

Alexandra E. Jones-Kellett, Ph.D.

Postdoctoral Associate

jonesae@mit.edu

lexi-jones.github.io

Dept. of Earth, Atmospheric &

Planetary Sciences

77 Massachusetts Avenue

Building 54-1519

Cambridge, MA 02139-4307

EDUCATION

- 2025 **MIT-WHOI Joint Program in Oceanography, Ph.D.**
Biological Oceanography
Thesis: A Lagrangian Perspective of Mesoscale Biophysical Interactions in the Subtropical Ocean (<https://hdl.handle.net/1721.1/158812>)
Committee: Drs. Michael J. Follows (Advisor; MIT), Stephanie Dutkiewicz (MIT), Amala Mahadevan (WHOI), Colleen Mouw (URI)
- 2018 **Temple University, B.A.** (*cum laude*, top 9% in College of Science and Technology)
University Honors Program; Major: Mathematics; Minors: Physics, Business
Honors Scholar Thesis: Impact of Warm Water Anomalies on Phytoplankton Composition in the Santa Barbara Channel ([dx.doi.org/10.34944/dspace/4610](https://doi.org/10.34944/dspace/4610))
Committee: Drs. Henry Houskeeper (Advisor; UCSC, WHOI), Raphael Kudela (Advisor; UCSC), Eric Cordes (TU)

RESEARCH POSITIONS

Massachusetts Institute of Technology, Department of Earth, Atmospheric & Planetary Sciences

- 2024 – pres. POSTDOCTORAL ASSOCIATE, Follows Marine Biogeochemical Modeling Group
- Researching the role of mesoscale physical features in shaping phytoplankton abundances using amplicon sequence data from the SCOPE-Gradients 4 cruise and Lagrangian trajectory simulations with Python
 - Running an idealized $1/10^9$ MITgcm-Darwin simulation of the North Pacific Ocean and studying phytoplankton community succession along 3D Lagrangian trajectories within mesoscale eddies
- 2019 – 2024 GRADUATE RESEARCH ASSISTANT, Follows Marine Biogeochemical Modeling Group
- Sampled North Pacific microbial communities on the SCOPE-Gradients 4 cruise and examined how fine-scale ocean transport shapes community composition
 - Studied how the fluid dynamical structure of mesoscale eddies affects local phytoplankton concentrations, differentiating features that trap from those actively mixing using satellite remote sensing observations in Python

University of Southern California, Department of Biological Sciences

- 2022 VISITING GRADUATE RESEARCH ASSISTANT, Fuhrman Marine Microbial Ecology Group
- Developed protocols for genomic internal standards, performed DNA extractions, and ran PCR for SCOPE-Gradients 4 cruise samples

Woods Hole Oceanographic Institution, Biology Department

- 2019 VISITING GRADUATE RESEARCH ASSISTANT, Sosik Optical Ocean & Phytoplankton Ecology Lab
- Validated satellite phytoplankton function type algorithms with flow cytometry imagery
 - Processed and extracted chlorophyll samples from SPIROPA research cruises

NASA Jet Propulsion Laboratory, Earth Science Division

2018 PROJECT LEAD, NASA DEVELOP National Program

- Led a team of three other early-career researchers, which included assisting with MATLAB and data analysis, and writing weekly progress reports to administrators
- Evaluated environmental and ecological factors driving habitat range shifts for the California grunion, a fish species, with satellite remote sensing observations and in situ citizen science Grunion Greeters data (<https://www.grunion.org/>)
- Developed a predictive model and GUI interface application with MATLAB AppDesigner for local governmental and academic end-users to predict the potential size of grunion spawning events based on input environmental conditions

NASA Armstrong Flight Research Center & University of California, Irvine

2017 INTERN, NASA Student Airborne Research Program

- Quantified changes in phytoplankton community composition and biomass as a response to decadal ocean temperature shifts and environmental fluctuations in the Santa Barbara Channel with MATLAB and satellite remote sensing observations
- Assisted in the operation of instruments onboard a NASA Airborne Science Program aircraft to sample atmospheric chemicals and image land and water surfaces
- Participated in a day-long research cruise measuring water quality in the Santa Barbara Channel

Temple University, Department of Biology

2018 – 2019 RESEARCH ASSISTANT, Kulathinal Evolutionary Genomics & Biological Informatics Lab

- Developed Python scripts to study the evolution of duplicate (“de novo”) genes in the *Drosophila* lineage and their functions
- Updated the open-source website PlayBIGData.org in HTML including increasing functionality and developing educational modules on big data and coding fundamentals

