

John M. Toole

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B. A., University of Maine, Orono, 1975 (Physics). Sc.D., Massachusetts Institute of Technology and Woods Hole Oceanographic Institution Joint Program in Oceanography, 1980 (Physical Oceanography).

Woods Hole Oceanographic Institution: Emeritus Research Scholar, Jan 2025-present; Emeritus Scientist, June 2024-January 2025; Senior Scientist, 1996-2024; Department Chair, July 2010-August 2014; Associate Scientist, 1986-1996; tenure awarded, 1990; Assistant Scientist, 1982-1986. National Research Council Postdoctoral Research Associate: July 1980-June 1982, Pacific Marine Environmental Laboratory, NOAA. MIT/WHOI Joint Program Graduate Research Assistant: August 1975-March 1980.

Member, Phi Beta Kappa, Phi Kappa Phi, Sigma Phi Sigma
Fellow of the American Geophysical Union, 2004
Fellow of the American Academy of Arts and Sciences, 2008

U.S. Patents:

No. 5,869,756: Moored water profiling apparatus. Inventors: K. W. Doherty, J. M. Toole and D. E. Frye, Feb. 9, 1999.
No. 5,665,909: Free-fall, wire-guided hydrographic profiler. Inventors: K. W. Doherty, J. M. Toole, and R.C. Millard, Sept. 9, 1997
No. 16/840,526: Articulating Moored Profiler System. Inventors: J. Toole, K. Doherty, J. O'Brien and F. Thwaites, April 6, 2020. Augmentation accepted April 4, 2022.

Research Interests: The physics of ocean mixing including the nature of finescale and microscale velocity, temperature and salinity fluctuations and the relationships between them. Polar oceanography and upper-ocean/sea ice interactions, Seasonal to multi-decadal variability of ocean water properties, stratification and circulation, ocean time-series stations. Global oceanic heat and fresh water budgets, water mass formation and circulation. Low-latitude ocean circulation, El Niño. Oceanographic instrument development.

Educational Activities: Principal advisor to 5 PhD candidates and 1 MS candidate; Thesis Committee Member or Thesis Defense Chair for 22 individuals; Postdoctoral advisor to 7 individuals; Co-instructor MIT/WHOI Joint Program course 12.808 Introduction to Physical Oceanography – 2017 to present.

Peer-reviewed Publications

Joyce, Terrence M., Walter Zenk, and John M. Toole, 1978. The anatomy of the Antarctic Polar Front in the Drake Passage. *Journal of Geophysical Research*, **83**(C12), 6093-6113.
Horne, E. P. W., and J. M. Toole, 1980. Sensor response mismatches and lag correction techniques for temperature-salinity profilers. *Journal of Physical Oceanography*, **10**(7), 1122-1130.
Toole, John M., and Daniel T. Georgi, 1981. On the dynamics and effects of double-diffusively driven intrusions. *Progress in Oceanography*, **10**, 123-145.
Toole, John M., 1981. Sea ice, winter convection, and the temperature minimum layer in the Southern Ocean. *Journal of Geophysical Research*, **86**(C9), 8037-8047.
Toole, John M., 1981. Intrusion characteristics in the Antarctic Polar Front. *Journal of Physical Oceanography*, **11**(6), 780-793.

- Toole, John M., 1981. Anomalous characteristics of equatorial thermohaline fine- structure. *Journal of Physical Oceanography*, **11**(6), 871–876.
- Georgi, Daniel T., and John M. Toole, 1982. The Antarctic Circumpolar Current and the oceanic heat and freshwater budgets. *Journal of Marine Research*, Supplement to **40**, 183–197.
- Hayes, S. P., J. M. Toole, and L. J. Mangum, 1983. Water-mass and transport variability at 110°W in the equatorial Pacific. *Journal of Physical Oceanography*, **13**(2), 153–168.
- Toole, John M., and Stanley P. Hayes, 1984. Finescale velocity-density characteristics and Richardson Number statistics of the eastern equatorial Pacific. *Journal of Physical Oceanography*, **14**(4), 712–726.
- Toole, John M., and Mark D. Borges, 1984. Observations of horizontal velocities and vertical displacements in the equatorial Pacific Ocean associated with the early stages of the 1982/83 El Niño. *Journal of Physical Oceanography*, **14**(5), 948–959.
- Toole, John M., 1985. Near equatorial CTD observations at 85°W in October 1982. *Journal of Geophysical Research*, **90**(C1), 929–933.
- Toole, John M., and Mary E. Raymer, 1985. Heat and fresh water budgets of the Indian Ocean – revisited. *Deep-Sea Research*, **32**(8A), 917–928.
- Mangum, L. J., S. P. Hayes, and J. M. Toole, 1986. Eastern Pacific Ocean circulation near the onset of the 1982/83 El Niño. *Journal of Geophysical Research*, **91**(C7), 8428–8436.
- Toole, John M., Hartmut Peters, and Michael C. Gregg, 1987. Upper ocean shear and density variability at the Equator during TROPIC HEAT. *Journal of Physical Oceanography*, **17**(9), 1397–1406.
- Toole, John M., and Raymond W. Schmitt, 1987. Small-scale structures in the northwest Atlantic subtropical front. *Nature*, **327**, 47–49.
- Leetmaa, A., D. W. Behringer, A. Huyer, R. L. Smith, and J. Toole, 1987. Hydrographic conditions in the eastern Pacific before, during and after the 1982/83 El Niño. *Progress in Oceanography*, **19**, 1–47.
- Peters, H., M. C. Gregg, and J. M. Toole, 1988. On the parameterization of equatorial turbulence. *Journal of Geophysical Research*, **93**, 1199–1218.
- Schmitt, Raymond W., John M. Toole, Richard L. Koehler, Edward C. Mellinger, and Kenneth W. Doherty, 1988. The development of a fine- and microstructure profiler. *Journal of Atmospheric and Oceanic Technology*, **5**(4), 484–500.
- Toole, J. M., E. Zou, and R. C. Millard, 1988. On the circulation of the upper waters in the western equatorial Pacific Ocean. *Deep-Sea Research*, **35**(9), 1451–1482.
- Peters, H., M. Gregg, and J. Toole, 1989. Meridional variability of turbulence through the equatorial undercurrent. *Journal of Geophysical Research*, **94**(C12), 18,003–18,009.
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- Toole, John M., Robert M. Millard, Z. Wang, and S. Pu, 1990. Observations of the Pacific North Equatorial Current bifurcation at the Philippine coast. *Journal of Physical Oceanography*, **20**(2), 307–318.
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- Delcroix, Thierry, Gérard Eldin, Marie-Hélène Radenac, John Toole, and Eric Firing, 1992. Variation of the Western Equatorial Pacific Ocean, 1986–1988. *Journal of Geophysical Research*, **97**(C4), 5423–5445.

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