

Dr. Eric Deal

Citizenship: Canadian, American

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EDUCATION

University of Grenoble-Alpes, Grenoble, France
Ph.D., Geomorphology Feb. 2014 – Mar. 2017

University of British Columbia, Vancouver, Canada
B.Sc., Geophysics Sep. 2008 – May 2012

WORK EXPERIENCE

Oberassistent (Senior Scientist/Lecturer) in the Earth Sciences Department
at the *Swiss Federal Institute of Technology in Zurich (ETH)* Nov. 2020 – present

Postdoctoral Researcher in the Earth Sciences Department at *ETH* Oct. 2019 – Nov. 2020

Postdoctoral Associate in Earth, Atmospheric and Planetary Science
at *Massachusetts Institute of Technology* Aug. 2017 – Sep. 2019

Research assistant in the Geological Fluid Dynamics lab at
University of British Columbia Sep. 2011 – May 2012

Hydrology field technician at *Bureau of Land Management* Summer 2009 & 2011

GRADUATE THESIS SUPERVISION

Doctoral thesis of Karla Vlatković at ETH (expected graduation: Fall 2026)
“*Flow resistance in rough self-formed river channels*” Nov. 2022 – present

Masters thesis of Maureen Gretener at ETH (expected graduation: Summer 2023)
“*Measuring boulder size and density in river channels using Unoccupied
Aerial Vehicles, structure-from-motion and automated image segmentation*” Jun. 2022 – present

Masters thesis of Till Born at ETH (expected graduation: Summer 2023)
“*The Past, Present and Future of the Carpathian River Network*” Mar. 2022 – May 2023

Masters project of visiting student Clara Sfez from ENS, Paris
“*Roughness boundary layer characterisation of steep mountain rivers
with structure-from-motion photogrammetry*” Mar. – Jul. 2022

Masters thesis of Di Deng at ETH (graduated Summer 2021)
“*A study of the recent evolution of Doubs River near Besançon
investigating links between tectonics, climate and network geometry*” Jun. 2020 – Aug. 2021

Bachelors thesis of Matthew Rushlow at MIT (graduated Summer 2019)
“*Using Machine Learning, Particle Tracking, and Grain Shape Modeling
to Characterize Bed load Sediment Transport*” Jan. 2019 – Jul. 2019

TEACHING

Instructor for Digital Topography - Masters level course at ETH every spring 3 credits (4 hours/week for 7 weeks)	2020 – present
Instructor for Tectonic Geomorphology - Masters level course at ETH every spring 6 credits (4 hours/week for 7 weeks and a one week field school)	2020 – present

FUNDING

Swiss National Science Foundation Projects-MINT grant as PI (CHF 273,464 / \$290,000) Grant # 200021-208068 “ <i>The importance of boulders on bedrock river network dynamics</i> ” Funding for three years of field trips to Taiwan and a PhD student	Nov. 2022 – Oct. 2026
NSERC USRA Undergraduate Student Research Award (\$6000)	2012
German DAAD international student scholarship (\$4000)	2010

PROFESSIONAL & OUTREACH EXPERIENCE

Organizer of Earth Surface Dynamics group seminar at ETH (6 invited talks/semester)	Oct. 2019 – present
Regular reviewer for the Journal of Geophysical Research: Earth Surface, Geophysical Research Letters, Geology, and Earth Surface Dynamics	4-8 times/year since 2017
Session Convener at the European Geosciences Union in Vienna, Austria	2017, 2018, 2020, 2022, 2023
Organizing committee member for the 31st HKT workshop held in Aussois, France (100 person, 3 day conference)	May 2015 – May 2016

NOTABLE INVITED TALKS

Experimental & Physical Volcanology seminar at LMU, Munich “ <i>An up close look at sediment transport in rivers</i> ”	2023
Earth Science Discipline seminar at the University of Newcastle “ <i>Grain shape effects in bed load sediment transport</i> ”	2023
Earth and Space Science departmental seminar at the University of Washington “ <i>Physical models of width in channelized flows</i> ”	2023
Landscapes Live online seminar [recording] : “ <i>Self formed channels with emergent channel width and sediment transport</i> ”	2022
Departmental seminar, Colorado State University, online “ <i>The Sliding Ice Incision Model</i> ”	2020
Departmental seminar, Columbia University (Lamont), New York City, USA “ <i>Following form to function: Understanding what landscape morphology reveals about mountain building</i> ”	2019
COG3 lecture, MIT, Cambridge, USA “ <i>Following form to function: Understanding what landscape morphology reveals about mountain building</i> ”	2019
BiSEPPS Seminar, Harvard University, Cambridge, USA “ <i>The surprisingly simple relationship between rainfall intensity and streamflow variability</i> ”	2018

PEER REVIEWED PUBLICATIONS

- **[In review]** Zhang, Q., Deal, E., Perron, J.T., Venditti, J., Benavides, S., Rushlow, M., Kamrin, K.
“*Discrete simulations of fluid-driven transport of naturally shaped sediment particles*” Submitted to

JGR: Earth Surface [\[preprint\]](#)

