

Jacob A. Cram Curriculum vitae

CURRICULUM VITAE

Calendar Year 2024 Jacob A. Cram

Horn Point Laboratory

University of Maryland Center for Environmental Science

Certification

I have reviewed this Curriculum Vitae and here certify that it is a current and accurate statement of my professional record for this calendar year.

Signed:  _____ Date: 17 October 2024
Assistant Professor

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Jacob A. Cram Curriculum vitae

Jacob A. Cram
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I. EDUCATION

University of Southern California **2014**
Ph.D., Biology
Dissertation: Dynamics of Marine Bacterial Communities from Surface to Bottom and the Factors Controlling Them

Grinnell College **2006**
BA., Biology with Honors

II. PROFESSIONAL EXPERIENCE

Horn Point Laboratory, Cambridge, MD. **2018 – Present**
Assistant Professor

Kublin Group, Fred Hutch CRC, Seattle WA. **2017 – 2018**
Post-doctoral Research Fellow

Deutsch Group, U. of Washington, Seattle WA. **2014 – 2017**
Post-doctoral Researcher

Fuhrman Group, U. of Southern California, Los Angeles, CA. **2008 – 2014**
Graduate Student Researcher

III. RESEARCH

Areas of Professional Expertise: Microbial Ecology, Biological oceanography, Biogeochemistry, Carbon-cycle, Nitrogen Cycle, Ocean-modeling, Oyster microbiome

A. Publications

Total per-reviewed publications plus book chapters: 35 (14 as first author; 16 since starting at

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HPL).

ORCID: <https://orcid.org/0000-0001-9546-1130>

Web of Science H-Index: 15; **Total Citations:** 2,190

Google Scholar H-Index: 16; **Total Citations:** 2,933

1. Publications under review

Dougherty, E., J.A. Cram, A. Hollins. Under Review. The relationship between size, abundance, and mass of particles in the surface and bottom waters of the Chesapeake Bay. *Estuaries and Coasts*. Preprint at 10.1002/essoar.10508364.1.

Fuchsman, C.A., J.A. Cram. Under Review. Size-fractionated suspended organic carbon and nitrogen suggest that cyanobacteria and zooplankton produce organic matter within the offshore Eastern Tropical North Pacific Oxygen Deficient Zone. *Global Biogeochemical Cycles*.

Fuchsman, C.A., M.E. Duffy, J.A. Cram, P. Huanca-Valenzuela, B. P. Gregory, L. Plough, J. J. Pierson, C. L. Fitzgerald, A. H. Duvol, R. G. Keil. Under Review. Contributions of Vertically Migrating Metazoans to Sinking and Suspended Particulate Matter Fuel N₂ production in the Eastern Tropical North Pacific Oxygen Deficient Zone. *Global Biogeochemical Cycles*.

Cohen, A.B., V. Klepac-Ceraj, K. Bidas, F. Weber, A. Garber, L.N. Christensen, J.A. Cram, M.L. McCormick, G.T. Taylor. Under Review. Sedimentation in a modern permanently redox-stratified lake provides insights into organic carbon sequestration and benthic-pelagic coupling during the Proterozoic Eon. *Limnology and Oceanography*

Gleich, S.J., L.Y. Mesrop, J.A. Cram, J.L. Weissman, S.K. Hu, Y. Yeh, J.A. Fuhrman, D.A. Caron. With a little help from my friends: Importance of protist-protist interactions in structuring marine protistan communities in the San Pedro Channel Under Review. *MSystems*.

2. Peer-reviewed publications

33- Huanca-Valenzuela, P., J.A. Cram, C.A. Fuchsman. 2024. Niche differentiation in microorganisms capable of using alternative reduced nitrogen sources studied across depth and between oxic and anoxic ocean regions. *Frontiers in Marine Science*.

32- Cram, J.A., A. McCarty, S. Willey, S. Alexander. 2024. Microbial community structure variability over the development of healthy and underperforming oyster larval hatchery

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broods. *Frontiers in Aquaculture*.

