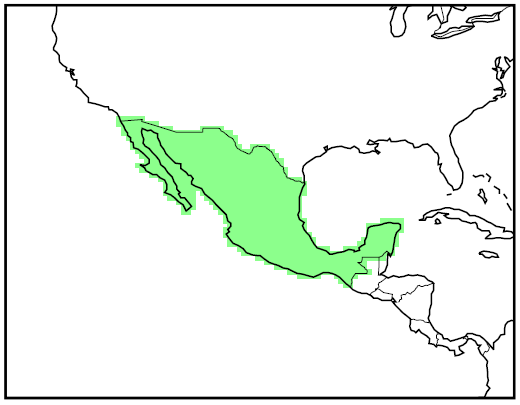
UNDP Climate Change Country Profiles

Mexico



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General Climate

Mexico stretches from 15˚ to 32.5˚ north of the equator, sitting on the edge of the tropics and stretching well up into the arid sub-tropics. This wide latitudinal band means that climate varies greatly between the north, with a temperate climate, and south, with a tropical climate. The varied topography in Mexico superimposes further climatic differences between different regions of the country.

Mean annual temperatures are lowest in the central, upland areas (15-20˚C) and higher in coastal lowland regions (23-27˚). The seasonal variations in these temperatures are small in the south of the country, but in the northernmost regions range from less than 10˚ in winter (DJF) to more than 30˚ in summer (JJA).

In the far north, rainfall is less than 50mm per month throughout the year, whilst the southern regions and central highlands experience a distinct 'wet' season from June to October, the wettest (southernmost) regions receiving up to 550mm per month at this time of year. The rainfall received in this region is controlled largely by the North American Monsoon and the position of the Inter-Tropical Conversion Zone (ITCZ). The coastlines of Mexico are also vulnerable to tropical cyclones and hurricanes from both the Atlantic and Pacific oceans from July through to October. Heavy rainfalls accompanying these storms contribute a significant fraction towards the high wet-season rainfall totals.

Inter-annual variations in climate in northern Mexico are caused by natural variability in the monsoon, and the El Niño Southern Oscillation (ENSO). El Niño events bring relatively cool and wet conditions in the winter in northern regions of Mexico, whilst La Niña events bring warmer and drier conditions at that time of year. In El Niño years, the number of Pacific hurricanes increases, but Atlantic hurricanes decreases, with the opposite pattern occurring in La Niña episodes.

Recent Climate Trends

Temperature

- Mean annual temperature has increased by 0.6˚C since 1960, a rate of around 0.13˚C per decade. The rate of increase is most rapid in the dry seasons (MAM and DJF) at a rate of 0.18-0.2˚C per decade and slower in the wet seasons (JJA and SON) at a rate 0.12˚C per decade.
- The frequency of hot days[1] and hot nights has increased significantly since 1960 in every season.
    - The average number of 'hot' days per year in Mexico has increased by 36 (an additional 9.9% of days[2]) between 1960 and 2003. The rate of increase is seen most strongly in JJA when the average number of hot JJA days has increased by 3.5 days per month (an additional 11.3% of JJA days) over this period.
    - The average number of 'hot' nights per year increased by 21 (an additional 5.6% of nights) between 1960 and 2003. The rate of increase is seen most strongly in JJA when the average number of hot JJA nights has increased by 2.6 days per month (an additional 8.5% of JJA nights) over this period.
- The frequency of cold days[3] and nights, annually, has decreased significantly since 1960.
    - The average number of 'cold 'days per year has decreased by 11 (3.1% of days) between 1960 and 2003. This rate of decrease is most rapid in DJF when the average number of cold DJF days has decreased by 1.3 days per month (4.2% of DJF days) over this period.
    - The average number of 'cold' nights per year has decreased by 11 (3.1% of days). This rate of decrease is most rapid in DJF when the average number of cold DJF nights has decreased by 1.5 nights per month (4.9% of DJF nights) over this period.

Precipitation

- Mean rainfall over Mexico does not show any consistent increase or decrease since 1960. A particularly wet autumn in 2004 causes an apparent increasing trend in SON.

- The proportion of rainfall that occurs in heavy[4] events has increased a little, by 1.2% per decade, on average, since 1960.

[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.
[2] The increase in frequency over the 43-year period between 1960 and 2003 is estimated based on the decadal trend quoted in the summary table.
[3] '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.

- The observed maximum 1- and 5-day rainfalls do not show any substantial alteration in magnitude since 1960 in any season except SON, when small increasing trends of +0.85 and +1.50mm per decade in 1- and 5-day events, respectively, are seen.

[4] 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.

GCM Projections of Future Climate

Temperature

- The mean annual temperature is projected to increase by 1.1 to 3˚C by the 2060s, and 1.3 to 4.8 degrees by the 2090s. The range of projections by the 2090s under any one emissions scenario is around 1.5˚C.
- The projected rate of warming is similar in all seasons, but more rapid in the north and central regions of the country.

- All projections indicate substantial increases in the frequency of days and nights that are considered 'hot' in current climate.
    - Annually, projections indicate that 'hot' days will occur on 18-34% of days by the 2060s, and 22-54% of days by the 2090s. Days considered 'hot' by current climate standards for their season are projected to occur on 21-83% of days of the season by the 2090s, with the fastest rates on increase in summer (JJA).
    - Nights that are considered 'hot' for the annual climate of 1970-99 are projected to occur on 22-39% of nights by the 2060s and 29-56% of nights by the 2090s. Nights that are considered hot for each season by 1970-99 standards are projected to occur on 22-91% of nights in every season by the 2090s, with the fastest rates of increase in summer (JJA).
- All projections indicate decreases in the frequency of days and nights that are considered 'cold' in current climate. These events are expected to become exceedingly rare, occurring on maximum of 1-5% of days in the year, and potentially not at all in some seasons, by the 2090s.

Precipitation

- Projections of mean annual rainfall from different models in the ensemble are broadly consistent in indicating decreases in rainfall for Mexico. Ensemble median values for almost all seasons and emissions scenarios are negative. Projections vary between -60% and +8% by the 2090s with ensemble median values of -3 to -15%.
- Relative changes in rainfall projected show the strongest decreasing signal in dry season (DJF and MAM) rainfall.

- The proportion of total rainfall that falls in heavy events does not show a consistent direction of change, but tend towards negative changes, particularly for the dry seasons DJF and MAM.
- Maximum 1- and 5-day rainfalls tend towards negative changes in the dry seasons DJF and MAM, and positive changes in SON. This is broadly consistent with the directions of change seen in the observed data.

Additional Regional Climate Change Information

- Tropical cyclones are poorly captured by GCMs and thus potential changes in intensity and tracks of tropical cyclones in the future are very uncertain. Whilst evidence indicates that tropical cyclones are likely to become, on the whole, more intense under a warmer climate as a result of higher sea-surface temperatures, there is great uncertainty in changes in frequency, and changes to storm tracks and their interactions with other features of climate variability (such as the El Niño Southern Oscillation) which introduces uncertainty at the regional scale (Christensen *et al*., 2007).
- This uncertainty in potential changes in tropical cyclone contributes to uncertainties in future wet-season rainfall. Potential increases in summer rainfall associated with tropical cyclone activity, which may not be captured in the GCM projections, may counteract the projected decreases in rainfall in the region (Christensen *et al*., 2007).
- Model simulations show wide disagreements in projected changes in the amplitude of future El Niño events. ENSO influences the monsoon system in Central America and affects the position of the ITCZ, thus contributing to uncertainty in climate projections for this region.
- Mexico's coastal lowlands (particularly on the Yucatan Peninsula) may be vulnerable to sea-level rise. Sea-level in this region is projected by climate models to rise by the following levels[5] by the 2090s, relative to 1980-1999 sea-level:

  Pacific coastline:
  - 0.13 to 0.38m under SRES B1
  - 0.16 to 0.48m under SRES A1B
  - 0.18 to 0.51m under SRES A2

  Atlantic coastline:
  - 0.13 to 0.43m under SRES B1
  - 0.16 to 0.53m under SRES A1B
  - 0.18 to 0.56m under SRES A2

- For further information see Christensen *et al.* (2007) IPCC Working Group I Report: '*The Physical Science Basis'*, Chapter 11 *(Regional Climate projections*): Section 11.6 *(South and Central America*).

[5] Taken from the IPCC Working group I (*The Physical Science Basis*): Chapter 10 (Global Climate Projections) (Meehl *et al*., 2007). Regional sea-level projections are estimated by applying regional adjustments (Fig 10.32, p813) to projected global mean sea-level rise from 14 AR4 models.

Data Summary

	Observed Mean 1970-99	Observed Trend 1960-2006		Projected changes by the 2030s Min	2030s Median	2030s Max	Projected changes by the 2060s Min	2060s Median	2060s Max	Projected changes by the 2090s Min	2090s Median	2090s Max
Temperature												
	(˚C)	*(change in ˚C per decade)*		*Change in ˚C*			*Change in ˚C*			*Change in ˚C*		
			A2	0.9	**1.2**	1.5	2	**2.5**	2.8	3.1	**4.1**	4.8
Annual	20.8	0.13*	*A1B*	0.7	**1.4**	1.6	1.4	**2.5**	3.0	2.2	**3.2**	3.9
			B1	0.5	**1.0**	1.3	1.1	**1.8**	2.1	1.3	**2.0**	2.8
			A2	0.5	**1.0**	1.6	1.6	**2.1**	2.9	2.7	**3.8**	4.7
DJF	16.0	0.20*	*A1B*	0.5	**1.2**	1.8	1.3	**2.0**	3.1	2.1	**2.7**	3.9
			B1	0.4	**0.9**	1.3	1.1	**1.5**	2.1	1.1	**1.8**	2.6
			A2	1.0	**1.2**	1.8	1.9	**2.6**	2.9	3.2	**4.2**	4.9
MAM	21.2	0.18*	*A1B*	0.8	**1.4**	1.9	1.4	**2.5**	3.0	2.2	**3.4**	4.0
			B1	0.5	**1.0**	1.4	1.1	**1.8**	2.1	1.2	**2.2**	2.7
			A2	1.0	**1.3**	1.7	2.0	**2.6**	3.1	3.2	**4.2**	5.1
JJA	24.8	0.12*	*A1B*	0.7	**1.4**	1.7	1.5	**2.5**	3.3	2.3	**3.3**	4.2
			B1	0.6	**1.1**	1.4	0.9	**1.8**	2.3	1.4	**2.1**	3.2
			A2	0.9	**1.4**	1.7	2.0	**2.5**	3.0	3.2	**4.2**	5.1
SON	21.0	0.12*	*A1B*	0.6	**1.4**	1.7	1.4	**2.6**	3.1	2.3	**3.4**	4.3
			B1	0.4	**1.1**	1.7	1.0	**1.8**	2.3	1.4	**2.1**	3.0
Precipitation												
	(mm per month)	*(change in mm per decade)*		*Change in mm per month*			*Change in mm per month*			*Change in mm per month*		
			A2	-9	**-4**	0	-22	**-5**	3	-29	**-9**	4
Annual	61.7	-0.4	*A1B*	-13	**-2**	6	-21	**-6**	2	-24	**-6**	8
			B1	-8	**-2**	3	-18	**-2**	5	-22	**-2**	3
			A2	-15	**0**	0	-29	**-7**	3	-34	**-13**	1
DJF	24.0	-1.3	*A1B*	-21	**-6**	7	-23	**-4**	1	-25	**-6**	5
			B1	-13	**-3**	14	-20	**-4**	4	-29	**-3**	3
			A2	-11	**-4**	3	-16	**-6**	11	-21	**-8**	5
MAM	25.3	-0.4	*A1B*	-12	**-2**	5	-15	**-4**	8	-20	**-5**	14
			B1	-9	**-2**	14	-13	**-3**	8	-12	**-3**	10
			A2	-19	**-7**	5	-24	**-10**	8	-38	**-14**	8
JJA	117.2	-1.9	*A1B*	-14	**-4**	7	-26	**-9**	6	-28	**-9**	13
			B1	-12	**-6**	5	-28	**-6**	11	-27	**-6**	11
			A2	-11	**-3**	10	-24	**0**	11	-36	**-1**	31
SON	80.1	2.5	*A1B*	-11	**-2**	11	-28	**-1**	26	-34	**-3**	28
			B1	-11	**-1**	4	-21	**2**	13	-27	**1**	16
Precipitation (%)												
	(mm per month)	*(change in % per decade)*		*% Change*			*% Change*			*% Change*		
			A2	-18	**-5**	0	-46	**-7**	3	-60	**-15**	4
Annual	61.7	-0.6	*A1B*	-27	**-4**	8	-45	**-8**	1	-51	**-9**	8
			B1	-18	**-3**	4	-38	**-2**	6	-46	**-3**	3
			A2	-31	**-2**	1	-58	**-11**	6	-70	**-18**	2
DJF	24.0	-5.5	*A1B*	-42	**-9**	24	-47	**-11**	3	-52	**-14**	8
			B1	-26	**-7**	28	-41	**-5**	15	-58	**-6**	6
			A2	-39	**-11**	8	-54	**-14**	15	-62	**-28**	7
MAM	25.3	-1.7	*A1B*	-38	**-6**	8	-45	**-14**	11	-47	**-18**	19
			B1	-32	**-5**	36	-22	**-6**	10	-28	**-9**	27
			A2	-20	**-6**	4	-42	**-9**	5	-58	**-13**	5
JJA	117.2	-1.7	*A1B*	-26	**-3**	6	-46	**-11**	5	-51	**-8**	8
			B1	-18	**-4**	4	-50	**-4**	10	-49	**-5**	6
			A2	-13	**-3**	9	-37	**0**	9	-54	**-1**	20
SON	80.1	3.2	*A1B*	-13	**-2**	10	-42	**-2**	22	-51	**-4**	26
			B1	-8	**-1**	6	-32	**2**	11	-41	**0**	22

