

CURRICULUM VITAE

Rob. L. Evans

Marine Geophysicist
Senior Scientist
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Education

1985-1988	B.Sc. (Hons) Physics	Bristol University
1988-1991	Ph.D. Marine Geophysics	Bullard Labs, Cambridge University
1991-1994	Post Doctoral Fellow	Dept. of Physics, University of Toronto.

Graduate Supervisor: Dr. Martin. C. Sinha (Cambridge)

Postdoctoral Sponsor: Prof. R. Nigel Edwards (Toronto)

Professional Experience

1994-1998	Assistant Scientist	Dept. Geology and Geophysics, W.H.O.I.
1998-2002	Associate Scientist	Dept. Geology and Geophysics, W.H.O.I.
2002-2011	Associate Scientist (Tenured)	Dept. Geology and Geophysics, W.H.O.I.
2009	Visiting Scientist	Institute de Physique du Globe de Paris
2011-	Senior Scientist	Dept. Geology and Geophysics, W.H.O.I.

Professional Societies

AGU; Society of Exploration Geophysicists (SEG), Active Member.

Research Interests

The use of controlled source electromagnetic (CSEM) methods to measure the electrical resistivity of the seafloor in deep water, continental shelf and coastal environments.

Natural source electromagnetic (EM) techniques (i.e. Magnetotellurics (MT)) in oceanic and continental environments to look deeper into the mantle.

Active areas of research include:

- Hydrothermal circulation at midocean ridges.
- Melting processes beneath midocean ridges and subduction zones.
- Structure of the continental and oceanic lithosphere.
- Structural controls on groundwater discharge to the continental shelf.

- Mapping locations of shallow gas hydrates.
- Processes involved in coastal change.

Professional Activities and Outside Committees

Convener of Special Session, Fall AGU, 2001

Organized workshop on coastal Change, WHOI, 2004.

Congressional Testimony, House subcommittee on Fisheries and Oceans, 2005.

Emsoc Steering Committee Member 2005-2009

Earthscope EM working Group Member 2005-2010

Secretary of AGU Ocean Sciences (Marine Geology and Geophysics) section 2010-

AGU Fall Meeting Planning Committee, 2010, 2011, 2012.

NERC Geophysical Equipment Facility Steering Committee Member 2010-

Science advisor to Mass. Coastal Zone Management on Beach Scraping at Plum Island 2010

Member of the Interagency Transportation, Land Use, and Climate Change Cape Cod Pilot Project (Department of Transport), 2010

GeoPrisms Steering and Oversight Committee 2011-

Awards

WHOI Coastal Ocean Institute Fellowship 2006-2009

Journal Publications

(* Denotes Student Authored Publication

Denotes Post-Doc Authored Publication)

1. **Evans, R.L.**, S.C. Constable, M.C. Sinha, C.S. Cox and M.J. Unsworth, Upper-Crustal Resistivity Structure of the East Pacific Rise Near 13N, *Geophys. Res. Letts.*, 18, 1917-1920, 1991.
2. **Evans, R.L.** and M. E. Everett, Magnetotellurics and Mid-Ocean Ridge Melt Transport: A 2-D Perspective. *in* Mantle Flow and Melt Generation at Mid-Ocean Ridges Geophysical Monograph 71, A.G.U., 353-361, 1992.
3. **Evans, R.L.**, M.C. Sinha, S.C. Constable and M.J. Unsworth, On the electrical nature of the axial melt zone on the East Pacific Rise near 13N, *J. Geophys. Res.*, 99, 577-589, 1994.
4. **Evans, R.L.** and M. E. Everett, Discrimination of hydrothermal mound structures using transient EM methods, *Geophys. Res. Letts.*, 21, 501-504, 1994.
5. **Evans, R.L.**, Constraints on the large scale porosity of young oceanic crust from seismic and resistivity data. *Geophys. J. Int.*, 119, 869-879, 1994.
6. **Evans, R.L.**, A seafloor gravity profile across the TAG hydrothermal mound, *Geophys. Res. Letts.*, 23, 3447-3450, 1996.
- 7*. Cairns G., **R.L. Evans** and R.N. Edwards, A time domain electromagnetic survey of the TAG hydrothermal mound, *Geophys. Res. Letts.*, 23, 3455-3458, 1996.

