CURRICULUM VITAE

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EDUCATION

2002-2004 **M.S., Marine Science**, The University of Texas at Austin Marine Science Institute, Port Aransas, TX.

1997-2001 **BA, Biology**[1], **Environmental Science**[2], Clark University, Worcester, MA. *Cum laude* with high honors.

Fall 1997 Sea Education Association, Woods Hole, MA. Fall semester 1999. Class W-165.

RESEARCH INTERESTS

Biogeochemical changes in tracemetal and nutrient species
Use of isotopes as environmental tracers to study contemporary and geologic events
Use of radioisotopes to study

AWARDS & SCHOLARSHIPS

2003-2004 National Science Foundation GK-12 Graduate Fellowship, University of Texas at Austin

Fall 2003 Summer Graduate Fellowship, Environmental Science Institute, University of Texas at Austin

1997-2001 Carlson Science Scholarship, Clark University 1997-2001

1997-2001 Scholar Athlete in Varsity Swimming

PROFESSIONAL EXPERIENCE

Jan 2008 - current. Research Assistant III. Dept. Marine Chemistry and Geochemistry, WHOI.

(1) Work with Matt Charette: Our lab studies the cycling of radioisotopes, trace metals and nutrients in groundwater and the chemical changes that occur when submarine groundwater discharges to the coast. I have been involved in all aspects of this research, including fieldwork, processing and analysis of trace metals, nutrients and radioisotopes, data analysis and writing of reports and publications.

(2) Work with Ken Buesseler: In April of 2011 I began assisting in Ken's lab to help with preparation of materials and processing of aerosol, rain and water column samples to measure I-131 and Cs-137 from Fukushima nuclear reactors. Participated in June 2011 Fukushima Cruise and will be responsible for sample processing post-cruise.

Jan-Sept 2006. Researcher. Department of Geological and Environmental Sciences, Stanford University.

Work with Jonathan Payne: Investigated causes for the Permian-triassic mass extinction. Processing and purification of carbonate samples and measurement of Carbon, Oxygen and

Strontium isotopic ratios on a Finnegan Mass Spectrometer. (2) Work with Adina Paytan: Collection and measurement of radium, nutrients, bacteria, caffeine and other tracers to quantify and study groundwater discharge in Kona, Hawaii.

2004-2006. Research Associate. Biogeochemistry lab at University of Texas at Austin Marine Science Inst.
Work with Dr. Henrietta Edmonds. Preparation of materials for collection and detection of water column and porewater radium, nutrients and other environmental parameters to estimate groundwater flux into Texas bays. Daily procedures involve processing of water column derived radium samples for measurement via alpha and gamma spectroscopy (gamma requires extraction and precipitation of radium from samples).

Sept-Nov 2004. Research Assistant. University of Texas at Austin Marine Science Institute.
Work in Dr. Edward Buskey's Zooplankton Ecology Lab. Video analysis of predator-prey interactions. Use of Metavue program to measure and estimate copepod reaction ("jump") distances and latencies in response to live blenny stimulus and water motion stimulus created by a siphon.

2002-2004. M.S. and Graduate Research Assistant. University of Texas at Austin Marine Science Institute.
Studied the effect of red tide on copepod feeding, fecundity, and behavior. Involved maintenance of phytoplankton cultures, design, set up and running feeding experiments and video analysis with a high speed video camera. Also required the field collection of zooplankton, phytoplankton and environmental samples (D.O., light attenuation, pore-water, etc.) and the enumeration & identification of phytoplankton cells via light microscopy and a new digital imaging FlowCam system. Data analysis using Sigma Stat program. **Thesis title: The role of copepods in red tide (*Karenia brevis)* bloom dynamics*:* suppressors, initiators or innocent bystanders?**

2001-2002. Research Technician. Academy of Natural Sciences, Philadelphia, PA.
Jackson River study, Covington, VA. Collection, enumeration and analysis of periphyton & macrophyte samples, analysis of river samples for chlorophyll a, total suspended solids, stable isotopes to study effects of paper mill effluent on diurnal and seasonal changes in dissolved oxygen, water chemistry and algal species.

