

5. Daniels Harbour

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 collected at Daniels Harbour. The IDF curve decreased during the update (Table 5.1). Where there are decreases greater than 5 percent, users should exercise caution when using the updated IDF curve, or use the EC IDF curve.

Table 5.1 Differences Between IDF Curves for Daniels Harbour

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	-4.5 (-1.5)	-5.1 (-2.1)	-5.3 (-2.6)	-5.6 (-3.1)	-5.7 (-3.5)	-5.8 (-3.9)
12-hr	-2.2 (-0.9)	-5.8 (-3.3)	-7.3 (-4.9)	-8.7 (-6.8)	-9.5 (-8.3)	-10.1 (-9.8)
24-hr	0.5 (0.3)	-4.2 (-3.2)	-6.1 (-5.6)	-7.7 (-8.5)	-8.6 (-10.7)	-9.3 (-12.9)
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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DANIELS HARBOUR NL 8401400
Updated with 6-hr data measured at Daniels Harbour (8401400): 1996-2014

Latitude: 50 14'N Longitude: 57 35'W Elevation/Altitude: 19 m
Years/Années : 1969 - 2014 # Years/Années : 26

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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	1969	2.5	4.8	5.3	7.4	10.4	12.2	23.4	28.2	28.2
EC-IDF	1970	2.5	2.8	3.8	7.1	9.9	15.0	25.1	31.5	40.9
EC-IDF	1971	4.6	8.1	9.9	10.4	17.5	22.1	27.7	38.9	42.9
EC-IDF	1972	3.0	5.8	6.6	9.4	14.5	22.9	31.0	37.8	37.8
EC-IDF	1973	4.1	6.1	8.4	8.6	15.0	28.7	48.8	65.3	103.9
EC-IDF	1974	4.8	6.1	6.6	8.4	14.7	19.6	30.0	38.1	62.0
EC-IDF	1975	1.8	3.0	3.8	5.1	7.4	11.4	19.6	29.2	41.7
EC-IDF	1976	3.0	5.3	5.3	5.3	9.1	16.3	27.7	40.9	53.6
EC-IDF	1977	4.8	5.8	6.9	8.9	11.2	12.7	30.2	38.6	46.2
EC-IDF	1978	3.1	4.5	5.3	5.8	8.7	13.1	30.3	34.4	53.3
EC-IDF	1979	3.6	5.6	7.1	12.9	18.4	25.3	45.0	80.2	109.4
EC-IDF	1980	4.7	5.2	6.5	10.7	11.7	18.8	28.7	46.4	61.8
EC-IDF	1981	5.5	8.0	11.2	13.9	22.8	26.8	46.8	53.8	65.7
EC-IDF	1982	5.2	7.4	8.0	8.4	10.9	19.7	44.8	72.8	91.3
EC-IDF	1983	14.8	18.1	18.9	20.7	25.2	27.4	34.6	38.7	51.7
EC-IDF	1984	5.5	6.0	6.9	9.8	14.0	23.7	55.9	75.0	111.1
EC-IDF	1985	5.2	8.3	8.9	8.9	11.9	17.4	32.6	34.0	47.2
EC-IDF	1986	2.1	3.9	4.2	4.2	5.6	9.0	20.9	28.6	29.0
EC-IDF	1987	5.4	7.7	11.5	21.3	31.3	33.2	39.6	42.0	42.0
EC-IDF	1989	3.6	5.3	6.2	7.3	13.5	21.2	34.6	37.8	45.1
EC-IDF	1990	3.4	5.9	7.8	10.4	16.4	26.7	43.9	47.0	57.4
EC-IDF	1991	3.1	4.6	5.7	7.4	11.2	19.1	31.9	44.0	48.6
EC-IDF	1992	1.3	1.8	2.5	4.6	9.2	13.0	16.4	28.5	35.2
EC-IDF	1993	4.3	8.4	10.2	13.6	13.8	16.4	32.5	41.0	43.1
EC-IDF	1994	5.0	7.1	7.3	11.9	18.6	20.0	27.6	34.8	55.2
EC-IDF	1995	3.2	5.0	7.0	10.8	15.8	24.4	58.5	83.7	114.3
UPDATE	1996	NM	NM	NM	NM	NM	NM	32.0	32.0	-99.9
UPDATE	1998	NM	NM	NM	NM	NM	NM	24.0	43.0	66.0
UPDATE	2000	NM	NM	NM	NM	NM	NM	20.0	37.0	49.0
UPDATE	2001	NM	NM	NM	NM	NM	NM	33.0	40.0	60.0
UPDATE	2003	NM	NM	NM	NM	NM	NM	29.0	56.0	84.0
UPDATE	2004	NM	NM	NM	NM	NM	NM	38.0	38.5	-99.9
UPDATE	2005	NM	NM	NM	NM	NM	NM	47.0	47.0	57.0
UPDATE	2006	NM	NM	NM	NM	NM	NM	47.0	53.0	57.0
UPDATE	2007	NM	NM	NM	NM	NM	NM	30.0	39.0	53.0
UPDATE	2008	NM	NM	NM	NM	NM	NM	34.0	50.0	59.0
UPDATE	2009	NM	NM	NM	NM	NM	NM	23.0	41.0	41.0
UPDATE	2010	NM	NM	NM	NM	NM	NM	30.0	48.0	77.0
UPDATE	2011	NM	NM	NM	NM	NM	NM	26.0	41.0	49.0
UPDATE	2012	NM	NM	NM	NM	NM	NM	24.0	36.0	54.0
UPDATE	2013	NM	NM	NM	NM	NM	NM	21.0	27.0	43.0
UPDATE	2014	NM	NM	NM	NM	NM	NM	22.0	35.0	54.0