	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
	% Frequency	Change in frequency per decade					Future % frequency			Future % frequency		
Frequency of Hot Days (TX90p)												
			A2	****	****	****	26	**29**	33	36	**43**	54
Annual	11.6	2.31*	*A1B*	****	****	****	23	**29**	34	29	**38**	50
			B1	****	****	****	18	**25**	29	22	**29**	36
			A2	****	****	****	28	**33**	51	45	**55**	74
DJF	12.1	1.52*	*A1B*	****	****	****	26	**35**	49	35	**43**	66
			B1	****	****	****	20	**26**	41	21	**31**	52
			A2	****	****	****	31	**37**	43	47	**59**	65
MAM	11.3	2.40*	*A1B*	****	****	****	27	**36**	43	38	**51**	60
			B1	****	****	****	20	**30**	33	24	**36**	43
			A2	****	****	****	41	**48**	57	60	**71**	83
JJA	11.6	2.63*	*A1B*	****	****	****	41	**47**	57	49	**64**	80
			B1	****	****	****	29	**39**	47	38	**47**	59
			A2	****	****	****	32	**38**	42	43	**56**	68
SON	11.8	2.24*	*A1B*	****	****	****	25	**38**	45	37	**48**	65
			B1	****	****	****	21	**30**	38	25	**37**	46
Frequency of Hot Nights (TN90p)												
			A2	****	****	****	31	**35**	38	40	**50**	56
Annual	10.4	1.31*	*A1B*	****	****	****	28	**34**	39	35	**44**	54
			B1	****	****	****	22	**28**	32	29	**32**	42
			A2	****	****	****	26	**32**	52	40	**57**	76
DJF	10.8	1.01*	*A1B*	****	****	****	23	**35**	53	33	**46**	75
			B1	****	****	****	18	**27**	42	22	**33**	51
			A2	****	****	****	32	**36**	43	48	**58**	71
MAM	9.8	1.22*	*A1B*	****	****	****	26	**38**	44	38	**51**	65
			B1	****	****	****	21	**30**	35	26	**35**	46
			A2	****	****	****	56	**62**	71	79	**83**	91
JJA	10.2	1.97*	*A1B*	****	****	****	51	**59**	74	66	**74**	88
			B1	****	****	****	35	**46**	61	48	**56**	75
			A2	****	****	****	38	**45**	49	50	**64**	74
SON	10.5	1.61*	*A1B*	****	****	****	32	**46**	49	44	**57**	70
			B1	****	****	****	25	**35**	40	33	**43**	54
Frequency of Cold Days (TX10p)												
			A2	****	****	****	1	**3**	5	0	**1**	3
Annual	8.9	-0.72*	*A1B*	****	****	****	2	**4**	6	0	**2**	4
			B1	****	****	****	2	**5**	6	1	**4**	5
			A2	****	****	****	0	**2**	5	0	**1**	2
DJF	8.4	-0.98*	*A1B*	****	****	****	1	**3**	5	0	**1**	4
			B1	****	****	****	1	**4**	6	0	**4**	5
			A2	****	****	****	1	**2**	4	0	**1**	2
MAM	9.2	-0.51	*A1B*	****	****	****	1	**3**	4	0	**2**	3
			B1	****	****	****	2	**5**	5	1	**3**	4
			A2	****	****	****	0	**1**	2	0	**0**	1
JJA	8.8	-0.70*	*A1B*	****	****	****	0	**1**	3	0	**0**	2
			B1	****	****	****	0	**2**	4	0	**1**	3
			A2	****	****	****	1	**3**	4	0	**1**	2
SON	9.6	-0.14	*A1B*	****	****	****	1	**3**	5	0	**1**	3
			B1	****	****	****	2	**4**	6	1	**3**	5
Frequency of Cold Nights (TN10p)												
			A2	****	****	****	1	**4**	5	0	**1**	2
Annual	8.6	-0.72*	*A1B*	****	****	****	1	**3**	5	0	**2**	4
			B1	****	****	****	3	**5**	7	2	**5**	5
			A2	****	****	****	0	**3**	6	0	**0**	1
DJF	8.4	-1.13*	*A1B*	****	****	****	0	**3**	4	0	**1**	3
			B1	****	****	****	1	**4**	6	1	**4**	5
			A2	****	****	****	1	**3**	4	0	**0**	2
MAM	9.2	-0.53	*A1B*	****	****	****	1	**3**	4	0	**2**	2
			B1	****	****	****	2	**4**	6	1	**4**	4
			A2	****	****	****	0	**0**	1	0	**0**	0
JJA	7.8	-0.96*	*A1B*	****	****	****	0	**0**	1	0	**0**	0
			B1	****	****	****	0	**1**	3	0	**0**	1
			A2	****	****	****	1	**3**	5	0	**1**	2
SON	9.3	-0.44	*A1B*	****	****	****	1	**3**	6	0	**2**	3
			B1	****	****	****	2	**4**	7	1	**3**	6

	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 %*		
			A2	****	****	****	-10	**0**	3	-14	**1**	7
Annual	24.4	1.17*	*A1B*	****	****	****	-8	**1**	4	-10	**1**	8
			B1	****	****	****	-8	**0**	3	-10	**1**	5
			A2	****	****	****	-13	**-2**	0	-16	**-6**	4
DJF	****	****	*A1B*	****	****	****	-9	**-2**	1	-11	**-2**	0
			B1	****	****	****	-9	**-1**	1	-18	**0**	5
			A2	****	****	****	-17	**-4**	3	-26	**-7**	0
MAM	****	****	*A1B*	****	****	****	-13	**-2**	1	-14	**-3**	4
			B1	****	****	****	-13	**0**	3	-10	**-1**	6
			A2	****	****	****	-10	**0**	4	-17	**0**	7
JJA	****	****	*A1B*	****	****	****	-10	**-1**	3	-13	**0**	8
			B1	****	****	****	-11	**-1**	5	-14	**0**	7
			A2	****	****	****	-8	**-1**	7	-18	**3**	7
SON	****	****	*A1B*	****	****	****	-11	**1**	7	-15	**2**	9
			B1	****	****	****	-7	**1**	5	-10	**1**	4
Maximum 1-day rainfall (RX1day)												
	mm	*Change in mm per decade*					*Change in mm*			*Change in mm*		
			A2	****	****	****	-9	**1**	11	-15	**2**	18
Annual	66.6	1.21	*A1B*	****	****	****	-8	**1**	7	-10	**0**	16
			B1	****	****	****	-9	**1**	7	-10	**1**	11
			A2	****	****	****	-7	**-1**	0	-12	**-2**	3
DJF	11.8	-0.11	*A1B*	****	****	****	-8	**-1**	0	-6	**-1**	1
			B1	****	****	****	-7	**0**	1	-12	**0**	3
			A2	****	****	****	-6	**-1**	1	-7	**-1**	1
MAM	13.8	0.20	*A1B*	****	****	****	-4	**-1**	1	-6	**0**	3
			B1	****	****	****	-3	**0**	2	-3	**0**	2
			A2	****	****	****	-9	**0**	8	-12	**0**	9
JJA	31.0	0.13	*A1B*	****	****	****	-6	**0**	4	-7	**0**	4
			B1	****	****	****	-8	**0**	5	-8	**0**	3
			A2	****	****	****	-7	**2**	8	-12	**3**	16
SON	26.2	0.85*	*A1B*	****	****	****	-7	**1**	9	-11	**1**	19
			B1	****	****	****	-7	**1**	7	-8	**1**	8
Maximum 5-day Rainfall (RX5day)												
	mm	*Change in mm per decade*					*Change in mm*			*Change in mm*		
			A2	****	****	****	-21	**5**	21	-32	**5**	28
Annual	112.4	-0.09	*A1B*	****	****	****	-19	**1**	16	-23	**4**	25
			B1	****	****	****	-20	**2**	13	-24	**3**	16
			A2	****	****	****	-16	**-3**	0	-25	**-6**	5
DJF	18.9	-0.19	*A1B*	****	****	****	-16	**-2**	3	-13	**-4**	1
			B1	****	****	****	-14	**-2**	0	-23	**0**	6
			A2	****	****	****	-10	**-3**	2	-12	**-4**	3
MAM	21.1	0.29	*A1B*	****	****	****	-8	**-2**	4	-12	**-2**	6
			B1	****	****	****	-5	**-2**	4	-7	**-2**	5
			A2	****	****	****	-15	**-1**	11	-22	**-1**	12
JJA	58.5	-0.46	*A1B*	****	****	****	-11	**-2**	7	-14	**0**	13
			B1	****	****	****	-16	**-1**	9	-16	**0**	9
			A2	****	****	****	-15	**5**	15	-24	**7**	26
SON	47.5	1.50*	*A1B*	****	****	****	-17	**3**	17	-23	**4**	31
			B1	****	****	****	-14	**4**	13	-16	**4**	15

* indicates trend is statistically significant at 95% confidence

**** indicates data are not available

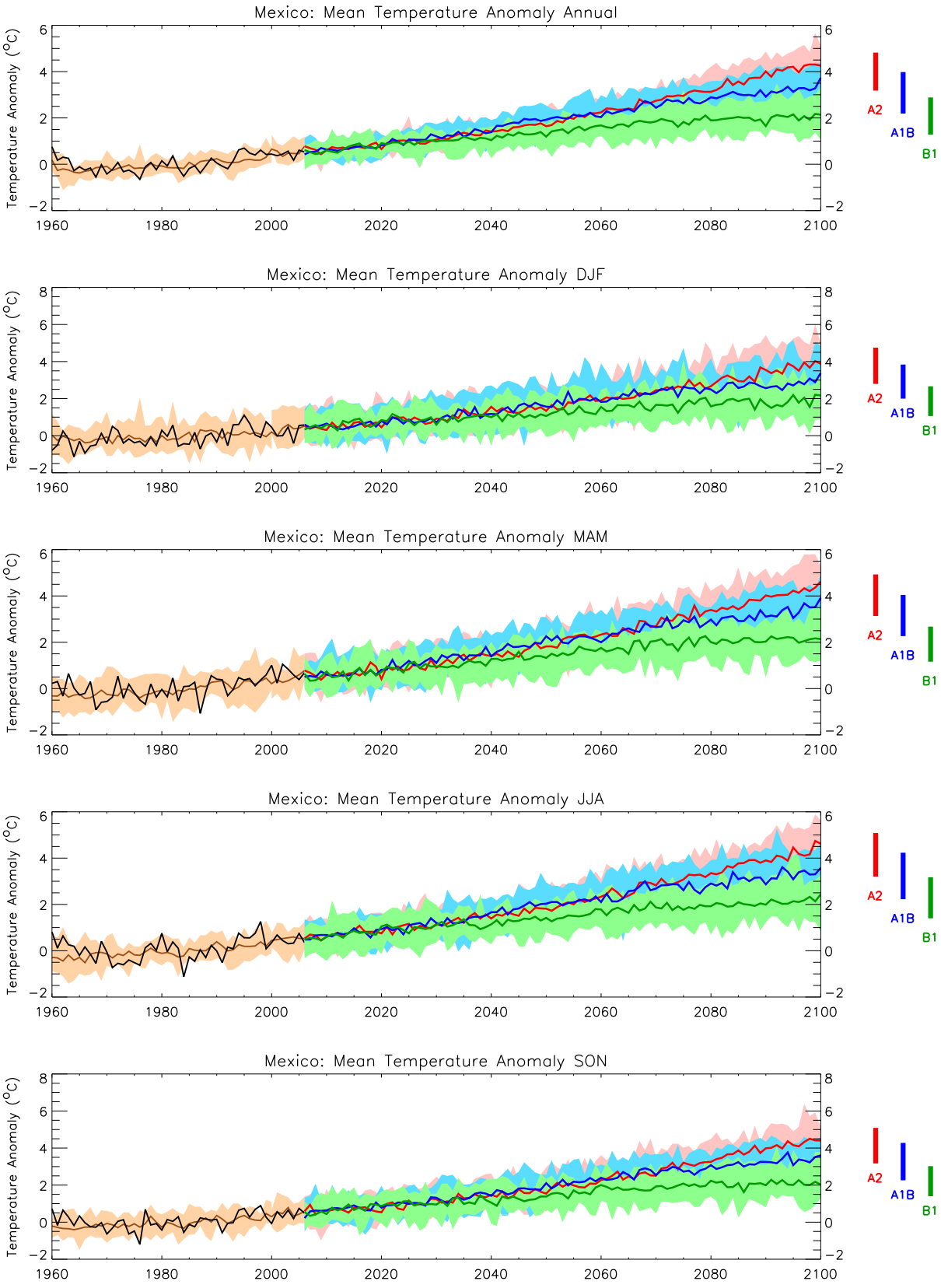

Figure 1: Trends in annual and seasonal mean temperature for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. Black curves show the mean of observed data from 1960 to 2006, Brown curves show the median (solid line) and range (shading) of model 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.

