

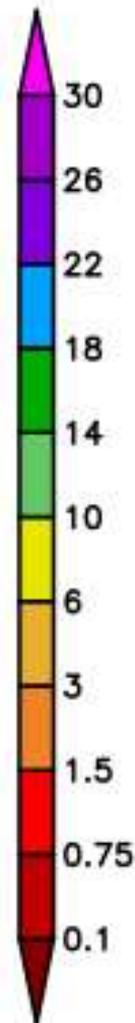
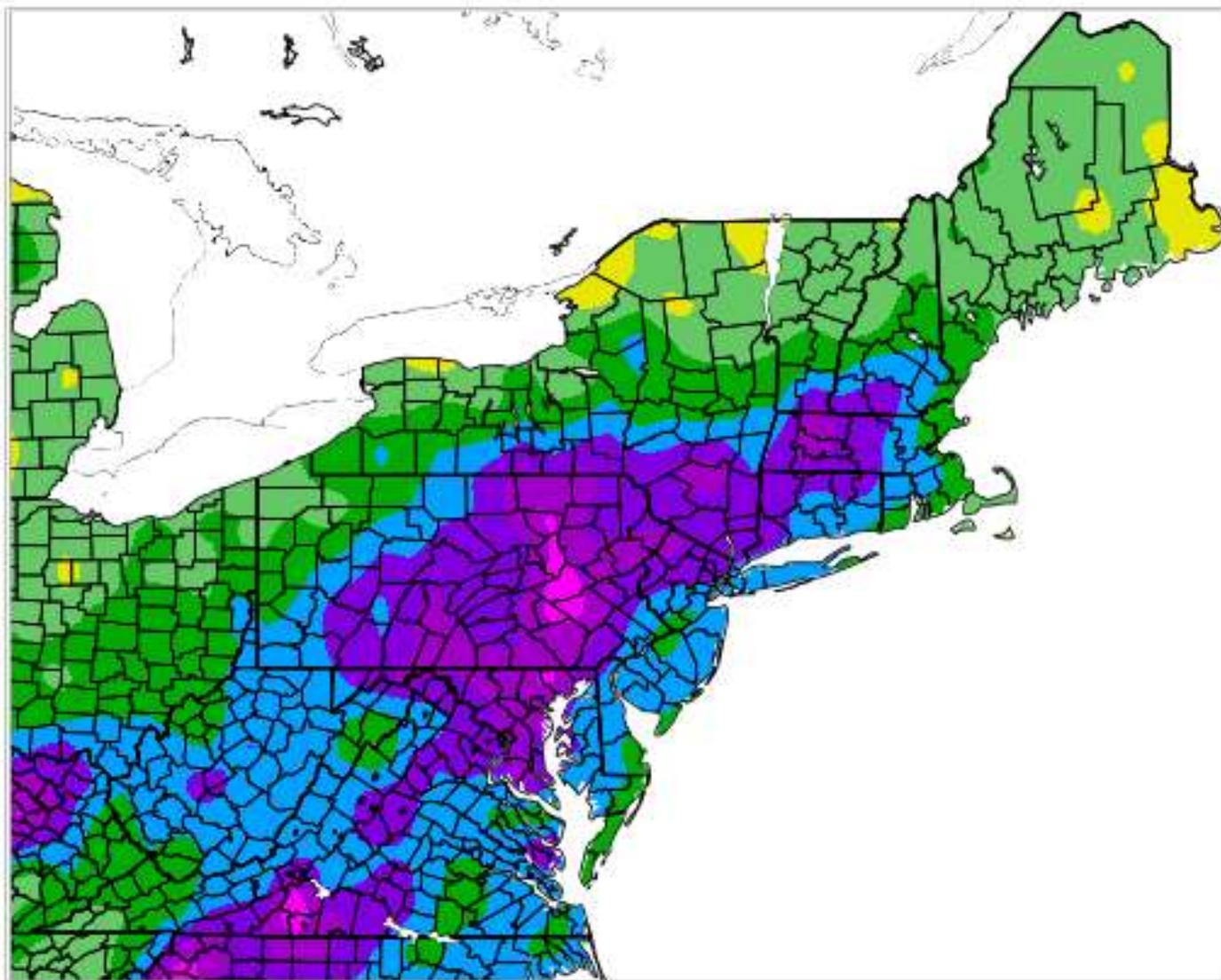
# Stormwater Considerations

## – West Elmira

# Recent Storm Events & Precipitation

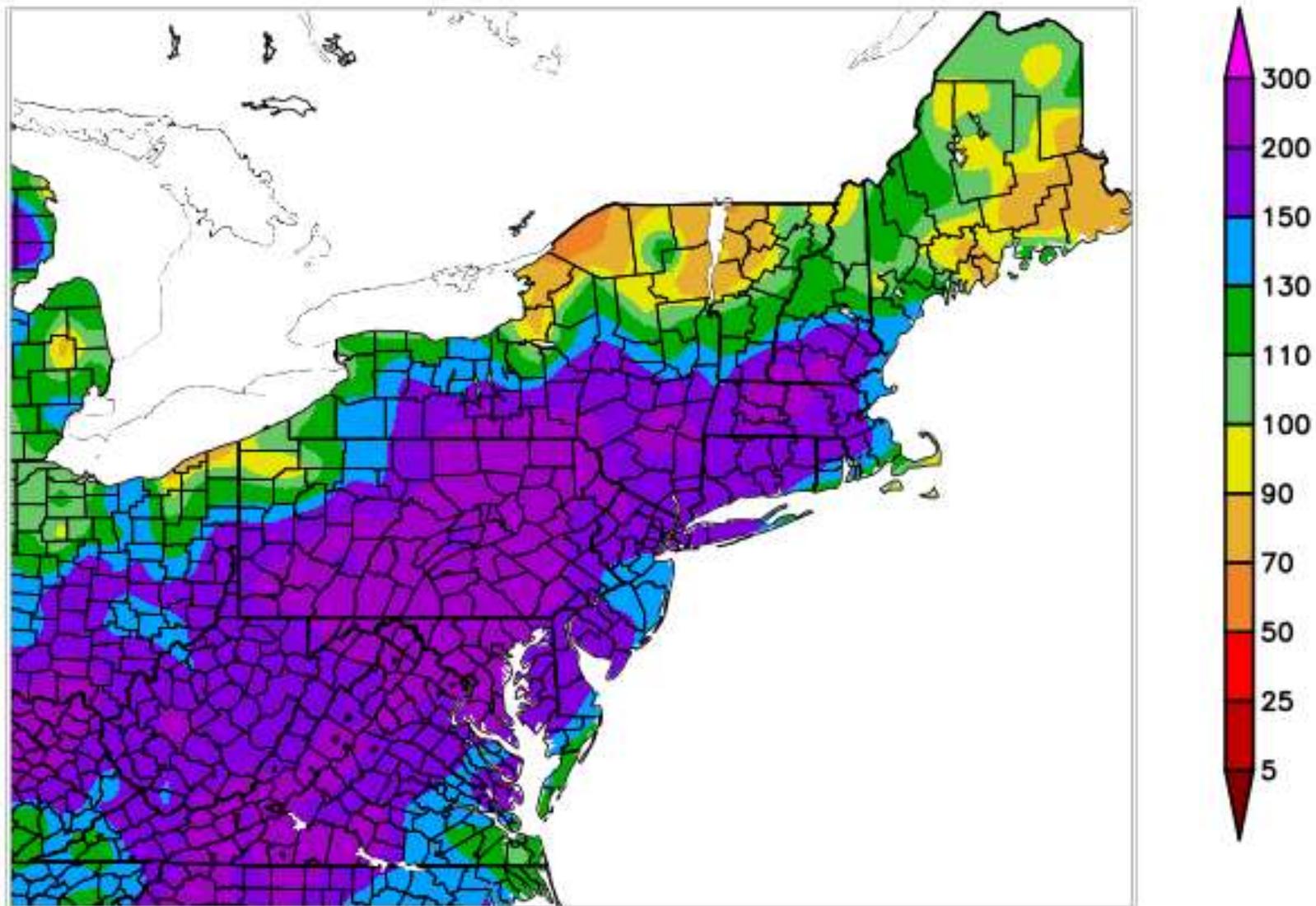
# Precipitation (in)

