# Craig E. Nelson, Associate Research Professor *Curriculum Vitae*

Department of Oceanography and Sea Grant College Program
Daniel K. Inouye Center for Microbial Oceanography: Research and Education
School of Ocean and Earth Science and Technology (SOEST)
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I am a microbial ecosystems biologist specializing in the structure and function of natural bacterial communities in aquatic habitats such as coral reefs, lakes, streams, and the open ocean. My research broadly seeks to identify novel bacteria and understand their role in ecosystem processes and biogeochemical transformations. Much of my work centers around culture-independent phylogenetic and metagenomic characterization of natural microbial communities and measurement of biogeochemical processes and chemical constituents in the surrounding environment which regulate and are regulated by these microbes. I maintain ancillary projects understanding the microbiomes of eukarya (corals, humans, amphibians, macroalgae) and studying bacterial pathogens in natural waters in the context of water quality.

**Education**

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|---|---|---|---|
| PhD | UC Santa Barbara | Ecology, Evolution & Marine Biology | 2002-2008 |
| BA | UC Berkeley | Integrative Biology / English (double major) | 1993-1998 |
| | | Minors: Forestry; Entomology; Native American Studies | |

**Research Appointments**

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|---|---|---|
| Associate Research Professor | Department of Oceanography, University of Hawai'i | 2019-current |
| Assistant Research Professor | Department of Oceanography, University of Hawai'i | 2013-2019 |
| Associate Specialist | Marine Science Institute, UCSB (PI: Craig Carlson) | 2008-2013 |
| Graduate Student Assistant | Dept. Ecology, Evolution & Marine Biology, UCSB | 2002-2008 |
| Staff Research Associate | Div. Infectious Disease, Dept. Medicine, UCSF, CA | 2001-2002 |
| Research Assistant | Center for Biological Control, UC Berkeley, CA | 1999-2000 |

**Teaching Appointments** (Summary table in Teaching Section below)

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|---|---|---|
| Full Graduate Faculty | Department of Oceanography, UH Mānoa | 2013-current |
| Full Graduate Faculty | Marine Biology Graduate Program, UH Mānoa | 2014-current |
| Cooperating Graduate Faculty | Natural Resources & Envir. Mgmt., UH Mānoa | 2018-current |
| *Instructor of Record:* | | |
| Biogeochemical Systems | | F 2018,19,20 |
| Ridge to Reef: Coastal Ecosystem Ecology, OCN 457, UH, Undergrad, ~10 students | | S 2015,16,18 |
| Aquatic Pollution, UH, Undergrad, ~25 students | | S 2017 |
| Microbial Oceanography, Graduate International, UH/BIOS, ~15 students | | Sum 2009-15 |
| General Biology, EEMB 3, UCSB, Lower Division, ~120 students | | F 2009-10 |
| Invertebrate Zoology, EEMB 116, UCSB, Upper Division ~80 students | | S 2007 |
| *Instructional Mentoring:* OCN 399, 499, 699, MBIO 699; 1-3 students each semester | | 2014-current |
| *Teaching Assistant:* Dept. Ecology, Evolution & Marine Biology, UCSB (8 qtrs) | | 2003-2008 |
| UCSB Grad Student Assoc, Academic Senate Outstanding Teaching Asst Award | | 2004, 2006 |
| *Teaching Certificate:* College and University Teaching (CCUT), UCSB | | 2008 |
| *Teaching Portfolio (2008):* http://sites.google.com/site/nelsoncraige2/NelsonTeachingPortfolio.pdf | | |

**Peer-Reviewed Publications:** (students and postdoctoral scholars supported are underlined)

*Contribution estimations. In my field typically the first and last author positions are reserved for and represent the lead author (generally a student or postdoctoral scholar) and senior author (generally the primary investigator), respectively; aside from those positions, author order typically approximates a gradient from technical to managerial engagement, with all authors intellectually contributing to the manuscript development. In rare cases authorship is alphabetical after first.*

- Lead author: Carried out the research and wrote the majority of the manuscript, but did not necessarily fund or conceptualize the broader research themes.
- Senior author: Guided the research and the manuscript, contributing analyses and extensive editing and project development, generally conceived the research, but may not have carried out the majority of the research logistics or lead writing of the manuscript.
- Coauthor: Edited the manuscript, provided analyses of samples and data, made graphics, but did not lead writing or coordinate the project.
    - Secondary Coauthor denotes a major role in research and manuscript creativity.
    - Collaborating Coauthor denotes a proportional contribution by author order.
- Corresponding author: Managed the manuscript, including coordinating authoring of the paper, leading all editing and submission duties, and directing figures and analyses.

*- In Review -*

Reef communities persist under future ocean acidification and warming. Christopher P. Jury1, Keisha D. Bahr2, Evan W. Barba1, Russell E. Brainard3, Annick Cros4, Kerri L. Dobson5, Andrew T. Graham1, Rowan H. McLachlan5, **Craig E. Nelson**6, James T. Price5, Mariana Rocha de Souza1, Leah Shizuru1, Celia M. Smith7,8, Wesley Sparagon6, Cheryl A. Squair7, Molly A. Timmers9,10, Tiana Tran11, Jan Vicente1, Maryann K. Webb1, Nicole H. Yamase8, Andréa G. Grottoli5*, Robert J. Toonen1*§. *In Review at **Nature Climate Change**.* CONTRIBUTION: Collaborating Coauthor.

A ridge-to-reef ecosystem microbial census characterizes environmental reservoirs for animal and plant microbiomes. Anthony S. Amend1, Sean O. I. Swift1, John L. Darcy1,2, Mahdi Belcaid1, **Craig E. Nelson**1, Joshua Buchanan1, Nicolas Cetraro1, Kiana Frank1, Kauaoa M.S. Fraiola3, Kacie Kajihara1, Camilo Mora1, Terrance G. McDermot1, Margaret McFall-Ngai1, Matthew Medeiros1, Kirsten K. Nakayama1, Nhu H. Nguyen1, Randi L. Rollins1, Peter Sadowski1, Wesley Sparagon1, Mélisandre A. Téfit1, Joanne Y. Yew1, Danyel Yogi1, Nicole A. Hynson1. *Submitted to **Science**.* CONTRIBUTION: Collaborating Coauthor.

Identifying locations of sewage pollution within a Hawaiian watershed for coastal water quality management actions. Dr. Tracy Wiegner, Steven Colbert, Ph.D.; Leilani Abaya, M.S.; Jazmine Panelo, M.S.; Kristina Remple, M.S.; **Craig Nelson**, Ph.D. *Submitted to **Journal of Hydrology: Regional Studies.*** CONTRIBUTION: Collaborating Coauthor.

*- In Revision -*

Coral reef biofilm bacterial diversity and successional trajectories are structured by reef benthic organisms and shift under chronic nutrient enrichment. Kristina L. Remple, Nyssa J. Silbiger, Zachary A. Quinlan, Michael D. Fox, Linda Wegley Kelly, Megan J. Donahue, **Craig E. Nelson**. *In Revision at **NPJ Biofilms and Microbiomes**.* CONTRIBUTION: Senior Author. Funding - NSF

OCE-1923877

Microbial interactions with dissolved organic matter are central to coral reef ecosystem function and resilience. **Craig E. Nelson**, Linda Wegley Kelly and Andreas F. Haas. *Submitted to* ***Annual Reviews in Marine Science****.* CONTRIBUTION: Lead Author.

Climate warming may cause a shift to unusual algal symbionts in corals Matsuda, Shayle; Chakravarti, Leela ; Cunning, Ross; Huffmyer, Ariana; **Nelson, Craig**; Gates, Ruth; van Oppen, Madeleine, *In Revision at* **Global Change Biology** CONTRIBUTION: Senior Author.

Distinguishing the molecular diversity and energetic potential of exometabolites produced by macroalgae and reef building corals. Linda Wegley Kelly, **Craig E Nelson**, Daniel Petras, Irina Koester, Zachary A Quinlan, Milou G.I. Arts, Louis-Felix Nothias, Jacqueline Comstock, Brandie M White, Ellen C. Hopmans, Fleur C van Duyl, Craig A Carlson, Lihini I. Aluwihare, Pieter C. Dorrestein, Andreas F Haas. *In Revision at* ***PNAS****.* CONTRIBUTION: Secondary Coauthor. Funding - NSF OCE-1949033

*- 2021 -*

53. Kelly LW, Nelson CE, Aluwihare LI, Arts MGI, Dorrestein PC, Koester I, Matsuda SB, Petras D, Quinlan ZA and Haas AF (2021) Molecular Commerce on Coral Reefs: Using Metabolomics to Reveal Biochemical Exchanges Underlying Holobiont Biology and the Ecology of Coastal Ecosystems. **Frontiers in Marine Science.** 8:630799. doi: 10.3389/fmars.2021.630799. CONTRIBUTION: Secondary Coauthor. Funding - NSF OCE-2023298

52. Innis T, Allen-Waller L, Brown K, Sparagon W, Carlson C, Kruse E, Huffmyer A, **Nelson C**, Putnam H, Barott K. Marine heatwaves depress metabolic activity and impair cellular acid-base homeostasis in reef-building corals regardless of bleaching susceptibility. 2021. **Global Change Biology** 27(12):2728-2743. doi: 10.1111/gcb.15622. CONTRIBUTION: Collaborating Coauthor. Funding - NSF OCE-1923877

