

Beth A. Stauffer

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Research Interests

The roles of physical, behavioral, and physiological processes in the initiation and maintenance of algal blooms in marine and aquatic environments. Investigations into phytoplankton community and water quality dynamics through the use of networked and autonomous sensing. Impacts of climate change, including ocean acidification, and coastal hypoxia on microbial community structure, trophic transfer, grazing interactions, and carbon export.

Education

- 2011 Ph.D. Marine Environmental Biology, University of Southern California
Dissertation title: Plankton dynamics in a nearshore coastal environment: responses to short-term environmental fluctuations and top-down control.
Advisor: David Caron
Committee: Dale Kiefer, Burt Jones, Karla Heidelberg, Gaurav Sukhatme
- 2000 B.S. Marine Science, B.S. Biology, University of Miami

Professional Experience

- 2012-present Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory of Columbia University
- 2006-2011 Graduate Research Assistant, University of Southern California, Department of Biological Sciences and Center for Embedded Networked Sensing (CENS)
- 2003-2006 Laboratory Research Technician II, University of Southern California, Department of Biological Sciences and Center for Embedded Networked Sensing (CENS)
- 2000-2002 Marine Technician (sea-going), University of Miami (RSMAS), R/V Seward Johnson

Teaching Experience

- 2012 Course Scientist, Climate Change, American Museum of Natural History Seminars on Science, graduate-level course for educators
- 2012 "Ocean Acidification," invited presentation to students in Environmental Science and Policy Master's Program, Columbia University
- 2009, 2010 Teaching Assistant, Introduction to Microbiology, University of Southern California
- 2009 Field Teaching Assistant, Advanced Seminar in Plankton Biology, University of Southern California

Graduate Mentoring (LDEO)

A. Bausch (2012-present)

Undergraduate Mentoring (USC)

D. Rico (2010-2012), C. Sur (2010-2011), D. Coit (2007-2009)

Honors & Awards

- 2012 Invited Participant - Ecological Dissertations in the Aquatic Sciences (Eco-DAS X) Symposium, University of Hawaii at Manoa
- 2012 Travel and Registration Award, Invited participant - Time-series Analysis in Marine Science and Applications for Industry Conference, Logonna-Daoulas, France
- 2012 Invited Participant - 2nd EU-U.S. Developing a New International Architecture for Maritime Policy Conference, Columbia University, New York, NY
- 2012-2014 Lamont-Doherty Postdoctoral Fellowship, Lamont-Doherty Earth Observatory of Columbia University

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- 2011 Anita Brown Wilson Scholarship for Environmental Studies, University of Southern California
- 2011 Student Travel Award, American Society for Limnology and Oceanography (ASLO) Winter Conference
- 2010 IEEE Distinguished Student Humanitarian Prize (2nd Place), Presidents' Change the World Competition
- 2010 Outstanding Teaching Assistant Award, Introduction to Microbiology, University of Southern California
- 2009 Invited Participant - Pan-American Sensors for Environmental Observatories (PASEO), an NSF Pan-American Advances Studies Institute (PASI), Argentina
- 2006-2011 College Doctoral Fellowship, University of Southern California
- 2000 General University Honors, University of Miami

Research Awards

The Climate Center, Lamont-Doherty Earth Observatory. 2012-2013, \$8000 - The Role of Climate Change and Hypoxia in the Sudden Emergence of Blooms of the Dinoflagellate *Noctiluca Miliaris* in the Arabian Sea. **CoPI** with H. Gomes and J. Goes (LDEO)

Lamont-Doherty Earth Observatory Postdoctoral Fellowship Award. 2012-2014, \$115,000 (stipend & research budget) - Effects of predicted ocean acidification on the growth and physiology of red-tide dinoflagellates. **Postdoctoral Research Fellow.**

Pending Proposals

NSF, Coastal SEES, *Pending* – Coastal SEES (Track 1): The intersection of real and perceived risk: Water quality variability and decision-making in urban river recreation. **PI** with CoPIs N. Petrovic (CRED, Columbia University), J. Goes, H. Gomes, A. Juhl (LDEO).

