Stephanie B. Kennedy, Ph.D.

SENIOR SCIENTIST II

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Dr. Stephanie Kennedy is an ecotoxicologist at ToxStrategies with expertise that contributes to both the Health Sciences and Exposure practices. Dr. Kennedy has experience in ecotoxicological hazard identification and ecological risk assessment, and is well versed in aquatic ecotoxicology. She has worked with a diverse client base, including industry and industry trade associations, government (federal and state), and nonprofit organizations. Dr. Kennedy has applied various regulatory paradigms when assessing chemical hazards and deriving ecological toxicity values, including guidance from the European Chemicals Agency (ECHA), the European Commission (EC), and the United States Environmental Protection Agency (EPA). Dr. Kennedy has experience in collecting, extracting, appraising, and synthesizing scientific evidence and communicating findings effectively to facilitate informed decision-making. She has performed chemical hazard assessments according to criteria from GHS and Cradle to Cradle methodologies. Dr. Kennedy has served as an ecotoxicological technical expert on multi-disciplinary work groups, including the Interstate Technology and Research Council (ITRC), and has provided expert comment and support regarding ecological issues on draft regulatory documents.

In addition to her ecotoxicological technical skills, Dr. Kennedy is also proficient in information sciences. She is familiar with searching and navigating databases such as ToxPlanet, PubMed, and Embase for literature review and establishing workflows in systematic review software such as DistillerSR. Dr. Kennedy has streamlined reference management for a large evidence base and managed literature review for the rapidly evolving knowledge base on a contaminant of emerging concern, incorporating QA/QC throughout the project to ensure data accuracy. She also developed a novel ecological toxicity study reliability assessment framework which integrated concepts from existing critical appraisal tools (NTP-OHAT, CRED, USEPA-TSCA) and was applied to PFAS ecotoxicity studies.

Dr. Kennedy previously worked at the state regulatory level in water quality and environmental health monitoring programs. She assisted in project management by coordinating biological sampling efforts and laboratory activities. She also used her capability with geographic information system software (ArcGIS) to correlate water quality parameters with site physical characteristics. She is also well versed in water quality topics such as aquatic ecology, harmful algal blooms, water chemistry, and the application and integration of these topics within the context of state and federal regulations. Her diverse educational background includes a B.S. in Marine Science, an M.S. in Environmental Health Science, and a Ph.D. in Environmental Toxicology. Her dissertation research investigated the acute and chronic toxicity of tire-wear particles to aquatic organisms, using biomarker analyses to identify adverse effects. This research included field surveys of stormwater ponds to determine environmental exposure. She also incorporated outreach within her dissertation research that provided opportunities for undergraduate and high school students to develop practical laboratory skills and encouraged scientific inquiry related to microplastic and environmental science research. Her additional research projects extend into evaluating the endocrine-related effects on largemouth bass within a PCB-contaminated reservoir.

EDUCATION AND DEGREES EARNED

2021 Ph.D., Environmental Toxicology, Clemson University, Clemson, SC
(Certificate in Engineering and Science Education, 2019)

2017 M.S., Environmental Health Sciences, The University of South Carolina, Columbia, SC

2014 B.S., Marine Science, The University of South Carolina, Columbia, SC
(specializing in Biological Oceanography)

PROFESSIONAL ASSOCIATIONS

2023–2025 Interstate Technology and Regulatory Council (ITRC) — Tire Anti-Degradants (6PPD) Team

2016–Present Society of Environmental Toxicology and Chemistry (SETAC)

- North America 2024 Annual Meeting Program Committee
- Environmental Risk Assessment Interest Group, Chair (2025 – Present)

2016–Present Carolinas Chapter of Society of Environmental Toxicology and Chemistry (CSETAC)

- Board of Directors (2023-Present)

RECOGNITIONS/AWARDS

2021 Stephen Klaine Memorial Fellowship, Clemson University

2021 Graduate Student Travel Grant, Clemson University

2021 Graduate Student Travel Grant, SETAC North America Chapter

2019 2nd Place Best Poster Presentation in College of Science, Clemson University GRADS

2016 Graduate Student Travel Grant, SETAC North America Chapter

2014 Magellan Scholar, University of South Carolina

SELECTED PROFESSIONAL EXPERIENCE

Ecotoxicology and Ecological Risk Assessment

Reviewed existing water quality criteria or benchmarks for the protection of aquatic life and their basis for a large project developing proposed aquatic life-based thresholds in support of water quality standards protective of human health and aquatic life for a state regulatory agency.

