

## N. Gary Hemming

Queens College  
City University of New York  
School of Earth and Environmental Sci.  
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### EDUCATION

Ph.D., Geochemistry, SUNY at Stony Brook, Stony Brook, NY, 1993.

Dissertation title: *Boron isotope systematics in natural and laboratory grown carbonates* Advisors: G. N. Hanson, W. J. Meyers, and R. J. Reeder

M.S., Geology, Tulane University, New Orleans, LA, 1985.

Thesis title: *Controls on the water chemistry of some springs in a volcanic terrain, Nayarit, Mexico*  
Advisors: G. C. Flowers, S. A. Nelson, and W. Back

Undergraduate geology courses, University of New Orleans, LA, August, 1981 through August 1982

M.Ed., Rehabilitation Counseling, Kent State University, Kent, Ohio, December, 1976

B.A., Psychology, Kent State University, Kent, Ohio, August, 1975

### POSITIONS HELD

September, 2004 to present, Queens College, Flushing, NY

**Associate Professor, School of Earth and Environmental Sciences**

Concurrent Appointments:

**Adjunct Research Scientist**, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY

**Visiting Professor**, Department of Geosciences, SUNY, Stony Brook, NY

August, 2000 to September, 2004, Queens College, Flushing, NY

**Assistant Professor, School of Earth and Environmental Sciences**

*Courses taught:* Intro. to Geology, Earth Materials, Environmental Sci., Geochemistry, Natural Hazards

August, 1999 to January 31, 2000, Queens College, Flushing, NY

**Adjunct Assistant Professor**

*Courses taught:* Natural Resources and the Environment, Natural Disasters, Introduction to Geology

July, 1998 to August, 2000, Lamont-Doherty Earth Observatory, Palisades, NY

**Senior Staff Associate**

May, 1994 to July, 1998, Lamont-Doherty Earth Observatory, Palisades, NY

**Post-Doctoral Research Scientist** funded by NSF.

August, 1993 to May, 1994, Lamont-Doherty Earth Observatory, Palisades, NY and SUNY at Stony Brook, Stony Brook, NY

**Post-Doctoral Research Scientist**

March, 1991 to August, 1993, SUNY at Stony Brook, Stony Brook, NY

**Laboratory Manager** for mass spectrometry lab (three thermal ionization mass spectrometers and associated chemistry labs) funded by a Department of Energy grant to G.N. Hanson

August, 1987 to March, 1991, SUNY at Stony Brook, Stony Brook, NY

**Research Assistant** in mass spectrometry lab funded by a Department of Energy grant to G.N. Hanson and a Petroleum Industry Fund grant to W.J. Meyers

August, 1986 to August, 1987, SUNY at Stony Brook, Stony Brook, NY

**Teaching Assistant**

Laboratory courses taught: Introduction to Geology, Petrology

January, 1984 to August, 1985, Tulane University, New Orleans, LA

**Research Assistant** responsible for the operation and maintenance of a plasma emission spectrometer and other equipment in a geochemistry lab.

August, 1982 to August, 1984, Tulane University, New Orleans, LA

**Teaching assistant manager** responsible for Introduction to Geology Labs and lab instructors

## PUBLICATIONS

### Articles:

Hönisch, B., **Hemming**, N.G., Loose, B.D., 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* 71 (2007) 1636–1641.

**Hemming**, N.G. and Hönisch, B., 2007, Boron isotopes in marine carbonate sediments and the pH of the ocean (invited), in *Proxies in Late Cenozoic Paleoceanography*, Claude Hillaire-Marcel & Anne de Vernal (eds.), Elsevier.

Hönisch, B., and **Hemming**, N. G., 2005 Surface ocean pH response to variations in pCO<sub>2</sub> through two full glacial cycles, *Earth Planet. Sci. Lett.* 236, 305-314.

Chillrud, S.N., **Hemming**, N.G., Ross, J.M., Wallace, S., LoIacono, N., 2005, A rapid and precise procedure for Pb isotopes in whole blood by Fe co-precipitation and MC-ICPMS analysis, *Applied Geochemistry*, V. 20, p. 807-813.

