

An aerial photograph showing a winding river cutting through vibrant green rice terraces. The terraces are arranged in a series of curved, stepped patterns that follow the contours of the land. The river is a dark, narrow channel that meanders through the landscape. In the background, there are some palm trees and a few small structures, possibly farmhouses or storage buildings. The overall scene is a lush, rural landscape.

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RETHINKING WATER, PLACE & COMMUNITY

# WATER FUTURES

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from multiple perspectives within and beyond the academy.

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The cover image is by Ivan Bandura, <https://ivan.graphics/>.

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PERSPECTIVES

# CREATING OUR WATER FUTURES

By Teresa Opheim, Douglas Snyder,  
Kate A. Brauman, and Valerie Were

*This issue of Open Rivers invites us all to envision the kind of future we hope to have with water. It encourages us to see the possibilities. By imagining the relationships we want with water, imagining the water conditions we want to see in our future, we begin to see both the challenges and potentials in our present and*

*the steps necessary to move us to these desired and desirable water conditions.*

*As a way to start the conversation about water futures, we asked community partners, researchers, faculty, and students, people connected to policy work and people creating change in the field, in their communities, and*



*Climate Land Leaders are learning that soil health is needed for healthy waters.  
Image courtesy of Sharing Our Roots.*



*in the classroom, to share their response to the following question: What knowledges, practices, and perspectives do we need in order to create the water futures we imagine and want?*

*Here we share four responses to this question that all speak to the ways our values are entangled with water and to the value of water itself. We hope this collection will spur an ongoing conversation to which you, our readers, may contribute. We welcome anyone who is*

*interested in responding to this question to share your perspective via our google form ([z.umn.edu/waterfutures](https://z.umn.edu/waterfutures)). Periodically, we will include a collection of responses in subsequent issues of Open Rivers. By drawing together a variety of ways of imagining more equitable, sustainable, hopeful water futures, we begin to create these futures together.*

*-Laurie Moberg, Managing Editor*

## Teresa Opheim, Love the Soil, Protect the Waters

After farmers harvested corn and soybeans last fall, most left their fields bare. Soil will blow away and erode into our waterways until planting again later this spring.

But not at the Sharing Our Roots Farm near Northfield. This 100-acre farm is covered with grasses and trees. Life in the soil is increasing. Carbon is being drawn out of the atmosphere and into the ground where it belongs. And the soil is becoming sponge-like, slowing the movement of water and keeping it in place.

Sharing Our Roots Farm is a member of the Climate Land Leaders, a group of farmland owners who are working collaboratively and creatively for the land and water, and for those who grow our food. Landowners have tremendous power and responsibility to steward our land. As Climate Land Leader Helen Gunderson says, “Land is a limited resource, and people who own it are in a unique position to make a difference.”

The Climate Land Leaders know that we will improve our waters and make our land more

climate-resilient by implementing some basic principles:

- Cover the soil.
- Keep living roots in the ground year round.
- Minimize soil disturbance.
- Increase the diversity of crops and livestock.

The Climate Land Leaders are learning so much! They now know that climate change is resulting in increasingly volatile weather, including more intense rainfalls. They also are discovering that re-greening the land is a climate change solution because it helps restore the water cycle. Perennial landscapes can help moderate temperatures; land stripped of vegetation cannot.

The Sharing Our Roots Farm is a vision of the land regeneration we could achieve across the Midwest. The Farm’s land stewards and all the Climate Land Leaders are strengthening their own commitment to place and sense of awe about nature. Building the soil means improving the water and addressing with compassion and commitment our climate crisis.





*Sharing Our Roots acquired 100 acres of degraded cropland in October 2016 and has since been transitioning it to a resilient, regenerative system. Images courtesy of Sharing Our Roots.*



## Douglas Snyder

Stated simply, the perspective I would want everyone to have is that water is indeed precious and provides innumerable benefits to us. We must work to ensure that these benefits are brought front and center, rather than remain hidden or underappreciated, by all of us who benefit from clean water when experiencing nature, when living our urban lives, and when undertaking our economic activities. If everyone understood this and incorporated it into their decision-making, their purchasing decisions, and their work life, water would have a better chance of being valued and protected, and not endangered through ignorant actions or unintended consequences.

