

Brice Loose

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CURRENT POSITION

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| 2012- | Assistant Professor, Graduate School of Oceanography, University of Rhode Island |
| 2012- | Adjunct Associate Research Scientist, Lamont-Doherty Earth Observatory of Columbia University. |

EDUCATION

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| 2009-11 | NOAA Climate and Global Change Postdoctoral Fellow, Woods Hole Oceanographic Institution. Host: Bill Jenkins |
| 2005-09 | PhD, Marine Chemistry and Geochemistry , Columbia University. Dissertation Title: <i>Gas in ice: A tale of dissolution, segregation and evasion during freezing and melting of H₂O</i> . Advisor: Peter Schlosser |
| 2000-03 | M.Sc. Civil and Environmental Engineering (<i>Maximum distinction</i>), Catholic University of Chile. Advisor: Yarko Niño. |
| 1999 | B.S. Hydrologic Sciences (<i>Honors</i>), University of California at Santa Barbara. |

TEACHING AND MENTORING EXPERIENCE

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| Student mentoring | Ann Lovely, URI/GSO. URI/GSO Masters of Oceanography, expected: June 2014.
Josephine Fong, UC Berkeley. URI/GSO Summer Undergraduate Research Fellowship Opportunity, 2012.
Rebecca Johnson, Columbia U. Lamont-Doherty Summer Internship, 2008.
Patrick Alexander, Columbia U. Lamont-Doherty Summer Internship, 2007. |
| 2012 | Course Instructor, OCG 506: Numerical models and data analysis in ocean sciences, 1 semester, Graduate School of Oceanography, University of Rhode Island. |
| 2007 | Teaching Assistant; Quantitative Methods of Data Analysis for graduate students, 1 semester, Dept. of Earth and Environmental Sciences, Columbia University. |
| 2001-02 | Teaching Assistant; Fluid Mechanics, 3 semesters, College of Engineering, Catholic University of Chile. |

PROFESSIONAL SERVICE

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| Manuscript reviewer | Nature - Geoscience, Climate Change; Geophysical Research Letters; Journal of Hydraulic Research; Water Resources Research; Journal of Geophysical Research - Atmospheres, Oceans; Antarctic Science |
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- 2003-05 Co-founder, Board Member; Waterscience Research Community, an IRS 501(c)(3) nonprofit organization.** The goal of WRC is to support Open Source sharing and distributed collaboration in water-related disciplines by hosting research tools published under Public license and by bringing engineers and scientists together with organizations that are working in the public interest. URL: <http://www.water-sci.org>

AWARDS AND FUNDING

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- 2012 Using opportunistic radon measurements to estimate the gas transfer velocity in partial sea ice cover.** US National Science Foundation, Office of Polar Programs. PI: **Brice Loose**, co-PI's: Brad Moran, William Smethie. Duration: Nov. 2012-Oct. 2014. \$388,269.-
- 2012 Climate change mitigation at the village level: How to optimize mangrove revegetation, Casamance River, Senegal.** . URI Proposal Development Grant. PI: **Brice Loose** Duration: Oct. 2012-Sep. 2013. \$14,972.-
- 2010 GAs Transfer through Polar Sea ice (GAPS): Mechanisms of turbulence production in the seasonal ice zone, and its control of mixed layer ventilation.** US National Science Foundation, Office of Polar Programs. PI: Peter Schlosser, co-PI's: Wade McGillis, Chris Zappa. Duration: Oct. 2010-Oct. 2012. \$460,273.-
- 2010 Controls on CO₂ Fluxes in the Marginal Ice Zone: Biological Productivity and Air-Sea Gas Exchange,** Arctic Research Initiative, Woods Hole Oceanographic Institution. PI's: Rachel Stanley, **Brice Loose**, Duration: Jun. 2010-Jun. 2013. \$192,056.-
- 2009 NOAA/UCAR Climate and Global Change Postdoctoral Fellowship,** National Oceanographic and Atmospheric Administration. Duration: Dec. 2009 - Dec. 2011
- 2008 Faculty Fellowship,** Lamont-Doherty Earth Observatory of Columbia University.
- 2007-08 LDEO Climate Center Fund for Start-up Research in Climate Change.** Laboratory measurement of gas transport through sea ice, with application to the Southern Ocean inorganic carbon budget. **B. Loose**, D.T. Ho, P. Schlosser, T. Takahashi. \$6,000.-
- 2007 Surface Ocean Lower Atmosphere Science (SOLAS) Summer School,** Corsica, France.
- 2006 National Science Foundation Summer School in Porous Media,** Purdue University.
- 2006 Jerome M. Paros-Palisades Geophysical Institute Fund for Engineering Innovation in Geoscience,** A portable universal water sampler for dissolved gases, M. Stute, and **B. Loose**. \$10,000.-.
- 2005-08 National Science Foundation,** IGERT Fellowship in Earth Science and Applied Math.
- 2005 University of California Mexico-US Foundation,** Developing a sustainable water resources management plan for San Cristbal de las Casas, Chiapas. **B. Loose**, J.F. Clark, and A. Keller. \$15,000.-.

