WHALES in a SEA of TROUBLES

AMERICAN CETACEAN SOCIETY
18TH INTERNATIONAL CONFERENCE

SAN DIEGO
CALIFORNIA

NOVEMBER 4-6
2022

KONA KAI
RESORT & SPA

WHALES in a SEA of TROUBLES
AMERICAN CETACEAN SOCIETY

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IMAGE BY ALISA SCHULMAN-JANIGER

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CONFERENCE DEDICATION

IMAGE BY JAYNE VANDERHAGEN

We dedicate this 18th International Conference of the American Cetacean Society in the loving memory of Christine Fitzsimmons (1949-2021) and Isodore 'Izzy' Szczpaniak (1950-2021).

Both Christine and Izzy have served on the board of the San Francisco Chapter of the American Cetacean Society. Both have selflessly given much of their time and passion to our organization. In turn our organization has been enriched by their invaluable knowledge and boundless dedication.

ISIDORE "IZZY" SZCZEPANIAK. IMAGE COURTESY OF SIMONE SILVERSTEIN

CHRISTINE FITZSIMMONS. IMAGE BY MICHELE RAPONI

WELCOME ALL

IMAGE BY JAYNE VANDERHAGEN

IMAGE BY KELSEY STONE

UKO GORTER

It is my distinct honor and pleasure to welcome you at our 18th International Conference of the American Cetacean Society in San Diego, California.

Our last in-person conference was held in 2018. We were blissfully unaware of a looming global pandemic that would change all our lives in so many ways. Our organization too, had to adapt and meet the new challenges.

While we had to cancel and postpone our 2020 conference, we opted for a virtual conference held on January 30, 2021 (*Science of Whales, Understanding the History, Informing Conservation*). This proved to be a successful conference, in that it opened opportunities to host speakers and welcome attendees from all over the globe.

Yet, we still longed for an in-person conference where we could see each other again. So here we are, gathered in a hybrid conference, accommodating both in-person and virtual attendance.

MESSAGE FROM THE PRESIDENT

This year's conference theme is, *"Whales in a Sea of Troubles"*, borrowing from Shakespeare's Hamlet. Prince Hamlet agonizing in this famous soliloquy about his struggles of life and death. The logo-graphic was inspired by the 'Great Wave of Kanagawa', by the Japanese artist Hokusai, somewhere in the 1830s. The human finger-like the wave tips menacing towards the whale's entangled peduncle. It is a haunting visual how we humans have impacted the oceans, including whales.

Although commercial whaling inspired conservation actions dating back to the birth of our own organization in 1967, more insidious threats have emerged since then that harm cetaceans in ways we could never have imagined. Much of it caused by us.

We promise that this conference is not all gloom and doom. We will leave you inspired and hopeful for a better future of whales, dolphins, and porpoises.

We will hear from a cadre of eminent scientists and biologists discussing issues ranging from by-catch and entanglements to conservation tools to help mitigate the myriad of threats faced by cetaceans. A unique screening of the documentary film, *"The Witness is a Whale"*, highlights the illegal soviet whaling period during the post-war era. It is a cautionary tale of overexploitation, greed, and corruption. We are well advised to understand its history in order not to repeat it.

We round out our conference weekend with a panel discussion, *"Vaquita and Beyond: What we have learned to benefit other small cetaceans"*. A look at the current precarious status of the critically endangered vaquita porpoise (*Phocoena sinus*), and how we could apply the lessons learned to aid other small coastal cetaceans.

I like to take this opportunity to thank all the speakers and panelists for agreeing to take time away to share their knowledge and expertise with all of us.

We hope all of you come away inspired and with a deeper appreciation for the issues facing whales, dolphins, and porpoises worldwide, and what is being done on their behalf. Enjoy the conference!

DONORS

ACS would like to thank the many ACS members who have made an extra donation with their registration. A special mention goes out to Marsha Devot for her generous donation towards the conference. Together, these donations have been very helpful and meaningful. Thank you!

IMAGE BY ALISA SCHULMAN-JANIGER

ACKNOWLEDGEMENTS

The American Cetacean Society wishes to thank

The Bernot Family, Tony, Debby, Anthony and Jenny, for their continuous support of our past conferences, by providing excellent Audio/Visual services. Their knowledge and skills are unmatched, as is their patience working with all of us to make our conferences a success.

We want to thank the ACS San Diego Chapter and its president, Leigh Anne Gibbons, for being our gracious hosts in San Diego, California

ACS is indebted to Kelsey Stone, who has deftly managed our Social Media platforms.

CONFERENCE SCHEDULE

Friday, November 4

8am - 4pm	**WHALE WATCH** *Whale watch trip on the yacht "America"*
5:30 - 7pm	**REGISTRATION**
7pm	**WELCOME RECEPTION** *Slide show of Hawaiian whales & dolphins presented by Robin W. Baird.*

