How seasonal forecast can improve the water planning in multipurpose reservoirs: ROAT climate service, a reservoir operation assessment tool

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FRAMEWORK: H2020 CLARA project

EGU General Assembly 2020

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Partners

- Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (Fondazione CMCC) - Italy
- Sveriges Meteorologiska och Hydrologiska Institut (SMHI) - Sweden
- Agenzia Regionale per la Prevenzione, l'Ambiente e l'Energia dell'Emilia-Romagna (ARPAE) - Italy
- Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) - Italy
- Universidad de Cordoba (UCO) - Spain
- Gecosistema Srl - Italy
- Apertum IT AB - Sweden
- The Climate Data Factory - France
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- Regione Emilia Romagna - Italy
- Sistemas Abiertos de Informacion Geografica S.L. (SAIG) - Spain

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Climate forecast enabled knowledge services

CLARA

THE GOAL

Develop a new **Climate Service** for **reservoir managers** in **South Spain** using **Seasonal Forecast**

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THE PROCESS

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Climate Service — Previous study of VALUE and MARKEABILITY

Reservoir managers — Close contact with end user: COGENERATION

South Spain — Water scarcity and weather unpredictability: REAL CHALLENGE

Seasonal Forecast — Streamflow from SMHI. QUANTILE MAPPING correction based on measurements

