

Robert S. Pickart

Physical Oceanographer

Senior Scientist

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B. S., 1981, Susquehanna University (Physics and Mathematics)

Ph. D., 1987, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution,
(Physical Oceanography)

Senior Scientist, 2003–present; Associate Scientist, 1994–2003; tenure awarded, 1998; Assistant Scientist, 1990–1994; Woods Hole Oceanographic Institution.

Postdoctoral Investigator, January–August, 1987; Assistant Marine Scientist, September 1987–March 1990, University of Rhode Island, Graduate School of Oceanography

Summer Student Fellow, 1980; Assistant Scientist, April 1990–1994; Associate Scientist, 1994–present, Tenure awarded, 1998, Woods Hole Oceanographic Institution

Stine-Robinson Mathematics Prize, 1979; Lindback Foundation Award, 1980; University Professors Award, 1981; Blair Heaton Memorial Award, 1981, Susquehanna University

2011: Awarded the Columbus O'Donnell Iselin Chair for Excellence in Oceanography.

Member of ASOF Scientific Steering Group.

Member of Pacific Arctic Group

Member WHOI Space Committee

Research Interests: Structure and dynamics of boundary currents, ventilation and deep convection; shelfbreak processes.

Author or co-author of 108 refereed scientific publications.

Refereed Publications:

- Hogg, Nelson G., Robert S. Pickart, Ross M. Hendry, and William M. Smethie, Jr., 1986. The northern recirculation gyre of the Gulf Stream. *Deep-Sea Research*, **33**(9), 1139–1165.
- Pickart, Robert S., 1988. Entrainment and homogenization of a passive tracer in a numerical model gyre. *Journal of Geophysical Research*, **93**(C6), 6761–6773.
- Pickart, Robert S., Nelson G. Hogg, and William M. Smethie, Jr., 1989. Determining the strength of the deep western boundary current using the chlorofluoromethane ratio. *Journal of Physical Oceanography*, **19**(7), 940–951.
- Pickart, Robert S., and N. G. Hogg, 1989. A tracer study of the deep Gulf Stream cyclonic recirculation. *Deep-Sea Research*, **36**(6), 935–956.
- Pickart, Robert S., and D. R. Watts, 1990. Using the inverted echo sounder to measure vertical profiles of Gulf Stream temperature and geostrophic velocity. *Journal of Atmospheric and Oceanic Technology*, **7**(1), 146–156.
- Pickart, Robert S., and D. R. Watts, 1990. Deep Western Boundary Current variability at Cape Hatteras. *Journal of Marine Research*, **48**(4), 765–791.
- Pickart, Robert S., 1992. Space-time variability of the Deep Western Boundary Current oxygen core. *Journal of Physical Oceanography*, **22**(9), 1047–1061.
- Pickart, Robert S., 1992. Water mass components of the North Atlantic Deep Western Boundary Current. *Deep-Sea Research*, **39**(9), 1553–1572.
- Pickart, Robert S., and D. Randolph Watts, 1993. Gulf Stream meanders over steep topography. *Journal of Geophysical Research*, **98** (C4), 6895–6905.
- Pickart, Robert S., and William M. Smethie, Jr., 1993. How does the Deep Western Boundary Current cross the Gulf Stream? *Journal of Physical Oceanography*, **23**, 2602–2616.
- Pickart, R. S., and S. S. Lindstrom, 1994. A comparison of techniques for referencing geostrophic velocities. *Journal of Atmospheric and Oceanic Technology*, **11**(3), 813–824.
- Pickart, Robert S., 1994. Interaction of the Gulf Stream and Deep Western Boundary Current where they cross. *Journal of Geophysical Research*, **99**(C12), 25,155–25,164.
- Pickart, Robert S., 1995. Gulf Stream-generated topographic Rossby Waves. *Journal of Physical Oceanography*, **25**(4), 574–586.
- Pickart, Robert S., and Rui Xin Huang, 1995. Structure of an inertial Deep Western Boundary Current. *Journal of Marine Research*, **53**(5), 739–770.
- Pickart, Robert S., William M. Smethie, Jr., John R. N. Lazier, E. Peter Jones, and William J. Jenkins, 1996. Eddies of newly formed upper Labrador Sea Water. *Journal of Geophysical Research*, **101**(C9), 20,711–20,726.

