

# William K. Oestreich

PhD Candidate

Stanford University

Department of Biology; Hopkins Marine Station

woestreich@stanford.edu

## Education

---

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

Advised by Dr. Jeremy Goldbogen and Dr. Larry Crowder

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

Advised by Dr. Luisa Marcelino

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

## Peer-Reviewed Publications

---

7. **Oestreich, WK**, Fahlbush, JA, Cade, DE, Calambokidis, J, Margolina, T, Joseph, J, Friedlaender, AS, McKenna, M, Stimpert, AK, Southall, BL, Goldbogen, JA, and Ryan, JP, 2020: Animal-borne metrics enable acoustic detection of blue whale migration. *Current Biology*. In press.
6. 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, 2020 : Seasonal trends and primary contributors to the low frequency soundscape of the Cordell Bank National Marine Sanctuary. *Journal of the Acoustical Society of America* 148, 845-858.
5. **Oestreich, WK**, Chapman, MS, and Crowder, LB 2020: A comparative analysis of dynamic management in marine and terrestrial systems. *Frontiers in Ecology and the Environment*. doi: 10.1093/fes/2243.
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* 123, 22-39.
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 (complete drafts available)

---

Green, KM, et al. including **Oestreich, WK**: How adaptive capacity shapes the Adapt, React, Cope Response to climate impacts: insights from small-scale fisheries. (*In revision at Climatic Change*).

Cade, DE, et al. including **Oestreich, WK**: The spatial distribution of prey within high-quality prey patches drives the formation of super groups of humpback whales (*In review at Functional Ecology*).

Cade, DE, et al. including **Oestreich, WK**: The temporal persistence of patchy prey determines competition or cooperation in rorqual whale social foraging networks (*In submission at Behavioral Ecology*).

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

Chapman, MS, **Oestreich, WK** et al.: Environmental justice in the protection of Areas Beyond National Jurisdiction. (*In prep*).

### ***Fellowships and Research Awards***

---

**NSF Graduate Research Fellowship** (\$138,000; 2018-2021)

**David & Lucile Packard Stanford Graduate Fellowship** (\$275,000; 2017-2020)

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

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

**SPICE (Student Projects for Intellectual Community Engagement) Grant** - (\$10,000; 2019-2021)

**Conference Travel Grants** - Stanford Univ. Office of Graduate Education (totaling \$1800; 2018-2019)

**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)

### ***Teaching Experience***

---

**Co-instructor**, Fellowship and Proposal Writing, CSUMB REU program (2019-2020)

**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***

---

Mojca Sebanc - Stanford University guest student from University of Ljubljana (2020)

Stephanie Cortes - Salinas High School Internship Program (2020)

Alex Khieu - Salinas High School Internship Program (2019)

### ***Academic Journal Reviewing***

---

Reviewer for the following journals: *Marine Mammal Science*, *Proceedings of the Royal Society B*, *Integrative Zoology*

### ***Academic 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).

**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 1<sup>st</sup> 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)

### *Academic Leadership Experience*

---

**Graduate student representative**, Friends of Hopkins Marine Station Board, Pacific Grove, CA (2019-2020).

**Treasurer and symposium organizer**, Surf 'n' Turf Research Symposium, Biology Dept., Stanford University, Palo Alto, CA (2018-2020).

**Institution representative for Hopkins Marine Station**, Monterey Area Research Institutions Network for Education (MARINE), Santa Cruz, CA (2018-2020).

### *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, Meyer, 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.