

CURRICULUM VITAE

SPRUCE W. SCHOENEMANN, PH.D.

ASSOCIATE PROFESSOR
Environmental Sciences Department
The University of Montana Western

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Dillon, MT, 59725
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SUMMARY OF QUALIFICATIONS

- Strong professional and personal interest in Environmental, Geological and Climatological Sciences
 - 13-years experience of climate-related scientific research; applying analytical tools and implementing research methods
 - Experienced in teaching and designing inclusive and engaging curriculum for undergraduate students
 - Extensive teaching experience in academic and outdoor/experiential education settings
 - Skilled in organizing and facilitating field research and course field trips
 - Strong commitment to developing students' critical reasoning skills and interdisciplinary approaches to problem-solving
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EDUCATION

Ph.D. Earth & Space Sciences, University of Washington **Mar 2015**
▪ Climatology, Ice Core Paleoclimate Reconstructions, and Stable Isotope Geochemistry

Certificate: Graduate Certificate in Climate Science, Program on Climate Change **Jun 2014**

Related Coursework: Paleoclimatology and Proxies, Isotope Geochemistry, The Global Carbon Cycle, Ice and Climate, Climate Dynamics, Objective Statistical Analysis, Principles of Glaciology, and Energy, Science, and Technology,

B.A. in Geology and Environmental Studies, Whitman College **May 2003**
Awarded Dr. Albert Ripley Leeds Prize in Geology (2003)

Sea Education Association (SEA), Boston University **Sep – Dec 2001**
*Nautical Science and Oceanography semester aboard
SSV Schooner Westward*

RESEARCH INTERESTS

- Understanding the variability and dynamics of past and present climate change, thereby informing our projections of future climate change
- Paleoclimate reconstructions from proxy records including ice cores, sediment and ocean cores, glacier deposits, and other environmental recorders
- Utilize geochemical tracers, such as water isotopes, to investigate spatial and temporal changes in the Earth's hydrological cycle, including polar and alpine regions, local precipitation and snowpack, and lake systems.

TEACHING INTERESTS

- Undergraduate and graduate environmental science and climate courses, including Environmental Geochemistry, Intro to Environmental Geology, Earth's Climate System, Glaciology and Ice Sheets, Paleoclimate and Proxies, Carbon Cycle and Climate, and Regional Climate Impacts
- Commitment to developing science curriculum that promotes transferable skills including: scientific inquiry, data analysis and interpretation, problem-solving, comprehend long-term implications, critical reading and effective writing
- Advising graduate and undergraduate research projects and coordinating capstone seminars

RESEARCH & FIELD EXPERIENCE

Associate Professor

The University of Montana Western **Dillon, MT** **Aug 2019 – present**
Environmental Sciences Dept.

- Taught Weather & Climate, Carbon Cycle and Climate, Intro to Environmental Geology, Geology of the American West, Intro to General Chemistry, Environmental Geochemistry, Rocks, Minerals and Resources, Sustainable Natural Resource Management, and Water in the West: Science and Society.
- Courses are developed for Experience One (known as X1) where students take one course at a time for 3.5 weeks.
- Classes provide authentic practice in the discipline, including hands-on, experiential, and project-based research with an emphasis on transferable job skills.
- Developed research program in paleolimnology of alpine lakes, combined with tree-ring records and regional water isotope systematics to reconstruct past winter hydroclimate in the Northern Rocky Mountains.

Assistant Professor

The University of Montana Western **Dillon, MT** **Aug 2016 – Aug 2019**
Environmental Sciences Dept.

- See description from above. *Note:* in addition to my 3 years as Assistant Professor I had 2 years of prior lectureship experience credited toward my promotion to Associate Professor rank.

Postdoctoral Research Associate

University of Washington, Earth & Space Sciences **Seattle, WA** **Feb 2015 – Aug 2016**

- Investigation of Holocene climate of Antarctica and the Southern Hemisphere through high-resolution ice cores and sediment cores with an aim to understand the application of ^{17}O -excess as a sea ice proxy.
- Utilize back-trajectory modeling and isotope models for investigating connections between Arctic permafrost cores and moisture source regions during the Holocene period.

