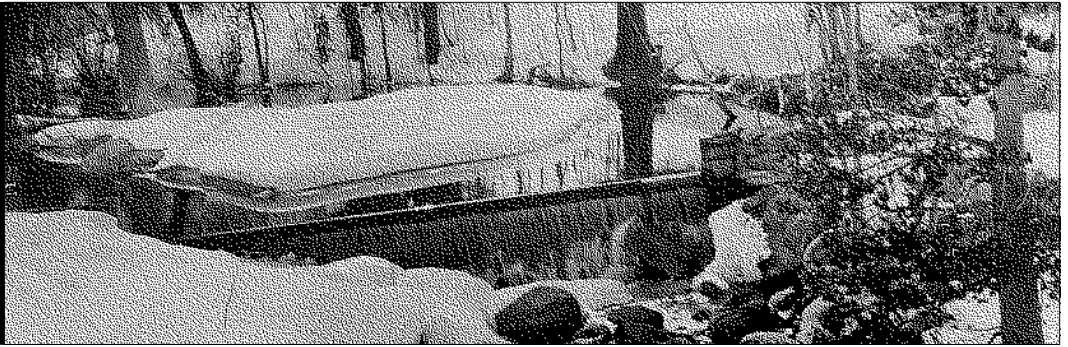


WRCA NEWS



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POPULIST RHETORIC, PRIVATE GAIN

By Gray Brechin

Roman Polanski's *Chinatown* is, I believe, the most educational movie ever to come out of Hollywood. A California historian once took me to task for voicing this opinion too publicly, insisting that Robert Towne's script plays fast and loose with the particularities of the Owens Valley water grab early in the 20th century. I agreed; the movie's Hollis Mulwray is *not* William Mulholland, nor is the villainous Noah Cross an exact equivalent of *Los Angeles Times* owners Harrison Gray Otis and Harry Chandler. What viewers remember vividly, however, is that land and water must be brought together in the arid west in order to grow great cities and that a few people profit enormously by persuading the taxpayers to pay for the wedding.

I could not escape the same conclusions while doing the research for my books *Imperial San Francisco: Urban Power, Earthly Ruin* and *Farewell, Promised Land: Waking from the California Dream* (both U.C. Press, 1999). If I have any problem with *Chinatown*, it is that the movie gives the impression that the leaders of Los Angeles were uniquely venal and the citizens unusually gullible to pay for an aqueduct which dead-ended in the San Fernando Valley twenty miles shy of downtown Los Angeles. Some of those leaders used their insider knowledge to secretly buy the valley as soon as they knew that the aqueduct was a certainty. In the movie, Noah Cross explains to gumshoe Jake Gittes, "You either bring the water to L.A. or you bring L.A. to the water" by annexing the San Fernando Valley. When Gittes asks Cross why, despite his enormous wealth, he wants more, Cross replies simply "The future, Mr. Gittes, the future." For Cross in the film — and for Chandler, et al in real life — the future meant the speculative valuation of desert land and imported water paid for by others.

Polanski and Towne could just as easily set *Chinatown* in San Francisco as Los Angeles. Several years before engineer J.B. Lippincott helped agents of Los Angeles to obtain water rights in the Owens Valley, he filed for rights to the Tuolumne River in Hetch Hetchy Valley on behalf of San Francisco mayor James D. Phelan. Lippincott was an ideal choice for the job since his official capacity as coast representative of the U.S. Geological Survey allowed him to pursue his work for Phelan free of suspicion.

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Theodore Roosevelt's Secretary of the Interior, Ethan Allen Hitchcock, complained to the president that "It appeared that [Lippincott's] survey for the sites in question had been made surreptitiously and without securing the consent of the Department to enter [Yosemite National Park] for that purpose." Roosevelt, however, felt that Hetch Hetchy Valley should be sacrificed for "the permanent material development of the region."

The President said "region" instead of "San Francisco." As the city's leading banker and urban visionary, J. D. Phelan foresaw that the publicly-funded water and electricity from Hetch Hetchy would create a regional metropolis he called "Greater San Francisco." He and his associates in the city's elite Bohemian Club sought to annex the lands around San Francisco Bay just as the San Fernando land syndicate extended the boundaries of Greater Los Angeles to encompass the valley into which they brought the Owens River.