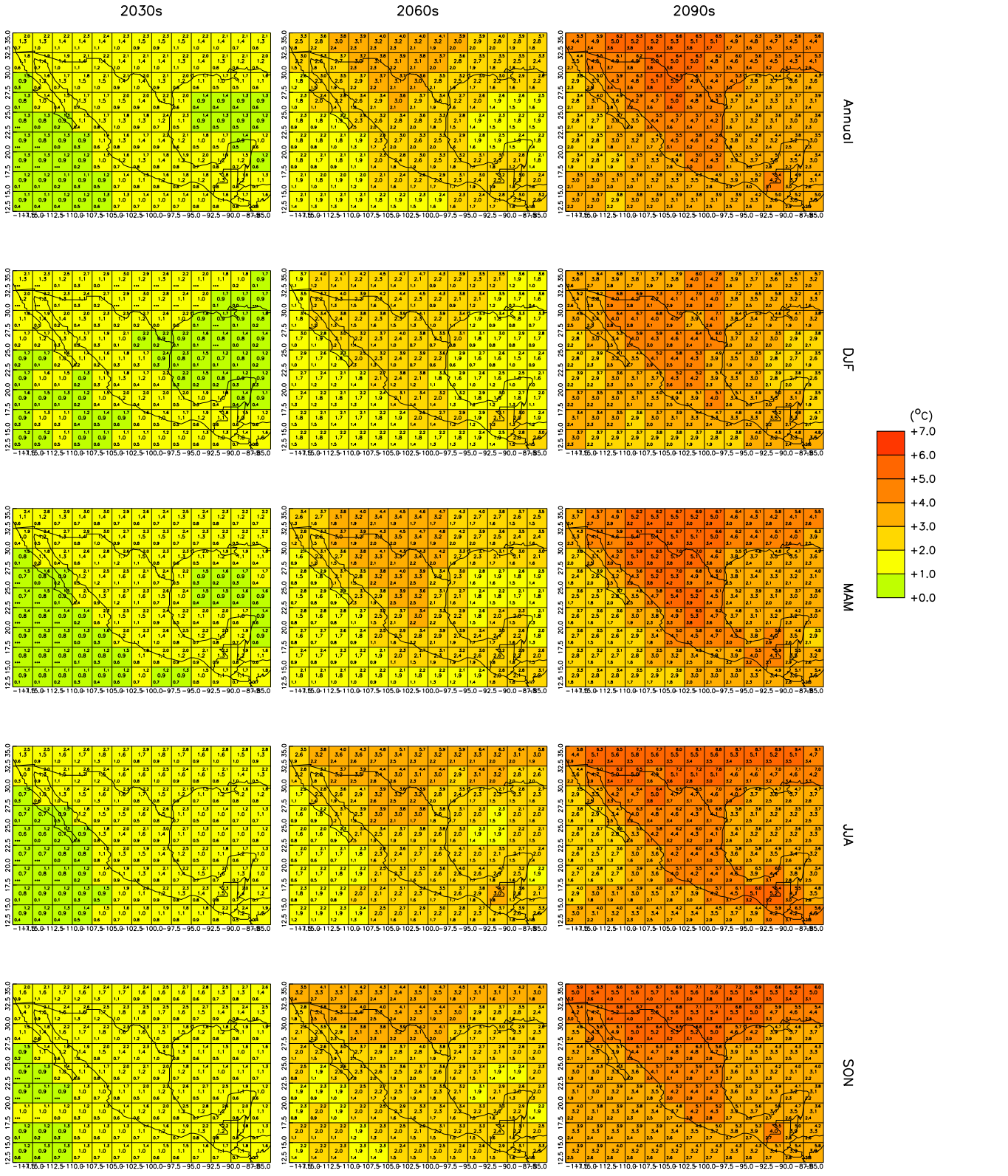

Figure 2: Spatial patterns of projected change in mean annual and seasonal temperature for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. In each grid box, the central value gives the ensemble median and the values in the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

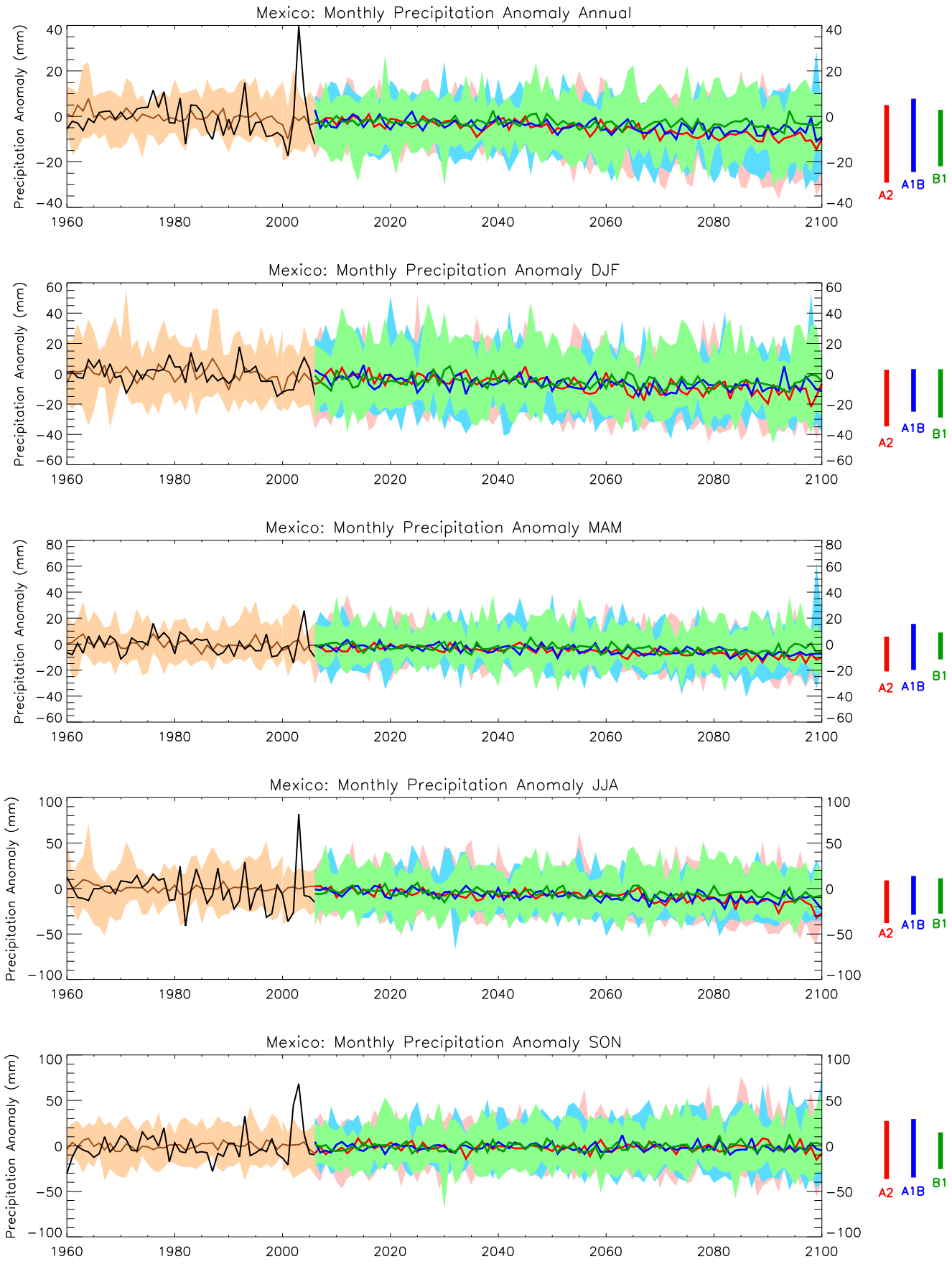

Figure 3: Trends in monthly precipitation for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

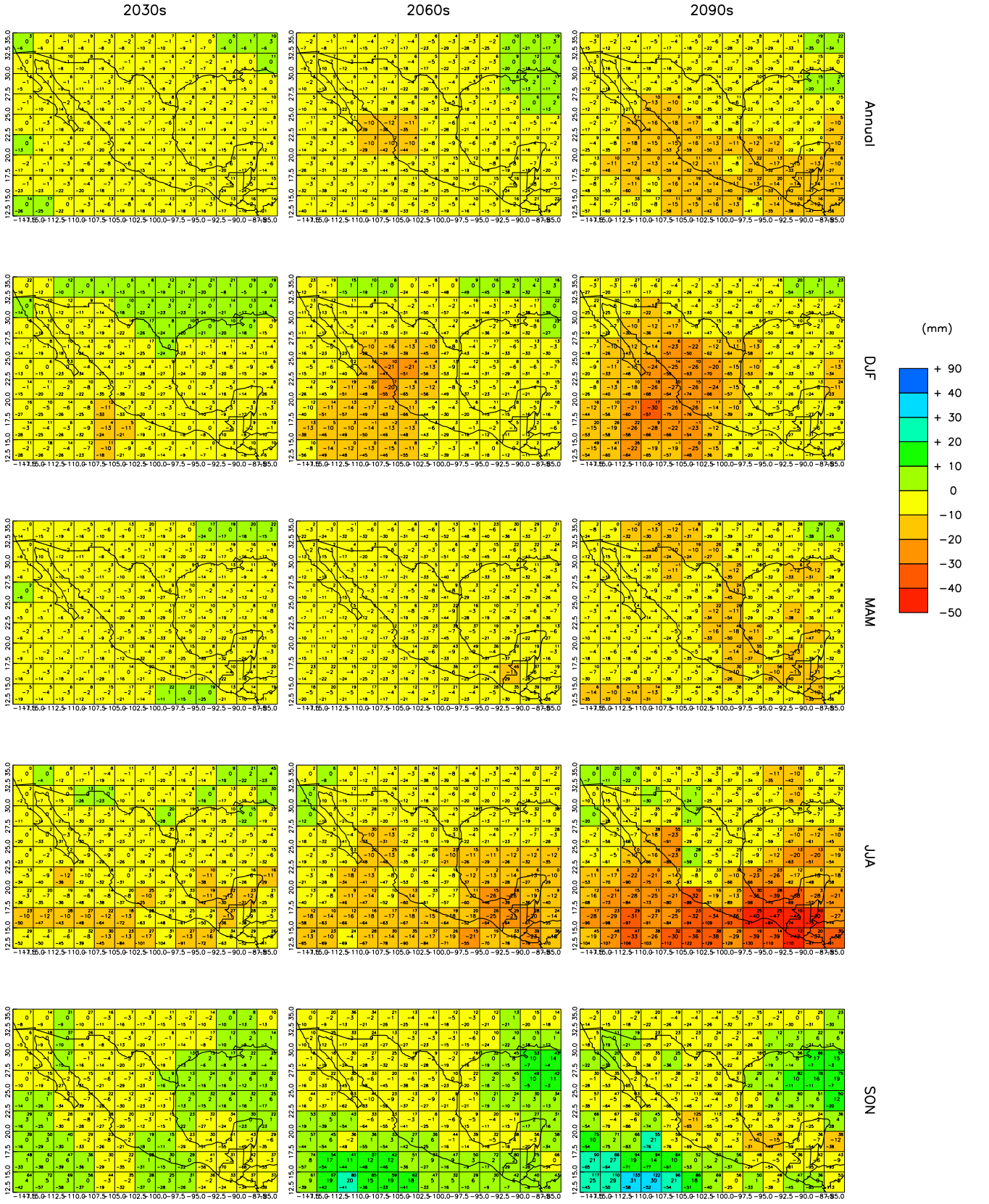

Figure 4: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999.See Figure 2 for details.

