

September 2015

RALPH ARCHIBALD STEPHEN

Marine Geophysicist

Senior Scientist

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Citizenship: USA, Naturalized, 1989

B.A.Sc. (Hon) University of Toronto, 1974, Engineering Science

Ph.D. University of Cambridge, 1978

Assistant Scientist, Woods Hole Oceanographic Institution, June 1978 - May 1982

Associate Scientist, June 1982 to May 1986

Associate Scientist with tenure, June 1986 to November 1990

Senior Scientist, November 1990 to present

Research Interests:

Marine seismology and bottom interacting ocean acoustics

Seismic structure of oceanic crust

Propagation and scattering in absorptive, anisotropic and heterogeneous elastic media

Borehole seismic experiments

Synthetic seismogram methods

Ambient noise in the ocean

Broadband seismology (1mHz to 1KHz)

Seismometry

Professional Societies:

Acoustical Society of America, 1987-present

American Geophysical Union, 1977-present

Royal Astronomical Society, 1980-present

Society of Exploration Geophysicists, 1977-present

Seismological Society of America, 1983-present

Awards:

Roy Jarvis Henry Admission Scholarship, 1970

Ontario Scholarship, 1970

Samuel Beatty Scholarship in Mathematics, 1970

Don Salt Memorial Fellowship, 1973

Shell Canada Postgraduate Scholarship, 1974-1978

Mellon Independent Study Awards, 1995, 1998, 2001

Fellow of the Acoustical Society of America, Awarded 2006.

Edward W. and Betty J. Scripps Chair for Excellence in Oceanography, 2008-2012

Committees:

JOIDES Ocean Crust Panel, November 1979 to August 1983
Ocean Margin Drilling Program, Downhole Measurements Committee
Ocean Margin Drilling Program, Ships Space Committee
Associate Editor, Reviews of Geophysics - June 1985 - December 1988
JOIDES Downhole Measurements Panel - June 1986 - December 1988
JOIDES East Pacific Rise Working Group - February 1988 - August 1990
ASA Technical Committee - Acoustical Oceanography - May 1997 - April 2000, May 2004 - April 2010
ASA Technical Committee - Underwater Acoustics - May 1993 - April 1996, May 1997 - April 2018
ASA Committee on Education in Acoustics - May 1999 - June 2008
ASA Specialty Subcommittee on Integrated Acoustic Systems for Ocean Observatories (IASOO) - December 2002 – December 2012
Ocean Seismic Network Steering Committee - December 1995 - June 2007
International Ocean Networks (ION) - Participant - 6/1993-5/2007, Chair - 6/2007-6/2011
IRIS Board of Directors - February 1996 - 2004, Institutional Representative 2004 - 2013
LDEO-Borehole Research Group Board - December 1998 - October 2003
AGU Meetings Committee - July 2000 - June 2004
Associate Editor, Journal of the Acoustical Society of America, January 2002 - June 2011
Chairman of the IODP-Industry Science Program Planning Group, November 2005 - December 2008
NSERC (Canada) Ship Time Allocations Committee - July 2008 - June 2011.
Editor, Studia Geophysica et Geodaetica, September 2005 - present.
Associate Editor, Journal of Geophysical Research, August 2009 - present.

Cruises:

R/V ATLANTIS II - September 1975 - Leg 92A - Visiting Scientist - OBH deployment in the Western Atlantic
R/V KNORR - March 1976 - Visiting Scientist - Aborted borehole seismic experiment
RRS JOHN MURRAY - May 1976 - Assistant Scientist - PUSS deployment in North Sea
D/V GLOMAR CHALLENGER - February/April 1977 - DSDP Leg 52 - Geophysicist - First deep sea borehole seismic experiment (at Site 417)
D/V GLOMAR CHALLENGER - March 1979 - DSDP Leg 65 - Geophysicist - Borehole seismic experiment (at Site 483)
R/V GILLISS - December 1979 - (in conjunction with D/V GLOMAR CHALLENGER, DSDP Leg 70) - Chief Scientist - Borehole seismic experiment (at Site 504)
R/V OCEANUS - June 1981 - Assistant Scientist - Multi-ship multi-channel seismics (Large Aperture Seismic Experiment - LASE)
D/V GLOMAR CHALLENGER - August - September 1982 - DSDP Leg 88 - Co-Chief Scientist - MSS and OSS borehole seismic experiments (at Site 584)
R/V ELLEN B. SCRIPPS - April 1983 - (in conjunction with D/V GLOMAR CHALLENGER, DSDP Leg 92) - Chief Scientist - Borehole seismic experiment (at Site 504)
R/V FRED H. MOORE - March/April 1985 - (in conjunction with D/V SEDCO/BP 471 - ODP Leg 102) - Chief Scientist - Borehole seismic experiment (at Site 418)
NADIR - July/August 1988 - Visiting Scientist - Submersible re-entry at DSDP Hole 395

Cruises, cont'd:

R/V MELVILLE - May 1989 - Visiting Scientist - Attempted wire-line re-entry at DSDP Holes 417 and 418
R/V MELVILLE - August 1989 - Co-chief Scientist - LFASE deployment (at Site 534)
R/V MELVILLE - September 1989 - Co-chief Scientist - LFASE recovery (at Site 534)
R/V CORY CHOEST - July 1993 - Scientist - ARSRP Acoustics Cruise
R/V ROGER REVELLE - August 1997 - Chief Scientist - Survey of Hawaii-2 cable
D/V JOIDES RESOLUTION - October/December 1997 - ODP Leg 176 - VSP and Physical Properties Specialist - Southwest Indian Ridge (at Site 735)
R/V THOMAS THOMPSON - January/February 1998 - Chief Scientist - OSN Pilot Experiment Deployment Cruise
R/V MELVILLE - June 1998 - Chief Scientist - OSN Pilot Experiment Recovery Cruise
D/V JOIDES RESOLUTION - December 2001/January 2002 - ODP Leg 200 - Co-Chief Scientist - Nuanu Landslide (Site 1223) and Hawaii-2 Observatory (Site 1224)
KAIREI - October 2002 - Visiting Scientist - Data recovery cruise to WP-1 (Philippine Sea)
R/V ROGER REVELLE - July 2010 - Visiting Scientist - Controlled source cruise for PhilSea 10
R/V ROGER REVELLE - April-May 2011 - Chief Scientist - Ocean bottom seismometer augmentation in the Philippine Sea (OBSAPS) Experiment.
R/V MELVILLE - June-July 2013 - Co-Principal Investigator, Ocean bottom seismometer augmentation in the North Pacific (OBSANP) Experiment.
Yesterday Camp, Ross Ice Shelf - October-November 2014 - Co-Principal Investigator - Dynamic response of the Ross Ice Shelf to wave-induced vibration (DRRISWIV)