- 31- Cram, J.A., A. Hollins, A.J. McCarty, G. Martinez, M. Cui, M. Gomes, C.A. Fuchsman. 2024. Microbial diversity and abundance vary along salinity, oxygen, and particle size gradients in the Chesapeake Bay. *Environmental Microbiology*.
- 30- Smith, J., J.A. Cram (co-first author), M.P. Berndt, V. Hoard, D. Shultz, A.C. Deming. 2023. Quantifying the linkages between California sea lion (*Zalophus californianus*) strandings and particulate domoic acid concentrations at piers across Southern California. *Frontiers in Marine Science*.
- 29- McCarty, A.J., S. Hood, K. Huebert, J. Cram, K. McFarland, L.V. Plough. 2023. Evaluating a short vs. long-term progeny test and investigating physiology associated with survival in extreme low salinity for the eastern oyster (*Crassostrea virginica*). *Aquaculture*.
- 28- Fuchsman, C.A., D.G. Garcia-Prieto, M.D. Jays, J.A. Cram. 2023. Associations between picocyanobacterial ecotypes and cyanophage host genes across ocean basins and depth. *PeerJ*.
- 27- Cohen, A.B., V. Klepac-Ceraj, K. Butler, F. Weber, A.I. Garber, L.N. Christensen, J.A. Cram, M.L. McCormick, G.T. Taylor. 2023. Particles, season, and redox gradients shape microbial community composition in a permanently redox-stratified freshwater lake. *Limnology and Oceanography*.
- 26- Gleich, S., J. Cram, D. Weissman, D.A. Caron. 2022. Using generalized additive models to improve the predictive power of ecological network analyses constructed using time-series data. *ISME Communications*.
- 25- Cram, J.A., M.W. Gray, K. McFarland, A. Hollins. 2022. Microbiota of *Crassostrea virginica* larvae during a hatchery crash and under normal production: Amplicon sequence data. *Data in Brief* 40: 107755. doi: 10.1016/j.dib.2021.107755.
- 24- Cram, J.A., C.A. Fuchsman, M.E. Duffy, J.L. Pretty, R.M. Lekanoff, J.A. Neibauer, S.W. Leung, K.B. Huebert, T.S. Weber, D. Bianchi, et al. 2022. Slow particle remineralization, rather than suppressed disaggregation, drives efficient flux transfer through the Eastern Tropical North Pacific oxygen deficient zone. *Global Biogeochemical Cycles* 36(1): e2021GB007080. doi: 10.1029/2021GB007080.
- 23- Gray, M.W., S.T. Alexander, B.F. Beal, T. Bliss, C.A. Burge, J.A. Cram, M.D. Luca, J. Dumhart, P.M. Glibert, M. Gonsior, et al. 2022. Hatchery crashes among shellfish research hatcheries along the Atlantic coast of the United States: A case study of production analysis at Horn Point Laboratory. *Aquaculture* 546: 737259. doi:

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- 10.1016/j.aquaculture.2021.737259.
- 22- Tully, B.J., J. Buongiorno, A.B. Cohen, J.A. Cram, A.I. Garber, S.K. Hu, A.I. Krinos, P.T. Leftwich, A.J. Marshall, E.T. Sieradzki, et al. 2021. The Bioinformatics Virtual Coordination Network: An open-source and interactive learning environment. *Frontiers in Education* 6. Available at [Frontiers](#). Accessed 2022 Feb 21.
 - 21- Leung, S.W., T. Weber, J.A. Cram, C. Deutsch. 2021. Variable particle size distributions reduce the sensitivity of global export flux to climate change. *Biogeosciences* 18(1): 229–250. doi: 10.5194/bg-18-229-2021.
 - 20- Cram, J.A., A.J. Fiore-Gartland, S. Srinivasan, S. Karuna, G. Pantaleo, G.D. Tomaras, D.N. Fredricks, J.G. Kublin. 2019. Human gut microbiota is associated with HIV-reactive immunoglobulin at baseline and following HIV vaccination. *PLOS ONE* 14(12): e0225622. doi: 10.1371/journal.pone.0225622.
 - 19- Ai, D., X. Li, H. Pan, J. Chen, J.A. Cram, L.C. Xia. 2019. Explore mediated co-varying dynamics in microbial community using integrated local similarity and liquid association analysis. *BMC Genomics* 20(Suppl 2): 185. doi: 10.1186/s12864-019-5469-8.
 - 18- Needham, D.M., E.B. Fichot, E. Wang, L. Berdjeb, J.A. Cram, C.G. Fichot, J.A. Fuhrman. 2018. Dynamics and interactions of highly resolved marine plankton via automated high-frequency sampling. *The ISME Journal* 12(10): 2417. doi: 10.1038/s41396-018-0169-y.
 - 17- Cram, J.A., K.W. Hager, J.G. Kublin. 2018. Utilizing gnotobiotic models to inform the role of the microbiome in vaccine response heterogeneity. *Current Opinion in HIV and AIDS* 13(1): 1–8. doi: 10.1097/COH.0000000000000422.
 - 16- Hernando-Morales, V., M.M. Varela, D.M. Needham, J.A. Cram, J.A. Fuhrman, E. Teira. 2018. Vertical and seasonal patterns control bacterioplankton communities at two horizontally coherent coastal upwelling sites off Galicia (NW Spain). *Microbial Ecology* 76(4): 866–884. doi: 10.1007/s00248-018-1179-z.
 - 15- Cram, J.A., T. Weber, S.W. Leung, A.M.P. McDonnell, J-H. Liang, C. Deutsch. 2018. The role of particle size, ballast, temperature, and oxygen in the sinking flux to the deep sea. *Global Biogeochemical Cycles* 32(5): 858–876. doi: 10.1029/2017GB005710.
 - 14- Cram, J.A., K.W. Hager, J.G. Kublin. 2017. Utilizing gnotobiotic models to inform the role of the microbiome in vaccine response heterogeneity. *Current Opinion in HIV and AIDS*.
 - 13- Hernando-Morales, V., M.M. Varela, D.M. Needham, J.A. Cram, J.A. Fuhrman, E. Teira.

