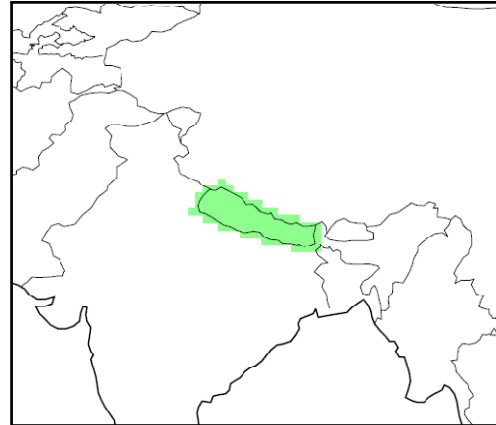


Nepal

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<http://country-profiles.geog.ox.ac.uk>



General Climate

Nepal's climate is strongly influenced by its topography, which varies greatly between the north-western border, at very high altitudes in the Himalayan mountain range (8 of the world's highest mountains are located in the Nepalese Himalayas), and the south-eastern edge of the country which sits in the northern rim of the Gangetic plain at only around 300m above sea level.

The lowland regions of Nepal have a warm and humid sub-tropical climate, with temperature around 22- 27°C in summer months, dropping to 10-15°C in the winter. The high altitude mountainous regions are considerably colder, at 5-15°C in summer months, and remaining well below zero in the winter. Monsoon rainfalls arrive in June and continue until August or September, bringing 250-450mm of rainfall per month in most of the country, but only 100-150 to the north-western mountain regions. The winter months are very dry and all regions receive less than 50mm per month.

Recent Climate Trends

Temperature

- Mean annual temperature has not increased over Nepal in the observed climate period. Temperatures have slightly decreased particularly in the warm, dry seasons MAM and JJA.
- The frequency of hot days¹ has not changed significantly since 1960.
- Although the mean annual temperature has not increased since 1960, there has been a small, but statistically significant, increase in the frequency of hot nights.
 - The average number of 'hot' nights per year in Nepal increased by 9 (an additional 2.5% of nights) between 1960 and 2003.

¹ 'Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season.

- The frequency of cold days² and nights, annually, has decreased significantly since 1960.
 - The average number of 'cold' days per year has decreased by 19 (5.2% of days) between 1960 and 2003. This rate of decrease is most rapid in SON when the average number of cold SON days has decreased by 2.2 days per month (7.2% of SON days) over this period.
 - The average number of 'cold' nights per year has decreased by 32 (8.7% of days). This rate of decrease is most rapid in DJF when the average number of cold DJF nights has decreased by 3.3 nights per month (10.5% of DJF nights) over this period.

Precipitation

- A significant decrease in precipitation of an average 3.7mm per month (-3.2%) per decade has been observed in annual precipitation in Nepal, arising mainly due to an average decrease in JJA of -10.8mm per month (-3.8%) per decade.
- The magnitudes of 1- and 5-day rainfall maxima have shown statistically significant increases in DJF and MAM since 1960. 1-day maxima have increased by an average of 1.0mm (DJF) and 1.23mm (MAM) per decade in DJF and 5-day maxima by 1.7mm (DJF) and 3.0mm (MAM) per decade. Trends in JJA and SON are negative, although not statistically significant. The annual trend in 1-day maxima is also negative, decreasing by 9.5mm per decade.

GCM Projections of Future Climate

Temperature

- The mean annual temperature is projected to increase by 1.3 to 3.8°C by the 2060s, and 1.8 to 5.8°C by the 2090s. The range of projections by the 2090s under any one emissions scenario is 1.5- 2°C.
- The projected rate of warming is most rapid in DJF and MAM.
- All projections indicate some increase in the frequency of days and nights that are considered 'hot' in current climate.
 - Annually, projections indicate that 'hot' days will occur on 11-28% of days by the 2060s, and 12-39% of days by the 2090s. Days considered 'hot' by current climate standards for their season are projected to increase most rapidly in JJA, occurring on 12-81% of days of the season by the 2090s.
 - Nights that are considered 'hot' for the annual climate of 1970-99 are projected to occur on 18-28% of nights by the 2060s and 20-39% of nights by the 2090s. Nights that are considered hot for each season by 1970-99 standards are projected to increase most rapidly in JJA, occurring on 40-85% of nights in every season by the 2090s.

² 'Cold' days or 'cold' nights are defined as the temperature below which 10% of days or nights are recorded in current climate of that region or season.

- All projections indicate decreases in the frequency of days and nights that are considered 'cold' in current climate, and in much of the country, do not occur at all by the 2090s in some projections.

Precipitation

- Projections of mean annual rainfall averaged over the country from different models in the ensemble are broadly consistent in indicating increases in rainfall over Nepal. This is largely due to increases in JJA and SON (wet season) rainfall.
 - JJA rainfall is projected to change by -36mm (-22%) to +224mm (+104%) per month by the 2090s. SON rainfall is projected to change by -17mm (-38%) to +44mm (+71%) per month by the 2090s. These increases are offset a little by projected decreases in DJF rainfall, such that annually, projected changes range from -14mm (-31%) to +59mm (58%) per month.
 - The increases in JJA rainfall are largest in the South-East of Nepal.
- The proportion of total rainfall that falls in heavy³ events is projected to increase in projections from most models. Annually, changes in projections range between -7 to +17% by the 2090s. Increases in JJA and SON are offset partly by decreases in DJF.
- Projections indicate that maximum 1- and 5-day rainfalls are expected to increase in the future, and that these increases may be dramatic. Annually, 1-day maxima change by -7mm to +53 mm by the 2090s, and 5-day maxima change by -16 to +129mm. These increases are most evident in JJA and SON (wet season) rainfall, when changes of -4 to +125mm in JJA and -10 to +57 mm are projected in 5-day maxima for the 2090s; the maximum increases projected by the model ensemble are twice the magnitude of current average 5-day maximum rainfalls.

Additional Regional Climate Change Information

- Complex topography in this part of the world means that local variations in response to global warming, particularly precipitation, are likely to be large and many areas may vary from the regional trend (Christensen *et al.*, 2007).
- A lack of consistency between models in representing monsoon processes contributes to uncertainty in estimates of future precipitation in this region (Christensen *et al.*, 2007).
- For further information on Climate Change projections for Asia, see Christensen *et al.* (2007) IPCC Working Group I Report: '*The Physical Science Basis*', Chapter 11 (*Regional Climate projections*): Section 11.4 (*Asia*).

³ A 'Heavy' event is defined as a daily rainfall total which exceeds the threshold that is exceeded on 5% of rainy days in current the climate of that region and season.

Data Summary

| | Observed Mean 1970-99 | Observed Trend 1960-2006 | Projected changes by the 2030s | | | Projected changes by the 2060s | | | Projected changes by the 2090s | | | |
|--------------------------|--------------------------|---------------------------------|-----------------------------------|------------------------|------------|-----------------------------------|------------------------|------------|-----------------------------------|------------------------|------------|-----|
| | | | Min | Median | Max | Min | Median | Max | Min | Median | Max | |
| Temperature | | | | | | | | | | | | |
| | (°C) | (change in °C per decade) | | Change in °C | | | Change in °C | | | Change in °C | | |
| Annual | 14.4 | -0.07* | A2 | 0.8 | 1.4 | 1.9 | 1.8 | 2.9 | 3.8 | 3.4 | 4.8 | 5.8 |
| | | | A1B | 0.9 | 1.8 | 2.2 | 2.0 | 2.8 | 3.7 | 2.9 | 3.9 | 5.2 |
| | | | B1 | 0.8 | 1.2 | 1.7 | 1.3 | 2.0 | 2.8 | 1.8 | 2.6 | 3.9 |
| DJF | 10.0 | 0.04 | A2 | 0.7 | 1.6 | 2.8 | 1.8 | 3.4 | 4.3 | 3.6 | 5.2 | 6.5 |
| | | | A1B | 1.2 | 1.8 | 2.7 | 2.1 | 3.2 | 4.7 | 2.7 | 4.4 | 5.7 |
| | | | B1 | 1.0 | 1.3 | 2.0 | 1.1 | 2.3 | 3.7 | 2.0 | 2.8 | 4.4 |
| MAM | 15.7 | -0.13* | A2 | 0.8 | 1.7 | 2.2 | 2.1 | 3.1 | 4.5 | 3.8 | 5.2 | 6.6 |
| | | | A1B | 0.9 | 1.9 | 2.4 | 1.9 | 3.0 | 4.1 | 2.9 | 4.1 | 5.9 |
| | | | B1 | 0.3 | 1.4 | 2.1 | 1.6 | 2.1 | 3.2 | 1.6 | 2.8 | 4.4 |
| JJA | 18.4 | -0.09 | A2 | 0.6 | 1.4 | 1.9 | 1.3 | 2.3 | 3.2 | 2.5 | 3.9 | 5.2 |
| | | | A1B | 0.7 | 1.5 | 2.1 | 1.6 | 2.5 | 3.6 | 1.9 | 3.5 | 4.8 |
| | | | B1 | 0.5 | 1.0 | 1.5 | 1.0 | 1.6 | 2.8 | 1.4 | 2.2 | 3.5 |
| SON | 14.6 | 0.00 | A2 | 0.5 | 1.2 | 2.0 | 1.7 | 2.7 | 4.0 | 3.4 | 4.4 | 5.7 |
| | | | A1B | 0.6 | 1.3 | 2.1 | 1.8 | 2.6 | 3.5 | 2.6 | 3.5 | 4.9 |
| | | | B1 | 0.4 | 1.1 | 1.9 | 1.2 | 1.9 | 2.6 | 1.4 | 2.3 | 3.4 |
| Precipitation | | | | | | | | | | | | |
| | (mm per month) | (change in mm per decade) | | Change in mm per month | | | Change in mm per month | | | Change in mm per month | | |
| Annual | 113.5 | -3.7* | A2 | -12 | 1 | 10 | -13 | 6 | 32 | -10 | 13 | 59 |
| | | | A1B | -9 | 1 | 15 | -10 | 7 | 32 | -13 | 2 | 42 |
| | | | B1 | -1 | 2 | 8 | -3 | 2 | 15 | -14 | 5 | 19 |
| DJF | 21.9 | -0.7 | A2 | -24 | -2 | 3 | -24 | -2 | 3 | -18 | -4 | 6 |
| | | | A1B | -27 | -1 | 3 | -13 | -3 | 3 | -20 | -3 | 8 |
| | | | B1 | -15 | -1 | 10 | -13 | -4 | 4 | -25 | -1 | 3 |
| MAM | 59.7 | 1.5 | A2 | -13 | 0 | 8 | -19 | 0 | 11 | -25 | 0 | 20 |
| | | | A1B | -11 | 0 | 3 | -14 | 0 | 12 | -21 | 0 | 16 |
| | | | B1 | -8 | 0 | 9 | -12 | 0 | 5 | -24 | 0 | 13 |
| JJA | 282.8 | -10.8* | A2 | -37 | 6 | 58 | -40 | 5 | 132 | -20 | 30 | 224 |
| | | | A1B | -15 | 7 | 91 | -14 | 4 | 124 | -36 | 26 | 150 |
| | | | B1 | -8 | 11 | 53 | -12 | 6 | 50 | -10 | 9 | 104 |
| SON | 89.4 | -4.1 | A2 | -13 | -2 | 15 | -7 | 4 | 18 | -13 | 17 | 44 |
| | | | A1B | -14 | 1 | 21 | -9 | 3 | 28 | -17 | 12 | 23 |
| | | | B1 | -10 | 4 | 20 | -8 | 5 | 17 | -15 | 5 | 28 |
| Precipitation (%) | | | | | | | | | | | | |
| | (mm per month) | (change in % per decade) | | % Change | | | % Change | | | % Change | | |
| Annual | 113.5 | -3.2* | A2 | -26 | 2 | 11 | -27 | 7 | 31 | -22 | 17 | 58 |
| | | | A1B | -21 | 1 | 14 | -21 | 6 | 31 | -28 | 1 | 41 |
| | | | B1 | -1 | 4 | 9 | -10 | 3 | 20 | -31 | 8 | 22 |
| DJF | 21.9 | -3.2 | A2 | -35 | -8 | 7 | -34 | -6 | 15 | -46 | -13 | 21 |
| | | | A1B | -42 | -7 | 10 | -34 | -6 | 16 | -44 | -9 | 36 |
| | | | B1 | -45 | -7 | 25 | -30 | -16 | 15 | -63 | -6 | 12 |
| MAM | 59.7 | 2.5 | A2 | -31 | 0 | 11 | -37 | -3 | 30 | -48 | 0 | 37 |
| | | | A1B | -27 | 0 | 15 | -27 | 0 | 19 | -40 | -3 | 30 |
| | | | B1 | -22 | 0 | 11 | -28 | 1 | 10 | -46 | 1 | 22 |
| JJA | 282.8 | -3.8* | A2 | -15 | 3 | 27 | -12 | 11 | 61 | -19 | 21 | 104 |
| | | | A1B | -22 | 4 | 42 | -16 | 7 | 57 | -22 | 10 | 70 |
| | | | B1 | -4 | 9 | 29 | -16 | 5 | 43 | -6 | 12 | 48 |
| SON | 89.4 | -4.5 | A2 | -27 | -3 | 40 | -14 | 6 | 47 | -31 | 16 | 65 |
| | | | A1B | -35 | 1 | 43 | -21 | 2 | 38 | -38 | 15 | 54 |
| | | | B1 | -7 | 8 | 29 | -10 | 6 | 43 | -27 | 5 | 71 |

