

Craig B. Brinkerhoff

(He/Him, Citizenship: American)

Dept. of Civil & Environmental Engineering

University of Massachusetts, Amherst

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EDUCATION

PhD Civil Engineering, University of Massachusetts, Amherst, MA	Expected 2022
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- Concentration: Environmental & Water Resources Engineering
- Dissertation: *Integrating remote sensing, hydraulic geometry, and hydrography into ungauged basins and drainage network gas evasion*
- Advisor: Dr. Colin Gleason

Ba&Sc Honours Environment, McGill University, Montreal, QC	2018
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- Concentration: Hydrology & Water Resources, Minor: GIS & Remote Sensing
- Thesis: *An Exploratory Analysis of Watershed Characteristics and Flow Class Variation in Unregulated Eastern Canadian Rivers*
- Advisor: Dr. Michel Lapointe

RESEARCH & TEACHING EXPERIENCE

Graduate Research Assistant	2018-Present
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Department of Civil & Environmental Engineering, University of Massachusetts, Amherst

- Dr. Colin Gleason's Fluvial@UMASS lab

Teaching Assistant	2019
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Department of Civil & Environmental Engineering, University of Massachusetts, Amherst

- Course: GIS for Engineers (cross-listed undergraduate/graduate)

Undergraduate Research Assistant	2017-2018
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Department of Geography, McGill University

- Funded project on modeling global river density
- Dr. Bernhard Lehner's GlobalHYDRO lab

PEER-REVIEWED PUBLICATIONS

(In review/in preparation work on page 4)

Maavara, T., Logozzo, L., Stubbins, A., Aho, K.A., **Brinkerhoff, C.B.**, Hosen, J., Raymond, P.A. (2021) Does photomineralization of dissolved organics matter in temperate rivers?. *Journal of Geophysical Research-Biogeosciences*. <https://doi.org/10.1029/2021JG006402>.

Frasson, R.P.M., Durand, M.T., Larnier, K., Gleason, C.J., Andreadis, K.M., Hagemann, M.H., Dudley, R.W., Bjerklie, D.M., Oubanas, H., Garambois, P.A., Malaterre, P.O., Lin, P., Pavelsky, T.M., Monnier, J., **Brinkerhoff, C.B.**, David, C.H. (2021). Exploring the factors controlling the error characteristics of the Surface Water and Ocean Topography mission discharge estimates. *Water Resources Research*. <https://doi.org/10.1029/2020WR028519>

Brinkerhoff, C.B., Raymond, P.A., Maavara, T., Ishitsuka, I., Aho, K.S., Gleason, C.J. (2021). Lake Morphometry and River Network Controls on Evasion of Terrestrially Sourced Headwater CO₂. *Geophysical Research Letters*, <https://doi.org/10.1029/2020GL090068>

Brinkerhoff, C. B., Gleason, C.J., Feng, D., Lin, P. (2020). Constraining Remote River Discharge Estimation Using Reach-Scale Geomorphology. *Water Resources Research*, 56, e2020WR027949. <https://doi.org/10.1029/2020WR027949>

Andreadis, K. M., **Brinkerhoff, C. B.,** & Gleason, C. J. (2020). Constraining the Assimilation of SWOT Observations With Hydraulic Geometry Relations. *Water Resources Research*, 56(5), e2019WR026611. <https://doi.org/10.1029/2019WR026611>.

Brinkerhoff, C. B., Gleason, C. J., & Ostendorf, D. W. (2019). Reconciling At-a-Station and At Many-Stations Hydraulic Geometry through River-Wide Geomorphology. *Geophysical Research Letters* 46(16) 9637-9647. <https://doi.org/10.1029/2019GL084529>.

FIRST-AUTHOR CONFERENCE PRESENTATIONS

(Complete list of conference presentation on page 5)

Brinkerhoff, C.B., Gleason, C.J., Raymond, P.A., Zappa, C.J., Harlan, M.E. (2021, December). Gas Exchange in Large Rivers Controlled by Largest Turbulent Eddies: Implications for Remotely Sensing Gas Exchange via SWOT. In *AGU Fall Meeting 2021*. AGU. Oral Presentation

(Invited) **Brinkerhoff, C.B.,** Saccardi, B., Winnick, M., Gleason, C.J. (2021, December). Towards continental-scale transport modeling of drainage network CO₂ evasion. In *AGU Fall Meeting 2021*. AGU. eLightning presentation.

-Invited for AGU's "Student Engagement to Enhance Development: Outstanding Student Presentation Award Winners from Fall Meeting 2020" Union session

Brinkerhoff, C.B., Raymond, P.A., Maavara, T., Ishitsuka, I., Aho, K.S., Shaoda, L. Gleason, C.J. (2020, December). Lake/reservoir controls on evasion of inland water CO₂ and implications for remote sensing of network-scale CO₂ emissions. In *AGU Fall Meeting 2020*. AGU. Oral presentation.

-Won AGU Fall Meeting 2020 OSPA Award (Outstanding Student Presentation Award)

Brinkerhoff, C. B., Gleason, C. J., Lin, P., & Andreadis, K. (2019, December). Constraining Remotely-Sensed River Discharge Estimation Using Reach-Scale Geomorphology. In *AGU Fall Meeting 2019*. AGU. Oral presentation.

