

CAITLIN PAGE CASAR, PHD



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@DeepSubsurfer



CaitlinCasar

RESEARCH INTERESTS

data science, astrobiology, geobiology, microbial ecology, bioinformatics

EDUCATION

- 2021 Ph.D. Earth and Planetary Sciences, Northwestern University
- 2018 M.S. Earth and Planetary Sciences, Northwestern University
- 2015 M.S. Earth and Environmental Sciences, University of Illinois at Chicago
- 2012 B.S. Geology, East Carolina University, Magna Cum Laude

EMPLOYMENT

- 2021 Data Scientist, 84.51°

TECHNICAL SKILLS

R, Python, CSS, HTML, SQL, Git, Apache Spark, Hadoop, Shiny
Adobe Illustrator, Photoshop, InDesign, Premiere Pro, After Effects
Bioinformatics
Scanning Electron Microscopy
Fluorescence Microscopy
Microbial Culturing
DNA Extraction
PCR
X-ray Energy Dispersive Spectroscopy
2015 ArcGIS Certification
2011 NAUI Master Scuba Diver Certification

PROFESSIONAL EXPERIENCE

- 2021 84.51° Data Science Development Program
- 2020 84.51° Data Science Summer Internship
- 2019 President, Academics for Careers in Data Science, Northwestern University
- 2018 Organizing Committee, Midwest Geobiology Symposium, Northwestern University
- 2018 International Geobiology Field Course
- 2018 Teaching Assistant, Communication for Geoscientists, Northwestern University
- 2017 President, Geoclub, Northwestern University
- 2016 ECOGEO Workshop, Intro to Environmental 'Omics, University of Hawaii at Mānoa
- 2012-2015 Teaching Assistant, University of Illinois at Chicago

Global Environmental Change
 Earth, Energy, and Environment
 Physical Systems in Earth and Space Science
 2013-2015 President, Terra Society, University of Illinois at Chicago
 2011 USGS Summer Internship
 2009 Manager, East Carolina University Geology Field Camp

TEACHING EXPERIENCE

2018 Teaching Assistant, Communication for Geoscientists
 2012-2015 Teaching Assistant, Global Environmental Change; Earth, Energy, and the Environment; Physical Systems in Earth and Space Science

AWARDS AND FELLOWSHIPS

2019 Love Data Week Poster Contest Honorable Mention
 2018 NASA Earth and Space Science Fellowship
 2018 Illinois Space Grant Fellowship
 2017 Northwestern Conference Travel Grant
 2017 AbSciCon Travel Grant
 2017 CoSURF Travel Grant
 2014 UIC Departmental Citizenship Award
 2014 UIC Provost Award
 2013 Knourek Scholarship
 2011 NAGT Fellowship

PUBLICATIONS

Casar, C. P., Momper, L. M., Kruger, B. R., Osburn, M. R. (*submitted*). Iron-fueled life in the continental subsurface: Deep Mine Microbial Observatory, SD, USA. *Applied and Environmental Microbiology*.
Casar, C. P., Kruger, B. R., Momper, L. M., Osburn, M. R. (*submitted*). Mineral-enhanced thiosulfate disproportionation by a novel *Sulfuricella* sp. from the continental deep subsurface. *Microbial Genomics*.
 Momper, L. M., **Casar, C. P.**, Osburn, M. R. (2021) A metagenomic view of novel microbial and metabolic diversity found within the deep terrestrial biosphere. *BioRxiv*.
Casar, C. P. (2021). Geobiology of Biofilms in the Continental Subsurface. *Northwestern University*.
Casar, C. P., Kruger, B. R., & Osburn, M. R. (2021). Rock-hosted subsurface biofilms: mineral selectivity drives hotspots for intraterrestrial life. *Frontiers in Microbiology*, 12, 1-14.
 Rowe, Annette R., Abuyen, K., Lam, B. R., Kruger, B. R., **Casar, C. P.**, Osburn, M. El-Naggar, M. Y., and Amend, J. P. (2021) Electrochemical evidence for in situ microbial activity at the Deep Mine Microbial Observatory (DeMMO), South Dakota, USA. *Geobiology* 19(2), 173-188.
 Osburn, M. R., **Casar, C. P.**, Kruger, B., Momper, L., Flynn, T. M., & Amend, J. P. (2020). Contrasting variable and stable subsurface microbial populations: An ecological time series analysis from the deep mine microbial observatory, South Dakota, USA. *BioRxiv*.
Casar, C. P., Kruger, B. R., Flynn, T. M., Masterson, A. L., Momper, L. M., & Osburn, M. R. (2020). Mineral-hosted biofilm communities in the continental deep subsurface, Deep Mine Microbial Observatory, SD, USA. *Geobiology*, 18(4), 508-522.

- Osburn, M. R., Kruger, B., Masterson, A. L., **Casar, C. P.**, & Amend, J. P. (2019). Establishment of the deep mine microbial observatory (DeMMO), South Dakota, USA, a geochemically stable portal into the deep subsurface. *Frontiers in Earth Science*, 7(196), 1-17.
- D'Arcy, R., **Casar, C. P.**, Simon, A. G., Cardace, D., Schrenk, M. O., & Arcilla, C. A. (2018). Biofilm formation and potential for iron cycling in serpentinization-influenced groundwater of the Zambales and Coast Range ophiolites. *Extremophiles*, 22(3), 407-431.
- Casar, C. P.** (2015). Geobiology of the Zambales Ophiolite, Philippines and Coast Range Ophiolite, California. *University of Illinois at Chicago*.