51. Fox, M.D.; **Nelson, C.E.**; Oliver, T.A.; Quinlan, Z.; Remple, K.; Glanz, J.; Smith, J.E.; Putnam, H.M**.** Differential resistance and acclimation of two coral species to chronic nutrient enrichment reflect life history traits. 2021. ***Functional Ecology*** 5:1081-1093. doi:10.1111/1365-2435.13780. CONTRIBUTION: Secondary Coauthor. Funding - NSF OCE-1538393

*- 2020 -*

50. Winter, K., Y. Rii, F. Reppun, K. Hintzen, R. Alegado, B. Bowen, L. Bremer, M. Coffman, J. Deenik, M. Donahue, K. Falinski, K. Frank, E. Franklin, N. Kurashima, N. Lincoln, E. Madin, M. McManus, **C. Nelson**, R. Okano, A. Olegario, P. Pascua, K. Oleson, M. Price, M. A. Rivera, K. Rodgers, T. Ticktin, C. Sabine, C. Smith, A. Hewett, R. Kaluhiwa, M. Cypher, B. Thomas, J.-A. Leong, K. Kekuewa, J. Tanimoto, K. Kukea-Shultz, A. H. Kawelo, K. Kotubetey, B. Neilson, T. Lee, and R. Toonen. 2020. Collaborative research to inform adaptive comanagement: a framework for the He‘eia National Estuarine Research Reserve. ***Ecology and Society*** 25(4):15. doi: 10.5751/ES-11895-250415 CONTRIBUTION: Collaborating Coauthor.

49. Liu S, Baetge N, Comstock J, Opalk K, Parsons R, Halewood E, English C, Giovannoni S, Bolaños

LM, **Nelson CE**, Vergin K and Carlson CA (2020) Stable Isotope Probing Identifies Bacterioplankton Lineages Capable of Utilizing Dissolved Organic Matter Across a Range of Bioavailability. ***Frontiers in Microbiology*** 11:580397. doi: 10.3389/fmicb.2020.580397 CONTRIBUTION: Collaborating Coauthor. Funding - NSF OCE-1923877

48. Florybeth F. La Valle, Michael B. Kantar, **Craig E. Nelson.** 2020. Coral reef benthic community structure is associated with the spatiotemporal dynamics of submarine groundwater discharge chemistry. ***Limnology and Oceanography*** 66(1):188-200. doi: 10.1002/lno.11596 CONTRIBUTION: Senior Author. Funding - NSF OCE-1923877

47. Kirs, M., V. Kisand, **C. E. Nelson**, T. Dudoit, and P. S. Moravcik. 2020. Distinct bacterial communities in tropical island aquifers. ***PLoS ONE*** 15: e0232265. doi:10.1371/journal.pone.0232265. CONTRIBUTION: Collaborating Coauthor.

46. Winter, K., Lincoln, N., Berkes, F., Alegado, R., Kurashima, N., Frank, K., Pascua, P., Rii, Y., Reppun, F., Knapp, I., McClatchey, W., Ticktin, T., Smith, C., Franklin, E., Oleson, K., Price, M., McManus, M., Donahue, M., Rodgers, K., Bowen, B., **Nelson, C.**, Thomas, B., Leong, J.-A., Madin, E., Rivera, M. A., Falinski, K., Bremer, L., Deenik, J., Gon III, S., Neilson, B., Okano, R., Olegario, A., Nyberg, B., Kawelo, A. H., Kotubetey, K., Kukea-Shultz, J. K. & Toonen, R. 2020. Ecomimicry in Indigenous resource management: optimizing ecosystem services to achieve resource abundance, with examples from Hawai‘i. ***Ecology and Society*** 25(2):26. doi:10.5751/ES-11539-250226. CONTRIBUTION: Collaborating Coauthor.

45. James, A. K., L. Washburn, C. Gotschalk, S. Maritorena, A. Alldredge, **C. E. Nelson**, J. L. Hench, J. J. Leichter, A. S. J. Wyatt, and C. A. Carlson. 2020. An Island Mass Effect Resolved Near Mo’orea, French Polynesia. ***Frontiers in Marine Science*** 7. doi:10.3389/fmars.2020.00016. CONTRIBUTION: Collaborating Coauthor.

*- 2019 -*

44. Quinlan, Z. A.-D., R. Ritson-Williams, B. J. Carroll, C. A. Carlson, and **C. E. Nelson**. 2019. Species-specific differences in the microbiomes and organic exudates of crustose coralline algae influence bacterioplankton communities. ***Frontiers in Microbiology*** 10. doi:10.3389/fmicb.2019.02397. CONTRIBUTION: Senior Author.

43. La Valle FF, Thomas FI, **Nelson CE**. 2019. Macroalgal biomass, growth rates, and diversity are influenced by submarine groundwater discharge and local hydrodynamics in tropical reefs. ***Marine Ecology-Progress Series*** 621:51-67. doi: 10.3354/meps12992 CONTRIBUTION: Senior Author.

42. Wegley Kelly, L., **Nelson, C. E.**, Haas, A. F., Naliboff, D. S., Calhoun, S., Carlson, C. A., Edwards, R. A., Fox, M. D., Hatay, M., Johnson, M. D., Kelly, E. L. A., Lim, Y. W., Macherla, S., Quinlan, Z. A., Silva, G. G. Z., Vermeij, M. J. A., Zgliczynski, B., Sandin, S. A., Smith, J. E. & Rohwer, F. 2019. Diel population and functional synchrony of microbial communities on coral reefs. ***Nature Communications*** **10**: 1691. doi:10.1038/s41467-019-09419-z. CONTRIBUTION: Co-Lead author. *Authors contributed equally.

Press: NSF SOEST University of Hawai‘i Science Daily

41. Möhlenkamp, P.; Beebe, C.K.; McManus, M.A.; Kawelo, A.H.; Kotubetey, K.; Lopez-Guzman, M.; **Nelson, C.E.**; Alegado, R. A. 2019. Kū Hou Kuapā: Cultural Restoration Improves Water Budget and Water Quality Dynamics in He'eia Fishpond. ***Sustainability*** 11: 161. doi: 10.3390/su11010161 CONTRIBUTION: Collaborating Coauthor.

*- 2018 -*

40. James AK, Wegley Kelly L, **Nelson CE**, Wilbanks EG and Carlson CA. 2018. Elevated $pCO_2$ Alters Marine Heterotrophic Bacterial Community Composition and Metabolic Potential in Response to a Pulse of Phytoplankton Organic Matter. ***Environmental Microbiology***. doi: 10.1111/1462-2920.14484 CONTRIBUTION: Collaborating Coauthor.

39. Mathews L., Faithfull C.L., Lenz P.H. and **Nelson C.E.**. 2018. The effects of food stoichiometry and temperature on copepods are mediated by ontogeny. ***Oecologia*** 188: 75-84. doi:10.1007/s00442-018-4183-6. CONTRIBUTION: Senior Author.

38. Silbiger NJ, **Nelson CE**, Remple K, Sevilla JK, Quinlan ZA, Putnam HM, Fox MD, Donahue MJ. 2018. Nutrient pollution disrupts key ecosystem functions on coral reefs. ***Proceedings of the Royal Society B: Biological Sciences*** 285: 20172718. doi:10.1098/rspb.2017.2718 CONTRIBUTION: Secondary Coauthor.

Press: University of Hawai'i ScienceDaily

37. Wear, E. K., E. G. Wilbanks, **C. E. Nelson**, and C. A. Carlson. 2018. Primer selection impacts specific population abundances but not community dynamics in a monthly time-series 16S rRNA gene amplicon analysis of coastal marine bacterioplankton. ***Environmental Microbiology***. doi:10.1111/1462-2920.14091. CONTRIBUTION: Collaborating Coauthor.

36. Quinlan ZA, Remple K, Fox MD, Silbiger NJ, Oliver TA, Putnam HM, Kelly LW, Carlson CA, Donahue MJ and **Nelson CE**. 2018. Fluorescent organic exudates of corals and algae in tropical reefs are compositionally distinct and increase with nutrient enrichment. ***Limnology and Oceanography: Letters*** 3: 331-340. doi:10.1002/lol2.10074. CONTRIBUTION: Senior and Corresponding Author.

35. Kelly, L. W.*, A. F. Haas*, and **C. E. Nelson***. 2018. Ecosystem Microbiology of Coral Reefs: Linking Genomic, Metabolomic, and Biogeochemical Dynamics from Animal Symbioses to Reefscape Processes. ***mSystems*** 3: e00162-17. doi:10.1128/mSystems.00162-17 CONTRIBUTION: Co-Lead and Corresponding Author. *All 3 authors contributed equally.

See also Kelly, L. W. and **C. E. Nelson**. 2018. Invisible engineers: Microbes and the sustainability of coral reef ecosystems. ***Research Features*** 123: 66-69. Both authors contributed equally.

34. Hynson, Nicole A., Kiana L. Frank, Rosanna A. Alegado, Anthony S. Amend, Mohammad Arif, Gordon M. Bennett, Andrea J. Jani, Matthew C.I. Medeiros, Yuriy Mileyko, **Craig E. Nelson**, Nhu H. Nguyen, Olivia D. Nigro, Sladjana Prisic, Sangwoo Shin, Daisuke Takagi; Samuel T. Wilson and Joanne Y. Yew. 2018. Synergy among Microbiota and Their Hosts: Leveraging the Hawaiian Archipelago and Local Collaborative Networks To Address Pressing Questions in Microbiome Research. ***mSystems*** 3: e00159-17. doi:10.1128/mSystems.00159-17. CONTRIBUTION:

Collaborating Coauthor.

