PMIP4 HadGEM2-A dust data

The simulation of the pre-industrial and LGM climate states with HadGEM2-A are described in more detail by Hopcroft & Valdes (2015), whilst the dust results are described by Hopcroft et al (2015). The dust scheme itself has been documented by Woodward (2011). HadGEM2-ES is documented by Collins et al (2011).

Contact

Information and data provided by Peter Hopcroft

Data files

- file names = `PMIP4_DUST_Hopcroft_<field>_<expt>.nc`
  - `field` = see Variables section below
  - `expt` = `PI` or `LGM`

Dimensions

- nb_time = 12 (12 monthly time steps in each file)
  - **Warning!** The time steps are ordered from January to December in the files but, due to the time axis units, the time axis values are not monotonically increasing. This can potentially confuse some programs
    - `time:units = "days since 2117-12-01 00:00:00"`
    - `time = 45, 75, 105, 135, 165, 195, 225, 255, 285, 315, 345, 15`
- nb_lat, nb_lon = 145, 192
  - latitude_values = [-90, -88.75, -87.5, ... 87.5, 88.75, 90]
  - longitude_values = [0, 1.875, 3.75, ... 354.375, 356.25, 358.125]
- size_bin = 6
  - dust size bin edges = 0.0316, 0.1, 0.316, 1.0, 3.16, 10.0 and 31.6 µm (radius)
- nb_wavelength = 6
  - AOD is given on 6 wavelengths. These are 0.38, 0.44, 0.55, 0.67, 0.87 and 1.02 µm (Bellouin et al 2007).
- nb_levels = 38
  - check the `PMIP4_DUST_Hopcroft_conc_<expt>.nc` files for details about the hybrid coordinates

Variables

2D dust fields

- **emis**: emission (lon,lat,size,month) [g/m2/a]

- **ddep**: dry deposition (lon,lat,size,month) [g/m2/a]
- **wdep**: wet deposition (lon,lat,size,month) [g/m2/a]
- **load**: dust loading (lon,lat,size,month) [kg/m2]
- **aot**: aerosol optical thickness (lon,lat,wavelength,month) [unitless]
- **rfss**: surface short-wave radiative forcing (lon,lat,month) [W/m2]
- **rfsl**: surface long-wave radiative forcing (lon,lat,month) [W/m2]
- **rfts**: TOA short-wave radiative forcing (lon,lat,month) [W/m2]
- **rftl**: TOA long-wave radiative forcing (lon,lat,month) [W/m2]

3D dust fields

- **conc**: mass mixing ratio (lon,lat,lev,month) [kg/kg] x 6 bins

References



Please cite at least the **2015 JGR paper**

- Bellouin, N et al., (2007), **Improved representation of aerosols for HadGEM2**, Hadley Centre Technical Note 73, Met Office Hadley Centre, Exeter, UK:
- Collins, WJ et al (2011), **Development and evaluation of an Earth-System model – HadGEM2**, Geoscientific Model Development, 4, 1051-1075, doi:10.5194/gmd-4-1051-2011.
- Hopcroft, P.O. and P.J. Valdes (2014), **Last Glacial Maximum constraints on the Earth System Model HadGEM2-ES**, Climate Dynamics, 45(5), 1657-1672, doi:10.1007/s00382-014-2421-0.
- Hopcroft, P.O., P.J. Valdes, S. Woodward and M. Joshi (2015), **Last glacial maximum radiative forcing from mineral dust aerosols in an Earth System model**, J Geophysical Research, 120(16), 8186-8205, doi:10.1002/2015JD023742.
- Woodward, S. (2011), **Mineral dust in HadGEM2**, Hadley Centre Technical Note 87, Met Office Hadley Centre, Exeter, UK.

Download

You will find below a table with all the available data files, and their *md5sum* checksum (if you want to check that you download was OK, you can just type `md5sum file.nc` and compare the result to what is displayed in the table).

If you want to download a file, click on the PMIP4 HadGEM2-A dust data download link and then on the file you need.

md5sum output	Data file
e0fcb2757ac775ca424e87469239500b	PMIP4_DUST_Hopcroft_aot_LGM.nc
9b2bf8adcef3b34e06cfa73ee3c568c2	PMIP4_DUST_Hopcroft_aot_PI.nc
5e2c81a4fc053f9487c0c23bf002d152	PMIP4_DUST_Hopcroft_conc_LGM.nc
dd8467e85b4b1642cdcf7fc190214196	PMIP4_DUST_Hopcroft_conc_PI.nc

md5sum output	Data file
42a1bd07f5800a49349b926c870a71d0	PMIP4_DUST_Hopcroft_ddep_LGM.nc
33a14aa5ac91b14a929fa039f0e8687f	PMIP4_DUST_Hopcroft_ddep_PI.nc
75d031a9d5fc97998320b690b67a0935	PMIP4_DUST_Hopcroft_emis_LGM.nc
5215ce343b5afbe6c4f7119083ef557d	PMIP4_DUST_Hopcroft_emis_PI.nc
6d7fed87d5f6d4968401c322b722222c	PMIP4_DUST_Hopcroft_load_LGM.nc
7567bcfe0e1e19e322db5811e8986b1a	PMIP4_DUST_Hopcroft_load_PI.nc
3ca8f43ec1386a35a221ef70b21782be	PMIP4_DUST_Hopcroft_rfsl_LGM.nc
680d89ac26d7c1a04d27a06b9f65b0a0	PMIP4_DUST_Hopcroft_rfsl_PI.nc
cedd10b69f9af2c8a7e10085379e592f	PMIP4_DUST_Hopcroft_rfss_LGM.nc
229106383bdd5d822d194443ae515b70	PMIP4_DUST_Hopcroft_rfss_PI.nc
10d8915a44e33c1fc90ddcd5ef7b74af	PMIP4_DUST_Hopcroft_rftl_LGM.nc
63113c043a11a6b4d66525effef66ff7	PMIP4_DUST_Hopcroft_rftl_PI.nc
4543d92f00fcbd135c09cf101ea2b125	PMIP4_DUST_Hopcroft_rfts_LGM.nc
a734cc9405f4c0c44a904eb6efbdbe69	PMIP4_DUST_Hopcroft_rfts_PI.nc
6b3a25aacd6ef871ef22cf9c38a1dcc3	PMIP4_DUST_Hopcroft_wdep_LGM.nc
a5762553ebf87d0ab36f25babcda0de8	PMIP4_DUST_Hopcroft_wdep_PI.nc

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