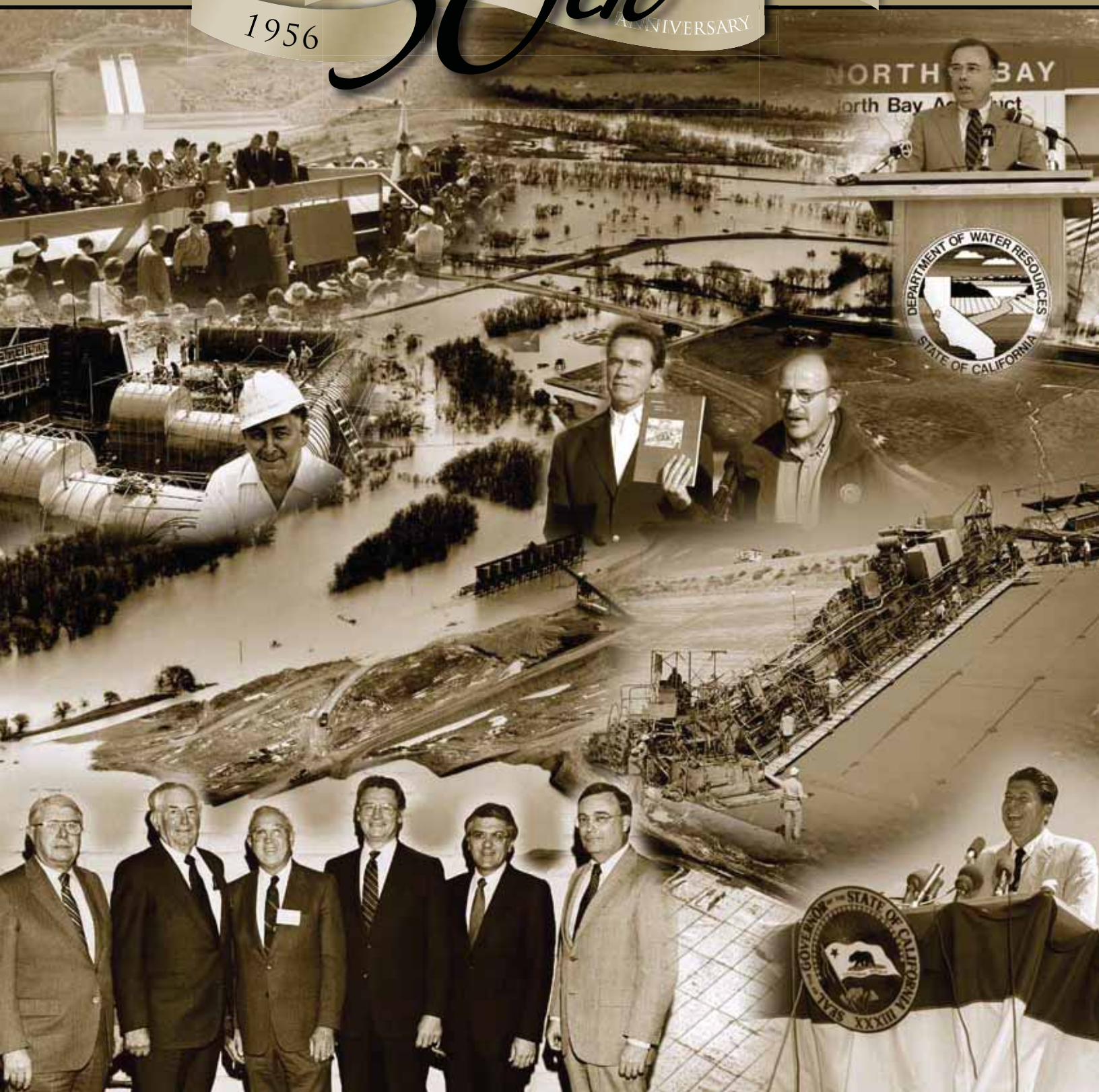
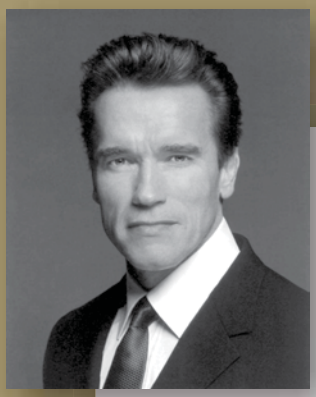
DWR NEWS *People*

DWR'S 1956 50th ANNIVERSARY 2006





GOVERNOR ARNOLD SCHWARZENEGGER

Department of Water Resources

I am pleased to join all Californians in offering my congratulations as you celebrate your 50th anniversary.

For half a century, through fair weather, drought or flood, DWR has helped guide and nurture water resources planning and management in California. The department has garnered international respect for building and operating the State Water Project and California Aqueduct that supplies water to homes and businesses, irrigates productive farmland, fuels economic development, helps fish and ecosystems, and recharges groundwater basins.

DWR is a trailblazer in innovative management practices and provides top quality engineering and technical expertise to California water policy makers. You are a vital partner in planning and achieving goals for water quality, flood management, dam safety, conservation and water supply reliability.

I salute the Department as you celebrate 50 years of excellence, and I thank you for improving and sustaining our water resources for future generations.

Sincerely,

Arnold Schwarzenegger

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DWR NEWS *People*

DWR's 1956 50th Anniversary 2006

GOVERNOR's BOND PROPOSAL ON PAGE 39

Governor Schwarzenegger, Director Snow, and Secretary for Resources Chrisman announce Flood Protection and Clean, Safe, and Reliable Water Supply Bond and Financing Acts of 2006 and 2010.

SAVE THIS DATE:

Wednesday, May 31, 2006, DWR will celebrate its 50th Anniversary at the State Capitol. More Information to be announced on DWR's Web site at ***http://www.water.ca.gov/***

Table of Contents

5 The Birth of DWR

6 Director Snow Looks to DWR's Future

8 DWR's Former Directors

28 Through the Years...Memories at DWR

30 DWR Personnel Join Emergency Response in New Orleans

34 Historic Floods Prove Need for Readiness

38 DWR Responds to Recent North State Storms and Flooding

41 Update on the Future Operations Program

44 FERC (Federal Energy Regulatory Commission)

46 DWR Keeps the Power Flowing During Energy Crisis

48 40th Anniversary of Western Water Council

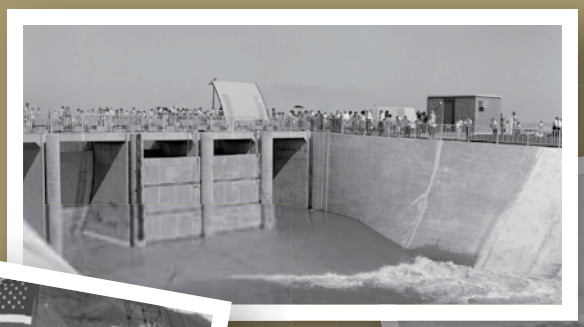
50 The Changing Era of Technology Services

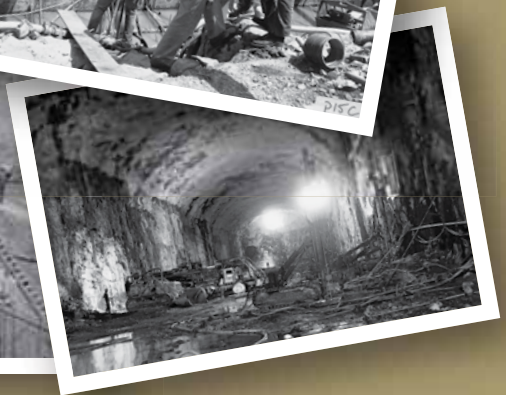
56 DWR's Oral History Program

58 Remembering the Earlier Days

66 State Water Project Octopus Got Lots of Ink

DWR MEMORIES





the birth of DWR

by Ted Thomas

Former California Assemblyman Caspar W. Weinberger, who authored legislation creating the Department of Water Resources in 1956, views a gift copy of the California State Water Project Atlas. On June 11, 2002, Author Weinberger was in downtown Sacramento for a book-signing to promote his memoir, "In The Arena," which tells about his efforts to create DWR and develop the State Water Project.

The Department of Water Resources was born from legislative hearings held by **Caspar W. Weinberger**, a California Assemblyman from San Francisco who would go on to become Secretary of Defense and collaborate with **President Reagan** and **Pope John Paul II** on the demise of the Soviet Union.

As Chairman of the Assembly Government Organization Committee, Weinberger conducted hearings up and down California in 1954 and 1955 with the goal of consolidating water development and management responsibility in a single department that could build and operate the State Water Project.

In his 2001 autobiography, "In The Arena," Weinberger wrote: "To me, the water problem was a fascinating subject that involved engineering, law, economics, and politics, and I flung myself into every detail—how to trap and transport the water; how much power was required to lift it over the mountains; how it would be distributed once it reached the south—to say nothing of the violent north-south fights on the political side."

"And, to emphasize the need for a quick solution," Weinberger wrote, "I hammered away on the point of how long it would take to build the California Water Project and how few years we had before we would actually face real shortages."

After extensive debate, Weinberger's bill creating the Department of Water Resources was passed in a 1956 special session called by **Governor Goodwin Knight**, and responsibility for water resource development was invested in the new agency.

"The California Water Project (State Water Project) moved from the drawing board to reality in the 1960s because we established the management and administrative foundation and framework that such a huge project required," Weinberger wrote.

William R. Gianelli, the DWR Director under whom the State Water Project's initial facilities were completed, agrees. In a 1985 interview, Gianelli (DWR Director under Governor Reagan from 1967 to 1973) said that the old Division of Water Resources "would not have been an adequate organization, under public works, to carry on the construction of the State Water Project."

Harkening back to the 1950s in his autobiography, Weinberger said the feeling was that while the State Water Project "would be a huge and complex undertaking, it was felt, like most problems in California, to be entirely solvable."

"We were all optimists then," said Weinberger, who today serves as chairman of Forbes, Inc. and divides his time when not traveling between Maine and Washington, D.C. ■

Director Snow looks to DWR's Future

by Margarita Macias

"The State Water Project is even more critical to the California economy now than it was a few decades ago." —Lester Snow

Change and continuity were both in the cards when Lester A. Snow took the helm of DWR as its ninth director on February 24, 2004.

DWR was created a half century ago—on July 5, 1956—largely to build the massive State Water Project, its signature achievement that has played a major role in jumping California's economy to the seventh largest in the world.

"The State Water Project is even more critical to the California economy now than it was a few decades ago," said Snow. "Therefore, one of our future challenges will be to maintain this aging facility and ensure it continues to serve our state with the water it needs to grow and prosper."

While maintaining and improving the State Water Project, Director Snow is breaking new ground at DWR with innovative concepts such as integrated regional water management to meet future water needs.

(Left to Right) On June 5, 2004, Director Snow and Governor Schwarzenegger visited the levee break that flooded about 12,000 acres of farmland on the Upper and Lower Jones Tract in the southern Delta. (Photo by Steven Hellon)

Director Snow is sworn in as DWR Director by Secretary for Resources Mike Chrisman.

Massive systems of dams, reservoirs, canals and pumping plants such as the State Water Project and federal Central Valley Project will remain backbones of California's water supply systems, but new approaches are necessary to stretch and conserve water. The blueprints for these efforts are found in Bulletin 160-05, DWR's most recent update of its landmark 1957 California Water Plan.

"California water management has changed significantly over the past 40 years," Snow writes in California Water Plan Update 2005. "Today, there is greater recognition of the need to manage water as a vital natural resource."

Regional water planning will play an important role in integrating diverse water and resource management activities to meet local objectives and respond to uncertainties in the years ahead. "Instead of looking for silver bullet solutions to water projects, Californians will find success with integrated projects, such as conservation, groundwater storage, and waste water recycling," said Snow, who has been involved in integrated regional water management since his time as General Manager of the San Diego County Water Authority from 1988 to 1995. "DWR can help make this happen. We will offer technical assistance, financial support through grants, and planning support, and provide the leadership that Californians have come to expect from our organization and its outstanding employees."

While working to assure that California has enough water, DWR under Snow has also raised public awareness and focused greater attention on the need for better flood management.

"California faces a potential flood management 'perfect storm'—the result of several conditions that threaten public safety and our state's economic well-being," Snow wrote in a November 21, 2004 article published by The Sacramento Bee. In response, DWR has proposed a stable funding source for flood management programs, improving emergency response, updating floodplain maps, and other actions to protect Californians.

Looking forward, Snow also sees new opportunities for DWR to help address the sustainability of the Sacramento/San Joaquin Delta, provide long-term, stable funding for public investments in water infrastructure and planning, increase water conservation, invest in new water technologies, improve water quality, and promote stewardship of natural resources.

DWR's Executive Management (Left to Right) **Sitting:** Chief Counsel Nancy Saracino, Director Lester Snow, Deputy Director and Acting Chief Deputy Director Stephen Verigin. **Back Row:** Assistant Director for Legislative Affairs Brian White, Acting Deputy Director Les Harder, Chief Deputy Director and Acting California Bay-Delta Authority Director P. Joseph Grindstaff, Acting Deputy Director Ralph Torres, Deputy Director Gerald Johns, and Assistant Director for Public Affairs Susan Sims. (**Not in photo:** Acting Deputy Director for the California Energy Resources Scheduling Division Viju Patel)

"DWR can't stay the same when California's water management needs are changing; I'm always looking at new ideas," Snow said of his management approach. Those new ideas and his success at balancing short term needs with long-term objectives have resulted in a solid record of accomplishment that will continue to benefit DWR and its future initiatives. ■

After earning a Bachelor of Science degree in Earth Sciences from Pennsylvania State University and a Master of Science degree in Water Resources Administration at the University of Arizona, Snow spent six years with the Arizona Department of Water Resources, including four years as Tucson Area Director. While with Arizona DWR, Snow and others in the late 1970s implemented the first Arizona Groundwater Management Act.

In both Arizona and San Diego where he was General Manager of the San Diego County Water Authority from 1988 to 1995, Snow was involved with Colorado River issues of key importance to California and other Colorado River Basin states.

From 1995 to 1999, Snow was the founding Executive Director of CALFED, now the California Bay-Delta Authority. He left CALFED to become Regional Director for the Bureau of Reclamation for two years, directing operations of the Central Valley Project. Prior to joining DWR, Snow was a Sacramento-based water consultant in the private sector.

Harvey O. Banks

DWR Director 1956-1961

by Margarita Macias

Harvey O. Banks, a Civil Engineer, was appointed DWR's first Director by Governor Goodwin Knight on July 5, 1956. During Banks' years as Director, the Department completed the California Water Plan (since updated in the Bulletin 160 series), and work began on the State Water Project (SWP).

Banks graduated from Syracuse University with a Bachelor of Science degree in Civil Engineering in 1930. Three years later, he received his Master's degree in Hydraulic and Sanitary Engineering from Stanford University. He worked for the City of Palo Alto until he joined the U.S. Soil Conservation Service in May of 1935.

In 1938, Banks joined the Division of Water Resources' Los Angeles Office, where he worked on groundwater investigations and adjudications. After military service from 1942 to 19412, he returned to the Division of Water Resources. By 1946, Banks was an engineering consulting partner in a firm in Los Angeles.

1956

Governor Goodwin J. Knight called a special session of the Legislature to create the Department of Water Resources (DWR). The legislation that created the Department also abolished the Water Project Authority and the Division of Water Resources of the Department of Public Works. DWR also succeeded to the duties of a reconstituted State Water Resources Board. The Board was renamed the State Water Board and later was changed to the California Water Commission. The new Department was organized with a Division of Water Resources Planning; Division of Design and Construction, and Division of Administration.

Governor Knight appointed Harvey O. Banks as the first Director of Water Resources on July 5, 1956, the day that DWR was officially established. Banks served until his resignation on December 31, 1960 and passed away on September 22, 1996.

The first DWR seal was selected by Director Banks as the Great Seal of the State of California with DWR printed on top.

During Banks' tenure as DWR's Director, voters approved the Burns-Porter Act, known as the California Water Resources Development Bond Act of 1960.

DWR's first Director Banks directed DWR in the planning and initial construction of the State Water Project.

Banks returned in 1950 to the Division of Water Resources' newly activated Water Quality Program.

He became Assistant State Engineer in 1953 and oversaw the administration of water rights and the Division's water quality activities. When **Arthur D. Edmonston** retired as State Engineer, Banks became State Engineer.

During Banks' tenure as DWR's Director, voters approved the Burns-Porter Act, known as the California Water Resources Development Bond Act of 1960. **Governor Brown** and Banks campaigned strongly for this $1.75 billion bond issue.

Banks also directed the Department in the planning and initial construction of the SWP. In the original SWP Plan, the San Luis Joint-Use Complex was not included. Through the efforts of Banks and others, San Luis became part of the plan in 1960. In 1957, SWP construction began. South Bay Aqueduct's construction began in 1958.

As Banks mentioned in his oral history, The California Water Plan (Bulletin 3) was a physical plan for conserving and redistributing the water resources of the State. It was never seen as a specific project proposal.

Banks also served as member of the State Water Pollution Control Board (now known as the State Water Resources Control Board).

Banks was an engineering consultant on water matters until his death in 1996.

On June 2, 1981, Delta Pumping Plant, which is the beginning of the California Aqueduct, was renamed Harvey O. Banks Pumping Plant.■

1957

The following appointments were made: Chief Topographic Engineer, Chief Geologist, Training Officer, and Public Information Office Chief.

1960

The Policy and Program Office was established. This office, which was eliminated when the Division of Operations was established in 1961, was responsible for contract negotiations, preparing of comprehensive reports on State Water Project facilities (SWP), and for developing and recommending broad water policies.

The Burns-Porter Act, a $1.75 billion bond act to assist in funding the construction of the State Water Project, was approved.