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2017. Vertical and seasonal patterns control bacterioplankton communities at two horizontally coherent coastal upwelling sites off Galicia (NW Spain). *Microbial Ecology*.
- 12- Weber, T.S., J.A. Cram, S.W. Leung, T. Devries, C. Deutsch. 2016. Deep ocean nutrients imply large latitudinal variation in particle transfer efficiency. *PNAS*.
- 11- Cram, J.A., A.E. Parada, J.A. Fuhrman. 2016. Dilution reveals how viral lysis and grazing shape microbial communities. *Limnology and Oceanography*.
- 10- Weiss, S., W. Van Treuren, C. Louzupone, K. Faust, J. Friedman, Y. Deng, L.C. Xia, Z.Z. Xu, L. Ursell, E.J. Alm, A. Birmingham, J.A. Cram, J.A. Fuhrman, J. Raes, F. Sun, J. Zhou, R. Knight. 2016. Correlation detection strategies in microbial data sets vary widely in sensitivity and precision. *The ISME Journal*.
- 9- Cram, J.A. 2015. New insights into relationships between active and dormant organisms, phylogenetic diversity, and ecosystem productivity. *News and Views: Molecular Ecology*.
- 8- Fuhrman, J.A., J.A. Cram, D.M. Needham. 2015. Marine microbial community dynamics and their ecological interpretation. *Nature Reviews Microbiology*.
- 7- Cram, J.A., L.C. Xia, D.M. Needham, R. Sachdeva, F. Sun, J.A. Fuhrman. 2015. Cross-depth analysis of marine bacterial networks suggests downward propagation of temporal changes. *The ISME Journal*.
- 6- Cram, J.A., C.T. Chow, R. Sachdeva, D.M. Needham, A.E. Parada, J.A. Steele, J.A. Fuhrman. 2015. Seasonal and interannual variability of the marine bacterioplankton community throughout the water column over ten years. *The ISME Journal*.
- 5- Needham, D.M., C.E. Chow, J.A. Cram, R. Sachdeva, A.E. Parada, J.A. Fuhrman. 2013. Short-term observations of marine bacterial and viral communities: patterns, connections, and resilience. *The ISME Journal*.
- 4- Chow, C., R. Sachdeva, J.A. Cram, J.A. Steele, D.M. Needham, A. Patel, A.E. Parada, J.A. Fuhrman. 2013. Temporal variability and coherence of euphotic zone bacterial communities over two decades in the Southern California Bight. *The ISME Journal*.
- 3- Xia, L.C., D. Ai, J.A. Cram, J.A. Fuhrman, F. Sun. 2013. Efficient statistical significance approximation for local association analysis of high-throughput time series data. *Bioinformatics*.
- 2- Xia, L.C., J.A. Steele, J.A. Cram, Z.G. Cardon, S.L. Simmons, J.J. Vallino, J.A. Fuhrman, F.

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Sun. 2011. Extended local similarity analysis (eLSA) of microbial community and other time series data with replicates. *BMC Systems Biology*.

- 1- Xia, L.C., J.A. Cram, T. Chen, J.A. Fuhrman, F. Sun. 2011. Accurate genome relative abundance estimation based on shotgun metagenomic reads. *PLOS ONE*.

3. Book chapters

- 2- Turk, V., Malkin, S.Y., Celussi, M., Tinta, T., Cram, J., Malfatti, F., Chen, F. 2021. Ecological Role of Microbes: Current Knowledge and Future Prospects. In: Malone, T.C., Malej, A., Faganeli, J., editors. *Coastal Ecosystems in Transition: A Comparative Analysis of the Northern Adriatic and Chesapeake Bay*. John Wiley & Sons.

- 1- Cram, J.A., F. Sun, J. Fuhrman. 2014. Marine bacterial, archaeal, and protistan association networks. *Encyclopedia of Metagenomics*.

B. Contracts and Grants

Total Awarded at UMCES: \$781,808

1. Active/Recommended

National Science Foundation BIO-OCE, 2024-2029, (\$408,770). Collaborative Research: Understanding efficiency of particulate organic carbon transfer to depth in the ocean's oxygen minimum zones. PI: Black, E. Co-PIs: Weber, T., Cram, J., Stone, J., Santoro, A.

Northeastern Regional Aquaculture Center, 2024–2027 (Cram is a “contractor” – award to UMCES depends on services rendered ~ UMCES project scope is ~\$30,000) The Northeast Bivalve Hatchery Health Collaborative: Preventing larval mortalities in Northeast hatcheries. PI: Marta Gomez Chiarri et al. Microbiome Sequencing Contractor: Cram, J.

National Science Foundation BIO-OCE, Aug. 2023 – July 2026, (\$367,277) Collaborative Research: Ecological and biogeochemical role of Rhizaria in the oligotrophic ocean PI: Stone, J., Co-PIs: Cram, J. Blanco-Bercal, L., Noyes, K.

2. Past

Maryland SeaGrant Program Development Funds. March 2023 – April 2024. (\$5,761) Identifying the taxonomic identity of an unknown toxic *Lyngbya* species and associated microbiota in the Chesapeake Bay. PI: Cram, J.A. Co-PI: O’Neil, J.M.

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Ocean Memory Project, (\$2,425). Apr. 2022 – Apr. 2023. Invisible Kelp Forest: From Smell to Sound. PI: Jue, M. Co-PIs: Yermakova, A., Cram, J., Stein, E..

Joint Genome Institute (Department of Energy), 2022–2024. (JGI sequenced 92 metagenomes). Examining the partitioning of microbial metabolic potential in suspended particles and the sediments across oxygen gradients of the Chesapeake Bay. PI: Malkin, S. Co-PIs: Cram, J., Gomes, M., Fuchsman, C., Lapham, L., Preheim, S.

