dr. Lea advises, "Never give up! Offer your assistance on all those projects as you'd eventually love to run yourself. Be open to learning as much as you can and working with as many different people as possible."

Alexandre Zerbini, Ph.D.

Dr. Alexandre Zerbini is currently a Postdoctoral Fellow of the National Research Council at the National Marine Mammal Laboratory of the Alaska Fisheries Science Center, U.S. National Marine Fisheries Service in Seattle, Washington, while also affiliated with the Instituto Aqualie, Rio de Janeiro, Brazil. Dr. Zerbini's research interests include population ecology, assessment, and conservation. Important educational steps in the development of Dr. Zerbini's career include receiving a B.S. in Biological Oceanography at the Universidade do Rio Grande, Brazil (1992), an M.S. in Zoology at the Universidade de São Paulo, Brazil (1998), and a Ph.D. in Aquatic and Fishery Sciences at the University of Washington (2006). Important professional steps in the development of Dr. Zerbini's career include serving as a Marine Mammal Researcher at the Oceanographic Museum of the Universidade do Rio Grande, Brazil; as a Professor of Marine Mammalogy at the Universidade do Vale do Itajaí, Brazil; as a Member of the IUCN Cetacean Specialist Group; and as a Member of the Scientific Committee of the International Whaling Commission, where he acted as Chair of the Sanctuary Review Working Group and the Other Southern Hemisphere Whale Stocks Sub-Committee. For students pursuing a career in distribution, diving, and movement, Dr. Zerbini advises you to: 1) Be creative, flexible and (as much as possible) independent; 2) Learn a programming language; 3) Learn GIS software; 4) Some marine mammals are global, so learn about the problems they face elsewhere and not only your country/area; and 5) If you become interested in working abroad, learn another language.

## **Evolutionary Biology and Archeology**

Annalisa Berta, Ph.D.

Dr. Annalisa Berta is currently with the Department of Biology at San Diego State University, California. Dr. Berta's research interests include marine mammal evolution, systematics, morphology, and biogeography, especially of pinnipeds and cetaceans. Regarding important educational and professional steps in the development of her career, Dr. Berta emphasizes her broad training and experience in biology. She had a background in anatomy and spent the first years of her academic career teaching human anatomy. She then volunteered to teach a course that she developed in Marine Mammal Evolution and Ecology that she was later able to teach due to the success of the course and high student demand. Further, she developed a strong graduate student program in marine mammal evolution and systematics. For students pursuing a career in evolutionary biology, Dr. Berta advises, "Keep your 'eye on the prize' – be persistent, work hard and take advantage of research and teaching opportunities even if they are not exactly what you'd planned. Pursue an emergent research area where you are the expert. Develop and maintain collaborations with colleagues. Publish your research results in diverse, high quality journals in a timely manner."

Michael Etnier, Ph.D.

Dr. Michael Etnier is currently Affiliate Faculty with the Department of Anthropology at the University of Washington and Founder of Applied Osteology. Dr. Etnier's research interests focus on evaluating the degree to which human activity in the recent and distant past has altered the ecology of marine mammals. As he states, "Most of the data we have on marine mammal ecology post-dates massive population declines brought about by commercial harvests and/or culling programs. By combining analyses of both modern and ancient samples (mostly bones and teeth), I try to determine what, if anything, has changed in the ecology of a wide variety of species, ranging from northern fur seals and sea otters to sperm whales and orcas." Important educational steps in the development of Dr. Etnier's career include receiving an M.A. in 1997 and a Ph.D. in 2002, both in Anthropology with an Archeology focus. As for important professional steps in the development of his career, Dr. Etnier explains, "After I finished my doctorate, I realized that nobody was ever going to write the perfect job description for me. So in 2006 I wrote my own, and started a consulting business [Applied Osteology] that allows me to combine my research interests with middle-school and high-school science teaching." For students pursuing a career in archeology, Dr. Etnier advises, "1) Don't let your degree (or lack of one) dictate what you think you can and cannot accomplish. While earning my degrees was an extremely valuable experience, I do not think that there is any necessary relationship between a degree and intelligence or an ability to do good science. There are plenty of smart people doing good science that do not have degrees, just like there are plenty of people with degrees who...; and 2) Try to build as many research collaborations as possible. Whether you are hoping to gain a spot on a field expedition or just want someone to bring home some samples for you, the rising costs of field work and the increasing complexity of getting research permits, creative collaborations can provide fantastic returns on relatively little investment of time/energy/money."

