



Master's thesis opportunity

Wood in rivers origin and sources

Context:

Instream wood (i.e., downed trees, trunks, rootwads and branches in rivers) is a key element of river ecosystems. Wood significantly affects river morphology and sediment dynamics, supporting biodiversity, influencing the nutrient and organic carbon cycles, and providing a variety of physical habitats in rivers. However, the transport of large quantities of instream wood during floods may enhance related damages. Knowledge about the origin of instream wood is crucial for understanding wood transport processes and is critical for optimizing river and flood management. Instream wood vary through space and time according to the wood's origin, recruitment process (e.g., landslides, bank erosion) and transport. However, in large catchments, little is known about where wood comes from (hillslopes, channel banks, floodplain). The riverine vegetation source of instream wood is an important factor controlling wood characteristics; thus, the taxonomy of the wood gives first-order indications of where it might be recruited from.

Goals:

The goal of this project is to better understand the role of the forest stand in instream wood dynamics to derive information on instream wood origin at the river basin scale.

Knowledge and skill required:

High motivation. Interest and motivation for fieldwork in riverine environments and laboratory analysis of wood samples (dendrochronology). Basic knowledge of GIS and remote sensing would be an advantage. Good knowledge of English.

Collaboration:

SNSF Project led by Prof. Virginia Ruiz-Villanueva (RivES Research Group <https://wp.unil.ch/rives/>)

Keywords: instream large wood, riparian vegetation, river ecosystem, tree rings, dendrochronology

Working place: Fieldwork in several Swiss rivers (e.g., Vallon de Nant, Arve, Valserine, Allondon) and laboratory work at IDYST, Geopolis, UNIL-Mouline, CH-1015 Lausanne, Switzerland

References:

- Ruiz-Villanueva, V., Piégay, H., Gurnell, A.A., Marston, R.A., Stoffel, M., 2016. Recent advances quantifying the large wood dynamics in river basins: New methods and remaining challenges. *Rev. Geophys.* 54. doi:10.1002/2015RG000514
- Wohl, E., Kramer, N., Ruiz-Villanueva, V., Scott, D., Comiti, F., Gurnell, A., Piégay, H., Lininger, K., Jaeger, K., Davis, W., Fausch, K., 2019. The natural wood regime in rivers. *Bioscience* 69, 259–273. doi:<https://doi.org/10.1093/biosci/biz013>

Contact: Virginia Ruiz-Villanueva, IDYST, Virginia.Ruiz-Villanueva@unil.ch
 Pascal Vittoz, Université de Lausanne, IDYST, pascal.vittoz@unil.ch; 021 692 43 67