

## CURRICULUM VITAE

**Dr. William McKay Balch**  
**Bigelow Laboratory for Ocean Sciences**  
**60 Bigelow Drive**  
**East Boothbay, ME 04544**

DATE: 21 February, 2023

### PERSONAL

Office Phone: (207) 315-2567 (Ext. 301)  
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Current Position: Senior Research Scientist

Citizenship: U. S. A.

INTERESTS Phytoplankton physiological ecology, bio-optics, phytoplankton mixotrophy, ocean acidification and remote sensing.

### HIGHER EDUCATION

Institutional: Cornell University, B.A., 1980. *Cum laude* in biology  
Scripps Institution of Oceanography, Ph.D., 1985

Certification, licensure: Univ. of Miami Radioisotope License, 1988-1995  
Bigelow Laboratory Radioisotope License, 1995-present

### HONORS

Elected Councilor to The Oceanography Society (TOS; 2015-2017; three-year term)

Invited keynote speaker, Schulich Ocean Studies Initiative Conference, Eilat, Israel.  
October 2017

Invited plenary speaker, 20<sup>th</sup> anniversary of the Atlantic Meridional Transect Conference.  
June 2015. “Contributions of the AMT program to knowledge about coccolithophore distributions at the basin scale, their optical properties and decadal trends”

14<sup>th</sup> Annual Gordon Riley Memorial Lecture – Dalhousie University November 2012;  
established in 1999 to honor the memory of the late Gordon A. Riley, Professor of

Oceanography and Director of the Institute of Oceanography (now Department of Oceanography)

Invited plenary speaker, 14<sup>th</sup> International Nanoplankton Association, Reston, VA; September, 2013

## EXPERIENCE

### *Academic:*

Senior Research Scientist , Bigelow Laboratory for Ocean Sciences, 1995-present, External Graduate Faculty member, School of Marine Sciences, University of Maine, Orono, ME; 2017-2022; Old Dominion University, Norfolk, VA 2018-2022; Rutgers University (2020-present)

Research Faculty, Colby College, 2010-present.

Adjunct Scholar, Dalhousie University, Halifax Nova Scotia (2014)

Undergraduate Education Coordinator with University of New England 1995-2005

Adjunct Professor. Division of Life Sciences, University of New England, Biddeford, ME. 1996 to 2005

Associate Professor. Division of Marine Biology and Fisheries, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida. 1992-1995. Tenure awarded June 1994. Leave of absence from U. Miami from 5/95-8/97.

Assistant Professor. Division of Marine Biology and Fisheries, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida. 1988-1992.

Post-doctoral Investigator. Institute of Marine Resources, Scripps Institution of Oceanography, San Diego, California. 1986-1987.

### *Non-Academic:*

Research Associate. Joint program between Bigelow Laboratory for Ocean Sciences and the Instituto Español de Oceanografía, Vigo, Spain. 1986.

Contract Scientist with Dr. W.G. Harrison. Marine Ecology Laboratory, Bedford Institute of Oceanography, Dartmouth, N.S., Canada. 1985-1986.

Visiting Investigator with Dr. P.M. Holligan, Marine Biological Association, Plymouth, England. 1980.

Laboratory Technician for Drs. C.S. Yentsch and C.M. Yentsch, Bigelow Laboratory for Ocean Science, Boothbay Harbor, Maine. 1974-1979.

Laboratory Technician for Drs. C.S. Yentsch and Dr. C.M. Yentsch. University of Massachusetts Marine Station, Gloucester, Massachusetts. 1972-1973.

**PUBLICATIONS A total of 143 journal articles, book chapters, monographs, data sets: 5 papers in preparation, submitted, or in revision, 19 published technical reports and one book; Google Scholar h-index = 56; 11,188 citations; Researchgate h-index =53, 9763 citations; SCOPUS h-index=43; 6827 citations; Orcid number: 0000-0003-4926-195X**

- 143) **Balch, W. M.** and Mitchell, C. (2023), Remote sensing algorithms for particulate inorganic carbon (PIC) and the global cycle of PIC, *Earth System Reviews*, *Accepted 2/18/23*
- 142) Friedland KD, Record NR, Pendleton DE. **Balch WM**, Stamieszkin K, Moisan J, Brady D (2022) Asymmetry in the rate of warming and the phenology of seasonal blooms in the Northeast US Shelf Ecosystem. *ICES J Mar Sci (In press)*
- 141) Valente, A., S. Sathyendranath, V. Brotas, S. Groom, M. Grant, M. Taberner, D. Antoine, R. Arnone, **W. M. Balch**, K. Barker, R. Barlow, S. Bélanger, J. F. Berthon, S. Beşiktepe, Y. Borsheim, A. Bracher, V. Brando, B. Brewin, E. Canuti, F. Chavez, A. Cianca, H. Claustre, L. Clementson, R. Crout, G. Dall’Olmo, R. Frouin, C. García-Soto, S. W. Gibb, R. Goericke, R. Gould, N. Guillocheau, S. B. Hooker, C. Hu, M. Kahru, M. Kampel, H. Klein, S. Kratzer, R. Kudela, J. Ledesma, S. Lohrenz, H. Loisel, A. Mannino, P. Matrai, D. McKee, B. G. Mitchell, T. Moisan, E. Montes, F. Muller-Karger, A. Neeley, L. O’Dowd, M. Ondrusek, T. Platt, A. J. Poulton, M. Repecaud, T. Schroeder, T. Smyth, D. Smyth-Wright, H. M. Sosik, G. Tilstone, M. Twardowski, V. Vellucci, K. Voss, J. Werdell, M. Wernand, S. Wright, B. Wojtasiewicz and G. Zibordi (2022). "A compilation of global bio-optical in situ data for ocean-colour satellite applications - Version three." *Earth System Science Data*; 14, 5737–5770 <https://doi.org/10.5194/essd-14-5737-2022>.
- 140) **Balch, W. M.**, Dave T. Drapeau, Bruce C. Bowler, Nicholas Record, Nicholas R. Bates, Sunny Pinkham, Rebecca Garley and Catherine Mitchell. 2022. Changing hydrographic, biogeochemical and acidification properties in the Gulf of Maine as measured by the Gulf of Maine North Atlantic Time Series, GNATS, between 1998-2018. *JGR Biogeosciences*, V. 127, e2022JG006790. <https://doi.org/10.1029/2022JG006790>
- 139) **Balch, W.M.**, M. Carranza, I. Cetinic, J.E. Chaves, S. Duhamel, A. Fassbender, A. Fernandez-Carrera, S. Ferrón, E. García-Martín, J. Goes, H. Gomes, K. Gundersen, K. Halsey, T. Hirawake, T. Isada, L. Juranek, G. Kulk, C. Langdon, R. Letelier, D. López-Sandoval, A. Mannino, J. Marra, P. Neale, D. Nicholson, G. Silsbe, R. Stanley, and R.A. Vandermeulen. 2022. Aquatic Primary Productivity Field Protocols for Satellite Validation and Model Synthesis. In *IOCCG Protocol Series Volume 7.0, 2022; IOCCG Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation*, edited by R. A. Vandermeulen and J. E. Chaves. Dartmouth, NS, Canada: IOCCG. doi: <http://dx.doi.org/10.25607/OBP-1835> . 201pp.

- 138) Collister, B.L., R. C. Zimmerman, V. J. Hill, C. I. Sukenik, **W. M. Balch**. (2022) The influence of particle concentration and bulk characteristics on polarized oceanographic lidar measurements. *Limnology and Oceanography*. V. 67(6), p. 1374-1387. <https://doi.org/10.1002/lno.12088> .
- 137) Godrijan, J., Drapeau, D.T. and **Balch, W.M.** (2022), Osmotrophy of dissolved organic carbon by coccolithophores in darkness. *New Phytol.* V.233 (2), p. 781-794. <https://doi.org/10.1111/nph.17819>
- 136) Collister, B. L., Zimmerman, R. C., Hill, V. J., Sukenik, C. I., and **Balch, W. M.**, 2020, Polarized lidar and ocean particles: Insights from a mesoscale coccolithophore bloom: *Applied Optics*, v. 59, no. 15, p. 4650-4662. <https://doi.org/10.1364/AO.389845>
- 135) Godrijan, J., D. Drapeau, **W.M. Balch**. (2020), Mixotrophic uptake of organic compounds by coccolithophores. *Limnology and Oceanography*, 20, 1410-1421 <https://doi.org/10.1002/lno.11396>.
- 134) Hopkins, J., S. A. Henson, A. J. Poulton, and **W. M. Balch\*** (2019), Regional influences on temporal variability in global particulate inorganic carbon inventory, *Global Biogeochem. Cycles*, 33, <https://doi.org/10.1029/2019GB006300>. \*Corresponding author.
- 133) **Balch, W.M.**, Bowler, B.C., Drapeau, D.T., Lubelczyk, L.C., Lyczkowski, E. Mitchell, C. and Wyeth, A. 2019 Coccolithophore distributions of the North and South Atlantic Ocean. *Deep-Sea Research 1*. <https://doi.org/10.1016/j.dsr.2019.06.012>.
- 132) Boss, E., Haëntjens, N., Ackleson, S., **Balch, W.M.**, Chase, A., Dall’Olmo, G., Freeman, S., Liu, Y., Loftin, J., Neary, W., Nelson, N., Novak, M., Slade, W., Proctor, C., Tortell, P., and Westberry, T. (2019). Inherent Optical Property Measurements and Protocols: Best Practices for the Collection and Processing of Ship-Based Underway Flow-Through Optical Data. IOCCG Protocol Series, *IOCCG Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation*, Volume 4.0, edited by A. R. Neeley and A. Mannino, IOCCG, Dartmouth, NS, Canada. <https://repository.oceanbestpractices.org/handle/11329/1144>.
- 131) Valente, A., Sathyendranath, S., Brotas, V., Groom, S., Grant, M., Taberner, M., Antoine, D., Arnone, R., **Balch, W. M.**, Barker, K., Barlow, R., Bélanger, S., Berthon, J.-F., Beşiktepe, Ş., Borsheim, Y., Bracher, A., Brando, V., Canuti, E., Chavez, F., Cianca, A., Claustre, H., Clementson, L., Crout, R., Frouin, R., García-Soto, C., Gibb, S. W., Gould, R., Hooker, S. B., Kahru, M., Kampel, M., Klein, H., Kratzer, S., Kudela, R., Ledesma, J., Loisel, H., Matrai, P., McKee, D., Mitchell, B. G., Moisan, T., Muller-Karger, F., O’Dowd, L., Ondrusek, M., Platt,

