5.3.18 Tianjin

The GHG emissions of Tianjin was 8.8 $MtCO_2e$ in 1975, that escalated to 20.3 $MtCO_2e$ in 1990 and 63.5 $MtCO_2e$ in 2015. A significant proportion of the GHG emissions in 2015 (Figure 5.52, top) were contributed by the industry sector (55%), followed by the energy sector (29%). Meanwhile, the emissions from transport sector (8%), residential sector (8%) and agricultural sector (~0%) were marginal. As per the ICLAP model estimates (Figure 5.52, below), there would be an increase in emissions at 5.1% per annum, leading to 74.3 $MtCO_2e$ in 2030 and 98.3 $MtCO_2e$ in 2050.

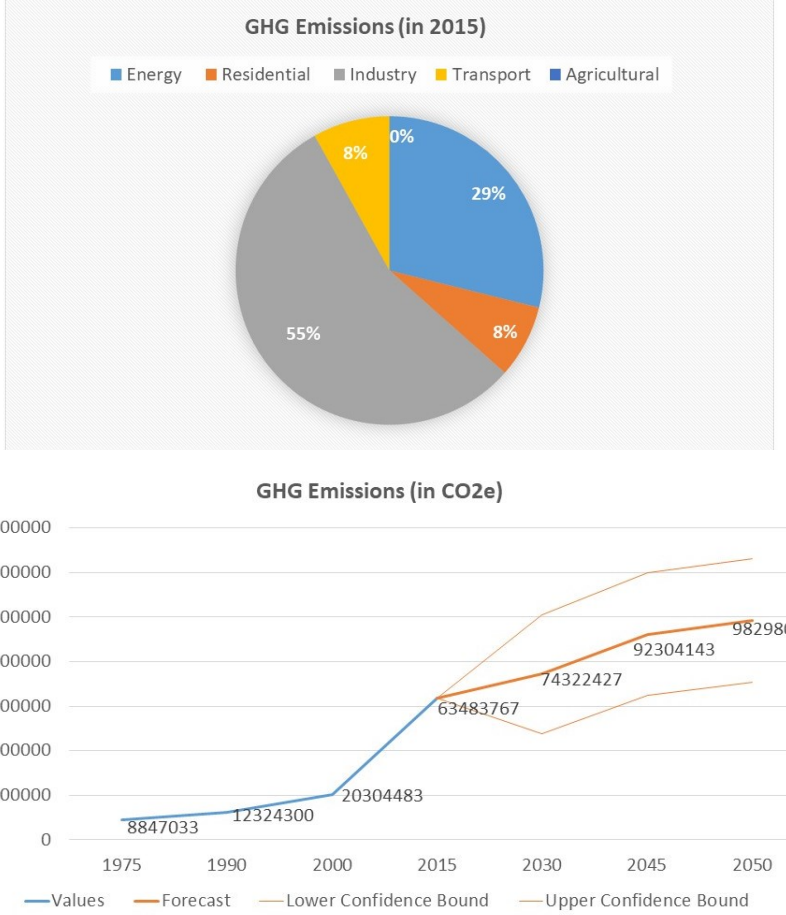

Figure 5.52: GHG contributions from different sectors in Tianjin (top); ICLAP model estimates for Tianjin's GHG emissions till 2050 (bottom)

The results for climate variability in Tianjin indicate that depending on the emission scenarios, there would be a temperature increase of 1.3–4.4 degC from 2030 to 2080s (Figure 5.53, top). The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 1.3 degC during 2030s (above the 1980 baseline temperature), 1.85 degC in 2050s, peaking to 2.3 degC during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.53 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 1.75 degC during 2030s (above the 1980 baseline temperature), 2.7 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 5.53 (bottom). Meanwhile, the precipitation change for Tianjin shows a very high variability in the long run, ranging 50 mm to 250 mm from the normal (Figure 5.54, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 160 mm

during 2030s (from the 1980 baseline rainfall), rebounding to 50 mm in 2050s. The rainfall is expected to increase significantly to 250 mm (above the 1980 baseline) during 2060s, thereafter it declines gradually to 150 mm above normal during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.54 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows Tianjin's rainfall to be rise above 120 mm (from the 1980 baseline rainfall) during 2030s, continues to do so up to 180 mm during 2050s and that stabilizes to 200 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.54 (bottom).

