

DWR

SPRING/SUMMER 2014

a magazine from the
California Department of
Water Resources

California
Copes

Living with
The Drought **Page 6**

Center Stage

“The best-laid schemes of mice and men gang aft a-gley.”

—Robert Burns

In the world of California hydrology, there is seldom an “average” year, despite our regular use of that metric. 2013 was certainly extreme—the driest calendar year on record. As last quarter’s DWR Magazine noted, and as you will read further in this edition, DWR has been at the center of the State’s activities to respond to the drought.



DWR’s Drought Team, led by Bill Croyle and Jeanine Jones, and staffed by many employees from across the Department, has been doing double- and even triple-duty since the beginning of the year. They have been called upon to operate the State’s emergency response network, manage the additional projects and extra workload generated by the drought, and, in all their spare time, take care of their normal responsibilities.

This was not the most auspicious time for the challenges of a drought. The Department is working to complete the Bay Delta Conservation Plan, update the California Water Plan, negotiate extensions to contracts with State Water Project contractors, renovate portions of the State Water Project, implement cutting-edge environmental restoration projects and many other tasks. With this water year starting out as the driest on record and now being one of the six driest, our ability to provide water supplies for the many uses we serve—agriculture, cities, habitat and fish, etc.—has been severely constrained. We are only able to offer an unprecedented five percent of allocations to our water contractors.

Yet, the drought has given us an opportunity to build our collaboration with our resource management partners—the Bureau of Reclamation, the Fish and Wildlife Service, the National Marine Fisheries Service, the Department of Fish and Wildlife and the State Water Resources Control Board. Working collaboratively in the Real-Time Drought Operations and Management Team (RTDOMT), we have been able to adjust operations of the water projects to maximize our ability to capture and store water, while minimizing impacts on the environment. With the bleak hydrologic picture we faced in January, we were able to secure approval from this team to avoid additional releases of water which would otherwise have been required to meet Delta outflow standards.

The storms in February and March improved the picture slightly, and allowed us to meet environmental requirements during most of the spring. To manage this changing situation, many of our staff (and staff in our partner agencies) worked nights and weekends to update models, evaluate biological conditions and revise the operating plans and regulatory approvals. The hard work of the RTDOMT, and of all of DWR’s employees involved in drought activities, has helped solidify the partnerships that we will need to successfully implement the Bay Delta Conservation Plan and adapt our programs to the changing climate and hydrologic conditions that we will experience in the future. 💧

Paul Helliker, *Deputy Director*

What's INSIDE



Photo by Zack Cunningham



Where's our snowpack? . . . see page 11

On the Cover:

California manages statewide drought and plans for the future

Photo above:

On May 1 near Echo Summit, DWR's Frank Gehrke of California's Snow Surveys logs final snow survey measurements that came in dismally low with statewide snowpack's water content at a mere 18 percent of average for the date.

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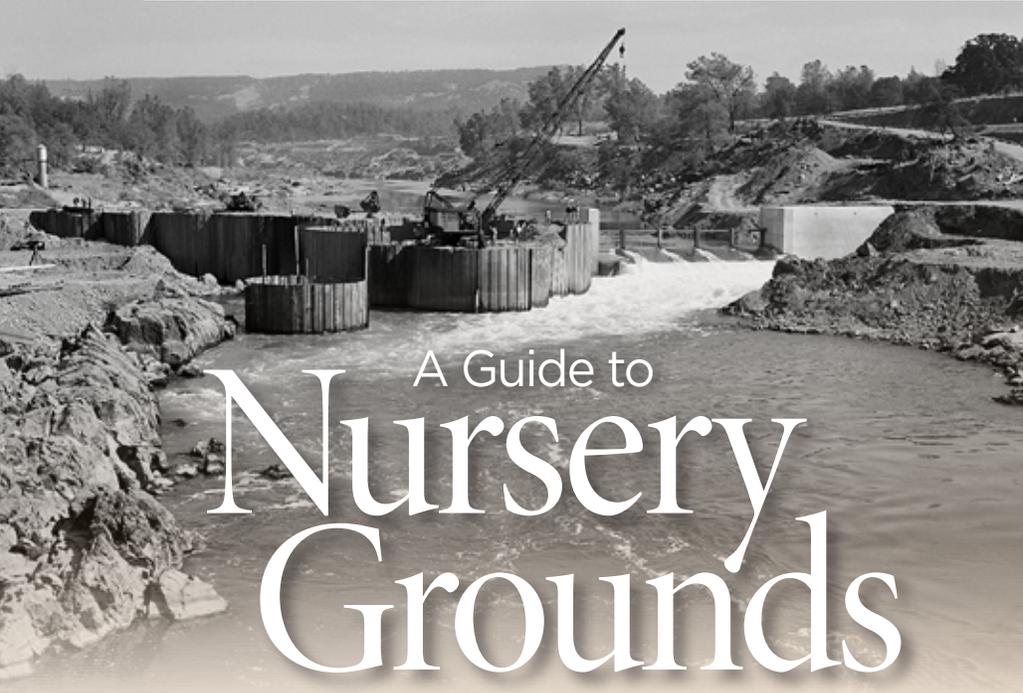
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A Guide to Nursery Grounds

Feather River Fish Barrier Dam Leads Fish to Hatchery for Spawning

The Feather River Fish Barrier Dam near Lake Oroville has been guiding salmon and steelhead into the Feather River Fish Hatchery to spawn for decades.

The hatchery, built by the Department of Water Resources and operated by the Department of Fish and Wildlife, compensates for Feather River spawning ground that was blocked by the construction of Oroville Dam. Fish raised from eggs at the hatchery account for an estimated 20 percent of Chinook salmon caught off California's coast by Pacific Ocean sport and commercial anglers.



An underwater observation window near the fish barrier dam allows visitors to watch fish leaping the fish ladder (*center photo*) into the hatchery. Constructed from 1962 to 1964, the 91-foot-tall barrier (*top and bottom*) has a crest length of 600 feet. To learn more about the barrier and hatchery, visit www.youtube.com/watch?v=15ztuZx6GNA ♦



Edmund G. Brown Jr.
Governor

John Laird
Secretary for Natural Resources

Mark Cowin
Director, Department of Water Resources

Nancy Vogel
Assistant Director, Public Affairs

Maggie Macias, Editor

Contributing Writers
Doug Carlson • Jennifer Iida
Christina Jimenez • Maury Roos •
George Qualley • Vicki Reedy
Ted Thomas • Akiela Moses

Design
DWR GRAPHIC SERVICES
Bob Peterson • Scott Olling

Photography
DWR PHOTOGRAPHY UNIT
John Chacon • Kelly Grow
Paul Hames • Florence Low

DWR Magazine is published quarterly by the California Department of Water Resources

Please send your questions, comments, or story ideas to:

DWR Magazine
Public Affairs Office
Department of Water Resources
1416 Ninth Street, Room 252-21
Sacramento, CA 95814

Email:
dwrpeople@water.ca.gov
Phone: (916) 653-8743



DWR Magazine's Web site is
www.water.ca.gov/publications/dwrNewsMag.cfm

Funded by
the State Water Project Contractors
Printed on recycled paper



A Safer Trail

The New Georgiana Slough Barrier Guides Fish to Safety by Jennifer Iida

A new fish diversion “fence” aims to keep young salmon migrating to the Pacific Ocean from taking a dangerous detour through Georgiana Slough near Walnut Grove in the Sacramento-San Joaquin Delta. The floating fish barrier installed in February will be evaluated through May 2014 by DWR’s Bay Delta Office staff.

Key features of the barrier include the five-foot wide metal sheets suspended beneath large bright orange floats.

“The idea is the fish will recognize the metal wall as they would a shore line and swim away from it,” said Ryan Reeves, DWR Senior Engineer in the Bay Delta Office.

During a 2011-2012 evaluation of non-physical barriers, DWR installed a Bio-Acoustic Fish Fence using sound, lights and bubbles to steer fish away from Georgiana Slough.

“The new floating barrier is a much simpler, passive technology,” said Reeves. “It’s a physical structure reaching down about five feet, and since it’s floating it doesn’t have major impacts to the flow so we’re really curious to see how the technology compares to the previous studies.”

This and previous studies are part of a 2009 National Marine Fisheries Service Biological and Conference Opinion requiring DWR and the U.S. Bureau of Reclamation to consider engineering solutions to keep migrating fish in the main stem of the Sacramento River.

Research shows only 20-35 percent survival rate of young salmon that enter Georgiana Slough, leading to the confusing maze of waterways of the interior Delta. Many are eaten by striped bass or other predators while others are lost to pumping operations of the State Water Project and Central Valley Project in the southern

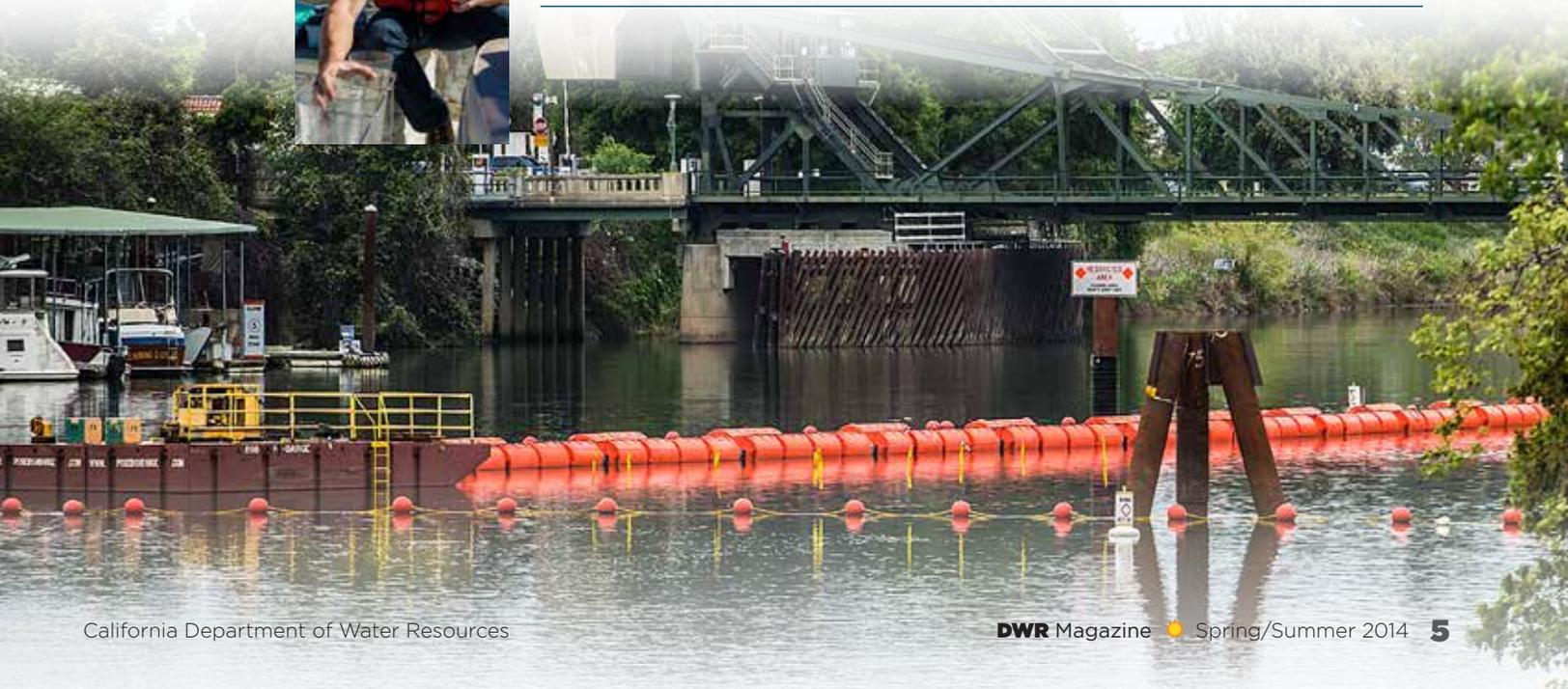
Delta. Studies show that fish that migrate via the Sacramento River, Sutter and Steamboat sloughs have a better chance of reaching the ocean to mature and return to their native waters.

If successful, this Georgiana Slough project will offer a relatively low-cost technology that may be used at other locations in the Delta.

Project updates can be found at <http://baydeltaoffice.water.ca.gov/> 



(Above) Project Manager Ryan Reeves inspects Georgiana Slough barrier to be installed. **(Left)** Mike Cane, an Environmental Scientist with the Bay Delta Office, performs water quality monitoring tests near barrier.



California Copes

Dealing with
it now and
planning
for the future.

by Doug Carlson



“THE FULL IMPACT OF THESE CRITICALLY DRY CONDITIONS HAS YET TO BE SEEN.”

— Bill Croyle, DWR Drought Manager

California has had numerous dry periods lasting three years or more during the past century, and depending on your age, you may have experienced several of them.

Californians 90 years of age or older were alive during one of the State's driest periods, 1923-24, and today's toddlers are living in a drought that began in 2012 and was officially declared an emergency in January of this year.

That means every Californian has experienced at least one and maybe several droughts, so what's all the concern about this one?

For one thing, there's more demand than ever on the water we do have. California's population has grown from under 25 million in 1980 to 38 million today. Another great concern is that the decline in water availability could damage the State's agricultural

industry, which has been the nation's greatest food provider for more than 50 years.

Another difference that makes the current drought more problematic is the changing climate. Last year was the fourth warmest in California's recorded history and continued a warming trend that's been evident since at least 1980. When precipitation does fall, it's more likely to come as rain and not snow that would otherwise add to the snowpack, often called California's biggest reservoir.

The persistent dry conditions—especially in Southern California—have increased the State's fire risk substantially. Last summer's Yosemite wildfire was a consequence of conditions in the southern Sierra that were much drier than normal.

As Water Year 2014 unfolded, rain disappeared for weeks at a time. Sacramento

went 52 consecutive days without it, the city's longest streak ever. Northern California rainfall from October through December was less than 20 percent of the historical average.

After two consecutive dry years and the start of a third, reservoir storage was alarmingly low by early 2014. Shasta, Oroville, Folsom and San Luis reservoirs averaged only 30 percent of their capacity by mid-January. As Folsom shrank, boat owners were ordered to remove their boats from the lake's marina, and Gold Rush era settlements were exposed for the first time in decades as the waters receded.

