

Effects of ProcellaCOR in Lake George



Initial results from the monitoring of Blairs Bay and Jelliffe-Knight Bay by The Jefferson Project and the Lake George Association (LGA)

September 3, 2024

On June 29, 2024, the Lake George Park Commission applied ProcellaCOR in Blairs Bay and Jelliffe-Knight (formerly Sheep Meadow) Bay to test the use of the herbicide on Eurasian watermilfoil (EWM) in Lake George. EWM is an invasive plant species that has existed in the Lake for nearly 40 years.

The LGA and The Jefferson Project have undertaken a comprehensive scientific monitoring of the effects of ProcellaCOR. Here are the initial results. Monitoring will continue into 2025.

Preliminary Data & Observations

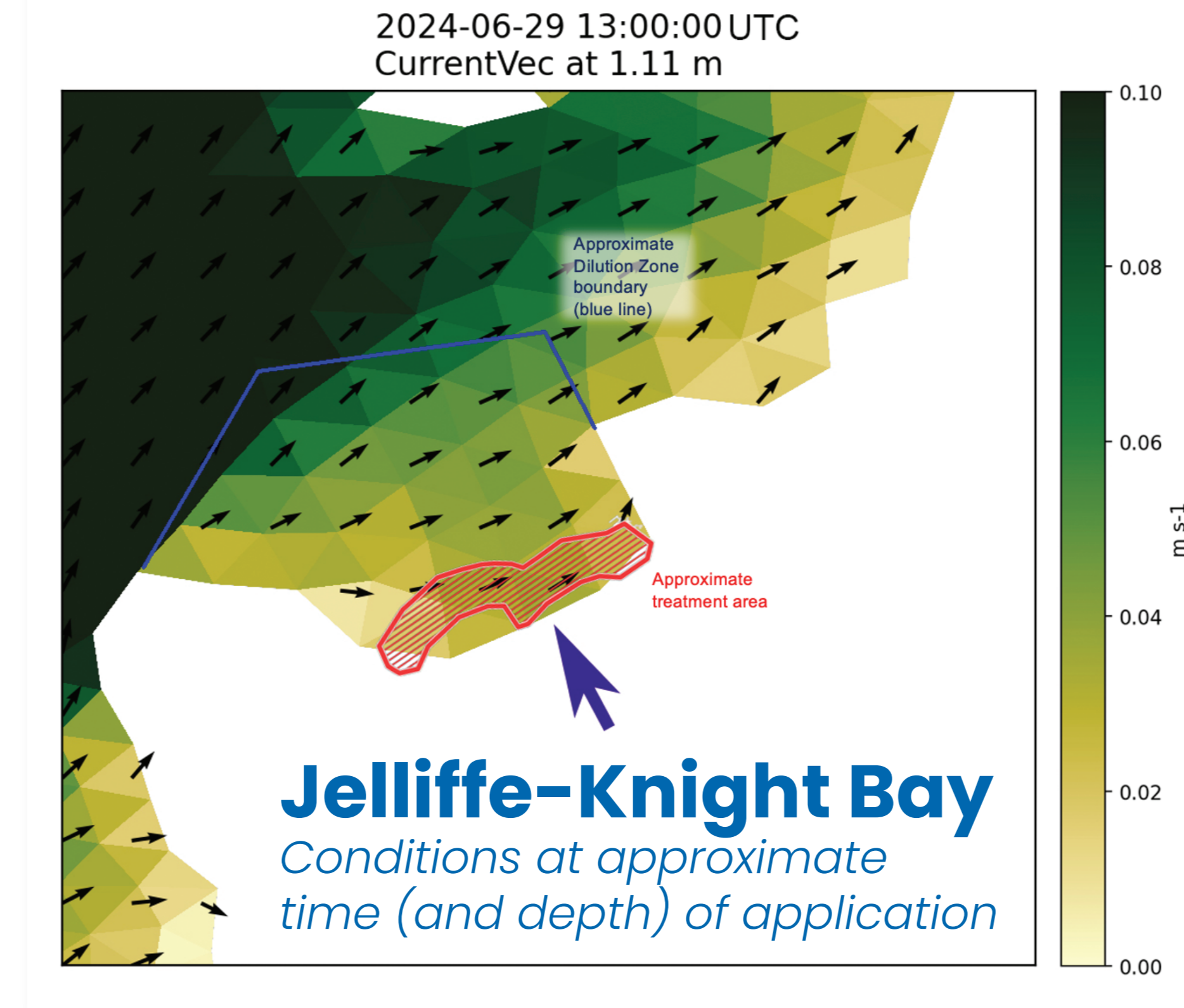
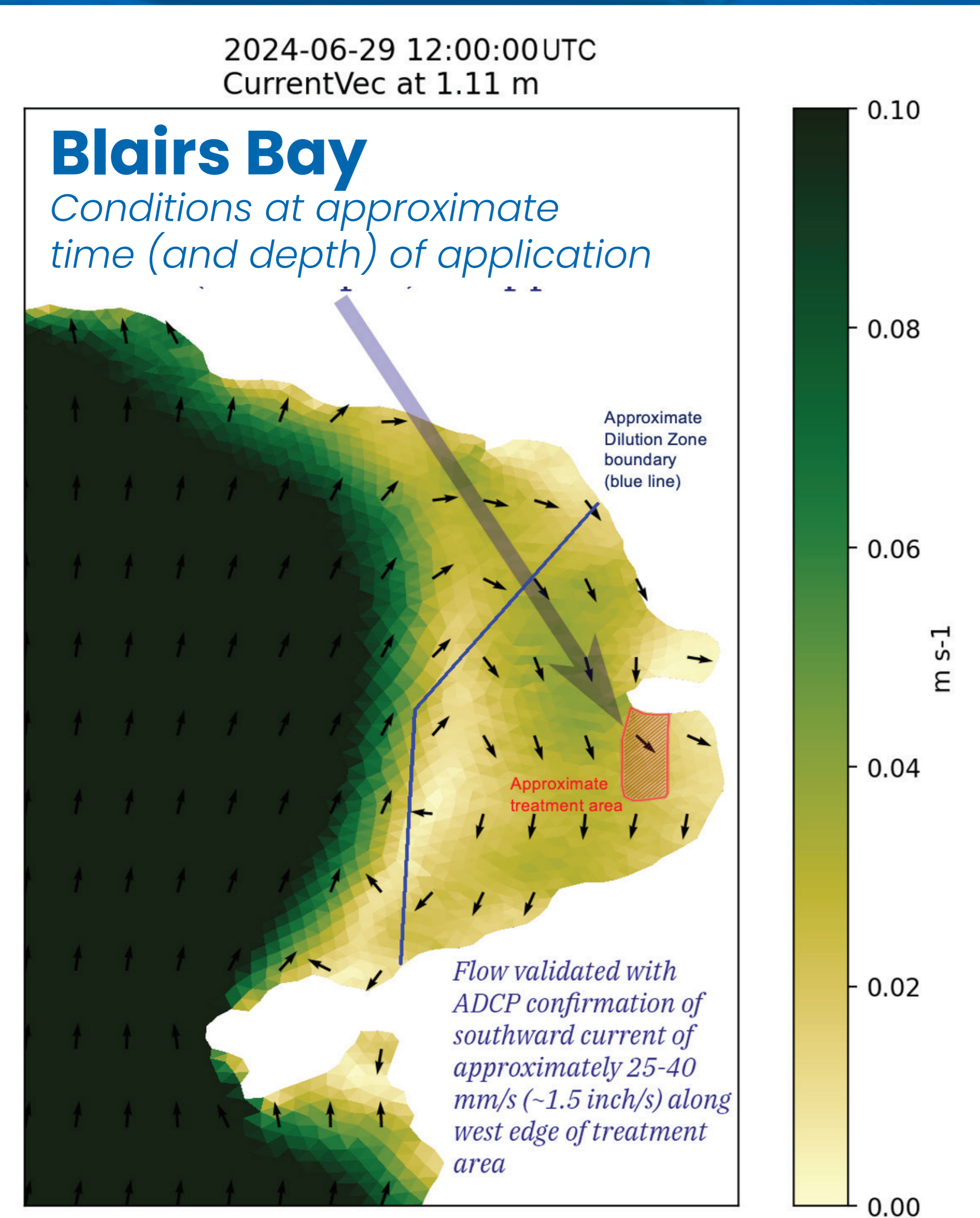
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- ProcellaCOR largely killed EWM in both bays within the treatment areas, but not the dilution zone.
- The Lake's water circulation affected the dispersal and dilution of the applied herbicide
 - The majority of EWM in the treatment zone was killed in both bays
 - Dilution of the ProcellaCOR was not uniform
 - ProcellaCOR and its degradants spread beyond the treatment zones
- ProcellaCOR degradants are in the lakebed

