

# **A new record for an aquatic invasive species at the northern limit of its range**

**Dynamics of an Asian Clam population  
in association with power plant**

Ressources naturelles  
et Faune  
Québec 

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## Introduction

# The St. Lawrence: an ecosystem in evolution

## Human development



# The St. Lawrence: an ecosystem in evolution

## Species assemblage



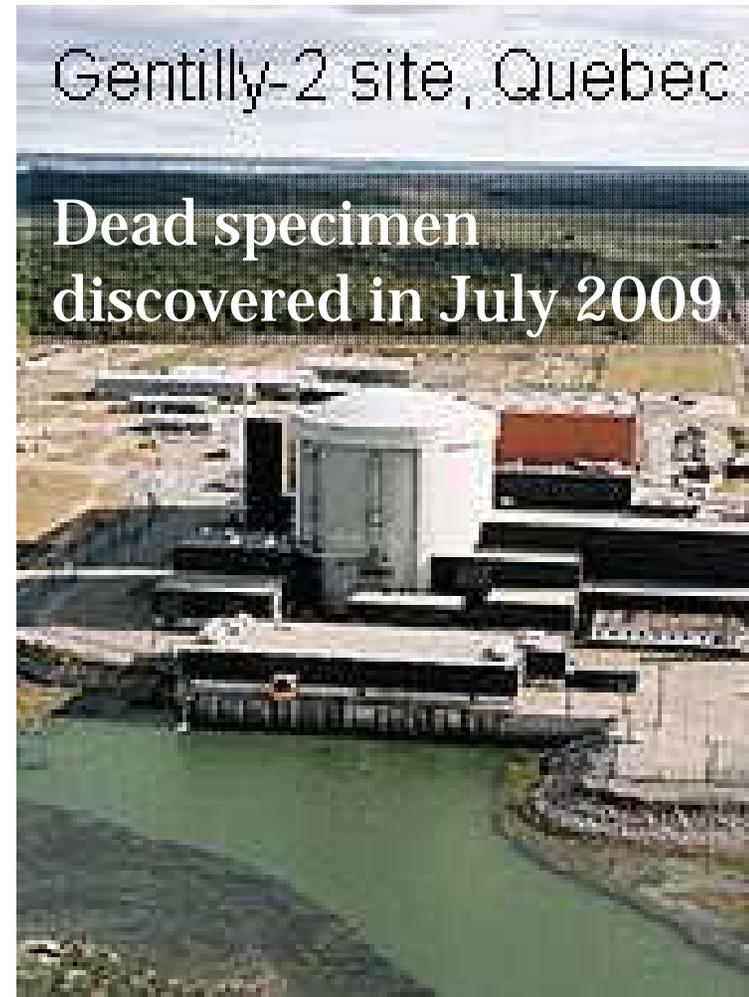
Introduction

# The St.Lawrence: an ecosystem in evolution

The latest addition!

## **Asian clam**

***Corbicula fluminea***



## Species description

# *Corbicula*: what are the risks of this species?

## Asian clam

## Biology and impacts



- Hermaphrodite bivalves
- Can produce up to 35 000 offspings/year
- Live up to 5 years
- Maximum size of 5 cm

