

REPORT 79/2024: To The Full Authority

FROM: Peter Dragunas, Water Management Technician

SUBJECT: Catfish Creek Channel Sounding

DATE: September 26, 2024

Purpose:

To update the Full Authority on the results of the September 17, 2024 Catfish Creek channel sounding at Port Bruce.

Discussion / Background:

Please find attached maps for the July 2023, June 2024 and September 2024 Catfish Creek Channel Soundings and associated results at Port Bruce.

At the time of the September 2024 sounding, the Lake Erie water level at Port Bruce was 0.919 m (3.02 ft.) above chart datum (CD), (Environment Canada, Lake Erie water level station #12400 at Port Stanley).

Lake Erie water levels for the soundings referred to in this report are:

- July 2023, 1.11 m (3.63 ft.),
- June 2024, 1.163 m (3.82 ft.),
- September 2024, 0.919 m (3.02 ft.) above chart datum.

As illustrated above the water levels in Lake Erie fluctuate due to various external affects, the main being the volume of water entering the great lake hydrologic cycle. Therefore the aforementioned information identifies the requirement to use a sounding baseline to remove the fluctuating water level data, accordingly chart datum of 173.5 meters is used for all soundings as the Lake Erie water level baseline at Port Bruce

The September 2024 sounding relative to the June 2024 sounding shows that the Lake Erie water level is down 0.244m (0.8 ft.). Since the Catfish Creek Channel Sounding data is evaluated relative to CD, the lake levels do not affect the bathymetric mapping results and are included for information purposes only.

The September 2024 sounding continues to outline three regular areas of deposition along with an additional persistent and optimistically ephemeral area identified in the June 2024 sounding. The first zone is located at the northern reach of the sounding area, the second is just south of the Imperial Street bridge, the third is at BeeLine trailer park, and the 2024 ephemeral area persists immediately north of the harbour breakwall at the southern outlet of Rocabore Bay.

The Rocabore Bay depositional area can be rationalized by the 2023, 2024 mild winter weather, lack of lake ice coupled with winter storm wave swells which transport lake sediment into the northern margins of the harbour at the southern outlet of Rocabore Bay. The 2024 spring and summer seasons did not produce significant channel flows to flush this area out, consequently this sedimentation zone will persist into the 2024 fall storm season (Lower Catfish Creek, Deposition and Transport Zones Map).

There are two possible scenarios:

1. If the lake remains open for any length of time during the fall/winter storm season the incoming southerly winds could produce waves that will transport additional sediment into the harbour essentially depositing more sediment in this area.
2. On the other hand if the dominant winds do not persist from the south and there is sufficient precipitation to produce significant channel flows to flush the sediment back out to the lake, then the area will open and possibly create additional free board for the spring ice migration.

The September 2024 results do not identify a good clear thalweg depth throughout the sounding area. The lower half of the sounding area from Erie Marina displays a relatively (relative to the upper sounding reaches) deeper thalweg, who's connectivity with a moderate thalweg at Levis Street is interrupted by a lesser depositional zone at the BeeLine trailer park.

It is anticipated that the aforementioned sediment depositional zone volumes may decrease as seasonal channel water levels rise and flows increase during the wetter fall season. The increased flows are anticipated to flush and distribute some of the grounded sediment more evenly over the study area as the sediment migrates out to the lake. This will relieve the depositional zones of excess sediment and optimistically lessen the possibility of ice jamming in these perpetual zones of sedimentation.

Thalweg Rationalization

Even though this summer may have seen more precipitation than normal, the rains did not produce sufficient increased channel flows to transport the sediment downstream or move the Rocabore Bay south sediment out to the lake. The continued natural depositional areas (inside bends, wider and deeper channel areas) along with the channels transport zones (narrower, straighter with less depth) within the Hamlet of Port Bruce identify the channels morphological equilibrium which appears to be abating in this morphological cycle reducing the channels ability to maintain a suitable hydrological conveyance resulting in a sporadic thalweg within the lower reaches of the Catfish Creek within Port Bruce.

