



# Water Resilience

CATALYZING A GLOBAL TRANSFORMATION

2021 ANNUAL REVIEW





# At the Pacific Institute, It's About the Solutions

Dear friends,

This year, the debilitating impacts of climate change on water made bold headlines. As historic floods raged across Asia and Europe, record-setting droughts threatened the US West, Brazil, and the Horn of Africa. More than 30 years ago, the Pacific Institute issued early warnings about how climate change would cause such water disasters. During 2021, we saw them unfold—tangibly—before our eyes. The global water crisis brings intensifying risks to people, nature, and economies. More than 2 billion people lack safe drinking water and, by 2040, more than two-thirds of us may live in water stress. Our shared water concerns can seem overwhelming. **But, at the Pacific Institute, we've always focused on one thing: advancing solutions.**

**2021—A watershed year for action:** 2021 was one of our boldest years yet. Despite ongoing COVID challenges, the Pacific Institute continued record-setting growth, signifying the urgent demand for the Institute's thought leadership. More than 20 new publications put innovative research, tools, and policy recommendations into the hands of those with the power to transform water systems. The Pacific Institute has embraced an inflection point of growth—evolving into an increasingly global virtual organization positioned for further expansion and impact.

**Catalyzing a water resilience transformation:** This year, the Pacific Institute built new momentum for governments, businesses, and communities to re-envision how they engage in water resilience action. The Institute launched the [Water Resilience Issue Brief](#), calling on decisionmakers to rapidly scale specific solutions. The Institute's water resilience thought leadership was center stage at global water and climate events, including the United Nations Climate Change Conference (COP26) in Glasgow.

**A renewed emphasis on equity:** Recognizing water insecurity is experienced disproportionately by frontline communities, this year the Pacific Institute significantly expanded its water and climate equity work. A dedicated strategy positions the Pacific Institute to further scale these efforts in 2022 and beyond.

**Mobilizing the corporate sector:** 2021 was also a record year to mobilize businesses through the CEO Water Mandate, a partnership between the United Nations Global Compact and the Pacific Institute. The Pacific Institute has now led more than 200 companies to commit to leading water stewardship practices. 2021 also saw substantial expansion in the Water Resilience Coalition, nearly quadrupling its membership since its 2020 founding. By the end of 2021, the Coalition united CEOs of 27 corporations with the shared goal of elevating global water stress to the top of corporate agendas.

**Looking ahead:** 2021 was a powerful year for water resilience commitments—and for the role the Pacific Institute played in driving them. However, the severity of the water crisis calls for even more aggressive action ahead. Simply put, we must turn commitments into action. Decisionmakers continue to turn to the Pacific Institute for solutions to address one of the greatest challenges of our lives. We thank you for your continued partnership and investment to make this transformative work possible.

In partnership,



**Sally Liu**  
*Chair, Pacific Institute  
Board of Directors*



**Jason Morrison**  
*President, Pacific Institute  
Head, CEO Water Mandate*

## Climate Change Is Water Change

Water systems in most parts of the world today are simply not resilient. As climate change has intensified, so has the water crisis. Today, about 90% of disasters are water related. During 2021, intensifying floods and droughts wreaked havoc, the United Nations' Sustainable Development Goal 6 for water was "alarmingly off track," frontline communities were disproportionately water insecure, and water-supporting ecosystems continued to suffer. Many communities are moving into crisis mode.

Against this backdrop, the Pacific Institute is advancing a global transformation to water resilience. Founded in 1987, the Pacific Institute is a non-partisan global water think tank. The Institute combines science-based thought leadership with active outreach to advance solutions to the world's most pressing water challenges. To scale solutions in policy and practice, the Pacific Institute collaborates with a wide range of partners, including NGOs, Fortune 500 companies, the United Nations, and other water decisionmakers.



# Advancing Water Resilience on the Global Policy Stage



Left: United Nations 2021 Climate Change Conference (COP26), Glasgow, Scotland. Right: Pacific Institute President Jason Morrison (left) moderates a water resilience session at COP26.

