Seasonal Water Management for Semiarid Areas
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Short Project Summary

Seasonal Water Management – Online Prototype for Reservoir/Dam Management Support

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Providing stakeholders with meaningful information for dam and reservoir management is a challenge. The SaWaM project provides a number of complex information products which are not easy to understand. Therefore an Online Prototype for decision support was developed to help stakeholders to use and understand the delivered geo-information and compare information from past seasons and events to the coming months.

Main information presented in the Online Prototype are the seasonal forecasts and historical data – so called hindcasts – to help decision makers in dam management in planning the next months strategy. Users are now able to compare and retrieve decision support information on future water availability through modelled hydro-meteorological and hydro-logical information like precipitation, temperature and inflow.

Methods and Data

The online prototype is based on a micro-services architecture using Geoserver technology to provide the spatial information and retrieves the data (mainly NetCDF data) through a THREDDS-Server where the scientific data is ingested in a controlled manner using a dedicated Meta-data tool to help scientists and data specialists to provide these complex data sets in a standardized way.

The presentation of the data sets is split into historical and forecast data and provides absolute and categorical value presentations of the model outputs.
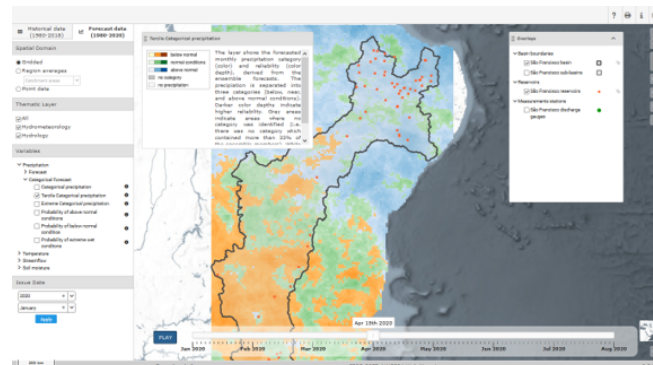
A timeline provides dynamic views on the development of the situation in the respective river basins or subbasins relevant for dam management.

Figure 1: SaWaM Online Prototype architecture
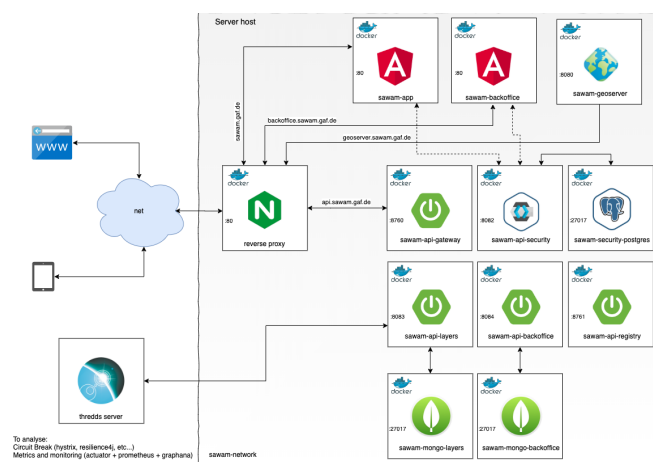
Graphical presentation of the values together with different confidence value presentations help decision makers to understand the information.

Figure 2: SaWaM Online Prototype view for Sao Francisco Basin, Brasil showing categorical precipitation (issue date Jan 2020 – next 7 months)

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Results and Conclusions

Initially it was planned that the system should present all the information especially of the seasonal forecasts and its uncertainties as geospatial layers. Discussions with data providers and users based on their usual information "consumption" showed that this was too complex for understanding and easy decision making. So the data itself was presented as spatial timelines and graphes of e.g. area averages showing the situation in the relevant part of the basins having influence on the reservoir or dam.

The possibility to compare the forecast to past situations together with fact sheets and scientific background information provided together with the data, supports the interpretation of the forecast data and decision making in a comprehensive way.

Further layers and feedbacks from users based on the growing experience will be implemented in the next months further improvement the system.

Figure 3: SaWaM Online Prototype view for Rio Sao Francisco, Brasil. Comparison of historical and forecast categorical precipitation (basin average).
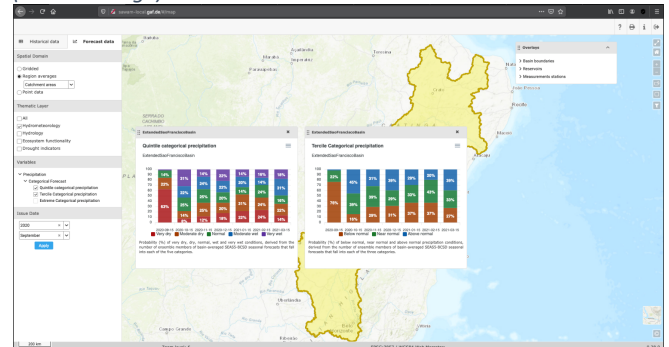
References

https://sawam.gaf.de access requires guest account (requests to thomas.kukuk@gaf.de).