Supplement to:

Sea Level Emulator Intercomparison Project (SLEIP) Phase 1: Assessing emulated multi-century global mean sea level projections

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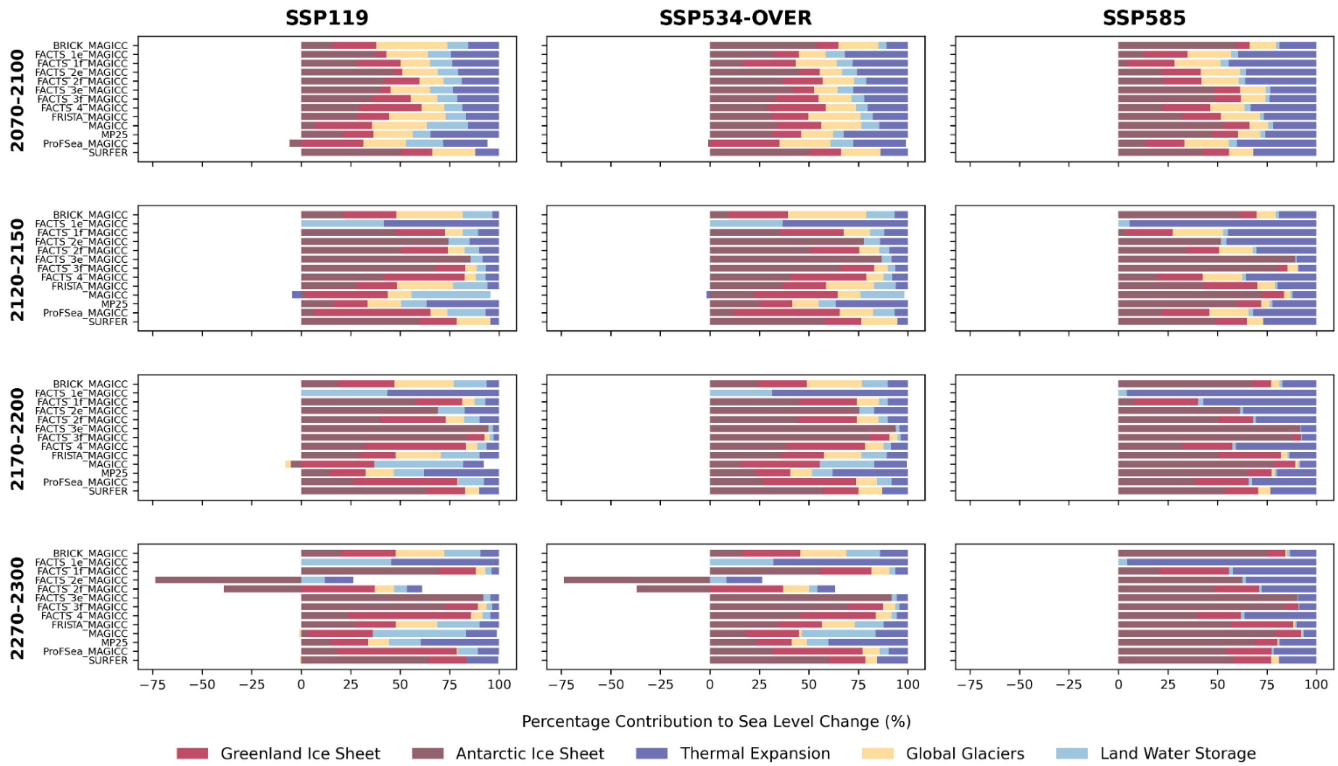

Figure S1. Relative component contributions to global mean sea-level rise per emulator for selected scenarios and time periods. Stacked bars show the percentage contribution of each sea level component to total GMSLR per emulator and time period. Panel rows correspond to four 30-year time periods (2070-2100, 2120-2150, 2170-2200, 2270-2300), columns to three selected scenarios (SSP1-1.9, SSP5-3.4-OS, SSP5-8.5). Negative contributions (bars extending left of zero) indicate components where the modelled response reduces total sea level rise in the respective period.

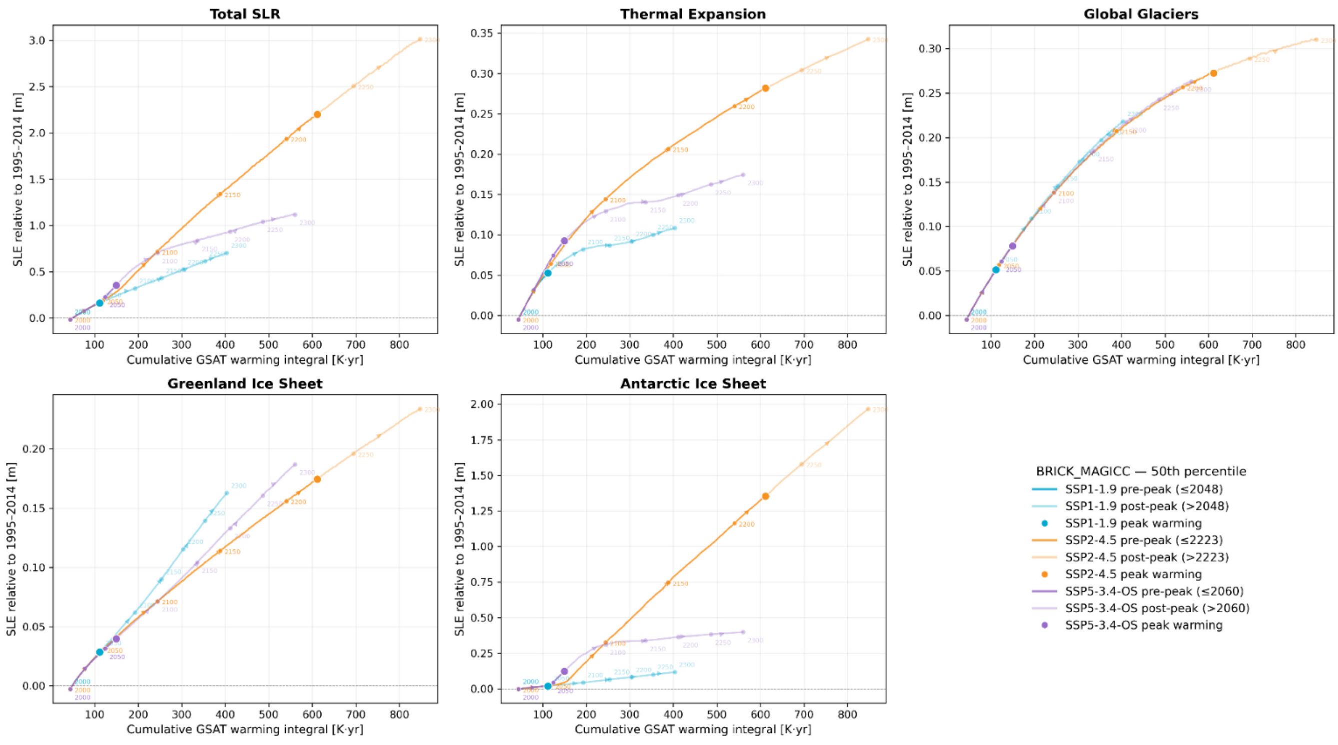

Figure S2. Cumulative GSAT warming integral versus component-wise sea level contributions for BRICK runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

