

Marisa Repasch, Ph.D. (she/her)

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RESEARCH INTERESTS: fluvial geomorphology; global carbon cycle; isotope tracers of Earth surface processes (cosmogenic radionuclide geochemistry, radiocarbon)

EDUCATION

Ph.D., Geochemistry, University of Potsdam (Germany), <i>summa cum laude</i>	2021
Dissertation: "Fluvial sediment routing and the carbon cycle: Insights from the Rio Bermejo, Argentina"	
Advisors: Dr. Niels Hovius, Dr. Dirk Sachse	
M.S., Earth and Planetary Sciences, University of New Mexico	2016
Thesis: "Birth and evolution of the Rio Grande fluvial system in the last 8 Ma: Interplay among tectonics, volcanism, climate, and river evolution"	
Advisor: Dr. Karl Karlstrom	
B.S., Earth and Environmental Sciences, Lehigh University	2014

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow, University of Colorado Boulder	May 2022-Present
Postdoctoral Researcher, Lawrence Livermore National Laboratory	2021-2022
Research/Teaching Assistant, GFZ German Research Center for Geosciences, Potsdam, Germany	2016-2021
Research/Teaching Assistant, University of New Mexico	2014-2016
Research Assistant, Lehigh University, Bethlehem, PA	2012-2014

PUBLICATIONS

ORCID: <https://orcid.org/0000-0003-2636-9896>

Google Scholar: <https://scholar.google.com/citations?user=z2hcXL4AAAAJ&hl=en>

11. Weibel, C. L., Szupiany, R., Latosinski, F., Amsler, M., & **Repasch, M.** (2022). Sources and temporal dynamics of suspended sediment transport along the middle Paraná River. *Journal of South American Earth Sciences*, 103968. <https://doi.org/10.1016/j.jsames.2022.103968>
10. McFarlane, K. J., Throckmorton, H. M., Heikoop, J. M., Newman, B. D., Hedgpeth, A. L., **Repasch, M. N.**, & Wilson, C. J. (2022). Age and chemistry of dissolved organic carbon reveal enhanced leaching of ancient labile carbon at the permafrost thaw zone. *Biogeosciences*, 19(4), 1211-1223. <https://doi.org/10.5194/bg-19-1211-2022>.
9. **Repasch, M.**, Scheingross, J. S., Hovius, N., Vieth-Hillebrand, A., Mueller, C. W., Höschen, C., et al. (2022). River organic carbon fluxes modulated by hydrodynamic sorting of particulate organic matter. *Geophysical Research Letters*, 49, e2021GL096343.

8. Golombek, N. Y., Scheingross, J. S., **Repasch, M. N.**, Hovius, N., Menges, J., Sachse, D., et al. (2021). Fluvial organic carbon composition regulated by seasonal variability in lowland river migration and water discharge. *Geophysical Research Letters*, 48, e2021GL093416.
7. **Repasch, M.**, Scheingross, J.S., Hovius, N. et al. (2021). Fluvial organic carbon cycling regulated by sediment transit time and mineral protection. *Nature Geoscience*, 14, 842–848.
6. **Repasch, M.** (2021). Unexpected consequences of river engineering on the carbon cycle. *AGU Advances*, 2(1), e2021AV000402.
5. Scheingross, J. S., **Repasch, M. N.**, Hovius, N., Sachse, D., Lupker, M., Fuchs, M., ... & Schleicher, A. M. (2021). The fate of fluvially-deposited organic carbon during transient floodplain storage. *Earth and Planetary Science Letters*, 561, 116822.
4. **Repasch M.**, Wittmann H., Scheingross J. S., Sachse D., Szupiany R., Orfeo O., Fuchs M. and Hovius N. (2020). Sediment Transit Time and Floodplain Storage Dynamics in Alluvial Rivers Revealed by Meteoric 10Be. *Journal of Geophysical Research: Earth Surface*, 125, 1–19. <https://doi.org/10.1029/2019JF005419>.
3. Scheingross, J.S., Hovius, N., Dellinger, M., Hilton, R.G., **Repasch, M.**, Sachse, D., Gröcke, D.R., Vieth-Hillebrand, A., Turowski, J.M. (2019). Preservation of organic carbon during active fluvial transport and particle abrasion. *Geology*, v. 47. doi: <https://doi.org/10.1130/G46442.1>.
2. **Repasch, M.**, Karlstrom, K., Heizler, M, and Pecha, M. (2017). Birth and evolution of the Rio Grande fluvial system in the past 8 Ma: Progressive downward integration and the influence of tectonics, volcanism, and climate. *Earth-Science Reviews*, v. 168, pg. 113-164. <http://doi.org/10.1016/j.earscirev.2017.03.003>.
1. **Repasch, M.**, Karlstrom, K., Heizler, M., and Koning, D. (2016). Reconstructing the provenance of the post-640 ka Rio Grande-Rio Chama fluvial system using detrital zircon dating. *New Mexico Geological Society Guidebook*, v. 67, p. 479-489.

