

MONICA M. ARIENZO

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APPOINTMENTS

Assistant Research Professor, 2016 – current

Desert Research Institute, Division of Hydrologic Sciences, Nevada System of Higher Education

Post-Doctoral Fellow, 2014 – 2016

Desert Research Institute, Division of Hydrologic Sciences, Nevada System of Higher Education

EDUCATION

University of Miami, Miami, FL, 2008- 2014

Department: Marine Geology and Geophysics

Dissertation *Subtropical Atlantic Climate Variability Recorded in Speleothems from the Bahamas*

Advisor: Dr. Peter Swart

GPA: 3.57

Franklin & Marshall College, Lancaster, PA, 2004-2008

B.A. Geology with Departmental Honors

Cum Laude

RESEARCH INTERESTS

Paleohydrologic linkages between low and high latitudes; albedo impacts in seasonal snow areas and glaciers for hydrologic application; human impacts in high latitude environments; linkages between fire, temperature and hydrology.

RESEARCH EXPERIENCE

Post-Doctoral Research: Trace Element Ice Core Lab, Desert Research Institute, 2014-2016

Analyzed the trace element chemistry of Arctic and Antarctic ice cores for trace elements, black carbon, and water isotopes. Including the maintenance of two Thermo Element 2 ICP-MS instruments, Tiamo Titrator, and the analysis of external samples.

Doctoral Research: Stable Isotope Laboratory, University of Miami, 2008- 2014

Analyzed the geochemistry of stalagmite samples from the Bahamas to understand the paleoclimate of the region. This project required the application of various geochemical tools, extensive laboratory and field work. Additionally included the development of the clumped isotope methodology and the fluid inclusion extraction device.

Additional experience with teaching undergraduates, visiting scientists various methodologies.

Doctoral Research: Stable Isotope Laboratory, Vrije Universiteit, Amsterdam, NL, July 2011

Advisor: Dr. Hubert Vonhof

Analyzed stalagmite samples to determine the isotopic composition of fluid inclusions.

Undergraduate Honors Research: Department of Geology, Franklin & Marshall College, 2008

Senior Honors Thesis: *Dedolomitization of the Cambrian Ledger and Kinzer Formations York County, PA*

Advisor: Dr. Carol deWet

Geochemical study (isotopes and trace elements) of dolomitized and dedolomitized carbonates.

PUBLICATIONS (PEER REVIEWED)

Arienzo, M. M., Swart, P.K., Broad, K., Clement, A. C., Pourmand, A., Kakuk, B. *In review*. Multi-proxy evidence of millennial scale climate variability from multiple Bahamian speleothems, *Quaternary Science Reviews*.

De Wet, C., **Arienzo, M. M.**, Dinterman, P., Hopkins, D. *In Review*. Depositional facies influence on shallow burial dolomitization, and Triassic dedolomitization in the Middle Cambrian Ledger Formation, York, Pennsylvania, USA, *Jour of Sed Research*.

Chellman, N., McConnell, J. R., Heyvaert, A., Vanni re, B., Wennrich, V., **Arienzo, M.** *In Review*. Laser-based method for black carbon determination in lake sediment cores, *Environmental Science & Technology*.

Arienzo, M. M., McConnell, J. R., Chellman, N., Criscitiello, A. S., Curran, M., Fritzsche, D., Kipfstuhl, S., Mulvaney, R., Nolan, M., Opel, T., Sigl, M., Steffensen, J. P. 2016. A method for continuous ²³⁹Pu determinations in Arctic and Antarctic ice cores, *Environmental Science and Technology*, 50 (13), 7066–7073, DOI: 10.1021/acs.est.6b01108.

Legrand, M., McConnell, J., Fischer, H., Wolff, E. W., Preunkert, S., **Arienzo, M.**, Chellman, N., Leuenberger, D., Maselli, O., Place, P., Sigl, M., Sch pfbach, S., Flannigan, M. 2016. Boreal fire records in Northern Hemisphere ice cores: a review, *Climate of the Past*, 12(10), 2033-2059.

