

Samuel E. Muñoz

Associate Professor
Department of Marine & Environmental Sciences
Department of Civil & Environmental Engineering
Northeastern University

Marine Science Center (1 MSC)
430 Nahant Road
Nahant MA 01908
Website: web.northeastern.edu/munoz

email: s.munoz@northeastern.edu
office: 781.581.7370 x 367
lab: 781.581.7370 x379

I. EDUCATION & EMPLOYMENT HISTORY

Education

- 2004-2008 B.Sc. (Honors), Physical Geography (Minor: Geomatics)
Carleton University (Ottawa, Canada)
Advisor: Michael Pisaric
- 2008-2010 M.Sc., Geography
University of Ottawa (Ottawa, Canada)
Advisor: Konrad Gajewski
- 2010-2015 Ph.D. Physical Geography (Minor: Quaternary Science)
University of Wisconsin-Madison (Madison, Wisconsin)
Advisor: John (Jack) Williams

Employment History

- 2015-2017 Weston Howland Jr. Postdoctoral Scholar
Department of Geology & Geophysics
Woods Hole Oceanographic Institution
Sponsors: Jeffrey P. Donnelly & Liviu Giosan
- 2017-present Adjunct Scientist
Department of Geology & Geophysics
Woods Hole Oceanographic Institution
- 2017-2023 Assistant Professor
Department of Marine & Environmental Sciences
Department of Civil & Environmental Engineering
Northeastern University
- 2023-present Associate Professor
Department of Marine & Environmental Sciences
Department of Civil & Environmental Engineering
Northeastern University

II. SCHOLARSHIP & RESEARCH

Honors & Awards

2023	National Science Foundation (NSF) CAREER award
2021	G.K. Gilbert Award for Excellence in Geomorphological Research, American Association of Geographers (AAG)
2015	Weston Howland Jr. Postdoctoral Scholarship, Woods Hole Oceanographic Institution
2010	Canada Graduate Scholarship, National Science and Education Research Council
2010	Postgraduate Scholarship, National Science and Education Research Council
2008	Postgraduate Scholarship, National Science and Education Research Council
2008	Ontario Graduate Scholarship, Government of Ontario, Canada

Publications

As of June 2, 2023:

Google Scholar: h-index = 18, total times cited = 1690

Peer-Reviewed articles

†Indicates graduate student advisee; *Indicates undergraduate student advisee

My lab uses the Vancouver Protocol as a guideline for determining authorship. As first author on a paper, I typically performed all analyses and wrote most of the text. As final author, I typically worked closely with the first author on all analyses, interpretation, writing, and editing of the manuscript.

1. Shen Z, Conway N, Bao SB, **Muñoz SE**, Lang A (in review) Mid-20th century land-use change greatly reduced flood intensity in the Southeastern US. *Nature Communications*.
2. O'Donnell KL, Tomiczek T, Higgins A, **Muñoz SE**, Scyphers S (in review) Stakeholder Driven Sensor Deployments to Characterize Nuisance Flood Inundation and Duration in Key West Florida. *Earth's Future*.
3. Wiman C*, Harden T, Shen Z, Curry BB, Reinders JB*, Beighley RE, **Muñoz SE** (in review) Large floods on the lower Ohio River inferred from slackwater deposits. *Progress in Physical Geography*.
4. Reinders J†, & **Muñoz SE** (in revision). Accounting for Hydroclimatic Properties in Flood Frequency Analysis Procedures. *Hydrology and Earth System Science*.
5. Reinders J†, & **Muñoz SE** (in revision). The role of ocean-atmosphere dynamics on mediating spring flood hazard in southeast Texas. *Journal of Climate*.
6. **Muñoz SE**, Dee SG, Luo X, Haider MR, O'Donnell M†, Parazin B, Remo JWF (2023) Mississippi River low-flows: context, causes, and future projections. *Environmental Research: Climate*, doi: 10.1088/2752-5295/acd8e3.
7. Luo X, Dee SG, Lavenhouse T, **Muñoz SE**, Steiger N (2023) El Niño events drive hydroclimate extremes in the Mississippi River Basin over the Last Millennium. *Geophysical Research Letters*, <https://doi.org/10.1029/2022GL100715>.
8. **Muñoz SE**, Hamilton, B.*, Parazin, B.* (2023) Contrasting ocean-atmosphere dynamics mediate flood hazard across the Mississippi River basin. *Earth Interactions*, doi.org/10.1175/EI-D-22-0015.1
9. Dunne, K., Dee, S.G., Reinders, J.†, **Muñoz, S.E.**, Nittrouer, J. (2022). Examining the impact of emissions scenario on lower Mississippi River flood hazard projections. *Environmental Research Communications*, doi:10.1088/2515-7620/ac8d53.

