

## Curriculum/Academic Vitae

### Bruce C. Frederick, PG, PhD

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bruce.c.frederick@gmail.com

#### ***EDUCATION***

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- PhD, August 2015, University of Texas, Austin-Jackson School of Geosciences, Austin, Tx.  
Concentration in Geophysics: Potential fields and seismic sequence stratigraphy and basin analysis research.
- M.S., May 1994, Univ of Miami/RSMAS, Key Biscayne, Fl. Concentration in Geology: Stratigraphy, sedimentology, and paleoclimatology research.
- B.A., May 1991, Colgate University, Hamilton, NY. Concentration in Geology (High Honors): Marine geology and hydrology research.

#### ***PROFESSIONAL EMPLOYMENT***

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- 2015- *Geology Department, University of Kansas, Lawrence, KS, Postdoctoral Researcher*  
Conducted geologic research in clastic source to sink sediment dispersal and eustasy-subsidence impacts on sedimentary depocenters.
- 2009-2015 *Jackson School of Geosciences, University of Texas-Austin, Austin, TX, Research Asst.*  
Conducted marine and aerogeophysical research on the subglacial and submarine sedimentary basins of Wilkes Land, East Antarctica.
- 2002-2009 *Frederick Holdings Company, LLC, Consulting Services*  
Self-employed conducting environmental and financial risk management services.
- 2000-2002 *Merrill Lynch, Financial Advisor*  
Financial advisor for 80 households and businesses with assets totaling over \$8.5MM.
- 1998-2000 *Brown and Caldwell, Project Manager/Geologist*  
Managed EPA RCRA and TDEQ VCP projects involving environmental risk management, litigation support, and environmental permitting processes.
- 1995-1998 *ERM-Southwest, Inc., Project Manager/Geologist*  
Assisted with the design and implementation/installation of groundwater and soil remediation projects for EPA RCRA and TDEQ VCP projects.

(Additional industry experience detailed in section below)

#### ***HONORS/AWARDS***

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Postdoctoral Research Travel Award - University of Kansas Postdoc Association, 2016.

Travel Stipend – National Association of Geoscience Teachers and Science Education Resource Center, 2016.

Late Career Scientist Travel Award - GSA and U.S. National Committee for the International Union of Geological Sciences (USNC/GS), 2015.

Late Career Scientist Travel Award - Global Innovation Initiative Grant from the British Council (ICECAP2), 2015.

Rosa & Thomas Layman Field Experience Scholarship – Univ. of Texas-Austin Jackson School for Geosciences, 2013.

Early Career Scientist Travel Award - GSA and U.S. National Committee for the International Union of Geological Sciences (USNC/GS), 2012.

High Honors - Faculty Award for Outstanding Achievement in Geology, Colgate University, May 1991.

Dean's Award, Colgate University, Fall 1989-Spring 1991.

Antarctica Service Medal, NSF Antarctic Research – ICECAP project, Nov-Dec 2011.

Antarctica Service Medal, NSF Antarctic Research for Undergraduate Institutions project, Nov-Dec 1990.

## ***PUBLICATIONS AND THESES***

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**Frederick, B.C.**, Gulick, S.P.S., Fernandez-Vasquez, R.A., Blankenship, D.D., Young, D.A., Domack, E., Leventer, A., Blum, M., 2018, Quantitative Geomorphological Analysis of the Sabrina Coast Continental Shelf and Aurora Subglacial Sedimentary Basins, East Antarctica, Geomorphology (In Preparation).

**Frederick, B.C.**, Blum, M.D., Snedden, J.W., Norton, I.O., 2018, Continental-scale provenance, paleodrainage, and structure of the Pre-Salt Eagle Mills Formation and coeval formations, Northern Gulf of Mexico Basin, GSA Bulletin (In Preparation).

Montelli, A., Gulick, S.P.S., Fernandez, R., **Frederick, B.C.**, Shevenell, A.E., Leventer, A., Blankenship, D.D., 2018, Seismic stratigraphy of the Sabrina Coast shelf, East Antarctica: history of early dynamic glaciations, GSA Bulletin (In Review).

**Frederick, B.C.**, Blum, M.D., Fillon, R.H., Roberts, H.H., 2017, Resolving the contributing factors to Mississippi Delta subsidence: Past and Present, Basin Research (In Press).

