

Michael Scott McCartney

Physical Oceanographer

Scientist Emeritus

Department of Physical Oceanography

Woods Hole Oceanographic Institution

B. S., Case Institute of Technology, 1970

M. S., Case Western Reserve University, 1972

Ph. D., Case Western Reserve University, 1973

Graduate Assistant, summer 1970; NSF Trainee, 1970–1971; Graduate Assistant, 1971–1973; Postdoctoral Research Associate, 1973, Case Western Reserve University; Summer Student Fellow in Geophysical Fluid Dynamics, 1972; Postdoctoral Scholar, 1973–1974 Postdoctoral Investigator, 1974–1975; Assistant Scientist, 1975–1979; Principal Lecturer, 1979, Program of Summer Study in Geophysical Fluid Dynamics – Polar Oceanography; Associate Scientist, 1979–1994, tenure awarded, 1983; Senior Scientist, 1994–, Columbus O'Donnell Iselin Chair for Excellence in Oceanography, 2000–2004, Woods Hole Oceanographic Institution.

Member, International Southern Ocean Studies (ISOS) Executive Committee, 1975–1982

Associate Editor, *Journal of Geophysical Research* (Oceans and Atmospheres), 1980–1985;

Journal of Physical Oceanography, 1985–1989

Senior Editor, Supplement to Volume 40 of the *Journal of Marine Research* (Worthington Volume), 1981–1982

Member, U.S. NRC Panel on Climate Variability on Decadal-to-Century Time Scales, 1995–1998

Fellow, The Cooperative Institute for Climate and Ocean Research (CICOR—a Joint Institute of WHOI and NOAA), 1998–present

Member, Institute Advisory Committee for the WHOI Climate Institute, 2001–2003

U.S. CLIVAR Atlantic Implementation Panel, 1999–2001

International CLIVAR Implementation Panel, 2000–2001

Research Interests: Descriptive physical oceanography: distribution and circulation paths and intensities of water masses, particularly those originating in the polar and subpolar zones; the potential effects of carbon dioxide-induced atmospheric warming on oceanic circulation and water mass formation; paleoceanography.

Publications

McCartney, M. S., 1975. Inertial Taylor columns on a beta-plane. *Journal of Fluid Mechanics*, **68**, Part 1, 71–95.

McCartney, M. S., 1976. The interaction of zonal currents with topography with applications to the Southern Ocean. *Deep-Sea Research*, **23**, 413–427.

- McCartney, M. S., 1977. Subantarctic Mode Water. In: *A Voyage of Discovery: George Deacon 70th Anniversary Volume*, M. V. Angel, editor, Supplement to *Deep-Sea Research*, Pergamon Press, Oxford, pp. 103–119.
- McCartney, M. S., L. V. Worthington, and W. J. Schmitz, Jr., 1978. Large cyclonic rings from the northeast Sargasso Sea. *Journal of Geophysical Research*, **83**(C2), 901–914.
- McCartney, Michael S., L. Valentine Worthington, and Mary E. Raymer, 1980. Anomalous water mass distributions at 55W in the North Atlantic in 1977. *Journal of Marine Research*, **38**(1), 147–172.
- McCartney, Michael S., 1982. The subtropical recirculation of Mode Waters. *Journal of Marine Research*, Supplement to **40**, 427–464.
- Talley, L. D., and M. S. McCartney, 1982. Distribution and circulation of Labrador Sea Water. *Journal of Physical Oceanography*, **12**, 1189–1205.
- Schmitz, William J., Jr., and Michael S. McCartney, 1982. An example of long-term variability for subsurface current and hydrographic patterns in the western North Atlantic. *Journal of Marine Research*, Supplement to **40**, 707–726.
- McCartney, Michael S., and Lynne D. Talley, 1982. The Subpolar Mode Water of the North Atlantic Ocean. *Journal of Physical Oceanography*, **12**, 1169–1188.
- McCartney, M. S., and L. D. Talley, 1984. Warm-to-cold water conversion in the northern North Atlantic Ocean. *Journal of Physical Oceanography*, **14**, 922–935.
- McCartney, M. S., S. L. Bennett, and M. E. Woodgate-Jones, 1991. Eastward flow through the Mid-Atlantic Ridge at 11°N and its influence on the abyss of the eastern basin. *Journal of Physical Oceanography*, **21**, 1089–1121.
- McCartney, M. S., and M. E. Woodgate-Jones, 1991. A deep-reaching anticyclonic eddy in the subtropical gyre of the eastern South Atlantic. *Deep-Sea Research*, **38**, Supplement 1, S411–S443.
- Richardson, P. L., M. S. McCartney, and C. Maillard, 1991. A search for Meddies in historical data. *Dynamics of Atmospheres and Oceans*, **15**, 241–265.
- Speer, Kevin G., and M. S. McCartney, 1991. Tracing lower North Atlantic Deep Water across the equator. *Journal of Geophysical Research*, **96**(C11), 20,443–20,448.
- Speer, K. G., and M. S. McCartney, 1992. Bottom water circulation in the western North Atlantic. *Journal of Physical Oceanography*, **22**(1), 83–92.
- Tsuchiya, M., L. D. Talley, and M. S. McCartney, 1992. An eastern Atlantic section from Iceland southward across the equator. *Deep-Sea Research*, **39**, 1885–1917.

