

## Chile

In this section explore the latest projections about climate change

### What is Chile's climate like?

- Chile extends from the tropics down almost to Antarctica - 38° in latitude
- Chile is located on the west side of the Andes
- The north of the country experiences very hot and arid conditions (Atacama desert) with no recorded rainfall
- The climate in central Chile is Mediterranean with cool, wet winters between April and September with average temperatures around 11°C and summer temperatures around 18°C. The annual rainfall is 500-1000mm
- In the extreme south the weather is cold and wet most of the year, with over 4000mm of rainfall in some areas
- The climate in Chile is controlled by the cold Humboldt ocean current, the Andes mountains, the Pacific anticyclone and the southern circumpolar low pressure area

### Graph one: How did Chile's temperature change between 1960 and 2009?

- The black line shows the actual temperature anomaly for each year from 1960 to 2000. This is the difference in temperature between the year's recorded temperature and the average of all years between 1970 and 1999. If the anomaly is positive, that year was warmer than the 1970-1999 average. If it is negative, that year was colder than the 1970-1999 average
- The brown line shows past temperature anomalies as produced by a computer model with the brown shading showing the range of temperatures produced by the model
- The mean annual temperature in Chile has not changed significantly since 1960. However, the temperature in SON has decreased at an average rate of 0.12°C each decade
- The green, blue and red lines show projected future temperatures from 2006 to 2100, according to three different emission scenarios – green (low), blue (medium) and red (high). The shading around each line shows the range of temperature that might be possible with each emission scenario
- Chile's annual temperature is projected to increase by 0.8-1.9°C by the 2060s and 1.2-3.1°C by the 2090s

### Graphs two to four: How will Chile's annual temperature change during the 2030s, 60s and 90s?

- These 3 maps show projected temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded deep orange will be 6°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be the same as the 1970-1999 average
- The numbers in the centre of each grid box is the average projected temperature; numbers in the upper and lower corners give the highest and lowest possible annual mean temperature
- Northern Chile is expected to warm significantly more (over 4°C by the 2090s) than central and southern Chile

### Graphs five to seven: How will Chile's temperature change seasonally? – December,

## January, February

- These 3 maps show projected December, January and February (DJF) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be the same as the 1970-1999 average
- The number in the centre of each grid box is the average projected temperature; numbers in the upper and lower corners give the highest and lowest possible DJF mean temperature
- The projected rate of warming is similar throughout the year
- Northern Chile is expected to warm significantly more than central and southern Chile in all seasons

## Graphs eight to 10: How will Chile's temperature change seasonally? – March, April, May

- These 3 maps show projected March, April and May (MAM) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average
- The number in the centre of each grid box is the average MAM temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and lower corners give the range of average temperature anomalies that might occur
- The projected rate of warming is similar throughout the year
- Northern Chile is expected to warm significantly more than central and southern Chile in all seasons

## Graphs 11 to 13: How will Chile's temperature change seasonally? – June, July, August

- These 3 maps show projected June, July and August (JJA) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average
- The number in the centre of each grid box is the average JJA temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and lower corners give the range of average temperature anomalies that might occur
- The projected rate of warming is similar throughout the year
- Northern Chile is expected to warm significantly more than central and southern Chile in all seasons

## Graphs 14 to 16: How will Chile's temperature change seasonally? – September, October, November

- These 3 maps show projected September, October and November (SON) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average
- The number in the centre of each grid box is the average SON temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and

lower corners give the range of average temperature anomalies that might occur

- The projected rate of warming is similar throughout the year
- Northern Chile is expected to warm significantly more than central and southern Chile in all seasons

## Graphs 17 to 18: How will Chile's frequency of hot days change?

- These two maps show the percentage of hot days expected during the 2060s and 2090s given high carbon dioxide emissions through the century (scenario A2)
- A hot day is defined by the temperature exceeded on 10% of days in 1970-1999. So, in 1970 – 1999, you would have expected 1 in 10 days to be hot. If the map shading indicates that more than 10% of days are hot, then there has been an increase in the number of hot days
- In areas shaded deep red, every day will be a hot day. Yellow areas will have 30% hot days
- The number in the centre of each grid box is the number of hot days we expect; the smaller numbers in the upper and lower corners give the range of numbers of hot days that might occur
- Hot days will occur on 17-26% of days by the 2060s and on 20-37% of days by the 2090s

