

Tłıchoᑭ Aquatic Ecosystem Monitoring Program (TAEMP) Lac La Martre 2014



Presented to the community of Whatì, February 11, 2015
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Background

- Lac La Martre is a large, 70 km long inland lake, part of the Marian River watershed that flows into the North Arm of Great Slave Lake
- The lake supports resident populations of Lake Trout, Whitefish and Jackfish



Typical shoreline along
Lac La Martre

Background

- Introductory and planning meetings were held in Whatì in June and August to discuss fish, water and sediment sampling
- Community members expressed concerns about fish health and future development in the area
- Decisions were made about the camp in September, such as: participants, best place for the camp, sampling locations, and safety



Why We Monitor

- Baseline of metals in fish is important for future comparisons, because the future may bring different conditions (because of mining and climate change)
- If we see an increase in mercury in fish, we may be able to determine if it is because of mining activity in the area, or natural causes

A large Lake Trout looks for small fish along the shallow shoreline



Fish Health and Mercury

- Mercury is known to naturally occur in small amounts in all clean lakes throughout the North
- Large predatory fish “accumulate” mercury because they eat many small fish for years and years
- So a big, old Lake Trout will have higher mercury levels than a Whitefish
- The longer a fish lives, the more mercury builds-up in its body

Large predatory fish like this Jackfish are highest in mercury



Fish Camp

Purpose:

Set up a camp in the wilderness and spend 5 days collecting samples, learning about fish species, traditional ways to prepare fish and traditional land-use in the area

Jackfish caught on Lac La Martre



Objectives

The purpose of the fish camp was to:

- 1) Obtain information on large-bodied fish (size, sex, overall health, age)
- 2) Obtain baseline information on level of “contaminants” in large-bodied fish typically consumed by the community fishery
- 3) Collect information on sediment and water quality
- 4) Provide educational opportunities for youth concerning science and traditional knowledge

Eating Whitefish and Jackfish for lunch at fish camp on Lac La Martre, 2014



Methods

- A camp was organized for Lac La Martre between September 8 to September 12, 2014
- A site was chosen on Burnt Island - used traditionally for subsistence netting by community members, and provides shelter

Time for coffee and discussion



Methods

- Events were recorded by film maker Alan Booth and made into a summary of the fish camp experience
- Interviews were made with each participants including youths, elders, community members and biologists

Alan Booth recording a Lac La Martre sunset



Methods

- Nets were set after consultation with Elders and community members familiar with the land and fish
- Standard gillnets were used at several locations in the lake near our camp
- Different fish habitats were sampled, ranging from shallow areas to deeper holes

Back from travel on the lake



Methods

Fish processing

Fish were:

- a) Measured
- b) Weighed
- c) Sex determined
- d) Health assessed
- e) Stomach content examined
- f) Age structures were removed from **40** fish (20 Lake Trout and 20 Whitefish)
- g) Tissue sample was collected and sent to lab for analysis from **40** fish (20 Lake Trout and 20 Whitefish)
- h) Parasites noted when present

Otolith removal showing small size of boney structure



Methods

- Water and sediment samples were taken in several locations selected by community members (`6)
- Sent to Taiga lab in Yellowknife for analyses
- Youth were involved in sampling – used Ekman dredge and Sonde equipment



Back with water samples

Results

The Catch

<i>Species</i>	<i>Number caught</i>
Northern pike	17
Lake trout	27
Lake whitefish	27

- In total, 71 fish were captured
- Total “soak time” for nets was 41 hours



Results

- Three species of fish were captured at the Lac La Martre sites
- Different age/size classes were captured for all species
- Lake Trout and Jackfish were the common top predators captured

