

## **BRIAN W. STEWART**

Department of Geology & Planetary Science  
University of Pittsburgh  
Pittsburgh, PA 15260

### **EDUCATION**

#### **Ph.D., Geochemistry (1990) University of California at Los Angeles**

Dissertation: Neodymium and strontium isotopic investigations of magma chamber processes: Case studies of the Skaergaard intrusion, East Greenland, the Stillwater Complex, U.S.A., and the Muskox intrusion, Canada (*D. J. DePaolo, advisor*)

#### **B.S., Geology (1983) Brown University**

### **RESEARCH INTERESTS**

Application of radiogenic and metal stable isotope geochemistry to fundamental problems in geological, planetary and environmental sciences.

### **RESEARCH APPOINTMENTS**

- 2001 – present    **Associate Professor of Geology & Planetary Science, University of Pittsburgh**  
2005 – 2008      **Department Chair, Geology & Planetary Science, University of Pittsburgh**  
2002 – 2003      **Visiting Scientist, Cornell University**  
1995 – 2001      **Assistant Professor of Geology, University of Pittsburgh**  
1994 – 1995      **Research Assistant Professor of Geology, University of Pittsburgh**  
1994              **Postdoctoral Research Fellow, University of California, Riverside**  
                      (*R.C. Graham, Department of Soil & Environmental Science, Sponsor*)  
1992 – 1994      **Associate Scientist & Visiting Associate, California Institute of Technology**  
1990 – 1992      **Postdoctoral Research Fellow, California Institute of Technology**  
                      (*G.J. Wasserburg, Department of Geological & Planetary Sciences, Sponsor*)  
1989 – 1990      **Research Associate, University of California, Berkeley**  
1984 – 1989      **Research Assistant/Associate, University of California, Los Angeles**

### **PUBLICATIONS**

#### **Peer-Reviewed Articles**

- Hamel, B.L., **Stewart, B.W.** and Kim, A.G. (2010) Tracing the interaction of acid mine drainage with coal utilization byproducts in a grouted mine: Strontium isotope study of the inactive Omega Coal Mine, West Virginia (USA). *Applied Geochemistry* 25, 212-223.
- Cole, R. B. and **Stewart, B. W.** (2009) Continental margin volcanism at sites of spreading ridge subduction: Examples from southern Alaska and western California. *Tectonophysics* 464, 118-136.
- Liu, R., Wolfe, A. L., Dzombak, D. A., Horwitz, C. P., **Stewart, B. W.**, and Capo, R. C. (2008) Electrochemical study of hydrothermal and sedimentary pyrite dissolution. *Applied Geochemistry* 23, 2724-2734.
- Liu, R. Wolfe, A. L., Dzombak, D. A., **Stewart, B. W.**, and Capo, R. C. (2008). Comparison of dissolution under oxic acid drainage conditions for eight sedimentary and hydrothermal pyrite samples. *Environmental Geology* 56, 171-182.

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- Ewing, S., Yang, W., DePaolo, D. J., Michalski, G., Kendall, C., **Stewart, B. W.**, Thiemens, M. and Amundson, R. (2008) Non-biological fractionation of stable Ca isotopes in soils of the Atacama Desert, Chile. *Geochimica et Cosmochimica Acta* 72, 1096-1110.
- Wolfe, A.L., Liu, R., **Stewart, B. W.**, Capo, R.C. and Dzombak, D.A. (2007) A method for generating uniform size-segregated pyrite particle fractions, *Geochemical Transactions* 8:9 doi:10.1186/1467-4866-8-9; 8p.
- Watanabe, Y., **Stewart, B. W.** and Ohmoto, H. (2004) Organic- and carbonate-rich soil formation ~2.6 billion years ago at Schagen, East Transvaal district, South Africa. *Geochimica et Cosmochimica Acta* 68, 2129-2151.
- Doran, P. T., Clifford, S. M., Forman, S. L., Nyquist, L., Papanastassiou, D. A., **Stewart B. W.**, Sturchio, N. C., Swindle, T. D., Cerling, T., Kargel, J., McDonald, G., Nishiizumi, K., Poreda, R., Rice, J. & Tanaka, K. (2004) Mars chronology: assessing techniques for quantifying surface processes. *Earth Science Reviews* 67, 313-337.
- Schatzel, S. J. and **Stewart, B. W.** (2003) Rare earth element sources and modification in the Lower Kittanning coal bed, Pennsylvania: implications for the origin of coal mineral matter and rare earth element exposure in underground mines. *International Journal of Coal Geology* 54, 223-251.
- Pretti, V. A. and **Stewart, B. W.** (2002) Solute sources and chemical weathering in the Owens Lake watershed, eastern California. *Water Resources Research*, doi:10.1029/2001WR000370.
- Stewart, B. W.**, Capo, R. C., and Chadwick, O. A. (2001) Effects of rainfall on weathering rate, base cation provenance, and Sr isotope composition of Hawaiian soils. *Geochimica et Cosmochimica Acta* 65, 1087-1099.
- Whipkey, C. E., Capo, R. C., Chadwick, O. A., and **Stewart, B. W.** (2000) The importance of sea spray to the cation budget of a coastal Hawaiian soil: a strontium isotope approach. *Chemical Geology* 168, 37-48.
- Stewart, B. W.**, Capo, R. C. and Chadwick, O. A. (1998) Quantitative strontium isotope models for weathering, pedogenesis and biogeochemical cycling. *Geoderma* 82, 173-195.
- Capo, R. C., **Stewart, B. W.** and Chadwick, O. A. (1998) Strontium isotopes as a tracer of earth surface processes: Theory and methods. *Geoderma* 82, 197-225.
- Stewart, B. W.**, Papanastassiou, D. A. and Wasserburg, G. J. (1996) Sm-Nd systematics of a silicate inclusion from the Caddo IAB iron meteorite. *Earth and Planetary Science Letters* 143, 1-12.
- Stewart, B. W.** and DePaolo, D. J. (1996) Isotopic studies of processes in mafic magma chambers: III. The Muskox intrusion, Northwest Territories, Canada. In S.R. Hart and A.R. Basu, eds., *Earth Processes: Reading the Isotopic Code. Geophysical Monograph* 95. New York, American Geophysical Union, 277-292.
- Stewart, B. W.**, Papanastassiou, D. A. and Wasserburg, G. J. (1994) Sm-Nd chronology and petrogenesis of mesosiderites. *Geochimica et Cosmochimica Acta* 58, 3487-3509.
- Stewart, B. W.** and DePaolo, D. J. (1992) Diffusive isotopic contamination of mafic magma by coexisting silicic liquid in the Muskox intrusion. *Science* 255, 708-711.
- Stewart, B. W.** and DePaolo, D. J. (1990) Isotopic studies of processes in mafic magma chambers: II. The Skaergaard intrusion, East Greenland. *Contributions to Mineralogy and Petrology* 104, 125-141.

