

George B. McManus
Department of Marine Sciences
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Education:

B.A. Cornell University, Biological Sciences 1973
M.S. SUNY Stony Brook, Marine Environmental Sciences 1981
Ph.D. SUNY Stony Brook, Coastal Oceanography 1986

Professional Experience:

Nov. 1986- Feb. 1989. Post-doctoral Research Associate,
Institute of Ecosystem Studies, Millbrook, NY

Feb. 1989- Sep. 1991. Assistant Research Scientist. Chesapeake Biological Laboratory, University of Maryland

Sep. 1991- Sep 1995. Senior Scientist. Marine Environmental Sciences Consortium, Dauphin Island, AL

Jul. 1992 – Aug 1995. Associate Professor, Department of Marine Sciences. University of South Alabama

Sep. 1995 - present. Associate Professor, Professor (2007), Department of Marine Sciences, University of Connecticut, jointly appointed in the Department of Ecology and Evolutionary Biology and the Marine Sciences and Technology Center

Sep. 2000 – Sep. 2005. Co-ordinator, Coastal Studies major, University of Connecticut, Department of Marine Sciences. Interim co-ordinator, 2009.

July 2002 – Sep 2004. Associate Department Head, Marine Sciences, University of Connecticut

Professional Affiliations:

American Society of Limnology & Oceanography
American Society of Microbiology
American Association of University Professors
American Geophysical Union
International Society of Protistologists

Honors and Awards:

Sigma Xi Grant-in-Aid for Research, 1979
Jessie Smith Noyes Fellowship, 1982-83
Samuel Riker Fellowship, Bermuda Biological Station, 1987
Fulbright Research Fellowship, Trinity College, University of Dublin, 2002
Elected member of the Connecticut Academy of Science and Engineering, 2011

Research Interests:

Interactions between populations of planktonic organisms and physical processes in coastal waters; trophic roles of protozoa and other microzooplankton; bacterioplankton growth and mortality; biogeography of eukaryotic microbes.

Recent funded research projects:

1. Collaborative Research: Testing hypotheses about diversity, gene flow, and effective population size in marine planktonic ciliates. NSF. \$300,000 (2007-2010).
2. Carbon and Nitrogen acquisition and cycling in heterotrophic and mixotrophic ciliates. NSF. \$426,000 (2008-2011).
3. Collaborative research: Diversity and dynamics of planktonic ciliates – what can next-generation sequencing technologies tell us? NSF. \$408,000 (2011-2014).
4. Collaborative research: Patterns of diversity in planktonic ciliates - spatio-temporal scales and community assembly in the coastal ocean. NSF \$541,804 (2014-2017).
5. HuskyTeach: Next Generation STEM Teachers. Co-PI with Neag Sch. of Education Prof. J. Settlage. NSF \$1.2M (2014-2019)

Recent Abstracts and Presentations:

1. McManus, GB. Deep-sequencing the ciliates: Diversity in a major planktonic group. Sea Education Association. 21 Mar 2014, 14 Apr 2015, 11 Apr 2016, 12 April 2017, 11 April 2018. INVITED
2. !Santoferrara, LF, S Guida, H Zhang, and GB McManus. 2014. What can transcriptome data tell us about mixotrophy in a marine planktonic ciliate? ISOP Conference, August 2014, Banff, Canada.
3. !Dierssen, H.M., G. B. McManus, S. Lin, A. Chlus, D. Qiu and B.-C. Gao. 2015. Hyperspectral HICO imagery reveals yellow fluorescing ciliate bloom in Long Island Sound, USA. International Ocean Colour Science Meeting. San Francisco, CA. June 2015.
4. Grattepanche, J-D, LF Santoferrara, GB McManus, and LA Katz. 2015. Unexpected Diversity of Planktonic Ciliates in Deep Ocean. Gordon Research Conference on Applied Microbiology.

