



### SESSION #3B

## The Intercultural Center for the Study of Deserts and Oceans (CEDO) 40 years of diplomacy: science, education, fisheries, and community development in the Gulf of California

Thursday, Oct. 24, 2019

4:00 – 5:00 pm

#### CHAIRS:

**Dr. Robert G. Varady**, *CEDO Inc. Board Member & Immediate Past Director of UA's Udall Center for Studies in Public Policy*

**Bio:** Bob Varady's work has addressed environmental and water-management governance and policy in arid regions, with an emphasis on transboundary issues, especially along the U.S.-Mexico border and throughout the Americas. He has been a consultant to UNESCO, FAO, and GEF on a number of water-related efforts, and recently led an evaluation of UNESCO's World Water Assessment Program. He also has directed environmental and agricultural projects in West Africa, the Middle East, and South Asia, is past president of the International Water History Association (IWHA) and was recognized by the University of Arizona's 2012 Award for Excellence in Global Service.

**Dr. Christine Flanagan**, *CEDO Inc. Board President*

**Bio:** Christine A. Flanagan is an educator and plant enthusiast from Tucson, Arizona. After earning her Ph.D. studying marine reef fish communities in the central Gulf of California, she was turned to the "green side" by her love of plants and the desert. She retired to Tucson from the U.S. Botanic Garden where she directed public programs from 1996 through 2011 and was a recognized leader in the development of innovative plant education, exhibits and conservation programs. She has been on the CEDO, Inc. Board since 2015 and currently serves as Board President.

**Dr. Nélide Barajas Acosta**, *CEDO's Executive Director*

**Bio:** Before taking the reins of CEDO on July 1st, 2019, Nélide was already an accomplished ecosystem and wildlife manager, with emphases in water-use, river basins, ecosystem services, environmental education, protected areas, smart infrastructure, sustainable hydropower, financial mechanisms for conservation, and international environmental affairs, and led programs for organizations like World Wildlife Fund, The Nature Conservancy, Mexico's National Electricity Commission, CONABIO, the IUCN, the MX National Academy of Environmental Education, and the Climate Change Council in San Luis Potosí, Mexico.

#### PRESENTERS:

# Citizen Science to Governance: Building a Sustainable Future for Northern Gulf of California Communities

**M.Sc. Peggy Turk-Boyer**, *CEDO Founder & Director Emeritus*

**Bio:** In 1980 Peggy Turk Boyer sealed her destiny when she moved from Tucson, Arizona to Puerto Peñasco, Sonora, to conduct field work in intertidal ecology as part of her master of science degree at UA under Dr. Donald A. Thomson. She became the first resident biologist of a new facility named after Agustin Cortés, a local pioneer who promoted international science collaboration. She invited classes and researchers from throughout the US and Mexico, founding CEDO, the Intercultural Center for the Study of Deserts and Oceans, and initiating a new era of field-based research, education and community outreach in and around the Sea of Cortez and Sonoran Desert. Through CEDO's programs over the past 40 years, hundreds of thousands of people have participated in environmental programs reaching the highest levels of government. Peggy was nominated for the Pew Fellows Program in Conservation and the Environment, and in 1996 was recipient of the Margarita Mirandas de Mascareñas Foundation's International Award for Excellence in the Border Region. Recently, her international work for marine conservation was commended in a letter entered into the US congressional record by AZ Congresswoman, Anne Kirkpatrick.

**Abstract:** Capturing lessons from 40 years of CEDO's experience in the Upper Gulf of California, and in response to fishers' interest in establishing order for their fisheries system in Sonora, we focused on creating a strong multi-tiered governance system that brought together 2,000 fishermen from six communities with authorities and scientists to design an integrated plan for spatial use of the Puerto Peñasco to Puerto Lobos ecosystem. In a bottom-up process, fishers participated alongside scientists and authorities to analyze data and propose spatially explicit tools for fisheries and ecosystem management using the framework of coastal marine spatial planning. With over 200,000 geospatial data points, an intensive capacity building program, and over 95 workshops involving the different stakeholder groups, consensus was reached for an integrated management proposal, submitted to the government in summer 2018. The proposal includes fisheries refuges, quota, locally managed marine areas and regularization of permits, which together would help give order to this fishery system. The process is already fostering stewardship, while new fisheries authorities decide on how to implement this comprehensive system, not only in the Peñasco-Lobos Corridor, but also replicating it for ordering fisheries systems throughout Mexico. Backed by strong scientific data and a transparent and inclusive governance structure, CEDO is building capacity at all levels to build a sustainable future, where communities are empowered to be stewards of their ecosystems.

