Zachary J. Lundeen, Ph.D.

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**Education**

**Ph.D.** Geography, University of Utah (2012)

Dissertation Title:*Paleoecological and Isotopic Records of Climate Change and*

*Variability from Lakes and Speleothems, Bear River Range, Southeast Idaho*

**M.S.** Geosciences, University of Massachusetts Amherst (2005)

Thesis Title: *Elemental and Isotopic Constraints on the Late Glacial-Holocene*

*Transgression and Paleoceanography of the Chukchi Sea*

**B.A.** Geology, Idaho State University (2001)

Minors: Anthropology, History

# Current Appointments

**2012-Present Director,** Bonderman Field Station at Rio Mesa, University of Utah

**2012-Present Research Assistant Professor**, Department of Geography, University of Utah

**2012-Present Affiliate Faculty,** Global Change and Sustainability Center, University of Utah

**2020-Present** **Advanced Placement (AP) Environmental Science Exam Development**

**Committee,** College Board

**2009-Present Advanced Placement (AP) Environmental Science Exam Reader/Table**

**Leader/Question Leader (Seasonal)**, Educational Testing Services (ETS)

**Past Positions**

**2011-2012 Associate Instructor**, University of Utah, Department of Geography

**2011- 2012 Adjunct Instructor**, Columbia College-Salt Lake City

**2006-2010 Graduate Instructor/ Research Assistant**, University of Utah, Department

of Geography

**2005- 2006 Environmental Geologist**, Parsons Corporation, South Jordan, UT

**2005 Information Analyst**, State of Utah, Department of Environmental Quality

**Courses Taught**

**University of Utah Courses**

* *Geomorphology: Mountains, Rivers, & Deserts (GEOG 3200)*
* *Introduction to Environmental and Sustainability Studies (ENVST 2100)*
* *Water in Utah (GEOG 3290/5290)*
* *Resource Conservation and Environmental Management (GEOG 3350)*
* *The Oceans and Us: Contemporary Marine Environmental Issues (GEOG 5435)*
* *Earth Environments and Global Change: Intro to Physical Geography (GEOG 1000)*
* *GeoExcursions in Utah (GEOG 3000)*
* *Ocean Environments (GEOG 3963)*
* *Water & Sustainability- Block U Learning Community* (UGS 2215)
* *Pyrogeography: Fire, Humans, and the Environment (GEOG 3230)*
* *World Regional Geography (GEOG 1300)*

**Columbia College, Salt Lake City Courses**

* *Introduction to Physical Geology*

**University of Massachusetts-Amherst Courses**

* *Experiencing Geology*
* *Introduction to Oceanography* (Teaching Assistant)

**Academic Service**

* University of Utah – Graduate Research Fellowship Review Committee (2022)
* Reviewer- *Geophysical Research Letters* (2021)
* Dissertation Committee Member- Joshua Heyer, Ph.D (2020), University of Utah
* University of Utah- University Research Committee (2018-2019)
* University of Utah- Interdisciplinary Teaching Programs Faculty Appointments Advisory Committee (2017-2018)
* University of Utah- Environmental and Sustainability Studies Undergraduate Scholarship Review Committee (2017)
* Reviewer - *The Holocene* (2017)
* Reviewer - *Ecosphere* (2017)
* Reviewer - National Science Foundation, Division of Earth Sciences, P2C2 (2015)
* Reviewer - *Quaternary Science Reviews* (2015)
* Reviewer - U of Alaska Center for Global Change Student Research Grant (2013, 2014)
* U of Utah Global Change and Sustainability Center Graduate Fellowship (2013)/ College of Social and Behavioral Sciences Faculty Committee
* Graduate representative for Herbarium Curator/Biogeography faculty hire- University of Utah, Department of Geography (2008)
* Graduate representative for Biogeography/Climatology faculty hire- University of Utah, Department of Geography (2007)
* Undergraduate representative for faculty promotion review committee- Idaho State University, Department of Geology (2000)
* President- Idaho State University Geology Club (2000-2001)