7/17/2018 – 10/14/2018



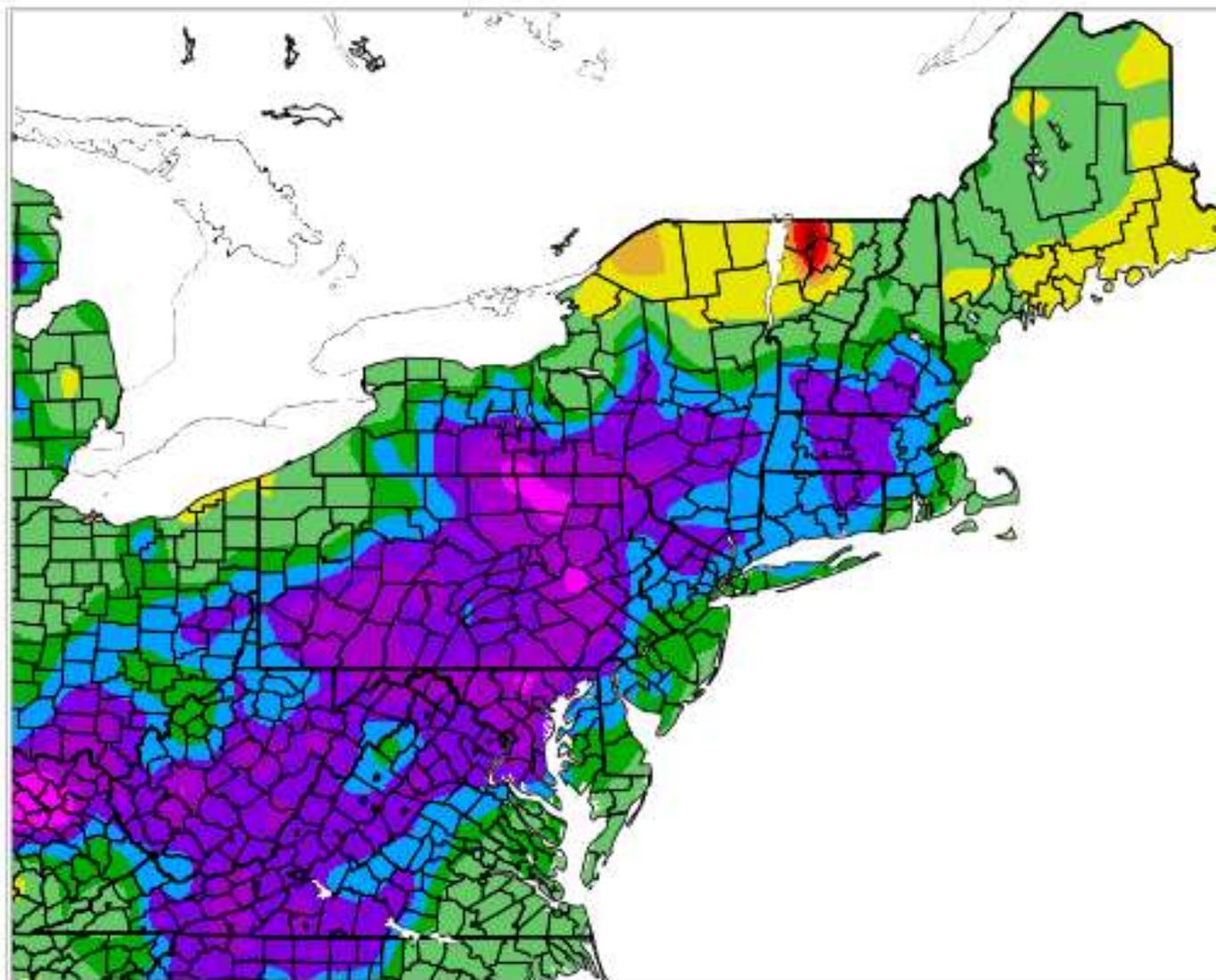
# Percent of Normal Precipitation (%)