Shortly after his work for Phelan, Lippincott was hired as regional engineer for the new U.S. Reclamation Service. That position enabled him to provide former Los Angeles mayor Fred Eaton and water superintendent William Mulholland with access to public land office records and other insider privileges in the Owens Valley that would be necessary if the burgeoning city was to get the valley's river. Such services flouted the intent of the National Reclamation Act of 1902, which unequivocally stated that the agency it created was to provide water to small, owner-occupied farms. Yet one of the first actions taken by the Reclamation Service was to divert water away from farmers in order to raise land values more than 200 miles to the southwest. Despite the Jeffersonian rhetoric of its enabling legislation, the Bureau of Reclamation has never ceased growing cities instead of crops.

The National Reclamation Act is often known as the Newlands Act for the Nevada congressman who sponsored it. Representative Francis Griffith Newlands found himself land rich after his marriage into San Francisco's Sharon family. He also maintained close ties to railroad interests seeking to develop the San Fernando Valley and so much else in the arid west. Newlands understood the need to have the taxpayer foot the bill for engineering

projects that would give value to desert lands which he, his family, and associates claimed in or near Reno, Phoenix, and Los Angeles, so it may be less than accidental that those were the loci of the first federal reclamation projects. President Roosevelt said of Reclamation's pioneering effort in southern California: "It is a hundred or thousandfold more important to the State and more valuable to the people as a whole if [this water is] used by the city than if used by the people of the Owens Valley."

Some people did make fortunes at the expense of "the people as a whole," a lesson which the latter have been slow to learn. Edmund G. (Pat) Brown told an interviewer from the Bancroft Library's Regional Oral History Program that as governor, he and his advisers stretched the truth before submitting the State Water Project to the voters in 1958, deliberately low-balling its price tag at \$1.75 billion in order to launch construction that hasn't stopped since. "This project was a godsend to the big landowners of the state of California," Brown later told the interviewer. "It really increased the value of their property tremendously." Brown knew just how tremendously, since his Beverly Hills law firm represented those landowners after he left Sacramento.

The California Aqueduct and Highway 5 gave value added to the baronial Kern County, Newhall, and Irvine Land Companies and to the Tejon Ranch in the Tehachapi Mountains, a vast spread claimed by the estate of Moses Sherman and the *Times*-owning Chandler family, both descendants of partners in the San Fernando land syndicate. The highway and the aqueduct also fertilized the real estate of the J.G. Boswell Company, the largest landholder in Kings and Tulare Counties. With the death of her second husband in 1952, Ruth Chandler Boswell, sister of *L.A. Times* owner Norman Chandler, became the major stockholder and chair of the board of multinational Boswell, then building Sun City on land that it owned in Arizona with help from the Bureau of Reclamation.

The historian Bernard DeVoto once succinctly defined the western attitude to the federal government as "Get out and give us more money." U.S. taxpayers footed the bill for the lakes, Kilarney-green golf links, and political contributions necessary to grow luxury developments

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such as Estrella west of Phoenix, along with the cheap energy, which makes life in the desert bearable. Snaking over the sere mountains from the Colorado River, the Granite Reef Aqueduct of the \$3 billion Central Arizona Project may, as water historian Marc Reisner wrote in *Cadillac Desert*, “come as close to socialism as anything this country has ever done.” But for the moment, the dams, aqueducts, and powerhouses keep the illusions of Ireland in the desert green and alive, as well as the illusion of widely spread benefits promised by the Newlands Act. In Chinatown, observed Jake Gittes, nothing is what it seems to be.

Dr. Gray Brechin is an architectural historian, co-founder of the Mono Lake Committee, and former San Francisco journalist and television producer with a longstanding interest in California water and urban growth issues.

ARCHIVES AWARDED LAUC GRANT

The Water Resources Center Archives was awarded a grant by the Librarians Association of the University of California (LAUC) to conduct a survey of California’s approximately 800 water and irrigation districts.

No comprehensive directory of these districts exists. The Archives will hire a library assistant to compile a directory that will include such information as the location of the district, population served, source of water, and amount of water delivered. The survey also will identify the historical materials that have been created and maintained by the districts. This information will be compiled, organized and updated in a searchable database that will be available at the Archives and possibly on-line on the WRCA web site.