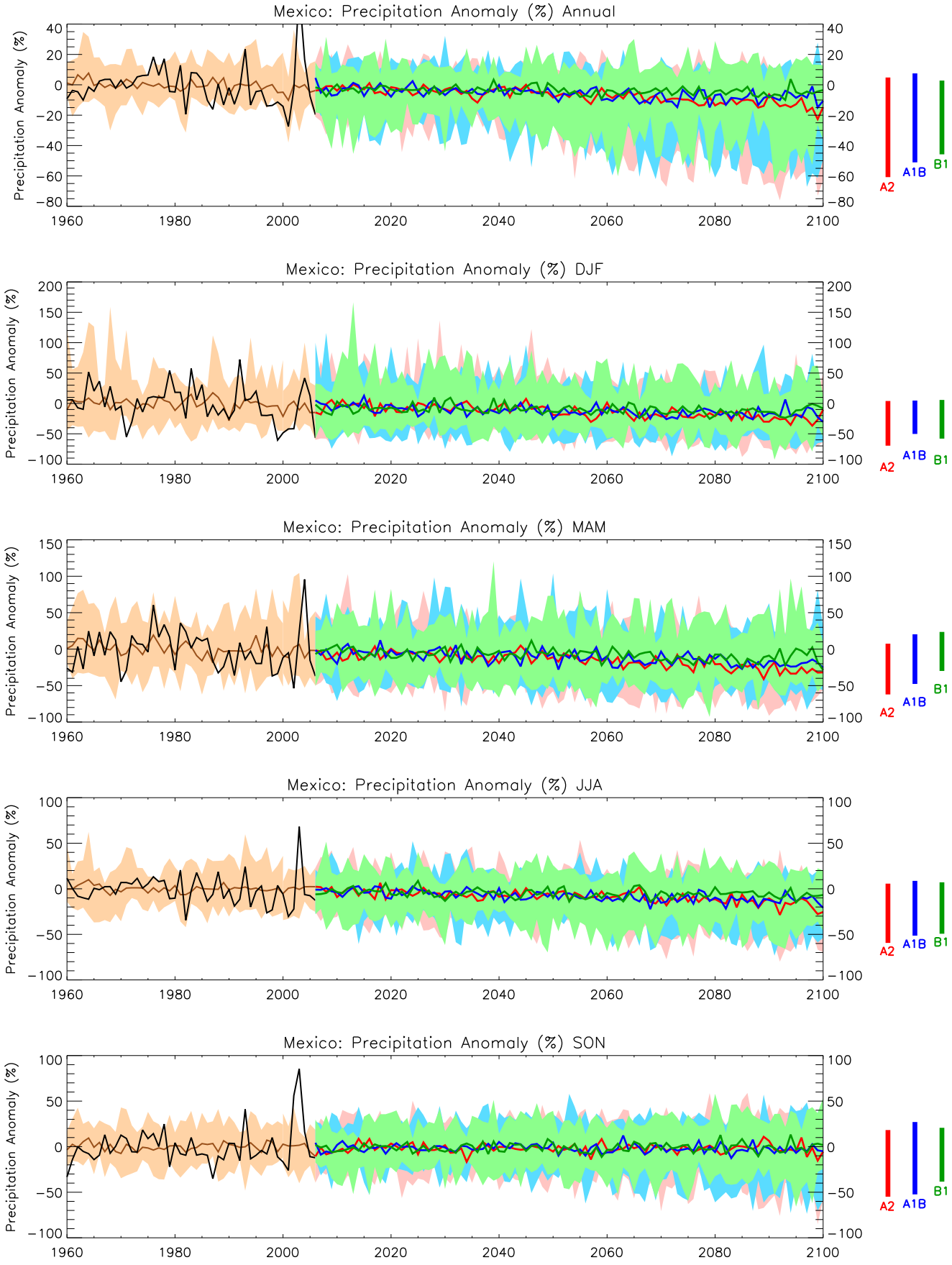

Figure 5: Trends in monthly precipitation for the recent past and projected future. All values shown are percentage anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

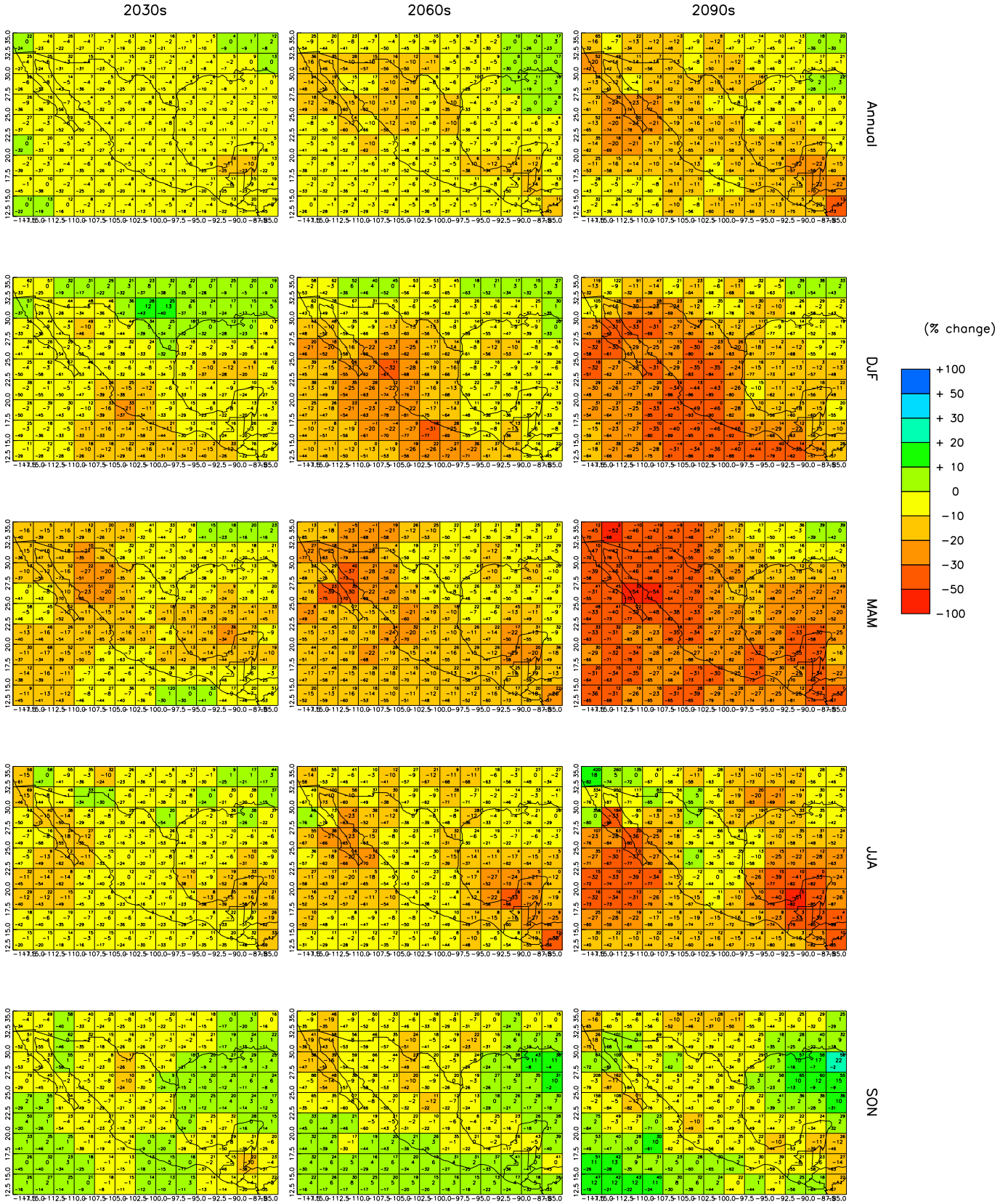

Figure 6: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are percentage anomalies relative to the mean climate of 1970-1999.See Figure 2 for details.

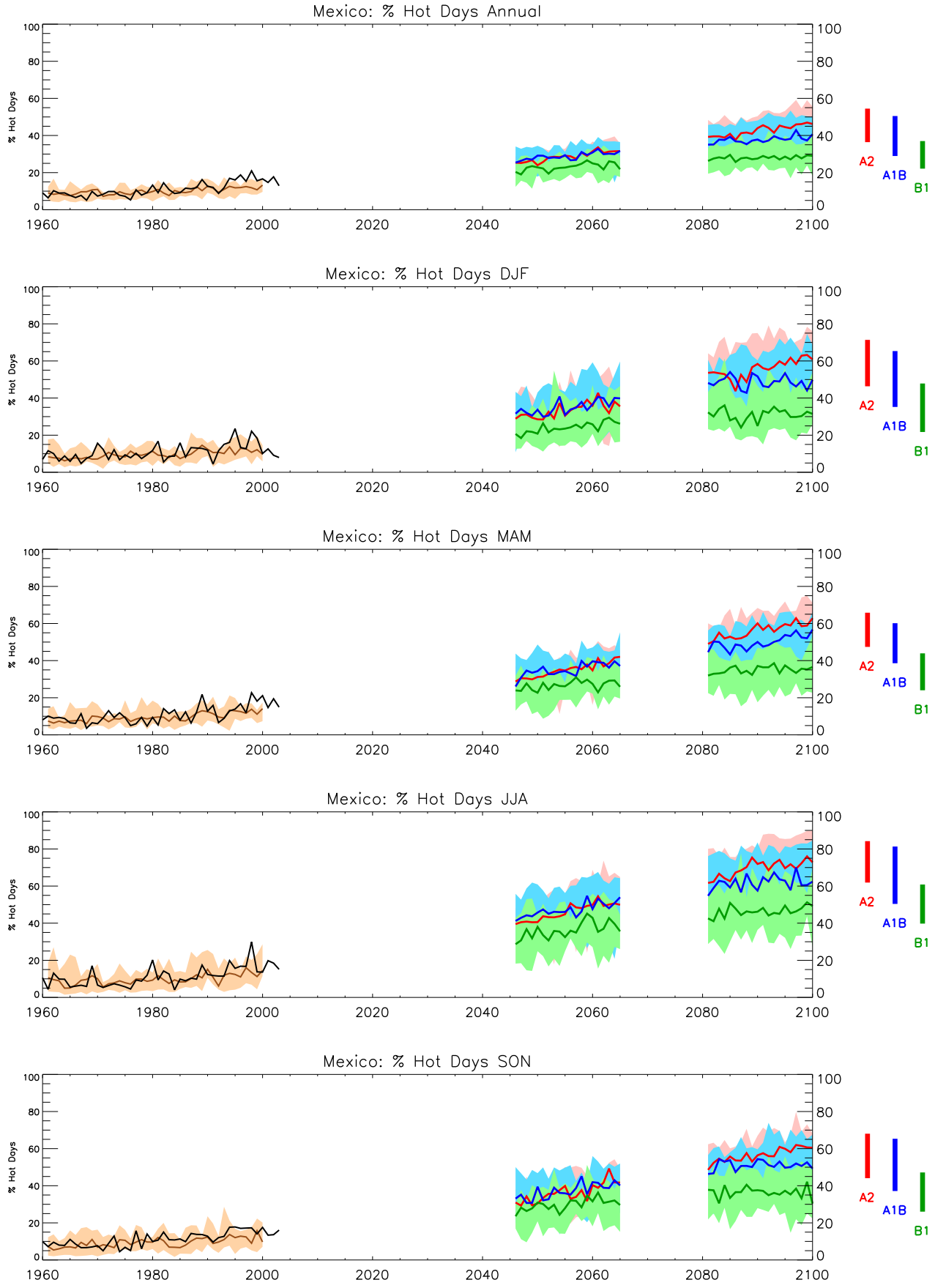

Figure 7: Trends in Hot-day frequency for the recent past and projected future. See Figure 1 for details.

