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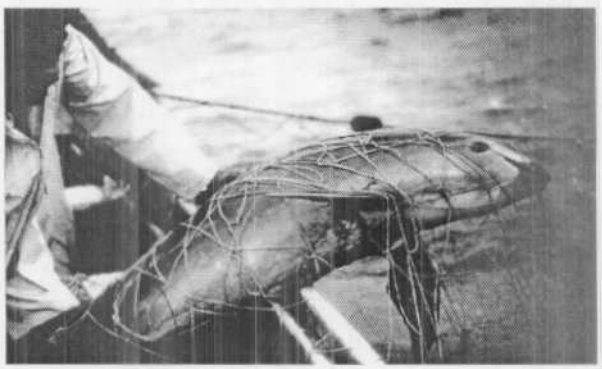
Science and Policy in the 'Hollow of God's Hand'

by Kathryn Vincent

UC MEXUS began nearly five years ago to draw the plans for a project that would bring the work of UC researchers and their Mexican collaborators to bear on a host of critical issues related to water in the U.S.-Mexico border region, particularly in the Colorado River watershed. The area of focus defined by the UC MEXUS Border Water Project coincides with the upper half of the basin-like Colorado Desert, earlier named in Spanish La Palma de la Mano de Dios (the palm of God's hand). The Colorado Desert spans the Californias, connected north to south from Needles to the River's mouth at the upper Gulf of California, and along the Gulf's west bank to a point south of the Bahía de Los Angeles, just above the line that divides the Mexican states of Baja California and Baja California Sur.

The upper Gulf of California or, as it is also called, the Sea of Cortez, has been a place of special interest to UC MEXUS. Since the creation of UC MEXUS in the early 1980s, the Institute has been sponsoring the research of UC marine scientists, ecologists, earth scientists and wildlife biologists working in the Gulf. But the University's involvement long precedes UC MEXUS grants. The Gulf once was a place of spectacular biological richness, physical intrigue, and scientific fecundity and a seemingly limitless source of fish for food, for commerce, and for sport. It is home and nursery to an enormous diversity of life, including endemic and endangered species. And it is seriously threatened today: its stocks in severe decline, its estuaries denuded by years of uncertain water flows from the Colorado, its small fishing communities nearly starved out of business.

The upper Gulf of California is the only place known to harbor the most endangered marine mammal on earth, a small porpoise called the *vaquita*, or little cow, officially identified and named less than fifty years ago by a UC scientist, **Kenneth Norris** and his colleague **William McFarland**. Indeed, the first one they saw was dead—Norris came across its skull on a San Felipe beach. In the mid-sixties evidence emerged that associated the vaquita's scarcity with the proliferation of fishing nets in the gulf. It was not until 1985 that scientists were able to examine intact, fresh specimens—seven animals that had drowned in the nets! By 1992, the fate of the mysterious, severely



endangered vaquita hit the UC MEXUS agenda together with that of the ubiquitous dolphins of the Eastern Tropical Pacific. The deaths of both officially were considered to be "incidental" to the economic demands of fishing for food and for sport.

A binational conference called "Current Crises in Marine Mammal Management," was convened in 1992 to consider the tuna-dolphin and vaquita issues. **Arturo Gómez-Pompa**, then UC MEXUS director, observed in his opening statement that "the protection of marine mammals is part of an ongoing debate of great significance to all humanity: the conservation of nature versus economic development." The conference was part of the Critical Issues in U.S.-Mexican Relations series organized by UC MEXUS with the sponsorship of the John D. and Catherine T. MacArthur Foundation. The result of that particular meeting had little influence on the tuna-dolphin issue other than to air it in an exciting and eloquent binational scientific forum. The loss of marine mammals in the harvesting of tuna is a huge global dilemma that seems to be far more dependent upon diplomacy and international economic power than on science for its resolution.

For the Upper Gulf, however, a bit of magic happened at the meeting, and one might think the *duendes* (elves)—another local nickname for the elusive vaquita—were at work. The Mexican Secretary of Fisheries, **Guillermo Jiménez Morales**, arrived at the meeting to give the keynote address and heard the evidence—provided by U.S. and Mexican scientists, environmental groups, and local fishermen—that over-fishing was emptying the Gulf waters of life. Still, the idea persisted that polluted and insufficient water entering the Gulf from the Colorado River was really to blame for the crisis. At the dinner table, an ebullient Mexican marine ecologist named **Saúl Alvarez-Borrego** persuaded the Mexican minister that the Gulf waters remained rich and clean and well able to support abundant life, and that the Colorado River Delta was the key to environmental health in the entire transnational region. It was a turning point. The following year, the Mexican government and the United Nations established a U.N. Man and the Biosphere Programme (MAB) reserve in the Upper Gulf, with the Delta of the Colorado at its core.

