

Nicaragua

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General Climate

Nicaragua is located in the tropics, 11-16° north of the equator, where there is little seasonal variation in temperature, but distinct 'wet' and 'dry' seasons. Mean air temperature is around 25 to 27°C in the coastal and lowland regions throughout whilst the cooler Central Highlands experience temperatures around 21-25°C.

Seasonal rainfall in Nicaragua is controlled largely by the Pacific and Atlantic monsoons and the position of the Inter-Tropical Convergence Zone (ITCZ), which interact to cause a distinct 'wet' season between May and October. In this 'wet' season the country receives, on average, around 250-300mm rainfall per month but this varies considerably between eastern (~250-500mm) and western regions (~150-250mm). A dry period called the 'Canicular', interrupts the wet season during the second half of July and first half of August. The coastlines of Nicaragua are also vulnerable to tropical cyclones and hurricanes from both the Atlantic and Pacific oceans from July through to October. Heavy rainfall accompanying these storms contributes a significant fraction towards the high wet-season rainfall totals. In the dry season the whole country receives considerably less rainfall –100-200mm per month in the East and less than 100mm in the West.

The length and intensity of the wet season in Nicaragua can vary considerably from one year to the next. The most well documented cause of inter-annual variations in climate in Central America is the El Niño Southern Oscillation (ENSO) and its interactions with the monsoon system. El Niño events bring relatively warm and dry conditions between June and August, whilst La Niña events bring colder and wetter conditions at that time of year.

Recent Climate Trends

Temperature

- Mean annual temperature has increased by 0.9°C since 1960, a rate of around 0.2°C per decade. A similar rate of increase is observed in all seasons.
- The frequency of hot days and hot nights¹ has increased significantly since 1960 in every season.
 - The average number of 'hot' days per year in Nicaragua has increased by 60 (an additional 16.4% of days²) 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 6.2 days per month (an additional 20% of JJA days) over this period.
 - The average number of 'hot' nights per year increased by 43 (an additional 11.7% of nights) between 1960 and 2003. The rate of increase is seen most strongly in SON when the average number of hot SON nights has increased by 5.5 days per month (an additional 17.6% of SON nights) over this period.
- The frequency of 'cold' days³ has decreased significantly in all seasons since 1960. The frequency of cold nights has decreased significantly annually, and in JJA and SON.
 - The average number of 'cold' days per year has decreased by 20 (5.5% of days) between 1960 and 2003. The rate of decrease is similar in all seasons.
 - The average number of 'cold' nights per year has decreased by 18 (4.9% of days). This rate of decrease is most rapid in JJA when the average number of cold JJA nights has decreased by 2.3 nights per month (7.6% of JJA nights) over this period.

Precipitation

- Mean annual rainfall has declined within the last 15 years. This is mainly due to lower wet season (JJA and SON) rainfalls. The average trend over the observed period since 1960 is a decrease of 5-6% of average total rainfall per decade.
- Despite the observed decreasing trend in total rainfall, the proportion of rainfall that occurs in 'heavy' events⁴ has increased since 1960 by 2.2 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.

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.

- The observed maximum 1- and 5-day rainfalls have also shown significantly increasing trends since 1960. The annual maximum 1-day (5-day) rainfall had increased by 8mm (14mm) per decade, on average, since 1961. Increasing trends in these extremes are seen in both wet season and dry season rainfall.

GCM Projections of Future Climate

Temperature

- The mean annual temperature is projected to increase by 0.6 to 2.7°C by the 2060s, and 1.2 to 4.5 degrees by the 2090s. The range of projections by the 2090s under any one emissions scenario is around 2°C.
- The projected rate of warming is similar in all seasons, but more rapid in the north-east 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 25-64% of days by the 2060s, and 26-85% of days by the 2090s.
 - Days considered 'hot' by current climate standards for their season are projected to occur on 40-97% 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 30-78% of nights by the 2060s and 43-95% of nights by the 2090s.
 - Nights that are considered hot for each season by 1970-99 standards are projected to occur on 50-99% of nights in each season by the 2090s.
- All projections indicate substantial decreases in the frequency of days and nights that are considered 'cold' in current climate. These events are exceedingly rare, occurring on maximum of 1-3% of days in the year, and not at all in some seasons, by the 2090s.

Precipitation

- Projections of mean annual rainfall do not show a consistent direction of change, but the ensemble median values are consistently negative for all seasons and emissions scenarios.
Projections vary between -63% and +16% by the 2090s, with ensemble median values of -8 to -21%.
- Percentage changes in rainfall projected show the strongest decreasing signal in JJA rainfall, the wettest season of the year in this region (-76% to + 11%).

- The proportion of total rainfall that falls in heavy events does not show a consistent direction of change, but the ensemble median values are negative for all seasons for all but the lowest emissions scenario. The strongest negative signal is seen in MAM rainfall, in which the range of changes is -29 to +15 (median of -10). This feature of projected future climate contradicts the observed trend towards increasing proportions of heavy rainfall.
- Maximum 1- and 5-day rainfalls do not show a consistent trend in projections of future climate, and the range of changes indicated across projections from different models span a wide range of both positive and negative changes. For 5-day rainfalls, the ensemble mean consistently tends towards slightly negative values for most seasons and under most emissions scenarios, which contradicts the observed trend towards increasing maximum rainfalls.

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 to storm tracks and their interactions with other features of climate variability (such as the El Niño Southern Oscillation), introducing 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 has strong influences on the monsoon system in Central America and also affects the position of the ITCZ, thus contributing to uncertainty in climate projections for this region.
- Nicaragua's Pacific and Atlantic coastal lowlands may be vulnerable to sea-level rise. Sea-level in this region is projected by climate models to rise by the following levels⁵ 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:
 - 0.18 to 0.43m under SRES B1
 - 0.21 to 0.53m under SRES A1B
 - 0.23 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			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	25.2	0.24*	A2	0.8	1.0	1.4	1.7	1.9	2.6	2.7	3.5	4.5
			A1B	0.5	1.1	1.7	1.1	2.1	2.7	1.6	3.0	4.0
			B1	0.3	0.9	1.2	0.6	1.4	2.0	1.2	1.8	2.4
DJF	24.3	0.24*	A2	0.8	1.0	1.4	1.5	1.9	2.5	2.4	3.2	4.4
			A1B	0.5	1.0	1.6	1.1	2.0	2.6	1.5	2.7	4.0
			B1	0.4	0.9	1.3	0.8	1.4	2.1	1.1	1.7	2.3
MAM	26.1	0.26*	A2	0.7	1.0	1.6	1.6	2.0	2.7	2.7	3.4	4.8
			A1B	0.5	1.0	1.8	1.0	2.1	3.0	1.5	2.8	4.0
			B1	0.2	0.9	1.3	0.6	1.5	1.9	1.1	1.8	2.5
JJA	25.4	0.24*	A2	0.6	1.1	1.6	1.7	2.3	2.8	2.7	3.7	4.8
			A1B	0.6	1.2	1.8	1.1	2.1	2.9	1.7	3.0	3.6
			B1	0.3	0.9	1.5	0.5	1.5	1.9	1.3	1.9	2.5
SON	24.9	0.24*	A2	0.7	1.1	1.4	1.6	2.1	2.7	2.7	3.6	5.0
			A1B	0.5	1.2	1.6	1.2	1.9	2.8	1.6	2.9	4.4
			B1	0.5	0.9	1.2	0.8	1.4	2.1	1.3	1.7	2.6
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	186.5	-9.5*	A2	-18	-3	12	-22	-4	18	-46	-9	20
			A1B	-19	-4	9	-22	-6	13	-40	-8	14
			B1	-12	-1	9	-24	-3	11	-22	-6	13
DJF	97.8	-2.3	A2	-6	-1	9	-12	-2	4	-15	-3	6
			A1B	-8	-1	4	-14	-3	10	-12	-3	9
			B1	-11	0	10	-11	-1	2	-14	-1	3
MAM	94.4	-3.7	A2	-9	-1	21	-20	-2	32	-27	-3	15
			A1B	-13	-1	22	-19	-2	24	-29	-2	7
			B1	-9	-1	22	-14	-1	11	-22	-1	11
JJA	300.7	-17.7*	A2	-33	-10	24	-63	-18	36	-92	-24	33
			A1B	-36	-15	7	-55	-25	7	-79	-18	24
			B1	-31	-4	25	-51	-5	32	-61	-11	33
SON	251.5	-13.8*	A2	-36	-1	40	-24	5	29	-93	-5	39
			A1B	-28	-3	15	-34	-4	50	-69	-9	38
			B1	-19	1	27	-34	-2	16	-35	0	44
Precipitation (%)												
	(mm per month)	(change in % per decade)		% Change			% Change			% Change		
Annual	186.5	-5.1*	A2	-30	-5	15	-40	-10	10	-63	-21	11
			A1B	-27	-6	5	-47	-11	16	-54	-12	7
			B1	-21	-1	14	-43	-8	9	-54	-8	16
DJF	97.8	-2.4	A2	-17	-4	51	-37	-9	24	-44	-11	31
			A1B	-22	-5	24	-25	-13	56	-32	-13	51
			B1	-34	0	25	-29	-8	6	-17	-4	16
MAM	94.4	-3.9	A2	-21	-2	35	-29	-16	19	-44	-21	19
			A1B	-23	-12	13	-37	-11	18	-35	-24	13
			B1	-24	-7	30	-41	-11	11	-33	-7	19
JJA	300.7	-5.9*	A2	-54	-11	14	-51	-21	12	-76	-32	11
			A1B	-36	-14	3	-61	-22	2	-63	-20	8
			B1	-32	-9	13	-57	-10	14	-68	-14	11
SON	251.5	-5.5*	A2	-29	0	22	-30	3	16	-51	-7	18
			A1B	-22	-4	7	-42	-3	28	-60	-8	18
			B1	-12	1	18	-21	-1	10	-46	0	25