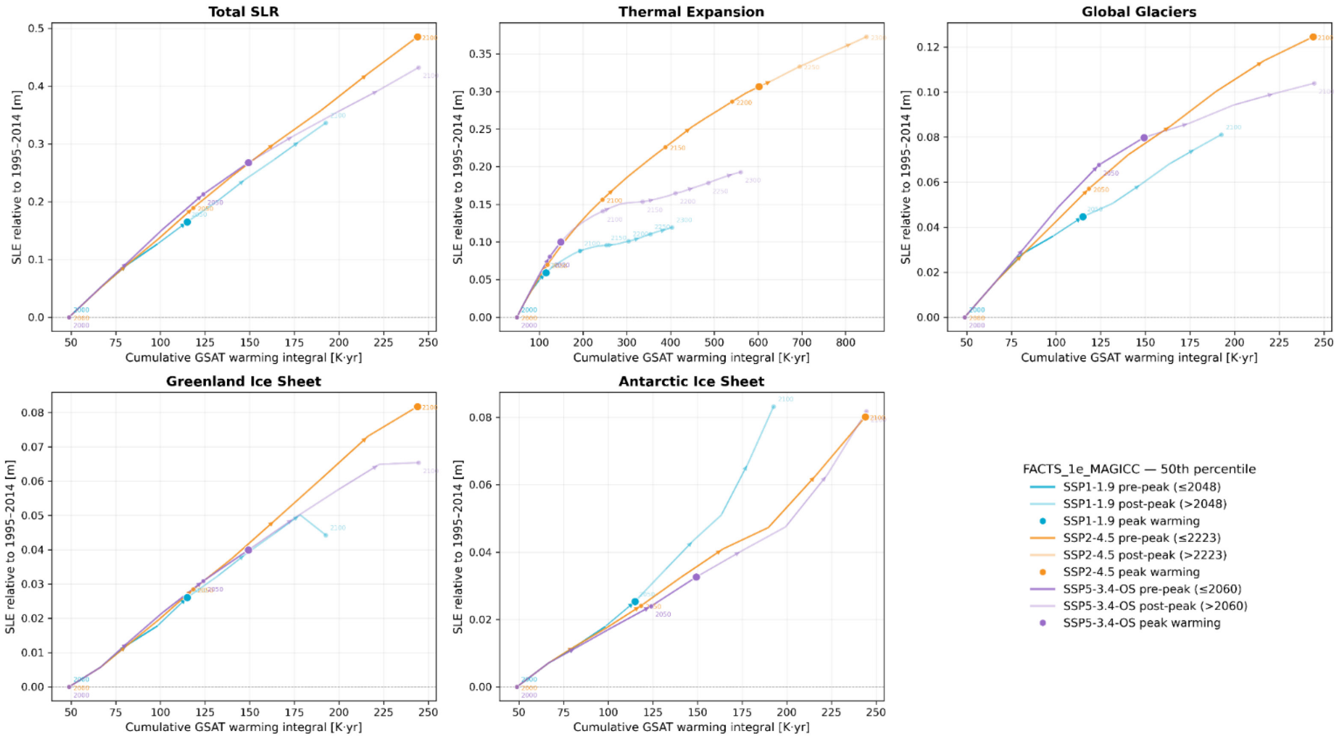

Figure S3. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 1e runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

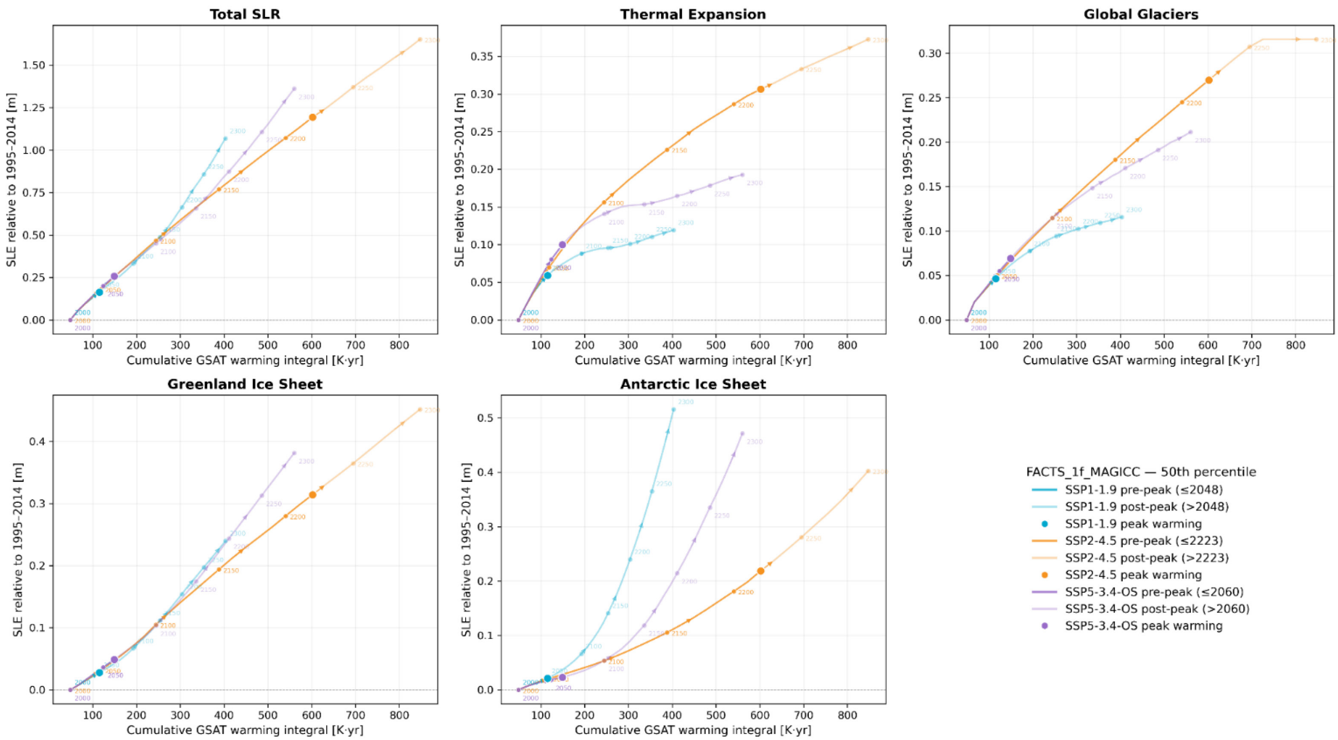

Figure S4. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 1f runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

