

Susan Wier Mills
Redfield 1-20, MS #34
Woods Hole Oceanographic Institution
Woods Hole, MA 02543
508-289-3435

Education:

Brown University 1969-1973, ScB in Biology, 1973
Boston University Marine Program 1975-1980

Employment

June 1992 - present: Research Assistant (1992 – 2002) and Research Associate (2002 – present) in Lauren Mullineaux's laboratory, WHOI

February 2009 – present: Research Associate III
2002-2009: Research Associate II
1998-2002: Senior Research Assistant I
1993-1998: Research Assistant III
1992-1993: Research Assistant II

1980 - 1992: Research Assistant in Judith Grassle's laboratory, MBL

Awards: 1999 Linda Morse-Porteous Award

Field Experience (Summary):

Participated in fourteen deep-water cruises to hydrothermal vents and seamounts (14 submersible dives) and one Arctic cruise, plus numerous coastal sampling cruises aboard R/V *Asterias* to sample soft-bottom benthos

Professional Activities:

Schmidt Ocean Institute proposal review panel, September 2014

Science outreach:

Science Made Public speaker, July 2005 & August, 2014
Volunteer at Alvin sendoff and Trenches event - 2013
Tour guide, Knorr tour, August 2011
Computer volunteer in the Falmouth school system 1996 - 2005
Science fair judge since 1998 (Falmouth & Martha's Vineyard)
Give presentations on our research to local elementary and middle school students
Speaker at several SEA semester career seminars
Invited speaker at Massachusetts Marine Educators meeting, April 2002

Projects:

With Lauren Mullineaux include:

- Larval dispersal and colonization at hydrothermal vents
- Identification of hydrothermal vent larvae and juveniles
- Larval behavior in turbulence
- Ocean acidification effects on bivalves
- Coral populations of the New England seamounts
- Studies of uptake of trace elements in larval bivalve shells
- Studies on *Mya* post-settlement resuspension in the field and in the flume
- Larval dispersal and settlement at Fieberling Guyot
- Development and maintenance of Mullineaux lab web pages

With Judy Grassle include:

- Settlement of invertebrate larvae in still water and in the paddlewheel flume
- Speciation in various polychaete genera using life history, morphology, electrophoresis and karyotypes
- Population genetics of hydrothermal vent species
- Effects of PCB's on the benthos of New Bedford Harbor

Other projects:

Winter 2012 – Summer 2013: Conducted benthic macrofauna survey, Roberts Cove, Orleans, as part of Don Anderson's study on effects of resuspension on *Alexandrium fundyense*

Fall 2012 – 2014: Synthesized historical data on Arctic copepod distributions for Carin Ashjian

Summer 2012: Participated in RUSALCA cruise to the Chukchi Sea to collect VPR data for Carin Ashjian

Spring 2011: Conducted benthic macrofauna survey, Nauset Salt Pond, as part of Don Anderson's study on effects of resuspension on *Alexandrium fundyense*

August 2009 – April 2011: Counting Antarctic nanoplankton with the fluorescence microscope for Mark Dennett

January 1999 – summer 2001: Maintained the WHOI Biology Department web pages

February 1996 - April 1997: Benthic and plankton sorting and assisting with various projects for Robert Wheatcroft and Cheryl Ann Butman

April - July 1994: Sorting and identifying benthic invertebrates from

Massachusetts Bay for Robert Wheatcroft

1993 - 1994: Sorting LEO 15 benthic samples for J. Frederick Grassle (Rutgers University)

January - June 1992: Sorted benthic samples (CARDS, LEO 750) for Larry Madin and Paul Snelgrove (WHOI)

April - November 1987: Sorted benthic and sediment trap samples for Cheryl Ann Butman (WHOI)

Field Experience (Detail):

August – September 2012 – Participant in joint Russian-American RUSALCA cruise to the Chukchi Sea to collect VPR data to study zooplankton distributions for a long-term census of the Arctic

September 2010 – Participant in R/V Yokosuka cruise with Shinkai 6500 submersible to southern Mariana Trough vent sites to study larval frequencies and behavior.