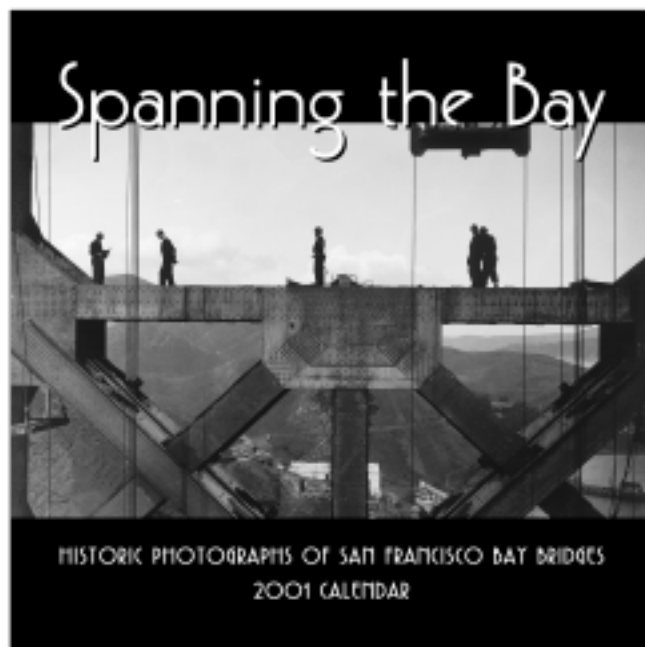
California’s water agencies began organizing in the 1850s in order to manage local water resources and safeguard water rights, and they continued to organize throughout the 20th century. Much of the historical record of these agencies – including minutes of meetings, annual reports, technical documents, maps, and photographs – is scattered throughout the state and is not currently accessible to the public.

The new database will be a resource for students and faculty of the University of California and for governmental agencies, private industry, the public, and the water districts themselves.

SPANNING THE BAY 2001

Following up on the popular and successful publication of the 2000 calendar, *Spanning the Bay: Historic Photographs of San Francisco Bay Bridges*, the Water Resources Center Archives and the Harmer E. Davis Transportation Library have collaborated on a new calendar for 2001. This year’s calendar focuses on the design and construction of San Francisco Bay’s signature bridges, the San Francisco-Oakland Bay Bridge and the Golden Gate Bridge, and features historic photographs from WRCA’s Charles Derleth, John D. Galloway, and Walter Huber collections.

Publication of the calendar was again generously underwritten by T.Y. Lin International / Moffatt & Nichol Engineers, a joint venture. To purchase calendars, please contact Calendar Sales, 412 McLaughlin Hall, MC1720, University of California, Berkeley, CA 94720; (510) 642-3604; fax: 510-642-9180; email vchan@library.berkeley.edu. For more information, please see <http://www.lib.berkeley.edu/WRCA/calendar.html>.



Next Issue

A Different Perspective — Author and historian Catherine Mulholland shares her thoughts on her grandfather, William Mulholland, and discusses her new book.

IN THE SPOTLIGHT - ROBERT L. WIEGEL

By Janet Mandelstam

Robert L. Wiegel is professor emeritus of civil engineering at UC Berkeley. For five decades he has been a teacher, researcher and practitioner in the field of coastal and ocean engineering. A Bay Area native, he is known throughout the world for his work in coastal wave and beach processes and tsunamis. His personal collection, "The Wiegel Ocean Engineering Archive," is housed at WRCA.

Q: You've said many times that you are always learning. What are you learning now?

A: Well, I like to keep busy. In the last three months, I've been to Australia for the International Conference on Coastal Engineering – not only for the conference and the papers, but to go on the post-conference field trip to the Gold Coast of Queensland. You might say it is the equivalent of Miami Beach. It's 20 kilometers of high rises and only four blocks wide. It's also one of the biggest collections of coastal engineering projects in the world, and I wanted to find out what they had learned.

I'm also just wrapping up a stint as an independent adviser to the Golden Gate National Parks Association on the Crissy Field tidal basin project in San Francisco. They have built a new small tidal marsh in a location where one existed up until about 1900. I like that for several reasons. I'm a great believer in having science projects available in the school systems, and the location of the marsh is very close to the Exploratorium. The fact that kids can go to both of them is wonderful. And the birds have been waiting for a hundred years for the wetland to come back.

Just before that I spent three months off and on doing a project for the California Coastal Commission. The Irvine Corporation is putting in a development immediately south of Newport Beach. One of my former students and I were asked by the commission to be the independent third party reviewer of the plans with respect to the coast: how it would affect the beaches and things of that nature.

Q: What were some of the major coastal issues discussed at the conference in Sydney?

A: One of the big ones worldwide is beach nourishment. Most of the recession that's occurring on beaches in the

United States and many other places has been because we've done something. Santa Barbara is a classic example worldwide because it is one of the first places to be studied thoroughly. It was decided in the 1920s that they would like a small boat harbor in Santa Barbara for commercial fishing, pleasure boats, and things of that sort. So they built a harbor out into the littoral. The waves in that area, on average, transmit sand from the northwest to the southeast. When they built the breakwater out into the surf, this trapped the sand that was being moved by the waves and it backed up and formed new beaches and new land on the northwest side. But the waves were still there, and they kept eroding the beach to the southeast. Santa Barbara lost a beach within a few years, and was about to lose a highway, so they hired an engineer who found out what was causing it and what should be done. They decided to dredge the sand that was filling in the harbor and pump it and place it on the downdrift side. This did two things. One: The harbor now could be used again; it was no longer filling with sand. Secondly, it made a beach. That is one type of beach nourishment.

