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Transboundary Water Management along the U.S.- Mexico Border

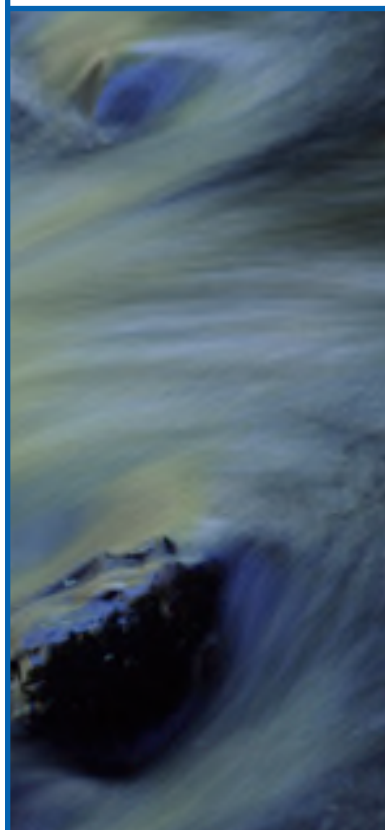
by Linda Fernandez

Forty percent of river basins worldwide are transboundary waterways shared by two or more countries (Wolf, 1999). The U.S.-Mexico border region can serve as a laboratory for studying transboundary water management among dissimilar societies in a region experiencing continued expansion of population and commerce.

The variety of water bodies along this 1,952-mile border is representative of the worldwide spectrum of transboundary water bodies: of the 23 shared surface waterways, some flow north to south and others flow south to north, and both deep and shallow groundwater aquifers straddle the border. More than 10 million people share these resources, many in semi-arid and arid landscapes, using the water for municipal, industrial, and agricultural purposes. Crop cultivation accounts for 60-80% of water use on the border (Mumme, 2005). Thus this border region provides many different scenarios in which to study economic, political, and social incentives for coordinating water management across boundaries.

The sharing of surface and subsurface water resources requires binational cooperation in addressing water quantity and quality issues simultaneously. Historically, international treaties have specified surface water quantity allocation between the U.S. and Mexico. Excess diversions have increased, however, making various areas more susceptible to drought due to fluctuations in climate and water supply.

For example, the Rio Colorado Delta has been dramatically altered by transbasin diversions from the Colorado River (Morrison et al., 1996). Although the 1944 International Boundary Waters Treaty requires the U.S. to deliver 1.5 million



California Colloquium on Water

Spring 2006 Schedule

Lectures are in a new room this spring:
Goldman School of Public Policy, Room 250,
2607 Hearst Ave. at LeRoy Ave.

This spring's Colloquium opened February 14 with "Hell and High Water in the Delta: The Fate of California's Water Supply Hub." If you missed this standing-room-only lecture by Jeff Mount, director of the UC Center for Watershed Science, you can watch it on the Colloquium Web site as streaming video (see below).

March 14

"The Invaded Estuary: Exotic Species in San Francisco Bay"
Andrew N. Cohen
Senior Scientist and Director of the Biological Invasions Program, San Francisco Estuary Institute

April 11

"Utilizing California's Water Supply Efficiently and Effectively"
Tom Birmingham
General Manager/General Counsel, Westlands Water District

May 9

"Recycled Water: Conveying the Message to Non-Water Experts"
Roy Herndon
Chief Hydrogeologist, Orange County Water District

Visit the Colloquium Web site for more information: <http://www.lib.berkeley.edu/WRCA/ccow.html>. You can view the flyer for each lecture and the brochure for the spring semester as PDF files. Streaming videos of the lectures will be posted there as they become available. The lectures will also become available in VHS format for loan or in-house viewing at WRCA. The Colloquium & Events email list is now a Listserv list; see page 6 for details.

The Colloquium is sponsored by the Water Resources Center Archives of the University of California. It is

financially supported by the Deans of the UC Berkeley Colleges of Engineering, Environmental Design, Letters & Science, Natural Resources, and the Boalt Hall School of Law; the Beatrix Farrand Fund of the Department of Landscape Architecture & Environmental Planning; the UC Berkeley Executive Vice Chancellor & Provost; the Earth Sciences Division of the Ernest Orlando Lawrence Berkeley National Laboratory; the Groundwater Resources Association of California; and the Metropolitan Water District of Southern California.