TEACHING EXPERIENCE

2006-2008 Science Teacher. Grade 7. Plymouth Community Intermediate School
Full time, taught grade 7 science standards to 5 classes of students. Included designing and modification of lessons, labs & fieldtrips. Curriculum taught: Scientific method, chemistry, cells, classification, oceanography and physics.

2003-2004 NSF GK-12 Graduate Fellow. University of Texas at Austin, Marine Science Institute
Worked with local teachers and grade 5-8 students developing and implementing innovative

science labs, fieldtrips in various fields of research. Teacher training on use of new digital microscope image projection system in the classroom.

Fall 2002 Teaching Assistant. **University of Texas at Austin.**
Assisted in development & evaluation of labs, exams and assignments for Introduction to Oceanography course for non-majors. Tutored students, and acted as a liaison between students and professor.

SUPERVISION AT WHOI

- **2010- current** Benjamin Linhoff, PhD candidate.
- **2010- current. Morgan Dinello** (Part time help)
- **May to Dec 2010 and Summer 2009.** Joseph Murray, visiting undergraduate and SSF.
- **2009-2010. Qian Liu**, visiting PhD student.
- **2009-2010. Grace Rago** (Part time help)

FIELDWORK/CRUISE PARTICIPATION AT WHOI

- May 29-June 19, 2011. Depart from Yokohama, Japan. Cruise R/V KOK with Ken Buesseler's group to study ocean transport of radioisotopes from nuclear fallout and wash down of power plant.
- October 17-22, 2010. Florida. 3 days in estuaries on small boat, 1 day groundwater sampling.
- April 12-15, 2010. Florida. 3 days estuaries on small boat, 2 days land groundwater sampling.
- Dec 1-10, 2009. Yucatan, Mexico. NSF Subterranean Estuary Research Grant. Two days offshore, 3 days small boats in estuaries, 5 days sampling cenotes and groundwater from land.
- April 2009- June 2010. Monthly sampling for time series study, Waquoit Bay, MA.
- October 11-16, 2009. Florida. Two days offshore boats, 2 days on boats ,1 day land.
- 12-17 April 2009. Florida. Cove Point Foundation grant. 2 days offshore, 1 day estuaries-small boat, 2 days land.

FURTHER EDUCATION

2010 ICP-MS Training by Bernhard Peucker-Ehrenbrink

PUBLICATIONS, REPORTS & ABSTRACTS

Please note: ***My maiden name is Firth,*** *presenting author

J.A. Breier, C.F. Breier and H.N. Edmonds. 2010. Seasonal dynamics of dissolved Ra isotopes in the semi-arid bays of south Texas. *Marine Chemistry* **122**: 39-50.

Breier, C.F. and E.J. Buskey. 2007. Effects of the red tide dinoflagellate, *Karenia brevis*, on grazing and fecundity in the copepod, *Acartia tonsa*. *Journal of Plankton Research* **29** (2), 115-126.

Breier, J.A., C. F. Breier, and H.N. Edmonds. 2006. Detecting submarine groundwater discharge with synoptic surveys of sediment resistivity, radium, and salinity. *Geophysical Research Letters*, **32**.

Reports:
Charette, M.A., Henderson, P.H., Breier, C.F., Liu, Q. Drift Algae Project Final Report. Task 3: Quantifying Groundwater Discharge to the Caloosahatchee River Estuary, October 2010.

Charette, M.A., Henderson, P.H., Breier, C.F. A link between submarine groundwater discharge and red tide in southwest Florida? The Cove Point Foundation Year End Report, Nov 2010.

Charette, M.A., Henderson, P.H., Breier, C.F. A link between submarine groundwater discharge and red tide in southwest Florida? The Cove Point Foundation Mid-Year Report, June 2010.

Charette, M.A., Henderson, P.H., Breier, C.F. A link between submarine groundwater discharge and red tide in southwest Florida? The Cove Point Foundation Year-End Report, November 2009.

