Raquel Portes, PhD

Curriculum vitae

Visiting Assistant Professor
Earth and Climate Sciences
Bates College - Maine
+1 907 723 7370 (mobile)
rportes@bates.edu

Professional website
Bates College website
Google Scholar
ResearchGate
LinkedIn

Professional experience

Visiting Assistant Professor in Earth Surface Processes Aug. 2021 – Aug. 2023
Department of Earth and Climate Sciences, Bates College

Visiting Researcher 2019 - 2021
USDA US Forest Service – PNW Juneau Forestry Sciences Lab

Visiting Assistant Professor in Geology and Geomorphology 2018 - 2019
Department of Geography, Minas Gerais State University, Brazil

Postdoc Researcher 2016 - 2018
Department of Geography, University of Zurich, Switzerland

Education

PhD in Soil Science 2010 - 2014
Federal University of Viçosa, Brazil

PhD Visiting Researcher 2013 - 2013
University of Tübingen, Germany

MS of Soil Science 2008 - 2010
Federal University of Viçosa, Brazil

BS in Geography 2003 - 2008
Federal University of Viçosa, Brazil

Peer-reviewed publications (*denotes advisee)

13- Spinola, D., Portes, R., Fedenko, R.*, Lybrand, R., Dere, A., Biles, F., Trainor, T., Bowden, M., D`Amore, D. Lithologic controls on soil geochemistry, mineralogy, and micromorphological properties in a coastal temperate rainforest of Southeast Alaska. Geoderma. Online: https://doi.org/10.1016/j.geoderma.2022.116211

12- Borrelli, P., Portes, R., et al., 2021. Soil erosion modeling: A global review and meta-analysis. Science of the Total Environment, 780. Online: https://doi.org/10.1016/j.scitotenv.2021.146494

11- Bezak, N., Portes, R., et al., 2021. Soil erosion modeling: A bibliometric analysis. Environmental Research. Online: https://doi.org/10.1016/j.envres.2021.111087

10- Calitri, F.*, Sommer, M., Norton, K. Temme, A., Brandová, D., Portes, R., Christl, M., Ketterer, M., Egli, M., 2019. Tracing the temporal evolution of soil redistribution rates in an agricultural landscape using $^{239+240}$Pu and ^{10}Be. ESP. Online: https://doi.org/10.1002/esp.4612

9- Portes, R., Dahms, D., Brandová, D., Raab*, G., Kühn, P, Egli, M., 2018. Evolution of soil erosion rates in alpine soils of the Central Rocky Mountains using fallout Pu and δ^{13}C. Earth and Planetary Science Letters 496, 257–269. Online: https://doi.org/10.1016/j.epsl.2018.06.002

8- Raab*, G., Scarciglia, F., Norton, K., Dahms, D., Brandová, D., Portes, R.C., Christl, M., Ketterer, M. E., Ruppli, A., Egli, M., 2018. Denudation variability of the Sila Massif upland (Italy) from decades to millennia using ^{10}Be and $^{239+240}$Pu. Land degradation & development 1-17. Online: https://doi.org/10.1002/ldr.3120

7- Dahms, D., Egli, M., Brandová, D., Portes, R. C., Fabel, D., Harbor, J., Christl, M., 2018 Quaternary glacial succession and post-LGM recession in the South-eastern Wind River Range, USA. Quaternary Science Reviews 192, 167-184. Online: https://doi.org/10.1016/j.quascirev.2018.05.020

6- Spinola, D. N., Portes, R. C., Srivastava, P., Torrent, J., Barrón, V., Kühn, P., 2018. Diagenetic reddening of Early Eocene paleosols on King George Island, Antarctica. Geoderma 315, 149–159. Online: https://doi.org/10.1016/j.geoderma.2017.11.010

5- Egli, M., Berger, A., Kündig, R., Krebs, R., Portes, R. C., Berger, R., Widmer, R, 2017. The long-term interaction of mine tailings with soils and their wider environment: Examples from Mont Chemin, Switzerland. Journal of Geochemical Exploration 182, 53-69. Online: https://doi.org/10.1016/j.gexplo.2017.08.011

4- Raab*, G., Halpern, D., Scarciglia, F., Raimondi, S., Norton, K, Pettke, T., Hermann, J., Portes, R. C., Sanchez, A. M. A., Egli, M., 2017. Linking tephrochronology and soil characteristics in the Sila and Nebrodi Mountains, Italy. Catena 158, 266-285. Online: https://doi.org/10.1016/j.catena.2017.07.008

