

## CURRICULUM VITAE

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### EDUCATION:

B.S.: Geology, Stanford University (graduated with distinction, 1980).

M.S.: Geological Oceanography, University of Washington (1983).

Ph.D.: Geological Oceanography, University of Washington (1989).

Thesis title: Physical and Chemical Controls on the Growth of Hydrothermal Vent Structures: a Model of Transport and Chemical Reaction (R.E. McDuff, J.R. Delaney, Advisors).

### PROFESSIONAL EXPERIENCE:

Associate Dean, WHOI (2010-present).

Director, Deep Ocean Exploration Institute, WHOI (2008-2010).

Senior Scientist, Woods Hole Oceanographic Institution (2008-present).

Associate Scientist w/tenure, Woods Hole Oceanographic Institution (1999 to 2008).

Associate Scientist, Woods Hole Oceanographic Institution (1994 to 1998).

Assistant Scientist, Woods Hole Oceanographic Institution (1990 to 1994).

Post-Doctoral Investigator, Woods Hole Oceanographic Institution (1990).

Post-Doctoral Scholar, Woods Hole Oceanographic Institution (1989).

Research and teaching assistant, University of Washington (1982 to 1988).

Physical Science Technician/Geologic Field Asst, U.S.G.S., Office of Marine Geology (1979 to 1981).

### FELLOWSHIPS/AWARDS:

Arnold B. Arons Award for Excellence in Teaching, Advising, and Mentoring (2010).

Woods Hole Post-Doctoral Scholarship (1989).

Achievement Rewards for College Scientists Foundation (ARCS) Dissertation Fellowship (Fall 1987).

Graduate Opportunities Program for Women and Minorities in Science Fellowship (Spring 1983).

University of Washington EGTVEDT Scholarship for new graduate students (1981 to 1982).

### PROFESSIONAL AFFILIATIONS:

Member, Geochemical Society (1987 - present)

Member, American Geophysical Union (1983 - present)

### RESEARCH INTERESTS:

Aqueous geochemistry

Formation of seafloor massive sulfide deposits.

Quantification of heat and mass transfer in hydrothermal systems.

Field studies of active vent sites, including development and use of instrumentation at active vent sites.

Examination of mineral textures, trace element distributions, and mineral precipitation processes in seafloor massive sulfide deposits.

### EDUCATION ACTIVITIES:

Associate Dean (August 2010-present)

Attended Council of Graduate Schools Deans' Workshops 2016, 2014, 2012, 2011

Attended Consortium of Ocean Leadership Ocean Science Educators Retreats 2016, 2014, 2010

Chair, MIT-WHOI Joint Program Admissions Committee (2011-present)  
Invited Panelist, mentoring workshop of the Marine Biological Laboratory's SUCCESS (Shaping and Understanding Career Choices in Education, Science and Self) program: "THIS IS AN AUDITION: Your Resume and the Job Market" July 8, 2015  
Prepared materials for and participated in MIT-WHOI Joint Program 2014 External Review  
Attended NNOCCI meeting at New England Aquarium Oct 1, 2014  
Attended CIHE-NEASC Regional meeting, UMass Boston, to review accreditation standards, Oct 2, 2014  
Attended CIHE-NEASC Accreditation Workshop, October 17-18, 2013  
Invited Panelist, mentoring workshop of the Marine Biological Laboratory's SUCCESS (Shaping and Understanding Career Choices in Education, Science and Self) program: "What makes a good mentor: how to find one and how to keep one" July 30, 2014  
Education Coordinator, MC&G department (2004-2008)  
Education council (2000-2002, 2004-2008)  
Chair of JCCO (Sept 1, 1999 – Aug. 31, 2002)  
Joint Committee on Chemical Oceanography (JCCO) 1996-2002; 2004-2008

**Students:**

Advisor/Co-advisor: Carrie Friedman (M.S., JPMG&G 1998, w/S.E, Humphris), Linda Rasmussen (JPCO 1997-1999), Paul Craddock (PhD JPCO 2009, w/Wolfgang Bach), Guy Evans (PhD candidate JPMG&G, 2011-present)

Pre-generals committees/advising: Sarah Herbelin (1992-1993), Youngsuk Huh (1992-1993), Kirsten Laarkamp (1992-1993), Payal Parekh (1997-1999), Anna Cruse (1997-1999)

Reader: D. Andrew Trivett's Ph.D. defense (JPAOSE 1991)

Member: general exam committee for Anna Michel (JPAOSE candidate, 2004)

Thesis committee member: Kevin O'Grady (University of New Hampshire, defended 9/6/01), Anna Cruse (JPCO 1999-2002), Rachel Gallant (University of New Hampshire, 2002-2003), Anna Michel (JPAOSE 2004-2007), Eoghan Reeves (JPCO 2007-2010), Claire Pontbriand (JPMG&G 2011-2013), Jill McDermott (JPCO 2011-2014), Lauren Kipp (JPCO 2016-present), Gabriela Farfan (JPCO 2016-present)

Chair: Anna Cruse's thesis proposal defense (1999), Cara Santelli's General Exam (2003), Cara Santelli's thesis proposal defense (2003), Cara Santelli thesis defense (JPCO 2007), Diane Adams thesis defense (JPBO 2007), Naomi Levine thesis defense (JPCO 2009), Alysia Cox thesis defense (JPCO 2011), Jill McDermott thesis proposal defense (JPCO 2011), Dan Ohnemus thesis defense (JPCO 2013), Evan Howard thesis defense (JPCO 2016), Emily Estes thesis defense (JPCO 2017)

**Post-doctoral scholar sponsor/co-sponsor:**

Chen Zhu (w/G. Thompson, 1991-1992), Wenlu Zhu (w/ J.G. Hirth, R. Evans, 1997-1998), Thibaut Barreyre (w/ Rob Sohn, Dan Fornari, Adam Soule, 2014-2015)

**Summer Student Fellow sponsor/co-sponsor:**

Kathleen Ward (1990), Charles Labbe (w/J. Seewald, 1997), Rachel Stanley (1999), Hilary Gittings (w/W. Zhu, 2002), Alden Denny (2008), Niya Grozeva (2011)

**Teaching:**

Seminar in Marine Chemistry (jointly with B. Peucker-Ehrenbrink - Spring Semester 1999)  
Instructor, Aquatic Chemistry (1/3 course, Fall 2005), Lecturer for Marine Chemistry (1-3 lectures, 2004-2006)

**SUPERVISION AT WHOI:**

**Administrative personnel:** Julia Westwater, Registrar/Graduate & Undergraduate Administrator (August 2010-present); Lea Fraser, Graduate Administrator/Student Affairs Officer (December 2012-present); Tricia Gebbie, Graduate Administrator/Student Affairs Officer (December 2010 – October 2012); Marsha Armando, Graduate Administrator/Student Affairs Officer (August - November 2010); Andrew Daly, Administrative Associate II (Sept 2008-2010).

