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Professional Interests:

The study and use of carbon isotope techniques to quantify biogeochemical processes; the study of the fate of organic matter, natural and anthropogenic, in sediments; development of techniques for analysis of oceanographic samples by AMS.

Education:

B.S. Chemistry, Trinity College, Hartford, CT, 1978

Ph.D. Chemical Oceanography, Joint Program in Oceanography, Woods Hole Oceanographic Institution/Massachusetts Institute of Technology, Woods Hole, MA, 1986.
Thesis Title: *A Study of the Remineralization of Organic Carbon in Nearshore Sediments Using Carbon Isotopes.*

Professional Experiences:

2002-Present Senior Research Specialist, National Ocean Sciences Accelerator Mass Spectrometer Facility, Woods Hole Oceanographic Institution, Woods Hole, MA.
1993-2002 Research Specialist, National Ocean Sciences Accelerator Mass Spectrometer Facility, Woods Hole Oceanographic Institution, Woods Hole, MA.
1989-1993 Research Associate, National Ocean Sciences Accelerator Mass Spectrometer Facility, Woods Hole Oceanographic Institution, Woods Hole, MA.
1988-1989 Research Scientist, Battelle Ocean Sciences, Duxbury, MA.
1988 Visiting Investigator with Dr. Glenn A. Jones, Woods Hole Oceanographic Institution, Woods Hole, MA.
1988 Visiting Lecturer and Post-doctoral Investigator, Massachusetts Institute of Technology, Cambridge, MA.
1986-1988 Visiting Investigator with Drs. Cindy Lee, Stuart Wakeham, and Ellen Druffel, Woods Hole Oceanographic Institution, Woods Hole, MA.
1980-1986 Graduate Research Fellow, Woods Hole Oceanographic Institution, Woods Hole, MA.
1979-1980 Research Assistant, Dr. R.B. Merrifield, Rockefeller University, New York, NY.

Professional Memberships:

Phi Beta Kappa, American Geophysical Union, American Chemical Society, Sigma Xi

Professional Activities and Invited Talks:

Reference Materials for Ocean Sciences, committee member, Committee charged by the National Research Council of the National Academy of Sciences to recommend reference materials for ocean science studies. June 2001-December 2002.

Associate Editor, *Radiocarbon*

17th *International Radiocarbon Conference*, member of International Advisory Board, Jerusalem Israel, June 2000.

Workshop on Sample Preparation, organizer of workshop at AMS-8, the 8th International conference on Accelerator Mass Spectrometry, Vienna, Austria, September 1999.

AMS and the Ocean: Tracing Natural Processes with Rare Isotopes, session chairperson, 216th ACS National Meeting, Boston, MA, August 1998.

Carbon in the Oceans, Scientific Coordinator and Chairperson for pre-conference workshop, 15th International Radiocarbon Conference, Glasgow, Scotland, August 1994.

Carbon cycling in coastal sediments: The use of carbon isotope ratios to investigate the oxidation of organic matter, presented at the Symposium on Organic Substances and Sediments in Water. American Chemical Society Meeting, Boston, April 1990.

The oxidation of organic carbon in marine sediments - from thermodynamics to the environment, presented to New England Association of Chemistry Teachers, 51st Summer Conference. Roger Williams College, August 1989.

Education Activities:

Courses Taught -

Aquatic Chemistry and Biology Laboratory, lecture and laboratory course, MIT.

Student Supervision -

Ann Pearson, MIT/WHOI Joint Program, 1994 - 1999, co-chair, thesis committee.

Fabian Batista, Minority Summer Student Fellow/WHOI, Summer 2003.

Anne-Sophie Kremer, Guest Student, Spring/Summer 2002.

Amy Englebrecht, MIT/WHOI Joint Program, Summer/Fall 2001.

Julia Parsons, MIT/UROP Program, Summer 2000.

Robert Ziemian, MIT/UROP Program, Summer 1999.

Emily Chen, MIT/UROP Program, Summer 1996.

Sarah O'Connor, MIT/UROP Program, Summer 1994

Annette Guy, MIT/UROP Program, Summer 1992.

Julian Sachs, MIT/WHOI Joint Program, Winter 1991.

