



## **Samuel R. Laney**

*Oceanographer & Engineer*

Associate Scientist with Tenure

MS #34, 266 Woods Hole Road, Woods Hole, MA 02543

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<https://www2.whoi.edu/site/laneylab/>

### **EDUCATION**

University of Massachusetts, Amherst, Massachusetts M.Ed., expected 2022  
College of Education  
*Concentration:* Higher Education

Oregon State University, Corvallis, Oregon Ph.D., Oceanography, September 2006  
College of Oceanic & Atmospheric Sciences – College of Engineering  
Major: Biological Oceanography Minor: Electrical Engineering and Computer Science  
Thesis: Seconds to hour scale photosynthetic responses in marine microalgae.  
Advisors: Drs. Mark R. Abbott & Ricardo M. Letelier

Oregon State University, Corvallis, Oregon M.S., Oceanography, December 2000  
College of Oceanic & Atmospheric Sciences  
*Major:* Biological Oceanography *Minor:* Physical Oceanography  
Thesis: Environmental sources of variability in the natural fluorescence signal of phytoplankton.  
Advisor: Dr. Mark R. Abbott

Cornell University, Ithaca, New York B.S., Agricultural & Biological Engineering, January 1993  
Joint program: College of Engineering – College of Agricultural & Life Sciences  
*Concentration:* Instrumentation and sensors in biological systems

Deep Springs College, Deep Springs, California, 1989  
Completed the Program of Study (Liberal Arts): 1987-1989.

### **APPOINTMENTS**

Associate Scientist w/Tenure, Woods Hole Oceanographic Institution, Woods Hole MA. 7/2017–present.

Associate Scientist, Woods Hole Oceanographic Institution, Woods Hole MA. 8/2013–7/2017.

Assistant Scientist, Woods Hole Oceanographic Institution, Woods Hole MA. 5/2009–8/2013.

Faculty, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography/Applied Ocean Science and Engineering. 1/2010–present.

Postdoctoral Investigator, Woods Hole Oceanographic Institution, Woods Hole MA. 7/2008–5/2009.

Ocean Life Institute Postdoctoral Scholar, Woods Hole Oceanographic Institution, Woods Hole MA. 9/2006–6/2008.

Visiting Professor, Deep Springs College, Deep Springs CA. 1–4/2007 & 9–10/2011.

Graduate Research Assistant, Oregon State University, Corvallis OR. 1997–2000 & 2003–2004.

Graduate Research Assistant, University of Maine, Orono ME. 2000–2002.

Research & Design Engineer, Oceanographic & Atmospheric Sciences Division, Brookhaven National Laboratory, US Department of Energy, Upton, New York. 1992–1994.

## RESEARCH INTERESTS

Photosynthesis and production in marine ecosystems, particularly in polar oceans.  
Optical methods for assessing phytoplankton photosynthesis and ecology.  
Autonomous oceanographic instrumentation and sensor development.  
Numerical modeling of marine photosynthesis and ecophysiology.  
Nonlinear dynamics and regulation in algal physiology and ecology.

## AWARDS, SCHOLARSHIPS, FELLOWSHIPS, & HONORS

James E. and Barbara V. Moltz Fellowship for Climate-Related Research, Woods Hole Oceanographic Institution, 2020-2023.  
2012 NASA Group Achievement Award (for contributions to ICESCAPE), December 2012.  
NASA New Investigator Program award recipient, 2010-2013.  
Santa Fe Institute, 2008 Complexity Science Summer School, selectee & participant.  
NSF Office of Polar Programs, New Generation of Polar Researcher (NGPR) selectee, 2008.  
Woods Hole Oceanographic Institution (Ocean Life Institute) Postdoctoral Scholarship, 2006.  
NSF International Research Fellowship Program Postdoctoral Fellowship, 2006 (declined).  
NSF International Graduate Training Course in Antarctic Biology Scholarship, 2005.  
Cobler Graduate Student Achievement Award, Oregon State University, 2000.  
Link Foundation Ocean Engineering and Instrumentation Fellow, 2002-2004.  
US Dept. of Energy Student Research Scholar, Brookhaven National Laboratory, 1992-1993.

## PUBLICATIONS: PAPERS

\* - Contribution of student or postdoctoral member of Laney research group.

\*\* - Contribution involving doctoral or postdoctoral guest research in Laney lab.

- O'Shea\*, R., and **S. R. Laney**. A simulation framework for evaluating lightweight spectral cameras in drone-based aquatic sensing applications. 2020. *Appl. Opt.* **59**(10), C52-C62.
- O'Shea, R.\*, **S. R. Laney**, and Z. Lee. Evaluation of glint correction approaches for fine-scale ocean color measurements by lightweight hyperspectral imaging spectrometers. 2020. *Appl. Opt.* **59**(7), B18-B34.
- Mills, M. M., Z. W. Brown, **S. R. Laney**, E. Ortega-Retuerta, K. E. Lowry, G. L. van Dijken, and K. R. Arrigo. Nitrogen limitation of the summer phytoplankton and heterotrophic prokaryote communities in the Chukchi Sea. 2018. *Front. Mar. Sci.* **5**, 362.  
doi:10.3389/fmars.2018.00362. *Contribution: provided archive of Chukchi Sea algal assemblage data, contributed to synthesis.*
- Assmy, P. M. Fernández-Méndez, P. Duarte, A. Meyer, A. Randelhoff, C. J. Mundy, L. M. Olsen, H. M. Kauko, A. Bailey, Me. Chierici, L. Cohen, A. P. Doulgeris, J. K. Ehn, A. Fransson, S. Gerland, H. Hop, S. R. Hudson, N. Hughes, P. Itkin, G. Johnsen, J. A. King, B. P. Koch, Z. Koenig, S. Kwasniewski, **S. R. Laney**, M. Nicolaus, A. K. Pavlov., C. M. Polashenski, C. Provost, A. Rösel, M. Sandbu, G. Spreen, L. H. Smedsrud, A. Sundfjord, T. Taskjelle, A. Tatarek, J. Wiktor, P. M. Wagner, A. Wold, H. Steen & M. A. Granskog. Leads in Arctic pack ice enable early phytoplankton blooms below snow-covered sea ice. *Sci Rep* **7**:40850, 1-9. doi: 10.1038/srep40850.
- Selz, V.\*\* , **S. Laney**, A. E. Arnstead, K. Lewis, K. Lowry, H. Joy-Warren, M. M. Mills, G. L. van Dijken, and K. R. Arrigo. 2017. Ice algal communities in the Chukchi and Beaufort Seas in spring and early summer: composition, distributions, and coupling with phytoplankton assemblages. *Limnol. Oceanogr.* **63**, 1109-1133. doi:10.1002/lno.10757. *Contribution: provided archive of Chukchi Sea algal assemblage data, hosted student and supervised data analyses and synthesis.*
- Olsen, L. M.\*\* , **S. R. Laney**, P. Duarte, H. M. Kauko, M. Fernández-Méndez, C. J. Mundy, A. Rösel, A. Meyer, P. Itkin, L. Cohen, I. Peeken, A. Tatarek, M. Róžańska-Pluta, J. Wiktor, T.