ProcellaCOR was effective in killing the majority of Eurasian watermilfoil in the treatment zones, but a portion remained in Blairs Bay, due in large part to water circulation and water exchange. The herbicide also traveled beyond the targeted dilution zone. Sample results found degradants (what the herbicide breaks down into) were in the Lake sediment.

Water Circulation in the Bays on June 29, 2024

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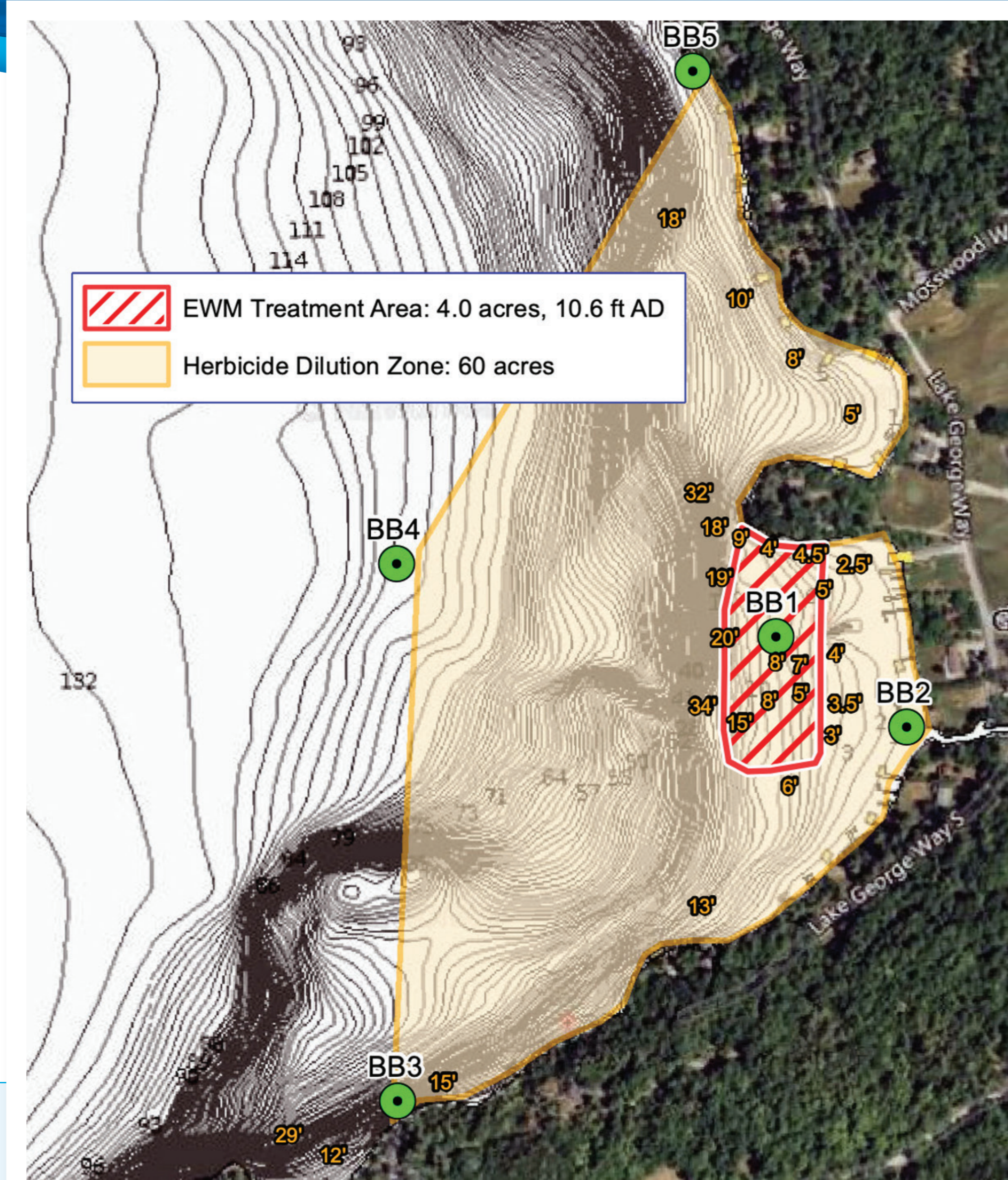
Effects of ProcellaCOR in Lake George

These are circulation models of the water movement, both direction and speed, in the two Lake George bays. They were made by The Jefferson Project the morning of June 29 at the time of ProcellaCOR treatment in the areas shown in red. The flows were validated by acoustic doppler current profilers in the Lake.

