

# Water Offsets as a Strategy to Grow in a Water-Scarce Environment

## SERIES OVERVIEW

In 2022, California is in the midst of a severe drought — just a few years after the worst drought in a millennium ended in 2017.

This pattern of accelerating and deepening droughts is consistent with climate change models for the state, which forecast longer, more severe and more frequent droughts punctuated by heavy rain and flooding.

Unlike past droughts, these events are not periods to survive until “normalcy” returns. Instead, they are a sign that the climate is changing — and that the state must fundamentally change how it uses water.

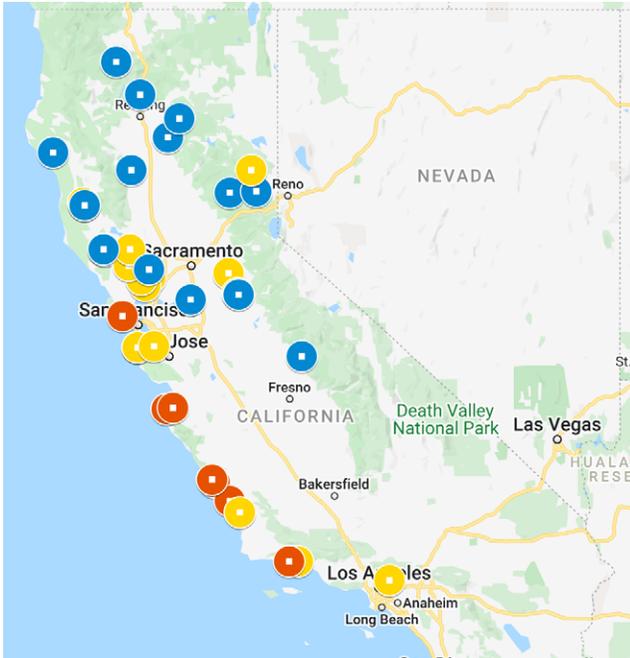
These six case studies — a follow-up to SPUR and Pacific Institute’s report *Water for a Growing Bay Area* — highlight leaders who are pioneering more sustainable approaches to water in Northern California. We highlight public water agencies, private corporations, nonprofit affordable housing developers and local land use authorities who are using water more efficiently, protecting groundwater supplies, reusing stormwater and recycling water.

Water sustains life, and its status — whether it is plentiful or scarce, clean or polluted, fresh or salty — shapes the well-being of all living creatures. These six case studies illustrate strategies for California to meet the challenge of a changing climate and emerge with a healthy environment and flourishing communities.

## Key Takeaways

- Santa Cruz County, on California’s coast, relies on local aquifers that were severely overdrafted and had declined to levels that made them vulnerable to permanent seawater contamination.
- Soquel Creek Water District implemented a water-neutral development policy, where new developers paid a fee to offset their water demand with efficiency improvements elsewhere in the system. The district curbed water demand by 40% since 2003, even as the water district’s population grew by 3%.
- In 2023, a water recycling plant will come online to recharge groundwater, replenishing its aquifers by mid-century.

How can a community grow when faced with severe water-supply limitations? At least 37 communities in California faced with water shortages have placed moratoriums on new development (see Figure 1). But other communities have taken a different approach, requiring instead that all new developments offset their future water demand. Water offset policies allow communities to grow while they develop supplemental water supplies to reduce or eliminate shortages, or even to decrease water demand as they grow. While water offset programs have been adopted by just slightly more than a dozen small communities in California thus far, they may become an increasingly important strategy to allow growth



**FIGURE 1**  
**Water-related Building Moratoriums in California**  
 Thirty-seven communities in California had placed moratoriums on new construction due to water supply limitations as of March 2021. An interactive version of this map is available at [spur.org/buildingmoratoriums](https://spur.org/buildingmoratoriums)

Source: See Appendix D of *Water for a Growing Bay Area* at [spur.org/bayareawater](https://spur.org/bayareawater)

as urban areas reach the limits of their current water supplies.<sup>1</sup>

Water-neutral development requires new water customers to offset at least 100% of their projected water demand by performing water efficiency projects or paying in-lieu fees to their water utility to implement water efficiency projects. A review of 17 such programs in California concluded that most communities enacting such policies were fed by a small, limited local supply such as groundwater and were in the midst of a drought when the programs were first instituted.<sup>2</sup> Most of the programs use plumbing fixture retrofits to achieve greater water efficiency in their districts.



**FIGURE 2**  
**Soquel Creek Water District**  
 Soquel Creek Water District is a mid-sized water district serving a portion of the city of Capitola and unincorporated regions of Santa Cruz County. Ringed by the Santa Cruz mountains, it has no major infrastructure to import water. Instead, it relies on two aquifers that are vulnerable to seawater intrusion.