Graduate Research Assistant

University of Washington, Earth & Space Sciences **Seattle, WA** **2009 – 2014**

- Study past climate of Antarctica and the Southern Hemisphere through water isotopes preserved in ice cores with an aim to better understand the mechanisms responsible for the last deglacial transition.
- Implementation and inclusion of $\delta^{17}\text{O}$ isotopes into isotope-enabled General Circulation Model, and in Intermediate Complexity Isotope-Models for interpretation of $^{17}\text{O}_{\text{excess}}$ sensitivity to climate conditions.
- Developed sample preparation line and Isotope Ratio Mass Spectrometer methods for high precision measurement of $\delta^{17}\text{O}$ and $\delta^{18}\text{O}$ isotopes of O_2 .

Graduate Student Representative

Program on Climate Change, University of Washington **Seattle, WA** **2011 – 2012**

- Represented graduate student perspectives, curricular needs, and feedback/suggestions on PCC Advisory Committee
- Provided regular feedback to graduate students on PCC state of affairs, student opportunities for fellowships, and upcoming PCC-related events

Field & Lab Technician

University of Washington **Kangerlussuaq, Greenland** **Aug – Sep 2012**

- Gathered water samples for performing a suite of geochemistry and sedimentological analysis.
- Filter waters for sediment grain size & distribution, Sulfates, Particulate Organic Carbon, and Dissolved Organic Carbon
- Utilized a spectrophotometer for measurements of Fe(II), Fe(tot), and DOC absorbance
- Responsibilities included site maintenance of data loggers, checking rain gauges, calculating stream discharge, and measuring pH, Ec, and DO

Field Technician

University of Washington **Mt Waddington, B.C** **Jun – Jul 2010**

- Assisted with assembly, set up & operation of drilling tower, winch, and core barrel
- Responsibilities included recovering the ice core, logging the core, and packing for shipment

Ice Core Handler and Science Technician

University of New Hampshire

WAIS Divide, Antarctica

Nov 2008 – Jan 2009

Science Coordination Office

- Responsibilities included removing the drilling fluid from the core, measuring the length, quality, and electrical properties of the core, packing the core for shipment, and assisting the drillers with quality control
-

TEACHING EXPERIENCE: ACADEMIC

Lecturer

The Earth System and Climate, ESS201

Univ. of Washington, Earth & Space Sciences

Seattle, WA

Spring Qtr. 2015

- Designed overall course syllabus and assessment design
- Developed a “flipped classroom” structure including: course videos, readings, and online quizzes
- Presented and facilitated course lectures, student-led discussions, group worksheets and activities
- Developed and facilitated lab experiments, data analysis, demonstrations, and field trips

Visiting Lecturer

Environmental Program

Colorado College

Colorado Springs, CO

Nov – Dec 2012

- Developed science curriculum and assessments for Intro to Global Climate Change course
- Planned and facilitated daily class lectures, discussions, and labs
- Organized field trip to National Ice Core Lab and INSTAAR Stable Isotope Lab

Teaching Assistant

The Earth System and Climate, ESS201

Univ. of Washington, Earth & Space Sciences

Seattle, WA

Winter Qtr. 2011, 2013

- Assisted in the overall course planning and assessment design
- Presented course material during faculty absence
- Facilitated lab sections and discussions, and labs

Science Fellow

Eagle Rock School and

Estes Park, CO

Sep 2006 – Aug 2007

Professional Development Center

- One-year residential teaching fellowship position at the Eagle Rock School and Professional Development Center
 - Developed interdisciplinary science curriculum and assessments for diverse learning styles
 - Instructed or co-instructed courses on geology, region specific environmental and social studies, river ecology, climate change, and physics
 - Provided positive role modeling and developed mentoring relationships with students to help them foster their academic and personal growth
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TEACHING EXPERIENCE: EXPERIENTIAL

Instructor

Outward Bound Wilderness, HIOBS

Wheeler Bay, ME

May – Aug 2006

- Led 22 & 16-day Ocean Bound Expeditions to Bermuda and Nova Scotia respectively and one 8-day Pulling Boat course
- Responsibilities included pre-program preparation, program coordination and planning
- Taught core values, seamanship, nautical and maritime science, all in an expeditionary-based learning model
- Encouraged and developed teamwork, compassion, service, and physical fitness

Crew Leader

Student Conservation Association

Naches, WA & Seward, AK

Jun 2004, Jul 2005

- Led 4-week backcountry trail crew of high school age volunteers in conservation service projects for US Park Service
- Duties included pre-program preparation, backcountry living instruction, group facilitation, risk management, environmental and experiential education, and trail maintenance project completion

