

CURRICULUM VITA

Kelly D. Goodwin, Ph.D.

National Oceanic and Atmospheric Administration (NOAA), Oceans and Atmospheric Research (OAR), Atlantic Oceanographic and Meteorological Laboratory (AOML), Ocean Chemistry and Ecosystems Division (OCED), 4301 Rickenbacker Causeway Miami, FL 33149, stationed at the National Marine Fisheries Service (NMFS), Southwest Fisheries Science Center (SWFSC), 8901 La Jolla Shores Drive, La Jolla, CA 92037
office: 858 546-7142, mobile: 954 593-5253, email: kelly.goodwin@noaa.gov

Educational History

Ph.D., 1996	California Institute of Technology	Environmental Engineering Science
Subject Minor, 1993	California Institute of Technology at Scripps Institute of Oceanography	Oceanography
M.S., 1991	California Institute of Technology	Environmental Engineering Science
B.S. high honors, 1988	University of Florida	Neurobiological Science

Professional Employment

2003–present	NOAA	Microbiologist. Current Position/Pay Band: ZP-IV/03
1999–2003	University of Miami	NOAA Cooperative Institute of Marine and Atmospheric Science (CIMAS) Principal Investigator at AOML Associate Scientist (2001–2003) Assistant Scientist (2000–2001) Sr. Research Associate (1999–2000)
1995–1998	US Geological Survey	National Research Council Postdoctoral Associate

Special Assignments

2020-2021	Acting Deputy Director, Ocean Chemistry and Ecosystem Division, AOML
2011–present	Oversee the research portfolio of the Ocean Chemistry and Ecosystem Division with responsibility for milestone and performance measure reporting. Advises Division Director on NOAA planning procedures and provides alerts regarding new opportunities for program development. AOML Point of Contact for Strategy, Execution, and Evaluation (SEE) to ensure timely and complete responses from AOML on SEE-related data calls.
2012–2017	Technical Lead for Marine Sampling and Analysis at Weston Solutions, Inc. via a Cooperative Research and Development Agreement (CRADA) with NOAA. Provided specialized microbiology expertise such as assay development and implementation, microbial source tracking (MST), and quantitative microbial risk assessment (QMRA). Supervised microbiology and molecular biology testing with focus on assay validation and quality control.
2004–2011	Adjunct Assistant Professor, Marine Biology and Fisheries, University of Miami, Rosenstiel School of Marine and Atmospheric Studies (RSMAS).
2000	Visiting Research Fellow in Environmental Molecular Microbiology, Department of Biological Sciences, University of Warwick, Coventry, UK (Oct. – Nov.).

Honors and Awards

Department of Commerce Bronze Medal, Leadership	2020
<i>The highest medal awarded by the NOAA Under Secretary of Commerce for Oceans and Atmosphere for advancing awareness and application of 'omics research for a strategic NOAA vision to shape science priorities and implementation of research.</i>	
Outstanding Scientific Paper Award, Oceans & Great Lakes Category	2018
<i>Recognizes the preeminent science that OAR employees and affiliates publish through rigorous peer review processes</i>	
AOML Performance Award	2018
<i>For increasing AOML visibility through the NOAA Research Database</i>	
NOAA Certificate of Appreciation	2016
<i>In recognition of pioneering work to establish a research program within NOAA for the study of 'omics and its importance to marine ecosystems globally</i>	
Department of State Certificate of Appreciation	2015
<i>Bureau of Oceans and International Environmental and Scientific Affairs for contributions to the World Ocean Assessment Review Process</i>	
NOAA Technology Transfer Award	2012
<i>Exemplary activities that promote the domestic transfer of science and technology developed within NOAA and result in the use of such science and technology by American industry or business, universities, State or local Government, or other non-Federal parties</i>	
NOAA Certificates of Recognition or Appreciation	
<i>AOML Leadership in SEE-Related Integrated Response</i> 2012	
<i>Contribution to Ecosystem Goals</i> 2010	
<i>Advancing NOAA's Priorities through Regional Collaboration</i> 2012	
<i>Exemplary One-NOAA Efforts</i> 2009	
Takeda Techno-Entrepreneurship Award Finalist Commendation	2001
National Research Council Postdoctoral Associateship	1995, 1996, 1997
Recognition of USGS Special Act Service Award	1997
National Institute of Health Biotechnology Training Grant	1994, 1995
Soroptimist Society Fellowship	1990
Caltech Tuition Award	1989
University of Florida Graduation with High Honors	1988
Golden Key National Honor Society	1987
Phi Beta Kappa, early admission	1986

Publications

1. C.C. Chase, A.D. Barton, L.A. Zeigler, R.H. Lampe, A. Rabines, A. Schulberg, H. Zheng, R. Goericke, K.D. Goodwin, A.E. Allen. Transitions in nutrient supply drive variation in pelagic ocean microbiome biodiversity and distribution in a coastal upwelling ecosystem. In review.
2. Z. Gold, E. Choi, D. Kacev, B. Frable, R. Burton, KD GOODWIN, A. Thompson, P. Barber. FishCARD: Fish 12S California Current Specific Reference Database for Enhanced Metabarcoding Efforts.
<https://www.authorea.com/doi/full/10.22541/au.161407483.33882798/v1> In review.

3. T. Gallaudet, J. Sims, E. Lobecker, A. Netburn, C. Alexander, K.D. GOODWIN, A. Skrivaneck. Advancing Ocean Science at Sea in the COVID-19 Era” by The Journal of Ocean Technology, V15(4), pp. 1-13, 2020.
4. K.J. Harper, K.D. GOODWIN, L.R. Harper, E.L. LaCasella, A. Frey, P.H. Dutton. Finding Crush: Environmental DNA analysis as a tool for tracking the green sea turtle *Chelonia mydas* in a marine estuary. *Frontiers in Marine Science* 6, doi: 10.3389/fmars.2019.00810 (2020).
5. A.B. Boehm, Silverman A.I., Schriewer A., GOODWIN K.D. Systematic Review and meta-analysis of decay rates of waterborne mammalian viruses and coliphage in surface waters. *Water Research* 164, 114898 (2019).
6. K.M. Yamahara, C.M. Preston, J. Birch, K. Walz, R. Marin III, S. Jensen, D. Pargett, B. Roman, W. Ussler, Y. Zhang, J. Ryan, B. Hobson, B. Keift, B. Ranaan, K.D. GOODWIN, F. Chavez, C. Scholin. In-situ, autonomous acquisition and preservation of marine environmental DNA using an autonomous underwater vehicle. *Frontiers in Marine Science*, doi: 10.3389/fmars.2019.00373 (2019).
7. G. Canonico. P.L. Buttigieg, E. Montes, C.A. Stepien, D. Wright, A. Benson, B. Helmuth, M.J. Costello, F.E. Muller-Karger, I.S. Pinto, H. Saeedi, J.A. Newton, W. Appelatns, N. Bednarsek, L. Bodrossy, B.D. Best, A. Brandt, K.D. GOODWIN, K. Iken, A. Marques, P.L. Miloslavich, M. Ostrowiski, W. Turner, E. Acterberg, T. Barry, O. Defeo, G. Bigattit, L-A. Henry, B. Ramiro Sanchez, P. Duran Murnoz, M. Cuadrado, T. Morato, M. Roberts, A.G. Garcia-Alegre, B.J. Murton. Global observational needs and resources for marine biodiversity. *Frontiers in Marine Science*, doi: 10.3389/fmars.2019.00367 (2019).
8. L.R. Thompson, M.F. Haroon, A.A. Shibl, M.J. Cahill, D.K., Ngugui, G.J. Williams, J.T. Morton, R. Knight, K.D. GOODWIN, U. Stingl. Red Sea SAR11 and *Prochlorococcus* single-cell genomes reflect globally distributed pangenomes. *Applied and Environmental Microbiology*. 85:e00369-19. DOI: 10.1128/AEM.00369-19 (2019).
9. K.D. GOODWIN, F. Muller-Karger, G. Canonico. Molecular Approaches for an Operational Marine Biodiversity Observation Network. IN: *World Seas: An Environmental Evaluation, Vol III. Ecological Issues and Environmental Impacts*, 2nd edition. C. Sheppard, ed., Elsevier, pp. 613-631. ISBN: 9780128052044 (2018).
10. L.R. Thompson, J.G. Sanders, D. McDonald, A. Amir, J. Ladau, K.J. Locey, R.J. Prill, A. Tripathi, S.M. Gibbons, G. Ackermann, J.A. Navas-Molina, E. Kopylova, Y. Vázquez-Baeza, S. Janssen, J.T. Morton, S. Mirarab, Z.ZXu, M.F. Haroon, J. Kanbar, Q. Zhu, A. Gonzalez, S.J. Song, T. Kosciolk, N.A. Bokulich, J. Lefler, C.J. Brislawn, G.C. Humphrey, S.M. Owens, J. Hampton-Marcell, D. Berg-Lyons, V. McKenzie, N. Fierer, J.A. Fuhrman, A. Clauset, R.L. Stevens, A. Shade, K.S. Pollard, K.D. GOODWIN, J.K. Jansson, J.A. Gilbert, R. Knight & The Earth Microbiome Project Consortium. A communal catalogue reveals Earth’s multiscale microbial diversity. *Nature* 551: 457-463, doi:10.1038/nature24621 (2017).
11. Y. Cao, M.R. Raith, P.D. Smith, J.F. Griffith, S.B. Weisberg, A. Schriewer, A. Sheldon, C. Crompton, G.G. Amenu, J. Gregory, J. Guzman, K.D. GOODWIN, L. Othman, M. Manasjan, S. Choi, S. Rapoport, S. Steele, T. Nguyen, and X. Yu. Regional assessment of human fecal contamination in southern California coastal drainages. *International Journal of Environmental Research and Public Health* 14(8):874, doi:10.3390/ijerph14080874 (2017).

