Ocean Prediction | UN DECADE COLLABORATIVE CENTRE

Connecting the world around ocean forecasting

OceanPredict Science Team (OPST) Meeting - 2024

Developments achieved by REMO-Navy Team and Chalenges

Capt(Ret) Luiz Claudio

9th Annual Meeting of the OceanPredict Science Team (OPST-9) - July, 22nd 2024

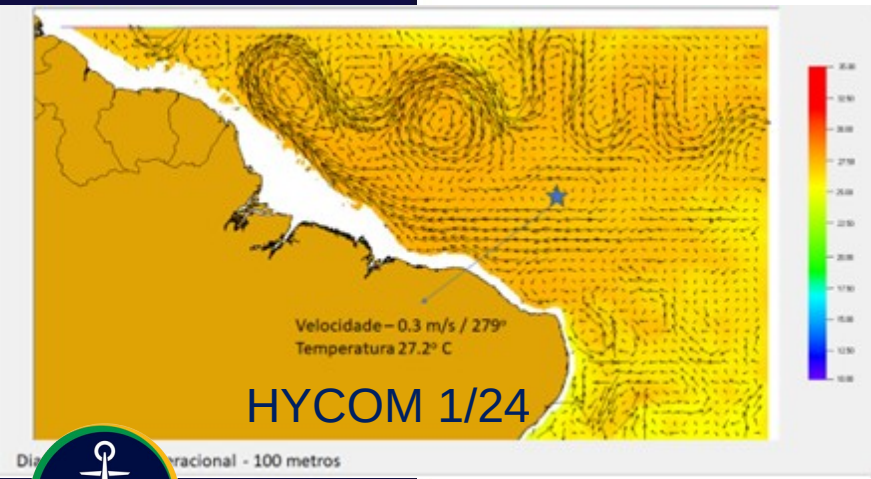
SUMMARY - Developments

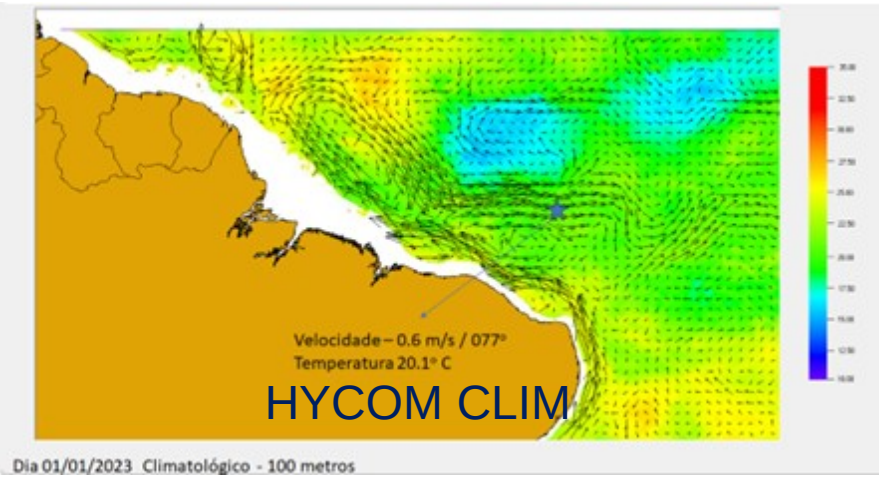
- **Deep Ocean Modeling - HYCOM**
- **Coastal Modeling – ADCIRC**
- **Wave Modeling – WW3**
- **Oil Spil Model - CMOP**
- **Marine Environmental Forecast (PAM) – Web Page**

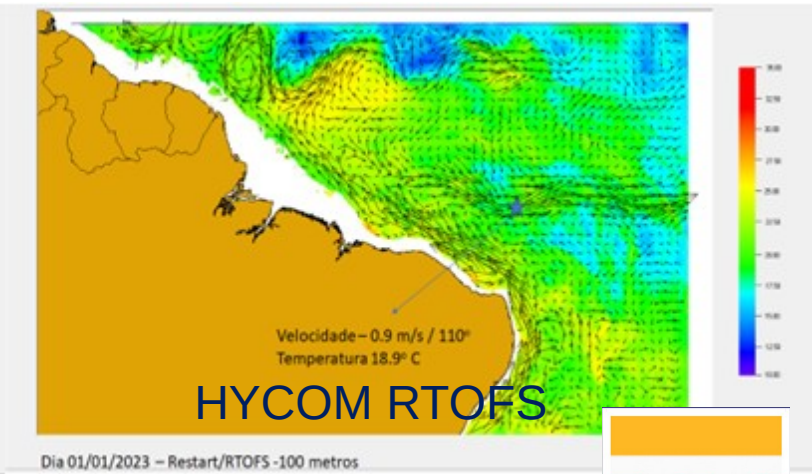
HYCOM

- A discrepancy in our results was identified mainly in the equatorial region in which the depth of the mixed layer was larger than expected.
- Consequently, the temperature and speed presented were inconsistent.

