

## CURRICULUM VITAE – 8/09

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### Degrees

- 1980 B.A. Chemistry, Princeton University, *magna cum laude*
- 1983 M.A. Geological and Geophysical Sciences, Princeton University
- 1987 Ph.D. Geological and Geophysical Sciences, Princeton University

### Professional Experience

- 8/80-8/81 Fulbright Scholar in Peru
- 9/81-9/86 Teaching and Research Assistant in Dept. of Geological and Geophysical Sciences, Princeton University
- 9/86-6/91 Assistant Professor of Geosciences, Penn State
- 6/91-7/97 Associate Professor of Geosciences, Penn State
- 1/95-7/95 Visiting Scientist, U.S. Geological Survey Menlo Center
- 1/95-7/95 Visiting Scientist, Stanford University
- 7/97-present Full Professor of Geosciences, Penn State
- 7/98-04/03 Director, Center for Environmental Chemistry and Geochemistry, Penn State
- 8/99-1/03 Director, Biogeochemical Research Initiative for Education, Penn State
- 1/03-7/03 Visiting Scientist, U.S. Geological Survey Menlo Center
- 4/03-present Director of Earth & Environmental Systems Institute, College of Earth and Mineral Sciences, Penn State
- 1/04-1/06 Vice-President, Geochemical Society
- 9/04-present Director, Center for Environmental Kinetics Analysis, Penn State
- 1/06-12/07 President, Geochemical Society
- 11/07 Member, Task Force on Interdisciplinary Strategies in Graduate Education, Penn State
- 1/08 Distinguished Professor
- 08-present Member, Department of Energy, Council on Earth Sciences

### Honors and Awards

- 1982-1985 NSF Graduate Student Fellowship
- 1981-1982 IBM Fellowship, Princeton University
- 1987-1992 NSF Presidential Young Investigator Award
- 1988-1993 David and Lucile Packard Fellowship
- 1996 Wilson Research Award, College of Earth and Mineral Sciences, Penn State
- 2001 Pardee Lecturer, Geological Society of America National Meeting
- 2002 Ingerson Lecturer of the Geochemical Society, Geol. Society of America National Meeting
- 2003 Wilson Faculty Mentoring Award, College of Earth and Mineral Sciences, Penn State
- 2006 Pardee Lecturer, Geological Society of America National Meeting
- 2007 Elected AGU Fellow

## Honors and Awards (continued)

- 2007 Wilson Award for Outstanding Service, College of Earth and Mineral Sciences, Penn State
- 2008 Pardee Lecturer, Geological Society of America National Meeting

## Publications

- 1979 Sheridan, R., S.L. Brantley, L.C. Allen. Use of electrostatic fingerprints to determine the receptor site conformation of enkephalins, in Drug Action and Design: Mechanism-based Enzyme Inhibitors, A. Kolman, ed. Elsevier North-Holland, 289-302.
- 1984 Maest, A., S.L. Brantley, P. Bauman, M. Borcsik, D. Crerar. Geochemistry of metal transport in the Raritan River and estuary. New Jersey Bulletin, New Jersey Academy Science 29, 69-78.
- 1984 Wood, S., D.A. Crerar, S.L. Brantley, M. Borcsik. Mean molal stoichiometric activity coefficients of alkali halides and related electrolytes in hydrothermal solutions. American Journal Science, 284, 668-705.
- 1984 Brantley, S.L., D.A. Crerar, N. Moller, J. Weare. Geochemistry of a modern marine evaporite: Bocana de Virrila, Peru, Journal Sedimentary Petrology, 54, 447-462.
- 1984 Giddings, J.C., S.L. Brantley. Shear field-flow fractionation: theoretical basis of a new, highly selective technique. Separ. Science and Technology 19(10), 631-651.
- 1985 Crerar, D.A., S. Wood, S. Brantley, A. Bocarsly. Chemical controls on solubility of ore-forming minerals in hydrothermal solutions. Canadian Mineral 23, 333-352.
- 1986 Brantley, S.L., S.R. Crane, D.A. Crerar, R. Hellmann, R. Stallard. Dissolution at dislocation etch pits in quartz. Geochimica Cosmochimica Acta 50, 2349-2361.
- 1986 Brantley, S.L., S.R. Crane, Crerar, D.A., R. Hellmann, R. Stallard. Dislocation etch pits in quartz, in Geochemical Processes at Mineral Surfaces, J.A. Davis and K.F. Hayes, eds., American Chemical Society. Washington, pp. 635-649.
- 1987 Brantley, S.L., A. Borgia, G. Rowe, J.F. Fernandez, J.R. Reynolds. Poas volcano crater lake acts as a condenser for acid metal-rich brine, Nature 330, 470-472.
- 1989 Schott, J., S.L. Brantley, D. Crerar, C. Guy, M. Borcsik, C. Willaime. Dissolution kinetics of strained calcite, Geochimica Cosmochimica Acta 53, 373-382.
- 1989 Rowe, G., S.L., Brantley, A. Borgia, J. Fernandez, J. Barquero. La sistema hidrotermal del Volcan Poas, Boletin de Volcanologia 20, 23-31.
- 1990 Brantley, S.L., B. Evans, S.H. Hickman, D.A. Crerar. Healing of microcracks in quartz: implications for fluid flow, Geology 18,136-139.
- 1991 Lee, V.W., S.J. Mackwell, S.L. Brantley. The effect of fluid chemistry on wetting textures in novaculite, Journal Geophysical Research 96, 10,023-10,037.