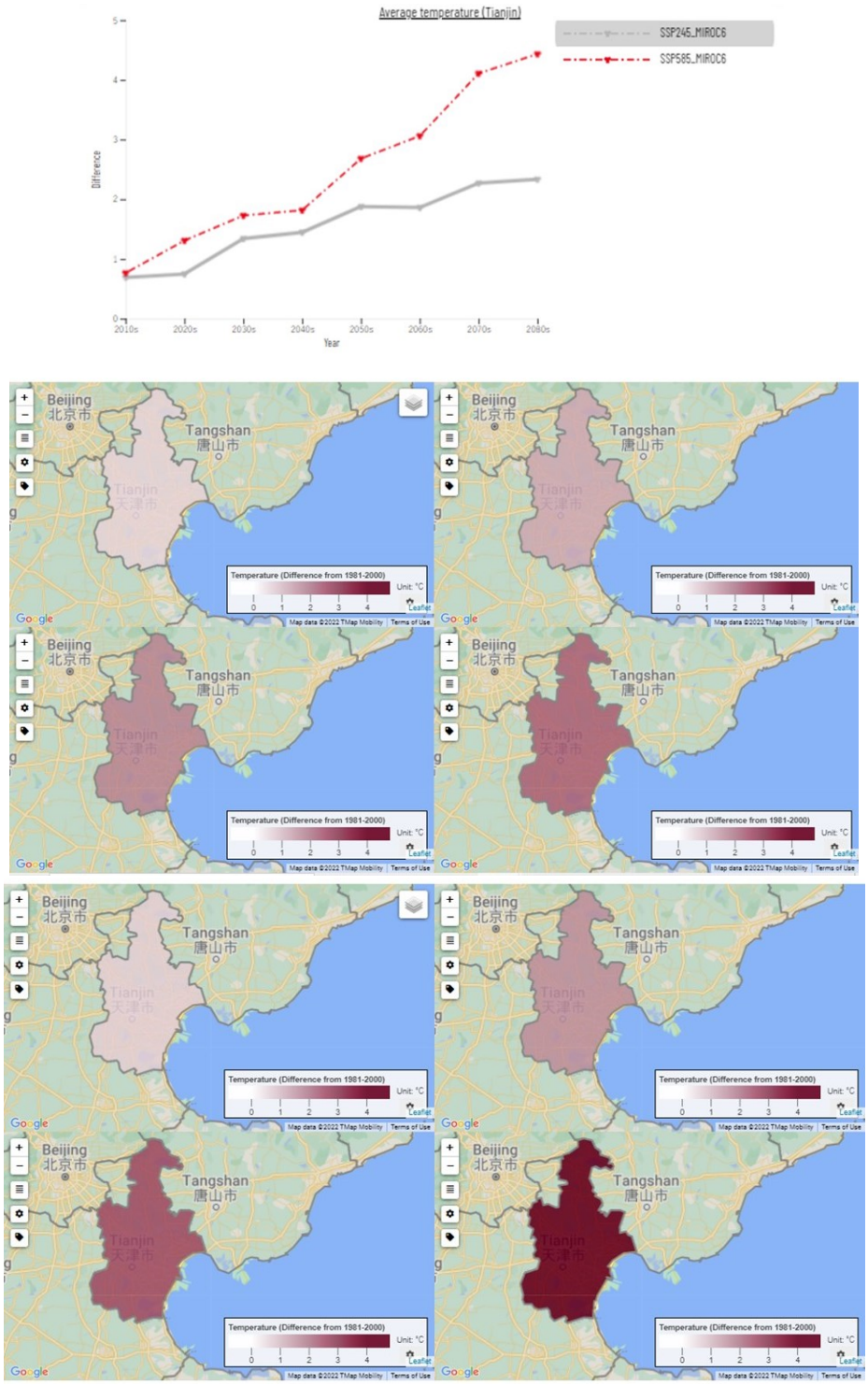

Figure 5.53: Temperature increase in Tianjin under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