NASA, Remote Sensing of Water Quality, *Pending* – Remotely-assessed water quality indicators in an urbanized estuary. **CoPI** with J. Goes, H. Gomes, A. Chekalyuk, A. Juhl (LDEO), G. Fargion (SDSU)

Publications

1. **Stauffer, BA**, AG Gellene, C Oberg, G Sukhatme, DA Caron (*submitted*) Tidally-mediated bloom initiation in a nearshore embayment resolved from a high resolution time-series. *Limnology & Oceanography*.
2. **Stauffer, BA**, JI Goes, HR Gomes, PJ Stabeno. (*submitted*) Interannual variability of spring-1 time phytoplankton community composition in the western Gulf of Alaska and southeastern Bering Sea. *Deep Sea Research II Special Issue*.
3. **Stauffer, BA**, A Schnetzer, AG Gellene, C Oberg, GS Sukhatme, DA Caron. 2013. Effects of an acute hypoxic event on microplankton community structure in a coastal harbor of Southern California. *Estuaries and Coasts* 36: 135-148.
4. **Stauffer, BA**, AG Gellene, A Schnetzer, EL Seubert, C Oberg, GS Sukhatme, DA Caron. 2012. An oceanographic, meteorological and biological 'perfect storm' yields a massive fish kill. *Marine Ecology Progress Series* 468: 231-243.
5. Golubchik, L, D Caron, A Das, A Dhariwal, R Govindan, D Kempe, C Oberg, A Sharma, **B Stauffer**, G Sukhatme, B Zhang. 2011. AMBROSia: An Overview and Recent Results. *Journal of Algorithms & Computational Technology* 5 (4): 583-600.
6. Smith, RN, J Das, H Heidarsson, A A. de Menezes Pereira, F Arrichiello, I Cetinic, L Darjany, ME Garneau, MD Howard, C Oberg, M Ragan, E Seubert, **B Stauffer**, A Schnetzer, G Toro-Farmer, DA Caron, BH. Jones, GS Sukhatme. 2010. USC CINAPS Builds Bridges: Observing and Monitoring the Southern California Bight. *IEEE Robotics and Automation Magazine* 17 (1): 20-30.

