Flood/Rainfall Event: August 23-25, 2023

Update for ERCA Board of Directors Meeting – October 12, 2023

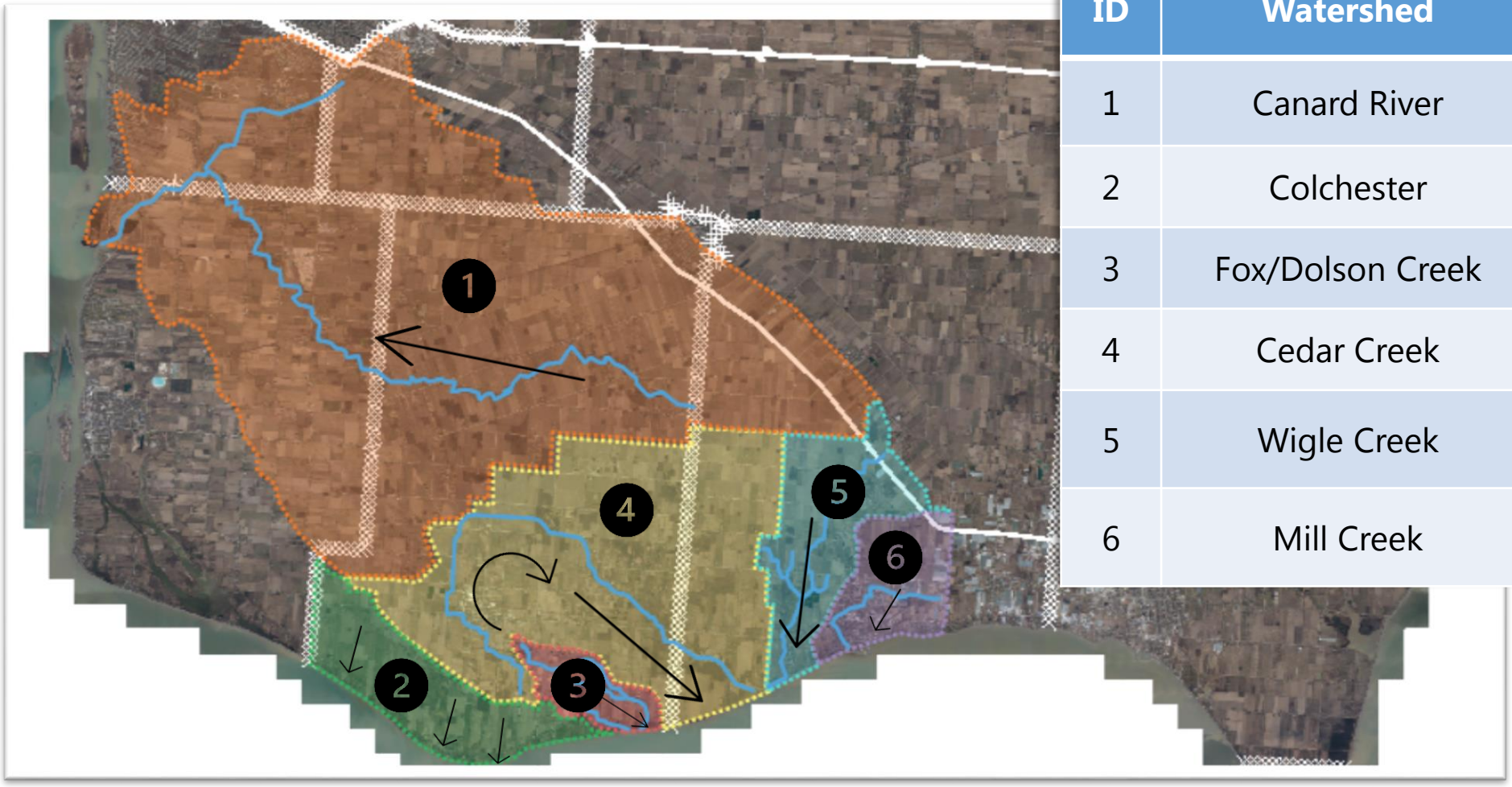
James Bryant, P.Eng.
Director of Watershed Management Services

Essex Region Conservation Authority

August 23 – 25, 2023 Rainfall and Flood Event Summary

- Significant rainfall occurred over the Essex Region varying in amounts from 100mm (4 inches) to over 200mm (8 inches) over a 37-hour period.
- Storm occurred starting on August 23rd and ended by August 25th, with the most intense portion of the storm occurring overnight in the early hours of August 24th.
- Widespread flooding occurred with the most impacted areas being the southern portions of Essex County (primarily the towns of Essex and Kingsville) and the Township of Pelee.
- Road washouts occurred in some locations, with significant length of roadways closed due to water overtopping the road surface, pavement instability, and shoulders washed out.
- Significant number of homes affected by both sewer backup and overland flooding, with farmland and public infrastructure also impacted.

Most Affected Watersheds



ID	Watershed	Approx. Drainage Area (Sq. Km)
1	Canard River	342.76
2	Colchester	35.46
3	Fox/Dolson Creek	12.12
4	Cedar Creek	128.04
5	Wigle Creek	35.30
6	Mill Creek	21.62

IDF Curves – What are they?

I = Intensity

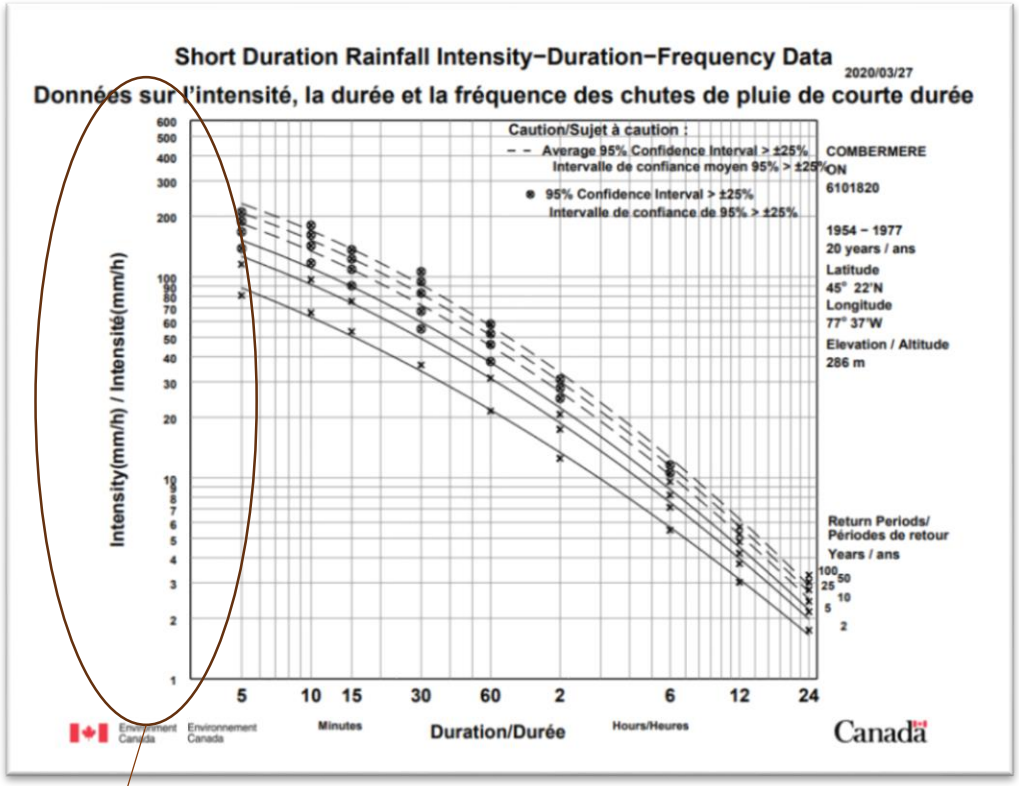
Average rainfall over a specified duration / time period. Generally expressed as mm/hr or in/hr.

D = Duration

The time period of interest. Typical periods of interest are 5, 10, 15, 30 mins, and 1, 2, 6, 12, and 24 hours.