## **Publications** (continued)

- 1991 Voigt, D.E., S.L. Brantley. Inclusions in synthetic quartz. Journal Crystal Growth 113, 527-539.
- 1992 Rowe, G.L., S.L. Brantley, M. Fernandez, J.F. Fernandez, J.A. Barquero, A. Borgia. Fluid-volcano interactions at an active stratovolcano: the crater lake system of Poas Volcano, Costa Rica, Journal Volcanol. and Geothermal Research 49, 23-51.
- 1992 MacInnis, I., S.L. Brantley. The role of dislocations and surface morphology in calcite dissolution, Geochimica Cosmochimica Acta 56, 1113-1126.
- 1992 Weedman, S., S.L. Brantley, W. Albrecht. Secondary compaction after secondary porosity: can it form a pressure seal? Geology 20, 303-306.
- 1992 Rowe, G., S. Ohsawa, B. Takano, S.L. Brantley, J.F. Fernandez, J. Barquero. Using crater lake chemistry to predict volcanic activity at Poas Volcano, Costa Rica, Bulletin of Volcanology 54, 494-503.
- 1992 Brantley, S.L., G.L. Rowe, L. Konikow, W. Sanford. Toxic waters of Poas Volcano, Research and Exploration 8, 328-337.
- 1992 Brantley, S.L. The effect of fluid chemistry on quartz microcrack lifetimes, Earth and Planetary Science Letters 113, 145-156.
- 1992 Fisher, D., S.L. Brantley. Models of quartz overgrowth and vein formation: deformation and episodic fluid flow in an ancient subduction zone, Journal Geophysical Research 97, 20,043-20,061.
- 1993 MacInnis, I., S.L. Brantley. Development of etch pit size distributions (PSD) on dissolving minerals, Chemical Geology 105, 31-50.
- 1993 Rowe, G.L., S.L. Brantley. Estimation of the dissolution rates of andesitic glass, plagioclase, and pyroxene in a flank aquifer of Poas Volcano, Costa Rica. Chemical Geology 105, 71-88.
- 1993 Brantley, S.L., A. Blai, I. MacInnis, D. Cromeens, D. Darmody. Natural etching rates of hornblende and feldspar. Aquatic Science 55, 262-272.
- 1993 Brantley, S.L., A. Agustsdottir, G.L. Rowe. Crater lakes reveal heat and volatile fluxes of volcanoes. GSA Today 3, 175-178.
- 1994 Agustsdottir, A.M., S.L. Brantley. Volatile fluxes integrated over four decades at Grimsvotn volcano, Iceland. Journal Geophysical Research 99, 9505-9522.
- 1995 Stillings, L.L., S.L. Brantley. Feldspar dissolution at 25°C and pH 3: Reaction stoichiometry and the effect of cations. Geochimica Cosmochimica Acta 59, 1483-1496.

## Publications (continued)

- 1995 Stillings, L.L., S.L. Brantley, M. Machesky. Proton adsorption at an adularia feldspar surface. Geochimica Cosmochimica Acta 59, 1473-1482.
- 1995 Shiraki, R., S.L. Brantley. Kinetics of near-equilibrium calcite precipitation at 100°C: an evaluation of elementary reaction-based and affinity-based rate laws, Geochimica Cosmochimica Acta 59, 1457-1471.
- 1995 Rowe, G.L., S.L. Brantley, J.F. Fernandez, A. Borgia. The chemical and hydrologic structure of Poas Volcano, Costa Rica. Journal Volcanology Geothermal Research 64, 233-267.
- 1995 Sanford, W., L. Konikow, G.L. Rowe, S.L. Brantley. Groundwater transport of crater-lake brine at Poas Volcano, Costa Rica. Journal Volcanology Geothermal Research 64, 269-293.
- 1995 Fisher, D.M., S.L. Brantley, M. Everett, J. Dzvonik. Cyclic fluid flow through a regionally extensive fracture network within the Kodiak accretionary prism. Journal Geophysical Research 100, 12881-12894.
- 1995 Brantley, S.L. K. Koepenick. Measured carbon dioxide emissions from Oldoinyo Lengai and the skewed distribution of passive volcanic fluxes. Geology 23, 933-936.
- 1995 Clark, M.B., S.L. Brantley, D.M. Fisher. Power-law vein thickness distributions and positive feedback in vein growth. Geology 23, 975-978.
- 1995 Fein, J.B., N. Gore, D. Marshall, L. Yassa, A. Loch, S.L. Brantley. The effect of aqueous complexation and gibbsite surface sites on the decarboxylation rate of malonate. Geochimica Cosmochimica Acta 59, 5071-5081.
- 1996 Voigt, D.E., S.L. Brantley, R. Hennet. Chemical fixation of arsenic in contaminated soils. Applied Geochemistry 11, 633-643.
- 1996 Stillings, L.L., J.I. Drever, S.L. Brantley, Y. Sun, R. Oxburgh. Rates of feldspar dissolution at pH 3-7 with 0-8 mM oxalic acid. Chemical Geology 132, 79-90.
- 1996 Weedman, S.D., S.L. Brantley, R. Shiraki, S.R. Poulson. Diagenesis, compaction, and fluid chemistry modeling of a sandstone near a pressure seal: lower Tuscaloosa formation, Gulf Coast. AAPG Bulletin 80, 1045-1064.
- 1996 Koepenick, K.W., S.L. Brantley, J.M. Thompson, G.L. Rowe, A.A. Nyblade, C. Moshy. Volatile emissions from the crater and flank of Oldoinyo Lengai volcano, Tanzania. Journal Geophysical Research 101, 13819-13830.
- 1996 Wilkin, R.T., H.L. Barnes, S.L. Brantley. The size distribution of framboidal pyrite in modern sediments: An indicator of redox conditions, Geochimica Cosmochimica Acta 60, 3897-3912.

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- 1996 Brantley, S.L., L.L. Stillings. Feldspar dissolution at 25°C and low pH. American Journal of Science 296, 101-127. (1997, Brantley, S.L., L.L. Stillings. Reply to comment: feldspar dissolution at 25°C and low pH, American Journal of Science 297, 1021-1032.)
- 1997 Deleuze, M., S.L. Brantley. Inhibition of calcite crystal growth by Mg<sup>2+</sup> at 100°C and 100 bars: Influence of growth regime, Geochimica Cosmochimica Acta 61, 1475-1487.
- 1997 Chen, Y., S.L. Brantley. Temperature- and pH-dependence of albite dissolution rate at acid pH, Chemical Geology 135, 275-292.
- 1997 Foster, A.L., Brown, Jr., G. E., Parks, G.A., Tingle, T.N., Voigt, D.E., Brantley, S.L. XAFS determination of As(V) associated with Fe(III) oxyhydroxides in weathered mine tailings and contaminated soil from California, U.S.A., Journal Physics of France, 7, supplement au Journal de Physique III d'avril, Colloque C2, Cd-815-816.
- 1998 Murphy, S.F., S.L. Brantley, A.E. Blum, A.F. White, H. Dong. Chemical weathering in a tropical watershed, Luquillo Mountains, Puerto Rico: II. Rate and mechanism of biotite weathering, Geochimica Cosmochimica Acta 62, 227-244.
- 1998 Erratum to S. F. Murphy, S. L. Brantley, A. E. Blum, A. F. White, H. Dong "Chemical weathering in a tropical watershed, Luquillo Mountains, Puerto Rico: II Rate and mechanism of biotite weathering, Geochimica Cosmochimica Acta 62:13, 2404.
- 1998 Chen, Y., S.L. Brantley. Diopside and anthophyllite dissolution at 25°C and 90°C and acid pH. Chemical Geology 147, 233-248.
- 1998 Brantley, S.L., J.T. Chesley, L.L. Stillings. Isotopic ratios and release rates of Sr measured from weathering feldspars, Geochimica Cosmochimica Acta 62, 1492-1500.
- 1998 Nugent, M.A., S.L. Brantley, C.G. Pantano, P.A. Maurice. The influence of natural mineral coatings on feldspar weathering, Nature 395, 588-591.
- 2000 Chen, Y., S.L. Brantley, E. Ilton. X-ray photoelectron spectroscopic measurement of the temperature dependence of leaching of cations from the albite surface, Chemical Geology 163, 115-128.
- 2000 Liermann, L., B. Kalinowski, S.L. Brantley, J.G. Ferry. Role of bacterial siderophores in dissolution of hornblende, Geochimica Cosmochimica Acta 64, 587-602.
- 2000 Lewicki, J., S.L. Brantley. CO<sub>2</sub> degassing along the San Andreas fault, Parkfield, California Geophysical Research Letters 27, 5-8.
- 2000 Chen, Y., S.L. Brantley. Dissolution of forsteritic olivine at 65°C and 2 < pH < 5, Chemical Geology 165, 267-282.

