



# Colin J. Gleason

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## EDUCATION

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**Ph.D. (2016)** Geography, University of California Los Angeles (2011-2016)

**M.S. (2011)** Environmental Resources Engineering, State University of New York College of Environmental Science and Forestry (2009-2011)

**B.S. (2009)** Forest Engineering, State University of New York College of Environmental Science and Forestry *Magna Cum Laude* (2005-2009)

## PEER-REVIEWED JOURNAL PUBLICATIONS

(published or accepted)

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Pitcher, L.H, Smith, L.C., & **C.J. Gleason** (2016). CryoSheds: a GIS Modeling Framework for Generating Hydrologic Watersheds for land-terminating glaciers and ice sheets using Digital Elevation Models and Remote Sensing Observations. *GIScience and Remote Sensing*. 10.1080/15481603.2016.1230084

**Gleason, C.J.**, Smith, L.C., Chu, V.W., Legleiter, C.J., Pitcher, L.H., Overstreet, B.T., Rennermalm, A.K., & R.R. Forster (2016) Characterizing supraglacial meltwater channel hydraulics on the Greenland Ice Sheet from in situ observations. *Earth Surface Processes and Landforms*. 10.1002/esp.3977

Durand M., **Gleason, C.J.**, Garambois, P.A., Bjerklie, D., Smith, L.C., Roux, H., Rodriguez, E., Bates, P., Frasson, R., et al (2016) Intercomparison of remote sensing river discharge estimation algorithms from measurements of river height, width, and slope. *Water Resources Research*. 10.1002/2015WR018434

Bonnema, M., Sikder, S., Hossain, F., Durand, M.A., **Gleason, C.J.**, & D. Bjerklie (2016). Benchmarking wide swath altimetry-based river discharge estimation algorithms for the Ganges river system. *Water Resources Research* 10.1002/2015WR017830

- Yang, K., Smith, L.C., Chu, V.W., Pitcher, L.H., **Gleason, C.J.**, Rennermalm, A.K., & M. Li (2016). Fluvial morphometry of supraglacial river networks on the southwest Greenland Ice Sheet, *GIScience & Remote Sensing*, 10.1080/15481603.2016.1162345
- Yang, K., Smith, L.C., Chu, V.W., **Gleason, C.J.**, & M. Li (2015). A caution on the use of digital elevation models to simulate supraglacial hydrology of the Greenland Ice Sheet. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 10.1109/JSTARS.2015.2483483
- Gleason, C.J.**, & J. Wang (2015). Theoretical basis of at-many-stations hydraulic geometry (AMHG). *Geophysical Research Letters*, 10.1002/2015GL064935.
- Gleason, C.J.**, & A.N. Hamdan (2015). Crossing the (watershed) divide: Satellite data and the changing politics of international river basins. *The Geographical Journal*, 10.1111/geoj.12155
- Gleason, C.J.**, Smith, L.C., Finnegan, D.C., LeWinter, A.L., Pitcher, L. H, and Chu, V.W. (2015). Technical note: Semi-automated classification of time-lapse RGB imagery for a remote Greenlandic river. *Hydrology and Earth Systems Sciences* 19, 1-8
- Smith, L.C., Chu, V.W., Yang, K., **Gleason, C.J.**, Pitcher, L.H., Rennermalm, A.K., Legleiter, C.J., Behar, A.E., Overstreet, B.T., Moustafa, S.E., Tedesco, M., Forster, R.R., LeWinter, A.L., Finnegan, D.C., Sheng, Y., Balog, J. (2015), Efficient meltwater drainage through supraglacial streams and rivers on the southwest Greenland ice sheet, *Proceedings of the National Academy of Sciences*, 112(4) 1001-1006
- Gleason, C.J.** (2015) Hydraulic geometry: a review and future directions. *Progress in Physical Geography*, 10.1177/0309133314567584
- Gleason, C.J.**, Smith, L.C., & J. Lee (2014). Retrieval of river discharge solely from satellite imagery and at-many-stations hydraulic geometry: sensitivity to river form and optimization parameters. *Water Resources Research*, 10.1002/2014WR016109
- Gleason, C.J.** & L.C. Smith (2014). Towards global mapping of river discharge using satellite images and at-many-stations hydraulic geometry. *Proceedings of the National Academy of Sciences*, 111 (13) 4788-4791
- Wang, J., Sheng, Y., **Gleason, C.J.**, & Y. Wada (2013). Downstream Yangtze River levels impacted by the Three Gorges Dam, *Environmental Research Letters*, 8 (4)

