Cuba

In this section explore the latest projections about climate change

What is Cuba's climate like?

- Cuba sits at a latitude of 20-23°N, on the boundary of the tropical and sub-tropical zones. The island experiences the year-round warm, humid conditions associated with the Tropics, but with more distinct seasonal variations than the Southern Caribbean Islands
- Seasonal mean temperatures range from 22-24°C in the cooler months of December to February, to 27-28°C in the warmer months of July and August. The wet season occurs through May to October, during which the island receives around 100-150mm per month
- Inter-annual variability in Cuban climate is influenced strongly the El Nino Southern Oscillation (ENSO). El Niño episodes bring warmer and drier than average conditions between June and August and La Niña episodes bring colder and wetter conditions at this time
- Cuba lies in the heart of the Atlantic hurricane belt, where hurricanes occur throughout August, September and October. Heavy rainfall associated with cyclones and hurricanes contributes significantly to wet season rainfall totals

Graph one: How did Cuba'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
- Cuba experienced warmer than average temperatures in the early 1960s
- Mean annual temperature has increased by around 0.1°C per decade since 1970
- 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 mean annual temperature is projected to increase by 0.8 to 2.4°C by the 2060s, and 1.2 to 3.8 °C by the 2090s

Graphs two to four: How will Cuba'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
- By the 2090s, all of Cuba will be between 3-4°C warmer

Graphs five to seven: How will Cuba's temperature change seasonally? – December, January, February

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- 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
- Cuba will warm by about 3°C in all seasons

Graphs eight to 10: How will Cuba'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 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
- Cuba will warm by about 3°C in all seasons

Graphs 11 to 13: How will Cuba'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 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
- Cuba will warm by about 3°C in all seasons

Graphs 14 to 16: How will Cuba'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 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
- Cuba will warm by about 3°C in all seasons

Graphs 17 to 18: How will Cuba'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)

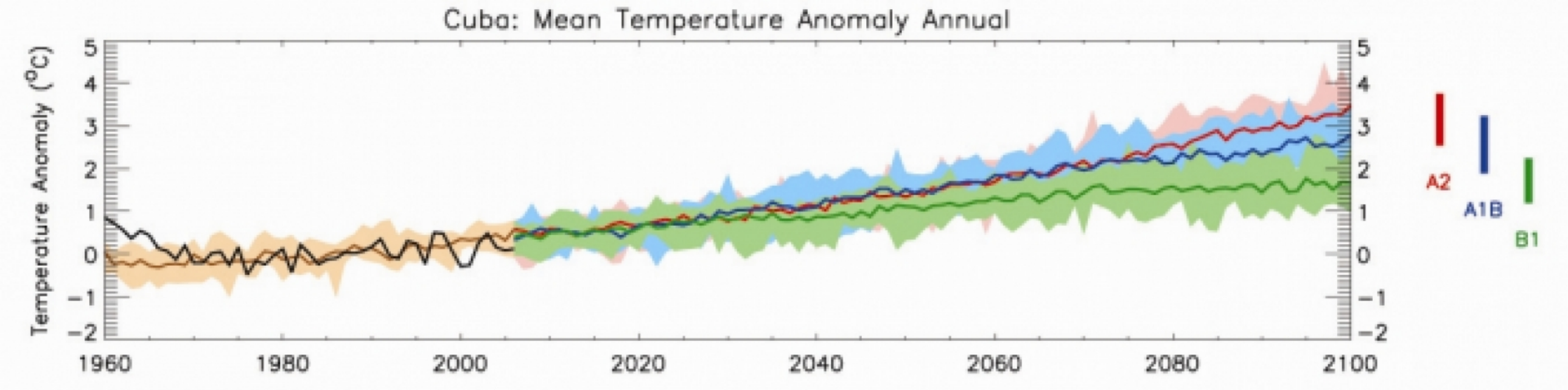
- A hot day is defined by the temperature exceeded on 10% of days in 1970-1999. So, in 1970– 1999, you would have expected 1 in 10 days to be hot. If the map shading indicates that more than 10% of days are hot, then there has been an increase in the number of hot days
- In areas shaded deep red, every 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
- Annually, projections indicate that 'hot' days will to occur on 25-61% of days by the 2060s, and 26-86% 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 51-99% of days of the season by the 2090s

Graphs 19 to 20: How will Cuba'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 inthe 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
- Nights that are considered 'hot' for the annual climate of 1970-99 are projected to occur on 31-59% of nights by the2060s and 37-85% of nights by the 2090s
- Nights that are hot for each season are projected to increase most rapidly in JJA, occurring occur on 68-99% of nights in every season by the 2090s

Graph 21: How will Cuba'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 themodel
- 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
- Mean rainfall over Cuba has decreased at an average rate of 7.4mm per month (7.1%) per decade since 1960. This decrease is mainly due to decreases in JJA and SON rainfall, of 13.9 and 8.8 mm per month (9.3% and 6.5%) per decade respectively
- Cuba's rainfall will probably fall. Projections vary between -45% (drier) to +15% (wetter) by the 2090s
- Rainfall is likely to fall most in MAM and JJA. SON rainfall may increase or decrease


Cuba: Mean Temperature Anomaly Annual
Temperature Anomaly (°C)
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−1
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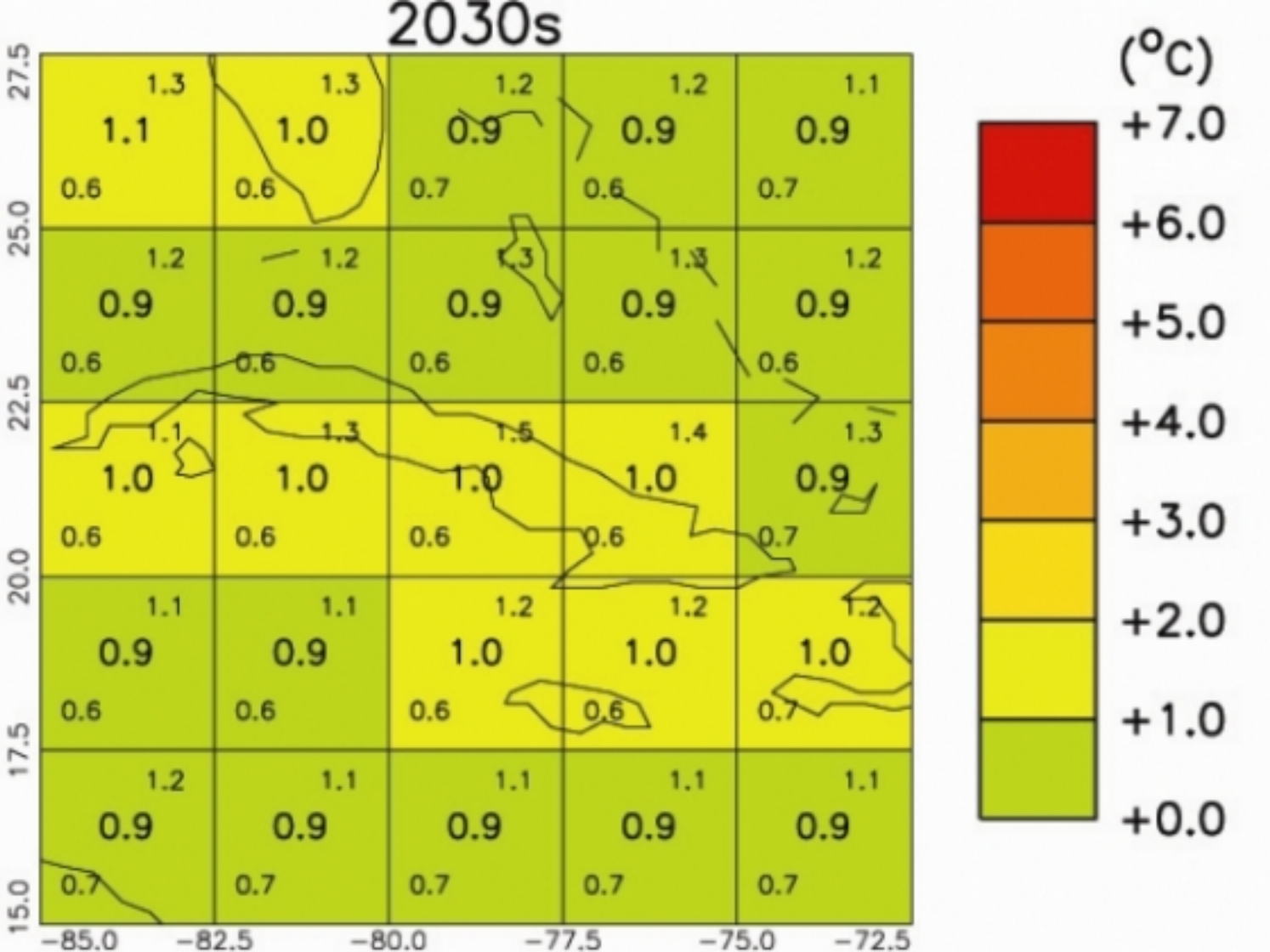
1980
2000
2020
2040
2060
2080
2100
A2
A1B
B1