	Observed Mean	Observed Trend	Projected changes by the 2030s			Projected changes by the 2060s			Projected changes by the 2090s			
	1970-99	1960-2006	Min	Median	Max	Min	Median	Max	Min	Median	Max	
	% Frequency	Change in frequency per decade				Future % frequency			Future % frequency			
Frequency of Hot Days (TX90p)												
Annual	13.3	3.81*	A2	****	****	****	37	42	60	56	65	85
			A1B	****	****	****	38	43	64	44	58	83
			B1	****	****	****	25	35	51	26	45	63
DJF	13.4	3.76*	A2	****	****	****	51	59	69	70	83	90
			A1B	****	****	****	49	59	74	61	76	85
			B1	****	****	****	28	48	54	39	56	63
MAM	13.3	3.36*	A2	****	****	****	43	59	74	69	83	93
			A1B	****	****	****	44	61	79	60	77	91
			B1	****	****	****	20	46	64	37	59	76
JJA	13.6	4.66*	A2	****	****	****	55	64	83	76	87	98
			A1B	****	****	****	51	64	81	64	81	96
			B1	****	****	****	34	54	72	47	67	86
SON	12.9	4.02*	A2	****	****	****	40	63	83	63	88	97
			A1B	****	****	****	40	63	87	55	77	95
			B1	****	****	****	33	48	73	33	66	85
Frequency of Hot Nights (TN90p)												
Annual	11.6	2.72*	A2	****	****	****	48	58	77	71	88	95
			A1B	****	****	****	46	59	78	54	82	92
			B1	****	****	****	30	46	62	43	55	76
DJF	10.7	2.46*	A2	****	****	****	60	71	82	86	96	99
			A1B	****	****	****	57	76	87	70	93	98
			B1	****	****	****	38	59	76	57	71	87
MAM	12	2.55*	A2	****	****	****	54	67	77	83	95	98
			A1B	****	****	****	50	70	81	61	87	96
			B1	****	****	****	25	55	65	48	66	78
JJA	12.3	3.28*	A2	****	****	****	76	88	98	95	99	99
			A1B	****	****	****	76	87	99	90	97	99
			B1	****	****	****	40	69	89	67	86	98
SON	12.4	4.09*	A2	****	****	****	66	81	94	93	98	99
			A1B	****	****	****	66	80	97	80	95	99
			B1	****	****	****	48	67	83	59	81	94
Frequency of Cold Days (TX10p)												
Annual	8.8	-1.28*	A2	****	****	****	0	1	2	0	0	1
			A1B	****	****	****	0	1	2	0	0	1
			B1	****	****	****	1	2	3	0	1	3
DJF	8.8	-1.18*	A2	****	****	****	0	1	2	0	0	0
			A1B	****	****	****	0	0	4	0	0	1
			B1	****	****	****	0	1	2	0	1	3
MAM	8.4	-1.31*	A2	****	****	****	0	1	2	0	0	0
			A1B	****	****	****	0	1	3	0	0	1
			B1	****	****	****	1	2	2	0	1	2
JJA	9.0	-1.24*	A2	****	****	****	0	0	1	0	0	0
			A1B	****	****	****	0	0	1	0	0	0
			B1	****	****	****	0	2	2	0	0	1
SON	8.7	-1.11*	A2	****	****	****	0	0	2	0	0	0
			A1B	****	****	****	0	0	1	0	0	0
			B1	****	****	****	0	1	2	0	0	2
Frequency of Cold Nights (TN10p)												
Annual	8.8	-1.13*	A2	****	****	****	0	0	2	0	0	1
			A1B	****	****	****	0	0	2	0	0	1
			B1	****	****	****	0	1	2	0	0	2
DJF	9.8	-0.74	A2	****	****	****	0	0	2	0	0	1
			A1B	****	****	****	0	0	2	0	0	1
			B1	****	****	****	0	0	3	0	0	3
MAM	8.4	-1.07	A2	****	****	****	0	0	1	0	0	0
			A1B	****	****	****	0	0	1	0	0	0
			B1	****	****	****	0	1	1	0	0	1
JJA	7.9	-1.76*	A2	****	****	****	0	0	0	0	0	0
			A1B	****	****	****	0	0	0	0	0	0
			B1	****	****	****	0	0	1	0	0	0
SON	8.0	-1.66*	A2	****	****	****	0	0	0	0	0	0
			A1B	****	****	****	0	0	1	0	0	0
			B1	****	****	****	0	0	2	0	0	0

	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	24.5	2.19*	A2	****	****	****	-18	0	9	-24	-1	15
			A1B	****	****	****	-13	-1	8	-20	-3	13
			B1	****	****	****	-16	2	5	-20	1	8
DJF	****	****	A2	****	****	****	-10	-3	6	-14	-1	8
			A1B	****	****	****	-13	-2	17	-10	0	4
			B1	****	****	****	-9	-3	11	-4	1	15
MAM	****	****	A2	****	****	****	-20	-5	8	-29	-10	15
			A1B	****	****	****	-16	-1	10	-19	-3	15
			B1	****	****	****	-19	-2	10	-24	0	7
JJA	****	****	A2	****	****	****	-14	0	9	-17	-3	15
			A1B	****	****	****	-12	-5	10	-23	-4	13
			B1	****	****	****	-15	-2	6	-17	0	11
SON	****	****	A2	****	****	****	-8	0	6	-21	0	15
			A1B	****	****	****	-15	0	10	-23	0	17
			B1	****	****	****	-12	0	5	-10	1	9
Maximum 1-day rainfall (RX1day)												
	mm	Change in mm per decade				Change in mm			Change in mm			
Annual	116.8	7.90*	A2	****	****	****	-6	0	8	-42	0	30
			A1B	****	****	****	-6	0	18	-23	1	18
			B1	****	****	****	-20	1	8	-15	1	14
DJF	27.1	0.89	A2	****	****	****	-2	0	0	-1	0	2
			A1B	****	****	****	-2	0	2	-1	0	2
			B1	****	****	****	-1	0	1	-1	0	1
MAM	36.0	2.32*	A2	****	****	****	-1	0	5	-9	-1	13
			A1B	****	****	****	-1	0	10	-3	-1	10
			B1	****	****	****	-8	0	3	-1	0	6
JJA	51.2	1.74*	A2	****	****	****	-21	0	6	-24	0	10
			A1B	****	****	****	-19	-1	10	-23	0	17
			B1	****	****	****	-23	0	7	-16	0	8
SON	52.6	1.53	A2	****	****	****	-2	0	8	-40	0	18
			A1B	****	****	****	-4	0	20	-22	1	21
			B1	****	****	****	-14	0	6	-15	0	18
Maximum 5-day Rainfall (RX5day)												
	mm	Change in mm per decade				Change in mm			Change in mm			
Annual	215.9	13.86*	A2	****	****	****	-20	-2	25	-92	-4	49
			A1B	****	****	****	-19	-2	29	-64	-1	41
			B1	****	****	****	-37	0	25	-43	-1	30
DJF	49.2	3.94*	A2	****	****	****	-5	-1	1	-8	-1	6
			A1B	****	****	****	-7	-2	10	-3	0	8
			B1	****	****	****	-8	0	4	-5	0	5
MAM	64.1	3.97*	A2	****	****	****	-7	-2	17	-17	-4	36
			A1B	****	****	****	-8	-2	15	-12	-3	25
			B1	****	****	****	-15	-1	5	-5	-1	15
JJA	101.1	2.15	A2	****	****	****	-39	-1	23	-50	-8	33
			A1B	****	****	****	-38	-5	21	-49	-2	33
			B1	****	****	****	-45	-2	19	-32	0	28
SON	106.5	5.15	A2	****	****	****	-7	-2	14	-88	-1	24
			A1B	****	****	****	-10	0	33	-62	-1	38
			B1	****	****	****	-28	1	14	-40	1	36

* indicates trend is statistically significant at 95% confidence

**** indicates data are not available

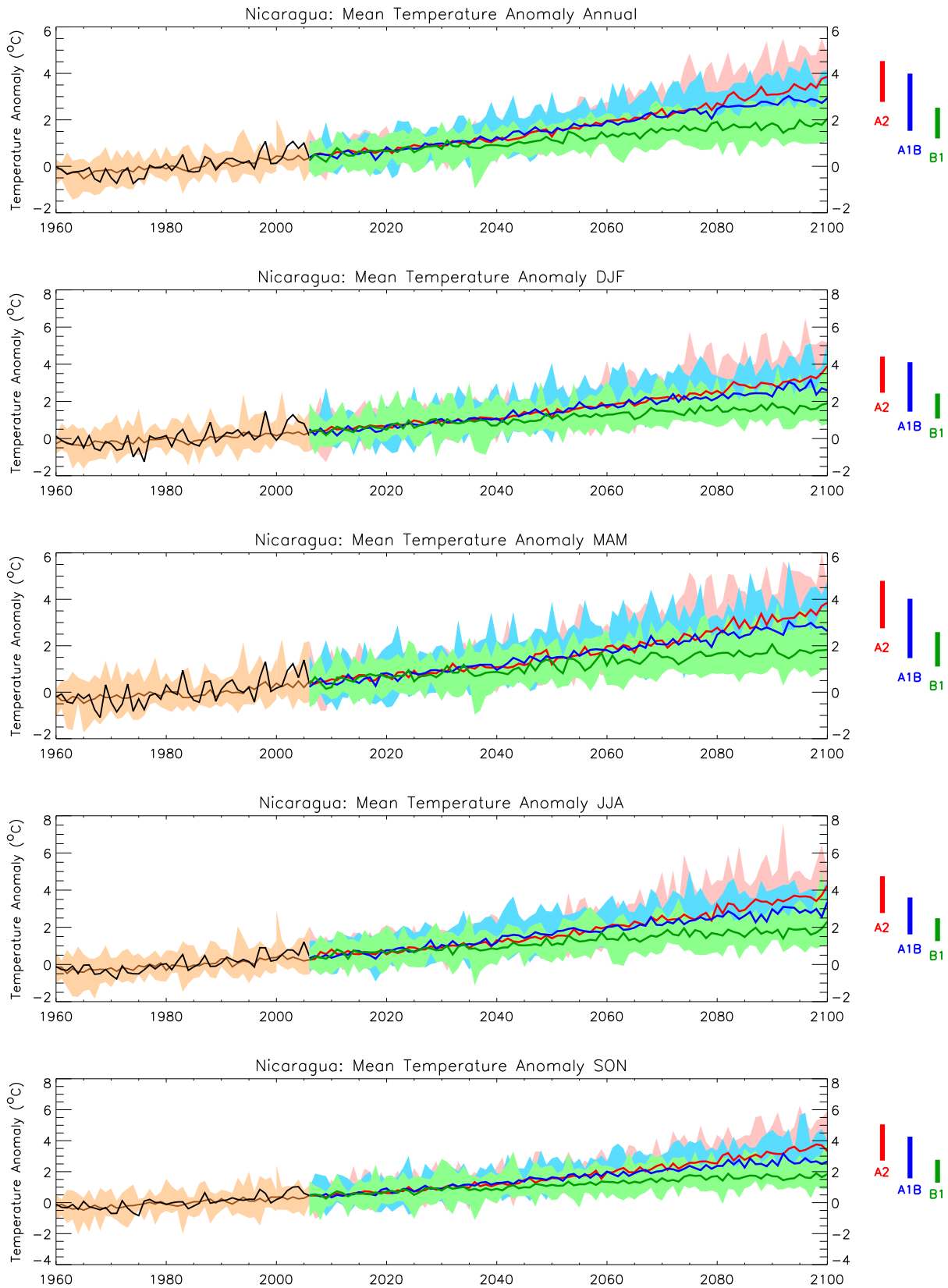


Figure 1: Trends in annual and seasonal mean temperature for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. Black curves show the mean of observed data from 1960 to 2006, Brown curves show the median (solid line) and range (shading) of model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