7. Ishikawa, F. N., **BA Stauffer**, DA Caron, C Zhou. 2009. Rapid and Label-Free Cell Detection by Metal-Cluster-Decorated Carbon Nanotube Biosensors. *Biosensors and Bioelectronics*. 24 (10): 2967-2972.
8. **Stauffer, BA**, RA Schaffner, C Wazniak, DA Caron. 2008. An immunofluorescent flow cytometric technique for counting the brown tide alga, *Aureococcus anophagefferens*. *Applied & Environmental Microbiology* 74(22):6931-40.
9. Caron, DA, **BA Stauffer**, SD Moorthi, A Singh, M Batalin, E Graham, M Hansen, WJ Kaiser, J Das, A Pereira, A Dhariwal, B Zhang, C Oberg, GS Sukhatme. 2008. Macro- to fine-scale spatial and temporal distributions and dynamics of phytoplankton and their environmental driving forces in a small subalpine lake in southern California, USA. *Limnology and Oceanography* 53: 2333-2349.
10. **Stauffer, BA**, GS Sukhatme, C Oberg, B Zhang, A Dhariwal, A Requicha, DA Caron. 2008. Use of embedded networked sensors for the study of cyanobacterial bloom dynamics. In: *Cyanobacterial Harmful Algal Blooms: State of the Science and Research Needs*, HK Hudnell (ed.). *Advances in Experimental Medicine and Biology* 619: 176-177.
11. Singh, A, M Batalin, MJ Stealey, B Zhang, A Dhariwal, **B Stauffer**, S Moorthi, C Oberg, A Pereira, V Chen, Y Lam, D Caron, M Hansen, WJ Kaiser, G Sukhatme. 2007. Human Assisted Robotic Team Campaigns for Aquatic Monitoring. *Journal of Field Robotics* 24 (11-12): 969-989.
12. Sukhatme, GS, A Dhariwal, B Zhang, C Oberg, **BA Stauffer**, DA Caron. 2007. Design and Development of a Wireless Robotic Networked Aquatic Microbial Observing System. *Environmental Engineering Science* 24 (2): 205-215.
13. Schnetzer, A, PE Miller, RA Schaffner, **BA Stauffer**, BH Jones, SB Weisberg, PM DiGiacomo, WM Berelson, DA Caron. 2007. Blooms of *Pseudo-nitzschia* and domoic acid in the San Pedro Channel and Los Angeles harbor areas of the Southern California Bight, 2003–2004. *Harmful Algae* 6 (3): 372-387.
14. D Caron, A Das, A Dhariwal, L Golubchik, R Govindan, D Kempe, C Oberg, A Sharma, **B Stauffer**, G Sukhatme, B Zhang. 2007. AMBROSia: An Autonomous Model-Based Reactive Observing System. *Lecture Notes in Computer Science* 4487: 995-1001.
15. Moorthi, SD, PD Countway, **BA Stauffer**, DA Caron. 2006. Use of quantitative real-time PCR to investigate the dynamics of the red tide dinoflagellate *Lingulodinium polyedrum*. *Microbial Ecology* 52 (1): 136-150.
16. Golubchik, L, D Caron, A Das, A Dhariwal, R Govindan, D Kempe, C Oberg, A Sharma, **B Stauffer**, G Sukhatme, B Zhang. 2006. A generic multi-scale modeling framework for reactive observing systems: An overview. *Computational Science – ICCS, Part 3, Proceedings Lecture Notes in Computer Science* 3993: 514-521.
17. Lee, AS, M Mahapatro, DA Caron, AAG Requicha, **BA Stauffer**, ME Thompson, CW Zhou. 2006. Whole-cell sensing for a harmful bloom-forming microscopic alga by measuring antibody-antigen forces. *IEEE Transactions on Nanobioscience* 5 (3): 149-156.

Manuscripts in preparation (*indicates undergraduate author)

Stauffer, BA, JI Goes, HR Gomes. Spatial variation of phytoplankton community structure in the western Gulf of Alaska and eastern Bering Sea, 2011-2012.

Stauffer, BA, AG Gellene, D Rico*, C. Sur*, DA Caron. Growth of the heterotrophic dinoflagellate *Noctiluca scintillans* on red tide-forming dinoflagellates and raphidophytes.

Stauffer, BA, SD Moorthi, DA Caron. Compositional changes in phytoplankton community in a cyanobacteria-dominated montane lake.

Oceanographic Cruises, Field Experience, & Credentials

- 2012 Water Quality monitoring cruise aboard Riverkeeper boat, Hudson River, NY (PI: Juhl)
- 2012 Oceanographic cruise aboard RV Oscar Dyson in the Gulf of Alaska and Bering Sea to study spatial patterns of plankton community structure relative to sea ice extent (NASA, PI: Goes)
- 2011 YSI EcoMapper AUV deployment in Monterey Bay as part of Monterey Bay Aquarium Research Institute CANON program (PI: Chavez)
- 2011 YSI Ecomapper AUV Training, St. Petersburg, FL
- 2005-2011 Extensive shore-side *in situ* sensing and sampling of phytoplankton in Santa Monica Bay, CA
- 2003-2010 Webb Slocum Glider deployment and piloting, numerous day cruises in waters off Southern California in support of ECOHAB and Bight projects studying environmental triggers of toxic *Pseudonitzschia* blooms in the San Pedro Bay (PI: Caron)
- 2008 Webb Slocum Glider Training, Falmouth, MA
- 2008 Oceanographic cruise aboard RVIB Nathaniel B. Palmer in Ross Sea, Antarctica studying trophic cascades of plankton assemblages in coastal and polynya systems (NSF OPP, PI: Caron)
- 2005-2006 Multi-day seasonal sampling of sub-alpine Lake Fulmor in San Jacinto mountains, CA (NSF CENS, PI: Estrin)
- 2004 Scientific Dive Training (AAUS), USC Wrigley Institute
- 2002 Oceanographic cruise aboard RV Endeavor to assist in recovery of deep-sea sediment traps in the North Atlantic (PI's: Capone, Michaels)
- 2001 Numerous oceanographic cruises (total 6 months at sea) aboard RV Seward Johnson in the Caribbean, North Atlantic, Sargasso Sea, and Gulf of Mexico in support of diverse NSF-funded research projects