Saturday, November 5

7:30am	**REGISTRATION & BREAKFAST**
9:00am	**WELCOMING REMARKS**
	SATURDAY SESSIONS **(Point Loma II & III)**
9:30am	**Michelle Fournet** *From Devilfish to Selfie Sticks: the evolving relationship between humans and whales*
10:30am	***BREAK***
10:45am	**Thomas A. Jefferson** *How Can Something So Boring Be So Fascinating?: The History of Cetacean Taxonomy and Nomenclature*
11:45am	***LUNCH***
1:15pm	**Robin W. Baird** *The interplay between science and management of Hawaiian dolphins and whales*
2:15pm	***BREAK***
2:30pm	***Movie Screening of "The Witness is a Whale"*** *followed by a panel discussion with filmmakers* ***Cheryl*** *&* ***Nick Dean****,* *and collaborators,* ***Yulia Ivashchenko*** *&* ***Phil Clapham.***
4:00pm	**STUDENT POSTER SESSION** **(Point Loma I)**
7:00pm	**BANQUET** *John Heyning Award Presentation*

Sunday, November 6

8:00am	**REGISTRATION DESK OPEN & BREAKFAST**
8:00am	***STUDENTS & SCIENTISTS MEET AND GREET*** **(Point Loma I)**
9:00am	**OPENING REMARKS** *(awards)*
	SUNDAY SESSIONS **(Point Loma II & III)**
9:30 am	**Leigh Torres** *Why be a PCFG? A close look at life as Pacific Coast Feeding Group gray whale*
10:30am	***BREAK***
10:45am	**Brian D. Smith** *A multi-taxa approach to preventing the extinction of small cetaceans from fisheries bycath*
11:45am	***LUNCH***
1:15pm	**Jeffrey E. Moore** *An assessment framework for supporting bycatch management for marine mammals, in the USA and abroad*
2:15pm	***BREAK***
2:30pm	**VAQUITA AND BEYOND:** *What have we learned to benefit other small cetaceans?* PANEL DISCUSSION – Speakers & Panelists: **Barbara Taylor, Lorenzo Rojas-Bracho, Sarah Mesnick, Thomas Jefferson & Brian Smith.**
4:00pm	**CLOSING REMARKS**

WHALE WATCHING DETAILS

THE TRIP

On Friday, November 4, we have arranged an exciting all-day (8am–4pm) whale watch trip on the 139-foot yacht *America*. This two-masted schooner, built in 1995, is a near perfect replica of the original and famous racing yacht *America* from 1851, after which the *America's Cup* was named after. The *America*, owned and operated by Next Level Sailing, provides a unique platform from which to watch whales.

Coffee, tea, and pastries are offered in the morning, and a sandwich lunch buffet is also included. Wine, beer, and soda are available for purchase. People may bring their own water.

CHECK-IN LOCATION

Check-in starts at 7:30AM. We will start boarding after everyone arrives so that we can get down to the dock and depart by 8AM. Check-in is located at 2050 Shelter Island Drive, which is directly across the street from the Best Western Island Palms Hotel and the Blue Wave Bar & Grill. The check-in area is on a grassy park adjacent to the free parking lot. Once you are on Shelter Island Drive you will reach a roundabout intersection, turn right (southwest) and continue on Shelter Island Drive. As soon as you pass Silver Gate Yacht Club, look LEFT for a "Check-In" flag on the grass. Please park anywhere in this fabulous FREE all-day parking lot. If you are using public transportation, Lyft, or Uber, please check-in at this location as well.

7:00AM MEET IN THE KONA KAI RESORT & SPA LOBBY

7:30AM CHECK-IN AT 2050 SHELTER ISLAND DRIVE, SAN DIEGO, CA 92106

8:00AM DEPART

IMAGE PROVIDED BY NEXT LEVEL SAILING

WHALE WATCHING DETAILS CONTINUED

BOARDING

Once everyone has arrived, a crew member will escort you to the Yacht America. You will be walking on a wooden dock, so please make sure to wear comfortable shoes. Please note that stilettos will get stuck between the wooden planks.

PARKING

FREE All-Day Parking is located in the parking lots surrounding 2050 Shelter Island Drive. There is free parking on the street as well.

RESTROOMS

Restroom facilities are available on Yacht *America* during the trip. If you need to use the restroom prior to check-in, there is a public restroom facility next to the Shelter Island Boat Launch Ramp at 2210 Shelter Island Drive.

CLOTHING

We recommend bringing layers as the air is always cooler on the water and conditions can change hour to hour. You can always shed layers as necessary. We do provide blankets for guests that may become cold.

QUESTIONS?

Please feel free to reach out to us if you have any questions or special requests! We are here to assist. Feel free to call Next Level Sailing's event planner and on-site coordinator, Fathom, at (858) 922-3522. She can also be reached directly via email fathom@nextlevelsailing.com. Thanks!