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### Non-Peer Reviewed Reports

Doran, P. T., Clifford, S. M., Forman, S. L., Nyquist, L., Papanastassiou, D. A., **Stewart, B. W.**, Sturchio, N. C. and Swindle, T. D., eds. (2000) Workshop report: Assessing chronometric techniques for quantifying surficial processes on Mars.

[http://marsweb1.jpl.nasa.gov/dating/mars\\_chronology\\_report.pdf](http://marsweb1.jpl.nasa.gov/dating/mars_chronology_report.pdf)

### EXTERNAL GRANTS

**Department of Energy**-National Energy Technology Laboratory (2/10-9/10; *Co-Investigator*)

*Novel Geochemical Tools to Predict and Monitor Fate and Impact of Subsurface CO<sub>2</sub>*

PI R. Capo (Univ. Pittsburgh); Co-I D. Vesper (West Virginia University)

**Department of Energy**-National Energy Technology Laboratory (7/06-6/09; *Principal Investigator*)

*Regional Collaboratory for the Study of Trace Elements Associated with Fossil Fuels and Utilization Byproducts*

Co-Is R. Capo (Univ. Pittsburgh), D. Vesper and F. King (West Virginia University)

**National Science Foundation** – Instrumentation and Facilities Program (9/05-8/08; *Co-Investigator*)

*Technician Support: Geochemistry Laboratories at the University of Pittsburgh, Phase II*

PI R. Capo (Univ. Pittsburgh)

**National Science Foundation** – UC Berkeley Subcontract (1/05-12/07; *Subcontract PI*)

*Role of Rainfall on the Geochemical Evolution of Soils: The Atacama Desert of Chile*

PI R. Amundson (UC Berkeley)

**National Science Foundation** – Instrumentation and Facilities Program (1/05-12/05; *Co-Investigator*)

*Suppl. Request: Repair of Thermal Ionization Mass Spectrometer for Iron Isotope Analyses*

PI R. Capo (Univ. Pittsburgh)

**NASA Origins Program** – Astrobiology Institute (7/03–6/09; *Co-Investigator*)

*Evolution of a Habitable Planet*

PI H. Ohmoto (Penn State) with 12 co-Is from Penn State, Univ. Pittsburgh, SUNY Stony Brook

**National Science Foundation** – Hydrology Program (1/03–12/05; *Co-Investigator*)

*Collaborative Research: Field and Experimental Iron Isotope Investigation of Sedimentary Pyrite Dissolution in Appalachian Coal Mine Drainage*

PI R. Capo (Univ. Pittsburgh); PI D. Dzombak (Carnegie Mellon University)

**National Science Foundation** – Instrumentation and Facilities Program (7/02-6/05; *Co-Investigator*)

*Technician Support: Geochemistry Laboratories at the University of Pittsburgh, Phase I*

PI R. Capo (Univ. Pittsburgh)

**NASA Planetary Instrument Development and Definition Program** (3/99–1/01; *Principal Investigator*)

*Miniature In Situ Geochronology Instrument for Planetary Surface Deployment: Breadboard Development*

