

Economic Resilience: Water

A PARCHED FUTURE POSES NEW RISKS AND OPPORTUNITIES IN BUSINESS



Climate change. It's hard to deny something is happening in our region — higher tides, bigger storms, extended and drier heat patterns. Scientists from well-known Scripps Institution of Oceanography at the University of California, San Diego, housed right here in the San Diego region, tell us our world is changing.

By being aware of how climate change is likely to affect our region, businesses, scientists and regional leaders are working together and investing today to identify how technology, talent and local expertise can ensure our region maintains a strong economy, healthy environment and vibrant quality of life not just for today's workforce, but for all future generations.

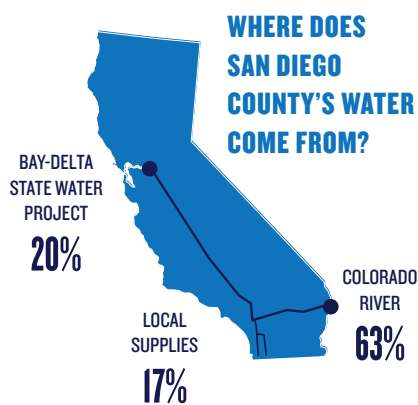


A Parched Future Poses New Risks

The San Diego region's primary water sources are impacted by a warming climate

Our two main sources – the Colorado River and Sierra Nevada (via the State Water Project) – are likely to be impacted as warmer temperatures and more extended droughts reduce the amount of snowpack and river flow.

FORECAST: Drier with a chance of flooding – Local rainfall patterns are also changing in ways that make both drought and flood events more likely. By mid-century, scientists project:



8% more rainfall during large storms (contributing to the likelihood of flooding)

12% expected decrease in runoff and streamflow that replenish our major water sources in San Diego County

16% fewer rainy days on average

46% expected increase in San Diego County's water demand by 2035 due to increasing population, rising temperatures, less frequent rain and increased soil and water reservoir evaporation

Why Should Our Businesses Care?

Water is the lifeblood of any regional economy. The businesses that make up our region's three major industries – tourism, innovation, and the military – as well as the local businesses that make up the other half of our \$200+ billion regional economy, all rely on clean and stable water supplies. Biotechnology and pharmaceutical businesses, a major part of our region's economy, also face a substantial risk because they need reliable access to clean water and must meet strict regulations on discharge limits. Water is a precious resource. Working together, we must adopt policies and strategies to ensure an abundant water supply for our economy, quality of life and future generations.

Perspectives from local leaders:

"We've enhanced our region's water supply reliability by improving water efficiency and diversifying our supplies with innovative projects that will improve our drought resiliency for decades. Between 1990 and 2015, we reduced per capita daily potable water use by nearly 40 percent, while regional GDP almost doubled and our population grew by 800,000 people. These accomplishments would not have been possible without the support of our member agencies and communities continuing to work together."

Maureen Stapleton

General Manager, San Diego County Water Authority



Diversifying Regional Water Supplies

Local and imported water supplies will be under stress from more intense and frequent drought conditions. As we face increased risks together, securing a reliable supply will cost more. In fact, importing water could soon cost twice as much due to rising energy costs and required capital improvements to aqueducts and other infrastructure. For example, there is an 80% additional cost to the San Diego County Water Authority for desalinated water compared to conventional supplies.¹

Risks of Flash Flooding

While San Diego County will likely be much drier in the future, the rainfall we receive is expected to arrive in more concentrated bursts that can lead to costly flash flooding. We've already been experiencing weather events like this.