IMAGE PROVIDED BY NEXT LEVEL SAILING

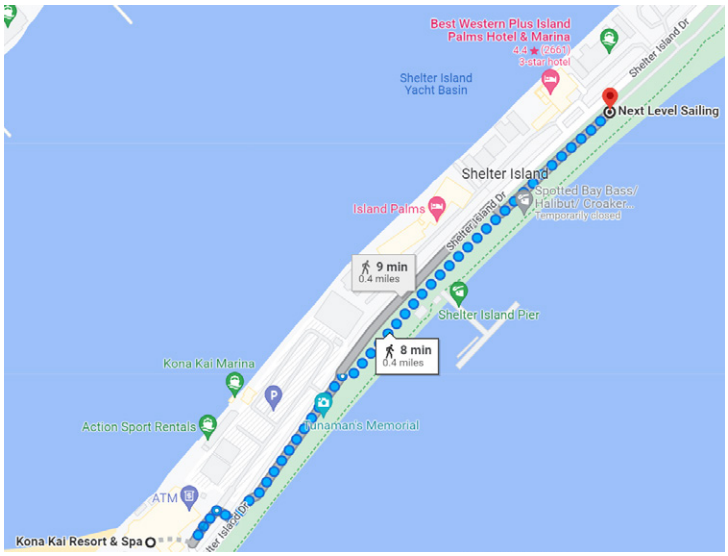

IMAGE PROVIDED BY GOOGLE MAPS

PRESENTERS & SPECIAL GUESTS

IMAGE BY ALISA SCHULMAN-JANIGER

MICHELLE FOURNET

BIO

Dr. Michelle Fournet is an acoustic ecologist who specializes in marine mammal communication and human impacts on ocean ecosystems. She is an award-winning public speaker, whose work has been featured in the *New York Times*, the *Atlantic*, *National Geographic*, and BBC. She received her MS and PhD from Oregon State University, where she investigated the acoustic ecology of humpback whales in Southeast Alaska. She spent four years as a post-doctoral researcher with Cornell University's K. Lisa Yang Center for Conservation Bioacoustics, where she revived a 30-year Arctic dataset to look at the impact of climate change on the migratory behavior of Arctic whales and pinnipeds. She is currently the director of the Sound Science Research Collective, an Alaska based conservation non-profit as well as the Associate Director for Education for the Center for Acoustics Research and Education at the University of New Hampshire.

From Devilfish to Selfie Sticks: the evolving relationship between humans and whales

Human civilization has been irrevocably shaped by cetaceans. Early peoples depended on whales as an important food source that drove human migration along the coast, while the exploitation of whales for oil jump started the industrial revolution at a global scale. In the modern era, whales and dolphins are revered as highly intelligent, gentle-giants, gracing the seas and inspiring generations. One commonality that we can identify in the human relationship to cetaceans across the ages, is that it is driven by cultural perceptions that are often if not always independent of the species' perspective or ecological reality.

THOMAS JEFFERSON

BIO

Dr. Jefferson has been studying marine mammals since 1983, when he was an undergraduate student. His main interests are the development of marine mammal identification aids, and the systematics and population ecology of the more poorly-known species of dolphins and porpoises. Essentially all of his work has been related to conservation and management of marine mammals threatened by human activities. His current primary research focuses on the conservation biology of the humpback dolphin (*Sousa spp.*) and finless porpoise (*Neophocaena spp.*) populations. In addition, he is involved in many other projects, including those on the conservation of the critically-endangered vaquita (*Phocoena sinus*). In 2015, with co-authors Marc Webber and Robert Pitman, he published a comprehensive identification guide to the marine mammals of the world (view book on Elselvier store). He has authored over 190 books and papers on marine mammals, and recently published a study revising the taxonomy of the humpback dolphins and describing a new species (*Sousa sahulensis Jefferson & Rosenbaum, 2014 - the Australian humpback dolphin*).

How Can Something So Boring Be So Fascinating?: The History of Cetacean Taxonomy and Nomenclature

Most people interested in marine mammals find cetacean taxonomy and nomenclature rather boring. However, taxonomy is arguably the most basic and important aspect of biology. Sound wildlife conservation and management are based on taxonomies that reflect evolutionary relationships and recognize (and protect) units of genetic diversity. This talk will give a quick overview of the history of cetacean taxonomy and nomenclature, and draw attention to some of the little-known, but surprisingly fascinating, personalities and controversies involved. It will also cover some of the taxonomic changes on the horizon.

VAQUITA IMAGE BY THOMAS JEFFERSON

PANELIST AND SPEAKER FOR THE VAQUITA AND BEYOND PANEL DISCUSSION

ROBIN BAIRD

The interplay between science and management of Hawaiian dolphins and whales

For Hawaiian whales and dolphins, conservation issues abound, including bycatch in fisheries, deliberate shooting, high levels of persistent organic pollutants, and harassment from swimmers and boaters. Over the last 23 years our work in Hawai'i has focused on science that can inform conservation and management. In many cases this process has worked, including the recognition of small insular populations of bottlenose dolphins, spotted dolphins, and melon-headed whales, and the listing of the main Hawaiian Islands insular population of false killer whales as endangered. But much of the science points to other management issues that need addressing, with little or no action on the part of regulators. This presentation will talk about the interplay of science and management in relation to Hawaiian whales and dolphins, highlighting both the successes and calling for action in cases where inertia or politics is interfering with solutions.

BIO

Robin Baird obtained his Ph.D. in Biology from Simon Fraser University in 1994, and was a Post-doctoral Fellow at Dalhousie University in Halifax, Canada from 1996 to 1999. For many years his research focused on marine mammals in British Columbia and Washington, and while an itinerant biologist after graduate school he participated in studies in New Zealand, Japan, Mexico, North Carolina, Nova Scotia, Iceland, and Italy. Since 1999 his primary focus has been a multi-species, multi-question study of Hawaiian odontocetes. He has authored or co-authored more than 150 peer-reviewed publications, two books (Killer Whales of the World published in 2002 and The Lives of Hawai'i's Dolphins and Whales, Natural History and Conservation, published in 2016 by the University of Hawai'i Press) and a number of book chapters. Since 2003 he has been living in Olympia, Washington, working as a Research Biologist with Cascadia Research Collective. He is also an Affiliate Faculty at the Hawai'i Institute of Marine Biology, Oregon State University, and Hawai'i Pacific University, and an Editor of Endangered Species Research.