Co-Is G. Cardell, M. Sinha (JPL); R. Capo, D. Crown (Univ. Pittsburgh)

**National Science Foundation** – Geology & Paleontology Program (1/99-1/02; *Sole Investigator*)

*Quaternary paleohydrology of the western Great Basin Province, U.S.A*

**NASA Origins Program** – Astrobiology Institute (7/98–6/03; *Co-Investigator*)

*Establishment of the Penn State Astrobiology Center*

PI H. Ohmoto (Penn State) with 12 co-Is from Penn State, Univ. Pittsburgh, SUNY Stony Brook

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**JPL/Caltech** Center for Space Microelectronics (7/97–6/98; *Principal Investigator*)  
*Development of Variable Environment Laser Ablation System for Mars In Situ Geochronology Instrument*  
Co-I R. Capo (Univ. Pittsburgh)

**JPL/Caltech** Mini-Directors Research Development Fund (7/97–6/98; *Principal Investigator*)  
*In-Situ Miniature Age Dating Laboratory Development*  
Co-I R. Capo (Univ. Pittsburgh)

**National Science Foundation** – Instrumentation and Facilities Program (1/97-12/98; *Co-Investigator*)  
*Acquisition of a Thermal Ionization Mass Spectrometer*  
PI R. Capo (Univ. Pittsburgh)

### ABSTRACTS & PRESENTATIONS

#### 2009

Chapman<sup>†</sup>, E.C., Capo, R.C., **Stewart, B.W.**, Hedin, R. and Weaver, T. (2009) Sr isotope quantification of deep brine and shallow acidic coal mine drainage inputs to high TDS gas well discharges in western Pennsylvania. *Eos, Trans. Am. Geophys. Union*, 90(52), Fall Meet. Suppl., Abstract H51I-0907.

Gardiner<sup>†</sup>, J.B., **Stewart, B.W.**, Capo, R.C. and Hakala, J.A. (2009) Strontium isotope tracking of groundwater-CO<sub>2</sub> interactions in Chimayo, New Mexico, and implications for carbon storage in geologic formations. *Eos, Trans. Am. Geophys. Union*, 90(52), Fall Meet. Suppl., Abstract H13A-0912.

**Stewart<sup>†</sup>, B.W.**, Hynicka, J., Ewing, S. and Amundson, R. (2009) Radiogenic isotope provenance of dry deposition in hyperarid soils of the Atacama Desert, Chile. *ASA-CSSA-SSSA Ann. Meeting* #55908.

**Stewart<sup>†</sup>, B.W.** and Capo, R.C. (2009, *invited*) Radiogenic Isotopes as Tracers: A History of Applications From Planetary Differentiation to Pedogenesis. *ASA-CSSA-SSSA Ann. Meeting* #54671.

Johnson<sup>†</sup>, I.M., Watanabe, Y., **Stewart, B.W.** and Ohmoto, H. (2009) Earth's oldest (~3.4 Ga) lateritic paleosol in the Pilbara Craton, Western Australia. *Goldschmidt Conf. Abstr., Geochim. Cosmochim. Acta* 73, Suppl. 1: A601.

#### 2008

**Stewart<sup>†</sup>, B.W.** and Capo, R.C. (2008) Strontium isotope tracking of Pleistocene solute sources in Great Basin pluvial systems: Results from Searles Lake, eastern California. AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: PP13C-1461.

Chapman<sup>†</sup>, E.C., **Stewart, B.W.**, Capo, R.C., Brubaker, T. M., Spivak-Birndorf, L. and Schroeder, K.T. (2008) Significant shifts in boron isotope ratios during column leaching of coal fly ash. Geological Society of America Fall Meeting Houston. *Geol. Soc. Am. Abstr. Prog.* 272-13.

Brubaker<sup>†</sup>, T. M., Chapman, E.C., **Stewart, B.W.**, Capo, R.C., Spivak-Birndorf, L. and Schroeder, K.T. (2008) Strontium Isotope Tracking of coal utilization by-product (CUB) interactions with environmental waters: Results from column leaching experiments. Geological Society of America Fall Meeting Houston. *Geol. Soc. Am. Abstr. Prog.* 247-13.

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<sup>†</sup> Meeting presenter

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Hynicka, J. D., **Stewart<sup>†</sup>, B. W.**, Ewing, S. and Amundson, R. (2008) Tracking the provenance of soil nutrients in arid to hyperarid soils of the Atacama Desert, Chile, using strontium isotopes. Geological Society of America Fall Meeting Houston. *Geol. Soc. Am. Abstr. Prog.* 51-5.

Hynicka<sup>†</sup>, J.D., **Stewart, B.W.**, Ewing, S.A. and Amundson, R. (2008) Radiogenic isotope tracking of cation sources in the arid soils of the Atacama Desert, Chile. *NASA Astrobiology Institute Annual Meeting*, Santa Clara, CA.

Wolfe<sup>†</sup>, A.L., Liu, R., **Stewart, B.W.**, Capo, R.C. and Dzombak, D.A.. (2008) Fe isotope investigation of the pyrite lifecycle. *NASA Astrobiology Institute Annual Meeting*, Santa Clara, CA.