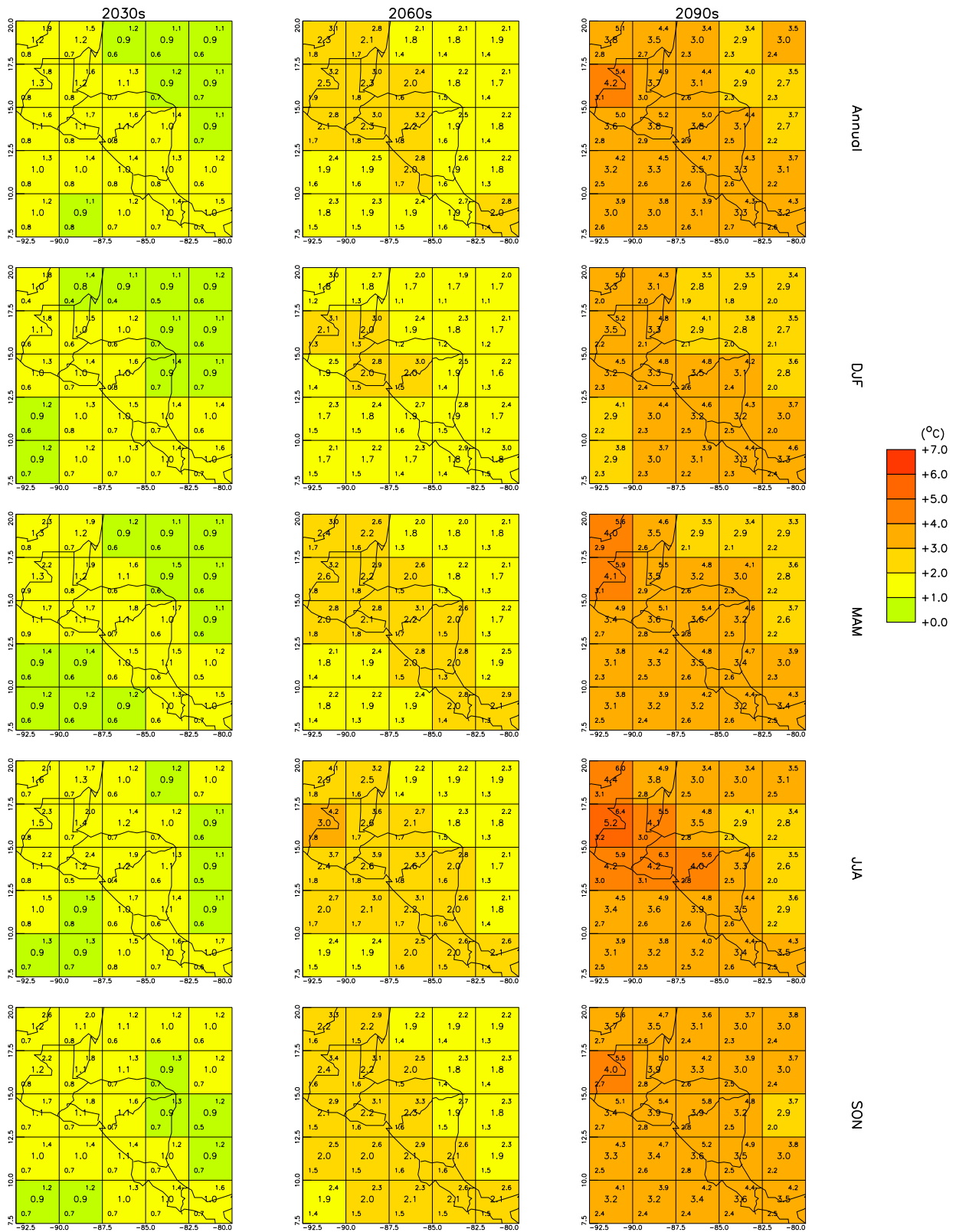


Figure 2: Spatial patterns of projected change in mean annual and seasonal temperature for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. In each grid box, the central value gives the ensemble median and the values in the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

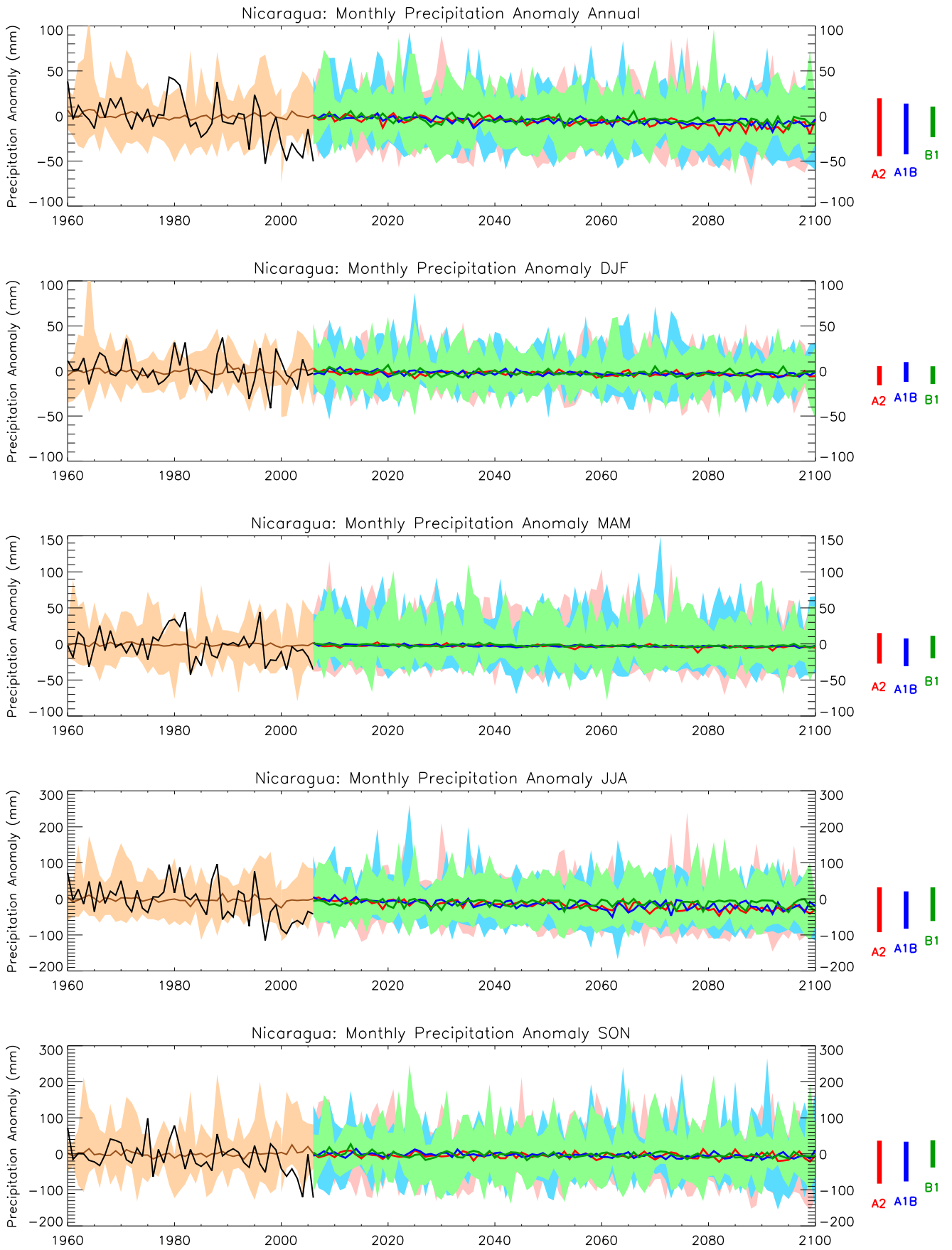


Figure 3: Trends in monthly precipitation for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

