

CURRICULUM VITAE

Nicholas R. Patton

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EDUCATION

2018- 2022

University of Canterbury, NZ - The University of Queensland, AUS (transferred)

- PhD: Geology
- Focus: Geomorphology, GIS, landscape evolution, and geochronology
- Thesis: Landscape evolution of the southeast Queensland dune fields

2014-2016

Idaho State University, USA

- MSc: Geology
- Focus: Soil science, biogeochemistry, geomorphology, and GIS
- Thesis: Topographic controls on total mobile regolith and total soil organic carbon in complex terrain

2010-2013

PennWest California, USA

- BSc (Dual): Chemistry and Geology
- Focus: Hydrology, environmental chemistry, aqueous chemistry
- Thesis: Using aqueous chemistry to understand above and below ground flow paths within the Oregon Hollow wetland, PA

WORK EXPERIENCE

2023-Present

Postdoctoral Associate, Idaho State University – ID, USA

- Research on NSF funded Geochemistry and Microbiology (Geomicro) project to simulate and evaluate soil carbon pools (microbial and mineral associated) using a Community Land Model and the Microbial Mineral Carbon Stabilization model (MIMICS) within Reynolds Creek CZO

2022-2023

Postdoctoral Researcher, Desert Research Institute – NV, USA

- Conduct soil, geomorphic, and terrain analysis for Department of Defense contracts in relations to vehicle mobility studies, and remote predictive soil/landform mapping applications

2019-2020

Health, Safety and Wellness Representative, School of Earth and Environmental Science – QLD, AUS

- Participated in quarterly safety meetings, aid in mitigation plans for safety protocols and maintain health and safety codes for the School of Earth and Environmental Science

2016-2017

Lab/Field Manager, Center for Ecological Research and Education – ID, USA

- Collected and processed ecological samples on a WestCo Scientific SmartChem discrete analyzer, DIONEX ion chromatograph, and Shimadzu TOC/TN and SSM

2016-2017

Hydrologic Technician GS-1316-07, USDA-ARS Boise Office – ID, USA

- Assisted in field/lab research for both USDA-ARS and graduate students, collected and processed soil, water and vegetation samples, and installed a suite of *in situ* instruments

2013-2014

Hydrologist, Hatch Mott MacDonald – PA, USA

- Aided in mining subsidence mitigation, sampled wells and streams, measured hydraulic head and discharge, monitored fish kills, and located fractures and no-flow stream sections

2012

Safety Manager, FCI (Federal Correction Institute) Morgantown - Internship – WV, USA

- Audited government facility to maintain safety code and regulation for government, OSHA, DEP, and EPA standards

2012

Chemist, Comtech Industries Inc. – PA, USA

- Conducted water treatments and mitigation for hydraulic fracturing, assisting in NORM radiation surveys, and aided in OSHA safety inspections on drilling platforms

TEACHING EXPERIENCES

2020-2022

School of Earth and Environment, University of Canterbury

- GEOL 246: Earth Surface Dynamics (*Course Coordinator*)
- ENVR 101: Introduction to Environmental Science
- Advised student on masters research project (on going)

2018-2020

School of Earth and Environmental Science, The University of Queensland

- GEOS 1100: Environment and Society Field Trip
- GEOS 1100L: Environment and Society
- GEOS 2103/7103: Biogeography and Geomorphology Lab
- Advised students on undergraduate research projects

2014-2017

Department of Geosciences, Idaho State University

- GEOL 1100: The Dynamic Earth
- GEOL 1100L: The Dynamic Earth Labs
- GEOL 1101: Physical Geology
- GEOL 3306: Environmental Geology
- Mentored eight students granted a Career Path Internship (CPI)
- Mentored three students granted a MILES Undergraduate Research Internships (MURI)

2011-2013

Department of Earth Sciences, California University of Pennsylvania

- EAS 391: Northwest United States Field Geology
- EAS 331: Mineralogy

LABORATORY EXPERIENCE

2020-2022

University of Canterbury Cosmogenic Lab – Christchurch, NZ

- *In situ* and meteoric ^{10}Be

2018-2020

Australia's Nuclear Science and Technology Organization (ANSTO) – Lucas Heights, NSW, AUS

- *In situ* and meteoric ^{10}Be and ^{26}Al
- Radiocarbon dating (^{14}C)

2018-2019

British Geological Survey (BGS) – Keyworth, UK

- Stable isotopes ^{13}C , ^{15}N , and ^{18}O

2018-2019

Utah State University Luminescence Laboratory – Logan, Utah, USA

- Optically-Stimulated Luminescence dating

2016-2017

Center for Ecological Research and Education – Pocatello, ID, USA

- DOC, DIC, TOC, anions and cations

2014-2016

ISU Stable Isotope Laboratory – Pocatello, ID, USA

- Stable isotopes ^{13}C , ^{15}N , and ^{18}O

PUBLICATIONS (ORCID: 0000-0002-4137-0636)