In-House Activities:

Journal Club - member - January, 1981 - September 1983, Chairman - 7/'81 - 9/'82
MIT-WHOI Joint Program Admissions Committee - January 1981 - December 1982
MIT-WHOI Joint Committee for Marine Geology and Geophysics, Sept/83 - Mar/86
Chairman, Promotion Committee for Dr. J. Lynch - July 1985 - January 1986
RSVP Computer Committee - July 1985 - December 1986
Chairman, Promotion Committee for Dr. J. Jaffe - October 1987 - January 1988
G & G ad Hoc Space Committee - July 1987 - December 1988
G & G ad Hoc Recruitment Committee - June 1988 - August 1990
Henry Bryant Bigelow Award Committee - January - May, 1992
Chairman, Promotion Committee for Dr. S. Rajan - September 1992 - February 1993
Computer Revolutionary Committee - May - August 1993
Science Advisory Committee for Computer Service - 9/'93 - 8/'96
Chairman, Promotion Committee for Dr. D.J. Tang - March - April 1996
Web Advisory Committee - February 1996 - August 1996
Retirement Plan Task Force - February 1997 - November 1998
Chairman, CIS Director Search Committee - January 1999 - June 1999
Senior/Tenured Scientist Executive Committee - 8/1998 - 10/2001, Chair - 8/2000 - 8/2001
Associate Scientist Review Committee for John Collins - May 2001
Retirement Committee - August 2000 - March 2004
Ad Hoc Task Force on Alternatives for Medical Coverage for 2002 - October 2001
Associate Scientist Review Committee for Rob Sohn - December 2005.
Information Technology Advisory Committee - Chair - January 2001 - March 2007.

In-House Activities, cont'd:

Associate Scientist Review Committee for Jeff McGuire - September 2007.
G&G Department Space Committee - November 2007 - February 2008
WHOI Rep. to Research Partnership to Secure Energy for America - 7/2007-12/2009
Chairman, Promotion Committee for Dr. Y.-T. Lin - June - September 2012
Partnerships Program - 1995 - 2001, 2006 - present

Educational Program:

Advisor for Joint Program Students: W. Loy, N. Bird, G. Duckworth,
M. Dougherty, R. Fricke, C. Bradley and R. Greaves
Examination Committee Member for: A. Merab, F. Pardo-Casis (MIT), D. Burns (MIT),
H. Kawahara, P. Dahl, J. Snow, N. Cheng (MIT), M. Imhof (MIT),
V. Lupien (MIT), L. Souza (MIT) and M. Xu
Supervised papers for: S. Little, L. Kong, A. Gunstensen (MIT), L. Li, C. Williams and M.
Xu
Supervised Summer Student Fellows: W. Schmidt, A. Harding, M. Burton, S. Childress,
M. Holzrichter, J. Walter., S. Nag and D. Bhaskar
Supervised Summer Guest Students: I. Zeldenrust, S. Buenz,

Courses Taught (MIT-WHOI Joint Program):

12.77 Marine Geophysics, Spring 1980 (with C. Denham and other geophysics staff)
12.78 Marine Geophysics II, Fall 1982 (with C. Bowin and M. Purdy)
12.77 Introduction to Marine Geophysics, Fall 1983 (with T. Brocher)
12.712 Advanced Marine Seismology, Fall 1984 (with T. Brocher), Spring 1989 (with P.
Shaw), Fall 1991, Fall 1992 and Spring 1995 (with R. Detrick), Spring 1997,
Spring 2000, Spring 2009, Fall 2013
12.711 Introduction to Marine Geophysics, Fall 1985, 1986, 1987, 1989 (with R. Von
Herzen), Spring 1992 (with M. Tivey)
12.504/711 Introduction to Marine Geophysics, Spring 1993 (with M. McNutt)
12.710/711 Marine Geology and Geophysics, Fall 1993/Spring 1994 (with R. Detrick, N.
Shimizu and W. Curry), Fall 1994/Spring 1995
12.710 Marine Geology and Geophysics, Fall 1995 (with R. Detrick, G. Giese and M.
Raymo), Fall 1996 (with G. Giese and M. Raymo)
12.571 Seismology Seminar: Numerical Wave Propagation, Fall 2000 (with N. Toksoz
and V. Cormier)

Sabbatical Leave:

Hawaii Institute of Geophysics, Honolulu, Hawaii, December 1984 to February 1985
SACLANT Undersea Research Center, La Spezia, Italy, September 1990 to August 1991
Earthquake Research Institute, University of Tokyo, October 2002 to March 2003

Author or co-author of over two hundred scientific papers.

