

Extreme Precipitation Statistics Adjusted for a Changing Climate

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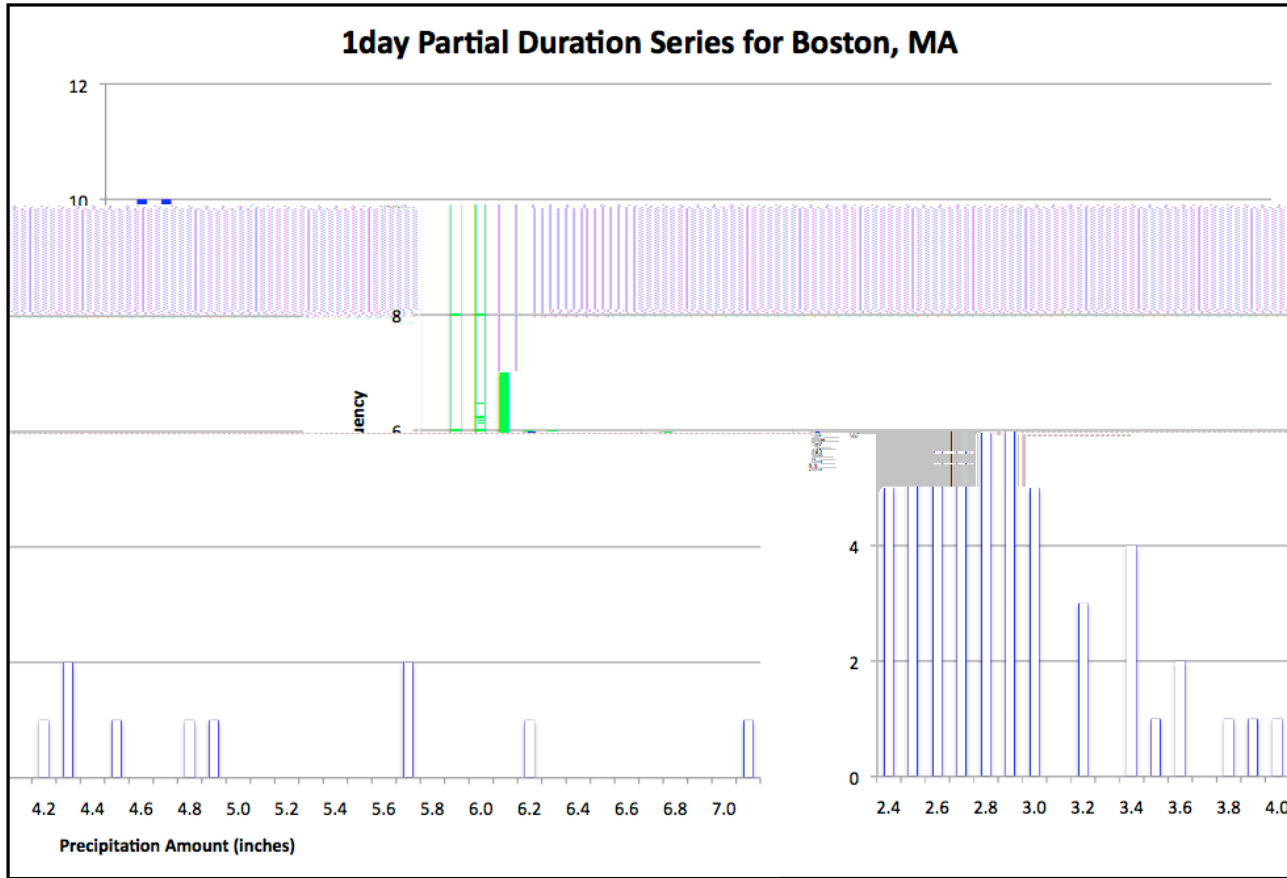
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Gather Observed Rainfall