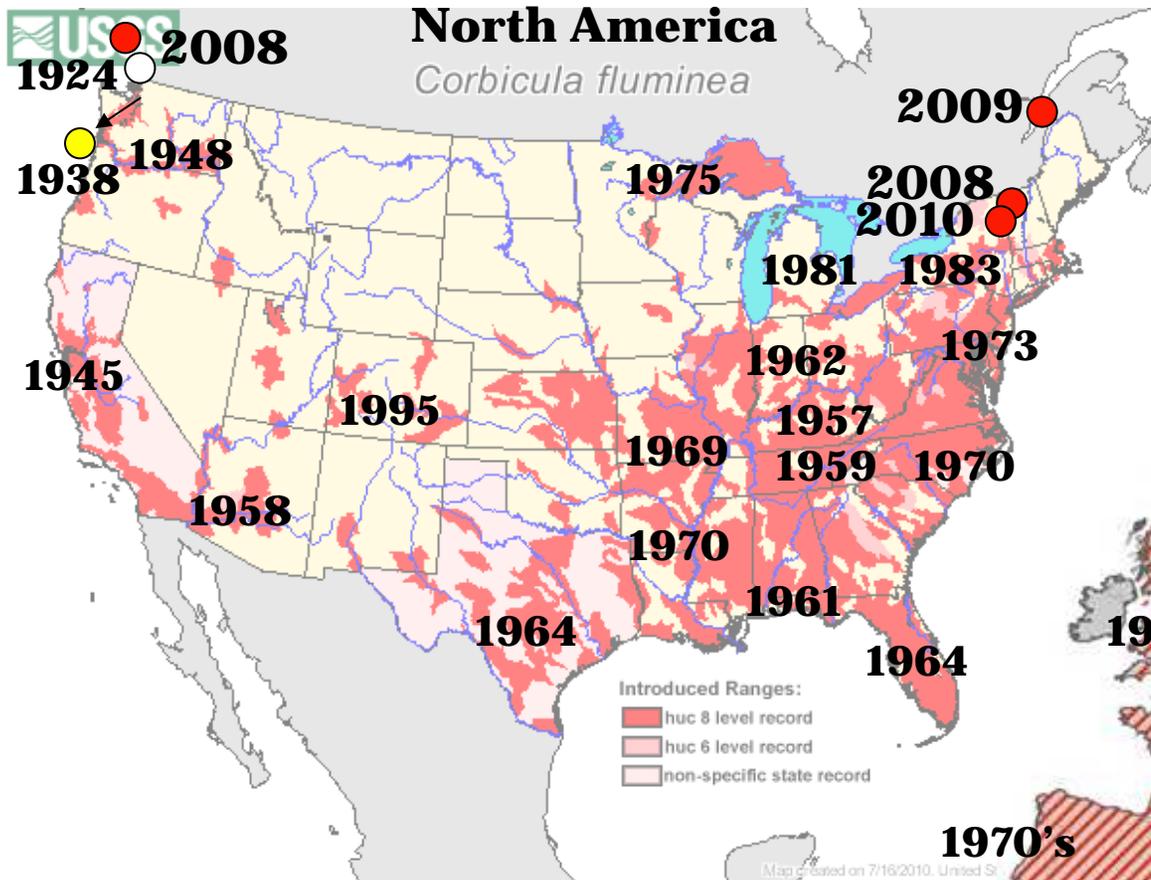
- High filtration rate reduces material in suspension
- Increases water clarity
- Affects food web by removing phytoplankton
- Competes with native mussels
- Clogging water drainage

