

DANIEL SETH JONES

Curriculum Vitae

University of Minnesota
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Education

Penn State University, Ph.D. Geosciences and Biogeochemistry 2011
Carleton College, B.A. Geology 2006

Professional experience

2014-present, MnDRIVE Research Associate and Industry Liaison, University of Minnesota, BioTechnology Institute and Department of Earth Sciences
2013-2014, Postdoctoral Researcher and Lecturer, University of Minnesota, Earth Sciences
2011-2013, Agouron Institute Geobiology Postdoctoral Fellow, University of Minnesota
2010, Fall, Intern, ExxonMobil Upstream Research Company, Petroleum Geochemistry section
2006-2011, Research Assistant & Graduate Teaching Assistant, Penn State University

Publications (excluding in review and in prep)

- Jones DS, Lapakko KA, Wenz ZJ, Olson MC, Roepke EW, Sadowsky MJ, Novak PJ, Bailey JV (2017 *in press*). Novel microbial assemblages dominate weathered sulfide-bearing rock from copper-nickel deposits in the Duluth Complex, Minnesota, USA. *Appl Environ Microbiol* 83:e00909-17 (*in press*) (doi:10.1128/AEM.00909-17)
- Jones DS, Roepke EW, Hua, AA, Flood BE, Bailey JV (2017, *in press*). Complete genome sequence of *Sulfuriferula* sp. str. AH1, a sulfur-oxidizing autotroph isolated from weathered mine tailings from the Duluth Complex in Minnesota. *Genome Announc* (*in press*)
- Grettenberger CL, Pearce AR, Bibby KJ, Jones DS, Burgos WD, Macalady JL (2017). Efficient low-pH iron removal by a microbial iron oxide mound ecosystem at Scalp Level Run. *Appl Environ Microbiol* 83:e00015-00017. (doi:10.1128/AEM.00015-17)
- Sharrar AM, Flood BE, Bailey JV, Jones DS, Biddanda BA, Ruberg SA, Marcus DN, Dick GJ (2017) Novel large sulfur bacteria in the metagenomes of groundwater-fed chemosynthetic microbial mats in the Lake Huron basin. *Front Microbiol* 8: 791. (doi: 10.3389/fmicb.2017.00791)
- Galdenzi S and Jones DS, (2017, *in press*). The Frasassi Caves: A “classical” active hypogenic cave. In Klimchouk A, Palmer A, Waele JD, Auler A, Audra P (ed), Hypogene Karst Regions and Caves of the World. Springer. (ISBN 978-3-319-53347-6)
- Jones DS, Schaperdoth I, Macalady JL (2016). Biogeography of sulfur-oxidizing *Acidithiobacillus* populations in extremely acidic cave biofilms. *ISME J* 10: 2879 (doi:10.1038/ismej.2016.74)
- Flood BE, Fliss R, Jones DS, Dick GJ, Jain S, Kaster AK, Winkel M, Mußmann M, Bailey JV (2016). Single-cell (meta-)genomics of a dimorphic *Candidatus* Thiomargarita nelsonii reveals genomic plasticity. *Front Microbiol* 7: 603 (doi: 10.3389/fmicb.2016.00603)
- Jones DS, Flood BE, Bailey JV (2016). Metatranscriptomic insights into polyphosphate metabolism in marine sediments, *ISME J* 10: 1015 (doi:10.1038/ismej.2015.169)
- Jones, DS and Macalady, JL (2016). The snotty and the stringy: energy for subsurface life in caves. in *Advances in Environmental Microbiology: Their World: a Diversity of Microbial Environments*, ed. by C.J. Hurst, Springer DE, Heidelberg, Germany, p. 203-224 (doi: 10.1007/978-3-319-28071-4_5)
- Jones DS, Polerecky L, Dempsey BA, Galdenzi S, Macalady JL (2015). Fate of sulfide in the Frasassi cave system and implications for sulfuric acid speleogenesis, *Chem Geol* 410: 21 (doi:10.1016/j.gca.2015.10.028)

