

John M. Toole

Department of Physical Oceanography
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543
Tel: 508-289-2531; Fax: 508-457-2181
Email: jtoole@whoi.edu

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).

Department Chair, July 2010-present; Senior Scientist, 1996-present; Associate Scientist, 1986-1996; tenure awarded, 1990; Assistant Scientist, 1982-1986; Woods Hole Oceanographic Institution. National Research Council Postdoctoral Research Associate, July 1980-June 1982, Pacific Marine Environmental Laboratory, NOAA.

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

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.

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.
- McPhaden, M. J., S. P. Hayes, L. J. Mangum, and J. M. Toole, 1990. Variability in the western equatorial Pacific Ocean during the 1986–87 El Niño/Southern Oscillation event. *Journal of Physical Oceanography*, **20**(2), 190–208.
- 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.
- Mangum, L. J., S. P. Hayes, J. M. Toole, Z. Wang, S. Pu, and D. Hu, 1990. Thermohaline structure and zonal pressure gradient in the western equatorial Pacific. *Journal of Geophysical Research*, **95**, 7279–7288.
- Halliwel, George R., Jr., Peter Cornillon, Kenneth H. Brink, Raymond T. Pollard, David L. Evans, Lloyd A. Regier, John M. Toole, and Raymond W. Schmitt, 1991. Descriptive oceanography during the Frontal Air–Sea Interaction EXperiment: Medium-to-large-scale variability. *Journal of Geophysical Research*, **96**(C5), 8553–8567.
- Weller, R. A., D. L. Rudnick, C. C. Eriksen, K. L. Polzin, N. S. Oakey, J. W. Toole, R. W. Schmitt, and R. T. Pollard, 1991. Forced ocean response during the frontal air–sea interaction experiment. *Journal of Geophysical Research*, **96**, (C5), 8611–8638.
- 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.
- McPhaden, M. J., F. Bahr, Y. duPenhoat, E. Firing, S. P. Hayes, P. P. Niiler, P. L. Richardson, and J. M. Toole, 1993. The response of the western equatorial Pacific Ocean to westerly wind bursts during November 1989–January 1990. *Journal of Geophysical Research*, **97**(C9), 14,289–14,303.
- Millard, Robert C., Gary Bond, and John M. Toole, 1993. Implementation of a titanium strain-gauge pressure transducer for CTD applications. *Deep-Sea Research*, **40**(5), 1009–1021.