Extreme Rainfall 101



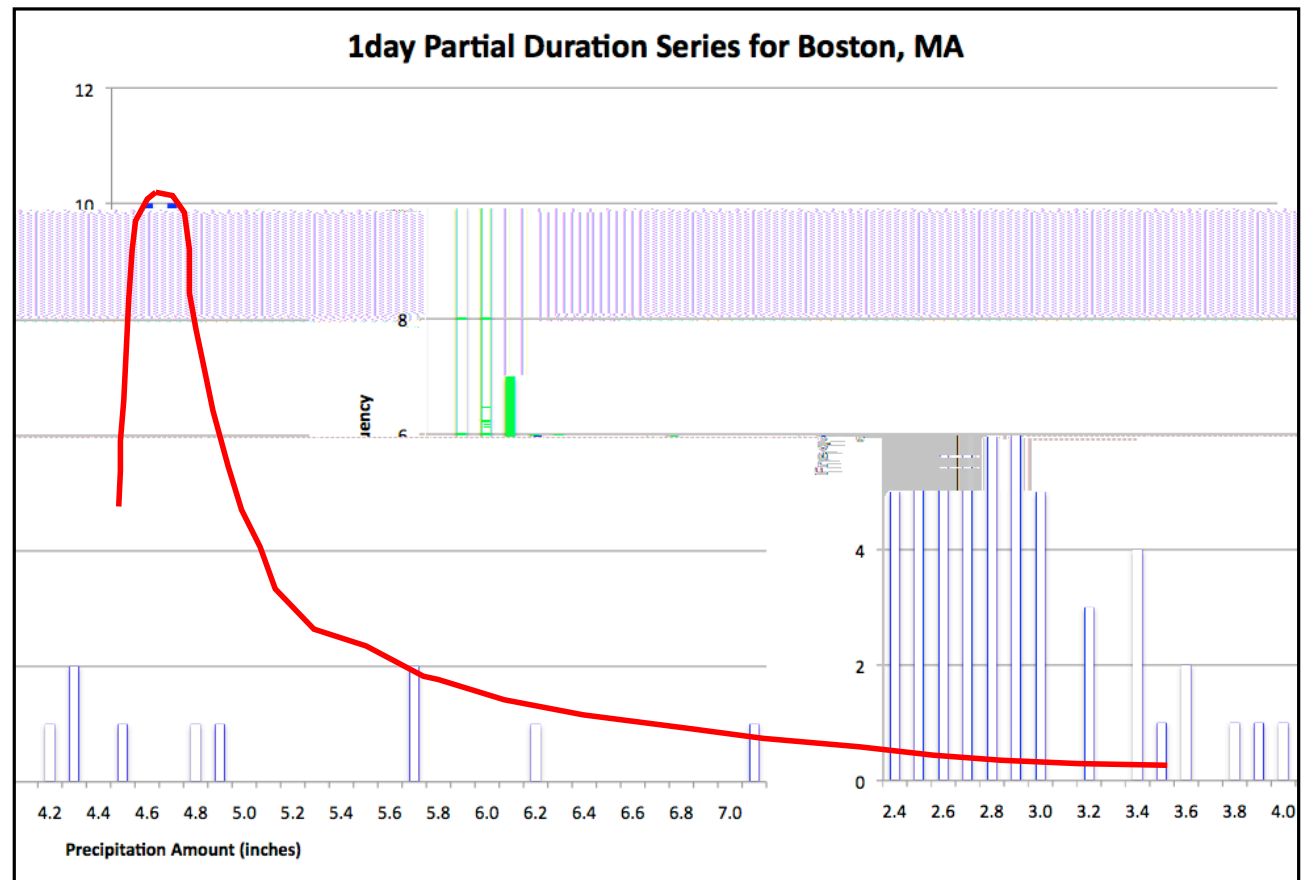
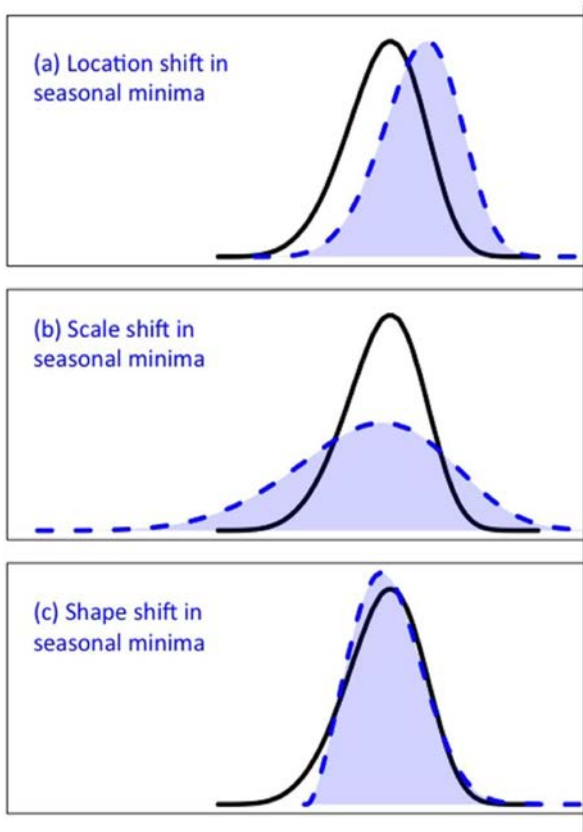
