*Figure 1A: Temporal evolution of a) temperature and b) precipitation over the historical period for the different ensemble members. The solid orange line depicts the simulation used in the study. The thick red line shows the ensemble mean of all simulations from r1i1p1 to r4i1p1.*
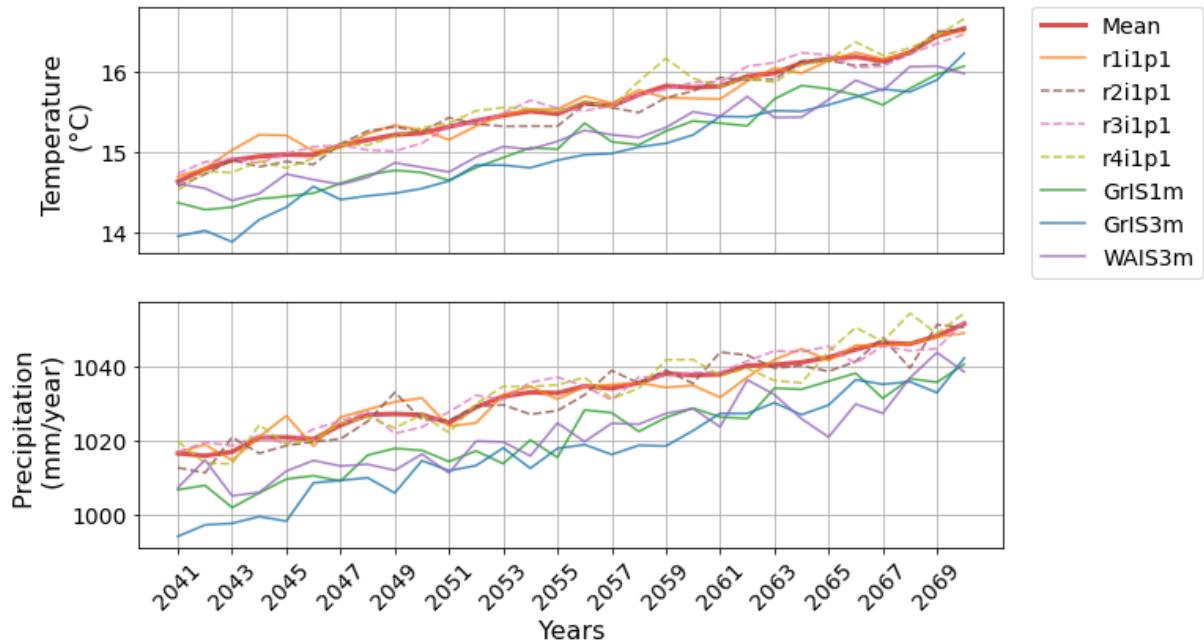
*Figure 1B: Temporal evolution of a) temperature and b) precipitation over the future period