F = Frequency

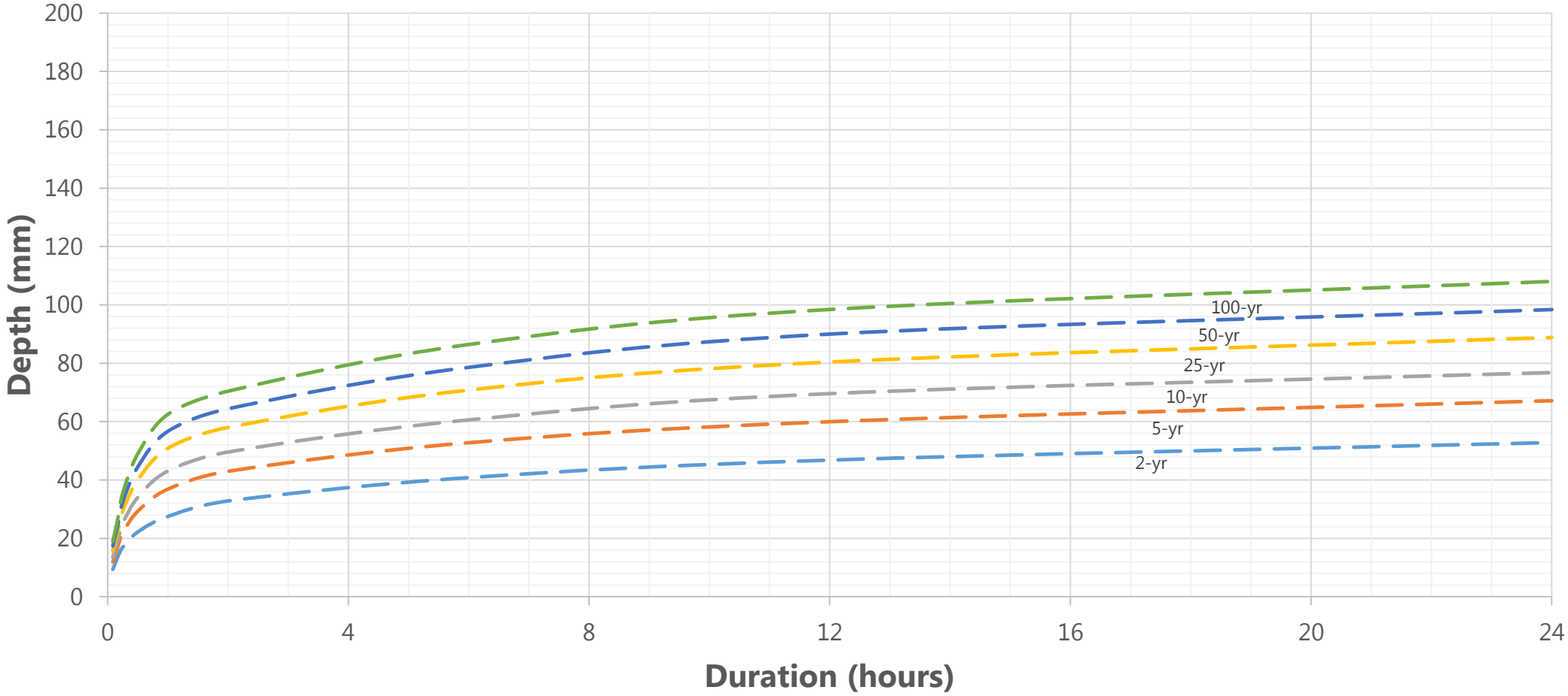
How often the combination of intensity and duration occurs, using historical data and statistics.



Rainfall data is collected by ECCC, reviewed, and fit to a specific statistical distribution, with intensity and corresponding duration plotted for each statistical return period.

Intensity x Duration = Depth
Example: 4.5 mm/hr x 24 hours = 108 mm

Windsor Airport Gauge: Intensity-Duration-Frequency (IDF) Curves



50% 2-yr Return Period

20% 5-yr Return Period

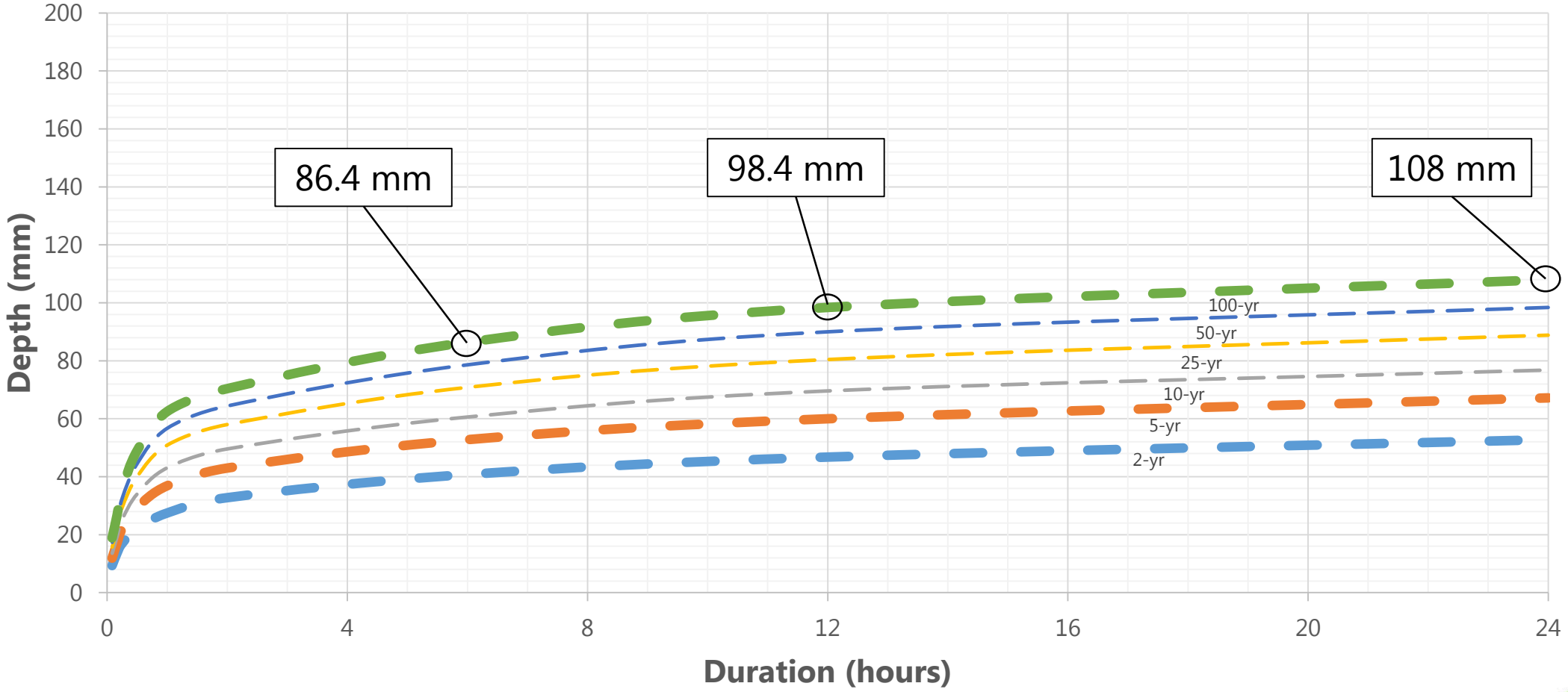
10% 10-yr Return Period

4% 25-yr Return Period

2% 50-yr Return Period

1% 100-yr Return Period

Windsor Airport Gauge:
Intensity-Duration Frequency (IDF) Curves



50% 2-yr Return Period

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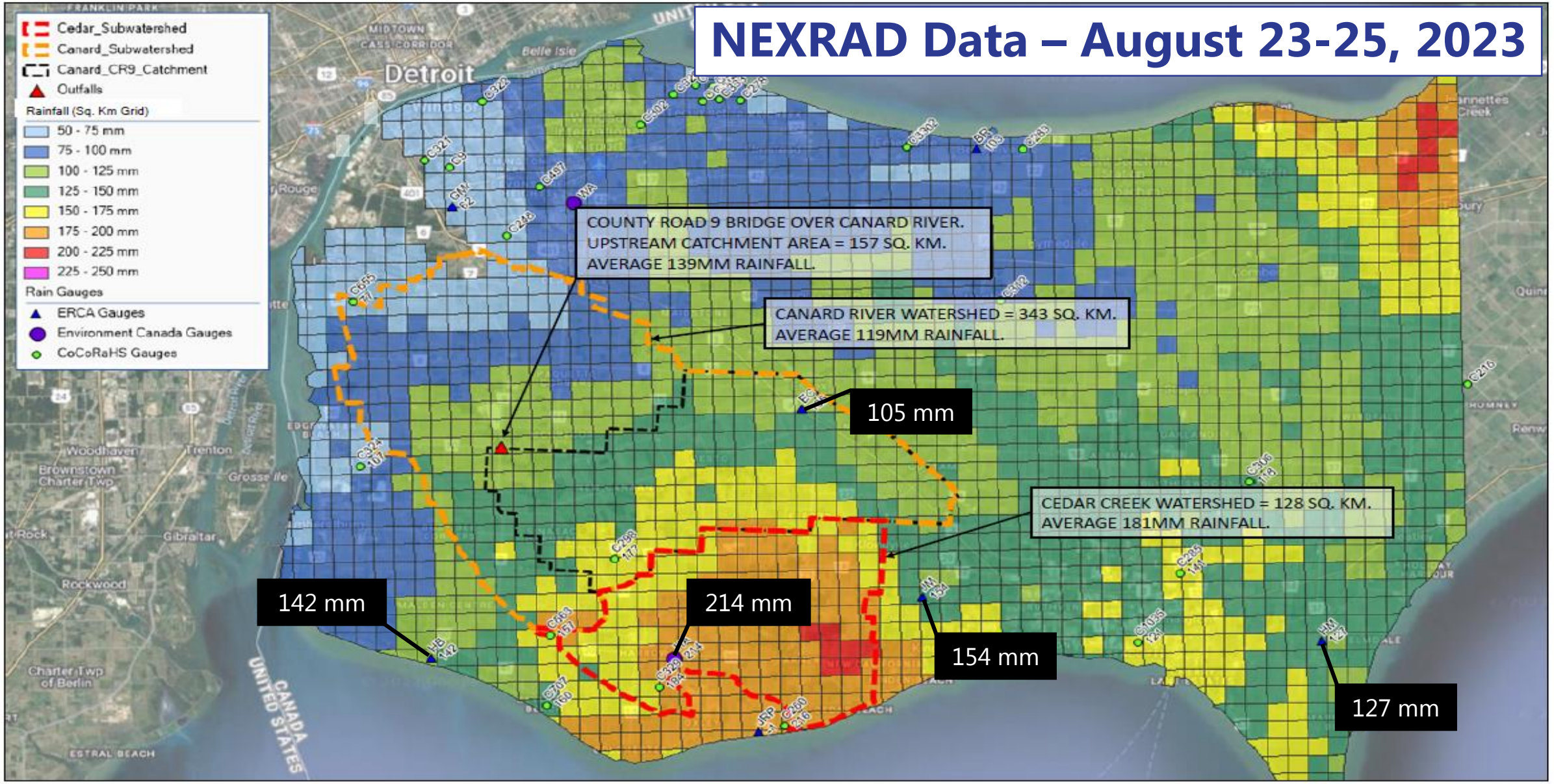
1% 100-yr Return Period