### 2007

Cole<sup>†</sup>, R., **Stewart, B. W.** (2007) Post-collisional magmatism across an accreted terrane assemblage in south-central Alaska: Connections between mantle sources, deformation, and plate margin dynamics. AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: Vxxxxx (CD).

### 2006

Hynicka<sup>†</sup>, J. D., **Stewart, B. W.**, Ewing, S. and Amundson, R. (2006) Assessing cation deposition and remobilization in arid soils of the Atacama Desert, Chile. Geological Society of America Fall Meeting, Philadelphia. *Geol. Soc. Am. Abstr. Prog.* 38, no. 7, p. 522.

Spivak-Birndorf<sup>†</sup>, L. J. and **Stewart, B. W.** (2006) Use of boron isotopes to track the interaction of coal utilization byproducts with water in the environment. *Geological Society of America Fall Meeting*, Philadelphia. *Geol. Soc. Am. Abstr. Prog.* 38, no. 7, p. 95.

Wolfe<sup>†</sup>, A. L., Liu, R., **Stewart, B. W.**, Capo, R. C. and Dzombak, D. A. (2006) Pyrite dissolution experiments: Production of clean, uniform particle size fractions. *Geological Society of America Fall Meeting*, Philadelphia. *Geol. Soc. Am. Abstr. Prog.* 38, no. 7, p. 546.

Liu<sup>†</sup>, R., Wolfe A., Dzombak, D. A., **Stewart, B. W.** and Capo, R. C. (2006) Rate and extent of dissolution of various sedimentary and hydrothermal pyrite samples. *American Chemical Society Fall Meeting*, San Francisco, September 10-14.

### 2005

Hamel, B. L., **Stewart<sup>†</sup>, B. W.** and Kim, A. (2005) Use of strontium isotopes to quantify interaction of water with coal combustion byproducts in an abandoned, partially grouted coal mine, West Virginia, U.S.A. AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: H23F-1503.

Wolfe<sup>†</sup>, A. L., **Stewart, B. W.** and Capo, R. C. (2005) Iron isotope investigation of sedimentary pyrite associated with coal mine discharges (AMD). AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: H23F-1504.

Stafford, S. L., Capo<sup>†</sup>, R. C., **Stewart, B. W.** and Macpherson, G. (2005) Geochemical and textural investigation of an Archean paleosol, South Roberts Pit, Steep Rock area, Ontario, Canada. AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: V43B-1583 (CD).

Ewing<sup>†</sup>, S. A., Amundson, R., Yang, W., Kendall C., **Stewart, B. W.** and DePaolo, D. J. (2005) Two Million years of desert aerosols: Evidence for non-biological isotopic fractionation of Ca in hyperarid soils of the Atacama Desert, Chile. AGU Fall Meeting, San Francisco. *Eos, Trans. Am. Geophys. Union*: PP34A-08.

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<sup>†</sup> Meeting presenter

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### 2004

Walden<sup>†</sup>, K., **Stewart, B. W.**, Watanabe, Y. and Ohmoto, H. (2004) Neodymium isotopic evolution of the Kalkkloof paleosol, South Africa. AbSciCon 2004, NASA Ames Research Center, California. *Int. J. Astrobiology* Supplement 1.

### 2003

Ewing<sup>†</sup>, S., **Stewart, B. W.**, Kendall, C., McKay, C. P. and Amundson, R. G. (2003) Aerosol deposition to hyperarid soils of the Atacama Desert. *Eos, Trans. Am. Geophys. Union* 84, F259.

### 2002

**Stewart<sup>†</sup>, B. W.**, Bau, M. and Capo, R. C. (2002) Neodymium isotope investigation of 2.6 Ga Hamersley Group carbonate, Western Australia. *Proc. 12th Ann. V.M. Goldschmidt Conf.*

Stafford<sup>†</sup>, S. L., Capo, R. C., **Stewart, B. W.**, Marmo, J. and Ohmoto, H. (2002) Paleoenvironmental investigation of the Proterozoic Hokkalampi paleosol, eastern Finland. *Proc. 12th Ann. V.M. Goldschmidt Conf.*

Hamel<sup>†</sup>, B., Kim, A. G. and **Stewart, B. W.** (2002) Strontium isotopes as a tracer of water movement in a grouted mine. *Am. Soc. Surf. Min. Recl., 19th Ann. Meeting.*

Schatzel<sup>†</sup>, S. J. and **Stewart, B. W.** (2002) Rare earth element sources and modification in a Late-Middle Pennsylvanian-age coal bed and associated units, western Pennsylvania. *Geol. Soc. Am. Abstr. Prog. North-Central/Southeastern Sect. Joint Meeting.*

### 2001

**Stewart<sup>†</sup>, B. W.**, Roof, S., Boulanger, J. R. and Lowenstein, T. K. (2001) Connectivity of Owens River system paleo-lakes during Quaternary glacial periods: The strontium isotope record. *Eos, Trans. Am. Geophys. Union*, **82**, F754.

