

# JOHN D. KESSLER

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## I. EDUCATION AND EXPERIENCE

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### EDUCATION

**Postdoctoral Research**, Geoscience, September 2005 – August 2008  
**Princeton University**

**Ph.D.**, Earth System Science, September 2005  
**University of California, Irvine**

**M.S.**, Earth System Science, December 2003  
**University of California, Irvine**

**B.S.**, Chemistry and Mathematics, May 1998  
**Gettysburg College**

### PROFESSIONAL EXPERIENCE

**University of Rochester, Dept of Earth & Environmental Sciences, Rochester, NY**    September 2012 - Present  
ASSOCIATE PROFESSOR

**Texas A&M University, Department of Oceanography, College Station, TX**    August 2008 – August 2012  
ASSISTANT PROFESSOR

**Princeton University, Department of Geosciences, Princeton, NJ**    September 2005 – August 2008  
POSTDOCTORAL RESEARCH ASSOCIATE

**University of California Irvine, Earth System Science Department, Irvine, CA**  
GRADUATE RESEARCH ASSISTANT    August 2000 – September 2005

**National Institute of Standards and Technology, Gaithersburg, MD**    June 1998 – July 2000  
**Atmospheric Chemistry Group, Surface and Microanalysis Science Division**  
RESEARCH CHEMIST

**National Institute of Standards and Technology, Gaithersburg, MD**    May 1996 – June 1998  
**Microanalysis Research Group, Surface and Microanalysis Science Division**  
PHYSICAL SCIENCE TRAINEE

## II. RESEARCH AND SCHOLARLY ACTIVITIES

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### AWARDS

Professor of the Year in the Natural Sciences, award by the Student Association	2017-2018
The Goergen Award for Excellence in Undergraduate Teaching	2015
National Academy of Sciences: U.S. Kavli Frontiers of Sciences	November 2014
Alfred P. Sloan Research Fellow: Ocean Sciences (\$50,000)	2012-2013
Discover Magazine: 100 Top Stories of 2011	2011
Microbeam Analysis Society Distinguished Scholar Award	2001

### FUNDED PROJECTS WITH JOHN D. KESSLER AS LEAD PRINCIPAL INVESTIGATOR

- 1) National Science Foundation (OCE-1634871); “Development of an ultra-fast method for continuous and automated analysis of dissolved greenhouse gases in surface waters,” September 1, 2016 – August 31, 2018.
- 2) Department of Energy (DE-FE0028980); “Characterizing Ocean Acidification and Atmospheric Emission caused by Methane Released from Gas Hydrate Systems along the US Atlantic Margin,” October 2016 – September 2019.
- 3) National Science Foundation (PLR-1417149); “Determining the Source of Methane in Arctic Ocean Waters Adjacent to Subsea Permafrost,” September 1, 2014 – August 31, 2016.
- 4) National Science Foundation (OCE-1318102); “Investigating the chemical and isotopic kinetics of aerobic methane oxidation,” December 10, 2012 – February 28, 2015
- 5) National Science Foundation (OCE-1042650); “RAPID: The effect of methane laden oil on climate and dissolved oxygen: using the Deepwater Horizon oil spill as an analog for clathrate decomposition and seeping methane,” June 1, 2010 - May 31, 2012
- 6) National Oceanic and Atmospheric Administration (through a contract with Consolidated Safety Services, Inc.); “Gulf of Mexico Oil Spill,” September 1 – December 21, 2010
- 7) National Science Foundation (OCE-0849246 and OCE-1300040); “Collaborative Research: Development of a Diode Laser Cavity-Ringdown Spectrometer for Shipboard Measurements of the Stable Isotopes on Oceanic Methane,” October 1, 2008 – November 30, 2012

### FUNDED PROJECTS WITH JOHN D. KESSLER AS CO-PI

- 8) National Science Foundation (OCE-1139203); “EAGER: Development of a portable air-water flux system for methane,” July 15, 2011 – June 30, 2014, PI: Dr. Shari Yvon-Lewis, **Co-PI: Dr. John D. Kessler**
- 9) Gulf of Mexico Research Initiative; “Gulf Integrated Spill Research Consortium,” September 1, 2011 – August 31, 2015, PI: Dr. Piers Chapman, **Co-PI: Dr. John D. Kessler**

### SHIPBOARD & FIELD EXPERIENCE

R/V Hugh Sharp, US Atlantic Margin, USA ( <b>Chief Scientist</b> )	August 24 – September 7, 2017
R/V Blue Heron, Lake Superior and Michigan, USA ( <b>Chief Scientist</b> )	June 13-22, 2017
R/V Blue Heron, Lake Superior, USA ( <b>Chief Scientist</b> )	October 17-22, 2016
R/V Madtom, Lake Ontario, USA	May, August – November, 2016
R/V Ukpik, Beaufort Sea, Alaska, USA ( <b>Chief Scientist</b> )	August 28 – September 5, 2015

