

ROSEMARY CLARE CAPO
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EDUCATION

Ph.D., Geochemistry, 1990, University of California, Los Angeles

Dissertation: *Application of strontium isotopes to Late Cenozoic paleoceanography and stratigraphy* (D.J. DePaolo, advisor)

M.A., Geology, 1984, University of Texas at Austin

Thesis: *Petrology and geochemistry of a Cambrian paleosol developed on Precambrian granite, Llano Uplift, Texas* (L. Long, D.S. Barker, R.L. Folk, advisors)

B.S., Geology, with honors, 1980, University of Texas at Austin

RESEARCH SPECIALIZATIONS

Studies of surficial processes and low-temperature and environmental geochemistry; the use of radiogenic isotopes for stratigraphic correlation and dating; geochemical and isotopic studies of cation cycling in soil-vegetation systems, carbonate diagenesis, terrestrial weathering, coal mine drainage, groundwater, paleoclimate, chemical evolution of the oceans and geoarcheology.

PROFESSIONAL/RESEARCH APPOINTMENTS

2000- **Associate Professor of Geology, University of Pittsburgh**
2002-2003 **Visiting Scientist, Cornell University**
1994-2000 **Assistant Professor of Geology, University of Pittsburgh**
Design and set up of geochemistry facilities including isotope clean laboratory, geochemistry sample preparation laboratories, ICP-AES and thermal ionization mass spectrometer; research in isotope and environmental geochemistry
Mar-Aug 94 **Associate Scientist, California Institute of Technology**
Isotopic analysis of basalts; research on the effects of climate on the formation of tropical soils using isotopes, petrology, soil micromorphology and geochemistry
1992 – 1994 **Postdoctoral Associate, Jet Propulsion Laboratory, Caltech**
Visiting Associate in Geochemistry, Caltech
Studies of weathering processes and soil evolution, including the effect of climate change and atmospheric inputs to desert soils (Supervisor: O.A. Chadwick)
1990 – 1992 **Research Fellow in Geochemistry, Charles Arms Laboratory, Caltech**
Radiogenic isotope geochemistry (Sr, U, and Th) and thermal ionization mass spectrometry of Quaternary marine carbonate and bone phosphate (Supervisor: G.J. Wasserburg)
1989 – 1990 **Graduate Student Research Associate, UC Berkeley Center for Isotope Geochemistry/Lawrence Berkeley Laboratory**
Geochemical analysis of marine sediments and fossils; modeling of isotopic data for paleoclimatic and paleoceanographic studies (Supervisor: D.J. DePaolo)
1984 – 1989 **Graduate Student Research Associate, University of California, Los Angeles**
1980 – 1984 **Graduate Student Research Assistant, University of Texas at Austin**
Texas Gulf Coast Diagenesis Project; carbonates, brine and silicate geochemistry
1979 – 1980 **Student Research Assistant, Texas Bureau of Economic Geology**
Gulf Coast Geothermal Project

GRANTS: External

NASA Origins Program – Astrobiology Institute
“Habitability” 7/03–6/08 (PI H. Ohmoto; with 12 co-Is from Penn State, Univ. of Pittsburgh, SUNY Stony Brook.

National Science Foundation – Hydrology Program
“Collaborative Research: Field and Experimental Iron Isotope Investigation of Sedimentary Pyrite Dissolution in Appalachian Coal Mine Drainage” 1/03–12/05. R. Capo and B. Stewart, PIs @Univ. of Pittsburgh; D. Dzombak, PI @CMU

National Science Foundation – Instrumentation and Facilities Program

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“Technician Support: Geochemistry Laboratories at the University of Pittsburgh, Phase I” 7/02 – 6/05.
R. Capo, B. Stewart co-I

Department of Energy – National Energy Technology Laboratory
“Abandoned Mine Pool Flooding of the Pittsburgh, Ohio and Irwin Basins” 9/00–10/02 (National Mine Reclamation Center, with 6 PIs from West Virginia University, Carnegie Mellon and University of Pittsburgh) R. Capo, subcontract PI

NASA Planetary Instrument Development and Definition Program
“Miniature In situ Geochronology Instrument for Planetary Surface Deployment: Breadboard Development” 3/99 – 1/01. B. Stewart PI; G. Cardell, JPL PI; R. Capo, D. Crown, M. Sinha co-Is

Department of Energy – Environmental Protection Agency
“Monongahela Basin Mine Pool Project” 7/99–12/99 (PI P. Ziemkiewicz, National Mine Reclamation Center, with 5 co-Is from West Virginia University, Carnegie Mellon and University of Pittsburgh) R. Capo, subcontract PI

NASA Origins Program – Astrobiology Institute
“Establishment of the Penn State Astrobiology Center” 7/98–6/03 (PI H. Ohmoto; with 12 co-Is from Penn State, Univ. of Pittsburgh, SUNY Stony Brook.

