

SUPPLEMENT TO:

Assessing Changes in US Regional Precipitation on Multiple Time Scales

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Journal of Hydrology 2019

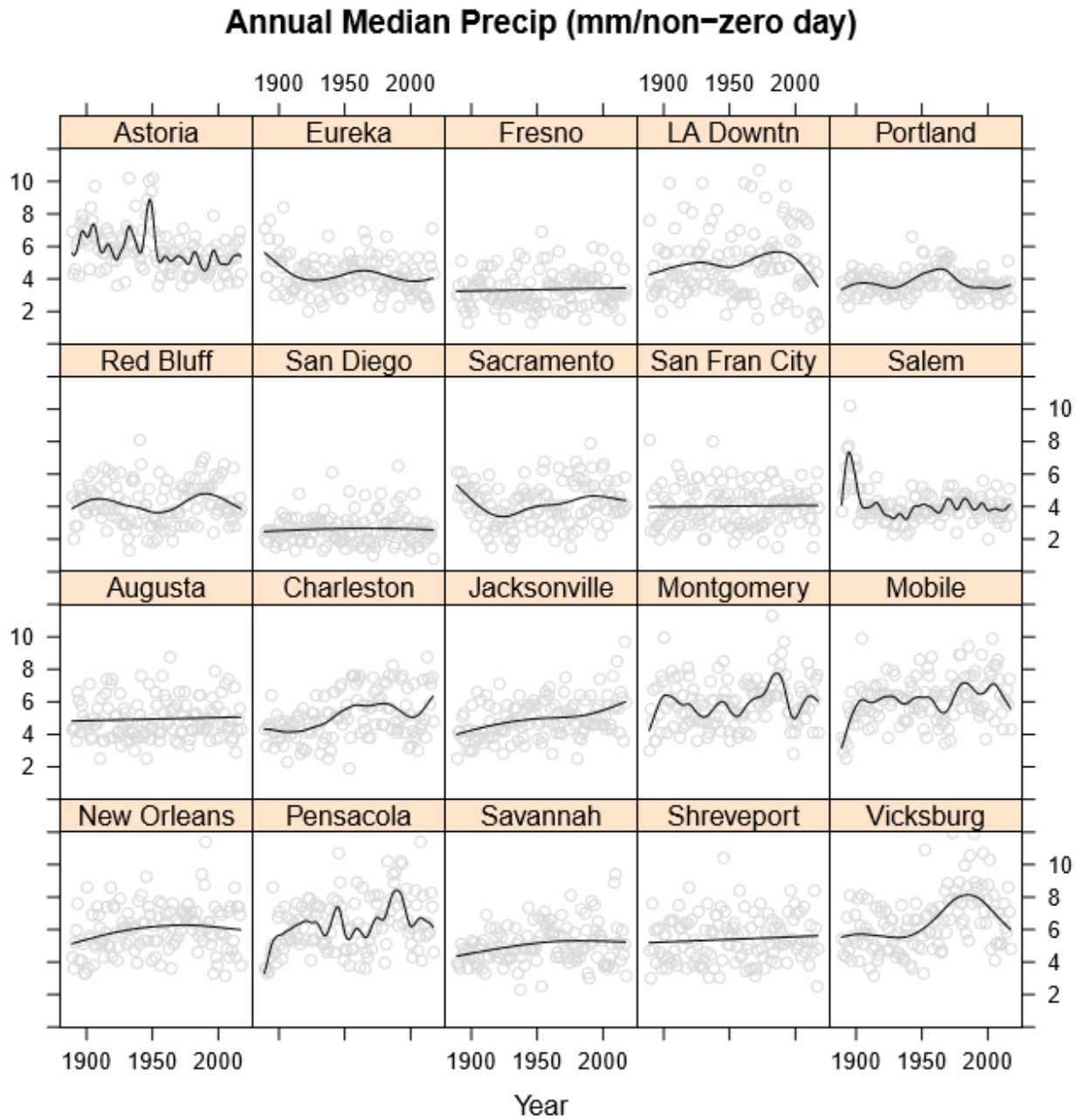


Figure S1: Annual Median (mm/day) of Non-Zero Days 1889-2017 in each of the studied locations with spline smoother shown.

