

5.3 Discussion of Results- GHGs and Climate Variability

5.3.1 Beijing

The GHG emissions of Beijing was 7.5 MtCO_{2e} in 1975, that escalated to 16.5 MtCO_{2e} in 1990 and 77.8 MtCO_{2e} in 2015. A majority of the GHG emissions in 2015 (Figure 5.1, top) were contributed by the industry sector (45%) and energy sector (28%), followed by transport sector (15%) and residential sector (12%). As per the ICLAP model estimates (Figure 5.1, below), there would be an increase in emissions at 6% per annum, leading to 92.3 MtCO_{2e} in 2030 and 122.8 MtCO_{2e} in 2050.

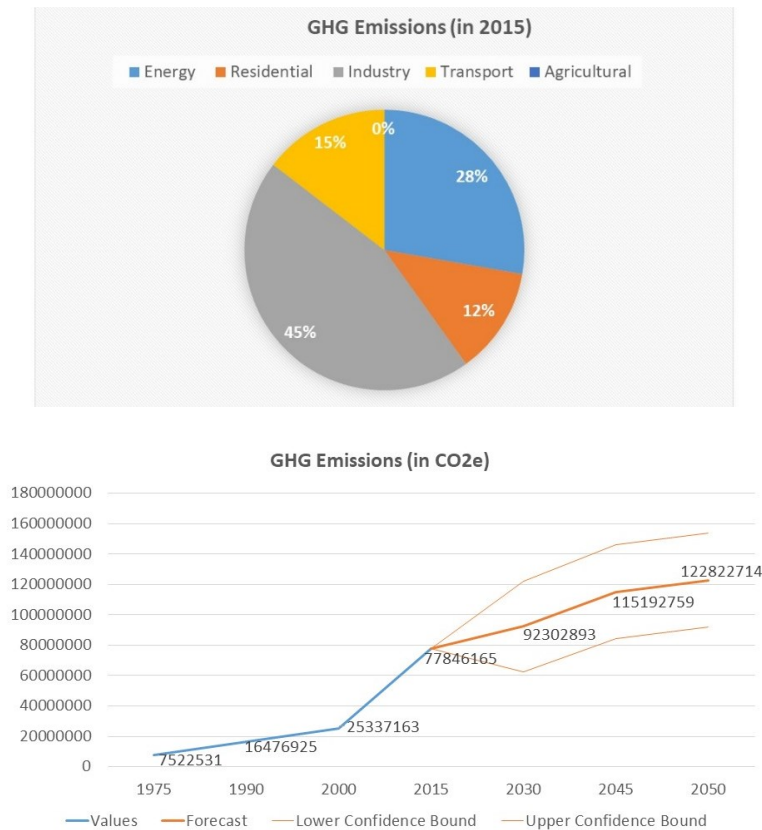


Figure 5.1: GHG contributions from different sectors in Beijing (top); ICLAP model estimates for Beijing's GHG emissions till 2050 (bottom)

The results for climate variability in Beijing indicate that depending on the emission scenarios, there would be a temperature increase of 1.5–4.3 degC from 2030-80s (Figure 5.2, top). The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 1.5 degC during 2030s (above the 1980 baseline temperature), 1.8 degC in 2050s, peaking to 2.5 degC during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.2 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 1.7 degC during 2030s (above the 1980 baseline temperature), 2.8 degC in 2050s further rising sharply to 4.4 degC above normal up to 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.2 (bottom). Meanwhile, the precipitation change for Beijing shows a very high variability in the long run, ranging from 100 to 255 mm from the normal (Figure 5.3, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of over 120 mm during 2030s (above the 1980 baseline rainfall), declining to 100 mm in 2050s, rising again to 200 mm during 2070s and dipping to 145 mm during

2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.3 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows Beijing's city rainfall increase to around 145 mm (above the 1980 baseline rainfall) during 2030s, rising up to 190 mm in 2050s, declining to 135 mm in 2060s, re-escalating to about 230 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.3 (bottom).

