

6. Deer Lake A

This station was updated in CRA (2015). The updated IDF curve from CRA (2015) is reproduced below, with the addition of the 20-year return period.

This IDF curve was updated using 6-hr data from Deer Lake A and Deer Lake A (relocated). The IDF curve generally increased during the update, but decreased slightly for the 6-hr duration (Table 6.1).

Table 6.1 Differences Between IDF Curves for Deer Lake A

Percent Difference in Precipitation Amount (%) (Difference in Precipitation Amount (mm))						
Duration	Return Period (years)					
	2	5	10	25	50	100
5-min	N/A	N/A	N/A	N/A	N/A	N/A
10-min	N/A	N/A	N/A	N/A	N/A	N/A
15-min	N/A	N/A	N/A	N/A	N/A	N/A
30-min	N/A	N/A	N/A	N/A	N/A	N/A
1-hr	N/A	N/A	N/A	N/A	N/A	N/A
2-hr	N/A	N/A	N/A	N/A	N/A	N/A
6-hr	-2.3 (-0.7)	-1.6 (-0.6)	-1.3 (-0.5)	-1.0 (-0.5)	-0.8 (-0.4)	-0.6 (-0.3)
12-hr	2.4 (0.9)	3.0 (1.3)	3.2 (1.6)	3.5 (2.0)	3.7 (2.3)	3.8 (2.5)
24-hr	4.9 (2.1)	8.3 (4.3)	10.0 (5.8)	11.7 (7.7)	12.8 (9.0)	13.6 (10.4)
Notes: Red numbers indicate that the updated IDF curve is lower than the EC-IDF V2.3 IDF curve for that duration and return period. Bold numbers indicate changes greater than 5 percent.						

Office of Climate Change and Energy Efficiency

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes
de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2015/10/30

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DEER LAKE A NL 8401501
Updated with 6-hr data measured at Deer Lake A (8401501): 2003-2011
Updated with 6-hr data measured at Deer Lake A (8401502): 2012-2014
Latitude: 49 13'N Longitude: 57 24'W Elevation/Altitude: 21 m
Years/Années : 1966 - 2014 # Years/Années : 36

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Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

