Dr. Karen McLaughlin

Chemist
Biogechemistry Department
Southern California Coastal Water Research Project

Education

Ph.D., geological & environmental sciences, Stanford University, 2005

B.S., geosciences, Pennsylvania State University, 1999

Professional Experience

Senior Scientist, Southern California Coastal Water Research Project. Costa Mesa, CA. 2007-present

Postdoctoral Researcher, University of California, Irvine. Irvine, CA. 2006-2007

Graduate Research Assistant, Stanford University Department of Geological & Environmental Sciences. Stanford, CA. 1999-2005

Undergraduate Research Assistant, Penn State University Department of Geosciences. State College, PA. 1997-1999

Honors and Awards

Stanford University-US Geological Survey Graduate Fellow (2001)

Schlanger Ocean Drilling Program Fellow (2000)

Stanford University McGee Research Grant Recipient (2000)

Honorable Mention, National Science Foundation Graduate Research Fellowship (2000)

Distinction Graduate, Department of Geosciences, Penn State University (1999)

Phi Kappa Phi National Honor Society (1998)

Teas Scholarship for Geological Sciences, Penn State University (1998)

Drake Scholarship for Summer Field School, Penn State University (1998)

Trustees Scholarship for Geological Sciences, Penn State University (1997)

Golden Key National Honor Society (1996)

Phi Eta Sigma Freshman Honor Society (1995)

Professional Societies

American Geophysical Union

American Society of Limnology and Oceanography

Coastal and Estuarine Research Federation

California Estuarine Research Society

Selected Presentations and Conference Proceedings

2020. Ocean Acidification: Causes and Implications of Changing Ocean Chemistry. University of California, Irvine. CEE60, "Contemporary and Emerging Environmental Challenges" Guest Lecture.

McLaughlin, K., K. Schiff, N. Bednarsek, B. Du, D. Gillett, J.F. Griffith, D.n Greenstein, A. Parks, J. Smith and S. Weisberg. Regional Monitoring for Sediment and Water Quality in the Urban Ocean of the Southern California Bight (CP21A-06). Ocean Sciences Meeting, February 2020, San Diego, CA.

McLaughlin, K. 2019. Ocean Acidification: Causes and Implications of Changing Ocean Chemistry. University of California, Irvine. CEE60, "Contemporary and Emerging Environmental Challenges" Guest Lecture.

McLaughlin, K., F. Kessouri, M. Sutula, M. Ho, J. McWilliams, C. Deutsch, D. Bianchi, N. Bednarsek, L. Renault, R. Feely, R. Ambrose, Stephen Weisberg. Validation of a High-Resolution Physical-Biogeochemical Model for Pollution Impact Assessments in the Southern California Bight.

Coastal and Estuarine Research Federation 25th Biennial Conference, 2019, Mobile, AL.

McLaughlin, K., C. Deutsch, F. Kessouri, M. Howard, J. McWilliams, M. Sutula. 2017. Understanding the Impact of Anthropogenic Nutrients on Coastal Ocean Nutrient and Carbon Cycling. Coastal and Estuarine Research Society Biennial Conference. Providence, RI.

McLaughlin, K. 2017. Monitoring Acidification in Coastal and Estuarine Waters. California State Water Resources Control Board. Office of Information Management & Analysis Brown Bag Seminar.

McLaughlin, K. 2016. Acid Ocean? The What, When, Where and Why of Ocean Acidification. Teen Science Café. Aquarium of the Pacific, Long Beach, CA.

Virmani, J., M. Huelsenbeck, K. McLaughlin. 2015. pH Sensors from the Wendy Schmidt Ocean Health XPRIZE. California Current Acidification Network, Ocean Acidification Round Table Webinar.

McLaughlin, K., N.P. Nezlin, S.B. Weisberg. 2015. An Evaluation of Potentiometric pH Sensors in Coastal Monitoring Applications. Coastal and Estuarine Research Federation Biennial Meeting. Portland, OR.

