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SWOT-SATELLITE-ENABLED TIDAL DATA IN ESTUARIES

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Remote sensing methods are increasingly able to resolve the complex behaviour of estuaries, but accessing tidal water level data at the fine spatial and temporal scales needed for such work has usually required high resolution tidal models that rely on imperfect, incomplete and ever-changing bathymetry maps.

The Surface Water and Ocean Topography (SWOT) satellite's high resolution scanning altimeter data is now allowing simplified approaches to observing and deriving tidal data in estuaries.

Three months of daily overpass data from the SWOT satellite were compared with and validated against in-situ tide gauge data across the Liverpool Bay area. These data were then used to estimate the tidal phase lag on a 250m grid across the 120km wide swath of the SWOT overpass.

This simple tidal phase lag was then used as a first order correction to tidal elevation data from the Liverpool Gladstone Dock tide gauge for the purpose of mapping the extensive and highly dynamic intertidal regions of the Mersey Estuary using the Temporal Waterline Method.

More sophisticated spatially varying corrections to the tidal curve shape and amplitude are also shown to be possible using these data, which will provide further enhancements to the tidal input of NOC's intertidal mapping algorithms.