Annual Variance in Precip

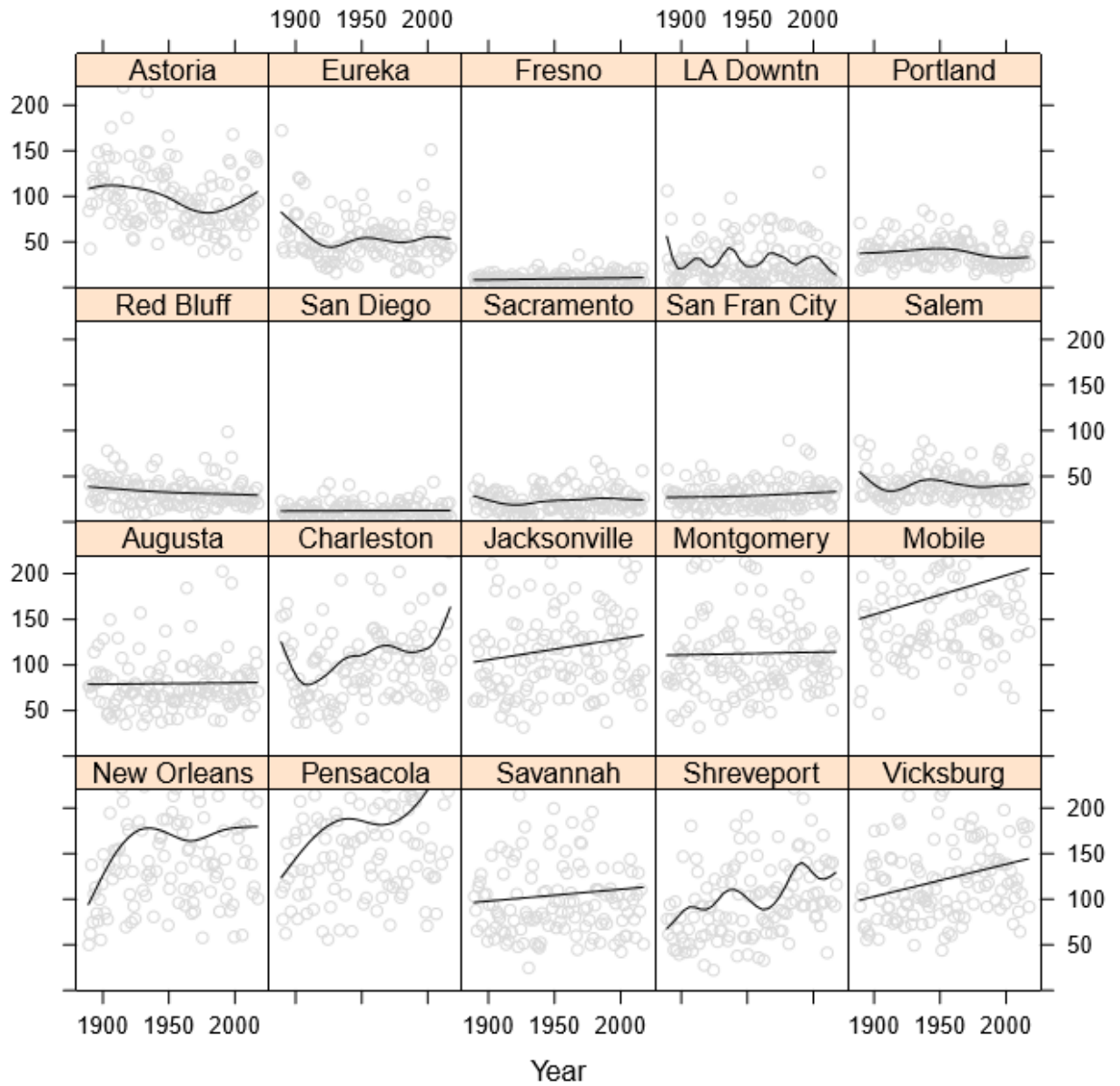


Figure S2. Annual variance 1889-2017 in each of the studied locations with spline smoother shown.

Annual Downpours (>25 mm/day)