12. K.D. GOODWIN, A. Schriever, A. Jirik, K. Curtis, A. Crumpacker. Consideration of natural sources in a bacteria TMDL – Lines of evidence, including beach microbial source tracking. *Environmental Science and Technology* 51(14):7775-7784, doi: 10.1021/acs.est.6b05886 (2017).
13. C. Staley, T. Kaiser, M.L. Gidley, I.C. Enochs, P.R. Jones, K.D. GOODWIN, C.D. Sinigalliano, M.J. Sadowsky, and C.L. Chun. Differential impacts of land-based sources of pollution on the microbiota of southeast Florida coral reefs. *Applied and Environmental Microbiology* 83(10): e03378-16, doi:10.1128/AEM.03378-16 (2017).
14. K.D. GOODWIN, L.R. Thompson, B. Duarte, T. Kahlke, A.R. Thompson, J.C. Marques, and I. Caçador. DNA sequencing as a tool to monitor marine ecological status. *Frontiers in Marine Science* 4(107):1-14, doi: 10.3389/fmars.2017.00107 (2017).
15. K.D. GOODWIN, S. Gruber, M. Vondrak, A. Crumpacker. Watershed assessment with beach microbial source tracking and outcomes of resulting gull management. *Environmental Science and Technology* 50(18):9900-9906, doi: 10.1021/acs.est.6b02564 (2016).
16. E. Stulberg, D. Fravel, L.M. Proctor, D.M. Murray, J. LoTempio, L. Chrisey, J. Garland, K. GOODWIN, J. Graber, M.C. Harris, S. Jackson, M. Mishkind, D.M. Porterfield, A. Records. An assessment of US microbiome research. *Nature Microbiology* 1:1-7. Article number: 15015, doi: 10.1038/NMICROBIOL.2015.15 (2016).
17. A. Kopf, M. Bicak, R. Kottmann, J. Schnetzer, I. Kostadinov, K. Lehmann, A. Fernandez-Guerra, C. Jeanthon, E. Rahav, M. Ullrich, A. Wichels, G. Gerdts, Pa. Polymenakou, G. Kotoulas, R. Siam, R.Z Abdallah, E.C Sonnenschein, T. Cariou, F. O'Gara, S. Jackson, S.i Orlic, M. Steinke, J. Busch, B. Duarte, I. Caçador, J. Canning-Clode, O. Bobrova, V. Marteinsson, E.Reynisson, C. Magalhães, L. Gian. M. Luna, G. Marina, Q. Carolin. R. Löscher, A. Kremp, M.E DeLorenzo, L. Øvreås, J. Tolman, J. LaRoche, A. Penna, M. Frischer, T. Davis, B. Katherine, C.P Meyer, S. Ramos, C. Magalhães, F. Jude-Lemeilleur, M.L. Aguirre-Macedo, S. Wang, N. Poulton, S. Jones, R. Collin, J.A Fuhrman, P.Conan, C. Alonso, N. Stambler, K. GOODWIN, et al. The ocean sampling day consortium. *GigaScience* 4(1):1-5, doi: 10.1186/s13742-015-0066-5 (2015).
18. J.D. Happel, Y. Mendoza, Y., and K.D. GOODWIN. A reassessment of the soil sink for atmospheric carbon tetrachloride based upon static flux chamber measurements. *Journal of Atmospheric Chemistry* 71(2), 113-123, doi 10.1007/s10874-014-9285-x (2014).
19. N. Davies, D. Field, L. Amaral-Zettler, M.S. Clark, J. Deck, A. Drummond, D.P. Faith, J. Geller, J. Gilbert, F.O. Glöckner, P.R. Hirsch, J.A. Leong, C. Meyer, M. Obst, S. Planes, C. Scholin, A.P. Vogler, R.D. Gates, R. Toonen, V. Berteaux-Lecellier, M. Barbier, K. Barker, S. Bertilsson, M. Bicak, M.J. Bietz, J. Bobe, L. Bodrossy, A. Borja, J. Coddington, J. Fuhrman, G. Gerdts, R. Gillespie, K.D. GOODWIN, et al. The founding charter of the Genomic Observatories Network. *GigaScience* 3(2):1-5, doi: 10.1186/2047-217X-3-2 (2014).
20. A.M. Cox and K.D. GOODWIN. Sample preparation methods for quantitative detection of DNA by molecular assays and marine biosensors. *Marine Pollution Bulletin* 73(1):47-56, doi: 10.1016/j.marpolbul.2013.06.006 (2013).
21. D.L. Ebentier, K.T. Hanley, Y. Cao, B.D. Badgley, A.B. Boehm, J.S. Ervin, K.D. GOODWIN, M. Gourmelon, J.F. Griffith, P.A. Holden, C.A. Kelty, S. Lozach, C. McGee,

- L.A. Peed, M. Raith, H. Ryu, M.J. Sadowsky, E.A. Scott, J. Santo Domingo., A. Schriewer, C.D. Sinigalliano, O.C. Shanks, L.C. Van de Werfhorst., D. Wang, S. Wuertz, J.A. Jay. Evaluation of the repeatability and reproducibility of a suite of PCR-based microbial source tracking methods. *Water Research* 47(18):6839-6848, doi: 10.1016/j.watres.2013.01.060 (2013).
22. J.R. Stewart, A.B. Boehm, E.A. Dubinsky, T.-T. Fong, K.D. GOODWIN, J.F. Griffith, R.T. Noble, O.C. Shanks, K. Vijayavel, S.B. Weisberg. Recommendations following a multi-laboratory comparison of microbial source tracking methods. *Water Research* 47(18):6829-6838, doi: 10.1016/j.watres.2013.04.063 (2013).
23. A. Schriewer, K.D. GOODWIN, C.D. Sinigalliano, A.M. Cox, D. Wanless, J. Bartkowiak, D.L. Ebentier, K.T. Hanley, J. Ervin, L.A. Deering, O.C. Shanks, L.A. Peed, W.G. Meijer, J.F. Griffith, J. Santo Domingo, J.A. Jay, P.A. Holden, and S. Wuertz. Performance evaluation of canine-associated *Bacteroidales* assays in a multi-laboratory comparison study. *Water Research* 47(18):6909-6920, doi: 10.1016/j.watres.2013.03.06 (2013).
24. C.D. Sinigalliano, J. Ervin, L.C. Van de Werfhorst, D. Wang, D. Wanless, J. Bartkowiak, B. Layton, M. Raith, A.B.B. Schriewer, C. Lee, K.D. GOODWIN, J. Lee, A.B. Boehm, R. Noble, P.A. Holden, J. A. Jay, S. Wuertz, M. Byappanahalli, R. Whitman, M.J. Sadowsky, W. G. Meijer, E. Balleste, M. Gourmelon, J.F. Griffith, H. Ryu, and J.W. Santo Domingo. Multi-laboratory evaluations of the performance of *Catelicoccus marimammalium* PCR assays developed to target gull fecal sources. *Water Research* 47(18):6883-6896, doi: 10.1016/j.watres.2013.02.059 (2013).
25. K.D. GOODWIN, M. McNay, Y. Cao, D. Ebentier, M. Madison, J.F. Griffith. A multi-beach study of *Staphylococcus aureus*, MRSA, and enterococci in southern California seawater and beach sand. *Water Research* 46(13):4195-4207, doi: 10.1016/j.watres.2012.04.001 (2012).
26. K. Yamahara, L. Sassoubre, K.D. GOODWIN and A. Boehm. Occurrence and persistence of human pathogens and indicator organisms in beach sands along the California coast. *Applied and Environmental Microbiology* 78(6):1733-1745, doi: 10.1128/AEM.06185-11 (2012).
27. J. Gooch-Moore, K.D. GOODWIN, C. Dorsey, R.D. Ellender, J.B. Mott, M. Ornelas, C. Sinigalliano, B. Vincent, D. Whiting, S.H. Wolfe. New USEPA Water Quality Criteria by 2012: GOMA concerns and recommendations. *Journal of Water and Health* 9(4):718-733, doi: 10.2166/wh.2011.15 (2011).
28. Y. Mendoza, K. GOODWIN, and J.D. Happell. Microbial removal of atmospheric carbon tetrachloride in bulk aerobic soils. *Applied and Environmental Microbiology* 77(17):5835-5841, doi: 10.1128/AEM.05341-11 (2011).
29. E.J. Viau, K.D. GOODWIN, K.M. Yamahara, B.A. Layton, L.M. Sassoubre, S.L. Burns, H.I. Tong, S.H. Wong, Y. Lu, A.B. Boehm. Bacterial pathogens in Hawaiian coastal streams--associations with fecal indicators, land cover, and water quality. *Water Research* 45(11):3279-3290, doi: 10.1016/j.watres.2011.03.033 (2011).
30. M.R. Diaz, J.W. Jacobson, K.D. GOODWIN, S.A. Dunbar, J.W. Fell. Molecular detection of harmful algal blooms (HABs) using locked nucleic acids and bead array technology. *Limnology and Oceanography Methods* 8(6):269-284, doi: 10.4319/lom.2010.8.269 (2010).

