




**Water
Foundation
Strategy**

Spring 2019



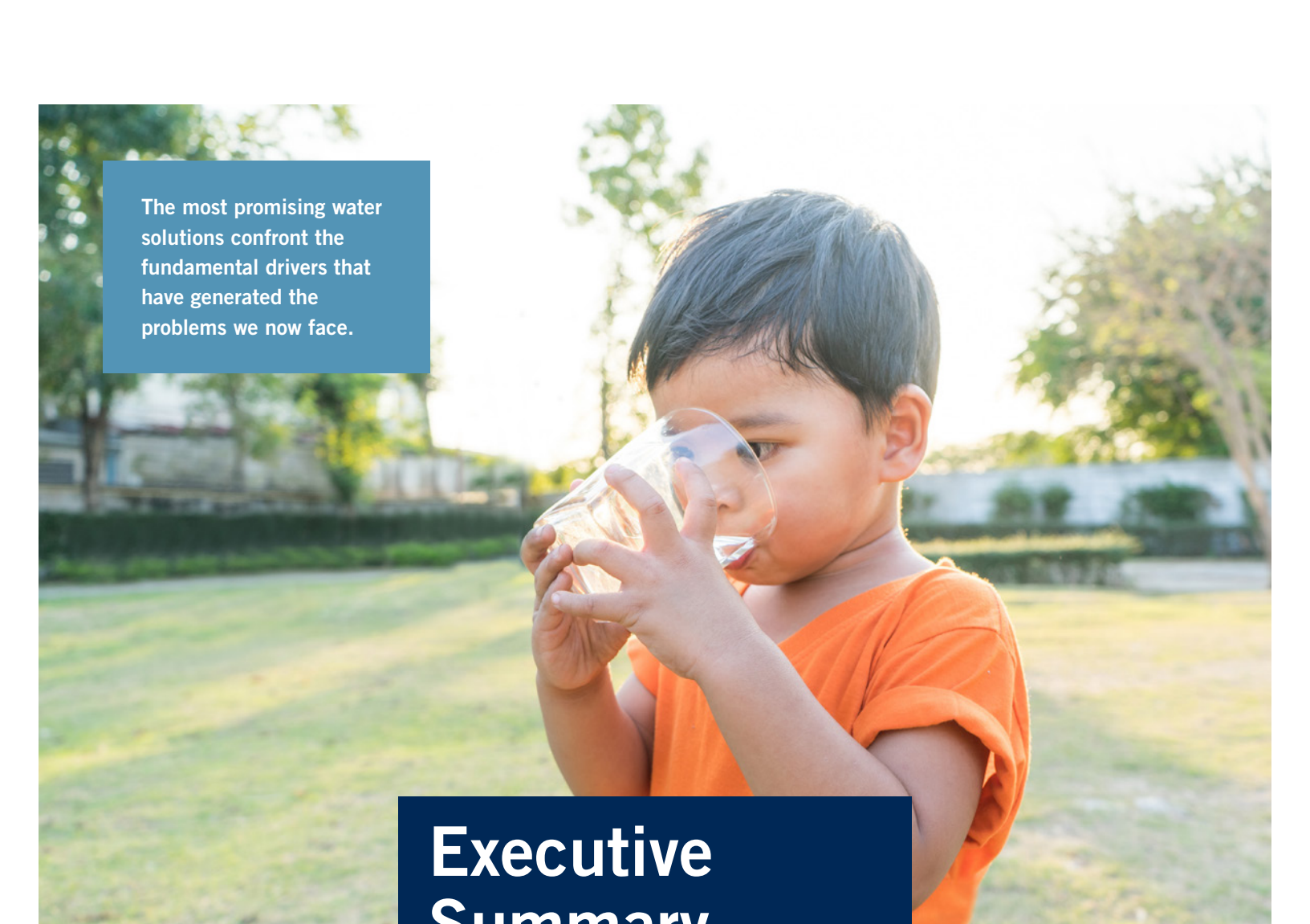
It is time to enable new,
innovative approaches
to meet our collective
water needs.

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The most promising water solutions confront the fundamental drivers that have generated the problems we now face.

Executive Summary

Clean, reliable water lets communities prosper and ecosystems thrive. Yet today, millions of people lack access to safe drinking water, many of our rivers, lakes, and wetlands are in peril, and the benefits water delivers are unevenly shared. Intensifying droughts and flooding make these problems worse. Traditional approaches to managing water have generally not kept pace with these daunting challenges. New ideas, game changing policies, and creative leaders are needed to build a thriving water future in the American West and beyond.

We tackle immediate and long-term water challenges together:

urgent problems:

degraded freshwater ecosystems



polluted drinking water



flood and drought impacts



system interventions:

change the ways we move and share water

broaden who makes water decisions and how

strengthen the stories we tell about water

fundamental drivers:



legacy infrastructure



social inequality



fragmented institutions

An unprecedented opportunity exists for philanthropy to help build this future. Total annual foundation philanthropy for environmental issues in the US approaches more than \$5 billion, but only a small fraction, approximately \$167 million, supports work in freshwater. This is the moment to radically increase that investment to transform the water sector.

The most promising water solutions confront the fundamental drivers that have generated the problems we now face. These drivers include winner-takes-all thinking that pits water users against one another, an antiquated web of water laws and regulations, outdated infrastructure that no longer works well for people and nature, deeply fragmented water decision-making, and racial and economic inequity. These powerful underlying drivers have shaped water management as we know it, and we will not address today's greatest water challenges without disrupting them.

The Water Foundation's new strategy therefore takes a systemic approach. We will tackle urgent water problems, including polluted drinking water and collapsing ecosystems, in ways that alter

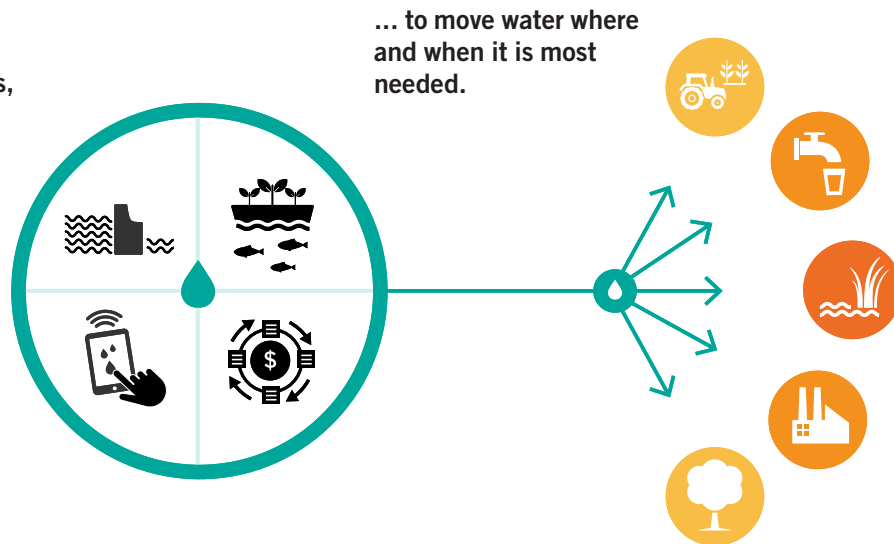
system drivers, such as social inequality and outmoded infrastructure. We will work to build cohesion across funders, groups, and leaders, encourage alignment around shared objectives, and support adaptive strategies that respond to changing conditions.

We will prioritize securing safe, clean water for people, restoring and sustaining freshwater environments, and building urban and rural resilience to a

Our work will prioritize:



Multi-benefit solutions merge traditional infrastructure with proven nature-based solutions, innovative use of data, and flexible markets...



changing climate. These three ambitious goals are critical to our water future. Human health requires safe, clean drinking water. Flourishing rivers and lakes support land and water-based ecosystems, as well as human communities, and provide places of beauty to connect with the natural world. And a changing climate is already altering our water systems in unprecedented ways, so maintaining thriving communities, economies, and natural places means adapting to accelerating climate impacts.

To advance these priorities, we will emphasize system interventions that change the ways we move and share water, broaden who makes water decisions and how, and strengthen the stories we tell about water.

The way we move water in the United States has changed very little over the past century, relying on a network of concrete-dominated infrastructure, including dams, canals, levees, sewers, and water treatment plants. While this infrastructure has largely delivered the economic benefits it was designed to produce, over time it has also damaged freshwater ecosystems, left some communities without safe drinking water, and struggled to adapt to climate-driven variability. In addition,

it is nearing the end of its designed life. We can seize this moment to merge traditional infrastructure operations with proven nature-based solutions, innovative use of information and data, and flexible markets to move water where and when it is most needed.

Water laws and institutions are currently not well-equipped to advance such new approaches. Rules and decision-making are fragmented, water agencies are often technically-oriented and risk averse, and water institutions are largely not designed to respond effectively to the full range of environmental and community needs. This must change. Tackling complex, long-standing water challenges requires diversifying water leadership and strengthening integration across water uses and sectors. It also requires altering the power structures that drive water decisions. Expanding the voice and political influence of those most impacted by water challenges and broadening the range of leaders calling for change can generate more democratic, responsive, and effective water institutions.