- 1999** **Department of Environmental Studies, Hydrology** Distinction in the Major.
- 1997** **Department of Ecology, UC, Santa Barbara** Undergraduate Research Training Grant.

PUBLICATIONS IN PREPARATION

Loose, B., Jenkins, W.J. (submitted). Heavy noble gases provide a unique trace of glacial meltwater, *Geophysical Research Letters*.

Loose, B., M. G. McPhee, W. R. McGillis, D. Perovich, C. J. Zappa, and P. Schlosser (in prep.). A parameter model of gas exchange for the seasonal sea ice zone, Ocean Science, in *Ocean Science*.

Loose, B., McGillis, W. (under review). Gas transport pathways at fronts and interfaces in the seasonal ice zone: A review. in *Chemical Oceanography of Frontal Zones*. Editor, Igor Belkin. Springer-Verlag.

Loose, B., Stute, M., Matter, J., and Schlosser, P. (in preparation for *Environmental Science and Technology*). A characterization of the aquifer system beneath the Hellisheidi geothermal plant Reykjavik, Iceland, using noble and ignoble gas tracers.

Loose, B., Jenkins, Moriarty, R., W.J., Ballantine, C. (in preparation). Tracer constraints on deep water formation in the Weddell: results from the ANDREX project.

PEER-REVIEWED PUBLICATIONS

Shepson, P.B., P. A. Ariya, C. J. Deal, D. J. Donaldson, T. A. Douglas, **B. Loose**, T. Maksym, P. A. Matrai, M. Russell, B. Saenz, J. Stefels, N. Steiner (2012). Changing Polar Environments: Interdisciplinary Challenges, *EOS*, V. 93, No. 11, March 2012.

Loose, B. and Schlosser, P. (2011). Sea ice and its effect on CO₂ flux between the atmosphere and the Southern Ocean interior. *Journal of Geophysical Research*, 116, C11019, doi:10.1029/2010JC006509

Loose, B., Miller, L.A., Elliott, S., and Papakyriakou, T. (2011). Sea ice biogeochemistry and material transport across the frozen interface. *Oceanography*, 24(3):202218, <http://dx.doi.org/10.5670/oceanog.2011.72>.

McGillis, W., Langdon, C., **Loose, B.**, Yates, K. K. and Corredor, J. (2011). Productivity of a coral reef using boundary layer and enclosure methods. *Geophysical Research Letters*, 38, L03611, doi:10.1029/2010GL046179.

Loose, B., Schlosser, P., Perovich, D., Ho., D., Ringelberg, D., Reynolds, C., Richter-Menge, J., McGillis, W.R. and Tison, J.-L. (2010). Gas diffusion through columnar laboratory sea ice: Implications for mixed-layer ventilation of CO₂ in the seasonal ice zone. *Tellus* 63B, doi:10.1111/j.1600-0889.2010.00506.x

Loose, B., Schlosser, P., Smethie, W.M., and S. Jacobs (2009). An optimized estimate of glacial melt from the Ross Ice Shelf, using noble gases, stable isotopes and CFC transient tracers. *Journal of Geophysical Research*, 114, doi:10.1029/2008JC005048.

