

Jocelyn A. Sessa

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Current: Senior Scientist in Paleontology & Education, American Museum of Natural History.

Postdoctoral Experience:

2012 to 2016 Departments of Paleontology & Education, American Museum of Natural History.
2010 to 2012 Department of Paleobiology, Smithsonian National Museum of Natural History.
2009 to 2010 Department of Earth Sciences, Syracuse University.

Education:

Ph.D., 2009 Department of Geosciences, Pennsylvania State University, University Park, PA.
2005 6-week Paleobiology Database Intensive Course in Analytical Paleobiology.
M.S., 2003 Department of Geology, University of Cincinnati, Cincinnati, Ohio.
B.A., 2000 Department of Geological Sciences, State University of New York at Geneseo,
Geneseo, NY. *Cum laude*, minor in Environmental Studies.

Publications (* indicates student author; ‡ indicates corresponding author):

Self-Trail, J.M., Robinson, M.M., Bralower, T.J., Sessa, J.A., Hajek, E.A., Kump, L.R., Trampush, S.M., Willard, D.A., Edwards, L.E., Powars, D.A., and Wandless, G.A. (*submitted*) Coastal marine response to global climate change during the Paleocene Eocene Thermal Maximum, Salisbury Embayment. *Geology*.

Jardine, P.E., Harrington, G.J., Sessa, J.A., Dašková, J. (*submitted*) Drivers and constraints on floral latitudinal diversification gradients. *Global Ecology and Biogeography*.

Paynter, A.N.*, Metzger, M.J., Sessa, J.A., and Siddall, M.E. (*accepted*) Evidence of cross-species transmissibility of the cancer-inducing *Steamer* retrotransposon among ecological cohort bivalve species. *Diseases of Aquatic Organisms*.

Janssen, A.W., Sessa, J.A., and Thomas, E. 2016. Pteropoda (Mollusca, Gastropoda, Thecosomata) from the Paleocene-Eocene Thermal Maximum of the United States Atlantic Coastal Plain. *Palaeontologia Electronica*. 19.3.47A: 1-26.
palaeo-electronica.org/content/2016/1662-pteropoda-from-the-usa-petm

Knoll, K.*, Landman, N. H., Cochran, J. K., MacLeod, K. G., and Sessa, J. A. ‡ 2016. Microstructural preservation and the effects of diagenesis on the carbon and oxygen isotope composition of Late Cretaceous aragonitic mollusks from the Gulf Coastal Plain and the Western Interior Seaway. *American Journal of Science* 316:591–613. An image from this article is the issue's cover.

Sessa, J.A., Larina, E.*, Knoll, K.*, Garb, M., Cochran, J.K., Huber, B.T., MacLeod, K.G., Landman, N.H. 2015. Ammonite habitat revealed via isotopic composition and comparisons with co-occurring benthic and planktonic organisms. *Proceedings of the National Academy of Sciences* 112:15562-15567. <http://www.pnas.org/content/early/2015/11/11/1507554112>

Publications continued:

Sluijs, A., van Roij, L.*, Harrington, G.J., Schouten, S., Sessa, J.A., Levay, L.J., Reichart, G.J., Slomp, C.P. 2014. Warming, euxinia and sea level rise during the Paleocene-Eocene Thermal Maximum on the Gulf Coastal Plain: implications for ocean oxygenation and nutrient cycling. *Climate of the Past* 10:1421-1439.

Sessa, J.A., Callapez, P.M., Dinis, P.A., Hendy, A.J.W. 2013. Paleoenvironmental and paleobiogeographical implications of a Middle Pleistocene mollusc assemblage from the marine terraces of Baía das Pipas, Angola. *Journal of Paleontology* 87:1016-1040.

Nadeau et al. 2013. Pilot program for teaching Earth Science in New York. *EOS* 94:205-212.