These infrastructure and governance challenges have not been resolved, in part, because water is mostly taken for granted in the United States. The work water

The way we move water in the US has changed very little over the past century, relying on a network of concrete-based infrastructure, including dams, canals, levees, sewers, and water treatment plants.



above: Harvesting green peppers on Uesugi Farms in Gilroy, California



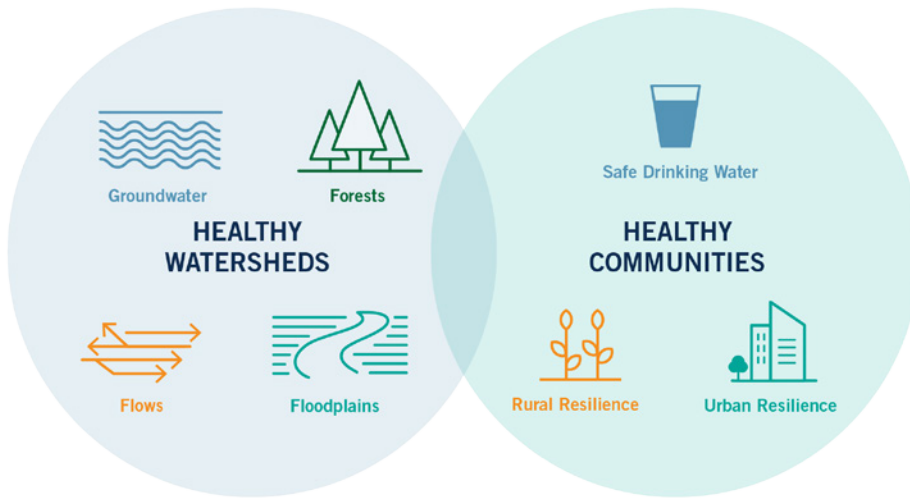
agencies do to divert, treat, and deliver water is invisible to most Americans. When people do hear about water, the stories often focus on technical issues and fail to connect with human values and priorities. This is a lost opportunity. Americans maintain strong, but latent, support for safe, reliable water. We can activate this commitment by amplifying human-centered stories that highlight health, safety, and personal connections to specific lakes and rivers. Compelling water narratives can translate broad public support into political will for change.

Moving forward, we will focus our grantmaking in a limited number of basins and the states they encompass. Hydrologic basins—or watersheds—delineate natural water limits, making them the most appropriate scale for achieving long-term water balance for people and nature. Yet, state governments largely control how water is shared, used, and funded, and enforce safeguards to protect water for both people and nature. So we will also advance water solutions in states with strong political opportunities. We will concentrate our grantmaking in basins and states that currently confront human or ecological crisis and where water stakeholders are

committed to working together toward positive change. As our work expands, we will link basins and states that have similar water challenges and opportunities to support mutual learning.

Strong progress has been made addressing pressing water problems in many areas, but improvements must be more widespread. We will build on this progress and on our existing programs as we expand to new basins and states. We will continue to work in California and its Central Valley Basin, fed by the Sacramento and San Joaquin rivers. We seek flows for people and nature in the Central Valley, and work to secure safe drinking water and resilient landscapes for all Californians. We will also continue to work in the Colorado River Basin, with emphasis on the Lower Colorado River and Salton Sea, where our partners aim to balance human and environmental water needs. In 2019, we will begin making exploratory investments in additional river basins and states that offer promising political and ecological conditions for moving toward basin balance.

Over the next five years, we will partner with organizations across the American West and beyond to deliver scalable



solutions that can ensure safe and reliable water for people and nature. To achieve this goal, our work will be organized into two programs—Healthy Communities and Healthy Watersheds. The Healthy Watersheds program will support the integration of legacy infrastructure with nature-based solutions and new technologies, building momentum for a new paradigm of watershed management. This program will center around groundwater, floodplains, forests, and flows. The Healthy Communities program will support work to establish a clear pathway to clean, safe, and reliable water for all and to build urban and rural climate resilience.

As an intermediary foundation, we will continue to serve the entire water field, including both nonprofits and donors. In our primary role as a singularly focused water funder, we will deploy our staff expertise to move resources to the groups that have the most potential to transform water systems. Our grantmaking will demonstrate and scale on-the-ground solutions and will encourage collaboration across historic fragmentation. When the field asks for our engagement, and where doing so will deepen the impact of our investments and we are uniquely positioned to help, we will also serve as a field-builder, campaign strategist, and convener. These functions will allow us

to bolster the capacity of local and regional organizations, facilitate cross-sector learning and partnership, and support work to develop and implement shared water solutions.

Our new strategy builds on our experience transforming California water policy and linking people and ideas across political, institutional, and geographic divides. The first six years of the Water Foundation demonstrated the value of an engaged intermediary concentrating on water. With our partners, we delivered over \$40 million in funding to the field, convened hundreds of diverse nonprofit, private, and community-based organizations, and secured landmark water policies. We now seek to raise an expansion fund to extend our work into the American West and beyond.

Heightened awareness of water challenges, from catastrophic flooding and drought to drinking water contamination, has activated public concern about water, and innovative leaders are advancing collaborative water solutions that transcend partisan divides and traditional conflicts. This growing attention creates openings to fundamentally rethink how we ensure safe, reliable water for people and nature. Our mandate is to help philanthropy seize this opportunity.

Total annual foundation philanthropy for environmental issues in the US approaches more than \$5 billion, but only a small fraction, about \$160 million, supports work in freshwater.

opposite: Harvesting lettuce in California

Strategy



Legacy infrastructure
has imperiled the
health of our rivers
and our communities.



The State of the Field

Texas National Guard
aiding people in
heavily flooded areas
from the storms of
Hurricane Harvey

Water is life. It sustains our bodies, our land, plants and animals, and our economies. Water is both a practical element that flows through every aspect of our lives, and a source of deep beauty, creativity, and connection to the natural world. When water is abundant and clean, people and nature can thrive. When it is not, life suffers. For this reason, it is one of our planet's most precious resources.

The Challenge

Over the last two centuries, the United States has engineered water to support economic development, growing flourishing cities in the desert and establishing an agricultural sector that feeds the world. This infrastructure has captured, stored, and delivered water across thousands of miles to some of the driest places on earth. Modern lives are made possible by these incredible water systems.

As scientific understanding of nature has improved, however, it has become clear that this legacy infrastructure has imperiled the health of our rivers, lakes, and wetlands. Many species of fish and wildlife that depend on these natural systems have gone extinct, or are under threat of extinction, and the services these ecosystems provide to people have been greatly diminished.¹

It has also become apparent that the economic prosperity delivered by water has not been equally shared. Many communities suffer from contaminated water sources or simply have no running water at all. Today, more than 27 million people in the US drink water from systems

with recent Safe Drinking Water Act violations.² Agricultural communities, which are highly dependent on reliable water to grow crops, face critical economic threats, including mounting supply uncertainty and poor water quality.

Where demands for water exceed available supplies, deep and lasting conflicts have arisen. In basin after basin, competing water users have battled over water supplies while greatly reducing natural river flows. Fights that pit agriculture against cities, fish against farms, or clean water against economic development have defined water management, particularly in the American West. This adversarial pattern reduces economic security for farms and communities and threatens fish and wildlife.

States have evolved complex webs of laws, rights, and regulations to allocate water and address these conflicts. While these rules have enabled contemporary water use as we know it, many are complicated and apportion more water than actually exists. Day-to-day water management is also deeply fragmented;

far right: Because of toxic tap water, Poplar, California resident Sandra Garcia is forced to buy bottled water for her home



over 50,000 water agencies currently operate in the US. Dozens of agencies often treat and deliver the water within a single watershed without any common planning or formal coordination, and completely different institutions sometimes oversee the same water at different stages of use—irrigation water, drinking water, waste water, and stormwater.

Global climate change compounds all of these water challenges. Warming temperatures dry soils, increase water evaporation, and reduce mountain snowpack, which provides one-third of the water supply in the western states. The changing climate is already worsening droughts and intensifying winter storms, increasing catastrophic flooding. Water infrastructure, constructed over the last century to capture rain and snow in a fairly predictable hydrologic cycle, is not well prepared to adapt to this climate change-driven variability.

Americans care about water. Public polling consistently confirms this fact.³ However, water is typically not top-of-mind. The systems that move it from place to place, clean it, and deliver it to users are largely invisible, and the way water decisions are made is equally obscure to most people. This means water is seldom perceived as an urgent issue outside of droughts or floods. As a result, voters only prioritize major investments in water management intermittently, and public officials are only occasionally moved to devote real political capital to improving water systems.



Global climate change compounds water challenges, worsening droughts and intensifying winter storms.

Tilapia, one of the few remaining fish that can survive in the high salinity of the Salton Sea, lie dead near the water's edge

A range of talented leaders and groups work to address water challenges, and have achieved important improvements for people and nature. But while the organizations largely agree on the most pressing current issues, their work is disjointed. These groups often focus on one aspect of the water system, or limit their projects to a single place, and their expertise and membership tend to be narrowly concentrated. Much of this work also tries to solve specific, immediate water problems. Fewer efforts focus on shifting the systems that shaped these problems in the first place. The scale and depth of looming water challenges dwarf these compartmentalized approaches. Broader, systems-oriented change that galvanizes real public will is desperately needed.

