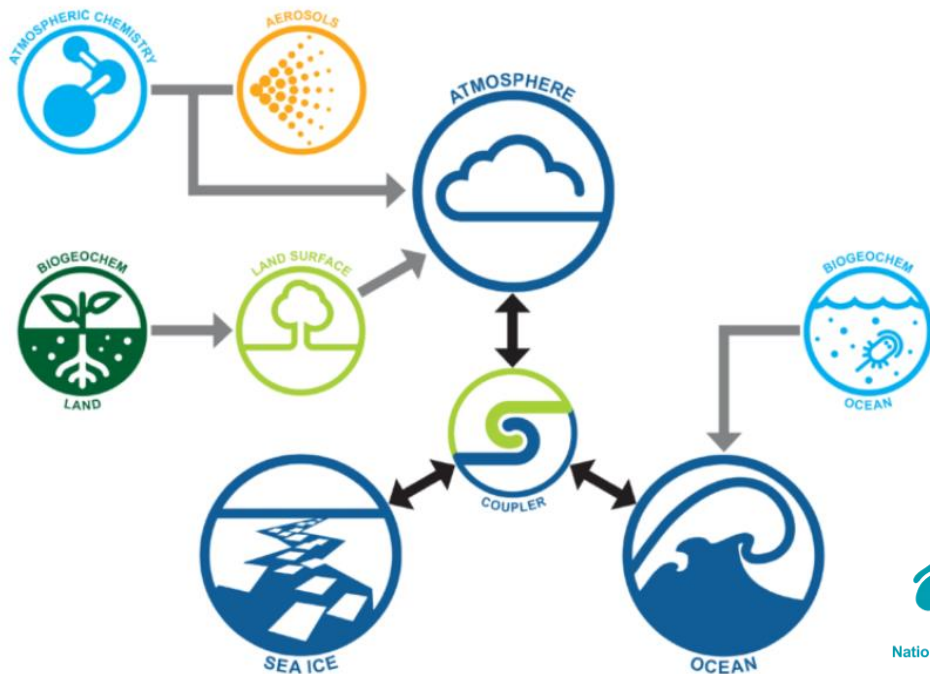


Planning for an ACCESS submission to CMIP7

Rachel Law
6th September 2023



National Environmental Science Program

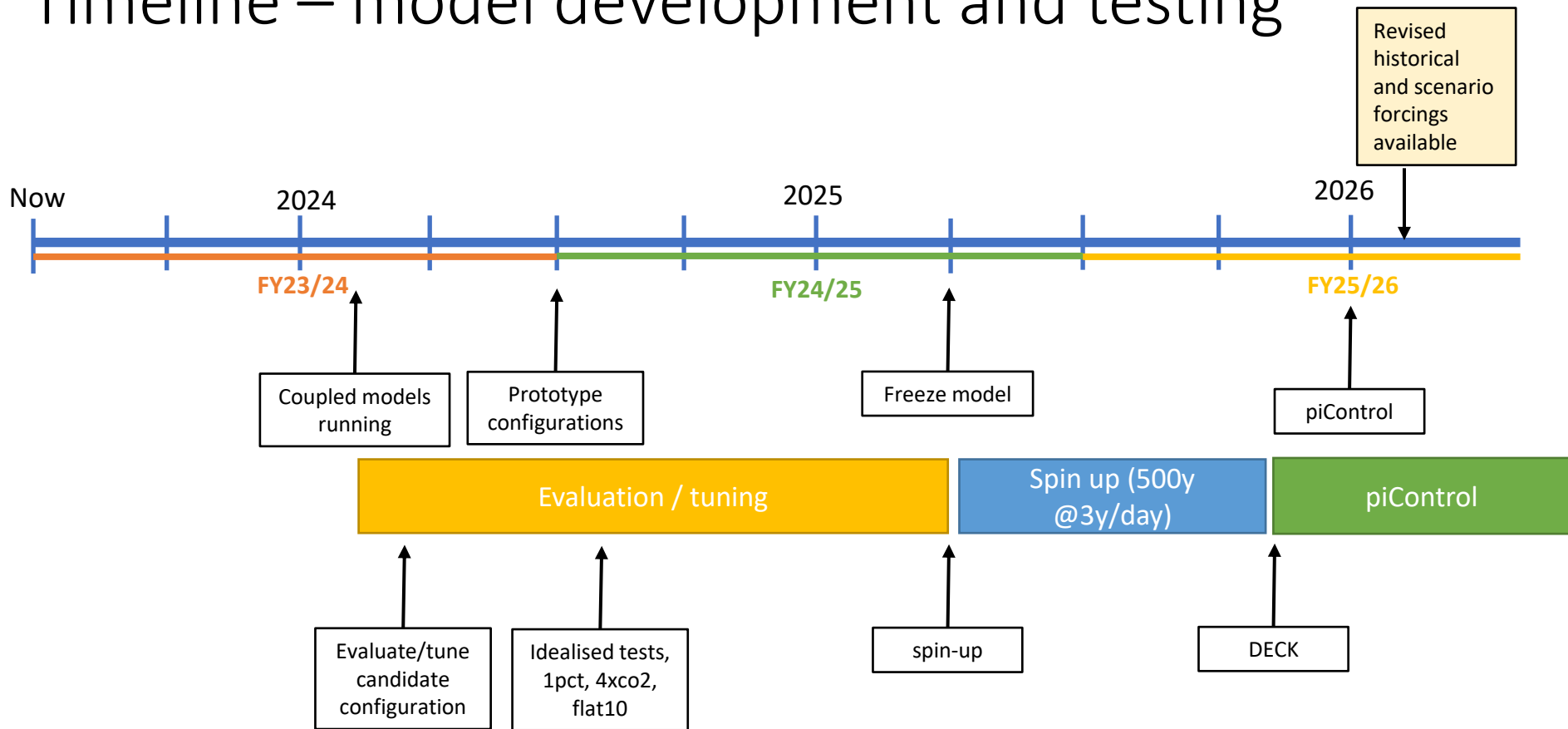


Timeline

	CMIP	ACCESS
2023	Task team activity ScenarioMIP workshop Engagement with modelling centres	Model development (components)
2024	CMIP7 description paper submitted Historical forcing to Dec 2021 available	Model development (coupled)
2025	Data request initial version	Model testing, evaluation, refinement
2026	Scenario forcings available Revision of historical forcing	Core model simulations
2027		Additional core simulations, MIP simulations
2028		Additional MIP simulations

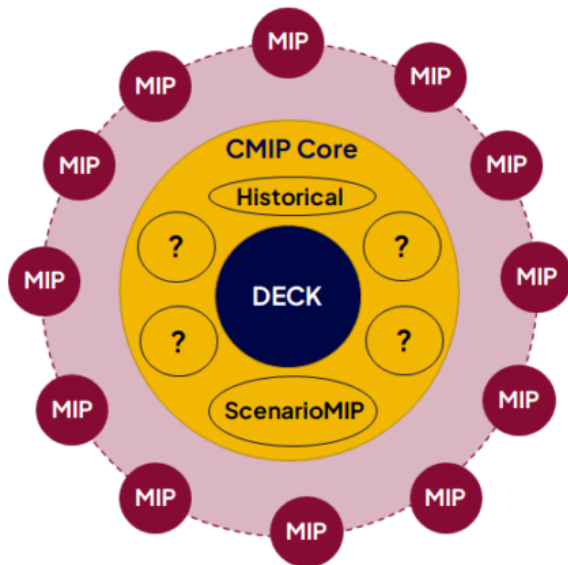
Core dependent on IPCC timeline. Community MIPs do not need to align with IPCC timeline but may choose to.

Timeline – model development and testing



CMIP7 design

Potential CMIP7 structure



DRAFT



The DECK - remains as an entry card to CMIP supporting model characterisation

A **Core** set of streamlined policy focused MIPs/experiments aligned with key policy/decision making timelines (e.g., IPCC)

Community experiments/MIPs could operate on timeline driven by scientific and model development advances but can benefit from working with Core MIPs/experiments (aligning experiment design and data requirements, e.g. requesting variables from CMIP7 piControl and historical simulations).