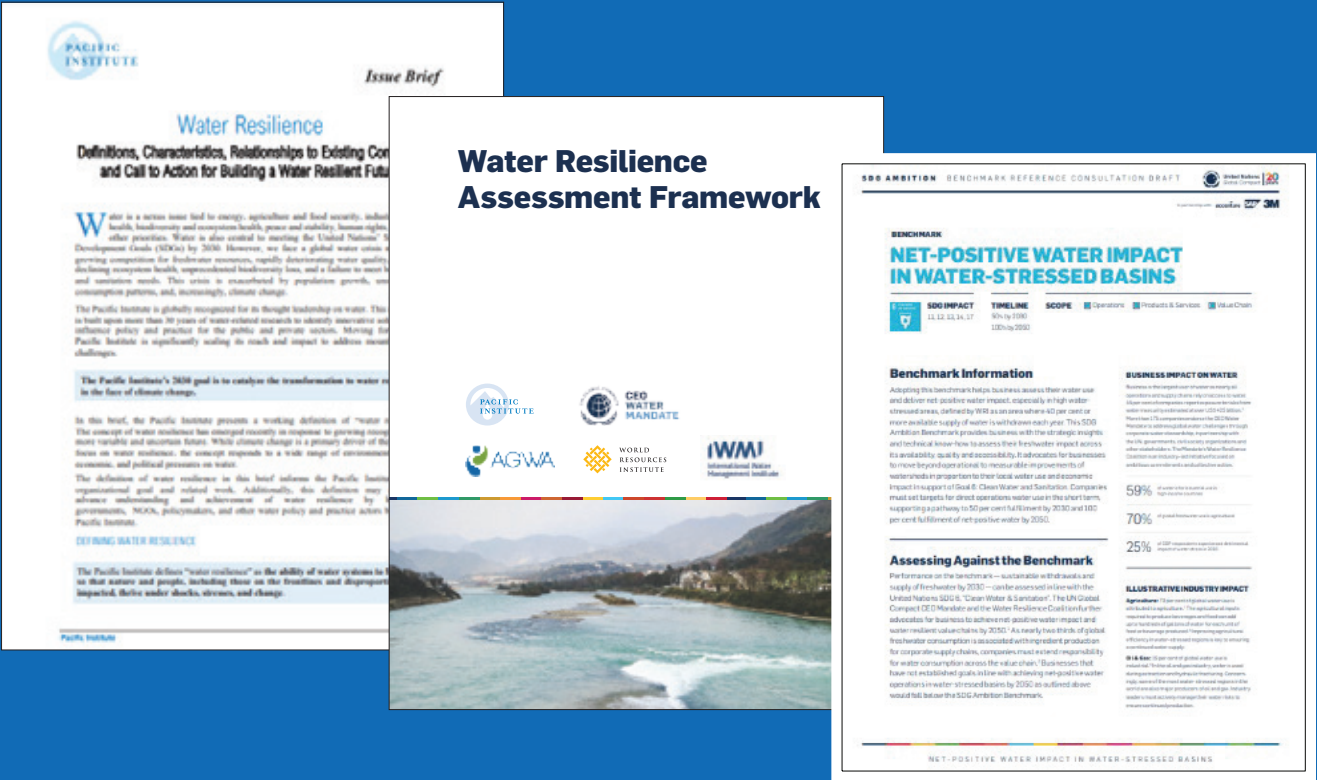
The Pacific Institute’s thought leadership on water resilience was front and center on the 2021 global policy stage. This year, the Institute seized historic opportunities—including during the United Nations Climate Change Conference (COP26)—to call on decisionmakers to rapidly scale water resilience solutions. Thought leaders presented during a range of COP26 sessions, highlighting research, innovative tools, and policy recommendations.

## New Water-Energy-Climate Nexus Research Featured at UN’s COP26

During the COP26 Water Pathways to Reduce Energy Use and GHG Emissions session, Director of Research Heather Cooley presented new research quantifying how climate change increases pressures on water resources and how water decisions impact energy usage and greenhouse gas (GHG) emissions. This new Pacific Institute water-energy-climate nexus research highlights that nearly 20 percent of California’s electricity use is related to water, including water collection, treatment, and heating, as well as wastewater management.

**// Saving water saves energy and reduces greenhouse gas emissions. Water efficiency has tremendous potential for meeting climate targets, especially as drought and water scarcity increase with climate change.”**

—Heather Cooley, *Director of Research*



## New Water Resilience Tools and Research

During 2021, the Pacific Institute introduced a range of new tools and resources to advance water resilience solutions in policy and practice.

The Pacific Institute’s **Water Resilience Issue Brief** provides guidance for governments, policymakers, businesses, NGOs, and other actors to rapidly scale solutions, including integrating nature-based solutions with grey infrastructure and increasing investments in water efficiency and reuse.

The Water Resilience Assessment Framework provides a guiding light for businesses, utilities, and basin managers to measure progress towards long-term water resilience, preventing shocks and stresses from becoming crises.

Leveraging its technical expertise, the Pacific Institute advanced the **Net Positive Water Impact (NPWI)** framework in the corporate sector during 2021. This new corporate water approach is the most ambitious commitment companies are making on water at the enterprise level. The NPWI concept is now featured in the United Nations Global Compact **SDG Ambition** for water, setting a new benchmark for what businesses can do to accelerate progress to achieve the United Nations’ **SDG 6** for water.

**The Water Resilience Issue Brief defines water resilience as: “the ability of water systems to function so that nature and people, including those on the frontlines and disproportionately impacted, thrive under shocks, stresses, and change.”**



// Climate change is water change. The Colorado River Basin manifests this in dramatic and sobering ways.”

—Michael Cohen, Senior Researcher

## Calling for a More Water Resilient United States Amid Historic Megadrought

After more than 21 years of megadrought in the US West, a historic Shortage Condition was declared during 2021 in the Lower Colorado River Basin. The situation’s severity sent reverberations throughout the water policy world—both in the United States and globally. “What we’re seeing in the future is that the hydrology gets worse and worse,” said Michael Cohen, Senior Researcher for the Pacific Institute. “Continued climate change impacts could reduce Colorado River flows by 50% by the end of the century. Leaders need to wrap their arms around this reality and take decisive action. It’s an existential threat to Western life.”