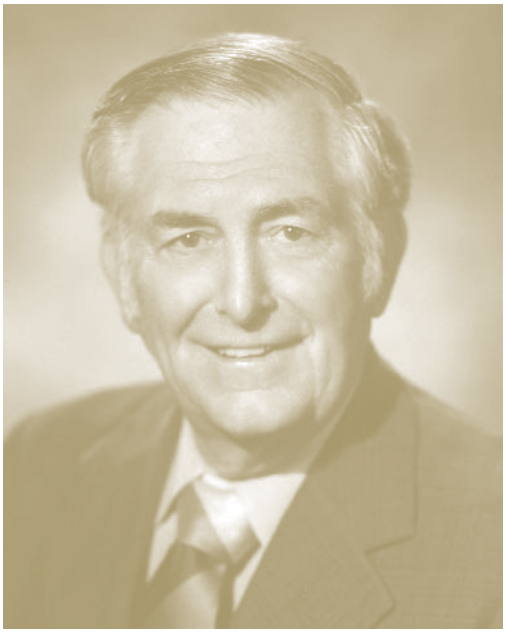
1961

Governor Edmund G. "Pat" Brown appointed William E. Warne as DWR Director Warne served until December 31, 1966 and passed away on March 9, 1996.

William E. Warne

DWR Director 1961-1967

by Anna Torres



William E. Warne, who was California's second DWR Director from 1961 to 1967 along with also being first Resources Agency Secretary from 1961 to 1963, was also a long-time federal administrator. He displayed a passion for water administration and development through the books he wrote and the topics he discussed.

After **Governor Edmund G. Brown** appointed Warne DWR Director, Warne escalated and managed the construction of the State Water Project. During peak SWP construction, DWR's employees increased in number to 4,600 and construction

1961

Director Warne adopted DWR's second seal showing Shasta Dam. The seal was later modified to include "The Resources Agency."

DWR was reorganized with the Division of Resources Planning split into four branches located in Sacramento. The branches were known as the Bay Area, Delta, Northern and San Joaquin Valley, and a Technical Services Office. The Division of Operations and Maintenance was also added to DWR.

The Oroville Project, Lower San Joaquin Project, and South Bay Project offices were established.

California and U.S. Government officials signed an agreement to build the San Luis Joint-Use Complex.

Director Warne inspects the construction in Oroville in August of 1963.

spending approached $1 million a day. Warne was an advocate of public development of water and power and a proponent of the 1960 $1.75 billion water bond issue that funded SWP construction.

A persuasive spokesman for water development, Warne was respected even by those who differed with him. During debate over building the State Water Project, **Joe Jensen**, Chairman of Metropolitan Water District of Southern California prophetically acknowledged: "Bill Warne can get the project built if anybody can."

When Warne left DWR, Oroville Dam was almost completed, construction of the California Aqueduct was well underway, the Tehachapi Crossing was ready to begin, and water deliveries had begun to the Santa Clara Valley and Alameda County.

Before joining DWR, Warne was Director of the California Department of Agriculture in 1960 and the Department of Fish and Game in 1959. During his years with the federal government, he was Chief of Information of The Bureau of Reclamation from 1937 to 1942. He then served as Assistant Director of the Division of Power in the U.S. Department of Interior (DOI) from 1941 to 1943; Assistant Commissioner, Bureau of Reclamation, from 1943-47; Assistant Secretary of DOI from 1947-51; and Assistant Secretary for Water and Power Development in DOI from 1950 to 1951. He also served eight years as U.S. Minister in Iran, Brazil, and Korea.

Warne, who was raised on a farm in California's Imperial Valley, received his English degree from the University of California at Berkeley in 1927. He worked as a reporter for newspapers in San Francisco, Oakland, Brawley, and Calexico. As an Associated Press writer in the 1930s, he served its bureaus in San Diego, Los Angeles, and Washington, D.C.

He was the author of: "Mission for Peace," a book about his experience in Iran administering the first U.S. Point 4 program, and "The Bureau of Reclamation."

Familiar with the controversies that accompany most water issues, Warne told a 1964 regional planning conference: "Strong men quail at the thought of proposing a politically sensitive solution to a water supply problem, no matter how regionally logical it may be."

In a 1996 article, Warne wrote: "California's destiny is never, so long as the state grows, to resolve her water problems, but always to work at it."

Warne died on March 9, 1996 of pneumonia in Menlo Park.

William E. Warne Powerplant, located near Pyramid Lake, is named in honor of Warne. ■

1962

The Internal Audit Office was created.

Alfred R. Golze was appointed on February 10 as the first Chief Engineer, the highest Civil Service Classification in DWR.

President John F. Kennedy and Governor Edmund G. Brown joined in a ground breaking ceremony for San Luis Dam and Reservoir.

This was the first year of State Water Project deliveries, totaling 8,906 acre-feet of water.

William Gianelli

DWR Director 1967-1973

by Pete Weisser

William R. Gianelli served as DWR Director from 1967-1973 under Governor **Ronald Reagan**. Under Gianelli, DWR completed construction of the basic infrastructure of the California State Water Project (SWP) and achieved initial deliveries of SWP water into Southern California.

A civil engineer, Gianelli was the third director of DWR. As Reagan's key water policy adviser, Gianelli developed a strategy to overcome a fiscal shortfall that threatened to thwart building the SWP.

Following Gianelli's recommendation, Reagan convened a SWP Task Force to deal with the $300 million budget problem.

"This shortfall had to be addressed to assure the Project's completion and financial integrity," Gianelli wrote in a 2004 article.

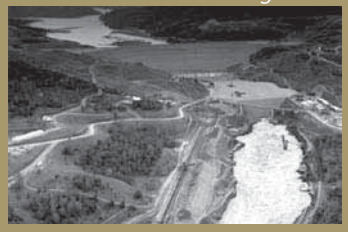
1963

San Joaquin District was created in Fresno.

1964

From September 12 to October 31, DWR staff moved from 19 locations into DWR's new headquarters in the Resources Building at 1416 Ninth Street, Sacramento. The dedication was held on January 8, 1965.

December Floods on North Coast Rivers kill 24 persons. The unfinished Oroville Dam saves Oroville from Feather River flooding.



> "During my tenure as director, all of the State Water Project facilities from Oroville Dam on the Feather (River) to Perris Dam in Riverside County were completed and placed in operation."—Gianelli

Reagan pursued Gianelli's corrective strategy, scaling back and delaying some Project features and securing needed money via tidelands oil revenues and revenue bond funding. With these adjustments, the SWP's essential statewide blueprint was transformed into an operational reality in the early 1970s and water deliveries into Southern California began.

"During my tenure as director, all of the State Water Project facilities from Oroville Dam on the Feather (River) to Perris Dam in Riverside County were completed and placed in operation," Gianelli stated in a 1985 interview. "As I recall, we expended over $1.5 billion during this period. That is why Project financing was so important."

One of the first engineers hired after WWII by the then-Division of Water Resources, Gianelli worked as a civil servant under Governors **Earl Warren, Goodwin Knight** and **Edmund G. "Pat" Brown** during an era when the State Water Project was planned and the Department of Water Resources was created and given the task to build it.

"We really needed a new, independent Department, with Cabinet status, expert staffing, fiscal ability and legal authority to take on such a great mission as financing, building and operating the largest State water project in the United States," states Gianelli. "I think time has proven that DWR was the right agency for the task, and that the SWP is fulfilling its vital water mission."

In 1967, Director Gianelli and Miss California pour Lake Oroville's water into a canteen as a symbol that State Water Project water soon would be on its way to Southern California.

He contends that in May 1972, Governor Reagan's firmness in dealing with a first-ever strike by State employees—hydroelectric plant operators on the SWP—came at a critical time as DWR was building project features south of the Tehachapi Mountains. The employees returned to their jobs within the time limit specified by the Governor and work resumed.

Gianelli notes that DWR's staffing reflected the SWP construction workload. It hit a peak of about 4,600 and then declined gradually over four years as construction was completed to about 2,500 as his term as DWR Director ended.

1965

The Northern Branch opened offices in Red Bluff in December.

The Delta Branch became the Sacramento District.

The San Joaquin Valley Branch became the San Joaquin District.

1967

Director Warne attended South Bay Aqueduct's dedication ceremony.

On January 1, Governor Ronald Reagan appointed William R. Gianelli as DWR Director.

1967

From 500 employees in 1956, DWR expanded to a peak strength of 4,600 employees.

Gianelli continued from page 13

Reagan personally took part in many SWP milestone events, Gianelli recalls, including the 1967 dedication of Oroville Dam, and later ceremonies at the Delta Pumping Plant, Edmonston Pumping Plant and at Perris Dam in Riverside County.

"Without Governor Reagan's involvement in the water project," said Gianelli. "I have some doubt whether the SWP would have been completed and placed in operation in the timely manner it was."

Gianelli went on to serve under President Reagan as Assistant Secretary of the Army for Public Works, with jurisdiction over the U.S. Army Corps of Engineers and Arlington National Cemetery, and finally as Chairman of the Panama Canal Commission.

Director Gianelli and his late wife Shirley visit the Romero Overlook Visitors Center, where the Gianelli's DWR memorabilia is displayed.

After four years of Reserve Officer Training Corps (ROTC), in December 1940, Gianelli was commissioned a Second Lieutenant in the U.S. Army Corps of Engineers. He graduated in Engineering from the University of California at Berkeley in May 1941 and was soon called to active military duty.

Following Army engineer training at Fort Belvoir, Va., Gianelli was assigned to the 47th Engineer Regiment and shipped to the Pacific. He arrived in Hawaii a month to the day after the Pearl Harbor attack. He worked on building defense structures in Hawaii.

Later, while on Saipan building Aslito Airfield, Gianelli was wounded in a firefight with Japanese troops, earning a Purple Heart. Airfields his unit helped build made possible American bombing missions to Japan.

In all, Gianelli spent over 42 months overseas during WW II. He was discharged with the rank of Major in 1945.

Today, Gianelli is retired, living in Pebble Beach. Still vitally interested in California water issues, the former director is an occasional visitor to San Luis Joint-Use Complex, where the Gianelli Pumping-Generating Plant bears his name. A collection of his DWR memorabilia is on display in the Romero Visitors Center, located near San Luis Reservoir. ■

1967

San Luis Dam, the largest off-stream reservoir in the United States, was completed.

Feather River Fish Hatchery was completed.

1968

With the phasing out of major design and construction work for SWP facilities, the Department was downsized to almost half the number of its employees.

Bay Area District, located in Vallejo, merged with the Sacramento District to form Central District.

John R. Teerink

DWR Director 1973-1975

by Margarita Macias

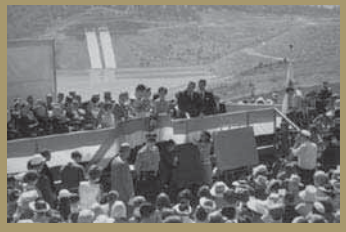
John R. Teerink was appointed DWR Director in 1973 by Governor **Ronald Reagan**. Teerink is the only employee in the Department's history to progress through the ranks to become Director. He served as Junior Engineer in 1946, Assistant Chief Engineer in 1962, Deputy Director in 1967, and was appointed DWR Director in 1973.

1969

Southern Field Division was created. The South Bay Project Office was closed.

The Program Analysis Office was established.

Oroville Dam, the tallest and one of the largest dams in the United States, was completed.



On July 12, the American Society of Civil Engineers designated Edward Hyatt Powerplant as "Outstanding Civil Engineering Achievement of 1969."

Teerink continued from page 15

During Teerink's 29 years with the Department, he had various lead roles in the implementation of the State Water Project ranging from the initial layout of the California Aqueduct to its design and direction of operations following construction.

Director Teerink gave monthly reports to the California Water Commission.

During Teerink's 29 years with the Department, he had various lead roles in the implementation of the State Water Project ranging from the initial layout of the California Aqueduct to its design and direction of operations following construction. He initiated and directed preparation of Bulletin No. 200, "The California State Water Project," which documents the early planning, policies, legislation, design, water service contracting, construction, and twelve years of operation of this monumental project. He directed an inventory of the State's hydroelectric potential and plans for increases in State Water Project water supplies.

Other key roles carried out by Teerink included District Engineer for the Southern District and Deputy Director responsible for all five districts. He served as a part-time lecturer in fluid mechanics at California State University, Sacramento. He was also chairman of a task force appointed by Governor Reagan to analyze the workload of the University of California and the California State College and University systems.

The Teerink family was from Auburn, California. Teerink's father worked for the U.S. Army Corps of Engineers and Teerink as a youth followed major dam projects under construction on the Columbia River. He graduated with a Bachelor of Science degree in civil engineering from Oregon State University in 1944. In 1965, he received a Master of Public Administration degree at Harvard University. He joined the Department of Water Resources in 1946 after his discharge as a captain in the Army Air Force.

When he left DWR in 1975, he and a longtime friend and former DWR employee, **Herb Greydanus**, worked as consultants with Bookman-Edmonston Engineering Incorporated's Sacramento office.

At the age of 71, Teerink was killed in an automobile accident near Sacramento on July 30, 1992. In April of 1993, Wheeler Ridge Pumping Plant located near Bakersfield was renamed John R. Teerink Wheeler Ridge Pumping Plant. ■

1969

Harvey O. Banks Pumping Plant was completed.

1970

Skinner Fish Facility, which began operating in 1968, is completed.

1971

The Vallejo Field Office was closed in February.

The San Joaquin Field Division Office opened near Wind Gap.

1972

The Division of Manpower and Management Services was established.

Ronald B. Robie

DWR Director 1975-1982

by Pete Weisser

Ronald B. Robie, an attorney and expert on California water law, served as DWR Director from 1975-1982 under Governor Edmund G. (Jerry) Brown.

Robie led DWR during an era of rising environmental concerns, confronting complex issues of Delta water quality and water supply.

Under Robie's guidance, DWR adapted to environment regulations and made progress on water conservation. He was influential in developing DWR's skills in innovative water management and storage programs

"My years at DWR were some of the greatest of my career," said Robie. "The employees of the Department were always first rate—the finest in State government. We worked together to obtain reliable power supplies for the Project, and to increase its yield. We laid the groundwork for current CALFED efforts. We were also able to guarantee that several California wild rivers were incorporated in the federal wild rivers system. In this way, we were able to balance Project and environmental needs."

A longtime legislative consultant on water policy, Robie skillfully spearheaded Governor Brown's campaign to achieve legislative approval in 1980 for Senate Bill (SB) 200 (by State Senator Ruben Ayala). This controversial bill authorized an expanded State Water Project, including a Peripheral Canal to improve water delivery reliability for the system.

Though a sound engineering concept with ecological as well as supply benefits, the Peripheral Canal ultimately drew heated opposition, both among environmentalists and within a divided California water community.

1973

Edmonston Pumping Plant, which has the world's highest single lift of water, was dedicated.

1975

On September 1, John R. Teerink was appointed DWR Director. He resigned as Director on March 5, 1975, and returned to civil service status. (Teerink died in an automobile accident on July 30, 1992.)

1975

On March 4, Ronald B. Robie was appointed DWR Director by Governor Edmund G. "Jerry" Brown, Jr. Robie resigned December 31, 1982.

Director Robie adopted the wave seal and the "Save Water" logo.

Robie continued from page 17

Robie's forces won the legislative battles for SB 200 and the bill was signed into law by Governor Brown. However, it was overturned by a 1982 referendum, and the Peripheral Canal was banished to political neverland.

Both former Governor Brown and ex-DWR Director Robie remain proud of the 1980 Peripheral Canal's legislative passage, approved by a two-thirds vote in both the Assembly and State Senate.

"This was a very significant legislative achievement," said Robie.

He drew high marks from environmental groups for his strong public conservation leadership during the major statewide drought of 1976-77, the first big drought in California since 1934.

Director Robie was sworn as DWR's fifth Director by the late Claire Dedrick, Secretary for Resources.

Today, Robie passes DWR headquarters daily, walking to his office in the Library and Courts Building. Since 2002, he has been an Associate Justice of the Third District Court of Appeal.

A 1958 graduate of the University of California, Berkeley, Robie earned a Bachelor of Arts degree in Journalism.

In a distinguished public career, Robie has served in all three branches of State government. He began his State service in the Legislature, serving as a consultant to the Assembly water policy committee. He worked closely with one of the Legislature's veteran water leaders, Assemblyman **Carley Porter**.

Porter was the coauthor with State Senator **Hugh Burns** of the California Water Resources Development Bond Act (known as the Burns-Porter Act). Its passage in 1959 authorized the issuance of $1.75 billion in general obligation bonds to finance construction of California's State Water Project.

In November 1960, California's voters approved the bond issue, setting in motion construction of the largest State-run water and power system in the nation.

While working as a legislative consultant, he earned a law degree at McGeorge Law School. During his years as a legislative consultant, he became an acknowledged expert on water law and California water policy. This expertise was helpful to him when Governor **Ronald Reagan** appointed him to serve on the State Water Resources Control Board, a regulatory body with jurisdiction in areas of water rights and water quality.

1975

In March, the Division of Manpower and Management Services became the Division of Employee Relations and Management Services. In May, it was retitled the Division of Management Services.

1977

The State Water Project Analysis Office was established in November.

1979

The Dam Safety Program's 50th Anniversary. The State began regulating dams on August 14, 1929.

The Snow Survey Program celebrated its Golden Anniversary in August.

Robie served on the water board from April 1969 to February 1975.

"I had the unique opportunity to write the legislation creating the Water Board and then being a member of it," recalls Robie. "During the time I was on the Board, it issued some very important decisions: The first Delta Decision (D 1379), the American River Flows Decision (D 1400), and the New Melones Decision (D 1422). We also were the first State to receive delegation to implement the Federal Clean Water Act."

"I was fortunate to have been able to approach all my State positions in a bipartisan manner," notes Robie. "When I was consultant to the Assembly Water Committee, the Committee was equally divided between the political parties and between North and South. Then I was honored with appointment and reappointment by Governor Ronald Reagan to the Water Board and Governors Edmund G. Brown, Jr. and **Gray Davis** to the courts."