2030s
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+4.0
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27.5
25.0
22.5
20.0
17.5
15.0
−85.0
−82.5
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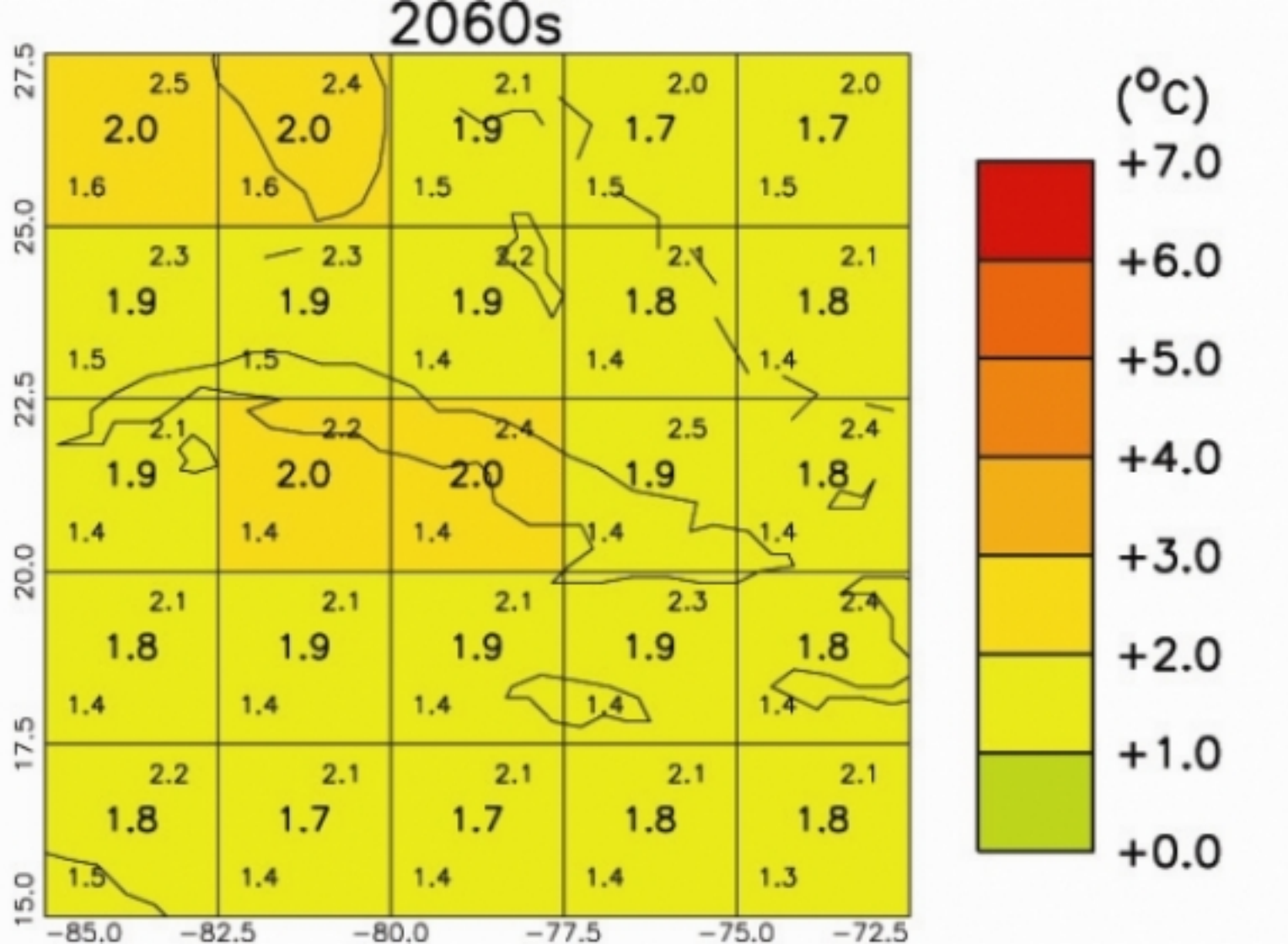
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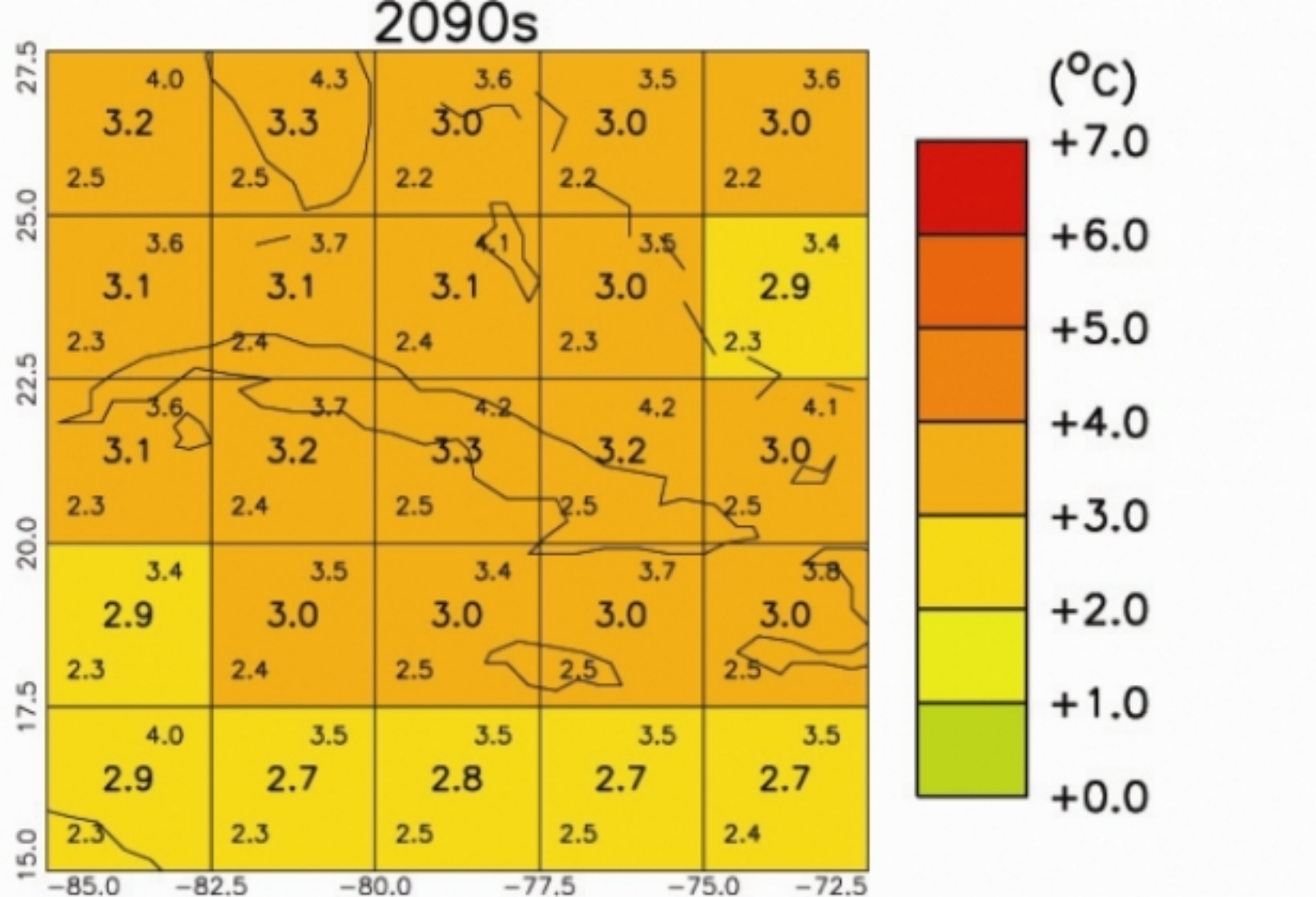
2090s
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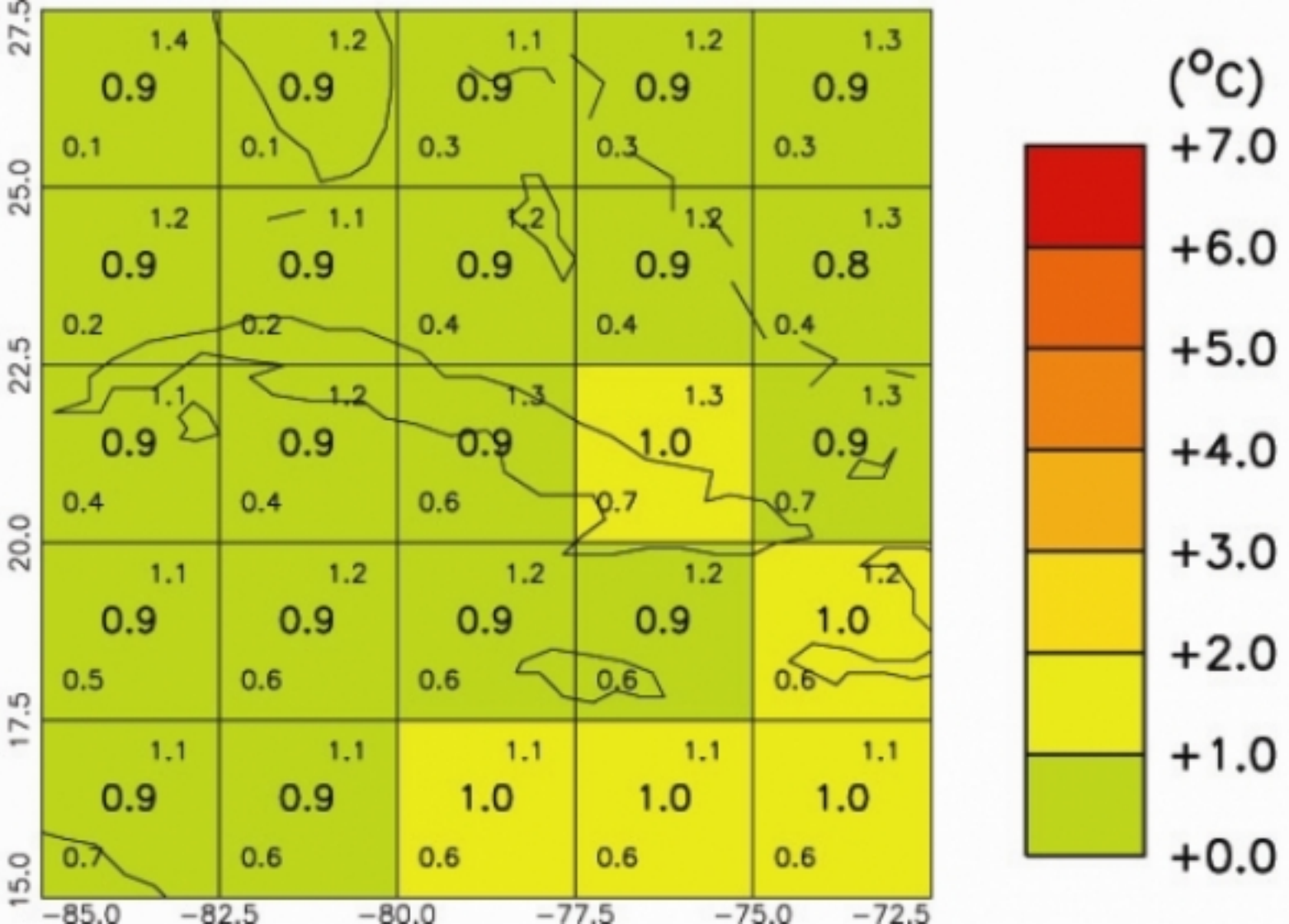
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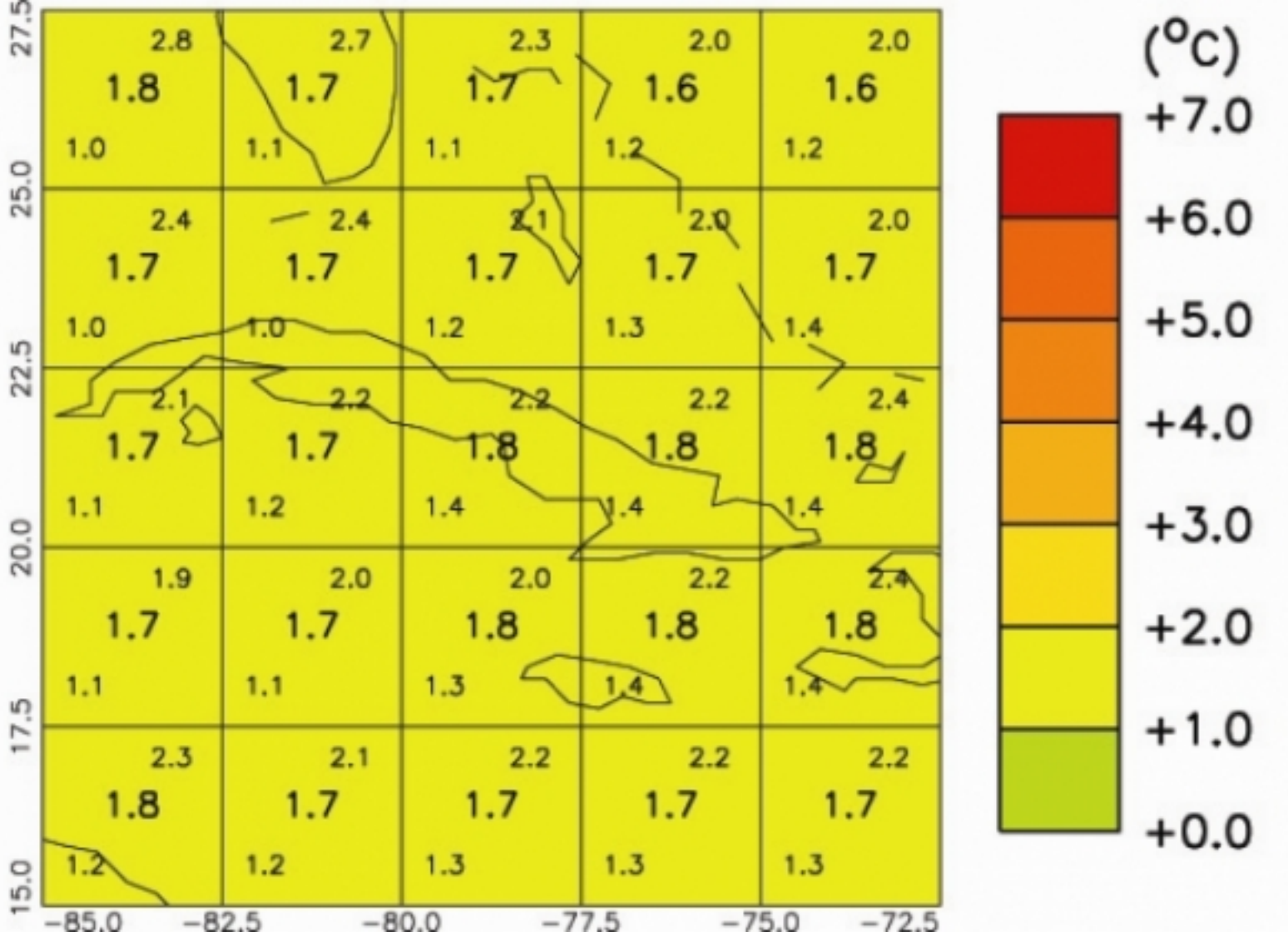
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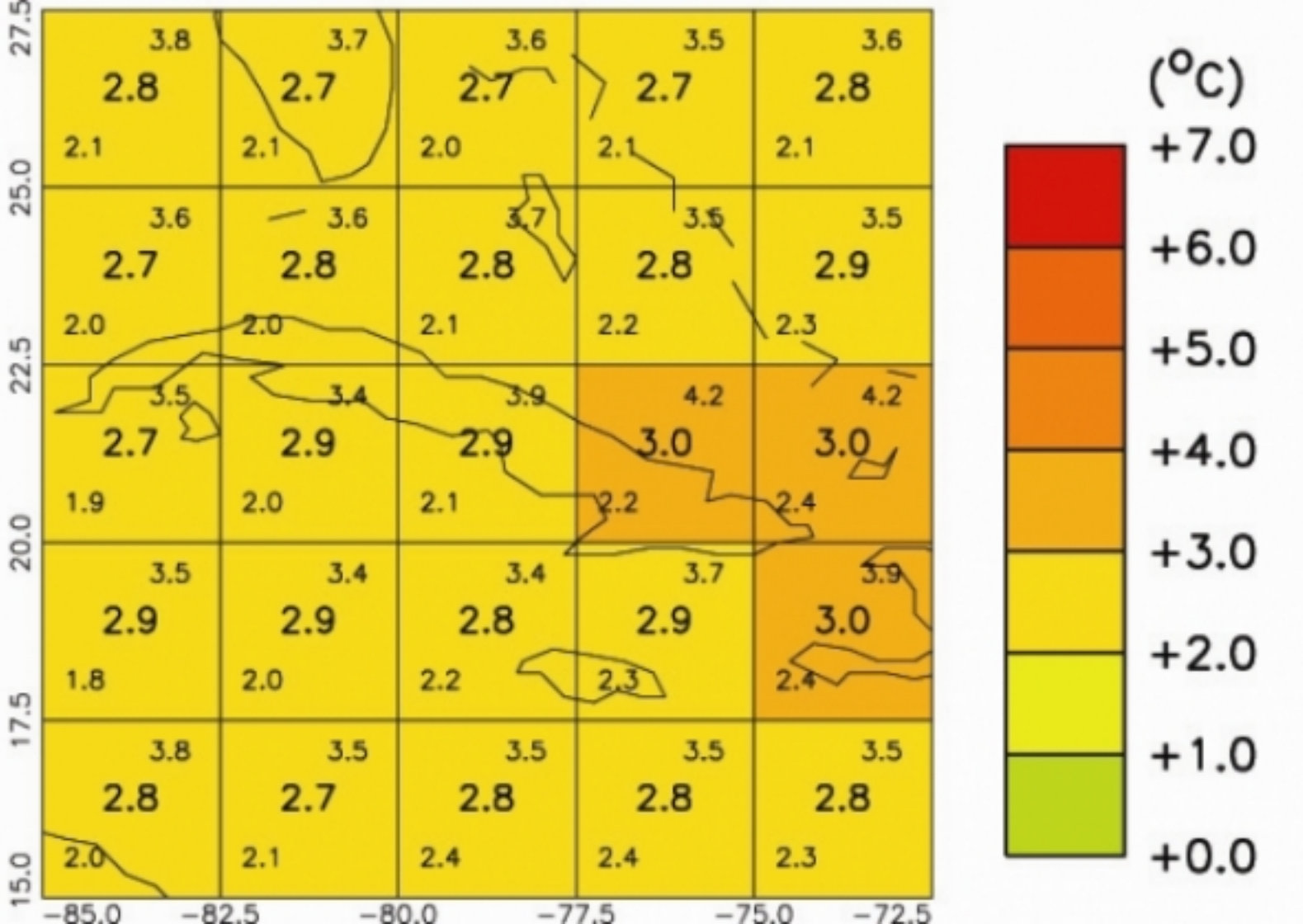
