

Alison P. Chase

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EDUCATION

Ph.D., Oceanography School of Marine Sciences, University of Maine, Orono, ME	2020
M.S., Oceanography School of Marine Sciences, University of Maine, Orono, ME	2014
Calibration and Validation for Ocean Color Remote Sensing NASA-funded summer course hosted at the Darling Marine Center, University of Maine, Walpole, ME	2011
B.A., Geology and Environmental Studies <i>Cum Laude</i> in Geology, Bowdoin College, Brunswick, ME	2009

PROFESSIONAL EXPERIENCE

Senior Oceanographer, Air-Sea Interaction and Remote Sensing Department Applied Physics Laboratory - University of Washington, Seattle, WA	Sept 2023 – present
Washington Research Foundation Postdoctoral Fellow Applied Physics Laboratory - University of Washington, Seattle, WA	Jul 2020 – Aug 2023
Research Associate, Radiation and Climate Group Atmospheric and Environmental Research Inc. (AER), Lexington, MA	Aug 2010 – Jun 2012

PEER-REVIEWED PUBLICATIONS

Submitted/in review:

Hilary I. Palevsky, Sophie Clayton, Heather Benway, Mairead Maheigan, Dariia Atamanchuk, Roman Battisti, Jennifer Batryn, Annie Bourbonnais, Ellen M. Briggs, Filipa Carvalho, **Alison P. Chase**, et al. A Model for Community-driven Development of Best Practices: The Ocean Observatories Initiative Biogeochemical Sensor Data Best Practices and User Guide. *Frontiers in Marine Science*.

Sasha J. Kramer, Luis M. Bolaños, Dylan Catlett, **Alison P. Chase**, Michael J. Behrenfeld, Emmanuel S. Boss, E. Taylor Crockford, Stephen J. Giovannoni, Jason R. Graff, Nils Haëntjens, Lee Karp-Boss, Emily E. Peacock, Collin S. Roesler, Heidi M. Sosik, David A. Siegel. Toward a synthesis of phytoplankton community composition methods for global-scale application. *Limnology and Oceanography: Methods*. Preprint: bioRxiv 2023.09.07.556589; doi: <https://doi.org/10.1101/2023.09.07.556589>

Peer-reviewed:

Cetinić, I., Rousseaux C.S, Carroll, I.T., **Chase, A.**, et al. (2024). Phytoplankton composition from sPACE: requirements, opportunities, and challenges. *Remote Sensing of Environment*, 302 (2024) 113964, <https://doi.org/10.1016/j.rse.2023.113964>.

Bisson, K.; Werdell, P. J.; **Chase, A.**; Kramer, S.; Cael, B. B.; Boss, E.; et al. (2023). Informing ocean color inversion products by seeding with ancillary observations. *Optics Express*, 31:24, <https://doi.org/10.1364/OE.503496>.

