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SATELLITE-ENABLED TEMPORAL WATER LINE INTER-TIDAL MONITORING: 3 CASE STUDIES: THE MERSEY, THE WASH & THAMES ESTUARY

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Intertidal zones provide vital ecosystem services and form critical habitats for a wide range of species. They are under significant pressure from multiple sources including coastal development and sea level rise. Long-term intertidal morphology monitoring is important for tracking erosion patterns and calculating regional sediment budgets, improving predictions and nature-based mitigation of estuarine flooding, guiding the protection and restoration of intertidal ecosystems and biodiversity, and identifying shifting channels to ensure safe ship navigation.

The NOC have been at the forefront of research and development of novel environmental mapping capabilities using marine radars for over two decades. The high-resolution X-band radar Temporal Water Line mapping (TWL) method, developed at NOC, is now provided as a commercial service by Marlan Maritime Technologies Ltd. Ongoing development work at NOC has adapted the TWL method to use a combination of SAR and Optical satellite imagery to estimate intertidal bathymetry over larger spatial extents. This per-pixel method provides a unique capability for low-cost and long-term monitoring of inter-tidal bathymetry at 10 to 25cm vertical elevation accuracies.

The talk will present three case studies demonstrating potential and limitations of this method for regional scale inter-tidal bathymetry monitoring.