### **Fisheries Interactions and Human Dimensions**

Nick Gales, Ph.D.

Dr. Nick Gales is currently with the Australian Centre for Applied Marine Mammal Science. Dr. Gales' research interests include applied science for the management of human and marine mammal interactions. Regarding important educational and professional steps in the development of his career, Dr. Gales explains, "I am originally a veterinarian, which provided me with a broad and very practical base degree for applied marine mammal research. My Ph.D. on the reproductive physiology and demography of Australian sea lions provided a sound foundation for the development of research skills and sparked my interest in focusing on research outcomes that can be directly translated in effective management action. Most of my research career has been associated closely with Government, and I have come to appreciate that with patience and tenacity it is from there that direct change can be affected. I have been fortunate to have dealt with many different aspects of marine mammal and human interactions (e.g. in fisheries, tourism, and in forums such as the International Whaling Commission), where applied science can lead to direct positive conservation outcomes. This has maintained and sharpened my interest in such work." For students pursuing a career in fisheries interactions and human dimensions, Dr. Gales advises, "Internationally, the numbers of funded research opportunities working with marine mammals are relatively few. These animals are difficult to work with, and subsequently the quality of science is limited by such operational limitations. If your desire is highly academic, then many other more accessible taxa might be better suited. However, if your fascination is with marine mammals, then tenacity and academic excellence are the best credentials in achieving such goals. Well developed quantitative skills are essential and should be given a high priority in under and post-graduate research and course choices."

E.C.M Parsons, Ph.D.

Dr. E.C.M. Parsons is currently an Assistant Professor in the Department of Environmental Science and Policy at George Mason University, Fairfax, Virginia. Dr. Parsons' research interests include: 1) Marine Environmental Science – pollutants (heavy metals, organochlorines and pathogens), habitat degradation and environmental change ; 2) Marine Mammal Science - biology (ecology, behavior and physiology/anatomy) and conservation (whaling issues, impacts of pollutants, noise, and anthropogenic activities, public attitudes) ; 3) Conservation Policy – marine environmental and endangered species protection; and 4) Sustainable Marine Resources Use – marine ecotourism, reducing anthropogenic impacts human activities in the oceans. Important educational steps in the development of Dr. Parsons' career include receiving a B.A. and M.A. in Zoology at St. Peter's College of Oxford University and a Ph.D. in Marine Biology at the Swire Institute of Marine Science of the University of Hong Kong. Important professional steps in the development of Dr. Parsons' career include serving as a Postdoctoral Research and Consultant at the Veterinary Department, Ocean Park, Hong Kong; as a

Lecturer at Cannington College, Somerset, UK; as a Research and Education Director with The Hebridean Whale and Dolphin Trust, Tobermory, Isle of Mull, Scotland; as a Research Associate with the University Marine Biological Station, Millport, Isle of Cumbrae, Scotland; as a Freelance Scientific Consultant for various NGOs including the Whale and Dolphin Conservation Society, Humane Society of the United States, Humane Society International, World Society for the Protection of Animals, and Natural Resources Defence Council; and a member of many committees, such as the International Whaling Commission Scientific Committee. Dr. Parsons also has an extensive instructional record, teaching a large number and wide variety of courses, as well as advising numerous students.

Jooke Robbins, Ph.D.

Dr. Jooke Robbins is a Senior Scientist at the Provincetown Center for Coastal Studies and the Director of its Humpback Whale Studies Program. Dr. Robbins' research interests include large whale biology, population structure and dynamics, and human impacts. Important educational steps in the development of Dr. Robbins career include receiving a Ph.D. in Marine Biology from the University of St. Andrews, Scotland. Important professional steps in the development of Dr. Robbins career include studying humpback whales since 1995, particularly in the form of collaborative research in the North Atlantic, the North Pacific, and the South Pacific Oceans. She is also a member of the Atlantic Large Whale Take Reduction Team and the U.S. Delegation to the Scientific Committee of the International Whaling Commission.

### **Foraging Ecology and Nutrition**

Rob Harcourt, Ph.D.