- T., Poulton, A. J., Repecaud, M., Schroeder, T., Smyth, T., Smythe-Wright, D., Sosik, H. M., Twardowski, M., Vellucci, V., Voss, K., Werdell, J., Wernand, M., Wright, S., and Zibordi, G.: A compilation of global bio-optical in situ data for ocean-colour satellite applications – version two, **Earth Syst. Sci. Data**, 11, 1037–1068, <https://doi.org/10.5194/essd-11-1037-2019> , 2019.
- 130) Record, N.R., J. A. Runge, D.E. Pendleton, **W.M. Balch**, K.T.A. Davies, A.J. Pershing, C.L. Johnson, K. Stamieszkin, R. Ji, Z. Feng, S.D. Kraus, R.D. Kenney, C. Hudak, C.A. Mayo, C. Chen, J. Salisbury, C.R.S. Thompson. (2019) Rapid climate-driven circulation changes threaten conservation of endangered North Atlantic right whales. **Oceanography**. <https://doi.org/10.5670/oceanog.2019.201>
- 129) Record, N. R., **W. M. Balch**, and K. Stamieszkin (2019), Century-scale changes in phytoplankton phenology in the Gulf of Maine, *PeerJ*. 7:cc6735 <http://doi.org/10.7717/peerj.6735> .
- 128) Mitchell, C., H. R. Gordon, B. C. Bowler, D. T. Drapeau, and **W. M. Balch** (2018), Optical inversions of the water column based on glider measurements., **Optics Express**, 26(25), 32824–32838. <https://doi.org/10.1364/OE.26.032824> .
- 127) Daniels, C.J., A. J. Poulton, **W. M. Balch**, E. Marañón, T. Adey, B. C. Bowler, P. Cermeño, A. Charalampopoulou, D. W. Crawford, D. Drapeau, Y. Feng, A. Fernandez, E. Fernandez, G. M. Fragoso, N. Gonzalez, L. M. Graziano, J. Harlay, R. Heslop, P. M. Holligan, J. Hopkins, M. Huete-Ortega, D. A. Hutchins, P. J. Lam, M. S. Lipsen, D. C. Lopez-Sandoval , S. Loucaides, A. Marchetti, K. Mayers, A. P. Rees, C. Sobrino, E. Tynan, T. Tyrrell and A. Wyeth . 2018. A global compilation of calcite production rates by coccolithophores. **Earth System Science Data**. 10: 1-18.
- 126) White, M. M., J. D. Waller, L. C. Lubelczyk, D. T. Drapeau, B. C. Bowler, **W. M. Balch**, and D. M. Fields\* (2018), Coccolith dissolution within copepod guts affects fecal pellet density and sinking rate, **Scientific Reports**, 8(1), 9758.  
\*Corresponding author
- 125) White, M. M., D. T. Drapeau, L. C. Lubelczyk, V. C. Abel, B. C. Bowler, and **W. M. Balch\*** (2018), Calcification of an estuarine coccolithophore increases with ocean acidification when subjected to diurnally fluctuating carbonate chemistry. **Marine Ecology Progress Series**. 61: 59-76. <https://doi.org/10.3354/meps12639>.  
\*Corresponding author.
- 124) Collister, B.L. Zimmerman, R.C., Sukenik, C.I., Hill, V.J., **Balch, W.M.** 2018. Remote Sensing of Optical Characteristics and Particle Distributions of the Upper Ocean Using Shipboard Lidar. **Remote Sensing of the Environment**. 215: 85-96. <https://doi.org/10.1016/j.rse.2018.05.032>

- 123) Hopkins, J. and **Balch, W.M.** 2018. A new approach to estimating coccolithophore calcification rates from space. **J. Geophys. Res.- Biogeosciences**. *123*: 1447-1459. doi [10.1002/2017JG004235](https://doi.org/10.1002/2017JG004235).
- 122) **Balch, W.M.**, B. Bowler, D. Drapeau, L. Lubelczyk, and E. Lyczkowski. 2018. Vertical distributions of coccolithophores, PIC, POC, biogenic silica and chlorophyll *a* throughout the global ocean. **Global Biogeochemical Cycles**, *32*(1):2-17.
- 121) **Balch, W.M.** Ecology, Biogeochemistry, and Optical Properties of Coccolithophores. 2018. **Annual Reviews in Marine Science**. *10*:71-98.
- 120) Cao, X., Aiken, G. R. , Butler, K. D. , Huntington, T. G., **Balch, W. M.**, Mao, J., Schmidt-Rohr, K. 2018. Carboxyl-rich alicyclic molecules as major structural components in dissolved organic matter along a river to sea transect, **Organic Geochemistry**.*116*: 62-76
- 119) Mitchell, C., C. Hu, B. Bowler, D. Drapeau and **W. M. Balch**, 2017. Estimating particulate inorganic carbon concentration from ocean color measurements using a reflectance difference approach. **Journal of Geophysical Research Oceans**. *122*. <https://doi.org/10.1002/2017JC013146>
- 118) Smith, H. E. K., **Balch, W. M.**, Twining, B. Bates, N. Hopkins, J. Poulton, A. J. 2017. "The Influence of Environmental Variability on the Biogeography of Coccolithophores and Diatoms in the Great Calcite Belt." **Biogeosciences**. *14*, 4905–4925, <https://doi.org/10.5194/bg-14-4905-2017>.
- 117) Randolph, K., H. M. Dierssen, A. Cifuentes-Lorenzen, **W. M. Balch**, E. C. Monahan, C. Zappa, D. Drapeau, and D. Bowler. 2017, Novel methods for optically measuring whitecaps under natural wave breaking conditions, **Journal of Atmospheric and Oceanic Technology**, doi: [10.1175/JTECH-D-16-0086.1](https://doi.org/10.1175/JTECH-D-16-0086.1).
- 116) Huntington, T., **Balch, W.M.**, Aiken, G., Sheffield, J., Luo, L., Roesler, C., Camill, P., 2016. Climate change and dissolved organic carbon export to the Gulf of Maine. **Journal of Geophysical Research Biogeosciences**; DOI: [10.1002/2015JG003314](https://doi.org/10.1002/2015JG003314).
- 115) **Balch, W. M.**, Bates, N. R., Lam, Phoebe J., Twining, B. S. , Rosengard, S. Z., Bowler, B.C., Drapeau, D.T., Garley, R., Lubelczyk, L., Mitchell, C. E., Rauschenberg, S. (2016), Factors regulating the Great Calcite Belt in the Southern Ocean and its biogeochemical significance, **Global Biogeochem. Cycles**, *10.1002/2016GB005414*.
- 114) Marañón, Emilio, **W. M. Balch**, Pedro Cermeño, Natalia González, Cristina Sobrino, Ana Fernández, María Huete-Ortega, Daffne C. López-Sandoval, Maximino Delgado, Marta Estrada, Marta Álvarez, Elisa Fernández-Guallart,

- Carles Pelejero. 2016. Pelagic calcification and carbonate chemistry in the tropical ocean. **Limnology and Oceanography**. 61(4):1345-1357.
- 113) Valente, A., S. Sathyendranath, V. Brotas, S. Groom, M. Grant, M. Taberner, D. Antoine, R. Arnone, **W. M. Balch**, K. Barker, R. Barlow, S. Bélanger, J.-F. Berthon, S. Besiktepe, V. Brando, E. Canuti, F. Chavez, H. Claustre, R. Crout, R. Frouin, C. García-Soto, S. W. Gibb, R. Gould, S. Hooker, M. Kahru, H. Klein, S. Kratzer, H. Loisel, D. McKee, B. G. Mitchell, T. Moisan, F. Muller-Karger, L. O'Dowd, M. Ondrusek, A. J. Poulton, M. Repecaud, T. Smyth, H. M. Sosik, M. Twardowski, K. Voss, J. Werdell, M. Wernand, and G. Zibordi. 2015. A compilation of global bio-optical in situ data for ocean-colour satellite applications. **Earth System Science Data**. 8:235-252. doi:10.5194/essd-8-235-2016
- 112 ) **Balch WM**, Huntington T, Aiken G, Drapeau DT, Bowler BC, Lubelczyk L, Butler K (2016b) Towards a quantitative and empirical dissolved organic carbon budget for the Gulf of Maine, a semi-enclosed shelf sea. **Global Biogeochem Cycles** 30:doi: 10.1002/2015GB005332
- 111) Rivero-Calle, S., DelCastillo, C.E., Gnanadesikan, A., **Balch, W.M.**, Guikema, S.D., 2015. Increase of coccolithophorids in the North Atlantic over recent decades. **Science**. 350:6267, 1533-1537. DOI: 10.1126/science.aaa8026.
- 110) Rosengard, S.Z., Lam, P.J., **Balch, W.M.**, Auro, M.E., Pike, S.M., Drapeau, D.T., Bowler, B.C., 2015. Carbon export and transfer to depth across the Southern Ocean Great Calcite Belt. **Biogeosciences**. 12: 3953–3971, 2015  
www.biogeosciences.net/12/3953/2015/ ; doi:10.5194/bg-12-3953-2015
- 109) Salisbury, J., Jonsson, B., **Balch, W.M.**, Chakraborty, S., Chapron, B., Hales, B., Lohrenz, S., Mannino, A., Mathis, J., Reul, N., Signorini, S., Vandemark, D., Wanninkhof, R., Yates, K., 2015. How can present and future satellite missions support scientific studies that address ocean acidification? **Oceanography**. 28(2): 108-121. <http://dx.doi.org/10.5670/oceanog.2015.35> .
- 108) **Balch, W. M.**, Drapeau, D. T., Bowler, B. C., Lyczkowski, E., Lubelczyk, L. C., Poulton, A. J., and Painter, S. C., 2014, Surface biological, chemical and optical properties of the Patagonian Shelf coccolithophore bloom, the brightest waters of the Great Calcite Belt: **Limnology and Oceanography**. 59 (5): 1715-1732.
- 107) **Balch, W.M.**, Bowler, B.C., Lubelczyk, L.C. and Stephens, M., 2014. Aerial extent, composition, bio-optics and biogeochemistry of a massive under-ice algal bloom in the Arctic. **Deep-Sea Research II**, 105: 42-58.
- 106) Arrigo, K.R., Perovich, D.K., Pickart, R.S., Brown, Z.W., van Dijken, G.L., Lowry, K.E., Mills, M.M., Palmer, M.A., **Balch, W.M.**, Bates, N.R., Benitez-Nelson, C., Brownlee, E., Frey, K.E., Laney, S.R., Mathis, J.T., Matsuoka, A., Mitchell, B.G.,