- Taskjelle, A. K. Pavlov, S. R. Hudson, M. A. Granskog, H. Hop, and P. Assmy. 2017. The seeding of ice algal blooms in Arctic pack ice: The multiyear ice seed repository hypothesis. *J. Geophys. Res. Biogeosci.* **122**, 1529-1548, doi:10.1002/2016JG003668. *Contribution: facilitated algal assemblage analyses of N-ICE samples, hosted postdoctoral researcher and contributed to data analyses and synthesis.*
- Laney, S. R.**, R. A. Krishfield, and J. M. Toole. 2017. The euphotic zone under Arctic Ocean sea ice: vertical extents and seasonal trends. *Limnol. Oceanogr.* **62**, 1910-1934, doi: 10.1002/lno.1054.
- Islam, F., M. D. DeGrandpre, C. M. Beatty, M.-L. Timmermans, R. A. Krishfield, J. M. Toole, and **S. R. Laney**. 2017. Sea surface  $p\text{CO}_2$  and  $\text{O}_2$  dynamics in the partially ice-covered Arctic Ocean. *JGR-Oceans.* **122**, doi:10.1002/2016JC012162. *Contribution: provided bio-optical profile data sets and contributed phytoplankton ecology/biogeochemistry expertise.*
- Assmy, P., M. Fernandez-Mendez, P. Duarte, A. Meyer, A. Randelhoff, C. Mundy, L. Olsen, H. Kauko, A. Bailey, M. Chierici, L. Cohen, A. Doulgeris, J. Ehn, A. Fransson, S. Gerland, H. Hop, S. Hudson, N. Hughes, P. Itkin, G. Johnsen, J. King, B. Koch, Z. Koenig, S. Kwasniewski, **S. Laney**, M. Nicolaus, A. Pavlov, C. Polashenski, C. Provost, A. Rösel, M. Sandbu, G. Spreen, L. Smedsrud, A. Sundfjord, T. Taskjelle, A. Tatarek, J. Wiktor, P. Wagner, A. Wold, H. Steen, and M. Granskog. 2017. Leads in Arctic pack ice enable early phytoplankton blooms below snow-covered sea ice. *Sci. Rep.* **7**, 40850. *Contribution: algal assemblage assessments.*
- Laney, S. R.** 2017. A general-purpose, microcontroller-based framework for integrating oceanographic sensors, instruments, and peripherals. *J. Atmos. Ocean. Tech.* **34**, 415-427.
- Lotliker, A. A., M. M. Omand, A. J. Lucas, **S. R. Laney**, A. Mahadevan, and M. Ravichandran. 2016. Penetrative radiative flux in the Bay of Bengal. *Oceanogr.* **29**(2), 214-221. *Contribution: adapted Laney 'smart cable' technology to enable field measurements of hyperspectral radiometry on specialized profilers; provided expertise in bio-optical analyses.*
- H. Wang\*, Y. Chen, H. Song, and **S. R. Laney**. 2015. Correcting temperature dependence in miniature spectrometers used in cold polar environments. *Appl. Opt.* **54**, 3162-3172. *Contribution: directly supervised the doctoral engineering student research that led to these new cold-temperature spectrometric corrective approaches.*
- H. Wang\*, Y. Chen, H. Song, and **S. R. Laney**. 2014. A fiber optic spectrometry system for measuring irradiance distributions in sea ice environments. *J. Atmos. Ocean. Tech.* **31**, 2844-2857. *Contribution: developed the core spectroscopic method presented in this paper and directly supervised its refinement within engineering doctoral student research.*
- Laney, S. R.**, and H. M. Sosik. 2014. Phytoplankton assemblage structure in and around a massive under-ice bloom in the Chukchi Sea. *Deep-Sea Res. II* **105**, 30-41.
- Arrigo, K. R., D. K. Perovich, R. S. Pickart, Z. W. Brown, G. L. van Dijken, K. E. Lowry, M. M. Mills, M. A. Palmer, W. B. Balch, N. R. Bates, C. Benitez-Nelson, E. Brownlee, K. E. Frey, **S. R. Laney**, J. Mathis, A. Matsuoka, B. G. Mitchell, G. W. K. Moore, R. A. Reynolds, H. M. Sosik, J. H. Swift. 2014. Phytoplankton blooms beneath the sea ice in the Chukchi Sea. *Deep-Sea Res. II* **105**, 1-16. *Contribution: led research component to assess phytoplankton assemblage structure during ICESCAPE 2010-11.*
- Laney, S. R.**, R. A. Krishfield, J. M. Toole, T. R. Hammar, C. J. Ashjian, and M.-L. Timmermans. 2014. Assessing algal biomass and bio-optical distributions in perennially ice-covered polar ocean ecosystems. *Polar Science* **8**, 73-85.
- Laney, S. R.**, R. J. Olson, and H. M. Sosik. 2012. Diatoms favor their younger daughters. *Limnol. Oceanogr.* **57**, 1572-1578.
- Arrigo, K. R., D. K. Perovich, R. S. Pickart, Z. W. Brown, G. L. van Dijken, K. E. Lowry, M. M. Mills, M. A. Palmer, W. B. Balch, F. Bahr, N. R. Bates, C. Benitez-Nelson, B. Bowler, E. Brownlee, J. K. Ehn, K. E. Frey, R. Garley, **S. R. Laney**, L. Lubelczyk, J. Mathis, A. Matsuoka, B. G. Mitchell, G. W. K. Moore, E. Ortega-Retuerta, S. Pal, C. M. Polashenski, R.