Dr. Rob Harcourt is currently with the Marine Mammal Research Group, Graduate School of the Environment at Macquarie University in Sydney, Australia. Dr. Harcourt's research interests include animal behavior, ecology, and conservation of marine mammals, focusing on the importance of individual variation in behavior to foraging, communication, mating tactics, life experience, and human impact on marine ecosystems. Important educational steps in the development of Dr. Harcourt's career include receiving a B.Sc. Hons. in Animal Behaviour at Adelaide University, Australia (1983), and a Ph.D. in Zoology at Cambridge, UK (1990), which included two years of field work in Peru working with South American fur seals. Important professional steps in the development of Dr. Harcourt's career include: 1) Being mentored by people from British Antarctic Survey and Sea Mammal Research Unit (then in Cambridge), where he met lots of visitors there including Dan Costa; 2) Attending his first Biennial Conference on the Biology of Marine Mammals in Monterey in 1989, which included two weeks visiting California universities, including Burney LeBoeuf's lab at the University of California, Santa Cruz ("very important for U.S. perspective and meeting many members of the marine mammal community"); 3) Teaching at Friday Harbor Labs in Washington in 1991, where he met Doug DeMaster and gained much insight into the U.S. research process ("also attended Chicago Biennial – very important networking"); 4) Running the Marine Mammal Lab La Paz Baja California Sur, Mexico in 1992, conducting sea lion and cetacean research; 5) Conducting Postdoctoral research with the University of Otago, New Zealand, from 1993-1995 on a fur seal project, but also worked with Antarctic penguins ("working out of Scott Base got to know much better many of the pioneers of this field, including Gerry Kooyman, Paul Ponganis, Randy Davis, Terrie Williams, and Don Siniff"); 5) serving as a Lecturer in Marine Science at Waikato University in 1996, when he started a Weddell seal program out of Scott Base; and 6) Moving to Australia to start the Marine Mammal Research Program in 1997, where he began long-term research and continues to get "lots of good students." For students pursuing a career in foraging ecology and nutrition, Dr. Harcourt advises, "It's always been hard to get employment in this field, but if you do what you love, work hard, and are prepared to be very flexible then anything is possible – persistence is critical."

Charles Littnan, Ph.D.

Dr. Charles Littnan is currently an Ecologist with and the Program Head of the Hawaiian Monk Seal Research Program, Protected Species Division, Pacific Islands Fisheries Science Center, U.S. National Marine Fisheries Service. As for his research interests, Dr. Littnan states, "I have been working on marine mammals for 12 years. My primary research interest is determining the diet and foraging ecology of marine mammals with the use of telemetry and diet analyses (fatty acid, stable isotope, and faecal/regurgitate analyses). My work on the monk seal program includes examining the potential impact of commercial/recreational fisheries and other sources of anthropogenic activity on marine seal populations. I also work to improve the ethical standards relating to the way research and conservation efforts are undertaken within the field of marine mammal

science.” Important educational steps in the development of Dr. Littnan’s career include receiving a B.S. in Marine Biology at Texas A&M University (1998) and a Ph.D. in Environmental Sciences at Macquarie University in Sydney, Australia (2004). Important professional steps in the development of Dr. Littnan’s career include conducting field research in a variety of locations including New Zealand, Australia, and Antarctica and co-convening two workshops on Ethics in Marine Mammal Science at the Biennial Conferences in Greensboro and San Diego. For students pursuing a career in foraging ecology and nutrition, Dr. Littnan advises, “Education and experience are critical. If you have a strong desire to become a marine mammal researcher, a higher degree is a valuable, if not essential, tool, but most important is to take advantage of internship and volunteer opportunities to expand your experiences and skills.”

Iain Staniland, Ph.D.

Dr. Iain Staniland is currently with the British Antarctic Survey. Dr. Staniland’s research interests include the foraging ecology of Antarctic fur seals. He states, “Within this, I have done dietary analysis (scat, FASA) and many years of satellite tracking. Within recent years my interest has been comparing these animals behavior under different foraging constraints, i.e. males vs. females, central place foraging, low and high food availability, and at different colonies.” Reflecting on important educational and professional steps in the development of his career, Dr. Staniland recalls, “I did my undergraduate in Marine Biology at Swansea University (UK). I then moved straight to a PhD researching the feeding ecology and behavior of North Sea whiting, *Merlangius merlangus*. During this time, I gained experience working on ships and with dietary analysis techniques. Using this experience, I moved to a job with the British Antarctic survey and spent 2.5 years on South Georgia working hands-on daily with Antarctic fur seals. This long period helped me gain a strong knowledge of these animals. I then moved back to the UK and have undertaken numerous field trips to the Antarctic.”

