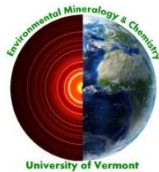


# Nico Perdrial

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## CURRENT POSITION

**Assistant Professor (Tenure-Track)**, University of Vermont, Department of Geography & Geosciences, Burlington, VT (08/2019 - CURRENT)

## EDUCATION

- **Ph.D.** (Physics, Chemistry & Biology of the Environment) Université Louis Pasteur, Strasbourg, France. 2007.
- **M.S.** (Sedimentology & Geochemistry) Université Paris XI - Ecole Normale Supérieure, Paris, France. 2003.
- **B.S.** (Biology & Geology) Université de Nantes - Laboratoire de Planétologie & Géodynamique. Nantes, France. 2001.

## PROFESSIONAL EXPERIENCE

**Research Assistant Professor**, University of Vermont, Burlington, USA, 2013-2019

**Assistant Research Scientist**, University of Arizona, Tucson, USA, 2012-2014

**Research Associate**, University of Arizona, Tucson, USA, 2008-2012

**Lecturer (ATER)**, Université Louis Pasteur, Strasbourg, France, 2006-2007

**Teaching Assistant**, Université Louis Pasteur, Strasbourg, France, 2003-2006

**Archaeogeologist**, ARC'Antic Laboratory, Nantes, France, summer 2002

**Archaeologist**, Association La Riobe, Chateaubleau, France, summers 1998,1999,2000,2001,2002,2003,2004,2005,2006

**Lab assistant**, Planetology & Geodynamic Laboratory, Nantes, France, 2001

## AWARDED RESEARCH GRANTS

**University of Vermont** (total awarded as PI and co-PI: \$1.8M, including: \$888,416 to UVM)

JUNE 2021 – JUNE 2025 “Collaborative Research: A fossil ecosystem under the ice: deciphering the glacial and vegetation history of northwest Greenland using long-lost Camp Century basal sediment” (NSF Arctic Natural Sciences); PI: Paul Bierman (UVM); **Co-PIs: Nico Perdrial** and Andrew Christ (UVM). \$1,166,018 (\$524,315 for UVM, Indirect: \$129,835). Part of a collaborative NSF effort.

SEPT 2020 – SEPT 2024 “Assessing Nutrient Sustainability in Forest Management: Novel Applications Of Metal Isotopes And In-Situ Mineral Measurements.” USDA AFRI. PI: Justin Richardson (UMass); **Co-PIs: Nico Perdrial** and Anthony D’Amato (UVM). \$470,835 (\$249,340 for UVM, indirect: \$95,000).

SEPT 2019 – SEPT 2022 “Development and Application of PXRF Protocols to Potentially Hazardous Metals in Soils of Urban Forests and Gardens.” USDA NRCS. PI: Justin Richardson (UMass), **Co-PI: Nico Perdrial**. \$76,588 (\$23,723 for UVM, indirect: \$12,077).

SEPT 2019 – SEPT 2022 “Lead Water and Soil Education and Assessment by Vermont Middle and High School Students.” EPA Healthy Communities. **PI: Nico Perdrial**, Co-PI: Paul Bierman (UVM). \$27,963 (\$27,963 for UVM, indirect: \$7,687).

JUNE 2018 – JUNE 2019 “Mineral weathering at the atomic scale”. VT NASA-EPSCoR GRFC. **PI: Nico Perdrial**, \$ 37,051 (graduate student stipend). “Mineral weathering at the atomic scale”.

SEPT 2017 – SEPT 2019 “Weathering on Mars: Extending the concept of the critical zone to extraterrestrial bodies”. VT NASA-EPSCoR FRC. Collaboration with NASA-JSC. (Proposals are sent to an internal review panel and ranked for funding). \$26,024 (including 50% matching costs), PI: Julia Perdrial (UVM), **Co-PI: Nico Perdrial**.

SEPT 2017 – SEPT 2019 “Nanoscale Characterization of Apatite Weathering”. UVM CAS Small Grant (Proposals are sent to an internal review panel and ranked for funding). **PI: Nico Perdrial**. \$2,487.

SEPT 2014 – SEPT 2016 “Multiscale impacts of soil microenvironments distribution and density on metal sorption as a tool for sustainable remediation”. UVM, CAS Small Grant. **PI: Nico Perdrial**, \$2,750. 2014-2016.

### **University of Arizona**

SEPT 2011 – SEPT 2014 “Collaborative project: Uranium and strontium fate in waste-weathered sediments: Scaling of molecular processes to predict reactive transport”. DOE, SBR 2011-2014), PI: Jon Chorover (UofAz), Co-PIs: Carl Steefel (LBNL), Peggy O’Day (UC Merced); Karl Mueller (PNNL). \$1.20 M. **Nico Perdrial co-authored** the proposal which funded his position as Research Scientist (Research Associate not authorized as PIs on grants at UofA).

## TEACHING EXPERIENCE

### **University of Vermont** (2,227 STUDENTS TAUGHT SINCE AT UVM)

“Extraterrestrial Life” GEOL096, AS096, HUMN096, PHYS096. (Spring 2020, Spring 2021, Spring 2022). Enrolment: 250 students. New creation, introductory level, team-taught. 3 cr., 1CE.

“Earth System Sciences” GEOL001. (Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020). Enrolment: 160 students. Introductory level. 4cr., 2CE. Management of 4-5 GTAs.

“Environmental Geology” GEOL055. (Spring 2014, Spring 2015, Spring 2016, Summer 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022, Spring 2023). Enrolment: 30 students until 2022, 160 students since 2022. Introductory level. 4cr., 2CE. Management of 4-5 GTAs. Requirements for 3 majors at UVM.

