

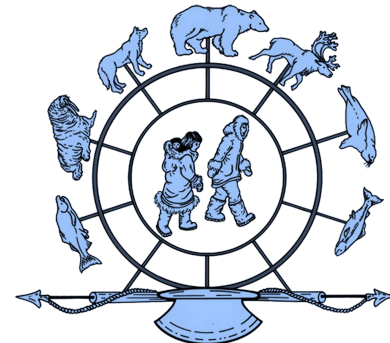
# Food Security and the Marine Ecosystem



## The Arctic We Want ICC 2018

Austin Ahmasuk  
Marine Advocate

*Protect*



KAWERAK, INC.

*The People of Kauwerak*  
*Legends of the Northern Eskimo*  
William Oquilluk

- First Disaster “ACUTE COLD”
- Second Disaster “FLOOD”
- Third Disaster “NO SUMMER” (535 or 1816?)
- Fourth Disaster “TERRIBLE SICKNESS” (1918 Influenza)
- William Oquilluk postulated a Fifth Disaster

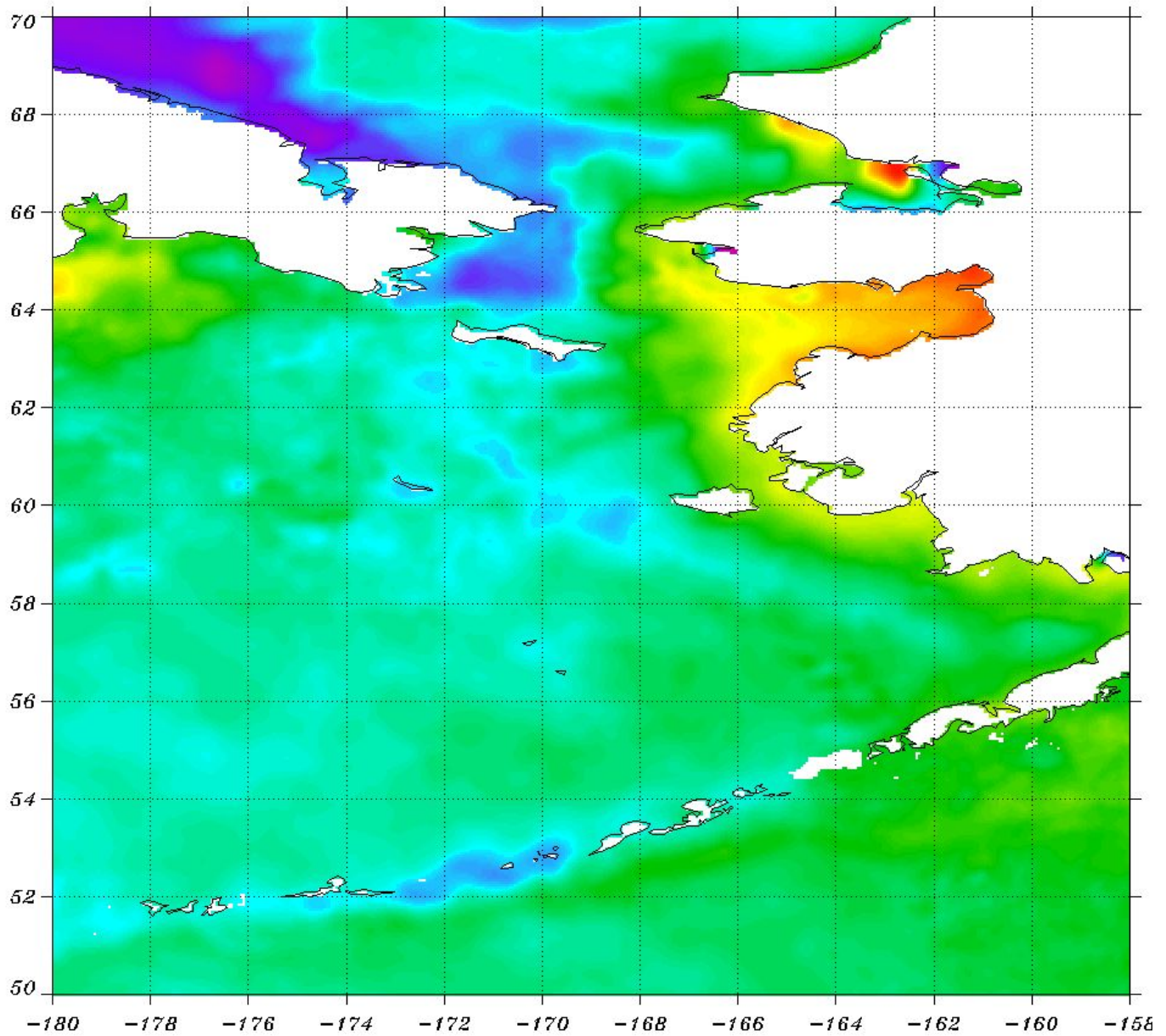


- Volcanoes
- Bering Land Bridge
- Mammoth

**NOT MANY OLD PEOPLE LEFT / LOSS of LANGUAGE**



*NOAA/NESDIS GEO-POLAR BLENDED 5 km SST ANALYSIS  
FOR THE BERING STRAIT*



*16 JULY 2018*

# First documentation of oil fouling in subsistence-harvested ringed (*Phoca hispida*) and spotted seals (*Phoca largha*) in Bering Strait - Fall 2012

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## INTRODUCTION

The Bering Strait is a narrow waterway that divides Alaska from Russia and forms the only maritime transportation corridor for shipping routes between the Pacific and Arctic oceans. Concurrently, reliance on marine resources harvested in this region remains essential to the human population. Decreasing ice conditions herald not only ecosystem changes but increased opportunities for industrialized maritime use in the Bering Strait.

During fall 2012, an oil spill of unknown origin was detected in the Bering Strait through the subsistence harvest of three oiled female ice seals [spotted (*Phoca largha*; n=2); ringed (*Phoca hispida*; n=1)] near Shishmaref (Figure 1) and Saint Lawrence Island (Figures 2, 3). Concurrently, several oiled seabirds were located near Saint Lawrence Island.

