

## **Tunungani Ualiniqhianut Ikaaqliat Havaaghat Ayuqnaqtunik Qauyihaiyut Naunaitkutait 2019**

Taamna Tunungani Ualiniqhianut Ikaaqliat (Northwest Passage) Havaaghat (NPP) manighaqtitaavaktut Katitauhimayut Aviktuqhimaniit Ayuqnaqtunik Qauyihagtuliqiyinit (US National Science Foundation) qauyihariami aallannguqpalliyuq Ukiuqtaqtumi Taryuq takuhiuqhutik katitiriyunik aallatqiingnik qunngiaqtunik hulilukaaqtunik taryuqmi qaritauyakkut, takughauttiaqtumik National Science Foundation malrungnik (2) ikaaqliuyuq unipkaa, nunallaaqnilu hulilukaaqviinik. Takuhiuqtut umiaqmiinnahuat *RVIB (Qauyihaiyut Umiangat Hikuhiutiklu) Oden-mi*. Ilihaqtaarahuat ilihaqtaaqhimayullu ilauniaqtut takuhiuqtunut taapkualu qauyihaiyit, ingilraaqnitamik qauyihaiyit, unipkaaliuqtit, Nunavunmiutat ilihaqtut, inulrammiq Nunavunmiut ayuqnaqtunik qauyihaiyi, qunngialiuqtillu.

**Ayuqnaqtut qauyihagtauyughat aullaqtitaavaktut qauhittiarumaplugu qanuq immat Kanatam Kiklianit Qikiqtautait (CAA) aallannguqtut uquuhivalliyumi Ukiuqtaqtum Kiklianit.** Inirahuaqpaktavut havaaghat atuqhugit qauhimayut amihunik taryumiutanik qauyihautinik takuhiuqlugit aallannguqhimayut hitamanit (4) havaaghanit.

**Unipkaa 1: Imautit iluliillu harvaqviallu iluani Kanatam Kiklianit Qikiqtautait (CAA)**  
Havaaghanit qauyihainahuat imarikpaallirnia talvani hanguviallu qulvahikpaanit Ukiuqtaqtum Taryuanit uquuhivalliyumi Ukiuqtaqtumi. Mahakpalliyuq, kuugaq harvaqtuq, anurilu aallannguqtaqtuq imarighivalliyutiyuq ualiniqhianit Ukiuqtaqtuq. CAA-t, taamnalluaq Tunungani Ualiniqhianut Ikaaqliat, harvaqviuvaktuq imariktumik Ukiuqtaqtum Taryuanit talvunga Tununganut Atlantic-mut, kihimi, naluyauyuq qanuq harvaqpaktuq imariqtuq hakugingnianiklu immap. Harvaqtut talvani Kanatam Kiklianit Qikiqtautait (CAA) qauyihagtaunahuat atuqlutik Nipikittunik Paqittitjutinik (LADCP) naunaitkutanik, taaffuminngalu CTD-nik (Hakugingnianik, Niklamanianik, Itinianiklu) Tunungani Ualiniqhianut Ikaaqliat Havaaghaanit qauyihainahuat Hinaanit-Hinaanut CTD-nik/LADCP-niklu quulliriiktunik 6-iuyunit nayugaqnit titiraqhimayut umitjam ikaaqvighaanit (X01-X06). Taimaa nakuuniqhanik-ingilrutituqhutik CTD-nik iqqaqhaqpangniat imaq qauyihaglugu CTD-nut naktitaqtuq LADCP-kut.

### **Unipkaa 2: Iyikkut takunnaittut Imaqmiutat Nuutpalliyut**

Ukiuqtaqtumi taryuq uunnakpalliyumi hikulu aughiqpalliyumi, taryumi qaanganiittut aallannguqpalliyut, taryumiutallu anngutighat naatjuhiit aallannguqpangniaqtut. Ihivriuriamik nayugaqnik ikaaqvianit, kingungnut kuvyait qakugunnguraangat kaliyauvangniat taryum qaangani uunatqiyamit imaqmit (ikkatqiyaanik 100 meters-nit). Kuvyaninngaaqtut titiraqtaunahuat. Naunaitkutanut ilauniaqtut qauyihagvium ighivautap-qaanganunngalaanik piksaliutit FlowCam, ilittuqhilaqtumik kitittilaaqtumiklu 'hunavalungnik' taryumit taimaa katiqhuqhimayunik natianit, nauyunik, kingungniklu. Ahiagullu, qauyihautituqlutiklu qunngiaqpagahuaqtait taapkua kinguit iqaluillu imaqmit. Katittugit havaaghat taimaa uumayunik qauyihaiyut ilitturinnaqhitivalliyavaktut.