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During 2021, Pacific Institute experts were featured in hundreds of media interviews, continuing their decades-long advocacy for resilient and equitable water solutions in California, the Colorado River Basin, and across the US West.

### Los Angeles Times

Colorado River decline seen as cautionary tale

// As world leaders meet in Scotland this week to discuss efforts to address the climate crisis, experts are urging greater focus on adapting to fundamental shifts in the planet’s water supplies – and they’re pointing to the Colorado River as a prime example. . . . Because many people are talking more about ‘water resilience’ lately, researchers at the Pacific Institute . . . wrote a paper presenting a definition of the term. They defined water resilience as ‘the ability of water systems to function so that nature and people, including those on the front lines and disproportionately impacted, thrive under shocks, stresses, and change.’

—Ian James and Jaweed Kaleem  
Reporters, *Los Angeles Times*, November 4, 2021

### The Guardian

From dust bowl to California drought: a climate scientist on the lessons we still haven’t learned

// The last drought was a wake up call to the effects of climate change. For the first time, the public began to make the connection that humans were impacting the climate and the water cycle – affecting the intensity and severity of our droughts.”

—Dr. Peter Gleick  
Co-Founder  
*The Guardian*, April 29, 2021

### Early Warnings

The Pacific Institute issued some of the earliest warnings to policymakers about the impacts of climate change on water resources. More than 30 years ago, climate-water assessments were conducted both domestically and internationally—from the Colorado River Basin in the US West to the Nile River Basin in Africa. In 1990, the Pacific Institute conducted one of the earliest assessments of sea-level rise impacts for the San Francisco Bay Area. In 2009, this analysis was expanded to cover the entire California coast. One of the first reports to assess socioeconomic vulnerability to sea level rise, the report ultimately became a significant lever for policy change.



### Early Solutions

The Pacific Institute also developed some of the earliest solutions for building water resilience in the face of climate change. During the 2000s, the Pacific Institute’s co-founder, Dr. Peter Gleick, pioneered the “soft path” for water concept, which challenges decisionmakers to stop seeking an endless, unsustainable supply of water. Instead, it calls for a more resilient approach that can withstand the impacts of climate change. Many leading water solutions being advanced today found inspiration from this approach.

Dr. Peter Gleick  
Senior Fellow and Co-Founder

### abc NEWS

How will the West solve a water crisis if climate change continues to get worse

// The efforts to conserve [water] have already made great strides in recent decades. In California, cities such as Los Angeles and San Francisco are using the same amount of water, or less, as they did 30 years ago, despite substantial increases in population, Heather Cooley, director of research at the Pacific Institute, wrote.”

—Featuring Heather Cooley  
Director of Research  
ABC News, July 12, 2021

### E&E NEWS | GREENWIRE

Could LA water recycling be a miracle for the parched West

// Throughout the United States and in the West, there’s a huge need for water infrastructure investments.”

—Cora Kammeyer  
Senior Researcher  
*E&E News Greenwire*  
September 27, 2021



# Building Water Resilience in Three Focus Areas

During 2021, the Pacific Institute focused its water resilience strategy on three key areas of research and advocacy: Water and Climate Equity, Nature-Based Solutions, and Water Efficiency and Reuse. Each of these contributes to ensuring people, nature, and communities have the water they need to thrive.

1

Water and Climate Equity

Recognizing water resilience must be approached through the lens of equity, the Pacific Institute made significant investments in its water-climate equity work during 2021. The Institute hired additional staff to lead this effort, conducted a national listening tour, and completed an assessment of more than 300 publications to gather input to inform a future strategy. Moving into 2022, the Pacific Institute’s new comprehensive water-climate equity strategy will outline plans to collaborate on an assessment of water, sanitation, hygiene, and climate change in the United States. This assessment will advance work toward ensuring equitable water access in a changing climate.



BOARD MEMBER PROFILE

**Marielle Villar Martiney**  
*Board Member*  
New York City, New York

*Marielle Villar Martiney is an organizational strategist, community advocate, and equitable environmental policy enthusiast. She currently serves as the Director of Strategic Initiatives at the Good Old Lower East Side, a community-based environmental, housing, and racial justice organization in New York City. Marielle joined the Pacific Institute Board of Directors in 2021.*

“As someone who lived in an environmental justice community, experiencing water shut offs and polluted tap water, I am most engaged in the Pacific Institute’s water, climate, and social equity work. The Institute is science-based, uses their studies to formulate policy recommendations, and seeks to center equity throughout the process as well as their organization. I’ve always been a water nerd. I first learned about the Pacific Institute after finding their 2009 study on the impacts of a rising sea-level in California. At the time, I was leading a community effort to count residents in an environmental justice community for the 2020 Census and I thought to myself, ‘I wonder what that map would look like with the latest Census demographic information superimposed?’ After learning more about the Pacific Institute, I knew that it was a serious, science-based organization looking to expand its work at the intersection of water, climate, and social equity. I couldn’t wait to get more involved.”