*- 2017 -*

33. Petras D, Koester I, Da Silva R, Stephens BM, Haas AF, **Nelson CE**, Kelly LW, Aluwihare LI and Dorrestein PC. 2017. High-Resolution Liquid Chromatography Tandem Mass Spectrometry Enables Large Scale Molecular Characterization of Dissolved Organic Matter. ***Frontiers in Marine Science*** 4:405. doi: 10.3389/fmars.2017.00405 CONTRIBUTION: Collaborating Coauthor.

32. Goldberg, S. J., **C. E. Nelson**, D. A. Viviani, C. N. Shulse, and M. J. Church. 2017. Cascading influence of inorganic nitrogen sources on DOM production, composition, lability and microbial community structure in the open ocean. ***Environmental Microbiology*** 19:9. 3450–3464. doi:10.1111/1462-2920.13825 CONTRIBUTION: Secondary Coauthor and Corresponding Author.

31. Sogin, E. M., H. M. Putnam, **C. E. Nelson**, P. Anderson, and R. D. Gates. 2017. Correspondence of coral holobiont metabolome with symbiotic bacteria, archaea and Symbiodinium communities. ***Environmental Microbiology Reports*** 9: 310–315. doi:10.1111/1758-2229.12541 CONTRIBUTION: Collaborating Coauthor.

*- 2016 -*

30. Page, H.M., S.D. Cooper, S.W. Wiseman, D.M. Bennett, K. Klose, S. Sadro, **C.E. Nelson**, and T. Even. 2016. Comparisons of stable isotope (C, H, N) signatures for revealing organic matter sources and trophic relationships in headwater streams. ***Canadian Journal of Fisheries and Aquatic Sciences*** 74(12): 2110-2121. doi:10.1139/cjfas-2016-0322. CONTRIBUTION: Collaborating Coauthor.

29. Quistad, S. D., Y. W. Lim, G. G. Z. Silva, **C. E. Nelson**, A. F. Haas, L. W. Kelly, R. A. Edwards, and F. L. Rohwer. 2016. Using viromes to predict novel immune proteins in non-model organisms. ***Proceedings of the Royal Society B: Biological Sciences*** 283: 20161200. doi:10.1098/rspb.2016.1200. CONTRIBUTION: Collaborating Coauthor.

28. Haas, A.F., M.F.M. Fairoz, L.W. Kelly, **C.E. Nelson**, Y.W. Lim, B. Knowles, E.A. Dinsdale, R.A. Edwards, S. Giles, M. Hatay, N. Hisakawa, H. Maughan, O. Pantos, T. Roach, S.E. Sanchez, S. Sandin, J.E. Smith and F. Rohwer. Global microbialization of coral reefs. 2016. ***Nature Microbiology*** 16042 doi: 10.1038/nmicrobiol.2016.42. CONTRIBUTION: Collaborating Coauthor.

Press: Nature News & Views NSF UH SDSU Behind the Paper.

*- 2015 -*

27. **Nelson, C.E.,** M.J. Donahue, H. Dulaiova, S.J. Goldberg, F.F. La Valle, K. Lubarsky, J. Miyano, C. Richardson, N.J. Silbiger and F.I.M. Thomas. 2015. Fluorescent dissolved organic matter as a multivariate biogeochemical tracer of submarine groundwater discharge in coral reef ecosystems. ***Marine Chemistry*** 177: 232-43. doi:10.1016/j.marchem.2015.06.026. CONTRIBUTION: Lead author and Corresponding Author.

26. Cooper, S.D., H.M. Page, S.W. Wiseman, K. Klose, D.M. Bennett, T. Even, S. Sadro, **C.E. Nelson**, and T.L. Dudley. 2015. Physicochemical and biological responses of streams to wildfire severity in

riparian zones. ***Freshwater Biology*** 60: 2600-19. doi:10.1111/fwb.12523. CONTRIBUTION: Collaborating Coauthor.

25. Wear, E.K., C.A. Carlson, A.K. James, M.A. Brzezinski, L.A. Windecker and **C.E. Nelson**. 2015. Synchronous shifts in dissolved organic carbon bioavailability and bacterial community responses over the course of an upwelling-driven phytoplankton bloom. ***Limnology & Oceanography*** 60: 657-77. doi:10.1002/lno.10042. CONTRIBUTION: Collaborating Coauthor.

*- 2014 -*

24. Kelly, L.W., G. J. Williams, K.L. Barott, C.A. Carlson, E.A. Dinsdale, R.A. Edwards, A.F. Haas, M. Haynes, Y.W. Lim, T. McDole, **C.E. Nelson**, E. Sala, S.A. Sandin, J.E. Smith, M.J.A. Vermeij, M. Youle and F. Rohwer. 2014. Local genomic adaptation of coral reef-associated microbiomes to gradients of natural variability and anthropogenic stressors. ***Proceedings of the National Academy of Sciences of the United States of America*** 111:10227-32. doi:10.1073/pnas.1403319111. CONTRIBUTION: Collaborating Coauthor.

23. **Nelson, C.E.** and E.K. Wear. 2014. Microbial diversity and the lability of dissolved organic carbon. ***Proceedings of the National Academy of Sciences of the United States of America*** 111:7166-67. doi:10.1073/pnas.1405751111. CONTRIBUTION: Lead author and Corresponding Author.

22. Parsons, R.J., **C.E. Nelson**, C.A. Carlson, C.C. Denman, A.J. Andersson, A.L. Kledzik, K.L. Vergin, S.P. McNally, A.H. Treusch and S.J. Giovannoni. 2014. Marine bacterioplankton community turnover within seasonally hypoxic waters of a sub-tropical sound: Devil's Hole, Bermuda. ***Environmental Microbiology*** 17: 3481–99. doi: 10.1111/1462-2920.12445. CONTRIBUTION: Second Coauthor.

*- 2013 -*

21. **Nelson, C.E.**, C.A. Carlson, C.S. Ewart, E.R. Halewood. 2013. Community differentiation and population enrichment of Sargasso Sea bacterioplankton in the euphotic zone of a mesoscale mode-water eddy. ***Environmental Microbiology*** 16:871-87. doi: 10.1111/1462-2920.12241. CONTRIBUTION: Lead author and Corresponding Author.

20. Leichter, J.J., A.L. Alldredge, G. Bernardi, A.J. Brooks, C.A. Carlson, R.C. Carpenter, P.J. Edmunds, M.R. Fewings, K.M. Hanson, J.L. Hench, S.L. Holbrook, **C.E. Nelson**, R.J. Schmitt, R.J. Toonan, L. Washburn, and A.S.J. Wyatt. 2013. Biological and physical interactions on a tropical island coral reef: Transport and retention processes on Moorea, French Polynesia. ***Oceanography*** 26:52–63. doi: 10.5670/oceanog.2013.45. CONTRIBUTION: Collaborating Coauthor.

----------*BEGINNING OF AFFILIATION WITH UNIVERSITY OF HAWAI'I*----------

19. Haas, A.F., **C.E. Nelson**, F. Rohwer, L.W. Kelly, S.D. Quistad, C.A. Carlson, J.J. Leichter, M. Hatay, J.E. Smith. 2013. Influence of coral and algal exudates on microbially mediated reef metabolism. ***PeerJ*** **1**:e108. doi: 10.7717/peerj.108. CONTRIBUTION: Secondary Coauthor.

18. Smith, J.E., N.N. Price, **C.E. Nelson**, A.F. Haas. 2013. Coupled changes in oxygen concentration and pH caused by metabolism of benthic coral reef organisms. ***Marine Biology*** **160**:2437-47. doi: 10.1007/s00227-013-2239-z. CONTRIBUTION: Collaborating Coauthor.

**17. Nelson, C.E.**, S.J. Goldberg, L.W. Kelly, A.F. Haas, J.E. Smith, F. Rohwer, and C.A. Carlson. 2013. Coral and macroalgal exudates vary in neutral sugar composition and differentially enrich reef bacterioplankton lineages. ***The ISME Journal*** **7**: 962-79. doi: 10.1038/ismej.2012.161. CONTRIBUTION: Lead author and Corresponding Author.

**16. Nelson, C.E.***, D.M. Bennett*, and B.J. Cardinale. 2013. Consistency and sensitivity of stream periphyton community structural and functional responses to nutrient enrichment. ***Ecological Applications*** **23**: 159–73. doi: 10.1890/12-0295.1 *These authors contributed equivalently. CONTRIBUTION: Lead author and Corresponding Author.

*- 2012-*

15. Paver, S.F., **C.E. Nelson**, and A.D. Kent. 2012. Temporal succession of putative glycolate-utilizing bacterioplankton tracks changes in dissolved organic matter in a high-elevation lake. ***FEMS Microbiology Ecology*** **83:** 541-51. doi: 10.1111/1574-6941.12012. CONTRIBUTION: Secondary Coauthor.

**14. Nelson, C.E.** and C.A. Carlson. 2012. Tracking differential incorporation of dissolved organic carbon types among diverse lineages of Sargasso Sea bacterioplankton. ***Environmental Microbiology*** **14:** 1500-16. doi: 10.1111/j.1462-2920.2012.02738.x. CONTRIBUTION: Lead author and Corresponding Author.