- **[In review]** Braun, J., Deal, E., “Implicit algorithm for threshold Stream Power Incision Model” submitted to JGR: Earth Surface [\[preprint\]](#)
- **[In review]** van Dongen, R., Scherler, D., Wendi, D., Deal, E., Mao, L., Marwan, N., Meier, C. “El Nio Southern Oscillation (ENSO)-induced hydrological anomalies in central Chile” Submitted to HESS.
- Benavides, S., Deal, E., Venditti, J., S., Bradley, R., Zhang, Q., Kamrin, K., Perron, J.T. “How fast or how many? Sources of intermittent sediment transport” *Geophysical Research Letters* 50.9 **2023**: e2022GL101919. [\[doi\]](#)
- Deal, E., Venditti, J., Benavides, S., Bradley, R., Zhang, Q., Kamrin, K., Perron, J.T. “Grain shape effects in bed load sediment transport” *Nature*. *Nature* 613.7943 (2023): 298-302. **2023** [\[doi\]](#)
- Deal, E. “Flow resistance in very rough channels” *Water Resources Research*, e2021WR031790. **2022** [\[doi\]](#)
- Zhang, Q., Deal, E., Perron, J.T., Venditti, J., Benavides, S., Rushlow, M., Kamrin, K. “Fluid-driven transport of round sediment particles: from discrete simulations to continuum modeling” *Journal of Geophysical Research: Earth Surface*, e2020GL089263. **2022** [\[doi\]](#)
- Benavides, S., Deal, E., Rushlow, M., Venditti, J., Zhang, Q., Kamrin, K., Perron, J.T. “The Impact of Intermittency on Bed Load Sediment Transport” *Geophysical Research Letters* 49.5, 10.1029/2021JF006504. **2022** [\[doi\]](#)
- Deal, E., and G. Prasicek. “The Sliding Ice Incision Model: A New Approach to Understanding Glacial Landscape Evolution.” *Geophysical Research Letters* 48.1, e2020GL089263. **2021** [\[doi\]](#)
- Prasicek, G., Hergarten, S., Deal, E., Herman, F. and Robl, J., “A glacial buzzsaw effect generated by efficient erosion of temperate glaciers in a steady state model.” *Earth and Planetary Science Letters* 543: 116350. **2020** [\[doi\]](#)
- Venditti, J. G., Li, T., Deal, E., Dingle, E., and Church, M. “Struggles with stream power: Connecting theory across scales.” *Geomorphology*: 106817. **2019** [\[doi\]](#)
- Deal, E., J. Braun, and G. Botter. “Understanding the role of rainfall and hydrology in determining fluvial erosion efficiency.” *Journal of Geophysical Research: Earth Surface* 123.4: 744-778. **2018** [\[doi\]](#)
- Herman, F., J. Braun, E. Deal, G. Prasicek “The response time of glacial erosion.” *Journal of Geophysical Research: Earth Surface* 123.4: 801-817. **2018** [\[doi\]](#)
- Deal, E., Favre, A.C. & Braun, J. “Rainfall variability in the Himalayan orogen and its relevance to longterm erosion rates.” *Water Resources Research* 53.5: 4004-4021. **2017** [\[doi\]](#)
- Frame, C.H., Deal, E., Nevison, C.D., Casciotti, K.L., “N2O production in the eastern South Atlantic: Analysis of N2O stable isotopic and concentration data.” *Global Biogeochemical Cycles* 28.11: 1262-1278, **2014** [\[doi\]](#)

SELECTED CONFERENCE PRESENTATIONS

- Deal, E., Venditti, J., Benavides, S., Bradley, R., Zhang, Q., Kamrin, K., Perron, J.T. “Grain shape effects in bed load sediment transport” EGU General Assembly, abstract number: EGU23-12076 (**2023**)
- Deal, E., Benavides, S. J., “Shear stress based models of bedrock river hydraulic geometry and long river profiles” AGU Fall General Assembly, abstract number: EP52A (**2022**)
- Deal, E., “A mechanistic understanding of self-formed channel shape and scale” EGU General Assembly (**2022**)
- Deal, E., “A simple and effective model for channel width in self-formed channels paves the way from Navier-Stokes to the stream power incision model” AGU Fall General Assembly (**2021**)
- Deal, E., Zhang, Q., Perron, J. T., Benavides, S., Kamrin, K., Venditti, J., “A close look at the effect of grain shape on bedload transport” AGU Fall General Assembly (**2020**)

- **Deal, E.**, Perron, J. T., Venditti, J., Benavides, S., Rushlow, M., Zhang, Q., Kamrin, K., “*Influence of particle shape on bedload transport efficiency.*” AGU Fall General Assembly (**2019**)
- **Deal, E.**, Zhang, Q., Perron, J. T., Venditti, J., Kamrin, K., “*Observing the role of grain shape on bedload transport in paired flume experiments and numerical simulations.*” AGU Fall General Assembly **2018**, abstract EP41B-2650
- **Deal, E.**, Zhang, Q., Venditti, J., Kamrin, K., Perron, J. T., “*Direct comparison of bedload transport in flume experiments and numerical simulations.*” 20th EGU General Assembly, EGU, **2018**
- **Deal, E.** & Braun, J. “*Sometimes processes don’t matter: the general effect of short term climate variability on erosional systems.*” EGU General Assembly 19 (**2017**): EGU 2017-15026-3