Even before these “drought markers” were fully apparent, DWR Director Mark Cowin appointed Flood Operations Branch Chief Bill Croyle as the Department Drought

DWR's Drought Preparedness Manager Bill Croyle, who has 30 years of water regulatory and operations experience, makes presentation about the drought. The State Water Project's Lake Oroville has 36 percent of its capacity on January 17, 2014





At 18 percent of capacity, the Central Valley Project's Folsom Lake reaches historically low water level in January of 2014.

Manager and Interstate Resources Manager Jeanine Jones as Deputy Drought Manager.

Together they began mobilizing DWR resources in December and worked with federal, State and local agencies as participants in the newly formed interagency Drought Task Force in preparing and responding to water shortages.

Governor Edmund G. Brown Jr. declared a drought emergency on January 17 and called on Californians to reduce their water use by 20 percent. Working with leaders of the legislative branch, the Governor announced legislation to provide \$687.4 million to support drought relief.

Four weeks later, President Barack Obama met with the Governor and farmers near Fresno and pledged \$183 million in federal assistance for California livestock producers, food banks to help families impacted by the drought, emergency watershed protection and other federal help.

In March, the California Legislature approved a legislative package that provided housing and food for workers directly affected by the drought, bond funds for projects to help local communities capture and manage water and funding for securing emergency drinking water supplies for drought-impacted communities.

Croyle later reflected on the effort that was launched among local, State and federal

agencies during the near-record drought conditions. "The full impact of these critically dry conditions has yet to be seen," he warned. "This summer and fall will bring many challenges, and all the agencies are conducting advance planning to respond to these anticipated impacts."

Deputy manager Jones said the two dry years that preceded 2014's drought had made the response especially challenging. DWR employees "have been doing a great job of rising to the challenge," she said. "A lesson learned from this year is the need to focus on developing more operational response capacity in the department. We need to strengthen ties with partner agencies and enhance outreach with the water community."

Employees throughout DWR have found themselves engaged in drought-related work, taking on new responsibilities as they continued their usual duties.

One of many examples was the early-April issuance of a proposal by DWR's IRWM office to expedite the award of \$200 million in bond funds to help alleviate drought impacts and improve regional drought preparedness. The solicitation process anticipates grants to

A speaker at several drought workshops statewide, Jeanine Jones, Deputy Drought Manager, has worked as DWR's interstate resources manager on Colorado River and other interstate water negotiations during her 30 years with DWR.

local public agencies and non-profit organizations this fall.

Additionally, DWR is working with recent grant recipients to expedite the execution of agreements with more than 30 water conservation and recycled water projects.

The drought of 2012–14 surely has left its mark, but Mark Twain had it only partly right when he allegedly said "everybody talks about the weather, but nobody ever does anything about it." DWR and other State agencies are doing everything they can to lessen the drought's impacts.

For more drought information visit <http://ca.gov/drought> 



Doing Our Part

Californians Using Water Wisely

WHAT DOES A 20% REDUCTION
in water use look like?



AVERAGE DAILY USE

The average Californian uses 196 gallons of water per day. Here are some easy ways to reduce water use. Find the right combination for you to reduce by 20% or 38 gallons a day.



INSTALL AERATORS ON BATHROOM FAUCETS

saves
1.2 GALLONS
per person/day



WASH ONLY FULL LOADS OF CLOTHES

saves
15-45 GALLONS
per load



TURN OFF WATER WHEN BRUSHING TEETH OR SHAVING

saves
10 GALLONS
per person/day



TAKE FIVE MINUTE SHOWERS INSTEAD OF 10 MINUTE SHOWERS

saves
12.5 GALLONS
with a water efficient showerhead



FIX LEAKY TOILETS

saves
30-50 GALLONS
per person/day



INSTALL EFFICIENT, WATERSENSE-LABELED SHOWER HEADS

saves
1.2 GALLONS
per minute



OR

10 GALLONS
per average 10-minute shower



INSTALL A HIGH-EFFICIENCY WATERSENSE-LABELED TOILET (1.28 GALLON PER FLUSH)

saves
19 GALLONS
per person/day



As California's winter season ends with below normal snowpack and precipitation, water conservation is necessary to minimize impacts of the drought.

While urging all Californians to reduce water use by 20 percent, Governor Edmund G. Brown Jr. directed State agencies to take all necessary actions to prepare for water shortages.

State agencies throughout California are helping with the drought. The Department of General Services (DGS) implemented water use reduction plans for all State facilities, such as reducing or eliminating landscape water use and eliminating all car washes in state garages other than those required for safety. Even some lawn surrounding the State Capitol was allowed to turn brown and crisp. Besides putting water conservation messages on its more than 700 electronic highway signs, the Department of Transportation will cut water usage along California's roadways by 50 percent. The Department of Corrections and Rehabilitation has installed and inspected low-flow shower heads and toilets. State employees are also helping to conserve water by reporting water wasting to <http://www.saveourh2o.org/report-water-waste>

"Save Our Water," a statewide water conservation education program created by DWR and the Association of California Water Agencies in 2009, is working with local water agencies to help Californians learn ways to save water inside and outside their homes. For water conservation information, visit <http://www.saveourh2o.org>

For more tips on reducing water use, visit [saveourh2o.org](http://www.saveourh2o.org)!



A Historical Perspective on California's Droughts

by Maury Roos, DWR Chief Hydrologist

It has been nearly 40 years since drought year 1977, the driest water year in the 20th century.

Previously, 1924 held the record, although 1931 in the middle of the six-year 1929-1934 drought was not far behind. For a while, 1991, the fifth year of the more recent six-year drought of 1987-1992, looked like it might eclipse 1977. The “miracle March” with three times normal precipitation saved California that year from a dire situation, adding enough water to meet the most pressing needs.

In January, a new dry record looked like it would be set in the 2014 Water Year (WY), but the 120 percent of average precipitation statewide in the month of February eased the worst of the problem. However, 2014 is still expected to be one of our drier years even with normal spring rains and is likely to be ranked fourth driest with current runoff projections. March rains seem to have been near average in the northern part of the State, ensuring total runoff will stay above record minimums.

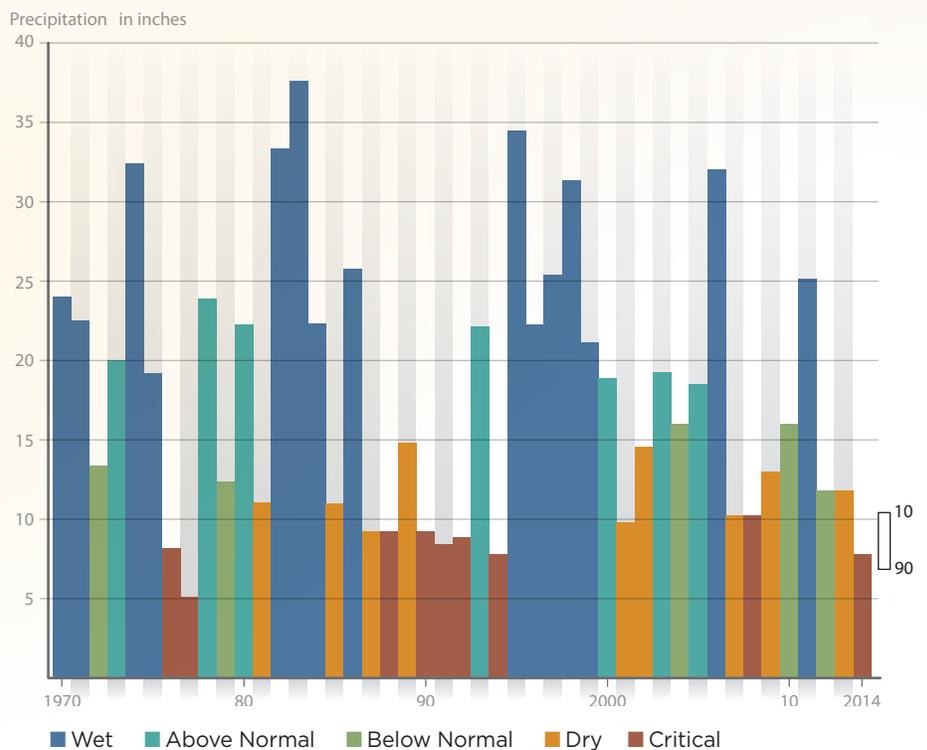
There has been quite a bit of publicity that calendar year 2013 (January through December) was the driest year of record at many locations in California, exceeding by a wide margin, previous dry calendar years such as 1923 and 1976, both of which led into a subsequent critically dry water year in 1924 and 1977.

The first part of WY 2013 had a good start in November and December. After December, only two of the drier months, June and September, had above-average rainfall, but the amounts were low. These showers were helpful for fire control, but they contributed little to water supply.

The chart shows the recent history of Sacramento River system unimpacted (essentially natural) runoff color-coded in the five categories used for the Sacramento River index. The last bar on the right is the May 1 median forecasted amount for 2014.

By end of December 2013, statewide

Sacramento River unimpeded runoff since 1906



reservoir storage had fallen to 70 percent of average, thereby reaching a hydrologic drought level, and 41 percent of capacity.

After the bleak moisture forecasts, the Governor proclaimed a drought emergency. January continued nearly rainless until a small storm during the last week of the month. The Central Valley was especially dry; Sacramento had had 52 consecutive days with no measurable rain by January 28, exceeding the previous winter dry spell record of 46 days set in 1884 and the 44 days in 1976.

At the end of January, a comparable year in a 90-year northern Sierra record seemed to be 1991, when severe shortages were averted by a triple “miracle March.” The other comparable water year was 1977, which saw some rain in February and March, but went into our record books as the driest run-off year in record.

The impact on our snowpack has been greater than the deficit in precipitation. Many of the winter storms we did get were warmer than average. December was cold, but above-average temperatures in the January through March period caused some melting of lower-elevation snow. The snowpack on March 1 was the second lowest since World War II; only 1977 had less snow. Normally, April 1 marks the maximum snowpack accumulation. This year, however, snowpack measurements on April 1 were similar to that of 1977. Late-season precipitation in April and May is helpful in some years, but it did not arrive to boost 2014’s water supply.

Precipitation in the northern Sierra from October through April was the 10th driest on record going back to 1920. The southern Sierra is appreciably drier.

We had hoped for a major late-season surprise, but it is unlikely that severe hardships to California’s agriculture and fisheries will be avoided in 2014. ♦

El Niño may be a La Nada for Drought

“It’s not nice to fool Mother Nature.” That was the warning in a 1970s-era TV commercial, so considering the weather California’s had recently, maybe it’s time to ask what’s upset her so much. First came dry water year 2013, which produced the driest calendar year in the state’s recorded history. Water year 2014 began with almost no water at all, and on January 17 the Governor declared a drought emergency in the middle of California’s hottest winter ever.

What’s next? It’s starting to look like an El Niño is next, and what that means for the drought is anybody’s guess.

El Niño is what they call the warmer-than-normal sea surface temperatures

that show up every two to five years in the tropical Pacific Ocean near South America. The condition gets its name from fishermen who noticed unusually warm water at the end of the year near Christmas. El Niño is Spanish for “the boy child” and refers to the baby Jesus.

Michael Anderson, DWR’s state climatologist, says the likelihood of an El Niño arriving by late fall is nearly 80 percent.

“The typical description of an El Niño is that Southern California tends to be wetter, the Pacific Northwest is drier, with Northern California in the transition zone between wet and dry,” he says.

Most of California’s major reservoirs are in the

north, so what’s typical may not be much help in a drought. But Anderson says the description is far from definitive.

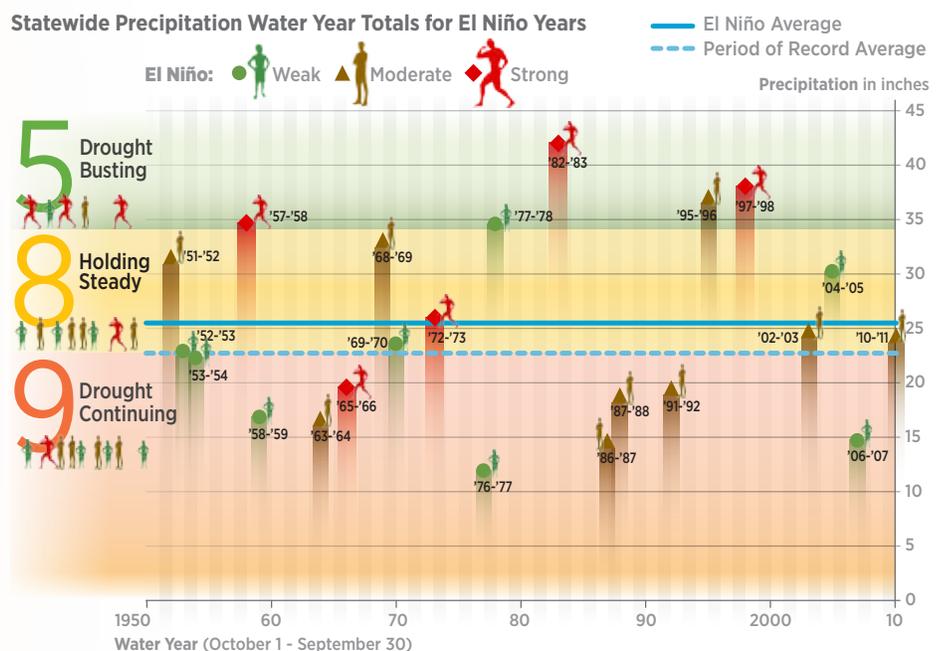
Of the 22 El Niños since the early 1950s, five were “drought-busters” with heavy statewide precipitation, nine happened during relatively light precipitation and eight were in the middle.

Anderson says even strong El Niños (with temperatures at least 2.7 degrees Fahrenheit warmer than normal) aren’t necessarily predictors of heavy precipitation. They’ve also been present during dry and moderate water years.

“There’s no super consistency during El Niños,” says Anderson.