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- 2000 Kalinowski, B., L. Liermann, S.L. Brantley, A. Barnes, C.G. Pantano. X ray photoelectron evidence for bacteria-enhanced dissolution of hornblende, Geochimica Cosmochimica Acta 64, 1331-1343.
- 2000 Boomer K., C. Werner, S.L. Brantley. CO<sub>2</sub> emissions related to the Yellowstone volcanic system 1. Developing a stratified adaptive cluster sampling plan, Journal Geophysical Research 105, 10817-10830.
- 2000 Werner C., S.L. Brantley, K. Boomer. CO<sub>2</sub> emissions related to the Yellowstone volcanic system 2. Statistical sampling, total degassing, and transport mechanisms. Journal Geophysical Research 105, 10831-10846.
- 2000 Kump, L., S.L. Brantley, M.A. Arthur. Chemical weathering, atmospheric CO<sub>2</sub> and climate, Earth and Planetary Science Reviews 28, 611-667.
- 2000 Hamilton, J., C.G. Pantano, S.L. Brantley. Dissolution rates of albite crystal and glass. Geochimica Cosmochimica Acta, 64, 2603-2615.
- 2000 Liermann, L., A.S. Barnes, B.E. Kalinowski, X. Zhou, S.L. Brantley. Microenvironments of pH in biofilms grown on dissolving silicate surfaces, Chemical Geology 171, 1-16.
- 2000 Kalinowski, B.E., L. J. Liermann, S.Givens, S.L. Brantley. Rates of bacteria-promoted solubilization of Fe from minerals: a review of problems and approaches, Chemical Geology 169, 357-370.
- 2000 Werner, C., J. Wyngaard, S.L. Brantley. Eddy-correlation measurement of hydrothermal gases, Geophysical Research Letters 27, 2925-2928.
- 2000 Brantley, S.L., N. Mellott. Surface area and porosity of primary silicate minerals, American Mineralogist 85, 1767-1783.
- 2001 Brantley, S.L., L. Liermann, S. Wu, M. Bau. Uptake of trace metals and rare earth elements from hornblende by a soil bacterium, Geomicrobiology Journal 18, 37-61.
- 2001 Mellott, N.P., S.L. Brantley, J.P. Hamilton, C.G. Pantano. Evaluation of surface preparation methods for glass, Surface and Interface Analysis 31, 362-368.
- 2001 Brantley, S., L. Liermann, T. Bullen. Fractionation of Fe isotopes by soil microbes and organic acids, Geology 29, 535-538.
- 2001 Hamilton, J., Brantley, S.L., Pantano, C.G., Criscenti, L., Kubicki, J. Dissolution of nepheline, jadeite and albite glasses: toward better models for aluminosilicate dissolution, Geochimica Cosmochimica Acta 65, 3683-3702.
- 2002 Goyne, K.W., A.R. Zimmerman, B.L. Newalkar, S. Komarneni, S.L. Brantley, and J. Chorover. Surface charge of variable porosity Al<sub>2</sub>O<sub>3(s)</sub> and SiO<sub>2(s)</sub> adsorbents. Journal of Porous Materials 9, 243-256.

## Publications (continued)

- 2003 Tsomaia, N., Brantley, S.L., Hamilton, J.P., Pantano, C.G., Mueller, K.T., NMR evidence for formation of octahedral and tetrahedral Al and repolymerization of the Si network during dissolution of aluminosilicate glass and crystal, American Mineralogist 88, 54-67.
- 2003 Buss, H. L., Brantley, S. L., and Liermann, L. J. Nondestructive methods for removal of bacteria from silicate surfaces, Geomicrobiology Journal 20, 25-42.
- 2003 Turner, B.F., Stallard, R.F., Brantley, S.L. Investigation of *in situ* weathering of quartz diorite bedrock in the Rio Icascos basin, Luquillo Experimental Forest, Puerto Rico, Chemical Geology 202, 313-341.
- 2003 Werner, C., Chiodini, G., Voigt, D., Caliro, S., Avino, R., Russo, M., Brombach, T., Wyngaard, J., Brantley, S.L. Monitoring volcanic hazard using eddy covariance at Solfatara Volcano, Naples, Italy. Earth and Planetary Science Letters 210, 561-577.
- 2003 White, A.F. and Brantley, S.L., The effect of time on the weathering of silicate minerals: why do weathering rates differ in the laboratory and field? Chemical Geology 202, 479-506.
- 2003 Lewicki, J.L, Evans, W.C., Hilley, G.E., Sorey, M.L., Rogie, J.D., Brantley, S.L. Shallow soil CO<sub>2</sub> flow along the San Andreas and Calaveras faults, California. Journal of Geophysical Research 108 (B4), 2187, doi:10.1029/ 2002JB002141.
- 2004 Bau, M., B. Alexander, J.T. Chesley, N.P. Mellott, P. Dulski, S.L. Brantley. Mineral dissolution in the Cape Cod aquifer, Massachusetts, USA: I. Reaction stoichiometry and impact of accessory feldspar and glauconite on strontium isotopes, solute concentrations, and REY distribution. Geochimica Cosmochimica Acta 68, 1199-1216.
- 2004 Zimmerman, A.R., Goyne, K.G., Komarneni, S., Chorover, J., Kubicki, J., Brantley, S. L., Mineral mesopore effects on nitrogenous organic matter adsorption. Organic Geochemistry 35:3, 355-375.
- 2004 Icopini, G.A., Anbar, A.D., Ruebush, S.S., Tien, M., Brantley, S.L. Iron isotopic fractionation during microbial reduction of iron: the importance of adsorption, Geology 32, 205-208.
- 2004 Goyne, K.W., Chorover, J, Zimmerman, A.R., Komarneni, S., and Brantley S.L. Influence of mesoporosity on the sorption of 2, 4-dichlorophenoxyacetic acid to alumina and Silica. Journal of Colloid and Interface Science 272, 10-20.
- 2004 Werner, C., and Brantley, S.L. CO<sub>2</sub> emissions from the Yellowstone volcanic system. Geochemistry, Geophysics Geosystems 4:7, 1061.
- 2004 Sak, P. B., Fisher, D., Gardner, T., Murphy, K. M. & Brantley, S. L. Rates of weathering rind formation on Costa Rican basalt Geochimica et Cosmochimica Acta 68:7, 1453-1472.
- 2004 Brantley, S.L., Guynn, R.L., Liermann, L.J., Anbar, A., Barling, J., Icopini, G. Fe

