

**CURRICULUM VITAE OF
THOMAS G. PLYMATE
JULY 20, 2011**

5225 S. Timberlake Dr.
Springfield, MO 65804

work: (417) 836-4419
home: (417) 889-3634

EDUCATION

- Ph.D. University of Minnesota, 1986, Geology (Mineral Physics/Solid Earth Geophysics).
Advisor: Dr. James H. Stout.
- M.A. Indiana University, 1978, Geology (Sedimentary Petrology).
Advisor: Dr. Lee J. Suttner.
- B.S. Indiana University, 1976, Geology (with Honors).
Advisor: Dr. Judson Mead.

- Awards Exxon Graduate Fellowship, University of Minnesota, 1982-1985.
Charles F. Deiss Geology Field Camp Scholarship, Indiana University, 1974.
Earth Science Scholarship, Indiana University, 1971-1972.

TEACHING EXPERIENCE

- Department Head, Department of Geography, Geology, and Planning, Missouri State University,
Springfield, Missouri, May 2005 to present.
- Professor of Geology, Missouri State University, Springfield, Missouri, Fall 2003 to present
(Acting Department Head, October 2004 to May 2005).
- Associate Professor of Geology, Southwest Missouri State University, Springfield, Missouri,
Fall 1993 to Spring 2003.
- Assistant Professor of Geology, Southwest Missouri State University, Springfield, Missouri,
Fall 1986 to Spring 1993 (tenured since Fall 1988).
- Instructor of Geology, Southwest Missouri State University, Springfield, Missouri,
Fall 1978 to Spring 1982.
- Instructor of Geology, St. Francis College, Fort Wayne, IN, Summer 1978.
- Instructor of Geology, Ball State University, Muncie, IN, Spring 1978 (sabbatical replacement).
- Associate Instructor of Geology, Indiana University, 1976-1977.

- Courses Taught: Petrology
Optical Mineralogy/Petrography
X-ray Mineralogy
Writing II: Reporting Geological Information
Physical Geology Lecture, both regular and Honors sections
Physical Geology Laboratory, both regular and Honors sections
Field Geology
Environmental Geology

PROFESSIONAL AFFILIATIONS

- Geological Society of America (Chair, North-Central Section, 2010)
- American Geophysical Union
- Mineralogical Society of America
- Council on Undergraduate Research
- Missouri Academy of Sciences
- Association of Missouri Geologists (President, 2003-2004)
- Missouri Registered Geologist # RG 0474

PUBLICATIONS IN REFEREED SCIENTIFIC JOURNALS

- Plymate, T.G. and Suttner, L.J., 1983, Evaluation of Optical and X-ray Techniques for Detecting Source-rock-controlled Variation in Detrital Potassium Feldspars, *Journal of Sedimentary Petrology*, v. 53, p. 509-519.
- Cavaleri, M.E., Plymate, T.G., and Stout, J.H., 1988, A Pressure-Volume-Temperature Equation of State for Sn(β) by Energy Dispersive X-ray Diffraction in a Heated Diamond Anvil Cell, *Journal of Physics and Chemistry of Solids*, v. 49, p. 945-956.
- Plymate, T.G., Stout, J.H., and Cavaleri, M.E., 1988, Pressure-Volume-Temperature Behavior and Heterogeneous Equilibria of the Non-quenchable Body-centered Tetragonal Polymorph of Metallic Tin, *Journal of Physics and Chemistry of Solids*, v. 49, p. 1339-1348.
- Plymate, T.G. and Stout, J.H., 1989, A Five-parameter Temperature-corrected Murnaghan Equation for P-V-T Surfaces, *Journal of Geophysical Research*, v. B94, p. 9477-9483.
- Plymate, T.G. and Stout, J.H., 1990, Pressure-Volume-Temperature Behavior of Fayalite Based on Static Compression Measurements at 400°C, *Physics and Chemistry of Minerals*, v. 17, p. 212-219.
- Plymate, T.G., Daniel, C.G., and Cavaleri, M.E., 1992, Structural State of the K-feldspar in the Butler Hill–Breadtray Granite, St. Francois Mountains, Southeastern Missouri, *Canadian Mineralogist*, v. 30, p. 367-376.
- Plymate, T.G. and Stout, J.H., 1994, Pressure-Volume-Temperature Behavior of γ -Fe₂SiO₄ (Spinel) Based on Static Compression Measurements at 400°C, *Physics and Chemistry of Minerals*, v. 21, p. 413-420.
- Plymate, T.G., Kendall, J., Shepard, L.M., and Clark, K.C., 2001, Structural State of the K-feldspar in the Ring Plutons and Rhyolitic Ash-Flow Tuffs in the Butler Hill–Breadtray Caldera Complex, St. Francois Mountains, Southeastern Missouri, *Canadian Mineralogist*, v. 39, p. 73-83.
- Mathenia, C.M. and Plymate, T.G., 2003, Structural State of K-feldspar in the Younger Granites of the Western St. Francois Mountains, Southeastern Missouri: Further Evidence for Pervasive Alteration of the Mesoproterozoic St. Francois Mountains Complex, *Transactions of the Missouri Academy of Science*, v. 37, p. 50-58.
- Plymate, T.G., Evans, K.R., Gutierrez, M., and Mantei, E.J., 2005, Alumni of Geology B.S. Program Express Strong Support for Field Geology and Related Field and Laboratory Experiences, *Journal of Geoscience Education*, v. 52, n. 2, p. 215-216.
- Plymate, T.G., Moeglin, T.D., and Van Schmus, W.R., 2005, Petrology, Geochemistry, and Geochronology of Proterozoic Granitoid and Related Rocks of the Northern Mummy Range, North-central Colorado, *Rocky Mountain Geology*, v. 40, p. 115-155.
- Nondorf, L., Gutierrez, M., and Plymate, T.G., 2011, Modeling Carbon Sequestration Geochemical Reactions for a Proposed Site in Springfield, Missouri, *Environmental Geosciences*, v. 18, p. 91-99.
- Plymate, T.G., Mickus, K.L., and Smith, J.E., Late Cenozoic Mafic Volcanism in and near Petrified Forest National Park, Northeastern Arizona, *Rocky Mountain Geology*, accepted pending revisions.
- Plymate, T.G., Johnson, A.W., Woolsey, A.M., and Craig, M.M., The “Silver Mine Quartz Basalt”: An Unusual Xenocryst-bearing Basaltic Dike Exposed in the St. Francois Mountains, Southeastern Missouri, in preparation for *Transactions of the Missouri Academy of Science*.

