IAHS2022-473, updated on 28 May 2023
https://doi.org/10.5194/iahs2022-473
IAHS-AISH Scientific Assembly 2022

Service chaining, end-using, and support-to-action of a PUB-hydrograph modelling: the SIMFEN web service API

Tom Loree[1], Hervé Squividant[1], Josette Launay[1,2], Alban de Lavenne[3], and **Christophe Cudennec**[1]
[1]UMR SAS, Institut Agro, INRAE, Rennes, France
[2]Centre de ressources et d'expertise scientifique sur l'eau de Bretagne, Rennes, France
[3]Université Paris□Saclay, INRAE, UR HYCAR, Antony, France

A consolidated geomorphology-based approach for discharge Prediction in Ungauged Basins (PUB) through deconvolution of discharge signals from gauged donor catchments, their transposition and their convolution towards target outlets, has been made available online to end-users through a Web Processing Service Application Programming Interface (WPS API) for the synoptic peninsular region of Brittany, France. In the spirit of hydrological services, the SIMFEN WPS API (https://geosas.fr/simfen, Dallery et al., in press) allows anyone to execute the hydrological modelling package transfR (https://CRAN.R-project.org/package=transfR) online through: (1) Open Geospatial Consortium (OGC®) interoperability standards; (2) collection and use of public hydrometric data; (3) connection to the pre-existing MNTSurf WPS API for geomorphometric analysis; (4) visualization using a collaboratively developed Mviewer; and (5) innovative WPS API chaining workflows. The ability to model discharge series at any ungauged outlet of the synoptic region is offered to specialists of other disciplines, non-modeller water practitioners and interested citizens to support interdisciplinarity, water monitoring and management, and related science-society-policy debates and actions. This communication will demonstrate how hydroinformatic developments have been made openly available, ergonomy has been designed, and contextual informations are additionally provided to end-users. It will also show thanks to non-academic metrics how the users' community is actually active; and how it is considering further chaining developments in the spirit of web service interoperability and reusability, towards hydrochemical, hydroecological, and hydroclimatic aspects.

Dallery D. et al., in press. *An end-user-friendly hydrological Web Service for hydrograph Prediction in Ungauged Basins.* Hydrological Sciences Journal, https://doi.org/10.1080/02626667.2020.1797045

de Lavenne A., Cudennec C., 2019. *Assessment of freshwater discharge into a coastal bay through multi-basin ensemble hydrological modelling.* Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2019.02.387

de Lavenne A. et al., 2016. *Transferring measured discharge time-series: large-scale comparison of Top-kriging to geomorphology-based inverse modeling.* Water Resources Research, http://dx.doi.org/10.1002/2016WR018716