- Pickart, Robert S., Michael A. Spall, and John R. N. Lazier, 1997. Mid-depth ventilation in the western boundary current system of the subpolar gyre. *Deep-Sea Research I*, **44**, 1025–1054.
- Lab Sea Group, 1998. The Labrador Sea Deep Convection Experiment. *Bulletin of the American Meteorological Society*, **79**, 2033–2058.
- Pickart Robert S., and William M. Smethie, Jr., 1998. Temporal evolution of the deep western boundary current where it enters the subtropical domain. *Deep-Sea Research I*, **45**, 1053–1083.
- Pickart, Robert S., Daniel J. Torres, Theresa K. McKee, Michael J. Caruso, and Jennifer E. Przystup, 1999. Diagnosing a meander of the shelfbreak current in the mid-Atlantic Bight. *Journal of Geophysical Research*, **104**, 3121–3132.
- Joyce, Terrence M., Robert S. Pickart, and Robert C. Millard, 1999. Long-term hydrographic changes at 52° and 66°W in the North Atlantic subtropical gyre & Caribbean. *Deep-Sea Research II*, **46**(1–2), 245–278.
- Pickart, Robert S., Theresa K. McKee, Daniel J. Torres, and Stephanie A. Harrington, 1999. Mean structure and interannual variability of the slopewater system south of Newfoundland. *Journal of Physical Oceanography*, **29**, 2541–2558.
- Keigwin, Lloyd D., and Robert S. Pickart, 1999. The slopewater current over the Laurentian Fan on inter-annual to millennial timescales. *Science*, **286**, 520–523.
- Pickart, Robert S., 2000. Bottom boundary layer structure and detachment in the shelfbreak jet of the Middle Atlantic Bight. *Journal of Physical Oceanography*, **30**(11), 2668–2686.
- Spall, Michael A., and Robert S. Pickart, 2001. Where does dense water sink? A subpolar gyre example. *Journal of Physical Oceanography*, **31**(3), 810–826.
- Fratantoni, P. S., R. S. Pickart, D. J. Torres, and A. Scotti, 2001. Mean structure and dynamics of the shelfbreak jet in the Middle Atlantic Bight during fall and winter. *Journal of Physical Oceanography*, **31**(8), Part 1, 2135–2156.
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- Pickart, Robert S., Daniel J. Torres, and R. Allyn Clarke, 2002. Hydrography of the Labrador Sea during active convection. *Journal of Physical Oceanography*, **32**, 428–457.
- Straneo, F., M. Kawase, and R. S. Pickart, 2002. Effects of wind on convection in strongly and weakly baroclinic flows with application to the Labrador Sea. *Journal of Physical Oceanography*, **32**, 2603–2618.
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- Fratantoni, P. S., and R. S. Pickart, 2003. Variability of the shelfbreak jet in the Middle Atlantic Bight: Internally or externally forced? *Journal of Geophysical Research*, **108** (C5) 3166, doi:10.1029/2002JC001326.
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- Pickart, R. S., M. A. Spall, M. H. Ribergaard, G.W.K. Moore, and R. F. Milliff, 2003. Deep convection in the Irminger Sea forced by the Greenland tip jet. *Nature*, **424**, 152–156.
- Spall, M. A., and R. S. Pickart, 2003. Wind-driven recirculations and exchange in the Labrador and Irminger Seas. *Journal of Physical Oceanography*, **33**, 1829–1845.
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- Pickart, R. S., 2004. Shelfbreak circulation in the Alaskan Beaufort Sea: Mean structure and variability. *Journal of Geophysical Research*, **109**(C4), C04024 10.1029/2003JC001912.
- Katsman, C., M. A. Spall, and R. S. Pickart, 2004. Boundary current eddies and their role in the restratification of the Labrador Sea. *Journal of Physical Oceanography*, **34**, 1967–1983.
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- Fratantoni, P. S., and R. S. Pickart, 2007. The western North Atlantic shelfbreak current system in summer. *Journal of Physical Oceanography*, **37**, 2509-2533.
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- Bracco, A., J. Pedlosky, and R. S. Pickart, 2008. Eddy formation near the west coast of Greenland. *Journal of Physical Oceanography*, **38**, 1992-2002.
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- Våge, R.S. Pickart, A. Sarafanov, Ø. Knutsen, H. Mercier, P. Lherminier, M. Bersch, H. van Aken, J. Meincke, and D. Quadfasel, 2011. The Irminger Gyre: Circulation, convection, and interannual variability. *Deep-Sea Research I*, **58**, 590–614. doi:10.1016/j.dsr.2011.03.00.
- Magaldi, M. G., T. W. N. Haine, and R. S. Pickart, 2011. On the Nature and Variability of the East Greenland Spill Jet: A Case Study in Summer 2003. *Journal of Physical Oceanography*, **41** 2307-2327. doi: 10.1175/JPO-D-10-05004.1.
- Våge, K., R.S. Pickart, M.A. Spall, H. Valdimarsson, S. Jonsson, D.J. Torres, S. Osterhus, T. Eldevik, 2011. Significant role of the North Icelandic Jet in the formation of Denmark Strait Overflow Water. *Nature Geoscience*, **4**, 723-727 doi:10.1038/ngeo1234.
- Von Appen, W-J., and R.S. Pickart, 2012. Two configurations of the Western Arctic shelfbreak current in summer. *Journal of Physical Oceanography*, **42**, 329-351. doi: 10.1175/JPO-D-11-026.1.
- Brearley, J.A., R.S. Pickart, H. Valdimarsson, S. Jonsson, R.W. Schmitt, and T.W.N. Haine, 2012. The East Greenland boundary current system south of Denmark Strait. *Deep-Sea Research I*, **63**, 1-19.
- de Jong, M.F., H.M. Van Aken, K. Våge, and R.S. Pickart, 2012. Convective mixing in the central Irminger Sea: 2002-2010. *Deep-Sea Research I*, **63**, 36-51.
- Moore, G.W.K. and R.S. Pickart, 2012. The Wrangel Island Polynya in early summer: Trends and relationships to other polynyas and the Beaufort Sea High. *Geophysical Research Letters*, **39**, L05503, doi: 10.1029/2011GL050691.
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- Carbonate Mineral Saturation States. *Geophysical Research Letters*, **39**, L07606, doi:10.1029/2012GL051574.
- Moore, G.W.K. and R.S. Pickart, 2012. Northern Bering Sea tip jets. *Geophysical Research Letters*, **39**, L08807, doi:10.1029/2012GL051537.
- Arrigo, K.R, D.K. Perovich, R.S. Pickart, and 28 co-authors, 2012. Massive phytoplankton blooms under Arctic sea ice. *Science*, **336**, 1408.
- Schulze, L.M. and R.S. Pickart, 2012. Seasonal variation of upwelling in the Alaskan Beaufort Sea. *Journal of Geophysical Research*, **117**, C06022, doi:10.1029/2012JC007985.
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- Harden, B.E., R.S. Pickart, and I.A. Renfrew, 2014. Offshore transport of dense water from the East Greenland shelf. *Journal of Physical Oceanography*, **44**, 229-245, doi: <http://dx.doi.org/10.1175/JPO-D-12-0218.1>.
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- Brugler, E.T., R.S. Pickart, G.W.K. Moore, S. Roberts, T.J. Weingartner, and H. Statscewich, 2014. Seasonal to Interannual Variability of the Pacific Water Boundary Current in the Beaufort Sea. *Progress in Oceanography*, **127**, 1-20, <http://dx.doi.org/10.1016/j.pocean.2014.05.002>

