



OUR STORIES

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The history of the development of the Western United States goes hand in hand with the history of water development in the area. One of the greatest challenges of living in this land is meeting the ever-growing demand for water. How can an arid state like California support large-scale agriculture, as well as an ever-growing human population? Out of that question grew the California Water Resources Oral History Series. Begun in 1954, the series of autobiographical interviews chronicles major water issues as seen through the eyes of the people who were not only present, but played active roles in these landmark events. Told in their own words, these are their stories preserved for generations to come.

The latest events to be chronicled in this on-going series were the passage of the Central Valley Project Improvement Act and the debate over the proposed development of the Baumberg Tract. Both were controversial topics and the effects from each will be felt for years to come. Since 1993, series director Malca Chall interviewed the key players, recording their experiences.

On May 30, 2001 the Bancroft Regional Oral History Office and the Water Resources Center Archives gathered to celebrate the completion of both of these oral histories. In a reception held in the Woman's Faculty Club on the UC Berkeley campus, participants and scholars alike met to mark the occasion.

WRCA director Linda Vida welcomed the guests and Charles Faulhaber, director of The Bancroft



Charles Faulhaber explains the history of the Water Resources Oral History Series

Library, spoke about the history of the Water Resources series. Thomas Graff of Environmental Defense spoke about his experience of participating in the Central Valley Project Improvement Act oral history, likening it to a military debriefing. He then commended Ms. Chall on her skill at the art of interviews. He was followed by Bob Douglass of Cargill Salt, who also spoke of his experience participating in the oral history. He then gave the listeners an update

on the future plans for parts of the Baumberg Tract, emphasizing the fact that the effect of these events is still very much felt today.

Ann Lage, acting head of the Regional Oral History Office, spoke next. She had the sad task of announcing Malca Chall's resignation. With a smile, Ms. Lage apologized for accepting the resignation, adding that Ms. Chall had retired once before, but had been pressed back into service. She then presented Ms. Chall with a volume of her own, *The History of Malca Chall*.



Ann Lage presents Malca Chall with her own oral history

The last to speak that evening was Malca Chall. She told the audience how the Baumberg Tract began out of curiosity and concern over events taking place in her community. A series of newspaper clippings and casual questions grew to a 3 year project. Soon the project came to encompass more than one neighborhood. It became obvious that this was an historic event with vast implications. Eleven interviews were conducted, with engineers, environmentalists, politicians and activists. In her 80's, Ms. Chall spoke of her work with passion and dedication, but concluded by saying her work was now completed.



From left to right: Judith Dunning, Lisa Rubens, Laura McCreery, Gaby Morris, Ann Lage, Willa Baum, Bob Douglass, Lee Swent, Malca Chall, Charles Faulhaber, Linda Vida and Thomas Graff

The full text of the Central Valley Project Improvement Act interviews and the Baumberg Tract interviews are available for viewing in both the Water Resources Center Archives and The Bancroft Library. Copies can be purchased from the Bancroft Regional Oral History Office. For more information on purchasing your own copy, please call (510) 642-7395 or visit the ROHO web site at www.lib.berkeley.edu/BANC/ROHO/.

THE "BEST DAM ARCHIVES IN THE WORLD" GETS EVEN BETTER

April was certainly the kindest month for the Archives this year. On a single day, the Archives received two major gifts of international dam and hydroelectric power plant materials. John Cassidy, a retired hydraulic engineer from Bechtel Corporation, and Arthur G. Strassburger, a consulting hydroelectric engineer, donated several boxes containing over two hundred books and journals, including several volumes of *Waterpower* (International Conference on Hydropower) proceedings—completing WRCA's holdings of this set—and the *International Water Power & Dam Construction* journal.

Following is a list of some of the major titles included in these acquisitions. As can be seen from just this small selection, the Archives' coverage of the dams of the world has increased tremendously—offering further support to dam historian Donald C. Jackson's claim that WRCA is "one of the best dam archives in the world."