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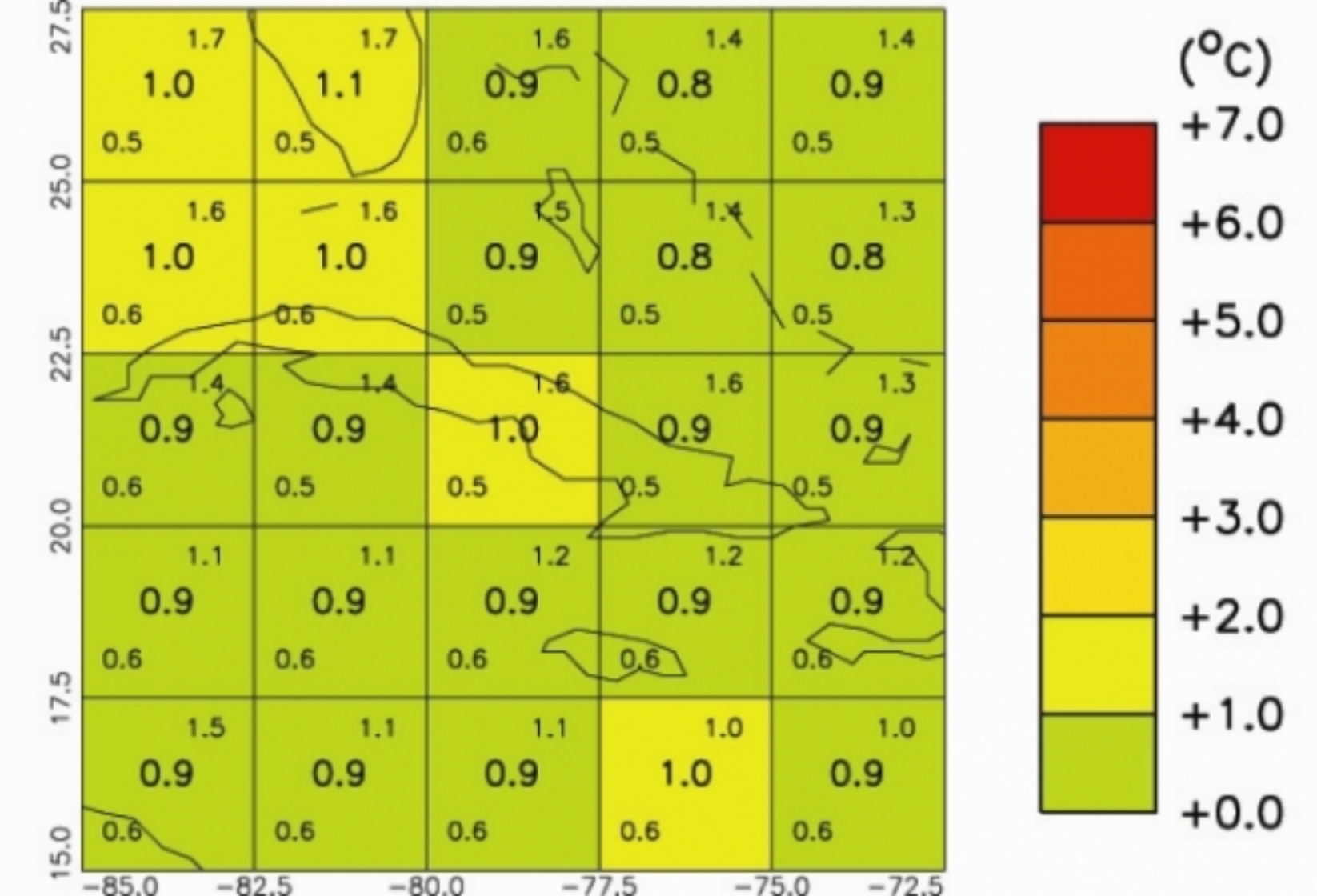
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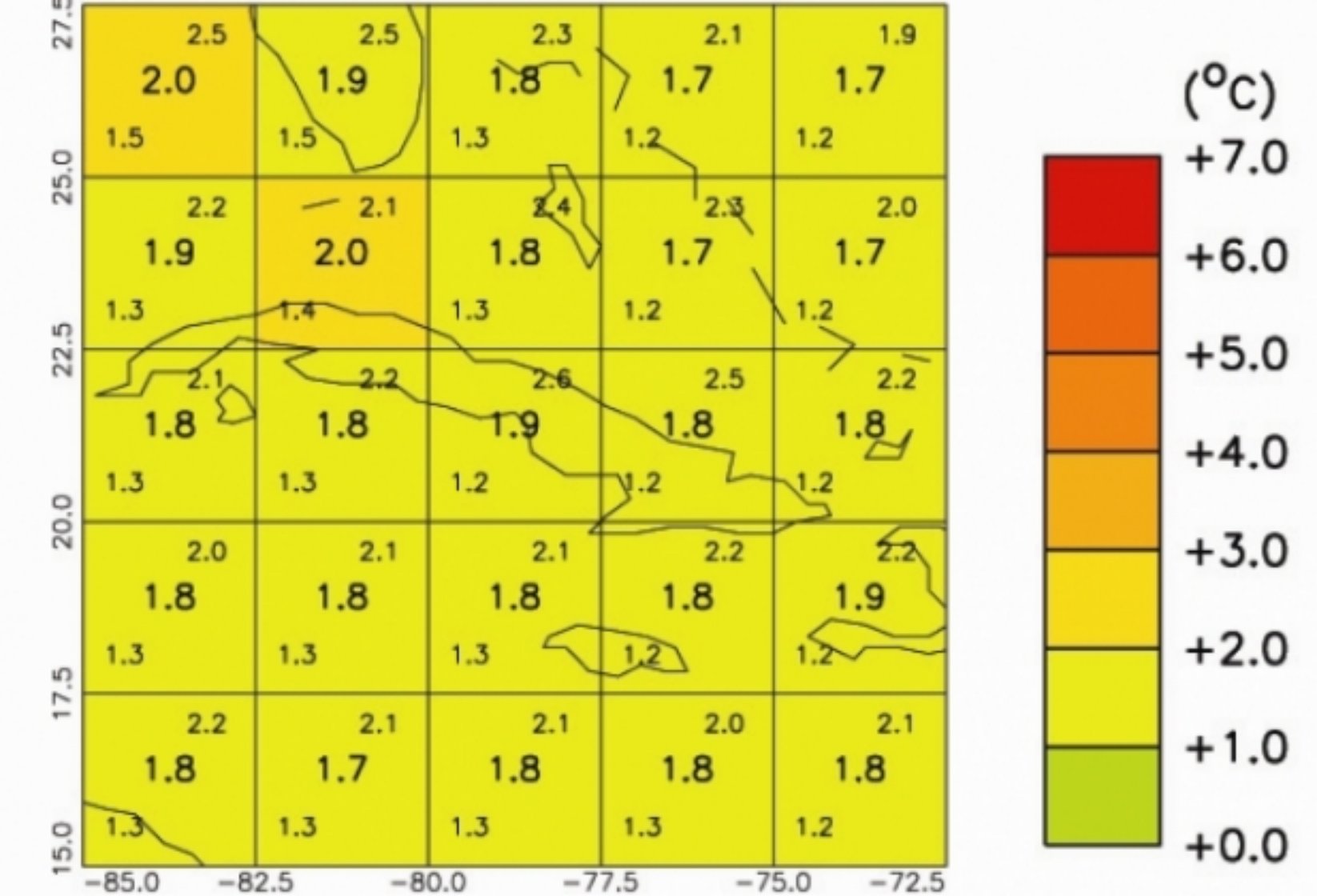
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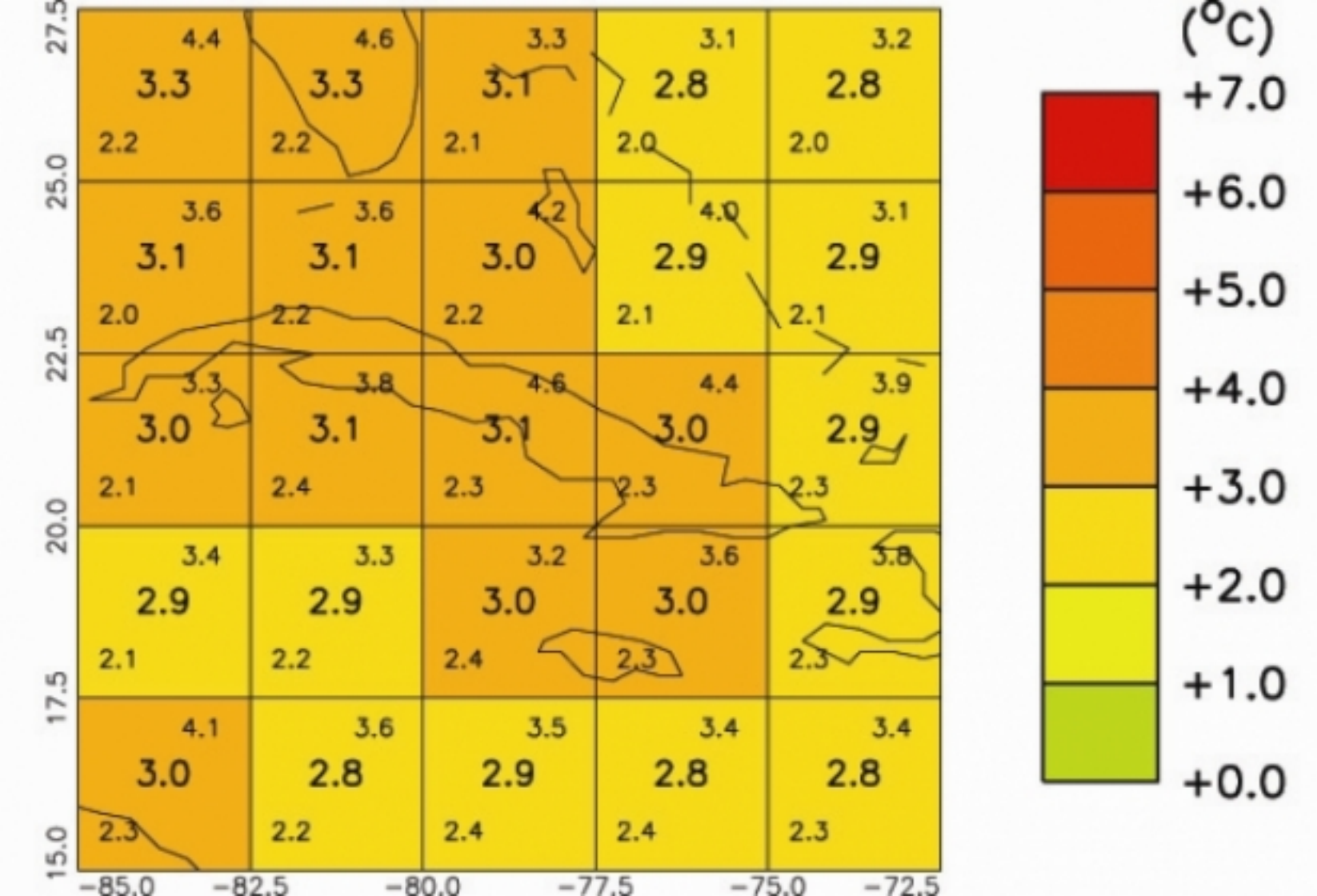
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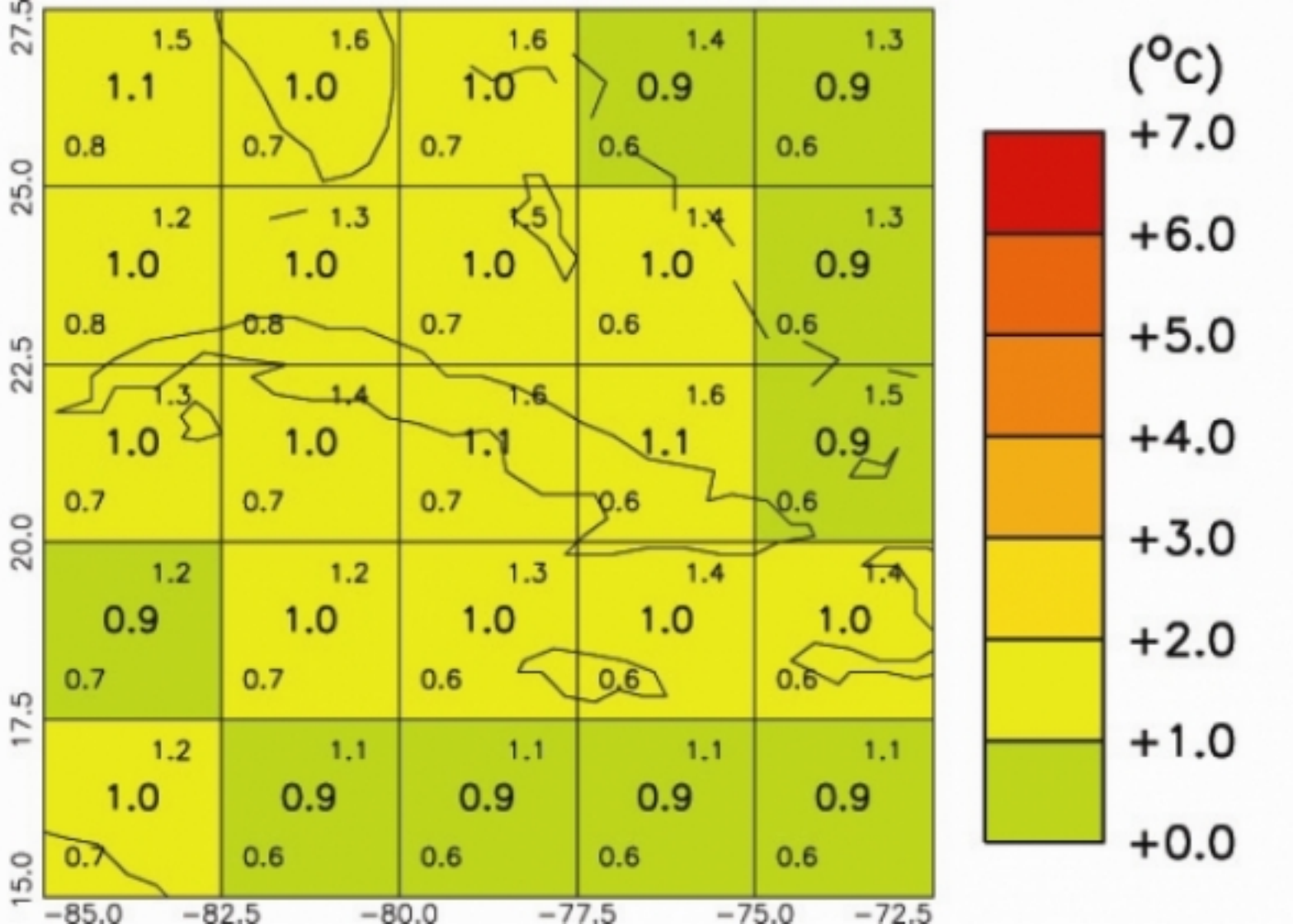
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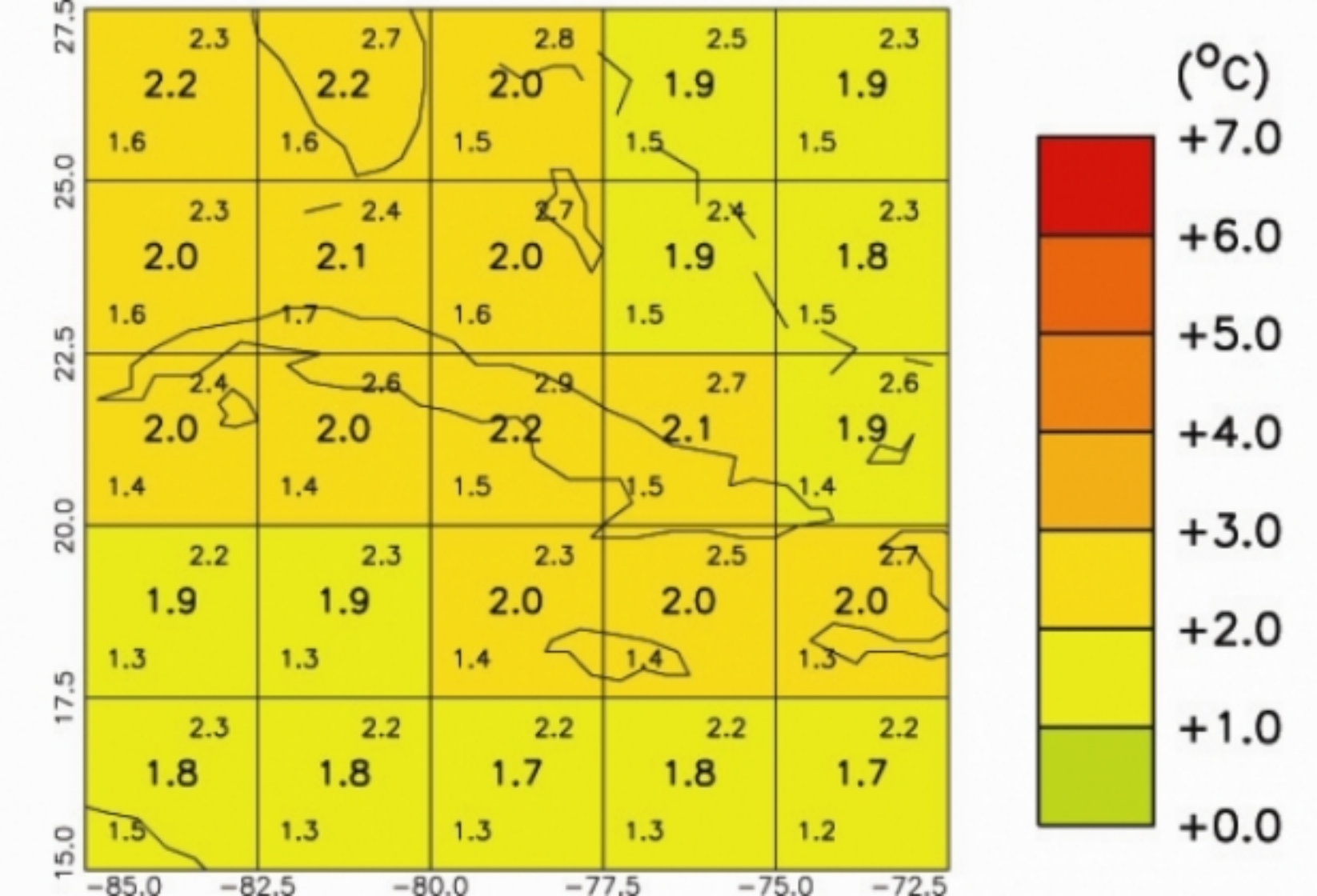
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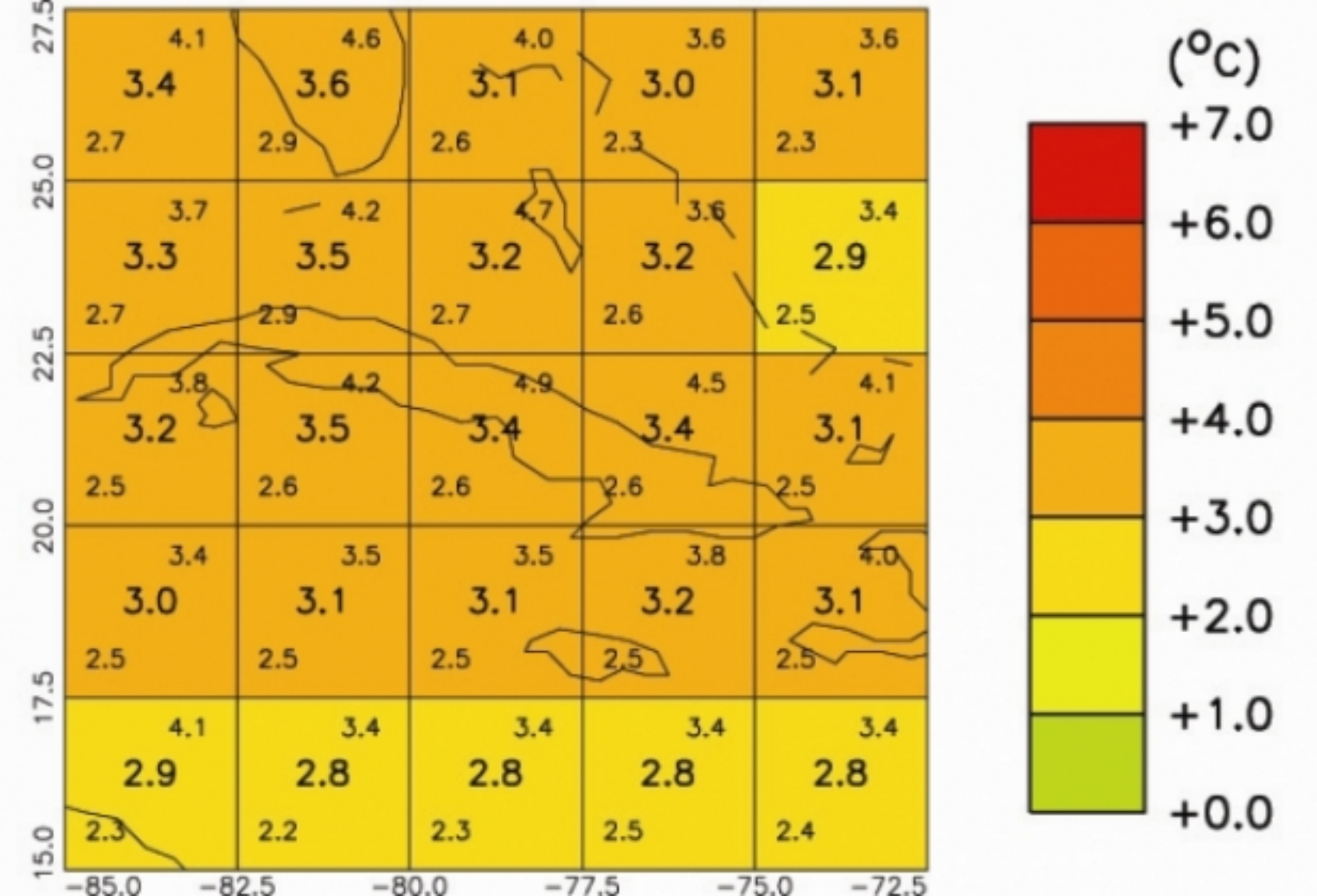
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3.5
3.1
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3.5
