

The effect of flow variability on the river meandering dynamics

Original

The effect of flow variability on the river meandering dynamics / Bassani, Francesca; Bertagni, Matteo Bernard; Ridolfi, Luca; Camporeale, Carlo. - (2020). ((Intervento presentato al convegno EGU General Assembly 2020 tenutosi a online nel 4–8 May 2020 [10.5194/egusphere-egu2020-20909]).

Availability:

This version is available at: 11583/2871809 since: 2021-02-18T12:10:25Z

Publisher:

EGU

Published

DOI:10.5194/egusphere-egu2020-20909

Terms of use:

openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

EGU2020-20909, updated on 18 Feb 2021
<https://doi.org/10.5194/egusphere-egu2020-20909>
EGU General Assembly 2020
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.



The effect of flow variability on the river meandering dynamics

Francesca Bassani, Matteo Bernard Bertagni, Luca Ridolfi, and Carlo Camporeale
Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino, 10129 Turin, Italy
(francesca.bassani@polito.it)

The dynamics of a meandering river has been widely investigated by the scientific community. However, the effects of discharge variability on the meander evolution is still an open question. In this work, we present numerical simulations of the short-term evolution of a plane river morphology (the Ikeda, Parker and Sawai model is used to describe the stream hydrodynamics) forced by a stochastic flow discharge (simulated by a compound Poisson process). The comparison of the simulation outcomes with those obtained for the same river under a constant discharge (equal to the mean of the stochastic process) shows interesting results. The discharge variability slows down both the formation of the meanders and the occurrence of the cutoff events, and induces lower meander curvilinear wavelengths and excess bank velocities. A theoretical analysis of the relationship between the channel erosion rate and the river discharge for the Kinoshita curve confirms the obtained numerical results.