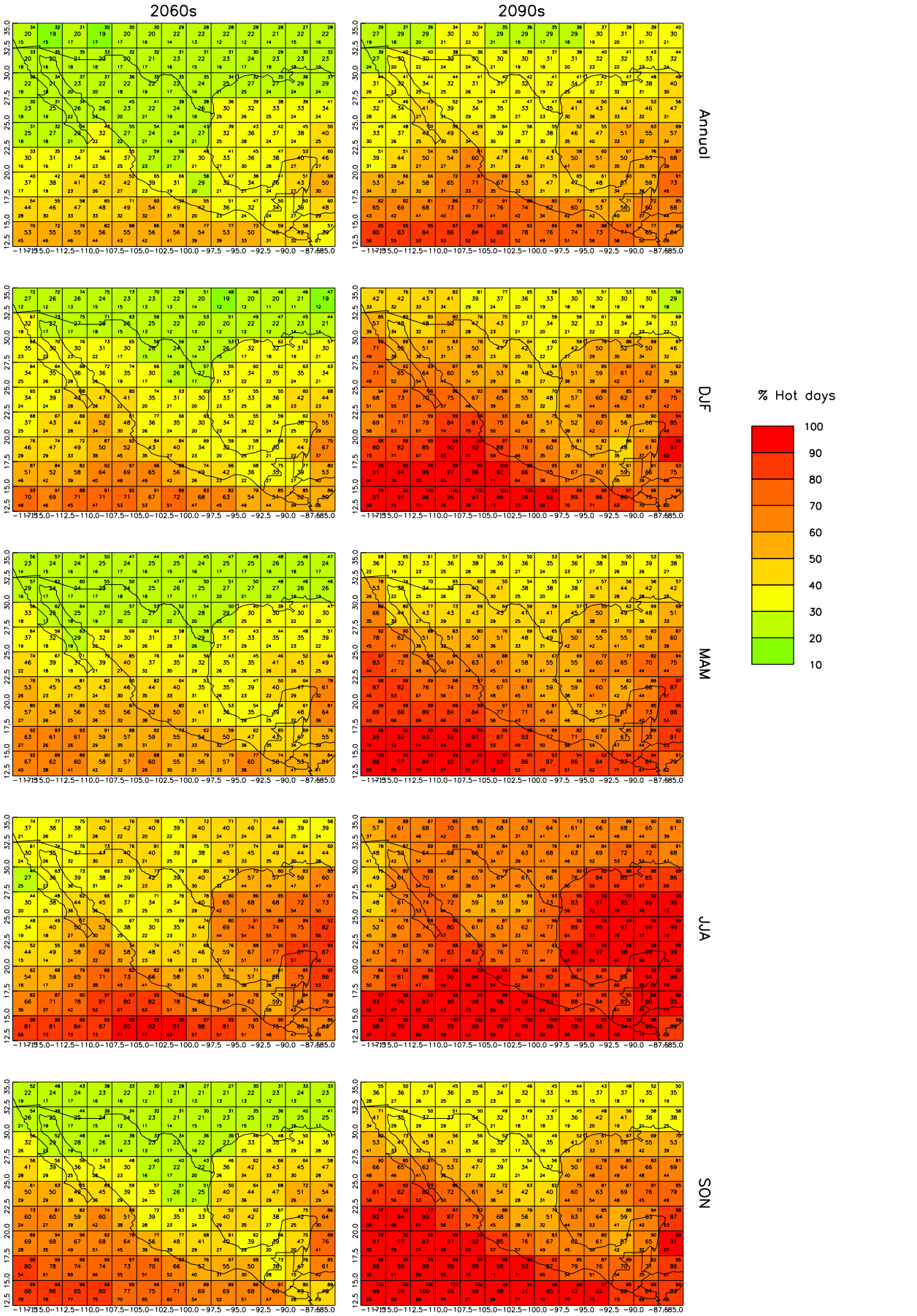

Figure 8: Spatial patterns of projected change in Hot-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

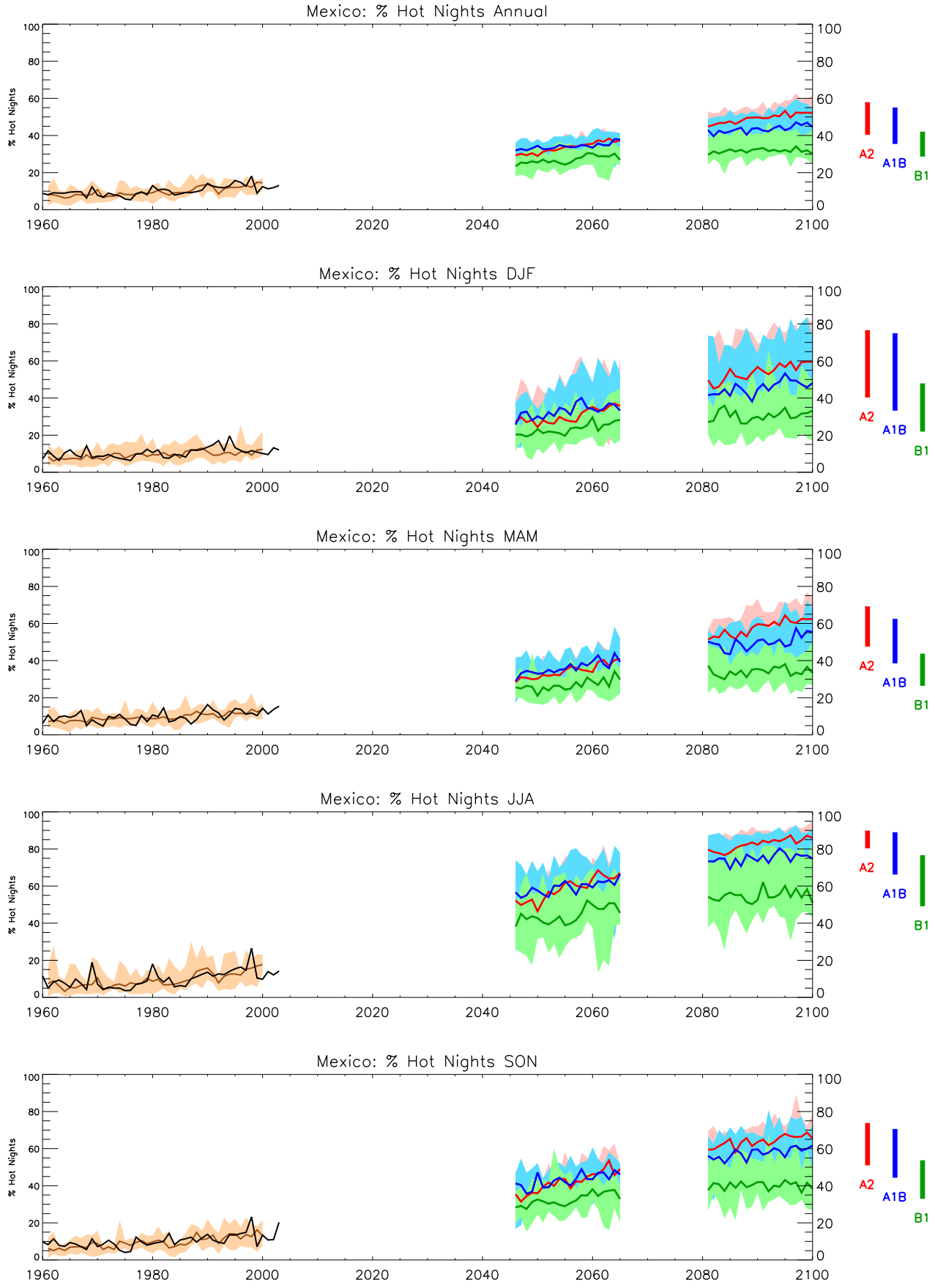

Figure 9: Trends in hot-night frequency for the recent past and projected future. See Figure 1 for details.

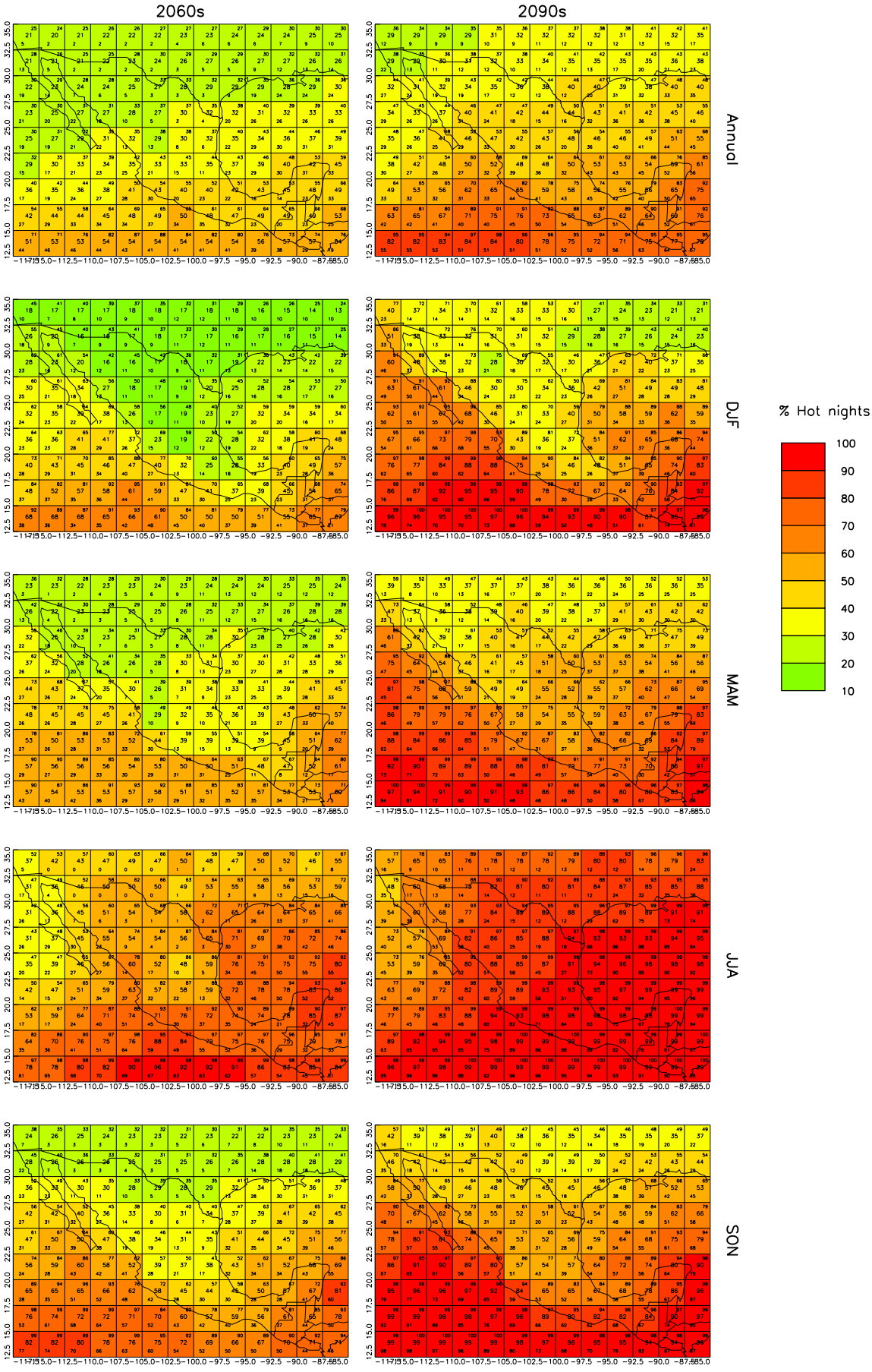

Figure 10: Spatial patterns of projected change in hot-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