BIBLIOGRAPHY

R.A. STEPHEN

PUBLICATIONS

- Stephen, R.A., 1977. Synthetic seismograms for the case of the receiver within the reflectivity zone. *Geophys. J. R. astr. Soc.*, 51, 169-181.
- Stephen, R.A., 1978. The Oblique Seismic Experiment in Oceanic Crust. Ph.D. Thesis. University of Cambridge, Cambridge, U.K.
- Stephen, R.A., 1979. The Oblique Seismic Experiment in Oceanic Crust - Equipment and Technique. *Mar. Geophys. Res.*, 4, 213-226.
- Salisbury, M. H., Stephen, R.A., Hamano, Y., Johnson, D., Donnelly, M., Francheteau, J., and Christensen, N., 1979. The physical state of the upper levels of Cretaceous oceanic crust from the results of logging, laboratory studies and the Oblique Seismic Experiment at DSDP Sites 417 and 418. In: Talwani, M. et al., *Deep Drilling Results in the Atlantic Ocean: Ocean Crust*, American Geophysical Union, Washington, D.C., 113-134.
- Salisbury, M. H., Stephen, R.A., Christensen, N., Francheteau, J., Hamano, Y., Hobart, M., and Johnson, D., 1979. The physical state of the upper levels of Cretaceous oceanic crust from the results of logging, laboratory studies and the Oblique Seismic Experiment at DSDP Sites 417 and 418. *Maurice Ewing Series*.
- Stephen, R.A., Louden, K.E., and Matthews, D.H., 1980. The Oblique Seismic Experiment on DSDP Leg 52. *Geophys. J.R. astr. Soc.*, 60, 289-300.
- White, R.S., and Stephen, R.A., 1980. Compressional to shear wave conversion in oceanic crust. *Geophys. J. R. astr. Soc.*, 63, 547-565.
- Stephen, R.A., 1981. Seismic anisotropy observed in upper oceanic crust. *Geophys. Res. Lett.*, 8, 865-868.
- Stephen, R.A., 1982. Travel-time curves for a simple sea floor model. *Marine Geophysical Research*, 5, 315-326.
- Crampin, S., Stephen, R.A., and McGonigle, R., 1982. The polarizations of P-waves in anisotropic media. *Geophys. J.R. astr. Soc.*, 68, 477-485.
- *Emerman, S.H., Schmidt, W., and Stephen, R.A., 1982. An implicit finite-difference formulation of the elastic wave equation. *Geophysics*, 47, 1521-1526.
- Stephen, R.A., 1983. The Oblique Seismic Experiment on DSDP Leg 70. In: Cann, J.R., Langseth, M.G., Honnorez, J., Von Herzen, R.P., White, S.M., et al., *Init. Repts. DSDP, 69*: Washington, D.C. (U.S. Government Printing Office), 301-308.

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- Stephen, R.A., and Harding, A.J., 1983. Travel time analysis of borehole seismic data. *J. Geophys. Res.*, 88, 8289-8298.
- Stephen, R.A., Johnson, S., and Lewis, B.T.R., 1983. The Oblique Seismic Experiment on DSDP Leg 65. In: Lewis B.T.R., Robinson, P., et al, *Init. Repts. DSDP*, 65: Washington (U.S. Government Printing Office), 319-326.
- *Emerman, S.H., and Stephen, R.A., 1983, Comment on "Absorbing boundary conditions for acoustic and elastic wave equations" by R. Clayton and B. Engquist. *Bull. seism. soc. Am.*, 73, 661-666.
- Stephen, R.A., 1984a. Finite difference seismograms for laterally varying marine models. *Geophys. J.R. astr. Soc.*, 79, 184-198.
- Stephen, R.A., 1984b. Synthetic vertical seismic profiles by the method of finite differences. In: Toksoz, M.N. and Stewart, R.R., *Vertical Seismic Profiling, Part B: Advanced Concepts*, Geophysical Press, Amsterdam, 63-79.
- Stephen, R.A., 1984c. Borehole seismic experiments and the structure of oceanic crust. In: Toksoz, M.N. and Stewart, R.R., *Vertical Seismic Profiling, Part B: Advanced Concepts*, Geophysical Press, Amsterdam, 351-374.
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- Stephen, R.A., 1985. Seismic anisotropy in the upper oceanic crust. *J. Geophys. Res.*, 90, 11,383-11,396.
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- Stephen, R.A., 1987. A finite difference formulation of Biot's equations for vertically heterogeneous full waveform acoustic logging problems. Full Waveform Acoustic Logging Consortium Annual Report, Earth Resources Laboratory, MIT, 115-123.
- Stephen, R.A., Duennebier, F.K., Bellows, D.R., and Inderbitzen, A., 1987. Wireline re-entry test on DSDP Leg 88. In: Duennebier, F.K., Stephen, R.A., Gettrust, J.F., et al., Init. Repts. DSDP, 88: Washington (U.S. Government Printing Office), 59-63.
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- Stephen, R.A., 1988a. Lateral heterogeneity in the upper oceanic crust at DSDP Site 504. J. Geophys. Res., 93, 6571-6584.
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- Lowell, R.P. and Stephen, R.A., 1991. Heat flow and lateral seismic velocity heterogeneities near DSDP Site 504. *Geology*, 19, 1141-1144.
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7th International Workshop on Seismic Anisotropy (7IWSA), Society of Exploration Geophysics, Tulsa, 255-270.

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- Stephen, R.A., Numerical modeling in elastic wave propagation and scattering, MIT Lincoln Laboratory, Boston, MA. October 21, 1999. (Invited Talk)
- Stephen, R.A., Ambient noise below the seafloor. Society of Exploration Geophysics Annual Meeting, Houston, Texas. October 31 to November 4, 1999. (Invited Talk)
- Stephen, R.A., Bolmer, S.T., Collins, J.A., Hildebrand, J.A., Orcutt, J.A., Peal, K.R., Spiess, F.N., and Vernon, F.L. The time dependence of ambient noise beneath the deep sea floor. Fall AGU, San Francisco, 1999.
- Stephen, R.A. Seismic experiments on ODP Legs 176 and 179. Leg 176/179 post-cruise meeting, Salishan Lodge, August 30-31, 1999.
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- Stephen, R.A. The Ocean Seismic Network pilot experiment: Permanent broadband stations in the deep sea floor, MIT Earth Resources Laboratory, Cambridge, MA, May 5, 2000 (Invited Talk).
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- Stephen, R.A. The scattering of low-grazing angle pulse-beams from fluid-saturated porous bottoms. High frequency sediment acoustics workshop, Villie-Morgon, France, 16-20 July, 2000.