E/V Nautilus, Gulf of Mexico, USA	April 8 – 21, 2015
R/V Endeavor, North Atlantic Bight, USA ( <b>Chief Scientist</b> )	July 7 – 14, 2014
R/V Cape Hatteras, Gulf of Mexico, USA ( <b>Chief Scientist</b> )	August 7 – 14, 2012
Kasitsna Bay Field Station, Alaska, USA	July 18-23, 2012
Kasitsna Bay Field Station, Alaska, USA	August 21 – 29, 2011
Toolik Lake Field Station, Alaska, USA	August 14 – 21, 2011
R/V Ukpik, Beaufort Sea, Alaska, USA	August 9 – 12, 2011
M/V Sarah Bordelon, Deepwater Horizon Oil Spill, Gulf of Mexico, USA ( <b>Chief Scientist</b> )	December 3-19, 2010
NOAA Boat Pisces, Deepwater Horizon Oil Spill, Gulf of Mexico, USA ( <b>Chief Scientist</b> )	September 7 – 17, 2010
R/V Cape Hatteras, Deepwater Horizon Oil Spill, Gulf of Mexico, USA ( <b>Chief Scientist</b> )	June 11 – 20, 2010
R/V Atlantis (DSV Alvin), Santa Barbara & Santa Monica Basins, CA, USA	September 11 – October 1, 2009
R/V Brooks McCall, Gulf of Mexico, USA	July 3 – 20, 2009
R/V New Horizon, Santa Barbara & Santa Monica Basins, CA, USA	June 21 – 30, 2004
B/O Hermano Gines, Cariaco Basin, Venezuela	January 21 – 24, 2004
R/V Alpha Helix, Skan Bay, Unalaska, Alaska, USA	August 28 – September 10, 2003
R/V Alpha Helix, Skan Bay, Unalaska, Alaska, USA	September 16 – October 2, 2001

### **REFEREED PUBLICATIONS**

(**bold** indicates graduate student authors; **bold and asterisk** indicates undergraduate student authors)

40) **Sparrow, K. J.** and J. D. Kessler (2018). Comment on “The origin of methane in the East Siberian Arctic Shelf unraveled with triple isotope analysis” by Sapart et al. (2017). *Biogeosciences*, 15, 4777-4779. <https://doi.org/10.5194/bg-15-4777-2018>

39) **Garcia-Tigreros, F.** and J. D. Kessler (2018). Limited acute influence of aerobic methane oxidation on ocean carbon dioxide and pH in Hudson canyon, northern U.S. Atlantic margin. *Journal of Geophysical Research: Biogeosciences*, 123(7), 2135-2144. <https://doi.org/10.1029/2018JG004384>

38) **Sparrow, K. J.**, J. D. Kessler, J. R. Southon, **F. Garcia-Tigreros**, K. M. Schreiner, C. D. Ruppel, J. B. Miller, S. J. Lehman, and X. Xu (2018). Limited contribution of ancient methane to surface waters of the U.S. Beaufort Sea shelf. *Science Advances*, 4(1), eaao4842. <https://doi.org/10.1126/sciadv.aao4842>

37) Shiller, A. M., **E. W. Chan**, D. J. Joung, M. C. Redmond, and J. D. Kessler (2017). Light rare earth element depletion during *Deepwater Horizon* blowout methanotrophy. *Nature: Scientific Reports*, 7, 10389. <https://doi.org/10.1038/s41598-017-11060-z>

36) **Sparrow, K. J.** and J. D. Kessler (2017). Efficient collection and preparation of methane from low concentration waters for natural abundance radiocarbon analysis. *Limnology & Oceanography: Methods*, 15(7), 601-617. <https://doi.org/10.1002/lom3.10184>

35) **Leonte, M.**, J. D. Kessler, M. Y. Kellermann, **E. C. Arrington**, D. L. Valentine, and S. P. Sylva (2017). Rapid rates of aerobic methane oxidation at the feather edge of gas hydrate stability in the waters of Hudson Canyon, US Atlantic Margin. *Geochimica et Cosmochimica Acta*, 204, 375-387. <https://doi.org/10.1016/j.gca.2017.01.009>

34) Ruppel, C. D. and J. D. Kessler (2017). The Interaction of Climate Change and Methane Hydrates. *Reviews of Geophysics*, 55(1), 126-168. <https://doi.org/10.1002/2016RG000534>

33) **Weinstein, A.\***, **L. Navarrete\***, C. Ruppel, T. C. Weber, **M. Leonte**, M. Y. Kellermann, **E. C. Arrington**, D. L. Valentine, M. I. Scranton, and J. D. Kessler (2016). Determining the flux of methane into Hudson Canyon at the edge of methane clathrate hydrate stability. *Geochem. Geophys. Geosyst.*, 17(10), 3882-3892. <https://doi.org/10.1002/2016GC006421>

32) **Garcia-Tigreros Kodovska, F.**, **K.J. Sparrow**, S.A. Yvon-Lewis, A. Paytan, N.T. Dimova, **A. Lecher**, and J.D. Kessler (2016). Dissolved methane and carbon dioxide fluxes in Subarctic and Arctic regions: Assessing

measurement techniques and spatial gradients. *Earth and Planetary Science Letters*, 436, 43-55. <https://doi.org/10.1016/j.epsl.2015.12.002>

31) **Chan, E.**, J. D. Kessler, A. Shiller, D.J. Joung, and F. Colombo (2016). Aqueous mesocosm techniques enabling the real-time measurement of the chemical and isotopic kinetics of dissolved methane and carbon dioxide. *Environmental Science & Technology*, 50(6), 3039-3046. <https://doi.org/10.1021/acs.est.5b04304>

30) **Christian, K.M.**, L.K Lutz, G.D Hoke, D.I Siegel, Z. Lu, and J. Kessler (2016). Methane occurrence is associated with sodium-rich valley waters in domestic wells overlying the Marcellus shale in New York State. *Water Resources Research*, 52(1), 206-226. <https://doi.org/10.1002/2015WR017805>

