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EDUCATION

- Sept. 2004 Ph.D., Geology, Massachusetts Institute of Technology, Cambridge, MA
Dissertation: Rates of Tectonic and Magmatic Processes in the North Cascades Continental
Magmatic Arc
Supervisor: Dr. Samuel A. Bowring
- May 1999 M.S., Geological Sciences, The University of Texas at Austin
Thesis: Origin of the 1.3 Ga Hästefjorden and Ursand intrusions, SW Sweden: Nd evidence
for crust-mantle interaction in the genesis of A-type suites
Supervisor: Dr. James N. Connelly
- May 1995 B.S., Magna Cum Laude, Geological Sciences, Saint Norbert College, WI

RESEARCH EXPERIENCE

- Oct. 2004 – present *Postdoctoral Fellow:* Berkeley Geochronology Center, Berkeley, CA
The University of California, Berkeley
Supervisors: Dr. Paul Renne and Dr. Roland Mundil
Projects in progress:
- 1) Evaluating models of pluton construction by resolving the intrusive and cooling history of the Tuolumne Intrusive Suite, California, with high-precision, U-Pb isotope dilution – thermal ionization mass spectrometry (ID-TIMS) and $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology
 - 2) Developing a better understanding of the dynamics of mass extinctions and subsequent biotic recovery at the Triassic-Jurassic boundary using high-precision ID-TIMS U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology on interlayered ash beds
 - 3) Participating in the intercalibration of zircon standards and tracer solutions between U-Pb geochronology labs in North America and Britain as part of the EARTHTIME initiative (www.earth-time.org).
- Jan. 1999 – Sept. 2004 *PhD Research:* Massachusetts Institute of Technology, Cambridge, MA
Supervisor: Dr. Samuel A. Bowring
- 1) Determined timescales of pluton emplacement at a range of crustal levels over the life of the Cretaceous North Cascades continental magmatic arc utilizing high-precision, ID-TIMS U-Pb zircon and titanite geochronology.
 - 2) Investigated spatial and temporal variations in Nd isotopic signatures across the North Cascades to constrain the tectonic evolution and crustal architecture of the arc.
 - 3) Documented rapid rates of burial and contractional deformation in the North Cascades arc by obtaining U-Pb analyses of detrital zircons from a high-pressure, meta-supracrustal terrane of the North Cascades.
 - 4) Constrained rates of cooling and exhumation across major fault systems and terrane boundaries of the North Cascades using $^{40}\text{Ar}/^{39}\text{Ar}$ analysis of hornblende, muscovite, and biotite from plutons and meta-sedimentary terranes.

RESEARCH EXPERIENCE (Continued)

- Jan. 1999 – Sept. 2004 *Related Research Activities:* Massachusetts Institute of Technology, Cambridge, MA
Supervisor: Dr. Samuel A. Bowring
As part of the working group on the Continental Dynamics of the Rocky Mountain region (CD-ROM) project, I used U-Pb zircon analyses from lower crustal xenoliths to contrast the timing of lithospheric growth and stabilization across an Archean-Proterozoic suture.
- Aug. 1995 – Dec. 1998 *MS Research:* The University of Texas at Austin
Supervisor: Dr. James N. Connelly
- 1) Determined the temporal relationship between episodes of granitic magmatism and orogenic events along the mid-Proterozoic margin of southwestern Sweden using high-precision U-Pb ID-TIMS geochronology.
 - 2) Investigated the nature of crust-mantle interaction in producing this granitic suite by obtaining whole rock Nd isotopic and trace element geochemical analyses.

TEACHING EXPERIENCE

- Feb. 2001 – May 2001 *Teaching Assistant:* MIT, Cambridge, MA
Co-taught undergraduate lab entitled “Analytical Techniques for Studying Environmental and Geologic Samples” which involved instruction on the use of the electron microprobe, instrumental neutron activation analysis, and thermal ionization mass spectrometry.
- Aug. 1995 – Dec. 1998 *Teaching Assistant:* The University of Texas at Austin
- 1) Taught undergraduate Introduction to Geology, Earth Materials, and Igneous and Metamorphic Petrology labs.
 - 2) Taught graduate level Analytical Techniques lab which involved instruction on use of the electron microprobe and scanning electron microscope.
 - 3) Assisted students with mapping exercises at the University of Texas field camp (Wyoming and Montana).
 - 4) Organized department lecture series.
- Jan. 1992 – May 1995 *Teaching Assistant:* Saint Norbert College, DePere, WI
Supervised Introductory Chemistry and Geology labs.