April – May 2010 – Participant in MESCAL cruise (N/O Atalante with Nautille submersible) to 9 & 13° N on the East Pacific Rise to continue monitoring of post-eruption recovery of vent fauna.

October – November 2008 – Participant in Sievert microbiology cruise to 9-10° N on the East Pacific Rise (AT 15-38b) to continue monitoring of post-eruption recovery of vent fauna.

November – December 2007 – Participant in LADDER 3 cruise to 9-10° N on the East Pacific Rise, studying larval dispersal, colonization and hydrodynamics.

December 2006 – January 2007 – Group leader and Alvin dive activities coordinator for LADDER 2 cruise to 9-10° N on the East Pacific Rise, studying post-eruption larval dispersal and colonization.

August 2005 – Participant in Deep Atlantic Stepping Stones cruise to New England and Corner Rise seamounts

May 2004: Participant in Mountains in the Sea II cruise to the New England seamounts

May-June 2003: Participant in cruise to the New England seamounts to study coral populations and to collect fossil corals for climate studies

May 2000: Group leader for final LARVE cruise to the hydrothermal vents on the East Pacific Rise at 9° N to collect vent larvae in the plankton

December 1995, May 1998, December 1998, December 1999: Participant in cruises to the vents at 9° N to collect study larval dispersal and colonization

April 1982: Cruise to the hydrothermal vents at 21° N on the East Pacific Rise to collect frozen tissue samples for electrophoretic analysis

1981-1984: Conducted numerous sampling trips on R/V Asterias to collect grab samples for benthic invertebrate surveys from New Bedford Harbor and the surrounding area

Publications, refereed:

Beaulieu, S.E., R.T. Sayre-McCord, S.W. Mills, F. Pradillon, and H. Watanabe 2014 Swimming speeds of polychaete larvae collected near deep-sea hydrothermal vents, in press, Marine Ecology.

Mills, S. W., L. S. Mullineaux, S. E. Beaulieu and D. K. Adams 2013 Persistent effects of disturbance on larval patterns in the plankton after an eruption on the East Pacific Rise. Marine Ecology Progress Series, 491:67-76.

Mullineaux, L.S., D.J.McGillicuddy Jr., S.W.Mills, V.K.Kosnyrev, A.M.Thurnherr, J.R. Ledwell and J.W.Lavelle 2013 Active positioning of vent larvae at a mid-ocean ridge. Deep-Sea Research II 92:46–57.

Mullineaux LS, Le Bris N, Mills SW, Henri P, Bayer SR, Secrist RG, Siu N 2012 Detecting the influence of initial pioneers on succession at deep-sea vents. PLoS ONE 7(12): e50015. doi:10.1371/journal.pone.0050015

Mullineaux, L.S., D.K. Adams, S.W. Mills and S.E. Beaulieu. 2010 Larvae from afar colonize deep-sea hydrothermal vents after a catastrophic eruption. Proc. Natl. Acad. Sci. 107:7829–7834.

Adams, D.K., S.W. Mills, T.M. Shank & L.S. Mullineaux. Morphological and molecular identification of hydrothermal vent gastropod larvae. 2010 Mar. Biol. 157:1049-1062.

Beaulieu, S.E., L.S. Mullineaux, D.K. Adams and S.W. Mills. 2009 Comparison of a sediment trap and plankton pump for time-series sampling of larvae near deep-sea hydrothermal vents. Limnology and Oceanography: Methods 7: 235-248.

Lenihan, H.S., S.W. Mills, L.S. Mullineaux, C.H. Peterson, C.R. Fisher, F. Micheli. 2008 Biotic interactions at hydrothermal vents: Recruitment inhibition by the mussel *Bathymodiolus thermophilus*. Deep Sea Research Part 1. 55:1707-1717.

Tyler, P.A., S. Pendlebury, S.W. Mills, L.S. Mullineaux, K.J. Eckelbarger, M. Baker and C.M. Young. 2008. Reproduction of gastropods from vents on the East Pacific Rise and the Mid-Atlantic Ridge. J. Shellfish Res. 27: 107–118.

