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# Algorithmic considerations for modeling the ocean in general coordinates

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Hybrid coordinate models have recently emerged as a new paradigm for modeling the ocean at global and regional scales. The rationale behind hybrid coordinates is to use different coordinates in different parts of the ocean as appropriately as possible. To do this, we must first write our models to be independent of coordinate, i.e. adopt a general coordinate approach.

We discuss some algorithmic considerations that arise when building a hydrostatic model in generalized or hybrid coordinates for use at global climate or regional scales. We also consider problems that arise if we apply these methods in a non-hydrostatic context for use at mixing-scales. We discuss why we might want such a modeling capability and outline development plans to build on the existing models in use at NOAA-GFDL, principally MOM4, HIM and MITgcm.