

Supplementary Figure 1. Average seasonal precipitation in the study area calculated for (a) winter (DJF); (b) spring (MAM); (c) summer (JJA); and (d) autumn (SON).

a)

	PRCPTOT	RR1	SDII	R95	CWD	CDD
<b>INDEX-SST-CAR</b>						
Cuba(NW)	↓*	↓**	↓	↓	↓**	↑
Cuba(SE)	↑**	↓	↑**	↑**	↓	↑
Haiti(N)	↑	↑**	↑	↑**	↑**	↑**
Haitu(S)	↑**	↑**	↑	↑**	↑**	↑
Saint Domingue	↑	↑**	↓	↓	↑**	↑
Jamaique	↑	↑	↑	↑	↓	↑
Porto-Rico	↑	↑	↑	↑**	↓**	↓

b)

	PRCPTOT	RR1	SDII	R95	CWD	CDD
<b>INDEX-NOA</b>						
Cuba(NW)	↓**	↑	↓**	↓**	↑	↓
Cuba(SE)	↓	↑	↓	↓**	↓	↓
Haiti(N)	↓**	↓	↓**	↓**	↓	↓
Haitu(S)	↓**	↑	↓	↓**	↓	↓
Saint Domingue	↓	↓	↓	↓**	↓	↓
Jamaique	↓**	↑	↓	↓**	↓	↓
Porto-Rico	↓	↓	↑	↓	↓	↑

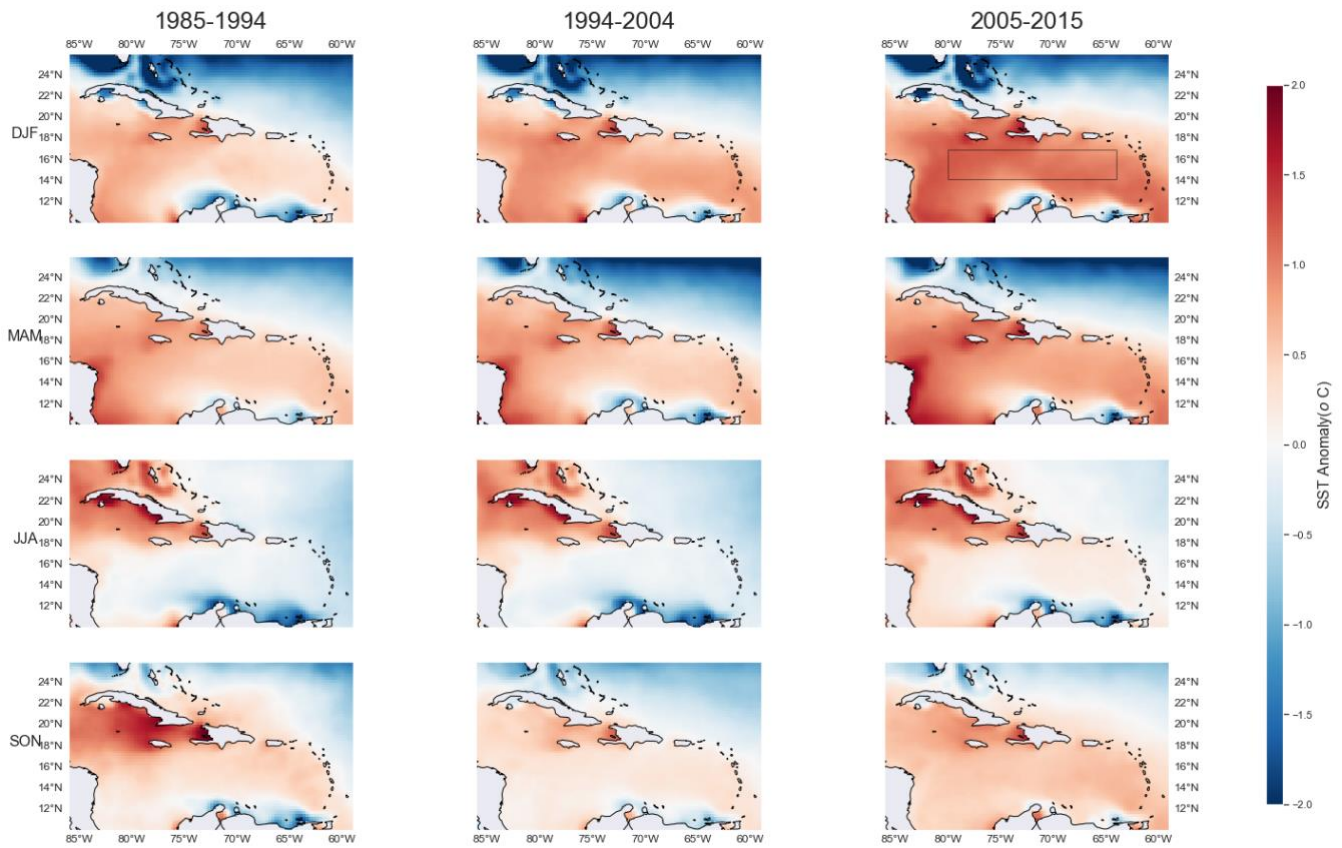
c)

	PRCPTOT	RR1	SDII	R95	CWD	CDD
<b>INDEX-SOI</b>						
Cuba(NW)	↓**	↓	↓	↓	↓	↑
Cuba(SE)	↑	↓**	↑**	↑**	↓	↑
Haiti(N)	↑	↑	↑	↑	↑	↑
Haitu(S)	↑	↑**	↓	↑	↑**	↑
Saint Domingue	↑	↑	↓	↑	↑**	↑**
Jamaique	↑	↓	↑	↑	↓	↓
Porto-Rico	↑**	↑	↑	↑**	↑	↑

d)

	PRCPTOT	RR1	SDII	R95	CWD	CDD
<b>INDEX-TSA</b>						
Cuba (NW)	↓	↓**	↓	↓	↓**	↑
Cuba(SE)	↑	↓**	↑**	↑**	↓**	↓
Haiti(N)	↑	↓	↑**	↑	↓	↑
Haitu(S)	↑	↓	↑	↑	↑	↑
Saint Domingue	↑	↑	↑	↑	↑	↑
Jamaique	↑**	↑	↑**	↑**	↓	↓
Porto-Rico	↑**	↑	↑	↑**	↑	↑

**Supplementary Table 1.** Table showing the local effect of large-scale SST indices on extreme precipitation. At the top of the table, the extremes are indicated and the first column on the left, the SST indices. The blue arrow indicates a negative effect on average, while the red arrow indicates a positive effect. Arrows without a symbol are not statistically significant, but those with one or/and two asterisks (\*) are significant at a threshold less than or equal to 0.05. The symbol (\*) means that the effect is statistically significant for a small part of the area, while (\*\*) the effect is mostly significant over the whole area.



**Supplementary Figure 2.** Spatial anomaly by decade of sea temperature in the Greater Antilles (1985-2015). The DJF, MAM, JJA and SON lines show the spatial anomaly of sea surface temperature in the Caribbean. The anomalies are divided into three decades. Each column of the figure corresponds to a decade; the first decade (1985-1994) is represented by the first column, while the second (1994-2004) and third (2005-2015) are represented by the second and third columns respectively.



**Supplementary Figure 3.** Temporal evolution of sea surface temperature anomalies (mean SST 14-16N, 65-85W; mean SST over 0-20S, 10E-30W) and pressure anomalies (NAO, SOI) over the period 1985-2015.