

# Jessie M. Kneeland, Ph.D.

## Senior Environmental Chemist

[jkneeland@gradientcorp.com](mailto:jkneeland@gradientcorp.com)



Dr. Kneeland is a senior environmental chemist with a diverse scientific background, including expertise in organic geochemistry, oceanography, and climate science. At Gradient, she interprets chemical signatures to discern different sources of chemicals in the environment. She also helps companies understand and comply with chemical regulatory requirements around the world. Prior to joining Gradient, Dr. Kneeland taught environmental chemistry at Haverford College. Her doctoral research involved identifying new chemical biomarkers of environmental stress in corals. She also used chemical proxies from marine sediments to reconstruct ancient ocean temperature records and related those histories to known climate shifts. Her scientific interests involve using chemical signatures to trace biological, chemical, and physical processes in the environment.

### Representative Projects

**Product Stewardship:** Analyzed existing data and identified data gaps to support new chemical registrations in the US (TSCA), EU (REACH), Australia, Japan, and China. Coordinated with commercial laboratories to obtain the necessary test data.

**Cost Allocation:** Coordinated a large, multidisciplinary project to evaluate equitable cost allocation options on behalf of a group of cooperating parties. Directed efforts to analyze site data, compile historical information, and consider risk assessments in the context of cost allocation among different chemicals, sites, and parties.

**Chemical Forensics:** Performed a multivariate data analysis on organic contaminant data to differentiate potential pollutant sources in support of an equitable cost allocation at a Superfund site with a long and complex history of industrial activity.

**TSCA New Owner Audit:** As part of a new owner's audit under the Toxic Substance Control Act (TSCA), reviewed a portfolio of chemical products for regulatory compliance. Oversaw the collection and evaluation of product composition data, chemical-specific regulatory restrictions, import/export transactions, and regulatory filings.

**Landfill permitting:** As part of a hearing regarding a proposed landfill expansion, evaluated potential impacts to surface water and groundwater from landfill leachate. Reviewed data regarding leachate, groundwater, and surface water chemistry, in comparison to regulatory standards and permit conditions. Prepared exhibits to be used in hearing testimony.

**Forensics of Natural Gas Liquids:** Performed forensic analysis of hydrocarbons in fugitive NAPL to evaluate claims of recent spills at a closed natural gas processing facility. Oversaw data analysis including ratio analysis and principal components analysis of PIANO data to compare hydrocarbon composition in groundwater monitoring wells to potential contamination sources.

### Areas of Expertise

- Organic Geochemistry
- Chemical Fingerprinting
- Product Stewardship
- Fate and Transport
- Oceanography
- Climate Change Science
- Environmental Forensics

### Education

Ph.D., Chemical Oceanography, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution

S.M., Climate Chemistry and Physics, Massachusetts Institute of Technology

B.S., Geology, California Institute of Technology

### Selected Publications and Presentations

**Kneeland, J;** Sharma, M. 2019 (Winter) "Billion dollar dilemma." *Gradient Trends - Risk Science & Application* 74:1-2.

**Kneeland, J;** Zhang, J; Becker, G. 2019. "Polymers: Global Product Stewardship Approaches." Presented at Product Stewardship Conference 2019, Columbus, OH, September 10-12. 57p.

Tcaciuc, P; **Kneeland, JM;** Wait, AD. October 17, 2018. "Natural Gas Condensate Forensics: A Case Study." Presented at the AEHS Foundation 35th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA. 20p.

**Kneeland, J.** November 2, 2017. "Around the World With Your New Chemicals." Presented at the Product Stewardship Society's Product Stewardship Conference 2017, Tampa, FL. 26p.

**Kneeland, JM;** Butler, EL. 2013. "Hydraulic Fracturing Fluid Forensics: Potential and Pitfalls." Presented at 20<sup>th</sup> International Petroleum Environmental Consortium Conference, San Antonio, TX, November 12.

**Kneeland, JM;** Hugen KA; Cervino J; Hauff B; Eglinton TI. 2013. "Lipid biomarkers in *Symbiodinium* dinoflagellates: New indicators of thermal stress." *Coral Reefs*. 32:923-934.



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One Beacon Street, 17<sup>th</sup> Floor, Boston, MA 02108 | 617-395-5000