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A climate service for small hydropower plants operation and management

The operation planning of run-of-river (RoR) plants is subject to the water availability, which presents a very high interannual variability, being even more significant in mountainous Mediterranean areas with snow cover. In this context, seasonal forecast constitutes an added source of information that may help to narrow down the operational options inferred from historical data sources.
In the framework of the H2020 project CLARA (Climate forecast enabled knowledge services) a climate service was developed in a co-generation process. This methodology leads to a correct scale of the forecast information and the right tools to convey it, which results in a more effective knowledge system but also a more robust knowledge and contextual applicability of the seasonal climate forecast.
The proposed climate service, SHYMAT (Small Hydropower Management and Assessment Tool), provides monthly river inflow forecast 1 to 6 months in advance as an indicator of water availability in a RoR hydropower system. Users can take advantage of the forecast in order to anticipate: (1) Periods in which there will be enough water to turbinate; and, on the other hand, (2) periods in which there will be an inadequate amount of water to turbinate, and maintenance tasks can be planned. Moreover, having knowledge of the possible water excess discharges coming from snowmelt, which may result in the spilling of water, gives managers the opportunity to quickly tune up additional turbines. Finally, great value comes from the prediction of energy production, which is clearly valuable information for market issues, and the minimum environmental river flow, to comply with the environmental requirements.
SHYMAT has been tested in southern Spain, but it is a scalable solution, which helps to bring the C3S information to other sites in Europe, while also contributing to the bloom off climate services as an emerging market.

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