

Peer-review journal publications

Caponi, F., Vetsch, D.F. & Siviglia, A. (2020) A model study of the combined effect of above and below ground plant traits on the ecomorphodynamics of gravel bars. *Scientific Report* 10, 17062. <https://doi.org/10.1038/s41598-020-74106-9>

Caponi F, Koch A, Bertoldi W, Vetsch DF and Siviglia A (2019) When Does Vegetation Establish on Gravel Bars? Observations and Modeling in the Alpine Rhine River. *Frontiers in Environmental Science* 7:124. <https://doi.org/10.3389/fenvs.2019.00124>

Caponi, F., & Siviglia, A. (2018). Numerical modeling of plant root controls on gravel bed river morphodynamics. *Geophysical Research Letters*, 45, 9013– 9023. <https://doi.org/10.1029/2018GL078696>

PhD thesis

Caponi F., (2020) Eco-morphodynamic modelling for gravel bed rivers. PhD Thesis, ETH Zurich, Research Collection. <https://doi.org/10.3929/ethz-b-000411119>

Pre-print

Caponi, Francesco and Vetsch, David Florian and Vanzo, Davide, 2022, Baseveg: A Python Package to Model Riparian Vegetation Dynamics Coupled with River Morphodynamics. Available at SSRN: <https://ssrn.com/abstract=4167071> or <http://dx.doi.org/10.2139/ssrn.4167071>

Conference contributions

2023

Vanzo D., D.F. Vetsch, Looser M., Caponi F., Modelling seed recruitment controls in an Alpine floodplain subject to hydropeaking, *submitted for EGU General Assembly 2023*, Vienna

Caponi F., D. S. Conde, D. F. Vetsch, Investigating transport and deposition of plant seeds in an alpine braided floodplain, *submitted for EGU General Assembly 2023*, Vienna

Cunico I., Siviglia, A., Bertoldi, W., and Caponi, F., Chaos in rivers: should we give up with the prediction of river trajectories? *Gravel Bed Rivers 9*, Villarrica, Chile, 10-13 January 2023

2022

Caponi F., D. F. Vetsch, P. Molnar, A. Salvetti, D. Vanzo, Integrated modelling and monitoring of e-flows regulation in a swiss alpine river, 14th International Symposium on Eco-hydraulics 2022, Nanjing, China (online)

Cunico I., Siviglia, A., Bertoldi, W., and Caponi, F. Chaotic behaviour in Gravel Bed Rivers morphological models: analysis and implications for prediction skill of river bar trajectories, 3rd Meeting on Bar Morphodynamics, 16 September 2022.

Cunico I., Siviglia, A., Bertoldi, W., and Caponi, F. Butterfly effect in a deterministic ecomorphodynamic model", Extended Abstract, River flow 2022, submitted in August 2022.

Caponi, F., Vetsch, D. F., Siviglia, A., and Vanzo, D.: BASEveg: A modelling framework integrating vegetation dynamics and river hydro-morphodynamic processes, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-8683, <https://doi.org/10.5194/egusphere-egu22-8683>, 2022.

Cunico, I., Siviglia, A., Bertoldi, W., and Caponi, F.: Intermediate hydro-morphodynamic disturbances amplify riparian vegetation dynamics, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-8495, <https://doi.org/10.5194/egusphere-egu22-8495>, 2022.

Caponi, F., Vetsch, D. F., and Vanzo Modelling the effect of the hydropeaking on vegetation establishment in a gravel bed river. IAHR World Congress, Granada, Spain, 2022

2021

Caponi F., Siviglia A., Vetsch F. D., Vanzo D. BASEveg: a freeware numerical model integrating vegetation dynamics and river morphology 12th Symposium on River, Coastal and Estuarine Morphodynamics (RCEM), online, poster presentation [doi: 10.13140/RG.2.2.12865.48480](https://doi.org/10.13140/RG.2.2.12865.48480)

Cunico, I., Fantin, D., Siviglia, A., Bertoldi, W., Bätz, N., and Caponi, F.: Modeling groundwater-driven morphodynamic evolution of a gravel bed river in presence of riparian vegetation, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-10083, <https://doi.org/10.5194/egusphere-egu21-10083>

2020

Caponi F., Vetsch D. F. & Siviglia A. (2020). Influence of plant traits on biogeomorphic patterns of gravel bed rivers. European Geoscience Union, EGU General Assembly, Wien, Austria (only virtual). <https://doi.org/10.5194/egusphere-egu2020-11453> oral presentation - [session highlight](#)

Caponi F., Wild. P., Vetsch, D. F., Boes R., Siviglia A., and Vanzo D.: Quantifying the role of hydropeaking regimes on reach-scale vegetation recruitment in a gravel bed river. AGU Fall Meeting Abstracts, (2020), EP052-0010, [Link to abstract](#)