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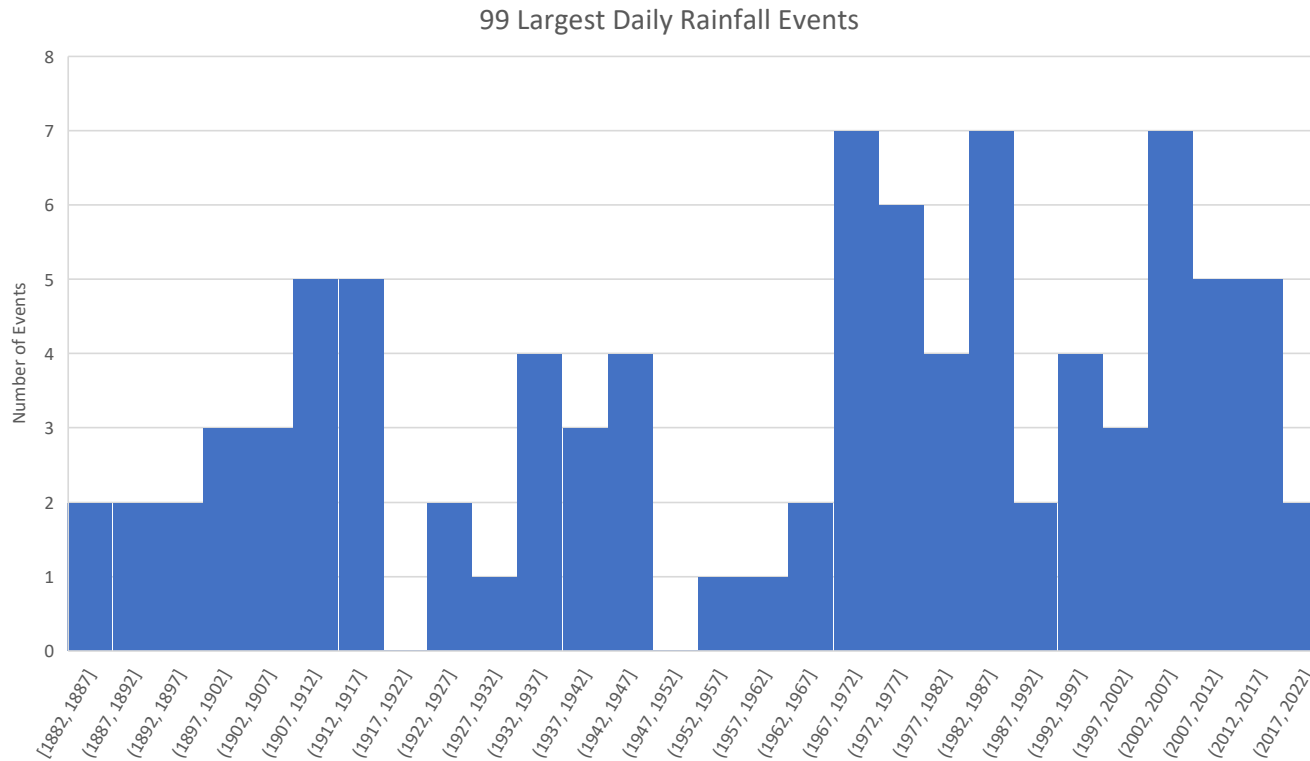
Choose and Fit a Distribution

