

# PRECIP.NET

## Extreme Precipitation in New York & New England An Interactive Web Tool for Extreme Precipitation Analysis

About this Project

Data & Products

Daily Monitoring

Documentation

### Select Product ?

Extreme Precipitation  
Tables - HTML ?

Extreme Precipitation  
Tables - Text/CSV ?

Partial Duration Series -  
by Point ?

Partial Duration Series -  
by Station ?

Distribution Curves -  
Graphical ?

Distribution Curves -  
Text/TBL ?

Intensity Frequency  
Duration Graphs ?

Precipitation Frequency  
Duration Graphs ?

GIS Data Files ?

Regional/State Maps ?

Select Location ? Double-click the map to place a marker, or enter address or latitude/longitude.

Locate by Address ?

Locate by Lat/Lon ?

Locate by State/County ?

Map data ©2015 Google Imagery ©2015 TerraMetrics Terms of Use Report a map error

Select Options ?

Smoothing ?

Yes

Delivery ?

Popup

Submit ?

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This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC)



Natural Resources Conservation Service (NRCS)



Contact: [precip@cornell.edu](mailto:precip@cornell.edu)

Art DeGaetano

Northeast Regional  
Climate Center

Dept. Earth and  
Atmospheric Science,  
Cornell University

# Project History

- USDA NRCS funded project for updated New York New England extreme precipitation atlas
- Match the products and output of NOAA Atlas 14 for NRCS compatibility.
- Add additional products to supplement NRCS hydrologic design.
- Produce automated real-time monitoring tools.

# Data

- 2,070 Coop Stations
- 649 daily stations in eastern Canada.
- Start of record to end of 2008
- At least 20 year and <25% of data record missing
- Available NOAA hourly and sub-hourly datasets

**AUTOMATIC**

## NRCC QC Process

Data is pre-screened by NOAA and climate center staff each month, and flagged if suspect, erroneous, or an accumulated value.

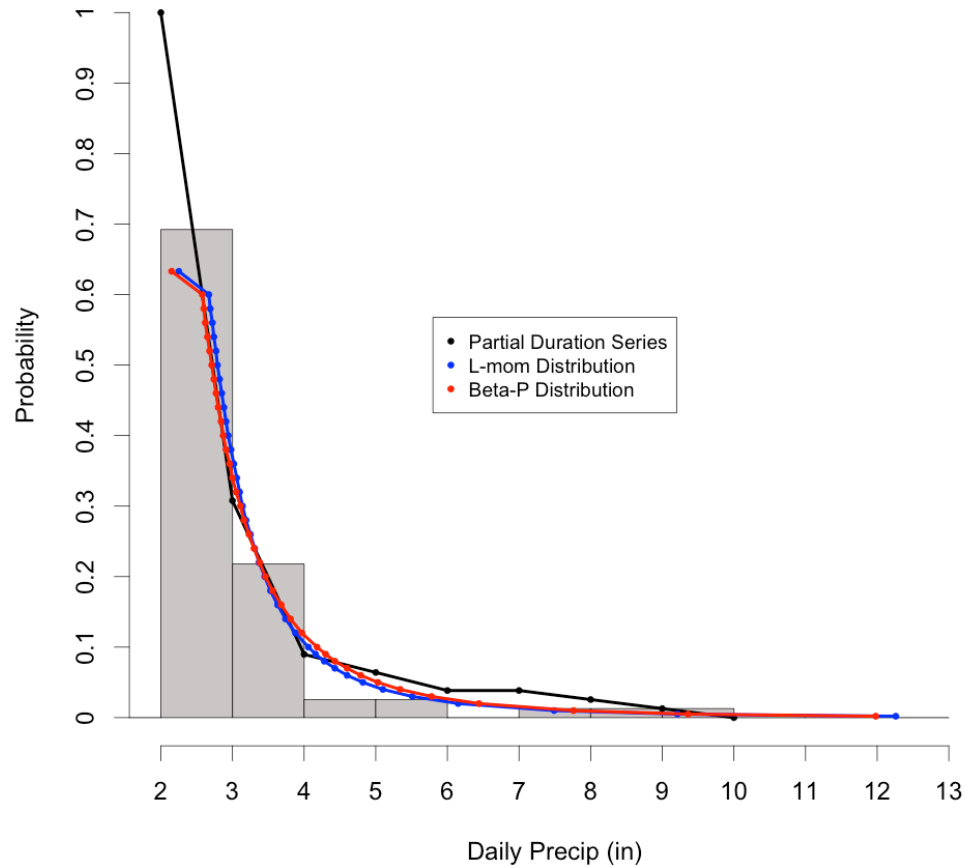
Unusually high daily data values are checked against nearby stations. If a daily rainfall value exceeds 10", at least two nearby stations (within 200 miles) must also have reported amounts of at least 5". If a daily rainfall value exceeds 5", at least two nearby stations must also have reported amounts of at least 3".

Hourly precipitation data are checked against corresponding daily data. For each hour's data, at least one nearby station must have recorded a higher daily total rainfall amount.

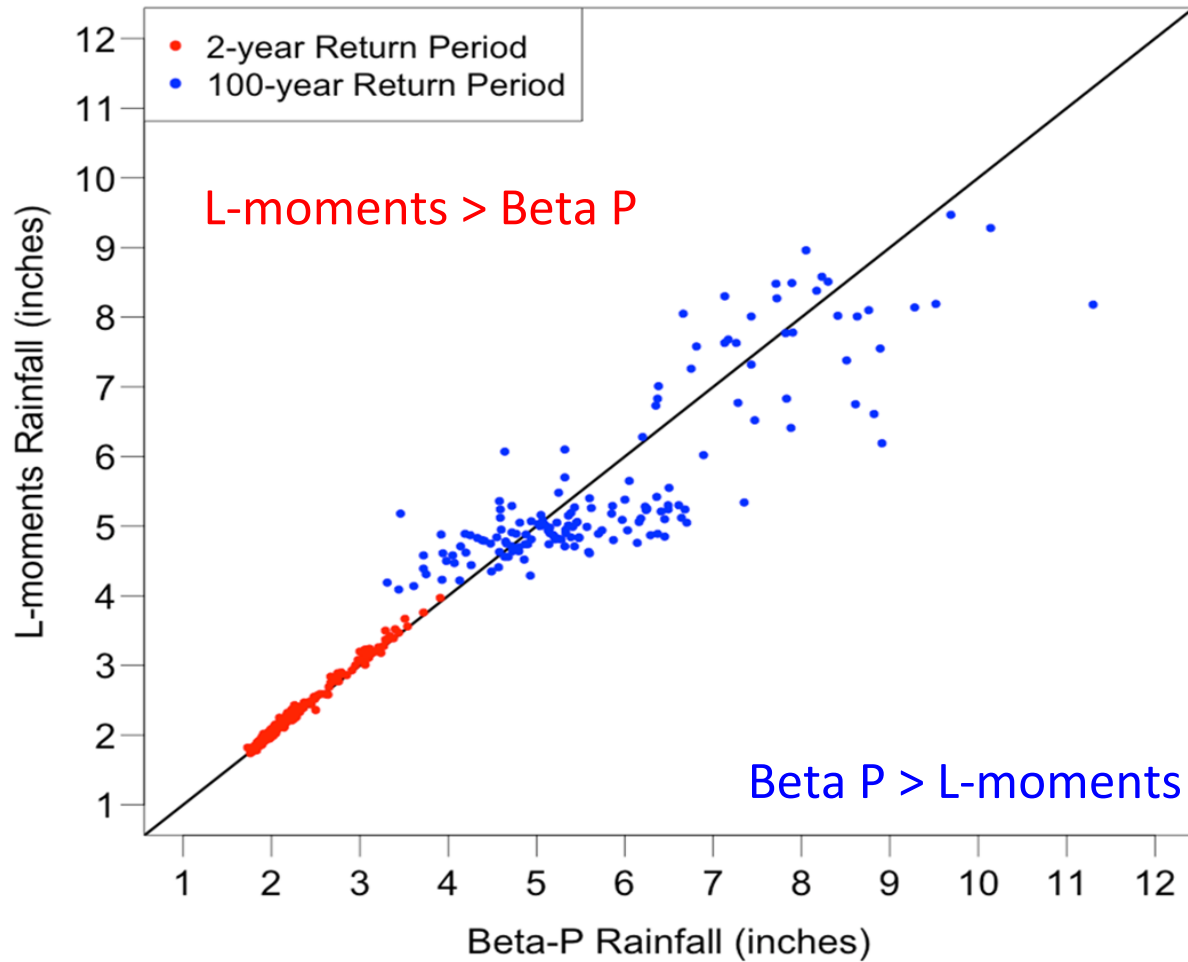
After the distribution is run for the entire Northeast, stations outside more than 2 standard deviations than the mean of all stations are removed.

