

Name/Title: Barbara M. Hickey, Professor  
Institution: University of Washington  
Department: School of Oceanography, Box 357940 Seattle, WA 98195-7940  
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#### EDUCATION

Ph.D., 1975, Scripps Institution of Oceanography, La Jolla (Physical Oceanography)  
M.S., 1969, Scripps Institution of Oceanography, La Jolla, UCSD, Calif. (Physical Oceanography)  
B.S., 1967, University of Toronto, Toronto, Ontario, Canada (Mathematics and Physics)

#### EMPLOYMENT

1985 - present Professor, School of Oceanography, U. of Washington  
1980 - 1985 Research Associate Professor, School of Oceanography, U. of Washington  
1974 - 1980 Research Assistant Professor, School of Oceanography, U. of Washington

#### PROFESSIONAL MEMBERSHIPS

Fellow, American Meteorological Society (1992); Member, American Geophysical Union (1974)

#### RESEARCH INTERESTS

Dynamics of coastal oceanography and bio-physical interactions such as hypoxia and harmful algal blooms; estuarine circulation, estuary-ocean interactions, eastern boundary current systems; circulation in submarine canyons; river plumes; flow over sills; semi-enclosed basin circulation.

#### RESEARCH EXPERIENCE

Dr. Hickey has, for more than 30 years, been wholly responsible for finding federal funding for, and directing the operations of, a current measurement and hydrographic measurement group. Current measurement techniques include both moored arrays of current meters and Lagrangian drifters. Dr. Hickey's group both designs and implements the experiments and processes and analyzes the data. Dr. Hickey is almost solely responsible for all current data collected off the Washington coast, its coastal estuaries and in the Santa Monica/San Pedro basin of southern California.

Recently, Dr. Hickey has been the Science Director of 2 major field programs. She is co-lead PI with Dr. Vera Trainer on 'ECOHAB PNW: Ecology and Oceanography of Toxic *Pseudo-nitzschia* in the Pacific Northwest Coastal Ocean' jointly funded by NOAA and NSF. The goal of this 5 year interdisciplinary study involving 10 PIs and 6 institutions was to study how and why toxic *Pseudo-nitzschia* may be transported from regions offshore of the coast to the Washington beaches and involved 6 three week long cruises

during 2003–2006 on which Dr. Hickey was the Chief Scientist.

She is the lead PI on the NSF project 'Collaborative Research: Productivity, Biogeochemical Transformations and Cross-margin Transport in an Eastern Boundary Buoyant Plume', later abbreviated to RISE (River Influences on Shelf Ecosystems). This study is a 5 year interdisciplinary project involving 12 PIs, a mix of biologists, physical oceanographers and geochemists from 5 institutions. Dr. Hickey participated as Chief Scientist on three of the four, three week cruises during the 2004-2006 field season.

She is the lead PI on a pending but approved study that combines the prior 2 studies to determine the role of the Columbia River Plume on cross-shelf transport of HABs (PNWTOX, Pacific Northwest Toxin study the Columbia plume: bio-reactor, barrier or conduit).

#### SELECTED PROFESSIONAL ACTIVITIES (2002-present)

Science Director, ECOHAB Pacific Northwest, 2002-2009

Science Director, RISE (River Influences on Shelf Processes), 2002-2009

Member, Advisory Board, ORHAB (Olympic Region HAB) program.

West Coast Governors' HAB Steering Committee(2009-present)

Invited "Fireside Chat" Speaker, EPOC, September 2003, Wrigley Center, Catalina Is., CA

Invited Speaker, GEOHAB meeting, Lisbon, Portugal, November 2003

Invited Speaker, Harmful Algal Bloom Symposium, WHOI, December 2003

Invited Speaker, Ocean Sciences meeting, January 2003

Invited Speaker, Fall AGU meeting, December 2004

Invited Speaker, EPOC Conference, October 2005

Invited Speaker, Ocean Sciences meeting, February 2006

Invited Speaker, On "freshwater effects", Workshop on Climate Change in the California Current, San Diego, November 2006

Sverdrup Lecture (Invited, All Union talk), Ocean Sciences meeting, February 2006

Invited Speaker, West Coast Regional HAB Summit, Feb. 2009

Member, Advisory Board, PISCO (Partnership for Interdisciplinary Studies of the Coastal Ocean), 2006-present

#### PUBLICATIONS (peer reviewed)

Taft, B.A., B.M. Hickey, C. Wunsch and D.J. Baker, Jr. (1974) Equatorial undercurrent and deeper flows in the central Pacific. *Deep-Sea Research*, 21: 403-430.

