NPC 150872: Ocean Tracking Network: Marine fish tracking in Baffin Bay and connected waters onboard the RV Kiviuq 1.

Close

Proposal Status: Conformity Determination Issued

Overview Documents

Project Overview

Type of application: New

Proponent name:

Kevin Hedges

Proponent company:

Fisheries And Oceans Canada

Project Description:

The main objective is to improve our understanding of the movement patterns and ecology of Greenland Shark, Greenland Halibut and Arctic Skate. Individuals of each species will be caught on bottom set longlines and marked with acoustic tags that allow the tracking of individual animals. Fish tracking moorings deployed near Clyde River and Qikiqtarjuaq, near the Disko Fan Conservation Area and along the shelf break in Baffin Bay will be retrieved, refit and redeployed. A new set of moorings will be deployed in the outer half of Cumberland Sound. Bottom set longline will be used to assess the distribution and relative abundance of commercially sized Greenland Halibut in inshore waters near Clyde River and Qikiqtarjuaq, Nunavut; fishing will not occur in Cumberland Sound. Longlines will be set for up to 12 hours; hooks will be baited with squid and the lines will be set on the ocean bottom. All captured fishes and invertebrates will be identified and the lengths and weights will be recorded for all Greenland Halibut and Arctic Skate. Tissue samples will be taken from a subset of specimens of all species (except SARA listed species and Greenland Sharks) for chemical tracer analyses to examine food web structure; gonad samples and morphometric measurements will also be taken from these individuals. VEMCO acoustic transmitters (V16s: http://www.vemco.com/pdf/v16cont.pdf) will be surgically implanted in the body cavities of captured and healthy Greenland Halibut (n=300), Greenland Sharks (n=60) and Arctic Skate (n=60). Surgical procedures and handling will be <5 mins to minimize stress to the animals. Greenland Sharks will be tagged from a zodiac, with the animals held parallel to the boat and just at the surface of the water. VEMCO acoustic monitors (VR2Ws: http://www.vemco.com/pdf/vr2w.pdf) that record the time and date of individual tagged animals (within >500 m of an individual monitor) will be deployed in arrays near Pond Inlet, Clyde River, Qikiqtarjuaq and in Cumberland Sound to track animal movements. Individual acoustic monitors will be secured using fixed 200lb weights, sub surface floats and an acoustic release mechanism that can be triggered the following year to retrieve monitors for data download. All non-retained animals will be returned to the water at the site of capture.

Project Schedule

Start Date:

2025-08-15

End Date:

2028-10-31

Project Map

List of project geometries:

Id

Geometry

Location Name

18720

point

cs1

18721

point

cs2

18722

point

cs3

18723

point

cs4

18724

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cs5

18725

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cs6

18726

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cs7

18727

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18728

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station 42

18369

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station 43

18370

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station 44

18371

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station 45

18372

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station 46

18373

point

station 47

NPC Planning regions:

No Approved Plan

Project Land Use and Authorizations

Project Land Use:

Scientific Research

Licensing Agencies:

Government of Canada - Fisheries and Oceans Canada

Nunavut Research Institute

Material Use

Equipment:

Type

Quantity

Type

Use

Kiviuq 1

1

28.53

The Kiviuq 1 is a steel fixed-gear fishing vessel owned by Arctic Fishery Alliance. It is equipped with freezing at sea capabilities. The net tonnage of the vessel is 199.38. The maximal vessel speed is 12 knots. The Kiviuq is primarily used for marine research and delivers supplies to Arctic Fishery Alliance's owner communities during the summer months.

Fuel Use:

Type

Container

Capacity

Use

Diesel

1

130000

On average a small research vessel fuel consumption is about 15-30 gallons per hour (this is dependent upon factors such as vessel size, speed and type of work occurring).

Hazardous Material and Chemical Use:

Type

Container

Capacity

Use

Oil and lubricant products

1

3000

2-20 gallons of oil and lubricant products are used on a daily basis for a vessel in the 25 meter size range.

Water Consumption:

Daily Amount (m^2)

Retrieval Method

Retrieval Location

3

Marine Environment

Desalination of seawater to freshwater onboard the vessel. Vessel is equipped with advanced water makers, capable of producing fresh potable water from seawater. This ensures a continuous supply of drinking water and fresh water for other needs, such as showers and laundry, for the duration of the survey.