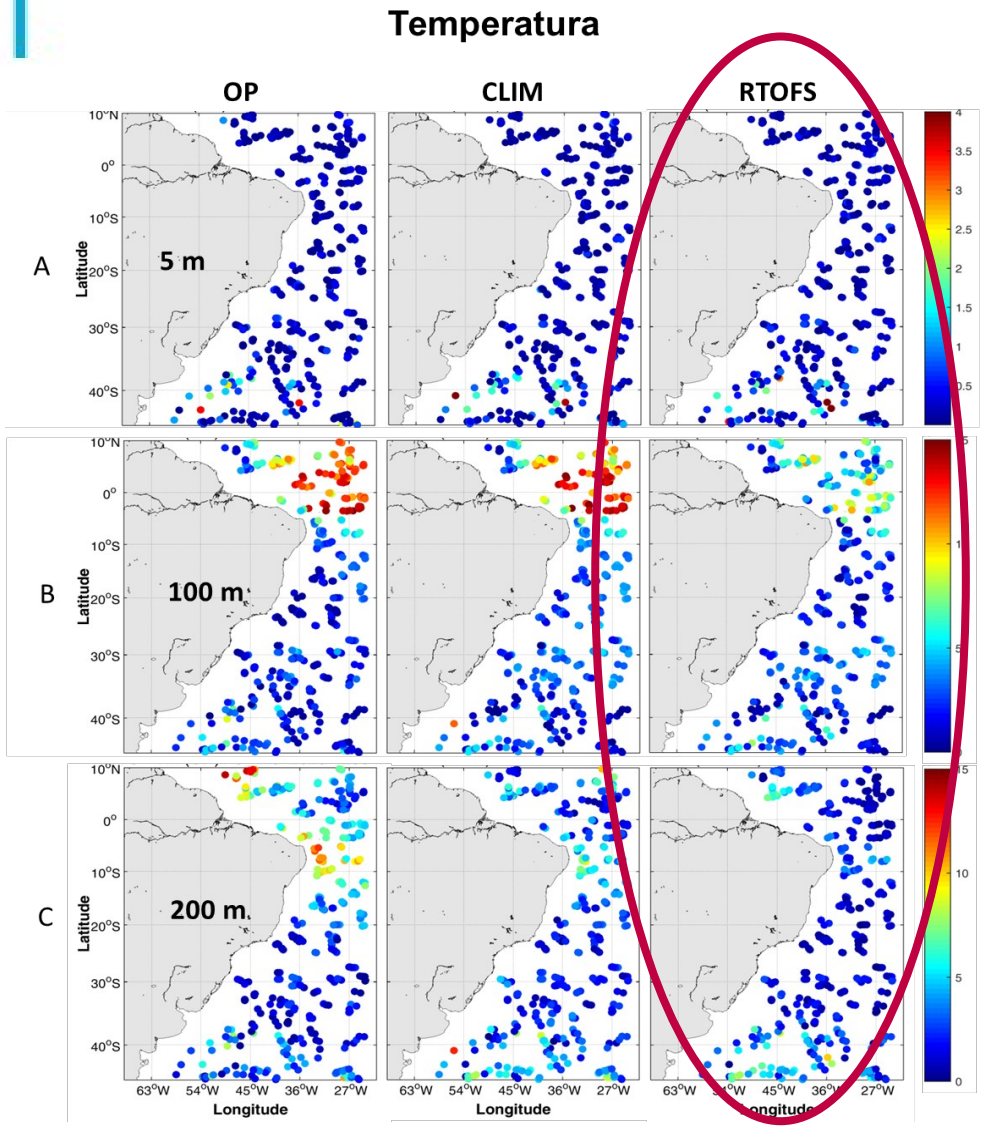
- Two strategies were adopt:
  1) Reanalysis with assimilation of climatological Temperature and Salinity data.
  2) Remapping a model with similar characteristics with coherent results.
  in this case the NCEP/NOAA Real-Time Ocean Forecast System – RTOFS model.