**Need water >2° C**

Species description

# *Corbicula*: what are the risks of this species?

## History of introduction & distribution

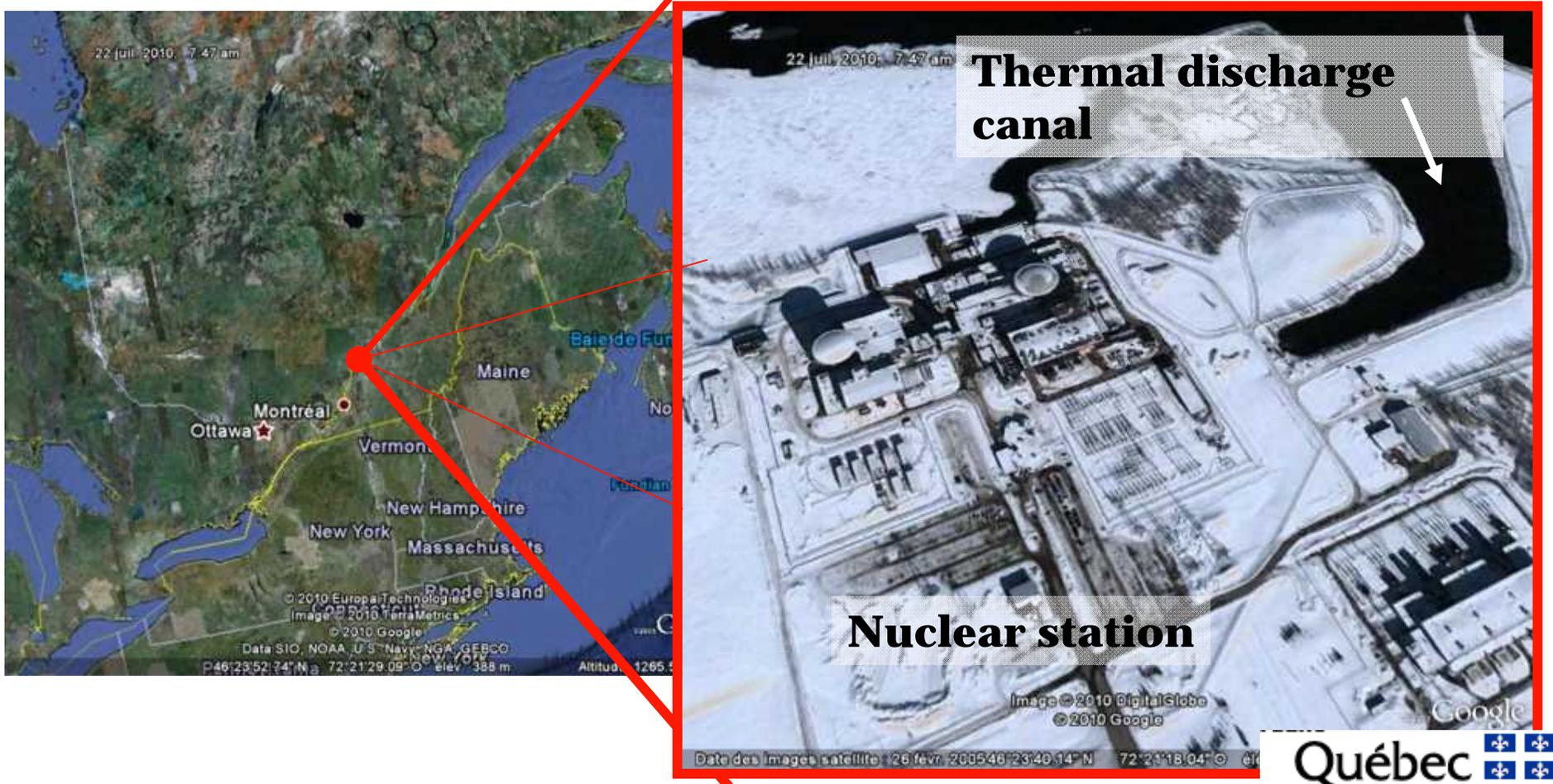


Distribution of *C. fluminea* limited in northern regions

## Study area

# *Corbicula*: its situation in the St.-Lawrence

## Description of the area



## *Corbicula*: its situation in the St.-Lawrence

### How we proceeded



**Peterson grab**



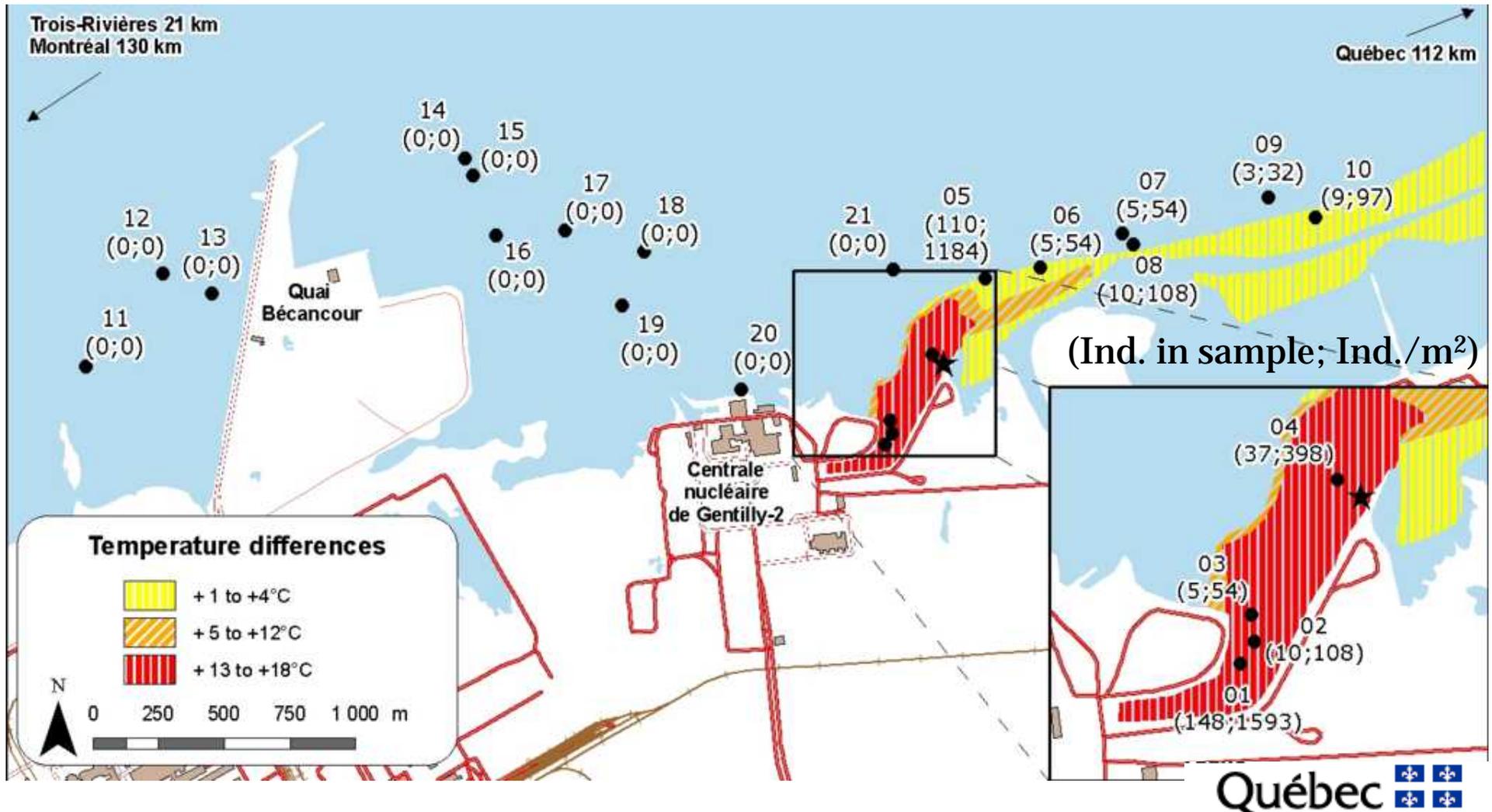
**1.7 mm sieve in 2009  
1 mm sieve in 2010**

- **First sampling in November 2009:**  
20 sampling sites around the nuclear station, 10 upstream and 10 downstream
- **Latest sampling in August 2010**  
50 sites outside thermal discharge  
20 sites in thermal discharge

# Results

## *Corbicula*: its situation in the St.-Lawrence

### What had we found in 2009



## Results

### *Corbicula*: its situation in the St.-Lawrence in 2009

What had we found in 2009

- **Overall density:  $368 \pm 176$  ind./m<sup>2</sup>**
- **Oldest individuals: about 3 years of age**



