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Mexico

In this section explore the latest projections about climate change

What is Mexico's climate like?

- Mexico stretches from 15° to 32.5° north of the Equator. The north has a temperate climate and the south, a tropical climate
- Average annual temperature is lowest in the central upland areas (15-20oC) and highest in the coastal lowland regions (23-27°C)
- In the south temperatures do not vary much between seasons, but in the north they range from - 10° in winter (DJF) to 30°C summer (JJA)
- In the far north, rainfall is less than 50mm per month throughout the year. Whereas, the south receives up to 550mm per month between June and October
- The coastlines of Mexico are vulnerable to tropical cyclones and hurricanes from both the Atlantic and Pacific oceans throughout the summer (JJA)
- El Nino and El Nina cause changes from year to year. El Nino brings cool and wet conditions in the north, whilst El Nina brings warmer and drier conditions

Graph one: How did Mexico'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
- Since 1960, average annual temperature has increased by 0.6°C – that's a rate of about 0.13°C per decade

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

- These maps show projected temperature change during the 2030s, 60s and 90s in different areas of Mexico (according to a high emissions scenario)
- All values are anomalies – compared to average temperatures from 1970 to 1999
- Areas shaded deep red will be 7°C hotter than average temperatures from 1970 to 1999. Whereas, areas shaded green will be the same
- The tiny numbers in the centre of each grid box is the average expected temperature; numbers in the upper and lower corners give the maximum and minimum temperatures
- The most rapid temperature increases will occur in northern and central regions

Graphs five to seven: How will Mexico'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 emission 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 gridbox is the average projected temperature; numbers in the upper and lower corners give the highest and lowest possible DJF mean temperature
- Temperature increase is expected to be greater in the dry seasons (DJF and MAM) – 0.18°C to 0.20°C per decade

Graphs eight to 10: How will Mexico'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 emission 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 temperature increase is expected to be greater in the dry seasons (DJF and MAM) – 0.18°C to 0.20°C per decade

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

- These 3 maps show projected June, July and August (JJA) - wet season - temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission 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
- Temperature increase is expected to be less in the wet seasons (JJA and SON) – 0.12°C per decade

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

- These 3 maps show projected September, October and November (SON) - wet season - temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission 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
- Temperature increase is expected to be less in the wet seasons (JJA and SON) – 0.12°C per decade

Graphs 17 to 18: How will Mexico'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 become more frequent in all areas of Mexico
- Hot days will occur on 18-34% of days by 2060s and 22-54% of days by 2090s. The fastest increases will be in the summer (JJA)

Graphs 19 to 20: How will Mexico'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
- The frequency of hot nights has increased significantly since 1960 in every season – especially summer (JJA)
- Hot nights will occur on 22-39% of all nights by the 2060s and 29-56% of nights by the 2090s
- Cold days and nights will become less frequent, occurring on a maximum of 1-5% of days in a year, mostly in winter (DJF)

Graph 21: How will Mexico's precipitation change?

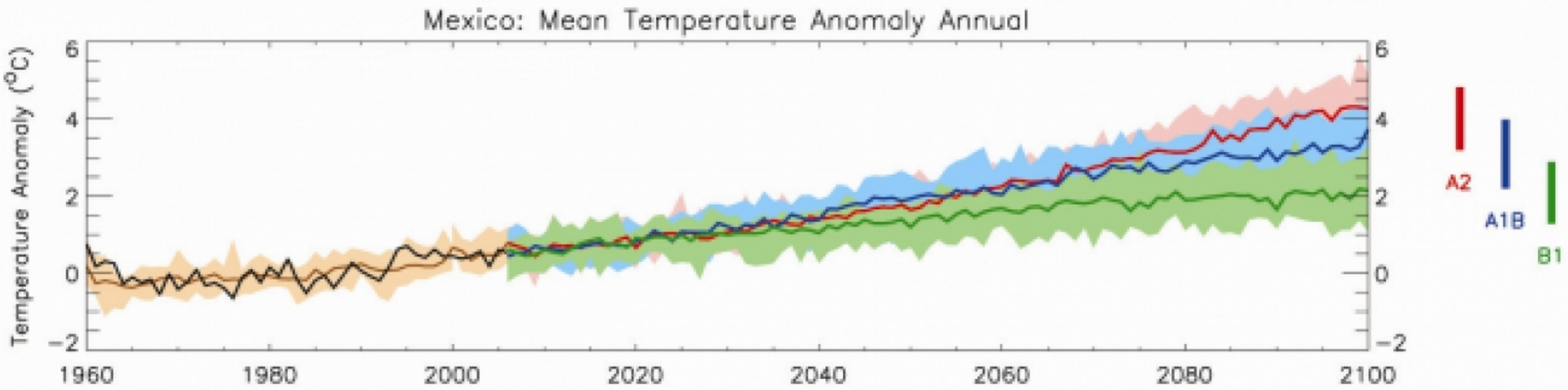
- This graph shows the 'precipitation anomaly' – the difference in rain or snowfall to the 1970-1999 average. If the graph shows a positive number, then it is wetter than the 1970-1999 average. If the graph shows a negative number, then it is drier
- The black line shows the actual precipitation anomaly 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. Average rainfall has not consistently increased or decreased since 1960
- Mexico is expected to become slightly drier, with greatest changes in the dry seasons (DJF and MAM)
- Tropical Cyclones are likely to become more intense in a warmer climate as a result of higher sea surface temperatures
- The proportion of rainfall from heavy storms and tropical cyclones may offset predictions of reduced rainfall

Graph 22: How will Mexico's temperature change between 2009 and 2100?

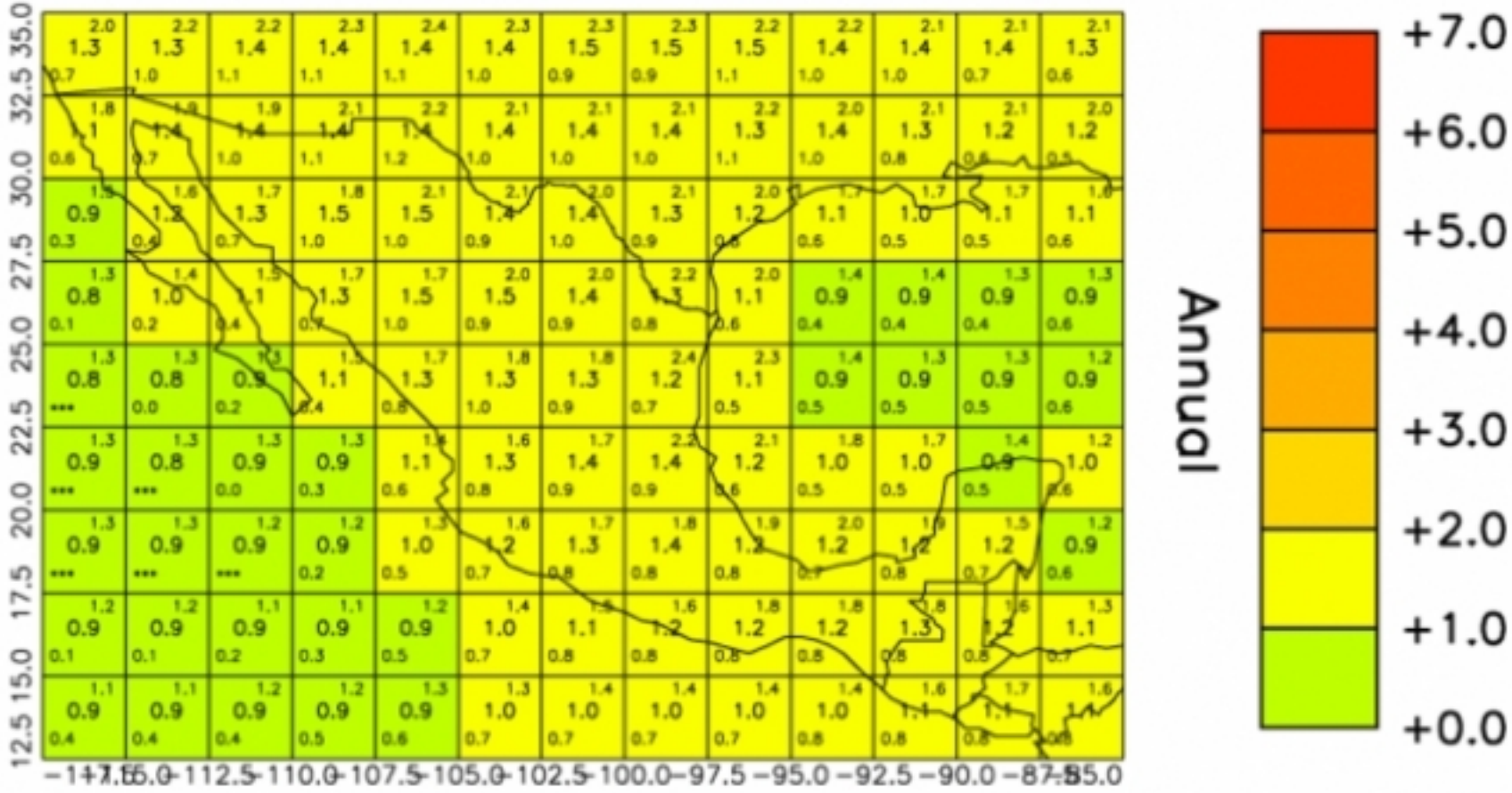
- The green, blue and red lines show projected future temperatures from 2006 to 2100, according to three different emission scenarios– green (low), blue (medium) and red (high). The shading around each line shows the range of temperature that might be possible with