A transnational regional view of the U.S.-Mexico borderlands became the essential geographic framework for the UC MEXUS border environment program. In May 1996, at the invitation of California Congressmen **George E. Brown, Jr.** and **Ken Calvert**, UCR Chancellor **Raymond Orbach** led a team of UC MEXUS researchers in a "border briefing" held in the packed House Science Briefing Room (see box on opposite page). The fast-paced presentations emphasized the inter-relationships of resources, people, and wildlife in the border zone, drawing a line that firmly connected the seas of the Colorado Desert. The Sea of Cortez and the Salton Sea became inextricably linked in the UC MEXUS border water agenda.

The challenges facing the Salton Sea in many ways recall those of the Gulf, but they are uglier and harder to solve. The Salton Sea was created in 1905 by an accidental diversion of the Colorado River into the Salton Sink. By the time the River was contained, a 35-mile-long sea was formed. The expansion of irrigated agriculture in the region relied upon the Sea for irrigation water disposal; now the Sea's continued existence depends on agriculture. By the middle of the century the Sea was host to a thriving water-based recreation industry and a magnificent wildlife preserve. As other wetlands were lost to development, the Sea assumed an increasingly critical role in the Pacific Flyway as a host for a huge variety of migrating birds. Some 380 species of birds are found in the region, and more than 75 species breed at the Sea. The Colorado River's delta at the upper Gulf of California is the next-closest link on the chain.

At the Salton Sea, however, there is no cleansing tide to freshen the waters, and its

borders already are closed; indeed, there is no outlet at all, and the only significant inflow reaches the Sea after traversing the agricultural fields of the Imperial Valley and the sewers of the booming Mexican border town of Mexicali. Now fish and birds at the Sea are subject to unexplained, periodic events of enormous mortality. Tons of fish and hundreds of thousands of birds have died there in the last seven years, their carcasses often covering the beaches in stinking, rotting piles. Shoreline development is thwarted by ever-changing water elevations that can alternately flood structures and agricultural land or strand docks and marinas in expanses of exposed sea-bottom. The water already is 30% more salty than ocean water, and salinity is steadily increasing, approaching the point where the resident species will cease reproduction. And future water supplies to the region are sure to diminish; California's partners along the Colorado River are demanding the full measure of their share of its water, urban California is clamoring for more, and the agricultural industry is learning how to work with less. Without intervention, the Sea will cease to exist as we know it, and possibly it will disappear.

What kind of future can be foreseen for the Salton Sea, and what does it mean for the lower Colorado River region? What are the implications for Mexico of proposed solutions to the Salton Sea's problems, and how can UC and Mexican scientists contribute to the development of actions that are appropriate in the context of the binational realities of the region? These critical questions were the basis for the UC-Mexico Salton Sea workshop convened by UC MEXUS together with the UC Water Resources Center in October 1998. The workshop was conceived and conducted within the traditional role of the university in society: To undertake independent scholarly investigation and inquiry free from the influence of political, economic, or other interests. Protection of that role was especially important because the crisis at the Salton Sea had gained national political attention, in part driven by the promise that a clean-up of the Sea would generate significant economic returns to the region.

The Salton Sea Reclamation Act of 1998, H.R. 3267, established a structure for determining what kind of project would achieve the restoration of the Sea for the purposes of regaining and maintaining elevation and salinity levels that would sustain economic development, fish and wildlife while enabling farmers to continue their irrigation practices. Some envisioned a return to the heyday of the 50s and 60s; others foresaw shoreline developments, casinos and recreational boating and sportfishing. In these visions of the future, the birds and the fish do not litter the shoreline but rather contribute to and benefit from a healthy environment in the Salton Sea. HR 3267, through its Research Management Committee and Science Subcommittee, has generated a wealth of new scientific knowledge about the Sea.

By the fall of 1998, the process established by HR 3267 had considerably narrowed the options for action at the Sea. One often-mentioned solution would exchange highly saline Salton Sea water for less-salty water from another source, such as the Pacific coast or the Upper Gulf of California. Control of the imported water would maintain both salinity and elevation at the Sea. Geography seemed to favor the Gulf as the discharge/intake site. But Mexico, and Mexican scientists, were hardly aware of the plan.