- Johnson, Gregory C., and John M. Toole, 1993. Flow of deep and bottom waters in the Pacific at 10°N. *Deep-Sea Research*, **40**(2), 371–394.
- Toole, John M., and Bruce A. Warren, 1993. A hydrographic section across the subtropical South Indian Ocean. *Deep-Sea Research*, **40**(10), 1973–2019.
- Gouriou, Yves, and John M. Toole, 1993. Mean circulation of the upper layers of the western equatorial Pacific Ocean. *Journal of Geophysical Research*, **98**, 22,495–22,520.
- Toole, John M., Kurt L. Polzin, and Raymond W. Schmitt, 1994. New estimates of diapycnal mixing in the abyssal ocean. *Science*, **264**, 1120–1123.
- Polzin, Kurt L., John M. Toole, and Raymond W. Schmitt, 1995. Finescale parameterizations of turbulent dissipation. *Journal of Physical Oceanography*, **25**, 306–328.
- Kunze, Eric, Raymond W. Schmitt, and John M. Toole, 1995. The energy balance in a warm-core ring's near-inertial critical layer. *Journal of Physical Oceanography*, **25**, 942–957.
- Wijffels, Susan, Eric Firing, and John Toole, 1995. The mean structure and variability of the Mindanao Current at 8°N. *Journal of Geophysical Research*, **100**, 18,421–18,435.
- Polzin, K. L., N. S. Oakey, J. M. Toole, and R. W. Schmitt, 1996. Fine structure and microstructure characteristics across the northwest Atlantic subtropical front. *Journal of Geophysical Research*, **101**(C6), 14,111–14,121.
- Wijffels, Susan E., John M. Toole, Harry L. Bryden, Rana A. Fine, William J. Jenkins, and John L. Bullister, 1996. The water masses and circulation at 10°N in the Pacific. *Deep-Sea Research I*, **43**(4), 501–544.
- Polzin, Kurt L., Kevin G. Speer, John M. Toole, and Raymond W. Schmitt, 1996. Intense mixing of Antarctic Bottom Water in the equatorial Atlantic. *Nature*, **380**(6569), 54–57.
- Chiswell, S. M., J. Toole and J. Church, 1997. Transports across the Tasman Sea from WOCE repeat sections: the East Australian Current 1990-94. *New Zealand Journal of Marine and Freshwater Research*, **31**, 469-475.
- Toole, John M., Raymond W. Schmitt, Kurt L. Polzin, and Eric Kunze, 1997. Near-boundary mixing above the flanks of a midlatitude seamount. *Journal of Geophysical Research*, **102**(C1), 947–959.
- Polzin, Kurt L., John M. Toole, James R. Ledwell, and Raymond W. Schmitt, 1997. Spatial variability of turbulent mixing in the abyssal ocean. *Science*, **276**, 93–96.
- Robbins, Paul E., and John M. Toole, 1997. The dissolved silica budget as a constraint on the meridional overturning circulation of the Indian Ocean. *Deep-Sea Research I*, **44**(5), 879–906.
- Toole, John M., Kenneth W. Doherty, Daniel E. Frye, and Robert C. Millard, 1997. A wire-guided, free-fall system to facilitate ship-borne hydrographic profiling. *Journal of Atmospheric and Oceanic Technology*, **14**, 667–675.
- Ffield, Amy, John Toole, and Doug Wilson, 1997. Seasonal circulation in the South Indian Ocean. *Geophysical Research Letters*, **24**, 2773–2776.
- Kunze, Eric, and John M. Toole, 1997. Tidally driven vorticity, diurnal shear, and turbulence atop Fieberling Seamount, 1997. *Journal of Physical Oceanography*, **27**(12), 2663–2693.
- Toole, J. M., 1998. Turbulent mixing in the ocean: Intensity, causes and consequences. In: *Ocean Modeling and Parameterization*, NATO Science Series C: Mathematical and Physical Sciences, Vol. **516**, E. P. Chassignet and J. Verron, editors, Kluwer Academic Publishers, pp. 171–190.
- Doherty, K. W., D. E. Frye, S. P. Liberatore, and J. M. Toole, 1999. A moored profiling instrument. *Journal of Atmospheric and Oceanic Technology*, **16**, 1816–1829.
- Ganachaud, Alexandre, Carl Wunsch, Jochem Marotzke, and John Toole, 2000. The meridional overturning and large-scale circulation of the Indian Ocean. *Journal of Geophysical Research*, **105**(C11), 26,117–26,134.
- St. Laurent, Louis C., John M. Toole, and Raymond W. Schmitt, 2001. Buoyancy forcing by turbulence above rough topography in the abyssal Brazil Basin. *Journal of Physical Oceanography*, **31**, 3476–3495.