Henrietta Edmonds, MIT/WHOI Joint Program, Summer 1991.

Catherine Lukancic, MIT/UROP Program, Summer 1991.

Numerous Tours of AMS Laboratory to classes, groups & individuals visiting WHOI.

Speaker for Lawrence Middle School's Women in Science Program, March 1992.

Field Experience:

1989-present Coordinate and participation in numerous cruises to Buzzards Bay, MA to collect water samples.

1988 Coordinated and participated in cruises to Boston Harbor to collect sediment samples.

1982-1986 Chief and assistant scientist on numerous cruises to collect sediment samples in Buzzards Bay aboard WHOI's R/V *Asterias*.

Summer, 1980 Participated in organic geochemistry cruise from Bermuda to Woods Hole aboard R/V *Oceanus*. Assisted in hydrographic sampling for carotenoid and amino acid research. Sectioned cores for light hydrocarbon studies.

WHOI Committees:

Women's Committee, (1989 - 1992).

Benefits Advisory Committee (1991 - 1992).

Geology & Geophysics Safety Committee (Chair, 1993 to 2000).

Institution Safety Committee (1995 to 2000).

MIT/WHOI Joint Program Alumni Committee, Secretary (1997-present)

Ad Hoc Safety Committee (2001)

Supervision (current):

Alan Gagnon, Research Associate III (1995- present)
Joanne Donoghue, Engineer II (1995-2003)
Dana Stuart, Research Associate II (1997-present)
Kristin Smith, Research Assistant II (2002-present)
Mary Lardie, Research Assistant II (2003-present)

Peer - Reviewed Publications:

- Hunt, J.M. and McNichol, A.P., 1984. The Cretaceous Austin Chalk of South Texas--A petroleum source rock. In: *Petroleum Geochemistry and Source Rock Potential of Carbonate Rocks*, J.G. Palacas, (ed.), *AAPG Studies in Geology* #18, 117-125.
- McNichol, A.P., Lee, C. and Druffel, E.R.M., 1988. Carbon cycling in coastal sediments: 1. A quantitative estimate of the remineralization of organic carbon in the sediments of Buzzards Bay, MA: *Geochimica et Cosmochimica Acta*, 52:1531-1543.
- Jones, G.A., McNichol, A.P., von Reden, K.F. and Schneider, R.J., 1990. The National Ocean Sciences AMS facility at Woods Hole Oceanographic Institution: *Nuclear Instruments and Methods in Physics Research*, B52:278-284.
- McNichol, A.P., Druffel, E.R.M. and Lee, C. 1991. Carbon cycling in coastal sediments: 2. An investigation of the sources of ΣCO_2 to pore water using carbon isotopes: In: *Organic Substances and Sediments in Water. Processes and Analytical*, Baker, R.A. (ed.), CRC Press, Boca Raton, FL, Vol. 2:249-272. WHOI Contribution No. 7413.
- Chin, Y.-P., McNichol, A.P. and Gschwend, P.M. 1991. Quantification and characterization of porewater organic colloids: In: *Organic Substances and Sediments in Water. Processes and Analytical*, Baker, R.A. (ed.), CRC Press, Boca Raton, FL, Vol. 2:107-126.
- Rowe, G.T. and McNichol, A.P., 1991. Carbon cycling in coastal sediments, 2. Estimating remineralization in Buzzards Bay, MA -- A comment: *Geochimica et Cosmochimica*, 55, 2989-2991.
- McNichol, A.P., Gagnon, A.R., Jones, G.A. and Osborne, E.A., 1992. Illumination of a black box: Gas composition changes during graphite target preparation for AMS: (Proceedings of the 14th International Radiocarbon Conference, 1991), *Radiocarbon*, 34:321-329.
- von Reden, K.F., Jones, G.A., Schneider, R.J., McNichol, A.P., Cohen, G.J. and Purser, K.H., 1992. The new National Ocean Sciences Accelerator Mass Spectrometer Facility at Woods Hole Oceanographic Institution - Progress and first results: (Proceedings of the 14th International Radiocarbon Conference, 1991), *Radiocarbon*, 34:476-481.
- McNichol, A.P. and Druffel, E.R.M., 1992. Variability of the $\delta^{13}\text{C}$ of dissolved inorganic carbon at a site in the North Pacific Ocean: *Geochimica et Cosmochimica Acta*, 56:3589-3592.
- McNichol, A.P., Osborne, E.A., Gagnon, A.R., Fry, B. and Jones, G.A., 1994. TIC, TOC, DIC, DOC, PIC, POC - Unique aspects in the preparation of oceanographic samples for ^{14}C -AMS: *Nuclear Instruments and Methods in Physics Research*, B92:162-165.
- Osborne, E.A., McNichol, A.P., Gagnon, A.R., Hutton D.L. and Jones, G.A., 1994. Internal and external checks in the NOSAMS Sample Preparation Laboratory for target quality and homogeneity: *Nuclear Instruments and Methods in Physics Research*, B92:158-161