Published Abstracts:
Linhoff, B.S.*, Breier, C., Charette, M.A. Submarine groundwater discharge as a sink for uranium. Presented at *American Society of Limnology and Oceanography meeting*, February 2011.

M. Charette*, P. B. Henderson, M. E. Gonneea, C. Breier, J. Murray, J.W. Jenson, S. Morales, J. Herrera-Silveira. Submarine Groundwater Discharge of Trace Elements and Isotopes from Karst Systems. *American Geophysical Union meeting* , Dec 2010.

Charette, M.*, C. Breier, H. Dulaiova, M. Gonneea, P. Henderson, K. Kroeger, A. Mulligan, A. Rao, and C. Slomp. Nutrient biogeochemistry in permeable sediments impacted by submarine groundwater discharge. 2010 Goldschmidt Conference. *Geochimica et Cosmochimica Acta*, 74, A162. *Invited.*

Charette, M.A.*, P.B. Henderson, C.F. Breier, M.E. Gonneea, J.W. Jenson, and J. Herrera-Silveira. Submarine Groundwater Discharge from Karst Systems: Is Radium Tracing the Fresh Component? *Ra-Rn3: Radium and Radon Isotopes As Environmental Tracers*, Jerusalem, Israel, March 2010. Invited.

Charette, M.A*, Gonneea, M., Henderson, P., Rao, A., Breier, C., and Murray, J. Subterranean estuaries in karst systems: biogeochemical cycling of trace metals and nutrients. 2009 *Geological Society of America* Meeting, Portland, Oregon. *Invited*.

Breier, C.F.* and E.J. Buskey. 2006. Presentation. Understanding HAB-Grazer dynamics: Ingestion of the harmful alga, *Karenia brevis*, by the copepod *Acartia tonsa*, and fecundity of the copepod, depends on the presence of other algal species. *AGU/ASLO Ocean Sciences Meeting,* Oahu.

Firth, C.A. 2004.* The role of the copepod *Acartia tonsa* in red tide (*Karenia brevis*) bloom dynamics: Suppressor, initiator or innocent bystander? Masters thesis, The University of Texas at Austin.

Firth, C.A.* and E.J. Buskey, 2004. Grazing and egg production of copepods fed natural red tide (*Karenia brevis*) assemblages or laboratory reared cultures. Poster. *American Society of Limnology and Oceanography* 2004 Summer Meeting.

K. Sachen*, C.A. Firth, N.E. Saxe, C.A. Flinders, F. Acker, and D.F. Charles. 2003. An ecological study of algal communities in the Jackson River (Covington, VA): Spatial and temporal trends in the taxonomic composition of algal assemblages. *North American Benthological Society* 2003 Annual meeting.

Acknowledgements:
K. L. Knee, R. Gossett, A.B. Boehm, and A. Paytan. 2010. Caffeine and agricultural pesticide concentrations in surface water and groundwater on the north shore of Kauai (Hawaii, USA). *Marine Pollution Bulletin* **60 (8):** 1376-1382.

K.L. Knee, J. H. Street, E.E. Grossman, A.B. Boehm, and A. Paytan. 2010. Nutrient inputs to the coastal ocean from submarine groundwater discharge in a groundwater-dominated system: Relation to land use (Kona coast, Hawaii, U.S.A.). *Limnol. Oceanogr*., **55(3)**: 1105–1122 .

K.L. Knee, J. H. Street, E.E. Grossman, and A. Paytan. USGS Scientific Investigations Report. Submarine Ground-Water Discharge and Fate Along the Coast of Kaloko-Honoko¯ hau National Historical Park, Island of Hawaii. Part 2, *Spatial and Temporal Variations in Salinity, Radium-Isotope Activity, and Nutrient Concentrations in Coastal Waters*, December 2003–April 2006.

COMPUTER SKILLS

Windows 95, 98, NT, XP. MS Office Suite.
Data analysis & management: MATLAB, EXCEL, Access, Statistica, Sigma Stat/Plot, “R”, “S” computer language.