Once again, only Mother Nature knows for sure. ♦

Statewide Precipitation Water Year Totals for El Niño Years



Protecting California's Environment Water Supply

By Doug Carlson

For more than half a century, California's two biggest water projects have been pumping water from the Sacramento-San Joaquin Delta. For at least that long, people have been debating a better way to divert that water.

Delta water delivered by DWR's State Water Project and the U.S. Bureau of Reclamation's Central Valley Project sustains hundreds of billions of dollars worth of economic activity in the Bay Area, San Joaquin Valley and Southern California. The water also sustains the Chinook salmon that underpin a commercial and recreational fishery along the entire West Coast, and the Delta's ever-shifting mix of salt and fresh water nurtures a host of wild species.

Some of those species are in trouble. Populations of salmon and Delta smelt reached historically low levels in recent years. Efforts to protect them have reduced the volume of water delivered to farms and cities and rendered those supplies unpredictable. Furthermore, the current water delivery system in the Delta is vulnerable to catastrophic disruption by earthquake, sea-level rise and the increasing storm intensity that climate change is expected to bring.

Balancing multiple demands for Delta water is one of DWR's toughest and most important jobs. It's become increasingly clear that for the sake of its economy and natural heritage, California must find a more environmentally protective and disaster-proof way to divert water from the Delta.

The most comprehensive, intensive and hopeful effort to do so is underway. It's called the Bay Delta Conservation Plan (BDCP), and DWR has been working the last eight years with a host of federal and state partners to shape the plan and push it past several key milestones.

Central to the plan is the proposed construction of a new way to divert water from the Delta. The proposal would allow DWR and Reclamation to reduce the use of the existing pumping plants in the south Delta. Those pumping plants sit on dead-end channels where it is impossible to effectively screen fish from the pumps. New

intakes 30 miles to the north, along the main Sacramento River, could be screened with modern, effective technology. New northern intakes also would allow a more natural flow pattern through the Delta.

The Bay Delta Conservation Plan has two co-equal goals at its heart—restoring the Delta ecosystem and securing California's water supply. To improve the Delta ecosystem, the BDCP calls for specific actions, known as the 22 conservation measures. The measures strive to improve water operations, protect water supplies and water quality and restore the ecological functions within a stable regulatory framework. While helping balance the needs of fish and wildlife with California's human and economic needs, the BDCP will restore or protect up to 150,000 acres of habitat and secure a more reliable water supply for 25 million Californians and more than three million acres of farmland.

In a reflection of the complexity of the Delta ecosystem, the plan itself and an accompanying environmental impact report/environmental impact statement run approximately 30,000 pages long. Those draft documents were released for official public review in December.

Lead State and federal agencies extended the public comment period an additional 120 days that will end July 29, 2014. A wealth of information about the plan is available at <http://baydeltaconservationplan.com> 



Faces of the BDCP

By Doug Carlson

The Bay Delta Conservation Plan is one of the most visible and controversial projects in DWR's history. There's a constant stream of news stories on the project, and they seem to write themselves according to a formula.

The ingredients include BDCP's cost, prominent mention of the project's twin tunnels, quotes from the opposition and maybe a few supporters, the project's goals and challenges and at least a mention of the Delta's endangered fish species.

Most DWR employees are probably familiar with BDCP's high points and maybe not much more, but the understanding goes much deeper for DWR's team working on BDCP.

Laura King Moon leads that team. BDCP has been her focus since its inception in 2006, and she reflected recently on the project's status after the last of 12 public open houses from Redding to San Diego to brief the public on the project.

Laura King Moon

Engaging in a
Reasoned Conversation

“BILL IS PART OF THE BRAIN TRUST THAT DEVELOPED THE HABITAT RESTORATION MEASURES FROM DAY ONE.”

— Laura King Moon,
Chief Deputy Director



Bill Harrell
Developing the
Conservation Path

“I think an awful lot of people who were initially resistant to BDCP now accept the idea that it’s going forward,” said Laura, DWR Chief Deputy Director. “They’re engaged in constructive comments that will make the project better from their perspective.”

“You still hit those pockets where people want to yell at you, but it seems like there’s a much more reasoned conversation now. People are trying to get a handle on how the project’s impacts can be mitigated in ways they can trust.”

Laura said DWR’s personnel are up to the challenge. The BDCP team consists of about 40 DWR staff members (the number fluctuates) who bring a variety of expertise to the project, with education and experience in biology, engineering, the law, finance, environmental protection, communications and many more disciplines.

Like many on BDCP’s team, Bill Harrell, Special Assistant to DWR’s Chief Deputy Director, began his career far afield from DWR’s policy-making 11th floor—literally far away in a field.

Bill graduated from California State University at Sacramento with a degree in Biological Conservation. After working with Ducks Unlimited for a year, he joined the Department of Fish and Wildlife in Stockton and later transferred to Sacramento, where he collaborated with DWR employees on various projects.

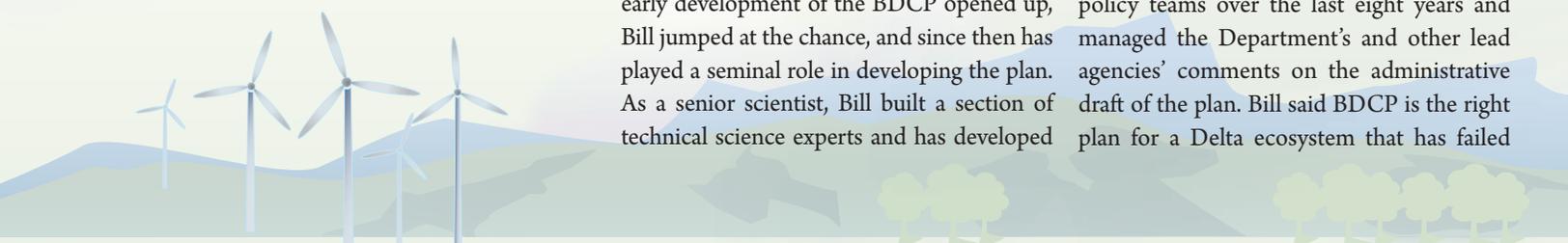
He liked the association and joined DWR in 1995, spending the next decade doing research on fish ecology and use of the Yolo Bypass floodplain.

When the opportunity to get in on the early development of the BDCP opened up, Bill jumped at the chance, and since then has played a seminal role in developing the plan. As a senior scientist, Bill built a section of technical science experts and has developed

matrix relationships with other Department experts that continue to make valuable contributions to the development of the plan despite his move to the 11th floor.

“Working on BDCP and moving from the technical area where I began to now playing a role in policy development has been fascinating,” he said. BDCP is designed as a 50-year project that will affect the department and the state for decades, so “we have to get it right.”

Bill is the only person at DWR other than Laura King Moon who’s been involved from the beginning of the BDCP program. Laura notes, “Bill is part of the brain trust that developed the habitat restoration measures from day one.” He has played a pivotal role in numerous BDCP technical and policy teams over the last eight years and managed the Department’s and other lead agencies’ comments on the administrative draft of the plan. Bill said BDCP is the right plan for a Delta ecosystem that has failed





One of the faces behind BDCP is Russ Stein, a biologist who began his DWR career in 2000 as part of the environmental review team for the Oroville Dam relicensing project. For the BDCP, Russ has been managing a staff that varies from 10 to more than 30 to ensure the thoroughness of the environmental impact documents.

Their task has been reducing those impacts, especially on the endangered species of the Delta. “All of our effort since 2010 has been preparing documents for public review,” said Russ. “It’s been all-encompassing. Every hour of every day was spent getting those documents ready.”

Russ said the biggest hurdle has been ensuring that the documentation is detailed enough to allow the federal lead agencies to issue permits for the project. “That job isn’t done,” he said, “and now that the public is adding comments, we may receive information we hadn’t thought of that could alter some of our planning.”

Russ is the youngest in a family of six boys and one girl, and not going to college was never an option. “My sister—the oldest—went off first, and the rest of us felt we didn’t have a choice in the matter,” he said. Three of them are engineers and the rest became biologists.

The farm near Bayside, California where teenager Russ raised sheep as a hobby had a trout stream running through it, and he said that might have planted the seed for his future studies and career.

many native species despite years of regulatory actions. “BDCP’s long-term regional approach is a more comprehensive approach to restoring the ecosystem,” he said.

But getting people outside DWR to appreciate BDCP’s big picture can be a challenge. “The tunnels are what most people think about,” he said, “but they’re just one conservation measure out of twenty-two. When I speak with people about the BDCP, I try to provide them with a broader perspective of the conservation plan.”

With changing water run-off patterns and sea level rise looming, Bill said the BDCP team is working to create a program that will withstand the test of time. “We have to be prepared as a department, one way or another,” he said.



Russell Stein
Safeguarding the Delta’s
Endangered Species



Cassandra Enos
Getting the Big Picture

Cassandra Enos, program manager of BDCP's environmental impact report, said she can't remember why she picked biology before studying the field at Sacramento State and later pursuing a master's degree in Water Science at University of California at Davis.

"I wanted a job that didn't tie me to a desk," she laughed. "Ironically, I'm behind a desk all the time managing the development of BDCP documents."

That work involves constant collaboration inside DWR and externally with consultants and the federal lead agencies that review all the environmental documentation.

"I wouldn't say it's a frustrating process," she said, "but like any large project, it involves a lot of negotiations. We're developing impacts, conclusions and mitigation for over 600 impact statements per alternative, and



Gordon Enas
Designing the Tunnels

BDCP engineering program manager Gordon Enas is deeply involved with BDCP's biggest construction challenge and magnet for criticism—the twin tunnels that will convey water for 40 miles from the Sacramento River in the north Delta to the State Water Project's Clifton Court Forebay in the south.

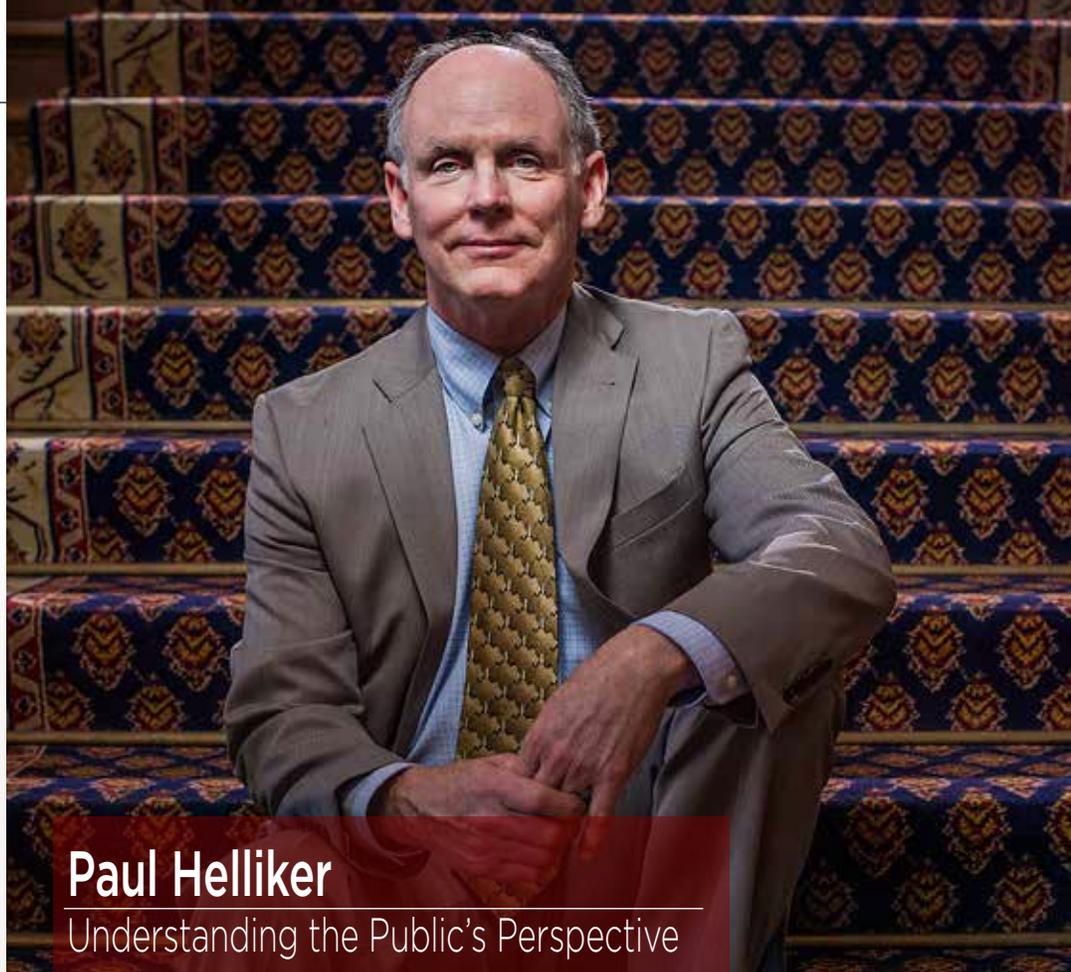
"My role is leading the team that prepares engineering studies and designs for the various conveyance options that are being evaluated in the BDCP," said Gordon, DWR Principal Engineer. "We also provide engineering support for the environmental documents evaluating a wide variety of construction impacts to groundwater, surface water, greenhouse gas emissions, levees and roads."

Gordon's DWR career has been spent mostly working on Delta issues, starting in 1987 in the Delta Planning Branch. He said that work gave him a good foundation for appreciating the Delta as a critical piece of the water supply system. He later transferred to the design and construction office and has been working on improving water's conveyance through the Delta ever since.

there are 15 action alternatives, so getting all the agencies' scientists to agree on the conclusions is sometimes challenging, to say the least."

Cassandra's team has monthly coordination meetings with the agencies on all the issues that need to be resolved. "Listening to other people's positions is a prerequisite," she said. "As we biologists like to say, ecology isn't rocket science—it's harder! It's not like the laws of physics, with gravity a constant today and tomorrow. In ecological sciences, there's much more variability over time."

Cassandra says BDCP is her most exciting work ever. "People tell me I'm crazy working on such a demanding project, but I really do love it. Being involved with something historic is pretty exciting."



Paul Helliker
Understanding the Public's Perspective

Perhaps the most visible of the BDCP's faces in recent months has been DWR Deputy Director Paul Helliker. He's been out front in the public meetings throughout the state, taking comments and questions that often are contentious and providing responses.