# PDS Series and Beta P Distribution Fit

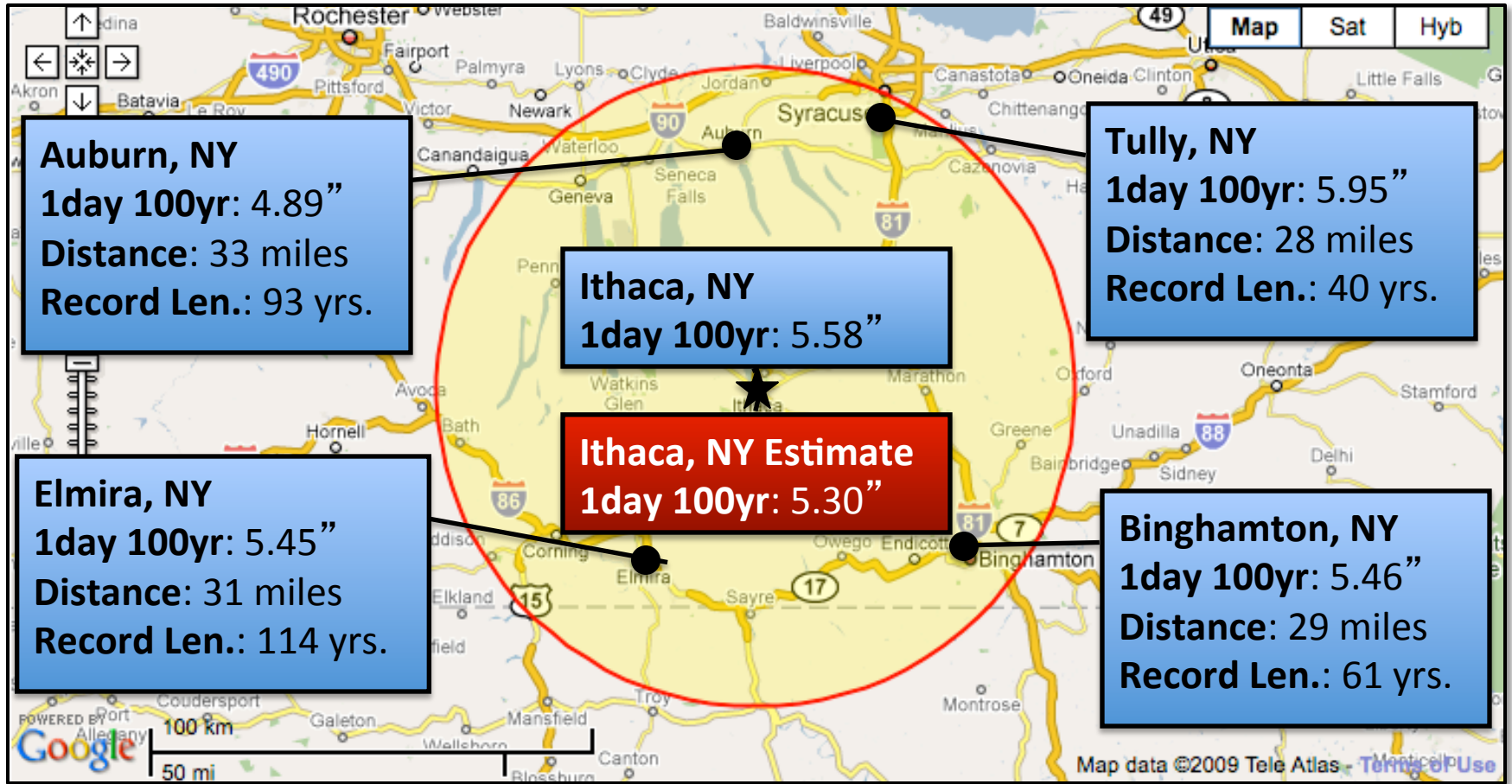
Partial Duration Series Density &  
Probability of Daily Precip > X (N=78)  
WEST OTIS, MA (199371)