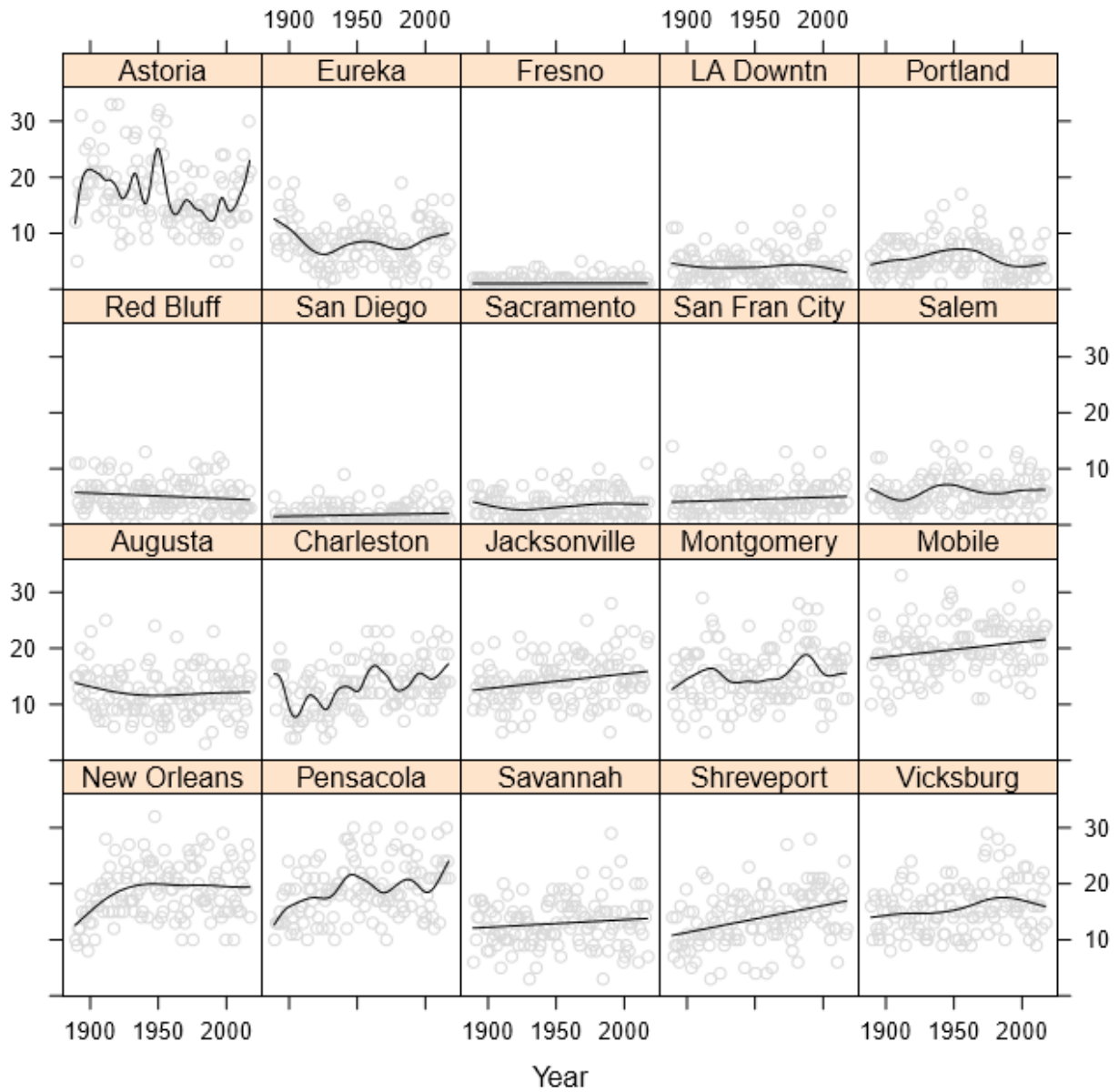


Figure S3: Annual Downpour Event Occurrence 1889-2017 in each of the studied locations applying a spline smoother.