for the different RCP8.5 runs (r1i1p1, r2i1p1, r3i1p1, r4i1p1) and for the different ice melt simulations (GrIS1m, GrIS3m, WAIS3m). The solid orange line depicts the simulation used in the study. The thick red line shows the ensemble mean of all RCP8.5 simulations from r1i1p1 to r4i1p1.*
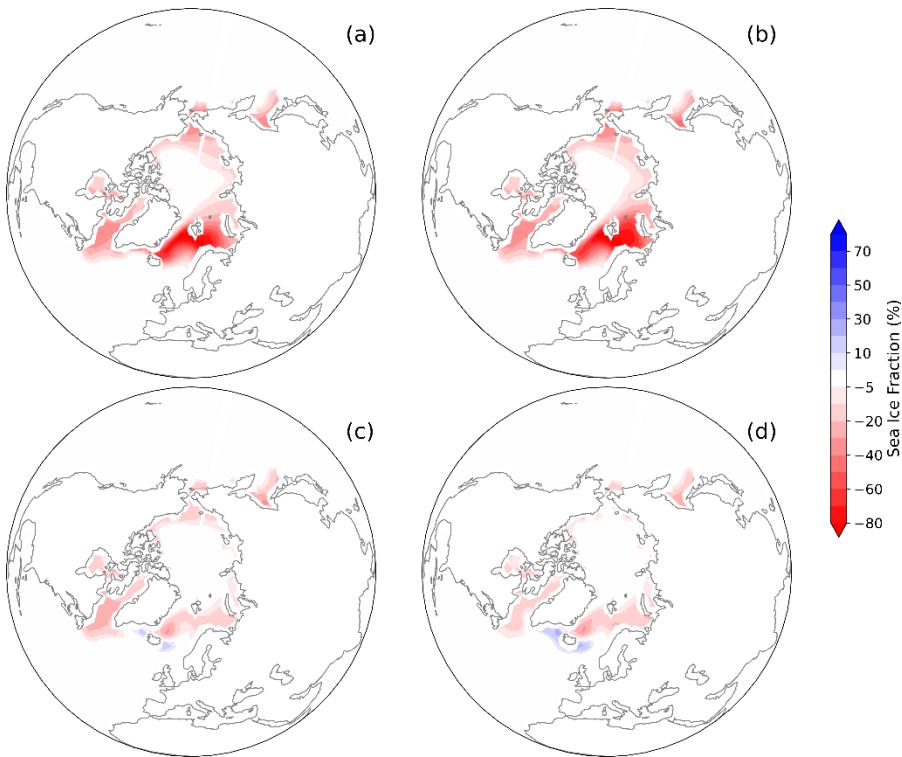
*Figure 1C: Sea ice fraction difference (%) between future scenario (2041-2070) a) RCP8.5 