- Moore, G.W.K., Reynolds, R.A., Sosik, H.M., Swift, J.H., 2014. Phytoplankton blooms under the sea ice in the Chukchi Sea. **Deep-Sea Research II** 105, 1-16.
- 105) Muller-Karger, F.E., Kavanaugh, M.T., Montes, E., **Balch, W.M.**, Breitbart, M., Chavez, F. P., Doney, S.C., Johns, E.M., Letelier, R.M., Lomas, M.W., Sosik, H.M. and White, A.E. 2014. A framework for a marine biodiversity observing network within changing continental shelf seascapes. **Oceanography**. 27(2), 18-23. <http://dx.doi.org/10.5670/oceanog.2014.56>
- 104) Valiadi, M., Painter, S.C., Allen, J.T., **Balch, W.M.** and Iglesias-Rodriguez, M.D., 2014. Molecular detection of bioluminescent dinoflagellates in surface waters of the Patagonian Shelf during early austral summer, 2008. **PLoS ONE**, 9(6): e98849. doi:10.1371/journal.pone.0098849
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- 102) Arrigo K.R., Perovich D.K., Pickart R.S., Brown Z.W., van Dijken G.L., Lowry K.E., Mills M.M., Palmer M.A., **Balch W.M.**, and others (2012) Massive phytoplankton blooms under Arctic sea ice. **Science**. 336: 1408.
- 101) **Balch, W.M.**, Drapeau, D.T., Bowler, B.C., Huntington, T., 2012. Step-changes in the physical, chemical and biological characteristics of the Gulf of Maine, as documented by the GNATS time series. **Marine Ecology - Progress Series**, 450, 11–35. doi: 10.3354/meps09555.
- 100) Codiga, D.L., **W.M. Balch**, SM Gallager, PM Holthus, HW Paerl, JH Sharp. 2012. Ferry-based Sampling for Cost-Effective, Long-Term, Repeat Transect Multidisciplinary Observation Products in Coastal and Estuarine Ecosystems. Community White Paper, IOOS Summit, Herndon, VA (November, 2012).
- 99) Brown, M.S., Craig, S.E., Franz, B.A., Werdell, P.J., Zhang, X., Grant, J., Lewis, M., **Balch, W.M.**, 2012. Quantification of the Contribution of Coccolithophores to Reflectance Spectra in the Southern Ocean. Ocean Optics. The Oceanography Society, Glasgow, Scotland, p. 9.
- 98) Poulton AJ, Young JR, Bates NR, **Balch WM** (2011) Biometry of detached *Emiliana huxleyi* coccoliths along the Patagonian Shelf. **Marine Ecology Progress Series**, 443: 1-17 doi: 10.3354/meps09445
- 97) **Balch WM**, Drapeau DT, Bowler BC, Booth ES, Lyczskowski E, Alley D (2011) The contribution of coccolithophores to the optical and inorganic carbon budgets during the Southern Ocean Gas Experiment: New evidence in support of the



"Great Calcite Belt" hypothesis. **Journal of Geophysical Research-Oceans** Special Issue. VOL. 116, C00F06, doi:10.1029/2011JC006941.

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- 93) Brzezinski, M., S.B. Baines, **W.M. Balch**, Charlotte Beucher, F. Chai, R.C. Dugdale, J.W. Krause, M.R. Landry, A. Marchi, C. Measures, D.M. Nelson, A. Parker, A. Poulton, K.E. Selph, P.G. Strutton, A.G. Taylor and B.S. Twining (2011), Co-limitation of diatoms by iron and silicic acid in the equatorial Pacific, **Deep -Sea Research II**, 58: 493-511. doi:10.1016/j.dsr2.2010.08.005.
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- 12) Orrico, C.M., A. Barnard, C. Roesler, **W.M. Balch**, H. Franklin, and D. Abraham. 2006. Seasonal Variability of Ocean Color Remote Sensing Reflectance in Penobscot Bay, ME. *Proceeding of Ocean Optics XVIII*, 9-13 October, Montreal.
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- Balch, W. M.** 1998. Phytoplankton optical properties. SeaWiFS Meeting, Baltimore January 6-8 1998
- Balch, W. M.** 1998. Backscattering of Light by Calcium Carbonate and Organic Matter in the Sea. AGU/ASLO 9-13 February, 1998
- Balch, W. M.,** Drapeau, D. T., Bowler, B., Ashe, A., Vaillancourt, R., and Dunford, S., 1998. Sea truth validation measurements in the Gulf of Maine Bigelow Laboratory for Ocean Sciences, NOAA Coastal Ocean Program Meeting , Wash D.C. 2-3 Sept, 1998
- Balch, W. M.** 1998. Validation of surface bio-optical properties in the Gulf of Maine as a means for improving satellite primary production estimates. Part II. 1998. SIMBIOS Meeting, La Jolla, CA 22-24, 1998
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- Balch, W. M.,** Drapeau, D. T., Bowler, B., Ashe, A., Vaillancourt, R., 1999. Error in SeaWiFS-derived chlorophyll in Case 1 vs. Case 2 waters of the Gulf of Maine. Case II Mini Workshop, Monterey 17 May, 1999.
- Balch, W. M.,** Drapeau, D. T., Bowler, B., Ashe, A., Vaillancourt, R. 1999. SeaWiFS validation results from the M/S Scotia Prince Ferry. ) SeaWiFS Team Meeting, Monterey, 18-20 May, 1999
- Balch, W. M.** 1999. Optical Properties of Coccolithophores. Coccolithophore Meeting, Sponsored by the Office of Naval Research. Plymouth England 23-25 August, 1999
- Balch, W. M.** 1999. Validation of surface bio-optical properties in the Gulf of Maine as a means for improving satellite primary production estimates. SIMBIOS Team Meeting, Annapolis, 13-15 September, 1999.
- Balch, W. M. ,** H. R. Gordon, D. T. Drapeau, B. C. Bowler, A. L. Ashe, J. I. Goes, and H. M. Gomes. 2000. PIC:POC and the Remote Sensing of Biogenic Carbon in the Sea. AGU/ASLO, January 2000 San Antonio
- Balch, W. M.,** David Drapeau, Bruce Bowler, Amanda Ashe, Joaquim Goes, Emily Scally. 2000. Anatomy of a Coccolithophore Bloom. Presented at Oceans from Space “Venice 2000”9-13 October, Scuola Grande Confraternita di San Teodoro, Venice, Italy.

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- H.R Gordon, G.C. Boynton, **W.M. Balch**, S.B. Groom, D.S. Harbour, and T.J. Smyth, “An algorithm for retrieval of coccolithophore calcite concentration from SeaWiFS imagery”, *Oceans from Space "Venice 2000"*, Scuola Grande Confraternita di San Teodoro, Venice, Italy, October.
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- Novotny, Sr, J. F., J. M. Vaughn, **W.M. Balch,** D. T. Drapeau, C. L. Vining, and E. S. Booth. 2003. The isolation of viral agents infecting *Emiliana huxleyi* from the Gulf of Maine. 103rd General Meeting of the American Society for Microbiology, May 18-22, 2003, Washington, D.C.
- Balch, W. M.** Viral control of mesoscale coccolithophore blooms in the Gulf of Maine...host culturing and optical results. Maine EPSCOR Review, July 2003.
- Balch, W. M.,** Albert Plueddemann, Cindy Pilskaln- Bigelow Lab, Hans Dam, George McManus, Joaquim Goes. Chalk-Ex: Transport of optically active particles from the surface mixed layer. University of Rhode Island, November, 2003.
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- Balch, W. M.** Plans for NASA-IDS sampling in 2004. IDS Team Meeting. April 1-2, 2004. Bigelow Laboratory for Ocean Sciences.
- Balch, W. M.** The MODIS Ocean Product for Particulate Inorganic Carbon (MOD 25): Refinement of calcium carbonate estimates in the global ocean. MODIS-Oceans Meeting. July 2004. Washington D.C.
- Balch, W. M.** Update on NASA-IDS sampling in 2004. IDS Team Meeting. September 2, 2004. Bigelow Laboratory for Ocean Sciences.
- Balch, W. M.** Summary of NASA-IDS 2004 activities. IDS Team Meeting. February 9, 2005. Bigelow Laboratory for Ocean Sciences
- Balch, W.M.** MODIS PIC Algorithm update **Balch, W. M.,** C. Roesler, T. Huntington, A. Barnard, G. Aiken, H. Xue Land-sea carbon coupling in the Gulf of Maine along a continuum of scales.
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- Balch, W. M.** Remote Sensing of suspended calcium carbonate. Workshop on the Impacts of Increasing Atmospheric CO<sub>2</sub> on Coral Reefs and Other Marine Calcifiers. St. Petersburg, FL USA 18-20 April, 2005



- Balch, W. M.**, D. T. Drapeau, B. C. Bowler, and E. S. Booth. Coccolithophores, calcium carbonate and light scattering along the Atlantic Meridional Transect. ASLO Meeting, Santiago de Compostela, Spain, 19-24 June, 2005.
- Balch, W. M.** Results from the Atlantic Meridional Transect cruises on the light scattering from suspended calcite. AGU Chapman Conference, Woods Hole, MA 24-26 July 2005.
- Balch, W. M.** Results from recent NASA IDS studies of the Penobscot Bay and Gulf of Maine. Bigelow Laboratory for Ocean Sciences, 2 December 2005.
- Balch, W. M.** Ocean Carbonate Dynamics- “Finding a cure for POC envy”. Plenary talk, MODIS team meeting. Baltimore MD. 4-6 January 2006.
- Balch, W. M.** Results from MODIS PIC algorithm work. MODIS team meeting. Baltimore MD. 4-6 January 2006.
- Balch, W.M.**, D. Drapeau, B. Bowler, E. Booth, L. Windecker, P. Utgoff. Light Scattering by Suspended Calcium Carbonate Particles in the Coastal and Central Atlantic Ocean- Increasing Relative Importance of CaCO<sub>3</sub> Backscattering With Increasing Oligotrophy. AGU Oceans Meeting, Honolulu, HI 20-24 February, 2006.
- Drapeau, D., **Balch, W.M.**, B. Bowler, A. Poulton, L. Windecker, J. Zima, E. Booth, K. Weber, Calcification and photosynthesis rates in the Equatorial Pacific Ocean between 110°W and 140°W. AGU Oceans Meeting, Honolulu, HI 20-24 February, 2006.
- Vaughn, J. M., J. F. Novotny, C. L. Vining, **Balch, W.M.**, P. Matrai, J.J. Goes, D. T. Drapeau, D. Kneifel. Isolation of *Emiliania huxleyi* viruses from the Gulf of Maine. AGU Oceans Meeting, Honolulu, HI 20-24 February, 2006.
- Balch, W.M.**, J. Vaughn, P. Matrai, J. Novotny, Viral control of Gulf of Maine phytoplankton. Meeting of the Technical Advisory Committee, Maine Space Grant, Portland, ME 25 January 2006.
- Balch, W.M.**, C. Roesler, A. Barnard, T. G. Huntington, H. Xue, G. R. Aiken. An interdisciplinary study of land-sea carbon coupling between the Penobscot River and Gulf of Maine. NASA Ocean Color Research Team meeting. Narragansett, RI April 11-13, 2006.
- Balch, W.M.**, D. Drapeau, B. Bowler, A. Poulton, L. Windecker and E. Booth. New results on calcification and photosynthesis from the Equatorial Pacific biocomplexity program. NSF Biocomplexity Review Meeting, Tiburon, CA September 2006.

