Merritt E. Harlan (she/her)
Dept. of Civil & Environmental Engineering
University of Massachusetts, Amherst
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774-641-4099

EDUCATION

University of Massachusetts, Amherst Present
PhD Candidate in Civil and Engineering (Environmental/Water Resources)
Future Investigators in NASA Earth and Space Science and Technology (FINESST) recipient 2019-2022
Advisor: Dr. Colin Gleason

Williams College 2016
BA in Mathematics

RESEARCH & TEACHING EXPERIENCE

Graduate Research Assistant 2017-Present
Department of Civil & Environmental Engineering, University of Massachusetts, Amherst
Dr. Gleason's Fluvial@UMASS lab

Capstone Project Advisor: Integrating Geosciences and Engineering in the Arctic 2020
Department of Civil Engineering & Geosciences, University of Massachusetts, Amherst

Teaching Assistant: GIS for Engineers 2019
Department of Civil & Environmental Engineering, University of Massachusetts, Amherst

Summer Researcher: Young Scientist Summer Program 2018
International Institute for Applied Systems Analysis, Vienna

Mentoring Co-Chair: Graduate Women in STEM 2018- present
University of Massachusetts, Amherst
Facilitated mentoring workshops, co-led STEM activities for K-12, and organized anti-racist book groups

Teacher and Academic Coach: Colorado Mountain College & Ski Club Vail 2016-2017
Minturn, CO
Taught small sections of algebra and calculus classes and GED prep

Engineering Intern Teacher: Advanced Studies Program Summer 2015
St. Paul's School, Concord NH
Taught an engineering class alongside a full-time teacher to top local New Hampshire high school students

FIELD EXPERIENCE

NASA SWOT Calibration/Validation & NASA Arctic-Boreal Vulnerability Experiment
Peace-Athabasca Delta, Canada Summer 2019
Primary science, personnel, and medical lead and for a nine-institution, six-week field deployment. Collected LiDAR topography, UAV images, shoreline maps, water surface elevation, sediment, greenhouse gas fluxes and water samples at 24 lakes, and ADCP discharge profiles and sediment profiles along 12 rivers.

North Slope, Alaska Summer 2017
Intensive three-week field camp approx. 350mi north of Fairbanks, AK. Surveyed rivers, ponds, lakes, and surrounding land with pressure transducers, advanced GPS drifters, acoustic Doppler current profilers, ground-based LIDAR, and permafrost probes.

Saskatoon, Canada, Summer 2017
Collected lidar topography for the North Saskatchewan River and collected water surface elevation measurements under the NASA AirSWOT instrument via canoe.

SCHOLARSHIP

In Revision/Review

Harlan, M. E., Gleason, C. J., Altenau, E. H., Butman, B., Carter, T., Chu, V. W., Cooley, S. W., Dolan, W. D., Durand, M. T., Eidam, E., Fayne J. V., Feng, D., Ishitsuka, I., Kuhn, C., Kyzivat E. D., Langhorst, T., Minear, J. T., Pavelsky, T. M., Peters, D. L., Pietroniro, A., Pitcher, L. H., Smith, L. C. (*in revision at Water Resources Research*) Rapid Discharge Estimation from Dense Arrays of Pressure Transducers.

Published

Pitcher, L. H., Smith, L. C., Cooley, S. W., Zaino, A., Carlson, R., Pettit, J., Gleason, C. J., Minear, T., Fayne, J. V., **Harlan, M. E**., Langhorst, T., Topp, S. N., Dolan, W., Kyzivat, E. D., Pietroniro, A., Yang, D., Carter, T., Onclin, C., Hosseini, N., … Pavelsky, T. (2020). Advancing field-based GNSS surveying for validation of remotely sensed water surface elevation products. *Frontiers in Earth Science*
https://doi.org/10.3389/feart.2020.00278

Kyzivat, E. D., Smith, L. C., Pitcher, L. H., Fayne, J. V., Cooley, S. W., Cooper, M. G., Topp, S.N., Langhorst, T., **Harlan, M.E**., Horvat, C., Gleason, C.J., & T.M. Pavelsky (2019). A High-Resolution Airborne Color-Infrared Camera Water Mask for the NASA ABoVE Campaign. *Remote Sensing*, doi.org/10.3390/rs11182163

Conference Presentations/Posters:

Harlan, M. E., Gleason, C. J., Andreadis, K. M., Feng, D., Lin, P. (2020). *Remote observations in changing locations: what can 40 years of satellite data tell us about the future of pan-Arctic streamflow?*., H010-0007.
https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/753838

Harlan, M. E., Gleason, C. J., Smith, L. C., Pavelsky, T., Dolan, W., Fayne, J. V., Ishitsuka, Y., Kyzivat, E. D., Langhorst, T., & Pitcher, L. H. (2019). *Rapid River Discharge Estimation from Pressure Transducer Arrays in the Peace-Athabasca Delta, Canada*. 2019, H21N-1952.
https://ui.adsabs.harvard.edu/abs/2019AGUFM.H21N1952H

Harlan, M. E., Gleason, C. J., Hagemann, M., Pavelsky, T., Smith, L. C., Altenau, E. H., Chu, V. W., Cooley, S. W., Dolan, W., Fayne, J. V., Kyzivat, E. D., Langhorst, T., Minear, J. T., Peters, D. L., Pitcher, L. H., & Tuozzolo, S. (2019). *Combining UAV and Surface Observations for Rapid Discharge Estimation and SWOT Validation in Remote Areas*. 2019, SWOT Science Team Meeting

Harlan, M. E., Gleason, C. J., Hagemann, M., Pavelsky, T., Smith, L. C., Altenau, E. H., Chu, V. W., Cooley, S. W., Dolan, W., Fayne, J. V., Jacquemart, M. F., Kyzivat, E. D., Langhorst, T., Minear, J. T., Overstreet, B. T., Peters, D. L., Pitcher, L. H., & Tuozzolo, S. (2018). *Rapid Discharge Estimation from Water Surface Elevations and Digital Elevation Models for SWOT Validation in Remote Areas*.
https://ui.adsabs.harvard.edu/abs/2018AGUFMOS53C1348H

HONORS & AWARDS

Gleason, C.J. (PI) & **M.E. Harlan** (2019-2022). Rapid Discharge Estimation and SWOT Validation in Remote Areas Through UAV and Surface Observation. NASA Future Investigators in Earth and Space Science and Technology (FINESST) Total Award: $135,000

MEMBERSHIP & SKILLS

Member: American Geophysical Union 2017-Present
Computers: R, ArcGIS, QGIS, Python, Google Earth Engine Javascript API
Certifications: Wilderness First Responder, FAA Part 107 UAV pilot
Field instruments: LiDAR, Acoustic Doppler Current Profiler, GPS base station, Mavic Pro UAV