3.1
2.5
3.8
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2.5
4.0
3.1
2.5
4.1
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3.4
2.8
2.5
3.4
2.8
2.4
27.5
25.0
22.5
20.0
17.5
15.0
−85.0
−82.5
−80.0
−77.5
−75.0
−72.5
(°C)
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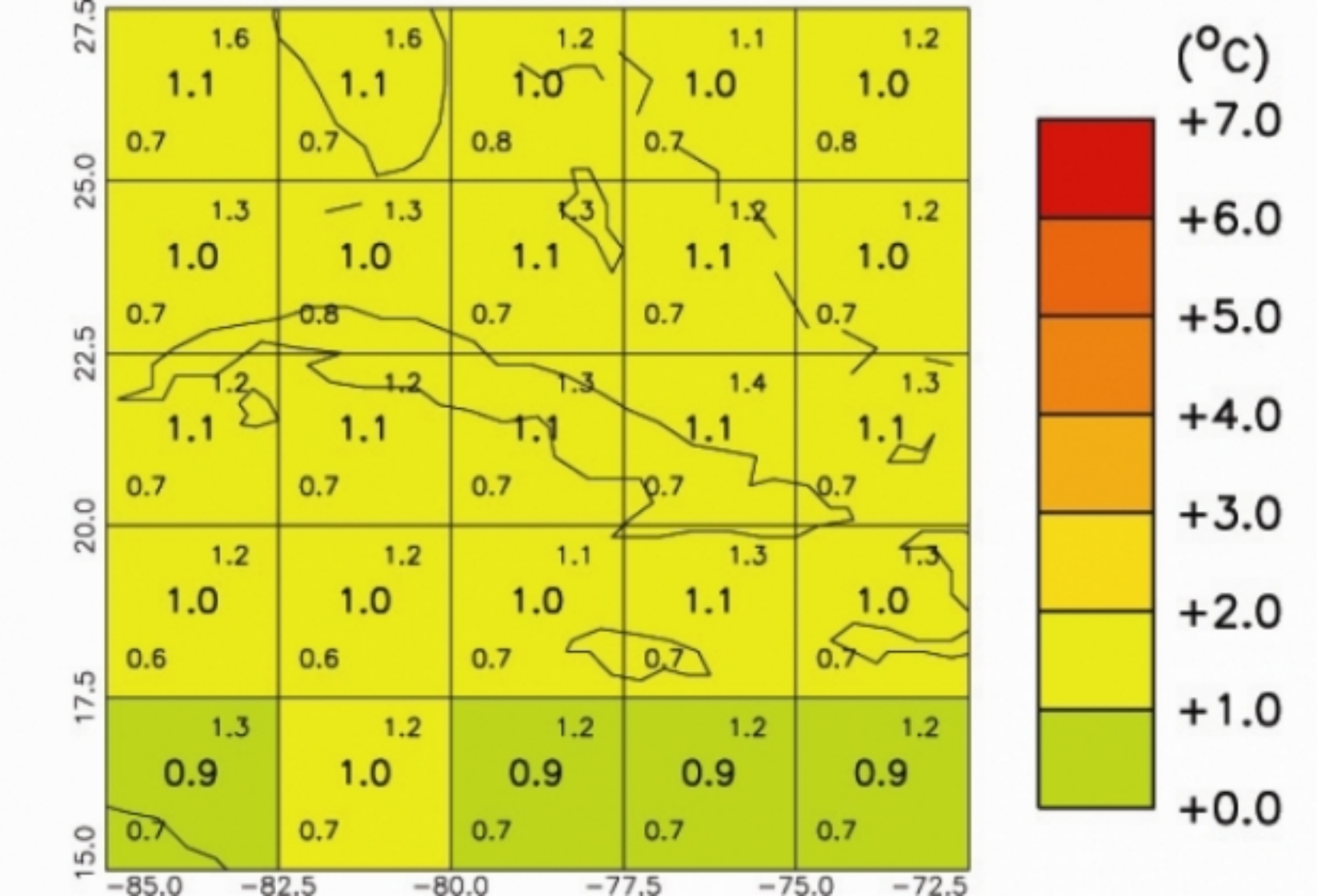
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0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+6.0
+5.0
+4.0
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+2.0
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−85.0
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1.6 1.6 1.2 1.1 1.2
1.1 1.1 1.0 1.0 1.0
