

Joanne Muller, PhD

Paleoclimatologist

Associate Professor
Department of Marine and Ecological Sciences
Florida Gulf Coast University

PROFESSIONAL RESEARCH EXPERTISE

I am a paleoclimatologist with expertise in terrestrial and marine systems. I use sedimentological and geochemical proxies to decipher past environmental change within these systems, in order to understand past climate change. Particular areas of research interest relate to: (1) Monsoon and El Niño Southern Oscillation strength reconstructions in tropical regions and their relationship to global climate change, (2) Past ocean circulation in key regions and its relationship to global climate change (3) Hurricane reconstructions in tropical regions and their relationship to global climate change

EDUCATION

- 2007 **PhD** – *Reconstructing climate change of the last 55 kyr: The Lynch's Crater peat mire record, NE-QLD, Australia.* School of Earth and Environmental Sciences, James Cook University, Townsville, Qld, Australia. Advisors: Dominik. J. Weiss and Raphael. J. Wust.
- 2003 **B.Sc. Honours (First Class)** – *Sediment Transport on The Strand, Rowes Bay, and Pallarenda Beach, Townsville, Queensland, Australia.* School of Earth and Environmental Sciences, James Cook University, Townsville, Qld, Australia. Advisor: Paul. J. Hearty.
- 2002 **B.Sc. Earth Sciences** - University of Technology, Sydney

PROFESSIONAL APPOINTMENTS

- 2017- present **Associate Professor of Paleoclimatology:** Florida Gulf Coast University, Department of Marine and Ecological Sciences, Fort Myers, FL, USA.
- 2011-2017 **Assistant Professor of Paleoclimatology:** Florida Gulf Coast University, Department of Marine and Ecological Sciences, Fort Myers, FL, USA.
- 2013-2015 **Marine Science Program Leader:** Florida Gulf Coast University, Department of Marine and Ecological Sciences, Fort Myers, FL, USA.
- 2009-2011 **Visiting Scientist:** Woods Hole Oceanographic Institution, Department of Geology and Geophysics. Worked with Senior Scientist Delia Oppo in determining past climate changes in low latitude regions
- 2007-2009 **Sir Keith Murdoch and Comer Postdoctoral Fellow:** Woods Hole Oceanographic Institution, Department of Geology and Geophysics. Worked with

Senior Scientist Jerry McManus on uranium series applications in paleoceanography

2003-2007 **PhD Research Student and Tutor in Marine Science**, School of Earth and Environmental Sciences, James Cook University, Townsville, Australia.

RESEARCH – REFEREED PUBLICATIONS IN JOURNALS (*Student)

*Ercolani, C., **Muller, J.**, Collins, J., Savarese, M. *Squicimara, L. (2015) Intense Southwest Florida hurricane landfalls over the past 1000 years, *Quaternary Science Reviews*, Vol. 126, pp.17-25

Gunnels B. Buzasi. D., Cassani. M., Douglass. J., Everham. E., Hartley. A., Herman. J., Mujtaba. M., **Muller. J.**, Nicolas. A., Thomas. S., Southard. L., Demers. N., (2015) Engaging students in ethical considerations of the scientific process through a simulated funding panel. *Counsel on Undergraduate Research*, Vol. 36, pp. 13-18

*Kaal, J., Schellekens, J., Nierop, K., Martinez Cortizas, A., **Muller, J.** (2014) Contribution of organic matter molecular proxies to interpretation of the last 55 ka of the Lynch's Crater record (NE Australia). *Paleogeography, Paleoclimatology, Paleoecology* Vol. 414, pp. 20-31

Muller, J., McManus, J.F., Oppo, D., Francois, R., Brown-Ledger, S. (2012) Strengthening of the North-East Monsoon over the Flores Sea, Indonesia, at the time of Heinrich Event 1. *Geology*, Vol 40, pp. 635-638

Muller, J., Kylander, M., Wüst, R., Weiss, D. Martinez-Cortizas, A., LeGrande, A. Jennerjahn, T. Behling, H. Anderson, W. Jacobso, G., (2008) Possible evidence for wet Heinrich phases in tropical NE Australia: The Lynch's Crater deposit, *Quaternary Science Reviews*, Vol 28, pp. 468-475

Muller, J. Kylander, M.E. Wüst, R.A.J, Weiss, D.J. Martinez-Cortizas A.M., Blake, K., Coles, B. and Garcia-Sanchez, R., (2008). The use of principle component analyses in characterizing trace and major elemental distribution in a 55 kyr peat deposit in tropical Australia: Implications to paleoclimate, *Geochimica et Cosmochimica Acta*, Vol 72, pp. 449-463.