Fernandez, R., Gulick, S., Domack, E., Montelli, S., Leventer, A., Shevenell, A., **Frederick, B.**, 2018, Past ice stream and ice sheet changes in the continental shelf off Sabrina Coast, East Antarctica, Geomorphology, 317, p. 10-22.

Gulick, S.P.S., Shevenell, A., Montelli, A., Fernandez, R., Smith, C., Warny, S., Bohaty, S., Sjunneskog, C., Leventer, A., **Frederick, B.**, Blankenship, D., 2017, Initiation and long-term instability of the East Antarctic Ice Sheet, Nature, 552 (7684), p. 225-229.

Blum, M.D., Pecha, M.E., Milliken, K.T., Snedden, J.W., **Frederick, B.**, Galloway, W.E., 2017, Detrital-zircon record of Cretaceous through Oligocene drainage integration and sediment routing for the northern Gulf of Mexico margin, Geosphere, 13 (6), p. 1-37.

- Frederick, B.C.**, Blum, Mike D., Lowery, Chris M., Snedden, John W., 2016, Resolving Pre-Salt Sediment Source Terrains and Dispersal Pathways for the Northern Gulf of Mexico Basin, 35<sup>th</sup> Annual Gulf Coast Section SEPM Perkins-Rosen Research Conference, p. 233-251.
- Blum, M.D., Milliken, K.T., Snedden, J.W., **Frederick, B.**, 2016, Cenomanian Gulf of Mexico Paleodrainage from Detrital Zircons: Source-to-Sink Sediment Dispersal and Prediction of Basin Floor Fans. In: Mesozoic of the Gulf Rim and Beyond: New Progress in Science and Exploration of the Gulf of Mexico Basin. 35th Annual GCSSEPM Perkins-Rosen Research Conference, p. 344-366.
- Frederick, B.C.**, Young, D.A., Blankenship, D.D, Richter, T.G., Kempf, S.D., Ferraccioli, F., Siegert, M.J., 2016, Distribution of subglacial sediments across the Wilkes Subglacial Basin, East Antarctica, *Journal of Geophysical Research*, 121, p. 790-813.
- Frederick, B.C.**, Submarine Sedimentary Basin Analyses for the Aurora and Wilkes Subglacial Basins and the Sabrina Coast Continental Shelf, East Antarctica, PhD Dissertation, University of Texas-Austin Jackson School for Geosciences, 2015.
- Goff, J.A., Allison, M.A., Gulick, S.P.S., Reece, R., Davis, M., Duncan, D., Saustrup, S., Aisner, R., Alvarez, G., Rocio Bernal, A.B., Campos, H., Chang, L., Eakin, D., Fongern, R., Hereid, K., Huffman, R., Lester, R., Ramirez, M., Bales, K., Dunlap, D., Erturk, N., **Frederick, B.**, Greenbaum, J., Lunsford, J., Meyer, D., Neely, W., Sanford, J., Tudor, E., Vara, M., Zurbuchen, J., 2014, Shoreface ravinement evolution tracked by repeat geophysical surveys following Hurricane Ike, Bolivar Peninsula, Texas, 2008-2013, *Geophysics*, Vol. 80, No. 3, p. WB1 - WB10.
- Frederick, B.C.**, The development of the Holocene stratigraphic sequence within the Broad-Lostman's River region, southwest Florida coast, Masters Thesis, Univ. of Miami-Rosentiel School for Marine and Atmospheric Sciences, 1994.
- Pinet, P.R., McClennen, C.E., **Frederick, B.C.**, 1992, Sedimentation erosion patterns along the southeastern shoreline of Lake Ontario, in April, R.H. ed New York State Geological Association Field Trip Guidebook: Hamilton, NY, Colgate University Dept. of Geology, p. 155-169.
- Frederick, B.C.**, Domack, E.W., McClennen, C.E., 1991, Magnetic susceptibility measurements in Antarctic glacial-marine sediment from in front of the Muller Ice Shelf, Lallemand Fjord, *Antarctic Journal of the United States*, 26 (5).
- Frederick, B.C.**, The interpretive utility of magnetic susceptibility measurements in modern Antarctic glacial-marine sediment, Geology Honors Thesis, Colgate University, 1991.