Hönisch, B.; **Hemming**, N.G., 2004, Ground-truthing the boron isotope-paleo-pH proxy in planktonic foraminifera shells: Partial dissolution and shell size effects. *Paleoceanography*, V. 19, art. no.-PA4010.

Hönisch, B., **Hemming**, N.G., Grottoli, A.G., Amat, A., Hanson, G.N., Buma, J., 2004, Assessing scleractinian corals as recorders for paleo-pH: Empirical calibration and vital effects. *Geochim. Cosmochim. Acta*, V. 68, p. 3675-3685.

Rasbury, E.T., Ward, W.B., **Hemming**, N.G., Li, H., Dickson, J.A.D., Hanson, G.N., and Major, R.P., 2004, Concurrent U-Pb age and seawater Sr-87/Sr-86 value of a marine cement, *Earth and Planetary Science Letters* V. 221, p. 355-371.

Reynaud, S., **Hemming**, N.G., Juillet-Leclerc, A., and Gattuso, J-P, 2004, Effect of pCO<sub>2</sub> and temperature on the boron isotopic composition of a zooxanthellate coral: *Acropora* sp., Coral Reef, Special Volume on Environmental and Climatic Proxies in Reef Organisms, *Coral Reefs*, V. 23, p. 539-546.

Tomascak P.B., **Hemming** N.G., and Hemming S.R., 2003, The lithium isotopic composition of waters of the Mono Basin, California. *Geochim. Cosmochim. Acta*, V. 67, p. 601-611.

Rasbury, E.T., Ward, W.B., **Hemming**, N.G., Li, H., Dickson, J.A.D., Hanson, G.N., and Major, R.P., 2003, Timing the Deposition of the Late Carboniferous Laborcita Formation, New Mexico, USA by U-Pb Dating and <sup>87</sup>Sr/<sup>86</sup>Sr of Marine Cements. *Earth and Planetary Science Letters*, (in press).

Hönisch, B., **Hemming**, N.G., Grottoli, A.G., Amat, A., Hanson, G.N., and Bijma, J., 2003, Assessing scleractinian corals as recorders for paleo-pH: Empirical calibration and vital effects, *Geochim. Cosmochim. Acta* (accepted for publication).

Zimmerman, S.R.H., Hemming, S.R., **Hemming**, N.G., Tomascak, P.B., 2002, Late Pleistocene variations of lake level and glacial activity at Mono Lake, CA, USA, *Geochim. Cosmochim. Acta*, V. 66, p. A881-A881, Suppl. 1.

Cullen, Heidi, deMenocal, P.B., Hemming, S.R., **Hemming**, N.G., Brown, F.H., Guilderson, T., and Sirocko, F., 2000, Climate change and the collapse of the Akkadian empire: Evidence from the deep sea, *Geology*, V. 28, p. 379-382.

**Hemming**, N.G., Reeder, R.J., and Hart, S.R., 1998, Growth-step selective incorporation of boron on the calcite surface, *Geochimica et Cosmochimica Acta*, V. 62, p. 2915-2922.

**Hemming**, N.G., Guilderson, T.P., and Fairbanks, R.H., 1998, Seasonal variations in the boron isotopic composition of coral: A productivity signal?, *Global Biogeochemical Cycles*, V. 12, p. 581-586.

Hemming, S.R., Biscaye, P.E., Broecker, W.S., **Hemming**, N.G., Klas, M., and Hajdas, I., 1998, Provenance change coupled with increased clay flux during deglacial times in the Western Equatorial Atlantic, *Palaeogeography, Palaeoclimatology, Palaeoecology*, V. 142, p. 217-230.

Sanyal, A., **Hemming**, N.G., and Broecker, W.S., 1997, Changes in pH in the eastern equatorial Pacific across stage 5-6 boundary based on boron isotopes in foraminifera, *Global Biogeochemical Cycles*, V. 11, p. 125-133.

Sanyal, A., **Hemming**, N.G., Broecker, W.S., Lea, David W., Spero, Howard J., and Hanson, G.N., 1996, Oceanic pH control on the boron isotopic composition of foraminifera: Evidence from culture experiments, *Paleoceanography* V. 11, p. 513-517.

