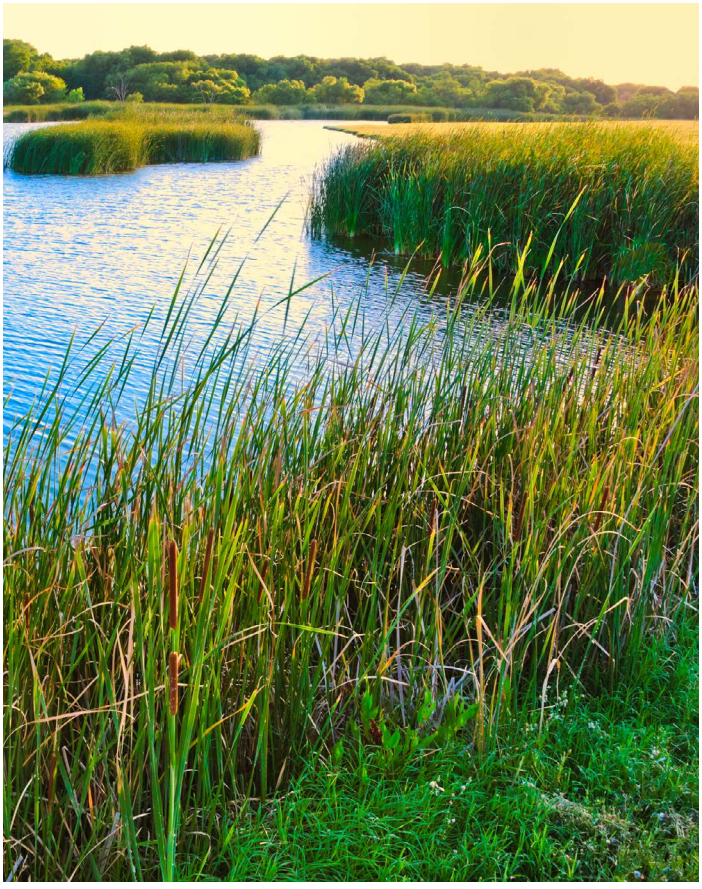
Community and Ecological Co-Benefits

KEY TAKEAWAYS

- Implement nature-based solutions, such as green infrastructure and wetland restoration, to improve water quality, sequester carbon, and enhance community resilience.
- Recover and repurpose byproducts from water and wastewater treatment, such as nutrients, biosolids, and lime to reduce waste, support agriculture, and promote circular economies.
- Partner with landowners to implement practices like wetland restoration and nutrient management, improving water quality and reducing agricultural emissions.
- Generate renewable energy through biogas recovery, solar installations, and heat capture to reduce emissions and create revenue opportunities.

INTRODUCTION

The path to net-zero emissions presents numerous opportunities to achieve community and ecological co-benefits. To maximize these benefits, water utilities need to adopt One Water approaches, which prioritize the protection and enhancement of watershed health through integrated water management strategies. This can be achieved by either stewarding utility-owned lands or partnering with other landowners to implement regenerative practices. Holistic strategies, such as nature-based solutions, habitat protection and restoration, resource recovery, and circular economy practices align with climate mitigation and resilience efforts. These strategies not only contribute to decarbonization but also enhance ecosystem health, community well-being, and overall environmental sustainability, enabling the water sector to meet both adaptation and resilience goals. Decarbonization provides a unique opportunity to reimagine traditional water management approaches, creating a more sustainable and resilient future.



ACTIVITIES AND ACTIONS

Adopt One Water Approaches for Watershed Health

Utilities can achieve community and ecological co-benefits by integrating water management across systems and stakeholders. This means looking beyond utility-owned assets to address the broader watershed, including forests, wetlands, urban spaces, and agricultural areas. A holistic approach enhances watershed health, supporting both climate resilience and improved community outcomes.

Nature-based solutions like green infrastructure, wetland restoration, and reforestation are key. These solutions offer carbon sequestration, flood mitigation, and habitat creation while also addressing community needs for recreation, clean air, and water quality. Integrating these strategies into capital planning aligns with mitigation and adaptation goals.

Tip: *Host a workshop with watershed stakeholders to identify collaborative nature-based projects like wetland restoration or urban green spaces that reduce GHG emissions through carbon sequestration and improve climate resilience.*

Implement Resource Recovery and Circular Economy Practices

Water utilities have a unique opportunity to shift from waste disposal to resource recovery, transforming byproducts from water and wastewater treatment into valuable resources for other sectors. This approach enhances sustainability and economic resilience by advancing circular economies, reducing waste, and creating benefits across multiple sectors.

