Matthew R. McIlvin

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Education:

- Ph.D. in Analytical Chemistry, 2008. University of Massachusetts, Lowell, MA.
- B.S. in Chemistry, B.S. in Mathematics, 1998. University of Massachusetts, Dartmouth, MA.

Work Experience:

Research Associate, Saito lab: 2010-present, Woods Hole Oceanographic Inst.

- Performed sample analysis using LTQ, TSQ, and ICPMS.
- Adapted multi-dimensional liquid chromatography methods for protein and metals analysis on cultured bacteria and field samples.

Research Associate, Casciotti lab: 2004-2010, Woods Hole Oceanographic Inst.

- Managed biogeochemical laboratory including all equipment maintenance, data and sample management, and supervision of post docs and graduate students.
- Operated stable isotope facility that earned approximately $35,000 per year running nitrate isotope samples for outside clients and ran over 10,000 samples for internal laboratory experiments.
- Methods developed: a more cost-effective, faster method of oxygen isotopic analysis of water; a simpler method for hydroxylamine concentration in seawater; and, the first method for nutrient and isotopic analysis of individual benthic foraminifera.
- Equipment designed and built: first automated system for concentration and isotopic analysis of dissolved N_2O in water samples; automated N_2O headspace purge and trap system interface for IRMS; and, incubation chambers for labeled isotope experiments with marine sponges.
- Organized and prepared for seven major oceanographic research expeditions to South Pacific, North Pacific, North Atlantic, South Atlantic, and Indian Oceans.
- Certified for scientific diving at WHOI, 2007.
- Over 3 months shipboard sampling and groundwater sampling.

Research Assistant, 1998-2004, Center for Marine Science and Tech., New Bedford, MA

- 6 years experience in a marine chemistry laboratory while working towards Ph.D.
- Developed novel methods for nitrogen and oxygen isotopic analysis of nitrate and nitrite in seawater and freshwater.
- Performed regular and major maintenance on two isotope ratio mass spectrometers, GC, and HPLC.
- Installed new EA-IRMS, purge and trap IRMS, and quadrupole MS.
- Enhanced GC-IRMS interface for nitrogen and carbon isotopic analysis of amino acids.
- Designed and built autosampler and nitrous oxide trapping system for IRMS.
- Over 4 months shipboard sampling and analysis in Atlantic and Southern oceans.

Marine Mechanic, 1990-2005, Ron's Marine Service, Chatham, MA

- Worked part to full time in a family business.
- Repaired and rebuilt boat engines and electrical systems.

Teaching Experience:

Umass Dartmouth Chemistry Dept., North Dartmouth, MA

- Instructor, Chemistry Lab and Organic Chemistry recitation (2001)
- Laboratory Teaching Assistant (1997-2002)
    - physical chemistry (4 semesters),
    - analytical chemistry (2 semesters),
    - organic chemistry
    - general chemistry (3 semesters)

Publications:

- Santoro AE, Buchwald C, **McIlvin MR**, Casciotti KL, Isotopic Signature of N_2O Produced by Marine Ammonia-oxidizing Archaea. SCIENCE, 333(6047), 2011, 1282-1285.
- **McIlvin MR**, Casciotti KL, Technical Updates to the Bacterial Method for Nitrate Isotopic Analyses, ANALYTICAL CHEMISTRY, 83(5), 2011, 1850-1856.
- Casciotti KL, **McIlvin MR**, Buchwald C, Oxygen isotopic exchange and fractionation during bacterial ammonia oxidation, LIMNOLOGY AND OCEANOGRAPHY, 55(2), 2010, 753-762.
- **McIlvin MR**, Casciotti KL, Fully automated system for stable isotopic analyses of dissolved nitrous oxide at natural abundance levels, LIMNOLOGY AND OCEANOGRAPHY-METHODS, 8, 2010, 54-66.
- Casciotti KL, **McIlvin MR**, and Buchwald C., Oxygen isotopic exchange and fractionation during bacterial ammonia oxidation, LIMNOLOGY AND OCEANOGRAPHY, 55(2), 2010, 753–762.
- Higgins MB, Robinson RS, Casciotti KL, **McIlvin MR**, et al., A Method for Determining the Nitrogen Isotopic Composition of Porphyrins, ANALYTICAL CHEMISTRY 81(1), 2009, 184-192.
- Casciotti KL, **McIlvin MR**, Isotopic analyses of nitrate and nitrite from reference mixtures and application to Eastern Tropical North Pacific waters, MARINE CHEMISTRY, 107(2), 2007, 184-201.
- Casciotti KL, Bohlke JK, **McIlvin MR**, et al., Oxygen isotopes in nitrite: Analysis, calibration, and equilibration, ANALYTICAL CHEMISTRY, 79(6), 2007, 2427-2436.
- **McIlvin MR**, Casciotti KL, Method for the analysis of delta O-18 in water, ALYTICAL CHEMISTRY, 78(7), 2006, 2377-2381.
- **McIlvin MR**, Altabet MA, Chemical conversion of nitrate and nitrite to nitrous oxide for nitrogen and oxygen isotopic analysis in freshwater and seawater, ANALYTICAL CHEMISTRY, 77(17), 2005, 5589-5595