



SEFS 12
Symposium for
European Freshwater Sciences

VIRTUAL CONFERENCE | 25–30 JULY 2021 | #SEFS12

Abstract Book



Classification of streams ecological status: comparing expert-knowledge and data-driven approaches

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8B_SS18 Functional indicators of freshwater ecosystem health & RS18 Microplastics: sources and impacts, July 29, 2021, 13:15 - 14:45

Expert knowledge is increasingly used in conservation science to classify dynamic and complex ecosystems, while overcoming typical data-limitations. Based on the expertise of field operators from the local Environment Agency, we classified 161 stream sites in Trentino according to the presence of known hydrological, morphological and chemical alterations, while also identifying sites in reference conditions. We then used machine learning approaches to examine the degree to which a-priori expert classification matched data-driven classification based on the taxonomic and functional composition of benthic macroinvertebrates. The majority of stream sites were a-priori considered impacted by either one or a combination of anthropogenic alterations (~80%), with only 16% of sites in reference conditions. Random Forest a-posteriori classification of stream sites according to taxonomic and functional macroinvertebrate data matched the expert-based classification only partially. While stream sites considered in reference conditions were correctly classified, discrimination among hydro-morphological and chemical alterations was often poor. This suggests that indicators used to assess the ecological status of streams in mountain areas based on macroinvertebrates taxonomic and functional classification can assess the overall stress of a waterbody, but they show poor sensitivity to specific stressors, with relevant outcomes for the water management of Alpine running waters.