

SmartICE tools to support Hudson Bay Search & Rescue

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SMARTICE 



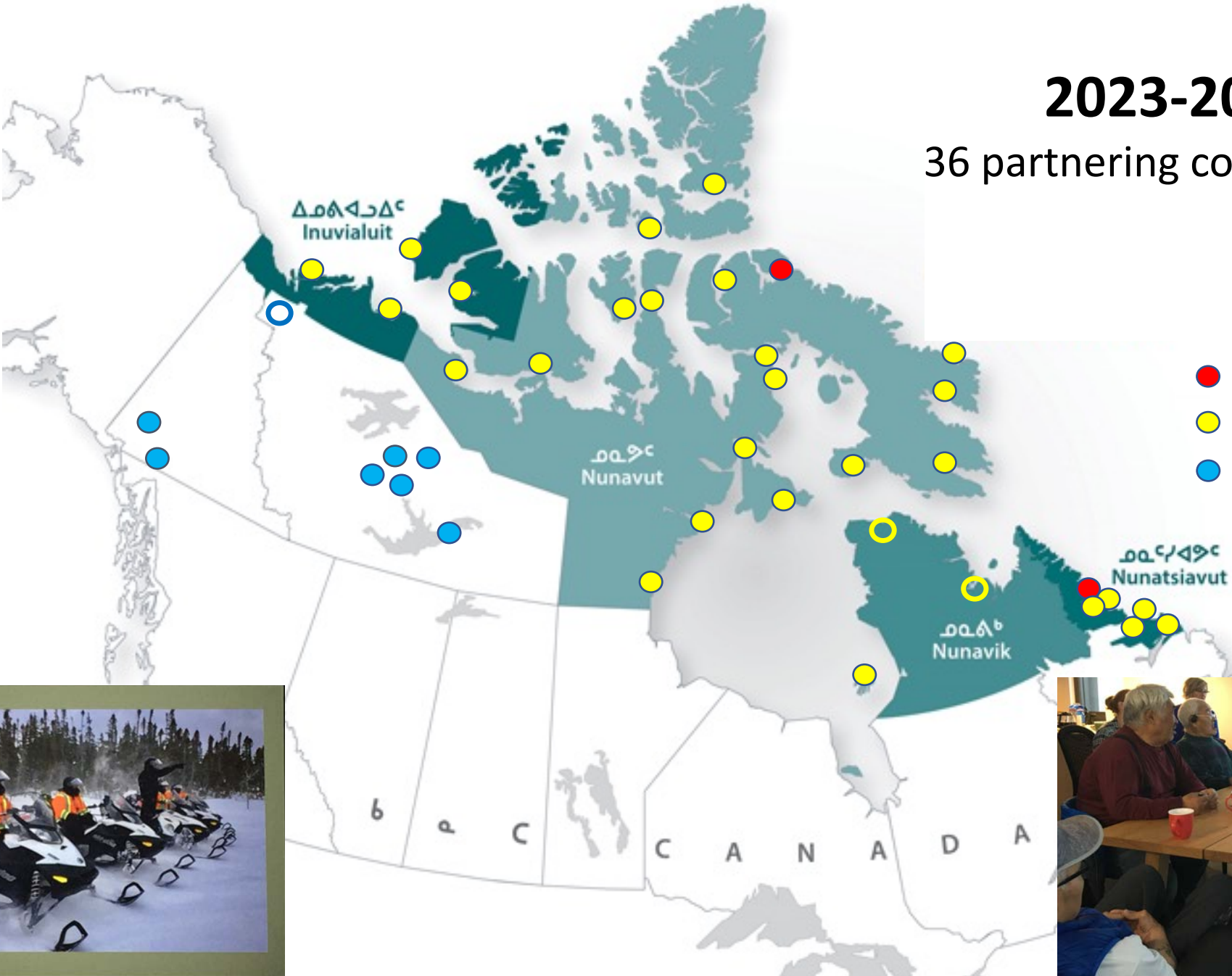


SmartICE Sikulirijiit



2023-2024

36 partnering communities



- Pilot communities
- Expansion communities
- Lake/river communities



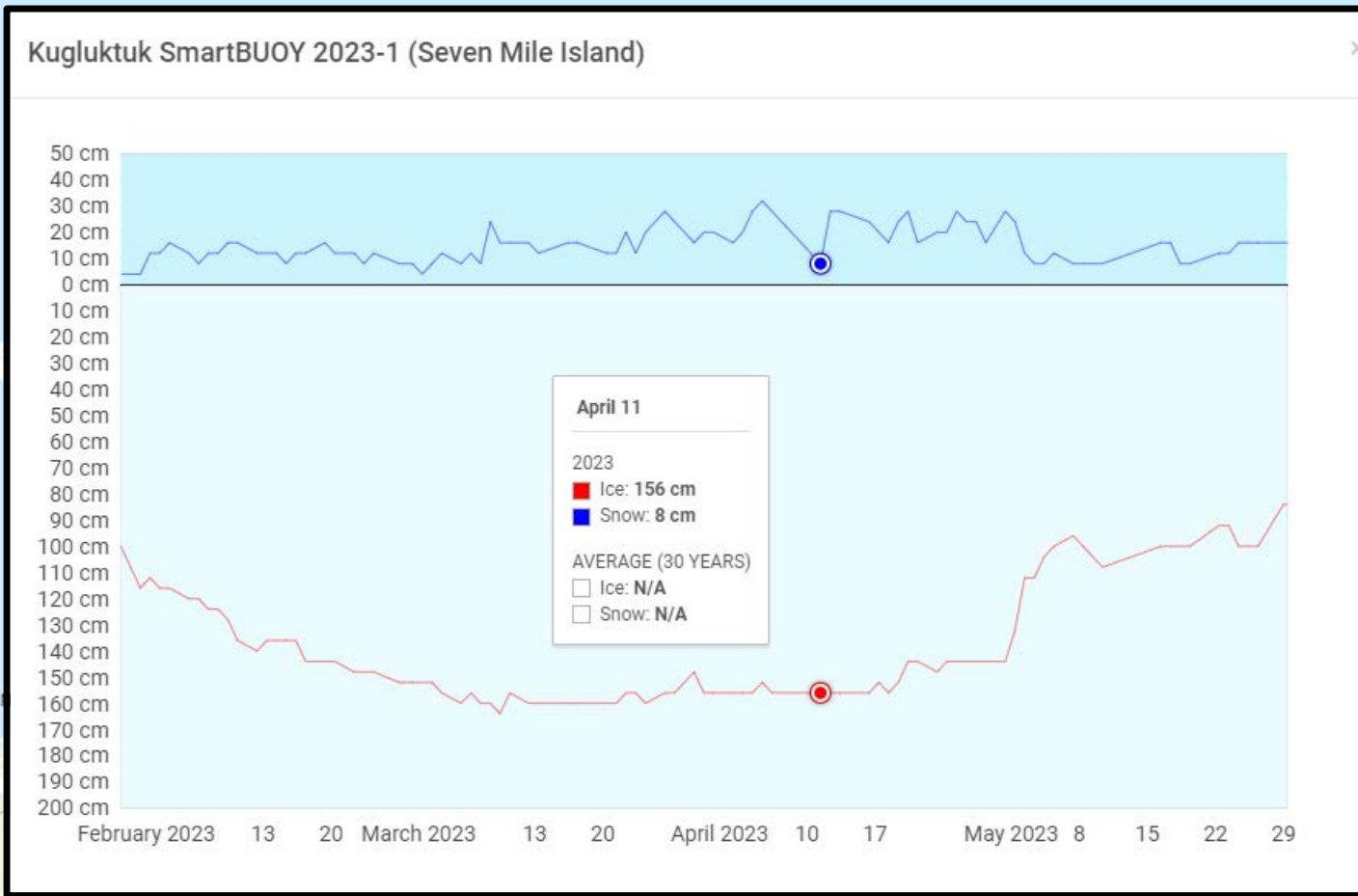
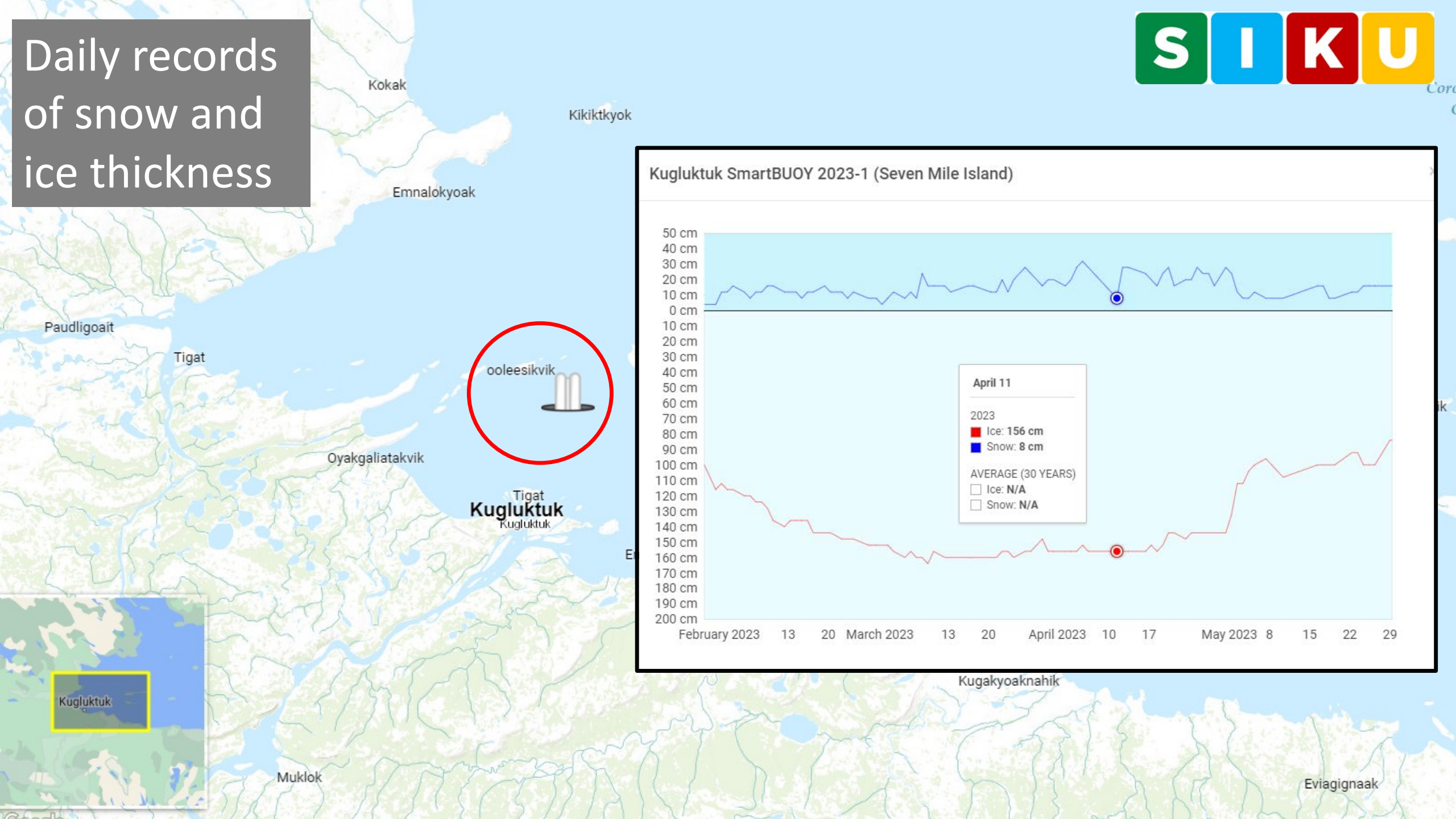
Sikuttiaq Qaujimajatuqangit

Good ice knowledge

- **Daily/weekly ice thickness monitoring** *Sikulirijikkut Pilirijangit*
- **Ice terminology** *Sikuit Taigusinginnik*
- **Ice travel safety posters** *Qaujimajariaqartut Aularniaruvit Sikukkuurniaruvit*
- **Seasonal IQ maps** *Inuit Qaujimajatuqangit Sikukkut Igliniugajuktunut Sikunnguaq*
- **Operational ice travel safety maps** *Nunalimmik Sikunnguaq*