13. Sadro, S., **C.E. Nelson**, and J.M. Melack. 2012. The influence of landscape position and catchment characteristics on aquatic biogeochemistry in high-elevation lake chains. ***Ecosystems*** **15:** 363-86. doi:10.1007/s10021-011-9515-x. CONTRIBUTION: Secondary Coauthor.

*- 2011 -*

12. Haas, A.F, **C.E. Nelson**, L.W. Kelly, C.A. Carlson, F. Rohwer, J.J. Leichter, A. Wyatt, and J.E. Smith. 2011. Effects of coral reef benthic primary producers on dissolved organic carbon and microbial activity. ***PLoS ONE*** **6**: e27973. doi:10.1371/journal.pone.0027973. CONTRIBUTION: Secondary Coauthor.

11. McCliment, E.A., **C.E. Nelson**, C.A. Carlson, A.L. Alldredge, J. Witting, and L.A. Amaral-Zettler. 2011. An all-taxon microbial inventory of the Moorea coral reef ecosystem. ***The ISME Journal*** **6**: 309-19. doi:10.1038/ismej.2011.108. CONTRIBUTION: Secondary Coauthor.

**10. Nelson, C.E.**, A.L. Alldredge, E.A. McCliment, L.A. Amaral-Zettler, and C.A. Carlson. 2011. Depleted dissolved organic carbon and distinct Bacterial communities in the water column of a rapid-flushing coral reef ecosystem. ***The ISME Journal*** **5:** 1374–87. doi:10.1038/ismej.2011.12 **.** CONTRIBUTION: Lead author and Corresponding Author.

[Faculty of 1000 selection by F. Azam: http://f1000.com/13271996]

**09. Nelson, C.E.** and C.A. Carlson. 2011. Differential response of high-elevation planktonic bacterial community structure and metabolism to experimental nutrient enrichment. ***PLoS ONE*** **6**: e18320. doi:10.1371/journal.pone.0018320. CONTRIBUTION: Lead author and Corresponding Author.

08. Sadro, S., **C.E. Nelson**, and J.M. Melack. 2011. Linking diel patterns in community respiration to bacterioplankton in an oligotrophic high-elevation lake. ***Limnology and Oceanography*** **56**: 540-50. doi: 10.4319/lo.2011.56.2.0540. CONTRIBUTION: Secondary Coauthor.

07. J.M. Melack, A.C. Finzi, D. Siegel, S. MacIntyre, **C.E. Nelson**, A.K. Aufdenkampe, and M.L. Pace. 2011. Improving biogeochemical knowledge through technological innovation. ***Frontiers in Ecology and the Environment.*** **9**: 37–43. doi:10.1890/100004. CONTRIBUTION: Collaborating Coauthor.

*- 2010 and prior -*

06. Huang, Y.J., **C.E. Nelson**, 21 others, and S.V. Lynch. 2010. Airway microbiota and bronchial hyperresponsiveness in patients with sub-optimally controlled asthma. ***The Journal of Allergy and Clinical Immunology*** **127**: 372-81. doi:10.1016/j.jaci.2010.10.048 . CONTRIBUTION: Secondary Coauthor.

[Faculty of 1000 selection by E. Goleva: http://f1000.com/8622960]

05. D.E. Hunt*, E. Ortega-Retuerta*, **C.E. Nelson***. 2010. Connections between bacteria and organic matter in aquatic ecosystems: Linking microscale ecology to global carbon cycling, p. 110-28. In P.F. Kemp [ed.], ***Eco-DAS VIII Symposium Proceedings.*** ASLO. CONTRIBUTION: Lead author. doi:10.4319/ecodas.2010.978-0-9845591-1-4.110 *All 3 authors contributed equivalently.

**04. Nelson, C.E.**, S. Sadro, and J.M. Melack. 2009. Contrasting the influences of stream inputs and landscape position on bacterioplankton community structure and dissolved organic matter composition in high-elevation lake chains. ***Limnology and Oceanography*** **54**: 1292-1305. doi:10.4319/lo.2009.54.4.1292. CONTRIBUTION: Lead author and Corresponding Author.

03. Cardinale, B.J., D.M. Bennett, **C.E. Nelson**, and K. Gross. 2009. Does productivity drive diversity or vice versa? A test of the multivariate productivity-diversity hypothesis in streams. ***Ecology*** **90:** 1227-41. doi:10.1890/08-1038.1 . CONTRIBUTION: Collaborating Coauthor.

[Faculty of 1000 selection by J. Snaddon and A. Hector: http://f1000.com/1161622]

**02. Nelson, C.E.** 2009. Phenology of high-elevation pelagic bacteria: the roles of meteorologic variability, catchment inputs, and thermal stratification in structuring communities. ***The ISME Journal*** **3**: 13–30. doi:10.1038/ismej.2008.81. CONTRIBUTION: Lead and Corresponding Author.

**01. Nelson, C.E.** and C.A. Carlson. 2005. A non-radioactive assay of bacterial productivity optimized for oligotrophic pelagic environments. ***Limnology and Oceanography: Methods*** **3**: 211–20. doi:10.4319/lom.2005.3.211. CONTRIBUTION: Lead author and Corresponding Author.

*- Submission pending; draft available on request -*

Biogeochemical differentiation of coral reef habitats from the surrounding ocean. **Craig E. Nelson**, James L. Hench, Craig A. Carlson, Kristina Remple, Anna K. James, Keith Seydel, Andrew J. Brooks, Libe Washburn, and Alice L. Alldredge. (in prep for Nature Communications). CONTRIBUTION:

Lead author and Corresponding Author.

Nutrient-rich submarine groundwater discharge increases algal carbon uptake in a tropical reef ecosystem. La Valle FF, Thomas FIM, **Nelson CE**. Rejected by ***Limnology and Oceanography: Letters***. CONTRIBUTION: Senior Author.

Calhoun SK, Haas AF, Takeshita Y, Johnson MD, Fox MD, Kelly ELA, Mueller B, Vermeij MJA, Kelly LW, Nelson CE, Price NN, Roach TNF, Rohwer FL, Smith JE. 2017. Exploring the occurrence of and explanations for nighttime spikes in dissolved oxygen across coral reef environments. PeerJ Preprints 5:e2935v2. CONTRIBUTION: Collaborating Coauthor.

**MENTORING (* indicates financial support provided from competitive grants):**

**Graduate Student Committee Chair**:

| | |
|---|---|
| Graduate Chair for PhD Candidate Kristina Remple (UH Oceanography)* | 2014- |
| Graduate Chair for Dr. Florybeth La Valle (UH Marine Biology)* | 2017-2018 |
| Graduate Chair for PhD Student Wesley Sparagon (UH Marine Biology)* | 2017- |
| Graduate Chair for MS Student Jessica Bullington (UH Oceanography)* | 2018- |
| Graduate Capstone Advisor for MS Student Katia Chikasuye (UH NREM) | 2018-2019 |
| Graduate Chair for PhD Student Shayle Matsuda (UH Marine Biology)* | 2019- |
| Graduate Co-Chair for MS Student Derek Esibill (UH NREM) | 2019-2020 |
| Graduate Chair for MS Student Nicolas Vanderzyl (UH Oceanography) | 2020- |

**Graduate Student Committee Member**:

| | |
|---|---|
| Graduate Committee for MS Student Elizabeth Monaghan (UH Marine Bio.) | 2018-2020 |
| Graduate Committee for MS Student Aurelia Gonzalez (UH NREM) | 2019-2020 |
| Graduate Committee for PhD Student Oscar Ramfelt (UH Oceanography) | 2019- |
| Graduate Committee for PhD Student Kristin Poff (UH Marine Bio.) | 2018- |
| Graduate Committee for PhD Student Hoaka Thomas (UH Marine Bio.) | 2018- |
| Graduate Committee for PhD Student Mariana Rocha De Souza (UH Marine Bio.) | 2018- |
| Graduate Committee for MS Student Clarisse Sullivan (UH Oceanography) | 2018- |
| Graduate Committee for PhD Candidate Sarah Tucker (UH Marine Bio.) | 2017- |
| Graduate Committee for MS Student Amy Markel (UH NREM) | 2017-2019 |
| Graduate Committee for PhD Candidate Eric Tong (UH Oceanography) | 2017- |
| Graduate Committee for MS Student Charles ‘Aka’ Beebe (UH Oceanogr.)* | 2016- |
| Graduate Committee for PhD Candidate Alice Vislova (UH Oceanogr.) | 2016- |
| Graduate Committee for MS Graduate Paula Moehlenkamp (UH Oceanogr.) | 2016-2018 |
| Graduate Committee for PhD Candidate Ariana Huffmyer (UH Marine Bio.) | 2015-2020 |
| Graduate Committee for PhD Candidate Molly Timmers (UH Marine Bio.) | 2015-2020 |
| Graduate Research Assistantship for Emilia (Maggie) Sogin, PhD (UH Zoology)* | 2015 |
| Graduate Committee for PhD Candidate Carla Gimpel (UH Marine Bio.) | 2014- |
| Graduate Committee for PhD Candidate Clara Loureiro (Univ. Azores) | 2014- |
| Graduate Committee for Dr. John Casey (UH Oceanography) | 2014-2017 |
| Graduate Committee for Dr. Lydia Baker (UH Oceanography) | 2013-2017 |
| Graduate Committee for Dr. Donn Viviani (UH Oceanography) | 2013-2016 |
| Graduate Committee for MS Graduate Anya Brown (CSUN Marine Biology) | 2012-2013 |