Minervini<sup>†</sup>, J. M. and **Stewart, B. W.** (2001) Neodymium isotope variations in late Quaternary carbonate lake sediments, Owens Valley, eastern California. *Eos, Trans. Am. Geophys. Union*, **82**, F754-F755.

**Stewart<sup>†</sup>, B. W.** and Capo, R. C. (2001) A radiogenic isotope record of Quaternary climate and weathering in clastic and carbonate sediments of Owens Lake, eastern California. *4th Int. Sympos. Appl. Isotope Geochem., Prog. Abstr.*, 100-102.

Capo<sup>†</sup>, R. C., Stafford, S. L., Kairies, C. L., **Stewart, B. W.**, Reynolds, A. C., Weaver, T. and Hedin, R. S. (2001) Tracking the geochemical evolution of coal mine drainage with radiogenic isotopes. *4th Int. Sympos. Appl. Isotope Geochem., Prog. Abstr.*, 155-157.

**Stewart<sup>†</sup>, B. W.**, Cardell, G., Taylor, M. E., Capo, R. C. and Crown, D.A. (2001) *In situ* geochronology of planetary surfaces: Application of the rubidium-strontium isotope system. *Proc. 11th Ann. V.M. Goldschmidt Conf.*, Abstract #3891. LPI Contribution No. 1088, Lunar & Planetary Institute, Houston, Texas (CD-ROM).

Boulanger<sup>†</sup>, J. R., **Stewart, B. W.**, Lowenstein, T. K. and Capo, R. C. (2001) Sources of water and dissolved solids in Death Valley: A strontium isotope investigation. *Proc. 11th Ann. V.M. Goldschmidt Conf.*, Abstract #3876. LPI Contribution No. 1088, Lunar & Planetary Institute, Houston, Texas (CD-ROM).

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<sup>†</sup> Meeting presenter

2000

- Macpherson, G. L., Stafford<sup>†</sup>, S. L., Capo, R. C., **Stewart, B. W.**, and Ohmoto, H. (2000) Geochemistry of an Archean paleosol, Steep Rock, Ontario, Canada: Whole rock and LAM-ICPMS analysis, *Geol. Soc. Am. Abstr. Prog.*, **32**, A485.
- Schatzel<sup>†</sup>, S. J. and **Stewart, B. W.** (2000) Coal mineral matter origin and provenance: a neodymium isotope study of the Lower Kittanning coal bed, western Pennsylvania, *Geol. Soc. Am. Abstr. Prog.*, **32**, A82.
- Stafford<sup>†</sup>, S. L., **Stewart, B. W.**, Capo, R. C., and Ohmoto, H. (2000) Neodymium isotope investigation of an Archean weathering profile: Steep Rock paleosol, Ontario, Canada, *Geol. Soc. Am. Abstr. Prog.*, **32**, A485
- Doran<sup>†</sup>, P. T., Cerling, T. E., Clifford, S. M., Forman, S., Nyquist, L., Papanastassiou, D. A., **Stewart, B. W.**, Sturchio, N. C., Swindle, T. D. (2000) Martian chronology: Goals for investigations from a recent multidisciplinary workshop. *Concepts and Approaches for Mars Exploration: Lunar and Planetary Institute, Houston, Texas* (<http://cass.jsc.nasa.gov/meetings/robomars/>)

1999

- Pretti<sup>†</sup>, V. A., **Stewart, B.W.**, Capo, R.C. (1999) Hydrologic sources for the Owens River System, eastern California: chemistry and strontium isotope composition of eastern Sierra Nevada stream water, *EOS, Trans. Am. Geophys. Union*, **80**, F431-432.
- Stafford<sup>†</sup>, S. L., Capo, R. C., **Stewart, B. W.**, Macpherson, G. L., Ohmoto, H. (1999) Micromorphology and geochemistry of an apparent Archean weathering profile, Ontario, Canada, *EOS, Trans. Am. Geophys. Union*, **80**, F1167.
- Stewart<sup>†</sup>, B.W.**, Capo, R. C., Watanabe, Y., Ohmoto, H. (1999) Provenance of a 2.6 Ga terrestrial carbonate sequence from the eastern Transvaal region, South Africa *EOS, Trans. Am. Geophys. Union*, **80**, F69-70.
- Stafford<sup>†</sup>, S. L., Capo, R. C., **Stewart, B. W.**, Hedin, R. (1999) Strontium isotopic ratios trace alkaline addition to coal mine drainage. Harvard University; *Lunar Planetary Institute Contribution No. 971, 9th Annual V.M. Goldschmidt Conference*, 283.