NEXRAD Data – August 23-25, 2023



Landmark Engineers Inc.

PRELIMINARY – FOR DISCUSSION PURPOSES ONLY

Title	37 HOUR RAINFALL – 23 AUG 12PM TO 25 AUG 1AM
Project	AUGUST 2023 RAINFALL
Date	AUG 2023
Scale	NTS
Project No.	

FIGURE 1

NEXRAD Data – August 23-25, 2023

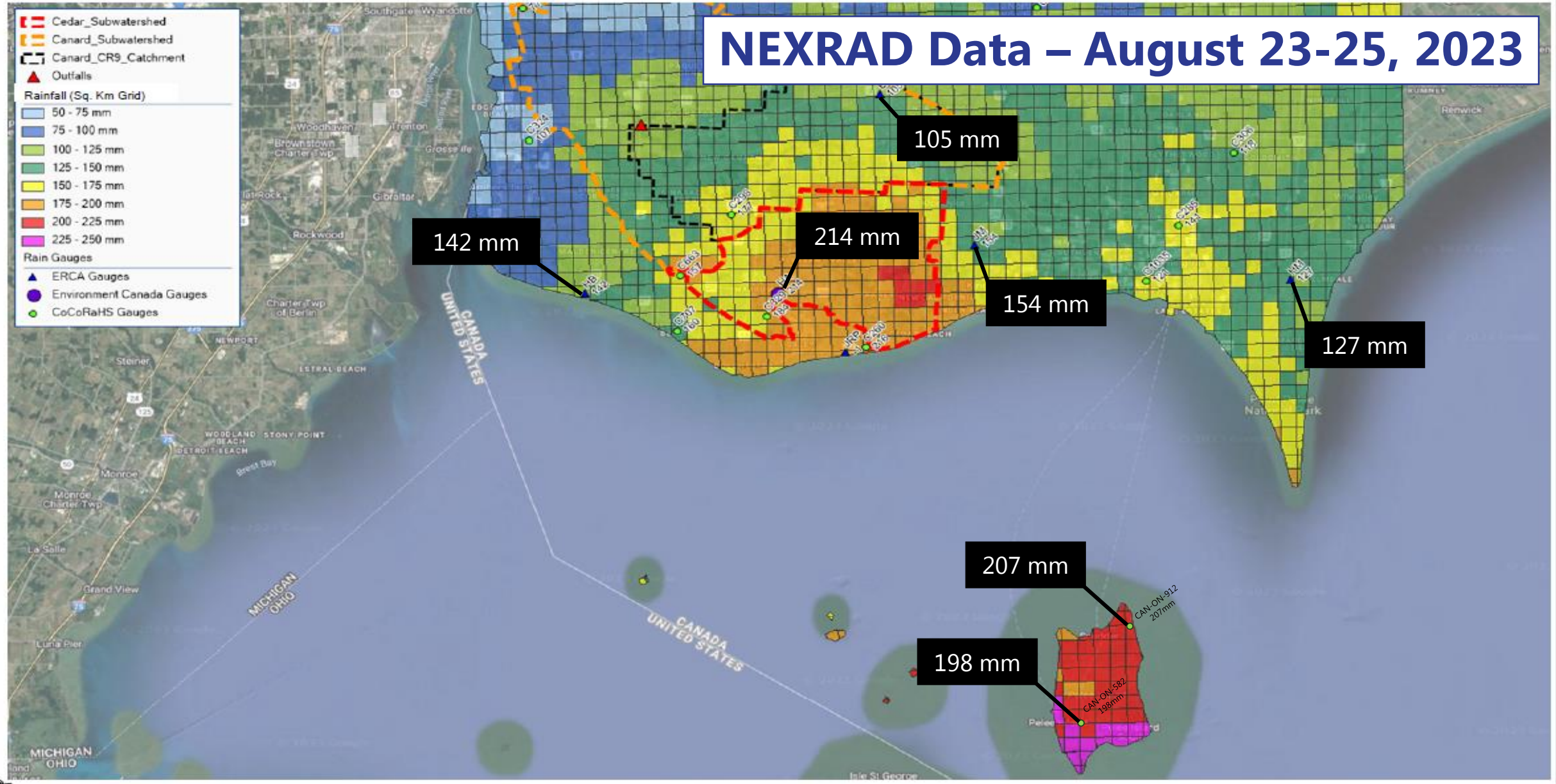


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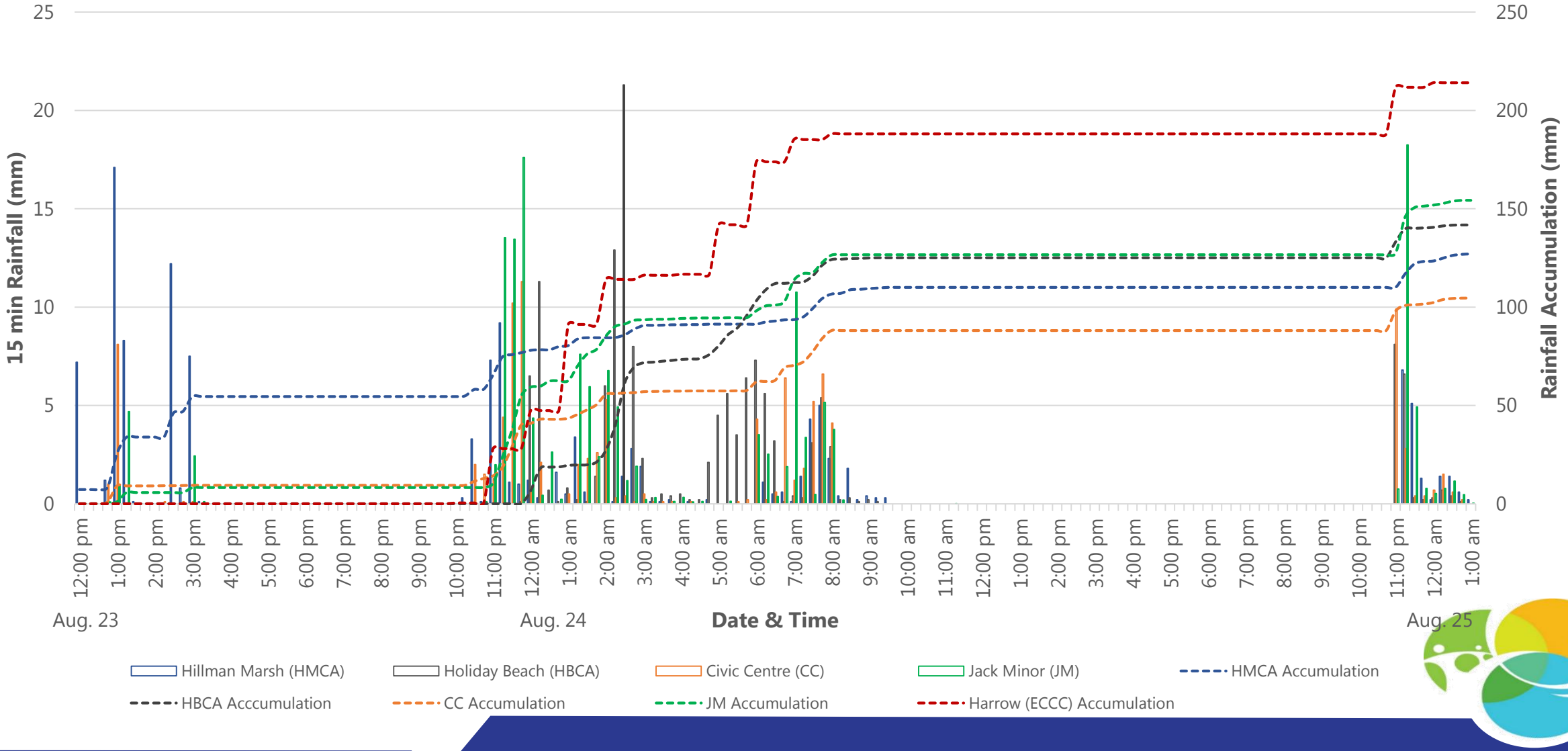
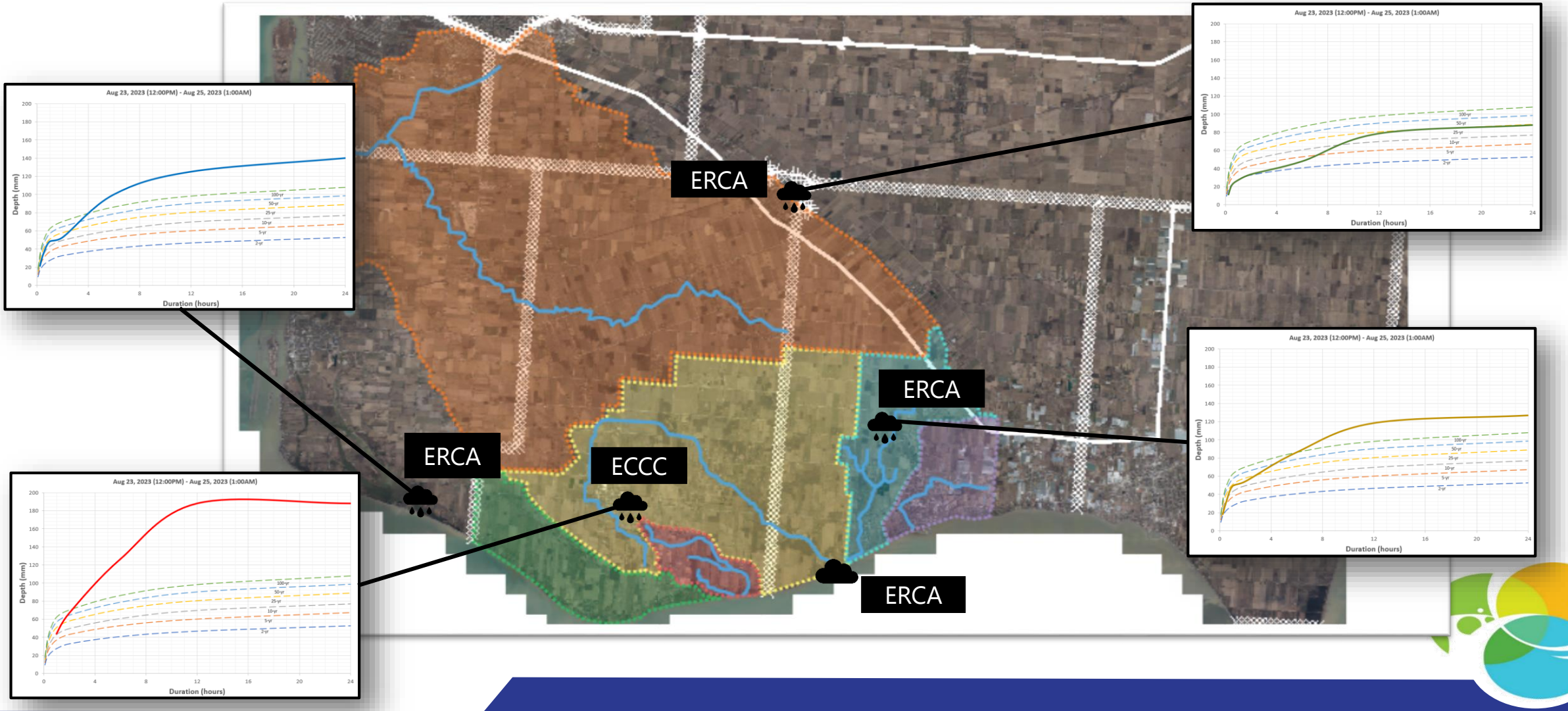
FIGURE 1.1

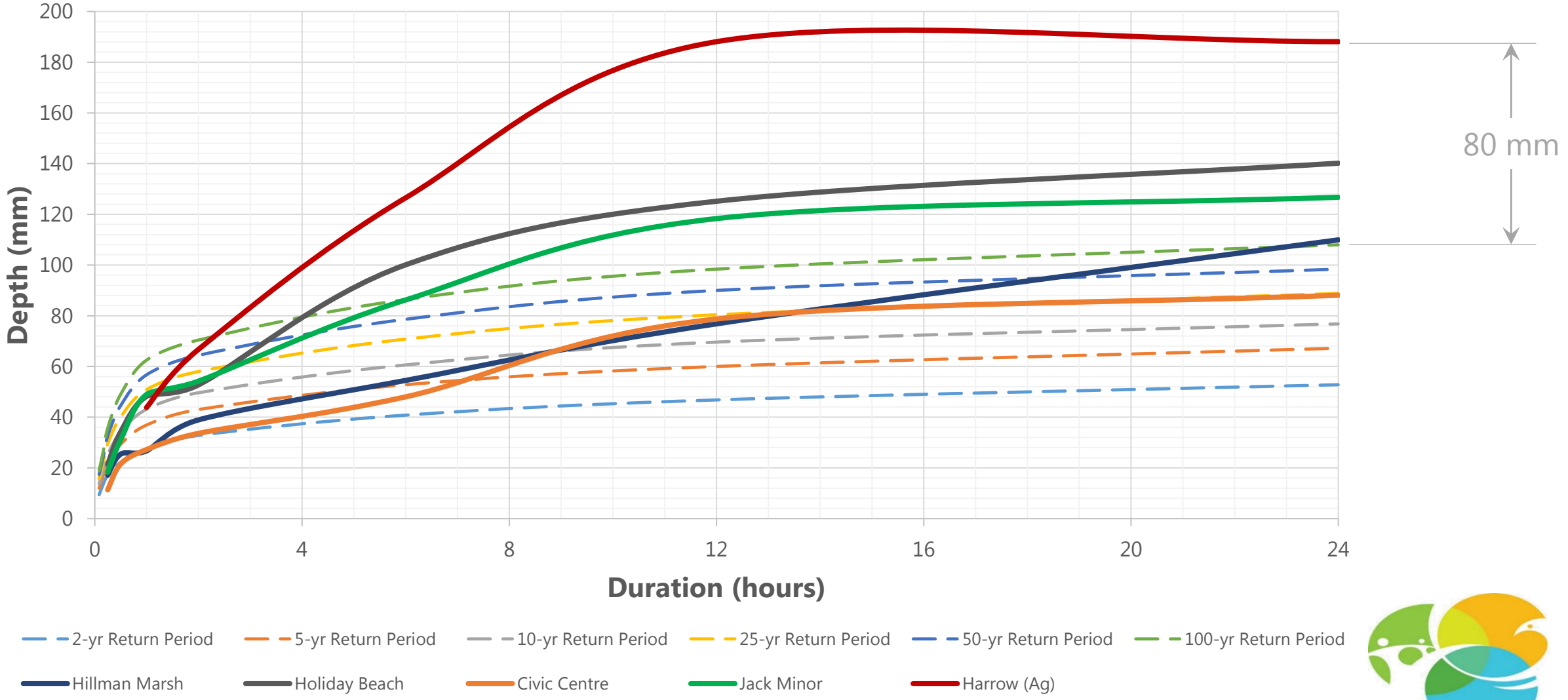
Rainfall Hyetographs – Various Climate Stations



Field Observations (Climate Stations): Aug 23-25, 2023



Rainfall IDF Curves: Aug. 23 (12PM)-25 (1AM), 2023



ERCA Flood Duty Actions

Flood Duty Officer monitored weather forecast and Issued **Flood Watch** based on rain forecast + ground conditions.

ERCA **Flood Warning** issued upon significant rainfall observed.

Staff deployed in the field to monitor, document, and advise municipal flood coordinators and public works departments through ERCA Flood Duty Officer.