Hickey, B.M. (1975) The relationship between fluctuations in sea level, wind stress and sea surface temperature in the equatorial Pacific. *Journal of Physical Oceanography*, 5: 460-475.

Huyer, A., B.M. Hickey, J.D. Smith, R.L. Smith and R.D. Pillsbury (1975) Alongshore coherence at low frequencies in currents observed over the continental shelf off Oregon and Washington. *Journal of Geophysical Research*, 80: 3495-3505.

- Hickey, B.M. (1979) The California current system—Hypotheses and facts. *Progress in Oceanography*, 8: 191-279.
- Torgrimson, G. and B.M. Hickey (1979) Barotropic and baroclinic tides over the continental shelf and slope off Oregon. *Journal of Physical Oceanography*, 9: 945-961.
- Hickey, B.M. and P. Hamilton (1980) A spin-up model as a diagnostic tool for interpretation of current and density measurements on the continental shelf of the Pacific Northwest. *Journal of Physical Oceanography*, 10: 12-24.
- Hickey, B.M. (1981) Alongshore coherence on the Pacific Northwest continental shelf (January-April, 1975). *Journal of Physical Oceanography*, 11: 822-835.
- Hickey, B.M. and N. Pola (1983) The seasonal alongshore pressure gradient on the west coast of the United States. *Journal of Geophysical Research*, 88: 7623-7633.
- Werner, F. and B.M. Hickey (1983) The role of a longshore pressure gradient in Pacific Northwest coastal dynamics. *Journal of Physical Oceanography*, 13: 395-410.
- Hickey, B.M. (1984) The fluctuating longshore pressure gradient on the Pacific Northwest shelf: A dynamical analysis. *Journal of Physical Oceanography*, 14: 276-293.
- Battisti, D. and B.M. Hickey (1984) Application of remote wind forced coastal trapped wave theory to the Oregon and Washington coasts. *Journal of Physical Oceanography*, 14: 887-903.
- Huyer, A., R.L. Smith and B.M. Hickey (1984) Observations of a warm-core eddy off Oregon, January to March 1978. *Deep-Sea Research*, 31: 97-117.
- Carson, B., E.T. Baker, B.M. Hickey, C.A. Nittrouer, D.J. DeMaster, K.W. Thorbjarnarson, and G.W. Snyder (1986) Modern sediment dispersal and accumulation in Quinault submarine canyon: A summary. *Marine Geology*, 71: 1-13.
- Baker, E.T. and B.M. Hickey (1986) Contemporary sedimentation processes in and around an active West Coast submarine canyon. *Marine Geology*, 71: 15-34.
- Hickey, B., E. Baker and N. Kachel (1986) Suspended particle movement in and around Quinault submarine canyon. *Marine Geology*, 71: 35-83.
- Kundu, P.K., R.E. Thomson, B.M. Hickey and P.H. LeBlond (1988) Interaction of internal waves and mean flow observed near a coast. *Journal of Marine Research*, 46: 1-23.
- Hickey, B.M. (1989) Patterns and processes of shelf and slope circulation. In: Landry, M.R. and B.M. Hickey (eds.), *Coastal Oceanography of Washington and Oregon*, pp. 41-115, Elsevier Science, Amsterdam, The Netherlands.

Hickey, B.M. (1989) Poleward flow at the northern and southern boundaries of the U.S. west coast. In: Neshyba, S.J., Ch. N.K. Mooers, R.L. Smith and R.T. Barber (eds.), Coastal and Estuarine Studies: Poleward Flows Along Eastern Ocean Boundaries, pp. 160-175, Springer-Verlag.