Water Resources Center Archives

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Mission *To maintain and continue to develop a collection of current and historical water-related materials to meet the needs of the University of California and the people of the state.*

Newsletter edited & designed by Nancy Novitski.
Photo details pages 1, 6, 11 © 2005 Brendan DeTemple.

Watching Guadalcanal Village Wetlands

by Sally Mack

Guadalcanal Village is a 53-acre wetland restoration site north of Vallejo. Located off Highway 37, at the base of the Mare Island exit, it is bordered by the highway, the Napa River, and Dutchman's Slough. Guadalcanal Village is a Caltrans "mitigation site," the restoration of which is intended to offset the destruction that was caused by the widening of the highway.

The name is a relic of the World War II-era Navy housing development that previously stood on the site, razed in the 1960s partly because of flooding problems. Restoration of the wetlands began in the 1990s when canals were dug, native plants replanted, remaining housing foundations removed, and a recreational paintball area cleaned up. The levee that had held back the Napa River at the site was breached on October 31, 2001, re-flooding the area and reintroducing it to tidal influence.

Caltrans coordinated the restoration in conjunction with the San Francisco Bay Conservation and Development Commission, the U.S. Fish and Wildlife Service, the San Pablo Bay National Wildlife Refuge, and other federal and state resource agencies. The area is slated to become part



of the San Pablo Bay National Wildlife Refuge in four years. Although Guadalcanal Village is currently open to the public only during hunting season, I have been granted access to photograph it.

What I photograph there is what

Frank Waters calls the "ignored significant." The beauty is everywhere: in the weeds and mud and water and hills and sky, underwater, above water, in reflections on the water's surface. Hunting hawks let out blood-curdling screeches, pelicans soar overhead, shorebirds avidly feed along the changing shore. Small mammals and snakes scurry in the underbrush. Water levels change with the tide. Anaerobic bacteria turn the brackish canal water red, brilliant blue, gold-green, and gold. Although thousands of people drive past Guadalcanal Village daily on Highway 37, the area feels wild and isolated.

Sally Mack is a contract and grant administrator for UC Berkeley. She has been a photographer for over 30 years. Some of her photos were recently on display at the Faculty Club. You can see more online: <http://www.sallymack.us>.

See an exhibit of new photos by Sally Mack April 1-May 31 at WRCA

Archival News

New eScholarship Collection: UC Faculty Working Papers

In January WRCA added a new collection to its growing online eScholarship Repository. Entitled *Working Papers*, the collection will make available publications that have historically been difficult to access: unpublished faculty writings on current water-related research. The two inaugural submissions are papers on sustainability by UC Berkeley Civil and Environmental Engineering Professor Slav Hermanowicz. The complete texts of these papers are available as PDF files at <http://www.lib.berkeley.edu/WRCA/escholarship.html>.

WRCA invites faculty from all the UC campuses to consider submitting materials to WRCA for inclusion in this collection.

WRCA's Repository is part of the California Digital Library's (CDL) eScholarship program, a forum for scholarly communication initiated as an alternative to traditional journal publications. eScholarship provides free online access to full texts of scholarly publications, and allows UC faculty and staff direct control of publishing.

Working Papers joins three existing collections that WRCA has been managing since March 2004, all of which continue to grow both in content and in popularity (see box). In the year since the initial three collections became available online via eScholarship, over 20,000 downloads of the PDF files have taken place. This online

WRCA's eScholarship Repository

<http://www.lib.berkeley.edu/WRCA/escholarship.html>

Working Papers —New!

Unpublished UC faculty writings on current water-related research.

Technical Completion Reports

Reports on research funded by the UC Center for Water Resources.

Hydrology and Restoration of Rivers & Streams

Two collections of graduate student papers from environmental planning classes taught by UC Berkeley Professor Matt Kondolf.

accessibility complements WRCA's physical collection, which includes hard copies of the majority of these documents, cataloged and searchable in UC's Melvyl online library catalog (<http://melvyl.cdlib.org>).

