Supplementary material

Impact of Climate Change on Water Balance Components and Droughts in the Guajoyo River Basin (El Salvador)

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Supplementary Table S1. Climatic stations used in the basin.

No.	Station Name	Latitude (°N)	Longitude (°W)	Elevation (m)	Category	Number of sub-basins using the station
1	Güija	14.23	-89.47	485	R	11
2	t142-894	14.21	-89.38	446	T	2
3	t142-897	14.21	-89.69	585	T	9

Note: The alphabets of R and T stand for rain gauge station and CFSR temperature data, respectively.

Supplementary Table S2. Monthly data used for model calibration and validation (2001-2012).

Date	Station				
	Güija	t142-894		t142-897	
	P (mm)	Tmax (°C)	Tmin (°C)	Tmax (°C)	Tmin (°C)
Jan-01	1.4	26.1	15.4	26.4	14.8
Feb-01	0	27.5	18.1	27.6	17.3
Mar-01	0	31.8	15.2	32.0	14.9
Apr-01	69	33.6	19.2	34.2	18.6
May-01	147.4	32.4	18.9	31.9	18.8
Jun-01	35.9	29.5	18.5	28.9	18.4
Jul-01	263.5	30.1	18.3	28.9	17.8
Aug-01	136.2	29.9	19.0	29.2	18.6
Sep-01	247	27.4	17.1	26.8	17.2
Oct-01	188.8	27.1	18.0	27.1	17.7
Nov-01	0	27.7	16.6	27.9	16.0
Dec-01	0	28.5	17.8	28.8	17.1
Jan-02	0	28.8	17.0	29.2	16.4
Feb-02	4.6	30.2	17.3	30.2	16.6
Mar-02	0.5	33.1	17.4	32.9	16.7
Apr-02	29.2	33.0	19.0	33.8	18.1
May-02	262.8	30.8	19.6	30.6	19.1
Jun-02	227.4	28.9	18.6	28.3	18.4
Jul-02	205.9	28.8	18.9	29.1	18.4
Aug-02	205.4	29.9	18.8	30.1	18.3
Sep-02	252.3	27.2	17.6	26.4	17.5
Oct-02	81.7	26.5	18.0	26.5	17.5
Nov-02	6.8	24.9	16.9	24.7	16.5
Dec-02	0	26.7	17.2	26.7	16.6
Jan-03	0	23.8	16.2	24.0	15.7
Feb-03	0	31.1	17.0	30.8	16.4
Mar-03	50.7	32.3	17.6	31.8	17.2

Apr-03	12	34.3	18.3	34.8	17.8
May-03	141.1	32.8	19.4	32.7	19.1
Jun-03	163.3	27.8	17.8	27.3	17.8
Jul-03	234.4	27.4	18.5	27.5	18.1
Aug-03	248.2	28.7	18.4	28.6	18.0
Sep-03	343.7	27.6	18.4	27.2	17.9
Oct-03	120.9	26.6	17.9	26.7	17.6
Nov-03	13.9	26.7	17.6	27.3	17.1
Dec-03	0	24.6	15.4	25.5	15.0
Jan-04	0	27.1	15.9	27.5	15.6
Feb-04		30.3	16.5	30.2	16.0
Mar-04	0	30.9	18.5	31.0	18.0
Apr-04	31.6	32.6	17.7	32.7	17.4
May-04	140.9	30.3	19.8	29.9	19.4
Jun-04	187.4	28.1	18.9	27.8	18.7
Jul-04	160.3	28.1	18.2	27.7	17.7
Aug-04	181.4	30.0	18.8	29.4	18.3
Sep-04	294.8	29.9	18.0	29.5	17.5
Oct-04	119.2	27.2	17.5	27.0	17.2
Nov-04	7.1	26.3	17.4	26.4	16.8
Dec-04	0	26.2	16.8	26.3	16.3
Jan-05	0	26.5	15.9	26.6	15.2
Feb-05	0	31.0	16.5	30.7	15.9
Mar-05	4.1	32.5	18.1	32.0	17.5
Apr-05	19.3	34.1	19.4	34.5	19.0
May-05	181.4	31.5	19.4	31.1	19.2
Jun-05	427.4	29.1	18.9	28.4	18.7
Jul-05	213.2	27.4	18.1	26.9	18.1
Aug-05	211.8	27.4	18.4	27.1	18.1
Sep-05	350.12	26.8	18.4	26.4	18.3
Oct-05	208.3	24.2	17.6	23.9	17.2
Nov-05	9	24.2	16.5	24.3	16.1
Dec-05	5	27.0	16.8	26.9	16.3
Jan-06	0	26.6	16.7	26.5	16.1
Feb-06	0.3	28.4	16.4	28.6	15.9
Mar-06	11.9	32.3	16.8	32.1	16.0
Apr-06	61.4	32.6	17.6	33.0	17.3
May-06	241.8	31.2	19.3	30.6	19.0
Jun-06	367.5	26.3	18.9	26.0	18.5
Jul-06	316.7	27.6	19.0	27.2	18.6
Aug-06	116.9	28.3	18.9	27.9	18.4
Sep-06	201.44	27.6	18.6	26.8	18.2
Oct-06	179.2	27.6	17.9	27.7	17.6
Nov-06	120.7	25.8	16.6	25.6	16.1
Dec-06	2	26.8	17.7	26.9	17.1
Jan-07	0	27.3	18.0	27.5	17.3
Feb-07	0	31.5	17.1	31.0	16.4
Mar-07	0.6	31.3	18.1	31.4	17.3
Apr-07	139.1	34.3	18.8	34.7	18.5
May-07	96.5	33.6	19.4	33.2	19.2
Jun-07	127.4	29.2	19.0	28.4	18.6
Jul-07	162	29.7	18.3	29.2	17.9
Aug-07	173.2	28.1	17.7	27.5	17.4
Sep-07	314.9	27.1	17.8	26.7	17.4
Oct-07	77.2	24.9	16.7	24.5	16.5
Nov-07	0	23.6	17.4	23.5	16.8
Dec-07	0	26.2	16.4	26.4	15.8