Mills, S.W., L.S. Mullineaux & P.A. Tyler. 2007 Habitat associations in gastropod species at East Pacific Rise hydrothermal vents (9°50'N). *Biol. Bull.* 212:185-194.

Mullineaux, L.S., S.W. Mills, A. K. Sweetman, A.H. Beaudreau, A. Metaxas, H.L. Hunt. 2005 Spatial structure and temporal variation in larval abundance at hydrothermal vents on the East Pacific Rise. *Marine Ecology Progress Series* 293:1-16.

Sancho, G., C.R. Fisher, S. Mills, F. Micheli, G.A. Johnson, H.S. Lenihan, C.H. Peterson and L.S. Mullineaux. 2005 Selective predation by the zoarcid fish *Thermarces cerberus* at hydrothermal vents. *Deep-Sea Research Part I-Oceanographic Research Papers* 52:837-844.

Mullineaux, L.S., C.H. Peterson, F. Micheli and S.W. Mills. 2003 Successionary mechanism varies along a gradient in hydrothermal fluid flux at deep-sea vents. *Ecological Monographs*, 73:523-542.

Micheli, F., C. H. Peterson, L. S. Mullineaux, C. R. Fisher, S. W. Mills, G. Sancho, G. A. Johnson and H. S. Lenihan. 2002 Predation structures communities at deep-sea hydrothermal vents. *Ecological Monographs*, 72:365-382.

Dunn, R., L. S. Mullineaux and S. W. Mills. 1999 Resuspension of postlarval soft-shell clams *Mya arenaria* through disturbance by the mud snail *Ilyanassa obsoleta*. *Marine Ecology Progress Series* 180:223-232.

Mullineaux, L.S., R., Dunn, S.W. Mills, H.L. Hunt and L.K. Gulmann. 1999 Biological influences on transport of postlarval soft-shell clams (*Mya arenaria*). In: *Coastal Ocean Processes Symposium: a Tribute to William D. Grant*, Woods Hole Oceanog. Inst. Tech. Rept. WHOI-99-04, pp. 155-162.

Mullineaux, L.S., S.W. Mills and E. Goldman. 1998 Recruitment variation during a pilot colonization study of hydrothermal vents (9°50'N, East Pacific Rise). *Deep-Sea Research II* 45:441-464.

Mullineaux, L.S. and S.W. Mills 1997 A test of the larval retention hypothesis in seamount-generated flows. *Deep-Sea Res.* 44:745-770.

Grassle, J.P., C.A. Butman & S.W. Mills 1992 Active habitat selection by *Capitella* sp. I larvae. II. Multiple-choice experiments in still water and flume flows. *J. Mar. Res.* 50:717-743.

Grassle, J.P., C.E. Gelfman & S.W. Mills 1987 Karyotypes of *Capitella* sibling species, and of several species in the related genera *Capitellides* and *Capitomastus* (Polychaeta). *Bull. Biol. Soc. Wash.* 7:77-88.

Technical Report:

Mills, S.W., S.E. Beaulieu and L.S. Mullineaux. 2009 Photographic identification guide to larvae at hydrothermal vents. Woods Hole Oceanographic Institution Technical Report WHOI-2009-05. 108 pp..

Abstracts and other publications:

Mills, S.W., N. Le Bris, S.E. Beaulieu, S. Sievert & L.S. Mullineaux 2014 Succession Following Eruptive Disturbance in a Deep-sea Hydrothermal Vent Metacommunity: Alternative Stable State or Return to Status Quo? Ocean Sciences Meeting, Honolulu, HI, February 2014.

Beaulieu, S.E., S.W. Mills, H. Watanabe, F. Pradillon, S. Kojima & L.S. Mullineaux 2013, Abundance, diversity, and behavior of larvae collected near southern Mariana back-arc vents. 5th International Symposium on Chemosynthesis-Based Ecosystems, Victoria, B.C., August 2013.