CHERYL DEAN & NICK DEAN

CHERYL DEAN BIO

Cheryl H. Dean is an international award-winning filmmaker whose documentaries celebrate wildlife and nature. She has been filming underwater since 2010 and has advanced, nitrox scuba, and PFI free diving certifications including safety training. Cheryl has served as President of the San Diego Undersea Film Exhibition since 2015 and is a past board member of the San Diego Underwater Photographic Society. Cheryl and her husband Nick founded Spindrift Images LLC whose latest film is The Witness Is a Whale. She has been effectively communicating scientific discoveries to lay audiences at scientific research organizations throughout her career; she is also an attorney. Cheryl hopes that her storytelling and images will inspire people to protect the astounding biodiversity on our planet.

NICK DEAN BIO

Nick completed a PhD in Biochemistry in the UK and then moved to the US where he spent 25 years in a successful scientific career, publishing more than 100 research articles before beginning filmmaking. He has been filming underwater wildlife and capturing the stories of people whose lives intersect with the ocean for the past 10 years. He has Advanced/Nitrox scuba certifications, PFI free diving/apnea certification, and has spent over 1500 hours underwater. Nick is a board member of the San Diego Undersea Film Exhibition and past president for the San Diego Underwater Photographic Society

The Witness is a Whale documentary

In 2015 Nick and Cheryl founded Spindrift Images, LLC (**spindriftimages.com**), a production company focused on underwater and wildlife documentary films. Spindrift Images' most recent documentary *The Witness is a Whale* was shot over 5 years in multiple locations worldwide. The Witness is a Whale was co-produced with Terra Mater Factual Studios in Austria **(terramater.at/productions/the-witness-is-a-whale)**. The Witness is a Whale has won numerous international awards and has screened on German, Austrian, and Chinese TV with distribution worldwide anticipated in 2023.

LEIGH TORRES

BIO

Dr. Leigh Torres is a marine ecologist interested in understanding how marine megafauna, such as marine mammals and seabirds, use their environment in the context of behavior, habitat, space and time. Leigh's research explores how marine predators select and find essential habitat and prey within variable marine ecosystems, and how animal health varies under different conditions. Leigh frequently collaborates with diverse stakeholder groups to address pressing management issues that must balance protection of threatened species with economic and cultural sustainability needs. Leigh enjoys developing novel research methods to inform efforts to separate threats and marine animals in time and space.

Why be a PCFG? A close look at life as a Pacific Coast Feeding Group gray whale

The majority of gray whales in the Eastern North Pacific (ENP; ~20,000 individuals) feed in the Arctic and sub-Arctic region, yet a small subgroup known as the Pacific Coast Feeding Group (PCFG; ~230 individuals) feed primarily in coastal habitats between northern California, USA and British Columbia, Canada. Life as an ENP and PCFG gray whale appear to be quite different: ENP whales must migrate about twice as far from breeding grounds in Baja California, Mexico to reach their foraging grounds; ENP and PCFG gray whales have difference foraging strategies and target prey items; exposure to anthropogenic disturbance contrasts across these two foraging grounds; the impacts of climate change manifest in different ways and intensities across the regions. So, who are these PCFG whales and why does this subgroup exist? Is the reduced energetic cost of a shorter migration enough to explain their existence? Over the past seven years we have studied the ecology and health of PCFG gray whales foraging in the coastal waters of Oregon, USA through collaborative and multidisciplinary approaches. We monitor coastal ambient ocean noise using hydrophones, assess gray whale reproductive and stress hormone levels through fecal sample collection and analysis, use drones to document whale behavior and body condition, collect zooplankton to describe prey quality and exposure to microplastics, and deploy GoPro camera drops to describe changes in habitat and prey availability across space and time. In this talk I will discuss our results that compare the prey quality of ENP vs PCFG whales, estimate the microplastic consumption rates of PCFG whales, demonstrate increased stress levels of PCFG whales relative to vessel traffic, document the rate and consequences of entanglement and vessel strike events of PCFG whales, contrast the body condition of PCFG and ENP whales during the current gray whale Unusual Mortality Event, and document the impacts on PCFG foraging due to rapid habitat change. These findings highlight the unique life history strategy, threats, and culture of PCFG gray whales.

BRIAN SMITH

BIO

Brian D. Smith has directed the Wildlife Conservation Society's (WCS) Asian Freshwater and Coastal Cetacean Program since 2001 and led the WCS Bangladesh Program since its establishment in 2006. Brian's work in Bangladesh initially focused on providing protection for among the world's largest populations of globally threatened freshwater and coastal dolphins through robust conservation science, strong engagement with community and government partners, and the establishment of protected areas in critical habitat. Later, it expanded to also focus on sharks and rays and sustainable fisheries. In addition to his work in Bangladesh, he has demonstrated leadership through more than 20 years of experience conducting research and conservation projects in other countries including Cambodia, Fiji, India, Indonesia, Myanmar, Nepal, the Philippines, Thailand, and Vietnam. Brian currently serves as the Asia Coordinator for the IUCN Species Survival Commission (SSC) Cetacean Specialist Group. He is also a member of the Society for Marine Mammalogy Conservation Committee and World Commission on Protected Areas/International Union for Conservation of Nature (IUCN) SSC Marine Mammal Protected Area Task Force.