Austria

Dams in Austria. Austrian National Committee on Large Dams, Vienna, 1991. **G685 N1**

Canada

River Tamers: Québec's Expertise in Hydroelectricity. Société d'édition de la revue FORCES, Montréal, 1989. **G174 M9**

Chile

Embalse Santa Juana, Vallenar, Chile. Ministerio de Obras Públicas, Dirección de Riego, Santiago, 1996. **G598 N6-2**

Large Dams in Chile. Chilean National Committee on Large Dams, Santiago, 1996. **G598 N6-1**

China

Large Dams in China: A Fifty-Year Review, by Jiazheng Pan and Jing He. China WaterPower Press, Beijing, 2000. **R G924 P**

Harnessing the Rivers : Large and Medium Hydropower Stations in China. Today China Press; China WaterPower Press, Beijing, 2000. **G924 P-1**

Iceland

Energy Resources and Dams in Iceland. Icelandic National Committee on Large Dams, Reykjavík, 1989. **G622 M9**

Indonesia

Dams in Indonesia. Indonesian National Committee on Large Dams, Jakarta, 1986. **G874 M6**

Iran

Ancient Dams of Iran. Iranian National Committee on Large Dams, Tehran, [n.d.]. **G828 M**

A General View on Iranian Dams, Past-Present-Future. Iranian National Committee on Large Dams, Tehran, 1993. **G828 N3**

Italy

Dams in Italy. Comitato Italiano Grandi Dighe, Firenze, 1997. Prepared in commemoration of the 19th Congress of the International Commission on Large Dams, Florence, Italy. **G683 N7**

Japan

Dams in Japan. Japanese National Committee on Large Dams, Tokyo, 1994. **G920 K-1 1994**

Norway

The Alta Power Plant and the Landscape, by Knut Ove Hillestad. Norges Vassdrags- og Energiverk, Oslo, 1993. **G626 N3**

Romania

Dams in Romania. Romanian National Committee on Large Dams, Bucharest, 2000. **G692 P**

Spain

Selección de Presas Españolas, 1973-1993. Ministerio de Obras Públicas, Transportes y Medio Ambiente, Dirección General de Obras Hidráulicas, Madrid, 1994. **G673 N4-2**

Our Work on Dam Construction. Confederación Hidrográfica del Guadalquivir, 1988. Prepared for the 16th ICOLD, San Francisco, 1988. **G673 M8-1**

The Canales Dam, by Guillermo Bravo. Confederación Hidrográfica del Guadalquivir, 1992. **G673 N2-1**

Dams & the Environment in Spain. Ministerio de Obras Públicas, Transportes y Medio Ambiente, Dirección General de Obras Hidráulicas, Madrid, [1994?]. **G673 N4-1**

Spanish RCC Dams, 1996. Instituto Español del Cemento y sus Aplicaciones (IECA); Comité Nacional Español de Grandes Presas (CNEGP), Madrid, 1996. **G673 N6**

South Africa

Large Dams and Water Systems in South Africa. South African National Committee on Large Dams, Pretoria, 1994. **G757 N4-1**

Syria

Water from Dams in Syria. International Commission on Large Dams, Paris, 1993. **G824 N3**

Turkey

Turkey and Water Issues in the Middle East, by Özden Bilen. South-eastern Anatolia Project (GAP) Regional Development Administration, Ankara, 1997. **G825 N7**

Dam Engineering in Turkey. Turkish National Committee on Large Dams, Ankara, 1999. **G825 N9**

Historical Dams in Turkey, by Ünal Özis. State Hydraulic Works Administration, Ankara, 1999. **G825 N9-1**

A Large Dam on Difficult Foundation : Keban Dam, by Refik Akarun. Yapi Teknik Engineering & Consultancy Company (Yapi Teknik publication no. 1), 1999. **G825 N9-2**

Are you an engineer, water rights attorney, professor, or historian?

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BOOK REVIEW

By **Tim Strohane**

SALT DREAMS

Writer William deBuys and photographer Joan Myers produce in *Salt Dreams: Land and Water in Low-Down California* a chronicle of the dreams of those inhabiting the desert region of Southern California. As rich as their work of prose and photography is, it reverses the truism that a picture is worth a thousand words. In *Salt Dreams*, each of Myer's desiccated black and white prints of "low-down California" is illuminated by deBuys' effortlessly evocative prose.