Extreme Rainfall 101



Choose a Period of Record

Extreme Rainfall 101



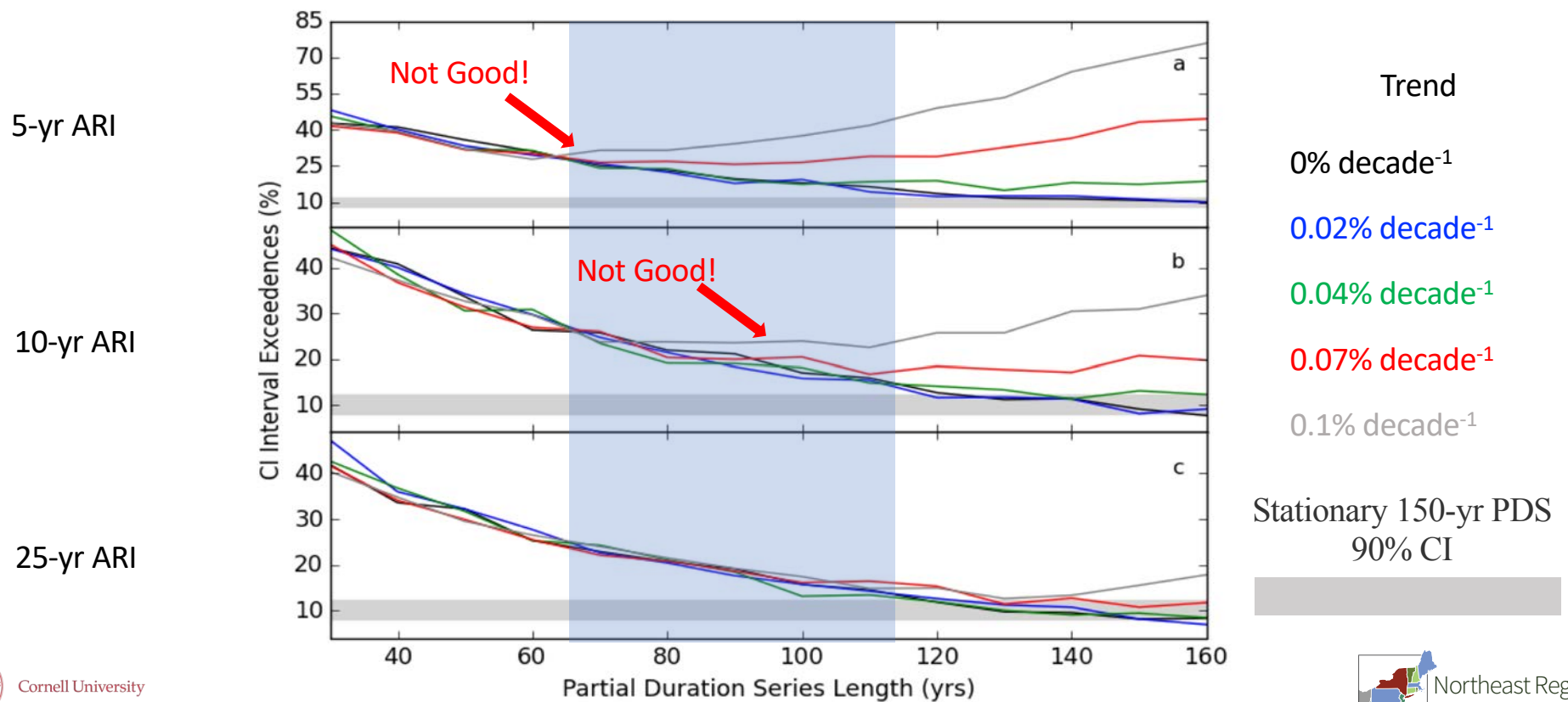
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Chose a Period of Record

Extreme Rainfall 101



Recent Extreme Rainfall Changes

For PDS starting in 1950



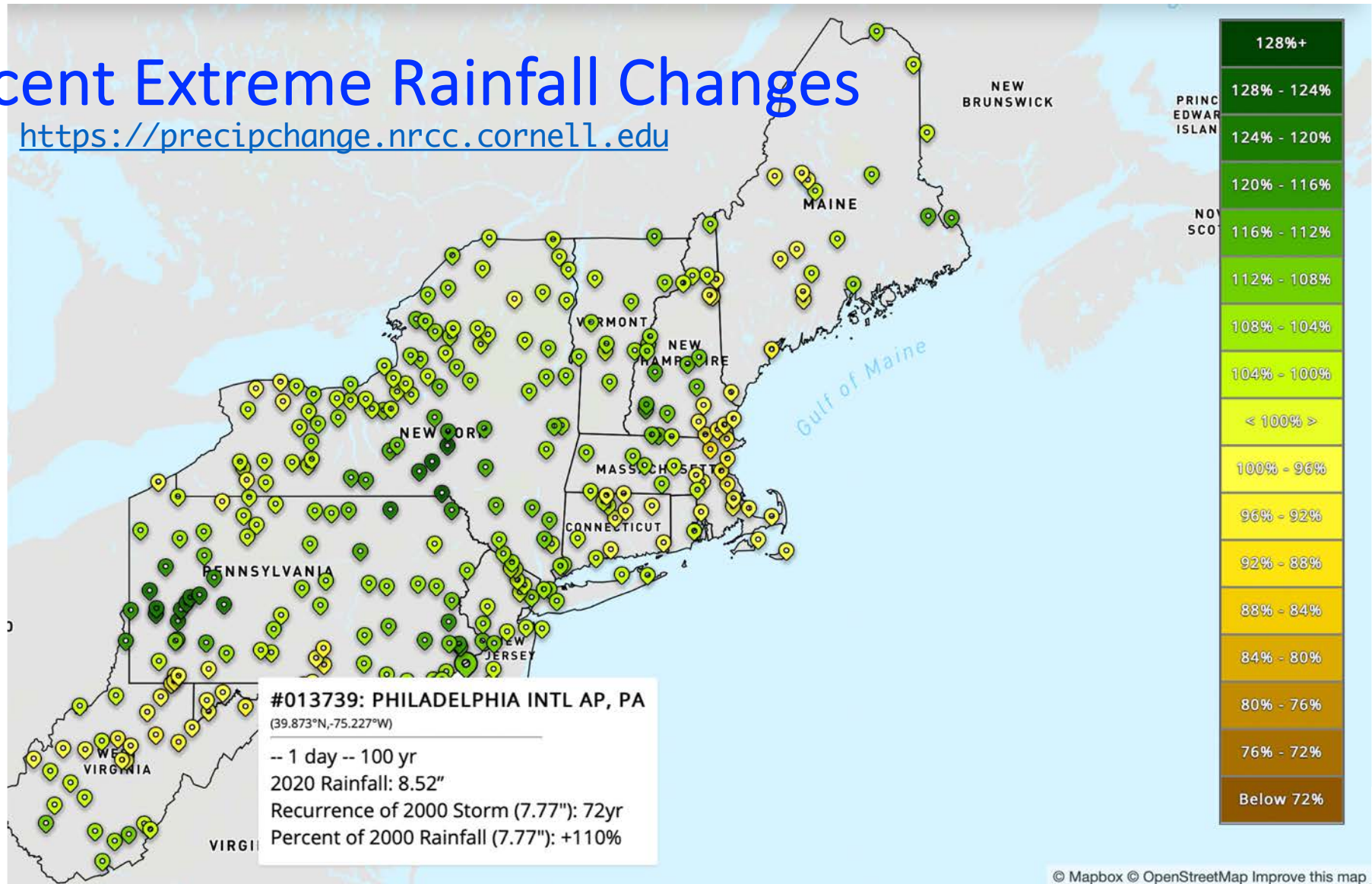
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Recent Extreme Rainfall Changes