A multi-taxa approach to preventing the extinction of small cetaceans from fisheries bycatch

Fisheries bycatch, particularly in gillnets, is the most critical threat facing small cetaceans in freshwater and coastal environments. Of the 92 recognized cetacean species, 19 are considered threatened with extinction in the IUCN Red List with 19 subspecies or subpopulations considered Critically Endangered (CR). Bycatch in gillnets is the dominant threat in 11 of 13 CR small cetacean species or populations. These cetaceans share habitat with other megafauna, including sharks, rays, and marine turtles, that are at similar risk of extinction from bycatch. Of the more than 1,200 recognized shark species, one third are considered threatened with extinction. Three quarters of threatened sharks and rays occupy coastal habitat where they are bycaught by small-scale fishers. Six out of the seven marine turtle species are threatened with extinction with two CR. Turtle bycatch has been recorded as two orders of magnitude greater in coastal small-scale compared to industrial gillnet fisheries.

A "whack-a-mole" or single species or taxa approach to bycatch reduction is unlikely to be effective in conserving the full assemblage of marine wildlife needed for a healthy ocean and healthy people. One multi-taxa approach to reducing bycatch of marine megafauna uses predictive models of habitat suitability combined with measures of fishing intensity in a marine spatial planning decision-making framework for determining the location, size, and boundaries of fishing gear restriction zones. This approach provides government and community stakeholders with a flexible decision-making framework that can incorporate the conservation status of the marine megafauna species occurring in the fishing area, the relative importance of different fishing areas to livelihoods and food security, and potential seasonal differences in fishing intensity and habitat suitability of the different marine megafauna that occur in the area. The approach has strong relevance to global marine protection efforts as countries attempt to meet Convention on Biological Diversity Aichi Target 11 to conserve areas of particular biodiversity importance in 10% of their marine waters and consider a proposed revision of this target to achieve 30% marine protection by 2030.

VAQUITA IMAGE BY THOMAS JEFFERSON

PANELIST AND SPEAKER FOR THE VAQUITA AND BEYOND PANEL DISCUSSION

JEFFREY MOORE

BIO

Jeff Moore leads the California Current Marine Mammal Assessment Program (CMAP) at NOAA Southwest Fisheries Science Center. His primary expertise includes quantitative ecology, population dynamics and risk assessment. In his time with NOAA, he has developed and applied Bayesian and other methods for: estimating marine mammal abundance, trends and other demographic parameters; quantifying population impacts of bycatch on sea turtles and marine mammals; conducting risk assessments for protected species; and developing quantitative decision tools to for policy and management. He has also worked on international small-scale fisheries bycatch issues.

Jeff has served on advisory or research bodies such as the Ocean Modeling Forum on Marine Mammal Bycatch, IUCN Cetacean Specialist Group, the Biological Review Team for northeastern Pacific white sharks, Status Review Group for gray whales, humpback whale recovery team, and the expert statistical panel for CIRVA (International Committee for Vaquita Recovery). He regularly contributes to protected species management processes such as updating the Guidelines for Marine Mammal Stock Assessments, Take Reduction Planning, and Pacific Fishery Management Council-related activities. He has authored >50 peer-reviewed scientific journal articles since 2004 in addition to numerous NOAA agency and IWC technical reports.

An assessment framework for supporting bycatch management for marine mammals, in the USA and abroad

Abundance of humpback whales (*Megaptera novaeangliae*) wintering in Central America and southern Mexico from a one-dimensional spatial capture-recapture model Fisheries bycatch is the greatest source of human-caused mortality to marine mammals worldwide, with severe impacts on the health and viability of many populations. Recent regulations enacted in the United States under the Fish and Fish Product Import Provisions of its Marine Mammal Protection Act require nations with fisheries exporting fish and fish products to the United States to have or establish marine mammal protection standards that are comparable in effectiveness to the standards for United States commercial fisheries. The framework used in the U.S. for managing fisheries bycatch is based on comparing estimates of bycatch to biological reference points derived from estimates abundance for the affected population. However, implementing this framework is difficult, requiring expertise and resources for estimating bycatch and population size that exceed what might be available in many countries. I will describe the assessment framework used in the U.S., how it is implemented, and some of the challenges for adopting the approach internationally.

BARBARA TAYLOR

BIO

Dr. Barbara Taylor has been researching marine mammals for over 30 years. She led the marine mammal genetics group at the Southwest Fisheries Science Center in La Jolla, California for 15 years and now is a senior scientist. The group identifies units to conserve using genetic data and has promoted developing guidelines and standards to facilitate naming new taxa of cetaceans using primarily genetic data. She also specializes in estimating risk of extinction and has worked with some of the most endangered species. She chairs the Conservation Committee of the Society for Marine Mammalogy, and serves as the Listing Authority for the Cetacean Specialist Group of the International Union for the Conservation of Nature (IUCN). In 2016 she was awarded the Society for Conservation Biology's LaRoe award for her outstanding career achievements in translating conservation science into real-world conservation efforts. She was chief scientist together with Dr. Lorenzo Rojas-Bracho on all vaquita surveys. She is a member of the vaquita recovery team, the steering committee for the acoustic monitoring project, and led the search effort for the attempt to take vaquitas into captivity. She co-chaired a workshop on Ex-Situ Options for Cetacean Conservation in 2018 and chaired a 2019 workshop to develop a One Plan Approach for Yangtze finless porpoise.