Daily records of snow and ice thickness



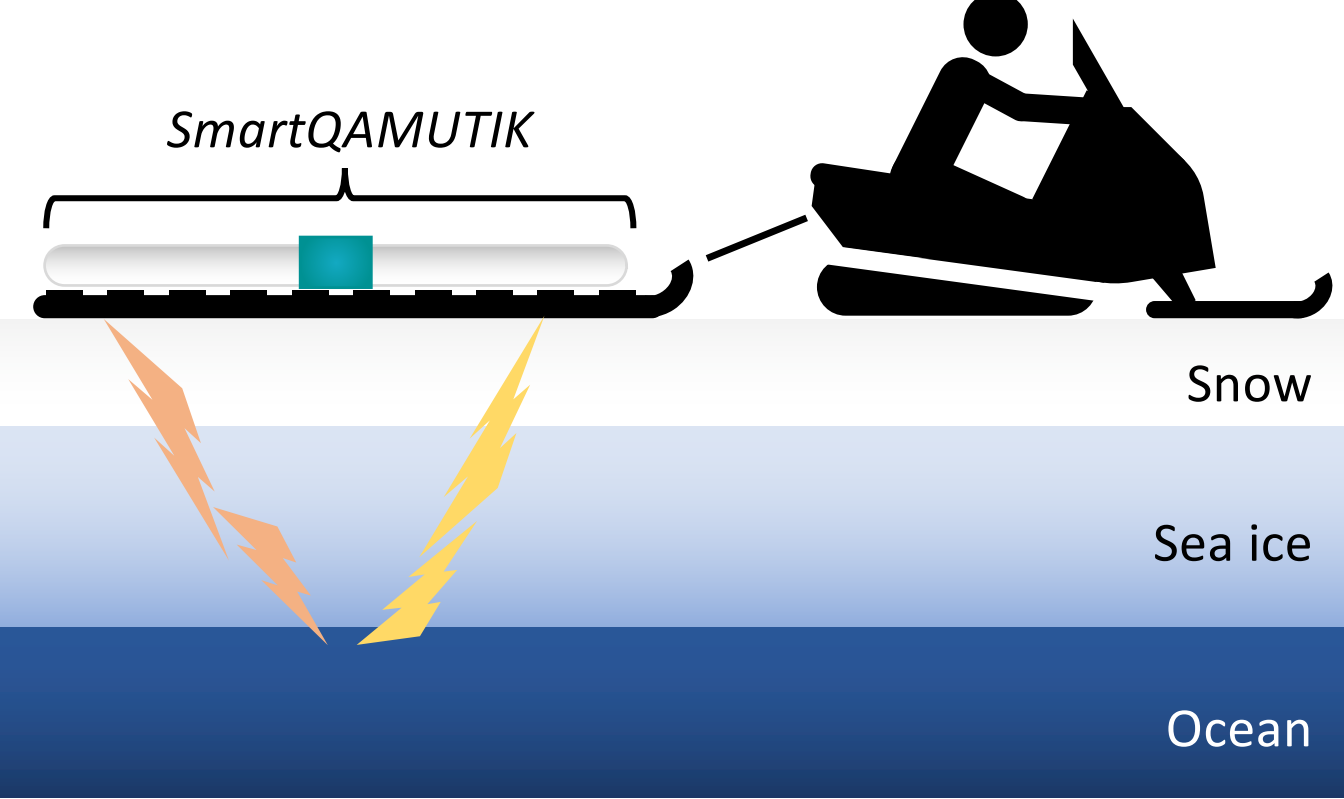
Kugluktuk

Kugakyoaknahik

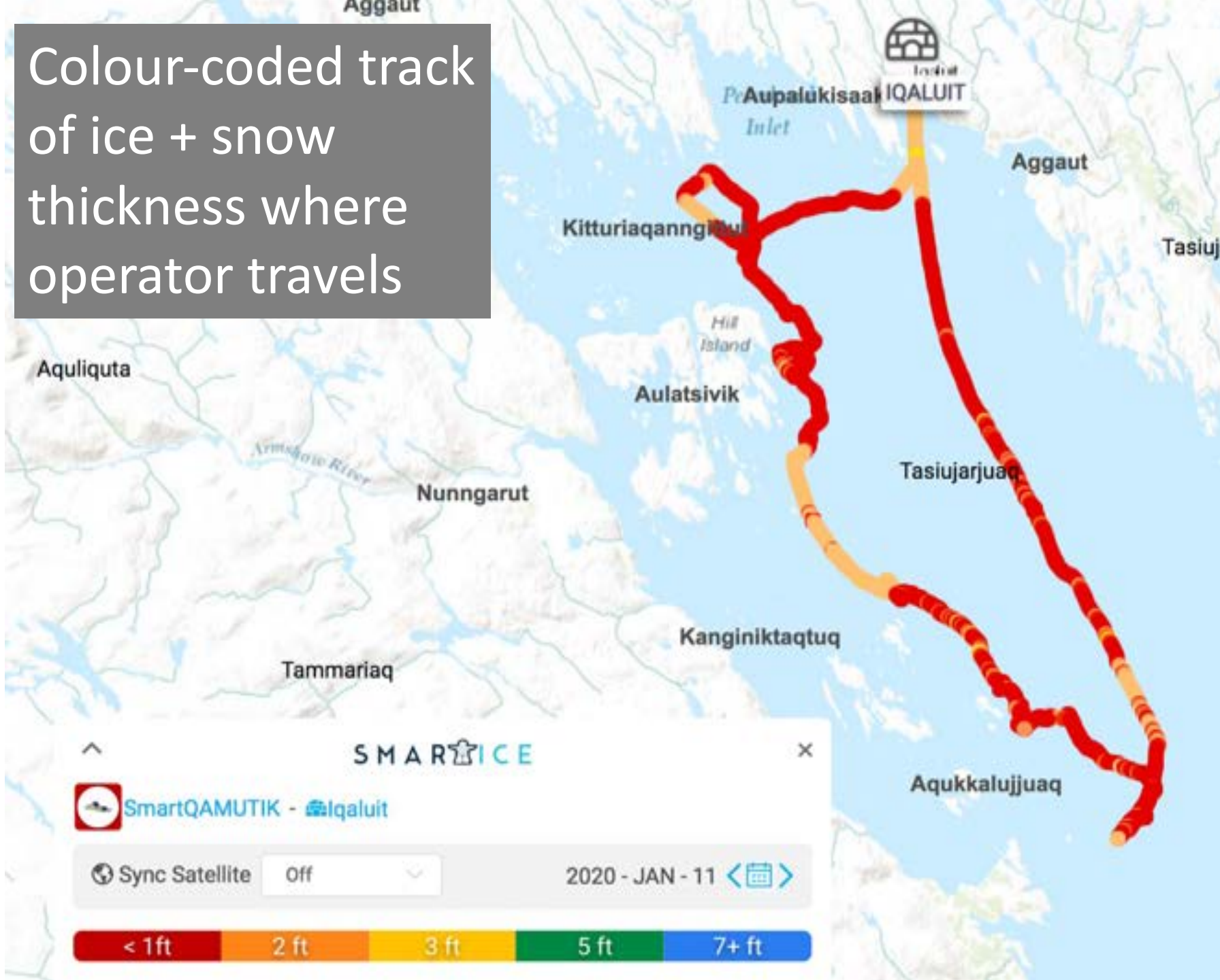
Muklok

Eviaginaak





Colour-coded track of ice + snow thickness where operator travels



SIKU

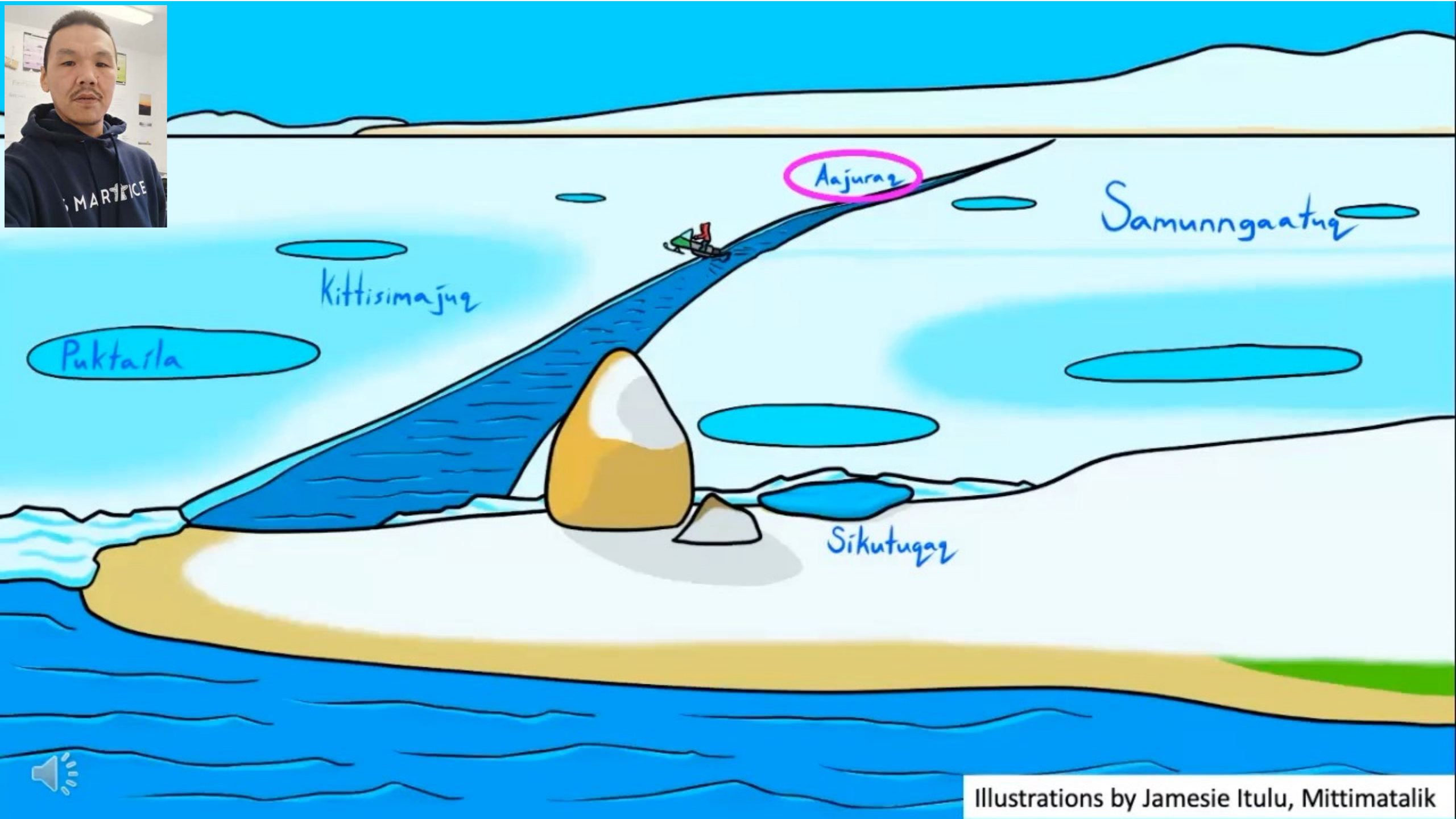


SmartQAMUTIK supporting SAR response



It begins with language and ice terminology





Ice Travel Safety Posters

ᐱᓄᐱᓐ ᐅᓄᓄᓐ...Sikumiut Uqartut...Sikumiut Says...

ᐱᓄᐱᓐ ᐅᓄᓄᓐ ᐱᓄᐱᓐ ᐅᓄᓄᓐ Pivagijarsimaviit ingiraniarlutit sikukkuut? Are you prepared to travel on the sea ice?

Aullalaunginninni silanniarutimi qaujigiaqaaqpaluti
Check the Weather Forecast Before you Leave
And ask experienced hunters about recent conditions and their Inuit Qaujijajatuqangit.

Pitumirtillugu
Lijmirtullugu taqij qanulligalimringanik; ajurritigitunnariaqaravik aullarsimajmut ikpiknaitunnariaqaravik. Taqij inuittullugu imar anginirsauliqattamat, kuuktuullu kulimirsaulituk ingiraniarlutit anginirsaulituni. Maniittut siku maninirsaulituk, nuttait aajuranglutik ammalu imauningit angilgiarlutik.

Inuutlutit Aullaqattangillutit
Never Travel Alone
Two heads are better than one.

Tusaumajutiqarpaklutit
Keep in Touch
Always have a way to communicate when out on the ice. Bring a radio, satellite phone, and SPOT device.

Piruluknartut Qangatuinnaq
Accidents Happen
Always take a first-aid kit, even if you're only planning to go for a few hours.

Uquunasugunnarlutit
Stay warm
Pack a lamp, stove, fuel, candles, matches, lighter, and sleeping bag to keep warm.

Saputisimajunnarlutit
Protection
Carry a rifle and bear spray to protect yourself. You don't want to face down a bear with nothing but your bare hands.

Qaujimalutit Namiimmangaarpit
