

**Figure S1.** The seasonal cycle of the model simulated monthly precipitation from the Community Earth System Model-Last Millennium Ensemble (CESM-LME).

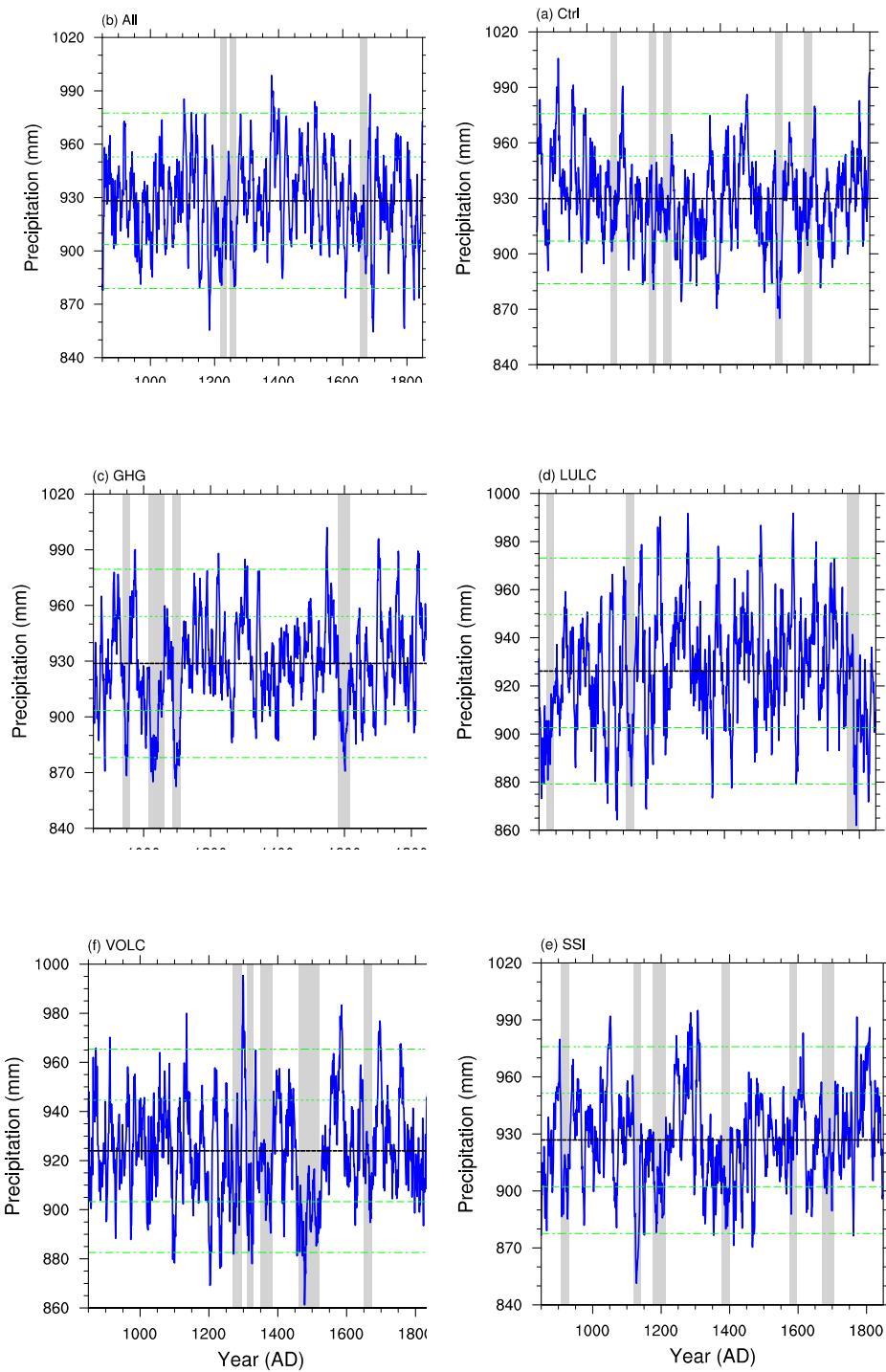
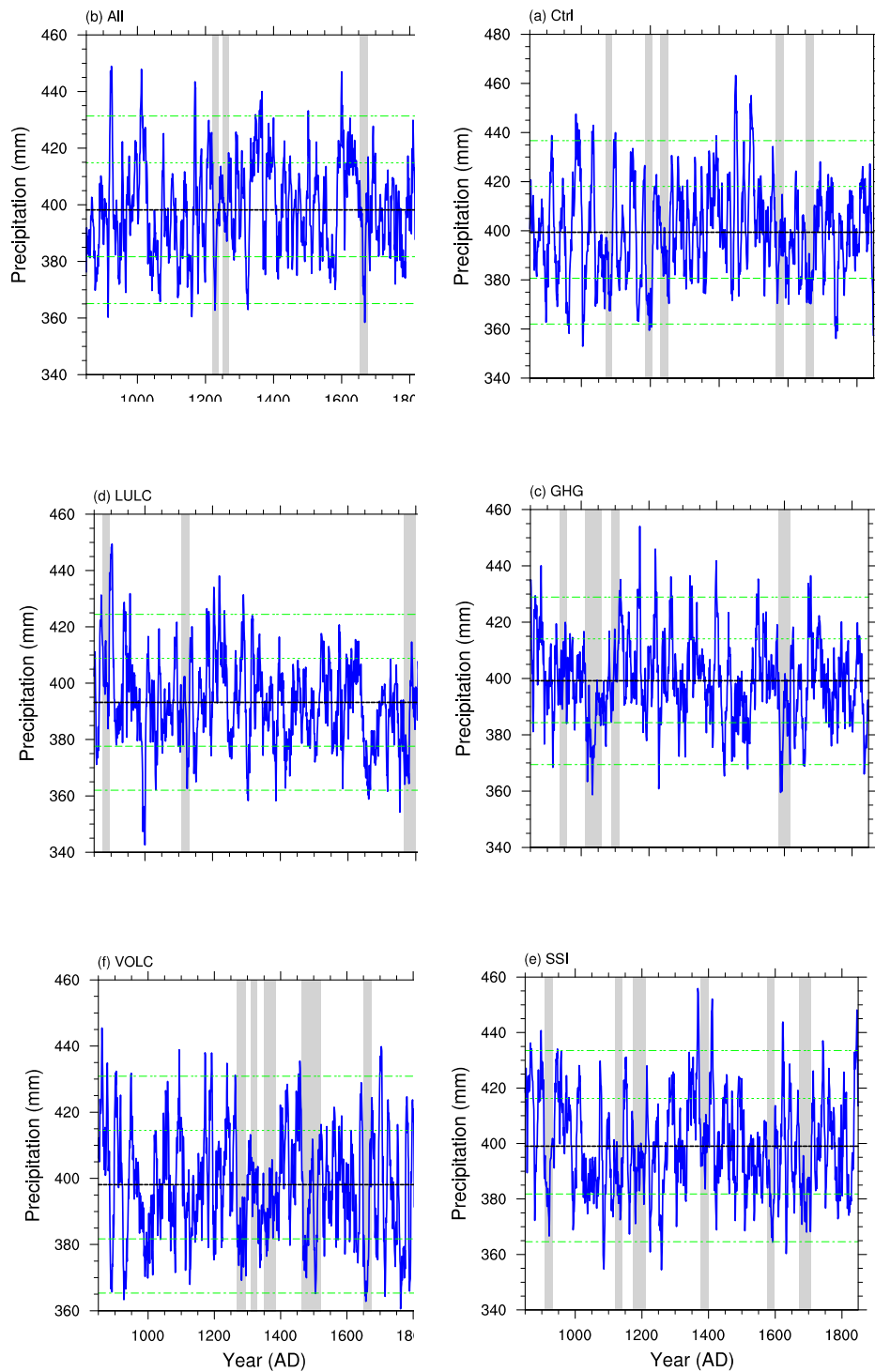