	Year Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
EC-IDF	1966	2.8	3.0	4.6	6.3	9.9	13.7	21.8	25.9	29.2
EC-IDF	1967	5.1	5.8	7.1	10.9	14.2	19.3	31.7	37.6	38.6
EC-IDF	1968	4.1	6.1	8.9	12.2	13.2	21.3	41.1	52.1	64.0
EC-IDF	1969	3.0	4.8	6.1	7.4	10.7	14.7	25.9	31.0	37.8
EC-IDF	1970	2.8	3.0	4.1	6.9	13.2	23.4	38.1	39.6	40.1
EC-IDF	1971	3.6	5.6	6.6	8.9	11.2	12.4	22.9	27.7	29.2
EC-IDF	1972	4.6	4.8	5.3	7.4	9.7	15.7	27.4	36.6	45.0
EC-IDF	1973	7.1	12.4	13.5	15.2	15.7	23.1	36.6	47.0	50.3
EC-IDF	1974	2.8	5.3	7.4	9.1	13.7	16.8	28.2	32.0	43.9
EC-IDF	1975	7.1	8.9	11.2	15.7	23.9	39.9	44.7	50.8	66.5
EC-IDF	1976	3.8	3.8	4.3	6.9	9.7	13.2	25.7	39.1	42.4
EC-IDF	1977	3.8	7.4	7.6	15.0	18.3	18.5	34.3	46.7	47.5
EC-IDF	1978	6.9	10.8	13.9	16.5	19.6	36.1	36.1	36.1	45.9
EC-IDF	1979	4.0	6.5	7.7	9.6	9.8	11.9	24.2	33.3	41.2
EC-IDF	1980	3.1	4.9	5.8	7.1	10.1	15.3	34.3	55.7	62.7
EC-IDF	1981	3.4	4.4	5.1	8.3	14.1	15.0	24.3	37.9	43.8
EC-IDF	1982	1.9	3.0	4.0	6.4	12.7	21.5	30.0	30.2	38.3
EC-IDF	1983	4.0	6.5	7.4	12.1	19.8	28.1	34.0	36.8	46.3
EC-IDF	1984	11.6	12.8	12.8	12.8	12.8	17.8	31.1	33.8	43.3
EC-IDF	1985	3.3	4.6	4.8	7.6	10.6	13.0	18.2	25.7	32.7
EC-IDF	1986	2.2	4.3	5.4	7.3	10.0	13.0	21.5	28.2	39.9
EC-IDF	1987	4.0	5.7	6.7	10.2	10.9	15.5	25.2	25.7	26.7
EC-IDF	1988	8.3	10.0	11.9	14.1	16.2	18.9	31.0	39.8	39.8
EC-IDF	1989	4.0	5.0	6.2	8.5	11.6	17.2	26.4	34.4	40.8
EC-IDF	1990	6.2	9.2	11.2	12.5	16.0	21.9	22.8	37.3	38.0
EC-IDF	1991	2.3	3.7	3.9	6.4	11.2	18.5	38.2	40.4	43.0
EC-IDF	1993	1.8	3.2	4.8	6.7	9.7	17.8	28.7	31.9	40.8
EC-IDF	1994	4.7	9.4	10.1	13.5	19.9	25.8	33.9	39.7	51.3
EC-IDF	1995	2.8	3.6	4.7	9.2	13.5	23.1	44.9	54.0	70.1
EC-IDF	1996	2.5	3.9	5.1	7.2	10.9	20.1	44.6	59.0	59.1
EC-IDF	1997	3.6	5.1	6.6	10.1	12.4	13.4	21.1	30.0	35.6
EC-IDF	1998	2.6	3.8	4.8	9.6	13.4	19.6	29.4	42.3	53.6
EC-IDF	1999	3.3	5.0	7.5	14.8	21.0	24.3	25.2	39.0	41.4
EC-IDF	2000	7.8	10.4	10.4	11.5	16.5	28.7	46.9	48.3	48.3
EC-IDF	2001	5.2	7.5	9.7	13.3	18.3	24.2	27.0	31.5	38.2
EC-IDF	2002	4.2	7.5	11.1	15.8	19.8	21.5	36.5	44.2	49.2
UPDATE	2003	NM	NM	NM	NM	NM	NM	30.0	42.0	54.0
UPDATE	2004	NM	NM	NM	NM	NM	NM	26.0	48.0	71.0
UPDATE	2005	NM	NM	NM	NM	NM	NM	31.0	58.0	80.0
UPDATE	2006	NM	NM	NM	NM	NM	NM	19.0	28.0	35.2
UPDATE	2007	NM	NM	NM	NM	NM	NM	43.0	49.0	67.0
UPDATE	2008	NM	NM	NM	NM	NM	NM	18.0	35.6	43.6
UPDATE	2009	NM	NM	NM	NM	NM	NM	26.0	43.0	49.0
UPDATE	2010	NM	NM	NM	NM	NM	NM	36.0	50.0	59.0
UPDATE	2011	NM	NM	NM	NM	NM	NM	40.0	57.0	80.0
UPDATE	2012	NM	NM	NM	NM	NM	NM	24.0	37.0	41.0
UPDATE	2013	NM	NM	NM	NM	NM	NM	25.0	27.0	35.0
UPDATE	2014	NM	NM	NM	NM	NM	NM	22.0	32.0	40.0

# Yrs. Années	36	36	36	36	36	36	48	48	48
Mean Moyenne	4.3	6.2	7.5	10.4	14.0	19.8	30.3	39.3	47.1
Std. Dev. Écart-type	2.1	2.7	2.9	3.2	3.9	6.3	7.7	9.3	12.7
Skew. Dissymétrie	1.64	0.98	0.76	0.43	0.81	1.34	0.49	0.47	1.00
Kurtosis	6.26	3.25	2.63	2.03	2.89	5.41	2.53	2.49	3.66

*-99.9 Indicates Missing Data/Données manquantes

* NM Indicates No Measurements/Aucunes mesures

Warning: annual maximum amount greater than 100-yr return period amount

Avertissement : la quantité maximale annuelle excède la quantité

pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
1975	2 h	39.9	39.7
1984	5 min	11.6	10.8
1984	5 min	11.6	10.8

Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

Duration/Durée	2	5	10	20	25	50	100	#Years Années
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	
EC-IDF 5 min	3.9	5.8	7.0	8.2	8.6	9.7	10.8	36
EC-IDF 10 min	5.7	8.1	9.7	11.2	11.7	13.2	14.7	36
EC-IDF 15 min	7.0	9.6	11.3	12.9	13.5	15.1	16.7	36
EC-IDF 30 min	9.8	12.7	14.6	16.4	17.0	18.7	20.5	36
EC-IDF 1 h	13.4	16.8	19.1	21.2	21.9	24.1	26.2	36
EC-IDF 2 h	18.8	24.4	28.1	31.7	32.8	36.3	39.7	36
UPDATE 6 h	29.0	35.8	40.3	44.6	45.9	50.1	54.3	48
UPDATE 12 h	37.8	46.0	51.4	56.7	58.3	63.4	68.5	48
UPDATE 24 h	45.0	56.2	63.6	70.7	73.0	79.9	86.8	48
* 6-hr data were used for the update: shorter durations were not updated								

Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits
Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

Duration/Durée	2	5	10	20	25	50	100	#Years Années
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	
EC-IDF 5 min	47.3	69.5	84.1	98.2	102.7	116.4	130.0	36
	+/- 7.5	+/- 12.7	+/- 17.1	+/- 21.6	+/- 23.0	+/- 27.6	+/- 32.1	36
EC-IDF 10 min	34.3	48.6	58.2	67.3	70.2	79.1	87.9	36
	+/- 4.9	+/- 8.2	+/- 11.1	+/- 14.0	+/- 15.0	+/- 17.9	+/- 20.8	36
EC-IDF 15 min	27.9	38.3	45.1	51.7	53.8	60.2	66.6	36
	+/- 3.5	+/- 5.9	+/- 8.0	+/- 10.1	+/- 10.8	+/- 12.9	+/- 15.1	36
EC-IDF 30 min	19.7	25.4	29.2	32.8	33.9	37.5	41.0	36
	+/- 1.9	+/- 3.3	+/- 4.4	+/- 5.6	+/- 5.9	+/- 7.1	+/- 8.3	36
EC-IDF 1 h	13.4	16.8	19.1	21.2	21.9	24.1	26.2	36
	+/- 1.2	+/- 2.0	+/- 2.6	+/- 3.3	+/- 3.6	+/- 4.3	+/- 5.0	36
EC-IDF 2 h	9.4	12.2	14.1	15.8	16.4	18.1	19.9	36
	+/- 0.9	+/- 1.6	+/- 2.2	+/- 2.7	+/- 2.9	+/- 3.5	+/- 4.1	36
UPDATE 6 h	4.8	6.0	6.7	7.4	7.7	8.4	9.1	48
	+/- 0.3	+/- 0.6	+/- 0.8	+/- 1.0	+/- 1.0	+/- 1.2	+/- 1.4	48
UPDATE 12 h	3.2	3.8	4.3	4.7	4.9	5.3	5.7	48
	+/- 0.2	+/- 0.3	+/- 0.5	+/- 0.6	+/- 0.6	+/- 0.7	+/- 0.9	48
UPDATE 24 h	1.9	2.3	2.6	2.9	3.0	3.3	3.6	48
	+/- 0.1	+/- 0.2	+/- 0.3	+/- 0.4	+/- 0.4	+/- 0.5	+/- 0.6	48
* 6-hr data were used for the update: shorter durations were not updated								

Table 3 : Interpolation Equation / Équation d'interpolation: $R = A \cdot T^B$

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)
RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)
T = Rainfall duration (h) / Durée de la pluie (h)

Statistics/Statistiques	2	5	10	20	25	50	100
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans
Mean of RR/Moyenne de RR	18.0	24.8	29.3	33.6	34.9	39.2	43.3
Std. Dev. /Écart-type (RR)	15.7	23.1	28.0	32.7	34.2	38.8	43.4
Std. Error/Erreur-type	1.8	1.5	1.5	1.5	1.5	1.6	1.7
Coefficient (A)	12.7	16.8	19.4	21.9	22.7	25.2	27.6
Exponent/Exposant (B)	-0.565	-0.594	-0.607	-0.616	-0.619	-0.625	-0.631
Mean % Error/% erreur moyenne	5.2	3.0	3.0	3.1	3.2	3.3	3.4