Hickey, B.M. and M.R. Landry (1989) Coastal oceanography of Washington and Oregon: A summary and prospectus for future studies. In: Landry, M.R. and B.M. Hickey (eds.), Coastal Oceanography of Washington and Oregon, pp. 595-599, Elsevier Science, Amsterdam, The Netherlands.

Landry, M.R. and B.M. Hickey (eds.) (1989) Coastal Oceanography of Washington and Oregon, 607 pp., Elsevier Science, Amsterdam, The Netherlands.

Hermann, A., B.M. Hickey, M. Landry and D. Winter (1989) Coastal upwelling dynamics. In: Landry, M.R. and B.M. Hickey (eds.), Coastal Oceanography of Washington and Oregon, pp. 211-253, Elsevier Science, Amsterdam, The Netherlands.

Jackson, G., F. Azam, A. Carlucci, R. Eppley, B. Finney, D. Gorsline, B. Hickey, C.A. Huh, R. Jahnke, I. Kaplan, M. Landry, L. Small, M. Venkatesan, P. Williams and K. Wong (1989) Elemental cycling and fluxes off the coast of southern California. EOS, 70.

Thomson, R.E., B.M. Hickey and P.H. LeBlond (1990) The Vancouver Island coastal current: Fisheries barrier and conduit. Effects of ocean variability on recruitment and an evaluation of parameters used in stock assessment models. Canadian Special Publication of Fisheries and Aquatic Sciences, 108: 265-296.

Hermann, A.J., B.M. Hickey, C.F. Mass and M.D. Albright (1990) Orographically-trapped coastal wind events in the Pacific Northwest and their oceanic response. Journal of Geophysical Research, 95(C8): 13,169-13,194.

Hughes, R.L., K.N. Ofofu and B. Hickey (1990) On the behavior of boundary undercurrents near canyons. Journal of Geophysical Research, 95(C1): 20,259-20,266.

Huh, C-A., S. Niemi, L. Small, B. Finney, B. Hickey, N. Kachel, D. Gorsline and P. Williams (1990) Sedimentation dynamics in the Santa Monica-San Pedro basin off Los Angeles: Radiochemical, sediment trap and transmissometer studies. Continental Shelf Research, 10(2): 137-164.

Hickey, B.M. (1991) Variability in two deep coastal basins (Santa Monica and San Pedro) off southern California. Journal of Geophysical Research, 96(C9): 16,689-16,708.

Hickey, B.M., R.E. Thomson, H. Yih and P.H. LeBlond (1991) Velocity and temperature fluctuations in a buoyancy-driven current off Vancouver Island. Journal of Geophysical Research, 96 (C6): 10,507-10,538.

Hickey, B.M. (1992) Circulation over the Santa Monica-San Pedro basin and shelf. *Progress in Oceanography*, 30: 37-115.

McConnaughey, R.A., D.A. Armstrong, B.M. Hickey and D.R. Gunderson (1992) Juvenile Dungeness crab, *Cancer magister*, recruitment variability and oceanic transport during the pelagic larval phase. *Canadian Journal of Fisheries and Aquatic Sciences*, 49: 2028-2044.

Hickey, B.M. (1993) Physical oceanography. In: Hood, D. (ed.), *Marine Ecology of the Southern California Bight*, Pergamon Press.

Hickey, B.M. (1995) Coastal submarine canyons. In: Muller, P. and D. Henderson (eds), *Proceedings of the University of Hawaii 'Aha Huliko'a Workshop on Flow Topography Interactions*, Honolulu, Hawaii, SOEST Special Publication, 265 pp.

Ledwell, J.R. and B.M. Hickey (1995) Evidence for enhanced boundary mixing in Santa Monica Basin. *Journal of Geophysical Research*, 100(C10): 20,665-20,679.

Hickey, B.M. (1997) Response of a narrow submarine canyon to strong wind forcing. *Journal of Physical Oceanography*, 27(5): 697-726.

