Michael Edward Sieracki

Bigelow Laboratory for Ocean Sciences

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Education

B.A. 1977. Biological Sciences. University of Delaware, Newark, DE

M.S. 1980. Microbiology. University of Rhode Island, Kingston, RI

Ph.D. 1985. Biological Oceanography. Graduate School of Oceanography, University of Rhode Island, Kingston, R.I.

Professional Experience

1977 - 1980: Biological Technician, Health Effects Research Laboratory, U.S. EPA, W. Kingston, RI.

1980 - 1981: Graduate Teaching Assistant for Marine Microbiology, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI.

1982 - 1985: Graduate Research Assistant, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI.

1985 - 1991: Assistant Professor, School of Marine Science, College of William and Mary and Virginia Institute of Marine Science, Gloucester Pt., VA.

1991: promoted to Associate Professor (with tenure), School of Marine Science, College of William and Mary and Virginia Institute of Marine Science, Gloucester Pt., VA.

1995 - 1996: Chairman of 3-person Interim Executive Committee administering and managing Bigelow Laboratory during Director search.

1991 - present: Research Scientist, and Director, J.J. MacIsaac Individual Particle Analysis Facility, Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, ME.

Teaching Experience

1980 & 1981: Instructor, summer NSF Oceanography course for advanced high school students.

1980 - 1981: Graduate Teaching Assistant for Marine Microbiology, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI.

1985 -1991: School of Marine Science, College of William and Mary. Series of 5 lectures in graduate Biological Oceanography core course. Two special topics courses in microzooplankton ecology. Guest lectures in Advanced Biological Oceanography course (graduate level).

1995 & 1996: Plankton Processes, Maine Maritime Academy, Castine, ME, upper level undergraduate course with lab (4 cr. hr.).

Graduate Student Advising

Major Professor for 2 Masters students (College of William and Mary).

Committee member for 3 Masters students (College of William and Mary), and 3 PhD students (College of William and Mary, Woods Hole/MIT, U.Maine).

Membership in Professional Organizations

American Society of Limnology and Oceanography

International Society for Analytical Cytology

Oceanographic Cruises

(over 150 days at sea)

1977 R/V Cape Henlopen and R/V Lulu. EPA cruise to study radioactive waste site on the continental slope off U.S east coast.

1979 R/V Endeavor. Caribbean Sea study of pico- and nanoplankton.

1989 R/V Atlantis II. U.S. JGOFS, North Atlantic spring bloom experiment.

1990 R/V Cape Hattaras. Chief scientist. Bacterial biomass, Sargasso Sea.

1992 R/V Cape Hattaras. Chief scientist. Spring bloom dynamics, Gulf of Maine.

1992 R/V Cape Hattaras. Chief scientist. Microzooplankton grazing, Gulf of Maine.

1994 R/V Endeavor. U.S. GLOBEC cruise. Grazing on microzooplankton, Georges Bank.

1995 Jan. R/V Endeavor. U.S. GLOBEC cruise. Grazing on microzooplankton, Georges Bank.

1995 R/V Argo Maine. Spring bloom/grazing, Gulf of Maine.

1995 June R/V Endeavor. U.S. GLOBEC cruise. Grazing on microzooplankton, Georges Bank.

1996 R/V Argo Maine. Spring boom/grazing, Gulf of Maine.

1996 R/V Argo Maine. Internal waves, Gulf of Maine.

1997 March R/V Endeavor. U.S. GLOBEC cruise. Grazing on microzooplankton, Georges Bank.

1997 May R/V Endeavor. U.S. GLOBEC cruise. Grazing on microzooplankton, Georges Bank.

1999 Oct R/V Cape Hatteras, Chief scientist, plankton size spectra, Gulf of Maine

2000 Apr R/V Cape Hatteras, Chief scientist, plankton size spectra, Gulf of Maine

2000 Aug R/V Cape Hatteras, Chief scientist, plankton size spectra, Gulf of Maine

2001 Aug, R/V Cape Hatteras, Chief scientist, bacterial activity, Sargasso Sea to Gulf of Maine

2001 Oct, R/V Cape Hatteras, Chief scientist, bacterial activity, Sargasso Sea to Gulf of Maine

Other Professional Activities

Aug. 1985 - Participated in the Flow Cytometry Workshop held at the Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, Maine.