Annual 1 day 99% Exceedances

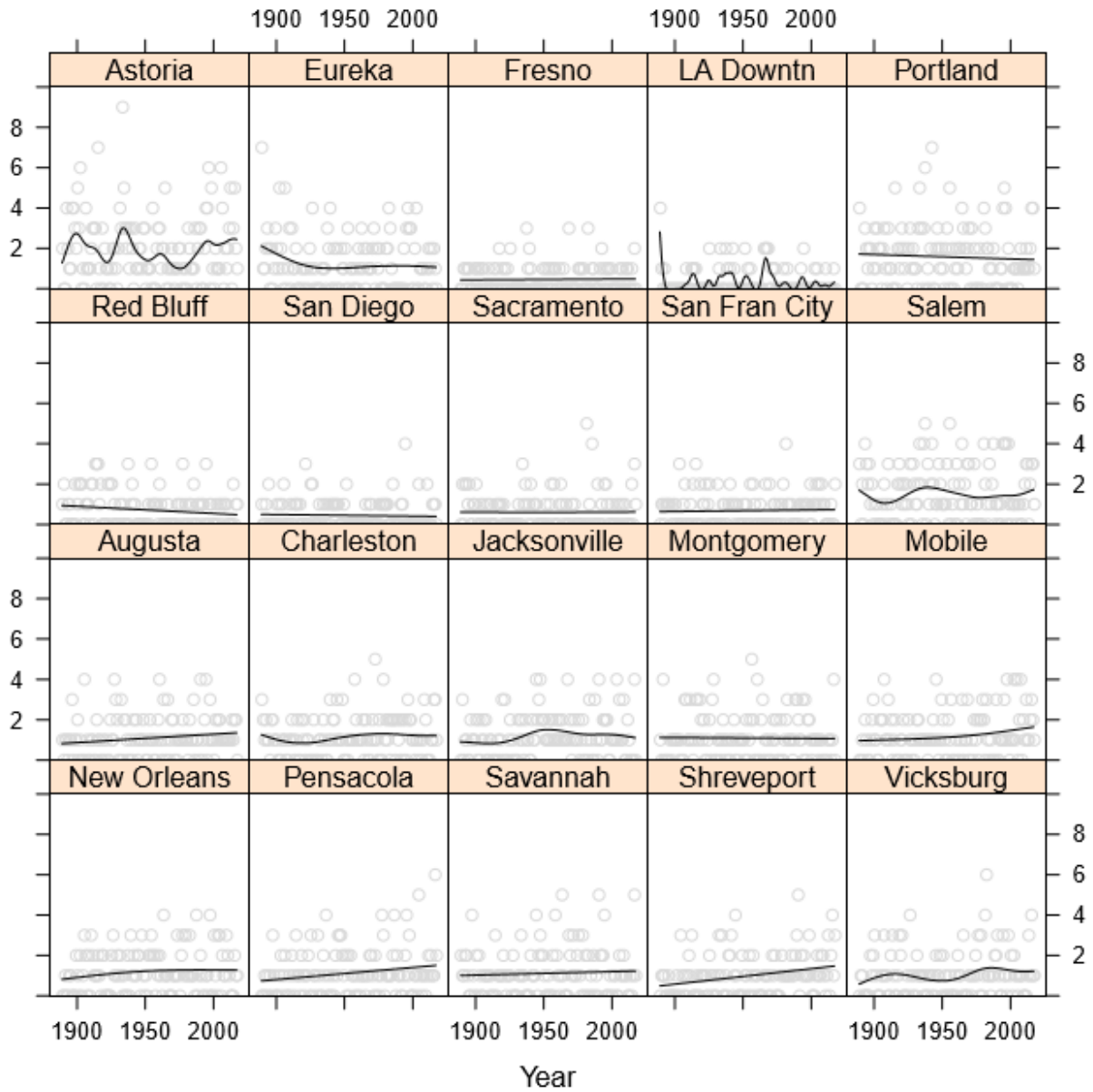


Figure S4. Annual 1-day exceedances of 1889 – 2017 1-day 99th percentile cut-off in each of the studied locations with spline smoother shown.

