NIRB Uuktuutinga Ihivriuqhikhamut #126452

Ecology and demography of killer whales in the eastern Canadian Arctic

Uuktuutinga Qanurittuq:	New
Havaap Qanurittunia:	Scientific Research
Uuktuutinga Ublua:	Thursday, May 14, 2026
Period of operation:	from 2026-07-09 to 2029-10-25
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QANURITTUT

Tukihiannaqtunik havaariyauyumayumik uqauhiuyun

Qablunaatitut: Title: Ecology and demography of killer whales in the eastern Canadian ArcticWho: Fisheries and Oceans CanadaWhat: Our killer whale field research program has been ongoing since 2009, developed in consultation with Inuit communities about their growing concerns about increasing killer whale presence around their communities. Our planned research program over the upcoming three years (2026-2029) is a continuation of this long-term project, with specific objectives regarding killer whale demographics and predator impacts. Core field work methods including satellite tagging, biopsy, and photo-identification will be used, as well as newer methods including drone recordings of behaviour, body composition, and group composition.[1] Satellite tag deployment: Killer whales will be slowly approached by boat to within 10 m. Satellite tags will be deployed onto the dorsal fin using crossbows, using metal darts to anchor the tag below the skin. Tags will transmit location and dive data up to 300 times daily as the whale surfaces to satellites. Tags using this technique typically last several weeks on killer whales, but have lasted for up to ~120 days. Telemetry data will be used to better understand killer whale distribution and migration patterns.[2] Biopsy: Skin and blubber biopsies will be collected using crossbows or an airgun to fire sterile stainless steel biopsies near the saddle patch (just behind the dorsal fin). Biopsied skin and blubber will be frozen for genetic and chemical analyses (e.g., stable isotopes and fatty acids). Genetics analyses will provide information on killer whale group and population structure, as well as evidence of gene expression in response to local adaptation to Arctic conditions. The microchemistry analyses will provide information on both diet and distribution.[3] Photo-identification: Killer whales will be photographed using digital SLR cameras. Individual killer whales have unique natural features (dorsal fin shape and size, scarring, and saddle patch and eye-patch shape) that can be used to identify them. Photo-identification has been used to match killer whale movements between different areas and therefore understand their distribution. Estimates of killer whale abundance will be updated using statistical models that compare the rates of newly identified and re-sighted whales.[4] Acoustic recordings and behavioural observations: Killer whale calls will be recorded using dip hydrophones from the research boat (i.e., not at the seafloor). At the same time, killer whale behavior will also be recorded using drones from a distance of approximately 300-1000 m for up to 30 minutes per session/focal group. Killer whale behaviors will be evaluated and analysed to better understand correlations between behavior and call type, which will be the first step to using passive acoustic recorders to monitor killer whale presence and activity (e.g., predation) in the Canadian Arctic.[5] Aerial photographs: Aerial photographs taken by drones will be analysed to assess killer whale body size and condition. Aerial photographs may also be used to determine reproductive status (e.g., pregnant females) and demographic information (e.g. group composition, pregnancy rates) for comparison among years to assess growth trends.One of the main goals of our Arctic killer whale research has been to develop scientific research capacity in northern communities. Inuit beneficiaries hired to conduct field research receive training in deploying satellite transmitters, biopsying and storing tissues, photography, and data entry. We typically hire up to five local research assistants and rent local equipment (e.g., boats) for our field work, as we work to establish a network of independent, Inuit-led research teams throughout the region.Why: Killer whales are important predators in marine ecosystems worldwide. Increases in killer whale sightings in the eastern Canadian Arctic over the past decades, most likely associated with decreases in sea ice extent and duration, have raised concerns about their ecological impacts on Arctic ecosystems. Killer whales in the eastern Canadian Arctic prey on marine mammals (narwhal, beluga, bowhead whales, and seals). Greater killer whale predation pressure on ecologically, culturally, and economically valuable marine mammal populations could impact their sustainable use for food by Inuit/Northerners. Moreover, our previous research has shown that killer whale presence alone can drastically alter the distribution and movements of prey species. There is therefore growing concern among Inuit communities that increasing killer whale presence in the Arctic may have adverse impacts on Arctic-endemic marine mammals. Several Inuit communities have asked for population assessments to determine whether killer whale populations can be sustainably harvested or culled. To understand how killer whales in the eastern Canadian Arctic impact populations of marine mammals that are harvested by Inuit, we need more information about their population structure, abundance and population trends, and ecology (e.g., distribution, movements, diet, and hunting behaviour) in the region.Where: Admiralty Inlet (Arctic Bay).When: Generally August, although possibly from July through September when killer whales are seasonally present

and weather conditions allow for boat-based field work. Multi-year project (2026-2029).