**Technicians:** Margaret Sulanowska, Senior Research Assistant II (1990-present, now casual); Scott McCue, Information Systems Associate II (part-time, 2006-2007); Steve Liberatore, Research engineer

(June/July and September 2000); Charles Labbe (part-time, w/J. Seewald, 1998); Sandipa Singh, Information System Associate II (part-time, 1995-1997)

**Post-doctoral Scholar:** Thibaut Barreyre (w/ Rob Sohn, Dan Fornari, Adam Soule, 2014-2015), Wenlu Zhu (w/J.G. Hirth and R. Evans, 1997-1998), Chen Zhu (w/G. Thompson, 1991-1992)

**Post-doctoral Investigator:** Jozee Sarrazin (1999-2000)

**Guest Students:** Jill Gribbin (August 2008), Rachel Stanley (June/July 2000), Damien Grelon (June/July 2000), Justus Hoffman (1992), Terri Cook (1992)

## **PROFESSIONAL ACTIVITIES**

### *WHOI (Non Education Related):*

Chair, WHOI self-study committee for the CIHE-NEASC reaccreditation of WHOI (2015-2016)

Member, Strategic Facilities Planning Steering Committee (2015 – 2016)

Member, Deep Submergence Advisory Committee (DSAC) (2013 – present)

Member, DOEI Proposal Review Panel for 2011 Fellow and Research Proposals

Chair, WHOI self-study committee for the CIHE-NEASC fifth-year interim report (followed 2006 Accreditation Review of WHOI) (August 2010- April 2011)

Member, Internal Oversight Committee of 6500m HOV (human occupied vehicle) Project (2009- 2013)

Member, Search committee For VP of Marine Ops and Facilities (2009)

Convened Ocean Ridge Initiative WHOI Workshop, February 25, 2009

Member, DOEI Advisory Committee (January 2008-August 2008)

Member, NENIMF internal advisory committee (2006-2009)

Member, MC&G Chair Search Committee (2006)

Member, NENIMF reorganization committee (2005)

Chair, Vehicles/NDSF sub-group of Access to the Sea Task Force (Spring 2004)

Member, Ad-hoc committees for promotion to Associate Scientist, K. Ruttenberg (1999), Wenlu Zhu (2003), Katrina Edwards (2003), Wolfgang Bach (2003)

Member, Search Committee for WHOI Ship Operations Manager (December 2002 – March 2003)

Member, Ad-hoc committee to review Marine Operations and NDSF (June – December 2002)

Helped edit handbook on “Navigating the Tenure Track” (2001)

Mentoring committees, Wenlu Zhu (2001-2007), Katrina Edwards (2001-2006), Wolfgang Bach (2001-2005), Karen Casciotti (2005-2008), Olivier Rouxel (2006-2009), Sheri White (2008-2009), Colleen Hansel (2014-2016), Scott Wankel (2014-present), Tristan Horner (2016-present)

Chair, Ad Hoc Review Committees for promotion to Associate Scientist for Sonya Legg (2001), John “Chip” Breier (2012), Veronique Le Roux (2017)

Member, Tenured Scientist’s Executive Committee (TenSEC) (November 2000-October 2002)

Member, SciSEC (2009 - 2010)

MC&G Space committee, 2000, 2002-2004

MC&G Hiring committee, 1999-2000, 2010-2011, 2017

G&G geofluids hiring committee 2008; metamorphic petrologist hiring committee 2010

Gender Equity Review Committee, 1999- 2000

Consultant for BBH exhibit and Turnstone publication “Down to a Sunless Sea.” (1999)

### *Outside WHOI:*

Panelist at Society for Women in Marine Science Symposium, October 10, 2015

Attended EarthCube: Deep Seafloor Processes and Dynamics Community Workshop, June 5-7 2013 at University of Rhode Island Graduate School of Oceanography

Invited participant, IODP Arc Hydrothermal Drilling Workshop, Lisbon, Portugal, November 15-17, 2012

NSF Panel member for OCE-PRF and OCE-RIG programs (virtual panel 2012)

Member, InterRidge Working Group on Hydrothermal Energy and Ocean Carbon Cycles (2010-2011)

Member, NSF Ridge2000 Lau Integration and Synthesis Committee (June 2008- 2011)

Attended InterRidge Workshop on “Deep-Sea Mining of Seafloor Massive Sulfides: A Reality for Science and Society in the 21<sup>st</sup> Century” (2009)  
 Moderator of discussion group at Ridge2000 Workshop (2009): Developing a holistic view of oceanic spreading center processes  
 Attended Morss Colloquium on “Precious metals from Deep-Sea Vents” (2009)  
 Breakfast Meeting Oral Presentation at CERAWEEK in Houston - Woods Hole Oceanographic Institution: “What’s Ahead for Deep Ocean Discovery?” (w/Andy Bowen as co-presenter, February 11, 2008)  
 Co-convener, Lau ISS integration and synthesis workshop (Sept 7-9, 2008, Salt Lake City).  
 Panelist, eighth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (June 27, 2007)  
 Member, Ocean Exploration Proposal Review Panel, January 18-19, 2007 in Silver Spring, MD  
 Member, AGU Ocean Sciences Section Nominating Committee (2007)  
 Member, organizing committee, InterRidge Theoretical Institute ‘Biogeochemical interaction at deep-sea vents’ (2007)  
 Lecturer, Ridge 2000 Theoretical Institute 2006: Modeling Oceanic Spreading Center Hydrothermal Processes: Magma to Microbe (2006)  
 Lecturer, From Vent Chemistry to Biochemistry Workshop, Santa Fe Institute Workshop (2006)  
 Member, InterRidge Working Group on Biogeochemical Interactions at Deep-Sea Vents (2005- 2009)  
 AGU Ocean Sciences Section 2005 Rachel Carson Lecturer  
 AGU FM04 Planning Meeting Member, September 29-Oct 1, 2004 (stand-in for K. Ruttenger)  
 Ridge2000 Distinguished Lecturer, Spring 2004  
 Co-chair, The ORION Workshop, 4-8 January 2004, San Juan, Puerto Rico  
 Co-chair, ORION (Ocean Research Interactive Observatory Networks) Workshop Steering Committee (April 2003-December 2004)  
 Co-convener, special session at Fall 2001 AGU on Endeavour Ridge Observatory  
 Moderator, Dahlem Workshop on Energy and Mass Transfer in Marine Hydrothermal Systems, Berlin, Oct 15-19, 2001  
 Co-convener, Endeavour Ridge Observatory Workshop, September 24-26, 2001, Seattle, WA  
 Co-convener, oral and poster session at Fall 2000 AGU on 2000 observatory effort  
 Co-convener, RIDGE Workshop, In-situ sensors: their development and application for the study of chemical, physical and biologic systems at mid-ocean ridges, 22-24 Oct 2000, Aptos and Moss Landing, CA  
 Convened RIDGE Observatory meetings in Seattle in November, 1999 and May, 2000, at AGU Dec 2000  
 Chair, NEPTUNE (NorthEast Pacific Time-series Undersea Networked Experiment) Ridge Crest Processes Science Working Group (1999-2000)  
 NSF RIDGE Endeavour Observatory Coordinator (1996-2002)  
 Associate Editor, Journal of Geophysical Research - Solid Earth (January 1996 - December 1999)  
 Member, RIDGE Steering Committee (1992-1995)