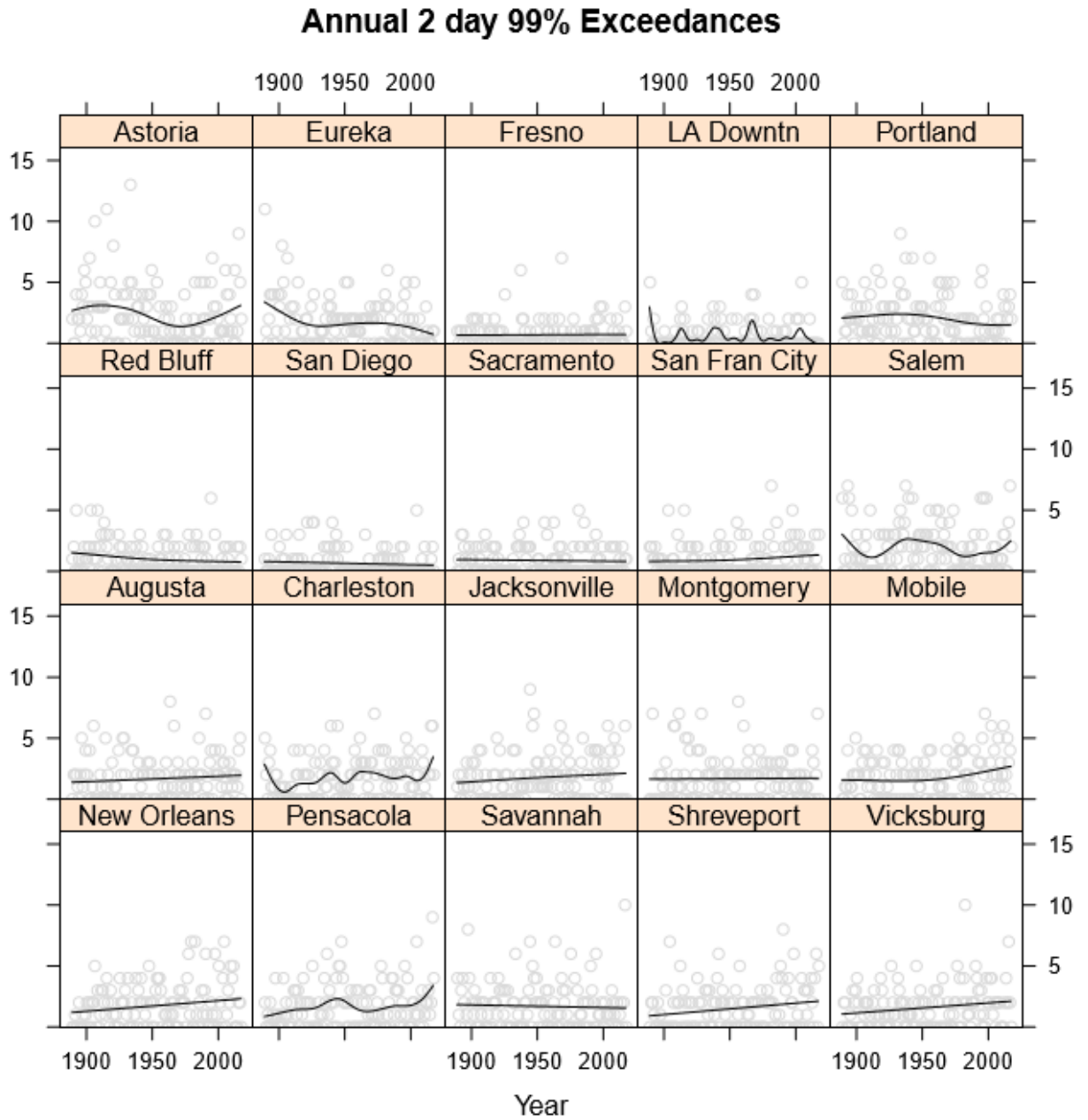


Figure S4. Annual 2-day exceedances of 1889 – 2017 2-day 99th percentile cut-off in each of the studied locations with spline smoother shown.

SUPPLEMENTARY TABLES

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SUMMARY TABLES - LONG TERM PRECIP FOR 10 US LOCATIONS
 START YEAR: 1889 ; SEASONAL FALSE ; SEASON (IF APPLICABLE) Fall
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Regional Trend Summaries:
 + pos sig, 0 pos insig, (0) neg insig, - neg sig; _w weighted

	Reg_avg	Reg_med	Reg_var	Reg_max	Reg_dpr	Reg_ldx	Reg_2dx
	(0)	(0)	(0)	(0)	(0)	(0)	-
Pacific							
SouthEast	+	+	+	+	+	+	+
Total	+	+	+	0	+	+	0

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Table S1: Summary Stats for 1-day Totals

	Start	Year	Mean	Median	Variance	Max	Trend	CI-lower	CI-upper	VF	Score
Astoria	1889	5.09	5.6	99.23	177.3	-0.0068	-0.0128	-0.0008		53.59	
Eureka	1889	2.73	4.1	54.78	172.5	-0.0015	-0.0095	0.0064		1.57	
Fresno	1889	0.71	3.3	9.75	60.5	0.0009	-0.0003	0.0021		25.22	
LA Downtn	1889	1.01	4.8	29.88	149.4	-0.0009	-0.0034	0.0016		5.52	
Portland	1889	2.76	3.8	38.37	114.3	-0.0016	-0.0075	0.0042		3.31	
Red Bluff	1889	1.60	4.1	33.13	102.6	-0.0016	-0.0055	0.0024		6.52	
San Diego	1889	0.69	2.5	12.20	82.0	-0.0003	-0.0020	0.0015		0.99	
Sacramento	1889	1.25	4.1	23.44	92.2	0.0012	-0.0021	0.0046		5.48	
San Fran City	1889	1.48	4.1	29.34	140.7	0.0009	-0.0019	0.0036		4.20	
Salem	1889	2.76	4.1	41.17	134.6	0.0007	-0.0028	0.0042		1.75	
Augusta	1889	3.03	4.8	79.87	247.9	-0.0009	-0.0038	0.0020		4.10	
Charleston	1889	3.36	4.8	109.82	292.1	0.0065	0.0004	0.0127		47.10	
Jacksonville	1889	3.55	4.8	118.08	249.4	0.0034	-0.0011	0.0078		24.04	
Montgomery	1889	3.55	5.6	112.70	246.4	0.0008	-0.0031	0.0047		1.75	
Mobile	1889	4.46	6.1	178.29	339.3	0.0047	0.0013	0.0081		78.80	
New Orleans	1889	4.24	5.8	164.32	355.9	0.0056	-0.0028	0.0140		18.61	
Pensacola	1889	4.29	6.1	187.25	395.0	0.0087	0.0036	0.0138		123.03	
Savannah	1889	3.31	4.8	104.97	229.1	0.0013	-0.0033	0.0058		3.17	
Shreveport	1889	3.16	5.3	104.99	306.1	0.0067	0.0032	0.0103		149.87	
Vicksburg	1889	3.62	6.4	121.85	222.3	0.0046	-0.0001	0.0094		40.02	