Q: In the Santa Barbara example the nourishment of the beach was necessitated by something that man had done. Is beach nourishment an issue where the beach has eroded or is receding because of natural forces such as storms?

A: There are some cases, but most of our serious erosion in this country is because of things that we have done. There is a lot of erosion due to storms, but mostly that comes back in a year or two. On Carmel Beach, in a severe winter most of the sand will move off shore. But then gradually in the next year it will move back on shore. That's a cyclic type of thing.

Q: Were there any major topics at the conference other than beach nourishment?

A: Wetlands are a big issue, certainly in the United States. The big one in southern California is Bolsa Chica in Huntington Beach. Bolsa Chica has had a lot of oil removed from it, causing land subsidence. So this is a wetland, but now it is too wet. You want a variety in wetlands: the type that are usually submerged; the type that are submerged maybe half the time, and the type that maybe don't get submerged very often. There were several papers on that.

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Q: You've had a long and illustrious career. When you look back on it now, what are one or two of the things that stand out as highlights?

A: One of the things I worked on right at the start were tsunamis, those big waves that are generated by underwater tectonic displacements, the biggest associated with earthquakes. Or the earthquake might trigger an underwater landslide. Or it could be an underwater volcano exploding. These are in any particular place rather rare, but they can be devastating. For example, there was a severe earthquake in Lisbon a couple of hundred years ago, and there were thousands of people killed, but most of them were killed by a tsunami. They were battered and drowned.

This was very interesting to me because we really didn't know the mechanism of tsunamis. When I was young I was asked to look at it, and what we thought was the case turned out to be right, and gradually through many years of different graduate students working at bits and pieces we got to the place where we can calculate them quite well. I'm currently an adviser to a group that's been set up by the governor's office in California on natural hazards, earthquakes, etc., and the group I'm working with is the one on the tsunamis.

Q: Your association with tsunamis started when you were very young and working with the military during World War II. What was your role in the atom bomb test at Bikini Atoll?

A: I wasn't at Bikini.

Q: You did the research here in Berkeley?

A: Yes. In fact, that's why I'm here. [Morrough P.] O'Brien, who was dean of engineering here, and Roger Revelle, who became director of Scripps later, were there and were worried that the explosion would generate a landslide on the ocean side of the Bikini lagoon and cause a tsunami. So they cabled back here to Berkeley asking if we could do a hydraulic model of it. I just happened to be on terminal leave from the army and walking in to see a professor about coming to graduate school when the call came in, and he said, "Are you doing anything for the next two weeks?" I said no. He said, "How'd you like to do this?" I said fine. You just wonder about how chancy everything is.

Q: And did you find out through your model that it would be safe to do the test?

A: Yes. And fortunately we were right. But it took many decades before we could do the mathematics of it.

Q: I wanted to ask you about the role of the research university in working with government or working with private industry. That was something that happened very naturally early in your career, but it seems to be more controversial now.

A: I think there are some people who generally worry about it, but I'm not a worrywart. Over the years we've had support from the federal government and we've done quite a bit of work for the corporations. Some of the best work that we have done here on water – mixing processes and such things – has been because of Pacific Gas & Electric Co. They fund the work and they do what we think should be done. I've never found any problem working with the military or private corporations.

Q: One of the things you've always emphasized in your teaching was combining scientific research with actual operational experience. How would you describe your teaching philosophy?

A: You often hear that engineering is applied science. Some is, but the Greeks and the Egyptians and the Romans had great engineering with very little science. They could build an aqueduct, and, finally, thousands of years later we understand the physics of it. Science is the study of what is – the physics, the chemistry, the biology. Engineering is the development and management of concepts. Take a bridge. There's a lot of science in a bridge, but somebody has to think of what it might look like and if it should be a concrete bridge or stone or steel. This is engineering. I think you have to teach both.

One of the reasons I like being at a university is that we have so many good people in so many disciplines, and we can tie all these things together. We have one of the top people in the world on water law here. How lucky we are that we can have lunch with people like this and talk with them and bounce ideas off of them, and get ideas from this synergy. You tell this to your students so they see that when they go out to practice as engineers they've got to

work with the local population and the politicians and people in many disciplines.

