CURRICULUM VITAE

PETER H. BARRY, Ph.D.
Assistant Scientist
Woods Hole Oceanographic Institution, MC&G Dept.
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Positions

2019-Present	Woods Hole Oceanographic Institution, Woods Hole, USA – Assistant Scientist
2014-2018	University of Oxford, UK – Postdoctoral Research Associate
2012-2014	The University of Tennessee, Knoxville, USA (NSF EAR-Postdoctoral Fellow)

Academic Preparation

2012	Scripps Institution of Oceanography, UCSD, USA – Ph.D. Earth Sciences
2011	Scripps Institution of Oceanography, UCSD, USA – M.S. Oceanography
2004	The State University of New York at Geneseo, USA – B.A. Geological Sciences

Research Interests

Fluids and volatile recycling, stable isotope and noble gas geochemistry; petrology – magmatic processes and the petrogenesis of volcanic/igneous rocks; geochemical co-evolution of Earth's mantle and lithosphere; crust-fluid interaction; fluid-gas partitioning in crustal systems

Peer-Reviewed Publications

40. **Barry**, **P.H.**, de Moor, J. M., Giovannelli, D. Schrenk, M., Hummer, D., Lopez, T., Pratt, C.A., Alpízar Segura, Y., Battaglia, A., Beaudry, P., Bini, G., Cascante, M. d'Errico, G., di Carlo, M., Fattorini, D., Fullerton, K., Gazel, E., González, G., Halldórsson, S. A., Iacovino, K., Kulongoski, J.T., Manini, E., Martínez, M., Miller, H., Nakagawa, M., Ono, S., Patwardhan, S., Ramírez, C.J., Regoli, F., Smedile, F., Turner, S., Vetriani, C., Yücel, M., Ballentine, C.J., Fischer, T.P., Hilton, D.R., Lloyd, K.G., (2018) Forearc carbon sequestration reduces long-term volatile recycling into the mantle. Nature, in review.

39. Le Voyer, M., Hauri, E.H., Cottrell, E., Kelley, K.A., Salters, V.J.M, Langmuir, C.H., Hilton, D.R., **Barry, P.H.**, Füri, E., (2018) Carbon fluxes and primary magma CO_2 contents along the global mid-ocean ridge system. Geology, Geophysics, and Geosystems (G-Cubed), in review.

38. **Barry, P.H.**, Lawson, M., W.P. Meurer, Cheng, A., Ballentine, C.J., (2018) Noble gases in deep-water oils of the U.S. Gulf of Mexico. Geology, Geophysics, and Geosystems (G-Cubed), in press.

37. Byrne, D.J., **Barry, P.H.**, Lawson, M., Ballentine, C.J., (2018) Quantifying the efficiency of source-rock closure in the Eagle Ford unconventional shale gas system. Geochim. Cosmochim. Acta, 241, 240-254. doi: 10.1016/j.gca.2018.08.042.

36. Broadley, M.W., **Barry, P.H.**, Ballentine, C.J., Taylor, L.A., Burgess, R. (2018) Plume-induced liberation of recycled volatiles triggers global environmental change. Nature Geoscience, 11 (9), 682. doi: 10.1038/s41561-018-0215-4.

35. Gannon, R.S., Saraceno, J.F., Kulongoski, J.T., Teunis, J.A., **Barry, P.H.**, Tyne, R.L., Kraus, T.E.C., Hansen, A.M., and Qi, S.L., (2018) Produced water chemistry data for the Lost Hills, Fruitvale, and North and South Belridge study areas, Southern San Joaquin Valley, California: U.S. Geological Survey data release. doi: 10.5066/F7X929H9.

34. **Barry, P.H.**, Kulongoski, J.T., Landon, M.K., Tyne, R.L., Gillespie, J.M., M.J. Stephens, Hillegonds, D.J., Byrne, D.J., Ballentine, C.J. (2018) Tracing enhanced oil recovery signatures in casing gases using noble gases. Earth and Planetary Science Letters, 496, 57-67. doi: 10.1016/j.epsl.2018.05.028.

33. Hunt, J.A., Zafu, A., Mather, T.A., Pyle, D.M., **Barry, P.H.,** (2017) Spatially Variable CO2 Degassing in the Main Ethiopian Rift: Implications for Magma Storage, Volatile Transport, and Rift□Related Emissions. Geochemistry, Geophysics, Geosystems, 18(10), 3714-3737. doi: 10.1002/2017GC006975.