10. Reinders J.B.†, Sullivan R.M., Winkler T.S., van Hengstum P.J., Beighley R.E., **Muñoz SE**. (2022). A hydraulic modelling approach to study flood sediment deposition in floodplain lakes. *Earth Surface Processes and Landforms*, doi: 10.1002/esp.5515.
11. Schroeder, S., White, A. J., Stevens, L. R., & **Muñoz, S. E.** (2022). Regional migration and Cahokian population change in the context of climate change and hydrological events. In *Following the Mississippian Spread* (pp. 65-109). Springer.
12. Broadman E, Kaufman DS, Anderson RS, Bogle S, Ford M, Fortin D, Henderson ACG, Lacey JH, Leng MJ, McKay NP, **Muñoz SE** (2022) Reconstructing postglacial hydrologic and environmental change in the eastern Kenai Peninsula lowlands using proxy data and mass balance modeling. *Quaternary Research*, 107: 1-26.
13. Arcusa SH, McKay NP, Wiman C†, Patterson S, **Muñoz SE**, Aquino-Lopez MA (2022) New approaches to dating intermittently varved sediment, Columbine Lake, Colorado, USA. *Geochronology*, doi: 10.5194/gchron-2021-15.
14. Stubbins A, Lavender Law K, **Muñoz SE**, Bianchi TS, Zhu L (2021) Plastics in the Earth System. *Science* 373(6550): 51-55.
15. Reinders J†, & **Muñoz SE** (2021). Improvements to flood frequency analysis using climate and paleoflood data. *Water Resources Research*, doi: 10.1029/2020WR028631.
16. Wiman C†, Hamilton B*, Dee SG, **Muñoz SE** (2021). Reduced lower Mississippi River discharge during the Medieval era. *Geophysical Research Letters*, e2020GL091182.
17. White AJ, **Muñoz SE**, Schroeder S, Stevens LR (2021). Reply to Skousen and Aiuvalasit: On the Primacy of Archaeological Data. *American Antiquity*, 86(1): 203-205.
18. **Muñoz SE**, Porter TJ, Bakkelund A, Nusbaumer J, Dee SG, Hamilton, B.*, Giosan L, Tierney JE (2020) Lipid biomarker record documents hydroclimatic variability of the Mississippi River basin during the Common Era. *Geophysical Research Letters*, e2020GL087237.
19. Broadman E, Kaufman DS, Henderson ACG, Berg EE, Anderson RS, Leng MJ, Stahnke SS, **Muñoz SE** (2020) Multi-proxy evidence for millennial-scale changes in North Pacific Holocene hydroclimate from the Kenai Peninsula lowlands, south-central Alaska. *Quaternary Science Reviews*.
20. White AJ, **Muñoz SE**, Schroeder S, Stevens LR (2020) After Cahokia: Indigenous repopulation and depopulation of the Horseshoe Lake watershed AD 1400 – 1900. *American Antiquity*, doi: 10.1017/aaq.2019.103
21. Lombardi R, Davis L, Stinchcomb G, **Muñoz SE**, Stewart L, Therrell M (2020) Fluvial activity in major river basins of the eastern U.S. during the Holocene. *The Holocene*, doi: 10.1177/0959683620919978
22. Arcusa S, McKay N, Routson C, **Muñoz SE** (2019) Dust-drought interactions over the last 15,000 years: a network of lake sediment records from the San Juan Mountains, Colorado. *The Holocene*, doi: 10.1177/0959683619875192
23. White AJ, Stevens LR, Lorenzi V, **Muñoz SE**, Schroeder (2019) Fecal stanols show simultaneous flooding and seasonal precipitation change correlate with Cahokia's population decline. *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1809400116
24. **Muñoz SE**, Giosan L, Blusztajn J, Rankin C, Stinchcomb G (2019) Radiogenic fingerprinting reveals anthropogenic and buffering controls on sediment dynamics of the Mississippi River system. *Geology*, doi: 10.1130/G45194.1

25. Wilhelm B, Ballesteros Cánovas JA, MacDonald N, Toonen WHJ, Baker V, Barriendos M, Benito G, Brauer A, Corella JP, Denniston R, Glaser R, Ionita M, Kahle M, Liu T, Luetscher M, Macklin M, Mudelsee M, **Muñoz SE**, Schulte L, St. George S, Stoffel M, Wetter O. (2019) Interpreting historical, botanical, and geological evidence to aid preparations for future floods. *WIREs Interdisciplinary Reviews*, doi: 10.1002/wat2.1318
26. Walsh JR, Corman JR, **Muñoz SE** (2018) Coupled long-term limnological data and sedimentary records reveal novel control on water quality in a eutrophic lake. *Limnology & Oceanography*, doi: 10.1002/lno.11083.
27. Giosan L, Orsi WD, Coolen M, Dunlea AG, Thirumalai K, **Muñoz SE**, Clift PD, Donnelly JP, Galy V, Fuller DQ (2018) Neoglacial climate anomalies and the Harappan metamorphosis. *Climate of the Past*, doi: 10.5194/cp-2018-37.
28. Brugam R, **Muñoz SE** (2018) A 1,600-year record of human impacts on a floodplain lake in the Mississippi River valley. *Journal of Paleolimnology*, doi: 10.1007/s10933-018-0033-0.
29. White AJ, Stevens LR, Lorenzi V, **Muñoz SE**, Lipo CP, Schroeder S (2018) A test of fecal stanols as indicators of population change. *Journal of Archaeological Science* 93: 129-134.
30. **Muñoz SE**, Giosan L, Therrell MD, Remo JWF, Shen Z, Sullivan RM, Wiman C, O'Donnell M, Donnelly JP (2018) Climate variability, river engineering, and unprecedented flood risk along the Mississippi River. *Nature*, doi: 10.1038/nature26145.
31. **Muñoz SE**, Dee SG. (2017) El Niño increases the risk of lower Mississippi River flooding. *Scientific Reports*, doi:10.1038/s41598-017-01919-6s.
32. Walsh JR, **Muñoz SE**, Vander Zanden MJ. (2016) Outbreak of an undetected invasive species triggered by a climate anomaly. *Ecosphere*, doi:10.1002/ecs2.1628.
33. Beach T, Johnson KM, McCusker Hill M, **Muñoz SE**, Peros M (2016) The view from the "Anthropocene": New perspectives in human-induced environmental change. *Anthropocene*, doi:10.1016/j.ancene.2016.09.004.
34. Radeloff VC, Williams JW, Bateman BL, Burke KD, Carter SK, Childress ES, Cromwell KJ, Gratton C, Hasley AO, Kraemer BM, Latzka AW, Marin-Spiotta E, Meine CD, **Muñoz SE**, Neeson TM, Pidgeon AM, Rissman AR, Rivera RJ, Szymanski LM, Usinowicz J (2015). The rise of novelty in ecosystems. *Ecological Applications* 25(8): 2051-2068.
35. **Muñoz SE**, Gruley KE, Fike DA, Schroeder S, Williams JW (2015) Reply to Baires et al.: Shifts in Mississippi River flood remain a contributing factor to Cahokia's emergence and decline. *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1509404112.
36. **Muñoz SE**, Gruley KE, Massie A, Fike DA, Schroeder S, Williams JW (2015). Cahokia's emergence and decline coincided with shifts of flood frequency on the Mississippi River. *Proceedings of the National Academy of Sciences* 112(20): 6319-6324.
37. **Muñoz SE**, Mladenoff DJ, Schroeder S, Williams JW (2014). Defining the spatial patterns of land use associated with the indigenous societies of eastern North America. *Journal of Biogeography*, 41(12): 2195-2210.
38. **Muñoz SE**, Schroeder S, Fike DA, Williams JW (2014). A record of sustained prehistoric and historic land use from the Cahokia region, Illinois, USA. *Geology* 42(6): 499-502.
39. Gajewski K, **Muñoz SE**, Peros M, Viau A, Morlan R, Betts M (2011) The Canadian Archaeological Radiocarbon Database (CARD): archaeological radiocarbon dates in North America and their paleoenvironmental context. *Radiocarbon* 53(2): 371-394.

