

May 26<sup>th</sup> 2023

# STOP Zebra Mussels





## Mission :

To inform, educate, influence and act on environmental issues that threaten water quality, the health of Lake Massawippi and the quality of life of its residents and users.

## Blue Massawippi is :

A non-profit  
running since 1969

2 permanent  
employees and up  
to 12 seasonal  
workers

Our field : the lake  
Massawippi and its  
watershed

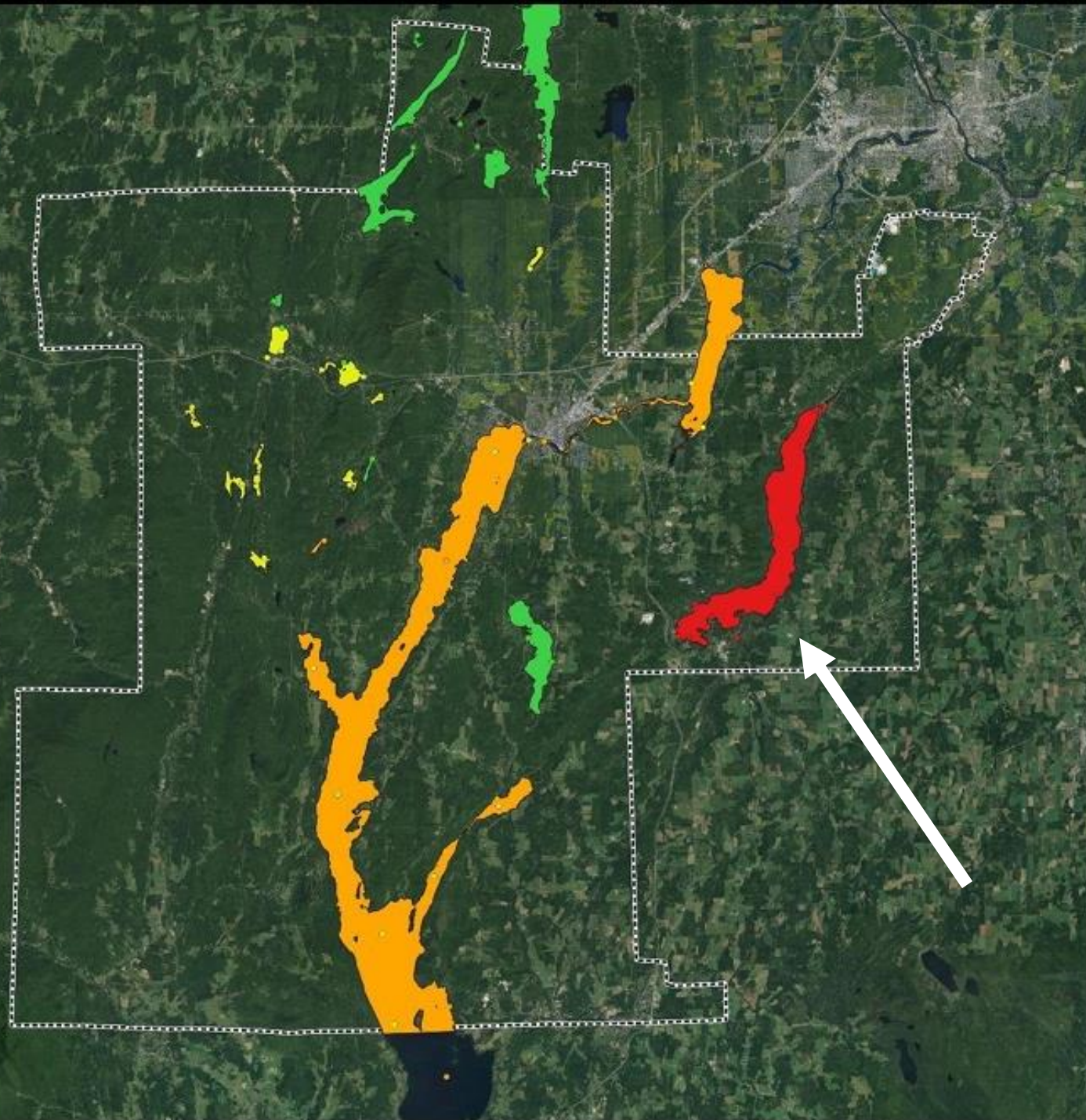


# STOP Zebra Mussels :

## Early detection











### Légende

 Limite de la MRC Memphrémagog

### Risque d'implantation par plan d'eau

-  Très faible (< 12 mgCa/l)
-  Moyen (12-19 mgCa/l)
-  Élevé (20-25 mgCa/l)
-  Très élevé (>25mgCa/l)

0 5 10 km

1:200000

Projection : NAD83 (CSRS) / MTM fuseau 8 (ESPG 2950)

### Sources :

Image satellite : Google imagerie @ 2018

Limites MRC : Géobase

Plan d'eau : GRHQ 03



### Carte 3

Niveau de risque d'implantation général des principaux plans d'eau de la MRC de Memphrémagog pour 2018.

Réalisée par : Vicky Bouffard  
Date : 2018-12-05



# STOP ZEBRA MUSSELS

Since 2018

## Early detection protocol

- Collectors (10 stations)
- Snorkel dives (40 stations)
- eDNA sampling (6 stations)



Merci aux donateurs, à nos partenaires,  
agents de terrain et bénévoles



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Forêts, Faune  
et Parcs

Québec



Massawippi  
Parc régional

Sépaq

Waterville



# STOP ZEBRA MUSSELS

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Detection : october 15th 2021

What now?