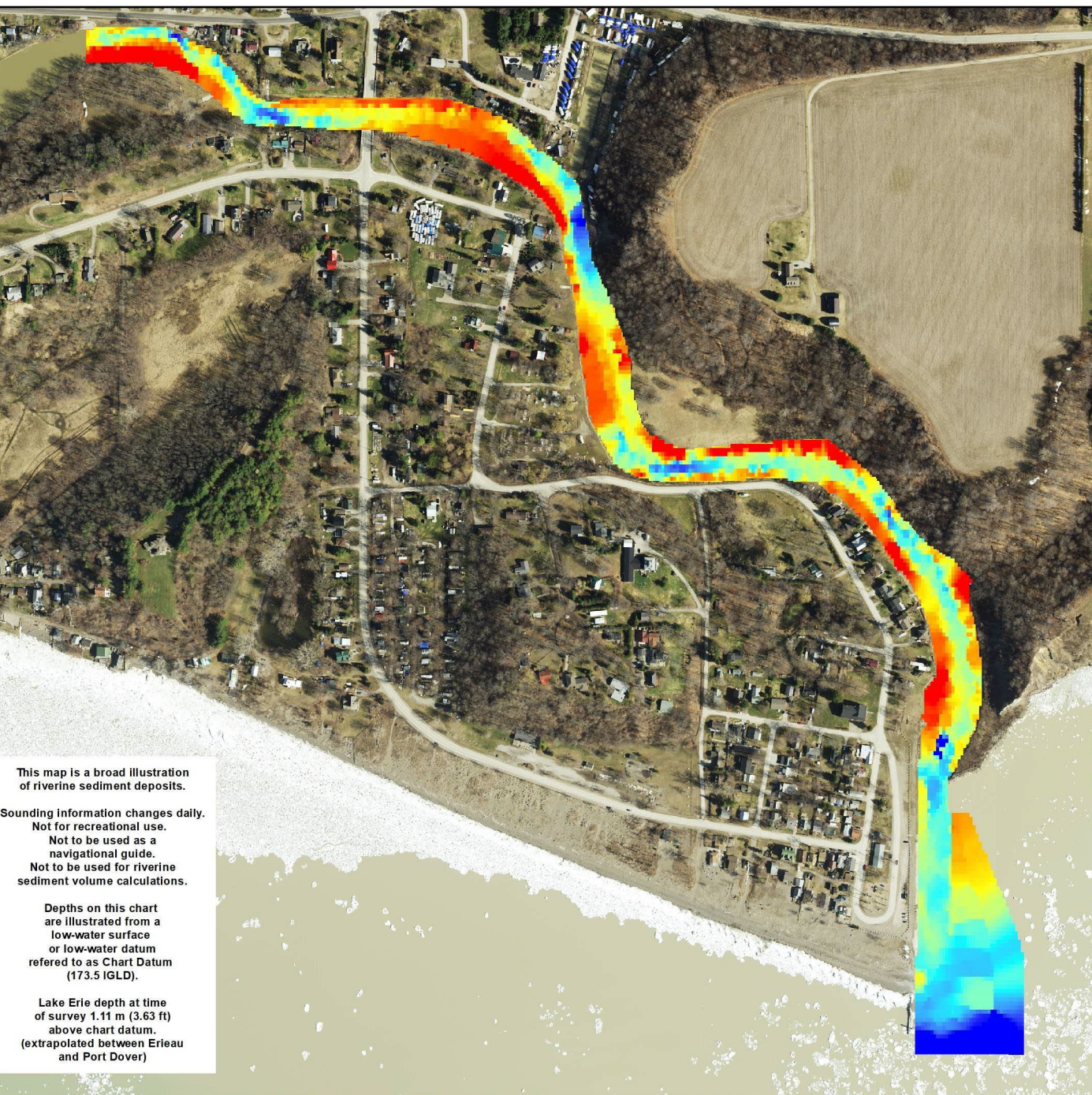
Observations may suggest that climate change is generating less lake ice (not freezing, winter of 2023-2024) which in turn allows open water storm waves to transport lake sediment into Port Bruce harbour/Rocabore Bay.

CCCA and Malahide Township staff met on October 1, 2024 to discuss the preliminary September 2024 sounding results and agreed to further consider procedures/approaches for lessening the impact of the aforementioned Lake Erie sediment.

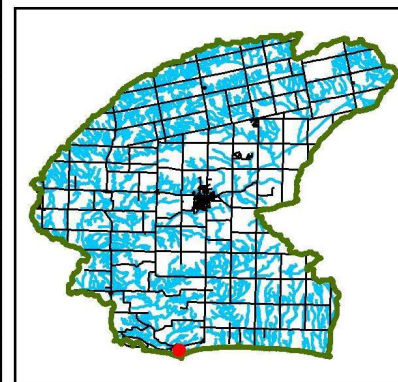
Recommendation:

That, the channel sounding observations described in Report /2024, be received as information at this time.