**Funding History**

* University of Utah-Global Change and Sustainability Center Interdisciplinary Research Grant, *Landscape Legacy Influence on Riparian Plant Communities in a Changing Environment* (2018). Awarded $5000 (Co-PI with Jennifer Follstad Shah).
* U.S. Fish and Wildlife,*Rio Mesa Center**Riparian Habitat and Enhancement Project* (2013-2018). Cooperative Agreement. Awarded $34,000.
* Bureau of Land Management, *Colorado Plateau Native Plant Evaluation, Development, and Research Garden at Rio Mesa Center (2011-2017)*. Cooperative Agreement. Awarded $130,000 after taking over as PI in 2012. (Total Award $145,000).
* University of Utah Graduate School- Graduate Research Fellowship (2010-2011). *Holocene paleoclimate and paleoecology of the Bear River Range, Southeast Idaho, from lakes and speleothems*. Awarded $15,000.
* NSF, Geography and Regional Science Program, Dissertation Improvement Grant- *Doctoral Dissertation Research: A Long-Term Paleoclimate Perspective on the Changing Hydroclimatology of the Bear River Basin and Likely Impacts (2009-2010)*. Awarded: $8875 (Co-PI with Andrea Brunelle).
* University of Utah, Funding Incentive Seed Grant- *Using Cave and Lake Sediment Records to Resolve the Climate History of the Bear Lake Region* (2008-2009). Awarded: $27,000. (Primary author and co-investigator, Andrea Brunelle-PI).
* U.S. Forest Service- *Reconstruction of Northern Great Basin Paleoenvironments from Close-Proximity Lakes and Speleothems in the Bear River Range, Southeast Idaho* (2007*).* Awarded: $9000 (Primary author and co-investigator, Andrea Brunelle-PI).
* Geological Society of America, Graduate Student Research Grant (2002). *Use of carbon and nitrogen isotopes in sedimentary organic matter to augment sea level reconstruction from Chukchi Sea sediments*. Awarded: $2000

**Peer-Reviewed Publications**

Heyer, J., Brewer, S., Brunelle, A., Leys, B., **Lundeen, Z**., Rittenour, T., & Power, M. (2022). Age control for the Lake Bottom oxbow in the Dolores River watershed of eastern Utah, USA. *Quaternary International*, v. 621, pp. 62-73.

Groves, M., Brunelle, A. R., Power, M. J., Petersen, K. L., & **Lundeen, Z. J.** (2021). Late-Holocene seasonal moisture variability: Range Creek Canyon, Utah, USA. *The Holocene*, 31(3), p. 356-367

Carter, V.A., Power, M.J., ***Lundeen, Z.J.****,* Morris, J., Petersen, K.L., Brunelle, A., Anderson, R.S., Shinker, J.J., Turney, L., Koll, R., Bartlein, P. (2018) A 1,500-year synthesis of wildfire activity stratified by elevation from the U.S. Rocky Mountains. *Quaternary International, v. 488, p. 107-119.*

***Lundeen, Z. J.,*** & Brunelle, A. (2016). A 14,000-year record of fire, climate, and vegetation from the Bear River Range, southeast Idaho, USA. *The Holocene*, v. 26 (6), p. 833-842.

***Lundeen, Z.****,* Brunelle, A., Burns, S.J., Asmerom, Y., Polyak, V., (2013) A Speleothem Record of Holocene Paleoclimate from the Northern Wasatch Mountains, Southeast Idaho, USA. *Quaternary International,* v. 310, p. 83-95.

Morris,J.L., le Roux, P.C., Macharia, A.N., Brunelle, A., Hebertson, E.G., ***Lundeen, Z.J.****,* (2012) Organic, elemental, and geochemical contributions to lake sediment deposits during severe spruce beetle (*Dendroctonus rufipennis*) disturbances. *Forest Ecology and Management*, v. 289, p. 78-89.

Nicoll, K. and ***Lundeen, Z.J.***, (2010) A Case Study on the Geomorphic Effects of Fire: the 2009 Big Pole Fire, Skull Valley, UT. Vignettes –Key Concepts in Geomorphology. Online vignette supporting textbook :Bierman, P. and Montgomery, D. (Eds.) Key concepts in Geomorphology.W.H. Freeman, Vermont. Online at <http://serc.carleton.edu/47063>.

**Other Publications/Manuscripts**

***Lundeen, Z.J.,*** Brigham-Grette, J., Petsch, S.T., Burns, S.J. (2015) A Holocene Record of Primary Productivity in the Chukchi Sea and Possible Evidence for Bering Strait flow reversal ~8.5ka. DOI: 10.13140/RG.2.1.4190.1606

***Lundeen, Z.J.* (2012)** *Paleoecological and Isotopic Records of Climate Change and Variability from Lakes and Speleothems, Bear River Range, Southeastern Idaho. Ph.D. Dissertation. University of Utah.*

***Lundeen, Z.J.*** (2005) Elemental and Isotopic Constraints on the Late Glacial-Holocene Transgression and Paleoceanography of the Chukchi Sea. M.S. Thesis. University of Massachusetts Amherst.

