

Scott Loranger

Postdoctoral Fellow

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Education

Ph.D.: Oceanography, University of New Hampshire (2019).

Thesis Title: Acoustic Detection and Quantification of Crude Oil (Thomas C. Weber, advisor)

B.S.: Ecology and Evolutionary Biology, Cornell University (2009).

Courses Taught

Ocean Engineering 765/865 Underwater Acoustics

Research Interests

I am an acoustical oceanographer with a background in marine biology. I specialize in detecting and quantifying targets in the water column using broadband acoustic backscatter. I am interested in using this approach to better understand a wide range of oceanographic topics. So far, this has included oil spills, carbon sequestration monitoring and determining right whale foraging habitat.

Research and Professional Experience

Postdoctoral Fellow, Ocean Frontier Institute, Dalhousie University / Woods Hole Oceanographic Institute, (2020 – present).

Postdoctoral Research Fellow, Norwegian Geotechnical Institute/University of Oslo, (2019).

Affiliate Research Faculty, University of New Hampshire, (2019).

Graduate Research Assistant, NOAA Center for Coastal and Ocean Mapping University of New Hampshire, (2013-2018).

Research Technician, Smithsonian Tropical Research Institute (2012).

Technical Coordinator, Alliance for Coastal Technologies / University of Maryland Center for Environmental Science, (2010-2012).

Research Assistant, Cornell Coagulation Laboratory Cornell University, (2008-2009).

Awards and Honors

Ocean Frontier Institute International Postdoctoral Fellow, (2020 – 2022).

Research Assistant Fellowship, Center for Coastal and Ocean Mapping, (2013-2018).

Student Council Representative for Acoustical Society of America, (2015-2017).

Outstanding Student Paper Award, *Fall Meeting of the American Geophysical Union*, (2017).

Best Student Paper, *Meeting of the Acoustical Society of America*, (2016).

Peer Reviewed Publications

Loranger, S., C. Bassett, J. P. Cole, B. Boyle, and T. C. Weber (2018). *Acoustically Relevant Properties of Four Crude Oils at Oceanographic Temperatures and Pressures*. The Journal of the Acoustical Society of America 144 (5): 2926–2936.

Padilla, A., **Loranger, S.**, Kinnamann, F. S., Valentine, D. L. and T.C. Weber (2019). *Modern Assessment of Natural Hydrocarbon Gas Flux at the Coal Oil Point Seep Field, Santa Barbara, California*. Journal of Geophysical Research: Oceans 124 (4):2472-2484.

Loranger, S., G. Pedersen and T.C. Weber (2019). *Broadband acoustic scattering from oblate hydrocarbon droplets*. The Journal of the Acoustical Society of America 144 (2): 1176-1188.

Loranger, S., and T.C. Weber. *Hydrocarbon detection and quantification at a marine oil and gas seep*. In prep. Estimated Submission: February 2020, Target Journal: Environmental Science and Technology.

Technical Reports

Johengen, T., G. Smith , H. Purcell, **S. Loranger**, S. Gilbert, T. Maurer, K. Gundersen , C. Robertson and M. Tamburri. *Performance Verification Statement for the Chelsea UviLux Fluorometer*, 2012. <http://www.act-us.info/evaluations.php>.

Johengen, T., G. Smith , H. Purcell, **S. Loranger**, S. Gilbert, T. Maurer, K. Gundersen , C. Robertson and M. Tamburri. *Performance Verification Statement for the Chelsea Aquatracka Fluorometer*, 2012. <http://www.act-us.info/evaluations.php>.

Johengen, T., G. Smith , H. Purcell, **S. Loranger**, S. Gilbert, T. Maurer, K. Gundersen , C. Robertson and M. Tamburri. *Performance Verification Statement for the Hach FP 360 sc Fluorometer*, 2012. <http://www.act-us.info/evaluations.php>.

Johengen, T., G. Smith , H. Purcell, **S. Loranger**, S. Gilbert, T. Maurer, K. Gundersen , C. Robertson and M. Tamburri. *Performance Verification Statement for the Turner C3Fluorometer*, 2012. <http://www.act-us.info/evaluations.php>.

Johengen, T., G. Smith , H. Purcell, **S. Loranger**, S. Gilbert, T. Maurer, K. Gundersen , C. Robertson and M. Tamburri. *Performance Verification Statement for the Wetlabs ECO FLCDRTD-1929 Fluorometer*, 2012. <http://www.act-us.info/evaluations.php>.

First Author Presentations

Invited

Loranger, S. Acoustic Quantification of Seafloor Sourced Hydrocarbon Production and Carbon Sequestration Leaks. *Dalhousie Oceanography Seminar Series*, Halifax, Nova Scotia, Canada. January 14, 2020.