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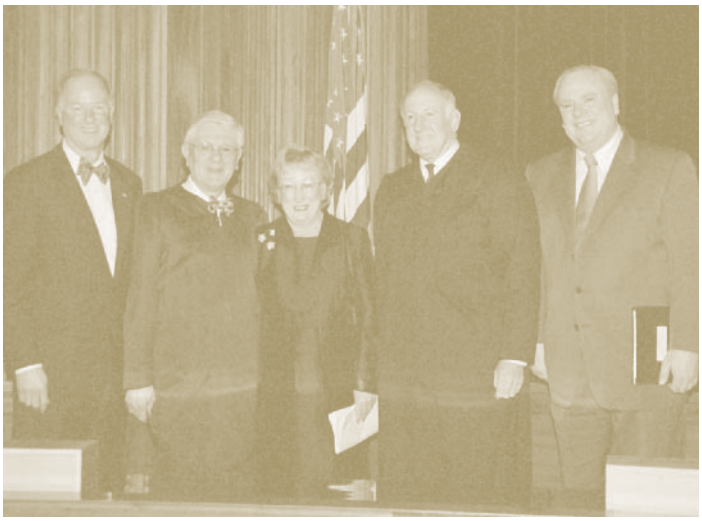


(Left to Right) At Director Robie's swearing in as Associate Justice of the Third District Court of Appeal in January of 2002, there was Arthur G. Scotland, Presiding Justice Third DCA, Director Robie, Robie's wife Lynn, Chief Justice Ronald George, and Attorney General Bill Lockyer.

In 1975, Brown appointed Robie to the DWR directorship. Robie was a prominent spokesman for water policy in California throughout the Brown era, both in water and government circles and as a public spokesman for State water policies.

"While Director, I presided over a gala party celebrating the Department's 25th birthday," recalls Robie. "How time flies."

After Robie left DWR, Governor Brown in 1983 appointed him to the Sacramento Municipal Court bench. In 1986, Robie won election to the Sacramento County Superior Court. In his years on the Superior Court bench, he earned a reputation as a tireless, energetic judge with an enormous workload. In 2002, Governor Gray Davis appointed him to the Court of Appeal, Third Appellate District. ■

1981

The Water Conservation Office was established in October.

DWR dedicated its first Wind Turbine at San Luis Reservoir in March.

On June 3, DWR celebrated its 25th Anniversary at the Sacramento Convention Center.

On June 3, Pyramid Powerplant was renamed William E. Warne Powerplant and the Delta Pumping Plant was renamed Harvey O. Banks Pumping Plant.

David N. Kennedy

DWR Director 1983-1998

by Margarita Macias

David N. Kennedy, a Civil Engineer and former Assistant General Manager of the Metropolitan Water District of Southern California, served as DWR Director from 1983 to 1998, spanning the terms of two Governors.

"When I first joined DWR in 1962 as a Junior Civil Engineer, I never imagined I would become DWR's Director," said Kennedy, the Department's longest-serving chief executive.

Despite dealing with floods, earthquakes, levee breaks, aqueduct leaks and a major drought, Kennedy said he enjoyed all his years with the Department.

"The Department has always been known as one of the best organized and managed agencies in State Government," Kennedy said. "DWR has a diversity of water management programs, such as flood management and dam safety."

Each of DWR's Directors presided over different phases of State Water Project construction. Projects completed

1982

The California Aqueduct was renamed the Governor Edmund G. Brown California Aqueduct. The dedication was in December.

1983

DWR became a bulk power entity and the State's largest consumer of power.

David N. Kennedy was appointed DWR Director by Governor George Deukmejian on June 22 and Governor Pete Wilson in 1991. Kennedy retired in 1998.

Director Kennedy adopted the DWR seal featuring the State Water Project. Logo with similar design was adopted in 1985.

during Kennedy's years include the Coastal Branch Aqueduct Phase II, North Bay Aqueduct Phase II, Delta pumping plant expansion and the East Branch Enlargement. More than $1 billion was invested in construction during his years as Director.

Negotiation of the Monterey Agreement is another of Kennedy's milestones as DWR Director. The 1994 Agreement provided significant benefits to State Water Project Contractors, including water transfer, storage and other management tools that help them to meet water supply demands. It also resolved longstanding legal disputes among the SWP Contractors and DWR. Another plus is greater equity in the allocation of SWP supply between agricultural and urban users.

Engineering has been an important part of Kennedy's life since his childhood. His father was a Civil Engineer for the Bureau of Reclamation in Oregon, a transportation engineer for the State of Washington's Department of Highways, and later an engineering professor at the University of California at Berkeley from 1950 to 1975.

"Being raised by an engineer was a great foundation for me," said Kennedy.

Kennedy, however, has interests including history, literature and travel well beyond his engineering foundation,

Director Kennedy prepares to start the pumps at North Bay Aqueduct's dedication ceremony in 1988.

1985

In March, a ground breaking ceremony was held for the North Bay Aqueduct Phase Two.

1986

After more than 25 years of negotiating, the Coordinated Operations Agreement was signed by the State and federal governments.

Rainfall between February 12 and 21 created California's worst flooding since 1964.

Alamo Powerplant was dedicated in October.

Kennedy continued from page 21

just as his father was an avid reader of Shakespeare in addition to being a lifelong engineer.

Kennedy earned his bachelor's and master's degrees in Civil Engineering from the University of California, Berkeley. He also served as a Lieutenant in the U.S. Army Corps of Engineers from 1959 to 1961.

In June of 1962, Kennedy joined DWR's Division of Design and Construction's Aqueduct Design Branch as a Junior Civil Engineer during the early construction of the State Water Project.

"My first DWR supervisor was John Silveira, who later became DWR's Deputy Director," said Kennedy.

Kennedy transferred to DWR's Northern Branch, which was located on 13th and K streets. It is now the location of the Sacramento Community Center. He was involved in the planning for the proposed Dos Rios Dam on the Eel River and the North Coastal Investigations Report.

In the summer of 1965, the Northern Branch moved to Red Bluff and Kennedy transferred to the Statewide Planning Branch on the Second Floor of the newly constructed Resources Building.

"I remember working on the Second Floor (where the Public Affairs Office is now located), which was just a big open area," said Kennedy. During this period, Kennedy assisted in producing the first Bulletin 160, the Department's periodic update of the California Water Plan.

With DWR downsizing to almost half of its employees, Kennedy decided to move to Southern California in 1968 to become an Associate Engineer with the Metropolitan Water District of Southern California (MWD).

"As many DWR employees left the Department to various locations, we joked that DWR was one of the greatest training places for water agencies all over the United States," said Kennedy.

(Left to Right) At the Coastal Branch dedication ceremony in July of 1997, Director Kennedy and the Chairman of the Central Coast Water Authority Robert Puddicombe were among the speakers.

As part of MWD's Hydrographic Engineering Section, Kennedy's assignments included studies of Colorado River hydrology and serving as liaison to the Colorado River Board of California. He also participated in Delta water rights hearings for the State Water Project.

In 1974, Kennedy became MWD Assistant General Manager, overseeing various divisions of MWD.

After 15 years with MWD, Kennedy was appointed by **Governor Deukmejian** as DWR Director in 1983. He remained Director for Governor Deukmejian's two terms as well as for **Governor Wilson**'s eight years in office. As Director, Kennedy managed a $900 million annual budget and oversaw the work of 2,500 employees throughout California.

"When I returned to DWR, the State Water Project construction was stabilized, deliveries were under way, and the aftermath (voter rejection) of the Peripheral Canal was being dealt with," Kennedy noted.

The East Branch Enlargement, which doubled the hydraulic capacity of the East Branch, began in 1986. The

1988

San Luis Dam was renamed B.F. Sisk San Luis Dam. San Luis Pumping-Generating Plant was renamed the William R. Gianelli Pumping-Generating Plant.

Helen Joyce Peters, DWR's first woman engineer, retired with 37 years of DWR service in 1988. She was known internationally as a specialist in ground water hydrology and management. Peters died on September 1, 2002.

Despite dealing with floods, earthquakes, levee breaks, aqueduct leaks and a major drought, Kennedy said he enjoyed all his years with the Department.

project included enlarging Devil Canyon Powerplant and Pearblossom Pumping Plant. The project also entailed raising the canal lining, building a new powerplant, and modifying other facilities. Construction of the Suisun Marsh Salinity Control Gates also began in 1986 and was completed in 1989. The Gates allow fresh water into the marsh to preserve it as the largest contiguous brackish wetlands remaining in the United States.

After the devastation from the floods of 1986, Kennedy moved to improve coordination with other agencies by helping establish the Joint Operations Center. The SWP Operations Center, the Central Valley Project Operations Center, DWR's Flood Management Division, and the National Weather Service were relocated into the newly created Joint Operations Center in 1995. Kennedy also directed DWR during the floods of 1995 and 1997.

Kennedy helped bring to conclusion the landmark 1986 Coordinated Operation Agreement (COA) that coordinated operations of the SWP and federal Central Valley Project to meet Bay-Delta water quality standards, increase water delivery efficiency during drought, and provide other benefits. The federal legislation authorizing the COA also authorized the Suisun Marsh Preservation agreements.

During the drought of 1987 to 1992, the Department created and implemented the State Emergency Drought Water Bank program. This was the longest Statewide Drought in the 20th Century. During the drought years of 1991, 1992, and 1994, the "bank" bought water from 300 sources in the Sacramento Valley and Delta and sold it to 15 entities.

North Bay Aqueduct Phase Two was completed and dedicated in 1988. The last four pumps were added to Banks Pumping Plant in the 1990s.

In late 1993, construction began on the Coastal Branch Aqueduct Phase II project, which included a 143-mile pipeline, storage tanks, and four pumping plants. Completion of the Coastal Branch, which cost $500 million, resulted in the delivery of SWP water to 23 project participants on the Central Coast. In July of 1997, Kennedy spoke during the Coastal Branch Aqueduct's dedication.

In 1994, Kennedy helped facilitate the 1994 Delta Accord to address Delta water quality and supply reliability problems.

In 1997, he received the Distinguished Engineering Alumni award from U.C. Berkeley. Kennedy was elected in 1998 to the National Academy of Engineering, one of the highest professional distinctions available to engineers

Kennedy and his wife, Barbara, reside in Sacramento. They have three children, one of whom continued the family's engineering tradition and earned his bachelor's and master's in Mechanical Engineering at the University of California, Berkeley.

Since retirement, Kennedy has accepted invitations to visit Japan to speak on Delta issues and the State Water Project, and to China, where he spoke on behalf of the World Bank about financing the SWP. Kennedy was also recently appointed to an independent panel that will review the work of government officials studying the New Orleans' levee failures. The 13-member external review panel was organized by the American Society of Civil Engineers at the request of Secretary of Defense **Donald Rumsfeld**. ■

1989

DWR participated in the first statewide celebration of Water Awareness Week, May 1-7.

1991

DWR operates the State Water Drought Bank. It is also opened in 1992 and 1994.

1992

DWR established the Environmental Services Office. It plays a major role in collecting and analyzing data for the Interagency Ecological Program investigations on the Bay-Delta estuary.

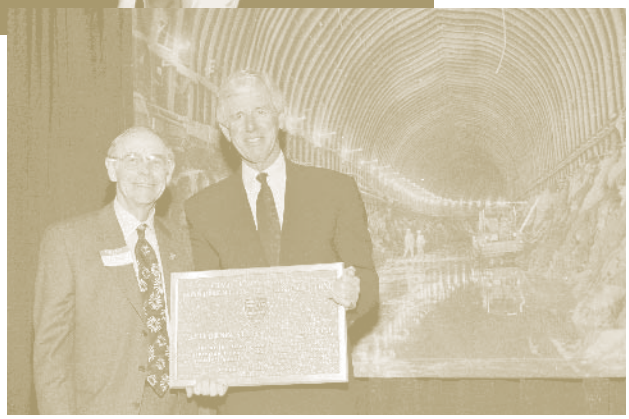
1994

DWR, along with other State and federal agencies, signed the Framework Agreement and later the Bay-Delta Accord. The State-federal CALFED program was established.

Thomas M. Hannigan

DWR Director 1999-2003

by Margarita Macias



(Left to Right) On May 22, 2001, the American Society of Civil Engineers' President Robert Bein presented the Civil Engineering Monument of the Milllennium award to Director Hannigan for the California State Water Project. The only other California engineering achievement honored was the Golden Gate Bridge.

Thomas M. Hannigan, a former member of the California Assembly, was appointed DWR Director by Governor **Gray Davis** on March 1, 1999. As Director, Hannigan led negotiations on the Quantification Settlement Agreement and was the acting power-purchasing agent for the State of California during the 2001 energy crisis.

1995

The new Joint Operations Center was opened. Along with the National Weather Service and DWR's Flood Management Division, this new building included both the SWP and CVP operations centers.

1996

The Division of Design and Construction was restructured and renamed the Division of Engineering.

1997

The Division of Local Assistance was renamed the Division of Planning and Local Assistance.

The Division of Planning was renamed the Office of SWP Planning. It later became the Bay-Delta Office.

Thomas M. Hannigan

1999-2003

As DWR's Director, Hannigan administered a water management Department with approximately 2,700 employees and an annual budget of $900 million. During Hannigan's years at DWR, the State Water Project surpassed 60 million acre-feet in water deliveries since deliveries began in 1962. In 2001, the SWP was honored by the American Society of Civil Engineers as one of the 20th century's greatest engineering achievements.

Hannigan was an Assemblyman from Solano County for 18 years, first being elected in 1978. From 1986 to 1996, he served as Majority Floor Leader in the Assembly. Due to term limits, his legislative career ended in 1996.

As a legislator, Hannigan supported a bill that put Proposition 204—the Safe, Clean, Reliable Water Supply Act—on the November 1996 ballot. With approval by voters, Proposition 204 provided $995 million to fund programs and projects to improve water systems in California. He also authored legislation to provide funding for restoration of Delta levees.

Upon leaving the Legislature, Hannigan, who is also a Realtor, was affiliated with a commercial real estate brokerage in Sacramento. Hannigan began his real estate career after serving three years in the Marine Corps. Beginning as a salesman, he later opened his own business, concentrating on residential property sales in Solano County.

As a veteran of public service at the city, county, and state levels, Hannigan began his public service in the City of Fairfield, serving on the Recreation Commission. He was then elected to the Fairfield City Council, serving from 1970 to 1974.

During 1973 and 1974, he was Mayor of Fairfield, the county seat of Solano County. In 1974, he was elected to the Solano County Board of Supervisors, serving as chairman in 1977 and 1978.

(Left to Right) During the East Branch Extension dedication ceremony, Mark Bulot, a member of The San Bernardino Valley Municipal Water District Board of Directors, presented Director Hannigan with a silver commemorative coin of the project on May 20, 2003.

Hannigan earned a Bachelor of Science degree from the University of Santa Clara. Born in Vallejo in 1940, Hannigan resides with his family in Green Valley, near Fairfield.

Following his retirement from DWR in June of 2003, Hannigan returned to his career in real estate. He enjoys backpacking, skiing, and running. He has run 15 marathons. ■

1998

The Coastal Branch Aqueduct Phase II was completed.

The 1997 floods forced more than 120,000 people from their homes. An estimated 30,000 residential and 2,000 business properties were damaged or destroyed. As a result, the 1997 Flood Emergency Action Team report was completed.

1999

The Power utility industry was deregulated. DWR entered deregulation.

East Branch Extension Phase I construction began expanding service to San Bernardino and San Gorgonio Pass areas.

Linda S. Adams

DWR Director 2003-2004

by Margarita Macias

Linda Adams, former Legislative Secretary to Governor **Gray Davis**, was appointed DWR's first woman Director by Governor Davis on November 13, 2003. She served under both the Davis and Schwarzenegger administrations.

As DWR's Director, she focused on the operation of the State Water Project, facilitation of water transfers, statewide water planning and education, flood protection, dam safety, management of the State's long-term energy contracts, management of program elements of the CALFED Bay-Delta Program, and overseeing the Colorado River Quantification Settlement Agreement.

During Adams' 32 years of service to the State of California, she served in a number of key positions in both

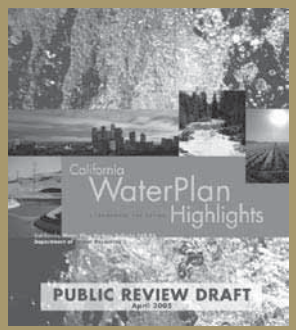
the Executive and Legislative branches. After joining Governor Davis' staff in January of 1999 as Chief Deputy Legislative Secretary, her primary responsibilities were negotiating legislation related to resources and environmental protection. Her major achievements included the CALFED Record of Decision for Bay-Delta restoration and Propositions 12 and 13, voter-approved bond measures which provided critically needed funding for natural resources, parks and water programs. In addition, Linda negotiated other key pieces of legislation on behalf of Governor Davis, including first-in-the-nation laws to combat global warming and promote environmental justice. Her successful negotiation of the "Clean Cars/Clean Air" legislation earned her the 2002 "Environmental Hero Award" from the California League of Conservation Voters.

1999 — *Governor Gray Davis appointed Thomas M. Hannigan, former California Assembly member, as DWR's Director. He served until 2003.*

2003 — *Governor Gray Davis appointed Linda S. Adams, his former Legislative Secretary, as DWR's first woman Director on November 13.*

2004 — *Governor Schwarzenegger appointed Lester A. Snow as DWR's ninth director on February 24.*

2005 — *The Public Review Draft of the California Water Plan Update was released.*



After being promoted to Legislative Secretary, where she served as the Governor's chief liaison to the Legislature, Adams retained her resources and environmental protection issues, while overseeing all legislation.

