Jeff S. Bowman

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Current Position:

Postdoctoral Fellow. Lamont-Doherty Earth Observatory, Columbia University. 2014 to present.

Research Associate. Blue Marble Space Institute of Science. 2013 to present.

Degrees Awarded:

Doctor of Philosophy, Oceanography and Astrobiology. University of Washington, 2014. Dissertation title: *Life in the cold biosphere: The ecology of psychrophile communities, genomes, and genes*.

Master of Science, Oceanography. University of Washington, 2010.

Bachelor of Science, Biological Oceanography. University of Washington, 2008.

Associate of Science with Honors. Bellevue Community College, 2006.

Additional Education:

University of Hawaii Astrobiology Winter School. University of Hawaii, 2011.

Program on Climate Change Summer Institute. University of Washington, 2010.

Biological Sequence Analysis Summer Course. Technical University of Denmark, 2010.

Nordic-NASA Astrobiology Summer School. University of Iceland, 2009.

Research Experience:

Postdoctoral Research Scientist. November 2014 to present. Department of Biology and Paleo Environment, Lamont-Doherty Earth Observatory, Columbia University. Supervisor: Hugh Ducklow, PhD, Professor.

Graduate Research Assistant. September 2008 to August 2014. School of Oceanography and Astrobiology Program, University of Washington. Supervisor: Jody Deming, PhD, Professor.

Undergraduate Research Assistant. August 2006 to September 2008. School of Oceanography, University of Washington. Supervisor: Julian P. Sachs, PhD, Associate Professor.

Field Experience:

***Laurence M. Gould*, LMG1401.** January-February 2014.

Barrow, Alaska. May 2013.

McMurdo, Antarctica. August-November 2011.

Barrow, Alaska. March-April 2011.

Barrow, Alaska. April 2010.

Barrow, Alaska. February 2010.

***Oden*, LOMROGII.** August-September 2010.

Barrow, Alaska. April 2009.

Cargill Saltworks. June 2008.

Canada Salt Lakes. June 2007.

Publications:

Bowman JS, Collins ER, Deming, JW. ***Evidence for enhanced horizontal gene transfer***

in psychrophile genomes and possible links to Phanerozoic climate. In review for *PNAS*.

Bowman JS and Deming JW. ***Alkane hydroxylase genes in psychrophile genomes and the potential for cold active catalysis***. In review for *BMC Genomics*.

Bowman JS and Deming JW. ***Amino acid preferences in the proteomes of psychrophilic bacteria: Is serine the answer to enzyme adaptation to low temperature and high salinity?*** In review for *BMC Genomics*.

Miller L, Bowman JS, Brown K, Collins ER, Else B, Ewert M, Fransson A, Fripiat F, Gosselin M, Lannuzel D, Meiners K, Michel C, Nishioka J, Nomura D, Papadimitriou S, Russell L, Sørensen L, Thomas D, Tison JL, A van Leeuwe M, Vancoppenolle M, Wolff E, Zhou J. ***Methods for biogeochemical studies of sea ice: Where we are and where we are going***. In review for *Elementa: Science of the Anthropocene*.

Ehn J, Pucko M, Rysgaard S, Deming J, Bowman JS, Papakyriakou T, Galley R, Sogaard D. ***Frost flower on young sea ice: The climatic, chemical, and microbial significance of an emerging ice type***. *JGR Atmospheres*, 2014. Available online in advance of print.

Hauptmann A, Stibal M, Baelum J, Sicheritz-Pontén T, Brunak S, Bowman JS, Hansen L, Jacobsen C, Blom N***. Bacterial diversity in snow on North Pole ice floes***. *Extremophiles*, 2014. Available online in advance of print. doi: 10.1007/s00792-014-0660-y.

Bowman JS, Berthiaume C, Armbrust V, Deming JW. ***The genetic potential for key biogeochemical processes in Arctic frost flowers and young sea ice revealed by metagenomic analysis***. *FEMS Microbiol Ecol*, 2014. 89: 376–387. doi: 10.1111/1574-6941.12331.

Bowman JS, Larose C, Vogel T, Deming JW. ***Selective occurrence of Rhizobiales on the surface of young sea ice near Barrow, Alaska and distribution in the polar marine rare biosphere***. *EMIR*, 2013. 5: 575–582. doi: 10.1111/1758-2229.12047.

Stüeken EE, Anderson RE, Bowman JS, Brazelton WJ, Colangelo-Lillis J, Goldman AD, Som SM, Baross JA. ***Did life originate in a global chemical reactor?*** *Geobiology,* 2013. 11: 101–126. doi: 10.1111/gbi.12025.