At the UC MEXUS workshop, scientists who worked at the Sea and in the Gulf presented their work in engineering, biology, chemistry, economics and anthropology. They considered the most likely solutions being raised through the legislative effort, and raised strong concerns about them. The deaths of fish and birds were attributed less to salinity than to disease and the high nutrient levels in the Sea. Expensive projects such as large-scale water exchange that would control salinity and elevation would not address these factors and thus would not significantly improve the fish and bird mortality statistics. Especially, the scientists who had worked in the region vehemently opposed solutions that might jeopardize

the already fragile ecosystems at the Upper Gulf.

Outside of the framework of the legislation, other alternatives were brought to the table for discussion, including one example that seems shocking at first look. What if the Sea were allowed to become increasingly saline? The current food chain would be replaced by an algae-brine shrimp-brine fly community, or a similar food chain typical of salt lakes around the world. Without fish, the Sea would not be dead, but it would be different.

A breakthrough came when UC Riverside environmental engineer **Mark Matsumoto** observed, "So far, engineers have been asked to develop solutions that address only salinity and elevation concerns. A broader range of alternatives exists to achieve other environmental goals." From this, the group began to imagine a different approach to dealing with the Salton Sea's problems, one that may completely alter the physical character of the Sea. "The shape of the Sea may indeed change if treatment of its problems is conceived creatively and regionally, building upon newly acquired and still-developing knowledge in environmental engineering, habitat restoration, and water resource remediation," the workshop report concluded. "The answer may lie within the realm of possibilities that can be imagined somewhere between large-scale engineering projects and the precarious future foreseen if no action is taken."

Indeed, the group saw the resolution of the Salton Sea's problems as an opportunity to advance understanding of the ecological balances necessary to sustain human food production and wildlife habitats in the entire lower Colorado River region. Citing successful agricultural/ environmental partnerships in other areas of California, Water Resources Center Director **John Letey**, a soil scientist, suggests "a strong focus on the agriculture/ wildlife connection to design ways to use agricultural drainage waters before they reach the body of the Sea in a series of remediating habitats." Saving the Salton Sea could contribute to the global search for new conservation management strategies that serve increasing human demands while protecting biological diversity and vulnerable species across national borders.

Much more work is needed to understand, restore and protect the two threatened seas of the Colorado Desert. They and the region they define continue to occupy a favored place in the UC MEXUS agenda. The Institute is a co-sponsor of the August 1999 International Congress on Ecosystem Health, which will address from a global perspective many of the issues that are important to the Lower Colorado River region, including agricultural/environmental partnerships, environmental pollution, ecosystem health and restoration, transnational management issues, and a case study of water use issues in the Rio Colorado Delta.

The Salton Sea workshop is one of several planned under the UC MEXUS Border Water Project, which is funded by a three-year grant from the UC Office of the President. *Alternative Futures for the Salton Sea* is the first report issued from the project. A second report is being prepared, based upon discussions held in a November 1998 workshop concerning access to water and energy resources in the region. And additional workshops are being planned for the coming year. "Mismanagement of water resources in the border region holds serious potential for irreversible environmental damage and human suffering," said UC MEXUS Director **Juan-Vicente Palerm** as he opened the Salton Sea workshop. "Our major goal is to enable U.S. and Mexican scientists to come together, to share their work, and to think creatively about critical water-related issues in the border region. UC MEXUS will continue to seed the collaborative research that leads to new discoveries, and the publications that inform the public about those discoveries, but we've found again and again that the best way to get science into policy is just to put the right people together at the table."

The report of the UC-Mexico Salton Sea Workshop, Alternative Futures for the Salton Sea, *is available free of charge from UC MEXUS. For further information about the UC MEXUS program on marine mammals, see UC MEXUS NEWS Number 31, Fall 1993.*

photo credit: C. Faesi

Kathryn Vincent has been Assistant Director of UC MEXUS since 1984, when she established the Universitywide Headquarters of the Institute at the University's Riverside Campus. She is editor of UC MEXUS NEWS and has authored and edited books and articles on various topics, including the environment, photography, U.S.-Mexico relations, higher education, and legal issues. Her recent works include (with Jaime E. Rodríguez) a co-edited set of volumes on the history of the U.S.-Mexico relationship, Myths, Misdeeds and Misunderstandings, *and* Common Border, Uncommon Paths, *published by Scholarly Resources. A chapter (with Juan-Vicente Palerm and B. R. Vincent) on the treatment of Mexican immigrants in U.S. courts was recently published in* Immigrants in Courts *(University of Washington Press). She is currently under contract with Texas A&M Press to co-edit with Rodríguez the last work of the late historian Nettie Lee Benson, the founder of the Benson Latin American Collection at the University of Texas.*

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