- Chase, A.**, E. Boss, N. Haëntjens, E. Culhane, C. Roesler, and L. Karp-Boss (2022), Plankton imagery data inform satellite-based estimates of diatom carbon. *Geophysical Research Letters*, doi: 10.1029/2022GL098076.
- Haëntjens, N., E. Boss, J. Graff, **A. Chase**, and L. Karp-Boss (2022), Phytoplankton size distributions in the western North Atlantic and their seasonal variability. *Limnology and Oceanography*, doi: 10.1002/lno.12172.
- Eveleth, R., D. M. Glover, M. C. Long, I. D. Lima, **A. P. Chase**, and S. C. Doney (2021), Assessing the skill of a high-resolution marine biophysical model using geostatistical analysis of mesoscale ocean chlorophyll variability from field observations and remote sensing. *Frontiers in Marine Science*, 8:612764. doi: 10.3389/fmars.2021.612764.
- Chase, A. P.**, S. J. Kramer, N. Haëntjens, E. S. Boss, L. Karp-Boss, M. Edmondson, and J. R. Graff (2020), Evaluation of diagnostic pigments to estimate phytoplankton size classes. *Limnology and Oceanography: Methods*, <https://doi.org/10.1002/lom3.10385>.
- Cael, B. B., **A. Chase**, and E. Boss (2020), Information content of absorption spectra and implications for ocean color inversion. *Applied Optics*, 59 (13): 3971. <https://doi.org/10.1364/ao.389189>.
- Bolaños, L.M., L. Karp-Boss, C. J. Choi, A. Z. Worden, J. R. Graff, N. Haëntjens, **A. P. Chase**, A. Della Penna, P. Gaube, F. Morison, S. Menden-Deuer, T. K. Westberry, R. T. O'Malley, E. Boss, M. J. Behrenfeld and S. J. Giovannoni (2020), Small phytoplankton dominate western North Atlantic biomass. ISME J. <https://doi.org/10.1038/s41396-020-0>
- Fox, J., M. J. Behrenfeld, Nils Haëntjens, **A. Chase**, S. J. Kramer, E. Boss, L. Karp-boss, et al. (2020), Phytoplankton growth and productivity in the western North Atlantic: Observations of regional variability from the NAAMES field campaigns. *Frontiers in Marine Science*, 7 (24): 1–15. <https://doi.org/10.3389/fmars.2020.00024>.
- Schulien, J. A., A. D. Penna, P. Gaube, **A. P. Chase**, N. Haëntjens, J. R. Graff, J. W. Hair, et al. (2020), Shifts in phytoplankton community structure across an anticyclonic eddy revealed from high spectral resolution lidar scattering measurements. *Frontiers in Marine Science*, 7 (June): 1–13. <https://doi.org/10.3389/fmars.2020.00493>.
- Casey, K., C. Rousseaux, W. Gregg, E. Boss, **A. Chase**, S. Craig, C. Mouw, et al. (2019), A Global Compilation of in Situ Aquatic High Spectral Resolution Inherent and Apparent Optical Property Data for Remote Sensing Applications. *Earth System Science Data Discussions*, 902230: 1–29. <https://doi.org/10.5194/essd-2019-105>.
- Boss, E., Haëntjens, N., Ackleson, S., Balch, B., **Chase, A.**, Dall'Olmo, G., Freeman, S., Liu, Y., Loftin, J., Neary, W., Nelson, N., Novak, M., Slade, W., Proctor, C., Tortell, P., and Westberry, T. IOCCG Protocol Series (2019). Inherent Optical Property Measurements and Protocols: Best Practices for the Collection and Processing of Ship-Based Underway Flow-Through Optical Data. IOCCG Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation, Volume 4.0, edited by A. R. Neeley and A. Mannino, IOCCG, Dartmouth, NS, Canada. <http://dx.doi.org/10.25607/OBP-664>
- Gao, M., P-W Zhai¹, B. Franz, Y. Hu, K. Knobelspiesse, P. J. Werdell, A. Ibrahim, B. Cairns, **A. Chase** (2019), Inversion of multi-angular polarimetric measurements over open and coastal ocean waters: a joint retrieval algorithm for aerosol and water leaving radiance properties. *Atmospheric Measurement Techniques*, 1–31. <https://doi.org/10.5194/amt-2019-67>.

McKinna, L. I.W., I. Cetinić, **A. P. Chase**, P. J. Werdell (2019), Approach for propagating radiometric data uncertainties through NASA ocean color algorithms. *Frontiers in Marine Science*, 1–17. <https://doi.org/10.3389/feart.2019.00176>.

Liu, Y., E. Boss, **A. Chase**, H. Xi, X. Zhang, R. Röttgers, Y. Pan, A. Bracher (2019), Retrieval of phytoplankton pigments from underway spectrophotometry in the Fram Strait. *Remote Sensing*, 11(318).

Chase, A., E. Boss, I. Cetinić, W. Slade (2017), Estimation of phytoplankton accessory pigments from hyperspectral reflectance spectra: Toward a global algorithm. *Journal of Geophysical Research: Oceans*, 122(12): 9725-9743. doi: 10.1002/2017JC012859.

Stamieszkin, K., M.A. May, and **A. Chase** (2016), Student-led retreats for graduate student cohesion and career success. *Oceanography*, 29(1): 80–81.

Villar, E., G. Farrant, M. Follows, L. Garczarek, S. Speich, S. Audic, L. Bittner, B. Blanke, J.R. Brum, C. Brunet, R. Casotti, **A. Chase**, J.R. Dolan, F. d’Ortenzio, J-P. Gattuso, N. Grima, L. Guidi, C.N. Hill, O. Jahn, J-L. Jamet, H. Le Goff, C. Lepoivre, S. Malviya, E. Pelletier, J-B. Romagnan, S. Roux, S. Santini, E. Scalco, S.M. Schwenck, A. Tanaka, P. Testor, T. Vannier, F. Vincent, A. Zingone, C. Dimier, M. Picheral, S. Searson, S. Kandel-Lewis, Tara Oceans Coordinators: S. G. Acinas, P. Bork, E. Boss, C. de Vargas, G. Gorsky, H. Ogata, S. Pesant, M.B. Sullivan, S. Sunagawa, P. Wincker, E. Karsenti, C. Bowler, F. Not, P. Hingamp, D. Iudicone (2015), Environmental Characteristics of Agulhas Rings Affect Interocean Plankton Transport. *Science*, 348 (6237):1–12.