Before Adams joined the Davis administration, she served as a staff member to the State Legislature for 20 years in various positions. She served as Chief Consultant to the Senate Committee on Agriculture and Water Resources, Chaired by Senator Jim Costa. For the State Assembly, she served as a Consultant to the Assembly Committee on Water, Parks, and Wildlife and the Assembly Committee on Local Government.

During DWR's 2003 Annual Awards ceremony, Director Adams presented a Superior Management Excellence Award to Viju Patel of the California Energy Resources Scheduling Division.

During her tenure as a Legislative staffer, she drafted and negotiated SB 900 (Costa), passed by the voters in 1996 as Proposition 204, a Delta restoration bond measure. She also was involved in the creation, development, and funding of the San Joaquin River Parkway. She negotiated $3 billion in bonds for passenger rail service and drafted the first comprehensive groundwater management legislation.

Adams worked for Governor **Arnold Schwarzenegger**'s California Performance Review (CPR) team from March to May of 2004. She prepared issue papers and made recommendations on reorganization of State government in the areas of natural resources and environmental protection.

After serving as Chief of Staff to State Controller Steve Westly from 2004 to 2005, Linda retired with 32 years of State service. Adams recently was appointed by Governor Schwarzenegger to the Central Valley Regional Water Quality Control Board. The Board is a state entity responsible for the protection and improvement of water quality in the Central Valley.

Adams also serves on the Board of Directors of the Sacramento Local Conservation Corps.

Adams is a long-time resident of Sacramento. ■

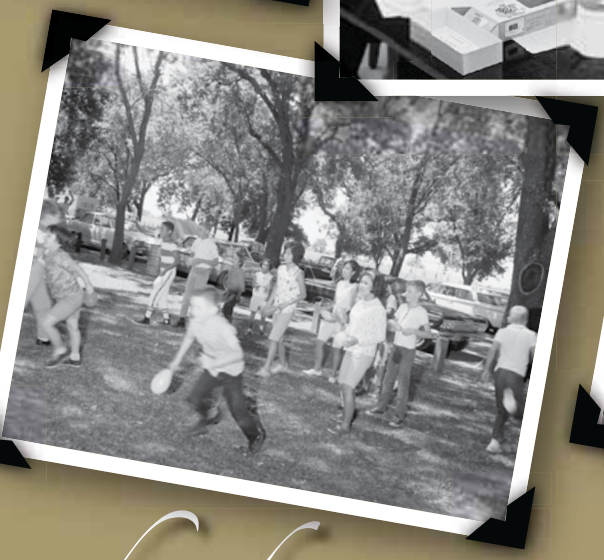
Oroville's Federal Energy Regulatory Commission (FERC) Relicensing application was submitted.

DWR has more than 2,700 employees statewide.

The State Water Project has delivered 75 million acre feet of water since its initial deliveries. "Flood Warnings: Responding to California's Flood Crisis" report is completed by DWR and sent to the Governor and Legislature.

through the years...

memories at



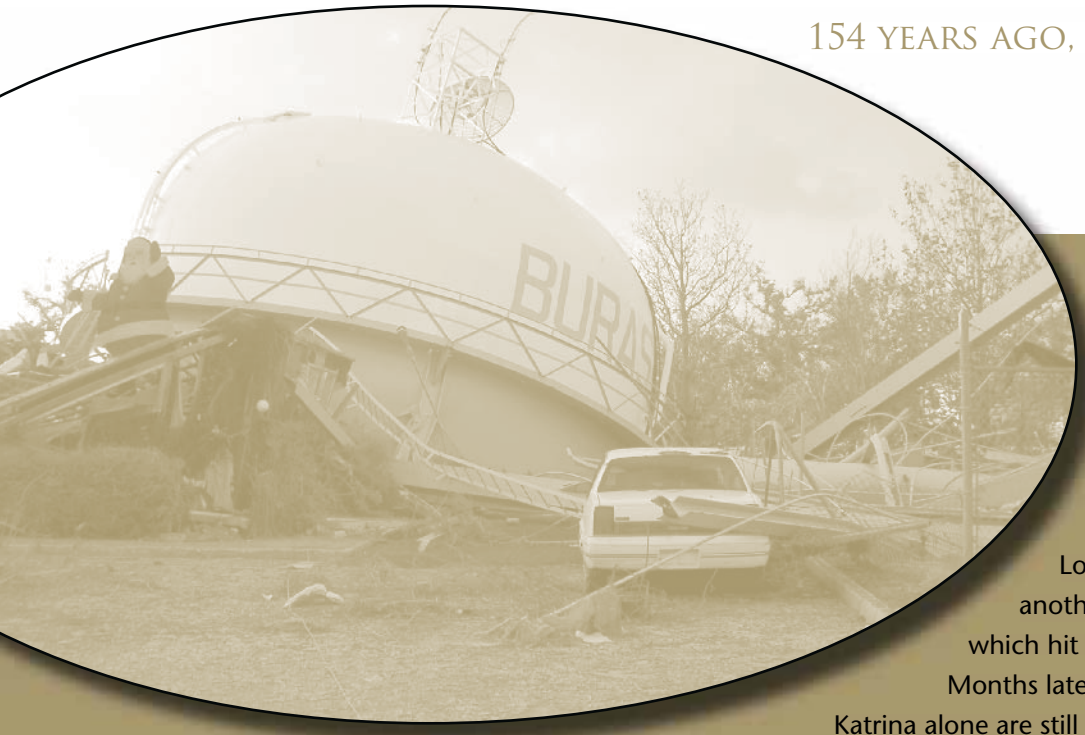
the department of water resources

2005 is Record-Setting Hurricane Year:

DWR Personnel

by Don Strickland

The 2005 Atlantic hurricane season spawned so many storms, 21, that the National Weather Service went through its entire list of common names used to describe them. The only other time that's happened, since record keeping began 154 years ago, was in 1933.



While most elevated water storage tanks in the affected area performed well, Katrina brought down the tank serving the community of Buras, in Plaquemines Parish, south of New Orleans. (Photo by John Andrews)

On August 29, 2005, category four hurricane "Katrina" slammed into America's Gulf Coast, packing 160 mile per hour winds. Then a category three hurricane, "Rita," struck September 24 near the Texas-Louisiana border. That was followed by another category three storm, "Wilma," which hit Florida on October 24.

Months later, the death and destruction from Katrina alone are still being assessed. By late October, nearly 1,300 people had been declared dead in Louisiana, Mississippi, Florida, Alabama, and Georgia. Ohio attributed two deaths to "Katrina" and Kentucky, one.

It could be years before all the costs are known, but insurance industry experts predict losses will far exceed $100 billion—making Katrina the nation's costliest natural disaster. Less than half of that damage was covered by insurance.

Join Emergency Response

Millie Hocking communicates by radio.

A number of DWR employees joined emergency and flood management personnel from agencies all over the country who responded to the Gulf area during and after the incident.

Les Harder, Jr., Acting DWR Deputy Director and former Chief of the Flood Management Division, and **Mike Inamine**, Division of Engineering's Construction Office Chief, were in New Orleans October 8 to 15 as part of a National Science Foundation team investigating the city's levee failures.

They found that 80 percent of New Orleans had been flooded by Katrina, with some parts of the city under 15 feet of water before it was pumped dry. Numerous levees had been breached, mainly by overtopping flows and scouring erosion. Three levees, one along the 17th Street Canal and two along the London Avenue Canal failed, not from overtopping, but because of foundation weaknesses.

Despite ongoing emergency activities, Harder and Inamine were granted unrestricted access to all sites. They needed free-ranging admittance because time was an important factor. Data had to be gathered and observations made before the evidence was lost or obscured by emergency repair and response operations. Among their activities, they examined breaches in flood protection infrastructure at both the 17th Street and London Avenue canals, and along the Industrial Canal. They also investigated entire reaches where levees were destroyed by storm surges along the Mississippi River Gulf Outlet, a deep water channel to the Port of New Orleans.

In a freakish and little-reported display of the flood's power, homes were floated clear of their foundations and deposited blocks away, in some cases high on Mississippi River levees. Harder and Inamine say the far-ranging destruction they witnessed was staggering. "You could see houses jammed against houses, cars overturned and mold and mud everywhere," remarked Harder in describing the flood devastation that covered miles of the Crescent City. "It was like someone had dropped an atomic bomb, minus the fire."

Inamine: "My initial reaction was that pictures did not do justice to the level of devastation that we saw. It was destruction like I've never seen before...beyond comparison to the 1997-98 California floods. Walking through the Ninth Ward of New Orleans was like walking through a battle zone. It was really overwhelming."

The levees along the 17th Street and London Avenue Canals examined by Harder and Inamine were of particular interest because they broke without being overtopped. At 17th Street, the levee failed by sliding on weak marshy peat and clay layers in the foundation, conditions that can be found beneath levees in the Sacramento-San Joaquin Delta. Levees along the London Avenue Canals probably collapsed from underseepage and piping through thick, foundation sand layers – a mechanism for distress and failure found in many Sacramento Valley levees.

"They provide important flood protection, but levees are only as strong as the weakest link," said Harder. "That's one thing that hit home for me. The New Orleans flood protection system performed pretty well overall, but in the places it failed, the results were catastrophic."

Acting Deputy Director Les Harder and Division of Engineering's Construction Office Chief Mike Inamine inspect the site of the Industrial Canal North Beach in the Ninth Ward of New Orleans.

Three Division of Planning and Local Assistance staffers also visited the hurricane-ravaged Gulf Coast: **John Andrew**, a Supervising Engineer with the Statewide Water Planning Office in Sacramento; **Millie Hocking** of the Surface Water Investigations Section in Red Bluff; and **Ed Perez** of Aqueduct Protection and Flood Management in Fresno.

Andrew was there the week of November 7 on behalf of the American Society of Civil Engineers. He was part of a team investigating the performance of engineering "lifelines" (water, wastewater, electric power, natural gas, communications, and transportation). His unit concentrated its efforts on water and wastewater systems along Mississippi's Gulf Coast and also in New Orleans and Plaquemines Parish, which is on the Mississippi River south of Orleans Parish.

No stranger to disaster scenes, Andrew worked 1989s Loma Prieta earthquake in the San Francisco Bay Area. That was a major event along the San Andreas fault zone which measured 7.1 on the Richter magnitude scale, causing

What remained of Main Street in Bay St. Louis, Mississippi after Hurricane Katrina. (Photo by Millie Hocking)

"My initial reaction was that pictures did not do justice to the level of devastation that we saw. It was destruction like I've never seen before... beyond comparison to the 1997-98 California floods. Walking through the Ninth Ward of New Orleans was like walking through a battle zone. It was really overwhelming."—Mike Inamine

67 deaths and $7 billion in damage. Yet he says the earthquake doesn't compare to the hurricane.

"Oh, Katrina was far worse," observed Andrew. "Mile after mile, neighborhood after neighborhood of devastation...it was shocking to see. A person certainly gets an impact from the pictures, but nothing like going there and seeing it firsthand... block after block of people's lives destroyed. It was just horrific."

Hocking and Perez spent two weeks in Mississippi under the Emergency Management Assistance Compact. They flew to Jackson on October 15 then drove to Biloxi and checked into the Imperial Palace Hotel. "All the emergency personnel stayed there," said Hocking, "because it was the only hotel in Biloxi's damaged area big enough to accommodate everybody...even though it no longer had a lobby."

Perez worked up the coast in Gautier while Hocking assisted in several south Mississippi communities, including Ocean Springs, where she spent about a week. "I did damage assessments of buildings in the flood plain," Hocking says, "and helped disseminate information on the National Flood Insurance Program."

For Hocking, it was her first experience with a disaster area. "Horrible" is how she describes the hurricane-ravaged area. "I just about cried," she says, in recalling her initial impression of the destruction.

"If you look at Main Street in Bay St. Louis, you can't find it. All you see is a manhole and a piece of sidewalk that's no longer where the sidewalk originally was located. Where buildings used to be, there are now just some pilings. Thirty-five feet of water went through Bay St. Louis and Waveland, pushed by incredibly strong winds. For about a mile inland, everything was just wiped out."

While Gulf Coast residents are not unaccustomed to hurricanes, Katrina is the worst in modern times. "They're dealing with it the best they can," said Hocking,

"It seemed like everyone was just shell shocked. At the time I was there, the main issues were getting FEMA trailers and temporary power along with food and other supplies. You'd be amazed at how difficult that can be. I hope California never has to experience a flood of that magnitude."

Inamine said he sees some disturbing parallels between the flood protection situation in New Orleans and what exists in Sacramento: "New Orleans looks a lot like Sacramento in terms of the inundation levels and the rough number of people protected by levees. New Orleans has, arguably, 200- to 250-year flood protection while Sacramento has only 100 year flood protection. It's very sobering to look at New Orleans and then visualize Sacramento in that same situation."

Harder believes the Gulf Coast disaster is a clear wake-up call for the Golden State: "Levees reduce the chances for areas to be flooded, but they do not eliminate the risk. Someday, a major California urban area such as Sacramento is going to be flooded. The devastation that Katrina caused in New Orleans put a face onto the numbers that have been projected for potential future California scenarios, and it is a very scary picture." ■

from air, rivers in flood stage,

MAJESTIC

by Pete Weisser *(Copyright, The Sacramento Bee, 1964)*

1964 *Sacramento Bee* Flood Story printed
on December 25, 1964

Out of their narrow Sierra canyons, the angry rivers tumble. They are the Yuba, the Feather, the Bear and the American, wild white forces hellbent for destruction in the rich, vulnerable Sacramento Valley below.

Background photo: The Feather River during the 1964 Flood.

dams, present PICTURE

Marysville aerial during the 1964 Flood.

But they are checked by dams. They flow into sluggish looking brown lakes trapped behind Camp Far West, Folsom Dam and the mighty partly-built dam at Oroville. Here the swift rivers are slowed, pacified and their wild fury dealt out gradually by spillway and diversion tunnel into the green and brown valley below.

At Christmas that valley, from Butte County to Sacramento County and from the cloud-decked Sierra to the purple line of the Coast Range, looks from the air like a vast network of rivulets, creeks, rivers, bypasses, sloughs, ponds, paddies, lakes and canals, all filled with brown, ugly water.

Fortress City

Amid all the water, like some medieval fortress city under inhuman siege, Marysville, Yuba County, stands above—barely above—the muddy, encircling waters of the Yuba and Feather Rivers.

The water has fallen slightly since the crest passed Wednesday. But the dirty-looking, foam-specked current still obviously is above the level of the neatly laid-out streets. The green levees sharply separate the death-dealing river from the busy, Christmas bustle.

Cars sparkled in the sun as shoppers completed last-minute shopping chores yesterday, oblivious of the water.

Ellis Lake, framed by the hand-cultivated park surrounding it in the heart of embattled Marysville, is clear and clean—a contrast to the flood waters which are filthy from Oroville to the Yolo Bypass.

East of Marysville, the Peachtree Golf Course has been transformed by inundation to a series of pretty green islands.

Havoc In Orchards

But it is in the rich orchard land east of Marysville where the true strength of the Feather and Yuba Rivers start to show their effects. Fruit trees lie uprooted, dragged from the ground. Ugly gashes are cut in the earth, like scars.

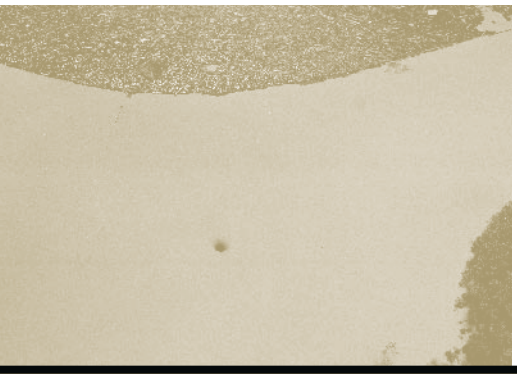
Timber waste clogs an orchard. A farmhouse is flooded northeast of Marysville on Oroville Road. A white-painted meat packing plant is isolated by water. Barns, sheds and trees are lapped by the waves. Where the fields are not flooded, they are wet, soggy, like organic blotters.

A green motorboat roars through an orchard, disturbing birds, spreading a wake through the desolated trees.

Farther north, after the rice fields with their ducks and geese, come the olive groves and broken foothills of Butte County, and then the Oroville Dam, where an immense three-pronged lake has appeared, a year ahead of schedule, to trap the Feather River.

Three huge timber jams mar the lake surface. Boats and a large old navy barge nose into the jams to clear them.

A gigantic whirlpool (see photo below) sucks the brown water down into two diversion tunnels under the dam, spitting it out with such force the Feather River almost turns around in its bed. The stormy Feather churns white and brown for a quarter-mile downcanyon toward the Thermalito Dam, sweeping smoothly over it and down the valley, toward Marysville.



Behind the Oroville Dam lake, white streams race down from the Sierra. Overhead, the clouds build up again.

Down the long Sacramento Valley, the sun still is warm on the Camp Far West Dam on the Bear River, where docks have been torn loose, and on the Yuba countryside where millions of creeks and rivulets wind toward the valley floor.

Chocolate Lake

Above Sacramento, Folsom Dam holds back a swollen, chocolate-colored lake. Five flood gates are open. The water spills smoothly down the dam face and then pounds into spume dozens of feet high with the force of its fall.

Below the dam, the American River is cocoa and dirty white, swirling powerfully under the bridge at Folsom, before smoothing its flow. Bare trees, standing deep in the river, show where the banks used to be.

Today's Flood Perspective

by Pete Weisser

On the sunny afternoon of Christmas Eve, 1964, when Harlin Smith, jaunty Sacramento Bee photographer, and I, a youthful Bee reporter, took a light plane flight over the Sacramento Valley, we viewed hundreds of miles of brown flood waters gleaming below.

Flooding was extensive, as documented in the Sacramento Bee story reproduced here. But it was mostly rural. Cities were well protected by levees, dams and bypasses. Happily, the still-unfinished Oroville Dam contained Feather River floodwaters, safeguarding Oroville from floods, holding back an angry brown lake, a year ahead of schedule.