The Opportunity

The increasing severity of water challenges paired with growing public awareness of these challenges create a timely opportunity to transform water systems. Latent public support could potentially be harnessed to drive water solutions further, faster, and more uniformly. In recent years, Flint, Michigan’s water contamination, oil pipeline threats to the Missouri River in Standing Rock, a long-term water shortage in the Colorado River system, and the California drought have all captured public attention. In the wake of these widely publicized crises, polling shows that Americans increasingly prioritize protecting and preserving freshwater across differences in income, geography, and political party.⁴ They also evince a willingness to pay for water systems improvements, and believe these systems are a public good and a government responsibility, offering a strong initial base of support for solving vexing water problems.⁵

Major players in a number of significant debates over water are growing weary of perpetual battles, and appear increasingly willing to negotiate creative solutions. Recent collaborations in river basins like the Colorado, Klamath, and Yakima demonstrate this dynamic. Leaders in these places are engaged in shared

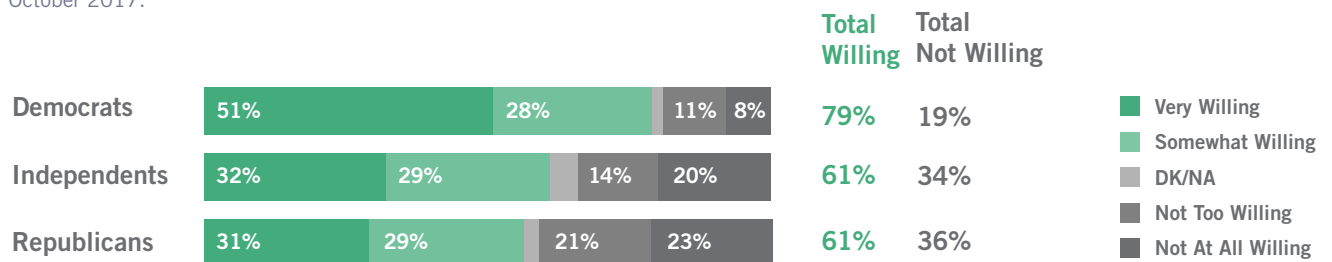
efforts to balance water needs that hold real promise for establishing stable and resilient systems. In addition, innovations in water infrastructure and management are gaining momentum. Recognition of the value of services provided by nature, or green infrastructure, to meet both human and environmental water needs is expanding. Dramatic technological improvements in our ability to measure, forecast, and manage water use are showing early potential to transform the sector. And the One Water movement to integrate formerly fragmented water management is taking hold across the country. Unfolding crises—including multi-year droughts, emergency flooding, frequent wildfires, and climate change-driven infrastructure failures—provide repeated windows of opportunity to drive solutions through our political systems.


Philanthropy can play an essential role in seizing this moment. The water sector, which is traditionally risk-averse and change resistant, cannot make these radical shifts alone. Philanthropy’s ability to convene, catalyze innovation, experiment with new ideas, and scale what works best offers the greatest hope for inciting the sweeping change necessary to reimagine our water systems.

Americans increasingly prioritize protecting and preserving fresh water across differences in income, geography, and political party.

Willingness to Pay for Water Improvements by Party

Water Foundation Western States Poll, conducted September and October 2017.



A man with a mustache, wearing a blue and grey plaid shirt, is smiling as he pours water from a large clear plastic jug over his head. The water is splashing down his face and shirt. He is outdoors, with green trees and a wooden fence in the background.

As a funder, we are focused on long-term systems change built on short-term wins.

Why the Water Foundation?

East Porterville, California resident Leonicio Ramirez and his family were among the first to receive water from a new system after their wells went dry during a five-year drought

The Water Foundation is uniquely positioned to capitalize on this opportunity to build a thriving water future. We hold a broad vision that integrates across fragmentation in the field, allowing us to tackle problems that span political, institutional, and geographic divides. We focus on achieving long-term systems change built on short-term wins, working closely with a range of partners to secure this change.

Role

We strive to be an engaged, highly strategic funder, operating in service to the field. We are committed to both moving resources quickly as opportunities arise and investing to sustain and grow the capacity of the water field over time. Our grantmaking will help the field demonstrate and scale on-the-ground solutions and will support collaboration across difference. Our staff offers deep issue expertise, paired with political experience, relationships, and lobbying capacity. Where field partners seek our assistance, and we are uniquely positioned to help, the team will enhance our primary funder role by:

- **Bolstering** the capacity of our partners to build their networks, strengthen their institutions, and access new leadership opportunities.
- **Convening** diverse leaders to solve difficult challenges, facilitate negotiations, and share expertise and resources.
- **Partnering** with funders, grantees, researchers, and other experts to design and execute compelling policy campaigns.

As an intermediary foundation, we serve both field and funders. On the field side, our effectiveness relies on true partnership with the nonprofits and key allies most engaged in and impacted by current water challenges. We will not be successful if we compete with existing organizations for the limited water dollars currently available, so we must bring new resources to the water field. We will look for partners to do the work first and will find opportunities to advance their efforts. We will only engage directly ourselves if there is a gap in the field, and we will invest to fill that gap over time.

On the funder side, many donors report avoiding water due to the perceived complexity of the water field and the seeming intractability of water problems. To address these perceptions, we will build easy on-ramps for potential new funders, expand the overall community of water funders to include more individual giving, health conversion foundations, and donor-advised funds, and provide opportunities for joint learning that highlights promising system-level solutions.

Our staff offers deep water expertise, paired with political experience and lobbying capacity.

Sacramento River bend area



Approach

All social and environmental change takes place in dynamic systems. Every day, ecosystems evolve, economies rise and fall, politics change, and constellations of stakeholders shift. Given this reality, our approach will emphasize building the relationships and capacities that allow organizations to tackle complex problems in adaptive ways as conditions change.⁶

This systems approach requires supporting the water field to identify shared long-term objectives and to work together to implement strategies to reach those objectives. Embodying this approach as a grantmaker will require us to avoid overly prescriptive grantmaking and to invest in alignment around broad visions for positive change.

Advancing a systems approach also means addressing current challenges in ways that shift their underlying root causes. Doing so effectively will entail developing a discipline of constant learning and adaptation. It will require nimble pilot investments as the landscape for the work shifts over time, and quick analysis and sharing of lessons learned to capitalize on what is working while it is still relevant.

Advancing water policy can be a powerful way to alter system dynamics. We will build on our experience in California, recognizing that windows of opportunity to change policy open when:

- a **problem** is widely acknowledged and well understood,
- **promising solutions** to address this problem have been identified and generally accepted,
- adequate **political will** can be built to implement the solutions.

This compelling model will anchor where and how we deploy our policy investments. In some cases, we may need to invest in amplifying awareness of a problem. In other cases, we may support experts who are coming up with the best solutions, or coalition-building to capture the votes needed to pass a new law. We will invest to make problems and their solutions clear, build field coordination around key priorities, and line up the politics and power so that our partners can seize windows of opportunity when they open and can ensure that good policy is actually implemented once it becomes law.

We advance lasting water solutions for communities, economies, and the environment.



Vision, Mission, & Goals

San Joaquin Valley residents call on California legislature to ensure clean and safe drinking water

Our vision is **reliable, clean water available for people and nature, both now and in the future.** Achieving this vision will allow communities to prosper and ecosystems to thrive.

Our mission is to **advance lasting water solutions for communities, economies, and the environment.** Water is a common resource that requires shared solutions, and the best solutions benefit both people and nature. We believe people need to work together across difference to find these shared solutions.

Goals

Three fundamental goals will guide our grantmaking in the years to come:

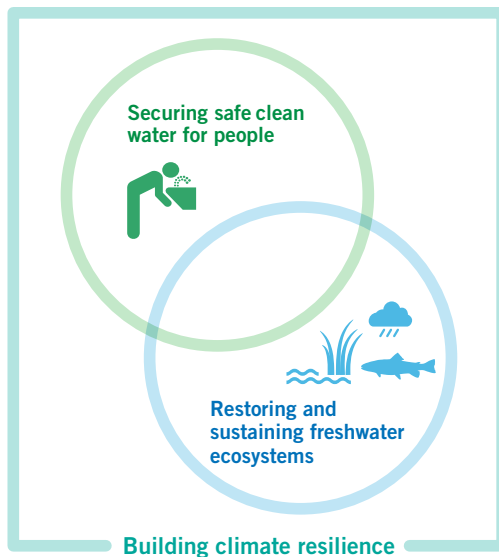
1) securing safe, clean water for people; 2) restoring and sustaining freshwater ecosystems; and 3) building climate resilience. Each of these goals, while ambitious, can be achieved over time with expanded philanthropic support.

Goal 1: Secure Safe, Clean Water for People

Several million people in the US lack reliable access to clean and safe water.⁸ This crisis disproportionately impacts rural areas, poor communities, and people of color. Unsafe water threatens human health on myriad levels. In the world's wealthiest country, communities without access to water suffer in untenable conditions.

The causes of unsafe drinking water are varied and complex, including agricultural production and industrial processes, leaching compounds from old pipes, and new “contaminants of emerging concern.”⁹ Pollution can be widely dispersed or very localized, and can result from an immediate spill or a slow accumulation. Unsafe water is often an invisible problem, since weak data exists to track many of these threats and toxic water can look clean. Existing safeguards to protect clean water are often inadequately enforced, and insufficient funding exists for infrastructure upgrades to treat polluted water and replace failing water infrastructure.

We will work to ensure that every person in the US has access to safe, clean water in their daily lives. While water pollution harms both people and the environment, we focus on the human need for clean water, given the moral imperative of clean water for all and the opportunity to build



political will to act by amplifying this basic human need.

Goal 2: Restore and Sustain Freshwater Ecosystems

Freshwater ecosystems—rivers, lakes, and wetlands—account for a tiny portion of the planet's total surface area, but support more than 100,000 species and are the lifeblood of the natural world.¹⁰ In parts of the arid western US, 60 percent of animals and 70 percent of all threatened and endangered species depend on river habitats.¹¹ These water bodies are also essential for human survival, filtering and cleaning drinking water supplies for most people. Despite their importance, many rivers, lakes, and wetlands are severely damaged by human activities, and freshwater ecosystems are declining at a much faster rate than land-based ecosystems.¹²

Water diversions and pollution have degraded many of these freshwater systems. The US Environmental Protection Agency estimates that more than 40 percent of waterways in the country remain unfishable and unswimmable, conditions

These three goals tackle the most pressing water problems and directly advance our vision to ensure reliable, clean water for people and nature into the future.

the Clean Water Act aimed to address almost 40 years ago.¹³ In California, studies predict that more than 82 percent of the native freshwater fish in the state will go extinct in the next century.¹⁴

Organizations that serve as a voice for these threatened freshwater ecosystems often do not have sufficient political power to enable the protection and restoration of these water bodies. In fact, these groups and their efforts often get positioned as a threat to economic interests such as farming and urban growth. When this happens, urban and agricultural interests typically prevail at the expense of the environment.