Chase, A., E. Boss, R. Zaneveld, A. Bricaud, H. Claustre, J. Ras, G. Dall’Olmo, T. Westberry (2013), Decomposition of in situ particulate absorption spectra. *Methods in Oceanography*, 7: 110-124.

Boss, E., M. Picheral, T. Leeuw, **A. Chase**, E. Karsenti, G. Gorsky, L. Taylor, W. Slade, J. Ras, H. Claustre (2013), The characteristics of particulate absorption, scattering and attenuation coefficients in the surface ocean; Contribution of the Tara Oceans expedition. *Methods in Oceanography*, 7: 52-62.

AWARDS

Funding

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|------|---|
| 2023 | <i>Ships of Opportunity for PACE (SO- PACE): Validation of water-leaving reflectances, IOPs, and plankton community metrics</i> , NASA, PI A. Chase (\$928,457) |
| 2023 | <i>A Scoping Study to Determine the Requirements of Satellite Primary Production Estimates for Fisheries Management</i> , NOAA NESDIS, PI P. Gaube, Co-I A. Chase (\$511,000) |
| 2023 | <i>Puget Sound Phytoplankton/Primary Productivity Vital Sign Indicator Development</i> , Puget Sound Partnership (\$55,000) |
| 2022 | Analysis of phytoplankton and environmental data in the Puget Sound, Washington Ocean Acidification Center (WOAC) (\$30,000) |
| 2022 | UW Data Science Postdoctoral Fellow: Research Funds, eScience Institute (\$2,500) |
| 2022 | UW Azure Cloud Computing Credits (\$10,000) |
| 2021 | UW Data Science Postdoctoral Fellow: Research Funds, eScience Institute (\$2,000) |
| 2020 | <i>Going beyond chlorophyll-a: Developing phytoplankton community composition algorithms from hyperspectral remote sensing reflectances</i> . Science and Applications Team, NASA PACE Mission, PI P. Gaube, Co-I A. Chase (\$493,293) |
| 2020 | Washington Research Foundation Postdoctoral Fellowship (\$217,500) |
| 2019 | Maine Space Grant Consortium (MSGC) Fellowship (\$6,000) |

2018 PLOS ONE Early Career Travel Award in the Physical Sciences (\$500)
2018 Maine Space Grant Consortium (MSGC) Fellowship (\$6,000)
2014 NASA Earth and Space Science Fellowship (NESSF) (\$90,000)
2008 MSGC Fellowship for undergraduate summer research (\$3,000)
2007 Rusack Fellowship for undergraduate summer research (\$3,000)

Recognition

2018 Best Student Paper Honorable Mention, Ocean Optics Conference XXIV
2013, 2014 NSF Graduate Research Fellowship Program Honorable Mention
2009 Sarah and James Bowdoin Scholar, Bowdoin College
2009 Arthur M. Hussey Award Recipient, Geology Department, Bowdoin College

TEACHING & MENTORING

Project Sponsor (fall/winter 2023): M.S. in Data Science Capstone Team, University of Washington
Mentor to T. Orlovic, visiting graduate student working on instrumentation for plankton and oceanographic observations (summer 2023)
Advisor & mentor to H. Bhatti, undergraduate researcher working on plankton image identification and deep learning (summer 2022)
Mentor, Society for Women in Marine Science mentorship program (2021-2022)
Mentor, Athena Talaria program for women and non-binary high school students from low-income and under-resourced backgrounds (summer 2021)
Organized and mentored several undergraduate students on projects within the lab group, Maine In-situ Sound and Color (MISC) Lab, University of Maine (2017-2019)
Mentor, High School Upward Bound Math Science program (summer 2018)
Teaching Assistant, Calibration and Validation of Ocean Color Remote Sensing, University of Maine (summer 2015; summer 2013)
Teaching Assistant, Integrative Marine Science III: Oceanography, University of Maine (fall 2014; fall 2013)
Substitute Teacher K-12, Shaker Regional School District, Belmont, NH (2009-2010 school year)
Teaching Assistant, Introduction to Geology, Bowdoin College (fall 2007)

SERVICE & OUTREACH

Across Lab Liaisons (ALL) Board Member, Applied Physics Laboratory (2023 -
2024 Ocean Optics Conference XXVI Planning Committee
OceanHackWeek 2023 Organizing Committee
APL Seminar Series Planning Committee, Applied Physics Laboratory, University of Washington (2021 – 2023)
Application reviewer for the Diverse & Inclusive Navy Oceanographic Summer Internship Program (DINOSIP), UW-APL (April 2023)
Volunteer participant in creation of video material for code.org k-12 computer science curriculum material (March 2023)