# Yrs. Années	26	26	26	26	26	26	42	42	40
Mean Moyenne	4.2	6.2	7.4	9.7	14.2	19.8	32.6	43.7	58.0
Std. Dev. Écart-type	2.5	3.0	3.2	4.2	5.7	6.1	10.1	13.8	21.7
Skew. Dissymétrie	3.20	2.56	1.82	1.38	1.29	0.18	0.81	1.51	1.36
Kurtosis	16.52	13.13	8.62	5.47	5.37	2.70	3.28	5.02	4.46

*-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
1983	5 min	14.8	12.0
1983	10 min	18.1	15.5
1983	15 min	18.9	17.5

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	3.8	6.0	7.5	8.8	9.3	10.6	12.0	26
EC-IDF 10 min	5.7	8.3	10.1	11.7	12.3	13.9	15.5	26
EC-IDF 15 min	6.8	9.7	11.6	13.4	14.0	15.8	17.5	26
EC-IDF 30 min	9.0	12.8	15.3	17.6	18.4	20.7	23.0	26
EC-IDF 1 h	13.2	18.3	21.6	24.9	25.9	29.0	32.1	26
EC-IDF 2 h	18.8	24.3	27.8	31.3	32.4	35.7	39.1	26
UPDATE 6 h	30.9	39.8	45.7	51.3	53.1	58.6	64.1	42
UPDATE 12 h	41.4	53.6	61.7	69.5	71.9	79.5	87.1	42
UPDATE 24 h	54.5	73.6	86.3	98.5	102.3	114.2	126.0	40

* 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	45.9	72.2	89.5	106.2	111.5	127.8	143.9	26
	+/- 10.5	+/- 17.6	+/- 23.8	+/- 30.1	+/- 32.1	+/- 38.4	+/- 44.8	26
EC-IDF 10 min	34.1	49.9	60.3	70.3	73.5	83.3	93.0	26
	+/- 6.3	+/- 10.6	+/- 14.3	+/- 18.1	+/- 19.3	+/- 23.1	+/- 26.9	26
EC-IDF 15 min	27.4	38.8	46.4	53.7	56.0	63.1	70.1	26
	+/- 4.6	+/- 7.7	+/- 10.4	+/- 13.1	+/- 14.0	+/- 16.8	+/- 19.5	26
EC-IDF 30 min	18.1	25.6	30.5	35.3	36.8	41.4	46.0	26
	+/- 3.0	+/- 5.0	+/- 6.8	+/- 8.6	+/- 9.2	+/- 11.0	+/- 12.8	26
EC-IDF 1 h	13.2	18.3	21.6	24.9	25.9	29.0	32.1	26
	+/- 2.0	+/- 3.4	+/- 4.6	+/- 5.8	+/- 6.2	+/- 7.4	+/- 8.6	26
EC-IDF 2 h	9.4	12.1	13.9	15.6	16.2	17.9	19.5	26
	+/- 1.1	+/- 1.8	+/- 2.5	+/- 3.1	+/- 3.3	+/- 4.0	+/- 4.6	26
UPDATE 6 h	5.2	6.6	7.6	8.6	8.9	9.8	10.7	42
	+/- 0.5	+/- 0.8	+/- 1.1	+/- 1.3	+/- 1.4	+/- 1.7	+/- 2.0	42
UPDATE 12 h	3.5	4.5	5.1	5.8	6.0	6.6	7.3	42
	+/- 0.3	+/- 0.5	+/- 0.7	+/- 0.9	+/- 1.0	+/- 1.2	+/- 1.4	42
UPDATE 24 h	2.3	3.1	3.6	4.1	4.3	4.8	5.2	40
	+/- 0.3	+/- 0.4	+/- 0.6	+/- 0.7	+/- 0.8	+/- 0.9	+/- 1.1	40