- McCartney, M. S., 1992. Recirculating components to the deep boundary current of the Northern North Atlantic. *Progress in Oceanography*, **29**, 283–383.
- Schmitz, William J., and Michael S. McCartney, 1993. On the North Atlantic circulation. *Reviews in Geophysics*, **31**, 29–49.
- McCartney, M. S., and R. A. Curry, 1993. Trans-equatorial flow of Antarctic Bottom Water in the Western Atlantic Ocean: abyssal geostrophy at the equator. *Journal of Physical Oceanography*, **23**, 1264–1276.
- Luyten, J., M. S. McCartney, H. M. Stommel, R. Dickson and E. Gmitrowicz, 1993. On the sources of North Atlantic deep water. *Journal of Physical Oceanography*, **23**, 1885–1892.
- McCartney, M. S., 1993. Crossing of the equator by the deep western boundary current in the western Atlantic Ocean. *Journal of Physical Oceanography*, **23**, 1953–1974.
- Lozier, Susan, Michael S. McCartney and W. Brechner Owens, 1994. Anomalous anomalies in averaged hydrographic data. *Journal of Physical Oceanography*, **24**(12), 2624–2638.
- Friedrichs, Marjorie A. M., Michael S. McCartney and Melinda M. Hall, 1994. Hemispheric asymmetry of deep water transport modes in the Atlantic. *Journal of Geophysical Research*, **99**(C12), 25,165–25,279.
- Tsuchiya, Mizuki, Lynne D. Talley and Michael S. McCartney, 1994. Water-mass distributions in the western Atlantic; A section from South Georgia Island (54°S) northward across the equator. *Journal of Marine Research*, **52**, 55–81.
- Coles, Victoria J., Michael S. McCartney, Donald B. Olson and William M. Smethie, Jr., 1996. Changes in Antarctic Bottom Water properties in the western South Atlantic in the late 1980s. *Journal Geophysical Research*, **101**(C4), 8957–8970.
- McCartney, M. S., 1997. Is the Ocean at the Helm? *Nature*, **388**, 521–522.
- Hall, Melinda M., Michael S. McCartney and J. A. Whitehead, 1997. Antarctic Bottom Water flux in the equatorial western Atlantic. *Journal of Physical Oceanography*, **27**(9), 1903–1926.
- Hufford, Gwyneth E., Michael S. McCartney and Kathy Donohue, 1997. Northern boundary currents and adjacent recirculations off southwestern Australia. *Geophysical Research Letters*, **24**, 2797–2800.
- Curry, Ruth G., Michael S. McCartney and Terrence M. Joyce, 1998. Oceanic transport of subpolar climate signals to mid-depth subtropical waters. *Nature*, **391**, 575–577.
- Molinari, Robert L., Rana A. Fine, W. Douglas Wilson, Jeff Abell, Michael McCartney and Ruth Curry, 1998. The arrival of recently formed Labrador Sea water in the Deep Western Boundary Current at 26.5°N. *Geophysical Research Letters*, **25**(13), 2249–2252.