| | Observed | Observed | Projected changes by the | | | Projected changes by the | | | Projected changes by the | | | |
|---|-----------|------------|--------------------------|--------|------|--------------------------|--------|-----|--------------------------|--------|-----|----|
| | Mean | Trend | 2030s | | | 2060s | | | 2090s | | | |
| | 1970-99 | 1960-2006 | Min | Median | Max | Min | Median | Max | Min | Median | Max | |
| | % | Change in | Future % frequency | | | | | | Future % frequency | | | |
| | Frequency | frequency | | | | | | | | | | |
| | | per decade | | | | | | | | | | |
| Frequency of Hot Days (TX90p) | | | | | | | | | | | | |
| Annual | 9.4 | 0.03 | A2 | **** | **** | **** | 12 | 18 | 27 | 16 | 27 | 39 |
| | | | A1B | **** | **** | **** | 12 | 19 | 28 | 14 | 25 | 37 |
| | | | B1 | **** | **** | **** | 11 | 16 | 23 | 12 | 17 | 28 |
| DJF | 9.4 | 0.13 | A2 | **** | **** | **** | 19 | 31 | 47 | 35 | 63 | 73 |
| | | | A1B | **** | **** | **** | 21 | 32 | 51 | 28 | 49 | 71 |
| | | | B1 | **** | **** | **** | 18 | 25 | 35 | 20 | 31 | 52 |
| MAM | 9.1 | -0.13 | A2 | **** | **** | **** | 17 | 25 | 42 | 27 | 43 | 57 |
| | | | A1B | **** | **** | **** | 20 | 28 | 33 | 26 | 36 | 53 |
| | | | B1 | **** | **** | **** | 17 | 21 | 28 | 17 | 25 | 39 |
| JJA | 9.8 | -0.14 | A2 | **** | **** | **** | 14 | 31 | 61 | 15 | 47 | 81 |
| | | | A1B | **** | **** | **** | 13 | 31 | 63 | 15 | 41 | 77 |
| | | | B1 | **** | **** | **** | 11 | 23 | 52 | 12 | 26 | 65 |
| SON | 9.5 | -0.13 | A2 | **** | **** | **** | 14 | 23 | 35 | 31 | 40 | 56 |
| | | | A1B | **** | **** | **** | 18 | 23 | 34 | 20 | 34 | 45 |
| | | | B1 | **** | **** | **** | 12 | 19 | 31 | 18 | 23 | 38 |
| Frequency of Hot Nights (TN90p) | | | | | | | | | | | | |
| Annual | 9.0 | 0.59* | A2 | **** | **** | **** | 21 | 24 | 26 | 28 | 34 | 39 |
| | | | A1B | **** | **** | **** | 20 | 25 | 28 | 25 | 31 | 38 |
| | | | B1 | **** | **** | **** | 18 | 21 | 24 | 20 | 23 | 30 |
| DJF | 9.1 | 0.15 | A2 | **** | **** | **** | 21 | 29 | 39 | 38 | 56 | 74 |
| | | | A1B | **** | **** | **** | 22 | 34 | 41 | 30 | 54 | 69 |
| | | | B1 | **** | **** | **** | 16 | 22 | 29 | 16 | 24 | 50 |
| MAM | 8.8 | 0.24 | A2 | **** | **** | **** | 24 | 26 | 35 | 35 | 46 | 56 |
| | | | A1B | **** | **** | **** | 24 | 26 | 37 | 31 | 43 | 48 |
| | | | B1 | **** | **** | **** | 19 | 20 | 25 | 20 | 25 | 34 |
| JJA | 8.3 | 0.05 | A2 | **** | **** | **** | 36 | 52 | 66 | 66 | 79 | 85 |
| | | | A1B | **** | **** | **** | 34 | 59 | 67 | 58 | 71 | 81 |
| | | | B1 | **** | **** | **** | 35 | 42 | 53 | 40 | 51 | 67 |
| SON | 8.8 | 0.02 | A2 | **** | **** | **** | 20 | 25 | 28 | 28 | 39 | 50 |
| | | | A1B | **** | **** | **** | 21 | 24 | 34 | 25 | 36 | 45 |
| | | | B1 | **** | **** | **** | 16 | 21 | 28 | 17 | 22 | 33 |
| Frequency of Cold Days (TX10p) | | | | | | | | | | | | |
| Annual | 9.0 | -1.21* | A2 | **** | **** | **** | 1 | 3 | 4 | 0 | 0 | 2 |
| | | | A1B | **** | **** | **** | 1 | 2 | 5 | 0 | 1 | 3 |
| | | | B1 | **** | **** | **** | 2 | 4 | 6 | 1 | 2 | 4 |
| DJF | 9.5 | -0.64 | A2 | **** | **** | **** | 0 | 2 | 3 | 0 | 0 | 1 |
| | | | A1B | **** | **** | **** | 1 | 1 | 4 | 0 | 1 | 2 |
| | | | B1 | **** | **** | **** | 1 | 2 | 4 | 0 | 1 | 4 |
| MAM | 9.0 | -0.94 | A2 | **** | **** | **** | 1 | 3 | 4 | 0 | 0 | 2 |
| | | | A1B | **** | **** | **** | 1 | 3 | 4 | 0 | 1 | 4 |
| | | | B1 | **** | **** | **** | 2 | 4 | 5 | 0 | 3 | 4 |
| JJA | 8.9 | -1.18* | A2 | **** | **** | **** | 1 | 2 | 8 | 0 | 0 | 5 |
| | | | A1B | **** | **** | **** | 0 | 2 | 6 | 0 | 1 | 9 |
| | | | B1 | **** | **** | **** | 1 | 3 | 9 | 0 | 2 | 6 |
| SON | 8.9 | -1.68* | A2 | **** | **** | **** | 1 | 4 | 7 | 0 | 1 | 2 |
| | | | A1B | **** | **** | **** | 1 | 4 | 6 | 0 | 1 | 2 |
| | | | B1 | **** | **** | **** | 2 | 5 | 8 | 1 | 3 | 6 |
| Frequency of Cold Nights (TN10p) | | | | | | | | | | | | |
| Annual | 8.2 | -2.03* | A2 | **** | **** | **** | 1 | 3 | 4 | 0 | 0 | 1 |
| | | | A1B | **** | **** | **** | 1 | 3 | 3 | 0 | 1 | 3 |
| | | | B1 | **** | **** | **** | 3 | 4 | 5 | 0 | 3 | 4 |
| DJF | 8.0 | -2.44* | A2 | **** | **** | **** | 0 | 1 | 2 | 0 | 0 | 0 |
| | | | A1B | **** | **** | **** | 0 | 1 | 2 | 0 | 0 | 1 |
| | | | B1 | **** | **** | **** | 1 | 2 | 4 | 0 | 2 | 3 |
| MAM | 8.4 | -1.61* | A2 | **** | **** | **** | 1 | 2 | 3 | 0 | 1 | 1 |
| | | | A1B | **** | **** | **** | 1 | 3 | 5 | 0 | 1 | 3 |
| | | | B1 | **** | **** | **** | 1 | 4 | 5 | 0 | 3 | 4 |
| JJA | 8.3 | -1.75* | A2 | **** | **** | **** | 0 | 1 | 3 | 0 | 0 | 0 |
| | | | A1B | **** | **** | **** | 0 | 1 | 3 | 0 | 0 | 1 |
| | | | B1 | **** | **** | **** | 1 | 2 | 5 | 0 | 2 | 4 |
| SON | 8.0 | -2.28* | A2 | **** | **** | **** | 1 | 2 | 5 | 0 | 0 | 1 |
| | | | A1B | **** | **** | **** | 0 | 2 | 5 | 0 | 1 | 2 |
| | | | B1 | **** | **** | **** | 1 | 4 | 5 | 0 | 3 | 5 |

| | Observed Mean 1970-99 | Observed Trend 1960-2006 | Projected changes by the 2030s | | | Projected changes by the 2060s | | | Projected changes by the 2090s | | | |
|--|--------------------------|-------------------------------|-----------------------------------|--------|------|-----------------------------------|--------|-----|-----------------------------------|--------|-----|-----|
| | | | Min | Median | Max | Min | Median | Max | Min | Median | Max | |
| % total rainfall falling in Heavy Events (R95pct) | | | | | | | | | | | | |
| | % | Change in % per decade | | | | Change in % | | | Change in % | | | |
| Annual | 24.3 | -1.17 | A2 | **** | **** | **** | -5 | 2 | 10 | 0 | 6 | 17 |
| | | | A1B | **** | **** | **** | -1 | 5 | 12 | -2 | 4 | 13 |
| | | | B1 | **** | **** | **** | -3 | 2 | 7 | -7 | 3 | 11 |
| DJF | **** | **** | A2 | **** | **** | **** | -13 | -3 | 2 | -13 | -5 | 9 |
| | | | A1B | **** | **** | **** | -14 | 0 | 5 | -15 | -3 | 13 |
| | | | B1 | **** | **** | **** | -8 | -4 | 2 | -16 | -3 | 2 |
| MAM | **** | **** | A2 | **** | **** | **** | -12 | 0 | 10 | -19 | 0 | 12 |
| | | | A1B | **** | **** | **** | -8 | 0 | 5 | -14 | 1 | 11 |
| | | | B1 | **** | **** | **** | -8 | -2 | 6 | -8 | 0 | 9 |
| JJA | **** | **** | A2 | **** | **** | **** | -3 | 3 | 14 | -12 | 8 | 23 |
| | | | A1B | **** | **** | **** | -11 | 6 | 16 | -7 | 6 | 18 |
| | | | B1 | **** | **** | **** | 0 | 3 | 9 | -4 | 4 | 13 |
| SON | **** | **** | A2 | **** | **** | **** | -5 | 1 | 15 | -8 | 7 | 17 |
| | | | A1B | **** | **** | **** | -9 | 4 | 15 | -12 | 5 | 19 |
| | | | B1 | **** | **** | **** | -5 | 3 | 14 | -10 | 2 | 19 |
| Maximum 1-day rainfall (RX1day) | | | | | | | | | | | | |
| | mm | Change in mm per decade | | | | Change in mm | | | Change in mm | | | |
| Annual | 103.3 | -9.54* | A2 | **** | **** | **** | -8 | 2 | 35 | -1 | 9 | 53 |
| | | | A1B | **** | **** | **** | -1 | 2 | 29 | -2 | 6 | 41 |
| | | | B1 | **** | **** | **** | -2 | 1 | 21 | -7 | 2 | 21 |
| DJF | 8.7 | 1.01* | A2 | **** | **** | **** | -8 | -1 | 3 | -4 | 0 | 5 |
| | | | A1B | **** | **** | **** | -7 | 0 | 3 | -5 | 0 | 6 |
| | | | B1 | **** | **** | **** | -5 | -1 | 2 | -10 | -1 | 4 |
| MAM | 15.7 | 1.23* | A2 | **** | **** | **** | -8 | 0 | 3 | -8 | 0 | 5 |
| | | | A1B | **** | **** | **** | -1 | 0 | 6 | -6 | -1 | 4 |
| | | | B1 | **** | **** | **** | -3 | -1 | 3 | -6 | 0 | 2 |
| JJA | 64.4 | -0.75 | A2 | **** | **** | **** | -1 | 2 | 37 | -2 | 4 | 57 |
| | | | A1B | **** | **** | **** | -2 | 3 | 33 | 0 | 3 | 43 |
| | | | B1 | **** | **** | **** | -2 | 2 | 22 | 0 | 3 | 23 |
| SON | 30.2 | -1.81 | A2 | **** | **** | **** | -2 | 2 | 10 | 0 | 7 | 26 |
| | | | A1B | **** | **** | **** | -3 | 2 | 18 | -3 | 4 | 17 |
| | | | B1 | **** | **** | **** | -4 | 1 | 11 | -3 | 1 | 14 |
| Maximum 5-day Rainfall (RX5day) | | | | | | | | | | | | |
| | mm | Change in mm per decade | | | | Change in mm | | | Change in mm | | | |
| Annual | 200.7 | ***** | A2 | **** | **** | **** | -16 | 2 | 76 | 0 | 18 | 129 |
| | | | A1B | **** | **** | **** | -6 | 7 | 71 | -5 | 15 | 98 |
| | | | B1 | **** | **** | **** | -10 | 7 | 39 | -16 | 6 | 48 |
| DJF | 12.9 | 1.69* | A2 | **** | **** | **** | -15 | -1 | 3 | -12 | -2 | 11 |
| | | | A1B | **** | **** | **** | -10 | -1 | 3 | -14 | -2 | 12 |
| | | | B1 | **** | **** | **** | -7 | -2 | 2 | -18 | -2 | 9 |
| MAM | 25.2 | 3.02* | A2 | **** | **** | **** | -18 | 0 | 5 | -17 | 3 | 11 |
| | | | A1B | **** | **** | **** | -6 | 0 | 19 | -14 | -1 | 8 |
| | | | B1 | **** | **** | **** | -9 | -2 | 8 | -18 | 0 | 5 |
| JJA | 131.7 | -0.70 | A2 | **** | **** | **** | -9 | 5 | 79 | -4 | 16 | 125 |
| | | | A1B | **** | **** | **** | -4 | 9 | 71 | -2 | 11 | 98 |
| | | | B1 | **** | **** | **** | -10 | 6 | 42 | 0 | 8 | 50 |
| SON | 56.1 | -2.98 | A2 | **** | **** | **** | -4 | 4 | 17 | -7 | 17 | 57 |
| | | | A1B | **** | **** | **** | -6 | 5 | 36 | -10 | 13 | 35 |
| | | | B1 | **** | **** | **** | -10 | 4 | 17 | -7 | 4 | 23 |