Jet Propulsion Laboratory Research Contract to University of Pittsburgh
NASA-JPL Center for Space Microelectronics “Development of variable environment laser ablation system for Mars in situ geochronology instrument” 7/97–4/99. B. Stewart, PI; R. Capo, co-I

Jet Propulsion Laboratory – California Institute of Technology
JPL Mini-Directors Research Development Fund “In-situ Miniature Age Dating Laboratory Development” 7/97–6/98. B. Stewart, PI; R. Capo, co-I

National Science Foundation – Education and Human Resources
“Enhancing geoscience education and public outreach: partnership between the University of Pittsburgh and the Carnegie Museum of Natural History” 9/98–8/00. R. Capo, PI; 4 co-Is

National Science Foundation – Geology and Paleontology Program
“The effect of Quaternary climate change on the balance of silicate mineral weathering and eolian input in desert soils” 1/97–12/00. R. Capo, PI

National Science Foundation – Instrumentation and Facilities Program
“Acquisition of a thermal ionization mass spectrometer” 1/97–12/98 R. Capo, B. Stewart co-I

GRANTS: Internal

University of Pittsburgh Central Research and Development Fund
“The effect of climate on weathering and soil formation: Kohala Peninsula” 7/95–6/97 R. Capo, PI

University of Pittsburgh Curriculum Development Grant
“Enhancement of Environmental Studies Curriculum” AY 96 R. Capo, PI

University Center for Social and Urban Research – Environmental Program
“An integrated environmental assessment model for indoor air quality” 12/97 – 6/98; R. Capo, PI, 2 co-Is

University of Pittsburgh Central Research and Development Fund
“Application of trace element and isotopic composition of freshwater mussels as a record of environmental change” 5/98–12/99 R. Capo and B. Stewart co-PIs

University of Pittsburgh Provost’s Fund: Research Instrumentation
“Acquisition of variable environment laser ablation system for Mars in situ geochronology instrument” 6/97 – 9/97 B. Stewart and R. Capo, co-PIs

OTHER GRANTS, CONTRACTS, AND FELLOWSHIPS

2004 PA Dept. of Environmental Protection Growing Greener Program
PI R.S. Hedin; Subcontract to R. Capo

2001 NASA Astrobiology Institute Director’s Research Scholar Program
8/01 – 1-02 (for Ph.D. student Sherry Stafford)

1999 – 2002 Department of Energy / National Energy Technology Laboratory
Student Partnership Program 9/99–12/02 (PI G. Holder, School of Engineering.
DOE-NETL Mentor: G. Watzlaf, Advisor: R. Capo, for Ph.D. student Candace Kairies)

1998– 2000 Dept. of Agriculture SBIR (PI R. S. Hedin, Hedin Environmental) Subcontract to R. Capo

1990 – 1992 Postdoctoral Research Fellowship, California Institute of Technology

Rosemary C. Capo

- 1984 – 1985 University Fellow, University of California, Los Angeles
1982 Summer University Fellow, University of Texas at Austin
1981 Geological Society of America Grant-in-Aid-of-Research

FIELD WORK

- June 2000 **Superior Province, Ontario, Canada**
Precambrian paleosols, marine carbonate, fluvial clastic sediments, and banded iron formation (led by H. Ohmoto)
- 1997 – 2005 **Monongahela Basin, southwestern Pennsylvania**
AMD and affected streams (with R. S. Hedin, T. Weaver, C. Kairies)
- 1997 – 1998 **French Creek/Pymatuning watershed, New York and Pennsylvania**
Stream water and shell sampling (led by R. Kyshakevych and B. W. Stewart)
- 1994 – 2002 **Kohala Peninsula and South Point, Hawaii**
Sampling of soil, rain, and vegetation; examination of soil profiles and pedogenic carbonate (led by O. A. Chadwick and R. Gavenda)
- 1993 – 2000 **Desert Project Research Site, Las Cruces, New Mexico**
Quaternary pedogenic carbonate (led by O. Chadwick, L. Gile, R. Grossman, C. Monger)
- 1993 – 2000 **Owens River system and Death Valley, California**
Plio-Pleistocene lacustrine sediments (led by B. Stewart)
- May 1984 **Squaw Creek, Central Texas**
Mapping and sampling Cambrian paleosol

PROFESSIONAL AFFILIATIONS

Member: American Geophysical Union, Geochemical Society, Geological Society of America

RECENT COLLABORATORS

M. Arthur (Penn State), J. Blachère (University of Pittsburgh); G. Cardell (Jet Propulsion Lab, Caltech); O.A. Chadwick (UC Santa Barbara); D. A. Dzombak (Carnegie Mellon U.) R.S. Hedin (Hedin Environmental); J.C.C. Hsieh (Texaco); G.L. Macpherson (University of Kansas); H.C. Monger (New Mexico State); H. Ohmoto (Penn State); B.W. Stewart (University of Pittsburgh); Y. Watanabe (Penn State); G. Watzlaf (DOE-National Energy Technology Lab)

