

Thriving coastal communities, sustainable  
livelihoods, and healthy ecosystems!







CEDO fosters vibrant communities and resilient ecosystems in the northern Gulf of California and other ecoregions by bringing together people, knowledge and solutions.

# MISSION



In 1980 when the doors of the Intercultural Center for the Study of Deserts and Ocean (CEDO) first opened in Puerto Peñasco, Sonora, an environmental vision emerged for the Northern Gulf of California: we saw a future where coastal communities would participate actively in creating vibrant and sustainable livelihoods that are in balance with healthy and resilient ecosystems.

Field research was among the first activities of this young institution. Through partnerships with visiting researchers from across the U.S. and Mexico, community monitoring projects, and its own studies, CEDO built a research program that advanced understanding of biophysical, ecological and socio-economic processes, making the Northern Gulf one of the best understood ecosystems in all of Mexico.

From the beginning, CEDO committed to sharing this knowledge with the community of Puerto Peñasco, and later with eight other coastal communities, fostering an environmental culture among residents and visitors, and impacting hundreds of thousands of lives throughout southwestern U.S. and northwestern Mexico. But with population growth, the influx of tourism, and increasing pressure on marine and coastal resources, the resulting impacts to species, habitats and processes grew to unsustainable levels. CEDO has responded with strategic conservation and management initiatives that bring together people, knowledge and solutions.

Thirty-five years later, CEDO has gleaned the local solutions and ideas offered during hundreds of initiatives as diverse as kids participating in environmental contests, commercial divers establishing a voluntary marine reserve, women making jewelry and handcrafts from recycled materials, and fishermen sharing thousands of hours of conversation and on-board observation to form the building blocks of CEDO's integrated approach. Tried and proven technical solutions in an array of disciplines (education & training, research & monitoring, climate change assessment & adaptation, and economic initiatives) are today being scaled to address the socio-economic needs of nine communities that depend critically on the sustainable management of two interdependent ecological systems across the Northern Gulf of California. CEDO has grown from a staff of two to 26 with annual budget of almost \$2 million and is now an international leader in ecosystem-based management. We believe that successful holistic solutions for complex systems can only spring from a core of community engagement and development. We invite you to join us as we continue to strengthen and challenge coastal communities to become stewards of their future and our oceans.



CEDO Intercultural is a unique collaboration between Mexican and U.S. not-for-profit organizations. Board members are drawn from five cities across the U.S. and Mexico. Operating through a United Executive Committee and inspired by a shared vision, mission and program strategies, CEDO pools its resources and experiences to offer realistic environmental and community-based solutions that recognize, respect, and leverage the cultural, socio-economic and biological interconnections between the U.S. and Mexico.



**LORENZO CUADRAS ROJO**  
President, Board of Directors  
CEDO, A.C. (México)



**PEGGY TURK BOYER**  
Executive Director  
CEDO Intercultural



**CHRISTINE FLANAGAN**  
President,  
Board of Directors CEDO, Inc. (US)



## ABOUT CEDO

CEDO owns and operates an environmental resource center at Puerto Peñasco, Sonora, on the shore of the Sea of Cortez. The CEDO campus houses administrative and program offices, a laboratory, library, dorm rooms, conference rooms, and an earthship visitor center, with exhibits and a gift shop. Tens of thousands of people visit the center yearly including local and U.S. school kids, fishermen, university faculty and students, and tourists. CEDO also has offices in Tucson, Arizona, and La Paz, Baja California Sur.



# CEDO'S BUILDING BLOCKS

## THE TECHNICAL SOLUTIONS

For 35 years CEDO has tested and developed six essential building blocks focused on strengthening communities to participate in the design and realization of sustainable livelihoods to ensure their future and the health of the ecosystems on which they depend. The blocks are integrated to achieve ecosystem conservation and fisheries co-management in two eco-regions of the Northern Gulf of California: The Upper Gulf of California/ Colorado River Delta Biosphere Reserve and the Puerto Peñasco- Puerto Lobos Biological Corridor.





# ENVIRONMENTAL EDUCATION

*Building Community Capacity*

## COMMUNITY ENVIRONMENTAL CULTURE

Field-based environmental education programs, workshops and curriculum built for youth, teachers, fishermen, coastal landowners and community leaders give local stakeholders a deep appreciation and understanding of the ecosystems on which they depend and the regulations that govern them. Empowered by knowledge and an atmosphere of respect, CEDO staff and community members build an ecologically literate public and work together to train future generations.

### YOUTH ENVIRONMENTAL CONTESTS

For 20 years CEDO has involved thousands of youth in Northern Gulf communities to understand and help solve environmental problems through an environmental contest. Themes have addressed urban issues such as trash management, recycling, and water conservation and natural resource problems such as fisheries and ecosystem management, climate change, and wetland conservation. Student work has caught the attention of officials and resulted in meaningful changes at the local level. CEDO's 2017 contest theme will be "From Ocean to Table". Students will explore and raise awareness in their communities about the inter-connections between sustainable fisheries, sustainable livelihoods and the production of food for their tables and for markets.