PANELIST AND SPEAKER FOR THE VAQUITA AND BEYOND PANEL DISCUSSION

VAQUITA IMAGE BY THOMAS JEFFERSON

LORENZO ROJAS-BRACHO

BIO

Dr. Lorenzo Rojas-Bracho before joining Ocean Wise as Whales Director in Vancouver, Canada, was United Nations Development Program UNDP (PNUD-Sinergia) seconded to the National Commission of Natural Protected Areas in Mexico. Most of his professional work has focused on vaquita research and conservation mainly by forming working groups with researchers with different backgrounds and expertise and other stakeholders in the Upper Gulf of California. He is a member of the Convention for Migratory Species Scientific Council's Aquatic Mammals Working Group, the IUCN's Cetacean Specialist Group, The Red List Authority and the Marine Mammal Protected Areas Task Force and the Integrated Conservation Planning for Cetaceans (ICPC). He chairs the International Whaling Commission´s Conservation Committee.

PANELIST AND SPEAKER FOR THE VAQUITA AND BEYOND PANEL DISCUSSION

VAQUITA IMAGE BY THOMAS JEFFERSON

SARAH MESNICK

BIO

Dr. Mesnick's research focuses on social evolution in the ocean and on the role of social behavior in explaining patterns of species diversity. Since receiving her Ph.D. in ecology and evolutionary biology at the University of Arizona (1996) her interests have shifted from marine fishes to mammals. The main goal of her research in recent years is to provide a social framework within which to investigate stock identity, population trends, and fishery interactions in cetaceans. She uses a variety of tools (genetic, acoustic, behavioral, comparative and phylogenetic) and works in collaboration on a number of different management issues. The unifying theme of these projects is to bring a social perspective to our understanding of the dynamics of marine mammal populations to use this knowledge to manage marine mammal populations more effectively. Her research interests include social and sexual ecology, social signals, social and population structure, social bonds and social disruption, and sexual selection.

VAQUITA IMAGE BY THOMAS JEFFERSON

PANELIST AND SPEAKER FOR THE VAQUITA AND BEYOND PANEL DISCUSSION

THE WITNESS IS A WHALE

IT'S TIME FOR THEM TO TELL THEIR STORY

SCREENING
SATURDAY, NOV. 5
2:30PM

A CO-PRODUCTION BY
SPINDRIFT IMAGES, MARK FLETCHER PRODUCTIONS, AND TERRA MATER FACTUAL STUDIOS
A FILM BY CHERYL & NICK DEAN NARRATED BY SIR JONATHAN PRYCE
SPINDRIFTIMAGES.COM

THE WHALE IS A WITNESS FILMMAKERS

SPINDRIFT IMAGES BIO

Spindrift Images is a documentary film production company focused on telling compelling stories of the intersection between people and the natural world. A passion for biodiversity, conservation and wilderness preservation are underlying values that shape all of our films.

NICK DEAN BIO

Nick Dean completed a PhD in the UK and then moved to the US where he spent 25 years in a successful scientific career before beginning filmmaking. He has been filming underwater wildlife and capturing the stories of people whose lives intersect with the ocean for the last 10 years.

CHERYL DEAN BIO

Cheryl Dean has been effectively communicating scientific discoveries to lay audiences at scientific research organizations throughout her career. Cheryl has been filming underwater since 2010. Cheryl has been the president of the San Diego Undersea Film Exhibition since 2015 and is a past board member of the *San Diego Underwater Photographic Society*.

NICK AND CHERYL ARE PARTICIPATING IN THE DISCUSSION FOLLOWING THE MOVIE SCREENING OF "THE WHALE IS A WITNESS"

DR. PHIL CLAPHAM

BIO

Until his retirement in 2019, Dr. Phil Clapham directed the Cetacean Assessment and Ecology Program at the NOAA's National Marine Mammal Laboratory in Seattle, where he oversaw a staff of 27 scientists studying cetacean species ranging from harbor porpoise to blue whales. His own research interests relate to the population biology, behavioral ecology and conservation management of large whales. Phil began his career at the Center for Coastal Studies in Provincetown, Massachusetts, where he directed the long-term study of humpback whales. Prior to his Seattle position, he directed large whale research at the Northeast Fisheries Science Center in Woods Hole, Massachusetts. Phil holds a Ph.D. in zoology from the University of Aberdeen (Scotland). Over the past forty years, he has advised several governments and other bodies on whale research and conservation. He is a former member of the Board of Governors of the Society for Marine Mammalogy, a founding member of the South Pacific Whale Research Consortium, and since 1997 has been on the U.S. delegation to the International Whaling Commission's Scientific Committee. He has also served as an editor or associate editor for several scientific journals, including for the Royal Society of London. He has published more than 180 peer-reviewed papers on whales and other cetaceans, as well as five books, and one novel.

PHIL IS PARTICIPATING IN THE DISCUSSION FOLLOWING THE MOVIE SCREENING OF "THE WHALE IS A WITNESS"

DR. YULIA IVASHCHENKO

BIO

Dr. Yulia Ivashchenko directs Seastar Scientific, a consulting company based on Vashon Island, Washington. Yulia currently works on historical studies of whaling, and also uses whaling data to facilitate assessments of the status of whale populations today. She has published detailed investigations of Soviet illegal whaling, and has played a key role in correcting the Soviet whaling catch record in the North Pacific. She also exposed extensive illegal catches by Japan in the 1960's. Russian by birth, Yulia holds a Ph.D. from Southern Cross University in Australia. In addition to her historical research, she has worked on living whales in various locations including Alaska, the Caribbean, the South Pacific and the Russian Far East. She has published numerous scientific papers, and is a member of the U.S. delegation to the International Whaling Commission's Scientific Committee.

