

## Curriculum vitae

### PERSONAL INFORMATION



Céline, Berni

📍 5 rue de la Doua, CS70077, 69 626 VILLEURBANNE Cedex, FRANCE

☎ +334.72.20.10.77

✉ [celine.berni@inrae.fr](mailto:celine.berni@inrae.fr)

📅 Date of birth 21 february 1984 | 🇫🇷 Nationality French

POSITION Researcher in river hydrodynamics and morphology

### EDUCATION

- Sept. 2008 – Sept. 2011 Ph. D in "Oceanography, Atmosphere and Hydrology", with in major Ocean physics, LEGI, Université de Grenoble.
- Sept. 2007 – Sept. 2008 Research Master in Earth Science and Environment, with honors, Université Joseph Fourier, Grenoble.  
Research Master Physics, École Normale Supérieure de Lyon.
- Sept. 2006 – Sept. 2007 Successfull training for the entrance exam to be teacher in highschoools (*Agrégation*).
- Sept. 2005 – Sept. 2006 Research Master (M1) in Physics, with honors, École Normale Supérieure de Lyon, Semester 2 in the National university of Singapore.

### EMPLOYMENT

- 2012 – today Researcher in river dynamics and morphology at the Hydrology-Hydraulics research Unit of INRAE (formerly irstea Lyon-Villeurbanne)
- 2011 – 2012 Assistant Professor at the ENSE<sup>3</sup> engineering school (energy, water and environment national school): 192 hours during the year.  
Research project at the geophysical and industrial flows laboratory (LEGI, Grenoble, France) on erosion under structure.
- 2008 – 2011 Ph. D at the LEGI, under the supervision of Hervé Michallet and Eric Barthélemy on *Sediment destabilisation and transport processes in the surf zone*.  
Experimental work on erosion processes in a wave flume.
- 2008 5 month internship at the LEGI, under the supervision of Hervé Michallet on *Field study of bed destabilisation of a beach under waves in the swash and surf zones*.
- 2006 3 month internship at the National university of Singapore, under the supervision of Lee Fook Hou et Zhao Pengjun on *Centrifugal modelisation of earthquakes in reclaimed lands*.

### TEACHING

- 2021 - ... Co-leader of a 30 hours-course unit in third year at the École Nationale Supérieure des Travaux Publics de l'État (ENTPE, France). Hydraulics and sediment transport lectures.
- 2016 - 2021 Co-leader of a 30 hours-course unit in first year at the École Nationale Supérieure des Travaux Publics de l'État (ENTPE, France). Hydraulics and sediment transport lectures.
- 2014 - 2015 Practical work in fluid mechanics, INSA of Lyon, France.
- 2013 - 2017 Hydraulic lectures for technical staff of EDF (French electricity company)
- 2012 - 2015 Physics and chemistry examiner in preparatory classes, La Martinière Montplaisir Highschool.
- 2012 - 2015 Lectures and practical work in fluid mechanics, hydraulics, resistance of materials, sediment transport, heating transfers, ENSE<sup>3</sup>, Grenoble INP, France.

## SUPERVISION

## PhDs

- 2021 - ... Bastien Cérino, *Large-scale flow structures in shallow shear flows over rough bed*, co-supervision with S. Proust.
- 2019 - ... Shashank Gupta, *Laboratory experiments on fine sediment erosion and deposition in an alternated bar system and its impact on bar morphodynamics*, co-supervision with B. Camenen.
- 2015 - 2018 Adrien Vergne, *Hydroacoustic measurements of sand suspension in large rivers*, co-supervision with J. Le Coz.
- 2014 - 2017 Emeline Perret, *Transport of moderately sorted gravels at low bed shear stresses: impact of bed arrangement and fine sediment infiltration*, co-supervision with B. Camenen, co-encadrement K. El Kadi.
- 2013 - 2016 Victor Dupuis, *Experimental investigation of flows subjected to a longitudinal transition in hydraulic roughness in single and compound channels*, co-supervision with A. Paquier and S. Proust.

## Post-doctorates

- 2013 - 2015 Albert Herrero, *Fine sediment infiltration in a gravel bed*.