31. K.D. GOODWIN and M. Pobuda. Performance of CHROMagar™ Staph aureus and CHROMagar™ MRSA for detection of *Staphylococcus aureus* in beach water and sand – comparison of culture, agglutination, and molecular analyses. *Water Research* 43(19):4802-4811, doi: 10.1016/j.watres.2009.06.025 (2009).
32. A.B. Boehm, J. Griffith, C. McGee, T.A. Edge, H.M. Solo-Gabriele, R. Whitman, Y. Cao, M. Getrich, J.A. Jay, D. Ferguson, K.D. GOODWIN, C.M. Lee, M. Madison, S.B. Weisberg. Faecal indicator bacteria enumeration in beach sand: a comparison study of extraction methods in medium to coarse sands. *Journal of Applied Microbiology* 107(5):1740-1750, doi: 10.1111/j.1365-2672.2009.04440.x (2009).
33. K.D. GOODWIN, L. Matragano, D. Wanless, C. Sinigalliano, M.J. LaGier. A preliminary investigation of fecal indicator bacteria, human pathogens, and source tracking markers in beach water and sand. *Environmental Research Journal* 2(4):395-417, novapublishers.com/catalog/product_info.php? products_id=21172 (2009).
34. K.D. GOODWIN and R.W. Litaker. Emerging technologies for monitoring recreational waters for bacteria and viruses. IN: *Oceans and Human Health: Risk and Remedies from the Seas*. P.J. Walsh, S.L. Smith, W.H. Gerwick, H. Solo-Gabriele, L. Fleming, eds. Academic Press, New York, pp. 381-404, ISBN-13: 978-0123725844 (2008).
35. C.J. Palmer, T.D. Bonilla, J.A. Bonilla, S. Elmir, K.D. GOODWIN, H.M. Solo Gabriele, A. Abdelzاهر. The future for monitoring. IN: *Oceans and Human Health: Risk and Remedies from the Seas*. P.J. Walsh, S.L. Smith, W.H. Gerwick, H. Solo-Gabriele, L. Fleming, eds. Academic Press, New York, pp. 405-429, ISBN-13: 978-0123725844 (2008).
36. K.D. GOODWIN, L. Matragano, D. Wanless, C. Sinigalliano, M.J. LaGier. The possibility of false negative results hampers the ability to elucidate the relationship between fecal indicator bacteria and human pathogens and source tracking markers in beach water and sand. IN: *Marine Pollution: New Research*. T.N. Hofer, ed. Nova Science Publishers, Inc., pp. 255-277, ISBN-13: 978-1604562422 (2008).
37. D. Voss, H. Maring, K.D. GOODWIN. Salt aerosol and bioaerosol production from a sea-salt aerosol generator. IN: *Marine Pollution: New Research*. T.N. Hofer, ed. Nova Science Publishers, Inc., pp. 399-429, ISBN-13: 978-1604562422 (2008).
38. M.J. LaGier, J.W. Fell, K.D. GOODWIN. Electrochemical detection of harmful algae and other microbial contaminants in coastal waters using hand-held biosensors. *Marine Pollution Bulletin* 54(6):757-770, doi: 10.1016/j.marpolbul.2006.12.017 (2007).
39. I.B. Baums, K.D. GOODWIN, T. Kiesling, D. Wanless, M.R. Diaz, J.W. Fell. Luminex detection of fecal indicators in river samples, marine recreational water, and beach sand. *Marine Pollution Bulletin* 54(5):521-536, doi: 10.1016/j.marpolbul.2006.12.018 (2007).
40. M.J. LaGier, C.A. Scholin, J.W. Fell, J. Wang, K.D. GOODWIN. An electrochemical RNA hybridization assay for detection of the fecal indicator bacterium *Escherichia coli*. *Marine Pollution Bulletin* 50(11):1251-1261, doi:10.1016/j.marpolbul.2005.04.034 (2005).
41. K.D. GOODWIN, R. Tokarczyk, F.C. Stephens, E.S. Saltzman. Description of toluene inhibition of methyl bromide biodegradation in seawater and isolation of a marine toluene-oxidizer that degrades methyl bromide. *Applied and Environmental Microbiology* 71(7):3495-3503, doi: 10.1128/AEM.71.7.3495-3503.2005 (2005).

42. K.D. GOODWIN, S.A. Cotton, G. Scorzetti, J.W. Fell. A DNA hybridization assay to identify toxic dinoflagellates in coastal waters: detection of *Karenia brevis* in the Rookery Bay National Estuarine Research Reserve. *Harmful Algae* 4(2):411-422, doi: 10.1016/j.hal.2004.07.005 (2005).
43. Yvon-Lewis, S.A., D.B. King, R. Tokarczyk, K.D. GOODWIN, E.S. Saltzman, J.H. Butler. Methyl bromide and methyl chloride in the Southern Ocean. *Journal of Geophysical Research* 109(C2): CO2008, doi:10.1029/2003JC001809 (2004).
44. R. Tokarczyk, K.D. GOODWIN, E.S. Saltzman. Methyl chloride and methyl bromide degradation in the Southern Ocean. *Geophysical Research Letters* 30(15):1808, doi: 10.1029/2003GL017459 (2003).
45. J.K. Schaefer, K.D. GOODWIN, I.R. McDonald, J.C. Murrell, R.S. Oremland. *Leisingera methylohalidivorans* gen. nov., sp. nov., a marine methylotroph that grows on methyl bromide. *International Journal of Systematic and Evolutionary Microbiology* 52:851-859, doi: 10.1099/ijs.0.01960-0 (2002).
46. R. Tokarczyk, K.D. GOODWIN, E.S. Saltzman. Methyl bromide loss rate constants in the North Pacific Ocean. *Geophysical Research Letters* 28(23):4429-4432, doi: 10.1029/2001GL013812 (2001).
47. K.D. GOODWIN, R.K. Varner, P.M. Crill, and R.S. Oremland. Consumption of tropospheric levels of methyl bromide by C₁ bacteria and comparison to saturation kinetics. *Applied and Environmental Microbiology* 67(12):5437-5443, doi: 10.1128/AEM.67.12.5437-5443.2001 (2001).
48. K.D. GOODWIN, J.K. Schaefer, and R.S. Oremland. Bacterial degradation of methyl bromide and dibromomethane in natural waters and enrichment cultures. *Applied and Environmental Microbiology* 64(12):4629-4636 (1998).
49. K.D. GOODWIN, W.J. North, M.E. Lidstrom. Production of bromoform and dibromomethane by Giant Kelp: factors affecting release and comparison to anthropogenic bromine sources. *Limnology and Oceanography* 42(8):1725-1734, doi: 10.4319/lo.1997.42.8.1725 (1997).
50. K.D. GOODWIN, M.E. Lidstrom, and R.S. Oremland. Marine bacterial degradation of brominated methanes. *Environmental Science and Technology* 31(11):3188-3192, doi: 0.1021/es970165g (1997).
51. K.D. GOODWIN. Natural cycles of brominated methanes: macroalgal production and marine microbial degradation of bromoform and dibromomethane. Ph.D. thesis, California Institute of Technology, <http://resolver.caltech.edu/CaltechETD:etd-12142007-081155> (1996).
52. S.L. Manley, K.D. GOODWIN, W.J. North. Laboratory production of bromoform, methylene bromide, and methyl iodide by macroalgae and distribution in near-shore southern California waters. *Limnology and Oceanography* 37(8):1652-1659, doi: 10.4319/lo.1992.37.8.1652 (1992).