* 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	17.7	25.7	31.0	36.0	37.7	42.6	47.5
Std. Dev. /Écart-type (RR)	15.2	23.7	29.3	34.7	36.4	41.7	47.0
Std. Error/Erreur-type	1.0	0.5	1.0	1.6	1.8	2.4	3.0
Coefficient (A)	12.9	18.0	21.3	24.5	25.5	28.6	31.6
Exponent/Exposant (B)	-0.530	-0.558	-0.570	-0.577	-0.579	-0.585	-0.589
Mean % Error/% erreur moyenne	3.1	1.1	2.0	2.7	2.8	3.3	3.7

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

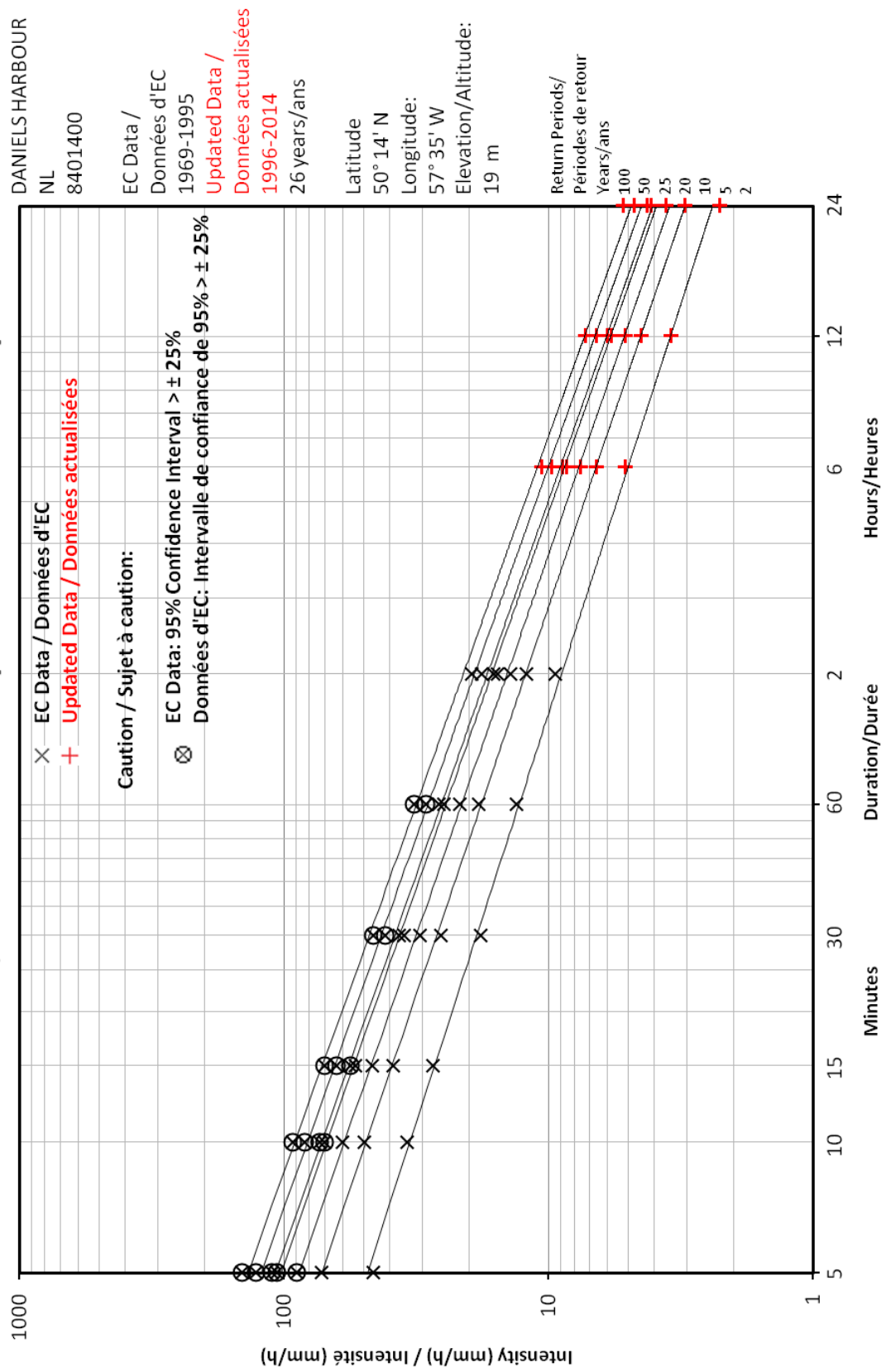
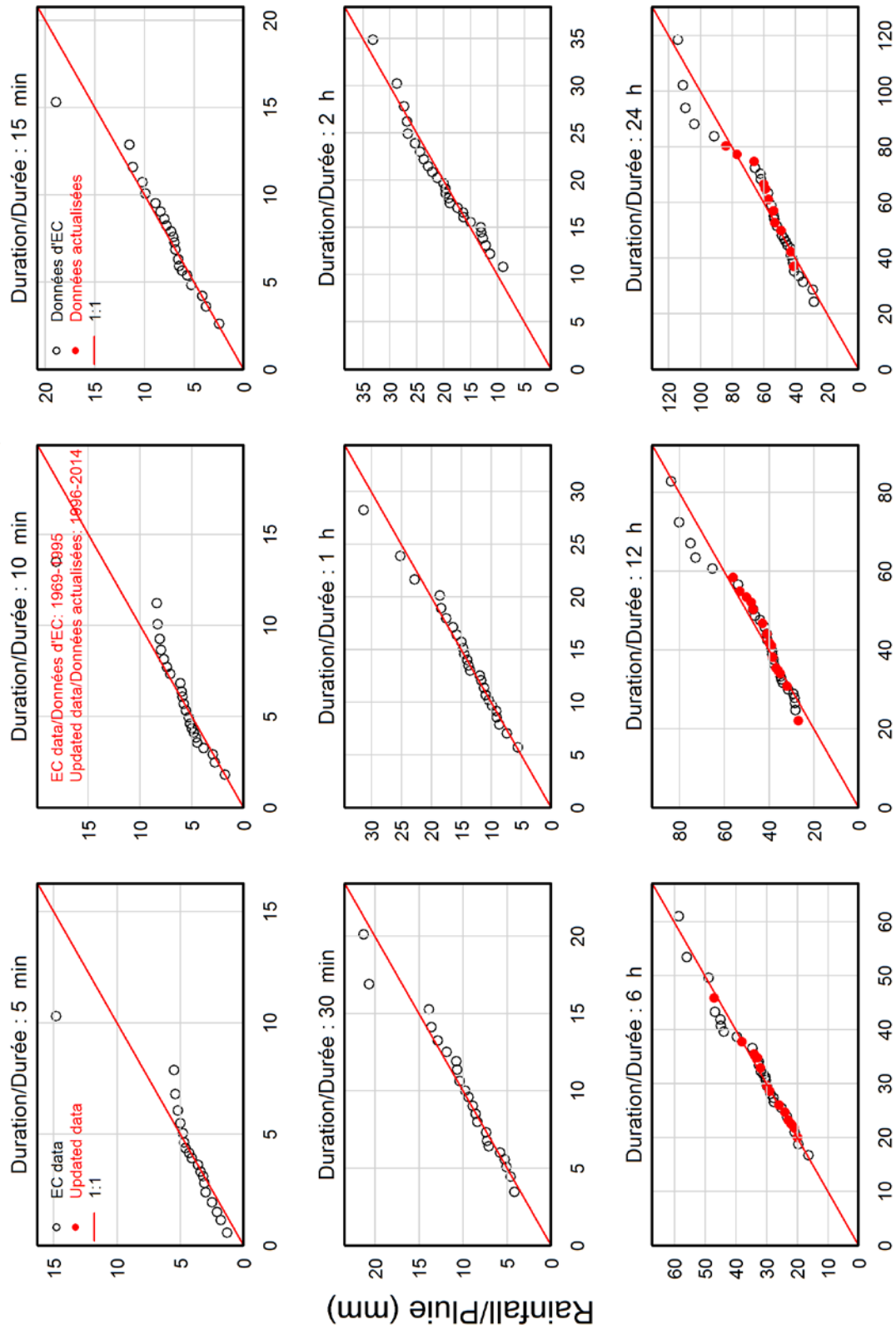