* indicates trend is statistically significant at 95% confidence

**** indicates data are not available

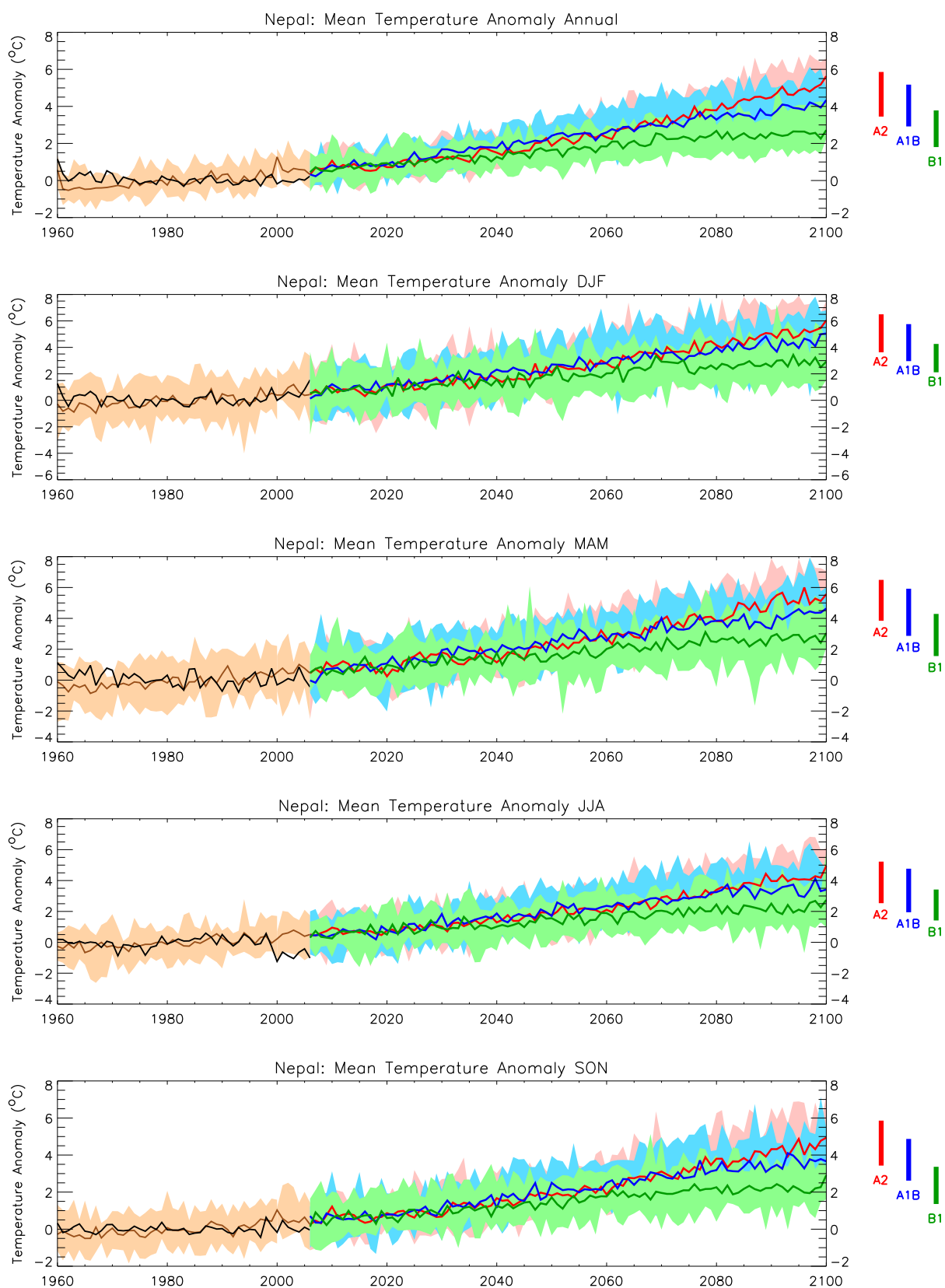


Figure 1: Trends in annual and seasonal mean temperature for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. Black curves show the mean of observed data from 1960 to 2006, Brown curves show the median (solid line) and range (shading) of model simulations of recent climate across an ensemble of 15 models. Coloured lines from 2006 onwards show the median (solid line) and range (shading) of the ensemble projections of climate under three emissions scenarios. Coloured bars on the right-hand side of the projections summarise the range of mean 2090-2100 climates simulated by the 15 models for each emissions scenario.

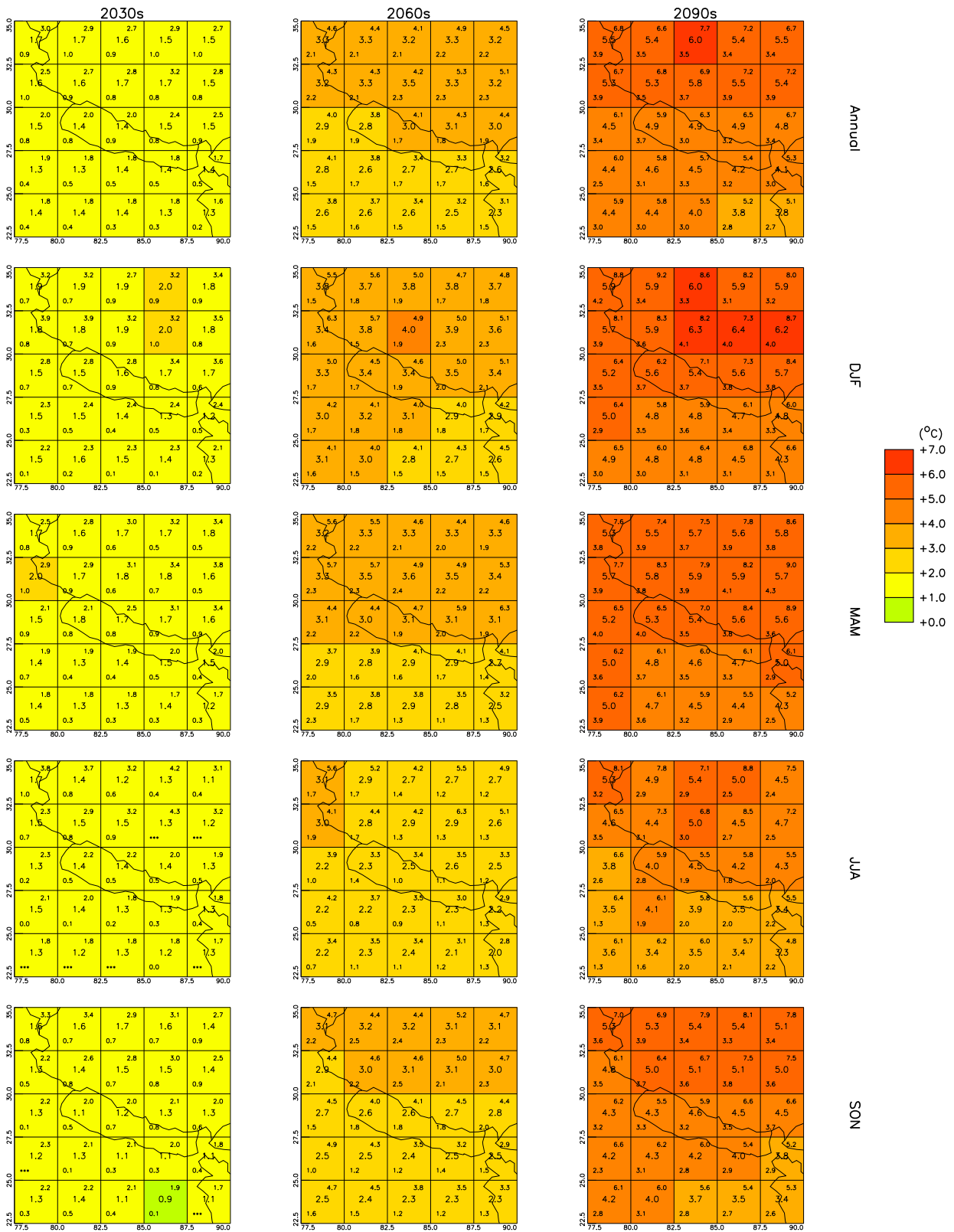


Figure 2: Spatial patterns of projected change in mean annual and seasonal temperature for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. In each grid box, the central value gives the ensemble median and the values in the upper and lower corners give the ensemble maximum and minimum.

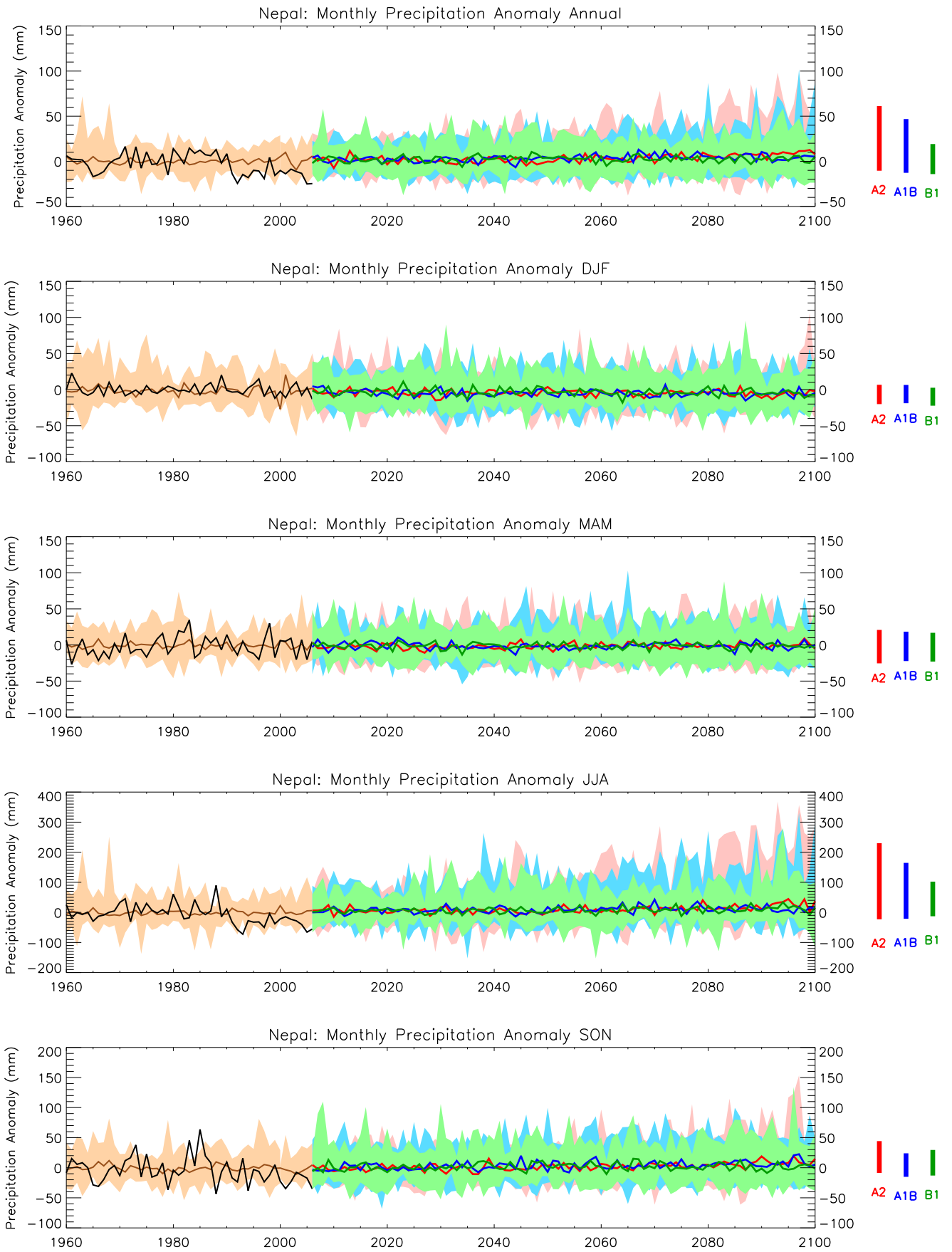


Figure 3: Trends in monthly precipitation for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