40. **Muñoz SE**, Gajewski K, Peros M (2010) Synchronous environmental and cultural change in the prehistory of the northeastern United States. *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1005764107.
41. **Muñoz SE**, Gajewski K (2010) Distinguishing prehistoric human influence on late Holocene forests in southern Ontario, Canada. *The Holocene* 20(6): 967-981.
42. Peros M, **Muñoz SE**, Gajewski K, Viau AE (2010) Prehistoric demography of North America inferred from radiocarbon data. *Journal of Archaeological Science* 37: 656-664.

Book chapters

Toonen WHJ, **Muñoz SE**, Cohen KM, Macklin MG (2019) High-Resolution Sedimentary Paleoflood Records in Alluvial River Environments: A Review of Recent Methodological Advances and Application to Flood Hazard Assessment, in *Palaeohydrology: Traces, Tracks and Trails of Extreme Events* (J. Herget & A. Fontana, eds.), Springer, pp. 213-228.

Non-Reviewed articles

Davis L, Harden TM, **Muñoz SE**, Godaire J, O'Connor JE (2018) Preface to historic and paleoflood analyses: New perspectives on climate, extreme flood risk, and the geomorphic effects of large floods. *Geomorphology*, doi: 10.1016/j.geomorph.2018.10.021.

Muñoz SE (2013) Review of 'Surviving Sudden Environmental Change (J. Cooper & P. Sheets, eds.)'. *Heritage & Society* 6(2): 203-204.

Books

Muñoz SE & Parrish H (2019) Shaped by Rivers. Field Guides to the Anthropocene Drift, no. 2. Goethe Institut, Munich, Germany.

Conference Abstracts

*Indicates invited presentation; †Indicates graduate student advisee

Murphy K, Dee SG, **Muñoz SE**, Dunne K, O'Donnell M†, Doss-Gollin J (2022) The Mississippi River's Hydrologic Response to Natural vs. Anthropogenic Forcing from the Last Millennium through the 21st Century. American Geophysical Union Fall Meeting, Chicago IL.

Luo X, Dee SG, Stevenson S, Okumara Y, **Muñoz SE**, Parson LA, Steiger NJ (2022) ENSO teleconnections over North America are non-stationary during the Common Era: Insights from data assimilation and reconstructions. American Geophysical Union Fall Meeting, Chicago IL.

Wiman C†, Harden T, Shen Z, Curry B, Reinders J, Beighley RE, **Muñoz SE** (2022) Large Floods on the Ohio River Inferred from Slackwater Deposits. American Geophysical Union Fall Meeting, Chicago IL.

Muñoz SE, Reinder J†, Sullivan RM, Winkler T, Beighley RE, van Hengstum PJ (2022) Sedimentary signatures of Hurricane Harvey and riverine flooding in southeast Texas. American Geophysical Union Fall Meeting, Chicago IL.

Dee SG, Dunne K, **Muñoz SE**, Luo X, Murphy K, Doss-Gollin J (2022) Past, Present, and Future Hydroclimate across the Mississippi River Basin and its Tributaries: Insights from Integrated Paleoclimate Data Analysis. American Geophysical Union Fall Meeting, Chicago IL.

