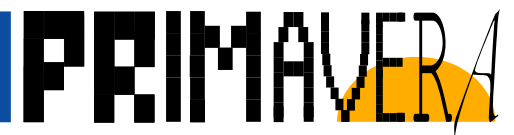


# PRIMAVERA WP8

Scientific Coordination

Co-funded by  
the European Union



# A year of good news

- HighResMIP paper in GMD
  - Haarsma et al. 2016: [High Resolution Model Intercomparison Project \(HighResMIP\)](#) Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-66, 2016
- BAMS paper under review
  - Roberts et al. 2017: [The benefits of global high-resolution for climate simulation: process-understanding and the enabling of stakeholder decisions at the regional scale.](#)
- A number of PRIMAVERA-funded papers already published, based on pre-PRIMAVERA data, albeit using PRIMAVERA methodologies
- Pre-PRIMAVERA analyses underway, using results from a number of PRIMAVERA models
- CLIVAR panels: collaborative links
- HighResMIP on PRACE (HiPRACE, Vidale et al. 2017-2019) proposal submitted to PRACE 14th
  - UM, ECHAM-FESOM, EC-Earth, CAM-NEMO

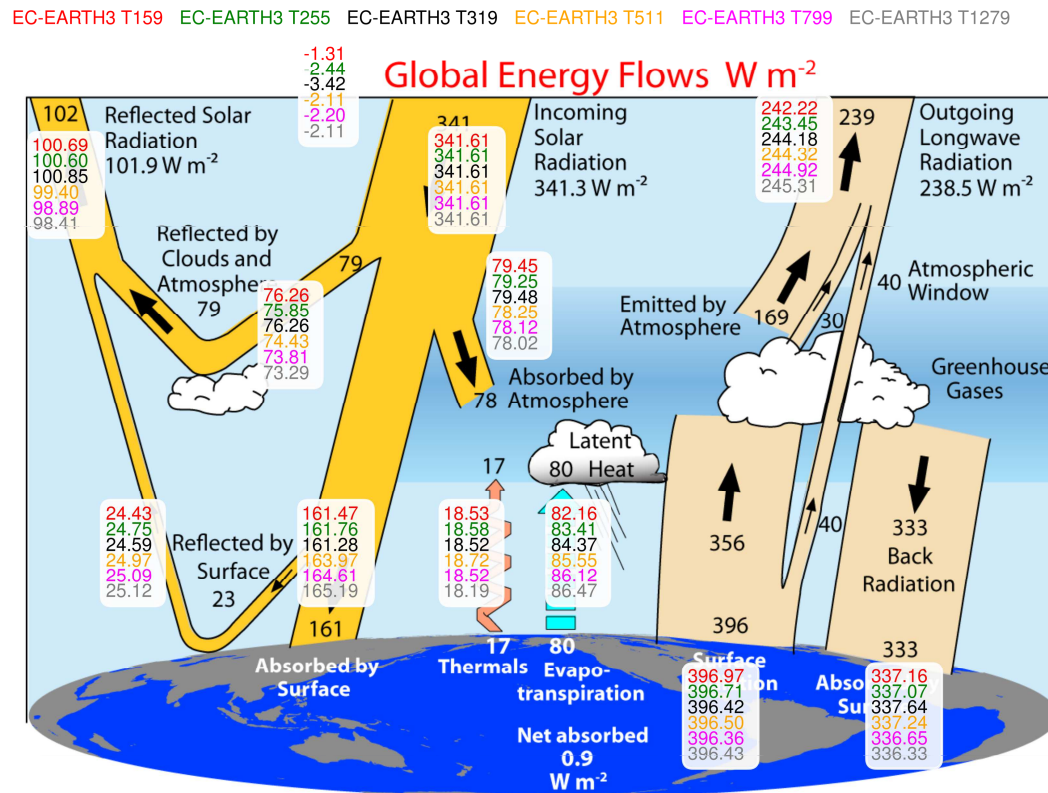
# Inter model comparison

We analyse an ensemble of four GCMs, coupled or uncoupled and various modelling methods (i.e. spectral, finite difference, finite volumes)