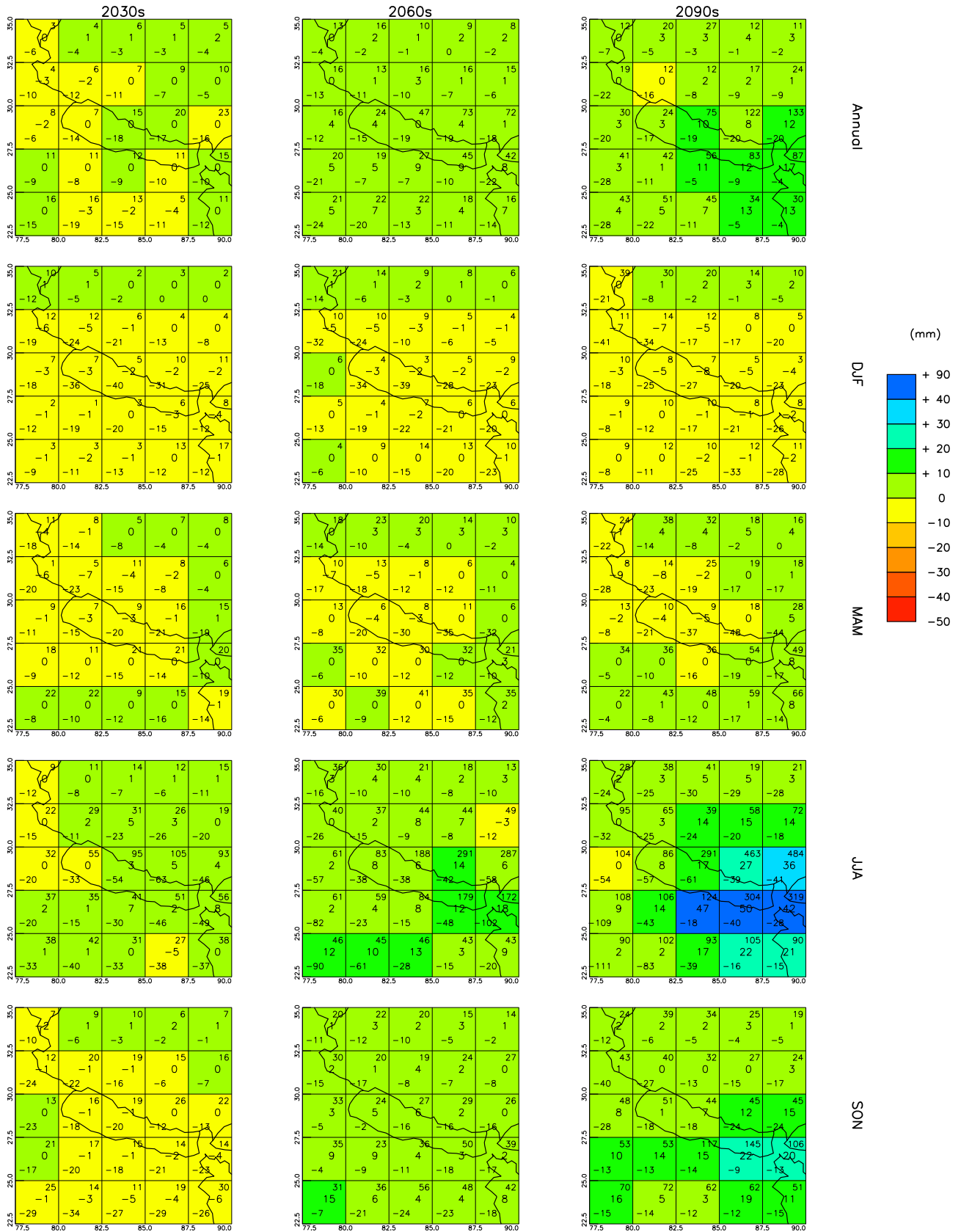


Figure 4: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

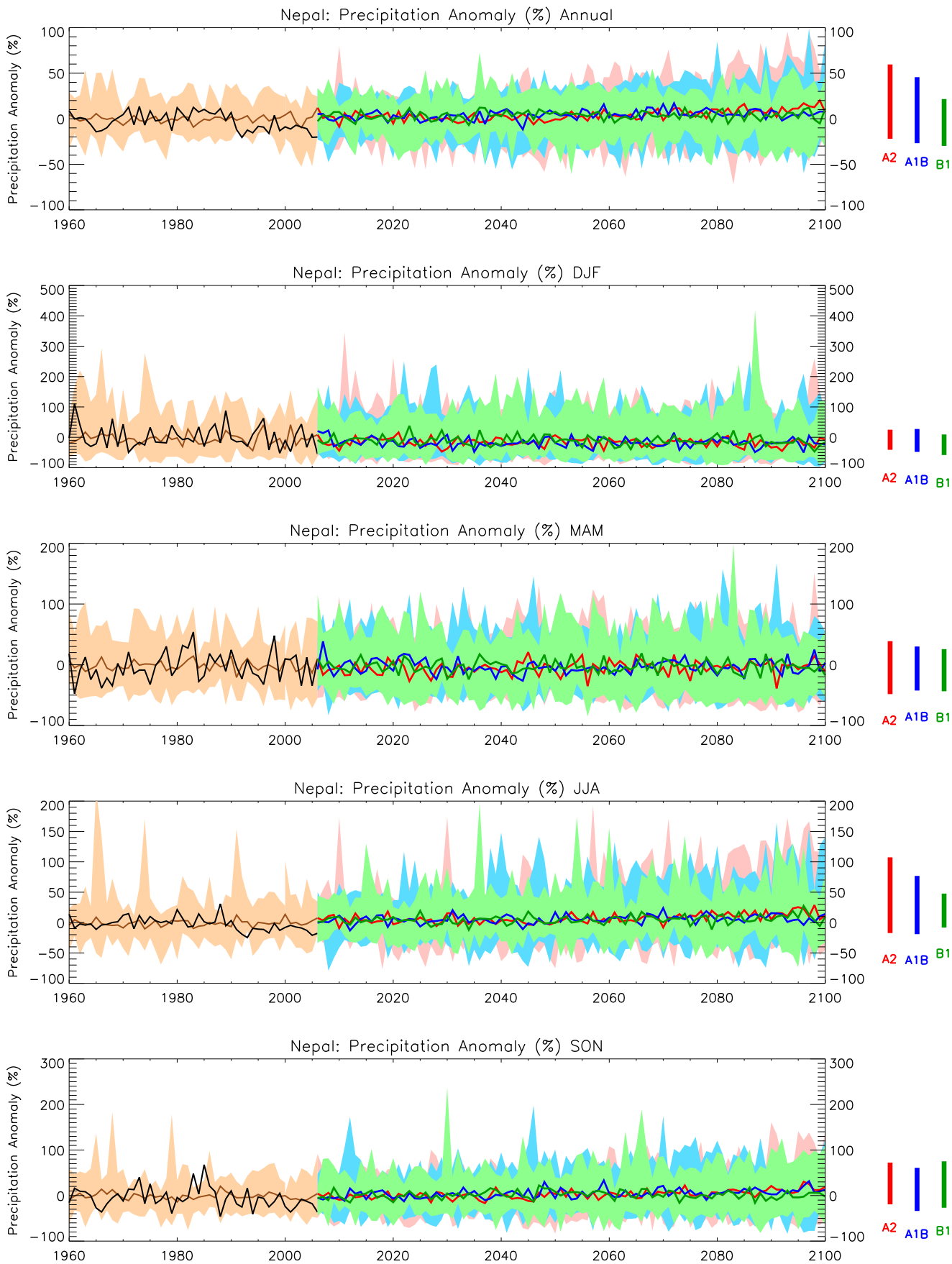


Figure 5: Trends in monthly precipitation for the recent past and projected future. All values shown are percentage anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

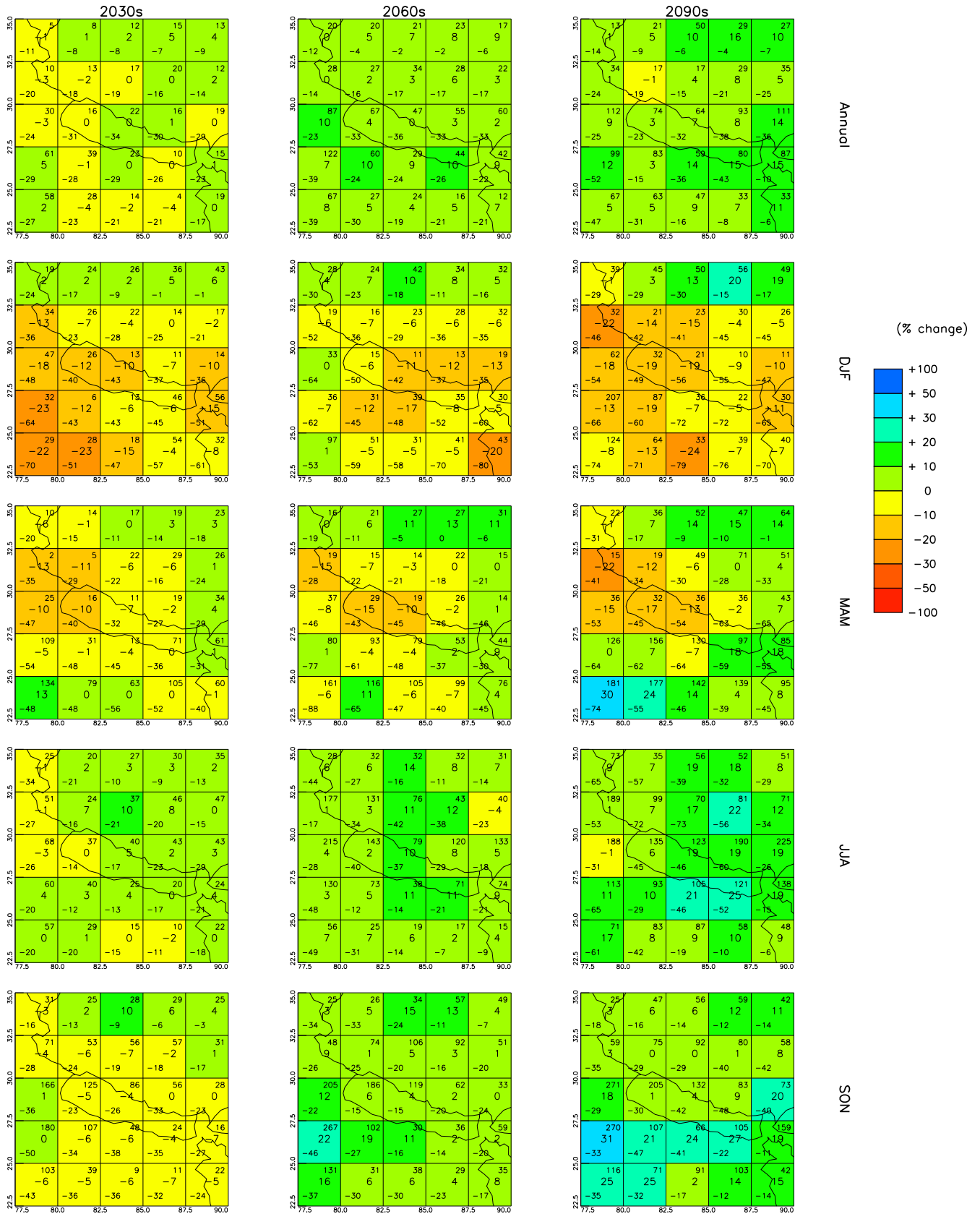


Figure 6: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are percentage anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