3. Pending

USDA Animal Health and Production and Animal Products: Animal Health and Disease), 2025 – 2028 (\$661,046). Identifying microbial and viral predictors of oyster hatchery die-off events and the factors that shape these predictive communities. PI: Cram, J.A

4. Declined

NASA ROSES OBB (June 2025 – May 2028, \$970,542): *Modeling and predicting temporal variability of ocean carbon transfer efficiency*. PI: Cram, J.A., Co-PIs: Weber, T., Stone, J., Pedrosa Pamies, R.

USDA Animal Health and Production and Animal Products: Animal Health and Disease (Aug. 2024 – Jul. 2027, \$548,243): *Identifying microbial and viral predictors of oyster hatchery die-off events and the factors that shape these predictive communities*. PI: Cram, J.A.

Northeastern Regional Aquaculture Center (Sep. 2024 – Aug. 2027, \$1,192,303): *Predicting oyster hatchery die-off events from microbiota and environmental conditions across a collaborative hatchery network*. PI: Cram, J.A., Co-PIs: Song, B., Walton, B., Gray, M., Lyubchich, V., Gomez-Chiari, M., Hudson, R., Bushek, D., Venugopalan, A.

NSF CHEM-OCE (Sep. 2023 – Aug. 2026, \$362,042): *Collaborative Research: Understanding efficient particulate organic carbon transfer to depth in the ocean's oxygen minimum zones*. PI: Weber, T.S., Co-PIs: Black, E., Cram, J., Stone, J.

Maryland Sea Grant (2024 – 2026, \$297,657): *Identifying microbial and viral predictors of oyster larval hatchery die-off events*. PI: Cram, J.A.

USC Sea Grant (2024 – 2026, \$163,555): *Modeling past and future impacts of harmful algae on California sea lion strandings in the Southern California Bight*. PI: Cram, J.A.

NSF-BIO-OCE (Jun. 2023 – May 2028, \$977,930): *CAREER: Quantifying microbial dynamics of Chesapeake Bay micro-habitats*. PI: Cram, J.A.

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NOAA-NOS-NCCOS (Sep. 2022 – Aug. 2025, \$1,499,445): *HAB-OA 2022: Production and fate of domoic acid under combined influences of ocean acidification and eutrophication*. PI: Kudela, R.M., Co-PIs: Anderson, C., Bianchi, D., Smith, J., Sutula, M., Cram, J.

AMFC Atlantic Hatchery Network (2022 – 2025, \$749,998): *Causes and management of production crashes at oyster hatcheries: Using coordinated monitoring and modeling with the Atlantic Hatchery Network*. PI: Gray, M., Co-PIs: Alexander, S., Beal, B., Bliss, T., Cram, J., et al.

NSF-OCE-BIO (Jul. 2022 – Jun. 2025, \$1,079,017): *Integrating size fractionation and inverse modeling to improve our understanding of the role of marine microbial diversity in controlling particle dynamics and sinking*. PI: Cram, J.A.

USC Sea Grant (2021, \$130,000): *Quantifying and modeling particle-mediated transport of domoic acid to the benthos of the Southern California Bight*. PI: Smith, J., Co-PI: Cram, J.

USGS (2021, \$192,323): *Quantifying and modeling particle-mediated transport of the algal toxin microcystin through the Chesapeake Bay and its tributaries*. PI: Cram, J., Co-PI: Smith, J.

Maryland Sea Grant (2021): *Quantifying and modeling particle-mediated transport of the algal toxin microcystin through the Chesapeake Bay and its tributaries*. PI: Cram, J., Co-PI: Smith, J.

NSF Chemical Oceanography (Feb. 2021): *Active transport and carcass degradation: How mesozooplankton affect N_2 production in an oligotrophic Oxygen Deficient Zone*. PI: Fuchsman, C.A., Co-PIs: Pierson, J., Cram, J.A.

DOE Sequencing (New Investigator) (2020): *Using metagenomics to build metabolic networks from the water column through the sediment in Chesapeake Bay along a gradient of oxygen depletion*. PI: Malkin, S., Co-PIs: Cram, J., Fuchsman, C.A., Gomes, M., Lapham, L., Preheim, S.

NIH (Nov. 2020, \$307,280): *Exploring the links between vitamin D deficiency and outcomes of COVID-19 in at-risk groups*. PI: North, Co-PIs: Jagus, Chung, Lyubchich, Cram, Potter, Mullin.

NIH RadX-Rad (Sep. 2020, \$575,000): *Investigating septic system discharge into natural environments to map the incidence of SARS-CoV-2 in rural populations*. PI: Cram, J., Co-PIs: Hood, Steele (SCCWRP), Leight, A.K. (NOAA).

NSF BIO-OCE (Aug. 2020, ~\$900,000): *CAREER: Exploring microbial diversity across space, time, and microhabitats*. PI: Cram, J.A.

Ocean Memory Project Seed Grant (Jul. 2020, \$10,000): *Aquatic-Net: Sharing ocean*

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memory and cognition networks through an interactive artistic demonstration. PI: Lee, C. (AZ State), Co-PIs: Cram, J., Siembieda, D. (Leonardo).

