

SUMMARY OF INFORMATION ON CONTAMINANTS IN COLVILLE RIVER FISH

A comparison of fish caught at Umiat and near Nuiqsut area and related research

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Introduction

This is a review of the information about contamination in Colville River fish following the discovery of elevated levels of some contaminants in fish caught at Umiat. Umiat, about 90 miles south, or upstream of Nuiqsut, on the Colville River, is a former U.S. Navy oil exploration and Air Force defense site. This history of industrial and military activity led to its listing as a federally registered contaminated site. The Army Corps of Engineers started cleanup activities in the late 1990's. The Colville River is the largest river drainage system on the North Slope and is an important subsistence resource for North Slope residents, especially the people of Nuiqsut.

During 2000-2001, four separate studies (includes 2 reviews) contributed to an assessment of fish contaminants in the Nuiqsut subsistence fishery after the news of contaminants documented in fish from Umiat area was released. These studies are described here and were conducted by: NSB Dept. of Wildlife Management (DWM), Agency for Toxic Substances and Disease Registry (ASTDR) (2 reviews), Ecology & Environment, Inc (evaluation study for Army Corps of Engineers or ACOE), and the Jesse Ford group (Jesse Ford, Susan Allen-Gil NSF study).

History of Events

1. News of contaminants in Umiat fish, Colville River system
In 1997 and 1998, Umiat fish and sediment samples were tested for contaminants as part of ACOE cleanup activities at Umiat and reported to have low levels of PCBs and DDTs. Whitefish, grayling and burbot were tested from the Umiat Slough, "seasonal stream", and Colville River near Umiat.

In 2000 the Alaska State Dept. of H&SS released an "**Interim Report/Health Consultation**" related to the Umiat site contaminants data. (Verbrugge 2000).
2. Related to the above news and other information related to accumulation of contaminants in the arctic, Nuiqsut and North Slope residents become increasingly alarmed about contaminants in their subsistence fish.
3. Community members, scientists, State and Federal officials join forces to re-examine the results and provide more thorough local information
ICAS, ADEC and the **US Army Corps of Engineers** contact **ATSDR** to review the Umiat fish contaminants data and do a public health consultation based on the "possible public health significance of environmental contaminants found in fish tissue samples collected at or near the former Umiat Air Force Station".

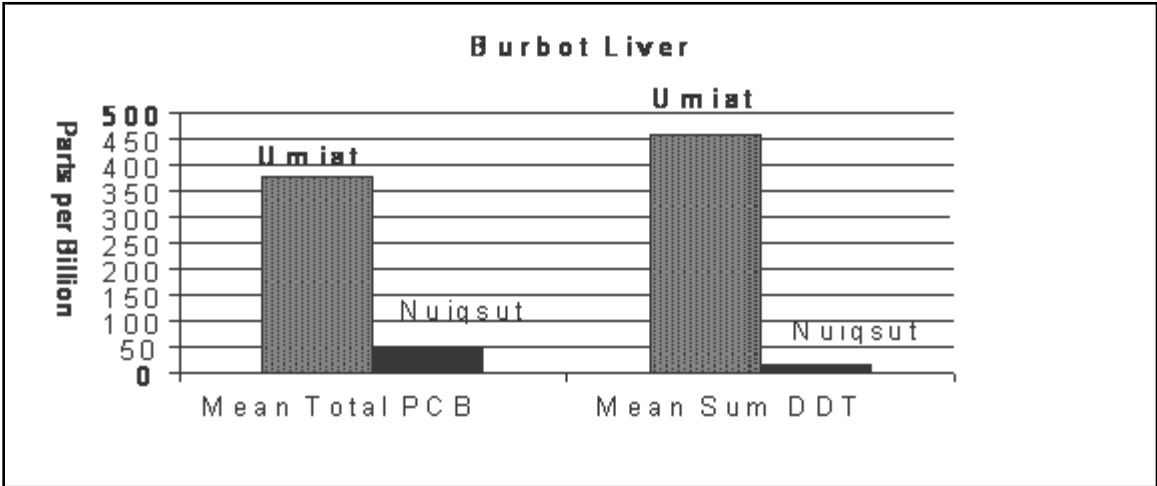
NSB-DWM wildlife research scientists collect burbot direct from Nuiqsut fisherman to analyze for contaminants from the actual local fishery.