Developed and proposed aquatic life threshold values protective of aquatic life in compliance with existing guidance documents from a state regulatory agency. This project involved reviewing aquatic toxicity-based data and literature for over 250 contaminants of emerging concern and was conducted to support the agency's exploration into expanding state water resources.

Evaluated the output of quantitative structure activity relationship (QSAR) models for ecotoxicity endpoints in a weight of evidence approach, including EPA ECOSAR, EPA T.E.S.T., and the European-based model, VEGA, to determine suitability for use in hazard identification for data-poor contaminants of emerging concern.

Developed annual average concentrations (AA-EQS) for several short-chain and ultrashort-chain per- and polyfluoroalkyl substances following European Commission (EC) assessment factor approach.

As a ChemFORWARD verified assessor, provides ecological and environmental toxicology support for chemical hazard assessments. Evaluation and hazard classification consists of human health and environmental toxicity endpoints, based on criteria from the United Nations' Globally Harmonized System of Classification and Labelling of Substances (GHS) and Cradle to Cradle Certified™ Material Health Assessment Methodology (C2C). Provides written rationales and data summaries to support conclusions and hazard classifications for environmental toxicity endpoints.

Performed a screening level risk assessment for particulate matter and 28 metals in the aquatic environment. This evaluation included comparing existing regulatory water quality screening values (e.g., Brazil, US, Europe) against field-collected data regarding metal concentrations in estuarine surface water and sediment.

Summarized human health and ecological toxicity data from scientific publications reporting tire-wear particles, a non-exhaust vehicle emission, and 6PPD-quinone, a transformation product of 6PPD, which is a widely used antiozonant found in rubber products (including motor vehicle tires). Extracted data were used to prepare conceptual exposure models and identify data gaps. These data were used to support industry trade association efforts to understand the evolving state of knowledge regarding TRWP and 6PPD-quinone in the environment and its potential risk to ecological receptors and humans.

Reviewed and summarized literature to update the current knowledge base on the toxicity of tire-wear particles and associated chemicals for human and environmental health. Created tabular and graphical summaries of toxicity values (e.g., LC50s) in Microsoft Excel and R. Created data visualizations and interactive tables using Tableau software.

Facilitated discussions at a multi-day meeting among researchers from various academic institutions, federal agencies, and industry regarding the potential mechanism of action in fish for a contaminant of concern.

Drafted summary documents on ecotoxicity of 6PPD and 6PPD-quinone and reviewed technical guidance materials produced by the Interstate Technology and Regulatory Council (ITRC) Tire Anti-Degradants (6PPD) Team.

Provided expert commentary related to ecotoxicity and ecological risk assessment considerations on regulatory draft documents (e.g., Washington Department of Ecology, California Department of Toxic Substances Control).

Collected and reviewed ecotoxicity hazard information for use in ecological risk assessments for various industries, including agricultural and chemical manufacturing facilities. Hazard information included review of standardized laboratory tests (e.g., OECD) and toxicity tests published in the peer-reviewed literature. Hazard data were integrated with exposure data and summarized in an ecological risk assessment report.

Derived toxicity values (Predicted No-Effect Concentrations or Environmental Quality Standards) following regulatory guidance for use in environmental and ecological risk assessments. Experience with various regulatory paradigms including ECHA's guidance on information requirements and chemical safety assessment (R.10), EC's Technical Guidance for Deriving Environmental Quality Standards, and US EPA's 1985 Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses.

Advised and recommended next steps regarding ecotoxicological study results on drugs for pharmaceutical companies with consideration of US and European regulations.

Prepared an environmental assessment for a new drug application for submission to the United States Food and Drug Administration (FDA) in accordance with FDA guidance. Assessed the expected introduction concentration into the aquatic environment and evaluated extraordinary circumstances that may significantly affect the quality of the human environment (e.g., estrogenic, androgenic, or thyroid activity of the new drug).

Conducted an environmental risk assessment for a new drug in accordance with the European Medicines Agency (EMA) guidelines for submission in a marketing authorization application. A predicted environmental concentration in surface water was determined, and screening for persistence, bioaccumulation, and toxicity (PBT) characteristics was performed. Reviewed and interpreted ecotoxicity and chemical fate test reports to evaluate potential environmental hazards.

Provided ecotoxicological support in the evaluation of potential environmental health risks associated with trace levels of PFAS in fluorinated containers, including with the manufacturing and downstream users' conditions of use.