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Table S2: Summary Stats for 2-day Totals

	Start	Year	Mean	Median	Variance	Max	Trend	CI-lower	CI-upper	VF	Score
Astoria	1889	10.17	9.4	272.92	227.3	-0.0135	-0.0256	-0.0015		52.87	
Eureka	1889	5.46	6.1	146.42	224.1	-0.0031	-0.0188	0.0126		1.61	
Fresno	1889	1.42	4.3	23.86	80.7	0.0018	-0.0005	0.0042		25.09	
LA Downtn	1889	2.00	5.8	76.99	202.6	-0.0020	-0.0068	0.0028		7.37	
Portland	1889	5.51	6.0	104.39	156.5	-0.0033	-0.0151	0.0084		3.41	
Red Bluff	1889	3.19	6.1	86.22	174.5	-0.0031	-0.0110	0.0048		6.51	
San Diego	1889	1.37	3.1	30.77	101.1	-0.0007	-0.0041	0.0028		1.64	
Sacramento	1889	2.50	5.6	61.64	147.3	0.0024	-0.0043	0.0090		5.30	
San Fran City	1889	2.96	5.6	76.25	172.3	0.0017	-0.0038	0.0072		3.96	
Salem	1889	5.51	6.3	114.32	186.7	0.0014	-0.0056	0.0084		1.64	
Augusta	1889	6.05	6.9	178.59	253.5	-0.0019	-0.0077	0.0039		4.48	
Charleston	1889	6.72	7.1	251.96	363.5	0.0131	0.0008	0.0254		47.93	
Jacksonville	1889	7.09	7.1	276.41	319.0	0.0068	-0.0022	0.0157		23.83	
Montgomery	1889	7.10	8.4	252.02	303.3	0.0016	-0.0061	0.0093		1.84	
Mobile	1889	8.91	9.1	408.65	339.3	0.0095	0.0025	0.0165		77.80	
New Orleans	1889	8.48	8.9	368.79	361.9	0.0112	-0.0056	0.0281		18.71	
Pensacola	1889	8.57	8.9	436.08	520.0	0.0174	0.0071	0.0277		118.87	
Savannah	1889	6.61	7.1	240.04	296.7	0.0026	-0.0067	0.0119		3.26	
Shreveport	1889	6.31	7.6	237.72	435.9	0.0133	0.0063	0.0204		149.58	

Vicksburg 1889 7.24 8.9 272.77 270.5 0.0093 -0.0001 0.0188 40.72

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Table S3: Trend Info for Annual Averages

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0063	-0.0126	0.0000	42.4208
Eureka	-0.0012	-0.0090	0.0066	1.0141
Fresno	0.0010	-0.0001	0.0022	33.4450
LA Downtn	-0.0008	-0.0032	0.0016	4.5387
Portland	-0.0014	-0.0072	0.0045	2.2760
Red Bluff	-0.0014	-0.0052	0.0025	5.4144
San Diego	-0.0002	-0.0020	0.0016	0.4971
Sacramento	0.0014	-0.0019	0.0046	7.4392
San Fran City	0.0011	-0.0016	0.0037	6.7204
Salem	0.0010	-0.0023	0.0044	3.8784
Augusta	-0.0010	-0.0040	0.0020	4.5743
Charleston	0.0063	0.0001	0.0126	43.1406
Jacksonville	0.0031	-0.0014	0.0076	20.0058
Montgomery	0.0008	-0.0031	0.0047	1.6955
Mobile	0.0046	0.0012	0.0080	76.1087
New Orleans	0.0055	-0.0029	0.0138	17.9683
Pensacola	0.0086	0.0035	0.0136	121.9534
Savannah	0.0010	-0.0036	0.0057	2.0817
Shreveport	0.0068	0.0032	0.0104	149.8639
Vicksburg	0.0047	0.0000	0.0094	42.4361
Pacific	-0.0007	-0.0025	0.0011	5.7909
South East	0.0040	0.0015	0.0066	103.6944
All	0.0017	0.0002	0.0032	52.9825

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Table S4: Trend Info for Annual Non-Zero Medians