8. Becker, K., R.P. Von Herzen, J. Kirklin, **R.L. Evans**, M. Kinoshita, O. Matsubayashi, D. Kadko, R. Mills., A. Schultz and P. Rona, Observations of conductive heatflow from submersible surveys at the TAG active hydrothermal mound, *Geophys. Res. Letts.*, 23, 3463-3466, 1996.
9. Wannamaker, P.E., A.D. Chave, J.R. Booker, A.G. Jones, J.H. Filloux, Y. Ogawa, M. Unsworth, P. Tarits and **R.L. Evans**, Sutures and deep physical state of the SE US Atlantic Margin: The southern Appalachians magnetotelluric experiment, *EOS*, 77, 329-333, 1996.
- 10*. Liming Yu, **R.L. Evans** and R. N. Edwards, Transient electromagnetic responses in seafloor with tri-axial anisotropy, *Geophys. Journal Int.*, 129, 292-304, 1997.
11. **Evans, R.L.**, S. C. Webb, M. Jegen and K. Sananikone, Hydrothermal circulation at the Cleft-Vance overlapping spreading center: results of a Magnetometric Resistivity Survey, *J. Geophys. Res.*, 103, 12,321-12,338, 1998.
12. **Evans, R.L.**, L.K. Law, B. St Louis, S. Cheesman and K. Sananikone, The Shallow Porosity Structure of the Eel Shelf, Northern California: Results of a Towed Electromagnetic Survey, *Marine Geology*, 154, 211-226, 1999.
13. **Evans, R.L.**, P. Tarits, A.D. Chave, A. White, G. Heinson, J.H. Filloux, H. Toh, N. Seama, H. Utada, J.R. Booker and M. Unsworth, Asymmetric electrical structure in the mantle beneath the East Pacific Rise at 17S, *Science*, 286, 756-759, 1999.
14. **Evans, R.L.**, L.K. Law, B. St Louis and S. Cheesman, Buried paleo-channels on the New Jersey continental margin: channel porosity structures from electromagnetic surveying, *Marine Geology*, 170, 381-394, 2000.
15. Hirth, G., **R.L. Evans** and A.D. Chave, Comparison of Continental and Oceanic Mantle Electrical Conductivity: Is the Archean Lithosphere Dry? *Geochem. Geophys. Geosyst.*, 1, paper no. 2000GC000048, 2000.
- 16*. Hoefel, F. and **R.L. Evans**, Impact of Low Salinity Porewater on Seafloor Electromagnetic Data: a Means of Detecting Submarine Groundwater Discharge? *Estuarine, Coastal and Shelf Science*, 52, 179-189, 2001.
17. Jones, A.G., I.J. Ferguson, A.D. Chave, **R.L. Evans** and G.W. McNeice, The electric lithosphere of the Slave craton, *Geology*, 29, 423-426, 2001.
18. **Evans, R.L.**, Measuring the Shallow Porosity Structure of Sediments on the Continental Shelf: A comparison of an Electromagnetic Approach with Cores and Acoustic Backscatter, *J. Geophys. Res.*, 106 (C11), 27047-27060, 2001.
19. **Evans, R.L.**, A.D. Chave, J.R. Booker, On the Importance of Offshore Data for Magnetotelluric Studies of Ocean-Continent Subduction Systems, *Geophys. Res. Letts.*, 29, 10.1029/2001GL013960, 2002.