- Ledwell, J. R., E. T. Montgomery, K. L. Polzin, L. C. St. Laurent, R. W. Schmitt, and J. M. Toole, 2000. Evidence for enhanced mixing over rough topography in the abyssal ocean. *Nature*, **403**(6766), 179–182.
- Toole, John M., and Trevor J. McDougall, 2001. Mixing and stirring in the ocean interior. Chapter 5.2 in *Ocean Circulation and Climate*, G. Siedler, and J. Church, editors, International Geophysics Series, Academic Press, pp. 337–356.
- Wijffels, S. E., J. M. Toole and R. E. Davis, 2001. Revisiting the South Pacific subtropical circulation: A synthesis of World Ocean Circulation Experiment observations along 32°S. *Journal of Geophysical Research*, **106**, 19,481–19,513.
- DiMarco, S. F., P. Chapman, W. D. Nowlin, Jr., P. Hacker, K. Donohue, M. Luther, G. C. Johnson and J. Toole, 2002. Volume transport and property distributions of the Mozambique Channel. *Deep-Sea Research II*, **49**(7-8), 1481–1511.
- Donohue, K. and J. Toole, 2003. A near-synoptic survey of the Southwest Indian Ocean. In: Topical Studies in Oceanography: Physical Oceanography of the Indian Ocean: from WOCE to CLIVAR, Fritz Schott, editor. *Deep-Sea Research II*, **50**, 1893–1932.
- Polzin, K. L., E. Kunze, J. M. Toole, and R. W. Schmitt, 2003. The partition of finescale energy into internal waves and subinertial motions. *Journal of Physical Oceanography*, **33**, 234–248.
- Nash, J. D. E. Kunze, J. M. Toole, and R. W. Schmitt, 2004. Internal tide reflection and turbulent mixing on the continental slope. *Journal of Physical Oceanography*, **34**, 1117–1134.
- Toole, J. M., H.-M. Zhang, and M. J. Caruso, 2004. On the time-dependent internal energy budgets of the tropical warm-water pools. *Journal of Climate*, **17**, 1398–1410.
- Schmitt, R. W., J. R. Ledwell, E. T. Montgomery, K. L. Polzin, and J. M. Toole, 2005. Enhanced Diapycnal Mixing by Salt Fingers in the Main Thermocline of the Tropical Atlantic. *Science*, **308**, 685–688.
- Schmitt, Raymond W., Robert C. Millard, John M. Toole and W. David Wellwood, 2005. A double-diffusive interface tank for dynamic-response studies. *Journal of Marine Research*, **63**, 263–289.
- Thurnherr, A. M., L. C. St. Laurent, K. G. Speer, J. M. Toole, and J. R. Ledwell, 2005. Mixing Associated with Sills in a Canyon on the Mid-Ocean Ridge Flank. *Journal of Physical Oceanography*, **35**, 1370–1381.
- Toole, J. M., and 12 others, 2006. Ice-Tethered Profilers sample the upper Arctic Ocean. *EOS, Transactions, American Geophysical Union*, **87**, 434–438.
- Johnson, G. C., J. M. Toole, and N. G. Larson, 2007. Sensor corrections for Sea-Bird SBE-41CP and SBE-41 CTDs. *Journal of Atmospheric and Oceanic Technology*, **24**, 1117–1130.
- Toole, J. M., 2007. Temporal Characteristics of Abyssal Finescale Motions above Rough Bathymetry. *Journal of Physical Oceanography*, **37**(3), 409–427.
- Timmermans, M. -L., J. Toole, A. Proshutinsky, R. Krishfield, and A. Plueddemann, 2008. Eddies in the Canada Basin, Arctic Ocean, observed from Ice-Tethered Profilers, *Journal of Physical Oceanography*, **38**, 133–145.
- Krishfield, R., J. Toole, A. Proshutinsky, and M.-L. Timmermans, 2008. Automated Ice-Tethered Profilers for seawater observations under pack ice in all seasons. *Journal of Atmospheric and Oceanic Technology*, **25**, Issue 11, 2091–2105.
- Silverthorne, K. E. and J.M. Toole, 2008. Seasonal Kinetic Energy Variability of Near-Inertial Motions. *Journal of Physical Oceanography*, **39**, 1035–1049, DOI: 10.1175/JPO3920.1 .
- Johnson, G. C., S. G. Purkey, and J. M. Toole, 2008. Reduced Antarctic meridional overturning circulation reaches the North Atlantic. *Geophysical Research Letters*, DOI: 10.1029/2008GL035619.
- Inoue, R., Kunze, E., St Laurent, L., Schmitt, R. W., Toole, J. M., 2008. Evaluating salt-fingering theories. *Journal of Marine Research*, **66**, 413–440.