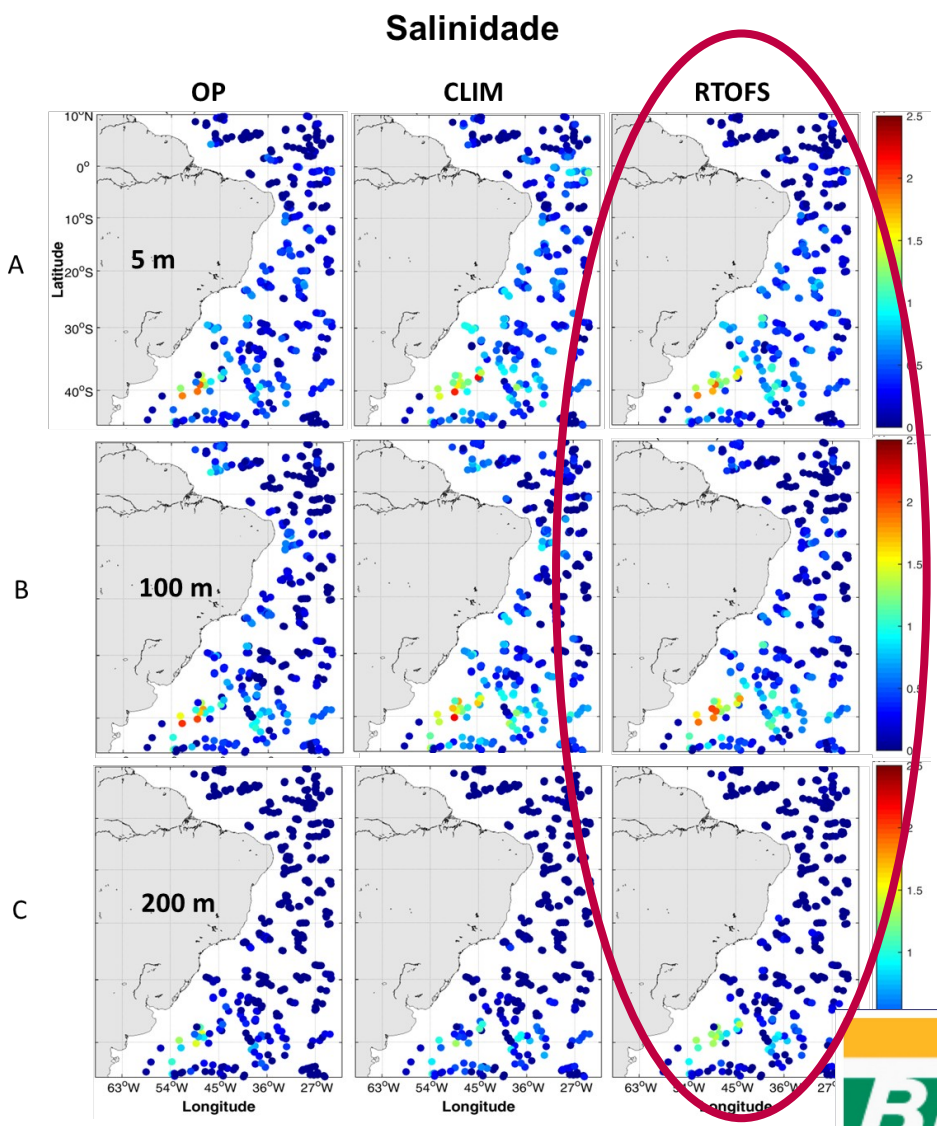






Diference Between Model x Obs

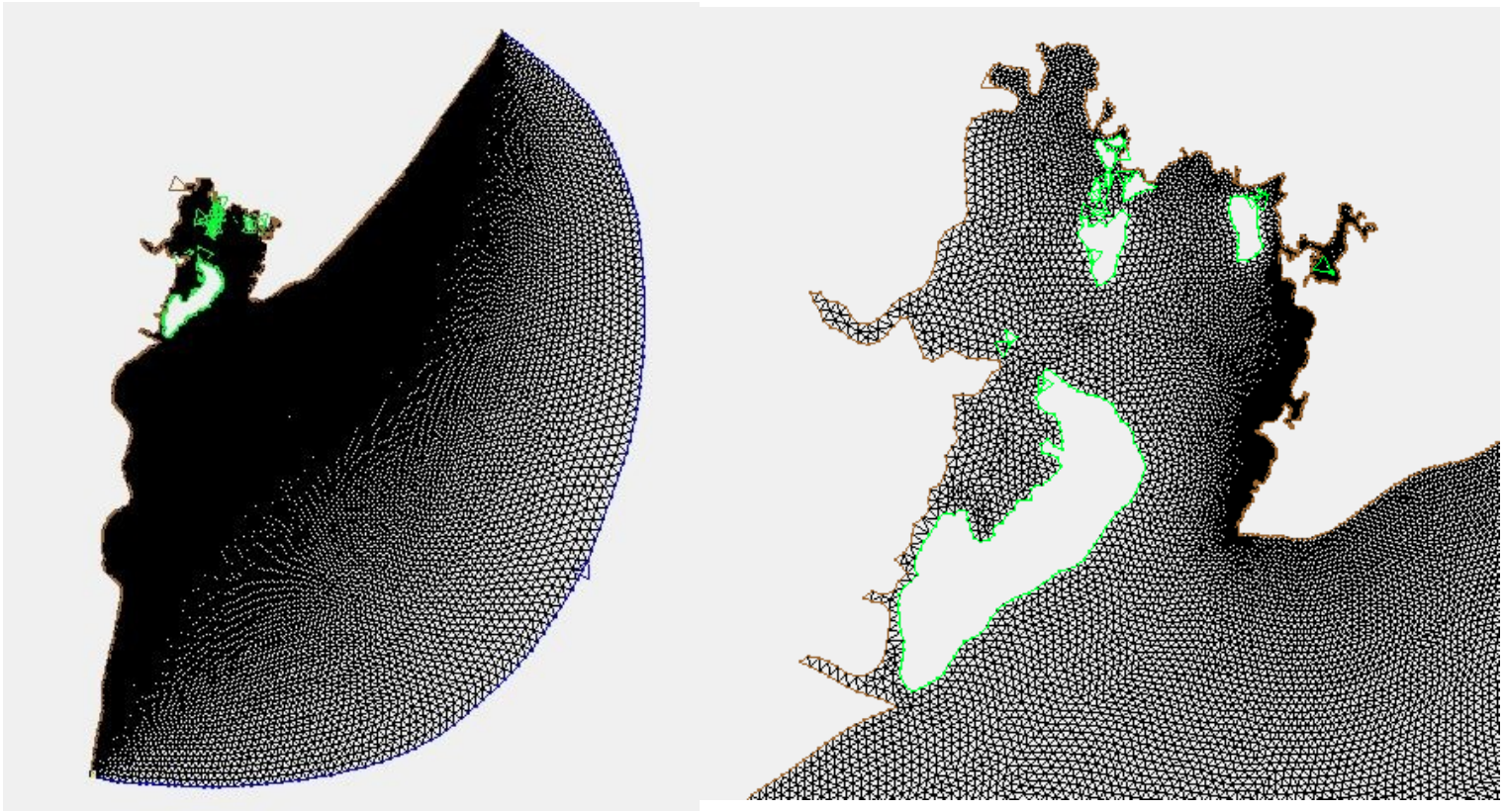




ADCIRC

- Implemented the Advanced Circulation Model (ADCIRC) on the coastal areas of Salvador and Vitória.
- Enhancing modeling capabilities in these critical regions.
- Providing more accurate and reliable coastal forecasts, supporting decision-making in these areas.