## 7/17/2018 – 10/14/2018



# 90 Day SPI

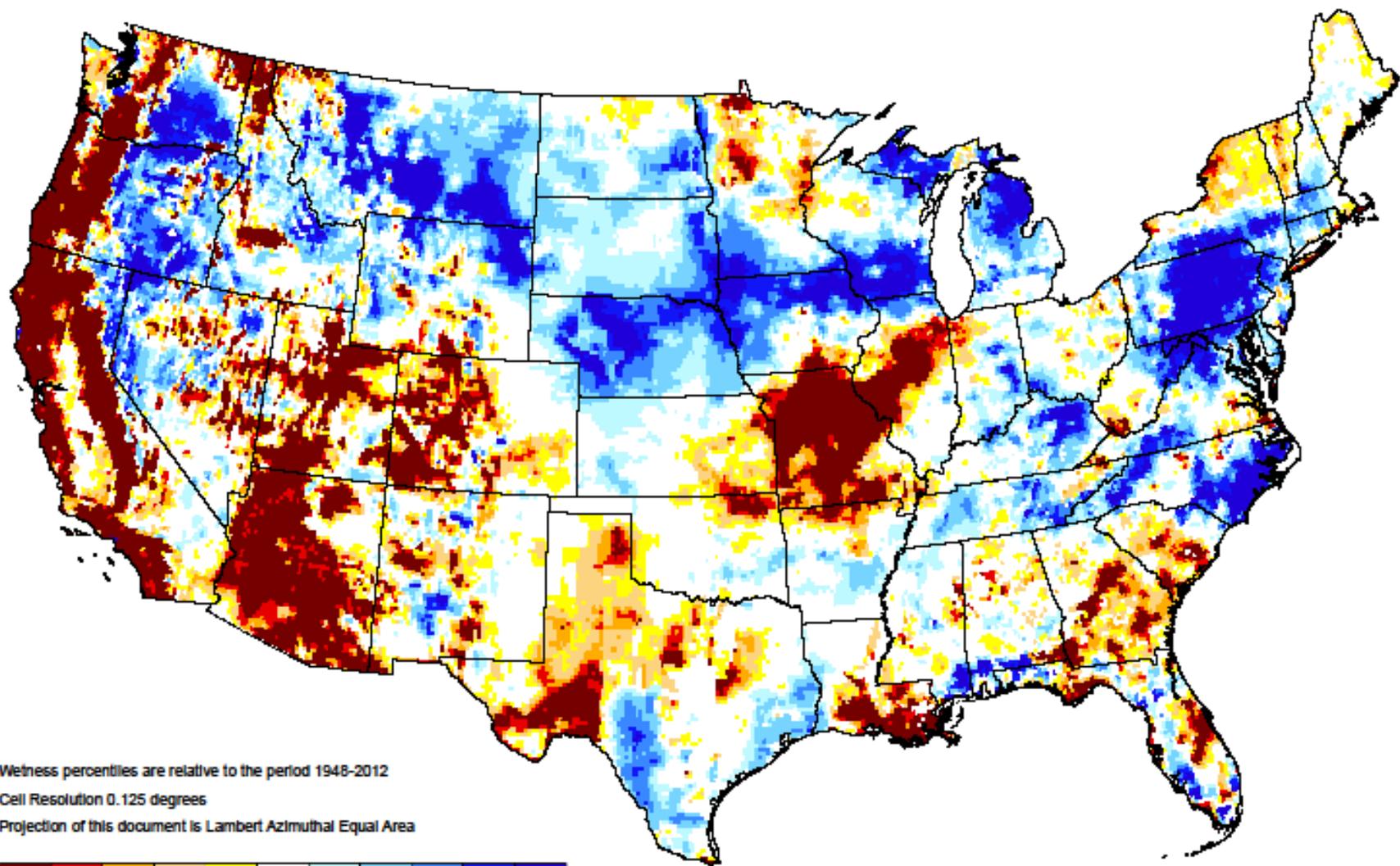
7/16/2018 – 10/13/2018





# GRACE-Based Shallow Groundwater Drought Indicator

October 08, 2018



Wetness percentiles are relative to the period 1948-2012

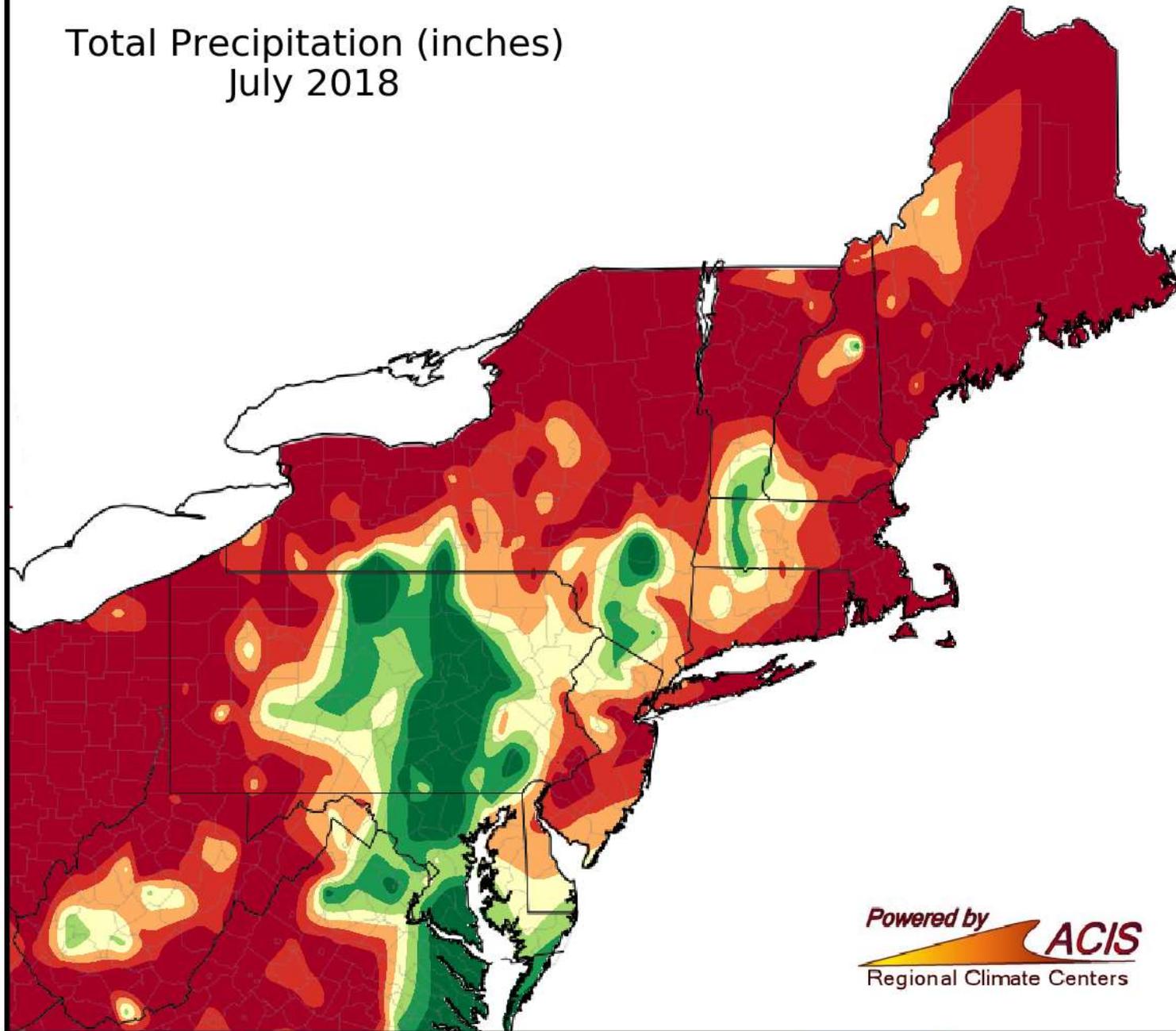
Cell Resolution 0.125 degrees

Projection of this document is Lambert Azimuthal Equal Area



<http://nasagrace.unl.edu>

# Total Precipitation (inches) July 2018



Powered by **ACIS**  
Regional Climate Centers



# July 14, 2018 Storm Event

- Initial portion of storm: 2 inches of rain/30-minute period
- Final portion of storm: 1.5 inches of rain/1-hour duration
- A gap between the end of the initial portion and the start of the final portion of the storm of approximately 1 hour occurred.

# 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	76.855 degrees West
Latitude	42.084 degrees North
Elevation	0 feet
Date/Time	Mon, 16 Jul 2018 10:41:52 -0400

### Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.27	0.42	0.52	0.68	0.85	1.04	<b>1yr</b>	0.73	0.91	1.18	1.42	1.68	1.98	2.24	<b>1yr</b>	1.75	2.15	2.56	3.07	3.52	<b>1yr</b>
<b>2yr</b>	0.33	0.50	0.63	0.82	1.04	1.27	<b>2yr</b>	0.89	1.14	1.44	1.71	2.02	2.35	2.61	<b>2yr</b>	2.08	2.51	2.94	3.48	3.96	<b>2yr</b>
<b>5yr</b>	0.39	0.61	0.76	1.02	1.30	1.61	<b>5yr</b>	1.13	1.43	1.82	2.16	2.52	2.91	3.27	<b>5yr</b>	2.58	3.14	3.64	4.23	4.80	<b>5yr</b>
<b>10yr</b>	0.44	0.69	0.88	1.19	1.55	1.93	<b>10yr</b>	1.34	1.69	2.19	2.58	2.99	3.42	3.88	<b>10yr</b>	3.03	3.73	4.29	4.91	5.55	<b>10yr</b>
<b>25yr</b>	0.53	0.84	1.07	1.48	1.96	2.45	<b>25yr</b>	1.69	2.13	2.77	3.26	3.75	4.24	4.87	<b>25yr</b>	3.75	4.69	5.32	5.99	6.73	<b>25yr</b>
<b>50yr</b>	0.60	0.97	1.24	1.74	2.35	2.94	<b>50yr</b>	2.03	2.53	3.33	3.90	4.45	4.99	5.79	<b>50yr</b>	4.42	5.57	6.27	6.96	7.79	<b>50yr</b>
<b>100yr</b>	0.70	1.13	1.46	2.06	2.81	3.52	<b>100yr</b>	2.42	3.01	3.98	4.64	5.27	5.88	6.88	<b>100yr</b>	5.20	6.62	7.39	8.09	9.02	<b>100yr</b>
<b>200yr</b>	0.80	1.31	1.70	2.43	3.36	4.22	<b>200yr</b>	2.90	3.59	4.77	5.54	6.26	6.92	8.19	<b>200yr</b>	6.13	7.87	8.71	9.41	10.44	<b>200yr</b>
<b>500yr</b>	0.98	1.61	2.10	3.04	4.26	5.37	<b>500yr</b>	3.68	4.52	6.06	6.99	7.84	8.60	10.30	<b>500yr</b>	7.61	9.91	10.83	11.48	12.68	<b>500yr</b>



For the initial portion of the storm, 2 inches of rainfall over a 30-minute duration corresponds to a storm event with a 91-year return period. Refer to the interpolation below.

$$= (100 \text{ year} - 50 \text{ year}) \times ((2.0 - 1.74)/(2.06 - 1.74)) + 50 \text{ year}$$

$$= 91\text{-year return period}$$

For the overall storm event, 3.5 inches of rainfall over a 2.5-hour duration corresponds approximately to a storm event with a 100-year return period. Refer to the information below.

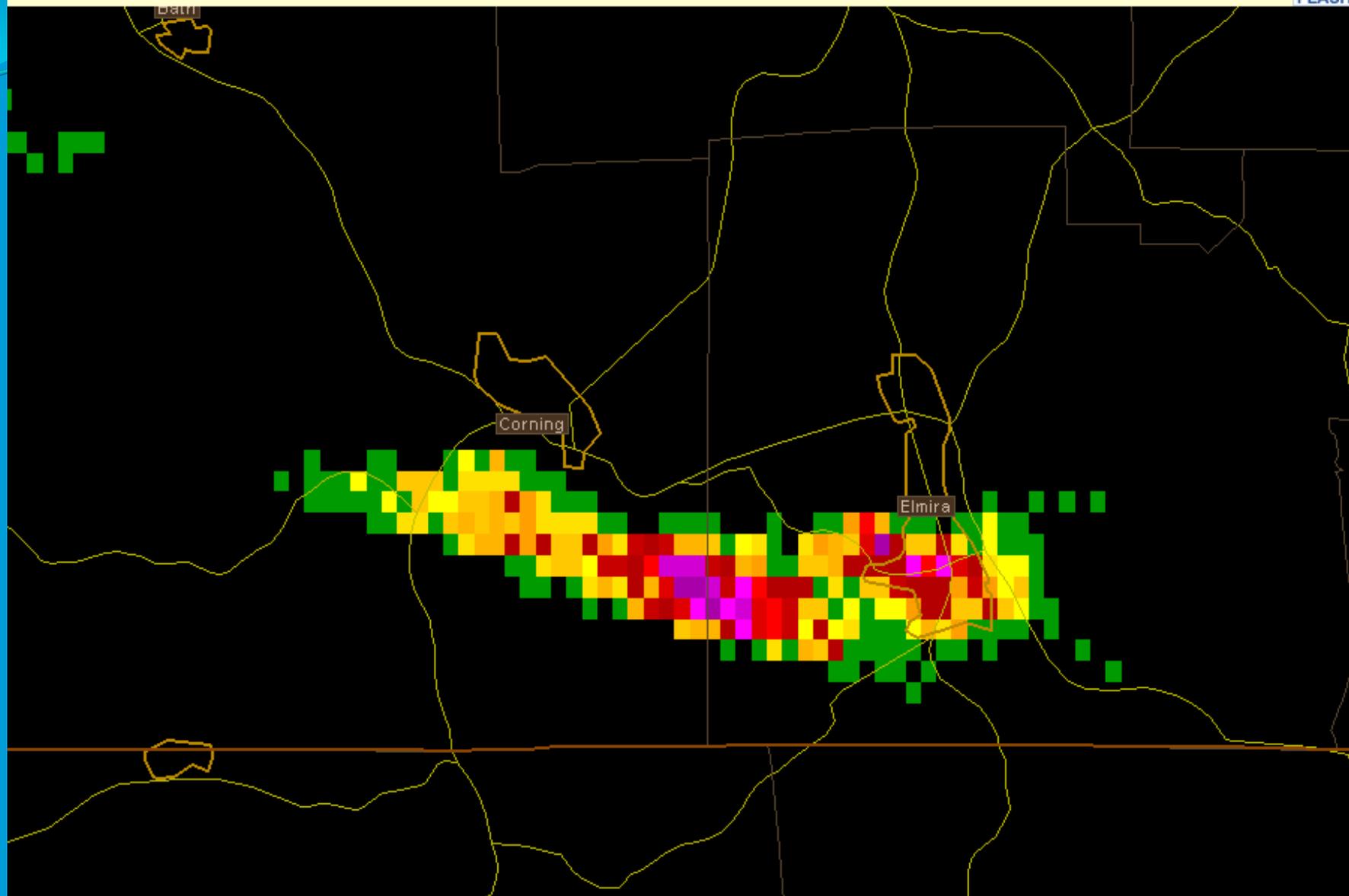
Return Period	Storm Duration		
	2-Hours	2.5-Hours	3-Hours
50-year	2.53 inches	2.93 inches	3.33 inches
100-year	3.01 inches	3.5 inches	3.98 inches
200-year	3.59 inches	4.18 inches	4.77 inches