OTHER SIGNIFICANT PUBLICATIONS (NON-REFEREED)

- Plymate, T.G., 1981, *Guidebook for Field Geology*, Southwest Missouri State University Department of Geosciences, 215p. (In-house guidebook for GLG 413, the summer Field Geology course required for all our senior Geology majors at SMSU.)
- Fagerlin, S., Plymate, T., and Rovey, C., 2001, *Geology of Wisconsin and Upper Michigan*, Southwest Missouri State University Department of Geography, Geology, and Planning, 36p. (In-house guidebook for GLG 360 Directed Fieldtrip conducted May 19-27, 2001.)

- Plymate, T.G. (ed.), 2004, *Field Trip Guidebook of the Association of Missouri Geologists 50th Annual Meeting, Springfield, Missouri, September 26-27, 2003*, Missouri Department of Natural Resources, Geological Survey and Resource Assessment Division, Report of Investigation No. 75 (Guidebook No. 26), 78 p.
- Plymate, T.G., Evans, K.R., Thomson, K.C., Miller, J.F., Rovey, C.W., II, Davis, G.H., and Cutler, J., 2004, Field Trip III: Ordovician and Mississippian Stratigraphy and Structural Geology of the Springfield-Branson Area, Southwestern Missouri, in Plymate, T.G. (ed.), *Field Trip Guidebook of the Association of Missouri Geologists 50th Annual Meeting, Springfield, Missouri, September 26-27, 2003*, Missouri Department of Natural Resources, Geological Survey and Resource Assessment Division, Report of Investigation No. 75 (Guidebook No. 26), p. 43-62.
- Gouzie, D. and Plymate, T., 2006, *Geology of Oklahoma, Texas, and New Mexico*, Missouri State University Department of Geography, Geology, and Planning, 36p. (In-house guidebook for GLG 360 Directed Fieldtrip conducted March 16-25, 2006.)
- Plymate, T.G. and Rovey, C.W., 2011, *Laboratory Coursepack for GLG 110: Principles of Geology*, Missouri State University Department of Geography, Geology, and Planning, 80p. (In-house laboratory coursepack required for all sections of our introductory Physical Geology course at MSU.)

PUBLISHED ABSTRACTS OF PRESENTATIONS AT SCIENTIFIC MEETINGS (* = PRESENTER)

