Coupled wave and surge modelling and implications for coastal flooding

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Wave modelling at POL has always focussed on the application to extreme waves, sea level and coastal flooding. In order to investigate the interaction between waves and mean flow (water levels and currents) we are using the 3D baroclinic hydrodynamic model, POLCOMS, coupled with the 3^{rd} generation WAM and SWAN wave models. The main focus is on the NW European shelf but within the ongoing EU MARIE project we have implemented POLCOMS-WAM for the Catalan Shelf of the Mediterranean Sea. Some recent results are presented for the NE Atlantic, NW European shelf and the Irish Sea, which is the site for the POL Coastal Observatory, with an intensive real-time measurement programme. We examine wave climate and extreme storm events.