Manuscripts in preparation (drafts available upon request):

Overeem, I., Wang, K., Anderson, R.S., Anderson, S.P., **Repasch, M.**, Koch, J., (in prep.) Models of Arctic landscape thaw suggest widespread sediment and carbon mobilization from foothills regions.

Repasch, M., Scheingross, J.S., Cook, K.L., Sachse, D., Hovius, N. (in prep.), Fluvio-geomorphic and geochemical effects of lithospheric flexure in the overfilled east-Andean Chaco foreland.

GRANTS & FELLOWSHIPS

- 2022 NSF Postdoctoral Fellowship - Polar Programs (NSF award # 2219107)
- 2022 Caltech Texaco Prize Postdoctoral Fellowship (declined)
- 2018 Geo.X Travel Grant (€500)
- 2017 Elsevier/European Association for Organic Geochemistry Research Scholarship (€2500)
- 2015 GSA/ExxonMobil Student Geoscience Research Grant (\$7500)
- 2015 New Mexico Geological Society Grant-in-Aid of Research (\$2500)
- 2013 Lehigh University Undergraduate Research Grant (\$4400 total, 2 awards)

AWARDS & HONORS

- 2021 Summa cum laude, Earth & Environmental Sciences, University of Potsdam

2016 AWG Laramide Chapter Outstanding Student Award

2015 V.C. Kelley Outstanding Graduate Student Award, UNM

TEACHING EXPERIENCE

Guest Lecturer, University of Colorado Boulder

- Stream Ecology (CVEN 5323), Fall 2022

Teaching Assistant, University of Potsdam

- Landscape Structure Analysis (Fall 2018)
- Earth System Science (Spring 2018)

Teaching Assistant, Department of Earth and Planetary Sciences, University of New Mexico

- Advanced Field Geology (Summer 2015, 2016)
- Structural Geology (Spring 2016)
- New Mexico Field Geology (Fall 2015)
- Physical Geology Laboratory (Fall 2015)

STUDENT MENTORSHIP

2022- Cole Cochran, M.S. student, University of Colorado Boulder: *Storage versus export: organic carbon dynamics in arctic river floodplains*

2021- Josie Arcuri, PhD student, University of Colorado Boulder: *Modeling permafrost bank erosion and organic carbon mobilization in Canning River, AK*

2017-19 Nina Golombek, M.S. Thesis: *Seasonality of organic carbon export and stable isotopic signatures in an Andean lowland river*

2018 Denise Postler, B.S. Thesis: *Climatic controls on river discharge dynamics in the lowland Rio Bermejo, Argentina*

SERVICE

2022- Associate Editor, Journal of Geophysical Research: Earth Surface

2020- Peer Reviewer: *JGR Biogeosciences, Geophysical Research Letters, EGU Biogeosciences, JGR Earth Surface*