Waste and Impacts

Environmental Impacts:

General Environmental Impacts of vessel work (https://doi.org/10.1016/j.ocecoaman.2023.106936) in Arctic Environments include: 1.) Impact of Water Bodies: a. Antifouling paint pollution: Releases copper ions, microplastics, etc., into the water and will negatively impact marine life's growth and survival, such as inhibiting reproduction, growth and causing deformities; b. Oil spill: Pollution of coasts and beaches affects animal health, reproductive cycle, mobility, and possibly causing their death, etc. c. NIS: Leading to the loss of Arctic biodiversity, local extinction, and decline in species richness, etc., d. Wastewater discharge: Pollution of waters, depletion of dissolved oxygen in water, red tides, etc., will cause unnecessary environmental toxicological impacts in the Arctic. Proposed Mitigation measures: the vessel will follow all guidelines provided by Transport Canada to minimize impacts to water bodies. This includes ensuring oil is stored properly and safely while on the vessel, minimizing risks of causing oil spills by following standard operating procedures to reduce risks of accidents. The vessel will carry an emergency spill kit . The vessel ballast water will only be exchanged in specific ballast water exchange zones designated by maritime guidelines and the Canadian Government. Garbage will be managed in accordance with the Canada Shipping Act 2001. No garbage of any kind shall be thrown overboard while on the vessel. Discharges of broken up or ground food waste (particles must be finer than 25 mm, or one inch - the size of a loonie or bottle cap) are permitted if 12 nautical miles or more from the nearest land, iceshelf or fast ice. Sewage will be managed in accordance with Canada’s Arctic Shipping Safety and Pollution Prevention Regulations. This law bans the discharge of any waste into Arctic waters except untreated sewage. The Act applies to waters north of 60 and up to 200 nautical 25 miles from the shoreline. Untreated sewage cannot be discharged within 12 nautical miles from any iceshelf or fast ice (ice attached to land), whereas treated sewage cannot be discharged within 3 nautical miles. No sewage can be discharged if the ice coverage exceeds 10% of open water. The captain and crew will be familiar with all safety procedures and maritime governance rules to reduce impacts to water bodies. 2. Impact of air emissions: a. Air pollution SOx: Cause acid rain and

seawater acidification, etc., NOx: Generate acid rain and soot, lead to ocean eutrophication, etc., O3Cause animal health damage, environmental damage, and other problems, PM: Air pollution etc., BC: Reduce the albedo of Arctic ice and snow and accelerate Arctic climate warming, VOC: Potentially increased probability of cancer, deformities, and genetic mutations in Arctic organisms. b. Radiative forcing: Produce warming and cooling effects on a wide range of temporal and spatial scales, and the climate impact of these components is largely dependent on the location and timing of emissions. Proposed Mitigation measures: The vessel will maintain proper functions of vessel engine and muffler, and all other mechanical aspects of the vessel to ensure that air pollution is minimized. The vessel will follow Standard Operating procedures to reduce accidental occurrences that would increase air pollution. The vessel captain and crew will know maritime regulations for the region and ensure that the standard of operation is maintained in accordance with the rules. 3. Impact on animal survival: a. Noise pollution: Masking Arctic animal communications, altering behavior patterns, and potentially causing temporary and permanent hearing loss to animals in surrounding waters, Light pollution: Interferes with directional discrimination of marine animals and induces bird strikes, Collisions with marine animals: Causing injury or even death to marine mammals, Influence animal behavior: Causing vigilance, escape, and decreased vocalisation in arctic mammals. Proposed Mitigation measures: The vessel will follow DFO and Nunavut guidelines to maintain distance of 100 meters, stay clear and move away from marine mammals. Vessels will also slow their speed if they do encounter a marine mammal while transiting an area to ensure that the marine mammal can move away from the noise and avoid a collision strike. Areas with high concentrations of marine mammals will be abandoned and no fishing equipment will be placed in the water during their presence in the region. Light pollution will be minimized by reducing lights during evening work events.

Waste Management:

Waste Type

Quantity Generated

Treatement Method

Disposal Method

Greywater

246 liters per day per person

No additional treatment procedures are identified.

Greywater will be released back into the marine environment in designated areas/zones where this is allowed. All marine transport laws will be followed. Greywater will include cleaning and rinsing of the vessel deck after sampling procedures are completed.

Hazardous waste

1-2% of heavy fuel oil is burned in a vessel's main engine and generators ends up as sludge.

No additional treatment procedures are identified.

All oil and lubricant products used will be stored safely in appropriate containers and disposed of when the vessel reaches the home port. Disposal at port will follow provincial and federal guidelines for safe disposal.

Non-Combustible wastes

1.4-2.3 Kg per person per day

No additional treatment procedures are identified.

All non-combustible waste will be stored on board the vessel and disposed when the vessel reaches a port. Disposal at the port will follow provincial/territorial and federal guidelines for safe disposal.

