

Elizabeth A. Holley

Professor

Department of Mining Engineering

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Summary of Qualifications

Professor Elizabeth Holley is an exploration and mining geologist who studies the processes responsible for ore deposit genesis, as well as the geologic characteristics that determine how ore bodies are developed, mined, and reclaimed. Her interdisciplinary work examines strategic pathways for critical mineral supply and the intersections between technical and social risks in mining, and she is a fellow of the Payne Institute for Public Policy. Dr. Holley's Mining Geology Research Group has raised over \$85 million in research funds, including support from the Department of Energy, National Science Foundation, CDC NIOSH, the USGS, major and mid-tier mining companies, and philanthropic foundations. Her work has been published in *Science*, *Nature Energy*, *Washington Post*, *NPR*, and in Congressional reports and testimonies. Dr. Holley has worked in the industry on five continents, and she contributed to the discovery of the White Gold deposit in the Yukon. She organized nearly 200 professional development short courses for the Society of Economic Geologists, is a fellow of the society, and served as the 2022 Society of Economic Geologists Distinguished Lecturer. In 2024 Dr. Holley became a standing member of the National Academies Committee on Earth Resources.

Education

Ph.D. Geology (GPA 4.0), 2012, Colorado School of Mines, Golden, CO

M.S. Geochemistry (with distinction), 2006, University of Otago, Dunedin, NZ

B.A. Geology (GPA 3.72), 2004, Pomona College, Claremont, CA

Current Position

2026 – Present, Professor of Mining Engineering

2020 – 2026, Associate Professor of Mining Engineering

2021 – Present, Lead Investigator, National Science Foundation “Responsible Critical Minerals” team awarded Phase 2 in Growing Convergence Program

2020 – Present, Site Director, NSF/Industry funded Center to Advance the Science of Exploration to Reclamation in Mining

2014 – Present, Primary Investigator, Mining Geology Research Group

Previous Experience

2014 – 2020 Assistant Professor of Mining Engineering

2012 – 2014 Assistant Teaching Professor of Geology and Geological Engineering

2010 – 2012 Adjunct Faculty, Environmental Sciences, Regis University

2009 – 2012 PhD fellowship, funded by Barrick Gold Corporation

2009 – 2009 Exploration Geologist, Ur-Energy, USA

2006 – 2009 Project Geologist, Underworld Resources, Yukon and sister companies
Reunion Gold Corporation, Suriname; Queensland Minerals, Australia

2005 – 2006 Rotary Ambassadorial Scholar to New Zealand

2004 – 2005 Geologist, Geothermal Surveys, Inc, California

Teaching

*MNGN 335: Communities and Natural Resources (designed new version in 2023)
*MNGN 298/528: Sustainable Mining field school (new course designed in 2022)
*GEOL 311/MNGN 311: Mining Geology
*MNGN 528: Graduate Mining Geology
GEOL 310/MNGN 310: Earth Materials and Resources
MNGN 428/429: Mine Evaluation and Design
GEGN 403: Mineral Exploration Design
MNGN 598: Mining Geology of the Western US: Field School
MNGN 625: Graduate Mining Seminar
GEOL 520: New Developments in the Geology and Exploration of Mineral Deposits
GEOL 523: Reflected Light and Electron Microscopy
Regis University: Environmental Chemistry, Environmental Science, Geology 101

Publications

Book Chapters

2. Simon, A., Howell, R., Chang, Z., **Holley, E.A.**, Ovalle, J., Smith, N., del Real, I., Tassara, S., 2025. Encyclopedia of Volcanoes, 3rd edition, C. Bonadonna, editor. Academic Press.
1. Holley, E.A., Mitcham, C., 2012. The Pebble Mine dialogue: A preliminary analysis of an effort to integrate geoscience, market exploitation, and the public good. *Participation and Scientific Culture: International Perspectives*, I. Díaz García and A. Muñoz van Eynde, eds, Arbor / Los Libros de La Catarata, Madrid, Spain.

