NWT CIMP/TARIUQ

Training of Tariuq community-based monitors for physical/chemical environmental sampling.

March 22-23, 2005
Aurora Research Institute, Inuvik

Report prepared by:

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TARIUQ/CIMP 2005 :Training of Tariuq community-based monitors for physical/chemical environmental sampling.

Location: Aurora Research Institute, Inuvik
Dates: March 22-23, 2005.

Objectives:

In a collaborative effort between NWT CIMP and the department of Fisheries and Oceans (DFO) on behalf of the Tariuq community-based monitoring program, to:

1. Train Tariuq monitors from Inuvik, Aklavik and Tuktoyaktuk to monitor mercury (Hg) levels in lake, river and sea-water.
2. Determine seasonal distribution of Hg, as linked to physical variables (e.g. snow melt)
3. Assess the Hg sources and pathways.

Background:

DFO has been measuring Hg and methyl-Hg in arctic waters as part of an effort to monitor the amounts of toxic contaminants in arctic Canada. It should be stressed that the amounts detected to date are well below the guidelines for adverse health effects. Nevertheless, the current project gives local communities the ability to assess HG levels first hand. This project may also aid researchers to determine the sources and pathways of Hg into the region. Lastly, it may aid in understanding the localization and storage of Hg in the arctic conditions.

In preparation of the seminar, four local organizations with representation on the Tariuq community-based monitoring program working groups, were asked to nominate monitors and helpers who will be trained in a two day course. These organizations are listed in Table 1. In keeping with the philosophy of involving youth in the Tariuq program, each organization was asked to nominate one monitor and one youth helper (younger than 29).

Table 1: Organizations from the Mackenzie delta participating in the TARIUQ05 projects

Organization	Contact	Monitor	Helper
Aklavik Ehdiitat	Jeremy Mosher	James Edwards	Jordan Peterson
Aklavik HTC	Agnes Tardiff	Donald Aviugana	Jimmy Doug Meyook
Inuvik HTC	Evelyn Bernhardt	William Day	William Aleekuk
Tuktoyaktuk HTC	Sarah McKay	Not available	Bradley Voudrach

Instructor:

The two day seminar was given by Mr. Dan Leitch, from the laboratory of the Fisheries and Oceans Contaminants Research Scientist, Dr. Gary Stern, Freshwater Institute, Winnipeg.

Outline of seminar:

On the first day the monitors and helpers were instructed how to use the pump, and sample acquisition and handling. The second day was sample collection from the Mackenzie River.

The classroom portion of training included the following:

- Description of equipment - All parts used in the filtering are made from Teflon, as Hg doesn't stick to it, and when properly cleaned and handled, it does not contaminate the samples. All the parts are soaked in an acid-bath for at least 24 hours, and the parts are then stored in Ziploc bags. All the parts were shown and explained to the participants.
- Handling of equipment - To engrain in the participants the importance of being "clean", the use of gloves was emphasized. No part in contact with sample water or sample bottles should ever be touched without rubber gloves. When wearing rubber gloves, it is important to be aware of what you touch." Clean-hands-dirty-hands" sampling protocol (St. Louis et al. 1994) was devised to minimize chances of contamination. This was thoroughly explained to them. The basis is that 2 people are wearing gloves, a 'clean hands' person and a 'dirty hands' person. 'Clean hands' touches the sample bottle and the inside Ziploc that sample bottle is stored in ONLY, and nothing else. 'Dirty hands' does everything else. Gloves are never re-used.
- Description of why water has to be filtered - Historically most water sampling has been done "whole" (not filtered). Filtering is more difficult and time-consuming, but ultimately offers more data and predictability. Both the water (dissolved) and the filter (suspended particulate matter) are analyzed. Higher numbers in the different states tells more about where that Hg is coming from and what environmental changes could influence the concentrations.
- Assembly of equipment – instruction was given on how to assemble equipment and monitors received hands on experience by assembling the equipment themselves All the participants set up the entire system from scratch, and filtered water from a beaker into a bottle as would be done in the field.

Technical Methods:

- Water samples are collected with a Masterflex E/S Portable Sampler Kit, Cole-Parmer part # U-07571-10.

- 50 ml water was collected into a falcon tube, sealed and bagged. Collection took 1-2 minutes. Total Hg levels are determined from water samples by measuring Hg fluorescence. This method was improved in the laboratory of Dr. Gary Stern to give reliable readings of less than 1 ppt (parts per trillion).

- Methyl-Hg levels, as total Hg, are determined by fluorescence. Methyl-Hg comprises about 1% of total Hg, and so 500 ml are required per measurement. The sample is collected into dark bottles, to minimize photo-demethylation. Methyl-Hg samples were not collected during the seminar.
- Note: Whenever possible, it is desirable to filter the water through a .45 μ filter connected before the pump. If the water is filtered, the filter needs to be bagged and sent with the samples for analysis.

The field component included the following:

- Travel to field site on the East Channel
- drilled a hole through the ice and collected 2 samples before water started to freeze.

Notes:
1. It was concluded that when working in winter, the pump would have to be in a heated tent, to slow down freezing in the tubing. During the seminars samples were collected outside, resulting in rapid freezing that would prevent the collection of 500 ml for methyl-Hg monitoring.
2. It was concluded that a 0.45 μ filter will not be used in winter, as it will slow the collection, and furthermore ice particles may block the filter.

Assessment of the Project:

In general, the training program achieved it's goals. As with any community-based effort, there were challenges in getting representatives from each organization, due to conflicting schedules. The Aurora Research Institute did an excellent job in hosting the class and outfitting the field component. The strength is this facility is often under appreciated for outfitting northern studies.

In future, we plan to hold a Tariuq working group meeting prior to undertaking any new training. In this way, the HTC's can ensure that they are able to send the people who are directly involved with the Tariuq program. These are the people who have the best appreciation of the goals and objectives of the Tariuq program. This will ensure the continued success of the program.

We believe that with the continued evolution of the Tariuq community-based monitoring program, new opportunities will arise for building capacity within communities for monitoring the health of the marine environment.

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