



William K. Oestreich

PhD Candidate

Hopkins Marine Station of Stanford University

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Education

Ph.D. – Biology (*In progress*); Stanford University Hopkins Marine Station, Pacific Grove, CA

Advised by Dr. Jeremy Goldbogen and Dr. Larry Crowder

M.S. – Environmental Engineering & Science; Northwestern University, Evanston, IL (2015)

B.S. (with Honors) – Environmental Engineering; Northwestern University, Evanston, IL (2015)

Honors Thesis: Variability in coral bleaching severity: Insights from application of Bleaching

Response Index (BRI) to global and Caribbean bleaching records (Advisor: Dr. Luisa Marcelino)

Peer-Reviewed Publications

4. **Oestreich, WK**, Frawley, TH, Mansfield, EJ, Green, KM, Green, SJ, Naggea, J, Selgrath, JC, Swanson, SS, Urteaga, J, White, TD, and Crowder, LB, 2019: The impact of environmental change on small-scale fishing communities: Moving beyond adaptive capacity to community response in Cisneros-Montemayor, AM, Cheung, W, and Ota, Y (ed). Predicting future oceans: Sustainability of social-ecological systems under climate change. Elsevier. New York, NY.
3. Glover, DM, Doney, SC, **Oestreich, WK**, and Tullo, A, 2018: Geostatistical analysis of mesoscale spatial variability and error in SeaWiFS and MODIS/Aqua global ocean color data. *Journal of Geophysical Research: Oceans* DOI: 10.1002/2017JC013023.
2. Swain, TD, Vega-Perkins, JB, **Oestreich, WK**, Triebold, C, DuBois, E, Henss, J, Baird, A, Siple, M, Backman, V, and Marcelino, L, 2016: Coral Bleaching Response Index: a new tool to standardize and compare susceptibility to thermal bleaching. *Global Change Biology* 22, 2475-2488.
1. **Oestreich, WK**, Ganju, NK, Pohlman, JW, and Suttles, SE, 2016: Colored dissolved organic matter in eutrophic estuaries: relationships between carbon sources and light attenuation. *Biogeosciences* 13, 583-595.

Manuscripts in review/revision, submission, or preparation

Oestreich, WK, Chapman, MS, and Crowder, LB (*In revision at Frontiers in Ecology and the Environment*): A comparative analysis of dynamic management in marine and terrestrial systems.

Cade, DE, Seakamela, M, Findlay, K, Fahlbusch, J, Fukunaga, J, Kahane-Rapport, S, **Oestreich, WK**, Warren, J, Calambokidis, J, Hazen, E, Friedlaender, A, Kirkman, S, Kotze, D, McCue, S, Meyer, M, Ryan, J, Wilke, C, and Goldbogen, JA (*Submitted to Nature*): The patchy distribution of krill within large swarms drives collective exploitation by super groups of rorqual whales.

Haver, SM, Rand, Z, Hatch, LT, Lipski, D, Dziak, RP, Gedamke, J, Haxel, J, Heppell, SA, Jahncke, J, McKenna, MF, Mellinger, DK, **Oestreich, WK**, Roche, L, Ryan, JP, and Van Parijs, SM. Seasonal trends and primary contributors to the low frequency soundscape of the Cordell Bank National Marine Sanctuary. (*In submission to Journal of the Acoustical Society of America*).

Green, KM, et al. including **Oestreich, WK** (*In prep for Global Environmental Change*): Adaptation of small scale fisheries to environmental change: A meta-analysis of community response.

Kitzes, J et al. including **Oestreich, WK** (*In prep*): Expanding the National Ecological Observatory Network (NEON) biodiversity surveys with new instrumentation and machine learning models.

Professional and Research Experience

Research Assistant III (*PI: Dr. Scott Doney*)

Computational Biogeochemistry Group, Woods Hole Oceanogr. Inst., Woods Hole, MA (2015-2017)

Field Research Assistant (*Advised by Dr. Parikshit Singh Tomar and Dr. Kimberly Gray*)

Jal Bhagirathi Foundation, Jodhpur, Rajasthan, India; and Northwestern University, Evanston, IL (2015)

Undergraduate Research Assistant (*Advised by Dr. Luisa Marcelino*)

Marcelino Research Group, Northwestern University, Evanston, IL (2013-2015)

Litigation Team Intern

Natural Resources Defense Council, Chicago, IL (2015)

Summer Student Fellow (*Advised by Dr. Neil Ganju*)

US Geological Survey Woods Hole Coastal & Marine Science Center, Woods Hole, MA (2014)

