



REQUEST FOR PROPOSALS (RFP)

Maximizing the Value of Natural Assets and Green Infrastructure at the Watershed Scale (5253)

Date Posted

Monday, September 11, 2023

Due Date

Proposals must be received by 3:00 pm Mountain Time on Tuesday, November 21, 2023.

WRF Project Contact

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Project Sponsors

This project is funded by The Water Research Foundation (WRF) as part of WRF's Research Priority Program.

Project Objectives

- Outline the benefits of natural asset management system and solutions for utilities and water resource managers
- Incorporate assessment metrics into natural assets, which will provide a more complete accounting framework that can be scaled up to watershed and community levels, including initial capital investment and long-term impacts
- Enhance accounting and monetization framework for natural assets and green infrastructure so that an effective approach to natural asset management has the confidence of utilities, government, funders, and financial/economic managers and regulators
- Expand from existing case studies illustrating where and how natural asset management systems have been implemented in the water sector, outlining the challenges faced, solutions found, and benefits realized

Budget

Applicants may request up to \$200,000 in WRF funds for this project.

Background and Project Rationale

Natural assets such as watershed areas, forests, wetlands, and stream enhancements provide many important core services and associated beneficial values to water utilities and the communities they serve. This key point is highlighted by WRF project 4727 "Asset Management Framework for Forested and Natural Assets" (Raucher et al. 2020). Using drinking water as an

example, utilities need to manage risks to drinking water safety and quantity at all points along the supply chain—from watershed to consumer. This approach recognizes that the impacts of watershed areas on source water are directly interrelated with treatment facilities and distribution networks. Thus, an integrated management approach is essential for water systems. The built infrastructure asset components of water systems (for drinking water, wastewater, stormwater, and recycled water) are typically supported by asset management systems (AMSs), which are used to track asset performance and condition and develop scheduled maintenance and replacement in order to maximize asset reliability, efficiency, and lifecycle benefits.

There is a growing recognition that improved management and the resultant reliability, efficiency, and lifecycle benefits for the natural asset components of water systems could also be achieved via their incorporation into an AMS. This would provide the additional advantage of enabling water service providers to improve visibility and interoperability of water assets across entire asset portfolios. For example, while forests provide timber and natural wetlands that mitigate flooding, green infrastructure (e.g., bioretention and permeable pavement) includes designed and engineered elements (beyond natural assets) that have been created to mimic natural functions and processes in the service of human interests. Since green infrastructure can include both natural and engineered assets, its coverage is broader than that of natural assets. The emerging development of natural AMSs strives to implement the systematic management process widely used in the built asset domain to provide a more systematic management approach for natural assets. Examples include forests, wetlands, bioretention basins, swales, and street trees/urban forests with similar and interoperable processes for natural assets and green infrastructure.

One of the greatest emerging challenges for water utilities in the implementation of natural AMSs involves the complexities associated with placing economic value on the services that natural assets and green infrastructure provide, which currently do not fit well with conventional business accounting practices. WRF research efforts to date (e.g., projects 4727 (Raucher et al. 2020), 4852 (Clements et al. 2021), and 5075 (Bledsoe et al. 2022)) have highlighted the key economic and financial impediments, which will need to be addressed to encourage widespread adoption of natural AMSs. These challenges include:

1. Financial accounting standards and protocols that do not always align with the full economic value provided by natural assets or the services they provide
2. Natural assets typically provide a mix of market and “non-market” goods and services, but the level and value of these goods and services often are not directly monetized
3. Access to financing for natural asset programs could be further expanded as opportunities allow
4. Services from natural assets and outcomes from efforts to maintain or enhance those assets often are not well defined or readily measured/quantified
5. Price-setting regulations and policies make it difficult to recover expenditures and evaluate benefits on natural asset programs

Therefore, there is a great need to further advance the existing economic analysis framework in order to rigorously account for the value of natural assets and green infrastructure at the watershed scale. In addition, real-world applications will demonstrate their value beyond drinking water and source water protection, helping to better quantify and maximize natural asset and green infrastructure's value in a One Water context.

The desired outcome of this research is two-fold. First: to provide utilities and water resource managers with clear, expert guidance on quantifying and monetizing the traditional non-market services, as well as the social and environmental benefits of natural assets and green infrastructure systems through the entire One Water cycle from source water to tap to water resource recovery facility outfall or reuse. Second: to provide water utilities with guidance on the development of a rigorous accounting framework for natural asset management, which will allow for their inclusion in enterprise financial statements. It would provide direction on key issues such as capital investment versus operational expenditure and how to allocate ongoing funding for operation, maintenance, and renewal across the life of a natural asset.