We will work to amplify the full range of environmental voices, grow the political heft of those advocating for healthy freshwater systems, and restore and sustain the natural function of rivers, lakes, and wetlands to allow ecosystems to recover and thrive.

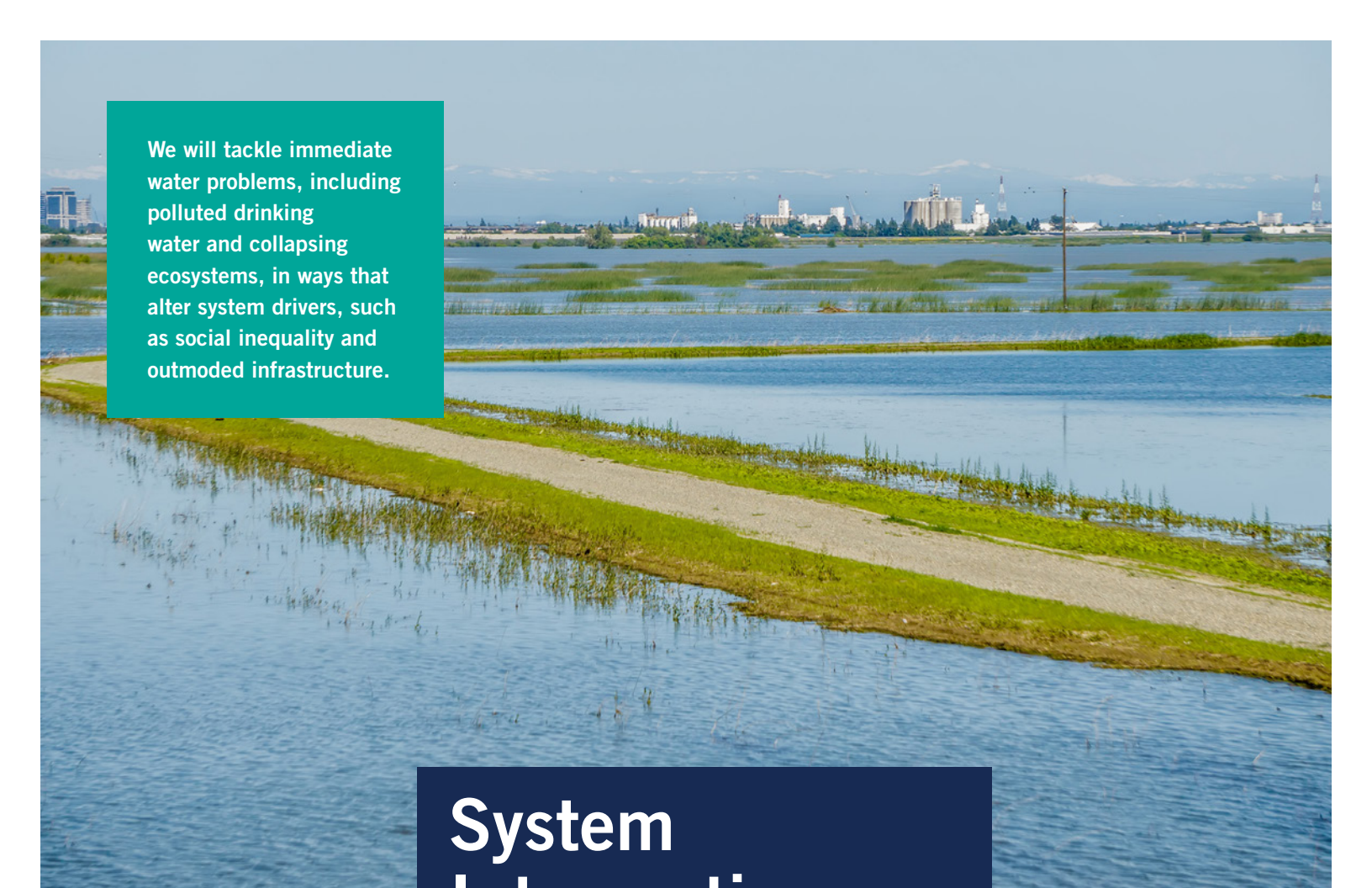
Goal 3: Build Resilience to a Changing Climate

Climate change is already delivering devastating water-related impacts in the form of longer and more punishing droughts, larger, more dangerous wildfires, and more deadly flooding.¹⁵ In the western US, relative water scarcity, already challenging given the arid climate, is getting worse. The Colorado River Basin,

for example, is nearly 20 years into a water shortage, and warming trends could lower river flows even more.¹⁶ Warming temperatures and drying conditions make forests more vulnerable to fires, including “megafires,” which threaten water quality and quantity across large watersheds.¹⁷ When precipitation does come to the West, typically during winter, increasingly concentrated outbursts of rain, not snow, threaten to overwhelm dams, levees, and stormwater infrastructure.¹⁸

Water policy and management across the US often completely ignore climate impacts. In 2016, for example, California’s Water Commission released a draft regulation to spend close to \$3 billion on new water infrastructure without any analysis of climate change for projects that were intended to last well into the next century. This lack of planning and preparation for climate impacts threatens people across the country. A great amount of work is needed to set the stage for good policies and outcomes before these crises occur.

We will work to build urban and rural resilience to the water-related impacts of climate change. This means helping land and water stewards—from urban water agencies to agricultural producers to public lands managers—understand increased drought, flood, and wildfire threats and take action to prepare and adapt.



We will tackle immediate water problems, including polluted drinking water and collapsing ecosystems, in ways that alter system drivers, such as social inequality and outmoded infrastructure.

System Interventions

Yolo Bypass, Sacramento, California

Addressing water's most acute problems in ways that shift some of the deep-seated, powerful factors that have created these problems requires profound system interventions.

These interventions can be thought of as broad strategies that are designed not only to solve an immediate problem but also to reshape the system that created the problem.

We will prioritize three system interventions: 1) change the ways we move and share water; 2) broaden who makes water decisions and how; and 3) strengthen the stories we tell about water. These interventions take aim at the physical, institutional, and cultural aspects of our current water system.

Our System Interventions

We will prioritize three system interventions to advance our goals:

1. Change the ways we move and share water

- Merge current infrastructure with proven nature-based solutions
- Integrate new technology and data
- Build flexible markets to move water where and when it is most needed

2. Broaden who makes water decisions and how

- Build representative and responsive water institutions
- Improve collaboration among institutions
- Increase the power of underserved communities and voices for freshwater environments
- Expand range of groups and leaders calling for water solutions

3. Strengthen the stories we tell about water

- Support creative and compelling narratives that can unify the water field
- Deploy those narratives to build political support for water solutions

1. Change the Ways We Move and Share Water

Water treatment and delivery in the US has changed very little over the past century, primarily relying on a network of concrete-dominated facilities, including dams, canals, levees, and sewers. Over the years, this rigid gray infrastructure has contributed to the steady decline of freshwater ecosystems, left some communities without clean drinking water, and proven unable to adapt to the increasing hydrologic variability of climate change. A significant portion of this legacy infrastructure is nearing the end of its designed life and no longer meets the growing needs of today's economy and society.¹⁹

This transitional moment offers an exciting opportunity to shape the way water moves to help people and nature thrive together. By merging traditional infrastructure operations, which

realistically will remain a backbone of our water systems for some time to come, with proven nature-based solutions, innovative use of information and data, and flexible markets, we can more effectively move water where and when it is most needed. This work expands on the idea of green infrastructure, building on the ecosystem services provided by healthy rivers, streams, floodplains, and forests, and linking nature to the newest technological tools for data capture and visualization. This approach also includes innovative ways to balance the natural function of rivers—often referred to as environmental flows—with water diversions from these river systems for human needs.

The era of static, single solution engineering is over. To address the range of human and environmental changes we face, we must prioritize cost-effective,



multi-benefit solutions. It is now insufficient, for example, to build higher levees to reduce human flood risk. Not only will those levees leave communities increasingly vulnerable to more and larger catastrophic floods, but they will likely damage protected fish species. Instead, rivers can be restored and floodplains widened in ways that keep communities safe, maintain farm fields and water rights, and restore freshwater ecosystems. It is similarly both expensive and environmentally damaging to build big, new above-ground storage to meet human water needs. Groundwater aquifers offer an existing below-ground solution that can provide water storage without massive construction costs.

In many places, water supply needs drive a cycle in which legacy infrastructure hurts fish and wildlife, and generates conflict between water users and environmental groups. Changing the way water moves by reimagining the systems recasts natural watershed functions as valued parts of water systems. This shift can contribute to the recovery of degraded ecosystems rather than simply mitigating impacts, enhance community and ecosystem resilience to climate change, and broaden the concept of drinking water infrastructure to include watersheds and source water protection.

2. Broaden Who Makes Water Decisions and How

Water decisions are made every day in tens of thousands of institutions across the country, including a vast array of federal, state and local agencies.²⁰ These institutions manage water through formal governance and rules, as well as informal cultural norms, with mixed success.

Many of these entities support sophisticated water systems that meet a range of needs, and the highest functioning agencies integrate the needs of people and nature, regularly innovate, and are responsive to the needs of all water stakeholders. However, a significant number of water institutions fall short of this standard, and have not effectively addressed the pressing water problems that burden disadvantaged communities, nor the environmental degradation that can result from water management. As a result, public interest groups have been forced to litigate or advocate to get unsafe drinking water conditions and ecosystem decline addressed.

Many water institutions have difficulty adopting new ideas. Facing serious potential consequences if experiments are not successful, water regulators and managers are often hesitant to explore different ways of accomplishing their goals. Traditional water management is engineering-oriented and risk-averse—necessary given the complexity and importance of water systems. However, this kind of organizational culture tends to rely on conventional infrastructure and management approaches, precisely the kinds of approaches that are less effective in the highly variable hydrologic situations we currently confront.