Sanyal, A., **Hemming**, N.G., Hanson, G.N., and Broecker, W.S., 1995, The pH of the glacial ocean as reconstructed from boron isotope measurements on foraminifera, *Nature*, V. 373, p. 234-236.

**Hemming**, N.G., Reeder, R.J., and Hanson, G.N., 1995, Mineral/fluid partitioning and isotopic fractionation of boron in synthetic calcium carbonate, *Geochimica et Cosmochimica Acta*, V. 59, p. 371-379.

**Hemming**, N.G. and Hanson, G.N., 1994, A procedure for the analysis of boron by negative thermal ionization mass spectrometry, *Chemical Geology*, V. 114, p. 147-156.

Sen, S., Stebbins, J.F., **Hemming**, N.G., and Ghosh, B., 1994, Coordination environments of boron impurities in calcite and aragonite polymorphs: A  $^{11}\text{B}$  MAS NMR study, *American Mineralogist*, V. 79, p. 819-825.

**Hemming**, N.G. and Hanson, G.N., 1992, Boron isotopic composition and concentration in modern marine carbonates, *Geochimica et Cosmochimica Acta*, V. 56, p. 537-543.

**Hemming**, N.G., Meyers, W.J., and Grams, J.C., 1989, Cathodoluminescence in diagenetic calcites: the roles of Fe and Mn as deduced from electron probe and spectrophotometric measurements, *Journal of Sedimentary Petrology*, V. 59, 3, p. 404-411.

*Selected Abstracts: (\* denotes invited)*

Rasbury, E.T., **Hemming** N.G., Dickson, J.A.D., Barrick, J.E., Saller, A.H., 2006,  $^{87}\text{Sr}/^{86}\text{Sr}$  chemostratigraphy across the Carboniferous-Permian boundary, 16<sup>th</sup> Annual VM Goldschmidt Conference, Melbourne, Australia.

\*Hoenisch, B., Hemming, N.G., Bickert, T., 2006, Paleo-Validation of the Boron Isotope Proxy in Benthic and Planktic Foraminifers, Ocean Sciences Meeting, Honolulu, HI, USA.

Simons, K.K., Sorensen, S.S., Harlow, G.E., **Hemming**, N.G., Brueckner, H.K., Goldstein, S., Langmuir, C.H., Hemming, S., (2006), Composition of the Subduction Component Fluid Estimated from Lithium Isotopes in Guatemalan HP-LT Rocks \*\*, *Eos Trans. AGU*, 87/(36), Jt. Assem. Suppl., Abstract V33A-04

Rasbury, E.T., **Hemming**, N.G., Dickson, J.A., Saller, A.H., Barrick, J.E., Leon, L., 2005, Sr isotope variation in U-Pb dated Permo-Carboniferous carbonate cycles of West Texas, *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract PP22A-06.

\***Hemming**, N.G. and B. Hönisch, A critical review and recent advances in the boron isotope paleo-pH proxy, oral presentation at Goldschmidt Conference, Moscow, Idaho, USA, 2005.

Hoenisch, B., Bickert, T., and **Hemming**, N.G., 2005, Boron Isotopes in Benthic Foraminifers: Monospecific Coretop Calibration and Paleo-Reconstruction Through Two Glacial Cycles, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract PP44A-06.

Reynaud, S., **Hemming**, N.G., Juillet-Leclerc, A., Gattuso, J.-P., 2005, Effect of  $\text{PCO}_2$  and temperature on the Boron isotopic composition of the zooxanthellate coral *Acropora* sp., European Geosciences Union 2005 International Meeting, Vienna, Austria.

**Hemming**, N.G. and Rasbury, E.T., 2004, Rare Earth Element Evidence for Paleolake Chemistry, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract PP41A-0587.

Hönisch, B., N.G. **Hemming**, A 140,000 year record of surface seawater pH in the eastern equatorial Atlantic, poster presented at ICP VIII, Biarritz, France, 2004.

Hönisch, B., N.G. **Hemming**, Ground-truthing the boron isotope paleo-pH proxy in planktonic foraminifera shells: Partial dissolution and shell size effects, 2003, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract B12B-0782.