2022 Convener, AGU FM, B043: *Responses of biogeochemical cycles to climate change*

2020 Convener, Goldschmidt, 10f: *Source to Sink Dynamics of Sediment, Solutes and Carbon: Implications for Climate, Biogeochemical Cycles, and Life*

2019 Convener, AGU FM, EP007: *Catching Cosmic Rays: Advances in Using Cosmogenic Nuclides to Quantify Earth Surface Processes*

2017-19 Organizer, Earth Surface Geochemistry Seminar Series, GFZ Potsdam

2018 Organizer, "Data Visualization: Methods and Design Principles," workshop in collaboration with *Figures CC* and *GeoX*, GFZ Potsdam

2015-16 President, Association of Geoscience Graduate Students, UNM

2015 AGI Geoscience Congressional Visits Day, Sep. 29-30, Washington, D.C.

2014-16 Grant Reviewer, UNM Graduate and Professional Student Association

WORKSHOPS & COURSES

- 2022 "Teaching Quantitative Reasoning Using Data: Project EDDIE" (7 Dec., virtual)
- 2022 CU Boulder Science Discovery Ambassadors Program, 8-week science communication course and two community outreach events (Fall 2022)
- 2022 "FieldSafe: Building Inclusive and Safe Field Teams" (Nov. 30 & Dec. 2, virtual)
- 2022 NSF Polar Science Early Career BAJEDI training workshop (Sep. 19 & 29, virtual)
- 2019 CSDMS workshop, Exploring Surface Processes: How to Build Coupled Models, *AGU Fall Meeting, Washington, D.C.*
- 2019 Radiocarbon Short Course, *UC Irvine, CA*
- 2018 Flipping a geochemistry classroom using team-based learning, Goldschmidt Conference, Boston, MA
- 2017 Workshop, "Advancing understanding of geomorphology with topographic analysis emphasizing high resolution topography." *Potsdam, Germany*

INVITED PRESENTATIONS

- 2022 Caltech; University of Nevada Reno; CU Boulder
- 2021 UC Merced
- 2020 AGU Fall Meeting (Earth Surface Processes & the Global Carbon Cycle)
- 2019 GFZ Department of Earth Surface Geochemistry
- 2018 CU Boulder
- 2017 ETH Zürich; Universidad Nacional del Littoral (Santa Fe, Argentina)

LABORATORY EXPERTISE

Carbon isotope analysis: radiocarbon dating; stable carbon isotope analysis (EA-IRMS)

Cosmogenic radionuclide geochemistry: ^{10}Be and reactive metal extraction from sediment and soil, AMS target preparation, Accelerator Mass Spectrometry

Organic geochemistry: lipid extraction, solid phase extraction, gas chromatography (GC-MS/FID), compound-specific stable isotope analysis (GC-IRMS)

Soil science: laser diffraction particle size analysis, specific surface area analysis, soil pH

Water chemistry: Dissolved organic carbon analysis, Ion chromatography, ICP-OES

FIELD EXCURSIONS

- 2022 Canning River, north slope Alaska: river water, suspended sediment, and soil sampling; ADCP measurements; soil temperature profiles
- 2021 California Coast Range: Soil depth profile sampling at UC reserves
- 2017, 2018, 2019 Rio Bermejo/Rio Parana, Argentina: Suspended sediment, water, soil, and floodplain sediment sampling, acoustic doppler current profiler (ADCP), UAV surveys
- 2015, 2016 Rio Grande valley, CO and NM: sediment sampling, paleohydrology

2014, 2015, 2016 Colorado River/Grand Canyon, AZ: teaching assistant for UNM advanced field camp