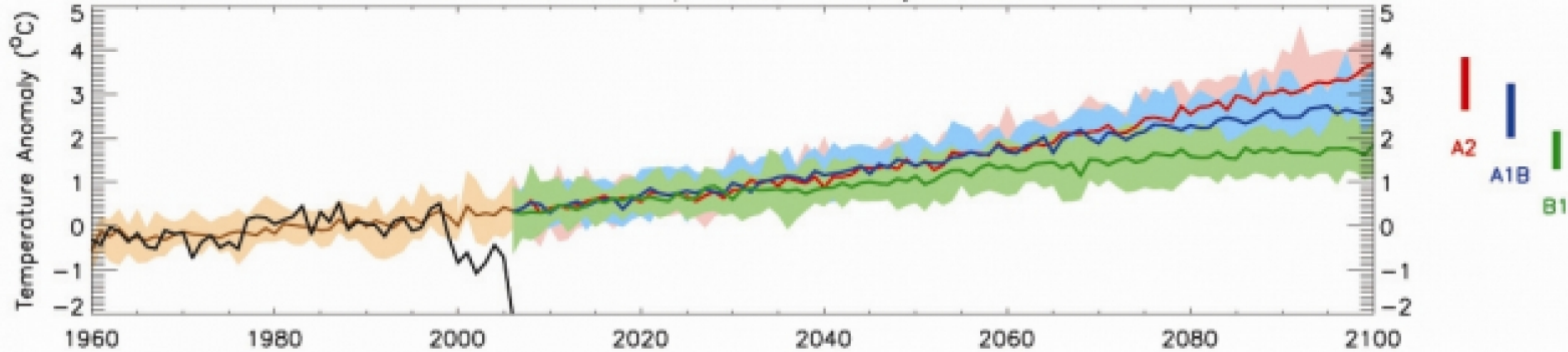
## Graphs 19 to 20: How will Chile's frequency of hot nights change?

- These two maps show the percentage of hot nights expected during the 2060s and 2090s given high carbon dioxide emissions through the century (scenario A2)
- A hot night is defined by the temperature exceeded on 10% of nights in 1970-1999. So, in 1970 – 1999, you would have expected 1 in 10 nights to be hot. If the map shading indicates that more than 10% of nights are hot, then there has been an increase in the number of hot nights
- In areas shaded deep red, every night will be a hot night. Yellow areas will have 30% hot nights
- The number in the centre of each grid box is the number of hot nights we expect; the smaller numbers in the upper and lower corners give the range of numbers of hot nights that might occur
- Hot nights are expected to occur on 15-26% of nights by the 2060s and 18-38% of nights by the 2090s

## Graph 21: How will Chile's precipitation change?

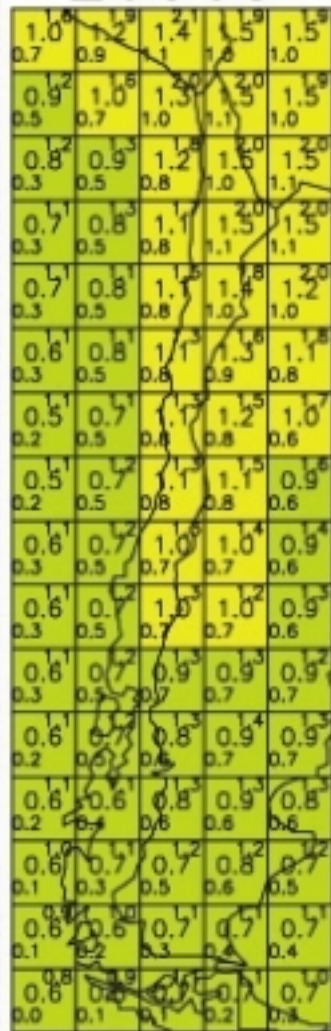
- This graph shows the 'precipitation anomaly' – the difference in rain or snowfall to the 1970-1999 average. If the graph shows a positive number, then it is wetter than the 1970-1999 average. If the graph shows a negative number, then it is drier
- The black line shows the actual precipitation anomaly for each year from 1960 to 2006. This is the difference in rain/ snowfall between the year's recorded precipitation and the average of all years between 1970 and 1999
- The brown line shows past precipitation anomalies as produced by a computer model with the brown shading showing the range produced by the model
- The green, blue and red lines show projected future precipitation from 2006 to 2100, according to three different carbon dioxide emission scenarios – green (low), blue (medium) and red (high). The shading around each line shows the range of precipitation that might be possible with each emission scenario
- There has not been any significant change in rainfall in Chile since 1960
- In the future, rainfall in Chile is expected to fall slightly by the 2090s. Most of this decrease will occur in central Chile and in September-November