5. Grattepanche, J-D, LF Santoferrara, GB McManus, and LA Katz. 2015. ! DGGE and HTS show the same common ciliates on the New England shelf. Gordon Research Conference on Applied Microbiology.
6. Seminar, Universidad Autonoma de Baja California. 11 Nov 2015. Biodiversity in ciliate microzooplankton: deep-sequencing the oligotrichs. INVITED
7. !McManus, GB, HM Dierssen, S Lin, and A Chlus. 2016. Remote sensing of a ciliate red tide in Long Island Sound. Long Island Sound Research Conference. Bridgeport, CT. May, 2016.
8. Santoferrara, LF and GB McManus. !2016. Curated reference sequences and updated phylogeny of Oligotrichia and Choreotrichia (Ciliophora, Spirotrichea). ISOP conference, Moscow, Russia. June 2016
9. Rubin, E, and GB McManus. 2016. Changes in the ciliate community across an eutrophication gradient in a large temperate estuary. ISOP conference, Moscow, Russia. June 2016
10. Montagnes, DJS and GB McManus. 2016. Linking genetic and ecological information in EukRef/UniEuk. IRCN for Ciliate Biodiversity meeting. Arlington VA. September 2016.
11. Smith, SA, W Song, NA Gavrilova, AV Kurilov, W Liu, GB McManus, LF Santoferrara. 2017. A Novel Brackish Tintinnid with Dual-ended Lorica Collapsibility. ISOP conference, Prague, Czech Republic. July 2017.
12. Seminar, Stony Brook University. 8 Sep 2017. ! Mixotrophy in planktonic ciliates: when a primary consumer is also a primary producer. INVITED
13. Seminar, Fordham University. 1 Nov 2017. !Mixotrophy in planktonic ciliates: when a primary consumer is also a primary producer. INVITED

Recent Publications:

1. York, JK, GB McManus, WJ Kimmerer, AM Slaughter, and TR Ignoffo. 2014. Trophic links in the plankton in the low salinity zone of a large temperate estuary: top-down effects of introduced copepods. *Estuaries and Coasts* 37:576–588. doi:10.1007/s12237-013-9698-9.
2. Grattepanche, J-D, L Santoferrara, J Andrade, AM Oliverio, GB McManus, and LA Katz. 2014. Distribution and diversity of oligotrich and choreotrich ciliates assessed by morphology and by DGGE in temperate coastal waters. *Aquat. Microb. Ecol.* 71:211-221. doi:10.3354/ame01675
3. Santoferrara, L, J-D Grattepanche, LA Katz, and GB McManus. 2014. Pyrosequencing for assessing diversity of eukaryotic microbes: analysis of data on marine planktonic ciliates and comparison with traditional methods. *Environ. Microbiol.* doi: 10.1111/1462-2920.12380