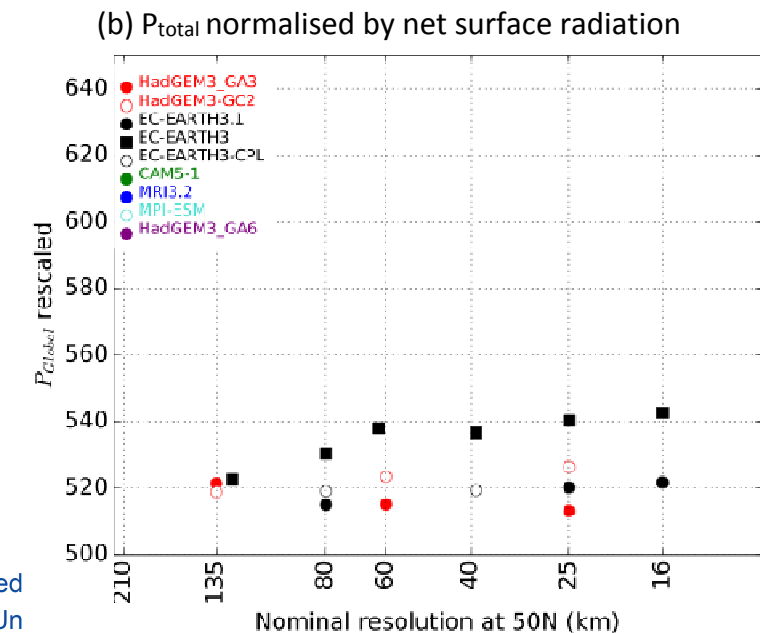
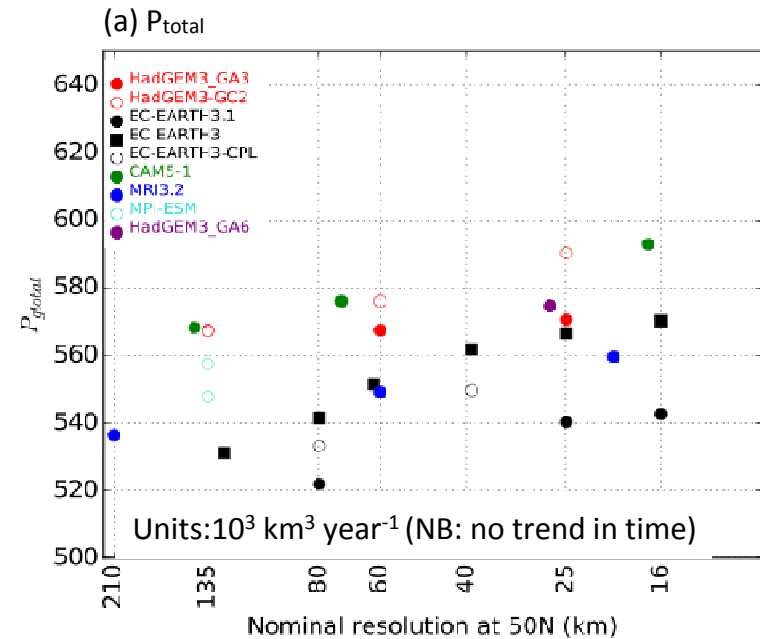
Model	Ocean coupling	Modelling method	Resolution and equivalent resolution at 50N
HadGEM3-GA3	No	Finite diff.	N96 (135km) N216 (40km) N512 (25km)
HadGEM3-GC2	Yes	Finite diff.	N96 (135km) N216 (40km) N512 (25km) +ORCA025 +ORCA025 +ORCA025
HadGEM3-GA6	No	Finite diff.	N480 (27km) and N480 with N96 topography
EC-EARTH3.01	No	Spectral	T159 (125km) T255 (80km) T319 (62km) T511 (39km) T799 (25km) T1279 (16km)
EC-EARTH3.1	No	Spectral	T255 (80km) T799 (25km) T1279 (16km)
EC-EARTH3.1/ORCA	Yes	Spectral	T255 (80km) T511 (39km) +ORCA1 +ORCA025
MRI3.2	No	Spectral	T95 (210 km) T319 (60km ) T959 (20km)
CAM5.1	No	Finite vol.	2deg(143km) 1deg (72km) 0.25deg (17km)

# Link of the global water cycle with the energy budget

Extension of the Demory et al. 2014 paper



- Models simulate well the link between the global energy cycle and the hydrological cycle.



