WHALES

in a

CHANGING WORLD

American Cetacean Society
11th International Conference

Monterey Bay, California
November 14-16, 2008

PROGRAM

American Cetacean Society

National

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P.O. Box 784
Pacifica, CA 94044
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The American Cetacean Society (ACS) is the oldest whale conservation group in the world. Founded in 1967, it is a nonprofit, volunteer membership organization with regional U.S. chapters and members in 22 countries.

Our National Headquarters is in San Pedro, California. ACS works to protect whales, dolphins, porpoises, and their habitats through education, conservation and research. We believe the best way to protect cetaceans is by educating the public about these remarkable animals and the problems they face in their increasingly threatened habitats.

ACS seeks to educate through its publications and the development of teaching aids. ACS reports on cetacean research in its publication, *Whalewatcher*. Some ACS Chapters offer grants to support cetacean research by biologists and graduate students.

They're Not Saved Yet!

A Message From The President

"The times, they are a'changin' … " Change is an eternal truth. We live in particularly volatile times. The economy is up and down, and most recently very down. We continually must do more with less, political realities vary day to day, global warming is of increasing concern, we celebrate small environmental victories even as other serious challenges arise. The one constant is change.

Animals also face the challenge of a changing world. Historically, changes were part of natural processes and species had to adapt or become extinct. Increasingly, however, animals are facing challenges due to human activities. Change comes too quickly to respond naturally. A species' very survival depends on whether humans reduce or remove negative change and encourage positive change. As animals and humans are intrinsically connected on this planet we all share, it behooves us humans - as the major agents of change - to take action.

Throughout this conference, we explore various global changes and discuss the challenges they present to cetacean populations. To set the context, each day begins with a historical overview of cetaceans, cetacean science, and cetacean scientists. Over the course of the sessions, we will explore significant threats such as whaling, endangered species, and climate change. We will learn how an ocean-wide study of one cetacean population - the humpback whale - serves as a model to better understand this species and their potential to react to changing stressors. We will discuss the challenges whales - and humans - face in a changing world. And together, we will build a force for positive change.

Welcome, and thank you for your participation.

Kathy Zagzebski
ACS National President

Whales in a Changing World
2008 Conference Committee

Diane Alps
Conference Committee Co-Chair & Event Coordinator

Jerry Loomis
Conference Committee Co-Chair

Bernardo Alps	Photo Contest Coordinator
Diane Glim	Publicity Coordinator
Uko Gorter	Logo Artist & Program Committee
Cathy Hachigian	Program Guide Design and Coordinator
Tony Lorenz	Field Trip Coordinator
Sandie Phipps	Committee Member
Kate Sardi	Poster Session Coordinator
Mason Weinrich	Program Committee & Conference Moderator
Kathy Zagzebski	Program Committee

Congratulations on your recent nuptials Kate!
We wish you could also be here!

WHALES in a CHANGING WORLD
2008 Photo Contest

ACS invited amateur photographers to participate in the "WHALES in a CHANGING WORLD" photo contest. The winning entries will be displayed during the conference on November 14-16, 2008.
There are three categories:

Mysticetes - Includes all species of baleen whales.

Odontocetes - All species of toothed whales, including dolphins and porpoises.

Other Marine Vertebrates - Includes other marine mammals such as pinnipeds, polar bears, otters and sirenians; sea turtles, sea birds, fishes, etc. (Sea birds in the context of this contest are birds that spend most of their time in or over salt water, like penguins, tubenoses, alcids, some gulls and others)

First, second and third places will be awarded in each category and certificates given to the winners.

2006 "Whales Without Borders" Photo Contest Winners

See back cover for the 1st place Winners

	MYSTICETES	ODONTOCETES	OTHER
2nd Place	Jodi Frediani	Cody Martin	Diane Alps
			
3rd Place	Diane Alps	Ursula Tscherter	Greg Boreham
			
Honorable Mention	Ursula Tscherter		Susan Hustad
			

2008 Whale Hero Awards

The American Cetacean Society/Los Angeles Chapter created the Whale Hero awards in 2003 to recognize individuals and organizations who have distinguished themselves in the area of marine conservation. Special consideration is given to those who help the American Cetacean Society accomplish its mission.

In 2008, we honor four outstanding individuals who embody the spirit of this award and who have made tremendous contributions to ACS.

The 2008 ACS/LA Whale Hero Honorees are:

Ken Balcomb
Center for Whale Research

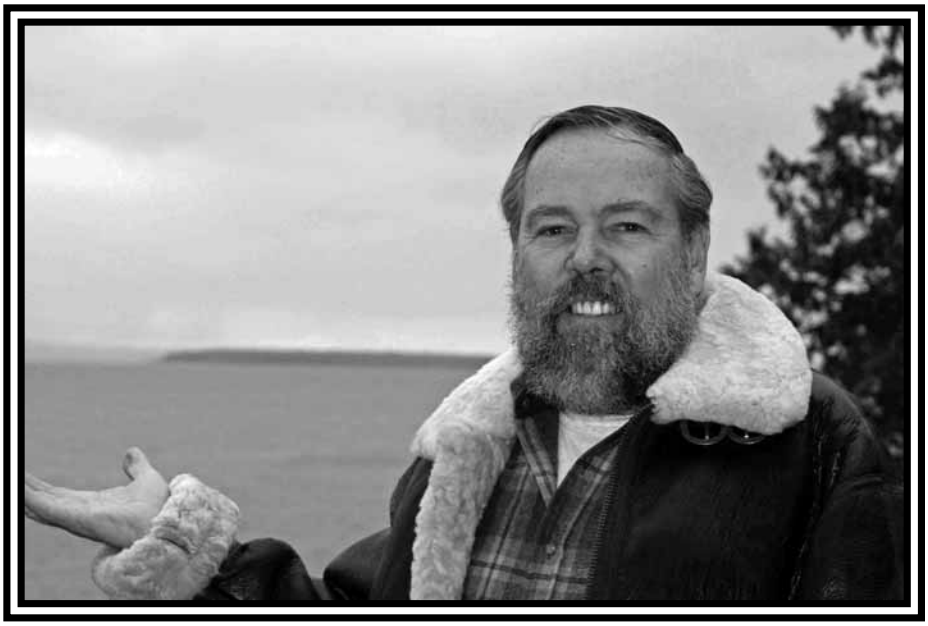
Alan & Sheila Baldridge
ACS/Monterey Bay

Bob Haskel
Pacific Life Foundation

KENNETH C. BALCOMB III

Banquet Guest Speaker!

Of Men and Whales - Changing Perspectives in a Changing World



Ken is Executive Director and Senior Scientist at the Center for Whale Research, which he founded in Friday Harbor, WA in 1985. An innovator in perfecting non-invasive techniques to study living whales, dolphins and porpoises, Balcomb has pioneered the development of high quality photo-identification methods in the study of killer whales, humpback whales and beaked whales. Balcomb has utilized these methods for more than 30 years during his work on the Orca Survey — an ongoing study of killer whales in the Pacific Northwest.

In 1990, Balcomb co-founded the Bahamas Marine Mammal Survey to benignly study whales and dolphins in the Bahamas archipelago employing photo-identification methods, providing previously unknown information on the behavior and demographics of beaked whales and developing a novel technique of obtaining samples for molecular genetic studies. He has also conducted studies in Greenland, Antarctica and the Pacific Northwest and has completed surveys and harvest monitoring for bowhead whales in the Bering, Beaufort, and Chuckchi Sea. During the Vietnam era, Balcomb worked as an aviator and oceanographic specialist as an officer in the US Navy, where he was immersed in the fascinating world of underwater sound surveillance. In this latter capacity as Operations officer, he tracked whales with the passive sonar SOSUS system, and made several important contributions to the Navy concerning developing an integrated sound surveillance system. Balcomb is currently working to determine the impacts of military active sonar on the marine mammals.

Balcomb earned his Bachelor's degree in Zoology from the University of California in 1963 with a special interest in cetaceans and anatomy. Balcomb also completed post graduate work in zoology and marine biology at University of California at Davis and Santa Cruz and has authored or co-authored more than thirty published research papers and five books based upon his experience in whale research.

Don't miss Ken at Saturday Evening's Banquet!

The presentation will include ramblings extracted from what is left of the speaker's memory, and a few photos if he can find them in the jungle of celluloid and cyberflotsam that lives in his basement. Patience will be asked of the audience in the event of technical difficulties that may occur while blending formats and time-scales on a single memory chip.

CONFERENCE SCHEDULE
Friday
November 14, 2008

FIELD TRIP

8:00 AM - 4:00 PM MONTEREY BAY WHALE WATCH / NATURAL HISTORY EXCURSION

We will board the "Sea Wolf II" for a natural history trip in world-famous Monterey Bay. Blue whales often linger into November and humpback whales are still a good possibility. The first gray whales can be expected on their southward migration. Several species of dolphins are regularly in the bay, including Pacific white-sided, Northern right whale, long-beaked and short-beaked common, Risso's and bottlenose as well as harbor porpoise. Killer whales and humpbacks have been sighted in recent weeks. Many other species are possible.

The "Sea Wolf II" is owned and operated by Monterey Bay Whale Watch

www.gowhales.com

REGISTRATION

5:30 - 7:00 PM Get your program guide and other goodies in front of the Laguna Grande Ballroom. A volunteer will be at this location throughout the weekend to answer any questions you may have.

WELCOME RECEPTION

7:00 - 10:00 PM See old friends again and make new ones at the Welcome Reception which will be held in the Seaside Ballroom.

CONFERENCE SCHEDULE
Saturday
November 15, 2008

8:30 - 09:00 WELCOME - Kathy Zagzebski, ACS National President & Mason Weinrich, ACS National Vice President

PLENARY SESSION

9:00 - 9:45 Science and the Whales: A Twentieth Century Saga, Graham Burnett, via telecast from Princeton University

9:45 - 10:00 Questions and Discussion

10:00 - 10:15 BREAK

SESSION 1: WHALING IN A CHANGING WORLD

10:15 - 10:35 Throwing Whales Overboard: How US Policies on Whaling Have Weakened and the Role of NGOs in Restoring US Leadership Within the IWC, D.J. Schubert

10:35 - 10:55 Whaling in the 21st Century...the Writing is on the Wall...and it's in Japanese....and it's Not Good, Jonathan Stern

10:55 - 11:15 How 'Scientific' is Japan's Scientific Whaling?, Phil Clapham

11:15 - 11:30 Questions and Discussion

11:30 - 1:00 LUNCH

SESSION 2: SPLASH

1:00 - 1:40 New Findings Into the Migrations, Population Structure, and Abundance of Humpback Whales in the North Pacific from SPLASH, John Calambokidis

1:40 - 2:00 The SPLASH Project: Assessing Health and Human Impacts, David Mattila

2:00 - 2:20 *gene*SPLASH, The Influence of Maternal Fidelity on Migratory Destinations in North Pacific Humpback Whales, Scott Baker

2:20 - 2:35 Questions and Discussion

2:35 - 3:00 BREAK

SESSION 3: WHALES IN LOCAL WATERS

3:00 - 3:30 Ecological Patterns of Killer Whales in Monterey Bay, California: A 21-Year Study, Nancy Black

3:30 - 3:45 Questions and Discussion

4:00 - 6:00 SILENT AUCTION

4:00 - 6:30 ART SHOW

4:00 - 6:30 POSTER CONTEST

7:00 - 11:00 BANQUET: Of Men and Whales - Changing Perspectives in a Changing World, Ken Balcomb

CONFERENCE SCHEDULE
Sunday
November 16, 2008

PLENARY SESSION

09:00 - 09:45	Pursuit of the Fat and Wet: Being A Brief And Most Peculiar History Of Marine Mammal Science (and Scientists), **Phil Clapham**
09:45 - 10:00	Questions and Discussion
10:00 - 10:30	BREAK

SESSION 4: WHALE CONSERVATION IN A CHANGING WORLD

10:30 - 10:50	Failure of the Yangtze River Dolphin Recovery Program: Conservation Lessons for Other Threatened Cetaceans, **Samuel Turvey**
10:50 - 11:10	Can the Western Gray Whale Population be Saved?, **David Weller**
11:10 - 11:30	What Went Wrong for Right Whales?, **Sharon Young**
11:30 - 12:00	Questions and Discussion - Opportunities for Action
12:00 - 1:30	LUNCH

SESSION 5: WHALES IN A CHANGING WORLD

1:30 - 1:50	Marine Mammals and Climate Change, **Sue Moore**
1:50 - 2:10	Cetacean Responses to Their Environment: What They Tell Us About Climate Change, **Steven Swartz**
2:10 - 2:40	Polar Bears in a Changing Ice World, **Bob Wilson** *plus* **Steven C. Amstrup and Ian Sterling, via telecast from the Arctic**
2:40 - 3:00	Save the Bears, Save the World: What Can Be Done Right Now? **Kierán Suckling**
3:00 - 3:45	Questions and Discussion
3:45 - 4:00	Closing Remarks, **Kathy Zagzebski & Mason Weinrich**

SPEAKERS

STEVEN C. AMSTRUP

SCOTT BAKER

NANCY BLACK

GRAHAM BURNETT

JOHN CALAMBOKIDIS

PHIL CLAPHAM

DAVID MATTILA

SUE MOORE

D.J. SCHUBERT

JONATHAN STERN

IAN STIRLING

KIERÁN SUCKLING

STEVEN SWARTZ

SAMUEL TURVEY

DAVID WELLER

BOB WILSON

SHARON YOUNG

Steven C. AMSTRUP

Dr. Steven C. Amstrup is a Research Wildlife Biologist with the United States Geological Survey at the Alaska Science Center, Anchorage, AK. He holds a B.S. in Forestry from the University of Washington (1972), an M.S. in Wildlife Management from the University of Idaho (1975), and a Ph.D. in Wildlife Management from the University of Alaska Fairbanks (1995). He has been conducting research on all aspects of polar bear ecology in the Beaufort Sea for 28 years. His interests include distribution and movement patterns as well as population dynamics of wildlife, and how information on those topics can be used to assure wise stewardship. He is particularly interested in how science can help to reconcile the ever-enlarging human footprint on our environment with the needs of other species for that same environment. Prior work experiences include studies of black bears in central Idaho, and pronghorns and grouse in Wyoming. On their honeymoon in New Zealand in 1999, Steven and his wife Virginia helped in a tagging study of little blue penguins. That experience gave Steve the honor of being one of the very few people ever to have been bitten by both polar bears and penguins.

