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Supplemental Material

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Analysis of the Atmospheric Water Cycle for the Laurentian Great Lakes Region using CMIP6 models

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SUPPLEMENTAL MATERIAL

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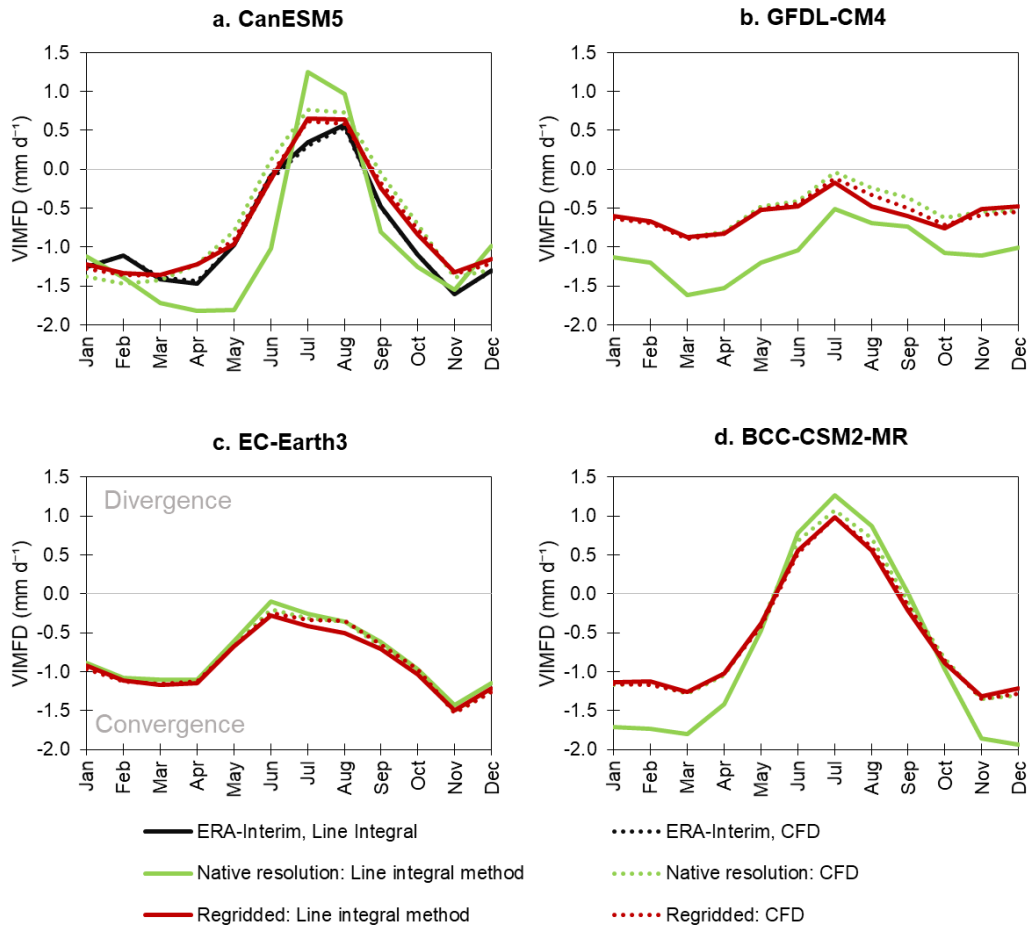


Figure S1: 1981 – 2010 mean climatology of vertically integrated moisture flux divergence (VIMFD) for four CMIP6 models; a) CanESM5, b) GFDL-CM4, c) EC-Earth3, and d) BCC-CSM2-MR. Two methods are used to compute VIMFD: Centered Finite Differences (CFD, dotted line), and 2D Divergence Theorem (line integral method; solid line). ERA-Interim reanalysis is shown in black in panel a. The regridded resolution is $1^\circ \times 1^\circ$ (red) while native resolutions (green) are:

CanESM5	$2.79^\circ \times 2.81^\circ$
GFDL-CM4	$2.0^\circ \times 2.5^\circ$
EC-Earth3	$0.7^\circ \times 0.7^\circ$
BCC-CSM2-MR	$1.121^\circ \times 1.125^\circ$