Q: *An ever-growing number of people are living along the coast. People want to go to the coast for vacations. You've got a very strong environmental movement now that wants to preserve as much of the coastline as possible. What are some of the competing pressures for use of the coast today?*

A: Well, there are several different competing pressures. One has to do with ports. We need to ship things. The importance of harbors and ports goes back to even before the U.S. was founded. There were navigable rivers, and then there were canals, fabulous works of engineering. Every one of these things has an impact on the coast, but 200 years ago, who would have given you five cents for all the sand in Miami Beach? It's only since we've acquired leisure – which has been a very short time if you look at the history of the world, within the last hundred, hundred and fifty years – that we've wanted to be at the coast. With leisure you have more and more recreational use. Kids love the beach. Many people like to bathe in the water. And then you have people starting to surfboard. Now you've got a problem. Say you're in southern California and you've got people surfboarding and families with small children wanting to go in, and it's dangerous. So that's a multiple use.

And then you've got major conflicts that have to do with cooling water for power plants. What nuclear energy does is give you a source of heat. Oil, a source of heat. Coal, source of heat. Natural gas, source of heat. So you boil water into steam then use the steam to generate electricity. In order to have it condense, you've got to cool it, and this requires great quantities of water. Now do you want to use fresh water, such a valuable commodity? Because you need water for cooling, and you don't want to waste fresh water, you want to build power plants close to the ocean so you can use salt water. You have large quantities of it, and you heat it up a little bit. There have been a lot of studies about the effect of returning the cooling water to the ocean, and it turns out that a lot of sea life like it a little bit warmer. They're like people. They don't complain when you heat the water up 10, 15, 20 degrees. So the siting of power plants along the coast was to get the cooling water.

Q: *Has the rise of the environmental movement and its interest in coastal issues had any effect on the work of coastal engineers?*

A: I'm a great believer in places like Waikiki Beach and Miami Beach. I think you should have these high-density areas. I myself like a place that doesn't have any people, but we've got an awful lot of people in this world, and many of them like to be with other people, so you need your urban beach environment. In San Francisco the water's too cold for swimming at Ocean Beach, but people like to walk along the beach, and it's accessible. You can go just a short distance to Santa Cruz or to Stinson Beach. Sociologically, it's extremely important to make beaches available without having to drive for 4-6 hours. Then, if you have those concentrations, you can have other areas that don't have many people – like due north of Mendocino, for example.

You're spending more of your time now seeing how a structure can affect the environment. Everything you do is going to affect the environment. It always has, always will. I don't get all that upset about environmental change. Nature is always changed in reacting to the last drought, the last flood, the last volcano, the last earthquake. You see it now with the fires. Is that good or bad? It's so terribly complicated. I remember going on a trip to Yellowstone, maybe 4-5 years after they had that terrible fire up there, and I was surprised at how much open land there is in Yellowstone. Grassland as far as you could see. I realized that there had always been fires there. That's why there was grassland. So is the grassland better? Are the trees better? I don't know. The older I get, the less I seem to know about things like that.

*For more information about the career of Professor Robert L. Wiegel, please refer to **Coastal Engineering: Research, Consulting, and Teaching, 1946-1997**. Regional Oral History Office, The Bancroft Library, University of California, Berkeley, c1997. [WRCA G4072 N7-4 Locked Cage]*

ARCHIVES UPDATE

As reported in the previous issue of *WRCA News* (Vol. 7, no. 2, July 2000), processing has been completed on the **Mono Lake Committee Collection**. The collection documents the organizational history of the Mono Lake Committee and encompasses 60 archival boxes. WRCA is pleased to announce that the finding aid to this collection has now been published online via the Online Archive of California (<http://www.oac.cdlib.org>).

Processing has also been finished on three smaller collections. The **Luna B. Leopold Papers** contain reprints of many of Leopold's journal articles and addresses, East Bay rainfall and runoff studies, and hydraulic geometry field data for Pacific Slope basins in California. Leopold is professor emeritus of geology and landscape architecture at the University of California, Berkeley, and a renowned expert on river and channel morphology. He has generously been donating materials to WRCA since 1983.