- *Plymate, T.G. and Suttner, L.J., Evaluation of Optical and X-ray Techniques for Detecting Source-rock-controlled Variation in Detrital Feldspars, Geological Society of America Annual Meeting, San Diego, CA, November, 1979. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 11, p. 496.)
- *Plymate, T.G. and Stout, J.H., A Temperature-corrected Murnaghan Equation of State for P-V-T Surfaces, American Geophysical Union Fall Meeting, San Francisco, CA, December 10, 1986. (Abstract published in *EOS: Transactions of the American Geophysical Union*, v. 67, p. 1217.)
- *Stout, J.H., Plymate, T.G., and Cavaleri, M.E., Volume and Entropy Systematics of Sn(β) and Sn(II) by *in situ* Energy Dispersive Diffraction in a Heated Diamond Anvil Cell, American Geophysical Union Fall Meeting, San Francisco, CA, December 10, 1986. (Abstract published in *EOS: Transactions of the American Geophysical Union*, v. 67, p. 1216.)
- Plymate, T.G. and *Stout, J.H., Static Compression of the α (Fayalite) and γ (Spinel) Polymorphs of Fe₂SiO₄ at 400°C (abs.), American Geophysical Union Fall Meeting, San Francisco, CA, December 11, 1988. (Abstract published in *EOS: Transactions of the American Geophysical Union*, v. 69, p. 1518.)
- *Daniel, C.G., Plymate, T.G., and Cavaleri, M.E., Structural State of the K-feldspar in the Butler Hill–Breadtray Granite, St. Francois Mountains, Southeastern Missouri, Geological Society of America North-central Section Meeting, Notre Dame, IN, April 20, 1989. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 21(4), p. 9.)
- *Moeglin, T.D. and Plymate, T.G., Precambrian Structural Geology of the Northern Mummy Range, North-central Colorado, Geological Society of America Rocky Mountain Section Meeting, Ogden, UT, May 13, 1992. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 24(6), p. 53.)
- *Woolsey, A.M., Plymate, T.G., and Craig, M. M., Compositional Variation in K-Feldspar Xenocrysts in a Basaltic Dike: an Example of the Use of SEM X-ray Elemental Mapping in Igneous Petrology. Missouri Academy of Science Annual Meeting, Kansas City, MO, April 23, 1993. (Abstract published in *Transactions of the Missouri Academy of Science*, v. 27.)
- *Plymate, T.G., Moeglin, T.D., Sabin, T.G., and Van Schmus, W.R., U-Pb Zircon Geochronology of Proterozoic Granitoids Exposed in the Northern Mummy Range, North-central Colorado, Geological Society of America Rocky Mountain Section Meeting, Durango, CO, May 4, 1994. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 26(6), p. 59.)

- *Ervin, S.D., Plymate, T.G., and Moon, D., Effects of Springfield's Southwest Sewage Treatment Plant on the Water Quality in Wilson's Creek and James River. Missouri Academy of Science Annual Meeting, Cape Girardeau, MO, April 29, 1994. (Abstract published in *Transactions of the Missouri Academy of Science*, v. 28, p. 130.)
- *Shepard, L.M., Kendall, J., Clark, K.C., and Plymate, T.G., Structural State of the K-feldspar in the Rhyolitic Tuffs and Ring Pluton Granites of the St. Francois Mountains, Southeastern Missouri. Missouri Academy of Science Annual Meeting, Springfield, MO, April 19, 1996. (Abstract published in *Transactions of the Missouri Academy of Science*, v. 30, p. 128.)
- *Johnson, A.W., Plymate, T.G., and Craig, M.M., Geochemical Analysis of an Unusual Xenocryst-bearing Basaltic Dike Exposed in the Silver Mine Area of the St. Francois Mountains, Southeastern Missouri. Missouri Academy of Science Annual Meeting, Warrensburg, MO, April 18, 1997. (Abstract published in *Transactions of the Missouri Academy of Science*, v. 31, p. 90.)
- Homburg, R.L., *Moeglin, T.D., and Plymate, T.G., Shear-sense Indicators Supporting Southeast-side-up Movement for the Skin Gulch Shear Zone, Northern Mummy Range, North-central Colorado, Geological Society of America Annual Meeting, Denver, Colorado, October 26, 1999. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 31(7), p. 205)
- *Plymate, T.G. and Moeglin, T.D., Proterozoic Granitoids of the Northern Mummy Range, North-central Colorado: Discrimination and Tectonic Interpretation Based on Field, Petrographic, and Geochemical Evidence, Geological Society of America Annual Meeting, Reno, Nevada, November 16, 2000. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 32(7), p. A-453.)
- *Mathenia, C.M. and Plymate, T.G., Structural State of K-feldspar in Granites of the Taum Sauk Caldera, St. Francois Mountains, Southeastern Missouri. Missouri Academy of Science Annual Meeting, Joplin, MO, April 21, 2001. (Abstract published in *Transactions of the Missouri Academy of Science*, v. 35, p. 73-74)
- *Plymate, T.G. and Mickus, K.L., and Smith, J.E., Late Cenozoic Basaltic Volcanic Structures in and near Petrified Forest National Park, Northeastern Arizona, Geological Society of America Rocky Mountain Section Meeting, Albuquerque, New Mexico, April 30, 2001. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 33(5), p. 6.)
- *Evans, K.R., Rovey, C.W., II, Mickus, K.L., Miller, J.F., Plymate, T.G., and Thomson, K.C., Weaubleau-Osceola Structure, Missouri: Deformation, Event Stratification, and Shock Metamorphism of a Mid-Carboniferous Impact Site, Third International Conference on Large Meteorite Impacts, Nordlingen, Germany, August 2, 2003.
- *Rovey, C.W., II, Evans, K.R., Mickus, K.L., Miller, J.F., Plymate, T.G., and Thomson, K.C., Impact Origin of the Weaubleau-Osceola Structure in Southeastern Missouri, Geological Society of America Annual Meeting, Seattle, Washington, November 4, 2003. (Abstract published in *Geological Society of America Abstracts with Programs*, v. 35(6), p. 339.)
- *Evans, K.R., Rovey, C.W., II, Davis, G.H., Mantei, E.J., Mickus, K.L., Miller, J.F., Moeglin, T.D., and Plymate, T.G., Oblique Impact at the Weaubleau-Osceola Structure, Missouri. (Abstract accepted for presentation at Geological Society of America Annual Meeting, Denver, Colorado, November, 2004; abstract will be published in *Geological Society of America Abstracts with Programs*, v. 36(6).)
- *Cox, M.R., Evans, K.R., Plymate, T.G., and Miller, J.F., 2006, Geologic mapping of the Weaubleau structure, west-central Missouri: Annual Meeting, Geological Society of America, Abstracts with Programs, 38(7), p. 58.
- *Cox, M.R., Evans, K.R., Plymate, T.G., and Miller, J.F., 2006, Geologic mapping of the Weaubleau structure, west-central Missouri: Impact Craters as Indicators for Planetary Environmental Evolution and Astrobiology Workshop, June 8-14, 2006, Östersund, Sweden.