- Klinedinst, D.B., McNichol, A.P., Currie, L.A., Schneider, R.J., Klouda, G.A., von Reden, K.F., Verkouteren R.M. and Jones, G.A., 1994. Comparative study of AMS target performance using the NOSAMS recombinator ion source: *Nuclear Instruments and Methods in Physics Research*, B92:166-171
- Schneider, R.J., Jones, G.A., McNichol, A.P., von Reden, K.F., Elder, K.A., Huang, K. and Kessel, E.D., 1994. Methods for data screening, flagging, and error analysis at the National Ocean Sciences AMS Facility: *Nuclear Instruments and Methods in Physics Research*, B92:172-175
- Jones, G.A., Gagnon, A.R., Schneider, R.J., von Reden, K.F. and McNichol, A.P., 1994. High-precision AMS radiocarbon measurements of central Arctic Ocean seawaters. *Nuclear Instruments and Methods in Physics Research*, B92:426-430.
- Cohen, G.J., Hutton, D.L., von Reden, K.F., Osborne, E.A., McNichol, A.P. and Jones, G.A., 1994. Automated sample processing at the National Ocean Sciences AMS Facility. *Nuclear Instruments and Methods in Physics Research*, B92:129-133.
- McNichol, A.P., Jones, G.A., Hutton, D.L. Gagnon, A.R. and Key, R.M., 1994. The rapid preparation of seawater ΣCO_2 for radiocarbon analysis at the National Ocean Sciences AMS Facility. *Radiocarbon*, 36(2):273-246.
- McNichol, A.P., Gagnon, A.R., Osborne, E.A., Hutton, D.L., von Reden, K.F. and Schneider, R.J., 1995. Improvements in procedural blanks at NOSAMS: Reflections of improvements in sample preparation and accelerator operation. *Radiocarbon*, 37(3):683-691.
- Schneider, R.J., McNichol, A.P., Nadeau, M.J. and von Reden, K.F., 1995. Measurements of the Ox-II/Ox-I ratio as a quality control parameter at NOSAMS. *Radiocarbon*, 37(3):693-696.
- Eglinton, T.I., Aluwihare, L.I., Bauer, J.E., Druffel, E.R.M., McNichol, A.P., 1996. Gas chromatographic isolation of individual compounds from complex matrices for radiocarbon dating. *Analytical Chemistry*, 68:904-912.
- Key, R.M., P.D. Quay, G.A. Jones, A.P. McNichol, K.F. von Reden and R.J. Schneider, 1996. WOCE AMS Radiocarbon I: Pacific Ocean Results (P6, P16 and P17). In: *^{14}C Cycling and the Oceans (in Tribute to Reidar Nydal)*, J. W. Beck, E.R.M. Druffel and A.P. McNichol (eds.), *Radiocarbon*, 38(3), 425-518.
- Beck, J.W., E.R.M. Druffel and A.P. McNichol, guest editors, 1996. *^{14}C Cycling and the Oceans (In Tribute to Reidar Nydal)*. *Radiocarbon*, 38(3), 643 pp.
- Tanner, R.L., Zielinska, B., Uberna, E., Harshfield, G., and McNichol, A.P., 1996. Concentrations of carbonyl compounds and the carbon isotope of formaldehyde at a coastal site in Nova Scotia during the Nare summer intensive. *Journal of Geophysical Research*, in press.
- Von Reden, K.F., A.P. McNichol, J.C. Peden, K.L. Elder, A.R. Gagnon and R.J. Schneider, 1997. AMS measurements of the ^{14}C distribution in the Pacific Ocean. In: *Proceedings of the Seventh International Conference on Accelerator Mass Spectrometry*, A.J.T. Jull, J.W. Beck, and G.S. Burr (eds.), Tucson, AZ, 20-24 May 1996, *Nuclear instruments and Methods in Physics Research*, B123:438-442.
- Gagnon, A.R., A.P. McNichol, D.L. Hutton, E.A. Osborne and J.C. Donoghue, 1996. Automated systems and techniques utilized at the NOSAMS sample preparation laboratory: An update of productivity and quality issues. *Radiocarbon*, 38(1):38-39.
- Eglinton, T. I., B.C. Benitez-Nelson, A. Pearson, A.P. McNichol, J.E. Bauer, and E.R.M. Druffel, 1997. Variability in radiocarbon ages of individual organic compounds from marine sediments. *Science*, **277**, 796-799.
- Schlosser, P., B. Kromer, B. Ekwurzel, G. Bönisch, A. McNichol, R. Schneider, K. von Reden, H. Östlund, and J. Swift, 1997. The First Trans-Arctic ^{14}C Section: Comparison of the mean ages of the deep waters in the