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## Advancing the Human Right to Water

The Pacific Institute has been a key advocate of the Human Right to Water for more than 30 years. During the 1990s, the Pacific Institute called on global policymakers to formally recognize water as a human right. Today, the Human Right to Water is formally recognized by the United Nations, the State of California, and dozens of global businesses.

During 2021, the Pacific Institute played a leading role in the Gap Analysis for Funding Solutions for Human Right to Water and At-Risk Drinking Water Systems. This study found US\$10.3 billion will be needed over the next five years to support struggling water systems and well owners across California. After the release of this research, the state expanded funding to address drinking water issues, from less than \$1 billion to \$2 billion.



# 2

## Nature-Based Solutions

Ecosystems like forests, wetlands, and grasslands naturally store and filter water. Nature-based solutions (NBS) involve investing in natural ecosystems, viewing them as a form of natural water infrastructure. In this way, NBS are powerful, cost-effective strategies providing a range of co-benefits for water sustainability and climate change mitigation and adaptation. For instance, restoring upland forests and watersheds could save \$890 million annually for water utilities (WRI, 2020), while simultaneously sequestering carbon, supporting biodiversity, and providing socio-economic opportunities. But NBS are often underutilized because their benefits can be challenging to quantify. The solution?

During 2021, the Pacific Institute launched new resources to scale NBS for water, many of them focused on simplifying the path for corporate and other decisionmakers to implement NBS and quantify their benefits.

The **Benefit Accounting of Nature-Based Solutions for Watersheds** guide launched in 2021 supports companies—and other organizations—making investments in NBS for water, providing a step-by-step pathway to quantify benefits. The related **NBS Benefits Explorer** tool has been accessed by more than 1,000 users around the globe. During 2021, the Pacific Institute pilot tested its NBS identification method—the backbone of both the guide and the tool—across 25 corporate case studies in forest and wetland habitats.