## Results

# *Corbicula*: its situation in the St.-Lawrence in 2010

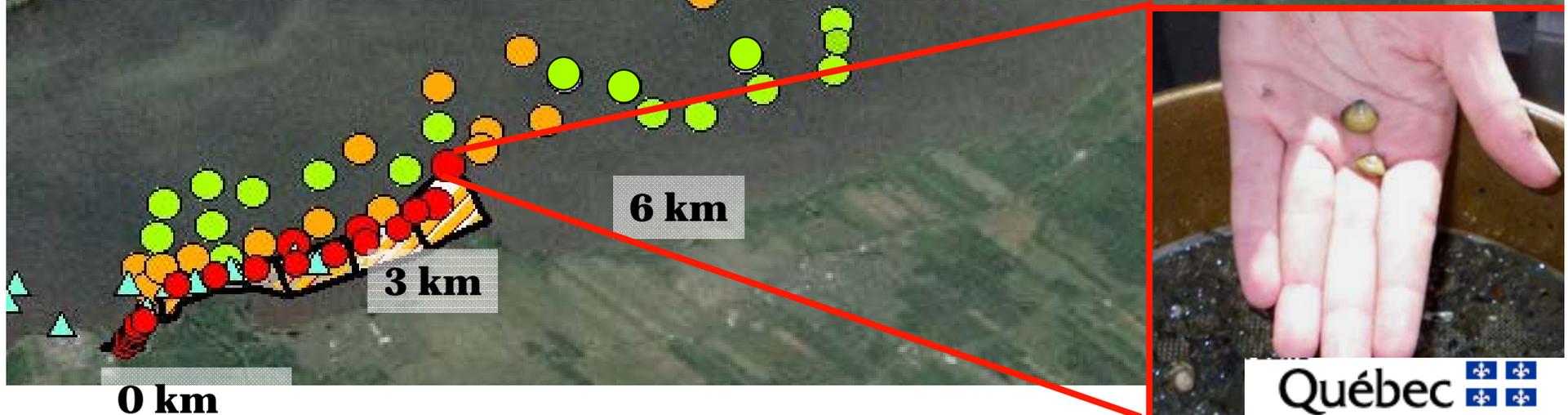
Latest research: preliminary results for 2010

Preliminary observations in 2010 from sieves during sampling

- Absence of *Corbicula* in sample (dead or alive)
- Presence of dead *Corbicula* in sample
- Presence of *Corbicula* alive
- ▲ 2009 results

➤ Overall density: 3380 ind./m<sup>2</sup>  
In canal: 5339 ind./m<sup>2</sup>  
outside canal : 1421 ind./m<sup>2</sup>