*Forestry Research at SUNY ESF*

**Gleason, C.J.**, & J. Im (2012). Forest biomass estimation from airborne LiDAR data using machine learning approaches. *Remote Sensing of Environment*, 125 80-91

**Gleason, C.J.** & J. Im (2012). A fusion approach for tree crown delineation from LiDAR data. *Photogrammetric Engineering & Remote Sensing*, 78(7) 679-692

**Gleason, C.J.**, & J. Im (2011). A review of remote sensing of forest biomass and biofuel: options for small area applications. *GIScience and Remote Sensing*, 48(2) 141-170

## **AWARDS & HONORS**

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UCLA Rosenfield-Abrams Dissertation Year Fellow 2015-2016

NASA Earth and Space Sciences Fellow 2012-2015

UCLA Department of Geography Outstanding Student Publication Award 2014

UCLA Chancellor's Fellow 2011-2012

SUNY ESF Presidential Scholar 2005-2009

## **RESEARCH GRANTS**

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Durand, M., **Gleason, C.J.**, & D. Bjerklie. Development and comprehensive validation of SWOT river discharge algorithms from AirSWOT, simulator, and field measurements. Submitted in response to NASA NRA A.10 Surface Water and Ocean Topography (SWOT) Science Team (Total Award \$742,961, Gleason award \$207,723)

Smith, L.C., Pietroniro, A., & **C.J. Gleason**. U.S.-Canada collaboration to build SWOT calibration/validation and science capacity for northern hydrology. Submitted in response to NASA NRA A.10 Surface Water and Ocean Topography (SWOT) Science Team (Total Award \$746,644, Gleason award \$101,300)

## **STUDENTS ADVISED**

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### **Post-doctoral scholars**

**Mark Hagemann** (2016): Now teaching at Carleton College

### **Graduate students**

**Ho-Zhen Chen** (2016-present): Currently at UMass

### **Undergraduate students (independent research)**

**Caitline Barber** (2017-present): Currently at UMass

**Olin Richter** (2017-present): Currently at UMass

**Leigh Hamlet** (2017-present): Currently at UMass

**Yuxi Suo** (2015-2016 @UCLA): Currently pursuing PhD at Northwestern

**Jinny Lee** (2014-2015 @UCLA): Currently pursuing PhD at UC Irvine

## **TEACHING**

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**CEE 560 Hydrology.** Students learn how to make a quantitative account of elements of the hydrologic cycle, including: atmospheric circulation and thermodynamics, precipitation, evapotranspiration, snowmelt, infiltration, surface runoff, and groundwater processes. Students apply basic laws from physics, meteorology, fluid mechanics, and thermodynamics, combined into simple mathematical descriptions used in the hydrologic design process.

**CEE 470/570 GIS for Engineers.** Introduction to fundamental principles and concepts necessary to carry out meaningful and appropriate geographic analysis with geographic information science (GIS). Reinforcement of key issues in GIS such as geographic coordinate systems, map projections, spatial analysis, use of remotely sensed data, and visualization of spatial data. Laboratory exercises use database query, database manipulation, and spatial analysis to address problems in hydrology, water treatment, renewable energy, and transportation with an emphasis on engineering design. Students gain familiarity with the leading commercial and open-source GIS platforms.

## **FIELD EXPERIENCE**

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### **Kangerlussuaq, Greenland, summer 2015**

Logistics manager for international team of 9. Coordinated helicopter charter with media, science, and local personnel, and set personnel schedules.

### **Kangerlussuaq, Greenland, winter 2015**

Drill through ice in proglacial rivers in search of winter discharge. Responsible for safety for team of 2 in -40C and colder temperatures.

### **Eastern Sierra, California/Nevada, fall 2014**

Map shorelines and collect water surface elevation measurements in coordination with AirSWOT airborne Ka-band radar.

### **Kangerlussuaq, Greenland, summer 2014**

Map streams in a supraglacial basin and use acoustic Doppler current profiling to measure stream discharge.

### **Western Mojave Desert, fall 2014**

Delineate wetland area and inundated vegetation in coordination with AirSWOT airborne Ka-band radar.