POLAR BEARS IN A CHANGING ICE WORLD

Steve will be participating via telecast from the Arctic.

Polar bears, at the top of the arctic food chain are key indicators of the health of arctic ecosystems that includes whales and seals. Polar bears life history is built upon a strategy of following the sea ice. The health of the polar bear population is directly linked to sea-ice coverage. The two best-studied populations are Western Hudson Bay in Canada and the Southern Beaufort Sea in the U.S. and Canada. It was long term monitoring of the Hudson Bay population that led to one of the first indications that global climate change was having direct influences on an animal population. Greater sea-ice retreats and longer ice-free season have resulted in declines in the physical stature and survival of some sex and age classes. The survival of cubs has declined over time and is lower in years with more restricted availability of sea-ice habitat near shore. Current studies reveal how the bears are trying to adapt. More bears are trying to den on land rather than sea ice. Some are moving greater distances. Some drownings are now observed from bears swimming from ice that has moved much further offshore. Cannibalism has been observed. Females have fewer cubs. It is currently projected that polar bears will disappear from Alaska, Russia, and Norway by 2050 but that remnant populations will survive along the northern coast of Greenland and in the Canadian high arctic. These bears will be able to repopulate the Arctic if humans react quickly to reverse the current warming trends in the Arctic.

Scott BAKER

Scott Baker is Associate Director of the Marine Mammal Institute, Oregon State University, in Newport, Oregon, and Professor of Molecular Ecology and Evolution at the University of Auckland, New Zealand. Scott has been involved in the study of whales and dolphins for nearly 30 years, starting as an undergraduate student at New College, in Sarasota, Florida (1977) and continuing with his PhD on humpback whales at the University of Hawaii (1985). He has acted as a delegate to the Scientific Committee of the International Whaling Commission for New Zealand or the US since 1994, and is a member of the Cetacean Specialist Group of IUCN - the World Conservation Union. In 2007, he was appointed as editor-in-chief of the *Journal of Heredity*, the oldest, continuously published journal of genetics. Scott's research includes both molecular and demographic approaches to the basic and applied investigation of evolutionary pattern and process in whales and dolphins, particularly their abundance, population structure, genetic diversity and systematic relationships. Current Research Topics include: demographic and genetic impacts of whaling; molecular taxonomy and applied bioinformatics for species discovery and wildlife forensics; molecular monitoring of meat from protected whales sold in commercial markets of Japan and Korea; and population structure and genetic diversity of whales, dolphins, sea lions and fur seals, including the New Zealand endemic Hector's and Maui's dolphins and New Zealand sea lion.

*GENE*SPLASH, THE INFLUENCE OF MATERNAL FIDELITY ON MIGRATORY DESTINATIONS IN NORTH PACIFIC HUMPBACK WHALES

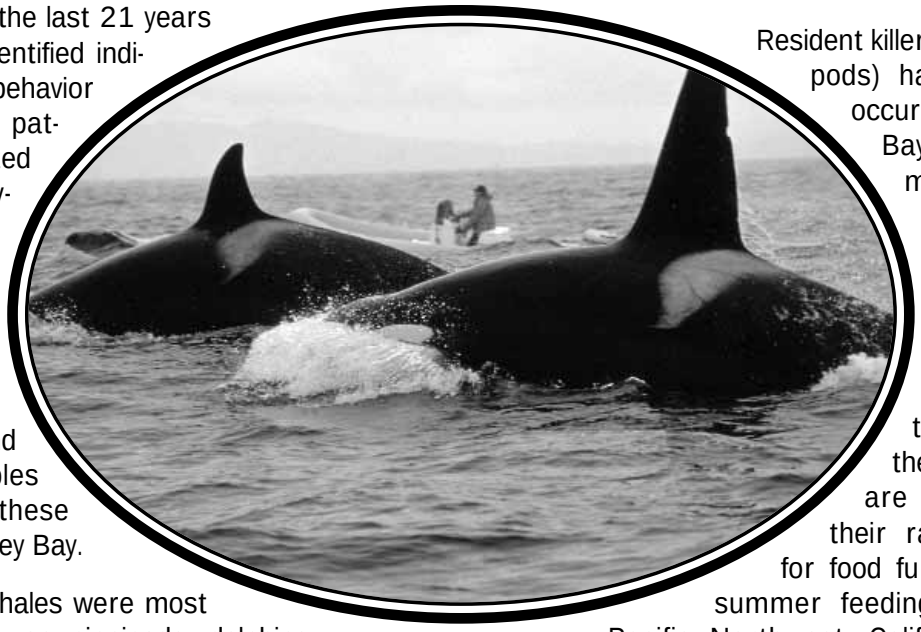
We report on initial results of the first comprehensive, ocean-wide survey of mitochondrial (mt) DNA diversity and population structure among humpback whales in the North Pacific using samples from n = 1,856 regional individuals, collected from 10 feeding and 8 breeding regions by the program *Structure of Populations, Levels of Abundance and Status of Humpbacks* (SPLASH). From sequencing of the mtDNA control region, we identified 28 unique maternal lineages (haplotypes) representing two divergent clades, one of which is thought to have originated from an historical connection with the Southern Hemisphere. The distribution of maternal lineages differed markedly among feeding regions and among breeding grounds, supporting previous characterization of strong maternal fidelity to migratory destinations. Among feeding regions, Russia, southeastern Alaska and California / Oregon, were notable for particularly high levels of differentiation from each other. Among breeding regions, Okinawa and the Central American were notable for particularly high level of differentiation from each other and from most other breeding grounds. However, a comparison between feeding and breeding regions also showed a large number of significant differences, even for those regions known to be strongly connected by patterns of individual migration (e.g., by photo-identification, Calambokidis et al. 2008). Thus the influence of maternal fidelity operates somewhat independently on feeding and breeding grounds over an evolutionary time scale, confounding a simple division of the oceanic population into 'stocks'. The potential to define multiple Genetic Management Units or Units to Conserve, on both feeding grounds and breeding grounds, presents the most complex pattern of population structure yet described for large whales.

Nancy BLACK

Nancy Black is a marine biologist that began studying killer whales in Monterey Bay in 1987 while completing her graduate studies at Moss Landing Marine Laboratories. Her research on killer whales is ongoing and has become a lifelong passion, which is necessary to gain needed information on these long-lived and highly social animals. Nancy was a National Geographic funded scientist and her research was documented in the National Geographic film *Secret Killers of Monterey Bay*. She also assisted and advised with the BBC's *Blue Planet*, and several other documentaries aired on Discovery Channel, Animal Planet, and National Geographic Channel. Her love of the ocean and marine mammals led her to share this with others by founding Monterey Bay Whale Watch.

ECOLOGICAL PATTERNS OF KILLER WHALES IN MONTEREY BAY, CALIFORNIA: A 21-YEAR STUDY

Three known population types of killer whales occur along the California coast; mammal hunters (transients), fish hunters (residents), and the offshore type. Over the last 21 years we have photo-identified individuals; studied behavior and association patterns; documented predation behavior, occurrence patterns, short and long-range movements, and life history parameters; and collected skin and blubber samples (transients) of these whales in Monterey Bay.

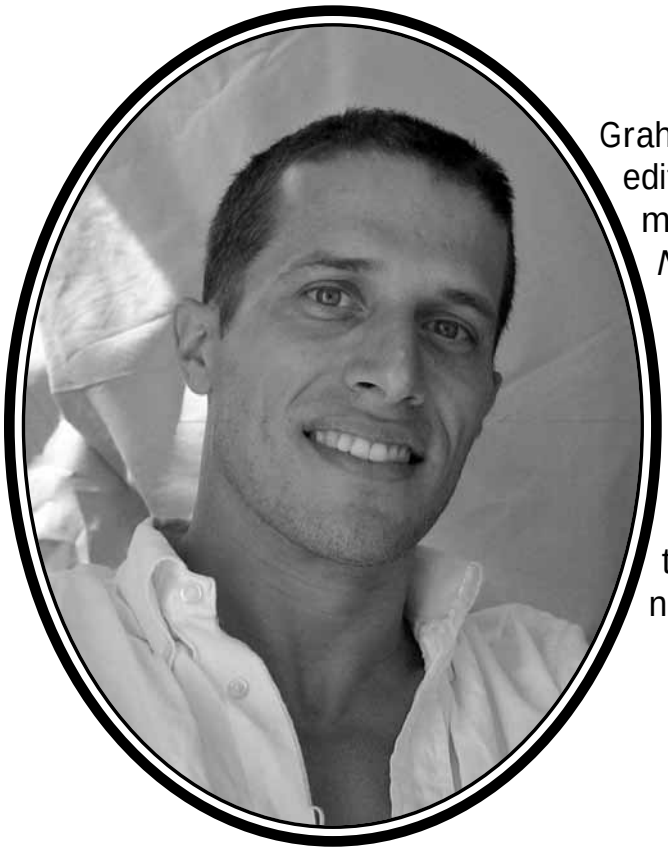


Transient killer whales were most common, feeding on pinnipeds, dolphins, porpoise, and baleen whales. Monterey Bay contains a deep submarine canyon, which provides an advantage to killer whales when hunting gray whale calves as they migrate north in spring. Abundance, occurrence, and predation rates by killer whales were correlated with the numbers of gray whale calves born each year, which can be highly variable depending on the reproductive success of female gray whales. This success depends on the feeding season for grays in the Arctic, something that can be affected by climate change; this may in turn be detrimental to the killer whales that rely on gray whales as a major food source. The blubber of Transient killer whales contained very high levels of chemical contaminants (i.e. PCB, DDT), including flame-retardants, which are still in use today. These toxins could negatively affect their immune and reproductive systems.

Resident killer whales (K and L pods) have infrequently occurred in Monterey Bay during winter months over the last 8 years where they fed on salmon. As salmon populations have declined along the west coast, these killer whales are likely extending their range to search for food further from their summer feeding areas in the Pacific Northwest. California's Chinook salmon population greatly declined this past year, which could have contributed to the further decline in the resident numbers this year.

Less is known about offshore killer whales as they are infrequently observed during winter and spring months along the California coast. Through photo-identification, we have found some killer whales sighted during winter in California traveled as far as the Bering Sea during summer. These long range movements are likely prey related suggesting that this type of killer whale may adapt well to climate changes by shifting their movements as prey patterns change.

Graham BURNETT



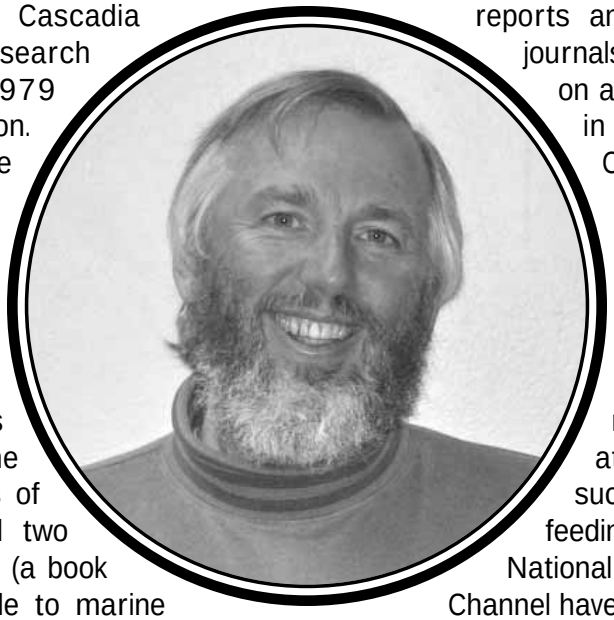
Graham Burnett teaches at Princeton, and is an editor at *Cabinet* magazine, in Brooklyn. His most recent work, *Trying Leviathan: The Nineteenth-Century New York Court Case That Put the Whale on Trial and Challenged the Order of Nature*, won the 2008 New York City Book Award and the Hermalyn Prize in Urban History. Burnett's interests include the sciences of earth and sea from the seventeenth through the twentieth century, including natural history, cartography, navigation, and hydrography.

SCIENCE AND THE WHALES: A TWENTIETH CENTURY SAGA

Graham will be participating via telecast from Princeton University.

Changing ideas about whales and dolphins have been at the center of a larger revolution in modern thinking about the natural world in the last hundred years. The scientific study of marine mammals in the twentieth century has played a significant role in this process, since ideas of cetacean intelligence and musicality were key to the emergence of a serious conservation campaign to "Save the Whales". Moreover, the very notion that several species of large whale were gravely endangered by industrial hunting depended for its force on the reliability of population assessments undertaken by biologists and fisheries scientists. Who knew what about whales in the twentieth century? When? And with what broader cultural effects? These are the questions that will be addressed in this talk, based on a book in progress on science and cetaceans in the modern period.

John CALAMBOKIDIS



John Calambokidis is a Research Biologist and one of the founders of Cascadia Research, a non-profit research organization formed in 1979 based in Olympia, Washington. He helped coordinate the SPLASH humpback whale project. He periodically serves as an Adjunct Faculty at the Evergreen State College teaching a course on marine mammals. His primary interests are the biology of marine mammals and the impacts of humans. He has authored two books on marine mammals (a book on blue whales and a guide to marine mammals) as well as more than 50 technical reports and publications in scientific journals. He has conducted studies on a variety of marine mammals in the North Pacific from Central America to Alaska. He has directed long-term research on the status, movements, and underwater behavior of blue, humpback, and gray whales. Some of his recent research has included attaching tags to whales with suction cups to examine their feeding behavior and vocalizations. National Geographic and Discovery Channel have featured his work.

