|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(a)****Model ID, Vintage** | **(b)****Sponsor(s),** **Country** | **(c)****Atmosphere****Top Resolution & Model References** | **(d)****Ocean\*****Resolution Z Coord., Top BC, & Model References** | **(e)****Sea Ice\*****Dynamics, Leads & Model References** | **(f)****Coupling\*****Flux adjustments & Model References** | **(g)****Land****Soils, Plants, Routing & Model References** | **(h)****PlioMIP2 Experiment Eoi400****(Standard/Enhanced Boundary Conditions & Experiment Citation)** | **(i)****Treatment of Vegetation (Static - Salzmann et al. 2008 or Dynamic)**  | **(j)****Climate Sensitivity (ECS) °C****(incl. source)** |
| CCSM4-UoT2011 | University of Toronto, Canada | Top = 2.2 hPa1.25° x 0.9°, L26Neale et al. (2013) | 0.27-0.54° x 1.1°, L60Depth, free surfaceSmith et al. (2010), Danabasoglu et al. (2012), Chandan and Peltier (2017) | Rheology, melt pondsHolland et al. (2012, Hunke and Lipscomb, (2010) | No adjustmentCraig et al., (2011) | Layers, canopy, routingLawrence et al. (2012) | EnhancedChandan and Peltier (2017, 2018) | Salzmann et al. (2008) | 3.2(Bitz et al. 2012) |
| EC-Earth 3.12013 | Stockholm University, Sweden | IFS cycle 36r4Top = 5 hPa1.125° x 1.125°, L62Hazeleger et al. (2012) | NEMO3.6, ORAC1 1.0° x 1.0°, L46Madec (2008) | LIM3Vancoppenolle et al. (2009) | No adjustmentsHazeleger et al. (2012) | Layers, canopy, routingBalsamo et al. (2009), Balsamo et al. (2011) | EnhancedZheng et al. (2019) | Salzmann et al. (2008) | 3.2(value calculated from a 4 x CO2 experiment)  |
| GISS2.1G2019 | Goddard Institute for Space Studies, United States of America | Top = 0.1 mb2.0˚ x 2.5˚, L40Kelley et al. (in prep) | 1.0˚ x 1.25˚, L40P\*, free surfaceKelley et al. (in prep) | Visco-plastic rheology, leads, melt pondsKelley et al. (in prep) | No adjustmentsKelley et al. (in prep) | Layers, canopy, routingKelley et al. (in prep) | EnhancedChandler et al. (in prep) | Salzmann et al. (2008) | 3.3(Kelley et al. in prep) |
| MIROC4m2004 | Center for Climate System Research (Uni. Tokyo, National Inst. for Env. Studies, Frontier Research Center for Global Change, JAMSTEC), Japan | Top = 30 kmT42 (~ 2.8° x 2.8°) L20K-1 Developers (2004) | 0.5° -1.4° x 1.4°, L43Sigma/depth free surfaceK-1 Developers (2004) | Rheology, leadsK-1 Developers (2004) | No adjustmentsK-1 Developers (2004) | Layers, canopy , routingK-1 Developers (2004); Oki and Sud (1998) | EnhancedChan et al. (in prep) | Salzmann et al. (2008) | 3.9(Uploaded 2 x CO2 minus PI experiment) |
| HadCM3 1997 | University of Leeds,United Kingdom | Top = 5 hPa2.5° x 3.75°, L19Pope et al. (2000) | 1.25° x 1.25°, L20Depth, rigid lidGordon et al. (2000) | Free drift, leadsCattle and Crossley, (1995) | No adjustmentsGordon et al. (2000) | Layers, canopy, routingCox et al. (1999) | EnhancedHunter et al. (2019) | Salzmann et al. (2008) | 3.5(Hunter et al. 2019) |
| COSMOSCOSMOS-landveg r24132009 | Alfred Wegener Institute,Germany | Top = 10 hPaT31 (3.75x 3.75), L19Roeckner et al. (2003) | Bipolar orthogonal curvilinear GR30, L40 (formal 3.0x 1.8)Depth, free surfaceMarsland et al. (2003) | Rheology, leadsMarsland et al. (2003), following Hibler (1979) | No adjustmentsJungclaus et al. (2006) | Layers, canopy, routingRaddatz et al. (2007), Hagemann and Dümenil (1998), Hagemann and Gates (2003) | EnhancedStepanek et al. (in prep.) | Dynamic | 4.7(Uploaded 2 x CO2 minus PI experiment) |
| IPSLCM6A-LR2018 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 1 hPa2.5° x 1.26°, L79 Hourdin et al. (in prep) | 1° x 1°, refined at 1/3° in the tropics, L75Free surface, Z-coordinatesMadec et al. (2017) | Thermodynamics, Rheology, LeadsVancoppenolle et al. (2009), Rousset et al. (2015) | No adjustmentsMarti et al. (2010), Mignot et al. (in prep) | Layers, canopy, routing, phenologyPeylin et al. (in prep) | EnhancedContoux et al. (in-prep) | Salzmann et al. (2008) | 4.8(Mignot et al. in prep) |