Jan-08	0.8	26.8	16.5	26.9	16.0
Feb-08	11.5	30.5	16.8	30.4	16.3
Mar-08	23	31.2	17.0	31.1	16.5
Apr-08	86.7	33.3	18.2	34.0	17.8
May-08	124	31.3	18.8	31.0	18.6
Jun-08	376.5	27.6	18.4	26.9	18.3
Jul-08	386	27.1	18.2	26.4	18.1
Aug-08	240	27.8	17.5	27.3	17.4
Sep-08	385	26.9	17.4	26.2	17.2
Oct-08	201.3	23.9	17.5	23.7	17.1
Nov-08	0	24.1	15.3	23.9	15.0
Dec-08	0	24.7	16.2	24.8	15.5
Jan-09	10.2	26.5	16.2	26.5	15.5
Feb-09	3.1	26.9	16.7	26.9	16.0
Mar-09	0.7	29.6	16.2	29.6	15.4
Apr-09	6.6	33.5	18.3	33.6	17.7
May-09	298.73	29.8	19.2	29.3	18.9
Jun-09	194.3	28.5	17.5	27.6	17.5
Jul-09	216.7	28.3	18.9	27.7	18.5
Aug-09	173.1	28.2	18.9	27.7	18.3
Sep-09	125.1	28.5	18.3	28.0	18.0
Oct-09	95.8	28.3	17.3	27.9	16.9
Nov-09	114.5	27.1	17.1	26.9	16.7
Dec-09	7.5	28.7	16.2	28.4	15.9
Jan-10	0	27.3	15.5	27.0	15.1
Feb-10	0	31.2	16.5	30.5	16.4
Mar-10	0.1	33.9	17.0	33.9	16.7
Apr-10	95.2	32.7	19.5	32.9	19.1
May-10	399.8	30.6	20.1	30.0	19.8
Jun-10	330.6	27.1	18.9	26.5	18.7
Jul-10	211.3	26.8	17.8	26.2	17.5
Aug-10	350.9	26.3	17.8	25.7	17.9
Sep-10	269.1	25.2	17.8	24.6	17.7
Oct-10	34.9	25.0	16.8	24.9	16.3
Nov-10	2.4	25.9	15.5	25.8	15.0
Dec-10	0	25.0	14.4	24.9	13.8
Jan-11	0.2	28.8	14.6	29.2	16.1
Feb-11	5.5	29.8	15.0	30.1	16.3
Mar-11	8.8	30.3	14.8	30.4	16.3
Apr-11	38.7	31.2	17.3	30.0	18.2
May-11	193.8	27.4	18.2	27.6	19.0
Jun-11	265.1	24.8	17.9	24.9	18.6
Jul-11	254.8	25.3	16.7	25.2	17.7
Aug-11	260.7	25.3	16.7	25.1	17.7
Sep-11	262.6	24.6	16.7	25.0	17.6
Oct-11	284	22.6	16.2	23.5	17.0
Nov-11	19.1	24.6	15.3	25.9	16.4
Dec-11	0	25.7	15.1	27.2	16.5
Jan-12	0.3	27.5	14.9	28.6	16.2
Feb-12	0.3	29.6	15.8	30.8	17.1
Mar-12	0	31.5	15.6	31.3	17.0
Apr-12	129	30.3	17.1	30.0	18.2
May-12	208	26.4	18.3	26.1	19.0
Jun-12	118.5	25.4	17.0	25.8	17.5
Jul-12	219.5	26.9	16.3	27.7	17.2
Aug-12	370.4	25.4	16.3	25.5	17.4
Sep-12	235.7	25.7	16.3	26.3	17.3

Oct-12	176.2	24.8	16.4	25.7	17.2
Nov-12	0	24.5	15.2	26.0	16.5
Dec-12	1	27.8	14.9	28.3	16.1

Supplementary Table S3. Modelled past data. Annual data for baseline period (1975-2004).