Hickey, B.M. (1998) Coastal oceanography of Western North America from the tip of Baja California to Vancouver Is. In: Brink, K.H. and A.R. Robinson (eds.), *The Sea*, Volume 11, Chapter 12, pp. 345-393, Wiley and Sons, Inc.

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Hickey, B.M., L. Pietrafesa, D. Jay and W.C. Boicourt (1998) The Columbia River Plume Study: Subtidal variability of the velocity and salinity fields. *Journal of Geophysical Research*, 103(C5): 10,339-10,368.

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Hickey, B.M., P. MacCready, E. Elliott and N.B. Kachel (2000) Dense plumes in a subtropical basin, Exuma Sound, Bahamas. *Journal of Geophysical Research*, 105(C5): 11,471-11,488.

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Stockhausen, W.T., R.N. Lipcius and B.M. Hickey (2000) Joint effects of larval dispersal, population regulation, marine reserve design, and exploitation on production and recruitment in the Caribbean Spiny Lobster. *Bulletin of Marine Research*, 66(3): 957-990.

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Roegner, C., B.M. Hickey, J. Newton, A. Shanks and D. Armstrong (2002) Estuarine-nearshore links during a coastal upwelling cycle: Plume and bloom intrusions into Willapa Bay, Washington. *Limnology and Oceanography*, 47(4): 1033-1042.

Hickey, B.M. and N. Banas (2003) Oceanography of the Pacific Northwest coastal ocean and estuaries with application to coastal ecosystems. *Estuaries*, 26(48): 1010-1031.

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Roegner, G.C., D.A. Armstrong and B.M. Hickey (2003) Ocean distribution and recruitment of Dungeness crab megalopae to estuaries in southern Washington state.

Estuaries, 26(4B): 1058-1070.

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Hickey, B.M., S. Geier, N. Kachel and A. MacFadyen (2005) A bi-directional river plume: The Columbia in summer. *Continental Shelf Research*, 25: 1631-1636.

MacFadyen, A., B.M. Hickey and M.G.G. Foreman (2005) Transport of surface waters from the Juan de Fuca eddy region to the Washington coast: Implications for HABs. *Continental Shelf Research*, 25: 2008-2021.

Swartzman, G., B. Hickey, P.M. Kosro, and C. Wilson (2005) Core undercurrent and equatorward surface currents in the Pacific Eastern boundary current in summer 1995 and 1988 and their relationship to the distribution of euphausiids. *Deep-Sea Research II*, 52(1-2): 73-88, doi:10.1016/j.dsr2.2004.09.028.

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Kosro, P.M., W.T. Peterson, B.M. Hickey, R.K. Shearman and S.D. Pierce (2006) Physical versus biological spring transition. *Geophysical Research Letters*, 33: L22S03, doi:10.1029/2006GL027072.

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- Banas, N.S., P. MacCready and B.M. Hickey (2008) The Columbia River plume as cross-shelf exporter and along-coast barrier. *Continental Shelf Research*, in press.
- Foreman, M.G.G., W. Wiggins, A. MacFadyen, B.M. Hickey and R.E. Thomson (2008) Modeling the generation of Juan de Fuca eddies. *Journal of Geophysical Research*, 113(C03006), doi:10.1029/2006JC004082.
- McCabe, R., B. Hickey and P. MacCready (2008) Observational estimates of entrainment and vertical salt flux behind the frontal boundary of a spreading river plume. *Journal of Geophysical Research*, 113(C08027), doi:10.1029/2007JC004361.
- MacFadyen, A., B. Hickey and W. Cochlan (2008) Influences of the Juan de Fuca eddy region on circulation, nutrients and HABs in the northern California Current System. *Journal of Geophysical Research*, C08008, doi:10.1029/2007JC004412.
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- Trainer, V., B. Hickey and S. Bates (2008) Toxic Diatoms. In: Walsh, P.J., S.L. Smith, L.E. Fleming, H. Solo-Gabriele and W.H. Gerwick (eds.), *Oceans and Human Health: Risks and Remedies from the Seas*, Elsevier Science Publishers, New York, 672 pp.
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