0.7 0.7 0.8 0.7 0.8
1.3 1.3 1.3 1.2 1.2
1.0 1.0 1.1 1.1 1.0
0.7 0.8 0.7 0.7 0.7
1.2 1.2 1.3 1.4 1.3
1.1 1.1 1.1 1.1 1.1
0.7 0.7 0.7 0.7 0.7
1.2 1.2 1.1 1.3 1.3
1.0 1.0 1.0 1.1 1.0
0.6 0.6 0.7 0.7 0.7
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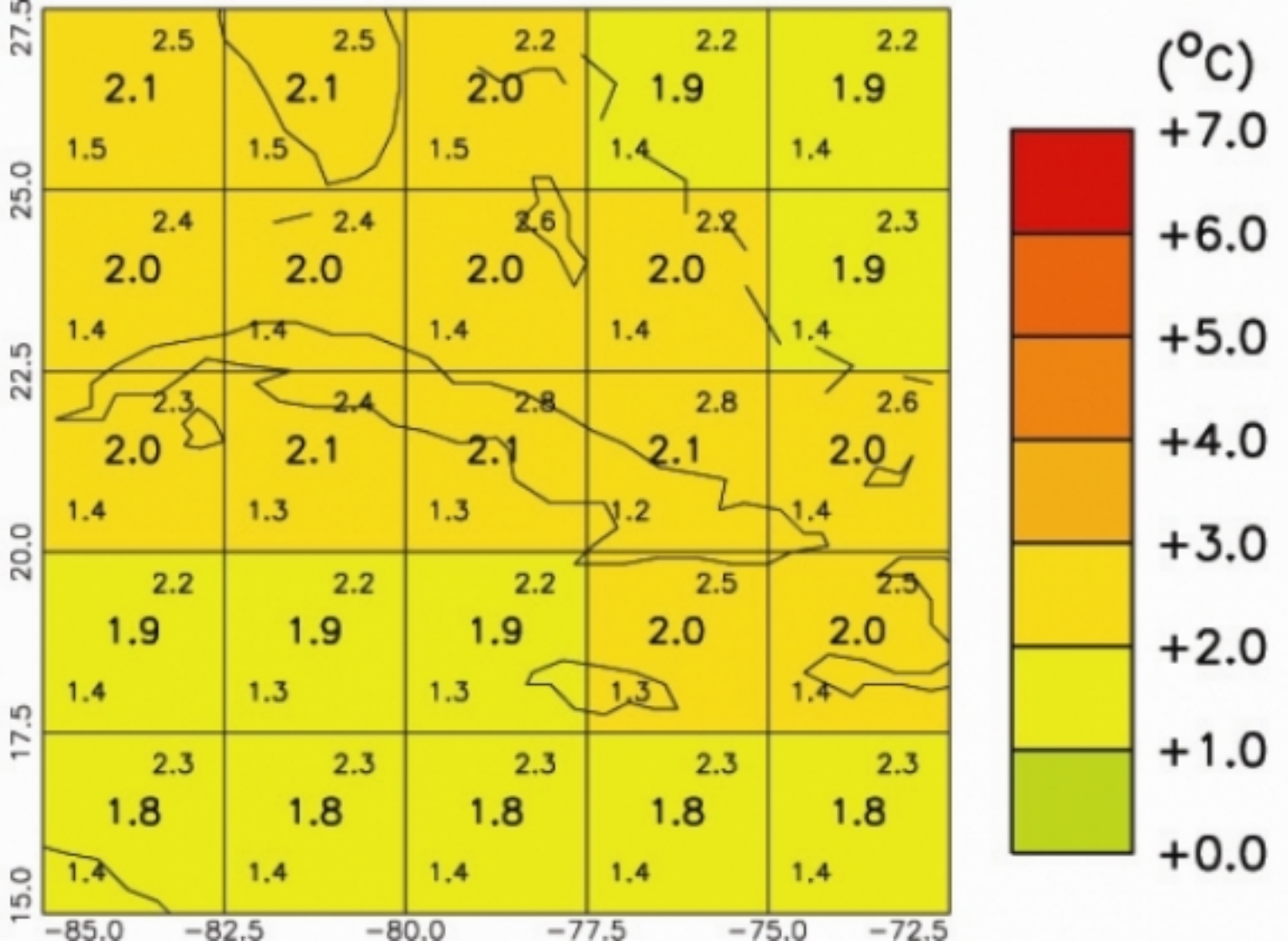
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+5.0
+4.0
+3.0
+2.0
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+0.0
27.5
25.0
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17.5
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−85.0
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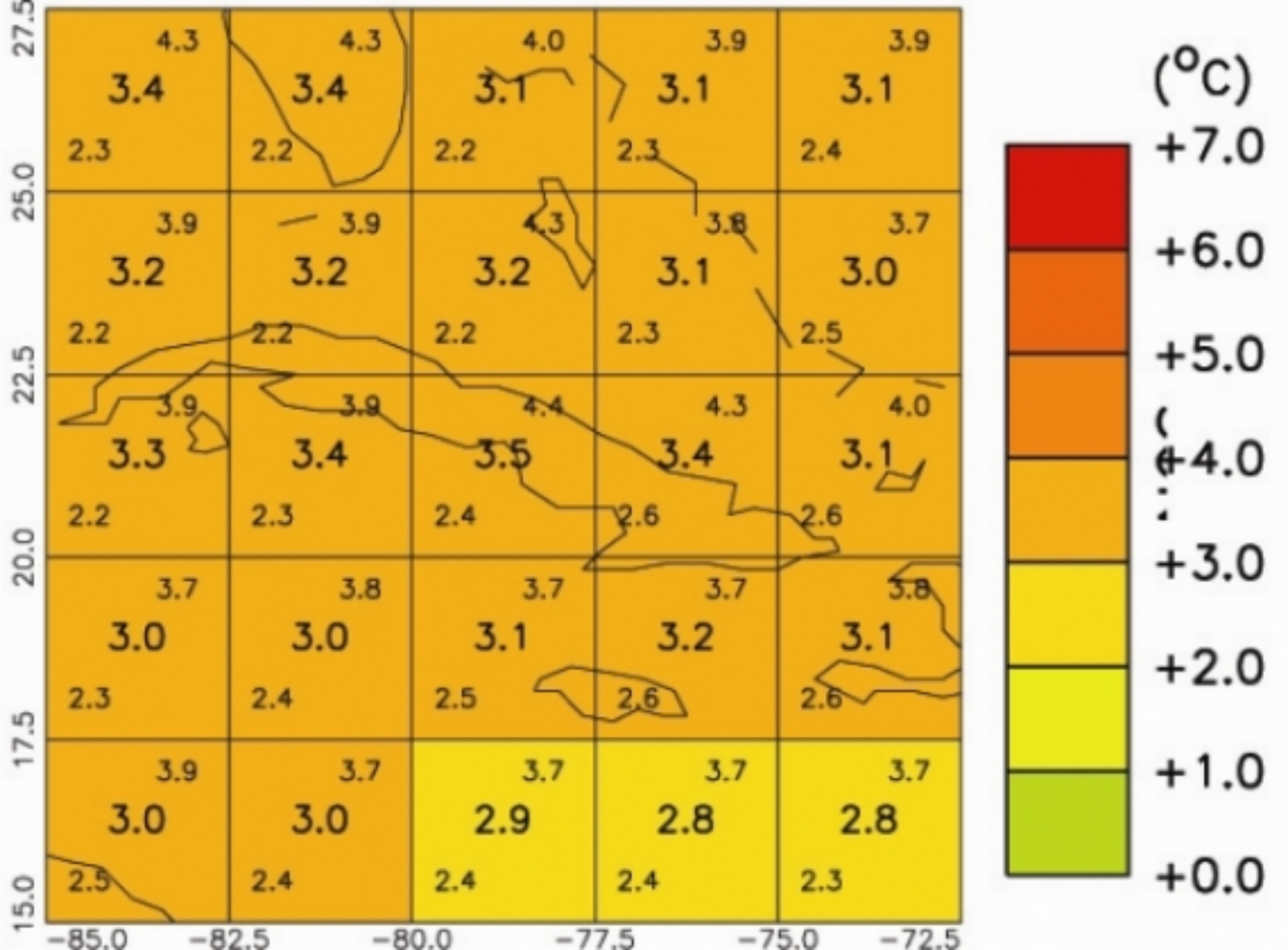
−75.0
−72.5