Largest specimen:  
34 mm

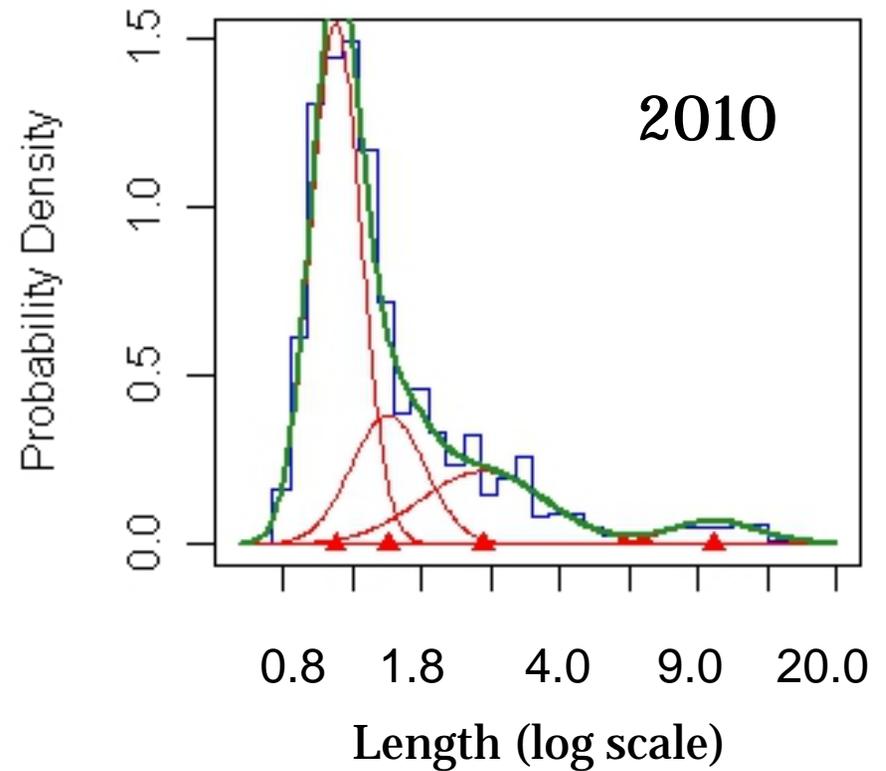
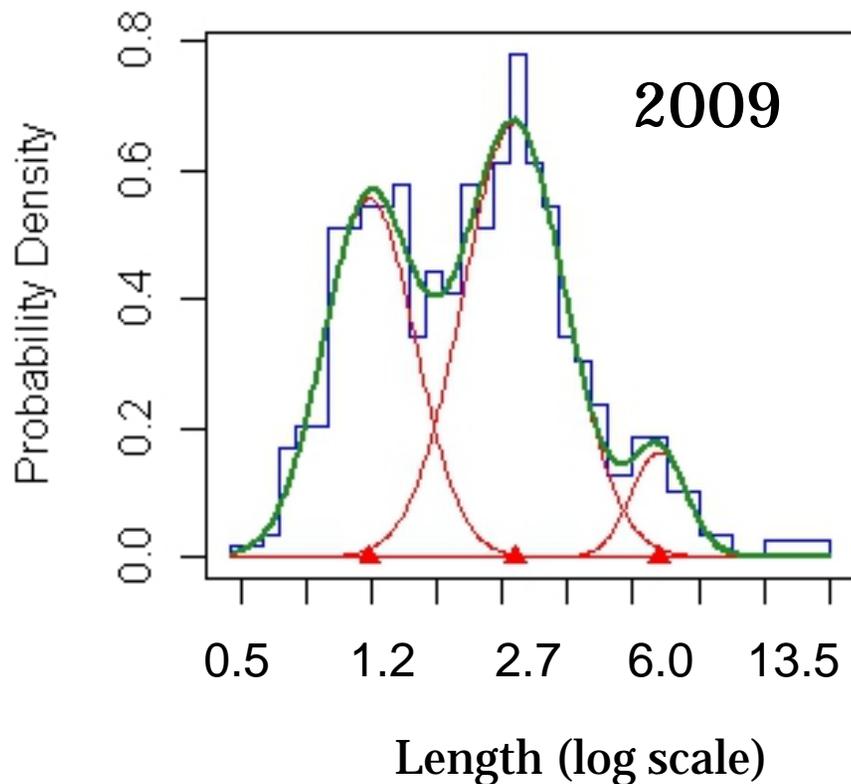


## Results

# *Corbicula*: its situation in the St.-Lawrence in 2010

Latest research: preliminary results

## Size structure in 2009-2010



# *Corbicula*: what should we expect in Québec ?

## How was it introduced ?



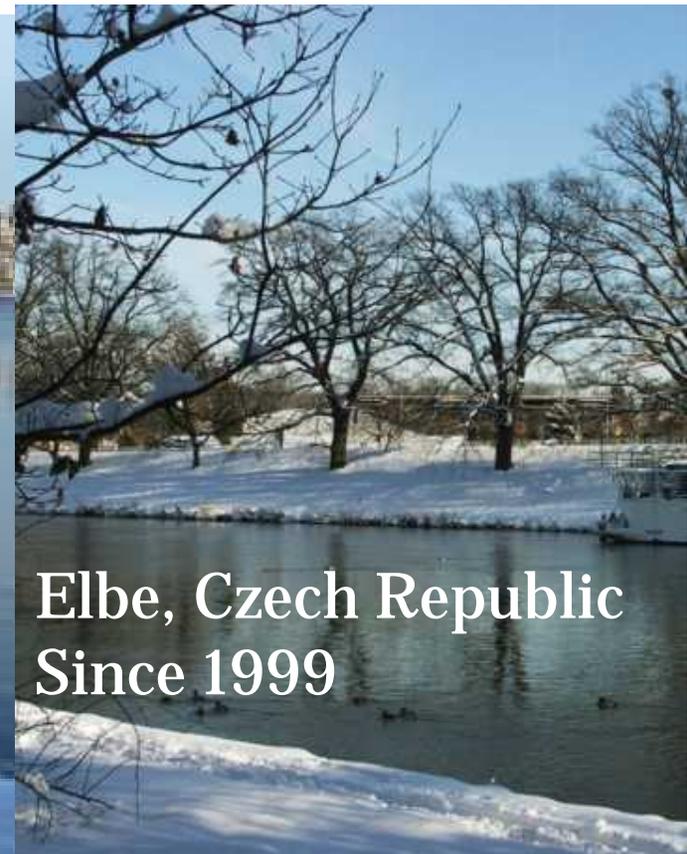
## Where does it come from?