Chile: Mean Temperature Anomaly Annual



# 2030s

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-775072.570.068550

(°C)

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# 2060s

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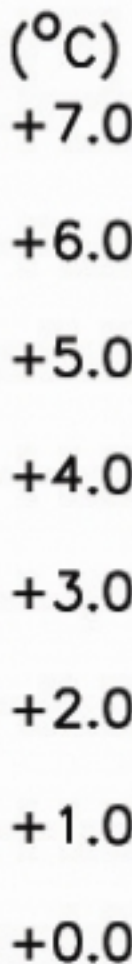
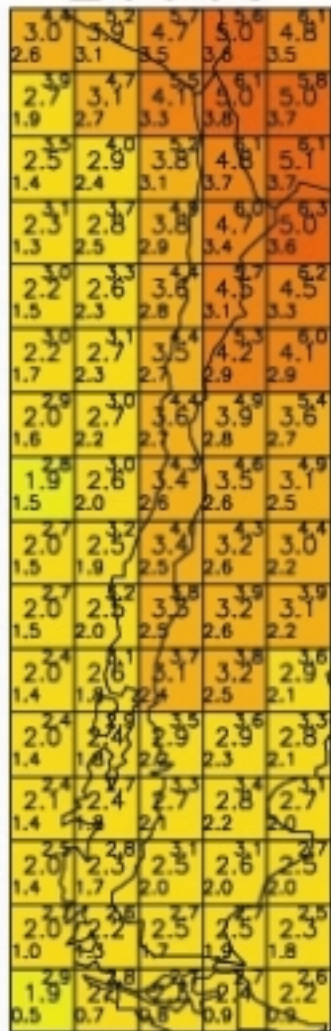
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# 2090s

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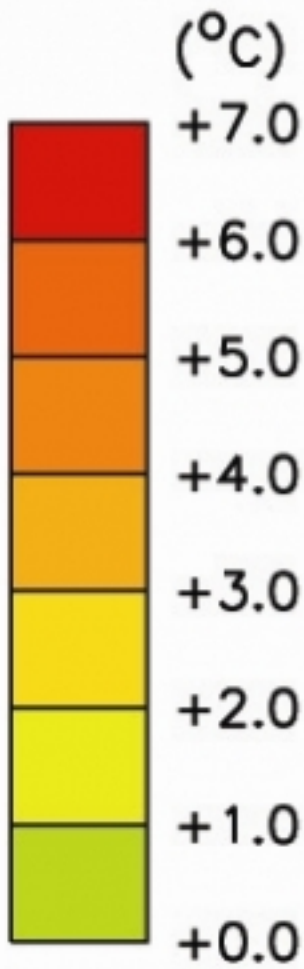


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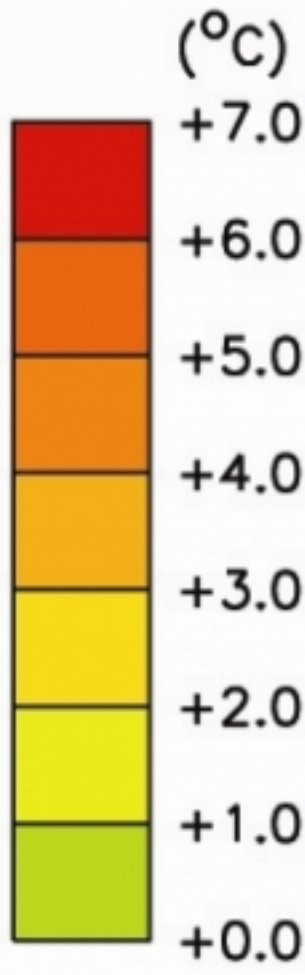




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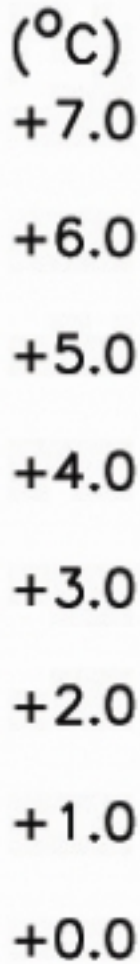