Swart, P. K., Cantrell, D., **Arienzo M. M.**, Murray S. T. 2016. Evidence for high temperature and ¹⁸O-enriched fluids in the Arab-D of the Ghawar Field, Saudi Arabia, *Sedimentology*, DOI: 10.1111/sed.12286.

Murray S. T., **Arienzo M. M.**, Swart, P. K. 2016. Determining the $\Delta 47$ acid fractionation in dolomites, *Geochimica et Cosmochimica Acta*, vol 174, 42-53.

Arienzo, M. M., Swart, P. K., Pourmand, A., Broad, K., Clement, A. C., Murphy, L. N., Kakuk, B. 2015. Bahamian speleothem reveals temperature decrease associated with Heinrich stadials, *Earth and Planetary Science Letter*, vol 430, 377–386, doi:10.1016/j.epsl.2015.08.035.

Pourmand, A., Tissot, F. H., **Arienzo M. M.**, Sharifi, A. 2014. Introducing a comprehensive data reduction and uncertainty propagation algorithm for U-Th geochronometry with extraction chromatography and isotope dilution MC-ICP-MS, *Geostandards and Geoanalytical Research*, vol. 38, 129-148, doi: 10.1111/j.1751-908X.2013.00266.x.

Murphy, L. N., Clement, A., Albani, S., Mahowald, N. M., Otto-Bliesner, B. L., Swart, P. K., **Arienzo, M. M.** 2014. Simulated changes in atmospheric dust in response to Heinrich Events, *Paleoceanography*, vol. 29, 1-14, doi:10.1002/2013PA002550.

Arienzo, M. M., Swart, P. K., Vonhof, H. B. 2013. Measurement of $\delta^{18}\text{O}$ and $\delta^2\text{H}$ of fluid inclusion water in speleothems using cavity ring-down spectroscopy compared with isotope ratio mass spectrometry, *Rapid Communications in Mass Spectrometry*, vol 27, 2616–2624, DOI: 10.1002/rcm.6723.

Arienzo, M. M., McConnell, J. R., Murphy, L. N., Chellman, N., Kipfstuhl, S., Das, S. *In Preparation*. Holocene black carbon in Antarctica paralleled insolation-driven South American climate, *Science Advances*.

Arienzo, M. M., Swart, P.K., Broad, K., *In Preparation*. Determining the drivers of calcite geochemistry in a monitored Bahamas cave, *Geochimica et Cosmochimica Acta*.

INVITED PRESENTATIONS

Bahamas Blue Holes: Archives of the last 100,000 years of climate, Jacksonville University, Jacksonville, Florida, March, 2013.

GRANTS, SCHOLARSHIPS & AWARDS

External Awards

2016 “Collaborative Proposal: Holocene Biomass Burning Records from the South Pole Ice Core” NSF PLR – Antarctic Glaciology, Lead Author. (\$188,000 – declined)

2014 “Collaborative Research: Continued Core Atmospheric and Snow Measurements at the Summit, Greenland Environmental Observatory” NSF PLR - AON Implementation, Lead Author. (\$756,204 - declined)

2011 “Bahamas Stalagmites as Recorders of Millennial Scale Temperature Variability” Geological Society of America Student Research Grant, Lead Author. (\$3,000)

2011 “Bahamas Stalagmites as Recorders of Millennial Scale Climate Variability” Cave Research Foundation Student Research Grant, Lead Author. (\$3,000)

Internal Awards

2015 “Quantifying Colorado River Basin Historic Hydrologic Drivers” DRI Maki Ph.D. Project Proposal, Co-PI.

2014 “Method Development and Validation of Black Carbon Measurements in Lake Sediment Cores: Application and Assessment in the Colorado River Basin” DRI Maki Endowment Research award Co-PI (\$157,735)

2011 NSF Graduate STEM Fellow in K-12 Education (GK-12) Program Fellowship

2011 “Bahamas Stalagmites as Recorders of Millennial Scale Temperature Variability” RSMAS Alumni Award Research Grant, Lead Author.