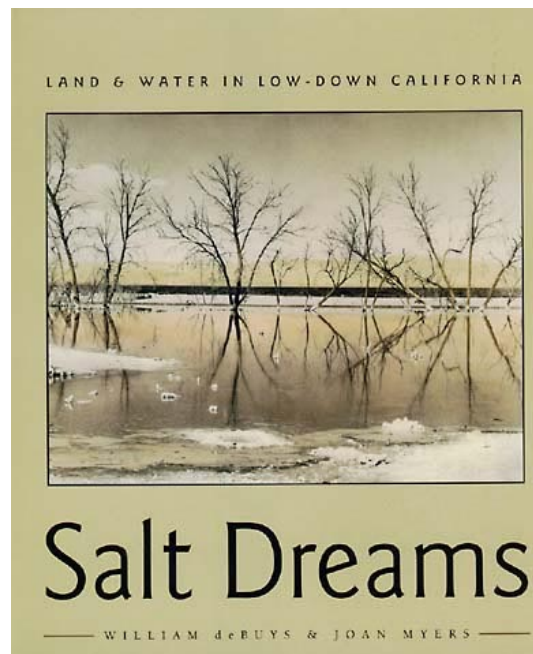
For all of my amateur's love of California's water and land, and all the books I have read on those subjects over the last 20 years, none has so moved me, so ably evoked being *there* as has *Salt Dreams*. By choosing to link human dreams to the material world, deBuys and Myers reveal Americans' presence on desert land and water. The bleak heat and timeless fragility of the desert parch their reader's mouth; I could not read the book at home without a tall glass of water beside me: a constant reminder to slake my vicarious thirst.

Those dreams – pipe dreams, mostly – propelled Americans to control the Colorado River and harness it to create the agricultural world of Imperial Valley, and the unplanned flooding of the Salton Sea in 1905. But before that, deBuys reminds us that native peoples dreamed the desert: the Quechan (Yuma) tribes and the Chemehuevi left their marks on the landscape, apparently in loving praise of the perfect creation they found about them. They etched petroglyphs into travertine, fashioned intaglios of horses on the ground, and gave shape to symbolic patterns of unknowable meaning, withstanding centuries in a hostile and austere desert clime. Myers faithfully records them all with her camera.

Conflicts arose between these tribes and the Spaniards and, later, Americans who came to the Colorado Desert to act out their dreams – from the seven cities of Cibola to modern state-sponsored self-made men of low-down hydraulic society. deBuys wisely recognizes that these dreams, brought with them dream-devices like "property" to separate a man from all others through the accumulation of money and possessions. And he rightly connects these devices to water.

deBuys does not necessarily think this is a wise view of water or land. But he and Myers are chroniclers, and they find other such dream-devices: the U.S.-Mexico border and Imperial Valley growers' dreams of infinitely fungible farm labor.

They also find dreams along paths less traveled: Leonard Knight's dream of spreading God's love in the desert wilderness, the dreams of personal freedom from others deBuys finds in the desert rats, migratory Midwestern "snow birds," flim-flam developers, and other footloose American characters. Myers' photos of these sorts and their leavings (such as the pathetic "Salton Riviera") make familiar the aspirations of ordinary Americans. But for their daily celebrations of desert freedom, some might be among the urban homeless. deBuys and Myers' prose and art give these women and men dignity stripped from so many of the homeless in America's cities.



Where dreams move a people too far, nightmares take over. "In low places consequences collect," reports deBuys ominously on page 223. Threats to desert freedom abound in the low-down Imperial Valley south of the Salton Sea. deBuys and Myers focus on unceasing pollution and mass bird deaths and fish kills plaguing the Salton Sea from agricultural wastewater and industrial offal from the New River and the Mexicali-Calexico maquiladoras. The Salton Sea itself floods tribal lands of the Torrez-Martinez Indians. Even Leonard Knight's montane homage to God's love consists of lead-based paint, and is considered a probable hazardous waste site by Imperial County's public health officials.