- Stephen, R.A. The scattering of low-grazing angle pulse-beams at interfaces between fluid and porous media. . Fall ASA, Newport Beach, December 2000, J. Acoust. Soc. Am., 108, 2535.
- Stephen, R.A. Gaussian beams and time domain finite difference solutions to interface scattering problems. Department of Aerospace and Mechanical Engineering, Boston University, Boston MA, November 10, 2000 (Invited Talk).
- Stephen, R.A. Geo-acoustic scattering at interfaces between fluid and porous media. Fall AGU, San Francisco, 2000.
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- Stephen, R.A. Geoacoustic scattering at interfaces between fluid and porous media. CNRS meeting on "Imaging of Complex Media with Acoustic and Elastic Waves", Cargese, France, July 7-14, 2001.
- Stephen, R.A. Gaussian beams, the time-domain finite difference method and geo-acoustic scattering from the seafloor. Progress in electromagnetics research symposium (PIERS), Boston, July 2002 (Invited Talk), 729.
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- Williams, C., Stephen, R.A. and Smith, D. Are T-phases blocked by bathymetry? A study of seismic events located at the Kane and Atlantis transform faults. Fall AGU, San Francisco, 2002. (Withdrawn)
- Stephen, R.A. Third party borehole seismic experiments during the ocean drilling program. IUGG, Sapporo, Japan, 2003
- Stephen, R.A., Duennebier, F.K., Harris, D., Jolly, J., Bolmer, S.T., Bromirski, P., and the ODP Leg 200 Scientific Party. Broadband seismic observations at the Hawaii-2 Observatory during ODP Leg 200: Part 1 - Overview, drilling noise and sediment resonances. IUGG, Sapporo, Japan, 2003.
- Stephen, R.A., Kasahara, J., Acton, G.D. and the ODP Leg 200 Scientific Party. Ocean crustal drilling at the Hawaii-2 Observatory. Scientific Submarine Cable Workshop, University of Tokyo, June 25-27, 2003.
- Stephen, R.A., Duennebier, F.K., Harris, D., Jolly, J., Bolmer, S., Bromirski, P.D. and the ODP Leg 200 Scientific Party. Broadband Seismic Observations at the Hawaii-2 Observatory During ODP Leg 200. Fall AGU, San Francisco, 2003.
- Bolmer, S.T., Hoskins, H., Stephen, R.A. and the ODP Leg 200 Scientific Party. 3.5kHz Profiling with Vertically Separated Source and Receiver. Fall AGU, San Francisco, 2003.
- Chave, A.D., Bailey, J.W., Beaulieu, S., Butler, R., Duennebier, F.K., Filloux, J.H., Harris, D., Manda, M., Orcutt, J.A., Smith, K., Stephen, R., Tarits, P., and Vernon, F.L. 2003 and 2004 Upgrades and Additions to the Hawaii-2 Observatory. Scientific Submarine Cable Workshop, University of Tokyo, June 25-27, 2003 and IUGG, Sapporo, Japan, 2003.
- Duennebier, F.K., Bromirski, P.D., Stephen, R.A., Harris, D., Jolly, J. and the ODP Leg 200 Scientific Party. The Origin and Propagation of Microseisms: ODP Leg 200 at the Hawaii-2 Observatory. Fall AGU, San Francisco, 2003.
- Swift, S.A., Stephen, R.A., Hoskins, H., and Bolmer, S.T. Third party borehole seismic experiments during the Ocean Drilling Program. Fall AGU, San Francisco, 2003.
- Williams, C., Stephen, R.A. and Smith, D. Are T-phases blocked by bathymetry? A study of seismic events located at the Kane and Atlantis transform faults. Spring AGU, Nice, France, 2003.
- Stephen, R.A. Numerical modeling of bottom scattering. Ocean Acoustics Conference, La Jolla CA, March 1-5, 2004.

- Stephen, R.A., Smith, D.K., and Williams, C.M. The dynamics of abyssal T-phases. Workshop on Seismo-acoustic Applications in Marine Geology and Geophysics, WHOI, Woods Hole, March 24-26, 2004
- Stephen, R.A., Smith, D.K., and Williams, C.M. Time-domain finite-difference modeling of abyssal T-phases. 16th Annual IRIS Workshop, Westward Look, Arizona, 2004.
- Stephen, R.A., Smith, D.K., and Williams, C.M. Time domain finite difference modeling of abyssal T-phases. Fall AGU, San Francisco, 2004.
- Araki, E., Stephen, R.A., Shinohara, M., Kanazawa, T. and Suyehiro, K. T-phase observed at deep seafloor boreholes, Workshop on Seismo-acoustic Applications in Marine Geology and Geophysics, WHOI, Woods Hole, March 24-26, 2004
- Araki, E., Stephen, R.A., Shinohara, M., Kanazawa, T. and Suyehiro, K. T-phase observed at deep seafloor boreholes, Fall AGU, San Francisco, 2004.
- Bromirski, P.D., Duennebier, F.K., and Stephen, R.A. Mid-ocean microseisms: coastal source areas and historical wave climate implications. Fall AGU, San Francisco, 2004.
- ION Steering Committee and Other Participants, Global siting plan for geophysical observatories in the International Ocean Network, Ocean Research Interactive Observatory Networks (ORION) Workshop, San Juan, Puerto Rico, 4-8 January, 2004.
- Williams, C.M., Stephen, R.A. and Smith, D.K. Hydroacoustic events located near the Atlantis (30°N) and Kane (23°30'N) Transform Faults on the MAR. Spring ASA, New York, NY, 2004.
- Williams, C.M., Stephen, R.A. and Smith, D.K. Hydroacoustic events located near the Atlantis (30°N) and Kane (23°30'N) transform faults on the MAR. Workshop on Seismo-acoustic Applications in Marine Geology and Geophysics, WHOI, Woods Hole, March 24-26, 2004.
- Stephen, R.A. Time-domain finite-difference modeling of seafloor compliance. IPG Paris, France. January 31, 2005.
- Stephen, R.A. Marine seismology, tsunamis and ocean observatories. Weston Observatory, Boston College. March 23 and 30, 2005. (Invited)
- Stephen, R.A. Waves and tsunamis. Massachusetts Marine Educators 2005 Conference: Access to the Sea, WHOI, April 30, 2005. (Invited)
- Stephen, R.A. Abyssal T-Phases. NRC/Canada/CTBTO Hydroacoustics Workshop, Victoria, Canada, May 2, 2005.
- Stephen, R.A. The role of vertical seismic profiles in core, log, seismic integration. CLSI Workshop, Tokyo, October 3-4, 2006.