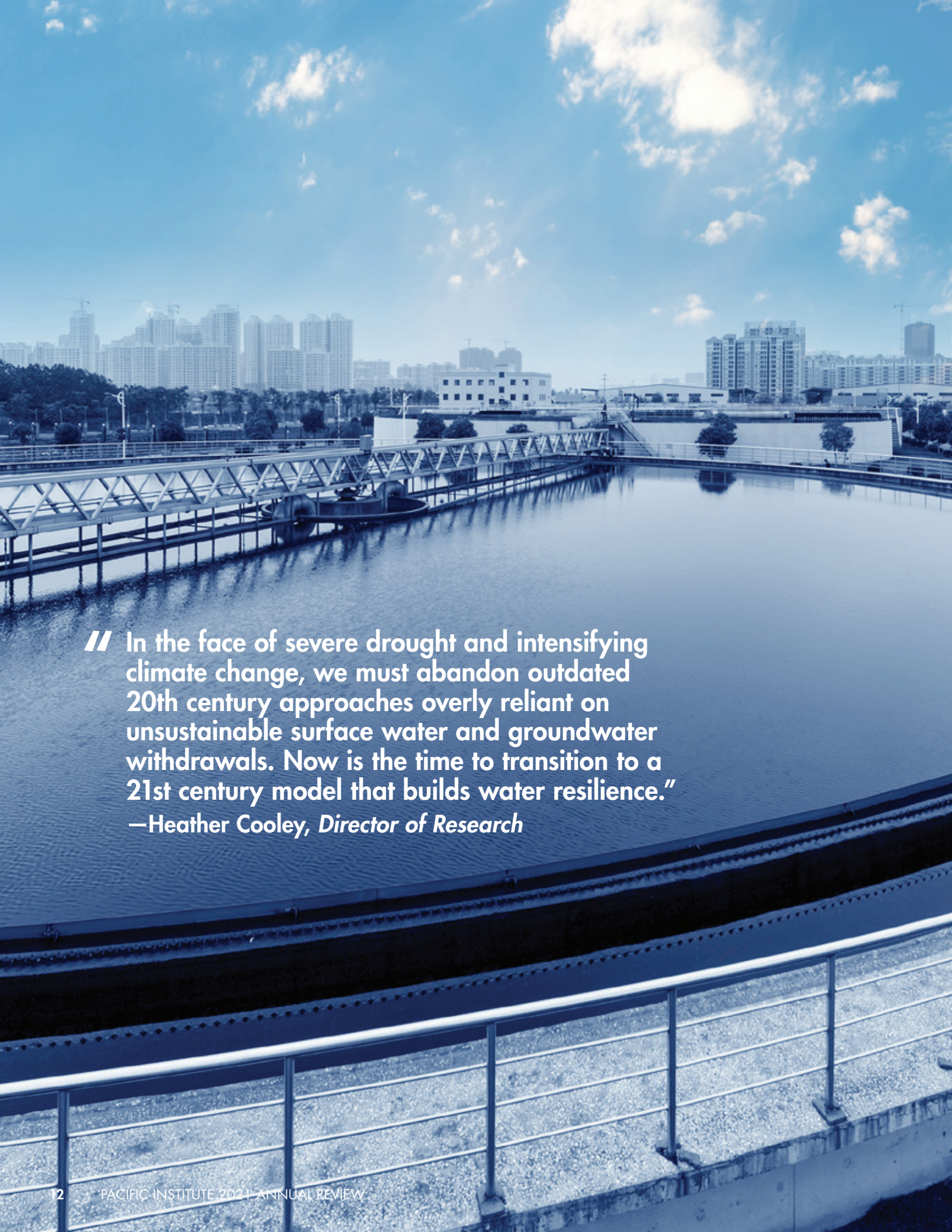


Restoring upland forests and watersheds could save \$890 million annually for water utilities (WRI, 2020), while simultaneously sequestering carbon, supporting biodiversity, and providing socio-economic opportunities.



“The private sector is increasingly realizing it has at its fingertips various approaches that rely on nature, not just engineered solutions.”  
—Gregg Brill, Senior Researcher





// In the face of severe drought and intensifying climate change, we must abandon outdated 20th century approaches overly reliant on unsustainable surface water and groundwater withdrawals. Now is the time to transition to a 21st century model that builds water resilience.”

—Heather Cooley, *Director of Research*

### 3

## Water Efficiency and Reuse

Saving water by increasing water efficiency measures and boosting local water supplies through water reuse can provide powerful short-term drought relief and longer-term water resilience.

During 2021, the Pacific Institute concluded a groundbreaking analysis finding California could dramatically reduce the gap between water supply and use through water efficiency, water reuse, and groundwater capture strategies. As California continued to face an extended severe drought, intensifying due to climate change, the study found the state could reduce urban water use by more than 30% through efficiency efforts and more than triple water reuse. While the findings are specific to California, they have the potential to inform water resilience strategies across the United States and beyond.

The Pacific Institute also tested emerging technology to detect leaks and save water in low-income multi-family housing—with promising results. Remote leak detection technology pilot tested in three Southern California buildings caught enough toilet leaks to reduce total water use by 20%. Scaled across California, the US, or beyond, this approach could radically reduce water waste.

This year, new partnerships were also forged between water and energy utilities towards greater investment in water efficiency. As part of this effort, the Institute updated a water-energy calculator for the California Public Utilities Commission, allowing energy utilities to receive credit for water efficiency measures with energy savings.



**Re-imagining urban spaces is key to water resilience. New Pacific Institute research estimates 44% of all urban water use in California, for instance, is attributed to outdoor water use, including irrigating landscapes, washing cars and sidewalks, and filling pools. Moderately converting landscapes from turf to less water-intensive alternatives could save 1.0 million acre-feet of water annually.**



# Record Growth Engaging Businesses



A new wave of businesses partnered with the Pacific Institute during 2021 to turn water commitments into action. Much of this momentum was achieved through the CEO Water Mandate, a partnership between the Pacific Institute and the United Nations Global Compact. This initiative leads businesses to progress on corporate water stewardship best practices and engage in collective action—to advance water resilience in basins around the world.

During 2021, the CEO Water Mandate welcomed 40 new member companies from 18 countries spanning 16 sectors. This marked record growth bringing the initiative to 210 total company endorsers.

The Pacific Institute was among the first to mobilize the private sector to solve the global water crisis. A 2004 Pacific Institute report called the private sector’s attention to intensifying water risks. Another assessment in 2007 highlighted concerns that large companies were not adequately reporting water risks to stakeholders. The CEO Water Mandate was established that same year.



## Water Action Hub Engages Companies In Collective Action On Water, Climate

The Water Action Hub is a global online collaboration and knowledge-sharing platform that engages companies, NGOs, and other actors in collective action to build water resilience. The Hub was created by the Pacific Institute as a project of the CEO Water Mandate. During 2021, the Hub expanded the scope of its work to include both water and climate-focused projects, engaging 173 new organizations in 390 new projects globally. By year’s end, the Water Action Hub featured 1,672 water and climate projects involving 1,047 organizations. The next version—Water Hub 4.0—will launch during 2022, positioning the platform to be a primary gateway for collective action on water.



## Thought Leadership at Global Events




The Pacific Institute and the CEO Water Mandate continued to be leading voices for corporate water resilience at global events, including Stockholm World Water Week, the United Nations Climate Change Conference (COP26), and UN Global Compact Uniting Business LIVE.

- **UN Climate Change Conference**  
The CEO Water Mandate was a Core Partner for the COP26 Water for Climate Pavilion, a newly established site to elevate the visibility of water. During 11 days of programming, the CEO Water Mandate led and participated in a range of sessions advancing corporate action on water resilience with climate-focused audiences.