And there is the potential nightmare of Imperial Irrigation District's water transfers to the Metropolitan Water District and the San Diego County Water Authority, presaging California's entry into a water market in which Colorado River water flows uphill to the wealthy coastal urban plain to irrigate developers' dreams of *More Growth*.

Finally, deBuys and Myers explore the international issue of dewatering the Colorado before it reaches Mexican farms and Mexico's once-rich Colorado delta, now starved of water from diversions in el norte.

"A society can rightly be judged by the dreams of its people. Every dream is a story about the future, a vision of how things should be. A dream mirrors the qualities of its dreamer; perhaps nothing mirrors them better," writes deBuys. The authors avoid judging too harshly; perhaps lest they be judged so themselves? Perhaps.

Ultimately, deBuys and Myers offer up *Salt Dreams* as an eloquent

elegy for American domination of the Colorado desert. But after Salt Dreams visits the Salton Sea, deBuys gamely tries to buoy our spirits.

“...The story of the future will be more like the story of the Salton Sea. It will concern society’s efforts to live within and at times ameliorate the consequences of what was broken. We have entered an age of obligatory adjustment and repair.”

deBuys and Myers neither hoot down nor mock, nor do they merely record their dreamers. They resist any temptation to predict low-down California’s future. Through word and image in *Salt Dreams*, they ply us with the folly and awesome-ness of human dreams, with the interplay and powers of ideas. As a work of art, read it and marvel. But keep a glass of water close by.

Tim Strosbane is editor and publisher of SPILLWAY, a newsletter about California water, land and people. SPILLWAY is available at the Water Resources Center Archives. For more information on SPILLWAY, you can reach Tim at spillway@yahoo.com or at SPILLWAY, P.O. Box 8362, Berkeley, CA, 94707-8362.

IN THE SPOTLIGHT

DESALINATION PLANT PROPOSED IN FLORIDA

by Charles Kovach

Groundwater is the primary source of water for the west-central region of Florida. Recent expansions of groundwater pumping to meet increasing demand has resulted in adverse impacts to wetlands and lakes in the vicinity of well fields, as well as saline intrusion. This necessitated the evaluation of alternate sources to enhance water supply for the 2 million retail water customers in the region. Tampa Bay Water, the regional water supply authority for the region encompassing Hillsborough, Pinellas, and Pasco Counties, has made a commitment to reduce groundwater withdrawals by the end of 2002, and has begun to develop an “Enhanced Surface Water Supply” plan. That plan includes water cropping from three rivers (the Hillsborough, Alafia, and Palm Rivers), permitting and construction of a regional reservoir, and permitting and construction of a desalination facility.

Initial proposals called for construction of the facility to begin early in 2001 and for operation to begin by the end of 2002. Should construction and operation begin as designed, this facility will be one of, if not the, largest seawater desalination facility operating in the western hemisphere.

A commitment was made to deliver water at a wholesale cost of \$1.71/1,000 gallons, with an average 30-year cost of \$2.08/1,000 gallons, well below the cost of other recent desalination efforts.

This cost partly reflects the blending of the desalination water source with other source waters, to include groundwater and surface water. This mixture of source waters is also expected to provide some degree of ‘insulation’ to the water supply during droughts such as are currently being experienced in the region.

The planning process for the proposed desalination facility began in 1996. In 1999 Tampa Bay Water approved the plans and the permitting process was initiated. Employing the process of reverse osmosis, the average production of the proposed facility would be approximately 25 million gallons per day (MGD) of product water using an average of 44.5 MGD of pre-treated water. Unlike traditional facilities, which begin with brackish water, the proposed facility will process seawater.