- Stephen, R.A. Head waves, diving waves and interface waves at the seafloor. Fall ASA, Minneapolis, Minn., October 2005, J. Acoust. Soc. Am., 118, 1968 (Invited).
- Stephen, R.A., Smith, D.K., and Williams, C.M. Time domain finite difference modeling of abyssal T-phases. Workshop on Seismic Waves in Laterally Inhomogeneous Media, Hruba Skala, Czeck Republic, June 20-24, 2005.
- Araki, E., Stephen, R.A., Shinohara, M., Kanazawa, T. and Suyehiro, K. T-phase observed at deep seafloor boreholes. IRIS/UNAVCO Annual Meeting, Skamania Washington, June 8-11, 2005.
- Araki, E., Shinohara, M., Kanazawa, T., Suyehiro, K. and Stephen, R.A., T-phase dynamics in the Western Pacific. International Conference on Underwater Acoustics Measurements, Heraklion, Greece, June 28-July 1, 2005. (Invited)
- Lavin, M., Strohschneider, D., Maichle, R., Frashure, K., Micozzi, N., and Stephen, R.A. The waves and tsunamis project. [ED53A-0323] Fall AGU, San Francisco, 2005.
- Micozzi, N., Frashure, K., Stephen, R., Maichle, R., Strohschneider, D., and Lavin, M. Understanding waves and plankton net challenge. NE-COSEE OSEI-II Wrap-up Session, Woods Hole, Mass., April 29, 2005.
- Stephen, R.A. The seismology of storms. Weston Observatory, Boston College. March 8 and 22, 2006. (Invited)
- Stephen, R.A., Mercer, J., Andrew, R. and Colosi, J. Seafloor hydrophone and vertical geophone observations during the NPAL/LOAPEX/SPIICE experiments. Ninth NPAL Workshop, Borrego Springs, CA, April 18-20, 2006.
- Stephen, R.A., Swift, S.A., Bolmer, S.T. and Hoskins, H. Third party borehole seismic experiments during the Ocean Drilling Program. Fault Zone Drilling Workshop, Miyazaki, Japan, May 23-26, 2006.
- Stephen, R.A., Crawford, W.C. and Iassonov, P., Time domain finite difference modeling of seafloor compliance. Fall AGU, San Francisco, 2006.
- Stephen, R.A., Mercer, J., Andrew, R. and Colosi, J. Seafloor hydrophone and vertical geophone observations during the North Pacific Acoustic Laboratory/ Long-range ocean Acoustic Propagation Experiment (NPAL/LOAPEX). Fall ASA, Honolulu, Hawaii. November 2006, J. Acoust. Soc. Am., 120, 3021.
- Bromirski, P.D., Stephen, R.A. and Duennebieer, F.K. The effects of local structure on seafloor ambient noise at the Hawaii-2 Observatory. Fall AGU, San Francisco, 2006.

- Lavin, M., Strohschneider, D., Maichle, R., Frashure, K., Micozzi, N., and Stephen, R.A. The waves and tsunamis project. Workshop on Interactions between Tsunamis and Underwater Geological Processes, Woods Hole, October 30-31, 2006.
- Stephen, R.A. Chris Chapman and marine seismology. Scientific meeting in honor of C.H. Chapman, Cambridge, U.K., May 3-4, 2007.
- Stephen, R.A., Mercer, J., Andrew, R. and Colosi, J. Seafloor hydrophone and vertical geophone observations during NPAL/LOAPEX. 10th NPAL Workshop, Sleeping Lady, Leavenworth, Washington, May 15-17, 2007.
- Stephen, R.A. Borehole seismic measurements. Gas Hydrate Observatories Workshop (GHOBS), Portland, OR, July 18-20, 2007. (Invited)
- Stephen, R.A. Bottom interaction in long-range ocean acoustic propagation. Geophysics Seminar, WHOI September 5, 2007.
- Stephen, R.A. Borehole seismic measurements. Workshop on Seismogenic Zone Observatory/Ocean Borehole Observatory Science - Current goals and challenges for next 10 years. JAMSTEC, Tokyo, Japan. November 27-28, 2007. (Invited)
- Stephen, R.A. What OBSs tell you about long-range ocean acoustic propagation. Geophysics Seminar, WHOI September 24, 2008.
- Stephen, R.A., Mercer, J., Andrew, R. Howe, B., Dzieciuch, M., Worcester, P., and Colosi, J. Bottom interaction in long-range ocean acoustic propagation. Fall AGU, San Francisco, Dec. 10, 2007.
- Stephen, R.A., Dzieciuch, M.A., Andrew, R.K., Colosi, J.A., Howe, B.M., Mercer, J.A., and Worcester, P.F. Deep shadow zone arrivals on ocean bottom seismometers in long-range ocean acoustic propagation. 11th NPAL Workshop, Borrego Springs, CA, April 15-17, 2008.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals: A new class of arrivals in long-range ocean acoustic propagation. ONR, Arlington, VA, October 15, 2008.
- Stephen, R.A., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Howe, B.M., Mercer, J.A. and Colosi, J.A. Deep shadow zone arrivals on the ocean bottom. Fall ASA, Miami FL, November 14, 2008.
- Nag, S., Swift, S.A. and Stephen, R.A. Using IODP Expedition 312 vertical seismic profile to investigate sub-basement reflections in multi-channel profiles. AGU Joint Assembly, Fort Lauderdale, FL, 27-20 May, 2008.
- Swift, S., Stephen, R.A., Reichow, M., Tikka, A., Tominaga, M. and Gilbert, L.A. Velocity Structure of Upper Ocean Crust at ODP Site 1256. Fall AGU, San Francisco, Dec. 15-19, 2008.