Loose, B., Stute M. , Alexander P., and W.M. Smethie (2009). Design and deployment of a portable

membrane equilibrator for sampling aqueous dissolved gases. *Water Resources Research*, 36, W00D34, doi:10.1029/2008WR006969.

Loose, B., McGillis, W.R., Schlosser, P., Perovich, D., and T. Takahashi (2009). The effects of freezing, growth and ice cover on gas transport processes in laboratory seawater experiments. *Geophysical Research Letters*, 36, L05603, doi:10.1029/2008GL036318.

Hönisch, B., Hemming N. G., and **Loose, B.** (2007) Comment on “A critical evaluation of the boron isotope-pH proxy: The accuracy of ancient ocean pH estimates” by M. Pagani, D. Lemarchand, A. Spivack and J. Gaillardet. *Geochimica et Cosmochimica Acta* Vol. 71(6): pp. 1636-1641.

Loose B., Niño Y., and Escauriaza C. (2005) Finite-volume modeling of variable density shallow water flow equations for a well-mixed estuary: application to the Rio Maipo, Chile. *Journal of Hydraulic Research*, Vol. 43(4).

PRESENTATIONS

Fong, J., Lovely, A. and **Loose, B.**. Using Kinect to Measure Wave Spectrum. Presented at: American Geophysical Union, Fall Meeting, San Francisco, CA, December 3-7, 2012.

Loose, B.. What can we expect from an ice-free Arctic Ocean? Presented at: America’s Cup World Series Event, Newport RI, June 30, 2012.

Loose, B.. Carbon and biogeochemistry of the sea ice zone. Presented at: Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) Science Planning Workshop, Boulder, CO, June 27-29, 2012.

Loose, B. (invited). Sea ice biogeochemistry and transport across the frozen interface. Presented at: Ice at the Interface: Atmosphere-Ice-Ocean Boundary Layer Processes and Their Role in Polar Change workshop, Boulder, CO, June 25-27, 2012.

Loose, B., Moran, S.B. Measuring polar gas exchange: the effects of sea ice formation and melt on the ^{222}Rn budget in the Arctic mixed layer, 4th International Ra-Rn Workshop, Narragansett, RI, June 3-8, 2012

Loose, B. A parameter model for the air-sea gas transfer velocity in the sea ice zone. How can we test it? Presented at Applied Ocean Physics and Engineering Seminar, Woods Hole Oceanographic Institution, Woods Hole, MA, June 3-8, 2012

Loose, B. W. Jenkins, W. Smethie (invited). Geochemical proxies for sub-ice shelf processes. Presented at: Interdisciplinary Approaches to Understanding Ocean/Ice Shelf/Ice Sheet Interactions Workshop, San Francisco, CA. December 2-3, 2011.

Loose, B., Miller, L., Elliott, S. and Papakyriakou, T. (invited). Biogeochemistry in sea ice: Transport and rate-limiting processes at the frozen interface. Presented at: Ocean-Atmosphere-Sea Ice-Snowpack (OASIS) Workshop, Telluride, CO. June 20-24, 2011.

Loose, B. (invited) Gas transport pathways in the seasonal sea ice zone. Presented at: Yale Symposium on Frontiers in Earth Surface System Interactions, Yale University, New Haven, CT. May 12-13, 2011.

Loose, B. (invited) High hopes for inert gas tracers of transport in the polar oceans and in biogeochemical cycles. Presented at: Graduate School of Oceanography Seminar Series, University of Rhode Island, Narragansett, Rhode Island. February 4, 2011.

Loose, B. (invited) Gas in Sea Ice - A Tale of Dissolution, Rejection and Evasion during Freezing and Melting of H₂O. Presented at: COAS Chemical Oceanography Seminar, Oregon State University, Corvallis, OR. 14 October, 2010.

Loose, B. (invited) GAs transfer through Polar Sea ice (GAPS): What we know and what we guess about air-sea exchange in ice covered waters. Presented at: Sea ice microphysics workshop, Santa Fe NM. 8 -10 September, 2010.

Loose, B. Putting down roots: Will 100 million seeds bring back the mangrove forests in Senegal? Presented at: Science Made Public Seminar. Woods Hole, MA. August 15, 2010.

