

Curriculum Vitae

Kiefer O. Forsch

Scripps Institution of Oceanography
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Postdoctoral Scholar

Faculty Mentors: Sarah Aarons (PhD, Scripps Institution of Oceanography) and Christopher Dupont (PhD, J. Craig Venter Institute)

Education

Scripps Institution of Oceanography, UC San Diego

PhD in Oceanography (completed 2021)

Thesis: Iron sinks, supply, and cycling in seasonally productive coastal seas

Studies in Marine Chemistry

Advisor: Katherine A. Barbeau, PhD

MS in Oceanography (completed 2016)

Rutgers, The State University of New Jersey

Spring Term 2013

Chemical Oceanography (Graduate Level, Non-matriculated): A

Oberlin College, Oberlin, OH

2012

BA in Chemistry

Tutoring 2010/11, 2011/12 academic years

TA 2010/11, 2011/12 academic years (General Chemistry 101/102; Organic Chemistry 205)

Research Experience

NOAA Great Lakes Environmental Research Lab: Ann Arbor, MI **Summer CILER Fellowship 2013**

Mentors: Drs. Hongyan Zhang (CILER), Doran Mason (NOAA), Ed Rutherford (NOAA), Lori Ivan (CILER); Lake Erie Atlantis ecosystem model; Fisheries Ecology; Quantitative methods in fisheries

Scripps Institution of Oceanography/UC San Diego: La Jolla, CA

Summer NSF SURF-REU 2011

Mentor: Dr. Lihini Aluwihare, Jenan Kharbush (PhD) Hopanoids Project; Biogeochemistry

Used Gas Chromatography-Mass Spectrometry to characterize hopanoids, a class of bacterial lipids.

Woods Hole Oceanographic Institute: Woods Hole, MA

January 2011

Mentor: Dr. Tracy Mincer, Dr. Carl Lamborg; Mercury Project; Analytical Chemistry, Biology, Field work experience

Investigated microbial transformation of mercury and the genes that confer resistance in oceanic bacteria.

Compared mercury resistance with the relative concentrations of different Hg species in the water and Hg turnover rates.

Universidade de São Paulo: São Paulo, Brazil

Summer NSF iREU 2010

Mentor: Dr. Ana Maria da Costa Ferreira; Novel Therapeutics Project; Bioinorganic Chemistry

Synthesized and characterized novel copper and zinc complexes by gravimetric, UV/Vis, IR, and elemental analyses. Goal was to discover effective tumor-targeting compounds and to explore Microwave Irradiation as an efficient and greener method of synthesis.

University of Michigan: Ann Arbor, MI

January 2010

Mentor: Dr. Vincent L. Pecoraro; Metallacrown Project; Inorganic Chemistry

Synthesized organic ligands and bridging molecules for the preparation of novel metal organic frameworks.

Used NMR, IR, Mass Spectrometry, and X-ray Crystallography methods.

Professional and Leadership Experience

Peer Mentor Leader, Scripps Institution of Oceanography

2017 – 2018

GSA Representative, University of California San Diego

2016 – 2017

I served as GSA representative for the Scripps Institution of Oceanography department.

Laboratory Technician | Sherrell Lab – Institute of Marine and Coastal Sciences, Rutgers University, New Brunswick, NJ

September 2012 – August 2014

My responsibilities were to analyze trace metals in seawater using novel automated technologies, to use trace metal clean methods for digestion and analysis of marine particles for trace metals, to learn and analyze data using oceanographic graphing software (ODV), and to prepare equipment for upcoming fieldwork.

Research Intern – Rutgers University, New Brunswick, NJ

Summer 2012

Over the summer I worked with Dr. Rob Sherrell in the Inorganic Analytical Lab at the Institute of Marine and Coastal Sciences. I analyzed seawater samples from the Amundsen Sea for multiple bio-active trace metals using Flow-Injection, Isotope Dilution, and Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) methods.