### ***ABSTRACTS/PRESENTATIONS***

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- Frederick, B.**, Blum, M., Roberts, H., Fillon, R, Lower Mississippi River Delta Deep-Seated Subsidence Rate Dynamics, Bias, and Spatial-Temporal Depocenter Complexities through the Neogene, Geological Society of America Annual Meeting, Seattle, Washington, October 22-25, 2017.
- Young, D., Blankenship, D., Cavitte, M., **Frederick, B.**, The roughness of grounded ice sheet beds: Case studies from high resolution radio echo sounding studies in Antarctica, Spring 2017 of the European Geosciences Union, Vienna, Austria, April 23-28, 2017.

- Frederick, B.**, The Positive Educational Impacts of Active, Evidence-based Teaching Methodologies in the Geosciences and other STEM disciplines, 5<sup>th</sup> Annual Postdoctoral Research Day, KU Postdoctoral Association, April 27, 2017.
- Frederick, B.**, Blum, M., Snedden, J., Lowery, C., Reconstructing Pre-Salt Paleodrainage Pathways and Source Terrains for the Late Triassic Eagle Mills Formation, Northern Gulf of Mexico Basin, AAPG Annual Convention & Exhibition, Houston, Texas, April 2-5, 2017.
- Frederick, B.**, Blum, M., Snedden, J., Lowery, C., Triassic Source Terrains and Sediment Dispersal of the Presalt Eagle Mills Formation, Northern Gulf of Mexico Basin, Annual Meeting of the Gulf of Mexico Basin Depositional Synthesis Project, Austin, Texas, January 11-12, 2017.
- Frederick, B.**, Blum, M., Snedden, J., Lowery, C., Norton, I., Preliminary Source to Sink Dispersal Fingerprints from the Presalt Eagle Mills Formation, Northern Gulf of Mexico Basin, 15<sup>th</sup> Annual GCSSEPM Foundation Perkins-Rosen Research Conference, Houston, Texas, December 7-9, 2016.
- Blum, M.D. and **Frederick, B.C.**, Fingerprinting Source Terrain and Sediment Routing using Detrital Zircons: Application to the Gulf of Mexico Basin, Annual Meeting of the Gulf of Mexico Basin Depositional Synthesis Project, Austin, Texas, January 13-14, 2016.
- Smith, C., Domack, E., Shevenell, A., Leventer, A., Gulick, S., **Frederick, B.**, A new Eocene sedimentary sequence from Antarctica and its palynologic character, 2015 Annual Meeting of the Geological Society of America, Baltimore, Maryland, November 1-4, 2015.
- Fernandez-Vasquez, R., Gulick, S., Saustrop, S., **Frederick, B.**, Domack E., Lavoie, C., Leventer, A., Shevenell, A., Blankenship, D.D., and the NBP1402 Science Party, Did the geomorphic and sedimentary record off the Sabrina Coast, East Antarctica, originate as a result of past subglacial water outbursts and ice collapse?, 12<sup>th</sup> International Symposium for Antarctic Earth Sciences, Goa, India, July 13-17, 2015.
- Frederick, B.**, Young, D., Blankenship, D., Greenbaum, J., Richter, T., Distribution of Sediments within the Wilkes Subglacial Sedimentary Basin, East Antarctica, 12<sup>th</sup> International Symposium for Antarctic Earth Sciences, Goa, India, July 13-17, 2015.
- Gulick, S.P.S., Montelli, A., **Frederick, B.**, Domack, E., Shevenell, A., Sjunneskog, C., Bohaty, S., Leventer, A., Blankenship, D., Fernandez, R., Sangiorgi, F.T., Insights into changing East Antarctic paleoenvironments since the Eocene based on first-ever seismic imaging and coring on the Sabrina Coast shelf, 12<sup>th</sup> International Symposium for Antarctic Earth Sciences, Goa, India, July 13-17, 2015.
- Montelli, A.I., Gulick, S.P.S., **Frederick, B.**, Blankenship, D., Leventer, A., Shevenell, A., Domack, E., Seismic Stratigraphy of the Sabrina Coast Shelf, East Antarctica: History of Paleogene to early Neogene glacial evolution, 12<sup>th</sup> International Symposium for Antarctic Earth Sciences, Goa, India, July 13-17, 2015.
- Montelli, A., Gulick, S.P.S., **Frederick, B.C.**, Blankenship, D.D., Leventer, A., Shevenell, A., Domack, E.W., Seismic Stratigraphy of the Sabrina Coast Shelf, East Antarctica: History of Late Paleogene to Early Neogene Glacial Evolution, Fall 2015 Meeting of the American Geophysical Union, San Francisco, California, December 14-18, 2015.