### **CRUISE PARTICIPATION:**

2009 – Scientist/diver, R/V Atlantis/HOV *Alvin* Guaymas Basin thermocouple arrays Nov 22 – Dec 6.  
 2009 – Scientist/diver, R/V Atlantis/HOV *Alvin* Guaymas Basin thermocouple arrays Nov 8-19.  
 2009 – Scientist, R/V Thompson/ROV *Jason2*, Lau Basin thermocouple arrays June 12- July 8.  
 2005 - Chief scientist, R/V Melville/ROV *Jason2*, Lau Basin Vent Characterization, Apr 5 – May 11.  
 2003 - Scientist, R/V Western Flyer/ROV *Tiburion*, Gulf of Calif. Expedition Leg 6, May 15-20.  
 2003 - Scientist, R/V Western Flyer/ROV *Tiburion*, Gulf of Calif. Expedition Leg 2, March 1-8.  
 2002 - Scientist, R/V Western Flyer/ROV *Tiburion*, testing isobaric gas-tight fluid samplers, Aug 5-10.  
 2000 - Co-chief scientist, Atlantis/HOV *Alvin* Endeavour Observatory cruise AT3-56, Sept 1 - Sept 19.  
 2000 - Co-chief scientist, Atlantis/*Alvin/Jason2* Endeavour Observatory cruise AT3-53, June 10 - July 12.  
 1999 – Scientist/ diver in Atlantis/HOV *Alvin* cruise to hydrothermal vent field w/Rita Colwell, Oct. 3 – 5.  
 1999 - Scientist/diver, R/V Atlantis/HOV *Alvin*, Juan de Fuca Ridge – sensor testing, Sept 12 - Oct 1.

1998 - Scientist/diver, Atlantis/HOVALvin, Southern EPR Hydrothermal Cruise, Oct. 10-Nov 18.  
 1998 – Scientist, R/V J.P. Tully Edifice Rex II, Mothra Field sulfide recovery, June 30 - July 12.  
 1995 - Scientist/diver, AtlantisII/HOVALvin Juan de Fuca Ridge cruise - instrument recovery (16 days).  
 1994 - Scientist, ODP Leg 158, Drilling the TAG active mound (56 days).  
 1994 - Scientist/diver, AtlantisII/HOVALvin instrument deployment cruise, Juan de Fuca Ridge.  
 1994 - Scientist/diver, R/V Nadir/HOV *Nautille* DIVANAUT 1 cruise, Mid-Atlantic Ridge (1994; 4 wks).  
 1993 - Scientist/diver, AtlantisII/HOVALvin Lucky Strike Expedition, Mid-Atlantic Ridge (10 days).  
 1993 - Scientist/diver, *JASON IV* Project with HOV *Turtle*, Guaymas Basin (8 days).  
 1991 - Scientist/diver, AtlantisII/HOVALvin chronology expedition, Juan de Fuca Ridge (11 days).  
 1990 - Scientist/diver, AtlantisII/HOVALvin hydrothermal processes cruise, Mid-Atlantic Ridge (34 days).  
 1984 - Scientist/diver, R/V AtlantisII/HOVALvin ridge crest processes cruise, Juan de Fuca Ridge.  
 1983 – Scientist, Juan de Fuca cruise, R/V T.G. Thompson.  
 1982 – Scientist, Juan de Fuca cruise, R/V T.G. Thompson.  
 1982 – Scientist, Bering Sea cruise, R/V S.P. Lee (USGS).  
 1981 – Scientist, Aleutian/Bering Sea cruise, R/V S.P. Lee.  
 1980 – Scientist, Bering Sea cruise, R/V S.P. Lee.

#### **PUBLICATIONS IN REFEREED JOURNALS AND BOOKS:**

- Evans, G.N., M.K. Tivey, J.S. Seewald, C.G. Wheat, Influences of the Tonga Subduction Zone on Seafloor Massive Sulfide Deposits along the Eastern Lau Spreading Center, *Geochimica et Cosmochimica Acta*, (in revision).
- Teske, A., D. de Beer, L.J. McKay, M.K. Tivey, J.F. Biddle, D. Hoer, K.G. Lloyd, M.A. Lever, H. Røy, D.B. Albert, H.P. Mendlovitz and B.J. MacGregor (2016) The Guaymas Basin Hiking Guide to Hydrothermal Mounds, Chimneys, and Microbial Mats: Complex Seafloor Expressions of Subsurface Hydrothermal Circulation. *Front. Microbiol.* **7**:75. doi: 10.3389/fmicb.2016.00075
- Jamieson, J., M.D. Hannington, M.K. Tivey, T. Hansteen, N. Williamson, M. Stewart, J. Fietzke, D.A. Butterfield, M. Frische, L. Allen, and B. Cousens (2016) Precipitation and growth of barite within hydrothermal vent deposits from the Endeavour Segment, Juan de Fuca Ridge. *Geochimica et Cosmochimica Acta* **173**, 64–85.
- Humphris, S.E., M.K. Tivey and M.A. Tivey (2015) The Trans-Atlantic Geotraverse Hydrothermal Field: A Hydrothermal System on an Active Detachment Fault. *Deep Sea Research II* **121** (2015) 8–16; DOI information: 10.1016/j.dsr2.2015.02.015
- McDermott, J.M., S. Ono, M.K. Tivey, J.S. Seewald, W.C. Shanks III, and A. Solow (2015). Identification of sulfur sources and isotopic equilibria in submarine hot-springs using multiple sulfur isotopes *Geochim. Cosmochim. Acta* **160**, 169–187.
- Jamieson, J.W., M.D. Hannington, D.A. Clague, D.S. Kelley, J.R. Delaney, J.F. Holden, M.K. Tivey, L.E. Kimpe (2013) Sulfide geochronology along the Endeavour Segment of the Juan de Fuca Ridge, *Geochem. Geophys. Geosyst.* doi: 10.1002/ggge.20133.
- Gribbin, J. L., W. Zhu, and M. K. Tivey (2012) Anisotropy in seafloor flange, slab, and crust samples from measurements of permeability and porosity: Implications for fluid flow and deposit evolution, *Geochem. Geophys. Geosyst.* **13**, Q03018, doi:10.1029/2011GC003840.
- Tivey, M.K., E. Becker, R. Beinart, C.R. Fisher, P.R. Girguis, C.H. Langmuir, P.J. Michael, and A.-L. Reysenbach (2012) Links from mantle to microbe at the Lau Integrated Study Site: Insights from a back-arc spreading center. *Oceanography* **25**(1):62–77, <http://dx.doi.org/10.5670/oceanog.2012.04>.
- Flores, G.E., J. H. Campbell, J. D. Kirshtein, J. Meneghin, M. Podar, J. I. Steinberg, J. S. Seewald, M. K. Tivey, M. A. Voytek, Z. K. Yang and A.-L. Reysenbach (2011), Microbial Community Structure of Hydrothermal Deposits from Geochemically Different Vent Fields Along the Mid-Atlantic Ridge, *Environmental Microbiology*, doi:10.1111/j.1462-2920.2011.02463.x.