## Last internships

- Jun-Aug 2022 Alexis Herrault, *Fine sediment in alternate gravel bars : experimental study*, co-supervision with S. Gupta, Master 1 internship.
- Jun-Sep 2022 Martin Turlan, *Carbone footprint of RiverLy Research unit : evaluation and mitigation*, co-supervision with J-P. Vidal, Master 1 internship.
- Mar-Aug 2021 Lorenzo Boisson, *Fine sediment deposits in floodplains : experimental study*, co-supervision with B. Camenen and S. Proust, Master 2 internship.
- Jul-Dec 2021 Yann Bonenfant, *Sediment trap efficiency*, Master 2 internship.
- Feb-June 2018 Céline Martin, *Alternated bars creation when deposition of an over-feeding flow: experimental study*, Master 2 internship.

## PERSONAL SKILLS

Mother tongue French

## Other languages

|         | UNDERSTANDING  |         | SPEAKING           |                   | WRITING |
|---------|----------------|---------|--------------------|-------------------|---------|
|         | Listening      | Reading | Spoken interaction | Spoken production |         |
| English | C1             | C1      | C1                 | C1                | C1      |
|         | CLES 2 in 2005 |         |                    |                   |         |
| German  | A2             | A2      | A2                 | A2                | A1      |

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user  
[Common European Framework of Reference for Languages](https://www.cedefop.europa.eu/en/etd/116)

Computer skills — macOSX, windows, basics of Linux,  
 — Matlab, basics in Labview, Python (and Notebooks),  
 —  $\LaTeX$ , Open Office, Microsoft Office.

Experimental skills — leading and conducting experiments in large installations (tilting flume, compound channels, wave flumes, large wave bassin)  
 — use of multiple sensors (acoustic Doppler velocimeter, optical sensors, capacitive sensors, PIV, pressure sensors...)  
 — Data acquisition with Labview.