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0127	-0.0237	-0.0016	55.4981
Eureka	-0.0060	-0.0163	0.0042	14.6146
Fresno	0.0016	-0.0032	0.0063	4.6585
LA Downtn	0.0033	-0.0101	0.0167	2.5284
Portland	0.0000	-0.0125	0.0124	0.0003
Red Bluff	0.0018	-0.0097	0.0132	0.9866
San Diego	0.0009	-0.0046	0.0063	1.0336
Sacramento	0.0043	-0.0098	0.0183	3.8406
San Fran City	0.0007	-0.0038	0.0053	1.0575
Salem	-0.0082	-0.0267	0.0102	8.3469
Augusta	0.0019	-0.0032	0.0070	5.7495
Charleston	0.0147	0.0019	0.0275	55.4595
Jacksonville	0.0122	0.0061	0.0183	168.5724
Montgomery	0.0064	-0.0052	0.0180	12.8004
Mobile	0.0112	0.0010	0.0215	50.2043
New Orleans	0.0067	-0.0053	0.0187	13.0296
Pensacola	0.0131	0.0013	0.0250	51.4718
Savannah	0.0070	-0.0023	0.0163	23.8539
Shreveport	0.0033	-0.0026	0.0092	12.9304
Vicksburg	0.0189	-0.0008	0.0386	38.8101
Pacific	-0.0014	-0.0053	0.0024	6.0170
South East	0.0095	0.0040	0.0151	122.3156
All	0.0040	0.0002	0.0078	47.6693

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Table S5: Trend Info for Annual Variances

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.2170	-0.5062	0.0723	23.6297
Eureka	-0.0853	-0.3367	0.1661	4.8337
Fresno	0.0197	0.0006	0.0389	44.6891
LA Downtn	-0.0257	-0.1429	0.0916	2.0159

Portland	-0.0586	-0.1904	0.0732	8.3081
Red Bluff	-0.0692	-0.1715	0.0331	19.2059
San Diego	0.0052	-0.0386	0.0491	0.5946
Sacramento	0.0303	-0.0490	0.1096	6.1230
San Fran City	0.0500	-0.0359	0.1359	14.2382
Salem	-0.0167	-0.1234	0.0899	1.0313
Augusta	0.0161	-0.1140	0.1463	0.6465
Charleston	0.3766	0.1076	0.6456	82.3458
Jacksonville	0.2298	-0.0789	0.5386	23.2798
Montgomery	0.0294	-0.1649	0.2237	0.9615
Mobile	0.4295	0.0711	0.7880	60.3347
New Orleans	0.3819	-0.2069	0.9707	17.6781
Pensacola	0.7078	0.0660	1.3496	51.1044
Savannah	0.1305	-0.0524	0.3134	21.3936
Shreveport	0.4114	0.1245	0.6984	86.3768
Vicksburg	0.3552	0.1177	0.5927	94.0075
Pacific	-0.0367	-0.0871	0.0137	22.2981
South East	0.3068	0.1714	0.4423	215.4897
All	0.1351	0.0615	0.2086	141.6970

Table S6: Trend Info for Annual Maximum

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0949	-0.2883	0.0985	10.1202
Eureka	-0.0935	-0.2120	0.0250	26.1808
Fresno	-0.0020	-0.0712	0.0671	0.0362
LA Downtn	-0.0481	-0.1884	0.0923	4.9307
Portland	-0.0683	-0.1438	0.0073	34.3239
Red Bluff	-0.0448	-0.1389	0.0494	9.5090
San Diego	0.0004	-0.0754	0.0762	0.0012
Sacramento	0.0181	-0.0654	0.1016	1.9761
San Fran City	0.0755	-0.0737	0.2246	10.7549
Salem	-0.0904	-0.1866	0.0057	37.1816
Augusta	0.0897	-0.0069	0.1864	36.2158
Charleston	0.1849	0.0218	0.3480	53.9858
Jacksonville	0.1052	-0.1384	0.3488	7.8364
Montgomery	-0.0180	-0.1934	0.1574	0.4420
Mobile	0.1787	-0.0596	0.4170	23.6202
New Orleans	0.1128	-0.2392	0.4649	4.3166
Pensacola	0.2975	-0.0114	0.6064	38.9704
Savannah	0.0290	-0.1221	0.1800	1.5447
Shreveport	0.1616	-0.0115	0.3346	36.6238
Vicksburg	0.1980	0.0388	0.3572	64.9772
Pacific	-0.0348	-0.0836	0.0140	21.3529
South East	0.1339	0.0340	0.2339	75.5047
All	0.0496	-0.0153	0.1145	24.5148