each emission scenario

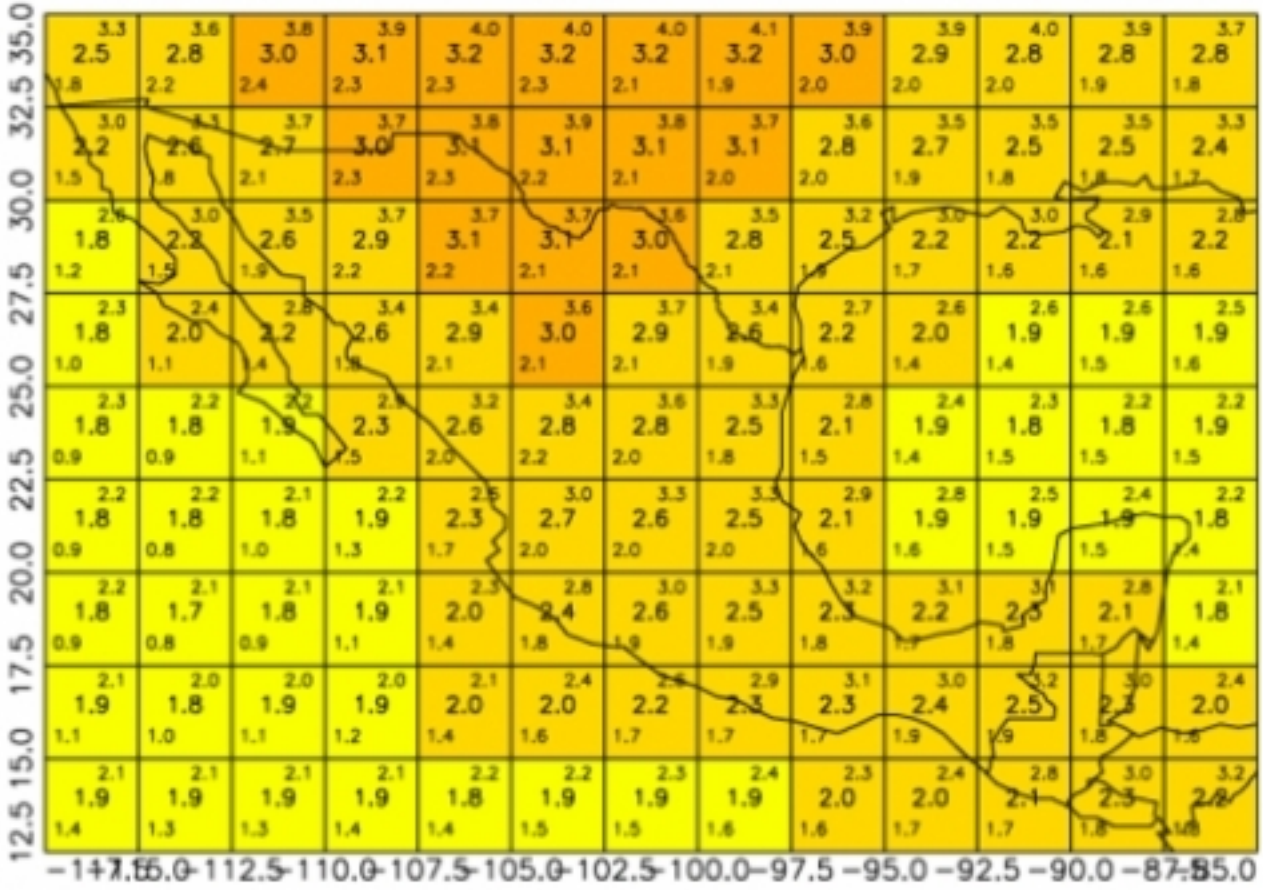
- The coloured bars summarise the range of temperatures for each emissions scenario
- All scenarios show future temperatures will be warmer
- Average annual temperature is expected to increase by 1.1 to 3°C by the 2060s, and 1.3 to 4.8°C by the 2090s


Mexico: Mean Temperature Anomaly Annual
Temperature Anomaly (°C)
6
4
2
0
−2
1960
1980
2000
2020
2040
2060
2080
2100
A2
A1B
B1

2030s


(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
Annual
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
−107.5
−105.0
−102.5
−100.0
−97.5
−95.0
−92.5
−90.0
−87.5
−85.0

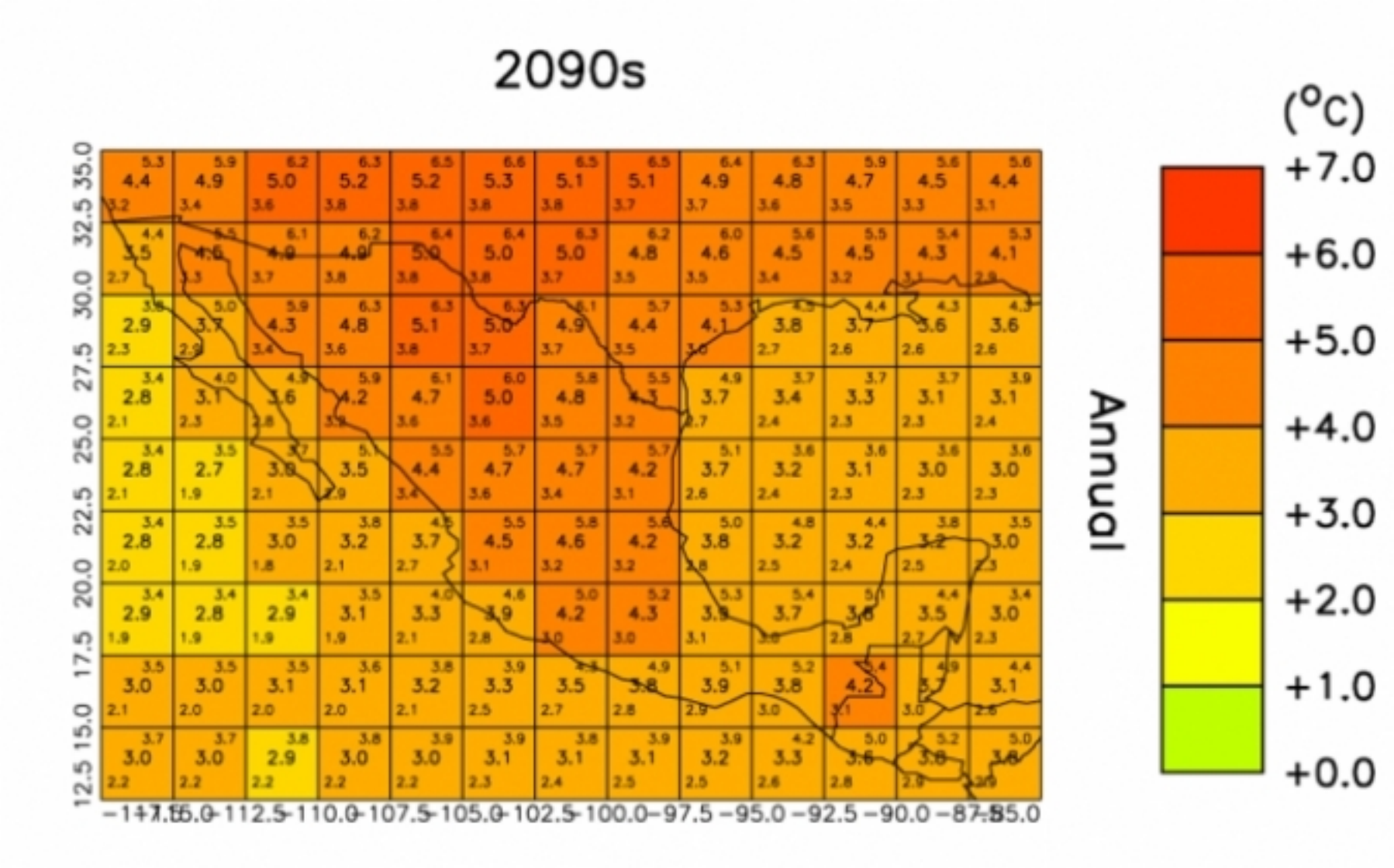
2060s



Annual

(°C)