- Timmermans, M.-L., J. Toole, R. Krishfield, and P. Winsor, 2008. Ice-Tethered Profiler observations of the double-diffusive staircase in the Canada Basin thermocline, *J. Geophys. Res.*, **113**, C00A02, doi:10.1029/2008JC004829.
- Marshall, J., A. Anderson, W. Dewar, S. Doney, J. Edson, R. Ferrari, G. Forget, D. Fratantoni, M. Gregg, T. Joyce, K. Kelly, S. Lozier, R. Lumpkin, G. Maze, J. Palter, R. Samelson, K. Silverthorne, E. Skyllingstad, F. Straneo, L. Talley, L. Thomas, J. Toole, and R. Weller, 2009. The Climode Field Campaign: Observing the cycle of convection and restratification over the Gulf Stream, 2009. *Bulletin of the American Meteorological Society*, **90**, Issue 9, 1337-1350.
- MacDonald, A.M., S. Mecking, J.M. Toole, P.E. Robbins, S.E. Wijffels, L. Talley, and M. Cook, 2009. The WOCE-era 3-D Pacific Ocean circulation and heat budget. *Progress in Oceanography*, **82**, Issue 4, 281-325.
- Proshutinsky, A., R. Krishfield, M.-L. Timmermans, J. Toole, E. Carmack, F. McLaughlin, W.J. Williams, S. Zimmerman, M. Itoh and K. Shimada, 2009. Beaufort Gyre freshwater reservoir: State and variability from observations, *Journal of Geophysical Research*, **114**, C00A10, doi:10.1029/2008JC005104.
- Proshutinsky, A., M.-L. Timmermans, I. Ashik, A. Beszczynska_Moeller, E. Carmack, I. Frolov, R. Krishfield, F. McLaughlin, J. Morison, I. Polyakov, K. Shimada, V. Sokolov, M. Steele, J. Toole, and R. Woodgate, 2010. The Arctic Oceans. [in "State of the Climate in 2009"]. *Bulletin of the American Meteorological Society*, **91** (6), S109-S112.
- Toole, J.M., M.-L. Timmermans, D. K. Perovich, R. A. Krishfield, A. Proshutinsky, and J.A. Richter-Menge, 2010. Influences of the Ocean Surface Mixed Layer and Thermohaline Stratification on Arctic Sea Ice in the Central Canada Basin. *Journal of Geophysical Research*, **115**, C10018, doi:10.1029/2009JC005660.
- Timmermans, M.L., R. Krishfield, S. Laney, and J. Toole, 2010. Ice-Tethered Profiler measurements of dissolved oxygen under permanent ice cover in the Arctic Ocean. *Journal of Atmospheric and Oceanic Technology*, 10.1175/2010JTECHO772.1.
- Polyakov, Igor V., and Coauthors, 2010: Arctic Ocean Warming Contributes to Reduced Polar Ice Cap. *Journal of Physical Oceanography*, **40**, 2743–2756. doi: 10.1175/2010JPO4339.1
- Ledwell, J.R., L.C. St. Laurent, J.B. Girtton, and J.M. Toole, 2010. Diapycnal Mixing in the Antarctic Circumpolar Current. *Journal of Physical Oceanography*, 10.1175/2010JPO4557.1.
- Rabe, B., M. Karcher, U. Schauer, J. M. Toole, R. A. Krishfield, S. Pisarev, F. Kaukera, R. Gerdes and T. Kikuchi. An assessment of pan-Arctic Ocean freshwater content changes from the 1990s to the IPY period. *Deep-Sea Research-I*, **58**, 173–185, ISSN 0967-0637, DOI: 10.1016/j.dsr.2010.12.002
- Brandt, P., A. Funk, V. Hormann, M. Dengler, R. J. Greatbatch, and J. Toole, 2011. Interannual atmospheric variability forced by the deep equatorial Atlantic Ocean. *Nature* **473**, 497-500 doi:10.1038/nature10013 Letter.
- Timmermans, M.-L., A. Proshutinsky, R.A. Krishfield, D.K. Perovich, J.A. Richter-Menge, T.P. Stanton and J.M. Toole, 2011. Surface freshening in the Arctic Ocean's Eurasian Basin: an apparent consequence of recent change in the wind-driven circulation. *Journal of Geophysical Research*, **116**, C00D03, 1, doi:10.1029/2011JC006975 doi:10.1029/2011JC006975.
- Toole, J.M., R.G. Curry, T.M. Joyce, M. McCartney and B. Peña-Molino, 2011. Transport of the North Atlantic Deep Western Boundary Current about 39° N, 70° W: 2004-2008. *Deep-Sea Research - II*, **58**, 1768–1780.
- Toole, J.M., R.A. Krishfield, M.-L. Timmermans and A. Proshutinsky, 2011. The Ice-Tethered Profiler: Argo of the Arctic. *Oceanography*, Toole, **24**(3):126–135, <http://dx.doi.org/10.5670/oceanog.2011.64>.