SALVADOR



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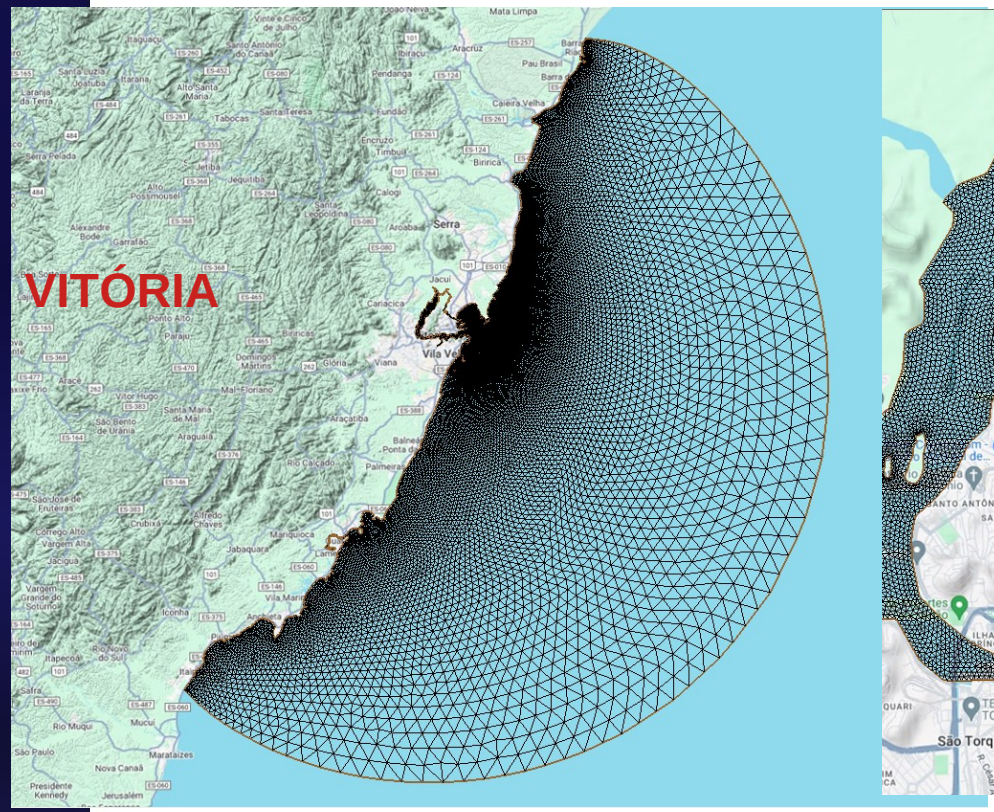