<https://precipchange.nrcc.cornell.edu>



Recent Extreme Rainfall Changes

precipchange.nrcc.cornell.edu

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Future Extreme Rainfall:

Data

Dataset	RCPs	Approximate gridded spatial resolution*	Temporal resolution	Downscaling approach
BCCAv2	4.5,8.5	12 km (7.5 miles)	Daily	Statistical
MACA	4.5, 8.5	4 km (2.5 miles)	Daily	Statistical
LOCA	4.5, 8.5	6 km (3.7 miles)	Daily	Statistical
NA CORDEX	8.5	25 km (15.5 miles)	Daily and Sub-daily	Dynamical
NA CORDEX	4.5	25 km (15.5 miles)	Daily	Dynamical
NA CORDEX	4.5	50 km (31 miles)	Daily	Dynamical

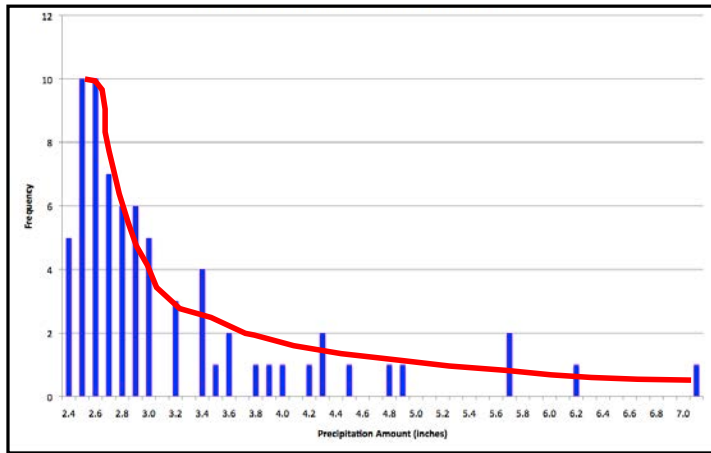


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Future Extreme Rainfall: Extreme Value Analysis



Future Extreme Rainfall:

Compute Change Factor

$$CF_i = \frac{P_{i,r,future}}{P_{r,historical}}$$



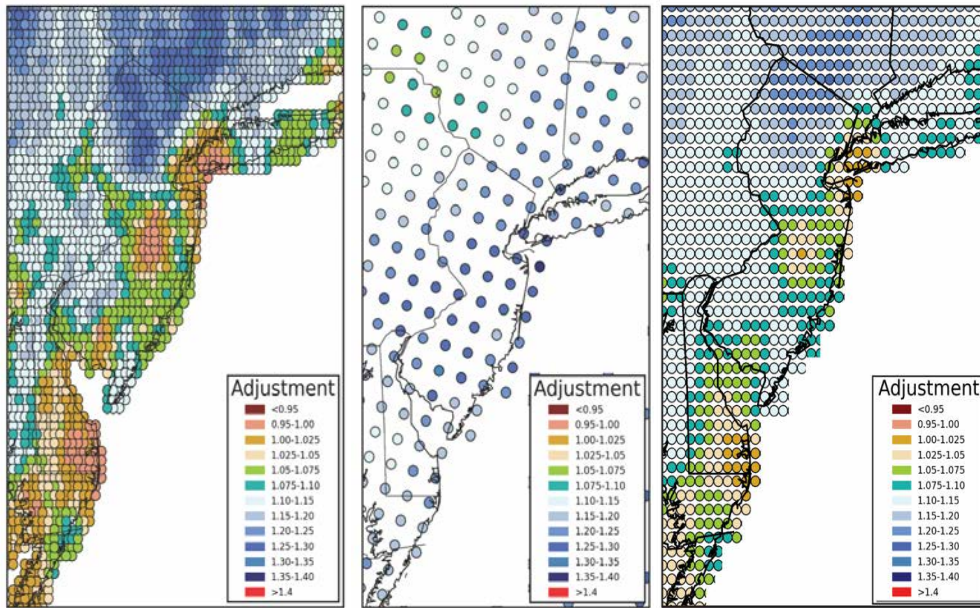
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Future Extreme Rainfall:

Interpolate and Smooth



LOCA

CORDEX

COMMON 0.1°

Low (RCP4.5) Emissions 2050-2099 100-yr Storm

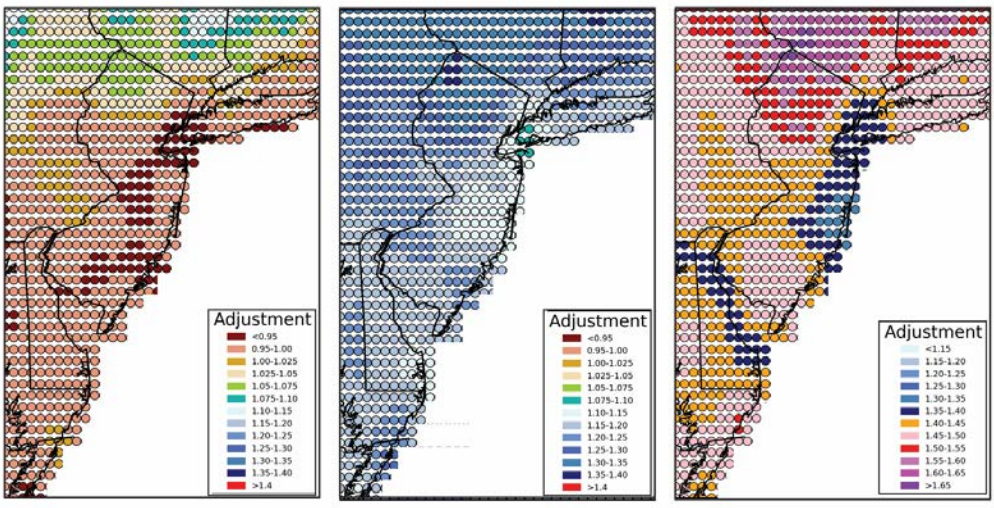


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Future Extreme Rainfall: Extract Ensemble Statistics