Program Coordinator & Instructor Deckhand

Guided Discoveries CIMI Tall Ship Expeditions **Long Beach, CA** **Feb – May 2005**

- Organized and implemented 2, 3, and 5-day overnight trips
- Taught marine science, oceanography, marlinspike seamanship, navigation, and ship operations
- Rotated between program coordinator, instructor, and deckhand

PROFESSIONAL EXPERIENCE

Climate Lecturer, Zodiac Driver, & Staff Photographer

Zegrahm Eco Expeditions **Seattle, WA** **Jan – Feb 2011**

Falklands, South Georgia, & Antarctic Peninsula

- Presented two lectures on Antarctic ice cores & climate change research
- Responsibilities included passenger safety and risk management, eco tours both by Zodiac boat and on foot, daily photo journal, descriptions of flora and fauna, species identification, and local geology

Community Outreach Coordinator

City of Boulder **Boulder, CO** **Jun 2008 – Nov 2008**

Office of Environmental Affairs

- Facilitated neighborhood climate action group meetings and coordinate among groups
 - Assisted with marketing/outreach of all Climate Action Plan programs (ClimateSmart, Residential Energy Audit Program, Weatherization, Home Energy Makeover contest, and Transportation)
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PEER-REVIEWED PUBLICATIONS

- [1] **Schoenemann, S. W.**, J. T. Martin, G. T. Pederson, and D. B. McWethy (2020), 2,200-year tree-ring and lake-sediment based snowpack reconstruction for the northern Rocky Mountains highlights the historic magnitude of recent snow drought, *Quaternary Science Advances*, 2, 1–13, doi:10.1016/j.qsa.2020.100013.
- [2] Porter, T. J., **S.W. Schoenemann**, L. J. Davies, E. J. Steig, S. Bandara, D. Froese (2019), Recent summer warming in northwestern Canada exceeds the Holocene thermal maximum, *Nat. Comms.* 10, 1-10, doi:10.1038/s41467-019-09622-y.
- [3] Jones, T. R., J.W.C. White, E. J. Steig, B. H. Vaughn, V. Morris, V. Gkinis, B. R. Markle, **S. W. Schoenemann** (2017), Improved Methodologies for Continuous Flow Analysis of Stable Water Isotopes in Ice Cores, *Atmospheric Measurement Techniques*, 10, 617-632, doi:10.5194/amt-10-617-2017.
- [4] **Schoenemann, S. W.** and E.J. Steig (2016), Seasonal and spatial variation of $^{17}\text{O}_{\text{excess}}$ and d_{excess} in Antarctic precipitation: insights from an intermediate complexity isotope model, *J. Geophys. Res. Atmos.* 121, doi:10.1002/2016JD025117.
- [5] Markle, B. R., E.J. Steig, C. Buizert, **S. W. Schoenemann**, C.M. Bitz, T. Fudge, J.B. Pedro, Q. Ding, T. Jones, J.W.C. White, T. Sowers (2016), Atmospheric teleconnections between the tropics and high southern latitudes during abrupt climate change, *Nature Geoscience*, Vol 10, pp. 36-40. *Contributed to key science concepts, editing manuscript and supplement, and reviewing figures.*
- [6] Schauer, A. J., **S. W. Schoenemann**, and E. J. Steig (2016), Routine high-precision analysis of triple water-isotope ratios using cavity ring-down spectroscopy, *Rapid Communications in Mass Spectrometry*, 30, 2059-2069, doi:10.1002/rcm.7682.
- [7] **WAIS Divide Project Members** (2015), Precise inter-polar phasing of abrupt climate change during the last ice age, *Nature*, 520, 661–665, doi:10.1038/nature14401. *Contributed to editing manuscript and interpretation of isotope/CH₄ records.*
- [8] **Schoenemann, S. W.**, E. J. Steig, Q. Ding, B. R. Markle, and A. J. Schauer (2014), Triple water-isotopologue record from WAIS Divide, Antarctica: controls on glacial-interglacial changes in ^{17}O -excess of precipitation, *J. Geophys. Res. Atmos.*, 119, 8741–8763.