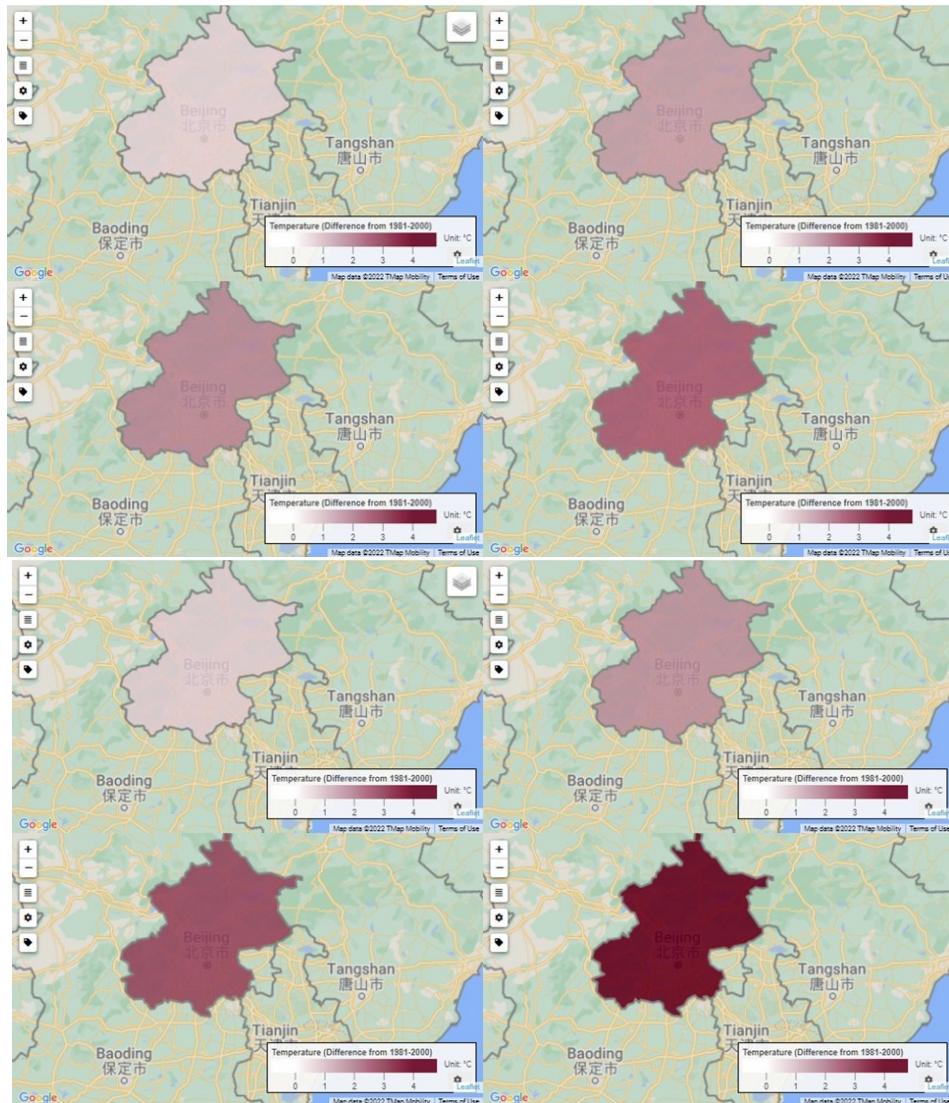
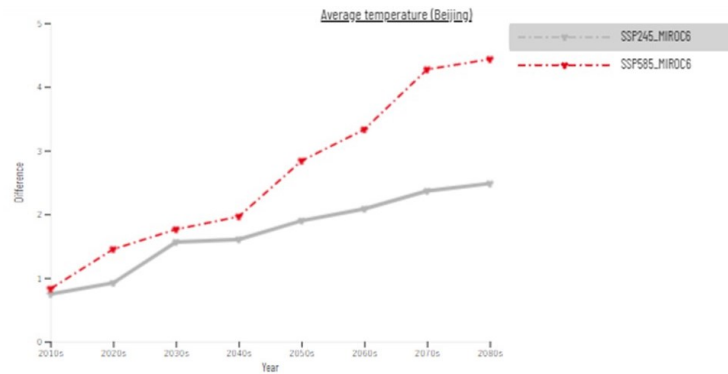


Figure 5.2: Temperature increase in Beijing under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

