



Town of Rowley

Conservation Commission

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Conservation@townofrowley.org

To: Conservation Commission

From: Brent Baeslack, Conservation Agent *BB*

Date: January 26, 2016

Re: NOAA Atlas 14 Precipitation Data

Please be advised that recently National Oceanic and Atmospheric Administration (NOAA) released new precipitation estimates for Massachusetts this year to supersede the 1961 estimates found in Technical Paper 40.

The new estimates essentially reflect greater rates of precipitation than the estimates from 1961. I am bringing this to your attention because hydrology studies using the 1961 estimates may result in under-sized detention pond, swale, culvert designs, which could result in negative impacts to down-gradient properties and resource areas.

NOAA has been updating its estimates across the country for a few years. In 2008, the noted "Cornell Study" was released and showed significant precipitation rate increases for our area. Your guess is as good as mine as to why DEP is so far behind in assessing these changes. You'll note in the last paragraph of the attachment, DEP offers the interim guidance that TP-40 estimates "should" continue to be used, unless applicant's volunteer to use data from the NOAA or NRCC Atlases. Outside of this guidance, I believe any stormwater-regulatory requirement to rely on TP-40 may be debated.

I would like to recommend that the Commission as a standard practice request applicants utilize the new NOAA Atlas 14 precipitation estimates in their analyses. This is consistent with good engineering practice and the data in the NOAA Atlas has an Ipswich Station table so it is local to the area.

Thanks for your consideration of this policy.

Brent Baeslack

Enc.

Public Meeting Jan. 26, 2016

Garner moved to adopt the policy to request that applicants use the NOAA Atlas 14 Precipitation Data for future calculations. DeMonico seconded the motion and the motion passed unanimously.