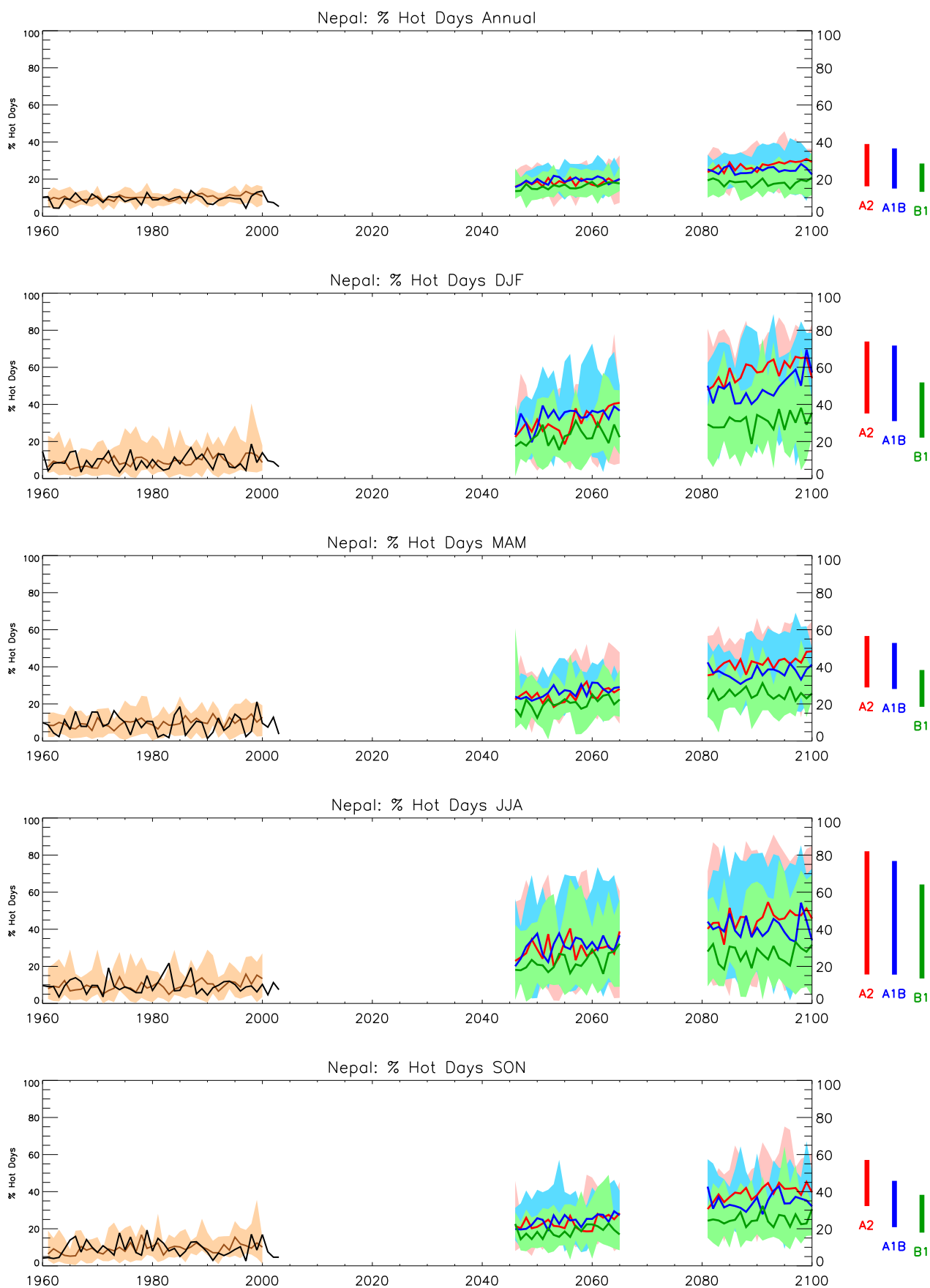


Figure 7: Trends in Hot-day frequency for the recent past and projected future. See Figure 1 for details.

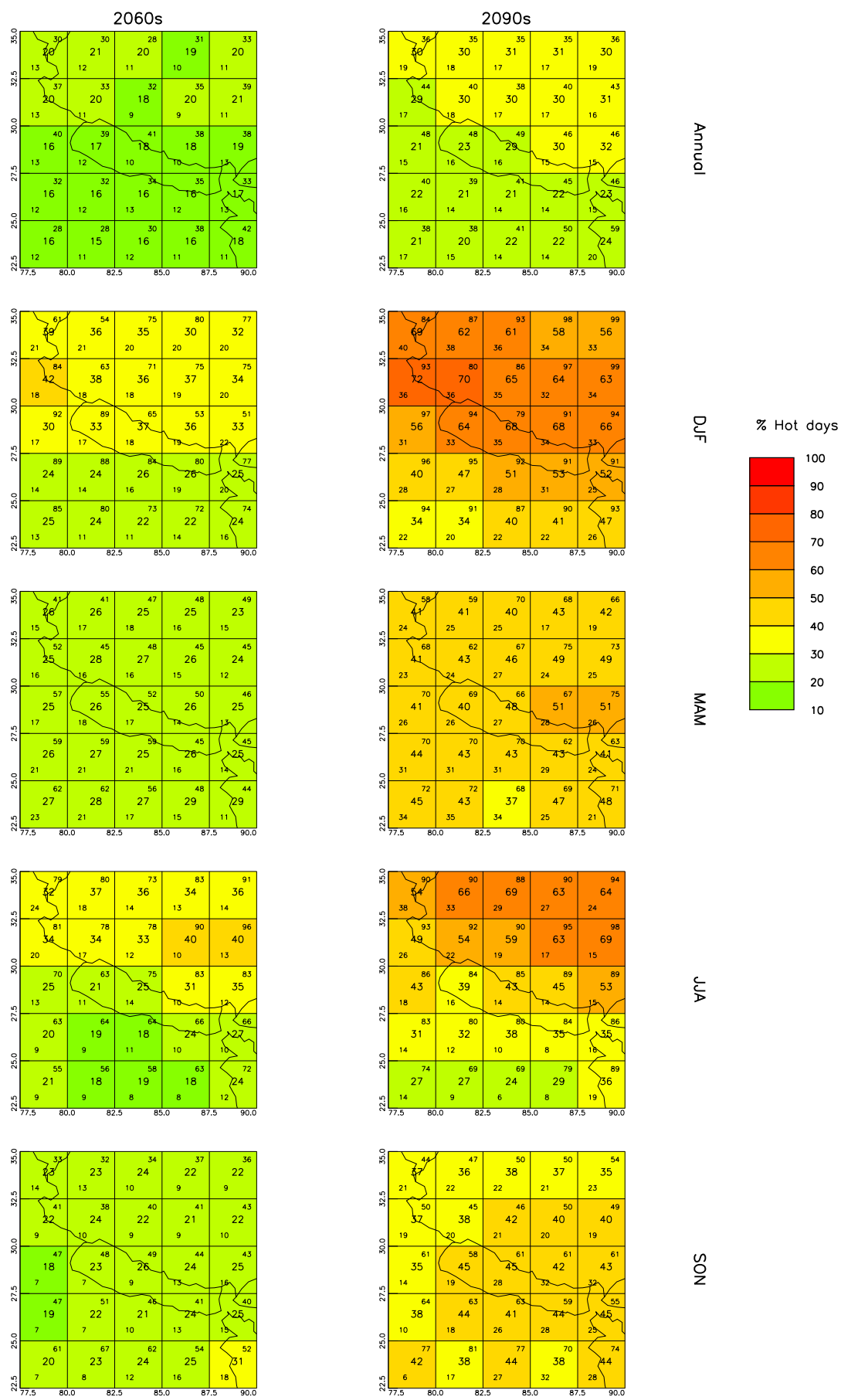


Figure 8: Spatial patterns of projected change in Hot-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

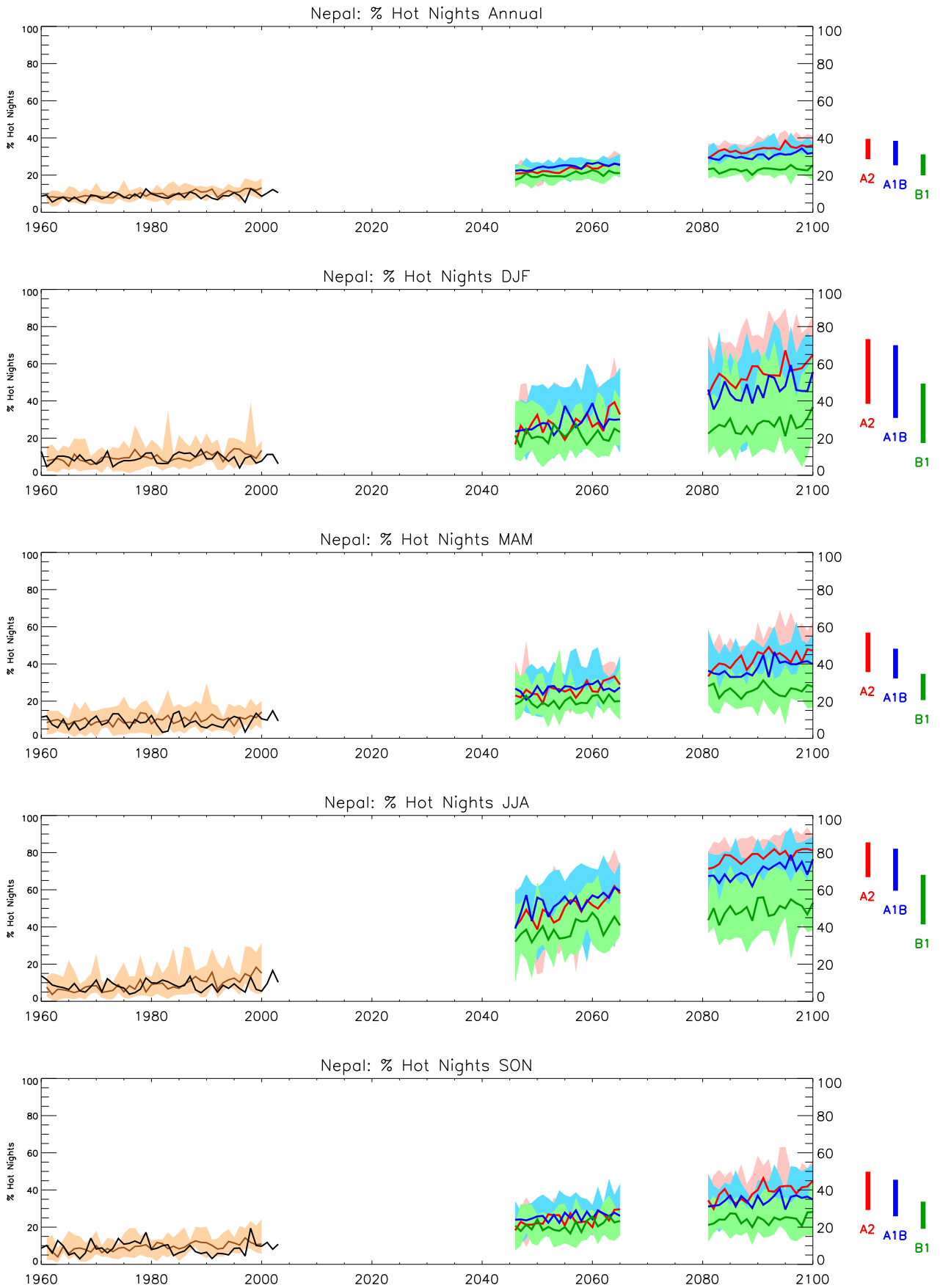


Figure 9: Trends in hot-night frequency for the recent past and projected future. See Figure 1 for details.

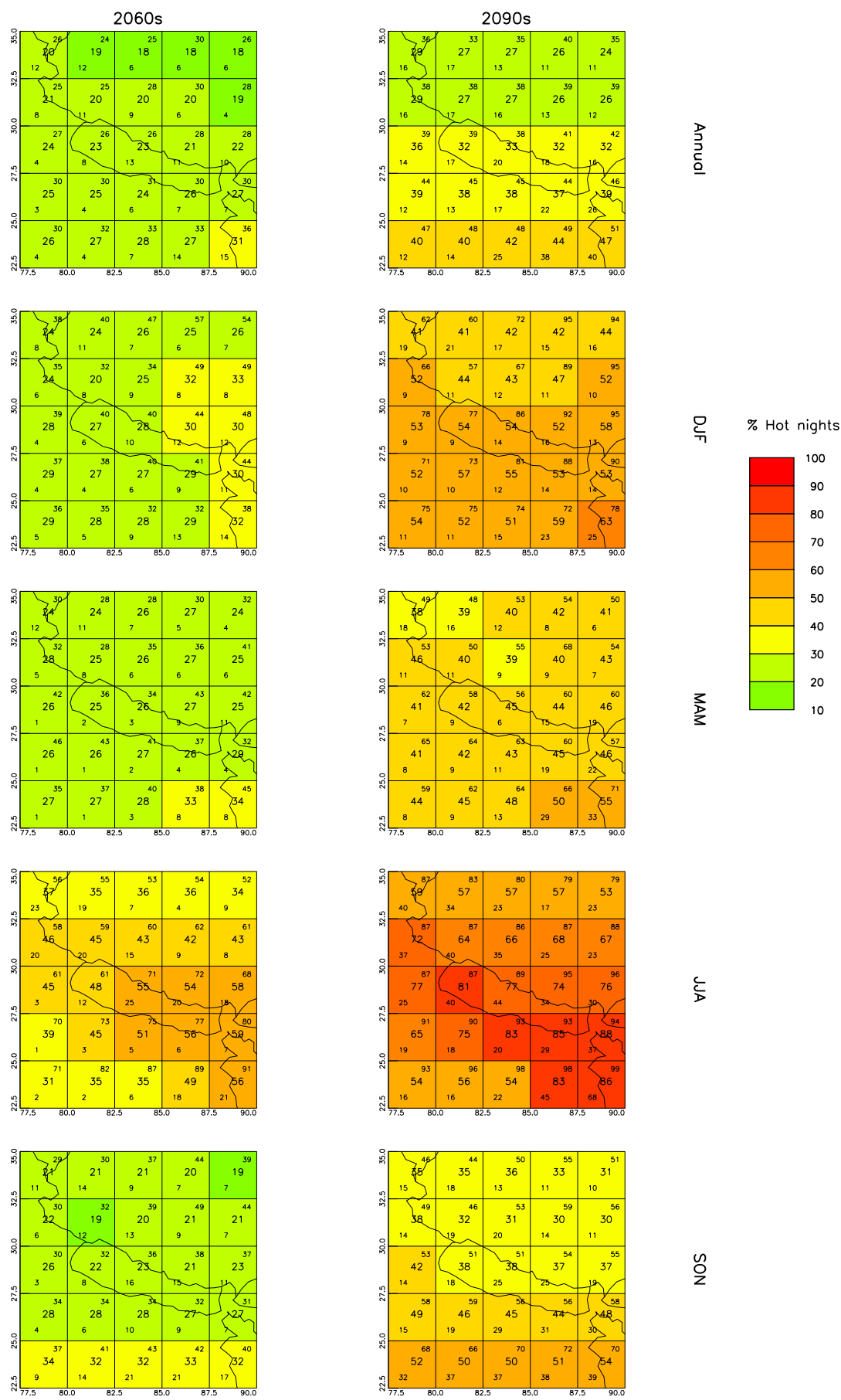


Figure 10: Spatial patterns of projected change in hot-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