- O'Donnell M†, Doss-Gollin J, Dee SG, **Muñoz SE** (2022) Validation of Community Earth System Model Hydrologic Variables Over the Mississippi River System To Understand Long Term Hydrometeorologic Changes. American Geophysical Union Fall Meeting, Chicago IL.
- Shen Z, Conway N, **Muñoz SE** (2022) Extreme River Flood in the Southeastern US Substantially Reduced by Land-use Change in the Mid-20th Century. American Geophysical Union Fall Meeting, Chicago IL.
- Sanborn LH, Donnelly JP, Chen QJ, **Muñoz SE** (2022) Reconstructing hurricane-driven sedimentation and erosion at New England barrier beaches through the late Holocene. American Quaternary Association Biannual meeting, Madison WI.
- Bunbury J, Carson E, **Muñoz SE** (2022) A post-glacial sediment record from a lake in southeastern Wisconsin. American Quaternary Association Biannual meeting, Madison WI.
- O'Donnell M†, Dee SG, **Muñoz SE** (2022) Validation of the Community Earth System Model to investigate the response of the Mississippi River system to late Quaternary climate change. American Quaternary Association Biannual meeting, Madison WI.
- Wiman C†, Harden T, Shen Z, Beighley RE, **Muñoz SE** (2022) Large flood on the lower Ohio River inferred from slackwater deposits. American Quaternary Association Biannual meeting, Madison WI.
- Muñoz SE*** (2022) Extreme flooding in southeast Texas in the context of the last millennium. SSPEED's Post-Harvey Climate & Flood Impacts on the Built Environment Conference, Rice University, Houston TX.
- Muñoz SE** (2021) On the ocean-atmosphere dynamics that mediate flood hazard within the Mississippi River basin. American Geophysical Union Fall Meeting, New Orleans LA, abstract H41J-06.
- O'Donnell M†, Dee SG, **Muñoz SE** (2021) Investigating the Response of the Mississippi River System to Climate Change Using Simulations and Observations of the Last Millennium. American Geophysical Union Fall Meeting, New Orleans LA, abstract PP55C-0676.
- Reinders J† & **Muñoz SE** (2021) Spring and Summer Floods in Southeast Texas: Mechanisms and Variability, American Geophysical Union Fall Meeting, New Orleans LA, abstract H45A-10.
- Broadman E, Kaufman DS, Anderson RS, Bogle S, Ford MS, Fortin D, Henderson ACG, Lacey JH, Leng MJ, McKay N, **Muñoz SE** (2021) Reconstructing postglacial hydrologic and environmental change in the eastern Kenai Peninsula lowlands using proxy data and mass balance modeling, American Geophysical Union Fall Meeting, New Orleans LA, abstract PP43B-07.
- Luo X, Dee SG, **Muñoz SE**, Steiger NJ, Lavehouse T (2021) ENSO's Impact on Hydroclimate Extremes over the Mississippi River Basin during the Last Millennium. American Geophysical Union Fall Meeting, New Orleans LA, abstract PP52A-02.
- Dee SG, Dunne KBJ, Reinders J, Luo X, **Muñoz SE** (2021) Past, present, and future hydroclimate across the Mississippi River Basin and its tributaries: Insights from Integrated Paleoclimate Data Analysis. American Geophysical Union Fall Meeting, New Orleans LA, abstract EP41D-03.
- ***Muñoz SE** (2021) Hydroclimate variability of the Mississippi River basin in the Common Era: Implications for modern and ancient hazards. Geological Society of America annual meeting, Portland OR, abstract 20-10.

- Wiman C†, Harden T, Beighley RE, **Muñoz SE** (2021) Large floods on the lower Ohio River inferred from slackwater deposits. Geological Society of America Annual Meeting, Portland OR, abstract 147-13.
- Hudson P, Heitmuler F, **Muñoz SE**, Costello J (2021) Contextualized sedimentation rates for large floods along the lower Mississippi River: the importance of flood duration. European Geophysical Union, abstract 15498.
- ***Muñoz SE** (2020) High magnitude floods in the late Holocene: insights from muds and models. American Geophysical Union Fall Meeting, abstract 662662.
- ***Muñoz SE** (2020) High magnitude floods in the late Holocene: insights from muds and models. American Quaternary Association biannual meeting, virtual.
- Reinders J† & **Muñoz SE** (2020) Improvements to flood frequency analysis using climate and paleoflood data. American Quaternary Association biannual meeting, virtual.
- Reinders J† & **Muñoz SE** (2020) Improvements to flood frequency analysis using climate and paleoflood data. American Geophysical Union fall meeting, virtual.
- Wiman C†, Hamilton B, Dee SG, **Muñoz SE** (2020) Reduced lower Mississippi River discharge during the Medieval climate anomaly. American Quaternary Association biannual meeting, virtual.
- Wiman C†, Hamilton B, Dee SG, **Muñoz SE** (2020) Reduced lower Mississippi River discharge during the Medieval era. American Geophysical Union fall meeting, virtual.
- Muñoz SE** & Porter TJ (2019) Flood hazard dipole across the Mississippi River basin: Observations, Reconstructions, and Implications. American Geophysical Union Fall Meeting, abstract H44F-02, San Francisco, CA.
- Reinders J†, van Hengstum PJ, Beighley RE, **Muñoz SE** (2019) How unusual was Hurricane Harvey? New paleoflood records for southeast Texas. American Geophysical Union Fall Meeting, abstract H41N-1905 San Francisco, CA.
- Wiman C†, McKay N, Routson C, Arcusa S, **Muñoz SE** (2019) Late Holocene spring snowfall and hydroclimate variability inferred from varved sediments, Columbine Lake, Colorado. American Geophysical Union Fall Meeting, abstract PP42B-04, San Francisco, CA.
- Muñoz SE** & Toonen WHJ (2019) Recent advances in the palaeoflood hydrology of alluvial rivers. International Quaternary Association meeting, abstract O3216, Dublin, Ireland.
- Muñoz SE** & Toonen WHJ (2018) Recent advances in the palaeoflood hydrology of alluvial rivers. American Quaternary Association Biannual Meeting, Ottawa, Canada.
- ***Muñoz SE** (2018) Floodplain lakes as a Rosetta Stone for paleohydrology, paleoecology, and paleoclimatology. Geological Society of America Annual Meeting, Paper No. 277-1, Indianapolis, IN.
- Giosan L, **Muñoz SE**, Khonde NN, Naing T, Yang Q, Min Tun M, Clift PD (2018) The Ayeyawady Delta: Links between monsoon, floods, and sediment fluxes. American Geophysical Union Fall Meeting, abstract #EP13C-2115, Washington, DC.
- Giosan L, Orsi WD, Coolen MJL, Wuchter C, Dunlea AG, Thirumalai K, **Muñoz SE**, Clift PD, Donnelly JP, Galy V, Fuller DQ (2018) Neoglacial climate anomalies and the Indus Civilization's metamorphosis. American Geophysical Union Fall Meeting, abstract #PP11D-1273, Washington, DC.

