



North Carolina Water Resources Research Institute
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REQUEST FOR PRE-PROPOSALS

May 1, 2024

The Water Resources Research Institute (WRRI) and the Urban Water Consortium (UWC) are requesting proposals for applied research to strengthen the UWC's response to and treatment of per- and polyfluoroalkyl substances (PFAS) contamination in drinking water and wastewater across North Carolina. This is a two-stage process, involving a pre-proposal and full proposal.

Introduction and Background: The Urban Water Consortium

The Urban Water Consortium (UWC) was established in 1985 to connect urban water managers in North Carolina with scientific research and information and with technology transfer. The Consortium provides research and information that enhances the management of water resources and wastewater in a cost-effective manner and allow water and wastewater utilities to adapt to future needs and changing operating and regulatory requirements. Today, water managers from 12 of North Carolina's populated urban areas are members of the Consortium, and they continue to connect with one another, as well as researchers and experts, to fund research and advance water management across the state.

UWC members include Charlotte Water, Cape Fear Public Utility Authority, City of Burlington, City of Durham, City of Greensboro, City of High Point, City of Raleigh, Fayetteville Public Works Commission, Greenville Utilities Commission, Orange Water and Sewer Authority, Town of Cary, and Winston-Salem/Forsyth County Utilities.

WRRI serves as the main facilitator, organizing meetings and providing grant administration and management for research projects supported by the Consortium. More information about the UWC can be found [here](#).

Need for Applied Research on PFAS

Scientific understanding and regulatory requirements related to testing and treatment of water and wastewater for per- and polyfluoroalkyl substances (PFAS), and management of PFAS in wastewater-generated biosolids are rapidly evolving directly alongside growing public concern.

Drinking water and wastewater utilities are on the front lines of addressing PFAS contamination for the benefit of public health and environmental protection, and challenges persist. Changes in analytical methods, variable reporting limits, and the prevalence of PFAS in everyday products can result in inconsistent findings. Treatment options will add significant and unexpected costs to utility capital and operating budgets, require tradeoffs with other critical infrastructure needs, and can be difficult to integrate into existing treatment facilities. Further, existing analytical methods (e.g., EPA 533, EPA 537.1, EPA 1633 draft) for water, wastewater, and biosolids detect only a few of the thousands of PFAS compounds. Therefore, treatment options cannot be fully vetted due to the limited number of PFAS detected by analytical methods (i.e. targeted analyses) and variability in confidence and reporting levels. Lastly, as treatment options are considered by utilities, there is the question of destruction versus capture. If PFAS are captured or trapped in a media or resin, the PFAS compounds will be concentrated and potentially transferred to another area of the environment (e.g., landfill) rather than destroyed.

The main purpose of this funding opportunity is to support research that can improve utility operations and analytical methods in a cost-effective manner as North Carolina utilities strategically prepare to address the future of evolving regulations, scientific understanding, and public perception. There is a need for accurate data that can inform future treatment options/operations and near-term decisions related to management and removal of PFAS. **This is a call for applied research that will strengthen the UWC's response to and treatment of PFAS, focused on the areas identified below.**

Research Focus Areas

Research is encouraged to address one or more of the questions below, as identified by the UWC through a previously held PFAS workshop series (agendas available: <https://wrri.ncsu.edu/wrri-pfas-workshop-series/>) and other ongoing discussions.

Research should be objective based and/or contain clear research questions. Other research questions not explicitly stated here, but that are related to PFAS management, detection, and removal as it relates to drinking water and wastewater management, will be considered.

1. Methodology

- Is there a screening method that could be used for trunkline tracing (for sewer system monitoring)? Maybe a variation of total oxidizable precursors or total organic fluorine? Consideration is needed for the method to be cost effective and useful for large-scale testing.
- Improved reliability of methodology, specifically for method 1633 and complex matrices. What are new or reliable methods for testing of biosolids and wastewater, and what analytes are the most important to test for?
- Is there a method that could be used for composite sampling which would provide more reassurance of representative sampling (example: catching or missing a slug may skew results of lab sample)?

