Introduction

The South Carolina Sea Grant Consortium (Consortium), University of Georgia Marine Extension and Georgia Sea Grant (MAREX), and the National Sea Grant Law Center (NSGLC) are leading a southeast regional research program focused on the influence of climate change on contaminants of emerging concern (CECs). The geographic scope of the project will focus on South Carolina, Georgia and Florida, and includes both the Atlantic and Gulf coasts of Florida.

The U.S. Environmental Protection Agency (EPA) defines contaminants of emerging concern as new or existing chemicals/substances that may not have regulatory standards, are not currently included in routine monitoring programs, and/or have the possibility of adverse toxicological effects. These include but are not limited to: persistent organic pollutants (POPs), pharmaceuticals and personal care products (PPCPs), and nanomaterials. CECs are being detected at increasing levels in the environment, and are receiving attention as their total toxicity to humans and wildlife is not fully understood.

There is a growing need for interdisciplinary research regarding CECs in the southeastern US, especially due to the rapid coastal change occurring in the region. We aim to prioritize research that will address identified issues within our project scope. The advisory committee will participate in a series of discussions to provide input on the prioritization of research needs based on our preliminary research literature gap analysis findings. We will also solicit advisory committee input regarding CEC outreach needs in the region, with a focus on reaching underserved and underrepresented audiences. This input will be combined and addressed through a competitive research grant program. Specifically, we will seek to fund research that can be achieved:

- With a $300,000 grant program;
- With a project ceiling of $60,000 to $70,000 (50% match required);
- Within a 12 to 18-month timeframe;
- Occur in the target geographic area; and
- Be responsive to the program goal of characterizing climate change impacts on CECs.

Common Gaps

Through our preliminary research literature review, common gaps were identified through the assessment of over 100 articles published to date. The following are a representation of these gaps in thematic areas that will be used to guide the advisory committee discussions.

Common Gap #1: Research using holistic approaches and interdisciplinary teams are needed in order to understand the complicated nature of CECs and identify climate’s effect on these contaminants.

Common Gap #2: Robust risk assessments are needed to quantify and update issues in relation to climate interactions and response.
Common Gap #3: Research methodology updates and improvements.
- Lab technology: Current laboratory technologies do not have the analytical capabilities to standardize, identify, and characterize most emerging contaminants (and non-target contaminants) present in the ecosystem.
- Parameters: There is a need for research focused on improving laboratory and site study methodology (and combining these to improve understanding) for representation of multiple stressors, climate effects, chemical mixtures, and multi-trophic level interactions in the ecosystem.

Common Gap #4: Current monitoring protocols do not adequately address the scope of emerging contaminants in waterways, soils, and habitats to supply needed empirical data.

Common Gap #5: Models are a tool that can be used to understand and predict climate - contaminant interactions, however they are currently limited by availability and scope of data sets, and validation is needed.

Common Gap #6: Development and full-scale testing of novel treatment technologies are needed to determine efficacy for use in wastewater and stormwater treatment.

Legal Scan

The preliminary legal scan focused on CECs that the EPA identified in its 2022 memo on how to implement the Clean Water and Drinking Water State Revolving Fund Provisions of the 2021 Bipartisan Infrastructure Law. These CECs include: Perfluoroalkyl and polyfluoroalkyl substances (PFAS) and other persistent organic pollutants (POPs); biological contaminants and microorganisms; pharmaceuticals and personal care products (PPCPs); and nanomaterials. The legal scan searched federal, South Carolina, Georgia, and Florida statutes and regulations for the identified CECs, as well as relevant state and federal agency websites. Key takeaways from the legal scan include:

1. Federal legislation has addressed PFAS by providing funding to the states.
   a. The Bipartisan Infrastructure Bill provided $5 Billion through the State Revolving Funds to help states reduce public exposure to PFAS, address discharges through wastewater, and also potentially address nonpoint sources of PFAS and related substances.¹
2. Federal PFAS regulation is still going through the rule-making process.
   a. Safe Drinking Water Act- EPA proposed the first national drinking water standards for 6 PFAS substances in March of 2022.² The proposed standard regulates PFOA and PFOS as individual substances, and any mixture containing one or more of PFNA, PFHxS, PFHBS, and/or GenX chemicals.³
   b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - EPA issued a notice of Proposed Rulemaking on Inclusion of two PFAS substances, PFOA and PFOS, as well as their salts and compounds with the same chemical formulas but different molecular structures, as CERCLA Hazardous Substances.
   c. In 2022, EPA set non-enforceable, non-regulatory Interim Lifetime Health Advisory levels for PFOA, PFOS, GenX chemicals, or PFBS in drinking water.
d. EPA’s fifth Unregulated Contaminant Monitoring Rule (UCMR 5) under the Safe Drinking Water Act established Minimum Reporting Levels (MRLs) established for 30 compounds (29 PFAS compounds and Lithium).4

3. Georgia and Florida have passed PFAS-related legislation. South Carolina has not.
   a. **GA** - Prohibits use of PFAS chemicals outside of an emergency firefighting or training context.5
   b. **FL** - Directs FL DEP to create statewide cleanup target levels for Perfluoroalkyl and Polyfluoroalkyl Substances on Jan 1, 2025 if no Federal Standards have been created.