“Geocomputing” GEOL185., (Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2022). Enrolment: 15 to 25 students. 3cr., 1CE. New creation, GST Minor.

“FYS: Planetology” GEOL095., (Spring 2018, Fall 2018, Spring 2021). Enrolment: 20 students. 3cr., 1CE. New creation, First-year seminar.

“Mars, Moons & Asteroids” GEOL2990 (Fall 2023 – incoming). Enrolment: 40 students. 3cr., 1CE. New creation.

“Introduction to Environmental Sciences” ENSC001. (Spring 2014, Spring 2015, Spring 2016). Enrolment 80 students. ENSC requirement. New course structure and content.

“Lead in the Environment” GEOL095: (Summer 2020). Enrolment: 12 students. 3Cr., 1CE. Students from UVM and Jackson State University.

### **University of Arizona** (2012-2013)

“Environmental Soil and Water Chemistry” (Spring 2012, 2013). Enrolment: 35 students. Intermediate Level. Role: Teaching Assistant and guest lecturer.

“Quantitative X-ray diffraction” (Fall 2012). Enrolment: 10 students. Advanced graduate workshop opened to graduate students, staff and faculty.

### **University of Strasbourg** (2004-2007)

“External Geodynamic” (Fall 2007). Enrolment: 60 students. Introductory level. Role: Main Instructor.

“Mineralogy & Petrography” (Fall 2003, 2004, 2005) Enrolment: 80 students. Introductory level. Role: TA of 4 lab sections.

- “Crystal-chemistry and reactivity of fine particles” (Fall 2007). Enrolment: 10 students. Advanced level. Role: TA.
- “Soil science” (spring 2007) Enrolment: 10 students. Intermediate Level. Role: Main Instructor.
- “Orogen of the Alps” (Spring 2007) Enrolment: 20 students. Advanced level. Role: TA during the 2 weeks field trip.
- “Fundamentals of Geochemistry” (Spring 2004, 2005, 2006). Enrolment: 20 students. Intermediate level. Role: TA.
- “Introduction to Geosciences” (Spring 2006). Enrolment: 15 students. Role: Main Instructor.
- “Mapping Camp” (Spring 2004, 2005, 2006). Enrolment: 35 students. Intermediate Level. TA during the 2 weeks field trip.

## UNIVERSITY AND PROFESSIONAL SERVICE

### *College level*

- Elected Natural Science Representative on the UVM College of Arts & Sciences Curriculum Committee, 2023 – current.
- Member of UVM College of Arts and Sciences APLE/Suiter award committee, 2019 – current.
- External member on the committee for the fifth-year review of the UVM Biology department chair. 2020.
- Member on the committee for the fifth-year review and reappointment of the UVM Geology department chair. 2019.

### *Department Level*

- Director of Graduate Studies, Masters of Geology, Fall 2022 - current.
- Member of the Geosciences BS/BA development team, 2022 - current.
- Organizer of Geology Seminar Series, Department of Geology, University of Vermont, 2018–2022.

### *Community*

- Ad-hoc manuscript reviewer for scientific journals (6-8 per year): *American Mineralogist*, *Applied Geochemistry*, *Chemical Geology*, *Chemosphere*, *Clays and Clay Minerals*, *European Journal of Soil Science*, *Environmental Chemistry*, *Environmental Research*, *Environmental Science & Technology*, *Geochimica et Cosmochimica Acta*, *Geoderma*, *Geology*, *International Geology Review*, *Journal of Environmental Quality*, *Journal of Hazardous Materials*, *Journal of Nuclear Materials*, *Minerals*, *Plos One*, *Radiochimica Acta*, *Rock Mechanics and Rock Engineering*, *Science of the Total Environment*, *Soil Biology and Biochemistry*, *Soil Science*, *Soil Science Society of America Journal*, *Water, Air & Soil Pollution*.
- Session organizer and chair: Environmental Geochemistry & Health – 2021 - GSA CONNECTS ONLINE, Oct 10-13
- Session organizer and chair: Environmental Geochemistry & Health – 2020 - GSA CONNECTS ONLINE, Oct 26-30
- Ad Hoc reviewer for the Fonds de Recherche du Quebec (Quebecian Foundation for Science), 2020.
- Ad Hoc reviewer for National Science Foundation, 2020-current.

Geology field trips lead for Burlington High school Earth Sciences Teachers, 2019.

GSA Northeastern Section – 2018 – Member of the Organizing Committee, Mar 18-20, Burlington, VT

Beamtime proposal external reviewer for the Stanford Synchrotron Radiation Lightsource (SSRL), 2015-present

Beamtime proposal external reviewer for the Canadian Lightsource (CLS), 2014-present

Beamtime proposal external reviewer for the Advanced Photon Source (APS), 2014-present

Session organizer and chair: Energy Resources: From Production to Environmental Impact – 2014 – Goldschmidt Conference, Sacramento, CA, Jun 8-1

Ad Hoc reviewer for Agence National de la Recherche (French National Research Agency), 2013.

Ad Hoc reviewer for the Fundacao para a Ciencia e a Tecnologia (Portuguese Foundation for Science) 2012.

## STUDENT RESEARCH ADVISING

### *Graduate Student Research*

Cat Collins (MS) – Sub-ice Mineralogy (2022-Current). Co-advisor with Paul Bierman

Juliana Guimaraes de Souza (MS) – Weathering under Ice (2022-Current). Co-advisor with Paul Bierman

Victoria Treto (MS) – In-situ weathering of calcium-bearing minerals in forested ecosystems (Defended March 2023)

Trevor Mackowiak (MS) – Monitoring of suspended sediment mineralogy in tropical rivers: Effects of flowrate, time and lithology.” Defended summer 2022.