Kylander, M.E. **Muller, J.** Wüst, R.A.J. Gallagher, K. Garcia-Sanchez, R. Coles B.J. and Weiss., D.J. (2007). Rare earth element and Pb isotope variations in a 52 kyr peat core from Lynch's Crater (NE Queensland, Australia): Proxy development and application to paleoclimate in the Southern Hemisphere, *Geochimica et Cosmochimica Acta*, Vol 71, Issue 4, pp. 942-960

Muller, J. Wüst, R.A.J., Weiss, D.J. and Hu, Y., (2006). Geochemical Evidence Of Environmental Change at Lynch's Crater, Queensland, Australia, *Global and Planetary Change*, Volume 53, Issue 4, pp. 269-277.

Muller, J. Wüst, R.A.J. and Hearty, P.J., (2006). Sediment movement along an artificially reconstructed beach: 'The Strand', Townsville, NE-Qld, Australia, *Estuarine Coastal and Shelf Science*, Vol. 66 (1-2), pp. 204-210.

BOOK CHAPTERS

Muller, J., Collins, J. Gibson, S., and Paxton, L. (2017) Recent Advances in the Emerging

Field of Paleotempestology. In Hurricanes and Climate Change, Vol 3. Eds. Collins, J & Walsh, K. Springer Publishers

Kylander, M.E. and **Muller, J. (2008)** Inorganic Geochemistry in Paleoclimate: Tools and Trends in the Analysis of Peat and Lake Sediments. In *Climate Change Research Progress* (Ed. Lawrence N. Peretz.) Nova Publishers, pp. 161-186

RESEARCH – REFERRED ARTICLES, ABSTRACTS AND PROCEEDINGS (2012-PRESENT)(*Student)

Muller, J. (2019) Florida Paleotempestology Records in *Paleoenvironmental Change, Hazards and Vulnerability, Climatology and Meteorology*, American Association of Geographers Annual Meeting, Washington, DC.

Muller, J., Collins, J., *Ercolani, C., *Ellis, S., *Ingalsbe, T. **(2015)** Intense Southwest Florida Hurricane Strikes over the Past 1 Thousand Years, (C06-P26) XIX International Union for Quaternary Research, Nagoya, Japan.

*Ellis, S., **Muller, J.,** Collins, J., *Ercolani, C., *Ingalsbe, T. **(2015)** Reconstructing the Last 150 years of Southwest Florida Hurricane Activity using Lagoonal Sediments, (C06-P34) XIX International Union for Quaternary Research, Nagoya, Japan.

Charles H. Paxton, **J. Muller** and J. M. Collins **(2015)** Paleotempestology: Storm surge records along the southwest Florida coast. American Meteorological Society 95th Annual Meeting (January 2015).

Muller, J., *Ercolani, C., Collins, J., *Paxton, C. **(2015)** Using the geologic record to determine long-term trends in hurricane landfalls along the west Florida coastline, 5th International Summit on Hurricanes and Climate Change, Chania, Greece.

Paxton, L., J.M. Collins, **J. Muller,** and C. Paxton, **(2015)** Southwest Florida Paleotempestology Records. 5th International Hurricane Summit on Hurricanes and Climate Change, Greece.

Muller, J., Collins, J., *Paxton, C., *Ercolani., C. **(2014)** A Millennial-Scale Record of Hurricane Landfalls along the Southwest Florida Coastline, Association of American Geographers Annual Meeting, Tampa, 4/9/2014, Session - 2230 Hurricane II: Paleotempestology/Geomorphic Impacts

Collins, J., **Muller, J.,** Paxton., C., *Monkhouse, A., *Ercolani., C. *Milcetic., J **(2014)** Sampling considerations for paleotempestology storm surge records along the southwest Florida coast, Association of American Geographers Annual Meeting, Tampa, 4/9/2014, Session - 3511 Hurricane VI: Paleotempestology and Societal Response

Muller, J., McManus, J., Oppo, D., Francois, R., **(2012)** Response of the Indo-Australian Monsoon System to Heinrich Events: Evidence from Marine and Terrestrial Sediments, American Geophysical Union (fall), Abstracts with Programs. PP52A-04.

*Squicimara, L., *Ercolani, C., **Muller, J.,** Savarese, M., and Wohlpart, S. **(2012)** Paleotempestology of Southwest Florida: Potential geologic proxies in determining past hurricane landfalls: Geological Society of America, Abstracts with Programs, Vol. 44, No. 7, p. 86

*Ercolani, C., *Squicimara, L., **Muller, J.**, Savarese, M., and Wohlpart, S. (2012) Tracking hurricane landfalls in Southwest Florida using geologic proxies in lagoon sediment cores, Geological Society of America, Abstracts with Programs. Vol. 44, No. 7, p.87

*Ingalsbe, T., **Muller, J.** Oppo, (2012) D. Utilizing deep-sea sediment proxies in the high-latitude North Atlantic to better understand Meridional Overturning Circulation during Heinrich Stadial 1, the Boiling Allerod and the Younger Dryas. Geological Society of America, Abstracts with Programs. Vol. 44, No. 7, p. 84