McLaughlin, K., M.D.A. Howard, N.P. Nezlin, C.D.A. Beck, G. Roberston. 2014. Unraveling the Impacts of Wastewater Effluent on Coastal Nitrogen Cycling: Lessons from the Southern California Bight. California Estuarine Research Society Fall Meeting. Bodega Bay, CA.

McLaughlin K, M.D.A. Howard, N.P. Nezlin, C.D.A. Beck, G. Robertson. 2014. Untangling the Impacts of Wastewater Effluent on Coastal Nitrogen Cycling: Lessons from the Southern California Bight. Ocean Sciences Meeting. Honolulu, HI.

McLaughlin, K., 2014. Ocean Acidification: Causes and Implications of Changing Ocean Chemistry. Back Bay Science Center Lecture Series, Newport Beach, CA.

McLaughlin, K., 2014. Ocean Acidification: Causes and Implications of Changing Ocean Chemistry. Coastal Commission, Newport Beach, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N. Nezlin, A. Sengupta, L. Stratton. 2013. Nutrients or Biological Response: How Should We Assess Eutrophication in Estuaries? Thoughts based on work in southern California. Coastal and Estuarine Research Federation Biennial Meeting, San Diego, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, S. Birosik, R. Dagit, J. Crooks, D. Gibson, K. Johnston, L. Stratton, 2013. Riverine Nutrient Inputs and Extent of Estuarine Eutrophication in the Southern California Bight: Results from the Bight 08 Regional Survey. California Water

Quality Monitoring Collaboration Network Webinar.

McLaughlin, K. Untangling the Effects of Anthropogenic Versus Natural Nutrient Sources in the Southern California Bight. 2013. University of California, Irvine. Civil and Environmental Engineering Department Seminar.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, S. Bergquist, J. Crooks, R.Dagit, D. Gibson, K. Johnson, and L. Stratton. 2012. Magnitude and Extent of Eutrophication in Southern California Bight Estuaries: Results of the Bight '08 Regional Survey. Presentation at Headwaters to Ocean Annual Conference. San Diego, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, S. Bergquist, J. Crooks, R.Dagit, D. Gibson, K. Johnson, and L. Stratton. 2012. Magnitude and Extent of Eutrophication in Southern California Bight Estuaries: Results of the Bight '08 Regional Survey. Presentation at California Estuarine Research Society Conference. Long Beach, CA.

Journal Articles

Sutula, M., M. Ho, A. Sengupta, F. Kessouri, K. McLaughlin, K. McCune, D. Bianchi. 2021. A baseline of terrestrial freshwater and nitrogen fluxes to the Southern California Bight, USA. *Marine Pollution Bulletin* DOI:10.1016/j.marpolbul.2021.112669 .

Kessouri, F., J.C. McWilliams, D. Bianchi, M. Sutula, L. Renault, C. Deutsch, R.A. Feely, K. McLaughlin, M. Ho, E.M. Howard, N. Bednarsek, P. Damien, J. Molemaker, S.B. Weisberg. 2021. Coastal eutrophication drives acidification, oxygen loss, and ecosystem change in a major oceanic upwelling system. *Proceedings of the National Academy of Sciences of the United States of America* DOI:10.1073/pnas.2018856118.

Sutula, M., M. Ho, A. Sengupta, F. Kessouri, K. McLaughlin, K. McCune, D. Bianchi. 2021. Dataset of terrestrial fluxes of freshwater, nutrients, carbon, and iron to the Southern California Bight, U.S.A.. *Data in Brief* DOI:10.1016/j.dib.2021.106802.

Nezlin, N.P., C. Beegan, A. Feit, J.R. Gully, A. Latker, K. McLaughlin, M.J. Mengel, G.L. Robertson, A. Steele, S.B. Weisberg. 2020. Colored Dissolved Organic Matter (CDOM) as a tracer of effluent plumes in the coastal ocean. *Regional Studies in Marine Science* DOI:10.1016/j.rsma.2020.101163.