In Blairs Bay on the left, you can see a north-to-south clockwise water movement, which affected the efficacy and uniformity of the herbicide, and also transported the chemical outside of the treatment zone.

Blairs Bay Treatment and Dilution Zones

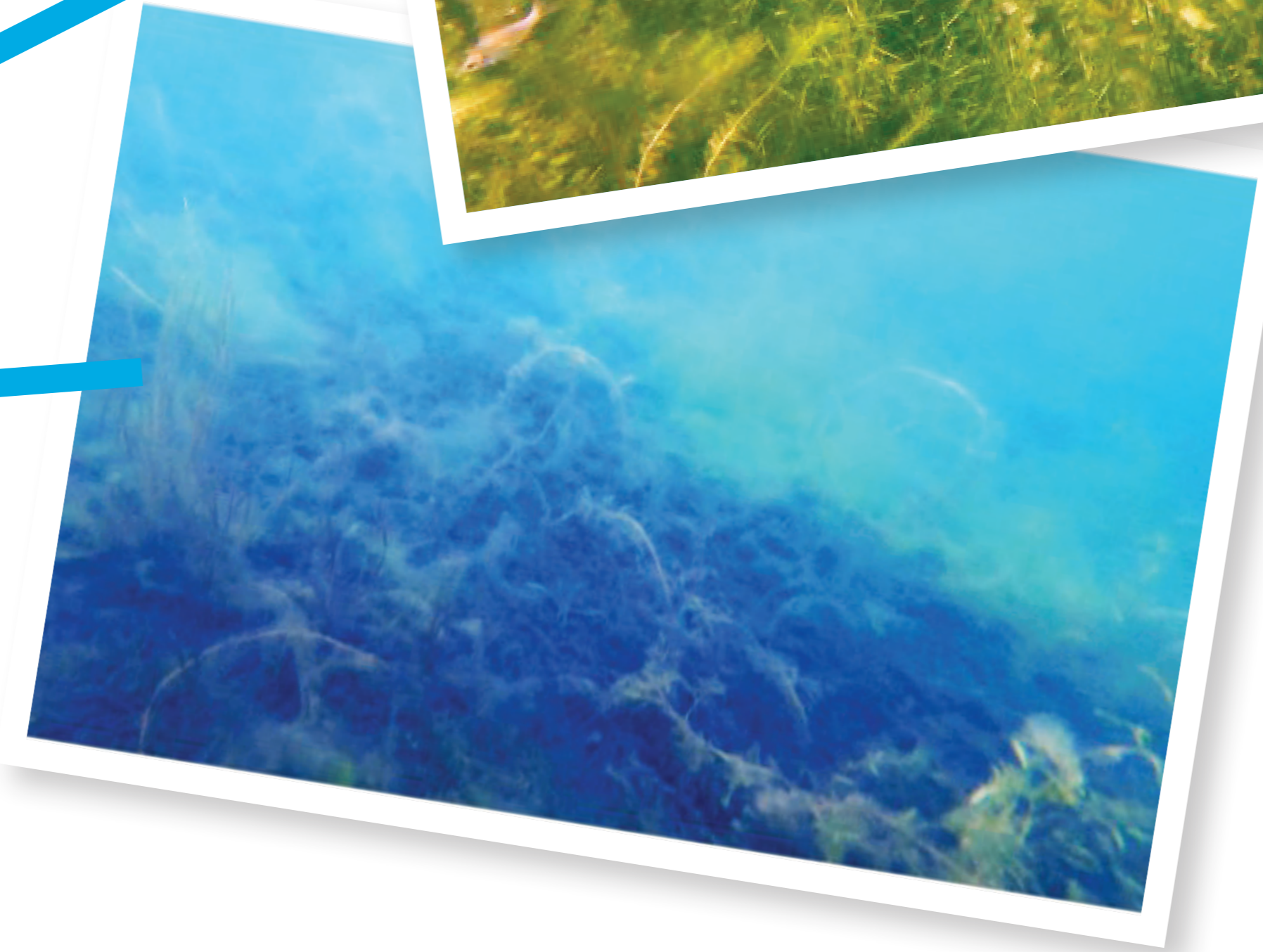
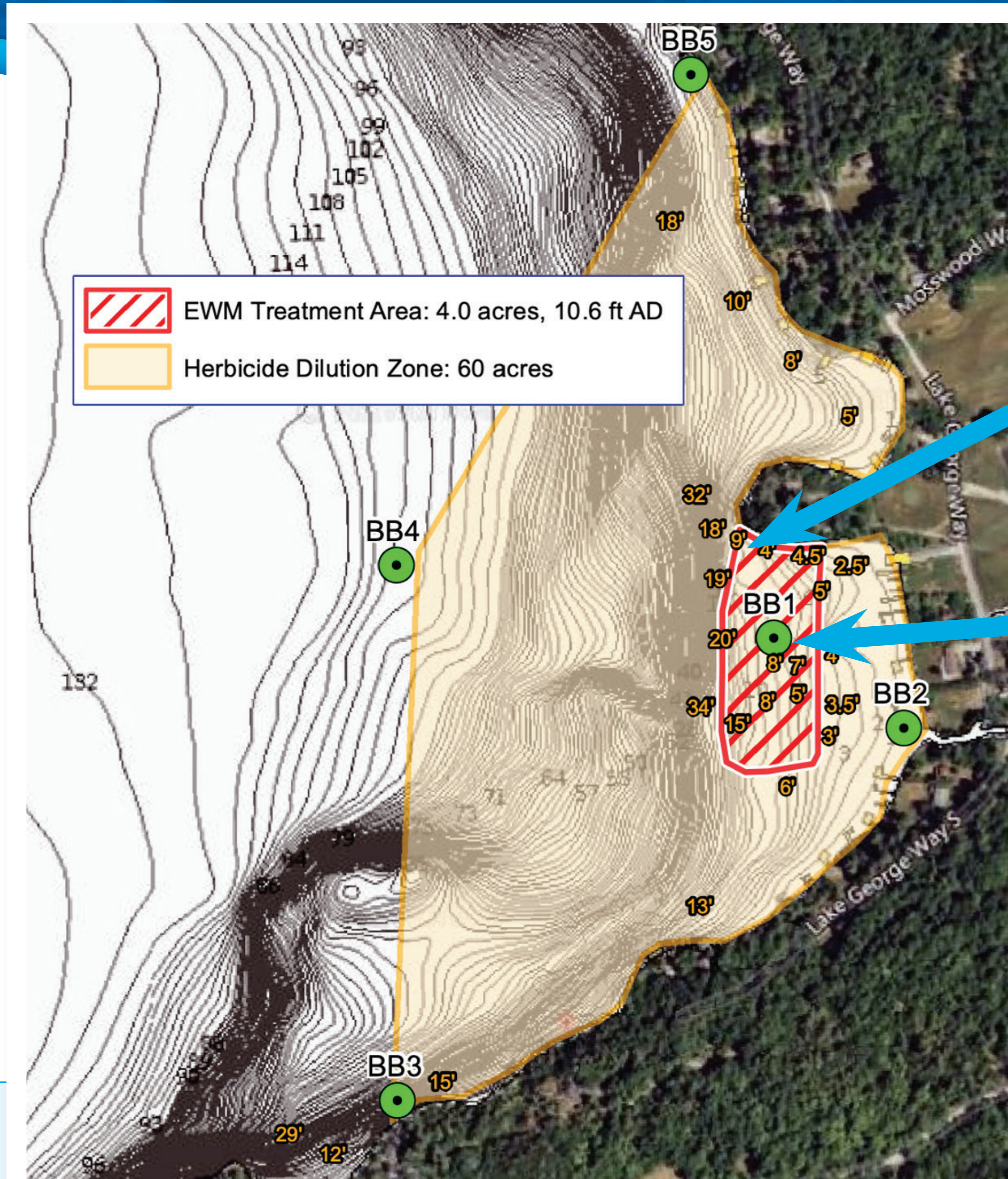
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ProcellaCOR was applied to Blairs Bay in the red area shown here, the treatment zone. The tan area surrounding it indicates the dilution zone, which is the area estimated to be exposed to ProcellaCOR, as defined by models from New York State that are based on uniform distribution of herbicide application.