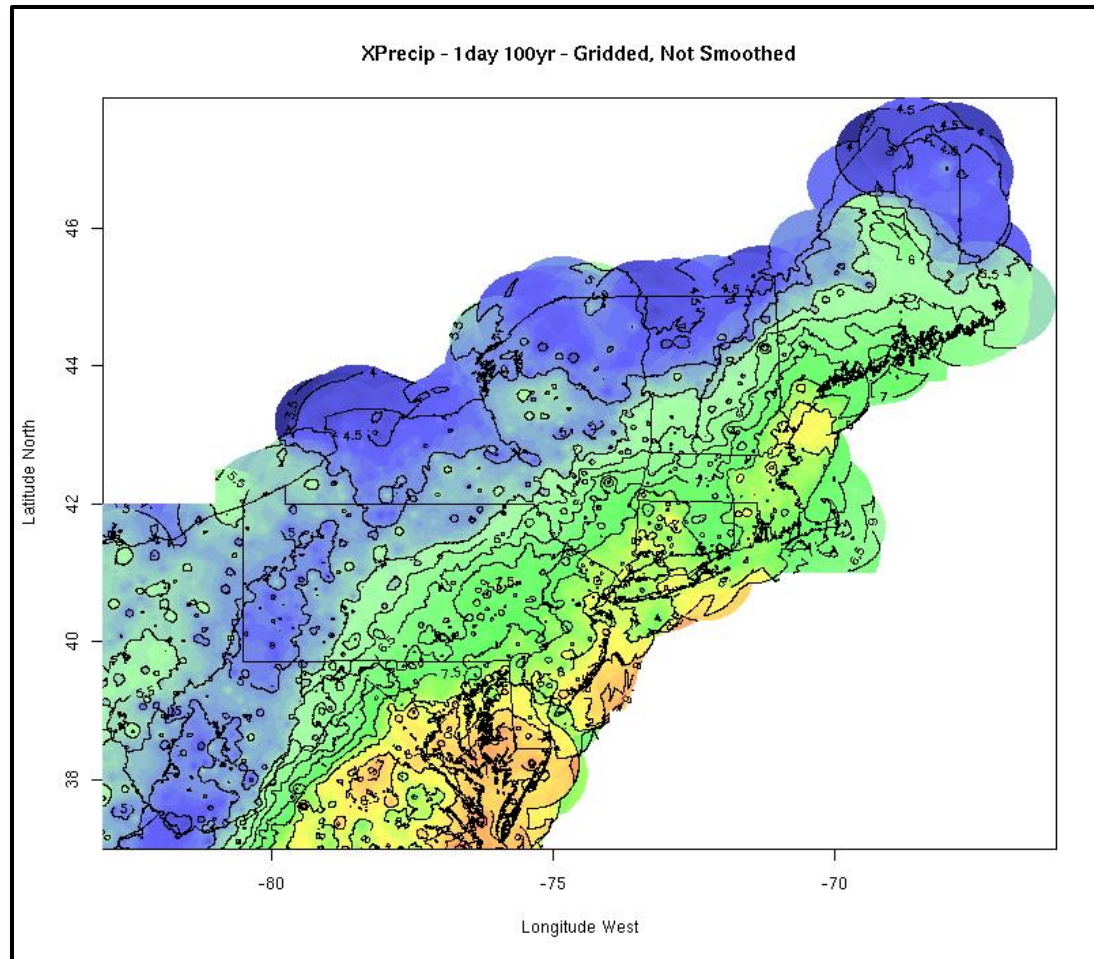
# Beta-P vs. L-moments



# Regionalization

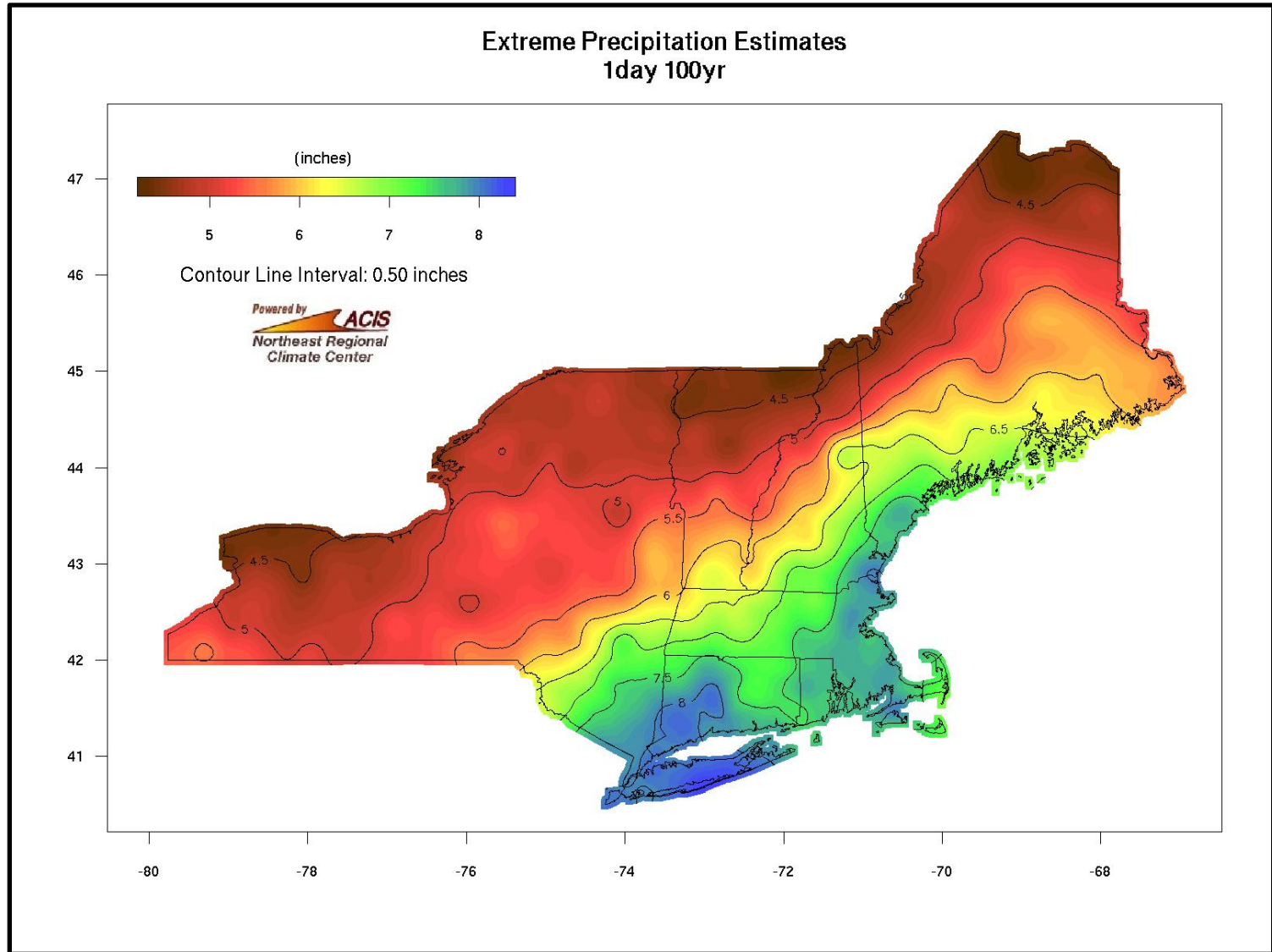


# Gridded Data





# Smoothed Final Output

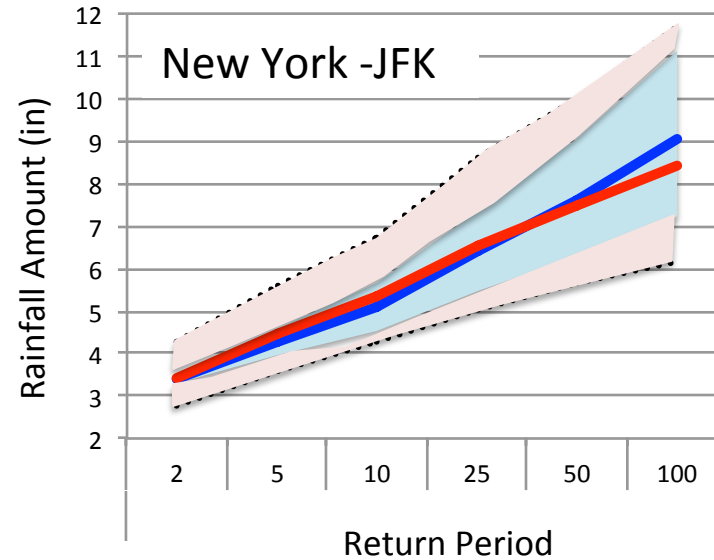
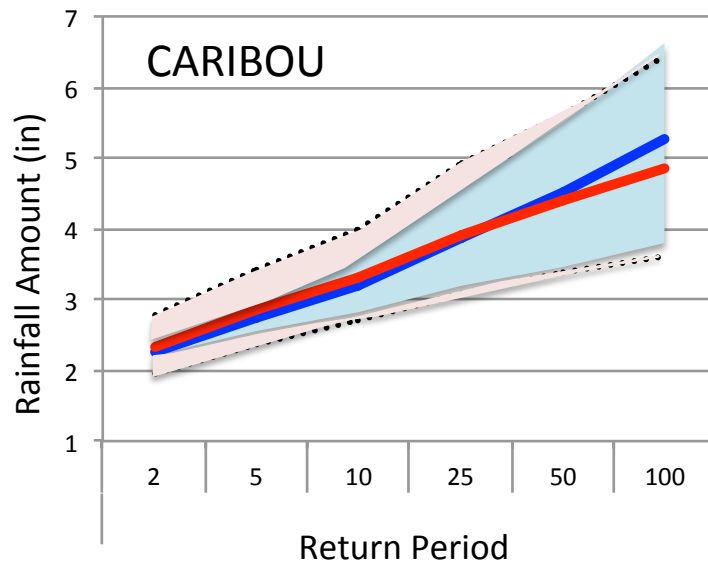
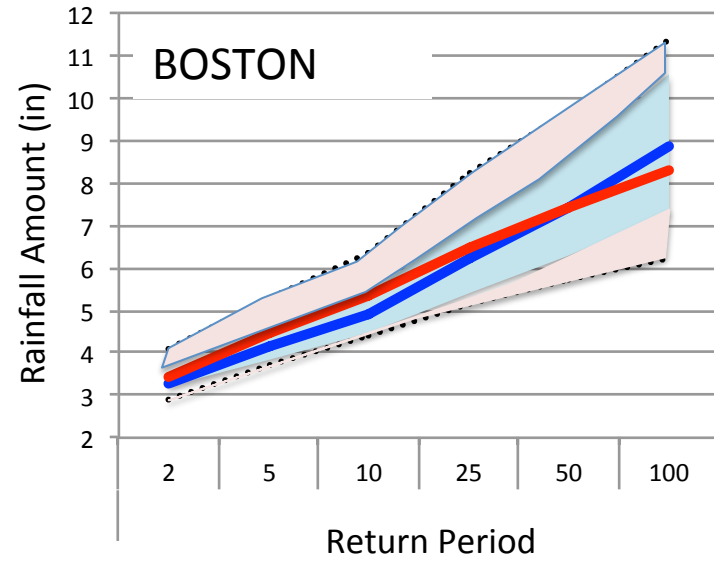
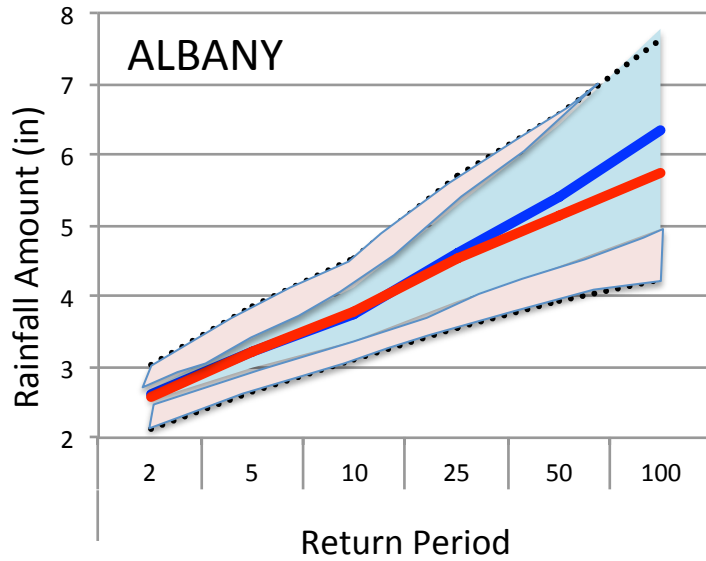