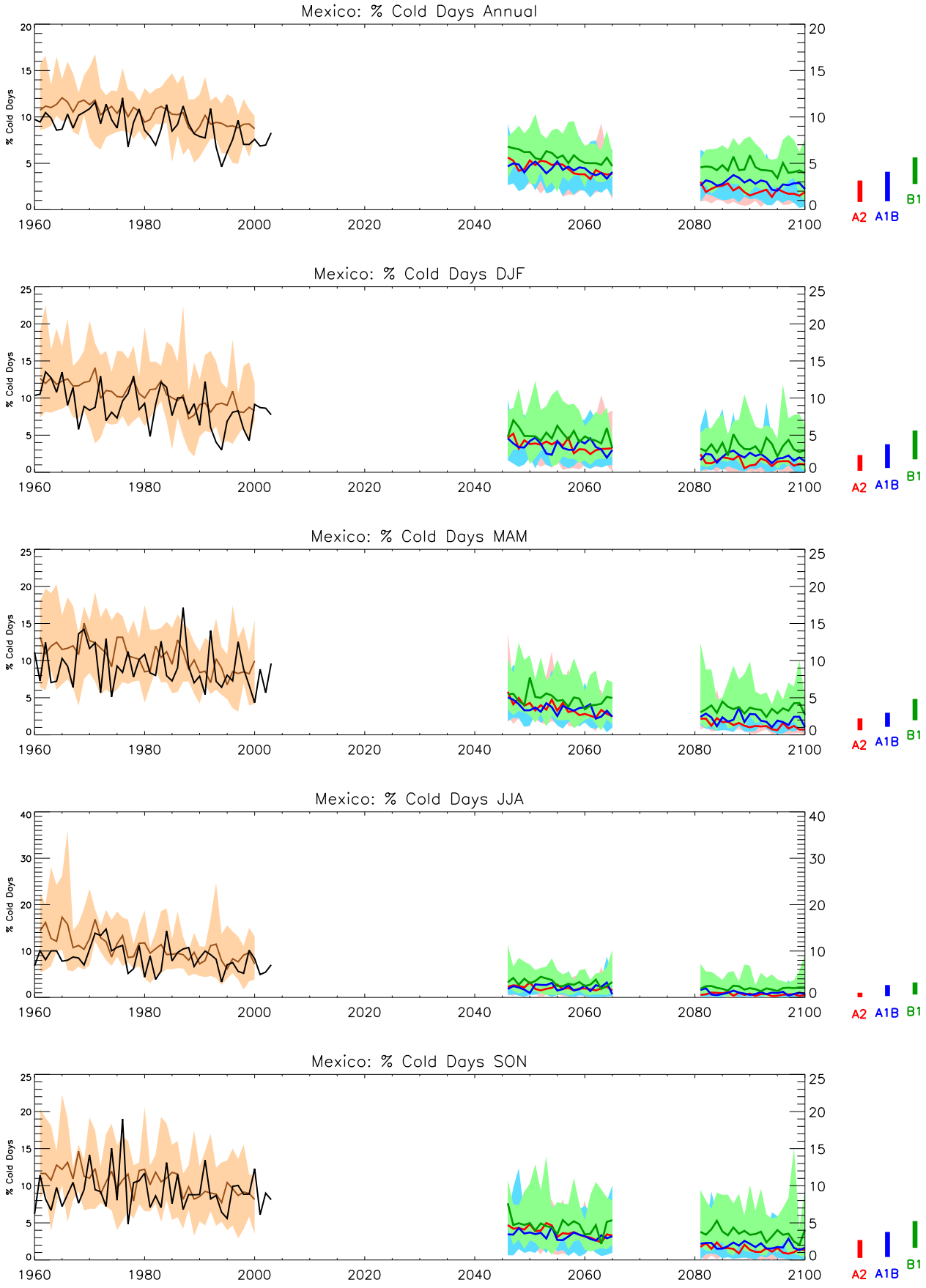

Figure 11: Trends in cold-day frequency for the recent past and projected future. See Figure 1 for details.

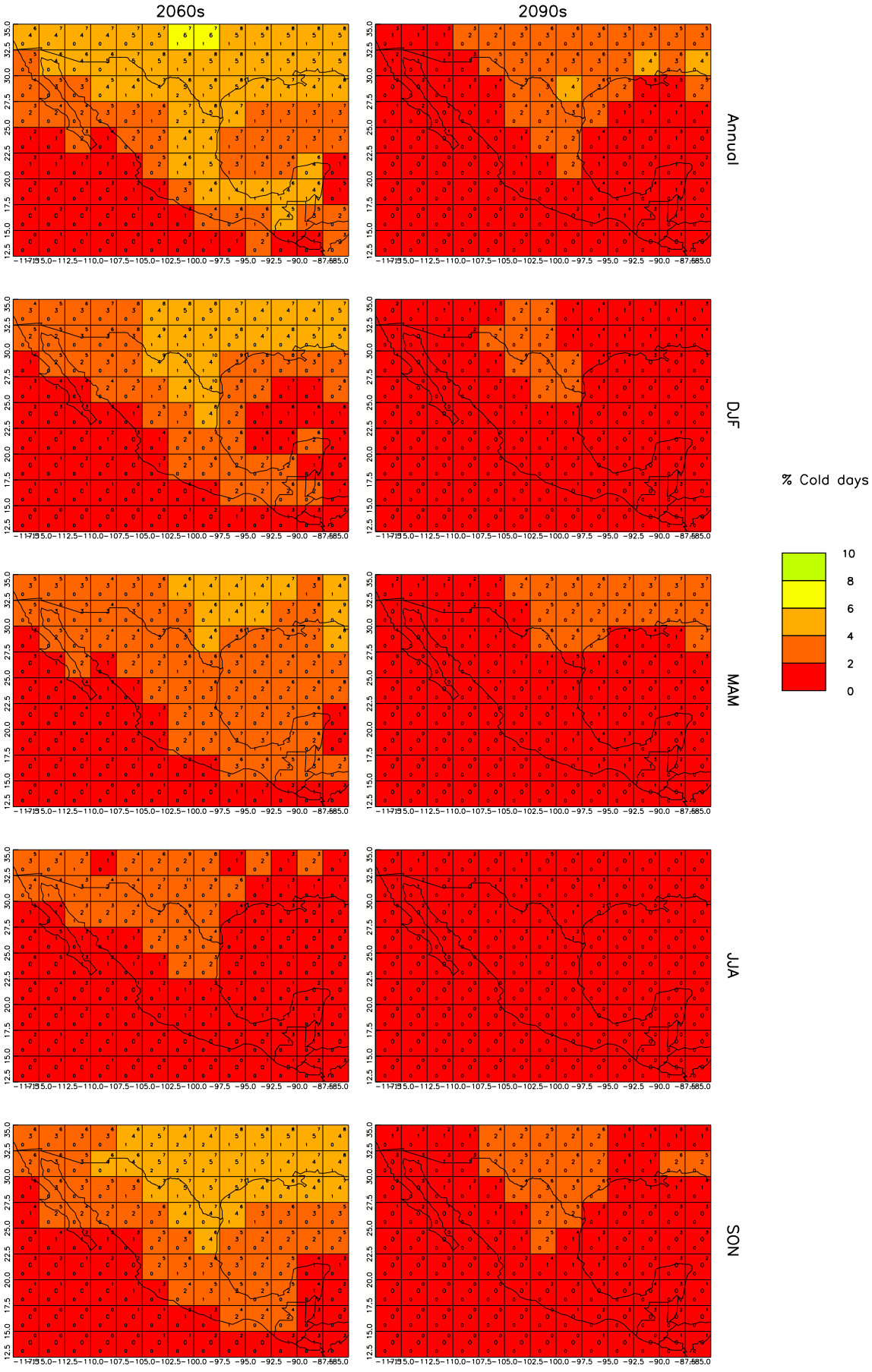

Figure 12: Spatial patterns of projected change in cold-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

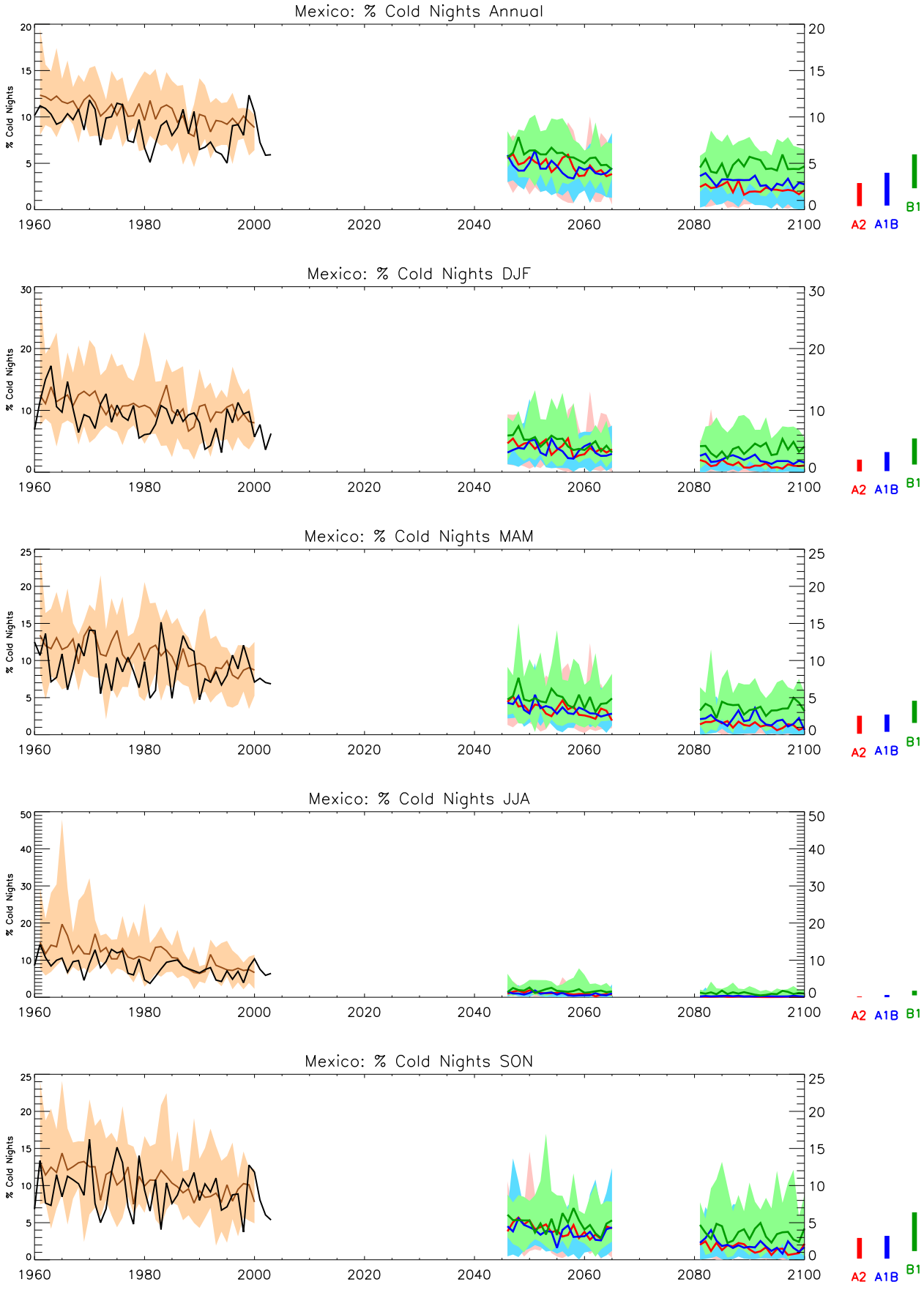

Figure 13: Trends in cold-night frequency for the recent past and projected future. See Figure 1 for details.

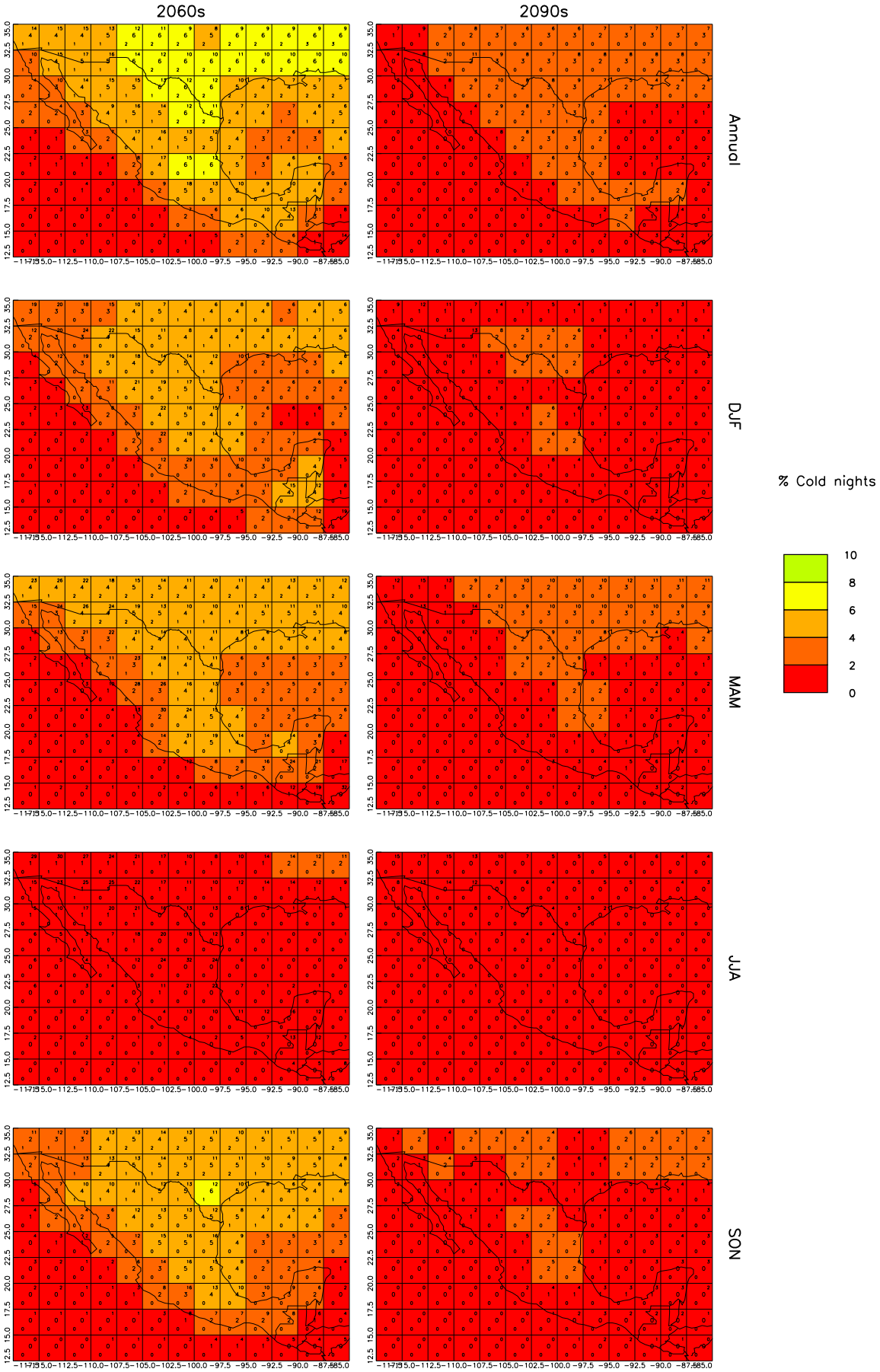

Figure 14: Spatial patterns of projected change in cold-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