The North Coast was not so lucky. Unchecked by dams, the wild Eel River rampaged, with the loss of 24 lives and destruction of entire towns.

But 1964 was a different California from today's. Though a population boom was underway, Northern California was still mostly farm country. Just two years prior, in November 1962, Governor **Edmund G. (Pat) Brown**, proudly announced that California had surpassed New York as the most populous state.

While California's 1960 population was under 16 million, by the time Pat Brown's son, **Jerry**, became Governor, the state's population had risen by about 40 percent. Today the population hovers near 36 million, growing inexorably by about 400,000 per year.

Two of the cities we flew over that day in 1964, Sacramento and Oroville, have more than doubled in population, Sacramento to 400,000, Oroville to 13,000. Wide swaths of the Central Valley are now more suburban tract than family farm.

During intervening decades, major floods hit California in 1986, 1997 and 1998. The 1986 flooding killed 14 and inflicted $1.5 billion in damages, mostly in central California. The 1997 flood caused 48 of California's 58 counties to be declared disaster areas, displaced 120,000 from their homes, killed eight and caused nearly $2 billion in damages. But even these huge flood

West of Sacramento, the Yolo Bypass shows as an unimaginably wide sheet of water. What weeks ago was rice stubble, dry and wind-whipped, now is a shallow, mud-carrying emergency river.

In the late afternoon sun, water in the bypass glistens. It parallels the deep water ship channel as far south as you can see, to the bay and the ocean.

The wild Sierra rivers have run home. ■

Above: Feather River flooding in 1964.

Left: Looking downstream on the Feather River at uncompleted Oroville Dam, which helped prevent Oroville's flooding.

events could not discourage development nor deter population growth. Projections are for a California population of 51 million by 2040.

Experts say that California's flood challenges are higher now than in 1964. California's population and housing continue relentlessly to expand and grow with astonishing speed.

Losing about 50,000 farmland acres per year to development, California is seeing its central valley transformed from fields and orchards to housing tracts and shopping malls.

"California's population growth presents a major challenge to the State's flood management system," notes a major DWR report urging flood program improvements. "In the Central Valley alone, much of the new development is occurring in areas that are susceptible to flooding."

That January 2005 report, "Responding to California's Flood Crisis", notes that a recent court decision (Paterno) "makes it possible the State will ultimately be held responsible for the structural integrity of much of the Central Valley flood control system—1,600 miles of levees that protect more than half a million people, 2 million acres of cultivated land and approximately 200,000 structures with an estimated value of $47 billion."

That report recommends improving flood management programs and their funding in California, especially in the Central Valley, an effort to which DWR is vigorously committed.

In 2005, Hurricanes Katrina and Rita, and the flooding of New Orleans, have dramatized anew on a national stage the flood disaster anxieties that historically accompany—and endanger—California life.

Though four decades have passed, the images of the 1964 Northern California flooding are still awesome to recall—and a compelling lesson on our need to prepare for the big floods that Mother Nature has in store for California.

DWR RESPONDS TO RECENT NORTH STATE STORMS AND FLOODING

by Pete Weisser

DWR responded quickly and efficiently to a series of powerful late December 2005 rainstorms that drenched Northern California, causing high flows in all major North State rivers and extensive flooding on the Napa and Russian rivers.

The mainstem Sacramento River flood control system performed well, from Shasta and Oroville reservoirs down to the Delta, where floodfighters successfully battled high winds and waves to bolster damaged levees and save storm-battered Twitchell Island.

Following a series of forecasts by DWR and National Weather Service staff over the Christmas holiday, DWR on December 27 called a Flood Alert, activating the State-Federal Flood Operations Center. **Jay Punia**, Chief of the Flood Operations Branch, called the alert, citing the need to track runoff, operate flood control facilities and prepare for flood fights. The Flood Center was fully staffed for eight days, beginning on December 27.

As storms intensified and rivers rose, DWR **Director Lester Snow** on December 29 declared DWR to be mobilized on an emergency basis. Snow, who participated in key flood management meetings during long hours at the Flood Center, cited high Delta tides and wet weather forecasts in the mobilization order.

Dozens of DWR employees worked around the clock through January 3, monitoring river flows, operating reservoirs for flood safety, patrolling levees, coordinating with local reclamation districts and public safety officials,

Top Photo: Yolo Bypass in January 2006. (Photo by Michael Miller)

During the 2006 flood event, there was a boil in a vineyard on the western levee of the Sacramento River in Reclamation District 150 (Merritt Island), located south of Clarksburg. (Photo by Flood Management staff)

and conducting flood fights with the help of California Conservation Corps crews and reclamation district staff.

While some rural portions of the upper Sacramento had overflows, the lower, leveed Sacramento River mainstem never exceeded high monitor stage, including flows through the metropolitan Sacramento area.

On December 31, the Sacramento River reached 27.5 feet elevation at Sacramento's I Street Bridge (where flood stage is 31 feet) and forecasts called for continued rising. As a result and in accordance with operating procedures, DWR on December 31 opened gates on the Sacramento Weir for the first time since 1998, spilling excess flows into the already surging Yolo Bypass.

The Delta was stressed with high tides and huge runoff from the river and bypass. High winds, gusting above 50 mph, and choppy waves, contributed to levee overtop-

Photo of Suisun Marsh flooding in January 2006. (Photo by Flood Management staff)

ping. More than 25 Delta incidents were recorded, with boils, seepage and levee problems stabilized by DWR, CCC and reclamation district teams.

Twitchell Island, a DWR-owned 3,500-acre island in Southern Sacramento County, was evacuated New Year's Day on orders of local officials, due to overtopping. Swift work by the local reclamation district, their contractors, together with work by DWR and CCC crews stabilized Twitchell Island by January 3. The evacuation order was lifted on January 4.

Governor Schwarzenegger paid visits to two storm-affected areas—Natomas Cross Canal, north of Sacramento, on January 3, and flood-ravaged communities along the Russian and Napa rivers on January 2. On both trips he spoke of the need to strengthen California's levee and flood protection system. As of January 3, the Governor had issued proclamations declaring 23 of California's 58 counties disaster areas due to flood impacts.

California news media—especially Northern California newspapers, broadcasters and television stations—devoted extensive coverage to the storm series and floods, most severe and widespread since those of 1998.

DWR officials and their flood alert partners in the National Weather Service held frequent news briefings for the news media, including two press events per day during the three-day New Year's holiday weekend. Information Officers handled hundreds of media inquiries from throughout California and across the nation.

As the flood flows subsided on January 3, total Delta outflows from the Sacramento River and Yolo Bypass hit the 400,000 cfs mark, an immense volume but just two-thirds of the total outflow during the major flood of record in 1997.

As the storm vanished and Northern Californians welcomed dry weather, DWR flood managers staged back from emergency status. But they remained busy, evaluating the flood experience and reviewing the flood management system for areas needing improvement.

Flood experts noted that California still had three potentially wet months left in its traditional flood season, advising the public to remain vigilant and prepared for potential floods.

(Left to Right) On January 6 at Nimbus Dam, Governor Schwarzenegger announced his long-term strategy for improving water management in California through a series of bond acts. DWR Director Lester Snow and Secretary for Resources Mike Chrisman also spoke at the event. (Photo by Elizabeth Scott)

Flood Protection and Clean, Safe, and Reliable Water Supply Bond and Financing Acts of 2006 and 2010

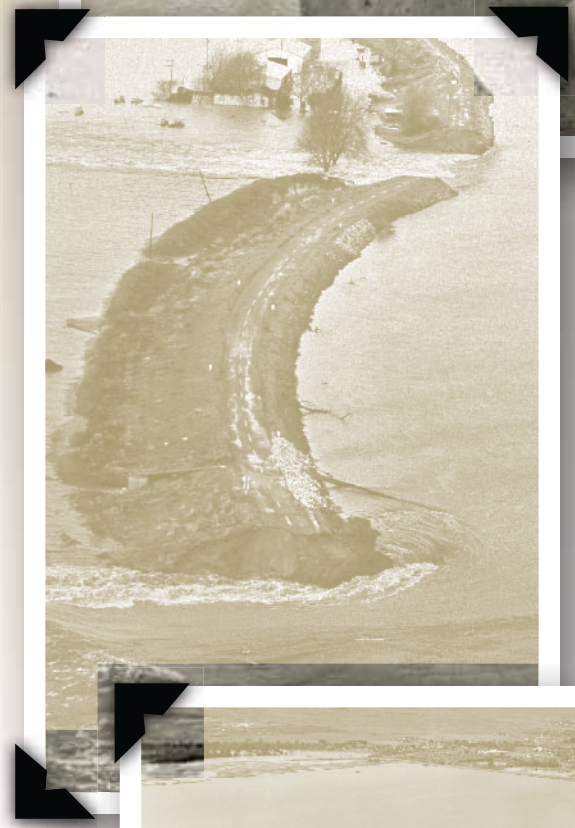
In January 2006, Governor Schwarzenegger proposed a Strategic Growth Plan for California. One component of the Plan will invest $35 billion over the next 10 years to improve California's flood management system, and ensure safe and reliable water supplies. This includes $21 billion from existing local and federal sources, $9 billion in general obligation bonds, $5 billion from a new revenue sources, the Water Resources Investment Fund.

The Flood Protection and Clean, Safe and Reliable Water Supply Bond and Financing Acts of 2006 and 2010 will provide $2.5 billion for flood management and $6.5 billion for water management activities.

Key flood management projects that will be funded with the bonds include remapping more than one million acres of Central Valley floodplains, repairing state-federal project levees, seismic strengthening of critical Delta levees, improving urban flood protection including modifications of Folsom Dam to help provide Sacramento with 200-year protection, and fully funding the state's share for flood control projects outside of the Central Valley.

The water management activities that will be funded include financial support for integrated regional water management plans, water supply and water quality improvements, groundwater cleanup, development of surface and groundwater storage programs, and research and development activities to support desalination, climate change issues and environmental protection.

CALIFORNIA FLOODS



Above: 1955 Flood.

Left: Levee failure in the Sacramento-San Joaquin Delta (Tyler Island) during the 1986 floods.

Below: 1964 Flood.

Sutter Bypass Levee failure in the 1997 floods.

Flooding in 1997.

The 1955 Flood in Yuba City.

Future Operations Program

by Alison Raymer

At about this time last year, the Future Operations Program was being implemented with the assistance from the divisions of Operations and Maintenance, Technology Services, Fiscal Services, and the State Water Project Analysis Office.

Today, the SWP is a stable and integral part of California's infrastructure and economy. Though stable, it is also an aging infrastructure that presents its own set of challenges, in addition to those that emerged in the 1990s with (a) the deregulated energy market and its resulting volatile costs, (b) the expiration of 20-year power contracts that had shielded DWR and the State Water Contractors from unstable costs for power to operate, (c) reduced Colorado River water, and (d) different and improved utility industry best business practices. In response to these issues and rising concerns of the State Water Contractors to stabilize costs, DWR established the Future Operations Program in 2002, to implement the business strategy for the continued operation of the SWP in the 21st Century. Sixteen projects were initially identified for implementation under the Future Operations Program. As you can see from the diagram on the following page, as of today, two of those projects are classified as ongoing; six have been completed; five are in progress; and three are still pending.

Future Operations Program

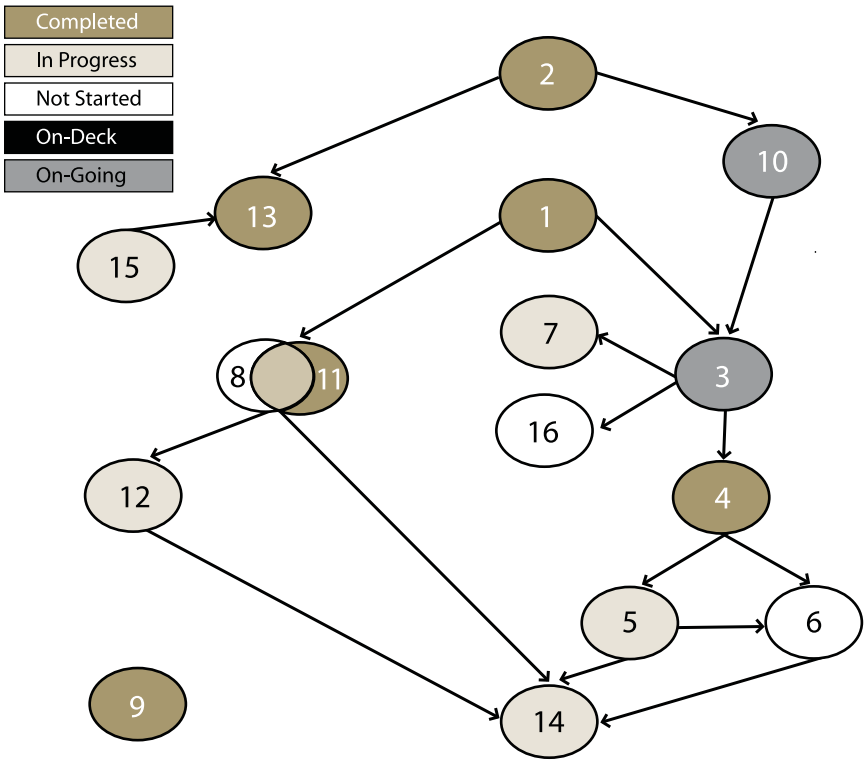
The most recently completed projects are the Phase 2B and Post-2004 Power Projects. The primary goals of these projects were to ensure that DWR was where it needed to be organizationally, technologically, and procedurally in order to assume full responsibility for independently operating the SWP by midnight of December 31, 2004.

The newest project on the Future Operations plate is the Centralized Control System Migration Project, Phase 1, referred to as the CCSM Project.

As a result of the completion of these two projects, DWR assumed work that had never before been done in DWR and successfully transitioned from operating under the protection of long-term energy contracts to independent operation in the energy market as described below.

The Post-2004 Power Project implemented a new power portfolio that enabled DWR to successfully and independently transact in the energy market. We continue to be a significant player in the energy market by the sheer amount of transacting we do. We have developed SWP energy risk and credit policies, planned financial hedging for natural gas, and executed numerous Request for Proposal's for power sales, purchases, and exchanges for 2005 and into the future. To accommodate this new work and to align ourselves with best industry practices, we are working on several employee classification proposals and we have developed and implemented a new organizational structure for the Division of Operations and Maintenance to reflect the segregation of duties inherent in any financially-oriented organization. This organization structure will be formalized July 1, 2006.

The Phase 2B Project developed and implemented the technological tools necessary to support the new energy transacting work. This project resulted in the implementation of the ACES tool, through which we communicate and schedule with the California Independent System Operator, track, monitor, and settle energy contracts, and document all energy transactions. The project also implemented SAP Business Warehouse software which enables us to take the



List of Projects

1. Future Operations Strategy Review
2. DWR Risk Analysis Methodology
3. Coordinated Resources Model
4. Control System Requirements/ Migration Strategy
5. Oroville Complex Control System
6. Aqueduct Control System
7. Multi-Skilling
8. Automated Tools
9. Quick Hits
10. Service Level Agreements
11. Phase 2B
12. MAPPER Migration Strategy
13. Post-2004 Power Project
    - Phase 1A
    - Phase 1B-1C
14. Communications Upgrade
15. Oroville FERC Re-Licensing
16. Water Accounting

Future Operations Program

From the Phase 2B Technology Team, Control Systems Technician III Susan Blood, Senior Informations Systems Analyst Pardeep Banga **(standing at left)** and consultant Mike Golshanara **(sitting)** reviewed the system architecture layout.

data collected in ACES and present it in customized reports in a variety of formats to meet the needs of our customers and stakeholders and in the management of an annual power portfolio of approximately $500 million.

An added benefit of the Phase 2B project and the tools it implemented was the completion of yet another endeavor, the Power Cost Distribution (PCD) Project. This Project automated a comprehensive process for collecting and distributing SWP power costs charged to the State Water Contractors. Historically, this process has been performed manually. The automation will significantly reduce staff time required to allocate power costs, leaving more time for validations and other invoicing activities. In addition, this project work reinforced the importance of inter-office communications—impacted organizations have worked together to ensure efficiency and consistency throughout the business process.

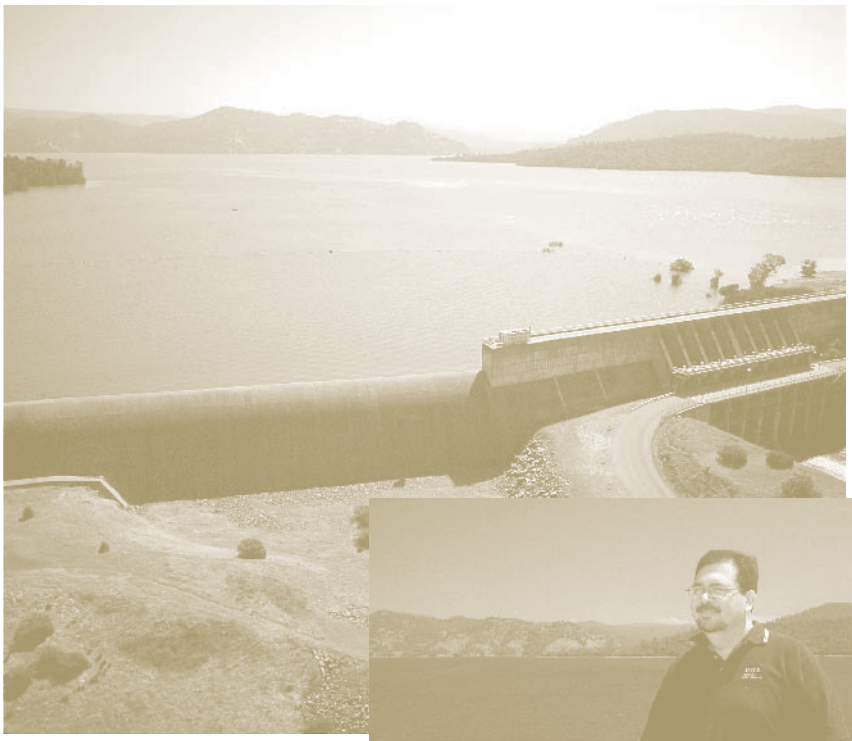
The newest project on the Future Operations plate is the Centralized Control System Migration Project, Phase 1, referred to as the CCSM Project. This Project is a follow-on project to the Future Operations Strategy Review and Control System Requirements Project completed in March of 2004. The earlier "Centralized Ops" project involved a high level look at (a) the risk involved in operating the SWP from a single, central point rather than by each Field Division, (b) the technical support system requirements to implement centralized operations, and (c) a strategy for migrating from remote operations to centralized operations. Based on this project, it was determined that DWR would centralize SWP operations, and future projects would flush out the details needed to do so. The CCSM project is also three-pronged, whose goals are to (a) prepare the current Control Systems to support centralized operations, (b) develop standards for future Control System equipment that supports centralized operations in a manner that accommodates evergreening, and (c) develop the requirements and an implementation plan for the Oroville Control System replacement. In conjunction with these goals, the Project will develop a long-term procurement strategy for future purchases of standardized Control System equipment. The CCSM Project is fully functional and is scheduled for completion in May 2006. Total migration to centralized operations and control is anticipated to take about seven years.