# Confidence Intervals Approach

## ➤ Monte Carlo Approach

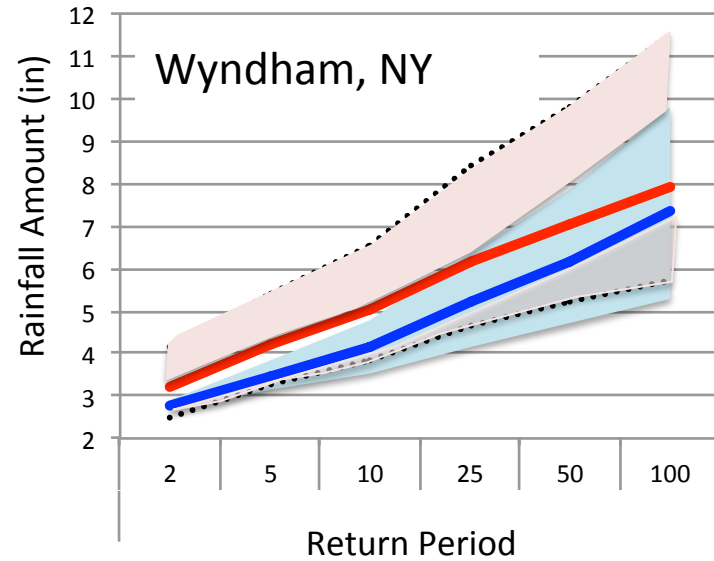
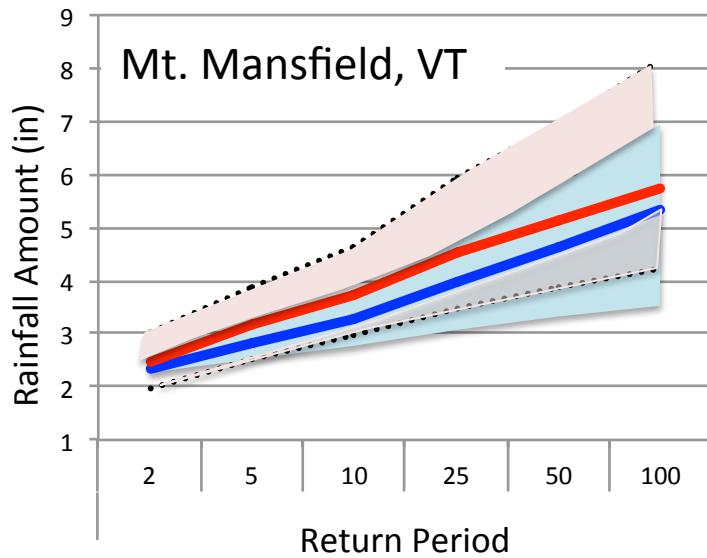
- Draw 1,000 x-year samples from fit Beta-P distribution at each station.
- Refit Beta-P based on random samples.
- Compute return period amounts for confidence intervals (90%)