Wietz M, Mansson M, Bowman JS, Blom N, Ng Y, Gram L. ***Wide distribution of closely related, antibiotic-producing strains throughout the Arctic Ocean***. *Appl Env Microbiol*, 2012. 78:6. doi:10.1128/AEM.07096-11.

Bowman JS, Rasmussen S, Blom N, Deming JW, Rysgaard S, Sicheritz-Pontén T. ***Microbial community structure of Arctic multiyear sea ice and surface seawater by 454 sequencing of the 16S RNA gene***. *ISME J*, 2011. 6. 11–20. doi:10.1038/ismej.2011.76.

Bowman JS and Deming JW. ***Elevated bacterial abundance and exopolymers in saline frost flowers and implications for atmospheric chemistry and microbial dispersal***. *Geo Res Let*, 2010. 37. L13501. doi:10.1029/2010GL043020.

Bowman JS and Sachs J. ***Chemical and physical properties of some saline lakes in Alberta and Saskatchewan***. *Saline Systems*, 2008. 4:3.

Conferences and Presentations:

Bowman JS, Deming JW, Collins ER. ***Increased rates of horizontal gene transfer in psychrophilic genomes and potential links to the Phanerozoic climate record***. Oral presentation. August, 2014. ISME15, Seoul, S. Korea.

Bowman JS, Deming JW. ***Prevalence of horizontal gene transfer among cold adapted microbes and implications for crude oil bioremediation in the polar environment***. Poster presentation. September, 2013. Polar and Alpine Microbiology Conference, Big

Sky, MT.

Bowman JS, Berthiaume CT, Armbrust VE, Deming JW. ***Metagenomic analysis of an unexpected community of widely distributed Rhizobiales in Arctic frost flowers***. Poster Presentation. March, 2013. Gordon Research Conference on Polar Marine Science, Ventura, CA.

Bowman JS and Deming JW**.** ***The distribution and cold adapted character of putative hydrocarbon degradation genes among the genomes of cold adapted microbes***. Oral presentation. January, 2013. Gulf Oil and Ecosystems Conference, New Orleans, LA.

Deming JW, Bowman JS, Ewert M, Collins RE. ***Microbial life at the boundary between sea ice and atmosphere***. Poster presentation. April, 2012. IPY, Montreal, Quebec, Canada.

Bowman JS, Larose C, Vogel T, Deming JW. ***Evidence for strong selective enrichment of bacteria within frost flowers on the surface of Arctic sea ice***. Oral presentation. February, 2012. Ocean Sciences Meeting, Salt Lake City, UT.

Bowman JS, Schmidt BE, Blankenship DD. ***Life in Ice: Defining the habitability of Europa***. Poster Presentation. October, 2011. AAS Division of Planetary Science Annual Meeting, Nantes, France.

Bowman JS, Chan KYK, Durkin C, Hennon G, Smith D, Sullivan B. ***Is diversity related to service provision across an ecosystem? An estuarine case study***. Oral presentation. September, 2011. World Conference on Marine Biodiversity, Aberdeen, Scotland.

Bowman JS and Deming JW. ***Integrating sequence based biology with biogeochemical and physical studies***. Poster presentation, June 2011. OASIS Science Meeting, Telluride, CO.

Bowman JS, Rasmussen S, Blom N, Deming JW, Thomas SP. ***Determining microbial community structure in MYI with mid-depth sequencing***. Oral presentation, March 2011. Gordon Research Seminar on Polar Marine Science, Ventura, CA.

Bowman JS, Rasmussen S, Blom N, Deming JW, Thomas SP. ***Determining microbial community structure in MYI with mid-depth sequencing***. Poster presentation, March 2011. Gordon Research Conference on Polar Marine Science, Ventura, CA

Bowman JS. ***Planets and Pedagogy: An astrobiology course for science educators***. Poster presentation, January 2011. UH NAI Winter School, Hilo, HI.

Bowman JS and Schmidt B. ***Putting the biology back in astrobiology for EJSM: How ice penetrating radar can define key habitat parameters.*** Poster presentation, December 2010. American Geophysical Union Annual Meeting, San Francisco, CA.

Bowman JS. ***A possible role for surface ice features in the origin of life***. Oral presentation, June 2010. Astrobiology Graduate Conference, Tällberg, Sweden.

Bowman JS and Deming JW. ***SCIFAR: A novel method for measuring microbial respiration at very low temperatures***. Poster presentation, April 2010. Astrobiology Science Conference, Houston, TX.