32. Byrne, D.J., **Barry, P.H.**, Lawson, M., Ballentine, C.J., (2017) Noble gases in conventional and unconventional petroleum systems. Geological Society, London, Special Publications, 468, SP468-5. doi: 10.1144/SP468.5.

31. **Barry, P.H.**, (2017) Deep mantle: Enriched carbon source detected. Nature Geoscience, 10(9), 625. doi: 10.1038/ngeo3001.

30. **Barry, P.H.**, Lawson, M., Meurer, D. Danabalan, Mabry, J.C., and Ballentine, C.J., (2017) Determining fluid migration and isolation times in multiphase crustal domains using noble gases, Geology 45 (9), 775-778. doi: 10.1130/G38900.1.

29. Ballentine, C.J. and **Barry, P.H.**, (2017) Noble gases. Springer Earth Sciences Series. Encyclopedia of Geochemistry. doi: 10.1007/978-3-319-39193-9_195-1.

28. Mikhail, S., **Barry, P.H.**, and Sverjensky, D.A., (2017) The role of pH on the deep-Earth nitrogen cycle. Geochim. Cosmochim. Acta, 209, 149-160. doi: 10.1016/j.gca.2017.04.007

27. **Barry, P.H.**, Lawson, M., Meurer, W.P., Warr, O., Mabry, J.C., Byrne, D.J., and Ballentine, C.J. (2016) Noble gases solubility models of hydrocarbon charge mechanisms in the Sleipner Vest methane field. Geochim. Cosmochim. Acta, 194, 291-309. doi: 10.1016/j.gca.2016.08.021.

26. **Barry P.H.**, and Hilton, D.R. (2016) Release of subducted sedimentary nitrogen throughout Earth's mantle. Geochemical Perspectives Letters, 2, 138-147. doi: 10.7185/geochemlet.1614.

25. Correale, A., Rizzo, A.L., **Barry, P.H.**, Lu, J., Zheng, J. (2016) Refertilization of lithospheric mantle beneath the Yangtze Craton, South East China: evidence from the noble gas geochemistry. Gondwana, 38, 289-303. doi:10.1016/j.gca.2015.12.021.

24. Halldórsson, S.A., Hilton, D.R., **Barry, P.H.**, Füri, E., Grönvold, K. (2015) Recycling of Phanerozoic crustal material by the Iceland mantle plume: new evidence from nitrogen elemental and isotope systematics of subglacial basalts. Geochim. Cosmochim. Acta, 176, 206-226. doi:10.1016/j.gca.2015.12.021.

23. Füri, E., **Barry, P.H.**, Taylor, L.A., Marty, B. (2015) Indigenous nitrogen in the Moon: Constraints from coupled nitrogen-noble gas analyses of mare basalts. Earth and Planetary Science Letters, 431, 195-205. doi:10.1016/j.epsl.2015.09.022.

22. Fischer, T. P., Ramirez, C., Mora Amador, R. A., Hilton, D. R., Barnes, J. D., Sharp, Z. D., Le Brun, M., de Moor, J. M., **Barry, P. H.**, Füri, E., and Shaw, A. M. (2015) Temporal variations in fumarole gas chemistry at Poás volcano, Costa Rica. Journal of Volcanology and Geothermal Research, 294, 56-70. doi:10.1016/j.jvolgeores.2015.02.002.

21. Pernet-Fisher, J.F., Howarth, G.H., Pearson D.G., **Barry, P.H.**, Woodland S., Pokhilenko N.P., Pokhilenko L.N., Agashev A.M. and Taylor, L.A. (2015) Plume impingement on the Siberian SCLM: Evidence from Re-Os isotope systematics. Lithos, 218, 141-154. doi: 10.1016/j.lithos.2015.01.010.

20. Day, J. M. D., **Barry, P. H.**, Hilton, D.R., Burgess, R., Pearson D.G., and Taylor, L.A. (2015) The helium flux from the continents and ubiquity of low-$^{3}He/^{4}He$ recycled crust and lithosphere. Geochim. Cosmochim. Acta, 153, 116-133. doi: 10.1016/j.gca.2015.01.008.