OTHER PROFESSIONAL EXPERIENCE

- June 1998 – Aug 1998 *Geology Intern:* Texaco, New Orleans, LA
Mapped subsurface reservoir sands using well-log and geophysical data.
- June 1995 – Aug. 1995 *Geologist:* USGS Water Resources Division, Altamonte Springs, FL
Assisted in the collection and processing of well-log data.
- June-Aug. 1991-1995 *Laboratory Technichian:* Northern Lake Services, Crandon, WI
Prepared environmental and geologic samples for trace element analysis.

PROFESSIONAL SERVICE

Co-organized Fall 2006 AGU session entitled “From Crystals to Plutons: Crystal-Scale Records of Magmatic Processes”
Reviewer for Journal of Metamorphic Geology, G-cubed and NSF (Petrology, Tectonics and Facilities sections)
Co-led 2003 GSA Fall Meeting field trip
Member of the Geological Society of America, American Geophysical Union, and Geochemical Society

FELLOWSHIPS AND HONORS

- 2001 Teaching Assistant Excellence Award, Dept. of Earth, Atmospheric, and Planetary Sciences, MIT
1998 Honorable Mention for Best Technical Presentation, Dept. of Geological Sciences, The Univ. of Texas
1996 Summer Research Grant, The University of Texas Geology Foundation
1995 Outstanding Student Paper, American Institute of Professional Geologists, Wisconsin Section
1993-94 Academic Geologist Award, Saint Norbert College
1992-95 Pritzl Science Scholar, Saint Norbert College
1991-95 Trustees Distinguished Scholar, Saint Norbert College

PUBLICATIONS (PAPERS)

- Matzel, J.**, Bowring, S. A., and Miller, R. B., 2006, Timescales of pluton construction at differing crustal levels: Examples from the Mount Stuart batholith and Tenpeak pluton, North Cascades, Washington, *GSA Bulletin*, doi: 10.1130/B25923.
- Matzel, J.**, Bowring, S. A., and Miller, R. B., accepted pending revisions, Spatial and temporal variations in Nd isotopic signatures across the crystalline core of the North Cascades, Washington: Implications for the tectonic evolution of a magmatic arc, *GSA Special Paper*.
- Matzel, J.**, Bowring, S. A., and Miller, R. B., 2004, Protolith age of the Swakane Gneiss, North Cascades, Washington: Evidence of rapid underthrusting of sediments beneath an arc, *Tectonics*, v. 23, TC6009, doi: 10.1029/2003TC001577.
- Jourdan, F., **Matzel, J.**, and Renne, P. R., accepted pending revisions, Direct measurement of ^{39}Ar (and ^{37}Ar) recoil ejection during neutron irradiation of sanidine and plagioclase crystals.
- Miller, J. S., **Matzel, J.**, Miller, C. F., Burgess, S. D., and Miller, R. B., in review, Zircon growth and recycling during the assembly of large, composite arc plutons, *Journal of Volcanology and Geothermal Research*.
- Miller, R. B., **Matzel, J.**, Paterson, S. R., and Stowell, H., 2003, Cretaceous to Paleogene Cascades Arc: Structure, metamorphism, and timescales of magmatism, burial, and exhumation of a crustal section, in Swanson, T. W., ed., *Western Cordillera and Adjacent Areas: Boulder, Colorado*, Geological Society of America, p. 107-135.
- Farmer, G. L., Bowring, S. A., **Matzel, J.**, Espinosa Maldonado, G., Fedo, C., and Wooden, J. L., 2005, Paleoproterozoic Mojave province in northwestern Mexico? Isotopic and U/Pb zircon geochronologic studies of Precambrian and Cambrian crystalline and sedimentary rocks, Caborca, Sonora, in Anderson, T. H., Nourse, J. A., McKee, J. W., and Steiner, M. B., eds., *The Mojave-Sonora Megashear hypothesis: development, assessment, and alternatives: Boulder, Colorado*, Geological Society of America, p. 183-198.
- Farmer, G. L., Bowring, S. A., Williams, M. L., Christensen, N. I., **Matzel, J.**, and Stevens, L. M., 2004, Contrasting lower crustal evolution across an Archean-Proterozoic suture: Physical, chemical and geochronologic studies of lower crustal xenoliths in southern Wyoming and northern Colorado, in Karlstrom, K. E., and Keller, R. G., eds., *The Rocky Mountain Region: An Evolving Lithosphere*, AGU Monograph 154.