- **Stockholm World Water Week**  
The Pacific Institute and CEO Water Mandate advanced thinking on corporate water stewardship during 11 events at 2021’s Stockholm World Water Week. In addition to serving as a leading partner for the Leadership in Business Accelerator, the CEO Water Mandate showcased the Water Resilience Assessment Framework, Water Action Hub 4.0, and new tools to quantify benefits of nature-based solutions for water. During Stockholm World Water Week, the WASH4Work initiative, for which the CEO Water Mandate serves as Secretariat, also made the business case for corporate investments in WASH (water, sanitation, and hygiene). In collaboration with the German Agency for International Cooperation (GIZ) and the Alliance for Water Stewardship (AWS), the CEO Water Mandate also formed the Water Stewardship Acceleration (WaSA) Forum, focused on creating an enabling environment globally to advance water stewardship on political agendas.



# Engaging Global CEOs to Lead the Charge



2021 was a record year of expansion to engage some of the world’s largest companies in the Water Resilience Coalition. This CEO-led initiative was launched by the CEO Water Mandate in 2020 to elevate global water stress to the top of corporate agendas. During 2021, the initiative rapidly expanded, gaining 10 new member companies and 9 new partners. By year’s end, the Water Resilience Coalition united CEOs of 27 global corporations and 17 partners, such as WaterAid, Water.org, and UNICEF.

CEOs of 27  
GLOBAL  
CORPORATIONS

  
10 NEW  
COMPANY  
MEMBERS

  
9  
NEW  
PARTNERS



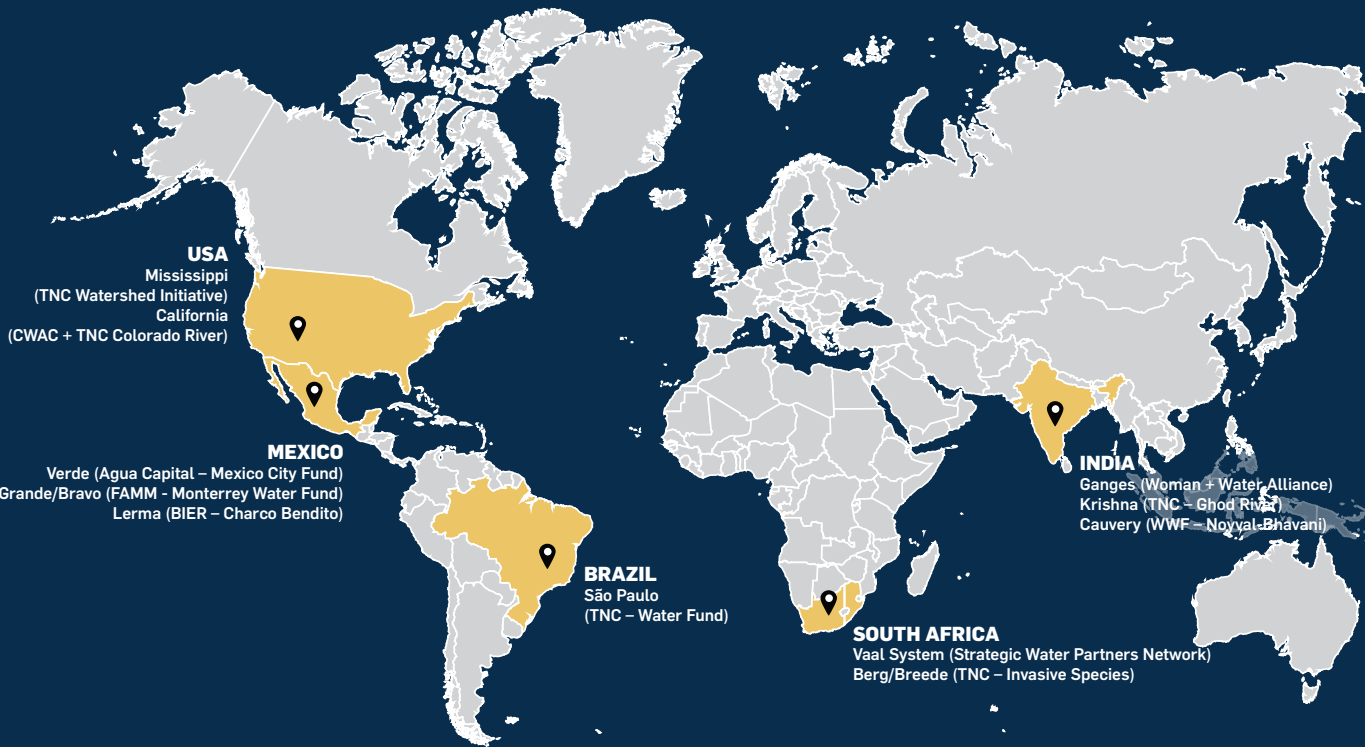
## BOARD MEMBER PROFILE

**Sanjeev Chadha**  
**Board Vice Chair**  
**Dubai, United Arab Emirates**

*Sanjeev Chadha is a global business leader passionate about water. He joined the Pacific Institute Board of Directors in 2019, focusing on engaging the corporate sector in water action through the CEO Water Mandate’s Water Resilience Coalition. Sanjeev retired from PepsiCo in 2018 as Chairman and CEO for Asia Pacific, Middle East, and North Africa. Under his leadership, PepsiCo’s Indian business achieved ‘positive water balance’—a global first in the food and beverage industry. Sanjeev was the recipient of the Stockholm Water Award for Industry on behalf of PepsiCo.*