Uiviititut: Titre : Écologie et démographie des épaulards dans l’est de l’Arctique canadienQui : Pêches et Océans CanadaQuoi : Notre programme de recherche sur les épaulards est en cours depuis 2009. Il a été élaboré en collaboration avec les communautés inuites, qui exprimaient des préoccupations croissantes concernant l’augmentation de la présence d’épaulards dans l’arctique canadien est. Le programme de recherche prévu pour les trois prochaines années (2026 2029) constitue la poursuite de ce projet à long terme, avec des objectifs précis portant sur la démographie des épaulards et leurs impacts en tant que prédateurs. Les méthodes de terrain principales — balises satellites, biopsies et photo identification — seront maintenues, et de nouvelles approches seront ajoutées, notamment l’utilisation de drones pour documenter le comportement, la composition corporelle et la composition des groupes.[1] Balises satellitesLes épaulards seront approchés lentement en bateau jusqu’à environ 10 m. Les balises satellites seront fixées sur la nageoire dorsale à l’aide d’arbalètes, avec des fléchettes métalliques ancrées sous la peau. Les balises transmettront jusqu’à 300 fois par jour des données de localisation et de plongée lorsque l’épaulard remonte à la surface. Ces balises demeurent généralement en place plusieurs semaines, parfois jusqu’à environ 120 jours. Les données télémétriques serviront à mieux comprendre la répartition et les migrations des épaulards.[2] BiopsiesDes échantillons de peau et de lard seront prélevés à l’aide d’arbalètes ou d’un fusil à air comprimé tirant des pointes stériles en acier inoxydable près de la tache gris pâle (derrière la nageoire dorsale). Les échantillons seront congelés pour des analyses génétiques et chimiques (p. ex., isotopes stables et acides gras). Les analyses génétiques fourniront de l’information sur la structure des groupes et des populations, ainsi que sur l’expression génétique liée à l’adaptation aux conditions arctiques. Les analyses microchimiques permettront d’obtenir de l’information sur le régime alimentaire et la répartition.[3] Photo identificationLes épaulards seront photographiés à l’aide d’appareils photo numériques reflex. Chaque individu possède des caractéristiques naturelles uniques (forme et taille de la nageoire dorsale, cicatrices, forme de la tache dorsale et de la tache oculaire) permettant de l’identifier. La photo identification permet de suivre les déplacements des épaulards entre différentes régions et d’améliorer notre compréhension de leur répartition. Les estimations d’abondance seront mises à jour à l’aide de modèles statistiques comparant les taux de nouvelles identifications et de réobservations.[4] Enregistrements acoustiques et observations comportementalesLes vocalisations des épaulards seront enregistrées à l’aide d’hydrophones suspendus depuis le bateau de recherche (et non depuis le fond marin). Parallèlement, leur comportement sera filmé par drone à une distance d’environ 300 à 1 000 m, pendant jusqu’à 30 minutes par séance ou groupe focal. Les comportements seront analysés afin de mieux comprendre les liens entre les types de vocalisations et les comportements observés. Il s’agit d’une première étape vers l’utilisation d’enregistreurs acoustiques passifs pour surveiller la présence et l’activité des épaulards (p. ex., prédation) dans l’Arctique canadien.[5] Photographies aériennesLes images aériennes captées par drone seront analysées pour évaluer la taille corporelle et l’état de condition des épaulards. Elles pourront aussi servir à déterminer le statut reproducteur (p. ex., femelles gestantes) et d’autres paramètres démographiques (p. ex., composition des groupes, taux de gestation) afin de comparer les tendances d’une année à l’autre.Un des objectifs principaux de notre programme de recherche sur les épaulards de l’Arctique est de renforcer la capacité scientifique au sein des communautés nordiques. Les bénéficiaires inuits embauchés pour le travail de terrain reçoivent une formation sur la pose de balises satellites, la collecte et l’entreposage des biopsies, la photographie et la saisie de données. Nous embauchons généralement jusqu’à cinq assistants de recherche locaux et louons de l’équipement local (p. ex., bateaux), dans le but d’établir un réseau d’équipes de recherche indépendantes dirigées par des Inuits dans toute la région.Pourquoi :Les épaulards sont des prédateurs importants dans les écosystèmes marins du monde entier. L’augmentation des observations d’épaulards dans l’est de l’Arctique canadien au cours des dernières décennies — probablement liée à la diminution de l’étendue et de la durée de la glace de mer — a suscité des préoccupations quant à leurs impacts écologiques. Dans cette région, les épaulards se nourrissent de mammifères marins (narvals, bélugas, baleines boréales et phoques). Une pression de prédation accrue sur ces espèces, qui ont une grande importance écologique, culturelle et économique, pourrait affecter leur disponibilité pour l’alimentation des Inuits et des résidents du Nord. De plus, nos recherches antérieures ont montré que la simple présence d’épaulards peut modifier de façon marquée la répartition et les déplacements de leurs proies.Ainsi, plusieurs communautés inuites expriment des inquiétudes quant aux effets potentiellement négatifs d’une présence accrue d’épaulards sur les mammifères marins endémiques de l’Arctique.

Certaines ont demandé des évaluations de population afin de déterminer si les épaulards pourraient être récoltés ou contrôlés de manière durable. Pour comprendre comment les épaulards de l'est de l'Arctique canadien influencent les populations de mammifères marins récoltées par les Inuits, nous devons mieux connaître leur structure de population, leur abondance, leurs tendances démographiques et leur écologie (p. ex., répartition, déplacements, régime alimentaire et comportement de chasse).Où : Admiralty Inlet (Arctic Bay).Quand : Généralement en août, mais possiblement de juillet à septembre, lorsque les épaulards sont présents de façon saisonnière et que les conditions météorologiques permettent le travail en bateau. Projet pluriannuel (2026 2029).

Inuktitut:

ᐊᑎᖓ: ᐊᕙᑎᖓ ᐊᒻᒪ ᓄᓇᒥ ᐊᑲᑦᑐᖅᓯᒪᔪᒧᑦ ᐋᖅᑯᐃᑦ ᑲᓇᓐᓇᖓᓂ ᑲᓇᑕᒥ ᐅᑭᐅᑕᖅᑐᒥᑭᒃᑯᑦ: ᐃᒪᕐᒥᐅᑕᓕᕆᔨᒃᑯᑦ ᑲᓇᑕᒥᑭᓱᒧᑦ: ᐋᖅᑯᓂᑦ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐱᓕᕆᐊᓄᑦ ᑲᔪᓯᓂᖃᖅᓯᒪᔪᖅ 2009−ᒥᓂᑦ, ᓴᖅᑭᖅᑎᑕᐅᓯᒪᔪᖅ ᑲᑎᒪᖃᑎᒌᓪᓗᒋᑦ ᐃᓄᐃᑦ ᓄᓇᓕᖕᒋᑦ ᐃᓱᒪᓗᓕᖅᐸᓪᓕᐊᓂᖕᒋᓐᓄᑦ ᐊᒥᓱᕈᖅᐸᓪᓕᐊᓂᖕᒋᓐᓄᑦ ᐋᖅᑯᐃᑦ ᓄᓇᓕᖕᒋᑕ ᖃᓂᒋᔭᖕᒋᓐᓂ. ᐸᕐᓇᓯᒪᔭᕗᑦ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ ᐱᖓᓲᓂᐊᖅᑐᓄᑦ ᐊᕐᕿᒍᓄᑦ (2026-2029) ᑲᔪᓯᓂᕆᔭᖓ ᑖᔅᓱᒧᖓ ᐊᑯᓂᐅᔪᒧᑦ ᐱᓕᕆᐊᒧᑦ, ᓇᓗᓴᐃᖅᓯᒪᔪᓂᑦ ᑐᕌᓚᖃᖅᑐᑎᑦ ᐱᔾᔪᑎᖃᖅᑐᓂᑦ ᐋᖅᑯᓂ ᓄᓇᖓᓂ ᐊᑲᑦᑐᖅᓯᒪᔪᒧᑦ ᐊᒻᒪ ᐆᒪᔪᐃᓂᑦ ᓂᕆᖃᑦᑕᕐᓂᖕᒋᓐᓄᓄᑦ ᐊᑦᑐᐃᓂᖃᕐᓂᖕᒋᑦ. ᐃᖅᑲᓇᐃᔭᖅᑕᓪᓗᐊᑕᐅᔪᑦ ᐊᑐᖅᑕᐅᓂᖕᒋᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᕿᒻᒨᐊᑦᑎᑕᐅᓯᒪᔫᒃᑯᑦ ᓂᕕᖓᑖᓕᖅᓯᓂᖅ, ᐋᖅᑯᓃᖖᖅᑐᓂᑦ ᖃᐅᔨᓴᕋᕐᓴᓂᑦ, ᐊᒻᒪ ᐊᔾᔨᓐᖑᐊᑎᒍᑦ ᓇᓗᓇᐃᖅᑕᐅᓂᖕᒋᓐᓄᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ, ᐊᒻᒪᓗᑦᑕᐅᖅ ᓄᑖᖑᓂᖅᓴᓂᑦ ᐊᑐᖅᑕᐅᔪᓂᑦ ᐱᖃᓯᐅᑎᓪᓗᑎ ᖃᖓᑕᓲᕋᕐᖁᒃᑯᑦ ᐊᔾᔨᓕᐅᕆᓂᖅ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ, ᑎᒥᖕᒋᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓄᑦ, ᐊᒻᒪ ᑲᑎᙵᔪᓂᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓄᑦ.[1] ᕿᒻᒨᐊᑦᑎᑕᐅᓯᒪᔫᒃᑯᑦ ᓂᕕᖓᑖᑦ ᐋᖅᑭᑦᑕᐅᓂᖕᒋᑦ: ᐋᖅᑯᖕᒋᑦ ᓰᒃᑲᐃᓵᖅᑐᓄᑦ ᐅᐸᑦᑕᐅᖃᑦᑕᓂᐊᖅᑐᑦ ᐅᒥᐊᕐᒧᑦ ᖃᓂᒋᔭᖓᓂ 10 ᒦᑕᐃᑦ. ᕿᒻᒨᐊᑦᑎᑕᐅᓯᒪᔫᒃᑯᑦ ᓂᕕᖓᑖᑦ ᐋᖅᑭᑦᑕᐅᓂᐊᖅᑐᑦ ᓇᐸᒋᑕᖕᒋᓐᓄᑦ ᐊᑐᕐᓗᑎ ᕿᑭᐅᑦᑕᐅᔭᒥᑦ, ᐊᑐᖅᑐᑎ ᓴᕕᕋᔭᓐᓂ ᓄᕗᓕᓐᓂᑦ ᐋᖅᑭᑦᑕᐅᓗᓂ ᓂᕕᖓᑖᖅ ᐊᑖᒍᑦ ᒪᑦᑕᖓᑕ. ᓂᕕᖓᑖᑦ ᐊᐅᓪᓚᑎᑦᑎᓂᐊᖅᑐᑦ ᓇᒦᓐᓂᖓᓄᑦ ᐊᒻᒪ ᐊᖅᑲᐅᒪᓂᖓᓄᑦ ᑐᑭᓯᒋᐊᕈᑎᓂᑦ ᑎᑭᓯᒪᔪᓂᑦ 300−ᕋᑎᖅᑐᑦ ᖃᐅᑕᒫᑦ ᐋᖅᑯᒃ ᐳᐃᒐᐃᒻᒪᑦ ᕿᒻᒨᐊᑦᑎᑕᐅᓯᒪᔪᒧᑦ. ᓂᕕᖓᑖᑦᐊᑐᖅᑕᐅᓂᖕᒋᑦ ᑖᔅᓱᒧᖓ ᐊᑐᖅᑕᐅᔪᒧᑦ ᐊᑯᓂᐅᓂᖃᓗᔪᑦᑐᑦ ᐊᒥᓱᓚᓐᓂᑦ ᐱᓇᓱᐊᕈᓯᓂᑦ ᐋᖅᑯᓄᑦ, ᑭᓯᐊᓂ ᐊᑯᓂᐅᓂᖃᖅᓯᒪᔪᑦ ~120 ᐅᓪᓗᓂᑦ.ᐅᖓᓯᑦᑐᒃᑯᑦ ᑐᑭᓯᒋᐊᕈᑏᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ ᑐᑭᓯᑦᑎᐊᓂᖅᓴᕆᓗᒋᑦ ᐋᖅᑯᐃᑦ ᓇᒨᖓᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᐅᑎᖅᑕᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ.[2] ᐋᖅᑯᓃᖖᖅᑐᑦ ᖃᐅᔨᓴᕋᕐᓴᐃᑦ: ᒪᑦᑕᖓᓂ ᐊᒻᒪ ᐅᖅᓱᖓᓂ ᖃᐅᔨᓴᕋᕐᓴᐃᑦ ᓄᐊᑕᐅᓂᐊᖅᑐᑦ ᐊᑐᕐᓗᑎ ᕿᑭᐅᑦᑕᐅᔭᒥᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐳᓪᓚᒨᖅᑐᒧᑦ ᕿᑭᐅᑎᒧᑦ ᓴᓗᒪᔪᓂᑦ ᕿᑭᓇᐊᕐᓗᑎ ᒪᕐᒥᑐᕐᓂᒍᓐᓇᖕᒋᑦᑐᓄᑦ ᓴᕕᕋᔭᓐᓄᑦ ᖃᐅᔨᓴᕋᕐᓴᐃᑦ ᖃᓂᒋᔭᖓᓂ ᓇᐸᒋᑕᖓᑕ (ᑐᓄᑦᑎᐊᖓᓂ ᓇᐸᒋᑕᖓᑕ) +. ᐱᔭᐅᔪᑦ ᖃᐅᔨᓴᕋᕐᓴᐃᑦ ᒪᑦᑕᖕᒋᑦ ᐊᒻᒪ ᐅᖅᓱᖕᒋᑦ ᕿᐊᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᐊᐅᖕᒋᑎᒍᑦ ᐊᒻᒪ ᐃᓗᓕᖕᒋᓐᓂ ᖃᐅᔨᓴᖅᑕᐅᓗᑎ (ᓲᕐᓗ ᒪᑦᑕᖓᓂ isotopes ᐊᒻᒪ ᐅᖅᓱᖕᒋᓐᓂ ᐋᓯᑦ). ᐊᐃᖕᒋᑎᒍᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᑐᑭᓯᒋᐊᕈᑎᖃᖅᑎᑦᑎᓂᐊᖅᑐᑦ ᐋᖅᑯᐃᑦ ᑲᑎᙵᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᓴᓇᓯᒪᓂᖕᒋᓐᓄᑦ, ᐊᒻᒪᓗᑦᑕᐅᖅ ᖃᐅᔾᔭᑎᐅᓗᑎ ᐊᐅᖕᒋᑎᒍᑦ ᓇᓗᓇᐃᖅᓯᓂᖕᒋᓐᓄᑦ ᓇᒦᓐᓂᖓᓄᑦ ᐊᑐᓕᕈᓐᓇᕐᓂᖕᒋᓐᓄᑦ ᐅᑭᐅᑕᖅᑐᒥ ᖃᓄᐃᓐᓂᕆᔭᖕᒋᓐᓂ. ᒥᑭᔫᑎᕋᕐᕆᑦ ᐃᓗᓕᖕᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖕᒋᑦ ᑐᑭᓯᒋᐊᕈᑎᖃᖅᑎᑦᑎᓂᐊᖅᑐᑦ ᑕᒪᒃᑭᓐᓂ ᓂᕆᖃᑦᑕᖅᑕᖕᒋᓐᓂ ᐊᒻᒪ ᓇᒨᖓᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ.[3] ᐊᔾᔨᓐᖑᐊᑎᒍᑦ ᓇᓗᓇᐃᖅᑕᐅᓂᖕᒋᑦ: ᐋᖅᑯᐃᑦ ᐊᔾᔨᓕᐅᖅᑕᐅᓂᐊᖅᑐᑦ ᐊᑐᕐᓗᑎ ᖃᕋᓴᐅᔭᒃᑰᕈᓐᓇᖅᑐᒧᑦ SLR ᐊᔾᔨᓕᐅᕈᑎᓄᑦ. ᐊᑕᐅᓯᒡᒍᑏᑦ ᐋᖅᑯᐃᑦ ᐊᔾᔩᖕᒋᑦᑐᓂᑦ ᖃᓄᐃᓕᖓᓂᖃᖅᑐᑦ (ᓇᐸᒋᑕᖕᒋᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᑦ ᐊᒻᒪ ᐃᔾᔨᖕᒋᑕ ᓴᓂᐊᓃᑦᑐᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᑦ) ᐊᑐᖅᑕᐅᔫᓇᖅᑐᑦ ᓇᓗᓇᐃᖅᓯᒍᒍᑎᐅᓗᑎ. ᐊᔾᔨᓐᖑᐊᑎᒍᑦ ᓇᓗᓴᐃᖅᑕᐅᓂᖕᒋᓐᓄᑦ ᐊᑐᖅᑕᐅᖃᑦᑕᖅᓯᒪᔪᑦ ᐊᔾᔩᑎᑎᓪᓗᑎ ᐋᖅᑯᐃᑦ ᓅᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᐊᔾᔩᖕᒋᑦᑐᓂᑦ ᓇᒦᓐᓂᖕᒋᓐᓂ ᐊᒻᒪ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᑐᑭᓯᔮᔅᓴᐅᔪᑦ ᓇᒨᖓᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ. ᒥᔅᓴᐅᓴᑦᑕᐅᓯᒪᔪᑦ ᐋᖅᑯᐃᑦ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᐅᓪᓗᒥᒨᖓᓕᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᐊᑐᕐᓗᑎ ᑭᓪᓕᓯᓂᐊᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᔾᔪᓇᖅᑐᓂᑦ ᐊᔾᔩᓐᖑᐊᑎᑦᑎᔾᔪᓇᖅᑐᑦ ᐊᒥᓱᐊᖅᑎᕐᓂᖕᒋᑦ ᓄᑖᑦ ᓇᓗᓇᐃᖅᑕᐅᔪᑦ ᐊᒻᒪ ᑕᑯᔭᐅᒃᑲᓂᖅᑐᑦ ᐋᖅᑯᐃᑦ.