NIH-RAPID (Nov. 2020, ~\$250,000): *Exploring the links between vitamin D deficiency and outcomes of COVID-19 in at-risk groups.* PI: North, Co-PIs: Jagus, Chung, Lyubchich, Cram, Potter, Mullin.

NSF BIO-OCE (Feb. 2020, ~\$600,000): *Drivers of particle-to-particle variability in the microbial community structure of marine snow.* PI: Cram, J.A.

NSF (Aug. 2019, ~\$750,000): *Collaborative Research: Exploring the microbial ecology of diverse particles.* PI: Cram, J.A., Co-PIs: Fuchsman, C.A., Rau (U. Penn).

CNAR-NOAA (Apr. 2019, ~\$250,000): *Development of metagenomic tools to improve the health and hatchery production of oyster larvae.* PI: Cram, J.A., Co-PI: Gray, M.

AMFC Atlantic Hatchery Network (2019, ~\$5 million): *A multi-institution and interdisciplinary research consortium seeking to improve oyster hatchery production.* PI: Gray, M., et al.

C. Seminars and presentations

(Since starting at HPL only)

1. Invited Seminars

- 6- Cram, J.A. Biogeochemistry of marine particles in anoxic environments. *University of Southern California*, Los Angeles, CA. 2021.
- 5- Cram, J.A. Dynamics and microbial ecology of marine snow. *University of Delaware*, Lewes, DE. 2020.
- 4- Cram, J.A. Interactions between marine bacteria and marine snow drive microbial ecology and ocean processes. *UMCES IMET*, Baltimore, MD. 2019.
- 3- Cram, J.A. Interactions between marine bacteria and marine snow drive microbial ecology and ocean processes. *UMCES CBL*, Solomons, MD. 2019.
- 2- Cram, J.A. Interactions between marine bacteria and marine snow drive microbial ecology and ocean processes. *UMCES AL*, Frostburg, MD. 2018.
- 1- Cram, J.A. Interactions between marine bacteria and marine snow drive microbial ecology and ocean processes. *Environmental Health and Engineering Departmental Seminar*, Johns Hopkins, Baltimore, MD. 2018.

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2. Conference Presentations

(* = Invited; # = Student or Postdoc Advisee Lead Author)

- 14- Cram, J.A., P. Huanca, A. Hollins, C.A. Fuchsman, J. Stone, M. Gonsior. Using size-resolved particle dynamics models, constrained with in-situ bacteria, organic carbon, and optical particle count data, to explore the dynamics of particles and their associated bacteria in the mesopelagic zone. *Ocean Sciences Meeting*, New Orleans, LA. 2024.
- 13- Hoffeditz, E.#, J.A. Cram. Assessment of viral production from an unknown *Lyngbya* species in the Northern Chesapeake Bay. *Ocean Sciences Meeting*, New Orleans, LA. 2024.
- 12- Cram, J.A. Biodiversity, at some depths, precedes stability in microbial growth rates and microbial community structure in the California coastal ocean. *Lightning Talk, Ocean Carbon Biogeochemistry Meeting*, Woods Hole, MA. 2023.
- 11- Cram, J.A. Network analysis reveals statistical associations between cyanophage host genes and cyanobacterial ecotypes across ocean basins. *Poster, Ocean Carbon Biogeochemistry Meeting*, Woods Hole, MA. 2023.
- 10- Cram, J.A. Mid-water factors affecting biological pump-based carbon sequestration. *Biogeoscapes mCDR Workshop*, Narragansett, RI. 2022.
- 9- Cram, J.A. Challenges and opportunities in organizing a cross-disciplinary, virtual seminar series and workshop around Ocean Memory. *Science of Team Science Conference*. Virtual. 2022.
- 8- Cram, J.A. Microbial diversity and abundance vary along latitudinal and particle size gradients in the Chesapeake Bay. *Chesapeake Community Research Symposium*, Annapolis, MD. 2022.
- 7- Cram, J.A., Dougherty, E.#, A. Hollins. Microbial diversity and abundance vary along latitudinal and particle size gradients in the Chesapeake Bay. *Ocean Sciences Meeting*, Honolulu, HI. 2022.
- 6- Cram, J.A. Microorganisms sense marine snow. *Ocean Memory Project Seed Seminar*, Virtual. 2021.
- 5- Cram, J.A.* Lightning Talk: Particle-attached bacteria and zooplankton in the Chesapeake Bay. Horn Point Laboratory, Cambridge, MD. 2021.
- 4- Cram, J.A., Fuchsman, C. Network analysis reveals statistical associations between

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cyanophage host genes and cyanobacterial ecotypes across ocean basins. *Biogeosciences Workshop*, Woods Hole, MA. 2021.

- 3- Cram, J.A. Particle size and abundance measurements suggest decreased particle attenuation and disaggregation in the Eastern Tropical North Pacific Oxygen Minimum Zone. *Ocean Sciences Meeting*, San Diego, CA. 2020.
- 2- Dougherty, E.#, Cram, J.A. Determining the abundance and diversity of bacteria on marine particles of different size classes. *AGU Ocean Sciences Meeting*, San Diego, CA. 2020.
- 1- Cram, J.A., Fuchsman, C., Duvol, A., Neibauer, J., Keil, R. Sinking marine particles in oxygen minimum zones produce ammonium, even at depths where it is undetectable in the water column. *AGU Meeting*, Washington, DC. 2018.

