Generation Y Ocean Model...

Phil Jones (LANL), project lead,
Climate, Ocean and Sea Ice Modeling (COSIM)
on behalf of the OMWG
...or Codename: Anglerfish

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MPAS-Ocean

- Model for Prediction Across Scales (MPAS)
  - Joint LANL/NCAR/Others
- Variable horizontal resolution
  - SCVT
- Hybrid vertical coordinate (ALE)
- Two time level
  - Split-explicit predictor corrector
  - JFNK options
- New dynamics
  - Ringler, Thuburn, Klemp, Skamarock
    - Higher-order conservative advection
- Co-design hybrid architectures
Current Status

• Tested in many configurations
  – SW, double-gyre, channel
  – Ocean, unsplit, several resolutions
  – Z-level equivalent
• Time splitting
  – Implemented, being tested
• Parameterizations
  – Vertical mixing
• Performance improvements
Near Future

- CESM Framework (4 months, CSSEF)
  - Generalized ocean model
  - Interpolation, coastlines and other issues
- Finish time integration (months)
- High-order transport (months)
- Parameterizations (on-going)
- Diagnostics and I/O (on-going)
- Performance (months-1year)
  - Computational co-design
- Hybrid vertical coords (on-going)
Whither (wither?) POP

- Ocean Limited Development For Additional Research and Testing (OLD FART)
  - Changes for CESM
  - Elimination of mixing steps
  - Fresh water flux conditions and surface layer issues
  - Incorporation of additional parameterizations
  - Advection, implicit time stepping?
- Eddy-resolving configurations
This Model Brought to You By:

• DOE
  – COSIM (3+ FTEs)
  – CSSEF (2? FTEs LANL and NCAR)
  – Computational Co-design (1+?)
  – Regional Project (postdocs)
  – EaSM

• NSF
  – MMM, CGD
  – EaSM