To read more about CDL and their eScholarship initiative, visit <http://www.cdlib.org/programs/escholarship.html>. For more information about submitting documents to the *Working Papers* collection, contact Linda Vida (lvida@library.berkeley.edu).

Coming Soon: Clearinghouse for Dam Removal Information

The aging of dams across the United States is forcing an ever-increasing number of communities and water managers to address a variety of concerns, including safety and environmental problems. One possible solution is dam removal.

To help policymakers and practitioners learn more about the dam removal option, WRCA is developing the Clearinghouse for Dam Removal Information, a neutral online repository of information about technical, fiscal, and social aspects of dam removal. By capturing gray literature that would otherwise be available only tran-

siently when a dam removal is being considered or taking place, the Clearinghouse will facilitate the sharing of experiences among parties involved in dam removal decisions.

WRCA is collaborating with a subgroup of participants from the Aspen Institute's "Dialogue on Rivers and Dams" (<http://www.aspeninstitute.org>).

Watch the WRCA Web site and future issues of WRCA News for the announcement of the Clearinghouse launch. Questions? Email dams@library.berkeley.edu.

California Colloquium on Water

Fall 2005 Summary

Fall's California Colloquium on Water lecture series brought experts to discuss current and future issues in water resources planning. Most lectures can be viewed as streaming video on the Colloquium Web site:
<http://www.lib.berkeley.edu/WRCA/ccow.html>.

In September, two speakers came together to address a hot-button local issue: the implications of removing O'Shaughnessy Dam and draining Hetch Hetchy Reservoir to allow for the restoration of Hetch Hetchy Valley in Yosemite National Park. The reservoir is the primary water supply for San Francisco and many surrounding communities. Sarah Null, Ph.D. student in geography at UC Davis, and Spreck Rosekrans, economic analyst at Environmental Defense, presented their respective feasibility studies. Null determined that existing water facilities could supply the city of San Francisco with the same amount of water if the dam were removed. Rosekrans estimated that water and power replacement costs (including groundwater exchanges, transfers, and building increased surface storage and water filtration plants) could run between \$0.5 and 1.6 billion. His report suggests that the remaining loss of power could be counterbalanced with a program of energy efficiency, dynamic pricing, renewable energy, and natural gas.

October's speaker traveled from the University of North Carolina at Chapel Hill to talk about water-related development issues. Dale Whittington, professor of environmental science and engineering, city and regional planning, and public policy, has studied the costs and benefits of installing water and sanitation infrastructure in developing countries. According to his findings, although in-home water and sanitation systems do improve public health, many communities do not benefit economically from the installation of such systems. His research also showed that people with access to a reliable source of water close to but outside of the

home are satisfied with this system, and people tend to prefer in-home electricity over in-home water access.

In November, UC Berkeley geography professor Kurt Cuffey discussed the effects of glaciers in California. These large rivers of ice have sculpted significant parts of California's terrain, including the emblematic curves and contours of Yosemite's Half Dome. The largest existing glacier in California is on the slopes of Mount Shasta. Minor glaciers dot the high crests of the Sierras. Cuffey also offered an unusual insight on global warming based on data from the last Ice Age: the sun may spontaneously become dimmer in coming centuries, which would help moderate the effects caused by increasing temperatures.

Norman Miller, staff scientist at Lawrence Berkeley National Laboratory and member of the United Nation's Intergovernmental Panel on Climate Change, further elaborated on California's fate in light of current climate trends. His December lecture focused on two of the possible future climate conditions in California: warm-wet and cool-dry. If the climate continues to grow warmer and wetter, the frequency of flooding and heat-related deaths will increase. A cooler, drier climate would help decrease those negative outcomes, but Miller is not hopeful that the latter scenario will prevail. His team hypothesizes that either way there will be a marked decrease in snowpack in all California mountain ranges if CO₂ levels continue to rise at the current rate.