# Select Precip.net Atlas-14 Comparisons

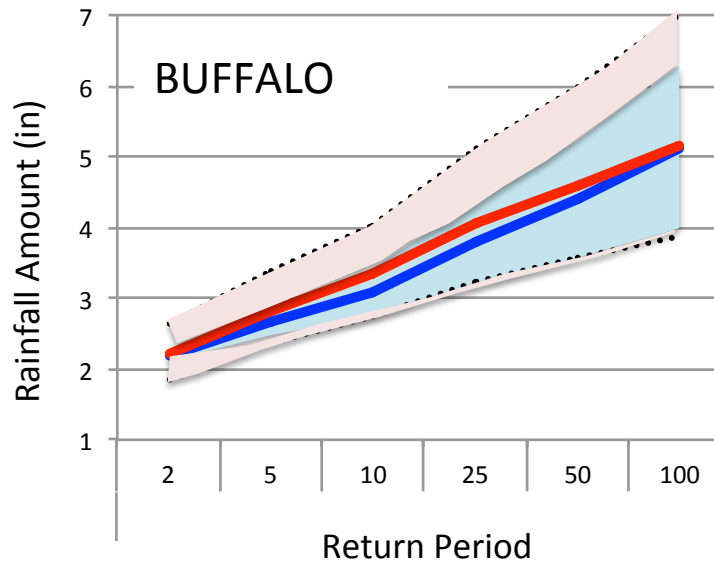


Atlas-14  
Precip.net

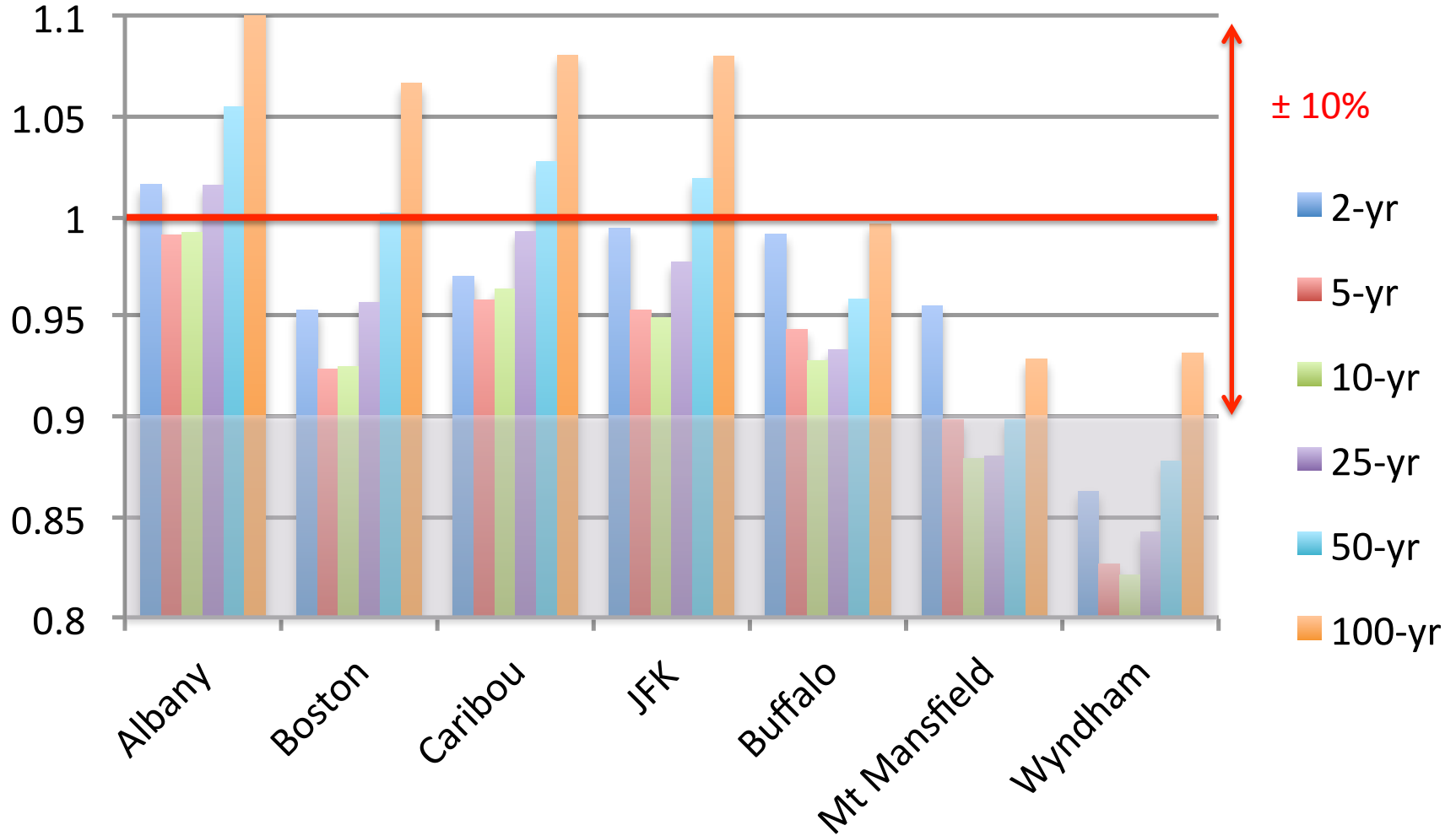
# Select Precip.net Atlas-14 Comparisons



Atlas-14  
Precip.net



# Ratio Precip.net to Atlas-14



# Extreme Precipitation in New York & New England

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- Regional/State Maps ?

**Select Location ?** Double-click the map to place a marker, or enter address or latitude/longitude.

Locate by Address ?

Locate by Lat/Lon ?

°N °W

Locate by State/County ?

**Select Options ?**

**Smoothing ?**

Yes

**Delivery ?**

Popup

**Submit** ?

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# Extreme Precipitation Tables

## Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	76.113 degrees West
Latitude	42.666 degrees North
Elevation	0 feet
Date/Time	Thu, 22 Oct 2015 11:27:04 -0400

### Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.69	0.86	1.05	1yr	0.74	0.95	1.19	1.42	1.68	1.97	2.27	1yr	1.75	2.18	2.63	3.19	3.65	1yr
2yr	0.32	0.50	0.62	0.81	1.02	1.26	2yr	0.88	1.13	1.43	1.70	2.01	2.35	2.66	2yr	2.08	2.55	2.99	3.58	4.12	2yr
5yr	0.38	0.60	0.75	1.00	1.28	1.58	5yr	1.10	1.41	1.79	2.13	2.49	2.87	3.23	5yr	2.54	3.11	3.61	4.27	4.88	5yr
10yr	0.43	0.68	0.86	1.17	1.52	1.88	10yr	1.31	1.67	2.13	2.52	2.92	3.35	3.75	10yr	2.96	3.61	4.18	4.89	5.56	10yr
25yr	0.51	0.82	1.04	1.43	1.90	2.37	25yr	1.64	2.08	2.68	3.15	3.62	4.09	4.58	25yr	3.62	4.40	5.07	5.84	6.59	25yr
50yr	0.58	0.93	1.19	1.67	2.26	2.83	50yr	1.95	2.47	3.20	3.74	4.27	4.77	5.32	50yr	4.22	5.12	5.87	6.68	7.51	50yr
100yr	0.67	1.08	1.39	1.97	2.69	3.36	100yr	2.32	2.93	3.80	4.42	5.01	5.56	6.20	100yr	4.92	5.96	6.81	7.65	8.55	100yr
200yr	0.76	1.24	1.61	2.31	3.20	4.01	200yr	2.76	3.48	4.53	5.24	5.89	6.49	7.22	200yr	5.74	6.95	7.90	8.76	9.74	200yr
500yr	0.92	1.52	1.98	2.88	4.03	5.06	500yr	3.48	4.39	5.70	6.55	7.29	7.96	8.85	500yr	7.05	8.51	9.63	10.47	11.59	500yr