- Muñoz SE**, Therrell MD, Remo JW, Giosan L, Donnelly JP (2017) Climatic and anthropogenic controls on Mississippi River floods: a multi-proxy palaeoflood approach. American Geophysical Union Fall Meeting, abstract PP-42A-04, New Orleans, LA.
- Muñoz SE** (2017) The view from the mud: Environmental perspectives on the rise and fall of Cahokia, a prehistoric city on the Mississippi River. American Association of Geographers Annual Meeting, Boston, MA.
- Muñoz SE**, Giosan L, Donnelly JP, Dee SG (2016) Extreme Mississippi River floods in the late Holocene: Reconstructions and simulations. American Geophysical Union Fall Meeting, abstract no. H42E-06, San Francisco, CA.
- ***Muñoz SE** (2016) Forests, Fields, and Floods: Environmental change and the rise and fall of Cahokia. Geological Society of America Annual Meeting, abstract 91-1, Denver, CO.
- Muñoz SE**, Giosan L, Donnelly JP (2016) A new generation of paleoflood records for the lower Mississippi River. Geological Society of America Annual Meeting, abstract 303-9, Denver, CO.
- Muñoz SE**, Giosan L, Donnelly JP, Dee SG, Shen Z (2016) Taming the Mighty Mississippi: Integrating paleo-flood data and modeling to understand the patterns and causes of extreme floods on a major river system. European Geophysical Union Annual Meeting, abstract EPSC2016-1808, Vienna Austria.
- ***Muñoz SE** (2015) Developing a long-term perspective of flooding in the Mississippi River basin using fluvio-lacustrine sediments. Geological Society of America Annual Meeting, Paper no. 82-12, Baltimore, MD.
- Muñoz SE**, Gruely KE, Massie A, Fike DA, Schroeder S, Williams JW (2015) Forests, Fields, and Floods: The historical ecology of the Cahokia region, Illinois, USA. American Association of Geographers Annual Meeting, Chicago, IL.
- Muñoz SE**, Gruely KE, Massie A, Williams JW (2014) Flooding of the Great River during the Common Era: A palaeohydrological record of high magnitude flood events from the central Mississippi River valley. American Geophysical Union Fall Meeting, abstract PP21E-05, San Francisco, CA.
- Muñoz SE**, Gruely KE, Massie A, Schroeder S, Williams JW (2014) Forests, Fields, and Floods: An environmental (Pre)history of the Cahokia Region. Midwestern Archaeology Conference Annual Meeting, Champaign, IL.
- Muñoz SE**, Schroder S, Fike DA, Williams JW (2014) A Paleoenvironmental record of prehistoric and historic land use from the Cahokia region. Society for American Archaeology Annual Meeting, abstract no. 260, Austin, TX.
- Muñoz SE**, Williams JW, Fike DA (2013) A record of recurrent prehistoric and historic land use from the Cahokia Region, Illinois USA. Geological Society of American Annual Meeting, Paper No. 5, Session No. 327, Denver, CO.
- Muñoz SE** & Gajewski K (2011) Distinguishing the influence of prehistoric agriculture on late Holocene forests of southern Ontario, Canada. American Association of Geographers Annual Meeting, Seattle, WA.
- ***Muñoz SE**, Gajewski K, Peros MC (2011) Synchronous environmental and cultural change in the prehistory of the Northeastern United States. Geological Society of America Annual Meeting, Paper no. 9, Session No. 161, Minneapolis, MN.