STUDENT RESEARCH

Graduate Student Advisees (University of Pittsburgh)

- Sherry L. Stafford (Ph.D., 2005): *Precambrian paleosols as indicators of paleoenvironments on the early Earth* (M.S., 1999). Thesis: *Strontium isotopic ratios trace natural alkaline additions to coal mine drainage*. Currently: Geologist, Exxon-Mobil, Houston, TX
- Lara Homsey, (M.S., 2003; Ph.D. Anthropology, 2004) M.S. Thesis: *Archeological feature identification using geochemistry: Dust Cave, AL*. Currently: Assistant Professor, Murray State University, KY; 2004-2005, Postdoctoral Scientist, U.S. Army Environmental Center
- Candace L. Kairies (Ph.D., 2003). Dissertation: *Characterization of iron rich precipitates associated with untreated and passively treated coal mine discharges in the Bituminous region of Pennsylvania and Maryland* Currently: DOE-NETL Postdoctoral Scientist; 2003-2004, Visiting Assistant Professor, Ohio Wesleyan
- Elizabeth Bryant, (M.S., 2002) Thesis: *Geochemical modeling of a bituminous coal basin, southwestern Pennsylvania* Currently: Hydrologist, CH2MHill, Ventura, CA
- Amanda C. Reynolds (M.S., 2001) Thesis: *Paleoenvironmental reconstruction of the Pennsylvanian-Permian Dunkard Basin: Geochemical evidence from lacustrine core and associated paleosols* Currently: Ph.D. student, Arizona State
- William Winters (M.S., 2000). Thesis: *Hydrogeologic and geochemical evolution of a bituminous coal basin, Westmoreland County, Pennsylvania* Currently: Hydrogeologist, Office of Surface Mining; 2000, Hydrogeologist, Moody & Associates, Pittsburgh, PA
- Charles E. Whipkey (Ph.D., 1999). Dissertation: *Effect of Quaternary climate change on the development of desert soils: mineralogical and isotopic analysis*. Currently: Assistant Professor, Dept. of Environmental Science & Geology, Mary Washington College, VA
- Theodore J. Weaver (M.S., 1998). Thesis: *Occurrence and significance of alkaline mine drainage in northern Appalachia*. Currently: Consulting Geologist, Hedin Environmental; 1998-1999, Geologist and Manager, Aggregate Division, IA Construction Corp., PA
- Craig Rowland (M.S., 1998; co-advised with D. Crown). Thesis: *An integrated environmental assessment model*

Rosemary C. Capo

for indoor air quality.

Gregory Ayres (M.S., 1997). Thesis: *Influence of pedogenesis on the weathering and mobility of rare earth elements along the Kohala climate transect, Hawaii*. Currently: Project Scientist, Malcolm Pirnie, Inc., Sewickley, PA

Graduate Committee Member (University of Pittsburgh)

Geology & Planetary Science:

Nicholas DeLillo (Ph.D., 1998); Mary Lynn H. Yurko (M.S., 1999); Victoria A. Pretti (M.S., 2000); Garrett E. Sleeman (M.S., 2000); Steven J. Schatzel (Ph.D., 2001); Joseph Minervini (M.S., 2001); Ann Kim (Ph.D., 2002), William Beatty (Ph.D., 2003), Gina Hobbs (M.S. 2003), Katie Walden (M.S. 2004)

Current: Amy Wolfe (M.S.), Barbara Hamel (M.S.), Brianne Cassidy (M.S.)

Anthropology: Lara Homsey (Ph.D., 2004)

School of Engineering/Department of Chemical Engineering: Celeste J. Powell (Ph.D., 2000)

Undergraduate Student Research Advisees

- 2005** Justin Hynicka (B.A. Environmental Studies, B.S. Chemistry)
- 2004** Patrick Millham¹ (B.S., Political Science, 2005). Geochemical analysis of AMD impacted blue lakes, PA
- 2002** Erin Minster (B.S., Environ. Geol., 2002). Sr isotopic composition of calcite, Desert Project Area, NM
Erich Zorn (major: Environmental Studies). Characterization of AMD: Chartiers Creek Watershed, PA
- 2001** Alyssa Lyons (major: Environ. Studies). Neodymium isotopic composition of coal mine discharges
- 2000** John Boulanger¹ (B.S., Geology, 2000) Effect of Pleistocene climate change: Las Cruces Trench, NM
M. Jenny Lee^{1,2} (B.S., Environmental Geology, 2000) Assessment of acidic drainage remediation efforts on Cowanshannock Creek, Armstrong County, Pennsylvania
- 1999** Erica Love (B.S., Geology, 1999). Internship: Pennsylvania Dept. of Environmental Protection
Jeffrey D. Patterson^{1,2} (major: Chemistry) Relationship between iron and aluminum loading and fish diversity: Little Deer Creek, Allegheny County, Pennsylvania
Jeanne Thompson (B.S., Biology, 2000). Comparison of trace metal content of commercial iron oxides and iron precipitates from coal mine drainage in southwestern Pennsylvania
Matthew Wolinsky^{1,3} (B.S. Applied Mathematics/B.A. Environmental Studies, 1999) Relationship of hydrology and geochemistry of mine discharges: Irwin basin, PA
- 1998** Laura Balch (B.S., Chemistry, 1998) Determination of trace metals content of iron oxides precipitated from coal mine drainage in southwestern Pennsylvania
Erik Hoffmann¹ (major: Geology). XRD of clay minerals associated with the Pittsburgh Coal
Tara Laishley (B.S., Geology, 1998). Internship: Ground Water Remediation Techn. Center
Chad R. Lupp^{1,2} (B.A., Environmental Studies, 1998) Faunal diversity and water quality in an abandoned mine discharge affected stream: Little Deer Creek, Allegheny County, PA
- 1997** Craig Rowland (B.S., CGS, 1997) Administration of indoor environmental quality
- 1996** Elizabeth Breitenbach (B.S., Geology, 1996) Subsurface geology of the University of Pittsburgh campus

