



Clarkson™



State University of New York College of Environmental Science and Forestry

CENTER OF EXCELLENCE IN

Healthy Water Solutions

A New York State-Designated Center of Excellence

Request for Proposals

- OVERVIEW..... 2**
- AREAS OF FOCUS.....3**
- INSTITUTIONAL RESOURCES AND CENTERS.....3**
- TIMELINE.....4**
- PROJECT & FUNDING PERIOD.....4**
- PROPOSAL CATEGORIES.....4**
 - 1. Research Seed Grants.....4
 - Objective.....4
 - Eligibility.....4
 - Funds Available.....4
 - Allowed Expenses.....4
 - 2. Concept Commercialization/Implementation.....5
 - Objective.....5
 - Eligibility.....5
 - Funds Available.....5
 - Allowed Expenses.....5
 - 3. Education and Outreach.....6
 - Objective.....6
 - Eligibility.....6
 - Funds Available.....6
 - Allowed Expenses.....6
- MATCHING FUNDS.....6**
- REVIEW AND SELECTION CRITERIA.....7**
- REPORTING REQUIREMENTS.....7**
- PROPOSAL FORMAT.....7**
- PAST FUNDED PROJECTS.....8**
- CONTACT.....11**

OVERVIEW

The vision of the New York State Center of Excellence in Healthy Water Solutions at Clarkson University and SUNY ESF (CoE) is to ensure a healthy and sustainable future through the protection and conservation of water resources. **Our mission is to generate solutions that help protect and improve waters for sustainable natural environments, healthy populations, resilient communities and sound economies.**

A key requirement for the CoE is to demonstrate an ability to support economic development in New York State. The CoE is growing a portfolio of projects that demonstrate the benefits of the CoE to the state in terms of answering critical water science questions while boosting employment, workforce training, or developing new technologies that can be commercialized.

Through this Request for Proposals (hereinafter referred to as “RFP”) process and funding, Clarkson and ESF faculty, staff, and students seek to strengthen existing partnerships and forge new collaborations with private industry, consultants/engineers, water districts, K-12 schools, colleges and universities, government agencies, policy-makers, and local stakeholders.

To meet these goals, the CoE is seeking concise proposals from Clarkson and ESF faculty for funding in the categories outlined in this Request for Proposals.



In 2019 New York State designated Clarkson University and SUNY College of Environmental Science & Forestry (ESF) to co-lead the Center of Excellence (CoE) in Healthy Water Solutions.

NYS Centers of Excellence are funded by the New York State Department of Economic Development's Division of Science, Technology, and Innovation ([NYSTAR](#)) to foster collaboration between the academic research community and the business sector to develop and commercialize new products and technologies, to promote critical private sector investment in emerging high-technology fields in New York State, and to create and expand technology-related businesses and employment.

AREAS OF FOCUS

Research has focused in three general categories (Emerging and Traditional Contaminants, Water in the Natural Environment and Water Resources Planning/Management). Below is a list of representative topics within each category. This is not an inclusive list of topics to be considered for funding but rather intended to provide an overview of potential projects.

Emerging and Traditional Contaminants

- Innovative PFAS treatment
- Sensor development for watershed management using citizen science
- Materials for cost effective nutrient recovery
- Solar-energy driven water desalination
- Aquaculture for nutrient management
- Resource recovery process development for improved agricultural land management
- Conservation, restoration, and enhancement of aquatic habitats
- Risk assessment frameworks for PFAS
- Predict and protect against HABs
- Hg fate and transport in aquatic systems

Water in the Natural Environment

- Predict and prevent flooding; predict and manage drought
- Preserve and restore wetlands
- Track microbial sources; microbial risk assessment
- Manage landscapes to reduce loading of stressors to water bodies
- Model sediment transport

Water Resources Planning and Management

- Sustainable infrastructure planning
- High resolution mapping and forecasting via low-cost sensors coupled with advanced data analytics
- Determine water consumption patterns and factors influencing consumption via detection systems and advanced data analytics

INSTITUTIONAL RESOURCES AND CENTERS

A cornerstone of the CoE is the ability to establish collaborative relationships between Clarkson University and SUNY ESF and across the breadth of resources. The following are some examples of potential partnerships that could be fostered to further your research goals and strengthen your proposal.

