

CIVIL ENGINEERING NEWS

WATER RESOURCES

Oregon Drought Forces Tough Water Control Decisions

For the first time in nearly 50 years, so little rain fell in and around Detroit Lake—the second-largest of 13 reservoirs in Oregon’s Willamette basin—that its two marinas suggested a desert landscape. As the Pacific Northwest experienced a near-record drought throughout the summer, Detroit Lake’s vacation-driven economy lost almost 90 percent of its revenue and stood as a parched reminder of the important and often difficult task of water management.

Each year in September, the Portland district of the U.S. Army Corps of Engineers, which controls the Willamette dams, empties Detroit Lake for its primary purpose—winter flood control. Under ordinary circumstances, the

Corps regulates water through the dam until February, at which point the release is stopped and water is collected for the summer, usually reaching an optimal level for recreation by Memorial Day. This year, however, after initially storing water, the Corps decided to divert much of the reservoir for hydroelectricity, downstream sanitation, and compliance with endangered species regulations.

“We made a decision to start storing water early,” says Colonel Randall Butler, who heads the Corps’s Portland district and is in his third year of a three-year post managing the area’s dams. “And even with that decision the rain in the valley was not rising in the reservoirs at a normal rate.” By spring the

Willamette basin had received less than half of its normal aggregate rainfall, and Oregon entered what would become its second-worst drought since 1892, when the National Weather Service began compiling statistics.

Meanwhile, pressure mounted to release the minimal amount of water that had collected. Oregon’s Bonneville Power Administration (BPA), which counts on the Willamette dams for much of its hydroelectricity, was in the midst of an energy shortage. Also, the Willamette River’s water level was dangerously close to dropping below the federally mandated flow level of 6,000 cfs (170 m³/s) at a gauging station in Salem, just downstream from the Detroit dam. To make matters worse, a 1999

Kane’s Marina rested on the dry bed of Detroit Lake during one of the worst droughts in Oregon’s history. This photograph was taken in July 2001, when the reservoir would normally be full. The water has been diverted for environmental and energy uses.



endangered species act required that in April the flow level at Salem be increased from 6,000 to 21,000 cfs (170 to 595 m³/s)—a deluge to aid the habitat of threatened salmon and steelhead.

Left with the task of mitigating these concerns, Butler first lobbied the Oregon Water Resources Department to relax its standards at the Salem gauging station to 5,000 cfs (140 m³/s), the minimum amount required for the water and sanitation needs of large industrial cities downstream, such as Oregon City and Portland. Even more critical, the National Marine Fisheries Service agreed to lower its flow regulation for threatened fish in April from 21,000 to 15,000 cfs (595 to 425 m³/s). With the lowered standards, Butler's hydrology team used the predicted amount of summer rainfall and the configuration of the basin to design a flow model that would leave the reservoirs with the minimum amount of water needed by the BPA.

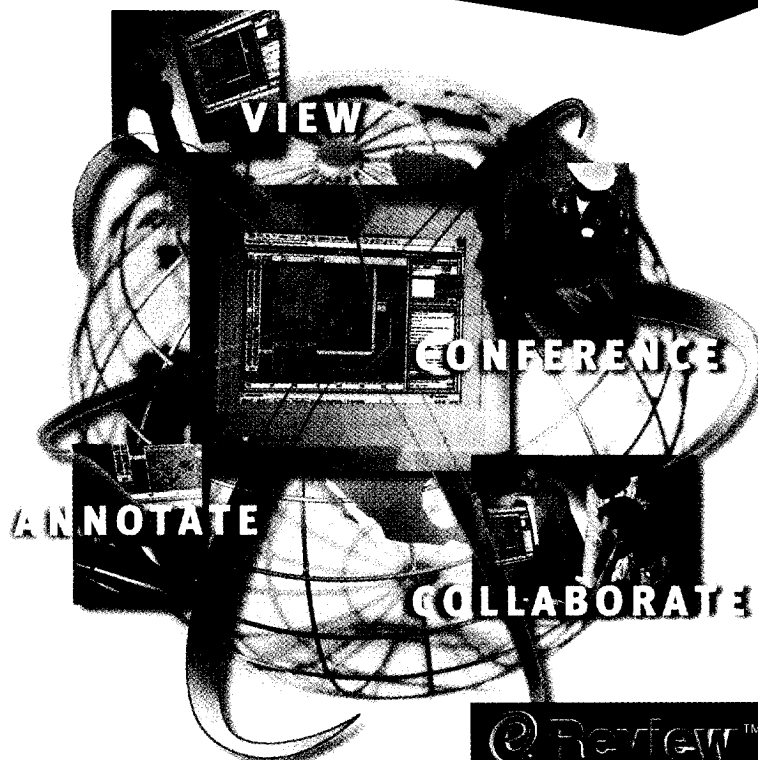
"In a normal year we try not to use Detroit's flow until the very end of the season," Butler says. "This past summer we weren't able to do that." In fact, the Detroit dam—which has more hydroelectric generating capacity than all but one dam in the Willamette basin—was among the most heavily tapped in the system, and the reservoir was more than 50 ft (15 m) below its normal elevation throughout the summer. The residents of Detroit, determined to keep this from happening again, have since applied for federal aid and formed a lobbying group called Save Our Lake.

Corps officials say even if the increased flow of water needed to meet endangered species regulations had not been released, Detroit Lake still would have been more than 45,000 acre-ft (55.5 million m³) shy of the 409,000 acre-ft (504.5 million m³) needed to fill the two marinas. "The environmental protection laws and the clean water laws required us to draw the reservoirs further down," Butler says. "But the reservoirs weren't full because Mother Nature didn't provide the rain."

—Greg Brouwer

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CTL Engineering, Inc., a 180-person engineering firm based in Columbus, Ohio, has acquired **Sachina Engineering**, a 12-person firm based in Bangalore, India.

The Thornton-Thomasetti Group, a 450-employee international engineering and design firm, has acquired **Knezevich & Associates**, a 10-person firm based in Fort Lauderdale, Florida, that specializes in the evaluation and design of hurricane-resistant building components.