Reports and Proceedings

53. NOAA 'Omics Strategic Plan 2021-2025. GOODWIN K., Strom M., Arzayus F., Bohan M. Busch S., Canonico G., Certner R., Davis J., Egan K., Greig T., Philibotte J., Koss J., Larsen K., Layton D., Nichols K., O'Neil J., Parks D., Poussard L., Trtanj J., Werner C. (2021).

54. Implementation of Environmental DNA (eDNA) as a Tool for Ecosystem-Based Fisheries Management. Louise Ray, J., Strom M.S., Johansen, T., GOODWIN, K.D. (editors). U.S.-Norway Intergovernmental Group on eDNA Implementation for Fisheries Stock Assessments and Management (UNIG). <https://doi.org/10.25923/e736-vn83> (2020).
55. NOAA 'Omics White Paper: Informing the NOAA 'Omics Strategy and Strategic Plan. K.GOODWIN, R. Certner, M. Strom, F. Arzayus, M. Bohan, S. Busch, G. Canonico, S. Cross, J. Davis, K. Egan, T. Grieg, E. Kearns, J. Koss, K. Larsen, D. Layton, D. K. Nichols, J. O'Neil, D. Parks, L. Poussard, C. Werner. <https://doi.org/10.25923/bd7z-zb37> (2020).
56. NOAA 'Omics Strategy: Strategic Application of Transformational Tools. Goodwin, K.D., Davis, J., Strom, M.S., Werner, C. <https://doi.org/10.25923/bd7z-zb37> (2020)
57. The Atlantic Ocean Research Alliance - Marine Microbiome Roadmap. H. Bolhuis, P.L. Buttigieg, K. GOODWIN, R. Groben; D. Ludicone, A. Lacoursière-Rousselm S. Pesant, S. Robinson, S. Björnsson, L.S. Erlendsson, M. Rae. doi: 10.5281/zenodo.3632526 (2020).
58. Assessment of Ichthyoplankton Metabarcoding for Routine Monitoring. D. Kacev, D. Gillett, A. Freire de Carvalho, C. Cash, S. Walther, C.D. Larsen, A. Thompson, L. Thompson, N. Bowlin, K. GOODWIN, E.D. Stein. Southern California Coastal Water Research Project (SCCWRP) Technical Report 1031 (2018).
59. Interagency Strategic Plan for Microbiome Research FY2018-2022. April 2018. Microbiome Interagency Working Group (MIWG), an interagency working group under the Life Science Subcommittee (LSSC) of the National Science and Technology Council (NSTC) Committee on Science (CoS). https://science.energy.gov/~media/ber/pdf/workshop%20reports/Interagency_Microbiome_Strategic_Plan_FY2018-2022.pdf (2018).
60. Integrating Marine 'Omics into the Marine Biodiversity Observation Network (MBON) in support of the U.N. sustainable development goals (SDG) and agenda 2030. K.D. GOODWIN, F.E. Muller-Karger, G. Canonico. Proceedings of TDWG 1: e2052, doi: 10.3897/tdwgproceedings.1.20521 (2017).
61. Southern California Bight 2013 Regional Monitoring Program: Volume IX. Shoreline Microbiology. Y. Cao M.R. Raith, P.D. Smith, J.F. Griffith, S.B. Weisberg, A. Schriewer, A. Sheldon, C. Crompton, G.G. Amenu, J. Gregory, J. Guzman, K.D. GOODWIN, L. Othman, M. Manasjan, S. Choi, S. Rapaport, S. Steele, T. Nguyen, X. Yu. Southern California Coastal Water Research Project (SCCWRP) Technical Report 1005 (2017).
62. Los Angeles Harbor Inner Cabrillo Beach Bacteria Total Maximum Daily Load (TMDL) Implementation and Natural Source Exclusion (NSE) Program: Exceedance Filters Part II. Weston Solutions, Inc. for the Port of Los Angeles. August (2017).
63. Challenges in Method Calibration. K. GOODWIN. Proceedings of the National Environmental Monitoring Conference (NEMC), Applications of Quantitative Polymerase Chain Reaction (qPCR) Methods for Microbiological Contaminants. (2016).
64. Los Angeles Harbor Inner Cabrillo Beach Bacteria Total Maximum Daily Load (TMDL) Implementation and Natural Source Exclusion (NSE) Program: Phase III, Special Studies Summary Report. Weston Solutions, Inc. for the Port of Los Angeles. November (2016).
65. FTAC-MM. Report of the Fast Track Action Committee on Mapping the Microbiome. Product of the Life Sciences Subcommittee of the National Science and Technology Council.

- https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/ftac-mm_report_final_112015_0.pdf (2015).
66. Influence of Nutrients and Temperature on Pelagic Ecosystem Microbial Networks in the Southern California Current Ecosystem. D. Checkley A.E. Allen, K. GOODWIN, R. Goericke, M. Bohan, S. Dovel, A. Rabines, M. Roadman, H. Zheng. CalCOFI Conference December 14-16, 2015, P-19 (2015).
 67. Los Angeles Harbor Inner Cabrillo Beach Bacteria Total Maximum Daily Load (TMDL) Implementation and Natural Source Exclusion (NSE) Programs: 2014-2015 Microbial Source Tracking (MST) with Integrated Analysis (2012-2015). Weston Solutions, Inc. for the Port of Los Angeles. September (2015).
 68. Los Angeles Harbor Inner Cabrillo Beach Bacteria Total Maximum Daily Load (TMDL) Implementation and Natural Source Exclusion (NSE) Programs: Overall Work Plan Version 3.0. Weston Solutions, Inc. for the Port of Los Angeles. July (2015).
 69. National Ocean Council. National Ocean Policy Implementation Plan. April 2013. https://obamawhitehouse.archives.gov/sites/default/files/national_ocean_policy_implementation_plan.pdf (2013).
 70. T. Carsey, S. Stamatēs, N. Amornthammarong, J. Bishop, F. Bloetscher, C. Brown, J. Craynock, S. Cummings, W. Dammann, J. Davis, C. Featherstone, C. Fischer, K. GOODWIN, D. Meeroff, J. Proni, C. Sinigalliano, P. Swart, J.-Z. Zhang. Boynton Inlet 48-hour sampling intensives: June and September 2007. NOAA Technical Report, OAR AOML-40, 43 pp. (2012).
 71. 2013 Annual Report Southern California Coastal Water Research Project (SCCWRP). Evaluation of the repeatability and reproducibility of a suite of qPCR-based microbial source tracking methods, D.L. Ebertier, K.T. Hanley, Y. Cao, B.D. Badgley, A.B. Boehm, J.S. Ervin, K.D. GOODWIN, et al., pp. 433-444 (2013).
 72. 2013 Annual Report Southern California Coastal Water Research Project (SCCWRP). Multi-laboratory evaluations of the performance of *Catelliboccus marimammalium* PCR assays developed to target gull fecal sources. C.D. Sinigalliano, J. Ervin, L.C. Van De Werfhorst, B.D. Badgley, E. Ballesté, J. Bartkowiak, A.B. Boehm, M. Byappanahalli, K.D. GOODWIN, et al., pp. 523-539 (2013).
 73. 2013 Annual Report Southern California Coastal Water Research Project (SCCWRP). Performance evaluation of canine-associated Bacteroidales assays in a multi-laboratory comparison study. A. Schriewer, K.D. GOODWIN, et al., pp. 540-553 (2013).
 74. 2013 Annual Report Southern California Coastal Water Research Project (SCCWRP). Recommendations following a multi-laboratory comparison of microbial source tracking methods. J.R. Stewart, A.B. Boehm, E.A. Dubinsky, T-T. Fong, K.D. GOODWIN, J.F. Griffith, R.T. Noble, O.C. Shanks, K. Vijayavel, S.B. Weisberg, pp. 581-593 (2013).
 75. Inner Cabrillo Beach 2012-2013 Source Identification Surveys. Weston Solutions, Inc. for the Port of Los Angeles. August (2013).
 76. Inner Cabrillo Beach Natural Source Exclusion Eligibility Study, Study Outline for Winter 2013 Mini-Study. Weston Solutions, Inc. for the Port of Los Angeles. January (2013).