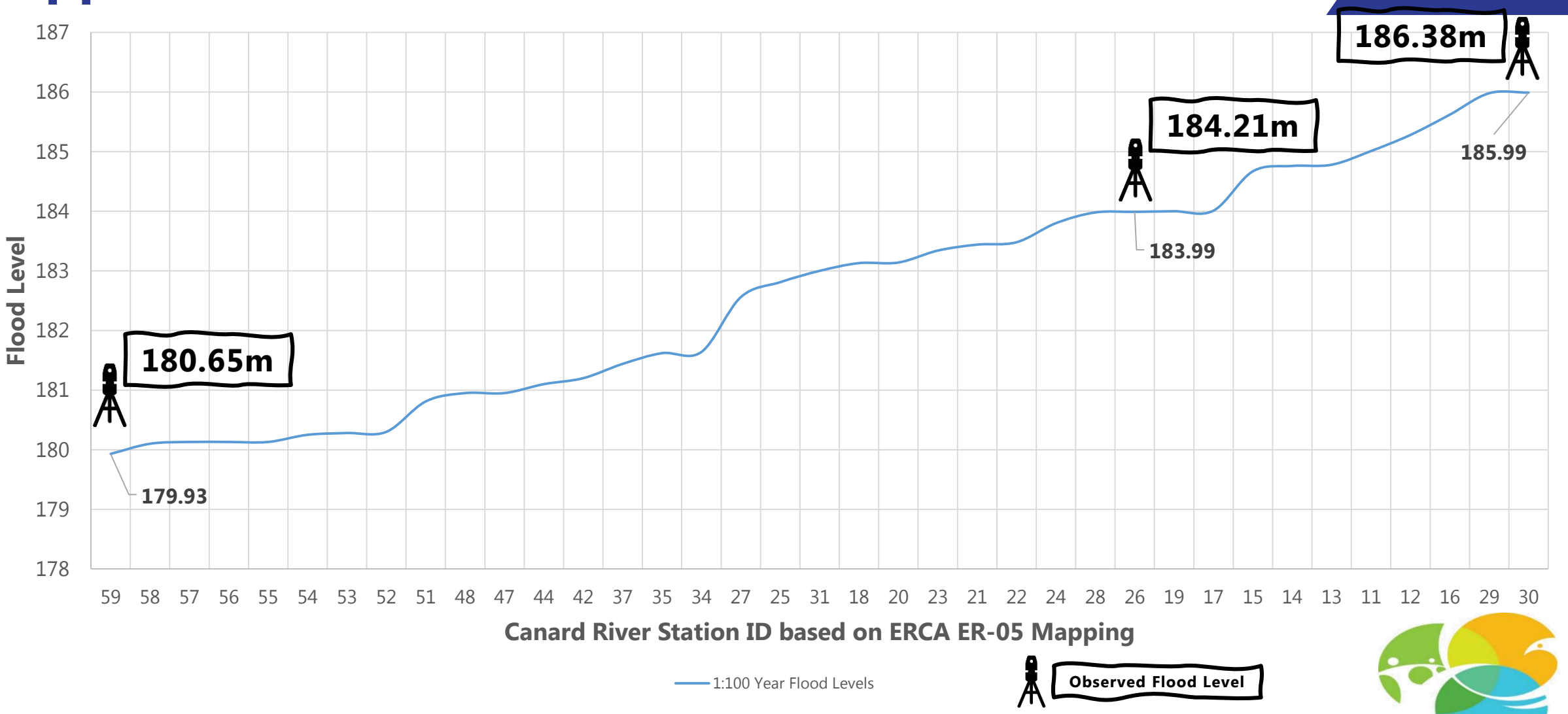
Administration reviewed the observed data and deployed technical staff to survey and obtain level logger information in coordination with other ERCA departments.

Select Road Closures: Aug 24-25, 2023

Preliminary Observed Flood Levels: Aug 23-25, 2023

Map ID	Location	100-yr Regulatory Flood Level	Aug. 23-25 Rainfall Event (Prelim)	Exceedance
1	CR 9 / CR 10 (Canard)	180.13 m	~~180.46 m~~ 180.65 m	~~+ 0.33 m~~ **+ 0.52 m**
2	CR 12 (Canard)	183.99 m	184.21 m	**+ 0.22 m**
3	CR 15 (Canard)	185.99 m	186.38 m	**+ 0.39 m**
4	CR 50 (Cedar)	175.90 m (Lake) 175.20 m (Creek)	175.83 m	- 0.07 m (Lake) **+ 0.63 m (Creek)**