19. **Barry, P. H.**, Hilton, D. R., Day J.M.D., Pernet-Fisher, J.F., Howarth, G.H., Agashev A.M., Pokhilenko N.P., Pokhilenko L.N., and Taylor, L.A. (2015) Helium isotope evidence for modification of the cratonic lithosphere during the Permo-Triassic Siberian flood basalt event. Lithos, 216-217, 73-80. doi: 10.1016/j.lithos.2014.12.001.

18. Howarth, G. H., Pernet-Fisher, J. F., Balta, B. J., **Barry, P. H.**, Bondar, R. J. and Taylor, L. A. (2014) Two-stage polybaric formation of the new enriched, pyroxene-oikocrystic/lherzolitic shergottite, NWA 7397. Meteoritics and Planetary Science, 1-19. doi: 10.1111/maps.12357.

17. Howarth, G.H., Sobolev, N.V, Pernet-Fisher, J.F., **Barry, P.H.**, Penumadu, D., Puplampu, S., Ketcham, R.A., Maisano, J., Taylor, D., and Taylor, L.A. (2014) The secondary origin of diamonds: multi-modal radiation tomography of diamondiferous mantle xenoliths. International Geology Review, 56 (9), 1172-1180. doi: 10.1080/00206814.2014.926784.

16. **Barry, P.H.**, Hilton, D.R., Füri, E., Halldórsson, S.A., Grönvold, K. (2014) Carbon isotope and abundance systematics, and CO_2 fluxes from Icelandic geothermal gases, fluids and subglacial basalts, Geochim. Cosmochim. Acta, 134, 74-99. doi: http://dx.doi.org/10.1016/j.gca.2014.02.038.

15. Pernet-Fisher, J.F., Howarth, G.H., Lui, Y. **Barry, P.H.**, Carmody, L., Valley, J.W., Bodnar, R.J., Spetsius, Z.V., Taylor, L.A. (2014) Komsomolskaya Diamondiferous Eclogites: Evidence for Oceanic Crustal Protoliths. Contributions to Mineralogy and Petrology, 167, 981. doi: 10.1007/s00410-014-0981-y.

14. Howarth, G.H., **Barry, P.H.**, Pernet-Fisher, J.F., Baziotis, I.P., Pokhilenko, N.P., Pokhilenko, L.N., Bodnar, R.J., Taylor, L.A. (2014) Superplume Metasomatism: Evidence from Siberian mantle xenoliths, Lithos, 184–187, 209–224. doi: 10.1016/j.lithos.2013.09.006

13. Carmody, L., **Barry, P.H.**, Shervais J.W., Kluesner, J.W. Taylor, L.A. (2013) Oxygen Isotopes in Subducted Oceanic Crust: A New Perspective from Siberian Diamondiferous Eclogites. Geology, Geophysics, and Geosystems (G-Cubed), 14. doi: 10.1002/ggge.20220.

12. Mposkos, E., Baziotis, I., Leontakianakos, G., **Barry, P.H.** (2013) The metamorphic evolution of the high-pressure Kechros complex in East Rhodope (NE Greece): implications from Na-Al-rich leucocratic rocks within antigorite serpentinites. Lithos 177, 17-33. doi: http://dx.doi.org/10.1016/j.lithos.2013.06.012.

11. **Barry, P.H.** and Taylor, L.A. (2013) Age of the Earth. In: Rink W., Thompson J. (Ed.) Encyclopedia of Scientific Dating Methods. doi: 10.1007/978-94-007-6326-5_65-7.

10. de Moor, J.M., Fischer, T.P., King, P.L., Botcharnikov, R.E., Hervig, R., Hilton, D.R., **Barry, P.H.**, Mangasini, F., and Ramirez, C. (2013) Volatile-rich silicate melts from Oldoinyo Lengai volcano (Tanzania): Implications for carbonatite genesis and eruptive behavior. Earth and Planetary Science Letters 361, pp 379-390. doi: http://dx.doi.org/10.1016/j.epsl.2012.11.006.

9. **Barry, P.H.**, Hilton, D.R., Fischer, T.P., de Moor, J.M., Mangasini, F, Ramirez, C.J., (2013) Helium and carbon isotope systematics of cold "mazuku" CO_2 vents and hydrothermal gases and fluids from Rungwe Volcanic Province, southern Tanzania, Chemical Geology 339, pp 141-156. doi: 10.1016/j.chemgeo.2012.07.003.

