

5.3.9 Harbin

The GHG emission of Harbin was 2.8 MtCO₂e in 1975, that escalated to 5.5 MtCO₂e in 1990 and 27.9 MtCO₂e in 2015. A majority of the GHG emissions in 2015 (Figure 5.25, top) were contributed by the energy sector (67%) and industry sector (23%), followed by residential sector (6%) and transport sector (4%). As per the ICLAP model estimates (Figure 5.25, below), there would be an increase in emissions at 5.9% per annum, leading to 33.3 MtCO₂e in 2030 and 44.3 MtCO₂e in 2050.

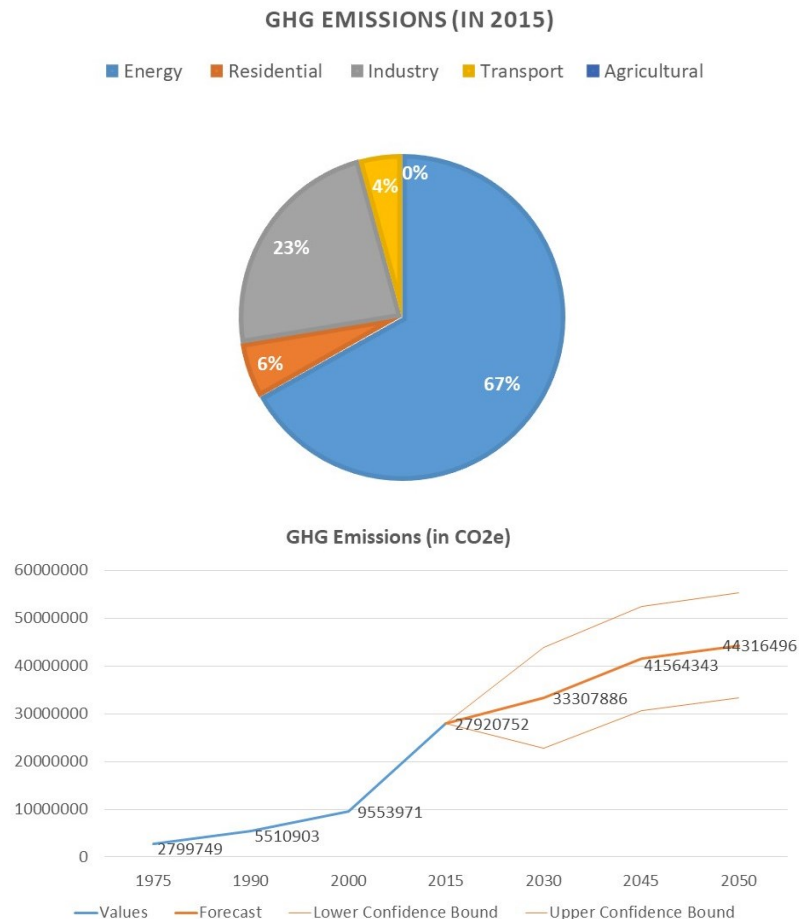


Figure 5.25: GHG contributions from different sectors in Harbin (top); ICLAP model estimates for Harbin’s GHG emissions till 2050 (bottom)

The results for climate variability in Harbin indicate that depending on the emission scenarios, there would be a temperature increase of 1.8–5.8 degC from 2030-80s (Figure 5.26, top). The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 1.8 degC during 2030s (above the 1980 baseline temperature), 2.7 degC in 2050s, peaking to 3.2 degC during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.26 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 2.4 degC during 2030s (above the 1980 baseline temperature), 3.2 degC in 2050s further rising sharply to 5.8 degC above normal up to 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.26 (bottom). Meanwhile, the precipitation change for Harbin shows a very high variability in the long run, ranging from 40 to 155 mm from the normal (Figure 5.27, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits

an increase of about 140 mm during 2030s (above the 1980 baseline rainfall), declining to 40 mm in 2050s, rising to 100 mm during 2070s and increasing again to 140 mm during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.27 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows Harbin's city rainfall increase to around 50 mm (above the 1980 baseline rainfall) during 2030s, rising up to 120 mm in 2050s and peaking to about 155 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.27 (bottom).