3- Boxleitner, M., Musso, A., Waroszewski, J., Malkiewicz, M., Maisch, M., Dahms, D., Christi, M., Portes, R. C., Egli, M., 2017. Surface processes and landscape evolution since the onset of the Holocene in a high-alpine valley. Geomorphology 295, 306-322. Online: https://doi.org/10.1016/j.geomorph.2017.07.006

2- Spinola, D. N., Portes, R. C., Schaefer, C. E. G. R., Solleiro-Rebolledo, E., Pi-Puig, T., Kühn, P., 2017. Eocene paleosols on King George Island, Maritime Antarctica: Macromorphology, micromorphology, and mineralogy. Catena 152, 69-81. Online: http://doi.org/10.1016/j.catena.2017.01.004

1- Portes, R. C., Spinola, D. N., Reis*, J. S., Ker, J. C., Costa, L. M., Fernandes Filho, E. I., Kühn, P., Schaefer, C. E. G. R., 2016. Pedogenesis across a climate gradient in tropical high mountains, Cordillera Blanca – Peruvian Andes. Catena 147, 441-452. Online: https://doi.org/10.1016/j.catena.2016.07.027

Publications in review or preparation

Portes, R., Spinola, D., Ketterer, M., Egli, M., Lybrand, R., Fedenko*, J., Trainor, T., Dere, A., D`Amore, D. Assessing soil redistribution rates in old-growth temperate rainforests of SE Alaska using $^{239+240}$Pu. In review (Major revisions) in Soil Science Society of America.

Portes, R., Spinola, D., Gundersen*, E, Ketterer, M., Bailey, S. The impact of whole-tree harvesting on soil redistribution rates in the Hubbard Brook Experimental Forest. In preparation for Science of the Total Environment.

Portes, R., Spinola, D., Protti*, L S., Ketterer, Randy Hesser, M., Biles, F., Lybrand, R., D`Amore, D. Evolution of soil erosion rates on recent post-glacial landscapes in the coastal temperate rainforest of southeast Alaska. In preparation for Geomorphology.

Fedenko*, J., Spinola, D., R., Portes, R., Trainor, T., Dere, A., D`Amore, D., Lybrand, R. Lithologic controls on soil carbon stocks in the per humid temperate rainforest of Southeast Alaska. In review in Soil Science Society of America Journal.

Spinola, D., Portes, R., Hesser*, R., Biles, F., Lybrand, R., D`Amore, D. Interplay among pedogenesis, mineralogy and soil organic carbon dynamics in a coastal temperate rainforest, southeast Alaska. In preparation for Geochimica et Cosmochimica Acta.

Selected abstracts

Portes, R., Spinola, D., Gundersen*, E., D`Amore, D., Ketterer, M. The use of $^{239+240}$Pu as erosion tracers for quantifying and evaluating soil erosion and sedimentation rates – Invited talk at the Radionuclides Symposium. Joint SE NE GSA meeting, 2023.

Margerum*, A, Spinola, D., Zhang, Y., D`Amore, D., Portes, R. Plant succession and soil chemical weathering on post-glacial landscapes, SE Alaska. Joint SE NE GSA meeting, 2023.

Gundersen*, Spinola, D., E, Ketterer, M., Bailey, S., Portes, R. The suitability of $^{239+240}$Pu isotopes as soil erosion tracers in the Northern hardwood forests. Joint SE NE GSA meeting, 2023.

Portes, R., Spinola, D., Ketterer, M., Gundersen*, E, Margerum*, A. , O`Brien*, M., King*, H., Protti*, L. S., Saltman*, E., Bailey, S. The impact of deforestation on soil erosion rates in an experimental watershed in the northern hardwood forest, USA. SSSA Annual meeting 2022.

Portes, R., Spinola, D., Protti*, L S., Ketterer, M., Hesser, R.,, Biles, F., Lybrand, R., D`Amore, D. Evolution of Soils and Erosion Rates on Recent Post-glacial Landscapes in the Coastal Temperate Rainforest of Southeast Alaska. AGU Fall meeting 2022.

Spinola, D., Portes, R., Lybrand, R., Fleiner, J, Qafoku, O., Dere, A., M. Trainor, D`Amore, D. Pedogenic and mineralogical influence on soil organic carbon stability and depth distribution in a coastal temperate rainforest, southeast Alaska. AGU Fall meeting 2022.