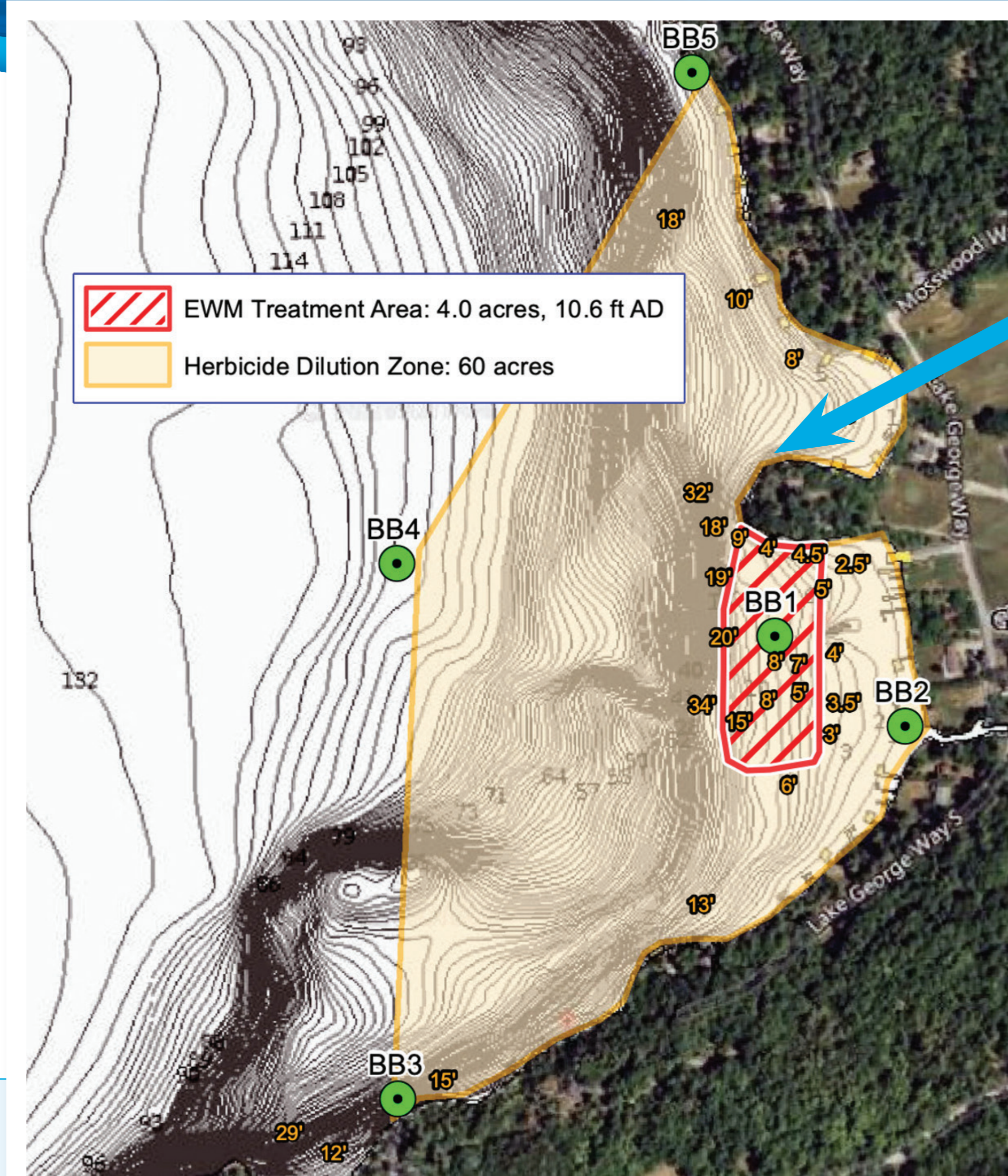
Uneven Impacts on EWM

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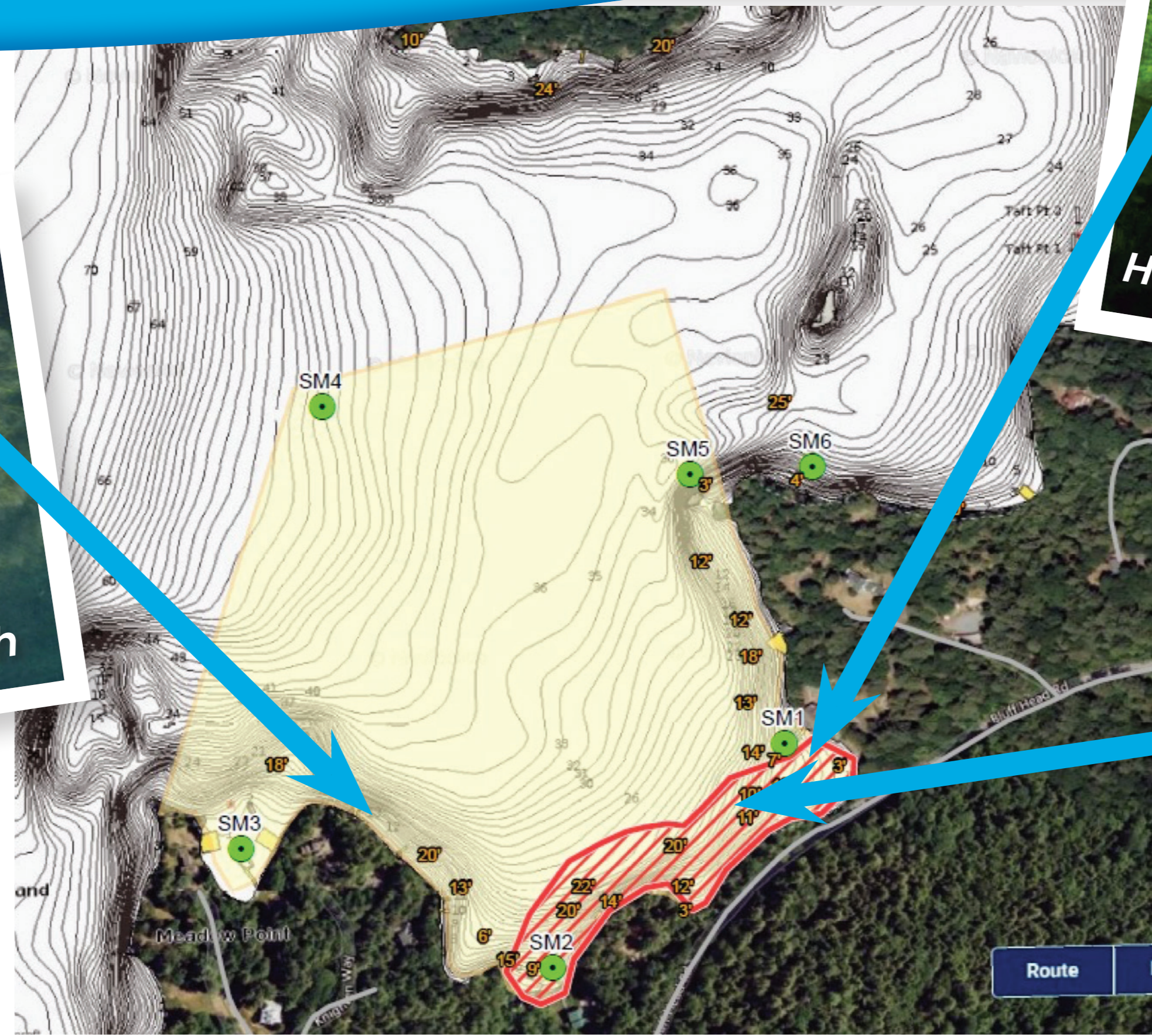
In early August, The Jefferson Project's underwater remotely operated vehicle took photos of Blairs Bay. The EWM was dead in the middle of the treatment zone, however, in the northern section of the zone, EWM does not appear to be impacted, due to north-to-south direction of the Lake water at the time of application on June 29.