Oct. 1987 - Co-presented the Epifluorescence Microscopy Workshop with B. and E. Sherr, at Shannon Pt. Marine Center, Western Washington University, Anacortes, WA.

July 1988 - Invited keynote lecturer in "Particle Characterisation" session of NATO Advanced Study Institute "Protozoa and their Role in Marine Processes" held 24 July - 5 August 1988 in Plymouth, U.K.

March 1990 - Participated in the First Data Workshop for the North Atlantic Bloom Experiment of the Joint Global Ocean Flux Study, Kiel, F.R.G.

June 1990 - Organized and chaired Special Session at summer ASLO meeting on "Technology, Image Analysis, and Molecular Biology", Williamsburg, VA.

Jan 1991 and Jan. 1992 - Panel review member, NSF Instrumentation and Laboratory Improvement (ILI) Program for undergraduate science education, Washington, D.C.

June 1992 - Instructor, lecture and lab: Flow and imaging cytometry in aquatic sciences. National Flow Cytometry Course, Bowdoin College, Brunswick, ME.

Oct. 1992 - Organized and co-instructed "Advanced Workshop for Fluorescent Probes in Marine Flow Cytometry", Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, ME.

July 1993 -Participated in the First Data Workshop for the Equatorial Pacific study of the Joint Global Ocean Flux Study, Seattle, WA.

Sept. 1993 - Organized and co-instructed 1-week course "Introduction to Flow and Imaging Cytometry for the Aquatic Sciences", Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, ME.

Jan 1994 - Invited speaker, Society for General Microbiology Symposium "Image Analysis of Microbes in their Habitats", University of Warwick, U.K.

Oct. 1994 - Organized and co-instructed the second "Advanced Workshop for Fluorescent Probes in Marine Flow Cytometry", Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, ME.

Oct. 1994 - Organized workshop on "Flow Cytometry in Aquatic Sciences" at the XVII Congress for the International Society for Analytical Cytology. Lake Placid, NY.

Nov. 1994 - Invited lecturer, Global Environmental Change Education workshop, University of New Hampshire.

July 1995 - Invited lecturer, European Union MAST course "Marine Flow Cytometry: Theory and Application to Ocean Processes", University of Plymouth and Plymouth Marine Laboratory, Plymouth, U.K.

Sept 1995 - Invited lecturer, Imaging cytometry course. Institute for Microbiology, University of Bergen, Bergen, Norway.

May 1996 - Co-organizer of "Gardens in the Sea" public workshop on remote sensing in the Gulf of Maine, Rockland, ME.

May 1996 - Participant and demonstrator, Physiology of Harmful Marine Algae, NATO-Advanced Study Institute, Bermuda Biological Station.

June 1997 - Organized and co-instructed 2-week course "Introduction to Flow and Imaging Cytometry for the Aquatic Sciences", Bigelow Laboratory for Ocean Sciences, W. Boothbay Harbor, ME.

June 1998 — Awarded second place prize in national Sigma Chemical photography contest.

Peer-Reviewed Publications

(44 meeting presentations with published abstracts not included)

(* denotes first author)

1985* The detection, enumeration and sizing of aquatic bacteria by image analyzed epifluorescence microscopy. Applied and Environmental Microbiology 49:799-810. with P.W. Johnson and J.McN. Sieburth.

1985 Estimating plankton populations with the Apple II. Bioscience 35:652-655. with S.J. Cynar and J.McN. Sieburth.

1985* Factors controlling the periodic fluctuation in total planktonic bacterial populations in the upper ocean: comparison of nutrient, sunlight and predation effects. Marine Microbial Food Webs 1**:**35-50. with J.McN. Sieburth.

1986* Sunlight-induced growth delay of planktonic marine bacteria in filtered seawater. Marine Ecology - Progress Series 33:19-27. M.E. Sieracki and J.McN. Sieburth.

