The generation of the Potential Fishing Zone (PFZ) information using MODIS satellites based on chlorophyll and sea surface temperature.

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Relevant oceanographic conditions, such as sea surface temperature (SST), chlorophyll concentration (CHL) and oceanic fronts, which strongly influence natural fluctuations of fish stocks, can be observed and measured by remote sensors on satellites and aircraft. The high spatiotemporal frequency of MODIS data (twice per day, 500m resolution) are provided in near-real time to help fishermen save fuel and ship time during their search for fish located along the Adriatic Sea. The purpose of this work is the integration of CHL and SST to generate potential fishing zones (PFZs) using an gradient-based edge detection algorithm [1]. The position of the fronts is detected by a Canny filter [2] were applied to gradient of CHL and SST images; the potential edges were subsequently validated statistically [3] and then were compared in terms of categorized fish catch per unit effort (CPUE, total catch divided by actual fishing hours). The results of this study will be presented and commented.

References

[1] Oram, John J., James C. McWilliams, and Keith D. Stolzenbach. "Gradient-based edge detection and feature classification of sea-surface images of the Southern California Bight." Remote Sensing of Environment 112.5 (2008): 2397-2415.
[2] Canny, John. "A computational approach to edge detection." Pattern Analysis and Machine Intelligence, IEEE Transactions on 6 (1986): 679-698.
[3] CAYULA, JEAN-F., and Peter Cornillon. "Edge detection algorithm for SST images." Journal of Atmospheric and Oceanic Technology 9.1 (1992): 67-80.