## OBJECTIVE

Document the chemical contamination, gross necropsy, and histological findings for three seals harvested for subsistence.

	Skin	Blubber	Liver	Muscle	Lung	Stomach contents	Feces
2012: Spotted seal – Shishmaref - N52-2012	220/58/280	35/0.6/36	22/2.6/25	14/1.2/15	13/<LOQ/13	13/4.7/18	22/3.2/25
2012: Spotted seal – Gambell - 2012-66	-/-	48/0.4/48	6.3/5.1/11	8/0.2/8.2	7.3/<LOQ/7.3	-/-	-/-
2012: Ringed seal – Gambell - N55-2012	37/8.9/46	18/<LOQ/18	7.9/<LOQ/7.9	6.9/0.2/7.1	7.1/<LOQ/7.1	11/7.7/19	-/-
1989: Unoiled Harbor seal –EVOS-PWS	-/-	19/2/21	<LOQ/<LOQ/<LOQ	<LOQ/<LOQ/<LOQ	-/-	-/-	-/-
1989: Oiled Harbor seal –EVOS-PWS	-/-	520/4/520	1.5/LOQ/1.5	5/<LOQ/5	-/-	-/-	-/-

Table 1. PAH Concentrations determined from various tissues of two spotted seals and a ringed seal collected in the Bering Strait region during 2012 as well as an unoiled and oiled harbor seal collected during the 1989 Exxon Valdez Oil Spill (EVOS) in Prince William Sound, Alaska. All results expressed in ng/g, wet weight. The first result number in each three number series is the sum of low molecular weight PAHs containing 2-3 ring compounds (LMWAH) and the second is the sum of high molecular weight PAHs containing 4-5 ring compounds (HMWAH). The sum of LMWAH and HMWAH is indicated by the underlined result number. Less PAH than the lower limit of quantification is indicated by <LOQ.