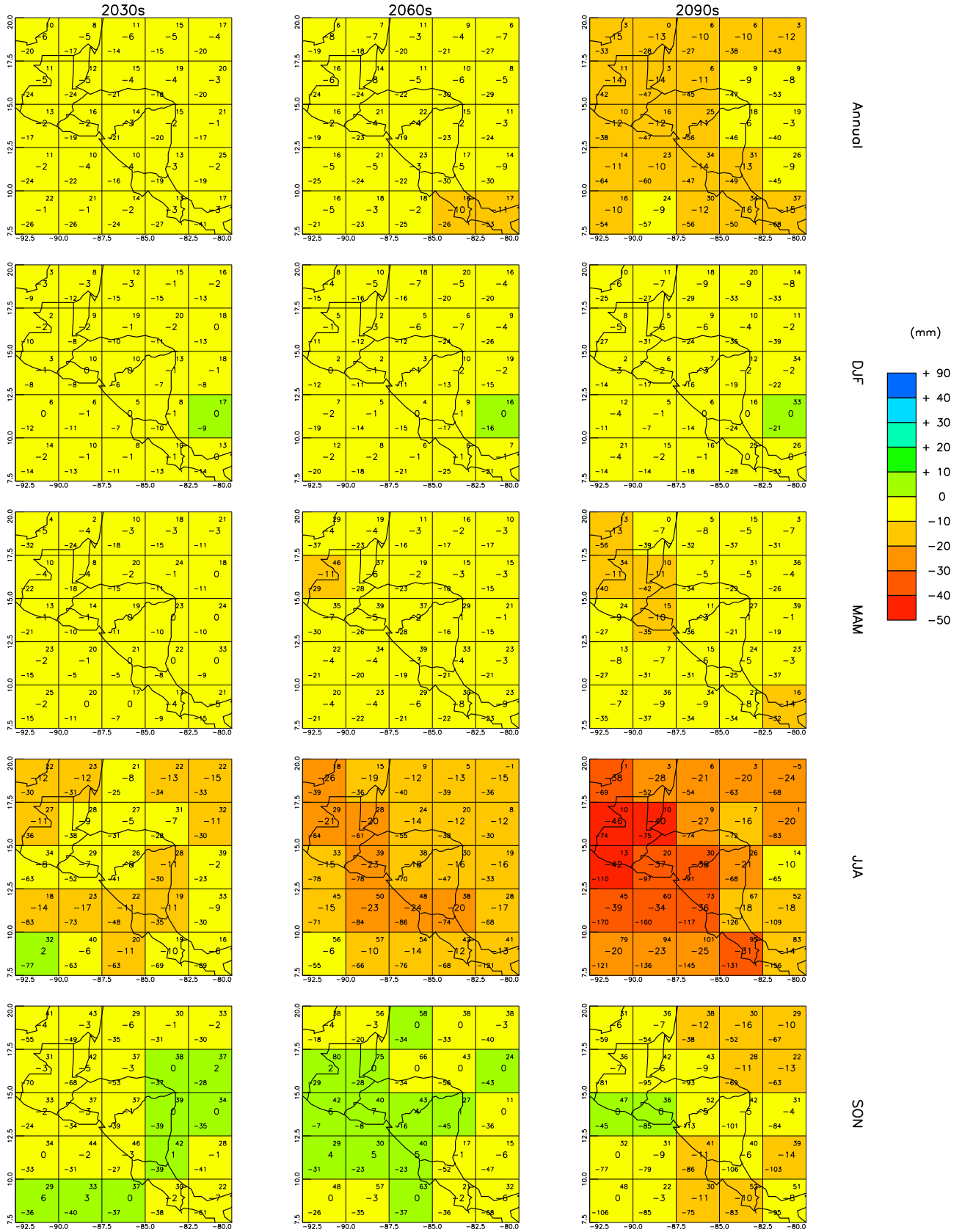


Figure 4: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

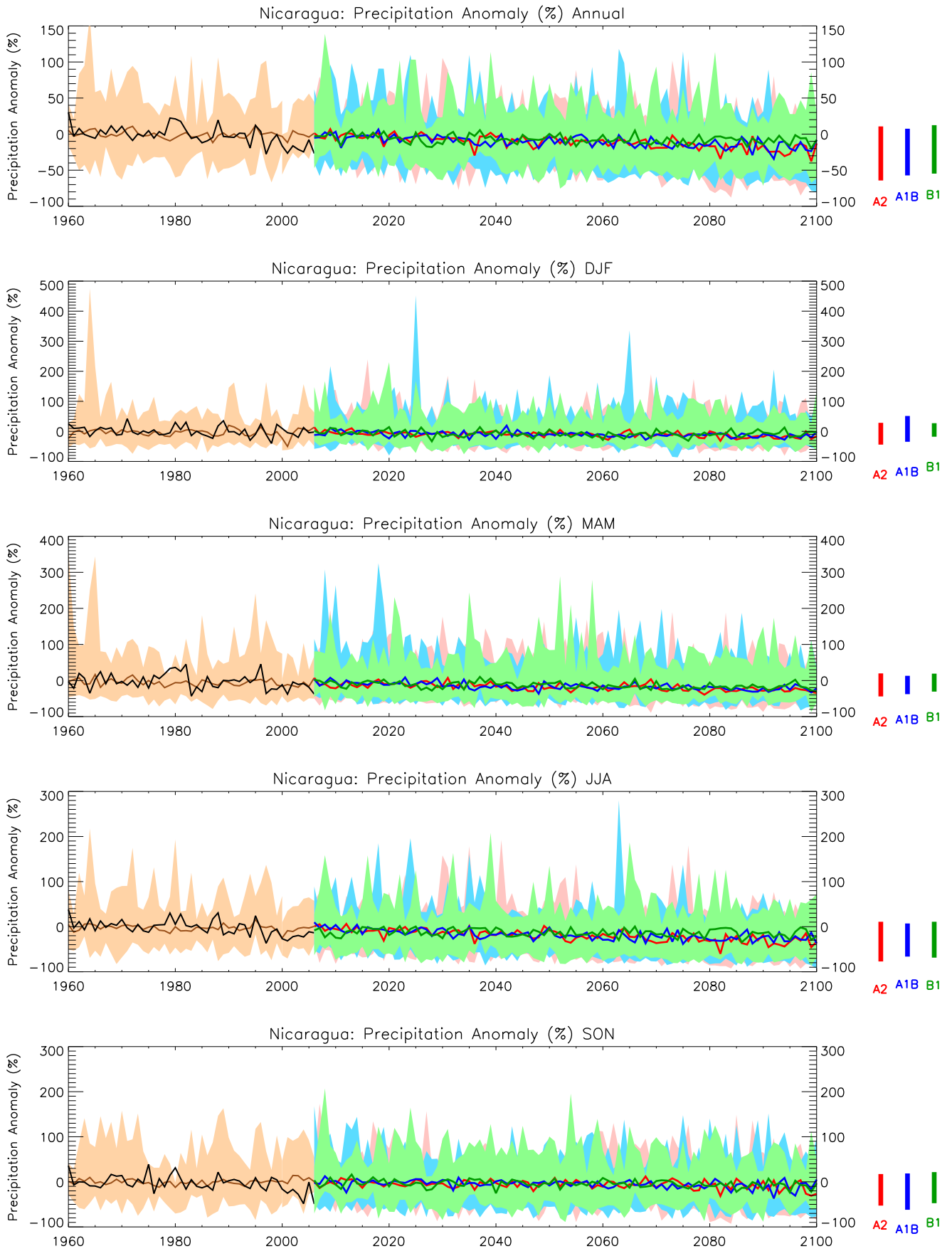


Figure 5: Trends in monthly precipitation for the recent past and projected future. All values shown are percentage anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

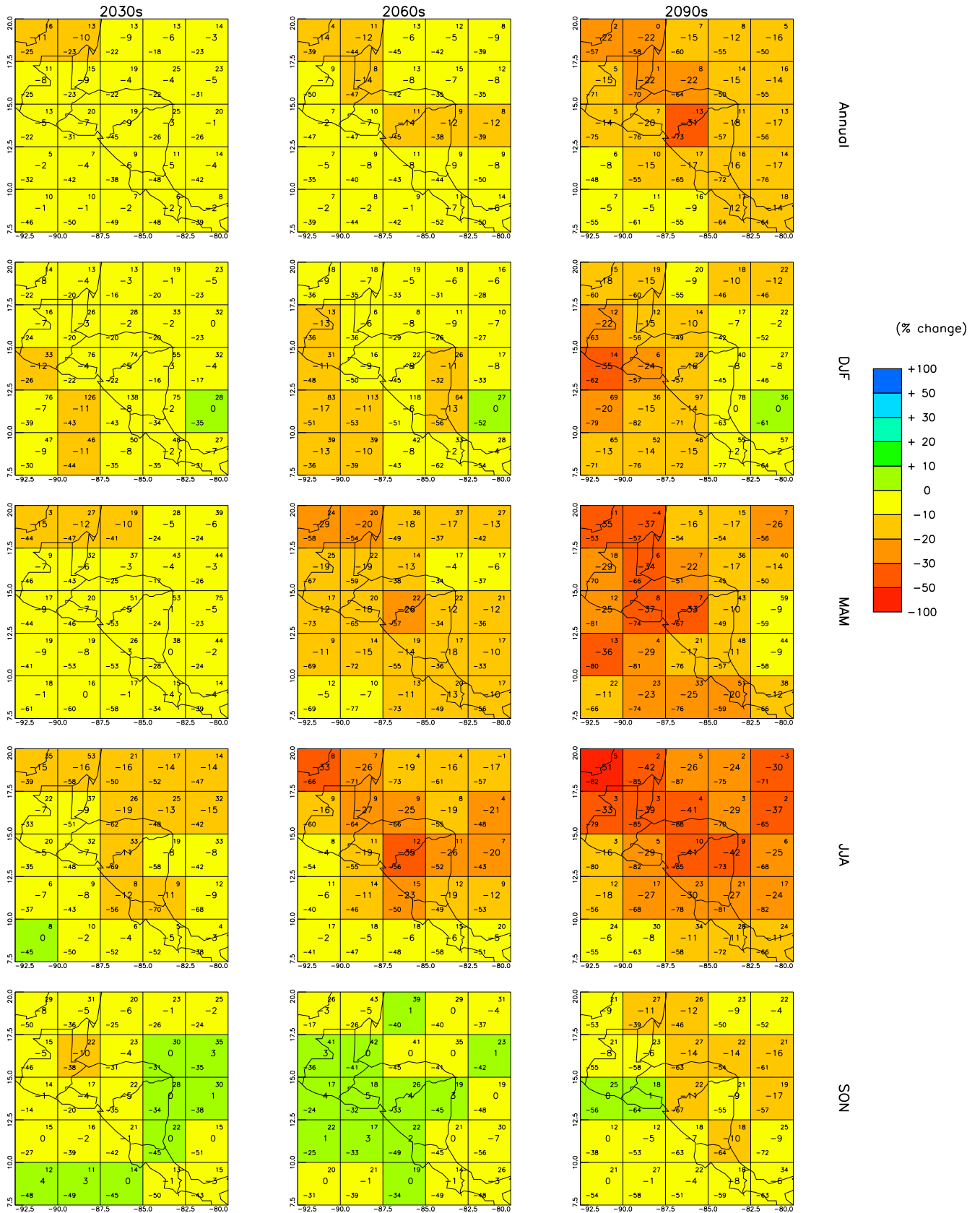


Figure 6: Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are percentage anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

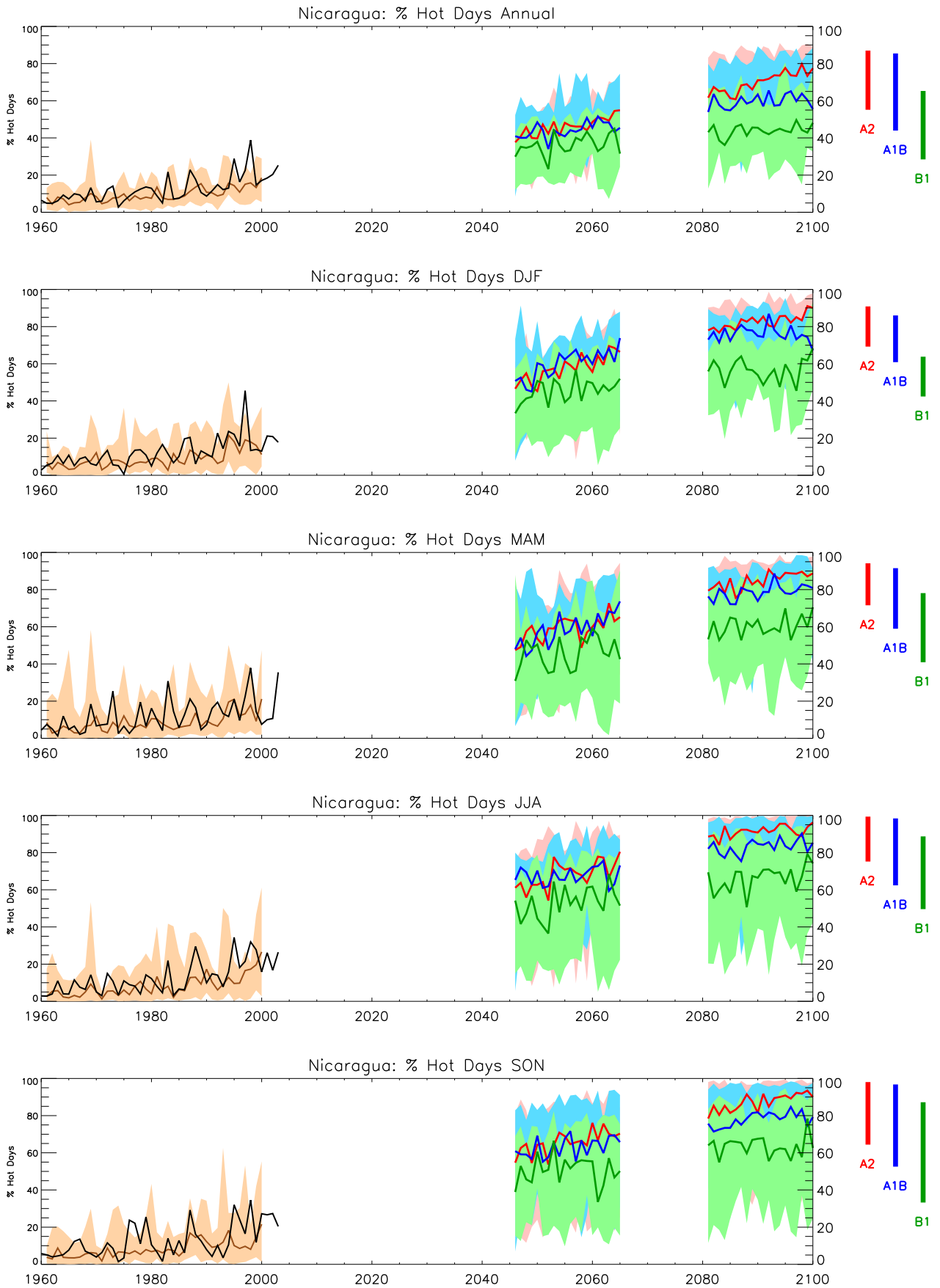


Figure 7: Trends in Hot-day frequency for the recent past and projected future. See Figure 1 for details.