Sessa, J.A., Ivany, L.C., Schlossnagle, T.H.*, Samson, S.D., Schellenberg, S.A. 2012. The fidelity of oxygen and strontium isotope values from shallow shelf settings: Implications for temperature and age reconstructions. *Palaeogeography, Palaeoclimatology, Palaeoecology* 342-343:27-39.

Sessa, J.A., Bralower, T.J., Patzkowsky, M.E., Handley, J.C. Ivany, L.C. 2012. Environmental and biological controls on the diversity and ecology of Late Cretaceous through early Paleogene marine ecosystems in the U.S. Gulf Coastal Plain. *Paleobiology* 38: 218-239.

Sessa, J.A., Patzkowsky, M.E., Bralower, T.J. 2009. Impact of lithification on the diversity, size distribution, and recovery dynamics of marine invertebrate assemblages. *Geology* 37:115-118.

Alroy et al. 2008. Phanerozoic trends in the global diversity of marine invertebrates, *Science* 321: 97–100.

Gibbs, S.J., Bown, P.R., Sessa, J.A., Bralower, T.J., Wilson, P.A. 2006. Nannoplankton origination and extinction across the PETM, *Science* 314:1770-1773.

Professional Commentary about JAS's Work:

November, 2015 IFLScience.com; Where in the ocean did iconic spiral ammonites live?

November, 2015 Christian Science Monitor; What were ammonites' lives like?

Sessa et al. (2015) was chosen for a PNAS commentary piece and as a "Featured Image" on PNAS's "In the News" webpage.

Hansen, B. (2009). Slipping through the cracks. Editor's Choice, *Science* v. 323, p. 1266.

Sessa et al. (2009) rose to #14 on the journal *Geology's* 50 most cited papers over the last five years.

Funded Research:

NSF EarthCube IA (NSF 540902): Enhancing Paleontological and Neontological Data Discovery API. Sessa became lead PI in Sept 2016. Amount: \$172,303 initially to AMNH, plus \$43,333 as a subaward; \$799,035 total collaborative award. Sept. 2015 - Sept 2017.

Honors:

2011 Stable Isotope Postdoctoral Fellowship at the Smithsonian National Museum of Natural History; \$45,000.

2009 Best student presentation, 'Climatic & Biotic Events of the Paleogene' conference.

Mentorship (bold indicates that I am the primary supervisor):

- 2016-current **Alexandra Buczek**, AMNH PhD candidate. I am co-advising Alexandra's dissertation work on using mollusks to decipher Pliocene climate change.
- 2016-current Katherine Ferguson, University of Missouri Masters student. I am a committee member for Kate, who is studying the ecology of ammonites, expanding on the results of my 2015 PNAS paper.
- 2016-current Ben Linzmeier, University of Wisconsin PhD student. Ben is focusing on the early ontogeny of scaphitid ammonites, expanding my 2015 PNAS paper results.
- 2015- 2016 Ashley Pintar, SUNY Binghamton senior. I co-advised Ashley on a project on the ecology and phylogeny of a transmissible cancer in extant bivalves, resulting an article where Ashley is the lead author.
- 2012-2016 **Katja Knoll**; Brooklyn College Masters student. Katja analyzed how shell micro-structure affects the preservation and isotopic composition of mollusk shells, resulting in her as lead author on one article and co-author on another.
- 2014-2015 Shaun Mahmood; recent graduate. Shaun researched geochemical signatures of the end-Cretaceous mass extinction within the proto-Atlantic ocean.
- 2010-2011 **Madeline O'Connor**; SUNY College of Environmental Science & Forestry (ESF) undergraduate. Maddie derived seasonal temperatures from mollusk shells.
- 2009-2010 **Trevor Schlossnagle**; SUNY ESF senior. Trevor analyzed strontium and oxygen isotopes from 54 million-year-old bivalves, resulting in a co-authored article.