29) **Lecher, A.L.**, J.D. Kessler, **K. Sparrow**, **F. Garcia-Tigreros Kodovska**, N. Dimova, **J. Murray**, S. Tulaczyk, and A. Paytan (2016). Methane transport through submarine groundwater discharge to the North Pacific and Arctic Ocean at two Alaskan sites. *Limnology and Oceanography*, 61, S344-S355. <https://doi.org/10.1002/lno.10118>

28) Dimova, N.T., A. Paytan, J.D. Kessler, **K.J. Sparrow**, **F. Garcia-Tigreros Kodovska**, **A.L. Lecher**, **J. Murray**, and S.M. Tulaczyk (2015). Current Magnitude and Mechanisms of Groundwater Discharge in the Arctic: Case Study from Alaska. *Environmental Science & Technology*, 49(20), 12036-12043. <https://doi.org/10.1021/acs.est.5b02215>

27) Paytan, A., **A. Lecher**, N. Dimova, **K. Sparrow**, **F. Garcia-Tigreros Kodovska**, and J.D. Kessler (2015). Methane transport from the active layer to lakes in the Arctic using Toolik Lake, Alaska, as a case study. *Proceedings of the National Academy of Sciences*, 112(12), 3636-3640. <https://doi.org/10.1073/pnas.1417392112>

26) **Pack, M.A.**, X. Xu, M. Lupascu, J.D. Kessler, and C. Czimeczik (2015). A rapid method for preparing low volume CH<sub>4</sub> and CO<sub>2</sub> gas samples for 14C AMS analysis. *Organic Geochemistry*, 78, 89-98. <https://doi.org/10.1016/j.orggeochem.2014.10.010>

25) Kessler, J.D. (2014). Atlantic Bubble Bath. *Nature: Geoscience*, 7(9), 625-626. <https://doi.org/10.1038/ngeo2238>

24) **Du, M.**, S. Yvon-Lewis, F. Garcia-Tigreros, D.L. Valentine, **S. Mendes**, and J.D. Kessler (2014). High resolution measurements of methane and carbon dioxide concentrations and air-sea fluxes reveal the influence of methane seepage on greenhouse gas dynamics in a massive natural seep field near Coal Oil Point, California. *Environmental Science & Technology*, 48(17), 10165-10173. <https://doi.org/10.1021/es5017813>

23) **Errera, R.M.**, S. Yvon-Lewis, J.D. Kessler, and L. Campbell (2014). Responses of the dinoflagellate *Karenia brevis* to climate change: pCO<sub>2</sub> and sea surface temperatures. *Harmful Algae*, 37, 110-116. <https://doi.org/10.1016/j.hal.2014.05.012>

22) Lutz, L.K., G.D. Hoke, Z. Lu, D.I. Siegel, J.D. Kessler, **K. Christian**, and N.G. Teale (2014). Using Discriminant Analysis to Determine Sources of Salinity in Shallow Groundwater Prior to Hydraulic Fracturing. *Environmental Science & Technology*, 48(16), 9061-9069. <https://doi.org/10.1021/es502244v>

21) Chen, Y., K. Lehmann, J.D. Kessler, B. Sherwood Lollar, G. Lacrampe-Couloume, and T.C. Onstott (2013). Measurement of the 13C/12C of atmospheric CH<sub>4</sub> using near-IR Cavity Ring-down Spectroscopy. *Analytical Chemistry*, 85(23), 11250-11257. <https://doi.org/10.1021/ac401605s>

20) **Du, M.**, and J.D. Kessler (2012). Assessment of the Spatial and Temporal Variability of Bulk Hydrocarbon Respiration Following the Deepwater Horizon Oil Spill. *Environmental Science & Technology*, 46(19), 10499-10507. <https://doi.org/10.1021/es301363k>

19) Ryerson, T.B., R. Camilli, J.D. Kessler, E.B. Kujawinski, C.M. Reddy, D.L. Valentine, E. Atlas, D.R. Blake, J. de Gouw, S. Meinardi, D.D. Parrish, J. Peischl, J.S. Seewald, and C. Warneke (2012). Chemical data quantify

Deepwater Horizon hydrocarbon flow rate and environmental distribution. Proceedings of the National Academy of Sciences, 109(50), 20246-20253. <https://doi.org/10.1073/pnas.1110564109>

18) **Hu, L.**, S.A. Yvon-Lewis, J.D. Kessler, and I.R. MacDonald (2012). Methane fluxes to the atmosphere from deepwater hydrocarbon seeps in the northern Gulf of Mexico. J Geophys Res-Oceans, 117, C01009. <https://doi.org/10.1029/2011JC007208>

17) Kessler, J.D., D.L. Valentine, M.C. Redmond, **M. Du, E.W. Chan, S.D. Mendes**, E.W. Quiroz, **C.J. Villanueva, S.S. Shusta, L.M. Werra**, S.A. Yvon-Lewis, and T.C. Weber (2011). A Persistent Oxygen Anomaly Reveals the Fate of Spilled Methane in the Deep Gulf of Mexico. Science, 331(6015), 312-315. <https://doi.org/10.1126/science.1199697>

16) Kessler, J.D., D.L. Valentine, M.C. Redmond, and **M. Du** (2011). Response to Comment on 'A Persistent Oxygen Anomaly Reveals the Fate of Spilled Methane in the Deep Gulf of Mexico'. Science, 332, 1033. <https://doi.org/10.1126/science.1203428>