*Corbicula*: what should we expect in Québec ?

**Could it adapt to northern winters ?**



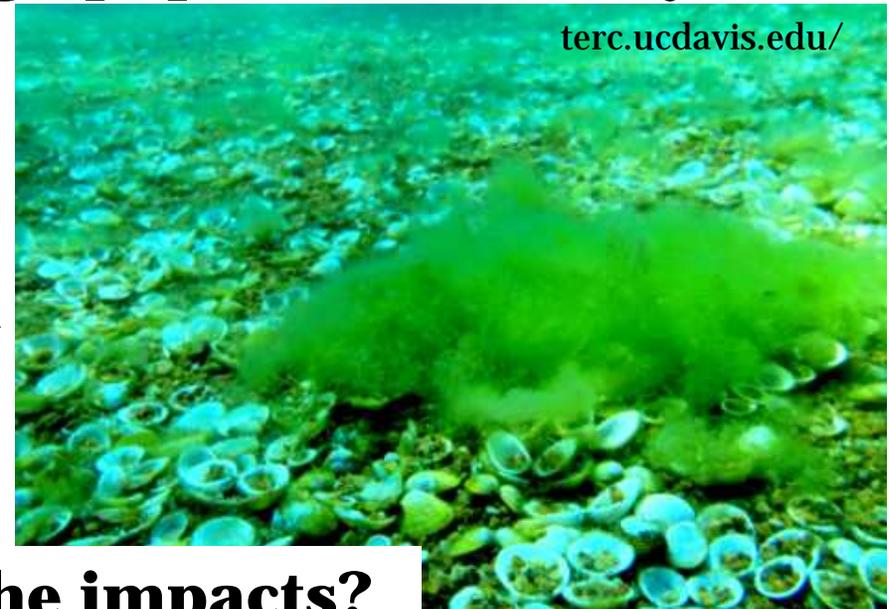
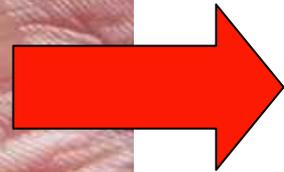
Lake George 2010



Elbe, Czech Republic  
Since 1999

*Corbicula*: what should we expect in Québec ?

**Could it reach high population density?**



**What can be the impacts?**



*Corbicula*: what should we expect in Québec ?

**What are the possible control methods?**



## *Corbicula* in Québec

### **Next steps**



Is *Corbicula* somewhere else?

What is the dynamic of this species in cold environments?

Does *Corbicula* present evidence of adaptation to cold?

## *Corbicula* and friends in Québec

### **A global approach against invasive species**



**New strategies on exotic species in the province of Québec:**

**Increasing prevention and monitoring**

## Acknowledgement

**Thank you for your attention!**

The image is a screenshot of a YouTube video player. The video title is "A Freshwater Clam or Corbicula fluminea slowly inching along" and it has 524 views. The channel is "fishbiology". The video shows a freshwater clam (Corbicula fluminea) moving slowly. The text "Corbicula a star on YouTube!" is overlaid on the video. The YouTube interface includes the search bar, navigation links (Browse, Upload), and a list of suggestions on the right side.