**Undergraduate Student Mentoring:**

| | |
|---|---|
| Global Environmental Science Steering Committee (Undergraduate Major) | 2018- |
| GES Undergraduate Advisor (8-12 students annually, meeting every term) | 2014- |
| Thesis Mentor: Rayna McClintock (UH Sophomore Global Env. Science) | 2019- |
| Thesis Mentor: Brenna Carroll (UH BS Global Environmental Science)* | 2016-2019 |
| Thesis Mentor: Lauren Mathews (UH BS Global Environmental Science)* | 2015-2016 |
| Thesis Mentor: Zachary Quinlan (UH BA Marine Biology)* | 2015-2017 |
| C-MORE Scholar Mentor: Leah Kamōʻīokalani Sausen (UH Anthropology) | 2014-2015 |

**Postdoctoral Research Associates Employed:**

| | |
|---|---|
| Dr. Stuart Goldberg (CMORE/PICSC Postdoctoral Trainee) | 2015 |
| Dr. Francois Seneca (UH Manoa PBRC - Kewalo Marine Lab, Junior Researcher) | 2016 |

**High School Student Mentored:** Pablo Furukawa (Senior, Kailua HS, Hawai‘i) 2015-2016

**TEACHING:**

**Courses taught as Instructor of Record:**

| Course Name | Institution | Code | Units | Level | Enrolled | Term | Contribution |
|---|---|---|---|---|---|---|---|
| Biogeochemical Systems | UHM | OCN 401 | 3 | Upper Div UG | 20 | Fall 2018-20 | 15-33% |
| Graduate Marine Biology | UHM | MBIO 604 | 3 | Graduate | 12 | Spring 2019 | 100% |
| Topics in Biological Oceanography | UHM | OCN 750 | 1-3 | Graduate | 4 | annually 2016-19 | 50-100% |
| Coastal Ecosystem Ecology | UHM | OCN 457 | 3 | Upper Div UG | 10 | Spring 2018 | 100% |
| Aquatic Pollution | UHM | OCN 320 | 3 | Upper Div UG | 25 | Spring 2017 | 100% |
| Coastal Ecosystem Ecology | UHM | OCN 457 | 3 | Upper Div UG | 7 | Spring 2016 | 100% |
| Microbial Oceanography | UHM | N/A | 4wks | Graduate | 15 | Summer 2015 | 20% |
| Coastal Ecosystem Ecology | UHM | OCN 457 | 3 | Upper Div UG | 10 | Spring 2015 | 100% |
| Oceanography Graduate Seminar | UHM | OCN 780 | 1 | Graduate | 5 | Fall 2014 | 100% |
| Microbial Oceanography | UHM | N/A | 4wks | Graduate | 15 | Summer 2014 | 10% |
| Microbial Oceanography | BIOS | N/A | 3wks | Graduate | 15 | Summer 2013 | 30% |
| Microbial Oceanography | BIOS | N/A | 3wks | Graduate | 15 | Summer 2012 | 30% |
| Microbial Oceanography | BIOS | N/A | 3wks | Graduate | 15 | Summer 2011 | 30% |
| General Biology | UCSB | EEMB 3 | 3 | Lower Div UG | 120 | Fall 2010 | 40% |
| Microbial Oceanography | BIOS | N/A | 3wks | Graduate | 15 | Summer 2010 | 30% |
| General Biology | UCSB | EEMB 3 | 3 | Lower Div UG | 120 | Fall 2009 | 40% |
| Microbial Oceanography | BIOS | N/A | 3wks | Graduate | 15 | Summer 2009 | 30% |
| Invertebrate Zoology | UCSB | EEMB 116 | 4 | Upper Div UG | 80 | Spring 2007 | 50% |

**Additional Instructional Mentoring and Research Advising Courses Taught**

Oceanography 399 (Fall 2015, Fall 2017)
Oceanography 499 (Spring 2015, Fall 2015, Fall 2017, Spring 2018)
Oceanography 699 (Every semester 2015-2018)
Marine Biology 699 (Fall 2017, Spring 2018)

**Guest Lecturing**

Apr 2015 Guest Lecturer: Marine Biology 691L
Apr 2015 Guest Lecturer: Botany 662 Graduate Course on Bioinformatics (A. Amend)
Oct 2015 Guest Lecturer: GG711 Groundwater Hydrology Graduate Seminar
Mar 2016 Guest Lecturer: Marine Biology 691L
Sept 2016 Guest Lecturer: Marine Biology 404 (Microbial Ecology of Coral Reefs)
Sept 2016 Guest Lecturer: Architecture 100 (Ecosystem Science of the Built Environment)
Oct 2016 Guest Lecturer: Planning 620 (Planning for Water Quality of Coastal Systems)
Oct 2016 Guest Lecturer: Civil Engineering 691 (Organic Geochemistry of Coral Reefs)
Feb 2017 Guest Lecturer: Oceanography 100
Oct 2017 Guest Lecturer: Architecture 100 (Ecosystem Science of the Built Environment)
Nov 2017 Guest Lecturer: Oceanography 626 Carbon Cycle in Microplankton Ecology
Nov 2017 Guest Lecturer: Geology & Geophysics 711 Groundwater Hydrology Grad Seminar
Jan 2018 Guest Lecturer: Oceanography 100
Apr 2018 Guest Lecturer: Marine Biology 604
Apr 2018 Guest Lecturer: NREM 301 Natural Resource Management “Ridge to Reef”
Nov 2018 Guest Lecturer: Oceanography 626 Carbon Cycle in Microplankton Ecology
Feb 2019 Guest Lecturer: OCN 320 Aquatic Pollution “Aquatic Pathogens”
Mar 2019 Guest Lecturer: Botany 662 Graduate Course on Bioinformatics (A. Amend)

**SERVICE:**

**Departmental and University Service (UH)**

Aug 2013 Sea Grant Academy (2 days)
Oct 2013 Contributor: Sea Grant Ka Pili Kai Magazine
Oct 2013 Professional Development Training Program (C-MORE) - Invited Presenter
Nov 2013 Departmental Seminar: UH Oceanography and HIMB
Dec 2013 Course Development-OCN457 Ridge to Reef: Coastal Ecosystem Biogeochemistry
Nov 2013 SOEST Open House - Presenter
Dec 2013 Coordinating meeting GES MS degree.
Apr 2014 GEP Program coordination meeting
Jun 2014 Coordinating meeting to redesign core Marine Biology curriculum
Fall 2014 Marine Biology Curriculum Planning Committee
Dec 2014 Sea Grant Programmatic Site Review - Presenter and Participant
Jan 2015 C-MORE Professional Development Presentation - Teaching Techniques
Spr 2015 CBOGS Invited Speaker (Graduate Student Symposium for Dept. Oceanography)
Sept 2015 C-MORE Professional Development Presentation - Proposal Writing
Nov 2015 UROP Reviewer (Undergraduate research proposals at UH)
Mar 2016 Data Analysis Workshop (10 participants, undergrad and grad students)
Mar 2016 UROP Reviewer (Undergraduate research proposals at UH)
Apr 2016 Guest Segment Manager: Oceanography 100 (Culturing and Sequencing Bacteria)
Apr 2016 Departmental Seminar: UHM Water Resources Research Center
Oct 2016 Guest Panelist for Eco-DAS: Alternative Careers in the Aquatic Sciences
Oct 2016 Guest Panelist for Eco-DAS: New Faculty Experiences
Nov 2016 Undergraduate Research Opportunities Council and Reviewer
Apr 2017 Undergraduate Research Opportunities Council and Reviewer
Apr 2017 Department Seminar: UHM Department Oceanography
Oct 2017 SOEST Open House - Exhibit leader (Na Kilo Honua o Heʻeia) & CMORE
Oct 2017 Marine Biology Administrator Hiring Committee
Nov 2017 Undergraduate Research Opportunities Council and Reviewer
Jan 2018 Departmental Seminar Speaker: Natural Resources and Environmental Management

**Community Participatory Outreach**

1998-2014 Aquatic Science Teacher, 2 week/yr, Cazadero Family Camp, Cazadero, CA
2006-2009 Secondary school outreach (science fair judge, watershed education, K-12 mentor)
2010 Teacher training lecturer (Santa Barbara LTER Teacher Training program)
Aug 2013 Sea Grant Green Building Community Design Symposium (2 days)
Sept 2013 Ocean 'Omics Symposium (EarthCubed) at USC/Wrigley Marine Lab Catalina
Dec 2013 Symposium Organizer: SWAC Symposium at C-MORE Moore Conference Center
Mar 2014 West Maui Ridge to Reef NOAA Research Conference Participant (2 days)
Mar 2014 Big Island Water Conference, UH Hilo (1 day)
Apr 2014 ASCENT Hawaiʻi Sustainability Conference (2 days)
Jun 2014 QAPP Planning Meeting for Maui Watershed Partnership and TNC
Oct 2014 Eco-DAS 2014 Professional Development Mentor (Panel service and Lecture)
Oct 2014 Hawaiʻi Department of Health advisory planning meeting - Windward Oʻahu