Book Discussion & Signing : Catherine Mulholland

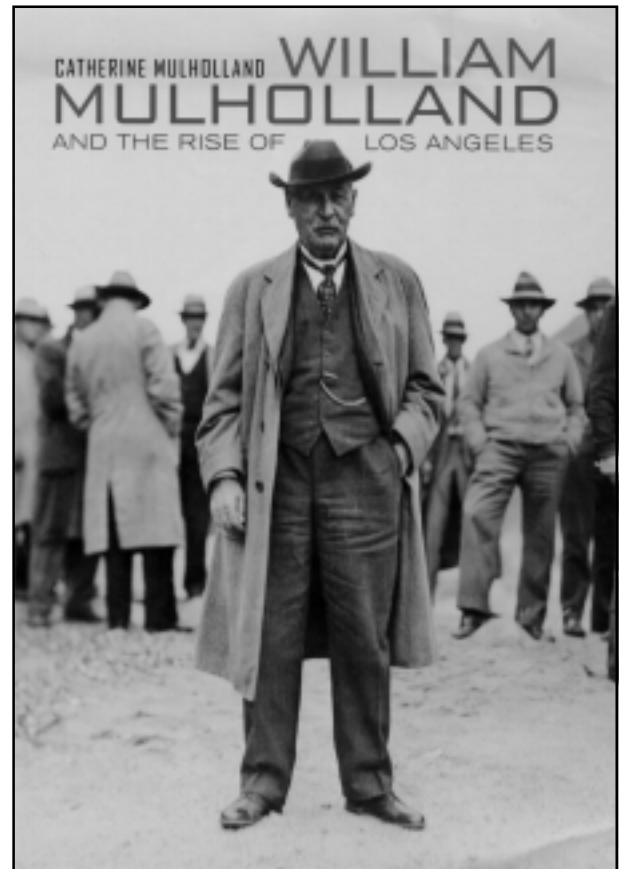
The story of Los Angeles' quest for water is both famous and notorious. It has received countless book treatments and has been the subject of the classic, yet historically distorted 1974 film *Chinatown*. However, a new book, *William Mulholland and the Rise of Los Angeles* (UC Press, 2000), by Catherine Mulholland promises to add a new chapter to the saga. Mulholland, granddaughter of famed Los Angeles water engineer William Mulholland, has produced the first full-length biography of her grandfather to be published.

The book challenges many of the prevailing versions of Mulholland's life story and sheds new light on the history of Los Angeles and its most prized resource—water. Catherine Mulholland provides insights into this story that family familiarity affords, and adds to our historical understanding with extensive primary research in her grandfather's office files (1902-1928) from the Los Angeles Department of Water and Power, which have only recently been discovered and made available.

The Water Resources Center Archives and Cody's Books co-sponsored two presentations and book signings by Catherine Mulholland. The first was held at 7:00 PM, Thursday, October 19, at the Cody's store on Fourth Street. On Friday, October 20, Catherine was at the Women's Faculty Club Lounge, on the UC Berkeley campus.

Doris Ostrander Dawdy, author of *Congress in Its Wisdom: The Bureau of Reclamation and the Public Interest* (1989), donated her research files for that book to WRCA in 1995. Dawdy's primary interests are in the study of politics and political science, with a focus on water management issues in California and the West. The **Doris O. Dawdy Papers** contain valuable materials on the Bureau of Reclamation, Westlands Water District, the Kesterson Reservoir, the San Luis Drain, and selenium studies in the San Joaquin Valley.

As this issue of *WRCA News* went to press, final editing was taking place on the finding aid to the **Omar J. Lillevang Papers**. Lillevang (1914-2000), a 1937 UC Berkeley graduate who studied under Prof. Morrrough P. O'Brien, was a practicing coastal engineer with over 50 years of experience in a wide range of California coastal problems. The collection consists of Lillevang's project files and reports detailing a multitude of engineering projects throughout California.



BOOK REVIEW

By *Nabil M. El-Khodari*

Shady, Aly M., et al., eds. *Management and Development of Major Rivers*. Oxford University Press, 1996, 469 p.

If you picked this book for its title, you are in for two surprises. First, the title is somewhat misleading. If you expected this to deal with the 'major rivers' of the world, you will find no mention of the Amazon, Euphrates, or Tigris. Second, if you expected a textbook that would lead logically to specific conclusions, you will be disappointed.

The book does include studies of different river systems of the world — the Rhine, Indus, St. Lawrence, Fraser, Ganges, Yellow, Danube, etc. — but its major focus is the Nile. This is not surprising given that the 30 articles in the book were selected from about 100 papers presented at the International Conference on Protection and Development of the Nile and other Major Rivers (better known as the Nile 2000 Conference) held in Cairo in 1992. The conference and the book were sponsored by the Canadian International Development Agency.

The book has the feel of a conference proceeding, but it is logically divided into four parts: river management, environmental issues, morphological processes and hydraulic structures. The first three parts contain studies from other river basins, the fourth is completely devoted to River Nile structures ranging from Old Nile Barrages to bank protection projects, control and conservation projects, and the High Aswan Dam.