- Jones DS, Kohl K, Grettenberger C, Larson LL, Burgos WD, Macalady JL (2015). Geochemical niches of iron-oxidizing acidophiles in a coal mine discharge, *Appl Environ Microbiol* 81: 1242 (doi:10.1128/AEM.02919-14)
- Jones DS, Flood BE, Bailey JV (2015). Metatranscriptomic analysis of diminutive *Thiomargarita*-like bacteria (*Candidatus* Thiopilula spp.) from abyssal cold seeps of the Barbados Accretionary Prism, *Appl Environ Microbiol* 81: 3142 (doi:10.1128/AEM.00039-15)
- Zerkle AL, Jones DS, Farquhar J, Macalady JL (2015). Sulfur isotope values in the sulfidic Frasassi cave system, central Italy: A case study of a chemolithotrophic S-based ecosystem, *Geochim Cosmochim Acta* 173: 373 (doi:10.1016/j.gca.2015.10.028)
- Flood BE, Jones DS, Bailey JV (2015). The complete genome of *Sedimenticola thiotaurini* strain SIP-G1, a polyphosphate and polyhydroxyalkanoate-accumulating sulfur-oxidizing gammaproteobacterium isolated from salt marsh sediments, *Genome Announc* 3:e00671-15 (doi:10.1128/genomeA.00671-15)
- Flood BE, Jones DS, Bailey JV (2015). *Sedimenticola thiotaurini* sp. nov., a sulfide-oxidizing bacterium isolated from salt marsh sediments, and emended description of the genus *Sedimenticola* and *Sedimenticola selenatireducens*, *Int J Sys Appl Microbiol* 65: 2522 (doi:10.1099/ij.s.0.000295)
- Hamilton TL, Jones DS, Schaperdoth I, and Macalady JL (2015). Metagenomic insights into S(0) precipitation in a terrestrial subsurface lithoautotrophic ecosystem, *Front Microbiol* 5: 756 (doi:10.3389/fmicb.2014.00756)
- Stevens ES, Bailey JV, Flood BE, Jones DS, Gilhooly WP, Joye SB, Teske A, Mason OU, (2015). Barite encrustation of benthic sulfide-oxidizing bacteria at a marine cold seep, *Geobiology* 13: 588 (doi:10.1111/gbi.12154)
- Jones, DS, 2015, Methods for characterizing microbial communities in caves and karst: a review. In *Microbial Life of Cave Systems*, ed. By A.S. Engel, De Gruyter, Berlin, Germany, p. 23-46 (doi:10.1515/9783110339888-004)
- Jones DS, Schaperdoth I, and Macalady JL, 2014, Metagenomic evidence for sulfide oxidation in extremely acidic cave biofilms. *Geomicrobiol J* 31:194-204. (doi:10.1080/01490451.2013.834008)
- Macalady JL, Hamilton TL, Grettenberger CL, Jones DS, Tsao LE, Burgos WD, 2013, Energy, ecology, and the distribution of microbial life. *Phil Trans Royal Soc B* 368. (doi:10.1098/rstb.2012.0383)
- Jones DS, Albrecht HL, Dawson K, Schaperdoth I, Freeman KH, Pi, Y, Pearson A, and Macalady JL, 2012, Community genomic analysis of an extremely acidophilic sulfur-oxidizing biofilm. *ISME J* 6: 158-170. (doi:10.1038/ismej.2011.75)
- Brown JF, Jones DS, Mills DB, Macalady JL, and Burgos WD, 2011, Application of a depositional *facies* model to an acid mine drainage site. *Appl Environ Microbiol* 77: 545-554. (doi:10.1128/AEM.01550-10)
- Jones DS, Tobler DJ, Schaperdoth I, Mainiero M, and Macalady JL, 2010, Community structure of subsurface biofilms in the thermal sulfidic caves of Acquasanta Terme, Italy. *Appl Environ Microbiol* 76: 5902-5910. (doi: 10.1128/AEM.00647-10)
- Jones DS, Lyon EH, Macalady JL (2008). Geomicrobiology of biovermiculations from the Frasassi cave system, Italy. *J Cave Karst Stud* 70: 78-93.
- Macalady JL, Dattagupta S, Schaperdoth I, Jones DS, Druschel GK, Eastman D (2008). Niche differentiation among sulfur-oxidizing bacterial populations in cave waters. *ISME J* 2: 590-601. (doi:10.1038/ismej.2008.25)
- Jones, DS, IA Fleming, LK Krentz, and KK Jones, 2008, Feeding ecology of cutthroat trout in the Salmon River estuary, Oregon. In Connolly PJ, Williams TH, Gresswell RE (eds). *The 2005 coastal cutthroat trout symposium: status, management, biology, and conservation*. Oregon Chapter, American Fisheries Society, Portland, p. 144-151.
- Macalady JL, Jones DS, Lyon EH (2007). Extremely acidic, pendulous microbial biofilms from the Frasassi cave system, Italy. *Environmental Microbiology* 9: 1402-1414. (doi:10.1111/j.1462-2920.2007.01256.x)

Teaching experience

Instructor:

- Instructor, University of Minnesota (UMN), fall, 2016 (ESCI 1006/1106: Oceanography)
- Instructor, UMN, spring, 2014 (ESCI 4801: Geomicrobiology)
- Instructor, UMN, spring, 2014 (ESCI 2203: Earth Surface Dynamics, with Dr. Chris Paola and Dr. Katsumi Matsumoto)
- Instructor, UMN, 2013 (ESCI 1006/1106: Oceanography)
- Instructor, UMN, 2012 (ESCI 1007: From Microbes to Mammoths: History of Life on Earth, with Dr. David Fox and Dr. Jake Bailey)
- Guest Instructor, Penn State University, 2011 (Geosc 597G: Environmental Metagenomic Analysis, with Dr. Chris House and Dr. Jenn Macalady)