4. States PFAS response projects are moving forward. Examples include:
   a. **SC** - South Carolina House Ways and Means Committee created a 10 million dollar state fund via a budget provision to test and address contamination in small and large wells.6
   b. **GA** - To supplement sampling conducted by the EPA under UCMR 5 the state conducted 3 rounds of sampling of wells, water sources, and finished drinking water and is publishing the results in an interactive map, the PFAS Story Map.7
   c. **FL** - Florida has expressed interest in being one of the nation’s leaders in the response to PFAS and has created a PFAS Dynamic Plan to deal with the issue.8

5. Other CEC programs are not as robust as PFAS. Certain municipalities have enacted legislation meant to deal with CECs, but statewide action is limited outside of PFAS.9
   a. Pharmaceuticals and personal care products (PPCPs):
      i. U.S. EPA regulates the generators of hazardous pharmaceutical waste under Resource Conservation and Recovery Act (RCRA) and prohibits the waste from being put in the sewer system. For individual disposal of prescription and over-the-counter drugs, the EPA suggests best management practices, such as drug take-back events.
      ii. After Key West, FL implemented an ordinance prohibiting the sale of certain sunscreens in order to protect reefs, the state legislature passed a law preempting all local regulation of over-the-counter proprietary drugs and cosmetics.10
   b. The categories of biological contaminants and microorganisms, pharmaceuticals and personal care products (PPCPs), and nanomaterials are quite broad. Future work on the legal scan could benefit from identification of certain CECs in these categories.
   c. General searches of state laws and regulations did not identify many specific state actions related to biological contaminants and microorganisms.
   d. Harmful Algal Blooms (HABs) are of concern in the Southeast, particularly in Florida, which is the only state out of those included in this project that has specifically passed legislation on identifying and monitoring HABs.
   e. Nanomaterials:
      i. The U.S. Food & Drug Administration believes the existing regulatory framework is flexible and robust enough to regulate nanomaterials and a nanomaterial-specific framework is not needed. The FDA Nanotechnology Task Force produced a report in July 2007 with recommendations the agency can take in order to protect and promote public health. The FDA has also produced guidance documents related to nanotechnology.
ii. The U.S. EPA regulates nanoscale materials that are regarded as "chemical substances" under the Toxic Substances Control Act (TSCA). EPA regulatory actions include a nanotechnology reporting rule for when a new substance is being produced or a new use for a substance, like carbon nanotubes, is being proposed.

Closing remarks

By the end of the advisory committee meetings, collaborative discussions will elucidate priorities to be incorporated into the Request for Proposals (RFP) grant competition, slated for a late 2023 release. The identified priorities should include consideration of community needs, stakeholder engagement, and research communication, as these are requirements for successful proposal submissions.

Thank you for agreeing to participate in this committee. We look forward to engaging in these discussions and addressing identified CEC needs in the southeast region.

If you can accept and would like to request to receive the participation stipend once the series of meetings concludes, please email Hailey (hailey.connell@scseagrant.org) for information.
Definitions and Common Uses of Emerging Contaminants

1. **Perfluoroalkyl and polyfluoroalkyl substances (PFAS)** - a group of substances used in a wide variety of applications for their resistance to degradation, heat, oil, and non-stick properties. PFOS and PFOA are part of a subset of PFASs known as perfluorinated alkyl acids (PFAAs).

2. **Pharmaceuticals and personal care products (PPCPs)** - a diverse group of chemicals that include all drugs (both prescription and over-the-counter medications) and non-medical consumer chemicals, such as the fragrances (musks) in lotions and soaps and the ultraviolet filters in sunscreens.

3. **Nanomaterials** - materials comparable in size to atoms or molecules which are either engineered to perform a specific purpose or exist as the result of breakdown of larger substances such as plastic pollution.

4. **Persistent Organic Pollutants (POPs)** - synthetic chemicals that were introduced into commercial use for pest and disease control, crop production, and industry.

5. **GenX chemicals** - GenX is a trade name for a processing aid technology used to make high-performance fluoropolymers without the use of PFOA.

References


3. Ibid.

4. Ibid.


12. *Contaminants of Emerging Concern (CECs) in Fish: Pharmaceuticals and Personal Care Products (PPCPs)*, U.S. Environmental Protection Agency, September 2013.