Paul came to DWR in 2012, the centennial year of the Marin Municipal Water District where he was the general manager. He has three degrees earned at Stanford University—a bachelor's degree in Philosophy, a bachelor's in Civil Engineering and a master's in Environmental Engineering. His background in philosophy has come in handy in his BDCP outreach.

"Part of the reason I studied humanities and philosophy was to get some experience in analysis and critical thinking, being able to understand the complexities of an argument and articulating a well-founded response," said Paul. "In my job, I'm not expected to be an expert on the nuances of biology. I have to understand the process and put it all in the context of the overall regulatory requirements and how we make good public policy."

Paul said he finds it exhilarating to be in the

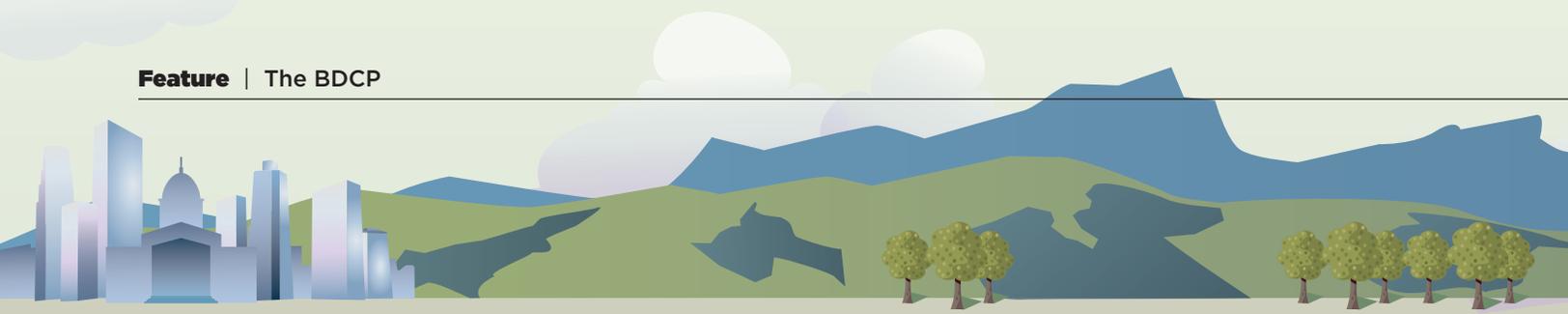
center of one of the most important issues in California today. "We're planning a 200-year life span for BDCP to create the long-term remedy for the changes we've made to the Delta over the past 150 years," he said. "We're attempting to strike a new balance among people, fish and animals for the benefit of society."

Laura King Moon said BDCP will help achieve that balance by conveying water under the Delta and thereby reducing the threat to the Delta's fish population—impacts that had triggered court rulings and curtailment of the State Water Project's pumping operations.

In 2014, conversations at DWR tend to begin and end with the drought, as did this one. "We had a big 'hole' in our reservoirs coming into this year's drought," Laura said, "and part of that hole was because we weren't able to pump water when we needed to because of the biological opinions."

The observation was another reminder of BDCP's importance in helping California adapt to conditions—drought and climate change among them—that are beyond anyone's and any government's control. 💧





DeepDig

The Bay Delta Conservation Plan's signature twin tunnels are attracting more than their share of attention.

By Doug Carlson

The tunnels will be 40 feet in diameter, 30 miles long, a minimum of 90 feet apart and up to 150 feet below the surface. They'll revolutionize the way water is delivered from Northern California to parts of the state that depend on the north's water to sustain cities, agriculture, commerce and life itself.

New facilities in the Northern Delta with protective fish screens will improve water reliability by reducing threats to the integrity of the conveyance system posed by aging levees and the potential for seismic events. Water drawn from the North Delta will be less subject to increased salinity from tidal influences and the effects of long-term climate change.

BDCP Principal Engineer Gordon Enas said the tunnel concept has been refined several times since the project's start. Changes announced last summer moved the tunnels' alignment east and further away from river communities. The refinement also reduced the size of the forebay that will be created at the north end of the tunnels to hold water after it's pumped from the Sacramento River and before entering the tunnels.

Gordon said tunneling technology is

constantly advancing, and large tunnels are becoming more commonplace around the world. A 30-mile tunnel seems remarkable, but then there's the 105-mile aqueduct that carries water to New York City.

"We have to make sure the operation is seamless from beginning to end," he said. "There can be no bottlenecks, and we still have a lot of geotechnical exploration to do. For example, we need to understand the geology of the soil we'll be boring through to design the tunnel boring machines. Geology is also really important because we'll be going under rivers and levees."

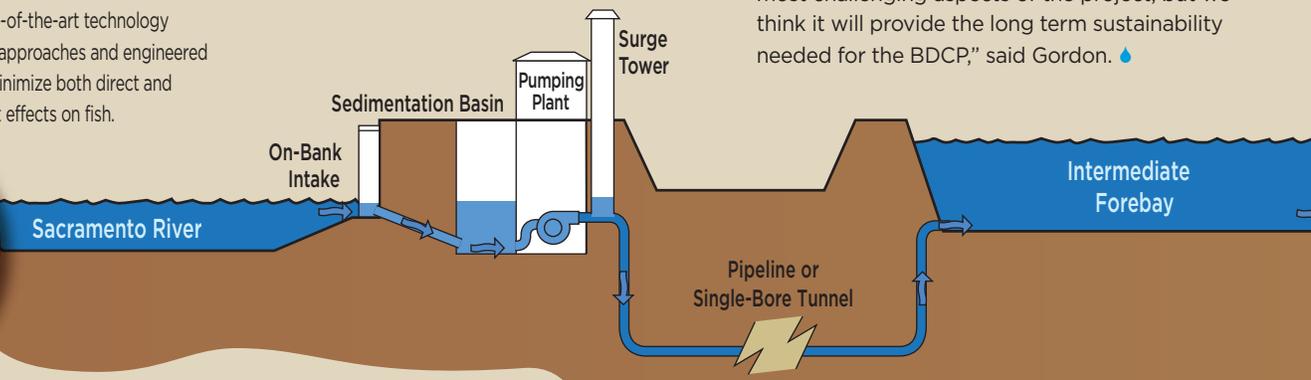
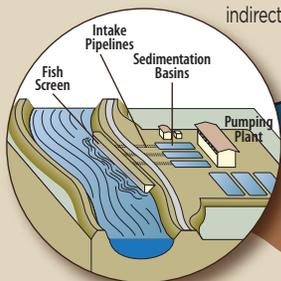
Water will flow by the force of gravity from the forebay at the tunnels' entrance near Hood all the way to a new forebay in the south Delta, where water will be held to feed into State and federal pumping plants.

"The exit point in the south will be lower in elevation than the entrance near Hood," Gordon said, explaining that, as always, water will flow downhill in BDCP's tunnels. The difference in elevation between the start and end will keep the water flowing without the aid of pumps.

"The tunnel construction will be one of the most challenging aspects of the project, but we think it will provide the long term sustainability needed for the BDCP," said Gordon. 💧

INTAKE SCHEMATIC

The proposed Sacramento River intakes would be screened with state-of-the-art technology that uses low-velocity approaches and engineered mesh—features that minimize both direct and indirect effects on fish.



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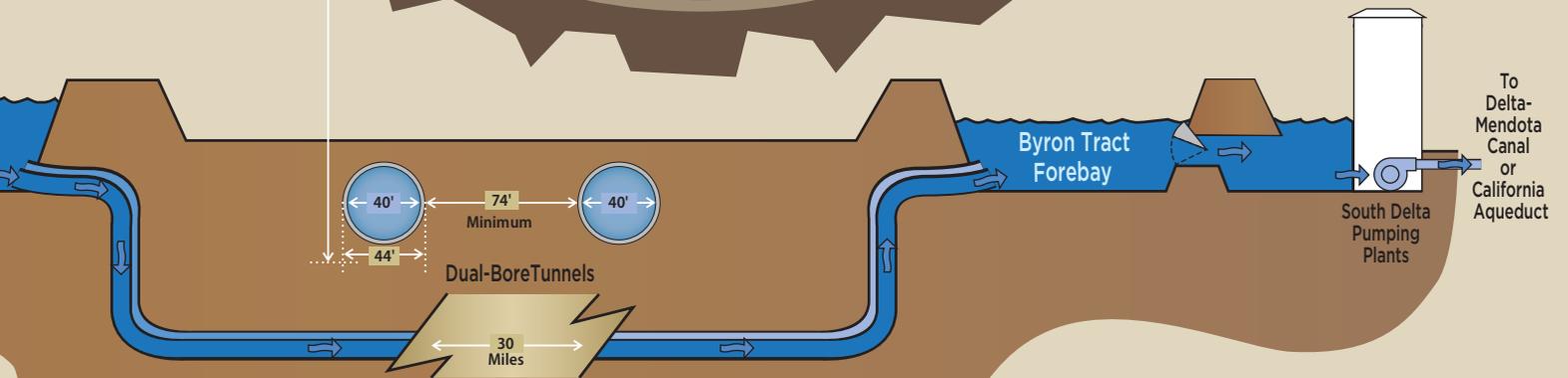
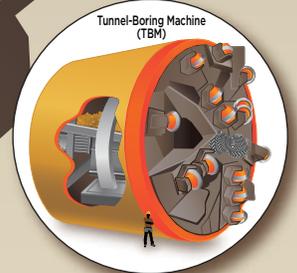
110 feet
Below Surface

THE TWIN TUNNELS

The new twin tunnels would be designed to operate by gravity, which eliminates the need for an intermediate pumping plant. Harnessing gravity to move the water south has many advantages: it reduces energy consumption and greenhouse gas emissions, requires the installation of fewer transmission lines, reduces the visual impacts of the project in the Delta, and cuts long-term operation and maintenance costs.

EXTREME ENGINEERING

Two Tunnel-Boring Machines (TBMs) will build the tunnels, digging at a rate of 40 feet per day. Prefab tunnel segments will be put in place as the TBMs advance. Each TBM consists of a rotating cutting wheel (*the front*), a cylindrical steel shell (*middle*) and a 300-foot train of tunnel-building contraptions (*the tail*). It takes about a year to assemble this complex construction equipment underground.



A Roadmap for California's Water

The California Water Plan Update 2013 sets the stage for a brighter water future

by Paul Massera, DWR Water Plan Program Manager



Known as California's roadmap to a prosperous water future, the final "California Water Plan Update 2013 (Update 2013)," which will be released this summer, provides a vision for the future of water management in California.

The five volumes were completed after four years of intensive technical analysis and collaboration by several State agencies; federal, tribal and local governments, diverse stakeholders and academia.

Update 2013 made significant strides toward improved integration and alignment across several DWR divisions and programs.

For almost 60 years, the California Water Plan (Water Plan) has served as the long-term strategic plan guiding sound management and development of water resources

in our state. Updated every five years, it remains the single most complete and relevant body of knowledge about statewide water resources and actions to steer us toward a brighter water future.

Besides laying out the State's strategic vision, goals and objectives for California's water future, Update 2013 broaches many of the state's most controversial and urgent issues, such as how we manage our groundwater, pay for future actions and improve agency coordination and consistency in water planning, regulation and management.

The Update's findings and recommendations underscore the urgency of resolving many water management issues.

With the goal of increasing the ease and efficiency of implementing the Water Plan,

Update 2013 is based on decades of scientific data and analyses, nearly 40 State agency plans and the voices of hundreds of stakeholders. The result is a plan that addresses specific needs and challenges, and has garnered the support of the water management communities required to progress from planning to action.

Is California's Water Future Imperiled?

Update 2013 describes the state's current trajectory, which indicates an imperiled water future. The uncertainties of increasing flood risk, reduced water supply reliability and changing water demands (such as demand hardening where more permanent crops and urban demands result in more susceptibility to drought impacts) are compounded by aging

FUTURE FUNDING NEEDS ARE GREATER THAN \$200 BILLION OVER THE NEXT 10 YEARS AND UP TO \$500 BILLION OVER THE NEXT FEW DECADES, JUST TO MAINTAIN CURRENT LEVELS OF SERVICE, ECOSYSTEM CONDITIONS AND QUALITY OF LIFE.”

infrastructure, snowpack reduction, sea level rise and the public's reduced ability and willingness to pay for public services. Beginning with the three themes below and ending with specific actions, Update 2013 seeks to create a common awareness of the risks we are facing and the fact that all Californians have a stake and must come together to implement solutions that move us toward the Update 2013 Strategic Vision.

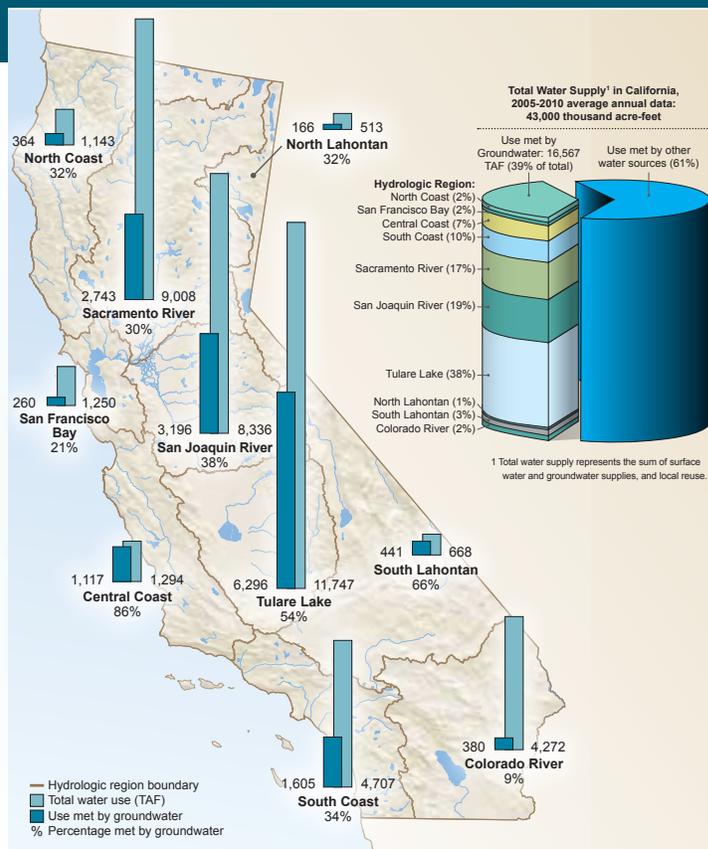
Update 2013 Themes

Update 2013 has significantly advanced the State's strategic plan in three critical areas. To address challenges and build on past successes, Update 2013 focuses additional planning and recommendations to (1) advance integrated water management, (2) strengthen government agency alignment and (3) invest in innovation and infrastructure.