Selected Media and Commentaries

18. Washington Post, 2025. Here's a source for critical minerals – hiding in plain sight (invited Op-Ed by **E.A. Holley** and P.P. Nelson).
<https://www.washingtonpost.com/opinions/2025/09/01/critical-minerals-rare-earths-recovery/>
17. Arizona Public Radio, 2025. Recovering just 1% of mining waste could reduce reliance on imported critical minerals (featuring study by **E.A. Holley**)
<https://www.kjzz.org/the-show/2025-10-06/report-recovering-just-1-of-mining-waste-could-reduce-reliance-on-imported-critical-minerals>
16. The Spokesman-Review, 2025. 'Mine, baby, mine': U.S. government's critical mineral crusade comes to Idaho, spurring fears from tribe, conservation groups (featuring study by **E.A. Holley**).
<https://www.spokesman.com/stories/2025/oct/12/mine-baby-mine-us-governments-critical-mineral-cru/>
15. New Scientist, 2025. We could get most metals for clean energy without opening new mines (featuring study by **E.A. Holley**).
<https://www.newscientist.com/article/2493449-we-could-get-most-metals-for-clean-energy-without-opening-new-mines/>
14. Grist, 2025. US mines are literally throwing away critical minerals (featuring study by **E.A. Holley**). <https://grist.org/science/us-mines-are-literally-throwing-away-critical-minerals/>

13. Chemistry World, 2025. Unrecovered byproducts from US mines could meet the country's demand for dozens of critical materials (featuring study by **E.A. Holley**). <https://www.chemistryworld.com/news/unrecovered-byproducts-from-us-mines-could-meet-the-countrys-demand-for-dozens-of-critical-materials/4022055.article>
12. Mining.com, 2025. Tailings could meet much of US critical mineral demand <https://www.mining.com/americas-critical-minerals-may-lie-in-its-own-mining-waste/>
11. Institute of Materials, Minerals & Mining, 2025. Stop throwing away critical minerals, USA told (featuring study by **E.A. Holley**). <https://www.iom3.org/resource/stop-throwing-away-critical-minerals-usa-told.html>
10. Earth.com, 2025. Buried treasure: The U.S. is throwing away its critical minerals (featuring study by **E.A. Holley**). <https://www.earth.com/news/buried-treasure-the-u-s-is-throwing-away-its-critical-minerals/>
9. Energy Voice, 2025. US could eliminate critical minerals imports – they're all in-house (featuring study by **E.A. Holley**). <https://www.energyvoice.com/insights/energy-opinion/581236/us-could-eliminate-critical-minerals-imports-theyre-all-in-house/>
8. Science News, 2025. Useful metals get unearthed in U.S. mines, then they're tossed (featuring study by **E.A. Holley**). <https://www.sciencenews.org/article/useful-metals-tossed-us-mines>
7. TechSpot, 2025. Study finds US could replace key mineral imports by recycling mine waste (featuring study by **E.A. Holley**). <https://www.techspot.com/news/109192-study-finds-us-could-replace-key-mineral-imports.html>
6. Mining.com, 2025. "Good Samaritan program may aid stalled mine cleanups (Op-Ed by *Morgan, M., Handler, B., **Holley, E.A.**) <https://www.mining.com/good-samaritan-program-may-deliver-where-mine-cleanup-has-stalled/>
5. BBC, 2025. The unexpected knock-on effect of Trump's critical minerals deal (E. Stallard interview of **E.A. Holley**). <https://www.bbc.com/news/articles/c30mjedjzgpo>
4. Colorado Sun, 2025. Leadville and other Colorado communities stand to benefit as president signs Good Samaritan Act (Op-Ed by *Morgan, M., **Holley, E.A.**, Smith, N.). <https://coloradosun.com/2025/01/02/opinion-colorado-good-samaritan-mining-act-benefits/>
3. National Public Radio, 2024. The American industry that wants more government intervention (K. Siegler interview of **E.A. Holley**). <https://www.npr.org/transcripts/nx-s1-5220261>
2. **Holley, E.A.**, Bullock, R., Nelson, P., Spiller, D.E., Hastings-Simon, S., 2021. Critical minerals and the legacy mine environment: a proposed data collection program to help address the US critical minerals gap. *Payne Institute for Public Policy Commentaries*. <https://www.mines.edu/global-energy-future/critical-minerals-and-the-legacy-mine-environment-a-proposed-data-collection-program-to-help-address-the-u-s-critical-minerals-gap/>
1. **Holley, E.A.**, 2019. Pebble, Alaska: Teaching economic geology and its broader context through a case study of a controversial mining project. *In the Trenches*, April 2019, National Association of Geoscience Teachers. https://nagt.org/nagt/publications/trenches/v9-n2/pebble_alaska_teaching_economi.html