¹Partial funding through University Honors College/Chancellor's Undergraduate Research Grants ²Presented at Geological Society of America Annual Meeting, Toronto, Oct. 98. ³Co-author of paper presented at 16th International Pittsburgh Coal Conf. Oct. 99

STUDENTS SUPPORTED (with partial support from external grants)

Graduate Students

Gregory Ayres, Elizabeth Bryant, Candace Kairies, Amanda Reynolds, Craig Rowland, Sherry L. Stafford, Theodore J. Weaver, Charles E. Whipkey, Mary Lynn H. Yurko, Sarah Zimmerman

*Undergraduate Students (*work-study)*

John Boulanger*, Richard Kilpatrick*, M. Jenny Lee, Chad Lupp, Pat Millham, Erin Minster*, Jeffrey Patterson*, Janelle Shelatz*, Jeanne Thompson*, Matthew Wolinsky, Erich Zorn, Amanda Illar*, Matthew McCullough, Valerie Costigan*, Justin Hynicka

Rosemary C. Capo

INVITED LECTURES, SYMPOSIA AND COLLOQUIA

University of Pittsburgh, Civil and Environmental Engineering (March, 2005)
Cornell University, Dept. of Earth and Atmospheric Sciences (November, 2001)
Surface Mine Drainage Task Force Symposium, Morgantown, West Virginia (April, 2001)
Carnegie Mellon University, Environmental Engineering seminar (April, 2001)
Spectroscopy Society of Pittsburgh/Society of Analytical Chemists of Pittsburgh Forum on Inorganic Mass Spectrometry Invited Speaker (July 1999)
The Pennsylvania State University, Department of Geosciences (November 1998)
AWG Phillips Petroleum Distinguished Lecturer:
University of California, Davis, Department of Geology (April 1998)
University of California, Irvine, Department of Earth Systems Science (May 1998)
Brown University, Department of Geological Sciences (November 1997)
University of Rochester, Department of Earth & Environmental Sciences (November 1997)
Geological Society of America Cordilleran Meeting Symposium: Hawaiian Islands as a Natural Laboratory for Soil Weathering and Ecosystem Studies, Kona, Hawaii (May 1997)
Jet Propulsion Laboratory, Caltech, Invited lecture "Radiometric dating of terrestrial and extraterrestrial materials" (August 1996)
Jet Propulsion Laboratory, Caltech; Kohala Climate Transect Meeting (January 1995)
Soil Science Society of America Annual Meeting Symposium: Stable isotopes in soil environments: theory and applications, Seattle (October 1994)
Indiana University/Purdue University at Indianapolis, Department of Geology, (February 1994)
State University of New York, Albany, Department of Geological Sciences (March 1994)
University of Pittsburgh, Department of Geology & Planetary Science (March 1994)
University of Miami, Rosenstil School of Marine Science, Florida (March 1994)
University of California, Riverside, Department of Soil and Environmental Sciences, (April 1993)
University of Kansas, Lawrence, Department of Geology (1992)
Scripps Institute of Oceanography, University of California (1992)

OTHER RESEARCH PRESENTATIONS

Penn State Astrobiology Research Center Annual Meeting, 1999-2005
Consol Energy: Hydrogeologic and geochemical evolution of a bituminous coal basin, Westmoreland County, Pennsylvania, 2000
DOE/National Energy Technology Laboratory, Student Partnership Program meeting, 2000
University of Pittsburgh School of Engineering Environment and Energy Colloquium 1997, 1998 (poster presentations)
University of Pittsburgh Honors College Undergraduate Research Fair 1998 (sponsored three student presentations)
6th Annual Monastery Run Project symposium, St. Vincent's College (November, 1998; Guest speaker: Overview of AMD Research; with speakers from CMU and Penn State. Advisor for four poster presentations)

Rosemary C. Capo

PUBLICATIONS (*graduate student or †undergraduate student supervised by R. Capo)