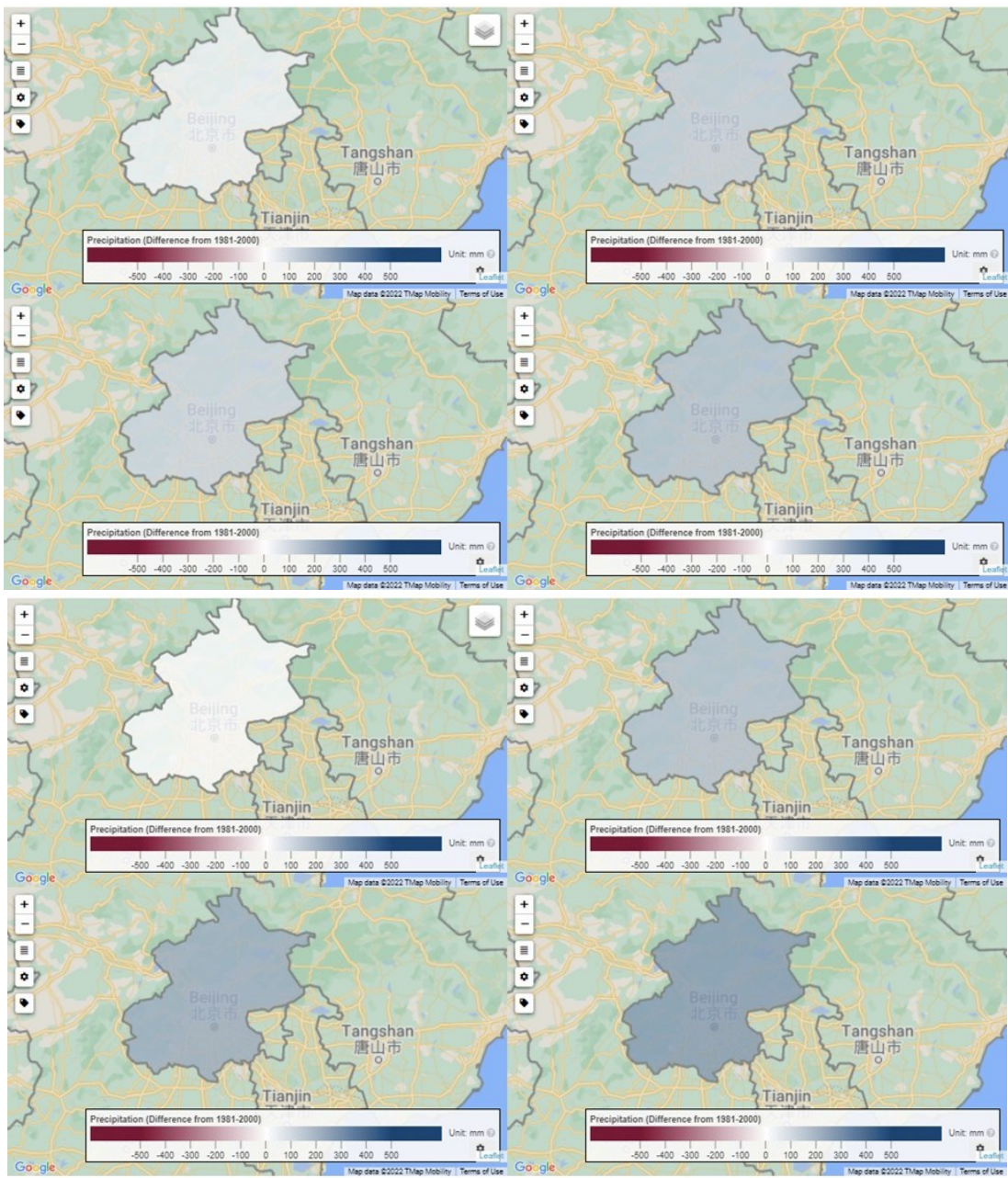
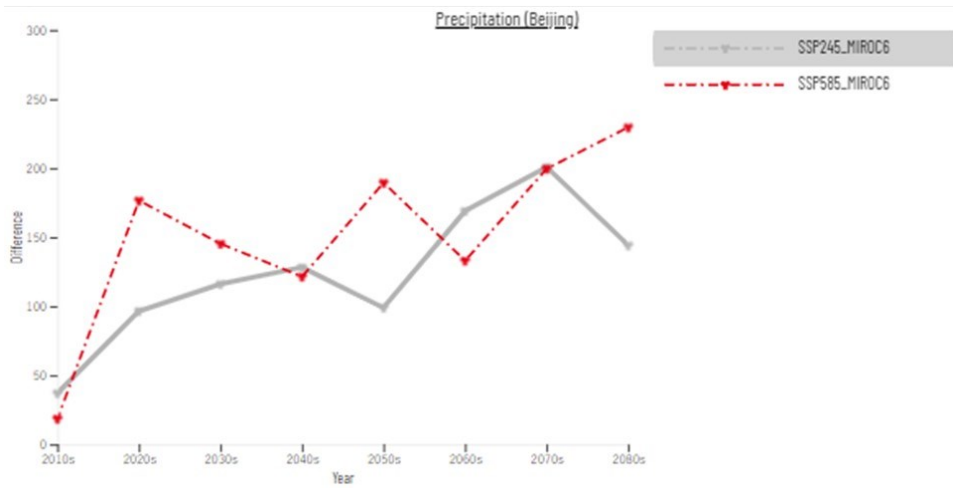


Figure 5.3: Precipitation variation in Beijing under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)