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- isotopic fractionation during mineral dissolution with and without bacteria. Geochimica Cosmochimica Acta 68:15, 3189-3204.
- 2004 Zimmerman, A.R., Chorover, J., Goyne, K.W., Brantley, S.L., Protection of mesopore-adsorbed organic matter from enzymatic degradation. Environmental Science and Technology 38:17, 4542-4548.
- 2004 Anderson, S.P., Blum, J., Brantley, S.L., Chadwick, O., Chorover, J., Derry, L.A., Drever, J.I., Hering, J.G., Kirchner, J.W., Kump, L.R., Richter, D., White, A.F. Proposed initiative would study earth's weathering engine. EOS, Transactions, American Geophysical Union 85:28, 265-269.
- 2005 Icopini, G, Brantley, S.L., and Heaney, P. J. Kinetics of silica oligomerization and nanocolloid formation from supersaturated solutions at 25°C. Geochimica et Cosmochimica Acta 69:2, 293-303.
- 2005 Neaman A., Chorover J., and Brantley S.L. Element mobility patterns record organic ligands in soils on early Earth. Geology 33:2, 117-120.
- 2005 Criscenti, L.J., Brantley, S.L., Mueller, K.T., Tsomaia, N., Kubicki, J.D. Theoretical and <sup>27</sup>Al CPMAS NMR investigation of aluminum coordination changes during aluminosilicate dissolution, Geochimica et Cosmochimica Acta 69:9, 2205-2220.
- 2005 Neaman A., Chorover J., and Brantley S.L. Implications of the evolution of organic acid moieties for basalt weathering over geological time. American Journal of Science 305, 147-185.
- 2005 Liermann, L.J., Guynn, R.L., Anbar, A., and Brantley; S.L. Production of a molybdophore during metal-targeted dissolution of silicates by soil bacteria, Chemical Geology 220, 285-302.
- 2005 Mathur, R., Ruiz, J., Titley, S., Liermann, L., Buss, H. and Brantley, S.L. Cu isotopic fractionation in the supergene environment with and without bacteria. Geochimica et Cosmochimica Acta 69:22, 5233-5246.
- 2005 Zerkle, A.L., House, C.H., and Brantley, S. L. Biogeochemical signatures through time as inferred from whole microbial genomes. American Journal of Science 30, 467-502.
- 2005 Buss, H.L., Bruns, M.A., Schultz, M.J., Moore, J., Mathur, C.F., and Brantley, S.L. The coupling of biological iron cycling and mineral weathering during saprolite formation, Luquillo Mountains, Puerto Rico, Geobiology 3, 247-260.
- 2005 Goyne, K.W., Chorover, J., Kubicki, J.D., Zimmerman, A.R., and Brantley, S.L. Sorption of the antibiotic ofloxacin to mesoporous and nonporous alumina and silica Journal of Colloid and Interface Science 283:1, 160-170.

## Publications (continued)

- 2006 Criscenti, L.J., Kubicki, J.D., Brantley, S.L. Silicate glass and mineral dissolution: calculated reaction paths and activation energies for hydrolysis of a  $Q^3S_1$  by  $H_3O_4$  using *Ab initio* methods, Journal of Physical Chemistry 110, 198-206.
- 2006 Ruebush, S.S., Icopini, G.A., Brantley, S.L. and Tien, M. *In vitro* enzymatic reduction kinetics of mineral oxides by membrane fractions from *Shewanella oneidensis* MR-1. Geochimica et Cosmochimica Acta 70, 56-70.
- 2006 Neaman, A., Chorover, J., and Brantley, S.L. Effects of organic ligands on granite dissolution in batch experiments at pH 6. American Journal of Science 306, 451-475.
- 2006 Ruebush, S., Brantley, S.L., and Tien, M. Reduction of soluble and insoluble iron forms by membrane fractions of *Shewanella oneidensis* grown under aerobic and anaerobic conditions. Applied Environmental Microbiology 72:40099-2240/06 2925-2935.
- 2006 Fletcher, R.C., Buss, H.L., and Brantley, S.L. A spheroidal weathering model coupling porewater chemistry to soil thickness during steady-state denudation. Earth and Planetary Science Letters 244:1-2, 444-457.
- 2006 Goyne, K.W., Chorover, J., and Brantley, S.L., Effects of organic acids and dissolved oxygen on apatite and chalcopyrite dissolution: implications for using elements as organomarkers and oxymarkers. Chemical Geology V. 234:1-2, 28-45.
- 2006 Brantley, S. L., Ross, D. and Tien, M. Kinetics of dissimilatory iron reduction in *Shewanella oneidensis* MR-1: Scaling from purified proteins to whole cell cultures. Eos Trans. AGU 87:52.
- 2007 Schaperdoth, I., Liermann, L.J., and Brantley, S.L. The effect of polymeric substances on apatite reactivity in the presence of a freshwater cyanobacterium. Geomicrobiology Journal 24, 79-91.
- 2007 Conrad, C. F., Icopini, G. A., Yasahura, H., Bandstra, J. Z., Brantley, S. L., and Heaney, P.J. Modeling the kinetics of silica nanocolloid formation and precipitation in geologically relevant aqueous solutions. Geochimica et Cosmochimica Acta 71:3, 531-542.
- 2007 Buss, H.L., Luttge, A., and Brantley, S.L. Etch pit formation on iron silicate surfaces during siderophore-promoted dissolution. Chemical Geology 240: 326-342.
- 2007 Hausrath E. M., Liermann L. J., House C. H., Ferry J. G., and Brantley S. L. The effect of methanogen growth on mineral substrates: will Ni markers of methanogen-based communities be detectable in the rock record? Geobiology 5(1), 49-61.
- 2007 Wasylenki, L.E., Liermann, L.J., Mathur, R., Gordon, G.W., Brantley, S.L., and Anbar, A.D. Metallomics and MC-ICP-MS: isotope fractionation during metal uptake. JAAS Metallomics II Special Issue 22, 905-910.