As you can imagine, the Future Operations Program is a busy place to be! Thanks to the vision of all of you, DWR continues to meet or exceed the challenges facing it. The next 50 years will continue to test all of us as we carry on the balancing act between ever-increasing water demand with a fluctuating natural resource and we face additional, as yet unimagined, challenges. Yet, through efforts such as the Future Operations Program and its dedicated staff, DWR persists in proving it can rise to any occasion. ■

(Left to Right) Phase 2B Integration Team members included Senior Water & Power Dispatcher Bob Floyd, Water & Power Dispatcher Louis Carillo, Senior Hydroelectric Plant Operator Linda Sue Solomon, Senior Water and Power Dispatcher Henry Munoz, Chief Water & Power Dispatcher and Quality Assurance Metrics Lead Terry Dennis.

FERC FEDERAL ENERGY

by Anna Torres



With the signing of the draft application for a new federal license for the Oroville Facilities by **Director Lester Snow** on January 26 of 2005, the Department of Water Resources passed another milestone toward obtaining a new license from the Federal Energy Regulatory Commission.

The document took five years to prepare. It contained a preliminary draft covering environmental, recreational, cultural, land use, engineering, and operations issues. The documents contain over 28,000 pages and include more than 130 reports covering 71 study plans that FERC will use to assess the Oroville Facilities.

Ralph Torres, Acting Deputy Director and the Department's primary negotiator for the settlement agreements, stated:

"The collaborative effort with over 50 stakeholder organizations is unprecedented in magnitude for hydropower relicensing."

Stakeholders met and negotiated conditions for the new license. Negotiations were completed in January, 2006. FERC will use this "settlement agreement" to help craft the new license conditions.

"The negotiating sessions were grueling, after 21 months of negotiating, stakeholders and Department staff were exhausted. Trying to make everyone happy was not

Above: Ralph Torres, DWR's primary negotiator for FERC agreements, views Lake Oroville.

Top: Oroville Dam is the tallest and one of the largest dams in the United States.

Right: Director Snow and DWR's FERC Relicensing Team.

REGULATORY COMMISSION

likely going to happen. However, having everyone equally unhappy was a more achievable goal," said Ralph.

The Department and many stakeholders reached important consensus agreements on a variety of issues.

"The most difficult issues involved water temperatures and flows in the Feather River. There are many different uses for the water requiring different flows and temperatures. We know that a single flow temperature scenario does not meet all needs. For example, salmon and steelhead needed colder water than the rice growers can use. Greater flows help habitat, however they reduce water supply and power generation. All of these are very big ticket items," said Ralph.

The Relicensing process is still underway with the present license expiring on January 31, 2007.

"We were given a great opportunity to design the future. Through a collaborative process an important agreement was reached and new positive relationships were established," said Ralph. ■

Lime Saddle campground is among several relicensing-related projects. It includes new campsites and restroom buildings.

DWR KEEPS POWER FLOWING

During Unprecedented Energy Crisis

by Oscar Hidalgo, Information Officer, California Energy Resources Scheduling

The order itself was straight-forward enough—keep the power flowing in California. But the task was enormous—purchase enough electricity for more than 27 million people during a period when supplies were scarce and prices were skyrocketing out of control.

On January 17, 2001, the Department of Water Resources (DWR)—known for its quick response to floods, protecting the Delta, or helping meet the water needs of California communities—was put on the front line of California's energy crisis with this very task.

It was a dark time in California history, both figuratively and literally. The California Independent System Operator relied on rotating blackouts to prevent a widespread collapse of the State's electrical grid, major utilities were in deep financial trouble, while energy companies took full advantage of a dysfunctional energy market.

Members of CERS' contracts, fuel and settlements teams gather for their weekly meeting. (Left to Right) Staff include Jon Edward, Tom McGivney, Bob Grow, Chuck Toney, George Baldini, John Pacheco and Carol Hurlock.

Within hours of the Governor's issuing of an Emergency Declaration, DWR mobilized with organized swiftness and created a new division within DWR, the California Energy Resources Scheduling (CERS) division. Staffed with State employees and hired consultants, CERS gathered in a hastily prepared emergency operations center in Sacramento to begin daily power purchases. The scale of energy purchases CERS was being asked to undertake dwarfed that of meeting the 2,000 megawatt demand to power the State Water Project. Overnight, DWR became the largest single power buyer in the West. During the first few weeks, more than 30 people were added to fill positions in operations, planning, logistics, finance, and public information.

The CERS trading room was a 24-hour a day, seven day a week operation where high-stakes bartering took place with sellers who knew that California was desperate for electricity. Average costs for energy were peaking at more than $300 per megawatt hour, nearly 10 times its fair market value. With a loan from the State's General Fund, CERS was spending more than $1 billion a month in the first half of 2001. CERS staff was working round the clock, sleeping overnight in conference rooms rather than going home. During the summer of 2001, CERS had purchased 17,000 megawatts of power, enough electricity to supply 17 million homes and businesses.

"It was likely the most difficult and challenging period of my career," said DWR Deputy Director **Pete Garris**, who oversaw energy purchases and energy delivery activities since day one of the DWR's involvement in the crisis. Garris retired in 2006. "We were working in a fast-paced, unstable environment while trying to keep supplies up and prices down."

To do that, CERS began to reduce the amount of electricity it needed to buy out of the volatile daily spot market by negotiating long-term contracts that would lock in more stable, predictable prices. The contracts had an additional benefit desperately needed in California: it brought more than 5,000 megawatts of newly built power supplies to the State. In total, the Department entered into 56 long-term agreements in 2001 at a cost of $42 billion over 12 years.

Although costly, contracted energy deliveries had a dramatic tempering effect on spot market prices. The average spot market price of electricity fell from $355 per megawatt hour in January 2001 to $72 a megawatt hour just five months later.

CERS also was successful in its main goal of keeping power flowing to California residents and businesses. There were no power interruptions in the summers of 2001 or 2002, an accomplishment that critics predicted was impossible at the time.

In late 2001, the mounting evidence that energy companies manipulated energy prices by shutting off powerplants and caused "phantom" congestion of power lines to stop energy deliveries into California gave CERS the leverage it needed to begin renegotiating most of the power contracts it had entered into during the height of the crisis. By the end of 2003, CERS had successfully renegotiated 34 of its original 56 agreements—saving more than $6.3 billion in contract costs. In addition, CERS successfully negotiated refunds from energy companies for overcharging market prices—a savings of an additional $5.1 billion.

In late 2001, the mounting evidence that energy companies manipulated energy prices by shutting off powerplants and caused "phantom" congestion of power lines to stop energy deliveries into California gave CERS the leverage it needed to begin renegotiating most of the power contracts it had entered into during the height of the crisis.

(Left to Right) Contract Analysts Stephanie King and Cindy Percival meet with Parviz Karami of CERS' Invoice Validation Unit.

In October and November 2002, CERS sold $11.2 billion in bonds—the largest bond sale in California's history—to pay for its power purchases. Bond proceeds were used to repay $6.5 billion to the General Fund, retire a $3.4 billion short-term loan, and to maintain adequate reserve levels.

CERS concluded its daily power purchases operation on January 1, 2003, successfully returning that daily responsibility to the utilities.

Today, CERS continues to manage its long-term contract portfolio as well as its bond debt. The task of effectively managing the State's portfolio of contracts and bond financing is important for maintaining reliability in California's energy supplies while maintaining the lowest possible costs for ratepayers. Both of these complex and critical responsibilities will continue until the last of the contracts expires in 2015 and the bond is completely retired in about 2020. ■

40th Anniversary of Western States Water Council

by Jeanine Jones

The year was 1965. **Edmund G. "Pat" Brown** was Governor of California. The Beatles made their fourth appearance on the Ed Sullivan Show. A Soviet astronaut made the first spacewalk. Construction was beginning on the State Water Project's Tehachapi (later Edmonston) Pumping Plant. The main embankment of Oroville Dam was still two years away from being topped out. Construction of the Bureau of Reclamation's (the Bureau's) Glen Canyon Dam on the Colorado River was being completed, although power generation had already begun the year before.

DWR planners and engineers were searching for ways to meet California's future water needs in a continuing response to the tremendous post-war population boom. With work well underway on initial features of the State Water Project, attention was turning to a broad menu of additional options. DWR reports confidently predicted that large-scale ocean desalting would relatively soon become affordable. The Bureau, DWR, and others were reviewing proposals for large-scale inter-regional water development projects—pipelines and canals to California from such far-flung locations as the Columbia River or the Great Lakes region (with other delivery points en route throughout the arid southwestern states).

At the request of Governor **Pat Brown**, **Wes Steiner**, then California's Coordinator of Interagency Planning, made a presentation at a 1964 Western Governors' Conference (WGC) meeting in San Francisco on large-scale, long-range planning studies. Governor Brown hoped to interest the other governors in creating a water council under the aegis of the WGC (subsequently to become the Western Governors' Association), to provide a forum for coordination of such interbasin studies. Subsequently, Steiner and **Don Maughan** (who ultimately retired as Executive Officer of the State Water Resources Control Board) were instructed to draft rules and related materials for a water council. The WGC acted on the proposal at its 1965 meeting in Oregon, where Governor **Mark Hatfield** of Oregon supported creation of an interstate council to study water needs, to preclude the idea of diverting the Columbia River to California.

As created in 1965, the Western States Water Council was composed of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The Council held its first meeting at Lake Tahoe. Governor Brown appointed State Senator **James Cobey**, DWR Director **William Warne**, and Colorado River Board Chairman **Ray Rummonds** as California's initial representatives to the Council.

When the Council began meeting, it became apparent fairly soon that unanimity on large-scale interbasin water

In 2005, Council Members meeting in Boise Idaho included California representatives Jeanine Jones of DWR (fourth from left front) and Tom Maddock, a Consultant (front, at far right).

transfers would not be forthcoming. In a 1966 letter to Governor Brown, **William Gianelli**, who later became DWR's Director, suggested that pressing the Council to develop consensus on interbasin transfers would not be fruitful. The division among the western states on this subject was made clear in 1968, when congressional representatives from northwestern states were successful in adding language to the Colorado River Basin Project Act prohibiting the Secretary of the Interior from studying importation of water into the Colorado River Basin for a 10-year period. The prohibition was subsequently modified to prohibit federal study of Columbia River Basin exports.

The Council accordingly shifted its focus to serving as a forum for exchange of ideas and information on western water issues, and representing state viewpoints on federal legislative and administrative actions. The Council maintains an office and a small staff in Salt Lake City, and is formally affiliated with the Western Governors' Association. Today there are 17 active member states—all of the original members plus Texas, North Dakota, South Dakota, Oklahoma, Kansas, and Nebraska. DWR remains active on the Council; two of DWR's Directors—Gianelli and **David Kennedy**—served as Chairs of the Council. ■

The 1985 Council Members representing California included California State Senator **Ruben Ayala** (middle, at far left) and DWR Director **David Kennedy** (front, fifth from right).

IBM 1620
DATA PROCESSING SYSTEM

The Changing Era of Technology Services

by Margarita Macias

The year 1956 was the beginning of several new technology advances: the first transatlantic telephone cable began operation, the first computer hard disk was used, and the first commercial videotape recorder was introduced.

When DWR was created in 1956, phones and typewriters were shared by staff, faxes were rare, and pagers, cell phones, personal computers, and the Internet did not exist. By the 1970s, the invention of floppy disks and word processors led DWR's technology in another direction.

Today, DWR's operation depends greatly on the advances of newer technology, such as cell phones, personal computers, fax machines, Web servers, control systems, and the Internet.

Technology Services has always had a great impact on several facets of DWR's communication system from telecommunications to the State Water Project's Information Technology system. With more than 2,700 employees statewide and extensive amounts of water related information, it is no wonder that technology has and will continue to play an important role at DWR.

Telecommunications

There was a time when phones were not on all DWR desks. Usually, only managers and supervisors had phones and these were shared by the unit. These phones did not have many of today's standard features, such as speaker phone, speed dial, and voice mail. Voice mail was first introduced into the Department in 1989.

Fax machines were also rare in the earlier days. As late as 1989, the Department had only one central fax machine located on the 16th floor of the Resources Building. Today, there are more than 200 fax machines throughout DWR.

Cell phones were first used by the Department in the early 1990s and were not the compact units being used today. They were "lunch box" size and carried in a bag. Since there were few cell phones, they required considerable justification for borrowing one from the phone pool. As time progressed, pagers and satellite phones became available. Today, the newer cell phones fit in your pocket and do much more than just make and receive calls. These new cell phones can retrieve and send email, take and send photos, and provide access to the Web.

"What's next, rumor has it that a cell phone built into sun glasses is available for around $600," said **Chuck Leni**, Chief of the Telecommunications Branch. "I wouldn't be surprised if the next generation, of babies, not phones, will come pre-equipped with wireless connectivity to the Internet and the phone network."

(Left) Keypunching of DWR information. **(Right)** Disk drive mounting to store computer data.

Internet and Security

Throughout the 1970s and 1980s, DWR's mainframe computers were locked in secure data centers and were maintained by trained computer operators. Customers received reports by hard copy. With the development of local and wide area networks in the late 1980s, the Internet

DWR's first venture onto the Internet originated in the Division of Planning and Local Assistance with a connection through the University of California at Davis in the early 1990s.

Above are some of the 1970 Computer Office assignments. **(Left)** Cards are fed into card reader. **(Middle)** Tapes are stored in the Tape Library. **(Top, Right)** Cards are placed in card tray for later usage in computer. **(Bottom, Right)** Control Data Corporation 3300 tape drive and console is being checked.

completely changed the nature of computing. The first organizations across the country to have the Internet-type access were the military, government agencies, and research units in universities. These organizations communicated with each other by using Unix workstations and character-based commands.

DWR's first venture onto the Internet originated in the Division of Planning and Local Assistance with a connection through the University of California at Davis in the early 1990s.

"The division had a long association with the University, using it to access newsgroups through a dial-up modem link into one of the early desktop computers in use at DWR," said **Roger Linder**, Systems Software Specialist, Network and Communications Support Office.

The initial establishment of the Department's Internet domain required DWR to establish a ca.gov domain, since only federal agencies had used the "gov" domain until that time. Teale Data Center later assisted in managing this domain.

As the Internet became a more important part of DWR's business needs, the Department contracted with an Internet Service Provider for a direct connection in 1996.

When the Internet's first worm was released by a college student in 1988, Internet security became of major importance. The earlier windows-based computers only had to worry about viruses on floppy diskettes.

DWR employee reviews printout on computer paper.

In the 1990s, two significant events, the Internet going public and early Web browsers becoming widely available, resulted in the changing role of security. Viruses moved from floppy disks to macros, which entered the Department through email attachments. The Department started offering its own Web sites and created a protected zone for public access.

Today, DWR has three layers of anti-virus software that scan incoming and out-going emails. Each desktop and laptop version of DWR's anti-virus software also includes a personal firewall. The Department blocks thousands of junk mail messages each day.

"We can expect that the bad guys will continue to take advantage of the weaknesses in any new technology. The risk from unprotected wireless connections has become well established and widely discussed," said **Bert Pierroz**, Deputy Chief Information Officer for the Division of Technology Services.

Data Processing

In the 1970s, DWR's data processing was done on a mainframe computer. The computer and its peripherals covered about one quarter of the Seventh Floor and consisted of tape drives, a card reader, card punch, peripheral controllers, memory bank, a system console, and disk drives. Memory banks, about 22 of them, were about the size of a double door refrigerator, and each one had a capacity of 16Kbytes.

"Tape drives, also about the size of a refrigerator, were used to store information, which at that time, was much cheaper than disk storage," said **Chris Navarrete**, Chief

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of IT Support Services Branch. "There were approximately 10,000 nine-track tapes (12 inch reels) in the tape library. Card readers were used to input data and programs into the computer, as there was no such thing as a terminal."

Job scheduling was not done by the system, it relied on the computer operator to manually figure out what jobs could "fit" in the computer's memory, and if the appropriate tape units or disks were available.

"Three shifts of computer operators worked five days a week running batch jobs and there were two shifts of key entry staff entering punch cards," said Chris. "The about 20 programmers at DWR in the 1970s had a vast choice of programming languages. Today, most programmers are programming html (web languages) and object oriented languages."

By the late 1970s, the Department's Information Technology (IT) needs were growing, so DWR purchased a used Control Data Corporation (CDC) 720 from California State University, Sacramento (CSUS).

In the 1970s, DWR's mainframe printer for the Headquarters Building in Sacramento was located in the Computer Room.