### **Unipkaa 3: Naatjuhiit Huratjat Kanatami Ukiuqtaqtumi Imautainit**

Huratjat naatjuhiit ingilraviillu atuqtaulaaqtut munaqhiyaamik aallannguqtaqtunik taryumiutat uumayuutainit. NPP qauyihainiaqtut naatjuhiiniklu ilittuqhaqlutik huratjat ikaaqvianit. Katimaviita huratjat nayugainilu uumayuutit taryumi naunaiqtaunahuat aallannganillu qauyihaqtaulutik hivuanit. Ikaaqtut atuqtaulluaqpaktunik kuinginnaittunik, qunngiarutikkut tingmiaqnik kitittivangniat.

### **Unipkaa 4: Immap Haviqarnia ilaliutiyuq Uunnakpalliyumut**

Haviqarnia taapkua methane taamnaluk carbon dioxide tipiit Ukiuqtaqtum Taryuani avatiinilu ihumagiyaavaktut tamangnik uunnakpalliyumut aulaviqaramik naulviqaqhutiklu Ukiuqtaqtumi. Qauyihaiyut haviqarnianik carbon dioxide-mik naunaiqhivigiyaaulaaqtuq nauviinik aallannguqtaqtullu carbon avatipitingnit. Taamna NPP qauyihainiaqtut haviqarnianik carbon dioxide-mi methane-milu qauyihaghugu hila imaqlu ingilrutituqhutik, imaq uunavyaktumit qauyihagniaqtaat methane tipaanik uumayut nungutpalliyuktunik ilittuqhaqlutik.

Avatinit tipinik qauyihaiyut: hila qauyihagtauvangniaqtuq haviqarniit ilittuqhaqlugit taapkua hydrogen oxygen-lu ( $^2\text{H}/^1\text{H}$  taamnaluk  $^{18}\text{O}/^{16}\text{O}$ ) taryumit immaplu minianit haviqarniillu ( $^{13}\text{C}$ ) of  $\text{CO}_2$  taamnaluk  $\text{CH}_4$ .

Taryuqmik qauyihaiyut:  $^{13}\text{-CH}_4$ , taamnaluk  $^{13}\text{-CO}_2$  qauyihagtauhimmaarahuat taryum ataanit imiqtaqhimayunillu qauyihagviat imautaanit. Ahiagullu qauyihainiaqtut taryum ataanit imiqtaqhimayuniklu taapkuninga taryuringnianik, niklamanianik, chlorophyll qaummariqtukkut, kalaliqhimayuq avuhimayut nauyut (cDOM) qaummariktumik avughamik, puplaktuqhutik qauyihaiyut carbon dioxide-mik ( $\text{pCO}_2$ ), pH, taimaa  $\delta^{18}\text{O}$  taryuqmit, nauyut pitquhiit carbon taamnaluk nitrogen (katiqhuqhimayut haviqarniillu), niqighayut ( $\text{NO}_3$ ,  $\text{PO}_4$ , taamnaluk  $\text{Si(OH)}_4$ ). Ayuqnaitpat qauyihavangniallu hikumik.

Imautimik ilittuqhaiyut/qauyihaiyut: 24 ikaaqniit naattaraangata imaaluuniit 100-nik nautical miles-nik ikaaraangat, atpakkuuqtumik “aajjikkutaliugaqmik” immap qanurininganianik imaalu imiqtaqlutik qauyihagtaghanik atuqhutik CTD Rosette-mik.

### **Qauyihaitjut nipiliuqhit**

NPP-nit ikaarahuat ilimayut ihumaaluutaunyuk nipiliuqhitinik atuqtunik ikpingnautauyunik taryumiutanut uumayunut, kihimilluag taryumiutanut anngutighanut. Havauhiit atuqtauniaqturiyauyut ikaaqtunit ikighihimanahuaqtaghait amirnautaulaaqtut.