Apr 2015 NOAA/CRCP/NFWF Research Planning Meeting for Coral Reefs in Hawai'i
Sep 2015 He'eia Science-to-Management Symposium, Windward Comm. Coll, Hawai'i
Mar 2016 Hawai'i Stream Conservation Workshop, East-West Center, Honolulu
May 2016 He'eia Science Night, Presentation on Water Quality (Oceanography course)
Feb 2017 Wastewater Town Hall: Flushing our Future (organizer and moderator)
Mar 2017 West Maui Ridge to Reef NOAA Research Conference Participant
May 2017 Imi Wai Ola Student Science Conference (breakout session leader)
May 2017 Student project group mentoring visit - 'Iolani School Biology Department
June 2017 Fore-C: Ecological Forecasting of Coral Disease in the Pacific planning meeting
Mar 2018 Maunalua Bay Expert Science Workshop - Malama Maunalua
June 2018 Lead Teacher Training 1 day Workshop for SMART Ala Wai - Water Quality Sampling
Aug 2018 Kulana Noi'i - Training in Community Researcher Partnerships Workshop

**National / International Service**

Invited Speaker: Scripps Institution of Oceanography, Geosciences Seminar May 2018
Invited Speaker: San Diego State University, Coral Club Seminar May 2018
Invited Speaker: Oregon State Univ, Ocean Ecology/Biogeochemistry Sem Mar 2018
Conference Session Organizer: ASLO Ocean Sciences Meeting Portland Feb 2018
Town Hall Organizer: ASLO Aquatic Sciences Meeting, Honolulu Feb 2017
Conference Session Organizer: International Coral Reef Symp. Honolulu June 2016
Conference Session Organizer: ASLO Ocean Sciences Meeting Honolulu Feb 2014
Journal Issue Editor: Marine Chemistry - "Marine Organic Geochemistry" 2014-2015
http://www.sciencedirect.com/science/journal/03044203/177/part/P2
Journal Section Editor: PeerJ 2017-present
Journal Editorial Board: The ISME Journal (Impact Factor 9.6) 2013-present
Journal Editorial Board: Environmental Microbiology (Impact Factor 6.2) 2016-present
NSF Grant Reviewer: OCE-PRFP, OCE-BO, OCE-Coastal SEES, OCE-CAREER 2014-present
Grant Reviewer for International Scientific Agencies: Netherlands (2014-16), Czech Republic (2013), Austria (2015), Israel Binational (2015-17)
Invited Peer Reviewer (>100) for 20+ international scientific journals 2005-present
*PNAS, Proceedings of the Royal Society B, The ISME Journal, Environmental Microbiology, Molecular Ecology, Scientific Reports, Biogeochemistry, Limnology and Oceanography, Marine Ecology-Progress Series, Biogeosciences, Journal of Experimental Marine Biology and Ecology, Microbial Ecology, Aquatic Microbial Ecology, Geochimica et Cosmochimica Acta, Fundamental and Applied Limnology, Frontiers in Aquatic Microbiology, Frontiers in Marine Science, Water Research, Hydrobiologia, African Journal of Microbiology, Bulletin of Marine Science, River Research and Applications, Central European Journal of Biology, Environmental Monitoring and Assessment, Science of the Total Environment, Marine Chemistry, PeerJ.*

**Professional Society Associations**

ASLO – Association for the Sciences of Limnology and Oceanography
ISME – International Society for Microbial Ecology
ISRS - International Society for Reef Studies

**Research Cruises**:

UNOLS Deployment R/V Kilo Moana 16-14 to Tahiti/Mo'orea; Jim Hench Chief Sci (Duke)
UNOLS Deployment R/V Kilo Moana 10-17 June 2015 to Station ALOHA; Matt Church Chief Sci (UH)

**RESEARCH GRANTS**

Current research support

Project Title: *Collaborative Research: Characterizing microbial transformation of marine DOM at the molecular level using untargeted metabolomics*
PI: Craig Nelson
Co-PI: Linda Wegley Kelly, Lihini Aluwihare, Pieter Dorrestein (SIO/UCSD)
Funding Agency: National Science Foundation: GEO-OCE-Chemical Oceanography
Total Award Amount: $272,144 to UH : 09/01/2020 to 08/31/2023

Project Title: *Collaborative Research: Diel dynamics of dissolved organic matter production and remineralization as a driver of coral reef nutrient recycling*
PI: Craig Nelson
Co-PI: Linda Wegley Kelly
Funding Agency: National Science Foundation: GEO-OCE-Biological Oceanography
Total Award Amount: $199,048 to UH: 07/01/2020 to 06/30/2023

Project Title: *Differentiating treated and untreated wastewater contamination in a tropical coastal community using microbial community genomics*
Funding Agency: UH Sea Grant
PI: Craig Nelson (UH Manoa)
Co-PIs: Tracy Wiegner (UH Hilo)
Total Award Amount: $46,664; 02/01/2020 - 12/31/2022

Project Title: *Collaborative Research: The Influence of Sponge Holobiont Metabolism on Coral Reef Dissolved Organic Matter and Reef Microorganisms*
Funding Agency: National Science Foundation (via Appalachian State University)
PI: Craig Nelson (UH Manoa)
Total Award Amount: $13,143
Total Award Period Covered: 08/15/2019 to 07/31/2022

Project Title: *KRuMBS: The Kyphosid Ruminant Microbial Biodigester of Seaweeds*
Funding Agency: DOE (ARPA-E)
PI: Neil Sims, Ocean Era LLC (Kampachi Farms, LLC)
Co-PIs: Craig Nelson (UH), Eric Allen and Pieter Dorrestein (UCSD), Linda Kelly (SDSU), Lieve Laurens (NREL), Steven Singer (LBNL).
Total Award Amount: $265,171 (to UH, with Nelson as sole PI)

Project Title: *Collaborative Research: RUI: Defining the biogeochemical context and ecological impacts of submarine groundwater discharge on coral reefs*
Funding Agency: National Science Foundation: GEO-OCE-Biological Oceanography
PI: Nyssa Silbiger (CSUN)
Co-PIs: Megan Donahue, Craig Nelson (UH)
Total Award Amount: $398,920 (to UH): 10/01/2019 to 9/30/2022

Project Title: *Establishing a Hawaiian Watershed as a Model Microbiome Mesocosm*
Funding Agency: W. M. Keck Foundation (Phase II)
PI: Margaret McFall-Ngai (UH)
Co-PIs: Anthony Amend, Nicole Hynson, Camilo Mora, Craig Nelson, Joanne Yew (UH)
Total Award Amount: $1,000,000 (Effort equally split among 5 Co-PIs)

Past research support

Project Title: *Enabling real-time predictive modeling of microbial pathogen risk along the Honolulu shoreline*
Funding Agency: UH Sea Grant
PI: Craig Nelson (UH)
Co-PIs: Anna Neuheimer, Grieg Steward, Margaret McManus (UH)
Total Award Amount: $89,930; 02/01/2018 - 12/31/2020 (Effort equally split among 4 Co-PIs)

Project Title: *Our Project In Hawaii's Intertidal: Examining Change over Time*
Funding Agency: UH Sea Grant
PI: Joanna Philippoff (UH)
Co-PIs: Craig Nelson, Heather Spalding (UH)
Total Award Amount: $89,930; 02/01/2018 - 01/31/2020 (Philippoff primary effort)

Project Title: *Dissolved organic matter feedbacks in coral reef resilience: The genomic & geochemical basis for microbial modulation of algal phase shifts*
Funding Agency: NSF (GEO-OCE: Biological Oceanography)
PI: Craig Nelson (UH)
Co-PIs: Craig Carlson (UCSB), Linda Kelly and Forest Rohwer (SDSU)
Total Award Amount: $382,869 (UH Portion), 01/01/16 - 11/30/20 (Nelson sole UH PI)

Project Title: *Strategic Monitoring And Resilience Training in the Ala Wai Watershed (SMART Ala Wai)*
Funding Agency: Office of the Vice Chancellor for Research (OVCR), U of Hawai‘i at Mānoa (UH)
PI: Brian Glazer (UH)
Co-PIs: 20, including Nelson (UH)
Total Award Amount: $600,000 11/2017 - 6/2019 (Nelson proportion ~ 10%)

Project Title: *Microbiomes of Hawaiian ahupua‘a (ridge-to-reef) watersheds: Data acquisition and mathematical analysis to discover the basis of sustainability across vital Hawaiian landscapes*
Funding Agency: Office of the Vice Chancellor for Research (OVCR), U of Hawai‘i at Mānoa (UH)
PI: Margaret McFall-Ngai (UH)
Co-PIs: 19, including Nelson (UH)
Total Award Amount: $700,000; 11/2017 - 6/2019 (Nelson proportion ~ 10%)

Project Title: *Collaborative investigation of hydraulic and geochemical connectivity between wastewaters and land-use and the oceanic waters of Kāne‘ohe Bay, O‘ahu*
Funding Agency: UH Sea Grant
PI: Craig Glenn (UH)
Co-PIs:Aly El-Kadi, Henrietta Dulai, Celia Smith, Craig Nelson (UH)
Award Amount and Period: $76,000; 3/1/2016-2/28/2018 (Glenn primary effort)

Project Title: *Source tracking coastal groundwater and runoff contamination with microbial genomics and dissolved organic fluorometry*
Funding Agency: UH Sea Grant
PI: Craig Nelson (UH)
Co-PIs: Craig Glenn, Henrietta Dulai (UH)
Award Amount and Period: $76,000; 3/1/2016-2/28/2018 (Nelson primary effort)

Project Title: *Setting Nutrient Thresholds Using Coral and Microbial Genomics*
Funding Agency: National Fish and Wildlife Foundation
PI: Craig Nelson (UH)
Award Amount and Period: $91,000; 01/01/2015 - 12/31/2016 (Nelson sole UH PI)