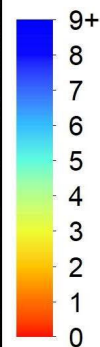
Peter Dragnas,
Water Management Technician



Port Bruce
July 10, 2023
Sounding



Feet



Data Sources: NRVIS, DFO, CCCA
CCCA GIS
July 10, 2023

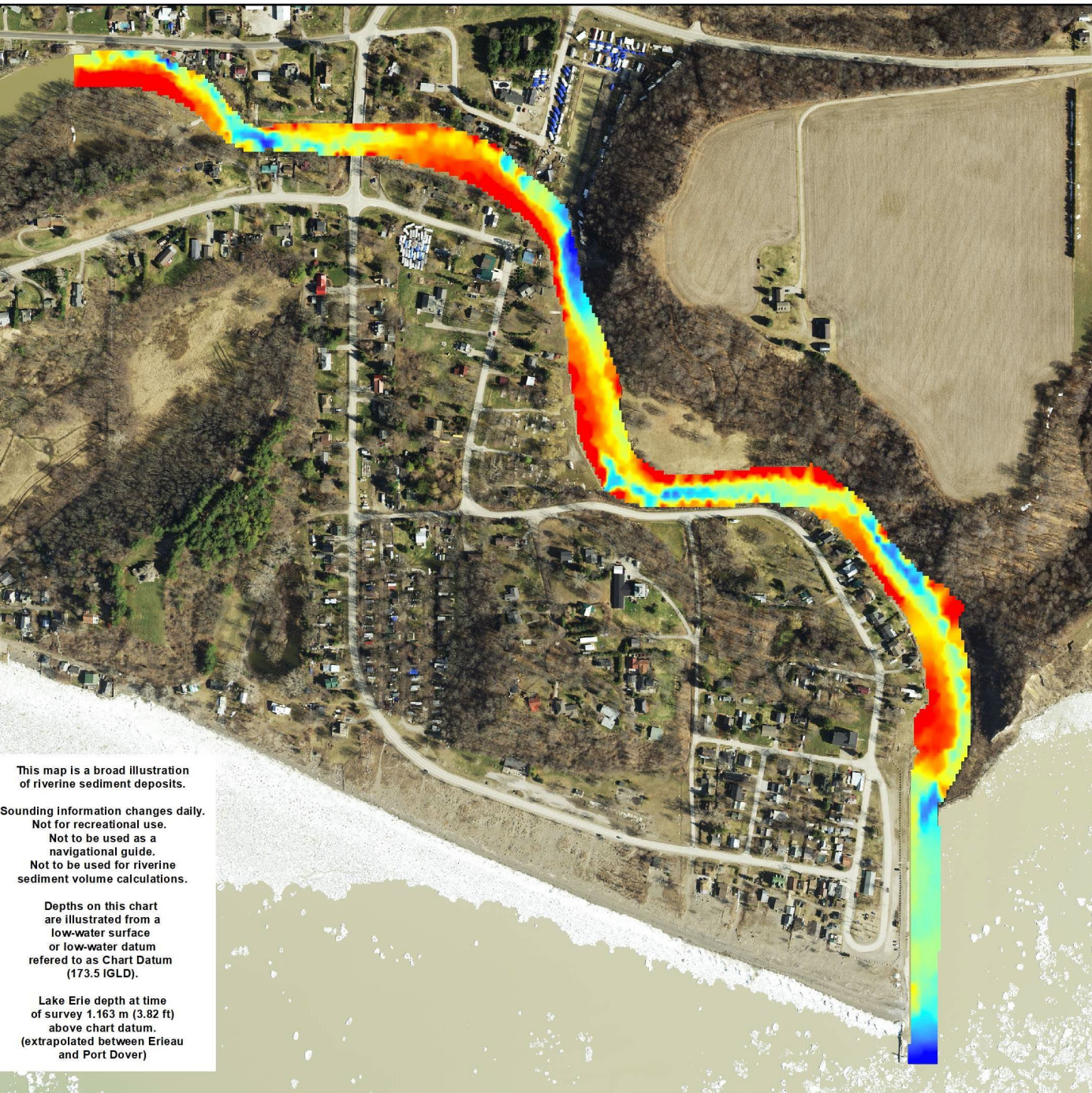
This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. Catfish Creek Conservation Authority (CCCA) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

This map is a broad illustration of riverine sediment deposits.

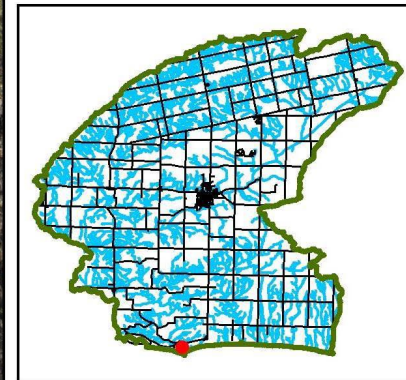
Sounding information changes daily.
Not for recreational use.
Not to be used as a navigational guide.
Not to be used for riverine sediment volume calculations.