| IPSLCM5A2.12017 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 70 km3.75° x 1.9°, L39Hourdin et al. (2006, 2013), Sepulchre et al. (in prep) | 0.5°-2° x 2°, L31Free surface, Z-coordinatesDufresne et al. (2013), Madec et al. (1997), Sepulchre et al. (in prep) | Thermodynamics, Rheology, LeadsFichefet and Morales-Maqueda, (1997, 1999), Sepulchre et al. (in prep) | No adjustment Marti et al. (2010), Sepulchre et al. (in prep) | Layers, canopy, routing, phenologyKrinner et al., (2005), Marti et al. (2010), Dufresne et al. (2013) | EnhancedTan et al. (submitted) | Salzmann et al. (2008) | 3.6(Sepulchre Pierre pers. Comm.) |
| IPSLCM5A2010 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 70 km3.75° x 1.9°, L39Hourdin et al. (2006, 2013) | 0.5°-2° x 2°, L31Free surface, Z-coordinatesDufresne et al. (2013), Madec et al. (1997) | Thermodynamics, Rheology, LeadsFichefet and Morales-Maqueda, (1997, 1999) | No adjustment Marti et al. (2010), Dufresne et al. (2013)  | Layers, canopy, routing, phenologyKrinner et al. (2005), Marti et al. (2010), Dufresne et al. (2013)  | EnhancedTan et al. (submitted) | Salzmann et al. (2008) | 4.1(Dufresne et al. 2013) |
| MRI-CGCM 2.32006 | Meteorological Research Institute and University of Tsukuba, Japan | Top = 0.4 hPaT42 (~2.8° x 2.8°) L30Yukimoto et al. (2006) | 0.5°-2.0° x 2.5°, L23Depth, rigid lidYukimoto et al. (2006) | Free drift, leadsMellor and Kantha (1989) | Heat, fresh water and momentum (12°S-12°N)Yukimoto et al. (2006) | Layers, canopy, routingSellers et al. (1986); Sato et al. (1989) | StandardKamae et al. (2016) | Salzmann et al. (2008) | 2.8(Uploaded 2 x CO2 minus PI experiment) |
| NorESM-F2017 | NORCE Norwegian Research Centre, Bjerknes Centre for Climate Research, Bergen, Norway | Top = 3.5 hPa1.9° × 2.5°, L26 (CAM4) | ~1° x 1°, L53 isopycnal layers | Rheology, melt pondsHolland et al., (2012); Hunke and Lipscomb (2010) | No adjustmentsGent et al. (2012) | Layers, canopy, routingLawrence et al. (2012) | Enhanced (modern soils)Li et al. (in prep) | Salzmann et al. (2008) | 2.3(Guo et al. 2019) |
| NorESM-L (CAM4)2011 | NORCE Norwegian Research Centre, Bjerknes Centre for Climate Research, Bergen, Norway | Top = 3.5 hPaT31 (~3.75° × 3.75°), L26 (CAM4) | G37 (~3° x 3° ), L30 isopycnal layers | Rheology, melt pondsHolland et al., (2012); Hunke and Lipscomb (2010) | No adjustmentsGent et al. (2012) | Layers, canopy, routingLawrence et al. (2012) | Enhanced (modern soils)Li et al. (in prep) | Salzmann et al. (2008) | 3.1(Haywood et al. 2013a) |
| CESM1.22013 | National Center for Atmospheric Research | Top = 3.6 hPaFV0.9x1.25 (~1°), L30 (CAM5) (Neale et al. 2010b) | G16 (~1°), L60 depth, rigid lid | Rheology, melt pondsHolland et al. (2012); Hunke and Lipscomb (2010) | No adjustmentsHurrell et al. (2013) | Layers, prescribed vegetation type with prognostic phenology, carbon cycle, routingOleson et al. (2008) | EnhancedFeng et al. (in prep) | Salzmann et al. (2008) | 4.1(Gettelman et al. 2012) |
| CCSM4(CESM 1.0.5)2011 | National Center for Atmospheric Research | Top = 3.6 hPaFV0.9x1.25 (~1°), L26 (CAM4) (Neale et al. 2010a) | G16 (~1°), L60 depth, rigid lid | Rheology, melt pondsHolland et al. (2012); Hunke and Lipscomb (2010) | No adjustmentsGent et al. (2011) | Layers, prescribed vegetation type with prognostic phenology, carbon cycle, routingOleson et al. (2008) | EnhancedFeng et al. (in prep) | Salzmann et al. (2008) | 3.2(Bitz et al. 2012) |
| CCSM4(CESM 1.0.5)2011 | IMAU,Utrecht University,the Netherlands | CAM4Top = 2hPaFV (2.5x 1.9)L26Neale et al. (2013 | POP2Bipolar Curvilinear320 x 384 (formal 1)L60Smith et al. (2010) | CICE4Hunke and Lipscomb (2008) | CPL7Craig et al. (2012) | CLM4Oleson et al (2010); Lawrence et al. (2011) | EnhancedTBA? | Salzmann et al. (2008) | 3.2(Bitz et al. 2012) |

**Table 1:** Details of climate models used with the MPEoi400 (Plio\_Core) experiment (a to g), plus details of boundary conditions (h), treatment of vegetation (i) and Equilibrium Climate Sensitivity values (j) (°C).