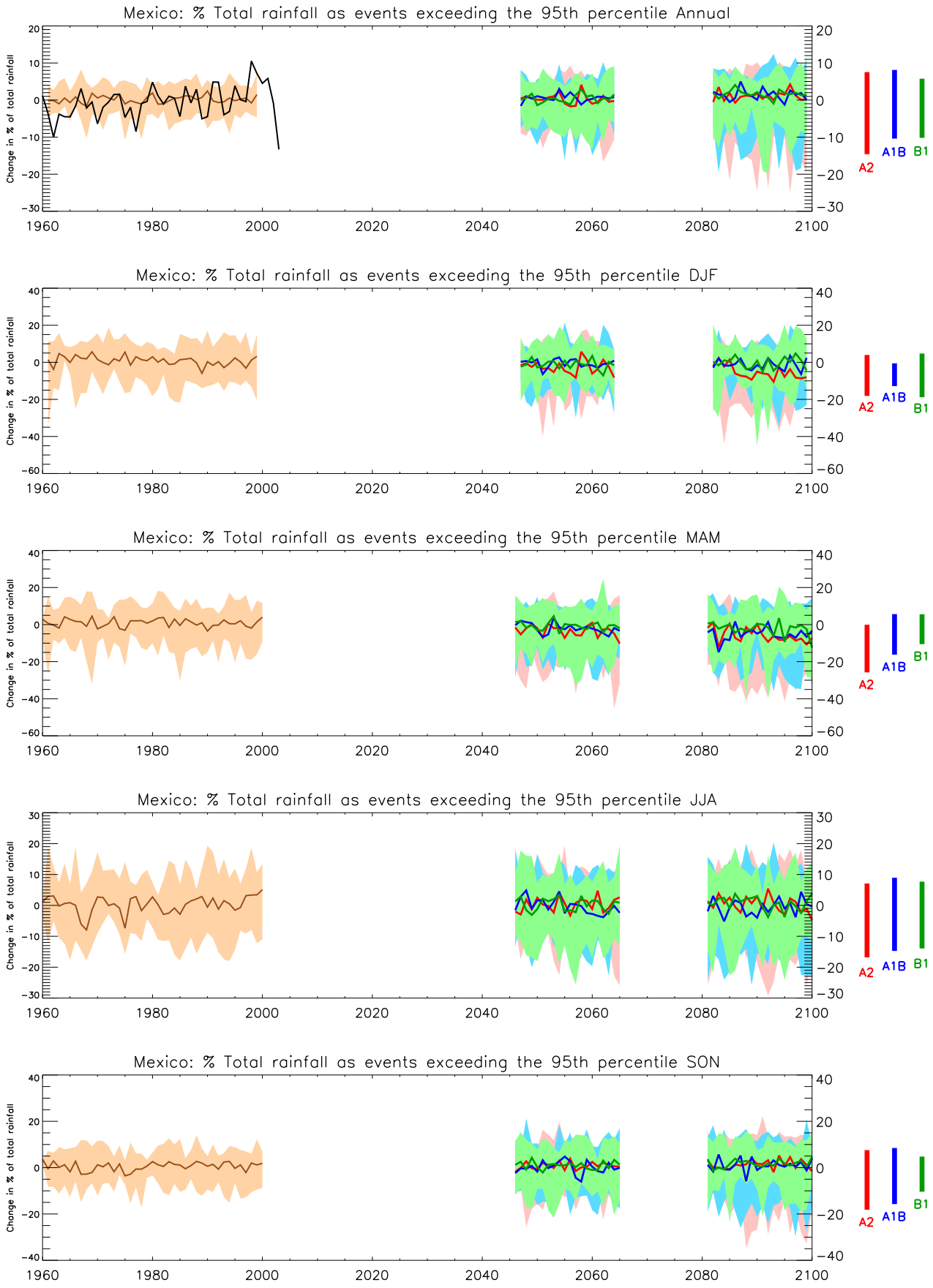

Figure 15: Trends in the proportion of precipitation falling in 'heavy' events for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

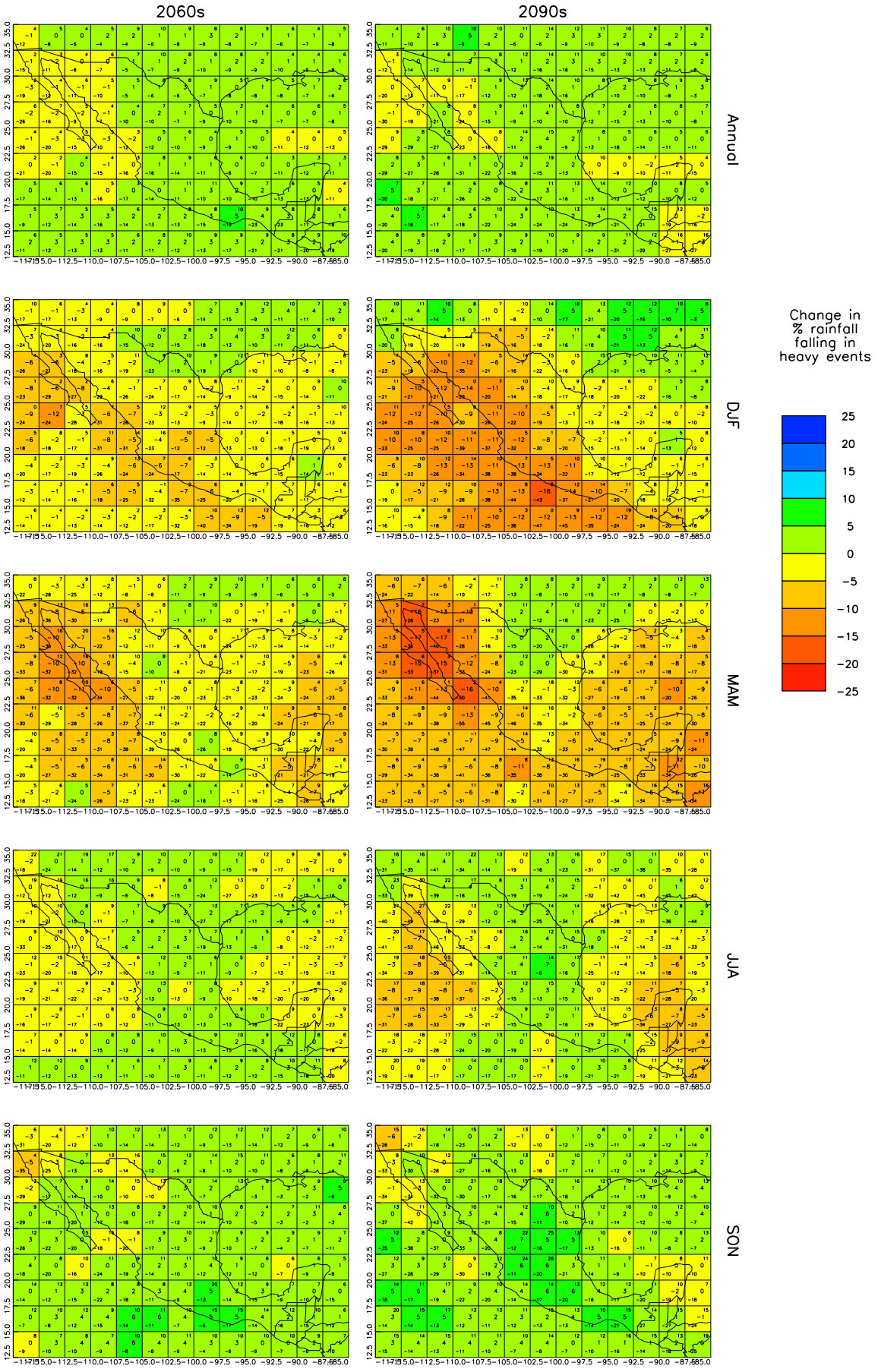

Figure 16: Spatial patterns of projected change in the proportion of precipitation falling in 'heavy' events for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

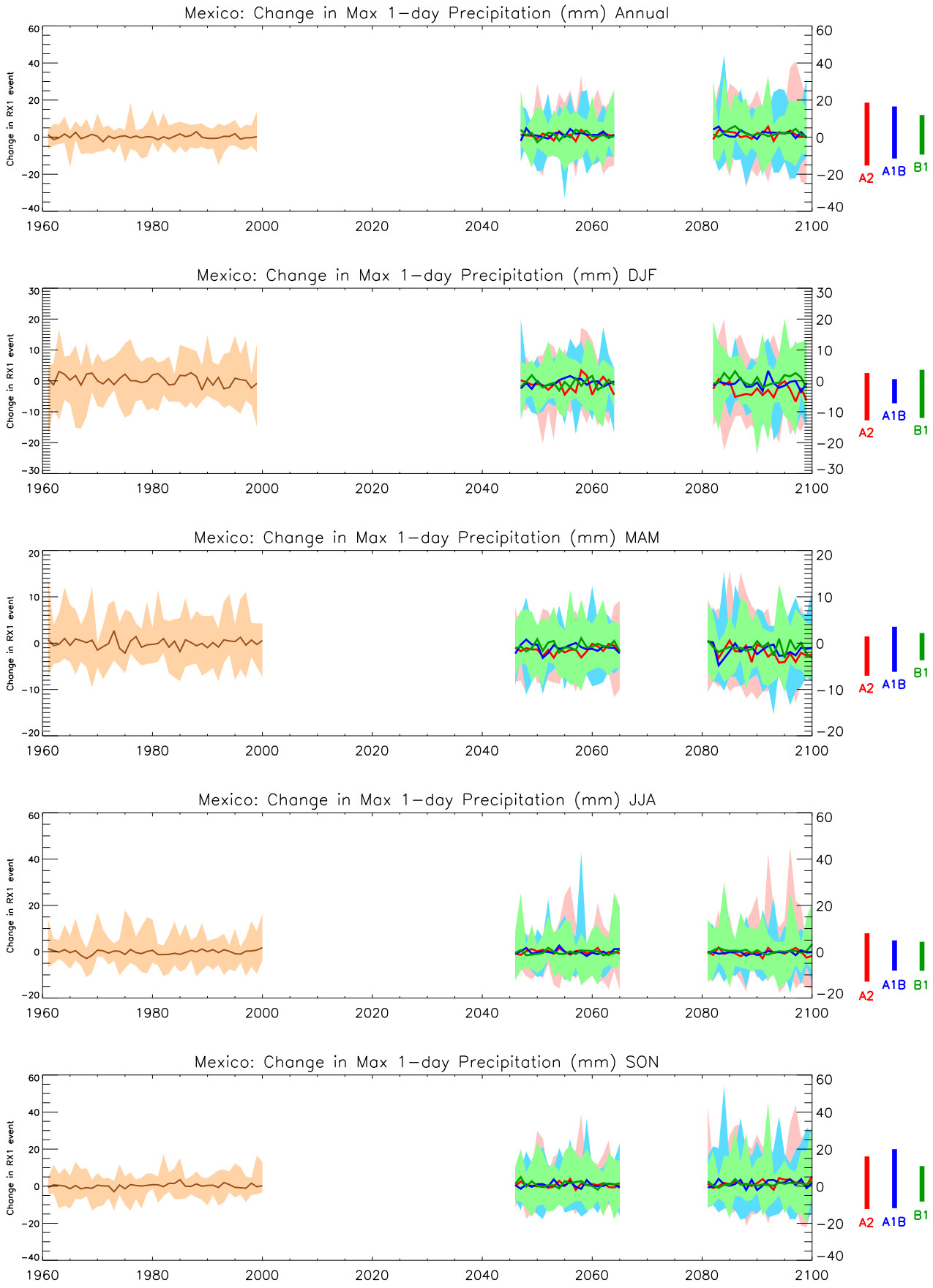

Figure 17: Trends in maximum 1-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