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- 2007 Liermann, L., Hausrath, L. and Brantley, S. Assimilatory and dissimilatory processes of microorganisms affecting metals in the environment. JAAS Metallomics II Special Issue 22, 867-877.
- 2007 Navarre-Sitchler, A. and Brantley, S. Basalt weathering across scales. Earth and Planetary Science Letters 261, 321-334.
- 2007 Ross, D.E., Ruebush, S., Brantley, S., Hartshorne, R. S., Clarke, T. A., Richardson, D. J., and Tien, M. Characterization of protein-protein interactions involved in iron reduction by *Shewanella oneidensis* MR-1. Applied and Environmental Microbiology 73:18, 5797-5808.
- 2007 Lebedeva, M.I., Fletcher, R.C., Balashov, V.N., and Brantley, S.L. A reaction diffusion model describing transformation of bedrock to saprolite. Chemical Geology 244:3-4, 624-645.
- 2007 Brantley, S.L., Goldhaber, M.B., and Ragnarsdottir, V. Crossing disciplines and scales to understand the Critical Zone. Elements 3, 307-314.
- 2008 Hausrath E. M., Navarre-Sitchler A. K., Sak P. B., Steefel C. I., and Brantley S. L. Basalt weathering rates on earth and the duration of liquid water on the plains of Gusev Crater, Mars. Geology 36:1, 67-70.
- 2008 Bandstra, J. and Brantley, S. L. Surface evolution of dissolving minerals investigated with a kinetic Ising model. Geochimica Cosmochimica Acta 72, 2587-2600.
- 2008 Jang, J.-H., Mathur, R., Liermann, L., Ruebush, S., and Brantley, S. L. An iron isotope signature related to electron transfer between aqueous ferrous iron and goethite. Chemical Geology 250, 40-48.
- 2008 Buss, H. L., Sak, P. B., Webb, S. M., and Brantley, S. L. Weathering of the Rio Blanco quartz diorite, Luquillo Mountains Puerto Rico: Coupling oxidation, dissolution and fracturing. Geochimica Cosmochimica Acta 72, 4488-4507.
- 2008 Brantley, S.L., Bandstra, J., Moore, J., and White, A.F. Modelling chemical depletion profiles in regolith. Geoderma 145:3, 494-504.
- 2008 Brantley, S. L. Understanding Soil Time. Science 321, 1454-1455.
- 2008 Washton, N.M., Brantley, S.L., and Mueller, K.T. Probing the molecular-level control of aluminosilicate dissolution: A sensitive solid-state NMR proxy for reactive surface area. Geochimica Cosmochimica Acta 72:24, 5949-5961.
- 2008 Fischer, T.B., Heaney, P.J., Jang, J.-H., Ross, D.E., Brantley, S.L., Post, J.E., Tien, M. Continuous -time resolved X-ray diffraction of the biocatalyzed reduction Mn oxide. American Mineralogist 93:11-12, 1929-1932.

## **Publications** (continued)

- 2008 Hausrath, E.M., Treiman, A.H., Vicenzi, E., Bish, D.L., Blake, D., Sarrazin, P., Hoehler, T., Midtkandl, I., Steele, A., and Brantley, S.L. Short- and long-term olivine weathering in Svalbard: Implications for Mars. *Astrobiology* 8:6, 1079-1092.
- 2008 Pelt, E., Chabaux, F., Innocent, C., Navarre-Sitchler, A.K., Sak, P.B., and Brantley, S.L. Uranium-thorium chronometry of weathering rinds: Rock alteration rate and paleo-isotopic record of weathering fluids. *Earth and Planetary Science Letters* 276(1-2), 98-105.
- 2009 Jang, J.-H., and Brantley, S. L. Investigation of Wustite (FeO) dissolution: implications for reductive dissolution of ferric oxides. *Environ. Sci. Technol* 43:4, 1086-1090.
- 2009 Kimball B. E., Mathur R., Dohnalkova A. C., and Brantley S. L. Copper Isotope Fractionation in Acid Mine Drainage. *Geochimica et Cosmochimica Acta* 73:5, 1247-1263.
- 2009 Mathur, R., Titley, S.R., Brantley, S.L., and Wilson, M. The use of Cu isotope fractionation in low temperature ore systems as a geochemical exploration tool. *Journal of Geochemical Exploration* 102:1, 1-6.
- 2009 Ross, D. E., Brantley, S.L., and Tien, M. Kinetic characterization of OmcA and MtrC, terminal reductases involved in respiratory electron transfer for dissimilatory iron reduction in *Shewanella oneidensis* MR-1. *Applied and Environmental Microbiology* 75:16, 5218-5226.

## **Submitted or in Revision**

- 2009 Harshorne, R., Brantley, S. L., et al. The Thermodynamic Properties and Modular Organization of an Electron Exchange Conduit Between Bacteria and the Extracellular Environment. (in final review), *Proc. of National Academies of Science*.
- 2009 Sak, P.B., Narre-Sitchler, A.K., Miller, C.E., Daniel, C.C., Lebedeva, M.I., and Brantley, S.L. Rates of formation of basaltic weathering rinds vary with clast curvature, *Chemical Geology* (in review).
- 2009 Fletcher, R.C. and Brantley, S.L. A model interpretation of weathering of bedrock blocks into corestones. *American Journal of Science* (in review).
- 2009 Jin, L., Ravella, R., Ketchum, B., Heaney, P. and Brantley, S.L. Mineral weathering and elemental transport during hillslope evolution: regolith formation on shale at Shale Hills Critical Zone Observatory. *Geochimica et Cosmochimica Acta* (in review).
- 2008 Navarre-Sitchler, A., Steefel, C., Yang, L., Tomutsa, L., and Brantley, S.L. Evolution of porosity and diffusive transport during basalt weathering. (in press), *Journal of Geophysical Research*.
- 2008 Lebedeva, M.I., V.N. Balashov, R.C. Fletcher, and S.L. Brantley, Mathematical model of steady-state regolith production at a constant erosion rate. (in final review), *Earth and*

Planetary Science Letters.

- 2008 Hausrath, E.M., Neaman, A., Brantley, S.L. Elemental release rates from dissolving basalt and granite with and without organic ligands (accepted pending revision), American Journal of Science.

**Published Reports**

- 1992 “America’s Academic Future: Presidential Young Investigator Workshop on U.S. Engineering, Mathematics, and Science Education for the Year 2010 and Beyond,” National Science Foundation.
- 1995 Review of U.S. Dept. of Energy Technical Basis Report for Surface Characteristics, Preclosure Hydrology, and Erosion, Committee for Yucca Mountain Peer Review: Surface Characteristics, Preclosure Hydrology, and Erosion, National Academy Press, Washington D.C.
- 2002 Remediation at the Moab Site – Now and for the Long Term. National Research Council, National Academy Press, Washington D.C.
- 2006 Brantley, S.B., White, T.S., White, A.F., Sparks, D., Richter, D., Pregitzer, K., Derry, L., Chorover, O., April, R., Anderson, S., and Amundson, R., *Frontiers in Exploration of the Critical Zone: Report of a workshop sponsored by the National Science Foundation (NSF), October 24-26 2005, Newark, DE, 30 p.*
- 2007 Brantley, S.B., *Building Critical Zone Research Cyberinfrastructure: Critical Zone Exploration Network Data and Information Systems Workshop; State College, PA, Sept. 17-18, 2007.*