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THE FACTORS

Climate

Service

Reservoir Managers

South Spain

Seasonal

Forecast

Multi-Purpose Reservoir. Need accurate tools for water management efficiency

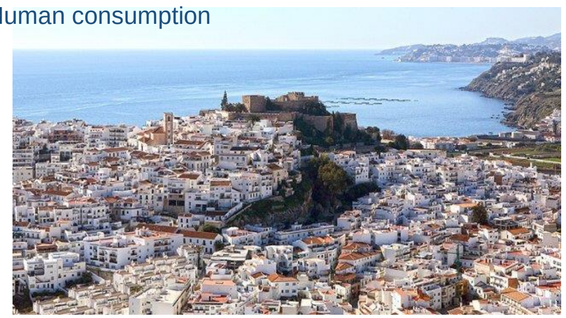
Irrigation

Rules-Beznar Reservoir System

Hydropower

Enviromental flow

Human consumption



Flood regulation /sediment problems

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THE FACTORS

Climate

Service

Reservoir

Managers

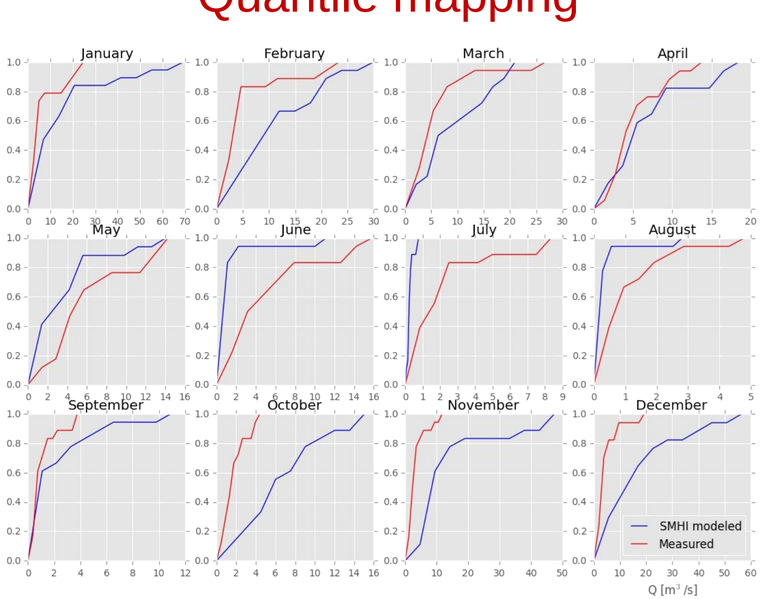
South Spain

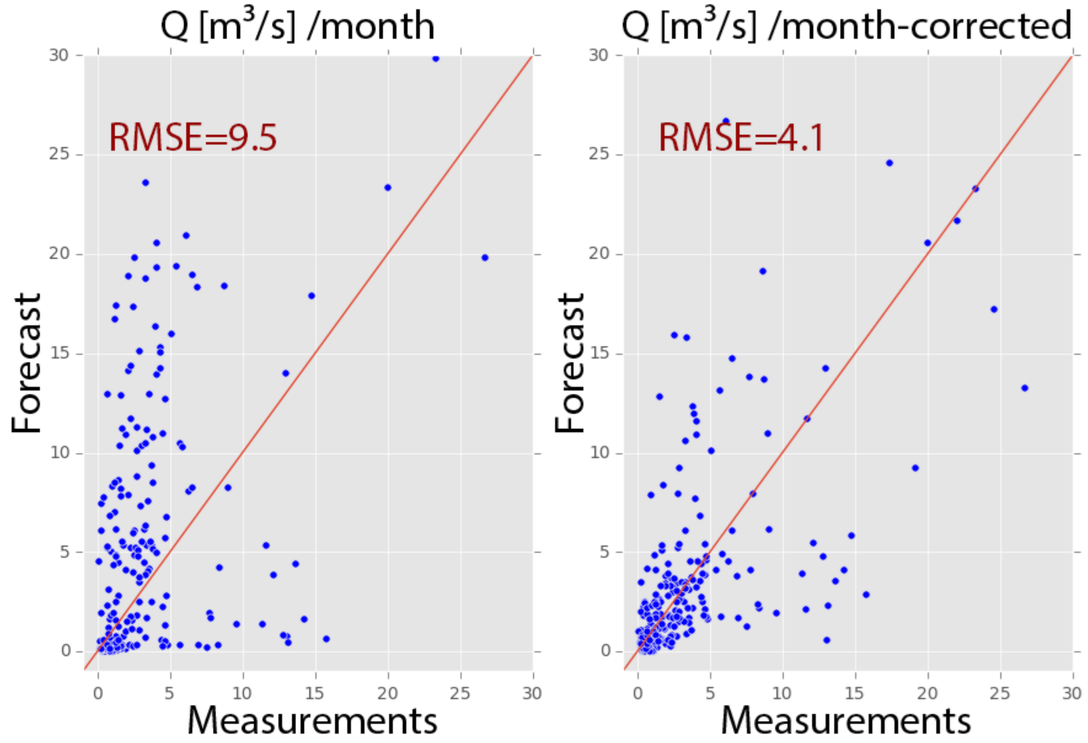
Seasonal Forecast

Seasonal forecast of River Discharge (Q) from SMHI with E-HYPE+ECMWF SEAS5.

- Results at basin scale
- Needs correction.

Corrected month by month with Quantile mapping





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THE DRAWBACK

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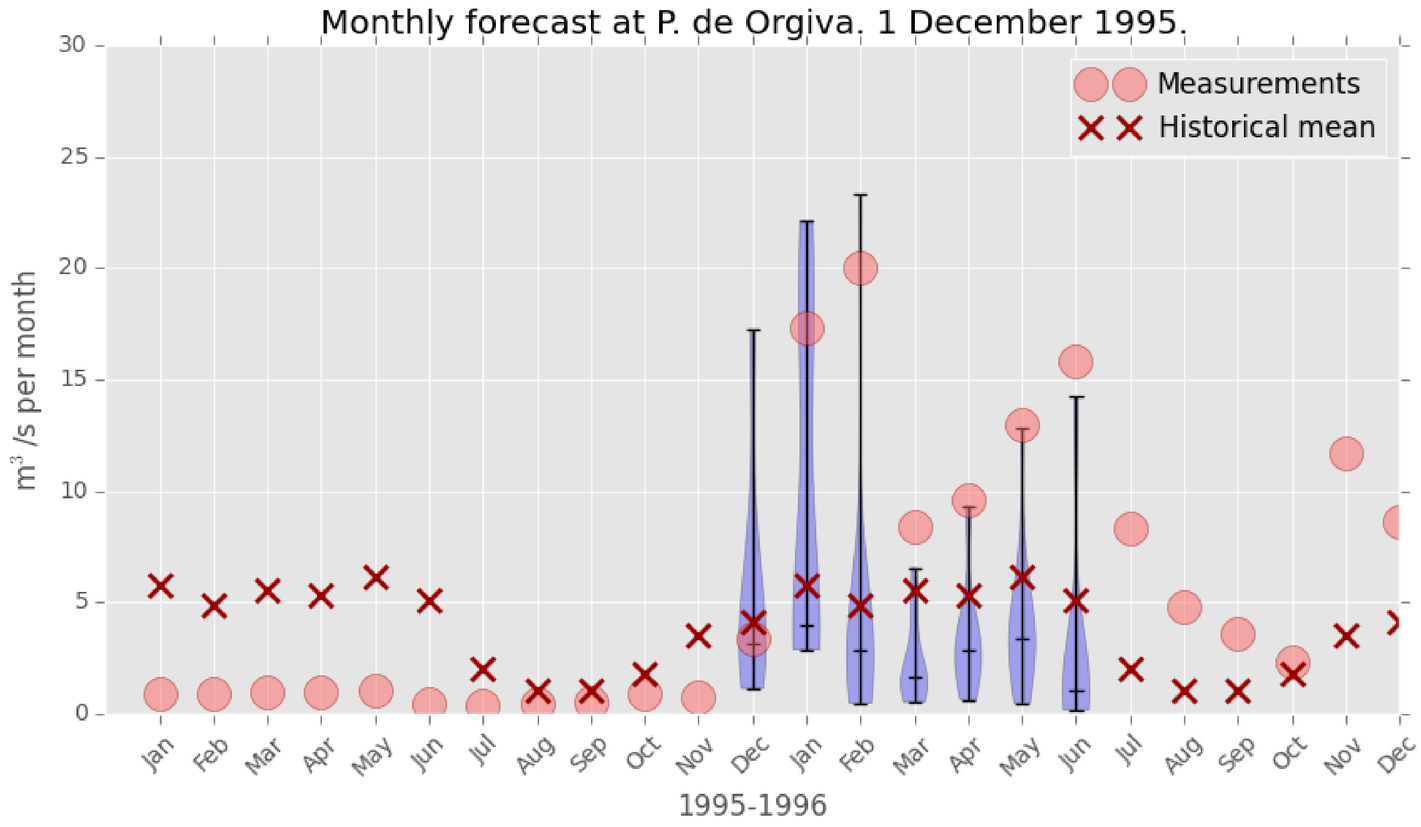
Climate Service