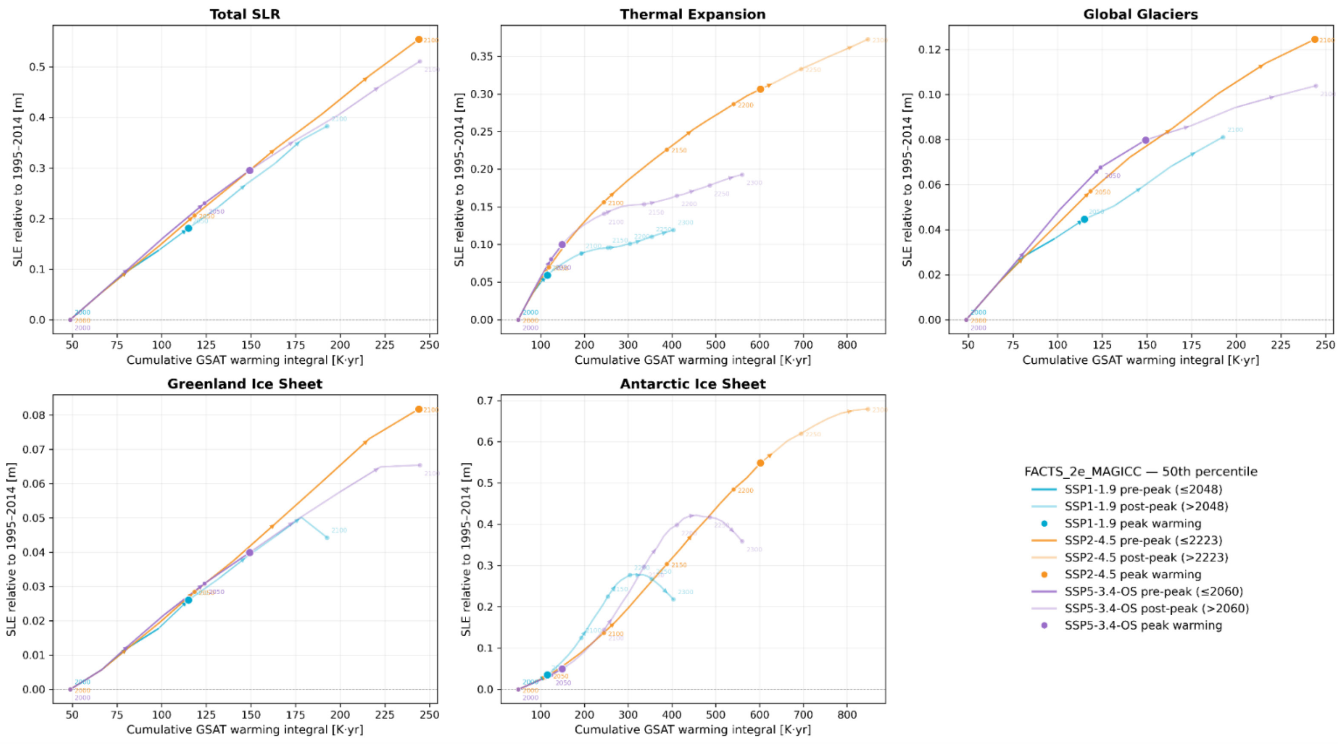

Figure S5. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 2e runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

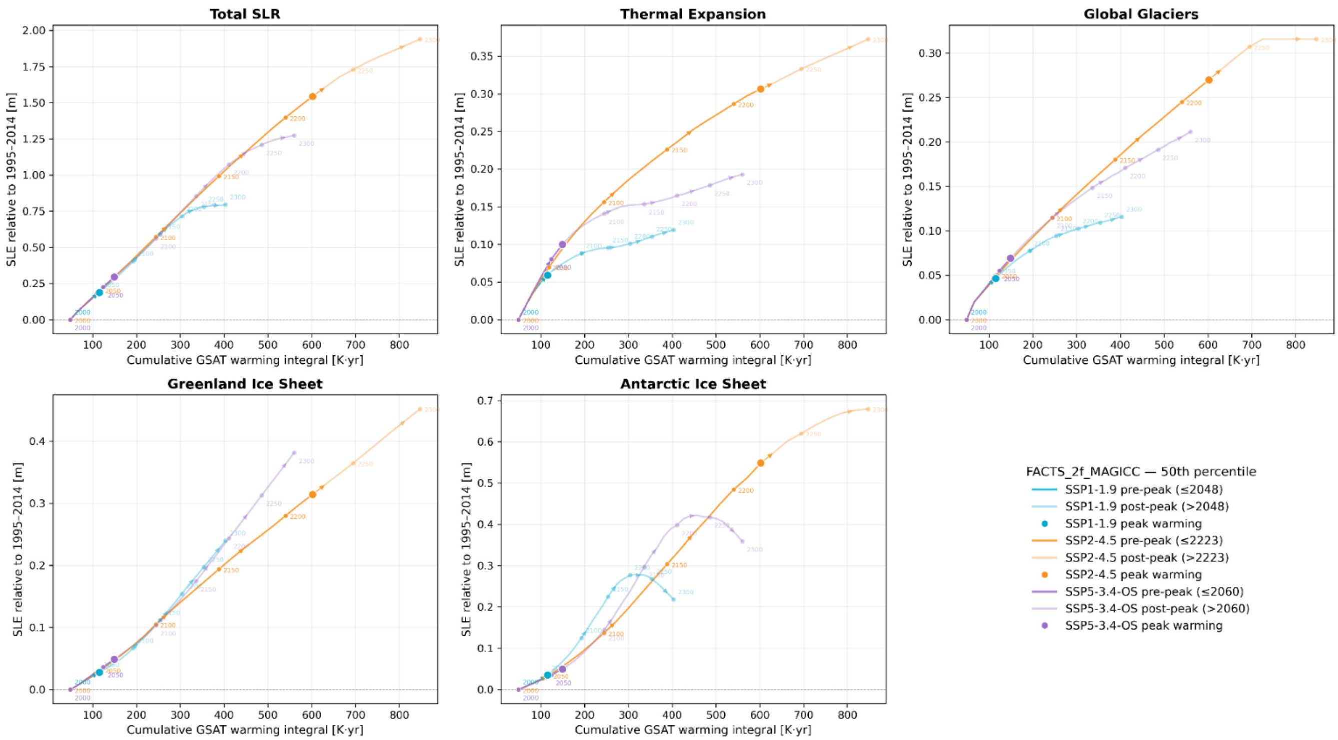

Figure S6. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 2f runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