### PUBLICATIONS AND OUTREACH

CEDO has filled a void by publishing bilingual information about the Northern Gulf of California that is accessible to tourists, fishermen, teachers, students, and local residents and businessmen. Our Tide Calendar is the regional standard. Our guides to the biota have served to increase knowledge and encourage conservation.

CEDO hosts students and researchers from all over the world at its field station and offers inspiring field-based programs. Tourists also participate, visiting the many habitats in the region.







# PARTICIPATION & TRAINING

*Promoting Collective Action*

## MANAGEMENT GROUPS

CEDO participates in and facilitates the creation of groups and management councils for collective action. By offering leadership training, strengthening communication and negotiation skills, and by connecting groups with networks, authorities and other resources, we help local communities and government build the social structure needed for success.

## FISHER EDUCATION & TRAINING

From 2010 to 2014 CEDO offered workshops for 2000 small-scale fishermen participating in the Upper Gulf of California Environmental Impact Assessment Program to raise awareness about the benefits of different management instruments and the regulations that fishers must comply with. The program trained fishermen to maintain logbooks of their daily fishing activities and to identify and document bycatch. This was the most comprehensive education program ever conducted for fishermen of the Reserve. Fisher education has continued in 2015-16 to reach the 1400 fishermen in the Puerto Peñasco-Puerto Lobos Biological Corridor.

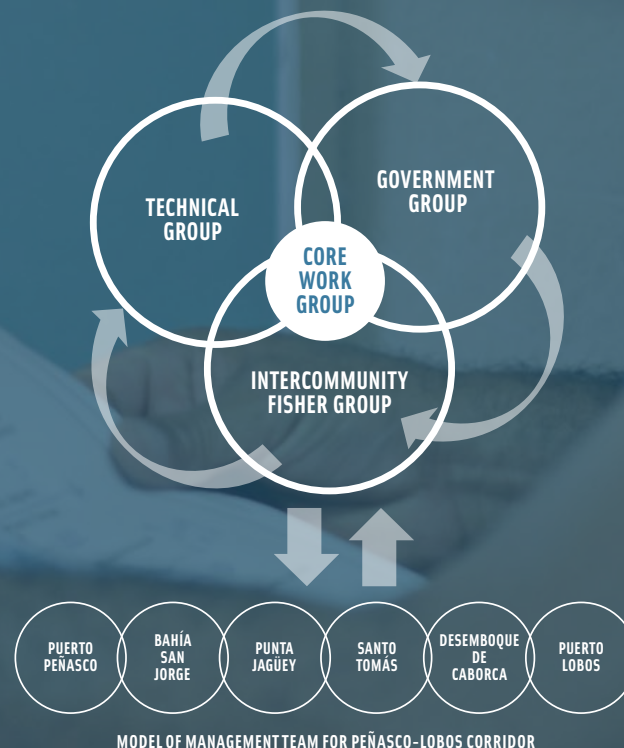
### UPPER GULF RESERVE, 2010 - 2014

90 workshops, 791/906 boats participating

### PEÑASCO-LOBOS CORRIDOR, 2015 - 2016

33 education trainings, 400 participants

51 community workshops, 970 participants





# RESEARCH & MONITORING

*Generating and Integrating Science Into Decision-Making*

## DEFINING INDICATORS WITH STAKEHOLDERS

Working with management groups to define goals and biophysical, socio-economic and governance indicators, we create a language for adaptive management that is strengthened with participatory monitoring.

## MONITORING CHANGE

### BIODIVERSITY

CEDO has generated baseline data to characterize the region's diverse habitats: estuaries, offshore sandy-muddy bottoms, intertidal and subtidal reefs. Local communities and visiting students help monitor individual species: sea lions, the least tern, migratory birds and rocky intertidal organisms.

### FISHERIES

CEDO has developed protocols and manuals for monitoring fisheries, and implements them with local communities to improve management.

- *In situ* monitoring of benthic invertebrates
- Community fisheries catch monitoring (6 communities, 2010 to date)
- Fishing logbooks (3 Upper Gulf communities, 25,000 days registered, 2013-14)
- Bycatch monitoring (commercial & endangered species: vaquita, totoaba, sea turtles)
  - Onboard observations (Upper Gulf, 996 observations, 9 fisheries 2013-14)
  - Video-camera technology (Gulf of Ulloa, 200 boats, 2016-17)





# CLIMATE CHANGE

*Assessment & Adaptation*

## **CEDO USES MODELING TO ASSESS:**

- Effects of increased ocean temperature and acidification on ecosystem processes and function
- Effectiveness of current marine reserves under future climate change
- Effectiveness of different fisheries management instruments under future climate change impacts
- Vulnerability of coastal fishing communities to climate change impacts

## **RESULTS ARE USED TO:**

- Guide establishment of appropriate management tools to mitigate climate change impacts
- Incorporate climate change adaptation actions into formal management instruments
- Work with communities to understand climate change impacts and implement management tools

## **DATA INTEGRATION & MODELING**

CEDO houses its data in a comprehensive Northern Gulf geo-referenced database with 160,683 biodiversity records, existing legal zones, fishing intensity from 3 data sources, conflict zones and more. Using various modeling programs (Atlantis, Zonation, and Invest) CEDO creates decision support tools by generating management scenarios for spatial planning for fisheries refuges, local management areas, climate change, and cost-benefit analysis.