Reservoir Managers South Spain Seasonal Forecast

Managers have to make decisions with a minimum of reliable information:
Wrong decisions cost a lot of money and social pressure.



✗ **Seasonal forecast skill not good enough for this area AND this purpose**

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CONTINGENCY PLAN

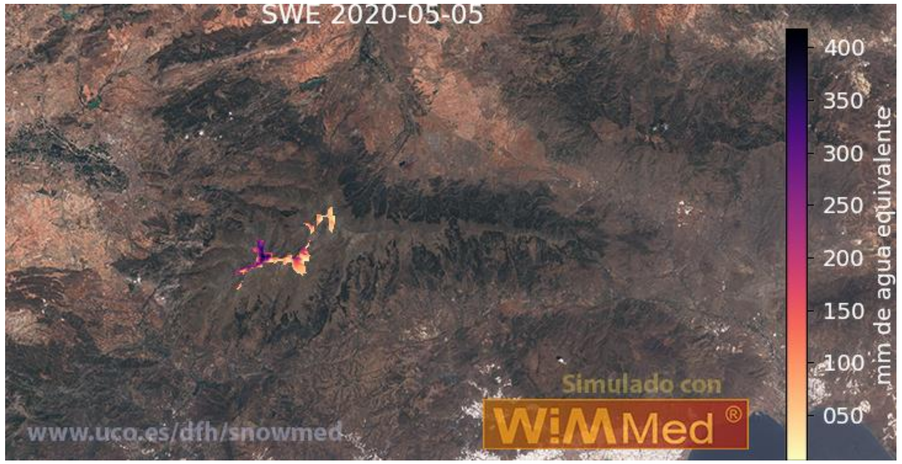
Climate Service

Reservoir Managers

South Spain

Seasonal Forecast

Hydrological modelling and data to offer accurate present water state in the basin



Snow water equivalent – soil moisture – aquifer storage Maps and graphs

Add value in the Service for the user: past and real-time measurements and modelling