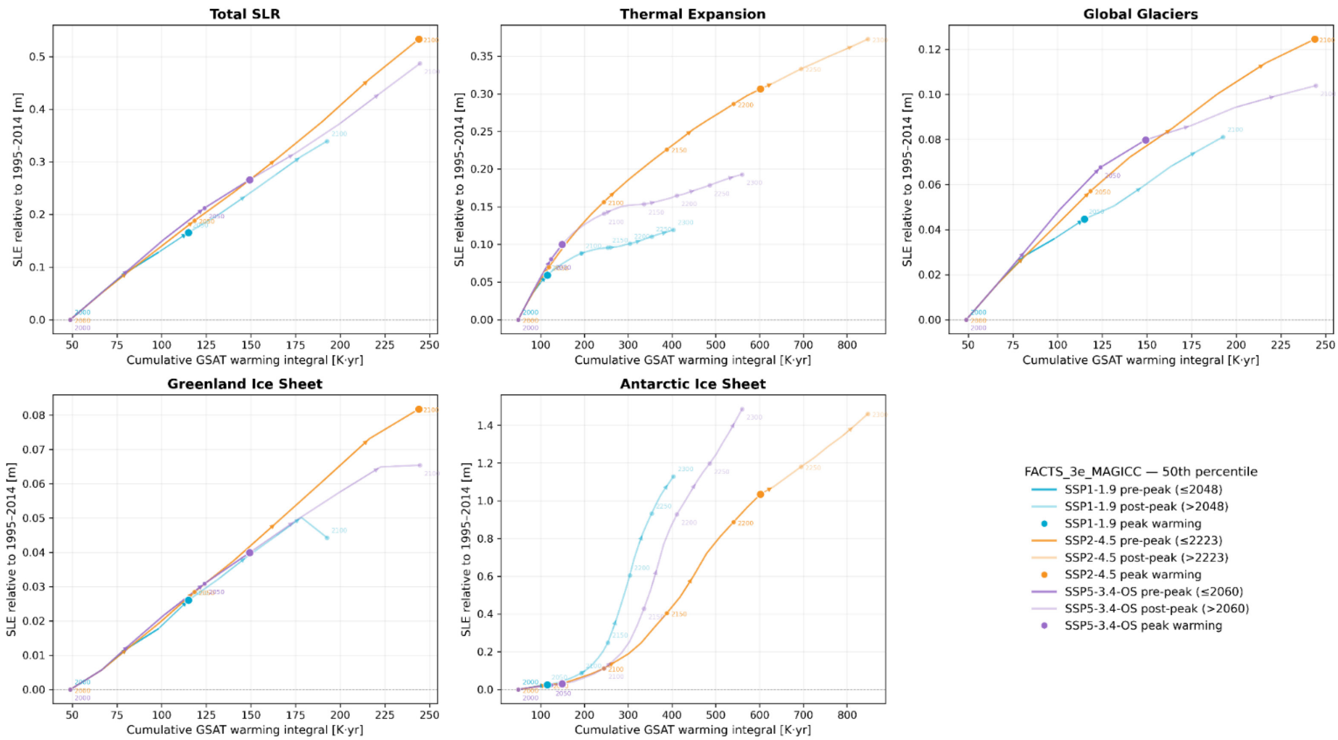

Figure S7. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 3e runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

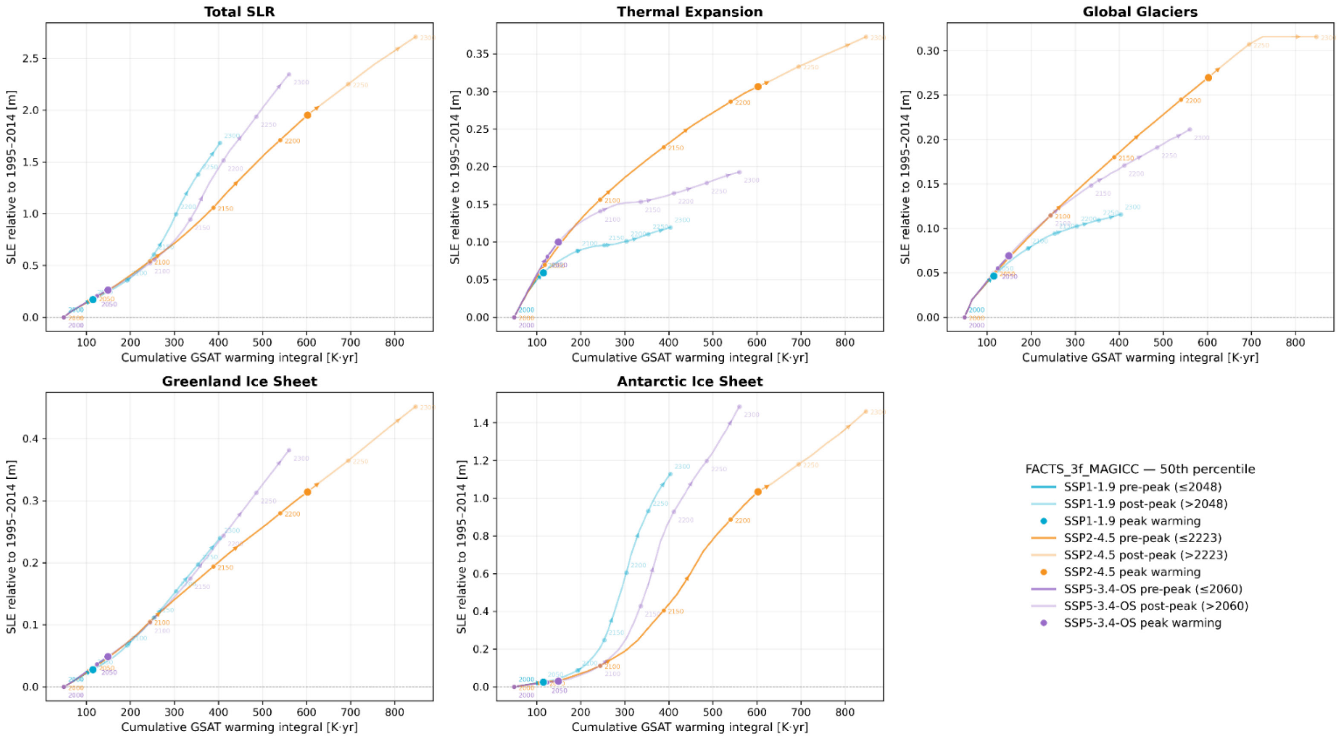

Figure S8. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 3f runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