Driving licence B

## PUBLICATIONS

Orcid ID <https://orcid.org/0000-0003-1806-7054>

## Peer-reviewed scientific articles

- Perret, E., Camenen, B., Berni, C., El kadi abderrezzak, K., and Renard, B. (2022). Inception motion of cohesionless particles: an evaluation of the critical bed shear stress and its uncertainty. *Journal of Hydraulic Engineering* 149, pp. 1–14.
- Proust, S., Berni, C., and Nikora, V. I. (2022). Shallow mixing layers over hydraulically smooth bottom in a tilted open channel. *Journal of Fluid Mechanics* 951. DOI: 10.1017/jfm.2022.818.
- Vergne, A., Berni, C., Le Coz, J., and Tencé, F. (2021). Acoustic Backscatter and Attenuation Due to River Fine Sediments: Experimental Evaluation of Models and Inversion Methods. *Water Resources Research* 57 (9). cited By 0. DOI: 10.1029/2021WR029589.
- Perret, E., Berni, C., and Camenen, B. (2020). How does the bed surface impact low-magnitude bedload transport rates over gravel-bed rivers? *Earth Surface Processes and Landforms* 45 (5), pp. 1181–1197. DOI: <https://doi.org/10.1002/esp.4792>.
- Vergne, A., Le Coz, J., Berni, C., and Pierrefeu, G. (2020). Using a Down-Looking Multifrequency ABS for Measuring Suspended Sediments in Rivers. *Water Resources Research* 56 (2).
- Berni, C., Perret, E., and Camenen, B. (2018). Characteristic time of sediment transport decrease in static armour formation. *Geomorphology* 317, pp. 1–9. DOI: DOI:10.1016/j.geomorph.2018.04.004.
- Perret, E., Berni, C., Camenen, B., Herrero, A., and El kadi abderrezzak, K. (2018). Transport of moderately sorted gravel at low bed shear stresses: The role of fine sediment infiltration. *Earth Surface Processes and Landforms* 43, pp. 1414–1430.
- Berni, C., Michallet, H., and Barthélemy, E. (2017). Effects of horizontal pressure gradients on bed destabilization under waves. *Journal of Fluid Mechanics* 812, pp. 721–725. DOI: 10.1017/jfm.2016.805.
- Dupuis, V., Proust, S., Berni, C., and Paquier, A. (2017). Compound channel flow with a longitudinal transition in hydraulic roughness over the floodplains. *Environmental Fluid Mechanics* 17 (5), pp. 903–928. DOI: 10.1007/s10652-017-9525-0.
- Dupuis, V., Proust, S., Berni, C., and Paquier, A. (2017). Mixing layer development in compound channel flows with submerged and emergent rigid vegetation over the floodplains. *Experiments in Fluids* 58 (30), p. 18. DOI: 10.1007/s00348-017-2319-9.
- Dupuis, V., Proust, S., Berni, C., and Paquier, A. (2016). Combined effects of bed friction and emergent cylinder drag in open channel flow. *Environmental Fluid Mechanics* 16 (6), pp. 1173–1193. DOI: 10.1007/s10652-016-9471-2.
- Herrero, A. and Berni, C. (2016). Sand infiltration into a gravel bed: a mathematical model. *Water Resources Research* 52, p. 14. DOI: 10.1002/2016WR019394.
- Berni, C., Barthélemy, E., and Michallet, H. (2013). Surf zone cross-shore boundary layer velocity asymmetry and skewness: an experimental study on a mobile bed. *Journal of Geophysical Research* 118 (4), pp. 2188–2200. DOI: 10.1002/jgrc.20125.
- Michallet, Hervé, Castelle, Bruno, Barthélemy, Eric, Berni, Céline, and Bonneton, Philippe (2013). Physical modeling of three-dimensional intermediate beach morphodynamics. *Journal of Geophysical Research: Earth Surface* 118 (2), pp. 1045–1059. DOI: 10.1002/jgrf.20078.
- Berni, C., Michallet, H., and Barthélemy, E. (2012). Measurements of surf zone sand bed dynamics under irregular waves. *Eur. J. Environ. Civil Eng.* 16 (8), pp. 981–994. DOI: 10.1080/19648189.2012.705957.
- Berni, C., Michallet, H., and Barthélemy, E. (2011). Local processes of bed destabilization in the surf zone. *Journal of Coastal Research* (SI 64 – ICS Proceedings), pp. 2017–2021.
- Castelle, B., Michallet, H., Marieu, V., Leckler, F., Dubardier, B., Lambert, A., Berni, C., Bonneton, P., Barthélemy, E., and Bouchette, F. (2010). Laboratory experiment on rip current circulations over a moveable bed: Drifter measurements. *Journal of Geophysical Research: Oceans* 115 (C12).
- Berni, C., Mignot, E., Michallet, H., Dalla-Costa, C., Grasso, F., and Lagauzère, M. (2009). Diversity of bed evolution at wave and tidal scales on Truc-Vert beach. *Journal of Coastal Research* (SI 56 – ICS Proceedings), pp. 1726–1730.