- Peña-Molino, B., T. M. Joyce and J. M. Toole, 2011. Recent changes in the Labrador Sea Water within the Deep Western Boundary Current Southeast of Cape Cod. *Deep-Sea Research - I*, **58**, 1019-1030
- Timmermans, M.-L., S. T. Cole, and J. M. Toole, 2011. Horizontal density structure and restratification of the Arctic ocean surface layer, *Journal of Physical Oceanography*, **42**, 659-668, doi: 10.1175/JPO-D-11-0125.1
- St. Laurent, L. C., A. Naveira Garabato, J. R. Ledwell, A. M. Thurnherr, J. M. Toole and A. J. Watson, 2012. Diapycnal Mixing in Drake Passage. *Journal of Physical Oceanography*, in press.
- Davis, X. J., F. Straneo, Y.-O. Kwon, K. A. Kelly, and J. M. Toole, 2012. Evolution and Formation of North Atlantic Eighteen Degree Water in the Sargasso Sea from Moored Data, *Deep-Sea Res.*, accepted.
- Peña-Molino, B., T. M. Joyce, J. M. Toole, 2012. Variability in the Deep Western Boundary Current: local versus remote forcing. *Journal of Geophysical Research*, accepted.
- Silverthorne, K. E. and Toole, J. M., 2012. Quasi-Lagrangian observations of the upper ocean response to wintertime forcing in the Gulf Stream, *Deep-Sea Research*, submitted.
- Brearley, J.A., E. L. McDonagh, B. A. King; H.L. Bryden, J.M. Toole and R. Curry, 2012. A Nineteen Year Time Series of Gulf Stream transports at 68°W from altimetric sea surface height observations. *Journal of Geophysical Research*, submitted.
- Elipot, S., C.W. Hughes, S.C. Olhede and J.M. Toole, 2012. Observed coherence of western overturning transports in the North Atlantic Ocean: boundary wave adjustments or deep western boundary current advection? *Journal of Physical Oceanography*, submitted.
- Mauritzen, C., B. Rudels and J. Toole, 2012. The Arctic and Subarctic Oceans/Seas. In *Ocean Circulation and Climate* 2nd edition, eds: J. Church, J. Gould, S. Gries and G. Siedler. Submitted.
- Cole, S.T., M.-L. Timmermans, J.M. Toole, R.A. Krishfield and F.T. Thwaites, 2012. Ekman veering, internal waves, and turbulence observed under Arctic sea-ice. *Journal of Physical Oceanography*, submitted.
- Sheen, K. L., J. A. Brearley, J. R. Ledwell, M. P. Meredith, A. C. Naveira Garabato, D. A. Smeed, L. St. Laurent, A. M. Thurnherr, J. M. Toole, S. Waterman, and A. J. Watson, 2012. Rates and mechanisms of turbulent dissipation and mixing in the Southern Ocean: Results from the DIMES experiment. *Journal of Geophysical Research*, submitted.