NEW FINDINGS INTO THE MIGRATIONS, POPULATION STRUCTURE, AND ABUNDANCE OF HUMPBACK WHALES IN THE NORTH PACIFIC FROM SPLASH

SPLASH (Structure of Populations, Levels of Abundance and Status of Humpbacks) represents one of the largest international collaborative studies of any whale population and involved over 50 research groups and more than 400 researchers in 10 countries. It was supported by NMFS, National Marine Sanctuary Program, National Fish and Wildlife Foundation, Pacific Life Foundation, DFO Canada, and Commission for Environmental Cooperation with additional support from a number of other organizations and governments for effort in specific regions. Field efforts were conducted on all known winter breeding and summer feeding areas for humpback whales in the North Pacific from 2004 to 2006, A total of 18,469 quality fluke identifications were made representing a total of 7,971 unique individuals. Migratory movements and population structure of humpback whales in the North Pacific were found to be more complex than had been previously described; a high degree of structure, however, was also apparent. The overall pattern showed that coastal wintering regions of the western (Asia) and eastern (mainland Mexico and Central America) North Pacific were the primary wintering areas for the lower latitude coastal feeding regions. The wintering areas off Hawaii and the Revillagigedos were the primary wintering regions for the more central and northern latitude feeding areas. SPLASH data did suggest the likely existence of a missing wintering area that has not been previously described. Individual whales showed high rates of return to specific wintering and feeding areas, suggesting site fidelity to both habitats. Interchange of whales between feeding areas was unusual and all but a few of these were between adjacent areas. Using several methods, the abundance of humpback whales was estimated to be just under 20,000 for the entire North Pacific, an estimate that is about double estimates made previously. While this represents a dramatic increase from other post-whaling estimates for the North Pacific, it is consistent with a moderate rate of recovery for a depleted population. While this overall abundance trend is encouraging, some areas remain of concern, especially Asia.

Phil CLAPHAM

The unacknowledged love child of a sordid tryst between Bigfoot and Alaska governor Sarah Palin, Phil Clapham lives in resentful seclusion in a cold, damp and rather drafty cave in the northern Cascade Mountains, emerging only occasionally to check on whether the whales are still responsible for global warming. In a parallel, kinder universe, Phil directs the Cetacean Assessment and Ecology Program at the National Marine Mammal Lab, where he pretends to oversee studies of everything from harbor porpoise to bowhead whales while simultaneously engaging in his major occupation, which is to convince Paul Wade that it's his turn to buy the expensive lunch even though he paid the last time. Phil's passing resemblance to an aging Quasimodo is due to four major factors: being stupid enough to edit for two journals; dealing with idiotic government bureaucrats; the fact that his daughter Genia recently turned 15 (and is gorgeous, and knows it); and having been a member of the US delegation to the IWC Scientific Committee for approximately the last 300 years. He has written several books on whales and more than 100 scientific papers, though quite why all this effort - which could have been much better spent drinking wine - was necessary now eludes him. Phil lives in Seattle with his whale biologist wife, a blonde Russian goddess named Yulia Ivashchenko, who is much smarter than him except, apparently, when it comes to choosing spouses. Phil and Yulia are both owned by a large, hairy dog called Cleo.

PURSUIT OF THE FAT AND WET: BEING A BRIEF AND MOST PECULIAR HISTORY OF MARINE MAMMAL SCIENCE (AND SCIENTISTS)

We review the history of marine mammal research, which can be broadly divided into several epochs, beginning with Aristotle's observations of seals, dolphins and whales in the 4th century BCE. Subsequent work consisted largely of compiling rather than original observation until the 1550's when Gesner, Belon and Rondolet all produced well-illustrated volumes that included selected marine mammals. During the Enlightment, Linnaeus' taxonomic revolution was supplemented for cetaceans by Lacépède; at the same time, Hunter and Cuvier introduced comparative anatomical approaches, while Bufon, the Cuvier brothers, Steller and others added greatly to existing knowledge. The 19th century was the age of the great Victorian-style naturalists (Eschricht, Van Beneden, Gervais, Gray, Andrews and Allen, among others), expanding museum collections and the first extensive hunt-based observations of whales and pinnipeds, notably by Scoresby, Scammon, Maury and True. During early modern whaling (*circa* 1900-1945), the importance of individual variation was recognized; also, the first multi-disciplinary investigations began with the *Discovery* expeditions, and the first journals devoted exclusively to whale biology were founded. The 1950's saw the first recordings of wild marine mammal sounds, while captive animals permitted previously impossible experimentation and observation. During this time careful and often large-scale studies of the life history and population dynamics of whales took advantage of the huge samples sizes arising from overexploitation. The modern era of marine mammal research can perhaps be said to have begun in August 1963, when Ken Norris convened the first comprehensive meeting of existing experts. In the 1970's, studies of free-ranging and individually identified marine mammals revolutionized the field. This was followed by major technological advances in areas such as telemetry and genetics, and by an increasing awareness of the importance of a comparative, multi-disciplinary and broad ecological approach to the study of marine mammal biology and behavior. The burgeoning interest in marine mammals in the 60's (particularly in their acoustics) led to a series of regular scientific meetings, the first of which were hosted by Thomas Poulter at Stanford Research Institute from 1964 to 1972. In 1975 Ken Norris hosted the first biennial conference in Santa Cruz, and in 1981 the Society for Marine Mammalogy was born. Today, numerous academic and other institutions maintain marine mammal research and education programs, and the field has developed into a highly professional multi-disciplinary endeavor.

Phil CLAPHAM

HOW 'SCIENTIFIC' IS JAPAN'S SCIENTIFIC WHALING?

The Government of Japan (GOJ) conducts two large-scale special permit whaling programs ("scientific whaling") in the Antarctic and North Pacific. Together, these programs have killed more than five times the number of whales that have been taken under scientific whaling by all other nations combined. As was apparent during an IWC review of the Antarctic (JARPA) program in 2006, Japan has consistently failed to meet its stated goals in these programs, and the publication record from such work is poor by any standards. Increasingly, Japan has shifted its objectives from studying population parameters to investigation of the "role of whales in the ecosystem", and there is little doubt that - no matter what the actual data say - Japan will conclude that whales are in competition with humans and each other for fisheries resources and therefore that they need to be "managed" (i.e. culled).

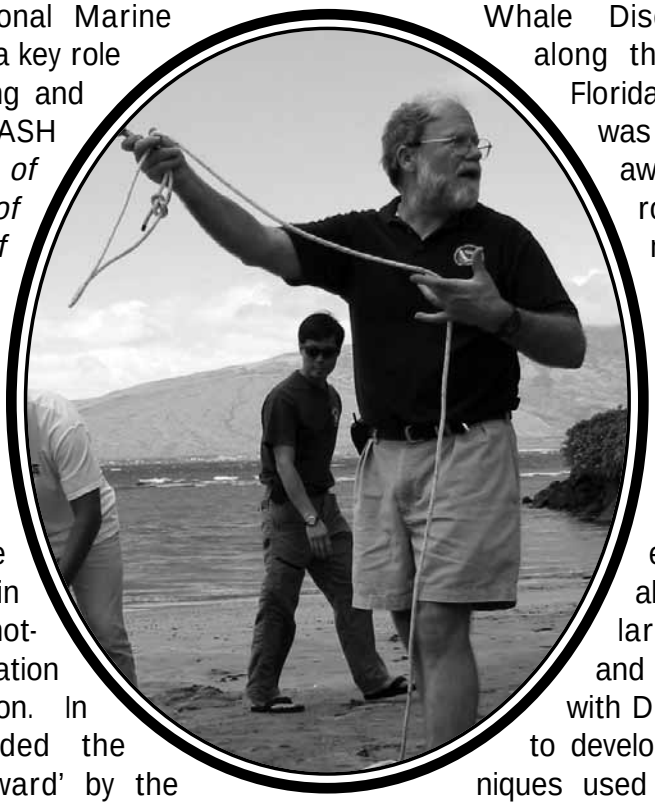
To properly manage whale populations today, we need to know (among other things) how many animals there are, how the population is structured and whether it is increasing or declining, and what are the biological parameters (such as reproduction and survival) of the animals themselves (i.e. how productive is the species or population?) After two decades of work and more than 11,000 dead whales, the Government of Japan has provided very few data with which to reliably answer any of these questions about the species being hunted. This is hardly surprising given that, instead of using much more effective modern non-lethal methods to study whales, GOJ researchers continue to pursue unreliable techniques and unnecessary lethal sampling.

Today, if one were to design a program of scientific research to meet the objectives set out by the GOJ, that program would have little in common with the studies being conducted using scientific whaling. As has occurred in many places throughout the world, ecosystem and population studies on Antarctic and North Pacific whale species would be carried out using photo-identification, biopsy sampling for genetics, diet and other analyses, satellite tagging, and integrated, multi-disciplinary investigations which examined the behavior of whales using sophisticated tags in association with detailed oceanographic sampling.

Unfortunately, the GOJ has failed to bring its science into the modern world, and instead expends a huge amount of effort and money to keep alive an industry that would otherwise likely fail.

* See prior page for Phil's bio and photo

David MATTILA



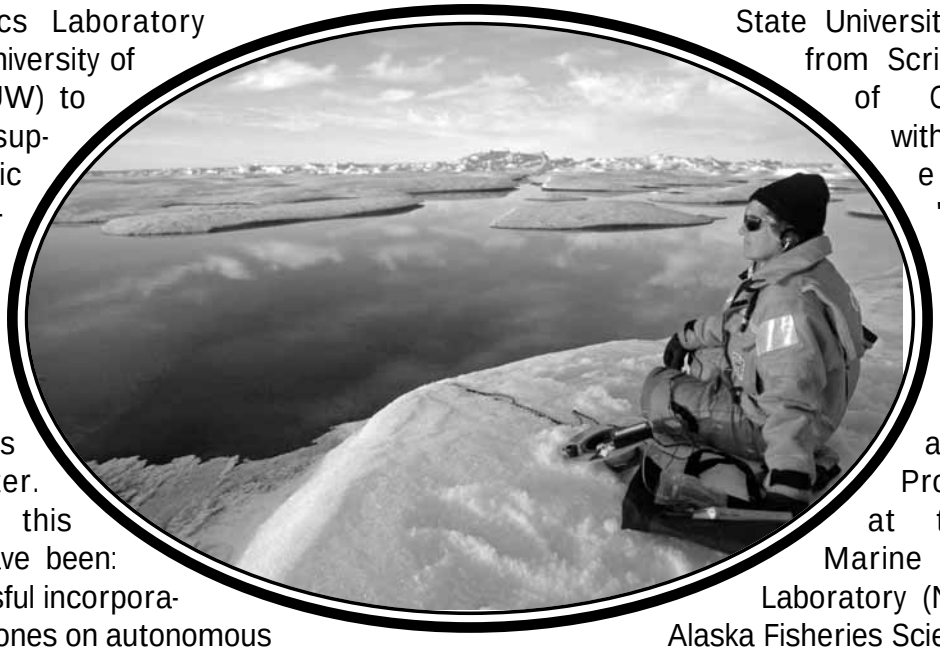
David Mattila is the Science and Rescue Coordinator, for the NOAA-Hawaiian Islands Humpback Whale National Marine Sanctuary. David played a key role in the conception, funding and coordination the SPLASH project (*Structure of Populations, Levels of Abundance and Status of Humpbacks*) in the North Pacific. He has conducted research on great whales since 1978 in the North Atlantic, and North and South Pacific and received the 'Ocean Hero Award' from the Smithsonian Institution in 1994 for his work promoting international conservation and scientific collaboration. In 1999, he was awarded the 'Environmental Hero Award' by the National Oceanic and Atmospheric Administration, in large part for establishing and directing (1996-2002) the Atlantic Large Whale Disentanglement Network along the US east coast from Florida to Canada. In 2006 he was recognized with a special award from NOAA for his role in creating and coordinating a whale disentanglement network in Hawaii, which is now partnering to help develop response capability in Alaska, the West Coast and Mexico. He is also an advisor to several governments and international forums on the issue of large whale entanglement and release, and collaborated with Dr. Jooke Robbins of PCCS to develop the photographic techniques used by SPLASH to monitor entanglement scarring in humpback whales.

THE SPLASH PROJECT: ASSESSING HEALTH AND HUMAN IMPACTS

The SPLASH project was the largest whale research project ever undertaken, thanks to the cooperation of over 400 researchers throughout the North Pacific Ocean. While a large part of the project was devoted to understanding the movements, population structure and abundance of North Pacific humpback whales, it also represented the first attempt to understand human impacts across an entire Oceanic population. Photographs and biopsy samples were collected to examine them for evidence of entanglement, ship strike and manmade toxins. Preliminary results show variations in incidence of these impacts throughout the North Pacific population. Perhaps of greatest concern is the finding that no population of humpback whales appears to be free of wounds from entanglement in manmade ropes, net and debris. The extent of the problem, complexities of interpreting these findings, along with the next steps being taken, will be discussed.

Sue MOORE

Sue Moore is a biological oceanographer, whose research focuses on the ecology, bioacoustics and natural history of whales and dolphins. She recently completed a detail to the Applied Physics Laboratory (APL) at the University of Washington (UW) to develop and support acoustic and Arctic-related research programs for NOAA's Alaska Fisheries Science Center. Highlights of this assignment have been: (1) the successful incorporation of hydrophones on autonomous sea-going gliders for detection of whale calls, and (2) assessment of sea ice variability in the Arctic at spatial and temporal scales relevant to bowhead and gray whale habitats. Sue received a BA in Biology from the University of California, San Diego, a MS in Biology from San Diego State University, and a PhD from Scripps Institution of Oceanography, with a dissertation entitled "Cetacean Habitats in the Alaskan Arctic". Sue has served as Director, and as Cetacean Program Leader, at the National Marine Mammal Laboratory (NMML), NOAA Alaska Fisheries Science Center.



MARINE MAMMALS AND CLIMATE CHANGE

The earth's climate is changing, possibly at an unprecedented rate. Overall, the planet is warming, sea ice and glaciers are in retreat, sea level is rising and pollutants are accumulating in the environment and within organisms. These clear physical changes undoubtedly affect marine ecosystems. Species dependent on sea ice, such as the polar bear (*Ursus maritimus*) and the ringed seal (*Phoca hispida*), provide the clearest examples of sensitivity to climate change. Cetacean responses to climate change are harder to discern, but in the eastern north Pacific evidence is emerging that gray whales (*Eschrichtius robustus*) are delaying their southbound migration, expanding their feeding range along the migration route and northward to Arctic waters and even remaining in polar waters over-winter - all indications that North Pacific and Arctic ecosystems are in transition. To use marine mammals as sentinels of ecosystem change, we must expand our existing research strategies to encompass the decadal and ocean-basin temporal and spatial scales consistent with their natural histories.