Bednarsek, N., R.A. Feely, E.L. Howes, B.P.V. Hunt, F. Kessouri, P. Leon, R. Lischka, A.E. Maas, K. McLaughlin, N.P. Nezlin, M. Sutula, S.B. Weisberg. 2019. Systematic Review and Meta-Analysis Toward Synthesis of Thresholds of Ocean Acidification Impacts on Calcifying Pteropods and

Interactions With Warming. *Frontiers in Marine Science* 6:227.

McLaughlin, K., N.P. Nezlin, S.B. Weisberg, A.G. Dickson, J.A.T. Booth, C.L. Cash, A. Feit, J.R. Gully, M.D.A. Howard, S. Johnson, A. Latker, M.J. Mengel, G.L. Robertson, A. Steele, L. Terriquez. 2018. Seasonal patterns in aragonite saturation state on the southern California continental shelf. *Continental Shelf Research* 167:77–86.

Nezlin, N.P., K. McLaughlin, J.A.T. Booth, C.L. Cash, D.W. Diehl, K.A. Davis, A. Feit, R. Goericke, J.R. Gully, M.D.A. Howard, S Johnson, A. Latker, M.J. Mengel, G.L. Robertson, A. Steele, L. Terriquez, L. Washburn, S.B. Weisberg. 2018. Spatial and Temporal Patterns of Chlorophyll Concentration in the Southern California Bight. *Journal of Geophysical Research: Oceans* 123:231-245.

Howard, M.D.A., R.M. Kudela, K. McLaughlin. 2017. New insights into impacts of anthropogenic nutrients on urban ecosystem processes on the Southern California coastal shelf: Introduction and synthesis. *Estuarine, Coastal and Shelf Science* 186:163-170.

Kudela, R.M., A.J. Lucas, K. Hayashi, M.D.A. Howard, K. McLaughlin. 2017. Death from below: Investigation of inhibitory factors in bloom development during a wastewater effluent diversion. *Estuarine, Coastal and Shelf Science* 186:209-222.

McLaughlin, K., N.P. Nezlin, S.B. Weisberg, A.G. Dickson, J.A. Booth, C.L. Cash, A. Feit, J.R. Gully, S. Johnson, A. Latker, M.J. Mengel, G.L. Robertson, A. Steele, L. Terriquez. 2017. An evaluation of potentiometric pH sensors in coastal monitoring applications. *Limnology and Oceanography: Methods* 15:679-689.

McLaughlin, K., A. Dickson, S.B. Weisberg, K. Coale, V. Elrod, C. Hunter, K.S. Johnson, S. Kram, R. Kudela, T. Martz, K. Negrey, U. Passow, F. Shaughnessy, J.E. Smith, D. Tadesse, L. Washburn, K.R. Weis. 2017. An evaluation of ISFET sensors for coastal pH monitoring applications. *Regional Studies in Marine Science* 12:11-18.

McLaughlin, K., N.P. Nezlin, M.D.A. Howard, C.D.A. Beck, R.I.M. Kudela, M.J. Mengel, G.L. Robertson. 2017. Rapid nitrification of wastewater ammonium near coastal ocean outfalls, Southern California, USA. *Estuarine, Coastal and Shelf Science* 186:263-375.

McLaughlin, K., S.B. Weisberg, A.G. Dickson, G.E. Hofmann, J.A. Newton, D. Aseltine-Neilson, A. Barton, S. Cudd, R.A. Feely, I.W. Jefferds, E.B. Jewett, T. King, C.J. Langdon, S. McAfee, D. Pleschner-Steele, B. Steele. 2015. Core principles of the California Current Acidification Network: Linking chemistry, physics, and ecological effects. *Oceanography* 28:160-169.

Barton, A., G.G. Waldbusser, R.A. Feely, S.B. Weisberg, J.A. Newton, B. Hales, S. Cudd, B. Eudeline, C.J. Langdon, I. Jefferds, T. King, A. Suhrbier, K. McLaughlin. 2015. Impacts of coastal

acidification on the Pacific Northwest shellfish industry and adaptation strategies implemented in response. *Oceanography* 28:146-159.