Portes, R., Spinola, D., Ketterer, M., Egli, M., Lybrand, R., Fedenko*, J., Trainor, T., Dere, A., D`Amore, D. Spodosols development and slope stability in old-growth temperate rainforests of SE Alaska. GSA meeting 2020 connects online.

Portes, R., Dahms, D., Brandová, D., Raab*, G., Kühn, P, Egli, M., 2018. Evolution of soil redistribution rates in alpine soils of the Central Rocky Mountains using fallout radionuclides 239+240Pu and δ13C. 21th WCSS, 2018. Gundersen*, Spinola, D., E, Ketterer, M., Bailey, S.,

Award

James and Julie Bockheim Distinguished Lecture in Soil Science. Dept. of Soil Science, University of Wisconsin-Madison, Madison, October 2021.

Invited talks

- Dartmouth College, Dept. of Earth Sciences, Spring seminar 2023. Soil formation, erosion processes, and landscape evolution, Hanover, May 2023

- GSA Radionuclides Symposium in the Joint SE & NE Section Meeting. The use of $^{239+240}$Pu and stable carbon isotopes as erosion tracers for quantifying and evaluating soil erosion and sedimentation rates, Virginia, March 2023.

- GeoLunch – SECS Research Seminar. Co-evolution of soils and landforms on post-glacial landscapes. Dept. of Earth and Climate Sciences, University of Maine, Orono, October 2021.

- Invited talk in the Soil Science Graduate Program about Pu isotopes technique for soil erosion assessment, Sao Paulo State University, Brazil, November 2018.

Grants and fellowships

Total funding: $151,234

2023 Bates Faculty Development Fund ($5,066)
Project entitled Assessing the magnitude of erosion processes on steep slopes across lithologies in Southeast Alaska

2023 Bates Faculty Development Fund ($4,968)

	Project entitled Evolution of soil erosion rates in a deforested watershed in the northern hardwood forest
2022	Bates Faculty Development Fund ($5,900) Project entitled *Soils and Landscape Evolution of SE Alaska and New England*
2021-2022	Bates Faculty Development Fund ($4,100) Project entitled *Evolution of soil erosion and chemical weathering on recent post-glacial landscapes in SE Alaska*
2021-2023	Bates Professional Travel fund ($3,500)
2016-2017	Postdoc Swiss Government Excellence Fellowship, University of Zurich ($42,000) Project entitled *Evolution of soil erosion rates in alpine soils of the Central Rocky Mountains using fallout Pu and $\delta^{13}C$*
2013	PhD CAPES Fellowship, University of Tübingen, Germany ($12,000)
2010-2014	PhD CNPq Fellowship, Federal University of Viçosa, Brazil ($57,000) Project entitled *Pedogenesis across a climate gradient in tropical high mountains, Cordillera Blanca – Peruvian Andes*
2008-2010	MS CAPES Fellowship, Federal University of Viçosa, Brazil ($ 12,700) Project entitled *Identification of land use in agroecological farm systems using remote sensing and community knowledge*
2007-2008	Undergraduate Research Fellowship, Federal University of Viçosa ($4,000) Project entitled *Assessment of land use degradation in Viçosa MG using geoprocessing tools and multicriteria decision analyses*

Teaching experience

Visiting Assistant Professor in Earth Surface Processes, Bates College

Sedimentary Processes and Environments, Fall 2022 (Upper-level)

Landscapes of SE Alaska Off-Campus in Juneau, Alaska, Spring 2022 (Intro-level)

Earth Surface Environments and Environmental Changes, Winter 2022 and 2023 (Intro-level)

Soils and Landscape Evolution, Fall 2021 and Winter 2023 (Upper-level)

Soil Geography of New England On-Campus, Spring 2023 (Intro-level)

Lecturer, Minas Gerais State University, Brazil

Physical Geology, Fall 2018 (Intro-level)

Earth Surface Processes and Geomorphology, Fall 2018 (Intro-level)

Environmental Analyses, Fall 2018 (Upper-level)

Lab instructor, University of Zurich, Switzerland

Lab course in Geochronology, Winter 2017 and 2018 (Graduate course)

Fundamentals of soil-plant-environment, Winter 2018 (Intro-level)

Mentorship experience as undergraduate senior thesis supervisor

Alana Margerum '23 – Bates College, 2022 – present

Topic: Plant succession, dendrochronology, and chemical weathering in post-glacial landscapes in SE Alaska.