D.J. SCHUBERT

After graduating from Arizona State University in 1983 with a degree in Wildlife Biology, it was off to Burkina-Faso in West Africa where D.J. served two years as a volunteer in the Peace Corps. Upon his return to the states, he briefly was employed by the U.S. Fish and Wildlife Service in East Lansing, Michigan. His passion for advocacy and his lifelong desire to protect animals, soon led him to the not-for-profit world of animal advocacy. For the past twenty-one years D.J. has worked for several national animal protection organizations on a diversity of animal protection campaigns and species-specific projects. He has spent the majority of his career working on both domestic and international wildlife issues. The issues he has worked on have been diverse and include: opposing sport hunting and trapping of wildlife, seeking protection for Yellowstone's beleaguered bison, challenging the Makah Tribe's gray whale hunt, advocating for greater protections for imperiled species, opposing snowmobile use in Yellowstone National Park, and confronting the government's mismanagement of wild horses. Since November 2005 he has been employed as a Wildlife Biologist with the Animal Welfare Institute. In this position his portfolio has expanded to include combating the problems of international wildlife trade and to advocating for greater protection of whales worldwide. In addition to his work for national animal protection organizations, D.J. has also worked for a public interest law firm where he honed his interest in using the law to benefit animals and managed a national animal sanctuary providing invaluable experience in the hands-on care of a variety of domestic and exotic animal species.

THROWING WHALES OVERBOARD: HOW U.S. POLICIES ON WHALING HAVE WEAKENED AND THE ROLE OF NGOS IN RESTORING U.S. LEADERSHIP WITHIN THE IWC

The United States government has consistently held that its policies on whaling and whale conservation have remained strong. It repeatedly claims to support the commercial whaling moratorium and to oppose "scientific whaling." Many anti-whaling non-governmental organizations have condemned the United States for its weakening position on whale conservation and the erosion of its leadership among the like-minded countries of the International Whaling Commission. Who's right? This presentation will look beyond the rhetoric to examine recent changes in U.S. policy on whales and whaling, to identify the origins of such policies, and to explain their implications. Efforts to revive the leadership role of the United States within the IWC will also be explored through the collective efforts of the Whales Need US coalition of U.S. non-governmental organizations.

Jonathan STERN

Jon is on the faculty at San Francisco State University. He has been studying minke whales since 1980 and has published several articles, and even a book about them. He has also worked on killer whales, humpback whales and fin whales. He is currently the Conservation Chair of the American Cetacean Society and is on the Scientific Advisory Committee of the Gulf of the Farallones National Marine Sanctuary.

WHALING IN THE 21ST CENTURY… THE WRITING IS ON THE WALL… AND IT'S IN JAPANESE…. AND IT'S NOT GOOD

Recent trends point to an increase in whaling on a global scale. Japan leads a number of nations intent to whale under various guises, ranging from local consumption to research to national security (I am not kidding). The latter says whales need to be killed because they are eating all of the fish. Several models show this is not the case, however, Japan stands by this claim. This raises many ecological, ethical and tactical questions. This presentation will focus on the rationale for scientific, consumptive and management whaling and its environmental implications.

Ian STIRLING

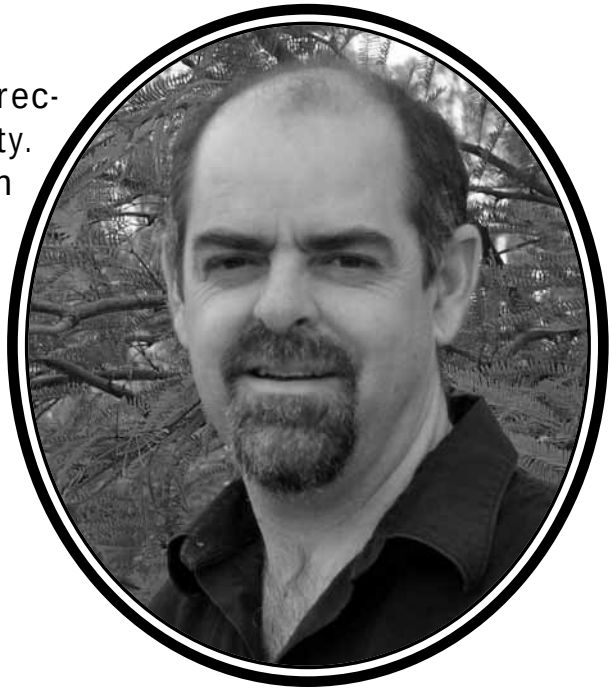
Dr. Ian Stirling is a Scientist Emeritus with the Canadian Wildlife Service and an Adjunct Professor in the Department of Biological Sciences at the University of Alberta. He holds a B.S. and M.S. from the University of British Columbia in Vancouver and a Ph.D. from the University of Canterbury in Christchurch, New Zealand, where he studied the population ecology of Weddell seals in Antarctica. He has studied polar bears throughout the Canadian Arctic for over 37 years. His long-term studies of polar bears in Western Hudson Bay, one of the world's most southerly populations, confirmed the negative effects of climate warming. Bears of all ages and sex classes are losing condition as the ice breaks up progressively earlier, shortening their ability to feed at the best time of year, before fasting for several months on land. The population has dropped 22% since 1987. Dr. Stirling has also studied the bears of the Southern Beaufort Sea and Canadian High Arctic for several decades as well their interrelationships with seals and sea ice. He is the author or co-author of over 200 scientific papers as well as three books for the public on bears, including *Polar Bears*, considered the definitive work on the biology of the polar bear. For his work, he has won several awards including the Northern Science Award, Officer in the Order of Canada, and an elected Fellow of the Royal Society of Canada.

POLAR BEARS IN A CHANGING ICE WORLD

Ian will be participating via telecast from the Arctic.

Polar bears, at the top of the arctic food chain are key indicators of the health of arctic ecosystems that includes whales and seals. Polar bears life history is built upon a strategy of following the sea ice. The health of the polar bear population is directly linked to sea-ice coverage. The two best-studied populations are Western Hudson Bay in Canada and the Southern Beaufort Sea in the U.S. and Canada. It was long term monitoring of the Hudson Bay population that led to one of the first indications that global climate change was having direct influences on an animal population. Greater sea-ice retreats and longer ice-free season have resulted in declines in the physical stature and survival of some sex and age classes. The survival of cubs has declined over time and is lower in years with more restricted availability of sea-ice habitat near shore. Current studies reveal how the bears are trying to adapt. More bears are trying to den on land rather than sea ice. Some are moving greater distances. Some drownings are now observed from bears swimming from ice that has moved much further offshore. Cannibalism has been observed. Females have fewer cubs. It is currently projected that polar bears will disappear from Alaska, Russia, and Norway by 2050 but that remnant populations will survive along the northern coast of Greenland and in the Canadian high arctic. These bears will be able to repopulate the Arctic if humans react quickly to reverse the current warming trends in the Arctic.

Kierán Suckling



Suckling is the founder and executive director of the Center for Biological Diversity. He holds a master's in philosophy from the State University of New York at Stonybrook. The Center focuses on the protection of imperiled species through creative legal action. It recently established the Climate Law Institute to help spur the development of a new legal framework to combat global warming.

SAVE THE BEARS, SAVE THE WORLD: WHAT CAN BE DONE RIGHT NOW?

While comprehensive greenhouse gas-limiting legislation is needed, climate activists can not and need not delay legal action to stem the melting of the Arctic and the potential triggering of non-anthropogenic tipping points. Existing state and federal laws founded on general concepts such as "cumulative effects," "indirect effects," "best available scientific information," "pollutant," and "cost / benefit analysis" provide a powerful legal framework requiring the immediate regulation of many greenhouse gas emission sources and changes in habitat and hunting management regimes to ensure species are able to survive unavoidable levels of global warming. Recent developments in this rapidly developing legal arena are summarized and suggestions for future actions—including engagement of the scientific community—are presented.

Steven SWARTZ

Steven is a native Californian and a founding charter member of the Society for Marine Mammalogy and the San Diego Chapter of the American Cetacean Society. Steven's career includes field research involving gray, bowhead, humpback, fin, blue and blue whales. He was born in California in 1949, received his B.A. degree from the University of California at Santa Barbara in 1972 and his Ph.D. in Marine Science from the University of California at Santa Barbara in 1986. Along with his wife, Ms. Mary Lou Jones, he co-founded Cetacean Research Associates which conducts research on cetaceans, principally breeding gray whales in Baja California, Mexico. He is Co-Principal Investigator with Jorge Urban R. for the Laguna San Ignacio Ecosystem Science Program (www.sanignacioecosystem.org) which provides scientific research in support the conservation of this coastal lagoon and marine protected area utilized by the gray whales and other marine life. Steven worked for the Center for Environmental Education (now the Ocean Conservancy), the U.S. Marine Mammal Commission as their Deputy Scientific Program Director, and for NOAA Fisheries for the past 18 years. Steven is a conservationist with an interest in terrestrial as well as marine issues, and a resource manager that strives to balance sustained utilization with environmentally sound and responsible wildlife management practices.

CETACEAN RESPONSES TO THEIR ENVIRONMENT: WHAT THEY TELL US ABOUT CLIMATE CHANGE

Large cetaceans have long been thought of as the mighty monarchs of the world's oceans. These long-lived species have been around for millions of years and have survived significant periods of geologic changes that have affected the ocean environment and its marine ecosystems. Large cetaceans have evolved specific life histories that afford them the opportunity to adjust to changes in their environments that affect their prey, migrations, breeding and survivorship. The scientific study of living whales allows the examination of how large cetacean species deal with changes in their environment and habitats they rely on for feeding, breeding and migrations. Some of the better studied species are exhibiting apparent responses to climate related changes in their habitats and the resources on which they depend. Thus, observations of these species can inform us about their health and status, and the health and status of their ocean habitats. Species such as the gray whale have been called by Sue Moore "Sentinels of the Seas." All of this information will be discussed in the context of how well large cetaceans serve as indicators of environmental change, and how these species are adjusting to such changes.

Samuel TURVEY

Samuel Turvey is a Research Fellow at the Institute of Zoology, Zoological Society of London (ZSL). He received a D.Phil. in Chinese palaeontology in 2002, and has since conducted research into the ecology of past and present mammal extinctions. He was one of the scientists involved with establishing ZSL's new EDGE of Existence programme (www.edgeofexistence.org), which prioritizes conservation efforts for phylogenetically distinct species. He was intensively involved with trying to establish active conservation efforts for the Yangtze River dolphin before the discovery of its probable extinction, and he is currently researching local informant data from Yangtze fishermen on patterns of cetacean mortality and last-sighting records across the mid-lower Yangtze river system. He is the author of *Witness to Extinction: How We Failed to Save the Yangtze River Dolphin*, published by Oxford University Press in October 2008.

FAILURE OF THE YANGTZE RIVER DOLPHIN RECOVERY PROGRAM: CONSERVATION LESSONS FOR OTHER THREATENED CETACEANS

The Yangtze River dolphin or baiji experienced a precipitous population decline throughout the late twentieth century driven by unsustainable by-catch in local fisheries and habitat degradation. An intensive survey in 2006 failed to find any evidence that the baiji still survives, and the species is now highly likely to be extinct. This represents the first probable extinction of a large-bodied vertebrate since the emergence of an international network of conservation organizations that have tended to prioritize conservation efforts on such charismatic animals; how then was it possible for a species of river dolphin to become extinct when it should have been the focus of intensive international conservation attention and activity? It is imperative to identify the key lessons that can be learnt from the history of Chinese and international attempts to conserve the baiji, and the ultimate failure of these attempts to prevent the extinction of this species. In particular, it is necessary to consider whether conservation efforts for the baiji were hindered by unique and insurmountable theoretical and / or practical challenges associated with the specific ecology of river dolphins, river systems, and associated threat processes, or whether the lack of successful conservation action resulted instead from institutional failure to implement a feasible recovery programme. Despite extensive deliberation for over twenty years about an ex situ recovery programme that aimed to establish a translocated breeding population of baiji under semi-natural conditions, minimal financial or logistical support for this active baiji conservation strategy was ever provided. A more dynamic international response is required if other threatened river dolphin species and other cetaceans are to be conserved in the future.

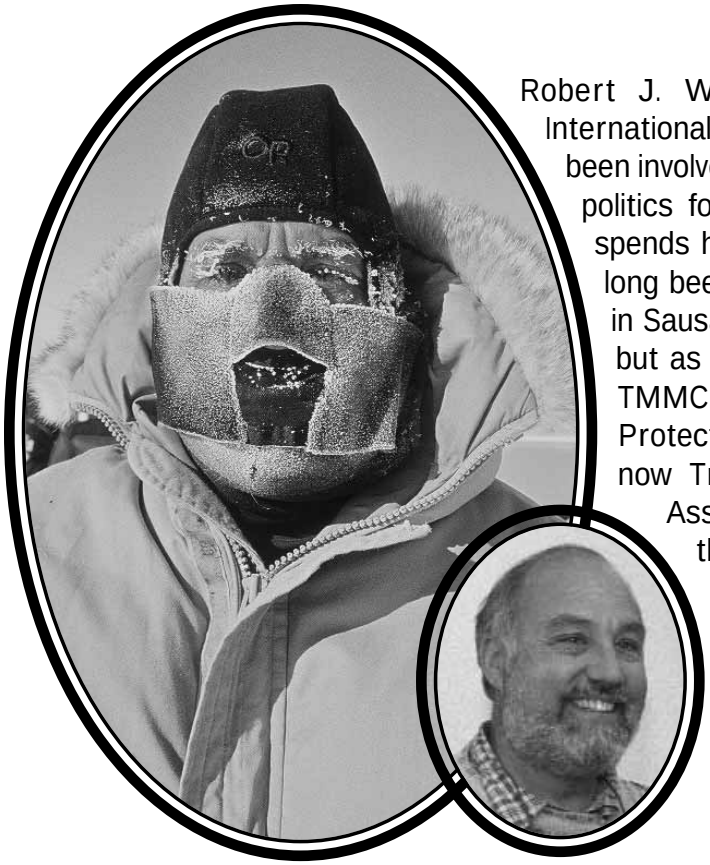
David WELLER

David has been studying the biology and ecology of marine mammals for nearly 25 years. His specialization is focused in the areas of behavioral ecology, population assessment and evaluation of potential disturbance impacts from human activities. He directs two well-established research programs that include: 1) an ongoing study of the behavior, ecology and population dynamics of a critically endangered population of western Pacific gray whales off Far East Russia; and 2) a long-term study of the behavioral ecology and population dynamics of coastal bottlenose dolphins off California. Recently, David has been working closely with the International Whaling Commission, International Union for Conservation of Nature (IUCN), U.S. Marine Mammal Commission and a variety of national and international academic institutions on issues related to the conservation and management of endangered whale and dolphin populations.