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# Early detection means low densities

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## Mean zebra mussel density in other lakes (m<sup>2</sup>)

- Magog (2019) : 7,5
- Memphrémagog (2019) : 5
- Memphrémagog (2022) : **2000**
- Témiscouata (2022): 300
- **Massawippi (2022) : 0,2**





## Our case :

Conditions are  
primed for record  
densities

Severe impacts are  
expected

Early detection  
=  
unprecedented  
advantage

No\* thorough  
control attempted



# STOP Zebra Mussel : a management experiment

- Can proliferation be slowed ? Stopped ?
- Can foreseeable impacts be avoided ?
- What methods work ?

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# STOP Zebra Mussels : Operations



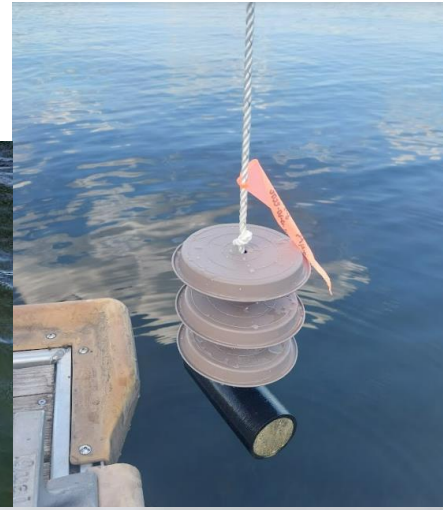


# STOP ZEBRA MUSSELS

Diving efforts since 2021:

- 430 dives
- 26 000 zebra mussels found

Seems like high counts, but no...



Thanks to our financial partners, scientific advisers, donors, field assistant and volunteers



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# STOP ZEBRA MUSSELS

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Population monitoring

- Floating veligers sampling
- Veligers settlement
- Adults densities
- Surface current modeling



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Other actions

- Media coverage
- Help at washing stations
- Raising awareness



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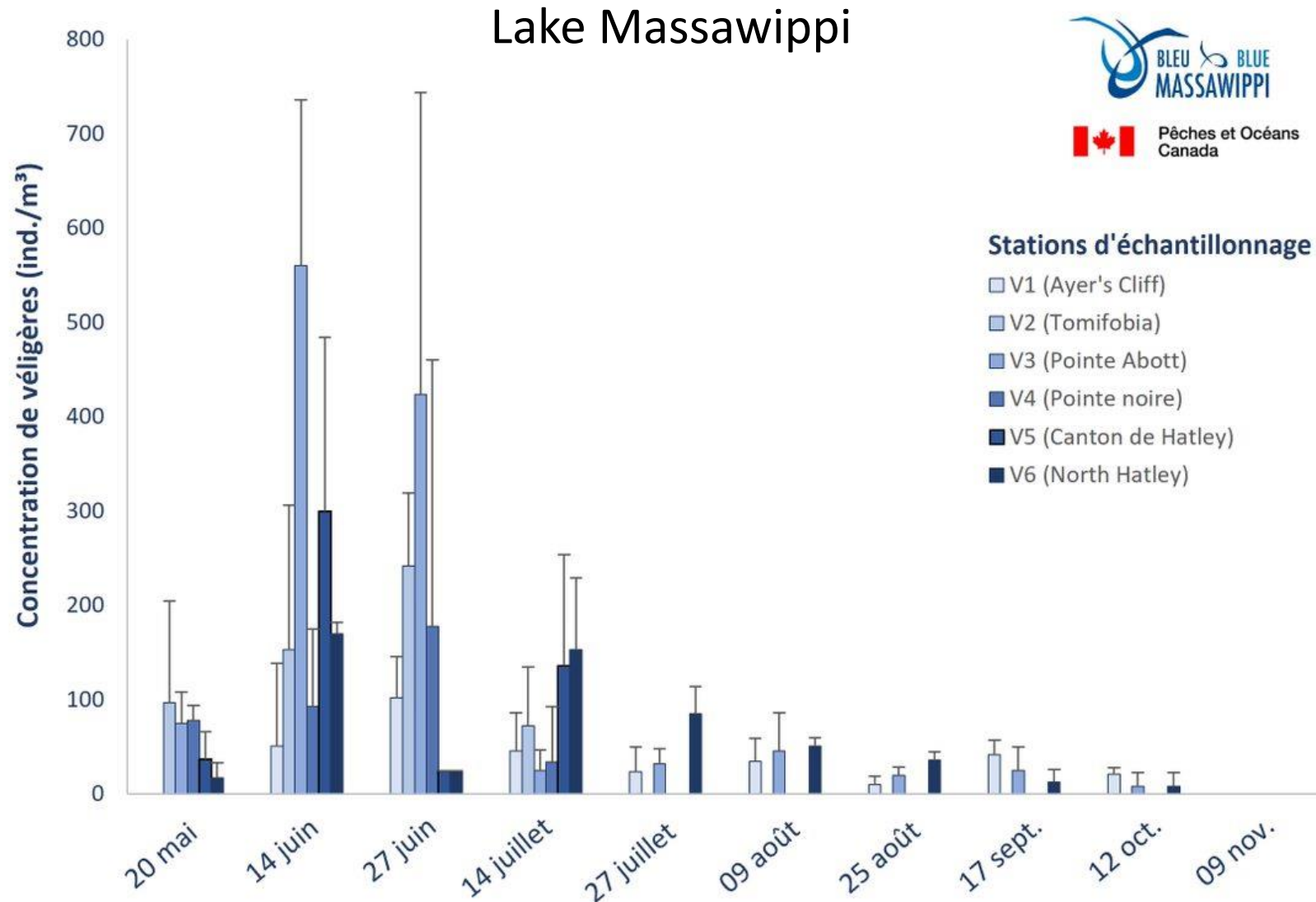
# STOP Zebra Mussels :