Primary Author

2023

- **Patton, N. R.**, Shulmeister, Hua, Q., Almond, P., Rittenour, T., Hanson, J. M., Greal, A., Gilroy, J., & Ellerton, D. (2023). Reconstructing Holocene fire records using dune foot-slope deposits at the Cooloola Sand Mass, Australia. *Quaternary Research* 1–23. <https://doi.org/10.1017/qua.2023.14>

2022

- **Patton, N. R.**, Shulmeister, J., Rittenour, T., Ellerton, D., Almond, P., & Santini, T. (2022). Using surface roughness to determine Holocene coastal dune ages at K'gari (Fraser Island) and the Cooloola Sand Mass, Australia. *Earth Surface Processes and Landforms* 47(10), 2455–2470. <https://onlinelibrary.wiley.com/doi/10.1002/esp.5387>
- **Patton, N. R.**, Shulmeister, J., Ellerton, D., & Seropian, G. (2022). Measuring landscape evolution from inception to maturity: insights from a coastal dune system. *Earth and Planetary Science Letters*, 584, 17448 <https://doi.org/10.1016/j.epsl.2022.117448>

2019

- **Patton, N. R.**, Ellerton, D., & Shulmeister, J. (2019). High-resolution remapping of the coastal dune fields of south east Queensland, Australia: a morphometric approach. *Journal of Maps*, 15(2), 578–589. <https://doi.org/10.1080/17445647.2019.1642246>
- **Patton, N. R.**, Lohse, K. A., Seyfried, M. S., Godsey, S. E., & Parsons, S. B. (2019). Topographic controls of soil organic carbon on soil-mantled landscapes. *Scientific Reports*, 9(1), 1–15. <https://doi.org/10.1038/s41598-019-42556-5>
- **Patton, N. R.**, Lohse, K. A., Seyfried, M., Will, R., & Benner, S. G. (2019). Lithology and coarse fraction adjusted bulk density estimates for determining total organic carbon stocks in dryland soils. *Geoderma*, 337, 844–852. <https://doi.org/10.1016/j.geoderma.2018.10.036>

2018

- **Patton, N. R.**, Lohse, K. A., Godsey, S. E., Crosby, B. T., & Seyfried, M. S. (2018). Predicting soil thickness on soil mantled hillslopes. *Nature communications*, 9(1), 1–10. <https://doi.org/10.1038/s41467-018-05743-y>

Co-Author

2024

- Shulmeister, J., **Patton, N. R.**, Rittenour, T., Ellerton, D., Hesp, P., Santini, T., Miot da Silva, G., Forman, S., Gontz, A., Bowyer, H., Kelly, J., McCallum, A., T., & Welsh, K. (*Quaternary Science Reviews*). Chronology and evolution of the world's largest sand island; K'gari (Fraser Island), Southeast Queensland, Australia. <https://doi.org/10.1016/j.quascirev.2024.108529>

2022

- Ellerton, D., Rittenour, T., Shulmeister, J., Roberts, A.P., Miot da Silva, G., Gontz, A., Hesp, P., Moss, P., **Patton, N. R.**, Santini, T., Welsh, K., & Zhao, X. (2022) Middle Pleistocene sea-level change linked to the formation of Fraser Island and initiation of the Great Barrier Reef. *Nature Geoscience*, 1752–0894. <https://doi.org/10.1038/s41561-022-01062-6>
- Lohse, K., Pierson, D., **Patton, N. R.**, Sanderman, J., Huber, D. P., Finney, B., Facer, J., Meyers, J., & Seyfried, M. (2022) Wildfire results in development of novel multi-scale ecosystem structure and function in non-forested shrubland ecosystems. *Scientific Reports*, 12(1). <https://doi.org/10.1038/s41598-022-26849-w>
- Pierson, D., Lohse, K., Wieder, W., **Patton, N. R.**, Facer, J., de Graaff, M., Georgiou, K., Seyfried, M., Flerchinger, G., & Will, R. (2022) Optimizing process-based models to predict current and future soil organic carbon stocks at high-resolution. *Scientific Reports*, 12, 10824. <https://doi.org/10.1038/s41598-022-14224-8>