20. **Evans, R.L.**, S.C. Webb and the RIFT-UMC Team, Crustal Resistivity Structure at 9 50N on the East Pacific Rise: Results of an Electromagnetic Survey, *Geophys. Res. Letts.*, 29, 10.1029/2001GL014106, 2002.
21. **Evans, R.L.** and D. Lizarralde, Geophysical Evidence for Karst Formation Associated with Offshore Groundwater Transport: An Example from North Carolina, *Geochem. Geophys. Geosyst.*, 4(8), 10.1029/2003GC000510, 2003.
22. Jones, A.G., P. Lezaeta, I.J. Ferguson, A.D. Chave, **R.L. Evans**, X. Garcia and J. Spratt, The electrical structure of the Slave Craton, *Lithos*, 71, 505-527, 2003.
23. Sinha, M.C. and **R.L. Evans**, Geophysical constraints upon the thermal regime of the oceanic crust, in *Mid-Ocean Ridges; Hydrothermal Interactions Between the Lithosphere and Oceans*, *Geophys. Monogr. Ser. Vol 148*, edited by C.R. German, J. Lin, and L.M. Parsons, pp19-62, AGU Washington, 2004.
24. Goff, J.A., L.A. Mayer, P. Traykovski, I.V. Buynevich, R. Wilkens, R. Raymond, G. Glang, **R.L. Evans**, H. Olsen, and C. Jenkins, Detailed investigation of sorted bedforms, or "rippled scour depressions", within the Martha's Vineyard Coastal Observatory, Massachusetts, *Continental Shelf Res.*, 25, 461-484, 2005.
25. **Evans, R.L.**, G. Hirth, K. Baba, D. Forsyth, A. Chave and R. Mackie, Geophysical controls from the MELT area for compositional controls on oceanic plates, *Nature*, 437, 249-252, 2005.
- 26#. Lezaeta, P., A.D. Chave, **R.L. Evans**, Correction of shallow-water electromagnetic data for noise induced by instrument motion, *Geophys.*, 70, 127-133, 2005.
- 27#. Baba, K. A.D. Chave, **R.L. Evans**, G. Hirth and R. Mackie. Mantle dynamics beneath the East Pacific Rise at 17 S: Insights from the Mantle Electromagnetic and Tomography (MELT) experiment, *J. Geophys. Res.*, 111, B02101, doi:10.1029/2004JB003598, 2006.
- 28*. Hamilton, M.P., A.G. Jones. **R.L. Evans**, S. Evans, C.J.S. Fourie, X. Garcia, A. Mountford, J. Spratt and the SAMTEX Team, Electrical anisotropy of South African lithosphere compared with seismic anisotropy from shear-wave splitting analyses, *Phys. Earth Planet. Ints*, 158, 226-239, 2006.
- 29#. Baba, K., P. Tarits, A.D. Chave, **R.L. Evans**, G. Hirth, and R. L. Mackie, Electrical structure beneath the northern MELT area of the East Pacific Rise, 15°45'S, *Geophys. Res. Letts*, 33, L22301, 10.1029/2006GL027528, 2006.
30. Mulligan, A., **R.L. Evans**, D. Lizarralde, The role of paleochannels in groundwater/seawater exchange, *J. of Hydrology*, 335, 313-329, 2007.
31. **Evans, R.L.**, Using controlled source electromagnetic techniques to map the shallow section of seafloor: From the coastline to the edges of the continental slope, *Geophysics*, 72, 105-116, 2007.

- 32#. Lezaeta, P., A.D. Chave, A. Jones, **R.L. Evans**, Source field effects in the auroral zone: Evidence from the Slave craton (NW Canada), *Phys. Earth Planet. Ints.*, 164, 21-35, 2007.
- 33#. Ashton, A., J. Donnelly, **R.L. Evans**, A Discussion of the Potential Impacts of Climate Change on the Shorelines of the Northeastern USA, *Mitigation and Adaptation of Strategies for Global Change*, 13, 719-743, 2008.
- 34*. Ellis, M., **R.L. Evans**, D. Hutchinson, P. Hart, J. Gardner, R. Hagen, Electromagnetic Surveying of Seafloor Mounds in the Gulf of Mexico, *Marine and Petroleum Geology*, doi:10.1016/j.marpetgeo.2007.12.006, 2008.
35. Eaton, D.W., F. Darbyshire, **R.L. Evans**, H. Grütter, A. Jones, and X. Yuan, The elusive lithosphere-asthenosphere boundary (LAB) beneath cratons, *Lithos.*, doi: doi:10.1016/j.lithos.2008.05.009, *Lithos*, 109, 1-22, 2009.
36. Jones, A.G., **R.L. Evans**, and D.W. Eaton Velocity-conductivity relationships for mantle mineral assemblages in Archean cratonic lithosphere based on extremal bounds, *Lithos*, doi: 10.1016/j.lithos.2008.10.014, *Lithos*, 109, 131-143, 2009.
37. Jones, A.G., **R. L. Evans**, M.R. Muller, M.P. Hamilton, M.P. Miensoopust, X. Garcia, P. Cole, T. Ngwisanyi, D. Hutchins, C.J. S. Fourie, M. Doucoure, T. Aravanis, Wayne Pettit, Sue Webb, Jan Wasborg, and The SAMTEX Team, Area selection for diamonds using magnetotellurics: Examples from southern Africa, *Lithos*, *Lithos*, 112, supplement 1, 83-92, 2009.
- 38#. M.R. Muller, A.G. Jones, **R.L. Evans**, H.S. Grütter, C. Hatton, X. Garcia, M.P. Hamilton, M.P. Miensoopust, P. Cole, T. Ngwisanyi, D. Hutchins, C.J. Fourie, H.A. Jelsma, T. Aravanis, W. Pettit, S.J. Webb, J. Wasborg, and The SAMTEX Team, Lithospheric structure, evolution and diamond prospectivity of the Rehoboth Terrane and western Kaapvaal Craton, southern Africa: constraints from broadband magnetotellurics, *Lithos*, 112, supplement 1, 93-105, 2009.
- 39*. C.-W.Chen, S. Rondenay, **R.L. Evans** and D.B. Snyder, Geophysical detection of relict metasomatism from an Archean subduction zone, *Science*, 326, 1089-1091, 2009.
40. D. Cohen, M. Person, P. Wang, C.W. Gable, D. Hutchinson, A. Marksamer, B. Dugan, H. Kooi, K. Groen, D. Lizarralde, **R.L. Evans**, F.D. Day-Lewis, and J.W. Lane, Origin and Extent of Fresh Paleowaters on the Atlantic Continental Shelf, *Groundwater*, 48, 143-158, 2010.
41. **R.L. Evans**, J. Escartin and M. Cannat, A Short Electromagnetic Profile Across the Kane Megamullion, *Geophysical. Res. Letts.*, 37, doi:10.1029/2010GL043813, 2010.
42. #Matsuno T., N. Seama, **R.L. Evans**, A.D. Chave, K. Baba, A. White, T.-N. Goto, G. Heinson, G. Boren, A. Yoneda, and H. Utada, Mantle electrical resistivity structure beneath the central Mariana subduction system, *Geochem., Geophys., Geosyst.*, 11, Q09003, doi:10.1029/2010GC003101, 2010.

