



POP/HYPOP Update

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POP

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- No new settlements



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 - Natural growth permitted
 - Finish propagating new infrastructure
 - Mat merge



POP

- No new settlements
 - Natural growth permitted
 - Finish propagating new infrastructure
 - Mat merge
- POP in DART
 - Decadal prediction
 - Multi-scale assimilation for high-res initial state



Advection and Time Stepping

- Incremental remap
 - Leapfrog

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 - Short campaign followed by free and fair elections
 - Leap frog will not get 61% of vote



Advection and Time Stepping

- Incremental remap
 - Leapfrog
- Time stepping
 - Short campaign followed by free and fair elections
 - Leap frog will not get 61% of vote
 - Implicit JFNK w/ Trilinos, preconditioner



Bipartisan support for diffusion

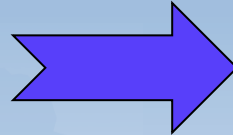
buoyancy
on tracer
grid



shear on
momentum
grid



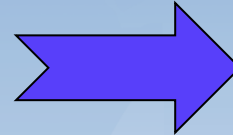
interpolation



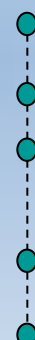
diffusion and
viscosity computed
on the union grid



interpolation



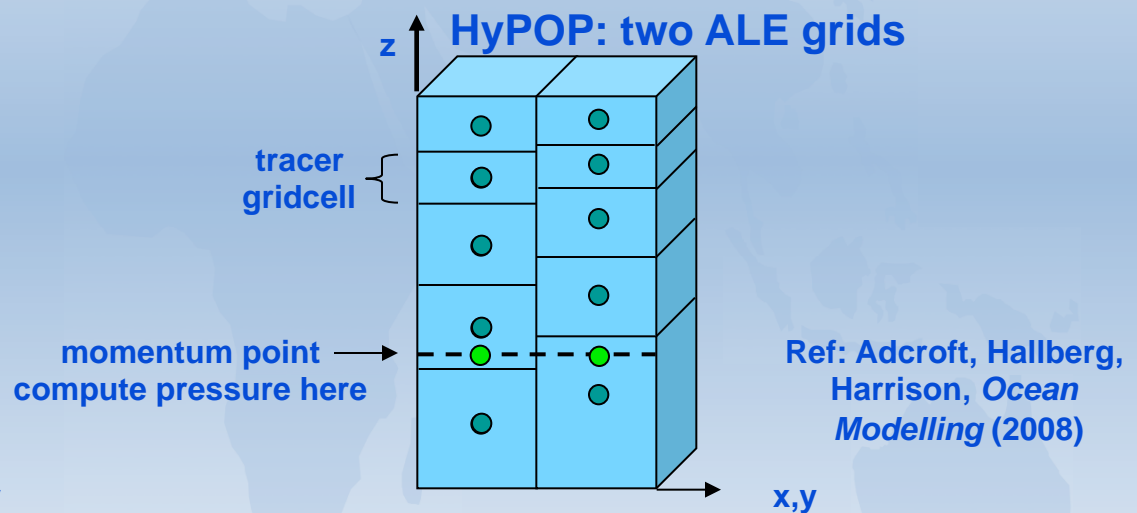
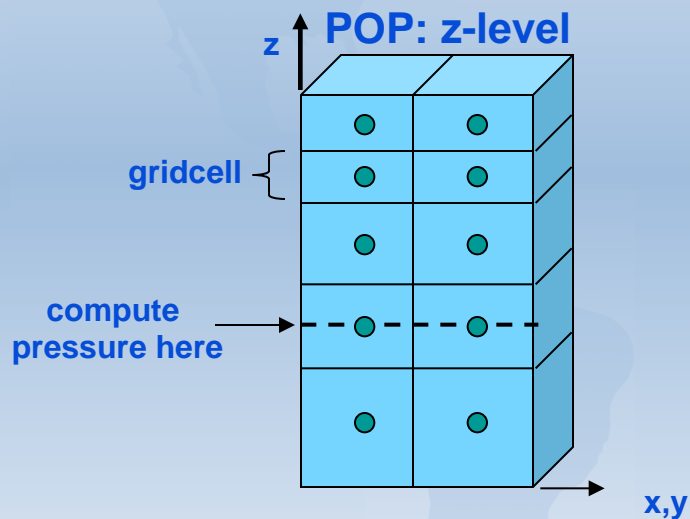
diffusion
on tracer
grid