- A. Reynolds, B. Schieber, H. M. Sosik, M. Stephens, J. H. Swift. 2012. Massive phytoplankton blooms under Arctic sea ice. *Science* **336**, 1408, doi:10.1126/science.1215065. *Contribution: led and conducted field efforts to assess phytoplankton assemblage structure in ICESCAPE program.*
- Timmermans, M.-L., R. Krishfield, **S. Laney**, and J. Toole, 2010. Ice-Tethered Profiler measurements of dissolved oxygen under permanent ice cover in the Arctic Ocean. *J. Atmos. Ocean. Tech.* **27**, 1936-1949, doi:10.1175/2010JTECHO772.1. *Contribution: provided analysis and interpretation of biologically forced components of under-ice dissolved oxygen signatures.*
- Laney, S. R.**, R. M. Letelier, and M. R. Abbott. 2009. Using a nonanalytical approach to model nonlinear dynamics in photosynthesis at the photosystem level. *J. Phycol.* **45**, 298-310.
- Laney, S. R.**, and R. M. Letelier. 2008. Artifacts in measurements of chlorophyll fluorescence transients, with specific application to fast repetition rate fluorometry. *Limnol. Oceanogr. Meth.* **6** 40-50.
- Desiderio, R. A., **S. R. Laney**, R. M. Letelier, and S. J. Giovannoni. 2007. Using lasers to probe the transient light absorption by proteorhodopsin in marine bacterioplankton. *Appl. Optics.* **46** 7329-7336. *Contribution: helped develop and perform the transient absorption spectroscopic measurements of proteorhodopsin in lysed cell preparations and in actual P. ubique cultures.*
- Giovannoni, S. J., L. Bibbs, J.-C. Cho, M. D. Stapels, R. Desiderio, K. Vergin, M. S. Rappe, **S. Laney**, L. J. Wilhelm, H. J. Tripp, E. J. Mathur, and D. F. Barofsky. 2005. Proteorhodopsin phototrophy in the ubiquitous marine bacterium SAR11. *Nature* **438**, 82-85, doi:10.1038/nature04032. *Contribution: helped develop and perform the transient absorption spectroscopic measurements of proteorhodopsin in cell preparations and P. ubique cultures.*
- Laney, S. R.**, R. M. Letelier, and M. R. Abbott. 2005. Parameterizing the natural fluorescence kinetics of *Thalassiosira weissflogii*. *Limnol. Oceanogr.* **50**, 1499-1510.
- Laney, S. R.** 2005. A generalized real-time signal processor for oceanographic applications. *Research Papers of the Link Foundation Fellows* **4**, B. J. Thompson, ed., pp. 333-349.
- Laney, S. R.** 2003. Assessing the error in photosynthetic properties determined with Fast Repetition Rate fluorometry. *Limnol. Oceanogr.* **48**, 2234-2242.
- Laney, S. R.**, R. M. Letelier, R. A. Desiderio, D. A. Kiefer, C. R. Booth, and M. R. Abbott. 2001. Measuring the natural fluorescence of phytoplankton cultures. *J. Atmos. Ocean. Tech.* **18**, 1924-1934.
- Laney, S. R.** 1997. Fast Repetition Rate fluorometry - Exploring phytoplankton fluorescence. *Sea Technology* **38**, 99-102.

#### **PUBLICATIONS: BOOK CHAPTERS**

- Laney, S. R.** 2011. *In situ* measurement of chlorophyll fluorescence transients. In D.J. Suggett et al. (eds.), *Chlorophyll a Fluorescence in Aquatic Sciences: Methods and Applications, Developments in Appl. Phycol.* **4**, doi:10.1007/978-90-481-9268-7\_2, Springer Science+Business Media B.V. (Invited and peer-reviewed).

#### **PATENTS AND APPLICATIONS**

- "Optical sensor biofouling assessment and correction system". U.S. Provisional Patent Application No. 61/696,369. Filed September 2012. S. Laney, sole inventor.
- "Sensor Degradation Assessment and Correction System". International Patent Application No. PCT/US2013/057951. Filed September 2103. S. Laney, sole inventor.



## **TEACHING AND EDUCATIONAL ACTIVITIES**

Faculty, MIT-WHOI Joint Program in Biological Oceanography (JPBO), 2009-present. MIT-WHOI Joint Program in Applied Ocean Science and Engineering (JPAOSE), 2015-present. MIT-WHOI Joint Program in Chemical Oceanography (JPCO), 2018-present.

MIT 7.47 (Biological Oceanography), 2009-2011. JPBO core course for first-year students.

MIT 7.433 (Marine Bio-optics), 2019, 2014. JPBO advanced topics course.

MIT 2.688 (Principles of Ocean Instrument Systems), 2017-present. JPAOSE required course.

MIT 12.702 (Elements of Modern Oceanography), 2018-2019.