43. *Miensopust, M.P., A.G. Jones, M R. Muller, X. Garcia, and **R.L. Evans**, Lithospheric structures and geometries in northeastern Botswana revealed through SAMTEX magnetotelluric profiling, *J. Geophys. Res.*, 116, B02401, doi:10.1029/2010JB007740, 2011.
44. **R.L. Evans**, A. Jones, X. Garcia, M. Muller, M. Hamilton, S. Evans, S. Fourie, J. Spratt, S. Webb, H. Jelsma, D. Hutchins, The Electrical Lithosphere beneath the Kaapvaal Craton, Southern Africa, submitted to *J. Geophys. Res.*, in press, 2011.
45. **R.L. Evans** and D. Lizarralde, The Competing Impacts of Geology and Groundwater on Electrical Resistivity Around Wrightsville Beach, N.C., *Continental Shelf Research*, 31, 841-848, 2011.
46. Szpak, M. T., X. Monteys, S. O'Reilly, A.J. Simpson, X. Garcia, **R.L. Evans**, C.C.R. Allen, D.J. McNally, D. Courtier-Murias, B.P. Kelleher, Geophysical and geochemical survey of a large marine pockmark on the Malin Shelf, Ireland, *Geochem., Geophys., Geosyst.*, 13, Q01011, doi:10.1029/2011GC003787, 2012.

Book Chapters

R.L. Evans, Chapter 3: Earth's Electromagnetic Environment. Part 1. Conductivity of Earth Materials, in Chave, A.D., and A.G. Jones (eds.), *The Magnetotelluric Method: Theory and Practice*, Cambridge University Press, in press.

Non-Reviewed or Non-Journal Articles

1. Sohn, R., **Evans, R.L.**, S.C. Webb, R. N. Edwards, J. Hildebrand, W. Crawford, E. Canuteson and M. Zumberge, Geophysical experiments during the MUSE experiment, *InterRidge News*, vol 4., 24-28, 1995.
2. **Evans, R.L.**, A current affair, *Oceanus*, 41, 32-33, 1998.
3. **Evans, R.L.**, A new geophysical tool for shallow-water surveying, *Annual Report of the Woods Hole Oceanographic Institution*, p. 15-17, 2000.
4. **Evans, R.L.** (Editor) Report on Workshop and Shortcourse on Coastal Change, WHOI, 2004.
5. **Evans, Rob**, Just add more water, *Nature, News and Views*, 429, 356-357, 2004.
6. **Evans, Rob**, Rising sealevels and moving shorelines, *Oceanus*, 43, 2005. Also reprinted in "Management of Coastal Resources", ICAFI Press, 2007; and in "Climate Change in Context", GALE Publishing, 2007.
7. **Evans, Rob. L.**, Carbon in Charge, *Science, Perspective*, 322, 1338-1340, 2008.
8. **Evans, Rob. L.**, MT and the Subduction Factory, *Margins Newsletter*, December 2010.

Selected Invited Talks and Conference Proceedings

- 1999 The MELT Experiment: Results of the MT Transect, European Geophysical Society.
- 2000 Melt Generation and Transport, RIDGE Integrated Studies Planning Meeting, DeKalb, IL.
- 2002 Geophysical Constraints upon the Thermal Regime of the Oceanic Crust, Interridge Theoretical Workshop (with Martin Sinha), Pavia Italy.
- 2007 Electrical Conductivity of the Oceanic Mantle: Constraints on Composition, Temperature and Melting Processes, Gordon Conference, Interior of the Earth, Mount Holyoke College, Mass.
- 2009 Structure of the Oceanic Mantle: Geophysical Constraints on Lithosphere Evolution, European Science Foundation Exploratory Workshop: Defining the Lithosphere-Asthenosphere Boundary, Dublin, June 2009.