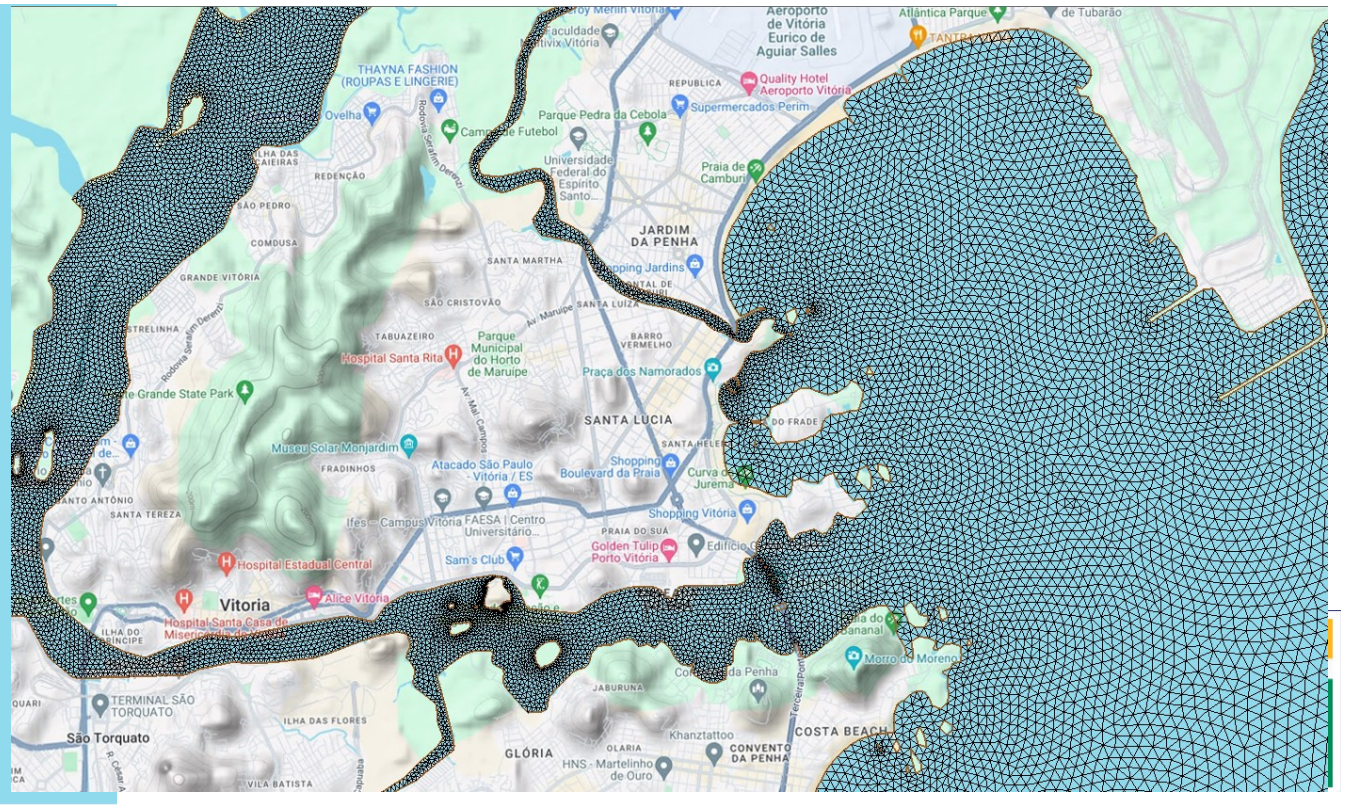
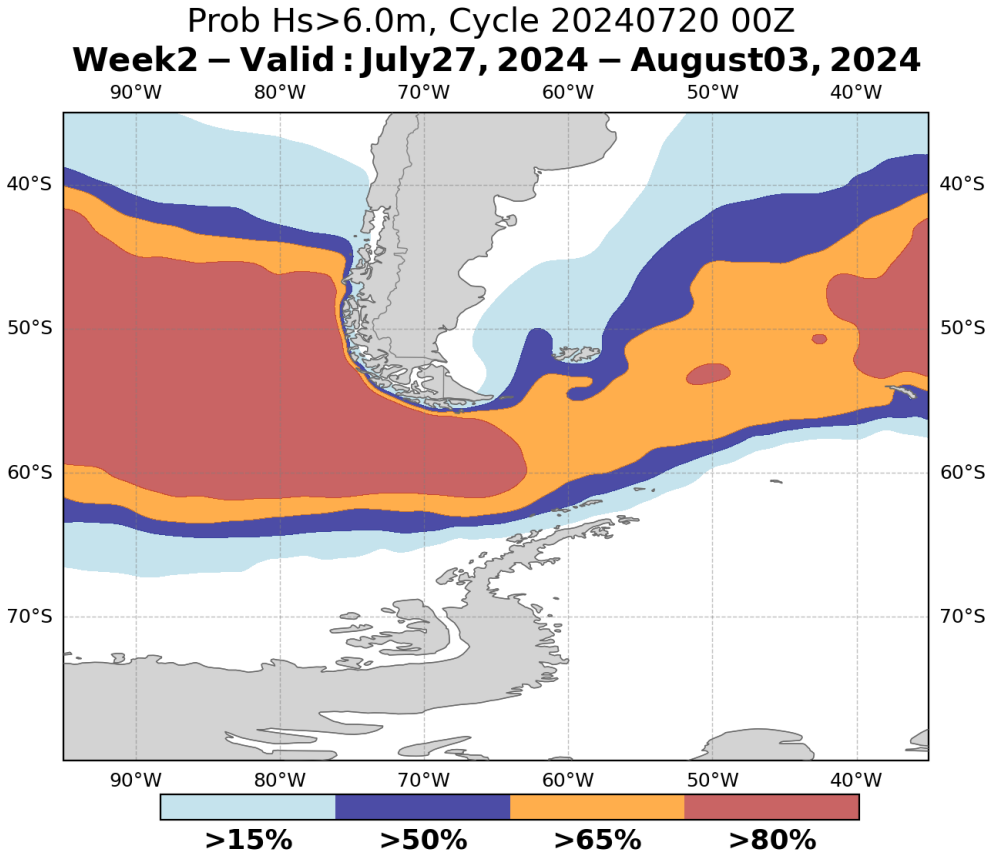