Performed data extraction of microplastics ecotoxicity data for the Southern California Coastal Water Research Project's Toxicity of Microplastics Explorer (ToMEx). Led a small group of researchers in developing a manuscript that evaluates microplastics research study quality and applicability to risk assessment.

Assisted in management of remediation and closure plans for an abandoned steel plant by reviewing RCRA Closure Plans for hazardous waste management units and ensuring proper submission of documentation to state and federal agencies while maintaining communication and status updates with project partners.

Provided ecotoxicological support and expert comment on an environmental investigation plan (EIP), an environmental assessment report (EAR), and human health and ecological risk assessment (HHERA) documentation for coal-fired power plants under the coal combustion residuals (CCR) rule. Performed laboratory-based toxicity tests to evaluate the response in fish species from acute and chronic exposures to tire and road-wear particles and their associated chemicals to elucidate environmental risks associated with exposure. Conducted biomarker analyses and refined chemical analytical techniques to determine exposure effects in fish.

Conducted Master's-level research on largemouth bass sampled from a PCB-contaminated reservoir to measure endocrine disruption effects (i.e., vitellogenin production in males, intersex condition) in fish.

Information Sciences

Organized and developed a literature search, review, and data extraction workflow using DistillerSR to enhance and streamline the summary of toxicity and occurrence data for a conceptual risk model.

Developed a novel study reliability assessment tool for evaluation of ecotoxicological studies. This tool was implemented in environmental risk assessments of PFAS compounds.

Performed literature searches using ToxPlanet, PubMed, Embase primary databases, and searches using regulatory sources (ECHA REACH registrations, USEPA ECOTOX) to identify toxicity information for chemicals.

Conducted title and abstract screening, full-text screening, data extraction, and study quality evaluations for chemical safety assessments.

Used DistillerSR and SWIFT Review to systematically review literature in chemical assessments.

Performed literature searches and data extraction from authoritative resources (e.g., FDA, EFSA) to obtain relevant information for food ingredient safety evaluations.

Conducted hazard assessments for ingredients (e.g., botanicals, minerals) intended for use in dietary supplement formulations, which included reviewing available information such as substance identity and properties, use and limit requirements determined by regulators, and general safety information.

Used ArcGIS software for spatial analysis and data visualization, which included modeling air emissions from oil refinery facilities and identifying exposure scenarios based on the modeling.

Documented ArcGIS spatial processing workflow and drafted methodology in a report that summarized how ArcGIS was used to identify potential exposure populations.

Environmental Sampling

Evaluated biomonitoring study designs used to assess ecological community metrics in ecological risk assessments to support conclusions of chemical risk.

Designed and conducted field surveys and analysis for microplastic abundance in biota from stormwater ponds.

Managed bacterial stream sampling at more than 300 locations and coordinated with five regional laboratories for a nonpoint-source pollution monitoring program conducted under Clean Water Act section 319.

Standardized laboratory protocol for a state-wide chlorophyll program to ensure data quality. Analyzed water samples for chlorophyll content as a biological indicator of water quality. Analyzed biological monitoring data (contaminants in fish, macroinvertebrate surveys) to assess human health and environmental hazards.

Used ArcGIS software to investigate relationships between water quality, site topography, and other characteristics.

Proficient in identification of benthic macroinvertebrates, including chironomids, for bioassessment of streams and rivers.

Proficient in identification of freshwater fishes of North America.

Researched the spatial and temporal characteristics of a South Carolina lake regarding its buffering capacity. Identified causes of spatial variability of algal blooms as a result of differences in lake water quality assessed using field surveys, sampling, and analysis of historical data. Formed a partnership with a local homeowners' association to encourage involvement, outreach, and public education.

Science Education & Outreach

Completed a Certificate in Engineering and Science Education from Clemson University (2019) that focused on effective teaching methods and practical teaching experience in higher education.

Coordinated environmental outreach to two high schools for Clemson University's "What's in Our Waters" program. Led groups of undergraduates in planning and organizing outreach activities, adapted and revised environmental education based on feedback, mentored undergraduate and high school students on environmental topics, and co-authored a peer-reviewed paper reporting these activities (see Godfrey et al., below).

Served as a mentor for undergraduate and high school students for the development and execution of environmental science research projects.

Developed course materials and taught undergraduate biological sciences laboratory course for non-majors at Clemson University.