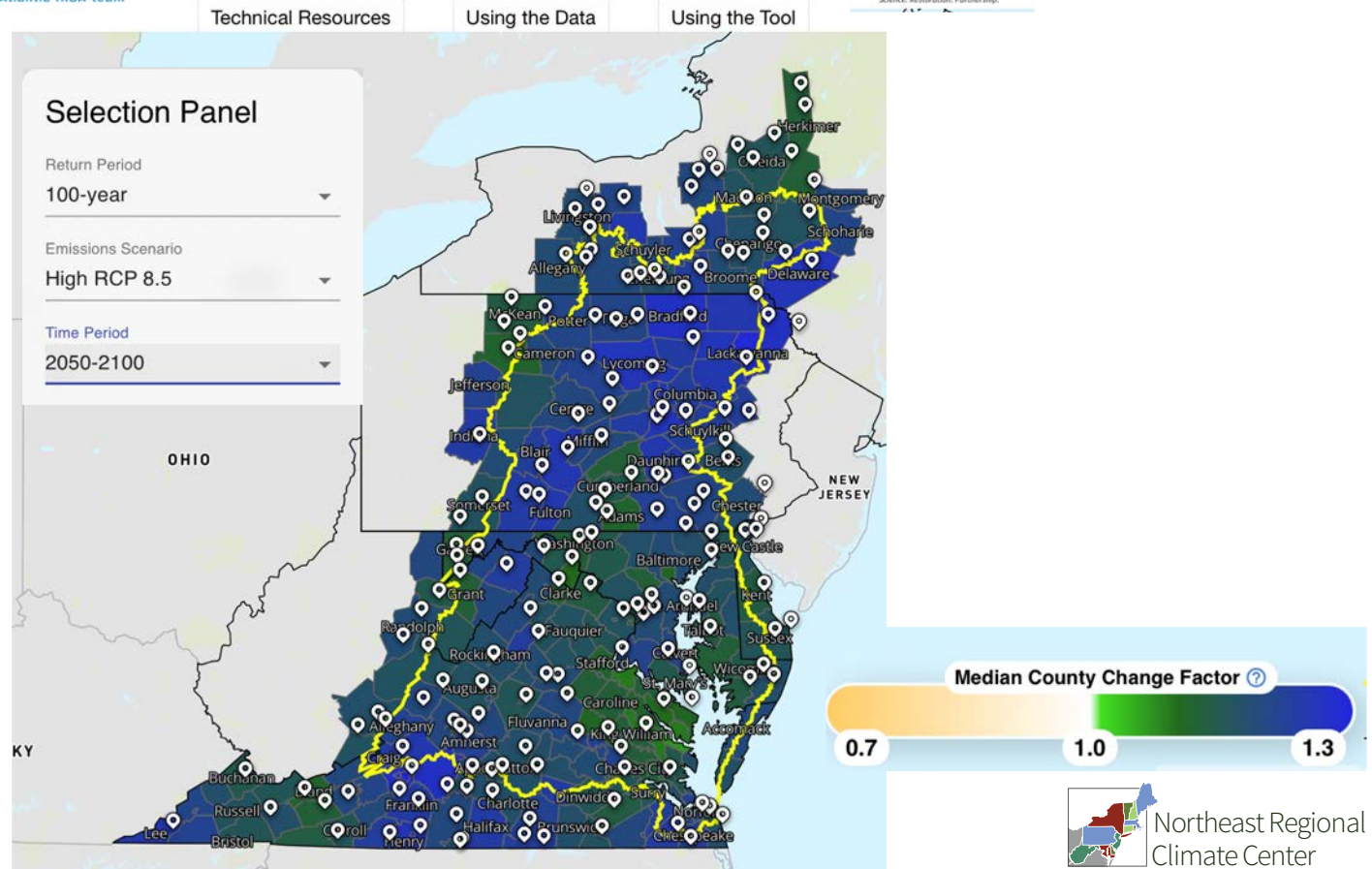
High Emissions 2050-2099 100-yr Storm

Future Extreme Rainfall

<https://midatlantic-idf.rcc-acis.org>



Projected Intensity-Duration-Frequency (IDF) Curve Data Tool for the Chesapeake Bay Watershed and Virginia