**Corbicula a star on YouTube!**

fishbiology | May 27, 2009 | 524 views

A Freshwater Clam or Corbicula fluminea slowly inching along

Suggestions:

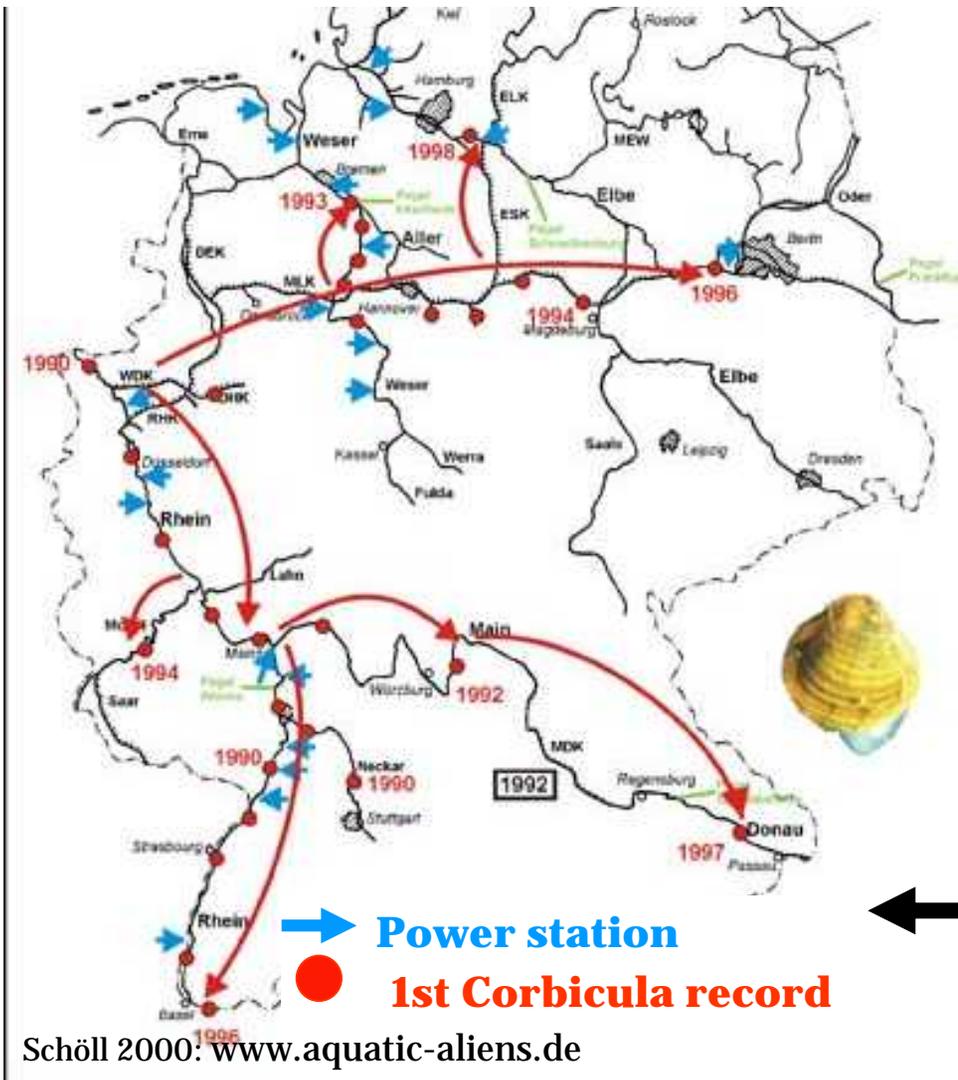
- Corbicula fluminea burying into the sand (4,560 views)
- shimijimi (68 views)
- Asian clams actively burying in sediment (131 views)
- Freshwater Clams (2,290 views)
- Have you seen this clam? (4,090 views)
- My Freshwater Clams in Home Aquarium (1,395 views)

Thanks to Rémi Bacon, Philippe Brodeur, Daniel Guérin, Benoît Landry, Yves Mailhot, Sophie Plante et Bruno Rochette.

Species description

# Corbicula: what are the risks of this species?

An association with power plant in northern regions



Association with power stations in Germany since 1990