+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0


2090s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
Annual
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
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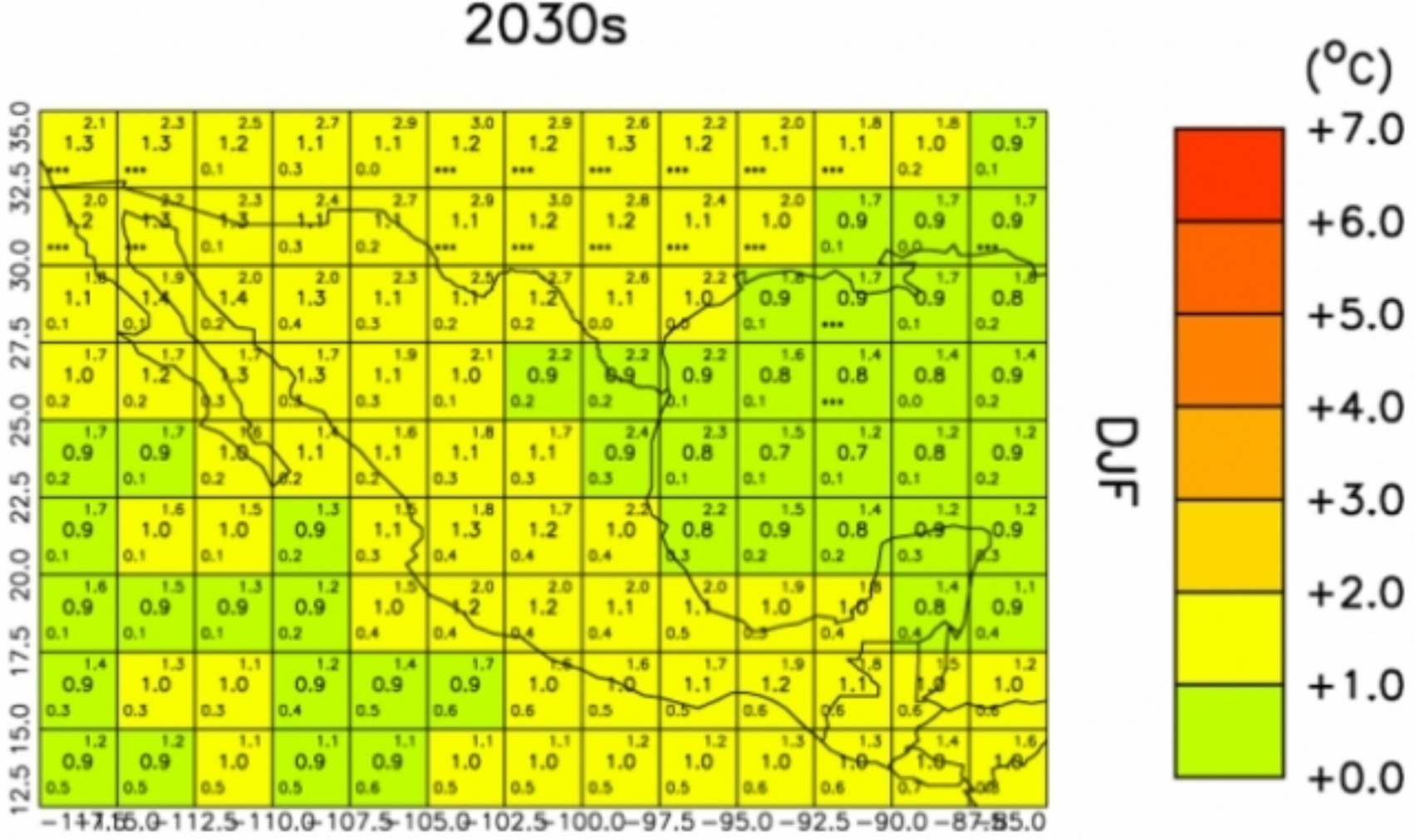
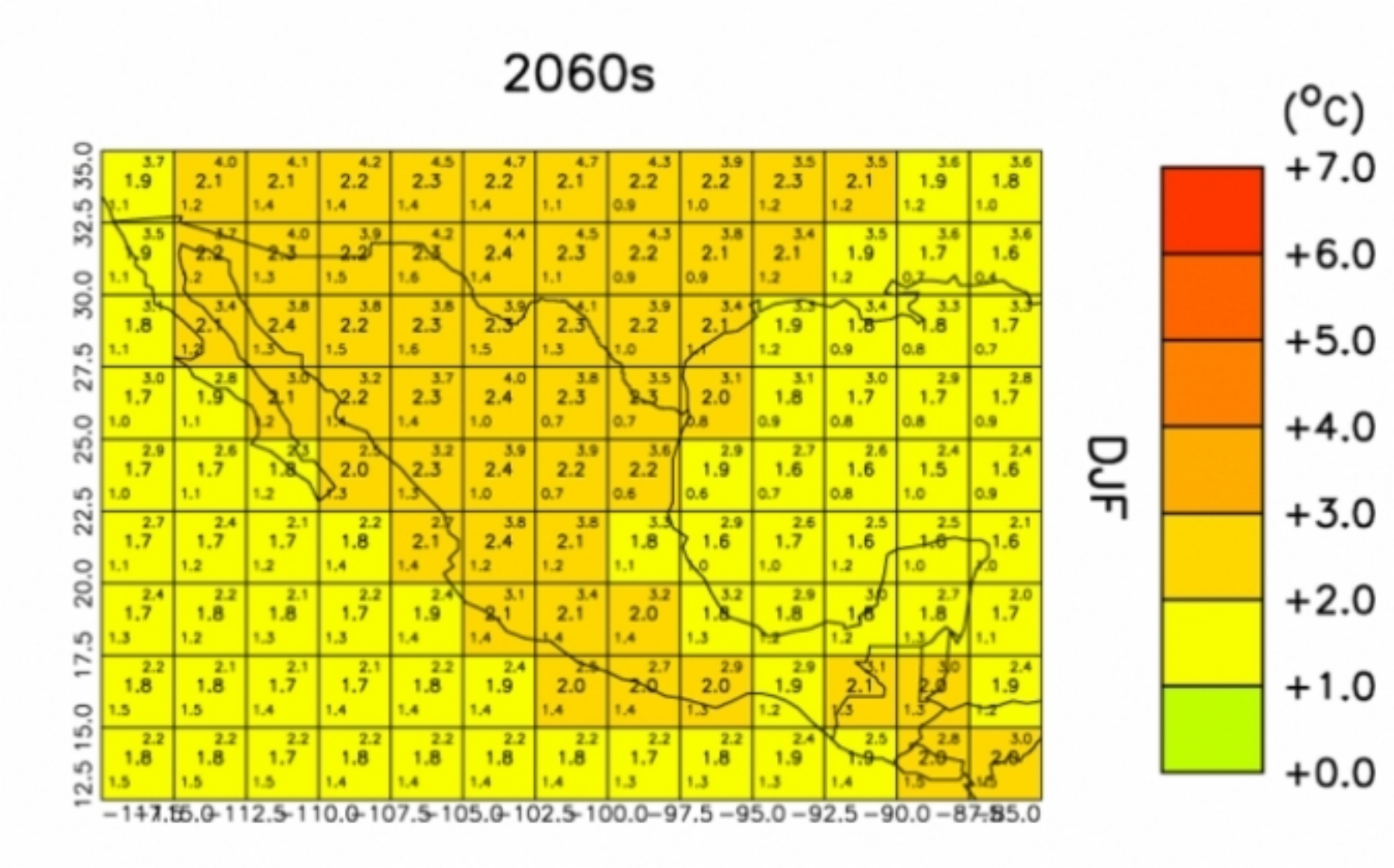
−97.5
−95.0
−92.5
−90.0
−87.5
−85.0


2030s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
DJF
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
−107.5
−105.0
−102.5
−100.0
−97.5
−95.0
−92.5
−90.0
−87.5


2060s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
DJF
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
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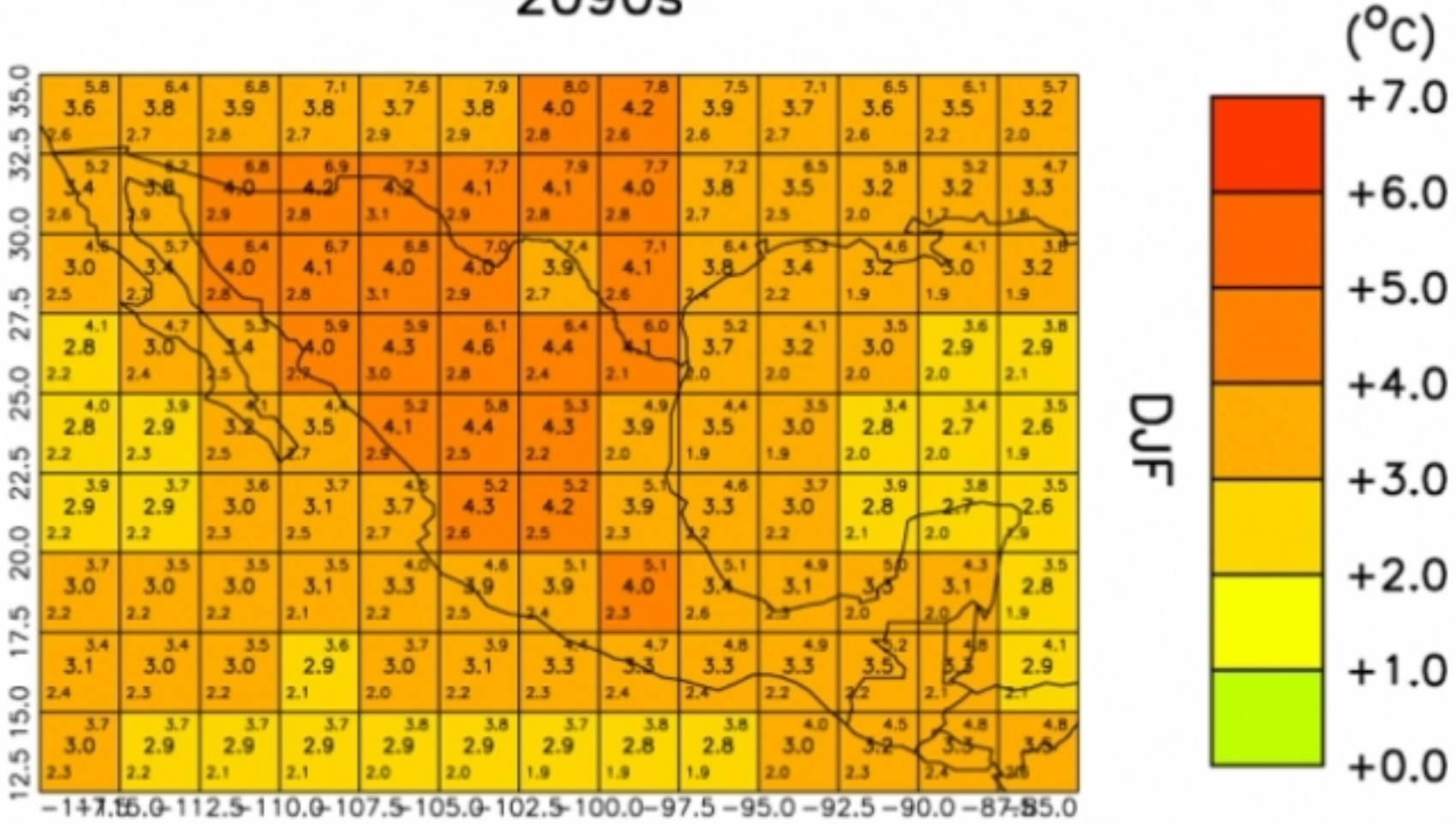
−87.5