- Eurasian and Canadian Basins of the Arctic Ocean, in *Proceedings of the 7th International Conference on Accelerator Mass Spectrometry*, Tucson, AZ, May 1996, *Nuclear Instruments and Methods B123*:431-437.
- Pearson, A., A.P. McNichol, R.J. Schneider, K.F. von Reden, and Y. Zheng, 1998. Microscale AMS ¹⁴C measurements at NOSAMS: (Proceedings of the 16th International Radiocarbon Conference, 1997), *Radiocarbon*, 40:61-75.
- Schneider, R.J., Hayes, J.M., von Reden, K.F., McNichol, A.P., Eglinton, T., 1997. Target preparation for continuous flow accelerator mass spectrometry: (Proceedings of the 16th International Radiocarbon Conference, 1997), *Radiocarbon*, 40:95-102.
- Elder, K.L., McNichol, A.P., Gagnon, A.R., 1997. Evaluating reproducibility of seawater, inorganic and organic carbon ¹⁴C results at the National Ocean Sciences AMS Facility (NOSAMS: (Proceedings of the 16th International Radiocarbon Conference, 1997), *Radiocarbon*, 40:223-230.
- von Reden, K.F., McNichol, A., Pearson, A., and Schneider, R. 1997, AMS Measurement of Small Samples with a High-Current System: (Proceedings of the 16th International Radiocarbon Conference, 1997), *Radiocarbon*, 40:247-253.
- Sonnerup R.E., P.D. Quay, A.P. McNichol, J.L. Bullister, T.A. Westby and H.L. Anderson (1999) Reconstructing the oceanic ¹³C Suess effect. *Global Biogeochemical Cycles* 13, 857-872.
- Martin W.R., A.P. McNichol, and D.C. McCorkle (2000) The radiocarbon age of calcite dissolving at the sea floor: Estimates from pore water data. *Geochim.Cosmochim. Acta* 64, 1391-1404.
- Sonnerup R.E., P.D. Quay, A.P. McNichol (2000) The Indian Ocean ¹³C Suess effect. *Global Biogeochemical Cycles* 14, 903-916.
- McNichol A.P., J.R. Ertel and T.I. Eglinton (2000) The radiocarbon content of individual lignin-derived phenols—Technique and initial results. *Radiocarbon* 42, 219-227.
- McNichol A.P., R.J. Schneider, K.F. von Reden, A.R. Gagnon, K.L. Elder, NOSAMS, R.M. Key and P.D. Quay (2000) Ten Years After—The WOCE AMS Radiocarbon Program. *Nucl. Instr. And Meth. In Phys. B* 172, 479-484.
- Pearson A., T.I. Eglinton and A.P. McNichol (2000) An organic tracer for surface ocean radiocarbon. *Paleoceanography* 15. 541-550.
- Lerperger M., A.P. McNichol, J. Peden, A.R. Gagnon, K.L. Elder, W. Kutschera, W. Rom and P. Steier (2000) Oceanic uptake of CO₂ re-estimated through δ¹³C in WOCE samples. *Nucl. Instr. And Meth. In Phys. B* 172, 501-512.
- Gagnon A.R., A.P. McNichol, J.C. Donoghue, D.R. Stuart and NOSAMS (2000) The NOSAMS sample preparation laboratory in the next millennium: Progress after the WOCE program. *Nucl. Instr. And Meth. In Phys. B* 172, 409-415.
- Currie L.A., J.D. Kessler, J.V. Marolf, A.P. McNichol, D.R. Stuart and J.C. Donoghue (2000) Low-level (submicromole) environmental ¹⁴C metrology. *Nucl. Instr. And Meth. In Phys. B* 172. 440-448.
- Martens C.S. and A.P. McNichol (2001) Radiocarbon dating of wood samples and plutonium sediment disturbance studies at the *Queen Anne's Revenge* wreck site. *Southeastern Geology* 40, 29-40.
- Pearson A., A.P. McNichol, B.C. Benitez-Nelson, J.M. Hayes and T.I. Eglinton (2001) Origin of lipid biomarkers in Santa Monica Basin surface sediment: A case study using compound-specific D14C analysis. *Geochim.Cosmochim.Acta* 65, 3123-3137.