The desalination facility is to be co-located with a power plant that currently withdraws up to 1.4 billion gallons per day (BGD) of seawater for cooling. The proposed design for the desalination facility calls for removal of an average of 44.5 MGD of once-through-cooling water upon exiting the cooling condensers. Treatment will include pre-filtration/clarification and reverse osmosis. An average of 19.5 MGD of brine will be discharged back into the cooling water discharge pipes of the power plant. By recycling the once-through-cooling water, rather than withdrawing additional seawater, the impact to the marine environment, specifically the entrainment & impingement of organisms, is reduced. This solution, however, is not without its challenges. The temperature of the water exiting the power plant is higher than that used at other desalination facilities, pushing the envelope of reverse osmosis technology.

It is proposed that membrane-cleaning solutions will be disposed of to a permitted regional domestic wastewater treatment plant, and solids generated from the pre-filtration/clarification process will be handled as solid waste and disposed of in an appropriately permitted facility. The draft permit would also allow for an auxiliary source water supply when the source water temperature exceeds 100° F, the allowable range of the reverse osmosis membranes.

The draft permit that has been issued for the facility calls for redundant pre- and post-construction monitoring of intake and discharge for of water quality. A pilot plant in operation at the power plant produced data for review of potential water quality impacts related to the composition of the source water, membrane cleaning, and concentration during the reverse osmosis process. Mass loading calculations were performed using this data to document the ability to comply with surface water discharge standards under the federal NPDES program and State water quality criteria.

Selected receiving water quality parameters will be monitored continuously over a three-day period each month for a year prior to and a year after discharge. Pre- and post- discharge monitoring of biological components of the receiving waters will be performed, including seagrasses, benthic macroinvertebrates and fish. The data generated from this monitoring will be reviewed in conjunction with other monitoring activities occurring in the vicinity of the discharge,

and may be modified based upon results from this initial sampling.

The draft permit has recently been challenged by third parties, and an administrative hearing may be set within the next several months. Issues to be decided in the hearing process include the potential impacts of the proposed discharge on receiving waters and surrounding habitat, as well as whether financial responsibility should be provided by the applicant under applicable Department rules.

For more information on the proposed facility, please visit the Florida Department of Environmental Protection Q&A page at www.dep.state.fl.us/officsec/news/desalqa.htm

Charles Kovach is an Environmental Manager with the Florida Department of Environmental Protection. He received his B.S. in Marine Science/Biology from the University of Miami, Miami and his M.S. in Botany from the University of South Florida, Tampa. In addition to his 6 years with FDEP, Charles has worked as a private consultant and as a Peace Corps volunteer in the West Indies.

Survey of California Water Agencies 2000-2001 Update

The history and prosperity of California is intimately connected to the development of its water resources. The Water Resources Center Archives received a grant to conduct a survey of historical and current records held by California water agencies. The purpose of the survey was to collect information about each district and to survey the extent and type of records and documents that each district may have, storage conditions, accessibility, etc. WRCA invited 450 California water agencies to participate in this project. The information provided by the participants has been compiled in a computer database. This database is accessible by the public on a computer terminal at WRCA. A tally of the responses has revealed the following information concerning the historical and current records held by California water agencies.

Date collections began

1940s-1960s - 51%
1900s-1930s - 28%
1800s - 11%
1970-present - 5%

Collections available for research

Yes - 94%

Ways in which users are able to locate descriptions of historical records

Typewritten registers/inventories/finding aids - 54%
Computer Catalog accessible in-house - 24%

Printed guide to whole collection - 7%

Significant impediments to the use of historical records

Lack of indexes or other finding aids - 68%
Cannot physically locate them - 18%
Necessary equipment not available (i.e. microfilm readers, tape players) - 18%
Records deteriorated beyond use - 11%

Portion of historical records documented in a finding aid

Less than 25% - 48%
75-100% - 25%
50-74% - 16%
25-49% - 14%

Available equipment for managing or making historical records available

Photocopier(s) - 90%
Computer(s) - 73%
Web site - 44%
Digital scanners - 43%
Tape/video player(s) - 37%
Digital cameras - 28%
Microfilm/fiche reader(s) - 25%
Copying equipment for photographs - 15%
Microfilm camera - 4%

Percentage of agencies that have experienced loss of historical records due to misfiles, water, fire, and theft

Misfiles - 52%
Water (floods, leaks) - 16%
Fire - 7%
Theft - 5%

Percentage of agencies that have undertaken the following preservation/conservation measures, either in-house or through an outside contractor