## First results





# Veligers density (2022)

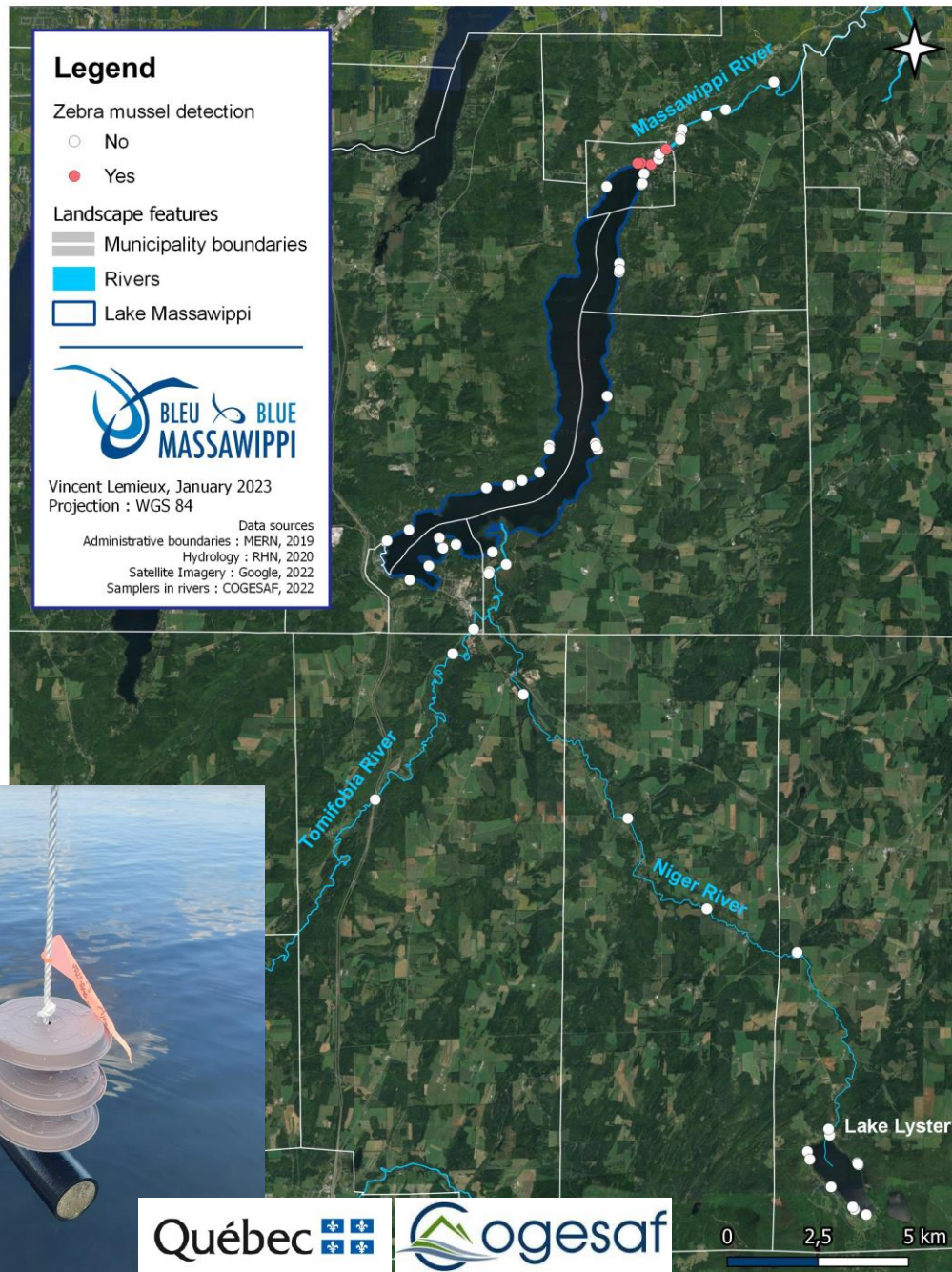


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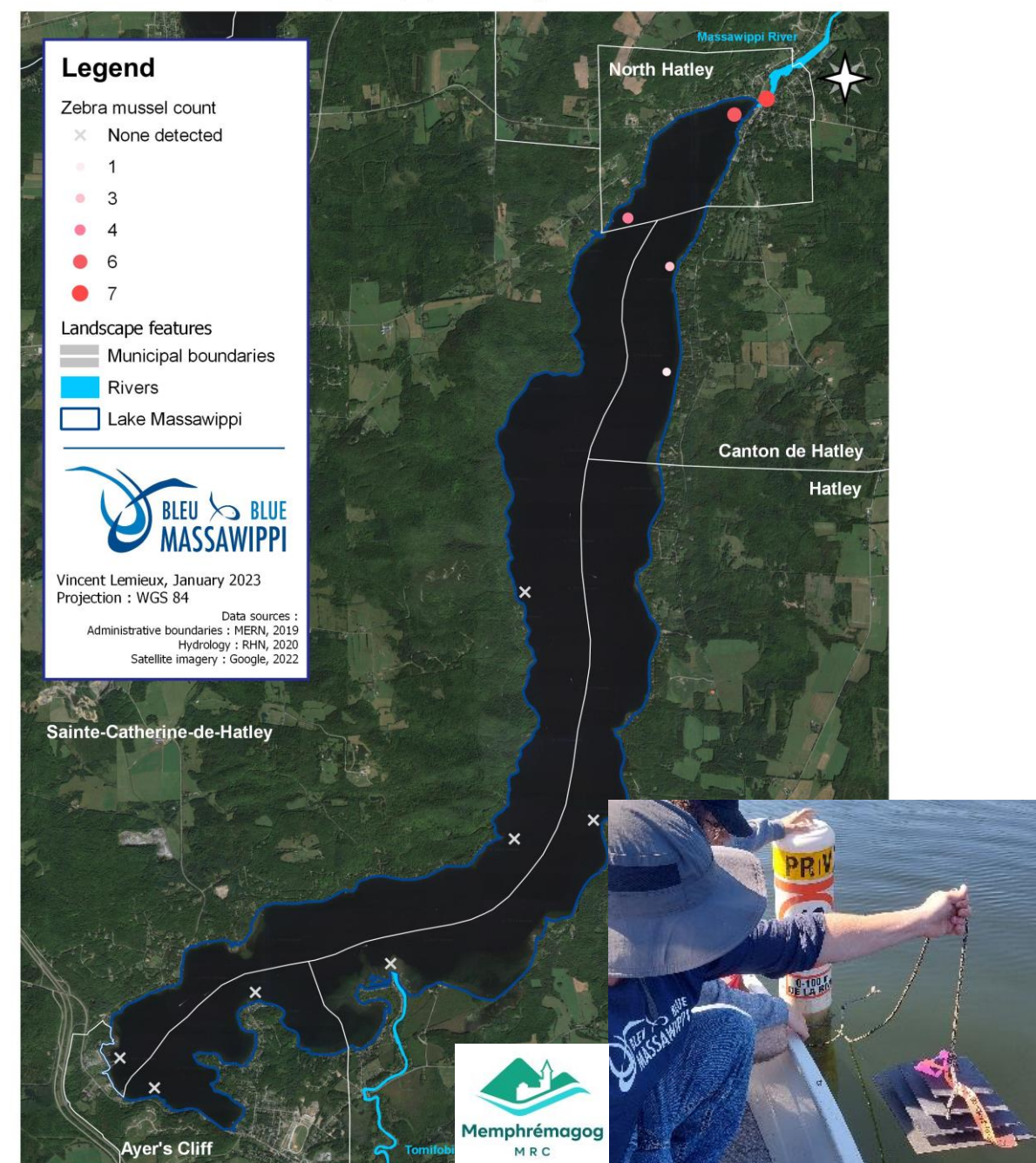
## Small zebra mussel samplers for citizens (2022)