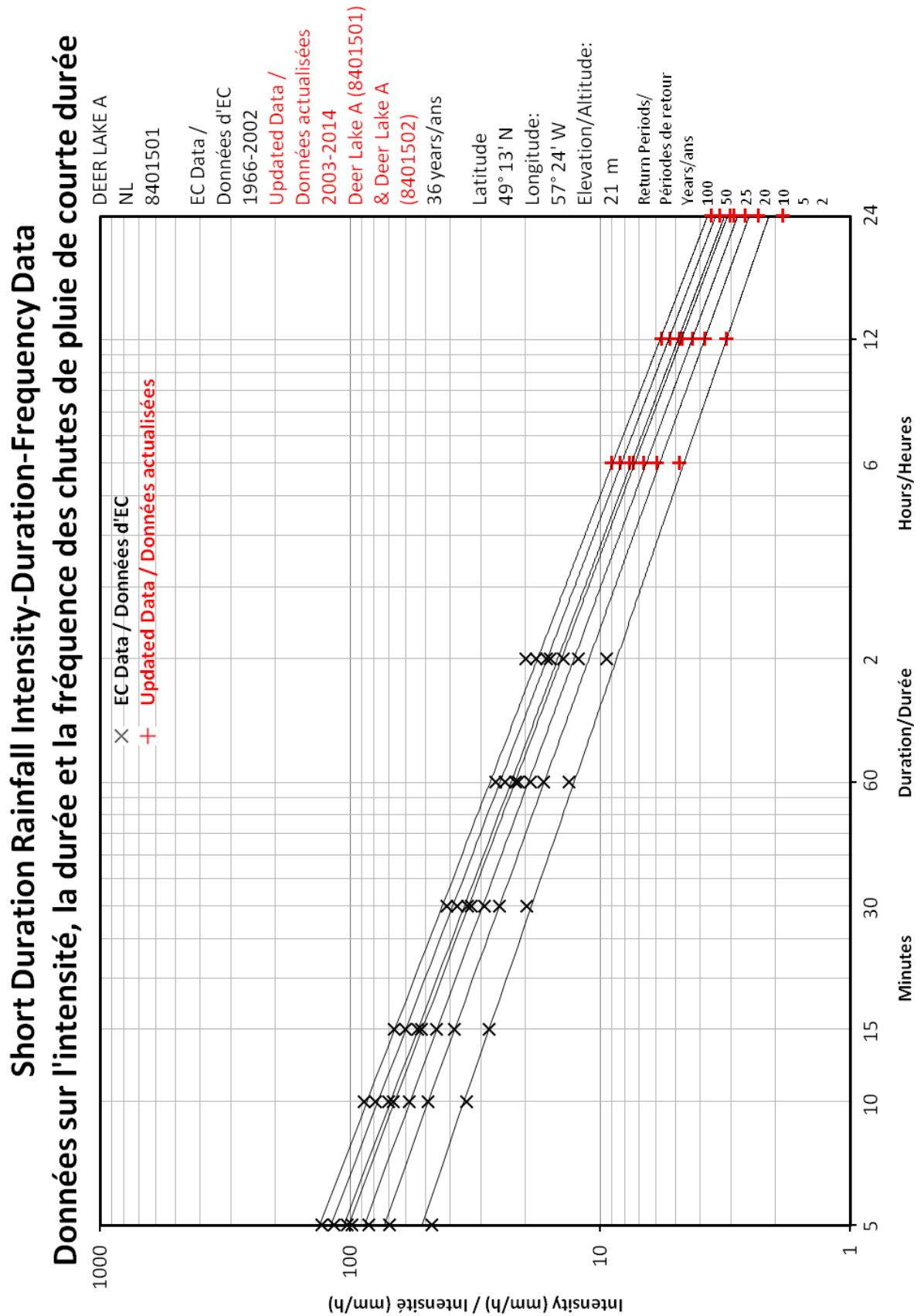