Hönisch, B., N.G. **Hemming**, A.G. Grottoli, A. Amat, G.N. Hanson, J. Bijma, 2003, The effect of light, respiration and  $\text{pCO}_2$  on  $\delta^{11}\text{B}$  in coral skeletons: results from culture and field experiments, oral presentation given at EGS-AGU Joint Assembly, Nice, France.

Krogstad, E.J., Bizzarro, M., and **Hemming**, N.G., 2003, Mg isotopic compositions of modern marine carbonates, American Geophysical Union, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract PP11A-0207.

Hönisch, B. and **Hemming**, N.G., 2003, Ground-truthing the boron isotope paleo-pH proxy in planktonic foraminifera shells: Partial dissolution and shell size effects, American Geophysical Union, 2003 Fall Meeting, San Francisco, CA, Abstracts with Programs.

**Hemming**, N.G., Ross, J.M., Wallace, S., LoIacono, N., and Chillrud, S.N., 2003, A rapid and precise procedure for Pb isotopes in whole blood by Fe co-precipitation and MC-ICPMS analysis, 5<sup>th</sup> International Symposium on Applied Isotope Geochemistry, International Association of Geochemistry and Cosmochemistry, Program and Abstracts, p. 29.

- Hönisch, B., **Hemming**, N.G., Grotoli, A.G., Amat, A., Hanson, G.N., Bijma, J., 2003, The effect of light, respiration and pCO<sub>2</sub> on δ<sup>11</sup>B in coral skeletons: results from culture and field experiments, EGS - AGU - EUG Joint Assembly, Nice, France, Abstracts with Program.
- Zimmerman, S.R.H., Hemming, S.R., **Hemming**, N.G., and Tomascak, P.B., 2002, Late Pleistocene variations of lake level and glacial activity at Mono Lake, CA, USA, VM Goldschmidt Conference, Davos, Switzerland.
- Chillrud, S.N., Wallace, S.M., **Hemming**, N.G., and Ross, J., 2002, Determination of lead isotopes in blood using FeOH co-precipitation separation method and analysis by multi-collector ICPMS, 2002 Winter Conference on Plasma Spectrochemistry, Scottsdale, AZ, Abstracts with Program.
- Pedone, V. **Hemming**, N.G., and Olson, J., 2002, Geochemical and Mineralogical Records from Ancient Lake Sediments, Geol. Soc. of Am. Annual Meeting, Denver, CO, Abstracts with Program.
- Pedone, V., **Hemming**, N.G., and Olson, J., 2002, Definition of the hydrogeologic history of the transgressive phase of Lake Bonneville, Utah by Sr isotopes, Geol. Soc. of Am. Annual Meeting, Denver, CO, Abstracts with Program.
- Tomascak P.B., **Hemming** N.G., and Hemming S.R., 2001, Controls on lithium isotope fractionation in evaporite systems. GSA Abst Prog
- Tomascak P.B., **Hemming** N.G., and Hemming S.R., 2001, Lithium isotopes in the Mono basin hydrologic system, Mono Lake, CA. Extended Abstract, Applied Isotope Geochemistry IV, Asilomar, CA.
- Tomascak P.B., **Hemming** N.G., and Pedone V.A., 2001, Lithium, boron, and strontium isotope constraints on solute sources for the Great Salt Lake, Utah. Eleventh V.M. Goldschmidt Conference Abst.
- Pedone, V.A., **Hemming**, N.G., Quade, J., and Kaufman, D.S., 2000, Inverse covariance between lake volume and strontium isotopic composition in the Great Salt Lake, Utah: Geological Society of America Abstracts with Programs, v. 32.
- Tomascak P.B., **Hemming** N.G., and Hemming S.R., 2000, Coupled Li-Sr isotope variations in the Mono Lake hydrologic system. Geol. Soc. Amer. Abst.
- Hemming**, N.G., and Swart, P.K., 2001, Boron isotope compositions of sediment interstitial brines, ODP Leg 182, Great Australian Bight, American Geophysical Union, Abstracts with Programs, V. 82.
- Hemming**, N.G., and Goldstein, S.L., 2001, Analytical procedures for the high precision analysis of boron isotopes in carbonates and natural waters on the Axiom multi-collector ICPMS, Applied Isotope Geochemistry 4, Asilomar, CA.
- Tomascak, P.B., **Hemming**, N.G., Pedone, V.A., 2001, Lithium, boron, and strontium isotope constraints on solute sources for the Great Salt Lake, Utah, Eleventh Annual V.M. Goldschmidt Conference, Hot Springs, VA, Abstracts, on C.D.
- Tomascak P.B., **Hemming** N.G., and Hemming S.R., 1999, Lithium isotope geochemistry of Mono Lake, California. Seventh International Conf. on Salt Lakes, Furnace Creek, CA.
- Tomascak P.B., **Hemming** N.G., and Hemming S.R., 1999, Lithium isotope geochemistry of Mono Lake, California. In: Ninth Annual V.M. Goldschmidt Conf., L.P.I. Contribution 971, p. 301, Lunar and Planetary Institute, Houston.
- Hemming**, N.G., 1999, Brachiopods as an archive of the secular variation of boron isotopes in seawater, American Geophysical Union, Abstracts with Programs, V. 80, p. F545.
- Hemming**, N.G., Goldstein, S.L., and Fairbanks, R.G., 1999, Osmium isotopic analysis by dynamic multiple collector inductively coupled plasma mass spectrometer using iridium-191 signal normalization, Ninth Annual V.M. Goldschmidt Conference, Cambridge, MA, Abstracts, p. 120.
- Cullen, Heidi, deMenocal, P., Hemming, S.R., **Hemming**, N.G., Brown, F., 1997, Possible role of climate in the collapse of the Akkadian Empire: evidence from Gulf of Oman marine sediments, American Geophysical Union, Abstracts with Programs, V. 78, p. F376.
- Hemming**, N.G., Guilderson, T.P., Fairbanks, R.G., 1998, Coupled Seasonal Variation in the boron and carbon isotope composition of coral, American Geophysical Union, Abstracts with Programs, V. 78, p. F388.
- Sanyal, A., **Hemming**, N.G., and Hanson, G.N., 1997, Changes in pH in the eastern equatorial Pacific across stage 5-6 boundary based on boron isotopes in foraminifera, American Geophysical Union, Abstracts with Programs, V. 77, p. F297.