- Ya-na, J., Zhang, Y., Huang, C. C., Wang, N., Qiu, H., Wang, H., Xiao, Q., Chen, D., Lin, X., Zhu, Y., Fu, L., Gu, K., & **Patton, N. R.** (2022) Late Pleistocene-Holocene aeolian loess-paleosol sections in the Yellow River source area on the northeast Tibetan Plateau: chronostratigraphy, sediment provenance, and implications for paleoclimate reconstruction. *Catena*. <https://doi.org/10.1016/j.catena.2021.105777>
- 2021**
- O’Bryan, C. J., **Patton, N. R.**, Hone, J., Lewis, J. S., Berdejo-Espinola, V., Risch, D. R., Holden M. H., & McDonald-Madden, E. (2021). Invasive wild pigs (*Sus scrofa*) as a human-mediated source of soil carbon emissions: Uncertainties and future directions. *Global Change Biology*. <https://doi.org/10.1111/gcb.15992>
 - O’Bryan, C. J., **Patton, N. R.**, Hone, J., Lewis, J. S., Berdejo-Espinola, V., Risch, D. R., Holden M. H., & McDonald-Madden, E. (2021). Unrecognized threat to global soil carbon by a widespread invasive species. *Global Change Biology*. <https://doi.org/10.1111/gcb.15769>
 - Florin, S. A., Roberts, P., Marwick, B., **Patton, N. R.**, Shulmeister, J., Lovelock, C. E., Barry, L. A., Hua, Q., Nango, M., Djandjomerr, D., Fullagar, R., Wallis, L. A., Fairbairn, A. S., & Clarkson, C. (2021). Pandanus nutshell generates a palaeoprecipitation record for human occupation at Madjedbebe, northern Australia. *Nature Ecology & Evolution*, 5(3), 295-303. <http://dx.doi.org/10.1177/09596836211019092>
 - Köhler, M., Shulmeister, J., **Patton, N. R.**, Rittenour, T. M., McSweeney, S., Ellerton, Daniel T. Ellerton, Justin C. Stout, & Hüneke, H. (2021). Holocene evolution of a barrier-spit complex and the interaction of tidal and wave processes, Inskip Peninsula, SE Queensland, Australia. *The Holocene*, 09596836211019092. <http://dx.doi.org/10.1177/09596836211019092>
 - Ya-na, J., Zhang, Y., Huang, C. C., Wang, N., Qiu, H., Wang, H., Yu, Y., Seilbike, A., Zou, M., Lin, X., Tan, Z., Liu, W., Hu, S., & **Patton, N. R.** (2021) Chronostratigraphic framework and paleoenvironmental interpretation of the Holocene loess-paleosol sequence in the Luoyang Basin, Central China. *Aeolian Research*. <https://doi.org/10.1016/j.aeolia.2020.100657>
- 2020**
- Gontz, A., McCallum, A., Ellerton, D., **Patton, N. R.**, & Shulmeister, J. (2020). The Teewah Transect: GPR-Derived Insights into the Younger Dune Morphosequences on the Great Sandy Coast, Queensland, Australia. *Journal of Coastal Research*, 95(S1), 500-504. <https://doi.org/10.2112/SI95-097.1>
 - Ellerton, D., Rittenour, T., Shulmeister, J., Gontz, A., Welsh, K. J., & **Patton, N. R.** (2020). An 800 kyr record of dune emplacement in relationship to high sea level forcing, Cooloola Sand Mass, Queensland, Australia. *Geomorphology*, 354, 106999. <https://doi.org/10.1016/j.geomorph.2019.106999>
- 2019**
- Zhang, Y., Huang, C. C., Tan, Z., Chen, Y., Qiu, H., Huang, C., Li Y., Zhang Y., Li, X., Shulmeister, J., **Patton, N. R.**, Liu, L., Zhu, Y., & Wang, N. (2019). Prehistoric and historic overbank floods in the Luoyang Basin along the Luohe River, middle Yellow River basin, China. *Quaternary international*, 521, 118-128. <https://doi.org/10.1016/j.quaint.2019.06.023>
 - Zhang, Y., Huang, C. C., Shulmeister, J., Guo, Y., Liu, T., Kemp, J., **Patton, N. R.**, Liu, L., Chen, Y., Zhou, Q., Cuan, Y., Zhao, H., & Wang, N. (2019). Formation and evolution of the Holocene massive landslide-dammed lakes in the Jishixia Gorges along the upper Yellow River: No relation to China's Great Flood and the Xia Dynasty. *Quaternary Science Reviews*, 218, 267-280. <https://doi.org/10.1016/j.quascirev.2019.06.011>
 - Shulmeister, J., Thackray, G. D., Rittenour, T. M., Fink, D., & **Patton, N. R.** (2019). The timing and nature of the last glacial cycle in New Zealand. *Quaternary Science Reviews*, 206, 1-20. <https://doi.org/10.1016/j.quascirev.2018.12.020>
 - Fellows, A. W., Flerchinger, G. N., Seyfried, M. S., Lohse, K. A., & **Patton, N. R.** (2019). Controls on gross production in an aspen–sagebrush vegetation mosaic. *Ecohydrology*, 12(1), e2046. <https://doi.org/10.1002/eco.2046>