## Genetics

Frank Cipriano, Ph.D.

Dr. Frank Cipriano is currently with San Francisco State University. Dr. Cipriano’s research interests include small cetacean behavioral ecology, marine tropho-dynamics, population structure, systematics, and conservation genetics of marine organisms (“from plankton to whales!”). Dr. Cipriano first became interested in animal behavior at a very young age and went to see Dr. Jane Goodall speak at Stanford University when he was a high school senior. He switched to a marine biology major at San Jose State after taking an invertebrate zoology course taught by Dr. Steve Webster. While studying phytoplankton primary productivity as an M.S. student in Marine Sciences at the Moss Landing Marine Laboratories in California, he assisted with the recovery of beachcast and stranded marine mammals and took classes in marine mammal behavior and ecology from Dr. Bernd Würsig. After completing his ‘MLMLMSMS,’ Dr. Cipriano designed a research project on the ecology of dusky dolphins in New Zealand with the help of Dr. Würsig, which formed the basis for his Ph.D. dissertation at the University of Arizona, which was completed in 1992. A National Science Foundation Postdoctoral Fellowship allowed Dr. Cipriano to learn molecular genetic analysis methods in the laboratory of Dr. Stephen Palumbi, first at the University of Hawaii and later at Harvard University. He became director of the Conservation Genetics laboratory at San Francisco State in 1999. For students pursuing a career in genetics, Dr. Cipriano advises, “The impact of molecular genetic analysis methods is indicated by the prevalence of the technology – today almost every biology lab seems to have at least one PCR machine! Molecular genetic analysis is a rapidly expanding part of many biological disciplines, given the importance of phylogenetic relationships to our understanding of behavior, physiology, development, and evolution, so the importance of molecular methods in multi-disciplinary studies of marine mammals is likely to increase. The rapid development of such methods for detection and diagnosis of marine mammal pathogens and toxins is also important, given the apparent increase in epizootics and the impact of harmful algal blooms, and the potential for further changes associated with global climate change. Population genetic analysis is a primary tool in our recognition of Evolutionarily Significant Units, and for detecting even smaller levels of (demographically significant) differentiation that may indicate distinct marine mammal Management Units.”

Luciana Möller, Ph.D.

Dr. Möller is currently a Macquarie University Research Fellow at the Graduate School of the Environment, Macquarie University, Australia. Her research interests include behavior, ecology, and molecular ecology of marine mammals, particularly cetaceans, and marine conservation. Dr. Möller states, “My current

research focuses on social evolution in dolphins, marine mammal mate choice, population genetics of whales and dolphins, cetacean molecular taxonomy, dolphin behavioral ecology, and human impacts on dolphins. Present research projects range from mate choice in bottlenose dolphins and Weddell seals to population genetics of blue whales and sperm whales.” Important educational steps in the development of Dr. Möller’s career include receiving a B.Sc. in Oceanography (with a Specialization in Renewable Resources) from the University of Rio Grande, Brazil (1993) and a Ph.D. in Environmental Sciences at the Graduate School of the Environment, Macquarie University (2001). Important professional steps in the development of Dr. Möller’s career include serving as a Research Scientist at the Oceanographic Museum, University of Rio Grande, Brazil; as a Research Assistant at the Brazilian Institution for the Environment and Renewable Resources, Brazil; and as a Research Affiliate with the Department of Ecology and Evolutionary Biology, Yale University, U.S.A.

Leslee Parr, Ph.D.