Referred Journal Articles

*indicates student or postdoctoral mentee of E. Holley

† indicates student or postdoctoral mentee of a collaborator

57. *Gibbs, G., Kim, J., **Holley, E.A.**, Smith, N., 2026. Material flow analysis of present and projected production chains of US nickel and cobalt for lithium-ion batteries. *Resources, Environment and Sustainability*, v. 25, 100325.
<https://doi.org/10.1016/j.resenv.2026.100325>.
56. Malone, A., Brett, A., Spiller, E., Battalora, L., **Holley, E.A.**, Fitzgerald, F., *Ruppert, C., *Reyes, A., Jann, J., 2026. Geotechnical, economic, social, and environmental dimensions of direct lithium extraction (DLE) from Smackover brines in Arkansas. *Environmental Research: Energy*.
<https://doi.org/10.1088/2753-3751/ae3e91>
55. **Holley, E.A.**, *Hadden, K.M., Hammerling, D., Eggert, R., Spiller, D.E., Nelson, P.P., 2025. By-product recovery from US metal mines could reduce import reliance for critical minerals. *Science*, v. 389, no. 6767, p. 1325-1331.
<https://www.science.org/doi/10.1126/science.adw8997>
54. *Morgan, M., Mathur, R., **Holley, E.A.**, Lasinsky, C., 2026. Cu isotopes resolve acid mine drainage source and treatment pathways at the Argo Tunnel Water Treatment Plant. *Chemical Geology*, 123250.
<https://doi.org/10.1016/j.chemgeo.2026.123250>
53. **Holley, E.A.**, *Fahle, L., Smith, N.M., †Deberdt, R., †Calderon, J., *Gibbs, G., Bazilian, M., 2025. Graphite and manganese mining in the US: proposed projects and federal battery mineral policies. *Resources Policy*, 105689.
<https://doi.org/10.1016/j.resourpol.2025.105689>
52. *Harris, I., **Holley, E.A.**, Spiller, E., Karl, S., *in review*. Methods to assess and concentrate critical minerals in mine waste: a case study of legacy placer tailings in Flat, Alaska. *Journal of Cleaner Engineering*.
51. *Meyer, J.M., Kokaly, R.F., Goldman, M.A., Holloway, J.M., **Holley, E.A.**, *in review*. Fusion of hyperspectral and LiDAR data collected in Yellowstone National Park – workflows, interpretations, and lessons learned. *International Journal of Applied Earth Observation and Geoinformation*.
50. †Simon, I., Pfaff, K., Ranville, J., Guillen, M., Ticona-Corrales, S., **Holley, E.**, 2025. Mineralogical controls on acid mine drainage from tailings in Arequipa, Peru. *Mine Water and Environment*.
<https://doi.org/10.1007/s10230-025-01063-y>
49. **Holley, E.A.**, Smith, N., Malone, A., *Fahle, L., Eggert, R., Lee, J., Bazilian, M., 2025. Nickel and cobalt availability from U.S. mines and refineries: Assessment of five dimensions of mineral availability. *Resources Policy*, 105687.
<https://doi.org/10.1016/j.resourpol.2025.105687>
48. *Brett, A., **Holley, E.A.**, Deberdt, R., *Fahle, L., Smith, N.M., 2025. Lithium production in the United States: Sociotechnical review of sites, environmental impacts, social acceptance. *Resources Policy*, 105599.
<https://doi.org/10.1016/j.resourpol.2025.105599>
47. **Holley, E.A.**, *Fahle, L., *Zaronikola, N., Malone, A., Nelson, P., Spiller, E., Bullock, R., 2025. U.S. industry practices and attitudes towards reprocessing mine