Articles and book chapters

- Stafford, S.L.*, **Capo, R.C.**, Stewart, B.W., Marmo, J., Ohmoto, H. (in prep.), Paleoenvironmental investigation of the Proterozoic Hokkalampi paleosol, eastern Finland.
- Stafford, S.L.*, **Capo, R.C.**, Stewart, B.W., Watanabe, Y. (in prep.), Geochemical and textural investigation of the Archean South Roberts Pit paleosol, Steep Rock area, Ontario, Canada.
- Kairies*, C.L., **Capo, R.C.**, and Hedin, R.S., Characterization and resource recovery of iron oxides from coal mine drainage (in preparation for Environmental Science and Technology)
- Kairies*, C.L., **Capo, R.C.**, Watzlaf, G. R. and Games, B.K. (in revision) Evaluation of a sequential extraction procedure for iron-rich precipitates associated with coal mine drainage, *Analytica Chimica Acta*.
- Homsey*, L. K., and **Capo, R.C.** (revision submitted, 2005) Integrating geochemistry and micromorphology to identify feature function at Dust Cave, a Paleoindian through Middle Archaic site in Northwest Alabama, *Geoarcheology*.
- Kairies*, C.L., **Capo, R.C.**, Watzlaf, G. R. (accepted, 2005) Chemical and physical properties of iron hydroxide precipitates associated with passively treated coal mine drainage in the bituminous region of Pennsylvania and Maryland, *Applied Geochemistry*.
- Winters*, W.R. and **Capo, R.C.** (2004) Groundwater flow parameterization of an Appalachian coal mine complex, *Ground Water*, v. 42, p. 700-710.
- Whipkey*, C. E., **Capo, R.C.**, Hsieh, J.C.C., and Chadwick. O.A., 2002, Development of magnesian calcite and dolomite in Quaternary soils on the island of Hawaii, *J. Sedimentary Research*, v. 72, pp. 158-165.
- Capo, R.C.**, Winters*, W. R., Weaver*, T. J., Stafford*, S. L., Hedin, R. S., Stewart, B.W., 2001, Hydrogeologic and geochemical evolution of deep mine discharges, Irwin syncline, Pennsylvania, *Proc. 22nd W. Virginia Surface Mine Drainage Task Force Symposium*, p. 144-153.
- Capo, R.C.**, Whipkey*, C.E., Chadwick, O.A., and Blachère, J., 2001, Reply: Pedogenic origin of dolomite in a basaltic weathering profile, Kohala Peninsula, Hawaii, *Geology*, v. 29, no. 6, p.563-565.
- Stewart, B.W., **Capo, R.C.**, and Chadwick, O.A., 2001, Effects of precipitation on weathering rate and base cation provenance in volcanic soils, Kohala Peninsula, Hawaii, *Geochimica et Cosmochimica Acta*, v. 65, no.7, 1087-1099.
- Capo, R.C.**, Whipkey*, C.E., Chadwick, O.A., and Blachère, J., 2000, Pedogenic origin of dolomite in a basaltic weathering profile, Kohala Peninsula, Hawaii, *Geology*, v. 28, p. 271-274.
- 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*, v. 168, p. 37-48.
- Winters*, W.R., **Capo, R.C.**, Wolinsky†, M.W., Weaver*, T.J., and Hedin, R.S., 1999, Geochemical and hydrogeologic evolution of alkaline discharges from abandoned mines, in *Proceedings from the Sixteenth Annual International Pittsburgh Coal Conference*, October 11-15, 1999. CD-ROM, ISBN 1-890977-16-0, section 6-5, p. 1-36.
- Capo, R.C.** and Chadwick, O.A., 1999, Sources of calcium and strontium in desert soil and calcrete, *Earth and Planetary Science Letters*, v. 170, p. 61-72.
- Capo, R.C.**, Stewart, B.W., and Chadwick, O.A., 1998, Strontium isotopes as tracers of earth surface processes: theory and methods, *Geoderma*, v. 82, p. 197-225.
- Stewart, B.W., **Capo, R.C.**, and Chadwick, O.A., 1998, Quantitative strontium isotope models for weathering, pedogenesis, and biogeochemical cycling, *Geoderma*, v. 82, p. 173-195.
- Montanari, A., Bice, D.M., **Capo, R.**, Deino, A., DePaolo, D.J., Emmanuel L., Monechi, S., Renard, M., Zevenboom, D., 1997, Integrated stratigraphy of the Chattian to mid-Burdigalian pelagic sequence of the Contessa Valley (Gubbio, Italy), in Montanari, A., Odin, G.S., and Coccioni, R., *Miocene Stratigraphy, An Integrated Approach, Developments in Paleontology and Stratigraphy*, vol. 15, Elsevier, Amsterdam, p. 249-277.
- Banner, J. L., Musgrove, M., and **Capo, R. C.**, 1994, Tracing ground-water evolution in a limestone aquifer using Sr isotopes: Effects of multiple sources of dissolved ions and mineral-solution reactions, *Geology*, v. 22, p. 687-690.
- Capo, R. C.**, 1994, Micromorphology and geochemistry of a Cambrian paleosol developed on granite, Llano Uplift region, central Texas, USA, in Ringrose-Voase, A. and Humphreys, G., eds., *Soil Micromorphology:*

