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Patricia M. Clyde, Ph.D.

Senior Environmental Chemist

Dr. Clyde is an environmental chemist specializing in contaminant fate and transport, environmental forensics, read-across assessment, and wastewater treatment. At Gradient, she provides chemistry expertise on a range of projects, involving cost allocation, source identification, remedy evaluation, and contaminant modeling. She also advises on the use of appropriate chemicals for toxicological read-across analyses to support consumer product safety assessments. Before joining Gradient, Dr. Clyde received her Ph.D. in Marine and Atmospheric Science from Stony Brook University, where she authored a dissertation on the fate and transport of pharmaceuticals and personal care products in on-site wastewater treatment systems. She also has experience working with quaternary ammonium compounds as tracers to assess the effects of extreme weather events on sewage distributions in coastal embayments.

Areas of Expertise

- Contaminant Fate & Transport
- Environmental Forensic Chemistry
- Analytical Chemistry
- Wastewater Treatment
- Read-Across Assessment

Education

- Ph.D., Marine and Atmospheric Science, Stony Brook University
- B.S., Chemistry, and B.A., Mathematics, Bucknell University

Selected Projects

Contaminant Evaluation at a Superfund Site: Evaluated the nature and distribution of contaminants near multiple properties at a complex sediment Superfund site. Used spatial distribution analyses, chemical fingerprints, and historical records to connect remedy-driving chemicals with potential upland sources in support of equitable cost allocation.

Fate and Transport Assessment: Evaluated the fate and transport of 1,4-dioxane on Long Island and the potential contribution of 1,4-dioxane from private septic systems to public water supply wells in Suffolk County.

Toxic Substances Control Act (TSCA) Chemical Analysis: Coordinated analytical laboratory testing of representative chemicals within a TSCA new chemical category. Assisted with the interpretation of the test results and related communications with US EPA.

Statistical Assessment of Tetrachloroethylene (PCE) in Groundwater: Provided technical and strategic support to a potentially responsible party group at a Superfund site to address a PCE plume in groundwater. Statistically assessed PCE plume stability and trend analyses as part of a proposed amendment to the remedial approach (*i.e.*, from active pump-and-treat to monitored natural attenuation).

Contaminated Sediments Evaluation: Updated an existing polycyclic aromatic hydrocarbon (PAH) forensics allocation model for contaminated sediments in an urban waterway.

Consumer Product Safety Chemical Analysis: Applied read-across, structure-activity relationship (SAR) models, and other chemistry-related tools to ensure consumer product safety and reduce reliance on animal testing. Authored reports supporting the use of read-across chemical analogs to predict the physiological behavior of chemicals that lack readily available toxicity data.

Selected Publications and Presentations

Clyde, PM; Zic, KA; Rice, JW. 2023. "Domestic Wastewater as a Potential Non-point Source of PFAS Contamination in the United States (and North America)." Poster # 4.13.P-Th-099. Presented at the SETAC North America 44th Annual Meeting, Louisville, KY, November 12-16.

Clyde, P; Smolinski, R; Price, R; Venkatesan, A; Brownawell, B. 2022. "Evaluating the Effects of Antibiotics on the Biological Transformation of Nitrogen and PPCP Removal from On-site Wastewater in Nitrifying Sand Columns." Presented at SETAC North America 43rd Annual Meeting 2022, Pittsburgh, PA, November 15.

Clyde, P; Chinniah, A; Kneeland, J. 2022. "Read-Across: A Promising Tool for Predicting Removal of Chemicals of Emerging Concern From Wastewater." Poster presented at SETAC North America 43rd Annual Meeting 2022, Pittsburgh, PA, November 15.

Clyde, P; Lee, C; Price, R; Venkatesan, A; Brownawell, B. 2021. "Occurrence and removal of PPCPs from on-site wastewater using nitrogen removing biofilters." *Water Res.* 206:117743.