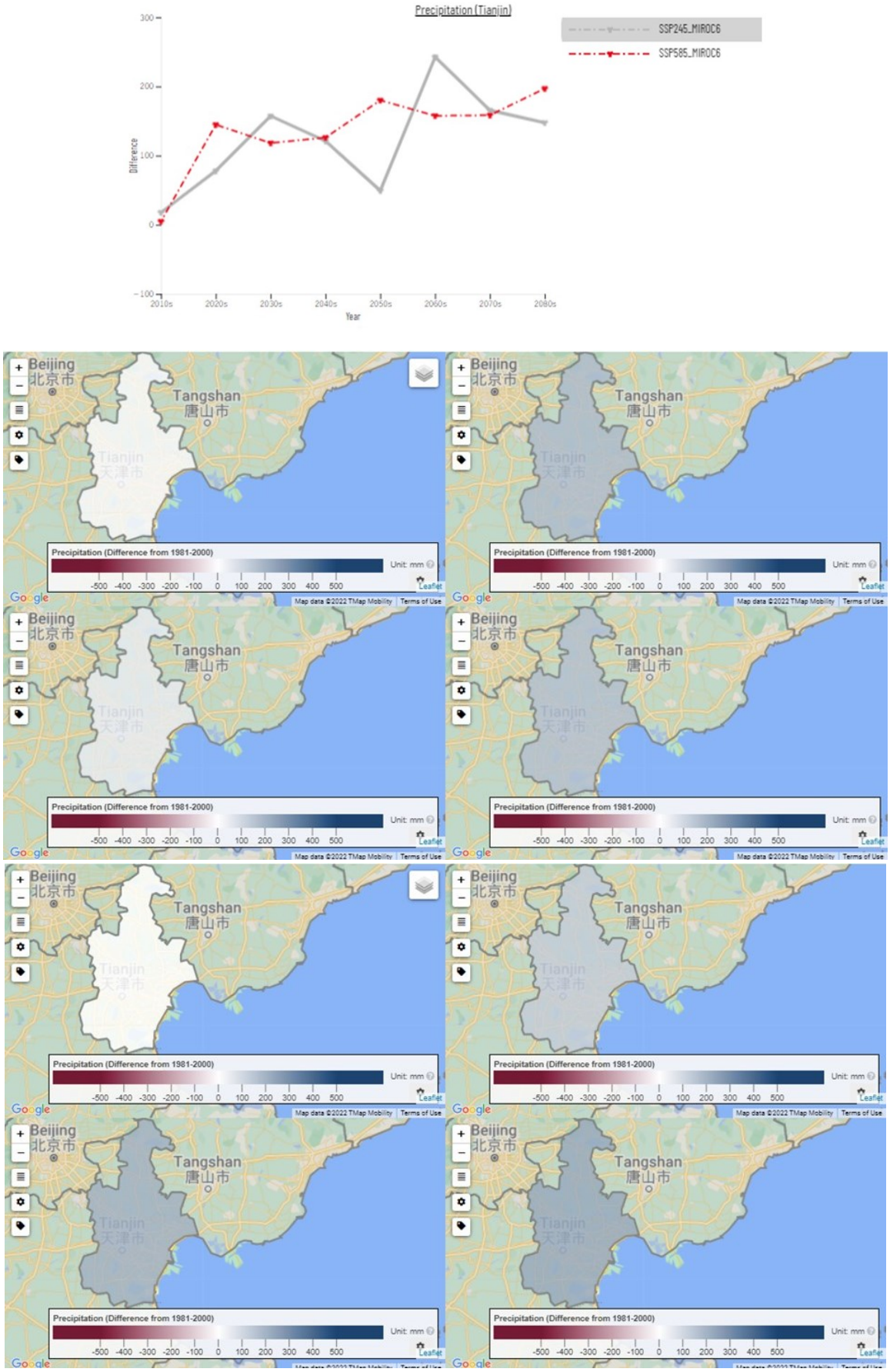

Figure 5.54: Precipitation variation in Tianjin under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)