

Hervé Guillon | Data Geoscience

Keywords: *Data Science and Machine Learning*
Climate Change Impacts
Statistical Terrain Analysis

herve@guillon.xyz · 530-204-3944
141 Ipanema Place · Davis, CA, 95616 · USA
www.guillon.xyz

Research

Oct 2018 – current 2 years	Research scholar (post-doc)	University of California, Davis <i>research lab. in water resources management (15 p., USA)</i>
		<ul style="list-style-type: none">· Led research in machine learning-based predictive modelling of channel types· Performed terrain analysis linking fractal and surface evolution concepts· Key member in big data literature review (deep learning, network analysis)
Sep 2016 – Aug 2017 1 year	Early career researcher (post-doc)	Institut des Géosciences et Environnement <i>research lab. in hydrology and glaciology (250 p., France)</i>
		<ul style="list-style-type: none">· Clustered suspended sediment using their settling characteristics
May – Jun 2016 2 months	Research engineer (post-doc)	Institut des Sciences de la Terre <i>research lab. in geology and geophysics (250 p., France)</i>
		<ul style="list-style-type: none">· Set up 3 hydro-sedimentary monitoring stations in high Alpine environment
Oct 2012 – May 2016 3.5 years	Early career researcher (PhD student)	Institut des Sciences de la Terre <i>research lab. in geology and geophysics (250 p., France)</i>
		<p>“Origin and transport of sediments in an Alpine glaciated catchment”</p> <ul style="list-style-type: none">· Quantified erosion processes from suspended load measurements· Analyzed and modeled cosmogenic nuclides concentrations· Developed numerical tools for statistical analysis and probabilistic modeling
Feb – Oct 2011 8 months	R&D engineer (intern)	Centre d’Ingénierie Hydraulique – EDF <i>design office, hydropower, Electricité de France (450 p., France)</i>
		<ul style="list-style-type: none">· Developed a model of the failure of an earth-filled dam by internal erosion

Teaching

Sep 2016 – Aug 2017 1 year	Temporary Research and Teaching Attaché (employee)	Université Grenoble Alpes <i>higher education and scientific research (5500 p., France)</i>
		<ul style="list-style-type: none">· Taught pipe and open channel hydraulics, soil physics and hydrology
Sep 2013 – Oct 2015 2 years	Teaching assistant (employee)	Université Savoie Mont-Blanc <i>higher education and scientific research (1250 p., France)</i>
		<ul style="list-style-type: none">· Taught Newtonian and continuum mechanics, geophysics and thermodynamics

Education

PhD <i>Earth, planetary and environmental sciences</i> <i>honors: Excellent</i>	Université Grenoble Alpes	May 2016
Master (MSc) Géosciences Appliquées à l’Ingénierie de l’Aménagement – <i>Engineering geology</i> <i>honors: Très bien (top 1%) – class rank : 1st</i>	Université de Savoie	Oct 2011
Bachelor (BSc) Sciences de la Terre et de l’Environnement – <i>Earth and environmental sciences</i> <i>honors: Bien (top 5%) – class rank : 1st</i>	Université de Cergy-Pontoise	Jun 2009

Awards

- 2018 • Most Data-licious Award – 2018 California Safe Drinking Water Data Challenge
- 2017 • Henri Milon Hydrology Award of the Société Hydrotechnique de France (SHF) – thesis award
- 2016 • Wiley Award – citation : [...] from across the spectrum of geomorphology, the paper by **Guillon et al.** stood out because of the way in which it combined thoughtful field data collection, careful and rigorous experimental design, and insightful analysis to address a question of longstanding importance [...].
Stuart Lane, chief editor of *Earth Surface Processes and Landforms*.

Invited talks

- 2019 • **H. Guillon**. Introduction to Machine Learning. *Davis, California, USA*. Nov 2019.
- **H. Guillon**. Machine Learning – What? Why? How?. *Logan, Utah, USA*. Oct 2019.
- **H. Guillon**. Machine Learning. *Davis, California, USA*. May 2019.
- 2016 • *Weekly Glaciology Seminar* : **H. Guillon**. Sediment origin and erosion processes within an alpine glaciated catchment (Bossons Glacier, Mont-Blanc, France). *ETH-VAW, Zurich*. Sep 2016.
- *Wiley Award Lecture* : **H. Guillon**, J.L. Mugnier, J.F. Buoncristiani, J. Carcaillet, C. Godon, C. Prud'homme, P., van der Beek and R. Vassallo. Sediment origin and erosion processes within an alpine glaciated catchment. *BSG Annual Meeting, Plymouth*. Sep 2016.