A key focus is nutrient recovery, particularly nitrogen and phosphorus from wastewater, which can be repurposed as fertilizers for agriculture, reducing reliance on synthetic inputs and mitigating nutrient pollution. Additionally, biosolids from wastewater can

enhance soil health and support carbon sequestration while metals and other materials can be recovered for industrial use.

Drinking water treatment also offers resource recovery opportunities. Sludge from coagulation and filtration can be repurposed for construction materials or land reclamation and lime or calcium-based byproducts from water softening can be used in cement manufacturing or as soil conditioners.

Tip: *Create a resource recovery roadmap that examines all byproducts and partner with regulators, local industries, researchers, and agriculturists to identify and scale high-impact projects.*

Foster Partnerships for Regenerative Land Management

Depending on the local context, utilities can play various roles in regenerative land management. They might act as conveners, bringing together landowners, watershed managers, agricultural extension agents, and conservation organizations to identify shared goals. Alternatively, they could offer technical guidance or financial support to help implement best practices, such as riparian buffers, nutrient management plans, or wetland restoration.

Rather than a one-size-fits-all approach, utilities should work closely with local partners to determine the most effective contributions. This could include facilitating information-sharing, aligning land management with broader water quality objectives, or co-developing long-term agreements that reflect regional needs. By remaining flexible and responsive, utilities can foster collaboration, enable diverse stakeholders to lead efforts, and drive improvements in ecosystem health and community resilience.

Tip: *To guide your own approach, reach out to other utilities that have implemented regenerative land management practices and schedule calls or site visits to understand their successes, challenges, and lessons learned.*

Utilities as Renewable Energy Producers

Water utilities can leverage existing infrastructure and land assets to become renewable energy producers. Key strategies include co-digesting food waste, recovering heat from treated effluent or sewer inflows, and co-locating community solar projects on utility-owned land.

For food waste co-digestion, assess infrastructure capacity and constraints. If feasible, engage local food producers, waste management companies, and regulators to secure a reliable supply. Establish clear protocols to ensure smooth processing without disrupting operations.

For community-based waste heat recovery, map thermal energy potential and evaluate local demand from district heating networks, community institutions, or industrial users. If viable, consult with energy experts on system design and develop policies that clarify ownership and responsibilities.

For community solar projects, assess utility-owned sites—such as rooftops or land—and engage local governments, community groups, and residents to gauge interest. Develop policies to guide project development and ensure benefits reach targeted subscribers, such as community institutions or individual customers.

Tip: *Prioritize projects that build on existing plans or infrastructure investments to leverage momentum and maximize impact.*

KEY CHALLENGES AND SOLUTIONS

Policy and Governance Frameworks

Regulatory frameworks often favor traditional infrastructure, making it difficult for utilities to implement innovative decarbonization and resource recovery strategies.

Solutions:

- Collaborate with regulators to pilot adaptive policies.
- Advocate for reforms recognizing the co-benefits of sustainable practices.
- Leverage pilot programs to showcase effective new approaches.
- Engage stakeholders to build a compelling case for evolving regulations.

Technical Expertise:

Many utilities face skills gaps in integrated water management, resource recovery, or renewable energy. Limited internal capacity can delay projects and increase reliance on costly external experts.

Solutions:

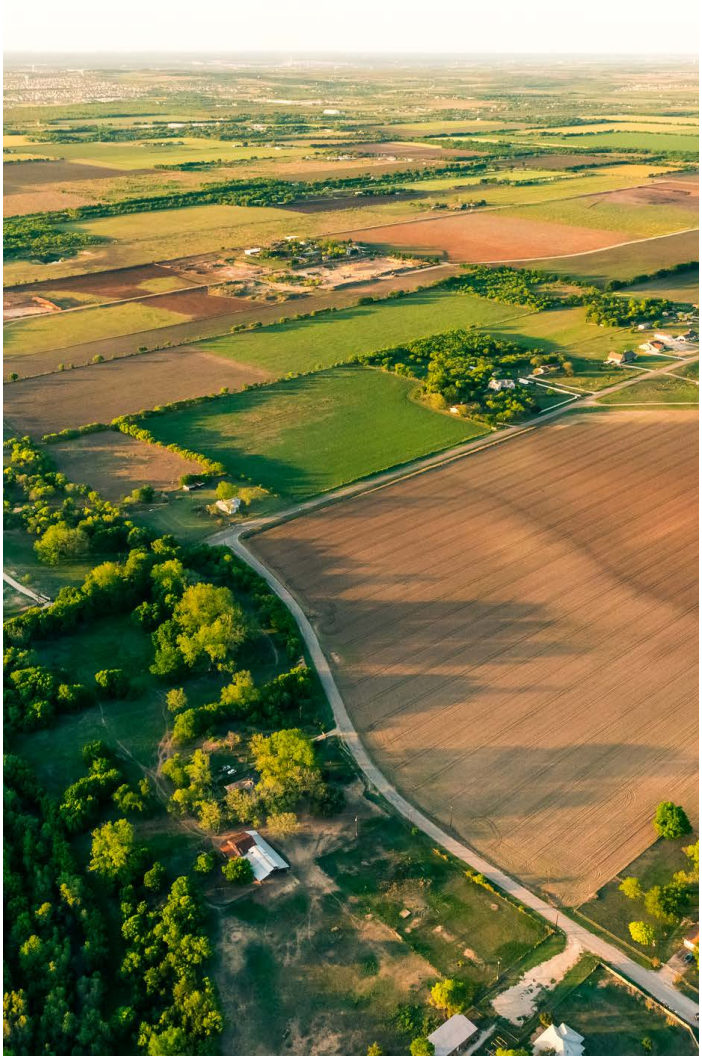
- Implement targeted training programs to build internal capacity.
- Partner with academic institutions, industry groups, and research organizations for temporary support while upskilling staff.
- Utilize peer learning networks to accelerate expertise development.
- Collaborate with regional agencies to pool expertise and resources.

Social and Community Barriers

Collaborating with landowners, farmers, and community groups can be challenging due to differing priorities, resistance to change, and the need to balance benefits. Miscommunication and a lack of trust can further complicate efforts.

Solutions:

- Work with trusted local organizations and community leaders to build support or vouch for the utility.
- Keep messaging simple and focus on clear, practical benefits.
- Start with small, visible wins through pilot projects to gain buy-in and scale participation.



SPOTLIGHT

Yahara WINS—A Collaborative Journey to Cleaner Waters

Launched in 2012 and led by Madison Metropolitan Sewerage District, the Yahara WINS project began as a compliance-driven initiative for phosphorus regulation but quickly evolved into a One Water model for watershed-scale collaboration. By bringing together utilities, municipalities, farmers, and community members, this partnership has successfully pooled resources and targeted interventions to maximize impact. Through its holistic approach, Yahara WINS has improved water quality in the Yahara watershed while delivering additional environmental and economic co-benefits.

Building a Foundation for Collaboration

Yahara WINS started with a feasibility study and a pilot project designed to test the viability of collaborative watershed management. Early adopters played a crucial role in securing buy-in, with Madison Metropolitan Sewerage District engaging trusted influencers to build support and expand participation beyond the initial pilot phase. These efforts culminated in formal agreements that solidified long-term commitments from all stakeholders, ensuring program continuity and scaling its impact.

> *"Yahara WINS is a good microcosm of One Water. We have all sorts of water, and there can't be any siloing or finger-pointing. We all have a piece and have to work together for the best outcome," said Martye Griffin, Director of Ecosystem Services at Madison Metropolitan Sewerage District.*

Key Insight: Early engagement with trusted stakeholders helps build momentum and ensures long-term commitment to collaborative environmental initiatives.

Carbon Benefits of Controlling Phosphorus

While the primary goal of Yahara WINS is phosphorus reduction, the project has also delivered significant carbon sequestration benefits. Conservation practices such as reduced tillage and cover cropping not only prevent phosphorus runoff but also enhance soil health and trap carbon in the soil. By implementing these agricultural best practices, Yahara WINS is demonstrating how regulatory compliance can simultaneously advance broader climate action goals.

> *"We have our primary channels where we implement best practices, but we also have other ideas about how to help the dollars go further and maybe even generate new revenue streams," said Mike Gilbertson, Watersheds Program Coordinator at Yahara WINS.*

Key Insight: Well-designed environmental initiatives can achieve multiple sustainability goals, demonstrating that water quality improvements and carbon reduction efforts can go hand in hand.

Delivering Value to Utilities, Farmers, and Municipalities

The Yahara WINS model has provided tangible benefits to multiple stakeholder groups. For utilities, it has offered a cost-effective, sustainable way to meet regulatory requirements while avoiding expensive infrastructure upgrades that often have high embodied carbon profiles. For farmers, the benefits include improved soil health, increased yields, and financial incentives for conservation practices, along with carbon reduction benefits that are valuable throughout the agricultural supply chain. For communities and municipalities, this model has resulted in enhanced water quality, fewer beach closures, and improved recreational opportunities, ultimately supporting local economies and public health.