Research Approach

The research team will conduct a comprehensive literature review on quantification and monetization frameworks for natural assets and green infrastructure by building from WRF's research efforts to date (please refer to selected examples in the "References and Resources" section of this RFP). In addition, the literature synthesis will include published documents by other organizations, such as the *Green Stormwater Infrastructure Asset Management Resources Toolkit* (Green Infrastructure Leadership Exchange 2021). Based on all available published literature, the research team will synthesize the information on valuation of natural assets and green infrastructure in North America and elsewhere, as applicable.

As one of the core components of this study, the research team will expand from existing work to develop an enhanced accounting and monetization framework for natural assets and green infrastructure at the watershed scale, including an enhanced benefit-cost analysis framework for "hard-to-quantify" benefit categories and approaches such as Triple Bottom Line (TBL) and Quadruple Bottom Line (QBL).

The research team will conduct a survey and targeted interviews with selected utilities and municipalities with the goal of synthesizing real-world practices of implementing natural asset monetization in decision-making. This will include challenges and lessons learned from utilities and municipalities that have utilized or attempted to apply previous iterations of monetization frameworks and tools and collaborating with interested utilities to develop new case studies for applying the enhanced monetization framework across geographic regions and different utility sizes.

The research team will develop a utility-facing "state-of-the-practice" guidance document, which includes a synthesis of case studies across different geographic regions and utility sizes by focusing on utilities and municipalities in North America. In addition, a separate chapter in the guidance document will be included to summarize the knowledge gaps, research needs, and preliminary project concepts for recommended future research projects.

In addition, a utility-focused invitation-only virtual workshop will be held with utilities and municipalities across geographic regions facing similar challenges. The objectives of this utility-facing workshop are to share what has or has not worked in the past, discuss pros and cons of different approaches, and identify future research needs. The virtual workshop participants will also include the Project Advisory Committee (PAC) members (i.e., a technical review committee managed by WRF), representatives from participating utilities, WRF's collaborators and partners, and other invitees recommended by WRF.

The research team will conduct one webcast hosted by WRF and collaborating organizations on the overall findings of this project. The research team is encouraged to submit one open access peer-reviewed journal paper after the completion of the project. In addition, the research team should consider additional outreach activities, such as presenting project findings at conferences.

Expected Deliverables

- A stand-alone comprehensive literature synthesis document, including annotations for the list of publications and resources used
- A user-friendly utility-facing guidance document that includes an enhanced accounting and monetization framework for natural assets and green infrastructure at the watershed scale with utility case studies across different geographic regions
 - In addition, this document will include a chapter and supporting technical appendix that summarizes the knowledge gaps, research needs, and preliminary project concepts for recommended future research projects, including recommended means to address those remaining gaps
- A utility-facing invitation-only virtual workshop for peer-to-peer information exchange and identification of future research needs, along with workshop planning and all supporting materials (e.g., agenda, presentations, meeting notes, and workshop summary)
- Broader outreach:
 - Conduct webcasts and deliver public outreach materials such as conference presentations
 - Submit one open access peer-reviewed journal paper and additional outreach products as applicable

Communication Plan

Please review WRF's *Project Deliverable Guidelines* for information on preparing a communication plan. The guidelines are available at <https://www.waterrf.org/project-report-guidelines#project-deliverable-guidelines>. Conference presentations, webcasts, peer-reviewed publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration

The anticipated period of performance for this project is 24 months from the contract start date. The submission of open access peer-reviewed journal paper can go beyond the project end date.

References and Resources

The following list includes examples of research reports, tools, and other resources that may be helpful to proposers. It is not intended to be comprehensive, nor is it a required list for consideration.