Overburden (organic soil, waste material, tailings)

80-200 kg per long line set

No additional treatment procedures are identified.

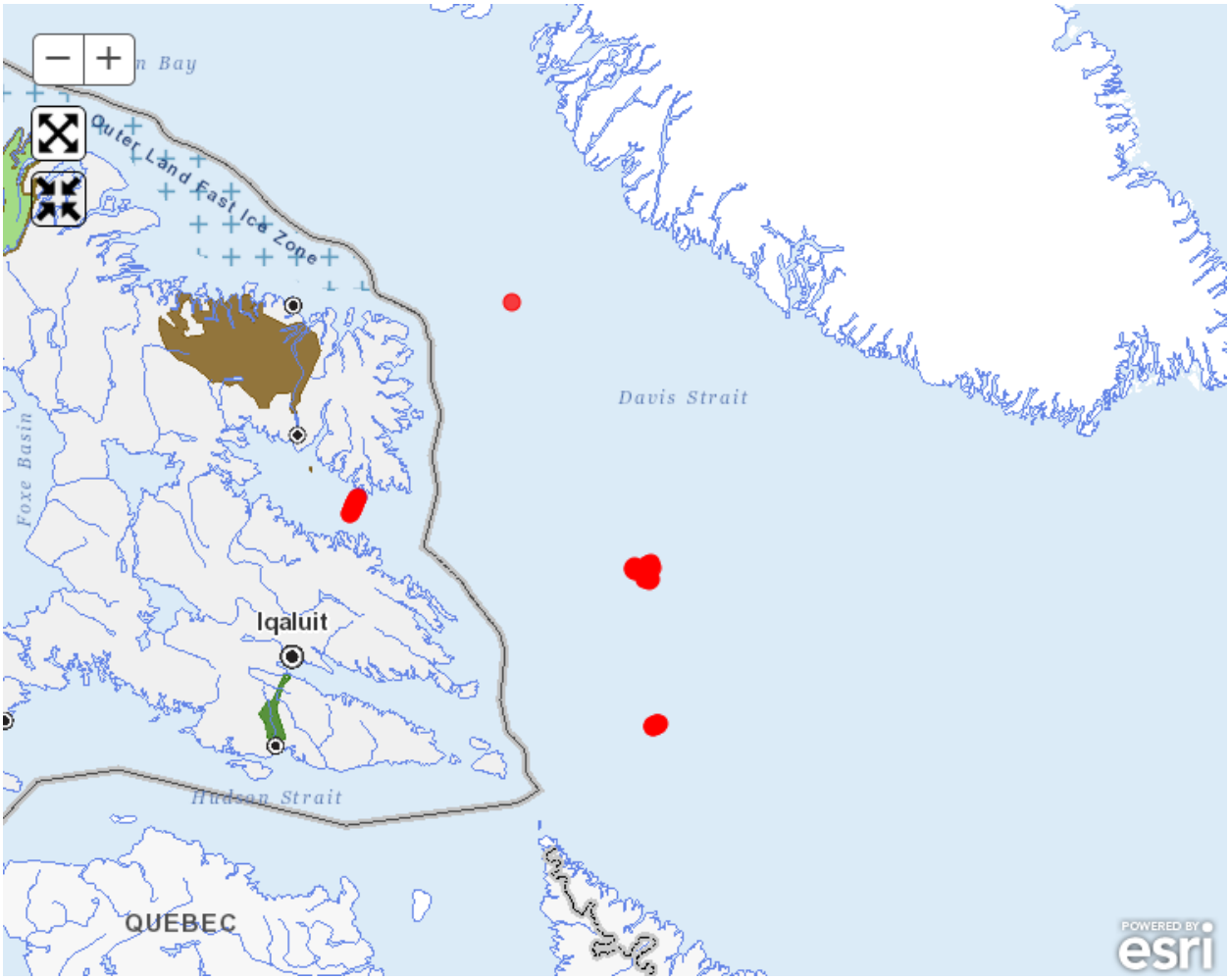
Overburden (organic waste products from longlining) will be released back into the marine environment in designated areas/zones where this is allowed. All marine transport laws will be followed.

Sewage (human waste)

30 liter per person per day

No additional treatment procedures are identified.

Sewage will be stored in a holding tank and released into the marine environment in designed areas where this is allowed. All marine transport laws will be followed regarding waste and dumping of waste.


Outer Land Fast Ice Zone
Davis Strait
Foxe Basin
Iqaluit
Hudson Strait
QUEBEC
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