2090s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
DJF
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
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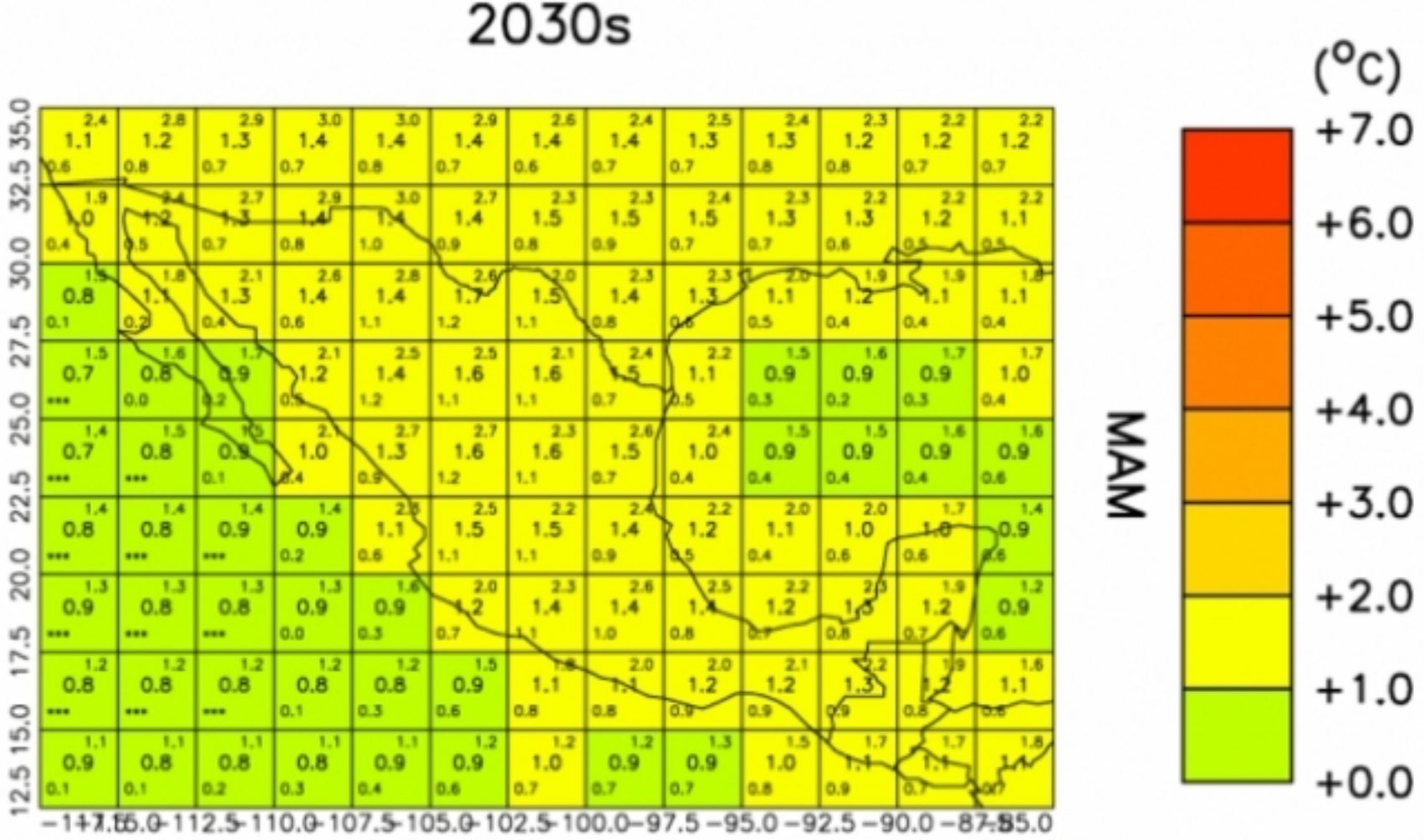
2030s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
MAM
35.0
32.5
30.0
27.5
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20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
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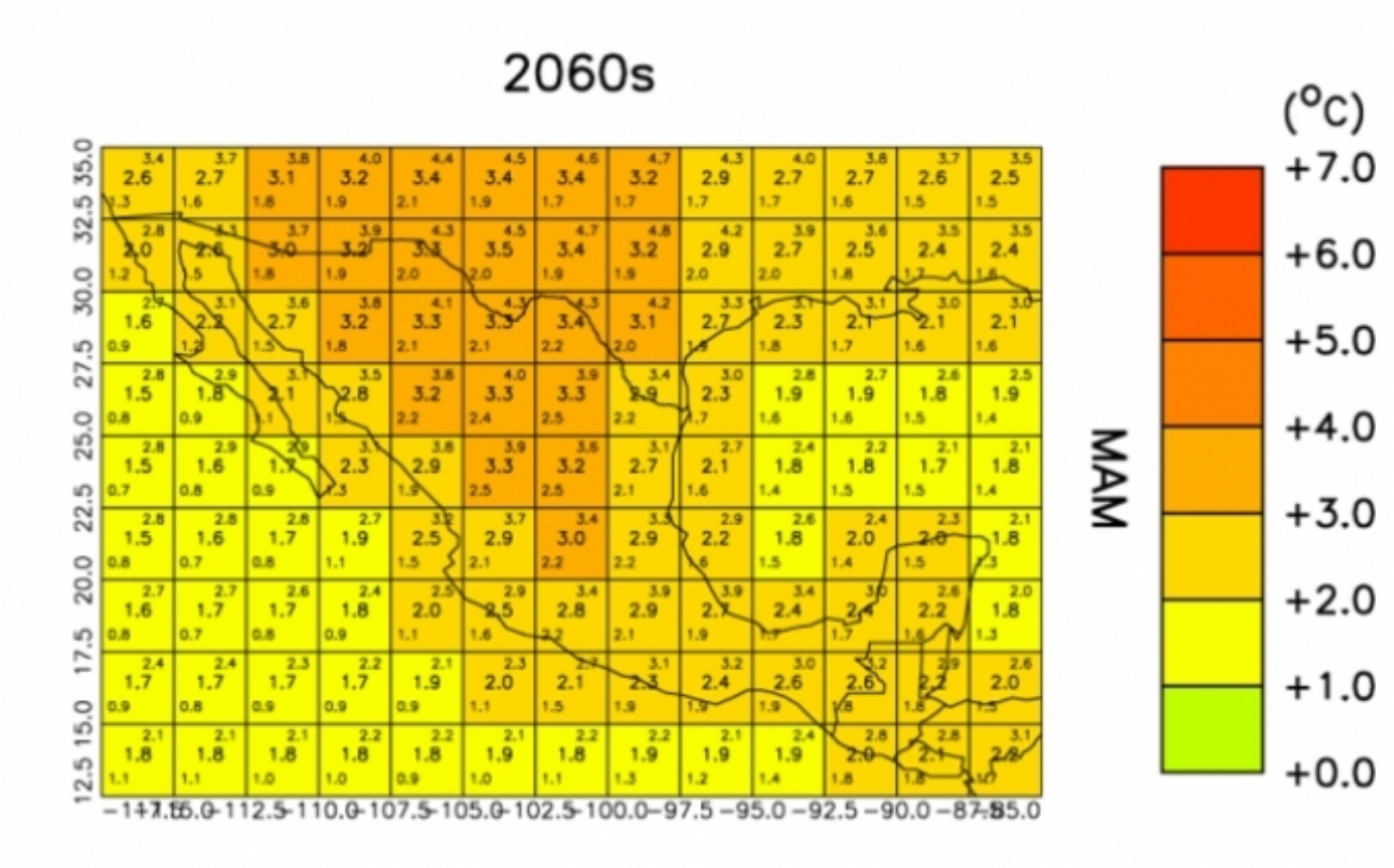
−87.5


