Justin Pflug

Visiting Post-Doctoral Fellow at the Cooperative Institute for Research in Environmental Science (CIRES)

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Education

University of Washington, Seattle, WA
Doctor of Philosophy (PhD) Civil and Environmental Engineering, 2018 – 2021
> ***Dissertation:*** *Improving estimate of snow deposition magnitude and heterogeneity using historic snow patterns in the California, USA, Sierra Nevada*

University of Washington, Seattle, WA
Master of Science (M.S.) Civil and Environmental Engineering, 2016 – 2018
> ***Thesis:*** *Modeling seasonal evolution of liquid water percolation in maritime and continental snowpacks*

Hastings College, Hastings, NE
Bachelor of Arts (B.A.) Physics, 2012 – 2016

Professional Experience

2021 - Present	**Chapter author for the Fifth National Climate Assessment (NCA5)**
	• Currently helping author a chapter about climate change's impact on water, and the resulting implications that this will have for the environment, economy, and livelihood of United States citizens.
Feb. – Mar. 2018	**Swiss Institute for Snow and Avalanche Research visiting researcher,** Davos, Switzerland
	• Assisted winter field work and processed airborne lidar data focused on snow depth in forested stands and canopy-driven snow deposition and melt processes.
Jun. – Sep. 2017	**Future Park Leaders of Emerging Change (FPL) intern,** Port Angeles, WA
	• Used airborne lidar and true color imagery to quantify decadal (1980 – present) and seasonal (2015) glacier extent change and mass-balance in Olympic National Park.
May – Aug. 2015	**Wellhead Electric Company, Inc.,** Sacramento, CA
	• Arranged meteorological data reports for buyers of a solar energy power station in southern California.

Awards and Honors

- Cooperative Institute for Research in Environmental Science visiting fellowship recipient (2021 – Present)
- Nece Endowed Fellowship awardee (2021)
- American Meteorological Society best student presentation award (2021; *https://www.youtube.com/watch?v=GOLICZNzkyg&t=91s*)
- American Meteorological Society conference on Mountain Meteorology student oral presentation award (2020; *https://ams.confex.com/ams/19Mountain/meetingapp.cgi/Paper/376303*)
- American Meteorological Society best student presentation award (2019; *http://depts.washington.edu/mtnhydr/news/JustinAMS.shtml*)
- Western Snow Conference best poster award (2019; *https://westernsnowconference.org/node/1874*)
- Eastern Snow Conference best poster award (2018)
- National Aeronautics and Space Administration (NASA) Earth and Space Science Fellowship recipient (2018 – present)
- American Avalanche Association Research Grant recipient (2017)
- University of Washington VALLE scholarship recipient (2016 – 2017)
- American Water Resources Association Washington Chapter scholarship recipient (2017)

Publications

- **Pflug, J.M.,** Margulis, S., Lundquist, J.D., 2021. Inferring watershed-scale mean snow magnitude and distribution using multidecadal snow reanalysis patterns and snow pillow observations. Authorea, doi:10.22541/au.163250588.84772578/v1.
- **Pflug, J.M.,** Hughes, M., Lundquist, J.D., 2021. Downscaling snow deposition using historic snow depth patterns: Diagnosing limitations from snowfall biases ,winter snow losses, and interannual snow pattern repeatability. Water Resources Research 57, e2021WR029999.
- **Pflug, J.M.** and Lundquist, J.D., 2020. Inferring Distributed Snow Depth by Leveraging Snow Pattern Repeatability: Investigation Using 47 Lidar Observations in the Tuolumne Watershed, Sierra Nevada, California. Water Resources Research 56, e2020WR02724.
- **Pflug, J.M.,** Liston, G.E., Nijssen, B., Lundquist, J.D., 2019. Testing model representations of snowpack liquid water percolation across multiple climates. Water Resources Research 55, 4820-4838.
- **Pflug, J.M.,** Fang, Y., Margulis, S., Livneh, B., 2022. The interaction and tradeoffs between thresholds and spatial discretizations: Insights from a wolverine habitat assessment in the Colorado Rocky Mountains. *In preparation for journal submission*.
- Fountain, A.G., Gray, C., Glenn, B.A., Menounos, B., **Pflug, J.M.,** Riedel, J.L., 2021. Glaciers of the Olympic Mountains, Washington – the past and future 100 years. doi:10.1002/essoar.10506698.1.
- Currier, W.R., **Pflug, J.M.,** Mazzotti, G., Jonas, T., …Lundquist, J.D., 2019. Comparing aerial lidar observations with terrestrial lidar and snow-probe transects from NASA's SnowEx campaign. Water Resources Research 55, 6285 – 6294.
- Mazzotti, G., Currier, W.R., Deems, J.S., **Pflug, J.M.,** …Jonas, T., 2019. Revisiting snow cover variability and canopy structure within forest stands: Insights from airborne lidar data. Water Resources Research 55, 6198 – 6216.
- Reynolds, D., **Pflug, J.M.,** Lundquist, J.D., 2020. Evaluating wind fields for use in basin-scale distributed snow models. Water Resources Research, e2020WR028536.
- Kim, R.S. Kumar, S., Vuyovich, C., …**Pflug, J.M.,** …Wang, S., 2020. Snow Ensemble Uncertainty Project (SEUP): Quantification of snow water equivalent uncertainty across North America via ensemble land surface modeling. The Cryosphere Discussions, 1-32.