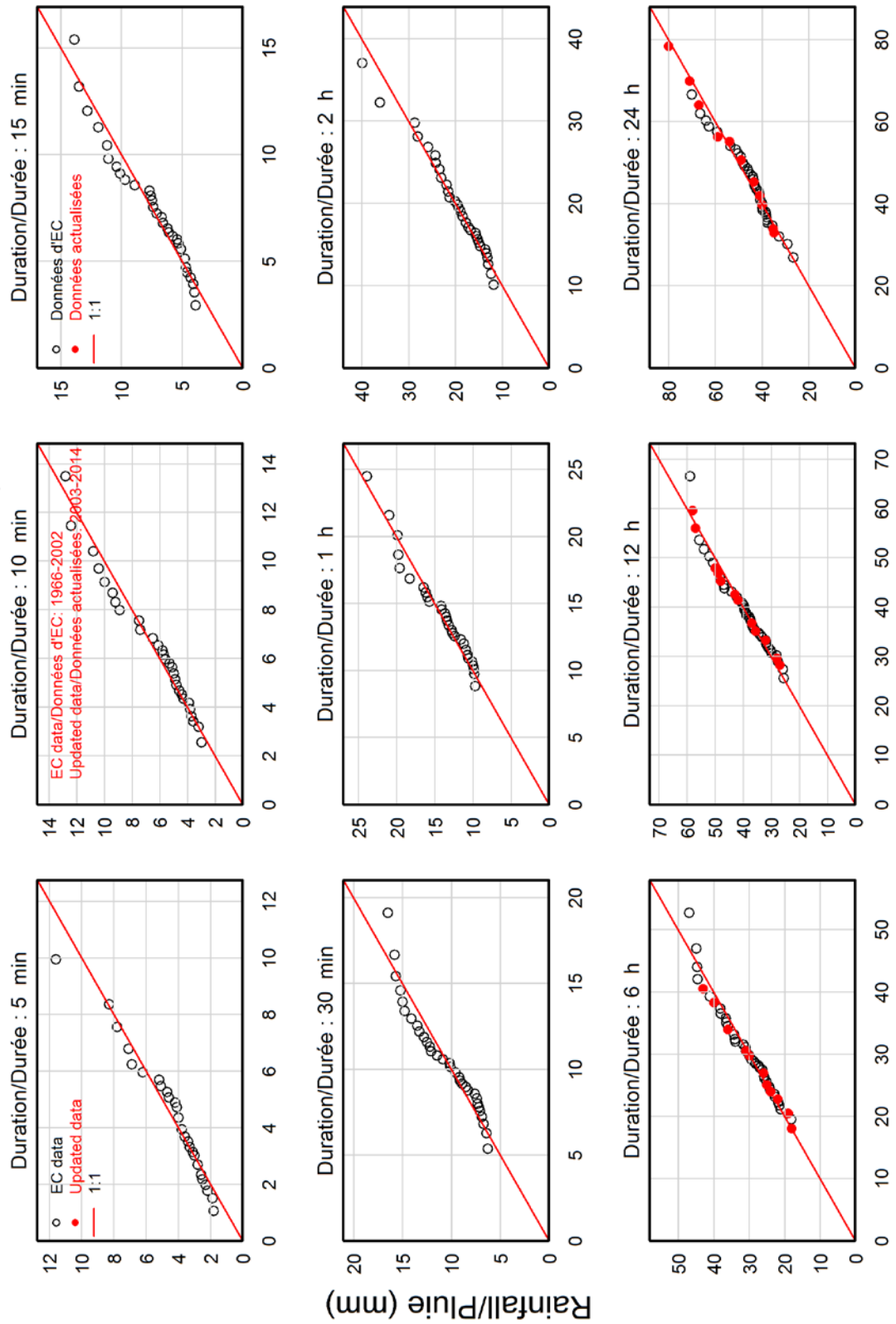