Figure 5.1 Daniels Harbour IDF Curve – Updated

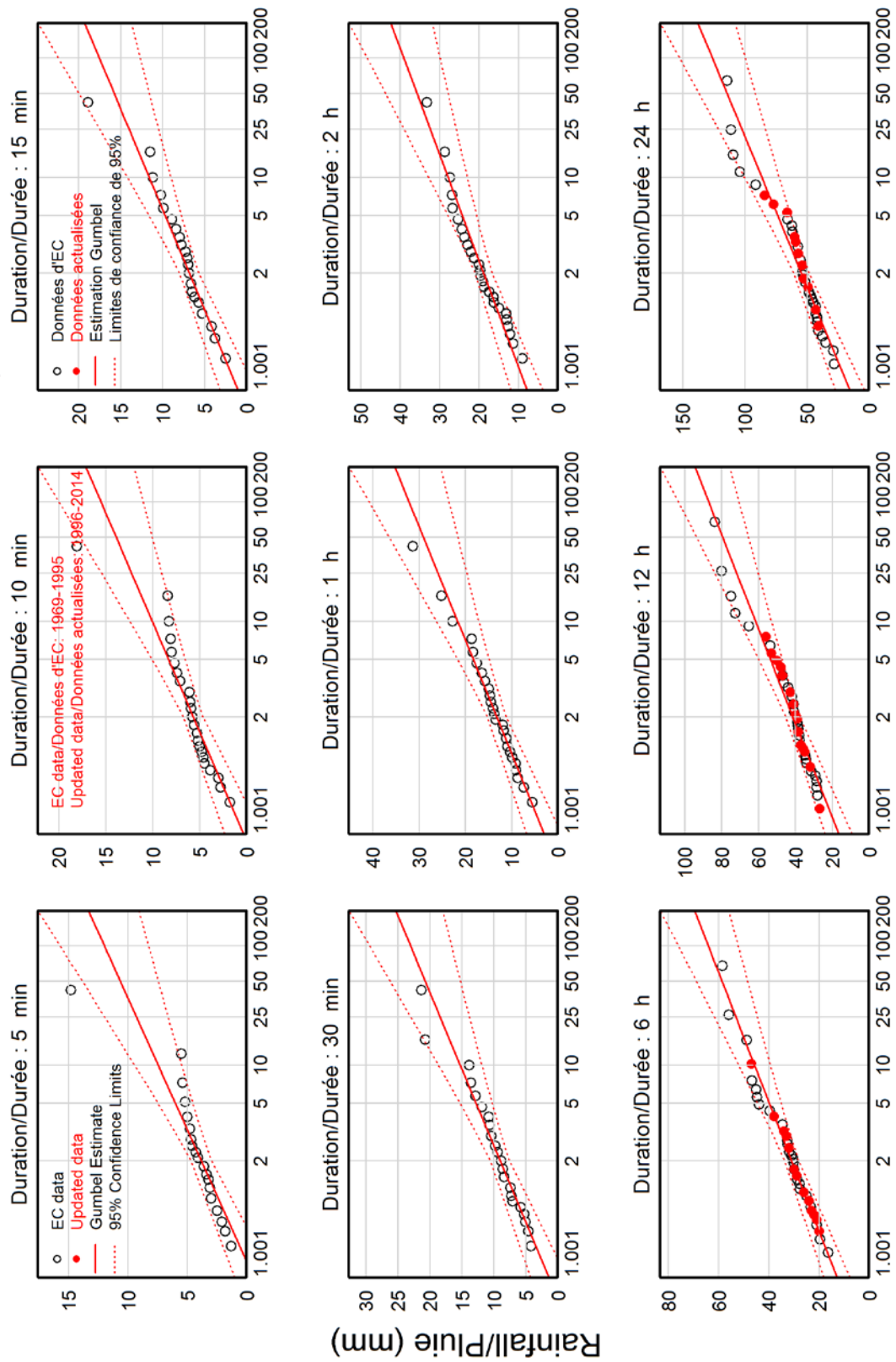
Quantile-Quantile : DANIELS HARBOUR, NL 8401400