- tailings for metal recovery. *Resources Policy*, 105643.
<https://doi.org/10.1016/j.resourpol.2025.105643>
46. *Huff, D.E., **Holley, E.A.**, Guenther, W., 2025. Geochronology and thermochronology of the northern Battle Mountain district, Nevada. *Economic Geology*, v. 120, p. 137–169.
<https://doi.org/10.5382/econgeo.5114>
 45. **Holley, E.A.**, 2024. Community benefit agreements are key to mining battery minerals on public lands. *Nature Energy*.
<https://doi.org/10.1038/s41560-024-01636-1>
 44. **Holley, E.A.**, Jilly-Rehak, C., Sack, P., Phillips, D.L., Gopon, P., 2024. Nanoscale characteristics of Carlin-like auriferous pyrite from the Nadaleen Trend, Yukon. *Economic Geology*, v. 119, p. 1643–1666.
<https://doi.org/10.5382/econgeo.5107>
 43. Malone, A., Smith, N., Deberdt, R., **Holley, E.A.**, 2024. Could Justice40 reproduce injustices in the critical minerals sector? *Environmental Science and Policy*, v. 161, 103894.
<https://doi.org/10.1016/j.envsci.2024.103894>
 42. †Keevil, H.A., Monecke, T., Goldfarb, R.J., **Holley, E.A.**, Feng, T., 2024. Genesis of the White Mountain gold deposit, Jilin Province, China, and exploration implications for sedimentary rock-hosted gold. *Economic Geology*, v. 118, p. 1715–1743.
<https://doi.org/10.5382/econgeo.5113>
 41. *Delgado Jimenez, J.A., Smith, N.M., **Holley, E.A.**, 2024. Towards sustainable ASM-based livelihoods: the role of institutional arrangements in the formalization of artisanal and small-scale mining. *Resources Policy*, v. 94, 105129.
<https://doi.org/10.1016/j.resourpol.2024.105129>
 40. *Huff, D.E., Fithian, M.T., *Fulton, A.A., **Holley, E.A.**, 2024. Gold deportment, quartz textures, and fluid characteristics in the Red Dot sulfide zone at Marigold Mine, Nevada. *Economic Geology*, v. 119, p. 1587–1609.
<https://doi.org/10.5382/econgeo.5109>
 39. **Holley, E.A.**, *Fulton, A.A., Jilly-Rehak, C., Gorman, B., 2024. Trace element zonation in Carlin-type pyrite: tracking ore-forming processes at the nanoscale. *Economic Geology*, v. 119, p. 1139–1169.
<https://doi.org/10.5382/econgeo.5089>
 38. †Simon, I., Pfaff, K., Sitchler, A.N., *Crespo, J., **Holley, E.A.**, Vanzin, G., Guillen, M., Ticona-Corrales, S., Sharp, J.O., 2024. Geological and anthropogenic contributions of metal(loid)s in the artisanal and small-scale (ASM) mining-impacted Ocoña watershed of Arequipa, Peru. *Applied Geochemistry*, v. 168, 106028.
<https://doi.org/10.1016/j.apgeochem.2024.106028>
 37. *Meyer, J.M., **Holley, E.A.**, Kokaly, R.F., 2024. Hyperspectral mapping of hydrothermal sericite, Battle Mountain mining district, Nevada. *Journal of Geochemical Exploration*, v. 259, 107395.
<https://doi.org/10.1016/j.gexplo.2024.107395>
 36. *Crespo, J., **Holley, E.A.**, Pfaff, K., Thompson, J.A., Fulton, A., Jilly-Rehak, C., 2024. Characteristics and evolution of quartz-calcite-sulfide veins in the Nazca-Ocoña belt, Perú. *Ore Geology Reviews*, v. 165, 105895.