- *Berger, M., and Plymate, T.G., 2010, Petrographic Analysis to Determine Spatial Variation of Porosity and Mineralogy in the Lamotte Sandstone in SW Missouri--A Proposal: Annual Meeting, Geological Society of America, Abstracts with Programs, 42(5), p. 114.
- *Hooker, S., Plymate, T.G., and Craig, M.M., 2011, Chemical Alteration in Zoned Alkali Feldspar Xenocrysts in the Silver Mines Quartz Basalt Dike, St. Francois Mountains, Southeastern Missouri: NE/NC Section Meeting, Geological Society of America, Abstracts with Programs, 43(1), p. 91.
- *Gutierrez, M.E., and Plymate, T.G., 2011, Modeling Solubility and Mineral Trapping of CO₂ at a Proposed Carbon Sequestration Site in Missouri: NE/NC Section Meeting, Geological Society of America, Abstracts with Programs, 43(1), p. 93.

RESEARCH FUNDING: EXTERNAL

- Plymate, T.G., Rovey, C.W., II, Castillon, D.A., Moeglin, T.D., James, H.R., Ross, B.S., Thielmann, V.J., and Mayanovic, R.A., 1992, Purchase of a New Scintag XDS-2000 X-ray Diffraction System, National Science Foundation: Earth Sciences/Instrumentation, \$60,000 (with \$60,000 in matching funds from SMSU).
- Plymate, T.G. and Mickus, K.L., 1998, Petrology, Geochemistry, and Geochronology of Igneous Rocks and Volcanic Structures in Petrified Forest National Park, Arizona, Petrified Forest Museum Association, \$3,800.
- Plymate, T.G., 2007, Groundwater Use and Its Effects on Groundwater Resources in Taney and Stone Counties, Missouri, US Army Corps of Engineers (in collaboration with Missouri Department of Natural Resources), \$43,512.
- Gouzie, D., Gutierrez, M., Mantei, E.J., Plymate, T.G., and Rovey, C.W. II, 2008-2010, Carbon Sequestration Feasibility Study (in collaboration with Springfield City Utilities), US Department of Energy, \$344,766.

RESEARCH FUNDING: IN-HOUSE (MSU FACULTY GRANTS PROGRAM)

- Plymate, T.G., 1979, Effects of Structural State on the Weathering of Plutonic K-feldspars, \$707.
- Plymate, T.G., 1988, Geologic Mapping of the Precambrian Bedrock of the Comanche Peak Quadrangle, Larimer County, Colorado, \$2391.
- Plymate, T.G., 1990, Major-element whole-rock Chemical Analysis using SMSU's New Scanning Electron Microscope, \$2900.
- Plymate, T.G., 1991, Radiometric Age Determination for Rock Samples from the Mummy Range, Northern Colorado, \$2190.
- Plymate, T.G., 1997, Quantitative Geochemical Analysis of the Silvermines Quartz Basalt, St. Francois Mountains, Southeastern Missouri, \$1383.