Research articles

- 2020 • A. J. DeVincentis, R. Díaz Gómez, **H. Guillon**, N. K. Patterson, L. E. Garza-Díaz, F. van den Brandeler, A. Koehl, J. P. Ortiz Partida, E. Goharian and S. Sandoval Solis. Bright Spots and Blind Spots of Water Research in Latin America. *Science*. In preparation.
- **H. Guillon** and J.L. Mugnier. From super-diffusive to sub-diffusive: crossover in bedload diffusion evidenced from the dispersion of RFID tracers in a proglacial stream. *Geophysical Research Letters*. In preparation.
- **H. Guillon**, J.L. Mugnier and J.F. Buoncristiani. Glacial drainage development controls temporal and spatial fluctuations of sediment flux in Mont Blanc's north face. *Earth and Planetary Science Letter*. In preparation.
- 2019 • **H. Guillon**, C.F. Byrne, B.A.A. Lane, S. Sandoval Solis and G.B. Pasternack. Combining machine learning with coarse-scale geospatial data and field surveys at 290 reaches predicts the channel types of 109k unsurveyed reaches in a large region. *Water Resource Research*. In review.
- C.F. Byrne, G.B. Pasternack, **H. Guillon**, B.A.A. Lane, and S. Sandoval Solis. Reach-scale bankfull channel types can exist independently of catchment hydrology. *Earth Surface Processes and Landforms*. In review.
- R. Pauloo, A. Escriva-Bou, H. Dahlke, A. Fencl, **H. Guillon** and G. Fogg. Domestic Well Vulnerability to Drought Duration and Unsustainable Groundwater Management in California's Central Valley. *Environmental Research Letters*. In review.
- 2017 • **H. Guillon**, J.L. Mugnier and J.F. Buoncristiani. Proglacial sediment dynamics from daily to seasonal scales in a glaciated Alpine catchment (Bossons glacier, Mont Blanc massif, France). *Earth Surface Processes and Landforms*. Dec 2017.
- 2015 • **H. Guillon**, J.L. Mugnier, J.F. Buoncristiani, J. Carcaillet, C. Godon, C. Prud'homme, P., van der Beek and R. Vassallo. Improved discrimination of subglacial and periglacial erosion using ¹⁰Be concentration measurements in subglacial and supraglacial sediment load of the Bossons glacier (Mont Blanc massif, France). *Earth Surface Processes and Landforms*. Jul 2015.

Datasets

- 2015 • **H. Guillon**, J.L. Mugnier, C. Godon, J.F. Buoncristiani, D. Goutaland, T. Winiarski and G. Bièvre. Sediment volume variations inferred from DGPS measurements within Bossons glacier proglacial area (Mont-Blanc massif, France). *Pangeae*. Sep 2015.
- **H. Guillon**, C. Godon, J.F. Buoncristiani and J.L. Mugnier. Hydro-sedimentary parameters measurements within the proglacial area of the Bossons glacier (Mont-Blanc massif, France). *Pangeae*. Aug 2015.
- 2014 • C. Godon, **H. Guillon**, J.F. Buoncristiani and J.L. Mugnier. Grain size distributions of the Bossons glacier (France). *Pangeae*. Sep 2014.