4. Lopez, G, D Carey, JT Carlton, R Cerrato, H Dam, R DiGiovanni, C Elphick, M Frisk, C Gobler, L Hice, P Howell, A Jordaan, S Lin, S Liu, D Lonsdale, M McEnroe, K McKown, G McManus, R Orson, B Peterson, C Pickerell, R Rosza, SE Shumway, A Siuda, K Streich, S Talmage, G Taylor, E Thomas, M VanPatten, J Vaudrey, C Yarish, G Wikfors and R Zajac. 2014. Biology and ecology of Long Island Sound. pp. 285-479 In: J. S. Latimer, M. A. Tedesco, R. L. Swanson, C. Yarish, P. E. Stacey, and C. Garza (eds), *Long Island Sound, Prospects for the Urban Sea*. Springer, New York.
5. Grattepanche, J-D, L Santoferrara, GB McManus, and LA Katz. 2014. Diversity of diversity: conceptual and methodological differences in biodiversity estimates of eukaryotic microbes as compared to bacteria. *Trends in Microbiology* 22:432-437. doi: 10.1016/j.tim.2014.04.006
6. Keeling, P and 81 others. 2014. The Marine Microbial Eukaryote Transcriptome Sequencing Project (MMETSP): Illuminating the functional diversity of eukaryotic life in the oceans through transcriptome sequencing. *PLOS Biology* doi: 10.1371/journal.pbio.1001889
7. Santoferrara, LF, S Guida, H Zhang, and GB McManus. 2014. *De novo* transcriptomes of a mixotrophic and a heterotrophic ciliate from marine plankton. *PLOS One* doi: 10.1371/journal.pone.0101418
8. Bouchillon, GM, JF Chau, GB McManus, and LM Shor. 2014. Microfluidic passive samplers for *in situ* collection of live aquatic protists. *Analytic Methods* doi: 10.1039/c4ay01572j
9. Santoferrara, L. F., M. Tian, V. A. Alder, and G. B. McManus. 2015. Discrimination of Closely Related Species in Tintinnid Ciliates: New Insights on Crypticity and Polymorphism in the Genus *Helicostomella*. doi:10.1016/j.protis.2014.11.005
10. Grattepanche, J.-D., L. F. Santoferrara, G. B. McManus, and L. A. Katz. 2015. Distinct assemblage of planktonic ciliates dominates both photic and deep waters on the New England shelf. *Mar Ecol Prog Ser* **526**: 1–9. doi: 10.3354/meps11256
11. Dunthorn, M., J. Lipps, and 55 others. 2015. Ciliates — Protists with complex morphologies and ambiguous early fossil record. *Marine Micropaleontology* **119**:1–6. doi:10.1016/j.marmicro.2015.05.004
12. Dierssen, HM, GB McManus, A Chlus, D Qiu, B-C Gao, and S. Lin. 2015. Space station image captures a red tide ciliate bloom at high spectral and spatial resolution. *PNAS*. doi: 10.1073/pnas.1512538112
13. Santoferrara, L, J-D Grattepanche, LA Katz, and GB McManus. 2015. Patterns and processes in microbial biogeography: do molecules and morphologies give the same answers? *ISME Journal* doi: 10.1038/ismej.2015.224
14. Mitra, A, KJ Flynn, U Tillman, JA Raven, D Caron, DK Stoecker, F Not, P Hansen, G Hallegraeff, R Sanders, S Wilken, G McManus, M Johnson, P Pitta, S Vage, T Berge, A Calbet, F Thingstad, HJ Jeong, J Burkholder, PM Glibert, E Graneli, and V

- Lundgren. 2016. Defining planktonic protist functional groups on mechanisms for energy and nutrient acquisition: incorporation of diverse mixotrophic strategies. *Protist* 167:106-120. doi:10.1016/j.protis.2016.01.003
15. Grattepanche, J.-D., L. F. Santoferrara, G. B. McManus, and L. A. Katz. 2016. Unexpected biodiversity of ciliates in marine samples from below the photic zone. *Molecular Ecology* 25:3987–4000
 16. Grattepanche, J.-D., G. B. McManus, and L. A. Katz. 2016. Patchiness of Ciliate Communities Sampled at Varying Spatial Scales along the New England Shelf. *PLoS One*.
 17. Santoferrara, LF, VA Alder, and GB McManus. 2017. Phylogeny, classification and diversity of Choreotrichia and Oligotrichia (Ciliophora, Spirotrichea). *Molec. Phylogenetics & Evol.* 112:12-22. doi.org/10.1016/j.ympev.2017.03.010
 18. Schoener, DM, and GB McManus. 2017. Growth, grazing, and inorganic C and N uptake in a mixotrophic and a heterotrophic ciliate. *J Plankton Res.* 39:379-391. doi: 10.1093/plankt/fbx014
 19. Tucker, SJ, GB McManus, LA Katz, and J-D Grattepanche. 2017. Distribution of abundant and active planktonic ciliates in coastal and slope waters off New England. *Frontiers Microbiol.* doi.org/10.3389/fmicb.2017.02178
 20. Smith, SA, W Song, NA Gavrilova, AV Kurilov, W Liu, GB McManus, and LF Santoferrara. 2017. *Dartintinnus alderae* n. g., n. sp., a Minute Brackish Tintinnid with Dual-ended Lorica Collapsibility. *J. Eukaryotic Microbiol.* doi:10.1111/jeu.12485
 21. Leles. S, A Mitra, K Flynn, D Stoecker, P Hansen, A Calbet, G McManus, R Sanders, D Caron, F Not, G Hallegraeff, P Pitta, J Raven, M Johnson, P Glibert, S Vage. 2017. Oceanic protists with different forms of acquired phototrophy display contrasting biogeographies and abundance. *Proc. Royal Soc. B* 284: doi:10.1098/rspb.2017.0664
 22. Santoferrara, L. F., and G. B. McManus. 2017. Integrating dimensions of biodiversity in choreotrichs and oligotrichs of marine plankton. *European Journal of Protistology* 61:323–330.
 23. Zhang, W, Y Pan, J Yang, H Chen, B Holohan, J Vaudrey, S Lin, GB McManus. 2018. The diversity and biogeography of abundant and rare intertidal marine microeukaryotes explained by environment and dispersal limitation. *Envir. Microbiol.* 20:462-476. doi: 10.1111/1462-2920.13916
 24. Santoferrara L.F., E. Rubin, and G.B. McManus. 2018. Global and local DNA barcoding of planktonic protists (tintinnid ciliates) reveals biogeographic patterns and unique phylotypes in land-margin environments. *J. Plankton Res.* 40:209-221. doi: 10.1093/plankt/fby011
 25. McManus, G.B., W. Liu, R.A. Cole, D. Biemesderfer, and J.L. Mydosh. 2018. *Strombidium rassoulzadegani*: a model species for chloroplast retention in oligotrich ciliates. *Frontiers in Marine Science.* doi: 10.3389/fmars.2018.00205