Water governance also suffers from severe fragmentation. It is normal for dozens of water agencies to oversee water use in a single watershed without any coordination. Disparate agencies typically manage the same water at different stages of its life cycle. Most water agencies are quite small; it is not uncommon for rural areas to be served by water agencies with only dozens of customers.²¹ This pervasive fragmentation exacerbates conflicts among water users and prevents the successful implementation of lasting water solutions.

Achieving water systems that support healthy human and natural communities requires diversifying water leadership and supporting water institutions to better coordinate, innovate, and integrate across water uses and needs. It also requires shifting the power that drives institutional decisions. Expanding the voice and political influence of those most impacted by water challenges can help generate more democratic, responsive, and effective water institutions.

California residents, led by Dolores Huerta, rally for clean drinking water in Sacramento





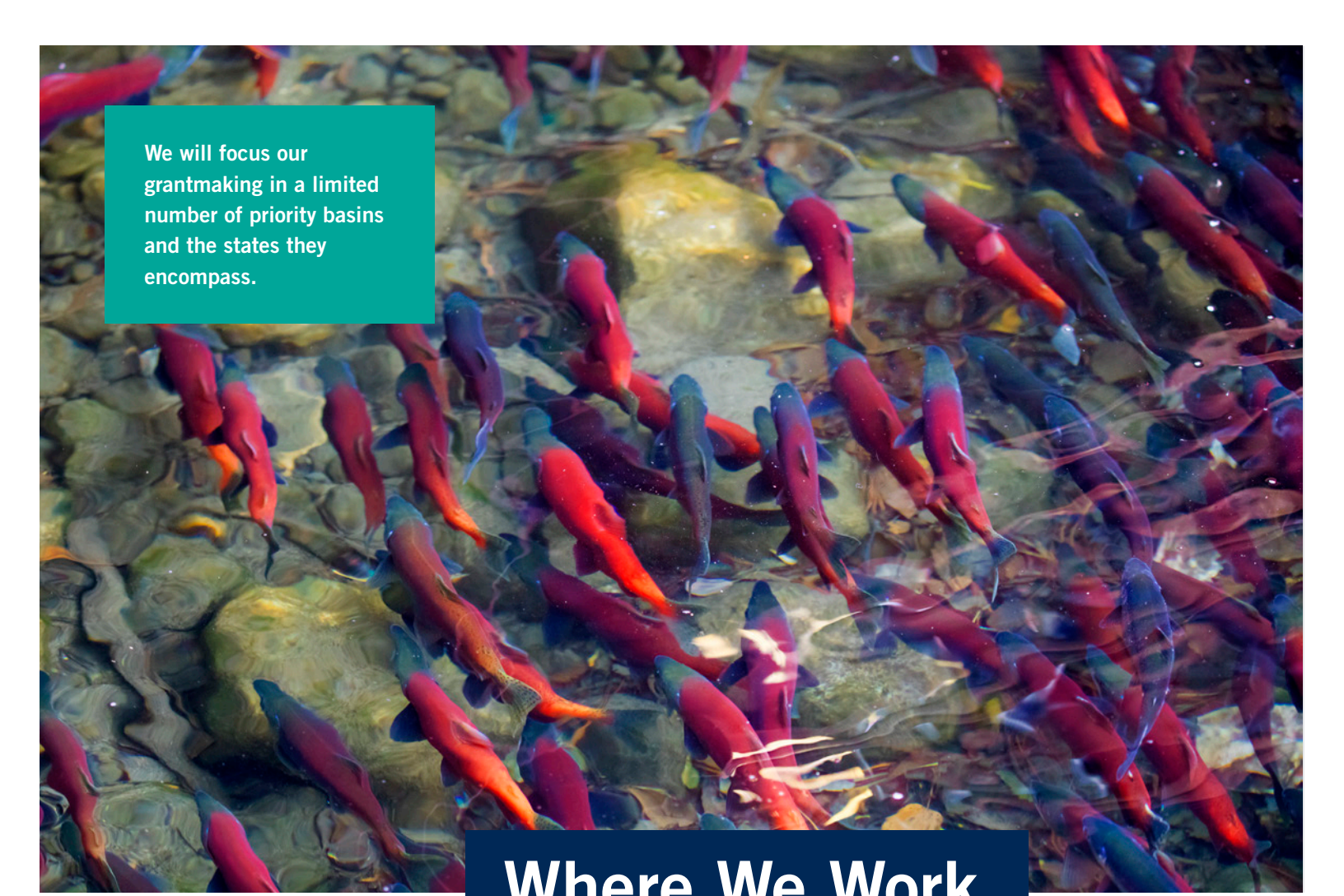
3. Strengthen the Stories We Tell About Water

Narratives have extraordinary power to shift the way we understand our relationships to each other and to the world around us. Narratives—collections of related stories articulated over time to represent a core belief—can make the impossible inevitable.²² They galvanize movements, win elections, and spur action.

The water field is in desperate need of better narratives.²³ Water systems in the United States typically operate without attracting attention. This means that most people take the regular availability of safe water for granted. When water issues are covered in the media, they are largely communicated through technical and environmental framing that fails to connect water challenges to human values and priorities. As a result, while strong public support exists for clean water for people and nature, the water field often fails to connect with people in a manner that generates sufficient political will to truly tackle current water problems.

Achieving safe water for people, freshwater ecosystem health, and climate resilient water systems will require more compelling narratives that use human-centered stories to highlight the urgency of taking action to advance water solutions. These narratives must link to concerns about individual and family health and personal connections to water, from specific experiences on beloved local lakes and rivers to the general appeal of swimming, fishing, and boating on clear, blue waters. They must be explicitly connected to building political will for water solutions for people and nature. Transforming water narratives, therefore, goes far beyond coordinating messages and communication tactics. It requires deep integration between communications, community outreach, and constituency- and coalition-building.

Achieving safe water for people, freshwater ecosystem health, and climate resilient water systems will require compelling narratives that use human-centered stories to highlight the urgency of taking action.



We will focus our grantmaking in a limited number of priority basins and the states they encompass.

Where We Work

Water systems are bounded by both ecology and politics.

Recognizing this, we will focus our grantmaking in a limited number of priority basins and the states they encompass. Hydrologic basins—or watersheds—delineate natural water limits, making them the most appropriate scale for achieving long-term water balance for people and nature.²⁴ At the same time, state governments largely control how water is shared, used, and funded, and enforce safeguards to protect water for both people and nature. Therefore, we will also advance water solutions in states that offer strong political opportunities to make change.



As our work expands, we will link basins and states that have similar water challenges and opportunities to support mutual learning.

We will focus our grantmaking in basins and states that currently confront human or ecological crisis, where real opportunity exists to strengthen water systems, and where stakeholders are committed to working together toward positive change. As our work expands, we will link basins and states that have similar water challenges and opportunities to support mutual learning.

We will remain committed to the work we have underway in California. Progress there will not only benefit the state's people and natural places, but can also influence water systems and policies more broadly due to the size and scope of California's economy and its political weight in the West and nationally. We will continue to focus on the Central Valley Basin, fed by the Sacramento and San Joaquin rivers. We seek flows for people and nature in the Valley, and we will work to secure safe drinking water and

resilient landscapes statewide. We will also continue to work in the California portion of the Colorado River Basin, with emphasis on the Lower Colorado River and Salton Sea, where our partners aim to balance human and environmental water needs.

Our work moving forward will not, however, be limited to California. Waterways often span state boundaries, communities and natural places across the region and country face shared challenges, and promising approaches frequently translate across geography. Recognizing this, we will begin exploratory investments beyond California in 2019, focusing on locations with immediate ecological or regulatory crises that are driving stakeholders toward collaboration and political opportunities to advance multi-benefit solutions. In subsequent years, we anticipate adding significant multi-year commitments to one or two new basins and the states they encompass.



Multi-benefit projects hold promise to meet several needs at once, often by integrating nature into infrastructure.

Programs

The Nigiri Project is a collaborative effort to restore salmon populations by reintroducing them during winter to floodplains that are covered with rice fields during summer

Our work will be organized in two programs: *Healthy Watersheds* and *Healthy Communities*. Each of these programs will deploy our system interventions to tackle immediate problems while shifting the deeply-rooted factors that shape water management and use. These programs will be closely integrated with one another due to the many relationships between and across watersheds and communities.

Our Healthy Watersheds Program



Groundwater



Floodplains



Forests



Flows

Healthy Watersheds

Watersheds must serve many needs, some of which compete directly with one another. Agriculture and cities divert water to sustain communities and economic growth, while animals and plants depend on freshwater ecosystems to survive. Often, the amount of water within a watershed needed for nature to thrive and water users to prosper exceeds available supplies, and pollution further fouls water resources. Conflict ensues and water users—including the fish and wildlife—suffer.

Freshwater ecosystems flourish amidst clean, natural water flows and adequate habitat. Many US watersheds have been heavily engineered to meet human needs and no longer provide these crucial functions. The best opportunity to regain natural functions in watersheds is not to attack current infrastructure or to try to mitigate the impacts of this infrastructure, but to fundamentally change the way water moves and is shared within these watersheds to meet ecosystem and human needs together. Multi-benefit projects hold promise to meet several needs at once, often by integrating nature into infrastructure. These win-win approaches can reduce historic water conflicts and restore ecosystems in a lasting manner.

Groundwater recharge, floodplain restoration, and headwaters forest

management are three of the most compelling opportunities to invest in new ways to move and share water. They are the renewable energy solutions of the water space, providing opportunities to work with nature to store water, protect communities and sustain healthy rivers, and ensure that clean water moves downstream to water users. All three have been piloted, so our Healthy Watersheds work will focus on accelerating adoption and getting to scale. This program will build on our existing work on groundwater and floodplains in California.