77 samplers on 62 properties, deployed from July to October



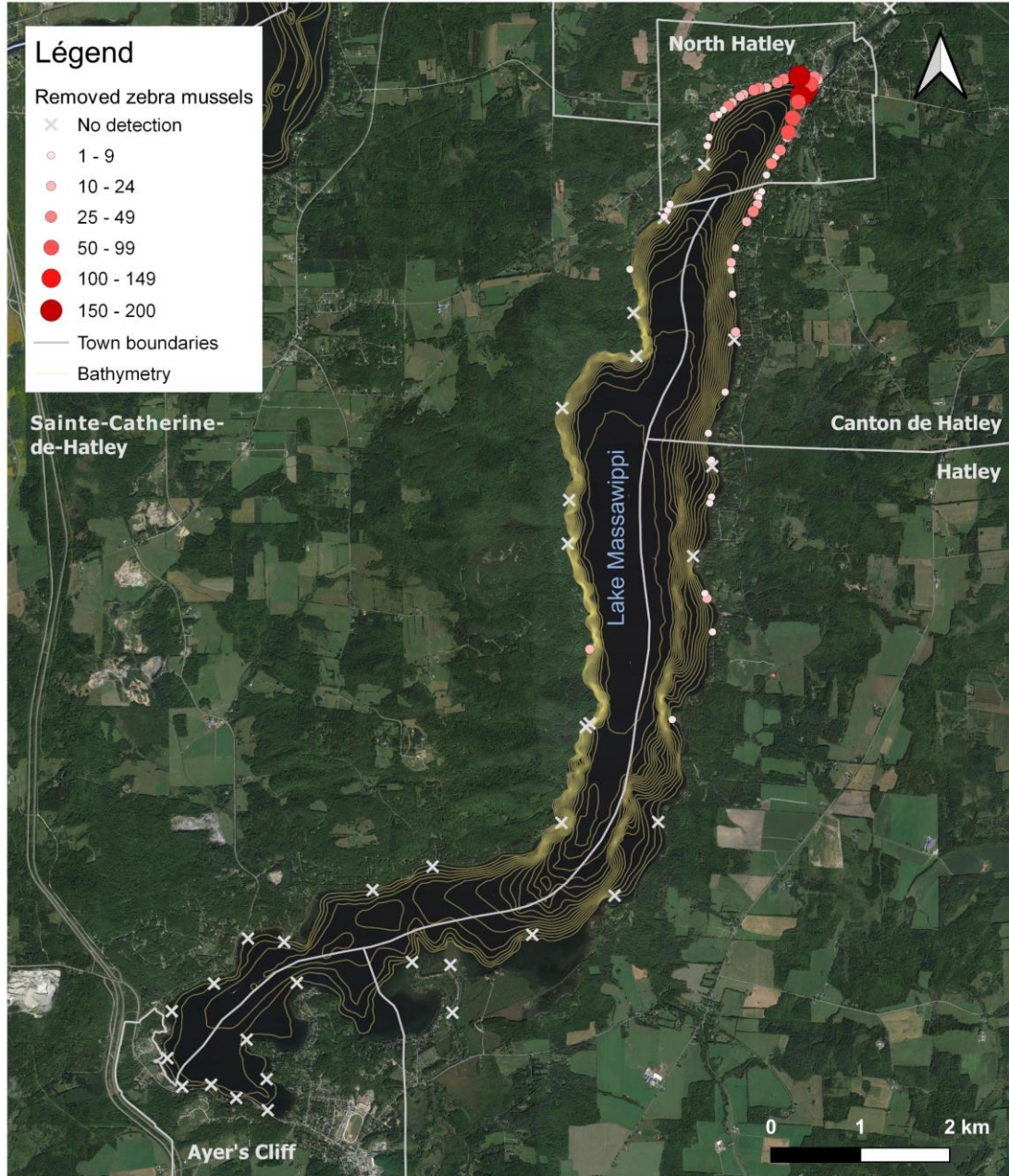
## Pyramidal samplers (2022)