(°C)
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
+0.0
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−85.0
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−75.0
−72.5
4.3 4.3 4.0 3.9 3.9
3.4 3.4 3.1 3.1 3.1
2.3 2.2 2.2 2.3 2.4
3.9 3.9 4.3 3.8 3.7
3.2 3.2 3.2 3.1 3.0
2.2 2.2 2.2 2.3 2.5
3.9 3.9 4.4 4.3 4.0
3.3 3.4 3.5 3.4 3.1
2.2 2.3 2.4 2.6 2.6
3.7 3.8 3.7 3.7 3.8
3.0 3.0 3.1 3.2 3.1
2.3 2.4 2.5 2.6 2.6
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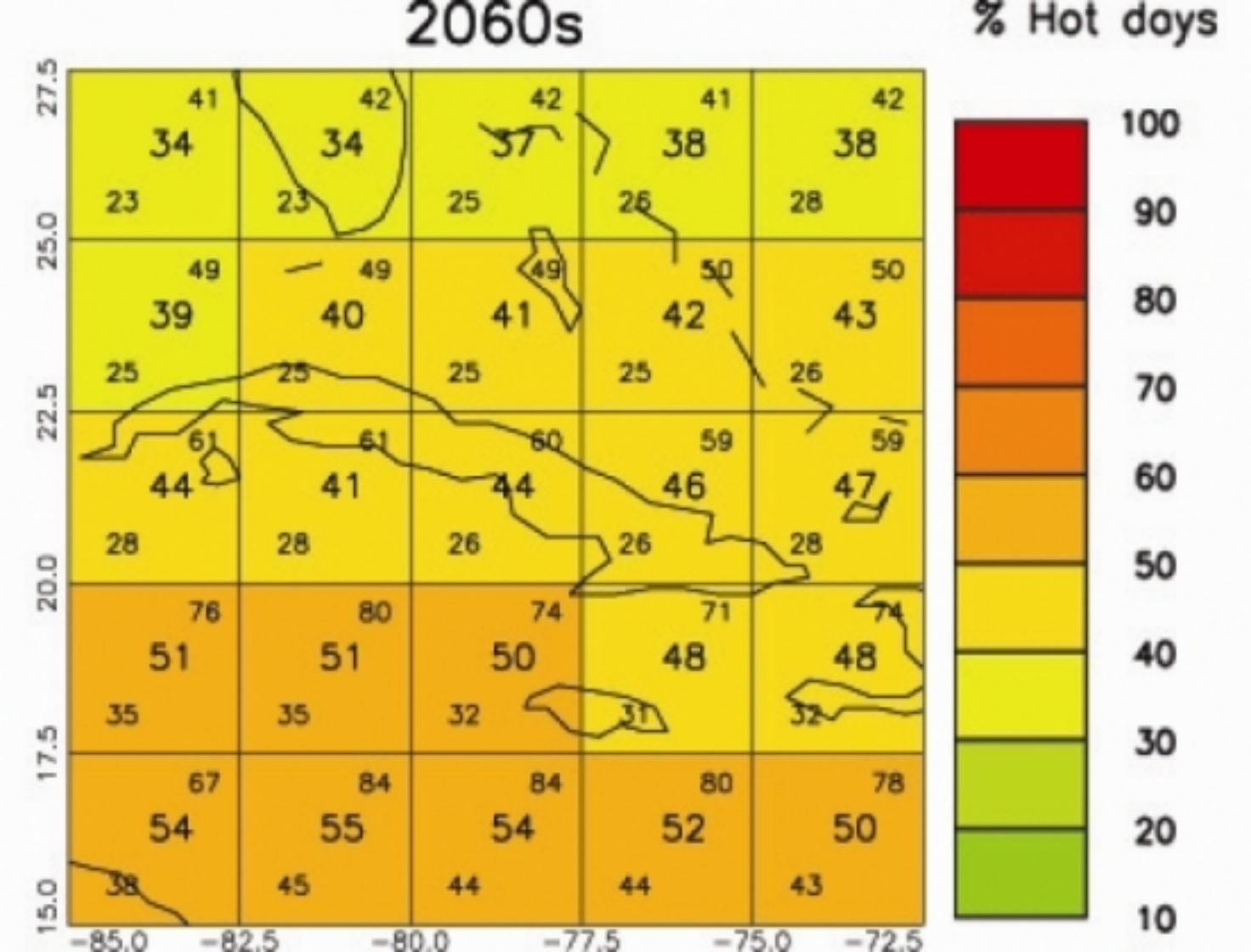
2060s
% Hot days
100
90
80
70
60
50
40
30
20
10
27.5
25.0
22.5
20.0
17.5
15.0
-85.0
-82.5
-80.0
-77.5
-75.0
-72.5
41 42 42 41 42
34 34 37 38 38
23 23 25 26 28
49 49 49 50 50
39 40 41 42 43
25 25 25 25 26
61 61 60 59 59
44 41 44 46 47
28 28 26 26 28
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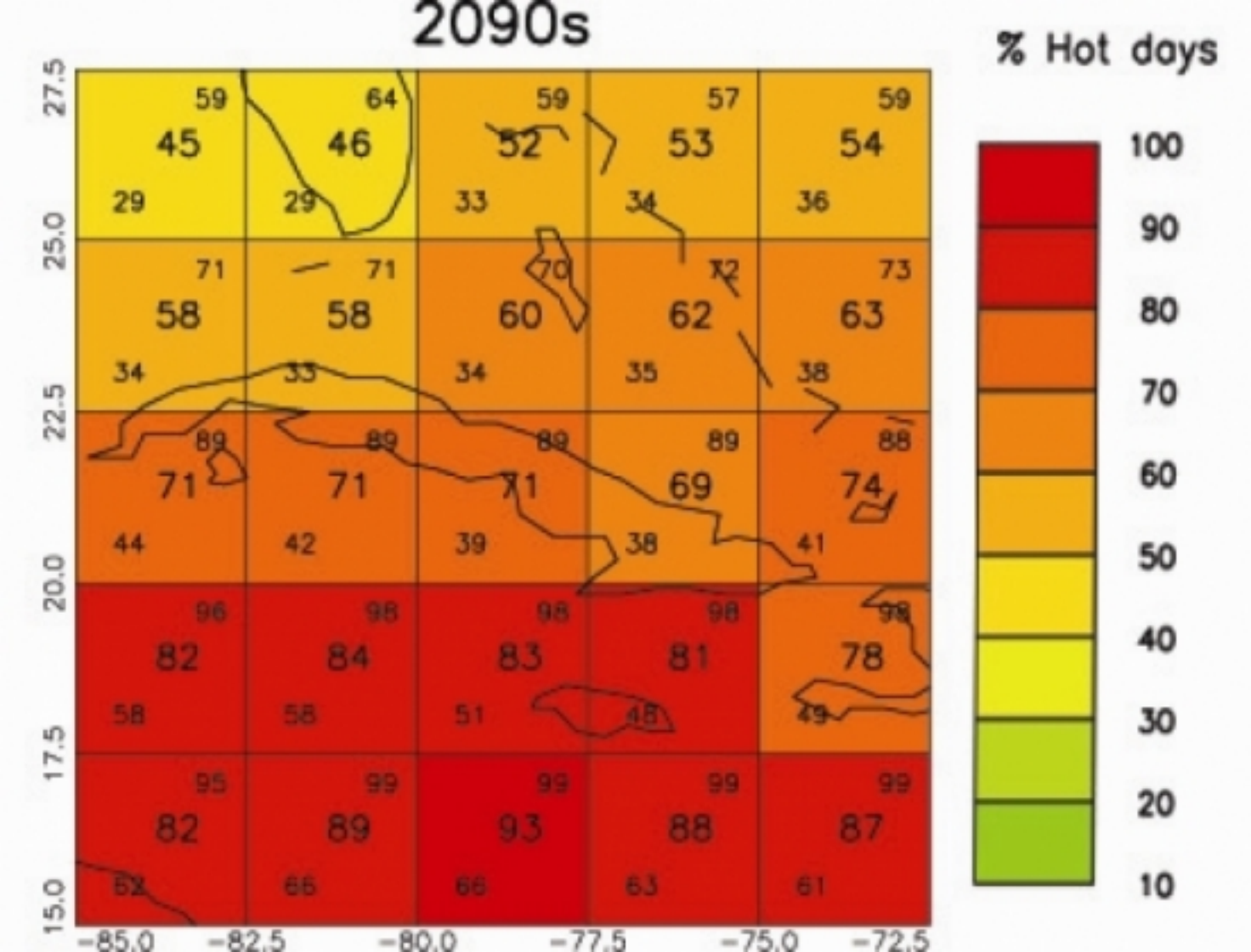
35 35 32 31 32
67 84 84 80 78
54 55 54 52 50
38 45 44 44 43