[4] ᓂᐱᖕᒋᑎᒍᑦ ᓂᐱᓕᐅᖅᑕᐅᔪᑦ ᐊᒻᒪ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᑕᑯᔭᐅᔪᑦ: ᐋᖅᑯᐃᑦ ᓂᐱᖕᒋᑦ ᓂᐱᓕᐅᖅᑕᐅᔾᔪᓇᖅᑐᑦ ᐊᑐᖅᓗᑎ ᐃᒪᕐᒥ ᑐᓵᔾᔪᑎᒥᑦ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐅᒥᐊᕐᒥᑦ (ᓲᕐᓗ,ᐃᖅᑲᖓᓂᐅᖕᒋᑦᑐᖅ). ᑕᕝᕙᓂᔅᓴᐃᓇᖅᑕᐅᖅ ᐋᖅᑯᐃᑦ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᑦ ᓂᐱᓕᐅᖅᑕᐅᓂᐊᕐᒥᔪᑦ ᖃᖓᑕᓲᕋᕐᖁᒧᑦ ᐅᖓᓯᓐᓂᖃᖅᑐᓂᑦ ᖃᓂᒋᔭᖓᓂ 300-1000 ᒦᑕᐃᑦ ᑎᑭᓯᒪᔪᓄᑦ 30 ᒥᓂᑦ ᐊᑐᓂ ᓂᐱᓕᐅᕆᓂᐅᔪᓂᑦ/ ᑲᑎᙵᔪᓂᑦ. ᐋᖅᑯᐃᑦ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑐᑦ ᐊᒻᒪ ᖃᐅᔨᓴᖅᑕᐅᓗᑎ ᑐᑭᓯᑦᑎᐊᓂᖅᓴᕆᓗᒋᑦ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᓂᐱᖕᒋᑦ ᖃᓄᐃᑦᑑᓂᖕᒋᓐᓄᑦ, ᓯᕗᓪᓕᖅᐹᖑᓂᐊᖅᑐᖅ ᐊᑐᖅᑕᐅᔪᖅ ᐊᑯᕐᓗᑎ ᓂᐱᓄᑦ ᓂᐱᓕᐅᕆᔾᔪᑎᑎᓄᑦ ᖃᐅᔨᓴᕐᓗᒋᑦ ᐋᖅᑯᖅᑕᖃᕐᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᖃᓄᐃᓘᖅᑕᐅᔪᓂᑦ (ᓲᕐᓗ ᐆᒪᔪᓂᑦ ᓂᕆᔪᑦ) ᑲᓇᑕᒥ ᐅᑭᐅᑕᖅᑐᖓᓂ.[5] ᖃᖓᑕᓲᒃᑯᑦ ᐊᔾᔨᓐᖑᐊᑦ: ᖃᖓᑕᓲᒃᑯᑦ ᐊᔾᔨᓕᐅᖅᑕᐅᔪᑦ ᖃᖓᑕᓱᕋᕐᖁᒧᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑐᑦ ᐱᔭᐅᓗᑎ ᐋᖅᑯᐃᑦ ᑎᒥᖕᒋᑕ ᐊᖕᒋᓂᖕᒋᑦ ᐊᒻᒪ ᖃᓄᐃᓐᓂᕆᔭᖕᒋᑦ. ᖃᖓᑕᓲᒃᑯᑦ ᐊᔾᔨᓐᖑᐊᑦ ᐊᑐᖅᑕᐅᔾᔪᓇᕐᒥᔪᑦ ᓇᓗᓇᐃᕐᓗᒋᑦ ᐋᖅᑯᓕᐅᒃᑲᓂᕐᓂᖕᒋᓐᓄᑦ ᖃᓄᐃᓕᖓᓂᕆᔭᖕᒋᓐᓂ (ᓲᕐᓗ, ᓇᔾᔨᔪᑦ ᐊᕐᓇᐃᑦ) ᐊᒻᒪ ᐊᑲᑦᑐᖅᓯᒪᔪᒥᑦ ᑐᑭᓯᒋᐊᕈᑏᑦ (ᓲᕐᓗ ᑲᑎᙵᔪᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓂ, ᓇᔾᔨᖃᑦᑕᕐᓂᖕᒋᑦ) ᐊᔾᔩᕖᖕᒍᐊᑎᓪᓗᒋᑦ ᐊᕐᕿᒎᓯᒪᔪᓂᑦ ᐱᔭᐅᓗᑎ ᐱᕐᑯᕐᓂᖕᒋᓐᓄᑦ ᐊᓯᔾᔨᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ.ᐃᓚᒋᔭᖓ ᑐᕌᓚᓪᓗᐊᑕᖓ ᐅᑭᐅᑕᖅᑐᒥ ᐋᖅᑯᓂ ᖃᐅᔨᓴᕐᓂᑎᓐᓄᑦ ᓴᖅᑭᖅᑎᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᖅᑎᓄᑦ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐅᑭᐅᑕᖅᑐᒥ ᓄᓇᓕᓐᓂᑦ. ᐃᓄᐃᑦ ᓄᓇᑖᖃᑕᐅᓯᒪᔪᑦ ᐃᖅᑲᓇᐃᐃᔭᖅᑎᑕᐅᔪᑦ ᖃᐅᔨᓴᕐᓂᖃᕐᓗᑎ ᐃᓕᓐᓂᐊᖅᑎᑕᐅᕙᑦᑐᑦ ᐋᖅᑭᑦᑕᐅᓂᖕᒋᓐᓄᑦ ᕿᒻᒨᐊᑦᑎᑕᐅᓯᒪᔫᒃᑯᑦ ᐊᐅᓪᓚᑎᑎᔾᔪᑏᑦ, ᖃᐅᔨᓴᕋᕐᓴᑖᓂᕐᒧᑦ ᐊᒻᒪ ᑐᖅᑯᖅᑕᐅᓂᖕᒋᓐᓄᑦ ᐋᖅᑯᓃᖖᖅᑐᑦ, ᐊᔾᔨᓐᖑᐊᑦ, ᐊᒻᒪ ᑐᑭᓯᒋᐊᕈᑏᑦ ᖃᕋᓴᐅᔭᒨᖅᑕᐅᓂᖕᒋᓐᓄᑦ. ᐃᖅᑲᓇᐃᔭᖅᑎᑦᑎᓚᔪᑦᑐᒍᑦ ᑕᓪᓕᒪᓂᑦ ᓄᓇᓕᒻᒥ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐃᑲᔪᖅᑎᓂᑦ ᐊᒻᒪ ᐊᑐᖅᑐᐊᖅᑐᑕ ᓱᓇᒃᑯᑖᓂᑦ (ᓲᕐᓗ, ᐅᒥᐊᑦ) ᐅᕙᒍᑦ ᐃᖅᑲᓇᐃᔫᓐᖓᓄᑦ, ᐃᖅᑲᓇᐃᔭᕐᓂᖅᑎᓪᓗᑕ ᓴᖅᑭᑎᑦᑎᓗᑕ ᑲᑎᙵᓐᖓᔪᓂᑦ ᐃᒻᒥᒍᖅᑐᒥᑦ, ᐃᓄᓐᓄᑦ ᑐᑭᒧᐊᖅᑎᑕᐅᔪᑦ ᖃᐅᔨᓴᖅᑏᑦ ᐊᑲᑦᑐᖅᓯᒪᔪᒥᑦ.ᓱᒻᒪᑦ: ᐋᖅᑯᐃᑦ ᐱᒻᒪᕆᐅᔪᑦ ᐆᒪᔪᓂᑦ ᓂᕆᖃᑦᑕᖅᑐᑦ ᐃᒪᖓᓂ ᐊᕙᑎᖓᓂ ᓯᓚᕐᔪᐊᓕᒫᒥᑦ. ᐊᒥᓱᕈᕆᐊᖅᑐᑦ ᐋᖅᑯᐃᑦ ᑕᑯᔭᐅᖃᑦᑕᖅᑐᑦ