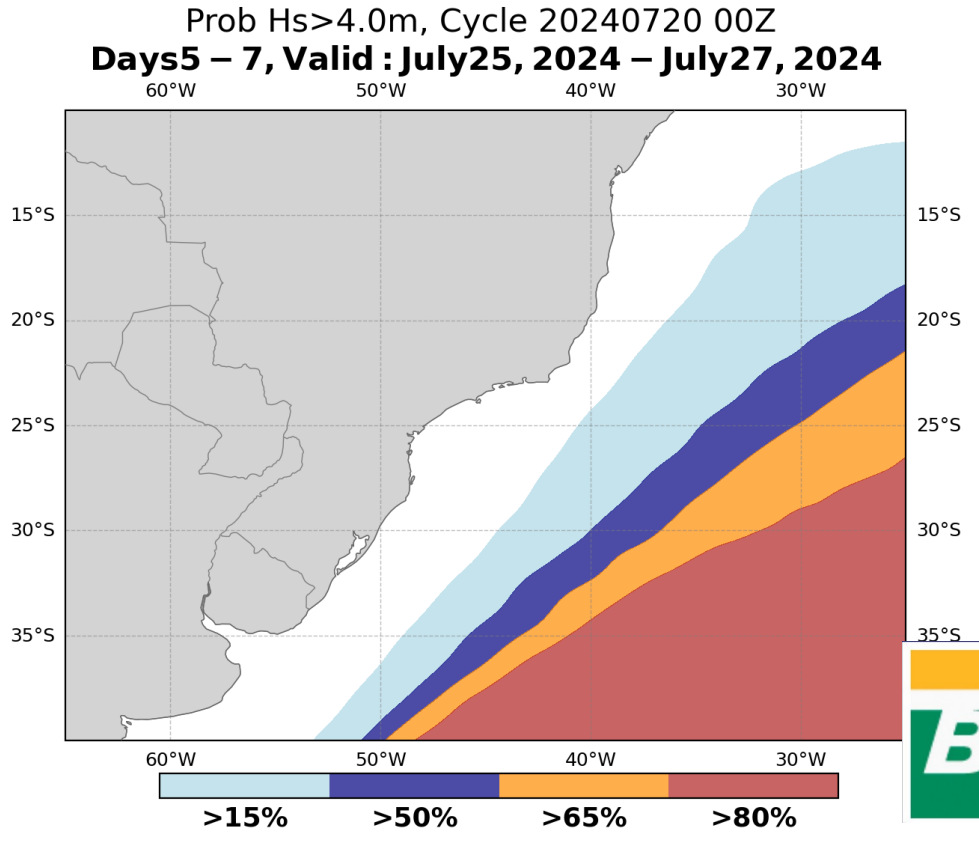


WW3 - Probabilistic Forecasts

- Developed 5-7 and 7-14 days probabilistic forecasts, improving predictive insights. Covering Antarctica, the South Atlantic, and the North Atlantic areas.

- Leveraging the Global Ensemble Forecast System Version 12 (GEFS V12) results.