Mullineaux, L.S., D.J. McGillicuddy Jr., S.W. Mills, V. K. Kosnyrev, A.M. Thurnherr, J.R. Ledwell, J.W. Lavelle 2013 Active positioning of vent larvae at a mid-ocean ridge. 5th International Symposium on Chemosynthesis-Based Ecosystems, Victoria, B.C., August 2013.

Mills, S. W., L. S. Mullineaux, S. E. Beaulieu and D. K. Adams 2013 Persistent effects of disturbance on larval patterns in the plankton after an eruption on the East Pacific Rise. 5th International Symposium on Chemosynthesis-Based Ecosystems, Victoria, B.C., August 2013.

Mills, S.W., S.E. Beaulieu & L.S. Mullineaux "Collection and Identification of Invertebrate Larvae at Hydrothermal Vents", oral presentation at MarVeL workshop, Okinawa, Japan, May 2012.

Mills, S.W., L.S. Mullineaux, S.E. Beaulieu & D.K. Adams. 2012 Severe and persistent effects of disturbance on larval supply at vents: Patterns in the plankton after the 2006 eruption on the East Pacific Rise. Ocean Sciences Meeting, Salt Lake City, UT

Mullineaux, L.S., N. Le Bris, S.W. Mills, R. Secrist, S.R. Bayer, N. Siu, S.E. Beaulieu. Initial pioneers matter: non-deterministic succession after catastrophic disturbance at a deep-sea hydrothermal vent. Ocean Sciences Meeting, Salt Lake City, UT.

White, M.M. L.S. Mullineaux, D.C. McCorkle, A.L. Cohen, S.W. Mills. Short-term high CO₂ exposure of larval bay scallops *Argopecten irradians* may show latent effects. Ocean Sciences Meeting, Salt Lake City, UT.

Wheeler, J., E. Anderson, K. Helfrich, B. McGann, S. Mills, L. Mullineaux. Turbulence-mediated settlement responses in larval oyster *Crassostrea virginica*. Ocean Sciences Meeting, Salt Lake City, UT.

Siu, N., S.W. Mills, L.S. Mullineaux, S. Bayer, & Gar Secrist. 2011 Recruitment Patterns of Hydrothermal Vent Communities following a Submarine Volcanic Resurfacing Event at the East Pacific Rise, 9°50'N. Pacific Estuarine Research Society (PERS) meeting, Astoria, OR.

Beaulieu, S.E., L.S. Mullineaux, S.W. Mills, H. Watanabe, F. Pradillon and S. Kojima 2010 Connectivity at hydrothermal vents: Studying larval dispersal at discrete and ephemeral habitats in the deep sea. Trench Connection Symposium, Tokyo, Japan.

Mullineaux, L., Adams, D., Mills, S., and Beaulieu, S. "Larval supply and re-colonization of deep-sea hydrothermal vents after a catastrophic eruption." 4th CBE Symposium, Okinawa, Japan, July 2009.

Mills, S. W., S. E. Beaulieu and L.S. Mullineaux, 2007. Photographic identification guide to larvae at hydrothermal vents in the eastern Pacific. Published at: <http://www.who.edu/vent-larval-id> (website administrator).

Mullineaux, L.S. & S.W. Mills 2005 Coral gardens in the dark depths. *Oceanus* 43:6-11.

Mullineaux, L.S., S.W. Mills, J. Blusztajn and S. Hart. 2002 Does elemental composition of larval clam shells reflect their natal environment? ASLO Summer Meeting, Victoria, B.C., Canada, June 2002.

Mills, S., J. Blusztajn, L. S. Mullineaux and S. Hart. 2000 Trace-element composition in larval bivalve shells as an indicator of dispersal. Talk presented at the Larval Biology Meetings, Santa Cruz, California, June 2000

Mullineaux, L.S., F. Micheli, S.W. Mills, C.R. Fisher, C.H. Peterson, S.L. Kim, D. Toleno and J.E. Agenbroad 1996 Biological interactions during colonization at hydrothermal vents and their implications for faunal zonation. *Trans. Am. Geophys. Un.* 76:95. Mullineaux, L.S. & S.W. Mills 1994 Larvae of benthic invertebrates in Fieberling Guyot. *Trans. Am. Geophys. Un.* 75:164.