1998

- Stewart<sup>†</sup>, B. W.** (1998) Quaternary weathering processes and climate change in the Sierra Nevada and western Great Basin: Radiogenic isotope results from the Owens River system. *Geol. Soc. Am. Abstr. Prog.* **30**, A66.
- Capo<sup>†</sup>, R. C., **Stewart, B. W.** and Chadwick, O. A. (1998) Delivery of dust and labile cations to desert surfaces: The soil carbonate record. *Geol. Soc. Am. Abstr. Prog.* **30**, A100.
- Yurko<sup>†</sup>, M. L., Stafford, S. L., **Stewart, B. W.**, Capo, R. C. and Rollins, H. B. (1998) Trace element and strontium isotope composition in freshwater mussels as a record of environmental change. *Geol. Soc. Am. Abstr. Prog.* **30**, A181-A182.

1997

- Stewart<sup>†</sup>, B. W.**, Capo, R. C. and Chadwick, O. A. (1997) Quantifying weathering rates using strontium isotopes: A tale of two parent materials. *Cordill. Sect. Geol. Soc. Am. Abstr. Prog.* **29**, no. 5, 67 (invited).

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<sup>†</sup> Meeting presenter

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Capo<sup>†</sup>, R. C., **Stewart, B. W.** and Chadwick, O. A. (1997) Silicate weathering rates and atmospheric strontium fluxes: A comparison of arid sites in Hawai'i and New Mexico. In *Seventh Annual V.M. Goldschmidt Conference*, LPI Contribution No. 921, Lunar and Planetary Institute, Houston, 41-42.

### 1996

**Stewart<sup>†</sup>, B. W.** (1996) Dissolved cation sources in a Plio-Pleistocene salt pan, Death Valley, California. *EOS, Trans. Am. Geophys. Union* **77**, 304.

### 1995

**Stewart<sup>†</sup>, B. W.**, Graham, R. C. and Chadwick, O. A. (1995) Fluxes and transport of plant-available strontium in soil from the San Dimas Experimental Forest, California. *5th V.M. Goldschmidt Conference Prog. Abstr.*, 90.

### 1994

**Stewart<sup>†</sup>, B. W.**, Chadwick, O. A. and Graham, R. C. (1994) Strontium isotope study of cation fluxes in a soil-vegetation-atmosphere system. *Abstr. Eighth Int. Conf. Geochron., Cosmochron. & Isotope Geol.: U.S. Geol. Surv. Circular* **1107**, 305.

**Stewart<sup>†</sup>, B. W.**, Hsieh, J. C. C. and Murray, B. C. (1994) Paleohydrology of the late Pliocene Basin and Range province using strontium isotopes. *Abstr. Eighth Int. Conf. Geochron., Cosmochron. & Isotope Geol.: U.S. Geol. Surv. Circular* **1107**, 305.

Capo<sup>†</sup>, R. C., **Stewart, B. W.** and Chadwick, O. A. (1994) Strontium isotopes as a tracer of land surface processes: Theoretical aspects. *Agronomy Abstracts, 86th Annual Meeting*, 345 (invited abstract).

**Stewart<sup>†</sup>, B. W.**, Chadwick, O. A. and Capo, R. C. (1994) Use of strontium isotopes for study of the soil-vegetation-atmosphere system. *Agronomy Abstracts, 86th Annual Meeting*, 345 (invited).

### 1993

**Stewart, B. W.**, Papanastassiou<sup>†</sup>, D. A., Capo, R. C. and Wasserburg, G. J. (1993) Fine resolution chronology based on initial  $^{87}\text{Sr}/^{86}\text{Sr}$ . *Lunar Planet. Sci.* **XXIV**, 1357-1358.

**Stewart<sup>†</sup>, B. W.**, Papanastassiou, D. A. and Wasserburg, G. J. (1993) Sm-Nd systematics of silicate inclusions in iron meteorites: Results from Caddo (IAB). *Lunar Planet. Sci.* **XXIV**, 1359-1360.

**Stewart<sup>†</sup>, B. W.**, Chadwick, O. A. and Graham, R. C. (1993) Application of radiogenic isotopes to the evolution of a soil-vegetation-atmosphere system on a decade time scale. *Geol. Soc. Am. Abstr. Prog.* **25**, A88.

**Stewart<sup>†</sup>, B. W.**, Hsieh, J. C. C. and Murray, B. C. (1993) Strontium isotope record of cation sources in Plio-Pleistocene lacustrine evaporite deposits, Death Valley, California. *Geol. Soc. Am. Abstr. Prog.* **25**, A455-A456.

**Stewart<sup>†</sup>, B. W.**, Chadwick, O. A. and Graham, R. C. (1993) Cation fluxes and soil weathering on a decade time scale: Application of strontium isotopes. *EOS, Trans. Am. Geophys. Union* **74**, 244.

### 1992

Kennedy<sup>†</sup>, A. K., **Stewart, B. W.**, Hutcheon, I. D., Papanastassiou, D. A. and Wasserburg, G. J. (1992) Partitioning of REE between phosphates and silicates in mesosiderites: Evidence for differing degrees of equilibration. *Lunar Planet. Sci.* **XXIII**, 681-682.