- Stephen, R.A. and Bromirski, P.D. Coherence and phase relationships of broadband ambient noise in the Pacific Ocean. Fall AGU, San Francisco, Dec. 15-19, 2008.
- Stephen, R.A. and Bromirski, P.D. Coherence and phase relationships of broadband ambient noise in the Pacific Ocean. IASPEI General Assembly, Cape Town, South Africa, January 11-16, 2009.
- Stephen, R.A., Petitt, R.A. and Pettigrew, T. Seismometers on CORKs (SeisCORKs). IASPEI General Assembly, Cape Town, South Africa, January 11-16, 2009.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Buck, L.J., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals – an unexplained set of arrivals in long-range ocean acoustic propagation. CTBTO - International Scientific Studies Conference, Vienna, Austria, June 10-12, 2009.
- Stephen, R.A. Long-range ocean acoustic propagation, T-phases, earthquakes and hydro-acoustic networks. CTBTO - International Scientific Studies Conference, Vienna, Austria, June 10-12, 2009. (Invited, Key Lecture) (video available at: http://msg.who.edu/CTBTO_Key_Lecture_RAS_files/RalphStephen_presentation_2.html)
- Stephen, R.A. Deep seafloor arrivals – a new set of arrivals in long-range ocean acoustic propagation. AOPE Seminar, WHOI, July 22, 2009 (Invited Talk).
- Stephen, R.A., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals: an unexplained set of arrivals in long-range ocean acoustic propagation. 12th NPAL Workshop, Carmel, CA, August 31 - September 2, 2009.
- Stephen, R.A., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals: Scattering or multi-path from ocean thermal structure? Fall ASA, San Antonio, TX, October 26, 2009.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Buck, L., Mercer, J.A., Colosi, J.A., and Howe, B.M. A new set of arrivals in long-range ocean acoustic propagation. Fall AGU, San Francisco, December 14-18, 2009.
- Stephen, R.A. Deep seafloor arrivals: A new class of arrivals in long-range ocean acoustic propagation.. NATO Undersea Research Centre, November 20, 2009 (Invited Talk).
- *Xu, M., Stephen, R.A., Canales, J., Carbotte, S.M., Nedimovic, M.R., and Mutter, J.C. Seismic waveform modeling of the reflection response from a mid-ocean ridge axial melt sill: Understanding the message behind the polarity of waves reflected off the melt lens. Fall AGU, San Francisco, December 14-18, 2009.
- Stephen, R.A. Earthquake T-phases and long-range ocean acoustic propagation. NERIES-ESONET OBS - Marine Seismology Workshop, IPGP - Paris, February 11-12, 2010 (Invited Talk).

- Stephen, R.A. Deep water ambient noise on the seafloor. Spring ASA, Baltimore, April 19, 2010 (Invited Talk).
- Stephen, R.A. Earthquake T-phases and long-range ocean acoustic propagation. Workshop on Seismic Waves in Laterally Inhomogeneous Media VII, Tepla, Czech Republic, June 21-25, 2010.
- Stephen, R.A., Petitt, R., and Pettigrew, T. Borehole seismic observatories for monitoring crustal processes. European Geophysical Union General Assembly, Vienna, May 3, 2010 (Invited Talk).
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Buck, L., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals: an unexplained set of arrivals in long-range ocean acoustic propagation. Workshop on Experiments with Portable Ocean Bottom Seismographs (EPOBS), Snowbird, Utah, September 26-28, 2010.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Mercer, J.A., Colosi, J.A., and Howe, B.M. Bathymetric scattering and seafloor interface waves in long-range ocean acoustic propagation. 13th NPAL Workshop, Airlie Center, VA, October 10-13, 2010.
- Stephen, R.A. and Worcester, P.F. Ocean bottom seismometer augmentation of the NPAL 2010-2011 Philippine Sea Experiment. 13th NPAL Workshop, Airlie Center, VA, October 10-13, 2010.
- Stephen, R.A., Heaney, K., Murray, J. and Campbell, R. Marine geology of the Philippine Sea. 13th NPAL Workshop, Airlie Center, VA, October 10-13, 2010.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Mercer, J.A., Colosi, J.A., and Howe, B.M. Deep seafloor arrivals: a new class of arrivals in long-range ocean acoustic propagation. Invited Speaker Series, Applied Ocean Sciences, Scripps Institution of Oceanography, La Jolla, CA, 28 October, 2010 (Invited Talk).
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, R.K., Buck, L.J., Mercer, J.A., Colosi, J.A., and Howe, B.M. Bathymetric scattering and seafloor interface waves in long-range ocean acoustic propagation. Fall ASA, Cancun, Mexico, November 17, 2010.
- Bromirski, P., Stephen, R., Sergienko, O., and MacAyeal, D. Ocean-ice shelf interaction: Gravity wave induced signals. Autonomous Polar Observing Systems Workshop, Potomac, MD, Sept. 30 - Oct. 1, 2010.
- Stephen, R.A. Adam Dziewonski and marine seismology. Adam M. Dziewonski Symposium, Harvard University, Cambridge, MA, June 4, 2011.
- Stephen, R.A., Worcester, P.F. and Dzieciuch, M.A. The depth dependence of earthquake T-phases at an ocean acoustic observatory. IUGG, Melbourne, Australia, June 28 - July 8, 2011.

Stephen, R.A., Marine seismology. G&G Pay-day Talk, 16 September, 2011.

Stephen, R.A., Kemp, J., Bolmer, S.T., Worcester, P.F., Dzieciuch, M.A., Carey, S., Aaron, E., Moskovitz, B., Calderwood, J., Cohen, B., McPeak, S.P., and Campbell, R. Ocean Bottom Seismometer Augmentation of the Philippine Sea Experiment - OBSAPS. 14th NPAL Workshop, Pala Mesa, CA., October 18-20, 2011.