- Mottl, M., J. Seewald, C.G. Wheat, M.K. Tivey, P.J. Michael, G. Proskurowski, T. M. McCollom, E. Reeves, J. Sharkey, C-F. You, L.H. Chan, T. Pichler (2011) Chemistry of hot springs along the Eastern Lau Spreading Center, *Geochimica et Cosmochimica Acta* **75**, 1013-1038.
- Craddock, P.R., W. Bach, J.S. Seewald, O. Rouxel, E. Reeves, and M.K. Tivey (2010) Rare Earth Element Abundances in Hydrothermal Fluids from the Manus Basin, Papua New Guinea: Indicators of Sub-seafloor Hydrothermal Processes in Back-Arc Basins, *Geochimica et Cosmochimica Acta*, **74**, 5494-5513.
- Sarrazin, J., P. Rodier, M.K. Tivey, H. Singh, A. Schultz, P.M. Sarradin (2009) A dual sensor device to estimate fluid flow velocity at diffuse hydrothermal vents, *Deep-Sea Research I*, **56**, 2065-2074.
- Ferrini, V. L., M. K. Tivey, S. M. Carbotte, F. Martinez, and C. Roman (2008) Variable morphologic expression of volcanic, tectonic, and hydrothermal processes at six hydrothermal vent fields in the Lau back-arc basin, *Geochem. Geophys. Geosyst.*, **9**, Q07022, doi:10.1029/2008GC002047.
- Pagé, A., M.K. Tivey, D.S. Stakes, and A-L. Reysenbach (2008) Temporal and spatial archaeal colonization of hydrothermal vent deposits, *Environmental Microbiology*, doi:10.1111/j.1462-2920.2007.01505.x
- Tivey, M.K. (2007) Generation of Seafloor Hydrothermal Vent Fluids and Associated Mineral Deposits, *Oceanography* **20**, No. 1, 50-65.
- Zhu, W., M.K. Tivey, H. Gittings, and P.R. Craddock (2007) Permeability-porosity relationships in seafloor vent deposits: Dependence on pore evolution processes, *J. Geophys. Res.*, **112**, B05208, doi:10.1029/2006JB004716.
- Reysenbach, A-L., Y. Liu, A. Banta, T.J. Beveridge, J.D. Kirshtein, S. Schouten, M.K. Tivey, K.L. Von Damm, and M.A. Voytek (2006) A ubiquitous thermoacidophilic archaeon from deep-sea hydrothermal vents, *Nature* **442**, 444-447.
- Kormas, K., M.K. Tivey, K.L. Von Damm, and A. Teske (2006) Bacterial and archaeal phylotypes associated with distinct mineralogical layers of a white smoker spire from a deep-sea hydrothermal vent site (9°N, East Pacific Rise), *Environmental microbiology*, **8**(5), 909-920.
- Ding, K., W. E. Seyfried, Jr., Z. Zhang, M. K. Tivey, K. L. Von Damm and A. M. Bradley (2005) The in situ pH of hydrothermal fluids at mid-ocean ridges, *Earth Planet. Sci. Lett.*, **237**, 167-174.
- Daly, K.L., R.H. Byrne, A.G. Dickson, S.M. Gallagher, M.J. Perry, and M.K. Tivey (2004) Chemical and biological sensors for time-series research: current status and new directions, *Marine Tech. Soc. Journal*, **38**, no. 2, 121-143.
- Tivey, M.K. (2004) Environmental conditions within active seafloor vent structures: sensitivity to vent fluid composition and fluid flow. In Wilcock, W., Cary, C., DeLong, E., Kelley, D., Baross, J. (Eds.) *Subseafloor Biosphere at Mid-Ocean Ridges*, Geophysical Monograph Series, No. 144. American Geophysical Union, Washington, DC, pp. 137-152.
- Von Damm, K.L., M.D. Lilley, W.C. Shanks III et al. (2003) Extraordinary phase separation and segregation in vent fluids from the southern East Pacific Rise, *Earth and Planet. Sci. Lett.* **206**, 365-378.
- Sarrazin, J., Levesque, C., Juniper, S. K. and Tivey, M.K. (2002) Mosaic community dynamics on Juan de Fuca Ridge sulfide edifices : Substratum, temperature and implications for trophic structure. *Cahiers de Biologie Marine*, **43**, 275-279.
- Tivey, M.K., A.M. Bradley, T.M. Joyce, and D. Kadko (2002) Insights into tide-related variability at seafloor hydrothermal vents from time-series temperature measurements. *Earth and Planet. Sci. Lett.* **202**, 693-707.
- Ding, K., W.E. Seyfried Jr., M.K. Tivey and A.M. Bradley (2001) In-situ measurement of dissolved H<sub>2</sub> and H<sub>2</sub>S in high temperature hydrothermal fluids at the Main Endeavour Field, Juan de Fuca Ridge, *Earth Planet. Sci. Lett.*, **186**, 417-425.