2090s
% Hot days
100
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80
70
60
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30
20
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27.5
25.0
22.5
20.0
17.5
15.0
-85.0
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-80.0
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-75.0
-72.5
59
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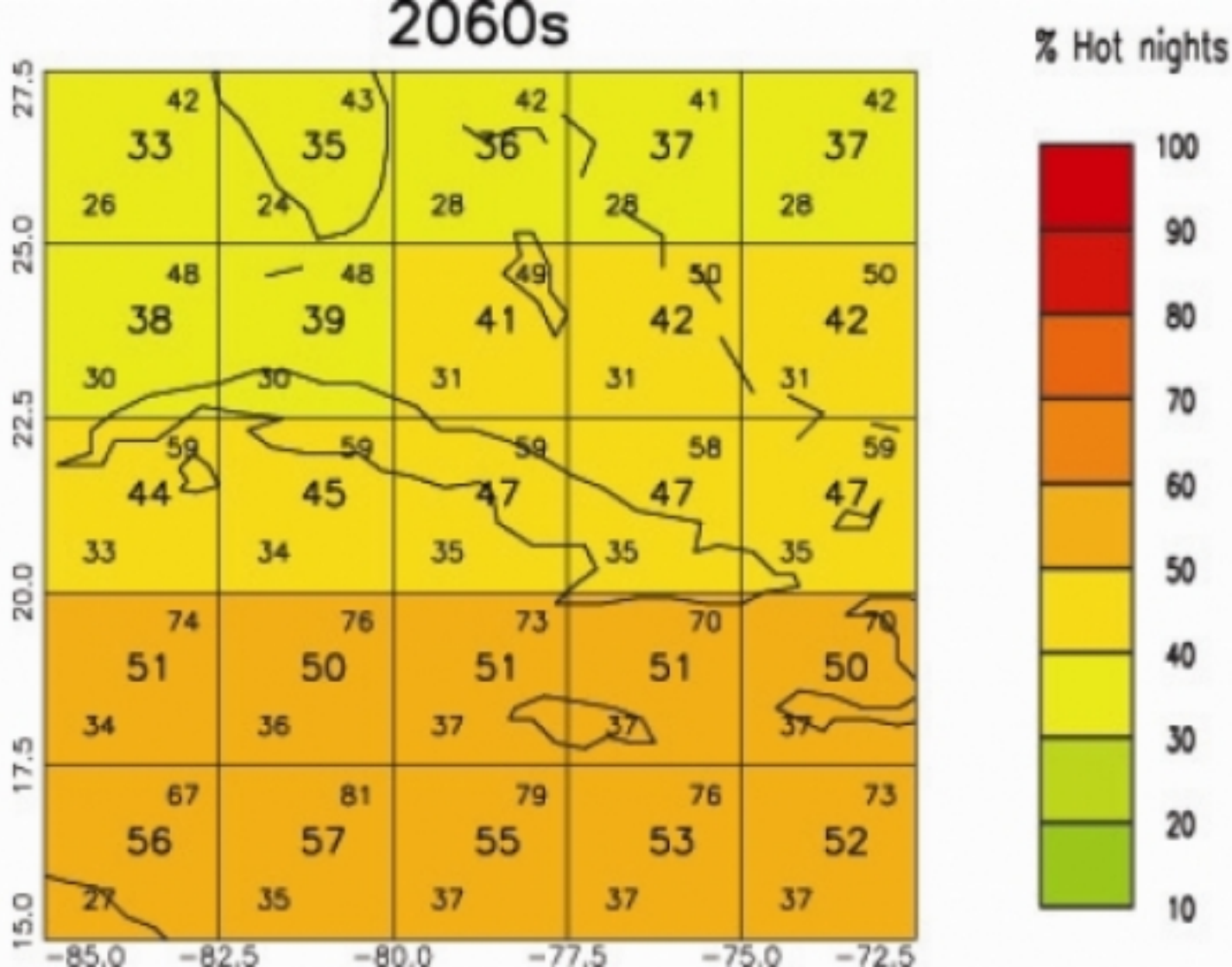
2060s
% Hot nights
100
90
80
70
60
50
40
30
20
10
27.5
25.0
22.5
20.0
17.5
15.0
-85.0
-82.5
-80.0
-77.5
-75.0
-72.5
42 43 42 41 42
33 35 36 37 37
26 24 28 28 28
48 48 49 50 50
38 39 41 42 42
30 30 31 31 31
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51 50 51 51 50
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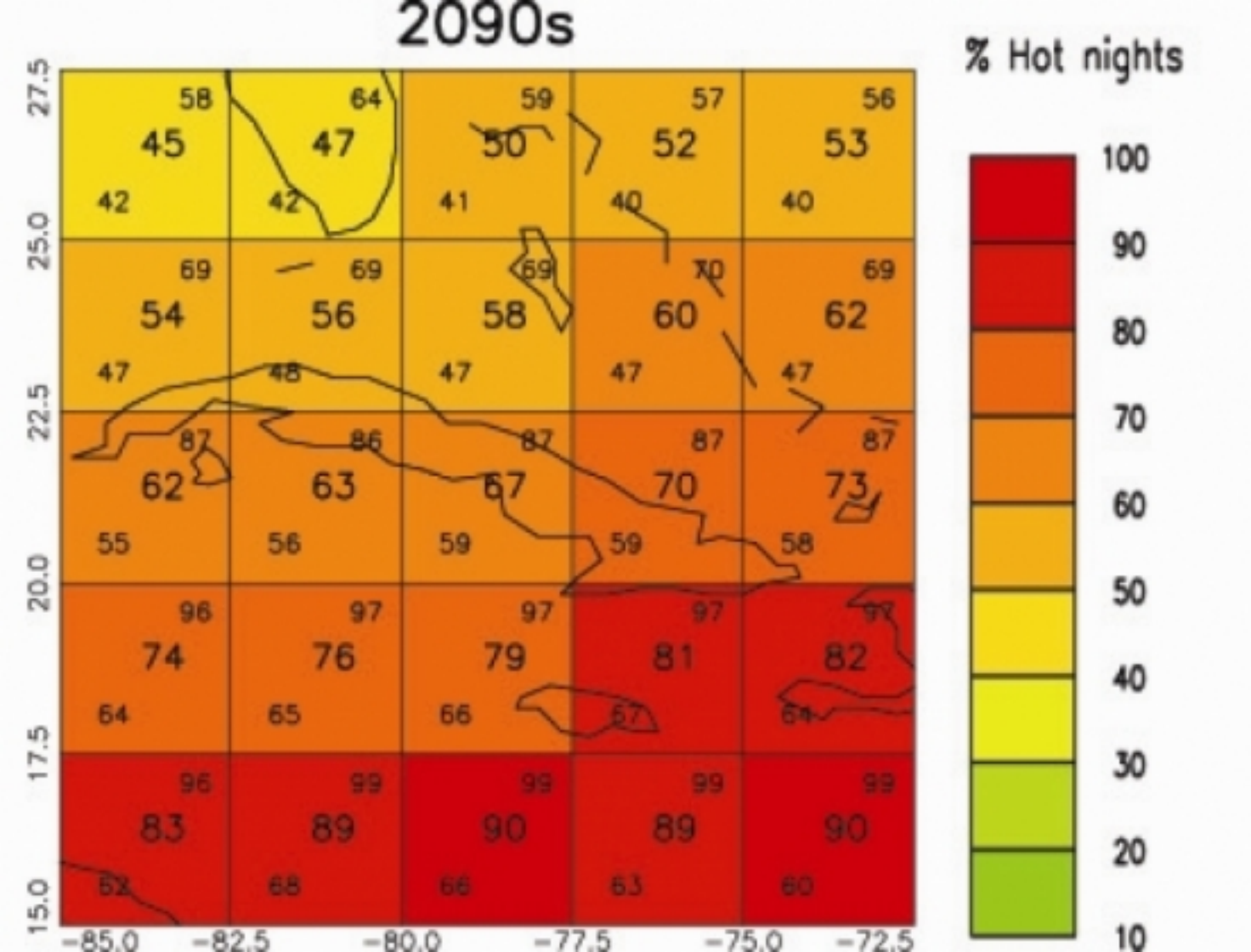
67 81 79 76 73
56 57 55 53 52
27 35 37 37 37