- Paillet, Jérôme, Michel Arhan and Michael S. McCartney, 1998. Spreading of Labrador Sea Water in the eastern North Atlantic. *Journal of Geophysical Research*, **103**, 10,223–10,239.
- Donohue, Kathleen A., Gwyneth E. Hufford and Michael S. McCartney, 1999. Sources and transport of the Deep Western Boundary Current east of the Kerguelen Plateau. *Geophysical Research Letters*, **26**(7), 851–854.
- McCartney, Michael S., and Cecilie Mauritzen, 2001. On the origin of the warm inflow to the Nordic Seas. *Progress in Oceanography*, **51**, 125–214.
- Curry, Ruth G., and Michael S. McCartney, 2001. Ocean gyre circulation change associated with the North Atlantic Oscillation. *Journal of Physical Oceanography*, **31**(12), 3374–3400.
- Send, Uwe, Bob Weller, Stuart Cunningham, Charlie Eriksen, Tom Dickey, Masaki Kawabe, Roger Lukas, Mike McCartney and Svein Osterhus, 2001. Oceanographic Time series Observatories In: Observing the Ocean for Climate in the 21st Century, eds. C.J. Koblinsky and N.R. Smith, GODAE, Bureau of Meteorology, Australia, Melbourne, Australia, 376–390.
- Marshall, John, Yochanan Kushnir, David Battisti, Ping Chang, Arnaud Czaja, James Hurrell, Michael McCartney, Saravanan, and Martin Visbeck, 2001. Atlantic climate variability. *International Journal of Climate*, **21**, 1863–1898.
- Mauritzen, C., K. L. Polzin, M. S. McCartney, R. C. Millard and D. E. West-Mack, 2002. Evidence in hydrography and density time structure for enhanced vertical mixing over the Mid-Atlantic Ridge in the western Atlantic. *Journal of Geophysical Research*, **107**, 10.1029/2001JC 001114.
- Cohen A. L., S. R. Smith, M. S. McCartney, J. van Etten, 2004. How brain corals record climate: an integration of skeletal structure, growth and chemistry of *Diploria labyrinthiformis* from Bermuda *Marine Ecology Progress Series*, **271**, pp.147–158.
- J. W. Hurrell, M. Visbeck, A. Busalacchi, R. A. Clarke, T. L. Delworth, R. R. Dickson, W.E. Johns, K.P. Koltermann, Y. Kushnir, D. Marshall, C. Mauritzen, M. S. McCartney, A. Piola, C. Reason, G. Reverdin, F. Schott, R. Sutton, I. Wainer, D. Wright, 2006. Atlantic Climate Variability and Predictability: A CLIVAR perspective. *Journal of Climate*, **19**(20), 5100-5121.
- McCartney, M. S. and K. A. Donohue, 2007: A deep cyclonic gyre in the Australian-Antarctic Basin. *Progress In Oceanography*, **75**, 675-750.
- Kanzow, T., U. Send, and M. S. McCartney, 2008. On the variability of the deep meridional flow in the tropical North-Atlantic. *Deep-Sea Research I*, **55**, 1601-1623.
- Fratantoni, P. S. and M. S. McCartney, 2010. Freshwater export from the Labrador Current to the North Atlantic Current at the Tail of the Grand Banks of Newfoundland. *Deep Sea Research Part 1: Oceanographic Research Papers*, **57**, 258-283.

Toole, J. M., R. G. Curry, T. M. Joyce, M. McCartney, and B. Penã-Molino, 2011. Transport of the North Atlantic Deep Western Boundary Current about 39°N, 70°W: 2004-2008. *Deep Sea Research Part II: Topical Studies in Oceanography*, **58 (17-18)**, 1768-1780.