- Domack, E.W., Gulick, S.P.S., Fernandez-Vasquez, R.A., **Frederick, B.**, Lavoie, C., Shevenell, A., Saustrop., S., Bohaty, S.M., Sangiorgi, F., Pre-glacial, Early Glacial, and Ice Sheet Stratigraphy Cored During NBP14502, Sabrina Coast, East Antarctic Margin, Fall 2014 Meeting of the American Geophysical Union, San Francisco, California, December 15-19, 2014.
- Fernandez, R., Gulick, S., Saustrop, S., **Frederick, B.**, Domack, E., Lavoie, C., Leventer, A., Shevenell, A., Blankenship, D.D., and the NBP1402 Science Party, The geomorphic and sedimentary record of past subglacial water outbursts, Sabrina Coast, East Antarctica, Fall 2014 Meeting of the American Geophysical Union, San Francisco, California, December 15-19, 2014.
- Frederick, B.C.**, Gulick, S.P.S., Saustrop, S., Fernandez-Vasquez, R.A., Blankenship, D.D., Leventer, A., Domack, E.W., Lavoie, C. and NBP1402 Scientific Party, Seismic Stratigraphy of Ice Sheet Advance-Retreat Cycles on the Sabrina Coast Continental Shelf, East Antarctica, Fall 2014 Meeting of the American Geophysical Union, San Francisco, California, December 15-19, 2014.
- Gulick, S., Fernandez-Vasquez, R., **Frederick, B.**, Saustrop, S., Domack, E., Lavoie, C., Leventer, A., Shevenell, A., Blankenship, D.D., and the NBP1402 Science Party, Transitions in ice volume based on seismic stratigraphy in Sabrina Coast, East Antarctica: Preliminary results from NBP1402, Fall 2014 Meeting of the American Geophysical Union, San Francisco, California, December 15-19, 2014.
- Gulick, S.P.S., Fernandez-Vasquez, R.A., **Frederick, B.**, Saustrop, S., Domack, E., Lavoie, C., Shevenell, A., Blankenship, D.D., Leventer, A., Environmental and ice volume changes based on seismic stratigraphy in Sabrina Coast, East Antarctica: Preliminary results from NBP1402, Fall 2014 Meeting of the American Geophysical Union, San Francisco, California, December 15-19, 2014.
- Frederick, B.C.**, Gooch, B.T., Richter, T.G., Young, D.A., Blankenship, D.D., Aitken, A.R.A., Siegert, M.J., Subglacial sedimentary basin characterization of Wilkes Land, East Antarctica via applied aerogeophysical inverse methods, Fall 2013 Meeting of the American Geophysical Union, San Francisco, California, December 9-13, 2013.
- Gooch, B.T., **Frederick, B.C.**, Richter, T.G., Young, D.A., Blankenship, D.D., Improved Geothermal Heat Flux Estimates for East Antarctic Subglacial Basins from Groundwater Modeling and Ocean Observations, Fall 2013 Meeting of the American Geophysical Union, San Francisco, California, December 9-13, 2013.
- Frederick, B.C.**, Young, D.A., Blankenship, D.D., Subglacial Sediment Distribution in the Aurora Basin, East Antarctica: Implications for Ice Sheet and Eustatic models, Scientific Committee for Antarctic Research: 11th International Symposium on Antarctic Earth Sciences (ISAES), Edinburgh, Scotland, July 10-15, 2011.
- Young, D.A., Blankenship, D.D., Siegert, M.J., van Ommen, T., Wright, A.P., Robert, J.L., Holt, J.W., Greenbaum, J.S., **Frederick, B.C.**, Schroeder, D.M., Warner, R.C., Young, N.W. and the ICECAP team, Extent, Geomorphology and Geophysics of the Aurora and Wilkes Subglacial Basins, East Antarctica: Influences on Ice Sheet Architecture, Scientific Committee on Antarctic Research (SCAR) Biannual Conference, Buenos Aires, Argentina, August 3-6, 2010.
- Wanless, H.R., **Frederick, B.**, Gelsanliter, S., and Risi, J.A., 1994, Dynamics and Historical Evolution of the Mangrove/Marsh Fringe Belt of Southwest Florida in Response to Sea-level History, Biogenic

Processes, Storm Influences and Climatic Fluctuations. Semi-Annual Research Report plus 3 Appendices to Everglades National Park and National Biological Survey, 15p.

