Orange County Water District (OCWD; the District) sustainably manages a groundwater basin that provides 85% of the drinking water supply to 2.5 million people in north and central Orange County. As part of its groundwater management program, OCWD maintains a diversified water supply portfolio to ensure a variety of water sources fill the basin including Santa Ana River flows, stormwater, local rainfall, imported water from northern California and the Colorado River, and recycled water from its Groundwater Replenishment System (GWRS).

OCWD’s long history of active management and investments has not only sustained the groundwater basin but doubled its annual yield.

**Groundwater Replenishment System**

In 2008, the District significantly enhanced its recharge capabilities when the GWRS, the world’s largest water recycling facility, came online. After undergoing an advanced purification process, the GWRS produces high-quality water that exceeds all state and federal drinking water standards.

In 2023, a final expansion to the GWRS was completed, producing 130 million gallons of water a day. This is enough water to serve nearly one million people. GWRS water is used year-round to recharge the groundwater basin. Over time, the placement of this ultra-pure water will significantly enhance the quality of water in the groundwater basin.

**Recharge System**

OCWD operates and maintains one of the world’s most advanced managed aquifer recharge systems to replace water that is pumped from the basin by local water agencies, cities, and other groundwater users. Since 1936, OCWD has acquired more than 1,600 acres of land which includes a six-mile stretch of the Santa Ana River and two dozen recharge basins in Anaheim and Orange.

Along with purchasing land, OCWD’s infrastructure investments have maximized the recharge capacity of its facilities. Inflatable rubber dams placed across the Santa Ana River in the early 1990s have enabled the District to capture runoff and direct it into the District’s recharge basins. Other improvements include pump stations, miles of pipelines, valves, flow meters, water level sensors, and a sophisticated computerized control system that allows operations to be monitored and controlled remotely.
Seawater Intrusion Barrier

One of the region’s biggest water supply threats is seawater intrusion – saltwater from the Pacific Ocean that could infiltrate into the basin and contaminate the drinking water supply.

For more than 50 years, OCWD has combated seawater intrusion in a proactive manner, from monitoring the elevation of freshwater used for pumping on a daily basis to injecting water into the basin to create a barrier between saltwater and freshwater. Approximately 30 million gallons per day of GWRS water can be pumped into a series of injection wells located along Orange County’s coast to support the District’s barrier operations.

Stormwater Capture

For decades, OCWD has worked collaboratively through its partnership with the U.S. Army Corps of Engineers (Corps) to increase stormwater capture behind Prado Dam. Owned and operated by the Corps, the dam is the primary flood control facility along the Santa Ana River. It also serves as an important way to hold water back and strategically release amounts of water that flow down the Santa Ana River to OCWD’s recharge system where it is diverted into the groundwater basin. The District is working with the Corps to increase the water conservation elevation, or the pool of water held behind the dam, allowing for more storage capacity and maximizing the use of local water resources. These actions could save water users millions of dollars in imported water purchases.

Forecast Informed Reservoir Operations (FIRO)

To further enhance stormwater capture, OCWD is testing FIRO at Prado Dam with the support of the Scripps Institution of Oceanography at UC San Diego and the Corps. FIRO uses modern science and technology to optimize the use of limited water resources and represents a viable option to adapt to extreme weather events and precipitation variability unique to the U.S. West Coast. The program aims to develop improved weather forecasting, including tracking storms and atmospheric rivers, and ultimately update the Corps’ control manuals to increase water storage levels behind the dam.