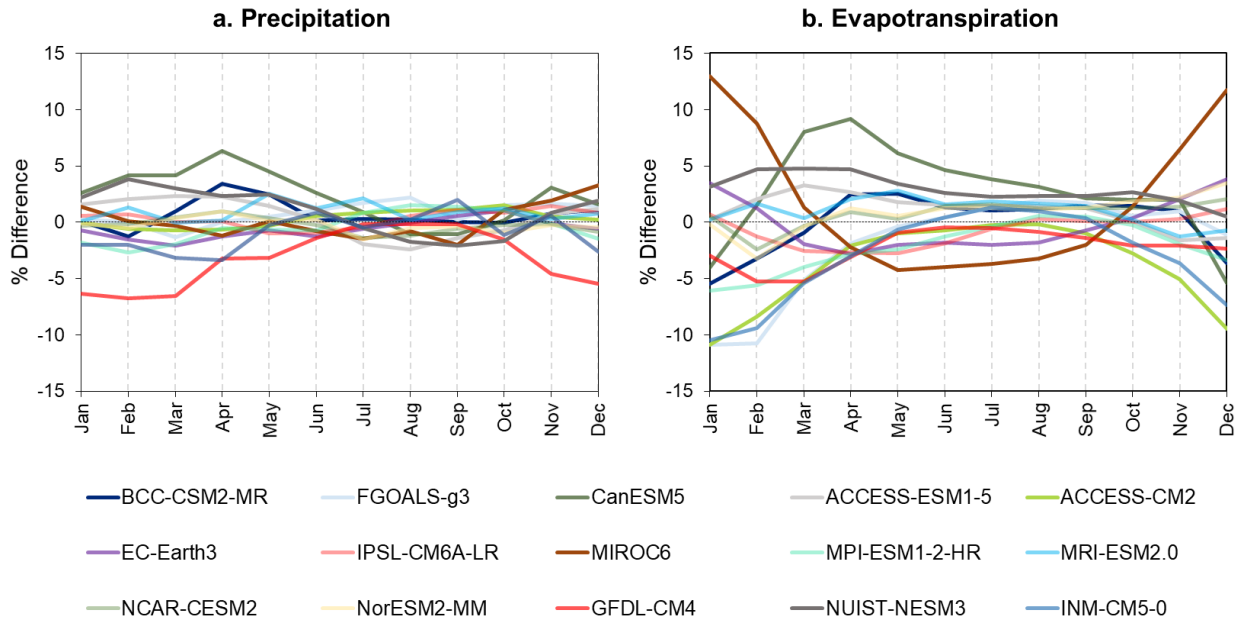


Figure S2: Percentage difference between regridded and native resolution of the fifteen CMIP6 models for 1981 – 2010 mean climatology of a) Precipitation and b) Evapotranspiration. The regridded resolution is 1° x 1° and the native model resolutions are provided in Table 1 in the main text.

“Percentage of the grid cell occupied by land (including lakes)” (variable: sftlf)