PEER-REVIEWED PUBLICATIONS

Submitted

Coffin S, Bertrand L, Ahmed KT, de Souza Leite L, Coger W, Siña M, Barrick A,..., **Kennedy SB**, et al. A comprehensive probabilistic framework for deriving microplastic hazard thresholds: Development and application to marine and freshwater ecosystems with ToMEx 2.0 data. *Submitted to J Haz Mat*, *August 2025*.

Kennedy SB, Antonio Vital AL, Kukkola A, Miller E, Yeh A, Coffin S, Ahmed TK, Bertrand L, et al. Trends in quality and risk assessment applicability of microplastic ecotoxicity studies. *Submitted to J Haz Mat*, *August 2025*.

Published

Hampton LMT, Wyler DB, Almroth BC, Coffin S, Cowger W, Doyle D,... Bare JL,... **Kennedy SB**, et al. 2025. The toxicity of Microplastics Explorer (ToMEx) 2.0. Microplast Nanoplast 5(1):38; doi: 10.1186/s43591-025-00145-6.

Kennedy SB, Heintz MM, Klaren WD, Wikoff DS, Haws LC, Fitch SE. 2025. An integrated ecotoxicological study reliability framework for use in toxicity value development. Environ Tox Chem 44(4):1142-1153; doi: 10.1093/etojnl/vgaf030.

Racz L, Gauthier A, Bare J, Heintz M, Feifarek D, **Kennedy S**, Panko J. 2024. Assessment of perfluorocarboxylic acids in fluorinated high-density polyethylene containers and estimation of potential non-cancer risks associated with anticipated use scenarios. Regul Toxicol Pharmacol 147(Feb):105560; doi: 10.1016/j.yrtph.2024.105560.

Godfrey G, **LaPlaca S**, Heintz M. 2022. Developing young watershed citizen scientists through professional partnerships in the classroom. Am Biol Teach 84(4):202–206; doi: 10.1525/abt.2022.84.4.202.

LaPlaca SB, Rice, CD, van den Hurk, P. 2022. Chronic toxicity of tire crumb rubber particles to mummichog (*Fundulus heteroclitus*) in episodic exposures. Sci Tot Environ 846(Nov 10):157447; doi: 10.1016/j.scitotenv.2022.157447.

LaPlaca SB, van den Hurk P. 2022. Accumulation of microplastic and microrubber particles in stormwater pond fish and invertebrates. bioRxiv 2022.2003.2003.482888; doi: 10.1101/2022.03.03.482888.

LaPlaca SB, van den Hurk P. 2020. Toxicological effects of micronized tire crumb rubber on mummichog (*Fundulus heteroclitus*) and fathead minnow (*Pimephales promelas*). Ecotoxicol 29(5):524–534; doi: 10.1007/s10646-020-02210-7.

PRESENTATIONS AND ABSTRACTS

Heintz MM, **Kennedy SB**, Brown L, Fender CL, Hecker M, Hughes SA, Naile J, DeLeo P. Toxicogenomics in ecological risk assessment: Current landscape, research gaps and recommendations to increase confidence across sectors. Abstract 1.02.T-01, Society of Environmental Toxicology and Chemistry (SETAC) North America 46th Annual Meeting, Portland, OR, November 2025.

East A, Wheeler M, **Kennedy S**. Artificial intelligence application to critical appraisal of published literature: A case example using the Criteria for Reporting and Evaluating Ecotoxicity Data (CRED) evaluation method. Poster presentation, Health and Environmental Sciences Institute (HESI) Biannual Meeting, Washington, DC, June 2025.

Coffin S, Barrick A, Yeh A, Kukkola A, Carney Almroth B, Miller E, Ahmed KT,..., **Kennedy SB**, et al. Application of probabilistic species sensitivity distribution modeling to characterize microplastic risk for marine and freshwater environments. Abstract 1.10.P-Tu-096, SETAC 35th Annual Meeting, Vienna, Austria, May 2025.

Kennedy SB, Doyle D, Coffin S, Mair MM, Cowger, Miller EL, Antonio Vital AL, Barrick A, et al. Trends in study quality and reporting in in microplastics research. Abstract 1.09.P-Mo-101, SETAC 35th Annual Meeting, Vienna, Austria, May 2025.

Thornton Hampton L, Mair MM, **Kennedy SB**, Wyler DB, Carney Almroth B, Coffin S, Cowger W,…, et al. The Toxicity of Microplastics Explorer (ToMEx) 2.0 database – A unique compilation of microplastics effects measurements for environmental risk assessment. Abstract 1.09.P-Mo-061, SETAC 35th Annual Meeting, Vienna, Austria, May 2025.