Geographic Information Systems (GIS) Intern

City of Evanston Water Utilities Department, Evanston, IL (2014)

Undergraduate Research Assistant (*Advised by Dr. Jean-Francois Gaillard*)

Environmental Aquatic Geochemistry Lab, Northwestern University, Evanston, IL (2012-2013)

Teaching Experience

Co-instructor, Fellowship and Proposal Writing, CSUMB & Stanford summer REU programs (2019)

Teaching Assistant, Marine Conservation Biology (BioHopk 173H), Stanford Univ. (2019)

Teaching Assistant, Intro to Research in Ecology and Evolutionary Bio (Bio 47), Stanford Univ. (2018)

Teaching Assistant, Public and Environmental Health (Env. Eng. 361), Northwestern University (2015)

Students Advised

Alex Khieu - Salinas High School Internship Program (2019)

Fellowships and Research Awards

NSF Graduate Research Fellowship (3 years tuition + stipend; 2018-2021)

David & Lucile Packard Stanford Graduate Fellowship (3 years tuition + stipend; 2017-2020)

Fieldwork Grant - California Ocean Alliance (COA)(\$1000; 2019)

Best Research Talk - Stanford Woods Institute Young Environmental Scholar Conference (\$250; 2019)

Conference Travel Grant - Office of Graduate Education, Stanford University (\$850; 2019)

Conference Travel Grant - Office of Graduate Education, Stanford University (\$950; 2018)

Whelan Grant - Woods Hole Oceanographic Institution (\$1000; 2015)

Jimmie E. Quon Memorial Award for Env. Eng. Senior - Northwestern Univ. (\$1000; 2015)

Summer Student Fellowship - Woods Hole Oceanographic Institution/US Geological Survey (2014)

Conference Travel Grant - Woods Hole Oceanographic Institution (\$1000; 2014)

Academic Leadership Experience

Graduate student representative, Friends of Hopkins Marine Station Board, Pacific Grove, CA (2019).
Treasurer and symposium organizer, Surf 'n' Turf Research Symposium, Biology Dept., Stanford University, Palo Alto, CA (2018-2019).
Institution representative for Hopkins Marine Station, Monterey Area Research Institutions Network for Education (MARINE), Santa Cruz, CA (2018-2019).

Academic Journal Reviewing

Reviewer for the following journals: *Marine Mammal Science*

Environmental Service, Volunteer, and Outreach Activities

Program Coordinator, Salinas High School - Hopkins Marine Station Internship Program, Salinas and Pacific Grove, CA (2019-2020).
"The Science of Sound" guest scientist, Pacific Grove Museum of Natural History Science Saturdays, Pacific Grove, CA (2019).
Field bioacoustics mentor, California Ocean Alliance (COA) Marine Mammal Scientist in Training Camp, Monterey Bay, CA (2019).
Creator and organizer, "The sounds of Monterey Bay" listening station exhibit, Hopkins Marine Station Open House, Pacific Grove, CA (2018-2019).
Guest speaker and instructor, marine science curriculum, Pacific Grove Public Schools, CA (2018)
Marine science pen pal, Mt. Pleasant Elementary 1st Grade Class, Wilmington, DE (2017-2019)
Stanford High School to PhD (HyPE), Graduate Student Volunteer, Palo Alto, CA (2017)
Volunteer judge, Bourne Science & Engineering Expo, Bourne, MA (2016)
Prairie restoration volunteer, North Branch Restoration Project, Chicago, IL (2013-2015)
Necropsy volunteer, WHOI Marine Mammal Necropsy Lab, Woods Hole, MA (2014)

Theses and Technical Reports

Oestreich, WK, 2015: Variability in coral bleaching severity: Insights from application of Bleaching Response Index (BRI) to global and Caribbean bleaching records. *BS/MS Honors Thesis*.
Oestreich, WK, and Leenay, AB, 2015: Water quality testing and potential for solar disinfection and distillation in villages of Barmer District, Rajasthan, India. *Technical Report for the Jal Bhagirathi Foundation*.
Oestreich, WK, and Yao, H, 2014: Developing a field-based water quality testing kit tailored to the environmental conditions of India's Thar Desert. *Technical Report for the Jal Bhagirathi Foundation*.

