# **COSIMA Update**

1 November 2018

# ACCESS-OM2 Model Suite

ACCESS-OM2 = [MOM5.1 + CICE5.1 + OASIS3-MCT + YATM + JRA55v13-do]

#### • ACCESS-OM2:

- 1° resolution, 50 levels, 252 cores
- 48 yrs/day 160 SU/yr

#### • ACCESS-OM2-025:

- 0.25° resolution, 50 (KDS) levels, 1824 cores
- 16 yrs/day 2800 SU/yr

#### • ACCESS-OM2-01:

- $\circ$  0.1° resolution, 75 (KDS) levels, 5744 cores
- 2.2 yrs/day 63 kSU/yr (provided dt=600 sec)
- Minimal config with 2064 cores, ~1 yr/day



# Status of current simulations

#### • ACCESS-OM2:

- 5 InterAnnual Forcing (IAF) cycles complete
- /g/data/hh5/tmp/cosima/access-om2/

1deg\_jra55v13\_iaf\_spinup1\_A

 Numerous Repeat Year Forcing (RYF) cases run by Kial Stewart (stored in access-om2)

#### • ACCESS-OM2-025:

- 5 IAF cycles complete
- /g/data/hh5/tmp/cosima/access-om2-025/025deg\_jra55v13\_iaf\_gmredi
- Additional IAF and RYF cases run by Andy Hogg (stored in access-om2-025)

#### • ACCESS-OM2-01:

- 40-year RYF spinup with variable parameters, tweaks, date fixes during spinup.
- Single IAF run from 1985 to 2017
- /g/data/hh5/tmp/cosima/access-om2-01/01deg\_jra55v13\_iaf
- Daily data also available thanks to BoM.



# Plans for publishing COSIMA model output

#### COSIMA model output collection

Collection of model output data for the Consortium for Ocean-Sea Ice Modelling in Australia (COSIMA). COSIMA is comprised of a number of university nodes (ANU, UNSW, UTas, UAdelaide) and the major publicly-funded research agencies (Bureau of Meteorology, Australian Antarctic Division and the CSIRO). We are strongly supported by the National Computational Infrastructure and the Australian Research Council. COSIMA goal is to develop ocean and sea ice model configurations. Models list: ACCESS is ...

#### Identifiers

DOI: 10.4225/41/5a2dc8543105a d

#### Access data

Access data via landing page NCI geonetwork record Download data NCI thredds listing

#### More data related to COSIMA model output collection

- COSIMA ACCESS-OM2 0.25 degrees ocean model output
- COSIMA ACCESS-OM2 1 degree ocean model output

View Record

# Plans for publishing COSIMA model output

Current Plan is:

- Publish last IAF cycle from each simulation (1°, 0.25°, 0.1°)
- Annually averaged 3D fields
- Monthly 2D fields
- Scalar timeseries
- Reformat into single-variable files; single directory per year
- Data processing underway

See https://researchdata.ands.org.au/cosima-model-output-collection/993052

# Plan for Model Announcement/Evaluation Paper

Goal is to announce and document model, including a cursory evaluation:

- Geoscientific Model Development
- "ACCESS-OM2: A Global Ocean-Sea Ice Model at Three Resolutions"
- You can see the paper draft here:

https://v1.overleaf.com/read/wtgqfhgbxbcv

And we are happy to distribute edit links if you would like to contribute.

- Community input on results is most critical...
- Aiming for full draft by November 30.
- Some figures to follow.

### **Global timeseries**

ACC



#### **Global Barotropic Streamfunction**

ACCESS-OM2-01





### **Global MOC Timeseries**



#### **Meridional Heat Transport**



#### Heat Uptake (no 0.1° case yet)













# **Equatorial Pacific**



- 28 - 26 - 24 - 22 22 - 20 - 18 due - 18 due - 16 -- 14 - 12 - 10











Ice concentration

March 1990-2014 mean, ACCESS-OM2-01

Ice concentration



#### September 1990-2014 mean, ACCESS-OM2-01



#### September 1990-2014 mean, observed







#### Sea ice area vs. obs



### Sea ice area rolling 12-month min, mean, max



#### Sea ice area seasonal cycle



### Sea ice volume by thickness category



# Upgrading the COSIMA Cookbook

The COSIMA cookbook is built on xarray/dask to efficiently analyse model output.

New instructions for using the cookbook: [with the fine print]

- 1. Log into VDI on NCI. [This is the virtual desktop infrastructure nci.org.au/services/vdi/]
- 2. Load conda3 analysis package. [Now has cookbook inbuilt. >>> module use /g/data3/hh5/public/modules; module load conda/analysis3]
- 3. Clone cosima-recipes repository. [github.com/OceansAus/cosima-recipes]
- 4. Use recipes as examples to construct your analysis code.
- 5. Feed back your experience through github issues
- 6. To see model evaluation scripts, see: github.com/OceansAus/ACCESS-OM2-1-025-010deg-report

### **Future Plans**

- 1. Work on Model Evaluation paper until November 30.
- 2. In late November/early December, let's hold another COSIMA meeting to discuss near-term plans, specifically:
  - Which model improvements are most critical?
  - Which simulations should we prioritise?
  - Managing data?