Published Datasets

2018

- **Patton, N. R.**, K. A. Lohse, M. S. Seyfried, & M. D. Murdock. (2018). Dataset for Soil Properties Determined at the Reynolds Creek Experimental Watershed (RCEW), Idaho [Idaho State University Collections 2010-2016]. (**Boise State University Scholar Works**) <https://doi.org/10.18122/reynoldscreek/11/boisestate>
- **Patton, N. R.**, K. A. Lohse, S. E. Godsey, S. B. Parsons, & M. Seyfried. (2018). Dataset for topographic controls on total soil carbon in semi-arid environments (**Boise State University Scholar Works**) <https://doi.org/10.18122/B2XT55>
- **Patton, N. R.**, K. A. Lohse, M. Seyfried, S. Benner & R. Will. (2018). Dataset for lithology and coarse fraction adjusted bulk density estimates for determining total organic carbon stocks in dryland soils (**Boise State University Scholar Works**) <https://doi.org/10.18122/B22M6Q>
- **Patton, N. R.**, K. A. Lohse, M. Seyfried, & M. D. Murdock. (2018). Dataset: Soil properties of Johnston Draw a subcatchment of Reynolds Creek, Idaho. (**Boise State University Scholar Works**) <https://doi.org/10.18122/B2612K>
- **Patton, N. R.**, K. A. Lohse, M. Seyfried, A. G. Radke, & S. E. Godsey. (2018). Dataset: Soil properties of Reynolds Mountain East a subcatchment of Reynolds Creek, Idaho. (**Boise State University Scholar Works**) <https://doi.org/10.18122/B29T3T>
- Murdock, M. D., D. P. Huber, M. S. Seyfried, **N. R. Patton**, & K. A. Lohse. (2018). Dataset for soil hydraulic parameter estimates along an elevation gradient in dryland soils (**Boise State University Scholar Works**) <https://doi.org/10.18122/reynoldscreek10boisestate>

2017

- **Patton, N. R.**, K. A. Lohse, M. Seyfried, B.T. Crosby & S.E. Godsey. (2017). Dataset for predicting soil thickness on soil mantled hillslopes (**Boise State University Scholar Works**) <https://doi.org/10.18122/B2PM69>
- Will, R. M., S. Benner, N. F. Glenn, J. Pierce, K. A. Lohse, **N. R. Patton**, L. P. Spaete, & C. Stanbery. (2017) Mapping SOC distribution in semi-arid mountainous regions using variables from hyperspectral, LiDAR and traditional datasets (**Boise State University Scholar Works**) <https://doi.org/10.18122/B2Q598>

Patents

- Lohse, K. A., **Patton, N. R.**, Godsey, S. E., & Crosby, B. T. (2023). Soil depth measurement system and method. United States Patent, US 11567055.

Department of Defense Reports

- Hartshorn, E., Bacon, S., Harsha, G., Kielhofer, J., **Patton, N. R.**, Page, D., and Sion, B. (2023). YTC Kofa Muggins Dust Course Analysis/Life Use/Relocation Study. Prepared for U.S. Army Yuma Proving Grounds and Soil Research for Army Training Ranges, 65 p.
- Kielhofer, J., **Patton, N. R.**, and Sion, B. (2023). YPG Cold Regions Test Center Blast Area Analysis. Prepared for U.S. Army Yuma Proving Grounds and Soil Research for Army Training Ranges, 39 p.
- **Patton, N. R.**, Baish, C., Kielhofer, J., Sion, B., & McDonald, E. V. (2022). Preliminary evaluation of Fort Greely as a US analog for high-latitude environments using soil-landform characteristics. Prepared for U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, 20 p.

In Preparation

- **Patton, N. R.**, Shulmeister, J., Leng, M., Jones, M., Hua, Q., & Hughes, C. Evaluating $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ variations within a modern Biggenden Banded snail (*Figuladra bayensis*) shell using radiocarbon dating: application for past climate reconstruction.

- **Patton, N. R.**, Shulmeister, J., Leng, M., Jones, M., Hua, Q., Welsh, K., Moss, P., & Hanson J. Late Pleistocene and Holocene stable isotope and pollen records from the subtropical Coalstoun Lakes, Queensland Australia.
- Sutherland, J., Shulmeister, J., Rittenour, T., Davies, T., & **Patton, N.** Evolution of proglacial Lake Speight within the Waimakariri Valley, New Zealand. (ESPL Special Issue on feedback between valley incision, sedimentation and glacier/ice sheet stability).