Visiting Professor, Deep Springs College, January-April 2007: developed and led lower division courses in numerical methods and computer modeling, Calculus I, and Calculus II. September-October 2011: developed and led lower division courses in single variable and multivariable calculus.

WHOI Doherty Chair in Education, 2017-2018.

Instructor, 2018 NSF International Graduate Training Course in Antarctic Biology. McMurdo Station, USAP. Lead instructors: D. Manahan, D. Karentz.

Teaching Assistant, Oregon State University, 2005. Introduction to Oceanography: freshman web-based University extension course. Dr. R. Keller, lead instructor.

Teaching Assistant, Oregon State University, 2004. Marine Phytoplankton Physiology: graduate course for oceanography and chemical engineering students. Dr. R. M. Letelier, lead instructor.

Teaching Assistant, 2001 NSF-ONR-NASA Ocean Optics Course (formerly at Friday Harbor WA). 6-week summer course, University of Maine, Darling Marine Center. Dr. M. J. Perry, lead instructor.

Lecturer, 2012 British Petroleum Oceanography Short Course: Phytoplankton Ecology and Bio-Optics. Woods Hole Oceanographic Institution.

## **EDUCATION SERVICE**

WHOI Summer Student Fellow coordinator (Biology Department), 2018-2020.

MIT/WHOI Joint Program Admissions committee, 2013-2016.

Postdoctoral Mentoring Committee, WHOI Biology Department, 2010-2012.

MIT/WHOI Joint Program in Biological Oceanography, Exam Committee, 2011.

MIT/WHOI Dissertation Defense Committee, Chair: Dr. Louie Wurch (August 2011), Dr. Harriet Alexander (December 2015), Dr. Emily Brownlee (March 2017).

MIT/WHOI Joint Program Exam Committee, Chair: Ms. Megan May (2015).

JPBO Curriculum Committee, 2016-17.

## **EDUCATIONAL PROFESSIONAL DEVELOPMENT**

Yale/Poorvu Summer Institute for Scientific Teaching, July 2019, Baton Rouge LA.

## **STUDENTS AND ADVISEES**

Doctoral advisor, Luka Catipovic, MIT/WHOI Joint Program in Applied Ocean Science and Engineering, Massachusetts Institute of Technology (EAPS), Woods Hole Oceanographic Institution (Department of Marine Chemistry and Geochemistry), June 2018 – present.

Doctoral advisor, Ryan O'Shea, MIT/WHOI Joint Program in Applied Ocean Science and Engineering, Massachusetts Institute of Technology (Department of Mechanical Engineering), Woods Hole Oceanographic Institution (Applied Ocean Physics and Engineering Department), June 2015 – present.

Doctoral co-advisor, Hangzhou Wang (Ph.D. candidate, Department of Mechanical Engineering, Zhejiang University, China), Doctoral guest student, Woods Hole Oceanographic Institution, September 2012 – August 2014.

Undergraduate research advisor, WHOI Summer Student Fellows: Paul Lerner (2012, University of California Berkeley). Erin Larragoite (2013, University of New Mexico). WHOI Winter Fellows: David Kenison (2014, Oberlin College). Naomi Roswell (2016, Oberlin College).

Honors Thesis advisor, Kristin Landgren (Honors College, Oregon State University), Oregon State University, 2007.

### **NATIONAL SERVICE AND COMMITTEES**

UNOLS Arctic Icebreaker Coordinating Committee, 2015-present; Chair 2019-present.  
Member, Technical Advisory Committee, Maine Space Grant Consortium, February 2013-present.

### **INSTITUTIONAL SERVICE AND COMMITTEES**

AVAST Advisory Group, Chair, 2020-2021.  
Scientific Staff Executive Committee, 2018.  
Biology Department Hiring Committee, 2013-2016.  
Seminar Co-coordinator, WHOI Biology Department, 2010-2012.  
Scientific Staff Search Committees, WHOI Biology Department, 2010, 2012.  
Biology Department Chair Selection (and later Advisory) Committee, 2010, 2019.

### **PROFESSIONAL MEMBERSHIPS, SERVICE, & RECOGNITIONS**

Manuscript reviewer, journals including: *Botanica Marina*, *Deep-Sea Research*, *Environmental Science & Technology*, *Journal of Atmospheric and Oceanic Technology*, *Journal of Geophysical Research*, *Journal of Photobiology*, *Journal of Phycology*, *Journal of Plankton Research*, *Limnology and Oceanography*, *Limnology and Oceanography: Methods*, *Marine Ecology Progress Series*, *Optics Express*, *IEEE Photonics*, *Journal of Sensors*.

Proposal reviewer or panelist: NSF, NASA, NOAA, EPA, Australian Antarctic Program, NSF Ocean Observing Initiative, Maine Space Grant Consortium, North Pacific Research Board, Czech Science Foundation.

Professional memberships: American Geophysical Union, American Society of Limnology and Oceanography, Scholarly Union of BioPhysical Arctic Researchers.

Professional service: ASLO Graduate Student Mentor, 2014 Ocean Sciences Meeting (2 students). 2015 Ocean Science Meeting (3 students). 2017 Aquatic Sciences Meeting (1 student).

### **PROFESSIONAL EXPERIENCE & CONSULTING**

Maine Science and Technology Fund, Business Plan Competition Winner, 2002 – \$10,000 prize to support exploratory R&D of new fluorometric protocols for examining marine photosynthesis.

Engineering Consultant, Chelsea Instruments Ltd., West Molesey, Surrey, U.K. – oversaw technology transfer of NASA fast repetition rate fluorometer SBIR research project to commercialization, 1996-1997.

Engineering Consultant, Oceanographic & Atmospheric Sciences Division, Brookhaven National Laboratory, US Department of Energy, Upton, New York – Design of optical/electronic instrument prototypes for oceanographic algal research, 1994-1996.