Dr. Leslee Parr is currently a 2007-2008 Visiting Scientist with the Moss Landing Marine Laboratories and an Associate Professor in the Department of Biological Sciences at San Jose State University, California. Dr. Parr’s research interests include: 1) Phylogenetics – “My past research examined the DNA sequences of four mitochondrial genes (cytochrome b, the tRNAs threonine and proline, and the control region or D-loop) of the subungulates (aardvarks, hyraxes, elephants, manatees and dugongs) in order to elucidate the evolutionary relationships of the subungulates, to test the morphologically based taxonomy of the three extant species of manatees, and to provide a database of genetic variation within and between manatee populations.” 2) Conservation genetics – “My current area of research is conservation genetics and specifically conservation genetics of marine mammals and invertebrates. Conservation genetics focuses on the problem of preserving genetic diversity in threatened or endangered species through population and habitat management. Informed management decisions require both estimates of genetic variation within the populations of concern and ongoing, qualitative assessment of changes in population size, connectedness, and genetic variability. My research is based on DNA sequencing and most recently, microsatellite analysis.” 3) Manatees and dugongs – “I have a long involvement in manatee and dugong conservation. I served two years on the Board of Sirenian International (2003-2005). I am one of the authors of a recent publication (February 2006) in *Molecular Ecology* which characterizes the genetics of all three extant species of manatee and confirms hybridization between two species of manatees. Recently, I was invited to participate in a dugong conservation management program along the Andaman coast of Thailand and Myanmar (Burma) in cooperation with Ellen Hines, Department of Environmental Geography, San Francisco State University and Kanjana Adulyanukosol, Marine Endangered Species Unit, Phuket Marine Biological Center, Phuket, Thailand. Ocean Parks Conservancy provided funding for us and three Burmese scientists to travel to and survey dugongs and small cetaceans off the coast of Myanmar during January 2007.” Reflecting on important educational and professional steps in the development of her career, Dr. Parr states, “I cannot imagine any step more important than the year my doctoral advisor, Debbie Duffield, began taking me to SMM conferences 16 years ago. Since my first SMM conference, I have not missed a Biennial meeting! ALL of my most important friendships and collaborations were started and strengthened at these meetings.” For students pursuing a career in genetics, Dr. Parr advises, “Meet as many colleagues and student cohorts as you can at this meeting. Keep every business card, e-mail, and cell phone number you collect here. You never know who will provide you a life-altering opportunity (professionally or personally). You never know who will become your most important collaborator, and/or your best friend.”

## **Policy and Management**

Doug DeMaster, Ph.D.

Dr. Doug DeMaster is currently the Research and Science Director of the Alaska Regional Office, Alaska Fisheries Science Center, U.S. National Marine Fisheries Service. He also serves as the Deputy Commissioner of the U.S. Delegation to the International Whaling Commission. Dr. DeMaster’s research interests include the stock assessment, fisheries interactions, and management of marine mammals. He has published over 100 peer-reviewed publications and reports on these topics. Important educational steps in the development of Dr. DeMaster’s career include receiving a Ph.D. from the University of Minnesota in 1978. Important professional steps in the development of Dr. DeMaster’s career include serving as Head of the Marine Mammal Division at the Southwest Fisheries Science Center, National Marine Fisheries Service; as Leader of the Cetacean Assessment and Ecology Program at the National Marine Mammal Laboratory, Alaska Fisheries Science Center; and as Director of the National Marine Mammal Laboratory. He was previously an Adjunct

Professor at the Scripps Institution of Oceanography and is now an Affiliate Professor at the School of Marine Affairs at the University of Washington.

Tim Ragen, Ph.D.

Dr. Tim Ragen is currently with the U.S. Marine Mammal Commission. Although Dr. Ragen's position focused on policy and not research, his previous research interests were in the demography, biology, and conservation of marine mammals, with experience studying northern fur seals, Hawaiian monk seals, and Steller sea lions. Regarding important educational and professional steps in the development of his career, Dr. Ragen recalls, "I received a Ph.D. in Oceanography in 1990 from Scripps Institution of Oceanography at the University of California, San Diego, California. My dissertation focused on both field and modeling studies of the northern or Alaska fur seal. After completing my dissertation, I completed a National Research Council Associateship at the U.S. National Marine Mammal Laboratory, where I continued modeling studies of the northern fur seal. I completed the Associateship in 1991, and joined the Honolulu Laboratory of the U.S. National Marine Fisheries Service, where I served as the program analyst for the Hawaiian monk seal recovery program. I left that position in 1997 to serve as the Steller sea lion Recovery Coordinator for the Alaska Region, National Marine Fisheries Service. In this position, my work was focused primarily on the potential for indirect interactions between the endangered Steller sea lion and the Alaska groundfish fisheries. At the end of 2000, I moved to Washington, D.C., to assume the position of Scientific Program Director for the U.S. Marine Mammal Commission. I held that position until October 2006, when I was appointed to the position of Executive Director for the Commission. For students pursuing a career in policy and management, Dr. Ragen advises, "I have three pieces of advice. The first is that you must decide what you would like to accomplish with your career and set your own goals. If you don't have a sense of direction, your career will unfold at the whims of chance. The second piece of advice is that you must assume full responsibility for your accomplishments and progress toward your goals. It is easy to look to and depend on others to accomplish your goals, to get you from point A to point B, and so on. But you must learn to assume full responsibility for each step or your career may settle into a convenient lull with no one to provide new energy. The third point is that in policy and management, you will work along a continuum with the ideal of truth at one end and the satisfaction of value at the other. Scientists should be ever-seeking the truth, whereas policy and management persons must work within a mix of truth and value. My advice would be that you never let value smother truth."