Invited Presentations:

- 2016, Spring University of Toronto, Mississauga, Department of Chemical and Physical Sciences.
- 2016, Spring Pennsylvania State University, Department of Geosciences.
- 2015, Spring American Museum of Natural History, Richard Gilder Graduate School.
- 2015, Spring College of Charleston, Department of Geology and Environmental Geosciences.
- 2013, Spring Brooklyn College, *Mass Extinction* graduate-level course.
- 2012, Winter Washington Paleontological Society.

Instructor Experience:

- 2015, Fall *Earth Evolution and Earth Processes*; AMNH. Graduate-level semester-long course, 13 students. Process and cycle-based labs and lectures, emphasizing linkages amongst the geosphere, hydrosphere, atmosphere, and biosphere.
- 2013-current, Summer *Practicum*; AMNH. Graduate-level eight-week field and research course, 15-17 students. I created and conducted numerous fieldtrips and field exercises, and corresponding lab and lecture components. I also design and supervise research projects for five masters students per year.
- 2013, Summer *Enrichment*; AMNH. Masters of education course, 20 students. Over two weeks, I led lectures and labs on sedimentary rocks and structures, fossils, and geologic time.
- 2013-current *Form and function of shark teeth*; lab and lecture for middle and high school students throughout the NYC-area. Students investigate the relationship between form and function by linking tooth shape with the diet of several groups of modern and fossil sharks. To date, I have visited eleven schools and taught ~1,300 students.

Teaching Assistant Experience:

- 2008, Spring *Geology of National Parks online course*; Penn State. Undergraduate non-major course, enrollment of ~650. I was one of several TAs responsible for interacting with students via email, hosting online discussions, and grading assignments.

Teaching Assistant Experience continued:

- 2008, Fall *Geology of National Parks online course*; Penn State; same as above.
- 2005, Fall *Dinosaur extinctions and other controversies*; Penn State. Undergraduate non-major course, enrollment of ~100. I took an active role in class discussions, occasionally lectured, and graded weekly exercises.
- 2005, Spring *Geobiology*; Penn State. Undergraduate major course, enrollment of ~20. I augmented class discussions, ran weekly labs, was integral in the planning and execution of a four day fieldtrip, and graded assignments.
- 2004, Spring *Earth futures: Climate change*; Penn State. Undergraduate honors course, enrollment of 25. I worked with students in weekly labs and advised a team of half the class on a half-semester project about regional climate models and public policy.
- 2003, Fall *Dinosaur extinctions and other controversies*; Penn State. Undergraduate honors course, enrollment of ~35. I contributed to class discussions and mentored a team comprising half the class on a multi-week project examining the causes of the end Cretaceous mass extinction; project culminated in a class debate.
- 2002, Summer *Carbonate Depositional Systems*; U of Cincinnati. Undergraduate/graduate course for majors and nonmajors, enrollment of 40; 3-week class in the Florida Keys and The Bahamas. I was one of several TAs who helped to coordinate daily field excursions, lectured in the field, and supervised field and lab work.

Departmental-Institutional Service (last 5 years):

- 2016-current Member of the Academic Advisory and Milestone Committee for the AMNH Master of Arts in Teaching (MAT) Earth Science program.
- 2013-current Member of the Admissions Committee for the AMNH MAT program.
- 2013 Reviewer for Smithsonian Institution Stable Isotope Postdoctoral Fellowships.
- 2011, 2012 Organizer of weekly journal discussion group, Smithsonian Natural History.
- 2010, 2011 Reviewer for Natural History Research Experience applications, Smithsonian.