3. Symposia organized/chaired for professional meetings

- 2- Cram, J.A. (Chair), Bowman, J., Edwards, B., Hennon, G.M., Labonte, J. (Co-Chairs). Understanding Microbial Marine Life Through the Molecular Lens. *Ocean Sciences Meeting*, February 2024.
- 1- Cram, J.A., M. Jue, A. Yermakova. Ocean Memory Project Seed Seminar, Sensing and Memory, Virtual. 2022

4. Workshops attended

- 7- Ocean Memory Project Cresting Conference, Virtual. 2023.
- 6- Ocean Memory Project Seed Seminar, Pollution Forgetting and Loss, Sapelo Island, GA. 2023.
- 5- Biogeosciences – Marine Carbon Dioxide Removal, Measurement Reporting, and Verification, Narragansett, RI. 2022.
- 4- Ocean Memory Project Seed Seminar, Sensing and Memory, Virtual. 2022. (Co-organizer)
- 3- Biogeosciences Workshop, Virtual. 2021.
- 2- Bioinformatics Virtual Coordination Network Workshop, Virtual. 2020.
- 1- Ocean Memory Project Seed Seminar, Cognition, Genomics, and Memory, Virtual. 2020.

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D. Technical Reports

1. Contracts and Grants Reporting

Cram, J.A., O'Neil, J.M. Identifying the taxonomic identity and associated microbiota of an unknown toxic *Lyngbya* species in the Chesapeake Bay 2024. Final report to Maryland SeaGrant

Cram, J.A. 2024. Collaborative Research: Ecological and biogeochemical role of Rhizaria in the oligotrophic ocean Annual report for NSF (Project number NSF -- 222767)

Cram, J.A., O'Neil, J.M. Identifying the taxonomic identity and associated microbiota of an unknown toxic *Lyngbya* species in the Chesapeake Bay 2023. Annual report to Maryland SeaGrant

2. Final Reports for Maryland Sea Grant, NSF/Research for Undergraduates Program

Langsford, E., J.A. Cram. 2024. Size to mass relationship of Collodaria in the summertime Sargasso Sea

Hoffeditz, E., J.A. Cram, 2023. Assessment of Viral Production from an Unknown *Lyngbya* Species in the Northern Chesapeake Bay.

Thompson, M.Q. J.A. Cram 2022. Analysis of Microbial Abundance on Marine Snow in the Deep Ocean

Martinez, G. 2021, J.A. Cram. 2021. Microbial Abundances Compared to Particle Mass Across the Chesapeake Bay

Dougherty, E., J.A. Cram 2019. Determining the Abundance of Bacteria on Marine Particles of Different Size Classes

E. Computational Tools

NetGam. Gleich et al. 2022. GitHub released R-Package.

- R-Package to implement the methods in Gleich et al. 2022. *ISME Communications*.
- Available at: <https://github.com/sgleich/NetGAM>

F. Data Sets: Public Access Data Sets Submitted to Repositories

15- Amplicon sequence of hatchery larvae microbiota #PRJNA1104222. *Short Read Archive*.

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- Amplicon sequence data corresponding to Cram et al. 2024. *Frontiers in Microbiology*.
- 14- Hatchery2021_ProcAmplicons. *Figshare Repository* #25686255
- Code for carrying out statistical analysis corresponding to Cram et al. 2024. *Frontiers in Microbiology*.
- 13- Hatchery2021AmpliconsAnalysis. *Figshare Repository* #25686261
- Code for processing amplicon sequence data, generating count tables, taxonomy tables, fasta files, and output files.
- 12- BeachedSeaLions. 2023. *Figshare Repository* #24415654
- Statistical analysis and visualization corresponding to Smith et al. 2023.
- 11- CyanoVirLasoo. 2023. *Figshare Repository* #21498402
- Network analysis scripts corresponding to Fuchsman et al. 2023. *PeerJ*.
- 10- Chesapeake_Mainstem_2019_Fractions_Analysis. 2023. *Figshare Repository* #21948425
- Statistical analysis and data visualization scripts corresponding to Cram et al. 2024.
- 9- Chesapeake_2019_Amplicon_Processing. *Figshare Repository* #21950354
- Amplicon data processing scripts corresponding to Cram et al. 2024.
- 8- Chesapeake Bay 2019 Particle Size Fractionation. 2022. *NCBI Sequence Read Archive (SRA) Repository*. Bioproject PRJNA898904
- Amplicon sequence data corresponding to Cram et al. 2024.
- 7- POMZ-ETNP-UVP-2017. *Figshare Repository* #14589435
- Model code and data corresponding to Cram et al. 2021. *Global Biogeochemical Cycles*.
 - Available at: <https://figshare.com/articles/software/POMZ-ETNP-UVP-2017/14589435>
 - Mirrored at: <https://github.com/cramjaco/POMZ-ETNP-UVP-2017>
- 6- HPLOH_Crash. *Figshare Repository* #15025446
- Data analysis pipeline corresponding to Gray et al. 2022 and Cram et al. 2022 hatchery crash papers.
 - Available at: https://figshare.com/articles/software/HPLOH_Crash/15025446

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5- Larval Hatchery Crash 16S Amplicon Sequencing. *NCBI Sequence Read Archive*, Project Accession PRJNA744562

- Amplicon sequence data corresponding to the hatchery crash papers.
- Available at: https://figshare.com/articles/software/HPLOH_Crash/15025446
- Mirrored at: https://github.com/cramjaco/HPLOH_Crash

4- Ballasted-Sinking Repository. *BitBucket*, 2018.

