

SETH BRYANT

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ceflood.com

TECHNICAL SKILLS

- Flood risk analysis & modelling
- Research software engineering
- ML inference engineering
- High-performance computing
- GIS analysis and processing
- Hydraulic modelling
- Grant application writing
- Data wrangling and analysis

PROGRAMMING

Python® (advanced)

pyQGIS® (advanced)

Google Earth Engine® (proficient)

R Statistical Computing® (prof.)

SSH® (proficient)

Git® (advanced)

PyTorch® (proficient)

PostGIS (advanced)

LaTeX (advanced)

Windows batch scripting (prof.)

Unix Shell (proficient)

Osmium Tool (proficient)

SOFTWARE

- AutoCAD Civil 3D® (advanced)
- Microsoft Office® (advanced)
- QGIS® (advanced)
- SOBEK® (advanced)
- Delft3D® (intermediate)
- HEC-HMS® (intermediate)
- HEC-RAS® (advanced)
- GitHub/GitLab (advanced)

REGISTRATIONS

- Professional Engineer (APEGA)
- CPESC (Envirocert)
- LEED GA (USGBCA)

EDUCATION

Doctor of Engineering DFG-RTG NatRiskChange	July 2024
GFZ German Research Centre for Geosciences Hydrology Section University of Potsdam Institute for Environmental Sciences and Geography	
Master of Science in Water Resources Engineering	Jan 2019
University of Alberta, Edmonton, Alberta, Canada	
Visiting MSc Student in Civil Engineering	Jan 2017
TU Delft, Delft, Netherlands	
Bachelor of Science in Civil Engineering	May 2009
Montana State University at Bozeman, Montana, USA	

SELECTED RESEARCH EXPERIENCE

Postdoctoral Research Associate, University of Wisconsin-Madison, U.S.A.	2025-current
<i>Research software engineer and scientist in Beth Tellman's lab</i>	
- Addressing flood impacts of adaptation and urban expansion with satellite observations - Collected, compiled, and processed NFIP historical archive dataset - Engineered and implemented ML EO inference pipeline on six sensors	
Postdoctoral Research Associate, University of Arizona, U.S.A.	2025-2026
<i>Research software engineer in Beth Tellman's lab</i>	
- Deep learning based super-resolution of flood inundation grids - Generated paired high-low resolution training data from hydrodynamic model - Developed and evaluated CNN model using hyperparameter tuning and validation	
Visiting Researcher, fathom, U.K.	2024-current
<i>Research and software engineer working under Oliver Wing</i>	
Developing and implementing flood hazard grid downscaler into global pipeline	
Doctoral/Affiliate Researcher, University of Potsdam & GFZ, Germany	2021-current
<i>Research and software development supervised by Heidi Kreibich and Bruno Merz</i>	
- Resolution enhancement of flood inundation grids - Developed novel algorithm for downscaling flood grids using high-resolution DEMs - Aggregating flood damage functions: the peril of Jensen's gap - Analyzed and parameterized loss model with >10 million building records - Bias in flood hazard grid aggregation - Performed flood simulation and calibration of hydrodynamic model on GPU cluster - Hidden risks of emergency response post-flood disasters - Implemented German transportation model of flood vulnerability from open-data - Flood exposure model for Germany [in-progress] - Calculate and validate against ground-truthed construction cost estimates	
Research Affiliate, University of Alberta, Canada	2019-2021
<i>Research projects collaborating with Evan Davies and others</i>	
Develop novel algorithm for supplementing remotely sensed flood footprints with DEM	
Research Assistant, University of Alberta, Canada	2016-2019
<i>MSc Thesis project supervised by Evan Davies</i>	
Research Assistant, Deltares, Netherlands	2017-2018
<i>A research project supervised by Erik Mosselman</i>	

AWARDS, SCHOLARSHIPS, AND GRANTS

NRCan Flood Hazard Identification and Mapping Program - \$225,000 CAD	2024
NSERC Postgraduate Scholarship-Doctoral (PG) - \$63,000 CAD	2022
NSERC Engage Grant - \$24,995 CAD	2017
C4 2018 Student Delegate Winner - \$1,000 CAD	2018

SOFTWARE AND MODEL DEVELOPMENT

- Lead developer of [floodsr](#), an AI-powered super-resolution for flood hazard rasters that turns coarse water grids into sharp inundation maps
- Lead developer of [FloodDownscaler2](#), an open source python-based flood grid resolution enhancement tool
- Lead developer of [RiCorDE](#), a python-based flood depth extrapolation tool for Natural Resources Canada
- Lead developer of Natural Resources Canada's Flood Risk Modelling Platform, [CanFlood](#) and [CanFlood2](#), a QGIS plugin
- Lead developer of Natural Resources Canada's Flood Depth Damage Function toolbox, [CanCurve](#), a QGIS plugin