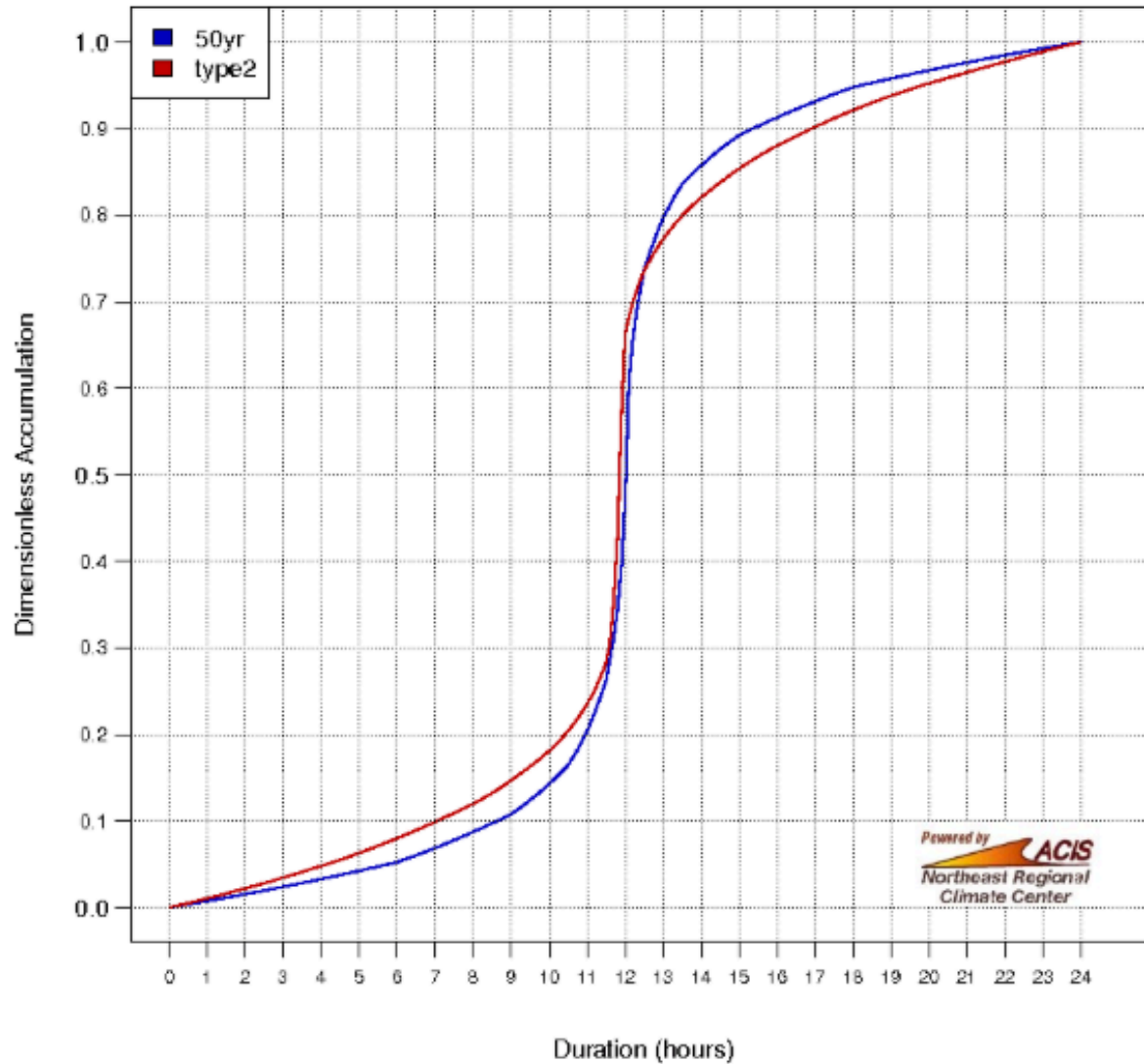
### Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.47	0.63	0.78	0.88	1yr	0.67	0.86	0.98	1.15	1.49	1.81	2.01	1yr	1.60	1.94	2.40	2.86	3.30	1yr
2yr	0.31	0.48	0.60	0.81	1.00	1.11	2yr	0.86	1.09	1.24	1.53	1.87	2.29	2.56	2yr	2.03	2.46	2.90	3.48	4.02	2yr
5yr	0.35	0.54	0.67	0.92	1.17	1.34	5yr	1.01	1.31	1.47	1.80	2.24	2.69	3.02	5yr	2.38	2.91	3.38	4.02	4.59	5yr
10yr	0.38	0.59	0.73	1.02	1.32	1.52	10yr	1.14	1.48	1.66	2.01	2.51	3.03	3.40	10yr	2.68	3.27	3.78	4.47	5.07	10yr
25yr	0.43	0.66	0.82	1.17	1.54	1.80	25yr	1.33	1.76	1.97	2.34	2.91	3.57	3.98	25yr	3.16	3.83	4.39	5.14	5.80	25yr
50yr	0.47	0.72	0.89	1.29	1.73	2.04	50yr	1.49	2.00	2.22	2.60	3.25	4.03	4.48	50yr	3.57	4.31	4.92	5.73	6.41	50yr
100yr	0.52	0.79	0.99	1.43	1.96	2.32	100yr	1.69	2.27	2.52	2.89	3.62	4.58	5.06	100yr	4.05	4.87	5.52	6.38	7.10	100yr
200yr	0.57	0.86	1.09	1.58	2.21	2.64	200yr	1.91	2.58	2.85	3.21	4.04	5.20	5.73	200yr	4.60	5.51	6.18	7.12	7.87	200yr
500yr	0.84	1.25	1.61	2.35	3.34	3.15	500yr	2.88	3.08	3.38	3.68	4.65	6.16	6.77	500yr	5.45	6.51	7.19	8.22	9.03	500yr

### Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.46	0.56	0.75	0.92	1.04	1yr	0.79	1.02	1.20	1.51	1.82	2.13	2.45	1yr	1.89	2.35	2.84	3.44	3.89	1yr
2yr	0.34	0.53	0.65	0.88	1.08	1.21	2yr	0.93	1.18	1.33	1.66	2.03	2.44	2.75	2yr	2.16	2.64	3.09	3.72	4.25	2yr
5yr	0.41	0.64	0.79	1.08	1.38	1.58	5yr	1.19	1.55	1.71	2.11	2.58	3.08	3.46	5yr	2.72	3.32	3.85	4.56	5.21	5yr
10yr	0.49	0.75	0.93	1.30	1.68	1.96	10yr	1.45	1.92	2.08	2.55	3.15	3.67	4.14	10yr	3.25	3.98	4.56	5.35	6.08	10yr
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500yr	1.20	1.79	2.30	3.35	4.76	6.75	500yr	4.11	6.60	6.32	7.80	9.84	10.05	11.60	500yr	8.89	11.16	12.14	13.22	14.71	500yr

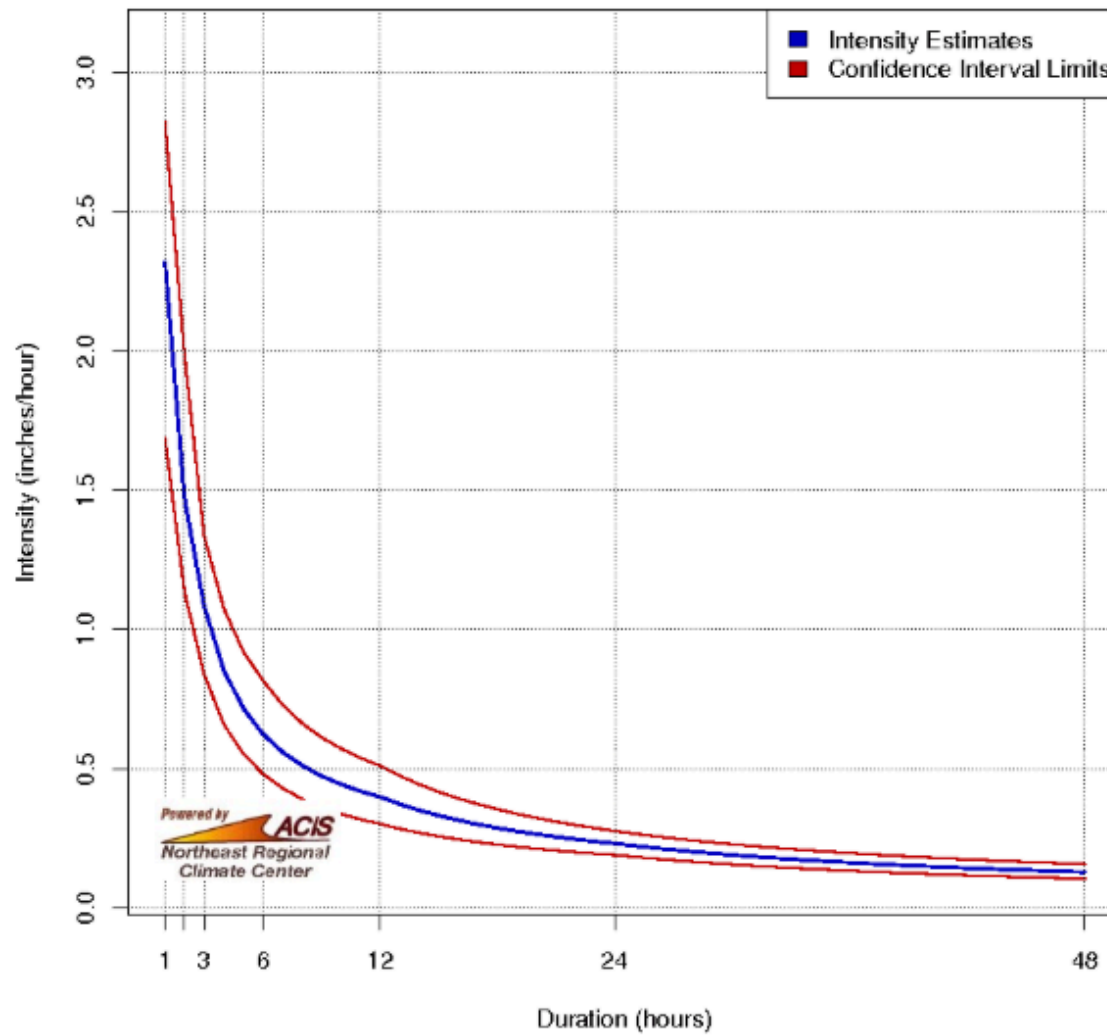
### Precipitation Distribution (42.666N, -76.113W) – 50yr/Type2 – Smoothed