Optical imaging or scanning - 53%
Microfilming - 45%
Document conservation/repair - 9%
Disaster recovery - 4%

The most pressing problem confronting historical records collections

Lack of space - 26%
Lack of time - 16%
Need for a cataloguing system - 13%

The survey also reveals the types of records preserved by water

agencies. Ninety-five percent of the agencies save administrative records (correspondence, minutes, annual reports, and bylaws). Ninety-one percent hold books, reports, scrapbooks, and clippings. Ninety-percent save their financial records such as budgets and audits. Seventy-three percent collect media records (photographs, slides, transparencies, audio recordings, oral histories, films, video recordings, microfilm/microfiche, and computer media). Only fifty percent of agencies preserve promotional materials (brochures and pamphlets). EIR/EIS and technical reports are available at seventy-eight percent of the water agencies. Ninety-four percent collect maps, architectural drawings, drawings, blueprints, plans, specifications, and field notes. Contracts, permits, estimates, bids, articles of incorporation, and formation papers are available at ninety-five percent of the agencies. Sixty-four percent of the agencies save their newsletters.

Agencies store eighty-four percent of the above material in office areas, fifty-eight percent in storage rooms, twenty-nine percent at off-site storage, eighteen percent in warehouses, and twelve percent in attics or basements. Unfortunately, the survey revealed that these storage areas are not ideal. Only twenty-eight percent of the storage areas are equipped with year round temperature controls, ten percent have year round humidity controls, thirty-five percent have fire detection devices (smoke/ heat alarms), and seventeen percent have fire suppression devices (sprinklers, Halon). Perhaps these storage areas have contributed to the loss organizations historical records. Seven percent of the organizations have experienced a loss of records due to fire. Floods or leaks have caused sixteen percent of the agencies to lose records. Fifty-two percent of our survey participants have experienced loss due to misfiles.

Around half of the surveyed agencies have undertaken preservation and conservation measures. Fifty-three percent engage in optical imaging or scanning and forty-five percent are involved in microfilming. Most agencies provide an assortment of equipment that allows the public to view their records. Ninety percent have photocopy machines. Seventy-three percent have computers. Forty-four percent maintain an active Web site. Forty-three percent use digital scanners. Thirty-seven percent provide tape/video players. Twenty-eight percent have digital cameras. Twenty-five percent supply microfilm/fiche readers. Fifteen percent of the survey participants have copying equipment for photographs.

At the end of the survey we asked the agencies to tell us their most pressing problem confronting their historical records collections. The three most common answers were lack of space (twenty-six percent), lack of time (sixteen percent), and the need for a cataloging system (thirteen percent).

Please join the WRCA staff in congratulating Erica Nordmeier on her recent appointment to The Bancroft Library. Erica was the friendly face behind the Survey of California Water Agencies. Our best wishes go out to her as she begins an exciting new job.

Our sincerest thanks to everyone who participated in the Water Agencies Survey.

If you were not able to complete your survey before the deadline, never fear. We would still love to hear from you.

You can complete the on-line survey at www.lib.berkeley.edu/WRCA/survey.html or call 510.642.2666 for a paper copy.

SPRING COLLOQUIUM

Did you know that over the next few years California could face a water crisis more devastating than the current energy crisis? Are you aware of the challenges of overseeing a very populated water district in an arid region? Do you know how many fish, plants and people all depend on the Bay Delta for water? Do you understand the chemical properties of water? If not, you didn't attend the California Colloquium on Water Spring Series.

The California Colloquium on Water is so much more than a lecture. It is a chance to learn about all aspects of water in California, from people who daily deal in the state's most precious commodity. More than dry statistics, the Colloquium speakers give the audience a peek "behind the scenes" into the legal, social, scientific and engineering aspects of the state's water issues.

The first three speakers in the spring lecture series California Colloquium on Water all dealt with the future of water supplies in the state, albeit from different perspectives.