- Balch, W.M.**, James Vaughn, Jim Novotny, Joaquim Goes David Drapeau, Laura Windecker, Emily Booth, Cathy Vining. The effect of viral infection on phytoplankton optical properties. Oral presentation and poster. Ocean Optics XVIII meeting, Montreal, Canada. October 2006.
- Balch, W.M.**, D. Drapeau, B. Bowler, E. Booth, A. Poulton, L. Windecker. Indices of coccolithophore calcification. American Society of Limnology and Oceanography meeting, Santa Fe, NM Feb 2007.
- Balch, W.M.**, C. Roesler A. Barnard, T. G. Huntington, H. Xue, G. R. Aiken. Non-conservative DOC transformations in Maine watersheds: “Can you tell the tea by its color?” NASA Ocean Color Research Team meeting. Seattle, WA April 11-13, 2007.
- Balch, W.M.**, D. Drapeau, B. Bowler, E. Booth, L. Windecker, Changes in absorption and backscattering in the Gulf of Maine associated with precipitation extremes. NASA Ocean Color Research Team meeting. Poster. Seattle, WA April 11-13, 2007.
- Balch, W.M.**. Use of remote sensing in assessing the impacts of ocean acidification. Ocean Carbon and Biogeochemistry Scoping Workshop on Ocean Acidification Research. Scripps Institution of Oceanography, La Jolla, CA. 9-11 October, 2007.
- Balch, W.M.**, B.C. Bowler, D.T. Drapeau, E.S. Booth. How on earth will we measure the impact of ocean acidification over basin scales? AGU/ASLO/TOS meeting. Orlando, FL, 3-7 March 2008.
- Balch, W.M.**, D. T. Drapeau, B. C. Bowler, E. S. Booth, L. A. Windecke and A. Ashe. Space-time variability of carbon standing stocks and fixation rates in the Gulf of Maine, along the GNATS transect between Portland, Maine, USA, and Yarmouth, Nova Scotia, Canada. 3 April 2008, Meeting “From cells to ecosystems”. Conference at University of Plymouth, Plymouth, U.K.
- Balch, W.M.**, G. Aiken, D. Drapeau, B. Bowler, E. Booth. Long-term changes in the pelagic carbon cycle of the Gulf of Maine, as documented by GNATS (Gulf of Maine North Atlantic Time Series). NASA Carbon Cycle and Ecosystems Meeting, Univ. Maryland, Adelphi, MD 28 April-1 May 2008.
- Balch, W.M.**. The Gulf of Maine GNATS program. Gulf of Maine workshop, University of New Hampshire, Alumni Center, Durham, NH. 2 May 2008.
- Balch, W.M.**. Carboy Results from the Equatorial Biocomplexity Experiment. 19-20 May 2008. Tiburon Center, Univ. San Francisco, San Frisco, CA. I participated in the meeting remotely and presented the above talk via video conference.

- Balch, W.M.**, A.J. Plueddeman, B. C. Bowler, D. T. Drapeau. On the mechanisms of thin layer formation: Evidence from Chalk-ex. 2008 Ocean Optics Meeting XIX, Tuscany Italy, October 2008.
- Cuhel, R., C. Aguilar-Diaz, **W.M. Balch**. 2008. Midwest Flood of 2008: Lake Michigan Basin-Wide Summer Plankton Bloom is not due to Nutrient Injection. AGU Fall Meeting. San Francisco, December 2008.
- Balch, W.M.** 2008. Pelagic Calcification. Workshop on Best Practices for Ocean Acidification Research, Kiel, Germany, November 19-21, 2008.
- Dierssen, H.M., K. Randolph, C. Buonassissi, M. Twardowski, S. Freeman, **W.M. Balch**, and D. Drapeau. 2009. Differentiating sources of backscattering in the Southern Ocean for ocean color remote sensing: calcite, bubbles and phytoplankton. ASLO Meeting. Nice France (January 2009).
- Balch, W.M.**, G. Aiken, A. Barnard, T. Huntington, C. Roesler, H. Xue. 2009. Land to ocean carbon coupling between the Penobscot watershed and Gulf of Maine. North American Carbon Program Meeting, Town and Country Hotel, San Diego, Feb 17-20, 2009.
- Balch, W.M.** 2009. Ocean acidification: documenting its impact on calcifying phytoplankton at basin scales. Presented at “Rising CO<sub>2</sub>, ocean acidification and their impacts on marine microbes” organized by the Plymouth Marine Laboratory and the Center for Microbial Oceanography: Research and Education (C-MORE) at the East-West Center on the Campus of the University of Hawaii 24 – 26 February 2009.
- Balch, W.M.** 2009. Coastal Time Series: Documenting change across the land-sea transition zone. Ocean Color Research Team Meeting, New York, NY. May 4-6, 2009.
- Balch W. M.** 2009. The MODIS time series of suspended calcium carbonate in the global ocean. IGARRS Meeting, Cape Town, South Africa. July 13-17, 2009.
- Balch, W.M.** 2009. Ocean Acidification: Another Facet of the Global CO<sub>2</sub> Problem. Café Scientifique. Boothbay Opera House, W. Boothbay Harbor, ME 28 July 2009.
- Balch, W.M.** 2009. The Gulf of Maine North Atlantic Time Series, **GNATS**: A retrospective of the productivity of the Gulf of Maine. Gulf of Maine Symposium St. Andrews, New Brunswick, NB, Canada. 4-9 October 2009.
- Balch, W.M.**, Drapeau, D.T., Bowler, B.C. and Alley, Danielle. 2009. Gas-Ex III results. Univ. Connecticut Progress Meeting, SoGasExIII. 6 November 2009

- Balch, W.M.** 2009. The Gulf of Maine North Atlantic Time Series, **GNATS**: A retrospective of the productivity of the Gulf of Maine. University of Connecticut Departmental Seminar. 6 November 2009.
- Balch, W.M.** 2009. Radioisotope Techniques for measuring coccolithophore calcification NSF-sponsored course on Ocean Acidification, Marine Biological Laboratory, Woods Hole, MA Nov 7, 2009.
- Balch, W.M.** 2010. Viewing the ocean's carbonate cycle with MODIS. Plenary Talk. MODIS meeting. Washington, D.C. 25-28 January 2010.
- Balch, W.M.** 2010. MODIS PIC algorithm (mod 23). MODIS meeting. Washington, D.C. 25-28 January 2010.
- Balch, W.M.** 2010. **GNATS** (The Gulf of Maine North Atlantic Time Series)—combining synoptic in situ and space-based observations to evaluate long-term change in coastal waters. Ocean Sciences Meeting, Portland Oregon. 22-26 February, 2010.
- Poulton, A.J., A. Charalampopoulou, **W.M. Balch**, and S. Painter (2010), Contrasting Coccolithophore Dynamics from the Iceland Basin (North Atlantic) and Patagonian Shelf (South Atlantic), in *From observation to prediction in the 21st century: 2010 Ocean Sciences Meeting*, pp. 68, AGU, ASLO and TOS, Portland, OR.
- Lee, P., **W.M. Balch**, T. Cyronak, D. Drapeau, E. Lyczkowski, M. Saggiomo, V. Saggiomo, I. Santarpia, A. Strand, and G.R. DiTullio (2010), Potential impact of increased pCO<sub>2</sub> on particulate DMSP and the production of dissolved DMSP through microzooplankton grazing, in *From observation to prediction in the 21st century: 2010 Ocean Sciences Meeting*, pp. 61, AGU, ASLO and TOS, Portland, OR.
- Balch, W.M.**, Drapeau, D.T., Bowler, B.C., Lyczkowski, E., Alley, D. 2010. The “Great Calcite Belt”: Are there really coccoliths down there? NASA Ocean Color Research Team Meeting, New Orleans, LA 10-13 May 2010.
- Balch, W.M.** Estimating the standing stock of CaCO<sub>3</sub> from space-based measurements. COCOS Meeting (Coordination Action Carbon Observation System), “Combining water column data with sediment trap and satellite observations for improved marine carbon export estimates”, Bergen Norway. June 2010.
- Balch, W.**, D. Drapeau, B. Bowler, E. Lyczkowski, D. Alley, E. Booth, T. Huntington, C. Roesler, A. Barnard, G. Aiken. 2010. Insights from the Gulf of Maine North Atlantic Time Series (GNATS)- II-An optical window into the changing carbon cycle of the coastal ocean. Ocean Optics XX, Anchorage, AK. September 2010.

- Balch, W.,** D. Drapeau, B. Bowler, E. Lyczkowski, D. Alley and E. Booth, 2010. Insights from the Gulf of Maine North Atlantic Time Series (GNATS) I- An optical window into the changing biogeochemistry of the coastal ocean. Ocean Optics XX, Anchorage, AK. September 2010.
- Balch, W.** 2011. Coccolithophore studies for 2011 Healy Cruise to Arctic. NASA planning meeting Stanford University 7-8 March 2011.
- Balch, W.** 2011. The Gulf of Maine North Atlantic Time Series, **GNATS**: Documenting a coastal ecosystem in transition. Invited departmental seminar, Dalhousie University, Oceanography Dept. April 7-9, 2011.
- Balch, W.** 2011. Science Data Analysis for the MODIS Ocean Product for Particulate Inorganic Carbon (PIC). MODIS team meeting. Univ. Maryland. 18-19 May, 2011.
- Balch, W.** 2011. A sharp, step-decrease in the carbon fixation of the Gulf of Maine...but why? NASA ACE Ocean Productivity and Carbon Cycle (OPCC) Workshop - June 6, 7 & 8 - UC Santa Barbara
- Balch, W.** 2011. Coastal Processes and Biogeochemical Fluxes at the Land-Ocean Interface. Invited talk presented at the NASA Ocean Carbon Meeting, October 3-7, 2011. Alexandria, Virginia.
- Balch, W.** 2011. Participant in NASA Science Direction Team for the new PACE mission. Crystal City, Virginia. November 2011.
- Balch, W.** 2012. Proposal Review Panel. Washington D.C.
- Balch, W.M.** 2012. High Reflectance Waters of the Southern Ocean- Recent observations from the 'Great Calcite Belt'. Invited plenary talk. NASA Ocean Color Research Team Meeting, 23-27 April, 2012, Seattle, WA.
- Balch, W.M.,** B.C. Bowler, D.T. Drapeau, L.C. Lubelczyk and E. Lyczkowski. 2012 Shipboard validation and refinement of the MODIS particulate inorganic carbon (PIC) algorithm [MOD 23]. Presentation at NASA MODIS workshop, Silver Spring, MD. 7-9 May, 2012.
- Brown, Michael S., **W. M. Balch,** S. Craig, B. Bowler, D. Drapeau, J. Grant. Optical closure within a Patagonian Shelf coccolithophore bloom. ACCESS'12. Atlantic Canada Coastal & Estuarine Science Society. Dalhousie University, Halifax, Nova Scotia. 10-13 May, 2012.
- Balch, W.M.,** B.C. Bowler, D.T. Drapeau, and L.C. Lubelczyk. 2012 Work in support of VIIRS calibration and validation. Presentation at NASA NPP workshop (poster and oceans discipline talk), Greenbelt, MD. 10-11 May, 2012.