- [9] Steig, E. J., V. Gkinis, A. J. Schauer, **S. W. Schoenemann**, K. Samek, J. Hoffnagle, K. J. Dennis, and S. M. Tan (2014), Calibrated high-precision $^{17}\text{O}_{\text{excess}}$ measurements using laser-current tuned cavity ring-down spectroscopy, *Atmospheric Measurement Techniques*, 6, 10191–10229.
- [10] **Schoenemann, S. W.**, A. J. Schauer, and E. J. Steig (2013), Measurement of SLAP2 and GISP $\delta^{17}\text{O}$ and proposed VSMOW-SLAP normalization for $\delta^{17}\text{O}$ and $^{17}\text{O}_{\text{excess}}$, *Rapid Communications in Mass Spectrometry*, 582–590, doi:10.1002/rcm.6486.
- [11] **WAIS Divide Project Members** (2013), Onset of deglacial warming in West Antarctica driven by local orbital forcing, *Nature*, 500, 440-444, doi:10.1038/nature12376. *Contributed to writing manuscript, GCM-enabled isotope modeling, and interpretation of isotope records and GCM results.*
- [12] Steig, E. J. et al. (2013), Recent climate and ice-sheet changes in West Antarctica compared with the past 2,000 years, *Nature Geoscience*, 6, 372–375.

INVITED DEPARTMENTAL COLLOQUIA

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|---|------------------------|---------------------|
| Idaho State University | Idaho Falls, ID | Nov 29, 2017 |
| Schoenemann, S. A. Steele, R. Sletten, A. Maloney, J. Sachs, A. Schauer | | |
| <i>Reconstructing Holocene Climate based on Alkenones and Isotopes from West Greenland Lake Sediments</i> | | |
| Montana Tech Public Lecture Series | Butte, MT | Sep 14, 2017 |
| Schoenemann, S. A. Steele, R. Sletten, A. Maloney, J. Sachs, A. Schauer | | |
| <i>Reconstructing Holocene Climate based on Alkenones and Isotopes from West Greenland Lake Sediments: Temperature or Effective Moisture as a Driver?</i> | | |
| USGS NOROCK EcoLunch Seminar Series | Bozeman, MT | Feb 16, 2017 |
| Schoenemann, S. T. Porter, D. Froese, and L. Davies | | |
| <i>A full Holocene Record of Water Isotopes from Syngenetic Pore Ice in central Yukon Territory</i> | | |
| RoughCut Series at Montana Institute on Ecosystems | Bozeman, MT | Feb 15, 2017 |
| Schoenemann, S. A. Steele, R. Sletten, A. Maloney, J. Sachs, A. Schauer | | |
| <i>Reconstruction of Holocene Climate from Greenland Lake Sediment Cores: A Pilot Study</i> | | |

PRESENTATIONS

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|--|----------------------------|------------------------|
| MT American Water Resources Assoc – Fall Meeting | Butte, MT (virtual) | Oct 5-9, 2020 |
| Schoenemann, S. and L. Von Oesen | | |
| <i>Lake Reconnaissance for Determining Potential Lake Cores with Carbonate for Retrieving Climate Records.</i> Oral. | | |
| American Geophysical Union – Fall Meeting | San Francisco, CA | Dec 9-13, 2019 |
| Schoenemann, S. J. Nusbaumer, A. LeGrande, T. Porter | | |
| <i>Ice Sheet-Moderated Changes in the Precipitation Isotope Climatology of NW Canada during the Late Deglacial.</i> Poster #C21E-1494 | | |
| MT American Water Resources Assoc – Fall Meeting | Red Lodge, MT | Oct 9-10, 2019 |
| Schoenemann, S. J. Martin, G. Pederson, D. McWethy | | |
| <i>Precipitation Isotope Ratios and Tree-ring based Snowpack Relationships to inform Paleoclimate Reconstructions from Lake Sediment Cores.</i> Poster. | | |
| MtnClim– Fall Meeting | Gothic, CO | Sep 11-14, 2018 |
| Schoenemann, S. J. Martin, G. Pederson, D. McWethy | | |
| <i>Precipitation Isotope Ratios and Tree-ring based Snowpack Relationships to inform Paleoclimate Reconstructions from Lake Sediment Cores.</i> Poster. Presenter G. Pederson. | | |
| CANQUA– Annual Meeting | Ottawa, Canada | Aug 7-11, 2018 |
| Porter, T, S. Schoenemann , L. Davies, S. Bandara, D. Froese | | |

A full Holocene summer temperature reconstruction from precipitation isotopes in syngenetic permafrost in central Yukon (eastern Beringia). Presenter T. Porter.