# Precipitation Accumulation Return Period

Valid: 07/14/2018 22:30:00 UTC



1-Hour



Return Period [yr]



42.36N  
77.42W 76.55W  
41.93N

# August 13, 2018 Storm Event

**Record of Climatological Observations**  
 These data are quality controlled and may not be identical  
 to the original observations.  
 Generated on 09/05/2018

Observation Time Temperature: Unknown Observation Time Precipitation: Unknown

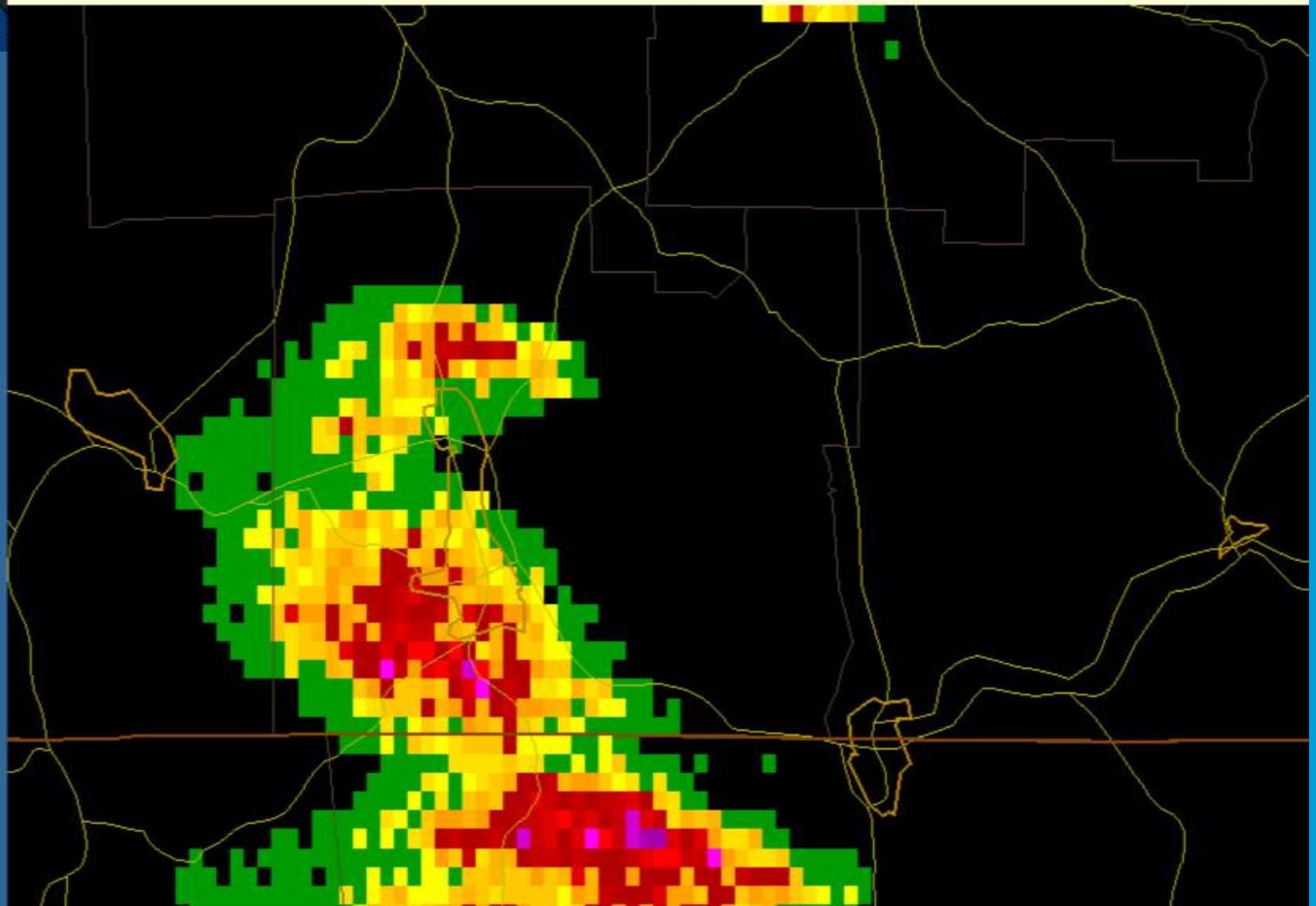
Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)						
			24 Hrs. Ending at Observation Time		At Observation	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth			
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag				Snow, Ice Pellets, Hail, Ice on Ground (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2018	08	01				0.00		0.0											
2018	08	02				0.03													
2018	08	03				0.21													
2018	08	04				0.10													
2018	08	05				0.00		0.0											
2018	08	06				0.00		0.0											
2018	08	07				0.00		0.0											
2018	08	08				0.34													
2018	08	09				0.60													
2018	08	10				0.00		0.0											
2018	08	11				1.74													
2018	08	12				0.23													
2018	08	13				0.26													
2018	08	14				3.40													
2018	08	15				0.46													
2018	08	16				0.03													
2018	08	17				0.21													
2018	08	18				0.26													
2018	08	19				0.05		0.0											
2018	08	20				0.00		0.0											
2018	08	21				0.00		0.0											
2018	08	22				0.02													
2018	08	23				0.19													
2018	08	24				0.01													
2018	08	25				0.00		0.0											
2018	08	26				0.00		0.0											
2018	08	27				0.00		0.0											
2018	08	28				0.05													
2018	08	29				0.00		0.0											
2018	08	30				1.43													
2018	08	31				0.00		0.0											
Summary								9.62		0.0									

Empty, or blank, cells indicate that a data observation was not reported.  
 \*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown  
 \*s This data value failed one of NCDC's quality control tests.  
 \*T values in the Precipitation or Snow category above indicate a "trace" value was recorded.  
 \*A values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.  
 Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

# Precipitation Accumulation Return Period

Valid: 08/13/2018 18:30:00 UTC

3-Hour



Return Period [yr]