Know Where You Are
Bring a GPS or map to help you navigate and share your travel routes with family and friends.

Naksakkannirlutit Nauttiamaniartunik
Extra Supplies
Pack more food, water and fuel than you expect to use. And always clean up after yourself; don't leave garbage lying around.

Urkkaa
Shelter
The weather can change, travel delays happen. Carry a tent for protection from the outside elements. Check the Sikumiut maps and add the coordinates of known shelter areas before you go.

Igaak
Shades
On a sunny day always wear sunglasses out on the ice so you don't become snow blind.

Annuraaggikanirpaglutit
Extra Clothing
Always take a second or third pair of clothes with you. What are you going to wear if you accidentally get wet?

Aullalaunginninni silanniarutimi qaujigiaqaaqpaluti
Ammalu apirilutit angunasuktimik qanuituungmangat siku ammalu Inuit Qaujijajatuqangit.

Check the Weather Forecast Before you Leave
And ask experienced hunters about recent conditions and their Inuit Qaujijajatuqangit.

Never Travel Alone
Two heads are better than one.

Piruluknartut Qangatuinnaq
Mattusiksani inuulsautinik naksagattarlutit, utirsaaliniarluarvilluunniit.

Accidents Happen
Always take a first-aid kit, even if you're only planning to go for a few hours.

Saputisimajunnarlutit
Qukiutiim naksagattarlutit amma tingmikaartitijutimit nanumuk saputinasugunnarlutit ilimik. Nanursiaruvit qukiutiqangikkuvit againnamurasikkjaraviuk.

Protection
Carry a rifle and bear spray to protect yourself. You don't want to face down a bear with nothing but your bare hands.

Naksakkannirlutit Nauttiamaniartunik
Nigigikkannirlutit, imiq, ammalu ursurianiartamik. Salumarsaigattarlutit; sanimik qimaigattangillutit.