Source: Soquel Creek Water District. "Soquel Creek Urban Water Management Plan," 2015, <https://www.soquelcreekwater.org/DocumentCenter/View/354/Urban-Water-Management-Plan-2015-PDF>

## Resolving the Water-Development Tension on the Central Coast

Soquel Creek Water District in Santa Cruz County has one of the best-documented water offset programs in the state.<sup>3</sup> The district is exclusively reliant on a groundwater basin that is chronically overdrafted due to historical over-pumping by the district itself and by other users of the basin.<sup>4</sup> When coastal groundwater aquifers such as this one decline, seawater can intrude inland and reach water supply wells, rendering them unusable. As a result, the Soquel District's board of directors adopted its first water-neutral policy in 2003 with the goal of preventing further overdraft and seawater

1 Harder, Jennifer. Demand Offsets: Water Neutral Development in California [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2600288](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2600288)  
 2 *ibid.*  
 3 *ibid.*  
 4 Soquel Creek Water District, "Groundwater," Accessed February 7, 2022, <https://www.soquelcreekwater.org/185/Groundwater>.

intrusion while still permitting new development to occur. The offset program was intended to serve as a bridge while the district developed supplemental water supplies that would allow for groundwater to return to levels that protect against seawater intrusion. The district's offset program accelerated conservation efforts as it implemented projects to increase supply.

Soquel District's water-neutral development policy requires any new development in its jurisdiction to offset projected water demand by 160%. Originally, developers were required to identify and perform plumbing fixture retrofits themselves to meet their project's offset requirements; over time, Soquel District transitioned to charging developers in-lieu fees and conducted the efficiency projects themselves. The district has developed estimates of annual water use for more than 40 types of development, which they refer to as the "water use factor" for each type of development.<sup>5</sup> Offsets are required to be equivalent to at least 160% of the development's projected annual water use over the next 20 years.<sup>6</sup> Currently, the water savings must also be from *additional* efficiency projects (projects that would not have otherwise happened without the offset program) and must be *measurable* (based on metering data, published studies or other reliable sources of information).

Soquel District's water-neutral development program and other aggressive conservation efforts have been extremely successful at curbing water demand. The amount of water produced and consumed in the district has decreased by approximately 40% since the water-neutral

program began in 2003.<sup>7</sup> This dramatic decline in water consumption has occurred even as the water district's population has grown, serving 3% more people in 2020 than in 2010.<sup>8</sup>

The water offsets program has bought Soquel District time by helping to lower demand and protect against worsening overdraft and seawater intrusion while the district pursues supplemental water supply options. The Pure Water Soquel project, which is expected to come online in 2022 or 2023, will inject 1.3 million gallons per day of purified recycled water into the groundwater basin and will replenish the basin by 2045.<sup>9</sup> The project will come none too soon, as climate change is likely to slow the rate of natural recharge via rainfall for the groundwater basin.<sup>10</sup>

Water-neutral development policies are not without their challenges. One of the biggest problems is that the cost of offsets and in-lieu fees falls on developers, driving up the already high costs of new housing development in California. Water-neutral development can also be politically unpopular with land use agencies that have high housing targets to meet. On the other hand, water-neutral development is often viewed as better than an outright building moratorium, or worse, a sudden shortfall in drinking water.

Another challenge related to cost is that affordable housing developers are not exempt from paying the full cost of offsets. Under Proposition 218 restrictions, public utilities are not allowed to use fees or rates charged to one customer to subsidize another. This problem could be addressed through action by the California State Legislature. A precedent on exempting certain housing types

5 In lieu of water providers having to develop custom water use factors for offset programs, they may be able to utilize studies and performance standards for water use by sector to be completed by the Department of Water Resources over the course of 2021 and 2022.

6 Soquel Creek Water District, Water Demand Offset (WDO) Program New Applicant Offset-Generating Project Proposal Application, 2019, <https://www.soquelcreekwater.org/DocumentCenter/View/178/Water-Demand-Offset-Program-New-Applicant-Offset-Generating-Project-Proposal-Application-PDF>.

7 Pers. comm., Shelley Flock, Conservation & Customer Service Field Manager, Soquel Creek Water District. 2/2021.

8 Soquel Creek Water District. "Urban Water Management Plan," 2015, Appendix J. <https://www.soquelcreekwater.org/DocumentCenter/View/354/Urban-Water-Management-Plan-2015-PDF>.

9 Soquel Creek Water District. "2019/20 Budget," June 2019, 115, <https://www.soquelcreekwater.org/615/Finance-Budget>.

10 Soquel Creek Water District. "Urban Water Management Plan," 2015, 9-7, <https://www.soquelcreekwater.org/DocumentCenter/View/354/Urban-Water-Management-Plan-2015-PDF>.

from fees was set by Senate Bill 13 (Wieckowski, 2019), which prohibited local agencies, special districts and water corporations from charging impact fees (such as those charged by offset programs) for new accessory dwelling units under 750 square feet. The intent of this law was to make it more affordable to build accessory dwellings as they are one component of solving the state's housing crisis. The law establishes a precedent that the legislature can exempt certain types of housing from covering their full cost of service, a principle that could be applied to new affordable housing.