Table S7: Trend Info for Annual Downpour Occurrences

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0386	-0.0853	0.0080	28.8410
Eureka	-0.0072	-0.0536	0.0392	1.0076
Fresno	0.0002	-0.0041	0.0046	0.1270
LA Downtn	-0.0027	-0.0194	0.0139	1.1391
Portland	-0.0074	-0.0494	0.0346	1.3061
Red Bluff	-0.0101	-0.0245	0.0042	20.8763
San Diego	0.0046	-0.0028	0.0119	16.1458
Sacramento	0.0054	-0.0115	0.0223	4.2304
San Fran City	0.0077	-0.0036	0.0191	19.7060
Salem	0.0071	-0.0166	0.0309	3.8066
Augusta	-0.0081	-0.0384	0.0222	3.0009
Charleston	0.0425	0.0099	0.0750	71.5727
Jacksonville	0.0262	0.0075	0.0450	82.0256

Montgomery	0.0170	-0.0135	0.0475	13.0140
Mobile	0.0266	0.0030	0.0502	53.3127
New Orleans	0.0354	-0.0198	0.0907	17.2733
Pensacola	0.0431	0.0015	0.0848	45.0850
Savannah	0.0134	-0.0107	0.0375	12.9651
Shreveport	0.0480	0.0288	0.0673	262.1735
Vicksburg	0.0275	0.0012	0.0539	45.8313
Pacific	-0.0041	-0.0121	0.0039	11.0506
South East	0.0272	0.0143	0.0401	186.2455
All	0.0115	0.0043	0.0187	107.8740

Table S8: Trend Info for Annual 1-day Exceedances of 1-day 99th percentile

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0012	-0.0145	0.0120	0.3526
Eureka	-0.0046	-0.0147	0.0054	8.8726
Fresno	0.0004	-0.0015	0.0023	1.6880
LA Downtn	-0.0013	-0.0059	0.0033	3.3282
Portland	-0.0022	-0.0096	0.0053	3.5820
Red Bluff	-0.0036	-0.0088	0.0017	19.3944
San Diego	-0.0008	-0.0037	0.0022	2.8449
Sacramento	0.0000	-0.0047	0.0047	0.0029
San Fran City	0.0008	-0.0032	0.0048	1.6416
Salem	0.0011	-0.0068	0.0091	0.8539
Augusta	0.0042	0.0012	0.0072	80.9513
Charleston	0.0030	-0.0027	0.0086	11.6066
Jacksonville	0.0038	-0.0044	0.0119	8.9365
Montgomery	-0.0004	-0.0062	0.0054	0.1993
Mobile	0.0050	-0.0022	0.0122	20.4760
New Orleans	0.0035	-0.0025	0.0095	13.9719
Pensacola	0.0060	0.0011	0.0110	61.7820
Savannah	0.0017	-0.0044	0.0079	3.3592
Shreveport	0.0077	0.0020	0.0134	77.0016
Vicksburg	0.0040	-0.0026	0.0107	15.4462
Pacific	-0.0011	-0.0037	0.0014	8.3769
South East	0.0038	0.0022	0.0055	222.2448
All	0.0014	0.0000	0.0027	45.0152

Table S9: Trend Info for Annual 2-day Exceedances of 2-day 99th percentile

	Trend	CI-lower	CI-upper	VF Score
Astoria	-0.0086	-0.0312	0.0140	6.1084
Eureka	-0.0113	-0.0255	0.0030	26.1820
Fresno	0.0005	-0.0027	0.0038	1.1641
LA Downtn	-0.0010	-0.0063	0.0043	1.4306
Portland	-0.0074	-0.0202	0.0054	13.8930
Red Bluff	-0.0059	-0.0146	0.0028	19.4600
San Diego	-0.0024	-0.0088	0.0041	5.7284
Sacramento	-0.0012	-0.0064	0.0040	2.2068
San Fran City	0.0042	-0.0036	0.0120	12.0888
Salem	-0.0027	-0.0166	0.0113	1.5211
Augusta	0.0045	-0.0032	0.0121	14.3713
Charleston	0.0074	-0.0004	0.0152	37.8219
Jacksonville	0.0061	-0.0047	0.0169	13.2806
Montgomery	0.0006	-0.0068	0.0080	0.2829
Mobile	0.0083	-0.0054	0.0219	15.4233
New Orleans	0.0087	0.0008	0.0166	51.2553
Pensacola	0.0078	-0.0028	0.0185	22.8595
Savannah	-0.0022	-0.0090	0.0046	4.3767
Shreveport	0.0094	0.0007	0.0181	49.1180
Vicksburg	0.0082	-0.0004	0.0169	38.4231
Pacific	-0.0036	-0.0067	-0.0004	54.7670
South East	0.0059	0.0033	0.0084	221.2736

All 0.0012 -0.0013 0.0036 9.1334
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