12 samplers deployed from July to October





## Zebra mussel control : Fall 2021 underwater dives summary

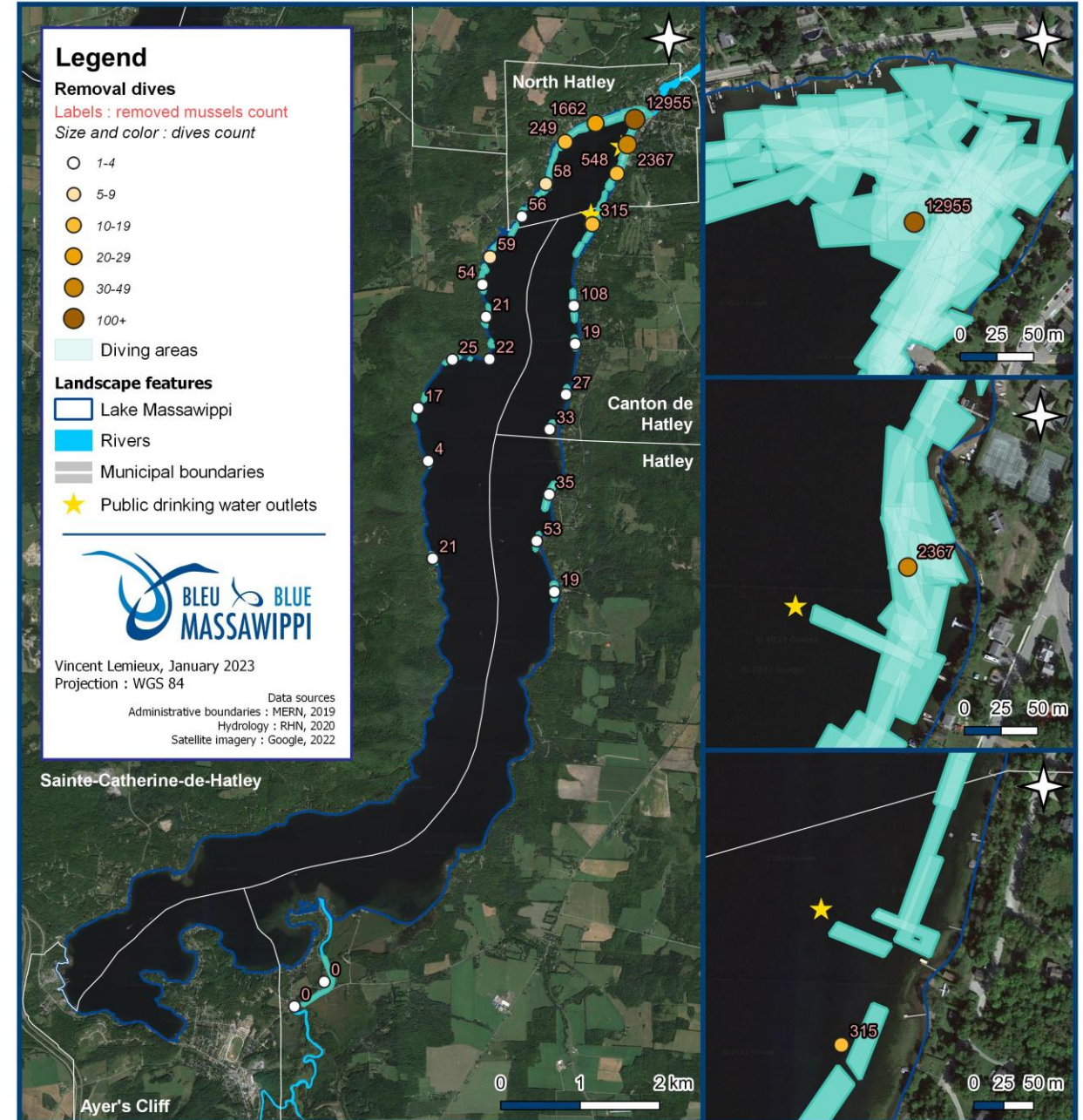


## Zebra mussel removal operations (2022)

241 scuba dives and 21 snorkel dives, 18 727 zebra mussels removed.

Zebra mussel counts were aggregated, for visual simplicity.