Date	Station				
	Güija	t142-894		t142-897	
	P (mm)	Tmax (°C)	Tmin (°C)	Tmax (°C)	Tmin (°C)
1975	1602.5	32.4	19.7	32.1	19.3
1976	1412.3	32.6	19.4	32.3	19.0
1977	1206.6	33.2	19.8	32.9	19.4
1978	1752.2	32.3	20.0	32.1	19.6
1979	1675.2	32.4	19.7	32.2	19.3
1980	1604.4	32.5	19.1	32.3	18.7
1981	1525.2	32.1	19.1	31.9	18.7
1982	1169.7	33.8	19.3	33.6	18.9
1983	1499.3	32.0	19.2	31.7	18.8
1984	1080.4	33.3	19.6	33.1	19.2
1985	1394.0	33.5	20.1	33.2	19.7
1986	1362.0	33.2	20.1	32.9	19.7
1987	1322.2	33.5	19.8	33.2	19.4
1988	1517.2	33.1	19.9	32.8	19.5
1989	1141.0	33.2	19.8	33.0	19.4
1990	924.4	33.9	19.6	33.6	19.2
1991	1422.2	32.8	19.5	32.6	19.1
1992	1489.2	32.1	19.6	31.8	19.2
1993	1148.2	33.6	19.6	33.3	19.2
1994	1661.8	32.4	19.6	32.2	19.2
1995	1551.7	32.7	19.9	32.5	19.5
1996	964.9	34.1	19.9	33.9	19.5
1997	1692.7	32.6	19.8	32.4	19.4
1998	1437.8	33.2	19.9	33.0	19.5
1999	1766.4	32.6	20.1	32.4	19.7
2000	1385.8	33.2	20.1	32.9	19.7
2001	1539.5	34.0	20.1	33.7	19.7
2002	1769.7	33.1	20.5	32.8	20.1
2003	1619.3	33.0	20.0	32.7	19.6
2004	1405.7	33.1	19.9	32.9	19.5

Supplementary Table S4. Modelled future data. Annual data for future period 2040-2099.

Date	Station									
	Güija		t142-894				t142-897			
	P (mm)		Tmax (°C)		Tmin (°C)		Tmax (°C)		Tmin (°C)	
	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5
2040	1732.8	1519.1	33.6	35.0	21.3	21.9	33.4	34.7	20.9	21.5
2041	1372.8	1523.0	34.1	34.1	21.1	21.4	33.9	33.8	20.7	21.0
2042	1232.6	1463.3	35.6	35.0	22.2	22.0	35.4	34.8	21.8	21.6
2043	1375.1	1417.4	35.3	34.7	22.1	22.0	35.1	34.4	21.7	21.6
2044	1374.1	1676.8	34.3	34.7	21.4	22.1	34.0	34.4	21.0	21.7
2045	1403.8	1447.9	35.4	34.1	22.0	21.5	35.2	33.8	21.6	21.2
2046	866.7	1372.6	36.2	34.6	21.9	21.9	36.0	34.3	21.5	21.5
2047	927.0	1373.6	36.0	34.8	22.0	22.0	35.7	34.6	21.6	21.6
2048	715.4	1286.2	37.1	36.1	22.1	22.3	36.8	35.9	21.7	21.9
2049	1089.4	1072.0	36.0	36.4	22.3	22.6	35.7	36.2	21.9	22.2
2050	1478.2	1279.3	35.0	35.7	21.9	22.7	34.8	35.5	21.5	22.3