Muller, J., MacManus, J., Oppo, D., MacDonald, J., Francois, R., Rosenthal, Y. (2012) Paleooceanographic Changes in the Timor and Flores Seas during the Last Glacial Maximum and Deglaciation: The Importance of the 230Th Normalization Proxy, Geological Society of America, Abstracts with Programs. Vol. 44, No. 7, p.121

RESEARCH GRANTS AND AWARDS

Grants awarded:

Muller, J., and Collins, J., 2018-2020. Florida Sea Grant -- **National Oceanic and Atmospheric Administration**, A multi-step method for extending the hurricane record back in time to obtain more representative return period calculations for East Florida communities. **\$193,061**

Muller J., (January- July 2019) Science Summer Camp for Girls-Assessing Environmental Change in Southwest Florida Southwest Florida Community Foundation **\$25, 801**

Muller J., (January- July 2018) Science Summer Camp for Girls-Assessing Environmental Change in Southwest Florida Southwest Florida Community Foundation **\$22, 584**

Muller, J., and Collins, J., 2013-2016, **National Science Foundation** – Marine Geology and Geophysics Program, Collaborative: RUI: Reconstructing the History of Hurricane Landfalls in Southwest Florida over the Past Five Thousand Years. **\$177,194.**

Muller, J., 2012-2013. Florida Sea Grant -- **National Oceanic and Atmospheric Administration**, Reconstructing the history of intense hurricane landfalls in southwest Florida over the past 5K years. **\$7,500**

Muller, J., 2012-2013. **Florida Gulf Coast University**, Graduate Student Research Assistantship (FGCU), Tracking Hurricane Landfalls in Southwest Florida over the last 5,000 years. **\$10,000**

Muller, J., 2012-2013. **Florida Gulf Coast University** Research Related Graduate Assistantship (FGCU), Reconstructing the variability in El Niño-Southern Oscillation over the last 5,000 years in Southwest Florida from Fakahatchee peat sediments. **\$3,000**

Muller, J., – 2012-2013. **Florida Gulf Coast University** Office of Research and Sponsored Programs, Developing a long, continuous history of hurricane landfalls in Southwest Florida: the Inner Clam Bay record, **\$5,000**. Submitted March 12th 2012.

Muller, J., and Oppo, D. 2009-2011. **Ocean and Climate Change Institute**. Falmouth Area

High School Summer Climate Change Internship. *\$20,000*

McManus, J.F., **Muller, J.**, and Toole, J., 2008-2010. **Woods Hole Oceanographic Institution**, Tropical Research Initiative. Past Dynamics of the Indonesian Throughflow, *\$93,000*

TEACHING EXPERIENCE

Florida Gulf Coast University (2011 – present)

Physical Geology (GLY1000C)
Graduate Seminar in Current Topics - Climate Change in the Tropics (EVS692)
Paleoclimatology (EVR4930)
Paleoclimatology (EVR6936)
Meteorology and Climatology (GLY4074C)
Scientific Process (ISC3120)
Directed Independent Study (CHM4905)
Intro to Earth Science (ESC1000C)
Senior Seminar in Marine Science (OCB4936)

SERVICE EXPERIENCE

Marine Science Program Leader (2013-2015)
Honors Executive Board (2013-2014)
Superior to Climate Change Minor (2012-present)
CAS Program Review Team (2016-present)
Marine Science Faculty Hiring Committee

ADVISING AND MENTORING

Graduated Students

Christian Ercolani – Masters in Environmental Science. Currently a PhD Student at the Université de Strasbourg, France.
Tara Ingalsbe – Masters in Environmental Science. Currently a PhD Student at the University of Toronto.
Nicholas Culligan - Masters in Environmental Science. Currently a PhD Student at the Louisiana State University.

Graduate Advising Major Professor

Blake Facuette.

Undergraduate Advising Major Professor

Louis Squiccimara – Fall 2012
Tara Ingalsbe – Fall 2012
Hannah Rodriguez – Spring 2013
Alexandra Walters – Summer 2015
Courtney Fernandez – Summer 2015
Shelby Ellis – Summer 2017
Tynisha Martin – Summer 2018
Cody Calandra – Spring 2019
Lexi Morales – Summer 2019

Graduate Thesis Committees

Nicole Fronczkowski – Graduated Fall 2013
Christian Ercolani – Graduated Spring 2014
Tara Ingalsbe – Graduated Fall 2015
Nicholas Culligan – Graduated Summer 2018
Jeff Zinger – Graduated Spring 2019

SYNERGISTIC ACTIVITIES

- 2009-present **Journal Reviewer:** Quaternary Research, Geoderma, Atmospheric Environment, Global and Planetary Change, Quaternary Science Reviews, Geochimica et Cosmochimica Acta, Nature Scientific Reports
- 2013-present **Reviewer for National Science Foundation** -- Paleo Perspectives on Climate Change (P2C2) program
- 2011-present **Grand Awards Judge:** Collier County High-school Science Fair
- 2018-Present **Leader:** STEM Summer Camp for High School Girls. Developed a climate change summer school in which female students learn about global warming, paleorecords, laboratory techniques and scientific interpretation.