2019

Caponi F., Vetsch D. F. & Siviglia A. (2019). Co-evolution of alternate gravel bars and vegetation: the role of plant traits. 11th Symposium on River, Coastal and Estuarine Morphodynamics (RCEM). Auckland, New Zealand. oral presentation – [best presentation award](#)

Caponi F. & Siviglia A. (2019). Modeling the effects of plant allometry on biogeomorphic feedbacks in gravel-bed rivers. European Geoscience Union (EGU), General Assembly, Wien, Austria. poster presentation

2018

Caponi F., BASEveg a tool for ecomorphodynamic modelling, BASEMENT Anwendertreffen, 2018, oral presentation

Caponi F. & Siviglia A. (2018). Plant root controls on riverbed evolution: a numerical modelling study. American Geophysical Union (AGU), Fall Meeting, Washington D. C., USA. poster presentation

Caponi F., Koch. A, Bertoldi W., Vetsch D., & Siviglia A. (2018). Vegetation pattern evolution on the alternate bars in the Alpine Rhine river: image analysis and numerical modelling. American Geophysical Union (AGU), Fall Meeting, Washington D. C., USA. poster presentation

Caponi F. & Siviglia A. (2018). The role of vegetation uprooting on fluvial morphodynamics: a modeling approach. 12th International Symposium on Ecohydraulics (**ISE 2018**), Tokyo, Japan, pp.S5-2-5. oral presentation

Camporeale, C.; Zen, S.; Bertagni, M.; Caponi, F.; Siviglia, A.; Zolezzi, G.; Bertoldi, W.; Perona, P. (2018). Stochastic modelling of organic carbon sequestration from river ecomorphodynamic

Scientific output, *Dr. Francesco Caponi*

processes. European Geoscience Union (EGU), General Assembly, Wien, Austria. poster presentation

Caponi F. & Siviglia A. (2018). The role played by plant roots on biogeomorphic feedbacks: a modeling approach. 2nd Meeting on bar Morphodynamics, EDF R&D Lab, Chatou, France. [invited oral presentation](#)

2017

Caponi F. & Siviglia A. (2017). Modelling the interactions between vegetation and morphodynamics in gravel bed rivers. 1st Meeting on bar Morphodynamics, EDF R&D Lab, Chatou, France: [invited oral presentation](#)

Caponi F., R. Boes & Siviglia A. (2017). A Simple Dynamic Model for Describing the Effects of Plant Root Systems on River Morphodynamics. 10th Symposium on River, Coastal and Estuarine Morphodynamics (RCEM), Padova-Trento, Italy. oral presentation

Seminar at pre-conference course titled "Process-based mathematical modelling of bio-morphodynamics". 10th Symposium on River, Coastal and Estuarine Morphodynamics (RCEM), Padova-Trento, Italy [invited oral presentation](#)

Software publication

Vetsch, D., Siviglia, A., Caponi, F., Bacigaluppi P., M., Gerke, E., Bürgler, M., L., Kammerer S., Conde D., Weberndorfer M., Boes R.M., (2020). BASEMENT Version 3.2. Laboratory of Hydraulics, Glaciology and Hydrology (VAW). ETH Zurich. url: <http://www.basement.ethz.ch/>

Vetsch, D., Siviglia, A., Caponi, F., Ehrbar, M., Gerke, E., Vonwiller, L., Kammerer S., Koch A., Peter S., Vanzo D., (2018). BASEMENT Version 2.8. Laboratory of Hydraulics, Glaciology and Hydrology (VAW). ETH Zurich. url: <http://www.basement.ethz.ch/>

Internal reports

Caponi F. Ecohydraulic modelling of residual flows in the Maggia river (Canton Ticino). VAW Annual Report 2021, ETH Zurich, <https://vaw.ethz.ch/en/the-institute/publications/annual-reports/2020-2029.html>

Caponi F.: BASEveg: modeling vegetation dynamics in BASEMENT version 3, VAW Annual Report 2020, ETH Zurich, <https://vaw.ethz.ch/en/the-institute/publications/annual-reports/2020-2029.html>

Caponi F.: The role of plant roots on biogeomorphic feedbacks: a modeling approach, VAW Annual Report 2017, ETH Zurich, <https://vaw.ethz.ch/en/the-institute/publications/annual-reports/2010-2019.html>

Outreach activities

Caponi F. Influenza delle caratteristiche morfologiche delle piante sulla morfodinamica fluviale, 22/03/2021 XX Giornata mondiale dell'Acqua. Accademia dei Lincei, Roma, Italia, [invited presentation](#)

Collaboration for the short television documentary on the "Ticino river Lab" on RSI "Il Giardino di Albert", February 2023.

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