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Coupled wave and current modelling in the MARIE project

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The MARIE (Modelling and Assimilation in RofI Environments) Project is studying wave-current interaction in ROFI environments, comparing the Ebro Delta/Catalan Shelf in the NW Mediterranean with Liverpool Bay in the Irish Sea on the NW European continental shelf. Liverpool Bay is a macrotidal shallow-water region influenced by the outflow from the Rivers Mersey and Dee. The wave climate is moderate, fetch-limited, with a maximum significant wave height of over 5m. The Catalan Shelf is microtidal with marked stratification and a relatively narrow shelf, influenced by occasional intense wind events with a maximum Hs of about 6m. Therefore these 2 regions show marked contrasts in their oceanographic conditions. Results of idealised and realistic cases using the coupled POLCOMS-WAM wave and current modelling system are presented. The interactions between the river plume, other currents (wind-driven, tidal and thermohaline) and waves are investigated with this 'state-of-the-art'coupled model system which includes the latest formulations of wave-current interactions.