SELECTED CONFERENCE ABSTRACTS

1. **Repasch, M.**, Hidy, A., Wharton, S., Cameron-Smith, P., Ehrmann, T.S., Beydoun, H., 15A.4 - Precipitation Scavenging of Cosmogenic ¹⁰be and ⁷be: Understanding the Spatial and Temporal Dynamics of Wet Deposition. AMS Annual Meeting, Denver, Jan 2023. *Oral*.
2. Arcuri, J., Overeem, I., **Repasch, M.**, Anderson, S., Anderson, R.S., Koch, J., Permafrost River Banks Shaped by Thaw-Dependent Fluvial Erosion, AGU Fall Meeting, Chicago, Dec. 2022. *Poster*.
3. **Repasch, M.**, Anderson, S., Koch, J., Rahman, S., Arcuri, J., Anderson, R.S., Overeem, I., Feedbacks between permafrost thaw and oxidative weathering in the Arctic critical zone. AGU Fall Meeting, Chicago, Dec. 2022. *Oral*.
4. Grant, K., **Repasch, M.**, Finstad, K., Broek, T., McFarlane, K., Soil Carbon Compound Class Persistence Across a Climate Gradient in California Grassland Soils. AGU Fall Meeting, Chicago, Dec. 2022. *Poster*.
5. Hidy, A., **Repasch, M.**, Wharton, S., Ehrmann, T., Beydoun, H., Cameron-Smith, P., Oerter, E., Visser, A., Searching for Signatures of Stratospheric Disturbance with Large Spatial Datasets of Meteoric ¹⁰Be/⁷Be. AGU Fall Meeting, Chicago, Dec. 2022. *Poster*.
6. **Repasch, M.**, Scheingross, J.S., Hovius, N., Vieth-Hillebrand, A., Hoeschen, C., Mueller, C., Szupiany, R.N., & Sachse, D., Fluvial organic carbon fluxes modulated by hydrodynamic sorting of mineral-bound and free particulate organic matter: AGU Fall Meeting, New Orleans, LA, Dec. 2021. *Oral*.
7. Dosch, S., Hovius, N., **Repasch, M.**, Scheingross, J., Turowski, J. & Sachse, D., Terrestrial biospheric carbon export from rivers by bedload transport. EGU General Assembly 2021.
8. **Repasch, M. N.**, Scheingross, J. S., Hovius, N., Lupker, M., Wittmann, H., Haghipour, N., ... & Orfeo, O., Balancing the Fluvial Organic Carbon Budget: Integrating Sediment Transit Time and Channel Mobility into the Equation. AGU Fall Meeting, Dec 2020. *Invited Talk*.
9. **Repasch, M.**, Scheingross, J.S., Zakrzewski, C., Hovius, N., Sachse, D., & Wagner, Dirk., Turnover of fluvial particulate organic matter: the roles of sediment residence time and microbiota: GSA Annual Meeting, Phoenix, AZ, Oct. 2019. *Oral*.
10. **Repasch, M.**, H. Wittmann, J. S. Scheingross, N. Hovius, D. Sachse, & R. N. Szupiany., Sediment transit times derived from meteoric cosmogenic ¹⁰Be in suspended sediment from a river with no tributaries. AGU Fall Meeting, Washington, D.C., Dec. 2018. *Poster*.
11. **Repasch M.**, Sachse, D., Hovius, N., Scheingross, J., Eglinton, T. & Lupker, M., Timescales of organic carbon transport and preservation in alluvial river systems: Rio Bermejo, Argentina. Goldschmidt Conference, Boston, MA, July 2018. *Poster*.
12. **Repasch, M.**, Sachse, D., Scheingross, J., Hovius, N., Vieth-Hillebrand, A., Geomorphic and geochemical controls on leaf wax biomarker transport and preservation in alluvial river systems: Rio Bermejo, Argentina. AGU Fall Meeting, New Orleans, LA, Dec. 2017. *Oral*.

PROFESSIONAL AFFILIATIONS

American Geophysical Union
 American Meteorological Society
 Earth Science Women's Network

European Geosciences Union
Geochemical Society