Book

McCartney, M. S., R. C. Beardsley and H. L. Bryden (Editors), 1982. *Cold Wind – Two Gyres, A Tribute to Val Worthington*. *Journal of Marine Research*, Supplement to Volume **40**, 860 + xxii pp.

Non-refereed Publications

McCartney, Michael S. and Isaac Greber, 1972. Experimental and theoretical investigation of the edgetone. *Bulletin of the American Physical Society*, **17(11)**, 1103 (abstract).

McCartney, Michael S., 1973. Taylor columns and Rossby wakes on a beta plane. *Bulletin of the American Physical Society*, **18(11)**, 1467 (abstract).

McCartney, Michael S., 1974. Inertial Taylor columns on a beta-plane. *Eos, Transactions of the American Geophysical Union*, **55(4)**, 306 (abstract).

McCartney, Michael S., 1975. Subantarctic mode water. *Eos, Transactions of the American Geophysical Union*, **56(12)** 1011 (abstract).

McCartney, M. S., 1976. A non-circumpolar renewal process for Antarctic intermediate water. *Eos, Transactions of the American Geophysical Union*, **57(12)** (abstract).

McCartney, M. S., 1977. Coupled water mass formation and bottom topographic current sharpening as a frontogenic process in the Southern Ocean. *Eos, Transactions of the American Geophysical Union*, **58(10)** (abstract).

McCartney, Michael S., 1978. Water mass renewal in the sub-Antarctic zone. *Antarctic Journal of the United States*, **XII(4)**, 54–56.

McCartney, M. S., 1980. Thin water mass structure in the Sargasso Sea. *Gulfstream*, **VI(6)**, 3, 6–7.

McCartney, M. S., and L. D. Talley, 1980. Subpolar circulation in the North Atlantic Ocean. *Eos, Transactions of the American Geophysical Union*, **61(17)**, 252 (abstract).

Talley, L. D., M. S. McCartney and C. H. Pilskaln, 1980. Distribution and circulation of Labrador Sea Water. *Eos, Transactions of the American Geophysical Union*, **61(17)**, 252 (abstract).

McCartney, M. S., and L. D. Talley, 1980. Warm water to cold water conversion in the northern North Atlantic and its relation to the general circulation. *International Council for the Exploration of the Sea (ICES) Document*, C.M. 1980, Hydrography Committee C:39, 19 pp.

- McCartney, M. S., and L. D. Talley, 1981. Variability of convectively formed water masses in the North Atlantic Ocean. *International Council for the Exploration of the Sea (ICES) Document*, C.M. 1981, Hydrography Committee C:29, 16 pp.
- McCartney, M. S., 1981. Observation of the convection formation of the Antarctic Intermediate Water of the South Pacific Ocean. *Eos, Transactions, American Geophysical Union*, **62**, 920–921 (abstract).
- McCartney, M. S., 1982. Decadal variability in water mass formation. *Eos, Transactions, American Geophysical Union*, **63**(29), 583 (abstract).
- McCartney, M. S., 1983. Is there a deep western boundary current of Antarctic Intermediate Water in the South Atlantic? *Eos, Transactions, American Geophysical Union*, **64**(45), 731 (poster abstract).
- Bennett, S. L., M. S. McCartney, and M. L. Bremer, 1983. Some aspects of the deep circulation of the tropical North Atlantic. *Eos, Transactions, American Geophysical Union*, **64**(52), 1027 (abstract).
- McCartney, M. S., M. E. Raymer, and C. A. Collins, 1983. A deep reaching anticyclonic eddy in the subtropical gyre of the South Atlantic: an Agulhas Current Retroflexion Fragment? *Eos, Transactions, American Geophysical Union*, **64**(52), 1091 (abstract).
- McCartney, M.S., 1986. Core Project 3: The gyre dynamics experiment. *Eos, Transactions, American Geophysical Union*, **64**(44), 1019 (abstract).
- Zemba, J. C. and M. S. McCartney, 1988. Transport of the Brazil Current: it's bigger than we thought. *Eos, Transactions, American Geophysical Union*, **69**(44), 1237 (abstract).
- Speer, K. G., and M. S. McCartney, 1990. The bottom water circulation of the Western North Atlantic: observations and a dynamical framework. *European Geophysical Society, XV General Assembly, Copenhagen, April 23–27, 1990, OII.3-2*, 120
- Smethie, W. M., Jr. and M. S. McCartney, 1990. Deep water mass structure in the Argentine Basin observed during the South Atlantic ventilation experiment. *Eos, Transactions, American Geophysical Union*, **71**(2), 168 (abstract).
- Bennett, S. L. and M. S. McCartney, 1990. The large transport Deep Western Boundary Current and its recirculation in the low latitude Atlantic. *Eos, Transactions, American Geophysical Union*, **71**(92), 168 (abstract).
- Speer, K. G., and M. S. McCartney, 1990. The bottom water circulation of the Western North Atlantic: observations and a dynamical framework. *Eos, Transactions, American Geophysical Union*, **71**(2), 168 (abstract).
- McCartney, M. S., 1990. Transequatorial flow of deep and bottom water in the Western Atlantic Ocean. *Eos, Transactions, American Geophysical Union*, **71**(92), 168 (abstract).