**Conference Presentations**

***Lundeen, Z.*** (2018) Bonderman Field Station at Rio Mesa: Laboratory for Research and Education and CPNPP partner. BLM Colorado Plateau Native Plant Program Annual Meeting, Grand Junction, CO.

***Lundeen, Z****.,* Brunelle, A., (2013) Complementary seasonal bias in records of Holocene paleoclimate, Bear River Range, southeast Idaho. 26th Pacific Climate Workshop (PACLIM), Pacific Grove, CA.

***Lundeen, Z****.,* Brunelle, A., Burns, S.J., Asmerom, Y., and Polyak, V. (2011) A Season-Specific Paleoclimate Record From A Northern Wasatch Mountains Speleothem and Linkages To The Pacific. 25th Pacific Climate Workshop (PACLIM), Pacific Grove, CA.

Morris, Jesse L., Mock, Cary J., ***Lundeen, Zachary***, and Brunelle, Andrea, (2010) Modern Perspectives on High Resolution Paleoclimate Data from the Eastern Great Basin, USA Geological Society of America Abstracts with Programs Vol. 42, No. 5, October 31-Nov 3, Denver.

***Lundeen, Z.****,* Brunelle, A., Burns, S.J., Asmerom, Y., Polyak, V., (2010)Paired Speleothem and Lacustrine Paleoclimate Records From The Bear River Range, Southeast Idaho. Geological Society of America Abstracts with Programs Vol. 42, No. 5, October 31-Nov 3, Denver.

***Lundeen, Z****.,* Brunelle, A., Burns, S.J., Asmerom, Y., Polyak, V., (2009)A speleothem record of climate variability over the last millennium from the northern Wasatch Mountains, *Eos Trans. AGU, 90(52),* Fall Meet. Suppl., Abstract PP41B-1515.

***Lundeen, Z.***and Brunelle, A., (2009) Records of Holocene Hydroclimatology from the Bear River Range, Southeastern Idaho. 24th Pacific Climate Workshop (PACLIM), Pacific Grove, CA, April 19-22.

***Lundeen, Z.***and Brunelle, A., (2009) A Paleoclimatic Perspective on Water Resources of the Bear River Basin, Annual Meeting of the Association of American Geographers, Las Vegas, Nevada, March 22-29.

***Lundeen, Z****.,* Brigham-Grette, J., Petsch, S., Burns, S., (2004) Elemental and Isotopic Constraints on the Late Glacial-Holocene Transgression and Paleoceanography of the Chukchi Sea, American Geophysical Union Abstracts, EOS Transactions, 85 (47).

Brigham-Grette, J., and ***Lundeen, Z.****,* (2004) Déjà vu: Paleoenvironmental Look at Sea ice Extent during earlier warm periods, Arctic Research Consortium of the United States, 16th Annual Meeting Abstract and Program. May 14-15, Washington D.C.

***Lundeen, Z.****,* Brigham-Grette, J., Driscoll, N., Keigwin, S., Burns, S., Petsch, S., (2003) Organic Matter Isotopic Analyses from Chukchi Sea Sediments: New Constraints on the Late Quaternary Sea Level History of Beringia, American Geophysical Union Abstracts, EOS Transactions, 84 (46)

Hill, J.C., Driscoll, N.W., Brigham-Grette, J., ***Lundeen, Z.****,* (2003) Large incised channels on the Chukchi Shelf provide new constraints on onshore drainage: Implications for tectonic and climatic evolution of NW Alaska, American Geophysical Union Abstracts, EOS Transactions, 84 (46)

Brigham-Grette, J, Neal Driscoll, Lloyd Keigwin*,* ***Zach Lundeen***, Jenna Hill, Mea Cook, Jeff Donnely, (2003) Beringian Sea Level and Marine Climate History: Investigations into Regional & Global Impacts, American Geophysical Union Abstracts, EOS Transactions, 84 (46)

***Lundeen, Z****.,* Brigham-Grette, J., Keigwin, L., Driscoll, N., and Donnely, J., (2002) Marine Climate and Relative Sea Level Across Central Beringia. NSF Arctic Systems Science (ARCSS) All Hands Workshop Meeting Abstract and Program. February 20-23, Seattle

**Professional Affiliations**

* Geological Society of America (GSA)
* American Geophysical Union (AGU)
* American Association for the Advancement of Science (AAAS)