Loranger, S. Geological Carbon Storage Monitoring. *Center for Coastal and Ocean Mapping Seminar Series*. Durham, New Hampshire, USA. October 11, 2019.

Loranger, S, Albright Blomberg A.E., Pedersen G., Waarum I., Austeng A. Acoustic Characterization of an Artificial CO₂ Seep Using Split-Beam Echo Sounders. *Underwater Acoustics Conference and Exhibition*, Crete, Greece. July 2, 2019.

Loranger, Scott. Broadband acoustic quantification of hydrocarbons. *Woods Hole Oceanographic Institution Applied Ocean Physics and Engineering Seminar*, Woods Hole, MA, USA. Oct. 17, 2018.

Loranger, S and T.C. Weber. Detection and Characterization of Hydrocarbon Droplets Using Broadband Echosounders. *Meeting of the Acoustical Society of America*, New Orleans, LA, USA. Dec. 8, 2017.

Loranger, S. and T.C. Weber. Properties of Submerged Oil Droplets. *School of Marine Science and Ocean Engineering Research Symposium*, Durham, NH, USA. April 13, 2015.

Contributed

Loranger, S., J.P. Cole, C. Bassett, and T.C. Weber. Measurements of the acoustic properties of oil in order to enhance predictive models of acoustic scattering. *Fall Meeting of the American Geophysical Union*, New Orleans, LA, Dec. 11, 2017.

- Loranger, S.** and T.C. Weber. Acoustic Property Measurements of Three Crude Oils at Oceanographically Relevant Temperatures and Pressures. *Meeting of the Acoustical Society of America*, New Orleans, LA, Dec. 4, 2017.
- Loranger, S.**, C. Bassett, and T.C. Weber. Measurements of the Acoustic Properties of Crude Oil. *Meeting of the Acoustical Society of America*, Honolulu, HI, Nov. 30, 2016.
- Loranger, S.** and T.C. Weber. An Evaluation of the Frequency Response of Hydrocarbon Droplets. *Meeting of the Acoustical Society of America*, Salt Lake City, UT, May 23, 2016.
- Loranger, S.**, and T.C. Weber. Detection and Quantification of Submerged Oil Droplets by a Broadband, High-frequency Echo Sounder. *Gulf of Mexico Oil Spill and Ecosystem Science Conference*, Tampa, FL, Feb. 4, 2016.
- Loranger, S.** and T.C. Weber. Diameter and Density Dependent Target Strength of Submerged Oil Droplets Measured by a Broadband, High-frequency Echo Sounder. *Meeting of the Acoustical Society of America*, Pittsburgh, PA, May 18, 2015.
- Loranger, S.** and M. Tamburri. Continuous Monitoring on the Patuxent River. *Atlantic Estuarine Research Society Meeting*, Solomons, MD, April 7, 2011.

Professional Service

- Co-Principal organizer, Special Session “Tools and Methods for Ocean Mapping,” *Meeting of the Acoustical Society of America*. Boston, MA, (June 26, 2017).
- Student Council Representative, Acoustical Society of America (2015-2017).
- Technical Committee Member, Acoustical Society of America Acoustical Oceanography (2015-present)
- Advisory Member (representing NOAA): Taylor Sheen Source Location Working Group (2015-2017)
- Seminar Series Organizer: Center for Coastal and Ocean Mapping (2014-2015).
- Peer Reviewer: *Methods in Oceanography*, *JGR: Oceans*, *JASA Express Letters*.

Outreach Activities

- Exhibit Volunteer, Ocean Discovery Day, (2014-2017).
- Scientist Mentor, First Lego League 5th Grade STEM-club, (2016).
- Science Judge, National Ocean Science Bowl Nor’easter Bowl, (2014).

Workshops and Training

- Alan Alda Science Communication Workshop, University of New Hampshire, January 2017
- ASA School, Graduate and Early Career Acoustics Workshop, Salt Lake City, UT, May 2016

Professional Affiliations

- America Geophysical Union (2017-present).
- American Association for the Advancement of Science (2016-present).
- Acoustical Society of America (2015-present).

Cruises/ DSV Dives/Deployments

- Scientist, **Norwegian Sea, 2019**: R/V G.O. Sars.
- Scientist, **Gulf of Mexico, 2017**: M/V Gerry Bordelon
- Scientist, **Bering Sea, 2016**: R/V Oscar Dyson.
- Scientist, **Gulf of Mexico, 2015**: DSV Alvin.
- Scientist, **Gulf of Mexico, 2015**: R/V Atlantis.

Scientist, **North Atlantic, 2015**: R/V Marcus G. Langseth.
Chief Scientist, **Patuxent River, MD 2011, 2012**: R/V Rachel Carson.
Research Diver, **Bocas del Toro, Panama 2012**.
Student, **Central Pacific, 2007**: SSV Robert C. Seamans.