2051	1154.4	1358.2	35.0	35.6	21.6	22.6	34.7	35.4	21.2	22.2
2052	1478.1	1286.7	34.9	36.1	21.6	22.7	34.7	35.9	21.2	22.3
2053	1472.3	1062.5	34.8	36.0	21.8	22.2	34.5	35.8	21.4	21.8
2054	1779.3	1439.1	33.3	35.3	21.4	22.5	33.1	35.1	21.1	22.2
2055	812.9	1476.8	36.3	35.2	22.2	22.4	36.1	34.9	21.8	22.0
2056	1320.6	1244.1	35.3	35.8	22.2	22.6	35.1	35.5	21.8	22.2
2057	1199.1	955.3	35.2	36.5	21.9	23.0	34.9	36.2	21.5	22.6
2058	1269.7	1112.6	35.5	36.8	22.2	23.1	35.2	36.5	21.8	22.7
2059	753.5	1536.1	36.6	36.7	22.1	23.3	36.4	36.5	21.7	22.9
2060	1220.7	1332.5	35.8	36.2	22.4	23.2	35.5	36.0	22.0	22.8
2061	1055.0	1132.5	36.7	37.1	22.5	23.4	36.5	36.8	22.1	23.0
2062	1580.7	1553.9	35.5	36.0	22.6	23.5	35.2	35.8	22.2	23.1
2063	1070.6	1209.6	35.9	36.3	22.5	22.9	35.7	36.1	22.1	22.5
2064	1769.3	1459.3	34.5	35.4	22.2	22.8	34.2	35.2	21.8	22.4
2065	1526.2	1268.5	34.6	36.7	22.2	23.4	34.3	36.4	21.8	23.0
2066	1077.9	966.0	36.1	36.8	22.6	23.2	35.8	36.5	22.2	22.8
2067	1119.9	1371.9	35.8	36.5	22.0	23.5	35.6	36.3	21.6	23.1
2068	639.9	1393.6	36.7	36.4	22.0	23.7	36.4	36.1	21.6	23.4
2069	687.5	1368.1	37.2	36.1	22.6	23.6	37.0	35.8	22.2	23.2
2070	1218.2	913.6	36.1	37.9	22.9	24.0	35.8	37.6	22.5	23.6
2071	1012.5	1100.0	36.6	37.4	22.9	23.6	36.3	37.2	22.5	23.2
2072	1258.7	1132.1	36.0	37.6	22.7	24.2	35.8	37.3	22.3	23.8
2073	1245.3	942.6	36.7	37.8	23.1	24.1	36.4	37.5	22.7	23.7
2074	914.7	1080.3	36.5	37.6	22.7	23.9	36.3	37.3	22.3	23.6
2075	1086.0	1250.3	37.1	37.4	22.9	24.0	36.9	37.1	22.5	23.6
2076	1108.9	1065.9	36.0	37.6	22.5	24.2	35.7	37.3	22.2	23.8
2077	1082.7	1175.2	36.2	38.3	22.7	24.6	35.9	38.0	22.3	24.2
2078	1063.1	1152.2	36.7	38.0	23.0	24.6	36.5	37.8	22.6	24.2
2079	990.6	1094.5	36.9	38.2	22.8	24.8	36.7	38.0	22.4	24.4
2080	928.2	1079.9	37.2	38.5	23.1	24.7	37.0	38.3	22.7	24.3
2081	1360.2	881.3	35.6	39.1	22.7	25.2	35.4	38.9	22.3	24.8
2082	1072.5	908.6	35.8	38.6	22.7	24.8	35.5	38.4	22.3	24.4
2083	1202.3	1229.7	35.8	37.5	22.6	24.5	35.6	37.3	22.2	24.1
2084	1176.4	1142.3	36.4	37.2	22.7	24.3	36.2	37.0	22.3	23.9
2085	1150.7	845.3	35.8	38.9	22.5	24.7	35.6	38.6	22.1	24.3
2086	1248.5	1036.4	36.1	38.4	22.8	25.0	35.8	38.2	22.4	24.6
2087	1449.8	675.8	35.8	39.3	22.7	25.2	35.6	39.0	22.3	24.8
2088	1489.7	524.4	35.8	40.1	22.9	25.5	35.6	39.8	22.5	25.1
2089	937.7	670.0	36.9	39.6	23.1	25.5	36.7	39.3	22.7	25.1
2090	1283.0	516.8	36.2	39.7	23.0	25.0	35.9	39.5	22.6	24.6
2091	976.9	869.4	36.7	38.9	22.7	25.5	36.5	38.7	22.3	25.1
2092	1176.4	942.0	36.4	38.7	22.7	25.2	36.2	38.4	22.3	24.8
2093	1067.1	664.7	36.7	39.9	23.1	25.5	36.5	39.6	22.7	25.1
2094	774.2	717.9	37.0	39.9	22.7	25.8	36.7	39.6	22.3	25.4
2095	1077.7	660.5	35.9	39.7	22.5	25.2	35.7	39.4	22.1	24.8
2096	1057.1	789.6	36.0	39.7	22.4	25.8	35.8	39.4	22.1	25.4
2097	1370.9	901.9	36.1	39.1	22.9	25.6	35.8	38.9	22.5	25.2
2098	1097.1	605.6	36.2	39.6	22.7	25.4	35.9	39.3	22.3	25.0
2099	992.1	986.9	36.9	39.3	22.8	25.8	36.7	39.1	22.4	25.4