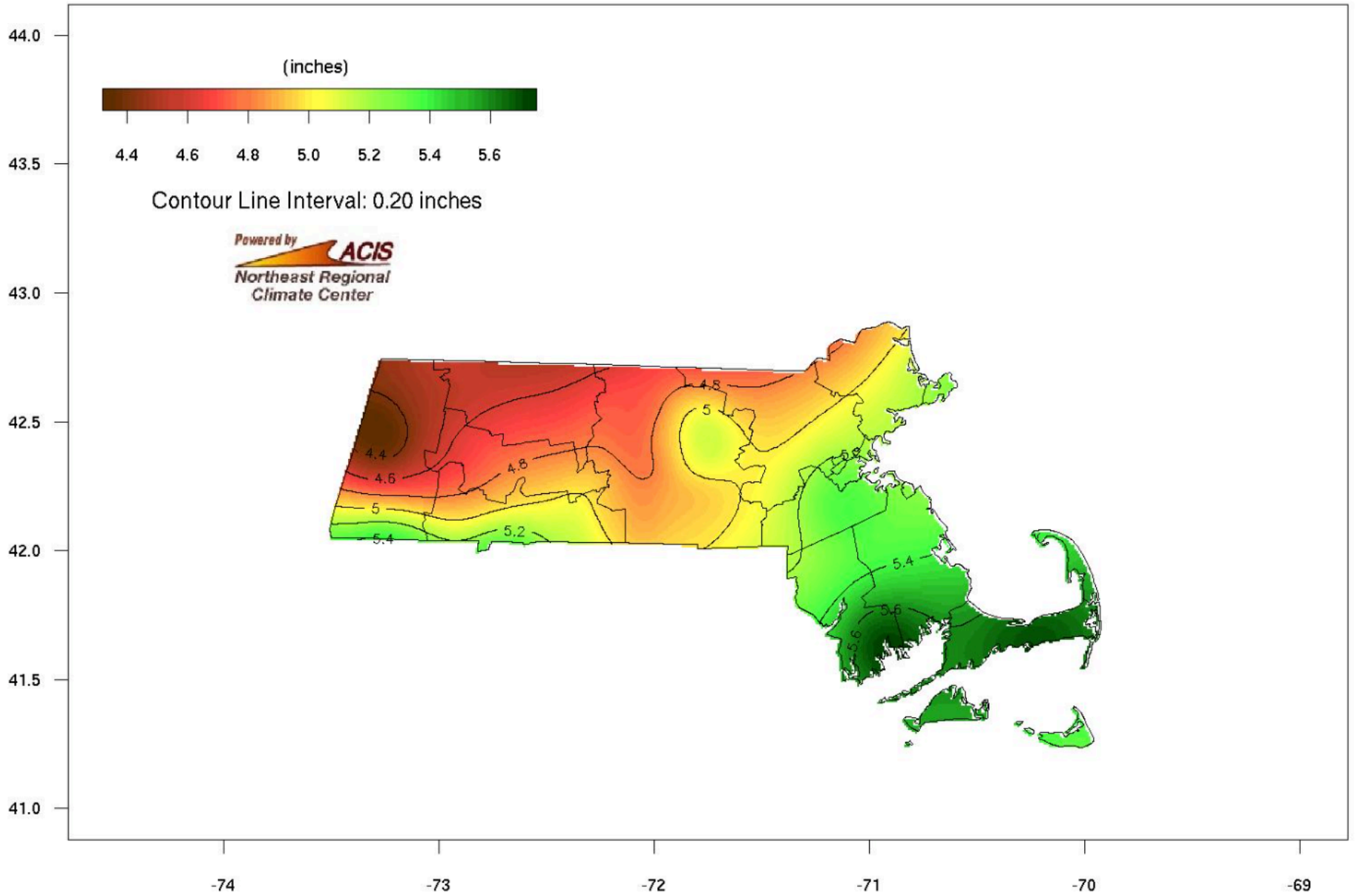
Powered by **ACIS**  
Northeast Regional  
Climate Center



### Intensity Frequency Duration - 100yr (42.666N, -76.113W)



# Extreme Precipitation Estimates 12hr 50yr



## About this Project

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View: **Map** Table Calendar