Professional Service & Outreach Activities

- Manuscript Review: Limnology & Oceanography, Journal of Marine Systems
- Proposal Review: National Science Foundation
- Member: Association for the Sciences of Limnology & Oceanography (ASLO)
- 2012 Lamont-Doherty Earth Observatory Open House – Interactive Plankton Exhibit
- 2012 Facilitator, American Museum of Natural History Educators' Night: "Bioluminescence"
- 2012 Blog Author, "Sea Ice Blooms in the Far North," during Bering Sea cruise aboard the R/V Oscar Dyson (<http://www.ldeo.columbia.edu/research/blogs/sea-ice-blooms-far-north>)
- 2011 Phytoplankton Identification Trainer, SoCal Community HABwatch Network (sponsors: COSEE West, SCCOOS)
- Provided on-site training to informal education centers on performing plankton net tows and qualitatively describing phyto- and microplankton communities.
 - Compiled photo guide of local harmful and common phytoplankton species.
- 2011 Invited Student Presenter, COSEE West Workshop on Harmful Algal Blooms for Informal Science Educators, "Research and monitoring of harmful algal blooms: Improving observations using autonomous vehicles and sensor networks."
- 2009-2010 Student Representative to the Faculty, USC Marine Environmental Biology
- 2007-2010 Vice President, Graduate Women in Biology, USC
- Organized USC Graduate Professionalism Initiative (GPI)-funded networking event to match up graduate and post-doctoral researchers in biology with female undergraduates pursuing laboratory experience (30 participants, April 2010).
 - Co-sponsored a funded GPI proposal for an interdepartmental Biology graduate student symposium (May 2008).

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- Organized series of informal lunch-time talks regarding the roles, challenges, and successes of women in science.
- 2008 Co-organizer, Communicating Marine Science for USC Graduate Students
- Co-organized a GPI-funded proposal for a one-day workshop run by the COMPASS group for communicating marine science to media and public audiences (28 student, post-doc participants)
- 2006-2007 Co-developer of Plankton Exhibit with the Aquarium of the Pacific, Long Beach, CA
- In cooperation with a team of graduate students and Aquarium staff, redesigned the plankton exhibit to include interactive modules, descriptive & informative videos, and hands-on displays

Presentations (all)