An additional challenge for water-neutral policies is maintaining momentum once the easy gains in water efficiency have been achieved. This is especially true for longer-running offset programs and/or areas that have already achieved significant water demand reductions through other conservation programs. As of 2020, at least 90% of common plumbing fixtures in Soquel District are estimated to have met high-efficiency building code standards. New retrofits tend to yield smaller efficiency gains for each new appliance installed. For example, toilet retrofit standards in Soquel District have changed from 3 to 1.6 to 1.28 to 1 gallon per flush. As readily available and less expensive efficiency project options have dwindled, the district's board more recently began requiring efficiency projects that would likely not happen without funding through offset program fees. The district has had to find more unusual and expensive efficiency measures, such as purchasing a specialized machine that recycles water when the utility conducts routine flushing of water mains for water quality purposes.<sup>11</sup>

Other communities seeking a more gradual approach to curb new water demand could require different, lower thresholds for offsets. Soquel District set an ambitious target of 160% water offsets because it had to take aggressive action to correct three decades of overdraft and prevent seawater intrusion from ruining its sole water supply source.<sup>12</sup> Other communities seeking a different balance between cost for developers and the rate of water savings could set the threshold lower.

## Strategies to Grow in Severely Water-Limited Areas

### **Find efficiencies in existing construction and infrastructure to offset water demand for new high-priority development projects.**

Water offsets are a strategy to “find the water” for high-priority types of development, such as affordable and infill housing, even in severely water-stressed areas. They function because most development and water infrastructure in California has inefficiencies that can be corrected to free up water for new development. Successful implementation of offset programs requires accurate water use factors for each type of development, procedures to ensure that offsets are additional<sup>13</sup> and measurable. Water districts can use water offsets as one tool in a portfolio of strategies to manage water demand as they work to improve supply resiliency. While water offset programs can be implemented in an urgent fashion, such as requiring developers to offset more than 100% of their projected demand, they can also be used to achieve more gradual

<sup>11</sup> Soquel Creek Water District. “Innovative Waste-Free Flushing Cleans Pipes and Saves Water.” Capitola Soquel Times, September 2018. [https://issuu.com/timespublishinggroup/docs/cti1609\\_tab\\_issuu/24?e=3533832/38328902](https://issuu.com/timespublishinggroup/docs/cti1609_tab_issuu/24?e=3533832/38328902).

<sup>12</sup> See note 45.

<sup>13</sup> In some cases, offsets may not need to be additional if the goal is not to capture new water savings, but simply to accelerate water savings through rapid uptake of efficiency measures.

<sup>14</sup> Mawhorter, Sarah, David Garcia, and Hayley Raetz. It All Adds Up: The Cost of Housing Development Fees in Seven California Cities, 2018.

water savings. To date, water offsets have been adopted by individual water agencies. The state legislature could require water demand offsets be used in circumstances of extreme water shortages.

**Who has authority:** Water utilities, California State Legislature

**Pass legislation to allow reduced impact fees, including water offset fees, for infill housing developments that serve middle- and low-income households.**

The downside to water demand offset programs is that historically they have charged the costs for efficiency upgrades to developers seeking permits, which, in conjunction with other fees and requirements, can deter developers from building.<sup>14</sup> These two housing types are in short supply in California, especially in already dense areas, and they serve many of the state's most disadvantaged residents. But making certain types of new development easier to build by exempting them from impact fees is no easy task. It would require action by the legislature, because most water agencies interpret Proposition 218 as prohibiting fee exemptions for certain categories of customers. However, there is legal precedent for exempting specified types of housing from impact fees in Senate Bill 13 (Wieckowski, 2019).

**Who has authority:** California State Legislature

**Develop streamlined, all-electronic processes for land use agencies and water utilities to increase coordination and better serve development project applicants.**

Successful water offset programs depend upon communication and coordination between land use agencies who approve planning and building permits and water utilities implementing an offset program. At a minimum, land use agencies could require that developers obtain a "will serve" letter from their water utility when they apply for planning or building permits. This ensures that the developer has obtained pre-approval from a water utility and has been fully apprised of the offset and other program requirements and fees early on in the development process.

When land use agencies use electronic software systems to track and review development project applications, it will greatly increase interagency coordination and efficiency to include water utilities in the plan check review and approval process.

**Who has authority:** Building departments, water utilities, any other agencies issuing permits required of new development

Read all the case studies at [spur.org/watershedmoments](https://spur.org/watershedmoments)



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