Project Title: *Microbial Source Tracking in the Lahontan Region*
Funding Agency: California State Water Resources Control Board – Lahontan District
PI: Craig Nelson (UH)
Co-PI: Roland Knapp (UCSB)
Award Amount and Period: $157,144 (UH Portion); 7/15/2014 - 2/28/2016 (Nelson sole UH PI)

Project Title: *Assessment of bacterial water quality in the Lahontan Region: A study to provide data on bacterial indicator concentrations and sources of bacteria in surface waters.*
Funding Agency: California State Water Resources Control Board – Lahontan District
PI: Craig Nelson (UH)
Co-PI: Roland Knapp (UCSB)
Award Amount and Period: $130,000; 2012-2015 (Nelson sole UH PI)

Project Title: *Grazing Management Practice Implementation and Assessment in One or More Targeted Watersheds in the Lahontan Region*
Funding Agency: Sierra Business Council – Subcontract from State Water Board
PI: Craig Nelson (UCSB)
Co-PI: Roland Knapp (UCSB)
Award Amount and Period: $56,000; 2012-2014 (Effort split equally among 2 Co-PIs)

Project Title: *E. coli water quality assessment for the Eastern Sierra area of the Lahontan Region for development of a Lahontan Basin Plan E. coli water quality objective.*
Funding Agency: California State Water Resources Control Board – Lahontan District
PI: Craig Nelson (UCSB)
Co-PI: Roland Knapp (UCSB)
Award Amount and Period: $40,000; 2012-2014 (Effort split equally among 2 Co-PIs)

Project Title: *Linking successional dynamics of bacterioplankton communities to biogeochemical processes at the landscape scale*
Funding Agency: NSF (BIO-DDIG)
PI:Craig Nelson (UCSB)
Award Amount and Period: $9,000; 2007-2009 (Nelson sole UCSB PI)

Project Title: *Nutrient deposition and alteration of food web structure in high Sierran lakes: response by microbial communities*
Funding Agency: University of California Water Resources Center
PI: Craig Nelson (UCSB)
Co-PIs: Carlson, Melack (UCSB)
Award Amount and Period: $58,000; 2004-2007 (Nelson primary effort)

<u>Unfunded proposal submissions (Since 1 Aug 2013 start date at UH)</u>

Project Title: Collaborative Research: Developing untargeted molecular networking as a tool to characterize widespread transformations of marine dissolved organic matter
Funding Agency: National Science Foundation: GEO-OCE-Chemical Oceanography
PI: Linda Kelly (SDSU)
Co-PIs: Lihini Aluwihare (SIO), Craig Nelson (UH)
Total Award Amount: $321,555 (to UH): 10/01/2019 to 9/30/2022

Project Title: *Collaborative Research: RUI: Submarine groundwater discharge as a key factor determining coral reef resilience*
Funding Agency: NSF (GEO-OCE: Biological Oceanography)
PIs: Nyssa Silbiger (CSUN), Craig Nelson and Megan Donahue (UH)

Total Award Amount: $375,801 (UH Portion); 8/1/2018 - 7/31/2021

Project Title: *Controls on lake carbon flows: disentangling effects of landscape-level variation in inputs, microbial recycling, and introduced predators*
Funding Agency: NSF (BIO-DEB: Ecosystem Studies)
PI: Craig Nelson (UH)
Co-PIs: Steven Sadro (UCD), Jonah Piovia-Scott (Western Washington Univ), Jim Sickman (UCR)
Total Award Amount: $340,874 (UH Portion); 05/01/2018 - 04/30/2021

Project Title: *Do algae kill corals with sugars? The role of dissolved organic compounds released by algae in the decline of coral reefs*
Funding Agency: Netherlands Organization for Scientific Research
PI and Co-PIs: Ben Mueller (CARMABI), Craig Nelson (UH), Mark Vermeij (UvA)
Total Award Amount: $150,000

Project Title: *Coastal SEES Collaborative Research: Linking microbial ecology, coral reef health and community values to improve wastewater management decisions*
Funding Agency: NSF (Coastal SEES: GEO-OCE)
PI and Co-PIs: Craig Nelson, Daniele Spirandelli and Kirsten Oleson (UH Manoa).
Total Award Amount: $958,288, 07/01/16 - 06/31/21

Project Title: *Dimensions: Beyond the 1%: Integrating functional and phylogenetic perspectives on the processes generating and structuring coral reef metazoan diversity*
Funding Agency: NSF (Dimensions: BIO-DEB/GEO-OCE)
PI and Co-PIs: Rob Toonen and Craig Nelson (UH), Tom Oliver and Rusty Brainard (NOAA)
Total Award Amount: $1,518,723, 01/01/16 - 12/31/20

Project Title: *Coral Microbiome Resilience to Macroalgal Exudates and Thermal Stressors*
Funding Agency: NSF (GEO-OCE; Biological Oceanography)
PI and Co-PIs: Tom Oliver, Craig Nelson, Ruth Gates (UH)
Award Amount and Period: $870,924; 1/1/2015 - 12/31/2017

Project Title: *PhRAME: Phylogenetic Resolution of ALOHA Microbial Ecotypes*
Funding Agency: Simons Foundation: Simons Collaboration on Ocean Processes and Ecology
PI: Craig Nelson
Award Amount and Period: $479,725; 10/1/2014 - 9/30/2017

Project Title: *Recovery of microbial and biogeochemical processes impacted by the spread of non-native invasive marine algae in Hawaiian coral reefs*
Funding Agency: DoD Strategic Environmental Research and Development Program
PI and Co-PIs: Craig Nelson (UH), Jennifer Smith (SIO), Forest Rohwer (SDSU), Craig Carlson (UCSB)
Award Amount and Period: $1,644,630; 3/1/2014 - 1/31/2018

Project Title: *Coral Microbiome Resilience to Macroalgal Exudates and Thermal Stressors*
Funding Agency: NSF (GEO-OCE; Biological Oceanography)
PI and Co-PIs: Tom Oliver, Craig Nelson, Ruth Gates (UH)
Award Amount and Period: $614,324; 1/1/2014 - 12/31/2016

Project Title: *Putting microbial genomics to work in the assessment of coral reef ecosystem function*
Funding Agency: Sloan Foundation Research Fellows in Ocean Sciences
PI: Craig Nelson
Award Amount and Period: $50,000; 6/1/2014 - 5/31/2016

Project Title: *Do symbiotic bacterial communities affect disease resistance? Linking causes of variation in the amphibian skin microbiome with consequences for disease*
Funding Agency: NSF (BIO-IOS; Symbiosis Defense and Self-Recognition)
PI and Co-PIs: Andrea Jani, Cherie Briggs, Roland Knapp (UCSB), Craig Nelson (UH)
Award Amount and Period: $187,132 (subaward to UH); 6/1/2014 - 5/31/2017

Project Title: *KRuMBS: The Kyphosid Ruminant Microbial Biodigestor of Seaweeds - The alimentary microbiome of an herbivorous reef fish as a transformer of algal feedstocks*
Funding Agency: NSF (IIP: STTR Phase I)
PI and Co-PIs: Neil Sims (Kampachi Farms), Craig Nelson (UH)
Award Amount and Period: $224,878; 4/1/2014 - 3/31/2015

Project Title: *The US Pacific Demonstration Coral Reef Ecosystem Biodiversity Observation Network (CREBON)*
Funding Agency: NOPP-NOAA-IOOS
PI and Co-PIs: Craig Nelson (UH) and Rusty Brainard (NOAA), multiple PIs and institutions.
Award Amount and Period: $1,666,207 (UH Portion only; $10m total); 06/01/14 – 05/31/19

Project Title: *Dissolved organic matter feedbacks in coral reef resilience: The genomic & geochemical basis for microbial modulation of algal phase shifts*
Funding Agency: NSF (GEO-OCE; Biological Oceanography)
PI and Co-PIs: Craig Nelson (UH), Forest Rohwer (SDSU), Craig Carlson (UCSB)
Award Amount and Period: $370,301 (UH Portion only); 6/1/2014 - 5/31/2017

Project Title: *The Influence of Biodiversity on Coral Reef Metabolism and Calcification*
Funding Agency: NSF (BIO-DEB; Dimensions in Biodiversity)
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**Additional Publications and Conference Presentations**

**Additional Publications** (non-peer-reviewed, including reports, dissertations, and book sections)**:**

Knapp, R.A. and **Nelson, C.E.** 2016. Microbial Source Tracking (MST) at Bacteria-impaired Waters of the Lahontan Region. Final Report to the California State Water Resources Control Board, Lahontan Region. CONTRIBUTION: Secondary Coauthor.

Repeta, D. J., L. Aluwihare, C. Carlson, Z. Liu, **C. Nelson**, and A. Stubbins. 2015. Introduction to the special issue on the Biogeochemistry of Dissolved Organic Matter. Marine Chemistry 177, Part 2: 203 – 204. http://dx.doi.org/10.1016/j.marchem.2015.10.002. CONTRIBUTION: Collaborating Coauthor.

Knapp, R.A. and **Nelson, C.E.** 2015. Assessment of Bacterial Water Quality in the Lahontan Region. Final Report to the California State Water Resources Control Board, Lahontan Region. CONTRIBUTION: Secondary Coauthor.