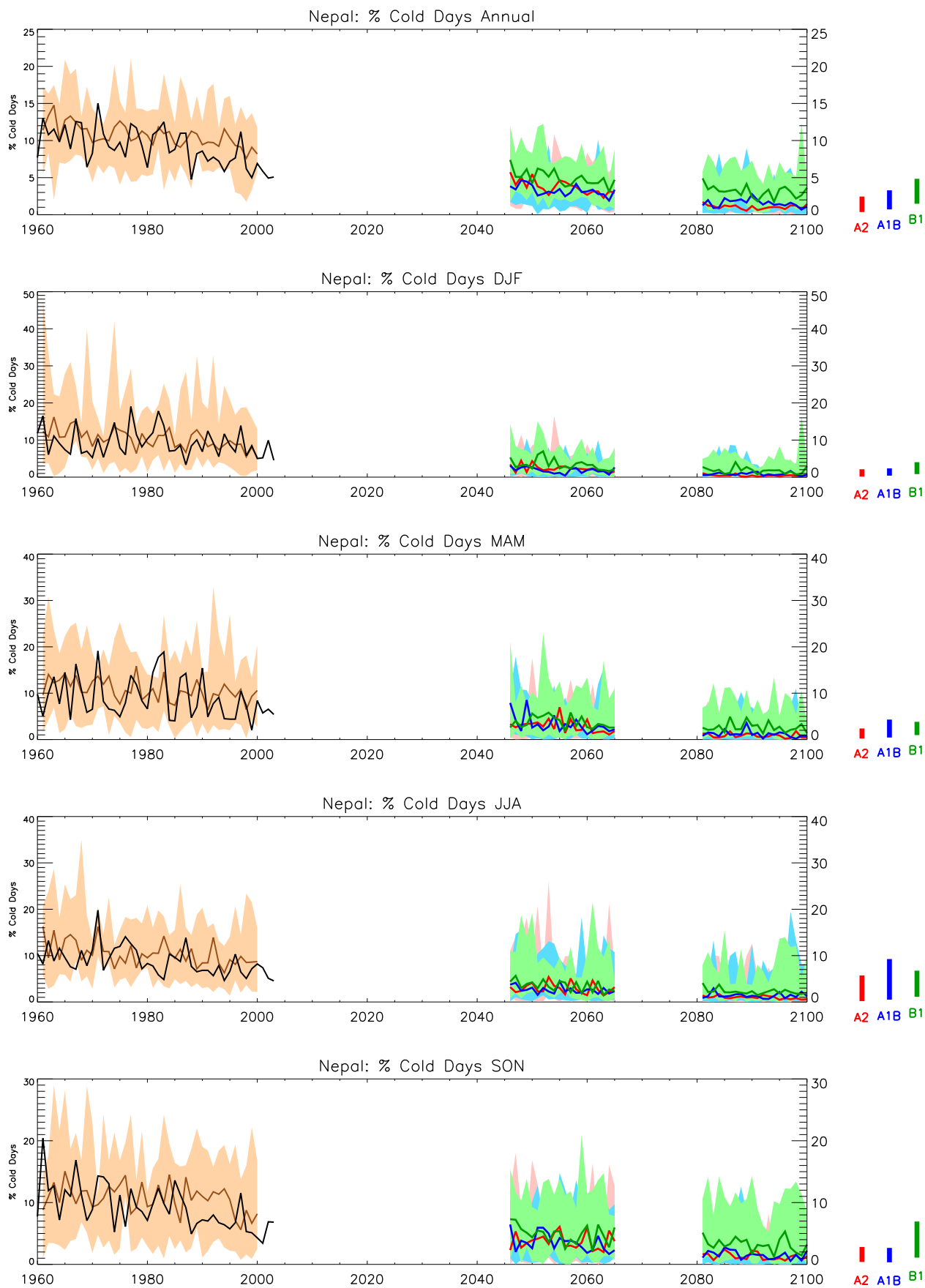


Figure 11: Trends in cold-day frequency for the recent past and projected future. See Figure 1 for details.

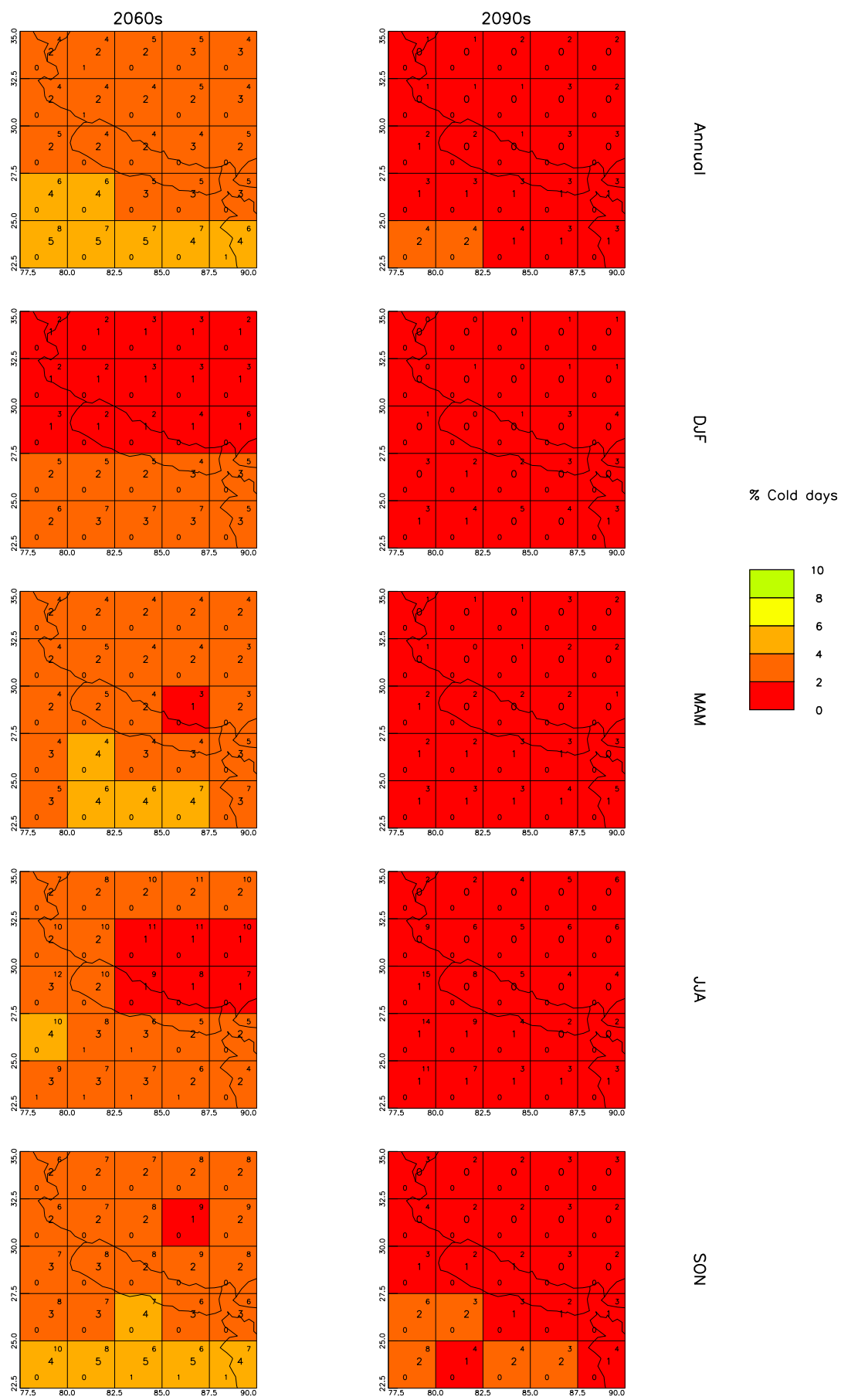


Figure 12: Spatial patterns of projected change in cold-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

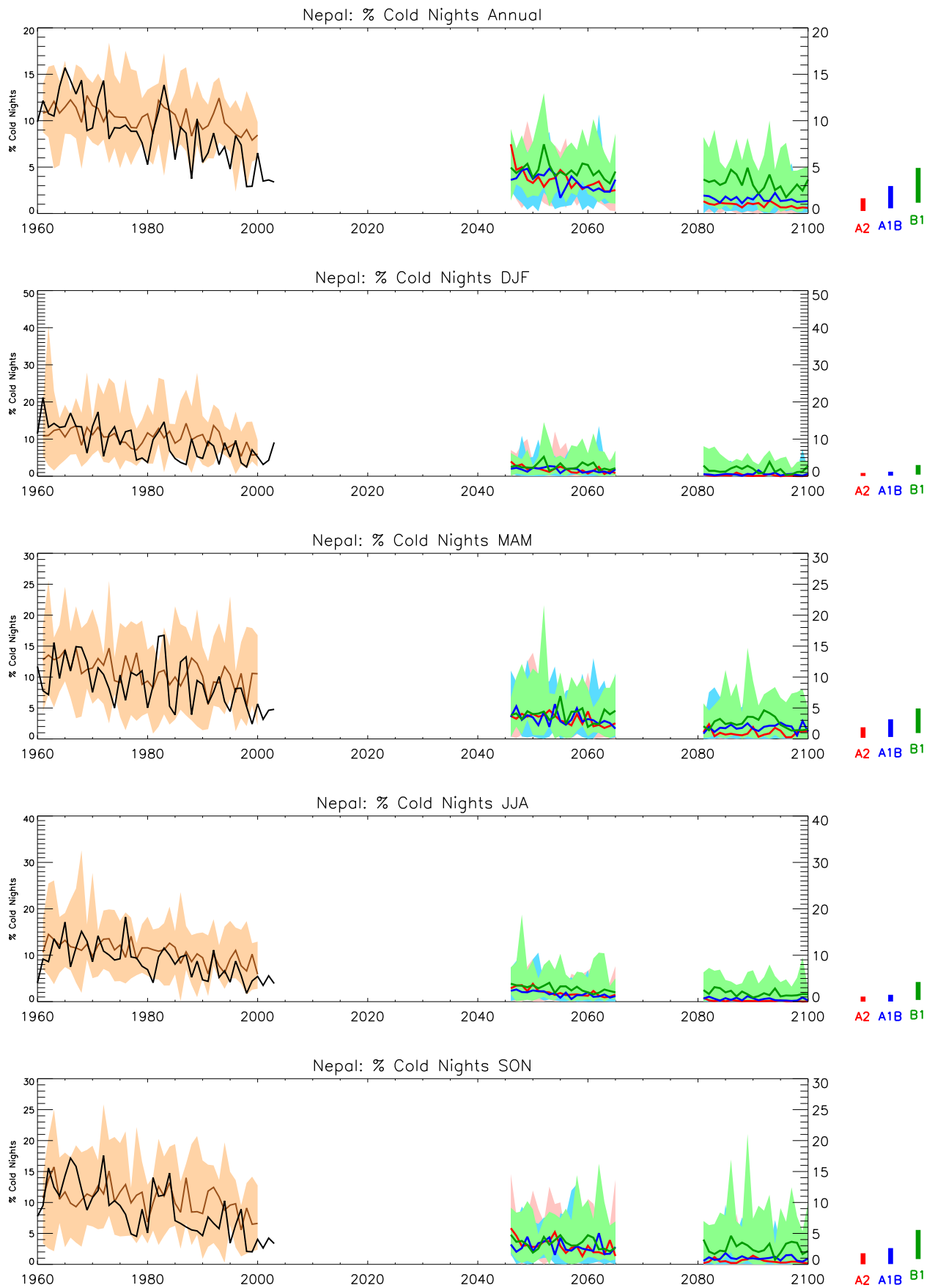


Figure 13: Trends in cold-night frequency for the recent past and projected future. See Figure 1 for details.