2060s
(°C)
+7.0
+6.0
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+4.0
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+0.0
MAM
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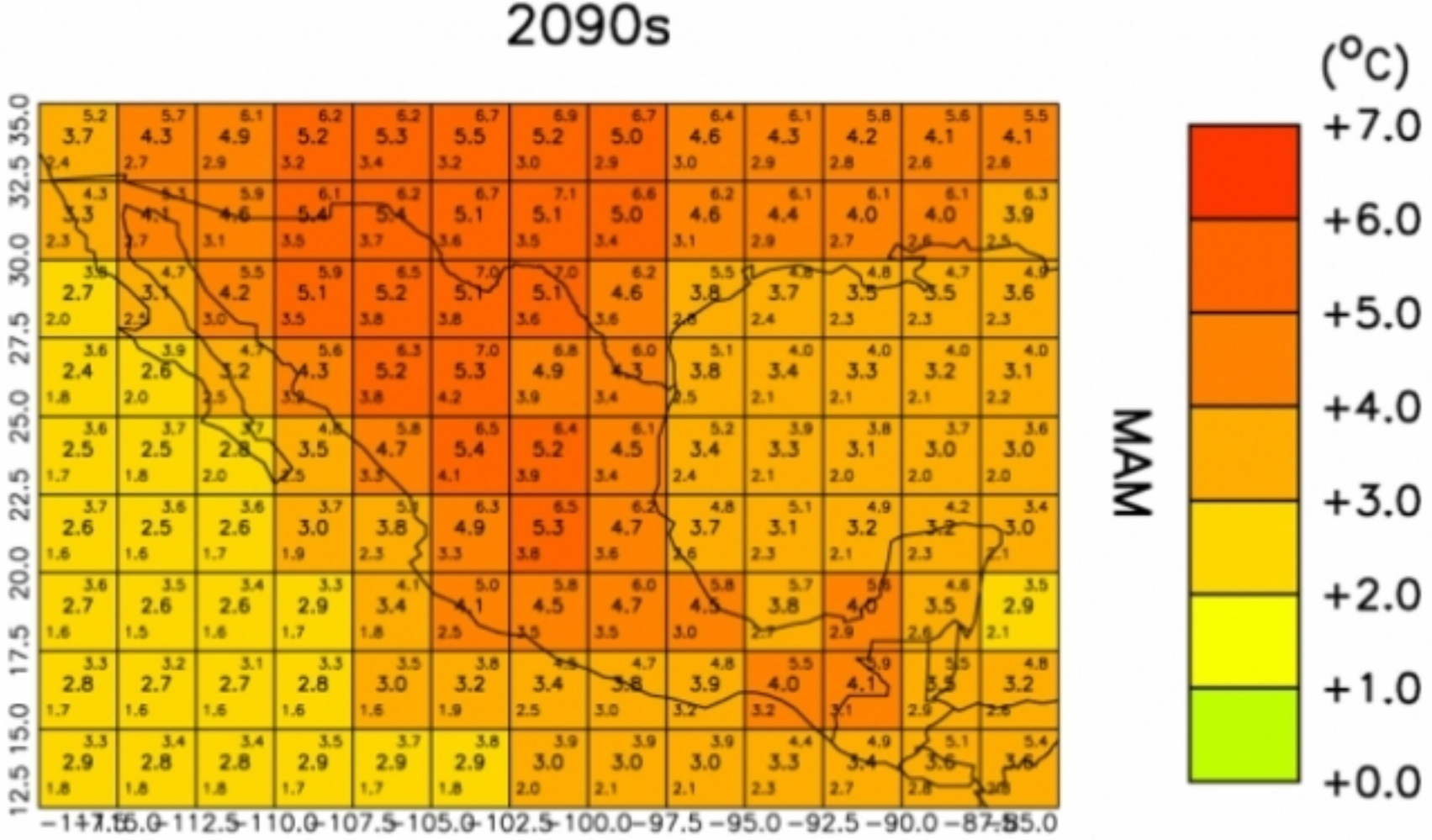
2090s
(°C)
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MAM
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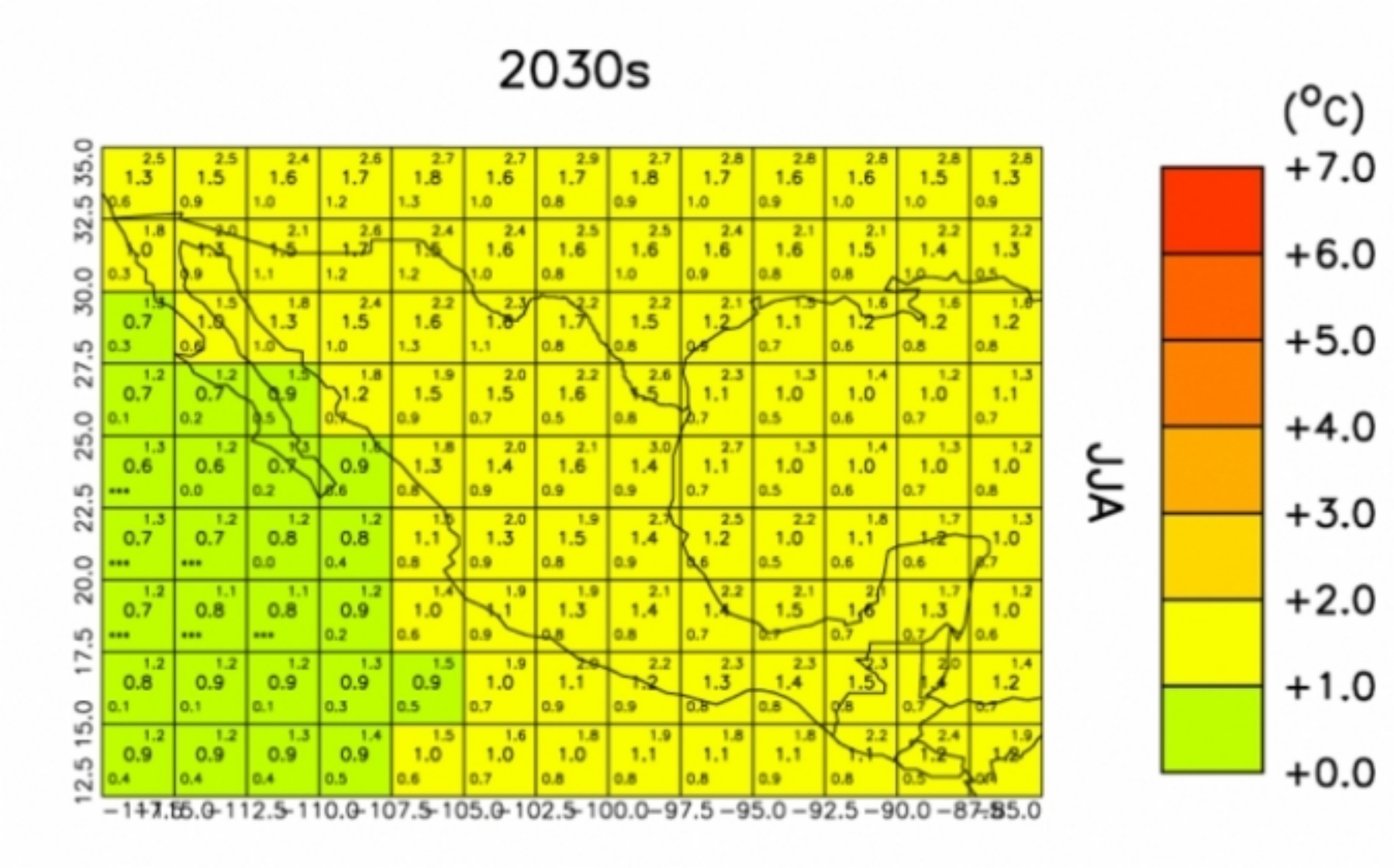
2030s
(°C)
+7.0
+6.0
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+4.0
+3.0
+2.0
+1.0
+0.0
JJA
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−112.5
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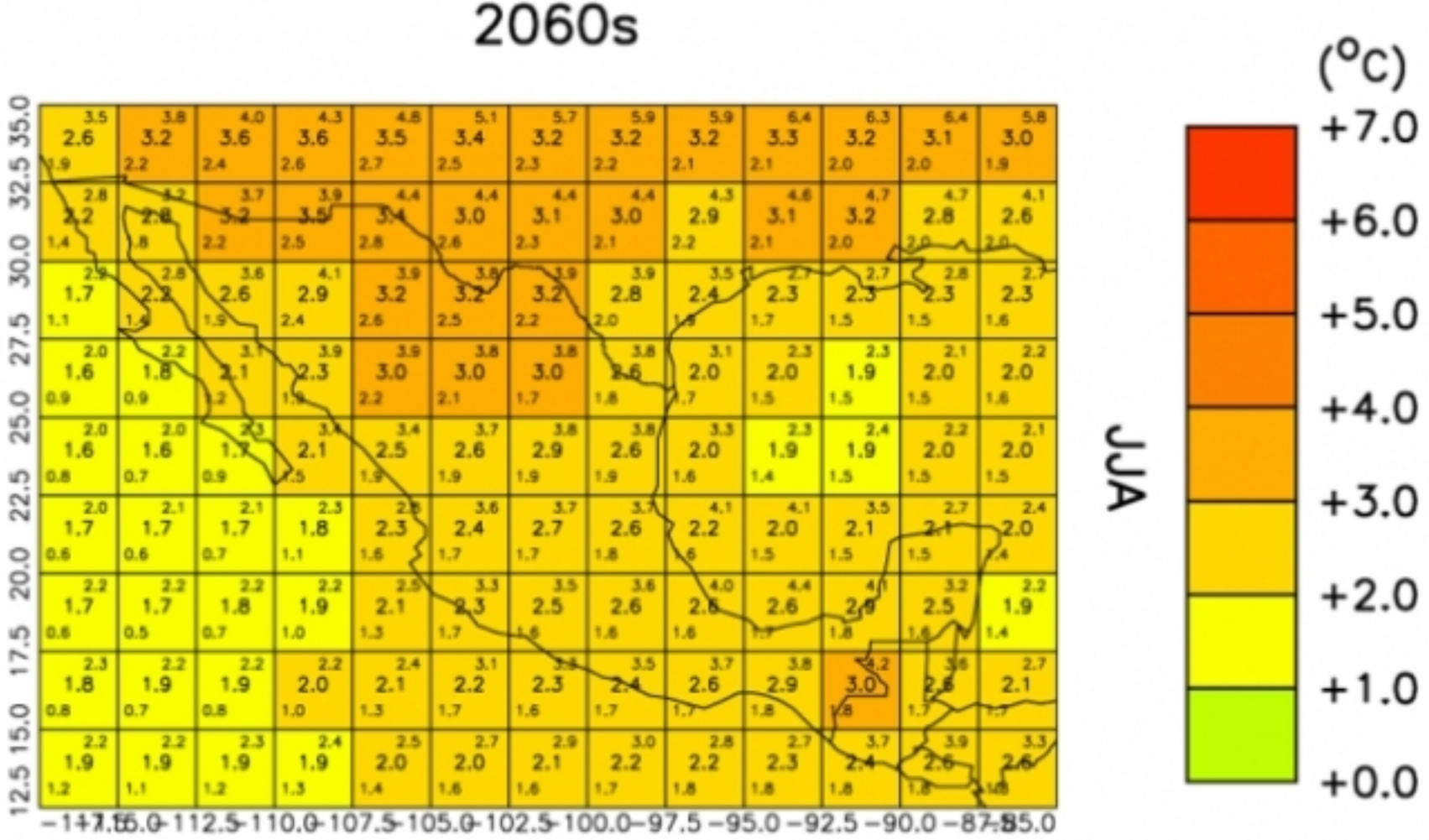
2060s
(°C)
+7.0
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+4.0
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JJA
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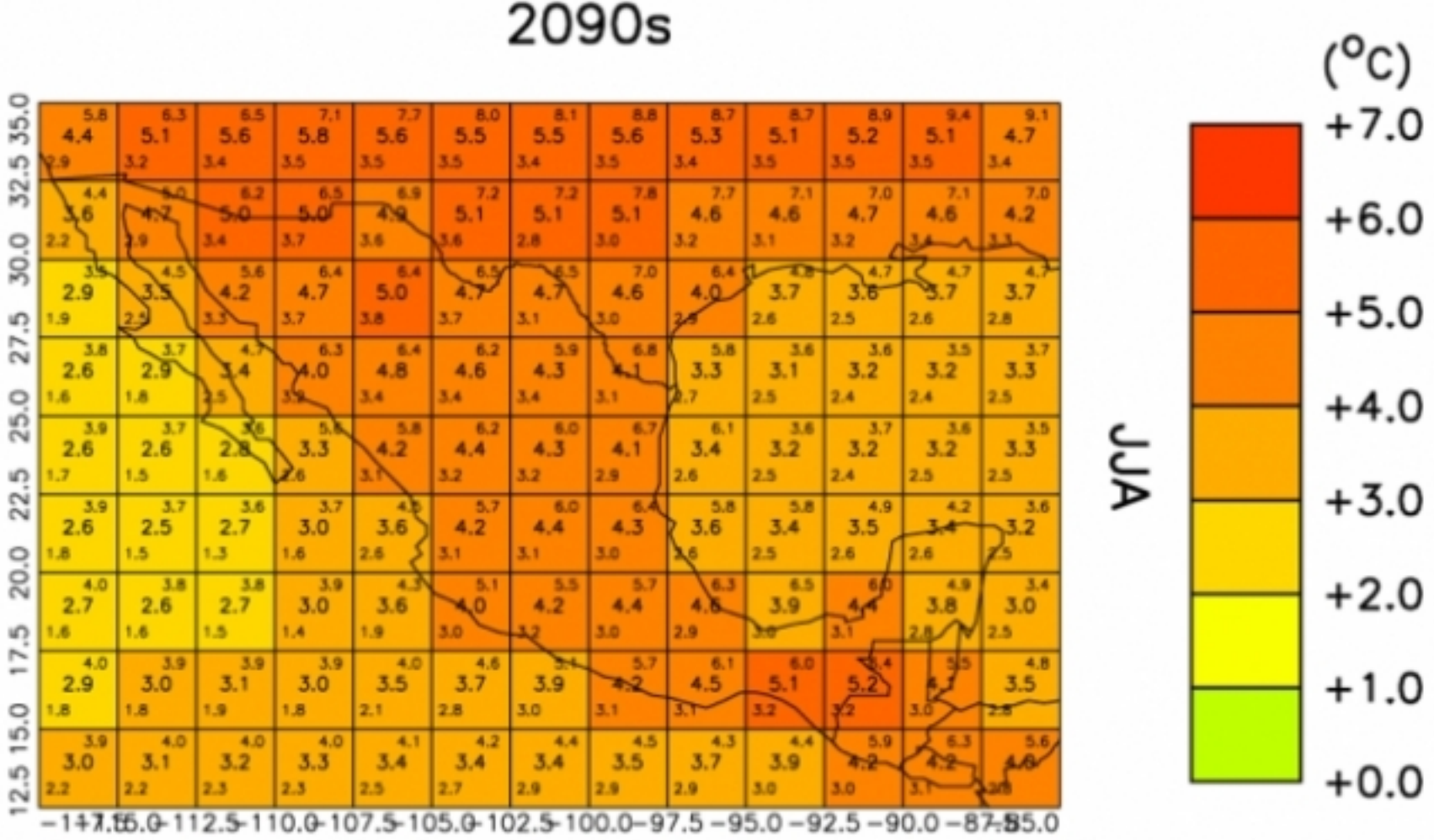