CLARKSON UNIVERSITY

[Beacon Institute for Rivers & Estuaries](#)

[Center for Air and Aquatic Resources Engineering and Sciences](#)

[The Center for Advanced Materials Processing \(CAMP\)](#)

[The Shipley Center for Innovation](#)

[Institute for STEM Education](#)

[Institute for a Sustainable Environment](#)

SUNY ESF

[Adirondack Ecological Center](#)

[Analytical & Technical Services](#)

[ESF Open Academy](#)

TIMELINE

- 5/10/2023** RFP Release
- 5/31/2023** RFP Deadline. Submit to coe@healthywaters.org by 5:00pm (ET). Proposals are accepted and considered on a competitive basis and are subject to the availability of funds.
- 6/9/2023** RFP Decision. Grant recipients will be announced on or about this date.

PROJECT & FUNDING PERIOD

Duration of funding will be from the time of award by institution's Sponsored Research department through June 30, 2024.

Some portion of funds will be available immediately, but the majority of funds will be available on or about July 1, 2023 pending approval of the NYSTAR contract.

PROPOSAL CATEGORIES

1. Research Seed Grants

Objective

Seed funding can be used to support novel applied research concepts, but it can also be used for development of plans to support commercialization of a technology. For instance, seed funding could be used to develop an application to an NSF I-Corps regional course (<https://www.unyicorps.org/regional-courses/>). To provide an example of the types of work that have been supported, funded projects from prior years are listed at the end of this document.

Eligibility

All projects must include at least one collaborator from both Clarkson University and SUNY ESF.

Funds Available

A total of \$150,000 is available to fund all competitive proposals with a maximum per project of \$30,000 (shared between Clarkson and ESF).

Proposed budget must include line item description and amount of 1:1 matching funds. Matching funds must be equal to or greater than the funding request. [See "MATCHING FUNDS" section for details.]

Allowed Expenses

Eligible expenses include student salary, tuition, supplies, equipment, and project travel.

2. Concept Commercialization/Implementation

Objective

A primary objective of the Centers of Excellence (CoE) within New York State is to support development of technology commercialization or economics. Besides involving the development of a product that can be sold or a technology that could be patented, in the context of water management this may entail implementation of practices that lead to tangible economic gains to municipalities or resource users, possibly in the form of reduced costs. Unlike the seed funding program, these funds are intended for more mature projects that are near a commercialization or implementation phase.

Proposals should justify commercial viability and clearly define the project steps and how they will be accomplished.

Eligibility

The key requisite to be eligible for this pool of funds is that an applicant must have 1:1 matching funds from a private sector partner, a federal grant or internal (university) sources (e.g. investigator salary cost sharing or tuition for students). *[See “MATCHING FUNDS” section for details.]*

Additionally, the applicant must be proposing a technology or management approach related to water quality that is at the applied testing phase, such that further work could in the near term lead to commercialization or implementation of a new policy or management scheme.

Multiple PIs from both Clarkson and ESF are encouraged, but not required. A proposal may include a single PI from either Clarkson or ESF.

An individual faculty member may serve as the primary PI for only one proposal. However, any individual may serve as co-PI on multiple proposals.

Funds Available

Project budgets cannot not exceed \$100,000 over the project period.

Allowed Expenses

Eligible expenses include student salary, tuition, supplies, equipment, project travel, and up to two (2) weeks of PI summer salary.

3. Education and Outreach

Objective

This funding category is intended to support projects involving K-12 education, community outreach, partnership building, or workforce development. Examples include providing research opportunities to underrepresented minority high school students in the fields of water science, creating a training workshop to build critical skills in a water-related field; or developing a workshop that builds industry-academic-government relationships around a water-related topic.

Eligibility

Multiple PIs from both Clarkson and ESF are encouraged, but not required. A proposal may include a single PI from either Clarkson or ESF.

Funds Available

A total of \$90,000 is available to fund all competitive proposals with a maximum per project of \$30,000 (shared between Clarkson and ESF).

Proposed budget must include line item description and amount of 1:1 matching funds. Matching funds must be equal to or greater than the funding request. [See “*MATCHING FUNDS*” section for details.]

Allowed Expenses

Eligible expenses include external partner expenses that directly support the project, student salary, tuition, supplies, equipment, and project travel.

MATCHING FUNDS

Proposed budget must include line item description and amount of 1:1 matching funds. Matching funds must be equal to or greater than the funding request.