Stephen, R.A., Bolmer, S.T., Worcester, P.F., Dzieciuch, M.A., Mercer, J.A. and Howe, B.M. The depth dependence of earthquake T-phases at an Ocean Acoustic Observatory. Fall ASA, San Diego, CA, November 2, 2011.

Stephen, R.A., Bolmer, S.T., Worcester, P.F., Dzieciuch, M.A., Mercer, J.A. and Howe, B.M. The depth dependence of earthquake T-phases at an Ocean Acoustic Observatory. Fall AGU, San Francisco, CA, December 6, 2011.

Bromirski, P.D. and Stephen, R.A. Comparison of wave-induced signals at the Ross Ice Shelf with tabular iceberg B15A and other land-based Antarctic seismic stations. [International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean, 5-10 June, 2011. La Jolla, California, USA.](#)

Freeman, S.E., D'Spain, G.L., Stephen, R., Heaney, K.D., Baggeroer, A., Worcester, P., Mercer, J., Lynch, S., and Murray, J. Time-evolving T-phase arrival structure using simultaneous recordings by large-aperture horizontal and vertical line arrays in PhilSea09. Fall ASA, San Diego, CA, November 2, 2011.

Udovydchenkov, I. A., Stephen, R. A., Duda, T. F., Worcester, P. F., Dzieciuch, M. A., Mercer, J. A., Andrew, R.K., and Howe, B. M., Bottom reflections from rough topography in the Long-range Ocean Acoustic Propagation Experiment (LOAPEX). 14th NPAL Workshop, Pala Mesa, CA., October 18-20, 2011.

Udovydchenkov, I. A., Stephen, R. A., Duda, T. F., Worcester, P. F., Dzieciuch, M. A., Mercer, J. A., Andrew, R.K., and Howe, B. M., Bottom reflections from rough topography in the Long-range Ocean Acoustic Propagation Experiment (LOAPEX). Fall ASA, San Diego, CA, November 2, 2011.

Stephen, R.A., Seismo-acoustic techniques for estimating ocean bottom properties. Workshop on subsea technologies & seafloor properties characterization, Society of Exploration Geophysicists Annual Meeting, Las Vegas, November 8, 2012. (INVITED)

Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, P.F., Mercer, J.A., Colosi, J.A. and Howe, B.M., Deep seafloor arrivals in long range ocean acoustic propagation. Fall ASA, Kansas City, October 22-26, 2012.

Stephen, R.A., Seismo-acoustic techniques for estimating ocean bottom properties. Workshop on subsea technologies & seafloor properties characterization, Society of Exploration Geophysicists Annual Meeting, Las Vegas, November 8, 2012. (INVITED)

- Stephen, R.A., Kemp, J., Bolmer, S.T., Worcester, P.F., Dzieciuch, M.A., Carey, S., Aaron, E., Moskovitz, B., McPeak, S.P., and Campbell, R., Ocean Bottom Seismometer Augmentation of the Philippine Sea Experiment - OBSAPS. Spring ASA, Hong Kong, May 13-18, 2012.
- Stephen, R.A., Bolmer, S.T., Dzieciuch, M.A., Worcester, P.F., Andrew, P.F., Mercer, J.A., Colosi, J.A. and Howe, B.M., Deep seafloor arrivals in long range ocean acoustic propagation. Fall ASA, Kansas City, October 22-26, 2012.
- Stephen, R.A., Udovydchenkov, I.A., Bolmer, S.T., Duda, T.F., Lin, Y.T., and Peter, D., Three dimensional numerical modeling in marine seismology. EarthCube End-User Workshop, Arizona State University, Tempe, Arizona, October 29-30, 2012.
- Heaney, K.D., Campbell, R.L., Baggeroer, A.B., Stephen, R.A., Scheer, E., Worcester, P.F., and Dzieciuch, M.A., Towed array measurements and modeling in the Philippine Sea. Spring ASA, Hong Kong, May 13-18, 2012.
- Udovydchenkov, I.A., Stephen, R.A., Duda, T.F., Lin, Y.-T., and Peter, D., Three-dimensional numerical modeling of sound propagation and scattering in the deep ocean with elastic (shear) bottoms. Fall ASA, Kansas City, October 22-26, 2012.
- Worcester, P.F., Andrew, R.K., Baggeroer, A.B., Colosi, J.A., D'Spain, G.L., Dzieciuch, M.A., Heaney, K.D., Bruce M. Howe, B.M., Kemp, J.N., Mercer, J.A., Stephen, R.A. and Van Uffelen, L.J., The North Pacific Acoustic Laboratory (NPAL) deep-water acoustic propagation experiments in the Philippine Sea. Spring ASA, Hong Kong, May 13-18, 2012.
- Stephen, R.A., Bromirski, P.D., Gerstoft, P. and Worcester, P.F. Microseism noise in the Phillipine Sea. IRIS OBSIP Workshop, Redondo Beach, CA, October 21-22, 2013.
- Stephen, R.A., Bromirski, P.D., Gerstoft, P. and Worcester, P.F. Microseism noise in the Phillipine Sea. Fall AGU, San Francisco, December 9-13, 2013.
- Stephen, R.A., Bolmer, S.T., Worcester, P.F. and Dzieciuch, M.A. Bottom interacting acoustics in the Phillipine Sea. ONR Peer Review, Stennis Space Center. MS, 22-23 April, 2014.
- Stephen, R.A. and Worcester, P.F. Ocean Bottom Seismometer Augmentation in the North Pacific (OBSANP). ONR Meeting, Arlington, VA, January 10, 2014.
- Stephen, R.A. Seismometers for bottom and ice interacting ocean acoustics. International workshop on Arctic ocean tomography, Arlington, VA, January 14-16, 2014.
- Stephen, R.A., Worcester, P.F., Udovydchenkov, I.A. and Dzieciuch, M.A. Bottom interacting acoustics in the North Pacific. Spring ASA, Providence, RI, May 9, 2014.
- Stephen, R.A. Using ocean bottom seismometers to study long-range ocean acoustics. Geochemistry and Geophysics Seminar, WHOI, August 5, 2014.

