## An operational daily current bulletin of Santos and Campos basins

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## Abstract

Offshore activities are greatly impacted by meteo-oceanographic variables, such as wind, waves, and currents, the knowledge of the state of the ocean and the atmosphere is then a crucial factor to the operation's success. Over recent years, the quality of ocean forecasting systems has significantly increased, however the results for current forecasting still differ from one model to another, which can crucially impact the operational usage of these results. With these factors in mind, this study proposes a model of daily current bulletins, based on synoptic meteorological charts, that combines data measured *in situ* and data from satellites to summarize the current fields and suggest tendencies for the near future in the basins of Santos and Campos.

More than 20 sensors with hourly measurements are used to indicate the maximum observed values in the last 24h, which gives an insight of the most sensible areas during the elaboration of the bulletin. A suite of satellite data is used to define the positioning of the Brazil Current (BC) front, meanders and related eddies. The sea surface temperature provides the thermal front associated with the baroclinic structure of the BC, the chlorophyll acts as a color tracer of the surface motion, and the altimetry data allows identify the positioning of the main current structures. All these data are used to infer the current troughs and intensified current zones. The bulletin is made available every morning to the planning and operational teams of PETROBRAS, through e-mail and internal website, in a graphically simple chart, accompanied of the forecaster's textual analysis.

Daily synoptic analysis of ocean circulation, like what is being done by meteorologist for decades for the atmosphere, enables the identification of multiple features that might otherwise go unnoticed. This not only allow a better understanding of the ongoing circulation condition but also promotes a better understanding of the interactions between different time and space scale features and gives insights of the possible future conditions. The bulletins also became a key part of choosing the most appropriate hydrodynamic model whenever necessary, for oil spill and other emergencies response.

As for next steps, it is planned to include the study of the genesis of eddies, and to track the current variability due to the passage of Coastal Trapped Waves. These upgrades will increase the capability of forecasting for larger ranges of time and will provide more theoretical basis to the bulletin.