- American Geophysical Union – Fall Meeting **New Orleans, LA** **Dec 11-14, 2017**
Schoenemann, S. A. Steele, R. Sletten, A. Maloney, J. Sachs, A. Schauer
Reconstructing Holocene Climate based on Alkenones and Isotopes from West Greenland Lake Sediments: Temperature or Effective Moisture as a Driver? - Invited Talk & Poster #243964
- Geological Society of America – Fall Meeting **Seattle, WA** **Oct 22-25, 2017**
Schoenemann, S. A. Steele, R. Sletten, A. Maloney, J. Sachs, A. Schauer
Reconstructing Holocene Climate based on Alkenones and Isotopes from West Greenland Lake Sediments: Temperature or Effective Moisture as a Driver? Poster. Presenter R. Sletten
- International Partnership in Ice Coring Sciences **Hobart, Tasmania** **Mar 7-11, 2016**
Schoenemann, S., and E. Steig
On the seasonality of ^{17}O -excess in Antarctic precipitation: insights from an intermediate complexity isotope model and high-resolution firn-core data. Poster. Presenter E. Steig
- American Geophysical Union – Fall Meeting **San Francisco, CA** **Dec 14-18, 2015**
Schoenemann, S. and E. Steig
Seasonal and spatial variation of ^{17}O -excess and d_{excess} in Antarctic precipitation: Insights from an intermediate complexity isotope model, Abstract PP78843
- WAIS Divide Ice Core Project– Science Meeting **La Jolla, CA** **Sept 22-23, 2015**
Seasonal and spatial variation of ^{17}O -excess and d_{excess} in Antarctic precipitation: Insights from an intermediate complexity isotope model and high-resolution seasonal data
- American Geophysical Union– Fall Meeting **San Francisco, CA** **Dec 15-19, 2014**
UWHS Climate Science: Uniting University Scientists and High School Teachers in the Development and Implementation of a Dual-Credit STEM-Focused Curriculum-Poster ED23A-0742
- American Geophysical Union– Fall Meeting **San Francisco, CA** **Dec 9-13, 2013**
Schoenemann, S., E. Steig, Q. Ding, A. Schauer,
Sea Ice Control of ^{17}O excess in Antarctic Precipitation, Abstract PP41D-08
- International Partnership in Ice Coring Sciences **Presqu'île de Giens, France** **Oct, 2012**
Schoenemann, S., E. Steig, Q. Ding, A. Schauer,
Glacial-Interglacial Change of ^{17}O excess at WAIS Divide and other Antarctic Cores. Poster
- 6th Graduate Climate Conference– Session Chair **Packwood Forest, WA** **Oct 26, 2012**
An Introduction and Background to our Favorite Climate Recorder: Paleo Cryosphere!
- Colorado College– Visiting Lecturer Interview **Colorado College, CO** **Oct 15, 2012**
What do Ice Cores and Water Isotopes tell us about Past Antarctic Climate?
- European Geosciences Union– General Assembly **Vienna, Austria** **Apr 26, 2012**
Schoenemann, S., E. Steig, Q. Ding, A. Schauer,
Ice Core Measurements and GCM Simulation of the Spatial Distribution and Glacial-Interglacial Change of ^{17}O -excess in Antarctica, Abstract EGU2012-1029
- American Geophysical Union– Fall Meeting **San Francisco, CA** **Dec 5-8, 2011**
Schoenemann, S., E. Steig, Q. Ding, A. Schauer,
Measurement and GCM Simulation of the Spatial Distribution and Glacial-Interglacial Change of ^{17}O -excess in Antarctica.
- Northwest Glaciologist – Science Meeting **Portland, OR** **Oct 19, 2011**
Measurement of the Spatial Distribution and Glacial-Interglacial Change of ^{17}O -excess in West Antarctica.
- WAIS Divide Ice Core Project– Science Meeting **La Jolla, CA** **Sept 27-30, 2011**
Measurement of the Spatial Distribution and Glacial-Interglacial Change of ^{17}O -excess in West Antarctica.
- Earth & Space Sciences Gala **University of Washington** **Mar 30, 2011**

FUNDING, HONORS, AND AWARDS

Funded Grants

T. Moon, A. Gold, A. Khan, **S. W. Schoenemann (co-PI)** (Aug 1, 2020-Jul 31, 2023), Collaborative Research: EHR-Polar DCL: Polar Space and Place: Using GIS and interactive environments to bring polar science to the classroom, National Science Foundation, Award# 2021275, 2021543, 2021503: \$299,963

S. W. Schoenemann (PI), L. Corbett, P. Bierman (Sep 15, 2020-Aug 31, 2022), Collaborative Research: A place-based, student-led research project in the Pioneer Mountains, Montana: an investigation of very dry, alpine glaciation proximal to the Laurentide Ice Sheet, National Science Foundation, Award# 2018222, 2018059: \$135,046.