Rippy, M.A., R. Stein, B.F. Sanders, K. Davis, K. McLaughlin, J.F. Skinner, J. Kappeler, S.B. Grant. 2014. Small Drains, Big Problems: The Impact of Dry Weather Runoff on Shoreline Water Quality at Enclosed Beaches. *Environmental Science and Technology* 48:14168-14177.

Howard, M.D.A., M. Sutula, D.A. Caron, Y. Chao, J.D. Farrara, H. Frenzel, B. Jones, G. Robertson, K. McLaughlin, A. Sengupta. 2014. Anthropogenic nutrient sources rival natural sources on small scales in the coastal waters of the Southern California Bight. *Limnology and Oceanography* 59:285-297.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, L. Stratton. 2014. A regional survey of the extent and magnitude of eutrophication in Mediterranean estuaries of Southern California, USA. *Estuaries and Coasts* 37:259-278.

McLaughlin, K., J.A. Sohm, G.A. Cutter, M.W. Lomas, A. Paytan. 2013. Phosphorus cycling in the Sargasso Sea: Investigation using the oxygen isotopic composition of phosphate, enzyme-labeled fluorescence, and turnover times. *Global Biogeochemical Cycles* 27:375-387.

Elsbury, K.E., A. Paytan, N.E. Ostrom, C. Kendall, M.B. Young, K. McLaughlin, M.E. Rollog, S. Watson. 2009. Using oxygen isotopes of phosphate to trace phosphorus sources and cycling in Lake Erie. *Environmental Science and Technology* 43:3108-3114.

Book Chapters

Schiff, K.C., K. McLaughlin, S.L. Moore, Y. Cao. 2019. Southern California Bight. in: C. Sheppard (ed.), *World Seas: An Environmental Evaluation* pp. 465-482. Academic Press. London, UK.

Technical Reports

Wisenbaker, K., K. McLaughlin, D.W. Diehl, A. Latker, K. Stolzenbach, R. Gartman, K.C. Schiff. 2021. Southern California Bight 2018 Regional Marine Monitoring Program: Volume IV. Demersal Fishes and Megabenthic Invertebrates. Technical Report 1183. Southern California Coastal Water Research Project. Costa Mesa, CA.

Smith, J., D. Shultz, M.D.A. Howard, G. Robertson, V. Phonsiri, V. Renick, D.A. Caron, R. Kudela, K. McLaughlin. 2021. Southern California Bight 2018 Regional Monitoring Program: Volume VIII. Harmful Algal Blooms. Technical Report 1170. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., K.C. Schiff, B. Du, J. Davis, A. Bonnema, G. Ichikawa, B. Jakl, W. Heim. 2020. Southern California Bight 2018 Regional Monitoring Program Volume V: Contaminant Bioaccumulation in Edible Sport Fish Tissue. Technical Report 1155. Southern California Coastal Water Research Project. Costa Mesa, CA.

Du, B., C.S. Wong, K. McLaughlin, K.C. Schiff. 2020. Southern California Bight 2018 Regional Monitoring Program: Volume II. Sediment Chemistry. Technical Report 1130. Southern California Coastal Water Research Project. Costa Mesa, CA.

Parks, A.N., D.J. Greenstein, K. McLaughlin, K.C. Schiff. 2020. Southern California Bight 2018 Regional Monitoring Program: Volume I. Sediment Toxicity. Technical Report 1117. Southern California Coastal Water Research Project. Costa Mesa, CA.

Nezlin, N.P., K. McLaughlin, A.T. Booth, C.L. Cash, D.W. Diehl, K. Davis, A. Feit, R. Goericke, J.R. Gully, M.D.A. Howard, S. Johnson, A. Latker, M.J. Mengel, G.L. Robertson, A. Steele, L. Terriquez, L.i.b.e. Washburn, S.B. Weisberg. 2017. Spatial and Temporal Patterns of Chlorophyll Concentration in the Southern California Bight. Technical Report 998. Southern California Coastal Water Research Project. Costa Mesa, CA.