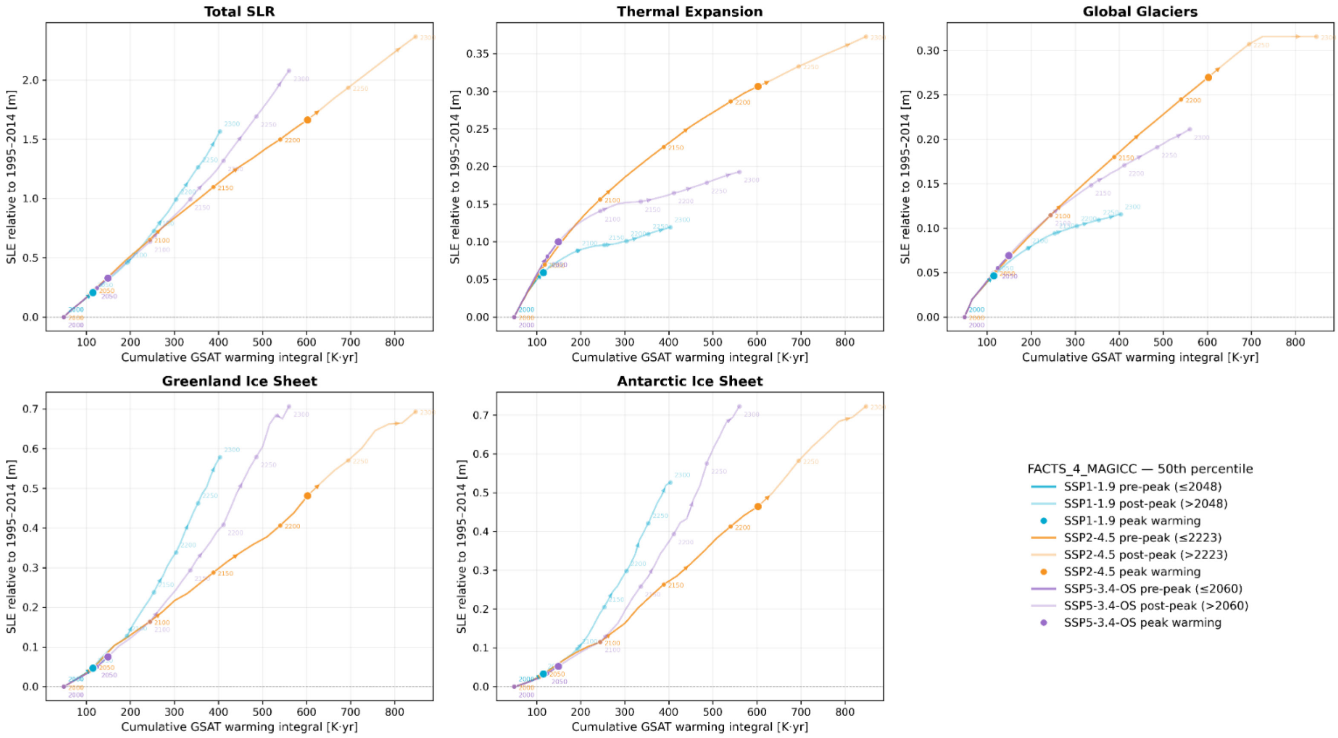

Figure S9. Cumulative GSAT warming integral versus component-wise sea level contributions for FACTS 4 runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

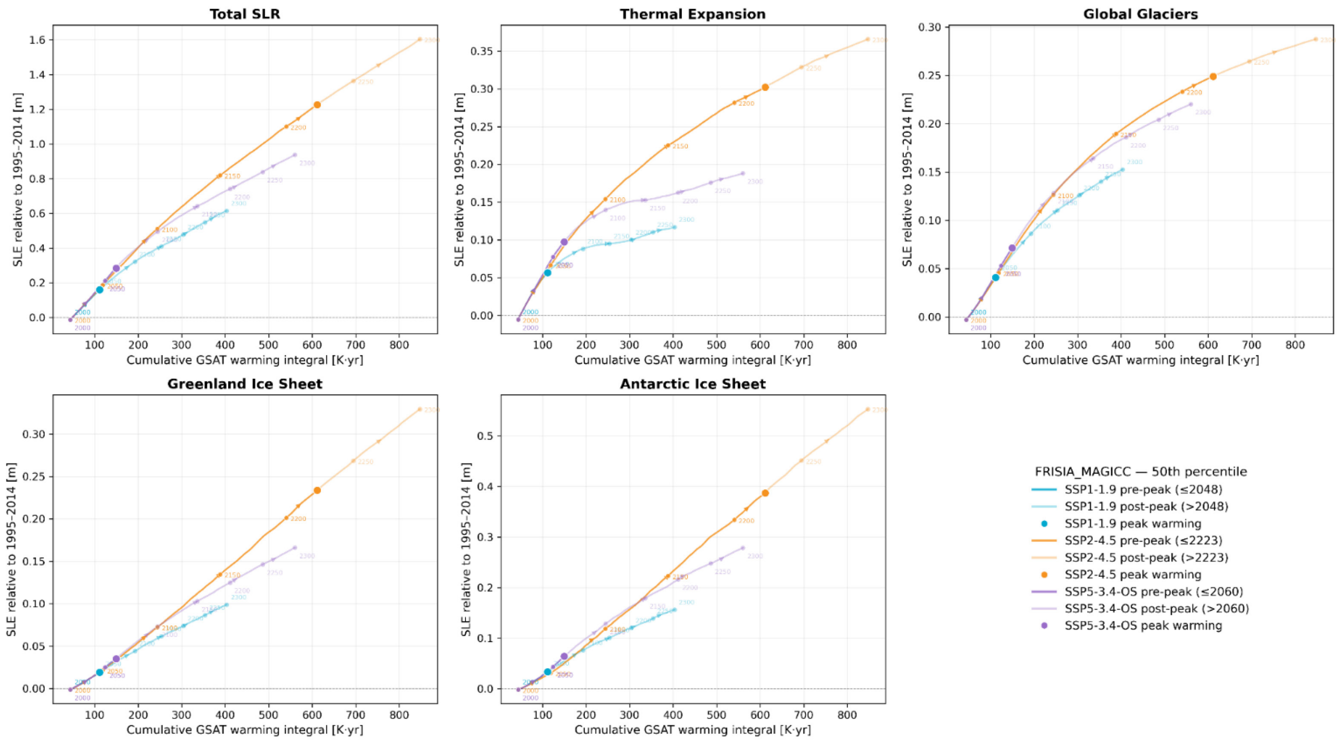

Figure S10. Cumulative GSAT warming integral versus component-wise sea level contributions for FRISIA runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