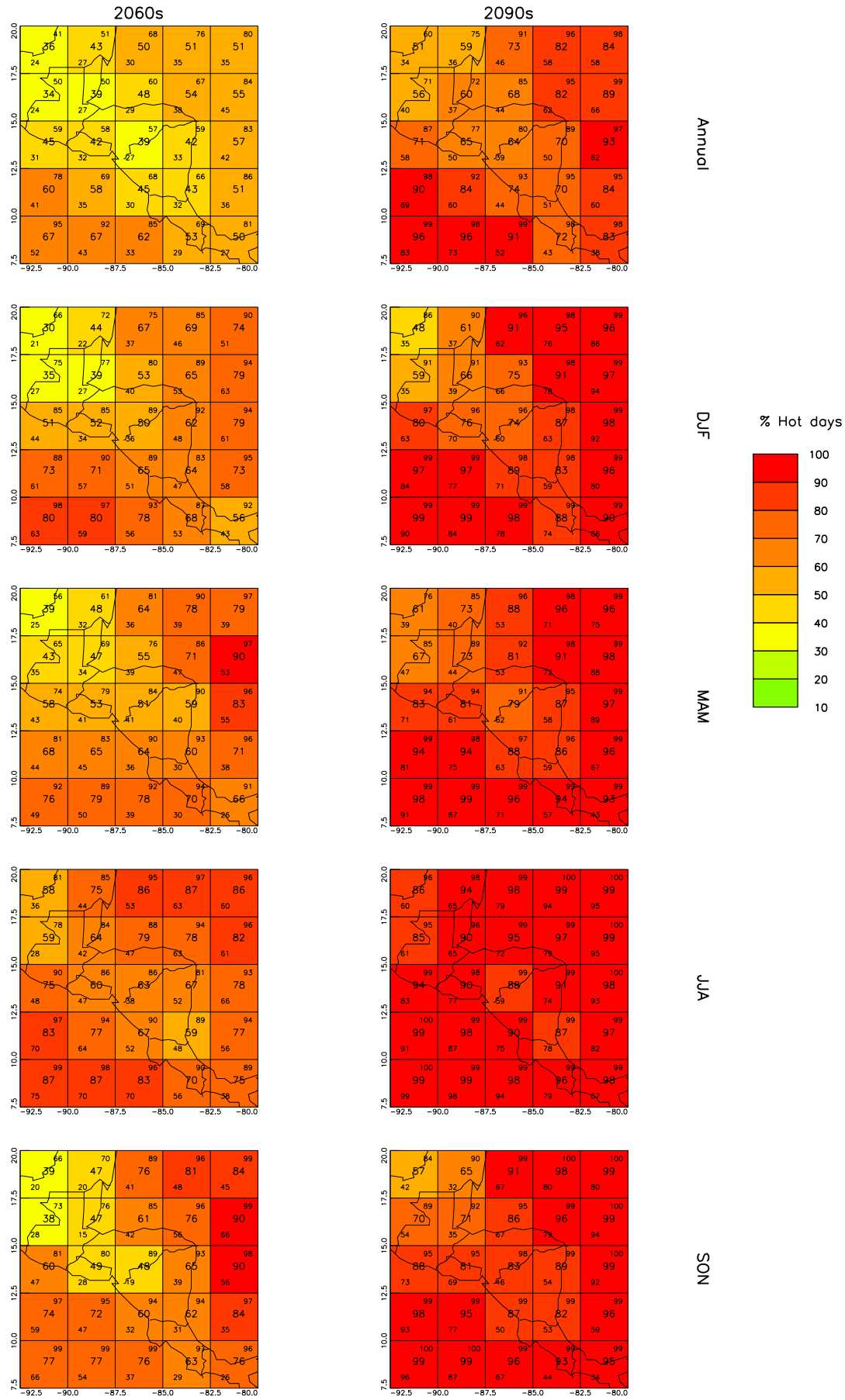


Figure 8: Spatial patterns of projected change in Hot-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

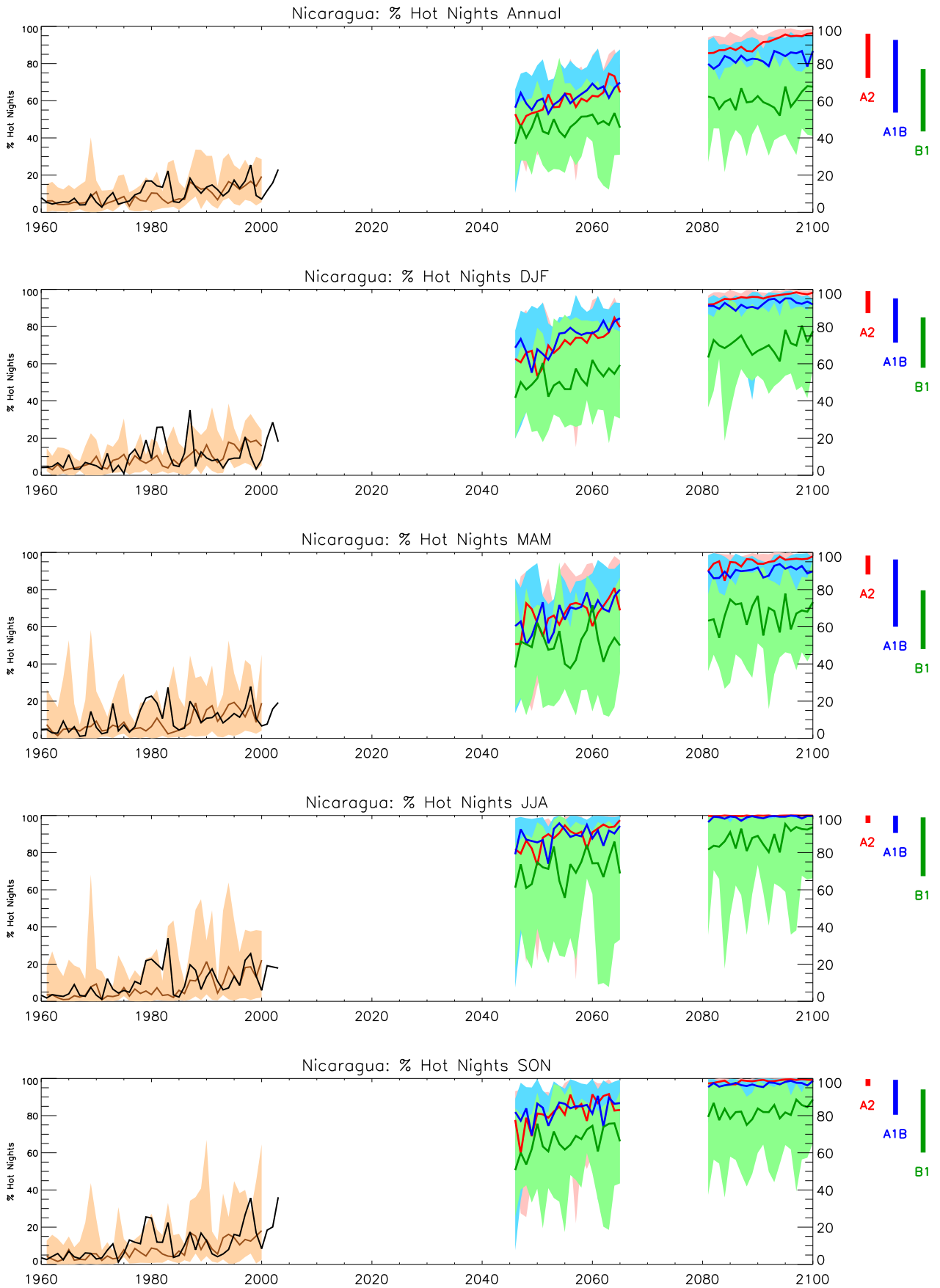


Figure 9: Trends in hot-night frequency for the recent past and projected future. See Figure 1 for details.

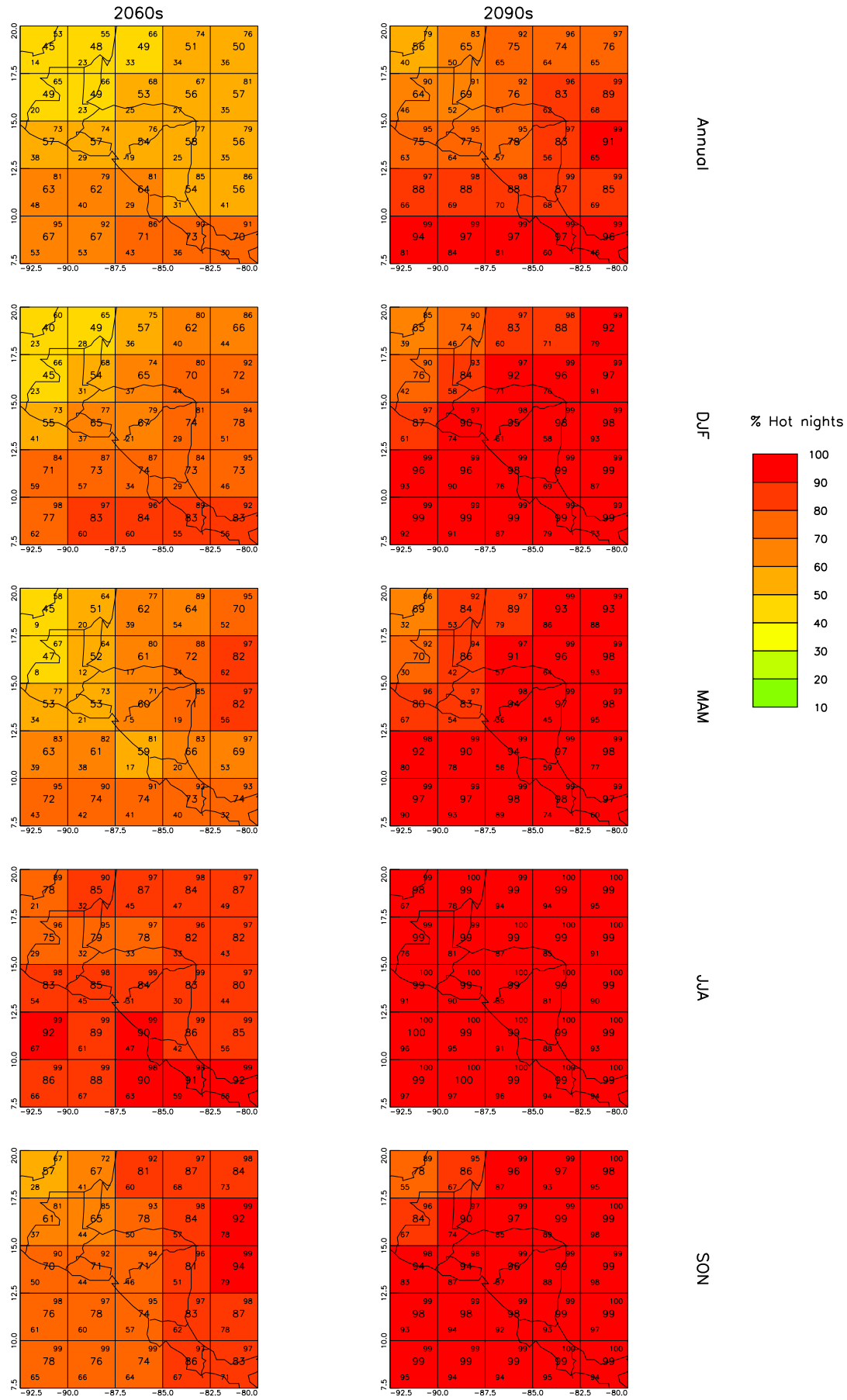


Figure 10: Spatial patterns of projected change in hot-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

