

Contribution of High Resolution Microwave and Optical Remote Sensing Observations in Detecting and Monitoring Ocean Coastal Features

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Synthetic Aperture Radar (SAR) satellite sensors have demonstrated their ability to observe ocean features related to dynamical processes. Because of the high resolution of available SAR sensors, circulation details and small-scale processes can be detected that are not observable by other sensors more frequently used for ocean research such as the NOAA AVHRR and the ORBVIEW2 SeaWiFS. In contrast to these, LANDSAT-TM thermal and optical channels can be used to observe sea surface temperatures, surface layer ocean color (upwelled radiance) as well as sun glint (reflected radiance) patterns of surface roughness at a spatial resolution comparable to that of SAR.

Several examples of TM images obtained in 1997-2003 over the Argentine coastal ocean region were selected from an extensive data set. These images were analyzed and compared with a series of SAR images acquired over the same region by the ERS satellites and in some cases near coincident with the TM data. This time period allowed the examination of the seasonal cycles as well as interesting episodic events of different ocean processes including: currents, fronts, upwellings, algal blooms, eddies, internal waves, and bathymetry signatures. Due in situ observations are scarce over this region; some of these processes have been documented for first time, helping to improve our understanding of some dynamical and biological aspects. Therefore, it can be concluded that high resolution optical, thermal and microwave data have the ability of providing consistent and complementary high-resolution information particularly useful in the management of coastal areas where available data is currently limited, ability that should be taken in consideration and in the design of futures missions.