2015 – 2018 UNDERGRADUATE RESEARCH ASSISTANT, Kulathinal Evolutionary Genomics & Informatics Lab

- Implemented command-line software tools and wrote custom Python scripts to study genetic variation and the intensity of natural selection in *Drosophila melanogaster* using a population genomics approach

PUBLICATIONS**Peer-Reviewed**

3. **Jones-Kellett AE** & Follows MJ. The satellite chlorophyll signature of Lagrangian eddy trapping varies regionally and seasonally within a subtropical gyre. *In press, Ocean Science*[♦]. Preprint: doi.org/10.5194/egusphere-2024-3211
[♦] Highlight Article, as selected by editors
2. **Jones-Kellett AE**, McNichol JC, Raut Y, Cain KR, Ribalet F, Armbrust EV, Follows MJ, Fuhrman JA (2024). Amplicon sequencing with internal standards yields accurate picocyanobacteria cell abundances as validated with flow cytometry. *ISME Communications*, 4(1): ycae115.
doi.org/10.1093/ismeco/ycae115
1. **Jones-Kellett AE** & Follows MJ (2024). A Lagrangian Coherent Eddy Atlas for Biogeochemical Applications in the North Pacific Subtropical Gyre. *Earth System Science Data*, 16, 1475-1501.
doi.org/10.5194/essd-16-1475-2024

Submitted / Under Review

1. Koestner D, Clayton S, Lerner P, **Jones-Kellett AE**, Walker SL. Biogeochemical-Argo floats reveal seasonality of the biological carbon pump influenced by the Lofoten Basin Eddy. *Under Review, Geophysical Research Letters*.

In Preparation

1. **Jones-Kellett AE**, McNichol JC, Raut Y, Fuhrman JA, Follows MJ. Eukaryotic phytoplankton are sustained by eddies and lateral mixing in the open ocean. *In preparation for PNAS*.

ACTIVE PROJECTS (+equal contribution, *student mentee)

4. **Jones-Kellett AE**, Jahn O, Dutkiewicz S, Follows MJ. Ecological Succession of Phytoplankton Communities Along 3D Lagrangian Trajectories in Modeled Eddies.
3. **Jones-Kellett AE**, McNichol JC, Raut Y, Fuhrman JA, Follows MJ. Meridional Transport Structures the Spatial Variability of Temperature-Adapted *Prochlorococcus* Ecotype Gene Abundances.
2. Lang S, Cornec M, **Jones-Kellett AE**, Puppa Kocsis V, Snow T, Masud-Ul-Alam M, Omand M. The Physical Structuring of Phytoplankton Communities in Gulf Stream Rings from NASA PACE, SWOT, and Argo Observations.
1. **Jones-Kellett AE**⁺, Padalino C⁺, Britten G, Follows MJ. The Effect of Mesoscale Eddies on pCO₂ Across the Global Ocean.

DATASETS & SOFTWARE (+equal contribution)

5. **Jones-Kellett AE** (2024). North Pacific Subtropical Gyre RCLV Atlas (Version 2). *Dataset*. doi.org/10.5281/zenodo.10849221; simonscmap.com/catalog/datasets/RCLV_atlas_version2
4. **Jones-Kellett AE**⁺, McNichol JC⁺, Raut Y, Fuhrman JA (2024). Universal Amplicon Sequences (mixed 16S/18S) from SCOPE Gradients 4 Cruise. *NCBI BioProject Dataset*. ncbi.nlm.nih.gov/bioproject/1079727
3. **Jones-Kellett AE** (2023). North Pacific Subtropical Gyre RCLV Atlas (Version 1). *Dataset*. doi.org/10.5281/zenodo.8139149; simonscmap.com/catalog/datasets/RCLV_atlas
2. **Jones-Kellett AE** (2023). RCLV Atlas. *Software*. doi.org/10.5281/zenodo.7702978
1. **Jones AE**⁺, Knapp H⁺, Peacock A⁺, Wakamatsu L⁺ (2018). Finding Suitable Spawning Habitats (FiSSH). *Software*. https://github.com/NASA-DEVELOP/FiSSH

TEACHING & MENTORING

Research Advising

MIT Undergraduate Research Opportunities Program

- 2024 Khyatee Atolia (Wellesley College), Which Satellite Products Best Capture Ocean Currents in the North Pacific?
- 2021 Sydney Kim (MIT), How do Eddies Modify the Ocean's Uptake of CO₂?

