# Dr. Susanna Theroux

Ecologist
Biology Department
Southern California Coastal Water Research Project

---

# Education

Ph.D., geological sciences, Brown University, 2012

M.S., geological sciences, Brown University, 2009

B.A., biology and geology, Williams College, 2005

# Professional Experience

Principal Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2022-present.

Senior Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2020-2022.

Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2016-2019.

Computational biology postdoctoral fellow, DOE Joint Genome Institute. Walnut Creek, CA. 2012-2015.

Graduate research assistant, Brown University Department of Geological Sciences. Providence, RI. 2007-2012.

Research technician, Woods Hole Marine Biological Laboratory. Woods Hole, MA. 2005-2007.

# Honors and Awards

DOE Joint Genome Institute Director’s Discretion Proposal, 2014.
American Association of University Women (AAUW) Dissertation Fellowship, 2011.
Geological Society of America (GSA) Student Research Grant, 2010.
Brown-MBL Graduate Fellowship, Brown University, 2007-2009.
Professor Jack L. Strominger Graduate Fellowship, Brown University, 2008.

# Professional Societies and Certifications

California Molecular Methods Workgroup

Marine Technology Society (MTS)

International eDNA Standardization Task Force (iESTF)

West Coast Ocean Biomolecular Observation Network (WC-OBON)

Ocean Biomolecular Observation Network (OBON)

# Selected Presentations and Conference Proceedings

Theroux, S. Standardization is a necessary step toward widespread eDNA adoption by decision-makers. Ecological Society of America Annual Meeting. Baltimore, MD. August 12, 2025.

Theroux, S. Guillemette, R., Zimmerman, J., Langlois, K, Patin, N., Steele, J., Griffith, J. State of play: Coupling mesocosms and DNA metabarcoding to illuminate the role of bacterial communities in marine eDNA decay. Southern eDNA Society Annual Meeting, Wellington, NZ. February 19, 2025.

Theroux, S. Integration of molecular methods into routine biological monitoring. Cold Spring Harbor Banbury Center Workshop on Nanopore Sequencing. September 22, 2024. Cold Spring Harbor, NY.

Theroux, S. Research to implementation: from national to local scales. 3rd National Workshop on Marine eDNA. June 3, 2024. Laurel, MD.

Theroux, S. Advancing eDNA method adoption for bioassessment and biomonitoring. 6th Annual

eDNA Technical Exchange Workshop. January 26, 2023. Via webinar.

Theroux, S. molecular methods standardization for biomonitoring and bioassessment. California Environmental Laboratory Accreditation Program (ELAP) Conference. June 2, 2021. Via webinar.

Theroux, S. California Dreaming of Molecular Methods for Bioassessment. National Water Monitoring Conference. April 20, 2021. Via webinar.

Theroux, S. Advancing eDNA Tools for Bioassessment Applications. California Aquatic Bioassessment Workgroup (CABW). October 13-14, 2020. Davis, CA.

Theroux, S. Mind the gap: bridging the distance between eDNA research and regulatory integration. International Workshop on Environmental Genomics. June 24-25, 2020. St John’s, Newfoundland, Canada.

Theroux, S. Mazor, R., Stein, E. 2019. Incorporating molecular ecology tools into coastal and estuarine monitoring programs. Paper presented at the Coastal & Estuarine Research Federation annual meeting. Mobile, AL.

Theroux, S. 2019. Efforts to standardize molecular approaches to bioassessment in California and beyond. Paper presented at the COST Action CA15219 ('DNAqua-Net') Meeting, Limassol, Cyprus.

Theroux, S., Vasselon, V., Bouchez, A., Stein, E. 2019. Effect of bioinformatic pipeline on bioassessment index performance. International Barcode of Life (iBoL) conference. Trondheim, Norway.

Theroux, S., Steele, J., Griffith, J., Stein, E. 2019. A tale of two taxonomies: comparing morpho- and molecular taxonomy for stream algal bioassessment. Paper presented at the Society for Freshwater Science (SFS) Annual Conference. Salt Lake City, UT.