8. Karlstrom, K.E., Crossey, L.J., Hilton, D.R., and **Barry, P.H.** (2013) Mantle ^{3}He and CO_2 degassing in carbonic and geothermal springs of Colorado and implications for neotectonics of the Rocky Mountains, Geology 41, pp 495-498. doi: 10.1130/G34007.1.

7. Kulongoski, J.T., Hilton, D.R., **Barry, P.H.**, Esser, B., Hillegonds, D., and Belitz, K. (2013) Mantle-volatile weakening of the Big Bend Section of the San Andreas Fault, California: helium and carbon-dioxide systematics, Chemical Geology 339 pp 92-102. doi: http://dx.doi.org/10.1016/j.chemgeo.2012.09.007.

6. de Moor, J.M., Fischer, T.P., Sharp, Z.D., Hilton, D.R., **Barry, P.H.**, Mangasini, F., and Ramirez, C. (2013) Gas chemistry and nitrogen isotope compositions of cold mantle gases from Rungwe Volcanic Province, southern Tanzania, Chemical Geology 339, pp 20-32. doi: http://dx.doi.org/10.1016/j.chemgeo.2012.08.004.

5. **Barry, P.H.**, Hilton, D.R., Halldórsson S. A., Hahm, D. and Marti, K. (2012) High precision nitrogen isotope measurements in oceanic basalts using a static triple collection noble gas mass spectrometry. Geology, Geophysics, and Geosystems (G-Cubed), (Technical Briefs) 13, Number 1. doi: 10.1029/2011GC003878, 2012.

4. Hilton, D.R., Halldórsson, S.A., **Barry, P.H.**, Fischer, T.P., de Moor, J.M., Ramirez, C.J., Mangasini, F. and Scarsi, P. (2011) Deep mantle plume contribution to the Rungwe volcanic province revealed by helium isotopes. Geophysical Research Letters. 38, pp 21. doi: 10.1029/2011GL049589.

3. Füri, E., Hilton, D.R., Halldórsson, S.A., **Barry, P.H.**, Hahm, D., Fischer, T.P. and Grönvold, K. (2010) Apparent decoupling of the He and Ne isotope systematics of the Icelandic mantle: the role of He depletion, melt mixing, degassing fractionation and air interaction. Geochim. Cosmochim. Acta. 74, pp 3307-3332. doi: http://dx.doi.org/10.1016/j.gca.2010.03.023.

2. Hilton, D.R., Ramirez, C., Amador, R.A., Fischer, T.P., Füri, E, **Barry, P.H.,** and Shaw, A.M. (2010) Monitoring of temporal and spatial variations in fumarole helium and carbon dioxide characteristics at Poas and Turrialba volcanoes, Costa Rica (2001-2009). Geochemical Journal 44, pp 431-440. doi: http://dx.doi.org/10.2343/geochemj.1.0085.

1. **Barry, P.H.,** Hilton, D.R., Tryon, M.D., Brown, K.M., and Kulongoski, J.T. (2009) A New Syringe Pump Apparatus for the Retrieval and Temporal Analysis of Helium (SPARTAH) in groundwaters and geothermal fluids, Geology, Geophysics, and Geosystems (G-Cubed), (Technical Briefs) 10, Number 5, doi: 10.1029/2009GC002422, 2009.

Fellowships, Grants and Funding

-Deep Carbon Observatory (DCO) Field Focus Site Award: *Biology Meets Subduction: A Collaborative and Multi-disciplinary Deep Carbon Field Initiative,* 2016-2019 (**Lead-PI; $464,129**)
- EPSRC Global Challenges Research Fund: *Developing soil gas surveying techniques to guide helium resource recovery in Tanzania,* 2016-2017 (**Lead-PI; £82,774**)
-USGS Award: *Understanding sources, pathways and the overall impact of oil and gas on California groundwaters: A unique noble gas isotope modeling approach,* 2016-2020 (**Lead-PI; $624,793**)
-NSF EAR Postdoctoral Fellowship: *A Petrological and Nitrogen Isotope Study of Crustal Recycling Through Time*, 2012-2014 (**Lead-PI; $170,000**)
-UCSD President's Dissertation Fellow, 2011-2012
-NSF EAPSI Fellow, 2008
-Research and Teaching Assistant Fellowship and Tuition Fee Stipend, UCSD, 2007-2011