## Communications in peer-reviewed conferences with full proceedings

- Proust, S., Berni, C., and Nikora, V. (2020). Emergence of Kelvin-Helmholtz instabilities in shallow mixing layers: An experimental study. In: *River Flow 2020, July 2020, Delft, Netherlands*, pp. 2255–2261.
- Vergne, A., Berni, C., and Le Coz, J. (2017). Acoustic measurement of suspended sediments in rivers: potential impact of air micro-bubbles? In: *Underwater Acoustics Conference and Exhibition 2017, 03/09/2017-08/09/2017, Skiathos, GRC / Underwater Acoustics Conference and Exhibition 2017*, pp. 749–754.
- Camenen, B., Perret, E., Herrero, A., Berni, C., Thollet, F., Buffet, A., Dramais, G., Le Bescond, C., and Lagouy, M. (2016). Estimation of the volume of a fine sediment deposit over a gravel bar during a flushing event. In: *River Flow, 11/07/2016-15/07/2016, St Louis, USA*, p. 8.
- Perret, E., Berni, C., Herrero, A., Camenen, B., El kadi Abderrezzak, K., and Buffet, A. (2016). Laser scanning method to characterize bed arrangement and its influence on incipient motion of gravel sediments. In: *River Flow, 11/07/2016-15/07/2016, St Louis, Missouri, USA*, p. 7.
- Proust, S., Berni, C., Boudou, M., Chiaverini, A., Dupuis, V., Faure, J. B., Paquier, A., Lang, M., Guillen Ludena, S., Lopez, D., Mignot, E., Riviere, N., Chagot, L., Rouzes, M., Moulin, F., Goutal, N., Oukacine, M., Peltier, Y., Ferreira, R. M. L., Brito, M., Alves, E., Gymnopoulos, M., Leal, J. B., Mathurin, B., Soarez Frazao, S., Bousmar, D., Fernandes, J. N., and Eiff, O. (2016). Predicting the flow in the floodplains with evolving land occupations during extreme flood events (FlowRes ANR project). In: *3rd European Conference on Flood Risk Management, 17/10/2016-21/10/2016, Lyon, FRA*, p. 12.
- Proust, S., Faure, J. B., Dupuis, V., Berni, C., and Paquier, A. (2016). 1D+ model for overbank flows with a transition bed friction – emergent rigid vegetation drag. In: *River Flow, 11/07/2016-15/07/2016, Saint Louis, USA*.
- Berni, C., Herrero, A., and Camenen, B. (2015). Computations of trapping coefficient for fine sediment infiltration. In: *36th IAHR World Congress, 28/06/2015-28/06/2015, The Hague, NLD / IAHR 2015*, p. 8.
- Camenen, B., Herrero, A., Dramais, G., Thollet, F., Le Bescond, C., Perret, E., and Berni, C. (2015). Field experiment on the dynamics of fine and coarse sediments over a gravel bar in an alpine river. In: *36th IAHR world congress, 28 June - 3 July 2015, The Hague, the Netherlands*, p. 8.
- Camenen, B., Herrero, A., Dramais, G., Thollet, F., Le Bescond, C., Perret, E., and Berni, C. (2015). Field experiment on the dynamics of fine sediments over a gravel bar in an alpine gravel-bed river. In: *9th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM, 30/08/2015-03/09/2015, Iquitos City, PER / 9th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM*, p. 4.
- Dupuis, V., Proust, S., Berni, C., Paquier, A., and Thollet, F. (2015). Open-channel flow over longitudinal roughness transition from highly submerged to emergent vegetation. In: *36th IAHR World Congress, 28/06/2015-03/07/2015, La Haye, NLD*, p. 9.
- Herrero, A., Berni, C., and Camenen, B. (2015). Laboratory analysis on silt infiltration into a gravel bed. In: *36th IAHR World Congress, 28/06/2015-28/06/2015, The Hague, NLD*, p. 9.
- Herrero, A., Berni, C., Camenen, B., and Thollet, F. (2015). Laboratory analysis on silt infiltration into a gravel bed. In: *9th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM, 30/08/2015-30/08/2015, Iquitos City, PER*, p. 4.
- Perret, E., Herrero, A., Berni, C., El Kadi, K., and Camenen, B. (2015). Incipient motion of a bimodal mixture of gravel and silt: a laboratory experimental study. In: *36th IAHR World Congress, 28/06/2015-03/07/2015, The Hague, NLD*, p. 11.
- Berni, C., Michallet, H., and Barthélemy, E. (2011). Physical modelling of waves induced sheet-flows. In: *34th IAHR world congress, Brisbane, Australia*.
- Berni, C., Michallet, H., and Barthélemy, E. (2011). Processus de mobilisation des sédiments en zone de déferlement : expériences de laboratoire en similitude. In: *20ème Congrès Français de Mécanique*.