2090s
% Hot nights
100
90
80
70
60
50
40
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27.5
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15.0
-85.0
-82.5
-80.0
-77.5
-75.0
-72.5
58 64 59 57 56
45 47 50 52 53
42 42 41 40 40
69 69 69 70 69
54 56 58 60 62
47 48 47 47 47
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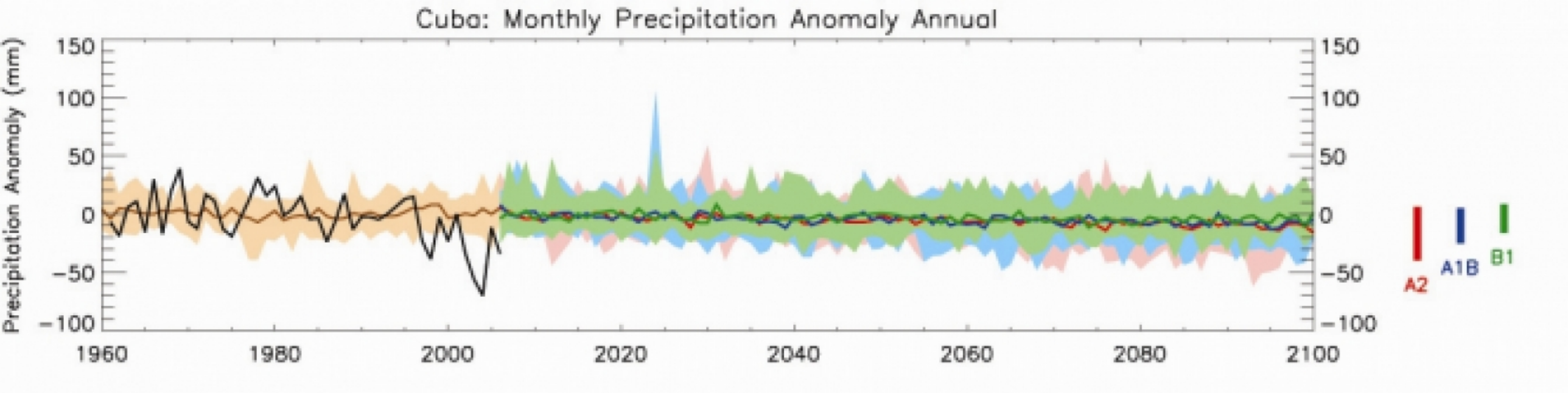
96 99 99 99 99
83 89 90 89 90
82 68 66 63 60


Cuba: Monthly Precipitation Anomaly Annual
Precipitation Anomaly (mm)
150
100
50
0
−50
−100
1960
1980
2000
2020
2040
2060
2080
2100
A2
A1B
B1