Formal Presentations

-Invited speaker - Geothermal Resources & Sustainable Development Workshop (Kenya), September 2018
-Goldschmidt Conference (Boston) – research presentation, August 2018
-AGU Fall meeting – research presentation, December 2017
- 3rd Deep Carbon Observatory Early Career Scientist Meeting, August 2017
-Goldschmidt Conference (Paris) – research presentation, August 2017
-DINGUE Conference (IPGP) – research presentation, August 2017
-Invited speaker – 68th GASG Colloquium, Natural Gas: Gas in Nature, July 2017
-Invited speaker – Woods Hole Oceanographic Institution, May 2017
-Keynote speaker – UK Doctoral Training Program, Solid Earth Stream Conference, April 2017
-Invited speaker – University of Oxford – Brown bag lunch seminar, April 2017
-Invited speaker –Third DCO International Science Meeting, March 2017
-Invited speaker – University of Edinburgh, School of GeoSciences, March 2017
-Invited speaker – Cornell University, Earth and Atmospheric Sciences Dept., March 2017
-Invited speaker – Carnegie Institution – Department of Terrestrial Magnetism, October 2016
-Invited speaker – Smithsonian – National Museum of Natural History, October 2016
-Goldschmidt Conference (Yokohama) – research presentation, June 2016
-DINGUE Conference (Nancy) – research presentation, April 2016
-Invited speaker – University of Edinburgh, School of GeoSciences, October, 2015
-Invited speaker – University of St. Andrews, Dept. of Earth and Environmental Science, October, 2015
-University of the Azores: 2nd Deep Carbon Observatory Early Career Scientist Meeting, September 2015
-Goldschmidt Conference (Prague) – research presentation, August 2015
-Invited speaker – University of North Carolina, Chapel Hill, February 2015
-Invited speaker – University of Oxford – Brown bag lunch seminar, February 2015
-Invited speaker – University of Bristol, School of Earth Sciences – 'Hot Stuff' Seminar, November 2014
-Goldschmidt Conference (Sacramento) - research presentation, June 2014
-AGU Fall meeting – research presentation, December 2013
-Goldschmidt Conference (Florence) - research presentation, August 2013
-DINGUE Conference (Florence) – research presentation, August 2013
-Lunar and Planetary Science Conference (Houston) – research presentation, March 2013
-Invited speaker – University of Tennessee, Klepser Seminar, September 2012
-Invited speaker – Scripps Inst. of Oceanography – Isotope Geochemistry Laboratory Seminar, April 2012
-International Conference on Gas Geochemistry (San Diego) – research presentation, December 2011
-Goldschmidt Conference (Prague) - research presentation, August 2011
-DINGUE Conference (Paris) – research presentation, August 2011
-Invited guest lecturer for SIO 251 - Whole Earth Geochemistry, June 2011
-Invited speaker at Caltech - Geology Club seminar series, May 2011
-CIDER workshop participant and presenter – July 2010
-AGU Fall meeting – research presentation, December 2009

Supervising Experience

Graduate Student Advising Experience:

- MS supervisor of Karim Mtili (University of Dar es Salaam) – 2018-present
- MS supervisor of Clarah Kimani (University of Dar es Salaam) – 2018-present
- PhD supervisor of Rebecca Tyne (University of Oxford) – 2016-Present
- PhD supervisor of David Byrne (University of Oxford) – 2014-Present

Field Research Experience

- Tanzania 2018: Sampling volcanic gases and high He seeps
- Yellowstone 2018: Sampling volcanic gases
- Panama 2018: Groundwater sampling in the volcanic forearc
- Costa Rica 2018: Lead PI on DCO funded 'Biology Meets Subduction' field expedition – part 2