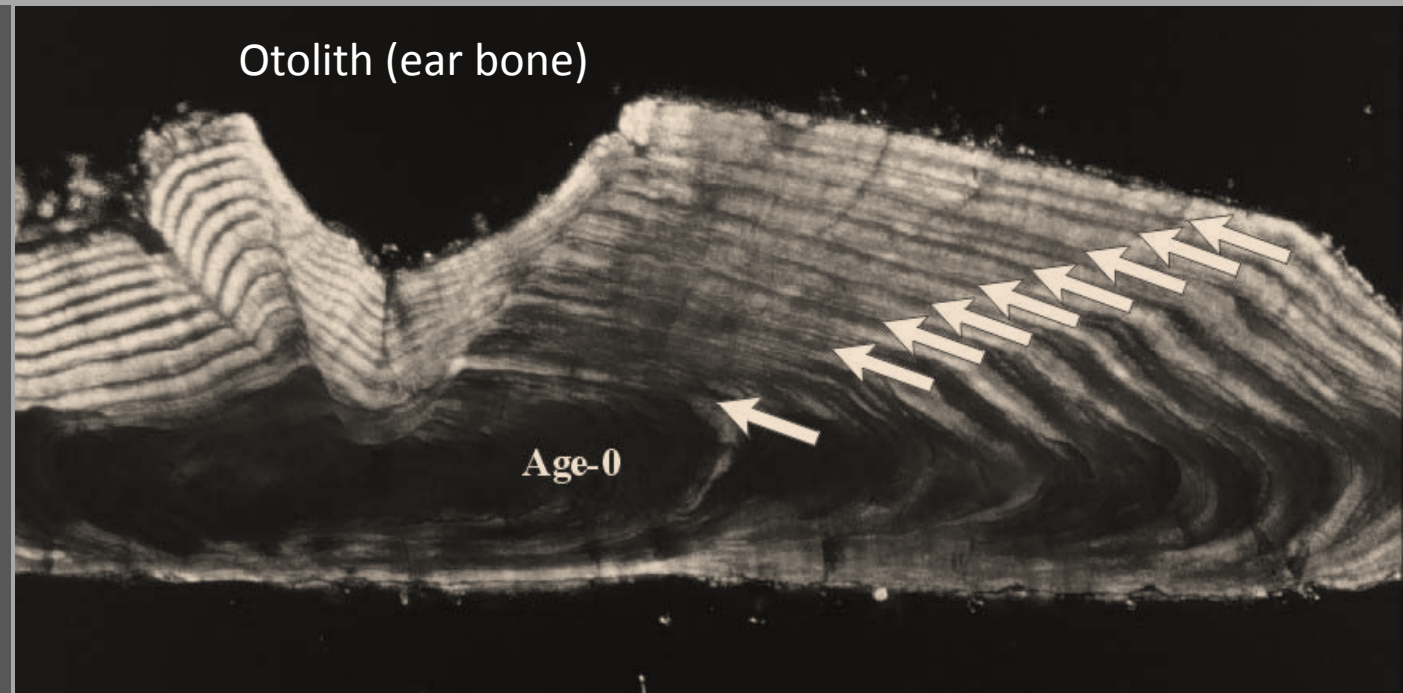


Whitefish made into dry fish at camp site

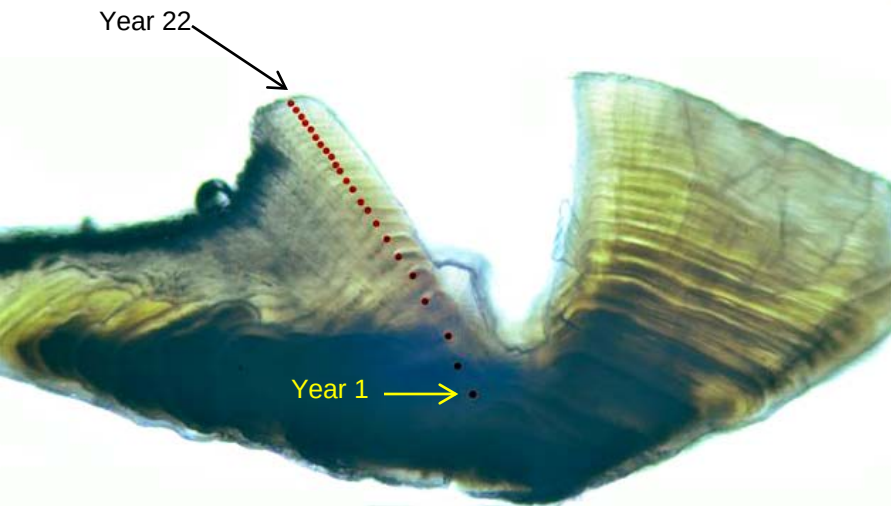