Attorney Arthur Littleworth, co-author of *California Water* and an expert on water law, kicked off the spring series in February with a speech provocatively titled "Are We Going to Run Out of Water in California?" Speaking as the state's energy crisis was making

headlines daily, Littleworth drew comparisons and distinctions between water and power supplies. The public, he noted, has always assumed that both would be readily available. While Californians were beginning to feel the effects of energy shortages, Littleworth said, “There is little comprehension in the state of what a water shortage would mean to our economy and our way of life.”

Power, he noted, can be made and imported from out of state, whereas it would be very difficult for California to import more water than is currently flowing into the state. “It takes very big systems to move water,” Littleworth said. The advantage that water has over power is that it can be stored.

“In my judgment, the key to meeting our water needs is storage,” he said.

That more water will be needed is a given. Noting that the state’s population is expected to grow by one million or more every year through 2025, Littleworth said California already is using more water annually than its average supply. “We don’t realize this because we are over-drafting groundwater resources. We are already drawing on our bank account as far as water is concerned.”

Californians have practiced water conservation, he said, pointing out that water use in southern California’s Metropolitan Water District is less than in 1986. “But conservation alone won’t meet future needs.” After discussing the practical and political difficulties involved in some potential solutions – reclamation, desalinization, and reallocation – Littleworth turned to storage as a viable option for meeting future needs.

An \$8 billion, seven-year plan, “California’s Water Future – A Framework for Action,” signed by Governor Gray Davis and former Interior Secretary Bruce Babbitt, allocates funds for a reclamation project and for groundwater storage but not for what Littleworth sees as an essential element in meeting the state’s water needs - Surface storage.

“I’m not talking about damming up a river,” he said. “I’m talking about off-stream reservoirs. Groundwater storage is essential, but it takes a long time; it has to percolate. We need surface storage.”

Surface storage takes 5-10 years to construct, Littleworth said. “If we don’t stay ahead of the problem, we will put the state in peril and we’ll be facing a crisis like the power crisis.”

In March, Ronald R. Gastelum brought the water supply issue into focus for a single, major district with his lecture, Metropolitan Water District: Challenges in a Changing California. Gastelum is general manager of MWD, which serves 17 million customers in 240 cities in an area stretching from Ventura County to the Mexican border.

“We’ve been struggling with how to be reliable,” he said. The drought conditions of the early 1990s led to two significant realizations for MWD. It wouldn’t get 2 million acre feet of water from the State Water Project, and it lacked sufficient storage capacity. Out of that experience came an Integrated Resources Plan (IRP) for the district.

Gastelum outlined the goals of the IRP, including developing additional storage, investing in conservation and recycling, keeping the Colorado Aqueduct full, controlling the cost of water, and reducing dependence on the State Water Project in dry years.

By investing in storage, he said, the district is able to “take water in wet years and store it to meet demand in dry years.” This has the advantage of meeting local needs while “lessening the impact on the Bay-Delta during those dry years.” He pointed to the district’s Diamond Valley Lake near the city of Hemet as a successful project with a six-month emergency supply of water. “It was successful for two reasons,” Gastelum said. “First of all, it’s off-stream, and, secondly, MWD was willing to invest in nearby ecological preserves that were important to the local community. We had to recognize that we would have impact on the local environment and deal with that.”

Since adopting the IRP, the district has invested \$220 million in conservation, working with the educational establishment – “We’re in every school with conservation programs” – and the business community – “We’re getting businesses involved in installing water-saving fixtures and systems” – and encouraging use of low-flush toilets and low-flow showerheads.

“What we would like to see in the future,” Gastelum said, “is more water transfers.” Acknowledging that MWD is often viewed with suspicion, he said, “I talk about developing business relationships” with water suppliers. “We’d like to do business with the Central Valley and northern California. We’d like to see water markets with other states. But the locals have to decide for themselves that they want to transfer water; they need to see the benefits. The problem is that there aren’t enough data on the impact of transfers.”

Such transfers, he said, would not only lessen the pressure on MWD but would diminish the need for a peripheral canal and would reduce demands on the Bay-Delta.