\$10-18m estimated costs to commercial, residential and government sectors per significant flooding event

\$367m in total damages from the most extreme flooding event when San Diego River spilled its banks

1-in-100-year flood events **could occur annually** in some parts of the region by 2050

4,798 businesses (approximately 4.8% of all businesses) countywide are currently located in areas that are more susceptible to flooding during flood events.²

How to Make Your Business Water Resilient

Efforts to conserve, reuse and recycle water can reduce operational risks and costs, create jobs, drive innovation, increase resilience to drought and help avoid regulatory burdens. Working together, businesses can cut water usage in various ways:

- Promote water conservation among facilities, fixtures and employees by improved filtration devices and use of sensors and electronics
- Adopt water-efficient irrigation practices and switch to drought-tolerant landscaping
- Take climate impacts into account in new developments or capital improvement projects
- Explore water reuse and recycling opportunities to further stretch limited supplies
- Incorporate drought or flooding into your risk management and business continuity planning
- Strengthen your organization's brand by implementing and sharing your environmental stewardship practices

¹ MIT Technology Review <http://www.technologyreview.com/featuredstory/533446/desalination-out-of-desperation/>

² National University System, Institute for Policy Research. Policy Brief: 'El Nino and the San Diego Economy'. 2015

We Can Slow Climate Change

Efforts to slow warming by reducing polluting greenhouse gas emissions are critical. A concerted effort by businesses everywhere to reduce emissions of climate warming gases would save money in the long run. In fact, more aggressive adoption of efficient and clean technologies could reduce the costs of climate change adaptation measures described above by as much as 40%.

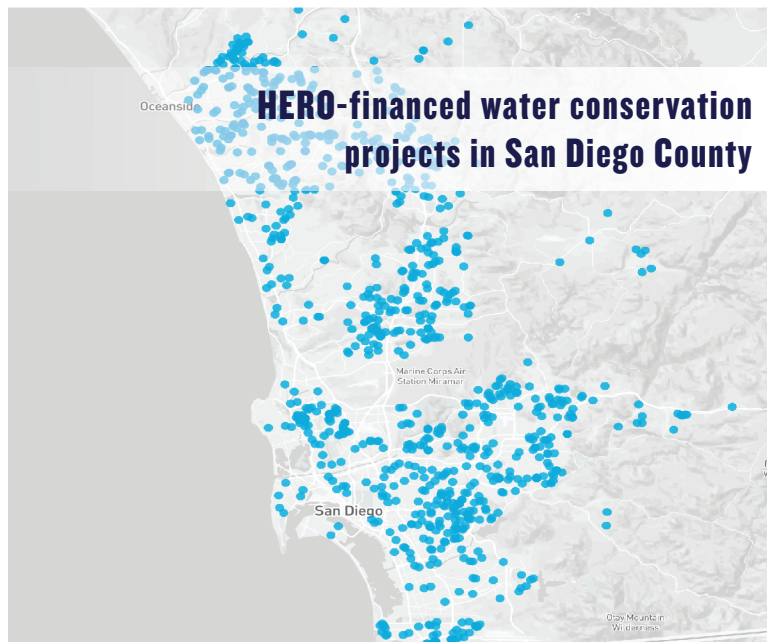
Ahead of the Curve

Businesses that take action sooner have longer to reap the cost-savings and reduce the risk of losses in a drought event. It will also help maintain competition with firms that do not operate in drought-prone areas. Companies in many sectors are improving their water efficiency and developing effective practices, adding value to their business in the process.

Investing in Efficiency, Homes and the Economy

The Home Energy Renovation Opportunity (HERO) is one financing program available to enable residents to upgrade their homes through low-interest financing repaid through property taxes. This new financing option in San Diego County also stimulates the local economy. Contractors are installing artificial turf, high efficiency faucets, fixtures and toilets, drought tolerant landscaping, rainwater catchment systems, greywater systems and more. Renovate America reports \$12.5 million in funding approved to date for water conservation improvements in San Diego County resulting in:

- ✓ An estimated 709 million gallons and \$6.9 million in water bill savings over the projects' lifetimes
- ✓ Installation of over 1000 different products by the 120+ HERO-registered contractors



Perspectives from local leaders:

"At Qualcomm, we aim to operate in a manner that minimizes our impact on community water resources, including conserving water, reusing water and using reclaimed water wherever feasible. At our headquarters, we employ an advanced water treatment system that reduces the water used in the cooling towers of our co-generation plant by more than 5.4 million gallons annually. Our recent water conservation campaign challenged employees to use less water in their daily lives, which resulted in millions of gallons of water saved worldwide."