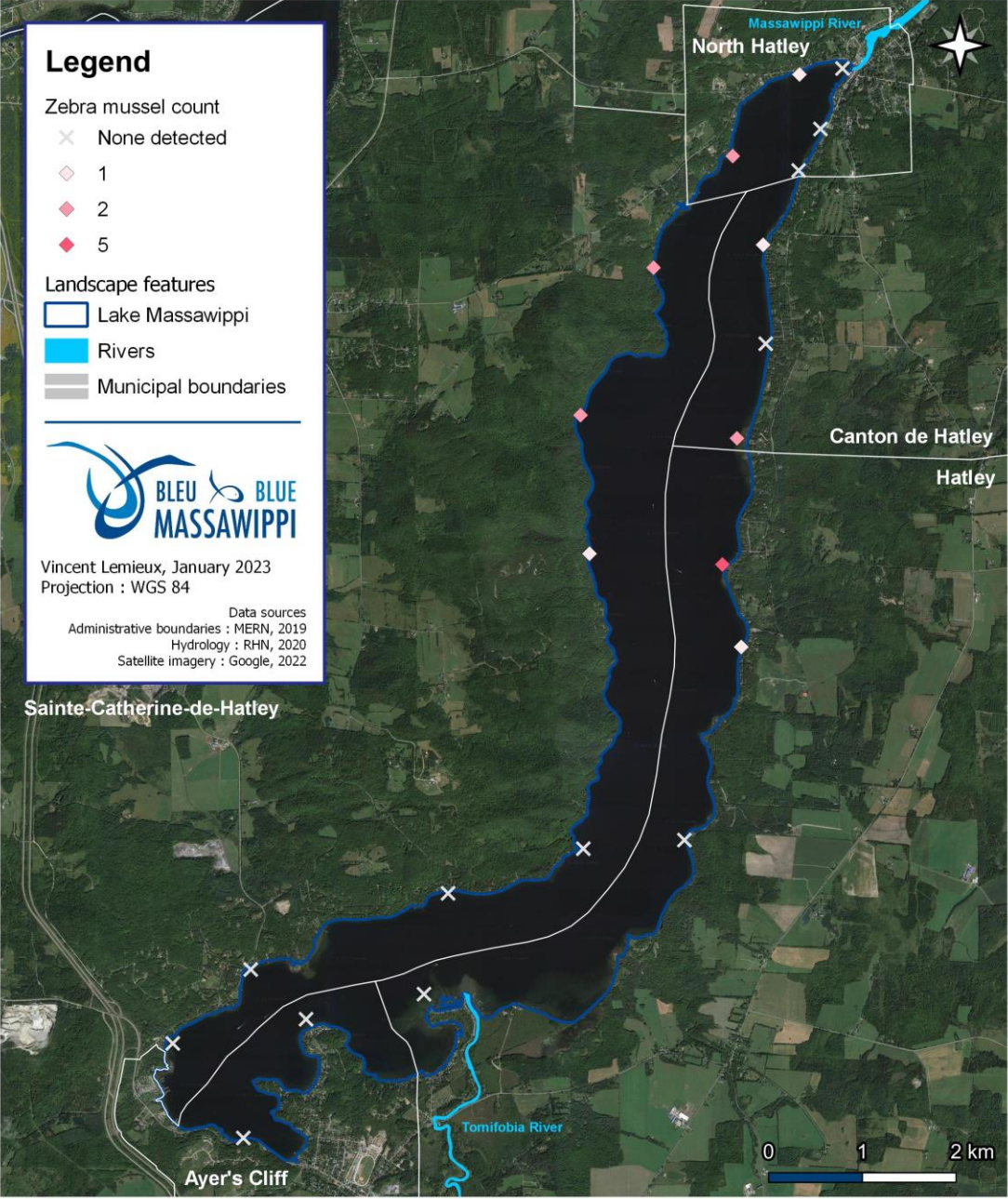
Diving areas are displayed larger in left map, for visualisation purposes.