Rosemary C. Capo

- Studies in Management and Genesis. *Developments in Soil Science Series*, v. 22, Elsevier, Amsterdam, p. 257-264.
- Montanari, S., Deino, A., Coccioni, R., Langenheim, V. E., **Capo, R. C.**, and Monechi, S., 1991, Geochronology, Sr isotope analysis, magnetostratigraphy, and plankton stratigraphy across the Oligocene-Miocene boundary in the Contessa section, Gubbio, Italy: *Newsletters in Stratigraphy*, v. 23(3), p. 151-180.
- Capo, R. C.** and DePaolo, D. J., 1990, Seawater strontium isotope variations from 2.5 million years ago to the present, *Science*, v. 249, p. 51-55.
- Patterson, R. T., Brunner, C. A., **Capo, R. C.** and Dahl, J., 1990, A paleoenvironmental study of Early to Middle Pleistocene foraminifera of the Santa Barbara Formation, Santa Barbara, California, *J. Paleontology*, v. 64, p. 1-25.
- Barton, M. D., Battles, D. A., Bebout, G. E., **Capo, R. C.**, Christensen, J. N., Hansen, R. B., Michelsen, C. J., and Trim, H. E., 1988, Mesozoic contact metamorphism in the western U.S.: in Ernst, W.G. (ed.), *Metamorphism and Crustal Evolution, Western Conterminous United States, Rubey Volume VII*, Prentice-Hall, p. 110-178.
- Capo, R. C.** and DePaolo, D. J., 1988, Sr isotopic analysis of marine carbonates from the Massignano section across the Eocene-Oligocene boundary: in Premoli-Silva, I., R. Coccioni, and A. Montanari, (eds.), *The Eocene-Oligocene boundary in the Umbria-Marche Basin (Italy)*, *Internat. Union Geol. Sci. Subcom. on Paleogene Stratigraphy Spec. Pub. III*, Ancona, Italy, p. 189-192.

Published abstracts of research presentations and papers (*graduate student or †undergraduate student supervised by R. Capo)

2004

- Capo, R. C.**, Bryant*, E.M., Stafford, S.L*., Weaver, T.J*., and Winters W. R*., Evolution of historically acid mine drainage (AMD) to alkaline Fe-contaminated discharges: Irwin coal basin, Pennsylvania, *Geol. Soc. America Abstracts with Programs*, Vol. 36, Denver, CO, October 2004
- Stiles, J.M., Donovan, J., Dzombak, D., and **Capo, R.C.**, Geochemical cluster analysis of mine water quality within the Monongahela Basin, Proc. Nat. Mtg of the American Society of Mining and Reclamation and the 25th West Virginia Surface Mine Drainage Task Force, Morgantown, WV, April 18-24, 2004.
- Winters*, W. R. and **Capo, R.C.**, Numerical modeling of a large mined coal basin – Irwin Syncline, Westmoreland County, Pennsylvania, Proc. Nat. Mtg of the American Society of Mining and Reclamation and the 25th West Virginia Surface Mine Drainage Task Force, Morgantown, WV, April 18-24, 2004.

2002

- Homsey*, L. K., and **Capo, R.C.**, 2002, Geochemical Identification of Feature Function and Activity Areas at a Late Paleoindian through Middle Archaic Archaeological Site: Dust Cave, AL, *Geol. Soc. America Abstracts with Programs*, Vol. 34, Denver, CO, October 2002.
- Stewart, B.W., Bau, M., and **Capo, R.C.**, Neodymium isotope tracking of rare earth element sources for carbonate of the 2.6 Ga Hamersley Group, Western Australia *Proc. Goldschmidt Conference*, Davos Switzerland, August 2002.
- Stafford*, S. L., **Capo, R. C.**, Stewart, B. W., Marmo, J. and Ohmoto, H. (2002). Paleoenvironmental Investigation of the Hokkalampi paleosol, Eastern Finland; *Proc. Goldschmidt Conference*, Davos Switzerland, August 2002.
- Bryant*, E. M., Winters*, W. R., and **Capo, R.C.** (2002) Development of natural alkalinity in Appalachian deep coal mine discharges, Irwin syncline, Pennsylvania, In: Proc. Natl. Mtg. Amer. Soc. for Mining and Reclamation, Lexington, KY, June 2002
- Cardell, G., Taylor, M. E., Stewart, B. W., **Capo, R.C.** and Crown, D. A. (2002) A combined laser ablation-resonance ionization mass spectrometer for planetary surface geochronology, Lunar Planet Sci. Conf. XXXIII, Houston, TX, April, 2002, Abstract #2047.
- Kairies*, C. L., **Capo, R.C.**, and G. R. Watzlaf (2002) Development and Evaluation of Sequential Extraction Procedures for Iron-rich Precipitates Associated with Coal Mine Drainage; In: Proc. Natl. Mtg. Amer. Soc. for Mining and Reclamation, Lexington, KY, June 2002
- Stafford*, S. L., **Capo, R. C.**, Stewart, B. W., Marmo, J. and Ohmoto, H. (2002). Geochemical Investigation of the Hokkalampi paleosol, Eastern Finland; *Proc. 2nd General Meeting of the NASA Astrobiology Institute*, NASA Ames, CA, April 2002.
- Stewart, B.W., Bau, M. & **Capo, R.C.** (2002). Neodymium isotope tracking of rare earth element sources for carbonate of the 2.6 Ga Hamersley Group, Western Australia. Annual Meeting of the NASA Astrobiology Institute, Ames Research Center, Mt. View, CA.
- Stewart, B.W., **Capo, R.C.**, and Chadwick, O.A. (2002) Effects of precipitation on weathering rate and base cation provenance in volcanic soils, Kohala Peninsula, Hawaii, Proc. 6th Internat. Symp. of Geochem. of the Earth's Surface, Honolulu, HI, May, 2002.

