



The Value of Information and Geospatial Technologies for the analysis of tidal current patterns in the Guanabara Bay (Rio de Janeiro)

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The study and validation of tidal current patterns relies on the combination of several data sources such as numerical weather prediction models, hydrodynamic models, weather stations, current drifters and remote sensing observations. The assessment of the accuracy and the reliability of produced patterns and the communication of results, including an easy to understand visualization of data, is crucial for a variety of stakeholders including decision-makers.

The large diffusion of geospatial equipment such as GPS, current drifters, aerial photogrammetry, allows to collect data in the field using mobile and portable devices with a relative limited effort in terms of time and economic resources. These real-time measurements are essential in order to validate the models and specifically to assess the skill of the model during critical environmental conditions. Moreover, the considerable development in remote sensing technologies, cartographic services and GPS applications have enabled the creation of Geographic Information Systems (GIS) capable to store, analyze, manage and integrate spatial or geographical information with hydro-meteorological data. This valuable contribution of Information and geospatial technologies can benefit manifold decision-makers including high level sport athletes.

While the numerical approach, commonly used to validate models with in-situ data, is more familiar for scientific users, high level sport users are not familiar with a numerical representations of data. Therefore the integration of data collected in the field into a GIS allows an immediate visualization of performed analysis into geographic maps. This visualization represents a particularly effective way to communicate current patterns assessment results and uncertainty in information, leading to an increase of confidence level about the forecast.

The aim of this paper is to present the methodology set-up in collaboration with the Austrian Sailing Federation, for the study of tidal current patterns of the Guanabara Bay, venue for the sailing competitions of Rio 2016 Olympic Games. The methodology relies on the integration of a consistent amount of data collected in the field, hydrodynamic model output, cartography and “key-signs” visible on the water into a GIS, proving to be particularly useful to simplify the final information, to help the learning process and to improve the decision making.