CMIP

Registered MIPs (at 1/9/23)
<https://wcrp-cmip.org/model-intercomparison-projects-mips/>

- AerChemMIP2
- CDRMIP
- GeoMIP
- VoIMIP/HT-MIP
- LMIP
- C4MIP
- ISMIP7
- CFMIP
- HighResMIP
- PMIP
- DCP
- RFMIP
- DAMIP
- LUMIP
- RAMIP
- MethaneMIP
- LongRunMIP
- NAHosMIP
- MUMIP
- MISOMIP2
- CERESMIP
- SP-MIP
- PPEMIP

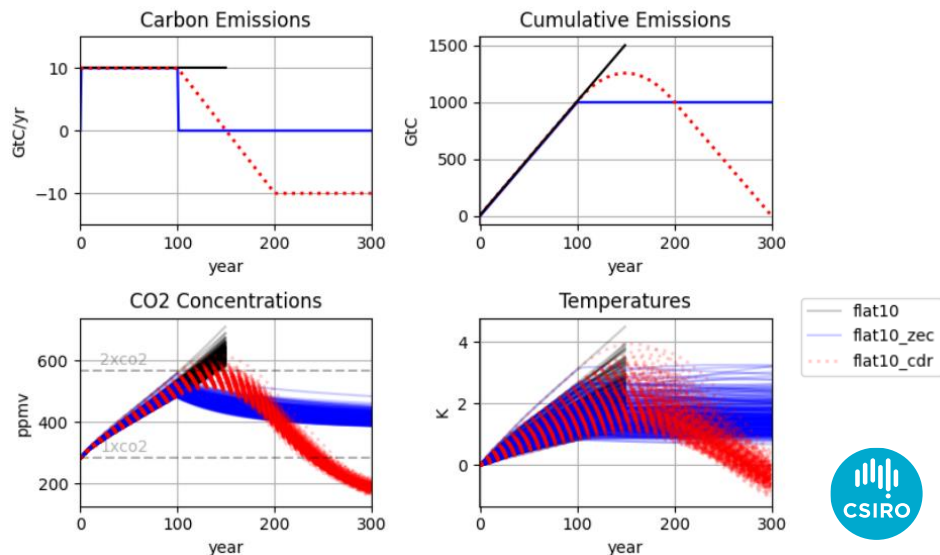
Emissions-driven simulations

- ScenarioMIP workshop report (July 2023)

“ ...it was clear that there was a recommendation to run (most) simulations in emission driven mode ... The runs would also be more consistent with current modelling capabilities, especially regarding the outcomes of land-based mitigation solutions, heavily dependent on feedbacks that would not be represented in concentration-driven experiments.”

- New DECK/Core simulations under discussion

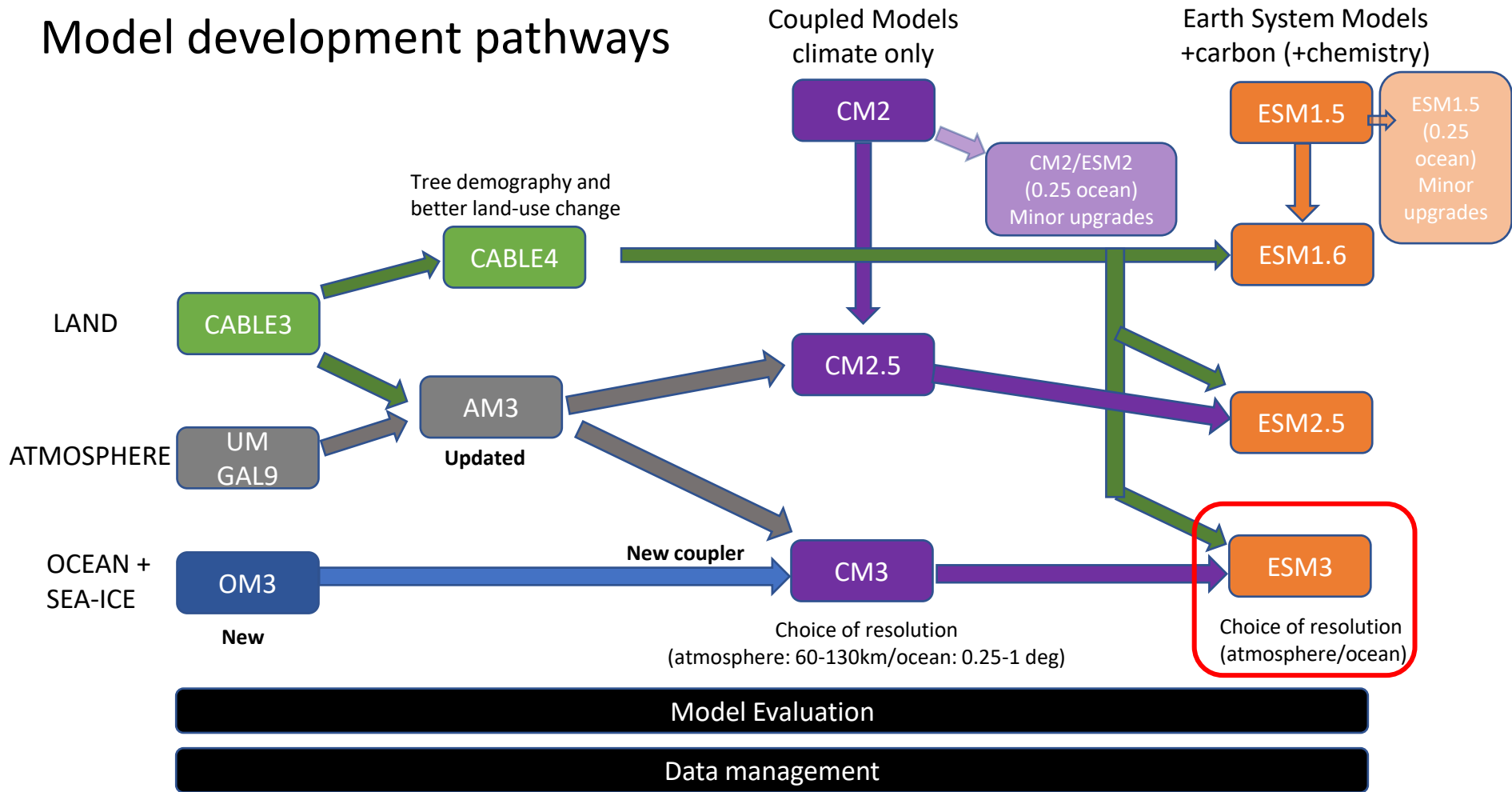
Sanderson et al, Proposal for esm-flat10 – a potential emissions-driven diagnostic experiment for the CMIP7 DECK. Email 30/8/23