GRANTS & FELLOWSHIPS

(2021-2023) "A First Global Analysis of Daily Riverine Gas Exchange Using the SWOT Satellite, Bayesian Remote Sensing, and Carbon Transport Modeling"

-NASA FINESST Award (Future Investigators in Earth & Space Science)

-\$135,000 USD

HONORS & AWARDS

AGU Fall Meeting 2020 OSPA Award (Outstanding Student Presentation Award)	2021
NSF GRFP Honorable Mention	2020
McGill University Undergraduate First-Class Honours	2018
McGill University Science Undergraduate Research Award	2017

TECHNICAL SKILLS

Programming languages: R, Stan, Shell, Python, JavaScript

Publishing: (R)Markdown, Microsoft Office, LaTeX

Software: QGIS, GRASS, Google Earth Engine, ArcGIS

Operating systems: Windows, Linux, MacOS

PROFESSIONAL SERVICES

Member: American Geophysical Union (AGU)

2018-Present

Reviewer: Biogeosciences, Journal of Hydraulic Engineering

REFERENCES

Dr. Colin Gleason, Associate Professor (cjgleason@umass.edu) (PhD committee chair)

Department of Civil & Environmental Engineering, University of Massachusetts, Amherst, MA

Dr. Peter Raymond, Professor (peter.raymond@yale.edu) (PhD committee member)

School of the Environment, Yale University, New Haven, CT

Dr. Konstantinos Andreadis, Assistant Professor (kandread@umass.edu) (PhD committee member)

Department of Civil & Environmental Engineering, University of Massachusetts, Amherst, MA

Dr. Bernhard Lehner, Associate Professor (bernhard.lehner@mcgill.ca)

Department of Geography, McGill University, Montreal, QC

IN REVIEW/IN PREPERATION WORK

In Review

Liu, S, Kuhn, C., Amatulli, G., Aho, K.S., Butman, D., Allen G.H., Lin, P., Pan, M., Yamazaki, D., **Brinkerhoff, C.B.**, Gleason, C.J., Xia, X., Raymond, P.A. (*in review: PNAS*). The importance of hydrology in routing terrestrial carbon to the atmosphere via global streams and rivers.

Liu, S., Maavara, T., **Brinkerhoff, C.B.**, Raymond, P.A. (*submitted to Global Biogeochemical Cycles*). Global controls on DOC reaction versus export in watersheds: A Damköhler number analysis.

In Preparation

Brinkerhoff, C.B., Gleason, C.J., Zappa, C.J., Raymond, P.A., Harlan, M.H. (*in preparation*). Using hydraulic geometry to remotely sense gas exchange velocity via the SWOT satellite.

Maavara, T., **Brinkerhoff, C.B.**, Hosen, J., Aho, K.S., Logozzo, L., Stubbins, A., Saiers, J., Raymond, P.A. (*in preparation*). Reaction vs. transport controls on dissolved organic carbon sources and sinks in watersheds: The Pulse-Shunt Concept 2.0.

Ward, M.W., Dai, C., Pollard, W., Liljedahl, A., van der Sluijs, J., **Brinkerhoff, C.B.**, Howat, I., Freymueller, J. (*in preparation*). Using ArcticDEM and shallow boreholes to quantify mass wasting sediment loss of retrogressive thaw slumps in the Eureka Sound Lowlands, Canadian high Arctic

COMPLETE LIST OF CONFERENCE PRESENTATIONS

2021

Brinkerhoff, C.B., Gleason, C.J., Raymond, P.A., Zappa, C.J., Harlan, M.E. (2021, December). Gas Exchange in Large Rivers Controlled by Largest Turbulent Eddies: Implications for Remotely Sensing Gas Exchange via SWOT. In *AGU Fall Meeting 2021*. AGU. Oral presentation.

(Invited) **Brinkerhoff, C.B.**, Saccardi, B., Winnick, M., Gleason, C.J. (2021, December). Towards continental-scale transport modeling of drainage network CO₂ evasion. In *AGU Fall Meeting 2021*. AGU. eLightning presentation.

-Invited for AGU's "Student Engagement to Enhance Development: Outstanding Student Presentation Award Winners from Fall Meeting 2020" Union session

Maavara, T., Logozzo, L., Stubbins, A., Aho, K.S., **Brinkerhoff, C.B.**, Hosen, J., Raymond, P.A. (2021, December). Does photomineralization of dissolved organics matter in temperate inland waters? In *AGU Fall Meeting 2021*. Oral Presentation.

Lummus, M., Stearns, L.A., van der Keen, C.J., Gleason, C.J., Brown, C., Wi, S., **Brinkerhoff, C.B.** (2021, December). Classification of glaciers in Koshi River Basin, Nepal using machine learning algorithms and clustering techniques. In *AGU Fall Meeting 2021*. Poster presentation

Ward Jones, M.K., Dai, C., Pollard W., Liljedahl, A., van der Sluijs, J., **Brinkerhoff, C.B.**, Howat, I., Freymueller, J. (2021, October). Using ArcticDEM and shallow boreholes to quantify mass wasting sediment loss of retrogressive thaw slumps in the Eureka Sound Lowlands, Canadian high Arctic. In *Regional Conference on Permafrost*. Poster presentation.

2020

Brinkerhoff, C.B., Raymond, P.A., Maavara, T., Ishitsuka, I., Aho, K.S., Shoda, L. Gleason, C.J. (2020, December). Lake/reservoir controls on evasion of inland water CO₂ and implications for remote sensing of network-scale CO₂ emissions. In *AGU Fall Meeting 2020*. AGU. Oral presentation.

Lin, P., Pan, M., Wood, E.F., Feng, D., Gleason, C.J., **Brinkerhoff, C.B.**, Yang, X., Pavelsky, T.M. (2020, May). Scaling up the assessment of the SWOT discharge inversion algorithm to thousands of gauges globally. In *EGU General Assembly 2020*. EGU. Poster presentation.

2019

Brinkerhoff, C. B., Gleason, C. J., Lin, P., & Andreadis, K. (2019, December). Constraining Remotely-Sensed River Discharge Estimation Using Reach-Scale Geomorphology. In *AGU Fall Meeting 2019*. AGU. Oral presentation.