- McCartney, M. S., 1992. The system of Deep Western Boundary Currents and recirculations in the Atlantic Ocean. *Eos, Transactions, American Geophysical Union*, **31**, (abstract).
- McCartney, M. S., 1992. Aspects of the observed deep circulation of the Atlantic Ocean. The Atlantic Climate Change Program, Proceedings from the Principal Investigators Meeting, University of Miami, March 9–11, 1992; *NOAA Climate and Global Change Program Special Report Number 7*, 157–161.
- McCartney, M. S. and M. O. Baringer, 1993. Notes on the S. Pacific hydrographic section near 32°S–WHP P6. *U.S. WOCE Notes*, **5**(2), 7 p.
- McCartney, M. S., M. O. Baringer, 1994. The subantarctic mode water – Antarctic Intermediate Water connection in the South Pacific Ocean. *Eos, Transactions, American Geophysical Union*, (abstract).
- McCartney, Michael S., 1994. Towards a model of Atlantic Ocean circulation: the plumbing of the climate's radiator. *Oceanus*, **37**(1), 5–8.
- Curry, R. G., W. B. Owens and M. S. McCartney, 1994. Deep circulation in the low latitude North Atlantic. *Eos, Transactions, American Geophysical Union*, (abstract).
- Friedrichs, M. S. McCartney and M. M. Hall, 1994. Hemispheric asymmetry of deep water transport modes in the Atlantic. *Eos, Transactions, American Geophysical Union*, (abstract).
- Coles, V. J., D. B. Olson and M. S. McCartney, 1994. Effects of temporally varying abyssal inflow to the deep Argentine basin. *Eos, Transactions, American Geophysical Union*, (abstract).
- Hall, M.M., J.A. Whitehead, M. S. McCartney, 1994. Moored Measurements of Arctic Bottom Water at the Equator. *International. WOCE Newsletter*, **17**, 5-8.
- McCartney, Michael S., 1996. Oceans & Climate. *Oceanus*, **39**(2), 2–3.
- McCartney, M. S., R. G. Curry and H. F. Bezdek, 1996. North Atlantic's transformation pipeline chills and redistributes subtropical water. *Oceanus*, **39**(2), 19–23.
- Curry, Ruth G., and Michael S. McCartney, 1996. Labrador Sea water carries northern climate signal south. *Oceanus*, **39**(2), 24–32.
- Curry, R. G., and M. S. McCartney, 1996. Subtropical response to subpolar convection variability. Handout at Amsterdam TOS meeting.
- McCartney, M. S., and R. G. Curry, 1996. The SST roots of interdecadal Labrador Sea Water. Handout at Amsterdam TOS meeting.
- Cohen, Anne and Michael S. McCartney, 1996. Seasonally-Resolved Records of Surface Ocean Conditions in Brain Coral from Bermuda. *Proceedings from the Atlantic Climate Variability Meeting*, 16-23.