Theroux, S., Mazor, R., Stein, E., Sutula, M. 2017. A DNA-based approach for stream algal bioassessment: a case study in Southern California. Paper presented at the Phycological Society of America Annual Meeting. Monterey Bay, CA.

Theroux, S. 2017. A High-Throughput DNA Sequencing Approach to Algae Monitoring Allows for Enhanced Bioassessment. Paper presented at the Southern California SETAC Annual Conference. Dana Point, CA.

Theroux, S. Hartman, W., Tringe, S. 2015. Marsh madness: Microbial Communities Driving Greenhouse Gas Cycling in Coastal Wetlands. Paper presented at the Genomics of Energy & Environment. Walnut Creek, CA.

Theroux, S. Hartman, W., He, S., Windham-Myers, L., Tringe, S. 2014. Microbial diversity and

carbon cycling in San Francisco Bay wetlands. Paper presented at the Joint Aquatic Sciences Meeting. Portland, OR.

# Journal Articles

Hajibabaei, M., F. Leese, C. Abbott, H. Araki, D.J. Baird, P. Beja, K. Deiner, H. Doi, N. Fahner, K.D. Goodwin, M.E. Hunter, R.P. Kelly, K. Klymus, M. Kondoh, N. Olivia Mapholi, T. Minamoto, X. Pochon, T.M. Porter, S. Theroux, A. Trujillo-Gonzalez, A. Watts, H. Yamanaka, X. Zhang, J. Darling, K. Meissner. 2026. The International eDNA Standardization Task Force (iESTF): toward development of inclusive international standards for eDNA biodiversity monitoring. *Metabarcoding and Metagenomics* DOI:10.3897/mbmg.10.193334.

Theroux, S., A. Sepulveda, C.L. Abbott, Z. Gold, A.W. Watts, M.E. Hunter, K.E. Klymus, S.L. Hirsch, J.M. Craine, D.N. Jones, R.J. Brown, J.A. Steele, M. Takahashi, R.T. Noble, J.A. Darling. 2025. What is eDNA method standardisation and why do we need it?. *Metabarcoding and Metagenomics* 9:91-106.

Vasselon, V., S.F. Rivera, E. Acs, S.F.P. Almeida, K.B. Andree, L. Apotheloz-Perret-Gentil, B. Bailet, A. Baricevic, K.K. Beentjes, J. Bettig, A. Bouchez, C. Capelli, C. Chardon, M. Duleba, T. Elersek, C. Genthon, M. Jablonska, L. Jacas, M. Kahlert, M.G. Kelly, J.N. Macher, F. Mauri, M. Moletta-Denat, A. Mortagua, J. Pawlowski, J. Perez-Burillo, M. Pfannkuchen, E. Pilgrim, P. Pissaridou, F. Rimet, K. Stanic, K. Tapolczai, S. Theroux, R. Trobajo, B. Van der Hoorn, M.I. Vasquez, M. Vidal, D. Wanless, J. Warren, J. Zimmermann, B. Paix. 2025. Proficiency testing and cross-laboratory method comparison to support standardisation of diatom DNA metabarcoding for freshwater biomonitoring. *Metabarcoding and Metagenomics* 9:35-70.

Klymus, K.E., J.D. Baker, C.L. Abbott, R.J. Brown, J.M. Craine, Z. Gold, M.E. Hunter, M.D. Johnson, D.N. Jones, M.J. Jungbluth, S.P. Jungbluth, Y. Lor, A. Maloy, C.M. Merkes, R. Noble, N.V. Patin, A.J. Sepulveda, S.F. Spear, J.A. Steele, M. Takahashi, A.W. Watts, S. Theroux. 2024. The MIEM guidelines: Minimum information for reporting of environmental metabarcoding data. *Metabarcoding and Metagenomics* 8:489-518.