ᑲᓇᓐᓇᖕᒐᓂ ᑲᓇᑕᒥ ᐅᑭᐅᑕᖅᑐᒥ ᐊᒥᓲᓕᖅᑐᓂᑦ ᐊᖏᒍᓂᑦ, ᐊᑦᑐᐊᓂᖃᕐᓇᖅᑐᑦ ᑭᑯᖃᖕᒋᓂᖅᓴᐅᓕᕐᓂᖕᒐᓄᑦ ᐊᒻᒪ ᓯᑯᖃᓂᖕᒐᓄ ᐊᑯᓂᐅᓂᖕᒐᓄᑦ, ᓴᖅᑭᑎᑦᑎᓯᒪᔪᑦ ᐃᓱᒫᓘᑎᓂᑦ ᐱᔾᔪᑎᖃᖅᑐᓂᑦ ᐊᕙᑎᖕᒐᓄ ᐊᑦᑐᖅᑕᐅᔪᓂᑦ ᐅᑭᐅᑕᖅᑐᒥ ᐊᕙᑎᖕᒐᓂ. ᐋᕐᓗᐃᑦ ᑲᓇᓐᓇᖕᒐᓂ ᑲᓇᑕᒥ ᐅᑭᐅᑕᖅᑐᒥ ᓂᕆᖃᑦᑕᖅᑐᑦ ᐃᒪᕐᒥᐅᑕᓂᑦ ᐆᒪᔪᓂᑦ (ᑑᒑᓛᑦ, ᕿᓚᓗᒐᐃᑦ, ᐊᕐᕌᑦ, ᐊᒻᒪ ᓇᑦᑏᑦ). ᐋᕐᓗᐃᑦ ᐆᒪᔪᓂᑦ ᓂᕆᖃᑦᑕᕐᓂᖕᒋᑦ ᐊᔅᓯᕈᑎᑦᑎᔪᑦ ᐊᕙᑎᖕᒐᓂ, ᐱᖁᓯᓄᑦ, ᐊᒻᒪ ᑮᓇᐅᔾᔭᓕᕆᓂᕐᒧᑦ ᐱᒻᒪᕆᐅᔪᓂᑦ ᐃᒪᕐᒥᐅᑕᓂᑦ ᐆᒪᔪᓂᑦ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᐊᑦᑐᐃᓂᖃᕈᓐᓇᖅᑐᑦ ᒪᑭᒪᑎᑕᔅᓴᐅᓂᖕᒋᓐᓄᑦ ᐊᑐᖅᑕᐅᑦ ᓂᕿᔅᓴᓄᑦ ᐃᓄᓐᓄᑦ/ᐅᑭᐅᑕᖅᑐᒥᐅᑕᓄᑦ.ᐃᓚᒋᐊᕐᓗᒍ, ᖃᐅᔨᓴᕐᓂᕆᓯᒪᔭᕗᑦ ᑕᑯᔅᓴᐅᑎᑦᑎᓯᒪᔪᑦ ᑖᒃᑯᐊ ᐋᕐᓗᐃᑦ ᑕᑯᔅᓴᐅᓂᖕᒋᑦ ᐊᓯᔾᔩᒍᓐᓇᖅᑐᑦ ᓇᒧᖕᒐᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᓅᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ ᓂᕆᖃᑦᑕᖅᑕᖕᒋᓐᓂ ᐆᒪᔪᓂᑦ. ᐊᖕᒋᓪᓕᕙᓪᓕᐊᓂᖃᖅᑐᖅ ᐃᓱᒫᓗᑕᐅᔪᑦ ᐃᓄᐃᑦ ᓄᓇᓕᖕᒋᓐᓂ ᑖᒃᑯᐊ ᐊᒥᓯᕈᖅᐸᓪᓕᐊᔪᑦ ᐋᕐᓗᐃᑦ ᐱᑕᖃᕐᓂᖕᒋᑦ ᐅᑭᐅᑕᖅᑐᒥ ᐱᐅᖕᒋᑦᑐᒥᑦ ᐊᑦᑐᐃᓂᖃᖅᑎᑦᑎᔪᓐᓇᖅᑐᑦ ᐃᑭᐃᑕᖅᑐᒥ ᐃᒪᕐᒥᐅᑕᓂᑦ ᐆᒪᔪᓂᑦ. ᐊᒥᓱᒐᓚᐃᑦ ᐃᓄᐃᑦ ᓄᓇᓕᖕᒋᑦ ᐊᐱᕆᓯᒪᔪᑦ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᓂᑦ ᓇᓗᓇᐃᕐᓗᒋᑦ ᐋᕐᓗᐃᑦ ᐊᒥᓲᓂᖕᒋᑦ ᒪᑭᒪᑎᑕᔅᓴᐅᔪᓂᑦ ᐋᕐᓗᖅᑕᐅᔪᓐᓇᕐᒪᖔᑕ ᐅᕝᕙᓘᓐᓃᑦ ᑐᖁᕋᖅᑕᐅᓗᑎ. ᒣᑐᑭᓯᓗᒋᑦ ᖃᓄᖅ ᐋᕐᓗᐃᑦ ᑲᓇᓐᓇᖕᒐᓂ ᑲᓇᑕᒥ ᐅᑭᐅᑕᖅᑐᒥ ᐊᑦᑐᐃᓂᖃᕐᒪᖔᑕ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᐃᒪᕐᒥᐅᑕᐃᑦ ᐆᒪᔪᐃᑦ ᐊᖑᓇᓱᑦᑕᐅᔭᑦᑐᑦ ᐃᓄᓐᓄᑦ, ᐱᒃᑲᓐᓂᓇᐊᖃᖅᑐᒍᑦ ᑐᑭᓯᒋᐊᕈᑎᓂᑦ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᓴᓇᓯᒪᓂᖕᒋᓐᓄᑦ, ᐱᑕᖃᕐᓂᖕᒋᓐᓄᑦ ᐊᒻᒪ ᐊᒥᓲᓂᖕᒋᓐᓄᑦ ᐊᓯᔾᔩᖃᑦᑕᖅᑐᑦ, ᐊᒻᒪ ᐊᕙᑎᖕᒐᓂ (ᓲᕐᓗ, ᓇᒧᖕᒐᖃᑦᑕᕐᓂᖕᒋᑦ, ᓅᖃᑦᑕᕐᓂᖕᒋᑦ, ᓂᕆᖃᑦᑕᖅᑕᖕᒋᑦ ᐊᒻᒪ ᐆᒪᔪᕋᓱᐊᓂᕐᒧᑦ ᖃᓄᐃᓘᖃᑦᑕᕐᓂᖕᒋᓐᓄᑦ) ᐊᕕᑦᑐᖅᓯᒪᔪᒥᑦ.ᓇᒥ: ᓴᓐᓂᕈᑎᐅᑉ ᑐᓄᓂᕈᓯᐅᓪᓗ ᐃᒪᖕᒐ (ᐃᒃᐱᐊᕐᔪᒃ).ᖃᖕᒐ: ᐋᒡᑮᓯᒥᐅᓚᒍᑦᑐᖅ, ᑭᓯᐊᓂ ᐃᒻᒪᖅ ᔪᓚᐃᒥ ᑎᑭᑦᑐᒍ ᑭᓯᐊᓂ ᐃᒻᒪᖅ ᔪᓚᐃᒥ ᑎᑭᑦᑐᒍ ᐱᓇᒧᑦ ᐋᕐᓗᐃᑦ ᐊᖏᒍᒍ ᐃᓗᐊᓂ ᑕᑯᔭᐅᖃᑦᑎᓪᓗᒋᑦ ᐊᒻᒪ ᓯᓚᖕᒐᓄ ᖃᓄᐃᓐᓂᕆᔭᖕᒋᓂ ᐅᒥᐊᕐᒥ ᖃᐅᔨᓴᕈᓐᓇᓂᕐᒧᑦ. ᐊᒥᓯᓄᑦ ᐊᖏᒍᓄᑦ ᐱᓕᕆᐊᖅ (2026-2029).