# Zebra mussel density (2022)

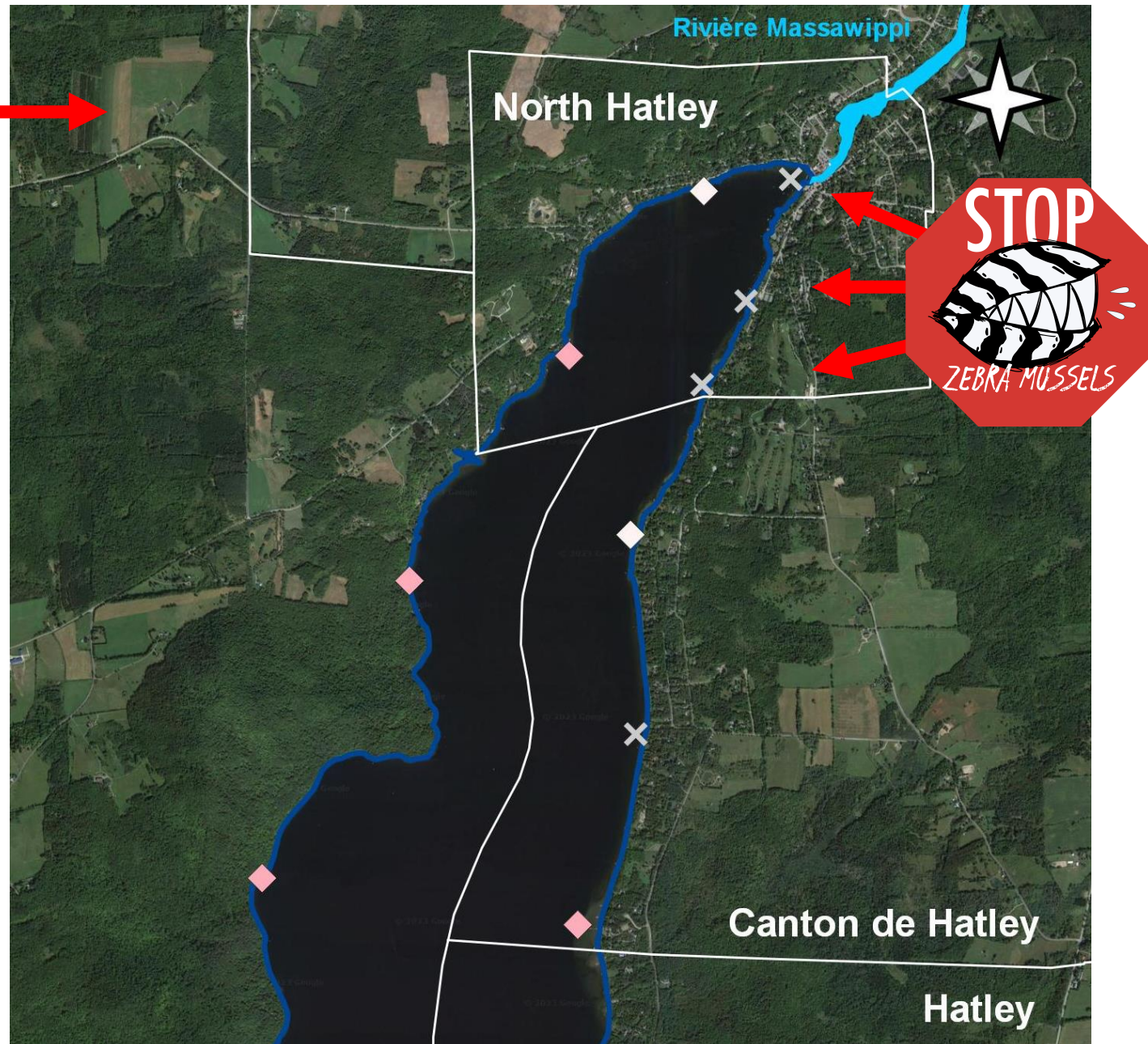
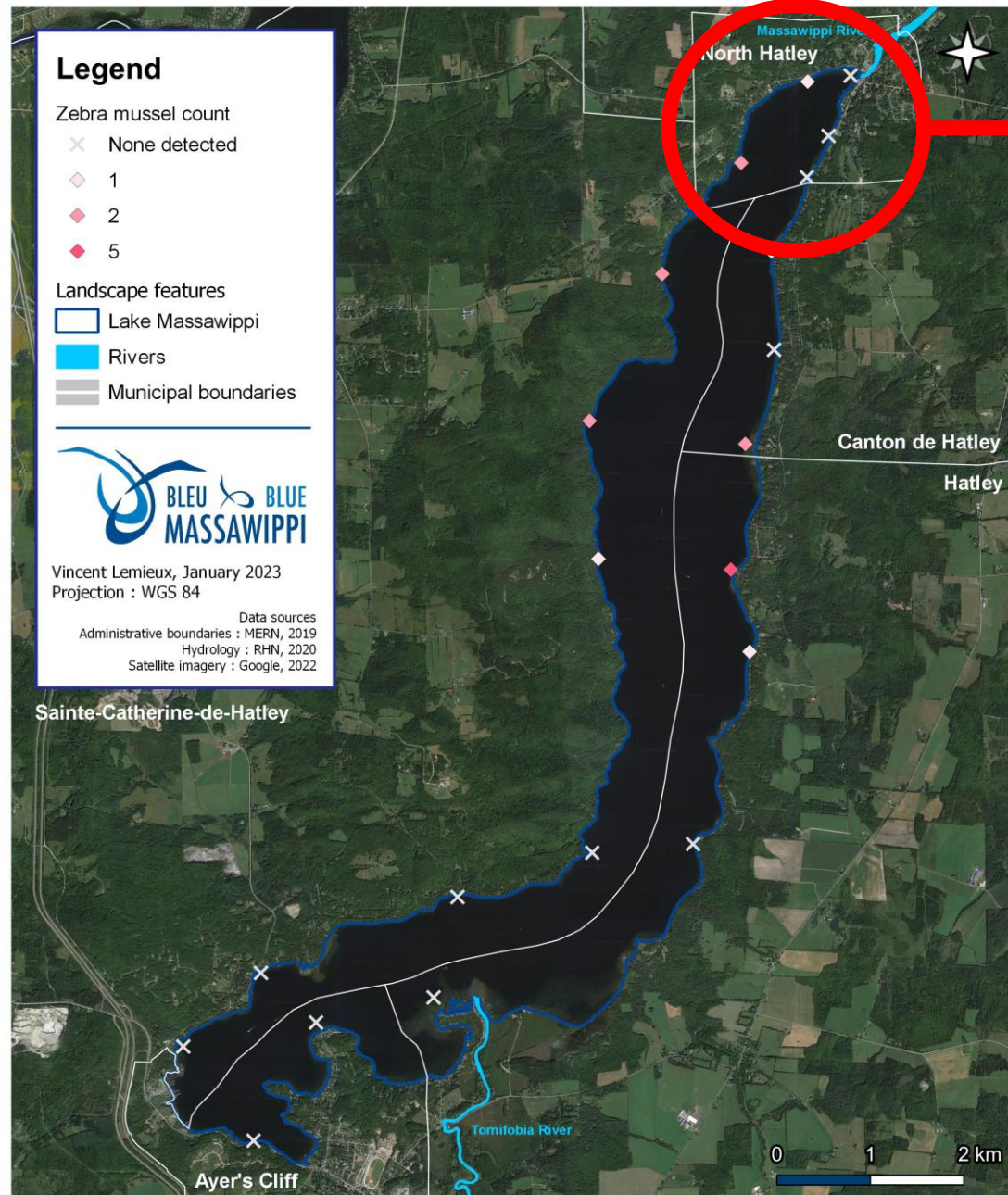
Quadrat sampling : 16 per station, 21 stations.  
Densities per square meter are being analyzed.