- Balch, W.** 2012. The Gulf of Maine North Atlantic Time Series, GNATS: Documenting a coastal ecosystem in transition. Presented at “The Gulf of Maine in a Changing Climate” June 12-13. Invited talk. Bowdoin College, Brunswick, ME.
- Balch, W.** 2012. Coccolithophores: the “Tums” of the sea. CATT presentation, Bigelow Laboratory for Ocean Sciences for *Nestlé PURINA*. 18 June, 2012
- Balch, W.** 2012. Participant in NASA Science Direction Team Meeting for the new PACE mission. Washington, D.C. June 25-27, 2012.
- Balch, W.** 2012. Poster Presentation, “The first direct measurements of  $^{14}\text{C}$  calcification by coccolithophores in the Arctic Ocean”, Joint ICESCAPE/MALINA meeting on Arctic biological oceanography, Ville Franche Sur Mer, France. 19-21 September, 2012
- Balch, W.M.** 2012. GNATS progress. NASA IDS Meeting, Bigelow Laboratory, 27-28 September, 2012.
- Balch, W.M.** 2012. Optical observations from the Great Calcite Belt- Likely the largest coccolithophore feature showing elevated reflectance in the global ocean, Ocean Optics XXI, Glasgow, Scotland. 8-12 October, 2012.
- Balch, W.M.** 2012. In search of the “sea of milk”: Coccolithophores, optics, the marine carbon cycle (and why you should care!). Riley Memorial Lecture. Dalhousie, CA. 14 November 2012.
- Balch, W.M.** 2012. The Great Calcite Belt- “Read my liths!”. Dalhousie Oceanography Department Seminar. 16 November, 2012
- Balch, W.M.** 2012. The Gulf of Maine North Atlantic Time Series, GNATS: Documenting a coastal ecosystem in transition. Invited talk, Environmental Sciences Dept., U.Mass Boston. 28 November, 2012.
- Balch, W.M.** and B.C. Bowler. 2013. Generating Environmental Data Records of Ocean Particulate Inorganic Carbon with NPP/NPOESS, NASA VIIRS Meeting, Greenbelt, MD. 23 January, 2013.
- Balch, W.M.**, B.S. Twining, D.T. Drapeau, B.C. Bowler, L.C. Lubelczyk, N.R. Bates, P. J. Lam, H.E.K. Smith, A.J. Poulton. 2013. The Great Calcite Belt: A circum-global coccolithophore feature in the Southern Ocean ASLO Aquatic Sciences Meeting, New Orleans, LA. 18-21 February, 2013.
- Bates, N.R., Rebecca Garley, **W. M. Balch**, Benjamin S. Twining, Phoebe J. Lam. 2013. Feedbacks between air-sea CO<sub>2</sub> and coccolithophores: the *Great Belt* of the Southern Ocean. ASLO Aquatic Sciences Meeting, New Orleans, LA. 18-21 February, 2013. (Talk presented by WMB as Bates could not attend).

- Rosengard, S.Z., Lam, P., **Balch, W.M.** 2013. Organic carbon export across the Great Calcite Belt ASLO Aquatic Sciences Meeting, New Orleans, LA. 18-21 February, 2013.
- Balch, W.M.** 2013. The Gulf of Maine: A coastal ecosystem in transition. Invited talk. Colby College meeting on *Changing Oceans and the Future of the Gulf of Maine: Solutions, Successes, and Sustainability*. 8 March, 2013.
- Balch, W.M.** 2013. ICESCAPE'11: Coccolithophores and bio-optics. Polar Gordon Conference, Ventura, CA 11-15 March, 2013.
- Balch, W.M.** and D.T. Drapeau. 2013. R/V Tangaroa Cruise Results- Balch Laboratory. Presentation for Workshop on GEOTRACES cruise from New Zealand. 8 April 2013
- Balch, W.M.** 2013. Particulate Inorganic Carbon Algorithm. Plenary talk for NASA MODIS meeting, 15-17 April, 2013.
- Balch, W.M.** 2013. NASA Ocean Color Research Team Meeting, Frankfurt, Germany. 6-8 May, 2013.
- Balch, W.M.** 2013. Maine EPSCOR meeting. Represented Bigelow Laboratory and their potential participation in the EPSCOR Aquaculture initiative. Point Look Out, Lincolnville, ME
- Balch, W.M.** 2013. Coccolithophores and calcification. NASA-COOPEX Experiment planning meeting, U. California Santa Barbara, CA. 3-5 June 2013.
- Balch, W.M.** 2013. ICESCAPE'11: Coccolithophores and bio-optics during ICESCAPE '11. Stanford University; ICESCAPE Meeting. Sept. 2013
- Balch, W.M.** 2013. Mental meanderings of a biological oceanographer about multi-tasking coccoliths. Workshop on the function of coccoliths. National Oceanography Centre, Southampton, U.K. Sept 2013.
- Balch, W.M.** 2013. The Great Calcite Belt- "Read my liths!". Plenary presentation. Fourteenth Meeting of the International Association of Nannoplankton. Reston, VA. Sept. 2013.
- White, M., Drapeau, D. Lubelczyk, L., Bowler, B., **Balch, W.** 2013. Coccolithophore growth, photosynthesis, calcification, and culture dynamics in response to increased  $p\text{CO}_2$ . National Science Foundation Meeting on Ocean Acidification. Gallaudet University, Washington, D.C. Sept. 2013.

- Balch, W.**, D. Drapeau, B. Bowler, L. Lubelczyk, M. White. NASA IDS progress-- Balch Lab-GNATS. Univ. Massachusetts Boston. Sept 2013.
- Balch, W. 2014.** Oceanographic variability across the Gulf of Maine as measured by GNATS (Gulf of Maine North Atlantic Time Series). Northeastern Coastal Acidification Network (NE-CAN) Webinare, Rye, NH. Jan. 2014.
- Smith, H.E.K., **Balch, W.M.**, Sanders, R., Poulton, A. Controls on coccolithophore and diatom distribution in the great calcite belt. 2014. Ocean Sciences Meeting. Honolulu, HI. Feb 2014
- Balch, W.M.**, Drapeau, D.T., Bowler, B.C., Lubelczyk, L.S., Smith, H.E.K., Twining, B. Bates, N., Lam, P. The Great Calcite Belt and the saga of residual nitrate. 2014. Ocean Sciences Meeting. Honolulu, HI. Feb 2014
- Bowler, B.C., Lubelczyk, L.S., Drapeau, D.T., **Balch, W.M.** Coccolithophores and calcification in the Western Arctic during the ICESCAPE expedition of 2011. 2014. Ocean Sciences Meeting. Honolulu, HI. Feb 2014
- Abel, V. E., **Balch, W. M.** and White, M. 2014. Light dependency of calcification and impacts of varying pH levels in the coccolithophorid, *Pleurochrysis carterae*. Ocean Sciences Meeting. Honolulu, HI. Feb 2014.
- White MM, Drapeau DT, Lubelczyk LC, Bowler BC, **Balch WM.** Calcification of an estuarine coccolithophore increases under increased  $p\text{CO}_2$ . Ocean Sciences Meeting, Honolulu, HI. Oral presentation. Feb 2014.
- Balch. W.M.** 2014. Particulate Inorganic Carbon. Plenary talk, MODIS Meeting, Columbia, MD. 29 April to 1 May.
- Balch, W.M.**, K. Arrigo, N. Bates, C. Benitez-Nelson, F. Chavez, L. Cooper, K. Frey, S. Freeman, R. Frouin, S. Hooker, S. Laney, P. Matrai, A. Matsuoka, B.G. Mitchell, E. Ortega-Retuerta, D. Perovitch, B. Pickart, R. Reynolds, H. Sosik, M. Steel, D. Stramski, J. Swift, J. Werdell, S. Yvon, J. Zhang. 2014. Plenary presentation. NASA Ocean Color Research Team Meeting, Silver Spring, MD. 5-7 May, 2014
- Balch, W.M.** The Gulf of Maine North Atlantic Time Series, **GNATS**: Documenting a coastal ecosystem in transition. NEAMGLL Meeting, Bigelow Laboratory for Ocean Sciences. 26 June, 2014.
- Balch, W.M.**, Huntington, T., Aiken, G., Drapeau, D., Bowler, B., Lubelczyk, L., White, M. and Butler, K. Coastal bio-optical change in the Gulf of Maine during the Anthropocene. International Ocean Optics Meeting. Portland, Maine October 2014.
- Aiken, G., Xiaoyan Cao, Jingdong Mao, Klaus Schmidt-Rohr, Robert Spencer, Simon Belanger, **William Balch**, and Thomas Huntington. The Influences of Riverine



- Dissolved Organic Matter in the Gulf of Maine. Fall AGU meeting, San Francisco, CA 2014.
- White MM, Lubelczyk L, Waller JD, Drapeau DT, Bowler BC, Vermont A, Fields DM, **Balch WM**. Dissolution of *Pleurochrysis carterae* coccoliths in *Acartia tonsa* guts: Testing the Tums hypothesis. Aquatic Sciences Meeting, Granada, Spain. Oral presentation. Feb. 2015.
- Balch, W.M.**, Bates, N.R., Lam, P.J. and Twining, B.S., Small coccolithophores with a big impact: The Great Calcite Belt. Aquatic Sciences Meeting, Granada, Spain. Oral presentation. Feb. 2015.
- Balch, W.M.** Tom Huntington, George Aiken, David Drapeau, Bruce Bowler, Laura Lubelczyk and Kenna Butler, 2015 Yellowing coastal seas in the Anthropocene. Princeton University. April 2015. Invited talk.
- Balch, W.M.** Tom Huntington, George Aiken, David Drapeau, Bruce Bowler, Laura Lubelczyk and Kenna Butler, 2015 Yellowing coastal seas in the Anthropocene. NASA CC&E meeting April 2015. Keynote talk.
- Balch, W.M.** 2015. Plates, fishing reels, chalk and the global cycle of particulate inorganic carbon: Read Howard's liths. Invited talk. University of Miami Symposium on the career of Howard Gordon. April, 2015.
- White, M., Fields, D., Drapeau, D., Lubelczyk, L, **Balch, W.** Ocean acidification and its impacts on a simple predator prey system. NSF-sponsored OA meeting, Woods Hole, MA. June, 2015
- Balch, W.M.** Optical properties of the Great Calcite Belt. NASA Ocean Color Research Team meeting. San Francisco, CA June 2015.
- Balch, W.M.**, D. T. Drapeau, B. C. Bowler, E. Lyczkowski and L. Lubelczyk. Contributions of the AMT program to knowledge about coccolithophore distributions at the basin scale, their optical properties and decadal trends. Celebrating 20 years of Atlantic Meridional Transect (AMT research), 23-25 June, 2015. Plymouth Marine Laboratory.
- Mitchell, C., Bowler, B., Drapeau, D., Lubelczyk, L., Hopkins, J. & **Balch, W. M.** (2015) Validation of the VIIRS particulate inorganic carbon algorithm. International Ocean Colour Science Meeting, San Francisco.
- Balch, W.M.** 2015. The biogeochemistry of coccolithophore blooms. Invited talk for special session on *Blooms*. OCB Summer Meeting WHOI, July 2015.