## **Saving vaquita: CEDO science, sustainable fisheries and smart seafood choices**

**Dr. Sarah Mesnick**, *CEDO Associate Board Member & Researcher at Scripps & NOAA Southwest Fisheries Science Center*

**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 UA in 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.

**Abstract:** Nearing extinction, the world's smallest porpoise numbers less than 22 individuals. Mexico's vaquita (*Phocoena sinus*) faces one primary threat – entanglement in gillnets. Although gillnet fisheries are currently banned by the Mexican government in the range of the vaquita, illegal fishing with gillnets threatens the survival of the species. Illegal fishing is motivated by high prices paid in China for the swim bladders of the endangered fish, totoaba (*Totoaba macdonaldi*), by a lack of legal permits for alternative gear for other fisheries, and sufficiently profitable economic alternatives for both the fishers and their communities to fishing in the vaquita's range. We describe efforts by CEDO and partners at NOAA Fisheries to engage stakeholders to save the species. The multi-dimensional approach merges people and disciplines, including science, education, communication, fisheries management, and a novel culinary approach, which connects fishers interested in using vaquita-friendly fishing practices with buyers and chefs and their customers on both sides of the Mexico/US border interested in seafood choices which protect vaquita and support fishers using alternative fishing methods. Our approach illustrates the number of ways that CEDO leverages cross-border relationships to promote conservation and sustainable livelihoods through science and culinary diplomacy.

## Marine Biology in the Desert

**Dr. Katrina Mangin**, *UA Director of Science Education & Outreach at the Department of Ecology and Evolutionary Biology*

**Bio:** Katrina received her PhD in Ecology and Evolutionary Biology at the UA in 1991. Katrina Mangin has been an instructor in the Department of Ecology and Evolutionary Biology at the University of Arizona since 1995. She teaches Marine Ecology and Conservation, Marine Discovery, Marine Biology, Introduction to Ecology and Evolution, and Galapagos Marine Ecology, a summer Study Abroad program offered through the UA. She also directs the Marine Discovery Outreach Program where undergraduates teach local middle school students at the Flandrau Science Center, and takes undergraduate students to CEDO at least once yearly to study field ecology across cultures and nations.

**Abstract:** The Center for the Study of Deserts and Oceans (CEDO) is an ideal setting for a field trip for undergraduate students at the University of Arizona studying marine biology and conservation. Within a short walk or drive from CEDO can be found an unusually high diversity of marine habitats including a negative estuary (estero), rocky reefs made of coquina, basalt and granite, sandy shores, and sandy bays. All major phyla of marine animals are readily found in the extensive intertidal zone, including many endemic species. These characteristics combined with the fisheries conservation work being conducted at CEDO make CEDO an invaluable resource for education. Students from the Marine Discovery Outreach Program and course (ECOL 450) at the University of Arizona (UA) visit CEDO each fall for a weekend field trip. The goals of the trip are to introduce undergraduate students to the diversity and ecology of the marine intertidal zone and to provide them an experience doing a mini-investigation on a topic of their own choosing in marine ecology. For example, they might measure physical factors such as temperature and pH in tide pools over the course of a day, or document the diversity of snail shells occupied by hermit crabs. Students return to Tucson able to share their newfound knowledge of marine life with elementary school children on a class field trip to the UA Flandrau Science Center.

Afterward we will share the vision for the international cooperation towards sustainability of the Upper Gulf of California from the Mexican governmental perspective.

After the presentations the panelist will open the dialogue with attendees.

The session will be co-chaired by the three conveners, who will also serve as discussants.