Sandra Walser (MS) – “Trace Metal Contamination In Urban Soils: A Field To Laboratory Methodological Framework For Characterization And Education”, defended summer 2021.

Adele Conde (MS) – “Nanoscale mechanisms of apatite dissolution”, defended summer 2019

Grant Reeder (MS) – “Microscale controls on lead speciation in soils: a framework for sustainable remediation”, defended October 2018.

Sophie Greene (MS) – “Comparing Meteoric  $^{10}\text{Be}$ , In Situ  $^{10}\text{Be}$ , And Native  $^9\text{Be}$  Across A Diverse Set Of Watersheds” defended Spring 2016. Co-advisor with Paul Bierman.

Jennifer Bower (MS) – “Speciation, Distribution, Prediction, and Mobility of Lead in Urban Soils: A Multiscale Study” defended summer 2017.

Billy Linker (MS) – Sorption of insensitive munition compounds to soil constituents. 2013. Co-advisor with Jon Chorover (UofAz).

Adrien Bouzzonville (MS) –State of soils in the Strasbourg urban area. 2007. Co-advisor with Françoise Elsass (U of Strasbourg).

### *Undergraduate Student Research*

#### *At UVM*

Kelly Daigle (BS) – (2022-current). “Chemical Fingerprinting of Pre-Columbian Obsidian Fragments from La Tolita (Ecuador) for Trade Route Reconstruction”. Co-advising with Jorge Garcia (UVM archeology).

Genevieve Foran (BS) – (2022-current). “Mineralogy and chemical composition of river sediments in Cuba”.

Megan Brown (BS) – (2022). Paid intern. Analysis of soil Pb for EPA healthy communities project.

Serena Veilleux (BS) – (2022) Paid intern. Analysis of soil Pb for EPA healthy communities project.

- Rebecca Holt (BS) – (2020-2021). “Optimization of ICP-OES methods for ultra-trace Pb analysis in tap water”. (no thesis)
- Eva Pepe (BS) – (2020-2021) “Multivariate Analysis of the Controlling Factors and Mechanisms Affecting Pb Bioaccessibility in the Northeastern United States.” Hawley-Mudge recipient. GEOL198.
- Ruth Oppenheimer (2020-2021) “Effects of moisture, grain size and organic matter on XRF Pb analysis.”
- Maria Ignacia Valladares (BS) – (2019-2020) Lab assistant
- Lily Zanta (BS) – (2018-2019), “Survival of Pb paint chips in gastric fluids: effects of size and occlusion.” Hawley-Mudge recipient. GEOL197/8.
- Izzy Ellenthal (BS) – (2018-2019), “Potential for Microorganism Survival in a Simulated Martian Environment”. Hawley-Mudge recipient. GEOL197/8.
- Alex Gagnon (BS) – (2017-2018) – “Weathering in martian conditions” Co-advisor with Julia Perdrial.
- Christian Wurzburger (BS) – (2017-2018), “Weathering rates of Apatite : the role of habitus and chemistry.” Hawley-Mudge recipient. GEOL197/8.
- Leah Williamson (BS) – (2017-2018), “Determination of process-coupling between Pb mobilization, Pb bioavailability and acidification during acid-PO<sub>4</sub> remediation of Pb contaminated soil” Hawley-Mudge recipient. GEOL197/8.
- Amanda Rossi (BS) – (2016-2018), “Soil Pb bioavailability and distribution in Burlington, Vermont: testing and assessment of a geospatial predictive model”. Hawley-Mudge recipient. GEOL198.
- Katelyn Czyzyk (BS) – (2016-2017), “Can blood and soil Pb levels be predicted in Burlington, VT?” Hawley-Mudge recipient. GEOL197/8.
- Amy Lewis (BS) – (2015-2016), “Testing for the origin of an atypically thick saprolite at Preston Brook: preservation from glacial erosion or a weathering hotspot?” Hawley-Mudge recipient. GEOL197/8.
- Garrett Hazebrouck (BS) – (2015). “Bioaccessibility of Pb in Burlington soils” Hawley-Mudge recipient. GEOL197/8.
- Sidney Lister (BS) – (2014-2015). “Geospatial evaluation of Pb distribution in playground soils” Hawley-Mudge recipient. GEOL197/8.
- Ifan Hywel (BS) – (2014-2015) “Mineralogical analysis on a section of anomalous paleocurrent direction in the Aberystwyth Grits Group: using bulk composition to determine provenance”. Co-advising with John Hughes.
- Chandler Noyes (BS) – (2014-2015), “Effects of rainwater pH on lead mobility in a local soil” Hawley-Mudge recipient. GEOL197/8.

*At UofA*

- Kris A. Ford (BS) – (2012- 2013) Laboratory Assistant
- Peirong Cao (BS) – (2012) Laboratory assistant
- Kelsie M. LaSharr (BS) – (2010-2013) Laboratory assistant
- Tyler J. Anderson (BS) – (2011) “Development of the Soil Pellets Method for elemental analysis of Soils and Sediments by X-Ray Fluorescence Spectroscopy”
- Sarah Verghese (BS) – Biosphere 2 (AZ), (2011). “Granular basalt mineral weathering reactions »

*At U of Strasbourg*

- Makhlouf Nait-Chabanne (BS) – (2007)

*Committee member*

- Xiaozhi Zhang (PhD – Materials Science) – “Investigating the role of desorption during local step flow mounded growth”. Committee Chair. Expected defense March 2024.