- Orcutt, California 2018: Produced water, oil and gas sampling
- Iceland 2017: Sampling fluids, gases and lavas from Northern Rift Zone
- Sicily 2017: Sampling fluids, gases and lavas from Etna Volcano
- Nicaragua 2017: Sampling fluids, gases and lavas from Telica Volcano
- Costa Rica 2017: Lead PI on DCO funded 'Biology Meets Subduction' field expedition – part 1
- Tanzania 2016: Testing portable mass spectrometer on high He seeps
- Lost Hills, California 2016: Produced water, oil and gas sampling
- Papua New Guinea 2016: Volcanic gas sampling
- Bakersfield, California 2016: Groundwater and oil and gas sampling
- Tanzania 2016: High helium natural seep sampling
- West Texas & Louisiana 2016: Methane sample collection
- Tanzania 2015: High helium natural seep sampling
- South Texas 2015: Methane sample collection
- Northern Germany 2014: Methane sample collection
- Southern California 2014: Groundwater sampling in the Santa Barbara Basin
- Costa Rica 2014: Deployment of SPARTAH; collection of geothermal fluids and groundwaters
- Panama 2013: Groundwater sampling in the volcanic forearc
- Central California 2014: Groundwater sampling along the San Andreas Fault
- China 2011: Sampling of volcanic fluids and gases
- Costa Rica 2010: Sampling fluids and gases
- Tanzania 2009: Sampling lavas, xenoliths, geothermal fluids and gases
- Japan 2008: Sampling geothermal gases
- California: Deployment of SPARTAH; collection of geothermal fluids and groundwaters
- Mascarene islands 2007: Sampling of lavas and xenoliths
- Central Indian Ridge 2007: SIO Knox11 research cruise (R/V Revelle) - Dredging for glasses
- Iceland 2007: Test deployment of SPARTAH; Sampling of lavas, xenoliths and geothermal fluids
- Costa Rica & El Salvador 2007: Sampling geothermal fluids and gases; Mini-DOAS: SO_2 fluxes

Professional Activities

Editorial Board Member:
- Chemical Geology

Proposal Reviewer:
- National Science Foundation

Journal Reviewer:
- Nature
- Nature Geoscience
- Geochemical Perspectives Letters
- Geology
- Earth and Planetary Science Letters
- Geochimica Cosmochimica et Acta
- Water Resources Research
- Chemical Geology
- Geology, Geophysics, and Geosystems
- Journal of Volcanology Geothermal Research
- Mineralogy and Petrology
- The Geological Society of London
- Journal of Geophysical Research: Solid Earth
- International Journal of Mass Spectrometry
- Solid Earth
- International Journal of Greenhouse Gas Control

Professional Organizations:

- American Geophysical Union (AGU) – Member
- European Association of Geochemistry (EAG) – Member
- Deep Carbon Observatory (DCO) – Member & 'Deep Energy' Representative

Conference Session Convener:

- Goldschmidt 2017 – 17f: Constraints on Past Carbon Cycle Dynamics and pCO_2
- Goldschmidt 2016 – 5g: The Deep Nitrogen Cycle and the Evolution of Planetary Atmospheres
- Goldschmidt 2016 – 7a: Cycling of Volatile Elements between Earth's Interior and Exterior Through Subduction Zones
- AGU 2016 – Volatiles within the Earth's mantle and core

Outreach and Synergistic Activities

- Deep Carbon Observatory 2019 Science Planning Committee, 2018
- Best Science Documentary – Goldschmidt Film Festival 2017 – hosted by Wild Orbit Films
- University of Oxford, Vice-Chancellor's Award for Public Engagement, 2017
- Deep Carbon Observatory Early Career Scientist workshop organizer, 2017
- Public dissemination of large helium discovery in Tanzania. The story was run (went viral) on over 200 news outlets including *the BBC, New York Times, NPR, Washington Post, CNN, Wired, Gizmodo, IFLScience 2016*
- NASA/STFC lunar sample outreach session for preschoolers, Oxford, UK 2016
- Outreach lecturer at the Cardinal Newman School in Luton, UK 2016
- Deep Carbon Observatory Synthesis Planning Workshop representative for Deep Energy 2015
- Deep Carbon Observatory Early Career Scientist workshop participant, 2015
- Invited outreach lecturer at "San Diego Continuing Education" 2014
- GK12 outreach program participant 2012-2014
- Student representative for the Geoscience Research Division at SIO 2009-2012
- President of the Scripps Academic Club, 2008-2012
- Outreach lecturer at the Gillispie school, La Jolla, CA 2007