Extra Supplies
Pack more food, water and fuel than you expect to use. And always clean up after yourself; don't leave garbage lying around.

Igaak
Siquinnitillugu atuqattarlugit igaak sikumiillutit ililijianginnavit.

Shades
On a sunny day always wear sunglasses out on the ice so you don't become snow blind.

Pitumirtillugu
Lijmirtullugu taqij qanulligalimringanik; ajurritigitunnariaqaravik aullarsimajmut ikpiknaitunnariaqaravik. Taqij inuittullugu imar anginirsauliqattamat, kuuktuullu kulimirsaulituk ingiraniarlutit anginirsaulituni. Maniittut siku maninirsaulituk, nuttait aajuranglutik ammalu imauningit angilgiarlutik.

Lunar Tides
Be aware of the moon phases: they could make or break your trip. The full moon creates a lot of water everywhere, more flow from rivers and lakes and stronger ocean currents. Rough ice may get rougher, small cracks may get wider and open water areas may get larger.

Keep in Touch
Always have a way to communicate when out on the ice. Bring a radio, satellite phone, and SPOT device.

Uquunasugunnarlutit
Naksarlugu supuujuuq, sirartuq, patujuag, ikumait, kasuk, ammalu qipik ukuijuutaujunnartut.

Stay warm
Pack a lamp, stove, fuel, candles, matches, lighter, and sleeping bag to keep warm.

Know Where You Are
Bring a GPS or map to help you navigate and share your travel routes with family and friends.

Urkkaa
Sila asillitqattamat, ingirajunnallinnarpak&unilu. Naksagattarlutit tupimik uqarijunnartamik. Qaujigiarlugu sikumiut nunanguaga titirarugillu naasautinga nunanguakutt uqarijujunnartut.

Shelter
The weather can change, travel delays happen. Carry a tent for protection from the outside elements. Check the Sikumiut maps and add the coordinates of known shelter areas before you go.

Annuraaggikanirpaglutit
Naksakkanniqattarlutit maruuknik pingasunikluunniit annuramik. Kisumik atigajarpit masakkuvit?

Extra Clothing
Always take a second or third pair of clothes with you. What are you going to wear if you accidentally get wet?



Sea-ice Inuit Qaujijajatuqangit from the Sikumiut Management Committee for SmartICE in Mittimattak | Illustrations by Jamies Inua, Mittimattak.

Mapping Inuit Ice Travel (geospatial) Knowledge

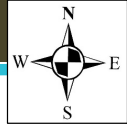


Seasonal IQ Maps

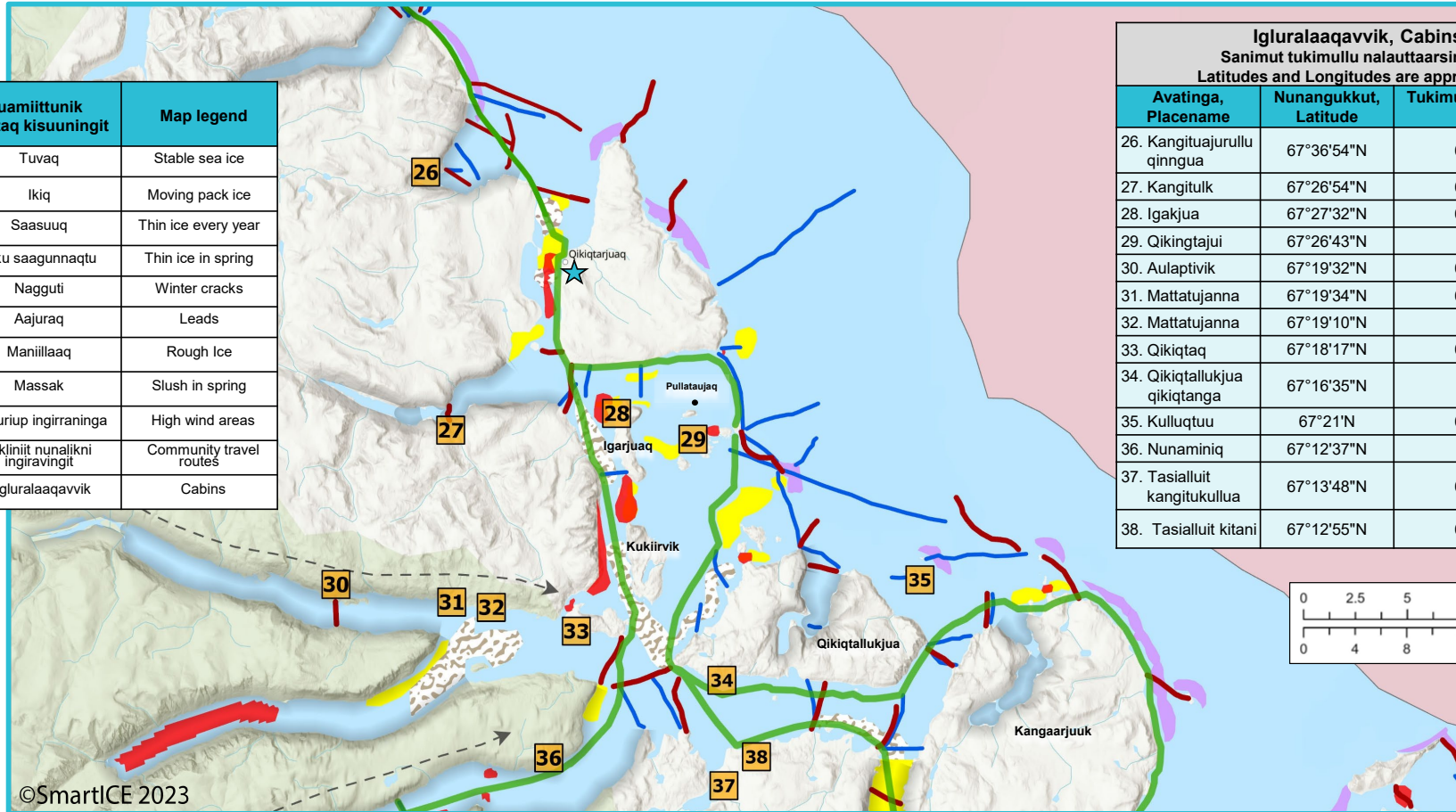
Jaannuari - Juuni, January - June



Qikiqtarjuaq: Inuit Qaujimagatuqangit Sikukkut Igluniugajuktunut Nunanguaq Qikiqtarjuaq: Inuit Qaujimagatuqangit Sea Ice Travel Map



Nunanguamiittunik nalunaikkutaq kisuuningit	Map legend
	Tuvaq Stable sea ice
	Ikiq Moving pack ice
	Saasuq Thin ice every year
	Siku saagunnaqtu Thin ice in spring
	Nagguti Winter cracks
	Aajuraq Leads
	Maniillaaq Rough Ice
	Massak Slush in spring
	Anuriup ingirraninga High wind areas
	Ikliniit nunalikni ingiravingit Community travel routes
	Iglurallaaqavvik Cabins