Research & Design Engineer, Oceanographic & Atmospheric Sciences Division, Brookhaven National Laboratory, US Department of Energy, Upton, New York – Engineering design of fast repetition rate fluorometer technology. Participated in several oceanographic field cruises to evaluate instrument prototypes. Research supervisors: Drs. Zbigniew Kolber & Paul Falkowski, 1992-1994.

### **PROFESSIONAL DEVELOPMENT & LEADERSHIP ACTIVITIES**

Small Project Organization training workshop, Corporate and Professional Education, Worcester Polytechnic Institution. Woods Hole Oceanographic Institution, November 2012, (0.4 CEU).

Massachusetts Institute of Technology, Professional Development course PI.61s, “Leadership skills for engineering and science faculty”, MIT, June 2012 (1.4 CEU).

### **SELECTED FIELD RESEARCH**

Coastal Alaskan Arctic fieldwork. 2017-2019: open water boat-based surveys, on-ice buoy deployment and research, land-based riverine sampling all around Stefansson Sound AK and adjacent rivers.

Bering Sea ice trials for RV *SIKULIAQ*. March-April, 2015. Member of science party designing and conducting ice trials science training for new UNOLS ice-capable research vessel.

Bering/Chukchi Sea Winter cruise, USCGC *HEALY*. November-December, 2011. Examined phytoplankton overwintering strategies in late fall/early winter Arctic ecosystems. Primary collaborators: C. Ashjian (WHOI), D. Stockwell (University of Alaska Fairbanks).

Station ALOHA - WHOTS ocean color radiometry. June 2011-June 2015. Autonomous ocean color observations on open-ocean moorings near Hawaii. Collaborators: A. Pleuddemann, R. Weller, WHOI.

ICESCAPE 2010, ICESCAPE 2011, USCGC *HEALY*. June-July 2010, 2011. Examined mesoscale distributions of phytoplankton and optical properties in the Chukchi and Bering Seas.

Arctic ocean optics, NOAA Ship *OSCAR DYSON*. August-September 2007. Conducted 3 week mesoscale survey of phytoplankton and ocean optical properties in the eastern Chukchi & Bering Seas from 70° N to 64° N.

Upwelling ecosystem microbiology, R/V *Wecoma*. September 2004. Investigated variability in photosynthesis and production during 13-day cross shelf transect at the Oregon shelf break.

Hawaii Ocean Time-series survey cruises HOT154, 172, 174, & 175. 2003 & 2005. Mooring deployment, August 2004. R/V *Kilo Moana* & R/V *Ka'imikai-o-Kanaloa*. Evaluated new optical methods for characterizing algal photophysiology in oligotrophic environments.

Gulf of Alaska Global Ocean Ecosystem, R/V *Wecoma*. May 2003. Thirty-day shelf survey off the Kenai Peninsula. Deployed active and passive fluorometric and bio-optical systems.

Persistent Small-Scale Biological Structure (Wec9808C), R/V *Wecoma*, August 1998. Oregon State University 15 day transect at the Oregon shelf break. Responsible for deployment of active and passive fluorometers.

ECO HAB (Ecology of Harmful Algal Blooms), R/V *Cape Hatteras*, July 1998. Fifteen day ECO HAB survey cruise in the Gulf of Maine. Responsible for hydro casts and ADCP operation.

Coastal Benthic Optical Properties (COBOP), R/V *Edwin Link*, June 1996. SCUBA trials for initial prototype handheld Fast Repetition Rate (FRR) fluorometer on coral substrate.

Atlantic Meridional Transect - 1 (AMT-1), RRS *James Clark Ross*, September - October 1995. British Antarctic Survey / Plymouth Marine Laboratory six week 7000 nm transect survey. Responsible for operation and data interpretation of experimental active fluorometers.

Chesapeake Bay fluorometry evaluation, R/V *Cape Henlopen*, April 1995. Evaluation of performance and behavior of a profiling FRR fluorometer in estuarine environments.

Lake Biwa Transport Experiment (BITE93), R/V *Hakken-Go*, Lake Biwa Research Institute, Shiga Prefecture, Japan August-September 1993. Responsible for physiological photosynthetic measurements in laboratory, shipboard, and enclosure experiments.

Ocean Margins Program (OMP) Cruise, R/V *Gyre*, May 1993. Responsible for chlorophyll analysis and experimental fluorometer deployment during US Department of Energy cruise.

### INVITED LECTURES

**Laney, S. R.** "Linking technology and oceanography to improve polar observation". Special session overview oral presentation, 2019 Gordon Polar Marine Science Conference, Barga Italy, March 2019.

**Laney, S. R.** "Dante's 9<sup>th</sup> circle of Hell is ice". Invited institute seminar, International Arctic Research Center, University of Alaska Fairbanks, April 2019.

**Laney, S. R.** "Dante's 9<sup>th</sup> circle of Hell is ice". Departmental seminar, Graduate School of Oceanography, University of Rhode Island, February 2019.

**Laney, S. R.** "New frameworks for representing the dynamics of the fluorescence-irradiance relationship". Invited oral presentation, AQUAFLUO II, Sydney Australia, December 2017.

**Laney, S. R.** "Phytoplankton and light under Arctic Ocean sea ice: vertical extents and seasonal trends". Invited oral presentation, Norwegian Polar Institute, Tromsø Norway, April 2017.

**Laney, S. R.** "New insight into polar phytoplankton through automated & autonomous technologies". Ocean University of China (Qingdao), Shanghai Ocean College (Shanghai), Second Institute of Oceanography (Hangzhou), and Zhejiang University Ocean College (Zhoushan), October 2015.

