PLENARY SPEAKER: Thursday, 23 Feb 2017 at 9 AM

P. Dee Boersma, PhD

Dr. Boersma is the Wadsworth Endowed Chair in Conservation Science in the University of Washington's Department of Biology. Her interest is in seabirds as reflectors and indicators of environmental change. Her research started with research on Galápagos penguins and how they breeding biology was honed to the predictably unpredictable Galapagos upwelling. She worked on Fork-tailed Storm-Petrels in the Barren Islands, AK for more than a decade showing they ingested petroleum and could be used to reflected oil spills. These seabird's unusual breeding biology include an amazing tolerance to neglect. Eggs can hatch anywhere from 36 days to 72 days after they are laid and their incubation temperatures are among the lowest known for seabirds. She heads the Center for Penguins as Ocean Sentinels at the University of Washington and for 30 years has directed the Magellanic Penguin Project at Punta Tombo, Argentina, in her role as a scientific fellow for the Wildlife Conservation Society.

Dr. Boersma has served on numerous national and international leadership and advisory positions including as a Founder of the Global Penguin Society, member of the Board of Trustees of Central Michigan University, as an advisor to the United States Delegation to the United Nations World Population Conference in Romania, as a member of President Nixon's Task Force of Women's Rights and Responsibilities, and as a member of the Board of Directors of Zero Population Growth. Professor Boersma was associate director of the Institute for Environmental Studies from 1987-1993 and Acting Chair of Biology 2005-2006.

Natural History and Long-term Studies Are Fundamental to Science

P. Dee Boersma, Center for Penguins as Ocean Sentinels, University of Washington, Seattle, WA. boersma@uw.edu

Natural history is an important component of science because it helps us determine what to measure to best test our hypotheses. Whether by experimental design or long-term observation of responses of species and ecosystems, natural history is the fundamental guide to how we and other species are going to live on this planet in the future. This is increasingly important in a human dominated world. Seabirds are long-lived, have delayed maturity, small clutches, and both parents are needed to successfully raise young. Because penguins do not fly and are central place foragers, small modifications in their distribution, abundance, and reproductive success provide insights into environmental variability. The natural history of the 18 species of penguins is remarkably variable. King penguins, a sub-Antarctic species, lay one egg and it takes 18 months to successfully rear one chick. In contrast, Galapagos penguins, living on the equator, can lay 3 clutches of 2 eggs in a year and can rear two chicks in just over 3 months. These extremes in natural history, and the penguin's dependence on the environment where they breed, make them useful sentinels of environmental variability. When penguins are breeding and molting, they are relatively easy to observe. When they are at sea, new technology allows us to assess where penguins are and their environment. Penguin ecology and population dynamics are intertwined with climate variability. The distance a penguin must travel to find food is a major determinate of its reproductive success. By investigating the natural history and success of individual penguins comprising a colony, we can understand how by modifying human behavior to use the environment with more concern for wildlife (e.g., tanker lanes routes, oil discharge, and designation of marine protective area, marine zoning, and providing quality nest sites). Knowledge used well by humans and our institutions can promote the success and resilience of penguins.

PLENARY SPEAKER: Friday, 24 Feb 2017 at 8:30 AM

George Divoky, PhD

George Divoky has studied Alaskan seabirds since 1970 when, as a Research Associate for the Smithsonian Institution, he censused marine birds and mammals in the Beaufort Sea adjacent to Prudhoe Bay. In 1975, as part of an environmental studies conducted in areas being considered for oil and gas leasing, he began a study of Mandt's Black Guillemots, on Cooper Island, 35 km east of Point Barrow, Alaska. The 42 years of research on the colony's breeding biology and feeding ecology provided some of the first examples of the biological consequences of snow and sea ice reductions in the Arctic.

Divoky has also worked for federal and state agencies on a range of Alaskan seabird management and conservation issues including the Alaska Native Land Claims Settlement Act, oil and gas exploration of the outer continental shelf, oil spill damage assessment and restoration, and regional climate change. He is currently Director of Friends of Cooper Island, a Seattle-based nonprofit organization working to continue the research on Cooper Island and provide its findings to the scientific community and public.

Divoky's research on Cooper Island has been featured in the New York Times Magazine and has received national media attention as an example of Arctic climate change. He has appeared on The Late Show with David Letterman and his research and experiences on Cooper Island were featured in *Greenland,* a play about climate change staged by the Royal National Theatre in London in 2011.

Divoky received his Bachelor's and Master's degrees from Michigan State University and a doctorate from the University of Alaska Fairbanks. In the early 1970s he was one of the founders of the Pacific Seabird Group.

The Importance and Unimportance of Seabirds in the New Abnormal

G.J. Divoky, Friends of Cooper Island, Seattle, WA divoky@cooperisland.org

At a time of major concern for the natural world and its fate, we are entering a unique period where the seabird conservation and research priorities of previous decades may no longer be relevant or appropriate. As seabird populations struggle to maintain themselves in a rapidly changing ocean, they are receiving growing attention from media and conservation groups. However, it is increasingly unclear what seabird conservation and research should address as the earth's ocean paradigm shifts.

Earlier seabird conservation strategies of setting aside refuges and marine protected areas or focusing on "endangered" species appear to be less appropriate given current broad-scale and long-term threats as an increasing human population warms and acidifies the oceans, through emission of fossil fuels, and overexploits fishery resources. Similarly, seabird research that recognizes the importance and magnitude of ongoing climatic modifications are increasingly hard to identify. Recent advances in technology provide heretofore unthinkable detail of the lives of seabirds, but the importance of life history and physiological minutiae during the Sixth Great Extinction is not clear. Seabird researchers seeking a government career, or conducting research with government funds, face the additional problem of working with or relying on agencies that have among their major tasks the facilitation of the fossil fuel extraction and seafood exploitation that are primary causes of the ocean's decline.

Seabird conservationists and researchers cannot reverse the global processes that will be affecting seabirds in coming decades. But, identifying and implementing meaningful conservation efforts and appropriate research is now more important than ever.