North Slope Borough Dept. of Wildlife Management (DWM) C. Hanns

Petroleum Hydrocarbons Fish Study 2004-2010 Baseline data documentation - Fish & Sediment

Objective: Document baseline levels of polycyclic aromatic hydrocarbons (PAH's) within NPRA from River & lake bottom sediments and subsistence harvested fish tissues (muscle, liver, bile)

The results provide a relatively large set of data on seven species of fish and are a snapshot of levels in areas sampled. Fish can be exposed to oil from natural sources such as the North Slope's natural seeps, or by activities associated with industry, camps, docks - minor or major oil spills. Since fish are able to metabolize and eliminate PAHs from their bodies, PAHs are more likely to be present in fish tissues from higher polluted environments or of fairly recent exposure.

Petroleum hydrocarbons (PHs) are the chemical "building blocks" of petroleum oil and coal.

Polycyclic aromatic hydrocarbons (PAHs) are the most toxic portions of oil.

Graphing the types of PAHs in a sample produces a "signature" profile indicating the more likely oil source, such as: combustion (ie boat fuel), fresh petroleum (crude or natural source) or combination.

Results summary - Fish tissue samples:

Overall PAH levels very low or non-detectable

None were detected in fish from the Nuigsut area

Sediments:

PAH levels in relatively low amounts all sediments and of several different profiles (component varieties)

A separate biomarker analysis on some samples indicated no signs of stress activation reaction. (C. Downs)

Full Report: Petroleum Hydrocarbons in Fish and Sediments of NPRA-A: Teshekpuk Lake, Colville, Ikpikpuk, Mead, and Kuk Rivers by Dana L. Wetzel, PhD, Phil Mercurio and Erin Pulster. Mote Marine Laboratory, Sarasota, FL. June 2012. [Data files including fish morphometrics, reproduction and age archived at DWM and Mote]

9 sediment samples: fresh crude combustion influence influence

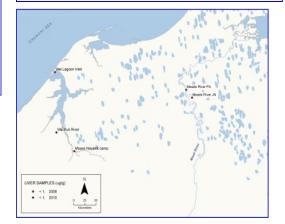
Example "signatures"

Sampling areas:

Teshekpuk Lake, Mayurgiaq & Ikpikpuk Rivers; Colville River – Nuigsut area

Atgasuk Meade River area & Wainwright Kuk River





Species tested:

Aanaa fig - broad white fish Savigunnaq - round white fish Tittaaliq - burbot *Iqaluaqpak* - lake trout *Iłhuagniq* – smelt Sulukpaugaq – grayling Kanayuq - sculpin

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State of Alaska Department of Community and Economic Development National Petroleum Reserve - Alaska, Impact Mitigation Program (IMP)