- Curry, R. G. and M. S. McCartney, 1996. Links between subtropical mid-depth warming/cooling patterns and variations in convection intensity in the subpolar Labrador Sea. *The Atlantic Climate Change Program: Proceedings from the Principal Investigators Meeting, May 14-16, 1996*, 27-35.
- Curry, R. G., and M. S. McCartney, 1996. Subtropical response to subpolar convection variability. ACCP Extended Abstracts: Proceedings of May 1996 Annual PI Meeting, pp. 27–35.
- McCartney M. S., and R. G. Curry, 1996. The mid-latitude formation of Lower North Atlantic Deep Water. ACCP Extended Abstracts: Proceedings of May 1996 Annual PI meeting, pp. 121–124.
- McCartney, M. S., R. G. Curry and H. F. Bezdek, 1997. The interdecadal warming and cooling of Labrador Sea Water. ACCP Notes, **IV**, 1, 1–11.
- Hufford, G. E., and M. S. McCartney, 1997. Deep circulation southwest of Australia. *International WOCE Newsletter*, **25**, 31–35.
- McCartney, Michael S., 1997. The North Atlantic Atmosphere-Ocean Oscillation. *U.S. WOCE Report*, 9, 55-60.
- Martinson, D. G., D. S. Battisti, R. Bradley, J. Cole, R. Fine, M. Ghil, Y. Kushnir, S. Manabe, M. McCartney, P. McCormick, M. Prather, E. Sarachik, P. Tans, L. Thompson and M. Winton, 1998. *Decade-to-Century-Scale Climate Variability and Climate Change: A science strategy*. National Research Council, Washington, D.C., 142 pp.
- McCartney, Michael S., and Ruth Curry, 1998. Research reveals interdecadal North Atlantic atmosphere–ocean oscillation. Woods Hole Oceanographic Institution 1998 Annual Report, pp. 24–25.
- McCartney, Michael, Kathy Donohue, Ruth Curry, C. Mauritzen, and Sheldon Bacon, 1998. Did the Overflow from the Nordic Seas Intensify in 1996-1997? *International WOCE Newsletter*, **31**, 3-7, 23.
- McCartney, Michael S., 2006. Oceans & Climate. *Flotsam & Jetsam: A newsletter for Massachusetts Marine Educators*, 35 (1), 3, 8-9.

Theses and Technical Reports

- McCartney, Michael S., 1972. An experimental investigation of the edgetone phenomenon. M.S. Thesis, Division of Fluid, Thermal and Aerospace Sciences, Case Western Reserve University. Issued as *FTAS TR 72-75*, with Isaac Greber as co-author.
- McCartney, Michael S., 1972. Taylor columns and Rossby wakes generated by isolated topographic features on a Beta plane. In: Vol. 2 of the Notes on the 1972 Summer Study Program in Geophysical Fluid Dynamics at the Woods Hole Oceanographic Institution. *Woods Hole Oceanographic Institution Technical Report WHOI-72-79*, pp. 60–81.

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- 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.
- McCartney, M. S., 1979. Course Lectures on Polar Oceanography. In Vol. 1 of the Notes on the 1979 Summer Study Program in Geophysical Fluid Dynamics at the Woods Hole Oceanographic Institution. *Woods Hole Oceanographic Institution Technical Report WHOI-79-84*, pp. 1–135.
- McCartney, Michael S., and Henry Lansford, 1980. Potential effects on ocean dynamics of an increase in atmospheric carbon dioxide. In: *Environmental and Societal Consequences of a CO-induced Climate Change*, American Association for the Advancement of Science and Department of Energy.
- Tarbell, Susan A., John A. Whitehead, Melinda M. Hall and Michael S. McCartney, 1997. Trans-Equatorial Bottom Water Flow in the Western Atlantic, Volume XLVI in a series of reports presenting data from moored current meters. *Woods Hole Oceanographic Institution Technical Report*, WHOI-97-01, 86 pp. and 3 microfiche.