MIT EAPS Master of Science Program

- 2022 – 2023 Christine Padalino (co-advised with Drs. Mick Follows & Greg Britten), The Effect of Eddies on fCO₂ in the North Pacific Surface Ocean

Teaching

Case Western Reserve University, Dept. of Earth, Environmental, & Planetary Sciences

Apr 26, 2023 GUEST LECTURER, Introduction to Oceanography

Massachusetts Institute of Technology, Dept. of Earth, Atmospheric, & Planetary Sciences

2022 TEACHING ASSISTANT, Mechanisms and Models of the Global Carbon Cycle

Other

2017 – 2019 MATHEMATICS TUTOR, High school Algebra & Geometry

Formal Mentoring

MIT EAPS Peer Mentor Program

2023 – 2024 Lucy Brock (Undergraduate Student)

2021 – 2023 Lucy Sandoe (Master's Student)

2021 – 2022 Kelly McKeon (Ph.D. Student)

MIT EAPS Application Mentorship Program & MIT-WHOI Joint Program Application Support

2019 – 2021 Prospective Ph.D. Students

HONORS & AWARDS

2024	MIT EAPS Community Builder Award
2023	Temple University 30 Under 30
2022	FilaChange Student Travel Grant (~\$1,000)
2019	MIT EAPS John H. Carlson Fellowship (~\$84,000)
2019	NSF Graduate Research Fellowship Program, Honorable Mention
2018	Ocean Sciences Meeting Student Travel Grant (\$500)
2017	Temple University Diamond Award
2017	Temple University Creative Arts Research and Scholarship Grant (\$4,000)
2016, 2017	David Tepper, CST '64 and Elaine Kowalewski Scholarship in Mathematics (\$3,000)
2016	Temple University Merit Scholarship Educational Enhancement Stipend (\$4,000)
2016	White Haven Lions Club Scholarship (\$500)
2014	Temple University Merit Scholarship (partial tuition, 4 years)

OCEANOGRAPHIC CRUISES

Nov 18 – Dec 15, 2021	R/V Thomas G. Thompson, SCOPE-Gradients 4, North Pacific
Sep 20 – 22, 2019	R/V Neil Armstrong, MIT-WHOI Joint Program Cruise, Northeast Atlantic
Jun 28 – Jul 7, 2019	SS/V Corwith Cramer, MIT-WHOI Joint Program Cruise, Northeast Atlantic

INVITED TALKS

3. **University of Washington School of Oceanography**, Banse Seminar. (Feb 26, 2025). The Phytoplankton Response to Lagrangian Eddy Trapping in the North Pacific Subtropical Gyre.
2. **NASA Goddard Ocean Ecology Lab**, MPOWIR NASA Speaker Series. (Jun 24, 2024). Lagrangian Interpretations of Mesoscale Biophysical Interactions in the North Pacific Subtropical Gyre.
1. **Woods Hole Oceanographic Institution**, Mahadevan Group Meeting. (Oct 10, 2023). Lagrangian Eddy Trapping Fosters Chlorophyll Hot Spots in the North Pacific Subtropical Gyre.

CONFERENCE PRESENTATIONS (first author only; +equal contribution)

20. Jones-Kellett AE, McNichol JC, Raut Y, Fuhrman JA, Follows MJ (Mar 30, 2025). Subtropical Phytoplankton Community Composition Reflects Lateral Mixing History and Mesoscale Eddies. Oral. *ASLO Aquatic Sciences Meeting*. Charlotte, NC, USA.
19. Jones-Kellett AE, McNichol JC, Raut Y, Fuhrman JA, Follows MJ (Nov 12, 2024). NPSG phytoplankton community composition from G4 reflects lateral mixing history and mesoscale eddies. Poster & Oral. *SCOPE Annual Meeting*. New York, NY, USA.
18. Jones-Kellett AE, McNichol JC, Raut Y, Fuhrman JA, Follows MJ (Feb 21, 2024). The Fluid Dynamical Structuring of Microbial Communities Along an Eastern North Pacific Transect. Poster. *Ocean Sciences Meeting*. New Orleans, LA, USA.
17. Jones-Kellett AE & Follows MJ (Nov 10, 2023). The Lagrangian History of the Biologically Anomalous Cyclone Cathy (Station 4) from the Gradients 4 Cruise. Poster. *SCOPE Annual Meeting*. New York, NY, USA.