Approximate Flood Extents: Max Observed



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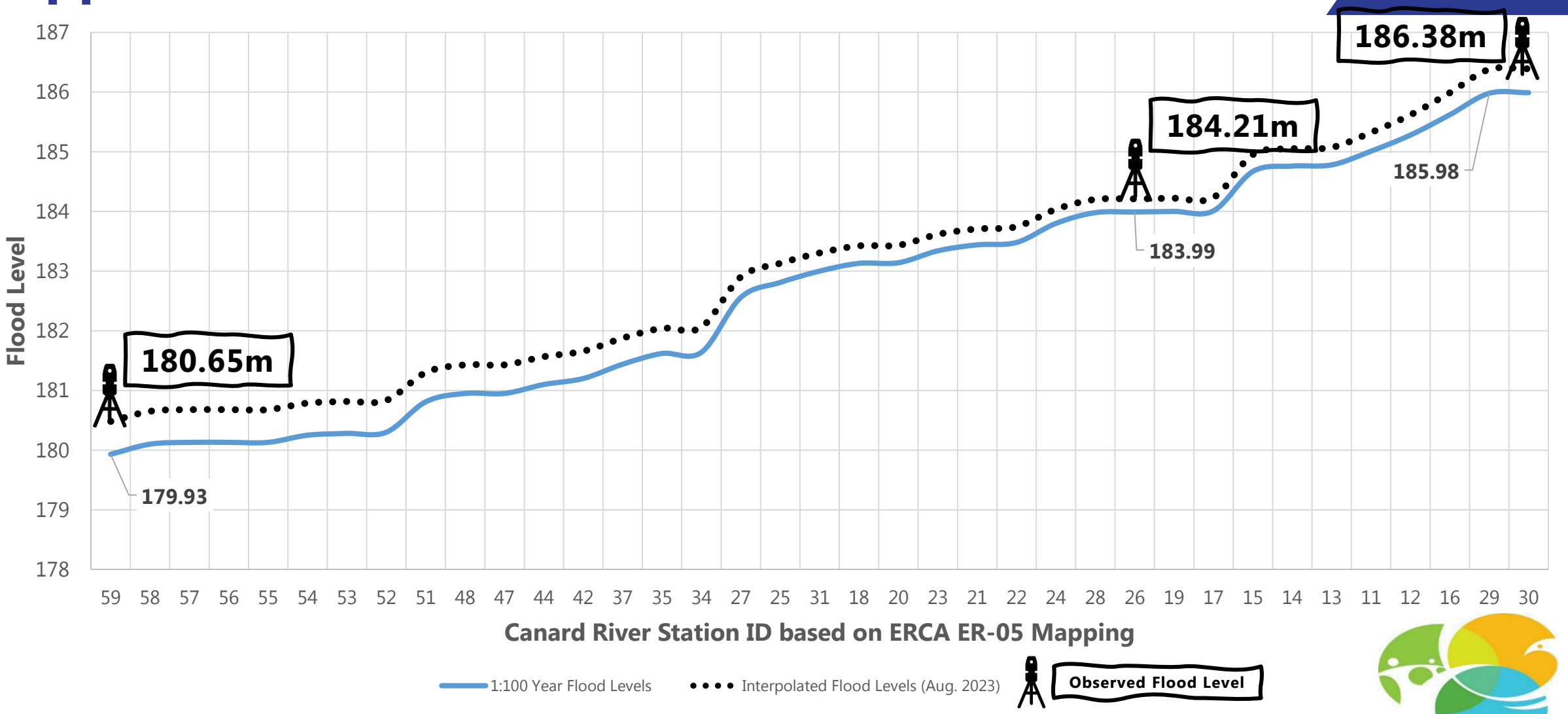
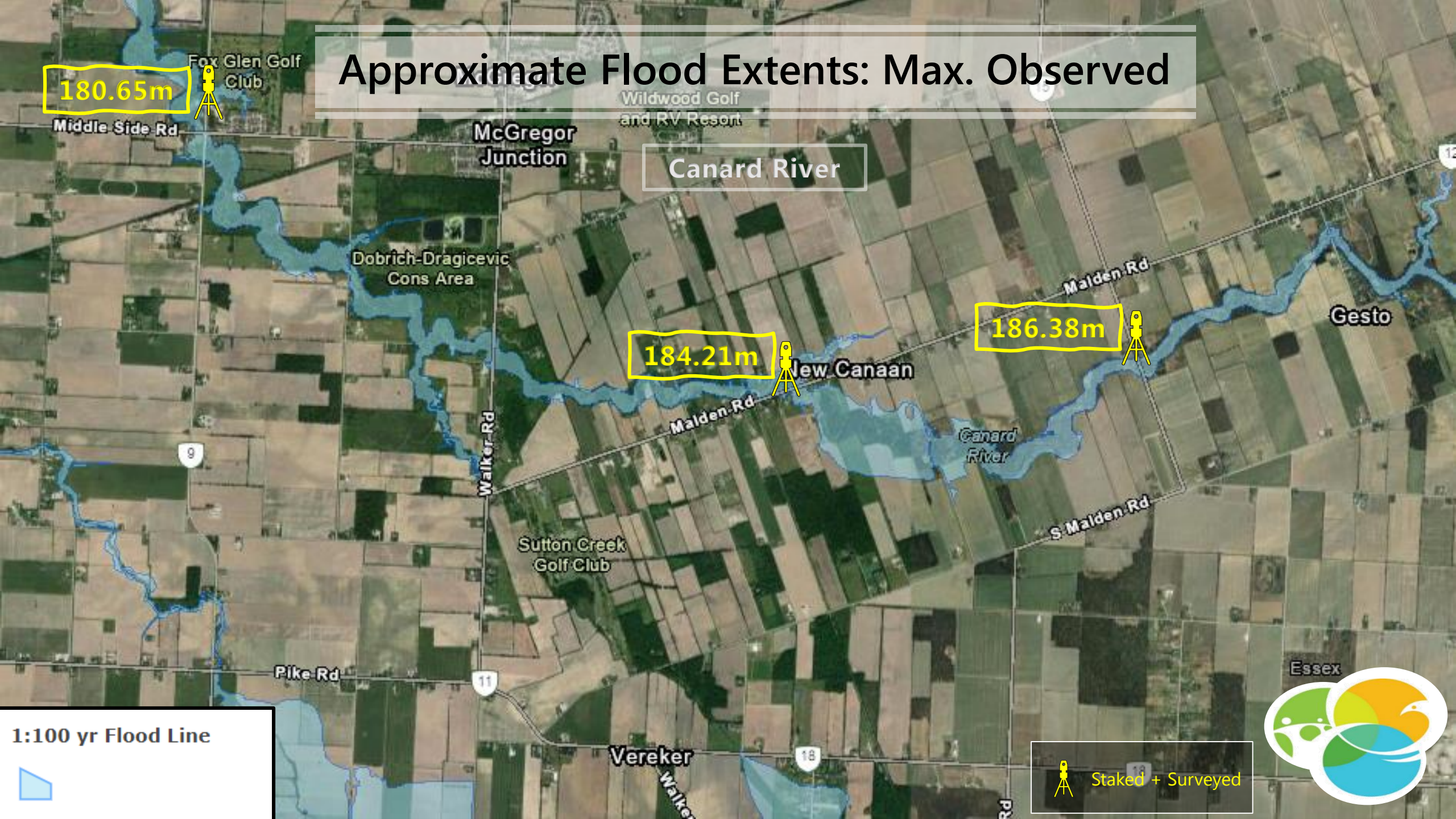
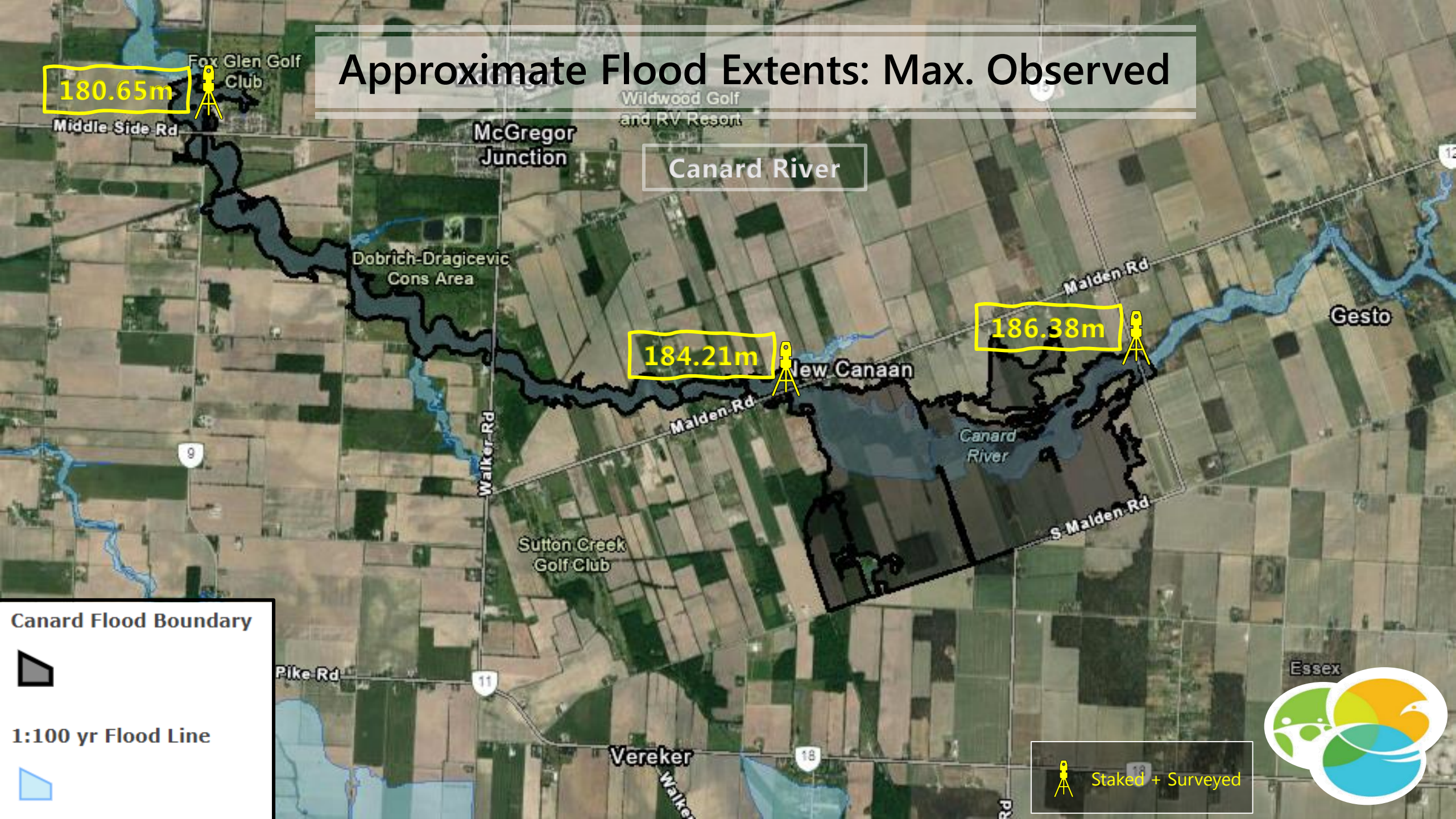