- Extraction of samples can be difficult, especially for wastewater and biosolid matrices. Are there any advancements that can be made to the extraction or analytical process that would improve laboratory turnaround times or quality assurance/quality control?

2. Treatment

- What are the PFAS migration risks from incineration of wastewater solids, and/or land application of different types of residuals (i.e., such as aerobically digested, anaerobically digested, dried, etc.) and different soil types.
- Once PFAS compounds are removed through the water treatment process, are they concentrated in the residuals generated? If so, what are ways to address managing residuals?
- What are the most cost-effective treatment and disposal methods for sorbent media (such as granular activated carbon or powdered activated carbon)? What happens to PFAS during thermal reactivation of granular activated carbon (GAC) filters?
- How effective is GAC or other sorbents in removing long vs. short chain compounds? What can be done for removing ultra short chain compounds if GAC is not effective (such as for perfluoropropionic acid, PFPrA)?

3. Education

- What are strategies that can be used to educate the public on PFAS analytical results found in drinking water, wastewater, and biosolids while also educating them on other exposure routes that are even higher? How can communication be improved? What is the baseline level of knowledge and attitudes in NC communities towards PFAS?
- What are “typical” domestic results of PFAS in wastewater as found in the published literature?

If your research expertise is outside the scope of this RFP but still applicable to water and wastewater management, please consider other funding opportunities offered by WRRI, available periodically at <https://wrri.ncsu.edu/funding/>.

Eligibility

Faculty and University Affiliates of any accredited college or university (public or private) in North Carolina may apply. Faculty, undergraduate, graduate, and/or post-doctoral support may be included in proposals, and WRRI and the UWC encourages student involvement.

Application of research should be focused on the needs of water and wastewater utilities in North Carolina. Any out-of-state collaborator is eligible to be involved in the project as a co-PI, but the PI must be based at a North Carolina college or university. **WRRI strongly encourages proposals from HBCUs and MSIs and/or from traditionally underserved and underrepresented communities.**

Proposals **not eligible** for funding under this call include those that focus on monitoring-only activities, those that focus only on ocean waters, and those that focus on health effects involving human subjects. Research that addresses the link between environmental and human health, as related to the focus areas, **is acceptable**.

Timeliness and researcher performance on past projects funded through WRRRI will be a factor in proposal selection. A researcher who is late reporting on or completing an ongoing study funded through WRRRI without an approved no-cost extension is not eligible to apply as a PI on a pre-proposal for this RFP. If you have any questions about your eligibility in this regard, please contact John Fear at jmfear@ncsu.edu, and/or Kaitlin Tucker, ktucker@ncsu.edu.

Project Funding and Duration

Pre-proposals may be submitted for either 1- or 2-year projects. The maximum award for a 2-year project is \$120,000, with a \$60,000 annual limit. The maximum award for a 1-year project is \$60,000. A single individual may be listed as an investigator (PI or Co-PI) on a maximum of two pre-proposals.

Matching funds are not required but are encouraged, and overhead charges are not allowable. A budget outline should be included as part of your pre-proposal submission (more details below). Pre-proposals do not need to go through sponsored programs offices to be submitted.

Please use January 1, 2025 as your planning target for a project start date. Actual start and end dates may be subject to change.

Pre-proposal Elements and Format

Please see Appendix 1 for detailed instructions regarding formatting and required elements.

Review Process and Criteria

Pre-proposals will be evaluated on the following:

- Quality of the project team (10%)
- Relevancy/need for the work (30%)
- Objectives and technical approach (30%)
- Clarity of research outcomes, including how findings will benefit the UWC (30%)

Reviewers of pre-proposals will include WRRRI staff, UWC members, and other experts as needed. WRRRI and the UWC will **invite** a subset of investigators representing the most highly competitive and pertinent pre-proposal submissions to submit a full proposal and engage directly with the UWC. Only invited PIs will be eligible to submit a full proposal. Full Proposal application instructions and review criteria will be provided to those applicants that are invited to the next stage.

Submission Process

WRRRI will only accept pre-proposal submissions through our proposal management system eWater at go.ncsu.edu/ncewrri.

