

Validation of key Arctic energy and water budget components in CMIP6

Supporting material

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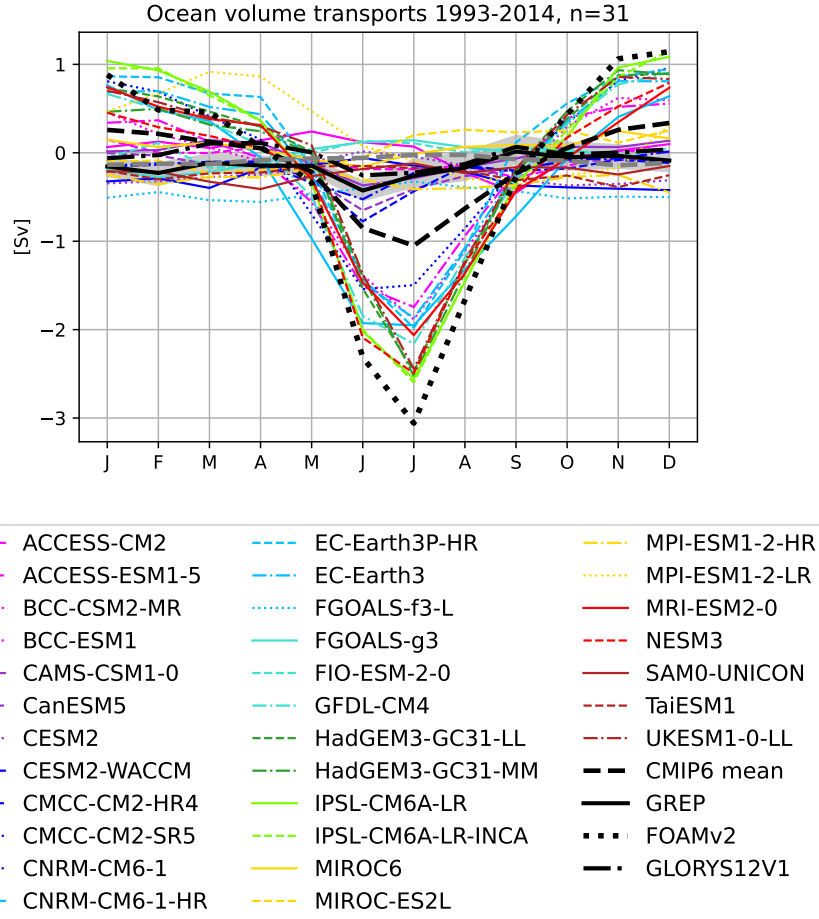


Fig. 1 Net oceanic volume transports without sea ice volume corrections for the NLFS models. Shading indicates the spread (2σ) of the GREP ensemble

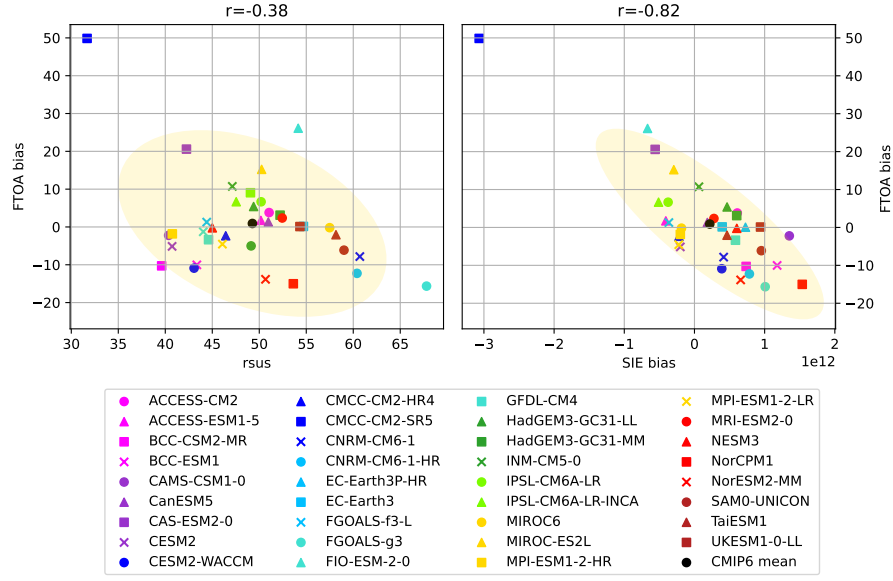


Fig. 2 Scatter diagrams of long-term averaged (1993-2014) summer FTOA bias with the reflected shortwave radiation (rsus, left panel) and the sea ice extent bias. Yellow ellipses show the 2-sigma confidence ellipses for the CMIP6 models.