15) **Pasche, N.**, Schmid, M., Vazquez, F., Schubert, C. J., Wüest, A., Kessler, J.D., **Pack, M.A.**, Reeburgh, W.S., and Burgmann, H. (2011). Methane sources and sinks in Lake Kivu. J Geophys Res-Bioge, 116, G03006. <https://doi.org/10.1029/2011JG001690>

14) Yvon-Lewis, S.A., **L. Hu**, and J.D. Kessler (2011). Methane flux to the atmosphere from the Deepwater Horizon oil disaster. Geophysical Research Letters, 38, L01602. <https://doi.org/10.1029/2010GL045928>

13) **Crowe, S.A.**, S. Katsev, K. Leslie, A. Sturm, C. Magen, S. Nomosatryo, **M.A. Pack**, J.D. Kessler, W.S. Reeburgh, J.A. Roberts, L. Gonzalez, G. Douglas Haffner, A. Mucci, B. Sundby, and D.A. Fowle (2011). The methane cycle in ferruginous Lake Matano. Geobiology, 9(1), 61-78. <https://doi.org/10.1111/j.1472-4669.2010.00257.x>

12) Valentine, D.L., J.D. Kessler, M.C. Redmond, **S.D. Mendes, M.B. Heintz**, C. Farwell, **L. Hu**, F.S. Kinnaman, S.A. Yvon-Lewis, **M. Du, E.W. Chan, F. Garcia-Tigreros**, and **C.J. Villanueva** (2010). Propane respiration jump-starts microbial response to a deep oil spill. Science, 330(6001), 208-211. <https://doi.org/10.1126/science.1196830>

11) Pape, T., A. Bahr, J. Rethemeyer, J. D. Kessler, H. Sahling, K. Hinrichs, S. A. Klapp, W. S. Reeburgh, and G. Bohrmann (2010). Molecular and isotopic partitioning of low-molecular-weight hydrocarbons during migration and gas hydrate precipitation in deposits of a high-flux seepage site. Chemical Geology, 269 (3-4), 350-363. <https://doi.org/10.1016/j.chemgeo.2009.10.009>

10) Kessler, J.D., W.S. Reeburgh, D.L. Valentine, F.S. Kinnaman, E.T. Peltzer, P.G. Brewer, J. Southon, and S.C. Tyler (2008). A survey of methane isotope abundance ( $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^2\text{H}$ ) from five nearshore marine basins that reveals unusual radiocarbon levels in subsurface waters. Journal of Geophysical Research, 113(C12), C12021. <https://doi.org/10.1029/2008JC004822>

9) Kessler, J.D., W.S. Reeburgh, and S.C. Tyler (2006). Controls on Methane Concentration and Stable Isotope ( $\delta^2\text{H-CH}_4$  and  $\delta^{13}\text{C-CH}_4$ ) Distributions in the water columns of the Black Sea and Cariaco Basin. Global Biogeochemical Cycles, 20(4), GB4004. <https://doi.org/10.1029/2005GB002571>

8) Kessler, J.D., W.S. Reeburgh, J. Southon, R. Seifert, W. Michaelis, and S.C. Tyler (2006). Basin-wide Estimates of Input of Methane from Seeps and Clathrates to the Black Sea. Earth and Planetary Science Letters, 243(3-4), 366-375. <https://doi.org/10.1016/j.epsl.2006.01.006>

7) Onstott, T.C., **D. McGown**, J. Kessler, B. Sherwood Lollar, K.K. Lehmann, and S.M. Clifford (2006). Martian  $\text{CH}_4$ : Sources, Flux, and Detection. Astrobiology, 6(2), 377-395. <https://doi.org/10.1089/ast.2006.6.377>

6) Kessler, J.D., W.S. Reeburgh, J. Southon, and R. Varela (2005). Fossil Methane Source Dominates Cariaco Basin Water Column Methane Geochemistry. Geophysical Research Letters, 32(12), L12609. <https://doi.org/10.1029/2005GL022984>

- 5) Kessler, J.D. and W.S. Reeburgh (2005). Preparation of Natural Methane Samples for Stable Isotope and Radiocarbon Analysis. Limnology and Oceanography: Methods, 3, 408-418. <https://doi.org/10.4319/lom.2005.3.408>
- 4) Currie, L.A. and J.D. Kessler (2005). On the isolation of elemental carbon (EC) for micro-molar <sup>14</sup>C accelerator mass spectrometry: development of a hybrid reference material for <sup>14</sup>C-EC accuracy assurance, and a critical evaluation of the thermal optical kinetic (TOK) isolation procedure. Atmospheric Chemistry and Physics, 5, 2833-2845. <https://doi.org/10.5194/acp-5-2833-2005>
- 3) Currie, L.A., J.D. Kessler, R.A. Fletcher, and J.E. Dibb (2005). Long range transport of biomass aerosol to Greenland: Multi-spectroscopic investigation of particles deposited in snow. Journal of Radioanalytical and Nuclear Chemistry, 263(2), 399-411. <https://doi.org/10.1007/s10967-005-0069-2>
- 2) Currie, L.A., B.A. Benner, Jr, H. Cachier, R. Cary, J.C. Chow, E.R.M. Druffel, T.I. Eglinton, O. Gustafsson, P.C. Hartmann, J.I. Hedges, J.D. Kessler, T.W. Kirchstetter, D.B. Klinedinst, G.A. Klouda, J.V. Marolf, C.A. Masiello, T. Novakov, A. Pearson, K.M. Prentice, H. Puxbaum, J.G. Quinn, C.M. Reddy, H. Schmid, J.F. Slater, J. Watson, and S.A. Wise (2002). A Critical Evaluation of Interlaboratory Data on Total, Elemental, and Isotopic Carbon in the Carbonaceous Particle Reference Material, NIST SRM 1649a. Journal of Research of the National Institute of Standards and Technology, 107, 279-298. <https://doi.org/10.6028/jres.107.022>
- 1) Currie, L.A., J.D. Kessler, J.V. Marolf, A.P. McNichol, D.R. Stuart, J.C. Donoghue, D.J. Donahue, G.S. Burr, and D. Biddulph (2000). Low-level (submicromole) Environmental <sup>14</sup>C Metrology. Nuclear Instruments and Methods B, 172, 440-448. [https://doi.org/10.1016/S0168-583X\(00\)00217-2](https://doi.org/10.1016/S0168-583X(00)00217-2)