CONFERENCE PRESENTATIONS AND POSTERS

2024

- **Patton, N. R.**, and Lohse, K. A. Soil density fractionation within the Critical Zone Network. CZNet GeoMicro Project Meeting in Riverside, California (Oral Presentation).
- Kielhofer, J., **Patton, N. R.**, Baish, C., Thomas, E., and Sion, B. A multiproxy paleoclimate record from a peat soil of interior Alaska: insight on mechanisms of Holocene peatland formation and landscape development. European Geosciences Union in Vienna, Austria (Poster).

2023

- **Patton, N. R.** Digging into past, present, and future landscape and climate change. University of St. Andrews, Scotland (Invited Presentation).
- **Patton, N. R.** Reconstructing Holocene fire records using dune foot-slope deposits at the Cooloola Sand Mass, Australia. International Union for Quaternary Research (INQUA) Congress in Rome (Invited Presentation).
- **Patton, N. R.** Using surface roughness to determine Holocene coastal dune ages at K'gari and Cooloola, Australia. International Union for Quaternary Research (INQUA) Congress in Rome (Poster).
- **Patton, N. R.** Reconstructing fire histories using dune depositional wedges. Friends of the Pleistocene (Invited Online Presentation).
- Sutherland, J., **Patton, N. R.**, Shulmeister, J., Rittenour, T. M., Nelson, M., and Carrivick, J. Glacial Lake Speight: A tale of two hypotheses. International Union for Quaternary Research (INQUA) Congress in Rome (Poster).
- Shulmeister, J., **Patton, N. R.**, Rittenour, T. M., Ellerton, D. T., Silva, G., Gontz, A., Hesp, P. and Welsh, K. Coastal dune timing, migration and formation on K'gari (Fraser Island) through the Quaternary. International Union for Quaternary Research (INQUA) Congress in Rome (Poster).
- Gontz, A., Shulmeister, J., **Patton, N. R.**, Rittenour, T. M., McCallum, A., Moss, P., Hofmann, H., Kemp, J., Marshal, J., Schulz, C., Ellerton, D. T., Welsh, K., and Negus, P. Stratigraphy of the World's Largest Coastal Sand System as Revealed by Ground Penetrating Radar, Great Sandy Coast, Queensland, Australia. International Union for Quaternary Research (INQUA) Congress in Rome (Poster).

2022

- **Patton, N. R.** Career development: pursuing your masters and/or doctorates degree. Pennsylvania Western University. California, PA (Invited Presentation).
- **Patton, N. R.**, Shulmeister, J., Hua, Q., Almond, P., Rittenour, T. M., Hanson, J. M., Ellerton, D. T., and Seropian, G. The geomorphic influence of wildfire on stabilized dune fields, an example from the Cooloola Sand Mass, Australia. Geological Society of America (GSA) Denver, Colorado, USA (Presentation).
- **Patton, N. R.**, Shulmeister, J., Rittenour, T. M., Almond, P., Ellerton, D., & Santini, T. Using surface-roughness dating to estimate coastal dune ages at Fraser Island and the Cooloola Sand Mass, Australia. New World Luminescence Dating Workshop. Grand Junction, Colorado, USA (Presentation).
- **Patton, N. R.** Overview of research and experience. Desert Research Institute. Online (*Presentation*).

2021

- **Patton, N. R.** Evaluating seasonal variability from carbon and oxygen stable isotope measurements of a modern Biggenden Banded snail (*Figuladra bayensis*). 15th International Conference on Accelerator Mass Spectrometry (AMS-15). Online (*Presentation*).

- **Patton, N. R.** Utilizing meteoric ^{10}Be to define the mobile-stable regolith boundary within unconsolidated sediment. 15th International Conference on Accelerator Mass Spectrometry (AMS-15). Online (*Presentation*).
- **Patton, N. R.** Validating seasonal variability from carbon and oxygen stable isotope measurements of a modern Biggenden Banded snail (*Figuladra bayensis*). Australasian Environmental Isotope Conference (AEIC). Online (*Invited Talk*).
- **Patton, N. R.** Using surface roughness to determine ages of coastal dunes at K'gari (Fraser Island) and the Cooloola Sand Mass, Australia. Australasian Quaternary Association (AQUA) Pop-Up E Conference. Online (*Presentation*).
- Gontz, A., McCallum, A., Ellerton, D., **Patton, N. R.**, & Shulmeister, J. The Teewah Transect – GPR-derived insights into the aeolian-soils relationships of the Southern Cooloola Sand Mass, Queensland, Australia. International Coastal Symposium Online from Seville (Spain) (*Poster*).