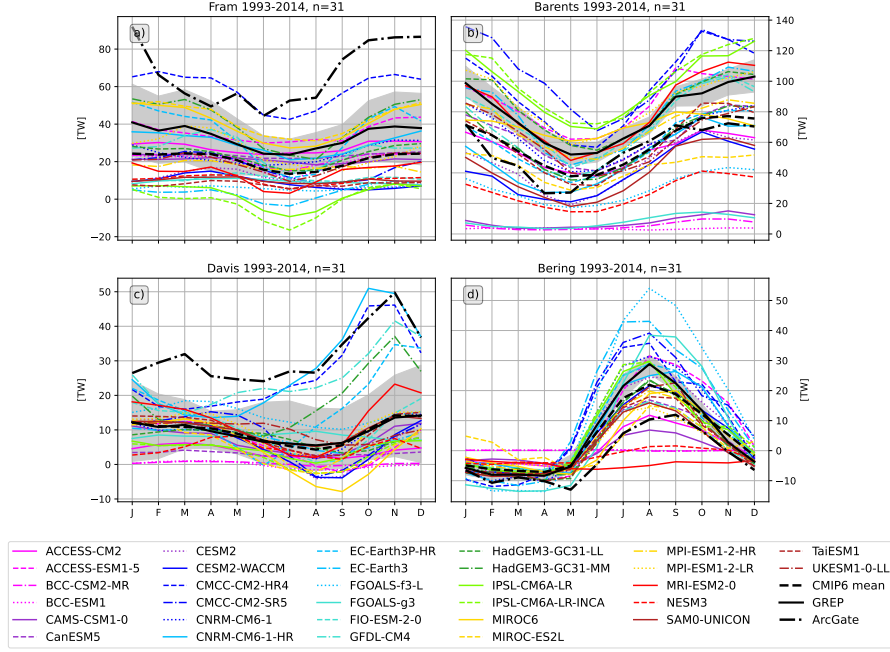


Fig. 3 Averaged annual cycles of oceanic heat transports through a) Fram Strait, b) Barents Sea Opening, c) Davis Strait and d) Bering Strait for various CMIP6 models (1993-2014), the GREP reanalyses mean (1993-2014) and ArcGate observations (2005-2010). Positive values denote transports into the Arctic. Shading indicates the spread (2σ) of the GREP ensemble

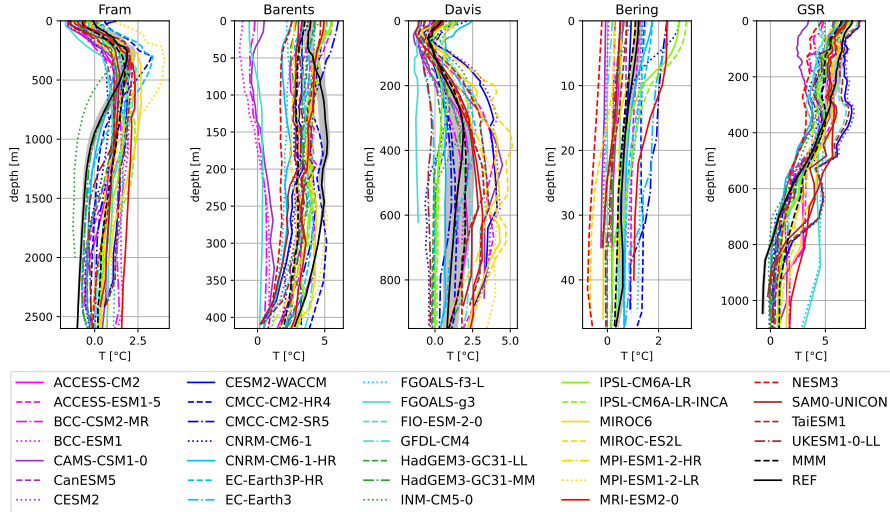


Fig. 4 Temperature profiles averaged along the main Arctic gateways. Reference values (REF) are taken from the GREP reanalyses ensemble. Shading indicates the spread (2σ) of the GREP ensemble