<sup>1</sup>Concentrations in parts per billion (ng/g) based on total area compared to the fluorescence of naphthalene standard at 292/335 nm v

<sup>2</sup>Concentrations in parts per billion (ng/g) based on total area compared to the fluorescence of phenanthrene standard at 260/380 nm v

<sup>3</sup>Concentrations in parts per billion (ng/g) based on total area compared to the fluorescence of benzo[a]pyrene standard at 380/430 nm v



Figure 1. A subadult spotted seal harvested for subsistence near Shishmaref, September 5, 2012 (ID N52-2012). Photo by G. Sheffield.



Figure 2. A subadult spotted seal harvested for subsistence near Gambell, October 16, 2012 (ID 2012-166). Photo by L. Tunguyan.



Figure 3. A ringed seal harvested for subsistence near Gambell, November 12, 2012 (ID N55-2012). Photo by G. Sheffield.

	Protein mg/ml	NPH equivalents <sup>1</sup>	PHN equivalents <sup>2</sup>	BaP equivalents <sup>3</sup>	PHN / NPH
Spotted seal – Shishmaref - N52-2012	98.7	620,000	150,000	1,000	0.24
Ringed seal – Gambell - N55-2012	48.2	66,000	21,000	1,200	0.32

Table 2. Levels of PAH metabolites and protein determined in bile of one ringed seal and one spotted seal collected in the Bering Strait region during 2012. All equivalents of fluorescent aromatic compounds results expressed in ng/g bile, wet weight.