Presentations

Invited Seminars

- Muñoz SE** (2022) Riverine floods in a changing environment. RisQ Lunch and Learn.
- Muñoz SE** (2022) Riverine floods in the late Holocene: insights from muds and models. International Association of Geomorphologists (IAG) North America Webinar.
- Muñoz SE** (2021) Riverine floods in the late Holocene: insights from muds and models. Department of Geology & Geophysics, University of Wyoming.
- Muñoz SE** (2020) Riverine floods in the late Holocene: insights from muds and models. Department of Earth & Environment, Boston University.
- Muñoz SE** (2020) Riverine floods in the late Holocene: insights from muds and models. Department of Earth & Atmospheric Sciences, Indiana University.
- Muñoz SE** (2020) Riverine floods in the late Holocene: insights from muds and models. Department of Earth, Environmental and Planetary Sciences, Rice University.
- Muñoz SE** (2020) Mississippi River floods in the late Holocene: new sedimentary records from floodplain lakes. US Army Corps of Engineers, Mississippi River Geomorphology & Potamology.
- Muñoz SE** (2020) Rivers in the Anthropocene: Insights from Muds and Models. Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA.
- Muñoz SE** (2019) Climatic and anthropogenic controls on Mississippi River floods: Insights from paleoflood records. NOAA Climate Program Office Webinar, Inland flooding in a changing climate: 2019 Mississippi/Missouri basin.
- Muñoz SE** (2019) The Past, Present, and Future of Mississippi River Floods. Mississippi River Research Consortium, La Crosse, WI.
- Muñoz SE** (2019) Forests, Fields, and Floods: Muddy perspectives on Cahokia, a prehistoric city on the Mississippi. Department of Geography & Earth Science, University of Wisconsin–La Crosse, La Crosse, WI.
- Muñoz SE** (2018) Muddy Perspectives: Recent advances in the application of geoscience in archaeology. Boston University, Department of Anthropology, Boston MA.
- Muñoz SE** (2018) Floodplain lakes as a ‘Rosetta Stone’ for assessing environmental change in low-lying regions. Department of Geosciences, Baylor University, Waco, TX.
- Muñoz SE** (2017) Connections, Hazards, and Sustainability across the land-sea interface. Department of Marine & Environmental Sciences, Northeastern University, Nahant, MA.
- Muñoz SE** (2017) New perspectives on hydroclimatic extremes: Merging reconstructions, observations, and simulations. Department of Geology, Rowan University, Glassboro, NJ.
- Muñoz SE** (2017) New perspectives on hydrometeorological extremes: Merging reconstructions, observations, and simulations. Department of Geography & Earth Sciences, University of North Carolina at Charlotte, Charlotte, NC.
- Muñoz SE** (2016) Extreme flooding of the Mississippi River: Lessons from lake sediments. Department of Geological Sciences, University of Colorado at Boulder, Boulder, CO.
- Muñoz SE** (2016) Extreme flooding of the Mississippi River: Stories from lake sediments. Department of Marine Science, Coastal Carolina University, Conway, SC.

- Muñoz SE** (2016) Flooding of the Mississippi River in the Common Era: Stories from lake sediments. Department of Geology & Geophysics, Woods Hole Oceanographic Institution, Woods Hole, MA.
- Muñoz SE** (2015) Developing a long-term perspective on flooding in the Mississippi River basin. Department of Earth, Environmental, and Planetary Sciences, Brown University, Providence, RI.
- Muñoz SE** (2015) Developing a long-term perspective on flooding in the Mississippi River basin using lake sediments. Department of Earth, Environment, and Physics, Worcester State University, Worcester, MA.
- Muñoz SE** (2015) Human dimensions of environmental change: Lessons from Earth history. Department of Geography, University of Alabama, Tuscaloosa, AL.
- Muñoz SE** (2015) Using oxbow lake sediments to understand the paleoecology and paleohydrology of the Cahokia region, Illinois, USA. Department of Earth Sciences, University of Minnesota, Minneapolis, MN.
- Muñoz SE** (2014) The marvels of mud: Using lake sediments to uncover the ecological history of the Cahokia region. Chicago Archaeological Society, Evansville, IL.
- Muñoz SE** (2014) The marvels of mud: Using lake sediments to understand the role of humans in Earth history. Department of Geography, University of Wisconsin–Platteville, Platteville, WI.
- Muñoz SE** (2014) The marvels of mud: Using lake sediments to uncover the ecological history of the Cahokia region. Illinois State Museum, Springfield, IL.
- Muñoz SE** (2014) The marvels of mud: Using lake sediments to uncover the ecological history of the Cahokia region. Cahokia Mounds State Historic Site & Interpretive Center, Collinsville, IL.

III. RESEARCH GRANTS

External – Funded

- 2023-2028 CAREER: Sedimentary signatures of large riverine floods to constrain risk and build resiliency. National Science Foundation (NSF), Geomorphology & Land Use Dynamics (GLD) and Hydrological Sciences (HS). **Muñoz SE** (PI). Total cost: \$718,373.
- 2022-2023 Evaluating hydroclimatic controls on riverine flooding in New England using reanalysis data and model simulations. United States Geological Survey (USGS) Massachusetts Water Resources Research Center’s 104b program. **Muñoz SE** (PI). Total cost: \$100,000.
- 2022-2025 CAS-MNP: Evaluating patterns and controls on microplastic accumulation in floodplains. National Science Foundation, Geobiology & Low-temperature Geochemistry (GG) and Geomorphology & Land Use Dynamics (GLD). **Muñoz SE** (PI), Stubbins A (Co-I), Beighley RE (Co-I). Total cost: \$530,345.
- 2022-2025 Collaborative Research: Evaluating the Past and Future of Mississippi River Hydroclimatology to constrain risk via integrated climate modeling, observations, and reconstructions. National Science Foundation (NSF) Climate and Large-scale Dynamics (CLD). Dee SG (PI) & **Muñoz SE** (Co-I). Total cost: \$725,453 (\$284,111 to Northeastern).
- 2021-2024 Collaborative Research: Morphodynamic simulations of coastal storms and overwash to characterize back-barrier lake stratigraphies. National Science Foundation (NSF)