77. Inner Cabrillo Beach Natural Source Exclusion Mini-Studies, Summer 2012. Weston Solutions, Inc. for the Port of Los Angeles. December (2012).
78. Los Angeles Harbor Inner Cabrillo Beach TMDL Implementation and Natural Source Exclusion Work Plan Version 2.0. Weston Solutions, Inc. for the Port of Los Angeles. May (2012).
79. Los Angeles Harbor Inner Cabrillo Beach TMDL Implementation and Natural Source Exclusion Workplan Draft Annotated Framework. Weston Solutions, Inc. for the Port of Los Angeles. April (2012).
80. 2012 Annual Report Southern California Coastal Water Research Project (SCCWRP). K.D. GOODWIN, M. McNay, Y. Cao, D. Ebentier, M. Madison, J.F. Griffith. A multi-beach study of *Staphylococcus aureus*, MRSA, and enterococci in seawater and beach sand. pp. 357-373 (2012).
81. Tijuana River Bacterial Source Identification Study Final Report. Weston Solutions, Inc. for the City of Imperial Beach (2012).
82. T. Carsey, C. Featherstone, K. GOODWIN, C. Sinigalliano, J. Stamates, J.-Z. Zhang, J. Proni, J. Bishop, C. Brown, M. Adler, P. Blackwelder, H. Alsayegh. Boynton-Delray Coastal Water Quality Monitoring Program. NOAA Technical Report, OAR AOML-39. (2011).
83. T.P. Carsey, H. Casanova, C. Drayer, C. Featherstone, C. Fischer, K. GOODWIN, J. Proni, A. Saied, C. Sinigalliano, J. Stamates, P. Swart, J.-Z. Zhang. FACE outfalls survey cruise - October 6-19, 2006. NOAA Technical Report, OAR-AOML-38 (2010).
84. 2009 Annual Report Southern California Coastal Water Research Project (SCCWRP). A.B. Boehm, J. Griffith, C. McGee, T.A. Edge, H.M. Solo-Gabriele, R. Whitman, Y. Cao, M. Getrich, J.A. Jay, D. Ferguson, K.D. GOODWIN, C.M. Lee, M. Madison, S.B. Weisberg. Fecal indicator bacteria (FIB) enumeration in beach sand: A comparison study of FIB extraction methods in medium to coarse sands. pp. 249-261 (2009).
85. Final Report: An Investigation of the South Central Regional Wastewater Treatment Plant Ocean Outfall and Coastal Environment. J. Proni, M. Adler, N. Amornthammarong, J. Bishop, F. Bloetscher, T. Carsey, J. Craynock, S. Cummings, P. Dammann, C. Drayer, C. Featherstone, D. Meerhoff, K. GOODWIN, E. Peltola, D. Pierrot, C. Sinigalliano, P. Swart, J. Stamates, K. Sullivan, R. Wanninkhof, J-Z Zhang (2009).
86. A glimpse of the Florida Area Coastal Environment (FACE) program. T. Carsey, K.D. GOODWIN, J. Hendee, J.R. Proni, C. Sinigalliano, J. Stewart, J-Z. Zhang, N. Amornthammarong, J. Craynock, S. Cummings, P. Dammann, C. Featherstone, J. Stamates, K. Sullivan. Proceedings of the 11th International Coral Reef Symposium, Ft. Lauderdale, Florida, 7-11 July 2008, Session number 16, Vol. 1:566-570 (2009).
87. T.P. Carsey, R. Ferry, K.D. GOODWIN, P.B. Ortner, J. Proni, P.K. Swart, J.-Z. Zhang. Brevard County Near Shore Ocean Nitrification Analysis. NOAA Technical Report, OAR AOML-37 (2005).
88. Detection of *Karenia brevis* by a microtiter plate assay. K.D. GOODWIN, G. Scorzetti, S.A. Cotton, T.L. Kiesling, P.B. Ortner, J.W. Fell. IN: Harmful Algae 2002. Proceedings of the 10th International Conference on Harmful Algae. K.A. Steidinger, J.H. Landsberg,

C.R. Tomas, G.A. Vargo, G.A. (Eds.). Florida Fish and Wildlife Conservation Commission, Florida Institute of Oceanography and Intergovernmental Oceanographic Commission of UNESCO: Paris (2004).

89. K.D. GOODWIN. The potential for biodegradation of trihalomethanes by aquifer bacteria. IN: M.S. Fram, B.A. Bergamaschi, K.D. GOODWIN, R. Fujii, J.F. Clark. Processes Affecting the Trihalomethane Concentrations Associated with the Third Injection, Storage, and Recovery Test at Lancaster, Antelope Valley, California, March 1998 through April 1999, U.S. Geological Survey Water-Resources Investigations Report, 03-4062, <http://water.usgs.gov/pubs/wri/wri034062/> (2003).
90. M.S. Fram, J.K. Berghouse, B.A. Bergamaschi, R. Fujii, K.D. GOODWIN, and, J.F. Clark. Water-quality monitoring and studies of the formation and fate of trihalomethanes during the Third Injection, Storage, and Recovery Test at Lancaster, Antelope Valley, California, March 1998 through April 1999. U.S. Geological Survey Open-File Report 2002-102, <https://pubs.er.usgs.gov/publication/ofr02102> (2002).

Selected Invited Presentations

- K.D. GOODWIN. NOAA 'Omics Strategy. Briefing to the NOAA Science Advisory Board, April 14 (2020).
- K.D. GOODWIN, et al. AORA Marine Microbiome Roadmap. All-Atlantic Ocean Research Forum, February 6 (2020), Brussels, Belgium.
- K.D. GOODWIN. 'Omics: New Technologies to Address NOAA Mission. AOML Review. November 19, (2019), Miami, FL.
- K.D. GOODWIN. A Brief Look at Some US Microbiome Science. Atlantic Ocean research Alliance, October 21, 2019, Reykjavik, Iceland.
- K. GOODWIN. Marine Genetic Resources and NOAA 'omics briefing. International Affairs Committee and Department of State, Biodiversity Beyond Areas of National Jurisdiction Marine Genetic Resources Team (BBNJ MGR), August 1 (2019).
- K. GOODWIN. NOAA 'omics strategy. NOAA Research Council, Silver Spring MD, July 30 (2019).
- K. GOODWIN. A glimpse at U.S. microbiome science. Atlantic Ocean Research Alliance, Brussels, Belgium, June 26 (2019).
- K. GOODWIN. NOAA 'omics to serve conservation priorities. NOAA Habitat Conservation Division Meeting, Miami, FL May 22 (2019).
- K. GOODWIN. Omics for fisheries stock assessments. NOAA Science Advisory Board Ecosystem Sciences and Management Working Group, Silver Spring MD, May 15 (2019).
- K. GOODWIN. NOAA 'omics to serve the blue economy. Briefing to T. Wilhelm, Director Office of Program Evaluation Planning and Risk Management, Miami, FL May 1 (2019).
- K. GOODWIN and M. Strom. NOAA omics roadmap. NMFS Science Board/ OAR Senior Research Council Bilateral Meeting, La Jolla CA, March 26 (2019).
- K. GOODWIN, C. Werner. eDNA: a NOAA perspective. The National Conference on Marine Environmental DNA, New York, November 29-30 (2018). (Plenary).
- K. GOODWIN. eDNA research priorities in NOAA, a broad perspective. US-Norway Science Workshop, Tromsø, Norway, October 8-11 (2018).

Kelly D. Goodwin, Ph.D.

