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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(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-UoT  2011 | University of Toronto, Canada | Top = 2.2 hPa  1.25° x 0.9°, L26  Neale et al. (2013) | 0.27-0.54° x 1.1°, L60  Depth, free surface  Smith et al. (2010), Danabasoglu et al. (2012), Chandan and Peltier (2017) | Rheology, melt ponds  Holland et al. (2012, Hunke and Lipscomb, (2010) | No adjustment  Craig et al., (2011) | Layers, canopy, routing  Lawrence et al. (2012) | Enhanced  Chandan and Peltier (2017, 2018) | Salzmann et al. (2008) | 3.2  (Bitz et al. 2012) |
| EC-Earth 3.1  2013 | Stockholm University, Sweden | IFS cycle 36r4  Top = 5 hPa  1.125° x 1.125°, L62  Hazeleger et al. (2012) | NEMO3.6, ORAC1  1.0° x 1.0°, L46  Madec (2008) | LIM3  Vancoppenolle et al. (2009) | No adjustments  Hazeleger et al. (2012) | Layers, canopy, routing  Balsamo et al. (2009), Balsamo et al. (2011) | Enhanced  Zheng et al. (2019) | Salzmann et al. (2008) | 3.2  (value calculated from a 4 x CO2 experiment) |
| GISS2.1G  2019 | Goddard Institute for Space Studies, United States of America | Top = 0.1 mb  2.0˚ x 2.5˚, L40  Kelley et al. (in prep) | 1.0˚ x 1.25˚, L40  P\*, free surface  Kelley et al. (in prep) | Visco-plastic rheology, leads, melt ponds  Kelley et al. (in prep) | No adjustments  Kelley et al. (in prep) | Layers, canopy, routing  Kelley et al. (in prep) | Enhanced  Chandler et al. (in prep) | Salzmann et al. (2008) | 3.3  (Kelley et al. in prep) |
| MIROC4m  2004 | Center for Climate System Research (Uni. Tokyo, National Inst. for Env. Studies, Frontier Research Center for Global Change, JAMSTEC), Japan | Top = 30 km  T42 (~ 2.8° x 2.8°) L20  K-1 Developers (2004) | 0.5° -1.4° x 1.4°, L43  Sigma/depth free surface  K-1 Developers (2004) | Rheology, leads  K-1 Developers (2004) | No adjustments  K-1 Developers (2004) | Layers, canopy , routing  K-1 Developers (2004); Oki and Sud (1998) | Enhanced  Chan 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 hPa  2.5° x 3.75°, L19  Pope et al. (2000) | 1.25° x 1.25°, L20  Depth, rigid lid  Gordon et al. (2000) | Free drift, leads  Cattle and Crossley, (1995) | No adjustments  Gordon et al. (2000) | Layers, canopy, routing  Cox et al. (1999) | Enhanced  Hunter et al. (2019) | Salzmann et al. (2008) | 3.5  (Hunter et al. 2019) |
| COSMOS  COSMOS-landveg r2413  2009 | Alfred Wegener Institute,  Germany | Top = 10 hPa  T31 (3.75x 3.75), L19  Roeckner et al. (2003) | Bipolar orthogonal curvilinear GR30, L40 (formal 3.0x 1.8)  Depth, free surface  Marsland et al. (2003) | Rheology, leads  Marsland et al. (2003), following Hibler (1979) | No adjustments  Jungclaus et al. (2006) | Layers, canopy, routing  Raddatz et al. (2007), Hagemann and Dümenil (1998), Hagemann and Gates (2003) | Enhanced  Stepanek et al. (in prep.) | Dynamic | 4.7  (Uploaded 2 x CO2 minus PI experiment) |
| IPSLCM6A-LR  2018 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 1 hPa  2.5° x 1.26°, L79  Hourdin et al. (in prep) | 1° x 1°, refined at 1/3° in the tropics, L75  Free surface, Z-coordinates  Madec et al. (2017) | Thermodynamics, Rheology, Leads  Vancoppenolle et al. (2009),  Rousset et al. (2015) | No adjustments  Marti et al. (2010),  Mignot et al. (in prep) | Layers, canopy, routing, phenology  Peylin et al. (in prep) | Enhanced  Contoux et al. (in-prep) | Salzmann et al. (2008) | 4.8  (Mignot et al. in prep) |