Date: 2011-08-28

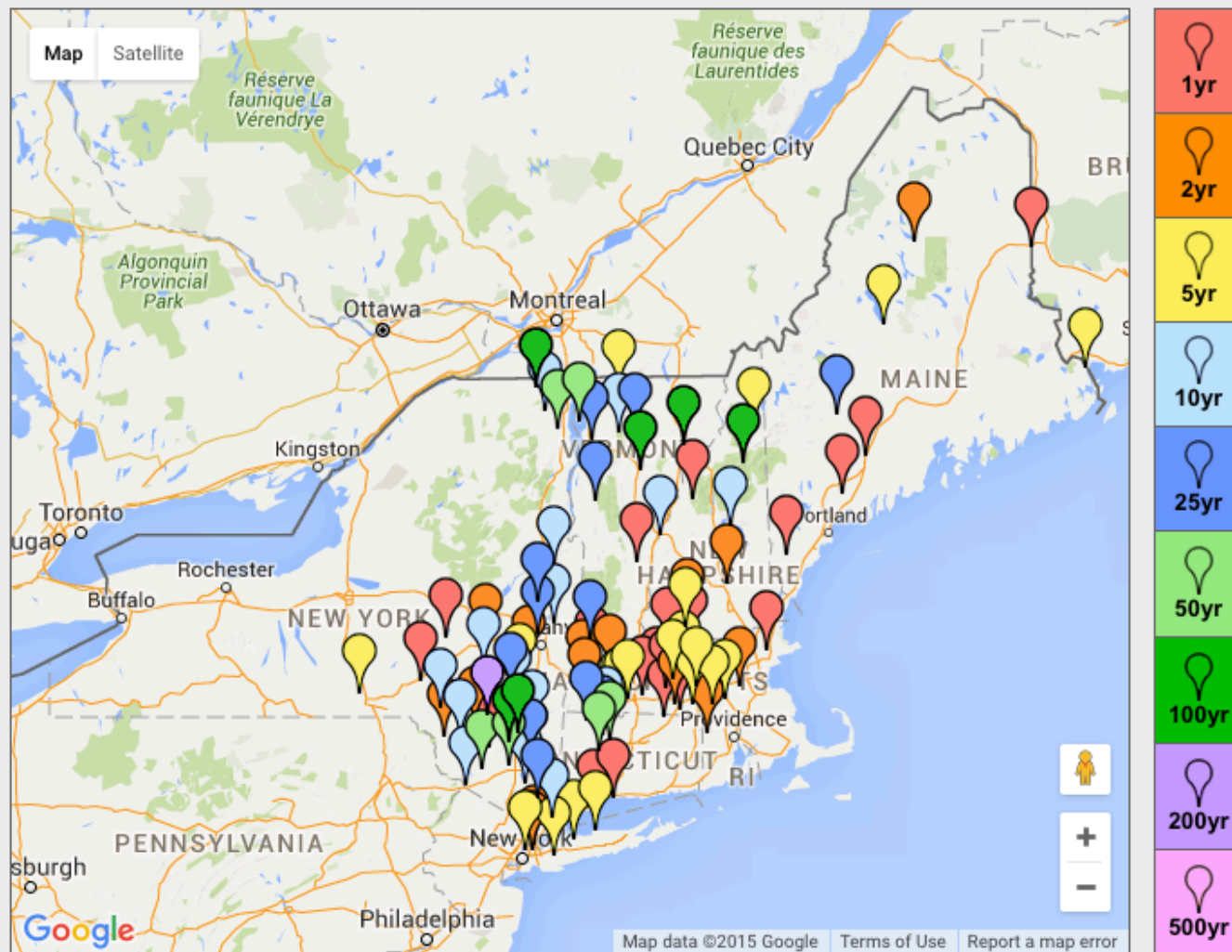
Duration: 1day

**CONTINUE** >>

- 200yr: Slide Mtn, NY
- 100yr: Barre Montpelier Ap, VT
- 100yr: Ellenburg Depot, NY
- 100yr: Mohonk Lake, NY
- 100yr: Mt Washington, NH
- 100yr: Rosendale 2 E, NY
- 100yr: Saint Johnsbury, VT
- 50yr: Bloomingburg 2 Sw, NY
- 50yr: Burlington, CT
- 50yr: Peru 2 Wsw, NY
- 50yr: South Hero, VT
- 50yr: Thomaston Dam, CT
- 50yr: Walden 1 Ese, NY
- 25yr: Albany Ap, NY
- 25yr: Bakersville, CT
- 25yr: Burlington Intl Ap, VT
- 25yr: East Jewett, NY
- 25yr: Farmington, ME
- 25yr: Morrisville Stowe State Ap.

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Northeast Regional  
Climate Center

Real-time monitoring is in BETA testing. Please be patient - products may take 10-15 seconds to load.



# Extreme Precipitation in a Changing Climate

Info

Map

Graph



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**ACIS**  
Northeast Regional  
Climate Center



Cornell University



Options:

Recurrence: 100yr (1%)

End Year: 2014

Color Code: Percent Difference from 2008

Refresh Map

## Percent Difference from 2008

1day 100yr storm  
for period ending in 2014

### #300042: ALBANY AP, NY

(42.743°N, -73.809°W)

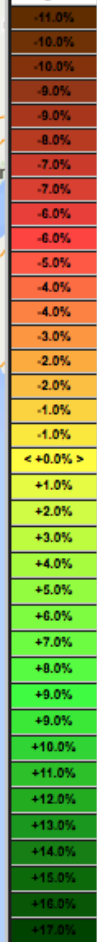
2014 100yr Storm: 6.49"

2014 Recurrence of 2008 100yr Storm (5.76"): 65yr

% Difference from 2008 100yr Storm (5.76"): +13%

% Difference from 1958 100yr Storm (6.35"): +2%

### Legend



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**ACIS**  
Northeast Regional  
Climate Center

Map data ©2015 Google, INEGI Terms of Use

[precipchange.eas.cornell.edu](http://precipchange.eas.cornell.edu)

Options:

Recurrence: 100yr (1%)

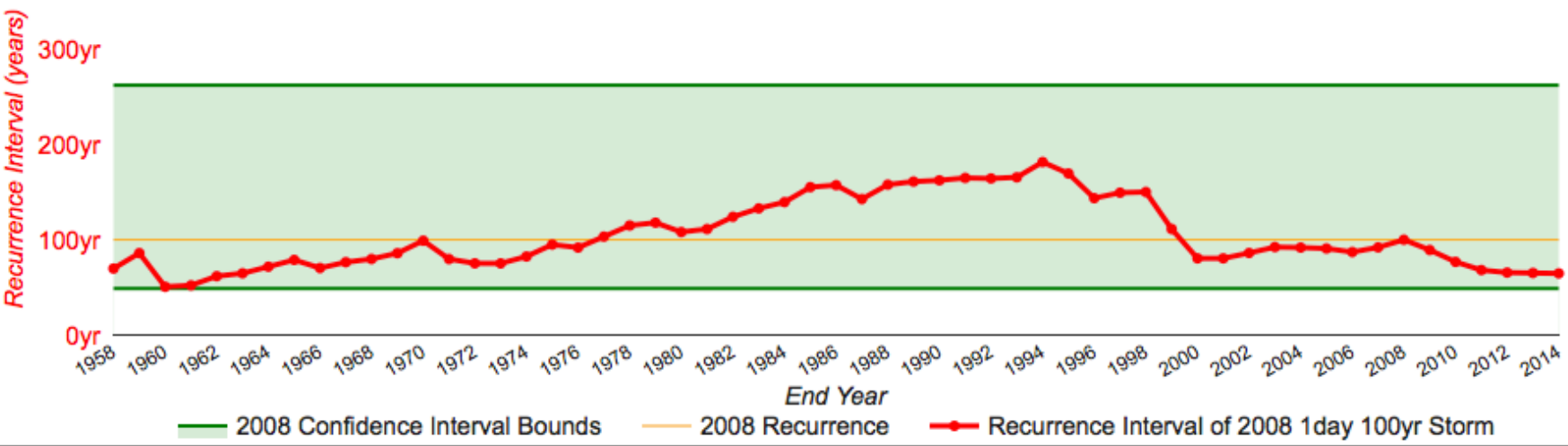
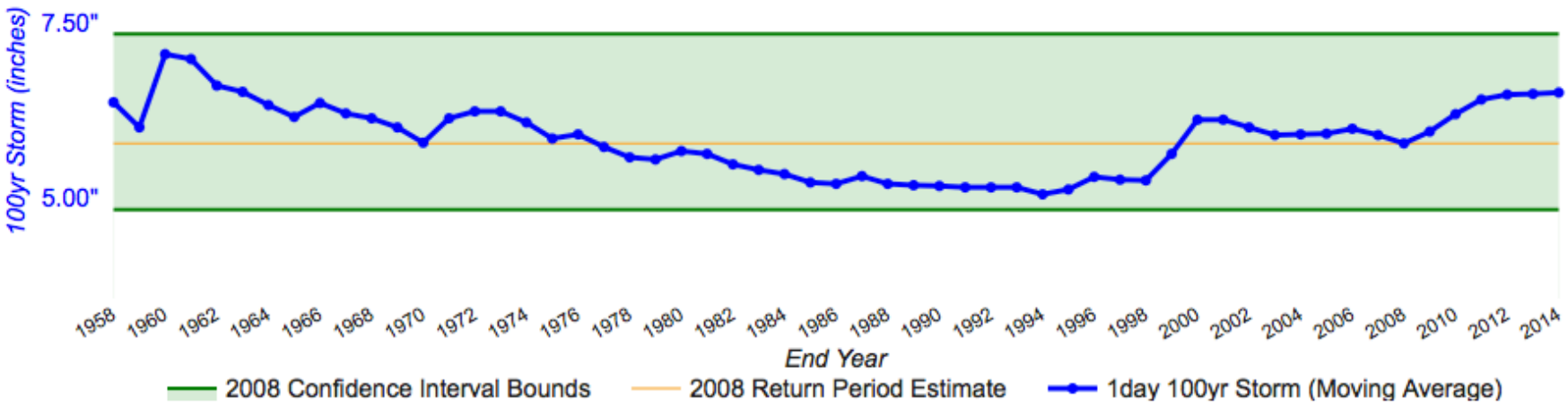
State: NY - New York

Station: #300042: ALBANY AP (NY)

Refresh Graph



Extreme Precipitation Statistics: #300042 ALBANY AP (NY)





**THANK YOU!**