Depths on this chart are illustrated from a low-water surface or low-water datum referred to as Chart Datum (173.5 IGLD).

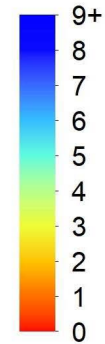
Lake Erie depth at time of survey 1.11 m (3.63 ft) above chart datum. (extrapolated between Erieau and Port Dover)



Port Bruce
June 3, 2024
Sounding



Feet



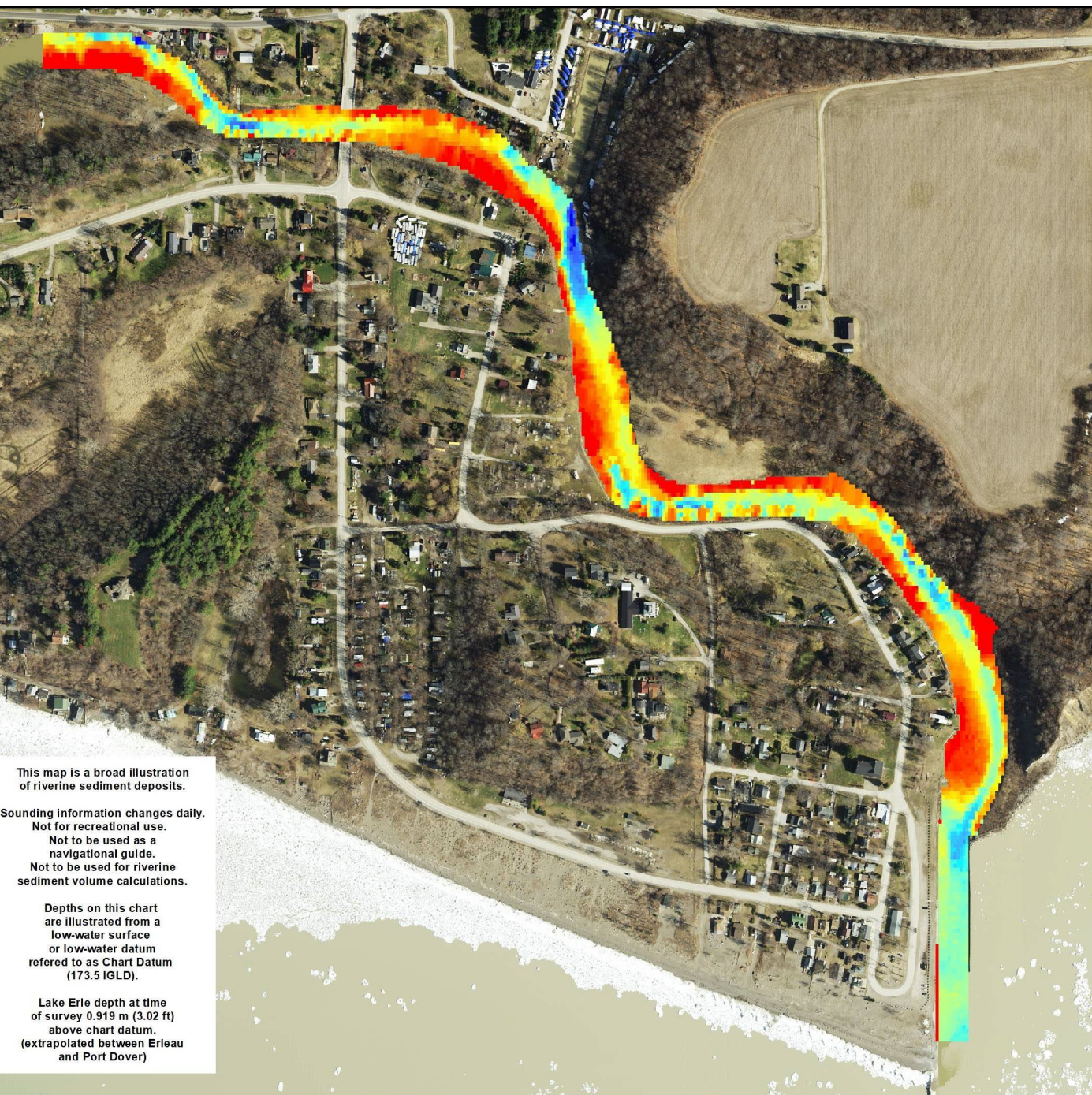
Data Sources: NRVIS, DFO, CCCA
CCCA GIS
June 3, 2024

