



Opportunities for Applied Research
North Carolina Department of Environmental Quality - Division of Water Resources
 December 2020

Purpose: The [North Carolina Office of Strategic Partnerships](#) facilitates research to improve policy and program operations for the benefit of all North Carolinians. Below are partnership opportunities with the **NC Department of Environmental Quality Division of Water Resources**. Each opportunity may have multiple facets and lead to more than one related project. See additional information below, including how to express interest.

	Topic	DEQ research questions/needs	Status of associated data	Relevant info or links
1	Emerging compounds	What are some potential adaptive management strategies for emerging compounds (1,4-dioxane and PFAS-related compounds in groundwater and surface water?	DEQ is currently collecting data and receiving data from permitted facilities. To date, more surface water data has been collected than GW; GW monitoring only for PFAS, not 1,4-dioxane.	DEQ Emerging Compounds: https://deq.nc.gov/news/key-issues/emerging-compounds/managing-emerging-compounds-water
2	Emerging compounds	Collect all DEQ data on 1,4 dioxane and PFAS-related compounds in the Cape Fear (i.e., NPDES, instream, RCRA site runoff) and develop a model to predict downstream concentrations at Public Water Systems (PWS) intakes based on point source reductions/adjustments	PFAS and 1,4-dioxane data is currently collected by DEQ staff and is also submitted by permitted facilities.	DEQ Emerging Compounds: https://deq.nc.gov/news/key-issues/emerging-compounds/managing-emerging-compounds-water
3	Emerging compounds	What is the efficacy of using compound specific isotope analysis for source tracking of emerging compounds like PFAS compounds and 1,4 Dioxane?	PFAS and 1,4-dioxane data collected by DEQ and submitted by permitted facilities is available for a source tracking study.	DEQ Emerging Compounds: https://deq.nc.gov/news/key-issues/emerging-compounds/managing-emerging-compounds-water

4	Emerging compounds	Continue and expand existing emerging compounds work to include other pollutants of the PFAS network (led by Kathleen Gray at UNC-CH and Katy May at NCSU) that helps us communicate with all residents on the risks of emerging contaminants		DEQ Emerging Compounds: https://deq.nc.gov/news/key-issues/emerging-compounds/managing-emerging-compounds-water NCPFAST Network Communication Team: https://ncpfastnetwork.com/research-team/team-6-communication/
5	Nutrient loading	Benefits of management practices; controlled field studies of nutrient mass loading reductions to stream resulting from various agricultural, urban and ecosystem management practices in Piedmont and Coastal Plain physiographic settings. <ul style="list-style-type: none"> • Example stormwater SCMs include floating treatment wetlands, disconnected impervious surface, green roofs, sand filters. • Example ecosystem practices include various riparian buffer improvements, floodplain reconnection. • Example ag practices include crop or pasture conversion to grass or trees, exclusion, buffered exclusion. 	Regulatory credit methods in place for most, but most also based on little, often indirectly applicable data. Varies by practice.	Practice design and crediting standards - https://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information
6	Nutrient loading	What are the sources/driving forces behind pronounced upward trends since ~2000 in annual organic nitrogen loads delivered to NC estuaries – Neuse, Pamlico, Chowan, others?	Neuse, Tar trend analyses by DWR- https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/special-studies	Recent journal papers from Paerl, Osburn – weather factors
7	Healthy water resources	The DEQ Division of Water Resources seeks a non-market benefit analysis of water quality restoration regulations/economic valuation of healthy water resources in North Carolina. This is needed in the context of the fiscal analyses that are part of required rulemaking.		Published and pending studies by Roger von Haefen are relevant
8	Water quality and safety	How can emerging polymerase chain reaction (PCR) analytical methods be folded into current regulatory	Existing E. coli and fecal coliform bacteria assessments in class B	https://www3.epa.gov/npdes/pubs/bacsork.pdf

		frameworks to address non-point source pollution impacted surface waters? How can PCR monitoring for enterococci be applied to class B (recreational waters) to provide more timely recreational advisory information? How can emerging PCR methods be used to for fecal bacterial source tracking in varying streamflow environments?	waters in the French Broad River and other locations.	https://www.epa.gov/sites/production/files/2015-07/documents/mst_for_tmdls_guide_04_22_11.pdf
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Commitment Needed: The research needs above have different timelines and DEQ may decide to pursue a project at any time with one or more researchers. Some opportunities will be short-term, requiring a commitment of a few months or less. Others will need longer commitments. Timeframe/deadlines for completing the projects above will be determined case by case.

Funding: Some projects may require funding. This will depend on the scope of the project, level of expertise needed, and other factors. Research partners, agency officials, and the Office of Strategic Partnerships can discuss funding details, including needs and potential sources, on a case by case basis.

Publication Policy: We are committed to open science best practices, including sharing results and distributing of materials needed to replicate. This includes academic and practitioner publishing and may also include interactive online materials, community forums, podcasts, and beyond as best fit for the relevant audiences.

Context: The North Department of Environmental Quality is a cabinet agency of NC state government, which serves over 10 million residents across policy and programmatic domains. The NC Office of Strategic Partnerships is organizationally part of the NC Office of State Budget and Management (OSBM), which includes data-driven and evidence-based decision making among its priorities.

How to Express Your Interest: Email partnerships@osbm.nc.gov, including your resume and a brief statement of how your skillset and interests align with one or more of the projects described here. Depending on current needs and other considerations, it is possible that not all individuals who express interest will receive a reply.