Biogeochemical Sensor Working Group (Bio-optics subgroup), Ocean Observatories Initiative & Ocean Carbon & Biogeochemistry (2021 - 2023)

Panel participant: "Science at Sea", Applied Physics Laboratory Seminar Series, University of Washington (2022)

Member, committee for Diversity, Equity, & Inclusion, Applied Physics Laboratory, University of Washington (Jul 2020 –

Presenter, Middle School Career Fair, United Technology Center, Bangor, ME (2018; 2015)

Graduate Senator Representative, School of Marine Sciences to the Graduate Student Government (2014 – 2015)

Grant reader, Graduate Student Government, University of Maine (2013 – 2015)

Moderator, Nor'easter Bowl, regional site of the High School National Ocean Sciences Bowl, Orono, ME (2015)

Co-founder, University of Maine Marine Science Professional Development Club (2014 – 2015)

Oceanography Student-Faculty liaison, School of Marine Sciences, University of Maine (2014 – 2015)

Presenter to middle school students, Graduate Students in the Classroom program, Center for Ocean Sciences Education Excellence (COSEE), Maine (2013-2014)

Manuscript reviewer: Biogeosciences, Deep-Sea Research Part I, Earth and Space Science, Energies, Frontiers in Marine Science, Journal of Geophysical Research – Oceans, Journal of Oceanology and Limnology, Journal of Quantitative Spectroscopy & Radiative Transfer, Limnology & Oceanography, Limnology & Oceanography - Methods, Oceanography, Ocean Science, Optics Express, Remote Sensing, Scientific Data (2014 –

SEA-GOING EXPERIENCE

Science Team Member, Washington Ocean Acidification Center (WOAC) time series sampling, R/V Rachel Carson, Puget Sound, WA Sept 2023 (5 days)

Oceanographic Engineer & Science Team Member, Tara Microbiomes Mission, R/V Tara South Atlantic Ocean crossing from Punta Arenas, Chile to Cape Town, South Africa Mar – Apr 2022 (50 days)

Oceanographic Engineer, Tara Microbiomes Mission, R/V Tara Amazon River mouth & Brazilian waters between Belem and Salvador, Brazil Sep – Oct 2021 (35 days)

Science Team Member, DoppScat Experiment, R/V Shana Rae Mid-California coastal waters Aug 2018 (5 days)

Science Team Member, North Atlantic Aerosols and Ecosystem Study (NAAMES) Expedition, R/V Atlantis North Atlantic; San Juan, PR to Woods Hole, MA Mar – Apr 2018 (24 days)

Science Team Member, Tara Pacific Expedition, R/V Tara Equatorial Pacific; Keelung, Taiwan to Lautoka, Fiji Apr – May 2017 (32 days)

Science Team Member, Ship-Aircraft Bio-Optical Research (SABOR), R/V Endeavor Northwest Atlantic Ocean Jul – Aug 2014 (20 days)

Optical Engineer, Tara Oceans Polar Circle Expedition, R/V Tara

Norwegian Sea; Lorient, France to Tromso, Norway

May – Jun 2013 (25 days)

PRESENTATIONS (*Invited)

2023

A Machine Learning Framework to Estimate Diatom Biomass from Space (Nov 2023) Poster, International Ocean Colour Science Meeting, St. Petersburg, FL

A workflow to process and classify open-ocean IFCB data (Oct 2023) Oral presentation, 'IFCBWorks23' workshop on the IFCB instrument, Woods Hole, MA

**Applications of in situ optical measurements to study open ocean plankton and particle communities* (July 2023) Lecture, Ocean Observatories Initiative BGC Summer Course, virtual

**Phytoplankton community composition & pigments from PACE: A science overview* (July 2023) Oral Presentation, NASA PACE Community of Practice telecon, virtual

**Phytoplankton community composition derived from optics and remote sensing: Approaches, challenges, and next steps* (July 2023) Lecture, Ocean Optics Summer Course, Bowdoin College, ME

Phytoplankton in Puget Sound during 2014-2019: HAB species and OA parameters (May 2023) Poster, WOAC Ocean Acidification Science Symposium, Seattle WA

A multi-phase machine learning workflow to predict distributions of phytoplankton communities in the open ocean (May 2023) Oral Presentation, 54th International Liège Colloquium – Machine Learning in Oceanography, Liège, Belgium