1. Tidally-mediated bloom initiation in a nearshore embayment resolved from a high resolution time-series. Europole Mer Timeseries Analysis in Marine Science and Applications for Industry conference, Brittany, France. Sept 2012. (*poster*)
2. Plankton dynamics in a near-shore Southern California coastal environment: responses to short-term environmental fluctuations and top-down control. Biology & Paleo-Environment Seminar Series. Lamont-Doherty Earth Observatory at Columbia University, Palisades, NY. March 2012. (*oral*)
3. The YSI-Iver EcoMapper Platform: An AUV for the Masses. Monterey Bay Aquarium Research Institute, Moss Landing, CA. April 2011. (*oral*)
4. Timeseries analysis of coastal marine ecosystem reveals strong physical forcing of phytoplankton biomass and diversity. ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico. Feb 2011. (*oral*)
5. Temporal variations in underlying physical forces driving phytoplankton biomass in King Harbor, Redondo Beach, CA. University of Oldenburg, Institute for Chemistry and Biology of the Marine Environment, Oldenburg, Germany. July 2010. (*oral*)
6. Networked Sensing of Small-Scale Water Column Dynamics in a Near-Shore Urban Embayment. ASLO Ocean Sciences Meeting, Portland, OR. Feb 2010. (*poster*)
7. Coastal Sensor Networks in Southern Californian Coastal Water in Support of Harmful Algal Bloom Research. Conference on Coastal Environmental Sensor Networks, Univ. Mass. Boston. July 2009. (*oral, invited*)
8. Sensor network technology in support of aquatic microbiology. CENS Research Review, UCLA. October 2009. (*oral, invited*)
9. RN Smith, **B Stauffer**, J Das, H Heidarsson, AA Pereira, Y Chao, L Darjany, I Cetinic, D Estrin, C Oberg, M Ragan, BH Jones, GS Sukhatme, DA Caron. Design and Implementation of Sensor Networks for the Observation and Research of Harmful Algal Blooms in Southern California Coastal Waters. 2009. Conference on Coastal Environmental Sensor Networks, Univ. Mass. Boston. July 2009.
10. Physical, chemical, and biological factors shaping phytoplankton community structure in King Harbor, Redondo Beach, California. CENS Site Visit, UCLA. May 2009.
11. A Pereira, J Das, H Heidarsson, RN Smith, **B Stauffer**, E Seubert, M-E Garneau, M Howard, L Darjany, C Oberg, I Cetinic, M Ragan, EC Smith, G Toro-Farmer, F Arrichiello, D Caron, A Schnetzer, B Jones, G Sukhatme. Networked Robotic Sensor Platform Deployments for use in Coastal Environmental Assessment in Southern California. CENS Site Visit, UCLA. May 2009.
12. A Pereira, J Das, H Heidarsson, RN Smith, **B Stauffer**, E Seubert, ME Garneau, M Howard, L Darjany, C Oberg, I Cetinic, M Ragan, EC Smith, G Toro-Farmer, F Arrichiello, D Caron, A

- Schnetzer, B Jones, G Sukhatme. Networked robotic sensor platform deployments for use in coastal environmental assessment in southern California. CENS Site Visit, UCLA. May 2009.
13. E Graham, V Chen, S Villamizar, A Rat'ko, H Pai, **B Stauffer**, T Harmon. Pan-American Sensors for Environmental Observations (PASEO): An Interdisciplinary Pan-American Advanced Studies Institute (PASI). CENS Site Visit, UCLA. May 2009.
 14. D Caron, **B Stauffer**, L Darjany, C Oberg, A Pereira, J Das, H Heidarsson, R Smith, E Smith, E Seubert, ME Garneau, M Howard, B Jones, I Cetinic, G Sukhatme. Networked Aquatic Microbial Observing Systems: An Overview. CENS Site Visit, UCLA. May 2009.
 15. B Aswin, C Butler, D Caron, T Harmon, CM Ho, J Judy, D Kim, M Liu, A Ratâko, L Sabet, A Schnetzer, **B Stauffer**, YC Tai. New Wireless Miniature Sensor Technologies for CENS. CENS Site Visit, UCLA. May 2009.
 16. M Liu, L Sabet, A Schnetzer, **B Stauffer**, D Caron, CM Ho, YC Tai. Field Operational Sensor and Lab-on-a-Chip System for Marine Environmental Monitoring and Analysis. CENS Site Visit, UCLA. May 2009.
 17. Protistan dynamics in the near-shore marine environment. Biology Interdepartmental Graduate Symposium USC. May 2009. (*oral*)
 18. Studying algal bloom dynamics in King Harbor, CA, using coordinated ENS approaches and human-mediated systems. CENS NSF Site Visit, UCLA. May 2008. (*poster*)
 19. Dynamics of Microalgal Blooms in Redondo Beach, California. Biology Interdepartmental Graduate Symposium, USC. May 2008. (*oral*)
 20. Small Scale Bloom Dynamics of Raphidophyte and Dinoflagellate Populations in King Harbor, Redondo Beach, California. 4th Symposium on Harmful Algae in the US, Woods Hole, MA. Oct 2007. (*poster*)
 21. Investigations of fine-scale diel migration of phytoplankton populations in King Harbor, Redondo Beach. CENS Research Review, UCLA. Oct 2007. (*poster*)
 22. X Bai, **B Stauffer**, L Darjany, D Caron, B Zhang, A Dhariwal, A Pereira, J Das, C Oberg, G Sukhatme. Monitoring and detecting harmful algal blooms in king harbor, city of Redondo Beach, CA, using a wireless sensor network. CENS Research Review, UCLA. Oct 2007.
 23. M Liu, S Zheng, **B Stauffer**, A Schnetzer, L Sabet, DA Caron, CM Ho, YC Tai. Lab-on-a-Chip Aquatic Microorganism Analysis System. CENS Research Review, UCLA. Oct 2007.
 24. C Oberg, **B Stauffer**, A Dhariwal, B Zhang, A Pereira, J Das, X Bai, L Darjany, GS Sukhatme, DA Caron. Networked Aquatic Microbial Observing System. CENS Research Review, UCLA. Oct 2007.
 25. B Zhang, A Dhariwal, A Pereira, J Das, C Oberg, **B Stauffer**, L Darjany, X Bai, D Caron, GS Sukhatme. Adaptive Sampling by Using Mobile Robots and a Sensor Network. CENS Research Review, UCLA. Oct 2007.
 26. A Dhariwal, G Sukhatme, D Caron, X Bai, L Darjany, J Das, C Oberg, A Pereira, **B Stauffer**, B Zhang. Automated Mapping and Exploration. CENS Research Review, UCLA. Oct 2007.
 27. Characterization of phytoplankton dynamics in Lake Fulmor, CA using ENS approaches. CENS Research Review, UCLA. Oct 2006. (*oral, invited*)
 28. Observation of Phytoplankton Bloom Dynamics in a Small Lake Using a Wireless Sensor Network. ASLO Summer Meeting, Victoria, BC, Canada. June 2006. (*poster*)
 29. Characterization of the Phytoplankton Community in Lake Fulmor, CA, Using Embedded Sensor Networks. CENS Event. 2006. (*poster*)