Personnel

Personnel on site: 10

Days on site: 30

Total Person days: 300

Operations Phase: from 2026-07-09 to 2029-10-25

Hulilukaarutit

Inigiya	Hulilukaarut Qanurittuq	Nunannga Qanurittaakhaanik	Initurlinga qanuritpa	Initurlinga utuqqarnitat unaluuniit Ingilraaqnitat Uyarannguqtut akhuurninnga	Qanitqiyauyuq qanitqiamut nunallaat kitulluuniit ahiruqtailiyainnit nuna
polygon encloses area of boat-based field work	Scientific/International Polar Year Research	Marine	n/a	n/a	within 0 to 200 km of Ikpiarjuk/Arctic Bay
location of field camp (at or near Kakiak)	Camp	Inuit Owned Surface Lands	site has a long history of use by Inuit (hunting, seasonal occupancy)	n/a -- but in current use by Inuit as hunting camp	approx 70 km from Arctic Bay

Nunaliin Ilauyun, Aviktuqhimayuniitunullu Ikayuuhiarunguyun

Nunauyuq	Atia	Timiuyuq	Upluani Uqaqatigiyaungmata
Ikpiaryuk	Bianca Amaaq, Manager Ikajutit HTA	Ikajutit HTA	2025-11-30

Angiuttauvaktunik

Naunaiqlugu nunanga talvani havauhikhaq ittuq:

North Baffin

Angiuttauvaktunik

Munariniqmut Ayuittiaqtuq	Angirutinga Qanurittuq	Tadja Qanurittaakhaanik	Ublua Tuniyauyuq/Uuktuqtuq	Umikvikhaa Ublua
Iqalukhiurniqmut Tariuqmilu Kaanata	Federal government departmentLicense to Fish for Scientific PurposesAuthorization to disturb a marine mammal (drone)	Applied, Decision Pending		

Project transportation types

Transportation Type	Qanuq Atuqtauniarmangaa	Length of Use
Water	local boats 18-27 feet	
Land	just at camp, walking around camp and to and from boats	

Project accomodation types

Temporary Camp

Ihuaqutivaluin Atuqtauyukhan

Hanalrutit atuqtaunahuat (ukuallu ikuutat, pampiutainnik, tingmitinik, akhaluutinik, hunaluuniit)

Hanalrutit Qanurittuq	Qaffiuyut	Aktikkulaanga – Qanurittullu	Qanuq Atuqtauniarmangaa
longhouse canvas tent	2	10x12	camp kitchen/meeting place and equipment storage
personal camping tents	5	6x6	each person sleeps in their own personal tent/space
generator	1	honda 2000	run electronics in camp (eg laptops, battery charging)
boat	2	TBD	Two boats will be required for access to killer whales and deployment of tags, biopsies, and hydrophones. Boats are either contracted through the local Hunters and Trappers Organizations or Inuit owned outfitters (if available).
crossbow	2	35.5 inches	Two crossbows used for deploying satellite tags and biopsy darts.
Drone	2	12x9.5x3.3 inches	Drones will be used to assess killer whale hunting behavior, numbers, group composition, and individual body condition.
Hydrophone	2-4	530mm x 60 mm	Hydrophones will be deployed to collect and record underwater noise, shipping, and vocalizations from marine mammals, with primary goals to assess killer whale vocal behavior while hunting, as well prey response.

Qanurittuq Urhuqyuaq unalu Qayangnaqtut Hunavaluit Aturninnga

Qanurittuq urhuqyuaq hunavaluit aturninnga:	Urhuqyuaq Qanurittuq	Qaffiuyut qattaryut	Qattaryuk Aktikkulaanga	Atauttimut Qaffiuyut	Ilanga	Qanuq Atuqtauniarmangaa
Gasoline	fuel	4	206	824	Liters	boat fuel, generator fuel
Propane	fuel	5	20	100	Lbs	primarily to run cooking stoves
Other	fuel	12	4	48	Liters	naphta to run stoves

Imaqmik Aturninnga

Ubluq qanuraaluk (m3)	Aturumayain imavaluin utiqtittagaani qanuq	Atulirumayain imavaluin utiqtittagani humi
1	most likely from a stream or river near camp; when possible, marine ice	there is a stream close to camp location and a larger river a bit farther away; sea ice if possible