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<sup>†</sup> Meeting presenter

## Brian W. Stewart

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- Stewart<sup>†</sup>, B. W.**, Bebout, G. E. and Grove, M. (1992) Miocene magmatism in a transcurrent tectonic setting: Isotopic data from Santa Catalina Island, California. *EOS, Trans. Am. Geophys. Union* **73**, 338.
- 1991**
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- Kennedy<sup>†</sup>, A. K., **Stewart, B. W.**, Hutcheon, I. D. and Wasserburg, G. J. (1991) Trace element partitioning within mesosiderite clasts. *Meteoritics* **26**, 356.
- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1991) Decoupling of chemical and isotopic exchange in the Muskox intrusion, Northwest Territories, Canada. *Geol. Soc. Am. Abstr. Prog.* **23**, A270.
- 1983-1990**
- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1990) Isotopic constraints on the interaction of basaltic magma and continental crust. *Seventh Int. Conf. on Geochronology, Cosmochronology & Isotope Geology (ICOG-7), Canberra, Australia: Geol. Soc. Australia Abstr.* **27**, 95.
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- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1989) Mafic magma chamber geometries and processes: Nd and Sr isotope evidence and constraints. *28th International Geological Congress Scientific & Technical Program Abstracts* **3**, 181
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- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1988) Sm-Nd age and Nd and Sr isotopic variations within the Muskox intrusion, Northwest Territories, Canada. *Geol. Soc. Am. Abstr. Prog.* **20**, A156.
- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1987) Sr isotope stratigraphy of the Stillwater complex, Montana: Evidence for multiple magma injections. *EOS, Trans. Am. Geophys. Union* **68**, 429.
- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1986) Nd and Sr isotope evidence for open system magmatic behavior of the Skaergaard intrusion. *Geol. Soc. Am. Abstr. Prog.* **18**, 764.
- Stewart<sup>†</sup>, B. W.** and DePaolo, D. J. (1985) A Nd and Sr isotopic study of the Skaergaard intrusion. *EOS, Trans. Am. Geophys. Union* **66**, 1138.
- Gromet<sup>†</sup>, L. P. and **Stewart, B. W.** (1983) REE distribution among minerals in an amphibolite: Implications for subsolidus redistribution of REE in plutonic rocks. *Geol. Soc. Am. Abstr. Prog.* **15**, 586.

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## Brian W. Stewart

### RECENT COLLABORATORS

*R. G. Amundson* Department of Environmental Science, Policy & Management, UC Berkeley  
*R. Cole* Department of Geology, Allegheny College  
*O. A. Chadwick* Department of Geography, University of California at Santa Barbara  
*D. A. Dzombak* Department of Civil & Environmental Engineering, Carnegie Mellon Univ.  
*R. C. Graham* Department of Environmental Sciences, University of California at Riverside  
*J. A. Hakala* National Energy Technology Lab, Pittsburgh  
*G. L. Macpherson* Department of Geology, University of Kansas  
*H. Ohmoto* Department of Geosciences & Astrobiology Research Center, Penn State Univ.  
*M. Reheis* U.S. Geological Survey, Denver, CO  
*K. Schroeder* National Energy Technology Lab, Pittsburgh  
*D. Vesper* Department of Geology & Geography, West Virginia University

### STUDENT RESEARCH

#### Current Graduate Student Advisees

Amy Wolfe (B.S. Marine Science, 2002, University of South Carolina) *Ph.D. expected 2010*  
Thesis Topic: Partitioning of iron in organic-rich sediments.

Tonya Brubaker (B.S. Geology, 2007, University of Pittsburgh) *M.S. expected 2010*  
Thesis Topic: Leaching of coal utilization byproducts by environmental fluids: A strontium isotope approach.

#### Previous Graduate Student Advisees

Lev Spivak-Birndorf, **M.S. 2007** (B.A. Environmental Studies, 2004, University of Chicago)  
Thesis Title: Strontium isotope systematics and geochemistry of coal utilization by-products.  
*Currently:* Ph.D. student, Arizona State University

Barbara Hamel, **M.S. 2005** (B.S. Environmental Science, 1993, Slippery Rock University)  
Thesis Title: Tracing interaction of acid mine drainage and coal combustion byproducts in a grouted coal mine: Application of strontium isotopes.  
*Currently:* Geologist, Key Environmental Inc., Pittsburgh

Katherine Walden, **M.S. 2005** (B.S. Geology, 2001, Ohio State University)  
Thesis Title: Neodymium and strontium isotope investigation of the Precambrian Kalkkloof paleosol, South Africa.  
*Currently:* Geologist, Equitable Production

Ann Kim, **Ph.D. 2002** (M.S. Geology, 1972, University of Pittsburgh)  
Dissertation Title: Fluid extraction of metals from coal fly ash: Geochemical simulation of natural leaching.  
*Currently:* Research Scientist, National Energy Technology Lab, Pittsburgh (retired)

Steven J. Schatzel, **Ph.D. 2001** (M.S. Geology, 1990, University of Pittsburgh)  
Dissertation Title: Tracking the provenance, transport, and redistribution of coal mineral matter using neodymium isotopes  
*Currently:* Research Scientist, NIOSH Pittsburgh

Joseph Minervini, **M.S. 2001** (B.S. Soil Science, 1999, Cal Poly State University)  
Thesis Title: Radiogenic isotope investigation of sources, transport, and deposition of rare earth elements in the Owens Lake drainage basin, eastern California.  
*Currently:* Research Scientist, ExxonMobil Exploration Company

## BRIAN W. STEWART

Victoria A. Pretti, **M.S. 2000** (B.S. Geological Sciences, 1997, Lehigh University)  
Thesis Title: Geochemical and isotopic characterization of streamwaters feeding the Owens River System, California.

