

Objectives

The service, SHYMAT (Small Hydropower Management and Assessment Tool) is aimed at the operational assessment of small hydropower plants in which operation feasibility is subjected to the run-of-river (RoR) flow which is also depending on a high variability in precipitation and snow cover. The management has to accomplish with some particular operation conditions of the plant but also some environmental flow requirements.



Methodology

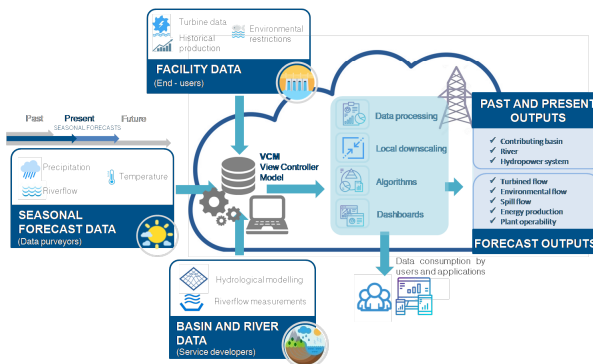
SHYMAT provides end-users with the most up-to-date hydrological combining measurements and modeling with the most advances seasonal forecast that currently exists at European level.

The service supports managers to anticipate:

- High production periods and shutdown periods, for maintenance and repair tasks planning;
- Spilling of water, giving managers the opportunity to quickly tune up additional turbines;
- Compliance with environmental river flow restrictions;
- Energy production, clearly valuable information for market issues.

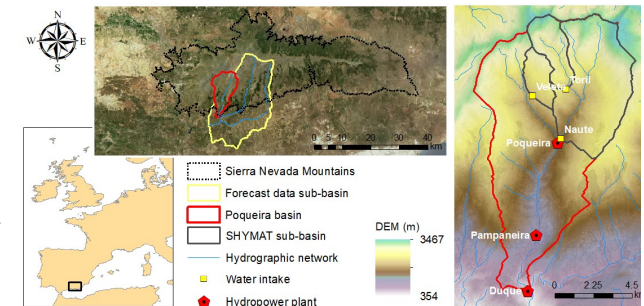


Data providers, service purveyors and potential end-users were involved in **local meetings and Multi Users Forums**, during which end-users closely participated in the design of the tool and local data provision. Co-generation leads to a **correct scale of the forecast information** and the **right 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.



Pilot application

SHYMAT has been tested in southern Spain, in a three RoR plants pilot system in the Poqueira River basin, a Mediterranean high mountain area where snow has a critical influence. However the service is a scalable solution, which can help to bring the use of climate forecast information to other sites in Spain and Europe.



How the service works

A cloud web application with restricted access but also an intuitive and friendly user interface:

- 1) A **geolocation map** which presents the user all the hydropower systems included in SHYMAT;
- 2) A **topological panel** module which shows the elements of the RoR system (basins, rivers, load chambers, hydropower plants, and power grid), interconnected according to the system operation;
- 3) A **water availability and operation** module which provides users with past, present and future information.

The **outcomes** give insight into how this kind of **services** could change the **traditional management** (normally based on past experience), providing a probability range of the future river flow and, based on that, additional information for management and operation issues. This highlights also the **utility of the co-generation process** to implement climate services for water and energy fields.