- <https://doi.org/10.1016/j.oregeorev.2024.105895>
35. †Calderon Lee, J., Smith, N.M., Bazilian, M., **Holley, E.A.**, 2024. Critical mineral demand estimates for low-carbon technologies: What do they tell us and how can they evolve? *Renewable and Sustainable Energy Reviews*, v. 189, 113938.
<https://doi.org/10.1016/j.rser.2023.113938>
 34. Martínez, G., García-Chevesich, P.A., Guillen, M., Tejada-Purizcana, T., Martinez, K., Ticona, S., Novoa, H.M., *Crespo, J., **Holley, E.A.**, McCray, J.E., 2024. Urban Stormwater Quality in Arequipa, Southern Peru: An Initial Assessment. *Water*.
<https://doi.org/10.3390/w16010108>
 33. *Fahle, L., Petruska, A.J., Walton, G., Brune, J.F., **Holley, E.A.**, 2024. Advancing Geotechnical Analysis with Octree-based Processing: Voxel-Level Integration of Mobile Laser Scanning Data, Geological Models, and Microseismic Data. *Rock Mechanics and Rock Engineering*, v. 57, p. 2661-2680.
<https://doi.org/10.1007/s00603-023-03704-6>
 32. *Zaronikola, N., **Holley, E.A.**, Mathur, R., Pace, D., 2023. Copper isotopes and constraints on ore genesis of Cu-Co deposits, Idaho Cobalt Belt, USA. *Minerals*.
<https://doi.org/10.3390/min13111355>
 31. Malone, A., Smith, N., **Holley, E.**, Bazilian, M., 2023. Prospects for American cobalt: Reactions to mine proposals in Minnesota and Idaho. *Energy Research and Social Science*, v. 104, 103284.
<https://doi.org/10.1016/j.erss.2023.103284>
 30. *Contreras Inga, C., Sinha, S., Walton, G., **Holley, E.A.**, 2023. Modeling Brazilian Tensile Strength Tests on a Brittle Rock Using Deterministic, Semi-deterministic, and Voronoi Bonded Block Models. *Rock Mechanics and Rock Engineering*, v. 56, p. 5293-5313.
<https://doi.org/10.1007/s00603-023-03329-9>
 29. *Crespo, J., **Holley, E.A.**, Pfaff, K., Guillen, M., Ticona, S., †Simon, I., Lizaga, I., Garcia-Chevesich, P., Martinez, G., 2023. Tracking sediment provenance applying a linear mixing model approach using R's FingerPro package, in the Mining-Influenced Ocoña watershed, Southern Peru. *Sustainability*.
<https://doi.org/10.3390/su151511856>
 28. **Holley, E.A.**, *Zaronikola, N., *Trouba, J., Pfaff, K., *Thompson, J., Spiller, E., Anderson, C., Eggert, R., 2023. Cobalt mineralogy at the Iron Creek deposit, Idaho Cobalt Belt, USA: Implications for domestic critical mineral production. *Geology*, v. 51, p. 773-778.
<https://doi.org/10.1130/G51160.1>
 27. *Fahle, L., Petruska, A.J., Walton, G., Brune, J.F., **Holley, E.A.**, 2023. Development and testing of octree-based intra-voxel statistical inference to enable real-time geotechnical monitoring of large-underground spaces with mobile laser scanning data. *Remote Sensing*, v. 15.
<https://doi.org/10.3390/rs15071764>
 26. **Holley, E.A.**, Phillips, D.L., 2022. Solving geological mixing problems with Bayesian tracer models: A demonstration of the method applied to Carlin-type pyrite. *Journal of Geochemical Exploration*, v. 242, 107091.
<https://doi.org/10.1016/j.gexplo.2022.107091>