Uneven Impacts on EWM



Just north of the treatment zone in Blairs Bay, photos from August 14 show largely unaffected EWM in the dilution zone along Davis Point.

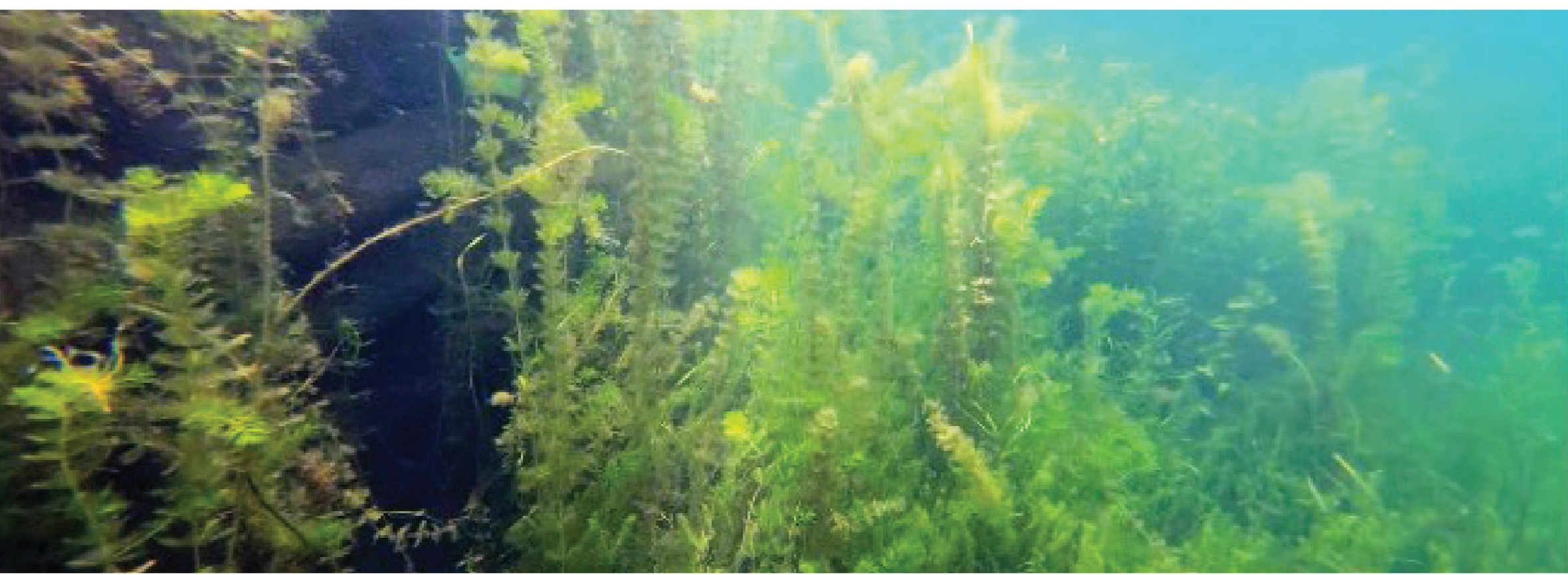
Uneven Impacts on EWM



In the treatment zone of Jelliffe-Knight Bay, we found potential signs of impact on native plants among the dead Eurasian watermilfoil with clouds of algae above it, as well as areas of healthy native plants. In the dilution zone, EWM with new growth was observed.