Wanless, H.R., **Frederick, B.**, Gelsanliter, S., and Risi, J.A., 1993, Dynamics and Historical Evolution of the Mangrove/Marsh Fringe Belt of Southwest Florida in Response to Sea-level History, Biogenic Processes, Storm Influences and Climatic Fluctuations, First Annual Research Report plus 6 Appendices to Everglades National Park and National Biological Survey, 28p.

**Frederick, B.C.**, Gelsanliter, S., Risi, J.A., and Wanless, H.R., 1992, Historical evolution of the southwest Florida coastline and its effect on the adjacent marine environments, Symposium on Florida Keys Regional Ecosystem, Univ. Miami and NOAA, p. 11.

**Frederick, B.C.**, McClennen, C.E., and Pinet, P.R., 1991, Quantification of differential erosion patterns on a drumlin bluff along the coast of southeastern Lake Ontario, Geological Society of America Abstracts with Programs, v. 23, p. 31.

Romanowicz, E.A., McNamara, J.P., Siegel, D.I., Glaser, P.H., Nelson, D., Neuzil, S.G., **Frederick, B.C.** and Struck, C., 1990, Ground-Water Discharge Beneath Raised Bogs, Lake Agassiz Peatlands, Minnesota: Part I: Hydraulic Evidence, EOS, Transactions of the American Geophysical Union, 71:43, p. 1299.

Siegel, D.I., McNamara, J.P., Romanowicz, E.A., Glaser, P.H., Nelson, D., Neuzil, S.G., **Frederick, B.C.** and Struck, C., 1990, Ground-Water Discharge Beneath Raised Bogs, Lake Agassiz Peatlands, Minnesota: Part 2: Geochemical Evidence, EOS, Transactions of the American Geophysical Union, 71:43, p. 1299.

## ***RESEARCH PROPOSAL AWARDS***

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Collaborative Research: Pre-Salt Sediment Dispersal Pathways for the Northern Gulf of Mexico Margin from Detrital Zircons, Gulf Basin Depositional Synthesis Consortium, Budget - \$165,000

Collaborative Research: Totten Glacier System, Cryosphere – Ocean Exchange and its Geologic Record, NSF\Polar Programs, Budget - \$181,212

Collaborative Research in IPY: Investigating the Cryospheric Evolution of the Central Antarctic Plate (ICECAP), NSF/Polar Programs, Budget - \$799,904

## ***SERVICE***

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Undergraduate Mentor, Jayhawks Breaking Barriers: Empowering women through STEM leadership and mentoring opportunities, University of Kansas, 2017.

Senator, University Staff Senate, University of Kansas, 2016-2017.

Member, University of Kansas Postdoctoral Researcher Association, 2015-present.

Volunteer Coordinator, University of Texas-Austin Geophysical Society, 2013-2014.

Treasurer, University of Texas-Austin Geophysical Society, 2012-2013.

Chairman, Wimberley Chamber of Commerce, 2001-2002.

Member, Geology Club, Colgate University, 1989-1991.

### ***TEACHING EXPERIENCE***

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Teaching: Co-Instructor for Terrigenous Clastic Depositional Systems upper-division undergraduate and graduate-level student course at the Univ. of Kansas under the auspices of Dr. Mike Blum, Sept – Dec 2016.

Teaching: Instructor for Introduction to Geology laboratory for undergraduate students at the Univ. of Texas-Austin. Drs. Leon Long and Laurie Duncan, supervisors, January – May 2012, January – May 2013.

Teaching: Instructor for Chemical Oceanography laboratory for undergraduate students at the Univ. of Miami. Dr. Frank Millero, supervisor, January – May 1992.

### ***GRADUATE STUDENT RESEARCH PROJECT COLLABORATION***

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Andrew Philbin (MS - 2017) – Evidence of Holocene eustatic variability from US Gulf of Mexico beach ridges

Abdullah Wahbi (PhD – 2020) – Paleodrainage of the Lower Cretaceous McMurray Formation, Alberta Foreland Basin System

### ***FIELD - LABORATORY EXPERIENCE***

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2015-7 Geochronological analysis of detrital zircons from the Bengal Fan, US Basin and Range and Gulf of Mexico regions at the University of Arizona LaserChron center.

