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# NEW REPORT CONFIRMS BENEFITS OF FIRO STRATEGY IN ENHANCING WATER MANAGEMENT AT PRADO DAM

***RIVERSIDE COUNTY, Calif. (December 4, 2023)*** – A new report illustrates the benefits of the Forecast Informed Reservoir Operations (FIRO) which will soon be implemented at Prado Dam. This innovative strategy, developed collaboratively by the U.S. Army Corps of Engineers (USACE), the Orange County Water District (OCWD), and the Center for Western Weather and Water Extremes (CW3E) at Scripps Institution of Oceanography at UC San Diego, is poised to revolutionize water resource management.

The report, titled the Prado Dam FIRO Final Viability Assessment, describes how forecasting tools can allow operators to increase the volume of stormwater that is temporarily retained behind the dam and released later at a rate that allows recharge into the Orange County groundwater basin to enhance water supply. FIRO enables the optimization of stormwater capture at Prado Dam through advanced forecasting of atmospheric rivers (ARs). These forecasts are crucial in managing both beneficial precipitation and flood risks in California.

The findings quantify FIRO effectiveness, revealing an average annual increase of 4,000-6,000 acre-feet of groundwater recharge, which is enough water for 32,000 to 48,000 people per year. In a wet year, FIRO could provide up to 23,000 acre-feet of additional recharge, which is enough water for over 180,000 people. Implementing FIRO at Prado Dam would result in a significant boost in water supply, valued at millions of dollars, and a positive impact on flood risk management.

OCWD President Cathy Green highlights the local benefits, stating, “It has been tremendously rewarding to partner with Scripps, USACE and other key stakeholders on this project, which will increase water supply reliability for the region. Local capture decreases the reliance on imported water, which is increasingly more expensive and less reliable.”

“FIRO pilot sites like Prado Dam add valuable experience to our agency’s understanding about how to implement FIRO in various kinds of watersheds and reservoirs, enabling us to find better balances between multiple authorized purposes such as flood-risk management, water supply and ecological benefits at our reservoirs. FIRO is also a powerful tool in adding flexibility to water management practice that improves the resiliency of existing infrastructure to better face the challenges presented by a changing climate” said Cary A. Talbot, with the U.S. Army Engineer Research and Development Center and FIRO program national lead for the Corps.

The first FIRO pilot study was at Lake Mendocino on the Russian River. Implementation of FIRO at Lake Mendocino was shown to increase water supply by nearly 20 percent. At Prado Dam, FIRO is expected to increase average stormwater recharge by 8 to 11 percent. Additional sites are being evaluated as part of a broader assessment by the USACE and CW3E including Seven Oaks Dam in San Bernardino,

Calif., and Howard Hanson Dam near Seattle, Wash., with a nationwide screening process underway. Advances in atmospheric river forecasting, supported by CW3E's Atmospheric River Reconnaissance program that collects data on these storms from Air Force and NOAA "Hurricane Hunters," and partnerships including California's Department of Water Resources, have significantly improved forecast reliability, aiding dam operators in effective water management.

Marty Ralph, chief scientist for the FIRO National Expansion Pathfinder and director of CW3E commented: "This FVA represents the second completed FIRO assessment, and like the first, demonstrates the positive impacts of using atmospheric river forecasts to enhance operational flexibility at a major dam. These scientific and engineering results are a key milestone towards incorporating FIRO more formally into the future rules that govern Prado Dam operations. The success of FIRO hinges on improvements in forecast skill and that skill is founded on scientific knowledge, specialized observations, and specialized forecast tools. Further advances in forecast skill are likely to enable greater flexibility in the future as we better anticipate where and when ARs will strike."

Justin Gay, deputy district engineer of the USACE Los Angeles District, which maintains Prado Dam, reflects on the project's historical context: "For several decades, Prado Dam has served its purpose well. The dam has reduced the flood risk for Orange County, while also balancing water conservation, ecological and recreational benefits. FIRO provides an opportunity to further enhance our dam operations to reduce flood risk for Orange County and provide water conservation and ecological benefits."

Michael Anderson, state climatologist with the California Department of Water Resources, sums up the collaborative effort: "The Prado Dam FIRO project is an example of how multiple agencies can collaborate to collectively explore the potential of emerging technologies and improved forecasts and create an adaptive strategy with multiple benefits for water management in a changing climate."

"FIRO ensures that the huge investment we've made in Prado Dam infrastructure provides the greatest benefits possible," said James Tyler, senior engineering manager at Orange County Public Works.

The success of the Prado Dam FIRO project showcases the efficacy of innovative water management strategies and sets a precedent for similar innovations across other USACE reservoirs nationwide. With the completion of this Final Viability Assessment, the FIRO strategy is set to be tested at Prado Dam over the next several years with the goal of making this a permanent feature of Prado Dam operations by 2027.

*About the U.S. Army Corps of Engineers*

*The U.S. Army Corps of Engineers Los Angeles District is a world-class organization, providing engineering solutions that respond to the needs of the nation, our environment and the communities we serve. The Corps' LA District is one of the largest in the U.S., covering projects across more than 226,000 square miles of southern California, southern Nevada, all of Arizona and a portion of Utah. The district operates in the second largest urban area in America, as well as works in small farming communities. The organization is responsible for a $750-million annual budget for planning, engineering, construction, real estate, regulatory, emergency management and environmental services for three Army and eight Air Force installations, interagency and international customers, and the nation's civil water resources infrastructure in the Southwest, with a current value of assets worth $240 million. More than 750 dedicated professionals and support staff provide extensive planning, design, engineering and construction expertise.*

*About the Orange County Water District*

*The Orange County Water District manages the local groundwater basin that provides 85% of the water supply for 19 cities and retail water districts in north and central Orange County, serving 2.5 million people. Guided by its commitment to sound planning and investment, high standards for water reliability, exceptional water quality, environmental stewardship, sound financial management, and transparency, OCWD has proactively implemented initiatives to protect and increase local water supplies. OCWD replenishes the basin, prevents seawater intrusion, and protects Orange County's rights to Santa Ana River water. For more information about OCWD, please visit www.ocwd.com and follow @OCWaterDistrict on social media.*

*About Scripps Institution of Oceanography at UC San Diego*

*Scripps Institution of Oceanography at the University of California San Diego is one of the world's most important centers for global earth science research and education. In its second century of discovery, Scripps scientists work to understand and protect the planet, and investigate our oceans, Earth, and atmosphere to find solutions to our greatest environmental challenges. Scripps offers unparalleled education and training for the next generation of scientific and environmental leaders through its undergraduate, master's and doctoral programs. The institution also operates a fleet of four oceanographic research vessels, and is home to Birch Aquarium at Scripps, the public exploration center that welcomes 500,000 visitors each year.*

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