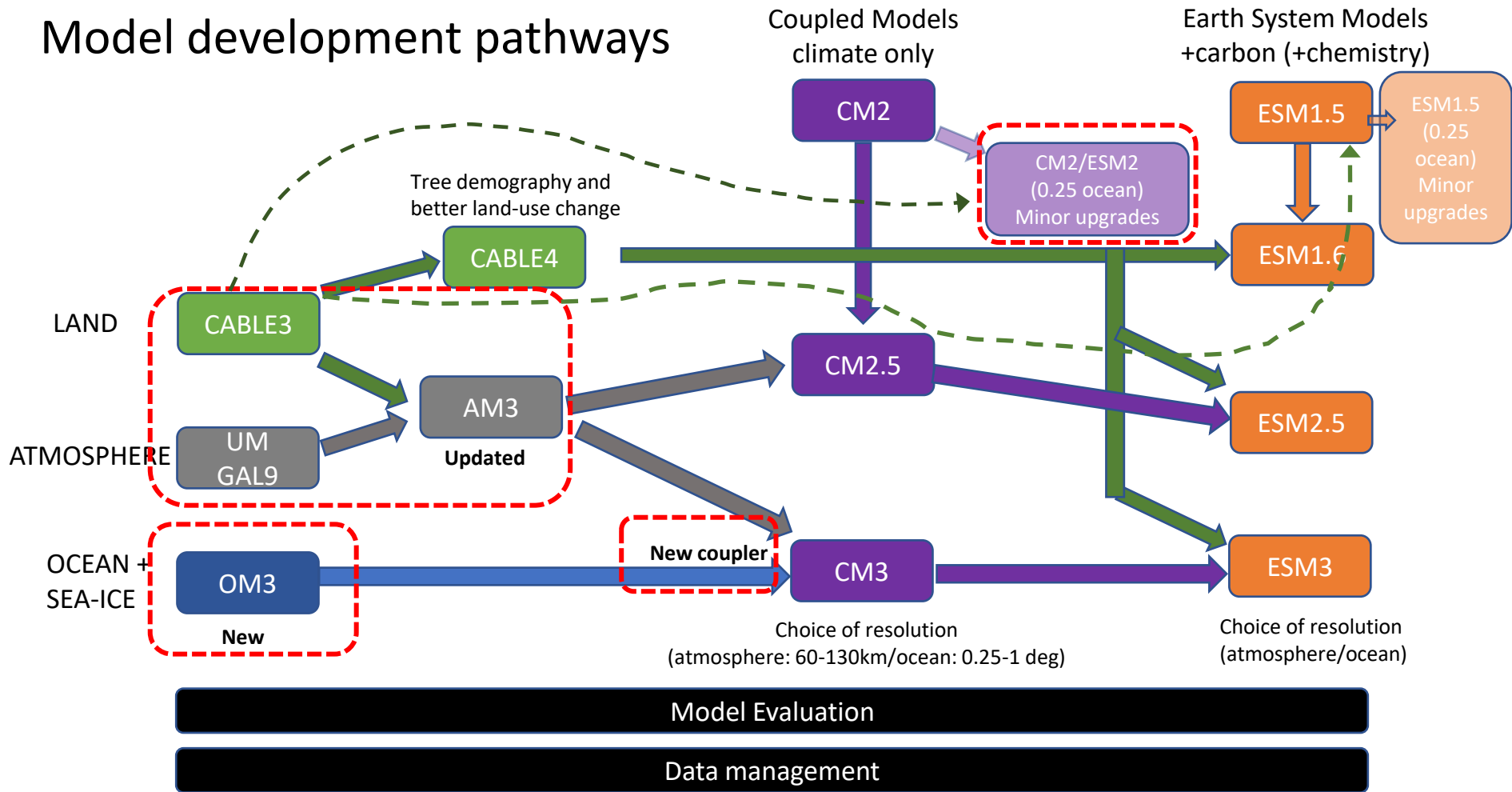
Australian CMIP7 Planning

- February 2023 workshop
- Consortium proposed
 - CSIRO to lead
 - ACCESS-NRI, NCI, Bureau of Meteorology, Universities, CoEs.
 - Alongside existing collaborations: NESP Climate Systems Hub, ACCESS-NRI
 - Value proposition written for DCCEEW.
 - Working on resourcing needs
- Governance ideas
 - Agreed work plan updated annually
 - Oversight committee – organisational reps with resourcing delegation
 - Project leadership team
 - Coordinator or similar
- Mapping model development pathways