A Closer Look at Blairs Bay

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In the top photos of the northern treatment zone, we see healthy EWM plants as well as auto-segmenting, which is when tips of EWM release from the plant with adventitious roots that enable it to propagate.



The bottom photos, also in the treatment zone, show clouds of filamentous algae over the dead EWM. It is likely the decaying plants released nutrients and organic matter on which algae feed, causing them to multiply and create blooms.

Growth Among Decaying EWM

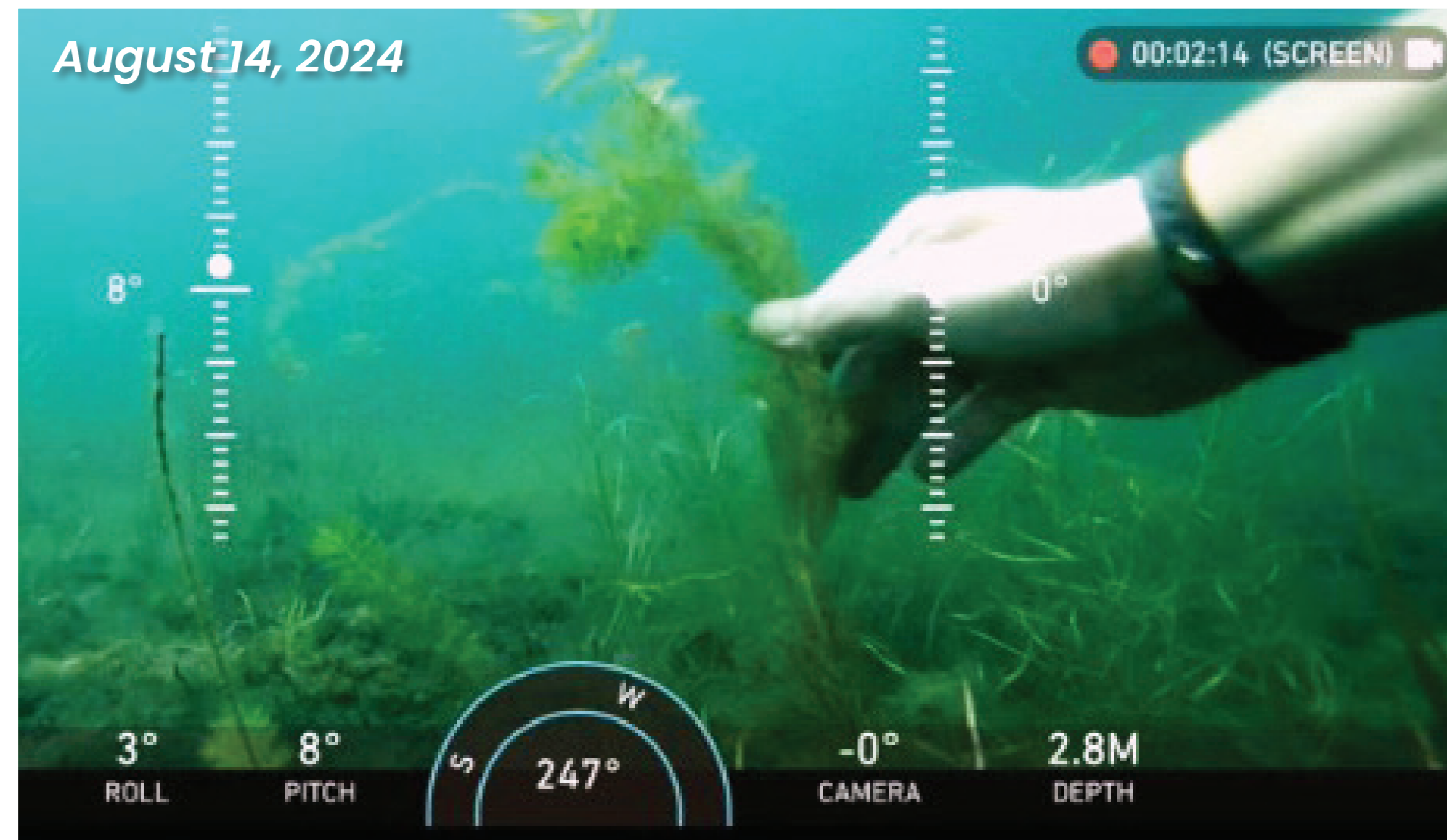
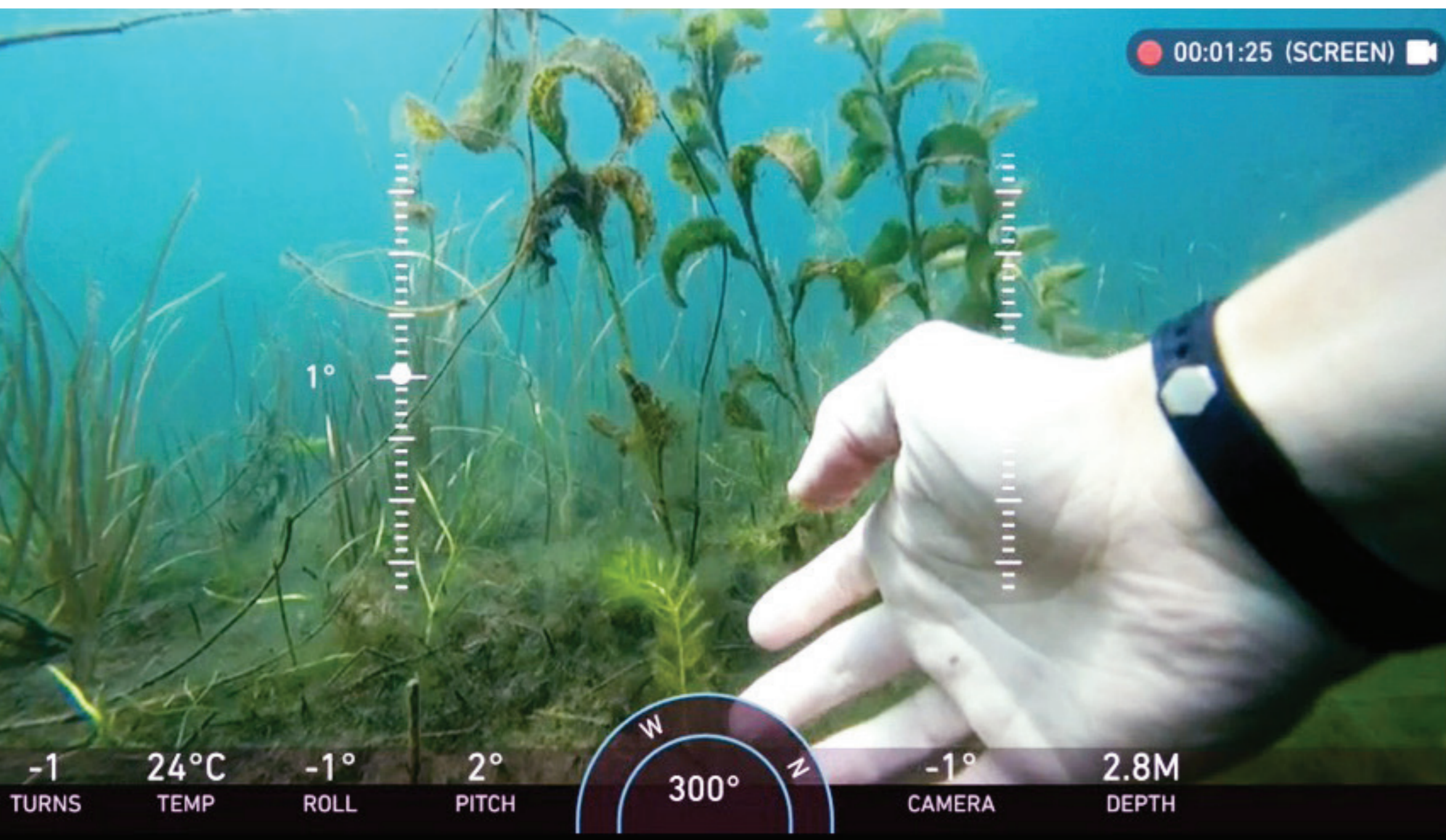
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In Blairs Bay, we found new growth from a decaying Eurasian watermilfoil stem, as shown here on August 2 in the treatment zone.