CAN THE WESTERN GRAY WHALE POPULATION SURVIVE?

The western gray whale population is critically endangered and its continued ability to survive is of concern. Hunted to such low numbers in the mid 20th century that some thought it to be extinct, the population remains highly depleted today. The International Whaling Commission and the International Union for Conservation of Nature have each expressed serious concern about the status of this population and have called for urgent measures to be taken to help ensure its protection. In addition to a number of biological difficulties that western gray whales are facing, the large-scale offshore oil and gas development programs near their summer feeding ground, as well as fatal net entrapments off Japan during migration, pose significant threats to the future survival of the population.

Bob WILSON



Robert J. Wilson is the Board Chair of Polar Bears International. He is also treasurer of PBI Canada. He has been involved in polar bear and marine mammal issues and politics for over 15 years. A retired attorney he now spends his time volunteering for marine issues. He has long been associated with The Marine Mammal Center in Sausalito not only as a crew and stranding volunteer but as a Director emeritus and is the policy liason for TMMC. He is a member of the Marine Mammal Protection Coalition. He is the former board chair, and now Treasurer of the Farallones Marine Sanctuary Association. He recently served as a stakeholder in the California Marine Life Protection Act process for establishing a network of marine protected areas in North Central California.

POLAR BEARS IN A CHANGING ICE WORLD

Polar bears, at the top of the arctic food chain are key indicators of the health of arctic ecosystems that includes whales and seals. Polar bears life history is built upon a strategy of following the sea ice. The health of the polar bear population is directly linked to sea-ice coverage. The two best-studied populations are Western Hudson Bay in Canada and the Southern Beaufort Sea in the U.S. and Canada. It was long term monitoring of the Hudson Bay population that led to one of the first indications that global climate change was having direct influences on an animal population. Greater sea-ice retreats and longer ice-free season have resulted in declines in the physical stature and survival of some sex and age classes. The survival of cubs has declined over time and is lower in years with more restricted availability of sea-ice habitat near shore. Current studies reveal how the bears are trying to adapt. More bears are trying to den on land rather than sea ice. Some are moving greater distances. Some drownings are now observed from bears swimming from ice that has moved much further offshore. Cannibalism has been observed. Females have fewer cubs. It is currently projected that polar bears will disappear from Alaska, Russia, and Norway by 2050 but that remnant populations will survive along the northern coast of Greenland and in the Canadian high arctic. These bears will be able to repopulate the Arctic if humans react quickly to reverse the current warming trends in the Arctic.

Sharon YOUNG

Sharon Young is the Marine Issues Field Director of the Humane Society of the United States (The HSUS). Prior to coming to the HSUS in 1992, she participated in field research on baleen whales including North Atlantic right whales. She is appointed to a variety of federal task forces dealing with marine mammal conservation including the Atlantic Large Whale Take Reduction Team, a stakeholder group charged under the Marine Mammal Protection Act with advising the National Marine Fisheries Service (NMFS) on measures to reduce fatal entanglements of endangered baleen whales. Other advisory panels to which she is appointed include 5 other NMFS take reduction teams; the Atlantic Scientific Review Group, which is charged with reviewing NMFS stock assessments; and the Bonneville Dam Pinniped Task Force, reviewing a government proposal to shoot sea lions eating salmon at Bonneville Dam. She has also been adjunct faculty at Tufts University in the Animals and Public Policy graduate program. The HSUS is a current (and has been a past) litigant against the NMFS on a variety of issues including litigation seeking additional measures to reduce both vessel collisions and fishery entanglements of right whales.

WHAT WENT WRONG FOR RIGHT WHALES?

The North Atlantic is one of the most beleaguered of large whales. Named because it was prized by whalers who ultimately decimated the species, right whales have struggled to recover. Although their counterparts in the southern hemisphere have done well, North Atlantic right whales have not, even after gaining protection in the U.S. with the passage of the Marine Mammal Protection Act in 1972 and the 1973 passage of the Endangered Species Act. Although they suffer from a reduced fecundity, countless scientific bodies have identified anthropogenic factors as the primary causes underlying their failure to recover. These include fatal entanglement in commercial fishing gear and collisions with large vessels, both of which disproportionately affect females and calves. Efforts to identify solutions have involved tension between those seeking precautionary management of impacts and industry groups whose economic interests are affected by conservation measures. As industry groups have used lobbying to weaken or delay proposed protective measures, conservation groups have relied primarily on litigation to enforce existing laws and regulations. At several junctures the White House has been involved in furthering either conservation or delay. Efforts at joint negotiations have been largely unsuccessful to date at gaining protection for whales while minimizing economic impact. This talk will detail the history of the contentious fight to save the species and advance recovery, the difference in Canadian versus U.S. efforts to protect a shared species and the politics that affect their future. We will also discuss the values that underlie efforts to advance conservation while allowing industries to continue to operate profitably.

GRAY WHALES AND CLIMATE CHANGE: SENTINELS OF THE NORTH PACIFIC/ ARCTIC ECOSYSTEMS

Monday, November 17, 2008

Held in Conjunction with the ACS Conference
Hosted by Steven Swartz and Sue Moore
Sponsored by Pacific Life Foundation

Pieter Folkens	Climate Change, Geologic Time Scales, and Cetacean Evolution
Tom Demere	Gray Whales Throughout Geologic Time - What Challenges Have They Survived?
Nick Bond	North Pacific-Arctic Ocean Climate Oscillations: Influence on Biota
Paul Fiedler	ENSO and Longer-term Variability of Productivity in the North Pacific
Sue Moore	Marine Mammals and Climate Change: Gray Whales and the Weight of Evidence
Dave Rugh	Eastern North Pacific Gray Whale Population History and Migration Timing Shifts
Wayne Perryman	Gray Whale Calf Production and Arctic Sea Ice
Bree Wittereen	Gray Whale Feeding Offshore of Kodiak, Alaska
John Calambokidis	Seasonal Resident Gray Whales in the Pacific Northwest: Results From Collaborative Research from 1999 to 2007
Laura Joan Feyrer, Dave Duffus and Christina Tombach-Wright	The Beggar's Banquet: Gray Whale Predator-Prey Dynamics on the Outskirts
Gina Ylitalo	Biochemical Analysis of Gray Whales
Francis Gulland	Gray Whale Health & Disease Issues
Amanda Bradford and David Weller	Resource Limitation - Skinny Gray Whales, Where and When?
Jorge Urbán and Steven Swartz	Observations of Gray Whales in Baja Breeding Lagoons: Indications of Response to Environmental Changes

SYMPOSIUM

POSTERS

01) **Janet Clarke, Laura Morse, Dave Rugh:** Marine Mammal Occurrence in the Northeastern Chukchi Sea, Alaska - Comparison of Data from Autumn 1988-91 & Autumn 2008

02) **Julie A. Deyan, Dennis L. Kelly, Lindsay S. King:** Documented Sightings of Bottlenose Dolphins (*Tursiops truncatus*) Entering Newport Harbor, Newport Beach, California During an18-Month Period from March 2007 to September 2008

03) **Michael Galginaitis:** Variability in Cross Island (Arctic Alaska) Subsistence Whaling: An Examination of "Natural" and Autogenic Factors

04) **Ellen Hines, Mark Mueller, Leslie Ward, Barbara Zoodsma:** Using AIS (Automatic Identification System) to Monitor Vessel Compliance with Recommended Shipping Lanes in the Southeastern US

05) **Michael Hopkins, Renae Poole, Laura Teigen:** A Researcher's Dilemma: How Do You Set Up a Land Based Killer Whale Research Site?

06) **Brian W. Kot:** Feeding Process Uniformities in Rorqual Whales: Comparative Kinematics and Biological Scaling

07) **Daniela Maldini, Mark P. Cotter, Alessandro Ponzo:** On the Prevalence and Severity of Epidermal Diseases in Coastal Bottlenose Dolphins in Monterey Bay, CA

08) **Jacqueline L Maud, Lei Lani Stelle, William M Megill:** "Switching" Predator in a Changing Ocean: Is Predator-Prey Cycling in Grey Whales Feeding Near Cape Caution, BC, Sustainable?

09) **Laura Morse, Janet Clarke, Dave Rugh:** Marine Mammal Occurrence in the Northeastern Chukchi Sea, Alaska - Summer 2008

10) **Laura Morse, Janet Clarke, Dave Rugh:** Swimming Polar Bears in the Alaskan Chukchi Sea - The Real Story

11) **Carrie Newell:** Ecological Interrelationships Between a Predator, Gray Whales, and Their Prey, Mysids, Along the Central Oregon Coast

12) **D.M. Palacios:** Children of the Tropics: Cetacean Community Response to an El Niño - La Niña Transition Off the Galápagos Islands

13) **Morgan Richie:** A Characterization of the Whale Watching Industry in Dana Point, California and a Census of Marine Mammals from 5/2008 to 10/2008

14) **Barton G. Selby:** Understanding Navigation and Obstacle Avoidance in Gray Whales

15) **Jennifer L. Smith, Sarah S. Mesnick:** The Lactation League Hypothesis: A Genetic Analysis of Sperm Whale (*Physeter macrocephalus*) Sociality in the Pacific Ocean

16) **Lei Lani Stelle, William M. Megill, Michelle R. Kinzel:** Activity Budget, Diving Behavior, and Foraging Ecology of Gray Whales (*Eschrichtius robustus*) Off Coastal British Columbia

17) **Timothy S. Wakefield, Robert E. Otis:** Is Whale Watching a Threat to Endangered Resident Orca Whales?

18) **Thomas White:** Dolphins as “Nonhuman Persons”

19) **Andrew Wilson, Bonnie Rogers, Jeanette Miller, Elisa Garcialassalle:** A Study of the Development of Diving Abilities in Neonate Cetaceans; Is Myoglobin a Limiting Factor?

01

Marine Mammal Occurrence in the Northeastern Chukchi Sea, Alaska - Comparison of Data from Autumn 1988-91 and Autumn 2008

Janet Clarke, Laura Morse, Dave Rugh

Broadscale aerial surveys in the northwestern Chukchi Sea for marine mammals were conducted in autumn 2008 after a hiatus of 17 years. The study area extends from the northwestern Alaskan coast westward to the International Dateline at 169°W, between 68° and 72°N (surveys were previously conducted north to 73°N). The area overlays Lease Sale 193 of the Chukchi Sea Planning Area, and surveys are being conducted to collect information on marine mammals undergoing seasonal migrations through these lease areas and associated waters. Broadscale surveys were previously conducted in this area from 1989-91. Changes in late autumn prevailing sea ice between 1991 and 2008 have been monumental, and there are concerns over the effect of later-developing sea ice on marine mammal populations. Sightings of cetaceans, including bowhead (*Balaena mysticetus*), gray (*Eschrichtius robustus*), and beluga (*Delphinapterus leucas*) whales, walrus (*Odobenus rosmarus*) and polar bears (*Ursus maritimus*) in autumn 2008 are compared to sightings of the same species in autumn 1989-1991. Observations of sea ice development during both time periods are also included. Results presented here are preliminary, as the 2008 survey season finished on 10 November. This is the first year of a multiyear study sponsored by the Minerals Management Service, Alaska OCS Region.

Documented Sightings of Bottlenose Dolphins (*Tursiops truncatus*) Entering Newport Harbor, Newport Beach, California During an 18-Month Period from March 2007 to September 2008

02

Julie A. Deyan, Dennis L. Kelly, Lindsay S. King
Marine Science Department, Orange Coast College, Costa Mesa, CA, USA

Historically, the stage for this research was set in 2004 when two bottlenose dolphins took up residence in the Upper Newport Bay, a phenomenon that had never been recorded until that time. A study conducted by Nikolai Alvarado and Dennis Kelly (2004) subsequently ended with the demise of both dolphins. A necropsy revealed that toxic contaminants found in the dolphin's tissues were contributing factors in their deaths. Recent reports of pollutants found in the sediment and fishes in Newport Bay suggest that the polluted food web in the bay likely played a key role.

When bottlenose dolphins were observed again in Newport Bay in early 2007, it was decided that their patterns of "migration" into the bay should be documented in order to determine if this new "trend" could have deleterious long-term effects on our coastal dolphin population.

The Newport Harbor dolphin research project, a study conducted under the auspices of the Coastal Dolphin Survey Project, was launched in March 2007 for the purpose of determining: how often and how many bottlenose dolphins were entering Newport Harbor; what areas of the harbor were they utilizing; what was the length of their stay; what types of behaviors were being observed; if feeding was apparent, what was the quantity and species of fish they were consuming; and were the dolphins having interactions with boats or people who utilize the harbor. Data was collected through observational reports and photos taken from a wide variety of sources including trained researchers, harbor personnel, and the general public.

Results revealed that dolphins are entering the harbor for short intervals on a regular basis, primarily to feed. Although there is potential for concern, there has been no evidence of adverse effects, likely due to the brevity of their "visits". However the long-term, accumulative effects remain questionable.

03 Variability in Cross Island (Arctic Alaska) Subsistence Whaling: An Examination of "Natural" and Autogenic Factors

Michael Galginaitis
Applied Sociocultural Research, msgalginaitis@alaska.net

Humans constitute an important and complex, but often overlooked or neglected, element of Arctic ecosystems. Monitoring changes in this human component presents substantial challenges, and tends to be most successful when focussed on especially significant socioeconomic aspects of local human activity. Contemporary subsistence (aboriginal) whaling is one such nexus for Native communities in northern Alaska. The Bering-Chukchi-Beaufort Seas stock of bowhead whale population is estimated at 10,500 individuals (2001) and increasing at an annual rate of 3.2 percent since 1978, the year the International Whaling Commission (IWC) first set a quota for the bowhead subsistence hunt. The current quota is flexible, to accommodate variable hunting conditions, but is conservatively limited to 280 whales landed for the five-year period of 2008-2012 (with no more than 67 strikes in any one year). While the bowhead population has continued to increase, intensified oil and gas (and other commercial) activities may adversely affect these whales, and the subsistence hunt.