No File Missing

42.39N  
77.16W 76  
41.91N

Submit/Refresh

Page Loaded:  
08/15/2018 11:53

## Precipitation Accumulation Return Period 24-Hour

Valid: 08/14/2018 09:00:00 UTC



General Archive Overlays Looping

Region Selection

North	West	South	East
42.81	-77.31	41.97	-75.55

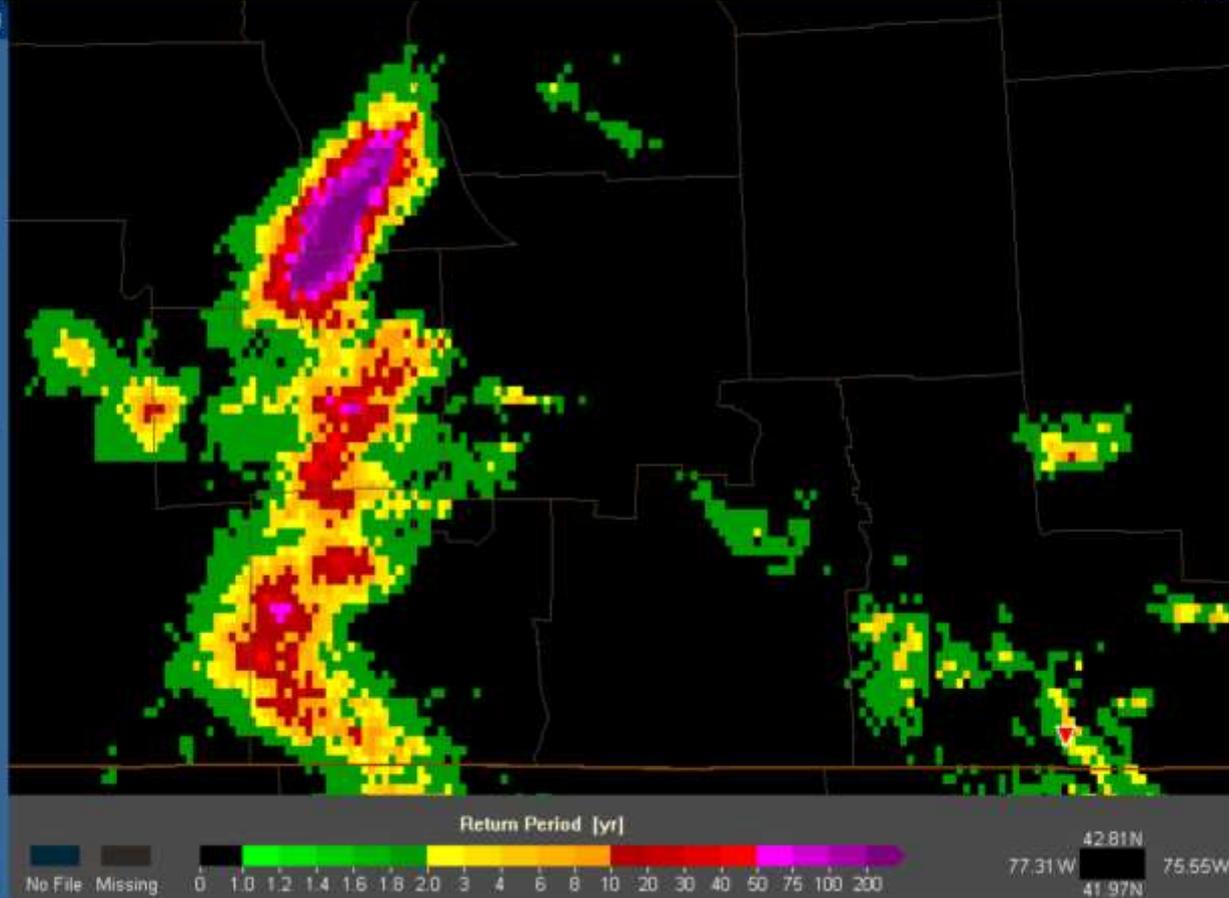


Product Selection  
24H Precip Return Period

Time Navigation

15 min	6 hr
30 min	12 hr
1 hr	24 hr
3 hr	48 hr

Mouse Mode



August 14, 2018 Storm Event

September 17/18, 2018 Storm Event



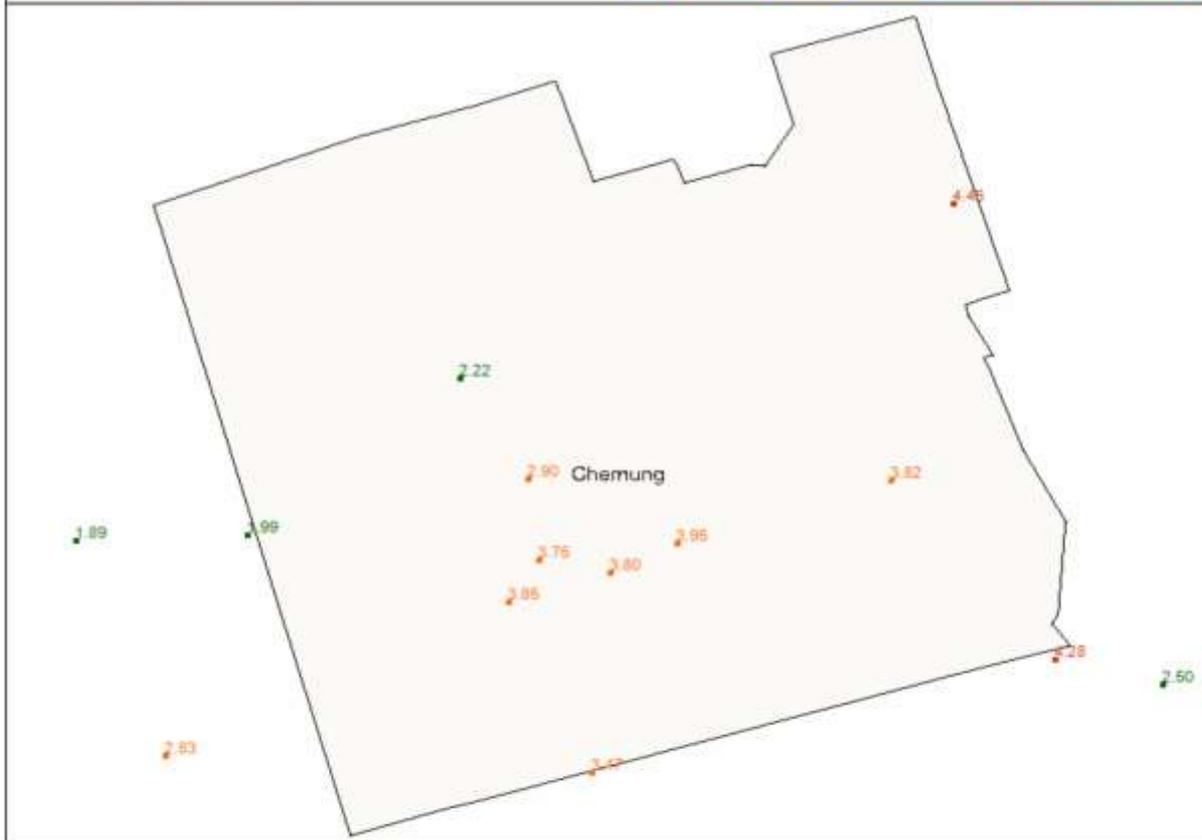
## Maps : Daily Precipitation

Map Type	Map Location	Date	Colors
Precipitation ▼	New York ▼	CM - Chemung ▼	9/18/2018 ▼ Standard ▼
<a href="#">Get Map</a>			

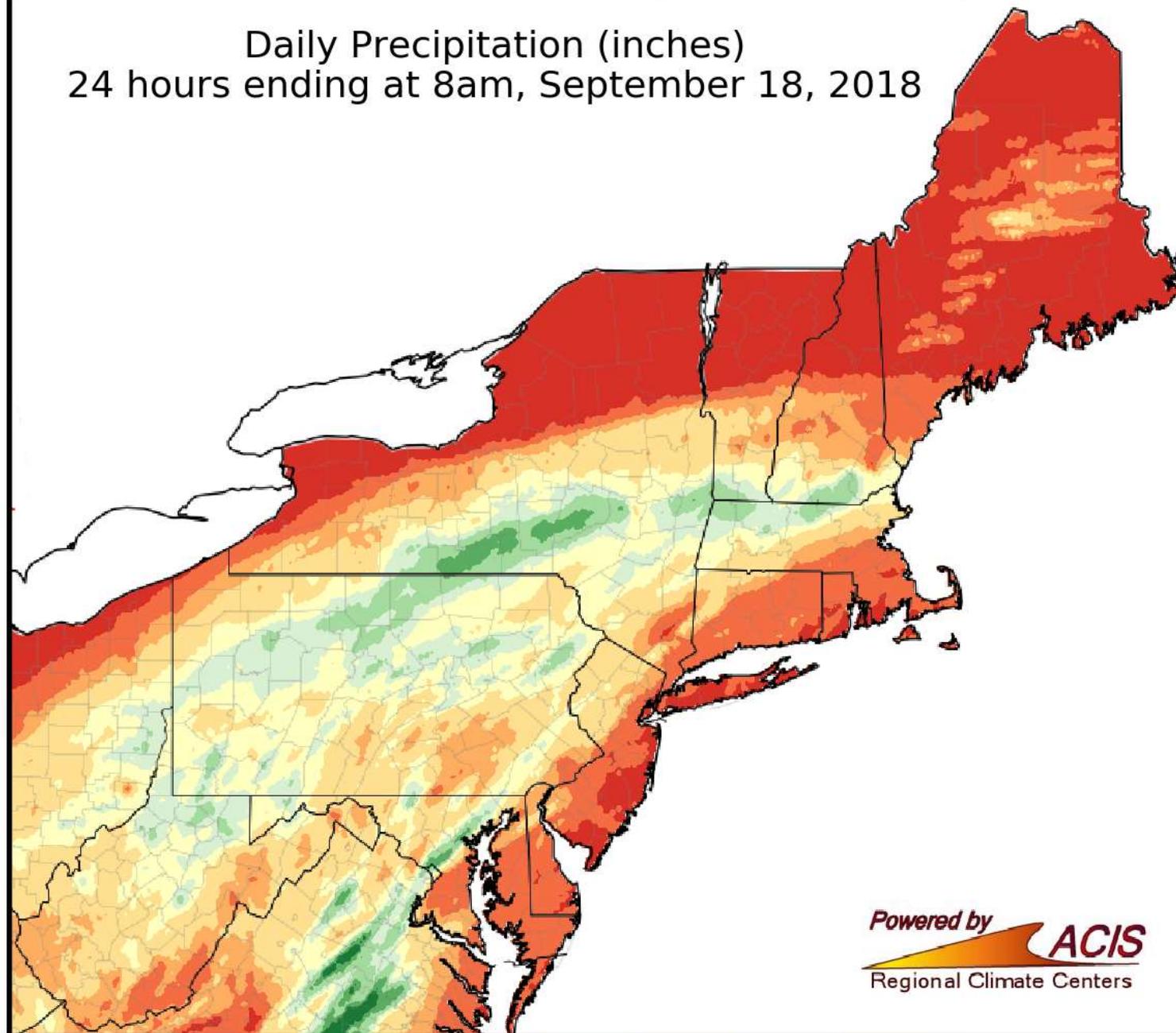
Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Chemung County, New York 9/18/2018