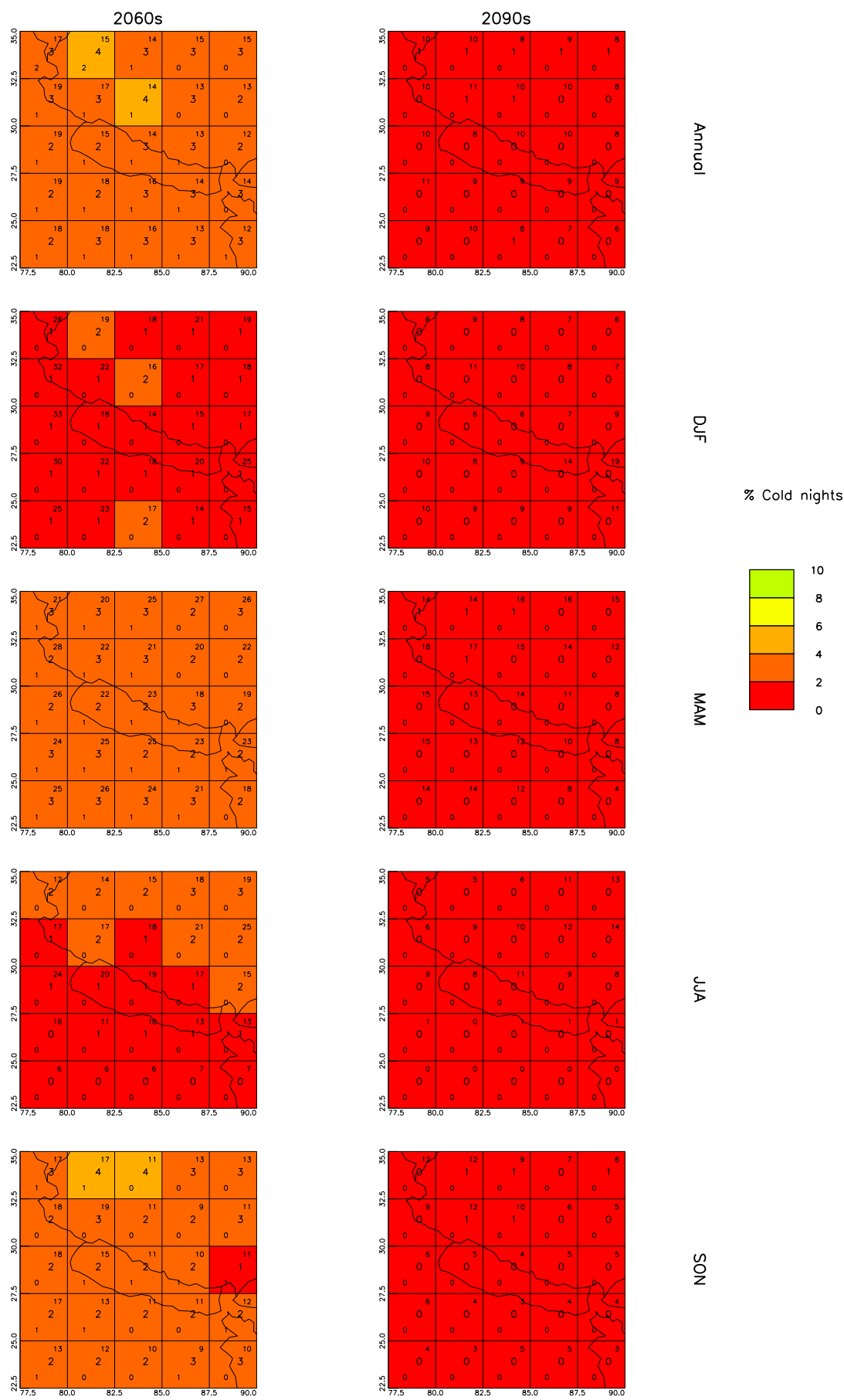


Figure 14: Spatial patterns of projected change in cold-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

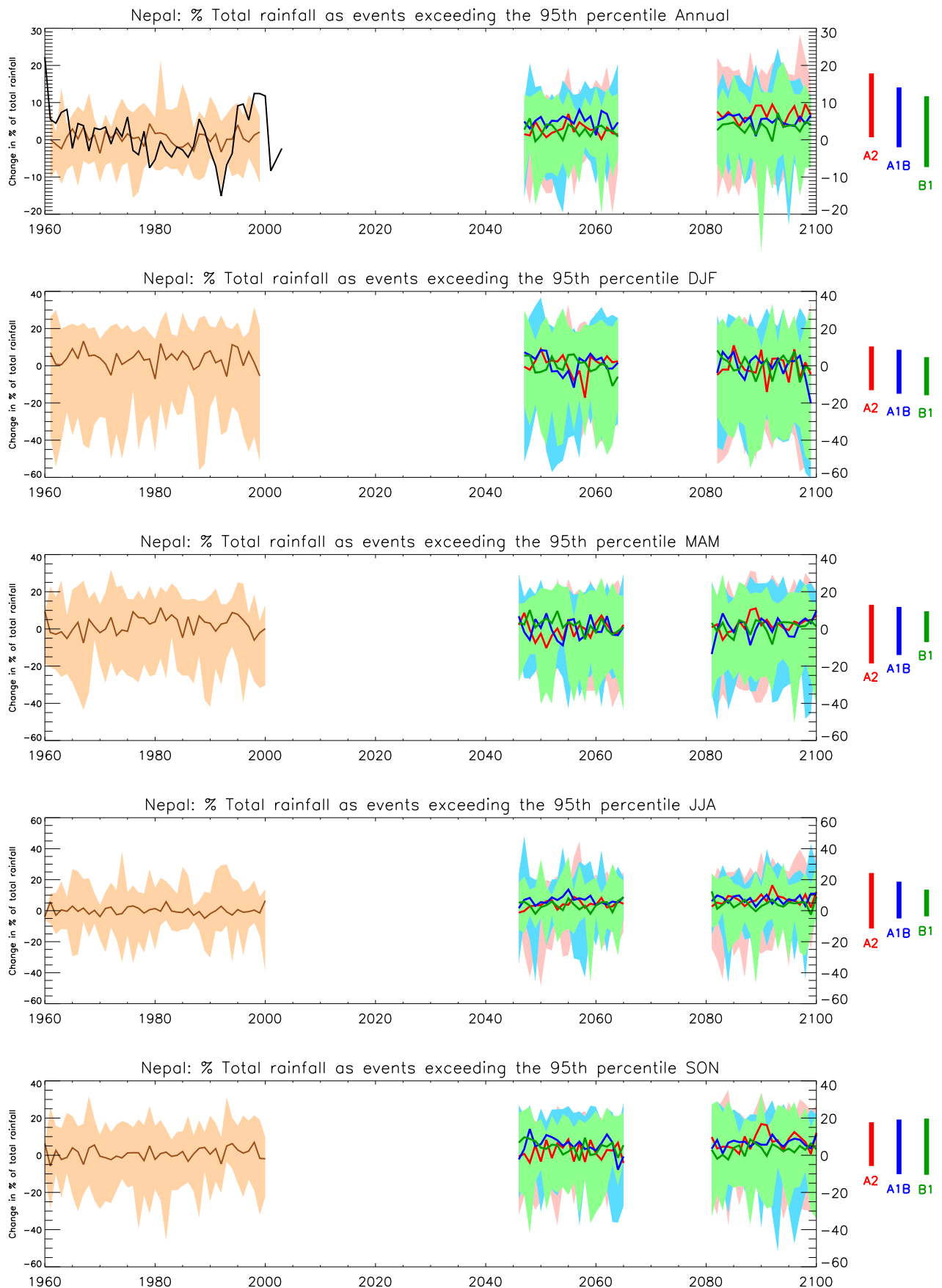


Figure 15: Trends in the proportion of precipitation falling in 'heavy' events for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

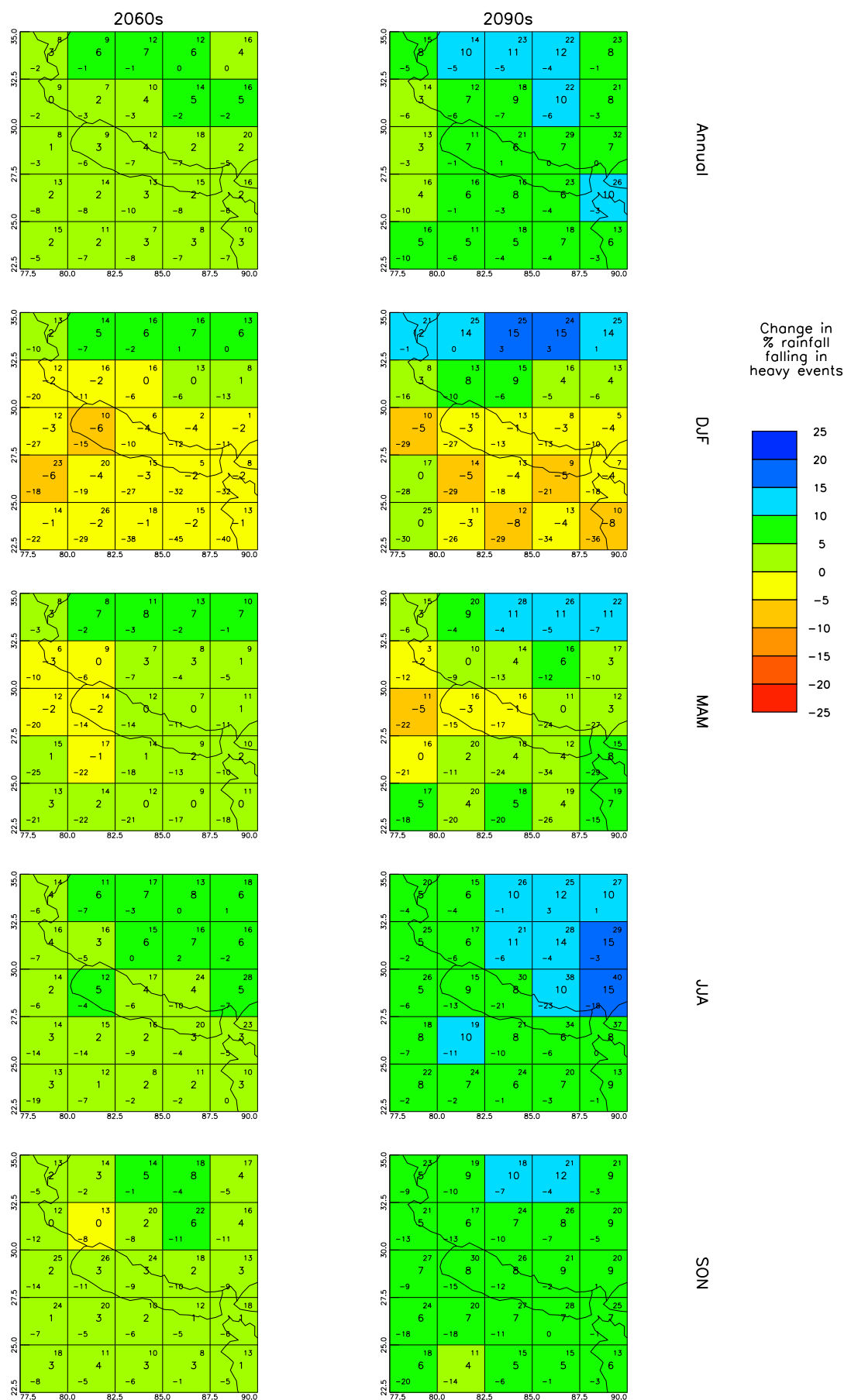


Figure 16: Spatial patterns of projected change in the proportion of precipitation falling in 'heavy' events for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

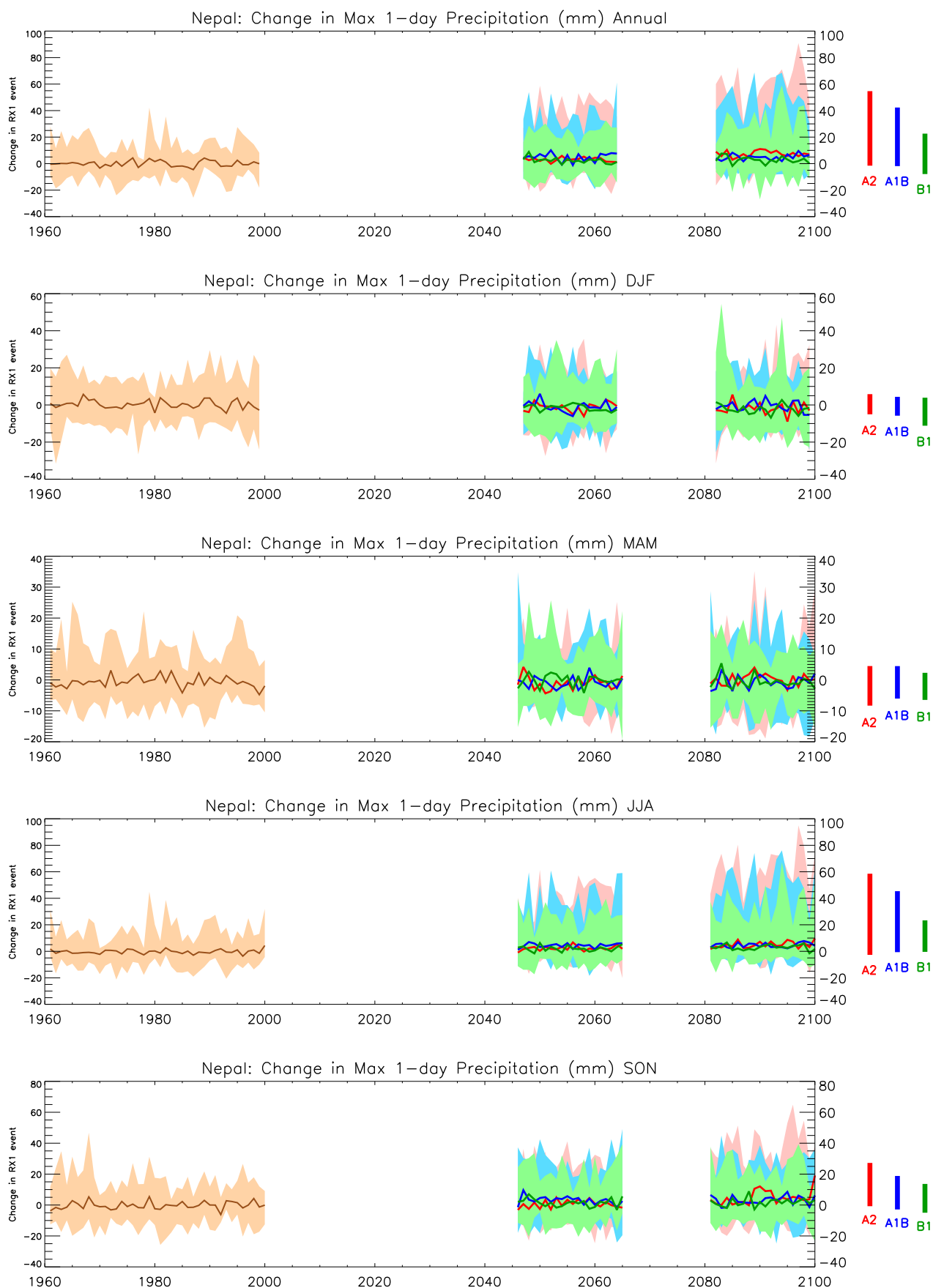


Figure 17: Trends in maximum 1-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