**Nelson, C.E.** 2008. The Phenology, biogeography, and metabolism of Bacteria in high-elevation lakes of the Sierra Nevada, California. PhD Dissertation. University of California, Santa Barbara. CONTRIBUTION: Lead author. ISBN:9780549478720 http://nelsoncraige.googlepages.com/NelsonDissertation2008.pdf

**Nelson, C.E.**, C.A. Carlson, and J.M. Melack. 2008. Nutrient deposition and alteration of food web structure in high-elevation lakes of the Sierra Nevada: Response by microbial communities. *University of California Water Resources Center.* http://escholarship.org/uc/item/1hw0w7gp. CONTRIBUTION: Lead author.

**Conference Presentations:**

Metabolic functions of microbes in coral reef waters. Linda Wegley Kelly1, Craig Carlson2, Andreas Haas3, **Craig Nelson**4, Forest Rohwer1, Stuart Sandin5, Jennifer Smith. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Biomarkers of stress in coral reef ecosystems. Zachary Quinlan1, Irina Koester2, Daniel Petras3, Wesley Sparagon4, Jacqueline Comstock5, Craig Carlson5, Pieter Dorrestein3, Andreas Haas6, Lihini Aluwihare2, **Craig Nelson**4, Linda Wegley Kelly. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Connecting individual-to-ecosystem effects of submarine groundwater discharge on a Hawaiian fringing reef. Megan Donahue1, Nyssa J. Silbiger2, Kim Falinski3, Henrieta Dulai4, Florybeth La Valle5, Margaret A. McManus4, Paula Moehlenkamp4, Doug Harper6, **Craig Nelson**. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Novel Combination of DOM Characterization Reveals Unique Modifications of Coral and Algae Exudate during Remineralization. Milou Arts1, Benjamin Mueller2, Benjamin Mueller3, Linda Wegley Kelly4, **Craig Nelson**5, Irina Koester6, Daniel Petras7, Mark Vermeij3, Mark Vermeij2, Andreas Haas. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Does structure shape the microbial landscape? Examining intra-colonial variability in microbial communities in a Hawaiian coral. Shayle Matsuda1, **Craig Nelson**2, Joshua Madin1, Brian Glazer2, Ruth Gates. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

The Fugacious Feast: Microbial Transformation of Dissolved Metabolites in Coral Reefs. **Craig Nelson**1, Linda Wegley Kelly2, Andreas Haas3, Daniel Petras4, Irina Koester5, Jacqueline Comstock6, Zachary Quinlan7, Lihini Aluwihare5, Pieter Dorrestein4, Craig Carlson. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Algal DOM and Thermal Stress Independently Alter the Coral Microbiome. Wesley Sparagon1, **Craig Nelson**. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Microbial Decomposition and Nutrient Recycling of Organic Matter over a Coral Reef in Mo'orea, French Polynesia. Irina Koester1, Zachary A. Quinlan2, Daniel Petras1, Jacqui Comstock3, Wesley Sparagon4, Craig A. Carlson3, Pieter C. Dorrestein5, Andreas Haas6, Linda Wegley Kelly2, **Craig E. Nelson**4, Lihini I. Aluwihare1. 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

Coral reef community responses to long-term experimental ocean acidification and warming. Chris Jury1, Keisha Bahr2, Andrea Grottoli3, **Craig Nelson**4, Rowan McLachlan3, James Price3, Mariana Rocha de Souza,1, Celia Smith4, Wesley Sparagon4, Cheryl Squair4, Molly Timmers1, Jan Vicente1, Nicole Yamase4, Robert Toonen1 . 14th International Coral Reef Symposium (ICRS), Bremen, Germany, 5-10 July 2020.

80. Tracking microbial uptake of phytoplankton derived DOM and model compounds by coral reef bacterioplankton using stable isotope probing. Comstock, **Nelson**, Haas, Wegley Kelly, Koester, Quinlan, Carlson. Ocean Sciences Meeting 2020, San Diego, CA, USA, 16-21 February 2020

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78. Changing diets – microbial remineralization of primary producer exudates from reefs during phase shifts. Milou Arts, Benjamin Mueller, Linda Wegley Kelly, **Craig E Nelson**, Irina Koester, Daniel Petras, Ellen C Hopmans, Mark JA Vermeij, Pieter Dorrestein and Andreas Haas. Ocean Sciences Meeting 2020, San Diego, CA, USA, 16-21 February 2020

77. Characterization of biologically reactive dissolved organic matter exuded by major reef primary producers. Zachary Quinlan, Irina Koester, Daniel Petras, Jacqueline Comstock, Craig A Carlson, Pieter Dorrestein, Andreas Haas, Lihini Aluwihare, **Craig E Nelson** and Linda Wegley Kelly. Ocean Sciences Meeting 2020, San Diego, CA, USA, 16-21 February 2020

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Vulnificus, in an Urbanized Estuary in Hawai‘i. Jessica A Bullington, Grieg Steward, Margaret Anne McManus, Anna B Neuheimer, Olivia Nigro, Brian Powell, Brian T Glazer and **Craig Nelson**. Ocean Sciences Meeting 2020, San Diego, CA, USA, 16-21 February 2020.
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74. Benthic Community and Nutrient Enrichment Influence Development of Reef Biofilms. Remple, Donahue, Fox, Putnam, Quinlan, Silbiger, **Nelson**. Ocean Sciences Meeting 2020, San Diego, CA, USA, 16-21 February 2020

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72. Integrating Genomics to Better Understand Coral Resilience to Bleaching RITSON-WILLIAMS, R*; CUNNING, R; NUNEZ-PONS, L; SOGIN, E; NELSON, C; FORSMAN, Z; WILLIS, S; GATES, R; ALBRIGHT, R; Society of Integrative and Comparative Biology 2019 Meeting, January 3-7, 2019. Tampa, FL, USA.

71. Milou G.I. Arts, **Craig E. Nelson**, Linda Wegley Kelly, Daniel Petras, Irina Koester, Zachary A. Quinlan, Pieter C. Dorrestein, Andreas F. Haas. Characterizing the Exometabolomic Fingerprint of Coral Reefs. YOUMARES 9 Conference, 11-14 September 2018, Oldenburg, Germany.

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Sciences Meeting, Feb 11-16, 2018, Portland, Oregon, USA. Oral. Submitted. https://agu.confex.com/agu/os18/meetingapp.cgi/Paper/307970

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https://www.sgmeet.com/aslo/honolulu2017/viewabstract.asp?abstractid=30034

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MATTER. 13TH International Coral Reef Symposium, 19–24 June 2016, Honolulu, Hawai'i. Poster. Submitted. https://www.sgmeet.com/icrs2016/viewabstract.asp?AbstractID=29769

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**29. Nelson, C. E.**, Remple K., Seydel K., Nielsen J., Brooks, A., Carlson, C. *Pelagic biogeochemistry of shallow coral reefs is distinct from the surrounding ocean.* 2014 MCR-LTER All Scientists Meeting,

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**27. Nelson, C. E.**; Sadro, S.; Knapp, R. A.. *Bacterial lineage distributions along oligotrophic montane lake chains: Linking biogeochemical and vegetation gradients to microbial metacommunity structure.* 2014 Joint Aquatic Sciences Meeting, 19-23 May 2014, Portland, OR. Oral. Submitted. http://www.sgmeet.com/jasm2014/viewabstract.asp?AbstractID=13492

26. Wear, E.K.; Carlson, C.A.; Windecker, L.A.; Brzezinski, M.A., and **Nelson, C.E.** *Bioavailability of diatom exudate induced by nutrient limitation influenced by both phytoplankton species and limiting nutrient identity (nitrogen vs. silica)*. 2014 Ocean Sciences Meeting, February 23-28, 2014, Honolulu, HI, USA. Oral. Submitted. http://www.sgmeet.com/osm2014/viewabstract.asp?abstractid=15200

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**23. Nelson, C.E.**, S.J. Goldberg, L.W. Kelly, A.F. Haas, F. Rohwer, J.E. Smith, and C.A. Carlson. *Differential bacterial population growth and community metabolism on organic exudates of coral and macroalgae in a reef ecosystem*. Association for the Sciences of Limnology and Oceanography (ASLO), Aquatic Sciences Meeting, 17-22 February 2013, New Orleans, LA. Oral. Submitted. https://www.sgmeet.com/aslo/neworleans2013/viewabstract2.asp?AbstractID=11010

22. Carlson, C. A.; **Nelson, C.**; Ewart, C.; Halewood, E. R.: *Submesoscale community differentiation and population enrichment of Sargasso Sea bacterioplankton in a Mode-Water Eddy.* Association for the Sciences of Limnology and Oceanography (ASLO), Aquatic Sciences Meeting, 17-22 February 2013, New Orleans, LA. Oral. Submitted. https://www.sgmeet.com/aslo/neworleans2013/viewabstract2.asp?AbstractID=11150

**21. Nelson, C.E.** and R.A. Knapp. *The Center for Eastern Sierra Aquatic Microbial Ecology (CESAME): Advancing microbial source tracking to improve water quality management.* University of California Santa Barbara Natural Reserve System Day, 8 Feb 2013, Santa Barbara, CA, USA. Poster. Submitted.

**20. Nelson, C.E.**, S.J. Goldberg, L.W. Kelly, A.F. Haas, F. Rohwer, J.E. Smith, and C.A. Carlson. *Exudates*

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**APPENDIX 3: COLLABORATOR AND ADVISOR REFERENCES**

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