- Initial meeting on model evaluation

Model development pathways



Model development pathways



ENSO Spectrum

Take Home Message:

pi-O1: Mainly two-year (950-1049), and even if we use different periods (1350-1449).

pd-O1: 2-year period and 4-5 years period

Both O025 experiments show a better ENSO period

pd-01gm: 1 ocn with changed GM parameters, better ENSO period

One-degree ocean:

piControl from CMIP6: period 1350-1449 (**pi-O1**)

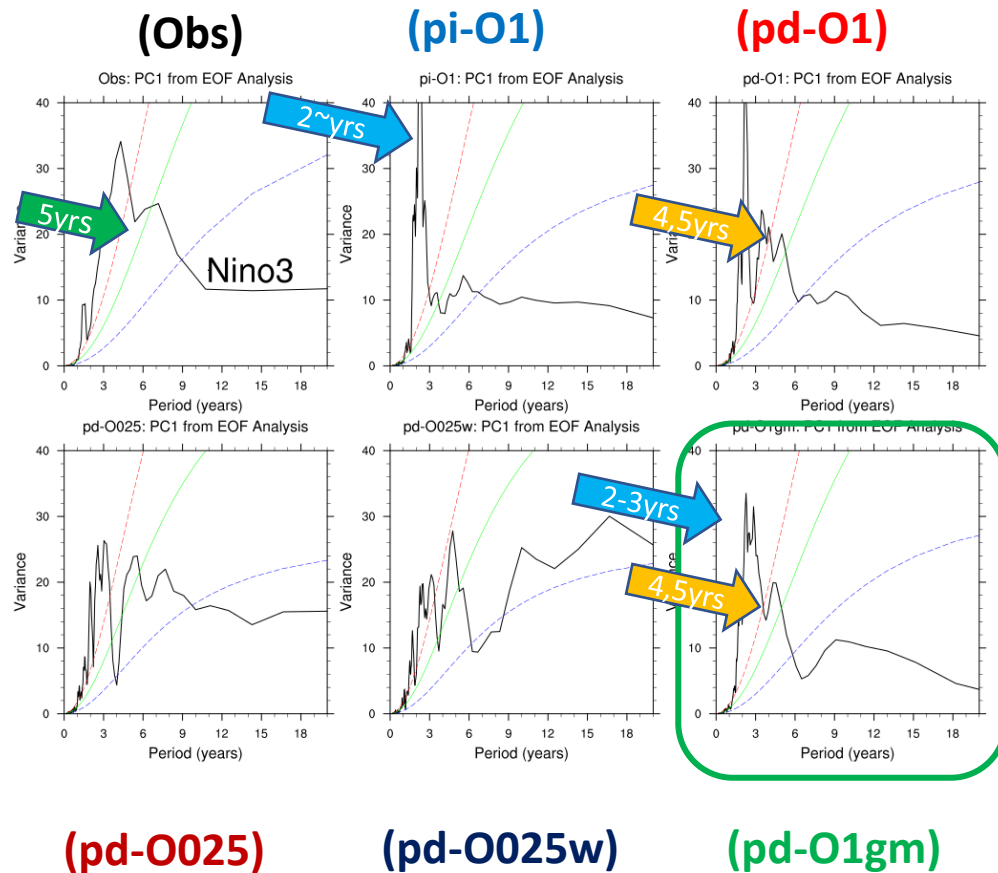
pdControl run: period 500-599 (**pd-O1**)