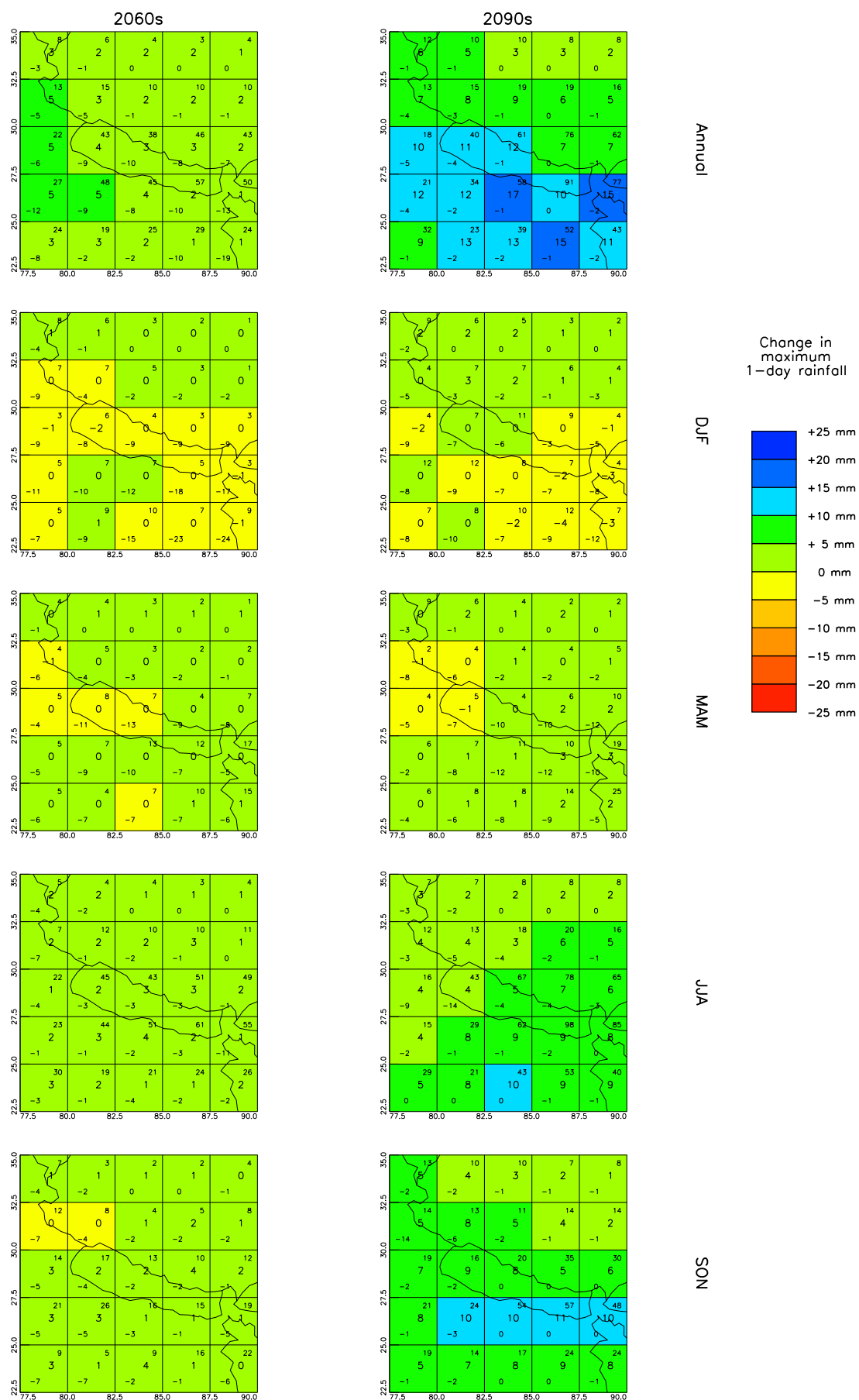


Figure 18: Spatial patterns of maximum 1-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

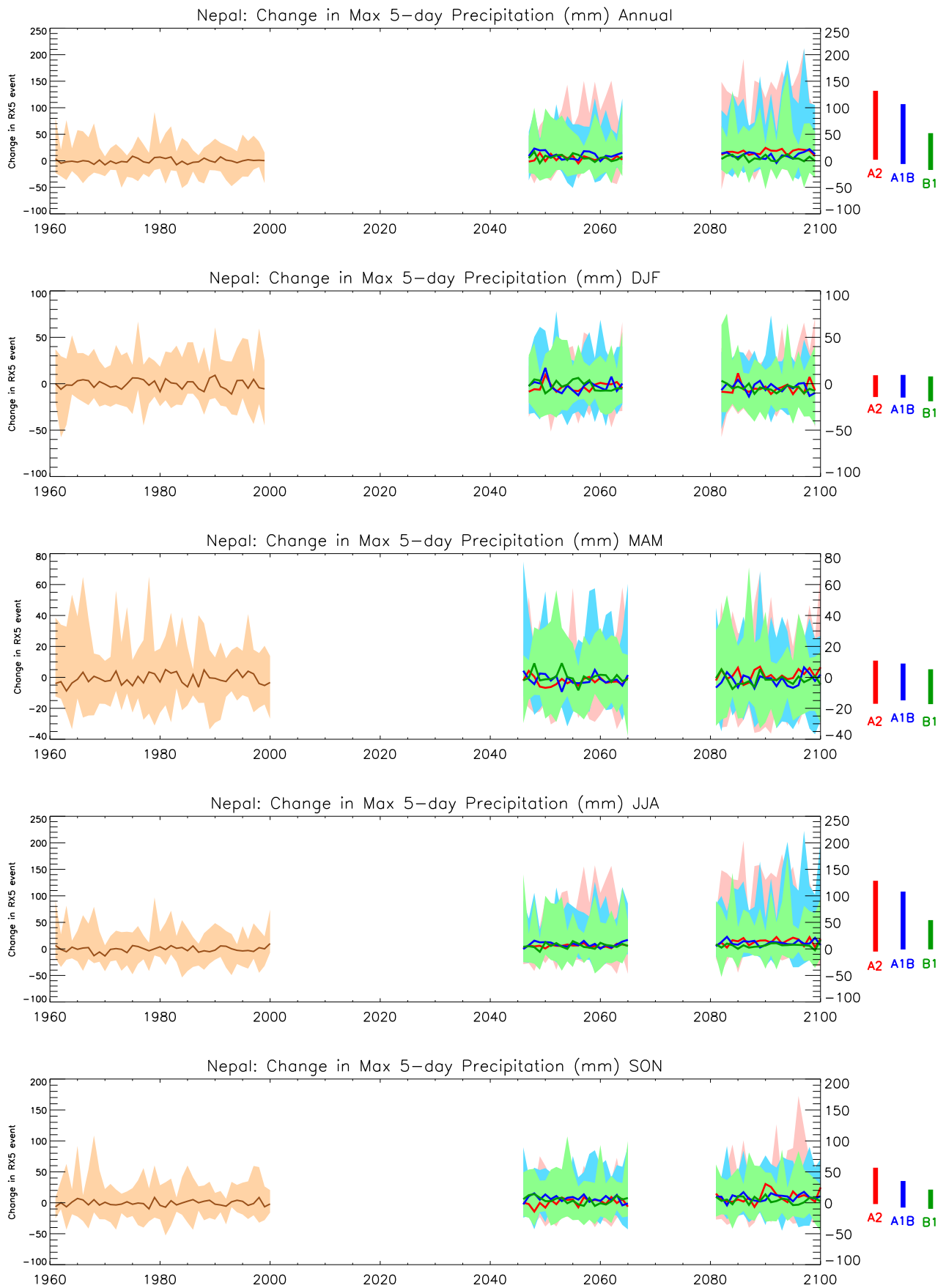


Figure 19: Trends in maximum 5-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

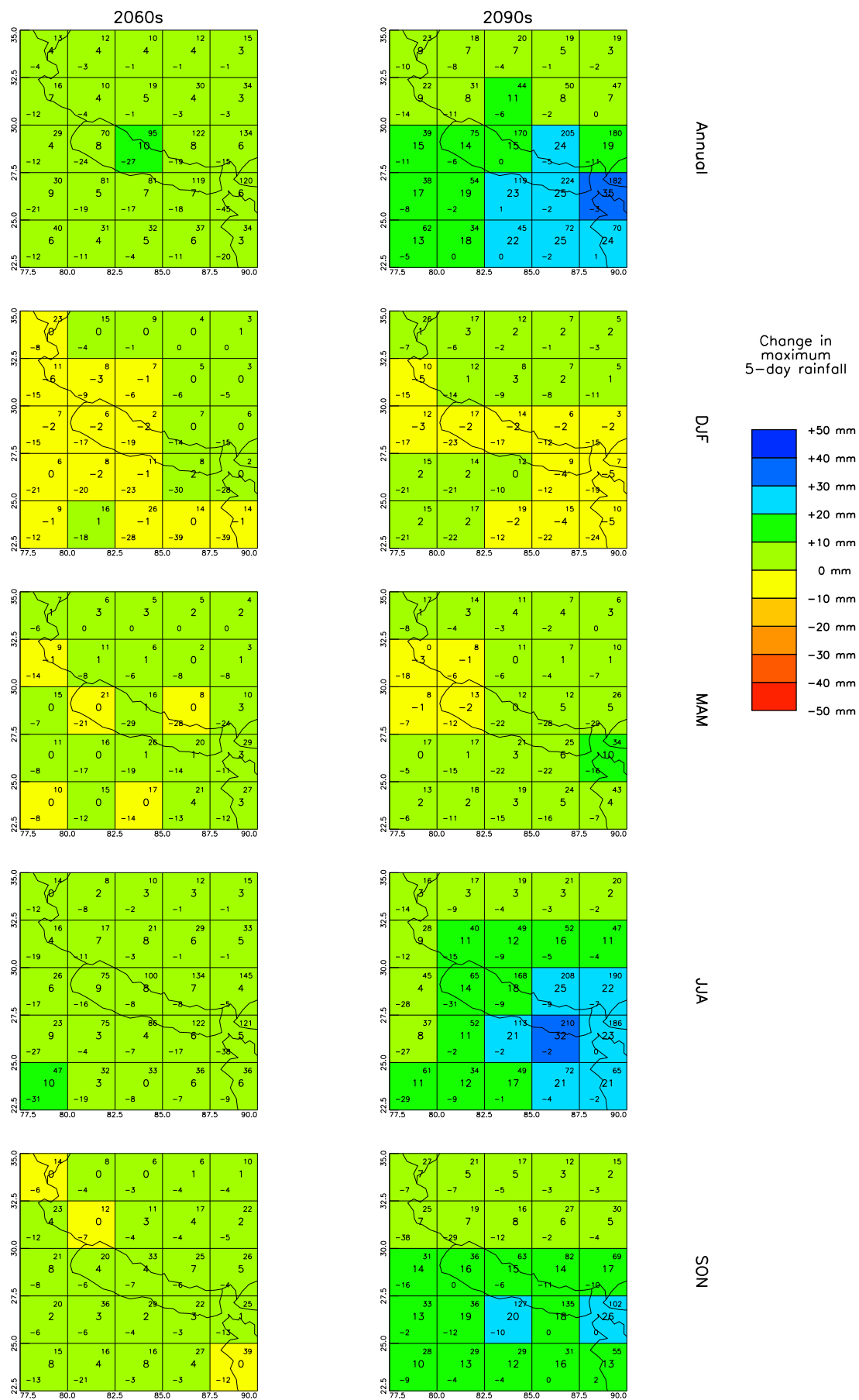


Figure 20: Spatial patterns of projected change in maximum 5-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.