- Baffoe-Bonnie, B. et. al. 2012. *Quantifying the Benefits of Water Quality Catchment (Watershed) Management Initiatives*. Project 4393. Denver, CO: Water Research Foundation; London: UK Water Industry Research Limited.
<https://www.waterrf.org/research/projects/quantifying-benefits-water-quality-catchment-watershed-management-initiatives>
- Bassi, A., G. Pallaske, L. Wuennenberg, L. Gracesm and L. Silber. 2019. *Sustainable Asset Valuation Tool: Natural Infrastructure*. Winnipeg, Manitoba, Canada: The International Institute for Sustainable Development (IISD).
- Bledsoe, B., R. Lammers, J. Clary, J. Jones, A. Earles, M. Leisenring, S. Struck, and E. Strecker. 2022. *Stream Restoration as a BMP: Crediting Guidance*. Project 5075. Denver, CO: The Water Research Foundation. <https://www.waterrf.org/research/projects/stream-restoration-bmp-crediting-guidance>
- British Columbia (BC) Ministry of Municipal Affairs and Housing (Canada). 2019a. *Asset Management for Sustainable Service Delivery: A BC Framework*. Asset Management BC. <https://www.assetmanagementbc.ca/wp-content/uploads/Asset-Management-for-Sustainable-Service-Delivery-A-BC-Framework-.pdf>
- British Columbia (BC) Ministry of Municipal Affairs and Housing (Canada). 2019b. *Integrating Natural Assets into Asset Management - A Companion Document to Asset Management for Sustainable Service Delivery: A BC Framework*. Asset Management BC. <https://www.assetmanagementbc.ca/wp-content/uploads/Integrating-Natural-Assets-into-Asset-Management.pdf>
- Clements, J., J. Henderson, and A. Flemming. 2021. *Economic Framework and Tools for Quantifying and Monetizing the Triple Bottom Line Benefits of Green Stormwater Infrastructure*. Project 4852. Denver, CO: The Water Research Foundation. <https://www.waterrf.org/research/projects/economic-framework-and-tools-quantifying-and-monetizing-triple-bottom-line>
- Conlan, K., P. Cryle, I. Dickie, E. Lawlor, A. Provins, D. Royle, and F. Tarkowski. 2017. *Implementing Ecosystem Service and Natural and Social Capital Accounting Approaches*. Published by UK Water Industry Research (UKWIR). Project 4745. Denver, CO: The Water Research Foundation; London: UK Water Research Limited. <https://www.waterrf.org/research/projects/implementing-ecosystem-service-and-natural-and-social-capital-accounting>
- Global Platform for Sustainable Cities, and World Bank. 2019. *Natural Asset and Biodiversity Valuation in Cities*. Technical Paper. Conference Edition. Washington, DC: World Bank. <https://documents1.worldbank.org/curated/en/287521568801462241/pdf/Technical-Paper.pdf>
- Green Infrastructure Leadership Exchange. 2021. *Green Stormwater Infrastructure Asset Management Resources Toolkit*. Green Infrastructure Ontario Coalition; The Green

Infrastructure Leadership Exchange; Southwest Environmental Finance Center.

<https://giexchange.org/wp-content/uploads/2021/12/GSI-AM-Resources-Toolkit-Final-Dec-17.pdf>

- Municipal Natural Assets Initiative (MNAI). 2023. *Legal Primer: Natural Asset Management by Local Governments in Canada*. MNAI.ca. <https://mnai.ca/media/2023/02/MNAI-Legal-Primer-Natural-Asset-Management-by-Local-Governments-in-Canada.pdf>
- Raucher, R., K. Vause, M. Lorie, T. Helgeson, and J. Cassin. 2020. *Asset Management Framework for Forested and Natural Assets*. Project 4727. Denver, CO: The Water Research Foundation. <https://www.waterrf.org/research/projects/asset-management-framework-forested-and-natural-assets>
- Water Services Association of Australia (WSAA). 2015. *Source Catchments as Water Quality Treatment Assets: Industry Best Practices and Triple Bottom Line Cost Evaluation of Catchment Management Practices*. Project 4570. Denver, CO: The Water Research Foundation. <https://www.waterrf.org/research/projects/source-catchments-water-quality-treatment-assets-industry-best-practices-and>
- The Water Research Foundation (WRF). 2023. *Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC)*. WRF. <https://www.waterrf.org/clasic>

Proposal Evaluation Criteria

The following criteria will be used to evaluate proposals:

- Understanding the Problem and Responsiveness to RFP (maximum 20 points)
- Technical and Scientific Merit (maximum 30 points)
- Qualifications, Capabilities, and Management (maximum 15 points)
- Communication Plan, Deliverables, and Applicability (maximum 20 points)
- Budget and Schedule (maximum 15 points)

PROPOSAL PREPARATION INSTRUCTIONS

Proposals submitted in response to this RFP must be prepared in accordance with WRF's *Guidelines for Research Priority Program Proposals*. The current version of these guidelines and the *Instructions for Budget Preparation* are available at <https://www.waterrf.org/proposal-guidelines>. The guidelines contain instructions for the technical aspects, financial statements, indirect costs, and administrative requirements that the applicant must follow when preparing a proposal.