Non-refereed Publications

- Millard, R., J. Toole, and M. Swartz, 1980. A fast responding temperature measurement system for CTD applications. *Ocean Engineering*, 7(3), 413–427.
- Hayes, S. P., and J. M. Toole, 1981. Equatorial finestructure in the eastern Pacific. In: *Recent Progress in Equatorial Oceanography: A Report of the Final Meeting of SCOR Working Group 47 in Venice, Italy, April 27–30, 1981*; J. P. McCreary, Jr., D. W. Moore and J. M. Witte, editors; Nova University/N.Y.I.T. Press, Fort Lauderdale, Florida, pp. 219–228.
- Toole, J. M., 1981. Upper ocean heat and salt content variations during STREX. In: *Storm Transfer and Response Workshop Report*, M. Miyake, Executive Scientist, University of Washington, Seattle; pp. 200–205.
- Toole, J. M., 1984. Sea surface temperature in the equatorial Pacific. *Oceanus*, 27(2, summer), 29–34.
- Toole, J., R. Schmitt, and K. Polzin, 1988. Fine- and microstructure characteristics near an upper ocean front. In: *Proceedings of Seventh Conference on Ocean–Atmosphere Interaction*, American Meteorological Society, pp. 90–92.
- Schmitt, R. W., K. L. Polzin, and J. M. Toole, 1989. Shear and salt fingers. In: *Parameterization of*

- Small-Scale Processes, Peter Müller and Diane Henderson, editors. Proceedings, Hawaiian Winter Workshop, University of Hawaii at Manoa, January 17–20, 1989; Hawaii Institute of Geophysics, Special Publication; pp. 127–144.
- Kunze, Eric, and John M. Toole, 1995. Fine- and microstructure observations of trapped diurnal oscillations atop Fieberling Seamount. In: Topographic Effects in the Ocean, Proceedings, 'Aha Huliko'a, Hawaiian Winter Workshop, University of Hawaii at Manoa, January 17–20, 1995; Peter Müller and Diane Henderson, editors; School of Ocean and Earth Science and Technology (SOEST) Special Publication; pp. 15–41.
- Schmitt, R., E. Montgomery, and J. Toole, 1995. A free vehicle explores deep-sea mixing. *Oceanus*, 38(1), 21–25.
- Toole, J. M., 1995. ALACE results help determine thermocline depth variability. *WOCE Notes*, 7, No. 2, September, 7–11.
- Toole, J. M., 1996. New data on deep-sea turbulence. *Oceanus*, 39, 33–35.
- Toole, J. M., J. R. Ledwell, K. L. Polzin, R. W. Schmitt, E. T. Montgomery, L. St. Laurent, and W. B. Owens, 1997. Brazil Basin Tracer Release Experiment. *International WOCE Newsletter*, No. 28, 25–28.
- Toole, J. M., 1997. Research Discoveries from the Open Ocean: 1980 to the present, a personal synopsis. Contributed to the Advances and Primary Research Opportunities in Physical Oceanography Studies (APROPOS) Workshop. http://www.joss.ucar.edu/joss_psg/project/oce_workshop/apropos/.
- Polzin, Kurt, John M. Toole, and Raymond W. Schmitt, 1998. Topographic roughness begets increased oceanic mixing. *Woods Hole Oceanographic Institution 1998 Annual Report*, pp. 21–22.
- Toole, J. M., K. W. Doherty, D. E. Frye, and S. P. Liberatore, 1999. Velocity measurements from a moored profiling instrument. *Proceedings of IEEE, Sixth Working Conference on Current Measurement*, March 11–13, 1999, San Diego, pp. 144–149.
- Morrison, A. T., III, J. D. Billings, K. W. Doherty, and J. M. Toole, 2000. The McLane Moored Profiler: A Platform for Physical Biological and Chemical Oceanographic Measurements. *Proceedings of the Oceanology International 2000 Conference*, March 7–10, 2000, Brighton, U.K.
- Morrison, A. T., III, J. M. Toole, R. Likas, S. E. WorriLOW, and K. W. Doherty, 2001. Results from the first successful field deployment of the McLane Moored Profiler. *MTS Oceans 2001 Meeting*, Hawaii, November, 2001.
- Visbeck M., A. Gordon, B. Smethie, P. Schlosser, J. Toole, B. Huber, and G. Krahmann, 2001. The CORC/ARCHES observing system for Weddell Sea deep and bottom water variability. *CLIVAR Exchanges*, 6, 23–25.
- Yamamoto, H., M. Fukasawa, Y. Yoshikawa, T. Hatayama, A. T. Morrison, III, and John M. Toole, 2002. The first science deployment of a McLane Moored Profiler. *Techno-Ocean 2002 Conference*, Japan.
- Williams, A.J., F.T. Thwaites, A.T. Morrison, J.M. Toole, R. Krishfield, 2010. Motion tracking in an acoustic point-measurement current meter. *Proceedings, OCEANS 2010 IEEE - Sydney*, Print ISBN: 978-1-4244-5221-7.
- Thwaites, F.T., R. Krishfield, M-L. Timmermans, J.M. Toole, and A.J. Williams 3rd, 2011. Noise in Ice-Tethered Profiler and McLane Moored Profiler velocity measurements. In *Proceeding of IEEE/OES/CWTMC Tenth Working Conference on Current, Wave, and Turbulence Measurement Technology*, Monterey, CA, 20-23 March 2011, 8 pages.
- Thwaites, F. T., R. Krishfield, M-L. Timmermans, J. M. Toole, and A. J. Williams 3rd, 2011. Flux Measurements from an Ice-Tethered Profiler: First Look, *Proceedings Oceans 2011 IEEE-Santander*, Spain, 6-9 June 2011, IEEE/OES, 6 pages.