Learn More: Hetch Hetchy

Environmental Defense's report (2004):

Paradise Regained: Solutions for Restoring Yosemite's Hetch Hetchy Valley

- At WRCA: call no. G4195 P4 Locked Cage
- Online: <http://www.environmentaldefense.org/hetchhetchy>

Sarah Null's master's thesis (2003):

Re-Assembling Hetch Hetchy: Water Supply Implications of Removing O'Shaughnessy Dam

- At WRCA: call no. G4793 P3
- Online: <http://cee.engr.ucdavis.edu/faculty/lund/students/SarahNullThesis.pdf>

Announcements

Email Lists Now Listserv Lists

WRCA's email lists are now Listserv lists, so you can subscribe and unsubscribe online. Please contact WRCA with any questions.

Colloquium & Events

<http://www.lib.berkeley.edu/mailman/listinfo/caconwater>
List members receive announcements about the monthly Colloquium lectures, other WRCA events, and other water-related events.

WRCA Publications

<http://www.lib.berkeley.edu/mailman/listinfo/wrcapubs>
List members receive announcements about WRCA News, Selected Recent Accessions, WRCA's free publications list, and the annual calendar.

WRCA Travel Grant Now Available to All UC Students

WRCA is pleased to offer its travel grant to all UC students who are interested in visiting WRCA as part of water-related research projects.

The travel grant consists of a one-time award of up to \$300 for travel to UC Berkeley. This amount may cover air and/or ground transportation and one night's lodging. Original receipts must be submitted to WRCA for reimbursement within 10 days of travel.

Graduate students and upper-division undergraduate students researching water-related topics are eligible. Applicants must be currently registered at one of the eight UC campuses outside the Bay Area: Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, Santa Barbara, or Santa Cruz.

The application form is available online as a PDF file:
<http://www.lib.berkeley.edu/WRCA/pdfs/travelgrant.pdf>

Web Site to Watch:

California Watershed Funding Database

<http://www.calwatershedfunds.org>

The California Watershed Funding Database is a comprehensive statewide database for watershed funding from private, local, state, and federal funding sources. An optional notification list allows you to receive emails when entries are added or updated. The database is hosted by UC Davis as part of the California Spatial Information Library (CaSIL), a service of the California Environmental Resources Evaluation System (CERES). Contact: Alicia Barr (abarr@ecst.csuchico.edu).

Upcoming Conferences

ReEnvisioning the Delta: The Hub of California's Future

Dates: March 16-17, 2006

Location: Rm. 112, Wurster Hall, UC Berkeley

Web site: <http://www-laep.ced.berkeley.edu/laep/delta>

Host: UC Berkeley Dept. of Landscape Architecture & Environmental Planning

This two-day symposium will consider the future implications of the ongoing urbanization of the Sacramento-San Joaquin Delta, and explore alternative futures for the Delta, emphasizing its key role for infrastructure, agriculture, and open space within the San Francisco-Sacramento-Stockton metropolis.

Annual Salinity/Drainage Meeting

Dates: March 29, 2006

Location: Red Lion Hotel, Sacramento, CA

Web site: http://www.lib.berkeley.edu/WRCA/WRC/sdp_meetings.html

Host: UC Center for Water Resources

Come catch up on the most current salinity issues in the state. This year's conference will focus on salt management in the Central Valley and the salinity of downstream surface water bodies. Registration is now open.



Transboundary Water Management

Continued from page 1

acre-feet to Mexico annually, the U.S. actually delivers only about 900,000 acre-feet per year. Terrestrial and marine flora and fauna have been affected by this shortfall. An additional 250,000 acre-feet of water beyond the actual amount delivered would be necessary to stimulate natural flooding (Newcom, 2002).

Serious water quality problems plague most of the surface waterways along the border, including the Tijuana River, New River, Colorado River, and Rio Grande. Ongoing urbanization in border cities near to rivers leads to urban runoff, untreated sewage flows, and sedimentation.

A consistent problem along the entire border is the overwhelming asymmetry in municipal financial resources between the U.S. and Mexico. Communities on both sides of the border continue to experience population growth, which is straining existing water infrastructure, but U.S. and Mexican cities differ in their capacity to self-finance expansions of and changes to that infrastructure. For example, while the cities of San Diego and Tijuana—right across the border from each other—are similar in population, with over 1.2 million people each, San Diego's municipal budget is 27 times greater than Tijuana's (Frisvold and Caswell, 2002). Long-term financing for vital public infrastructure projects remains a challenge for Mexican municipalities, which are limited by a tax system that sends locally collected taxes back to the federal government (Liverman et al., 1999).