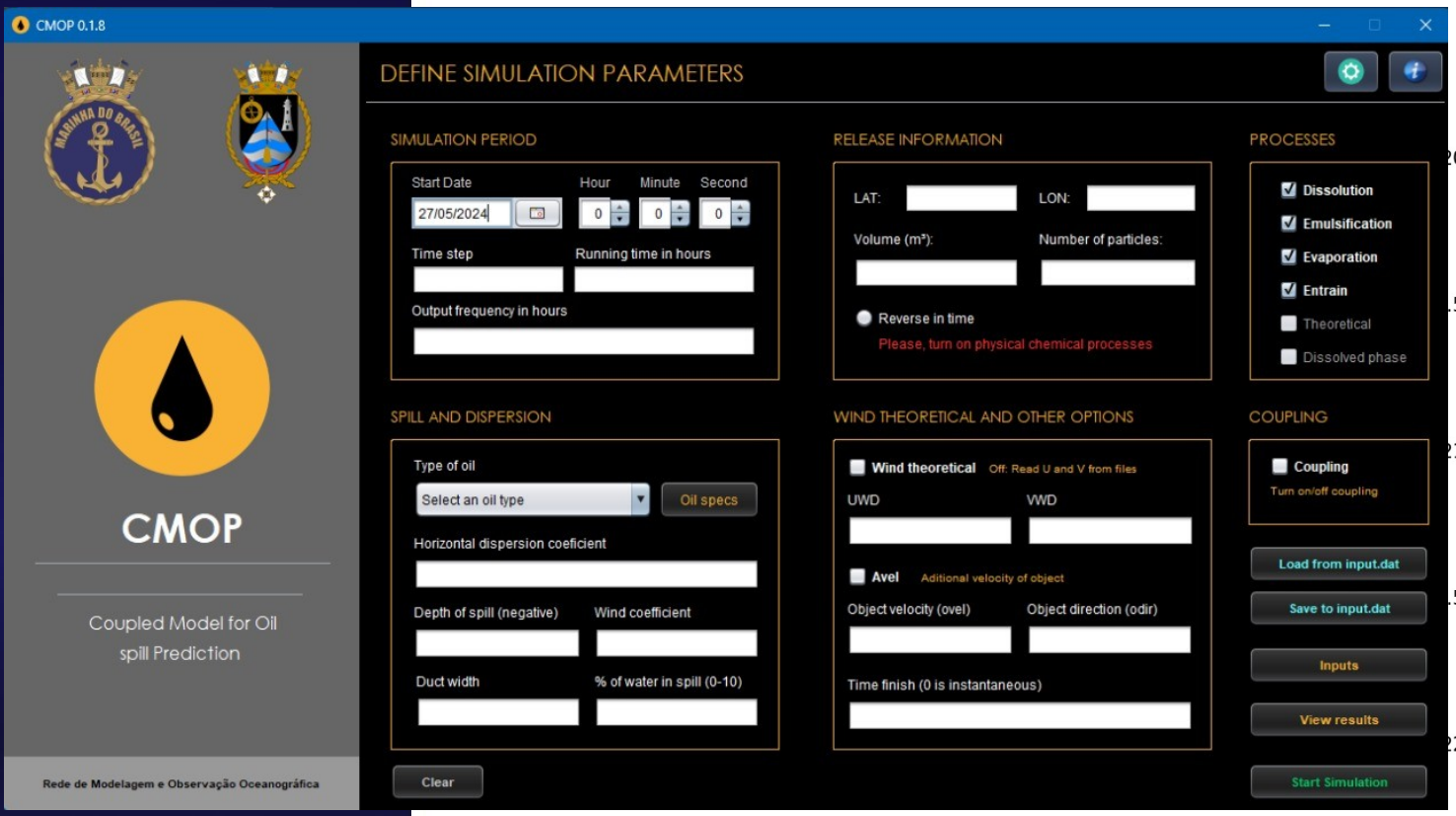


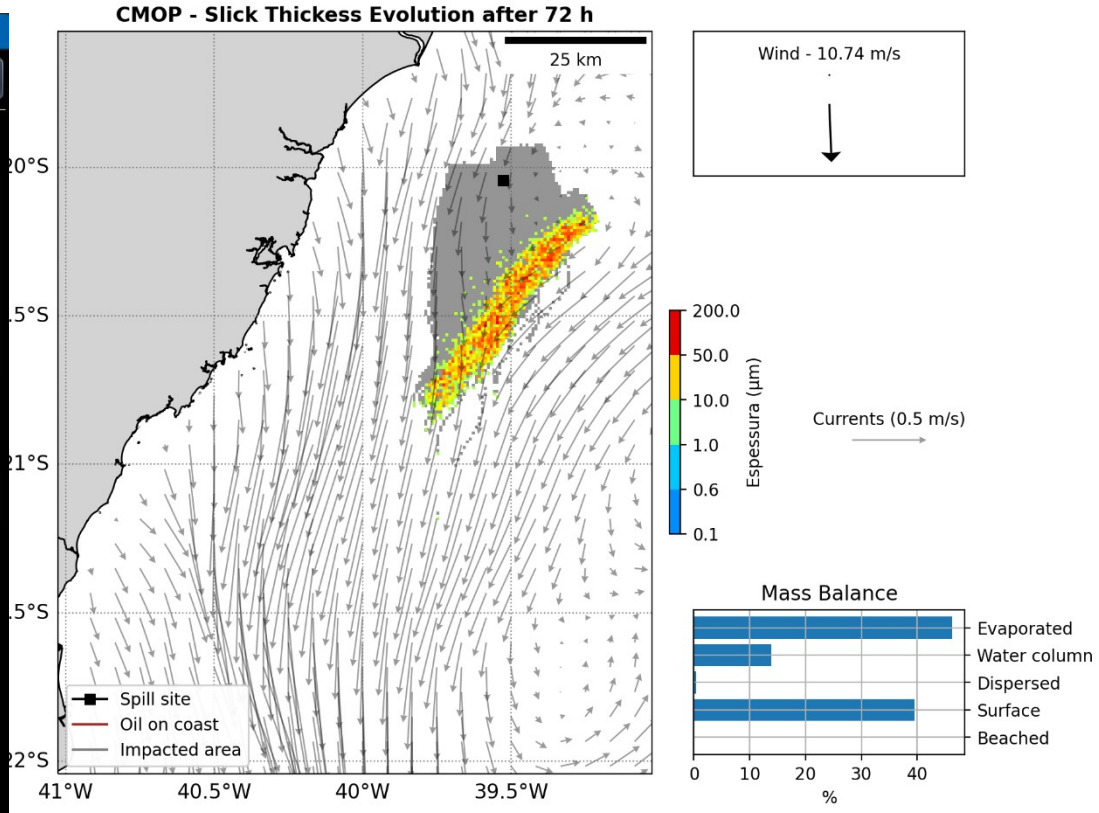


OIL SPILL MODEL - CMOP

Coupled Model for Oil spill Prediction – CMOP

- Coupling between Surface (advection / diffusion) and Subsurface (blowout) modules.
- Input data from a shape file.
- Developed a new, intuitive interface for better accessibility and usability of the oil model.