J. Sachs, R. Sletten, **S. W. Schoenemann (primary author)** (Jun 10, 2019-Jul 1, 2020), West Greenland Coastal Temperatures during the 8.2 ka Event derived from Alkenones, Quaternary Research Center-Univ of Washington, \$7,500.

S. W. Schoenemann, G. Pederson, D. McWethy, J. Martin (Jan 1, 2018-Dec 31 2018), Precipitation Isotope Ratios and Tree-ring based Snowpack Relationships to inform Paleoclimate Reconstructions from Lake Sediment Cores, NASA Montana Space Grant Consortium, \$101,476.08.

E. J. Steig, A. J. Schauer, **S. W. Schoenemann** (Oct 1, 2013-Jan 31, 2017), Development of a laser spectroscopy system for analysis of ¹⁷O-excess on ice cores, Grant Opportunities for Academic Liaison With Industry, Paleoclimate Program, Antarctic Instrumentation & Support, Antarctic Glaciology, Climate & Large-Scale Dynamics, \$357,627.00.

S. W. Schoenemann (2014–2015), Reconstruction of Holocene temperatures from Greenland lake sediment cores using a novel method: Clumped Isotopes, Quaternary Research Center, University of Washington, \$3300.

Funded Fellowships

S. W. Schoenemann (2018–2019), *Lake reconnaissance for identifying high-accumulation, carbonate-based sediment cores*, Montana Space Grant Consortium, NASA, \$6800

S. W. Schoenemann (2013–2014), *Reconstruction of Holocene temperatures from Greenland lake sediment cores using a novel method: Clumped Isotopes*, Earth & Space Sciences Departmental Award, Pilot Study \$2500

S. W. Schoenemann (Summer 2011), *From Water Isotopes to Temperature: Climate Reconstructions from Ice Cores*, NASA/UWHS Research Assistant Fellowship, NASA Global Climate Change Education/Program on Climate Change, ~\$4250

Other Awards

- Misch Research Assistant Fellowship (1 quarter), Earth & Space Sciences Departmental Award, May, 2012
 - Best Surface Processes, Oral Presentation, Earth & Space Science, Oct 26, 2010
 - Top Scholar Research Assistantship
Graduate School's Fund for Excellence and Innovation (GSFEI), University of Washington, Autumn, 2009
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COURSES TAUGHT

HONR 193F Iceland & Climate Change: Geological, Ecological, & Sustainability Investigations	Spring 2019
GEO 374 Carbon Cycle and Climate	Fall 2018, 19, 20
HONR 194 Water in the West: Science & Society	Fall 2018
GEO 110 Weather and Climate	Fall 17, Spr. 18, Fall 19, 20
NRSM 441 Sustainable Natural Resource Management	Spring 2018
GEO 103 Intro to Environmental Geology	Fall 2016, 17, 19
CHMY 121 Intro to General Chemistry	Fall & Spr. 17, 18, 19, 20

GEO 226 Rocks, Minerals & Resources	Spring 2017
GEO 431 Environmental Geochemistry	Spring 2017, 18, 19, 20
GEO 226 Geology of the American West	Fall 2016, Spr. 18, Fall 19
ESS 201 The Earth System and Climate	Spring 2015
EV 128 Introduction to Global Climate Change (team taught with Miro Kummel)	Fall 2011

PROFESSIONAL/DEPARTMENTAL SERVICE

Paper Reviewer – *Journal of Quaternary Science, Climate Dynamics, EPSL, The Cryosphere, The Holocene, PNAS, JGR Atmosphere* **2013–PRESENT**

UMWestern Environmental Sciences Department:

Environmental Geophysics Search Committee Member	Spring 2020
Strategic Enrollment Management Committee	Fall 2019–Present
Chemistry Search Committee Member	Fall 2018–Spring 2019
Honors Committee	Fall 2018–Present
Env. Sustainability Search Committee Member	Spring 2018
Environmental Sciences Department, Department Chair	Fall 2017–Fall 2018
Environmental Sciences Department, Budget Committee	Fall 2017–Fall 2018
Collective Bargaining Committee	Fall 2017–present
University Court Committee	Fall 2016–present

OUTREACH & SERVICE

Coordinator – <i>Snowpack Fest</i>	Dillon, MT	Jan 30-Feb 1, 2020
Co-coordinator/Presenter – <i>Save the Snow! Climate Summit</i> <i>Precipitation Isotope Ratios and Tree-Ring Based Snowpack Relationships to Inform Paleoclimate Reconstruction from Lake Sediment Cores</i>	Dillon, MT	Mar 15, 2019
Presenter – <i>Patagonia Outlet Store</i> <i>Antarctica to Iceland – Secrets of the Ice: Climate Research in Antarctica</i>	Dillon, MT	Dec 7, 2018
Presenter – <i>Washington Science Teachers Association</i> <i>Next Generation Science Standards and Climate Change in the High School Classroom</i>	Shorecrest, WA	Oct 24, 2015
Research Presenter – <i>Science Inside Out</i> <i>College of the Environment</i>	Seattle, WA	Nov, 2013
Program on Climate Change, UW in High School <i>Curriculum design and development for UW Atmos211</i>	Seattle, WA	2010–2015
Pacific Science Center <i>Polar Science Weekend (annual event)</i>	Seattle, WA	2010–2012, 2015
H.M. Jackson High School <i>Climate Expeditions: Adventures in Polar Research</i> <i>Developed in concert with the Ice Drilling Program Office – Dartmouth, NH</i>	Mill Creek, WA	Apr 11, 2012
UW in High School, University of Washington <i>Orbital Forcing of Climate, Interpreting Temperature Variations recorded in Ice Cores</i>	Seattle, WA	Mar 10, 2012
Bremerton High School <i>Climate Expeditions: Adventures in Polar Research</i>	Bremerton, WA	Feb 22, 2012
Ingraham High School <i>Antarctic Climate Evidence from Ice Cores</i>	Northgate, WA	Jan 5, Feb 2, 2012

ACADEMIC PROFESSIONAL DEVELOPMENT

CUAHSi Snow Field Measurement School-MSU	Bozeman, MT	Jan 7-11, 2019
Isotope Tracers in Catchment Hydrology – USASK Online webinar	Saskatoon, Saskatchewan, CA	May 14-18, 2018
National Association of Geoscience Teachers – UNM Earth Educators’ Rendezvous/SERC	Albuquerque, NM	Jul 17-21, 2017
Sixth Graduate Climate Conference– UW Program on Climate Change– Summer Institute (Topic: <i>Hydrologic Cycle</i>)	Pack Forest, WA Friday Harbor, WA	Oct 26-28, 2012 Sep 2011
Program on Climate Change– Summer Institute (Topic: <i>Climate Feedbacks</i>)	Friday Harbor, WA	Sep 2010
Fourth Graduate Climate Conference – UW Meeting the Global Energy and Climate Challenge– University of Colorado Boulder	Pack Forest, WA Boulder, CO	Oct 15-17, 2010 Aug 22-23, 2008
Global Climate Change Summit – OSU	Columbus, OH	Jan 2007

TECHNICAL SKILLS

Laboratory development and design, MatLab, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Mac Keynote, Adobe Illustrator, Effective Communication, Interpersonal Skills, Organizational Skills, Digital Photography, Website Design, Grant Writing 2007, 2008, & 2010 NSF Graduate Research Fellowship Program, and 2011, 2012, 2013 NSF Office of Polar Programs, 2016, 2017 MT NASA Space Grant Consortium

REFERENCES

Eric Steig – University of Washington

Professor of Earth & Space Sciences
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Miroslav Kummel – Colorado College

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Rebekah Levine – University of Montana Western

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ADDITIONAL REFERENCES

Trevor Porter – University of Toronto Mississauga

Assistant Professor of Geography
trevor.porter@utoronto.ca

(905) 828-5314

Justin Martin – USGS Northern Rocky Mtn. Sci. Center

Ecologist
justinmartin@usgs.gov
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Ron Sletten – University of Washington

Research Associate Professor of Earth & Space Sciences
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Andy Schauer – University of Washington

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Program and Education Specialist
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