b) WAIS3m c) GrIS1m d) GrIS3m and historical simulation (1976-2005) for the Northern Hemisphere in NDJFM.*
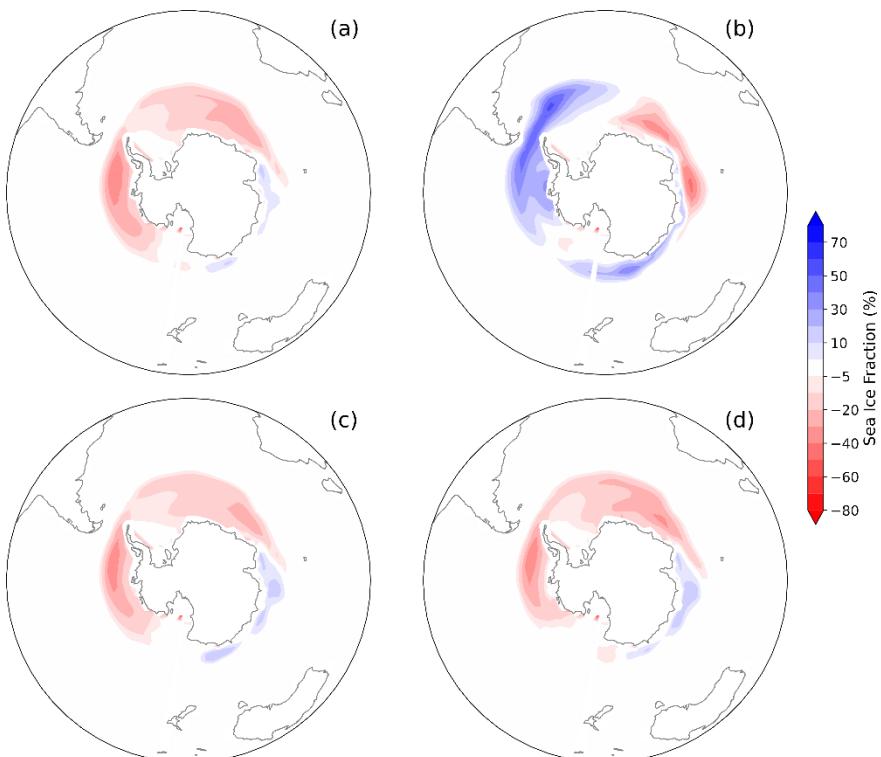
*Figure 1D: Sea ice fraction difference (%) between future scenario (2041-2070) a) RCP8.5 b) WAIS3m c) GrIS1m d) GrIS3m and historical simulation (1976-2005) for the Southern Hemisphere in MJJAS.*
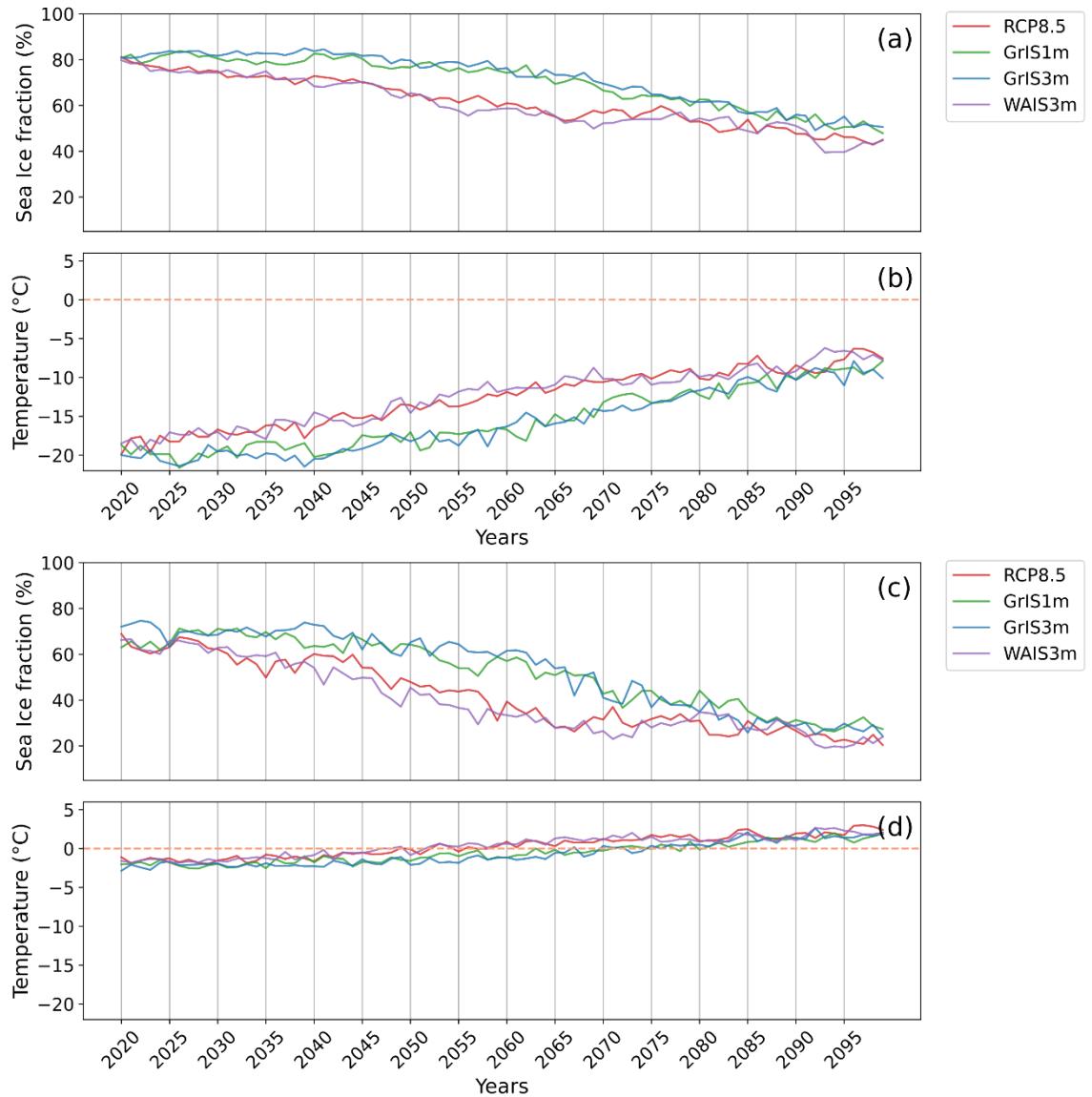