- Balch, W.M. 2015** “Gulf of Maine North Atlantic Time-Series (GNATS): Documenting change in a coastal marine ecosystem”. Invited talk for *Time Series* Special Session. OCB Summer Meeting WHOI, July 2015.
- Maine, Julia, White, Meredith M., **Balch, William** and Milke, Lisa. 2016. Effect of Ocean Acidification on the Food Quality of the Coccolithophore *E. huxleyi*. Poster. 2016 Ocean Sciences Meeting, New Orleans, LA Feb. 21-26, 2016.
- W.M. Balch**, D. T. Drapeau, B. C. Bowler, E. Lyczkowski and L. Lubelczyk, 2016. Scaling from Surface Satellite Measurements of PIC to Integrated Euphotic Estimates over the Global Ocean: Do Vertical Profiles of Coccolithophores Look Like Vertical Profiles of Chlorophyll? Talk. 2016 Ocean Sciences Meeting, New Orleans, LA Feb. 21-26, 2016.
- Hopkins, J, **W. Balch**, S. Henson, A. Poulton, D. Drapeau, B. Bowler, L. Lubelczyk. 2016. Inter-annual variability in global suspended particulate inorganic carbon inventory using space-based measurements, Poster. 2016 Ocean Sciences Meeting, New Orleans, LA Feb. 21-26, 2016.
- White, M., Waller, J., Lubelczyk, L., Drapeau, D., Bowler, B., Wyeth, A., Fields, D., and **Balch, W.** 2016. Calcium Carbonate Dissolution Above the Lysocline: Implications of Copepod Grazing on Coccolithophores. Talk. 2016 Ocean Sciences Meeting, New Orleans, LA Feb. 21-26, 2016.
- Zimmerman, R., V. Hill, C. Sukenik, B. Collister, A. Flouros, **W. Balch.** 2016. Exploiting In Situ Lidar To Retrieve Particle Distributions and Characteristics Of The Upper Ocean. Talk. 2016 Ocean Sciences Meeting, New Orleans, LA Feb. 21-26, 2016.
- Balch, W.M.**, Bowler, B.C., Drapeau, D.T. 2016. Combining high-tech glider optical, hydrographic and chemical measurements with canonical observations of Redfield (1934) to derive water column productivity. Ocean Optics XXIII. Victoria, B.C., Canada. Oct. 23-28, 2016.
- Boss, E., **W.M. Balch**, B. Bowler, G. Dall’Olmo, S. Freeman, W. Neary, N. Nelson, M. Novak, C. Proctor, W. Slade, T. Westberry. 2016. Collecting and processing in-line optical data. Ocean Optics XXIII. Victoria, B.C., Canada. Oct. 23-28, 2016.
- Balch, W.M.**, Drapeau, D.T., Bowler, B.C., Lubelczyk, L., Mitchell, C.M. and Lyczkowski, E.R. 2017. Biogeography, biogeochemistry, transport and fate of particulate carbon associated with the Great Calcite Belt. Aquatic Sciences Meeting. ASLO 2017. Honolulu, HI. 26 February-3 March, 2017.
- Onos, A. A. and **W.M. Balch.** 2017. Mixotrophy in the coccolithophores, *Pleurochrysis* and *Emiliana*. Aquatic Sciences Meeting. ASLO 2017. Honolulu, HI. 26 February-3 March, 2017.

- Balch, W.M.**, B.C. Bowler, D.T. Drapeau. 2017. Combining glider optical, hydrographic and chemical measurements to derive water column net primary production and net community production. International Ocean Optics Meeting, 15-18 May, 2017, Lisbon, Portugal.
- Collister, B; Zimmerman, R., Sukenik, C. I, Hill, V. J., **Balch, W. M.** 2017. Remote Sensing of Optical Characteristics and Particle Distributions of the Upper Ocean Using Shipboard Lidar. June, Ocean Carbon and Biogeochemistry Meeting, Woods Hole, MA Poster presentation.
- Balch, W.M.** Changing climate, carbon cycles and tea steeping in the Gulf of Maine. 2017. Schulich Ocean Studies Initiative in Eilat, Inter-university Institute for Marine Sciences. Joint Israel-Canada meeting, Keynote talk. October 2017 Eilat Israel.
- Balch, W.M.** and N. Bates. 2017. Friends of Casco Bay MOCA meeting 18 December, 2017, Bigelow Laboratory. GNATS Gulf of Maine Surface Phytoplankton, blooms and potential links to OA
- Balch, W.M.**, D. Drapeau, A. Wyeth and J. Godrijan. 2018. Uptake of DOC by mixotrophic coccolithophores. Ocean Sciences Meeting, Portland, Oregon. February, 2018.
- Bird, Clara, **W.M. Balch**, C. Mitchell. 2018. Seasonal Gulf of Maine CDOM variability as determined by satellites and ships. Ocean Sciences Meeting, Portland, Oregon. February, 2018.
- Balch, W.M.** The Great Calcite Belt. NASA Hyperwall presentation. Ocean Sciences Meeting, Portland, Oregon. February, 2018.
- Mitchell, C, H.R. Gordon, B.Bowler, D. Drapeau and **W.M. Balch**. 2018. The use of gliders to investigate phytoplankton populations throughout the water column at high spatial scales: a case-study in the Gulf of Maine. Ocean Sciences Meeting, Portland, Oregon. February, 2018.
- Balch, W.M.** 2018 BESO(ME): Biogeochemistry and Ecology of the Southern Ocean (and Mode water Export). OCB Summer Meeting, Woods Hole Oceanographic Inst. 6/27/18. Woods Hole, MA.  
<https://www.youtube.com/watch?v=4HmdbmAfMUU>
- Balch, W. M.**, David T. Drapeau, Bruce C. Bowler and Catherine Mitchell. 2018. Persistent UV reflectance signals in the Gulf of Maine observed using above-water, hyperspectral radiometry: New observations from the Gulf of Maine North Atlantic Time Series (GNATS) “MAAs Smoking Gun?” International Ocean Optics Meeting XXIV. Dubrovnik, Croatia. October 2018.

- Balch, W.M.** 2018. Particulate Inorganic Carbon from MODIS and VIIRS. MODIS/VIIRS Science Team Meeting. Silver Spring, MD. October 2018.
- Steinmetz, H., Mitchell, C.; **Balch, W.** Using multispectral versus hyperspectral radiometry to predict Forel-Ule ocean color. ASLO 2019 Aquatic Sciences Meeting Planet Water: Challenges and Successes, 23 February-2 March 2019, San Juan, Puerto Rico.
- Balch, W.M.**, Catherine Mitchell, David Drapeau, Bruce Bowler, Jelena Godrijan, Collin Fischer. 2019. "Meeting an old friend after 3 decades: The 2018 New England mesoscale coccolithophore bloom, but viewed with new glasses!" International Ocean Color Symposium, Busan, South Korea. April, 2019.
- Balch, W.M.**, Dave Drapeau, Bruce Bowler, Rebecca Garley & Nicholas R. Bates. Temperature and ocean acidification changes along the 21-year GNATS transect across the Gulf of Maine. Gulf of Maine 2050 International Symposium. Portland ME. 4-7 November, 2019.
- Balch, W.M.**, Catherine Mitchell, David Drapeau, Bruce Bowler, Colin Fischer. 2019. What's new with the PIC algorithm? NASA MODIS/VIIRS Team Meeting. University of Maryland, College Park, MD. 18-21 November, 2019.
- Godrijan, J., D. Drapeau and **W.M. Balch**. 2019. Osmotrophy by mixotrophic coccolithophores: Growth and uptake kinetics of acetate, glycerol and mannitol in darkness. B22B06. Fall AGU meeting. San Francisco. December 9-13, 2019.
- Martinez, G. and **Balch, W.M.** 2020. Gulf of Maine Temperature-Salinity Curves From the Early 1900s (Henry Bigelow) Compared to the Present (GNATS). Ocean Sciences Meeting. San Diego, CA. February 16-21, 2020.
- Brian Collister, Richard Carl Zimmerman, Victoria J Hill, Charles I Sukenik and **William M Balch**. 2020. What can polarized oceanographic lidar reveal about ocean particle assemblages? Insights from a mesoscale coccolithophore bloom. Ocean Sciences Meeting. San Diego, CA. February 16-21, 2020
- Balch, W.M.** 2020. SAMW Phytoplankton Field and Experimental Results. Annual Science Meeting of the NSF SAMW scientists. Meeting was remote due to covid. 29-30 Sept, 2020.
- Balch, W.M.** 2020. Science Plan and Risk Assessment Collaborative Research: Preconditioning of Subantarctic Mode Water by the Great Calcite Belt. This was a ship operations meeting for the decision to run the SAMW'21 cruise aboard R/V Revelle during covid (this was a meeting of NSF program managers, ONR [owners of R/V Revelle], Scripps Marine Superintendent, SIO Associate Director, multiple SIO department heads, two UCSD physicians.

- Balch, W.M.**, Bowler, B., Mitchell, Cath. 2020. Big things in little packages: a variable calcite package effect for light scattering by coccolithophores. Ocean Optics OOXV meeting Norfolk, VA. Meeting scheduled for October 2020 but cancelled due to covid.
- Balch, W.M.**, D.T. Drapeau, Nicole Poulton, Steven Archer, Carmen Cartisano, Craig Burnell and Jelena Godrijan. 2021. Coccolithophore mixotrophy. Bigelow Laboratory Science Symposium'21. 20 October, 2021.
- Balch, W.M.**, D. Drapeau, B. Bowler, S. Pinkham, N. Record, C. Mitchell, R. Garley, N. Bates. 2021. How is the Gulf of Maine changing? Twenty years of results from the Gulf of Maine North Atlantic Time Series, GNATS, between 1998-2018. RARGOM Annual Meeting, November 17-19th, 2021. Virtual.
- Balch, W.M.** 2021. SAMW Phytoplankton Field and Experimental Results. Annual Science Meeting of the NSF SAMW scientists. I organized and lead the meeting. 15-16 December, 2021. Virtual.
- Pinkham, S., **Balch, W.M.**, Mitchell, C. 2022. Remote Sensing for Ocean Acidification: Prediction of Dissolved Inorganic Carbon using a Neural Network Approach. Ocean Carbon from Space Meeting. 14-18 February, 2022. European Space Agency. Virtual
- Mitchell, C., Pinkham, S., and **Balch, W.M.** 2022. Global Variability in Light Scattering By Different Coccolithophore Species: Impacts on Particulate Inorganic Carbon Remote Sensing. Ocean Carbon from Space Meeting. 14-18 February, 2022. European Space Agency. Virtual
- Balch, W.M.**, D.T. Drapeau, Nicole Poulton, Steven Archer, Carmen Cartisano, Craig Burnell and Jelena Godrijan. Coccolithophore mixotrophy. Ocean Sciences meeting 2022. 27 February- 4 March, 2022. Virtual.
- Middleton, J., L. Tegler, **W.M. Balch**, P. Morton and T. Horner. 2022. Barite formation in the marine water column. Ocean Sciences meeting 2022. 27 February- 4 March, 2022. Virtual.
- Gustafson, B., W.M. Balch, and S. Pinkham. 2022. Diatom nutrient limitation in a Southern Ocean Eddy. Ocean Sciences meeting 2022. 27 February- 4 March, 2022. Virtual.
- Mitchell, C., S. Pinkham and **W.M. Balch**. 2022. Remote sensing of the carbon cycle and carbonate system in coastal shelf seas: a case study in the Gulf of Maine. Ocean Sciences meeting 2022. 27 February- 4 March, 2022. Virtual.
- Zimmerman, R., C. Sukenik, **W. M. Balch**, V. Hill. 2022. The influence of particle concentration and bulk characteristics on polarized oceanographic lidar

measurements. Ocean Sciences meeting 2022. 27 February- 4 March, 2022.  
Virtual.