This research, one part of the ANIMIDA/cANIMIDA project, gathered measures to assess the potential effects of industry activities, weather and ice conditions, and non-industry vessel and aircraft activities on subsistence whaling near Cross Island, Alaska. The Cross Island harvest is a relatively small part of the overall hunt, with an annual quota of four strikes, but takes place at the whaling location closest to both onshore and offshore oil and gas activities. This poster presents seven years of data to allow discussion of how year-to-year variability in subsistence whaling can be related to the factors identified above. Additional potential factors affecting whale behavior (and the subsistence hunt) such as whaling technology and climate change can also be addressed using grosser, but longer-term, data.

Using AIS (Automatic Identification System) to Monitor Vessel Compliance with Recommended Shipping Lanes in the Southeastern US

04

Ellen Hines[1,2], Mark Mueller[1], Leslie Ward[1], Barbara Zoodsma[3]

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The Florida Fish and Wildlife Conservation Commission has developed an innovative system for the collection and spatially explicit analysis of Automatic Identification System (AIS) data to improve understanding of vessel distribution and movements in the right whale calving grounds. AIS is a system for autonomous reporting of vessel data required worldwide for use by vessels of certain types, minimum lengths or tonnages. Transponder-equipped vessels use VHF to broadcast AIS data that includes latitude/longitude, course, speed, unique identifiers, vessel type and dimensions. Designated recommended vessel routes were put into place in November 2006 for approaches to the ports of Brunswick, Georgia, Jacksonville and Fernandina Beach, Florida. Based on historical patterns of whale distribution, the lanes were placed to minimize vessel strikes with endangered right whales during their winter calving season (November through April). To monitor voluntary compliance from lane inception, we used a geographic information system to analyze and compare AIS tracks in the critical habitat area for four bi-weeks of each of the three months in the 2006/2007 and 2007/2008 calving seasons. In all port approaches and departures, we found that the cumulative percentage of track distance showed that cargo vessels and tankers spent a significantly larger percentage of their time in the recommended lanes in the 2007/2008 season than the previous season.

05

A Researcher's Dilemma: How Do You Set Up a Land Based Killer Whale Research Site?

Michael Hopkins, Renae Poole, Laura Teigen

How does one establish a land-based killer whale observation facility on a remote island? During the summer of 2008 we were given an opportunity to observe and document the behavior of the Southern Resident Community of Killer Whales at Turn Point Lighthouse on Stuart Island, WA. There were a number of challenges we faced:

(1) Data collection issues: What behavioral activities will be observed? What ecological conditions will be taken into consideration?
(2) Finances: Where is the funding coming from? How is the observation equipment acquired?
(3) Living conditions: What will the arrangements be for housing? What range of weather is to be expected?
(4) Communication and networking: Who will be responsible for helping procure food, water, and prescriptions? Who is contacted in the case of an emergency?
(5) Bureaucratic considerations: Are there any land ownership issues? What is the degree (if any) involvement of the U.S. government?

These are challenges likely met by others making remote observations of marine mammals, yet it is an area not often addressed by scientific literature. We hope that an open discussion of these issues can facilitate more research of this type.

Feeding Process Uniformities in Rorqual Whales: Comparative Kinematics and Biological Scaling

06

Brian W. Kot
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Rorqual whales (Balaenopteridae) are the largest animals on earth yet little information exists about their filter-feeding process due to the difficulties of locating and studying feeding whales at sea. Rorquals mostly feed by lunging into aggregations of fishes or krill with their mouth open. They engulf a large volume of water and prey which is directed into their highly expandable ventral pouch. Water is then forced back out of the mouth through a set of baleen plates which retain prey. Most previous work on rorqual feeding involved anatomical studies of dead whales or telemetric studies of living whales which were not seen feeding. Therefore, functional aspects of the feeding process remain highly speculative. My research involves capturing and analyzing film of rorquals while they are visibly feeding at the sea surface. I use digital video to comparatively quantify the lunge-feeding kinematics of four species of rorqual whales: blue whales (*Balaenoptera musculus*), finback whales (*B. physalus*), minke whales (*B. acutorostrata*) and humpback whales (*Megaptera novaeangliae*). I observe and film surface-feeding whales from inflatable boats in the Gulf of St. Lawrence in eastern Canada during the summer months. Velocities of lunge-feeding and from key feeding anatomy (e.g., mandibles and ventral pouch) are calculated for each species. Results from 1300 hours at sea and over 3500 lunge-feeding events from hundreds of rorquals during 2004, 2006 and 2007 show variation, by species, in the anatomical motions of feeding. However, when scaled for body size the motions become very similar. This work provides evidence that rorqual whales use a somewhat uniform feeding process. It also documents some of the longest continual surface-feeding bouts ever recorded from individual blue, finback and minke whales.

07

On the Prevalence and Severity of Epidermal Diseases in Coastal Bottlenose Dolphins in Monterey Bay, CA

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Epidermal disease has been well documented in cetaceans. Bottlenose dolphin populations worldwide are affected by a variety of skin conditions potentially linked to environmental factors such as salinity and temperature, and to anthropogenic factors such as pollution and contaminants. The prevalence (i.e., proportion of examined individuals exhibiting a condition) and severity (i.e., proportion of the body affected) of epidermal disease in California coastal bottlenose dolphins (*Tursiops truncatus gilli*) in Monterey Bay was evaluated between 2006 and 2008. Of 163 unique adult individuals photographically examined, 59% were affected by dark (25%), pale (32%), cloudy (26%), dark fringe (17%) and white fringe (1%) lesions, and orange hue and/or patch (5%), as described by Wilson et al. (1997). The severity of each type of condition varied from very mild (<5% body cover) to severe (>80% body cover) with 11% of the individuals exhibiting a severe condition. Although affecting over half of the adult population, skin conditions in Monterey Bay had the lowest documented prevalence among bottlenose dolphin populations worldwide. The proportion of males with a severe condition was 68% as opposed to 42% for females. Of 31 calves of known mothers examined, 71% were affected and 16% were classified as severe. Orange hue and/or orange patch, possibly caused by diatoms, were the most prevalent conditions (41% of calves) and generally resolved themselves with time. One calf was first seen on 19 Aug 2006 exhibiting round open and bloody sores similar to those caused by a previously documented calicivirus (serotype Tursiops-1). By September 2006, the sores were covered by light scar tissue and, in September 2007, when the animal was re-sighted, the condition appeared resolved, leaving large discolored areas that could be classified as dark, pale and dark fringe lesions. Causal agents and factors influencing the occurrence of the observed conditions are being investigated.

"Switching" Predator in a Changing Ocean: Is Predator-Prey Cycling in Grey Whales Feeding Near Cape Caution, BC, Sustainable?

08

Jacqueline L Maud[1,3], Lei Lani Stelle[2,3], William M Megill[1,3]
1) Mechanical Engineering Dept, University of Bath
2) Dept of Biology, University of Redlands
3) Coastal Ecosystems Research Foundation, Seattle WA

It is well known that some Eastern grey whales do not complete the northward migration, summering instead in the Pacific Northwest. This "Southern Feeding Aggregation" is estimated to number about 250 animals, and is distributed between northern California and southeast Alaska, the so-called "tertiary" feeding area. These animals are known to feed primarily on mysid shrimp in the shallow coastal zone. In the Cape Caution, British Columbia, area, mysids are often, though not exclusively, associated with kelp beds, and form extensive, dense swarms. We have conducted grey whale surveys in the area annually since 1994. Our data show a cyclic abundance of grey whales, with a period of approximately eight years. The most recent cycle peaked at nearly 100 whales in 2004, followed by a crash the following year that bottomed out in 2007 to only five animals. Sighting effort remained constant throughout the period. The proximal explanation lies in the abundance of mysids: in the years immediately following the crash, mysids remained scarce in the study area. By 2007, recovery had begun, and in 2008 mysids appeared to have returned to levels similar to those observed in 1999-2000. The whales, too, returned: more than 25 whales were sighted in 2008, with many animals resident in the area all summer. We believe that the cycling is evidence of a classic predator-prey system, which includes a 'switching predator' - in this case, a highly mobile predator able to switch to other locations. As is the case with all such cycling predator-prey systems, however, the concern is that the abundance in low years must remain above some threshold for recovery to take place. The changing condition of the North Pacific may lead to grey whales locally overexploiting their patchily-distributed prey stocks to the point where they may be unable to recover.

09

Marine Mammal Occurrence in the Northeastern Chukchi Sea, Alaska Summer 2008

Laura Morse, Janet Clarke, Dave Rugh

Broadscale aerial surveys in the northwestern Chukchi Sea for marine mammals were conducted in summer 2008. This study represents the first effort to document the occurrence of marine mammals from mid-June through late August in this large geographic area. Previous survey efforts have occurred during the spring bowhead migration in April and May (although efforts have been confined to areas relatively close to shore) and during the early autumn migration from mid-September through October. The study area extends from the northwestern Alaskan coast westward to the International Dateline at 169°W, between 68° and 72°N. The survey area overlays Lease Sale 193 of the Chukchi Sea Planning Area, and surveys are being conducted to collect information on marine mammals undergoing seasonal migrations through and to lease areas and nearby waters. Sightings of cetaceans, including bowhead (*Balaena mysticetus*), gray (*Eschrichtius robustus*), fin (*Balaenoptera physalus*) and beluga (*Delphinapterus leucas*) whales, walrus (*Odobenus rosmarus*) and polar bears (*Ursus maritimus*) are summarized. Observations of summer sea ice breakup are also included and discussed with historical context. Results presented here are preliminary. This is the first year of a multiyear study sponsored by the Minerals Management Service, Alaska OCS Region.

Swimming Polar Bears in the Alaskan Chukchi Sea "The REAL Story"

Laura Morse, Janet Clarke, Dave Rugh

On 16 August 2008, ten polar bears (*Ursus maritimus*) were observed west and northwest of Point Barrow, Alaska, during an aerial survey for marine mammals. All ten bears were swimming. The "swimming polar bear" story was advanced by the popular press and used by various organizations to further discussion on global warming and the loss of sea ice. In the process, several facts were mis-stated, probably both accidentally and deliberately. This poster presents the facts of the swimming polar bears, including details of sightings and objectives and methodology of the study. Historical data on polar bear sightings in the western Alaskan Arctic are also presented.

11

Ecological Interrelationships Between a Predator, Gray Whales, and Their Prey, Mysids, Along the Central Oregon Coast

Carrie Newell, Ph.D. student, Biological Oceanography

Specific gray whales have maintained summer residency along the central Oregon coast from two days to over four months. A 25 km area of coastal waters (10m iosbath) was sampled to determine what food resources were available to maintain gray whales in this area. Diet of the whales was determined by collecting and analyzing opportunistic fecal samples. Fecal content analysis showed mysid fragments specifically telsons as the predominant prey item. To understand the linkage between the largest coastal predator, gray whales and one of the most abundant shallow water macrozooplanktonic prey, mysids, we must understand the spatial variability of both the predator and its prey. To understand the spatial distributions of the mysid swarms, I used SCUBA, net sampling, fish finder echograms, and Aquadopp data. Spatial distribution of gray whales was determined by photo identification of individuals with the GPS data of whale locations being overlaid on mysid swarm localities in a GIS program. I also characterized the inter-annual variability of both predator and prey as it related to nearshore oceanographic conditions in the northern California Current System (CCS). Gray whales varied annually by being in either good or poor body condition. Good body condition was determined if the area behind the blow hole was not depressed and the scapula was not showing while poor condition showed a pronounced depression behind the blowholes and a scapula protuberance. Mysid swarm presence or absence may be inversely related to water temperatures because during warmer water temperatures, swarms were absence. This information will contribute to the understanding of the ecological interrelationships between gray whale predators and mysid prey along the central Oregon coast and lead to an informed understanding of how environmental conditions are coupled with mysid biomass and summer residency of the gray whales.

Children of the Tropics: Cetacean Community Response to an El Niño - La Niña Transition Off the Galápagos Islands

12

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It was not long ago that the tropics were considered stable, unvarying environments. However, we now know that the tropical Pacific is the epicenter of the global-scale phenomenon El Niño-Southern Oscillation (ENSO), with a typical cycle of 4-7 years. Changes associated with ENSO have profound effects on the ecosystem, resulting in reduced primary production and catastrophic mortalities in the upper trophic levels during its warm phase (El Niño), and to enhanced productivity during its cool phase (La Niña). The impacts of these changes on cetacean community structure have not been documented, however. Understanding the cetacean response to natural environmental oscillations has applications for predicting the impact of climate change on cetacean communities. Between March 1993 and March 1994 we conducted monthly visual surveys for cetaceans on the western side of the Galápagos Islands, in the eastern equatorial Pacific. During this period we observed a transition between anomalously warm El Niño conditions at the beginning of the study period to anomalously cool La Niña conditions at the end. In response, short-beaked common dolphin (*Delphinus delphis*) relative abundance gradually decreased while that of the striped dolphin (*Stenella coeruleoalba*) increased. Encounter rates of sperm whales (*Physeter macrocephalus*) and Risso's dolphins (*Grampus griseus*) also increased during the cool phase, while short-finned pilot whales (*Globicephala macrorhynchus*) followed an opposite trend. The relative abundance of two coastal species, bottlenose dolphins (*Tursiops truncatus*) and Galápagos sea lions (*Zalophus wollebaeki*) remained relatively unchanged throughout the study period, while that of the Bryde's whale (*Balaenoptera edeni*) peaked during the austral spring (September-November), apparently unrelated to the ENSO cycle (the Galápagos fur seal, *Arctocephalus galapagoensis*, had the lowest encounter rate during September-November). Our results indicate that there were local environmental effects from ENSO and that the various species showed differential responses to this transition.

13 A Characterization of the Whale Watching Industry in Dana Point, California and a Census of Marine Mammals from 5/2008 to 10/2008

Morgan Richie
Pacific Naturalists

Beginning in May, naturalists on the whale watching vessel Ocean Adventure of Dana Point, began collecting data on cetacean sightings. The whale watching fleet in Dana Point consists of three main organizations with a core fleet of 4 dedicated whale watching boats and 1 part time fishing vessel. During fishing's off-season additional boats are added to the whale watching fleet. Captains from the three organizations are in a network of communication to locate marine mammals. Occasionally, this network includes private boaters. The general range for the three boats is under ten miles from the harbor entrance, limited by time and passenger safety.