Moving From Plans to Action

Update 2013 lays out a strong and clear call for action. It is aligned with the goals and objectives of the Governor's five-year Water Action Plan (January 2014).

The Brown Administration's Water Action Plan includes investment priorities for many of the more than 300 actions spelled out in the Update 2013 "Roadmap for Action." Update 2013 is a basis for the critical next



Groundwater comprises 39 percent of all water used in California, totaling more than 16 million acre-feet.

step of identifying how to implement the Governor's water priorities, which can be viewed at <http://www.waterplan.water.ca.gov/docs/news/Update2013Highlights-Foldout.pdf>. Using Update 2013 and related plans for guidance and specifics, DWR is aligning its resources and programs to efficiently and effectively meet the Water Action Plan's goals and objectives.

A Comprehensive Path

The fact is that we have become too reliant

on aging infrastructure, outdated governance and institutional processes, older technologies, and inadequate data and tools, which are no longer capable of meeting the levels of public safety, environmental stewardship and economic stability demanded by Californians. The good news is that these limitations can be mitigated and overcome through rapid and bold action backed by broad public support and adequate funding. The Water Action Plan acknowledges that the needed solutions are complex and expensive; they will require the cooperation and sustained commitment of all Californians working together.

The priority actions in the Governor's Water Action Plan and in Update 2013 will move us down a path toward reliability, restoration and resilience in California water. As spelled out in Update 2013's themes and core messages, our solutions must strike a balance between the need to provide for public health and safety (e.g., safe drinking water, clean rivers and beaches, flood protection), protect the environment and support a stable California economy. Update 2013 provides a vision and roadmap to water prosperity.

To view the plan, visit <http://www.waterplan.water.ca.gov/cwpu2013/>

South Bay Aqueduct enlarged and modernized

By Christina Jimenez

Modernization and expansion of the South Bay Aqueduct (SBA)—which made the State Water Project’s initial deliveries in 1962—was completed in March.

Terry Becker, Division of Engineering’s (DOE) Civil Engineering Branch Chief, said two goals have been accomplished with the \$250-million upgrade to the historic canal and pipeline system that serves more than two million South Bay residents in Alameda and Santa Clara counties.

“First, we strengthened the reliability of the aqueduct and second, we increased the system’s delivery capacity,” said Becker. Capacity of the aqueduct, consisting of both canals and pipeline, was boosted to 430 cubic feet per second (cfs), an increase of 130 cfs.

“Upgrades to control equipment, flow meters and other facilities within the SBA were also a project priority,” said Joe

The Oldest Link



Barron, Supervising Engineer with the Civil Engineering Branch's Pipelines Section and Project Manager of South Bay Aqueduct since 2008. "It is the oldest portion of the State Water Project and has been in service since the early 60's, so we took the opportunity to bring it up to the 21st century by updating and renovating the system wherever possible."

Initially moving State Water Project (SWP) water to Alameda County in 1962, the South Bay Aqueduct begins at Bethany Reservoir in Tracy and ends in San Jose. Through a 44.4-mile long aqueduct now consisting of 1.8 miles of tunnel, 10.8 miles of canal and 31.8 miles of pipeline, SBA conveys water to residents served by the Alameda County Water District, the Alameda County Flood Control and Water Conservation District (Zone 7) and the Santa Clara Valley Water District.

"What really kicked off this project was

the South Bay Water Contractors, specifically Zone 7, requesting more water delivery capability," said Becker.

"Restoring the durability of the system, increasing its capacity and the energy savings resulting from the upgrades gives DWR the ability to serve our water contractors and our clients by meeting their water needs well into the future," said Barron.

The Heart of the System

South Bay Pumping Plant, known as the heart of the system, was upgraded to help lift Delta water 566 feet through four miles of buried pipeline.

"One of the most critical upgrades made to the system was the installation of four new 45 cfs pumps, plus the purchase of a spare (fifth) pump, to the South Bay Pumping Plant," said Becker.

The 13 total pumps installed at the South Bay Pumping Plant help maintain the reliability of the equipment, as well as providing pumping capacity for the additional 130 cfs traveling through the system.

"Prior to this improvement project, there was no spare pump," said Becker, who has



(Below) New South Bay Aqueduct Pumping Plant with four pump bays **(Left to Right)** From the design to construction phase, DWR South Bay Aqueduct project team members included Civil Engineering Designer Vu Thai, Construction Supervisor II Rey Ballesteros, Supervising Engineer Jose Alvarado, Construction Supervisor Matthew Miller and Senior Engineering Designer Kevin Gray.



worked with DWR for 37 years. “Now, if repairs are needed to one of the pumps, we have a spare we can use.”

SBA canal embankments, canal linings and crossing structures and bridges along the Patterson Reservoir and Dyer, Livermore and Alameda canals were also elevated to allow space for the additional water.

“The system did not have the delivery capacity originally designed for—300 cfs. It was actually only capable of conveying about 270 cfs without exceeding freeboard requirements,” said Becker. “While we were still meeting water demands, we were meeting them by running water to the top of the concrete linings, which is not an appropriate long-term operation.”

In addition to replacing flow meters throughout SBA and completing seismic retrofit work at Patterson Reservoir and Surge Tank No. 1 and 2, upgrades included adding a bay at check structures, adding siphon barrels at five locations on the Dyer, Livermore and Alameda canals, and modifying five new drainage areas to allow uphill runoff to flow to the other side of the canal.

As part of South Bay Pumping Plant’s expansion, a new service bay was constructed to store spare pumps, motors and other key parts, and to provide an enclosed work area to perform repairs on plant equipment.

“The service bay is where repair work on the equipment takes place,” said DWR’s Construction Supervisor II Rey Ballesteros, who has worked on SBA since 2006. “The building allows staff to perform regularly scheduled maintenance on the pumps, motors and equipment in a clean and all-weather environment.”

Minimizing Power Costs

To help reduce power costs, Dyer Reservoir was constructed with more storage capacity than originally planned, and switchyard expansion at Banks Pumping Plant became part of the project.

Dyer Reservoir, located in Livermore and initially operational in 2012, serves as a holding-tank for South Bay water, easing peak



(Above) South Bay Aqueduct’s enlargement includes the new Dyer Reservoir outlet bifurcation to Dyer Canal. **(Center)** DWR Supervising Electrical Engineer Khalil Jafarnejad inspects installation of motor base. **(Below)** Matthew Miller (right) inspects refurbished outlet gates at Lake Del Valle “Glory Hole.”



power pumping costs for both contractors and residents.

Of the total 425 acre-feet of capacity of water in Dyer Reservoir, 225 acre-feet is for power savings and 200 acre-feet is for Zone 7’s reserve water.

“We will pump water and fill Dyer Reservoir in the evenings, when power costs are low,” said Barron. “Once Dyer is filled at night, we can gradually release the water into the South Bay Aqueduct in the daytime to meet our peak delivery using only gravity.”

Hand-in-hand with Dyer Reservoir, a third Brushy Creek Pipeline with a surge tank was built, connecting the South Bay Pumping Plant to Dyer Reservoir.

“The design head for the existing pipelines and pumps precluded the option of increasing flow through the two existing Brushy Creek Pipelines,” said Becker. “We needed to add a third pipeline to accommodate the extra water moving from the South Bay Pumping Plant to Dyer Reservoir.”

The new switchyard—a substation where switching protection, control equipment and transformers are installed—was also expanded at Banks Pumping Plant.

“For the first time in State Water Project history, DWR designed its very own 69

kilovolt (kV) transmission line from Banks Pumping Plant to South Bay Pumping Plant,” said Farshid Falaki, Chief of DWR’s Mechanical and Electrical Engineering Office.

DWR’s Mechanical and Electrical Engineering Office helped with design of this 1.5-mile transmission line as well as all of the mechanical and electrical equipment to upgrade South Bay Pumping Plant.

“The original switchyard at Banks Pumping Plant had to be expanded to accommodate additional equipment to step the power down from 230kV to 69 kV. A 69 kV line was constructed from Banks Pumping Plant to the South Bay Pumping Plant, allowing the South Bay Pumping Plant to avoid using PG&E’s local distribution lines,” said Becker. “This has significantly reduced our power costs.”



Removing Sediment

South Bay Pumping Plant's expansion had numerous challenges. One of the larger challenges was the removal of accumulated sediment.

"A natural mountain of rock sat in front of the existing pumping plant, and during construction of the expansion it served as a barrier," said Ballesteros. "We could dig deep without worrying about water interfering."

Once the expansion was complete, the mountain of rock in front of the new South Bay Pumping Plant, which separated the plant from the channel, needed to be removed. This required draining the SBA canal forebay.

The design team expected the draining and removal of the estimated 25,000 yards of accumulated sediment to be completed in 10

days. However, once the forebay was drained it was determined that an additional 15,000 yards of sediment should be removed. Crews worked 24 hours a day, seven days a week for 20 days to have the sediment removed and forebay replenished.

"Although we had set up a 10-day shut-down to the South Bay Pumping Plant to accomplish this work, we were still able to meet our deliveries to our customers using alternate sources of water including water deliveries made from Dyer and Del Valle reservoirs," said Barron. "While not part of the original planning, the Department was able to adapt and meet our obligations to our customers."

The SBA team, led by DWR's Division of Engineering, also included employees from Operations and Maintenance in Sacramento,

Delta Field Division, Office of the Chief Counsel, Fiscal Services and Executive.

"This project is an excellent example of DWR collaborating with every office in the Department, as well as the water contractors, their customers, and utilities who serve the greater south Bay Area residents from Livermore to Santa Clara Valley," said Barron. ♦

Aerial view of Stage III of South Bay Pumping Plant. (Left), new switchyard pad (right), Brushy Creek Pipeline (right) under construction. At South Bay Aqueduct's Lake Del Valle "Glory Hole," Matthew Miller and contractors prepare safety equipment for the upgrade of outlet structure control equipment.



(Left to Right) DWR's Folsom Dam JFP team includes Wilbur Huang, Central Valley Flood Protection Board Executive Officer Jay Punia, Len Marino, DWR Director Mark Cowin, DWR Deputy Director Gary Bardini, Kent Zenobia and Bob Scarborough.

First Gate for Folsom Dam Auxiliary Spillway

DWR Director Mark Cowin and other officials celebrated in April the arrival of the first massive gate for Folsom Dam's auxiliary spillway. The \$833-million Folsom Dam Joint Federal Project (JFP), a partnership among the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, DWR, the Central Valley Flood Protection Board and the Sacramento Area Flood Control Agency, will help achieve the goal of a 200-year level of protection for the Sacramento metropolitan area. The State has provided close to \$130 million of its \$204 million contribution from the Proposition 1E fund to the project. With the control structure at 70 percent complete, the overall project is 40 percent complete and slated for completion in 2017. The auxiliary spillway will have six huge bulkhead gates, like the one just delivered, and six additional tainter gates.



Helping Others in Need

DWR's Disability Advisory Committee (DAC) donated \$300 raised from book fairs to WarmLine Family Resources Centers of Sacramento and Rocklin to help families of children who have disabilities.

"WarmLine connects families with information and resources to other organizations that can assist them," said Raymond Sanchez, DAC Chair. "It also offers events for every family member who has a child with a disability from birth to age 22. Events include a coffee meet up for mothers, dad's bike ride with kids, siblings get togethers, classes for parents, movie nights and family picnics."

For the past three years, in the spring and fall, DWR's Disability Advisory Committee (DAC) has hosted book fairs through the Books Are Fun organization.

"Starting with 2014, DAC will make a yearly donation from book fair proceeds to an organization that serves persons with disabilities," said Sanchez.

For more information about WarmLine, visit <http://www.warmlinefrc.org/>



DAC Chair Raymond Sanchez assists with spring book fair in the Natural Resources building in Sacramento.

Ramping up

Invasive Mussel monitoring at SWP Reservoirs

DWR is increasing monitoring for invasive quagga and zebra mussels at 19 locations along the State Water Project (SWP).

The invasive species are not believed to be in SWP waters, but DWR is well aware of the infrastructure damage they have caused elsewhere and have been on alert since they were discovered in Southern California waters in 2007.

Beginning in March and continuing through the fall months, DWR takes bi-monthly water samples at numerous points up and down the length of the SWP.

“We increase the frequency during warmer months because mussels spawn during this time,” said Tanya Veldhuizen of DWR’s Aquatic Nuisance Species program in the Division of Operations and Maintenance. “Thus, the veligers—or free-swimming microscopic larvae—are more likely to be present in the water column during those months and it will come up in the sample results.”

DWR water samples are sent directly to the Scripps Institute of Oceanography for DNA analysis, and results are sent back to the Department.

In late 2013, quagga mussels were discovered in Ventura County’s Lake Piru,

operated by United Water Conservation District and located only 16 miles from DWR’s Castaic Lake.

Boat inspections are conducted at SWP reservoirs in effort to prevent introduction of mussels. Boats traveling from infested water can potentially spread mussels to other water bodies.

“Watercraft inspections continue at Lake Del Valle, San Luis Reservoir, O’Neill Forebay, Pyramid Lake, Castaic Lake, Silverwood Lake, and Perris Lake—all at-risk SWP reservoirs,” said Veldhuizen. “All boats must be 100 percent dry and mussel-free prior to launching.”