2090s
(°C)
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+6.0
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JJA
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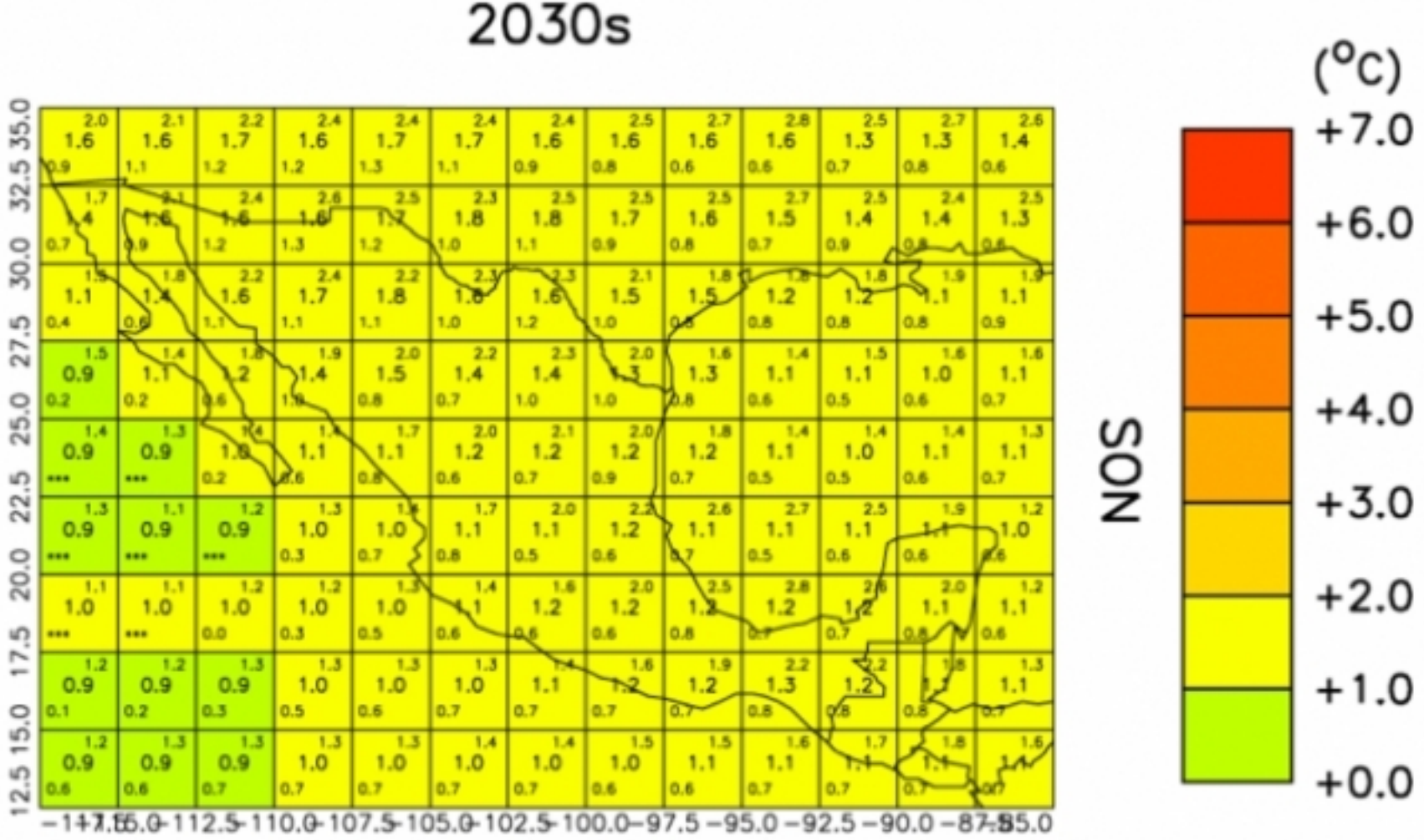
2030s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
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+0.0
NOS
35.0
32.5
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−115.0
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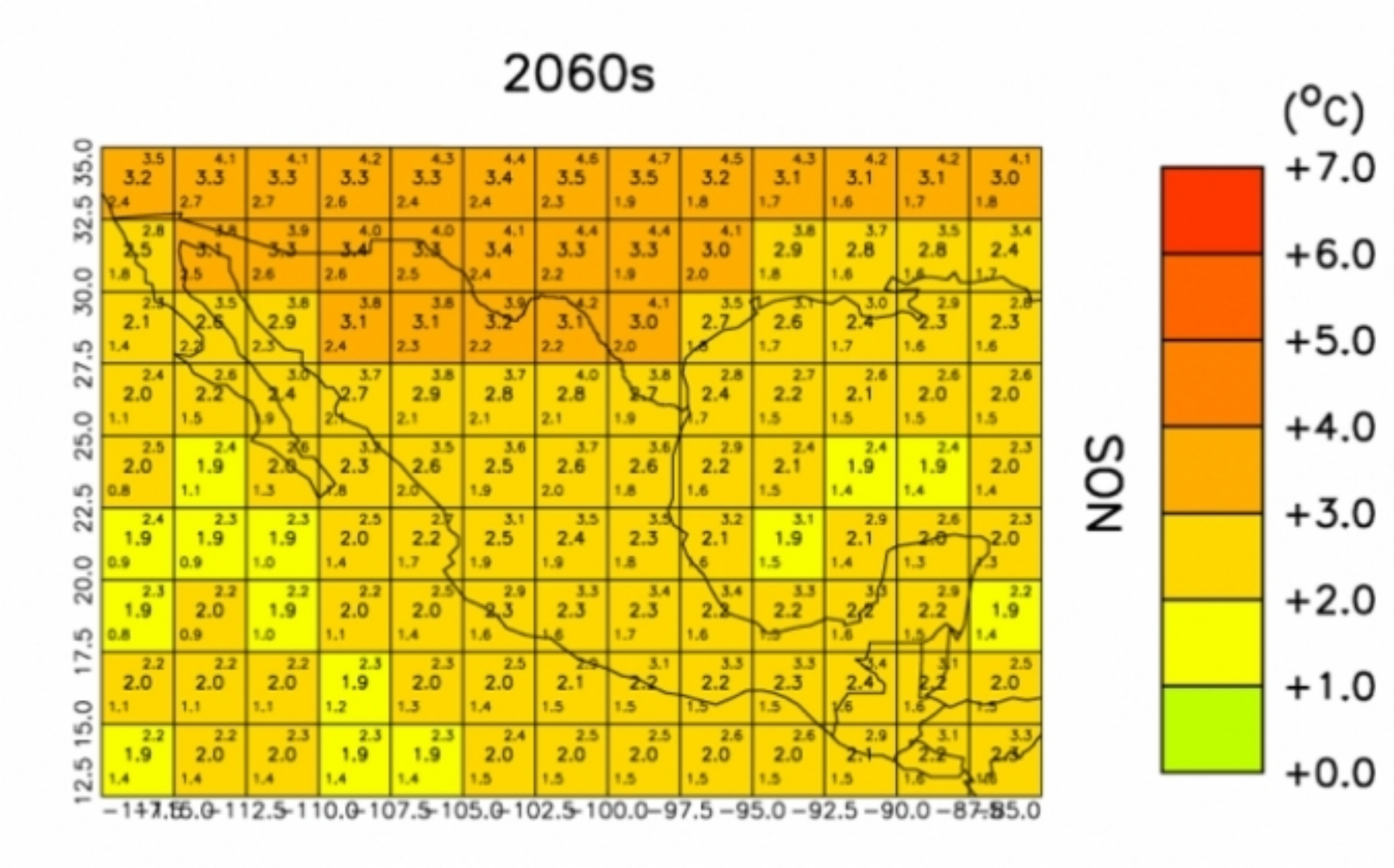
2060s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
NOS
35.0
32.5
30.0
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−115.0
−112.5
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−95.0
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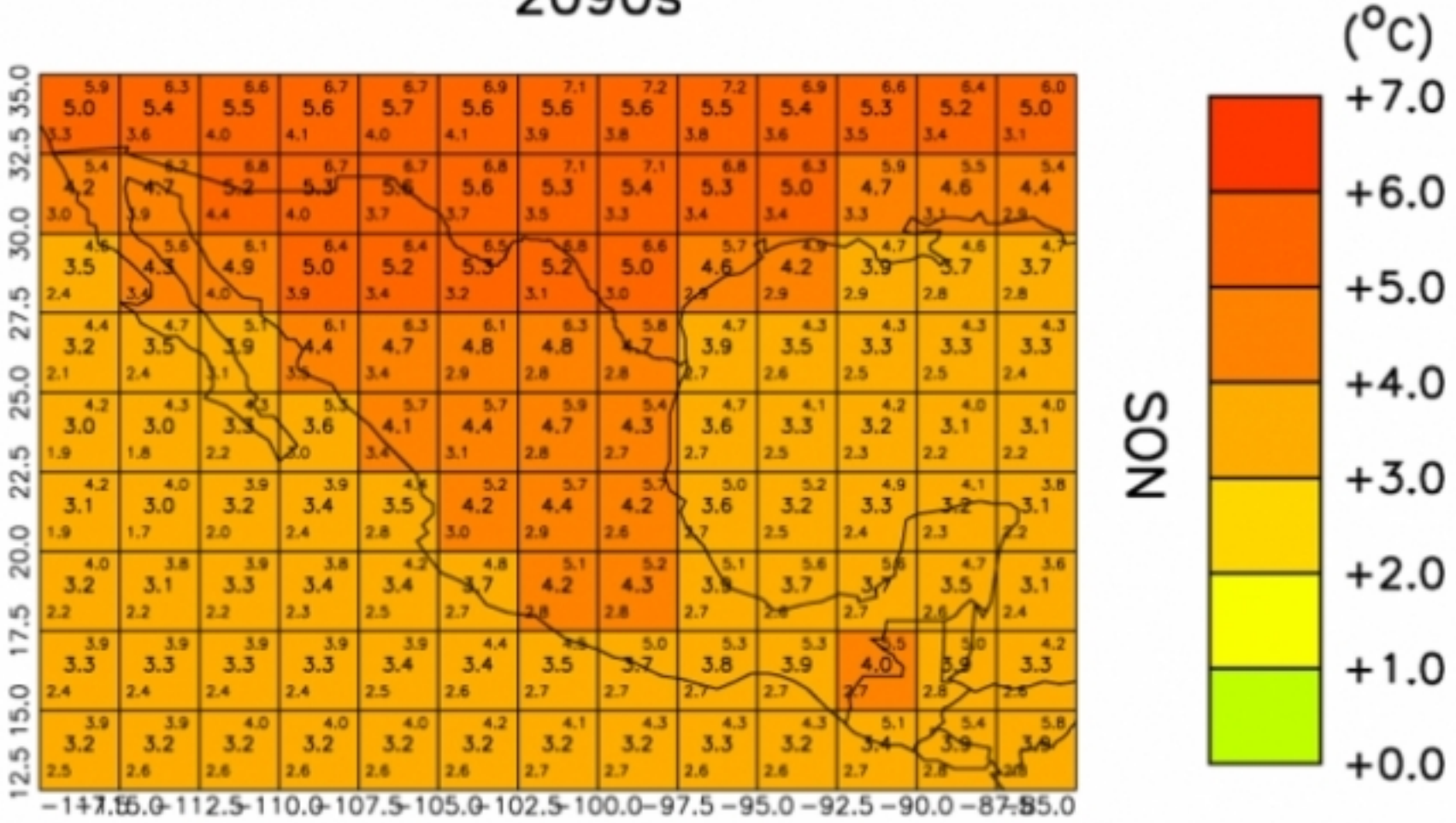
−90.0
−87.5