Rosemary C. Capo

Capo, R.C., Whipkey*, C.E., Chadwick, O.A., Stewart, B.W., and Hsieh, J.C.C. (2002) Development of carbonate minerals in Quaternary semiarid soils on the island of Hawaii, Proc. 6th Internat. Symp. of Geochem. of the Earth's Surface, Honolulu, HI, May, 2002.

2001

Bryant*, E. M., Winters*, W. R., and **Capo, R.C.** (2001) Development of natural alkalinity in Appalachian deep coal mine discharges, Irwin syncline, Pennsylvania, *EOS, Trans. Amer. Geophys. Union*, v. 82., p.

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

Capo, R. C., Stafford*, S. L., Kairies*, C. L., Stewart, B. W., and Hedin, R.S., (2001) Strontium and neodymium isotopic composition of coal mine drainage as a tracer of subsurface geochemistry, *Proc. 4th International Symposium on Applied Isotope Geochemistry*, Pacific Grove, CA, p. 155-157.

Kairies*, C. L., **Capo, R. C.**, Hedin, R. S., and Watzlaf, G. R. (2001) Characterization of iron-rich mine drainage precipitates associated with Monongahela and Allegheny group coals, *Proceedings of the National Meeting of the American Society for Surface Mining and Reclamation* (Albuquerque, NM, June 2-8, 2001), p. 278-279.

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Rosemary C. Capo

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Rosemary C. Capo

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- 1992**
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- 1984 – 1991**
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Rosemary C. Capo

TEACHING

Academic Appointments

- 1994 – **Assistant, Associate Professor of Geology, University of Pittsburgh**
Undergraduate courses:
Environmental Geology (GEOL 0860)
Groundwater Geology (GEOL 1051)
Environmental Geochemistry (GEOL 1515)
Geologic and Environmental Hazards (GEOL 1640)
Graduate courses:
Advanced Analytical Geochemistry (GEOL 2502)
Advanced Environmental Geochemistry (GEOL 2515)
Isotope Geochemistry (GEOL 2520)
Topics in Geochemistry: Trace element and isotope systems (GEOL 3952)
Topics in Geochemistry: Evolution of the atmosphere (GEOL 3953)
Topics in Geochemistry: Astrobiology (GEOL 3953)
Topics in Environmental Studies (Air Quality, Water Quality: GEOL 3962, 3963)
- 1984 – 1989 **Teaching Associate, University of California, Los Angeles**
Laboratory sections in Fundamentals of Earth Science, Earth History, Introduction to Oceanography, Principles of Paleontology, Mineralogy-Petrology
- 1982 – 1983 **Teaching Assistant, University of Texas at Austin**
Laboratory sections in Optical Mineralogy and Crystallography, Sedimentary and Metamorphic Petrology, Field Geology (summer camp), Analytical Techniques

Teaching accomplishments

- Member, Graduate Faculty (1996-)
- Developed new geology courses in Geologic Hazards (team taught) and Environmental Geochemistry
- Developed team-taught interdisciplinary science/policy courses (GEOL 3962: Air Quality in Southwestern Pennsylvania; GEOL 3963: Water Quality in Southwestern Pennsylvania) involving field trips and guest speakers from industry, environmental groups, health professions, regulatory and state and federal government agencies
- Awarded University Curriculum Development Grant to update groundwater geology course, adding a laboratory section that includes fieldwork and computer assignments.
- Developed recitation sections for Environmental Geology (150-250 student introductory course) to allow hands-on exercises related to lecture material
- Supervised numerous undergraduate research projects, resulting in published abstracts and presentation in regional and national meetings.