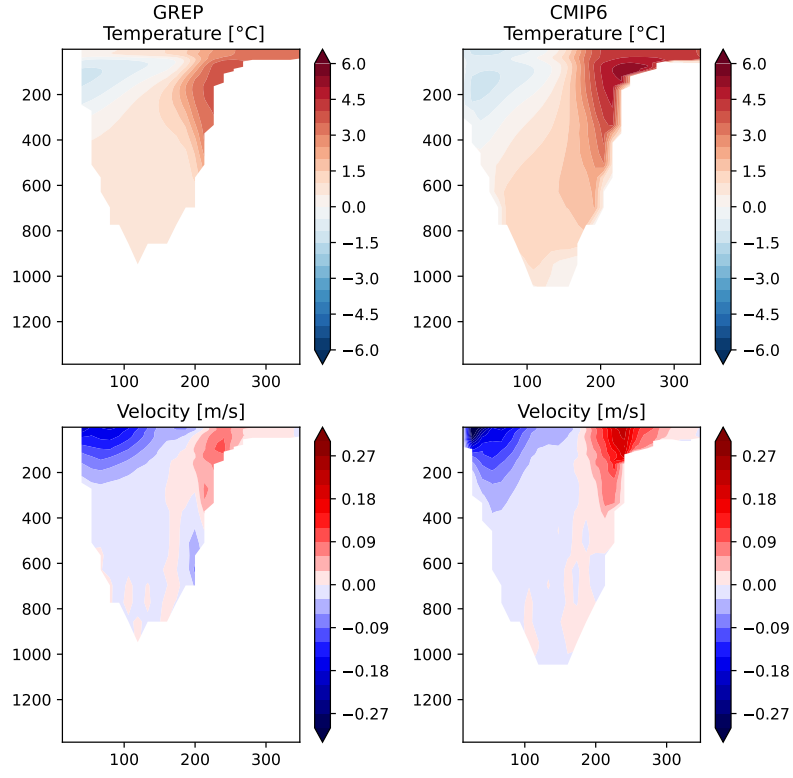


Fig. 5 Crosssections of temperatures (top) and velocities (bottom) across Davis Strait for the GREP ensemble mean (left) and the mean of all high resolution CMIP6 models.

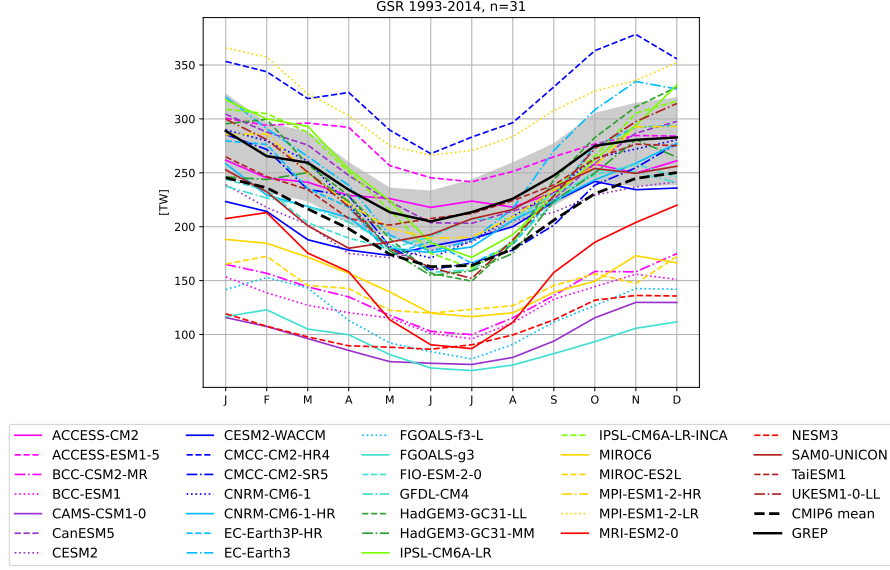


Fig. 6 Averaged annual cycles of oceanic heat transports through the Greenland Scotland Ridge (GSR) for various CMIP6 models (1993-2014), the GREP reanalyses mean (1993-2014) and ArcGate observations (2005-2010). Shading indicates the spread (2σ) of the GREP ensemble

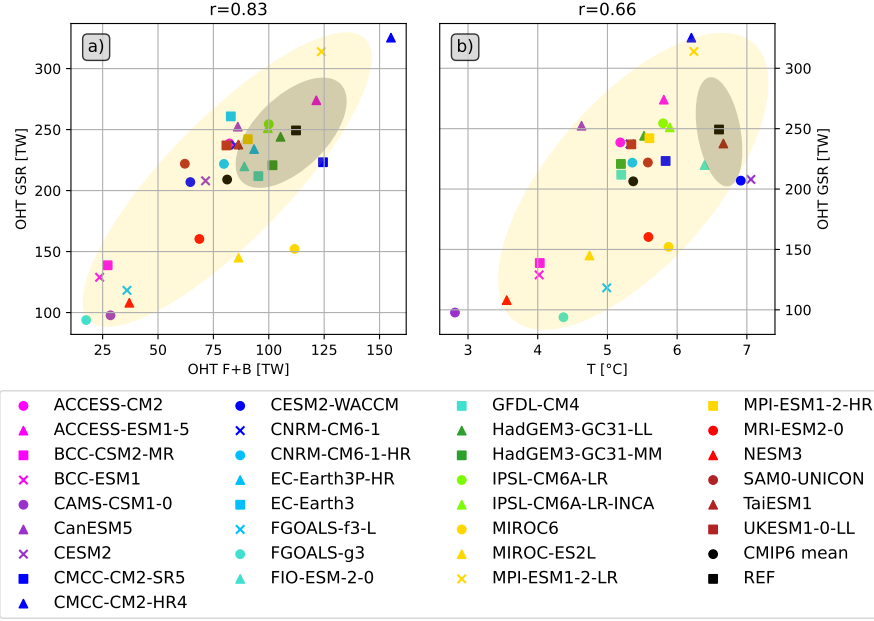


Fig. 7 Scatter diagrams of long-term (1993-2014) annual averaged a) OHT through Fram Strait + the BSO and the GSR and b) temperatures averaged across the GSR and OHT through the GSR. Reference values (REF) are calculated using the GREP ensemble. Yellow ellipses show the 2-sigma confidence ellipses for the CMIP6 models and grey ellipses for the GREP reanalyses.