Jessie Ford study group, (locally supported by NSB-DWM, BASC) joins with local fisherman to begin collections of fish from the North Slope, including the Nuiqsut area. This is a large study that was already in planning and funded by NSF. See (other section) for details of this study. This group collected fish during the *summers of 2000, 2001, and fall of 2001*.

- 4. Nationwide advisories related to mercury levels in fish create more general concern about eating fish. **Nationwide FDA & EPA fish advisory published** which recommends women and children limit their fish consumption based on mercury levels in some freshwater and marine fish.
- 5. **NSB F&G Management Committee, DWM staff & Mayor review advisories (2001)**
NSB DWM contaminants specialist Dr. Todd O'Hara reviews with NSB Mayor current knowledge and research needs; Alaska statewide advisory different from National advisory; local information important.

- 6. **Results of Analysis of Nuiqsut fish – Good News!**
February and March 2001 - NSB DWM reports to the NSB Mayor's Office the contaminants analysis for fish collected from Nuiqsut fisherman (from 2000). The results were compared to the findings reported from fish at Umiat.

The Burbot from Nuiqsut were 7 times lower for PCBs and 25 times lower for DDTs, than the Umiat fish. The Nuiqsut fishery burbot tested lower for PCBs and DDTs than bowhead whale blubber.



PCB and DDT levels found in Burbot livers from Umiat and Nuiqsut

Results of testing of Nuiqsut and Umiat fish for DDTs and PCBs:

Nuiqsut fish are considerably lower in PCBs and DDT than Umiat fish. The analysis was done as part of a larger Alaskan Arctic contaminants project the NSB Wildlife was working on with (then) graduate student Paul Hoekstra, working in the laboratory of Dr. Derek Muir with Environment Canada.

This new data from Nuiqsut fish caught directly from the local fishery helped show that the preliminary consumption advisory by the State for Umiat fish did not have to be used in the same way for Nuiqsut fish

The DWM recommended further sampling along the Colville (Umiat to Nuiqsut) and investigation into possible testing differences or accidental contamination of samples.

7. New Plan of Study by ACOE for Umiat Area

- a. *In June 2001*, the Army Corps of Engineers submitted a new plan to further evaluate the Umiat area that includes 7 upstream and 5 downstream sample collecting locations. E&E (Ecology and Environment, Inc) starts fish collections in *August 2001*.

Reports:

ATSDR Health Consultation Report - June 25, 2001

ATSDR conclusion summary based on 1997 and 1998 Umiat fish data:

- There is a point source of PCB and DDT contaminants in the Umiat slough, and slough fish are exposed to these contaminants.
 - Since no one is fishing and eating fish from the Umiat Slough, it is not a current public health problem.
- The Colville River fish sampled from within 4 miles of Umiat up and down stream, do not indicate a need for public health concern.
 - Broad white fish results were very low and the number of burbot tested was small.
 - The extent of downstream contamination is not yet well known.
 - Appropriate dietary information (where people fish and how much is eaten) is not yet available to adequately assess the potential risks.
- The dietary nutritional benefits of the native subsistence diet must be considered prior to changing the diet in the Umiat/Colville area.
 - Nutrient benefit values and contaminant data should be evaluated at the same time to determine the safety of fish in diet of area residents.
 - Dietary fish survey for subsistence users should be done
- Future chances of exposure to Umiat site related contaminants should be prevented (removing source, engineering controls to keep fish out of the slough, informing the public about potential risks related to the site).

NSB Department of Wildlife Management staff collect and report on more fish collected from Nuiqsut resident fisherman

- **Broad whitefish** and **burbot** caught in the mouth of Fish Creek and the Neglik Channel, Nanook area of the Colville River in July 2001 were sampled and sent to the Muir lab in Canada.
- The 2001 results show that Nuiqsut fish are 10 and 45 times lower than the Umiat original (1998) test results.
- The Department of Wildlife updates the NSB Mayor's Office on 2000 and 2001 fish sampled from Nuiqsut. PCB and DDT levels in the fish from the Nuiqsut fishery were 7-11 times lower for PCBs and 25-45 times lower for DDTs than the Umiat area fish.
- When the 2001 PCB and DDT levels in the Nuiqsut fish are figured into Canadian guidelines (Jensen et al 1997) the "allowed or recommended consumption amounts" are:

Allowed amounts of Nuiqsut burbot liver

- for PCBs
 - 31 pounds per week per person for a lifetime
- for DDTs
 - 2,117 pounds per week per person for a lifetime

New E&E/ACOE Umiat Study (Completed)

- The E&E report "Evaluation of PCBs and DDTs in the Colville River, Former Umiat Air Force Station, Umiat, Alaska" is released. Seventy fish were collected for PCB and DDT testing from up to 20 miles upriver and 90 miles downstream. Water samples were also collected.
- The main conclusions from this analysis:
 - The Umiat Slough contaminants were not responsible for the levels in fish near Nuiqsut.
 - The highest levels of PCBs and DDTs in burbot were found in fish from locations near the Umiat Slough.
 - Burbot and other fish that migrate into the Umiat slough "are responsible for the higher concentrations in the Colville River fishery upstream and downstream of Umiat."
 - Most of the burbot affected by PCBs and DDTs from the Umiat Slough were found nearest the slough, but some of these burbot have migrated approximately 60 miles downstream to Ocean Point.
 - The main source of PCB and DDT contamination of burbot in the main Colville River is atmospheric PCB and DDT (global pollution effect).
 - The levels of PCBs and DDTs in Colville River burbot are similar to burbot caught from other areas of the arctic (13 Canadian Yukon lakes).
 - Contaminants patterns in the water samples show PCBs and DDTs present in the Umiat slough affecting nearby downstream locations, but not locations nearest Nuiqsut.

NSB Department of Wildlife Management review - August 2003

- The NSB Dept. of Wildlife Management reviewed the ACOE “Critical Document Review No. 39-DA-00QZ-03 Human Health Effects Associated with PCBs at the Colville River Seasonal Slough, Former Umiat Air Force Station, Umiat, Alaska October 2002-February 2003.”
- The new study was commended for a more intensive sampling effort and noted that the following still needs to be done:
 - More proof is needed that the Umiat slough is not a continued source of contamination from Umiat activities.
 - An Alaskan subsistence fish use study is still needed to best assess exposure and risks

ATSDR health consultation November 2003

ATSDR reviewed and evaluated the new data to help the community weigh information about potential risk with information about the benefits of eating fish.

ATSDR determines that the fish are safe to eat at four different exposure levels:

1. Eating fish from the river every day for 70 years

“Conservative chronic exposure” from eating a high quantity of fish (up to almost a pound) from the river every day for 70 years

2. Eating whole burbot in high quantities 4 months of the year

“Intermediate exposure” from eating burbot in high quantities during certain times of the year (for example, during the seasonal harvest)

3. Eating burbot livers 4 months of the year

“Intermediate exposure” in which the elders of the Nuiqsut community eat about six burbot livers per week and children eat about three livers per week during the 4-month burbot harvest;

4. Eating several burbot livers in one sitting

“Acute exposure scenario” in which elders eat six burbot livers during one meal

Although PCBs, DDT, and DDT derivatives were detected in fish collected from multiple areas of the river, the levels were low, and exposures to those levels are not expected to cause harmful health effects.

Go to the ATSDR website for more information: <http://www.atsdr.cdc.gov/>

Summary of the “Jessie Ford” Study – July 2004

In July 2004, the Jessie Ford group traveled to villages for community meetings to review the preliminary results of their work. Staff from KBRW accompanied them and aired the meetings live. As part of their study, they checked tittaliq they had caught for contaminants and reviewed the results in light of community concern stemming from the information about Umiat fish.

- **Tittaliq** (burbot) liver higher in contaminant than **Aanakliq** and **Iqalusaaq** (broad whitefish and least cisco)
- Contaminate levels downstream (not right at Umiat) are much lower than Umiat levels
- Contaminate levels are similar to commercial food levels

This NSF funded study was very extensive and included samples from a wide area of lakes between Atqasuk and Nuiqsut. Their major work was with broad whitefish and least cisco. In a recent communication Jesse Ford said that “levels are generally low for pretty much all species compared to other parts of the arctic; since whitefish are so very low on the foodweb, the exposure to hm/te and POPs is also low. “ (Personal communication).