Figure 6.1 Deer Lake A IDF Curve – Updated

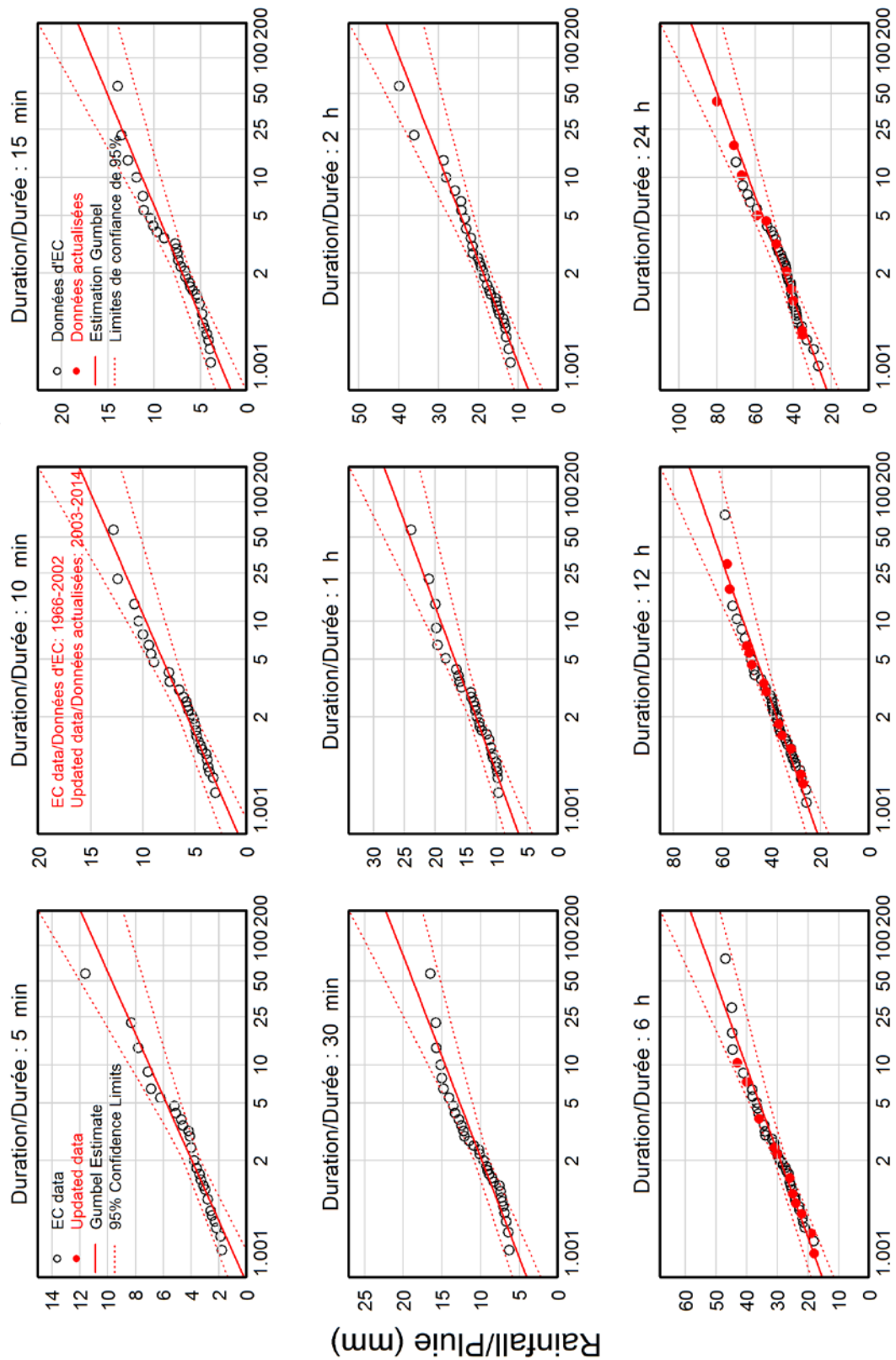
Quantile-Quantile : DEER LAKE A, NL 8401501



Gumbel Estimate/Estimation Gumbel (mm)

Figure 6.2 Deer Lake A Quantile-Quantile Plot - Updated

Return Level/Niveau de retour : DEER LAKE A, NL 8401501



Return Period/Période de retour (years/années)