- Code to run the model in Cram et al. 2018. *Global Biogeochemical Cycles*.
- Available at: <https://bitbucket.org/ohnoplus/ballasted-sinking>

3-Prism-Transfer-Efficiency. *Bitbucket*, 2018.

- Code and analysis carried out in Cram et al. 2018. *Global Biogeochemical Cycles*.
- Available at: <https://bitbucket.org/ohnoplus/prism-transfer-efficiency>

2- Cram et al. HVTN 096 Microbiome. *ATLAS-SHARP Portal*, 2018.

- Data and code corresponding to Cram et al. 2019. *PLOS ONE*.
- Available at: <https://atlas.ssharp.org/cpas/project/HVTN%20Public%20Data/HVTN%20096/begin.vie>
[w](#)
- Mirrored at: https://github.com/cramjaco/Nyvac_096_Microbiome

1- San Pedro Ocean Time-Series. *BCO-DMO*, 2014.

- Microbial diversity and environmental data corresponding to Cram et al. 2014.
- ARISA Relative Abundances #535919
- ARISA Bin Taxonomy #535520
- SPOT environmental data #537145

G. Transdisciplinary collaborative products

3- Jue, M., A. Yermakova, J. Cram, E. Stine. 2024. Invisible Kelp Forest: From Smell to Sound. *Plant Perspectives*.

- A written work of speculative fiction discussing the sonic expression of the olfactory experiences of organisms that live in the kelp forest off the coast of California.

2- Jue, M., J. Cram, A. Yermakova, E. Stein. 2022. Invisible Kelp Forest.

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- Produced and released an audio file, which is an electroacoustic composition and a piece of speculative fiction. It aims to be a sonic expression of the olfactory experiences of organisms that live in the kelp forest off the coast of California.
- The project involved training a humanities professor and artists on observational approaches in Biology.
- Sound files can be found at: <https://www.melodyjue.info/media>

1- Han, Y., I. Coss, J. Cram, M. Jue, A. Yermakova. 2022. Smell Walk.

- A walking exercise that invites participants to explore with their sense of smell, orienting with their surroundings by nose instead of eyes and ears.
- Released as part of the Ocean Memory, Sense and Sensing workshop.
- Available at: <https://oceanmemoryaudiosessions.bandcamp.com/releases>

G. Active memberships in professional societies

American Geophysical Union, 2018–Present.

III. TEACHING AND TRAINING

A. Membership

1- Member, UMCES Graduate Faculty

2- Member, MEES Faculty and USM Inter-Institutional Graduate Faculty

B. University System of Maryland Courses Taught

MEES 609D: Multivariate Analysis in Environmental Science, 2 Credits, *Spring 2023*.

- Taught by Cram alone.
- This course trains students to analyze and gain insight from environmental datasets where there are many more variables than samples. It leverages interactive team coding exercises which lead up to a final independent project focused on data challenges students face in their thesis work.

MEES 608D: Scientific Writing and Communication, 2 Credits, *Fall 2019, 2021, 2022*.

- Co-taught with Elizabeth North, Matt Gray and Cindy Palinkas
- This course trains students in the technical details of writing a scientific paper. Through interactive workshops, and peer editing and intensive feedback from instructors, students gain skills and create a scaffold of a paper.

MEES 684: Marine Microbial Ecology, 3 Credits, *Spring 2020, 2022, 2024*.

- Co-taught with Feng Chen in all years and Sairah Malkin in 2020.

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- This course gives students familiarity with the diversity, ecology, and biogeochemical roles of Bacteria, Archaea, microbial Eukaryotes, and viruses, in the marine environment and covers the latest discoveries in molecular microbial ecology. Sections that I lead often focus on the interface between microbial biogeography, especially at microscales and biogeochemical cycles.

C. Student training

1. Committee Chair

2- Jennifer Weiske, UMCES-MEES, Ph.D. *In Progress*.

1- Paulina Huanca (Co-advised with Clara Fuchsman), UMCES-MEES, Ph.D., 2024.

2. Committee Member

13- Sabeena Nazaar, UMCES-MEES, Ph.D, *In Progress*

12- Nick Ghallager, UMCES-MEES, Ph.D. *In Progress*

11- Veronica Malabanan Luccese, UMCES-MEES, Ph.D. *In Progress*.

10- Michella Salvitti, UMES-MEES, Ph.D. *In Progress*.

9- David Garcia, UMCES-MEES, Ph.D. *In Progress*.

8- Nicole Trenholm, UMCES-MEES, Ph.D. *In Progress*.

7- Erika Koontz, UMCES-MEES, M.S. *In Progress*.

6- Julia Charest, UMCES-MEES, M.S. *In Progress*.

5- Shayna Keller, UMCES-MEES, M.S. *Thesis Defended June 2024*.

4- Samantha Gleich, University of Southern California, Ph.D. 2024.

3- Matthew Q. Thompson, Gallaudet University, B.S. Honors Thesis, 2023.

2- Alexandra McCarty, UMCES-MEES, Ph.D. 2022.

