Climate forecast enabled knowledge services

AGU 100 FALL MEETING

Smart Climate Hydropower Tool (SCHT)

Artificial Intelligence for effective hydropower production forecast and management

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Why applying AI to discharge forecast?

To reduce **uncertainty of hydropower production** due to natural inflows variability

To Forecast expected deviation between **budget producibility** and final production and undertake the most advantageous corrective actions.

To Built forecast on **Globally available** data (i.e Copernicus **C**limate **D**ata **S**tore seasonal forecasts) and **scalable** forecast techniques

To **Customize** forecast on user own data and needs

To **Avoid** need of mechanistic models to be fed by field data

To Deploy final service through open-source **web-cloud-based service**

How to set it up?

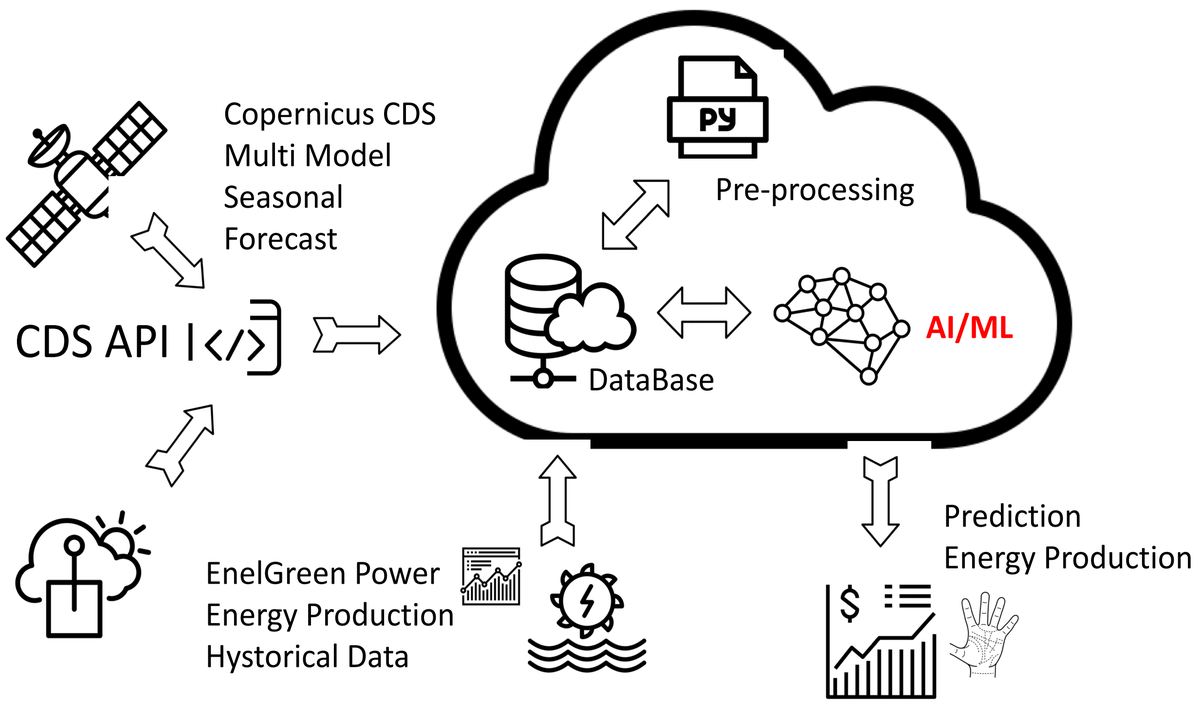


Fig 1 –Setting up the forecast service

Working prototype for EGP in Colombia

Interaction and performances

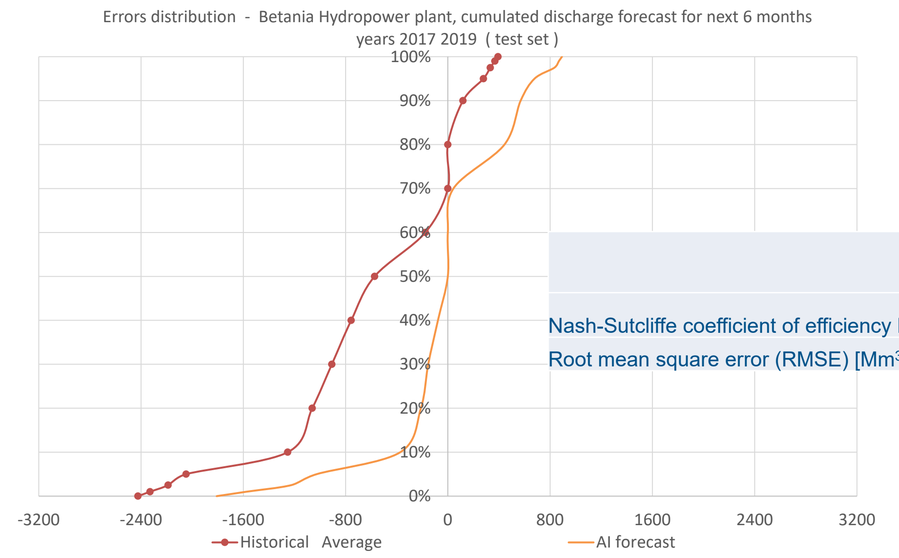
A **WEB SERVICE** that

Retrieves CDS Precipitation and Temperature seasonal forecasts & EGP discharge data

Runs trained AI algorithms

Shows an interactive web page with forecast and performances

A **SUBSTANTIAL FORECAST IMPROOVEMENT** over reference benchmark (Historical monthly average discharge)



	Historical Average	AI forecast
Nash-Sutcliffe coefficient of efficiency NSC	0.55	0.84
Root mean square error (RMSE) [Mm3]	998	572

Fig 2 – Error distribution [Mm3] for 6-month forecast- Betania HPP

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