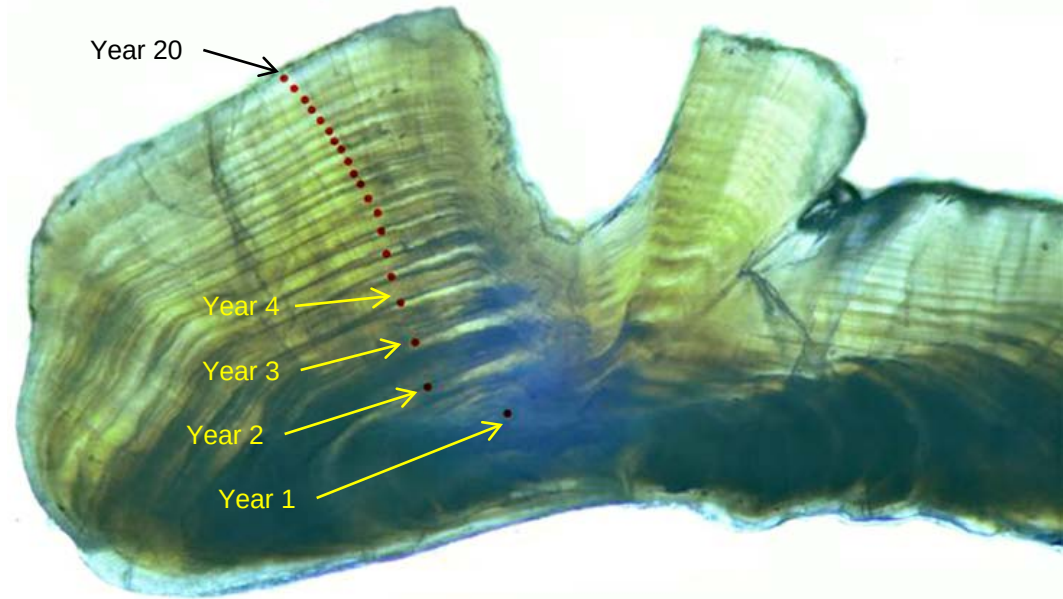
Results

- Age of Lake Whitefish ranged from 6-22 yrs
- Age of Lake Trout ranged from 8-21 yrs
- All fish 'aged' were adults