Phytoplankton communities from PACE: toward a global diatom product (Feb 2023) Oral Presentation, NASA PACE Science and Applications Team Meeting, San Diego, CA

2021-2022

Chasing open-ocean eddies and fronts using in-line optical measurements (Oct 2022) Poster, Ocean Optics XXV Conference, Quy Nhon, Vietnam

**Beyond total biomass: Progress towards detecting phytoplankton communities from space* (Sept 2022) Invited lecture, NOAA NOCCG Seminar Series, virtual

User-friendly Tools for Oceanic Plankton Image Analysis (UTOPIA) (May 2022) UW Data Science Seminar, eScience Institute, University of Washington, Seattle, WA

Leveraging big data and machine learning to shed light on complex ocean ecosystems (May 2022) Washington Research Foundation 2022 Postdoctoral Fellows Symposium, Seattle, WA

**Using optical oceanography to explore phytoplankton communities* (Jan 2022) Invited lecture, Banse Early Career Scientist Seminar Series, School of Oceanography, University of Washington, virtual

Exploring tiny ocean life on giant scales (Dec 2021) 5 minute speed talk, College of the Environment Postdoc

Pecha Kucha event, University of Washington, Seattle, WA

**Beyond Biomass: Phytoplankton Communities from Ocean Color* (June 2021) Oral Presentation, 2021 PACE Applications Water Quality & Resources Focus Session, NASA, virtual

2019-2020

Quantitative imaging flow cytometry reveals pigment-based overestimation of diatoms and microplankton in the North Atlantic (Feb 2020) Oral Presentation, Ocean Sciences Meeting, San Diego, CA

Phytoplankton community composition in global ocean surface waters (2020) Poster, Washington Research Foundation Postdoctoral Fellows Symposium, Seattle, WA

Optical-based methods used to detect phytoplankton community composition in the North Atlantic Ocean (2019) Poster, Hyperspectral Data Needs for Algal Bloom Detection Workshop, Ostend, Belgium

Influence of small-scale frontal features on phytoplankton community composition in the North Atlantic Ocean (2019) Oral presentation, ASLO Ocean Sciences Meeting, San Juan, PR

2017-2018

Deploying the Imaging FlowCytobot in the Western North Atlantic from a research vessel (2018) Oral presentation, McLane Labs IFCB Workshop, Woods Hole, MA

Spectral absorption-based estimates of phytoplankton community composition in the North Atlantic Ocean (2018) Oral presentation, Ocean Optics XXIV Meeting, Dubrovnik, Croatia

**Improved Estimates of Phytoplankton Community Size Structure with Application to the North Atlantic Ocean* (2018) Invited lecture, Maine Space Grant Consortium annual meeting, Augusta, ME

Phytoplankton Community Size Structure in the North Atlantic and Arctic Oceans: Comparing Multiple Analysis Approaches and Relationships with Physical Parameters (2018) Poster, Ocean Sciences Meeting, Portland, OR

**Phytoplankton in the Ocean: Collecting and Interpreting Optical and Imagery Data* (2017) Invited lecture, Undergraduate Oceanography course at Unity College, Unity, ME

Using Automated Imagery to Investigate Phytoplankton Size Structure and Community Composition in the North Atlantic (2017) Poster, High Throughput Imagery and Molecular Methods Meeting, Hannover, Germany

**Current efforts and goals in ocean color remote sensing and optical oceanography* (2017) Invited lecture, Atmospheric and Environmental Research, Lexington, MA

2010-2016

Exploring the capability for estimation of phytoplankton accessory pigments from hyperspectral reflectance spectra (2016) Poster, Ocean Optics XXIII Meeting, Victoria, BC

Using optics to investigate global marine phytoplankton composition (2015) Poster, NASA Biodiversity and Ecological Forecasting Team Meeting, College Park, MD

Optical size proxies and their relationship to phytoplankton size in the Arctic Ocean (2014) Poster, Ocean Optics

XXII Meeting, Portland, ME

Mapping phytoplankton types using in situ absorption spectra and linking results to future hyperspectral ocean color satellites (2014) Poster, Ocean Sciences Meeting, Honolulu, HI

Decomposition of in-situ particulate absorption spectra (2012) Poster, Ocean Optics XXI Meeting, Glasgow, Scotland

Obtaining quality ac-s meter spectra: a method for temperature and residual scattering corrections (2012) Poster, Ocean Sciences Meeting, Salt Lake City, UT

A reflectance ratio algorithm for detecting the springtime diatom-to- dinoflagellate transition in a coastal Maine sound: an early warning of Alexandrium fundyense (2010) Poster, Ocean Optics XX Meeting, Anchorage, AK