PRESENTATIONS

Arienzo, M. M., McConnell, J. R., Murphy Goes, L., Criscitiello, A. S., Das, S., Kipfstuhl, S. 2016. Antarctic black carbon parallels insolation and millennial scale climate variation, *American Geophysical Union*, Annual Meeting, San Francisco, CA

Massam, A., Mulvaney, R., McConnell, J., Abram, N., **Arienzo, M. M.**, Whitehouse, P. L. 2016. Insights into accumulation variability over the last 2000 years at James Ross Island, Antarctic Peninsula, *American Geophysical Union*, Annual Meeting, San Francisco, CA

Mehterian, S, **Arienzo, M. M.**, Pourmand, A., Broad, K., Swart, P. K. 2016. Millennial Scale Rapid Climate Change Events of the last 60kya as Observed in Multiple Stalagmites from The Bahamas, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M. McConnell, J. R., 2015. Antarctic black carbon tracks Southern Hemisphere climate throughout the Holocene, *IPICS meeting*, Hobart, TAS, Australia.

McConnell, J. R., **Arienzo, M. M.**, Chellman, N., Fritzsche, D., Kreutz, K., Kipfstuhl, S., Maselli, O., Nolan, M., Pasteris, D., Sigl, M., Steffensen, J. P. 2014. Dust in the Arctic during the past Millennium

from a developing array of ice cores: Linkages to climate and land use, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M., Mehterian, S., Swart, P. K., Broad, K. 2014. Determining the drivers of oxygen and carbon isotope fractionation in a monitored Bahamas cave, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Murray, S., Swart, P. K., **Arienzo, M. M.** 2014. Clumped isotopes in Bahamian dolomites: A Rosetta stone? *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M., Swart, P. K., Murray, S. M. 2014. Determining the drivers of clumped isotope fractionation in modern and ancient Bahamian speleothems, *Workshop on Clumped Isotopes*, ETH Zurich, Switzerland.

Arienzo, M. M., Swart, P. K., Pourmand, A., Broad, K., Clement, A. C., Murphy, L. N., Kakuk, B. 2013. Evidence of abrupt climate variability across Heinrich events from multiple Bahamian stalagmites, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M., Swart, P. K., Murray, S., Vonhof, H. 2013. Temperature determination from speleothems through fluid inclusion and clumped isotope techniques, *Goldschmidt Conference*, Florence, Italy.

Arienzo, M. M., Swart, P. K., Schroeder, C., Hsiao, G., Vonhof, H. B. 2013. Analysis of $\delta^{18}\text{O}$ and $\delta^2\text{H}$ of fluid inclusion water in speleothems using cavity ring-down spectroscopy, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M., Swart, P. K., Vonhof, H., Broad, K., Clement, A. C., Eisenhauer, A., Kakuk, B. 2011. Temporal variability of precipitation and temperature across Heinrich Events from a Bahamian stalagmite, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M., Swart, P. K., Broad, K., Clement, A. C., Eisenhauer, A., Kakuk, B. 2011. Bahamian speleothems reveal increased aridity associated with Heinrich Events, *Mineralogical Magazine*, Vol. 75, 3, p. 451.

Arienzo, M. M., Swart, P. K., Broad, K., Clement, A., Eisenhauer, A., Kakuk, B. 2010. Bahamian speleothems reveal Atlantic climate variability during Heinrich Events, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Greer, L., Katherine, T., **Arienzo, M. M.**, Rosenberg, A., Waite, A., Swart, P.K. 2010. Barbados corals as recorders of Amazon River salinity anomalies, *American Geophysical Union*, Annual Meeting, San Francisco, CA.

Arienzo, M. M. 2008. Dedolomitization of the Cambrian Ledger and Kinzers Formations, York County, PA, *Undergraduate Honors Thesis Chapter 1*, Franklin and Marshall College, Lancaster, PA.

Arienzo, M. M. 2008. Temporal and spatial distribution of corals at Tague Bay Reef and Buck Island National Monument Reef St. Croix, USVI, *Undergraduate Honors Thesis Chapter 2*, Franklin and Marshall College, Lancaster, PA.