The Bay-Delta was the topic of April’s lecture by Richard Denton, water resources manager of the Contra Costa Water District, who spoke about “Understanding the Sacramento-San Joaquin Bay-Delta – An Engineering Perspective.”

Denton referred to the Delta as the “choke point” in the delivery of water from north to south in California. A vast part of the state is affected by the Delta, which is the source of drinking water for 22 million people, is home to 750 plant and animal species, and

supports a \$27 billion agricultural industry. Denton has a special interest in preserving and enhancing the quality of the Delta because it is the source of Contra Costa County's water.

He outlined some goals for the Delta based on the CALFED process. These include ensuring water quality for drinking, for agriculture, and for fish; restoring a sustainable ecosystem; matching water supply and demand, and improving the structural integrity of the levee system.

Engineers take a "hard" approach to meeting these goals. Such approaches include building barriers like the South Delta Improvement Project to move the flow of water; designing fish screens that don't impede the movement of fish; increasing pumping capacity, and creating storage capacity to capture water in high rainfall years.

Denton recalled an incident in 1999 when the Delta Cross Channel was closed to allow fish to move downstream. "The closure caused Delta water quality standards to be violated. Modeling showed that wouldn't have happened without the closure. It was a time of tension between water purveyors and environmental groups and fisheries." Experiments are being conducted now to find ways to protect both the fish and the quality of the water. Denton and his colleagues are asking such questions as: "Do the fish move during the day or at night?" and, "What would be the effect of having the channel open for only a few hours at day?"

Proposals under study for new or expanded storage include adding six feet to the Shasta Dam Reservoir and increasing the capacity of Contra Costa's Los Vaqueros Reservoir from 100,000 acre feet to 500,000, which would require removing the current dam and building a new one.

Los Vaqueros, completed in 1998, was the first new reservoir in California in 10 years. "We store good quality water there," Denton said. "We can release it to blend with Delta water when the Delta water isn't so good, and we can get off the Delta when it's most important for the fish" to migrate freely.

Denton also cited some "soft" approaches to meeting the goals for the Delta. These include watershed protection, wetland and riparian habitat restoration, advanced drinking water treatment, removal of barriers to fish migration such as dams on small tributaries, and improved water use efficiency through conservation, reclamation, and water transfers. He acknowledged that water transfers would require "a very political decision" and suggested that perhaps market forces could be employed.

The May speaker, Richard Saykally, professor of Chemistry at UC Berkeley, started out by asking the audience *What makes water wet?* He demonstrated the qualities of water by using a large water gun to help the audience experience wetness. He then described some of the mysterious properties of water: a liquid phase (water), a solid phase (ice) and an aerosol phase (steam). There is only one other

substance on earth where a solid floats on a liquid. He also described some of the essential aspects of water for life on earth.

He discussed the peculiar bonding structure of frozen water in laboratory experiments and the variant forms of ice that have been discovered. There are ice molecules that are created by hydrogen bonds of one, two, three, four, five or six rings. He also discussed the research in which the Saykally Group is involved, to emphasize the importance of continued research into this remarkable substance.

If you are kicking yourself for missing the fun, video tapes of the talks given by both Richard Denton and Richard Saykally can be borrowed from WRCA. If you would like to learn more about any of the speaker's topics, visit the Archives Monday through Friday between 10:00 and 5:00.

The 2001 – 2002 series is beginning to take shape. Already, Joseph Sax, Professor of Law at UC Berkeley and Takashi Asano, winner of the Stockholm Water Prize have agreed to speak. As always, the series is free to anyone who wishes to attend. For more information as it becomes available, visit the WRCA web site at www.lib.berkeley.edu/WRCA/.

WHY ARE THE DOORS CLOSED?

WRCA is currently operating
on our summer hours.

10:00 AM to 5:00 PM
Monday through Friday.

We will return to our normal
hours of 9:00 AM to 5:00 PM
in the Fall.

FREE PUBLICATIONS

The following duplicates were received at the Archives and are available free by sending email to Michele Feltman-Strider, mfeltman@library.berkeley.edu, calling (510) 642-2666, or faxing (510) 642-9143.

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