

# Process-based Estimate of Global-mean Sea-level Changes in the Common Era

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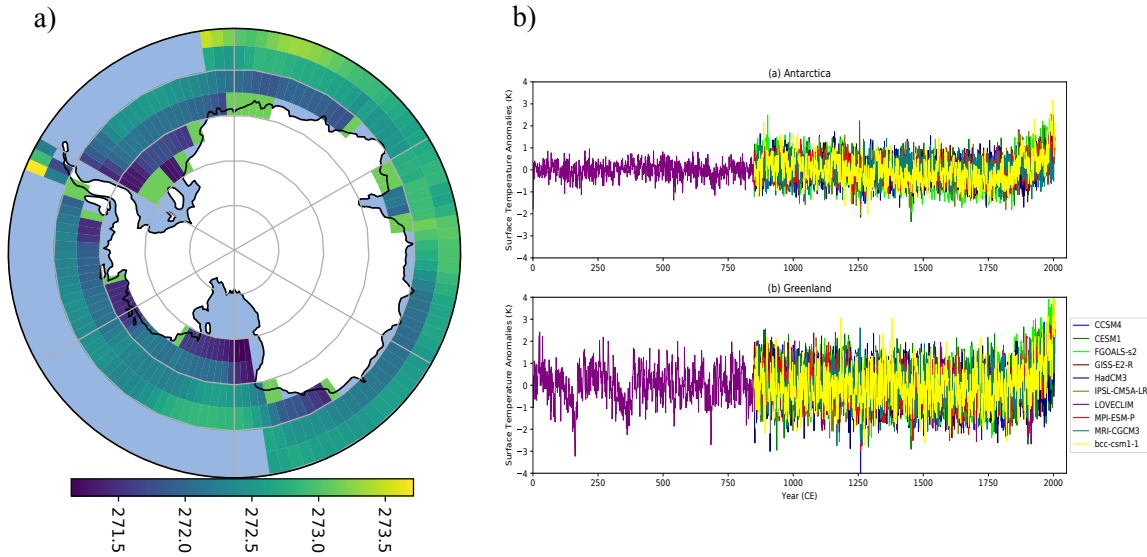
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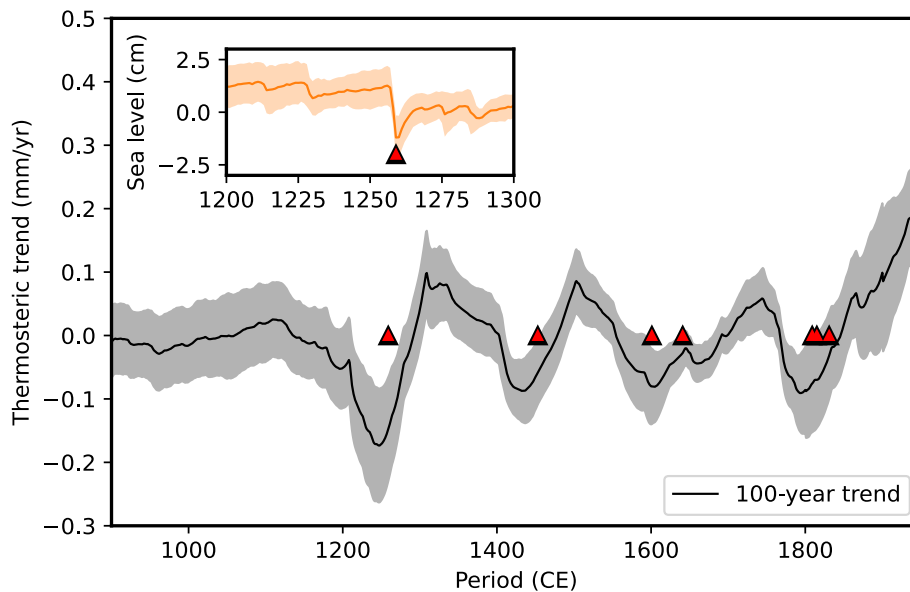
**|Supporting Information|**

|   | Model name | Ocean Model<br>Resolution<br>(Lat, Lon, Lev) | Institution                                                              | Reference                    |
|---|------------|----------------------------------------------|--------------------------------------------------------------------------|------------------------------|
| 1 | HadCM3     | 144, 288, 20                                 | University of Edinburgh, School of Geosciences, UK                       | Collins et al., (2001)       |
| 2 | MPI-ESM-P  | 220, 256, 40                                 | Max Planck Institute for Meteorology, Germany                            | Marsland et al., (2003)      |
| 3 | GISS-E2-R  | 180, 288, 32                                 | NASA/GISS (Goddard Institute for Space Studies) New York, NY             | Hansen et al., (2007)        |
| 4 | CCSM4      | 384, 320, 60                                 | NCAR (National Centre for Atmospheric Research) Boulder, CO, USA         | Gent et al., (2011)          |
| 5 | BCC-CSM1   | 232, 360, 40                                 | Beijing Climate Centre (BCC), China Meteorological Administration, China | Wu et al., (2014)            |
| 6 | MRI-CGCM3  | 368, 360, 51                                 | Meteorological Research Institute, Tsukuba, Japan                        | Yukimoto et al., (2012)      |
| 7 | FGOALS-S2  | 196, 360, 30                                 | LASG, IAP, CAS, Beijing, China                                           | Bao et al., (2013)           |
| 8 | CESM1      | 384, 320, 60                                 | National Centre for Atmospheric Research (NCAR)                          | Otto-Bliesner et al., (2016) |
| 9 | LOVECLIM   | 65, 120, 20                                  | Georges Lemaitre Centre for Earth and Climate Research, Belgium          | Goosse et al., (2010)        |

**Table S1: Details of climate models used in this study**



**Figure S1: a) Ocean temperature off Antarctica averaged over depths 400-600 meters for the 1900-2000 period from LOVECLIM, showing the spatial domain considered. Oceanic forcing has been extracted over this domain for LOVECLIM (1 – 2000 CE) and all PMIP models (850-2000 CE). b) Model surface temperature anomalies (base period 850-2000 CE for PMIP GCMs and 1 - 2000 CE for LOVECLIM) over Antarctica and Greenland, used as input to our Ice Sheet Model. Ice-core based surface temperature reconstructions used in this regard (EXP-I) are shown in Fig. 2.**



30 **Figure S2: 100-year rate of thermosteric sea level from PMIP3/CMIP5 (EXP-II). Triangles represent timings of the major volcanic eruptions during the last 1000 years, as noted in Schmidt et al., (2011); Sigl et al., (2015). The shading shows 1-sigma confidence level. The inset figure is thermosteric contribution (as shown in Fig. 2a for EXP-II) but zoomed over 1200-1300 CE. It shows the ~2 cm drop in GMTSL as a response to the 1258 eruption.**

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