*Currently:* Staff Scientist, New York State Department of Environmental Protection

Mary Lynn Hronakes-Yurko, **M.S. 1999** (B.S. Microbiology, 1988, Penn State University)  
Thesis Title: Strontium isotopic and major and trace element composition of freshwater mussel shells as a record of water chemistry: French Creek watershed, PA, 1897-1998.

*Currently:* Hydrogeologist, Environmental Strategies Corp., Pittsburgh, PA

### INVITED TALKS AND COLLOQUIA

**University of Delaware** (2009) Joint Symposium: Department of Plant and Soil Sciences and Department of Geological Sciences: *Radiogenic isotope tracking of dust feeding the arid to hyperarid soils of the Atacama Desert, Chile*

**Soil Science Society of America Annual Meeting** (2009) History of Mineralogy Special Session: *Radiogenic isotopes as tracers: A history of applications from planetary differentiation to pedogenesis*

**University of Pittsburgh** (2009) Department of Geology & Planetary Science Colloquium series: *Provenance of aerosols in the arid soils of the Atacama Desert, Chile: A strontium isotope approach*

**Pittsburgh Section, American Chemical Society** (2007) Chemists Club Symposium: *Astrobiological research at the University of Pittsburgh: What ancient soils tell us about the evolution of Earth's atmosphere*

**Dartmouth College** (2003) Department of Earth Sciences Symposium: *An isotopic record of Quaternary weathering in the eastern Sierra Nevada: The Owens River system, California*

**Cornell University** (2003) Department of Earth & Atmospheric Sciences Symposium: *Solute sources for streams in the eastern Sierra Nevada, California: Modern weathering and the Quaternary record preserved in playa lakes*

**Carnegie Mellon University** (1999) Robotics Research Seminar: *Rover-based geochemical and geochronologic analyses of planetary surfaces*

**NASA Campaign Strategy Working Group, Washington DC** (1998) Workshop on Evolution and Dynamics of Earth-like Planets: *In situ geochronology on planetary surfaces: Overview and prospects for instrument development*

**Spectroscopy Society of Pittsburgh/Society of Analytical Chemists of Pittsburgh** (1999) Forum on Inorganic Mass Spectrometry: *Measurement of Isotope Ratios by Thermal Ionization Mass Spectrometry*

**California Institute of Technology** (1997) Caltech/JPL Workshop on Planetary Surface Analysis: *Mass spectrometry of solid samples: Considerations for in situ sampling*

**Geological Society of America Cordilleran Meeting Symposium, Kona, Hawaii** (1997) Hawaiian Islands as a Natural Laboratory for Soil Weathering and Ecosystem Studies: *Quantifying weathering rates using strontium isotopes: A tale of two parent materials*

**University of Rochester** (1996) Department of Earth & Environmental Sciences Symposium: *Strontium isotope modeling of soil evolution*

**Jet Propulsion Laboratory** (1996) Microdevices Research Center Special Symposium: *Isotope geochronology: Applications to meteorites*

## BRIAN W. STEWART

**Soil Science Society of America Annual Meeting Symposium, Seattle** (1994) Stable Isotopes in Soil Environments: Theory and Applications: *Use of strontium isotopes for study of the soil-vegetation-atmosphere system*

**Brown University** (1994) Department of Geological Sciences Seminar: *Isotopic tracers of weathering and climate change in the soil-vegetation-atmosphere system*

**University of Pittsburgh** (1994) Department of Geology & Planetary Science Seminar: *Chronology and petrogenesis of stony-iron meteorites*

**State University of New York, Albany** (1994) Department of Geological Sciences Seminar: *Application of radiogenic isotopes to hydrologic and pedologic studies*

**University of California, Los Angeles** (1993) Department of Earth & Space Sciences Geochemistry Seminar: *Chronology and petrogenesis of mesosiderite meteorites: Clues from the Sm-Nd isotope systems*

**Harvard University** (1990) Department of Earth & Planetary Sciences Seminar: *Constraints on the interaction between basaltic magma and continental crust*

**Massachusetts Institute of Technology** (1990) Department of Earth, Atmospheric and Planetary Science Seminar: *Neodymium and strontium isotope studies of magma chamber processes*

### PROFESSIONAL AFFILIATIONS

*Member:* American Chemical Society, American Geophysical Union, Geological Society of America, International Association of Geochemistry, International Society of Aeolian Research, National Center for Science Education, Sigma Xi