Special courses and certifications:

- Open-water scuba. PADI, 1979
- Fluorescent probes for marine flow cytometry, an advanced workshop. JJ MacIsaac Individual Particle Analysis Facility, W Boothbay Harbor, ME, 10-14 October 1994
- Computer-assisted image analysis and measurement. North Carolina State University, 16-18 May 1995
- Methods in PCR. Perkin -Elmer Corporation, 27-29 Jan 1997
- Sea Safety and Survival. US Coast Guard/CT Sea Grant. 14 May 2001

Seagoing experience:

R.V. Oceanus	Feb 1985	Coastal N. Atlantic	2 weeks
R.V. Gyre	Jun 1985	Coastal N. Atlantic	3 weeks
R.V. Gyre	Aug 1985	Coastal N. Atlantic	3 weeks
R.V. Lund	Jan 1986	Chilean coast	3 weeks
R.V. Gyre	Apr 1986	Coastal N. Atlantic	4 weeks
R.V. Alpha Helix	Apr 1987	Bering Sea	3 weeks
R.V. Col. Iselin	Sep 1989	Caribbean	1 week
R.V. R. Warfield	Apr 1990	Chesapeake Bay	5 days
R.V. R. Warfield	May 1990	Chesapeake Bay	4 days
R.V. R. Warfield	Aug 1990	Chesapeake Bay	5 days
R.V. Col. Iselin	Jan 1991	Caribbean	2 weeks
R.V. Col. Iselin	Sep 1991	Caribbean	2 weeks
R.V. Col. Iselin	Jan 1992	Caribbean	3 weeks
R.V. Longhorn	May 1992	Gulf of Mexico	1 week
R.V. Oregon II	Feb 1993	Gulf of Mexico	2 weeks
R.V. Prof. Besnard	July 2001	South Atlantic	10 days
R.V. Endeavor	Nov 2001	North Atlantic	10 days
R.V. Endeavor	Jun 2003	North Atlantic	10 days
R.V. Cape Hatteras	July 2012	North Atlantic	4 days
R.V. Connecticut	Aug 2015	North Atlantic	3 days

Students and post-docs:

B.S. thesis: Rachel A. Cole (2018).

M.S. students supervised: C. Alan Foster (1996); Patrick Griffin (1998); Stacey McLeroy (1997); Carol Rosetta (2002); Katharine Haberlandt (2007).

Ph.D. students supervised: Donald Schoener (2013); Susan Smith (current)

Post-doctoral fellows: Joanna York, Luciana Santoferrara, Ewelina Rubin, Sheng-Feng Tsai.