- Stephen, R.A., Worcester, P.F., Udovydchenkov, I.A., and Dzieciuch, M.A. Bottom interacting acoustics in the Philippine Sea. Philippine Sea Data Analysis Workshop, Borrego Springs, CA, 15-17 October, 2014.
- Stephen, R.A., Worcester, P.F., Bromirski, P.D. and Dzieciuch, M.A. Microseisms and ambient noise in the Philippine Sea. Philippine Sea Data Analysis Workshop, Borrego Springs, CA, 15-17 October, 2014.
- Stephen, R.A. and Bromirski, P.D. Measurement of Wave-induced Signals on the Ross Ice Shelf - Part 2. McMurdo Science Lectures, Summer 2014-2015, McMurdo, Antarctica, November 7, 2014.
- Bromirski, P.D., Stephen, R.A., Gerstoft, P. and Sergienko, O. Measuring wave-induced vibrations on the Ross Ice Shelf. Twenty-first Annual WAIS Workshop, Camp Cedar Glen, Julian, CA, September 24-27, 2014
- Bromirski, P.D. and Stephen, R.A. Measurement of Wave-induced Signals on the Ross Ice Shelf - Part 1. McMurdo Science Lectures, Summer 2014-2015, McMurdo, Antarctica, November 7, 2014.
- Udovydchenkov, I.A., Stephen, R.A., Komatitsch, D., Xie, Z. and Tromp, J. Three-dimensional numerical modeling of sound propagation and scattering in the deep ocean with elastic bottoms. AGU Ocean Sciences Meeting, Honolulu, HI, February 23-28, 2014.
- Stephen, R.A., Worcester, P.F., Campbell, R.L., Udovydchenkov, I.A. and Dzieciuch, M.A. Bottom-diffracted surface-reflected arrivals in the Philippine Sea. Spring ASA, Pittsburgh, PA, 18-22 May, 2015. (INVITED)
- Stephen, R.A., Bolmer, S.T., Bromirski, P.D., Gerstoft, P., Aster, R.C., Wiens, D.A., and Nyblade, A. Wave induced vibrations on the Ross Ice Shelf. New England Glaciology Meeting, Woods Hole, MA. 16-17 April, 2015.
- Stephen, R.A., Elgar, S., Straneo, F., Bromirski, P.D., Gerstoft, P. and Aster, R.C. Ocean/seismic interaction with the Ross Ice Shelf (OSIRIS). IAES Workshop, Loveland, CO, September 20-22, 2015.
- Stephen, R.A., Udovydchenkov, I.A., Bolmer, S.T., Komatitsch, D., Tromp, J., Casarotti, E., Xie, Z., and Worcester, P.F. Three dimensional numerical modeling of bottom-diffracted surface-reflected arrivals in the North Pacific. Fall AGU, San Francisco, December 14-18, 2015.
- Aster, R., Bromirski, P., Gerstoft, P., Nyblade, A., Stephen, R., and Wiens, D. Ice shelf seismology: Recent broadband seismological observations and future prospects. WAIS Workshop, Loveland, CO, September 16-19, 2015.

- Aster, R., Bromirski, P., Gerstoft, P., Nyblade, A., Stephen, R., and Wiens, D. Ice shelf seismology: Recent broadband seismological observations and future prospects. XII International Symposium on Antarctic Earth Science, Goa, India, 13-17 July, 2015.
- Baker, Aster, Anthony, Wiens, Nyblade, Bromirski, Stephen and Gerstoft. Teleseismic earthquake signals observed on an ice shelf. Fall AGU, San Francisco, December 14-18, 2015.
- Bromirski, P., Diez, A., Gerstoft, P., Stephen, R., Aster, R., Wiens, D. and Nyblade, A., Ross Ice Shelf vibrations and structure. WAIS Workshop, Loveland, CO, September 16-19, 2015.
- Bromirski, P., Diez, A., Gerstoft, P., Stephen, R., Wiens, D., Aster, R. and Nyblade, A., Ocean wave vibrations: Ross Ice Shelf, Antarctica. Scripps Science Showcase, July 28, 2015.
- Clark, H., Stephen, R.A., Bolmer, S.T., Potty, G.R. and Miller, J.H. Wave propagation in muddy sediments using time domain finite difference approach. Spring ASA, Pittsburgh, PA, 18-22 May, 2015.
- Diez, A., Bromirski, P.D., Gerstoft, P., Stephen, R., Wiens, D., Aster, R., and Nyblade, A. Seismometer array at Ross Ice Shelf: Understanding ice shelf response to gravity wave excitation. EGU, Vienna, Austria, 27 April - 02 May, 2015.
- Diez, A., Gerstoft, P., Stephen, R.A., Wiens, D.A., Aster, R., Nyblade, A., Bromirski, P.D., Anthony, R., and Chen, C. Ice shelf structure from dispersion curve analysis of short-period seismic surface waves, Ross Ice Shelf, Antarctica. Fall AGU, San Francisco, December 14-18, 2015.
- Diez, A., Bromirski, P., Gerstoft, P., Stephen, R., Bolmer, T., R., Aster, R., Nyblade, A., and Wiens, D. Layer structure of the Ross Ice Shelf derived from surface waves of ambient noise. Alfred Wegner Institute, September 3, 2015.
- Wiens, D.A., Pratt, M., Aster, R., Nyblade, A., Bromirski, P., Stephen, R., Gerstoft, P., Diez, A., Cai, C., Anthony, R., and Shore, P. Seismic excitation of the Ross Ice Shelf by Whillans Ice Stream slip events. Fall AGU, San Francisco, December 14-18, 2015.

* - Graduate Student, Summer Student Fellow, or Student Employee under my supervision