- Bren Cable (MS – Geology) - Calcium bearing minerals weathering in Northeastern forests: Disturbances and resilience. Expected defense June 2024
- Jeffrey Ulbrandt (PhD – Materials Science) – “Investigation of the Role of Thermal, Non-Thermal and Energetic Processes on the Growth of Perovskite Metal-Oxide Thin-Films by Pulsed-Laser Deposition”. Committee Chair. ABD.
- Noah Slowik (MA - English) - “The Future of the Air: H. G. Wells and the Geopolitics of Aviation” Defended March 2023.
- Chris Halstead (PhD – Nat. Resources) – “Assessing Assumptions and Applying Cosmogenic Nuclide Methods to Earth Surface Processes”. Defended March 2022.
- Maziar Foroutan (PhD - Civ. & Env. Engineering) – “Geomechanical, geochemical, and hydrological aspects of CO2 injection into saline reservoirs”. Committee Chair. Defended August 2021.
- Arash Kamali-Asl (PhD – Civ. & Env. Engineering) – “Coupled thermal-hydrological-mechanical-chemical processes in geothermal and shale energy environments”. Committee Chair. Defended May 2019.
- Jenny Bower (PhD - NR) – “Plagioclase weathering in upslope soils drives mineral weathering gradients expressed at the hillslope scale”. Expected defense June 2023.
- Ashton Kirol (MS - Geology) – “Assessing the drivers of legacy phosphorus loading and distribution in shallow eutrophic lake sediments and the impacts of intervention”. Defended Fall 2022.
- Austin Wilkes (MS - Geology) - “Phosphorus mobility and speciation under fluctuating redox conditions in sediment-water systems”. Defended Summer 2019.
- Malayika Cincotta (MS - Geology) - “Soil aggregates: the mechanistic link to increased dissolved organic carbon in surface waters?”, defended October 2018
- Jesse Armfield (MS - Geology) - “Combining observations of soils and streams to investigate trends caused by reduced acid deposition in the Sleepers River watershed”, defended October 2018
- Katy Czar (Hon. Col.). “Effects of strain on organic thin film semi-conductors”. Committee Chair. Defended May 2019
- Evan Beretta (Hon. Col. - CHEM) – “Investigations into Phosphinidene Transfer Mediated by Main Group and Transition Metal Compounds”. Committee Chair. Defended May 2022.

## **AWARDS**

Outstanding Faculty Adviser Award 2016 - UVM Graduate Student Senate

## **MEMBERSHIPS:**

Member, American Chemical Society (2021-present)

Member, Geological Society of America (2018-present)

University of Vermont, Sustainability Fellow (2014-2015)

Member, American Geophysical Union (2011-present)

Member, European Geochemical Association (2010-present)

Member, Critical Zone Exploration Network (2009-present)

Member, Clay Mineral Society of America (2007-present)

## **CONTRIBUTIONS TO EQUITY AND DIVERSITY:**

Organizer of the UVM Geology Seminar series on Equity and Diversity in the Geoscience.

Teaching of environmental racism and racial justice to local high school students.

Pledge to the building of an Anti-Racist lab.

Member of UVM Unlearning Racism in the Geoscience (URGE) pod.

Member of the White Fragility UVM Geology book club.

## PUBLICATIONS

**Peer-reviewed Journal Articles.** As of May 2023: nb. of publications: 44, H-index: 19, Nb. of citations: 1196.

*A note about authorship, co-authorship, collaboration and mentoring:*

*In geosciences, single author papers are extremely rare, reserved to commentaries, reviews or purely theoretical works. Because geoscience combines a large variety of natural sciences and associated techniques, research in the field is typically multidisciplinary and relies on collaborative work. While the order of authors traditionally reflects the importance of an author's contribution to the publication, recent efforts to better reflect the different roles of authors have slightly changed this norm. As one's career evolves, authorship of a researcher is expected to transform from lead author to senior author, in charge of project management and student's advising. As a result, it is increasingly accepted that senior, leading authors on collaborative papers be listed last. Starting in 2017, I started to follow this norm, particularly when advised students led the publication. However, because of the variety of outlets and collaboration this is not always true in this list. In an effort to clarify this author's contribution to the articles, the estimated contribution to the final product in % and [CRediT](#) (Contributor Roles Taxonomy) is given after each paper. Student authors names at the time of the study are denoted by \*.*