Sea-Going Experience

1. 1988 RRS Discovery Josephine Seamount, offshore Portugal.
Seismic refraction survey.
2. 1989 RRS Charles Darwin East Pacific Rise, 13 N.
Controlled source EM across the ridge crest.
3. 1992 R/V Endeavour Juan de Fuca Ridge, Endeavour segment and Explorer Ridge.
Passive EM, towed EM, camera tows, CTD tow-yos.
4. 1993 R/V Atlantis II TAG, Mid-Atlantic Ridge
Alvin dive program using time domain EM to survey the TAG hydrothermal mound.
5. 1993 R/V Melville Juan de Fuca Ridge, Middle Valley and Axial seamount.
Towed EM, Passive EM, Micro-seismicity and refraction, seafloor gravity survey.
6. 1994 R/V New Horizon Juan de Fuca Ridge, Cleft Segment.
An MMR survey of the Cleft-Vance OSC.
7. 1994 R/V Yokosuka Mid-Atlantic Ridge, TAG.
Shinkai Dive program at the TAG hydrothermal mound. Seafloor gravity, deployment of thermistor arrays, regional geology and chemistry.
8. 1996 R/V Thompson Southern East Pacific Rise. MELT II.
MT instrument deployment and OBS recovery.
9. 1996 R/V W. McGaw Eel River Shelf.
(Chief Scientist) Towed EM survey within the ONR strataform area.
10. 1997 R/V Melville Southern East Pacific Rise. MELT III.
Magnetotelluric array recovery.
11. 1997 R/V Atlantis East Pacific Rise, 9N.
Tilt meter deployment.
12. 1998 R/V Oceanus New Jersey Margin
(Co-Chief Scientist) Towed EM survey.
13. 1998 R/V Atlantis East Pacific Rise, 9N.
Tilt meter Recovery
14. 2000 R/V Melville East Pacific Rise, 9N.
(Co-Chief Scientist) MMR experiment
15. 2000 R/V Cape Hatteras Wrightsville Beach, NC.
(Chief Scientist) Towed EM survey
16. 2002 R/V Cape Henlopen Martha's Vineyard, MA.
(Chief Scientist) Seismic survey

17. 2003 R/V Connecticut Martha's Vineyard, MA.
(Chief Scientist) Towed EM survey
18. 2003 R/V Gyre, Gulf of Mexico
Gas hydrates survey
19. 2004 R/V Pelican, Gulf of Mexico
(Chief Scientist) Towed EM and deep tow camera survey of hydrate mounds
20. 2005 R/V Magnus Heinason, Faroe Islands
(Chief Scientist) MT instrument recovery
21. 2006 MMV Atlantic Guardian
Client representative for industry marine CSEM survey.
22. 2006 R/V Kairei, Mariana Subduction System
Recovery of seafloor MT instruments
23. 2007 MMV REM Angler
Client representative for industry marine CSEM survey.
24. 2007 MMV Siem Mollie
Client representative for industry marine CSEM survey.
25. 2009 R/V Endeavor
(Chief Scientist) Towed EM survey at Kane Megamullion
26. 2010 R/V OR1
Towed EM survey of gas seeps off Taiwan
27. 2011 Isla de Alboran
Seafloor MT deployment in the Alboran Sea.

Field-Work

1997, 1998	Glenn Canyon	EM measurements of eolian sandstone
1998, 1999	Yellowknife, NWT Canada	Lakebottom MT deployment
2000, 2001	Wrightsville Beach, North Carolina	Resistivity Profiles
2003 -2005	Southern Africa	MT profile across the Kaapvaal craton and its surrounding terranes
2009	Massachusetts (various)	Beach Studies
2010	Destin, Florida	Barrier Beach Studies
2011	Destin, Florida	Barrier Beach Studies

Active Collaborators in Last 2 years:

WHOI – Alan Chave, Jeff Donnelly, Porter Hoagland, Dan Lizarralde, Andrew Ashton.

External – Estella Atekwana, Kiyoshi Baba, Steve Constable, Dave Eaton, Xavi Garcia, Greg Hirth, Marion Jegen, Alan Jones, Kerry Key, Alan Levander, Tetsuo Matsuno, Mark Muller, Anne Pommier, Stephane Rondenay, Nobukazu Seama, Mark Person, Phil Wannamaker.

Abstracts

Author or co-author on 149 conference abstracts.