**Chapters in Books**

- 1995 White, A.F., S.L. Brantley. Chemical Weathering Rates of Silicate Minerals: An Overview, *in* Chemical Weathering Rates of Silicate Minerals, A.F. White and S.L. Brantley (eds.), Mineralogical Society of America Short Course, v. 31, 1-22.
- 1995 Brantley, S.L., Y. Chen. Chemical Weathering Rates of Pyroxenes and Amphiboles, *in* Chemical Weathering Rates of Silicate Minerals, A.F. White and S.L. Brantley (eds.), Mineralogical Society of America Short Course, v. 31, 119-172.
- 1997 Brantley, S.L., D.M. Fisher, P. Deines, M.B. Clark, G. Myers. Segregation Veins: Evidence for the Deformation and Dewatering of a Low-grade Metapelite, *in* Deformation-enhanced Fluid Transport in the Earth’s Crust and Mantle, M. B. Holness, (ed.), Chapman, Hall, London, 266-287.
- 1999 Brantley, S.L., White, A.F., Hodson, M. Surface Area of Primary Silicate Minerals, *in* Growth and Dissolution in Geosystems, B. Jamtveit and P. Meakin (eds.), Kluwer Academic Publishers, Dordrecht, 291-326.
- 2002 Mellott, N.P., S.L. Brantley, C.G. Pantano, Topography of Polished Plates of Albite Crystal and Glass During Dissolution, *in* Water-Rock Interactions, Ore Deposits, and Environmental Geochemistry, A Tribute to David A. Crerar, Hellmann R. and Wood S.

(eds.), The Geochemical Society, Spec. Pub. No. 7, 83- 96.

- 2003 Brantley, S.L., Reaction Kinetics of primary Rock-forming minerals under Ambient Conditions, *in* Fresh Water Geochemistry, Weathering, and Soils, J.I. Drever (ed.), v. 5 of Treatise on Geochemistry, K.K. Turekian and H.D. Holland (eds.), Pergamon Press, Oxford, 73-118.
- 2006 Brantley, S.L., Ruebush, S., Jang, J-H., and Tien, M. Analysis of (Bio) Geochemical Kinetics of Fe III Oxides, *in* Methods for Study of Microbe-Mineral Interactions (ed. P. A. Maurice and L. A. Warren), The Clay Mineral Society, Chantilly, VA, V.14, 79-116.
- 2008 Brantley, S.L. and Conrad C.F. Analysis of Rates of Chemical Reactions, *in* Kinetics of Water-Rock Interaction, S.L. Brantley, J.D. Kubicki, & A.F. White (eds.), Springer, New York. 1-35.
- 2008 Bandstra J.Z., and Brantley S.L. Data Fitting Techniques with Applications to Mineral Dissolution Kinetics, *in* Kinetics of Water-Rock Interaction, S. L. Brantley, J. D. Kubicki and A. F. White (eds.), Springer, New York. 211-258.
- 2008 Bandstra J.Z., Buss H.L., Campen K., Liermann L., Moore J., Hausrath E.M., Navarre A.K., Jang J-H. and Brantley S.L. Appendix: Compilation of Mineral Dissolution Rates *in* Kinetics of Water-Rock Interaction, S. L. Brantley, J. D. Kubicki and A. F. White (eds.). Springer, New York. 731-808.
- 2008 Brantley, S.L. Kinetics of Mineral Dissolution, *in* Kinetics of Water-Rock Interaction S.L. Brantley, J.D. Kubicki, & A.F. White (eds.), Springer, New York. 151-196.
- 2009 Brantley, S.L. and White, A.F. Approaches to Modeling Weathered Regolith *in* Thermodynamics and Kinetics of Water-Rock Interaction, E.H. Oelkers and J. Schott, (eds), Reviews in Mineralogy and Geochemistry, V. 70, p. 435-484.
- 2009 Brantley, S.L., Lebedeva, M., Hausrath, E.M. A Geobiological View of Weathering and Erosion, Ch. 12 *in* Geobiology, K. Konhauser (ed.) (in press).

#### **Published poetry**

- 2002 Brantley, S.L., “Ode to a Geochemist”, Water-Rock Interactions, Ore Deposits, and Environmental Geochemistry, A Tribute to David A Crerar, Hellmann R. and Wood S. (ed.), The Geochemical Society, Spec. Pub. No. 7, xv-xvii.

#### **Published Conference Proceedings**

- 1986 Brantley, S.L., D.A. Crerar, B. Evans. Rates and mechanisms of porosity reduction in quartz: Implications for fluid flow in rocks. Proceedings Fifth International Conference on Water-Rock Interaction, Reykjavik, Iceland, 79-82.
- 1989 Brantley, S.L., D. Voigt. Fluids in metamorphic rocks: Effects of fluid chemistry on quartz microcrack healing. Proceedings Sixth International Conference on Water-Rock Interaction, Malvern, England, 113-116.
- 1990 Brantley, S.L. and Donovan, J. Marine evaporites, bittern seepage, and the genesis of subsurface brines. Chemical Geology 84, 187-189.

- 1992 Brantley, S.L. Kinetics of dissolution and precipitation—experimental and field results, Proceedings Seventh International Conference on Water-Rock Interaction, Park City, Utah, 3-6.
- 1992 Stillings, L.L., S.L. Brantley, and M.L. Machesky. Multisite proton adsorption at the feldspar-water interface, Proceedings Seventh International Conference on Water-Rock Interaction, Park City, Utah, 69-72.
- 1992 Agustsdottir, A.M., S.L., Brantley, M.T. Godmundsson, and H. Bjornsson. Volatile release rates from the Grimsvotn volcano, Iceland, Proceedings Seventh International Conference on Water-Rock Interaction, Park City, Utah, 465-468.
- 1992 Shiraki, R. and S.L. Brantley. Precipitation kinetics of calcite at elevated temperatures, Proceedings Seventh International Conference on Water-Rock Interaction, Park City, Utah, 111-114.
- 1997 Foster, A.L., Brown, Jr., G. E., Parks, G.A., Tingle, T.N., Voigt, D.E., Brantley, S.L. XAFS determination of As(V) associated with Fe(III)hydroxides in weathered mine tailings and contaminated soil from California, U.S.A., Proceedings au Journal de Physique III d'avril, Colloque C2, Journal Physics of France, Cd-815-816
- 1998 Nugent, M., P. Maurice, and S.L. Brantley. The field dissolution rate of feldspar in a Pennsylvania (USA) spodosol as measured by atomic force microscopy, Proceedings Ninth International Conference on Water-Rock Interaction, New Zealand, 225-229.
- 1999 Brantley, S.L., L. Liermann, B. Kalinowski, S. Givens, C.G. Pantano, and A. Barnes. Abiotic vs. biotic dissolution of hornblende, Geochemistry of the Earth's Surface, Armannsson, H. (ed.), Balkema, Rotterdam, 357-359.
- 2001 Brantley, S.L., M. Bau, S. Yau, and B. Alexander. Interpreting kinetics of groundwater-mineral interaction using major element, trace element, and isotopic tracers, Proceedings Tenth International Conference on Water-Rock Interaction, Villasimius, Italy, Cidu, R. (ed.), Balkema, Rotterdam, 13-18.
- 2002 Ruiz, J., R. Mathur, S. Brantley, and J.L. Uhrie. Experimental constraints on Cu fractionation in natural environments, Proceedings Sixth International Symposium on Geochemistry of the Earth's Surface, Honolulu, Hawaii, 283-285.
- 2004 Buss, H.L., Sak, P.B., White, A.F., and Brantley, S.L. Mineral dissolution at the granite-saprolite interface. Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 819-823.
- 2004 Moore J., White A. F., and Brantley S. L. Effects of giant sequoia on soil chemistry Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 1341-1345.
- 2004 Hausrath, E.M., Liermann, L.J., and Brantley, S.L. Enhanced dissolution in the presence of methanogens. Proceedings Eleventh International Symposium on Water-Rock