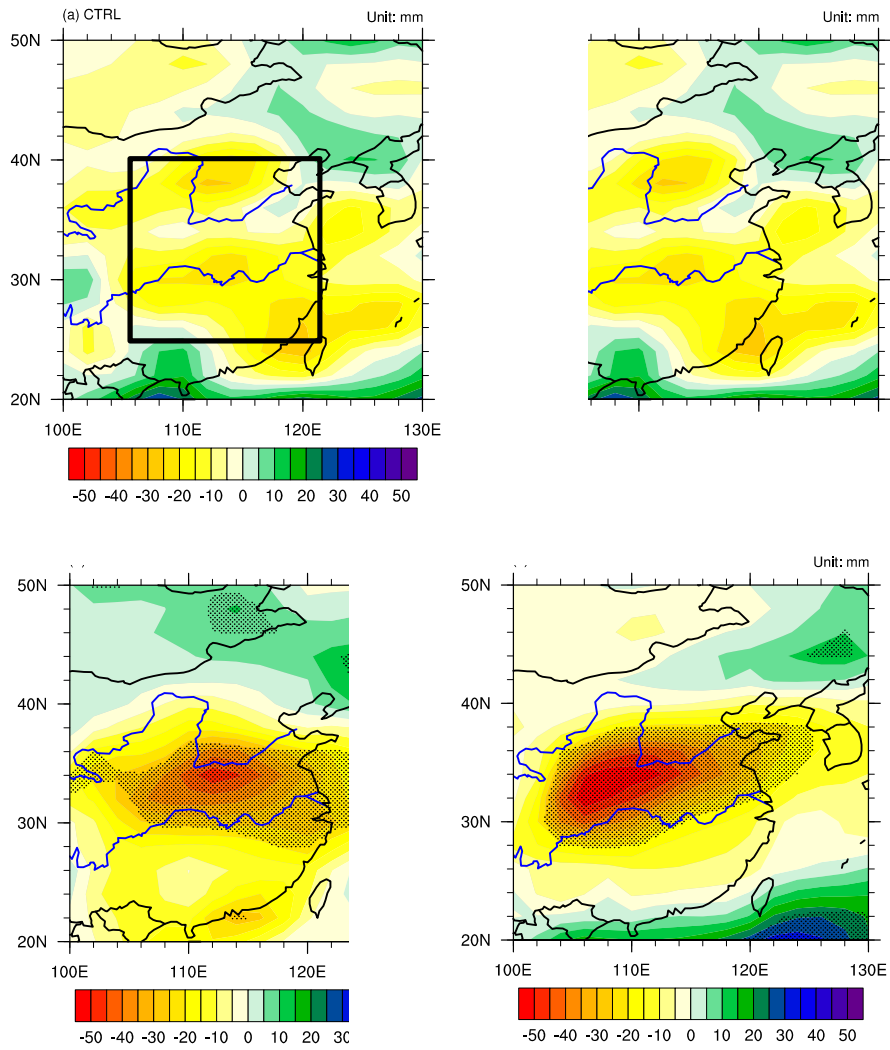
Figure 1. Annual precipitation averaged over eastern China from the control (CTRL) run (a, unit: mm/season), the first member of the all-forcing (ALL) experiment (b, unit: mm/season), greenhouse gases (GHGs) experiment (c, unit: mm/season), land use and land cover (LULC) experiment (d, unit: mm/season), spectral solar irradiance (SSI) experiment (e, unit: mm/season), and volcanic eruption (VOLC)