Our work on flows will focus on how water is used and shared in river basins, expanding our efforts to achieve greater balance through voluntary settlements on the Sacramento and San Joaquin rivers. Work on flows will require support for efforts to maximize flexibility in water systems and to ensure that struggling communities and environmental interests are not left out of basin-scale agreements or market mechanisms. It is long-term work for potentially large gains.

Watersheds System Interventions

Our Healthy Watersheds Program will draw on each of our three system interventions, with primary emphasis on changing the ways we move and share water.

The heart of the Watersheds work is merging nature with real-time data collective, data management, and data visualization to solve the infrastructure challenges we currently face.

The heart of the Healthy Watersheds work is merging our oldest technology—nature—with our newest technologies—real-time data collection, data management, and data visualization—to solve the infrastructure challenges we currently face. We will facilitate the use of aquifers as a primary means of water storage, and support work to demonstrate how floodplains can protect communities, provide habitat, and improve water supplies and quality. We will advocate for forest management for water quality and quantity benefits, and explore opportunities to re-operate existing dams to improve flow regimes for both wildlife and water users. To ensure that managers can move and share water efficiently, we will invest in new technology and data capabilities that can fill gaps in California’s Sustainable Groundwater Management Act (SGMA) implementation and the administration of surface flows, and can provide new information to foster basin-scale collaboration. To allow water users the flexibility to share water creatively, we will invest in policies and tools that lay the conditions for trading and markets for water, land, and ecosystem services.

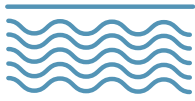
We will also work in the Healthy Watersheds program to broaden who makes water decisions and to shift how those water decisions are made. We will support collective efforts to align around policy and implementation, as we do now with the Groundwater Leadership Forum and the Flood Study Group. We will explore opportunities to support broader basin-scale water use agreements between disparate agencies and water users, and we will help to build the influence and capacity of disadvantaged communities and conservation groups to shape watershed management.

Finally, the Health Watersheds program will support work to strengthen the stories we tell about water by partnering with grantees to develop and disseminate messages that illustrate the power of multi-benefit projects to fulfill the needs of both communities and freshwater ecosystems.

Our Healthy Watersheds program has four primary parts: groundwater, floodplains, forests, and flows.

California leaders visit the Salton Sea





Groundwater

Groundwater basins provide a substantial portion of the water supply in many western states, including California, where groundwater provides 30 to 60 percent of the state's water supplies each year. Recharging groundwater and balancing its use can restore river ecosystems, reduce pressure to divert surface water from river systems for human use, and increase water security for communities and agriculture. Effective groundwater management is also one of the most powerful strategies for adapting to a changing climate. Given groundwater's importance, we will continue to prioritize investments in replenishing underground aquifers, balancing groundwater use, and expanding groundwater as a primary means of water storage. This work will be anchored in our efforts to ensure full, effective SGMA implementation.

By establishing limits, or caps, on groundwater pumping in each California groundwater basin, SGMA sets the enabling conditions for an opportunity to design, test, and implement innovative market strategies. These market strategies can help maximize flexible water management under the cap in each basin. While markets can potentially provide economic benefits, these caps will also lead to reductions in groundwater use that will present major challenges to the Central Valley's economy, environment, and social fabric. Recognizing this, we will invest in ways to smooth the transition in a manner that protects freshwater ecosystems, sustains the agricultural economy, and ensures safe drinking water for all Central Valley communities.

Our grantmaking will support the following five-year outcomes:

- Fair and effective plans are being implemented in California's major groundwater basins to sustain groundwater resources for decades to come in ways that protect public and environmental health.
- Market mechanisms that protect public interests and ease economic disruption from reduced groundwater use have been piloted in at least four groundwater basins and one surface water basin in California, and those that demonstrate success are on a path for full implementation and replication.
- Strategic, coordinated land retirement in the Central Valley minimizes the economic disruption of land fallowing and leads to the creation of thousands of acres of new habitat in the Central Valley.
- Leadership of Groundwater Sustainability Agencies in California reflects the diversity of water users and stakeholders in each groundwater basin.
- At least one other state has taken fundamental steps to improve groundwater management and increase sustainability of groundwater sources.



Floodplains

Expanding floodplains is among the most cost-effective and environmentally beneficial ways to reduce public safety threats from flooding. It reduces down-river flood risks, expands feeding grounds for fish, and provides ancillary income for farmers willing to lease their lands for this purpose. Floodplain expansion can play a particularly helpful role stabilizing threatened and endangered fish populations on the West Coast. Our work in this area will build on our existing investments in efforts to establish and implement the Conservation Strategy of California's Central Valley Flood Plan—the largest, most important flood program in the state.

Our grantmaking will support the following five-year outcomes:

- Thousands of acres of floodplains are being restored in the Central Valley in priority locations that maximize multiple benefits.
- Early investments in flood crisis communications generate support from key decision makers for multi-benefit approaches to flood management in California and at least one other state.
- Floodplain ecosystem restoration projects can be implemented more efficiently and cost effectively due to permit streamlining in California and at least one other state.



Forests

Improving forest conditions can protect water quality and supply hundreds of miles away while reducing the risk of catastrophic wildfires. Forests also provide important land-based environmental habitats and percolate the waters that feed aquatic ecosystems down rivers to the ocean. This is a new area of investment for the Water Foundation, in which we will seize opportunities to convey the value of healthy forests as water infrastructure and align drinking water utilities, rural landowners, government agencies, and conservation organizations toward forest management that benefits river systems. We are particularly interested in stimulating investment in upstream forest management by downstream beneficiaries of water supply. We will also explore advancing new protective state regulatory designations for the most healthy and pristine sources of drinking water.

Our grantmaking will support the following five-year outcomes:

- California adopts a coordinated statewide program to manage forests in critical watersheds that protects water quality and supply as well as reducing fire risk.
- Watershed-oriented forest management is being scaled in three additional locations beyond California.



Flows

In many basins, conflict over competing water uses has restricted water flows needed by ecosystems and created uncertainty among water users. Resolving these conflicts and balancing water use among environmental and human needs is essential to the long-term viability of freshwater ecosystems. Given the entrenched and polarized nature of these conflicts, achieving balance requires sustained investment, creative approaches that allow users to measure and share water more effectively, and broad coalitions moving toward a shared vision. Progress tends to be primarily incremental, with tangible improvements to ecosystems and water resilience secured on the pathway to broad balance.

Our work to balance water use and environmental flows will include advancing multi-benefit projects; supporting real-time data collection, data management, and data visualization; making it easier to innovate flexible ways to shift water from one use, or user, to another; and building collaboration and integration among decision makers and water institutions within basins.

Our grantmaking will support the following five-year outcomes:

- Sacramento and San Joaquin river systems are more flexibly and collaboratively managed to balance the full range of water needs for people and nature.
- New models for establishing and managing environmental flows have been developed and tested in the Central Valley and exported to at least one other region.
- A Drought Contingency Plan is being implemented in the lower Colorado River that balances water needs during dry periods.
- Restoration and stabilization of the Salton Sea are well underway, with improving environmental conditions for local communities and enhanced habitat for wildlife.
- Public water data is shared and integrated across the western states and is guiding precise, real-time water allocation decisions.
- Collaboration toward lasting voluntary agreements to balance watershed resources is in progress in at least one additional basin.

Achieving water use balance requires sustained investment, creative approaches, and broad coalitions moving toward a shared vision.

Our Healthy Communities Program



Safe Drinking Water



Urban Resilience



Rural Resilience

Healthy Communities

The health of our communities, from small towns to large cities, depends on the availability of clean and reliable water. Yet today, millions of Americans live in places where clean and safe water is not reliably available, or where they are threatened by flooding or drought and water scarcity. Climate change exacerbates these challenges.

Our Healthy Communities program tackles these problems through three focus areas: safe drinking water, rural resilience, and urban resilience. Our safe drinking water work will be anchored by continued investment in California supporting a unique alliance between environmental justice groups and agricultural leaders. Our urban resilience work will build on our multi-year investments in stormwater and green infrastructure in Los Angeles. We will continue to fund groups advancing integrated water resilience in LA, and will also broaden our investments to include other large cities. Rural resilience is a new area of investment for the Water Foundation, in which we will build on our existing work with agricultural groundwater users in California to support economic development transitions in water-stressed basins.

Communities System Interventions

The Healthy Communities Program will draw on our three system interventions, with primary emphasis on broadening who makes water decisions and how and strengthening the stories we tell about water.

The water field needs leaders who prioritize safe drinking water and climate resilience. This need is particularly acute in local water agencies where contamination taints drinking water and water supplies are not secure. One important way to elevate these priorities is to support leaders from underserved communities, where these challenges are most acute, to become decision makers in local agencies. Toward this end, we will prioritize securing community representation on the governing boards of newly-formed Groundwater Sustainability Agencies in California. If our grants demonstrate effectiveness in shifting board composition and priorities, we will broaden our investments into additional water institutions.

Convincing water decision makers to prioritize community and ecological needs often requires external political pressure. We will help build the capacity of community-based organizations to amplify the voice and grow the political power of those most impacted by water



The water field needs leaders who prioritize safe drinking water and climate resilience.

Green stormwater infrastructure ribbon-cutting in Los Angeles

challenges and will bolster environmental organizations' ability to advocate for clean drinking water. We will support groups to build coalitions that link equity and environmental priorities and engage constituencies that have not often participated in traditional forums for water decision-making. Some of these constituencies, including tribes and communities of color, have had a limited voice in water dialogues in the past, but are growing increasingly engaged and politically powerful. Other constituencies, such as business leaders and organized labor, have well-established political influence, but have not traditionally focused on water. Expanding the range of water advocates can lay the groundwork for securing effective and lasting water solutions.