Selected presentations

- **Pflug, J.M.,** Margulis, S.A., Livneh, B., 2021. Assessing changes in terrestrial and aquatic snow-driven habitat using climate change analogues (*Invited*). 2021 AGU Fall Meeting.
- **Pflug J.M.,** Hughes, M., Margulis, S.A., Lundquist, J.D., 2021. Learning from the past: downscaling snow deposition using historic snow accumulation patterns (*Invited*). 2021 AGU Fall Meeting.
- **Pflug, J.M.,** Margulis, S.A., Hughes, M., Livneh, B., Lundquist, J.D., 2021. Learning from the past: Using historic patterns to improve real-time and future simulations of mountain snowpack (*Invited*). NOAA Physical Science Laboratory seminar.
- **Pflug J.M.,** Margulis, S.A., Lundquist, J.D., 2021. Overcoming snow model and observational uncertainty using snowpack reanalysis patterns in mountainous terrain (*Awarded*). 101st American Meteorological Society Annual Meeting.
- **Pflug, J.M.,** Margulis, S.A., Lundquist, J.D., 2020. Comparing interannual snow pattern repeatability between snowpack reanalyses and airborne lidar observations in the California Sierra Nevada. 2020 AGU Fall Meeting.
- **Pflug, J.M.,** Margulis, S.A., Hughes, M., Lundquist, J.D., 2020. Leveraging precipitation pattern persistence for snow model corrections in the Upper Tuolumne watershed (*Awarded*). 19th Conference on Mountain Meteorology.
- **Pflug, J.M.,** Hughes, M., Lundquist, J.D., 2019. Integrating satellite and ground-based observations with airborne lidar snow pattern assimilation in mountainous terrain. 2019 AGU Fall Meeting.

- **Pflug, J.M.,** Liston, G.E., Lundquist, J.D., 2019. An investigation of liquid water percolation and model transferability in multiple snow climates (***Invited & Awarded***). 99th American Meteorological Society Annual Meeting.
- **Pflug J.M.,** Lundquist, J.D., Baccus, W., 2017. Vanishing ice. Understanding the rate and extent of glacier loss in the Olympic Mountains (***Invited***). National Park Service Climate Change Webinar.

Outreach, reviewing, and teaching experiences:

- Reviewer for multiple scientific journals including *Water Resources Research*, *The Cryosphere*, and *Geoscientific Model Development*.
- Guest lecturer for a field data collections course focused on snowpack (2020, Seattle University)
- Teaching assistant for *deterministic systems in hydrology* (2017, University of Washington)
- Volunteer at public education events such as the University of Washington Engineering Discovery Days (2017 – 2019) and the American Meteorological Society's Weatherfest (2017)
- Physics tutor and lab assistant (2014 – 2016, Hastings College)
- Club leader for the Hastings College Outdoor Club (2015 – 2016)