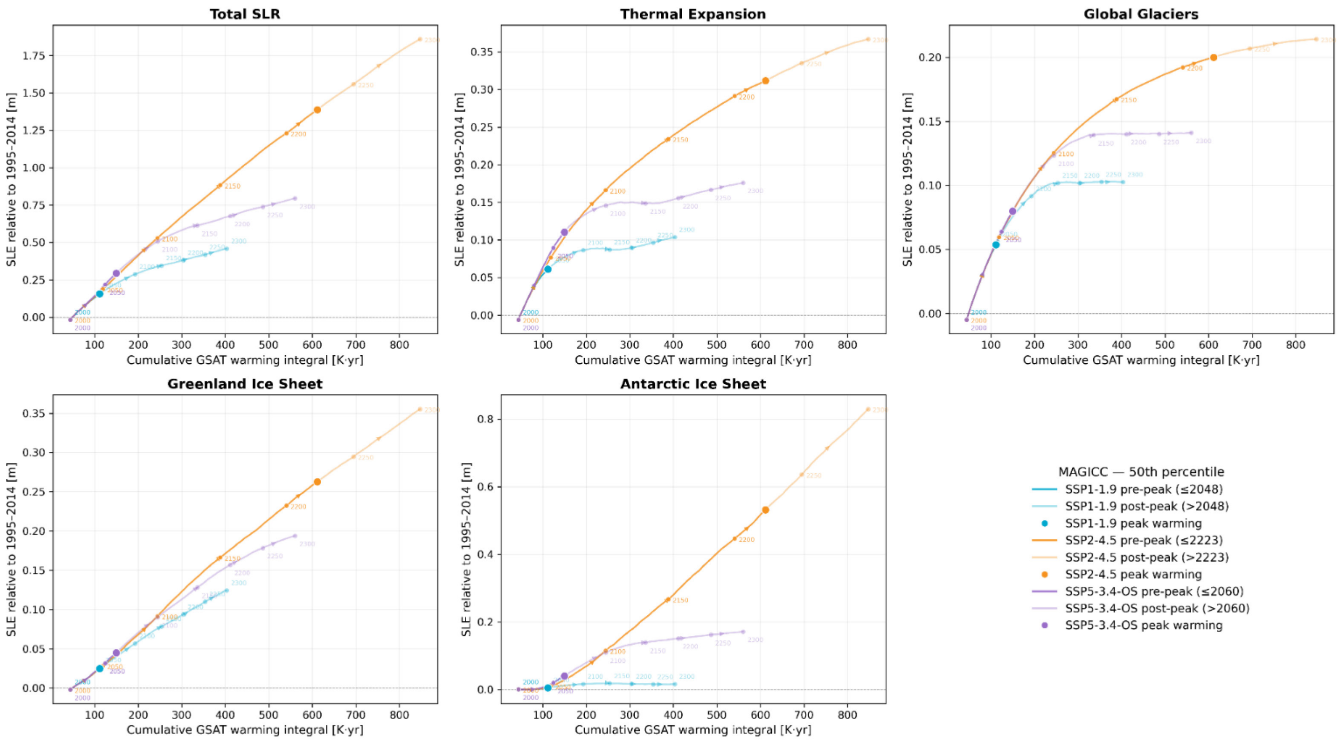

Figure S11. Cumulative GSAT warming integral versus component-wise sea level contributions for MAGICC runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

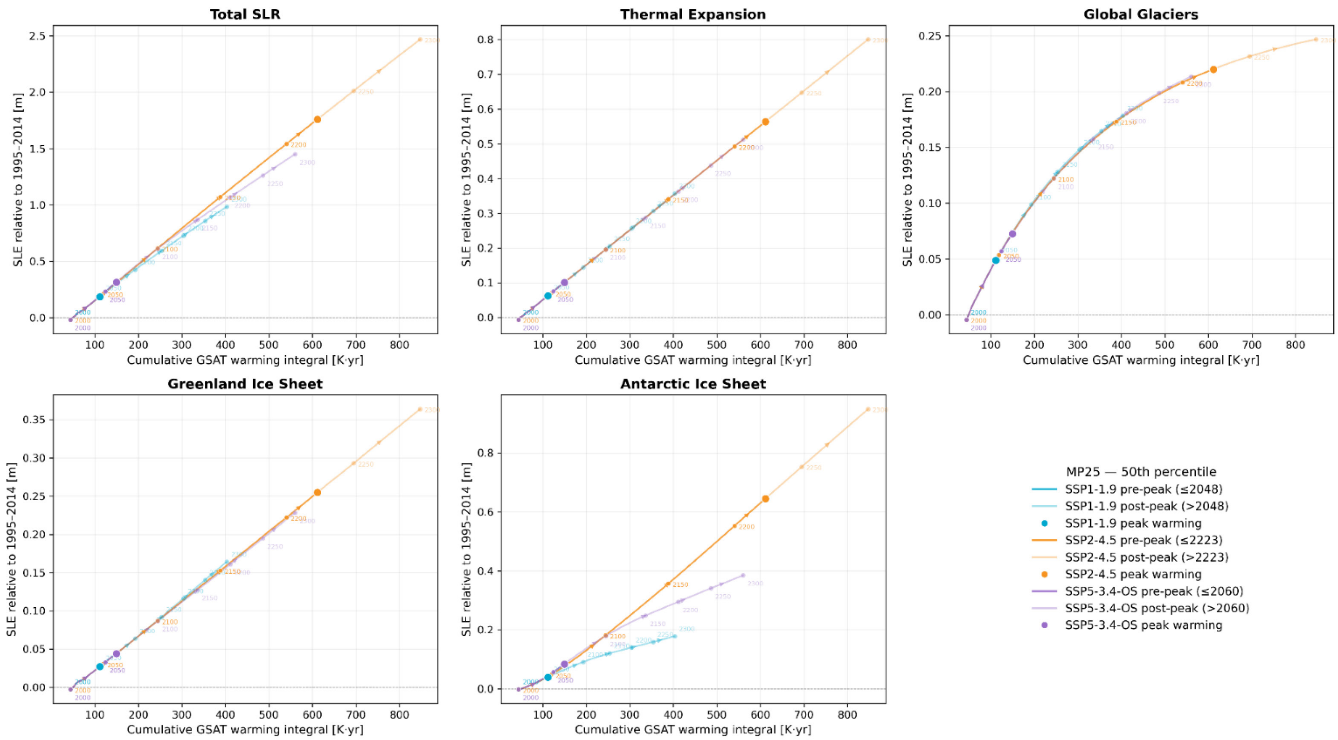

Figure S12. Cumulative GSAT warming integral versus component-wise sea level contributions for MP25 runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