- McNichol A.P., A.J.T. Jull and G.S. Burr (2001) Converting AMS data to radiocarbon values: Considerations and conventions. *Radiocarbon* 43, 313-320.
- Key R.M., P.D. Quay, P. Schlosser, A.P. McNichol, K.F. von Reden, R.J. Schneider, K.L. Elder, M. Stuiver and H. Gote Ostlund (in press) WOCE Radiocarbon IV: Pacific Ocean Results; P10, P13N, P14C, P18, P19 & S4P. *Radiocarbon*.
- Zheng Y., R.F. Anderson, P.N. Froelich, W. Beck, A.P. McNichol and T. Guilderson (2002) Challenges in radiocarbon dating organic carbon in opal-rich marine sediments. *Radiocarbon* 44, 123-136.
- Reddy C.M., A. Pearson, L. Xu, A.P. McNichol, B. Benner, A. Wise, G. Klouda, L.A. Currie and T.I. Eglinton (2002) Radiocarbon as a tool to apportion the sources of polycyclic aromatic hydrocarbons and black carbon in environmental samples. *Env. Sci. and Tech.* 36, 1774-1782.
- Quay P.D., R. Sonnerup, T. Westby, J. Stutsman and A.P. McNichol (2003) Changes of the $^{13}\text{C}/^{12}\text{C}$ of dissolved inorganic carbon in the ocean as a tracer of anthropogenic CO_2 uptake. *Global Biogeochemical Cycles* 17.
- Tanner R.L., W.J. Parker and A.P. McNichol (submitted) Fossil Sources of Ambient Aerosol Carbon based on ^{14}C Measurements. *Aerosol Science and Technology*.

Notes and Technical Reports:

- McNichol, A.P., Hunt, C. and Shea, D., 1989. Literature assessment of the relationship between organic carbon and nonpolar chemicals in sediments. Prepared by Battelle Ocean Sciences for Chemical Manufacturers Association.
- McNichol, A.P. and Jones, G.A., 1991. Measuring ^{14}C in seawater by Accelerator Mass Spectrometry. WOCE Hydrographic Operations and Methods manual, WOCE Hydrographic Programme Office, WOCE Report No. 68/91, Woods Hole Oceanographic Institution, Woods Hole, MA.
- Jones, G.A., McNichol, A.P., von Reden, K.F. and Schneider, R.J., 1993. The National Ocean Sciences Accelerator Mass Spectrometry Facility. WOCE Notes, V5, 5 pp.
- McNichol, A.P., 1993. Putting Ourselves to the Test: Analysis of the IAEA Intercomparison Samples. *AMS Pulse*, Vol. 1, No. 4, p. 3-4. Spring.
- Key, Robert M. and Ann McNichol, 1998. Technology Revolutionises Tracer Oceanography During WOCE. *International WOCE Newsletter*, No. 30, p. 19-20.