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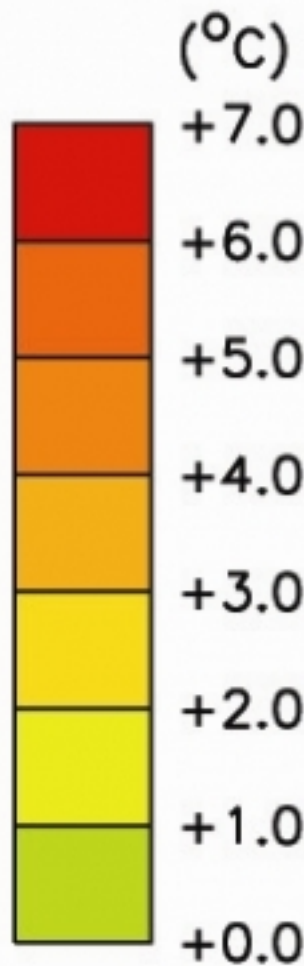


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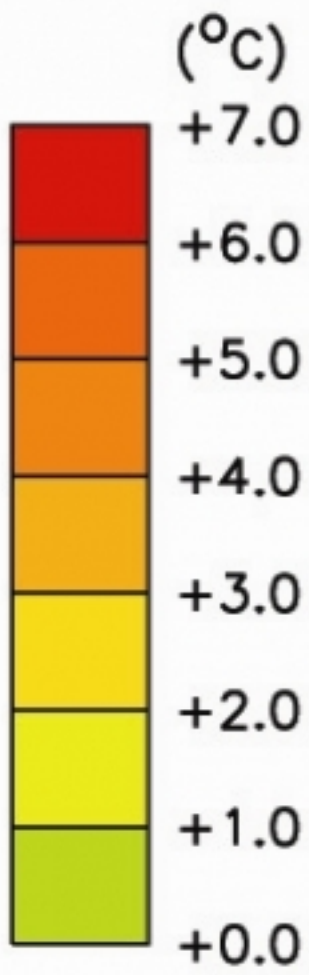
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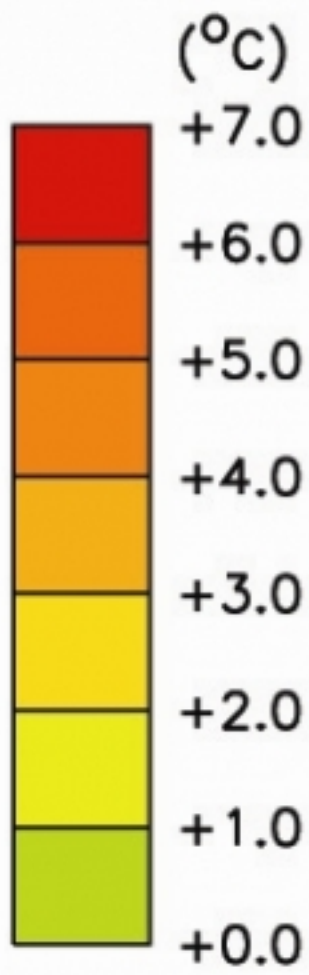
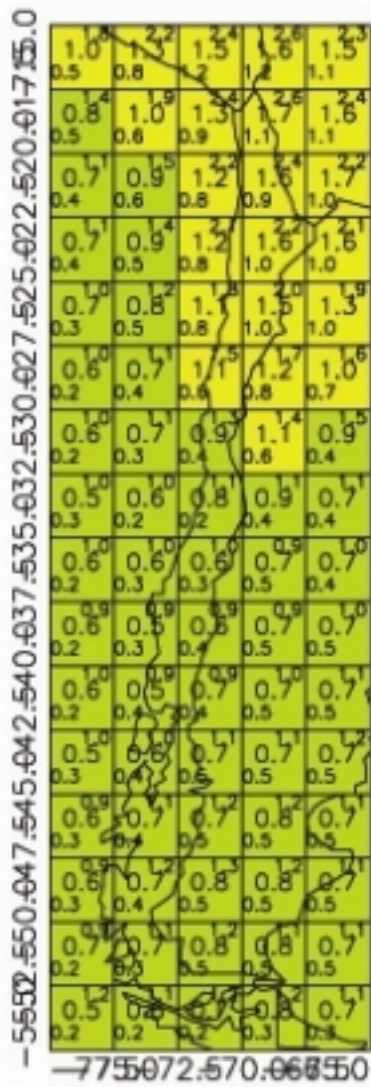