Thesis and Technical Reports

- Joyce, T., J. Dean, M. McCartney, R. Millard, D. Moller, A. Voorhis, C. Dahm, D. Georgi, G. Kullenberg, J. Toole, and W. Zenk, 1976. Observations of the Antarctic Polar Front during

- FDRAKE 76: A cruise report. Woods Hole Oceanographic Institution Technical Report WHOI-76-74, 150 pp.
- Toole, J. M., 1980. Wintertime convection and frontal interleaving in the Southern Ocean. Sc.D. Dissertation, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution Joint Program in Oceanography. Woods Hole Oceanographic Institution Technical Report WHOI-80-25, 326 pp.
- Mangum, L., J. Toole, and S. Hayes, 1985. CTD/O measurements on the Conrad cruise, September–October 1982. NOAA Data Report, ERL-PMEL-11, Seattle, Washington, 113 pp.
- Cook, M., L. Mangum, R. C. Millard, G. LaMontagne, S. Pu, J. Toole, Z. Wang, K. Yang, and L. Zhao, 1991. Hydrographic observations from the US/PRC cooperative program in the western equatorial Pacific Ocean: Cruises 1–4. Woods Hole Oceanographic Institution Technical Report WHOI-90-07, 379 pp.
- Lake, B. J., K. Yang, Z. Luizhi, R. C. Millard, S. Pu, J. M. Toole, Z. Wang, and L. J. Mangum, 1991. Hydrographic observations from the US/PRC cooperative program in the western equatorial Pacific Ocean: Cruises 5–8. Woods Hole Oceanographic Institution Technical Report WHOI-91-19, 415 pp.
- EPIC Voyageurs, 1991. Hydrographic data from the 10°N transpacific cruise, R/V Moana Wave Cruise #89-3, -4, -6. Woods Hole Oceanographic Institution Technical Report WHOI-91-32, 287 pp. + 4 plates.
- Cook, Margaret F., John M. Toole, George P. Knapp, Rana A. Fine, Zafer Top, and Joe C. Jennings, Jr., 1992. A Trans-indian Ocean hydrographic section at latitude 32°S data report of RRS Charles Darwin cruise # 29. Woods Hole Oceanographic Institution Technical Report WHOI-92-07, 202 pp.
- Montgomery, Ellyn T., and John M. Toole, 1993. Fine and microstructure observations at Fieberling Guyot, R/V New Horizon cruise report. Woods Hole Oceanographic Institution Technical Report WHOI-93-51, 27 pp.
- Krishfield, R., K. Doherty, D. Frye, T. Hammar, J. Kemp, D. Peters, A. Proshutinsky, J. Toole and K. von der Heydt, 2006. Design and operation of automated Ice-Tethered Profilers for real-time seawater observations in the polar oceans. Woods Hole Oceanographic Institution Technical Report WHOI-2006-11, 75 pp.
- Krishfield, R., J. Toole, and M.L. Timmermans, 2008. ITP data processing procedures. Woods Hole Oceanographic Institution Technical Report, www.whoi.edu/page.do?pid=23096.