Presentations at international scientific conferences

- 2020 · S. Schwindt, **H. Guillon**, R. Díaz Gómez, S. Haun, G.B. Pasternack and S. Wieprecht. Modelling and design automation of nature-based river engineering. *6th IAHR Europe Congress*. Jun 2020.
- 2019 · A comprehensive analysis of model outputs characterizes and compares machine-learning-enabled classification of rivers in seven distinct regions of California (USA). **H. Guillon**, C.F. Byrne, B.A.A. Lane, S. Sandoval Solis and G.B. Pasternack. *AGU Fall Meeting 2019*. Dec 2019 (poster).
- Mapping Water Resources Research in Latin America and the Caribbean. A. J. DeVincentis, R. Díaz Gómez, **H. Guillon**, N. K. Patterson, L. E. Garza-Díaz, F. van den Brandeler, A. Koehl, J. P. Ortiz Partida, E. Goharian and S. Sandoval Solis. *AGU Fall Meeting 2019*. Dec 2019 (poster).
 - R. Diaz-Gomez, G.B. Pasternack, **H. Guillon**, C.F. Byrne and S. Sandoval Solis. Can airborne lidar point clouds quantify grain size contributions to ground sediment facies?. *AGU Fall Meeting 2019*. Dec 2019 (poster).
 - Self-maintained riffle-pool couplets are less abundant than expected across California's diverse river systems. C.F. Byrne, G.B. Pasternack, B.A.A. Lane, **H. Guillon** and S. Sandoval Solis. *AGU Fall Meeting 2019*. Dec 2019 (poster).
 - A. J. DeVincentis, R. Díaz Gómez, **H. Guillon**, L. E. Garza-Díaz, N. K. Patterson, J. P. Ortiz Partida, E. Goharian, S. Sandoval Solis, F. van der Brandeler. Opportunities for Water Resources Management Research in Latin America. *EWRI World Environmental & Water Resources Congress*. May 2019.
- 2018 · **H. Guillon**, C.F. Byrne, B.A.A. Lane, S. Sandoval Solis, G.B. Pasternack and H. Dahlke. Predicting Channel Forms From Remote Sensing Data: A Multi-tiered Machine Learning Framework. *AGU Fall Meeting 2018*. Dec 2018 (poster).
- 2016 · **H. Guillon**, J.L. Mugnier and J.F. Buoncristiani. 18,000 displacement vectors and 44 positions surveys of RFID tracers show a normal diffusion of the bedload in a proglacial stream (Bossons glacier, France). *EGU General Assembly 2016*. Apr 2016 (poster).
- **H. Guillon**, J.L. Mugnier and J.F. Buoncristiani. Surface-to-base transfer and subglacial hydrology controls on subglacial erosion evidenced from 7 years of hydro-sedimentary observations within Bossons glacier catchment (Mont-Blanc massif, France). *EGU General Assembly 2016*. Apr 2016 (poster).
- 2015 · **H. Guillon**, J.F. Buoncristiani and J.L. Mugnier. Separating subglacial and proglacial inputs to the sediment flux from a glaciated alpine catchment. *15^{ème} Congrès Français de Sédimentologie*. Oct 2015.
- 2013 · F. Gimbert, V. C. Tsai, M. P., Lamb, **H. Guillon** and J.L. Mugnier. Exploring the mechanics of water flow and bedload sediment transport and their interplay with river topography using seismic observations acquired along the 'Les Bossons' river (France). *AGU Fall Meeting*. Dec 2013.
- **H. Guillon**, C. Godon, J.L. Mugnier, J.F. Buoncristiani, J. Carcaillet, J.L. Paquette, P., van der Beek and R. Vassallo. Origine supra ou sous-glaciaire des sédiments des torrents sous-glaciaires?. *14^{ème} Congrès Français de Sédimentologie*. Nov 2013.
- 2013 · **H. Guillon**, C. Godon, B. Goupy, A. Pohl, J.F. Buoncristiani and J.L. Mugnier. Glacial and periglacial erosion rate inferred from five years of detrital flux monitoring (Bossons stream, Mont-Blanc massif, France). *8th IAG International Conference on Geomorphology*. Aug 2013.
- **H. Guillon**, C. Godon, B. Goupy, A. Pohl, J.F. Buoncristiani and J.L. Mugnier. Periglacial area sediment budget of a rapidly retreating glacier. *Mountain Under Watch 2013*. Feb 2013 (poster).

Skills

Languages	French (mother tongue), English (fluent), Portuguese (intermediate)
Computer skills	R (27k l.), python (33k l.), Matlab (7k l.), version control (GitHub), slurm (HPC), bash (linux), Latex, ArcGIS, HEC-RAS
Specific skills	RFID methodology, stream gauging and monitoring, dGPS