1987 The first methane-oxidizing bacterium from the upper mixing layer of the deep ocean: *Methylomonas pelagica* sp., nov. Current Microbiology 14:285-293. with J. McN. Sieburth, P.W. Johnson, M.A. Eberhardt, M. Lidstrom, and D. Laux.

1987* The effect of fixation on particle retention by microflagellates: underestimation of grazing rates. Marine Ecology - Progress Series. 38:251-258. with L.W. Haas, D.A. Caron, E.J. Lessard.

1989 Autotrophic picoplankton dynamics in a Chesapeake Bay sub-estuary. Marine Ecology - Progress Series 52:273-285. R.T. Ray, L. W. Haas and M.E. Sieracki.

1989* Algorithm to estimate cell biovolume using image analyzed microscopy. Cytometry 10:551-557. with C.L. Viles and K.L. Webb.

1989* An evaluation of automated threshold selection methods for accurate sizing of microscopic fluorescent cells by image analysis. Appl. and Environ. Microbiol. 55:2762-2772. M.E. Sieracki, S. Reichenbach, K.L. Webb.

1990* Color image analyzed fluorescence microscopy: a new tool for marine microbial ecology. Oceanography. 3:30-36. M.E. Sieracki and C.L. Viles

1991 Automated enumeration by computer digitization of age-0 weakfish, *Cynoscion regalis*, scale

circuli. Fishery Bulletin. 89:337-340. S. T. Szedlmayer, M.M. Szedlmayer, and M.E. Sieracki.

1992 Measurement of marine picoplankton cell size and biomass using a cooled, charge coupled device camera with image-analyzed fluorescence microscopy. Applied and Environmental Microbiology. 58:584-592. C.L. Viles and M.E. Sieracki.

1992 Model-based frequency response characterization of a digital image analysis system for epifluorescence microscopy. Applied Optics. 31:1083-1092. R. Hazra, C.L. Viles, S.K. Park, S.E. Reichenbach, and M.E. Sieracki.

1992* Distributions and fluorochrome-staining properties of bacteria and sub-micrometer particles in the North Atlantic. Deep-Sea Research. 39:1919-1929. M.E. Sieracki and C.L. Viles.

1992 Spring phytoplankton blooms in the absence of vertical water column stratification. Nature. 360:59-62. David W. Townsend, Maureen Keller, M.E. Sieracki, S. G. Ackleson.

1992 Relationships between cell volume and the carbon and nitrogen content of marine photosynthetic nanoplankton. Limnol. Oceanogr. 37:1434-1446. P.G. Verity, C.Y. Robertson, C.R. Tronzo, M.G. Andrews, J.R. Nelson, M. E. Sieracki.

1993* Plankton community response to sequential silicate and nitrate depletion during the 1989 North Atlantic spring bloom. Deep-Sea Research II. 40:213-225. M.E. Sieracki, P.G. Verity and D.K. Stoecker.

1993 The abundance, biomass, and distribution of heterotrophic dinoflagellates during the North Atlantic spring bloom. Deep-Sea Research II. 40:227-244. Verity, P.G., D.K. Stoecker, M.E. Sieracki, P.H. Burkill, E.S. Edwards, and C.R. Tronzo.

1993 Biological and hydrodynamic regulation of the microbial food web in a periodically mixed temperate sub-estuary. Limnol. Oceanogr. 38:1666-1679. P.M. Eldridge and M.E. Sieracki.

1993 Grazing, growth and mortality of microzooplankton during the 1989 North Atlantic spring bloom at 47oN, 18oW. Deep-Sea Res. I. 40:1793-1814. Verity, P. G., D. K Stoecker, M. E. Sieracki, J. R. Nelson.

1994 Nanoplankton and protozoan microzooplankton during the JGOFS North Atlantic Bloom Experiment: 1989 and 1990. J. Mar. Biol. Assoc. UK.74:427-443. Stoecker, D.S., M.E. Sieracki, P.G. Verity, A.E. Michaels, E. Haugen, P.H. Burkill, E.S. Edwards.

1995* Overestimation of heterotrophic bacteria in the Sargasso Sea: direct evidence by flow and imaging cytometry. Deep-Sea Res. 42:1399-1410. M.E. Sieracki, E.M. Haugen, T.L. Cucci.