Example showing annual growth rings in otolith

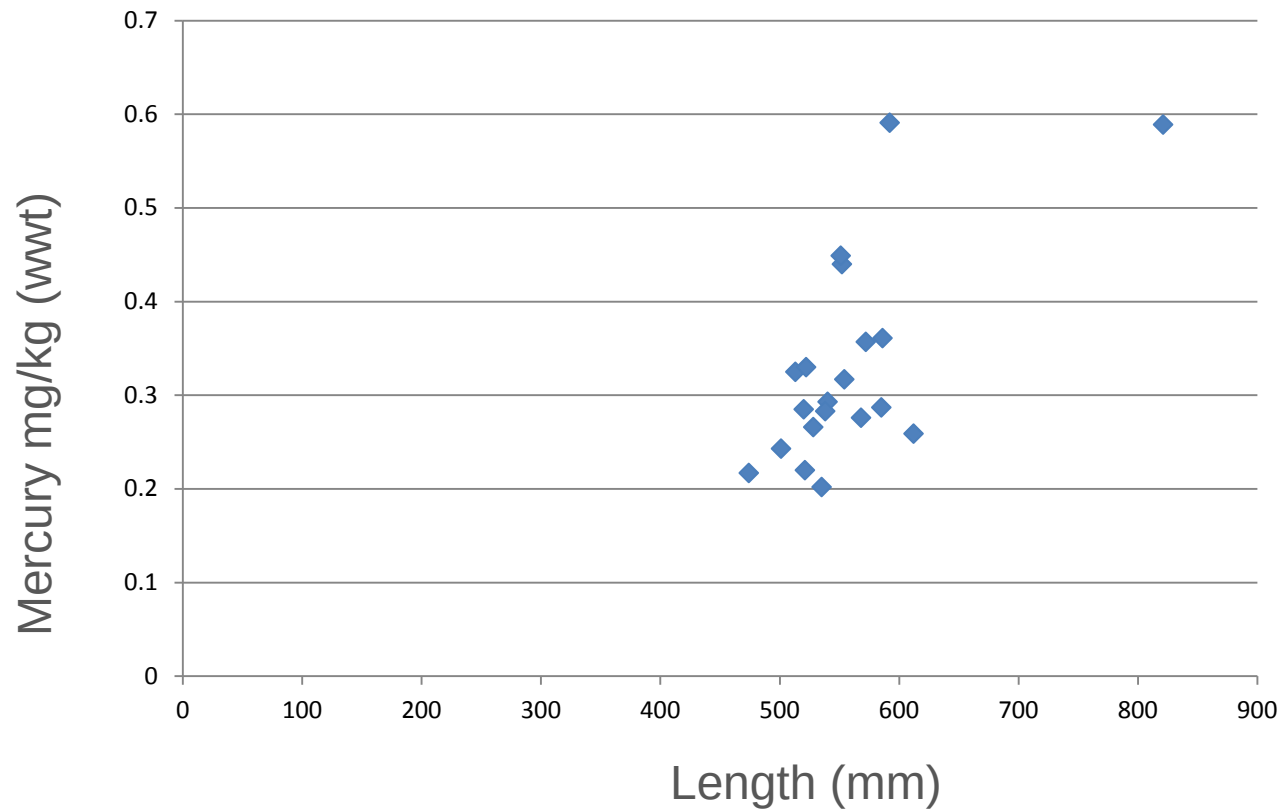


Results-The art of ageing



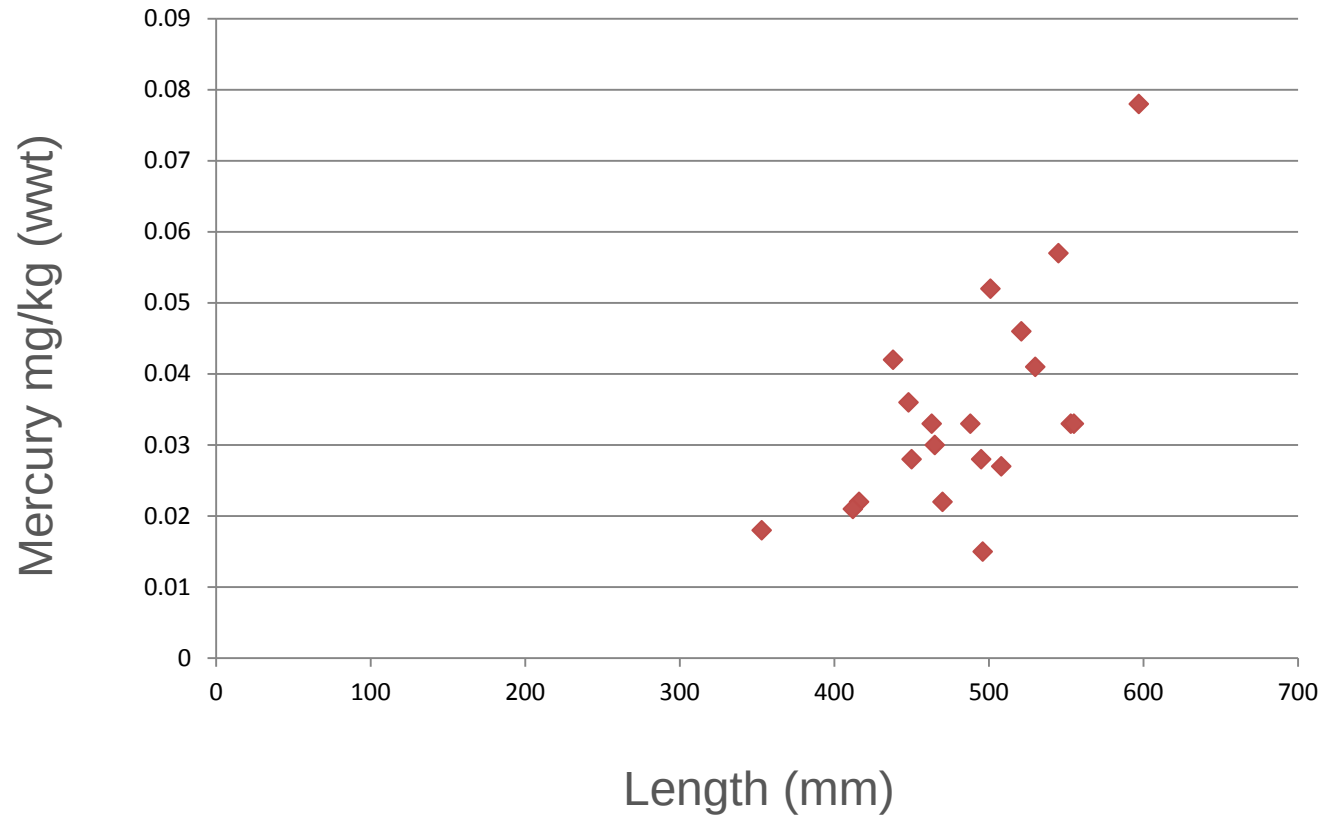
Results

Lake Trout mercury levels



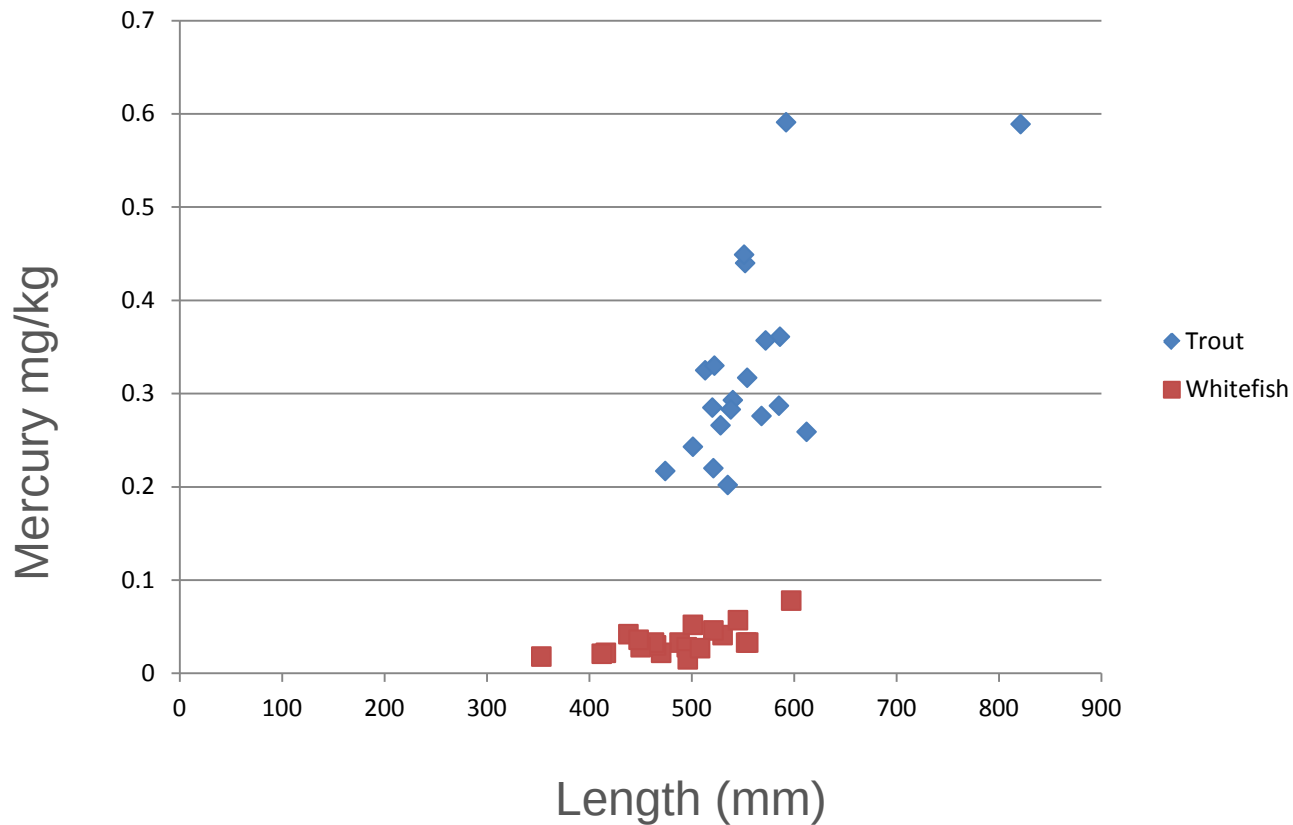
Results

Lake Whitefish mercury levels



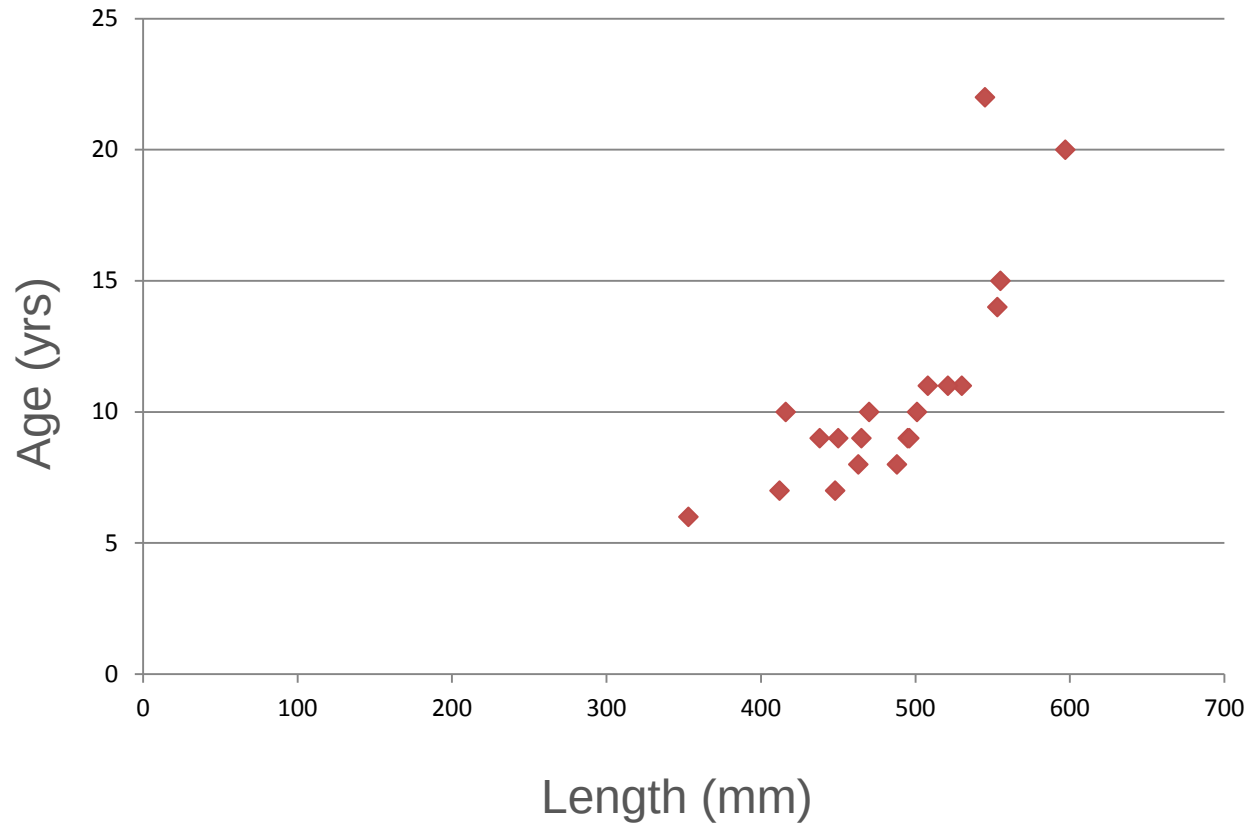
Results

Mercury levels in Lake Trout and Lake Whitefish combined



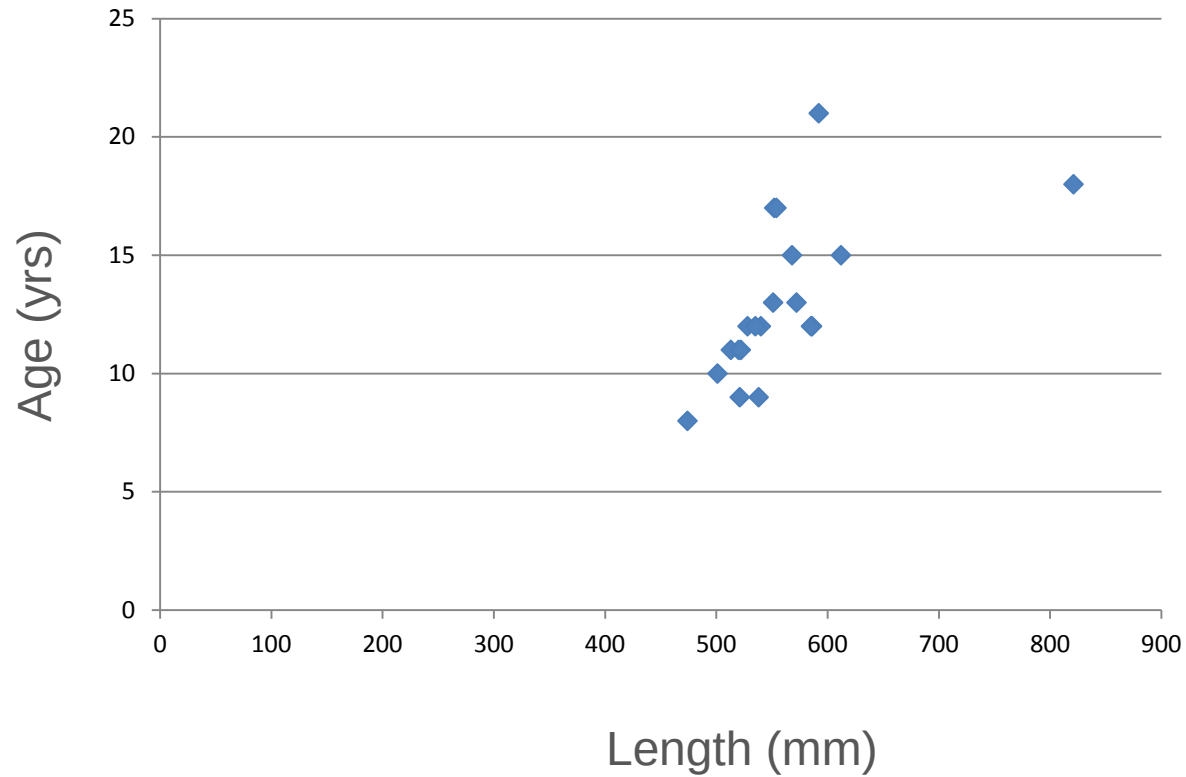
Results

Lake Whitefish ages



Results

Lake Trout ages



Results

How old is 22 years? **Well let's take a time capsule back to 1992:**

- George H. W. Bush becomes President of the U.S.A.
- Gold sells for \$343 an ounce (\$1,233 on Feb 10th !)
- T.V. hit shows: Roseanne and Cheers

The cast of Roseanne



Results

- Water quality of Lac la Martre is generally very good
- All sites show that water is “hard” - natural due to the minerals in the environment
- Copper and silver exceeded at 2 water sites each – low levels, and possibility of field blank contamination; no significant concern
- Mercury exceeded at 2 sediment sites – but water samples at same sites did not detect mercury; no significant concern

Beach near camp



Results

- Results support the expectation that water quality and sediment quality is good in Lac la Martre.
- More sampling in the future will allow us to see if there are changes over time

Collecting sediment
samples



Discussion

- The fishes of Lac La Martre represent what is typical of a cold lake at this northern latitude

View of cobble shoreline on
Lac La Martre



Discussion

- Mercury levels in Whitefish were very low
- Large Lake Trout were close to or exceeded Canadian guideline levels (but this is of concern only if you eat many Lake Trout on a regular basis all year)