And 15+ invited guest lectures at 4 institutions: University of Minnesota (ESCI 4801: Geomicrobiology, 2012 & 2013, ESCI 4471: Geochemistry, 2015, CE 5551: Environmental Microbiology, 2015, ESCI 1901: Caves and Karst: Rocks, Water, and Human Impact, 2016, and the Environment and BioTech Value Proposition Design Workshop, 2016); Carleton College (Geology 230: Paleobiology, 2013, Geology 110: Intro to Geology, 2012 & 2013, and Geology 370: Geochemistry, 2015); University of Wisconsin River Falls (ESM 412: Chemical Fate and Transport in the Environment, 2015); Penn State (Geosc 204: Geobiology, 2008-2011, and Geosc 310: Earth History, 2011)

Grants

- \$50,000, *Assessing microbial contributions to sulfide mineral oxidation in Cu-Ni ores of the Midcontinent Rift, NE Minnesota*, J. Feinberg and D. Jones (MnDRIVE Environment seed grant, UMN, 9/2016-)
- \$26,626, *Enhanced microbial sulfate removal and recovery through a novel electrode-integrated bioreactor*, C. Chun and D. Jones (Water Resources Center Competitive Grants Program, UMN, USGS, 3/2016-3/2017)
- \$36,000, Joint grant from the University of Minnesota Duluth's Natural Resources Research Institute and Swenson College of Science and Engineering, 2016-
- \$4,976, Annual Plan Agreement, MN DNR, Division of Lands and Minerals, 2014
- \$112,000, *Investigating the role of sulfur bacteria in past and present phosphorite deposition* (The Agouron Institute, Geobiology Postdoctoral Fellowship, 10/2011-10/2013)

Invited seminars

- University of Cincinnati, Biological Sciences (Apr. 2017)
- University of Massachusetts Amherst, Geosciences (Feb. 2016)
- University of Wisconsin River Falls, Plant and Earth Science (Nov. 2015)
- West Virginia University, Plant and Soil Sciences (Mar. 2015)
- University of Minnesota Duluth, Natural Resources Research Institute (Feb. 2015)
- University of Minnesota Duluth, Large Lakes Observatory (Feb. 2015)
- University of Minnesota, Department of Earth Sciences (Nov. 2014)
- Dartmouth College, Department of Earth Sciences (Jan. 2014)
- Carleton College, Geology Department (Jan. 2013)
- ExxonMobil Corporate Strategic Research, Clinton, NJ (January 2011)

Selected recent first author presentation abstracts

Jones DS, Johnson, NJ, Mitchell, CPJ, Walker, GM, Coleman Wasik, JK, Swain EB, Bailey JV, 2017, Mercury methylators and methylation rates in sulfate-impacted freshwater ecosystems downstream from iron mines in Northern Minnesota, 13th International Conference on Mercury as a Global Pollutant, Providence, RI, July 2017 (pending)

Jones DS, Roepke EW, Sadowsky MJ Novak PJ, Bailey JV, 2017, Metagenomic and genomic characterization of novel organisms associated with sulfide mineral leaching in ore and waste rock from the Duluth Complex, Minnesota, American Chemical Society, San Francisco, CA, April 2017.

Jones DS, Walker GW, Johnson NW, Mitchell CPJ, Coleman Wasik JK, Bailey JV, 2017, Microbial communities associated with methylmercury production in two sulfate-impacted Northern Minnesota lakes, American Chemical Society, San Francisco, CA, April 2017.

Jones DS, Hobart KK, Roepke EW, Novak PJ, Sadowsky MJ, Feinberg, JM, Bailey, JV, 2017, Microbial contributions to pyrrhotite oxidation in the Duluth Complex, Society of Mining, Metallurgy & Exploration Minnesota conference, Duluth MN, April 2017

Jones DS, Lapakko KA, Olson MC, Hua A, Roepke EW, Bailey JV, Sadowsky MJ Novak PJ, 2016, Geomicrobiology of moderately acidic, pyrrhotite-bearing ore and waste rock from a new copper nickel mine prospect, Minnesota, USA, 16th International Symposium on Microbial Ecology (ISME), Montreal CA, August 2016.

