Improvements in the Storm Surge forecasting system PronUy_RPFM

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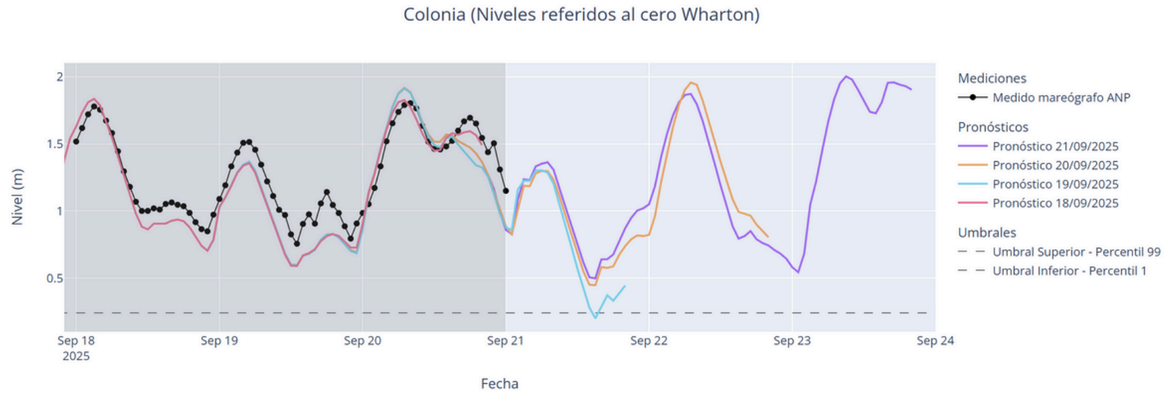
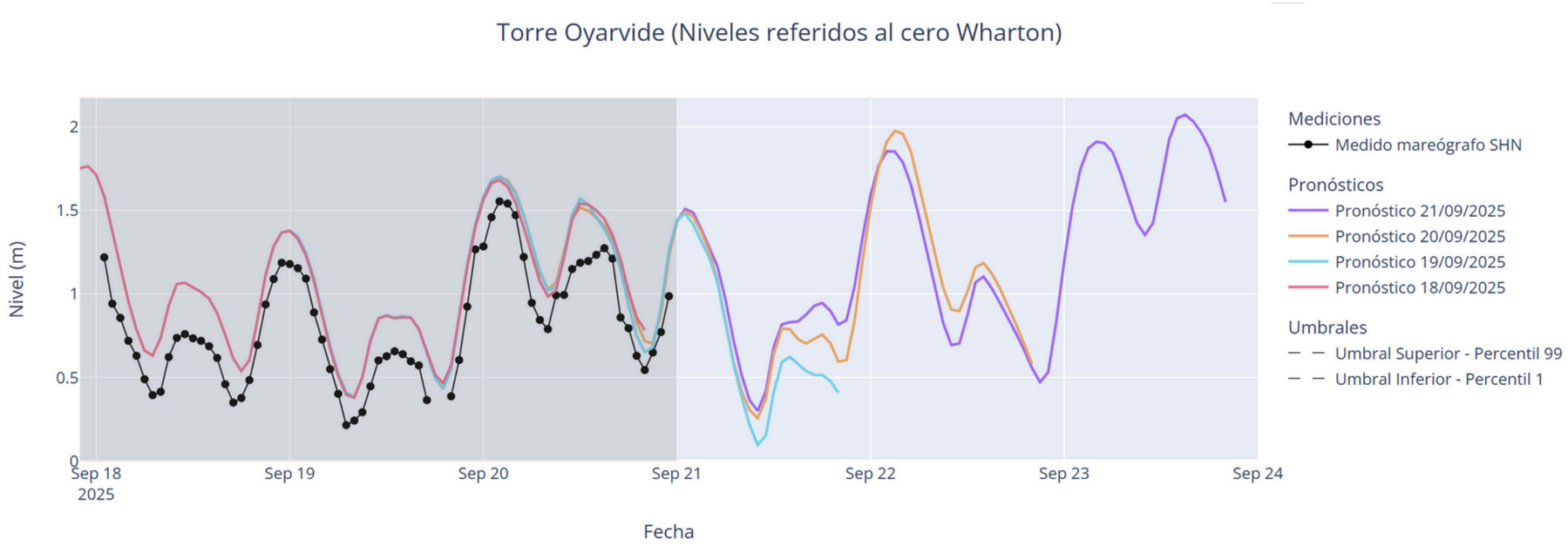
The Forecasting System

- 3-day water level forecasts
- Based on TELEMAC-2D model
- Forced with:
  - Oceanic boundary conditions
  - Wind forecasts
  - River discharges



Objective

The objective is to reduce the systematic bias in the forecast by adjusting the Mean Sea Level at the boundary.



Methodology

Generate an ensemble of 22 simulations

varying the Mean Sea Level value in the BC

Evaluate the ensemble with observed data

using different time windows

Select best-performing simulation

lowest bias (per station)