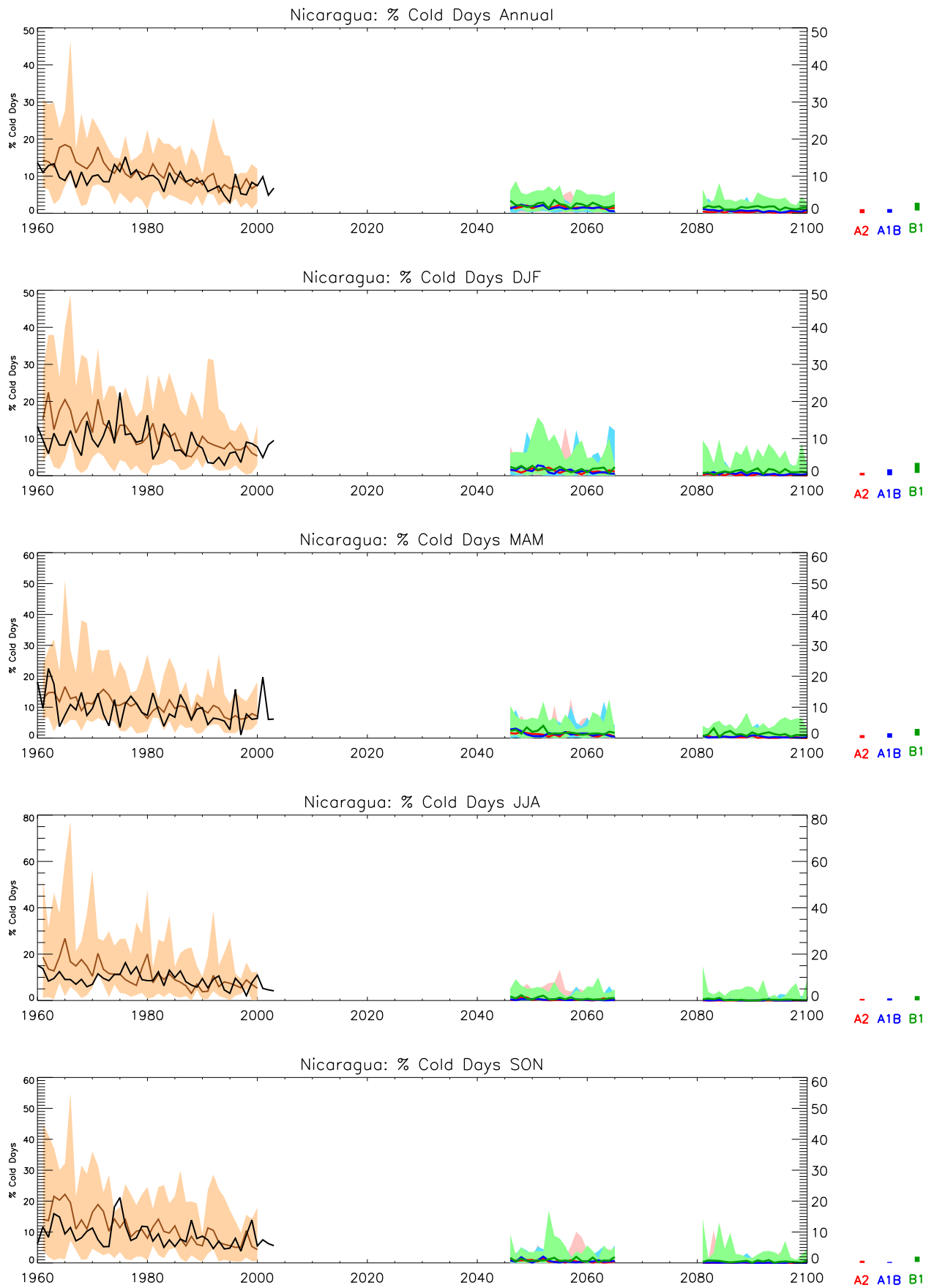


Figure 11: Trends in cold-day frequency for the recent past and projected future. See Figure 1 for details.

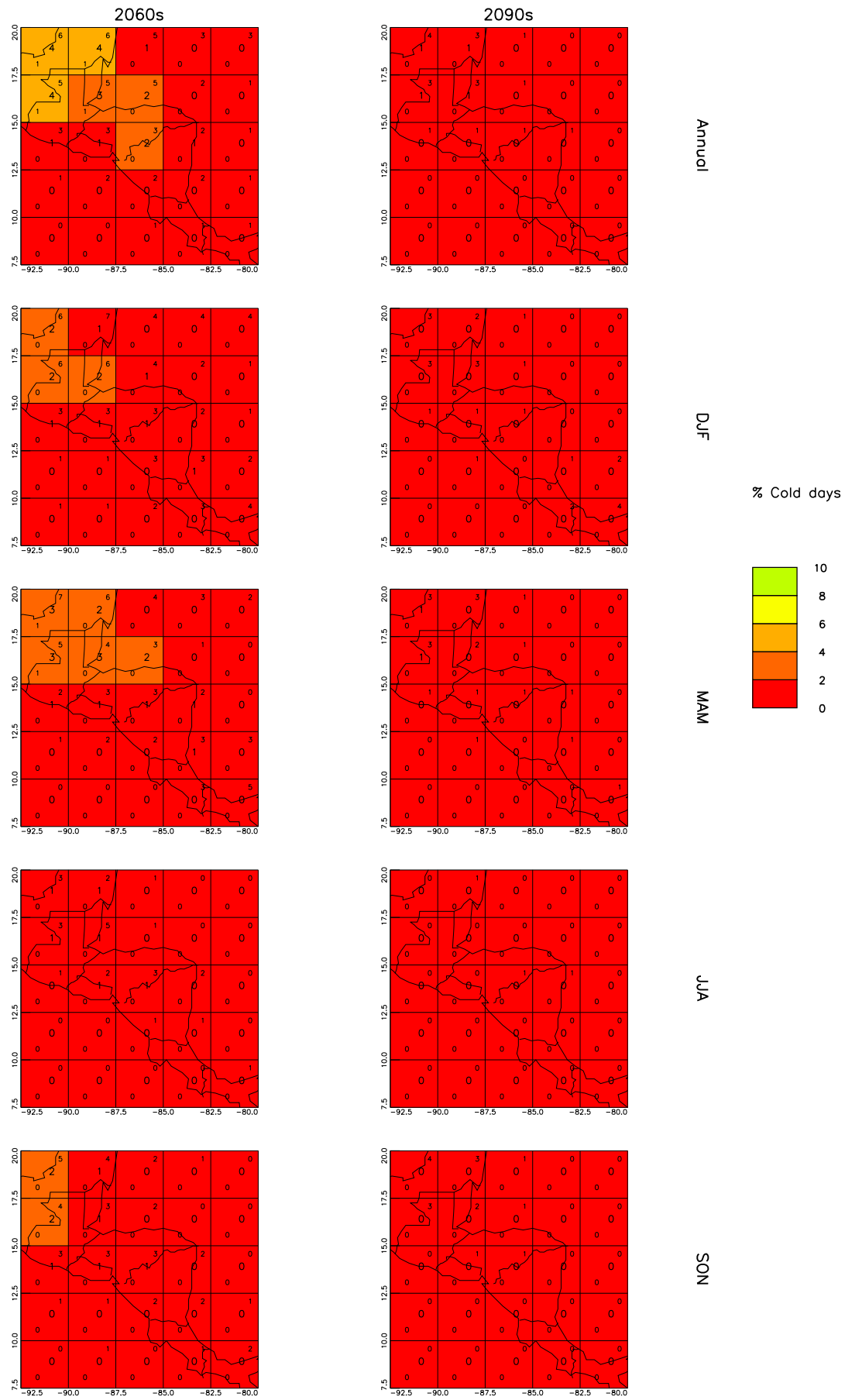


Figure 12: Spatial patterns of projected change in cold-day frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.



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

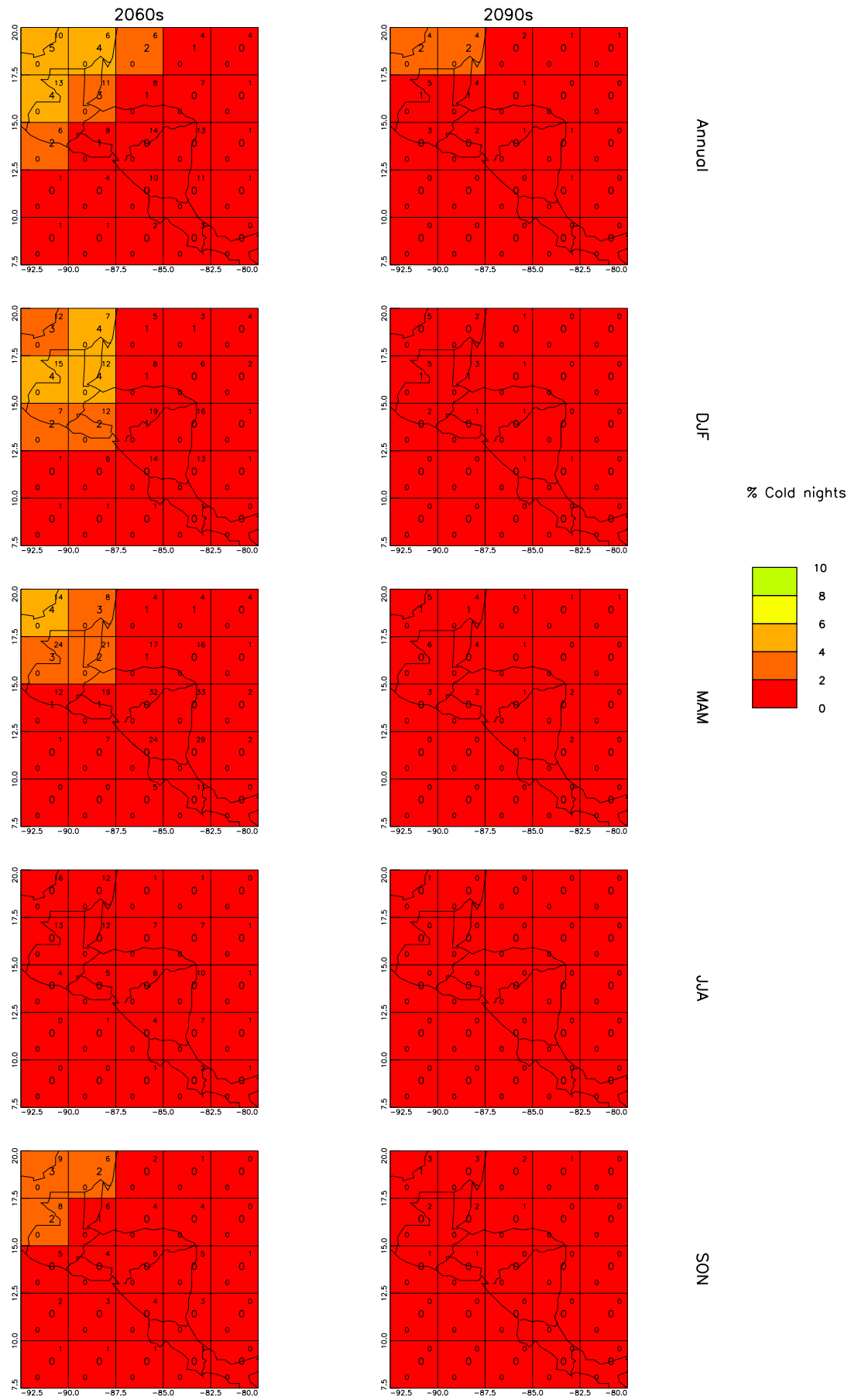


Figure 14: Spatial patterns of projected change in cold-night frequency for 10-year periods in the future under the SRES A2 scenario. See Figure 2 for details.