2016 Investigation of Holocene sea level fluctuation along the Texas-Alabama Gulf Coast using ground-penetrating radar.

2014 Totten Glacier System and the Marine Record of Cryosphere Ocean Dynamics, R/V Nathaniel B. Palmer Cruise 14-02.

2012 Investigation of the Cryospheric Evolution of the Central Antarctic Plate, Basler DC-3T aerogeophysical platform.

1992-3 Investigation of the Holocene stratigraphic sequence within the Broad-Lostman's river region, Everglades National Park, Florida.

1990 Investigation of Lallemand Fjord sedimentation rates in the Antarctic Peninsula, R/V Polar Duke Cruise 90-7.

1990 Advective transport and dispersion of solutes and dissolved gases, Glacial Lake Agassiz Peatlands, Washkish, MN.

1990 Mineralogic, morphologic, and sedimentary evaluation of glacial moraine erosion, Sitts Bluff, Lake Ontario, NY.

1989 Investigation of low-grade metamorphism in sandstones, Lake Champlain, NY.

## ***INSTRUMENT EXPERIENCE***

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X.R.D.	X.R.F.
Cesium Magnetometer	Shatter Box
S.E.M.	Smith-McInyre Grab Sampler
Rock Saw	Gas Chromatograph
Piezometer nests	Thermistor probe
Vertical Accumulation Tube	Groundwater Data logger
GPS	Marine piston, gravity, Kasten cores
BGM-3 & GT1A Gravity meters	Ice-penetrating radar (60 MHz)
Seismic Airgun & Streamer arrays	LA ICP-MS
Ground-penetrating radar	Vibracore
Kongsberg multibeam	

## ***SOFTWARE EXPERIENCE***

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Microsoft Office Suite (Word, Excel, Outlook, Powerpoint, Access)	
Quickbooks	ArcGIS
SMT Kingdom	Petra
Hampson-Russell	Caris
Paradigm GOCAD-VPmg	Focus
Petrel	RokDoc
Matlab	Linux
Landmark DecisionSpace	Peloton

## ***PROFESSIONAL ORGANIZATIONS***

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American Geophysical Union  
Society for Sedimentary Geology  
Geological Society of America  
Society of Exploration Geophysicists  
American Association of Petroleum Geologists  
National Association of Geoscience Teachers

## ***CO-CURRICULAR SERVICE***

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Certified, Advanced NAUI Open Water SCUBA Diver, 1984.

Certified Staff Member, Outdoor Recreation Dept, Colgate University 1989-1991.

Certified, Red Cross Advanced Life Saving and First Aid, Spring 1989.

Authorized, US Coast Guard 100-ton Master Near Coastal (Captain's) License with sail auxiliary, Summer 1988.

Authorized, FCC Marine Radio Operators Permit, Summer 1988.



Member, Crew Team, Colgate University, 1987.

### ***ADDITIONAL PROFESSIONAL EXPERIENCE***

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Exploration Geophysicist, Noble Energy Corporation, Denver, CO, Summer 2012. Interpreted 3D seismic and well data in the DJ Basin to attempt to advance new conventional plays.

Exploration Geophysicist, Encana Oil and Gas, Dallas, Tx, Summers 2010, 2011. Interpreted 3D seismic in Haynesville Shale play to better predict unconventional reservoir performance.

Petroleum Geologist, Amerada Hess Corporation, Houston, Tx, Summer 1991. Interpreted well log and seismic data to map multiple pay sands in an offshore field (Galveston 343) in an attempt to better exploit proven reserves.

Tugboat Deckhand, Spentonbush/Red Star Towing, New York, NY, Summer 1989. Assisted in securing lines from tug to various ships, barges, and docks in the New York harbor area, as well as learning the techniques of tug operation, line handling, and barge discharge.

Captain and Deckhand, Caribbean Sea Adventures, St. Croix, USVI, Summer 1986-1988. Served as captain and crew aboard 36 to 40' chartered sailboats operated daily between Buck Island and St. Croix.

**References Available Upon Request**