Bowman JS. ***Implications of a hydrated gel on the sea surface microlayer for prebiotic chemistry and the origin of life***. Poster presentation, January 2010. Gordon Research Conference on the Origin of Life, Galveston, TX.

Bowman JS and Deming JW. ***Elevated bacterial abundance in laboratory grown and naturally occurring frost flowers under late winter conditions***. Poster presentation, December 2009. American Geophysical Union Annual Meeting, San Francisco, CA.

Bowman JS. ***Extracellular polymers produced in abundance by microorganisms in saline ice: A potential biomarker for mid-IR spectroscopic observations of Europa?*** Oral presentation, July 2009. Astrobiology Graduate Conference, Seattle, WA.

Bowman JS and Deming J. ***Marine frost flowers as analogues for extraterrestrial***

environments of very low temperature and low water activity. Poster presentation, June 2009. NASA-Nordic Astrobiology Summer Program, Reykjavik, Iceland.

Bowman JS and Deming J. ***Microbial responses to sea ice conditions encountered during an arctic winter***. Poster presentation, November 2008. IMPETUS, St. Petersburg, Russia.

Bowman JS and Sachs J. ***Developing an indicator of salinity from membrane lipids in halophilic microorganisms.*** Oral presentation, June 2008. American Society of Limnologists and Oceanographers Summer Meeting, St. John's, Newfoundland.

Teaching:

Seminar Leader, University of Washington. *OCEAN 599, Bioinformatics Seminar*. 2012.

Instructor, North Central School District Math-Science Partnership. Wenatchee, WA. August 2011.

Instructor, North Central School District Math-Science Partnership. Wenatchee, WA. August 2010.

Instructor, University of Washington. *BEDUC 592, Fundamentals of Astrobiology for Science Educators.* 2010.

Teaching Assistant, University of Washington. *ASTBIO 115, Introduction to Astrobiology*. 2009.

Professional Service:

Organizing Committee, Astrobiology Science Conference (AbSciCon). July 2014 to July 2015.

Session Chair, Biodiversity, Adaptation, and Interaction in Extreme Environments. ISME15. August 2014, Seoul, Korea.

Member, SCOR working group 140, BEPSII: Biological Exchange Processes at the Sea-Ice Interface. March 2013 to present.

Chair, Gordon Research Seminar Polar Marine Science. March 2013, Ventura, CA.

Reviewer, *Applied and Environmental Microbiology.*

Reviewer, *Microbial Biotechnology.*

Reviewer, *JGR Atmospheres.*

Outreach:

Participant, AAAS-CASE Workshop. May, 2014.

Science Advisor, *Wild Canada*. May, 2013.

Science Advisor, The Weather Channel. *Earth's Strangest Weather: Arctic Blooms*. March, 2013.

Question Reviewer, National Science Bowl. December 2011.

Invited Presenter, Ballard High School. October 2010.

Question Writer, National Science Bowl. August 2010, December 2010, May 2011, June 2013.

Invited Presenter, Novozymes. June 2010.

Science Communication Fellow, Pacific Science Center. 2010 to 2013.

Invited Panelist, Seattle Central Community College. September 2009.

Invited Presenter, Garfield High School. September 2009.

Presenter, Theodore Jacobsen Observatory. September 2007 to present.

Scientist Like Me, Pacific Science Center. June 2009 to September 2009.

Invited Presenter, University of Washington Department of Education. December

2009.

Military Service: **2nd Airborne Ranger Battalion**. Infantry mortar team leader, E5 (last position held). Ft. Lewis, WA. August 1999 to December 2003.

Awards:

EPA STAR Fellowship. June 2011.

Moore Foundation. March 2010.

Soffen Memorial Fund. December 2009

Allen Library Research Award. June 2008.

National Science Foundation IGERT Fellowship. September 2008-June 2011.

National Science Foundation Graduate Research Fellowship Honorable Mention. April 2008.

Washington Sea Grant Science Writing Fellowship. April, 2008.

Levinson Emerging Scholar. November 2007.

Mary Gates Scholar. November 2007.

Dean's List. Winter 2007, Spring 2007, Fall 2007, Spring 2008. College of Ocean and Fisheries Science, University of Washington.

Societies:

International Society of Microbial Ecologists. 2014.

American Association for the Advancement of Science. 2009.

American Geophysical Union. 2009.

Association of Polar Early Career Scientists. 2008.

American Society of Limnologists and Oceanographers. 2008.

Phi Sigma Theta. 2007.

Phi Theta Kappa. 2004.