pdControl run: period 1060-1150 with changed GM parameters (**pd-O1gm**)

¼degree ocean: **all ¼ ocn has changed GM parameters**

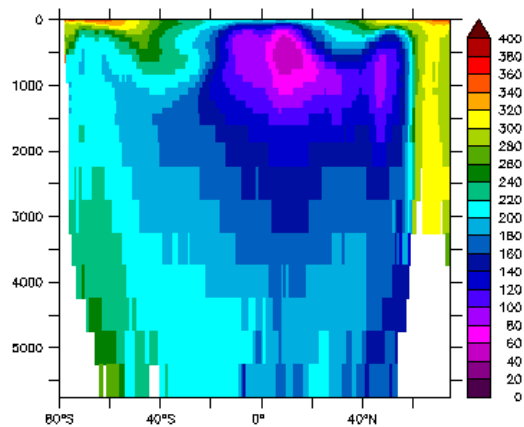
pdControl run: period 300-399 with vertical mixing turned (**pd-O025**)

pdControl run: period 300-399 add-in BGC (**pd-O025w**)



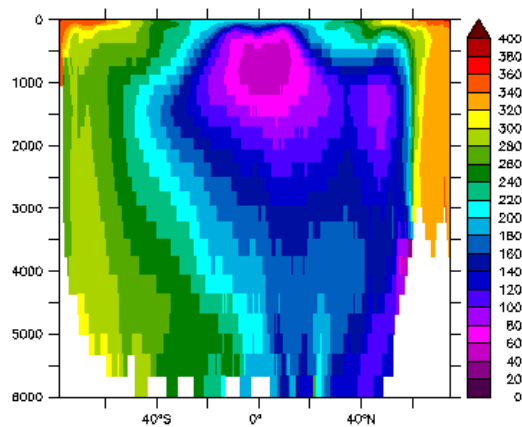
Ocean BGC - resolution

Zonal average ocean oxygen sections ($\text{mmol}(\text{O}_2)/\text{m}^3$)



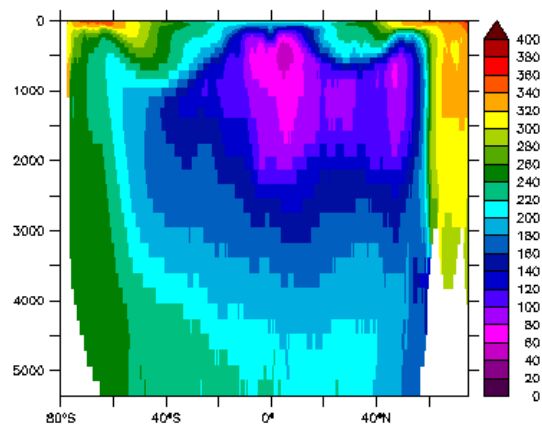
World Ocean Atlas

Observations



ACCESS-ESM1.5

ACCESS-ESM1.5 1°



ACCESS-CM2 0.25-deg

ACCESS-CM2 0.25°

Note improvement in low-oxygen water drawn towards surface at 60°S and oxygen-rich water subducted at 50°S

Next steps

- Project leadership team
- Data planning
- Evaluation planning
- Model development – components and coupling
- Resourcing and options
- Community interest in which MIPs
- Contribute to pilot of emissions-driven DECK experiments
- Get in touch (rachel.law@csiro.au) if you want to be more involved