Figure 6.3 Deer Lake A Return Level Plot – Updated

Trend/Tendance : DEER LAKE A, NL 8401501

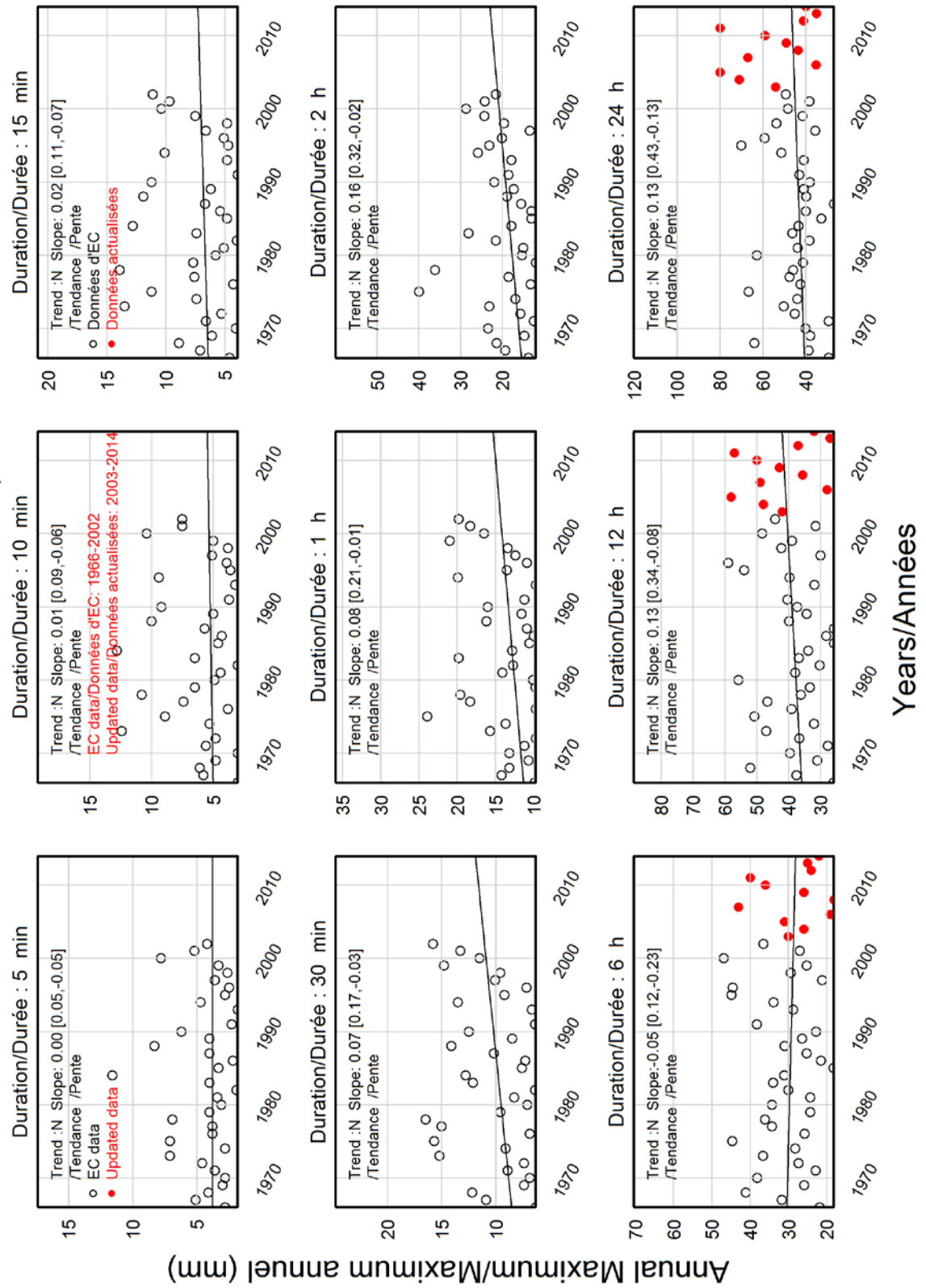


Figure 6.4 Deer Lake A Trend Plot - Updated