1. Christ A.J., Rittenour T.M., Bierman P.R., Kiesling B.A., (...+13...), **Perdrial N.**, Peteet D.M., Schaefer J.M., Steig E.J. Thomas E.K. (In Review) "Deglaciation of northwestern Greenland during Marine Isotope Stage 11". *Science*. Back from second round of review. (8%, funding, writing)
2. Mackowiak\* T.J., **Perdrial N.** (2023). "Monitoring of Suspended Sediment Mineralogy in Puerto-Rican Rivers: Effects of Flowrate and Lithology." *Minerals* 13 (2): 208. [Link](#). (50%, concept, resources, writing, funding, supervision)
3. Walser\* S.L., Sirkovich\* E.C., Richardson J.B., McStay\* A.E., **Perdrial N.** (2023) "Moisture, Organic Matter, and Large Particle Correction for Accurate Pb Portable X-ray Fluorescence Assessment in Urban Soils" *X-Ray Spectrometry.*, 52 (2), 72. [Link](#). (45%, concept, resources, writing, funding, supervision)
4. **Perdrial N.**, Vázquez-Ortega A., Reinoso-Maset E., O'Day P.A., Chorover J. (2022). Effects of flow on uranium speciation in soils impacted by acidic waste fluids. *Journal of Environmental Radioactivity*, 251-252, 106955. [Link](#). (50%, concept, methodology, investigation, visualization, writing)
5. McStay\* A., Walser\* S., **Perdrial N.**, Sirkovich\* E., Richardson J. (2022). Nutrient and toxic elements in soils and plants across 10 urban community gardens: Comparing pXRF and ICP-based soil measurements, *Journal of Environmental Quality*, 51, 439-450. [Link](#). (25%, concept, resources, writing, funding, supervision)
6. Bourgault\* R.R., Ross D.S., Bailey S., **Perdrial N.**, Bower\* J. (2022). Groundwater input drives large variance in soil manganese concentration and reactivity in a forested headwater catchment. *Soil Science Society of America Journal.*, 86, 1553-1570. [Link](#). (15%, concept, resources, writing, investigation)
7. Richardson J., Mischenko\* I.C., Mackowiak\* T.J., **Perdrial N.** (2022). Trace metals and metalloids and Ga/Al ratios in gray shale weathering profiles along a climate gradient and in batch reactors. *Geoderma*, 405, 115431. [Link](#). (10%, funding, supervision, writing)
8. Adler\* T., Underwood K., Rizzo D., Harpold A., Sterle\* G., Li L., Wen H., Stinson\* L., Bristol\* C., Shanley J.B., Lini A., **Perdrial N.**, Perdrial J. (2021) - Drivers of Dissolved Organic Carbon Mobilization From Forested Headwater Catchments: A Multi Scaled Approach. Submitted to *Frontiers in Water*, 3, 578608. [Link](#). (8%, concept, resources, supervision, writing)
9. Vázquez-Ortega A., **Perdrial N.**, Reinoso-Maset E., O'Day P. A., Chorover J. (2021). Phosphate Controls Uranium Release from Acidic Waste-Weathered Hanford Sediments. *Journal of Hazardous Materials*. 416, 126240. [Link](#). (35%, concept, investigation, writing)
10. Christ, A.J., Bierman P.R., Schaefer J.M., Dahl-Jensen D., Steffensen J.P., Corbett L.B., Peteet D.M., Thomas E.K., Steig E.J., Rittenour T.M., Tison J.-L., Blard P.-H., **Perdrial N.**, Dethier D.P.,

- Lini A., Hidy A.J., Caffee M.W., Southon J. (2021). A Multimillion-Year-Old Record of Greenland Vegetation and Glacial History Preserved in Sediment beneath 1.4 Km of Ice at Camp Century. *Proceedings of the National Academy of Sciences* 118 (13): e2021442118. [Link](#). (10%, concept, resources, visualization, supervision, writing)
11. Singer D., Herndon E., Zemanek\* L., Cole\* K., Sanda T., Senko J., **Perdrial N.** (2021) - Biogeochemical controls on the potential for long-term contaminant leaching from soils developing on historic coal mine spoil. *Soil Systems*. 5 (1): 3. [Link](#). (10%, investigation, visualization, writing)
  12. Foroutan\* M., Ghazanfari E., Amirlatifi A., **Perdrial N.** – (2021) - Variation of Pore-Network, Mechanical and Hydrological Characteristics of Sandstone specimens through CO<sub>2</sub>-Enriched Brine Injection. *Journal of Petroleum Science and Engineering*, 26, 100217. [Link](#). (12%, supervision, resources, writing)
  13. Kamali-Asl\* A., Ghazanfari E., **Perdrial N.**, Cladouhos T. (2020) - Effects of circulating fluid type on response of fractured rock in geothermal reservoir: An experimental study. *Geothermics*. 87: 101832. [Link](#). (12%, supervision, resources, writing)
  14. Reinoso-Maset E., **Perdrial N.**, Steefel C.I., Um W., Chorover J., O'Day P.A. (2020) - Dissolved carbonate and pH control the dissolution of uranyl phosphate minerals under flow conditions. *Environmental Science & Technology*, 54, 6031-6042. [Link](#). (35%, concept, investigation, writing)
  15. Singer D., Herndon E., Cole\* K., Koval J., **Perdrial N.** (2020) - Formation of secondary mineral coatings results in the persistence of reduced metal-bearing phases in soils developing on historic coal mine spoil. *Applied Geochemistry*, 121, 104711. [Link](#). (10%, investigation, visualization, writing)
  16. Bailey S., Ross D.S., **Perdrial N.**, Jercinovic M., Webber J., Bourgault\* R. (2019) - Determination of primary mineral content and calcium sources in forest soils using electron probe microanalysis mapping and cluster analysis. *Soil Science Society of America J.*, 83, 1830-1841. [Link](#). (12%, supervision, resources, investigation, visualization, writing)
  17. Cincotta\* M, Perdrial J.N., Shavitz\* A., Libenson\* A., Landsman-Gerjoi\* M., **Perdrial N.**, Armfield\* J., Adler\* T., Shanley J. (2019) - Soil aggregates as a source of dissolved organic carbon to streams: an experimental study on the effect of solution chemistry on water extractable carbon. *Frontiers Earth Science*, 7:172. [Link](#). (10%, supervision, resources, writing)
  18. Armfield\* J., Perdrial J., Gagnon\* A., Ehrenkrantz\* J, **Perdrial N.**, Cincotta\* M, Ross D.S., Shanley J., Underwood K.L., Ryan P. (2019) - Does stream water composition at Sleepers River in Vermont reflect dynamic changes in soils during recovery from acidification? *Frontiers Earth Science*, 6:246. [Link](#). (10%, supervision, resources, writing)
  19. Kamali-Asl\* A., Ghazanfari E., **Perdrial N.**, Bredice N. (2018) - Experimental study of fracture response in granite specimens subjected to hydrothermal conditions relevant for enhanced geothermal systems. *Geothermics*, 72, 205-224. [Link](#). (10%, supervision, resources, writing)
  20. **Perdrial N.**, Vazquez-Ortega A., Wang G., Kanematsu M., Mueller K.T., Steefel C.I., O'Day P., Chorover J. (2018) - Uranium speciation in acid waste-weathered sediments: The role of aging and phosphate amendments. *Applied Geochemistry*, 89, 109-120. [Link](#). (50%, concept, methodology, investigation, visualization, writing)
  21. Singer D.M., Jefferson A.J., Traub\* E.L., **Perdrial N.** (2018) - Mineralogical and geochemical variation in stream sediments impacted by acid mine drainage is related to hydro-geomorphic setting. *Elementa*, 6, 31. [Link](#). (10%, investigation, visualization, writing)
  22. Wang G., Um W., Wang Z.M., Reinoso-Maset E., Washton N.M., Mueller K.T., **Perdrial N.**, O'Day P.A., Chorover J. (2017) - Uranium Release from Acidic Weathered Hanford Sediments: Single-Pass Flow-Through and Column Experiments. *Environmental Science & Technology*, 51, 11011-11019. [Link](#). (15%, investigation, visualization, writing)