Between May 5, 2008 and September 28, 2008, the naturalists on the Ocean Adventure took data on 71 2-hour trips, or 142 hours on the water. The most frequently sighted cetaceans were Delphinus (both short and long-beaked.) Cetacean sightings also included (in order of sighting frequency): *Balaenoptera musculus*, *Grampus griseus*, *Tursiops truncatus* (mainly offshore variety), *Balaenoptera acutorostrata*, *Balaenoptera physalus*, and *Orcinus orca*. There was one anecdotal report of a small *Megaptera novaeangliae*, which is not included in this census. *Delphinus* were found in pods of 10-3000. *G. griseus* and *T. truncatus* were usually found in pods of 20-30, although at times larger pods were reported. *B. musculus* were typically seen alone or in small groups of 2-3. *B.acutorostrata* and *B. physalus* were single animals. Based on anecdotal reports of whale watching captains, frequency of near-shore sightings of *B. musculus* have greatly increased in the past 7-8 years in Dana Point. Future research may include collection of existing data from captains' log books as well as a continuation of data collection over the long term in order to identify changes in this area through time.

Understanding Navigation and Obstacle Avoidance in Gray Whales

14

Barton G. Selby

Non echo-locating whales have evolved senses to allow them to both navigate in the open ocean and avoid collisions with rocks and other ocean features. These senses must operate with cloud cover, at night, in storms and in water with very low visibility. It is most likely that they have evolved multiple senses, as hearing and vision will not function in many of the environments just described.

Understanding how near shore whales, including Gray, Right and Humpbacks sense their environment will also enable us to develop systems to prevent ship collisions, entanglements and standings.

This poster presents the hypothesis that whales have developed an ability to sense electromagnetic fields or some measure of mass, as principal or supporting senses used in conjunction with vision and hearing. The recent 'stranding' of two Humpbacks in the Sacramento River is analyzed and supports the hypothesis, as does personal experience following Gray whales in near shore migrations.

I propose a simple experiment can be done to measure this ability at numerous locations along the west coast with minimal impact to both whales and the environment.

15

The Lactation League Hypothesis: A Genetic Analysis of Sperm Whale (*Physeter macrocephalus*) Sociality in the Pacific Ocean

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Sarah S. Mesnick, NOAA Fisheries Service, Southwest Fisheries Science Center, Protected Resources Division, La Jolla CA; Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography, University of California, San Diego

There are many unknowns about how sperm whales assemble themselves. The working hypothesis is that females and their dependent offspring form "mixed groups", while the adult males seemingly act as "loners" and the sub-adult males form small "bachelor groups". The Lactation-League Hypothesis is the idea that lactation state plays a significant role in structuring groups due to the fact that a considerable amount of allonursing occurs within "mixed groups". If this is occurring between non-relatives, it is significant in that it provides no direct benefits to the care-giving individual's genetic fitness. This study analyzes patterns in sociality by examining the genetic relatedness among sperm whales opportunistically sampled during the marine mammal ecosystem research cruises in the eastern Pacific Ocean conducted by the Southwest Fisheries Science Center, NOAA Fisheries Service and during three mass strandings in Tasmania. The Tasmanian mass strandings are particularly relevant because this unusual behavior represents strong social bonds among individuals and these samples were used to compare to the samples collected from live groups at sea. Using these two sample sources, we tested whether kin-selection or lactation-state is structuring groups by comparing patterns of genetic relatedness using mitochondrial (mtDNA) and nuclear markers. MtDNA analysis showed the presence of nine different maternal lineages, which suggests that sperm whales are more genetically diverse than previously thought. Nuclear analysis afforded insight into mean relatedness values of lactating versus non-lactating females as well as average group relatedness.

Activity Budget, Diving Behavior, and Foraging Ecology of Gray Whales (*Eschrichtius robustus*) Off Coastal British Columbia

16

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Summer resident gray whales (*Eschrichtius robustus*) foraging on planktonic prey were studied in coastal bays along the north shore of Queen Charlotte Strait, British Columbia. *In situ* sampling by scuba divers described a prey community consisting of nine mysid species, dominated by *Holmesimysis sculpta*. Mysids formed spatially and temporally stable swarms, which were large and extremely dense (mean = 440,000/m3). Whales spent most of their time actively feeding or searching for prey (77%), whereas only 15% of their time was spent traveling and 8% socializing. The majority of the dives were short; the mean dive duration was 2.24 min with approximately 3 respirations per surfacing and 15 s between blows. Whales dove frequently (26.7 h-1), spending only 17% of their time at the surface with an overall blow rate of 1.14 respirations per minute. Activity states were characterized by significantly different diving and respiratory parameters; feeding whales dove more frequently, with shorter intervals between respirations, thus spending less time at the surface compared to when traveling or searching. This diving pattern differs from benthic-feeding whales and likely optimizes capture of the mobile mysid swarms in shallow waters. Although no relationship was found between whale feeding activity and the abundance of mysids, the number of whales feeding and the amount of time spent feeding were significantly greater in sites with larger mean mysid body length. Feeding was negatively related to mysid density because the densest swarms were formed of very small juveniles. Gray whales thus appear to choose patches of mysids on the basis of prey size. Swarms formed of very small individuals either may not be captured effectively by the baleen or juvenile mysids may be energetically deficient. These observations have important consequences for identifying critical feeding habitats as the gray whale population expands its range.

17 Is Whale Watching a Threat to Endangered Resident Orca Whales?

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Robert E. Otis, Professor of Psychology, Ripon College
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It is inarguable that accidents between boats and Orca whales have occurred and that some of these have proven fatal to the whales. However, does the routine practice of "whale watching" by both commercial and private boaters pose a serious threat to the continued existence of Orca whales, particularly the Southern Resident Community (SRC) located around the coast of Washington, USA and British Columbia, Canada? If the answer is "yes" it could be hypothesized that a correlation between the type and/or number of boats found in close proximity to whales and whale behavior should exist.

Surface behavior of SRC whales and the number and types of boats accompanying these whales has been recorded from 1990 to the present, in a 0.5 square mile study area on the western shore of San Juan Island, WA. After analyzing 12 years of data, no correlation could be found between number or type of boats and surface behaviors of Orca whales. The failure to reject the null hypothesis that these variables are unrelated is significant considering that the United States Secretary of Commerce's proposed recovery plan to save this endangered species specifically lists vessel effects as a "potentially high" threat to this endangered population. Our data and analysis indicate that time, effort and monetary resources would be better spent addressing any of the other potentially high threats indicated in the recovery plan, namely prey availability and contaminants.

Dolphins as "Nonhuman Persons"

18

Thomas I. White
Loyola Marymount University

The scientific evidence is now strong enough to support the claim that dolphins are, like humans, self-aware, intelligent beings with emotions, personalities and the capacity to control their actions. That is, dolphins are unquestionably a "who," not a "what." Accordingly, dolphins should be regarded as "nonhuman persons" and valued as individuals.

"Personhood" is a philosophical concept employed in order to avoid the possibility of species-bias in interspecies investigations. "Persons" are traditionally regarded as beings who: are alive and aware of their environment, have the capacity for pleasure and pain, have emotions and a sense of self, control their actions, recognize other persons and treat them appropriately, and have a variety of higher order intellectual skills (including abilities to learn, to communicate, to solve complex problems, and to engage in abstract thought).

Scientific research on dolphin cognitive abilities (John Gory, Lou Herman, Stan Kuczaj, Lori Marino, Diana Reiss) and social intelligence (Richard Connor, Denise Herzing, Ken Norris, Karen Pryor, Susan Shane, Rachel Smolker, Bernd Würsig) shows that dolphins have all of these traits.

The significance of the fact that dolphins qualify as "nonhuman persons" is that they are entitled to "moral standing" as individuals. Accordingly, from an ethical perspective, the injury, deaths and captivity of dolphins connected with fishing, entertainment, therapy, military use and even research are morally problematic.

19

A Study of the Development of Diving Abilities in Neonate Cetaceans; Is Myoglobin a Limiting Factor?

Andrew Wilson, Bonnie Rogers, Jeanette Miller, Elisa Garcialassalle
Cal State University Channel Islands

Myoglobin acts as an oxygen store within mammalian muscle cells, allowing cetaceans to tolerate extended periods of apnea. Our study focuses on neonates and aims to describe how stores of myoglobin build up as the young animals mature.

Samples have been obtained from the local marine mammal stranding network and include a fetus and two neonate odontocetes found in California, along with one mysticete calf, which stranded in Hawaii. Tissue from an adult odontocete was also analyzed for standardization and comparative purposes.

Our early results confirm, as in published data, that levels of myoglobin differ between adult and neonate cetaceans. Additionally we found that myoglobin levels were significantly lower in odontocete neonates compared to adult odontocetes, levels of myoglobin in the mysticete calf tissue were equivalent to levels in the odontocete fetus and neonate tissue lacked the stratification of myoglobin levels that was shown in adults.

If these low myoglobin levels constrain neonate diving ability this may reduce their ability to adapt to changes in prey types and prey diversity; these changes may be imminent as climate change progresses.

AUTHORS

Dan BORTOLOTTI

Just released in October, *Wild Blue* (Thomas Dunne Books) is the most comprehensive portrait of the blue whale. Equal parts history and science, it recounts the bloody decades of Antarctic whaling through interviews with the whalers themselves, then tells the fascinating story of how scientists are piecing together the mysteries of these enigmatic giants. The product of three years of research, *Wild Blue* includes an in-depth look at the California population of blues and the dedicated scientists who are studying them through photo-ID, acoustics, satellite tagging, feeding ecology and genetics. "This is quite simply one of the best books ever written on any whale: accurate, up to date and immensely readable," says Dr. Phillip Clapham.

Dan Bortolotti is a Canadian journalist and author of six previous books, including *Hope in Hell: Inside the World of Doctors Without Borders*.

www.danbortolotti.com

Tom WHITE

In his new book *In Defense of Dolphins: The New Moral Frontier* (Wiley-Blackwell), philosopher Thomas White argues that the scientific evidence is now strong enough to support the claim that dolphins are, like humans, self-aware, intelligent beings with emotions, personalities and the capacity to control their actions. Accordingly, White argues, dolphins should be regarded as "nonhuman persons" and valued as individuals. White also concludes that, from an ethical perspective, the injury, deaths and captivity of dolphins at the hands of humans are wrong. Looking at everything from the structure of the dolphin brain to the implications of the fact that humans and dolphins have dramatically different evolutionary histories, White explores the idea that, in the person of dolphins, humans have truly encountered an "alien intelligence."

Thomas I. White, Ph.D., is the Hilton Professor in Business Ethics at Loyola Marymount University in Los Angeles. The author of five books and numerous articles on a wide range of topics, Professor White is a Fellow of the Oxford Centre for Animal Ethics and the U.S. Ambassador for the United Nations' Year of the Dolphin program. He is also is a Scientific Advisor to Denise Herzing's Wild Dolphin Project.

www.indefenseofdolphins.com

ARTISTS

Rachael Andersen

Bryant Austin

Pieter Folkens

Uko Gorter

Randy Puckett

Kate Spencer

Ollie Thompson

EXHIBITOR

Whale Entanglement Team W.E.T.

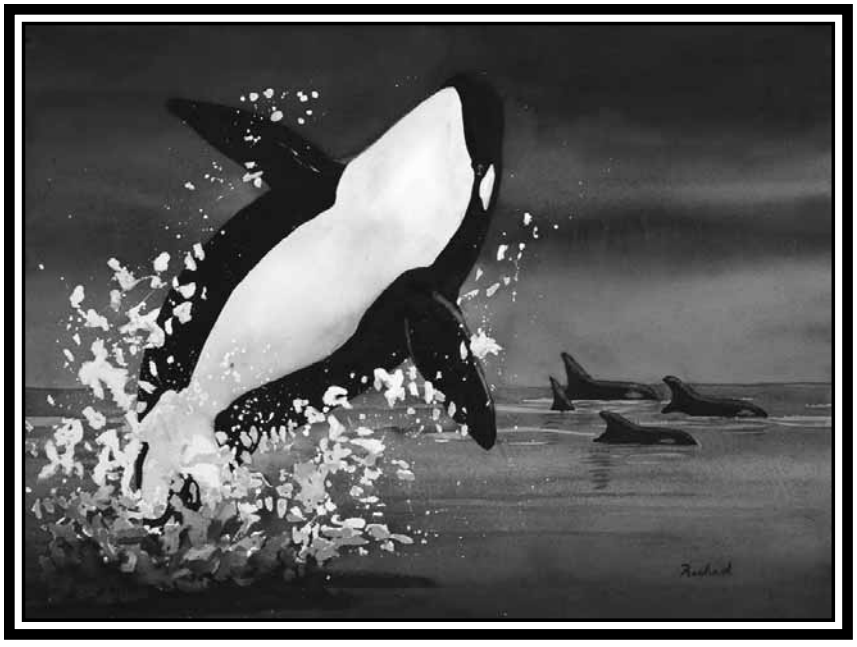
It all started about two years ago with a question. "Why doesn't California have a coordinated statewide program for disentangling whales like Hawaii?" Well, today it does. The Central and Northern California region now has a fully functional network of volunteers, NGO's and government agencies, available to assess a whale in distress and disentangle as needed. This new disentanglement network calls itself W.E.T (whale entanglement teams). Soon there will be a toll free hotline available 24/7 to report entangled whales.

Rachael ANDERSEN

Rachael Andersen, of Nature Girl Design, is a fourteen-year-old watercolor artist from Ben Lomond, California. A Monterey native, her passion is everything that lives and breathes under the ocean. At 12 years old, Rachael became a Jr. Advanced scuba diver, She was thrilled to swim alongside a school of "so-ugly-they're-cute" sunfish in Monterey. At 13 years old, Rachael got the chance of a lifetime to dive down 45' into the Indian Ocean and float in kelp alongside Leafy Sea Dragons in southern Australia.