### **Population Dynamics and Assessment**

Trevor Branch, Ph.D.

Dr. Trevor Branch is currently with the School of Aquatic and Fishery Sciences, University of Washington. Dr. Branch's research interests include solving biological problems using computer models, and his current projects include run reconstruction of Alaskan salmon, the ecological effects of individual transferable quotas, and trends in populations of Southern Hemisphere whales. Important educational steps in the development of Dr. Branch's career include receiving a B.Sc. (1994), a B.Sc. Hons. (1995), and an M.Sc. (1998) at the University of Cape Town, South Africa, and a Ph.D. from the University of Washington (2004). Important professional steps in the development of Dr. Branch's career include learning computer programming, mathematics, statistics and biological realism, as well as serving as an Invited Participant for the Scientific Committee of the International Whaling Commission. For students pursuing a career in population dynamics and assessment, Dr. Branch advises you to find a good advisor and program that specializes in quantitative studies, and work on problems that fascinate you.

Jaume Forcada, Ph.D.

Dr. Jaume Forcada graduated in Biology in 1993 and in 1998 obtained his Ph.D. on marine mammal population studies at the University of Barcelona, Spain. Based at the Department of Animal Biology, Dr. Forcada conducted research on marine mammals with special emphasis on their conservation problems and population biology since 1990. During those years, he was mostly involved in planning, conducting, and analyzing many cetacean line transect surveys in the Mediterranean, Northeast Atlantic, and North Sea. He was also involved in the monitoring of the critically endangered Mediterranean monk seal colony in the western Sahara-Mauritania, developing skills on photo-identification applied to population assessment. In 1999, Dr. Forcada joined the Protected Resources Division of the Southwest Fisheries Science Center, U.S. National Marine Fisheries Service, in La Jolla, California, as a research associate sponsored by the U.S. National Research Council. In La Jolla, he worked on improving stock assessment methods to evaluate the recovery of



dolphin stocks affected by the tuna purse seine fishery in the Eastern Tropical Pacific Ocean. In 2002, Dr. Forcada joined the British Antarctic Survey (BAS, Natural Environment Research Council, UK) as a population ecologist. In BAS, he heads a section called Food Web and Life History Interactions of the Conservation Biology Group, which is part of the Biological Sciences Division. His main concern is the life history buffering of Antarctic predators, including seals, penguins, and albatrosses, to increasing environmental variability. He explores the life history flexibility and constraints of these predators with climate change and its consequences for critical habitats and ecosystem fluctuations. Dr. Forcada also investigates the population dynamics of these predators and their trophic interactions in response to the environment, in particular relative to sea-ice dynamics. He has a growing interest in population genetics, in particular in the consequences of individual variability for demography and fitness. To develop his work, Dr. Forcada collaborates with scientists from many institutions, including Woods Hole Oceanographic Institution, Inter-American Tropical Tuna Commission (La Jolla), University of Cambridge (UK), and the Centre National de la Recherche Scientifique of Chizé, France. He is a member of the Group of Excellency in Research of Marine Mammals of the University of Barcelona, and ex-Council Member of the European Cetacean Society.

Philip Hammond, Ph.D.