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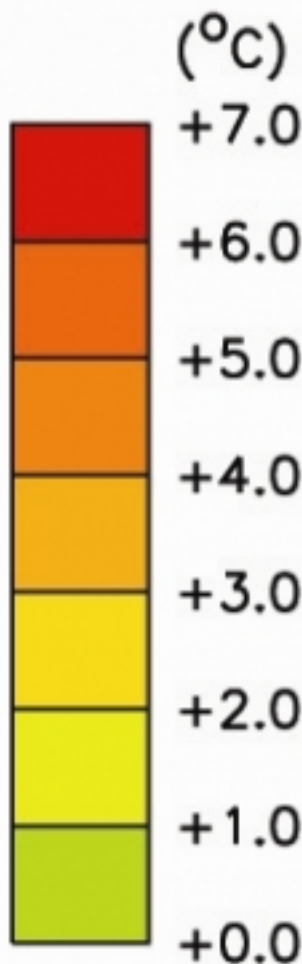




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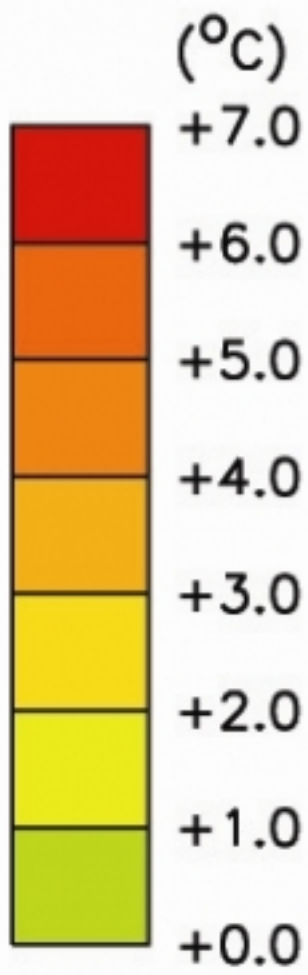
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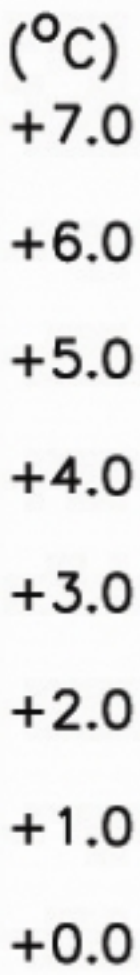


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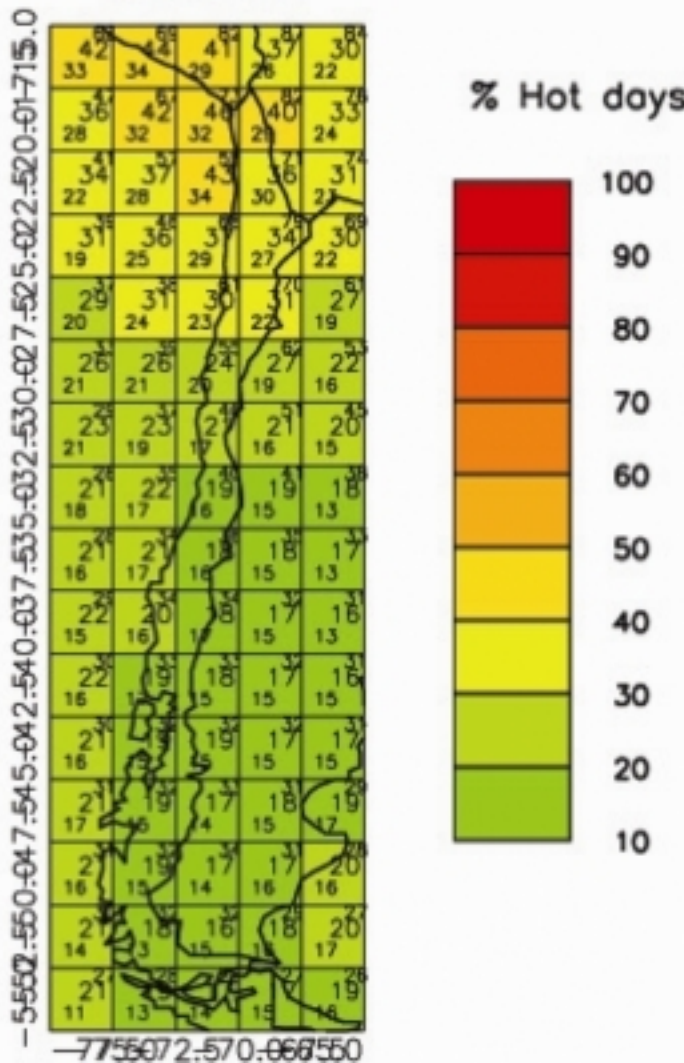