## **CONFERENCE PLATFORM PRESENTATIONS**

### **(ONLY LISTED ARE THE INVITED TALKS WITH KESSLER AS LEAD PRESENTER)**

- 1) *Title:* High Resolution Measurements of the Sea-to-Air Flux of Methane Released from Hydrates  
*Conference:* Gordon Research Conference on Natural Gas Hydrate Systems, Galveston, TX USA, February 25 - March 2, 2018.
- 2) *Title:* Quantifying the flux and fate of methane into the Hudson Canyon at the edge of methane clathrate hydrate stability  
*Conference:* American Geophysical Union, San Francisco, CA, December 14-18, 2015
- 3) *Title:* Someday We'll Find It; The Methane-Climate Connection  
*Conference:* Science Teachers Association of New York State – 120<sup>th</sup> Annual Conference, Rochester, NY, USA, November 6-9, 2015
- 4) *Title:* Assessing Hydrocarbon Biodegradation and Release Rates with Natural Stable Isotope Measurements  
*Conference:* The First Symposium on Deep Sea Oil Spills  
Qingdao Cooperative Innovation Center of Marine Science and Technology  
Ocean University of China, Qingdao, Shandong Province, China  
October 28-30, 2013
- 5) *Title:* A Chemical Investigation of Aerobic Methane Oxidation Following a Large Water Column Methane Perturbation  
*Conference:* Gordon Research Conference on Natural Gas Hydrate Systems, Ventura, CA, USA, March 18-23, 2012.  
*Session:* New Results
- 6) *Title:* The Biogeochemical Cycling of Dissolved Methane and Oxygen Associated with the Deepwater Horizon Disaster  
*Conference:* American Chemical Society, San Diego, CA, USA, March 25-29, 2012.  
*Session:* Fate of petroleum in the marine environment: Lessons learned two years after the Deepwater Horizon incident
- 7) *Title:* The Biogeochemical Cycling of Dissolved Methane and Oxygen Associated with the Deepwater Horizon Disaster  
*Conference:* Deepwater Horizon (DWH) Oil Spill Principal Investigator's One Year Update Workshop, St. Petersburg, FL, October 25-26, 2011
- 8) *Title:* Using the Deepwater Horizon Disaster to Investigate Natural Biogeochemical Cycling Associated with Rapid Methane Emissions  
*Conference:* American Association of Petroleum Geologists (AAPG), Houston, TX, April 10-13, 2011
- 9) *Title:* Using the Deepwater Horizon Disaster to Investigate Natural Biogeochemical Cycling Associated with Rapid Methane Emissions  
*Conference:* PERGAMON, Brussels, Belgium, February 21-23, 2011
- 10) *Title:* Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions  
*Conference:* Energy Forum 2011: Energy Security and Sustainability – Global Challenges, Texas A&M Engineering Institute, February 1, 2011
- 11) *Title:* Using the Deepwater Horizon Disaster to Investigate Natural Biogeochemical Cycling Associated with Rapid Methane Emissions  
*Conference:* American Geophysical Union, San Francisco, CA, December 13-17, 2010
- 12) *Title:* Using measurements of natural isotopes to determine oceanic methane sources, sinks, and fluxes  
*Conference:* American Geophysical Union, San Francisco, CA, December 15-19, 2008

**INVITED SEMINARS AT UNIVERSITIES AND RESEARCH INSTITUTIONS**

- 1) October 13, 2017  
University of Minnesota Duluth  
*Title:* Investigations of Methane Dynamics on the Great Lakes System
- 2) October 11, 2017  
University of North Carolina Chapel Hill  
*Title:* The Briny Blue Bubble Bender: Investigations of the chemical and isotopic kinetics of aerobic methane oxidation
- 3) February 5, 2015  
Rochester Institute of Technology  
*Title:* Someday We'll Find It; The Methane-Climate Connection
- 4) May 21, 2014  
Monterey Bay Aquarium Research Institute  
*Title:* Methane Munching Microbes: Calculated Consumption or Blowout Bender?
- 5) December 6, 2013  
University of Rochester: Laboratory for Laser Energetics  
*Title:* What the Deepwater Horizon Disaster taught us about Global Climate Change
- 6) October 18, 2013  
University of Rochester: Big Data Forum 2013  
*Title:* Big Data in the Ocean Sciences: from ultra-fast instrumentation to global data integration
- 7) October 11, 2013  
University of Rochester: Meliora Weekend (Joint with Prof. Vas Petrenko)  
*Title:* Fairchild Colloquium: The Adventure of the Geosciences: Atmospheric and Oceanographic Expeditions into Climate Change
- 8) April 5, 2013  
Stony Brook University  
*Title:* Challenges when Assessing Hydrocarbon Degradation via Isotopic Fractionation
- 9) February 13, 2013  
University of Rochester, Faculty Perspectives Seminar Series  
*Title:* Oceans and Rapid Climate Change: A Look at the Greenhouse Effect
- 10) February 8, 2013  
University of Rochester, Sustainability Seminar Series  
*Title:* Oceanic Secrets Revealed by the Deepwater Horizon Disaster
- 11) January 24, 2013  
Syracuse University, Department of Earth Sciences  
*Title:* Oceanic Secrets Revealed by the Deepwater Horizon Disaster
- 12) November 15, 2012  
University of Waterloo, Department of Earth and Environmental Sciences  
*Title:* Death of a Hydrocarbon Plume
- 13) November 9, 2012  
University of Southern Mississippi, Department of Marine Science  
*Title:* Death of a Hydrocarbon Plume