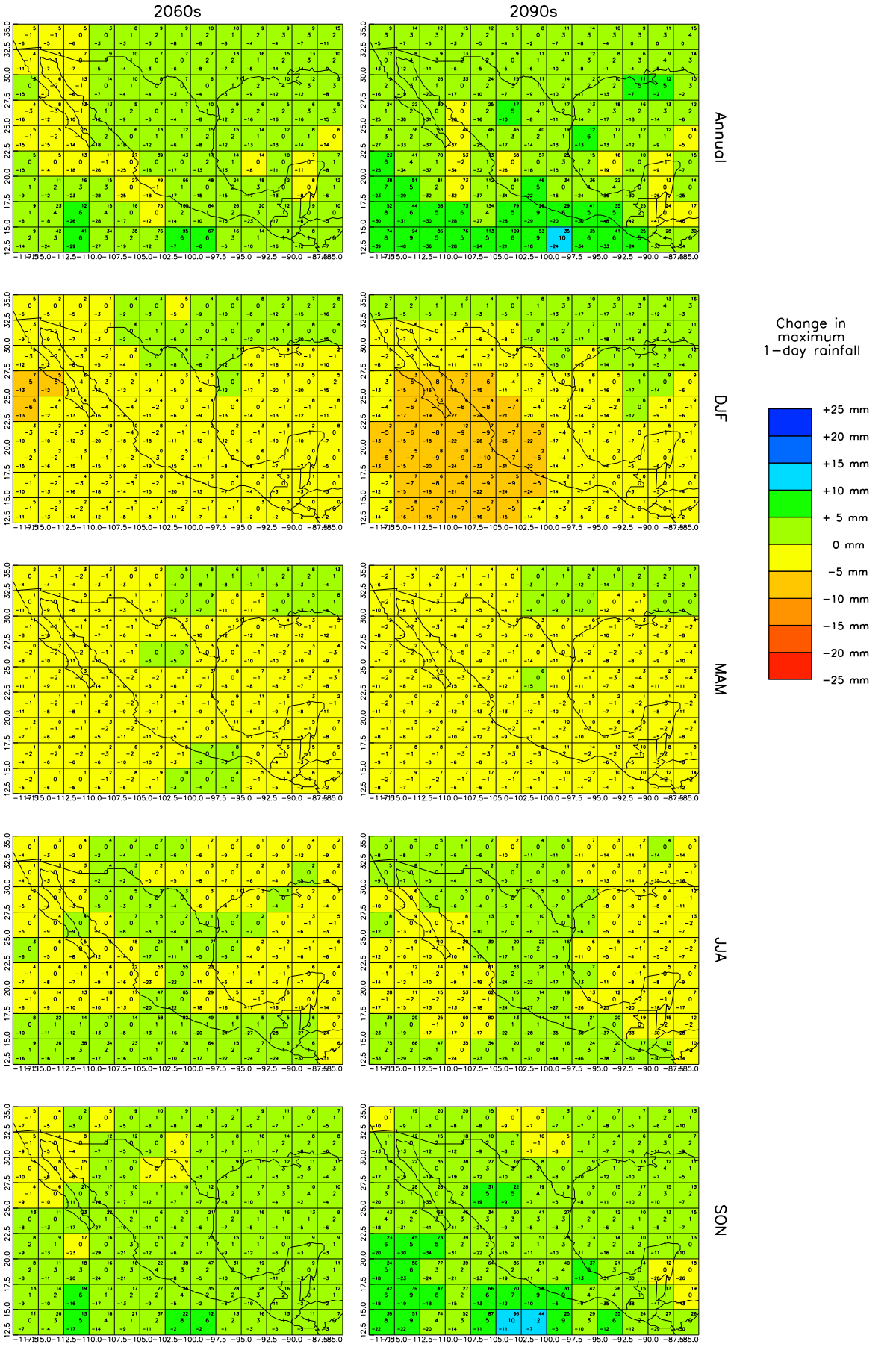

Figure 18: Spatial patterns of maximum 1-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

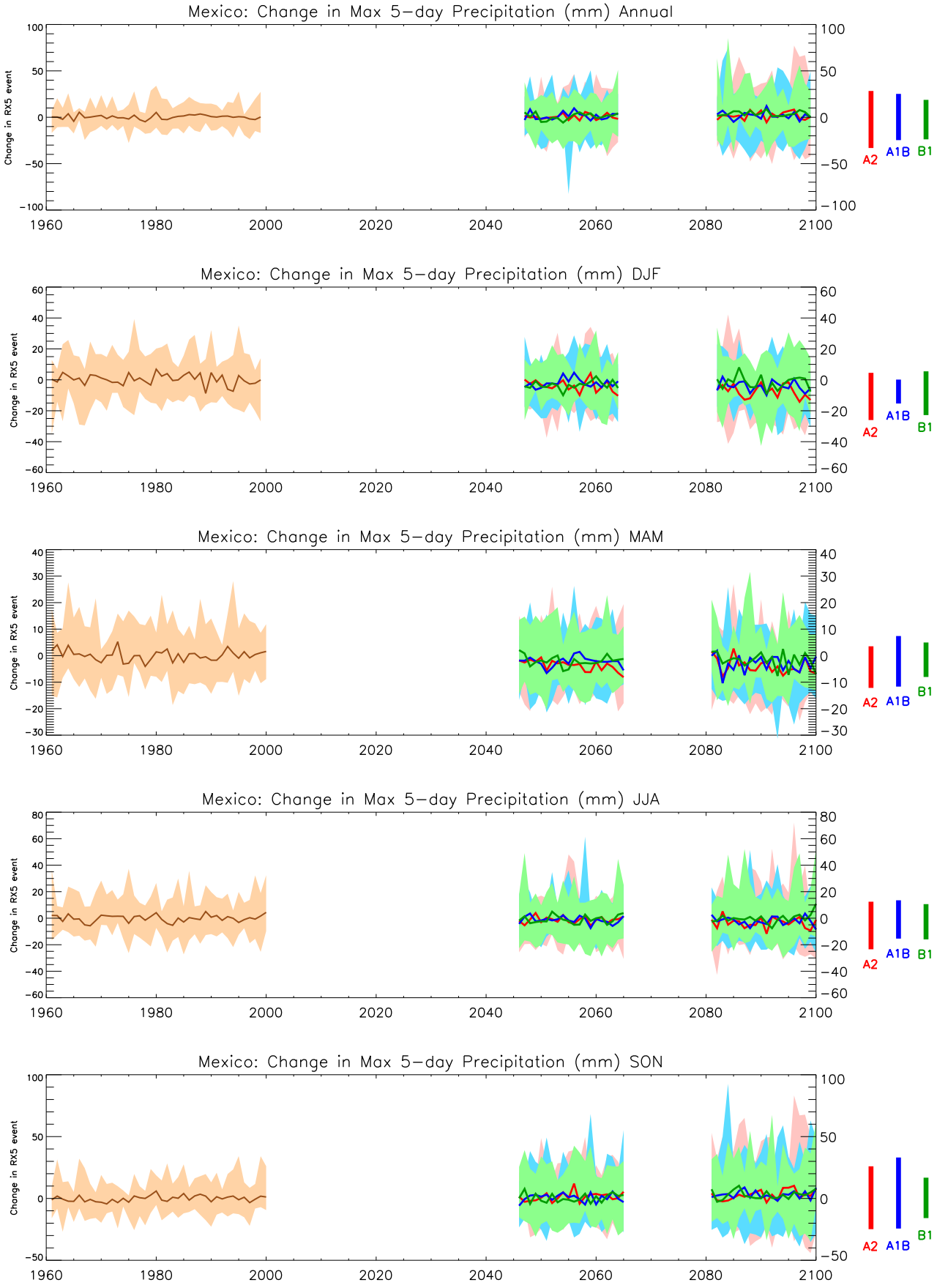

Figure 19: Trends in maximum 5-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

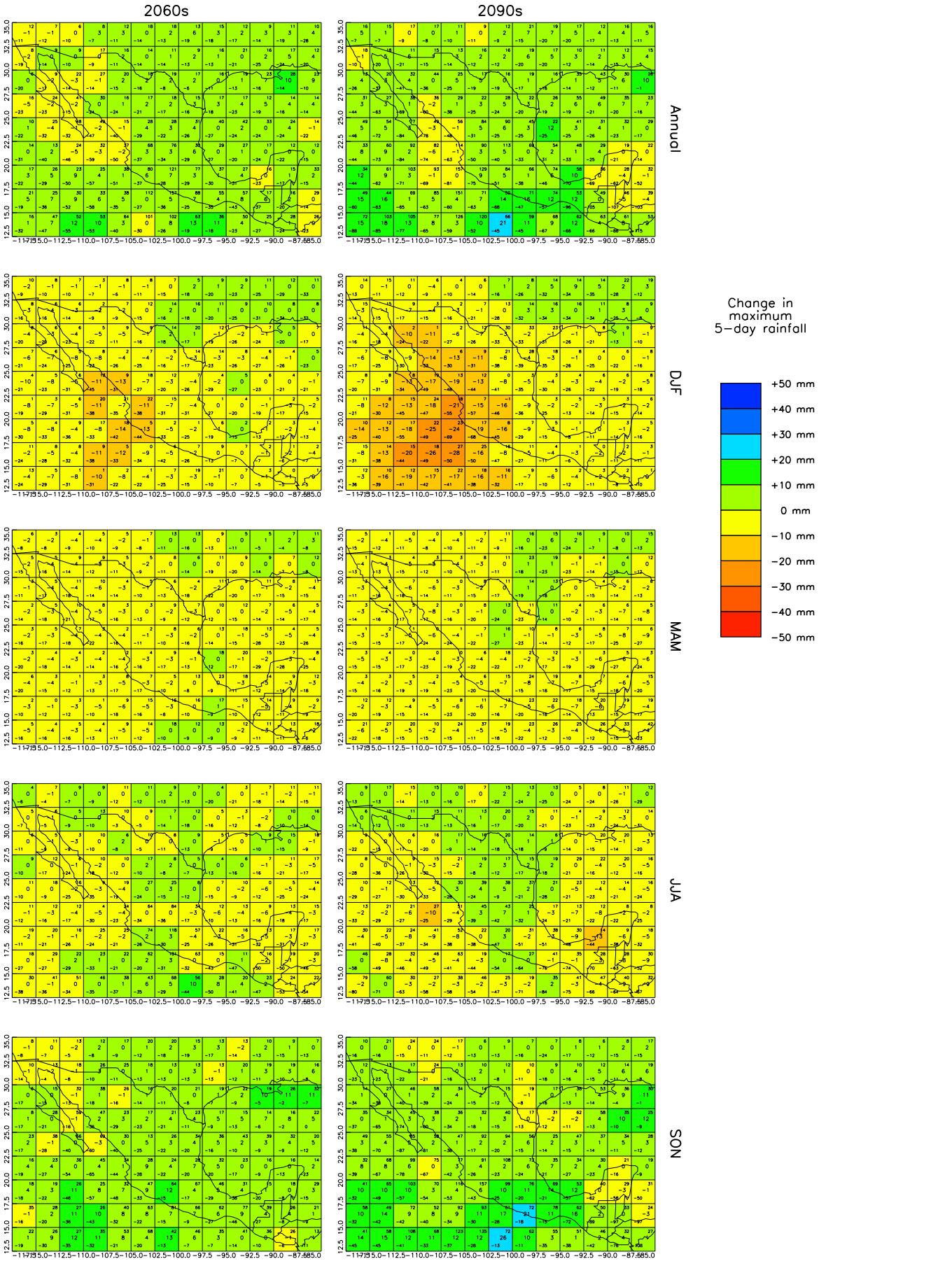

Figure 20: Spatial patterns of projected change in maximum 5-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.