- Humphris, S.E. and M.K. Tivey (2000) A synthesis of geological and geochemical investigations of the TAG Hydrothermal Field: Insights into fluid flow and mixing processes in a hydrothermal system, In: Y. Dilek, E. Moores, D. Elthon, A. Nicholas (eds.), *Ophiolites and Oceanic Crust: New Insights from Field Studies and the Ocean Drilling Program*: Boulder, Colorado, GSA Special Paper 349, p. 213-235.
- Tivey, M.K., D.S. Stakes, T.L. Cook, M.D. Hannington, and S. Petersen (1999) A model for growth of steep-sided vent structures on the Endeavour Segment of the Juan de Fuca Ridge: results of a petrologic and geochemical study. *J. Geophys. Res.*, **104**, 22,859-22,883.
- Mills, R.A., and M.K. Tivey (1999) "Seawater entrainment and fluid evolution within the TAG hydrothermal mound: Evidence from analyses of anhydrite." In: Cann, J. H. Elderfield, and A. Laughton (eds.), *Dynamics of Processes Associated with New Ocean Crust*, Cambridge University Press, Cambridge, U.K., pp. 225-248.
- Mills, R.A., D.A.H. Teagle, and M.K. Tivey (1998) Fluid mixing and anhydrite precipitation within the TAG mound. In: Herzig, P.M., S.E. Humphris, D.J. Miller, and R.A. Zierenberg (Eds.), *Proc. ODP, Sci. Results*, **158**: College Station, TX (Ocean Drilling Program), 119-127.
- Tivey, M.K., R.A. Mills and D.A.H. Teagle (1998) Temperature and salinity of fluid inclusions in anhydrite as indicators of seawater entrainment and heating in the TAG active mound. In: Herzig, P.M., S.E. Humphris, D.J. Miller, and R.A. Zierenberg (Eds.), *Proc. ODP, Sci. Results*, **158**: College Station, TX (Ocean Drilling Program), 179-190.
- Tivey, M.K. (1998) Documenting textures and mineral abundances in minicores from the TAG active hydrothermal mound using x-ray computed tomography. In: Herzig, P.M., S.E. Humphris, D.J. Miller, and R.A. Zierenberg (Eds.), *Proc. ODP, Sci. Results*, **158**: College Station, TX (Ocean Drilling Program), 201-210.
- Tivey, M.K., and S. Singh (1997) Nondestructive imaging of fragile sea-floor vent deposit samples. *Geology*, **25**, 931-934.
- Langmuir, C., S. Humphris, D. Fornari, C. Van Dover, K. Von Damm, M.K. Tivey, D. Colodner, J.-L. Charlou, D. Desonie, C. Wilson, Y. Fouquet, G. Klinkhammer, and H. Bougault (1997) Hydrothermal vents near a mantle hot spot: the Lucky Strike vent field at 37°N on the Mid-Atlantic Ridge. *Earth Planet. Sci. Lett.*, **148**, 69-91.
- Humphris, S.E., P.M. Herzig, D.J. Miller, J.C. Alt, K. Becker, D. Brown, G. Burgmann, H. Chiba, Y. Fouquet, J.B. Gemmel, G. Guerin, M.D. Hannington, N.G. Holm, J.J. Honnorez, G.J. Iturrino, R. Knott, R. Ludwig, K. Nakamura, S. Petersen, A-L. Reysenbach, P.A. Rona, S. Smith, A.A. Sturz, M.K. Tivey, and X. Zhao (1995) The internal structure of an active sea-floor massive sulphide deposit. *Nature*, **377**, 713-716.
- Fouquet, Y., H. Ondreas, J-L. Charlou, J-P. Donval, J. Radford-Knoery, I. Costa, N. Lourenco, and M.K. Tivey (1995) Atlantic lava lakes and hot vents. *Nature*, **377**, 201.
- Hannington, M.D., M.K. Tivey, A.C.L. Larocque, S. Petersen, and P.A. Rona (1995) The occurrence of gold in sulfide deposits of the TAG hydrothermal field, Mid-Atlantic Ridge. *Can. Mineralogist*, **33**, 1285-1310.
- Tivey, M.K., S.E. Humphris, G. Thompson, M.D. Hannington, and P.A. Rona (1995) Deducing patterns of fluid flow and mixing within the TAG active hydrothermal mound using mineralogical and geochemical data. *Journal of Geophysical Research*, **100**, 12,527-12,555.
- Tivey, M.K. (1995a) The influence of hydrothermal fluid composition and advection rates on black smoker chimney mineralogy: Insights from modeling transport and reaction. *Geochim. Cosmochim. Acta*, **59**, 1933-1949.
- Tivey, M.K. (1995b) Modeling Chimney Growth and Associated Fluid Flow at Seafloor Hydrothermal Vent Sites. In: *Seafloor Hydrothermal Systems: Physical, Chemical, Biological, and Geological*

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Tivey, M.K. and Y2K Observatory PIs (2000) The RIDGE Endeavour Segment seafloor observatory: Y2K coordinated experiments, *Eos, Trans. AGU* 81, 628 [abstract].

Tivey, M.K. (2000) Insights into seafloor hydrothermal systems from monitoring responses to natural perturbations, Symposium on Seafloor Observatories: Challenges and Opportunities (convened by the Ocean Studies Board, National Research Council), Key Largo, FLA.[abstract].

Tivey, M.K. (1999) Factors controlling growth of hydrothermal vent deposits on the Juan de Fuca Ridge, RIDGE Juan de Fuca Results Symposium [abstract].

**INVITED LECTURES (SINCE 1999):**

April 21, 2014 University of Wyoming Department of Geology & Geophysics “Controls on the formation and composition of Seafloor Massive Sulfide (SMS) deposits.”

May 13, 2013 "Seafloor hydrothermal vents, mineral deposits, and unusual biological communities in the deep sea." Brookhaven retirement community, Lexington, MA.

August 30, 2012 Summer school lecture: “Geochemical modeling of vent environments” at GEOCEAN Geodynamic processes and biochemical interactions at seafloor spreading ridges Symposium Jean Francheteau and Summer School in Brest, France, in August 2012

October 26, 2011 Anna-Louise Reysenbach with Meg Tivey, RIDGE2000 Distinguished Lecture Series talk at Rhode Island College: "Symbiotic relationships in research and at deep-sea hydrothermal vents."

September 21, 2011 American (U.S.) activities in marine mineral deposits, at Proceedings of the OCEANS 2011 MTS/IEEE KONA Conference & Exhibition

April 26, 2010 Determining conditions within and on surfaces of seafloor hydrothermal vent deposits, and insights they provide into faunal diversity, at Harvard Earth and Planetary Sciences Colloquium

April 19, 2010 How do you study microbial colonization at very hot deep sea vents? at Linden Ponds Hot Topics in Oceanography Lecture Series

March 5, 2010 An update on the Ocean Observatories Initiative (OOI): Final design network, and how to get involved, at The University of Texas, Institute for Geophysics (UTIG) Seminar Series

October 1, 2009 “Lau-Endeavour ISS Comparison,” at Ridge2000 Workshop: Developing a holistic view of oceanic spreading center processes

April 1, 2009, “Lau and Manus Basin Back-Arc Hydrothermal Systems,” at InterRidge Workshop on “Deep-Sea Mining of Seafloor Massive Sulfides: A Reality for Science and Society in the 21st Century” held at WHOI

November 13-14, 2008 University of Minnesota Department of Geology and Geophysics and I.T. Distinguished Women Scientists and Engineers Program invited speaker

- November 13, 2008 “Back-Arc Hydrothermal Systems in the Lau and Manus Basins”
- November 14, 2008 “pH as a controlling variable in seafloor hydrothermal deposits: effects on minerals, microbes, and megafauna”
- November 14, 2008 Pizza lunch and discussion with women in I.T. – I.T. Distinguished Lecture series

Sept 10, 2007, “Geochemical modeling of vent fluid – seawater interactions,” lecture for InterRidge Theoretical Institute ‘Biogeochemical interaction at deep-sea vents,’ Sept.10-14, 2007.