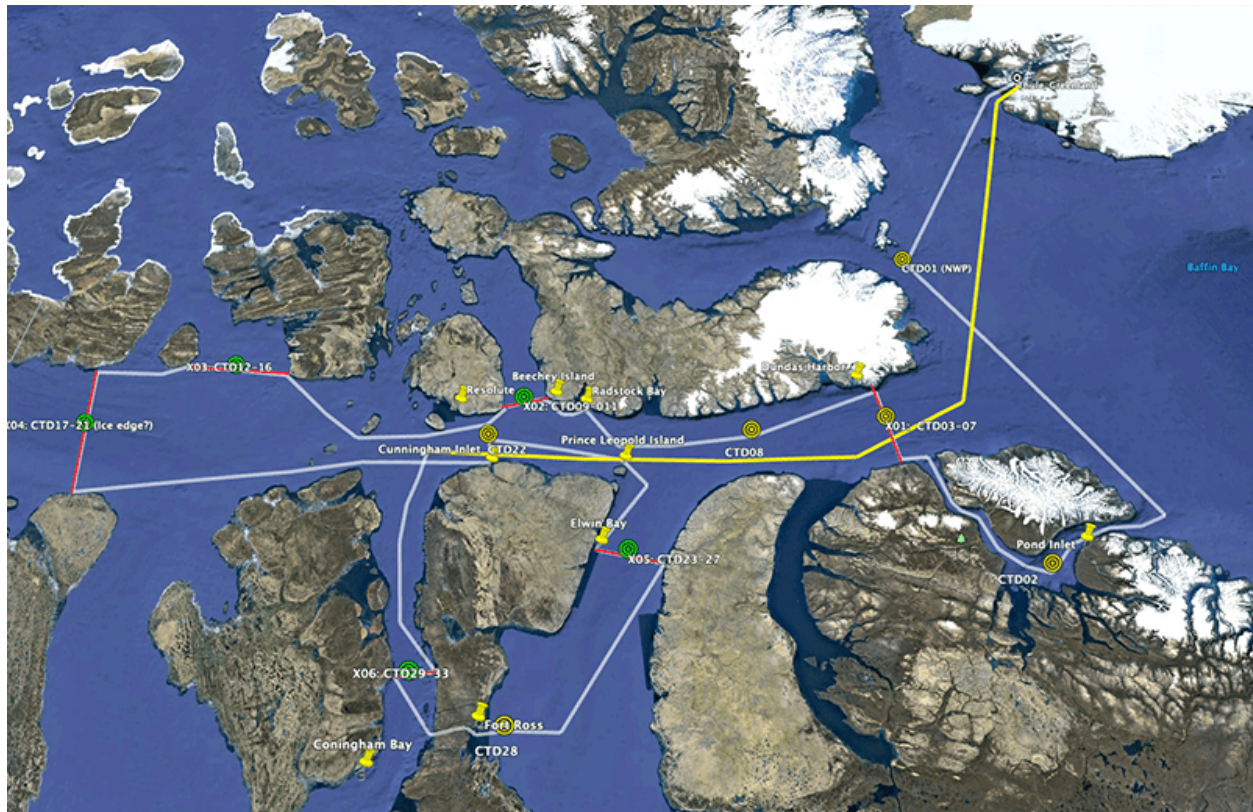
Qauyihautit atuqniaqhimayait talvani NPP 2019-mi ikaaqvianit taapkua iliuraqlugit umiap natianut taapkua 18 kHz nipiliuqhitit (taimaittumikluuniit 38 kHz taimaaluuniit 70 kHz) talvanilu natianit iliurailutik amihunik qauyihautilingmik 12 kHz nipiliuqhitimik auapkailugulu ingilraliqqata, kihimi taimaitpat:

1) Nipiliuqhitinik atuguinqiaqtut paqittigumik anngutighanik ungahiaqtumik 500 m-mik umiaqmit.

- 2) Nipiliuqhit qaminnganahuaqtuq qanilrumiitpat 5 km-nik Nunavunmi nunallaaqmit.
- 3) Ihumaaluutauvaktut amihuuyut tuugaalgit qilalukkat mighaagut hanguyut Ikpiaryumi Mittimatalingmilu, nipiliuqhitit qaminnganahuat Navy Board Kangiqhuani, Eclipse Kangiqhuani, Mittimatalingmilu. Taimaalu qamitauvangniaqtuq CTD-nut iliuraqtauhimayuq LADCP-nguyuq imaqmik qauyihavqianit talvani CTD-nut Havakvianit 02.
- 4) Amigaiqpakkamik taryumiutat anngutighat talvani Bellot Ikirahaanit, qauyihautit nipiliuqhitit atuqtaulaittut talvani Bellot Ikirahaanit imaaluuniit 5 km-nik ungahiaqtumik apuqvianit tamangnit iklugiingnit.
- 5) Hapummiyauhimaguniittut taryumi talvani Prince Leopold Qikiqtaani talvanilu Bylot Qikiqtaani Tingmitjat Nayugait talvanilu Pulaaqtaqtit Kanatami Imautainit, nipiliuqhitit qaminngavangniat.
- 6) Paqittinirumik anngutighanik 200 m-nik qanilruanit umiam taamna LADCP aullaqtitaulaittuq.

### **Angmaumayut Naunaitkutat Maligaghait**

Havaaghanit qauyihainiaqtut ayuqnaqtunik naunaitkutanik qanurininganiiniklu talvuuna NPP-kut qaritauyakkuurutainit. Tamangnik iniqtauhimayut qauyihaghimayut tutquumaniaqtut talvani Ayuqnaqtunik Qauyihagtuliqiyinit-ikayuqhimayainik Ukiuqtaqtumi Naunaitkutanik Tutquumavingnit tamangniklu ihuaqtut Kanatamiutat Inuillu ayuqnaqtunik qauyihaiyut tutquumaviit.



Piksaut 1. Umiaqtuqniaqhimayaat 18-nik uplunik ikaaqvighaat 2019-mik NPP aullaqvighaanit. Ikaaqvighaat taapkualu 6-iuyut qualliriiktut kikliliuqhimayut ikaaqvighaat nunauyaliuriamik taryuutainik (titiraqhimayut aupayaaqtumik). Imaqmik qauyihaviit ilittuqhitiyauhimagut naunaitkuhiqtuqhugit.