Service to the Professional Community (last 5 years):

- March 2015 Co-leader of a Paleobiology Database hackathon, where tools for research, education, & outreach are created via the PBDB's API; ex. R code, web applications, data analysis tools, visualizations, links to other databases.
- 2013-2016 Secretary of the Executive Committee of the Paleobiology Database.
- 2013-2014 GSA Geobiology Division joint technical program committee representative.
- 2010-2014 Reviewer for Paleontological Society Student Grants.
Reviewer for the journal *Geology*.
Reviewer for the journal *Proceedings of the National Academy of Sciences*.
Reviewer for the journal *Proceedings of the Royal Society B: Biological Sciences*.
Reviewer for the journal *PLoS1*.
Reviewer for the journal *Palaeogeography, Palaeoclimatology, Palaeoecology*.
Reviewer for the journal *Palaios*.
On site NASA-panel reviewer.

Outreach (last 5 years):

- 2016, Fall Presenter at AMNH's Family Party "Mission: Expedition", a hands-on event for ~1,000 guests where I showcased fossils I collected from Romania.
- 2016-current Led discussion groups at NYC high schools on careers within the geosciences.

Outreach (last 5 years) continued:

- 2015, Spring Presenter at the Student Science Summit, which provides career mentorship to high school students interested in the STEM fields.
- 2013-current Leader of “behind the scenes” tours of the Paleontology collections at the American Museum of Natural History.
- 2011 & 2012, Summer Supervisor for a Youth Engagement through Science (YES!) 6-week research project for a DC-area high school student; the project involved both specimen and lab work and culminated in a student poster presentation. Our research was profiled on a local news station.
- 2010-2013 Leader of “behind the scenes” tours of the Paleobiology collections at the Smithsonian National Museum of Natural History.

Selected conference presentations and non-peer reviewed work (* indicates student author):

- Self-Trail, J.M., Robinson, M.M., Sessa, J.A., Edwards, L.E., Willard, D.A., Spivey, W., and Bralower, T.J. 2016 Response of coastal marine flora and fauna to global climate change during the Paleocene-Eocene Thermal Maximum, Salisbury Embayment. North American Micropaleontological Society Geologic Problem Solving with Microfossils IV meeting.
- Linzmeier, B.J.*, Sessa, J.A., Orland, I.J., Landman, N.H., Peters, S.E., Valley, J.W. 2016 Stable isotope investigation of early ontogeny in Upper Cretaceous Owl Creek Formation ammonites. GSA Abstracts v. 48 No. 7 doi: 10.1130/abs/2016AM-286961.
- Sessa, J.A., Janssen, A.W., Thomas, E. 2016. Pteropods from the Paleocene-Eocene Thermal Maximum (PETM) of the Atlantic Coastal Plain, USA. GSA Abstracts v. 48 No. 7 doi: 10.1130/abs/2016NE-281572
- De Baets, K., Hoffman, R., Sessa, J. A. & Klug, C. 2016. Fossil Focus: Ammonoids. Palaeontology Online, v. 6, p. 1-15. www.palaeontologyonline.com/articles/2016/fossil-focus-ammonoids.
- Sessa, J.A., Self-Trail, J.M., Robinson, M.M., Spivey, W.E.*, Bralower, T.J., Thomas, E. 2015. Utilizing the mollusk fauna of the Atlantic Coastal Plain to reconstruct environmental conditions across the Paleocene-Eocene Thermal Maximum (PETM). GSA Abstracts v.47.
- Ebel, D.S., Mahmood, S.S.*, Jarret, S.J.*, Bigolski, J.N.*, Aldoroty, R.J.*, Sessa, J.A., Landman, N.H. 2015. New Jersey, a most habitable place during a meteorite strike: Shocked quartz and iridium spike co-occur below a Maastrichtian mollusk community on the NJ Coastal Plain. GSA Abstracts with Programs v. 47.
- Ebel, D.S., Kinzler, R.J., Harlow, G.E., Webster, J.D., Sessa, J.A., Nadeau, P.A., Ustunisik, G. 2015. Field and lab practicum provides tools to inspire geoscience classroom learning. GSA Abstracts with Programs v. 47.
- Smith, D.M., Butts, S.H., Gall, L., Karim, T.S., Landman, N.H., Nelson, G., Norris, C.A., Sessa, J.A., Uhen, M.D. 2015. The EPANDDA Project: Increasing accessibility to digitized data from the paleontological and neontological communities. GSA Abstracts with Programs v. 47.