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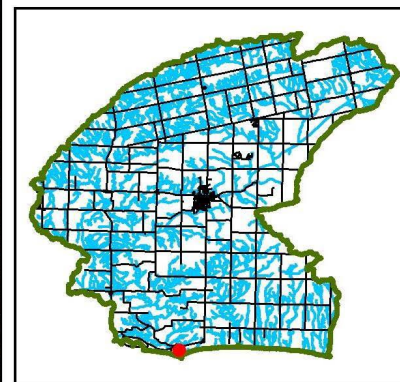
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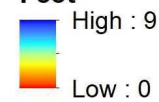
Lake Erie depth at time of survey 1.163 m (3.82 ft) above chart datum. (extrapolated between Erieau and Port Dover)



Port Bruce
September, 2024
Sounding



Feet



Data Sources: NRVIS, DFO, CCCA
CCCA GIS
September 17, 2024

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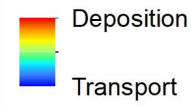
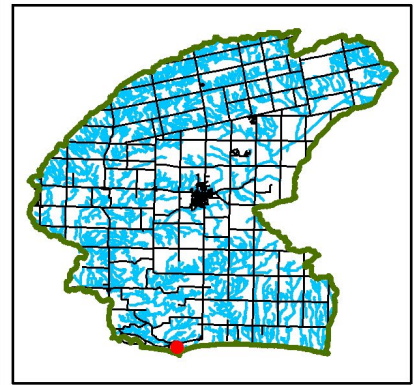
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Lake Erie depth at time of survey 0.919 m (3.02 ft) above chart datum. (extrapolated between Erieau and Port Dover)



Lower Catfish Creek Deposition and Transport Zones



Data Sources: NRVIS, DFO, CCCA
CCCA GIS
September 17, 2024

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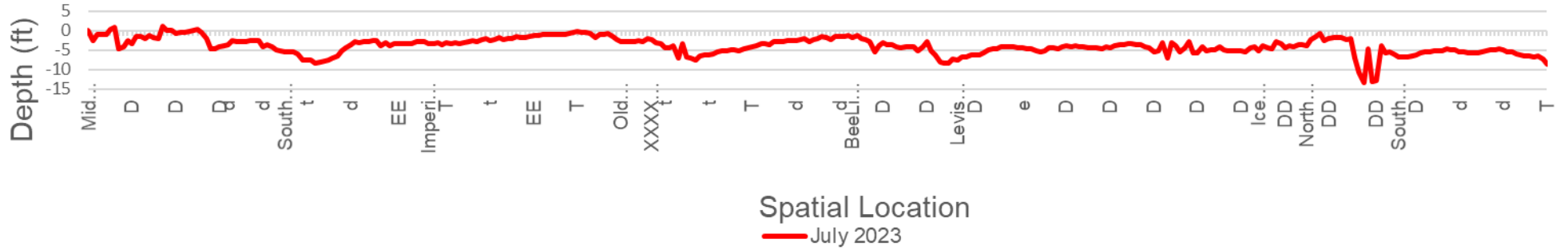
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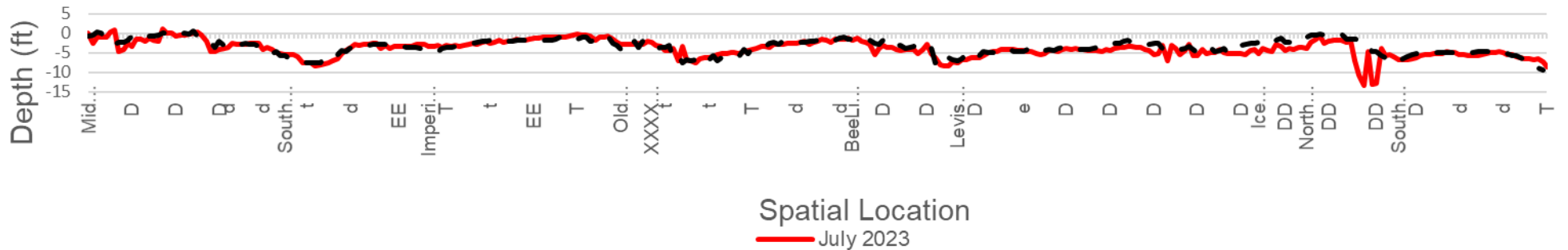
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Port Bruce Sounding Longitudinal Profile
July 2023



Port Bruce Sounding Longitudinal Profile
July 2023, June 2024



Port Bruce Sounding Longitudinal Profile
July 2023, June 2024, September 2024