2090s
(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
NOS
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
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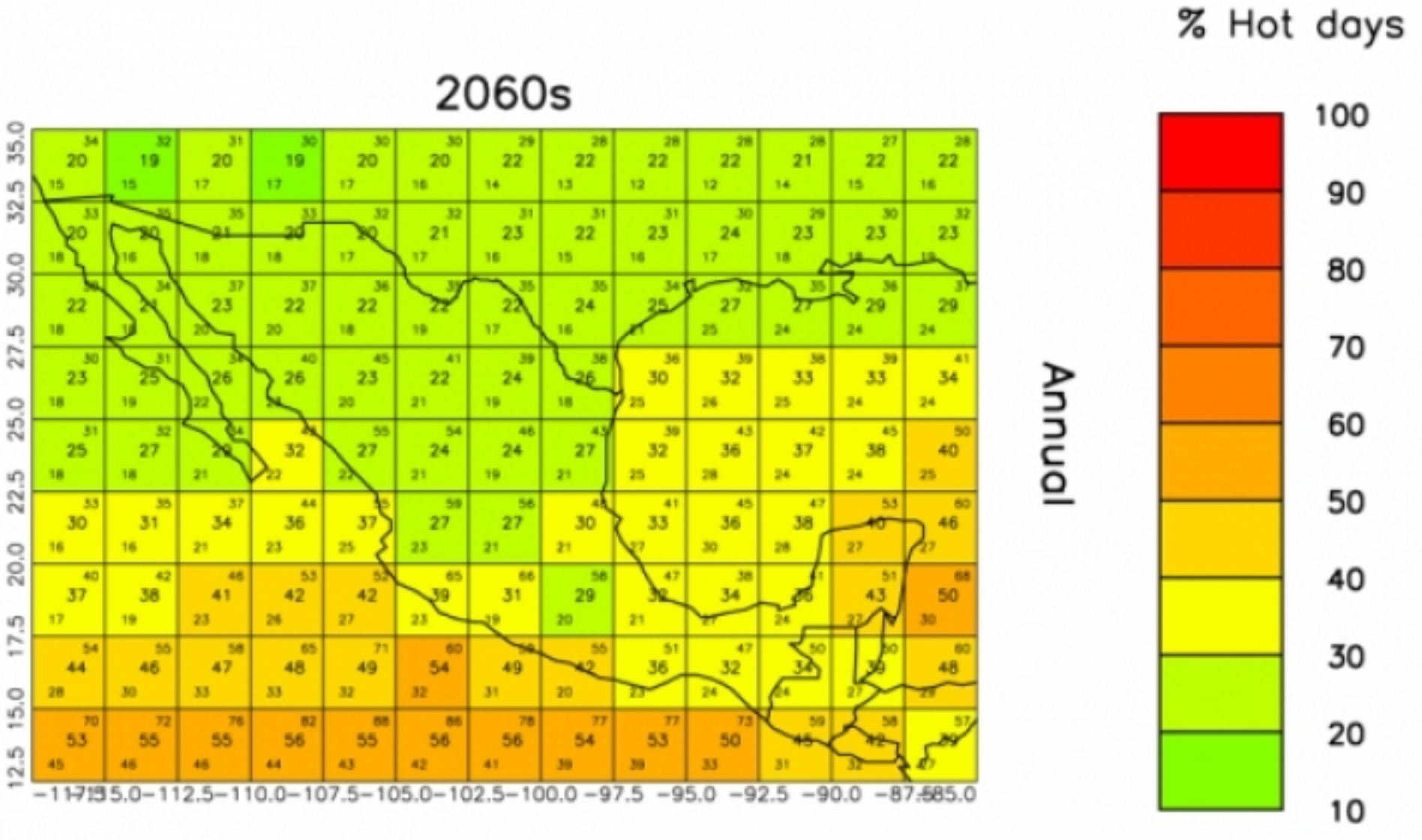
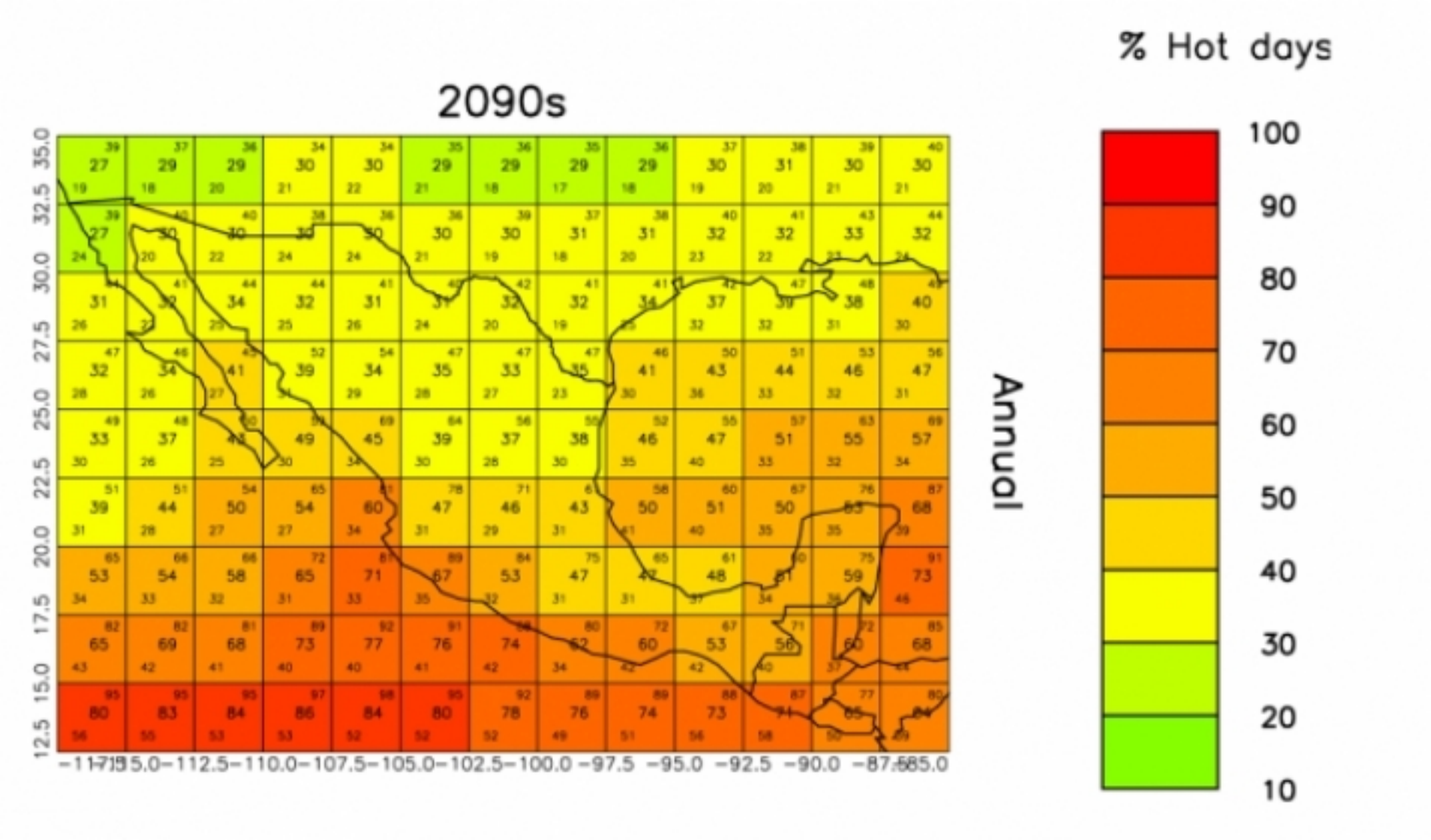