SELECTED PUBLICATIONS AND PREPRINTS

- 1) **Bryant, Seth**, Heidi Kreibich, and Bruno Merz. 2023. "Bias in Flood Hazard Grid Aggregation." *Water Resources Research* 59 (9): e2023WR035100. <https://doi.org/10.1029/2023WR035100>.
- 2) ——. 2024. "Flood Damage Model Bias Caused by Aggregation." In *Proceedings of IAHS*, 386:181–87. Copernicus GmbH. <https://doi.org/10.5194/piahs-386-181-2024>.
- 3) **Bryant, Seth**, Heather McGrath, and Mathieu Boudreault. 2022. "Gridded Flood Depth Estimates from Satellite-Derived Inundations." *Natural Hazards and Earth System Sciences* 22 (4): 1437–50. <https://doi.org/10.5194/nhess-22-1437-2022>.
- 4) **Bryant, Seth**, and Erik Mosselman. 2017. "Taming the Jamuna: Effects of River Training in Bangladesh." In *NCR Days 2017: Book of Abstracts*. <https://repository.tudelft.nl/islandora/object/uuid:074af0bf-9145-40f0-8d0d-ccbdc64de54f/datastream/OBJ/download>.
- 5) **Bryant, Seth P**, Evan G R Davies, David Sol, and Sandy Davis. 2022. "The Progression of Flood Risk in Southern Alberta since the 2013 Flood." *Journal of Flood Risk Management*, March, 18. <https://doi.org/10.1111/jfr3.12811>.
- 6) **Bryant, Seth**, Jody Reimer, Heidi Kreibich, and Bruno Merz. 2025. "Aggregating Flood Damage Functions: The Peril of Jensen's Gap." *Journal of Flood Risk Management* 18 (1): e13053. <https://doi.org/10.1111/jfr3.13053>.
- 7) **Bryant, Seth**, Guy Schumann, Heiko Apel, Heidi Kreibich, and Bruno Merz. 2024. "Technical Note: Resolution Enhancement of Flood Inundation Grids." *Hydrology and Earth System Sciences* 28 (3): 575–88. <https://doi.org/10.5194/hess-28-575-2024>.
- 8) **Bryant, Seth**, Jonas Wassmer, Paul Schimansky, et al. 2025. "Unveiling Hidden Risks in Healthcare from Flood-Induced Transportation Disruption in Germany." *Communications Earth & Environment* 6 (1): 1–11. <https://doi.org/10.1038/s43247-025-02645-y>.
- 9) Mester, Benedikt, Thomas Vogt, **Seth Bryant**, Christian Otto, Katja Frieler, and Jacob Schewe. 2023. "Human Displacements from Tropical Cyclone Idai Attributable to Climate Change." *NHESS* 23 (11): 3467–85. <https://doi.org/10.5194/nhess-23-3467-2023>.
- 10) Buhrmann, Aaron, Cecilia I. Nievas, Nivedita Sairam, James E. Daniell, Heidi Kreibich, and **Seth Bryant**. 2026. "Building-Level Exposed Asset Value Modelling for Germany." Preprint, Copernicus GmbH, November 13. <https://doi.org/10.5194/egusphere-2025-5172>.

SELECTED PRESENTATIONS

2018. "ABMRI: An Approach to Dynamic Flood Risk Assessment." Presented at C4 2018, Gatineau, QC, Canada, January 30.
- 2022a. "Flood Damage Model Bias Caused by Aggregation." Presented at the EGU22, Vienna, Austria, May 24.
- 2023a. "Scaling Issues in Flood Risk Models." **Invited Talk** presented at the Hydraulic Engineering Seminar, Politecnico di Milano.
- 2023c. "Resolution Enhancement of Flood Inundation Grids." Presented at CIROH DEVCon, Salt Lake City, Utah, USA, May.
- 2023e. "Deep Learning Based Super-Resolution of Flood Inundation Grids." Presented at the AGU, USA, December 14.
- 2023c. "Flood Damage Model Bias Caused by Aggregation." Presented at the ICFM9, Tsukuba, Japan, February 20.
- 2023e. "Modelling in Flood Management." Presented at the Modelling Across Disciplines, Philadelphia, US, April 3.
2024. "Faking high resolution in flood maps." Presented at the Engineering Seminar, Utah State University, US, November 6
- 2025 "Towards a multi-sensor satellite AI database of observed U.S. flood extents 2001–2024." AGU25, **Invited Presentation**, December

SELECTED PROFESSIONAL EXPERIENCE

Principal and President, CEFlood, Manitoba, Canada	2023-current
Lead Flood Risk Modeller, IBI Group, Calgary, Canada	2019-2022
Flood Risk Analyst, Northwest Hydraulics Consulting, Vancouver, Canada	2020-2021
Hydrotechnical Engineer, REB Engineering, St. Helena, U.S.A.	2015-2021
River Engineer, Northwest Hydraulics Consulting, Dhaka, Bangladesh	2017-2019
Field Engineer (EIT) and Civil Engineer (EIT), Worley Parsons, Edmonton, Alberta	2011-2014
Civil Engineer (EIT) and Summer Intern, REB Engineering, St. Helena, U.S.A.	2007-2010

SELECTED TEACHING AND SUPERVISION EXPERIENCE

- Co-supervised two MSc students at the University of Alberta (2019-2023) and one MSc student at the University of Potsdam (2024)
- Teaching assistant for one course at the University of Alberta (2018) and two courses at the University of Potsdam (2023-2024)