Iglurallaaqavvik, Cabins Sanimut tukimullu nalauttaarsimajut Latitudes and Longitudes are approximate		
Avatinga, Placename	Nunangukkut, Latitude	Tukimut nunanguakkut, Longitude
26. Kangituajurullu qinngua	67°36'54"N	64°15'45"W
27. Kangitulk	67°26'54"N	64°14'41"W
28. Igakjua	67°27'32"N	63°56'12"W
29. Qikingtajui	67°26'43"N	63°48'6"W
30. Aulaptivik	67°19'32"N	64°24'55"W
31. Mattatujanna	67°19'34"N	64°16'44"W
32. Mattatujanna	67°19'10"N	64°8'54"W
33. Qikiqtaq	67°18'17"N	63°59'35"W
34. Qikiqtallukjua qikiqtanga	67°16'35"N	63°42'7"W
35. Kulluqtuu	67°21'N	63°22'59"W
36. Nunaminuq	67°12'37"N	64°3'56"W
37. Tasiilluit kangitukullua	67°13'48"N	63°42'35"W
38. Tasiilluit kitani	67°12'55"N	63°44'25"W

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Qujagijaujut: Ikirmiut uqaujigiartit katimajingit sikulirinimut Qikiqtarjuaq saqittilaurtut nunanguamik ilulinginnik 2019 - 2022. Unurtuungalirtauariaqangittuq angirtausimangilluni sanajuvinimit. Sanajuq: Jotanie Keyootak, Shawna Dicker, ammalu Katherine Wilson

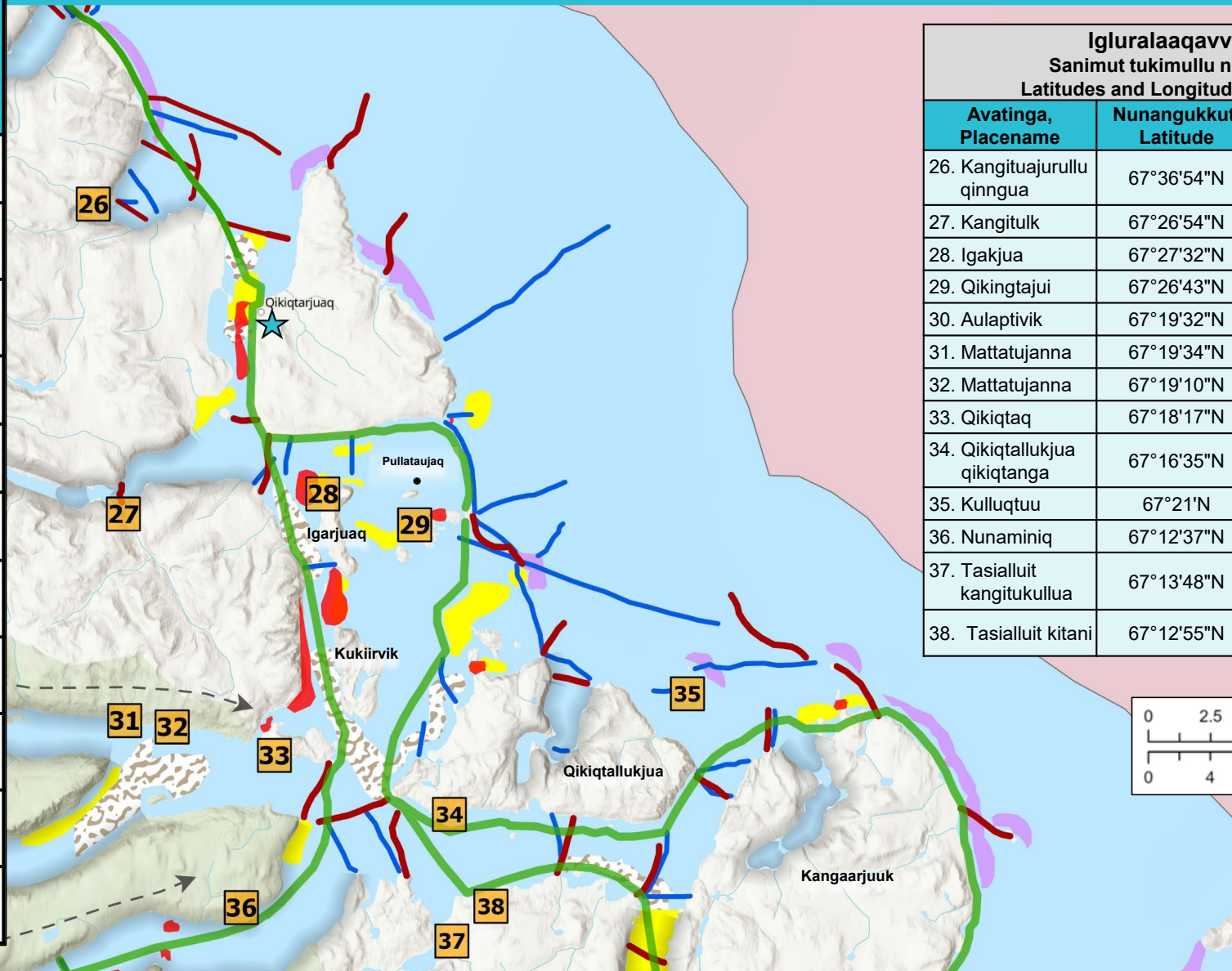
Acknowledgements: The Ikirmiut Management Committee for SmartICE in Qikiqtarjuaq produced the map content in 2019-2021. It is not to be reproduced without their written permission. Cartographers: Jotanie Keyootak, Shawna Dicker, and Katherine Wilson

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Qikiqtarjuaq: Inuit Qaujimaqatugangit Sikukkut Igluniugajuktunut Nunanguaq Qikiqtarjuaq: Inuit Qaujimaqatugangit Sea Ice Travel Map



Nunanguamiittunik nalunaikkutaq kisuuningit		Map legend
	Tuvaq	Stable sea ice
	Ikiq	Moving pack ice
	Saasuuq	Thin ice every year
	Siku saagunnaqtu	Thin ice in spring
	Nagguti	Winter cracks
	Aajuraq	Leads
	Maniillaaq	Rough Ice
	Massak	Slush in spring
	Anuriup ingirraninga	High wind areas
	Ikliniit nunalikni ingiravingit	Community travel routes
	Igluralaaqavvik	Cabins