2020

- **Patton, N. R.** Measuring landscape evolution from inception to senescence; an example from the Cooloola Sand Mass, Australia. Geoscience Society of New Zealand (GSNZ) Annual Conference. Christchurch, NZ (*Presentation*).

2019

- **Patton, N. R.** Spatial Distribution and Prediction of Hillslope Soil Organic Carbon. American Geophysical Union. San Francisco, CA, USA (*Invited Speaker*).
- **Patton, N. R.** Systematic relaxation of geomorphic features: Application on the southeast Queensland dune fields, Australia. American Geophysical Union. San Francisco, CA, USA (*Poster*).
- **Patton, N. R.** Landscape evolution of the southeast Queensland dune field, Australia. Australia's Nuclear Science and Technology Organization (ANSTO). Sydney, New South Wales, AUS (*Presentation*).
- **Patton, N. R.** Evaluation of steady-state topography of the Cooloola Sand Mass, Australia. University of Utah Luminescence Laboratory. Logan, UT, USA. (*Presentation*).
- **Patton, N. R.**, D. Ellerton, J. Shulmeister, V. Bianchi, & K. Welsh. Creeping towards a steady-state topography: landscape evolution of the Cooloola Sand Mass, QLD. The Australian and New Zealand Geomorphology Group (ANZGG). Inverloch, VIC, AUS. (*Poster*).
- **Patton, N. R.** Creeping towards a steady-state topography: landscape evolution of the Cooloola Sand Mass, QLD. The Australian and New Zealand Geomorphology Group (ANZGG). Inverloch, VIC, AUS. (*Presentation*).

2018

- **Patton, N. R.** Remapping the coastal dune fields of South-east Queensland: a morphometric approach. University of Queensland. St. Lucia, QLD, AUS. (*Presentation*).
- **Patton, N. R.** Predicting soil thickness on soil-mantled hillslopes. University of Queensland. St. Lucia, QLD, AUS. (*Presentation*).
- **Patton, N. R.** Predicting soil thickness and its potential applications in Quaternary science. University of Nottingham. Beeston, UK. (*Invited Speaker*).
- Lohse, K. A., **N. R. Patton**, C. Renner, A. Commendador, J. Thomas, B. Finney, R. Macneille, K. Gossner, Z. V. Orsdel, A. Millard, S. Hill, C. Durfee, K. Hawkes, J. Facer, K. Ferguson, A. Rozin, K. Aho, M. Seyfried, & F. Pierson. Temporal variation in soil carbon cycling in response to wildfire in the Reynolds Creek Critical Zone Observatory, Idaho, USA. American Geophysical Union. San Francisco, CA, USA. (*Poster*).
- Zellman, M. S., C. B. DuRoss, G. D. Thackray, R. W. Briggs, N. Cholewinski, T. Reyes, **N. R. Patton**, and S. A. Mahan. A paleoseismic investigation of the northern Teton fault at the Steamboat Mountain trench site, Grand Teton National Park, Wyoming. Seismological Society of America. Miami, FL. (*Poster*).

2017

- Radke, A. G., S. E. Godsey, K. A. Lohse, M. S. Seyfried, D. P. Huber, **N. R. Patton**, & W. S. Holbrook. Spatiotemporal heterogeneity of dissolved organic carbon in waters and soils of a snow-dominated headwater catchment. American Geophysical Union. New Orleans, LA, USA. (*Poster*).