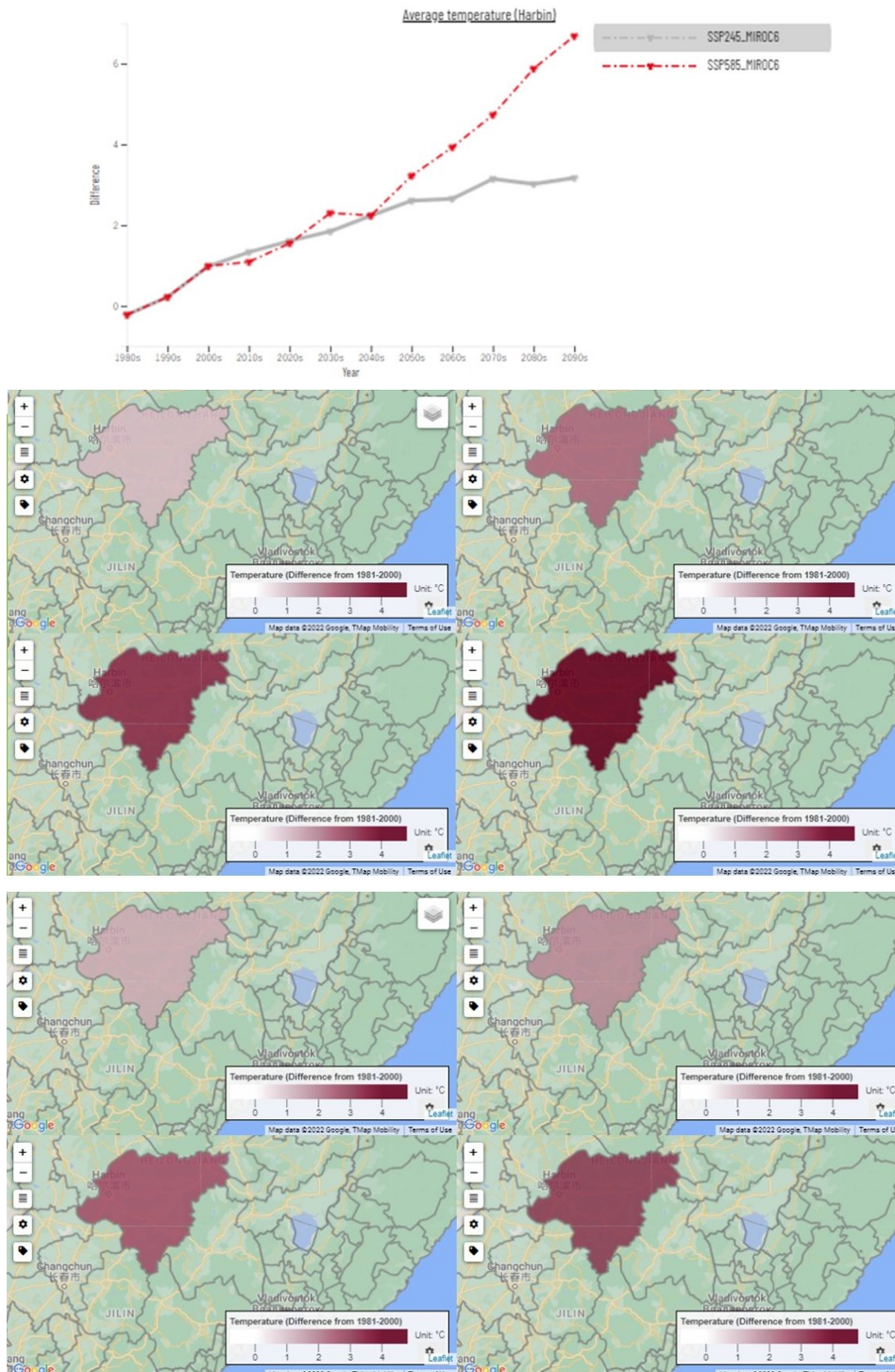


Figure 5.26: Temperature increase in Harbin under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