Kelly, R.P., D.M. Lodge, K.N. Lee, S. Theroux, A.J. Sepulveda, C.A. Scholin, J.M. Craine, E.A. Allan, K.M. Nichols, K.M. Parsons, K.D. Goodwin, Z. Gold, F.P. Chavez, R.T. Noble, C.L. Abbott, M.R. Baerwald, A.M. Naaum, P.M. Thielen, A.L. Simons, C.L. Jerde, J.J. Duda, M.E. Hunter, J.A. Hagan, R.S. Meyer, J.A. Steele, M.Y. Stoeckle, H.M. Bik, C.P. Meyer, E.D. Stein, K.E. James, A.C. Thomas, E. Demir-Hilton, M.A. Timmers, J.F. Griffith, M.J. Weise, S.B. Weisberg. 2024. Toward a national eDNA strategy for the United States. *Environmental DNA* DOI:10.1002/edn3.432.

Simons, A.L., S. Theroux, M. Osborne, S. Nuzhdin, R.D. Mazor, J.A. Steele. 2023. Zeta diversity patterns in metabarcoded lotic algal assemblages as a tool for bioassessment. *Ecological Applications* DOI:10.1002/eap.2812.

Stepien, C.A., S. Theroux, S.B. Weisberg. 2022. The Second National Workshop on Marine eDNA: A workshop to accelerate the incorporation of eDNA science into environmental management application. *Environmental DNA* DOI:10.1002/edn3.379.

Mazor, R.D., M. Sutula, S. Theroux, M. Beck, P.R. Ode. 2022. Eutrophication thresholds associated with protection of biological integrity in California wadeable streams. *Ecological Indicators* 142:109180.

Howard, M.D.A., J. Smith, D.A. Caron, R.M. Kudela, K. Loftin, K. Hayashi, R. Fadness, S. Fricke, J. Kann, M. Roethler, A. Tatters, S. Theroux. 2022. Integrative monitoring strategy for marine and freshwater harmful algal blooms and toxins across the freshwater-to-marine continuum. *Integrated Environmental Assessment and Management* DOI:10.1002/ieam.4651.

Irving, K., K.T. Taniguchi-Quan, A. Aprahamian, C. Rivers, G. Sharp, R.D. Mazor, S. Theroux, A. Holt, R. Peek, E.D. Stein. 2022. Application of Flow-Ecology Analysis to Inform Prioritization for Stream Restoration and Management Actions. *Frontiers in Environmental Science* 9:787462.

Bueno de Mesquita, C.P., J. Zhou, S. Theroux, S.G. Tringe. 2021. Methanogenesis and Salt Tolerance Genes of a Novel Halophilic Methanosarcinaceae Metagenome-Assembled Genome from a Former Solar Saltern. *Genes* 12:1609.

Zhou, J., S. Theroux, C.P. Bueno de Mesquita, W.H. Hartman, Y. Tian, S.G. Tringe. 2021. Microbial drivers of methane emissions from unrestored industrial salt ponds. *The ISME Journal* DOI:10.1038/s41396-021-01067-w.

Charles, D.F., M.G. Kelly, R.J. Stevenson, S. Poikane, S. Theroux, A. Zgrundo, M. Cantonati. 2021. Benthic algae assessments in the EU and the US: Striving for consistency in the face of great ecological diversity . *Ecological Indicators* DOI:10.1016/j.ecolind.2020.107082.

Howard, M.D.A., R.M. Kudela, K. Hayashi, A.O. Tatters, D.A. Caron, S. Theroux, S. Oehrle, M. Roethler, A. Donovan, K. Loftin, Z. Laughrey. 2021. Multiple co-occurring and persistently detected cyanotoxins and associated cyanobacteria in adjacent California lakes. *Toxicon* 192:1-14.

Theroux, S., R.D. Mazor, M.W. Beck, P.R. Ode, E.D. Stein, M. Sutula. 2020. Predictive biological indices for algae populations in diverse stream environments. *Ecological Indicators* DOI:10.1016/j.ecolind.2020.106421.

Paul, M.J., B. Jessup, L.R. Brown, J.L. Carter, M. Cantonati, D.F. Charles, J. Gerritsen, D.B. Herbst, R. Stancheva, J. Howard, B. Isham, R. Lowe, R.D. Mazor, P.K. Mendex, P.R. Ode, A. O'Dowd, J.