August 22, 2007, Goldschmidt (keynote talk), Trace element sulfide geochemistry as an indicator of vent fluid pH

June 27, 2007, United Nations, NY - "Responsible Research of Deep-Sea Hydrothermal Vents Promoted by the InterRidge Program," Panel presentation for the eighth meeting of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea

March 23, 2007, MBL Woods Hole, MA “Research at seafloor hydrothermal vents, necessarily interdisciplinary,” presentation to ISIS (S. Conn. State Univ.) fellows (high school teachers)

June 26, 2006 “Generation of vent fluids, and interactions of these vent fluids with seawater in plumes, at the seafloor, and within the ocean crust,” Ridge 2000 Theoretical Institute 2006: Modeling Oceanic Spreading Center Hydrothermal Processes: Magma to Microbe June 25-30, 2006, The Village at Mammoth Lakes; Mammoth Lakes, California, United States

June 24, 2006, “Results of hydrothermal studies, Lau Basin,” Lau ISS Science and Planning Workshop, Reno Nevada, June 24-25, 2006

May 29, 2006, “The Range of Physical and Chemical Environments Within Active Seafloor Hydrothermal Systems,” From Vent Chemistry to Biochemistry, Santa Fe Institute Workshop, 29 May - 1 June, 2006.

May 2005 - AGU Ocean Sciences Rachel Carson Lecture, presented at The 2005 Joint Assembly, New Orleans: Seafloor hydrothermal vents and their impact on the composition of the ocean crust, ocean chemistry, and biological activity in the deep sea

May 9, 2005 - Presentation to Ministry of Lands, Survey and Natural Resources of the Government of Tonga: Results from Lau Basin Vent Characterization Cruise TUIM05MV

March through June, 2004 - RIDGE2000 Distinguished Lecture series (Two lectures presented at 4 different undergraduate institutions): “The interplay of geology, physics, chemistry, and biology in seafloor hydrothermal vent systems” and “Using in situ measurements and geochemical models to identify the range of environmental conditions present within seafloor vent deposits”

- March 8-9, 2004, University of Wisconsin River Falls
- April 6, 2004, Montana Tech
- April 15-16, 2004, University of Massachusetts, Amherst
- May 6-7, 2004, Portland State University, Portland, OR,

March 14, 2002, “Microhabitats within active seafloor vent structures: sensitivity to vent fluid composition and fluid flow,” UC Santa Barbara, Santa Barbara, CA

May 11, 2001, Sea Education Association, “Hydrothermal Vent Systems”

July 31, 2000, RIDGE Theoretical Institute 2000: The Subsurface Biosphere at Mid-Ocean Ridges. “Modeling fluid flow and microhabitats (chemical and thermal environments) within active seafloor vent structures”

May 18, 2000, RIDGE 2000 Integrated Studies Planning Workshop, “Mid-ocean ridge hydrothermal systems: hydrology and fluid chemistry”

January 10, 2000, Keynote speaker, Symposium on Seafloor Observatories: Challenges and Opportunities (convened by the Ocean Studies Board, National Research Council), Key Largo, FLA, “Insights into seafloor hydrothermal systems from monitoring responses to natural perturbations”

November 8, 1999, Keynote speaker, RIDGE Juan de Fuca Results Symposium, “Factors controlling growth of hydrothermal vent deposits on the Juan de Fuca Ridge.”

November 8, 1999, Keynote speaker, RIDGE Juan de Fuca Results Symposium, “Growth and Evolution of Sulfide Structures.”

February 4, 1999, Bridgewater State College, “Physics, geology, and chemistry of seafloor hydrothermal systems.”

January 19, 1999, American Museum of Natural History, “Factors controlling growth of hydrothermal deposits at seafloor vent sites.”

last updated 2/27/17

## **Vice-President for Academic Programs and Dean Statement of Experience and Vision**

Margaret K. Tivey, Senior Scientist and Associate Dean, Woods Hole Oceanographic Institution

March 7, 2017

Woods Hole Oceanographic Institution (WHOI) is an interesting and unique place, particularly with respect to its education programs and how they are integrated with the rest of the Institution. Postdoctoral researchers, including those who come to WHOI as part of the highly competitive Postdoctoral Scholar (PDS) Program, are a major source of new recruits to the Scientific Staff. The MIT-WHOI Joint Program (JP) in Oceanography/Applied Science and Engineering continues to educate and train some of the very best of the world's oceanographers, and the WHOI Summer Student Fellowship (SSF) Program is a recruiting tool for the JP and other oceanography graduate programs, recognizing that many undergraduates with strong science backgrounds are not aware of oceanography as a field until well into their undergraduate degree. I am excited about the opportunity to apply for the position of Vice-President for Academic Programs and Dean (VP/Dean) at WHOI because of my interest in and commitment to education. The position would provide the opportunity to have significant impact, by playing a role in the training and mentoring of the next generation of excellent ocean scientists, and by helping to maintain and improve WHOI and its education programs and the critical role that education plays in oceanographic research.

The experience I would bring to the position is that of being a long-time WHOI scientist who has been involved in education at some level for my entire career. I came to WHOI in December 1988 as a Postdoctoral Scholar, and was hired into the Marine Chemistry and Geochemistry Department in 1990. While I had always had a strong interest in teaching and in being at a university, the opportunity for me, as well as my husband, to have tenure-track positions in two different departments at the same institution, and at the institution that runs the National Deep Submergence Facility (with both of us focused on deep-sea research) proved to be too much of a draw to leave. Additionally, we both really love the institution and its philosophy and climate in which to carry out scientific and engineering research and education. My research is focused on seafloor hydrothermal systems, mineral deposit formation, and determining environmental conditions present within vent systems by combining vent fluid data with detailed physical and geochemical studies of vent solids. These investigations are intrinsically interdisciplinary due to the effects that bottom currents, local topography and organisms can have on mixing, resulting mineral deposition, and fluxes of energy and mass through these complex systems. As a scientist with interests that straddle several departments, I have served as advisor/co-advisor, sponsor/co-sponsor, or committee member of students and postdocs in multiple disciplines and departments, and have been heavily involved in administrative aspects of education. As someone straddling departments, part of my interest in administrative aspects has been in trying to make it more straightforward to advise and teach across department boundaries. I became a member of the Joint Committee for Chemical Oceanography (JCCO) in 1996, was Chair of that committee from September 1999 through August 2002, was Education Coordinator for the MC&G Department from 2004 through 2008, and have been Associate Dean since August 2010. I have also held other leadership roles. I was Director of the Deep Ocean Exploration Institute (DOEI) at WHOI from September 2008 through 2010. I also have served on many committees related to deep-submergence at WHOI, and within the National Science Foundation (NSF) RIDGE Program as Steering Committee member from 1992 through 1995, as the NSF RIDGE Endeavour Observatory Coordinator from 1996-2002, and as Co-Chair (with Oscar Schofield) of The ORION (Ocean Ridge Interactive Observatory Networks) Workshop in 2004, which was the open community workshop for the Ocean Observatories Initiative. My most relevant experience for the VP/Dean position has been as Associate Dean at WHOI, which I have both enjoyed and found rewarding. I believe that as Associate Dean I have had a significant and positive impact on the MIT-WHOI Joint Program. I hope to bring the same type of approach and

positive outcomes to the role of VP/Dean, and below provide specifics about the experience I would bring, and the vision I have for WHOI and its academic programs.