**Laney, S. R.** "Phytoplankton blooms in high latitude systems". Oral presentation, 2015 Ocean Carbon & Biogeochemistry (OCB) workshop, Woods Hole Oceanographic Institution, Woods Hole MA, July 2015. { [HYPERLINK](http://mex1.who.edu:8080/http/WHOI_CMS/Events/OCB2015/Day3/Day3F.webm) "[http://mex1.who.edu:8080/http/WHOI\\_CMS/Events/OCB2015/Day3/Day3F.webm](http://mex1.who.edu:8080/http/WHOI_CMS/Events/OCB2015/Day3/Day3F.webm)" }.

**Laney, S. R.** "Seasonal trends in Arctic ice, light, and phytoplankton measured under perennial sea ice cover using autonomous profilers". Oral presentation, 2015 ESSAS Annual Science meeting, University of Washington, Seattle WA, June 2015.

**Laney, S. R.** "Monitoring ocean ecosystems under Arctic sea ice: Advances in observational Technology". Oral presentation, 2015 Ocean Outlook Workshop, University of Bergen, Bergen, Norway, February 2015.

**Laney, S. R.** "New Insight into Polar Phytoplankton through Automated & Autonomous Technologies". Institution seminar, University of Massachusetts Dartmouth, Dartmouth MA, April 2014.

**Laney, S. R.** "New Insight into Polar Phytoplankton through Autonomous Technologies". Departmental seminar, University of Maine School of Marine Sciences, Orono ME, February 2014.



**Laney, S. R.** “Optical Approaches for Monitoring Ocean Biology and Ecology on Observatories”. ZERO workshop seminar, Ocean College, Zhejiang University, Hangzhou China, December 2013.

**Laney, S. R.** “New Insight into Polar Phytoplankton through Autonomous Technologies”. Institution seminar, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven Germany, May 2013.

**Laney, S. R.** “Balancing the scales in phytoplankton ecology”. Institution seminar, Bigelow Laboratory for Ocean Sciences, Boothbay Harbor ME, January 2013.

**Laney, S. R.** “The lives of some cells: binary division in diatoms (observed in situ and in the lab)”. Departmental seminar, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, November 2012.

**Laney, S. R.** “The lives of some cells: binary division in diatoms (observed in situ and in the lab)”. Departmental seminar, Graduate School of Oceanography, University of Rhode Island, February 2011.

**Laney, S. R.** “The lives of some cells: binary division in diatoms (observed in situ and in the lab)”. Invited seminar, Ecosystem Center, MBL, Woods Hole MA, April 2010.

**Laney, S. R.** “Interpreting variable fluorescence using a stochastic framework”. Invited lecture, at Chlorophyll Fluorescence in Aquatic Sciences Meeting (AQUAFLUO). June 2007, Nove Hrad, Czech Republic.

**Laney, S. R.** and M. J. Perry. “Using numerical simulations to explore physiological photosynthesis models: examining the influence of second-order physiological factors”. Invited lecture, Fast Repetition Rate fluorometry workshop, Challenger Conference. 2002, University of Plymouth, UK.

**Laney, S. R.** “Interdisciplinary graduate education in oceanography”. Invited lecture, ‘Oceanography: The Making of a Science’, Heinz Foundation – Office of Naval Research. 2000, Seattle WA.

#### **OTHER FIRST AUTHOR PRESENTATIONS**

**Laney, S. R.** “Integrated observing systems for the Arctic”. Oral presentation, 2020 Ocean Outlook Workshop, Woods Hole, MA, May 2020 (virtual).

**Laney, S. R.**, S. Okkonen, K. Longnecker, & L. Catipovic. “Directly measuring biogeochemical proxies of the Kuparuk and Sagavanirktok Rivers during the spring freshet, in ice-covered adjacent coastal waters”. Oral presentation, 2020 Ocean Sciences Meeting, San Diego, CA, February 2020.

Karentz, D., D. Manahan, & **Laney, S. R.** “NSF Advanced Training Program in Antarctica for Early Career Scientists: Biological adaptations to environmental change”. Poster presentation, 2019 Gordon Polar Marine Science Conference, Barga Italy, March 2019.

**Laney, S. R.**, S. Okkonen, K. Longnecker, D. Stramski, & D. Koestner. “Assessing riverine carbon transport into Arctic coastal margins during the spring freshet”. Poster presentation, 2019 Gordon Polar Marine Science Conference, Barga Italy, March 2019.

**Laney, S. R.**, S. Okkonen, K. Longnecker, D. Stramski, & D. Koestner. “Assessing the contribution of organic carbon to the coastal Beaufort shelf during the spring freshet of the Kuparuk and Sagavanirktok Rivers”. Oral presentation, 2019 Aquatic Sciences Meeting, San Juan, PR, February 2019.

**Laney, S. R.**, & S. Okkonen. “Optical properties and hydrography associated with the spring freshet of the Kuparuk and Sagvanirktok Rivers in nearshore Beaufort Sea waters”. Oral presentation, 2019 Alaska Marine Science Symposium, Anchorage, AK, January 2019.

**Laney, S. R.**, S. Okkonen, K. Longnecker, D. Stramski, and D. Koestner. “Optical assessment of riverine inputs into Arctic coastal margins”. Poster presentation, 2018 Ocean Optics Meeting, Dubrovnik Croatia, October 2018.

**Laney, S. R.**, J. Toole, and R. Krishfield. “The euphotic zone under Arctic sea ice: seasonal assessment using autonomous systems”. Oral presentation, 2017 Ocean Outlook Meeting, Bergen Norway, April 2017.

**Laney, S. R.** “New frameworks for representing the dynamics of the photosynthesis-irradiance relationship”. Oral presentation, 2017 Aquatic Sciences Meeting, Honolulu, HI, February 2017.

**Laney, S. R.**, J. Toole, and R. Krishfield. “The vertical distribution & seasonality of light under Arctic Ocean sea ice”. Oral presentation, 2016 Ocean Optics Meeting, Victoria, BC, Canada, October 2016.