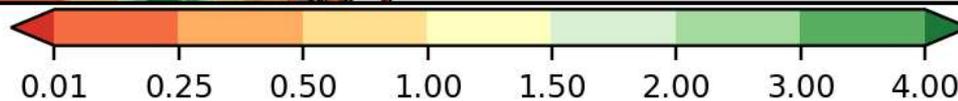
0.0 Trace 0.01 - 0.22 0.23 - 0.44 0.45 - 1.11 1.12 - 2.67 2.68 - 4.01 4.02 - 4.46



Daily Precipitation (inches)  
24 hours ending at 8am, September 18, 2018



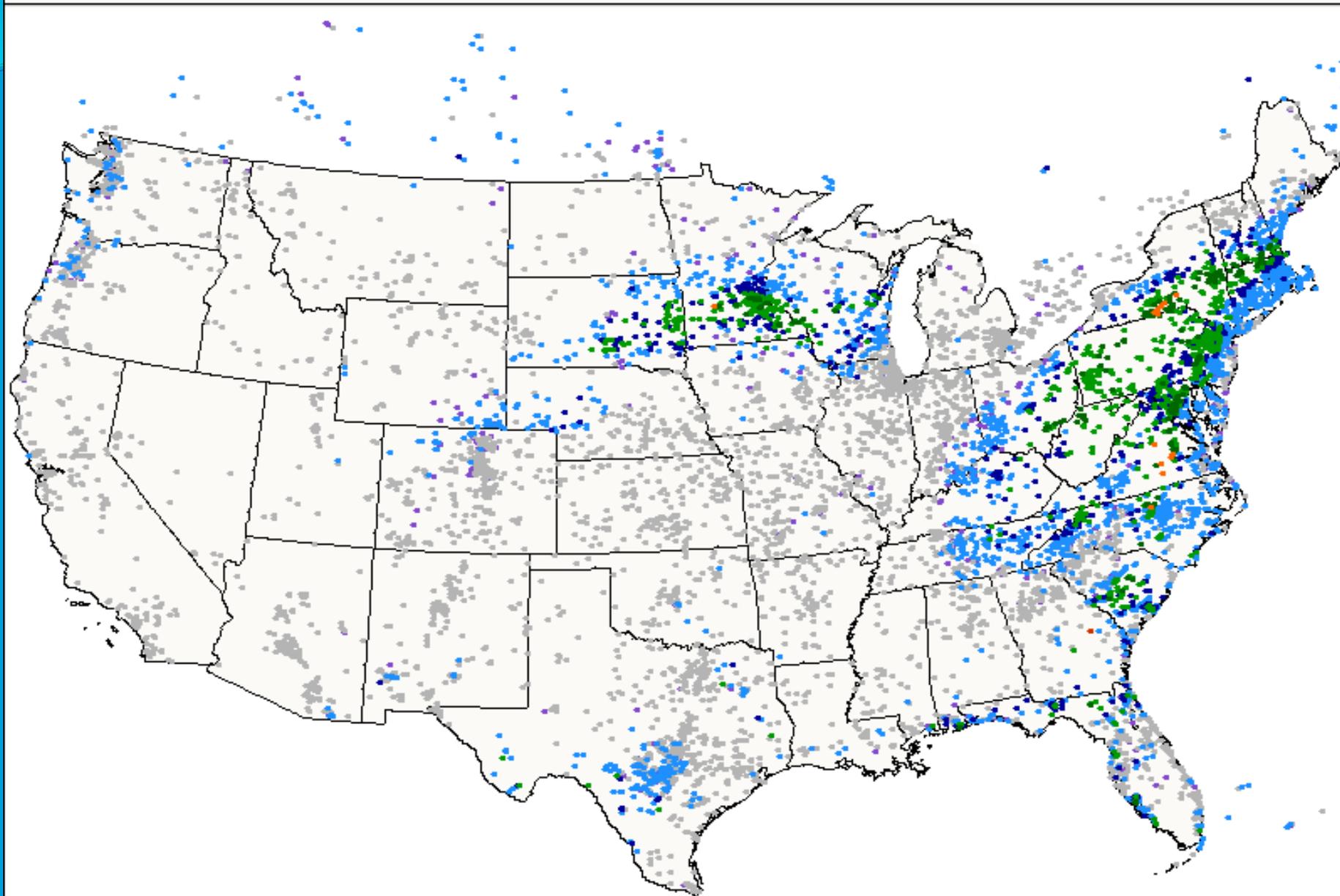
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Regional Climate Centers



Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

USA 9/18/2018

0.0 Trace 0.01 - 0.33 0.34 - 0.66 0.67 - 1.64 1.65 - 3.93 3.94 - 5.89 5.90 - 6.53









# Fern Dell Drive Stormwater System



Aerial Photograph Mapping
Fern Dell Drive Town of Elmira, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
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1 in = 50 ft