General Audience Publications

Oestreich, WK: "How hard can it be to find a whale?". *The Dish on Science*, May 2019
<http://thedishonscience.stanford.edu/posts/how-hard-can-it-be-to-find-a-whale/>

Popular Media Coverage

Earthier (Gizmodo): <https://earthier.gizmodo.com/the-worlds-largest-animal-has-a-secret-lingo-heres-what-1834270610>

Additional education and working groups

OceanHackWeek, University of Washington, Summer 2019

ACKME Mathematical Ecology Working Group, Woods Hole Oceanogr. Inst., Fall 2017

MARINE Ocean Policy Course; Center for Ocean Solutions, Stanford University, Summer 2017

Structured Population Models; Woods Hole Oceanographic Institution, Winter/Spring 2017

Modeling Methods for Marine Science; Woods Hole Oceanographic Institution, Fall 2016

Satellite Remote Sensing for Biological Oceanography; Cornell University, Summer 2016

Invited Talks, Conference Presentations, and Posters (- presenting author)*

Oestreich, WK*, Cline, DE, Cade, DE, Calambokidis, J, Fahlbusch, JA, Joseph, JE, Margolina, T, Southall, BA, Goldbogen, JA, and Ryan, JP “Temporal variation in blue whale call types in the Northeast Pacific at diel, seasonal, and interannual time scales with tag-derived behavioral context.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Oral presentation.

Cade, DE*, Seakamela, M, Findlay, K, Fahlbusch, J, Fukunaga, J, Kahane-Rapport, S, **Oestreich, WK**, Warren, J, Calambokidis, J, Hazen, E, Friedlaender, A, Kirkman, S, Kotze, D, McCue, S, Meÿer, M, Ryan, J, Wilke, C, and Goldbogen, JA “The patchy distribution of krill within large swarms drives collective exploitation by super groups of rorqual whales.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Oral presentation.

Calambokidis, J*, Fahlbusch, JA, Szesciorka, AR, Sirovic, A, Southall, BL, Cade, DE, Friedlaender, AS, **Oestreich, WK**, and Goldbogen, JA “New insights into blue, fin, and humpback whale feeding, movements, and impacts of human activities from medium duration archival tags.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Oral presentation.

Crowder, LB*, **Oestreich, WK**, Chapman, MS, and Hazen, EL “The emergence of dynamic management approaches in ocean ecosystems with a comparison to management of terrestrial ecosystems.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Oral presentation.

Green, KM*, et al. including **Oestreich, WK** “Adaptation of Small Scale Fisheries to Environmental Change: A Meta-analysis of Community Response.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Poster.

Haver, S*, Rand, Z, Hatch, L, Lipski, D, Dziak, RP, Gedamke, J, Haxel, J, Heppell, SA, Jahncke, J, McKenna, M, Mellinger, D, **Oestreich, WK**, Roche, L, Ryan, JP, and Van Parijs, SM “Passive acoustic monitoring reveals seasonal trends and primary contributors to the low frequency ambient soundscape of the Cordell Bank National Marine Sanctuary.” Ocean Sciences Meeting, San Diego, CA, Feb 2020. Poster.

Oestreich, WK*, Cade, DE, Calambokidis, J, and Goldbogen, JA “Context of blue whale vocalizations as determined via tag-mounted accelerometers.” World Marine Mammal Conference, Barcelona, Spain, Dec 2019. Oral presentation.

Ryan, JP*, Cline, DE, Benoit-Bird, KJ, Chavez, FP, Raanan, BY, Urmy, SS, Zhang, Y, **Oestreich, WK**, Goldbogen, JA, Joseph, JE, Margolina, T, DeVogelaere, A, Forney, K, Kudela, RM, and Santora, JA “Integrative passive acoustic monitoring in Monterey Bay National Marine Sanctuary.” Acoustical Society of America Annual Meeting, San Diego, CA, Dec 2019. Oral presentation.

Oestreich, WK*, Cline, DE, Cade, DE, Calambokidis, J, Goldbogen, JA, Crowder, LB, and Ryan, JP “Synthesis of acoustic, biologging, and machine learning methods enhances monitoring of blue whales from individual to population scales.” Joint Meeting of the

American Fisheries Society and The Wildlife Society, Reno, NV, Sept 2019. Oral presentation.

Oestreich, WK*, Chapman, MS, and Crowder, LB “Scales of forecasting for dynamic management: gaps in marine and terrestrial systems.” Joint Meeting of the American Fisheries Society and The Wildlife Society, Reno, NV, Sept 2019. Oral presentation.

Haulsee, DE*, Blondin, H, **Oestreich, WK**, and Crowder, LB “Seasonal occurrence and distributions of billfish related to climate variability in the Eastern Pacific Ocean.” Joint Meeting of the American Fisheries Society and The Wildlife Society, Reno, NV, Sept 2019. Oral presentation.