Olson, Y. Pan, A.C. Rehn, S. Spaulding, M. Sutula, S. Theroux. 2020. Characterizing benthic macroinvertebrate and algal biological condition gradient models for California wadeable Streams, USA. *Ecological Indicators* DOI:10.1016/j.ecolind.2020.106618.

Aylagas, E., A. Borja, X. Pochon, A. Zaiko, N. Keeley, K. Bruce, P. Hong, G.M. Ruiz, E.D. Stein, S. Theroux, N. Geraldi, A. Ortega, L. Gajdzik, D.J. Coker, Y. Katan, T. Hikmawan, A. Saleem, S. Alamer, B.H. Jones, C.M. Duarte, J. Pearman, S. Carvalho. 2020. Translational Molecular Ecology in practice: Linking DNA-based methods to actionable marine environmental management. *Science of the Total Environment* DOI:10.1016/j.scitotenv.2020.140780.

Beck, M.W., C. O'Hara, J.S. Stewart-Lowndes, R.D. Mazor, S. Theroux, D.J. Gillett, B. Lane, G. Gearheart. 2020. The importance of open science for biological assessment of aquatic environments. *PeerJ* DOI:10.7717/peerj.9539.

Simons, A.L., R.D. Mazor, S. Theroux. 2019. Using Co-occurrence Network Topology in Assessing Ecological Stress in Benthic Macroinvertebrate Communities. *Ecology and Evolution* DOI:10.1002/ece3.5751.

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A multi-indicator tool for enhancing environmental management. *Environmental and Sustainability Indicators* DOI:10.1016/j.indic.2019.100004.

Longo, W., Theroux, S., Giblin, A.E., Zheng, Y., Dillon, J.T., Huang, Y. 2016. Temperature calibration and phylogenetically distinct distributions for freshwater alkenones: Evidence from northern Alaskan lakes. Geochimica et Cosmochimica Acta 180: 177-196.

D'Andrea, W., Theroux, S., Bradley, R., Huang, X. 2016. Does phylogeny control Uk37-temperature sensitivity? Implications for lacustrine alkenone paleothermometry. Geochimica et Cosmochimica Acta 175:168-180.

Theroux, S., Toney, J.L., Amaral-Zettler, L., Huang, Y. 2013. Production and temperature sensitivity of long chain alkenones cultured haptophyte Pseudoisochrysis paradoxa. Organic Geochemistry. http://dx.doi.org/10.1016/j.orggeochem.2013.07.006.

Theroux, S. 2012. Diversity and ecology of lacustrine haptophyte algae: implications for paleothermometry. Ph.D. dissertations, Brown University. Providence, RI.

Theroux, S., Huang, Y., Amaral-Zettler. 2012. Comparative molecular microbial ecology of spring haptophyte blooms in an arctic oligosaline lake in Greenland. Frontiers in Microbiology. doi:

10.3389/fmicb.2012.00415.

Toney, J., Theroux, S., Andersen, R., Coleman, A., Amaral-Zettler, L., Huang, Y. 2012. Culturing of the first 37:4 predominant lacustrine haptophyte: Geochemical, biochemical, and genetic implications. Geochimica et Cosmochimica Acta 78:51-64.

# Technical Reports

Patin, N., M. Sutula, C.A. Frieder, S. Theroux. 2026. Best practices for monitoring biological effects of ocean acidification with environmental DNA (eDNA) and other 'Omics approaches: March 17-18, 2025, Workshop Proceedings. Technical Report 1461. Southern California Coastal Water Research Project. Costa Mesa, CA.

Smith, J., D. Shultz, A.A.Y. Lie, S. Theroux. 2023. Diversity and Prevalence of Cyanobacteria and Cyanotoxins in Los Angeles Region Recreational Lakes and Reservoirs. Technical Report 1309. Southern California Coastal Water Research Project. Costa Mesa, CA.

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A Multi-Indicator Tool for Enhancing Environmental Management Communication. Technical Report 1080. Southern California Coastal Water Research Project. Costa Mesa, CA.