Dr. Philip Hammond is currently with the Sea Mammal Research Unit, Gatty Marine Laboratory, University of St Andrews, Scotland, UK. Dr. Hammond's research interests are in population dynamics and ecology, in particular the applied aspects of how seals and cetaceans interact with mankind. His research activities focus on three main areas: 1) studies of the habitat usage, foraging ecology and diet of marine mammals; 2) the estimation of abundance, survival and reproductive rates, and the modeling of marine mammal populations; and 3) studies of the management of whaling, cetacean bycatch in fisheries, seal-fishery interactions, and the conservation of vulnerable species. Important educational steps in the development of Dr. Hammond's career include receiving a B.A. in Biology (1975) and a Ph.D. in Population Dynamics (1979) at the University of York, UK. Important professional steps in the development of Dr. Hammond's career include: 1) 1979-84: Inter-American Tropical Tuna Commission, La Jolla, California (Associate Scientist 1979-81; Senior Scientist 1981-82; Head of Tuna-Dolphin Investigation 1982-84); 2) 1984-2001: Sea Mammal Research Unit, Natural Environment Research Council, Cambridge, UK (Senior Scientific Officer 1984-89; Principal Scientific Officer 1989-96; Director 1996-2001); 3) 1996-present: University of St Andrews, UK (Reader in Biology 1996-2005; Professor of Biology 2005-present); 4) 1984-present: UK delegate IWC Scientific Committee (Chair 1992-1993); 5) 1998-present: Member IUCN Cetacean Specialist Group (Red List Authority 2006-present); and 6) Editorial boards: *Marine Mammal Science* 1998-2004; *Journal of Cetacean Research and Management* 1999-present. For students pursuing a career in population dynamics and assessment, Dr. Hammond advises: 1) Keep mathematics/statistics throughout your school career; 2) Choose a university where the subjects in which you are interested are taught by people who are active in research; 3) Focus on a discipline (e.g. population dynamics, ecology), not a taxonomic group (e.g. marine mammals); 4) If you get work experience (volunteering or paid), make sure you end up with a skill that you can put on your CV – future employers want to know you can actually do something as opposed to having learned about it in a course; 5) Get field experience (boat-handling, photo-identification, tagging seals, etc); 6) Get hands on experience with data handling, processing and data-basing (using e.g. Access, Excel); 7) Learn how to use programmable computer packages/languages (e.g. R, Matlab, Basic, C, Fortran) so you can do things that standard packages don't; 8) Try to get to know the key people in the areas in which you want to progress, but make sure contact is well-informed, personal, focused, interesting, short and contains a CV; and 9) Become knowledgeable about the specific topics that interest you most but keep your interests sufficiently broad that you can take advantage of a range of opportunities.

Barbara Taylor, Ph.D.

Dr. Barbara Taylor works at the Southwest Fisheries Science Center in La Jolla, California, for the U.S. National Marine Fisheries Service and has been researching marine mammals for over 30 years. She leads a group of scientists studying population structure using genetics and heads a project in quantifying risk to develop quantitative risk criteria for the U.S. Endangered Species Act. Dr. Taylor is a member of several endangered species recovery teams and the Cetacean Specialist Group of the World Conservation Union (IUCN) and is a delegate to the International Whaling Commission. Barbara was one of the researchers that designed the current system in the U.S. (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 specializes in estimating risk of extinction and has worked with some of the most endangered species. Last year she participated in the survey that failed to find any baiji, the Chinese river dolphin, portending the first human-caused extinction of a 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 of California porpoise in Mexico. Dr. Taylor spent 10 years doing field work before returning for her Ph.D., which concentrated on building skills in modeling. The addition of quantitative skills to her field experience toolbox has been very valuable in integrating science and management, i.e. in conservation science. For students pursuing a career in population dynamics and assessment, Dr. Taylor advises you to include more focus on writing and communication, in addition to quantitative skills (especially modeling).

## **Toxicology, Pathology, and Veterinary Medicine**

Jacques Godfroid, Ph.D.