There is not yet any management framework for groundwater along the border. The three most significant transboundary aquifers are the Hueco Bolson, covering about 3,000 square miles in Texas and Chihuahua; the Mesilla Bolson, covering about 7,450 square miles in New Mexico and Chihuahua; and the Mesa de San Luis Aquifer, covering about 3,000 square miles in Arizona, California, Sonora, and Baja California (Frisvold and Caswell, 2002). Existing treaties between the two countries do not regulate the distribution of groundwater, so aquifers are treated as open access resources (Randall, 1981). Lack of information on border groundwater resources leads to problems of overdraft and depletion, impeding cooperation and hindering implementation of the kind of adaptive management necessary for this dynamic resource.

In 2005 there was substantial support in the U.S. Congress to fund the first-ever mapping of border groundwater resources. Senate Bill 1957, the U.S.-Mexico Transboundary Aquifer Assessment Act, and House Resolution 469 would provide \$50 million for that purpose over the next decade (2005-2014). The bipartisan legislation aims to reduce widespread confusion by establishing a reliable database for decision-making. Mexico also expresses the need to invest more in its monitoring of the Hueco Bolson and other aquifers (Mendoza, 2004).

Governing Bodies

Water management in the border region falls under the purview of a variety of governmental and intergovernmental entities.

The International Boundary Water Commission (IBWC), established through the International Boundary Waters Treaty of 1944, is the binational agency with authority over territorial limits, water allocation under treaties, water treatment, sanitation, and water quality.

The U.S. Environmental Protection Agency (EPA) and Mexico's Secretaria de Medio Ambiente, Recursos Naturales (SEMARNAT) have developed programs to focus on environmental quality in the border region. The Border 21 Program (1995-2000) and subsequent Border 2012 Program (2000-present) have accomplished this through working groups devoted to air, land, and water, charged with identifying current problems along the border.

Two binational institutions were established through the side agreement of the North American Free Trade Agreement (NAFTA): the Border Environmental Cooperation Commission (BECC) and the North American Development Bank (NADBank). Both are important players in border water management and the principal source of new capital investment in border water infrastructure. The BECC certifies environmental infrastructure projects that address water, solid waste, wastewater, and, more recently, air quality along the border. The BECC also provides technical assistance and grants for project development to applicants for such certification. NADBank provides loans and grants for the environmental infrastructure projects that the BECC certifies.

By the end of 2004, NADBank had disbursed \$276 million in grants over nine years through the Border

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Transboundary Water Management

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Environment Infrastructure Fund (BEIF), benefiting 3,810,655 people (Good Neighbor Environmental Board, 2005). The total cost for the 105 projects that received grant funding—69 in the U.S. and 36 in Mexico—was \$2.1 billion.

Some NADBank funding is inefficient from a binational perspective. For example, in 2004 NADBank allocated \$7 million in grants from the water conservation fund for three canal-lining projects approved by the BECC to reduce seepage from the U.S. into Mexico. California's All-American Canal alone currently loses 200,000 acre-feet a year as seepage. But viewing that seepage as waste ignores the fact that the water feeds the Mesa San Luis Aquifer, reducing groundwater salinity and increasing its usefulness for agriculture in Mexico (Frisvold and Caswell, 2002). Thus the lining projects are effectively diversions—unilateral actions taken by the U.S. without regard for groundwater effects on Mexico (Sanchez, 2004).

Border Economic Analyses

Transboundary water resources can lead to cooperation or conflict depending on each party's perception of relative benefits (Sadoff and Grey, 2002). As the number of stakeholders included in an analysis increases, the costs (of information and transaction) for cooperation increase. While the border in question here separates only two countries, the number of other entities—government, private sector, civil society—involved in water management issues increases the cost of cooperation. The best hope for cooperation is to structure decision-making at the watershed scale. Several recent analyses explore these topics.