Kim, S.L., L.S. Mullineaux, S.W. Mills, K.R. Helfrich & P.H. Wiebe 1993 Larval dispersal via entrainment into hydrothermal vent plumes. Poster for the RIDGE Theoretical Institute, August 1993.

Wagenbach, G.E., J.P. Grassle & S.W. Mills 1983 Host specificity of intestinal gregarines (Protozoa, Apicomplexa) in two sympatric species of *Capitella* (Polychaeta). *Biol. Bull.* 165:538.

Hill, S.D., J.P. Grassle & S.W. Mills 1982 Regeneration and maturation in two sympatric *Capitella* (Polychaeta) sibling species. *Biol. Bull.* 163:366.

Oral presentations:

Mills, S.W. Larval gastropod identification. Oral presentation at INDEEP workshop on identification of early colonizers, Southampton, UK, June 2013

Mills, S.W., S.E. Beaulieu & L.S. Mullineaux "Collection and Identification of Invertebrate Larvae at Hydrothermal Vents", oral presentation at MarVeL workshop, Okinawa, Japan, May 2012.

Mills, S., J. Blusztajn, L. S. Mullineaux and S. Hart. 2000 Trace-element composition in larval bivalve shells as an indicator of dispersal. Talk presented at the Larval Biology Meetings, Santa Cruz, California, June 2000

Wagenbach, G.E., J.P. Grassle & S.W. Mills 1983 Host specificity of intestinal gregarines (Protozoa, Apicomplexa) in two sympatric species of *Capitella* (Polychaeta).

Poster presentations:

Mills, S.W., N. Le Bris, S.E. Beaulieu, S. Sievert & L.S. Mullineaux 2014 Succession Following Eruptive Disturbance in a Deep-sea Hydrothermal Vent Metacommunity: Alternative Stable State or Return to Status Quo? Ocean Sciences Meeting, Honolulu, HI, February 2014.

Mills, S.W., L.S. Mullineaux, S.E. Beaulieu & D.K. Adams. 2012 Severe and persistent effects of disturbance on larval supply at vents: Patterns in the plankton after the 2006 eruption on the East Pacific Rise. Ocean Sciences meeting, Salt Lake City, UT

Mills, S.W., L.S. Mullineaux and P.A. Tyler. Habitat associations in gastropod species at East Pacific Rise hydrothermal vents (9°50'N). Poster presented at the Deep Sea Biology Symposium, Southampton, England, July 2006.

Mills, S.W. and L.S. Mullineaux. Sizes and distributions of octocorals *Keratoisis* sp. and *Paragorgia* sp. on the New England Seamount Chain: implications for colonization dynamics. Poster presented at the Deep-Sea Coral Symposium, Miami, FL, December 2005.

Strasser, CA, SW Mills, LS Mullineaux and, S Thorrold Trace element composition of larval bivalve shells reflects natal environment. Poster presented at AGU Ocean Sciences, Portland, OR, January 2004.

Mills, SW, LS Mullineaux and PA Tyler Habitat preferences in gastropod species at hydrothermal vents at 9°50'N, East Pacific Rise. Poster presented at AGU Ocean Sciences, Portland, OR, January 2004.

Mills, S.W., L.S. Mullineaux, C.H. Peterson and F. Micheli. Species interactions during succession at hydrothermal vents. Poster presented at the Second International Symposium on Deep-Sea Hydrothermal Vent Biology, Brest, France, October 2001.

Mullineaux, L.S., S.W. Mills, A. Sweetman, A.H. Beaudreau, H.L. Hunt, A. Metaxas, C.M. Young. Larval distributions near hydrothermal vents at 9°50'N, East Pacific Rise. Poster presented at the Second International Symposium on Deep-Sea Hydrothermal Vent Biology, Brest, France, October 2001.

Mills, S.W., L.S. Mullineaux and Paul A. Tyler. Gastropods at deep-sea hydrothermal vents: an under-appreciated model system for dispersal and colonization studies. Poster presented at the LARVE results symposium, Ogden, Utah, May 2001.