New EWM Growth Prompts Questions

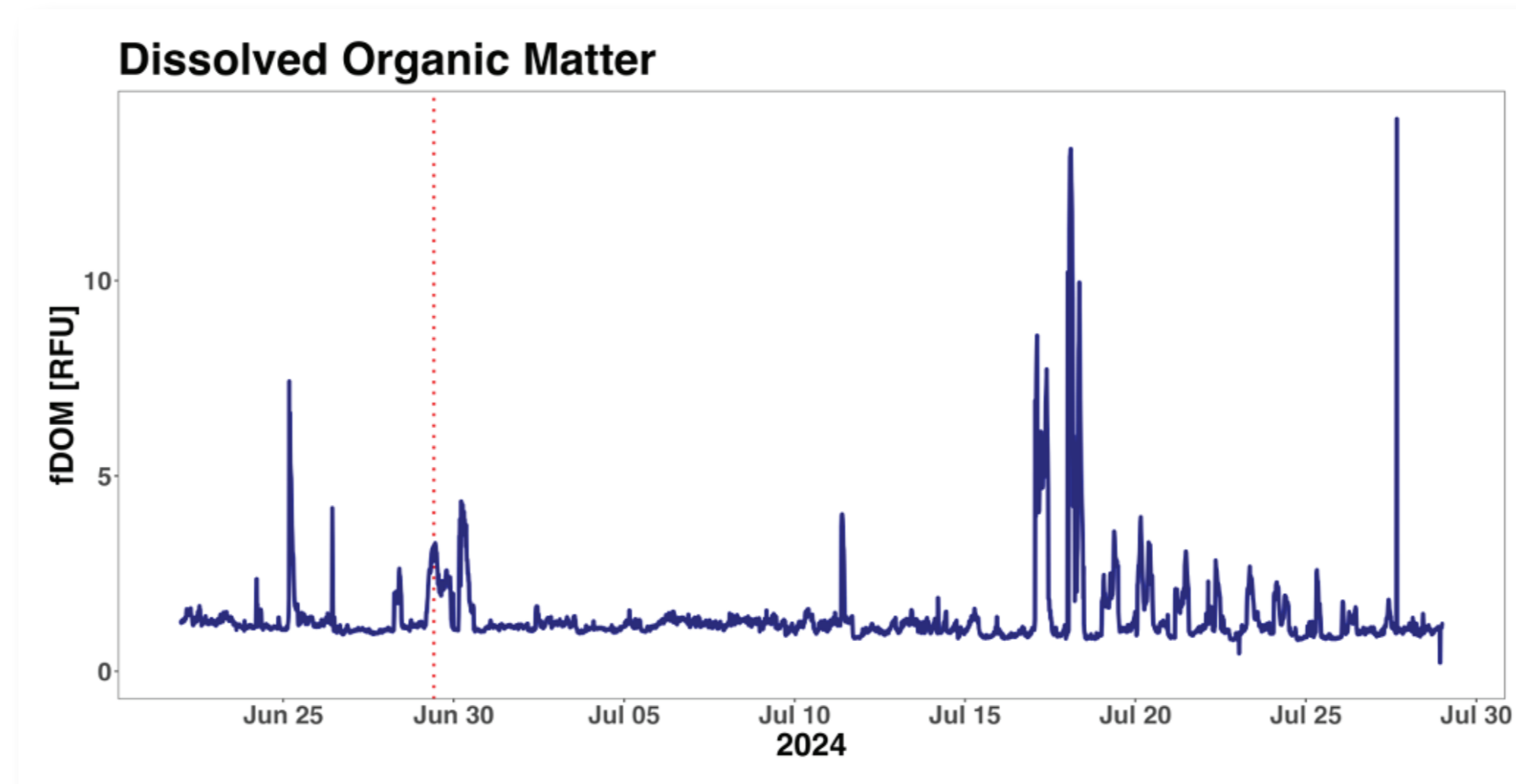
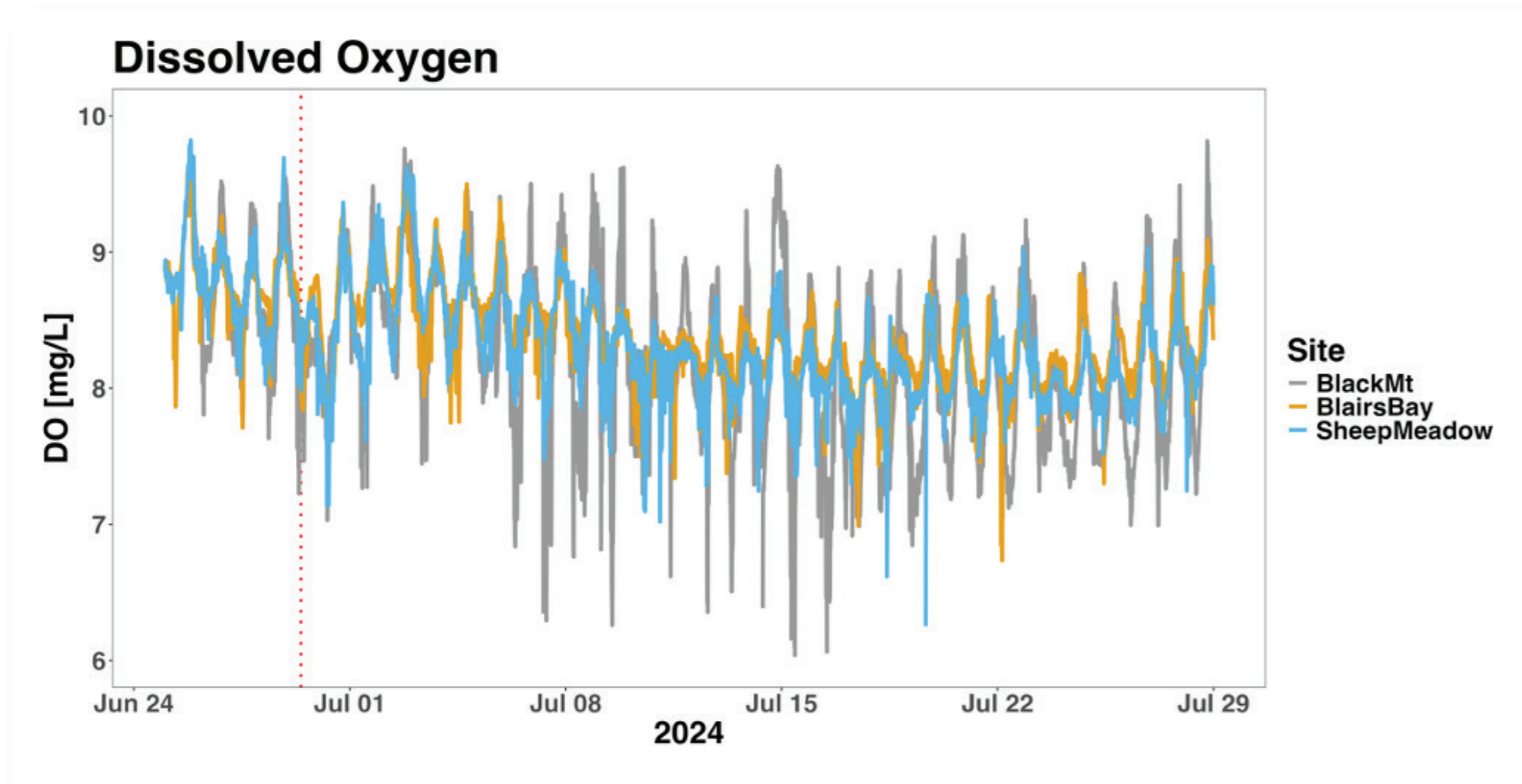
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The emergence of new EWM in several areas in the Blairs Bay treatment zone where much of the invasive was killed begs the questions: Did this EWM survive the treatment? Is this new growth? Is it both?