- Geomorphology & Land Use Dynamics (GLD). **Muñoz SE** (PI) & Chen Q (Co-I). Total cost: \$591,190 (\$353,666 to Northeastern).
- 2018-2019 RAPID: Collaborative Research: Sediment and Contaminant Mobilization by Extreme Flooding associated with Hurricane Florence. National Science Foundation (NSF) Geomorphology & Land Use Dynamics (GLD) and Geobiology & Low Temperature Geochemistry (GG). **Muñoz SE** (PI), Fernandez LA (Co-I), Larese-Casanova P (Co-I). Total cost: \$17,850 (\$7,850 to Northeastern).
- 2018-2022 Collaborative Research: Re-evaluating precipitation extremes and flood hazard in the wake of Hurricane Harvey. National Science Foundation (NSF) Hydrologic Sciences (HS). **Muñoz SE** (PI) & Beighley SE (Co-I). Total cost: \$259,140 (\$199,936 to Northeastern).
- 2018-2023 Collaborative Research: Extreme floods on the lower Mississippi River in the context of late Holocene climatic variability. National Science Foundation (NSF) Paleo-Perspectives on Climate Change (P2C2). **Muñoz SE** (PI). Total cost: \$586,529 (\$292,959 to Northeastern). INTERN Supplement: \$48,547.
- 2013-2015 Doctoral Dissertation Research: Assessing the characteristics and consequences of prehistoric land use in the Cahokia region. National Science Foundation (NSF), Geography & Spatial Sciences (GSS). Williams JW (PI), **Muñoz SE** (Co-I). Total cost: \$14,509.

Internal – Funded

- 2018-2020 Coastal flooding prediction and mitigation: Integrating high-fidelity computer models with field observations. Global Resilience Institute (GRI). Chen Q (PI), **Muñoz SE** (Co-I), Fu YR (Co-I). Total cost: \$100,000.
- 2016-2018 Fingerprinting Mississippi River sediment flux to the Gulf of Mexico. Ocean and Climate Change Institute (OCCI) of the Woods Hole Oceanographic Institution. **Muñoz SE** (PI), Giosan L (Co-I). Total cost: \$67,342.

IV. TEACHING & ADVISING

Courses taught at Northeastern University

1. Dynamic Earth (ENVR 1200), Undergraduate, 4 credits
 - a. Fall 2022: 93 students
 - b. Spring 2022: 99 students
 - c. Fall 2020: 67 students
 - d. Fall 2019: 55 students
 - e. Fall 2018: 65 students
2. Dynamic Earth Lab (ENVR 1201), Undergraduate, 1 credit
 - a. Fall 2022: 54 students
 - b. Spring 2022: 60 students
 - c. Fall 2020: 24 students
 - d. Fall 2019: 25 students
 - e. Fall 2018: 28 students
3. Natural Disasters & Catastrophes (ENVR 1104), Undergraduate, 4 credits
 - a. Spring 2019: 21 students
4. Seminar in Geosciences (EEMB 7104), Graduate, 2 credits

*New course developed for new PhD program in Marine & Environmental Sciences, co-taught with J. Bowen, J. Ries, and A. Stubbins

a. Spring 2022: 6 students

b. Spring 2019: 8 students

5. Climate & Atmospheric Change (ENVR/CIVE 5150), Undergraduate/Graduate, 4 credits

*New course developed for new BS Environmental Science & Sustainability, interdisciplinary with Civil & Environmental Engineering

a. Spring 2023: 75 students

b. Fall 2021: 16 students

c. Spring 2021: 25 students

d. Spring 2020: 21 students

Supervision of Graduate Students at Northeastern University

Joeri Reinders	2018-2022, Ph.D. in Marine & Environmental Sciences: Geosciences track. Dissertation: Extreme flooding in Southeast Texas in light of paleoflood and hydroclimate data.
Charlotte Wiman	2019-present, Ph.D. in Marine & Environmental Sciences: Geosciences track. Dissertation: Late Holocene paleoflood hydrology of the Mississippi River basin
Michelle O'Donnell	2020-present, Ph.D. in Civil & Environmental Engineering. Dissertation: Hydrologic simulations of the past and future Mississippi River and tributaries.
Lindsay Lawrence	2022-present, Ph.D. in Marine & Environmental Sciences: Geosciences track. Dissertation: Hydroclimatic and geomorphic controls on riverine flooding in New England.
Austin Gaydos	2023-present, Ph.D. in Interdisciplinary Engineering. Dissertation: Patterns and processes of microplastic accumulation in alluvial floodplains (Co-advised with Aron Stubbins)

Supervision of Undergraduate Students at Northeastern University

1. Senior Capstone

Portia Freeman 2022

Alex Bellavia 2022

Kira McKinley 2022

Rebecca Montante 2021

Brynnydd Hamilton 2021

Olivia Burek 2021

David Carter 2021

Aaron Goodman 2019

Carleigh Norton 2019

Daniel Litchmore 2018

2. Co-op Research Experience

Brynnydd Hamilton 2020

Olivia Burek 2020

David Carter 2018

3. Directed Study

Isabella Lopez 2019
Brandan Lawrence 2019

4. Interns

Grace Nyberg 2023 (NU MSC Summer Internship)
Meher Khanna 2023
Kim Marchese 2023
Cory Houde 2022 (IDEA Summer Internship)
Alex Bellavia 2021 (NU MSC Summer Internship)
Porta Freeman 2021 (NU MSC Summer Internship)
B Parazin 2020, 2022
Isabella Lopez 2020
Annie Tucker 2019 (NU MSC Summer Internship)
Brynnydd Hamilton 2019 (UG Research Award for Women in Physics)
Ilana Hirschfeld 2019
Michelle Chen 2018
Daniel Litchmore 2018