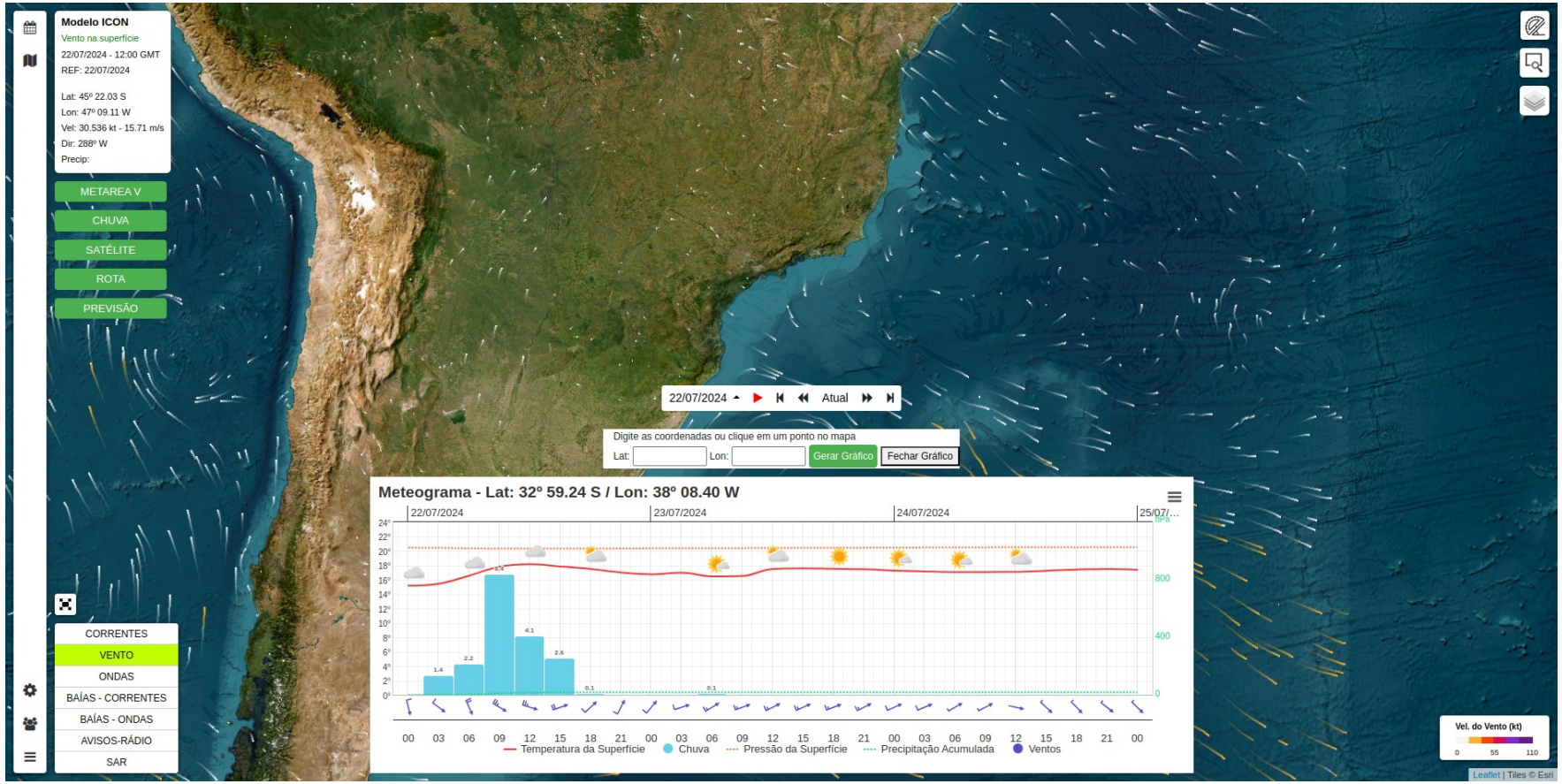




MARINE ENVIRONMENTAL FORECAST (PAM)

https://pam.dhn.mar.mil.br/index_en.html

- Developed a new, innovative meteogram presentation for enhanced visualization of marine environmental data.



Upcoming challenges

- Multivariate Data Assimilation - HYCOM.
- SWOT Data Assimilation - HYCOM.
- ADCIRC in equatorial region – Belém and Mouth of the Amazon.
- Machine Learning post processing products to increase accuracy and predictability.
- Operationalize of CMOP in a Singularity Container.
- Development of new visualization products to PAM.

THANK YOU !!!

“There will always be a lot left to do…”

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