Can we supplement in situ data with satellite?

With more than 6 million km², the Amazon is the largest river in the world in terms of the immensity of its basin, but certain sectors remain unknown.

The HYDROSIM platform combines innovative spatial and in-situ observation technologies with hydrological modelling to provide qualitative information covering the entire watershed.

« Thanks to HYDROSIM, which combines terrestrial and celestial hydrological data, **we have been able to extend our knowledge of the Amazon River** to areas that were remote and difficult to access. »

An official from the Brazilian National Water Agency - ANA

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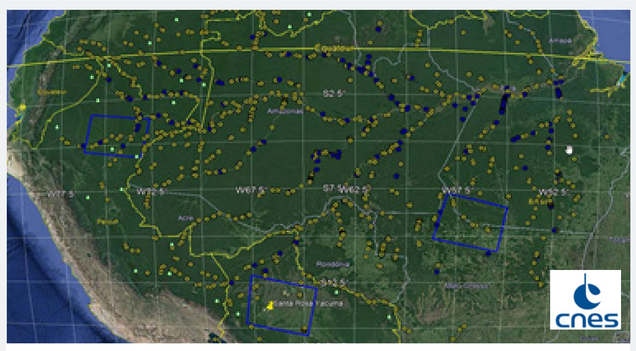
STEP 1 : Identifying virtual stations of interests

Pertinent by their location and presenting good quality data

- Identification of virtual stations
- Correction of spatial altimetric data
- Evaluation of altimetric data



Stations Virtuelles HydroWeb (avril 2019)

"opérationnelles" *"recherche"*

HydroWeb (http://hydroweb.theia-land.fr/) for the whole basin

Specific treatments for 3 test areas

- Increase in the number of Virtual Stations (densification of the network)
- Innovative measurement quality diagnostics
- Radar echo analysis

STEP 2 : Modelling the flow chronicle at virtual stations location

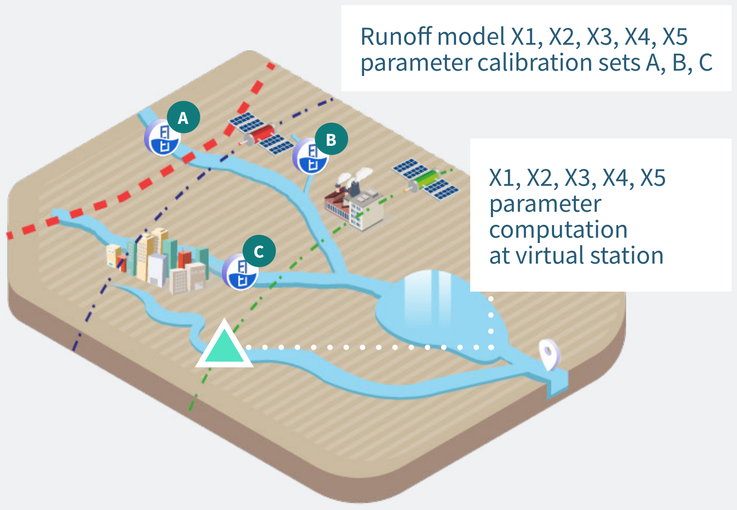
Hydrometric and meteorological data collection and analysis

Calibration :

- of EOS rainfall with in situ data ;
- of rainfall-runoff model (GR5J and SWAT) at hydrometric station location.

Regionalisation of parameters of rainfall-runoff models in order to model a flow data at virtual stations location

Comparison between modelled flow data and spatial altimetry data



1. Calculation of a maximum of rainfall-flow models* at the in-situ stations.

2. Compute a set of parameters at the virtual stations by **regionalization** of the parameters.

3. Model the flow at the virtual stations / integrate the water level data from the satellite to build a virtual rating curve.

Matching of water level data from the satellite with flows from hydrological modelling.

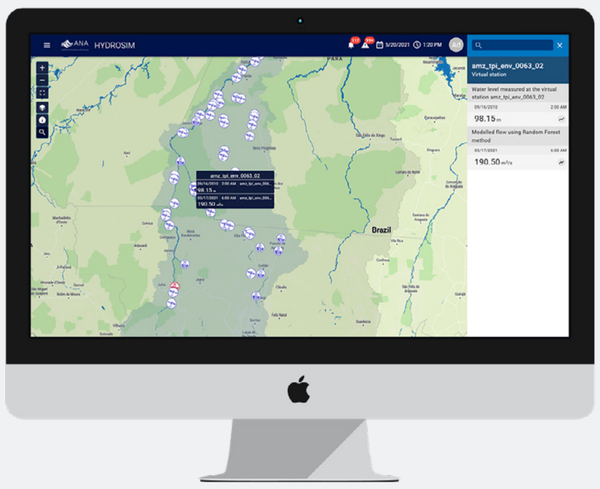
STEP 3 : Integrating the products of the project into an information system (WIMES)

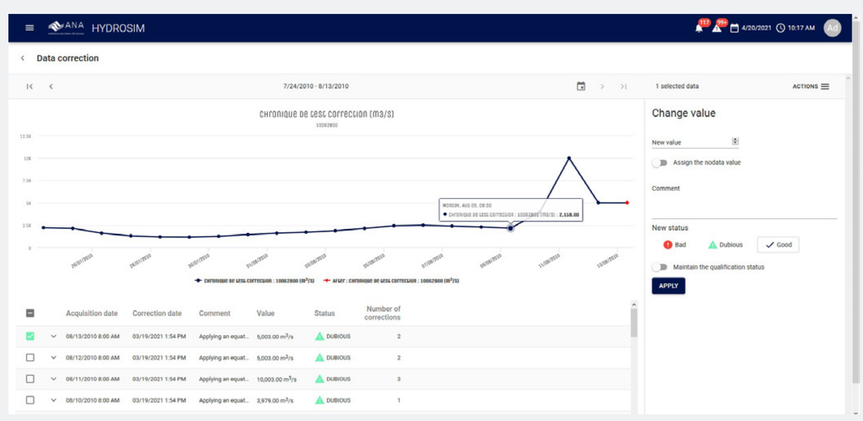
ANA
AGÊNCIA NACIONAL DE ÁGUAS

HYDROSIM

Deployed at the identified end office (ANA, Brasilia): monitoring and decision support tool

wimes





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