

# Identifying False Positives in Synthetic Aperture Radar (SAR) Data Over the Southern Timor Sea, Northwest Australia: Implications for Remote Sensing and Acoustic Seepage Studies

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A cost-effective method of screening offshore environments for potential indicators of hydrocarbon seepage, particularly in frontier regions, is through remote sensing and acoustic technologies. However, none of these tools in isolation are diagnostic of seepage, and as such, accurate identification of false positives within individual datasets is critical.

The Timor Sea region of the North West Shelf is one of natural hydrocarbon accumulation and seepage, and the current model for the spatial distribution of that seepage is partly based on Synthetic Aperture Radar (SAR). SAR identifies areas in which the capillary waves on the ocean surface have been damped, therefore it is a highly successful tool in delineating natural hydrocarbon seepage that forms oil slicks. However, damping of capillary waves may occur through a variety of alternative processes. Multibeam swath bathymetry and acoustic doppler current profile data indicates that tidal current flows may have contributed to the formation of slicks previously documented in the Timor Sea. Additionally, annular to crescent-shaped SAR slicks over carbonate reefs and shoals in the region that exhibit wind or wave driven 'feathering' are interpreted to be caused by a regional coral spawn event. Reinterpretation of these false positives may assist in accurately constraining the extent and frequency of active hydrocarbon (particularly oil) seepage in the region.

A similar process of judicious false positive screening is being applied to SAR over frontier exploration areas (in assessing potential seepage on the Central North West Shelf), and to archived echosounder data to differentiate between seepage and biological phenomena.