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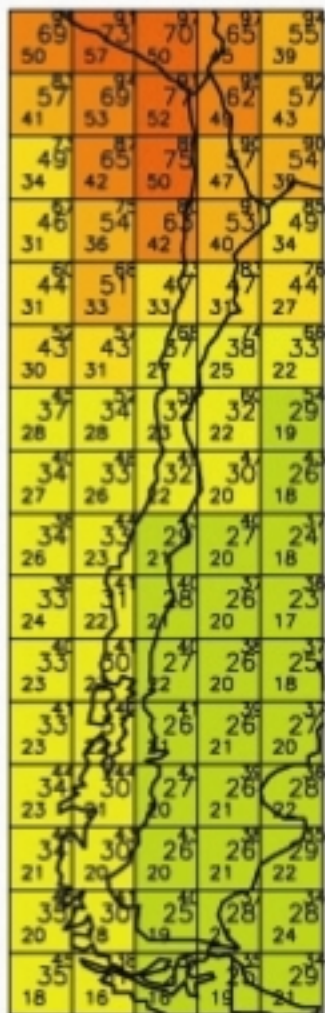
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# 2060s

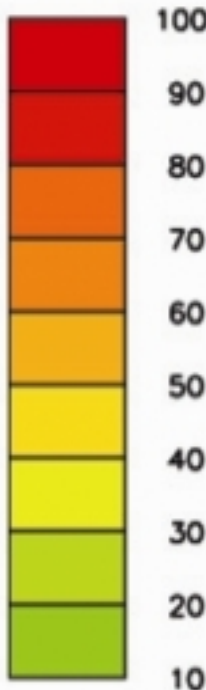


# 2090s

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% Hot days



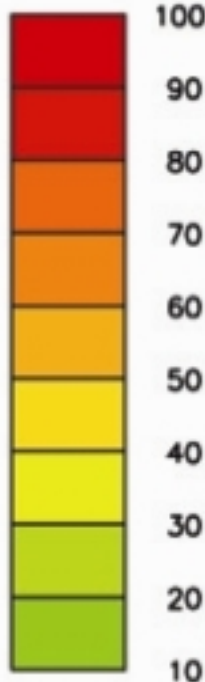
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# 2060s

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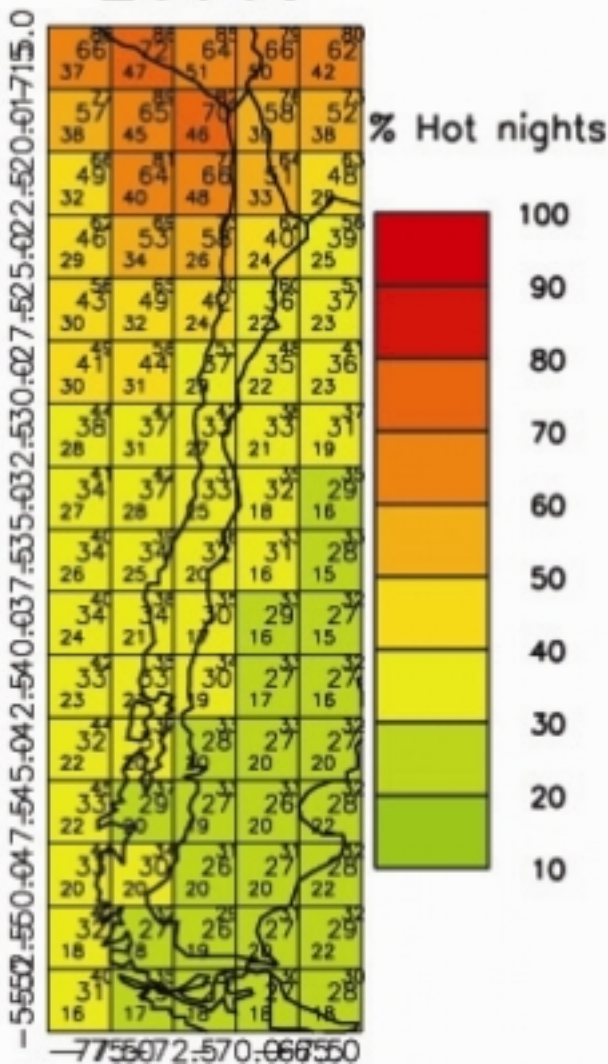


% Hot nights



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# 2090s



Chile: Monthly Precipitation Anomaly Annual