In 2013, nearly 12,000 vessels were inspected at the San Luis Complex, over 15,000 at Pyramid Lake and over 34,000 at Castaic Lake. For more information about invasive mussels, visit <http://www.dfg.ca.gov/invasives/quaggamussel/>

(Top to Bottom) Boat inspections for mussels at Castaic Lake. Water Resources Technician II Carlos Soria (middle) and Junior Engineering Technician Danny Campos (bottom) of Southern Field Division’s Water Quality Section collect water quality samples at Castaic Lake. **(Below)** Infested shoreline at Irvine Lake in Southern California





(Left to Right) DWR staff Norma Alvarado, Deputy Director Kathie Kishaba, Kathy Aldana, Jennifer Dong Kawate and Rob Whitlock present careers in energy award to Florin High School Student Jimmy Pham **(third from left)** at SMUD headquarters in Sacramento on March 13.

Careers in Energy Awards

Northern California students garner top awards

Part of the California Energy and Utilities Workforce Consortium, DWR Human Resources Office staff participated at the third annual California Careers in Energy awards to honor eight Northern California students considering careers in energy.

“This opportunity to partner with other companies and promote careers in science, technology, engineering and math (STEM) to our local area schools was invaluable,” said Jennifer Dong Kawate, DWR Chief of Classification and Succession Planning. “We had the chance to meet the students, talk about their career interests and provide information about why they should want a career in STEM and with DWR. DWR uses many classifications that fall within the STEM category, such as Environmental Scientist, Engineer, Electrical Engineer, Mechanical Engineer, Hydroelectric Power Utility Engineer, Hydroelectric Plant Technician, and Water and Power Dispatcher.”

DWR staff partnered on the event with fellow consortium members, SMUD, PG&E, Roseville Electric, Southern California Edison, San Diego Gas & Electric, and Northern California Power Authority to encourage high school and college

students to consider careers in energy. In 2013, Governor Brown asked Californians to remember the importance of energy by promoting the National Center for Energy Workforce Development’s Careers in Energy Week.

This nationwide effort focuses on educating kids about energy careers and promotes STEM because the U.S. Bureau of Labor Statistics foresees a significant shortage of available candidates to fill vacancies left by retiring personnel.

As part of the contest themed “STEM —Powering the Future Workforce of the Energy Industry,” high school students were asked to create a video while college students were asked to develop a mobile application or online game to educate K-12 students about the energy and utility industry.

Jimmy Pham, a student from Florin High School who created a video about careers at DWR was the recipient of the Northern California runner-up award and received \$250. 💧

Kids Learn Ways to Save Water

DWR presents awards at 2014 Sacramento Regional Fair

For their excellent science and engineering experiments, DWR staff presented Special Awards to three Sacramento area students at the Synopsys Sacramento Regional Science and Engineering Fair on March 22 at Rosemont High School.

"Based on the number of water conservation focused projects we saw this year, I can tell students and families are taking the drought seriously and believe our future is in great hands," said Michelle Robinson, DWR Public Affairs Office's Water Education Specialist who led the team of five DWR judges this year.

The middle school winner was Nisha Kyathsandra, a seventh grader from Folsom Middle School. Her project was on how to save water in farming and the impact on the plant yield. Her experiment successfully demonstrated that up to 50 percent of water can be saved through precision irrigation.

"Science is my favorite subject and I want to be a vet when I grow up, but I don't want agriculture to suffer from the drought and it's important to come up with a way to keep producing our crops," said Kyathsandra.

The high school winners Resya Sastry from Oak Ridge High School in El Dorado Hills and Maya Jayanth from Mira Loma High School in Sacramento teamed up by creating a similar project to prevent water waste. These ninth grade students focused on new technology to modify the precision irrigation by creating a robot to run the water lines throughout the plants.

"We found out that the moisture content is the most important part when you're deciding how much water the plant needs, so we focused on controlling it with the robots to not waste a lot of water," said Jayanth.

Both girls are leaning toward an engineering career in the future; however, Sastry is also interested in the medical world.

"It's really exciting to see the kids in



(Top) Left to Right: DWR's judges Michelle Robinson of Public Affairs, Scott Sochar of Engineering, Steven Garcia of FloodSAFE Environmental Stewardship and Statewide Resources, Devinder Dhillon of Statewide Integrated Water Management and Jag Nagendra of Operations and Maintenance score projects.

(Middle) Nisha Kyathsandra, a seventh grader at Folsom Middle School, won DWR's Special Award in the middle school division.

(Bottom) Left to Right: The team project of Maya Jayanth of Mira Loma High School and Resya Sastry of Oak Ridge High School won DWR's Special Award in the high school division.

the science, technology, engineering and mathematics (STEM) field, so eager to succeed," said DWR judge Jag Nagendra, Senior Control Engineer with Operations and Maintenance. "Participation is up with more than 600 projects entered this year compared to about 400 last year."

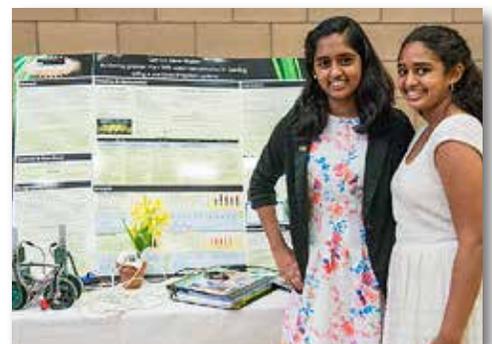
DWR winners received a certificate and statewide recognition in DWR magazine for their winning contributions. Participating in the fair for the last three years, DWR judges student's experiments for their ability to isolate and solve problems.

The grand prize winners compete in a global competition in May at the Intel International Science and Engineering Fair in Los Angeles.

The Sacramento Regional Science and Engineering Fair's mission is to encourage and inspire students in grades 6-12 in the Sacramento region to become interested in pursuing STEM degrees and careers.

To learn more about this event, visit

<http://sacstemfair.org/> 



People

New Assignment

Marshall Leads Bay-Delta Office

Paul Marshall, the new chief of DWR's Bay-Delta Office, is a strategic thinker who's intent on instilling that trait in his new surroundings. He wants his personnel to understand where they fit in the scheme of things so they're ready for whatever comes next.

"Something I really want to look at is succession planning in the Office," said Paul. "I'd like to utilize my position here to train people in BDO to be leaders and be even better at what they do for a living."

Paul said engineers too often aren't trained to be business thinkers, too, "so I'd like them to have a mindset that they're managers of California's waters."

To do that, Paul thinks engineers need to step out of their engineering box and appreciate the bigger picture.

"This business isn't just about the dollars and cents of the contracts we write and projects we deliver," he said. "It's also about getting the funding from the Legislature for positions we need to do the work that's in front of us."

A broader awareness gives DWR employees an appreciation of how their piece of a project fits into the overall puzzle, he said. "Once you have the big picture, you know what information you need to efficiently get the job done."

Paul spent nine years in the Bay-Delta Office managing the South Delta Branch and the Improvements Program there. More recently, he worked on the Bay Delta Conservation Plan and in the Division of Flood Management, where he was Assistant Division Chief and the Flood Risk Assessment Office Chief.

Paul began his new position on January 31 while still rehabbing a shoulder he broke nearly a year earlier while skiing at the Kirkwood Resort. He says he'll eventually ski black diamond runs again, but for now, BDO's high ground suits him fine. ♦

A Quick Fix

George Gongora Awarded for Invention



Picture this: You're an operator in the Gianelli Pumping-Generating Plant at San Luis Reservoir. It's the late-night shift, and the plant's units are pumping water from the O'Neill Forebay into the reservoir to take advantage of the lower night-time power rates.

Everything's humming like clockwork, when suddenly, the calm is broken as alarms go off, computer screens flash and what had been a routine night isn't. You quickly determine that Unit 4—one of Gianelli's eight pumping and generating units—has abruptly stopped.

Days later, maintenance workers discover the cause. Pieces of metal are found in the unit's rotating rotor housing in places no scrap metal should ever go. The unit had shut itself down to avoid a major failure.

Studs that secure a metal plate to the unit's stator, the stationary portion of an electric generator, had broken and fallen into the rotor. Later, inspectors find cracked studs on three other units.

Fortunately, this breakdown scenario didn't happen, but Unit 4 did experience an anomaly that might have required expensive repair work had it not been discovered during a scheduled biennial inspection.

Six broken stator stud portions and attached nuts were found in the unit's air baffles. They had broken from the bottom ends of the studs in the 150-RPM motor-generator. If the problem had gone unnoticed, the stator's laminated pieces might have vibrated out of position and caused the unit to trip off.

Plant workers brainstormed a solution, and Hydroelectric Plant Electrician II George Gongora suggested one that worked. His innovative idea

for a quick fix prevented a restack and rewind on at least three motor-generators and earned him an Improved Procedure Award.

George thought broken or cracked stud ends could be repaired with shouldered long nuts retained with set screws. DWR adopted his idea as a temporary repair to last until restacking and rewinding of the motor-generator later.

Since the preventive fix was made on eight of Gianelli's units, the plant's motor-generators have not had any failures.

So how did the 35-year DWR employee come up with the idea? "Training and experience," he answered. "They train us to think on our feet—to think positively, think intelligently and come up with novel ideas. That's just some of the things they pay us for."

George received the award for his novel idea on April 10 during a safety stand-down meeting at the plant. 💧



San Luis Field Division Chief Jim Thomas (right) presents award to George Gongora.



New Hires

John Airozo
San Luis Field Division
HEP* Mechanic Apprentice

John Baker
Fiscal Services
Accountant Trainee

David Beasley
San Joaquin Field Division
Utility Craftsworker

Jose Beitia
Human Resources Office
Staff Services Manager II (Managerial)

Madelene Benjamin
Human Resources Office
Office Technician (Typing)

Ronald Bennett
Engineering
Supervisor of Equipment and Materials
Inspection

Michael Berry
Northern Region Office
Senior Environmental Scientist (Supv.)

Jeffrey Blair
Oroville Field Division
HEP* Technician I

Jason Brabec
Flood Management
Engineer

Stuart Burke
Oroville Field Division
HEP* Mechanic I

John Carlson
Delta Field Division
Utility Craftsworker

Marla Cole
Flood Management
Office Technician (Typing)

Michael Crespo
Flood Management
Utility Craftsworker

Dustin Deeks
Operations and Maintenance
Electrical Engineer

Reginald Estaris
Environmental Services Office
Office Technician (Typing)

James Francia
Operations and Maintenance
Senior Delineator

Nicole Gergans
FESSRO***
Environmental Scientist

Bianca Gomez
Engineering
Engineer

*Hydroelectric Plant
***FloodSAFE Environmental Stewardship
and Statewide Resources Office

New Hires

Kelly Grow
Public Affairs Office
Senior Photographer

Minxue He
Flood Management
Engineer

Rebecca Heilman
San Luis Field Division
Materials and Stores Specialist

Zachary Heller
Human Resources Office
Office Technician (Typing)

Greg Hoban
Technology Services
Systems Software Specialist III

Brian Humphrey
Northern Region Office
Environmental Scientist

Derek Johansson
North Central Region Office
Staff Services Analyst

Raymond Jones
San Joaquin Field Division
HEP* Technician I

Mason Leach
San Luis Field Division
HEP* Operator

Marland Locken
Flood Management
Utility Craftsworker

Brian Mahardja
Environmental Services Office
Environmental Scientist

Satwinder Mahil
San Luis Field Division
HEP* Technician I

Christopher Marquis
Southern Region Office
Environmental Scientist

Kelsey McGrath
Integrated Regional Water Mgmt.
Environmental Scientist

Kevin Michalski
San Joaquin Field Division
HEP* Electrician I

Matthew Mobley
Oroville Field Division
HEP* Operator

Brian Moore
Engineering
Construction Mgmt. Supv.

Tara Moritz
Executive
Associate Governmental
Program Analyst

*Hydroelectric Plant



DWR's Kevin Mefford

Awarded Governor's Safety Award

Kevin Mefford, a Hydroelectric Plant Electrician with the Oroville Field Division, wore two hats—so to speak—during the Ronald B. Robie Thermalito Pumping-Generating Plant fire in 2012, earning him the Governor's Employee Safety Award in 2013.

"Kevin played a vital role during the fire at the plant and put his life at risk," said Tom Shannon, Hydroelectric Plant Supervisor of the Oroville Field Division's Electrical Section.

Kevin was one of the first responders dispatched to the scene, ironically not as a DWR employee, but as a Butte County Fire Department volunteer firefighter working alongside CALFIRE firefighters.

"His 21 years of plant experience, in addition to him being a seasoned fireman for more than 20 years, made him absolutely invaluable during the incident," said Tom. "He worked the entire weekend fighting the fire, making multiple entries where he led the crew throughout the plant and conceivably helped minimize the damage to our infrastructure."

"I have been a volunteer for many years for Butte County Fire, and I have been exposed to quite a few fires," said Kevin. "However, never has there been one so technically challenging as the plant fire. It was a team effort and I thank the brave career firemen that helped protect me in the fire."

"The Department of Water Resources, and the firemen who responded to the Robie Thermalito Power Plant fire, owe Kevin a tremendous amount of gratitude and appreciation for his efforts," said Operations and Maintenance Division Chief David Duval. Kevin's knowledge of the plant and its layout helped protect the lives of firefighters and he supplied critical information

during the event to DWR's incident commander.

"I was proud to be able to contribute to securing some of the plant systems and fighting the fire," said Kevin. "I took it personal when we lost the plant to the fire. I have had many hours in the past working in the plant and to see it damaged by fire was very difficult."

The veteran electrician and his fellow workers are responsible for maintaining electrical equipment in the Robie Thermalito Pumping-Generating Plant and Oroville Field Division. Kevin currently is working on the Thermalito crane retrofit, the 230,000 volt switchyard disconnect project and assisting in DWR's fire safety upgrade project.

Robie Thermalito, located four miles west of Oroville, operates in tandem with the Hyatt Powerplant and Thermalito Diversion Dam Powerplant.

As a result of the fire, DWR's Division of Operations and Maintenance launched the State Water Project Fire Systems Modernization Assessment Project to assess and upgrade fire suppression and detection systems.

Roughly 19 of the initial evaluations have been completed, including Hyatt Powerplant, Oroville Field Division's Operations and Maintenance Center, Robie Thermalito Pumping-Generating Plant and Skinner Fish Facility.