## Communications in peer-reviewed conferences with abstract

- Berni, C., Masson, M., Le Bescond, C., Thollet, F., Buffet, A., and Le Coz, J. (2017). Etude du fonctionnement de pièges à particules en conditions contrôlées. In: *Congrès Transport Sédimentaire et Morphodynamique des rivières, 08/11/2017-09/11/2017, Villeurbanne, FRA*, p. 15.
- Herrero, A., Berni, C., and Camenen, B. (2015). Laboratory experiments on silt infiltration into a gravel bed. In: *13th International Conference on Cohesive Sediment Transport Processes, 07/09/2015-11/09/2015, Leuven, BEL*, p. 2.
- Berni, C., Michallet, H., Castelle, B., Barthélemy, E., and Bonneton, P. (2013). Rip current morphodynamics in a wave basin. In: *8th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2013, 09/06/2013-12/06/2013, Santander, ESP*, p. 1.

## Poster

- Berni, C., Herrero, A., Perret, E., Buffet, A., Thollet, F., and Camenen, B. (2017). River restoration: a strategy to flush fine clogged sediments? In: *10th RCEM symposium, 15/09/2017-22/09/2017, Padoue, ITA*, p. 1.
- Perret, E., Herrero, A., Berni, C., El Kadi, K., and Camenen, B. (2015). Incipient motion for bimodal mixture of gravel and silt. In: *Workshop on modelling mixed-sediment river morphodynamics, 27/05/2015-29/05/2015, Delft, NLD*, p. 1.
- Berni, C., Michallet, H., and Barthelemy, E. (2014). Sediment bed destabilization induced by oscillating horizontal pressure gradients. In: *EGU General Assembly, 27/04/2014-02/05/2014, Vienne, AUT*, p. 1.
- Herrero, A., Berni, C., and Camenen, B. (2014). Infiltration of silt-sized sediment in a gravel-bed channel. In: *EGU General Assembly, 27/04/2014-27/04/2014, Vienne, AUT*, p. 1.

## Reports

- Camenen, B., Dramais, G., Vergne, A., Le Coz, J., and Berni, C. (2021). Mesure de la charge sableuse : méthodologies, Rapport OSR 5 action B3.2. Tech. rep.
- Berni, C., Buffet, A., Bonenfant, Y., Camenen, B., Le Bescond, C., Le Coz, J., Lepage, H., Masson, M., and Thollet, F. (Jan. 2019). OSR5 2018-2020 Etude et amélioration de l'efficacité d'échantillonnage des pièges à particules. Research Report. INRAE.
- Berni, C., Buffet, A., Camenen, B., Dabrin, A., Lagouy, M., Launay, M., Le Bescond, C., Le Coz, J., Masson, M., Perret, E., and Thollet, F. (2017). Étude du fonctionnement des pièges à particules dans le canal hydraulique. Tech. rep., p. 32.
- Berni, C., Buffet, A., Camenen, B., Dabrin, A., Lagouy, M., Le Bescond, C., Masson, M., Perret, E., and Thollet, F. (2017). Rapport mi-parcours de l'étude du piège à particules, Action III.2 de l'Observatoire des sédiments du Rhône. Tech. rep., p. 32.
- Launay, M., Dramais, G., Vergne, A., Berni, C., Buffet, A., Henry, E., Lagouy, M., Thollet, F., Le Coz, J., Camenen, B., Dussouillez, P., Benghouba, A., Delanghe, D., Vazquez Tarrío, D., Tal, M., Sabatier, F., and Geay, T. (2017). ZABR-OSR - Livrable action I.1 : Quantification de la charge sableuse. Tech. rep., p. 37.
- Berni, C., Herrero, A., Perret, E., Camenen, B., and Thollet, F. (2015). Décolmatage des sédiments fins dans le lit d'une rivière à graviers. Tech. rep. accord agence de l'Eau / Irstea.
- Camenen, B., Perret, E., Thollet, F., Buffet, A., Dramais, G., Herrero, A., Berni, C., Le Bescond, C., and Lagouy, M. (2015). Expérience de terrain lors de la chasse de l'Arc (9 juin 2015) pour l'estimation de la dynamique sédimentaire pour des conditions proches du seuil de mise en mouvement des galets. Tech. rep., p. 57.

## AWARDS

- Berni, C.**, Michallet, H. and Barthélemy, E. Physical modelling of waves induced sheet- flows. *34th congress of The International Association for Hydro-Environment Eng. and Res.*, 2011. *Award for the best oral presentation.*