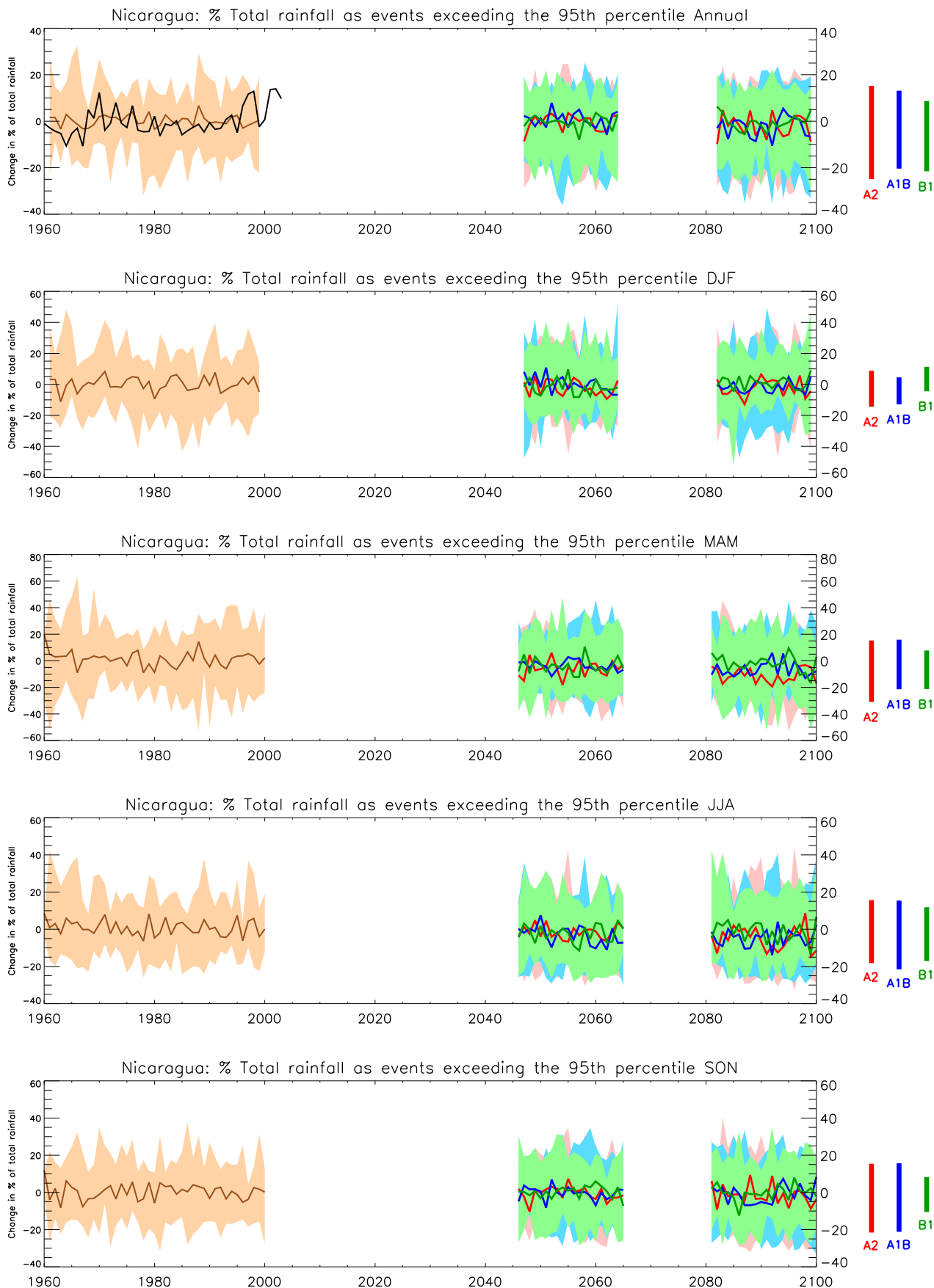


Figure 15: Trends in the proportion of precipitation falling in 'heavy' events for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

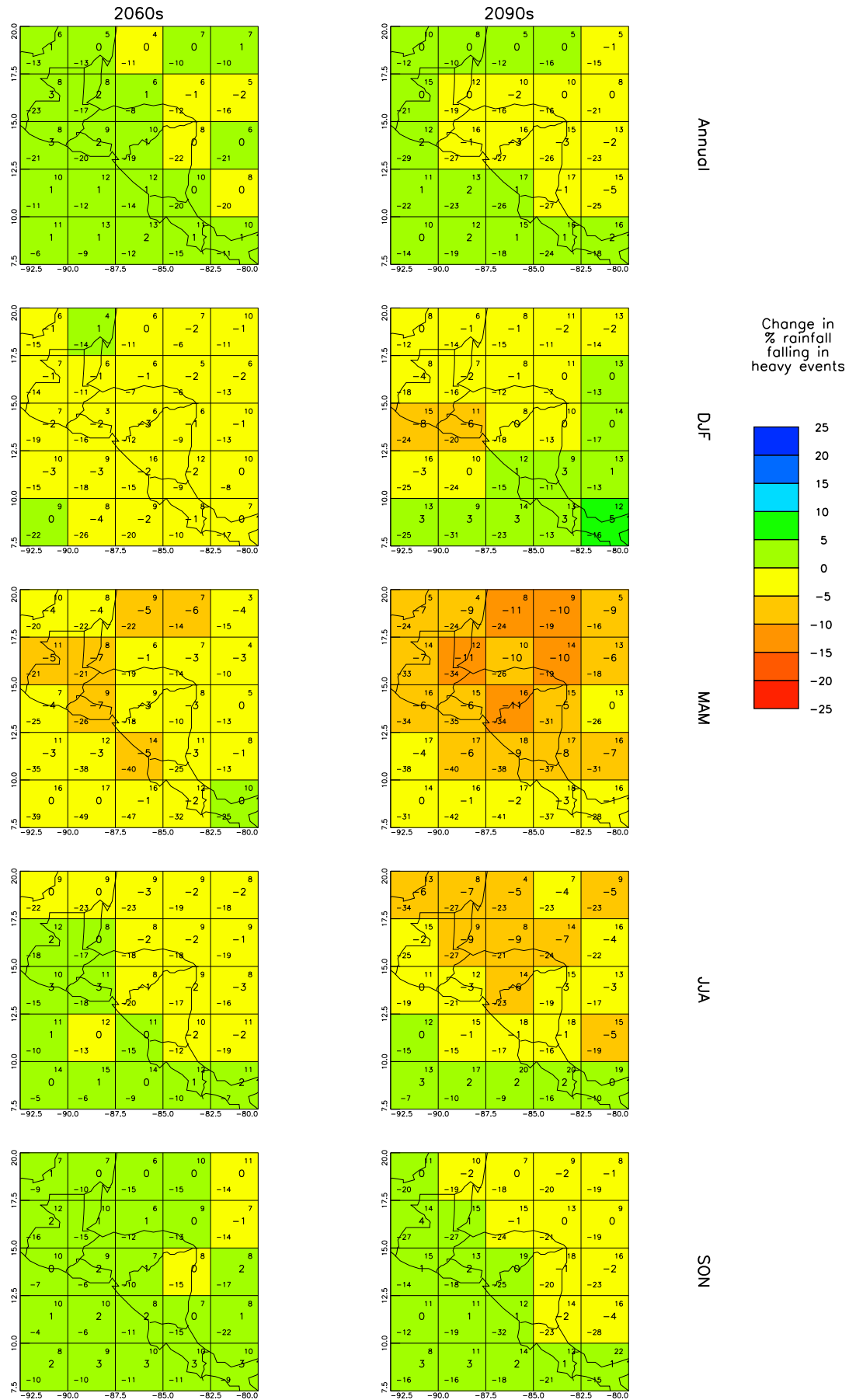


Figure 16: Spatial patterns of projected change in the proportion of precipitation falling in 'heavy' events for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

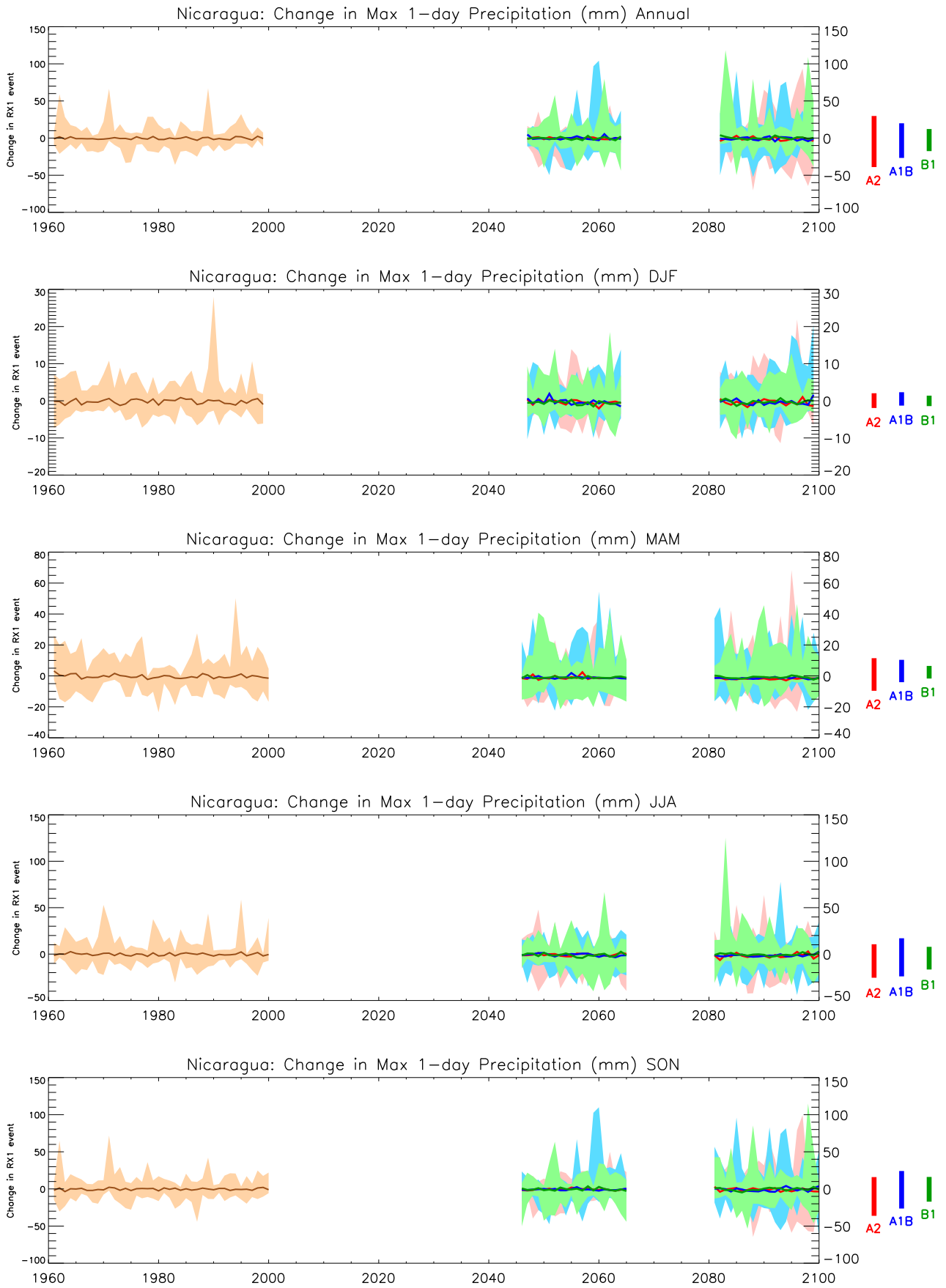


Figure 17: Trends in maximum 1-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