"Since the plant fire in 2012, my co-workers and I have been busy fire-proofing Hyatt Powerplant," said Kevin. "We have removed combustible materials from Hyatt and improved safety for the employees by improving fire awareness, fire blocking, inspections of cable trays and control cabinets, along with installing a fire suppression system in one of our electrical cabinets. ♦

DWR Alumni Corner

By Vicki Reedy, *DWR Alumni Club*

Did you know that DWR has a group of retired employees who gather a number of times each year to renew the friendships they developed while working for the Department? The DWR Alumni Club encourages and promotes camaraderie among retirees and former employees of the Department by sponsoring activities throughout the year.

Each spring, members gather for a luncheon in Sacramento where they welcome the Department's Director to bring them up to date on the Department's latest initiatives. During the summer, a number of them take in the excitement of a River Cats game, and in the fall, another large group gathers again at a local park for a picnic. The Club has sponsored tours in the past as well.

As you approach retirement, please remember the DWR Alumni Club and join us. With the first year free, dues are \$5 each year. We publish a newsletter for members to keep in touch and share some of their travel and retirement adventures. 💧



DWR Alumni members reunite at the Carmichael Elks Club for spring luncheon on March 6.

Attention DWR Retirees:

If you are interested in joining DWR's Alumni Club, contact: **Richard Jones**, DWR Alumni Club
(916) 212-3515 or email rdcjones@earthlink.net

New Hires

Mandana Pashminehazar
State Water Project Analysis Office
Engineer

Asha Raj
Flood Management
Associate Governmental Program Analyst

William Rawlings
Southern Field Division
HEP* Electrician I

Helen Riddle
Business Services Office
Office Technician (Typing)

Martha Romaso
Fiscal Services
Accountant Trainee

Kevin Sarff
San Joaquin Field Division
HEP* Operator

Sasha Silvestrini
Engineering
Office Technician (Typing)

Dustyn Smith
Operations and Maintenance
Heavy Equipment Mechanic

Daniel Sutherland
Oroville Field Division
Utility Craftsworker

Jason Swain
Business Services Office
Associate Governmental Program Analyst

Ryan Toomey
Oroville Field Division
HEP* Technician I

Christopher Umfleet
San Joaquin Field Division
HEP* Mechanic I

Elizabeth Wells
Environmental Services Office
Environmental Scientist

Michael Whipple
Delta Field Division
HEP* Operator

Geoff Womack
San Luis Field Division
HEP* Technician I

Kingtin Wong
Technology Services
Staff Programmer Analyst

Shaw Yalda
State Water Project Analysis Office
Electrical Engineer

Promotions

Linda Adams
Southern Field Division
Associate Governmental Program Analyst

*Hydroelectric Plant

CONGRATULATIONS

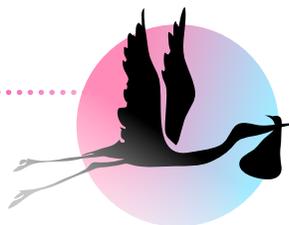
... to DWR's Newest Parents:

Max Khashchuk, an Engineer with Flood Management's Flood Project Inspection Section, has a daughter named **Anya Viktoria**, who was born on March 20, 2014 weighing 7 pounds, 1 ounce and measuring 19.25 inches long.

Bryce Kozak, a Fish and Wildlife Technician with the Bay-Delta Office, has a daughter named **Lena**, who was born on April 21, 2014 weighing 8.3 pounds and measuring 20 inches long.

Phil LeCocq, a Supervising Engineer with the SWP Deputy Director's Office, has a daughter named **Ivy Mays**, who was born on March 22, 2014 weighing 7 pounds, 1 ounce and measuring 19 inches long.

John Paasch, a Senior Engineer with Flood Management's Regional Flood Preparedness Section, has a son named **John Van de Pol**, who was born on March 18, 2014 weighing 9 pounds, 7 ounces and measuring 21.5 inches long.



Promotions

Bryan Armstrong
Operations and Maintenance
Associate Control Engineer

Devlin Autry
San Joaquin Field Division
HEP* Technician I

Jason Bacher
Engineering
Engineer

Raylene Barton
San Luis Field Division
Associate Governmental Program Analyst

Larry Borges
Operations and Maintenance
Mobile Equipment Superintendent I

James Briggs
North Central Region Office
Environmental Scientist

Carmel Brown
Executive
Supervising Engineer

John Bunce
Southern Field Division
Chief

Letitia Burns
Southern Field Division
Staff Services Analyst

Melanie Calastro
Operations and Maintenance
Staff Services Analyst

Rocco Campagna
Human Resources Office
Office Technician (Typing)

Amber Candela-Cooney
Delta Field Division
Assistant Utility Craftsworker Supt.

Victoria Chesnut
Southern Field Division
Business Service Assistant

Claire Chung
Human Resources Office
Staff Services Analyst

Philip Clark
Southern Field Division
Utility Craftsworker

Mina Danieli
Integrated Regional Water Mgmt.
Senior Environmental Scientist

Nicole Darby
Environmental Services
Program Manager II

Raymond Dascenzo
Southern Field Division
HEP* Operator Apprentice

Matthew De Groot
Engineering
Senior Right of Way Agent

Rebecca Devoto
Southern Field Division
HEP** Operator Apprentice

Chi Doan
SWP Power & Risk Office
Principal HEP** Utility Engineer

Jon Ericson
Flood Management
Principal Engineer

Clifford Feldheim
Environmental Services Office
Program Manager II

David Fernandez
Delta Field Division
Utility Craftsworker Supv.

Levoys Finley
Southern Field Division
Utility Craftsworker

Stacy Garrett
Environmental Services Office
Executive Secretary I

Ramesh Gautam
Flood Management
Engineer

Jacob Guillory
Oroville Field Division
HEP* Electrician I

Gary Hage
San Joaquin Field Division
Utility Craftsworker

Lesley Hamamoto
Environmental Services Office
Senior Environmental Scientist

Brett Harvey
Environmental Services Office
Senior Environmental Scientist

Kendall Hindman
Oroville Field Division
Staff Services Analyst

Tammy Hope
Northern Region Office
Staff Information Systems Analyst

Andrew Isner
South Central Region Office
Environmental Scientist

Elaine Jeu
Environmental Services Office
Environmental Scientist

Zachary Jojola
Flood Management
Engineer

Pasha Kashkooli
North Central Region Office
Water Resources Technician I

Toby Kinney
Oroville Field Division
Utility Craftsworker

State Service Anniversary
25 Years of Service



Melanie Baillie
FloodSAFE Environmental
Stewardship and Statewide
Resources Office
Administrative Officer II
May 2014



Duane Cornett
Engineering
Senior Environmental Scientist
March 2014



Glen Solberg
Operations and Maintenance
Chief Water and Power
Dispatcher
May 2014



Vahnita Hooker
San Joaquin Field Division
Hydroelectric Plant Mechanic I
May 2014



Simon Kwan
Bay-Delta Office
Senior Engineer
April 2014



Leonard Marino
Central Valley Flood
Protection Board
Principal Engineer
May 2014



Maurice Miller
Operations and Maintenance
Program Water and Power Dispatcher
April 2014



Ernie Tapia
Operations and Maintenance
Principal Engineer
May 2014

*Hydroelectric Plant
**Hydroelectric Power

Promotions

Teresa Lapanja
Human Resources Office
Staff Services Analyst

David Lawson
***FESSRO
Supervising Engineer

Lisa Lee
Executive
Senior Environmental Scientist

Justin Levitt
Human Resources Office
Associate Personnel Analyst

Xiaojun Li
Technology Services
Staff Programmer Analyst

Leiji Liu
Statewide Integrated Water Mgmt.
Senior Engineer

Don Curtis Manglona
Southern Field Division
HEP* Electrician I

Paul Marshall
Bay-Delta Office
C.E.A.

Paul Mensch
Business Services Office
Business Service Officer I (Supv.)

Luis Meza
San Luis Field Division
Senior HEP* Operator

Jeffrey Mickey
San Joaquin Field Division
HEP* Operator

Kevin Miller
Oroville Field Division
HEP* Technician II

Jack Miller
Oroville Field Division
Chief HEP* Operator

Robert Moore
Engineering
Supvg Electrical Engineer HS

Jacob Morse
San Joaquin Field Division
Senior HEP* Operator

Robert Neves
Operations and Maintenance
Senior Inspector of Automotive Equipment

Ben Nixon
San Joaquin Field Division
Associate Governmental Program Analyst

Tina Nycum
Technology Services
Senior Information Systems Analyst

Irma Peralez
Human Resources Office
Staff Services Manager I

Kacy Poletti
Engineering
Senior Right of Way Agent

Rodney Prasad
Operations and Maintenance
Associate HEP** Utility Engineer

Lana Quidgeon Graber
Integrated Regional Water Mgmt.
Associate Governmental Program Analyst

Jorge Quintero
Operations and Maintenance
Associate HEP** Utility Engineer

Daniel Rabatich
Engineering
Water Resources Technician I

Michael Rouch
Delta Field Division
HEP* Mechanic I

Stephanie Ruane
Delta Field Division
HEP* Electrician I

Ramona Sandahl
Southern Field Division
Utility Craftworker

Justin Sannar
Oroville Field Division
Utility Craftworker Supv.

William Schroeder
Environmental Services Office
Senior Programmer Analyst

Ravi Sharma
Operations and Maintenance
Supervising HEP** Utility Engineer

Linda Slavik
Flood Management
Research Analyst II

Johnathan Starks
Oroville Field Division
HEP* Technician II

Martin Summers
Oroville Field Division
HEP* Operator Apprentice

Jamie Suria
Environmental Services Office
Environmental Scientist

Trisha Swanson
Executive
Staff Services Manager I

Lisa Toms
Fiscal Services
Accounting Administrator III

Omid Torabian
Fiscal Services
Associate Governmental Program Analyst

Sarah Torgersen
Operations and Maintenance
Staff Services Manager II (Managerial)

Danika Tsao
Environmental Services Office
Senior Environmental Scientist

Charles Tyson
FESSRO***
Prog. Manager II, CA Bay-Delta Auth.

Vania Vartoomian
Fiscal Services
Accounting Officer

Sanita Velagic
Executive
Associate Governmental Program Analyst

Maribel Velazquez
FESSRO***
Engineer

Tyrel Voss
Delta Field Division
HEP* Operator

James Watson
San Joaquin Field Division
Utility Craftworker

Kenneth Webbs
Southern Field Division
HEP* Mechanic I

Xay Yang
Technology Services
Senior Programmer Analyst

Arian Zamanian
State Water Project Analysis Office
Engineer

Kevin Zimmerman
Technology Services
Staff Information Systems Analyst

Retirements

Sheilah Azvedo
Fiscal Services
Accounting Officer

Shelia Bradford
Management Services
Office Assistant

Gurdev Chima
FESSRO***
Engineer

Stephen Cimperman
Statewide Integrated Water Mgmt.
Supervising Engineer

Michael Cunnagin
State Water Project Analysis Office
Staff Services Manager III

Theresa Cuyar
Operations and Maintenance
Secretary

Deborah De Anda
Executive
Associate Governmental Program Analyst

Victor Dobbins
Technology Services
Staff Information Systems Analyst

Michael Gardner
Environmental Services Office
Senior Information Systems Analyst

Retirements

Angelica Giesbrecht
Flood Management
Associate Governmental Program Analyst

Anna Hegedus
Flood Management
Supervising Engineer

William Heyenbruch
FESSRO***
Engineer

Russell Kiriu
Human Resources Office
Staff Services Manager II (Managerial)

Thomas McGivney
California Energy Resources Scheduling
Senior HEP** Utility Engineer

Rita Meade
Fiscal Services
Deputy Comptroller

Pamela Myczek
Executive
Staff Services Manager I

Gerald Nolan
Flood Management
Staff Services Analyst

Shawn Perkins
Flood Management
Water Resources Technician II

Randy Pope
San Luis Field Division
Materials and Stores Specialist

Steve Porter
Flood Management
Senior Engineer

Balwant Purewal
SWP Power and Risk Office
Associate HEP** Utility Engineer

Richard Sanchez
Engineering
C.E.A.

Mary Jo Schall
Human Resources Office
Staff Services Manager I

Gene Sours
Operations & Maintenance
Associate Control Engineer

James Upholt
State Water Project Analysis Office
Senior Engineer

Valerie Whisenhunt
Engineering
Transportation Surveyor

Gil Wong
Engineering
Construction Supv. I

Dennis Woods
Statewide Integrated Water Mgmt.
Associate Governmental Program Analyst

Melinda Woods
Executive
Executive Assistant

* Hydroelectric Plant; ** Hydroelectric Power; *** FloodSAFE Environmental Stewardship and Statewide Resources Office

In Memoriam



Ernest C. "Ernie" James Jr., retired Civil Design Branch Chief, passed away at the age of 93 on February 2, 2014 in Santa Rosa.

A native of Nebraska, Ernie moved to California after high school to begin his studies at the University of California at Berkeley.

Leaving school for combat duty in the U.S. Army, Ernie landed on Utah Beach in Normandy on D-Day with the 238th Engineer Combat Battalion. As the action moved inland, Ernie took part in the liberation of Paris, the Battle of the Bulge and the liberation of concentration and slave labor camps at Nordhausen and Dora-Mittenbau. Notably, the future DWR engineer and his battalion built bridges across the Roer and Rhine rivers while under enemy fire, allowing U.S. forces to advance and shorten the war.

Never forgetting the horrific scenes at

Nordhausen and Dora-Mittenbau, Ernie often lectured on the Holocaust.

Ernie returned to Berkeley after the war, graduating in 1948 as a civil engineer. During that period, he also married his long-time wife, Faith.

Ernie worked for the California Department of Transportation for eight years until beginning his 24-year DWR career in 1956. He took part in the design of more than 200 State Water Project bridges and oversaw the design of several structures.

"One of the many managerial strengths that I recall of Ernie was his strong support of successive planning," said DWR retiree Stephen Kashiwada. "He was always seeking and hiring talented individuals and encouraged advanced education, technical training and personal development for his staff. His foresight prepared staff to take on more and more challenging tasks and projects."

Following retirement from DWR in 1980, Ernie worked for private engineering firms in Saudi Arabia and Egypt on studies of the infrastructure of Saudi and Egyptian cities. After the Loma Prieta earthquake in 1989, he co-authored a study on Catastrophic Response to Disasters for the State.