- 14) October 12, 2012  
University of Texas at Austin, Institute for Geophysics  
*Title: Challenges when Assessing Hydrocarbon Degradation via Isotopic Fractionation*
- 15) October 11, 2012  
University of Texas at Austin, Jackson School of Geosciences  
*Title: Death of a Hydrocarbon Plume*
- 16) April 17, 2012  
TAMU-CS Department of Atmospheric Science Seminar Series  
*Title: The Death of a Hydrocarbon Plume*
- 17) December 10, 2010  
TAMU Research Foundation Councilors and Board of Trustees Meeting  
*Title: Oceanic Secrets Revealed by the Deepwater Horizon Disaster*
- 18) November 9, 2010  
TAMU-Galveston Depart of Oceanography Seminar Series  
*Title: Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions*
- 19) November 5, 2010  
Yale University Yale School of Forestry & Environmental Studies Seminar Series  
*Title: Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions*
- 20) November 4, 2010  
Yale University, The Yale Climate & Energy Institute  
*Title: Disaster in the Gulf: A Panel Discussion on the Deepwater Horizon Spill*
- 21) November 1, 2010  
TAMU-CS Department of Oceanography Seminar Series  
*Title: Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions*
- 22) August 27, 2010  
Rice University, Center for the Study of the Environment and Society Seminar Series  
*Title: Persistent Localized Underwater Methane Emission Study (PLUMES)*
- 23) August 26, 2010  
Rice University, Depart of Earth Science Seminar Series  
*Title: Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions*
- 24) November, 2009  
University of Texas at Arlington  
*Title: Oceanic Methane Isotope Biogeochemistry: From Reeburgh to Rayleigh*

### III. INSTRUCTIONAL ACTIVITIES

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#### **GRADUATE CLASSES TAUGHT**

Chemical Oceanography	2010, 2013 – 2018
Isotope Geochemistry/Environmental Radiochemistry	2009, 2011, 2013, 2015, 2017
Advanced Seminar in Climate and Environmental Change	2015, 2017
Seminar in Stable Isotope Geosciences	2010
Research	2009 – 2018

#### **UNDERGRADUATE CLASSES TAUGHT**

Chemical Oceanography	2013 – 2018
Isotope Geochemistry	2013, 2015
Research in Ocean Biogeochemistry	2014, 2016, 2018
Advanced Seminar in Climate and Environmental Change	2015, 2017
Interdisciplinary Oceanography	2010, 2011, 2012
Introduction to Oceanography	2009, 2011, 2012
Undergraduate Research	2011 – 2018

#### **GRADUATE STUDENTS ADVISED**

Ph.D.: Mengran Du (2009-2014)

*Title of Dissertation:* Determining the fate of methane released from the seafloor in deep and shallow water environments

*Current Position:* Associate Scientist, Sanya Institute of Deep-sea Science and Engineering, Chinese Academy of Sciences, Sanya, China

Ph.D.: Kathryn Sparrow (2011-2017)

*Title of Dissertation:* Assessing the Contribution of Methane Sourced from Ancient Carbon in the Alaskan Arctic Ocean to the Modern Atmosphere Using Natural Radiocarbon Measurements

*Current Position:* Postdoctoral researcher, Department of Earth, Ocean, and Atmospheric Science, Florida State University

Ph.D. Eric Chan (2009-2017)

*Title of Dissertation:* Investigations of the Biogeochemical and Stable Isotope Kinetics of Aerobic Methane Oxidation in Seawater

*Current Position:* Postdoctoral researcher, School of Earth, Environmental, and Marine Sciences, The University of Texas Rio Grande Valley

M.S.: David Jaenike (2013-2014)

*Title of Thesis:* Changes in evaporation caused by increasing concentrations of dissolved CO<sub>2</sub> in water: a kinetic and isotopic effect

*Current Position:* TTM Technologies, Stafford, CT

M.S. Amy Eisenstadt (2016-2018)

*Title of Thesis:* Methane and Carbon Dioxide in Surface Waters of Lake Ontario and Lake Superior: Evaluation of Vacuum Extraction System, Air-Lake Flux, and Relationship with Chlorophyll

Ph.D. Mihai Leonte (2012-present) Passed written and oral qualifying exams

Ph.D. Fenix Garcia-Tigreros (2013-present) Passed written and oral qualifying exams