Fisco, D., **Arienzo, M. M.**, Soja, C., Hubbard, D. 2008. Post-Hugo recovery of a protected and unprotected reef: St. Croix, US Virgin Islands, *International Coral Reef Symposium*, Ft. Lauderdale, FL.

McKenna, M., **Arienzo, M. M.**, Ahern, R. 2008. Soil nickel influences pollination and reproduction in the nickel hyperaccumulators, *Alyssum murale* and *Alyssum corsicum*, *Pollination Conference*, Ecological Society of America.

Arienzo, M. M. 2007. Interactions of insects in *Alyssum* hyperaccumulators in low and high nickel soils, *REU Blandy Experimental Farm*, University of Virginia.

TEACHING EXPERIENCE

Lecturer: Introduction to Geology, University of Nevada Reno.
GEOL 101 (28 students), Fall 2016

Co-Lecturer: Isotopes in Hydrology, University of Nevada Reno.
GEOL 780 (8 students), Fall 2016

Teaching Assistant: Introduction to Oceanography, University of Miami
Prepared and delivered lectures, assignments and exams.
Spring 2011, Fall 2010, Spring 2010, Spring 2009

Resident Scientists: Carol City Middle School, Miami, FL
NSF Graduate STEM Fellowship in K-12 Education (GK-12) Program
Designed laboratory assignments and lectures with the class teacher.
Fall 2011- Spring 2012

Teaching Assistant: Environment and Human Values, Franklin & Marshall College
Spring 2008, Spring 2006

Guest Lectures: Monsoons, Spring 2015.

AWARDS

2015 Smith Prize, University of Miami

2009 AGU Fall Meeting Paleoceanography and Paleoclimatology Outstanding Student Paper Award

2008 Rosenstiel Fellowship

FIELD EXPERIENCE

Bahamas Cave Monitoring Project: 2012-2014

Running and organizing field excursions to the Bahamas for cave studies.
Maintenance for all field equipment.

Bahamas Drill Ship Cruise: March 2009

Live aboard the R/V Coral Reef II.
Aided with core retrieval and mapping of the Exumas Land and Sea Park.

Exxon-Mobil Field School: Bighorn Basin, Wyoming Summer 2009

Albion College Field School: Red Lodge, Montana and Black Hills, South Dakota, Summer 2008

SERVICE

Co-Convener AGU Fall Meeting 2016: Dust, Black Carbon, and other Aerosols in the Cryosphere

Co-Convener AGU Fall Meeting 2014: Clumped Isotope Geochemistry: From Advances in
Methodology to Applications in the Geosciences

Co-Organizer PAGES Workshop:

Cast, Cut, Sample and Analyze: A practical approach to processing speleothems for paleoclimate reconstruction, April 2014.

Lab Safety Committee Member: Jan 2014 - Current

Organizer of Dust reading group University of Miami: 2013

Chairman and Department Representative to Student Travel Fund Committee: 2010-2013

Geotopics Coordinator: Fall 2008 – Spring 2009

OUTREACH

GreenPower teacher training: June 2016

Conducted hands on lab tours for Nevada K-12 teachers.

Women in Science: February 2010, March 2012, September 2013

Introduced students to geochemistry/climate change science.

Miami Heights Elementary School: Feb. 2013

Lecture/activities with children about geology and geologic time.

Cape Eleuthera Institute/Island School: May 2012

Lecture titled: *What do Bahamas caves tell us about the past?*

RSMAS Open House: February 2011, October 2008

Engaged elementary students about South Florida geology.

PROFESSIONAL MEMBERSHIPS

American Geophysical Union: 2008-present

PROFESSIONAL SKILLS

Geochemical analytical tools: Thermo Element 2, DMT SP2, New Wave Research Computerized Micromill, Thermo-Finnigan Delta Plus IRMS with Keil III, Thermo Scientific MAT 253 IRMS with Keil IV, Varian ICP-OES, Thermo Scientific Neptune MC-ICP-MS, Picarro L2130-I, Delta Plus XP.

Analytical Methods: Clumped isotope method, extraction chromatography for U-Th, sample preparation for stable isotope and trace element analysis.

Geographical Information System (GIS)

MATLAB

PADI SCUBA certification: 2000-current