- The deadline for pre-proposals is **June 28, 2024 at 5pm EST**. The portal will automatically close at this time. **Late submissions cannot be accepted for any reason**. Please do not wait until the last minute to create your account and submit your proposal.
- You will receive an email confirmation when you submit your proposal. If you do not receive a confirmation email, please check your spam filters. If you still can not find your confirmation, please email ktucker@ncsu.edu or jmfear@ncsu.edu and we will confirm for you.

Questions

WRRRI welcomes investigators to contact us if they would like to discuss a research concept, have questions about eligibility, or have questions about the application process.

Investigators can reach out to the following WRRRI staff members:

- Kaitlin Tucker, Coordinator for Research and Engagement, ktucker@ncsu.edu
- John Fear, Deputy Director, jmfear@ncsu.edu

Full RFP timeline

5/1/2024: RFP released by WRRRI and UWC

6/28/2024: Pre-proposals due to WRRRI in eWater: go.ncsu.edu/ncewrri.

8/12/2024: Pre-proposal status and full proposal invitations released

9/30/2024: Full proposals due to WRRRI (by invitation only)

10/1/2024-11/8/2024: Engagement with the UWC (by invitation only)

11/22/2024: Full proposal notifications released with revision request if needed

1/1/2025: Project start date (estimated)

Disclaimer: While this RFP has been developed and issued in consultation with the Urban Water Consortium, there is no obligation for WRRRI or the UWC to fund any of the work proposed through this RFP.

APPENDIX 1: PRE-PROPOSAL FORMAT AND REQUIRED ELEMENTS

Pre-proposals that do not adhere to the following format guidelines may be disqualified from the competition. **Please double-check the formatting and number of pages of your pre-proposal carefully before submitting.**

Pre-proposals must adhere to the following format:

- 1-inch margins all around
- Times New Roman 12-point font
- 3-page limit (front and back counts as 2 pages) for items A-C below. If you want to include figures and diagrams, they must be incorporated into items A-C below and **do** count toward your page limit. Any information included in excess of 3 pages will not be considered in the review process.

Pre-proposals elements (**items A-C have a 3-page limit**):

- A. Abstract
- B. Objectives and technical approach
- C. Statement of expected outcomes
- D. References cited (not required. If included, there is no page limit, and it does not count toward the 3-page limit for items A-C.)
- E. CVs (2-page limit, see below)
- F. Budget Outline
- G. External reviewers

A. Abstract

Brief summary (approximately 250 words) of proposed work.

B. Objectives and technical approach

- Statement of research need: describe which research focus area(s) will be addressed and why this work is needed. What does your project seek to accomplish?
- Project scope, objectives, and timeline: state specifically what the scope and objectives are for the research. Provide the estimated timeline, milestones, and tasks to be completed.
- Methods: Provide information on the methods and how the project will be carried out to meet the objectives proposed. Include information on student and/or collaborator involvement. Be specific and provide detail for reviewers to assess the feasibility and appropriateness of your approaches.

C. Statement of expected outcomes

Explain the expected outcomes of your project, including what information will be gained. Consider how the findings can be applied to and shared with water and wastewater utilities and how the UWC will benefit from the results of this project. Please include information about the application of your research and anticipated limitations. The UWC is especially interested in understanding if the results can be scaled up and if the work will be beneficial on a larger scale.

D. References cited (optional). If included, there is no page limit, and it does not count toward the 3-page limit for items A-C.

E. CVs (2-page limit, which does not count toward the 3-page limit for items A-C.)
CVs are required for the lead PI and co-PIs. CVs must be in standard National Science Foundation (NSF) format. (See the section on “biographical sketches” at http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_index.jsp.)

F. Budget Outline

Include a draft budget. A reminder that pre-proposals do not need to go through sponsored programs offices, and overhead charges are not allowed.

G. External reviewers

Provide a list of two highly qualified peer reviewers for this proposal, including name, position, university/organization, email, telephone number, and a link to the reviewer’s website. Reviewers should be outside of your university and ideally out of state. Peer reviewers can not be collaborators (a co-author or research collaborator, or a former student or advisor) within the last 5 years or have other conflicts of interest.

Please combine all elements into a single pdf for submission into eWater:

go.ncsu.edu/ncwvri