Brent Baeslack

Town Hall Annex • Room 4 • 39 Central Street • P.O. Box 24 • Rowley, MA 01969



NOAA Atlas 14, Volume 10, Version 3
 Location name: Ipswich, Massachusetts, USA*
 Latitude: 42.6797°, Longitude: -70.8384°
 Elevation: 13.79 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orfan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.309 (0.239-0.386)	0.371 (0.287-0.464)	0.472 (0.364-0.593)	0.556 (0.426-0.702)	0.671 (0.499-0.885)	0.758 (0.553-1.02)	0.849 (0.601-1.19)	0.949 (0.639-1.36)	1.09 (0.707-1.61)	1.21 (0.764-1.82)
10-min	0.437 (0.339-0.547)	0.525 (0.406-0.658)	0.669 (0.515-0.841)	0.787 (0.604-0.996)	0.951 (0.707-1.25)	1.08 (0.782-1.45)	1.20 (0.851-1.68)	1.35 (0.905-1.92)	1.55 (1.00-2.29)	1.71 (1.08-2.58)
15-min	0.515 (0.399-0.644)	0.618 (0.478-0.774)	0.787 (0.606-0.989)	0.926 (0.710-1.17)	1.12 (0.831-1.48)	1.26 (0.921-1.70)	1.42 (1.00-1.97)	1.58 (1.07-2.26)	1.82 (1.18-2.69)	2.01 (1.27-3.03)
30-min	0.714 (0.553-0.893)	0.851 (0.658-1.07)	1.08 (0.828-1.35)	1.26 (0.968-1.59)	1.52 (1.13-2.00)	1.71 (1.25-2.30)	1.91 (1.36-2.67)	2.14 (1.44-3.06)	2.46 (1.59-3.63)	2.72 (1.72-4.10)
60-min	0.912 (0.707-1.14)	1.08 (0.839-1.36)	1.37 (1.05-1.72)	1.60 (1.23-2.02)	1.92 (1.43-2.53)	2.16 (1.57-2.91)	2.41 (1.71-3.37)	2.69 (1.81-3.85)	3.10 (2.00-4.58)	3.42 (2.17-5.16)
2-hr	1.18 (0.924-1.47)	1.42 (1.11-1.77)	1.82 (1.42-2.27)	2.15 (1.66-2.69)	2.60 (1.95-3.42)	2.93 (2.16-3.95)	3.29 (2.37-4.62)	3.72 (2.51-5.28)	4.38 (2.84-6.43)	4.93 (3.13-7.39)
3-hr	1.37 (1.08-1.70)	1.66 (1.30-2.06)	2.13 (1.67-2.65)	2.53 (1.97-3.16)	3.07 (2.32-4.03)	3.47 (2.57-4.67)	3.91 (2.83-5.48)	4.44 (3.00-6.28)	5.26 (3.42-7.71)	5.97 (3.80-8.91)
6-hr	1.76 (1.39-2.16)	2.14 (1.69-2.63)	2.77 (2.18-3.42)	3.29 (2.58-4.08)	4.00 (3.05-5.22)	4.53 (3.39-6.05)	5.10 (3.72-7.12)	5.82 (3.95-8.18)	6.92 (4.52-10.1)	7.87 (5.02-11.7)
12-hr	2.21 (1.77-2.70)	2.70 (2.16-3.30)	3.50 (2.79-4.29)	4.16 (3.30-5.14)	5.08 (3.90-6.68)	5.76 (4.33-7.63)	6.49 (4.75-8.98)	7.38 (5.04-10.3)	8.76 (5.74-12.7)	9.94 (6.36-14.6)
24-hr	2.64 (2.13-3.20)	3.27 (2.64-3.97)	4.30 (3.46-5.23)	5.15 (4.12-6.31)	6.33 (4.90-8.16)	7.20 (5.46-9.50)	8.15 (6.02-11.2)	9.32 (6.40-12.9)	11.2 (7.34-16.0)	12.7 (8.18-18.6)
2-day	3.02 (2.46-3.63)	3.81 (3.11-4.60)	5.12 (4.16-6.19)	6.20 (5.00-7.54)	7.69 (6.02-9.88)	8.78 (6.74-11.6)	9.99 (7.48-13.8)	11.6 (7.96-15.9)	14.1 (9.29-20.1)	16.3 (10.5-23.7)
3-day	3.33 (2.73-3.99)	4.19 (3.44-5.03)	5.60 (4.58-6.75)	6.77 (5.50-8.20)	8.39 (6.59-10.7)	9.56 (7.37-12.6)	10.9 (8.18-15.0)	12.6 (8.69-17.3)	15.4 (10.2-21.8)	17.8 (11.5-25.8)
4-day	3.63 (2.99-4.33)	4.52 (3.72-5.40)	5.97 (4.90-7.17)	7.18 (5.85-8.67)	8.84 (6.98-11.3)	10.1 (7.78-13.2)	11.4 (8.61-15.7)	13.2 (9.12-18.1)	16.1 (10.6-22.8)	18.6 (12.0-26.9)
7-day	4.43 (3.68-5.27)	5.35 (4.44-6.37)	6.86 (5.67-8.18)	8.10 (6.65-9.73)	9.82 (7.80-12.4)	11.1 (8.61-14.4)	12.5 (9.45-17.0)	14.3 (9.94-19.5)	17.3 (11.5-24.3)	19.9 (12.9-28.6)
10-day	5.15 (4.30-6.10)	6.09 (5.08-7.22)	7.63 (6.34-9.08)	8.91 (7.35-10.7)	10.7 (8.50-13.4)	12.0 (9.32-15.4)	13.4 (10.1-18.1)	15.2 (10.8-20.6)	18.1 (12.1-25.5)	20.7 (13.4-29.6)
20-day	7.17 (6.05-8.42)	8.20 (6.91-9.65)	9.89 (8.29-11.7)	11.3 (9.40-13.4)	13.2 (10.6-16.4)	14.7 (11.4-18.6)	16.2 (12.2-21.3)	18.0 (12.6-24.2)	20.6 (13.8-28.7)	22.8 (14.8-32.4)
30-day	8.82 (7.48-10.3)	9.94 (8.42-11.6)	11.8 (9.91-13.8)	13.3 (11.1-15.7)	15.3 (12.3-18.9)	16.9 (13.2-21.2)	18.5 (13.9-24.1)	20.3 (14.3-27.1)	22.7 (15.3-31.4)	24.6 (16.1-34.8)
45-day	10.9 (9.30-12.7)	12.1 (10.3-14.1)	14.1 (11.9-16.5)	15.7 (13.2-18.5)	18.0 (14.5-21.9)	19.7 (15.4-24.5)	21.4 (16.0-27.5)	23.2 (16.4-30.8)	25.4 (17.1-35.0)	27.1 (17.7-38.1)
60-day	12.7 (10.9-14.7)	14.0 (11.8-16.2)	16.0 (13.7-18.7)	17.8 (15.0-20.9)	20.1 (16.3-24.5)	22.0 (17.3-27.2)	23.8 (17.8-30.3)	25.5 (18.2-33.8)	27.7 (18.8-38.1)	29.3 (19.1-41.1)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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