Iqqakuq

Ikkakunik Munakgiyauyunik

Havauhikhaq Hulilukaarut	Qanurittuq Iqqakut	Ihumagiyauyuq Qanuraaluktut Atuqtait	Qanuq Iqqakuurniarmangaa	Halummaqtirarnirutikhan piyutin
Camp	Qirnarivyaktuq imaq	<1 m^3	Greywater will be disposed in a sump hole at least 30 m away from the high water mark and sleeping areas.	none
Camp	Ikulalimanngittun iqqakuuvaluin	1 m^3	will be packed up and disposed of in Arctic Bay	none
Camp	Anaagun (inuin anaaguin)	0.5 m^3	Sewage will be buried in compostable bags in a sump hole at least 30 m away from the high water mark and sleeping areas.	none

Avatiliriniqmut Ayurhautingit:

No adverse effects are expected based on this project. We will prevent potential fuel spills by storing all liquid fuels in a temporary berm located at least 30m above the high water mark. All liquid fuel transfer will be done within this berm using appropriate nozzles/funnels; and a spill kit will be readily available. Unused fuel and empty containers to be removed from site at the end of the program. The environmental impacts of the camp will be minimal. We will use the most durable surfaces when travelling, resting or re-filling water containers to avoid soil compaction/vegetation trampling. Biodegradable soap will be used (only when necessary) for dishwashing and bathing. The use of the motorboat and generator will be kept to a minimum to minimize noise and air pollution.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Qanurittuq Ittunik Avatinga: Avatingalluanga

Qanurittuq Ittunik Avatinga: Inuuhimayunut Avatinga

Qanurittuq Ittunik Avatinga: Inungit-maniliurutingit Avatinga

Miscellaneous Project Information

Naunaiyainiq ukuninnga Ayurhautingit unalu Piumayaat Ikikliyuumiutinahuarutit

Tamatkiumayunik Ihuikgutivaktunik

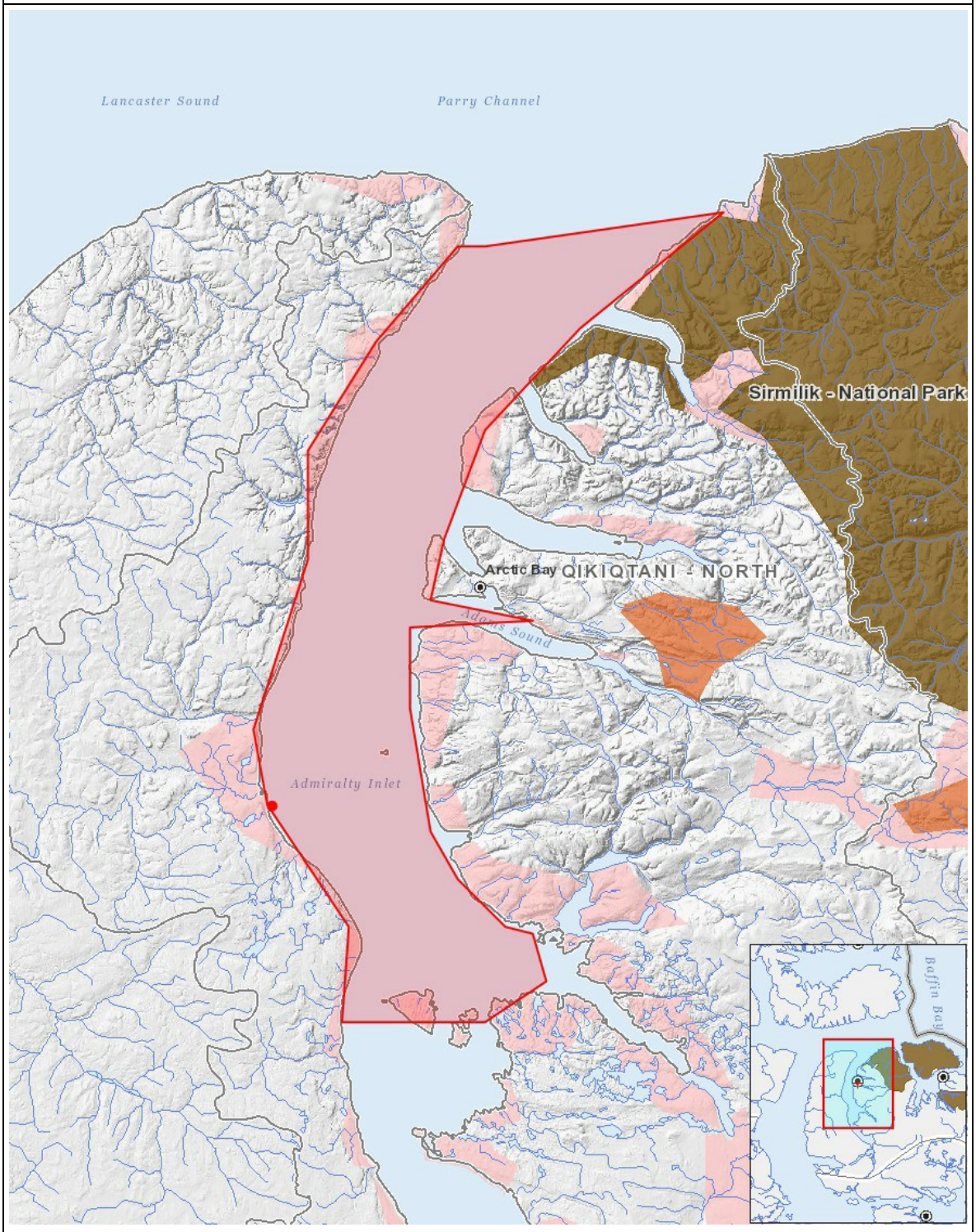
Impacts

Ilitariyauniq Avatiliriniqmut Ayurhautingit

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Havakvinga																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Aulapkaininnga																									
Camp		-	-	-	-	M	-	-	-	M	-	-	M		-	M	-	-	M		-	P	-	-	-
Scientific/International Polar Year Research		-	-	-	-	-	-	-	-	-	-	-	M		-	M	-	-	-		-	P	-	-	-
Piiqtauniq																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Nakuuyuq, N = Nakuungittut unalu mikhilimaittuq, M = Nakuungittut unalu mikhittaaqtuq, U = Naluyauyuq)

Havaariyauyukhamut Nayugaa



List of Project Geometries

1	polygon	polygon encloses area of boat-based field work
2	point	location of field camp (at or near Kakiak)