**Laney, S. R.**, J. Toole, R. Krishfield, and M.-L. Timmermans. “Light fields under Arctic Ocean sea ice”. Oral presentation, 2016 Ocean Outlook Workshop, Woods Hole, MA, April 2016.

**Laney, S. R.**, J. Toole, R. Krishfield, and M.-L. Timmermans. “Autonomous observations of coupled physical-biological processes in the ice-covered Arctic Ocean over diel to annual scales”. Oral presentation, 2016 Ocean Sciences Meeting, New Orleans, LA, February 2016.

**Laney, S. R.**, J. Toole, R. Krishfield, and M.-L. Timmermans. “Enhancing observational capabilities for Arctic Ocean ecosystems: Innovations using Ice-Tethered Profilers”. Oral presentation, 2015 Arctic Ocean Observing Science Meeting, Seattle, WA, November 2015.

**Laney, S. R.** and L. Eisner. “Using imaging flow cytometry to examine phytoplankton assemblage structure in the Bering Sea”. Oral presentation, 2015 PICES Conference, Qingdao, China, October 2015.

**Laney, S. R.**, J. Toole, R. Krishfield, and M.-L. Timmermans. “Year-long, daily-scale ecosystem observations under perennial ice cover in the Arctic Ocean”. Oral presentation, 2015 Arctic Science Summit Week (ASSW2105), ISAR-4 / ICARP III (Fourth International Symposium on the Arctic Research / Third International Conference on the Arctic Research Planning), Toyama, Japan, April 2015.

**Laney, S. R.** and H. Sosik. “Phytoplankton assemblage structure in the Chukchi Sea: Insight from flow cytometry”. Poster presentation, 2015 Alaska Marine Science Symposium, Anchorage, AK, January 2015.

**Laney, S. R.**, J. Toole, and R. Krishfield. “Year-long, daily-scale bio-optical observations under perennial ice cover in the Arctic Ocean”. Oral presentation, 2014 Ocean Optics Conference, Portland, ME, USA, October 2014.

**Laney, S. R.**, and others. “Year-long, daily-scale bio-optical observations under perennial ice cover in the Arctic Ocean”. Oral presentation, 2014 FAMOS, Woods Hole, MA, USA, October 2014.

**Laney, S. R.**, H. Sosik, and D. Stockwell. “Using imaging flow cytometry to examine phytoplankton assemblage structure in the Chukchi Sea”. Poster presentation, 2014 Ocean Science Meeting, Honolulu, HI, February 2014.

**Laney, S. R.**, H. Sosik, and D. Stockwell. "Using imaging flow cytometry to examine phytoplankton assemblage structure in the Bering Sea". Poster presentation, 2014 Bering Sea Ocean Science Meeting, Honolulu, HI, February 2014.

**Laney, S. R.** and H. Sosik. "Using imaging flow cytometry to examine phytoplankton assemblage structure in the Bering and Chukchi Seas". Poster presentation, 2014 Alaska Marine Science Symposium, Anchorage, AK, January 2014.

**Laney, S. R.**, J. Toole, and R. Krishfield. "Yearlong, Daily Assessments of Bio-Optical Distributions under Perennial Ice Cover in the Arctic Ocean". AGU Fall Meeting, San Francisco CA. December 2013.

**Laney, S. R.**, and H. Sosik. "Microplankton assemblage structure in ICESCAPE 2011". Oral presentation, ICESCAPE workshop. Stanford University, Palo Alto CA. September 2013.

**Laney, S. R.** "A new paradigm for interpreting remotely sensed phytoplankton fluorescence". Poster presentation, International Ocean Color Symposium. Darmstadt, Germany. May 2013.

**Laney, S. R.** and D. Stockwell. "Using imaging flow cytometry to examine phytoplankton assemblage structure in the Bering and Chukchi Seas". Oral presentation, 2013 Alaska Marine Science Symposium, Anchorage, AK, January 2013.

**Laney, S. R.**, J. Toole, R. Krishfield, and C. Ashjian. "Year-long monitoring of under-ice phytoplankton assemblages in the Arctic by Ice-Tethered Profilers". Oral presentation, Third International Symposium on the Arctic Research (ISAR-3), Tokyo, Japan, January 2013.

**Laney, S. R.** "Long term, high-resolution assessment of sun-stimulated fluorescence in the oligotrophic Pacific". Oral presentation, 2012 Ocean Optics XXI Meeting, Glasgow, Scotland, UK, October 2012.

**Laney, S. R.**, and H. Sosik. "Microplankton assemblage structure in ICESCAPE 2011". Oral presentation, ICESCAPE-Malina workshop. Villefranche-sur-mer, France. September 2012.

**Laney, S. R.** "Using active fluorescence to examine minutes-scale photosynthetic responses in phytoplankton". Oral presentation, 2012 Aquatic Sciences Meeting, Otsu, Japan, July 2012.

**Laney, S. R.** "Effects of cloud cover on remotely sensed ocean phytoplankton fluorescence". Poster presentation, 2012 Ocean Color Research Team Meeting, Seattle, WA, USA, April 2012.

**Laney, S. R.** "Automated, autonomous biosampling: Imaging FlowCytobot". Oral presentation, UNOLS vessel planning workshop for R/V *Sikuliaq*, Salt Lake City UT, USA, February 2012.

**Laney, S. R.** "A new dynamical modeling framework for interpreting phytoplankton natural fluorescence". Oral presentation, 2012 Ocean Sciences Meeting, Salt Lake City, UT, USA, February 2012.

**Laney, S. R.**, R. Krishfield, C. Ashjian, M.-L. Timmermans, and J. Toole. "Optical Assessment of Under-Ice Biology in the Arctic using Ice-Tethered Profilers". Poster presentation, 2011 AOMIP, Woods Hole, MA, USA, November 2011.