- **Patton, N. R.** Continuing your education in graduate school. California University of Pennsylvania. California, PA, USA (*Invited Speaker*).
 - **Patton, N. R.**, K. Lohse, M. Seyfried, B. Crosby, & S. Godsey. Predicting soil thickness and total organic carbon on soil mantled hillslopes. Critical Zone All Hands Meeting. Washington, DC, USA. (*Poster*).
 - Ripley, K., **N. R. Patton**, & K. Lohse. Examining and comparing unique soil profiles in Reynolds Creek, Idaho. Idaho State University Research Symposium. Pocatello, ID, USA. (*Poster*).
- 2016**
- **Patton, N. R.**, K. Lohse, R. Will, S. Benner, & M. Seyfried. Coarse fraction adjusted bulk density estimates using soil organic carbon and matter in a complex terrain. Critical Zone All Hands Meeting. Boise, ID, USA (*Poster*).
 - Commendador, A., B. Finney, **N. R. Patton**, & K. Lohse. Stable carbon and nitrogen isotopes in soils and plants along a climatic gradient. Critical Zone All Hands Meeting. Boise, ID, USA. (*Poster*).
 - Radke, A., **N. R. Patton**, K. Lohse, & S. Godsey. Hydrologic-geophysical impacts on soil carbon export in a snow-dominated headwater catchment. Critical Zone All Hands Meeting. Boise, ID, USA. (*Poster*).
 - Lohse, K. A., **N. R. Patton**, A. Fellows, P. Kormos, G. Flerchinger, M. Seyfried, E. McCorkle, & R. MacNeill. Taking the pulse of the skin of the earth: quantifying the spatial and temporal variability in soil biogeochemical cycling. American Geophysical Union. San Francisco, CA, USA. (*Poster*).
- 2015**
- **Patton, N. R.**, K. Lohse, M. Seyfried, B. Crosby, & S. Godsey. Determining total soil carbon storage in the critical zone using topography and lithology. American Geophysical Union. San Francisco, CA, USA. (*Poster*).
 - **Patton, N. R.**, K. Lohse, M. Seyfried, B. Crosby, & S. Godsey. Determining soil thickness and carbon storage in the critical zone, Idaho State University Research Symposium. Pocatello, ID, USA (*Poster*).
 - Will, R., Stanbery, C., Seyfried, M., Pierce, J., Lohse, K., Flores, A., Glenn, N., Spaete, L., **Patton, N. R.**, Black, C., Good, A., & S. Benner. Mapping the organic carbon content of soils (SOC) in the Reynolds Creek Watershed. Great Basin Consortium. Boise, ID, USA. (*Poster*).
- 2014**
- **Patton, N. R.**, M. Seyfried, T. Link, & K.A. Lohse. Controls of parent material and topography on soil carbon storage in the critical zone. American Geophysical Union. San Francisco, CA, USA. (*Poster*).
 - Seyfried, M., T. Link, Z. Klos, **N. R. Patton**, & K.A. Lohse. Ecohydrological implications of contrasting slope and aspect in complex terrain. American Geophysical Union. San Francisco, CA, USA. (*Poster*).
 - Will, R., Stanbery, C., Seyfried, M., Pierce, J., Lohse, K., Flores, A., Glenn, N., Spaete, L., **Patton, N. R.**, Black, C., Good, A., & S. Benner. Mapping the organic carbon content of soils (SOC) in the Reynolds Creek Watershed. CZO All Hands Meeting. (*Poster*).
 - **Patton, N. R.**, M. Seyfried, T. Link, & K.A. Lohse. Controls of parent material and topography on soil carbon storage. Critical Zone All Hands Meeting. Yosemite National Park, CA (*Poster*).
 - Jurkowski, C., D. Harris, & **N. R. Patton**. Geochemical analysis and classification of the Gates-Adah kimberlite dike. American Geophysical Union Fall Meeting 2014. San Francisco, CA, USA. (*Poster*).
 - **Patton, N. R.**, C. Killian, C. Jurkowski, & K. Fredrick. Inorganic ions contributing to elevated conductivity in Oregon Hollow wetland: A headwater tributary of Pike Run Watershed, Washington County, PA, USA. Pittsburgh Geological Society (*Poster*).
- 2013**
- **Patton, N. R.**, C. Killian, C. Jurkowski, & K. Fredrick. Water quality indicators of Oregon Hollow wetland: A headwater tributary of Pike Run Watershed, Washington County, Pennsylvania. Geological Society of America. Denver, CO, USA. (*Poster*).
 - **Patton, N. R.**, C. Killian, C. Jurkowski, M. Li & K. Fredrick. Investigation of inorganic species in Oregon Hollow wetland: Washington County, Pennsylvania. PASSHE Undergraduate Research Conference in Science, Technology, Engineering, and Mathematics. Slippery Rock University, PA, USA. (*Poster*).
- 2012**
- **Patton, N. R.** Identifying demographics surrounding parks: Frick, Schenley, Riverview and Highland Parks. Pittsburgh Park Conservancy, Pittsburgh, PA, USA. (*Poster*).

AWARDS, GRANTS, & HONORS

2024

- Idaho Global Entrepreneurial Mission Initiative Higher Education Research Council (IGEM-HERC) Grant (IGEM25-004) - *Demonstration of soil thickness and carbon (STC) method*: **\$350,000**

2023

- ANSTO Research Portal Proposal - *Meteoritic ¹⁰Be*: **\$40,000**
- ITAP Research Funding: **\$3,490**
- INQUA 2023 Congress in Rome Travel Grant: **\$2150**

2022

- UC Foundation Doctoral Publication Prize: **\$2000**

2021

- UC Foundation Doctoral Publication Prize: **\$500**
- Mason Trust Grant – *Predicting dune emplacement ages*: **\$877**
- Australasian Quaternary Association (AQUA) - *Best conference presentation*
- ¹⁴C Award - *Centre of Excellence for Australian Biodiversity and Heritage*: **\$8,000**