Eli Gundersen '23 – Bates College, 2022 – present

Topic: Evaluation of soil erosion rates in a deforested watershed in the Hubbard Brook Experimental Forest, NH using Pu isotopes as soil erosion tracer.

Luke Sedor Protti '22 – Bates College, 2021 - 2022
Topic: Evolution of soil erosion rates on recent post-glacial landscapes in the coastal temperate rainforest of southeast Alaska

Mentorship experience: Students advisee grants

Total funding: $8,200

Alana Margerum	- Bates Summer Research Fellowship, Winter 2022 ($5,500) - Bouley-Creasy Fund, Spring 2022 ($500)
Eli Gundersen	- GSA Undergraduate Research Grant, Spring 2022 ($1,500) - Bouley-Creasy Fund, Spring 2022 ($500)
Luke Sedor Protti	- Bates Student Research Fund ($200)

Mentorship experience: Co-mentoring graduate research students

Jennifer Fedenko – MS student, Oregon State University, advised by Prof. Rebecca Lybrand, 2019 – 2021.
Topic: Organic carbon storage in soils formed from different parent materials in SE Alaska.

Francesca Calitri – PhD student, University of Zurich, advised by Prof. Markus Egli, 2017-2018.
Topic: Using Pu isotopes to evaluate soil erosion rates in agricultural environments, Germany

Gerald Raab – PhD student, University of Zurich, advised by Prof. Markus Egli, 2017-2018
Topic: Soil formation and soil erosion rates in Calabria, Italy.

Research Assistant

Anna Sarrazin ´24 – Bates College, 2021 – 2022
Topic: Soil development on recent post-glacial landscapes in the coastal temperate rainforest of southeast Alaska.

Teaching development

DEI Workshop Pedagogy Matters - Each Day is a New Labor: What can black campus life teach us about pedagogy? Colby, Bates, and Bowdoin, August 2022

NAGT Workshop for Early Career Geoscience Faculty, University of Maryland, June 2022

DEI Workshop Pedagogy Matters - Toward Abolitionist Pedagogy: Liberating Our Syllabi from Carceral Logics Confirmation, January 2022

DEI Outreach

Upward Bound Program for high-school first-generation students, July 2022 and July 2023
Developed and led field trips to Juneau (AK) for Upward Bound and Bates students in collaboration with the Juneau Icefield Research Program, University of Maine, and Juneau US Forest Service.

Chirp Creek farm, Connecting Bates students and local organic farms, Fall 2021
Developed this outreach activity to facilitate soil formation and land use discussions between Bates students and local farms.

Volunteer at GeoLatinas (Latinas in Earth and Planetary Sciences), 2020 – present
Serving on the leadership council for career and professional development – Dry Run & Peer Review Initiative

Geology for kids: Inspiring the next generation of geoscientists, Minas Gerais State University, 2018

Developed and led this activity for local kids and undergraduate Geography major students.

Service

Reviewer for the NSF Arctic Panel, 2022

Reviewer for journals: Catena and Geoderma, 2016 - present

Convener of a technical session for Clay Minerals Society 2020 meeting, 2020

Lab management experience

Quaternary Geology and Sedimentology lab – Bates College, (Director), August 2022- present

Lab analyses experience

$^{239+240}$ Pu isotopes measurements using ICP-MS, Stable isotopes analyses (δ13C), ^{10}Be surface exposure dating, XRD, XRF, soil extractions such as Na-Pyrophosphate, Ammonium Oxalate, and Citrate-Bicarbonate-Dithionite extractions, particle size determination using SediGraph and Beckman Coulter, ArcGIS and Avenza Maps.

Fieldwork experience

Tongass National Forest, Southeast, Alaska, 2019, 2020, 2021, 2022 and 2023

Hubbard Brook Experimental Forest, New Hampshire, 2021 and 2022

Susten Pass – Alps, Switzerland, 2017

Wind River Range, Central Rocky Mountain, Wyoming, 2016

Huascaran National Park, Peruvian Andes, 2011 and 2012

Professional organizations

2022 – present	American Geophysical Union (AGU)
2022 – present	Soil Science Society of America (SSSA)
2017 – present	Geological Society of America (GSA)
2017 – present	European Geosciences Union (EGU)