Jones DS, Chun C, Novak PJ, Sadowsky MJ, 2015, Microbial sulfur cycling on the Iron Range of Minnesota, Society of Mining, Metallurgy & Exploration Minnesota conference, Duluth MN, April 2015

Invited: Jones, DS, Flood, BE, Bailey, JV, 2014, Microbial polyphosphate metabolism and phosphorus cycling in hypoxic marine sediments, Joint Aquatic Sciences Meeting 2014, Portland, OR

Jones, DS, Flood, BE, and Bailey, JV, 2013, *Thiomargarita*-like microorganisms from deep cold seeps of the Barbados accretionary prism, Geological Society of America Fall Meeting 2013, Denver, CO

Jones, DS, Flood, BE, and Bailey, JV, 2013, Microbial phosphate release from marine sediments: transcriptomics and geochemistry, Goldschmidt Conference 2013, Florence, Italy (abs#6111)

Invited: Jones, DS, Schaperdoth, I, and Macalady, JL, 2013, Subaerial microbial life in the sulfidic Frasassi cave system, Italy, Conference on Carbon and Boundaries in Karst, National Cave and Karst Research Institute, Carlsbad, NM

Jones, DS, Polerecky, L, Dempsey, BA, Galdenzi, S, and Macalady, JL, 2011, Biological and abiotic controls on sulfide oxidation, acid production, and carbonate dissolution in the Frasassi cave system, Italy, GSA Fall Meeting

Jones, DS, Davis, C, Justwan, H, and Wenger, L, 2011, Effect of PDC-bit platelets on geochemical data quality and hydrocarbon-systems evaluation, 25th International Meeting on Organic Geochemistry, Interlaken, Switzerland

Other: US Patent WO/2013/062640, Nanoparticle probes, methods, and systems for use thereof, A.C. Robinson, R.J. Pottorf, D.S. Jones, S. Dreyfus, Exxonmobil Upstream Research Company

Synergistic activities

Advising and mentoring:

- Graduate students: Kathryn Hobart (co-advised w/ Dr. Joshua Feinberg, Fall 2016-)
- Laboratory technicians: Elizabeth Roepke (2016, now a Ph.D. student with Cara Santelli)
- Faculty mentor for undergraduates: Charles Thunder (NorthStar STEM Alliance, summer 2015), An An Hua, Gabriel Walker, and Christian Rosenow (UMN Undergrad Research Opportunities Program, 2014-2015)
- Graduate committee member, UMN Earth Sciences (Fernando Medina, Ph.D., Roman Zoss, M.S., Timothy Kiesel, M.S. & Chris Mahr, M.S.)
- Lab supervisor for undergraduate students (Penn State: Dan Mills, Jignasha Patel, Rob Hegemann, and Courtney Kohl; UMN: Joe Huppert)

Organizer for multiple MnDRIVE water technology events (industry, state agency, university, and general public) at the University of Minnesota, including:

- Symposia ('Frontiers in Mine Water Technology: with a focus on bioremediation for Minnesota's mine waters' Minneapolis MN, Sep. 26th, 2016)
- Listening sessions (Water technology listening sessions: 'Technologies for the treatment of mine water', St. Paul, MN, May 13th, 2015 and 'Technologies for the treatment of agricultural wastewaters', St. Paul, MN, July 22nd, 2016)
- Workshops ('Mining, Metals, and Microbes in Minnesota – North,' Biwabik, MN, Oct. 12-14, 2014).

Conference sessions chaired:

- Microbially-Driven Geochemical Reactions: Kinetics and Communities (253rd ACS National Meeting & Exposition, April 2-6, 2017, San Francisco, CA)
- Emerging Technologies in Water Treatment: Active and Passive Approaches (2018 SME National Meeting, Feb. 25-28, 2018, Minneapolis, MN) (pending)

Scientific consultant for two children's books, *All About Earth* (S.L. Latta) and *Living Earth* (S. Garbe), Capstone Press, 2015

Participant in the Classroom Observation Project, Geomicrobiology (ESCI 4801, spring 2014).
Information at <http://serc.carleton.edu/NAGTWorkshops/certop/index.html>

Participant and presenter for the international workshop *The Frasassi Stygobionts and their Sulfidic Environment*, September 10th-13th 2009, hosted by the Federazione Speleologica Marchigiana, and the Osservatorio Geologico di Coldigioco, Marche Region, Italy

Ad hoc reviewer for The ISME Journal, Genome Biology and Evolution, FEMS Microbiology Ecology, Geobiology, Chemical Geology, Minerals Engineering, Environmental Science and Pollution Research, Geomicrobiology Journal, Journal of Cave and Karst Studies, and for the Geobiology and Low-Temperature Geochemistry Program of the National Science Foundation, Review editor for *Frontiers in Microbiology*.

Geomicrobiology-related outreach activities include: Field trip and activity leader for the Astrobiology Teacher Workshop (astrobiology-related activities for PA public school teachers, hosted by the Penn State Astrobiology Research Center), 'Shake, Rattle, Rocks' (geosciences activities for PA 5th graders), Exploration Day (astronomy and astrobiology activities for local PA kids and families, Penn State Astrobiology Research Center), geobiology lab tours and activities for St. Anthony High School biology students (UMN).