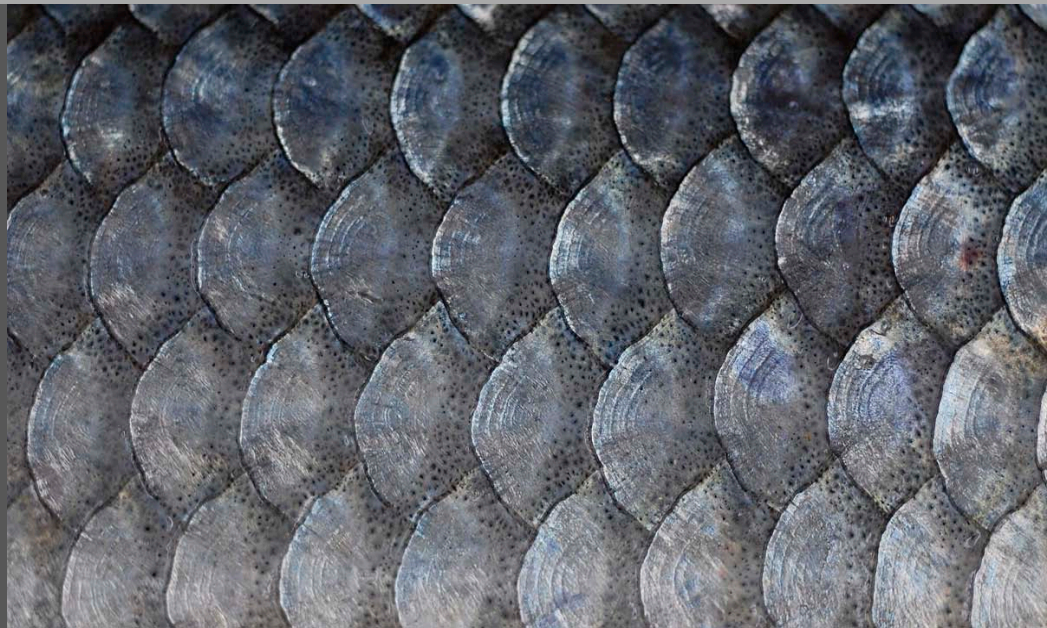
Lake Trout



Discussion

- Biodiversity is greater than first seems
- The small fish remains largely unknown and could not be caught with gillnets
- Minnows and Ninespine Stickleback were seen in the stomach contents of predatory fish but none were captured

Lake Trout



Discussion

- The need for repeat sampling - sampling frequency (redo what we did on same lakes every four years)
- Repeat sampling will be key in detecting change over time and space



Summary

- Lac La Martre supports a variety of fish species
- Fish health is good, water quality is good
- Mercury levels are relatively low except in very large and very old Lake Trout
- To observe any changes to fish, water and sediment, a long-term monitoring program should continue to be developed and implemented

Morning on Lac La Martre



Summary

- Lake Trout always have higher mercury levels than Whitefish (even in the “cleanest” lakes in the world)
- If you eat fish a lot, eat mainly Whitefish
- Camp was made up of a great combination of people who had a lot to share with each other

Community Elders preparing Whitefish and Jackfish for lunch at fish camp on Lac La Martre, 2014



Whatì TAEMP 2014

Elders:

Joe Champlain
Madeline Champlain
Jimmy Nitsiza
Lucy Nitsiza
Margaret Nitsiza
Francis Simpson
Georgina Simpson

Youth:

Mason Beaverho
Jacintia Flunkie
Twyla Nitsiza
Anika Romie
Alexander Simpson
Isiah Zoe

Partners:

Susan Beaumont	WRRB
Roberta Judas	WLWB
Francois Larouche	DFO
Sean Richardson	TG
Boyan Tracz	WRRB
Paul Vecsei	Golder
Shirley Beaverho	TG Whatì
Freddie Flunkie	TG Whatì
Ted Nitsiza	TG Whatì

Community members:

Foreman:	Archie Nitsiza
Foreman Assistant:	John Beaverho
Camp Assistant:	Lawrence Peter Nitsiza
Head Cook:	Elizabeth Young
Cooks Helper:	Bernice Beaverho

Translation:

Jonas Lafferty
James Rabesca

Video:

Alan Booth
YK Films

Thank You

- Again to the community of Whatì – to camp participants and for logistical support in town
- To staff from the Department of Fisheries and Oceans (DFO), Tłjcho Government, Wek'èezhìi Land and Water Board (WLWB), Wek'èezhìi Renewable Resources Board (WRRB), and Golder Associates
- For funding provided by the Cumulative Impacts Monitoring Program (CIMP), the Department of Environment and Natural Resources (ENR), DFO, the Northern Contaminants Program (NCP), and Tides Canada



Whatì community members enjoying a break on the beach

TAEMP Partners 2014/15