## UNDERGRADUATE STUDENTS ADVISED WITH THESIS RESEARCH IN THE LAB AND FIELD

B.S.: Stephanie Hendrickson (Spring 2011)  
Michele Ebbole (Spring 2012)  
Adam Solomon (Spring 2012)  
Lili Schachter (Spring 2013)  
Daniel Diaz-Etchevehere (Spring 2016)  
Gabryella Pulsinelli (Spring 2016)

## PRESENTATIONS BY ADVISED GRADUATE STUDENTS (asterisk & bold indicates graduate student authors)

*Title:* Determination of Methane Sources and Sinks Using Stable Isotopes in Areas of Active Gas Seepage (Poster)

*Authors:* **Mihai Leonte\***, B. Wang, S. A. Scolofsky, and J. D. Kessler

*Conference:* Gordon Research Conference on Natural Gas Hydrate Systems, Galveston, TX USA, February 25 - March 2, 2018

*Title:* Limited contribution of ancient methane to surface waters of the U.S. Beaufort Sea shelf (Invited)

*Authors:* **Katy J. Sparrow\*** and John D. Kessler

*Conference:* American Geophysical Union, San Francisco, CA, December 11-15, 2017

*Title:* Dissolved Methane and Carbon Dioxide Fluxes in Subarctic and Arctic Regions: Assessing Measurement Techniques and Spatial Gradients (Poster)

*Authors:* **Fenix Garcia-Tigeros Kodovska\***, K.J. Sparrow, S.A. Yvon-Lewis, A. Paytan, N.T. Dimova, **A. Lecher**, J.D. Kessler

*Conference:* Ocean Sciences, New Orleans, LA, February 21-26, 2016

*Title:* Investigating the emission, dissolution, and oxidation of CH<sub>4</sub> within and around a seep bubble plume in the Gulf of Mexico (Poster)

*Authors:* **Mihai Leonte\***, J. Kessler, S. Scolofsky

*Conference:* Ocean Sciences, New Orleans, LA, February 21-26, 2016

*Title:* Investigating the Chemical and Isotopic Kinetics of Aerobic Methane Oxidation in Two Different Novel Environments (Talk)

*Authors:* **Eric Chan\***, J. Kessler, A. Shiller, M. Redmond, **E. Arrington**, D.L. Valentine

*Conference:* Gulf of Mexico Oil Spill & Ecosystem Science Conference, Tampa, FL, February 1-4, 2016

*Title:* High Resolution Analytical Techniques for the Analysis of Methane Oxidation in Mesocosm Experiments (Poster)

*Authors:* **Eric Chan\***, J. Kessler, M. Redmond, A. Shiller, **E. Arrington**, D.L. Valentine, F. Colombo

*Conference:* Gulf of Mexico Oil Spill & Ecosystem Science Conference, Tampa, FL, February 1-4, 2016

*Title:* Investigating the chemical and isotopic kinetics of aerobic methane oxidation in the Northern US Atlantic Margin, Hudson Canyon (Poster)

*Authors:* **Eric Chan\***, J. Kessler, A. Shiller, M. Redmond, **E. Arrington**, D.L. Valentine

*Conference:* American Geophysical Union, San Francisco, CA, December 14-18, 2015

*Title:* High resolution and comprehensive techniques to analyze aerobic methane oxidation in mesocosm experiments (Poster)

*Authors:* **Eric Chan\***, J. Kessler, M. Redmond, A. Shiller, **E. Arrington**, D.L. Valentine, F. Colombo

*Conference:* American Geophysical Union, San Francisco, CA, December 14-18, 2015

*Title:* Carbonate Chemistry Dynamics in an Area of Active Gas Seepage: the Hudson Canyon, US Atlantic Margin (Poster)

*Authors:* **Fenix Garcia-Tigeros Kodovska\***, J. Kessler, **M. Leonte**, A. Chepigin, M. Kellermann, **E. Arrington**, D.L. Valentine

*Conference:* American Geophysical Union, San Francisco, CA, December 14-18, 2015

*Title:* The potential influence of aerobic methane oxidation on ocean carbon dioxide and pH (Talk)

*Authors:* **Fenix Garcia-Tigeros Kodovska\*** and J. Kessler

*Institution:* Center for Arctic Gas Hydrates, Environment and Climate (CAGE), The Arctic University of Norway, December 2, 2015

*Title:* Efficient collection and preparation of methane from extremely large volumes of water for natural radiocarbon analysis (Talk)

*Authors:* **Katy Sparrow\*** and J. Kessler

*Conference:* 22<sup>nd</sup> International Radiocarbon Conference, Dakar, Sénégal, November 16-20, 2015

*Title:* A Comprehensive Analysis of Methane Oxidation Events in Mesocosm Experiments (Talk)

*Authors:* **Eric W. Chan\*** and J. Kessler

*Conference:* Goldschmidt, Prague, CZ, August 16-21, 2015

*Title:* Efficient Collection of Methane from Extremely Large Volumes of Water for Natural Radiocarbon Analysis (Poster)

*Authors:* **Katy Sparrow\*** and J. Kessler

*Conference:* American Geophysical Union, San Francisco, CA, December 14-19, 2014

*Title:* Comparison of Two Techniques to Calculate Methane Oxidation rates in Samples Obtained from the Hudson Canyon Seep Field in the North Atlantic (Poster)

*Authors:* **Mihai Leonte\***, J. Kessler, **A. Chepigin**, T. Weber, C. Ruppel, M. Kellermann, **E. Arrington**, D. Valentine, S. Silva