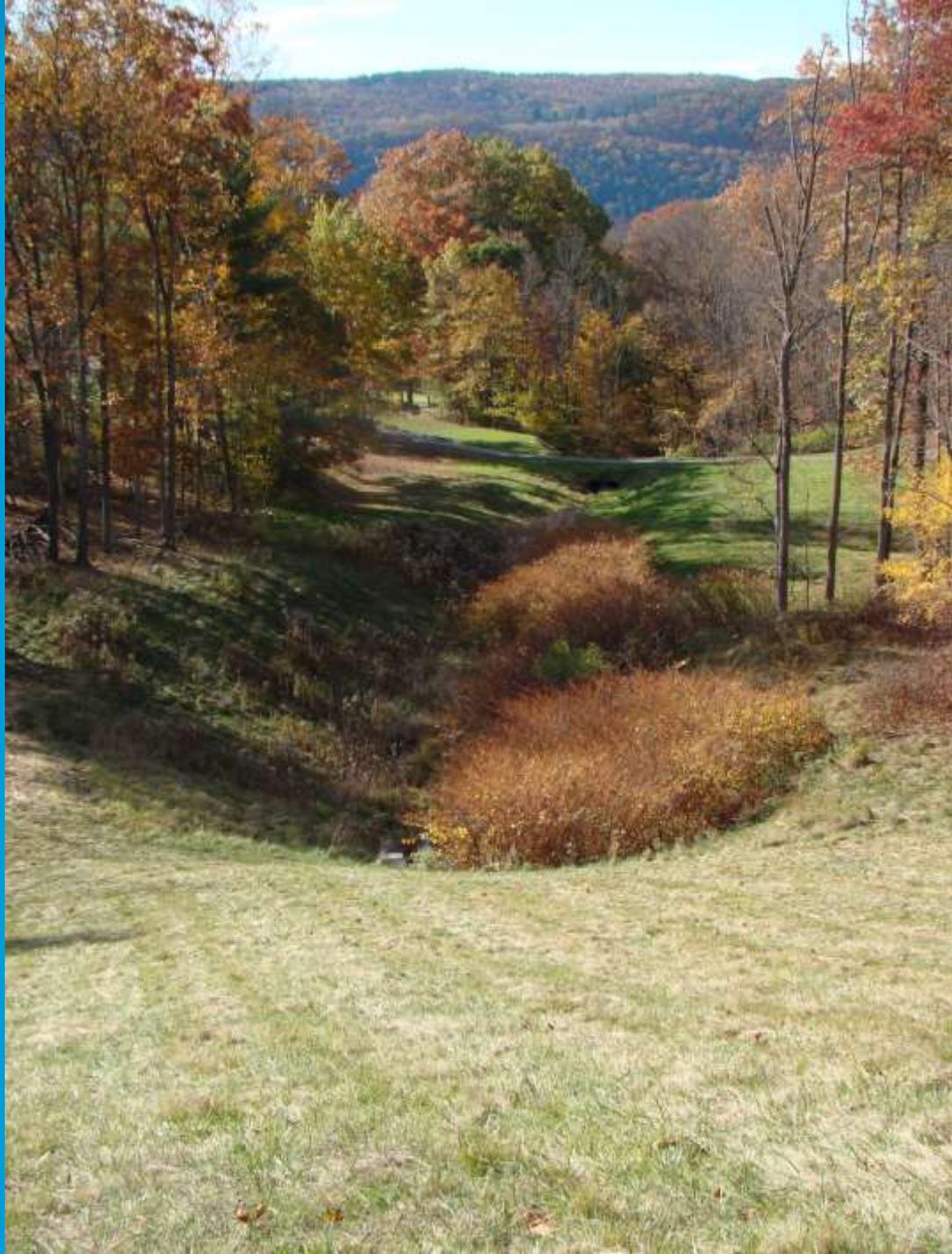


**NO**  
**TRESPASSING**

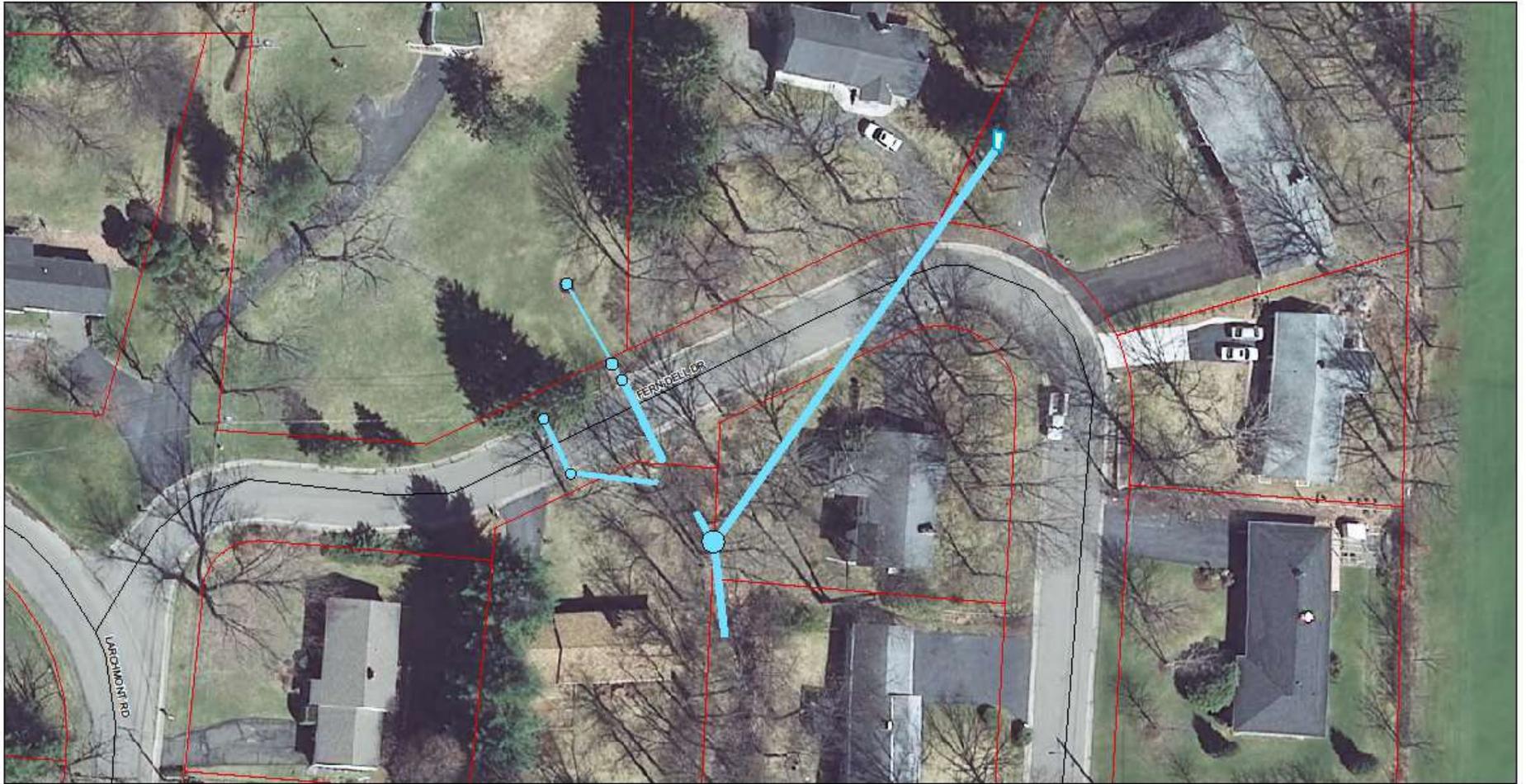
By order of the  
Board of Directors

**ELMIRA  
COUNTRY  
CLUB**

*Violators will be Prosecuted*







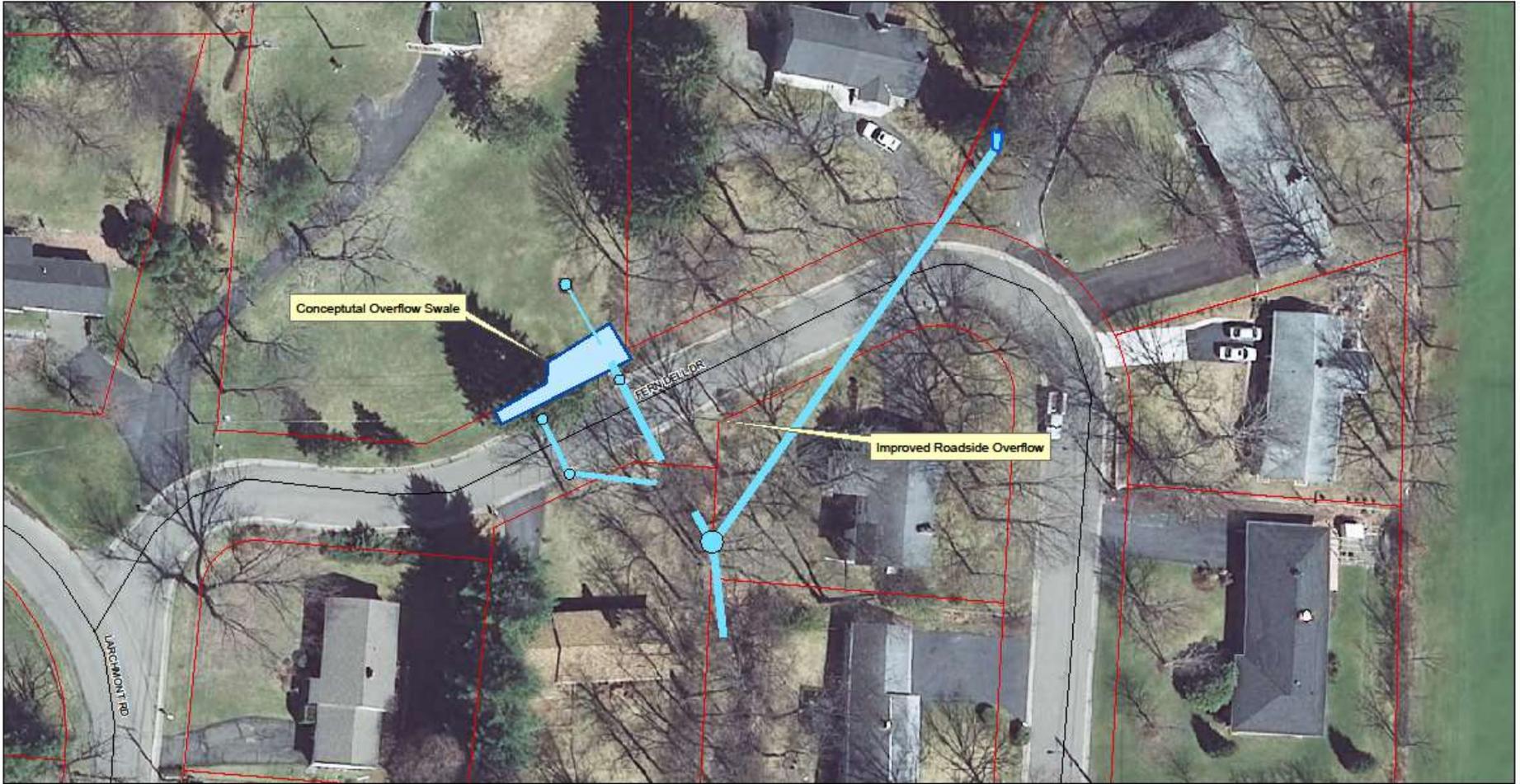
Storm Sewers - Schematic Plan
Fern Dell Drive Town of Elmira, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
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1 in = 40 ft