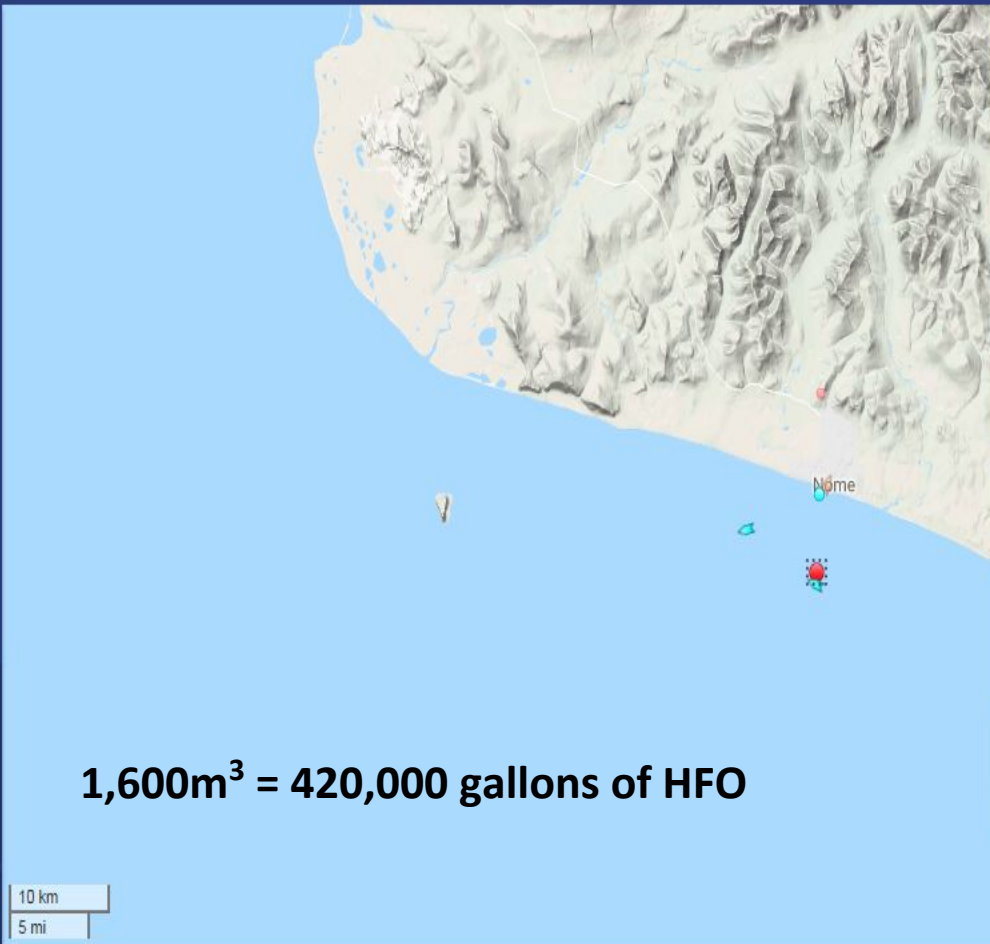
## Key findings

- Overall PAH levels were relatively low (sum PAH < 50 ng/g, wet wt.), except skin from the spotted seal from Shishmaref (N52-2012; sum PAHs=280 ng/g, wet wt.), with higher blubber PAH concentrations measured in both spotted seals vs. ringed seal (Table 1)
- Blubber PAH concentrations were lower than those measured in post EVOS oiled seals.
- High bile protein values indicated non-feeding status of the oiled seals and the bile PAH metabolite values in the oiled ice seals are most likely confounded by feeding status since they concentrate in the bile of non-feeding animals (Table 2).
- PAH equivalents measured in seal bile confirmed exposure to PAHs and were similar to, or higher, than those reported in oiled harbor seals collected in Prince William Sound, Alaska after the Exxon Valdez oil spill (EVOS).
- Fluorescence chromatogram and PHN/NPH ratio data were inconclusive in determining petroleum exposure.
- Tissue PAH patterns (% of summed PAHs) of the spotted seal from Shishmaref (N52-2012) showed petroleum exposure whereas tissue PAH patterns of the ringed (N55-2012) and spotted (2012-66) seals harvested near Gambell showed exposure to mixed PAH sources (Table 3).
- Histopathological lesions were observed in the digestive, respiratory, and integumentary system; their relationship to oiling was inconclusive (Table 3).

Animal ID	Skin Oiling	Liver Gross	Liver Histopath	Lung Gross	Lung Histopath	Gastrointestinal Tract Gross	Gastrointestinal Tract Histopath
N52-2012 #	Ventrum	Pale brown to ochre;	Autolyzed	Congested	Tracheal edema	Stomach empty	N/A


Food For Thought

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Oil/Chemical Tanker

29°47.24  
16°36'09.63  
4965, -166.6027



Sergei Skriabin  
MarineTraffic.com

Add to Fleet Vessel Details

DAESAN ANCH [KR] NOME ANCH [US]  
ATD: 2018-06-22 14:33 ATA: 2018-07-03 18:07

Past Track Route Forecast

Status: <b>At Anchor</b>	Speed/Course: <b>0kn / 0°</b>	Draught: <b>12.2m</b>
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Received: 2 minutes ago (AIS Source: 1421)

1,600m<sup>3</sup> = 420,000 gallons of HFO



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SAT1 for a single ship



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# PORT WILLIAM SHUYAK ISLAND BUNKER C SPILL

## Location

Port William, Southern end of Shuyak Island, approximately 50 miles NNW of the city of Kodiak

## Time/Date of Incident

The incident occurred at approximately 8:00 a.m. on February 26, 2018

## Spill Number

18249905701

## Product/Quantity

Up to 3,000 gallons of Fuel Oil No. 6 (Bunker C).

## Cause

It was previously reported that wind gusts exceeding 80 mph pushed a building with the fuel bladder off a dock, causing the 3,000 gallon capacity fuel bladder to rupture and release its contents. Upon further investigation it has been determined that the dock structure supporting the building collapsed. This caused much of the building, along with the fuel bladder, to fall to the shoreline and water below.



[Open map in ArcGIS Web app](#)

# Ice Dependent Lifestyle





c/o Frances Ozenna



# Harmful Algal Blooms and Marine Mammals

**Federal Food Safety Limit 800 nanograms of saxotoxin per gram**

**2017 walrus harvested in the Bering Strait region and had greater than 4000 nanograms saxotoxin per gram**

