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## 'Unified' unstructured ocean, land and river modelling in the coastal zone

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The representation of coupled physical processes in coastal models is often constrained and simplified by details of the underlying numerical approach. Ocean, land and river dynamics are generally represented using different computational grids and numerical methods, and are not typically resolved at the fine spatial and temporal scales needed to capture coupled dynamics. In this work, we describe a new 'unified' approach to coupled ocean, land and river modelling, in which all components are represented on a common, multi-scale unstructured mesh, and employ compatible numerical formulations and coupling strategies. In contrast to conventional approaches, this unified approach does not rely on a hierarchy of nested sub-models, but rather leverages the flexibility of unstructured grids to seamlessly embed high-resolution domains within global model configurations. This initiative is an extension of the US Department of Energy's E3SM framework, designed to enhance the representation of coastal dynamics in global-scale ESMs. Initial work on a 'unified' representation of coastal environments is reported, focusing on the development of an unstructured model for the US mid-Atlantic coastal zone as part of the Integrated Coastal Modelling (ICoM) effort.