

Can we improve the numerical formulation used in MPAS-Ocean?

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Wouldn't it be fantastic if we could improve the accuracy and robustness of MPAS-Ocean's numerical formulation – targeting improved performance on 'aggressive' variable resolution meshes, better representation of nonlinear waves and eddies, more realistic physics, as well as enhanced scaling on hybrid computing architectures? Of course! The question is how best to do so. In this talk, we present a range of ongoing and upcoming efforts designed to 'upgrade' the MPAS-Ocean dycore, focusing on revisions and improvements to the underlying 'TRiSK' numerical scheme, the inclusion of enhanced physics, such as non-Boussinesq effects, as well as various features and workflows to support embedded coastal modelling efforts. We outline a range of both near- and medium-term goals that aim to improve MPAS-Ocean's capabilities.