Molly Gavin

Vice President, Government Affairs and Sustainability - Qualcomm Incorporated

"To create the world's first LEED Platinum commercial airport terminal, we invested in reducing and reusing water from our operations. Working with partners, we



installed xeriscaping with local and drought-tolerant plants, a satellite water-tracking system to prevent unnecessary irrigation, low-flow water fixtures saving 4 million

gallons, and redirected storm water from the parking lot drains into bioswales to irrigate plantings."

Thella F. Bowens

President/CEO, San Diego Regional Airport Authority

"Today, more than 80% of our regional water supplies are imported. A better balance is possible. The City of San Diego is investing in Pure Water San Diego, a multi-phased program to locally produce one-third of the city's drinking water supply through water purification technology. The Water Reliability Coalition is a growing group of consumer, business, environmental, labor, and technical organizations, working together to support such efforts to enhance safe, reliable and cost-effective local water supplies."



Lani Lutar

Executive Director, Water Reliability Coalition



DISCOVER MORE ABOUT REGIONAL WATER AND CLIMATE ISSUES

- ❑ Climate Education Partners – www.sandiego.edu/2050
- ❑ Equinox Project, an Initiative of Center for Sustainable Energy – www.energycenter.org/equinox/

ACCESS TOOLS, TIPS AND INCENTIVES TO PUT WATER INNOVATION INTO ACTION

- ❑ WaterSmart San Diego – www.watersmartSD.org/business
- ❑ World Business Council for Sustainable Development Global Water Tool – www.wbcSD.org/work-program/sector-projects/water/global-water-tool.aspx
- ❑ Water Conservation Garden – www.thegarden.org/

CONNECT WITH OTHER BUSINESSES COMMITTED TO WATER RESILIENCE

- ❑ Cleantech San Diego – www.cleantechsandiego.org
- ❑ Water Reliability Coalition – www.sdwatersupply.org
- ❑ San Diego Regional Chamber of Commerce – www.sdchamber.org/policy/water
- ❑ The Maritime Alliance – www.themaritimealliance.org

Working Together, Investing Today

Working together, we can make our businesses more resilient and cost-efficient by developing action plans for reducing water and energy use and greenhouse gas emissions. Business resiliency planning resources are available to help us prepare for the effects of our changing climate.



San Diego County Building's — Drought Tolerant Landscaping

This summary report is based on “San Diego, 2050 is Calling. HOW WILL WE ANSWER?” and research from Josh Graff Zivin, Ph.D. at UC San Diego, Steve Messner and Tom Jensen with e360 LLC, and e360’s partners. We also want to thank the following for data, input and reviews in assembling this summary: Steve Alexander – The Steve Alexander Group, Jason Anderson – Cleantech San Diego, Lisa Bicker, Michael Combs – San Diego Regional Economic Development Corporation, Kirsten Guirguis – Scripps Institution of Oceanography, Chanelle Hawken – San Diego Regional Chamber of Commerce, Cody Hooen – City of San Diego, Paulina Lis – San Diego Green Building Council, Jim Miller – SANDAG, and Ann Tartre – Ann Tartre Consulting.

This summary report is intended to provide additional insights to complement the regional climate impacts information provided by The San Diego Foundation and Climate Education Partners in the report, “San Diego, 2050 is Calling. HOW WILL WE ANSWER?” For more info regarding sources for this assessment, or to download reports by Climate Education Partners, discover more at www.sandiego.edu/climate. The report was funded by The San Diego Foundation, with financial support from the National Science Foundation under award DUE-1239797. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



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