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30. A Dhariwal, B Zhang, A Pereira, C Oberg, **B Stauffer**, S Moorthi, D Caron, G Sukhatme. NAMOS: Networked Aquatic Microbial Observing System. CENS Event. 2006.
31. G Sukhatme, D Caron, C Oberg, B Zhang, A Dhariwal, **B Stauffer**, S Moorthi, A Pereira. ENS Approaches for Observing and Sensing of Microbial Communities in Aquatic Ecosystems An Overview. CENS Event 2006
32. S Moorthi, **B Stauffer**, C Oberg, G Sukhatme, D Caron. Investigating Vertical Migration and Bloom Dynamics of a Red Tide Dinoflagellate: Laboratory Observations and a Novel Sensing Approach. CENS Event 2006.
33. A Benahmed, N Rechner, R Lam, M Bendikov, A Ratko, C Butler, I Goldberg, D Kim, M Glickman, D Zhang, M Liu, S Zheng, M Mahapatro, P Gross, **B Stauffer**, A Lee, M Thomspson, Ch Zhou, D Caron, A Requicha, T Harmon, J Judy, Y-C Tai, C-M Ho. Wireless Miniature Sensors for CENS Overview. CENS Event. 2006
34. Use of Embedded Networked Sensing for the Study of Cyanobacterial Bloom Dynamics. International Symposium on Cyanobacterial Harmful Algal Blooms (ISOC-HAB), Research Triangle Park, NC. Sept 2005.

Presentations (accepted)

35. Coastal sensor networks allow elucidation of causative mechanisms underlying algal bloom and fish kill events. To be presented at ASLO Aquatic Sciences Meeting, New Orleans, LA. Feb 2013. (*oral*)
36. Seubert, EL, L Chilton, AG Gellene, A Jones, B Seegers, **BA Stauffer**, J Thomas, DA Caron. Construction of a community based harmful algal bloom monitoring program: Bridging university research with informal science centers. To be presented at ASLO Aquatic Sciences Meeting, New Orleans, LA. Feb 2013. (*oral*)