% Hot days
2060s
Annual
100
90
80
70
60
50
40
30
20
10
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0 −112.5 −110.0 −107.5 −105.0 −102.5 −100.0 −97.5 −95.0 −92.5 −90.0 −87.5 −85.0


2090s
% Hot days
Annual
100
90
80
70
60
50
40
30
20
10
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
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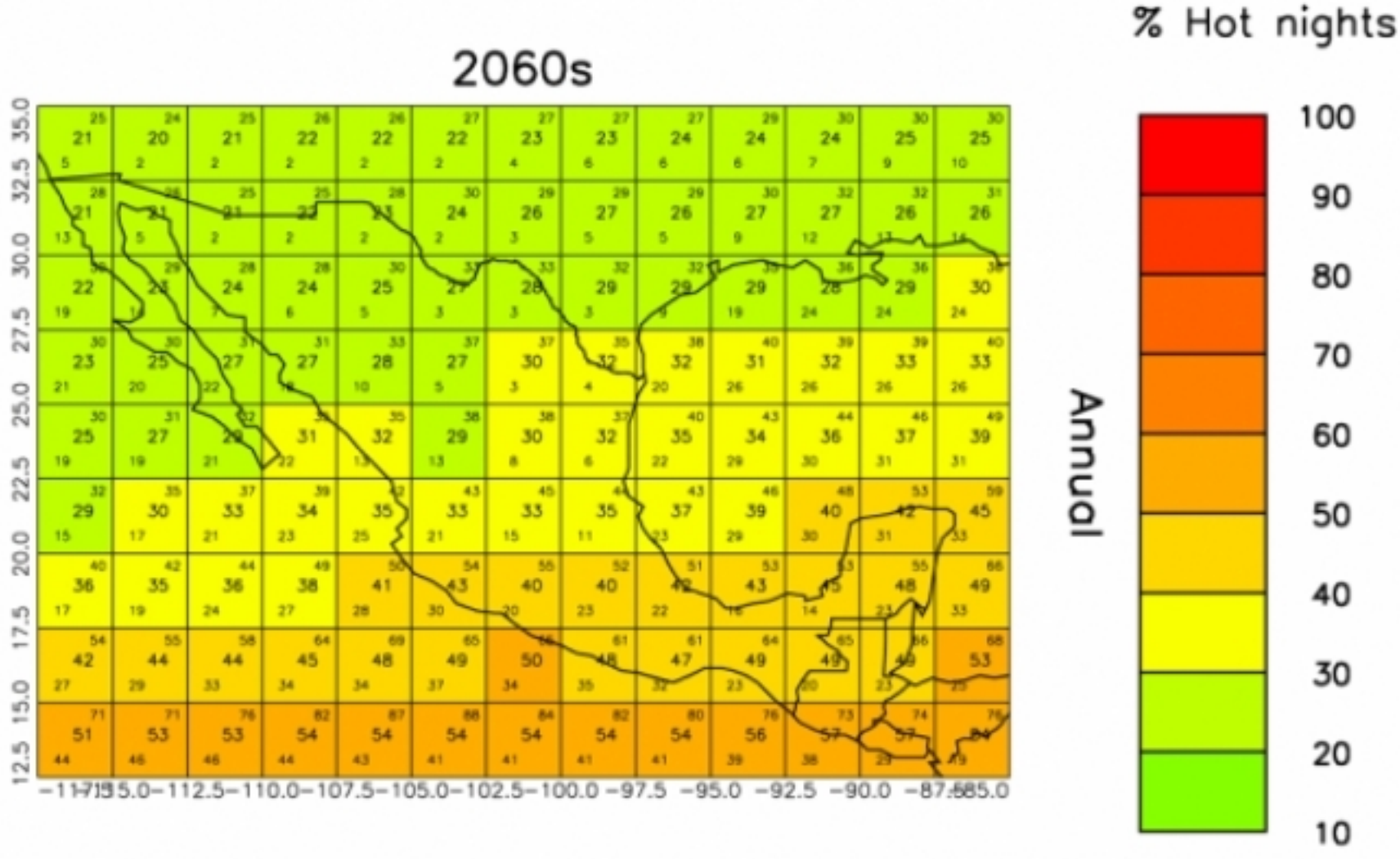
−92.5
−90.0


2060s
% Hot nights
Annual
100
90
80
70
60
50
40
30
20
10
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0
−112.5
−110.0
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−97.5
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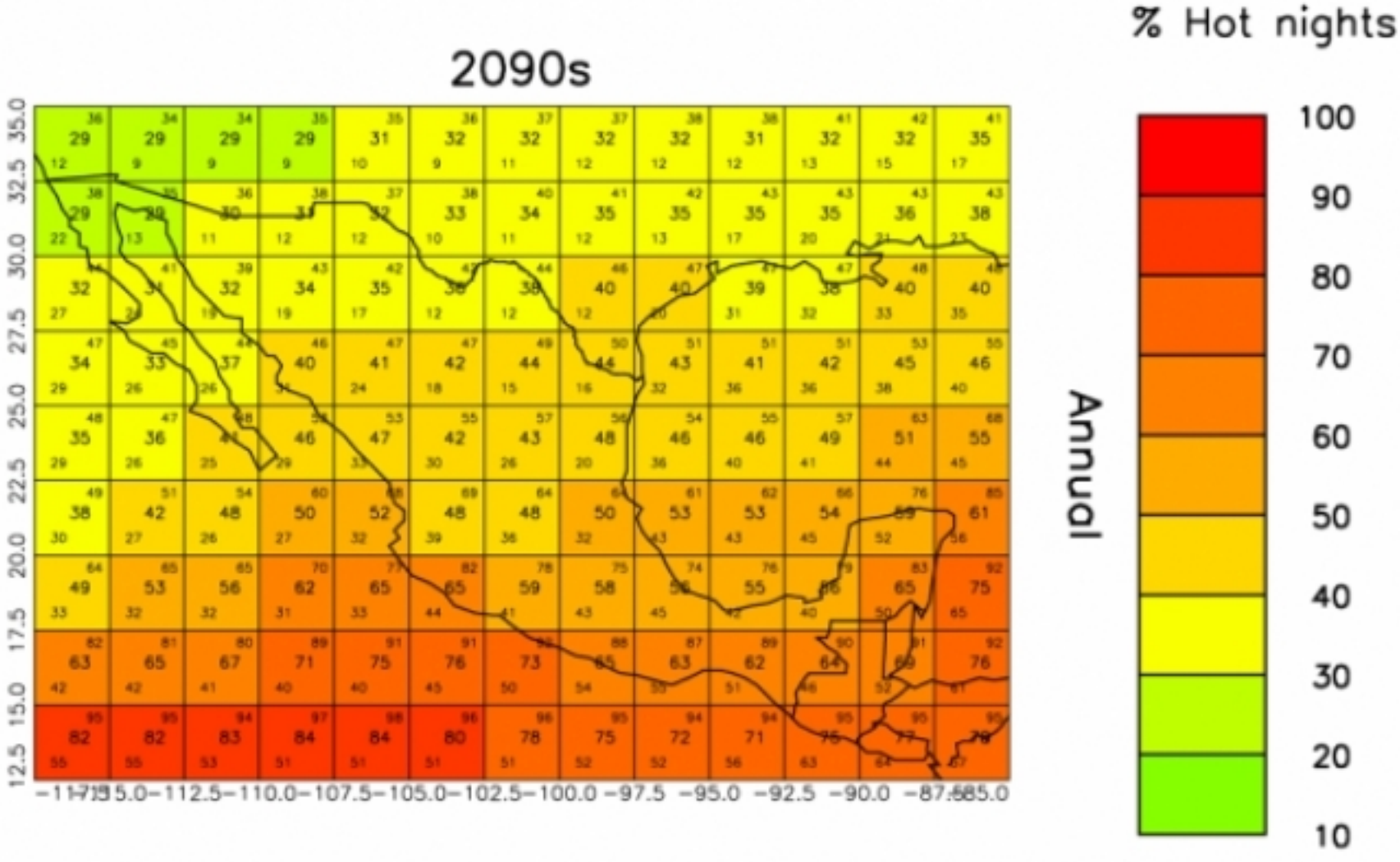
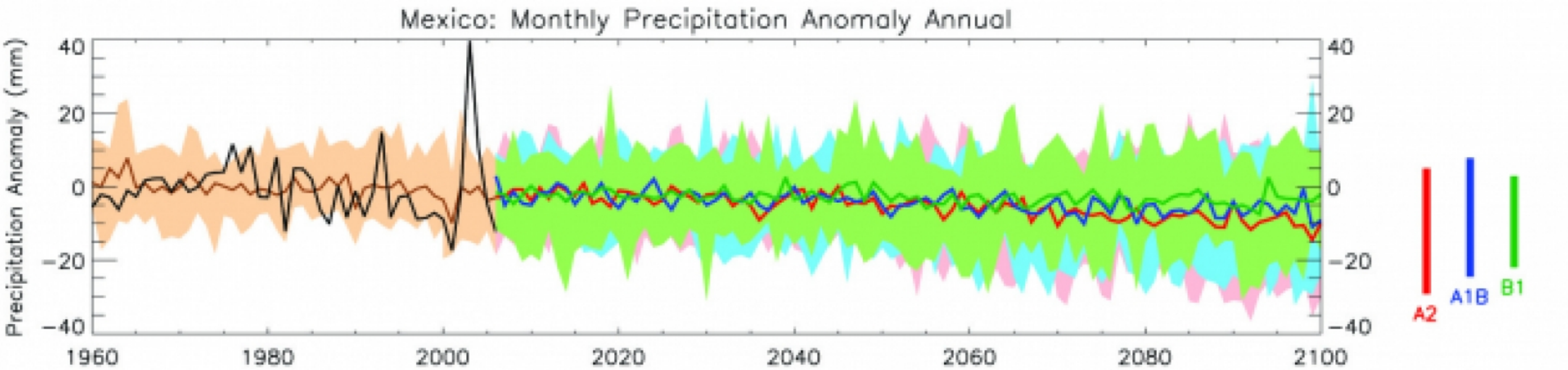
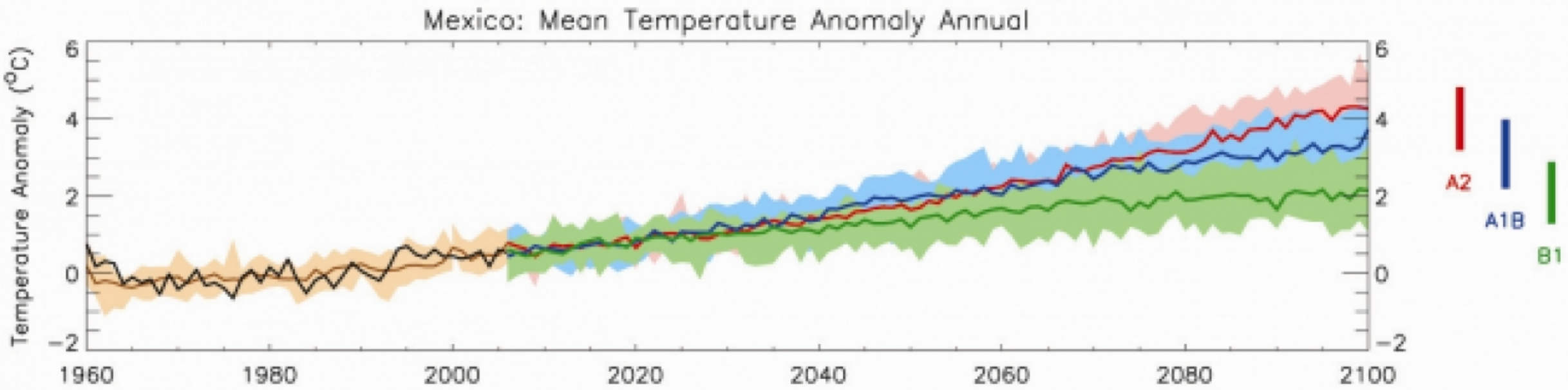
−85.0


2090s
% Hot nights
Annual
100
90
80
70
60
50
40
30
20
10
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
−115.0 −112.5 −110.0 −107.5 −105.0 −102.5 −100.0 −97.5 −95.0 −92.5 −90.0 −87.5 −85.0


Mexico: Monthly Precipitation Anomaly Annual
Precipitation Anomaly (mm)
40
20
0
−20
−40
1960
1980
2000
2020
2040
2060
2080
2100
A2
A1B
B1


Mexico: Mean Temperature Anomaly Annual
Temperature Anomaly (°C)
6
4
2
0
−2
1960
1980
2000
2020
2040
2060
2080
2100
A2
A1B
B1