16. Jones AE & Follows MJ (Jun 5, 2023). Enhanced Biological Activity in Lagrangian Coherent Eddies of the North Pacific Subtropical Gyre. Oral. **ASLO Aquatic Sciences Meeting**. Palma de Mallorca, Spain.
15. Jones AE & Follows MJ (Aug 31, 2022). Satellite Chlorophyll Signatures of Eddy Coherency in the North Pacific Subtropical Gyre. Oral. **FilaChange**. Providence, RI, USA.
14. Jones AE & Follows MJ (Mar 4, 2022). Does coherency shape the chlorophyll signature of North Pacific subtropical gyre eddies? Oral. **Ocean Sciences Meeting**. Virtual.
13. Jones AE & Follows MJ (Jan 25, 2022). Does eddy coherency affect plankton populations in the NPSG? Oral. **SCOPE Annual Meeting**. Virtual.
12. Jones A⁺, Knapp H⁺, Peacock A⁺, Wakamatsu L⁺, Holt B (Dec 10, 2018). Predicting Grunion Migration Patterns and Spawning Areas in Response to Changes in California's Oceans by Coupling Satellite and In Situ Data. Poster. **American Geophysical Union Fall Meeting**. Washington, DC, USA.
11. Jones A⁺, Knapp H⁺, Peacock A⁺, Wakamatsu L⁺, Holt B (Aug 1, 2018). Predicting Grunion Migration Patterns and Spawning Areas in Response to Changes in California's Oceans. Poster. **NASA Annual Earth Science Application Showcase**. Washington, DC, USA.
10. Jones AE, Ranz JM, Kulathinal RJ (Apr 12 & 14, 2018). Evolution of de novo genes in the *Drosophila melanogaster* lineage. Poster. **59th Annual Drosophila Research Conference**. Philadelphia, PA, USA.
9. Jones AE, Ranz JM, Kulathinal RJ (Apr 12, 2018). Evolution of de novo genes in the *Drosophila melanogaster* lineage. Poster. **Temple Undergraduate Research Forum and Creative Works Symposium**. Philadelphia, PA, USA.
8. Jones AE, Houskeeper HF, Kudela RM (Feb 15, 2018). Impact on phytoplankton composition in the Santa Barbara Channel from the 2013-2015 warm water anomaly. Poster & lightning talk. **Ocean Sciences Meeting**. Portland, OR, USA.
7. Jones AE, Ranz JM, Kulathinal RJ (Jan 20, 2018). Evolution of de novo genes in the *Drosophila melanogaster* lineage. Poster. **Harvard National Collegiate Research Conference**. Cambridge, MA, USA.
6. Jones AE, Houskeeper HF, Kudela RM (Oct 6, 2017). Warm water anomaly effect on Santa Barbara Channel phytoplankton composition. Poster. **College of Science and Technology 8th Annual Temple Undergraduate Research Symposium**. Philadelphia, PA, USA.
5. Jones AE, Houskeeper HF, Kudela RM (Aug 8, 2017). Effect of changing sea surface temperature on phytoplankton composition in the Santa Barbara Channel. Oral. **NASA Student Airborne Research Program Meeting**. Irvine, CA, USA.
4. Jones AE, Stanley CE, Kulathinal RJ (Apr 20, 2017). A dynamic and adaptive male genomic landscape in *Drosophila*. Oral. **Temple Undergraduate Research Forum and Creative Works Symposium**. Philadelphia, PA, USA.
3. Jones AE, Stanley CE, Kulathinal RJ (Apr 1, 2017). Functional genomic landscape in *Drosophila* provides evidence for pervasive adaptation of sexually selected male traits. Oral. **93rd Annual Meeting of the Pennsylvania Academy of Science**. Wilkes Barre, PA, USA.
2. Jones AE, Chin JL, Stanley CE, Kulathinal RJ (Sep 16, 2016). Adaptive functional landscape of reproductive genes in *Drosophila* provides evidence for positive selection on sperm-specific proteins. Poster. **College of Science and Technology 7th Annual Temple Undergraduate Research Symposium**. Philadelphia, PA, USA.
1. Jones AE, JL Chin, NH Rigby, CE Stanley, RJ Kulathinal (Jul 29, 2016). Functional landscape of locally adaptive reproductive proteins in *Drosophila melanogaster*. Poster. **Temple University Biology Department Summer Undergraduate Research Program Poster Session**. Philadelphia, PA, USA.