It appears that the majority of conference attendees were hydraulic engineers and hydrologists. Half of the papers contain the inevitable complex formulae associated with river modeling. Because of the differences between rivers, these papers have doubtful applicability to the Nile. Nonetheless, this book is a must-read for anyone interested in the Nile Basin, its development and its future — including the equal possibilities of cooperation and conflict. The book offers the example of the Niger River system management as something that Nile Basin countries would be well-advised to follow.

The book contains authoritative texts by the world's leading authorities on the Nile and on water resources management and development. The opening articles of each of the four sections lay out the philosophical, historical, scientific, environmental, and practical background for that section. The book also highlights the questions to be considered in deciding whether to undertake water resource development projects, especially dams, and a wide spectrum of projects from waterfront development to bank protection as well.

Nabil M. El-Khodari is a former environmental studies Ph.D. student in Egypt and moderator of the Nile River mailing list: <http://www.egroups.com/group/NileRiver>

GIFTS

WRCA wishes to thank the following corporations and individuals for becoming Friends of the Archives.

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Sacramento Municipal Water Authority

BOOK REVIEW

By Matthew Nelson

Gillilan, David M., and Thomas C. Brown, . *Instream Flow Protection: Seeking a Balance in Western Water Use*. Island Press, 1997, 417 p.

So you really want to know what all the ruckus is about instream flows? Or maybe you're looking to anticipate how the Feds might try to protect instream flows in your river basin? Perhaps you just need to understand the difference between leaving instream water rights in the hands of individuals vs. state agencies? Well, here is a book that excels at conveying, at all levels, the essence of these and many other complicated instream flow issues.

In *Instream Flow Protection*, Gillilan and Brown manage to draw together distant and disparate corners of the widespread debate over instream flows and present a vivid and comprehensive portrayal of the problems that pervade current efforts at instream flow protection. As you ease into this volume, it is immediately apparent that the authors have put together an engaging and highly thoughtful must-read that will enlighten almost anyone involved in instream flow protection issues. Whether you're a hydrologist, farmer, lawyer, economist, natural resource manager, journalist, or part-time conservationist, you'll find it exceedingly well written and informative. The authors display a rare ability to intertwine and convey complex hydrologic, legal, economic, political, and biological information as they explain the underlying reasons why protecting instream flows is no simple matter.

They carry out their examination of instream flow issues by draping inter-disciplinary responses, rather than answers, over a series of central questions, each of which forms a chapter. Chapter 1: "What's the Big Deal, Anyway?" orients the reader. Chapter 2 provides a brisk history that, by revealing the fundamental flaws of the prior appropriation system, lucidly describes what happened to instream flows. The remaining chapters examine the following questions: What are instream flows for? (Chapter 3), How much water should be left in the stream? (Chapter 4), What are the states doing about instream flows? (Chapters 5 and 6), How do instream flows impact other water users? (Chapter 7), and How do federal authorities, programs, and laws influence instream flows? (Chapters 8-10). Chapter 11 summarizes their previous thoughts, offers warnings of the difficulties that lie ahead, and lists strategies for instream flow protection.

The book is well organized, although it might have made sense to present Chapter 7, which explains the interrelationship between instream flows and other uses, prior to the description of state issues and efforts found in the two preceding chapters. The chapters explaining the hydrologic nuts and bolts of instream issues (4 and 7), were particularly original in their perspectives and scopes and would be especially useful to anyone attempting to develop strategies for protecting instream flows. Valuable references abound.

The authors' backgrounds in water resources management, law, and economics are reflected in their cogent and pragmatic analyses. Although it is clear that Gillilan and Brown support the development of measures that provide for instream flows, arguments to the contrary are recognized throughout the book. The tone is dispassionate, the analysis even-handed, and the observations often refreshingly blunt, as in their candid appraisal of the institutions responsible for managing water: "Unfortunately, most states so far seem to assign instream flow protection activities to public agencies for just the opposite reason – to discourage rather than encourage instream flow protection."

They reveal many sources of conflict but always with an eye on reaching solutions that will maximize the total benefits produced by our limited water supplies. They explain various strategies for protecting instream flows including unconventional methods such as the "purchase of offstream water rights by downstream hydropower producers," an alternative that some might not readily recognize as potentially beneficial for the environment. They clarify the difference between minimum flows and optimum flows. They delve into the sometimes-convoluted strategies, both successful and failed, that federal agencies have employed in their efforts to protect instream flows. They even manage to explain such things as the Instream Flow Incremental Methodology in layman's terms.