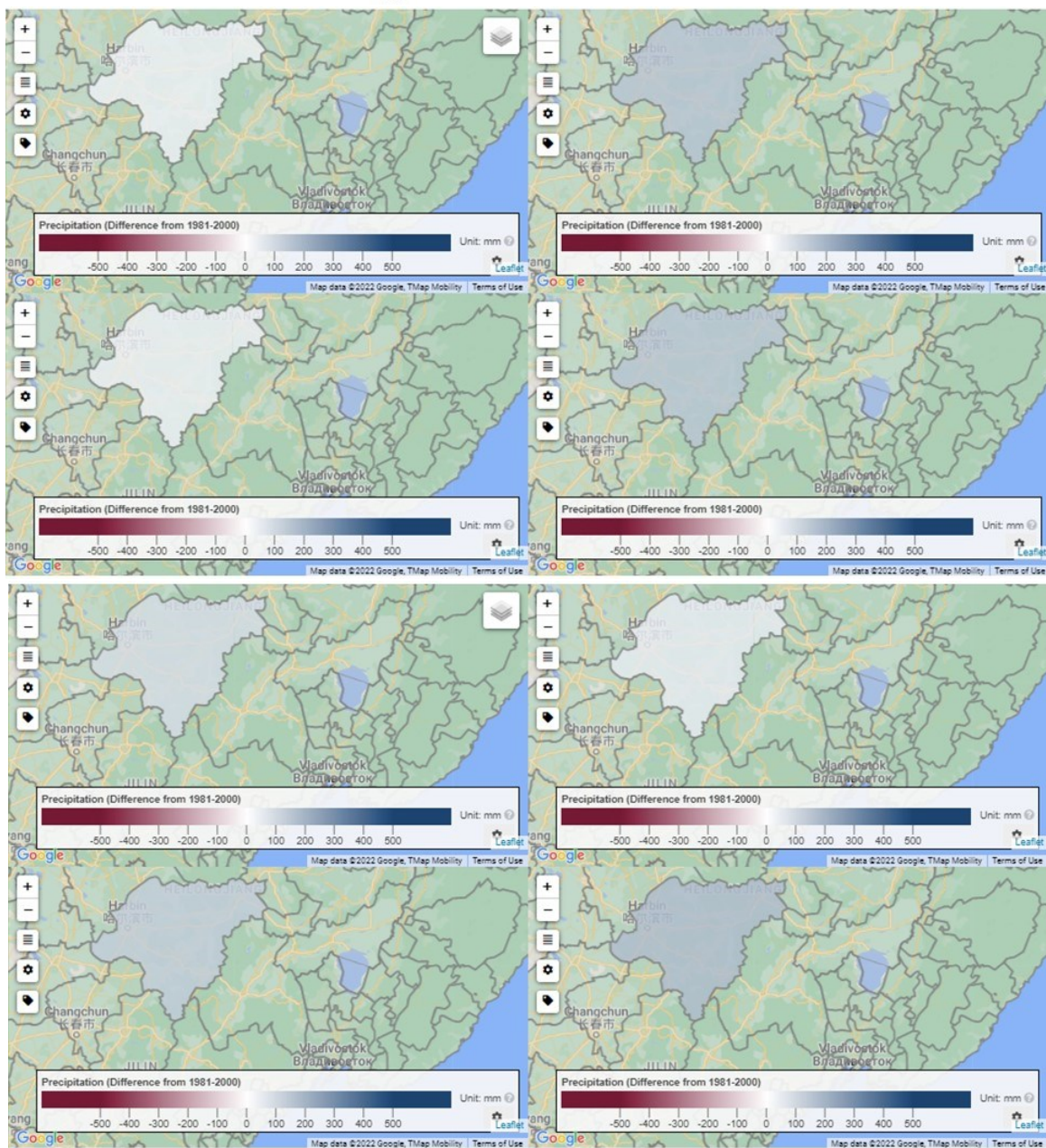
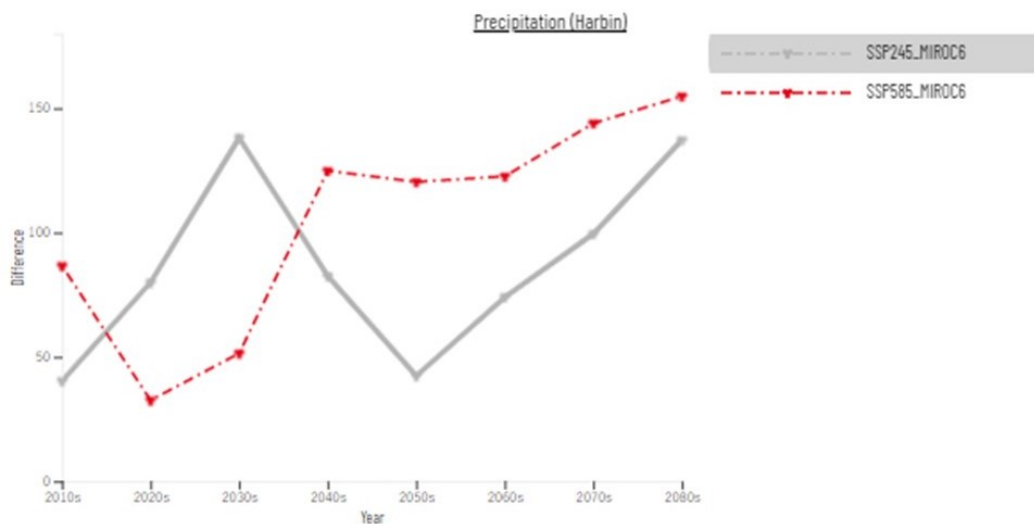


Figure 5.27: Precipitation variation in Harbin under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)