Conceptual Improvement - Overflow Swale

Fern Dell Drive  
Town of Elmira, New York

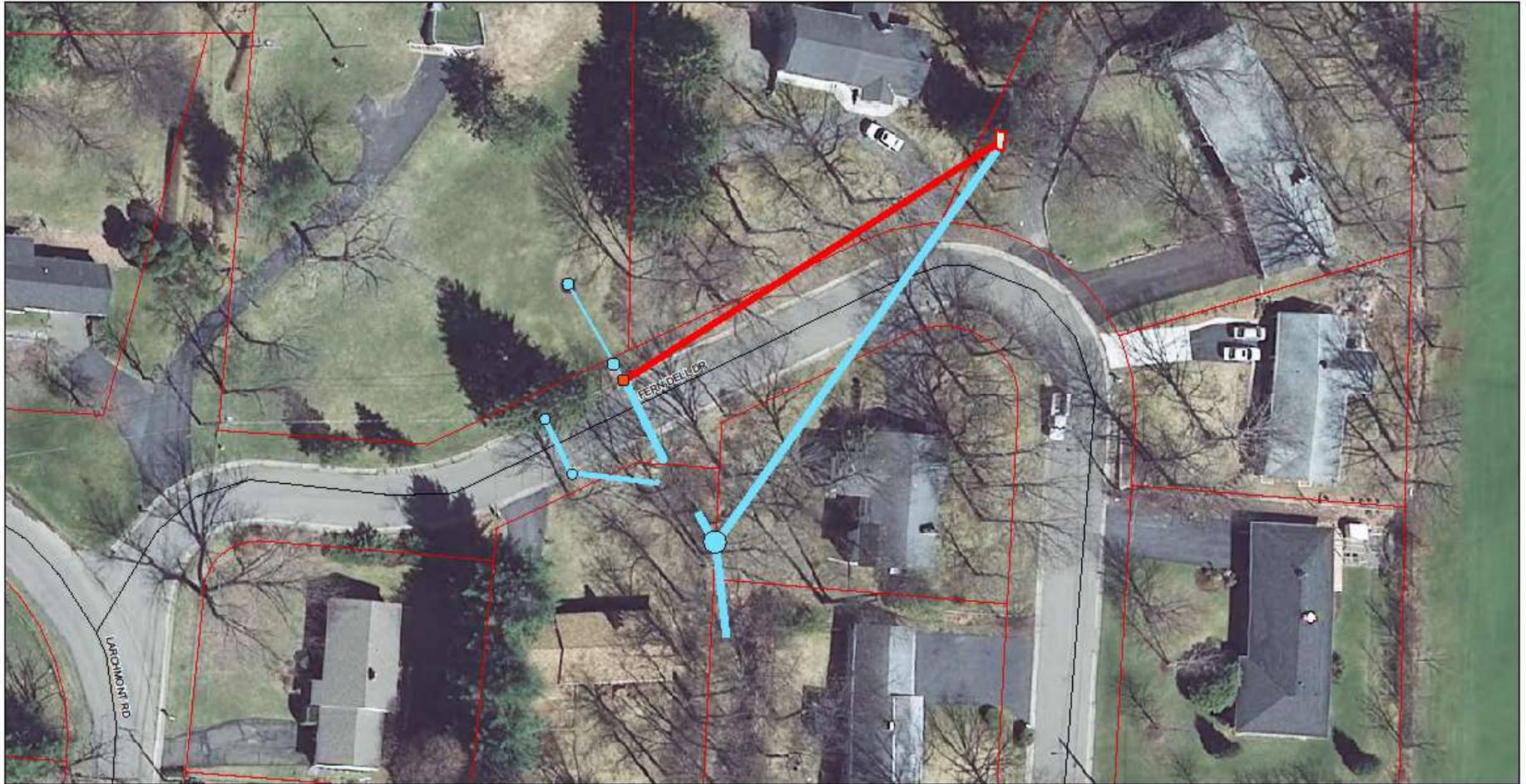
Prepared By

Chemung County Stormwater Coalition  
851 Chemung Street  
Horseheads, New York 14845

1



1 in = 40 ft



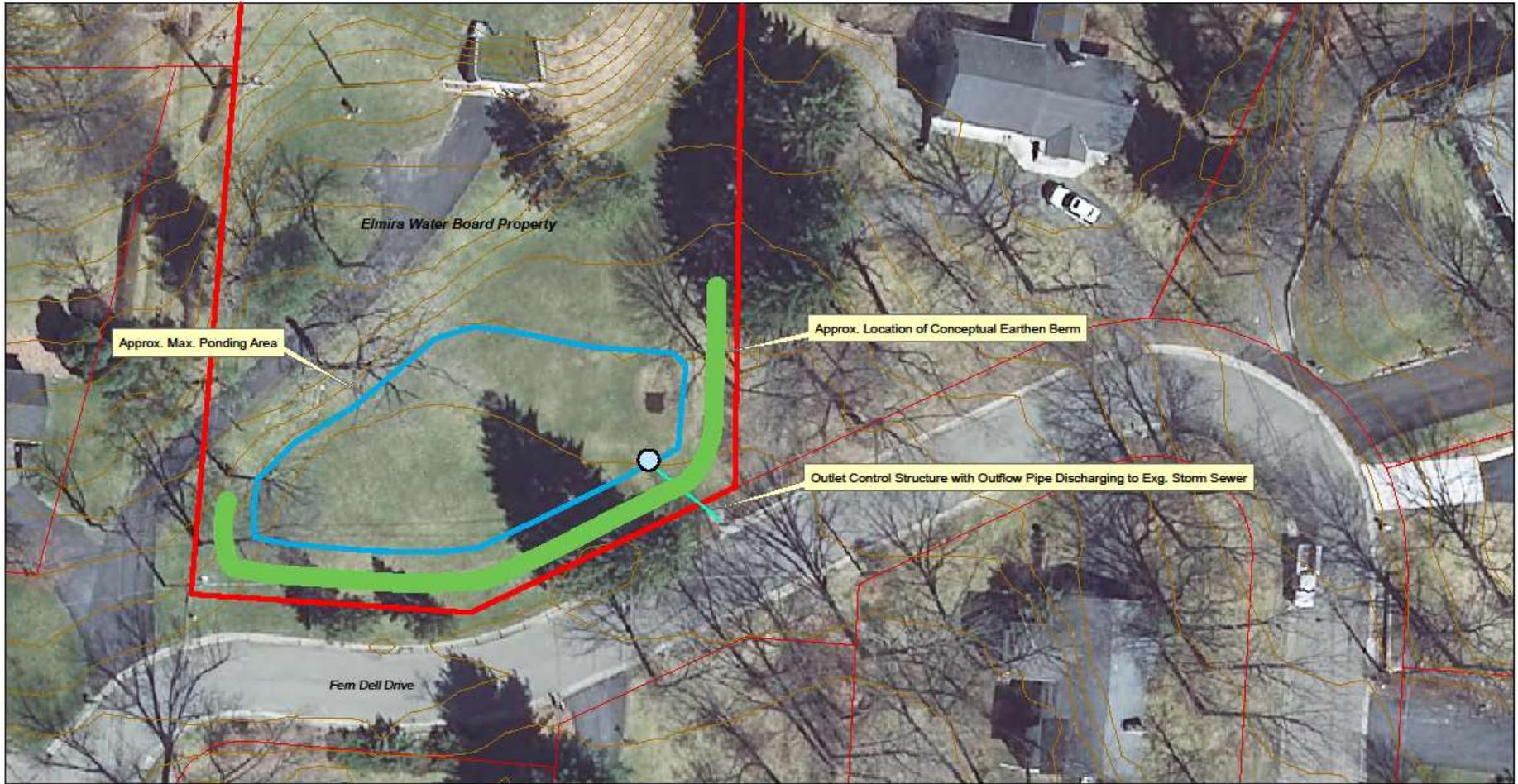
Conceptual Improvement
Fern Dell Drive Town of Elmira, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
---



1 in = 40 ft



Conceptual Stormwater Detention Basin
Elmira Water Board Property on Fern Dell Drive Town of Elmira, Chemung County, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
---



1 in = 30 ft

# Comprehensive Storm Drainage Studies



Aerial Photograph Mapping
West Elmira Town of Elmira, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
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1 in = 500 ft



Aerial Photograph Mapping
West Elmira Town of Elmira, New York

Prepared By
Chemung County Stormwater Coalition 851 Chemung Street Horseheads, New York 14845

1
---



1 in = 500 ft





**TABLE 3: MODEL-PREDICTED PEAK STORMWATER FLOW RATES @ COLEMAN AVENUE**

STORM RETURN PERIOD	ESTIMATED PEAK <u>STORMWATER</u> FLOW RATES (CFS)			
	TYPE II DISTRIBUTION W/ NOAA RAINFALL DEPTHS	TYPE II DISTRIBUTION W/ NRCC RAINFALL DEPTHS	CUSTOMIZED NOAA RAINFALL DISTRIBUTION & DEPTHS	CUSTOMIZED NRCC RAINFALL DISTRIBUTION & DEPTHS
2-YEAR	65.6	59.5	66.4	61.3
5-YEAR	108.8	92.4	106.2	91.9
10-YEAR	150.1	126.7	145.4	122.8
25-YEAR	214.4	189.0	205.1	181.1
50-YEAR	267.0	251.1	253.7	238.1
100-YEAR	320.0	327.8	304.2	311.5