Loose, B. Schlosser, P. Sea ice regulation of mass transport between the atmosphere and Southern Ocean interior. Presented at: European Geophysical Union General Assembly; Vienna, Austria. May 5, 2010

Loose, B. The Super Gas-o-Matic: Three ways that sea ice can alter the surface ocean CO₂ budget. Presented at: Marine Chemistry and Geochemistry Seminar. Woods Hole Oceanographic Institution. Woods Hole, MA. Woods Hole, MA. June 8, 2010.

Loose, B., Schlosser, P., Perovich, D., Ringelberg, D., Ho, D., Takahashi, T., Richter-Menge, J., Reynolds, C. and McGillis, W. (2009). Gas transport through columnar laboratory sea ice: Implications for transport of biogenic gases. Presented at: American Geophysical Union, Fall Meeting. San Francisco.

Johnson, R., Zappa, C., **Loose, B.** (2008). The effects of ice on gas transfer seen through an infrared lens. Presented at: American Geophysical Union, Fall Meeting. San Francisco.

Loose, B., McGillis, W., Schlosser, P., Perovich D. and Takahashi T. (2008). The Effects of Freezing and Partial Ice Cover on Gas Transport in Laboratory Seawater Experiments. Presented at: American Geophysical Union, Fall Meeting. San Francisco.

Alexander, P., **Loose, B.** and Stute, M. (2007). Design and deployment of a portable membrane equilibrator for sampling aqueous dissolved gases. Presented at: American Geophysical Union, Fall Meeting. San Francisco.

Loose, B., Takahashi, T., Ho, D., Schlosser, P. (2007). The carbonate chemistry of sea ice and its effect on ocean-atmosphere CO₂ flux. Presented at: American Geophysical Union, Fall Meeting. San Francisco.

Loose, B., Takahashi, T., and Ho. D. (2007) Carbonate chemistry in sea ice and its effects on CO₂ in the surface ocean. Presented at: Surface Ocean, Lower Atmosphere (SOLAS) Summer School; Corsica, France.

Loose B., and Niño Y. (2002) Finite-Volume density coupled estuary modeling: Application to the Río Maipo Estuary, Chile. XXX IAHR Congress, Thessaloniki, Greece.

OTHER RESEARCH EXPERIENCE

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| 2003-05 | Post-graduate Researcher, Marine Science Institute, UC Santa Barbara. Analyzed limnologic field data, conducted simple modeling exercises, wrote and prepared technical literature for publication. |
| 2001 | Engineering Team Member; Analysis of Urban Stormwater Quality at Infiltration Wells, Santiago, Chile. Project financed by the Public Works Ministry, Chile. Organized neighborhoods to collect rainwater samples during storms. Analyzed for total coliform, particulate organic, and heavy metal presence, to assess the water quality of runoff reaching the city aquifer. |
| 1997-99 | Laboratory Assistant II, Geologic Sciences, UC Santa Barbara. Maintained a snow hydrology field site in Sequoia National Park, California. Tasks included repairing meteorological stations, collecting samples for nutrient analysis, and performing data preprocessing. |

Sea time

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| 2010 | RRS James Clark Ross, Montevideo Uruguay to the Weddell Sea. Antarctic Deep Water Rates of Export (ANDREX). Responsible for geochemical sampling of noble gases ³ He, ⁴ He, ³ H, Ne, Ar, Kr, Xe and ¹⁴ C. with Roisin Moriarty (U. of Manchester). |
| 2007 | R/V Nathaniel B. Palmer, McMurdo Station to the Amundsen/Bellingshausen Seas. Responsible for designing the geochemical sample spacing, including ³ He, ⁴ He, ³ H, Ne, and $\delta^{18}\text{O}$. Supervised a fellow graduate student in the water sample collection. |
| 2005 | R/V Robert Gordon Sproul, Santa Monica Basin. pilot experiment to compare SF ₅ CF ₃ with SF ₆ as a deliberate tracer in the ocean. Responsible for measurements using purge and trap method. Helped design sediment coring tool. |
| 2004 | R/V Revelle, CLIVAR Leg PO2 Hawaii to San Diego. Responsible for CFC collection and measurement using purge and trap method during 12 hour shift. |