Decaying Plants Impact Ecosystem

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Plant productivity (photosynthesis) was lessened, as indicated by the lower amounts of dissolved oxygen in the treatment zones of Blairs and Jelliffe-Knight Bays compared with a control bay in Black Mountain Point. Microbial breakdown of the plants also could have lowered dissolved oxygen levels.

The sudden increase in decomposing plants in the treatment zone put more dissolved organic matter as well as nutrients into the water, likely causing an increase in algae growth over the decaying plants.

Blairs Bay: Water & Sediment Samples Show ProcellaCOR & Degradant Presence

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*ppb=parts per billion
ng/g=nanograms per gram*

ProcellaCOR

Water

3/10 samples were positive

Range: **.34 – 6.52 ppb**

Sediment

2/26 samples were positive

Range: **13.2–40.1 ng/g**

Degradant

1/10 samples were positive

Range: **1.54 ppb**

6/26 samples were positive

Range: **26.3 – 49.1 ng/g**

In Blairs Bay, water samples throughout the bay found ProcellaCOR in 3 out of 10 samples, and degradant in 1 out of 10 samples. The sediment samples from Blairs Bay found ProcellaCOR in 2 out of 26 samples, and degradants in 6 out of 26 samples.

Degradants last longer in the environment than ProcellaCOR and contain herbicidal properties.

Jelliffe-Knight Bay: Water & Sediment Samples Show ProcellaCOR & Degradant Presence

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*ppb=parts per billion
ng/g=nanograms per gram*

ProcellaCOR

Water

1/7

samples were positive

Range:

3.34 ppb

Sediment

1/20

samples were positive

Range:

13.2 ng/g

Degradant

2/7

samples were positive

Range:

.86 - 1.47 ppb

1/20

samples were positive

Range:

80.5 ng/g

In Jelliffe-Knight Bay, ProcellaCOR showed up in 1 out of 7 water samples, while degradants were in 2 out of 7 samples. One out of 20 sediment samples detected ProcellaCOR, and 1 out of 20 samples detected a degradant.

Degradants last longer in the environment than ProcellaCOR and contain herbicidal properties.

Analysis of Plant Samples to Be Released in Mid-September

Plant samples are currently undergoing analysis by an independent laboratory at the University of Connecticut.

💧 Preliminary Data and Observations

- ProcellaCOR killed large amounts of EWM but did not eradicate it. The return of EWM must be closely monitored.
- Water circulation and exchange impacted ProcellaCOR
 - Efficacy was less than 100%
 - Dilution was not uniform
 - ProcellaCOR and degradants spread
- Degradants were measured in lakebed sediment samples, and its potential effects must be closely monitored mid- and long-term.

Initial results indicate that longer-term studies are necessary

Monitoring to Continue

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- For a better understanding of the behavior of ProcellaCOR in the Lake:
 - September 2024: Survey and sampling of Eurasian watermilfoil, native plants, sediment
 - Plant sample analysis and macroinvertebrate analysis
 - Spring 2025: Survey and sampling of Eurasian watermilfoil, native plants, sediment

Monitoring analysis for ProcellaCOR and degradant concentrations will be released to the public as it is received.