Booker and Ward (2002) examine the possibilities for binational cooperation in management of the upper Rio Grande basin for both human water use and instream flows supporting Rio Grande Silvery Minnow habitat requirements as defined by the U.S. Endangered Species Act. Their model integrates hydrology, treaty rules, and economic impacts in order to estimate the impacts of policies for addressing water shortages and instream flow needs. They found that in "low flow" years, market-based water transfers increase average annual flows near the El Paso-Ciudad Juarez portion of the U.S.-Mexico border stretch of the Rio Grande by 27% while allowing

for decreases in groundwater pumping of 20,000 acre-feet per year. In years of flow greater than low flow, the gain from market-based water transfers is a 6% increase in average annual flows and a decrease in groundwater pumping by 7,000 acre-feet per year.

Fernandez (2005) investigates optimal strategies for solving unilateral suspended sediment flow in surface water from

Mexico to the

U.S. within the Tijuana River watershed. The empirical analysis takes into account asymmetry in budgets,

abatement costs, and damages between upstream and downstream communities. Incentives for controlling sediment include prevention of property damage (upstream) and protection of habitat and public and environmental health (downstream). The differential game analysis of Fernandez shows cooperation is viable according to several allocation rules that include financial and technical assistance transfers from downstream to upstream through the viable channels of the BECC and NADBank.

Frisvold and Caswell (2000) discuss examples of different cost-benefit allocations for wastewater treatment plants. For example, for a wastewater plant built in 1951 in Ambos Nogales, actually two adjacent border cities in Arizona and Sonora, the IBWC recommended allocating costs in proportion to benefits so that the U.S. bore higher costs for its greater benefits.

Fernandez (2002) introduces a differential game model that links transboundary water pollution to trade policy in the context of solving wastewater pollution problems in the Rio Grande between the border cities of El Paso and Ciudad Juarez. The analysis includes a comparison of noncooperative and cooperative wastewater treatment decisions with and without NAFTA. Since the BECC and NADBank were set up through the NAFTA side agreement, they offer a tangible institutional framework for both countries to cooperate on wastewater treatment. The model shows that trade liberalization through

The U.S. canal-lining projects are effectively diversions—unilateral actions taken by the U.S. without regard for groundwater effects on Mexico.

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Transboundary Water Management

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NAFTA has removed the U.S. limit on importation of Mexican cotton, offering an incentive for Mexico to reclaim wastewater. It has also driven the U.S. to reclaim and reduce the wastewater pollution in the Rio Grande. The empirical results suggest cooperation and trade liberalization would improve water quality in the shared border waterway.

Fernandez (2004) provides the only econometric analysis of revealed preferences of the BECC. The study provides quantitative tests for what ultimate criteria the BECC has used during eight years of decision-making about environmental infrastructure projects along the border. Possible criteria include equity, cost minimization, or "polluter pays." Results show that the BECC favors upstream water and wastewater projects that truly alleviate transboundary pollution. Since more transboundary surface water bodies flow north-south than south-north, the U.S. has received the majority of projects and the grants to fund them (68%). While this may mean that the BECC supports the "polluter pays" principle in theory, the underlying financial details have not always borne this out.

These and other efforts to include hydrology, institutions, and environmental costs and benefits in economic models bring greater understanding of the water management issues at the U.S.-Mexico border, but many issues remain to be solved. Both theoretical and empirical studies can offer insight to guide policy and strengthen understanding of viable strategies to manage precious water resources in this border region and worldwide.

Linda Fernandez is an associate professor of environmental sciences at University of California, Riverside. This is a shortened version of her chapter in Frontiers in Water Resource Economics, recently published by Springer Verlag (Renan-Ulrich Goetz and Dolores Berga, eds.): <http://www.springer.com/sgw/cda/frontpage/0,11855,4-40109-22-93868018-0,00.html>.

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Staff Update

Welcome, Becky

Becky Dyas joined the WRCA team of student assistants in September. She is a second-year Berkeley undergrad majoring in political science and minoring in art history, and plans to attend law school when she graduates. At WRCA Becky shelves books, labels materials, runs errands, makes copies, and does anything else that Linda, Paige, Trina, and Paul can think of. Becky enjoys WRCA for its staff as well as its interesting library materials, and she plans to return for many semesters to come.