Publications

Forsch, K., Fulton, K. C., Krause, J. W., Stukel, M. R., Barbeau, K. A. Iron and silicon cycling during lateral advection of a coastal filament in the southern California Current. (*in prep for submission to L&O*)

Koestner, D., Stramski, D., **Forsch, K.**, Pan, J., Reynolds, R. A. Measurements of the contributions of colloidal particles to angular scattering in contrasting marine environments. (*in prep*)

Lampe, R.H., Coale, T.H., **Forsch, K.O.**, Jabre, L.J., Kekuewa, S., Bertrand, E.M., Horak, A., Obornik, M., Rabines, A.J., Rowland, E., Zheng, H., Andersson, A.J., Barbeau, K.A., Allen, A.E. Diverse iron acquisition and conservation mechanisms support resistance to acidification in upwelling-associated phytoplankton. *Nature Communications (under review)*

Ruacho, A., **Forsch, K.**, Barbeau, K.A., Bundy, R.M. A Novel Method for the Processing of Multiple Analytical Window Electrochemical Titration Copper Speciation Data. *Front. in Mar. Sci. (under review)*

Forsch, K. O., Hahn-Woernle, L., Sherrell, R. M., Rocanova, J., Bu, K., Burdige, D., Vernet, M. and Barbeau, K. A.: Seasonal dispersal of fjord meltwaters as an important source of iron and manganese to coastal Antarctic phytoplankton, *Biogeosciences*, 2021, 1–49, doi:10.5194/bg-2021-79, 2021.

Pan, B Jack, Maria Vernet, Lauren Manck, **Kiefer Forsch**, Lindsey Ekern, Martina Mascioni, Katherine A Barbeau, Gastón O Almandoz, and Alexander J Orona. 2020. “Environmental Drivers of Phytoplankton

Taxonomic Composition in an Antarctic Fjord.” *Progress in Oceanography* 183: 102295.
<https://doi.org/https://doi.org/10.1016/j.pocean.2020.102295>.

Sherrell, R.M., Lagerström, M., **Forsch, K.O.**, Stammerjohn, S.E., Yager, P.L. 2015. “Dynamics of dissolved iron and other bioactive trace metals (Mn, Ni, Cu, Zn) in the Amundsen Sea Polynya, Antarctica.” *Elementa* 3:71. doi:10.12952/journal.elementa.000071.

Presentations

Kiefer Forsch, Maxwell Fenton, Marley Weiss, Katherin Barbeau. Labile iron-bearing particles transported offshore by coastal upwelling filaments in the California Current Ecosystem. Ocean Sciences Meeting, March 2022. (Oral Presentation)

Kiefer Forsch, Lisa Hahn-Woerlne, Rob Sherrell, David Burdige, Maria Vernet, Katherine Barbeau. Dispersal of trace elements by a glacial sediment plume. Ocean Sciences Meeting, February 2020. (Oral Presentation)

Kiefer Forsch, Kayleen Fulton, Lauren Manck, Katherine Barbeau. Iron limitation of a coastal upwelling filament in the southern California Current Ecosystem. ASLO Meeting, February 2019. (Oral Presentation)

Kiefer Forsch, Lauren Manck, Kayleen Futon, Niv Anidjar, Katherine Barbeau. Iron limitation of a coastal filament in the southern California Current Ecosystem. Scripps Student Symposium (S³) and All Science Meeting LTER Network, October 2018. (Poster)

Kiefer Forsch, Lauren Manck, B. Jack Pan, Lindsey Eckern, Maria Vernet, Katherine Barbeau. Seasonal cryospheric iron sources to a productive Antarctic fjord, Andvord Bay, West Antarctic Peninsula. Ocean Sciences Meeting, February 2018. (Poster)

Kiefer Forsch, Lauren Manck, Craig Smith, Maria Vernet, Katherine Barbeau. Cryospheric sources of iron to coastal west Antarctic Peninsula. Polar Marine Science Gordon Research Conference, March 2017. (Poster)

Kiefer Forsch. Long range transport of hydrothermal iron facilitated by dissolved particulate exchange. Ocean Sciences Meeting, February 2015. (Oral Presentation)

Hélène Planquette; Robert M. Sherrell, Maria Lagerström, **Kiefer Forsch**, Sharon E. Stammerjohn. Particulate trace elements (Zn, Cu, Cd, Co, Ni and P) in One of the Most Productive Antarctic Polynyas: the Amundsen Sea. Ocean Sciences Meeting, February 2014. (Contributing Author)

Kathleen M. Harazin, Maria Lagerström, **Kiefer Forsch**, Silke Severmann, Robert Sherrell. The Metal-to-Phosphorus ratio of Natural Phytoplankton Assemblages in the Amundsen Sea Polynya and Western Antarctic Peninsula, West Antarctica. Ocean Sciences Meeting, February 2014. (Contributing Author)