| IPSLCM5A2.1  2017 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 70 km  3.75° x 1.9°, L39  Hourdin et al. (2006, 2013), Sepulchre et al. (in prep) | 0.5°-2° x 2°, L31  Free surface, Z-coordinates  Dufresne et al. (2013), Madec et al. (1997), Sepulchre et al. (in prep) | Thermodynamics, Rheology, Leads  Fichefet and Morales-Maqueda, (1997, 1999), Sepulchre et al. (in prep) | No adjustment Marti et al. (2010), Sepulchre et al. (in prep) | Layers, canopy, routing, phenology  Krinner et al., (2005), Marti et al. (2010), Dufresne et al. (2013) | Enhanced  Tan et al. (submitted) | Salzmann et al. (2008) | 3.6  (Sepulchre Pierre pers. Comm.) |
| IPSLCM5A  2010 | Laboratoire des Sciences du Climat et de l'Environnement (LSCE), France | Top = 70 km  3.75° x 1.9°, L39  Hourdin et al. (2006, 2013) | 0.5°-2° x 2°, L31  Free surface, Z-coordinates Dufresne et al. (2013), Madec et al. (1997) | Thermodynamics, Rheology, Leads  Fichefet and Morales-Maqueda, (1997, 1999) | No adjustment Marti et al. (2010), Dufresne et al. (2013) | Layers, canopy, routing, phenology  Krinner et al. (2005), Marti et al. (2010), Dufresne et al. (2013) | Enhanced  Tan et al. (submitted) | Salzmann et al. (2008) | 4.1  (Dufresne et al. 2013) |
| MRI-CGCM 2.3  2006 | Meteorological Research Institute and University of Tsukuba, Japan | Top = 0.4 hPa  T42 (~2.8° x 2.8°) L30  Yukimoto et al. (2006) | 0.5°-2.0° x 2.5°, L23  Depth, rigid lid  Yukimoto et al. (2006) | Free drift, leads  Mellor and Kantha (1989) | Heat, fresh water and momentum (12°S-12°N)  Yukimoto et al. (2006) | Layers, canopy, routing  Sellers et al. (1986); Sato et al. (1989) | Standard  Kamae et al. (2016) | Salzmann et al. (2008) | 2.8  (Uploaded 2 x CO2 minus PI experiment) |
| NorESM-F  2017 | NORCE Norwegian Research Centre, Bjerknes Centre for Climate Research, Bergen, Norway | Top = 3.5 hPa  1.9° × 2.5°, L26 (CAM4) | ~1° x 1°, L53 isopycnal layers | Rheology, melt ponds  Holland et al., (2012); Hunke and Lipscomb (2010) | No adjustments  Gent et al. (2012) | Layers, canopy, routing  Lawrence 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 hPa  T31 (~3.75° × 3.75°), L26 (CAM4) | G37 (~3° x 3° ), L30 isopycnal layers | Rheology, melt ponds  Holland et al., (2012); Hunke and Lipscomb (2010) | No adjustments  Gent et al. (2012) | Layers, canopy, routing  Lawrence et al. (2012) | Enhanced (modern soils)  Li et al. (in prep) | Salzmann et al. (2008) | 3.1  (Haywood et al. 2013a) |
| CESM1.2  2013 | National Center for Atmospheric Research | Top = 3.6 hPa  FV0.9x1.25 (~1°), L30 (CAM5) (Neale et al. 2010b) | G16 (~1°), L60 depth, rigid lid | Rheology, melt ponds  Holland et al. (2012); Hunke and Lipscomb (2010) | No adjustments  Hurrell et al. (2013) | Layers, prescribed vegetation type with prognostic phenology, carbon cycle, routing  Oleson et al. (2008) | Enhanced  Feng 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 hPa  FV0.9x1.25 (~1°), L26 (CAM4) (Neale et al. 2010a) | G16 (~1°), L60 depth, rigid lid | Rheology, melt ponds  Holland et al. (2012); Hunke and Lipscomb (2010) | No adjustments  Gent et al. (2011) | Layers, prescribed vegetation type with prognostic phenology, carbon cycle, routing  Oleson et al. (2008) | Enhanced  Feng 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 | CAM4 Top = 2hPa FV (2.5x 1.9) L26 Neale et al. (2013 | POP2 Bipolar Curvilinear 320 x 384 (formal 1) L60 Smith et al. (2010) | CICE4 Hunke and Lipscomb (2008) | CPL7  Craig et al. (2012) | CLM4 Oleson et al (2010); Lawrence et al. (2011) | Enhanced  TBA? | 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).