1996. The formation of high nutrient - low salinity water in the Gulf of Maine: a nutrient trap?. Estuarine, Coastal and Shelf Science. 42:617-628. C.G. Garside, J.C. Garside, M.D. Keller, M.E. Sieracki.

1996. Microzooplankton grazing of primary production at 140°W in the equatorial Pacific. Deep-Sea Res. II 43:1227-1256. P.G. Verity, D.K. Stoecker, M.E. Sieracki, J. R. Nelson.

1997 Cellular DNA content of marine phytoplankton using two new fluorochromes: taxonomic and ecological implications. J. Phycol. 33:527-541. M.J.W. Veldhuis, T. L. Cucci, M.E. Sieracki.

1998. An imaging-in-flow system for automated analysis of marine microplankton. Mar. Ecol. Progr. Ser. 168:285-296. C.K. Sieracki, M.E. Sieracki, C.S. Yentsch.

1998* A *Chaetoceros socialis* Lauder patch on Georges Bank: Distribution, colony structure, and grazing losses. Oceanography. 11:30-35. M. Sieracki, D. Gifford, S. Gallager, C. Davis.

1998 Carbon and nitrogen densities of the cultured marine heterotrophic flagellate *Paraphysomonas* sp. J. Microbiol. Methods. 34:151-163. Y.Sin, K.W. Webb, M.Sieracki.

1999* Flow cytometric analysis of 5-cyano-2,3-ditoyl tetrazolium chloride activity of marine bacterioplankton in dilution cultures. Applied and Environmental Microbiology.65(6):2409-2417. M. Sieracki, T.L.Cucci, J. Nicinski.

2001 Effects of mismatched refractive indices in aquatic flow cytometry. Cytometry. 44(3) Cucci, T.L. and M. E. Sieracki.

Book Chapters

1991* Applications of image analyzed fluorescence microscopy for characterizing planktonic protist communities. In: Reid, PC, Turley, CM, Burkill, PH. (eds) Protozoa and their role in marine processes. p. 77-100. Springer, Berlin Heidelberg New York. M.E. Sieracki and K.L. Webb.

1993 Use of color image analysis and epifluorescence microscopy to measure plankton biomass. In: Kemp, P.F., B.F. Sherr, E.B. Sherr and J.J. Cole (eds.), Current Methods in Aquatic Microbial Ecology. Lewis Publishers. Verity, P.G. and M. E. Sieracki.

1998* Enumeration and sizing of micro-organisms using digital image analysis. In: Schut, F. and M. Wilkinson (eds.) Digital Image Analysis of Microbes: Imaging, Morphometry, Fluorometry and Motility Techniques and Applications. Elsevier Press. M.E. Sieracki and C.L. Viles

Other Publications (not peer-reviewed)

1991* Classification of plankton cell types by color image analyzed fluorescence microscopy using HSV (hue, saturation, value) color space. Signal and Noise (newsletter) 4(2):2. M.E. Sieracki, M.S. Mort, and C.L. Viles.

1992* Review of the book "Image Analysis in Biology". in J. Exp. Mar. Biol. Ecol.

1993* Report on the advanced workshop on fluorescent probes for marine flow cytometry: Use of fluorescent probes in the study of phytoplankton physiology and cellular biochemistry. Signal and Noise (newsletter) 6(1):1-2.

1993* A note on losses of *Prochlorococcus* cells due to preservation. Signal and Noise (newsletter) 6(1):2. M. Sieracki, G. Valet, and T. Cucci.

1997 A high throughput volume particle in-flow imaging system. In: Ackleson SG, Frouin R (eds) Ocean Optics XIII. *Proc. SPIE* **2963**:886-891. Sieracki CS, Sieracki MS.

1999 FlowCAM: An instrument for continuously moinitoring and imaging phytplankton. The Plankton Net: Maine's Phytoplankton Monitoring Newsletter. Vol. 1(2):10-11. February 1999. C.K. Sieracki and M. E. Sieracki.

Patent

C.K. Sieracki, M. E. Sieracki, and C.S. Yentsch. 2000. Device and method for studying particles in a fluid. U.S. Patent number 6,115,119.