**Hemming, N.G., Liu, T., and Broecker, W.S., 1997, Constraints on desert varnish provenance using radiogenic isotope signatures, 1997 V.M. Goldschmidt Conference, Tucson, Arizona, p. 91-92.**

Barth, Susanne, **Hemming, N.G.,** Hanson, G.N., Hoehn, E., and Gercken, B., 1996, Boron isotope systematics in ground waters from solid waste disposal sites (Switzerland): A new tracer for anthropogenic contamination, 1996 V. M. Goldschmidt Conference, Heidleberg, Germany.

**Hemming, N.G.,** Guilderson, T.P., Sanyal, A., Broecker, W.S., and Fairbanks, R.H., 1996, Boron isotopes in carbonates as a proxy for paleo-pH: Applications and limitations, 1996 V. M. Goldschmidt Conference, Heidleberg, Germany.

**Hemming, N.G.,** Guilderson, T.P., Sanyal, A., Broecker, W.S., and Fairbanks, R.H., 1995, Boron isotope variation within single coral samples, American Geophysical Union, Abstracts with Programs, V. 76, p. F319.

Sanyal, A., **Hemming, N.G.,** Lea, D.W., Spero, H.J., and Broecker, W.S., 1995, Oceanic pH control on the boron isotopic composition of foraminifera: evidence from culture experiments, American Geophysical Union, Abstracts with Programs, V. 76, p. F321.

**Hemming, N.G.,** Sanyal, A., Broecker, W.S., Guilderson, T.P., Rubenstone, J.L., and Fairbanks, R.H., 1995, Boron isotopic composition of Holocene and Pleistocene coral from Barbados, European Union of Geosciences, Abstracts with Programs.

**Hemming, N.G.,** Reeder, R.J., and Hanson, G.N., 1995, Boron isotope partitioning in natural and synthetic calcium carbonates, V.M. Goldschmidt Conference, Abstracts with Programs.

Sanyal, A., **Hemming, N.G.,** Hanson, G.N., and Broecker, W.S., 1995, pH estimation of glacial oceans based on boron isotopic composition of foraminifera, ICOG-8, Berkeley, CA.