Approximate Flood Extents: Max. Observed
180.65m
Fox Glen Golf Club
Middle Side Rd
McGregor Junction
Wildwood Golf and RV Resort
Canard River
Dobrich-Dragicevic Cons Area
184.21m
New Canaan
Malden Rd
186.38m
Gesto
Walker Rd
Canard River
S Malden Rd
Sutton Creek Golf Club
Pike Rd
Vereker
Essex
1:100 yr Flood Line
Staked + Surveyed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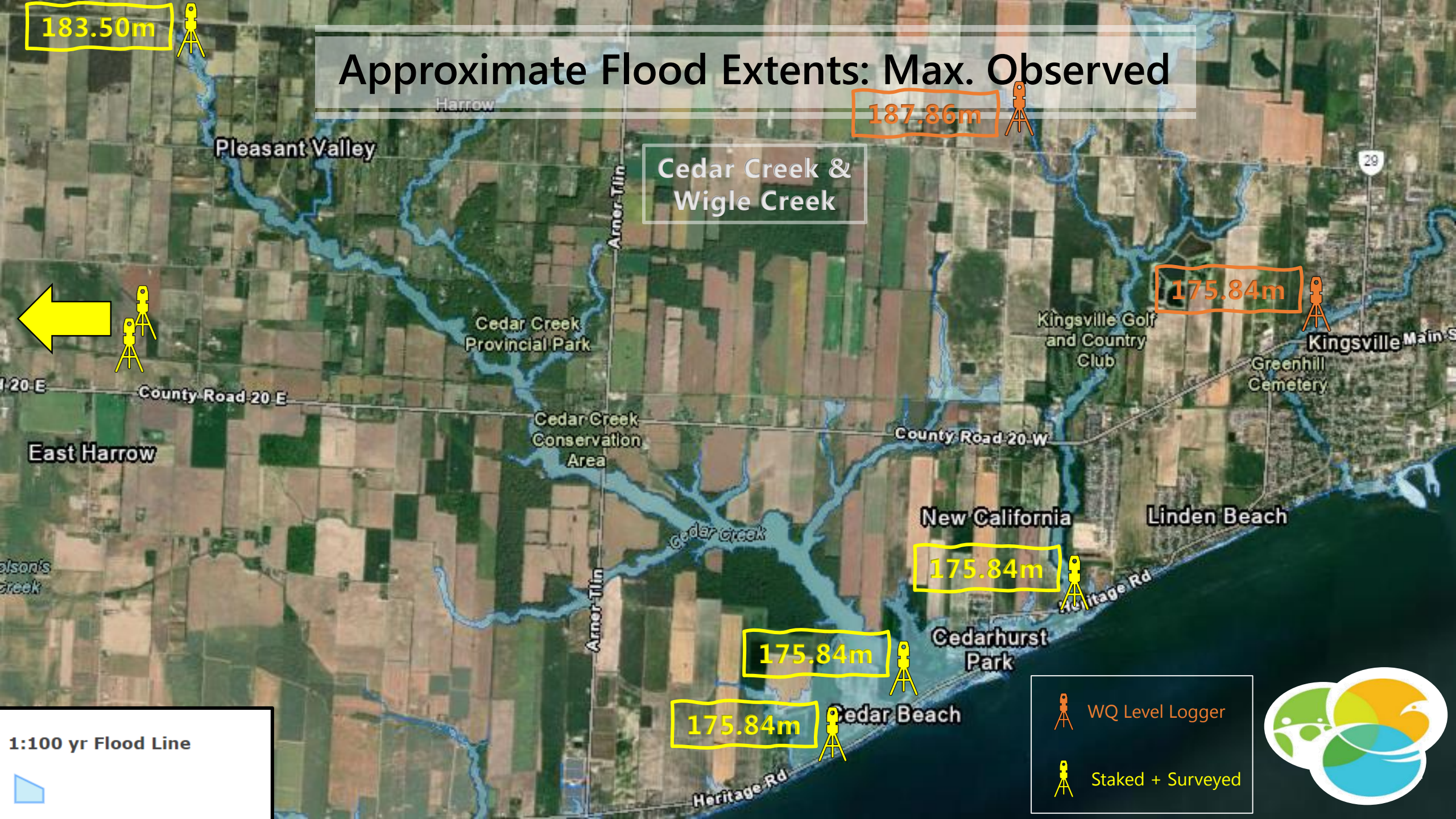
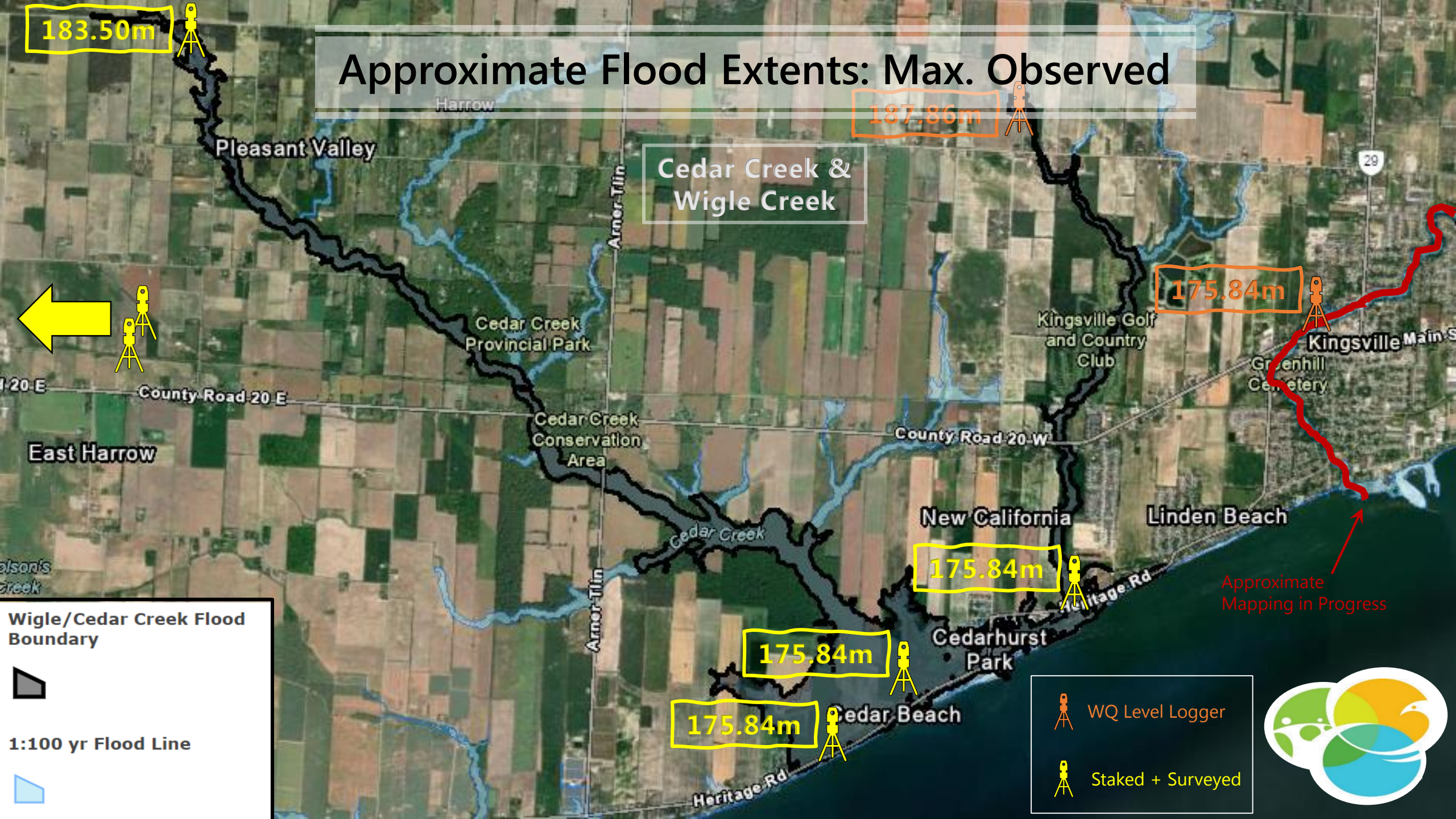

Approximate Flood Extents: Max. Observed
183.50m
187.86m
175.84m
175.84m
175.84m
175.84m
Cedar Creek & Wigle Creek
Harrow
Pleasant Valley
Arner Tlin
Cedar Creek Provincial Park
Kingsville Golf and Country Club
Kingsville
Greenhill Cemetery
Main S
County Road 20 E
East Harrow
Cedar Creek Conservation Area
County Road 20 W
New California
Linden Beach
Cedar Creek
Heritage Rd
Cedarhurst Park
Cedar Beach
29
1:100 yr Flood Line
WQ Level Logger
Staked + Surveyed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Greenhill Cemetery
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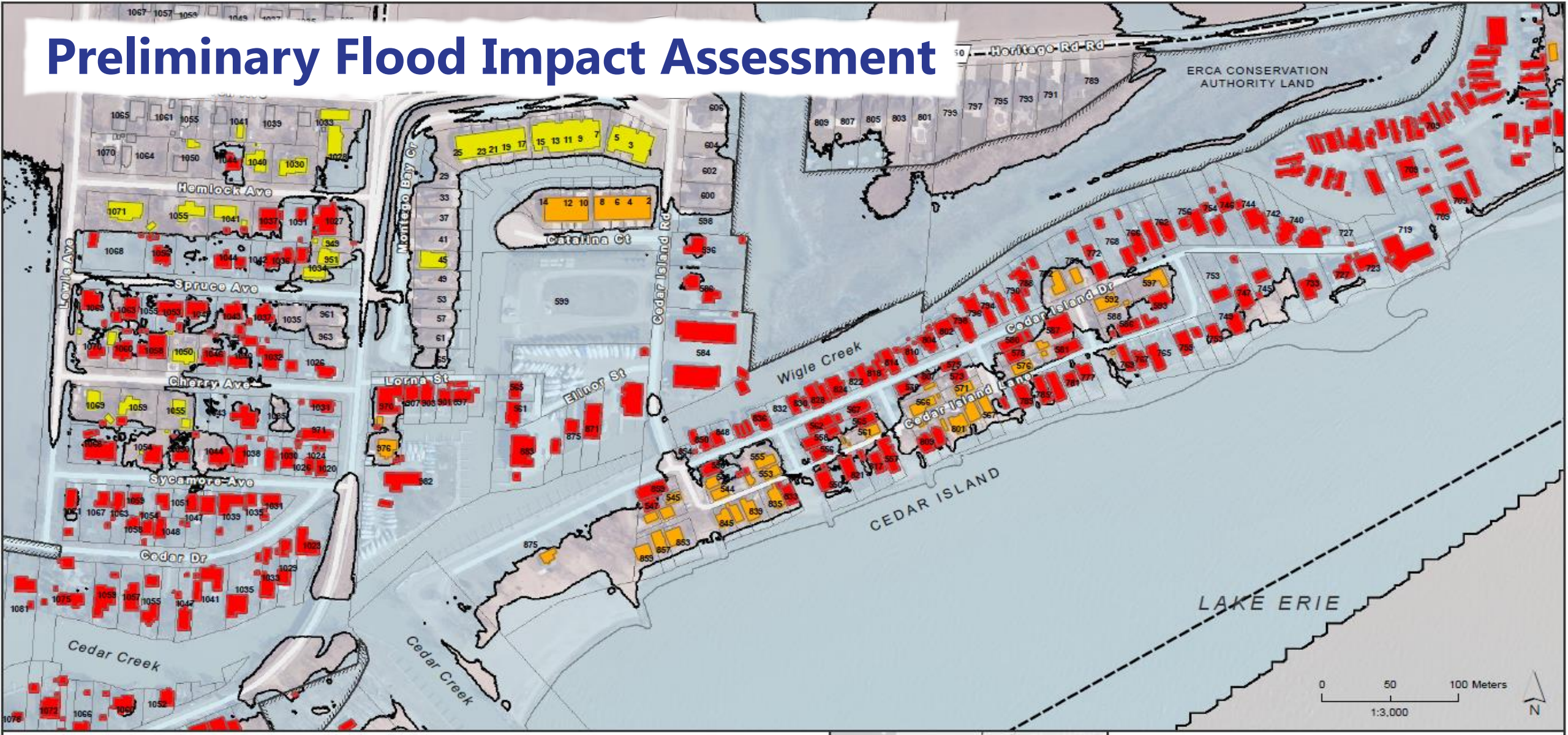
East Harrow
Cedar Creek Conservation Area
County Road 20 W
Cedar Creek
New California
Linden Beach
Heritage Rd
Approximate Mapping in Progress
Cedarhurst Park
Cedar Beach
Heritage Rd
29
Wigle/Cedar Creek Flood Boundary
1:100 yr Flood Line
WQ Level Logger
Staked + Surveyed