Kiefer Forsch. Forecasting Food Web Dynamics in Lake Erie: Development of the Atlantis Ecosystem Model. CILER Summer Fellowship Presentation, August 15th, 2013. (Oral Presentation)

Kiefer Forsch. Investigation of Lipid Composition and Abundance Across Metabolically Diverse Environments. University of California – San Diego Undergraduate Summer Research Symposium: August 2011, La Jolla, CA. (Oral Presentation)

Kiefer Forsch. Investigation on Syntheses and Characterization of Metal Complexes with Indolomine Ligands. ACS National Meeting: Spring 2011, Anaheim, CA. (Poster)

Field Experience

LTER Student Cruise, *RV Oceanus*, July 2015 (5 days). California Current, Channell Islands, Point Conception, Santa Barbara Basin.

LMG15-10 FjordEco project, *ARSV Laurence M. Gould*, Nov 14 – Dec 28, 2015 (44 days). Anvord Bay, West Antarctic Peninsula.

NBP16-03 FjordEco project, *ARIB Nathaniel B. Palmer*, March 18 – May 1, 2016 (44 days). Anvord Bay, West Antarctic Peninsula.

BH16-09 UNOLS Chief Scientist Training Program – Great Lakes, *RV Blue Heron*, June 13 – 19, 2016 (4 days). Duluth, MN to Milwaukee, WI.

SR1703 R/V Sally Ride Test Cruise. *R/V Sally Ride*, March 2017 (3 days), offshore San Diego.

RR1706 CCE LTER project, *R/V Roger Revelle*, June 2017 (32 days), southern California Current.

Voyage IN2018_V02 Subantarctic Biogeochemistry of Carbon and Iron, *R/V Investigator* (CSIRO), March 2018 (22 days) Southern Ocean Time Series site (SOTS).

P1908 CCE LTER project, *R/V Atlantis*, August 2019 (32 days), southern California Current.

SR2007 CCE LTER Student Cruise, *R/V Sally Ride*, July 2020 (3 days), CalCOFI Line 93 southern California Current.

P2107 CCE LTER project, *R/V Roger Revelle*, July 2021 (31 days), southern California Current.

Total days at sea: 220 days

Professional Affiliations and Activities

AGU (2014-present)

Oceanography Society (2014-present)

ASLO (2018-present)

Ad hoc referee for following journals: *The Cryosphere*; *Analytica Chimica Acta*; *Marine Chemistry*

Teaching and Outreach

Alaska Native Science and Engineering Program (ANSEP) Launch Friday: Guest speaker on polar oceanography (February, 2022)

BSA Scouting: Reviewer and editor of Oceanography Merit Badge Pamphlet (ongoing)

Instructor of Record, SIO 90 Introduction to Research at Scripps, UCSD (Spring 2020)

From STEM to Stars: science panel and Q&A with NASA astronaut Jessica Meir (from ISS) (January 27, 2020)

Teaching Assistant, SIO 40 Life and Climate, UCSD (Fall 2019)

Completed Course, Introduction to College Teaching, Teaching + Learning Commons UCSD (Spring 2019)

Teaching Assistant, SIO 102 Introduction to Geochemistry, UCSD (Winter 2019)

Supervisor for undergraduate projects – Niv Anidjar (summer 2018), Marley Weiss (summer 2021)

Keynote Speaker SURF Program (June 2018)

SIO 2016 Block Party
Beach Science at Scripps Institution of Oceanography (2016 – 2020)

Scholarship/Awards

NSF Postdoctoral Research Fellowship, Ocean Sciences, *Isotopic and microbial investigations of the iron bioavailability of glaciogenic particles* (2021 – 2023, \$297,994 over two years)

SIO Department Travel Award (2018, 2019)

Edna Bailey Sussman Trust Special Merit Award (2018, \$7,500)

Outstanding Peer Mentor Award (2016 – 2017)

NSF Graduate Research Fellowship, Geosciences (2015 – 2019, \$138,000 over three years)

John F. Oberlin Scholarship (2008 – 2012)

Robert M. Miller Scholarship (2011 – 2012)

NSF S-STEM Scholar in Computation and Modeling at Oberlin College (June 2011)

NSF REU Chemistry Leadership Group Travel Award (March 2011)

Men's Varsity Soccer: (2008-2011); NCAA All-Academic Team '08, '10 and '11; All-NCAC-Second Team Accolades 2011

Last updated on February 20, 2022