EGU23-2227, updated on 29 Mar 2024
https://doi.org/10.5194/egusphere-egu23-2227
EGU General Assembly 2023

Extremes in river flood hydrology: making Black Swans grey

Alberto Viglione
Politecnico di Torino, Department of Environment, Land and Infrastructure Engineering, Department of Environment, Land and Infrastructure Engineering, Torino, Italy (alberto.viglione@polito.it)

Black Swans in river flood hydrology are unexpected events that surprise flood managers and citizens, causing massive impacts when they do occur, but that appear to be more predictable in retrospect, after their occurrence. My talk aims at showing how black swans in river flood hydrology can "be made grey", i.e. can be anticipated to a certain degree, in probabilistic terms, and/or made less impactful, by (1) expanding information on flood probabilities by gathering data on floods occurred in other places and at other times; (2) understanding the mechanisms causing heavy tails in flood frequency distributions; (3) understanding the mechanisms causing river flood changes in time; (4) accounting for uncertainties in data, models and flood frequency estimates; (5) accounting for the possible dynamics of coupled human-water systems; and (6) coupling the classical top-down approach to hydrological risk assessment based on predictive modelling with a bottom-up approach that is centered on robustness and resilience.