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- von Appen, W.-J., I.M. Koszalka, R.S. Pickart, T.W.N. Haine, D. Mastropole, M.G. Magaldi, H. Valdimarsson, J. Girton, K. Jochumsen, and G. Krahnmann, 2014. The East Greenland Spill Jet as an important component of the Atlantic Meridional Overturning Circulation. *Deep-Sea Research I*, **92**, 75-84. <http://dx.doi.org/10.1016/j.dsr.2014.06.002>
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- Sutherland, D.A., F. Straneo, and R.S. Pickart. Characteristics and dynamics of two major Greenland glacial fjords. *Journal of Geophysical Research*, **119**, 3767–3791.
- Brown, Z.W., K.L. Casciotti, R.S. Pickart, J.H. Swift, and K.R. Arrigo. Aspects of the Marine Nitrogen Cycle on the Chukchi Sea shelf and Canada Basin. *Deep-Sea Research II*, in press.
- Mills, M.M., Z.W. Brown, K.E. Lowry, G.L. van Dijken, S. Becker, S. Pal, C. Benitez-Nelson, A.L. Strong, J.H. Swift, R.S. Pickart, and K.R. Arrigo. Impacts of low phytoplankton NO₃:PO₄-utilization ratios over the Chukchi Shelf, Arctic Ocean. *Deep-Sea Research II*, in press.
- Gong, D. and R.S. Pickart. Summertime circulation in the eastern Chukchi Sea. *Deep-Sea Research II*, in press.
- de Steur, L., R.S. Pickart, H. Valdimarsson, and D.J. Torres. Recent changes in the freshwater composition of the East Greenland Current. *Geophysical Research Letters*. in press.
- Brown, Z.A., K.E. Lowry, M.A. Palmer, G. van Dijken, M.M. Mills, R.S. Pickart, and K.A. Arrigo. Characterizing the subsurface chlorophyll a maximum in the Chukchi Sea. *Deep-Sea Research II*, in press.
- Itoh, M., T. Kikuchi, R.S. Pickart, Y. Fukamachi, K. Ohshima, D. Simizu, K.R. Arrigo, S. Vagle, J. He, C. Ashjian. Water properties, heat and volume fluxes of Pacific water in Barrow Canyon during summer 2010. *Journal of Geophysical Research*, accepted.
- Moore, G.W.K., K. Våge, R.S. Pickart, and I.A. Renfrew. Open-ocean convection becoming less intense in the Greenland and Iceland Seas. *Nature Climate Change*, submitted.
- Pisareva, M., R.S. Pickart, M. Spall, C. Nobre, D. Torres, G.W.K. Moore, 2015. Flow of Pacific water in the western Chukchi Sea: Results from the 2009 RUSALCA Expedition. *Deep-Sea Research I*, submitted.
- Lowry, K.E., R.S. Pickart, M.M. Mills, Z.W. Brown, G.L. van Dijken, N.R. Bates, and K.R. Arrigo. Influence of winter water on phytoplankton blooms in the Chukchi Sea. *Deep-Sea Research II*, submitted.
- Pickart, R.S., G.W.K. Moore, C. Mao, F. Bahr, C. Nobre, T.J. Weingartner. Circulation of winter water on the Chukchi shelf in early summer. *Deep-Sea Research II*, submitted.