As Associate Dean, I have been intimately involved with the administration of the MIT-WHOI Joint Program (JP). This includes chairing the Admissions Committee; supervising the Graduate Admissions and Student Affairs Officer (GA&SAO) Lea Fraser, and the Registrar/Graduate and Undergraduate Administrator Julia Westwater, and working with them on a wide range of JP student issues; working with Christine Charette (Budget Manager) and Jim Yoder (VP/Dean) on issues that impact finances; collaborating with colleagues at MIT; and working with the WHOI Education Coordinators and Joint Committees of each discipline to review student progress, find solutions to student issues, and maintain and improve procedures.

One of the most rewarding aspects of the position is helping to resolve issues facing students and postdocs. Often a problem seems intractable, but from a more objective view, and with knowledge of established protocols and best practices, issues can be resolved. To address and be more proactive about such issues, I have focused on making sure that JP students are aware of the full range of graduate student support services available at MIT, including within the MIT Office of the Dean of Graduate Education (ODGE), the MIT Student Disability Services Office, MIT Medical, and the MIT Ombuds Office. The Academic Programs Office has excellent contacts within the MIT ODGE and we encourage students to contact the Assistant or Associate Dean there to be best directed to needed resources. These types of services are not currently available at WHOI, but are needed for both the WHOI undergraduates and postdoctoral investigators. WHOI does provide some similar resources, but one area that could use attention is to work with Human Resources to review existing resources for undergraduates and postdocs, identify gaps, and consider methods for filling gaps. One example is WHOI's lack of an Ombuds, and while it may not be practical to employ one full-time, efforts could be made to provide similar services where incidents can be reported and an independent and objective person can identify patterns of behavior as opposed to isolated incidents.

Another focus I have had as Associate Dean is in increasing transparency, providing information through meetings and the web site, and setting clear protocols (e.g., for housing exceptions, TA assignments) and making information about existing protocols (e.g., advisor and student expectations) easily available. For example, in 2011 I instituted hour-long "Introduction to the Joint Program" sessions for new (and old) JP faculty. At the most recent session I added information about advising and mentoring. In 2016, I instituted mentoring and advising workshops for the JP students that are now held every six months to discuss mentoring and advising and make sure students know about available resources. The impetus for these mentoring and advising sessions came both from national Council of Graduate School Deans' workshops and requests from students.

At the advice of former Associate Dean Jim Price I have also spent considerable time on the MIT-WHOI JP web site ([mit.who.edu](http://mit.who.edu)), working with the GA&SAO and the Registrar to improve the site's effectiveness for recruiting students, and as an information source for both students and JP faculty. We addressed issues raised by the JP Strategic Planning Committee and solicited suggestions from JP students and faculty. Improvements have included creating a home page that identifies the five focal areas and interdisciplinary studies, adding interdisciplinary studies under "fields of study," creating (with the help of a working group) a section on "Climate Variability and Impacts," adding content on the Navy Program, creating separate web pages for prospective and current students, and adding a JP faculty page that includes information for all JP faculty as well as an internal page (accessible using LDAP) for WHOI-based faculty that includes information about costs of a student, how to request a TA, how faculty hours are assigned, and resources for advising and mentoring.

I have also worked on procedures to help lower barriers between disciplines and make it easier for students and advisors to straddle departments. This was done through creating disciplinary e-mail lists that are not determined based on the department someone resides in, but by research interests – thus those interested can be faculty in more than one discipline. While progress has been

made in this area, more is needed, and similar efforts could be made for undergraduate and postdoctoral programs.

I have also had considerable experience with external reviews. I prepared materials for the 2014 MIT-WHOI JP external review, and chaired the Self-Study committees for both the Commission on Institutions of Higher Education New England Association of Schools and Colleges (CIHE-NEASC) fifth-year interim report of 2011, and the ten-year reaccreditation in 2016. As Chair of the 2016 Self-Study committee I compiled the 100-page Self-Study Report (and supporting data and materials) that covers the sub-points of eleven “standards” (everything from WHOI’s mission to finances). I worked with people from all areas of the institution including the Board of Trustees, APO, MBLWHOI Library, Facilities, Operations and Finance, and Human Resources. The process was time consuming but rewarding with the purpose to make sure WHOI is doing well in all areas. The focus is on identifying areas where improvements should be made, and steps to be taken to strengthen and enhance the Institution’s mission. The process also clarifies ways in which education programs are intimately connected with functions of the whole institution.

There are aspects of Academic Programs that I have less experience with, such as housing (that includes significant maintenance issues), and oversight of the MBLWHOI library, though I do have an idea of what is required and upcoming challenges through information learned during the self study process (e.g., the MBLWHOI Library MOU). Also, my experience with the postdoctoral and undergraduate programs is primarily through participating in ethics workshops, giving SSF lectures and judging poster sessions, and meeting with SSF and postdoctoral researchers when they want advice. I would welcome the opportunity to become more involved, and my experiences as Associate Dean and knowledge gained from participating in Council of Graduate School Deans’ workshops, Consortium of Ocean Leadership Ocean Science Educators’ Retreats and CIHE-NEASC accreditation meetings would translate well to oversight of all aspects of academic programs.

The VP/Dean also is involved in strategic planning for the institution. While I have not served as the Chair of a department at WHOI, I have been involved as an Institute Director, worked with the Development Office, and been involved in promotions and hiring at various levels within WHOI, including serving on search committees for the WHOI Ship Operations Manager and also the VP of Marine Operations and Facilities. I have also served on review committees of several facilities including Marine Operations, NDSF, and NENIMF, and have recently been on the Strategic Facilities Planning Steering Committee. In addition, my involvement in the Self-Study for reaccreditation has made me very aware of the challenges facing WHOI, particularly with respect to finances and deferred maintenance issues. I would look forward to being involved in helping to formulate a strategic path to address these challenges, help with policies and procedures that would benefit WHOI’s ability to recruit and retain the very best across all parts of the Institution, and enhance its already strong education activities.