Talking about the global water crisis during his opening speech at Stockholm World Water Week 2021, Sanjeev Chadha, Vice Chair of the Pacific Institute Board of Directors, highlighted that “the crisis is getting worse with every passing year, despite having proven, cost-effective solutions.” He further remarked, “Business as usual is definitely not an option. Time is not on our side. We need much greater speed and scale behind proven solutions, unprecedented collaboration and teamwork, and all hands on deck to turn the tide against the water crisis. And that is pretty much the DNA of the Pacific Institute.”

# A Bold Roadmap for Action



During 2021, the Water Resilience Coalition charted a 2030 roadmap outlining bold ambition. In just eight short years, the Coalition aims to have positive water impact in 100 water-stressed basins, enable resilient access to water and sanitation for at least 300 million people, and recruit 150 companies—with the potential to influence one third of global water use.

Through a collective action approach, member companies are uniting with other businesses, NGOs, and the public sector to build water resilience through nature-based solutions, regenerative agriculture, wastewater recycling, water reuse, and other climate-positive approaches. Collective action will prioritize specific water basins, where corporations collaborate to co-fund water resilience projects.

## 2030 AMBITION



Positive water impact in  
**100**  
WATER-STRESSED  
BASINS



**150**  
COMPANIES  
JOINING HANDS



WASH access for  
**300 MILLION PEOPLE**



Potential to influence  
**1/3 GLOBAL WATER USE**

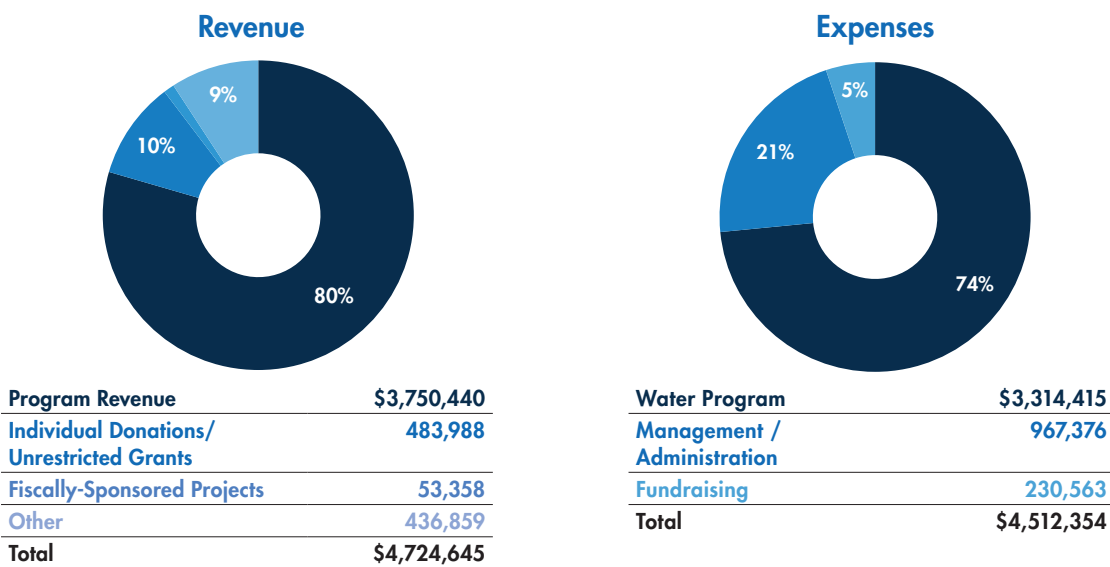


**“Working with some of the planet’s largest companies, we have the potential to positively impact one-third of the world’s freshwater use.”**