- Interactions, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 1123-1125.
- 2004 Navarre, A., Sak, P., and Brantley, S., Processes controlling weathering rind advancement on Costa Rican basalt clasts, Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 853-857.
- 2004 Cameron, V., Zhang, Z., House, C.H., and Brantley, S.L., A search for hydrothermal tungsten ligands, Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 1269-1273.
- 2004 Mathur, R., Ruiz, J., Liermann, L., and Brantley, S.L. Cu isotopic fractionation associated with oxidation of Cu sulfide with and without *T. ferrooxidans*. Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty & R. Seal (eds.), A.A. Balkema Publishers, London, 1, 1327-1330.
- 2004 Neaman, A., Chorover, J., and Brantley, S.L. The effect of organic ligands on basalt and granite weathering. Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty and R. Seal (eds.), A.A. Balkema Publishers, London, 1347-1350.
- 2004 Zimmerman, A.R., Brantley, S.L., Goynes, K.G., and Chorover, J. Investigations of the effects of mineral mesopores on the adsorption and preservation of organic matter. Proceedings Eleventh International Symposium on Water-Rock Interaction, R. Wanty and R. Seal (eds.), A.A. Balkema Publishers, London, 1059.
- 2008 Hausrath, E.M., Navarre-Sitchler, A.K., Moore, J., Sak, P.B., Brantley, S.L., Golden, D.C., Sutter, B., Schröder, C., Socki, R., Morris, R.V., Ming, D.W. (submitted) Mars sample return: The value of depth profiles. Ground truth from Mars: Science payoff from a sample return mission April 21-23, 2008, Albuquerque, New Mexico.
- 2008 Brantley, S. L., Jin, L., and White, T. (2008) Observations Emerging from a Network of Critical Zone Observatories: Shale Weathering at the Susquehanna-Shale Hills Observatory. *Geological Society of America with Programs*, 40:6, p. 275

### **Theses Supervised**

- 1990 Lee, Vivian: “Fluid Wetting Characteristics of Quartzites” (M.S. co-advised by S.J. Mackwell)
- 1991 Rowe, Gary: “The Acid Crater Lake System of Poas Volcano, Costa Rica: Geochemistry, Hydrology, and Physical Characteristics” (Ph.D.)
- 1991 MacInnis, Ian: “Dissolution Kinetics of Calcite and Quartz under Surface Reaction Control” (Ph.D.)
- 1993 Agustsdottir, Anna: “Volatile Release Rates of Grimsvotn, Volcano, Iceland” (M.S.)
- 1993 Stillings, Lisa: “Feldspar Surface Chemistry and Dissolution Kinetics” (Ph.D.)

- 1995 Koepenick, K.W.: “Volatile Emissions from Oldoinyo Lengai Volcano, Tanzania” (M.S.)
- 1995 Murphy, S.: “The Weathering of Biotite in a Tropical Forest Soil, Luquillo Mountains, Puerto Rico” (M.S.)
- 1997 Everett, Mark, “Distribution of Veins in the Kodiak Accretionary Complex” (M.S.)
- 1997 Nugent, Melissa, “Temporal Evolution of Feldspar Surfaces during the Initial Stages of In-situ Weathering” (M.S.)
- 1999 Yau, Simmy, “Dissolution Kinetics of Feldspar in the Cape Cod Aquifer, Massachusetts: Calculation of Ground Water Residence Time” (M.S.)
- 1999 Werner, Cindy, “CO<sub>2</sub> Emissions Related to the Yellowstone Volcanic System: Statistical Sampling, Total Degassing, and Transport Mechanisms” (M.S.)
- 2000 Mellott, N.P., “Evolution of Surface Roughness with Aqueous Corrosion of Alkali and Alkaline-Earth Aluminosilicate Minerals and Glasses” (M.S.)
- 2001 Turner, Ben, “Effects of Temperature and Climate on Chemical Weathering in Two Contrasting High-Rainfall Mountainous Catchments” (Ph.D.)
- 2002 Lewicki, Jen, “Soil CO<sub>2</sub> Flow along the San Andreas and Calaveras Faults, California” (Ph.D.)
- 2002 Werner, Cynthia, “CO<sub>2</sub> Emissions in Yellowstone, USA, and Solfatara Volcano, Italy: Use of Eddy Covariance and Mass Flux Modeling” (Ph.D.)
- 2006 Buss, Heather, “Biogeochemical Weathering of Iron-Silicate Minerals” (Ph.D.)
- 2007 Hausrath, Elizabeth, “Basalt Weathering on Mars” (Ph.D.)
- 2007 Moore, Joel, “Biogeochemistry of Granitic Weathering” (Ph.D.)
- 2007 Navarre-Sitchler, Alexis "Weathering advance rates in basalt: prediction and comparison across scales" (Ph.D.)
- 2008 Williams, Jennifer, “The Effect of Temperature and Precipitation on Sodium Depletion Fronts in Soils Developed on Peoria Loess” (M.S.)
- 2009 Alexander, Brian W. “Controls on Groundwater Chemistry in the Cape Cod Aquifer, Massachusetts: The Impact of Accessory Mineral Phases on Solute Concentrations, <sup>87</sup>Sr/<sup>86</sup>Sr, and Rare Earth Element Distributions (M.S.)

### **Special Volumes Edited**

- 1993 Brantley S. L., M. Velbel (eds.) Geochemical Kinetics of Mineral-Water Reactions in the Field and in the Laboratory, Chemical Geology, v 105.

- 2007 Brantley, S. L., White, T. S., Ragnarsdottir, K. C. (eds.) *The Critical Zone: Where Rock Meets Life*, Elements, v 3.