Selected conference presentations and non-peer reviewed work (* indicates student author) continued:

Mahmood, S.S.*, Jarret, S.J.*, Sessa, J.A., Bigolski, J.N.*, Aldoroty, R.J.*, Ebel, D. S., Landman, N.H. 2015. Presence of shocked quartz at two Cretaceous/Paleogene (K/Pg) sites in the New Jersey Coastal Plain. Annual Meeting of the Meteoritical Society, abstract #5329.

Sessa, J.A., Knoll, K.*, Larina, E.*, Cochran, J.K., Huber, B.T., MacLeod, K.G., Landman, N.L. 2014. Ammonite habitat revealed via isotopic composition and comparisons with co-occurring benthic and planktonic organisms. GSA Abstracts with Programs v. 46, p. 77.

Knoll, K.*, J.A., Sessa, Landman, N.L., MacLeod, K.G., Garb, M., Larina, E.*, Cochran, J.K., 2014. The Influence of Shell Microstructure on the Preservation and Isotopic Composition of Late Cretaceous Bivalve and Gastropod shells. GSA Abstracts with Programs v. 46, p. 329.

Sessa, J.A., Callapez, P.M., Dinis, P.A., Hendy, A.J.W. 2013. Out of Africa: Paleoclimatic and paleobiogeographic implications of a Pleistocene assemblage from Angola, Tropical West Africa. GSA Abstracts with Programs v. 45, no. 7, p. 533.

Zirakparvar et al. 2013. An alternative path to improving university Earth science teaching and developing the geoscience workforce: Postdoctoral research faculty involvement in clinical teacher preparation. AGU Fall meeting; abstract ID # ED13C-0788.

Handley, J., Sessa, J.A. 2013. Using Capture Mark Recapture to Assess the Effects of Climate Change on Marine Invertebrate Evolutionary Patterns. Joint Statistical Meeting, Aug. 3-8.

Nadeau, P. A., Flores, K. E., Ustunisik, G., Zirakparvar, N. A., Grcevich, J., Pagnotta, A. Sessa, J. A., Kinzler, R. J., Macdonald, M., Mathez, E., Mac Low, M.-M. 2013. Putting teachers-to-be in the field and the lab: Hands-on research at the American Museum of Natural History. AGU Fall meeting; abstract ID # ED14B-08.

Atta, C.J.*, Laflamme, M., Sessa, J.A., Tweedt, S.*, Erwin, D.H. 2012. Taphonomic biases influencing exceptionally preserved *Naraoia* from the Burgess Shale. GSA Abstracts with Programs v. 44, p. 441.

Sessa, J.A., Ivany, L.C., Handley, J.C., Lockwood, R., Allmon, W.D. 2011. Climatic controls on Late Cretaceous through Paleogene ecosystems. Climate and Biota of the Early Paleogene, Conference Program and Abstracts, 5 – 8 June 2011, Salzburg, Austria; p. 147.

Schlossnagle, T.H.*, Sessa, J.A., Ivany, L.C., and Samson, S.D. 2010 Strontium isotope ratios from the Early Eocene Gulf Coast – Influence of salinity and potential for age control. GSA Abstracts with Programs vol. 42, no. 1, p. 162.

Sessa, J.A., Ivany, L.C., Handley, J.C., Allmon, W.D., Lockwood, R. 2010. Lack of major faunal change in shallow marine assemblages across the Paleocene-Eocene boundary in the U.S. Gulf Coastal Plain. GSA Abstracts with Programs v. 42, p. 193.

Ivany, L. C., and Sessa, J. A. 2010. Effects of ocean warming and acidification during the PETM on deep and shallow marine communities. Ecological Society of America Annual Meeting.