Matching funds can include:

- Cash and in-kind contributions from external partners, including federal funding agencies. With the exception of federal grants where match can be documented by the research office, matching funds (cash or in-kind) from partners should be stated in a letter of support from the partner and included with proposal submission.
- Faculty and student salaries, and fringe benefits paid by Clarkson or ESF for percent of time working on the project.
- Partner or collaborator employee salary and fringe benefits for percent of time working on the project.
- Graduate tuition paid through a federal or foundation grant, or the university, for graduate students participating on the project (related to industry). Budget must include the name of the agency that provided the grant.

REVIEW AND SELECTION CRITERIA

Proposals will be evaluated by an internal review committee composed of representative faculty experts from each campus who are not competing in this call for proposals, as well as a panel of external reviewers.

Proposals will be evaluated on the following criteria:

1. **Feasibility:** Does the project team have sufficient expertise and appropriate institutional resources (e.g. lab space, instrumentation, etc.)? Is the scope commensurate with the budget?
2. **Quality of Science/Relevance:** Does the proposal provide sufficient description to contextualize the proposed work within the broader state of knowledge in the field? If focused on workforce development, does it provide evidence of need for the training? Is the work timely and important?
3. **Economic Development Potential:** Is there evidence of potential for economic impacts? Examples could include matching funds from an industry partner (ideally from NYS), industry collaboration, technology transfer, workforce development, licensing and commercialization. Applicants should provide concrete details and measurable milestones for success in this area. This is a critical part of each proposal and should not be short changed.

REPORTING REQUIREMENTS

Progress Reports **for all projects** are due to coe@healthywaters.org on June 30th and December 31st of each year. CoE will provide a report format.

PROPOSAL FORMAT

Format:

- 1 inch margins
- 1.08 multi-line spacing
- 12 point Times New Roman font
- Number pages

Cover Page which includes items 1-6 (1 page)

1. Category of Funding
2. Funding Start and End Date [end date no later than June 30, 2024]
3. Project Title
4. Clarkson/ESF Team Members (names and contact information)
5. External Partners
6. Water research area addressed in proposal

Project Description (< 2 pages for Seed and Education; 3-5 pages for Commercialization):*

- Problem Statement
- Objectives
- Tasks
- Project Impacts (summarize briefly here)
 - Social/Environmental
 - Business/Economic Development
- Expected Scientific Outcomes
- Expected Economic Development Outcomes

* For Commercialization proposals: include narrative providing overview of technology/management scheme, development history, current status, and next steps for commercialization. This section should clearly indicate how these funds will be used and the benefit of these funds in moving toward commercialization or implementation.

Budget and Budget Justification (<1 page)

Provide a table that identifies

- Primary budget categories (student pay, supplies, travel, etc.).
- Per CoE funding guidelines, 15% indirect cost needs to be applied to all personnel costs. For other costs, indirect costs have been waived. Additionally, travel is only allowed within NYS unless prior permission is given.
- Budget must include a column with line item description and amount of 1:1 matching funds. Matching funds must be equal to or greater than the funding request. [see “MATCHING FUNDS” section for details.]
- For proposals with more than one PI per institution, include % of effort for each PI and Co-PI for the project.

Investigator CV

Provide a 2-page biosketch for each investigator following the [NSF](#) or similar format.

PAST FUNDED PROJECTS

2022-2023 SEED Projects

Project Title: The Abundance and Distribution of Microplastics Pollution in a Riverine System at a Temporal and Spatial Scale

PIs: Leanne C. Powers (ESF); Abul BM Baki, Thomas Holsen (Clarkson)

Project Title: Biochar-based materials for electrochemical removal of scaling ions and heavy metals

PIs: Chang Geun Yoon (ESF); Taeyoung Kim, Sitaraman Krishnan (Clarkson)

Project Title: Common loons as sentinel species for environmental health, PFAS and mercury exposure in New York's waters

PIs: Stacy McNulty, Roxanne Razavi (ESF); Sujan Fernando (Clarkson)

Project Title: Meeting drinking water needs in New York State: Improvements in desalination technology and degradation of disinfection byproducts using visible-light induced photoelectrochemical cells

PIs: Leanne C. Powers, Gyu Leem (ESF); Taeyoung Kim, Sitaraman Krishnan (Clarkson)

Project Title: Early Warning of Harmful Algal Blooms Enabled by a Novel CRISPR-based Biosensor

PIs: Yaqi You (ESF); Siwen Wang (Clarkson)