Gumbel Estimate/Estimation Gumbel (mm)

Figure 5.2 Daniels Harbour Quantile-Quantile Plot – Updated

Return Level/Niveau de retour : DANIELS HARBOUR, NL 8401400



Return Period/Période de retour (years/années)

Figure 5.3 Daniels Harbour Return Level Plot – Updated

Trend/Tendance : DANIELS HARBOUR, NL 8401400

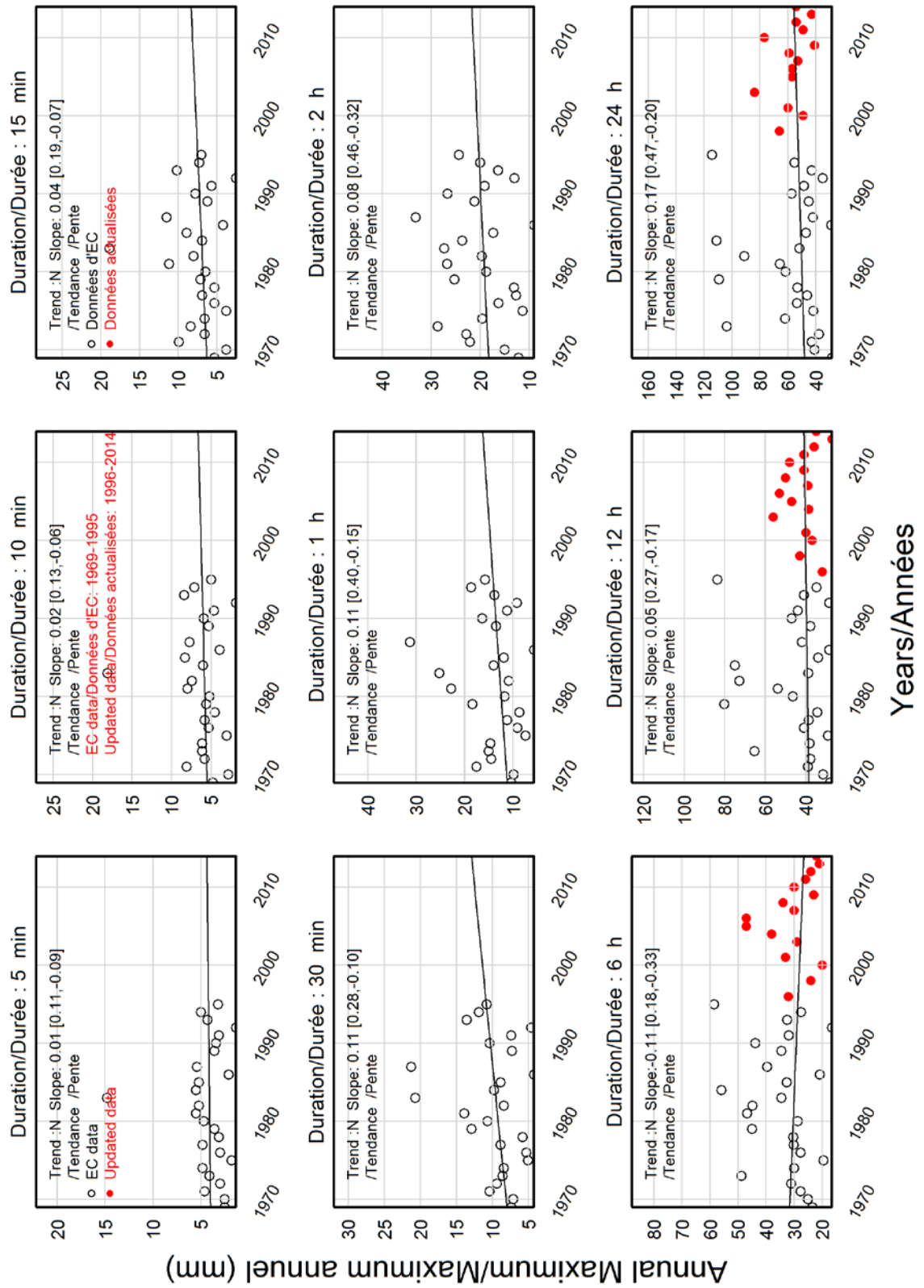


Figure 5.4 Daniels Harbour Trend Plot - Updated