Oestreich, WK*, Frawley, TH, Mansfield, EJ, Green, KM, Green, SJ, Naggea, J, Selgrath, JC, Swanson, SS, Urteaga, J, White, TD, and Crowder, LB “The impact of environmental change on small-scale fishing communities: Moving beyond adaptive capacity to community response.” Nippon Foundation Nereus Science Conference, Princeton, NJ, Sept 2019. Oral presentation.

Oestreich, WK* “Connecting behavior across individual, population, and ecosystem scales: ecological and management implications for the blue whale.” Monterey Area Research Institutions Network for Education (MARINE) Annual Colloquium, Moss Landing, CA, May 2019. Oral presentation.

Oestreich, WK* “Enhancing cetacean monitoring using a novel synthesis of passive acoustics, machine learning, and biologging.” Bay Area Conservation Biology Symposium, Berkeley, CA, Apr 2019. Oral presentation.

Chapman, MS*, **Oestreich, WK**, Beytell, P “Impacts of ephemeral water availability and human infrastructure on elephant herd movement.” Bay Area Conservation Biology Symposium, Berkeley, CA, Apr 2019. Oral presentation.

Oestreich, WK* “Integrating blue whale behavior from individual to ecosystem scales.” Hopkins Marine Station, Stanford University, Pacific Grove, CA, Feb 2019. Oral presentation.

Southall, BL*, Ryan, JP*, **Oestreich, WK***, Urmy, SS*, Joseph, JE*, Stimpert, AK*, Cline, DE*, Cade, DE*, Goldbogen, JA* “Discussion of sound related research in Monterey Bay National Marine Sanctuary.” Monterey Bay National Marine Sanctuary Research Activity Panel (RAP) Meeting, Moss Landing Marine Laboratories, Moss Landing, CA, Nov 2018.

Oestreich, WK* “Harnessing dynamic animal behavior data to inform dynamic management practices.” Biology Department Surf 'n' Turf Symposium, Stanford University, Palo Alto, CA, Oct 2018. Oral presentation.

Cline, DE*, **Oestreich, WK***, McGill, P*, and Ryan, JP* “Blue whale acoustic detection and classification workflow.” MARS Soundscape Research Symposium, Monterey Bay Aquarium Research Institute, Moss Landing, CA, Oct 2018. Oral presentation.

Oestreich, WK* “Listen and learn: Exploring patterns of cetacean behavior via passive acoustics and machine learning.” Hopkins Marine Station, Stanford University, Pacific Grove, CA, June 2018. Oral presentation.

Oestreich, WK* “Listen up: Learning about whale and human behavior in the oceans using acoustics and machine learning.” GenerationSci Conference, Stanford University, Palo Alto, CA, April 2018. Oral presentation.

Glover, DM, Doney, SC, **Oestreich, WK***, and Tullo, A “Geostatistical Analysis to Quantify Mesoscale Spatial Variability, Patchiness, and Error in SeaWiFS and MODIS/Aqua Global Ocean Color Data.” Ocean Sciences Meeting, Portland, OR, February 2018. Poster.

Oestreich, WK*, Grimes, T*, Spies, N*, Zuercher, R*, and Zweig, C* “Socioeconomic data collection in the National Marine Sanctuaries.” Center for Ocean Solutions Ocean Policy Workshop, Monterey Bay Aquarium, Monterey, CA, July 2017. Oral presentation.

Doney, SC*, Lima, I, **Oestreich, WK**, Kavanaugh, MT, and Glover, DM “Biogeochemical Modeling and Remote Sensing.” North Atlantic Aerosols and Marine Ecosystems Study (NAAMES) PI Meeting II, Hampton, VA, May 2017. Oral presentation.

Doney, SC*, Lima, I, **Oestreich, WK**, Kavanaugh, MT, and Glover, DM “Biogeochemical Modeling and Remote Sensing.” North Atlantic Aerosols and Marine Ecosystems Study (NAAMES) PI Meeting I, Corvallis, OR, July 2016. Oral presentation.

Oestreich, WK* “Coral reefs and climate change: Understanding drivers and patterns of coral bleaching.” Natural Resources Defense Council Chicago Litigation Team Retreat, May 2015. Oral presentation.

Oestreich, WK*, Ganju, NK, Pohlman, JW, and Suttles, SE “Colored dissolved organic matter in shallow estuaries: the effect of source on quantification.” Northwestern University Research & Arts Expo, Evanston, IL, May 2015. Poster.

Oestreich, WK*, Ganju, NK, Pohlman, JW, and Suttles, SE “Colored dissolved organic matter in shallow estuaries: the effect of source on quantification.” American Geophysical Union Fall Meeting, San Francisco, CA, December 2014. Poster.