

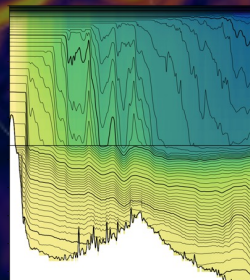
### What is ACCESS-OM3?

#### Australia's next-generation ocean – sea ice – wave model suite, under development

- Upgrades ACCESS-OM2 to state of the art
- Regional and global configurations
- Multiple resolutions
- Open development, freely available
- To be used in next-generation climate and Earth system models ACCESS-CM3 and ACCESS-ESM3 for CMIP7

#### Ocean: upgraded to MOM6

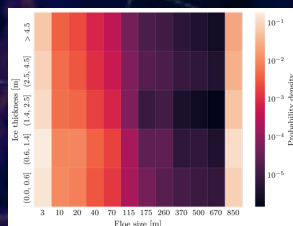
- **ALE vertical coordinate**
  - Arbitrary vertical coords
  - Reduced numerical mixing
  - No vertical CFL limit
  - Ice shelf cavity circulation
  - Wetting/drying; grounding line retreat
- **C-grid: narrower straits**
- **Fast BGC: long tracer timestep**
- **Regional configurations**
- **Improved tides**



ALE vertical coordinate (Angus Gibson)

#### Sea ice: upgraded to CICE6

- **Joint floe size / thickness distribution:** represents wave-ice breakup
- Landfast ice
- Depth-resolved ice BGC



CICE6 floe size/thickness distribution (Noah Day)

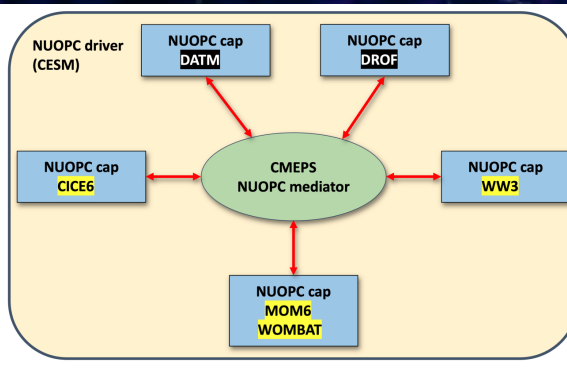
#### Surface waves: WW3 added

- State of the art surface wave model
- 2-way coupling with ocean and sea ice: surface wave mixing, sea ice interaction

### Architecture

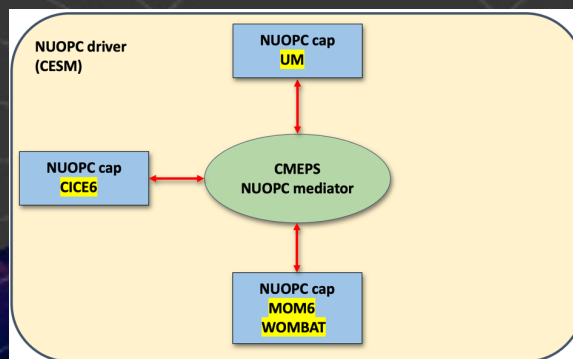
Model components compiled into one executable

- each **model** or **data** **model** wrapped in a **cap** (API)
- **CMEPS mediator** couples models via their caps
- **driver** creates **connectors** between caps and mediator (with regridding) and timesteps components

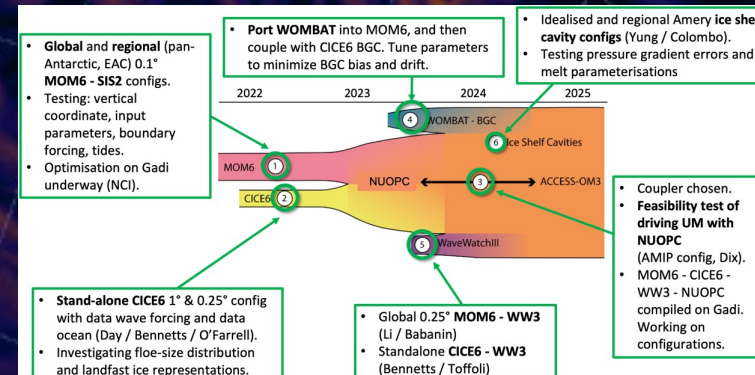


#### New coupler: NUOPEC (not OASIS3-MCT)

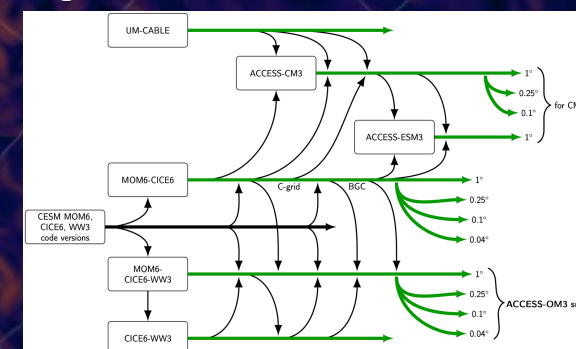
- Modular plug-and-play design
- Components interact via "cap"
- Cap provides standard data structures and interfaces to model execution routines (init, run, finalize)
- Supports hierarchical development, e.g. easily replacing models with prescribed data
- Parallel regridding of coupled fields
- Hub-and-spoke: model components communicate via CMEPS mediator
  - Used in CESM3, UFS, etc
  - Supports exchange grids for accurate flux calculations
- ACCESS-NRI have built a UM NUOPEC cap for ACCESS-CM3 and ACCESS-ESM3



### Development progress and plans



- All components under active development
  - We're tracking the latest CESM model component versions
- Focusing on MOM6-CICE6 1° as initial testbed, aiming for ACCESS-CM3, -ESM3 for CMIP7



#### More information

Click "watch" to be kept up to date:

#### ACCESS-OM3 codebase:

- [github.com/COSIMA/access-om3](https://github.com/COSIMA/access-om3) – see *wiki!*

#### ACCESS-OM3 configurations:

- [github.com/COSIMA/MOM6-CICE6](https://github.com/COSIMA/MOM6-CICE6)
- [github.com/COSIMA/MOM6-CICE6-WW3](https://github.com/COSIMA/MOM6-CICE6-WW3)
- [github.com/COSIMA/CICE6-WW3](https://github.com/COSIMA/CICE6-WW3)

#### Contributions welcome!

- Model evaluation metrics, parameter advice
- Test runs, bug reports, wiki contributions