People care deeply about water when it touches them—when they drink it, cook with it, or bathe in it. Polling consistently shows that ensuring clean and safe water is among Americans' greatest worries and highest priorities, cutting across ideology and political party. This reservoir of public priority presents a massive opportunity. It can be leveraged to solve the drinking water crisis and strengthen public support for broader water solutions such as

watershed protection and drought planning. Recognizing this, we will augment our partners' capacity to communicate in ways that activate public commitment to protecting and preserving water.



Safe Drinking Water

When it comes to securing drinking water, communities face three primary challenges: unsafe water, unaffordable water, and unreliable water. Each of these challenges has unique sources and human impacts. Unsafe water is caused by poor water quality, and its impacts include acute sickness and chronic disease. Unaffordable water is generated by water service costs that exceed a customer's ability to pay. Acute impacts include water system shut offs for unpaid bills, and chronic impacts include consistent water poverty in which household income simply cannot accommodate rising water bills. Unreliable water is driven by inadequate water infrastructure or water demand outstripping water supply. Immediate unreliable water access can

Our initial focus will prioritize pollution treatment, given the urgent need to protect communities currently living with contaminated water.

be due to a lack of indoor plumbing. Over the long-term, unreliable water can be triggered by water shortages, which can be exacerbated by climate change. We will first concentrate primarily on unsafe water, with the caveat that these challenges interact and can reinforce one another.

Securing safe, clean water requires either stopping pollution from entering drinking water supplies—source water protection—or treating water that is already contaminated—pollution treatment. Our work on safe drinking water will encompass both approaches, but our initial focus will prioritize pollution treatment, given the urgent need to protect communities currently living with contaminated water.

We will continue our investments in ensuring treatment of contaminated water supplies in disadvantaged communities in California. These investments will advance water agency consolidation and build water agency capacity, and will also help partners secure needed state funding for pollution treatment in communities struggling to make ends meet. Consolidating underperforming agencies—through changes to state law, regulations, and funding—can resolve drinking water problems while reducing the extensive fragmentation of our water systems. Where consolidations are impractical or could harm local water users with onerous rate hikes, we will help to improve the capacity of underperforming agencies to provide safe drinking water.

While agency consolidation and capacity-building can address some safe water threats, pollution treatment in disadvantaged communities remains a chronically underfunded fiscal orphan in most states, so we will also support work to provide funding to subsidize water treatment or support litigation in cases where there is an at-fault party.

As we work to ensure effective pollution treatment in local communities, we will remain vigilant for emerging opportunities to address threats to safe and clean water for people, recognizing that events such as lead contamination in Flint, threats from oil and gas development at Standing Rock, and toxic algal blooms in Oregon provide important moments to seize on public concern to achieve lasting clean water solutions.

Our grantmaking will support the following five-year outcomes:

- Threats from unsafe water are transparent and well understood, communities that suffer from unsafe water are identified, and regulators and legislators are using this information to drive solutions across the West.
- Adequate state funding exists in California to subsidize the operations and maintenance of pollution treatment infrastructure in disadvantaged communities.
- Consolidation of failing water agencies in California is taking place across the state on a regular basis; state agencies are well-organized to drive fair, effective consolidations.
- Consolidation pathways have been strengthened in at least one other state, where consolidations are expanding access to clean and safe water.
- Local water agencies, Groundwater Sustainability Agencies, and regional water boards in California have new staff and appointed/elected leaders who come from underrepresented communities.



Rural Resilience

Many small towns and sparsely populated counties across the country face increasing water supply uncertainty and declining water quality. At the same time, these rural communities confront dwindling populations, growing unemployment, and increasing wealth concentration in the agricultural sector. Roughly 60 million people—20 percent of our national population—are currently navigating these difficulties. Climate-driven extreme weather, including less predictable precipitation and worsening droughts, will exacerbate the stress on these rural communities.

Agriculture, which anchors many rural communities, is the primary user of both ground and surface water in the United States, deploying approximately 80 percent of the water collected for human use. This water produces food for our country and the world and generates critical rural economic activity. Changes in water management and infrastructure impact agriculture and, likewise, changes in agricultural water management often affect other water users, including fish, wildlife, and cities.

Where agriculture relies on irrigation, farms and ranches need consistent water supplies. In many places, these water supplies are increasingly uncertain due to worsening droughts, groundwater depletion, overallocation of water rights, and the need to keep water in rivers to protect collapsing ecosystems. Agricultural producers, and the rural communities that depend on them, need support navigating water supply uncertainties in ways that sustain rural economies. Changes to water management and infrastructure must also take into account impacts on rural communities.

Large agricultural interests have significant political power across the country, and therefore maintain strong influence on water policy and decision-making. Recognizing this, agricultural irrigation districts and their constituents are important stakeholders in all water issues and a necessary partner for lasting water solutions.

Given the importance of water to rural livelihoods, and the likelihood that changing water availability will impact agriculture-centered economies, this program will invest in helping rural communities sustain their economic security and way of life. This is a new area of investment for the Water Foundation, and work may include improving drought planning, forest protection, and regenerative agricultural practices, including soil health rejuvenation and maintenance. We will partner with agricultural leaders to improve water stewardship and increase economic productivity, and also help rural communities in water-stressed basins plan for economic transitions.

Our grantmaking will support the following five-year outcomes:

- California's San Joaquin Valley is transitioning to reduced annual groundwater use in an organized manner that is minimizing economic disruption to rural communities.
- Two or more rural areas in California and at least one other state have designed and piloted new approaches to managing climate-driven variability and their success stories and lessons learned have been widely shared.

Changes in water management and infrastructure impact agriculture, and changes in agricultural water management often affect other water users, including fish, wildlife, and cities.



Urban Resilience

Our country's cities and metropolitan areas are contending with a range of water-related challenges: reliance on distant, sometime overallocated rivers for water supply; aging infrastructure; hardened cityscapes vulnerable to flooding; polluting stormwater runoff; and localized industrial pollution. Climate change will compound these challenges by sharpening water scarcity during droughts and increasing major flooding threats.

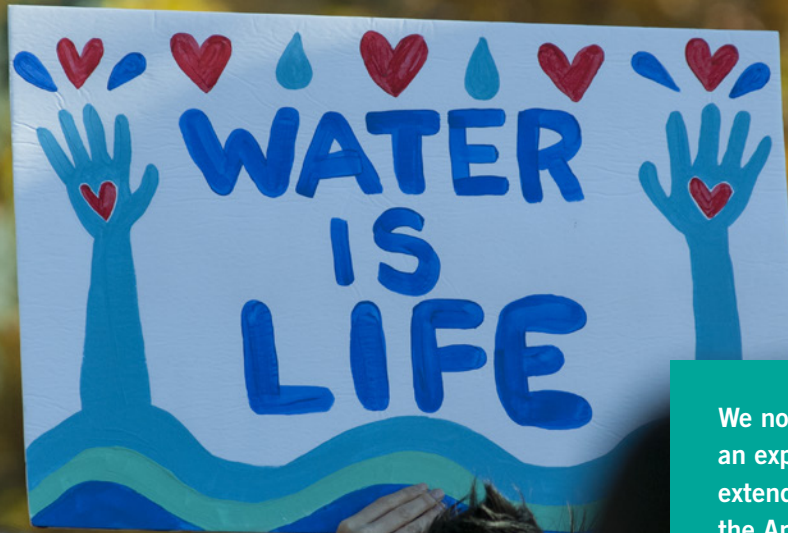
Urban areas also figure centrally even in water difficulties and opportunities that span an entire state or region. About 20 percent of water diverted for human use in the US is used municipally, and urban-controlled water systems often extend for hundreds, even thousands, of miles beyond city boundaries. Cities and metropolitan areas have large populations and economies, which gives them significant political power in statehouses and beyond, and this influence will likely grow as urban areas continue to expand. Cities will be integral stakeholders in any broad, lasting water solutions.

Our urban resilience work will prioritize integrated and equitable water management. We will help local leaders and institutions develop holistic approaches that: 1) build urban self-sufficiency and reduce reliance on external water supplies; 2) decrease pollution and flooding risks that threaten human and environmental health; and 3) ensure equitable, affordable access to water. This requires linking environmental interests with non-traditional water constituencies,

including equity-focused organizations, business groups, and labor associations, and bolstering their capacity to help design and advance resilient water solutions. We will build on our existing work in greater Los Angeles, where we will continue to invest in the movement to build local self-sufficiency, reduce pollution, and ensure access to clean and safe water.

Our grantmaking will support following five-year outcomes:

- Los Angeles County is actively implementing its Water Resilience Plan, which includes leveraging Measure W funding and other sources to expand multi-benefit infrastructure throughout the county and advancing measurable actions to reduce reliance on the Sacramento, San Joaquin and Colorado Rivers.
- Two other metropolitan areas have developed comprehensive water resilience plans and are making progress building their self-sufficiency, reducing pollution and flooding threats, and ensuring all residents have access to clean and safe drinking water.
- Broad coalitions for urban water resilience are in place and working well in at least two cities. Urban water leaders have collaborated with health, technical, economic justice, and/or traditional environmental allies on major campaigns.



We now seek to raise an expansion fund to extend our work into the American West and beyond.

Moving Forward

The first years of the Water Foundation demonstrated the value of a philanthropic intermediary solely focused on water. With our partners, we delivered over \$40 million in funding to the field, convened hundreds of diverse nonprofit, private, and community-based organizations, and advanced significant new water policies in California. We now seek to raise an expansion fund to extend our work into the American West and beyond.