Igluralaaqavvik Sanimut tukimullu n Latitudes and Longitud	
Avatinga, Placename	Nunangukkut Latitude
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27. Kangitulk	67°26'54"N
28. Igakjua	67°27'32"N
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30. Aulaptivik	67°19'32"N
31. Mattatujanna	67°19'34"N
32. Mattatujanna	67°19'10"N
33. Qikiqtaq	67°18'17"N
34. Qikiqtallukjua qikiqtanga	67°16'35"N
35. Kulluqtuu	67°21'N
36. Nunaminiq	67°12'37"N
37. Tasiilluit kangitukullua	67°13'48"N
38. Tasiilluit kitani	67°12'55"N

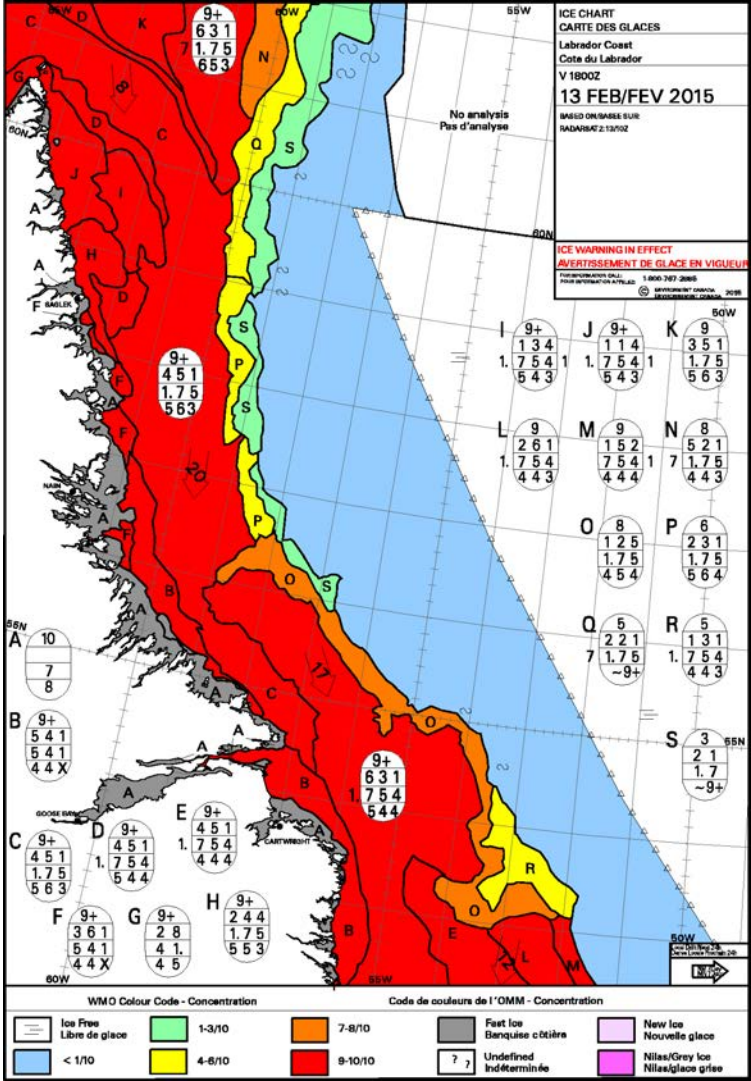
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Qujagijaujut: Ikirmiut uqaujigiartit katimajingit sikulirinirmut Qikiqtarjuaq saqittilaurtut nunanguamik ilulinnipik 2019 - 2022

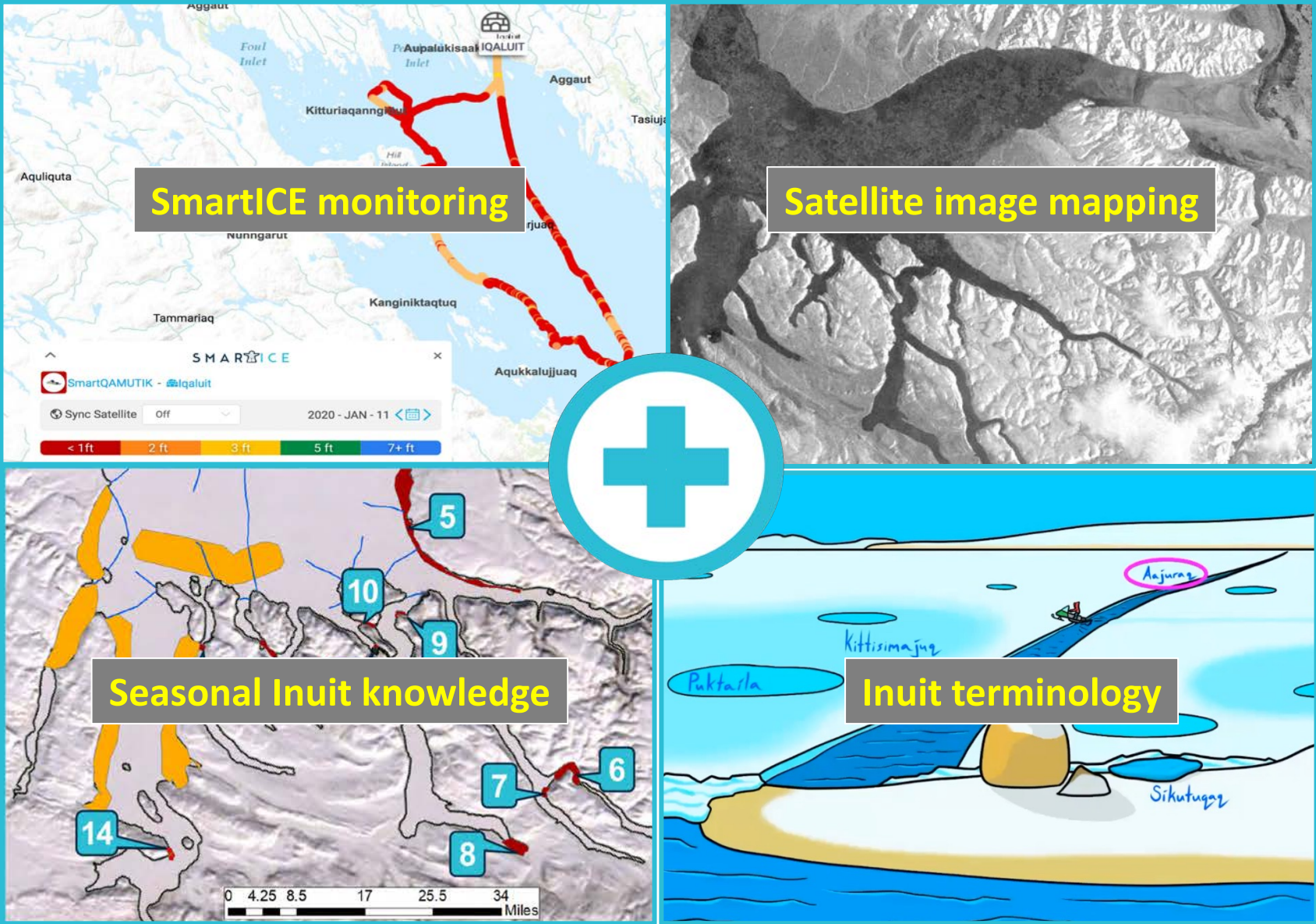
Acknowledgements: The Ikirmiut Management Committee for SmartICE in Qikiqtarjuaq produced the map content in 2019