SCIENTIFIC MEETINGS HOSTED (since 2012)

NASA IDS meeting, Bigelow Laboratory for Ocean Sciences, Sept 2012

NASA IDS meeting, Bigelow Laboratory for Ocean Sciences, October 2014

NASA PACE Underway Optical Measurement Protocols Workshop. Bigelow Laboratory  
for Ocean Sciences, March, 2015

OUTREACH (since August 2008)

**W. Balch** 2008. The long view. Boston Globe article. Interviewed by Beth Daley.  
August 18, 2008.

[http://www.boston.com/news/science/articles/2008/08/18/the\\_long\\_view/](http://www.boston.com/news/science/articles/2008/08/18/the_long_view/)

**W. Balch.** 2009. Acidification takes growing toll on ocean life. Portland Press Herald  
article. Interviewed by John Richardson. 24 November 2009

**W. Balch** 2010. Ocean Acidification- a looming problem in the sea. Bristol Area Lions  
talk. 1 February 2010.

**W. Balch.**2010 Ocean Acidification Overview. Café Scientifique. Boothbay Opera  
House, Boothbay Harbor, ME. 6 July 2010.

**W. Balch.** 2010 The Global Challenge of Ocean Acidification:  
A Brief Introduction. Friends Meeting House, Damariscotta, ME, 27 October  
2010.

**W. Balch,** 2010. Radio segment for “Our Ocean World” on ocean acidification.

**W. Balch** 2011. “Scientists set sail to study vital plankton” Interviewed at sea by Beth  
Quimby while at sea aboard R/V Melville. Portland Press Herald 18 January  
2011. 50,000 circulation/day

**W. Balch** 2011. “Maine oceanographer studies climate change” Interviewed on Maine  
Public Radio by Tom Porter. Interviewed while at sea on R/V Melville.  
<http://www.mpbn.net/Home/tabid/36/ctl/ViewItem/mid/3478/ItemId/15049/Default.aspx> 27000 listeners/day

**W. Balch** 2011 9 August. Bigelow Café Scientifique talk on our Arctic studies on  
coccolithophores and climate change. Boothbay Opera House. ~100 participants

**W. Balch** 2011 11 August. Lecture on our Arctic studies on coccolithophores and  
climate change. Claremont Hotel, Southwest Harbor, ME 40 Participants

- W. Balch**, January 2012. Assembled materials for VIIRS poster on the PIC product and coccolithophores produced by NASA
- W. Balch**, May 2012. Interviewed by L. Betz (NASA Goddard Science Writer for special piece on VIIRS PIC product.
- W. Balch**, May 2012. Interviewed by T. Porter (Maine Public Radio) for our recent GNATS paper.  
<http://www.mpbn.net/News/MPBNNews/tabid/1159/ctl/ViewItem/mid/3762/ItemId/21990/Default.aspx> . Listenership 27,000/day
- W. Balch**, May 2012. Interviewed by Chris Cousins (Bangor Daily News) for our recent GNATS paper. <http://bangordailynews.com/2012/06/10/environment/study-finds-potentially-disastrous-threat-to-single-celled-plants-that-support-all-life-on-earth/>
- W. Balch**, May 2012. Interviewed by David Able (Boston Globe) for our recent GNATS paper. [http://articles.boston.com/2012-06-11/news/32177503\\_1\\_marine-food-food-chain-phytoplankton](http://articles.boston.com/2012-06-11/news/32177503_1_marine-food-food-chain-phytoplankton) Circulation 245,500
- W. Balch**, May 2012. Interviewed by Christine Parrish (Free Press) for our recent GNATS paper;  
<http://freepressonline.com/main.asp?SectionID=52&SubSectionID=78&ArticleID=19678> Unknown circulation
- W. Balch**, 2013 (March) Interviewed by Savannah Judge for recent article for Colby magazine, “New research laboratory in East Boothbay”. Unknown circulation.
- W. Balch**, 21 March, 2013. *The Global Challenge of Ocean Acidification*. Seminar at Camden Public Library. 40 participants.
- W. Balch**, 28 May, 2013. Interviewed by Matt Burn, Portland Press Herald on warming in the Gulf of Maine, as measured by GNATS. Article titled, “In Maine, green crabs threaten clamming”. [http://www.pressherald.com/news/green-crabs-threaten-clamming-\\_2013-05-28.html?pagenum=full](http://www.pressherald.com/news/green-crabs-threaten-clamming-_2013-05-28.html?pagenum=full) Circulation = 50,000
- W. Balch**, 8 September, 2013. Interviewed by North Cairn, Portland Press Herald on Sentinal Species for article titled, “What are these animals telling us?”  
[http://www.pressherald.com/news/what-are-these-animals-telling-us\\_2013-09-08.html?pagenum=full](http://www.pressherald.com/news/what-are-these-animals-telling-us_2013-09-08.html?pagenum=full) Circulation = 50,000
- W. Balch**. 14 January, 2014. Webinare for New England-Coastal Acidification Network (NE-CAN). This also involved writing a 6p. summary and participating in the NECAN meeting on 10 April, 2014. 35 participants.

- W. Balch.** 11 March, 2014. I gave a class (also open to the public) on ocean acidification at the Watershed School, Camden, ME. “Ocean Acidification, the other CO2 problem”. 50 participants.
- W. Balch.** 1 July, 2014. “What I did on my summer vacation” : A 14-year-old’s perspective of global ocean research at Bigelow Laboratory, 40 years later. Opera House at Boothbay Harbor, Boothbay Harbor, ME. 100 participants.
- W. Balch.** 2014. Job candidacy & interviewing — research focused positions. Bigelow Laboratory Post-doc seminar. October 2014.
- W. Balch.** 2015. Interviewed by David Abel, Boston Globe., Article published, “Cruise ship offers spa, casino, and perch for scientific method—Researchers ply gulf on Nova Star” as cover story on 26 Oct. 2015.  
<https://www.bostonglobe.com/metro/2015/10/25/cruising-gulf-maine-better-understand-changing-climate/eAWXw5jNE05rVkSH7nM3OP/story.html>  
 Circulation= 246,000
- W. Balch.** 2015. How to write a proposal budget. Bigelow Laboratory Post-doc seminar.
- W. Balch.** 2015. Interviewed by Joe Gelarden, Boothbay Register for article that appeared on Dec. 30, 2015. “Uncle Joe’s New Year’s resolutions”.  
 Circulation=~7,000
- W. Balch.** 2016. Interviewed by Fred Bever, Maine public radio about new paper published in Global Biogeochemical Cycles. <http://news.mpbn.net/post/study-shows-gulf-maine-yellowing-after-scientists-find-data-hiding-plain-sight>  
 Listenership: all of Maine, parts of New Hampshire, Massachusetts and New Brunswick, Canada.
- W. Balch.** \_November 2016. Interview by Colin Woddard, Portland Press Herald for story “Idea to cut NASA’s role in climate science could be major loss for Maine, scientists say”. <http://www.pressherald.com/2016/11/28/idea-to-cut-nasas-role-in-climate-science-threatens-major-loss-for-maine-scientists-say/> Circulation = 246,000
- W. Balch.** November 2016. Interview with Tory Ryden, WCSH TV News (Maine’s leader in TV viewership as ranked by the Nielsen Ratings), Portland, ME regarding proposal to eliminate Earth science from NASA’s mandate. Viewer impact: <http://www.wcsh6.com/news/local/maine-fallout-over-trump-adviser-comment-on-nasa-research/358574344>



- W. Balch.** Wavelengths of change in the Gulf of Maine, 2017. Portsmouth Music Hall Annex, January, 2017. Portsmouth, NH. Attendees = 100
- W. Balch.** Wavelengths of change in the Gulf of Maine, 2017. Western Maine Audubon, April, 2017. Farmington, ME. Attendees = 75
- W. Balch.** “Sacred Cod”. This is a documentary produced by David Liss and David Abel about the fishing industry of the Gulf of Maine. We invited them to accompany us on a GNATS trip in 2016 aboard the *R/V Connecticut* and this film has an entire segment devoted to our work on the GNATS. The publication rights were sold to the Discovery Channel and the piece was shown nationwide on 13 April 2017 (and across Britain and Europe a week later).  
<https://www.imdb.com/title/tt5783208/> Unknown viewership.
- W. Balch.** "Wavelengths of Change: The Impacts of a Yellowing Gulf of Maine," Café Scientifique July 11, 2017. Bigelow Laboratory for Ocean Sciences (200 attendees).
- W.M. Balch.** Presentation of GNATS work to Broadreach Foundation principals regarding science opportunities at Bigelow, 16 January 2018.
- W.M. Balch.** Interviewed by David Abel, Boston Globe for article “After year of record deaths, right whales produce no new calves, which could be ‘catastrophic’”. Published 26 February, 2018. Circulation= 246,000  
<https://www.bostonglobe.com/metro/2018/02/25/after-year-record-deaths-right-whales-produce-new-calves-which-could-catastrophic/wzPwtQSk9iRDIIvmaFp5nJ/story.html>
- W. Balch.** 2018. GNATS: Gulf of Maine North Atlantic Time Series-20 years of change in the Gulf of Maine. Lecture for Fishermens’ Climate Forum, Island Institute, Rockland, ME 28 February, 28, 2018.
- W. Balch.** 2018. Interviewed for radio show, “Positively Maine”, Produced by Torey Ryden (aired 20 May, 2018) on News Radio WGAN. Broadcast range Southern to Mid-Coast Maine. 5000 Watts.
- W. Balch.** 2018. Interviewed by Fred Bever, (Maine Public) on how Mainers are lowering their carbon footprints. December 2, 2018.  
<https://www.mainepublic.org/post/amid-dire-climate-change-news-mainers-are-looking-lower-their-carbon-footprints> This was also published by the Bangor Daily News. <https://bangordailynews.com/2018/12/03/news/state/mainers-look-to-lower-their-carbon-footprint-amid-dire-climate-change-news/>
- W. Balch** Feb 2019. Talk: “GNATS: Gulf of Maine North Atlantic Time Series- 20 years of change in the Gulf of Maine.” Watershed School, Camden. Spoke to 50 students and local members of the community.