# A year of bad news

- HiPRACE proposal submitted → 3PB of data...

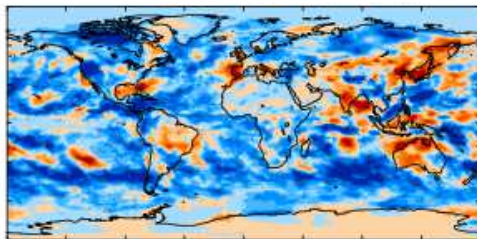
Model	Atmospheric resolution	Oceanic resolution	Version
HadGEM3-NEMO	25km	1/12°(ORCA12 L85)	GC3.1 VHR
ECHAM-FESOM	50km (T255L95)	Variable, 1/4 to 1/12°	6.3
CAM-NEMO	25km	1/4° -1/16°(ORCA16 L98)	HR-VHR
ECEarth-NEMO	25km (T511L91)	1/4° (ORCA025 L75)	3.2

- Nightm-Aerosol (néé EasyAerosol)
- CMIP6 and model delays: implications for stream 2 simulations and analyses

# Test

- Compare two 1.5-year simulations:
  - Simulation 1: GLOMAP
  - Simulation 2: EasyAerosol prescriptions made from

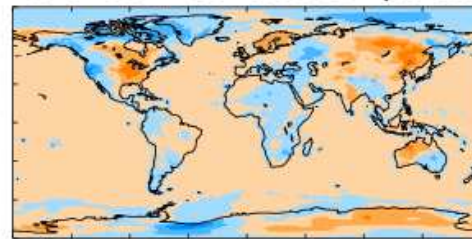
Difference in SW TOA all-sky



Mean:  $-2.31 \text{ W m}^{-2}$

-10 -6 -2 2 6 10

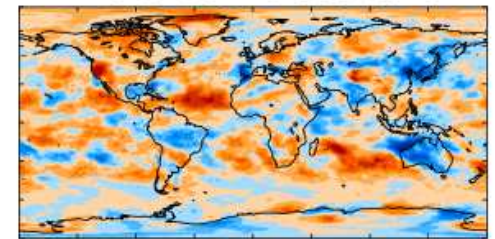
Difference in surface temperature



Mean:  $+0.05 \text{ K}$

-5 -3 -1 1 3 5

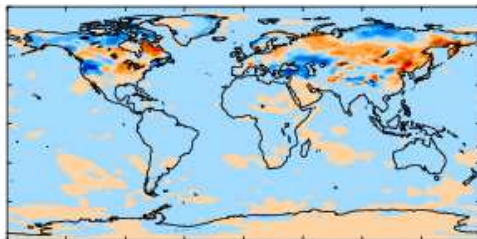
Difference in cloud cover



Mean:  $+0.01$

-0.1 -0.06 -0.02 0.02 0.06 0.1

Difference in SW TOA clear-sky



Mean:  $-0.11 \text{ W m}^{-2}$

-10 -6 -2 2 6 10

All differences are within the noise, with no aerosol-like pattern appearing. (Longer simulations ongoing.)

Also true for fluxes at the surface and in the longwave spectrum.

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# The year ahead

- Common analysis and tools workshop with CRESCENDO, mid-2017:
  - Boundary conditions for land, rivers, etc.
  - Data sets for verification, targeting processes etc.
  - Cross-project theme on the value of model complexity vs model resolution
- Negotiating new time lines with the EC, and with collaborative groups in HighResMIP/CLIVAR