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CONTINGENCY PLAN

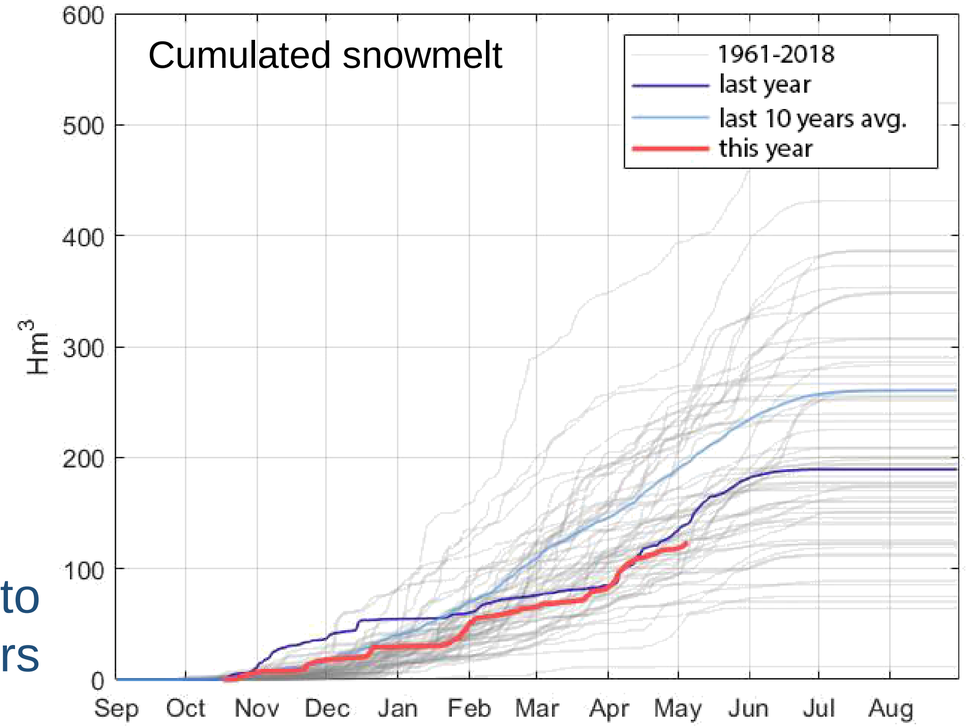
Climate Service

Hydrological modelling and data to offer accurate present water state in the basin

Reservoir Managers

South Spain

Seasonal Forecast



Available water compared to previous years

Add value in the Service for the user: past and real-time measurements and modelling

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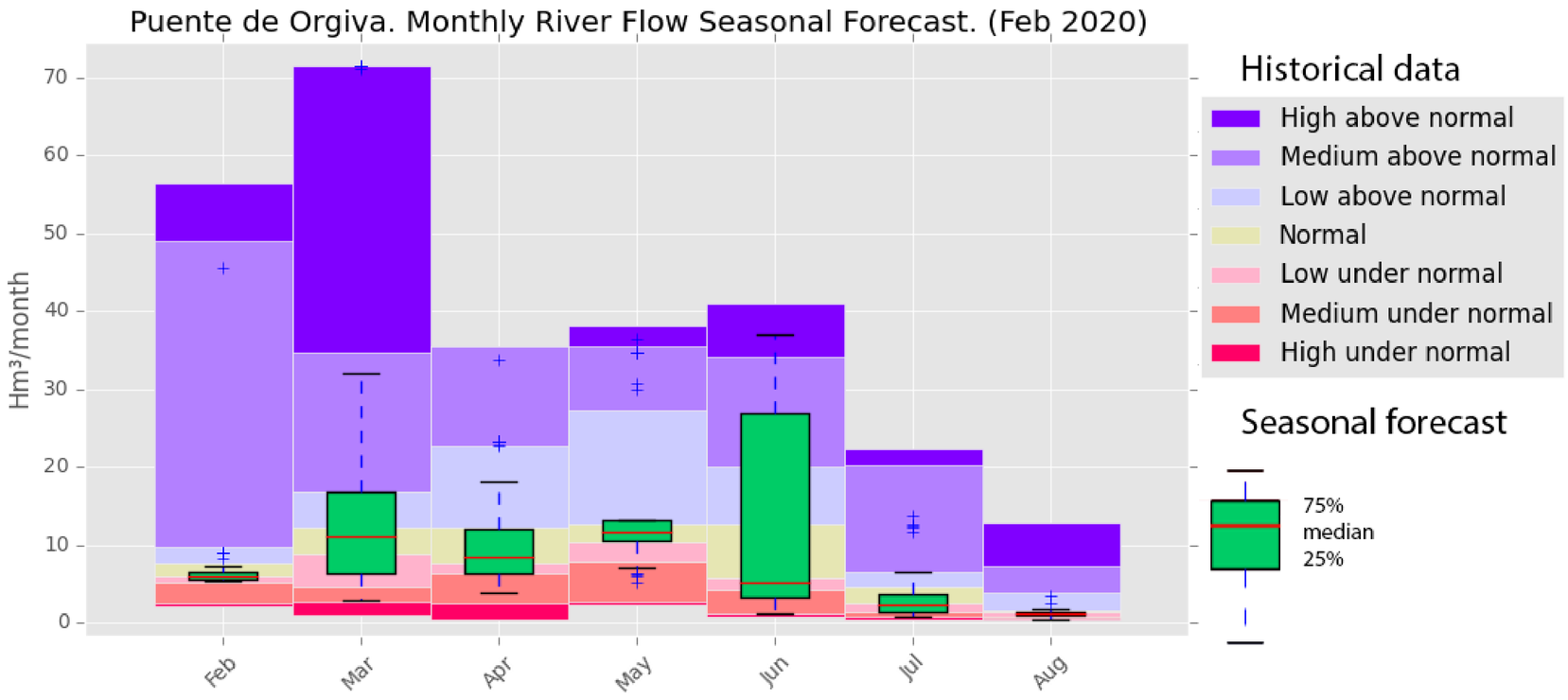
THE RESULT

Climate Service

Reservoir Managers

South Spain



Seasonal Forecast

Very positive **POTENTIAL VALUE** for users, but useless given actual skill. **Needs improvement**

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THE RESULT

Climate Service

Web app, daily updated and easily scalable

Reservoir Managers

South Spain

Seasonal Forecast

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THANKS FOR READING!

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