viscosity on
momentum
grid

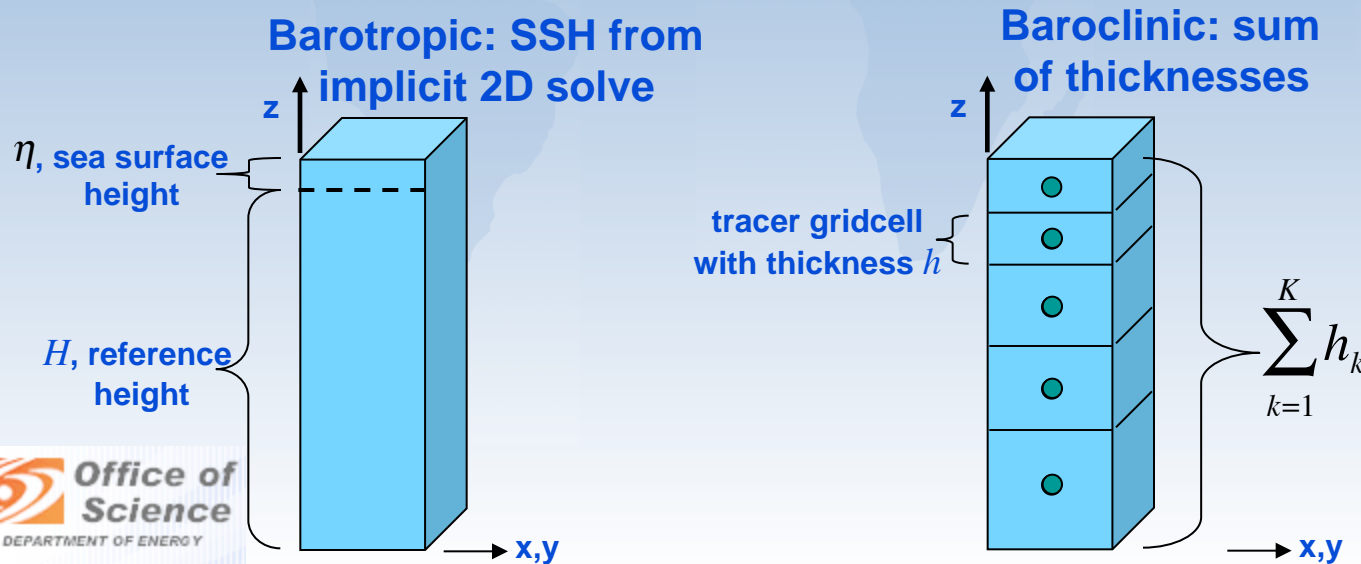


HyPOP: How do we avoid the thermobaric instability?



HyPOP: Reconciling barotropic and baroclinic SSH

- Barotropic SSH includes surface gravity waves
- Layer thicknesses, which are treated as a tracer, do not include surface gravity waves.
- Sum of baroclinic layer thickness does not match the barotropic SSH.
- We implemented a flux correction to the baroclinic layer thicknesses.



Ref: Hallberg, Adcroft,
Ocean Modelling
(2009)

HyPOP: Other issues

- HyPOP infrastructure development is largely complete.
- Other recent bits:
 - Deflating leapfrog
- Next:
 - Time-dependent regridding (relaxation to target grid)
 - Further testing with different vertical grids for momentum and tracers
- Then moving into research and testing, including:
 - Evaluate various grid combinations
 - Criteria for transition from Z-level in mixed layer to isopycnal grid at depth
 - Evaluation of HyPOP in global simulations
 - Improving efficiency of the code

Personnel

- New long-term funds for COSIM
 - Cryosphere (sea ice, land ice, Arctic BGC, ocean): new ocean modeler
 - Decadal prediction: further review – focus on high resolution