Research results are published in peer reviewed journals and in CEDO publications directed towards stakeholders and managers. For a complete listing, visit [www.cedointercultural.org](http://www.cedointercultural.org)

## Two Regional Programs

# UPPER GULF OF CALIFORNIA BIOSPHERE RESERVE / VAQUITA REFUGE

**MIA**  
**MANIFESTACIÓN**  
**DE IMPACTO**  
**AMBIENTAL**  
para la pesca ribereña  
responsable en la Reserva de la  
Biosfera Alto Golfo de California  
y Delta del Río Colorado





# CEDO'S ECOSYSTEM APPROACH



## PEÑASCO-LOBOS BIOLOGICAL FISHERIES CORRIDOR



Six fishing communities in Northern Sonora share the use of this rich ecosystem, abundant with benthic and demersal fisheries, rocky, sandy and muddy-bottom habitats and wetlands. Open access to fisheries and lack of management

cause conflict and over fishing, which threatens the primary economic activity and destabilizes small communities.

*Coastal-Marine Spatial Planning* offers an ecosystem level solution. CEDO facilitates a process which brings together six fishing communities, regional and national authorities, and experts, to define and formalize management instruments for the use of this space. This management team is informed by a comprehensive spatially explicit data base generated with community monitoring and other research. This science and community-driven decision-making process is working to establish: 1) local management areas; 2) fisheries refuges; 3) quotas, and 4) other ways to reduce fishing effort and conflict.







# ECONOMIC SOLUTIONS

The coastal communities of the Northern Gulf of California have few economic opportunities. Fishing is the mainstay of the economy, with tourism an alternative in some communities. CEDO works with communities to diversify their opportunities, increase value of existing activities and, assure that their economies are environmentally sustainable for the future.

## **NATURARTE ECOTOURISM CORRIDOR**

Promotes development of local ecotourism businesses, with training and marketing support.



**NaturArte**  
ecotourism corridor

## **SUSTAINABLE FISHERIES & SEAFOOD**

This initiative seeks to promote sustainable fisheries by connecting responsible fishers to interested markets. CEDO can assist by laying the groundwork to close the information and economic loop between producers from the Northern Gulf and environmentally conscious consumers in Southwestern US. and Northwestern Mexico.

## **COMMUNITY ECONOMIC ASSESSMENT**

CEDO works with local communities to identify viable alternative livelihoods, assess capacity and find resources to incubate businesses.





# INVESTMENT OPPORTUNITIES

**CEDO is looking for institutional investors, please consider us if you believe...**

...community empowerment can fuel the future of conservation.

...that building on 35 years of proven experience makes sense.

...conservation moves forward fastest when motivated, creative people come together.

...conservation and a healthy economy can coexist.

...complex systems need integrated solutions.

...that recognizing, respecting and leveraging the socio-economic and biological interconnections between the U.S. and Mexico is mutually beneficial.





# INSTITUTIONAL SUPPORTERS

Alianza Carlos Slim Foundation-World Wildlife Fund

American Cetacean Society – Monterey Bay Chapter

Blue Solutions

Comisión de Ecología y Desarrollo Sustentable del Estado de Sonora

Comisión Nacional de Acuacultura y Pesca

Consejo Nacional de Ciencia y Tecnología (CONACYT)

David and Lucile Packard Foundation

Disney Conservation Fund

Environmental Defense Fund

Fondo de Acción Solidaria, A.C.

Federación de Sociedades Cooperativas de Producción Pesquera  
Ribereña del Puerto de San Felipe, S de. R. L. de C.V.

Federación de Cooperativas Ribereñas Andrés Rubio Castro, S. P. R. de R.L.

Agrupación de Cooperativas de Pescadores Ribereños de  
Puerto Peñasco y Golfo de Santa Clara, Sonora

Fondo Mexicano para la Conservación de la Naturaleza

Fondo para la Conservación del Golfo de California

Fondo Noroeste, A.C.

George A. Binney Conservation Foundation

German Corporation for International Cooperation (GIZ)

Instituto de Acuacultura del Estado de Sonora





Lawrence and Jaqueline Stern Foundation

Maricopa Audubon Society

Marisla Foundation

National Oceanic and Atmospheric Administration, National Marine  
Fisheries Service (Northwest Fisheries Science Center)

Pronatura A.C.

RARE

San Diego Zoo Global

Save the Whales

Secretaría del Medio Ambiente y Recursos Naturales (Comisión Nacional  
de Áreas Naturales Protegidas; Dirección General de Vida Silvestre)

Secretaría de Pesca y Acuicultura del Gobierno de Baja California

Steven C. Leuthold Family Foundation

Voces por la Naturaleza, A.C.

The Living Desert

The Nature Conservancy

United Nations Development Program

University of Arizona

Universidad de Baja California Sur

University of South Florida

U.S. Fish and Wildlife Service, Southwest Division

Vecinos de Las Conchas Homeowners Association

Walton Family Foundation







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