Proposals that include the production of web- or software-based tools, such as websites, Excel spreadsheets, Access databases, etc., must follow the criteria outlined for web tools presented in the *Web Tool Criteria and Feasibility Study for The Water Research Foundation Project Deliverables* at <https://www.waterrf.org/project-report-guidelines#webtool-criteria>.

Eligibility to Submit Proposals

Proposals will be accepted from both U.S.-based and non-U.S.-based entities, including educational institutions, research organizations, governmental agencies, and consultants or other for-profit entities.

WRF's Board of Directors has established a Timeliness Policy that addresses researcher adherence to the project schedule. The policy can be reviewed at <https://www.waterrf.org/policies>. Researchers who are late on any ongoing WRF-sponsored studies without approved no-cost extensions are not eligible to be named participants in any proposals. Direct any questions about eligibility to the WRF project contact listed at the top of this RFP.

Administrative, Cost, and Audit Standards

WRF's research program standards for administrative, cost, and audit compliance are based upon, and comply with, Office of Management and Budget (OMB) Uniform Grants Guidance (UGG), 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 48 CFR 31.2 Contracts with Commercial Organizations. These standards are referenced in WRF's *Guidelines for Research Priority Program Proposals*, and include specific guidelines outlining the requirements for indirect cost negotiation agreements, financial statements, and the Statement of Direct Labor, Fringe Benefits, and General Overhead. Inclusion of indirect costs must be substantiated by a negotiated agreement or appropriate Statement of Direct Labor, Fringe Benefits, and General Overhead. Well in advance of preparing the proposal, your research and financial staff should review the detailed instructions included in WRF's *Guidelines for Research Priority Program Proposals* and consult the *Instructions for Budget Preparation*, both available at <https://www.waterrf.org/proposal-guidelines>.

Budget and Funding Information

The maximum funding available from WRF for this project is \$200,000. The applicant must contribute additional resources equivalent to at least 33% of the project award. For example, if an applicant requests \$100,000 from WRF, an additional \$33,000 or more must be contributed

by the applicant. Acceptable forms of applicant contribution include cost share, applicant in-kind, or third-party in-kind that comply with 2 CFR Part 200.306 cost sharing or matching. The applicant may elect to contribute more than 33% to the project, but the maximum WRF funding available remains fixed at \$200,000. Proposals that do not meet the minimum 33% of the project award will not be accepted. Consult the *Instructions for Budget Preparation* available at <https://www.waterrf.org/proposal-guidelines#RPP-instr-budget-prep> for more information and definitions of terms.

Period of Performance

It is WRF's policy to negotiate a reasonable schedule for each research project. Once this schedule is established, WRF and its sub-recipients have a contractual obligation to adhere to the agreed-upon schedule. Under WRF's No-Cost Extension Policy, a project schedule cannot be extended more than nine months beyond the original contracted schedule, regardless of the number of extensions granted. The policy can be reviewed at <https://www.waterrf.org/policies>.

Utility and Organization Participation

WRF encourages participation from water utilities and other organizations in WRF research. Participation can occur in a variety of ways, including direct participation, in-kind contributions, or in-kind services. To facilitate their participation, WRF has provided contact information, on the last page of this RFP, of utilities and other organizations that have indicated an interest in this research. Proposers are responsible for negotiating utility and organization participation in their particular proposals. The listed utilities and organizations are under no obligation to participate, and the proposer is not obligated to include them in their particular proposal.

Application Procedure and Deadline

Proposals are accepted exclusively online in PDF format, and they must be fully submitted before 3:00 pm Mountain Time on Tuesday, November 21, 2023.

The online proposal system allows submission of your documents until the date and time stated in this RFP. To avoid the risk of the system closing before you press the submit button, do not wait until the last minute to complete your submission. Submit your proposal at <https://forms.waterrf.org/cbruck/rfp-5253>.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Harry Zhang, PhD, PE; 571.384.2098 or h Zhang@waterrf.org. Questions related to proposal submittal through the online system may be addressed to Caroline Bruck at 303.347.6118 or cbruck@waterrf.org.

Utility and Organization Participants

The following utilities have indicated interest in possible participation in this research. This information is updated within 24 business hours after a utility or an interested organization submits a volunteer form, and this RFP will be re-posted with the new information. **(Depending on your settings, you may need to click refresh on your browser to load the latest file.)**

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