Advising Activities at Northeastern University

Ph.D. Committees

Puja Das 2023-present, Ph.D. in Civil & Environmental Engineering
Nicole Vandale 2023-present, Ph.D. in Marine & Environmental Sciences
Karina Ramos 2022-present, Ph.D. in Marine & Environmental Sciences
Eeshan Basu 2022-present, Ph.D. in Interdisciplinary Engineering
Jaclyn Gehring 2022-present, Ph.D. in Civil & Environmental Engineering
Seyed Mohammad Saleh Niknejad 2020-2021, Ph.D. Interdisciplinary Engineering
Kate Duffy 2018-2021, Ph.D. in Civil & Environmental Engineering
Cassandra Nickles 2018-2021, Ph.D. in Civil & Environmental Engineering
Kevin Ryan 2018-2022, Ph.D. Marine & Environmental Sciences
Jessica Gould 2018-present, Ph.D. Marine & Environmental Sciences
Brian Donnelly 2018-present, Ph.D. Marine & Environmental Sciences
Bharat Sharma 2018-2022, Ph.D. in Civil & Environmental Engineering
Kiera O'Donnell 2017-2022, Ph.D. Marine & Environmental Sciences
Dongmei Feng 2017-2018, Ph.D. in Civil & Environmental Engineering

Advising Activities outside Northeastern University

Ph.D. Committees

Lily Sanborn 2022-present, Ph.D. in Geology & Geophysics, MIT/WHOI Joint Program

V. SERVICE & PROFESSIONAL DEVELOPMENT

Departmental Service at Northeastern University

2023 Chair, Search Committee, GIS Teaching Professor
2022-present Co-Advisor, B.S. Environmental & Sustainability Sciences
2022-present Member, Diversity, Equity, and Inclusion Committee
2021-present Member, Undergraduate Student Awards Committee
2021 Member, Search Committee, NTT Environmental Sciences
2021 Member, Search Committee, NTT Biostatistics
2020-present Member, Faculty Hiring Advisory Committee

2020-present	Member, Graduate Curriculum Committee
2019	Member, Ad hoc committee on undergraduate curriculum
2018-2021	Member, Muckenhoupt Award Committee
2018-2021	Member, Seminar Series Committee
2018-2019	Member, Undergraduate Curriculum Committee

College Service at Northeastern University

2023	Chair, 2022-2023 INVEST Search Committee
2022	Chair, 2021-2022 INVEST Search Committee
2021	Member, 2020-2021 INVEST Search Committee
2020	Member, College of Science Fall Teaching Focus Group

Service to the Discipline & Profession

Society Leadership	American Quaternary Association (AmQua) Council Member, Terrestrial Geoprocesses (2020-2024)
Journal Editing	<i>Geomorphology</i> (Historic and Palaeofloods Special Issue, Co-Editor)
Journal Reviewer	<i>Annals of the American Association of Geographers, Anthropocene; Archeometry; Catena; Earth's Future; Earth Surface Processes & Landforms; Earth Science Reviews; Ecological Monographs; Environmental Research Letters; Frontiers in Earth Sciences; Geology; Geomorphology; Geophysical Research Letters; Global and Planetary Change; Holocene; Journal of Biogeography; Journal of Ecology; Journal of Climate; Journal of Hydrometeorology; Journal of Quaternary Science; Nature; Nature Communications; Nature Geoscience; Nature Climate Change; Palaeogeography, Palaeoclimatology, Palaeoecology; Physical Geography; PLOS ONE; Quaternary Science Reviews; Science; Science Advances; Scientific Reports; Sustainability; Water</i>
Proposal Panelist	National Science Foundation – PREEVENTS National Science Foundation – Hydrological Sciences (HS)
Proposal Reviewer	National Science Foundation – Geomorphology & Land use dynamics (GLD) National Science Foundation – Geography & Spatial Sciences (GSS) National Science Foundation – Hydrological Sciences (HS) National Science Foundation – Paleo Perspectives on Climate Change (P2C2) National Science Foundation – EAR Postdoc Program National Science and Engineering Research Council (Canada)– Earth Sciences National Geographic Society National Oceanographic & Atmospheric Administration – Sea Grant
Conference Sessions	Geological Society of America 2016 Annual Meeting, “T59. Paleofloods and Related Fluvial Processes during the Late Quaternary: Reconstructions and Causes.” Co-organized with Lisa Davis and Matthew Therrell (University of Alabama) American Geophysical Union 2016 Fall Meeting, “H092. Shifting Rivers: Trends in Flood Magnitude and Frequency” Co-organized with Scott St. George (University of Minnesota) and Stacey Archfield (USGS)

Position Statements Geological Society of America, Position Statement on “*U.S. Flood Risk Management*” Co-written with representatives from academia and government.

Service to the Community & Public

2021 Speaker & Panelist, Extinction Rebellion seminar series
2019 Speaker & Panelist, NOAA Climate Program Office Webinar on 2019 Mississippi & Missouri River Floods
2017 Speaker & Panelist, END Initiative Panel on Climate Change
2017-present Media interviews published in 20+ venues, including National Public Radio (*Science Friday*), Washington Post, Associated Press
2016 Speaker & Panelist, Woods Hole community screening of “Before the Flood”
2016 Featured Scientist, Ancient Mysteries S1E2 “America’s Hidden Pyramid City”, aired on Channe5 (UK) and Smithsonian Channel (USA)
2015 Speaker, Wednesday Nite @ the Lab, Wisconsin Public Television

Professional Society Affiliations: American Geophysical Union
American Quaternary Association
American Association of Geographers
Geological Society of America