Dr. Jacques Godfroid is currently a Professor of Bacteriology in the Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, South Africa. Dr. Godfroid's research interests include veterinary and wildlife immunology, particularly wildlife tuberculosis and brucellosis. He is the author or co-author of more than 50 international peer-reviewed manuscripts and author of 6 brucellosis chapters in international veterinary textbooks. After Dr. Godfroid's veterinary studies in Belgium in 1981, he was appointed as a Lecturer in Veterinary Pathology and Parasitology at the Faculty of Veterinary Medicine, University of Liège, Belgium, and in 1986 at the Ecole Inter-Etats des Sciences et de Médecine Vétérinaire, Dakar, Sénégal, where he stayed for four years. Students at this International Veterinary School came from 14 different West African countries. Beginning in 1990, he worked at the Belgian National Veterinary Research Institute in the Brucellosis and Mycobacterial Infections Laboratory, where he earned his M.Sc. and Ph.D. degrees. In 2000, he was appointed member of the European Union (EU) Task Force on bovine brucellosis and chairman of the EU Task Force on small ruminant brucellosis. The EU Task Force was created with the objective of monitoring disease eradication in the Member States and, in the case of some diseases like bovine brucellosis and tuberculosis, sub-groups were created to support the Task Force and the Member States in developing and implementing optimal disease eradication measures. Dr. Godfroid was also a member of the expert group who drafted the Opinion of the Scientific Panel on Biological Hazards of the European Food Safety at the request of the Commission related to "Tuberculosis in Bovine Animals: Risks for human health and control strategies" 2003. It is under his supervision that marine mammal brucellae were first characterized molecularly. Dr. Godfroid joined the Faculty of Veterinary Science of the University of Pretoria in 2004. In January of 2008, he will be joining the Norwegian School of Veterinary Science, Department of Arctic Veterinary Medicine, Tromsø, Norway.

Tracey Goldstein, Ph.D.

Dr. Tracey Goldstein is currently with the Wildlife Health Center, School of Veterinary Medicine, University of California, Davis. As for her research interests, Dr. Goldstein states, "My background is in marine mammal epidemiology and disease, and I have had the opportunity to study the effects of both infectious and non-infectious disease in a population. My interests are not only in studying disease and how it affects free-ranging marine mammal populations, but how disease relates to other aspects such as population dynamics, ecology, and environmental factors. Important educational steps in the development of Dr. Goldstein's career include receiving a Ph.D. in marine mammal disease with the Comparative Pathology Graduate Group at University of California, Davis. Specifically, Dr. Goldstein studied transmission and pathogenesis of phocine herpesvirus-1 in rehabilitating and free-ranging harbor seals. Important professional steps in the development of Dr. Goldstein's career include serving as a Postdoctoral fellow at the Alaska SeaLife Center, where she developed health and disease assessment studies for free-ranging sea otters and temporarily captive Steller sea lions; and as a Postdoctoral fellow at The Marine Mammal Center, where she managed a three-year National Oceanic and Atmospheric Administration funded Oceans and Human Health Initiative Funded grant to study the sub-lethal effects of domoic acid on California sea lion health. For students pursuing a career in Toxicology, Pathology, and Veterinary Medicine, Dr. Goldstein advises, "I think this is a very exciting time to be involved with studying health and disease. In recent years, we have had the opportunity to apply tools such as molecular diagnostics and disease modeling to begin to understand the affects on populations, and the need to understand more about health and disease are becoming increasingly recognized."

Ailsa Hall, Ph.D.

Dr. Ailsa Hall is currently the Deputy Director of the Sea Mammal Research Unit. Regarding her research interests, Dr. Hall states, "All my research interests over the years fall into the general category of

'factors affecting survival in marine mammals'. An epidemiologist by background, I became involved in marine mammal research following the first outbreak of phocine distemper amongst European harbor seals. Since then, I have carried out research into the influence of infectious and non-infectious disease and contaminants on marine mammal populations. I am particularly interested in the process of disease causation, the effect of contaminants on marine mammal physiology (such as immune and endocrine function), and how we can apply epidemiological and toxicological principles to risk assessment in marine mammals. As for important educational and professional steps in the development of Dr. Hall's career, she recalls, "This really has been a matter of luck to some extent, being in the right place at the right time. Clearly a background in a related discipline that suddenly was required in the field of marine mammal science had a big impact on the direction of my career. I was lucky enough to secure a permanent job in, what was then a UK government funded research institute. These posts are almost non-existent these days, so things are somewhat different for students wishing to pursue a career in marine mammal science." For students pursuing a career in Toxicology, Pathology, and Veterinary Medicine, Dr. Hall advises, "I would suggest that students take a higher degree in a related field so that they become fully conversant in a subject that is central to the questions now being asked within our field. However, from the perspective of pathology and veterinary medicine, these disciplines require students to be qualified as veterinarians in the first instance. However, for toxicology and epidemiology, those likely to succeed in the current climate would need to have broad skills and further experience within these subjects, be it through the human or veterinary medical routes. I would particularly recommend excellent numerical and statistical skills."