Non-refereed Publications:

- Hogg, Nelson G., and Robert S. Pickart, 1985. Recirculation and the deep Gulf Stream. In: *Proceedings, Gulf Stream Workshop*, April 23–26, 1985, University of Rhode Island W. Alton Jones Conference Center, Exeter, Rhode Island, D. Randolph Watts, Convener, University of Rhode Island; pp. II.288–II.303.
- Pickart, Robert S., and Nelson G. Hogg, 1986. On the entrainment of tracer into the cyclonic Gulf Stream recirculation gyre. *Eos, Transactions, American Geophysical Union*, **66**, 128.
- Pickart, Robert S., 1987. Determining the strength of the North Atlantic deep western boundary current using the F11–F12 ratio. *Eos, Transactions, American Geophysical Union*, **68**, 338.
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- Pickart, Robert S., 1992. Investigating how the Deep Western Boundary Current crosses the Gulf Stream. *Eos, Transactions, American Geophysical Union*, **72**, 32.
- Pickart, Robert S., 1993. Interaction of the DWBC with the North Atlantic Current. The North Atlantic Current System: A Scientific Report. *Proceedings of the North Atlantic Current Workshop*, Woods Hole Oceanographic Institution, April 19–20, 1993.
- Pickart, Robert S., 1994. Where currents cross: Intersection of the Gulf Stream and the Deep Western Boundary Current. *Oceanus*, **37**(1), 16–18.
- Pickart, Robert S., and Michael A. Spall, 1995. Mid-depth ventilation along the western boundary of the subpolar gyre. *ACCP Notes*, **II**, No. 2, pp. 4–7.
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- Pickart, Robert S., 1995. Short-circuits in the deep meridional conveyor of the North Atlantic. *Proceedings of the IAPSO XXI General Assembly*, Honolulu, Hawaii, p. 2.
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Synergistics: Dr. Pickart regularly gives lectures to general audiences (including undergraduates) on conducting field operations, and in particular using oceanographic research vessels in harsh climates. He has also carried out a series of interactive outreach projects for secondary school children and the lay public while at sea, including classrooms in foreign schools. The most recent of these can be found at www.greenlandsfrozenoast.com, which included essays written by a professional author, photo slide shows, and narrated video clips.

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