### **Sacramento River, fall 2014**

Establish measurement protocol and pilot a river raft to make hydraulic measurements.

### **Kangerlussuaq, Greenland, summer 2013**

Design and lead 15-day hydrologic measurement campaign. Responsible for safe travel of team of three and for all measurement protocol and research design in back country without vehicular support.

### **Sacramento River, spring 2013**

Establish pressure transducers in coordination with airborne instrument overflight (AirSWOT), and pilot both river rafts and motorized boats between camps established on the riverbank.

### **Kangerlussuaq, Greenland and atop Greenland Ice Sheet, summer 2012**

Medical lead for a five-day ice camp as part of a team of four that made supraglacial stream measurements atop the ice from a base camp and from extensive helicopter travel. Additionally, establish a tundra camp for several weeks and make proglacial hydrologic measurements.

### **Kangerlussuaq, Greenland, summer 2011**

Establish permanent time lapse camera installations in conjunction with the USACE and conduct helicopter surveys of a proglacial river.

### **Heiberg Forest, Upstate New York, fall 2011**

Design, plan, and lead measurement of forest inventory plots. Responsible for research design and safety of team of four.

## **SELECTED CONFERENCE PRESENTATIONS**

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**Gleason, C.J.** (2016). *Forward to the Future: Estimating River Discharge with McFLI*. Fall Meeting of the American Geophysical Union, San Francisco, CA.

**Gleason, C.J.** (2015). *Theoretical basis for at many stations hydraulic geometry (AMHG)*. Fall Meeting of the American Geophysical Union, San Francisco, CA.

**Gleason, C.J.** (2015). *At many stations hydraulic geometry (AMHG): theoretical development and relationships with traditional hydraulic geometry*. Annual meeting of the Association of American Geographers, Chicago, IL

**Gleason, C.J.** & T.M. Pavelsky (2015). *Characterizing post launch hydrologic campaigns*. NASA/CNES Surface Water and Ocean Topography Satellite Science Definition Team Meeting, Toulouse, France

**[Invited] Gleason, C.J.** & L.C. Smith (2014). *Satellite data, river discharge, and at-many-stations hydraulic geometry*. Fall Meeting of the American Geophysical Union, San Francisco, CA.

**Gleason, C.J.** & L.C. Smith (2014). *River discharge and at-many-stations hydraulic geometry: theory and methods*. NASA/CNES Surface Water and Ocean Topography Satellite Science Definition Team Meeting, Toulouse, France

## **SELECTED MEDIA COVERAGE**

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**The New York Times**, "Greenland is melting away," October 27, 2015

**The Los Angeles Times**, "Ice researchers capture catastrophic Greenland melt," January 12, 2015

**Southern California Public Radio**, "UCLA scientists find shortcut to estimating a river's volume," March 17, 2014

**Redorbit.com**, "Satellite-Based Imagery Could Make It Easier To Monitor River Discharge," March 19, 2014

**Phys.org**, "Geographers create 'easy button' to calculate river flows from space," March 18, 2014

**The New York Times**, "Probing a Glacier as It Thaws," August 5, 2011

## **PROFESSIONAL SERVICE AND AFFILIATIONS**

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**Participant (March 2017):** International Workshop to Reconcile Northern Permafrost Region Methane Budgets

**Organizer and Co-Chair (October 2016):** NASA SWOT Discharge Algorithm Workshop, New York City

**Science Team Member (2016-Present):** NASA Surface Water and Ocean Topography Satellite

**Science Definition Team Member (2014-2016):** NASA Surface Water and Ocean Topography Satellite

**Reviewer:** Geophysical Research Letters

**Reviewer:** Water Resources Research

**Reviewer:** Journal of Geophysical Research-Atmospheres

**Reviewer:** Progress in Physical Geography

**Reviewer:** International Journal of River Basin Management

**Reviewer:** Water

**Reviewer:** PLOS One

**Reviewer:** Hydrological Sciences Journal

**Reviewer:** River Research and Applications

**Member:** American Geophysical Union (2011-Present)

**Member:** European Geophysical Union (2015-Present)

**Member:** Association of American Geographers (2010-2011, 2014-Present)

## **UNIVERSITY SERVICE**

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**Geospatial Technologies Coordinator (2016-present):** University of Massachusetts dept. of Civil and Environmental Engineering. Software, licensing, and general information coordinator for all geospatial technologies.