ORAL PRESENTATIONS

- Casar, C.**, Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineral-hosted biofilm communities in a deep subsurface Mars-analog system: The Deep Mine Microbial Observatory (DeMMO), SD, USA. Astrobiology Science Conference, Seattle, WA, 2019.
- Casar, C.**, Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineral-hosted biofilm communities within the Continental Deep Subsurface. Midwest Geobiology Symposium, Northwestern University, Evanston, IL, 2018
- Casar, C.**, Osburn, M., Flynn, T., Masterson, A., Kruger, B. Cultivating the Deep Subsurface Microbiome. CoSURF Conference, South Dakota School of Mines, SD, 2017.
- Casar, C.**, Osburn, M., Flynn, T., Masterson, A., Kruger, B. Cultivating the Deep Subsurface Microbiome. Astrobiology Science Conference, Mesa, AZ, 2017.

POSTER PRESENTATIONS

- Casar, C.**, Momper, L., Kruger, B., Osburn, M. Taxonomic and functional diversity in the continental deep subsurface: Do different methods change our view? Geobiology Gordon Research Conference, Galveston, TX, 2020.
- Casar, C.**, Osburn, M. Big Data in Geobiology: Applications to DeMMO. Midwest Geobiology Symposium, St. Louis, MO, 2019.
- Casar, C.**, Karbelkar, A., Vinnichenko, G., Chen, M., Osburn, M., Orphan, V., Fischer, W., Sessions, A., 2018 International Geobiology Course Participants. Transformation of ancient organic carbon in exposed organic-rich black shale of the Monterey Formation, Naples Beach, Ca. American Geophysical Union Fall Meeting, Washington D.C., 2018.
- Casar, C.**, Osburn, M., Flynn, T., Masterson, A., Kruger, B. Mineralhosted biofilm communities in the Continental Deep Subsurface. North American International Society of Microbial Electrochemistry and Technology, University of Minnesota, St. Paul, MN, 2018.
- Casar, C. P.**, Osburn, M. R., Flynn, T. M., Masterson, A., & Kruger, B. Cultivating the Deep Subsurface Microbiome. American Geophysical Union Fall Meeting, New Orleans, LA, 2017.
- Casar, C. P.**, D. R. Meyer-Dombard, A. Simon, D. Cardace, and C. A. Arcilla. Microbially-influenced Fe-Cycling within high pH serpentinizing springs of the Zambales Ophiolite, Philippines. AGU, Chicago, IL, 2014.
- Casar, C. P.**, D. R. Meyer-Dombard, and A. Simon. Microbially-influenced Fe-Cycling within high pH serpentinizing springs of the Zambales Ophiolite, Philippines. Midwest Geobiology Symposium, Chicago, IL, 2014.

RESEARCH EXPERIENCE

- 2016-2021 Geomicrobiology of deep fracture-hosted mineral-associated biofilms in the Deep Mine Microbial Observatory, Lead, South Dakota. (Advisor: Magdalena Osburn)

- 2012-2015 Microbially influenced iron cycling in high pH serpentinizing systems in the Zambales Ophiolite, Philippines and Coast Range Ophiolite, California (Advisor: D'Arcy Meyer-Dombard)
- 2012 Cultivating and characterizing deep sea hydrothermal vent archaea (Advisor: Matthew Schrenk)
- 2011 Community composition and connectivity of deep sea coral and cold seep ecosystems in the Gulf of Mexico. (USGS Internship through NAGT Fellowship program)

FIELD EXPERIENCE

- 2016-2019 Deployment of field experiments and collection of fluids, biofilms, and fluid geochemical data from the Deep Mine Microbial Observatory, South Dakota for characterization of deep subsurface geomicrobiology
- 2016 Northwestern Earth and Planetary Science field course on sedimentology and stratigraphy of the Western Interior Seaway
- 2014 Collection of fluid geochemical data from the Coast Range Ophiolite Microbial Observatory, California
- 2013 Collection of serpentinizing spring fluids and sediments and spring fluid geochemical data from the Zambales Ophiolite, Philippines for characterization of spring geobiology
- 2013 Collection of hot spring fluid samples and geochemical data from Yellowstone National Park as part of an effort to study nitrogen and carbon fixation in hot spring systems
- 2012 Collection of sediment cores from the Pamlico Sound, NC for X-Ray diffraction and grain size analysis with depth as part of an investigation of coastal system response to sea level rise, climate dynamics, and geomorphic change
- 2011 Two week research cruise on the NOAA R.V. Nancy Foster collecting water column samples along canyon transects for particulate organic matter analysis from Cape Hatteras to the Gulf of Maine as part of a deep water canyon ecology research effort
- 2010 Geologic mapping of northern New Mexico and Southern Colorado as part of the six week ECU Geology summer field camp course