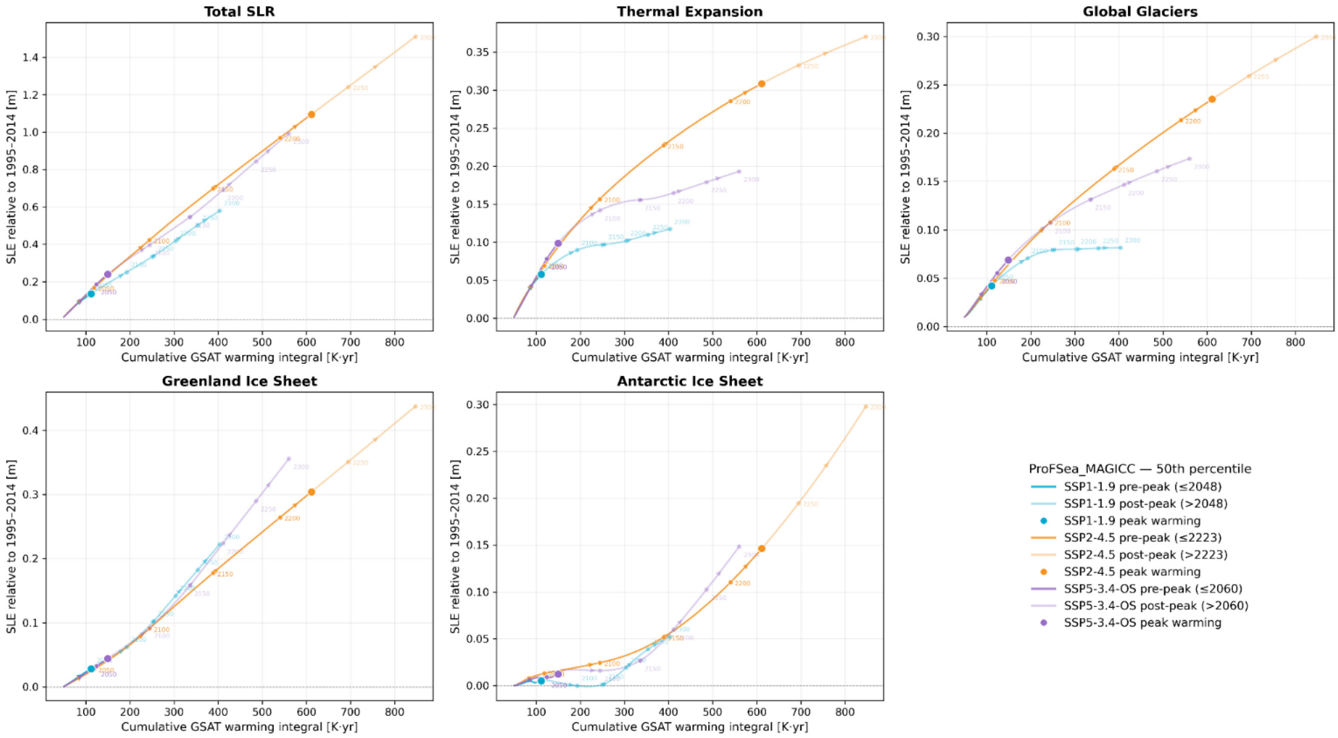

Figure S13. Cumulative GSAT warming integral versus component-wise sea level contributions for ProFSea runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

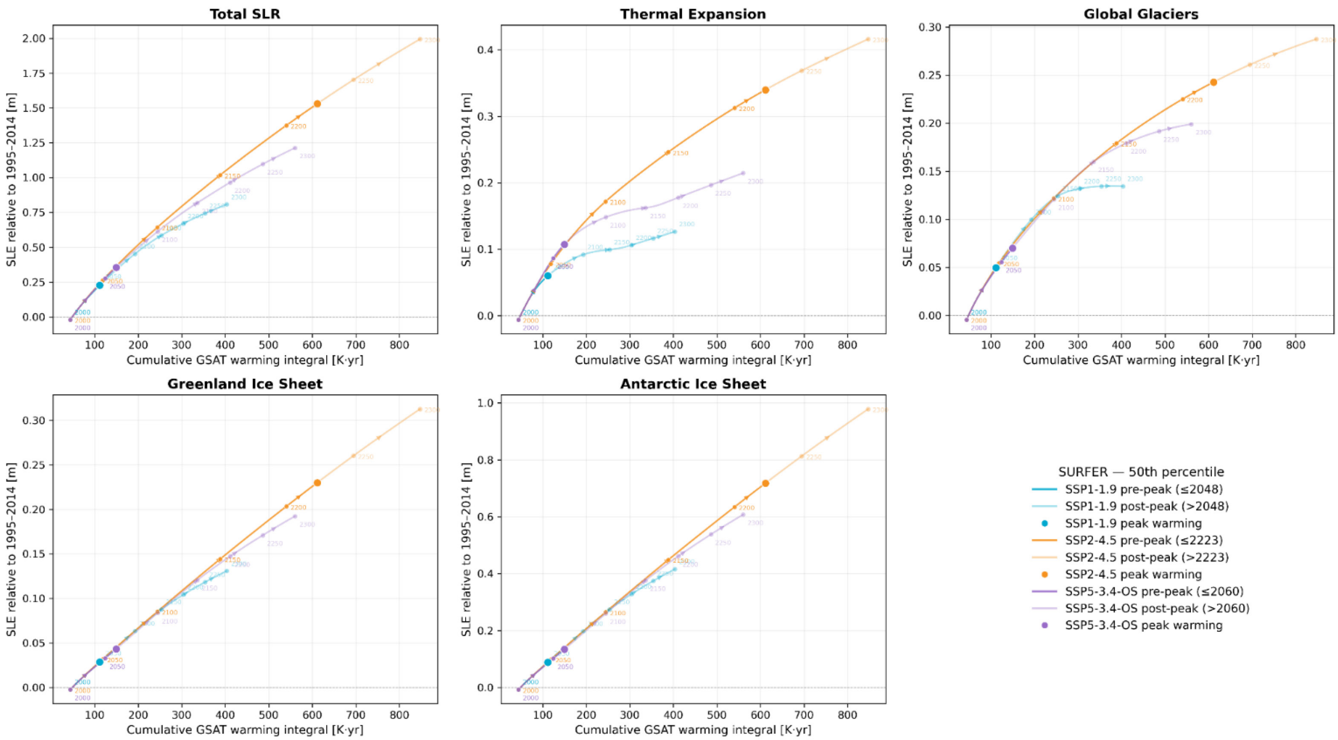

Figure S14. Cumulative GSAT warming integral versus component-wise sea level contributions for SURFER runs across selected scenarios. Cumulative MAGICC GSAT warming integral (∫ GMT dt from 1850 up to the year 2300 for of each data point, [K·yr]) against sea level equivalent (SLE, relative to 1995–2014) for climate-forcing sensitive SLR components across SSP1-1.9, SSP5-3.4-OS, and SSP2-4.5 scenarios. Each line represents the 50th percentile emulator response, with colours denoting individual models as indicated in the legend. Peak warming is indicated with a circle, post-peak GSAT change is plotted with less opacity, 50-year time increments are indicated to include information on temporal evolution.