Martz, T., K. McLaughlin, S.B. Weisberg. 2015. Best Practices for autonomous measurement of seawater pH with the Honeywell Durafet pH sensor. Technical Report 861. California Current Acidification Network. Santa Barbara, CA.

McLaughlin, K., M. Sutula. 2014. Estimating Wet and Dry Deposition of Nitrogen to Southern California Streams. Technical Report 837. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

McLaughlin, K., M. Sutula, J. Cable, P. Fong. 2013. Eutrophication and Nutrient Cycling in Santa Margarita River Estuary: A Summary of Baseline Studies for Monitoring Order R9-2006-0076. Technical Report 635. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N.P. Nezlin, L. Stratton. 2012. Southern California Bight 2008 Regional Monitoring Program: VIII. Estuarine Eutrophication. Technical Report 711. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N.P. Nezlin, L. Stratton. 2012. Southern California Bight 2008 Regional Monitoring Program: VIII. Estuarine Eutrophication (Appendix A). Technical Report 711.A. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N.P.

Nezlin, L. Stratton. 2012. Southern California Bight 2008 Regional Monitoring Program: VIII. Estuarine Eutrophication (Appendix B). Technical Report 711.B. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N.P. Nezlin, L. Stratton. 2012. Southern California Bight 2008 Regional Monitoring Program: VIII. Estuarine Eutrophication (Appendix C). Technical Report 711.C. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, N.P. Nezlin, L. Stratton. 2012. Southern California Bight 2008 Regional Monitoring Program: VIII. Estuarine Eutrophication (Appendix D). Technical Report 711.D. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, J. Cable, P. Fong. 2011. Eutrophication and Nutrient Cycling in Buena Vista Lagoon, Carlsbad, California. Technical Report 638. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, J. Cable, P. Fong. 2011. Eutrophication and Nutrient Cycling in Loma Alta Slough, Oceanside, California. Technical Report 630. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, J. Cable, P. Fong. 2011. Eutrophication and Nutrient Cycling in San Elijo Lagoon, Encinitas, California. Technical Report 636. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula, J. Cable, P. Fong. 2010. Eutrophication and Nutrient Cycling in Famosa Slough: A Summary of Baseline Data for Monitoring Order R9-2006-0076. Technical Report 629. Southern California Coastal Water Research Project. Costa Mesa, CA.

Fetscher, A.E., K. McLaughlin. 2008. Incorporating bioassessment using freshwater algae into California's Surface Water Ambient Monitoring Program (SWAMP). Technical Report 563. Southern California Coastal Water Research Project. Costa Mesa, CA.

McLaughlin, K., M. Sutula. 2007. Developing nutrient numeric endpoints and TMDL tools for California estuaries: An implementation plan. Technical Report 540. Southern California Coastal Water Research Project. Costa Mesa, CA.

Annual Report Articles

Sengupta, A., M. Sutula, K. McLaughlin, M.D.A. Howard, L.L. Tiefenthaler, T. Von Bitner. 2013. Terrestrial nutrient loads and fluxes to the Southern California Bight, USA.

McLaughlin, K., M. Sutula, L. Busse, S. Anderson, J. Crooks, R. Dagit, D. Gibson, K. Johnston, L. Stratton. 2013. A regional survey of the extent and magnitude of eutrophication in Mediterranean estuaries of southern California, USA.

Howard, M.D.A., M. Sutula, D. Caron, Y. Chao, J.D. Farrara, H. Frenzel, B. Jones, G. Robertson, K. McLaughlin, A. Sengupta. 2012. Comparison of natural and anthropogenic nutrient sources in the Southern California Bight.

McLaughlin, K., J.A. Sohm, G.A. Cutter, M.W. Lomas, A. Paytan. 2011. Phosphorus cycling in the Sargasso Sea: Investigation using the oxygen isotopic composition of phosphate, enzyme labeled fluorescence, and turnover times.