INTERNAL PRESENTATIONS

Mar 12, 2025	Simon's Collaboration on Computational Biogeochemical Modeling of Marine Ecosystems
Nov 15, 2023	
Sep 14, 2022	
Feb 13, 2025	MIT EAPS, Student Seminar
Oct 19, 2023	

Apr 14, 2023	
Oct 7, 2022	
Oct 26, 2021	
Mar 11, 2024	Simon's Collaboration on Ocean Processes and Ecology, Gradients series
Oct 2, 2023	
Nov 16, 2023	WHOI, Biology Dept. Seminar
Apr 29, 2021	
Aug 8, 2023	MIT EAPS, Afternoon Talk Series

WORKSHOP PARTICIPATION

2024	NASA/OCB PACE Hackweek, University of Maryland Baltimore County, Baltimore, MD
2024	Simons CBIOMES Workshop on Numerical Circulation & Ecosystem Modeling, NY, NY
2023	GO-BGC/BGC-Argo Float Data Workshop, UMass Boston, Boston, MA
2023	Simons CBIOMES Workshop on Transects & Eco-Provinces, MIT, Cambridge, MA
2021	TIDE Seminar: Racism, Colonialism, & Extraction within the Geosciences
2021	Unlearning Racism in Geoscience
2020	IOCCG 2020 Summer Lecture Series (Virtual Adaptation)

ACADEMIC SERVICE

2025	ASLO 2025 Aquatic Sciences Meeting Session Chair. Microbial Responses to Pulse Disturbances in Aquatic Environments.
2023 – 2024	MIT EAPS Toward Inclusion and Diversity (TIDE), Co-Organizer
2023	PLOS One Reviewer
2023	MIT EAPS-SCC Faculty Search, Graduate Student Advisory Group Member
2020 – 2022	MIT EAPS Let's Invest in Neighborhood K-12 (LINK-12), Co-Founder
2020 – 2022	MIT EAPS Student Advisory Committee, Public Service Chair
2021	EAPS Application Mentorship Program, Outreach Coordinator
2020 – 2021	MIT EAPS Diversity, Equity, and Inclusion Committee, Member

MEMBERSHIP

2025 – present	MPOWER Mentor Group
2019 – present	MIT EAPS Toward Inclusion and Diversity (TIDE)
2019 – present	MIT Women in Course XII
2016 – 2018	Temple University Mathematics Club
2016 – 2018	Temple University Association for Women in Mathematics

PUBLIC OUTREACH

John H. Carlson Lecture Science Exhibit Volunteer

Oct 24, 2024	New England Aquarium Simons Theatre, Boston, MA, USA
Oct 19, 2023	
Nov 14, 2019	

K-12 Volunteer Scientist Speaker (MIT EAPS LINK-12, Skype-a-Scientist, etc.)

Nov 22, 2024	Stephanie Magistro 9 th -12 th Grade, Charlestown High School, MA, USA
Dec 13, 2023	Jessica Crane 5 th Grade, Kelly Elementary School, MA, USA
May 17, 2023	Elizabeth Jones Kindergarten, Rice Elementary, PA, USA
May 20, 2022	
Feb 18, 2021	
May 19, 2020	

Jan 20, 2023 Christine Nicholson 5th Grade, Chenery Middle School, MA, USA
 Oct 22, 2020 STEM Story Time 1st-3rd Grade, LET'S GO Boys and Girls, Inc, DC, USA
 Oct 16, 2020 Dolores Simmons 4th Grade, Saint Mary's School, Vancouver, BC
 Oct 15, 2020 Jessica Lincecum Kindergarten, Green Elementary, OH, USA
 Sep 18, 2020 Caitlin Ward 12th Grade, Berkshire School, MA, USA
 Jun 2, 2020 Briana Button Kindergarten, Rice Elementary, PA, USA
 Jun 1, 2020 Michelle Brooks-Rogers Kindergarten, Rice Elementary, PA, USA
 May 28, 2020 Yvonne Barley Kindergarten, Rice Elementary, PA, USA
 May 21, 2020 Jennifer Detweiler Kindergarten, Rice Elementary, PA, USA
 May 20, 2020 Nicole Sivilli 4th Grade, Harmony School, NJ, USA
 May 18, 2020
 Apr 20, 2020 Aaron Huber 7th Grade, Cayman International, Cayman Islands
 Nov 2, 2019 Girls Day at the MIT Museum, Cambridge, MA

Trivia Creator and Host

2019 – 2020 Instagram Earth and Environment Tuesday Trivia (@lexi_ejones)

MEDIA COVERAGE

2024 [Innovative Sequencing Technique Enhances Marine Microbial Research](#), CBIOMES News
 2023 [Research and Technology Innovator: Alexandra Jones](#), Temple University 30 Under 30
 2023 [How This Grad Student Shifted Her Student Loan Strategy through the Pandemic](#), Personal Finance for PhDs Podcast
 2019 [Hey Beacher, Leave Those Fish Alone](#), Hakai Magazine
 2018 [Surfing with the Silversides*](#), YouTube

*2025 Update: Video has been removed by NASA