My vision for Academic Programs at WHOI is to have financially sound, strong postdoctoral, graduate, and undergraduate programs that 1) are integrated across the Institution and intimately linked to WHOI’s mission of research and education, 2) have high quality support services and 3) provide opportunities for recruitment and career development across the institution. Academic Programs at WHOI are currently very healthy, with the previous Dean, Jim Yoder, having done an excellent job of maintaining the quality of the SSF, JP and PDS programs, adding a new Semester-At-WHOI (SAW) program (and prior to that having an Ocean Research Experience (ORE) program for undergraduates). He also has improved the infrastructure of the classrooms and of housing, and was instrumental in proposing and overseeing the construction of the new dormitory. There are several challenges, however, that will face the next VP/Dean. Sizes of incoming MIT-WHOI JP classes are down, a reflection of the difficulties in success rates of federal grants. This is not just a WHOI issue, it is one that all graduate programs are struggling with (e.g., MIT is having the same issue for both the JP and its non-JP programs). Smaller incoming class size leads to difficulties in



having enough students to populate courses, and affects student morale and peer-to-peer learning and mentoring. The new overhead structure, MTDC, now results in overhead being charged on non-salary support, so research and travel funds for Postdoctoral Scholars and JP students don't go as far. Postdoctoral Scholar programs at other institutions compete with WHOI for the best scholars, and often offer longer appointments. The new SAW program is still in its early stages, but there are support resources that are standard at universities and colleges that WHOI does not have, and if the program continues to grow, needed resources should be put in place. Increasing diversity in all areas and at all levels within ocean sciences is a continuing challenge. To address these issues I will describe two "wish-lists," one of suggestions that can be implemented in a straightforward way provided there are funds available, and one of suggested protocols and resources that could be put into place without the need for large infusions of money.

As VP/Dean I would welcome the opportunity to work with the Administration and the Development Office to develop a strategy and solicit new revenue sources for:

- 1) Fellowships for JP students, with one of two models. Model 1 (extremely ambitious): Two-year fellowships for incoming JP students with a goal of being able to bring in classes of ~25 students each year (five per discipline) who would be able to take classes and do lab rotations and then in year two settle into the lab of their choice, to be covered by grant support for the final three years. Model 2 (more realistic and can be gradually implemented; builds on existing structure): Flexible fellowships to support JP students when grant support or external fellowships or TAships are not available. Enough fellowship support is needed to ensure that the program can enroll at least five students per discipline per year, and to ensure support for students when there are gaps during their five to five and a half years in the program. I have experience working on this type of support with the Development Office. As the Director of DOEI I worked with Priya McCue, Jane Neumann and Larry Madin to bring in an endowed first-year graduate student fellowship.
- 2) Increased support for the Postdoctoral Scholar program to allow for two-year positions (instead of 18-month) to maintain competitiveness with other programs and ensure at least ten Postdoctoral Scholars per year (~two per department, which could improve the opportunity that candidates who straddle two departments would be selected).
- 3) Creation of a research fund for Postdoctoral Scholars. Scholars currently have limited funds for analytical work or travel and thus are dependent on funds from their sponsors, or need to find other support, e.g., from internal calls. While some Scholars have success with internal calls, creation of a research fund solely for PDS requests would increase their ability to be innovative and carry out independent research, and make the WHOI PDS Program more attractive.
- 4) Funds to enlarge non-summer undergraduate programs (both SAW and ORE) to both recruit more students into oceanography and provide teaching opportunities for postdoctoral researchers and graduate students. Currently there are limited TAships for JP students; the ORE program provided opportunities for JP students to both develop curricula and teach.
- 5) Funds for field school programs (e.g., the Geodynamics Program, field programs funded using Doherty Chair funds such as the Short Course in Estuarine and Coastal Oceanographic Field Methods in 2014 and the Field Course on Tropical Marine Biology and Ecology in 2013).

This is an ambitious list, but raising funds for any of these would enhance and expand existing programs, and strengthen WHOI's mission. These are my current suggestions and I would work with the Educational Assembly to discuss other needs and priorities. I would also look into other possible funding from federal and state programs to provide support for education outreach. Jim Yoder was successful in bringing in grant support for outreach programs that provided opportunities for faculty, postdoc, student and APO staff involvement, and funds to partially support APO staff.

There are also several enhancements that could be made to programs that do not involve large infusions of money but that require research into policies and procedures practiced elsewhere that could and should be introduced at WHOI. Examples include:

- 1) More formal mentoring resources for students and postdoctoral researchers, and mentoring training for Education Assembly members who interact with students and postdocs. Resources are available (e.g., Entering Mentoring, A Seminar to Train a New Generation of Scientists, [www.hhmi.org/sites/default/files/Educational Materials/Lab Management/entering\\_mentoring.pdf](http://www.hhmi.org/sites/default/files/Educational%20Materials/Lab%20Management/entering_mentoring.pdf) ) and training sessions that are time-effective could be developed and implemented, with resources provided on the web page to be accessed prior to and after training. Federal funding agencies (e.g., NSF and NIH) are increasingly requiring PIs to document mentoring plans and activities, and this area is one that many universities have identified as critical for maximizing successful outcomes.
- 2) Career options and professional development training resources. WHOI and the MIT-WHOI JP already provide some seminars and workshops on this topic for postdocs and JP students, but more resources are becoming available, including from the Council of Graduate Schools, MIT, and other universities, and students have been requesting more resources.
- 3) Personal support and conflict resolution resources for undergraduates and postdoctoral researchers. WHOI now has a Title IX Coordinator, and could work further with Human Resources to review existing resources and consider methods for best providing support services.
- 4) Student disability services for undergraduates. Universities (e.g., MIT) have established protocols to accommodate disabilities in the classroom. WHOI now has undergraduates taking WHOI classes (the SAW program), so should have its own protocols put into place.
- 5) Data information systems for the undergraduate and Postdoctoral Scholar programs. This is a current issue, and IS has been working on the SSF and PDS application programs and faculty access to application materials. WHOI could look toward having a comprehensive information system that tracks student information from application through exit from WHOI.
- 6) Outreach to broader cross-sections of undergraduates. WHOI is currently part of the Woods Hole Diversity Advisory Committee and participates in the Partnership Education Program, but a more diverse pool of undergraduates could be reached through web pages, blogs, and with help from current students, postdocs and faculty. Jim Yoder was instrumental in setting up such a resource, Ocean Opportunities, now a facebook page, but resources needed to update the information on the page are no longer available.

Strengthening and enhancing these types of resources and support services, and increasing awareness about how to access them, would strengthen WHOI's academic programs and improve recruitment and retention and lead to more successful outcomes.

The position of VP/Dean offers opportunities to enhance WHOI's education programs and address challenges facing the institution. I trust the committee to keep WHOI's best interests in mind during the selection process, and realize (and hope) that there are many well-qualified candidates for the position. If another candidate is selected, I would welcome the opportunity to work in my role as Associate Dean through August 2018, and with the Academic Programs Office staff, to help in the transition and familiarize that individual with all aspects of WHOI's education programs. If I am selected, I would approach the position as I have approached previous leadership and administrative positions. Goals would be transparency, establishment of protocols to ensure fairness, and working with the Development Office and the Administration and Staff Council to ensure the fiscal health of education and research at WHOI. My focus would be on balancing the needs of the Academic Programs Office with those of WHOI overall, with an emphasis on always considering education and research activities in tandem, as integrated partners. I would bring to the position the perspective of someone who came to WHOI as a postdoc and has significant experience as a scientific staff member, a JP faculty member, and an administrator within the Academic Programs Office. I would welcome the opportunity to serve WHOI and work to enhance all aspects of its academic programs.