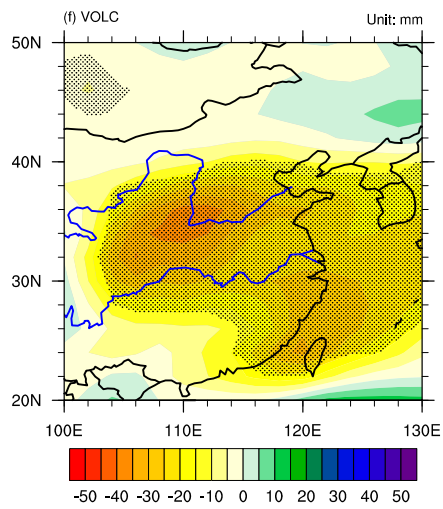


**F**

precipitation averaged over eastern China from the control (CTRL) run (a, unit: mm/season), the first member of the all-forcing (ALL) experiment (b, unit: mm/season), greenhouse gases (GHGs)

experiment (c, unit: mm/season), land use and land cover (LULC) experiment (d, unit: mm/season), spectral solar irradiance (SSI) experiment (e, unit: mm/season), and volcanic eruption (VOLC) experiment (f, unit: mm/season) with megadroughts highlighted in gray. The black solid lines





er monsoon (EASM) precipitation anomalies over eastern China (unit: mm) from the long-term means of the control (CTRL) run (a), all-forcing (ALL) runs (b), greenhouse gas (GHG) runs (c), land use and land cover (LULC) runs (d), spectral solar irradiance (SSI) runs (e), and volcanic eruption (VOLC) runs (d). Stippling indicates differences significant at the  $p=0.05$  level based on a t-test. The black rectangle indicates the location of the study region. The blue lines indicate the locations of Yellow River (upper one) and Yangtze River (bottom one).