Table S1. Ensemble p-box GMSLR projections derived from native SLEIP runs across six SSP-RCP scenarios for the year 2100, relative to 1995-2014. For each scenario and component, the lower bound reflects the minimum 17th percentile across models, the upper bound reflects the maximum 83rd percentile, and the central estimate represents the mean of model medians (50th percentile). All sea level equivalent contributions are provided in meters.

2100 native SLEIP projections
p-box: mean p50 (min p17 - max p83); relative to 1995-2014 in meters
*low confidence projections

Component	SSP1-1.9	SSP1-2.6	SSP5-3.4-OS	SSP2-4.5	SSP3-7.0	SSP5-8.5
Thermal expansion	0.11 (0.06-0.18)	0.13 (0.08-0.21)	0.16 (0.11-0.24)	0.18 (0.13-0.27)	0.24 (0.15-0.33)	0.28 (0.17-0.42)
Global glaciers	0.08 (0.05-0.12)	0.10 (0.05-0.14)	0.11 (0.06-0.16)	0.12 (0.06-0.16)	0.14 (0.06-0.18)	0.16 (0.08-0.22)
Greenland Ice Sheet	0.07 (-0.00-0.32)	0.08 (0.01-0.35)	0.09 (0.02-0.45)	0.10 (0.04-0.45)	0.12 (0.05-0.53)	0.14 (0.08-0.58)
Antarctic Ice Sheet	0.08 (-0.02-0.26)	0.09 (-0.01-0.29)	0.11 (-0.02-0.39)	0.11 (-0.02-0.40)	0.15 (-0.03-0.46)	0.19 (-0.04-0.67)
Land water storage	0.03 (0.01-0.05)	0.03 (0.01-0.05)	0.03 (0.01-0.05)	0.03 (0.01-0.05)	0.03 (0.01-0.05)	0.03 (0.01-0.05)
Total	0.38 (0.20-0.79)	0.43 (0.25-0.87)	0.52 (0.32-1.11)	0.55 (0.33-1.14)	0.70 (0.37-1.39)	0.82 (0.50-1.56)
IPCC AR6 Total	0.38 (0.28-0.55)	0.44 (0.32-0.62) 0.45 (0.32-0.79)*	-	0.56 (0.44-0.76)	0.68 (0.55-0.90)	0.77 (0.63-1.01) 0.88 (0.63-1.60)*

Table S2: Ensemble p-box GMSLR projections derived from native SLEIP runs across six SSP-RCP scenarios for the year 2150, relative to 1995-2014. For each scenario and component, the lower bound reflects the minimum 17th percentile across models, the upper bound reflects the maximum 83rd percentile, and the central estimate represents the mean of model medians (50th percentile). All sea level equivalent contributions are provided in meters.

2150 native SLEIP projections
p-box: mean p50 (min p17 - max p83); relative to 1995-2014 in meters
*low confidence projections

Component	SSP1-1.9	SSP1-2.6	SSP5-3.4-OS	SSP2-4.5	SSP3-7.0	SSP5-8.5
Thermal expansion	0.12 (0.06-0.22)	0.16 (0.09-0.27)	0.18 (0.11-0.30)	0.27 (0.17-0.40)	0.42 (0.27-0.60)	0.51 (0.32-0.77)
Global glaciers	0.11 (0.05-0.16)	0.13 (0.06-0.19)	0.15 (0.07-0.22)	0.18 (0.09-0.26)	0.22 (0.11-0.32)	0.25 (0.13-0.32)
Greenland Ice Sheet	0.12 (0.04-0.61)	0.13 (0.05-0.64)	0.16 (0.06-0.78)	0.18 (0.08-0.79)	0.25 (0.12-0.91)	0.30 (0.16-0.97)
Antarctic Ice Sheet	0.15 (-0.04-0.54)	0.17 (-0.02-0.58)	0.21 (-0.03-2.10)	0.25 (-0.05-2.12)	0.54 (-0.08-3.02)	0.73 (-0.10-3.60)
Land water storage	0.05 (0.02-0.08)	0.05 (0.02-0.08)	0.05 (0.02-0.08)	0.05 (0.02-0.08)	0.06 (0.02-0.09)	0.05 (0.02-0.08)
Total	0.54 (0.26-1.33)	0.66 (0.34-1.50)	0.77 (0.42-2.73)	0.94 (0.52-2.94)	1.51 (0.73-4.09)	1.87 (0.92-4.66)
IPCC AR6 Total	0.57 (0.37–0.86)	0.68 (0.46–0.99) 0.73 (0.46-1.34)*	-	0.92 (0.66–1.33)	1.19 (0.89–1.65)	1.32 (0.98–1.88) 1.98 (0.98–4.82)*

Table S3. Ensemble p-box GMSLR projections derived from native SLEIP runs across six SSP-RCP scenarios for the year 2300, relative to 1995-2014. For each scenario and component, the lower bound reflects the minimum 17th percentile across models, the upper bound reflects the maximum 83rd percentile, and the central estimate represents the mean of model medians (50th percentile). All sea level equivalent contributions are provided in meters.

2300 native SLEIP projections
p-box: mean p50 (min p17 - max p83); relative to 1995-2014 in meters
*17th to 83rd percentile of the associated probability distributions, +including Marine Ice Cliff Instability (MICI)

Component	SSP1-1.9	SSP1-2.6	SSP5-3.4-OS	SSP2-4.5	SSP3-7.0	SSP5-8.5
Thermal expansion	0.15 (0.05-0.29)	0.22 (0.09-0.40)	0.22 (0.09-0.38)	0.43 (0.20-0.68)	0.87 (0.43-1.29)	1.04 (0.52-1.60)
Global glaciers	0.13 (0.05-0.26)	0.18 (0.09-0.31)	0.19 (0.09-0.32)	0.28 (0.15-0.32)	0.32 (0.24-0.37)	0.32 (0.26-0.38)
Greenland Ice Sheet	0.23 (0.07-1.36)	0.28 (0.10-1.42)	0.32 (0.11-1.72)	0.42 (0.21-1.77)	0.72 (0.32-2.06)	0.92 (0.37-3.71)
Antarctic Ice Sheet	0.39 (-0.13-1.64)	0.46 (-0.10-1.82)	0.52 (-0.11-8.76)	0.74 (-0.19-8.81)	2.35 (-0.33-12.14)	2.97 (-0.40-13.49)
Land water storage	0.08 (0.03-0.15)	0.08 (0.03-0.15)	0.08 (0.03-0.15)	0.10 (0.03-0.15)	0.13 (0.03-0.31)	0.08 (0.03-0.15)
Total	1.00 (0.31-3.20)	1.26 (0.47-3.56)	1.40 (0.56-9.82)	2.02 (1.05-10.53)	4.46 (1.64-14.39)	5.45 (1.74-15.79)
IPCC AR6 Total	-	0.6 to 1.5* 1.4 to 2.1*+	-	-	-	2.2 to 5.9* 9.5 to 16.2*+