25. **Holley, E.A.**, *Rodriguez Novoa, O.F., Redwood, S.D., Smith, N.A., 2022. Coexistence of large-scale mining with artisanal and small-scale mining – A guide for geologists. *SEG Discovery*, v. 130, p. 22-34.
<https://doi.org/10.5382/Geo-and-Mining-16>
24. *Rodriguez Novoa, F., **Holley, E.A.**, 2022. Coexistence between large-scale mining (LSM) and artisanal and small-scale mining (ASM) in Peru and Colombia. *Resource Policy*, v. 80, 103162.
<https://doi.org/10.1016/j.resourpol.2022.103162>
23. *Delgado, A.D., Smith, N.A., **Holley, E.A.**, 2022. Capitals in artisanal and small-scale mining in Marmato, Colombia: Using the sustainable livelihoods framework to inform formalization. *The Extractive Industries and Society*, v. 12, 101157.
<https://doi.org/10.1016/j.exis.2022.101157>
22. *Fahle, L., **Holley, E.A.**, Walton, G., Petruska, A.J., Brune, J.F., 2022. Analysis of SLAM-based Lidar data quality metrics for geotechnical underground monitoring. *Mining, Metallurgy & Exploration*, v. 39, p. 1939-1960.
<https://doi.org/10.1007/s42461-022-00664-3>
21. **Holley, E.A.**, *Fulton, A., Jilly-Rehak, C., Johnson, C., Pribil, M., 2022. Nanoscale isotopic evidence resolves controversial origins of Carlin-type gold. *Geology*, v. 50, p. 660-664
<https://doi.org/10.1130/G49888.1>
20. *Meyer, J., **Holley, E.A.**, Kokaly, R., 2022. Hyperspectral remote sensing of white mica: A review of imaging and point-based spectrometer studies for mineral resources, with spectrometer design considerations. *Remote Sensing of Environment*.
<https://doi.org/10.1016/j.rse.2022.113000>
19. *Contreras, C., Walton, G., **Holley, E.A.**, 2021. Statistical assessment of the effects of grain structure representation and micro-properties on the behavior of bonded block models for brittle rock damage prediction. *Sustainability*, special issue “Advances in Rock Mechanics and Geotechnical Engineering.” v. 13.
<https://doi.org/10.3390/su13147889>
18. *Teschner, B., **Holley, E.A.**, 2021. Participation or Frustration? Local stakeholders and the National Environmental Policy Act (NEPA): Donlin Gold, Western Alaska. *Extractive Industries and Society*, 100962.
<https://doi.org/10.1016/j.exis.2021.100962>
17. *Crespo, J., **Holley, E.**, Pfaff, K., Guillen, M., Huamani, R., 2020. Ore mineralogy, trace element geochemistry and geochronological constraints at the Mollehuana and San Juan de Chorunga Au-Ag vein deposits in the Nazca-Ocoña Metallogenic Belt, Arequipa, Peru. *Minerals*, v. 10.
<https://doi.org/10.3390/min10121112>
16. *Huff, D.E., **Holley, E.A.**, Guenther, W.R., †Kaempfer, J.M., 2020. Fe-oxides in jasperoids from two gold districts in Nevada: characterization, geochemistry, and (U-Th)/He dating. *Geochimica et Cosmochimica Acta*, v. 286, p. 72-102.
<https://doi.org/10.1016/j.gca.2020.07.014>
15. *Nicco, M., **Holley, E.A.**, Hartlieb, P., Pfaff, K., 2020. Mineralogical controls on microwave-induced cracking of granites. *Rock Mechanics and Rock Engineering*.
<https://doi.org/10.1007/s00603-020-02189-x>