23. Bower\* J.A., Lister\* S., Hazebrouck\* G., **Perdrial N.** (2017) - Geospatial evaluation of lead bioaccessibility and distribution for site-specific prediction of threshold limit. *Environmental Pollution*, **229**, 290-299. [Link](#). (45%, concept, resources, writing, funding, supervision)
24. Clark K.E., Shanley J.B., Scholl M.A., **Perdrial N.**, Perdrial J.N., Plante A.F., McDowell W.H. (2017) - Tropical river suspended sediment and solute dynamics in storms during an extreme drought. *Water Resource Research*, **53**. [Link](#). (20%, concept, resources, writing, investigation, visualization, supervision)
25. Singleton\* A., Schmidt A., Bierman P., Rood D., Neilson T., Greene\* S., Bower\* J. **Perdrial N.** (2016) - Effects of Grain Size and Mineralogy on the Distribution of the Fallout Radionuclides <sup>7</sup>Be, <sup>10</sup>Be, <sup>137</sup>Cs, and <sup>210</sup>Pb in River Sediment. *Geochimica et Cosmochimica Acta*, **197**, 71-86. [Link](#). (10%, supervision, resources, visualization, writing)
26. Caulk\* R., Ghazanfari E., Perdrial J., **Perdrial N.** (2016) - Experimental investigation of fracture aperture and permeability change within Enhanced Geothermal Systems. *Geothermics*, **62**, 12-21. [Link](#). (15%, supervision, resources, visualization, writing)
27. **Perdrial N.**, Thompson A. LaSharr\* K., Amistadi M.K., Chorover J. (2015) - Quantifying particulate and colloidal release of radionuclides from saturated analog Hanford sediments. *Journal of Environmental Quality*, **44**, 945-952. [Link](#). (50%, concept, methodology, investigation, visualization, writing)
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34. Perdrial J.N., **Perdrial N.**, Porter\* C., Vazquez-Ortega\* A.; Leedy\* J., Chorover J., (2014) - Experimental assessment of passive capillary wick sampler suitability for inorganic soil solution constituents, *Soil Science Society of America Journal*, **78**, 486-495. [Link](#). (14%, methodology, investigation, visualization, supervision, writing)
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43. **Perdrial N.**, Elsass F., Liewig N. (2008) – New technique for in-situ sampling of particulate matter and colloids in soil and atmospheric fallout. *Colloids Surf. A.*, **317**, 742-746. [Link](#). (50%, concept, methodology, investigation, visualization, writing)
44. Muller D., Medigue C., Koechler S., Barbe V., Barakat M., Talla E., Bonnefoy V., Krin E., Arsene-Ploetze F., Carapito C., Chandler M., Cournoyer B., Cruveiller S., Dossat C., Duval S., Heymann M., Leize E., Lieutaud A., Lievreumont D., Makita Y., Mangenot S., Nitschke W., Ortet P., **Perdrial N.**, Schoepp B., Siguier N., Simeonova D.D., Rouy Z., Segurens B., Turlin E., Vallenet D., Van Dorselaer A., Weiss S., Weissenbach J., Lett M.C., Danchin A., Bertin P.N. (2007) – A tale of two oxidation states: Bacterial colonization of arsenic-rich environments. *PLoS Genetics*, **3** (4), e53. [Link](#). (5%, investigation, visualization, writing)

#### In Preparation as senior author:

45. Hellmann R., Conde\* A., Hughes J.M., **Perdrial N.** (In Prep), “Experimentally-derived mixed anion fluorapatite and hydroxylapatite dissolution kinetics: the influence of anions, crystal chemistry and Gibbs free energy ( $\Delta G_f^\circ$ )”. For Submission to *American Mineralogist*. At co-authors for final checks. Expected submission Summer 2023. (30%, concept, methodology, investigation, visualization, supervision, writing)
46. Treto\* V., Rice\* A., D’Amato A., Richardson J., **Perdrial N.** (In Prep). In-situ Weathering of Critical Ca-bearing Minerals in Northeastern Forests. For submission to *Geoderma*. Awaiting co-authors comments. Expected submission Summer 2023. (33%, concept, methodology, investigation, visualization, supervision, writing)
47. Williamson\* L., **Perdrial N.**, Hughes J., (...+11...), Alonso-Hernandez C., Racela J., Bierman P. (In Prep). Mineralogical fingerprinting of Central Cuba stream sediments. For Submission to *Journal of Environmental Quality*. Final analyses being performed. Expected submission Fall 2023. (33%, concept, methodology, investigation, visualization, supervision, writing, funding)

