Benthic dynamics for intermediate complexity models

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Slope-induced flows are critical to the global ocean circulation but notoriously hard to model. We revisit the problem of coupling a terrain-following bottom boundary layer to a geopotential-coordinate ocean model to represent such flows and describe a new scheme in which the bottom layer retains the full interior dynamics without significant extra computational cost. Setting the layer height to be constant in time leads to important simplifications and allows us to develop a parameterisation suitable for coupling to intermediate complexity models designed for multi-millenial simulations, in this case C-GOLDSTEIN. We use the resulting system to consider the spreading of long-timescale tracers from high-latitude sources throughout the global ocean.