- W. Balch**, 2019. Interviewed by Fred Bever, Maine Public for his series “Power Struggle”. <https://www.mainepublic.org/post/scientists-no-evidence-canadian-hydropower-cmp-project-would-disrupt-gulf-maine-food-chain>. Article appeared on 27 March, 2019.
- W. Balch**, 2019. June 25, interviewed by Laura Poppick for Knowable Magazine (a magazine that explores the real-world significance of scholarly work through a journalistic lens. A digital magazine from Annual Reviews.) on a story about coccolithophores. <https://www.knowablemagazine.org/article/living-world/2019/tiny-living-stones-sea>
- Train, M. and **W. Balch**. January-March 2019. Took Marcia Train (school teacher, Long Island, ME) to the Southern ocean to blog back to school students during our SubAntarctic Mode Water Cruise. She wrote about the science and interacted with hundreds of students during this 38d cruise aboard the R/V Thomas G. Thompson.
- Balch, W.M.** 2020. Distant but connected: *A Journey to Discover How Antarctic Algae Shape Northern Oceans*. Café Scientifique. Bigelow Laboratory for Ocean Sciences, July, 2020.
- Balch, W.M.** 2021. What is going on with the Gulf of Maine. Interview with Joe Gelarden, Boothbay Register. 19 May, 2021. <https://www.boothbayregister.com/article/what-going-gulf-maine/146816>
- Balch, W.M.** and Julie Crane. 2022. Art and Science: *Sharing Inspiration Through Creative Collaboration*. Café Scientifique, July 12, 2022. Bigelow Laboratory for Ocean Sciences, East Boothbay, ME Public outreach presentation about coccolithophores and art. Attendance 200.
- Balch, W.M.** 2022. Currents of Change: *A New Look at 20 Transformational Years in the Gulf of Maine*. Café Scientifique, July 26, 2022. Bigelow Laboratory for Ocean Sciences, East Boothbay, ME Public outreach presentation. Attendance 160.
- NASA Earth Observatory- Production of video on the GNATS program. Collaboration with the NASA Visualization Group and **W.M. Balch** and C. Mitchell.. <https://earthobservatory.nasa.gov/images/149915/phytoplankton-productivity-down-in-gulf-of-maine>
- Balch, W. M.** NASA Virtual Hyperwall Presentation given at AGU/ASLO/TOS Ocean Science Meeting. 2022.
- Welsh, Alec. 2023. Characters of the County: **Barney Balch** Balances Science and Art. Lincoln County News. 9 January, 2023. Circulation 7,500 papers per week. <https://lcnme.com/opinion/columns/characters-of-the-county-barney-balch-balances-science-and-art/> .

Whittle, Patrick, 2023. “Loss of tiny organisms hurts ocean, fishing, scientists say”, Associated Press article, 19 January 2023. Story about **Balch** et al. 2022 paper run by *Washington Post*, ABC News, Portland Press Herald and 10-20 of other news outlets.

SEA-GOING AND FIELD EXPERIENCE (total 853 sea days at sea plus 240 days running field stations):

Gulf of Maine 1978/79 (30h flight time in Cessna sea plane for aerial infra-red radiometry)  
Gulf of Maine, Monhegan Island 1978 (Ran field sampling station) 4 months  
Gulf of Maine, Southport Island 1979 (Ran field sampling station) 4 months  
Gulf of Maine 1978 (R/V Tioga) 10 d  
Sargasso Sea 1979 (R/V Eastward) 14 d  
Mid Atlantic Bight 1979 (R/V Westward) 6 weeks  
Sargasso Sea/Georges Bank 1979 (R/V Oceanus) 13 d  
Southern California Bight 1980 (R/V New Horizon) 14 d  
Celtic Sea/English Channel 1980 (R/V Sarsia) 14d  
Gulf of Maine 1982 (R/V Gyre) 18 d  
Southern California Bight 1983 (R/V New Horizon) 4 d  
Sargasso Sea 1983 (R/V Cape Hatteras) 7 d  
Southern California Bight 1984 (R/V New Horizon ) 10 d  
Southern California Bight 1985 (R/V Sproul) 8 d  
Southern California Bight 1986 (R/V Sproul) 10 d  
Southern California Bight 1987 (R/V Sproul; chief scientist) 9 d  
Gulf of Maine 1988 (R/V Argo Maine) 7 d  
Gulf of Maine 1989 (R/V Argo Maine) 14 d  
Sargasso Sea/Mid Atlantic Bight (R/V Atlantis II) 14 d  
Gulf of Maine 1990 (R/V Cape Hatteras) 14 d  
North Atlantic 1991 (R/V Charles Darwin) 21 d  
Gulf of Maine 1991 (R/V Cape Hatteras) 12 d  
Equatorial Pacific 1992 (R/V Thompson) 45 d  
Florida Current 1993 (R/V Corwith Cramer) 6d  
Florida Current 1995 (R/V Westward) 6d  
Arabian Sea July, 1995 (R/V Thompson) 30d  
Arabian Sea October, 1995 (R/V Thompson; chief scientist) 30d  
Gulf of Maine 1996 (R/V Pelican) 8d  
Gulf of Maine 1997 (R/V Albatross) 11d  
Gulf of Maine 1997 (R/V Delaware) 12d  
Gulf of Maine 1998 (R/V Albatross) 11d  
Gulf of Maine 1998 (M/S Scotia Prince) 10d  
Gulf of Maine 1999 (M/S Scotia Prince) 20d  
Gulf of Maine 2000 (M/S Scotia Prince) 12d  
Gulf of Maine 2001 (M/S Scotia Prince) 12d  
NW Atlantic 2001 (R/V Endeavor; chief scientist) 11d  
Gulf of Maine 2002 (M/S Scotia Prince) 12d

NW Atlantic 2003 (R/V Endeavor; chief scientist) 11d  
 Equatorial Pacific 2004 (R/V Revelle) 30d  
 Atlantic 2004 (R/V Discovery; AMT transect U.K. to S. Africa) 44d  
 Gulf of Maine 2004 (M/S Scotia Prince) 12d  
 Gulf of Maine 2005 (misc ships of opportunity) 12d  
 NW Atlantic 2006 (R/V Cape Hatteras) 10d  
 Gulf of Maine 2006 (misc. ships of opportunity) 8d  
 Gulf of Maine 2007 (misc. ships of opportunity) 19d  
 Gulf of Maine 2008 (misc. ships of opportunity) 12d  
 Patagonian Shelf 2008 (R/V Roger Revelle, chief scientist) 30d  
 Gulf of Maine 2009 (misc. ships of opportunity) 12d  
 Gulf of Maine 2010 (misc. ships of opportunity) 12d  
 Southern Ocean 2011 (R/V Melville; Chief Scientist). 37d  
 Arctic 2011 (R/V Healy) 35d  
 Southern Ocean 2012 (R/V Revelle; Chief Scientist). 35d  
 Gulf of Maine 2013 (misc. ships of opportunity) 8d  
 Gulf of Maine 2014 (misc. ships of opportunity) 9d  
 Gulf of Maine 2015 (misc. ships of opportunity) 12d  
 Gulf of Maine 2016 (misc. ships of opportunity) 8d  
 Gulf of Maine 2017 (misc. ships of opportunity) 8d  
 Gulf of Maine 2018 (misc. ships of opportunity) 8d  
 Gulf of Maine 2019 (misc. ships of opportunity) 9d  
 Southern Ocean 2020 (R/V Thomas G. Thompson; Chief Scientist. 39d  
 Southern Ocean 2021 (R/V Revelle; Chief Scientist. 60d  
 Gulf of Maine 2020 (R/V Connecticut) 7d  
 Gulf of Maine 2021 (R/V Connecticut) 5d

PROFESSIONAL AND HONORARY ORGANIZATIONS:

American Society of Limnology and Oceanography  
 The Oceanography Society  
 American Geophysical Union  
 American Association for the Advancement of Science (past member)  
 Honorary Society of Sigma Xi (past member)  
 Phycological Society of America (past member)

*Community Activities:* Design Review Board 1997-2005 (Newcastle, ME), Gifted and Talented Committee (1997-2002; Great Salt Bay School, Damariscotta, ME), trombonist various bands in Boston, New York, San Diego, Miami and Maine (last 53 years).

*Discography:*

- 10) **Balch, B.**, D. Clarke, M. Felder, D. Harris, H. Maine, B. Manning, M. Mitchell, S. Potter. 2019. "The Novel Jazz Septet- Ellington & Strayhorn Novellas". Produced by B. Balch. Sheepscoot Jazz and Swing Co., Newcastle, ME. SJSC 06212019 04. [https://www.mainejazz.net/home/music\\_samples\\_and\\_order\\_a\\_cd](https://www.mainejazz.net/home/music_samples_and_order_a_cd)
- 9) **Balch, B.**, B. Jones, Dave Clarke, M. Felder, M. Macksoud, H. Maine, M. Mitchell (Novel Jazz Septet). 2015. "Novel and Nouvelle- More Unearthed Treasures By Billy Strayhorn and Duke Ellington". Produced by B. Balch, M. Mitchell. Sheepscoot Jazz and Swing Co., Newcastle, ME. SJSC 606548685428; [https://www.mainejazz.net/home/music\\_samples\\_and\\_order\\_a\\_cd](https://www.mainejazz.net/home/music_samples_and_order_a_cd)
- 8) **Balch, B.** and M. Felder. "Spirituals". Collected spirituals for trombone and piano. Sheepscoot Jazz and Swing Company, Newcastle, ME. Released 15 June 2013.
- 7) Page, R., **B. Balch**, P. Collins, D. Creeden, D. Page, and J. Tukey. "Barrel House Bob Page and his Smokin' 88's" Copyright-Hottrax Records (751256001623);
- 6) **Balch, B.**, B. Boege, Dave Clarke, M. Felder, B. Friederich, H. Maine, M. Mitchell (Novel Jazz Septet). 2011. "Novel Jazz-Live; Ellington and Strayhorn Rediscovered." Produced by B. Balch, M. Mitchell and B. Boege. Sheepscoot Jazz and Swing Co., Newcastle, ME. SJSC 04102011; [https://www.mainejazz.net/home/music\\_samples\\_and\\_order\\_a\\_cd](https://www.mainejazz.net/home/music_samples_and_order_a_cd)
- 5) Page, R., D. Page, M. Havenstein, **B. Balch**, T.J. Wheeler, B. Terrie, and J. Tukey 2009. "Live at Lincoln Academy", Lincoln Academy, Newcastle, ME.
- 4) **Balch, B.**, B. Boege, Dave Clarke, M. Felder, M. Macksoud, H. Maine, M. Mitchell (Novel Jazz Septet). 2008. "Novel Ellington and Strayhorn." Produced by B. Balch and B. Boege. Sheepscoot Jazz and Swing Co., Newcastle, ME. SJSC 11082008; [https://www.mainejazz.net/home/music\\_samples\\_and\\_order\\_a\\_cd](https://www.mainejazz.net/home/music_samples_and_order_a_cd)
- 3) Havenstein, M. with J. Howe, L. Harris Jr., C. Jennison, R. Norris, N. Kaletsky, S. Philbrick, A. Doane, G. Wright, B. Page, D. Page, J. Tukey, **B. Balch**, P. Collins, L. McAuslin, M. Hamilton, P. Runnels, L. Percy, B. Costa, A. Delgado, J. LaValle, S. Neale, B. Mulkern, J. Hunter, B. Bragan, D. Pierce and C. Stone. 2003. "Muriel in concert". Beach Road Recording, Lincolnville, ME.
- 2) Page, R., **B. Balch**, P. Collins, L. McAuslin, D. Page, and J. Tukey. 1998. "Cash is a problem". Recorded and mixed at Rosewood Studio, Bremen, ME. Jump & Shout Records JASR 1001, Atlanta, GA.
- 1) Page, R., **B. Balch**, P. Collins, D. Creeden, D. Page, and J. Tukey. 1996. Bob Page "Project II- Blues in Dixieland". Produced by Aleck Janoulis. Recorded at R. W. Studio. Hottrax Records 5125-60004-2, Atlanta, GA.