This book undoubtedly will go a long way towards removing what Gillilan and Brown identify as the single greatest impediment to reaching that elusive balance in western water use: misperceptions of instream flows stemming from a lack of information.

Matthew Nelson, a UC Berkeley alumnus, is a research specialist in the Office of Planning at the Texas Water Development Board.

SAVING THE SALTON SEA?

By Linda Vida

The Salton Sea was the subject of the first lecture in the California Colloquium on Water. Professor Emeritus Gerald Orlob, UC Davis, discussed the current ecology of the Sea, its history, possible solutions for restoration as presented in the recently released Environmental Impact Report, and other concerns. An audience of approximately 25 UC faculty, staff, students and the public attended the lecture on September 12th.

The Salton Sea, the largest inland body of water in California, lies 35 miles north of the US-Mexico border and 65 miles east of San Diego in one of the most arid regions in North America. The Salton Sea is 25 percent saltier than the ocean, yet it teems with many different species of fish, all of which are introduced species. The sea was created in the winter of 1904-05 by a man-made mishap. In order to provide more water for agriculture in the Imperial Valley just south of the Salton Sea, a new intake was being cut south of the international border. Water was to be routed from the Colorado River to the Imperial Valley using the old channel of the Alamo River. During that winter, however, the river flooded on three occasions and water continued pouring into the old channel despite attempts to close the new intake. It took more than 18 months before the Colorado River could be turned back into its channel. This flood created the Salton Sea which eventually covered 400 square miles.

Today, the Salton Sea receives approximately 1.35 million acre-feet of water annually. More than 75 percent of this water is agricultural drainage, which adds additional salts and nutrients to the water. Since the Salton Sea is a terminus lake, as water evaporates, salts, selenium and other contaminants are concentrated in its sediments. In the 1950s and 1960s, the sea was a thriving recreational area supporting boating and fishing. Since that time, however, a combination of environmental and economic factors have caused a decline in the recreational value of the Salton Sea, and most of the water-front developments have been abandoned. Massive fish die-offs have been linked to the eutrophic conditions in the sea, and there have been significant numbers of bird deaths there as well.

For more than thirty years, private entities as well as state and federal agencies have developed proposals to restore the sea. A recent profusion of fish and bird deaths has

captured the attention of the media and policymakers, and more than \$20 million in state and federal funds has been allocated to study and address the problems..

In 1998, Public Law 102-575 directed the Secretary of the Interior to “complete all studies, including, but not limited to environmental and other reviews.” The five goals of the Salton Sea Restoration Project are: (1) maintain the Sea as a repository for agricultural drainage, (2) provide a safe environment for resident and migratory birds and endangered species, (3) restore recreational value uses, (4) maintain a viable sport fishery, and (5) enhance the Sea to provide economic development opportunities. Five slightly-varying scenarios have been identified to assist in restoration; the basis for each is to provide long-term salinity and elevation control of the Sea. It has been proposed that evaporation ponds be constructed within the Sea using barriers. The surface area and location of the ponds vary, but approximately 98,000 acre-feet of water would be pumped into these ponds annually. Evaporation would concentrate salts in the ponds and allow the salinity in the Sea to remain relatively stable. The ponds would also displace some of the water, which would help maintain the target elevation of the Sea if inflows of water decrease in the future. Additional measures to clean up the shoreline, improve recreational facilities and manage the fisheries would be implemented along with other long-term management strategies.

A question and answer period followed Professor Orlob’s presentation. A question asked was whether the Salton Sea was worth saving based upon the huge amount of funding that it would require and given that it is not a natural water body. Professor Orlob responded that the Sea has become a major part of the Pacific flyway for birds, and if for no other reason, must be restored to protect that habitat. This lecture – as can be expected in most matters concerning water in California – stimulated more questions than answers about the Salton Sea.

Additional resources:

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FREE PUBLICATIONS

The following duplicates were received at the Archives and are available free by faxing your request to Rachel, 510-642-9143, or e-mail to raronowi@library.berkeley.edu.

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Intermittent Surface Water Supply. Total Water Management Study for the Central Valley Basin, California. Working Document No. 6. U.S. Bureau of Reclamation. April 1975.

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Merced Wild and Scenic River. Draft Comprehensive Management Plan and Environmental Impact Statement. Parts 1 and 2. National Park Service. Department of the Interior. Prepared by Environmental Science Associates, San Francisco, California. January 2000.

Dissipation of Soil Selenium by Microbial Volatilization at Kesterson Reservoir. Final Report. U.S. Bureau of Reclamation. Prepared by W. T. Frankenberger, Jr. Department of Soil and Environmental Sciences, University of California, Riverside. May 1980.

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