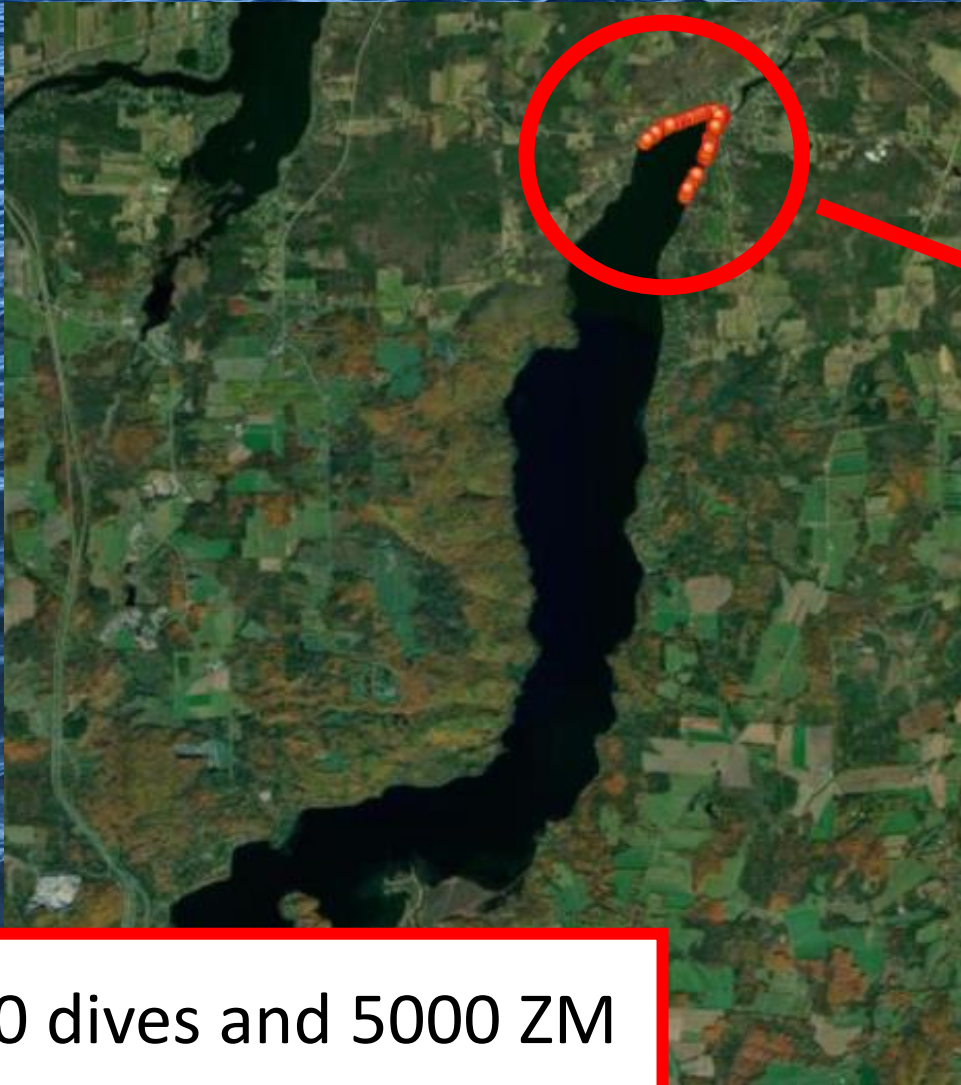
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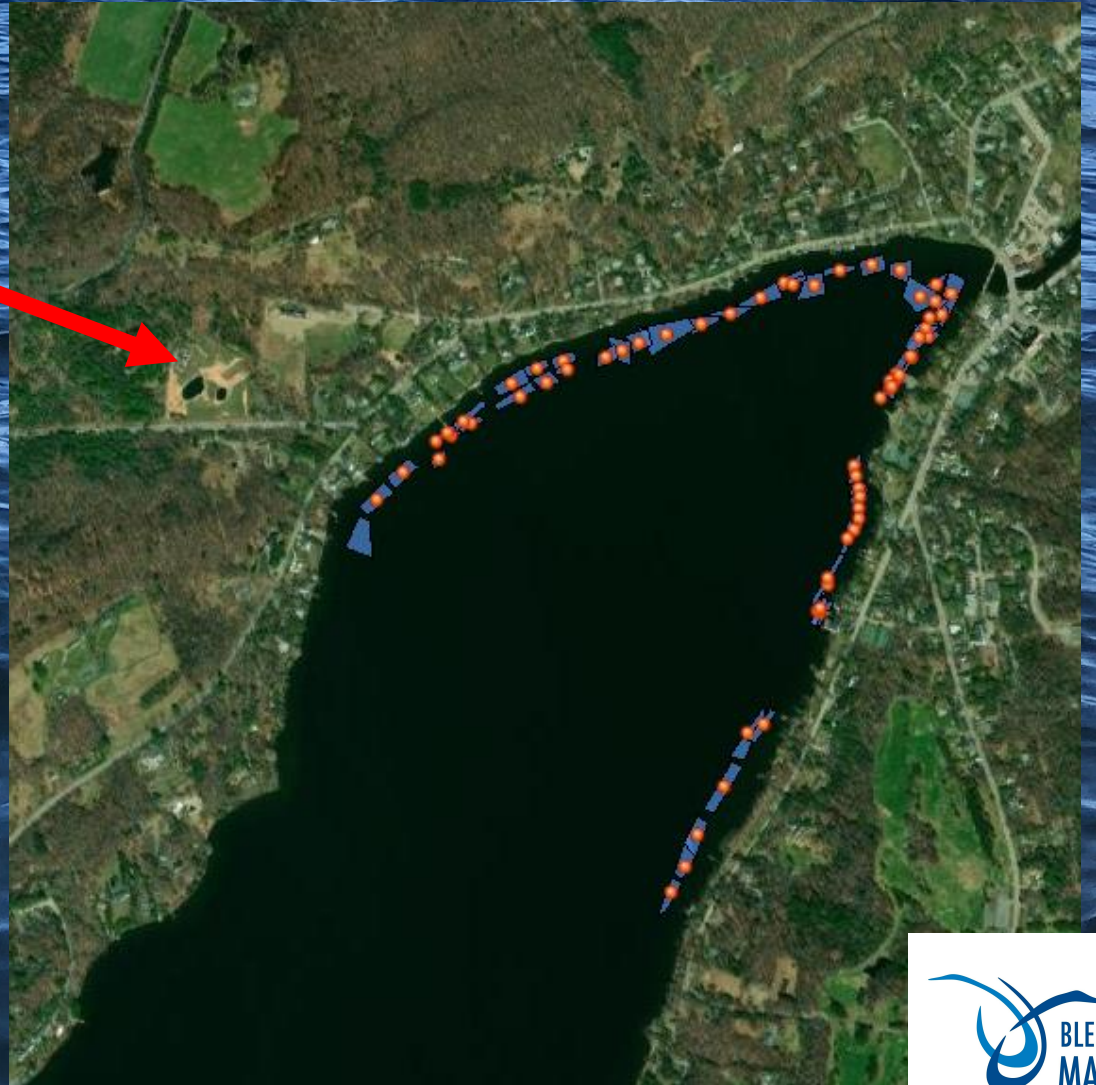




2023 so far !



70 dives and 5000 ZM







## Take home message

Early detection  
=  
unprecedented  
advantage

Densities are low

Removal efforts  
are high

STOP ZM will  
benefit other lakes



**Prevention is key !  
Thank you !!!**