Project Title: Development of a chemoselective electrochemical sensor for perfluorooctanoic acid in real aqua environments

PIs: Gyu Leem, Chang Geun Yoo (ESF); Ian T. McCrum (Clarkson)

2022-2023 COMMERCIALIZATION Projects

Project Title: Struvite Recovery for Organic Production

PI: Wendong Tao (ESF)

Project Title: PFAS Removal and Destruction from Semiconductor Manufacturing Wastewater

PIs: Thomas Holsen, Selma Mededovic, Diana Aranzales (Clarkson)

Project Title: Identification of Nitrification Inhibitors within Semiconductor Manufacturing Wastewaters

PIs: Stefan Grimberg, Thomas Holsen (Clarkson)

Project Title: Development of an AI-Vision Enabled Environmental Monitoring Sensor System for the Real-time Detection of Microplastics in a Waterbody

PI: Abul Baki, Masudul Imtiaz, Thomas Holsen (Clarkson)

Project Title: Linking Nutrient Run-off to Sources Using Microbial Source-Tracking in the Cayuga Lake Watershed

PI: Michael Schummer (ESF)

Project Title: Assessing Seneca Lake sportfish diets and contaminant exposures

PI: Roxanne Razavi (ESF)

Project Title: Analysis of Data and Field Experiments for the Development of Hyperspectral Imaging for PFAS Detection and Development of User Guidance and Handheld Instrument Use

PI: Lee Newman (ESF)

Project Title: Integrating satellite-derived earth observations and machine learning for water studies

PI: Giorgos Mountrakis (ESF)

2021 – 2022 SEED Projects

Project Title: High Capacity Sorbents for Rapid and Efficient Removal of Phosphorous from Nonpoint Sources of Runoff

PIs: Douglas Daley (ESF) and Silvana Andreescu (Clarkson)

Project Title: Non-targeted screening of drinking water disinfection byproducts and their degradation and detoxification using a continuous flow photoelectrochemical cell

PIs: Leanne Powers (ESF), Gyu Leem (ESF), and Jingyun Ye (Clarkson)

Project Title: Development of Sustainable and Renewable Photovoltaic System for Perfluorooctanoic Acids Removal in Aqueous Environment

PIs: Chang Geun Yoo (ESF), Gyu Leem (ESF), Yang Yang (Clarkson), and Ian T. McCrum (Clarkson)

Project Title: Advanced Sequencing to Assess Risks Associated with Antibiotic Resistance as An Emerging Contaminant in Great Lakes Sediment and Fish

PIs: Yaqi You (ESF), Susan Bailey (Clarkson), and Thomas Holsen (Clarkson)

2021 – 2022 COMMERCIALIZATION Projects

Project Title: Rapid Classification of HABs using Digital Field Microscopes and Artificial Intelligence

PIs: Roxanne Razavi, Gregory Boyer, Stephen Shaw (ESF)

Project Title: Cost Reduction and System Improvement of the Clarkson HAB Terminator to Accelerate Commercialization in New York State

PIs: Yang Yang, Stefan Grimberg (Clarkson)

Project Title: Pilot Testing of Ammonia Vacuum Stripping and Absorption on Multiple Waste Streams

PIs: Wendong Tao (ESF)

2020 – 2021 SEED Projects

Project Title: Assessing the ecotoxicity of mixtures of per- and polyfluoroalkyl substances

PIs: Roxanne Razavi and Christopher Whipps (ESF), Sujan Fernando (Clarkson University), and Philip Goodrum (GSI Environmental Inc.)

Project Title: Development of Energy-efficient Wastewater Treatment for Removal of Pharmaceutical contaminants

PIs: Gyu Leem and Chang Geun Yoo (ESF); Yang Yang (Clarkson)

Project Title: High-Capacity Sustainable Sorbents for Treatment of Per-Fluoroalkyl Substances (PFAS) in Contaminated Waters

PIs: Mario Wriedt (CU), Deepak Kumar (ESF), and Bandaru Ramarao (ESF)

Project Title: Forecasting Shoreline Erosion Using Deep Learning to Restore Coastal Ecosystem Services

PIs: Abul Baki (Clarkson), Weiming Wu (Clarkson), and Sharon Moran (ESF)

Project Title: Wetland and Sediment Plume Monitoring using Advanced Remote Sensing and Machine Learning Techniques

PIs: Bahram Salehi (ESF) and Sean Banerjee (Clarkson)

CONTACT

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