- K. GOODWIN, C. McLean, C. Werner, S. Thur. NOAA 'omics overview. Briefing to Legislative Staff, Senate Committee on Appropriations, Subcommittee on Commerce, Justice, Science and Related Agencies, Washington DC, September 26 (2018).
- K. GOODWIN. NOAA 'omics. Briefing to Rear Admiral Timothy Gallaudet, April 4 (2018).
- K. GOODWIN, M. Strom. NOAA 'omics collaborative activities. Briefing to Brandon Elsner, Senior Policy Advisor to the Administrator of NOAA, March 16 (2018).
- K. GOODWIN. NOAA 'omics research and efforts to transition into management applications and operational observations. Workshop on Enhancing Interoperability & Coordination of Long-term 'Omics Observations. Bremen, Germany, February 21 (2018).
- K. GOODWIN. NOAA cross-line, interagency, and international engagement in 'omics. NOAA Research Council. February 20 (2018).
- K. GOODWIN and M. Strom. 'Omics. OAR-NMFS Bilateral Meeting, August 30, 2016.
- K. GOODWIN. Challenges in method calibration. National Environmental Monitoring Conference, Applications of Quantitative Polymerase Chain Reaction (qPCR) Methods for Microbiological Contaminants. August 12 (2016).
- K. GOODWIN. 'Omics: An emerging approach to innovate environmental intelligence. NOAA Ecological Forecasting Roadmap Annual Meeting. April 27 (2016).
- K. GOODWIN. NOAA 'Omics. Transformational tools strategical applied. NOAA Ecosystem Sciences and Management Working Group, NOAA Science Advisory Board. November 20 (2015)
- K. GOODWIN. Ocean Sampling Day (June 21st) and other Nifty Marine Metagenomic Projects. Northern California Water Quality Workgroup Meeting, May 14 (2015).
- K. GOODWIN. Marine molecular microbiology to explore and understand biodiversity and ecological function. Ocean Sampling Day (OSD) and My Ocean Sampling Day (MyOSD) TransAtlantic Ocean Science and Ocean Literacy Online Workshop, May 12 (2015).
- K. GOODWIN and M. Bohan. NOAA-CalCOFI Ocean Genomic Project (NCOG) – exploring 'omics technologies to support ecosystem understanding & fisheries assessments. Interagency Working Group on Ocean Partnerships (IWG-OP) Biodiversity Ad Hoc Group. January 22 (2015).
- K.D. GOODWIN, C. Sinigalliano, M. Gidley. Oceans and Ecosystems Research, Molecular & Environmental Microbiology to explore biodiversity, understand ecological function, and protect health. AOML Program Review, March 4 (2014).
- K.D. GOODWIN. Marine microbial ecology and molecular microbiology, opportunities for scientific collaboration to explore biodiversity, understand ecological function, and protect health, US-EC Joint Consultative Group Meeting on Science and Technology Cooperation, hosted by the U.S. Department of State, Washington DC, February 12 (2013).
- K.D. GOODWIN. Molecular Microbiology to explore biodiversity, understand ecological function, and protect health. NOAA Science Day, NOAA Headquarters, Silver Spring, January 30 (2013)
- K.D. GOODWIN, K. Yamahara, A. Cox, B. Nilsson, B. Layton, A. Boehm, J. Griffith, M. Strom, S. Weisberg, C. Preston, C. Scholin, and Spyglass Inc. In-situ biological sensors for public health risk detection in coastal waters. 92ND American Meteorological Society Annual Meeting, Environment and Health Symposium, New Orleans, LA, January 24 (2012).

Kelly D. Goodwin, Ph.D.

K.D. GOODWIN. The need to improve sample preparation to advance sensing of microbial contaminants in marine environments. Sample Prep 2011, Knowledge Foundation 4th Annual Detection Technology Conference, Sample Preparation for Virus, Toxin & pathogen Detection & Identification. San Diego, CA, April 5 (2011).

K.D. GOODWIN. Constraints on Sample Preparation for Detection of Low Abundance Microbial Targets. Alliance for Coastal Technologies, Technical Workshop Series: Sampling the Aquatic Environment- Technologies for Sample concentration, Remote Sampling, and Sample Return. Monterey, CA, March 29-31 (2011).

Other Selected Presentations (since 2017, full list available upon request)

K. GOODWIN. AOML Contributions to the NOAA 'Omics Strategy NOAA Booth #222 Ocean Sciences, San Diego February 16-21 (2020).

Z. Gold, D. Kacev, P.H. Barber, K.D. Goodwin, L. Thompson, A. Thompson. Investigating patterns of larval fish community dynamics over the past two decades using a novel application of environmental DNA metabarcoding. Ocean Sciences, San Diego February 16-21 (2020).

K. Harper, K.D. GOODWIN, L. Harpe, E. LaCasella, A. Frey, P.H Dutton. Exploration of eDNA analysis to assess endangered sea turtles. Ocean Sciences, San Diego February 16-21 (2020).

K. Yamahara, C.M. Preston, J.M. Birch, R. Marin III, N. Truelove, Y. Zhan², K.D. GOODWIN, F. Chavez and C.A. Scholin. In-situ autonomous acquisition and preservation of environmental DNA using the Environmental Sample Processor. Ocean Sciences, San Diego February 16-21 (2020).

R.H. Lampe, A. Rabines, R. Goericke, A. Schulberg, H. Zheng, K.D. GOODWIN, L.A. Zeigler, A.E. Allen. The distribution and diversity of diatoms in a coastal upwelling biome. Ocean Sciences, San Diego February 16-21 (2020).

C.C. James, A.D. Barton, L.A. Zeigler, R.H. Lampe, A. Schulberg, H. Zheng, R. Goericke, K.D. GOODWIN, A.E. Allen. The structure and diversity of prokaryotic and eukaryotic plankton communities within the southern California Bight (2014-2018). Ocean Sciences, San Diego February 16-21 (2020).

C. Scholin, C. Preston, K. Yamahara, B. Ussler, J. Birch, K. GOODWIN, F. Chavez. The quest to develop ecogenomic sensors: A 25-year history the Environmental Sample Processor (ESP) as a case study. American Geophysical Union, Fall Meeting, #OS41A-04, Bibcode 2019AGUFMOS41A..04S (2019)

K.D. GOODWIN. Brief History of 'Omics in OAR and AOML 'Omics. OAR 'Omics All Hands. October 30, 2019

K.D. GOODWIN. NOAA 'Omics taskforce update briefing to the Great Lakes Environmental Research Laboratory August 28 (2019).

D. Legler, S. Brunner, E. Osborne, K. GOODWIN, C.Meinig, G. Goni, S. Thurston, R. Medley. Innovative science: Ocean observations. Senior Research Council Meeting, Silver Spring, MD July 23 (2019).

K.D. GOODWIN. NOAA 'Omics taskforce update. Briefing to the Pacific Marine Environmental Laboratory July 22 (2019)

Kelly D. Goodwin, Ph.D.

- G. Doucette, K., S. Ruberg, K. GOODWIN. Mobile, in-situ HAB toxin warning and genomic observation for the Great Lakes. NOAA Emerging Technologies Workshop, Silver Spring, MD, June 25-26 (2019).
- J-I Westgaard J-I and K. GOODWIN. IMR-NOAA joint eDNA project: moving forward together. Norway-US 3rd eDNA Science Workshop, May 9-10 (2019).
- C. Werner, J. Davis, K. GOODWIN, K. Nichols, O. Shelton, M. Strom. Omics & eDNA: a NOAA perspective. Ocean Studies Board, Washington DC, April 23 (2019).
- K. GOODWIN. NOAA ‘Omics with a focus on eDNA. Southwest Fisheries Science Center, La Jolla, CA April 17 (2019).
- L. Thompson, K. Harper, K. GOODWIN. Computational workflows for rapid and customizable analysis of amplicon sequencing data from environmental DNA. 48th Annual Meeting of the American Fisheries Society (AFS) Atlantic City, New Jersey August 20 (2018).
- K. Yamahara, C. Preston, R. Marin III, D. Pargett, S. Jensen, B. Roman, J. Birch, K. Van Houtan, F. Chavez, K. GOODWIN, C. Scholin. Autonomous eDNA Sampling: Development and application of eDNA methods on the 3rd generation Environmental Sample Processor. 48th Annual Meeting of the American Fisheries Society (AFS) Atlantic City, New Jersey August 21 (2018).
- Kacev, D. Gillett, D. Stein, E. de Carvalho, A.F. Gold, Z., Thompson, L. GOODWIN, K. Thompson, A. Metabarcoding to increase ichthyoplankton sampling capacity. 48th Annual Meeting of the American Fisheries Society (AFS) Atlantic City, New Jersey August 20 (2018).
- K.D. GOODWIN, L. Zeigler Allen, A. Rabines, J. McCrow, A. Allen. Inclusion of DNA sequencing into an ecosystem observing program in the southern California Bight. ICES CM 2017/C. International Council for the Exploration of the Sea 2017 Annual Science Conference 18-21 September (2017).
- L. Zeigler Allen, A. Rabines, J. McCrow, K. GOODWIN, A. Allen, Pelagic microbial linkages in the southern California Current Ecosystem, 29976, American Society of Limnology and Oceanography, February 26-March 3 (2017).
- D. Kacev, L. Thompson, K. GOODWIN, E. Stein, D. Gillette, A. Freire, A. Thompson. Developing a robust framework for applying metabarcoding analyses to identify pelagic ichthyoplankton. CalCOFI Conference, San Diego, CA December 6 (2017).
- L. Zeigler Allen, A. Rabines, J.P. McCrow, H. Zheng, K. GOODWIN, M. L. Bohan, A.E. Allen. Exploring ‘omic technologies to support ecosystem understanding and fisheries assessments. CalCOFI Conference, San Diego, CA, December 6 (2017).