Preliminary Flood Impact Assessment

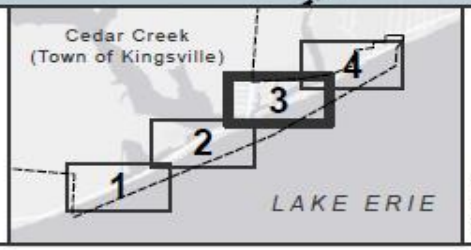


Flood Damage Assessment Summary - Town of Kingsville - Lower Cedar Creek

- Flooded Structure
- Structure Within Flood Area
- Structure Within 10m of Flood Extent
- Approximate Flood Extent due to August 23-25, 2023 storm (175.840 m)
- Study Area
- ERCA Owned Or Managed Land - Extent

Map 3 of 4

Note:
Please see the following document for complete notes on inputs and summary.
Flood Damage Assessment - Cedar Creek - 20230922.xlsx



Essex Region Conservation Authority
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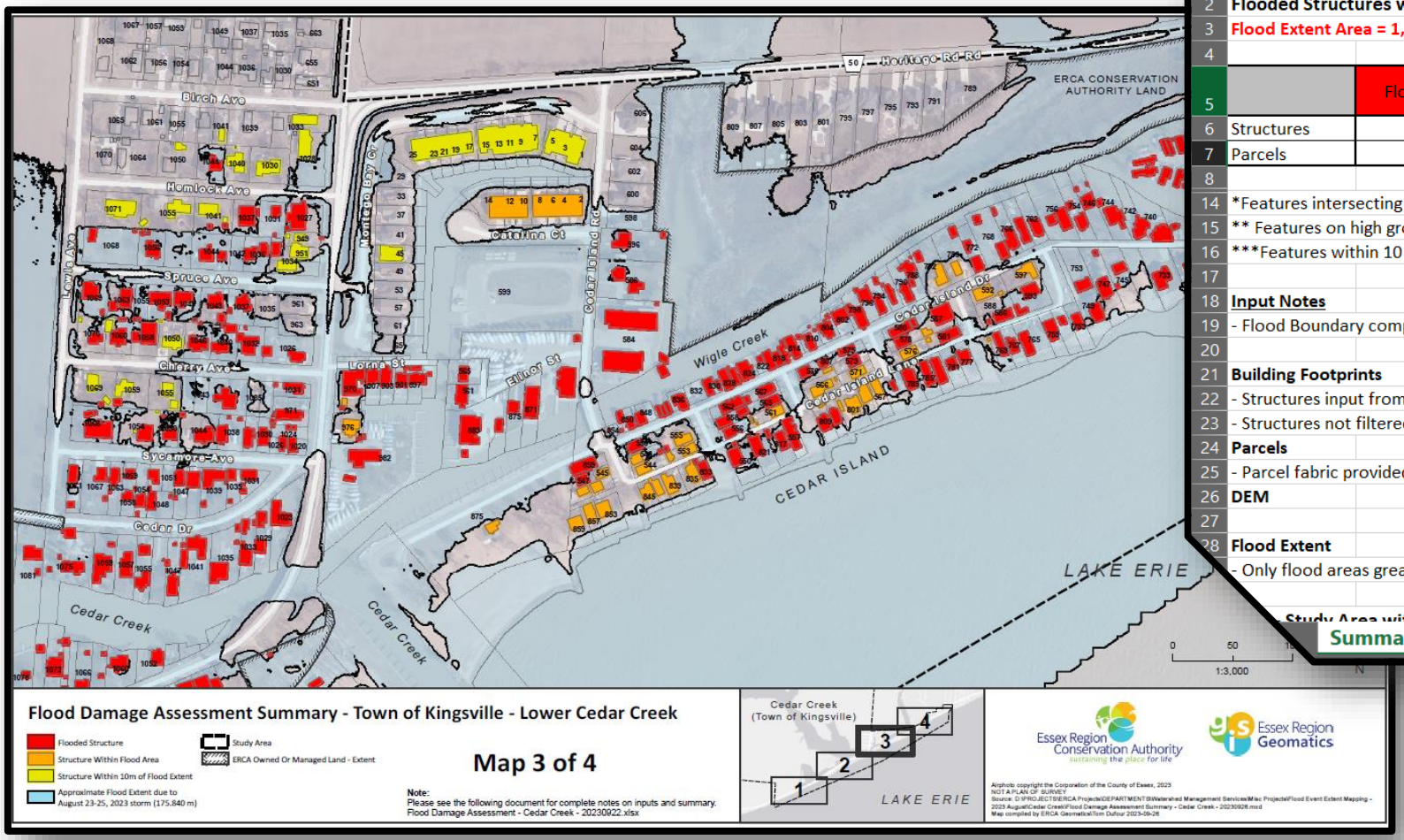
Essex Region Geomatics

Source: D:\PROJECTS\ERCA Projects\DEPARTMENTS\Watershed Management Services\Misc Projects\Flood Event Extent Mapping - 2023 August\Cedar Creek\Flood Damage Assessment Summary - Cedar Creek - 20230926.mxd
Map compiled by ERCA Geomatics\Tom Dufour 2023-09-26

Preliminary Overland Flood Impact Assessment



	A	B	C	D	E	F	G
1	**Flood Damage Assessment Summary - Cedar Creek/Wigle Creek**						
2	**Flooded Structures within the Modelled Flood Boundary in the Cedar Creek and Wigle Creek subwatersh**						
3	**Flood Extent Area = 1,035 acres**						
4							
5		Flooded*	Within Flood Area**	Within Proximity***	Total		
6	Structures	618	6	192	816		
7	Parcels	612	0	18	630		
8							
14	*Features intersecting flood boundary as modelled by Landmark Engineers.						
15	** Features on high ground completely surrounded by flooded area but not flooded itself.						
16	***Features within 10 m of mapped flood extent, excluding features already tallied as Flooded or Within Flood Area.						
17							
18	**Input Notes**						
19	- Flood Boundary compiled and supplied by Landmark Engineers in consultation with ERCA WMS staff.						
20							
21	**Building Footprints**						
22	- Structures input from Building Footprint file provided by Towns of Amherstburg (2015) and Essex (2014).						
23	- Structures not filtered for size. Records include homes and detached structures regardless of size.						
24	**Parcels**						
25	- Parcel fabric provided by MPAC via the County of Essex, dated September 2023.						
26	**DEM**						
27							
28	**Flood Extent**						
	- Only flood areas greater than 100 sq m were considered in analysis.						
	Study Area with structure damage assessment shown						

Summary | File Metadata | ⊕

Ongoing Work

Map flood extents using maximum observed data (surveys, photos, level loggers) – *In Progress*

Overland Flood Impact Assessment (structures and parcels affected) – *In Progress*

Direct communication with Provincial Ministry Emergency Management Coordinator (MEMC) at Ministry of Municipal Affairs and Housing (MMAH) to support Disaster Relief Funding – *In Progress*

Preliminary information (observation records) submitted to the MEMC – *Complete*

Submit technical analysis (flood mapping extents and impact assessments) – I*n Progress*

Next Steps:

Technical Memorandum

Complete internal ERCA Technical Memorandum documenting all details and technical analyses regarding the rainfall and flood event.

Evaluate Regulatory Impacts

- 1:100 year flood = minimum provincial flood standard
- 1:100 year applied by ERCA through O. Reg. 158/06
- Maximum Observed Flood Levels included in O. Reg. 158/06 exclusively for Ruscom River and Canard River.
- Evaluate ERCA responsibilities re: flood & erosion control and protection of people/property, and consider impacts to watershed and local communities.

Flood event standards

11. (1) The applicable flood event standards used to determine the maximum susceptibility to flooding of lands or areas within the jurisdiction of the Authority are the 100 Year Flood Event Standard, the March 1985 Flood Event Standard and the 100 year flood level plus wave uprush, described in Schedule 1. O. Reg. 158/06, s. 11 (1).

(2) The 100 Year Flood Event Standard applies to all watersheds within the area of jurisdiction of the Authority except for,

(a) the main branch and the east branch (Silver Creek) of the Ruscom River, and its tributaries within the Town of Lakeshore and the Town of Kingsville, where the March 1985 Flood Event Standard applies; and

(b) the main and north branch of Canard River in the Town of LaSalle, Concessions I and II, and on the main branch of the Canard River in the Town of Amherstburg, Concessions I, II, III and IV, where the March 1985 Flood Event Standard applies. O. Reg. 158/06, s. 11 (2).