YULIA IS PARTICIPATING IN THE DISCUSSION FOLLOWING THE MOVIE SCREENING OF "THE WHALE IS A WITNESS"

THE RICHARD TERNULLO POSTER SESSION

SATURDAY, NOVEMBER 5 AT 4PM

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: TARA STEVENS

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TITLE: Application of a user-friendly risk assessment model to assess encounter rates between large whales and sea turtles and vessel traffic from offshore wind development on the Atlantic outer continental shelf

ABSTRACT: Vessel traffic poses a collision risk to marine mammals and sea turtles. Vessel strike can lead to serious injury and mortality and is a continuing challenge to the recovery of endangered species such as the North Atlantic right whale. There is an overlap between marine mammal and sea turtle distributions with offshore wind (OSW) energy development, which is accompanied by an increase in vessel activity from ports and within lease areas. Vessel traffic associated with wind energy development therefore poses a collision risk to these species. CSA together with the Bureau of Ocean Energy Management (BOEM) developed a risk assessment tool to model the potential strike risk associated with OSW vessel operations on large whale and sea turtle species on the Atlantic outer continental shelf. Vessel strike risk is dependent on species density, behavior, and morphology relative to vessel class and speed. The risk assessment tool and underlying model determines the expected number of animals at risk for encounter by whale and turtle species based on a user's input criteria, allowing scenario development and comparative testing in an easy-to-use, spatially registered framework. In this application, a series of scenarios were run to assess relative risk for a hypothetical OSW project. Results demonstrate how project design or operational considerations could be assessed to implement vessel risk reduction strategies. The model, therefore, is a powerful tool that could be used to inform important decision making at the planning, impact assessment, and operational project levels.

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: ZOE SAX

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TITLE: The future is colorful: using color extraction as a proxy for visibility and primary productivity

ABSTRACT: Pacific Coast Feeding Group (PCFG) gray whale ecology has been studied in an ongoing project in Port Orford, OR, USA since 2015. Understanding which environmental factors drive zooplankton prey availability is essential to inform gray whale conservation. Zooplankton biomass is known to be linked to productivity, but there is limited knowledge of this connection in the more heterogeneous and dynamic nearshore environment. Data, including Secchi disk depth, a measure of turbidity, has been collected in Port Orford, but understanding how turbidity relates to primary productivity in this study system is needed. Turbidity may be a proxy for primary productivity, which provides nutrients to zooplankton prey of gray whales. Insight into what Secchi disk data represents in this region may add to the understanding of whale foraging ecology and population health. Secchi disk data and GoPro video footage from the field seasons of 2019 and 2021 were analyzed alongside satellite chlorophyll-a concentrations through the use of RGB color extraction. Screenshots were taken from videos between the depths of 2 to 4 meters, and average RGB color values were calculated. Multiple linear regression analyses revealed that turbidity was the driver of red and blue color values in low productivity years, while satellite chlorophyll-a concentrations were a driver of red and blue color values in high productivity years. Additional studies should be done to understand the nuances of this form of analysis, but this study suggests that RGB color is related to visibility and primary productivity, which can be related to prey abundance.

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: THERESA-ANNE TATOM-NAECKER

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TITLE: Investigating taxa- and species-specificity in fatty acid calibration coefficients and their implications for quantitative fatty acid signature analysis (QFASA) in cetaceans

ABSTRACT: Elucidating cetacean diet is critical for evaluating vulnerability and response to anthropogenic disturbances that increasingly disrupt prey access. Quantitative fatty acid signature analysis (QFASA) provides detailed, months-long diet estimates, using the fact that predators incorporate prey FAs into their blubber with only minor structural changes accounted for by calibration coefficients (CCs). CCs also impede QFASA's broader use, however. Calculating CCs requires blubber from managed-care animals with known diets, and the limited number of such marine mammals restricts CC development. Furthermore, taxa- and species-specific differences in tissue structure, metabolism, and diet may cause CC variation, diminishing CC interchangeability. Just one set of cetacean-specific CCs exist, calculated in killer whales (KW); all other cetacean studies have applied mink-derived CCs with only partial success. Here, we present the first managed-care bottlenose dolphin (*Tursiops truncatus*) CCs and investigate CC interchangeability by comparing the dolphins' true diets to diets estimated using the dolphin (n=2), KW (n=4), and mink (n=21) CCs. Dolphin CCs yielded the most accurate diet estimates, with 1.37% and 22.3% total error for each dolphin, respectively, when applying CCs derived from the other dolphin. However, mink CCs yielded lower-error estimates (13.9% and 57.3%) than KW CCs (25.5% and 221%), supporting previous cetacean studies' partial successes using mink CCs. We suggest significant differences in dolphin and KW diet influenced the CCs and estimates, increasing total error, but further investigation is ongoing. Our findings emphasize the importance of species-specific CCs for the highest-accuracy diet estimates, and thus our dolphin CCs expand QFASA's applicability in cetaceans.