Welcome, Doriel

In December Doriel Lutt joined WRCA as a part-time temporary Associate Librarian assigned to original cataloging. Doriel is no stranger to the Berkeley campus, having worked as a library assistant in the cataloging departments of both the main Library and the Bancroft Library before earning her MLIS from Berkeley. She

then held librarian positions at University of San Francisco, Mills College, and San Francisco Law Library, and also took a few years off to spend time with her children. She is very happy to be back at Berkeley and is enjoying learning all about the world of water resources.

Farewell, Celia

Celia Bein leaves behind a staff better for having worked with such a great student. Celia started as a student assistant at WRCA in fall 2003. She left to study abroad in Australia in 2004, then returned to WRCA during her last two semesters at UC Berkeley. Celia graduated in December with a B.A. in political science. Inspired by a summer internship at Human Rights Watch, she plans to work in human rights advocacy in developing countries. Later she hopes to attend law school to study international law. Celia says she will fondly remember WRCA as one of the most enjoyable places to work because of its positive, down-to-earth work environment.

In Memoriam: Dennis Underwood



Dennis B. Underwood, chief executive officer of the Metropolitan Water District of Southern California and member of the Water Resources Center Archives Advisory Board, passed away in November 2005 at the age of 60. Dennis's career in the water industry spanned over 35 years, including a term as commissioner of the U.S. Bureau of Reclamation from 1989 to 1993. Throughout his distinguished career, Dennis worked on Colorado River issues and grew to be an innovative, respected leader in the water community. During his five years on the WRCA Advisory Board, Dennis was committed to helping WRCA collect, preserve, and provide access to documents related to the Colorado River. WRCA hopes to establish a collection of such materials to commemorate his contributions to the Western water community.

To learn more about Dennis, visit the Metropolitan Water District's memorial Web page: <http://www.mwdh2o.com/mwdh2o/pages/memorial/index.html>.

Photo: Metropolitan Water District of Southern California.

Donors 2005-2006

Gifts-in-Kind

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Dr. L. Martin Griffin
Andrew Gunther, Center for Ecosystem
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Thank you!

Planned Giving: Help Secure WRCA's Future

Consider a planned gift to WRCA as part of your estate planning. You and your heirs can realize substantial financial benefits while helping to ensure WRCA's long-term financial security. There are many different ways to

make a planned gift: living trusts, charitable remainder trusts, gift annuities, and more. To learn more, please contact Linda Vida at lvida@library.berkeley.edu or (510) 642-2666.

Friends of the Archives

Please consider supporting WRCA by becoming a member. Membership forms are available on the Friends of the Archives Web site: <http://www.lib.berkeley.edu/WRCA/friends.html>.

Corporate Memberships

Member	\$150/year
Associate	\$250/year
Patron	\$500/year
Benefactor	\$1,000/year

Member **\$150**

Services include:

- Extended loan period (*1 semester*)
- Annual WRCA calendar of historic photographs
- Acknowledgement in WRCA newsletter, Web site, and annual report

Associate **\$250**

Services include all of the above, plus:

- 1/2 hour of research each month (*upon request*)

Patron **\$500**

Services include all of the above, plus:

- 1 hour of research each month (*upon request*)
- Document delivery by mail (*1 loan or 2 photocopies*)

Benefactor **\$1,000**

Services include all of the above, plus:

- Annual WRCA calendar of historic photographs (*3*)
- Document delivery by mail (*2 loans or 4 photocopies*)
- Acknowledgement on commemorative plaque on display at WRCA

Individual Memberships

Creek	\$25/year
River	\$50/year
Cascade	\$75/year
Watershed	\$100/year

Creek **\$25**

Services include:

- Extended loan period (*1 semester*)
- Acknowledgement in WRCA newsletter, Web site, and annual report

River **\$50**

Services include all of the above, plus:

- Annual WRCA calendar of historic photographs

Cascade **\$75**

Services include all of the above, plus:

- Document delivery by mail (*1 photocopy upon request*)

Watershed **\$100**

Services include all of the above, plus:

- Annual WRCA calendar of historic photographs (*2*)

Individual donations are tax-deductible.

Please make checks payable to "University of California Regents." Be sure to include contact information: name, organization name (if applicable), address, phone number, and email address.

Send checks to: Water Resources Center Archives
410 O'Brien Hall
University of California
Berkeley, CA 94720