48. Walser\* S., Sirkovich\* E., Richardson J. **Perdrial N.** (In Prep) “Portable X-ray fluorescence as a tool for social justice” For submission to *STOTEN*. In writing phase. Expected submission Fall 2023. (40%, concept, methodology, investigation, visualization, supervision, writing, funding)

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### **Book Section (Peer-reviewed)**

Muller D., Carapito C., Koechler S., Weiss S., Salmeron A., **Perdrial N.**, Lièvreumont D., Arsène-Ploetze F., Bertin P. and Lett M.-C. (2007) – Arsenic stress in bacteria: involvement in the colonization of arsenic-contaminated environments? in: Zhu Y., Lepp N. & Naidu R. eds, *Biochemistry of trace elements : environmental protection, remediation and human health*. Tsinghua University Press. p 544-545. ISBN : 978-7-302-15627-7

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### **Reports (not peer-reviewed)**

Richardson J and **Perdrial N** (2022) - “Portable X-Ray Fluorescence (pXRF) for Rapid Assessment of Toxic and Nutrient Metals in Soils”. USDA/NRCS Final report.

Chorover J, Mueller K, O'Day P, Steefel C, Um W, Zachara J, **Perdrial N**, Kanematsu M, Reinoso-Maset E, Poweleit E, Vazquez-Ortega A, Wang G. (2016) – “Uranium and strontium fate in waste-weathered sediments: Scaling of molecular processes to predict reactive transport”. United States: N. p., 2016. [Link](#).

Chorover J., **Perdrial N.**, Mueller K., Strepka C., O'Day P., Rivera N., Um W., Chang H.S., Steefel C. and Thompson A. (2012) – Release of aged contaminants from weathered sediments: Effects of sorbate speciation on scaling of reactive transport. DOE/ER/64615, US DOE SC Office of Biological and Environmental Research, 16pp. [Link](#)

Elsass P., Bouzouville A\*, Elsass F., Fourniquet G., Gorsy P., Liewig N., Morvan G. and **Perdrial N.** (2006) – Etude de synthèse des sols sur le territoire de la Communauté Urbaine de Strasbourg. Rapport final BRGM RP-54829-FR, 50 p.

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### **First and Senior Author Abstracts at Major Conferences only (\*denotes student author)**

**Perdrial N.**, 2023 “Soil Pb and social justice in North-eastern US cities”. USGS SynerGEM Seminar Series, Online June 27th. **INVITED**

Treto\*, V., **Perdrial N.**, Rice A., Smith G., Richardson J., D’Amato A. 2022. “In-Situ Weathering of Calcium-Bearing Minerals in Uneven-Aged Silvicultural Systems.” GSA Connects 2022, Denver, CO. <https://doi.org/10.1130/abs/2022AM-376329>.

**Perdrial N.**, Richardson J.B., Walser\* S.L., Sirkovich E.C. 2022 “Portable X-ray fluorescence as a tool for social justice”. ACS Spring Meeting 2022, San Diego, CA. **INVITED**

**Perdrial N.** 2022. “Multiscale Environmental Mineralogy: A Targeting Tool for Environmental Processes” University of Massachusetts Amherst, March 2022. **INVITED**

Mackowiak\* T. and **Perdrial N.** 2022. “Monitoring of Suspended Sediment Mineralogy in Tropical Rivers: Effects of Flowrate and Lithology” AGU Frontiers in Hydrology, 2022. San Juan, PR.

Richardson J.B. and **Perdrial N.** 2022 “Portable X-Ray Fluorescence (pXRF) for Rapid Assessment of Toxic and Nutrient Metals in Soils. USDA/NRCS Professional Seminars. **INVITED**

**Perdrial N.**, Hellmann R, Conde A\*, Rampe E, Christoffersen R, Murayama M., Chang J. (2021) - Apatite nanoresponse to acidic dissolution, Goldschmidt Conference, July 4-9, Online.