PUBLICATIONS (SELECTED ABSTRACTS)

- Matzel, J.**, Miller, J. S., Mundil, R., and Paterson, S. R., 2006, Zircon saturation and the growth of the Cathedral Peak pluton, *Geochimica Et Cosmochimica Acta*, v. 70, no. 18, Suppl. 1, p. A403.
- Matzel, J.**, Mundil, R., Renne, P. R., and Paterson, S. R., 2006, Using $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology to track the thermal evolution of the Tuolumne Batholith, Sierra Nevada, CA, EOS, Transactions of the American Geophysical Union Fall Meeting Suppl., v. 87, no. 52, Abstract V51E-1715.

- Matzel, J.,** Mundil, R., Paterson, S., Renne, P., and Nomade, S., 2005, Evaluating pluton growth models using high precision geochronology: Tuolumne Intrusive Suite, Sierra Nevada, CA, Geological Society of America Abstracts with Programs, v. 37, no. 7, p. 131.
- Matzel, J.,** Bowring, S. A., and Miller R. B., 2005, Spatial and temporal variations in Nd isotopic signatures across the crystalline core of the North Cascades, Washington, Geological Society of America Abstracts with Programs, v. 37, no. 4, p. 51.
- Matzel, J.,** Miller, R. B., Paterson, S. R., and Bowring, S. A., 2005, Implications for tectonic and magmatic processes from the ~5 to 40 km North Cascades crustal section, Washington, Geological Society of America Abstracts with Programs, v. 37, no. 4, p. 101.
- Matzel, J.,** S.A. Bowring, R.B. Miller, and S.R. Paterson, 2004, Temporal evolution of mid-crustal sheeted intrusions: Evidence from U-Pb geochronology of the Tenpeak, Entiat and Seven-Fingered Jack intrusive suites, North Cascades, WA, Geological Society of America Abstracts with Programs, v. 36, no. 5, p. 342.
- Matzel, J.,** Bowring, S. A., and Miller, R. B., 2003, Nd isotopic signatures of granitoid plutons across the crystalline core of the North Cascades, Washington: Implications for the tectonic evolution of a magmatic arc: Geological Society of America Abstracts with Programs, v. 35, no. 6, p. 306.
- Matzel, J.,** Bowring, S. A., and Miller, R. B., 2003, Geochronologic and isotopic constraints on arc dynamics, North Cascades, WA: EOS, Transactions of the American Geophysical Union, Fall Meeting Supplement, v. 84, Abstract V32F-06.
- Matzel, J.,** Bowring, S. A., and Miller, R. B., 2002, Geochronologic evidence of a Late Cretaceous protolith age for the Swakane Gneiss, North Cascades, WA: Geological Society of America Abstracts with Programs, v. 34, p. 105.
- Matzel, J.,** Bowring, S. A., and Miller, R. B., 2002, Timescales of pluton construction and the crystallization history of the Mt Stuart Batholith, North Cascades, WA: EOS, Transactions of the American Geophysical Union, Fall Meeting Supplement, v. 83, Abstract T11E-09.
- Matzel, J.,** Bowring, S. A., Williams, M. L., Stevens, L. M., and Farmer, G. L., 2001, Constraints on lithospheric structure from geochronology of crustal xenoliths (S. Wyoming and N. Colorado): EOS, Transactions of the American Geophysical Union, Spring Meeting Supplement, v. 82, Abstract S61A-13.
- Matzel, J.,** Bowring, S. A., Stevens, L. M., Williams, M. L., and Farmer, G. L., 2000, U-Pb geochronology of lower crustal xenoliths from across the Cheyenne Belt, S. Wyoming and N. Colorado: Geological Society of America Abstracts with Programs, v. 32, p. 387.

References available upon request