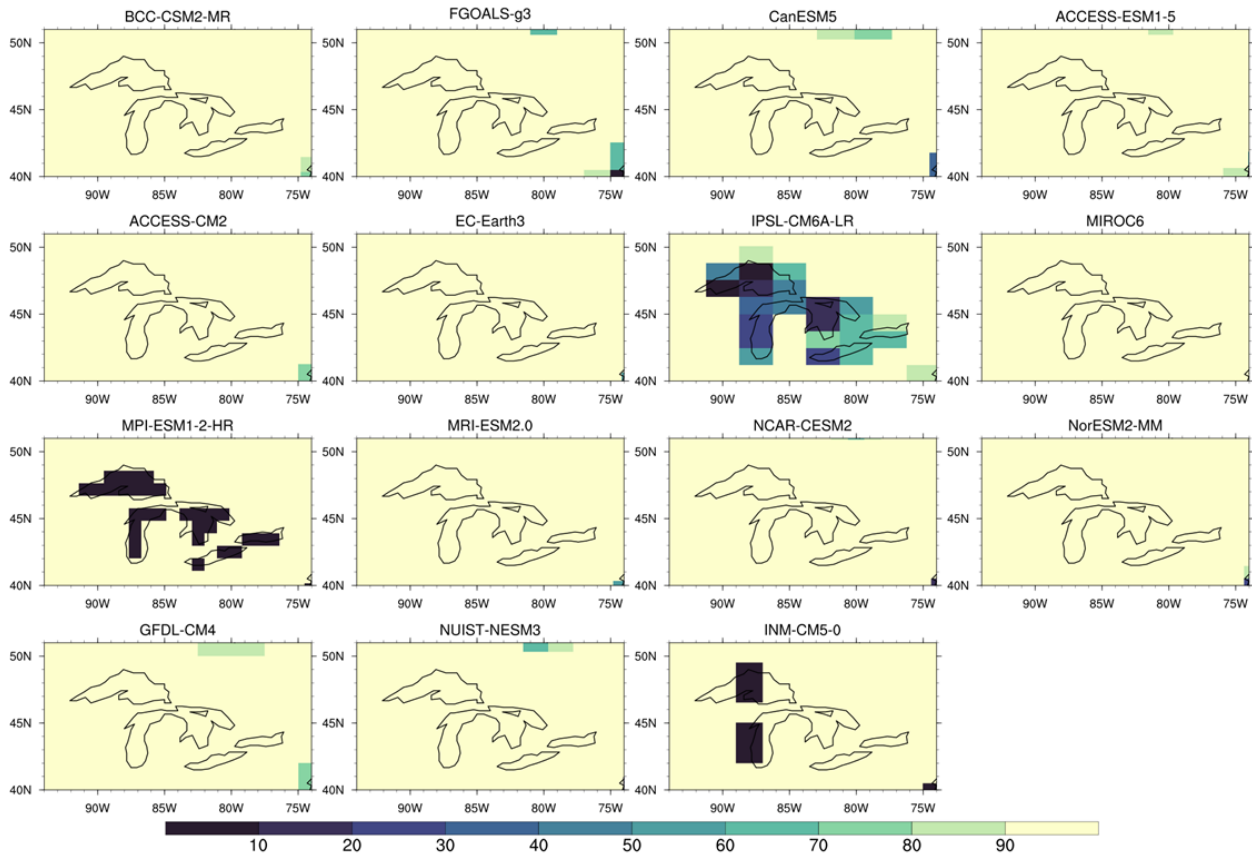


Figure S3: Percentage of the grid cell occupied by either land or lake in the CMIP6 models. 100% (yellow) indicates that the lakes are fully represented as land/lake while smaller percentages indicate that the ocean component of the GCM is likely active in these grid cells.

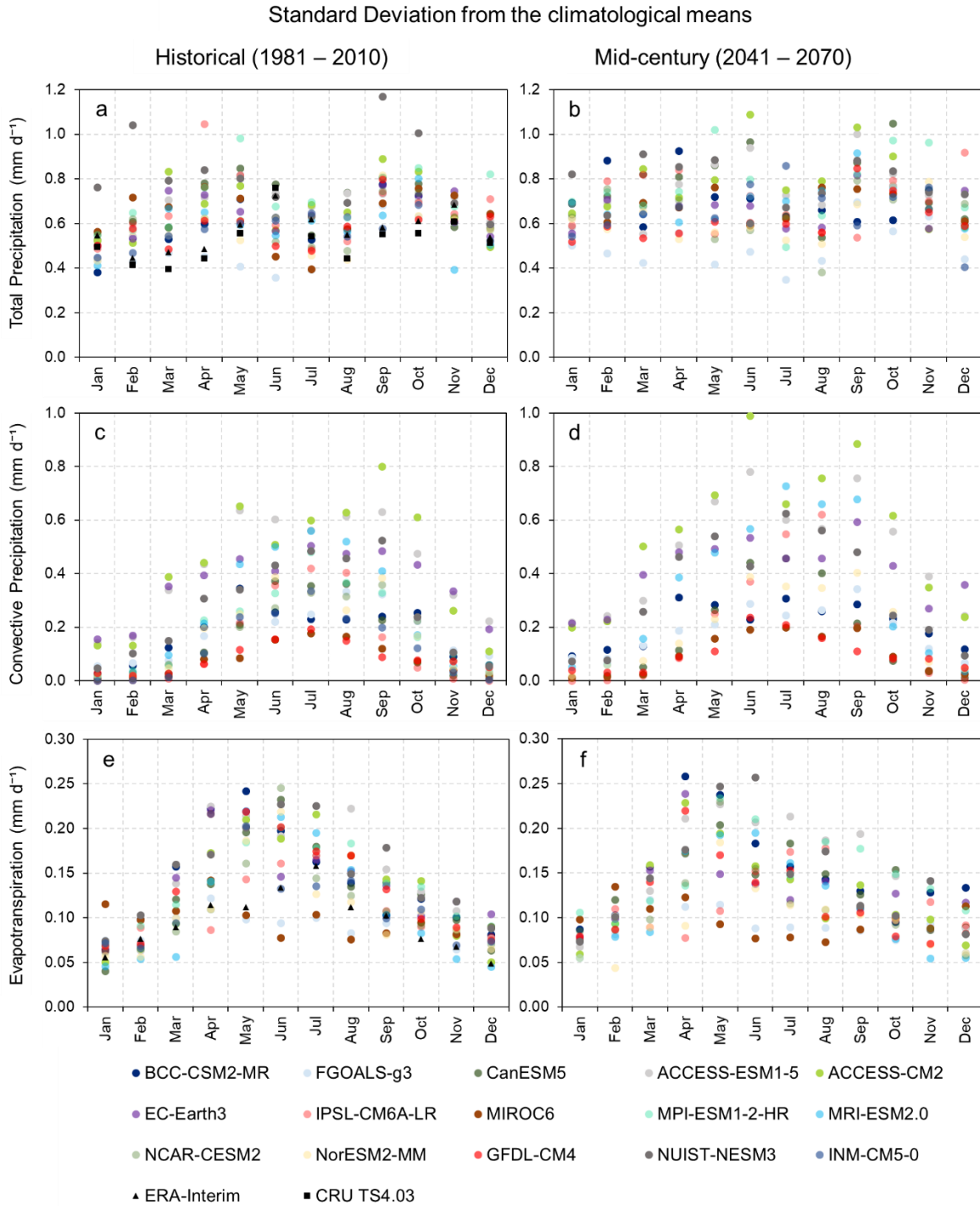


Figure S4: Standard deviation from the monthly climatology of total precipitation (top), convective precipitation (centre), and evapotranspiration (bottom) for the historical (left) and mid-century (right) periods. Units are in mm d^{-1} .