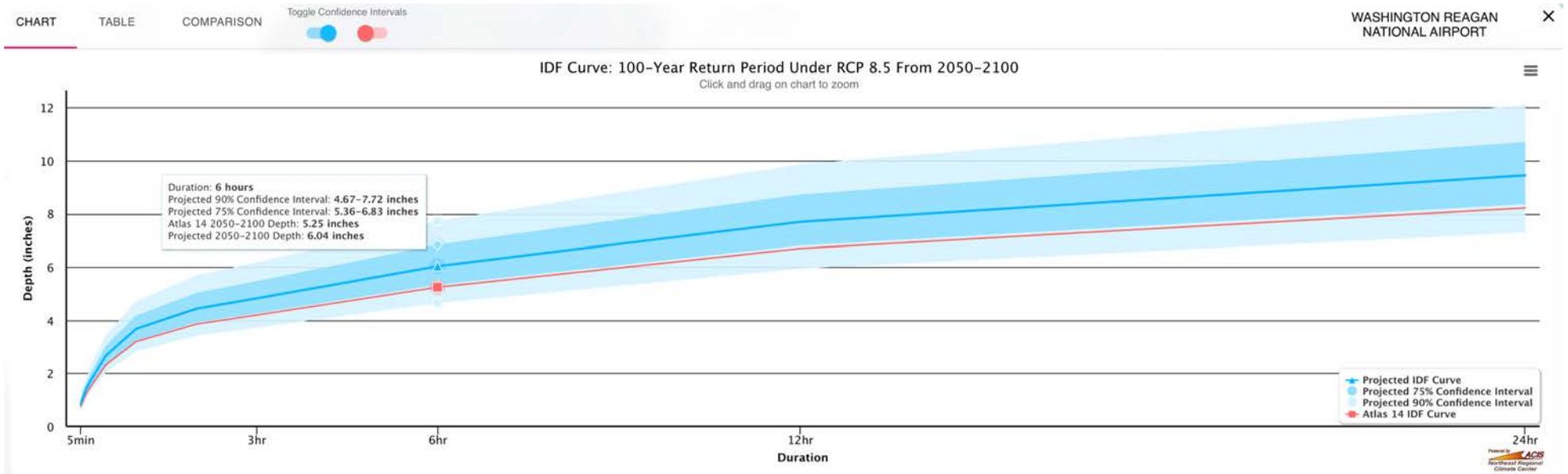


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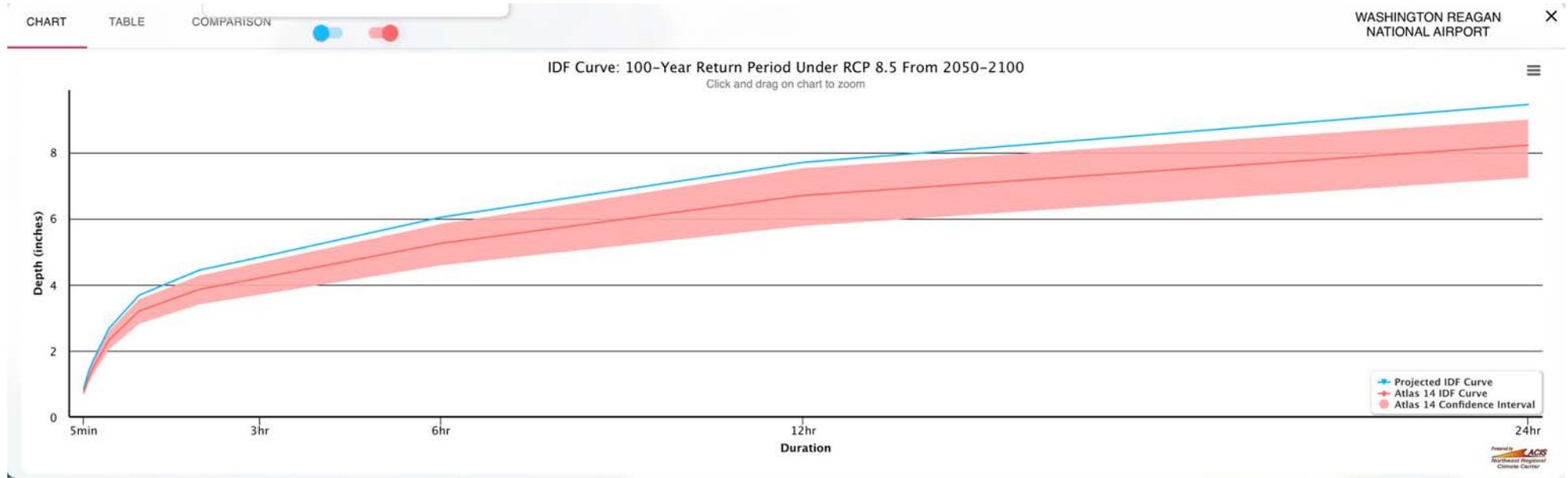
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Future Extreme Rainfall

County Values

CHART **TABLE** COMPARISON [DOWNLOAD CSV](#) PURCELLVILLE ✕

Percentile	10th	25th	Median	75th	90th	
County Change Factors:	0.98	1.05	1.14	1.26	1.481	Atlas 14 Depth (inches)
Duration	Projected 2050-2100 Depth (inches)					
5 min	0.76	0.82	0.89	0.98	1.16	0.78
10 min	1.19	1.27	1.38	1.52	1.79	1.21
15 min	1.49	1.60	1.73	1.92	2.25	1.52
30 min	2.22	2.38	2.59	2.86	3.36	2.27
60 min	3.03	3.24	3.52	3.89	4.58	3.09
2 hr	3.80	4.07	4.42	4.89	5.75	3.88
3 hr	4.10	4.39	4.77	5.27	6.19	4.18

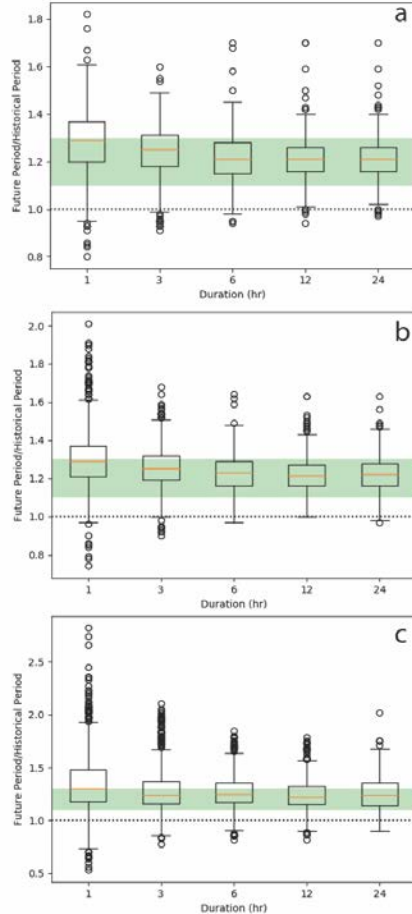
Future Extreme Rainfall

County Values

CHART	TABLE	COMPARISON	PURCELLVILLE		
Duration	Atlas 14 Depth (inches)	Projected 2050-2100 Depth (inches)	Change (inches)		
5 min	0.78	0.89	+0.11		
10 min	1.21	1.38	+0.17		
15 min	1.52	1.73	+0.21		
30 min	2.27	2.59	+0.32		
60 min	3.09	3.52	+0.43		
2 hr	3.88	4.42	+0.54		
3 hr	4.18	4.77	+0.59		
6 hr	5.16	5.88	+0.72		

Future Extreme Rainfall

Hourly CF



THANK YOU!



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