14. **Holley, E.A.**, Smith, N., *Delgado-Jimenez, A., †Casabuenas Cabezas, I., Restrepo-Baena, O.J., 2020. Socio-technical context of the interactions between large-scale and small-scale mining in Marmato, Colombia. *Resources Policy*.
<https://doi.org/10.1016/j.resourpol.2020.101696>
13. *Teschner, B., **Holley, E.A.**, 2019. The cost of mine suspension from social conflict: A decision tree model. *Resources Policy*.
<https://doi.org/10.1016/j.resourpol.2019.101443>
12. *Young, M., Walton, G., **Holley, E.**, 2019. Factors predictive of roof instability in addition to the existing CMRR criteria at two case study coal mines. *Journal of Coal Geology*, v. 13.
<https://doi.org/10.1016/j.coal.2019.103255>
11. **Holley, E.A.**, *Lowe, J.A., Johnson, C.A., Pribil, M.J., 2019. Magmatic-hydrothermal gold mineralization at the Lone Tree Mine, Battle Mountain, Nevada. *Economic Geology*, v. 114, p. 811-856.
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10. *Young, M., Walton, G., **Holley, E.**, 2019. Investigation of factors influencing roof stability at a Western U.S. longwall coal mine, *International Journal of Mining Science and Technology*, v. 29, p. 139-143.
<https://doi.org/10.1016/j.ijmst.2018.11.019>
9. **Holley, E.A.**, *Yu, Y.T., Sitchler, A., Winterton, J., 2018. Quantitative mineralogy and geochemistry of pelletized sulfide-bearing gold concentrates in an alkaline heap leach, *Hydrometallurgy*, v. 181, p. 130-142.
<https://doi.org/10.1016/j.hydromet.2018.06.017>
8. *Fithian, M.T., **Holley, E.A.**, Kelly, N.M., 2018. Geology of the Marigold gold deposits, Battle Mountain district, Nevada, *Reviews in Economic Geology: Diversity of Carlin-type deposits*, J. Muntean, ed., v. 20, p. 120-155. *Invited contribution; special publication not available online*.
7. *Nicco, M., **Holley, E.A.**, Hartlieb, P., Kaunda, R., Nelson, P.P., 2018. Comprehensive method for characterization of induced rock fractures: a case study of microwave irradiated granodiorite, *Rock Mechanics and Rock Engineering*, v. 51 no. 7, p. 2075-2093.
<https://doi.org/10.1007/s00603-018-1445-x>
6. **Holley, E.A.**, Monecke, T., Bissig, T., Reynolds, T.J., 2017. Evolution of high-level magmatic-hydrothermal systems: new insights from ore paragenesis of the Veladero high-sulfidation epithermal Au-Ag deposit, El Indio-Pascua belt, Argentina, *Economic Geology*, v. 112, p. 1747-1771.
<https://doi.org/10.5382/econgeo.2017.4528>
5. **Holley, E.A.**, 2017. Engaging mining engineers in geoscience through case studies and active learning. *Journal of Geoscience Education*, v. 65, n. 3, p. 240-249.
<https://doi.org/10.5408/16-145.1>
4. **Holley, E.A.**, Bissig, T., Monecke, T., 2016. The Veladero high-sulfidation epithermal gold deposit, El Indio-Pascua belt, Argentina: Geochronology of alunite and jarosite. *Economic Geology*, v. 111, p. 311-330.
<https://doi.org/10.2113/econgeo.111.2.311>
3. **Holley, E.A.**, Mitcham, C., 2016. The Pebble Mine dialogue: a case study in public engagement and the social license to operate. *Resources Policy*, v. 47, p. 18-27.
<https://doi.org/10.1016/j.resourpol.2015.11.002>

2. **Holley, E.A.**, Craw, D., Kim, J.P., 2010. Natural and mining-related mercury in an orogenic greywacke terrane, South Island, New Zealand. *New Zealand Journal of Geology and Geophysics*, v. 53, p. 103-114.
<https://doi.org/10.1080/00288306.2010.498784>
1. **Holley, E.A.**, Craw, D., McQuillan, A. J., 2007. Mercury mobilization from oxidative dissolution of cinnabar and metacinnabar. *Chemical Geology*, v. 240, p. 313-325.
<https://doi.org/10.1016/j.chemgeo.2007.03.001>