> *"Once you partner and see success, it breeds more partnerships and becomes a proven model that can work. We're now seeing partners working together in new ways outside of this framework," said Griffin.*

Key Insight: Collaborative environmental management can create shared value, reducing compliance costs for utilities while providing economic and ecological benefits to local communities.

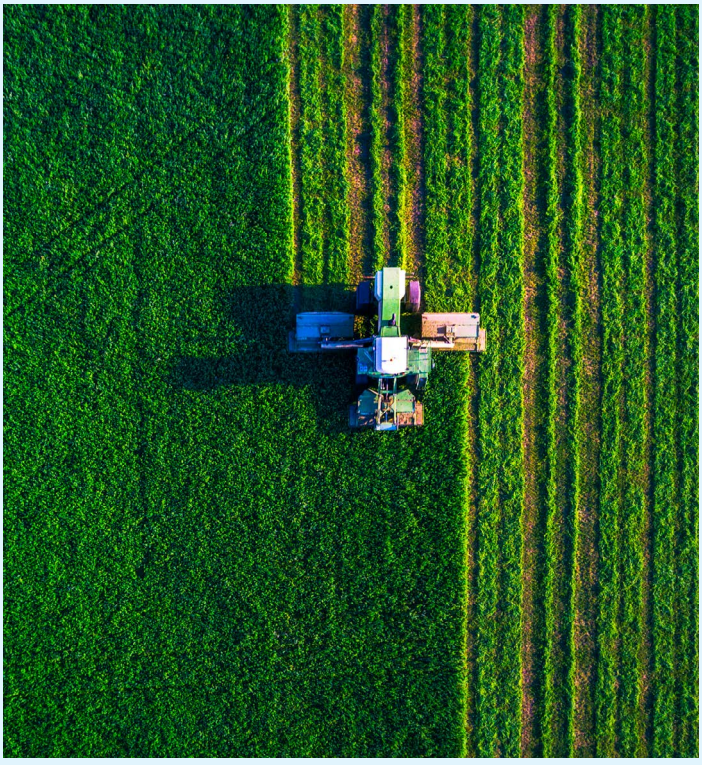
Inspiring a New Model for Environmental Management

Yahara WINS exemplifies the power of collective action in watershed management. By prioritizing relationship-building and mutual benefits, the program has successfully engaged diverse stakeholders to nurture a sense of shared responsibility for environmental stewardship.

> *"Even with a compliance driver, it's not as simple as just going into the watershed. You really have to buy into what [farmers, stormwater agencies, and municipalities] do, and they have to buy into what you do so you can move forward together," said Griffin.*

Key Insight: Long-term success in environmental initiatives depends on trust, collaboration, and aligning diverse stakeholder interests to create durable partnerships.

Yahara WINS demonstrates that regulatory compliance can serve as a catalyst for broader environmental and economic improvements. By embracing a collaborative approach, the initiative has not only met phosphorus reduction goals but also contributed to climate action, enhanced agricultural sustainability, and improved local water quality. This model of partnership-driven environmental management offers valuable lessons for utilities, policymakers, and stakeholders nationwide looking to implement similar One Water strategies in their own watersheds.



ADDITIONAL RESOURCES AND REFERENCES

1. Further explore the Yahara WINS project through example partner agreements, the Adaptive Management Plan, annual reports, and partner annual reports.
2. The Pacific Institute's Benefit Accounting of Nature-Based Solutions for Watersheds Landscape Assessment report outlines a structured approach to account for the multiple benefits of nature-based solutions, supporting more informed decision-making for water and climate projects.
3. The Nature Conservancy's Beyond the Source: The Environmental, Economic, and Community Benefits of Source Water Protection report summarizes how source water protection through nature-based solutions can improve water quality and supply while providing additional environmental and social benefits.
4. Understand how renewable energy generation at your utility can benefit citywide carbon management through the Local Government Solar Toolkit resources for implementing community-scale solar energy projects..

This paper is part of Net Zero Fundamentals, a collection of action-oriented briefs designed to help water and wastewater utilities cut climate pollution and chart a clear path to net zero. Each brief delivers practical insights, real-world utility examples, and implementation guidance for immediate impact. Access the collection of briefing papers on the US Water Alliance website.

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