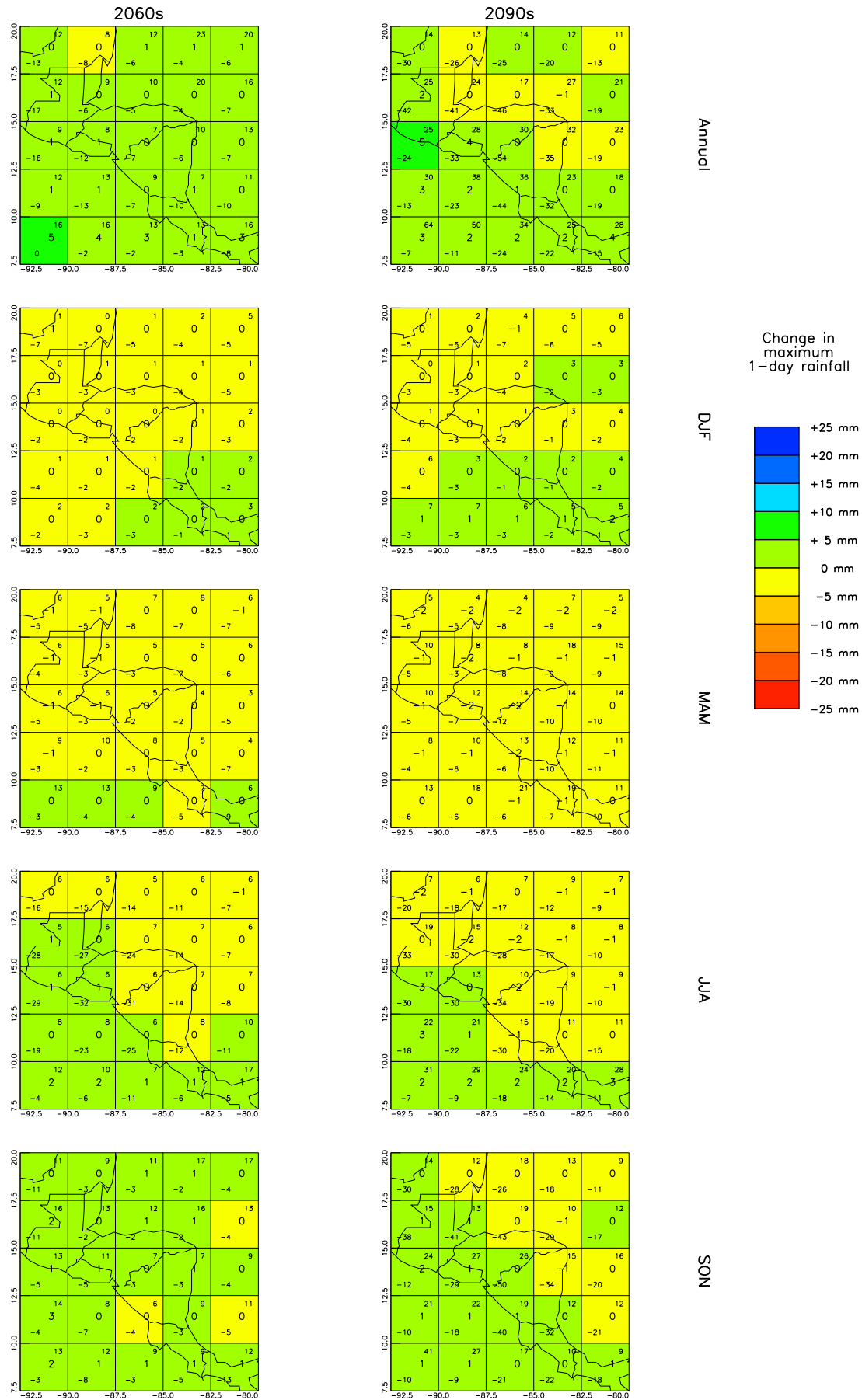


Figure 18: Spatial patterns of maximum 1-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.

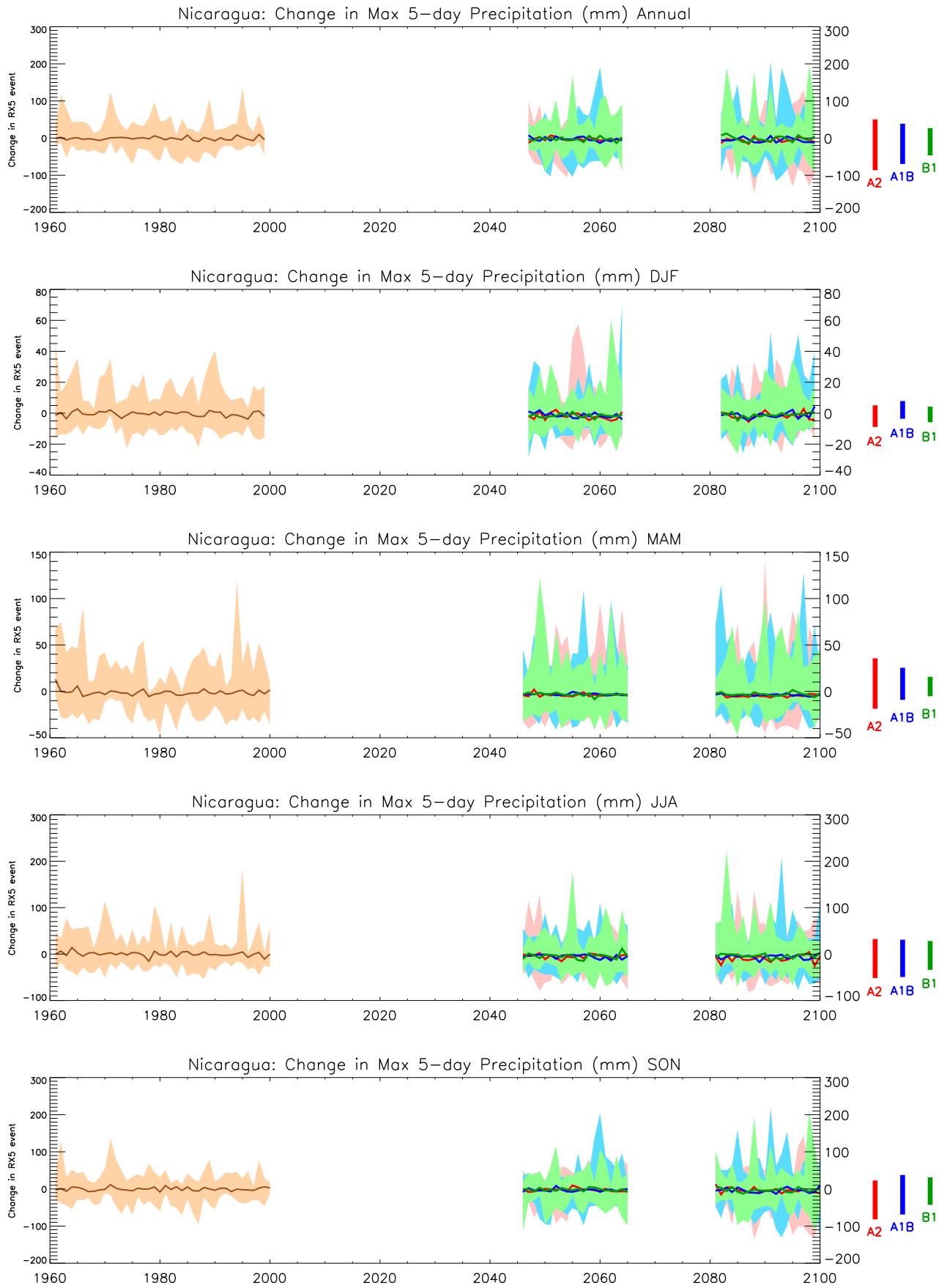


Figure 19: Trends in maximum 5-day rainfall for the recent past and projected future. All values shown are anomalies, relative to the 1970-1999 mean climate. See Figure 1 for details.

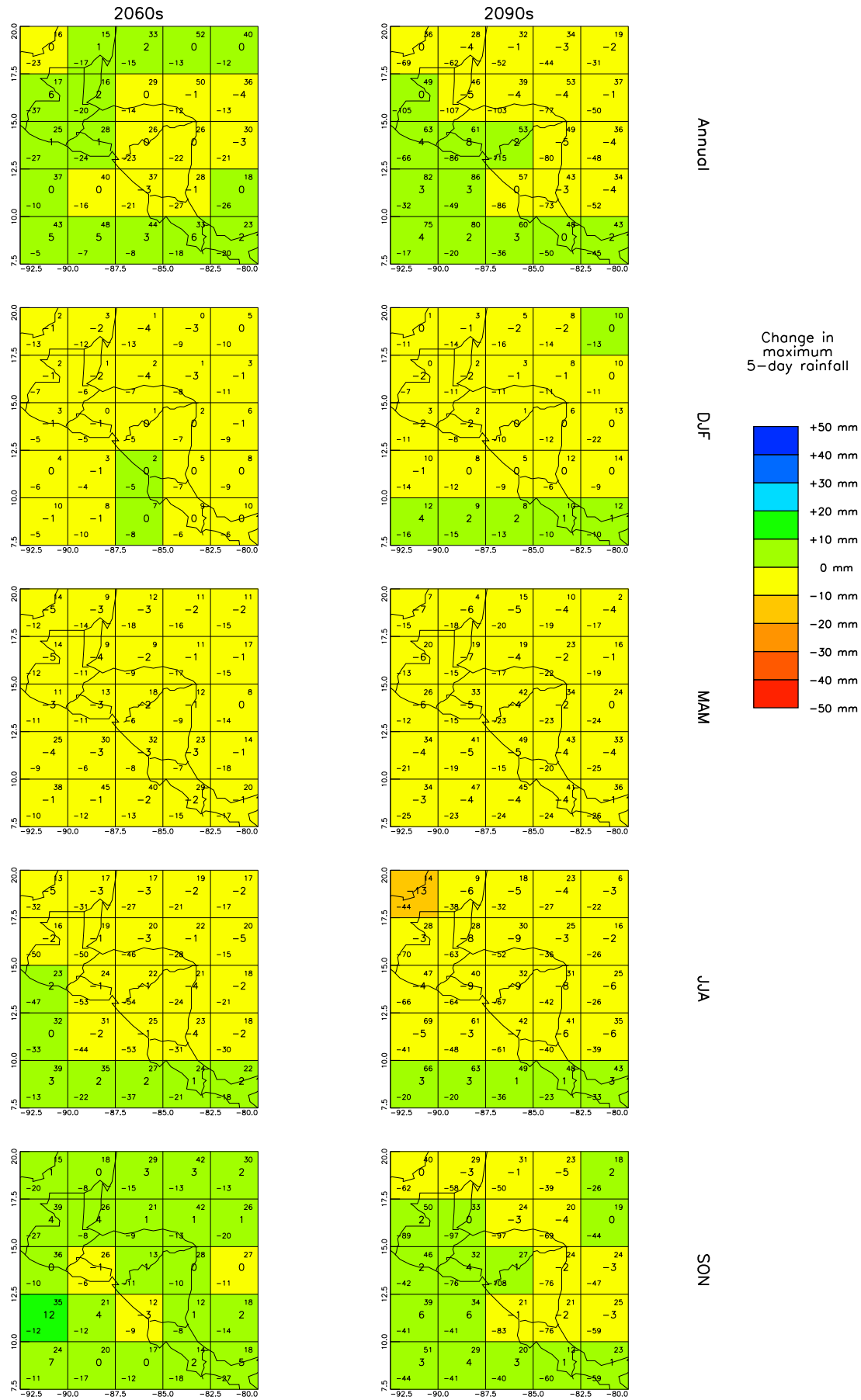


Figure 20: Spatial patterns of projected change in maximum 5-day rainfall for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999. See Figure 2 for details.