**Hemming, N.G.,** Hanson, G.N., and Meyers, W.J., 1993, Host rock control on the boron concentration and isotopic composition of ground water from the Edwards Aquifer of Central Texas, American Association of Petroleum Geologists Abstracts with Programs, 1993 Annual Convention, p. 116-117.

Sanyal, A., and **Hemming, N.G.,** 1993, Boron isotopic composition of foraminifera as a potential pH indicator, American Geophysical Union Fall Meeting, V. 74.

**Hemming, N.G.,** Hanson, G.N., and Meyers, W.J., 1991, Boron isotopic composition of Osagean (Miss.) marine cements and brachiopods: implications for marine cement fluids and secular variation of B isotopes, Geological Society of America Abstracts with Programs, V. 23, 5, p. A149.

#### **INVITED LECTURER**

1994, Dept. of Geology, Tulane University, New Orleans, LA

1995, Dept. of Geology, University of Maryland, College Park, MD

April 19, 1995: ETH, Zurich, Switzerland,

June 18, 1996: Dept. of Geology, University of Maryland, College Park, MD

1997, GEOTOP, University of Quebec, Montreal, Quebec

November 1998, Dept. of Earth and Space Sciences, SUNY Stony Brook, Stony Brook, NY

December 3, 1998, School of Earth and Environmental Sciences, Queens College, New York, NY

March 9, 2000, Institut fuer Mineralogie, Universitaet Muenster, Muenster, Germany

November 8, 2000, School of Earth and Environmental Sciences, Queens College, New York, NY

May 9, 2001, Geological Society of Washington, Washington, DC

October 3, 2002, Dept. of Earth and Space Sciences, SUNY Stony Brook, Stony Brook, NY

September 19, 2003, University of Pennsylvania, Philadelphia, PA

October 14, 2005, University of California Davis, Davis, CA

#### **RESEARCH INTERESTS**

Integration of natural, experimental, and theoretical analysis in mineral-aqueous systems:

-crystal growth mechanisms, trace element uptake, isotope fractionation, ion-exchange processes

-biological controls on isotope fractionation (calcification, photosynthesis, and respiration effects)

Application of above to environmental problems:

-Pb isotopes as tracers of anthropogenic contamination (humans, sediments, soils)

-tracer studies in hydrogeology (carbonate aquifers, hydrothermal systems, contaminant sources)

-climate change

-weathering and diagenesis

Geochemical applications of boron isotopes (ocean chemistry, natural and experimental mineral-fluid fractionation, environmental studies)

Development of geochemical tools and analytical methods

Isotope tracers in archaeology

## ADVISING

### *High School Students:*

Ross Chung, 2002-2003, Honorable Mention at Intel Science Fair

Marni Hersbain, 2006.

### *Undergraduate Students:*

Sarah Kantz, 2004-2006.

Corinne Hartin, 2005-2006.

### *Thesis Committees:*

Abhijit Sanyal, Ph.D., 1998, Columbia University, New York, NY

Zhaosheng Wang, Ph.D., April 11, 2000, SUNY at Stony Brook, Stony Brook, NY

Kirti Mehta, M.S., 2001, Queens College, Flushing, NY

Mo Zheng, Ph.D., 2003, CUNY, Graduate Center, New York, NY

Jenny Munster, M.S., 2005, SUNY at Stony Brook, Stony Brook, NY

Jessica Dutton, M.S., 2005, Queens College, Flushing, NY

Kyla Simons, Ph.D., in progress, Columbia University

Damayanti Gurung, in progress, Ph.D., CUNY, Graduate Center, New York, NY

Kirti Mehta, Ph.D., in progress, CUNY, Graduate Center, New York, NY

\*Rahul Sahajpal, Ph.D., in progress, CUNY, Graduate Center, New York, NY

\*Lily Leon, M.S., in progress, Queens College, Flushing, NY

\*Crystal Pearl, in progress, Queens College, Flushing, NY

\*Jacob Mey, PhD, in progress, CUNY Graduate Center, New York, NY

\*denotes primary thesis advisor

## PROFESSIONAL AFFILIATIONS

American Geophysical Union (including Hydrology division)

The Geochemical Society

New York Academy of Sciences