1- Pinky Liao, UMCES-MEES, M.S. 2021.

3. Research Internships Supervised

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- 7- Emma Langsford, Maryland Sea Grant REU, University of Wisconsin - Madison, *Summer 2024*
- 6- Elizabeth Hoffeditz, Maryland Sea Grant REU, Kutztown University of Pennsylvania, *Summer 2023*.
- 5- Matthew Q. Thompson, Maryland Sea Grant REU, Galludet University, *Summer 2022*.
- 4- Grace Martinez, Maryland Sea Grant REU, University of Missouri, *Summer 2021*.
- 3- Katherine Philipp, HPL Hatchery Internship and Cram Lab Internship, Cornell , *Summer 2021*.
- 2- Emily Dougherty, Maryland Sea Grant REU, Gwynedd-mercy College, *Summer 2019*.
- 1- Mekayla Reynolds, Independent Summer Intern, Frostburg State University, *Summer 2019*.

IV. SERVICE AND OUTREACH

A. Service Outside of the University of Maryland Center for Environmental Sciences

1. Proposal Reviewing

National Science Foundation, Panelist, Winter 2020

National Science Foundation, Reviewed Proposals, 2019 (x2), 2021, 2023, 2024 (x2)

Ocean Memory Project, Chair of Funding Panel, July 2023

- Assembled and led a panel of artists and scientists to evaluate and fund \$90,000 of transdisciplinary proposals.

Austrian Science Foundation, Reviewed Proposal, 2021

2. Journal Reviews

Applied Environmental Microbiology, 2023, 2024

ISME Communications, 2023

Global Biogeochemical Cycles, 2021, 2023

Limnology and Oceanography, 2018, 2020, 2023

Nature Communications, 2021, 2023

Science Advances, 2022, 2023

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PLOS ONE, 2022

PNAS Nexus, 2022

Elementa: Science of the Anthropocene, 2021, 2022

Molecular Ecology, 2020

Geophysical Research Letters, 2020

Environmental Microbiology, 2018, 2020

Molecular Ecology Resources, 2019

3. Preprint Server Public Comments

BioArxiv, 2020 –

Szabo RE, Pontrelli S, Grilli J, Schwartzman JA, Pollak S, Sauer U, Cordero OX. 2021. Ecological stochasticity and phage induction diversify bacterioplankton communities at the microscale. *Microbiology*. doi: 10.1101/2021.09.27.461956

Note: Preprint comments are analogous to journal reviews, except that they are not invited, and I am not anonymous. They may still factor into editorial decisions.

4. Workshops Organized

1- **Ocean Memory Project**, Sense and Sensing Workshop, 2022

- Organized a 30-person collaborative virtual workshop that featured cross-disciplinary discussions between artists, humanities scholars, and scientists.
- Invited plenary speakers on topics spanning whale locomotion, community gardening, and AI-derived artwork and dance, all on the theme of ocean memory and sense.
- Created an asynchronous activity, “Smell Walk,” with perfumer Yosh Han to bring participants into coastal environments, allowing them to sense those environments uniquely.

Ocean Memory Project, Virtual Symposium, 2020

- Organized a series of virtual seminars at the transdisciplinary interface with over 100 viewers.

5. Public Outreach

1- Bioinformatics Virtual Coordination Network, R-Open Course, Spring 2020

2- Bioinformatics Virtual Coordination Network, Network Science-Open Course, Spring 2020

Through BioVCN, I have released publicly available paired interactive coding exercises and videos on the following topics:

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- Correlations and linear models
- Correlation networks and compositional data
- Building time-lagged networks
- Extended local similarity analysis method for time-series

Lessons available online: <https://github.com/biovcnet/biovcnet.github.io/wiki>

6. Transdisciplinary collaboration

Ocean Memory Project, Co-leader, August 2022 – December 2023

- Oversaw and managed the budget of a transdisciplinary organization operating at the interface of arts and science.
- Provided constraints and budget for two conferences and funded seven sub-grants.

B. Service Within the University of Maryland Center for Environmental Sciences

1. Organizational leadership

1- HPL Seminar Series, Co-Organizer (with Clara Fuchsman), Fall 2021, Spring 2022, Fall 2024, Spring 2025 (planned)

2- HPL R-Club, 2018–Present

R-Club trains students, faculty, and staff at Horn Point Laboratory and beyond to solve computational challenges in their research. It collaborates with the Maryland Sea Grant REU program to train REU students in computing.

3- URGE Geoscience Pod, 2021

URGE explored ways to improve diversity, equity, and inclusion at HPL.

2. Horn Point Laboratory Committees

1- HPL Faculty Hiring Committee, January 2024 – June 2024

2- HPL Faculty Retreat & HPL-UMES Joint Faculty Retreat Planning Committee, 2023

3- Education Committee, 2020–2022

4- Computing Committee, 2020–2021

5- Diversity, Equity, and Inclusion Committee, 2020–Present

H. Media Mentions

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- 1- UMCES Press Release: Growing oxygen-deficient zones absorb carbon into the deep ocean. 2022.
- 2- Ramirez, E. (2019). Marine snow and super soakers at sea. *Science at Sea*. Available at: <https://science.umces.edu/science-at-sea/2019/08/13/marine-snow-and-super-soakers-at-sea/>