During the 1970s, DWR staff overseeing the jobs as they are entered into DWR's mainframe computer.

"I remember this CDC computer had to be removed from the CSUS science building through a window via a crane as it would not fit through their hallways," said Chris.

In the same timeframe, DWR along with the University of California, Davis brought in a Prime Computer and developed the California Irrigation Management Information System. Eventually, the system was replaced by a SUN Microsystems Corporation system.

In the 1980s DWR purchased Computer Aided Design and Drafting systems along with Four Phase Systems. The Four Phases were used for word processing throughout DWR Headquarters. By the 1990s, personal computers were installed and DWR was moving to the UNIX operating system. DWR programming staff developed the Business Information System (BIS) and Maintenance Management Information System (MMIS). These systems were to replace programs running on the mainframe systems. In the 1990s, the Seventh Floor was remodeled and a new data center was built. State of the art monitoring and Heating, Ventilation, and Air Conditioning (HVAC) were installed in the datacenter. In addition, the data center moved from beneath the Eighth floor cafeteria and its periodic water leaks onto the Seventh floor computer equipment room.

With the year 2000 on the horizon, DWR management decided to move to an enterprise planning system, SAP. After SAP went online on July 1, 2000, it brought an end to the BIS and MMIS systems.

"We are now moving to the next version of SAP. About every three years, we will upgrade the servers to faster and more reliable equipment," said Chris.

The State Water Project's Information Technology

When the State Water Project (SWP) was first constructed, the UNIVAC 418 was the main computer that supported Project Operations Control's operation. It had less than 200,000 bytes of memory. By 1982, the UNIVAC was emulated on a Sperry Rand 1100/60 computer.

DWR employee **Joe Kimbriel** along with former DWR employees **Howard Tanabe** and **Keith Work** were among the many employees who worked on setting up the SWP's Information Technology.

"When I joined DWR almost 40 years ago, any radial gate or valves that had to be opened was done manually," said Joe. "Operators were driving up and down the Aqueduct to open gates. They would communicate by car radios."

To initiate the remote operation the SWP facilities, Howard Tanabe along with others installed the first model control system in the 1960s at the Delta South Bay Aqueduct.

In 1968, Joe also assisted in the installation of a control system from Gianelli Pumping-Generating Plant to Buena Vista Pumping Plant. During this time, a hybrid system was being installed in the Oroville Field Division, which was replaced in the late 1980s with a single Supervisory Control and Data Acquisition (SCADA) system.

In the mid 1990s, the SWP's mini computers located along the Aqueduct were replaced with Remote Terminal Units (RTU's), which provided faster speed and more memory.

After 14 years of testing, integration, and migration of the SCADA system, the UNIVAC 418 emulator was turned off in November of 1999 and replaced by a fully functioning SCADA system.

With the aging of the existing SWP IT systems, the SCADA system will be upgraded or replaced depending on the facility and location. Oroville's facilities are scheduled for the second control system upgrade since the facilities were built. ■

The Remote Terminal Units control various State Water Project facilities, such as Thermalito Powerplant.

Thermalito Powerplant's Remote Terminal Unit.

Special Thanks to the following DWR employees and retirees who assisted in writing this article: Bert Pierroz, Chuck Leni, Roger Linder, Chris Navarrete, Keith Work, Howard Tanabe, and Joe Kimbriel.

DWR's ORAL HISTORY PROGRAM

by Joyce Tokita

Retired annuitants, **Ernie James** and **Art Winslow**, recognized that the Department's history was disappearing with the passing of its retired employees. The technical information of the planning, design, and construction of the State Water Project and other programs had been recorded in various bulletins and reports. However, these publications lacked a human touch. They wanted to preserve the wealth of technical knowledge and personal recollections of DWR employees who were involved in the development of these programs in their own words. From this desire developed an Oral History Program, which was completed at the end of 2005.

Left: Associate Governmental Program Analyst Joyce Tokita and Retired Annuitant Art Winslow review the Oral History Program's video and written report on DWR Retiree Joseph Burns. The entire report contains an executive summary, biographical synopses of 120 interviews, and an appendix.

Below: (Left to Right) DWR Retiree Merle Bashor answers questions during his Oral History Program interview with DWR Retired Annuitant Ernie James.

Even before the Department was established in 1956, many of these retirees were young engineers working for the State and traveling to different California regions to collect an array of water data; others compiled this data into Bulletin 1. Bulletin 2 followed, which forecasted the state's future water needs. At the same time, the Feather River Project report, the foundation of the State Water Project, was presented to the Legislature. This document assured the formation of the Department of Water Resources as a separate entity that would plan, design, and construct (later operate and maintain) the state's water system.

Once the voters approved the bond to fund the project, engineers from all over the nation were recruited to join the new department—not only to assist with the State Water Project but to take on many other responsibilities assigned to DWR.

Employees managed flood control systems, supervised dam safety, conducted snow surveys, served as local watermasters, and assisted communities with their water management projects. Ernie and Art were careful to select retirees who represented this variety of positions and programs.

The breadth and depth of the information collected within the Oral History Program's tapes range from the details of the controlled volume flow concept in the California Aqueduct to the changing evolution of the Department's internal organization to fond memories of a time when engineers were paid less than $400 a month.

Most of the interviews were taped in DWR's Film/Video studio by **Mark Lambert** and **Albert Madrid**. When a retiree could not make it to Sacramento, they traveled to their homes or businesses.

Countless hours were spent sorting through old employee rosters, making arrangements, going over notes, preparing for interviews, and conducting them. After the taping was completed, the writing part began. Ernie and Art wrote biographical synopses describing the person's personal and employment background. These synopses were compiled into a report which includes an appendix of additional information on specific individuals.

"The document that was produced captures the legacy these employees left for future generations of DWR employees," said Art. "Through **Joyce Tokita**'s efforts as a major promoter and supporter of the program, we obtained approval by **Director Kennedy** for this program. The result from this great teamwork is a program that will remain a vital part of the Department's history."

The tapes and report are available from the DWR's Film/Video Unit and were distributed to the State Library, the State Archives, and the University of California at Berkeley Water Resources Archives. Eventually the list of tapes will be placed online in the Film/Video catalog. ■

Remembering the Earlier Days of DWR

(Left to Right) In 1955, watermasters end of season meeting at McArthur in Modoc County. **Back Row:** Paul Art, "Vic" Vickroy, State Engineer A.D. "Bob" Edmonston, John Page, William Gianelli, Jan Warnshuis, Robert Whiting, Joe Nessler, Attorney Gavin Craig. **Front Row:** Harvey Banks, Vic Scammon **(on knee)**, Jack Cook, Cortland Lanning, Gus Kuiper, Lester Jopson, **Orville Abbott**, Ray Nesbit, and Dave Sabiston.

Orville Abbott

by Margarita Macias

As one of 10 Watermasters in three Northern California counties, **Orville Abbott** began working for the Division of Water Resources in 1950.

"When we conducted our watermaster duties, we had to become familiar with the owners of water rights on the many creeks and rivers, said Orville, who retired as Executive Officer of the California Water Commission.

Within six years of joining the Division of Water Resources, he became Senior Engineer and Supervisor of the Water Rights and Watermaster Section.

In addition to participating in two court cases involving the distribution of water in Lassen and Plumas counties, Orville also participated in the emergency sandbagging of levees along rivers and waterways in the Feather River area in 1952.

"I remember attending the dedication of SWP facilities, such as Castaic Dam in Los Angeles County and Perris Dam in Riverside County. I also attended the dedication of the federal government's New Melones Dam on the Stanislaus River," said Orville.

In 1963, Orville became Staff Engineer for the California Water Commission where one of his responsibilities was to assist with presentations to Congress on appropriations for flood control and other water projects.

Orville worked a few years in Statewide Planning, where he supervised economics, land use, and later the Davis-Grunsky program.

In 1972, he returned to the California Water Commission as Chief Engineer and Executive Officer until he retired in 1993.

Orville lives in Carmichael with his wife. They spend the winter months in Palm Desert.

"In other months, we have a small motor home in which we have traveled to each of the states in the continental USA, Alaska, and most of the Canadian Provinces. We play bridge, golf, and enjoy dancing. Each year, we attend the annual WW II reunion of the 73rd Bomb Wing," said Orville.

Joseph I. Burns

by Amanda Fulkerson

Above: (Left to Right) Joseph Burns signs Principal Engineer papers with Director Warne.

Right: Joseph speaks at a conference while Director Warne listens.

Joseph I. Burns, a partner in Murray, Burns and Kienlen Consulting Civil Engineers (now known as MBK Engineers), spent 14 years with DWR where he witnessed the birth of the State Water Project.

After earning his bachelor's and master's degrees in Civil Engineering from Stanford University, he joined the then Division of Water Resources as a Junior Civil Engineer in June 1949

From 1949 to 1951, his work focused on Bulletin 2. He developed data from six months in the field and studies for the Colorado Desert Area.

After a year's leave from 1951 to 1952, Joseph received his doctorate in Engineering from Stanford University. Joseph returned to work on flood control, snow surveys, hydrology, the Delta Biemond Plan, and Reclamation Board activities.

"There were very few people in the operations group, so you got a world of experience in a hurry," said Joseph.

Joseph married his wife Maxine on December 17, 1955. His wedding date coincided with the infamous December 1955 flood.

"I spent most of our honeymoon putting in 18 hour days in the office and flood fighting on the Natomas Cross Canal," said Joseph.

After his first-hand experience with flooding, Joseph began working with the Attorney General's Office on flood litigation, an issue which he would be involved with for over 35 years.

Joseph witnessed the Department of Water Resources being established and its rapid growth in employees to design, construct and operate the State Water Project.

In his 14 years with the Department, Joseph was promoted progressively from Junior Civil Engineer to Assistant, Associate, Senior, Supervising, and Principal Civil Engineer.

Joseph was responsible for briefing new Director **William Warne** on the status of the State Water Project. "Bill asked what the design capacity was of the first leg of the California Aqueduct. I responded that that was still being studied. He simply stated it had been studied enough and if we didn't size it, he would." Joseph says the capacity was set at 10,000 cubic feet per second the next day.

Joseph recalls DWR leadership fondly. "Build it on time and within Budget. If you need more people, get them," said Joseph of his Director's mantra.

He also calls the DWR engineering staff "the best and most competent water engineering organization ever assembled."

In 1963, Joseph left the Department and became Chief Engineer for Leedshill Deleuw Engineers, consultants to the East Pakistan Water and Power Development Authority.

In June 1966, Joseph returned to the Department and was assigned to the Contractor Claims Appeal Board. Six months later, he left DWR to become a Consultant with Murray, Burns and Kienlen, Consulting Civil Engineers.

Today, Joseph resides in Sacramento with his wife, Maxine, who still teases him for missing out on their honeymoon.

Robert (Bob) Edmonston

by Amanda Fulkerson

Robert (Bob) Edmonston began his DWR career in the Division of Water Resources of the Department of Public Works in 1947 and stayed for 12 years as it evolved into the Department of Water Resources.

Before joining DWR in 1956, Bob served in the U.S. Navy from 1943 to 1946. He attended Stanford University, then graduated from the University of California, Berkeley with a bachelor's degree in Civil Engineering in 1947. He began his DWR career as a Junior Civil Engineer in 1956. As Principal Hydraulic Engineer, he was the author of Bulletin 78, which recommended the SWP be built to serve Kern County, Southern California, and Santa Barbara County. He concluded his career as Chief of Planning and Design and Construction in the Southern District.

When asked what he remembers most about DWR Bob said, "The many fine people I had the privilege of working with." He keeps in touch with a few of his co-workers from DWR.

Bob helped lay the plans for the joint project between the City of San Luis Obispo and DWR that would become Whale Rock Dam. He supervised the final studies of the California Aqueduct routes.

Bob resigned from DWR in 1959 to form Bookman-Edmonston Engineering, Inc. As President, he supervised planning, design, construction management, and operation of irrigation projects in California and Arizona. He also worked on projects in Mexico, Costa Rica, and Sudan. His company specialized in water resources. In 1994, he sold the business and retired.

Bob currently resides in Montecito, California with his wife, Ann, and their Labrador dog, Jake. He stays active in the water community by serving as President of the Board of Directors of the Montecito Water District and as Director of Ramirez Water District in Yuba County.

Bob's father, **Arthur D. Edmonston**, was a former California State Engineer and Chief of the Division of Water Resources from 1950 to 1955. A.D. Edmonston directed the early planning of the Central Valley Project, the State Water Project, and the State Water Plan. Edmonston Pumping Plant, the SWP's largest pumping facility, was named in his honor.

Above: With Bookman-Edmonston Engineering, Inc. from 1959 to 1994, Bob traveled to various places, such as Mexico, Costa Rica, and Sudan.

Above Left: Bob and his wife Ann enjoy attending their grandson Brian's football games.

Left: In 1993, Bob spoke during the John R. Teerink Wheeler Ridge Pumping Plant's renaming ceremony.

Norman Hill

by Cheryl Henderson

During his 15 years with DWR, former Staff Counsel III Norm Hill provided legal advice on environmental laws, flood control issues, State Water Project water supply contracts, and other issues.

During **Norman Hill**'s State career with three State agencies, he had a profound effect on protection of California's environment and endangered species. Norm attended Wesleyan University in Connecticut, where he graduated with a combined major of Economics, History and Political Science in 1963. While attending college, Norm spent his summers as a firefighter with the U. S. Forest Service and ending as a Relief Fire Captain. He graduated from Stanford Law School in 1966 and received admission to the State Bar of California. He then spent three years with the Army, including a year in Korea.

In 1969, Norm began working for DWR. A year later, the Legislature passed the California Environmental Quality Act (CEQA). CEQA is regarded as the foundation of environmental law and policy in California. Norm began working on legislation and guidelines relating to CEQA, which still reflect much of his original work. From 1971 until 1983, Norm was Assistant Secretary in the Resources Agency working on legislation and CEQA Guidelines.

Norm returned to DWR in 1983, working on water contracts for the State Water Project. He helped develop and taught environmental awareness classes to DWR employees. He was part of the team that developed and implemented the Governor's Drought Water Bank in 1991, and considers this his major accomplishment with DWR. Norm assisted DWR management and staff in drafting and negotiating more than 300 contracts within six weeks. Approximately 800,000 acre feet of water was purchased from water districts in the Sacramento River Valley and Delta region and delivered through the State Water Project to areas south of the Delta. DWR received the Innovations in Government award from Harvard University's John F. Kennedy School of Government for the program. Norm also received the first Distinguished Service Award from the State Lawyers' Union.

In 1996, Norm became Chief Counsel of the Department of Forestry and Fire Protection. During this time, he worked with many officials and entities in negotiating and then defending the Headwaters forest deal. Under this agreement, 7,500 acres of ancient redwoods owned by Pacific Lumber Company were acquired by the State of California and the United States. The company's remaining 211,000 acres of forest became governed by a Habitat Conservation Plan that protects endangered species in the forest.

Norm was an active Boy Scout leader. He retired from the Army Reserve as a Lieutenant Colonel.

DWR and CDF attorneys praise Norm for his professionalism, high ethical standards and integrity. CDF attorney Bruce Crane says that Norm can be relied upon to find the perfect solution to any problem, no matter how controversial, difficult, or trying the situation may be. Crane sums it up by saying, "Norm is one of those rare people who make you a better person for having known him." Norm said, "In State government you never accomplish anything by yourself; you can only do it working with other people."

Since retiring from the State in 2003, Norm has been doing pro bono work for the Senior Legal Hotline and has been part of a Community Emergency Response team of the Sacramento Metro Fire District. He has taken up playing the saxophone after a break of 40 years. He and his wife have travelled to the Great Lakes, Hawaii, Oklahoma, Arkansas, and Yellowstone and Grand Teton National Parks.

Mona Lopez

by Margarita Macias

During her 38 years with DWR, Mona enjoyed working on several telecommunications assignments.

Mona Lopez, one of the first five employees to work in the Telecommunications Office, worked on several of DWR's advances in the field of technology during her 38 years with DWR.

"When I joined DWR in 1963, the only advanced equipment we had was the electric typewriter," said Mona. "Later, as part of the Telecommunications staff, I got to switch many six-button telephone sets to single-line concept throughout DWR's Sacramento headquarters, including Central District and the Safety of Dams 22/X relocation."

Mona's DWR career began in Division of Design and Construction (now called the Division of Engineering) as an Office Assistant and later Intermediate Stenographer. Among her earlier assignments, she typed specifications for the various projects throughout the State.

"I am very proud of all my parts in the whole State Water Project being as I started when the core block at Oroville was poured. I didn't do any design work, but without my skills and those of others, much of the project might have been much harder. Most engineers did not do typing back then."

After joining the Training Office, she was later promoted to Senior Stenographer, Management Services Technician, and Staff Services Analyst.

During Mona's years in the Training Office, she arranged various trips to each field division that gave her insight about the entire project.

In the early 1980s, Mona began a six-month rotation assignment with the Telecommunications Office. She enjoyed her assignment so much that she stayed there until her retirement as Associate Information Systems Analyst in 2000.

(Left to Right) In 1993, Jill Breault, Diana Cobleigh (now retired Chief of the Telecommunications Office), and Mona Lopez of the Telecommunications Office discuss the possible conversion of one of the headquarters offices to a new telephone system that was to replace the former six-button system.

"I began the migration from predominantly two-way radio communications to cellular service in the mid-80s," said Mona. "I also worked on the conversion of the older telephone system to the new CALNET telephone system, which involved converting about 3,500 lines."

With her retirement, Mona now spends her time remodeling her home, traveling throughout the U.S., and being active with DWR's Alumni Club and DWR Retired Ladies monthly luncheons.

"I enjoy seeing everyone who made a difference in making DWR a great Department to be proud of," said Mona.

Larry Mullnix

by Pete Weisser

A veteran California water engineer with over four decades of professional experience, **Larry Mullnix** today remains a vigorous cheerleader for California's State Water Project and DWR.