Daily publication of a three-day forecast on the website

Results - Storm surge events

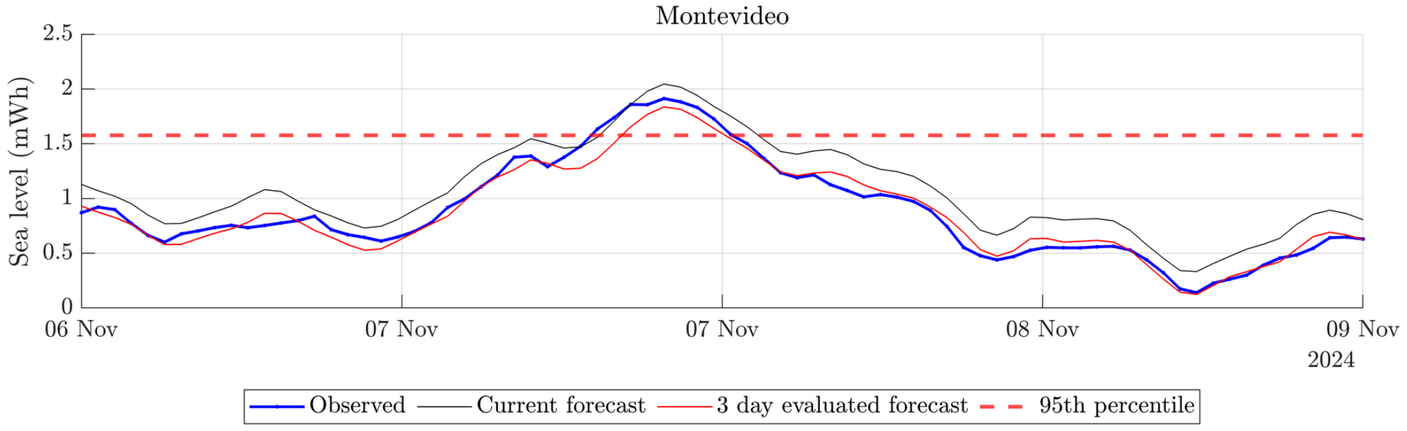
- Events = above 90th percentile
- Best performance with 3-day window
- False positives reduced (7 vs. 16)
- More reliable storm surge forecasts

3 day evaluated forecast

Forecasted \ Observed	yes	no
yes	44	7
no	4	-

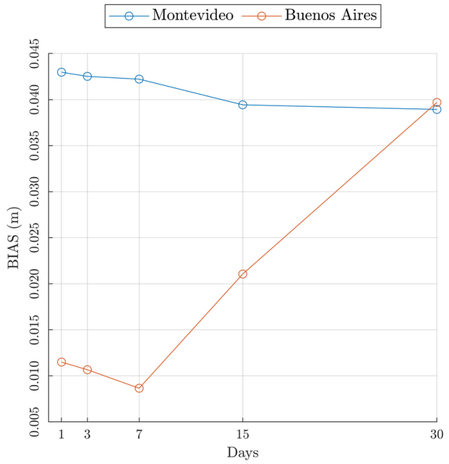
Single forecast

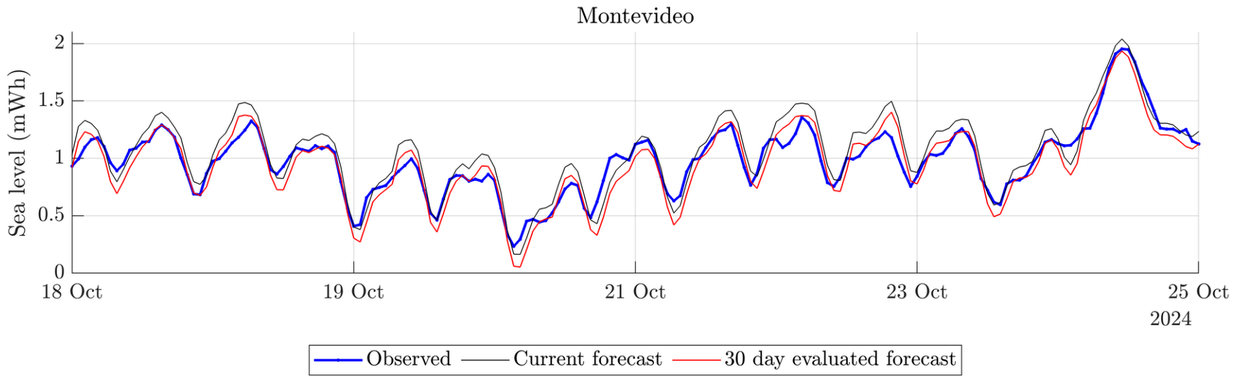
Forecasted \ Observed	yes	no
yes	46	16
no	2	-

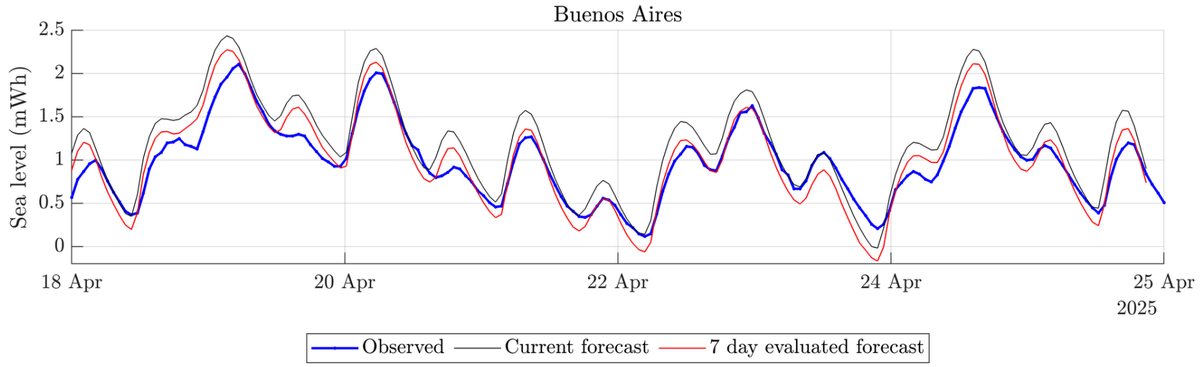


Results - General improvements

- Bias depends on the evaluation window
  - Montevideo → best with 30-day window
  - Buenos Aires → best with 7-day window







Thanks!

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