*Figure 1E: Temporal evolution of a-c) sea ice fraction (%) and b-d) temperature (°C) in the Northern Hemisphere for a-b) NDJFM and c-d) MJJAS. The orange dotted line represents the 0°C isotherm.*
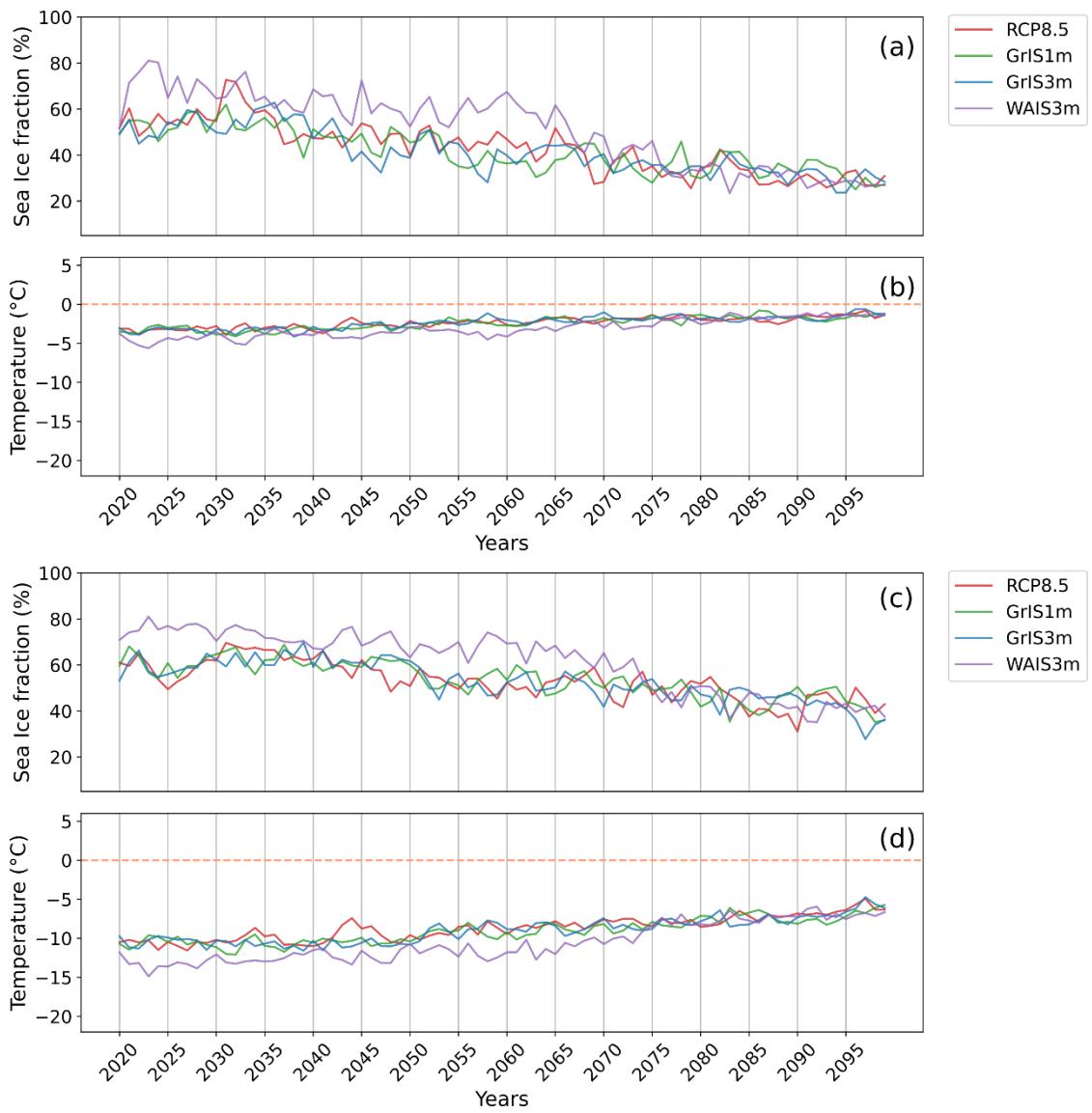
*Figure 1F: Temporal evolution of a-c) sea ice fraction (%) and b-d) temperature (°C) in the Southern Hemisphere for a-b) NDJFM and c-d) MJJAS. The orange dotted line represents the 0°C isotherm.*