Advisory Services

- | | |
|------|---|
| 2019 | Provided input to aid the President of the Conference, 2 nd Session of the Intergovernmental Conference (IGC) on the conservation and sustainable use of marine Biodiversity Beyond National Jurisdiction (BBNJ) |
| 2018 | Represented NOAA with Admiral Gallaudet to solicit stakeholder input regarding implementation of the Department of Commerce 2018–2022 Strategic Plan |
| 2018 | Briefing on ‘Omics to Legislative Staff, Senate Committee on Appropriations, Subcommittee on Commerce, Justice, Science and Related Agencies |
| 2018 | Extensive scientific review of position paper “Use of Marine Genetic Resources” for the September 2018 session of the IGC on an international legally binding instrument under the |

Kelly D. Goodwin, Ph.D.

- United Nations Convention on the Law of the Sea (UNCOLS) on the conservation and sustainable use of marine BBNJ
- 2018 Scientific advice on environmental DNA (eDNA) to Revive & Restore, a non-profit organization focused on bringing biotechnology to conservation
- 2018 Briefing on ‘Omics to NOAA’s Senior Policy Advisor and Director of Policy
- 2018 Provided input toward the NOAA/NMFS-Japan Fisheries Research & Education Agency 1st Bilateral regarding NOAA activities in ‘omics
- 2018 Provided multiple requested reviews of science regarding the use of seaweed bovine nutritional supplements to control methane emissions: GoogleX, Catalina Sea Ranch
- 2017 Review of position paper for BBNJ, “Use of Genetic Resources”
- 2017 Marine Resources Team, National Science and Technology Council (NSTC), Subcommittee on Ocean Science and Technology (SOST), An Ocean Research and Technology Plan for the United States: 2018–2028
- 2016 Presentation to NOAA Science Advisory Board (SAB) Ecosystem Sciences and Management Working Group to inform the Report on Emerging Technologies for NOAA Ocean Research, Operations, and Management in an Ecosystem Context
- 2016–2017 Microbiome Interagency Working Group (MIWG), under the Life Science Subcommittee (LSSC) of the National Science and Technology Council (NSTC) Committee on Science (CoS)
- 2015–2016 Fast Track Action Committee on Mapping the Microbiome, chartered by the NSTC/ LSS/ CoS (NOAA Chief Scientist Nomination)
- 2015 Lead Reviewer of “Use of Marine Genetic Resources” in the First Global Integrated Marine Assessment (“World Ocean Assessment, WOA”) United Nations Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs
- 2013 Presenter to the California Regional Water Quality Board, Los Angeles Region on science to inform implementation of Natural Source Exclusion (NSE)
- 2014 Congressional bill review for NOAA Legal Affairs, Marine Disease Emergency Act
- 2012 Reviewed and co-authored recommendations to the state of California regarding request for proposal (RFP) language for water quality research
- 2011 Congressional recommendations, National Council for Science and the Environment, Development of Marine Sensors for Human and Marine Animal Health
- 2005–2007 Internal Advisory Committee, University of Miami Oceans and Human Health Center
- 2005 Expert Science Panel Member, Near Shore Ocean Nutrifcation, Brevard County, Florida

Agency Service

Writing Teams and Contributions

Strategic Plans and Reports

- 2021 NOAA ‘Omics Strategic Plan
- 2020 NOAA ‘Omics White Paper
- 2020 NOAA ‘Omics Strategy
- 2020 NOAA ‘Omics Fact Sheet
- 2016 Chief Scientist Report, “New Frontier of Using DNA to Study Marine Life”
- 2012 Ecosystem Research Science Challenge Workshop: Informing NOAA’s Ecosystem Research Agenda
- 2012 Report to Congress: America Competes

Kelly D. Goodwin, Ph.D.

- 2011 US Integrated Ocean Observing Systems Marine Sensor Technology Improvement Program: A Program Plan for Transition into Operations
- 2007 Interagency Oceans and Human Health Research Implementation Plan: A Prescription for the Future.
- Research in NOAA: Toward Understanding and Predicting Earth's Environment A Five-Year Plan: Fiscal Years 2005 – 2009

Performance Measure Development

- Integrated Research Assessment (IEA) program
- Multiple AOML measures and milestones (>10)

Implementation Plans

- Holistic Understanding Enterprise FY13-19
- Environmental Modeling FY13-19
- Oceans and Atmospheric Research, Holistic Understanding 2012
- 2011 Plans: Enterprise Goal, Coastal Goal, Marine Transportation, AOML

Selected Alternatives, Initiatives, Program Change Summaries

- NOAA 'Omics Genome-Enabled Technologies
- Advancing Technology Alternative - Ocean Research Priorities Plan BioSensors Expansion
- Integrated Ecosystem Assessment Expansion: Increasing FMPs Capability to Sustainably Manage Trust Resources
- Sensors for Marine Ecosystems
- An Ecosystem Approach to Management to Solve Regional Challenges: Predicting and Managing the Ecosystem Impacts of Water and Wastewater Release into the Coastal Zone
- Research to Sustain Human and Ocean Health in Urbanized Coastal Ecosystems of the Tropics and Subtropics
- Ensure the Development of Regionally-Specific, Integrated Ecosystem Models to Support Ecosystem Management
- Early Warning Systems: Protecting Coastal Ecosystems, Humans, and Marine Animal Health
- National Health Early Warning System
- Coastal Threats to National Security: Microbial and Chemical Contaminants, Seafood Safety, and BioSecurity

White Papers

- Genomics: Modern techniques to address long-standing challenges in marine ecosystems and fisheries management
- Biosafe Aquaculture: A means to replenish protected and endangered species and to meet the growing demands for safe seafood
- Integrated Ecosystem Assessments
- A Draft Framework for Integrated Ecosystem
- Regional Ecological Forecasting Centers: Integrated Plan of Operations
- Safe and Sustainable Seafood: increased monitoring of seafood to support markets for legitimate imported and domestic products
- Health Early Warning Systems
- National Operational Harmful Algal Bloom and Microbial Contaminant Forecast System

Committees and Working Groups

2021– Chair, NOAA 'Omics Working Group

Kelly D. Goodwin, Ph.D.

- 2019– Interagency Working Group on Biological Data Sharing, Biological Science Subcommittee, Committee on Science, National Science and Technology Council
- 2019 Atlantic Ocean Research Alliance (AORA), Microbiome
- 2019 US-Norway Bilateral on eDNA
- 2018– NOAA ‘Omics Taskforce, Co-Chair with M. Strom, NMFS
- 2018– Government Environmental DNA Working Group (GEDWG)
- 2017 Annual Operating Plan (AOP) Refresh Working Group
- 2015– Marine Biodiversity Observing Network Working Group Participant
- 2014– NOAA OAR-NMFS Bilateral, OAR Point of Contact, Genomics
- 2012–2014 Strategy, Evaluation, and Execution (SEE) response team lead for AOML
- 2012–2017 NOAA Marine Microbes & Ecosystem Health Working Group (co-chair from 2014)
- 2014 S. California Regional Monitoring, SOP Development Subcommittee (Bight 13)
- 2013 NOAA Ecological Forecasting, Pathogens Working Group
- 2012 National Ocean Policy Implementation, Priority Objective Team
- 2011 NOAA Water Quality Objective Team, Coastal Goal
- 2011 NOAA Integrated Ecosystem Assessment (IEA) Team
- 2010 National Ocean Policy, NOAA Engagement Strategy
- 2010– NOAA One Health Working Group (point of contact for OAR since 2012)
- 2009–2011 NOAA Regional Team Member, Gulf of Mexico
- 2009–2011 NOAA Regional Team Integrated Ecosystem Assessment Subgroups, Gulf of Mexico and California Current
- 2008–2014 Gulf of Mexico Regional Alliance Water Quality Priority Team, Pathogens
- 2008–2009 Planning, Programming, Budgeting, and Execution System (PPBES) Tiger Team
- 2008 NOAA Ecosystem Goal Team, Integrated Ecosystem Assessments Priority Area Task Force (IEA PATT)
- 2007–2017 California Beach Water Quality Workgroup
- 2007–2008 NOAA’s Ecosystem Research Program Strategic Planning Team
- 2007 Gulf of Mexico Coastal Ocean Observing System (GCOOS-RA), Standing Task Team on Public Health
- 2007–2011 NOAA’s Ecosystem Research Program (ERP) AOML Point of Contact for PPBES (Planning, Programming, Budgeting and Execution System)
- 2006–2007 NOAA Ecosystem Goal 5-Year Research Plan Writing Team
- 2006 Coastal Ocean Observing System - Regional Association (GCOOS-RA), Gulf of Mexico Public Health Workgroup
- 2004 AOML Safety Committee

Panel Membership

- 2017 NOAA Office of Exploration funding panel (partial panel)
- 2016 NOAA Office of Exploration funding panel (full panel)
- 2011 NOAA SBIR Technical Representative, Phase 2: In-Field Sensors for Detection of Microbial Contaminants in Coastal Waters
- 2010 NOAA SBIR Technical Representative, Phase 1: In-Field Sensors for Detection of Microbial Contaminants in Coastal Waters
- 2008 Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) funding panel
- 2007 NOAA SBIR Technical Representative, In-Field Sensors for Detection of Microbial Contaminants in Coastal Waters
- 2007 NOAA Small Business Innovation Research (SBIR): Domoic Acid Detection Kit

Kelly D. Goodwin, Ph.D.