*Conference:* American Geophysical Union, San Francisco, CA, December 14-19, 2014

*Title:* High resolution measurements of methane concentrations and air-sea fluxes reveal the influence of methane seepage on greenhouse gas dynamics in a massive natural seep field near Coal Oil Point, California (Poster)

*Authors:* **Mengran Du\***, S. Yvon-Lewis, D. Valentine, **S. Mendes**, and J.D. Kessler

*Conference:* Gulf of Mexico Oil Spill and Ecosystem Science Conference, Mobile, Alabama, January 26-29, 2014

*Title:* Theoretical and Experimental Reevaluation of Stable Isotope Kinetics During Microbial Growth Stages (Platform)

*Authors:* **Eric Chan\*** and J.D. Kessler

*Conference:* American Geophysical Union, San Francisco, CA, December 9-13, 2013

*Title:* Methane Production and Destruction: Theoretical and Experimental Reevaluation of Methane Isotope Kinetics (Poster)

*Authors:* **Eric Chan\*** and J.D. Kessler

*Conference:* 2011 IYC O<sub>3</sub> Symposium on Stratospheric Ozone and Climate Change, Washington DC, November 7-11, 2011

*Title:* Using Dissolved Oxygen Anomalies to Assess the Spatial and Temporal Variability of Hydrocarbon Respiration in Response to the Oil Spill Event (Poster)

*Authors:* **Mengran Du\*** and J.D. Kessler

*Conference:* 2011 IYC O<sub>3</sub> Symposium on Stratospheric Ozone and Climate Change, Washington DC, November 7-11, 2011

*Title:* Using Dissolved Oxygen Anomalies to Assess the Spatial and Temporal Variability of Hydrocarbon Respiration in Response to the Oil Spill Event (Poster)

*Authors:* **Mengran Du\*** and J.D. Kessler

*Conference:* 2011 DWH Oil Spill Principal Investigator 1-Year Updated Workshop, St. Petersburg FL, October 2011

#### **IV. SERVICE AND ADMINISTRATIVE ACTIVITIES**

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##### **PRESENTATIONS TO COMMUNITY GROUPS**

June 15, 2017

Navy Pier, Chicago, IL

*Title:* Research Vessel Blue Heron: Viewing, Tours, and Presentations

May 30, 2017

Get Real! Science, Warner School of Education, University of Rochester

*Title:* Investigating Greenhouse Gases in the Great Lakes

January 20, 2017

James P.B. Duffy School # 12, Rochester, NY

*Title:* Changing Climate and Greenhouse Gases in Lakes and the Ocean

May 29, 2015

Science Adventure Day, Honeoye Falls-Lima Manor School

*Title:* The Ocean Sciences

February 1, 2014

TEDx Allendale

Allendale Columbia School

*Title:* The Broader Impacts of Science

March 31, 2011

College Station Rotary Club

*Title:* Using the Deepwater Horizon Disaster to Investigate the Biogeochemical Cycling Associated with Rapid Methane Emissions

September 23, 2010

College Station Rotary Club

*Title:* Persistent Localized Underwater Methane Emission Study (PLUMES)

July, 2010

Bryan Public Library

*Title:* Let's Make Lemonade: Using the Gulf oil spill to learn how the Earth Functions

##### **DEPARTMENTAL AND UNIVERSITY SERVICE**

Member of the Faculty Senate

Member of the Lead Through Research Strategic Planning Committee

Member of the Search Committee for the Dean of the College

Board of Academic Honesty

Member of Faculty Search Committee for the Chair of Environmental Medicine

Advisory Committee: River Campus Libraries

Internal Steering Committee: Institute for Data Science

Executive Committee: Center for Energy and the Environment

College Strategic Planning Committee

Contributed to the Faculty Search for Data Science (Global Biogeosciences Search)

Contributed to the Meeting/HSCCI Collaboratory for Visualization Science

Member of Faculty Search Committees

Undergraduate Advisor: Department

Undergraduate Advisor: Pre-Major

Member of Committee to Revise Environmental Sciences (BS) and Environmental Studies (BA) Majors

Discussion leader in NSF Responsible Conduct of Research Workshop  
Contributed to the Faculty Perspectives Seminar Series, Sponsored by the Office of Alumni Relations

**REVIEWER FOR THE FOLLOWING JOURNALS**

*Basin Research*  
*Biogeosciences*  
*Chemical Geology*  
*Environmental Science & Technology*  
*G-Cubed*  
*Geo-Marine Letters*  
*International Journal of Earth Sciences*

*Limnology & Oceanography*  
*Limnology & Oceanography: Methods*  
*Marine Chemistry*  
*Nature: Geoscience*  
*Proceedings of the National Academy of Sciences*  
*Science*

**PROPOSAL REVIEWER FOR THE FOLLOWING FUNDING AGENCIES**

National Science Foundation: Ocean Sciences: Chemical Oceanography (Panel Review as well)  
National Science Foundation: Polar Programs  
National Science Foundation: Major Research Instrumentation-Recovery and Reinvestment  
National Environmental Research Council  
Netherlands Organization for Scientific Research (NOW): Council for the Earth and Life Sciences Open Program

**V. OTHER**

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**MEMBERSHIPS**

American Geophysical Union

**SHORT COURSES**

Quantitative X-ray Microanalysis of Bulk Specimens and Particles,	Lehigh University,	June 1999
Scanning Electron Microscopy and X-ray Microanalysis,	Lehigh University,	June 1998