Her most beloved whale on earth is Lolita, a captive whale in an illegal-sized tank at an aquarium in Miami, Florida. Painting Lolita "free" to be reunited with her mother and family in the Pacific Northwest is one way Rachael can get the word out about Lolita's plight. Her water-color "Freedom" is Rachael's hope that this beautiful orca will be able to live out her final years in her natural habitat. Rachael is also a volunteer for Save Our Shores in Santa Cruz and enjoys doing clean-up dives, beach clean ups and talking about ocean conservation! She enjoys sharing with students about watersheds and how to keep litter from becoming marine debris.

Rachael's watercolor, "Got Jellyfish?" was created as a teaching tool to let people know how sea turtles and other marine mammals can mistake plastic bags for jellyfish and suffocate. She wants more than anything to use her art and her life do what she can for the ocean and everything living creature that calls it "home".

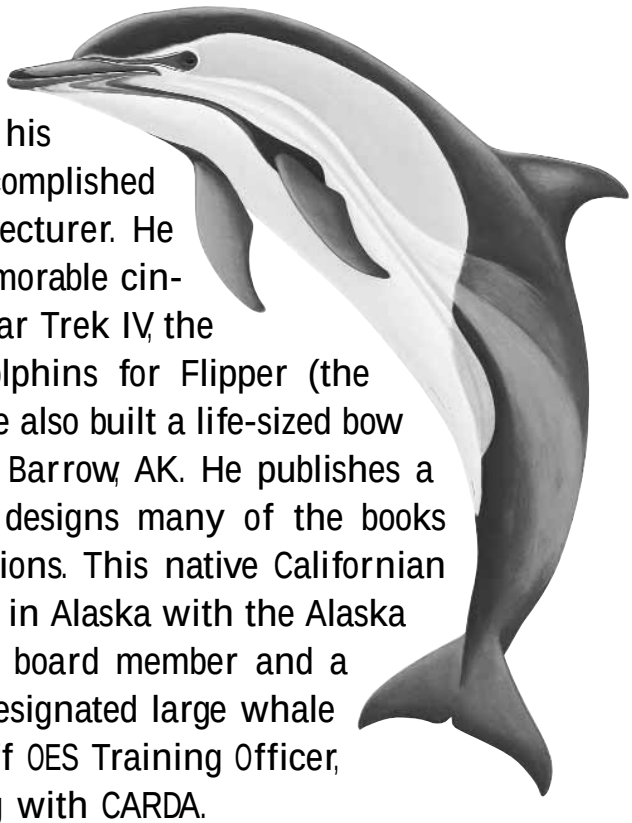


Bryant AUSTIN

Bryant is an artist working to produce life-size photographs of whales to fulfill his vision of inspiring change within countries who continue to hunt or harm these creatures. Despite the scale of his envisioned works reaching up to four meters high by thirty meters in length, it is the subtle and varied expressions in the eye of the whale and the emotions they evoke in us that he explores in-depth. He seeks out genuine connections with his subjects, where then, at a mere body's length from the whale, he begins the process of composing a series of photographs along the whale's body, ultimately to produce a full-size composite.

www.studiocosmos.com

Pieter FOLKENS



Pieter Arend Folkens is widely respected for his expertise in marine mammal external appearance and morphology. Although known best for his natural science illustrations, he is also an accomplished nature and science photographer, writer, and lecturer. He designed and sculpted the anatomy of such memorable cinematic cetaceans as the humpback whales in Star Trek IV, the killer whales in the Free Willy series, and dolphins for Flipper (the movie), White Squall, seaQuest DSV, and others. He also built a life-sized bow head whale for the Inupiat Heritage Center in Barrow, AK. He publishes a popular series of waterproof field guides and designs many of the books from major publishers that feature his illustrations. This native Californian spends his summers studying humpback whales in Alaska with the Alaska Whale Foundation, for which he is a founding board member and a licensed USCG 100T master. He is also a NMFS-designated large whale disentangler for W.E.T., the Solano County Sheriff OES Training Officer, and has a search and rescue puppy in training with CARDA.

Uko GORTER

Born in Holland, Uko Gorter ended a seventeen year career as a professional ballet dancer in 1997. Following in his father's footsteps, he then pursued his lifelong dream of becoming an illustrator. Uko enrolled in the School of Visual Concepts and the School of Realist Art in Seattle, WA. His interest in nature led him to become a natural history illustrator. Specializing in marine mammal illustration, he has traveled extensively to observe whales and dolphins in their own environment. Clients include the Seattle Aquarium, Ranger Rick magazine, National Wildlife Magazine, the International Fund of Animal Welfare, and the National Marine Life Center. He is currently president of the Puget Sound Chapter of the American Cetacean Society and a member of the Society for Marine Mammalogy. Uko designed the last three ACS conference logo's. Uko lives with his wife in Kirkland, Washington.

Uko Gorter will represent Rainforest Publications at this conference. This company publishes quality laminated field guides for a large number of areas. While it started out with just Costa Rica, it has expanded to include Baja, Mexico, Peru, California, North Pacific Coast and Hawaii, as well as behavior guides for humpback and killer whales. Rainforest Publications' field guides are comprehensive and accurate. Several of our guides include original research. If you are a naturalist, biologist, educator, student or an inquisitive tourist you'll want to own these guides. Browsing the intricacies of the natural world can be fascinating, mesmeric and outrageous good fun. Know what you're looking at.

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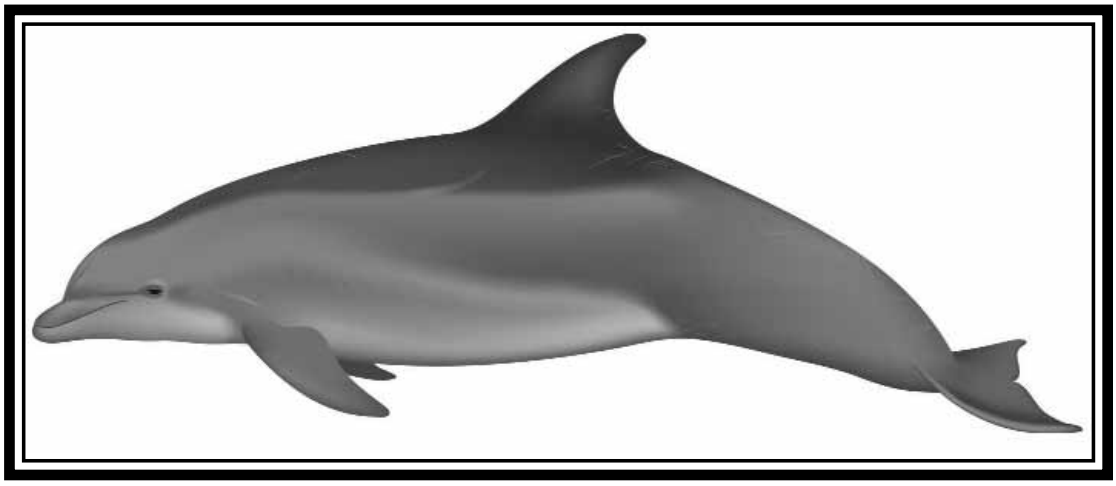


Randy PUCKETT

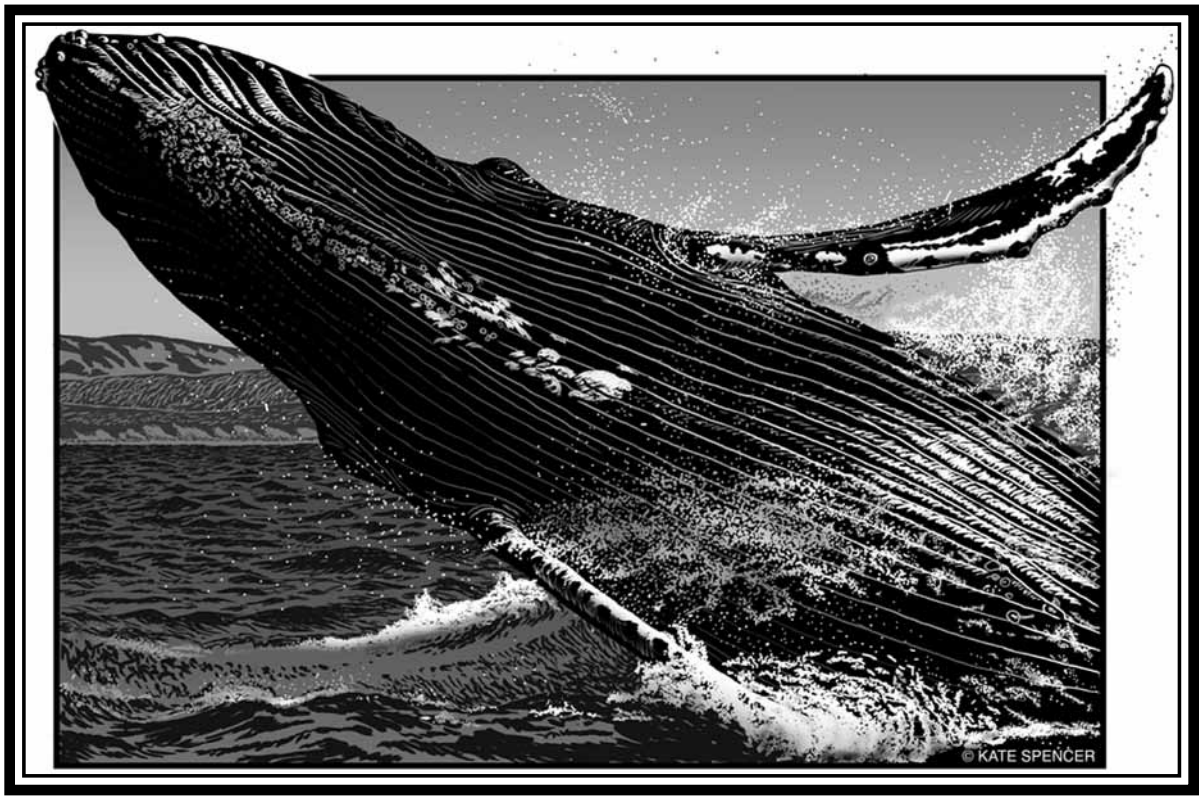
Since his childhood in Southern California, Randy Puckett has loved animals and the sea. In 1976, he carved a toy whale for his son, Justin, and his interests in sculpture and whales merged. Since then, Randy has sustained a passion for creating whales through sculpture. He eats, drinks, sleeps, and lives whales. He has found ways to be part of their world: dived with research biologists and Humpback Whales, been within 50 feet of a Blue whale, observed River Dolphins in the Orinoco and Sperm whales in the North Pacific and Sea of Cortez, Orcas off Puget Sound and Bottlenose Dolphins off Florida. If there is a chance to observe whales or dolphins, Randy finds a way, not least of which is studying the abundantly rich coastal waters off Monterey, California, where Randy makes his home. Randy collects and studies photographs, motion picture film and video tape, and current scientific literature on whales. With countless hours of personal observation, he knows whales inside and out, to include necropsies. Because of his devotion to craftsmanship and anatomical accuracy in his works, Randy may study pictures of a Beluga's blowhole, or grooves in the "armpit" of a Humpback Whale. The fun of his research is in the detail and in getting to know the scientists who discover those details.

www.randypuckett.com

Kate SPENCER

Kate Spencer moved across the continent to study and paint the wildlife of Monterey Bay. She grew up in Northern Virginia and for several years was a scientific illustrator at the Smithsonian Museum of Natural History in Washington, D.C.. Her art studio in Pacific Grove is a block from the rocky Pacific shore where sea otters, harbor seals, dolphins, and gray and humpback whales are often seen. Kate is a Research Associate with the Alaska Whale Foundation and works as a shipboard naturalist on cruises from Southeast Alaska to Cape Horn. At home she is a Marine Naturalist for Monterey Bay Whale Watch. She holds a B.A. in Biology and Studio Art from Smith College, Massachusetts and has studied at the Bermuda Biological Station for Research, the Washington Studio School, and the Corcoran School of Art. Her illustration clients include the Monterey Bay Aquarium, the Tagging of Pacific Predators (TOPP), the Nature Conservancy, Sierra Club Books, and many top scientists.

www.katespencer.com



Ollie THOMPSON

Ollie has been a painter and sculpturer since age five. He attended the Chouinard Art Institute and began painting endangered species in 1970. Ollie was recently honored to received the Golden Seal Award for his work on the documentary film California Sea Lion by RIO films

"I feel that the obligation and responsibilities of the environmental artist is to, through his work, educate and inspire ever larger numbers of people into meaningful involvement for the preservation and conservation of our endangered friends from the seas. This is a challenge I meet eagerly."

thompsonart.tripod.com

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To all our Suppliers, Volunteers, & NGO's,
who helped to make this event possible

To the support of our Monterey Chapter Board of Directors:
Jerry Loomis, David Zaches, Katy Castagna, Diane Glim, Sally Eastham, Tony Lorenz, Carol Maehr, Alan Baldridge, Gina Thomas, Barbara Oliver, Bob Mannix, Rene Rodriquez, Morgen Puckett, Randy Puckett, & Dida Kutz

Diane would also like to thank the following people for their help in making this conference come together:
Zan Diener, Susan Hustad, Jenn Corpuz and Shari Bookstaff and her students

Mark your calendars now for:
The Society of Marine Mammalogy's
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AMERICAN CETACEAN SOCIETY

California Coastal Commission's Whale Tail License Plate Grants Program

The American Cetacean Society wishes to thank Sylvie Lee and the California Coastal Commission for their support for this year's conference. This sponsorship was instrumental in bringing this conference to you and in keeping the registration fees affordable.

Funding for this conference was made possible by California drivers who purchased the Whale Tail℠ Coastal Protection License Plate. Every year, proceeds from the sales of these license plates fund a wide variety of coastal and marine education projects throughout California. In addition to funding the California Coastal Commission's Whale Tail℠ Grants Program, the license plates also support California Coastal Cleanup Day, the year-round Adopt-A-Beach program, beach access, and coastal habitat restoration.

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The American Cetacean Society would like to give our heartfelt THANKS to Tony Bernot and the Multimedia Communications Department at Kaiser Permanente for, once again, providing outstanding audio/visual equipment and services for our conference. This very generous donation has made it possible for us to have a quality media experience.

Kaiser Permanente is America's leading integrated health care organization. Founded in 1945, it is a nonprofit health plan, with headquarters in Oakland, California. Kaiser Permanente serves the health care needs of members in nine states and Washington, D.C.

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