**Laney, S. R.** "Assessing Natural Fluorescence Dynamics using Radiometry on Long-term Ocean Moorings". Poster presentation, 2011 NASA Carbon Cycle and Ecosystems Meeting, Washington, DC, USA, October 2011.

**Laney, S. R.**, and H. Sosik. "Monitoring Climate-Driven Changes in Arctic Algal Assemblages". Oral presentation, ICESCAPE 2011 planning workshop, Stanford University, Palo Alto CA, USA, March 2011.

**Laney, S. R.**, H. Sosik and R. Olson. "Diatoms favor their younger daughters". Oral presentation, 2010 Ocean Sciences Meeting, Portland, OR, USA, February 2010.

**Laney, S. R.** "The Dynamics of Sun-Stimulated Phytoplankton Fluorescence". Poster presentation, 2010 Ocean Optics XX Meeting, Anchorage, AK, USA, September 2010.

**Laney, S. R.**, and H. Sosik. "Monitoring Climate-Driven Changes in Arctic Algal Assemblages". Oral presentation, ICESCAPE 2010 planning workshop, Vancouver BC, Canada, December 2009.

**Laney, S. R.**, H. Sosik and R. Olson. "Examining cell-specific growth and division in phytoplankton using time-lapse photomicrography". Oral presentation, 2009 Aquatic Sciences Meeting, Nice, France, January 2009.

**Laney, S. R.**, and H. Sosik. "Optical Approaches for Monitoring Change in Coastal Arctic Marine Ecosystems". Oral and poster presentations, 2008 International Polar Year New Generation of Polar Researchers, Colorado Springs, CO, USA, May 2008.

**Laney, S. R.** and R. M. Letelier. "Ocean productivity and the role of pelagic ecosystems in the carbon cycle: a remote sensing perspective". Oral presentation, 2004 Conference of the International Society of Microbial Ecology. 2004, Cancun, Mexico.

**Laney, S. R.**, and M. J. Perry. "Second-order controls on single-turnover chlorophyll fluorescence yield and their influence on oceanic productivity models. Poster presentation, at 'Phytoplankton Productivity: an appreciation of 50 years of the study of production in oceans and lakes'. March 2002, Bangor, Wales, UK.

**Laney, S. R.**, R. M. Letelier, and M. R. Abbott. "The effect of nitrate and irradiance on natural fluorescence: Assessing the influence of environmental variables". Poster presentation, ASLO Ocean Sciences Meeting. February 2002, Honolulu HI.

**Laney, S. R.**, R. M. Letelier, and M. R. Abbott. "Physiological variability in the natural fluorescence of *Thalassiosira weissflogii*". Poster presentation, NASA Ocean Color Research Team meeting. May 2001, San Diego CA.

**Laney, S. R.**, R. M. Letelier, and M. R. Abbott. "Electron transport models of photosynthesis: does reaction center connectivity enhance photosynthesis?" Poster presentation, ASLO Aquatic Sciences Meeting. February 2001, Albuquerque NM.

**Laney, S. R.**, R. M. Letelier, R. A., Desiderio, and M. R. Abbott. "Laboratory time series of phytoplankton natural fluorescence". Poster presentation, AGU Ocean Sciences Meeting. January 2000, San Antonio TX.

## **WORKSHOPS ATTENDED**

Ocean Outlook 2017, Bergen Marine Cluster, Bergen, Norway, April 2017.

NASA Arctic COLORS workshop, Woods Hole Oceanographic Institution, Woods Hole MA July 2016

Ocean Outlook 2016, Woods Hole Oceanographic Inst., Woods Hole MA, April 2016.

Ocean Carbon & Biogeochemistry Summer Workshop, Woods Hole MA, July 2015.

Ocean Outlook 2015, Bergen Marine Cluster, Bergen, Norway, February 2015.

Ocean Carbon & Biogeochemistry Summer Workshop, Woods Hole MA, July 2014.

ZERO workshop, Ocean College Zhejiang University, Hangzhou, China, December 2013.



ICESCAPE synthesis workshop, Stanford University, Palo Alto CA, September 2013.

Ocean Carbon & Biogeochemistry Summer Workshop, Woods Hole MA, July 2013.

Towards Optics-Based Measurements in Ocean Observatories workshop, 2012 Ocean Optics XXI meeting, Glasgow Scotland, UK, October 2012.

ICESCAPE-Malina US/European Arctic science synthesis workshop, Villefranche-sur-mer, France, September 2012.

ICESCAPE 2011 cruise planning workshop, Stanford University, Palo Alto CA, USA, March 2011.

UNOLS vessel planning workshop for R/V *Sikuliaq*, Salt Lake City UT, USA, February 2011.

ICESCAPE 2010 cruise planning workshop, Victoria BC, Canada, December 2009.

2006 NSF Antarctic science and research logistics workshop, Arlington VA, USA, August 2006.

Fast Repetition Rate fluorometry workshop, Challenger Conference, University of Plymouth, UK, 2002.

### **SYNERGISTIC ACTIVITIES AND OUTREACH**

'v-code' FRRF analysis software. Designed and maintained open-source software for interpreting variable fluorescence transients, 1999-2006.

"Outlaw Algae", WHOI Ocean Science Exhibit Center kiosk project, 2013-2015. Developed content for an interactive kiosk presenting algal assemblages in the Alaskan Arctic. Supporting agency: NPRB. { [HYPERLINK "http://www.whoi.edu/feature/outlawalgae/"](http://www.whoi.edu/feature/outlawalgae/) }

"Ocean Color", WHOI Ocean Science Exhibit Center kiosk project, 2010-2013. Developed content for an interactive kiosk presenting ocean color research. Supporting agency: NASA (New Investigator Program). { [HYPERLINK "http://www.whoi.edu/graphics/oceancolor/"](http://www.whoi.edu/graphics/oceancolor/) }