"The water project has been a great investment for California, helping areas of need receive water and providing benefits for the environment, as well," says Mullnix, a Deputy Director with supervisory responsibility for three divisions when he retired in 1991. "DWR has done a superb job of building and running the SWP."

Long before DWR was created in 1956, Mullnix began working for the Division of Water Resources during summer vacations in the late 1940s while an engineering student at Stanford University. His mother, Irene, who supervised in the Division's file room and library, introduced him to the water agency. She enjoyed the distinction of starting an informal history of the Department. Irene's career spanned the years 1935 to 1970.

After graduating from Stanford in 1951, Larry began working for the Division full-time as an assistant engineer in construction. For most of the next 40 years, his assignments would focus on the SWP. The year DWR was born, 1956, Mullnix won promotion to senior engineer.

Starting in the 1960s with the Central District and Operations and Maintenance, he held a series of increasingly responsible management posts: Supervising Engineer of the Operations Section, Central District in 1964; Chief of O&M Water Operations Branch in 1972; Chief of the Water Engineering Office in 1974; Chief of Utilities Operations in 1981; Division Chief of Operations and Maintenance in 1982; and Deputy Director (supervising O&M, Design and Construction, and Land and Right of Way) in 1988.

Tall, energetic, curious and interested in all aspects of the SWP, Mullnix found his tasks fascinating and DWR an ideal place for an engineer to discover opportunities. "There were always fresh challenges and problems to solve, and we had the best engineers and managers to make things work," said Mullnix.

(Left to Right) Larry Gage, who retired as Chief of O&M's Operations Control Office in 2001, explains the savings bond program to Deputy Director Larry Mullnix.

During Larry's 40 years of engineering for the Department, he began working for Operations and Maintenance in the 1960's.

In addition to his operation and water engineering skills, Larry was an expert on the SWP's power generation program. As Deputy Director, he led the SWP during a time of expansion when four pumps were added to the Harvey O. Banks Pumping Plant and the East Branch of the California Aqueduct was enlarged. But it was an era also of rising environmental constraints and prolonged drought, when California experienced its longest modern statewide drought, from 1987 to 1992.

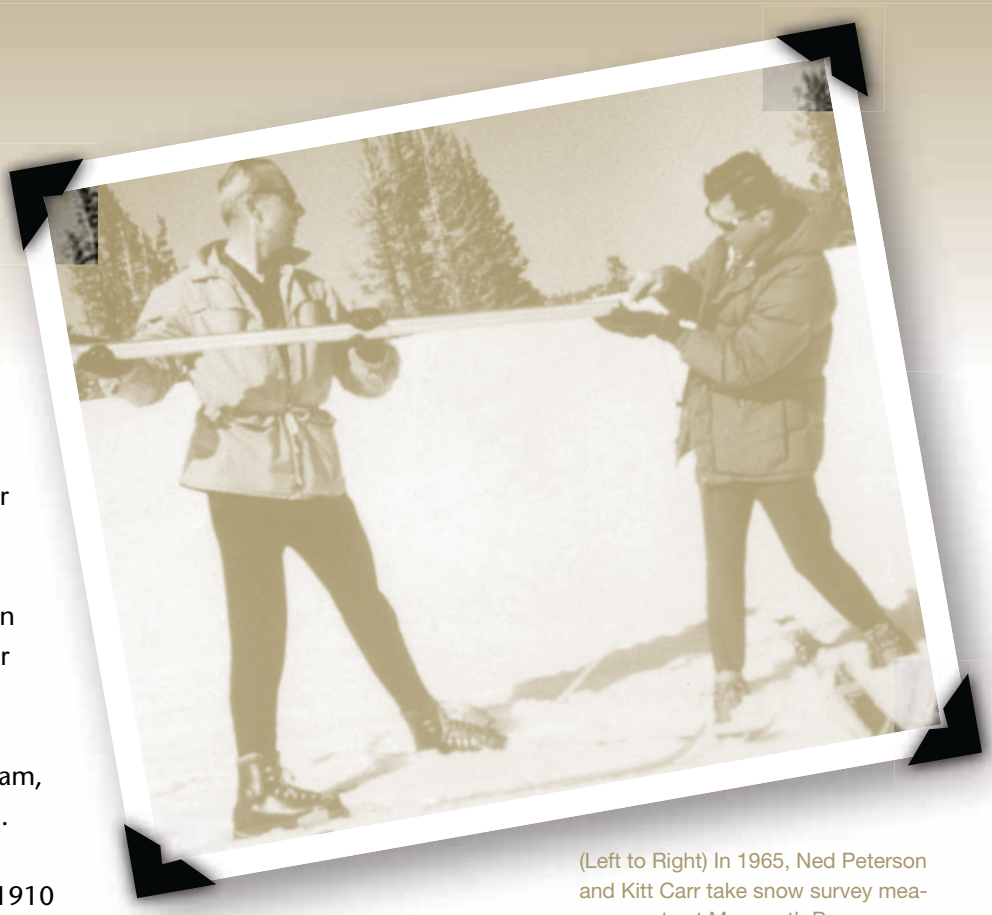
Mullnix takes great pride in the SWP's consistent record of water deliveries, technological modernization and operational efficiencies.

He unabashedly praises the SWP also as "very environmentally advanced for its time," citing the fish-friendly temperature control intake structure at Lake Oroville, the Skinner Delta Fish Protective Facility in the Delta to help safeguard fish from pumps and the Feather River Fish Hatchery to nurture Feather River salmon. A voluble and cheerful water advocate, Mullnix is a walking advertisement for the SWP and DWR.

Mullnix is also a history buff who appreciates the leaders who created DWR and built the SWP. He is not shy about telling you that they, too, did a great job.

Ned Peterson

by Margarita Macias



(Left to Right) In 1965, Ned Peterson and Kitt Carr take snow survey measurements at Mammoth Pass.

Ned Peterson's first assignment as an Engineering Aide for the Division of Water Resources was stream gaging in the Feather River basin, including the stream where Frenchman Reservoir was built. His flow measurements were used to size Frenchman Dam, which is the tallest of the three Upper Feather River dams.

Most of Ned's career continued in the California Cooperative Snow Surveys Program, which was created more than 75 years ago.

"Snow surveys were started by **Dr. Church** of the University of Nevada in 1910 to stop the 'Tahoe Water Wars.' They used the water supply forecasts to reach annual agreements on sharing the lake. Several California utilities started making snow surveys and the Division was asked to coordinate this work," said Ned. "When a position opened for snow surveying, I mentioned that I was a skier, backpacked the high Sierra with the Sierra Club, and I bowled, so I was hired."

Originally, the snow survey sites were very long. Ned and other staff reduced them to mostly 10 sample points and kept the mountain meadows clear of brush so the data would remain constant over the years.

Since the earlier days of snow surveying, changes occurred and automatic snow sensors developed. "We set up the 'Alpha Evaluation site' in the American River headwaters, and tested various sizes of rubber pillows and steel tanks filled with alcohol to indicate snow water content by pressure measurements. The current network transmits daily water pressure measurements to Sacramento, which give indications of increases between the monthly ground surveys."

During the snow survey work in summer and winter, Ned and other staff packed trips on horses to stock food and firewood in various State-owned high Sierra cabins, that were built over the years.

"Snow survey work was wonderful," said Ned. "Other fun times were when we flew over Aerial Snow Depth markers. The photos helped establish water content by comparing them with nearby snow course data at the same elevations."

After 22 years, Ned retired from DWR in 1983 as an Associate Engineer.

Ned and his wife of 50 years have traveled to over 40 countries around the world. "We bought a house trailer and belong to a recreational vehicle club. We camp out once a month with other friends. In addition to our visits to each others homes, we enjoy playing cards and eating potluck meals."

Ned prepares for his next snow survey journey.

Robert Potter

by Margarita Macias

Above: (Left to Right) Potter takes his oath as Chief Deputy Director with DWR Director Kennedy.

Left: In 1963, Potter reviews DWR documents at his desk in the Jackson Building on 14th and K streets in Sacramento.

Robert Potter, retired Chief Deputy Director of DWR from 1992 to 1998, became interested in a career with DWR during his Boy Scout troop backpacking trip in Desolation Valley in 1949.

"Our assistant Scout Master **Bill Berry** was a neighbor and Chief of Planning for the Division of Water Resources in the Department of Public Works. He spent some time explaining the geology and hydrology of the high Sierras," said Bob. "I was very impressed and probably started thinking of DWR right then."

From June 1957 through June 1959, Bob worked for DWR as an Engineering Aide II. He worked on the Calaveras County Investigation in the Local Projects Planning Section. After graduation from California State University, Sacramento in 1959, Bob transferred to Delta Studies as a Junior Civil Engineer. In 1962, he transferred to the Northern District. In 1965, DWR moved Bob, his wife Susan and their children Mike and Karen to Red Bluff.

"During my first years at DWR, I conducted field surveys and followed up with office engineering calculations," said Bob. "Some of my fondest early memories are of the great bosses I worked for such as **Fred Blankenberg, Robin Reynolds, Gordon Dukleth, Al Dolcini, Stu Pyle, George Baumli, Ed Barnes** and others."

Bob later joined the Division of Flood Management from 1976 to 1980 and the Division of Planning from 1980 to 1982. He became Chief of Central District in 1982, then he transferred to the Division of Planning's SWP Future Water Supplies Branch from 1984 to 1985. From 1985-1986, Bob was Chief of the Southern District. Bob became Deputy Director in 1986.

Bob's many projects with DWR included working on DWR Bulletin 76, a 1960 report which proposed a comprehensive plan for moving water through the Sacramento-San Joaquin Delta.

"Ironically, the plan from Bulletin 76 was killed by an outcry of support for a Peripheral Canal around the Delta," said Bob.

Other assignments included working on a 1974 review of California's total hydroelectric energy potential, chairing an interagency government-private task force created by the Resources Agency to seek solutions to save some tall redwood trees threatened by erosion on Redwood Creek, writing the 1976 Delta Alternative study, and helping write the Environmental Impact Report and guiding the permitting process for four new pumps at Banks Pumping Plant.

"During my last years at DWR as Chief Deputy Director to former DWR Director **Dave Kennedy**, many things were accomplished, both in the construction arena and in the policy arena," said Bob. "Projects on this list included four additional Delta Pumps, East Branch Enlargement, Coastal Aqueduct Construction, the Monterey Agreement, CALFED, creation of the San Joaquin River Management Council, the Upper Sacramento River 1086 Program, and the 1991 drought emergency water bank."

"I miss the great people at DWR. But, I doubt that I could keep up with today's pace of work."

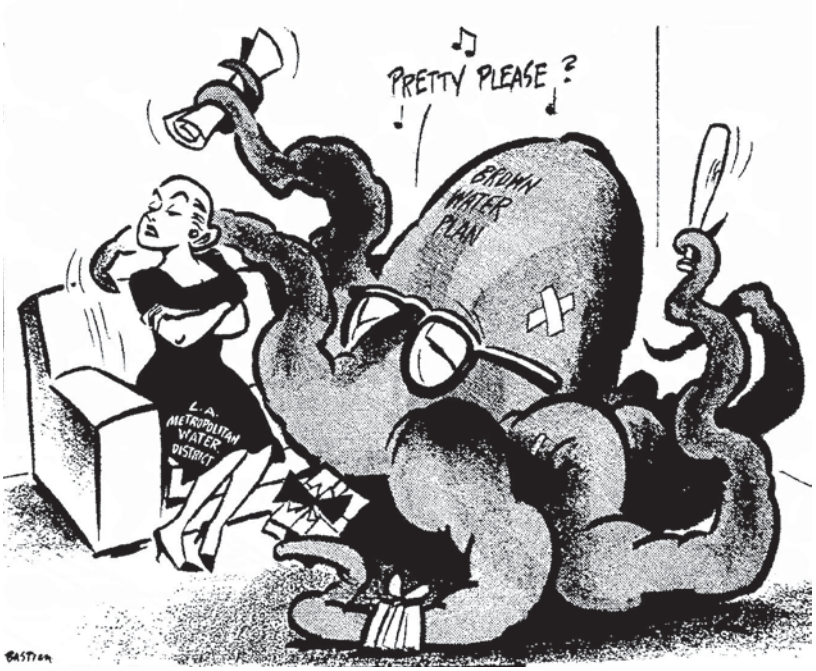
Bob and his wife Susan, who are both retired and live in Sacramento, enjoy traveling and a lot of walking.

"We play with our six grandchildren, our somewhat spoiled cat, and our completely spoiled dog," said Bob. "I spend time hunting and fishing. And, I also volunteer for the habitat restoration team at the Cosumnes Preserve."

Anti-State Water Project

Octopus Got Lots of Ink

by Amy Norris



In 1960, Governor **Edmund G. "Pat" Brown** presented voters with his controversial plan for our State Water Project. The bond measure needed to fund its construction appeared as Proposition One on the November ballot.

Sides were quickly polarized. Disagreement divided San Francisco, labor unions and even the Metropolitan Water District of Southern California, but no entity was more opposed than the San Francisco Chronicle.

An October 28, 1960 editorial proclaimed the project "an engineer's dream and a taxpayer's nightmare." Among its concerns, the Chronicle warned the project would never pay for itself. "If the voters go ahead with approval of Proposition 1, they are taking a desperate plunge into the unknown."

The Chronicle's editorial cartoonist, **Bob Bastian**, illustrated the paper's position in a series that featured the water project plan represented by an octopus. Often sporting glasses like the governor's, Bastian drew the octopus to suit his message—sometimes menacing but more often flabby and worn.

A groggy and deflated octopus appeared as a companion to the October 28 editorial, a water bottle on its head and tentacles in tourniquets. Some of its bandages read, "Break promises, ignore legality, and mortgage California's future." A consulting engineer in doctor's garb declared, "Otherwise he's in grand shape."

An October 27, 1960 cartoon depicted a southern Metropolitan Water District angler reeling a bandaged and water-logged octopus from the sea. MWD's Chairman **Joseph Jensen** urges the MWD fisherman to "Throw it Back!" But it appears his command falls on deaf ears. Jensen held steadfast against Proposition 1 nearly to the end in hopes of securing Colorado River water, but other board members broke ranks as approval of the water plan gained momentum in Southern California.

Bastian's image became a recognizable symbol of opposition to Brown's plan.

The octopus looks a little healthier in connection with San Francisco's County Supervisors. In a six-to-four vote, supervisors lent their approval to Brown's plan. Bastian's October 10, 1960 cartoon features a meaty octopus dangling threateningly over a table of supervisors engaged in a "Prop #1 Endorsement Fight."

Bastian's image became a recognizable symbol of opposition to Brown's plan. Whether wooing a standoffish woman labeled MWD of LA with a box of candy in one tentacle and a baseball bat in another, or lovingly entwining county supervisors in its bandaged arms, Bastian's meaning was always clear. Bastian may have depicted the water plan as leaky, but his cartoons hold their water. They are more interesting today in light of the State Water Project's success.

Editorials and cartoons are stored on microfilm in the California History Room of the State Library at 900 N Street. Many references can be found in the weeks before the November 8 election on the October 1-November 16 reels of the San Francisco Chronicle. ■

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To manage the water resources

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with other agencies,

to benefit the State's people,

and to protect, restore,

and enhance the natural

and human environments.

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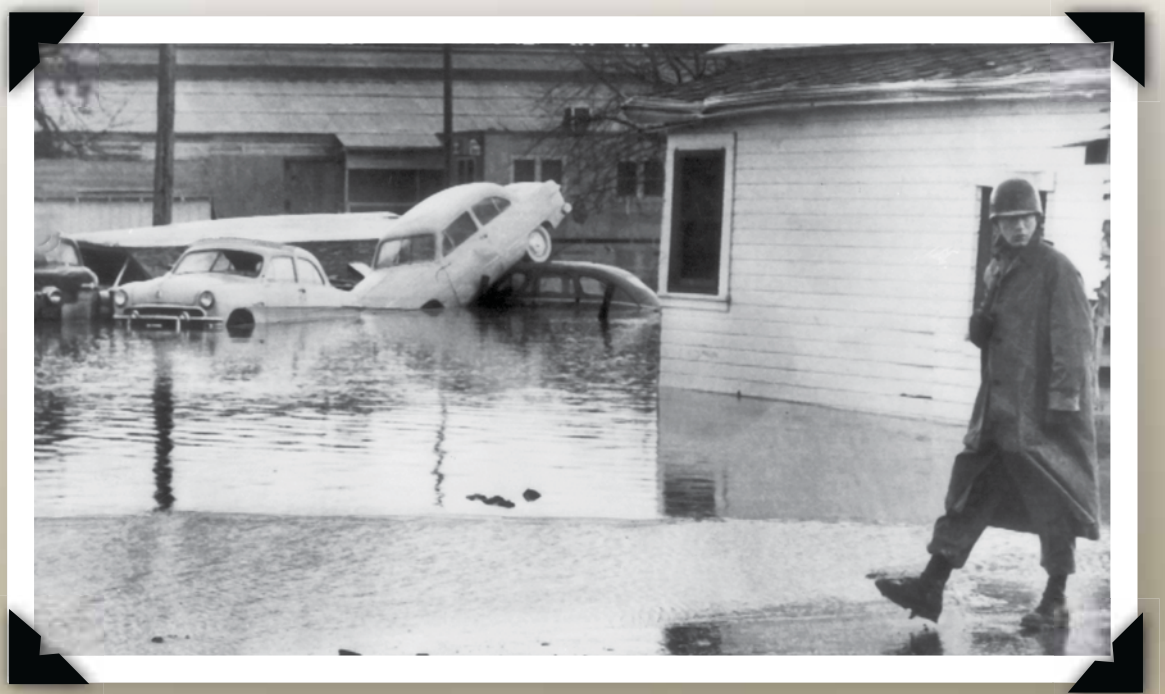
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