"In working with Ernie in the Design

Office, I was particularly impressed with his ability to judge the potential of young engineers joining DWR," said Keith Barrett, retired DWR employee. "I remember a comment he made after returning from an oral exam panel that one of the candidates was destined for upper management. Sure enough, the individual (Stephen Kashiwada) steadily rose through the ranks to DWR Deputy Director."

Ernie was particularly proud of helping create DWR's Oral Video History Program, which allows current staff to tap into the expertise of many of the key individuals who conceived, planned, developed, designed, constructed and operated the SWP during the past 60 years. During a visit in December 2013—knowing that time was running short—Ernie told DWR retiree George Qualley that "I have lived a good life with a wonderful wife and family to support me, and have thoroughly enjoyed my engineering career. I just wish I could somehow convey to those who follow the experience and ideas still bouncing around in my head."

Ernie is survived by his wife of 68 years, Faith, daughter Nikki, son Jamie, three grandchildren and two great-grandchildren. 💧

Orville Abbott, retired Chief Engineer and Executive Officer of the California Water Commission, passed away January 23 at the age of 91.

The Idaho native began his 43-year career with DWR in 1950 as a junior civil engineer conducting watermaster duties for Lassen County's Big Valley. One of 10 Watermasters in three Northern California counties in 1950, Orville spent the next six years 'mastering' the Watermaster program, and by 1956 was a senior engineer managing 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.

"Orville was a class act and a distinguished member of the greatest generation," said retired DWR Chief Deputy Director Bob Potter in the Lariat Lane News. "I feel privileged to have



known him and to have worked with him. His down home wisdom was always welcomed and usually right on the mark."

As a staff engineer at the California Water Commission (CWC) in 1963, Orville assisted with presentations to Congress on appropriations for flood control and other water projects. After working a few years in Statewide Planning on economics, land use and Davis-Grunsky program, he returned to the CWC in 1972, where he devoted the remainder of his career—21 years—as the Chief Engineer and Executive Officer, retiring in 1993.

Away from work, Orville enjoyed the thrill of skiing, as well as traveling the states—in which he saw all 50—in his motor home.

Orville served in United States Army Air Corps during World War II, where he completed 28 successful combat missions over Japan as B-29 bomber co-pilot and endured a plane crash. After his military service, Orville graduated from Oregon State University with a Civil Engineering degree in 1948.

He is survived by his wife and three children. 💧



Lou Beck, who retired in December 1999 as DWR's Chief of the South Central Region Office in Fresno, passed away at 86 on February 25, 2014. He joined the department in 1965 to work on the San Joaquin Valley Drainage Program and served as district chief for 20 years until his retirement.

Former colleagues remember Lou as a thoughtful and innovative leader. Dale Hoffman-Floerke, who

retired in 2013 as DWR's Chief Deputy Director, recalled that Lou hired DWR's first environmental specialist.

Throughout his DWR career, Lou was involved in planning studies for the disposal of subsurface agricultural drainage water. He worked at the Firebaugh Wastewater Treatment Evaluation Facility investigating methods of water treatment, and he later became director of the Interagency Drainage Program, a multi-agency planning program for the disposal of drainage water.

When he retired, Lou said his plans included "volunteer work in something other than water to learn something new." Lou was big on volunteer work even before retirement.

Wanda Beck, Lou's wife of 63 years, said the couple stepped up to parent two grandchildren when their daughter and son-in-law were killed in 1989 in a car crash caused by a drunk driver.

"Until that happened, Lou had planned to retire and do consulting, and we'd travel in our motorhome," she said, but taking on the responsibility of raising Beckie, 8, and Nick, 5, changed those plans. In his 60s, Lou coached Nick's Little League team and became "Chief Straight Arrow" when Beckie and he joined the Y Indian Guides program.

Lou spent untold hours volunteering for the Fresno Dixieland Society and was its president until he became ill last fall. Wanda said that after they moved to Fresno in 1965, word got out about Lou's vast collection of Dixieland music. The local public radio station had no music at all and invited Lou to host a show, which he did each Saturday for years.

Wanda said Lou wasn't as organized in retirement as he was at DWR. "Every spot in this house where he could put his stuff, he did," she chuckled. "May he rest in peace until I see him, because when I see him, I'm going to give him the word!"

In addition to Wanda, Beckie and Nick, Lou is survived by sons Jeffrey and Jason and grandchildren Daniel, Amber, Jasmine and Hillary. ♦

Eugene Pixley, a retired Associate Land and Water Use Scientist of the Division of Integrated Regional Water Management's Northern Region Office (NRO), passed away on February 5.

He retired in 2010 from DWR after working 52 years with the Department, 32 of those with the NRO.

"Eugene was known as NRO's 'go-to guy.' Any data requests that came into the office regarding historical data were always sent to him," said Tito Cervantes, NRO's Land and Water Use Chief. "His institutional knowledge was frequently relied upon for historical information. And with his great attention to detail, he was often asked to review documents that required extensive editing."

Joining the Department as a Junior Land and Water Use Analyst with the San Joaquin District in 1957, Pixley transferred to the Los Angeles Southern District in 1970 and later relocated to Red Bluff with NRO in 1977 where he spent the remainder of his career.

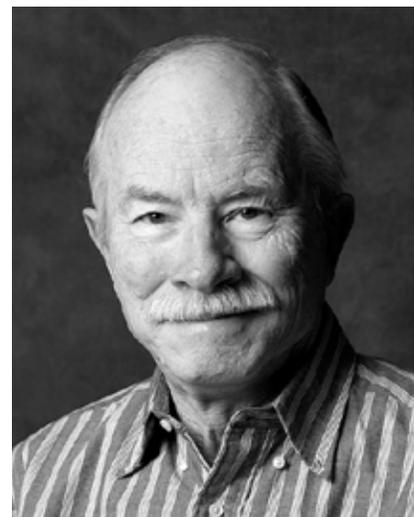
"He was very good at seeing the

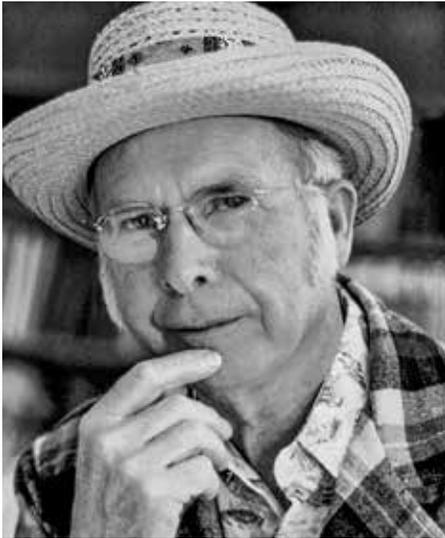
connections between current water issues we face today and circumstances that had happened in the past (drought, flood, etc.)," said Northern Region Office Chief, Curtis Anderson. "His many years of work at DWR made him a true 'water geek,' which is a sincere compliment coming from an engineer. He will be sorely missed."

Known for his memory and wealth of agricultural knowledge by his colleagues, Pixley enjoyed collecting aged books and newspapers, playing the clarinet with the Tehama County Community Band and volunteering at the Heidrick Ag History Center, an agricultural museum in Woodland, California where he created an inventory database.

"What I remember most about Gene was his outstanding ability to recollect the most amazing and obscure facts relating to land and water use in California," said Curtis. "The shelves in his office were filled with reference books dating back to the early 1900s, but he rarely needed to use them because of his incredible memory."

He is survived by his wife Brenda, daughters Eugena and Lois, son William, five grandchildren and three great grandchildren. ♦





William "Neal" Buck, a retired Associate Engineer with the Division of Design and Construction (Division of Engineering), passed away on March 29 at the age of 99.

Born and raised in Bethany, Missouri, Neal joined DWR in 1956—the same year the Department formed. He spent the succeeding 29 years working on a variety of structural design and construction projects tied into the development of the State Water Project. He assisted with the design and construction of Pyramid Dam, Oroville Dam and Reservoir and the Feather River Fish Hatchery. He also coordinated with the Federal Power Commission on the licensing of each project.

Prior to DWR, he earned a Bachelor of Arts in Math in 1936 at Park College in Parkville, Missouri. Two years later, he earned a Bachelor of Science in Civil Engineering, with an emphasis in Structural Design from the Missouri School of Mines and Metallurgy (now Missouri University of Science and Technology).

Neal also worked for Phillips Petroleum and on topographic mapping and editing for the United States Geological Survey as a field engineer.

After retirement in December of 1979, Neal enjoyed his time with family, gardening and raising rabbits and chickens. He also volunteered at the California Capital Museum and was a local 4-H leader.

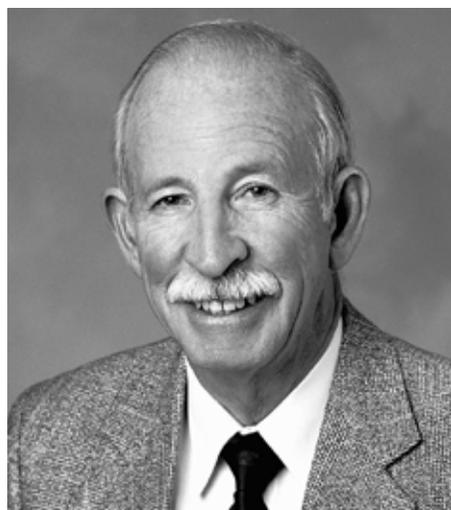
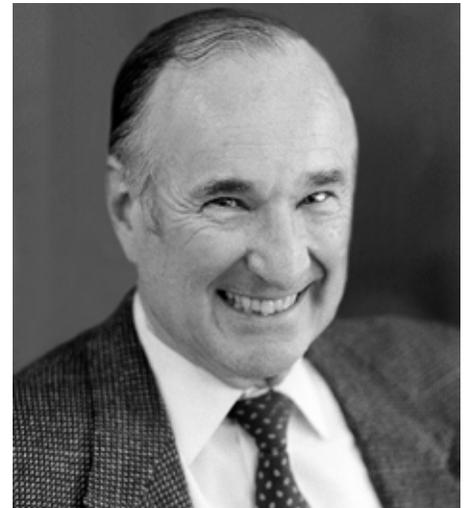
Neal is survived by his two daughters Donna and Bette of Carmichael. ♦

Jerry Vayder, retired Chief of Central District (now called the North Central Region Office) passed away on March 21, 2014.

His 43 years with DWR included working as chief of the Planning Unit for the Delta Branch, principal editor for the California Water Plan Outlook in 1974 and chief of Planning's Hydrology and Water Operations Section. His career began as a junior civil engineer working on Bulletins 2 and 3. He worked on the San Francisco Bay Barrier investigations and Upper Feather River Basin advanced planning studies. He coordinated the California Region Framework Study Group during 1968-71 and served on a task force to prepare comprehensive reports that dealt with the state's land and water resources, such as fish and wildlife, flood control and recreation. He was also statewide coordinator for administration of the Davis-Grunsky Act. After 42 years of DWR service, he retired in 1990.

Born in Bakersfield, he was raised in Sacramento graduating from C.K. McClatchy Senior High School in 1946. He graduated from the University of California, Berkeley with an Engineering degree in 1950.

Preceded in death by his wife of 46 years, Dorothy, he is survived by four children, 10 grandchildren, many great-grandchildren and his companion of 12 years, Dolores. ♦



Frank J. Lombard, retired Chief of Sacramento Project Headquarters with the Division of Engineering, passed away at the age of 82 on January 24, 2014.

After serving four years in the U.S. Air Force during the Korean Conflict, Frank returned to the University of Utah, where he graduated with a Bachelor of Science in Civil Engineering while working for the National Park Service.

With his first DWR assignment being part of a survey crew for the South Bay Aqueduct in 1960, Frank spent the next 35 years at DWR, where he began as a junior civil engineer and retired as principal engineer. He was an executive assistant for DWR's Deputy Director from 1968 to 1978. He also worked for the Operations and Maintenance Program Control Office, Program Analysis Office and the Energy Division before becoming chief of Contract Administration with the Division of Engineering's Construction Office. He retired in 1995 as chief of the Sacramento Project Headquarters.

Frank was President of the Sacramento Chapter of the American Society of Civil Engineers. He was known for his love of the outdoors, extensive vocabulary, humor and humility.

Frank is survived by his wife Joni, a son, two granddaughters, three stepsons, four step grandchildren and three step great grandchildren. ♦

New Drought Campaign



Californians Don't Waste Water—When you drive California's roads and highways as spring turns to summer, keep an eye peeled for the “Californians Don't Waste” campaign on more than 100 billboards around the Golden State, and listen for the radio spots placed on dozens of stations.

DWR's Graphic Design Unit and the Association of California Water Agencies (ACWA) created seven eye-catching designs for the outdoor campaign sponsored by DWR and ACWA. The above billboard is visible on eastbound highway lanes entering Oakland from the Bay Bridge. Other messages urge Californians to take short showers, tolerate dirty cars, fix leaky faucets and

clean driveways with brooms instead of water.

California is mired in its third consecutive dry year and one of the worst droughts in its history. Governor Edmund G. Brown Jr. designated May as Save Our Water Month. “As California approaches the summer fire season in the throes of a drought, I call on all Californians to take a thoughtful approach to water usage and conservation,” the Governor stated.

The “Californians Don't Waste” campaign on billboards, radio stations and the Internet will run through the end of June. Check out the billboards and listen to the radio spots at <http://www.water.ca.gov/waterconditions/droughtmedia.cfm> ♦

DWR Mission Statement

To manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

A photograph of a man, identified as Dave Allen, working in an industrial setting. He is wearing a blue jumpsuit, a cap, and safety glasses. He is leaning over a large, white, cylindrical piece of machinery, possibly a motor or pump, and appears to be adjusting or inspecting it. The scene is set on a metal walkway with railings, and the background shows various industrial structures and equipment. The lighting is bright and yellowish, typical of an indoor industrial environment.

Hydroelectric Plant Mechanic I Dave Allen of Operations and Maintenance's Delta Field Division assists contractors on the motor thrust bearings on a spare unit for South Bay Pumping Plant Stage 3 in the new maintenance service bay. Constructed in 2012, the bay provides staff a clean and all-weather environment to repair equipment, such as pumps and motors for State Water Project facilities.