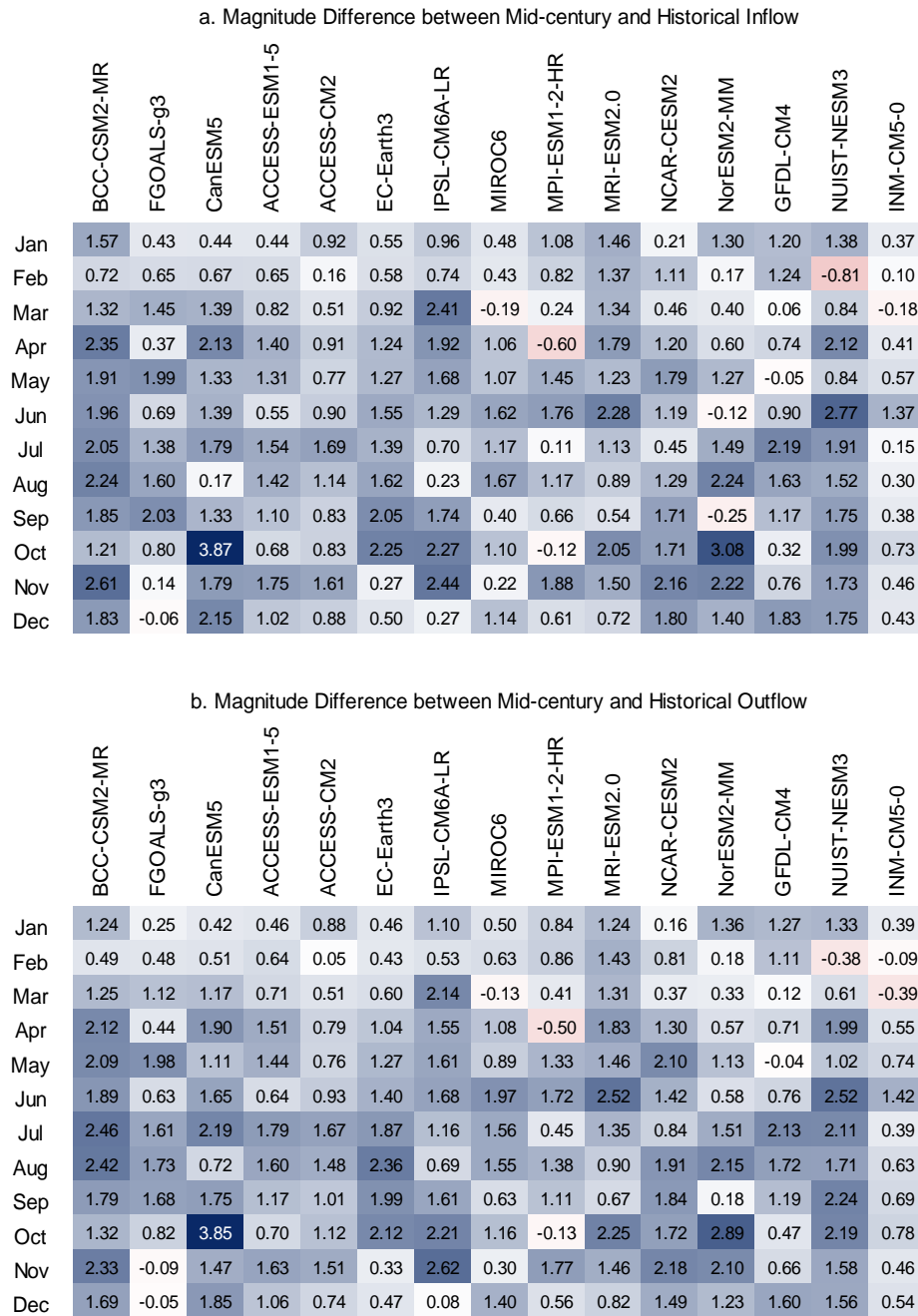


Figure S5: Difference in magnitude of total inflow (a) and outflow (b) between mid-century and historical values. Blue (red) colours indicate an increase (decrease) in mid-century magnitudes. All units are in mm d⁻¹.