### **Books Edited**

- 1995 White, A.F., S.L. Brantley, (eds.) Chemical Weathering Rates of Silicate Minerals, Mineralogical Society of America Shortcourse, v. 31.
- 2008 Brantley, S.L., Kubicki, J, and White, A.F. (eds.) (in press). Kinetics of Water-Rock Interaction. New York: Springer, 151-196.

### **Scientific Special Sessions Organized**

- 1991 Brantley, S.L., A. White (organizers). Geochemical kinetics: Field vs. laboratory rates, special Geochemical Society-sponsored session at the Geol. Society of America Annual Meeting, (27 papers presented). Fall '91.
- 1992 Brantley, S.L., C. M. Eggleston (organizers). Structure, bonding, and kinetics at mineral surfaces, sponsored by Geochemistry Division for the National Meeting of the American Chemical Society, special session (35 papers presented). Spring '92.
- 1993 Brantley, S.L., P. Heaney (organizers). Interactions between the Geosphere and Biosphere. A Symposium Honoring the Life and Career of David A. Crerar. Princeton University, (6 invited speakers). May '93.
- 1993 Brantley, S.L., B. Dutrow, J. Selverstone (organizers). Fluids and Fluid Flow in the Crust. Symposium at the Geological Society of America Annual meeting. Fall '93.
- 1995 Brantley, S.L., A.F. White (organizers). Chemical Weathering Rates of Silicate Minerals, Mineralogical Society of America Short Course, Fall '95.
- 2002 Brantley, S.L. Geomicrobiology, Geochemistry of the Earth's Surface, Hawaii, May '02.
- 2004 Brantley, S.L. (Secretary General WRI 11). Proceedings Eleventh International Symposium on Water-Rock Interaction, Working Group of the International Association of Geochemistry and Cosmochemistry, June '04.
- 2005 Brantley, S.L. WSSC Workshop, The Critical Zone Exploration Network: A Tool for Understanding Earth's Weathering Engine Arlington, Va. January 24-26 2005.
- 2005 Brantley, S.L., 2005 Goldschmidt The Earth's Weathering Engine: Coupling Chemical Weathering with Physical Erosion, Biology, Hydrology and Climate, May 19-23, 2005.
- 2005 Brantley, S.L., White, T.S. The Critical Zone Exploration Network: A Tool for Understanding Earth's Weathering Engine, University of Delaware, All-Hands Meeting, October 24-26, 2005.
- 2007 Hausrath, E., Brantley, S.L. and Michalski, J., 2007 Goldschmidt Conference. Chemical and physical weathering of basalt on the Earth, Moon, and Mars.

### **National Committees**

- 1995 Member, National Research Council Committee for Yucca Mountain Peer Review: Surface Characteristics, Preclosure Hydrology, and Erosion
- 1997 Participated in National Academies of Science Frontiers of Science
- 1998 Organized the National Academies of Science Frontiers of Science
- 1999 Served as outside reviewer for "Research Needs in Subsurface Science", publication by the National Research Council reviewing the U.S. Dept. of Energy's Environmental Management Science Program
- 2001-2003 Member, National Research Council Committee on Long-Term Institutional Management of DOE Legacy Waste Sites: Phase 2
- 2003-2006 Member, Advisory Committee for Directorate of Geosciences, National Sciences Foundation
- 2004 Member, NSF Committee of Visitors to review EAR Instrumentation and Facilities program
- 2005 Chair, NSF Committee of Visitors to review EAR Surface Earth Processes
- 2005-2007 Vice-chair of the Earth Sciences Policy and Research in Space Solid-Earth Panel established to write the Solid-Earth Contribution to the "Earth Science Applications from Space: A Community Assessment and Strategy for the Future" (Decadal Study)
- 2005-2007 Member, NRC Space Studies Board Panel, Astrobiology Strategy for the Exploration of Mars

### **Professional Societies and Service to Scientific Community**

- Member, Steering Committee, IGERT National Recruitment Program Advisory Committee (committee to enhance diversity within IGERT programs nationally)
- The Geochemical Society: Nominations Committee, member, 1990-1992; Chair of Nominations Committee, 1992-1993; Member of Board of Councilors (Directors) of the Society, 1995-1998; Publications Committee, 1999-2002; Vice President, 2004-2005, and President, 2006-2007
- Secretary General for WRI 11 (Water-Rock Interaction Working Group of the International Association of Geochemistry and Cosmochemistry), 2004-2007.
- Served as manuscript reviewer for: *Geochimica Cosmochimica Acta*, *Geology*, *Chemical Geology*, *Science*, *Water Resources Research*, as well as other journals
- Reviewer of grant proposals for National Science Foundation, Petroleum Research Fund, Department of Energy, NASA, and other agencies here and in Europe
- DOE Science Review Panel Member, Natural and Accelerated Bioremediation Interdisciplinary Research Program, 2003
- DOE Science Review Panel Chair, Environmental Molecular Science Program, July 2005
- NSF Earth Sciences Postdoctoral program, served as panelist
- NSF Environmental Geochemistry and Biogeochemistry Program (EGB), served as panelist
- American Geophysical Union, member
- American Chemical Society, member
- American Women in Science, member
- Association for Women Geoscientists, member
- Penn State Commission for Women, member, 2005-2007
- DOE Biological and Environmental Research Advisory/COV Panel, 2007
- Council for the Geosciences Program of the Office of Science of the Department of Energy, member, 2008

### **Editorial Activities**

Assistant Editor for Chemical Geology, 1/89 - 1/91  
Editor for Chemical Geology, 10/91-7/00  
Editorial board for Chemical Geology, 7/00-present  
Editorial board for Geofluids, 10/99-present  
Editorial board for  $G^3$ , 10/00-present  
Editorial board for Geobiology, 6/02-present

### **Summary of Research Interests**

Water-rock interaction; soil geochemistry and weathering; geomicrobiology; measurement of the kinetics of dissolution and precipitation of minerals in the laboratory and in the field; surface chemistry of minerals; environmental water problems and biogeochemical cycles; fluid-volcano interactions; volcanic release of volatiles.

### **Undergraduate and Graduate Courses Taught**

Geosciences 4 (Rocks and Minerals), Geosciences 201 (Earth Materials), Geosciences 303 (Environmental Geology), Geosciences 413 (Techniques in Environmental Geochemistry), Geosciences 522 (Geochemistry of Aqueous Systems), Geosciences 523 (Sedimentary Geochemistry), Geosciences 589 (Seminar in Aqueous Geochemistry) Geosciences 560 (Kinetics of Geochemical Systems), Geosciences 589 (Geochem Seminar), Geosciences 597 (Fluids in the Earth), Geosciences 597 (Biogeochemical Analysis), Earth 100 (Environment Earth).