2020

- Mason Trust Grant - *Landscape evolution of coastal dunes*: **\$3,335**
- ANSTO Research Portal Proposal - *Dune erosion rates using ¹⁴C dating*: **\$20,534**
- ANSTO Research Portal Proposal - *Meteoritic ¹⁰Be*: **\$37,800**
- ANSTO Research Portal Proposal - *Radiocarbon dating charcoal*: **\$4,440**

2019

- ANSTO Research Portal Proposal - *Radiocarbon dating of terrestrial snail shells*: **\$5,920**
- ANSTO Research Portal Proposal - *Insitu and meteoric ¹⁰Be*: **\$13,440**
- Australian & New Zealand Geomorphology Group Travel Grant: **\$360**

2015

- Idaho State University Travel Grant: **\$548**

2014

- Idaho State University Travel Grant: **\$653**
- Pittsburgh Geological Society Outstanding Student Research Poster

2013

- California University of Pennsylvania Earth Science Award
- Pennsylvania STEM Undergraduate Top Research Award

2011

- California University Residence Life Academic Excellence Award
- Certificate of Achievement for "The 7 Habits of Highly Effective People"

OUTREACH

2023

- **The Conversation:** A new source of fire records, hidden in the sands, gives us a bigger picture of the risks. https://theconversation.com/a-new-source-of-fire-records-hidden-in-the-sands-gives-us-a-bigger-picture-of-the-risks-205558?utm_source=twitter&utm_medium=bylinetwitterbutton

2022

- **Desert Research Institute Press Release:** Scientists Uncover Conditions Key to Formation of the Great Barrier Reef. <https://www.dri.edu/scientists-uncover-conditions-key-to-formation-of-the-great-barrier-reef/>

2021

- **Quaternary Australasian – Volume 38:** AQUA Conference Report
- **The Conversation:** One of the most damaging invasive species on Earth': wild pigs release the same emissions as 1 million cars each year. <https://theconversation.com/one-of-the-most-damaging-invasive-species-on-earth-wild-pigs-release-the-same-emissions-as-1-million-cars-each-year-163250>
- **The Conversation:** Los jabalíes, una de las especies invasoras más dañinas, liberan cada año las mismas emisiones que un millón de automóviles. https://theconversation.com/los-jabalies-una-de-las-especies-invasoras-mas-daninas-liberan-cada-ano-las-mismas-emisiones-que-un-millon-de-automoviles-164802?utm_source=twitter&utm_medium=bylinetwitterbutton
- **The Conversation:** Burnt ancient nutshells reveal the story of climate change at Kakadu — now drier than ever before. https://theconversation.com/burnt-ancient-nutshells-reveal-the-story-of-climate-change-at-kakadu-now-drier-than-ever-before-152760?utm_source=twitter&utm_medium=bylinetwitterbutton

2019

- **ANZGG Newsletter:** Digging for the truth- Landscape evolution of the Southeast Queensland Dune fields

2018

- **British Geological Survey (BGS) GEOBLOG Newsletter:** Getting a taste for Australian drought history. <http://britgeopeople.blogspot.com/2018/10/getting-taste-for-australian-drought.html>

PROFESSIONAL SERVICE & ACTIVITIES

Past and Current Affiliations

- American Geophysical Union (AGU)
- Australasian Environmental Isotope Group
- Australasian Quaternary Association (AQUA) - *NZ Representative*
- Australian & New Zealand Geomorphology Group (ANZGG)
- Australian Nuclear Science and Technology Organization (ANSTO)
- Australian Regolith Geoscientist Alliance (ARGA)
- British Geological Survey (BGS)
- British Society for Geomorphology (BSG)
- Center for Archaeology, Materials and Applied Spectroscopy (CAMAS)
- Center for Ecological Research and Education (CERE)
- Centre of Excellence for Australian Biodiversity and Heritage (CABAH)
- Critical Zone Observatories (CZO)
- European Geophysical Union (EGU) Geomorphology Division
- Geological Society of America (GSA)
- Pittsburgh Geological Society (PGS)
- Reynolds Creek Critical Zone Observatory (RC-CZO)

Invited Reviewer for Journal Publication

- Nature Geoscience
- Environmental Earth Science
- Soil Science Society of America
- Earth Surface Dynamics

Session Convener

- Australasian Quaternary Association/Friends of the Pleistocene Pop-up Conference: 2021 Session 1 – Lake, Rivers, and Landscapes

Community Outreach

- Reviewer on Undergraduate Research Opportunity Program (UROP) Summer 2023 and Academic Year 2023-2024
- Judge at the DRI's 2023 Research Symposium
- Reviewer on the 2023 INQUA/AQUA Student Travel Grant to Rome