- Walser S\*, **Perdrial N.**, Massey C., McNally D., Bierman P. (2021) - Lead Education And Discovery: Engaging young student scientists in a community health project, Goldschmidt Conference, July 4-9, Online.
- Perdrial N.**, Bierman P.R., Whittaker J.A., Vigoreaux J.O. (2020) - Soil and water Pb education in the time of COVID and Black Lives Matter. GSA Connects Online. Oct 26-30.
- Perdrial N.**, Walser S\*, Massey C & Bierman P Walser S., (2020) Lead in Water and Soil: Education and Assessment Involving Vermont Middle and High School Students Goldschmidt Virtual. June 21-26
- Walser S.\*, **Perdrial N.**, Bierman P.R., Massey C.A. (2020) - Citizen science as a tool for community outreach, data collection, and environmental justice in soil geochemistry. GSA Connects Online. Oct 26-30.
- Walser S.\*, **Perdrial N.**, Bierman P., Massey C. (2019) - Citizen science for a healthier community: Soil and water sampling in Burlington and Winooski. Vermont Citizen Science. peer-reviewed talk. 12-12-2019
- Perdrial N.**, (2019) - La minéralogie environnementale multi-échelle. Université du Québec A Montreal, 2/18/2019. **INVITED.**
- Perdrial N.**, Conde A\*, Hellmann R, Rampe E, Christoffersen R & Murayama M. (2019) - Dissolution of Apatite: Micro and Nanoscale Insights, Goldschmidt Conference, August 18-23, Barcelona, Spain.
- Williamson L.\*, **Perdrial N.**, Hughes J.M., (+13 authors), Bierman P. (2019) – Better understanding the geology of central Cuba through stream sediment composition analysis using X-Ray diffraction. Geological Society of America, September 22-25, Phoenix, AZ, USA.
- Conde A\*, Hellmann R., Michel F.M. & **Perdrial N.** (2018) - Effects of crystal chemistry, habitus, and experiment apparatus on apatite dissolution across scales. Geological Society of America, November 4-7, Indianapolis, IN, USA.
- Perdrial N.**, Armfield J\*, Reeder G\*, Gagnon A\*, Rampe E. & Perdrial J. (2018) - The Martian Critical Zone: Concept and Experimental Example. Goldschmidt Conference, August 12-17, Boston, MA, USA.
- Conde A\*, Hellmann R., Wurzbürger C\*. & **Perdrial N.** (2018) - Mechanism of Apatite Dissolution. Goldschmidt Conference, August 12-17, Boston, MA, USA.
- Reeder G.\*, Rossi A.\*, Czyzyk K.\*, Williamson L\*. & **Perdrial N.** (2018) – Bioaccessible Pb in Burlington (VT) soils: Field and microscale controls. NE Geological Society of America, 18-20 March, Burlington, VT, USA.
- Rossi A.\*, Reeder G.\*, Czyzyk K.\*, Williamson L.\* & **Perdrial N.** (2018) Soil Pb bioavailability and distribution in Burlington, Vermont: Testing and assessment of a geospatial model. NE Geological Society of America, 18-20 March, Burlington, VT, USA.
- Perdrial N.**, Bower J\* & Singer D (2017) - Speciation, Distribution, Mobility and Prediction of Pb in an Urban Soil. Goldschmidt Conference, August 13-18, Paris, France.
- Perdrial N.**, Clark K.E., Shanley J.B., Plante A.F., McDowell W.H. (2017) - Can the mineralogical signature of suspended sediments inform on the dynamics and resilience of river systems impacted by extreme climate events at Luquillo, Puerto Rico? AGU Chapman Conference, Jan 2017, San Juan, Puerto Rico.
- Perdrial N.** (2016) - Cold-war radionuclides legacy in the environment: Solving the problem one experiment at a time., Department of Civil and Environmental Engineering, UVM. **INVITED**
- Bower J\*. and **Perdrial N.** (2015) - Impacts of competitive sorption processes on Pb bioavailability in urban soils. GSA annual Meeting, Baltimore, MA, USA.

- Perdrial N., Vasquez-Ortega A., Reinoso-Maset E., O'Day P.A. and Chorover J., (2014)** – Acid-weathering and uranium speciation: Reaction kinetics and phosphate addition. Goldschmidt Conference, June 8-13, Sacramento, CA, USA.
- Perdrial N., Kanematsu M., Wang G., Um W., O'Day P. and Chorover J. (2013)** - Process coupling between mineral transformation and U speciation in acid waste weathered sediments. American Geophysical Union's 46th Annual fall meeting.
- Perdrial N., O'Day P. and Chorover J. (2012)** – Strontium fate in Hanford sediments – A multi-scale synchrotron X-Ray investigation. SSRL/LCLS Users' Conference, Oct 3-6, Menlo Park, CA, USA.  
**INVITED**
- Perdrial N., Thompson A. and Chorover J. (2011)** – Quantifying particulate and colloidal release of radionuclides from analog Hanford sediments. Fall Meeting, AGU, Dec 5-9, San Francisco, CA, USA.
- Perdrial N., Thompson A., Rivera N., Deng Y.-T., O'Day P. and Chorover J. (2011)** – Predicting the fate of radionuclides at the Hanford tank farm using analog sediments. Goldschmidt Conference, August 14-19, Prague, Czech Rep.
- Perdrial N., Thompson A. and Chorover J. (2010)** – Mineral transformations and contaminant release dynamics under wetting-drying cycles in simulated Hanford sediments. Goldschmidt Conference, June 13-18, Knoxville, TN, USA.
- Perdrial N., Thompson A. and Chorover J. (2009)** – Effects of mineral transformation, contaminant concentration and CO<sub>2</sub> pressure on contaminant speciation and mobility in simulated Hanford sediments. 46th Annual Meeting of the CMS, June 5-11, Billings, MT, USA.
- Perdrial N., Elsass F., Liewig N. (2007)** – TEM evidence for lead transport by bacteria in atmospheric deposition. Goldschmidt Conference, August 19-24, Cologne, Germany.
- Perdrial N., Elsass F., Liewig N. (2007)** – TEM investigation on the nature, distribution and factors affecting clays and nanoparticles in the soil system. 44th Annual Meeting of the CMS, June 2-7, Santa Fe, NM, USA.
- Perdrial, N., Elsass, F., Liewig, N. and Gelhaye, D. (2006)** – Aerosol particles over a french forest: size and composition of minerals and microbes. 43rd Annual Meeting of the CMS - 4ème colloque du GFA, 3-7 juin, Ile d'Oléron, France.
- Perdrial N., Elsass F., Lievremont D., Berger J. and Liewig N. (2006)** – Role of bacteria in controlling the toxicity and mobility of arsenic in soils. Proc. EGU General Assembly, April. 02-07 2006, Vienna, Austria.
- Perdrial N., Elsass F., Liewig N., Delphin J.-E. and Morvan G. (2005)** – Typologie quantitative des particules environnementales. suivi spatio-temporel dans un sol sous vignoble. 3ème colloque du GFA, May 18-19 2005, Paris, France.
- Perdrial N., Elsass F., Liewig N., Delphin J.-E. and Morvan G. (2004)** – Caractérisation physico-chimique des matières en suspension dans les eaux d'infiltration des sols. Proc. 20th RST, sept. 20-25 2004, Strasbourg, France.
- Perdrial N., Bossiere G. and Frere D. (2002)** – Analyses comparatives de céramiques archaïques, du 6ème siècle BC, de Gaule du sud et d'Etrurie. Proc. 19th RST, apr. 09-12 2002, Nantes, France.