Over the next five years, we will partner with organizations across the region to deliver scalable solutions that can ensure safe and reliable water for people and nature. We will support work to establish a clear pathway to clean and safe drinking water for all, ensuring that hundreds of communities gain access to clean drinking water. Our work will also result in the integration of legacy infrastructure with nature-based solutions and new technologies across the region, building momentum for a new paradigm of broad watershed management that balances the full range of water needs.

Notes

1. These ecosystem services are often separated into “supporting services” (e.g., biogeochemical cycling, production, habitat or refugia, and biodiversity), “regulating services” (e.g., regulation of water quality, climate, floods and erosion, and biological processes such as pollination, pests, and diseases), “provisioning services” (direct or indirect food for humans, fresh water, wood and fiber, and fuel), and “cultural services” (e.g., aesthetic, spiritual, educational, and recreational). Paul Ehrlich and Hal Mooney initially coined the term ‘ecosystem services’ to describe the various ways human existence relies on our natural surroundings in their 1983 paper, ‘Extinction, Substitution, and Ecosystem Services’ (*Bioscience* 33: 248–254).
2. Fedininick, Kristi, Mae Wu, Mekela Panditharatne, Eric D. Olsen. May 2017. Threats on Tap: Widespread Violations Highlight Need for Investment in Water Infrastructure and Protections. NRDC. Other estimates for the number of Americans affected by health-based drinking water violations every year range from 9 million to 45 million. See, for example, “National Trends in Drinking Water Violations” (Maura Allaire, Haowei Wu, and Upmanu Lall. *Proceedings of the National Academy of Science*, February 27, 2018: 2078–2083).
3. Chapman University Survey of American Fears, May 2017; “Americans Concerns about Water Pollution Edge Up,” Gallup News, March 17, 2016; Kaiser Family Foundation Health Tracking Poll, conducted April 12–19, 2016, Water Foundation Western States Poll, conducted September and October 2017; Gallup Poll, conducted March 2017; Value of Water Campaign National Public Opinion Polls, May 2017 and January 2016; National Infrastructure: Public Satisfaction and Priorities, Fall 2016 Ipsos Survey, among others.
4. Chapman University Survey of American Fears, May 2017; “Americans Concerns about Water Pollution Edge Up,” Gallup News, March 17, 2016; Kaiser Family Foundation Health Tracking Poll, conducted April 12–19, 2016, among many examples. For a comprehensive look at the most recent polling and analysis see <https://waterpolls.org>.
5. Water Foundation Western States Poll, conducted September and October 2017; Gallup Poll, conducted March 2017; Value of Water Campaign National Public Opinion Polls, May 2017 and January 2016; National Infrastructure: Public Satisfaction and Priorities, Fall 2016 Ipsos Survey.
6. Our approach here draws on the emergent strategy ideas laid out by Henry Mintzberg, Sumantra Ghoshal, and James B. Quinn in *The Strategy Process* (Prentice Hall, 1998), referenced in “Strategic Philanthropy for a Complex World” in the *Stanford Social Innovation Review* (Summer 2014), and explored most recently in adrienne marie brown’s *Emergent Strategy: Shaping Change, Changing Worlds* (AK Press, 2017).
7. This is built on James Kingdon’s ‘multiple streams’ model presented first in *Agendas, Alternatives, and Public Policy* (Pearson, 1984).
8. Over the last three decades, between 3 and 10 percent of the country’s water systems have been in violation of federal health standards each year (Maura Allaire, Haowei Wu, and Upmanu Lall, “National Trends in Drinking Water Violations,” *Proceedings of the National Academy of Science*, February 27, 2018: 2078–2083).
9. Contaminants of emerging concern are chemicals that were not previously detected in water supplies, or were previously found in much lower concentrations, and what is included in the category changes over time. Recent contaminants of emerging concern include pharmaceuticals, personal care products, endocrine disrupting chemicals,

nanoparticles, and flame retardants. They are important because the risk they pose to human health and the environment is not yet fully understood.

10. Freshwater ecosystems make up approximately 0.01 percent of the planet's total surface area.

11. See, for instance, 'Declining woody vegetation in riparian ecosystems of the Western United States' (RA Obedzinski, CG Shaw, and DG Neary, *Journal of Applied Forestry* 16(4), 2001: 169–181) and 'The thin green line: Riparian corridors and endangered species in Arizona and New Mexico' (AS Johnson in: G Mackintosh, ed. *Preserving communities & corridors*. Defenders of Wildlife, 1989: 35–46).

12. Ecological Society of America. Sustaining Healthy Freshwater Ecosystems, *Issues in Ecology* 10, Winter 2003. More on the primary scientific literature in *Ecological Applications* 12(5): 1247–1260.

13. *National Water Quality Inventory*: Report to Congress. US Environmental Protection Agency, August 2017. EPA 841-R-16-011.

14. Moyle, Peter B., Joseph D. Kiernan, Patrick K. Crain, Rebecca M. Quinones. *Climate Change Vulnerability of Native and Alien Freshwater Fishes of California: A Systematic Assessment Approach*. PLoS ONE 8(5), May 22, 2013: e63883.

15. The National Centers for Environmental Information reported that 2017 was a year of historical weather and climate disasters, reporting 16 separate weather and climate disaster events with losses exceeding \$1 billion each across the United States. The cumulative cost for those disasters was a record \$309 billion, a new annual record. Since 1980, there have been 230 of these massive weather and climate disasters for a total cost exceeding \$1.5 trillion. (NOAA National Centers for Environmental Information US Billion-Dollar Weather and Climate Disasters (2018). <https://www.ncdc.noaa.gov/billions/>)

16. Udall, Bradley, and Jonathan Overpeck, "The twenty-first century Colorado River hot drought and implications for the future," *Water Resources Research*, an AGU journal, February 17, 2017.

17. Megafire is the term the National Interagency Fire Center uses to describe fires greater than 100,000 acres. Additional relevant data can be found in the 2014 Union of Concerned Scientists report, *Playing with Fire: The Soaring Costs of Western Wildfire*. On wildfire and water, the issue is both the direct impact of lost forest cover on precipitation capture and filtration and the wildfire and post-fire rain driven flooding and erosion, which can decrease water quality and fill reservoirs with sediment. See, for instance, 'Climate, wildfire, and erosion ensemble foretells more sediment in western USA watersheds' (Joel B. Sankey, *et al*, *Geophysical Research Letters*, an AGU Journal 44(17), September 2017: 8884–8892) and 'Wildfire effects on water quality in forest catchments: A review with implications for water supply' (Hugh Smith, Gary Sheridan, Patrick Lane, Petter Nyman, and Shane Haydon, *Journal of Hydrology*, 396, 1/2011: 170–192).

18. Garfin, Gregg, executive editor. *Assessment of Climate Change in the Southwest United States*. National Climate Assessment Regional Technical Report Input Series. Island Press, 2013.

Dalton, Meghan M., Philip W. Mote, Amy K. Snover, lead eds. *Climate Change in the Northwest: Implications for our Landscapes, Waters, and Communities*. National Climate Assessment Regional Technical Report Input Series. Island Press 2013.

19. The American Society of Civil Engineers gave the US a "D" grade for the quality of its drinking water systems based on an evaluation of safety, condition, and capacity. Of the 25 states with individual grades, none scored higher than a "C+" (American Society of Civil Engineers, *Drinking Water Report, Infrastructure Report Card 2017*) The American Water Works Association estimates

that water systems will need about \$1 trillion in investment during the next 25 years just to maintain and expand water service. This price tag does not include the costs associated with getting rid of lead service lines or upgrading water treatment plants (American Water Works Association, *Buried No Longer: Confronting America's Water Infrastructure Challenge*, February 2012).

20. American Society of Civil Engineers, Drinking Water Report, *Infrastructure Report Card 2017*. <https://www.infrastructurereportcard.org/cat-item/drinking-water/>

21. The US Water Alliance national briefing paper, *An Equitable Water Future*, notes that, for comparison, the energy sector has just 3,000 electricity providers. It also highlights the fact that 55 percent of the 51,000+ water providers serve less than 500 people. The US Water Alliance's report drew on data from "Factoids: Drinking Water and Groundwater Statistics for 2005" (US Environmental Protection Agency, 2005) as well as from the 2015 State of the Water Industry Report from the American Water Works Association.

22. The Narrative Initiative describes narrative as "a collection or system of related stories that are articulated and refined over time to represent a core idea or belief. Unlike individual stories, narratives have no standard form or structure; they have no beginning or end." (*Toward New Gravity: Charting a Course for the Narrative Initiative*, 2017).

23. This perspective relies heavily on data provided in *Navigating Water Communications: A Landscape Analysis for the Water Funder Initiative*, July 2017, Freedman Consulting, LLC.

24. A drainage basin is any area of land where precipitation collects and drains off into a common outlet, such as a river or bay. The basin includes all the surface water from rain runoff, snowmelt, and nearby streams that run downslope towards the


shared outlet, as well as the groundwater underneath the earth's surface.

25. Soil health refers to soil's capacity to support crop and livestock production while maintaining and improving the environment. Healthier soils boost resilience to climate change, extreme flooding, and extreme drought by filtering water more quickly, increasing the water holding capacity of soils within the root zone, and decreasing soil temperature. There is also growing interest in soil's ability to sequester carbon, and, therefore, to integrate working lands sequestration into climate models. For broad reference, see *Soil Health Literature Summary – Effects of Conservation Practices on Soil Properties in Areas of Cropland* (USDA, Natural Resources Conservation Service, National Soil Survey Center, 1/9/2015), and *Effects on Soil Water Holding Capacity and Soil Water Retention Resulting from Soil Health Management Practices Implementation* (USDA, Natural Resources Conservation Service, March 2018).

26. The Innovation Network for Communities and O-H Community Partners. *Accelerating the Development of Sustainable Water Markets in the US*. January 2013.

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