I would have people understand that water decisions are ubiquitous. When you purchase a new pair of pants, your food, or products for managing your yard, you are making a decision that impacts water. How was the fabric grown or created? Were pesticides used? How it was manufactured? How far did it travel? How much and what kind of energy was needed? The answers to all of these questions have water consequences, and the issue today is that we do not take those consequences into account. Rather, they are viewed as externalities. Very soon, I think we will

not have the luxury to see the interconnectedness of things as externalities. We need to acknowledge the connections between our decisions and their impact on water.

I am optimistic that this is beginning to happen. In my work-world of stormwater management, rainwater was for many years viewed as waste—something that needed to be moved off the urban landscape as quickly as possible. Unfortunately, it also carried nutrients and pollutants with it, unintentionally causing problems for the lakes, streams, and rivers collecting it. Now we are seeing rainwater, snowmelt and other forms of precipitation being viewed as a resource that can be collected, cleaned, and used in place of potable water for numerous commercial, home, and landscape needs. It's a start. By no means have we solved how to deal with all the connected processes and externalities of the current system.

Water provides life to us, and is in many ways a living thing itself. It should be respected and honored as such. Only then will we make decisions that keep water clean and available to our environment and ourselves.



## Kate A. Brauman

To build a future in which limited water supplies are used equitably, productively, and resiliently, we need to understand not just what people are directly using water for, but what the purpose of that water use is. A green lawn in an arid region could be a status symbol or a place to play, a memory of home or a statement of what home could mean. Keeping the lawn green will always require a certain amount of water, but those real purposes, the deeper needs, might be met in other, less water-intensive ways. Once we shift our thinking and management to focus on achieving end goals, not just on providing water

for specific activities, there is a wide world of water alternatives that go way beyond increasing efficiency or raising prices. Instead of fighting about reallocating the same supply among more users, we could make the pie bigger by finding ways to achieve our goals in entirely different ways. Doing this requires talking to people, really understanding their values and needs and goals. Fun new technology is, well, fun, and we will need technical solutions. But even new technology can't be deployed effectively until we understand what water users are trying to achieve.



*Green lawn highlights outdoor sculpture at the Villa Panza in Varese, Italy. Image courtesy of Kate A. Brauman.*



## Valerie Were

We need more refined knowledge on how water security is experienced across the globe. Our imprint on the natural water cycle, which many in the United States begin learning about in elementary school, is profound and affects water security. The United Nation’s proposed definition for water security is “The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water

for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability” (UN Water 2013). Can anyone say they are completely water secure? Dr. Indrani Pal, a Research Scientist and colleague at the NOAA Cooperative Science Center for Earth System



*This aerial photo, released by the California Department of Water Resources, shows the damaged spillway with eroded hillside in Oroville, California during the dam crisis in 2017 during which the dam threatened collapse. This crisis remains emblematic of greater issues of water security globally and in California. Image by William Croyle, California Department of Water Resources.*

Sciences and Remote Sensing Technologies, and I were discussing this issue recently. She said that although the northeastern United States is projected to receive more precipitation due to climate change, much of it will likely be unavailable because of changes in how water flows.

A group of us wanted to address the urgent need to find better ways to predict water availability. We are developing a tool that predicts the availability of renewable freshwater resources in California's rivers using a combination of computer modeling and prediction, data visualization, and social sciences. The tool is unique in that we use actual river water data rather than basing predictions on components of the water cycle. The tool will also take into account the socio-economic factors that influence how much water is available at a given location at a given time. Advances in computer modeling make it possible to deal with missing data, which is often a limiting factor in understanding water. Learn more about our work here: <https://www.hydro-detectus.com/> and stay tuned for more!

We need to advance our knowledge around the value of water. We often think of value purely in economic terms but there are other ways to value water beyond assigning a dollar amount. Water has cultural value, it has aesthetic value, and those perspectives need to be included in conversations about valuation. That means inviting a variety of participants to conversations about water. The process takes time, commitment, and recognition that the current project cycles we use run counter to a meaningful engagement process. A big part of the engagement is making sure justice, equity, diversity, and inclusion are part of the process.

Perhaps I am just late to the game, but there also needs to be more focus on chronic issues. Sea level rise, for example, will have a profound impact on coastal communities. We still struggle to communicate that risk. We need deeper conversations about the realities of the displacement that sea level rise will bring. Climate migration is already happening in other parts of the world and the United States will be no different.



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