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# Towards seasonal hydrological forecasting in mountain catchments: preliminary results from the APRIL project

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The APRIL project aims at addressing the long term quantitative prediction of monthly discharge from mountain catchments and setting up a system which can then be used operationally. More specifically, its objectives are:
- To investigate the potential of EO products (snow cover extent, vegetation and soil moisture statust) and weather/climatic variables for the prediction of water streamflow from mountain catchments
- To develop a robust methodology for the long term quantitative forecast of montly discharge from EO and weather/climatic data
- To build a fully operational system for seasonal hydrological forecasting.
This contribution illustrates the general concept of the project as well as some preliminary results.
Water discharge in mountain catchments is physically related to antecedent snow cover and climatology (precipitation, temperature). Other factors may play a role, such as vegetation/soil status and topography. Historical discharge measurements and earth observation (EO) data are a valuable source for inferring the quantitative relationship between the discharge and its predictors using appropriate techniques.
The prediction is based on the Support Vector Regression (SVR)technique, a state of the art machine learning regression method with good intrinsic generalization ability and robustness. In the contribution we present and discuss results of a preliminary analysis on water discharge prediction ( with lead time of 1 to 3 months) in South Tyrol, Italy. Despite the use of a limited set of predictors (among which mainly snow cover area), the results are encouraging. The analysis is in the process of being extended at different spatial scales, which will give the possibility to investigate different aspects of the problem and develop different prediction systems; by updating on the current developments, the contribution discusses also perspectives and current limitations towards the set up of a fully operational seasonal hydrological forecasting system in Europe.