SERVICE

National/International:

- Program Committee, Geochemical Society (1996 – 1999)
- Co-convenor, Geological Society of America Annual Meeting symposium “Geochemical Indicators of Atmospheric Inputs into Terrestrial and Marine Environments”(Nov. 1998)
- Manuscript Reviewer: *Science, Nature, Earth & Planetary Science Letters, Geological Society of America, Geology, Geophysical Research Letters, Paleoceanography, Water Resources Research*
- Proposal Reviewer: National Science Foundation (Instrumentation and Facilities, Geology and Paleontology, Hydrology)

University:

- Environmental Studies BA Executive Committee (1995-1998; Chair, 1999 -)
- Spearheaded initiation of program and development of program structure, curriculum, interdisciplinary offerings, Advisory Board formation and recruitment efforts.
- Participated in fundraising efforts with Office of Institutional Development, including successful \$2 million Heinz Foundations endowment
- Faculty of Arts and Sciences Grants Committee (2001 – 2003)
- College of Arts and Sciences Science Committee (1997 – 2000)

Rosemary C. Capo

- Institute of Politics, Advisory Committee on Environment (1998 – 2000)
- University Center for Social and Urban Research Environmental Policy Studies Steering Committee (1995 – 1998)
- Co-organizer, A.J. Sharkey Symposium “Mass Spectrometry of the Earth and Environment” sponsored by the American Chemical Society and Spectroscopy Society of Pittsburgh (1997)
- Speaker, FAS Minority Graduate Student Workshop (1997)
- INVEST NOW minority high school student lab tour (1997); supervision of student intern (1999)
- Honorable mention, 32nd Annual Exhibition of Western Pennsylvania Printing: capabilities brochure: “Environmental Studies” (1997)
- Featured in articles in the Pittsburgh Business Times (1996), Pittsburgh Post-Gazette (1997), Pittsburgh TEQ magazine (1997), University Research Review (1997, 1998, 1999), Pitt Magazine (1998, 2000); Radio interview with KQV: University of Pittsburgh Environmental Studies Program (1996)

Departmental:

- Chair, G&PS Search Committee (Hydrogeology, 2000; Sedimentology, 2001)
- Member, G&PS Search Committee (Environmental Studies Coordinator, 1999; Lecturer, 2000)
- G&PS Space Committee (1996 – 2002)
- Assisted in development of 5-year facilities plan for G&PS, including reorganization of lab/office space in SRCC, Engineering Hall and Thaw Hall. Renovation of five laboratories, 4th floor SRCC.
- Geology & Planetary Science Curriculum Review Committee (1995 – 1999)
- Reviewed and modified curriculum for Bachelor of Science degrees in Geology and Environmental Geology, including addition of honors requirements involving undergraduate research.

Community Service:

- Girl Scouts: Gave presentation on watersheds at Troop 1444 meeting (May 1, 2002) and led field trip to Scrubgrass AMD treatment facility as part of EPA-developed Water Drop badge (May 4, 2002). Presentation on earth science and mineralogy for Rocks Rock badge (September, 2003)
- Speaker for Women’s Auxiliary, Shadyside Unitarian Church, Pittsburgh: “Adventures of a Field-based Geochemist” (February 15, 2001)
- K-6 Outreach -- Presentations at Liberty Elementary School, Pittsburgh: “Geology of the Western United States” (May 4, 1999); “Geology of Eastern Canada” (June 18, 1999); “Desert Geology” (June 12, 2000); “Calcium carbonate: caves, coral, caliche and clams” (June 14, 2001); “Field Adventures of Geologists and Their Daughter and Her Dragon” (June 10, 2002)
- Career panelist and workshop participant: *Expanding Your Horizons*, CMU (conference for girls in grades 6-10 to increase interest in math and science related careers), March 25, 2000
- Presentation for children, Latin American Cultural Union, August 19, 1999

PROFESSIONAL DEVELOPMENT, WORKSHOPS, FIELD TRIPS

Desert Project Tour, Las Cruces, New Mexico, sponsored by New Mexico State University and New Mexico Bureau of Mines and Mineral Resources (2000)

NASA – Jet Propulsion Laboratory

PIDDP Planetary Instrument Development Workshop (1997)

University of Pittsburgh Institute of Politics/Environmental City Network, Pittsburgh Technology Council Workshops

Combined Sewer Overflow/Storm Sewer Infrastructure (1998)

Land-Use Management Issues in Southwestern Pennsylvania (1999)

Land Use Management Techniques: Benefits and Costs (1999)

University of Pittsburgh Survival Skills and Ethics Workshops

Laboratory Management (1995)

Teaching (1994)

Spectroscopy Society of Pittsburgh Short Course

Elemental and isotopic analysis of elemental speciation by ICP-MS (1995)

Geological Society of America Continuing Education courses

Contaminant Organic Geochemistry (1995)

Hydrology and Geochemistry of Wetlands (1995)

Contaminant Hydrogeology: Monitoring, Protection, and Cleanup (1991)