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: DANIEL GILLIES

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TITLE: Using thermal cameras and theodolites to enable nocturnal observations of foraging gray whales

ABSTRACT: Theodolites have been long demonstrated as valuable tool for performing remote, non-intrusive shore-based measurements of whale movement, however those observations have been primarily limited to daylight hours. Foraging activities of gray whales in the Pacific Coast Feeding Group (PCFG) have been monitored using these methods, however nocturnal observations remain primarily limited to telemetry tag and recorder-based measurements, which present trade-offs in temporal resolution or recording duration. Elsewhere, thermal cameras have been successfully utilized to detect nighttime whale blows at distances over 2 km, to determine presence for use in avoiding ship strikes or as a tool for counting passing whales during migration surveys. The combination of the nighttime sensitivity of thermal imaging with the measurement precision of theodolites provides an opportunity to open a window into directly observing nocturnal behaviors of near shore gray whales, using non-contact methods which do not suffer from the temporal limitations of telemetry recorders. A functional architecture for merging these technologies has been developed and prototyped, along with a proposed plan for performing field measurements of PCFG gray whales off the Oregon coast in the near future.

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: CELEST SORRENTINO

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TITLE: Growing with Distance: using deep learning to track distance between gray whale mother-calf pairs.

ABSTRACT: The use of Unmanned Aerial Systems (UAS) has moved from a state of restricted military use toward inexpensive recreational activity within one's own backyard. As modern technology has become increasingly pronounced, its presence has gained traction as an efficient tool within the scientific community. Utilizing UAS can expand the scope of many observational studies by producing mass amounts of video datasets for review and analysis. One method to optimize the daunting process of video analysis is via machine learning. SLEAP A.I, a deep-learning framework, is an exciting platform that can track multiple animals in video using pose estimation. We applied SLEAP to track gray whale mother-calf pairs as a case study to demonstrate the usability of SLEAP on footage collected in an uncontrolled environment. Furthermore, we used the SLEAP tracking data to measure the distance between the mother and calf, as a proxy of calf independence, and examine the relationship between distance and calf age and size. These results provide insight into calf development and could eventually be related to weaning timelines, ultimately informing calf survival and population dynamics.

IMAGE BY ALISA SCHULMAN-JANIGER

PRESENTER: ALLISON DAWN

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TITLE: Multi-scale environmental drivers of nearshore aggregations of zooplankton prey during peak foraging season of PCFG gray whales

ABSTRACT: Environmental factors are known to influence the abundance and distribution of marine zooplankton; however, knowledge on how oceanographic patterns impact nearshore fine-scale zooplankton aggregations is limited. The Pacific Coast Feeding Group (PCFG) of gray whales are generalist feeders but have demonstrated selection preference for zooplankton patches in nearshore reef ecosystems off the Oregon coast, consisting of mysids, amphipods, and other small crustaceans. We hypothesize that local oceanographic conditions (e.g., temperature, turbidity, primary productivity) and benthic structures (e.g., habitat type and kelp health) influence the availability of prey for gray whales, and thus impact the PCFG foraging ecology and response to environmental perturbations. To address this hypothesis, we will characterize oceanographic conditions and their relative influence on prey patch distribution and gray whale foraging patterns near Port Orford, Oregon, USA. During the same four-week summer period in seven consecutive years (2016-2022), we collected gray whale theodolite tracklines (n>250), with concurrent zooplankton assessment through GoPro drops (n>1100) and net tows (n>950) from a research kayak. Ecosystem shifts due to climate change pose an increasing threat to population health, and could impact prey distribution patterns, which should be closely monitored to provide information to improve adaptive management of the PCFG population. My research will inform management decisions concerning this small, culturally distinct sub-group by identifying environmental patterns that influence the distribution and availability of their calorically rich prey.

IMAGE BY JAYNE VANDERHAGEN

PRESENTER: FERNANDA URRUTIA OSORIO

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TITLE: Phylogenetic relationships among Eastern Pacific common dolphins (*Delphinus spp.*)

ABSTRACT: Common dolphins in the eastern Pacific are currently recognized as separate subspecies, a short-beak form (*Delphinus delphis delphis*), and a long-beak form (*D. delphis bairdii*), which are sympatric across portions of their ranges in waters off California. While the taxonomic status of these forms is still unclear, several studies have shown that they represent different evolutionary trajectories. Most of this work has been conducted on common dolphins in the eastern North Pacific. In this study, we examined the phylogenetic relationship of these two forms, in addition to long-beak common dolphins occurring off Peru in the eastern South Pacific, using complete mitochondrial genomes. We found that Peruvian long-beaks and long-beaks from California form a monophyletic clade with respect to short-beaks from California and common dolphins from Senegal and the Black Sea. This clade of eastern Pacific long-beaks was estimated to have zero connectivity with California short-beaks. Within the long-beak clade, Peruvian long-beaks were monophyletic, although California long-beaks were paraphyletic. These results are consistent with long-beak common dolphins in the eastern Pacific being a species distinct from short-beaks in the same region.

IMAGE BY JAYNE VANDERHAGEN

THANK YOU FOR ATTENDING

WINNIE THE WHALE ILLUSTRATION BY ROSE FREIDIN

The mission of the
American Cetacean Society
is to protect whales, dolphins,
porpoises, and their habitats through
public education, research grants,
and conservation actions.

AMERICAN CETACEAN SOCIETY