- 2006 Ernest F. Hollings Undergraduate Scholarship Program Selection Committee
- 2005 Ernest F. Hollings Undergraduate Scholarship Program Selection Committee
- 2005 Cooperative Institute of Coastal and Estuarine Environmental Technology (CICEET) Program Review, Technology Transfer
- 2004 University of Miami, Marine Biology & Fisheries Dissertation Committee
- 2003 NOAA Paper of the Year National Committee
- 2003 University of Miami, Marine Biology & Fisheries, Faculty Search Committee
- 2002 NOAA Paper of the Year AOML Committee

Editor and Technical Review

Editor, Whole Journal

Miller L.G. and GOODWIN K.D., editors. Halocarbon Biogeochemistry, special issue. *Biogeochemistry* 60(2), 92 pages (2002)

Chief Editor, Books

Shin, J.C., Traditional Tang Soo Do: Volume 3 (2019) in press; Volume 2 ISBN: 978-0-9855903-9-0 (2018); Volume 1 ISBN: 978-0-9855903-4-5 (2014); Volume 6 ISBN: 978-0-9855903-0-7 (2012); Strong, W.R. One More Time ISBN: 978-0-9855903-7-6 (2018)

Article and Proposal Review (~5 per year)

Journals:

Aquatic Microbial Ecology, Applied and Environmental Microbiology, Bioscience and Bioengineering, Deep-Sea Research, Environmental Microbiology, Environmental Engineering and Management, Environmental Science and Technology, Fishery Bulletin, Harmful Algae, International Journal of Environmental Research and Public Health, Limnology and Oceanography, Marine Pollution Bulletin, Science of the Total Environment, Water, Water Research

Proposals:

NOAA Coral Reef Conservation Program, ECOHAB, Department of Agriculture, National Science Foundation, Natural Environment Research Council, NIST Construction Grant Program, NOAA Coastal Services Center Oceans and Human Health Initiative External Grants Program, NOAA Office of Exploration, NOAA Sea Grant, NOAA Small Business Innovative Research (SBIR), Saltonstall-Kennedy Competitive Research Program, UK SOLAS, USDA SBIR

Teaching Experience

University of California San Diego (lectures)

- 2015–2019 Marine Micro SIO126, Monitoring Harmful Microbes in the Marine Environment
- 2012, 2018 Graduate Marine Biotechnology, New Methods to Monitor Organisms
- 2015, 2016, 2020 Marine Biotechnology SIO 242B, Biosensing
- 2015 Marine Micro Lab SIO126L, Recreational Water Quality
- 2009, 2012, 2015 Bioinformatics BILD94, Environmental Molecular Microbiology

Rosenstiel School of Marine and Atmospheric Chemistry (lectures)

- 2004–2007 Fundamental Chemical Oceanography, MAC 605 & MAC 581, Environmental Microbiology/Biogeochemical Cycling/Biodegradation

California Institute of Technology (teaching assistant)

- 1990–1994 Microbial Diversity (ENV 168), Environmental Biology (ENV 145), Environmental Biology Laboratory (ENV 145L)

Professional Societies and Organizations

The Oceanography Society (TOS) American Chemical Society (ACS), American Society for Microbiology (ASM), American Association for the Advancement of Science (AAAS), Microbiome and Metagenomics Standards Alliance (IMMSA), Genomics Standards Consortium (GSC)

Outreach

- 2018 University of Texas Austin, marine ecology class NPR-style interview
- 2017 Washington Post, Health and Science Section contributor - Beach Dangers
- 2015 Citizen Science Training and Citizen Science Hub for Ocean Sampling Day
- 2014 Ocean Sampling Day at SIO pier with Girl Scouts participation
- 2013 NOAA and Our Planet Day, Aquarium of the Pacific ~4000 visitors
- 2009 Smithsonian National Museum of Natural History, Ocean Today Kiosk; authored "Healthy Beaches" with NOAA Oceans and Human Health
- 2005 Featured Scientist, Our Ocean World radio segment
- 2006 Community Science Workshop, Children's Trust and Citizens for a Better S. Florida
- 2006 Hands-on learning, AOML open house
- 2007 Guest Lecture, Career Choices for the PhD, Science Alliance
- 2000 Outreach Lecture for Environmental Science High School Teachers

Workshops and Sessions Organized

- 2020 "International Conference on the use of Environmental DNA (eDNA) in Marine Environments: Opportunities and Challenges" eDNA Scientific Advisory for Committee for the Partnership for Observation of the Global Ocean (POGO) Biological Observations Working Group
- 2020 "Envisioning the future of eDNA sampling and sample processing" Alliance for Coastal Technologies Workshop Series on eDNA
- 2018 AOML 'Omics Program Review
- 2017 AOML 'Omics Overview & Coordination with NOAA Programs, Lines, & Partners
- 2015 Coastal and Estuarine Research Federation Session co-Chair, Aquatic Microbial Indicators of Ocean Changes
- 2012 Ecosystem Research Science Challenge Workshop Organizing Committee
- 2011 National Council for Science and the Environment Session Chair, Monitoring and Forecasting Health Threats from the Oceans
- 2006 Florida Marine Biotechnology Conference Planning Committee
- 2004 Florida Marine Biotechnology Conference Planning Committee
- 2000 American Geophysical Union Fall Meeting Special Session Co-chair, Global Biogeochemistry and Contaminant Transformations

Selected Workshop Participation

- 2018 US-Norway Science Round Table: eDNA – A Tool for Quantitative Assessments of Marine Ecosystems, Woods Hole MA
- 2017 National Microbiome Data Collaboration, Washington DC
- 2017 Genomic/eDNA Interagency Meeting, Smithsonian National Museum, Natural History
- 2016 NIST Standards Workshop for Microbiome Measurements, Gaithersburg MD

Kelly D. Goodwin, Ph.D.

- 2015 MicroB3 Ocean Sampling Day (OSD) Analysis Workshop, Cambridge UK
- 2013 US-EU Joint Consultative Group Meeting on Science and Technology Cooperation
- 2013 NOAA Ecosystem Research Demonstration Roundtable, Silver Spring MD
- 2011 NOAA Ecosystem Research Portfolio Workshop, Silver Spring MD
Helped develop a comprehensive Ecosystem Research Agenda that strategically aligns and integrates the agency's science assets, partnerships and capabilities to facilitate research needed to support the sustainable use, protection, and restoration of coastal and marine ecosystems, and the resulting ecosystem services.
- 2009 NOAA Coral Reef Conservation Program Strategic Goals and Objectives Workshop, Land Based Sources of Pollution, Silver Spring MD
- 2008 Integrated Ecosystem Assessments Priority Area Task Team Workshop, La Jolla CA
- 2008 NOAA Coastal Integration Workshop, Silver Spring MD
- 2008 NOAA Ocean and Human Health Logic Model Workshop, Silver Spring MD
- 2008 Strength, Weakness, Opportunities, and Threats (SWOT) Analysis of the Ecosystem Research Program, Silver Spring MD

Sea Crossing Certifications

- 2001 South Polar Sea Dog (Antarctic Circle)
- 1999 Domain of the Golden Dragon (International Date Line)

Other Training (details available upon request)

qPCR; PCR, Quantitative Microbial Risk Assessment; Microbial Source Tracking; Marine Bioinformatics; Marine Mammal Stranding and Necropsy Training; Data Carpentry; Introduction to Git and GitHub; Kbase; R programming; Shotgun Metagenome Analysis; Prokaryotic Annotation and Analysis