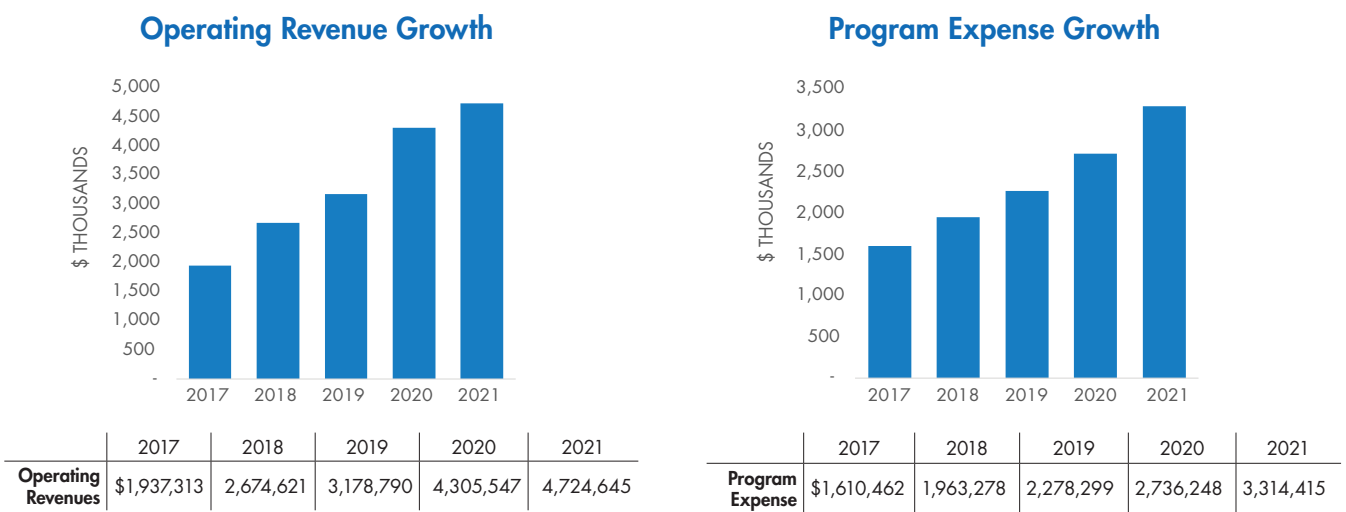
**—Sanda Ojiambo**  
**Assistant Secretary-General and CEO**  
**United Nations Global Compact**



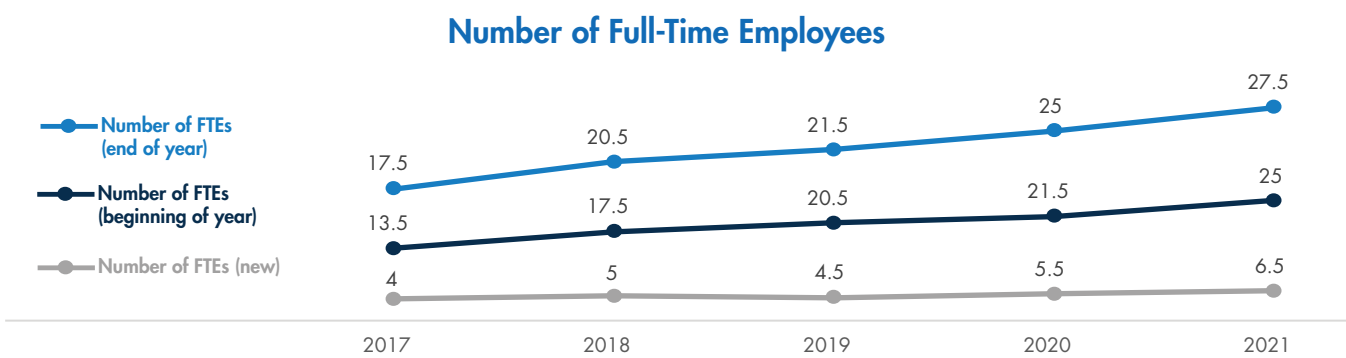
2021 REVENUE AND EXPENSES\*



FIVE-YEAR GROWTH IN REVENUE AND EXPENSES\*



FIVE-YEAR GROWTH IN STAFF



\*FY2021 financial reporting based on unaudited financial statements. FY2021 audited financial statements will be available at [www.pacinst.org/financials](http://www.pacinst.org/financials).

Your Support Makes it Possible

The global water crisis and the water-related impacts of climate change call for bold and immediate action. The Pacific Institute is positioned to scale water resilience solutions and lead transformations like few other organizations. Together, we are building the evidence base through research, technical analysis, and innovation to inform communities and decisionmakers, and influence policy to advance actionable solutions.

Financial support from individuals, businesses, and foundations fuels our work—and our mission to create and advance solutions to the world’s most pressing water challenges.

Ways to Give

Gifts can be made online at [www.pacinst.org](http://www.pacinst.org) or by mail to:

Pacific Institute  
344 20th Street,  
Oakland, CA, USA 94612

Federal Tax ID #94-3050434.

Thank you for your generosity investing in a water resilient future.

// The Pacific Institute has established an admirable track record of calling out future challenges and pioneering sustainable solutions. This thought leadership is rooted in fact-based research and analysis conducted by its talented and passionate team. The Institute has also played a strong role in establishing effective partnerships to accelerate the path to water resilience.”  
—Sanjeev Chadha  
Board Vice Chair

// Water is life. We cannot survive without water. Each year, water becomes increasingly scarce, expensive, polluted, and, in the context of rising sea-levels, more deadly. Now is the time to build water resilience to protect the lives of millions of people, not just in the future, but also today.”  
—Marielle Villar Martiney  
Board Member





**// The water-related impacts of climate change call for bold and immediate action. At the Pacific Institute, we focus on solutions. We are committed to catalyzing the transformation to water resilience in the face of climate change—and to do so by 2030. The time to act is now.”**

**—Jason Morrison  
*President, Pacific Institute***



[www.pacinst.org](http://www.pacinst.org)