Session co-chair: "Ensuring Scientific Integrity: Strategies for Assessing Study Reliability and Bias in Ecotoxicology." SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Bare J, **Kennedy SB**, Feifarek D, Panko J. Quality and reliability evaluation of 6PPD-quinone surface water occurrence data and considerations for use in risk assessment. Abstract 4.22.P-Mo-119, SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Feifarek D, **Kennedy SB**, Panko J. Mechanistic evaluation of 6PPD-quinone toxicity in fish. Abstract 4.22.B.T-03, SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Hampton LT, **Kennedy SB,** Barrick A, Wyler DB, Almroth BC, Coffin S, et al. The toxicity of microplastics explorer 2.0: Are we moving the needle forward on microplastics toxicity research? Abstract 7.03.T-05, SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Kennedy SB, Doyle D, Coffin S, Mair MM, Cowger W, Barrick A, et al. Trends in quality and risk assessment applicability of microplastic ecotoxicity studies. Abstract 7.03.P-Th-081, SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Lane R, Gill S, Miller EL, **Kennedy SB**, Shankar P, Williams T, et al. Rolling along: State of the science for tire related chemicals 6PPD and 6PPD-quinone. Abstract 4.22.P-Mo-115, SETAC North America 45th Annual Meeting, Fort Worth, TX, October 2024.

Kennedy SB, Feifarek D, East AW, Bare JL, Vivanco SN, Panko JM. Differential acute sensitivity to 6PPD-quinone among aquatic species and regional applicability. Poster presented at SETAC North America 44th Annual Meeting, Louisville, KY, November 2023.

LaPlaca SB, Heintz MM, Wikoff DS, Feifarek D, Haws LC. Multi-step integration of ecotoxicological study reliability in ecological risk assessment. Poster presentation at SETAC North America 43rd Annual Meeting, Pittsburgh, PA, November 2022.

Heintz MM, **LaPlaca SB**, Feifarek D, Haws LC. Development of annual average concentrations (AA-EQs) for several short-chain and ultrashort-chain per- and polyfluoroalkyl substances. Poster presentation at SETAC North America 43rd Annual Meeting, Pittsburgh, PA, November 2022.

LaPlaca SB, van den Hurk P. Accumulation of microplastic and microrubber particles in stormwater pond fish and invertebrates. Poster presentation at South Carolina Water Resources Conference, Columbia, SC, October 2022.

Fitch S, Klaren WD, Payne L, **LaPlaca S**, Wikoff D. Comparison of public and private literature databases for toxicological investigations. Poster presented at Society of Toxicology 61st Annual Meeting, San Diego, CA, March 2022.

LaPlaca SB, van den Hurk P. Toxicity of a pulsed chronic exposure to crumb rubber particles in mummichog (*Fundulus heteroclitus*). Platform presentation at SETAC North America 42nd Annual Meeting, Portland, OR, November 2021.

Fantone J, Charlot A, Kinard L, Moran K, **LaPlaca S**. Comparison of microplastics from suburban and rural areas of South Carolina. Poster presentation at Clemson Biological Sciences Annual Student Symposium, Clemson, SC, March 2021.

LaPlaca SB. Identification and toxicity of compounds associated with tire wear particles in fathead minnow and mummichog. Platform presentation at Pollutant Response in Marine Organism (PRIMO) symposium, Charleston, SC, May 2019.

LaPlaca SB. Toxicological effects of tire wear particles on mummichogs and fathead minnows. Poster presentation at annual meeting of the SETAC North America 39th Annual Meeting, Sacramento, CA, November 2018.

LaPlaca SB, Scott GI. Assessing potential endocrine disruption in largemouth bass from a PCB-contaminated reservoir in South Carolina. Poster presentation at SETAC North America 37th Annual Meeting, Orlando, FL, November 2016.

LaPlaca SB. Evaluation of intersex condition, vitellogenin, and endocrine disruption in largemouth bass from Lake Hartwell, SC. Platform presentation at the Carolina Area Biologist Association Workshop, Hot Springs, NC, April 2016.

LaPlaca SB, Tufford DL. Assessing the spatial and temporal aspects of buffer capacity in Lake Wateree, SC. Poster presentation at the South Carolina Water Resources Conference, Columbia, SC, October 2014.