Qaujigi
Co

Operational ice travel safety maps



Operational ice travel safety maps





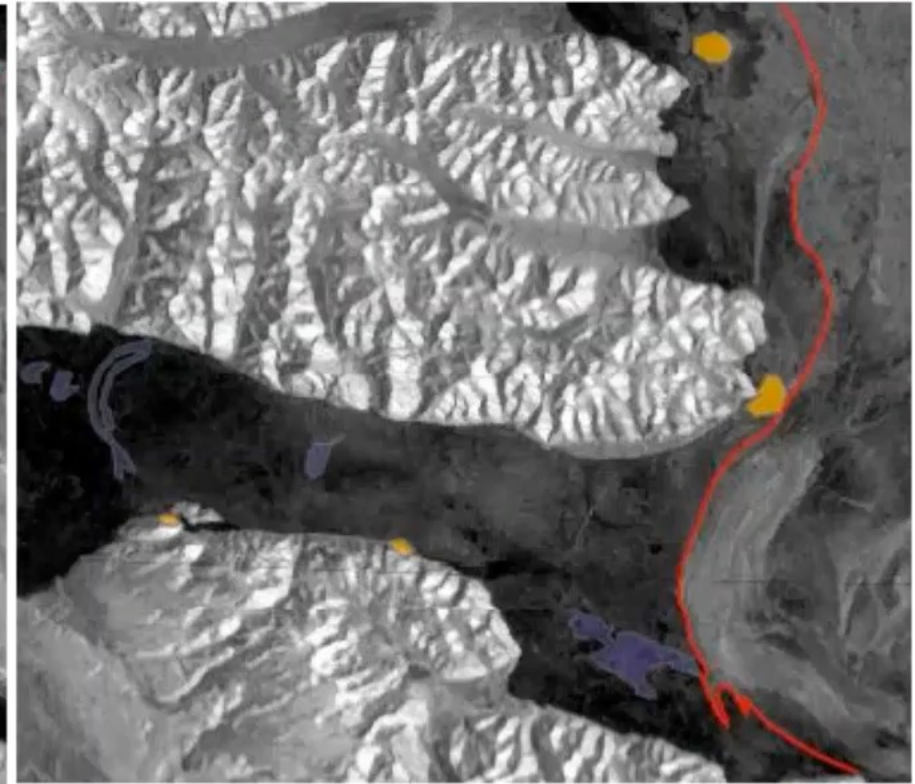
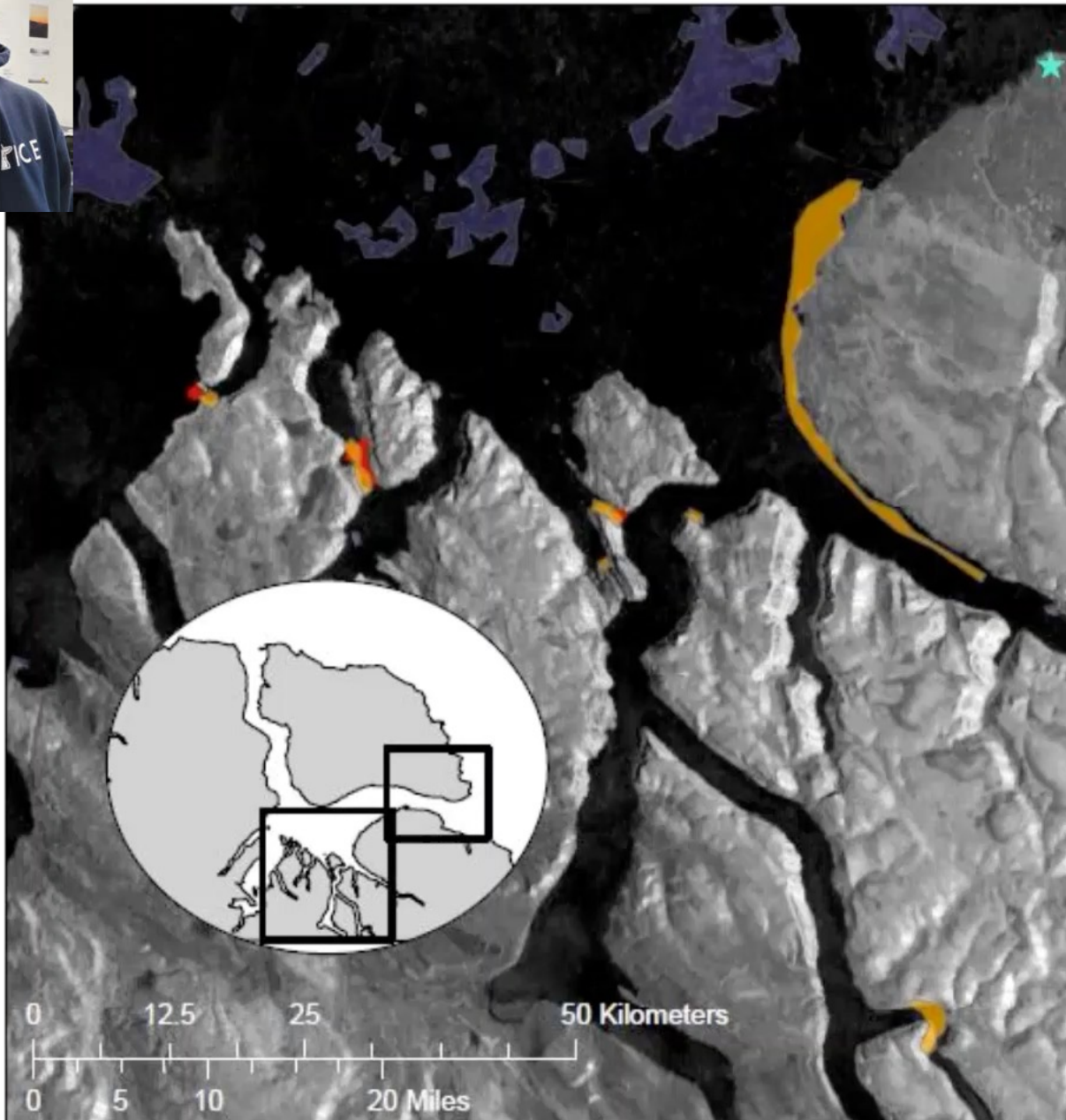
April 21, 2022

SMARTICE Ice Safety Map - Nain



- Nain
- Cabins
- Portion Crossing
- Ship Track
- Outer Edge
- Land
- Ratties

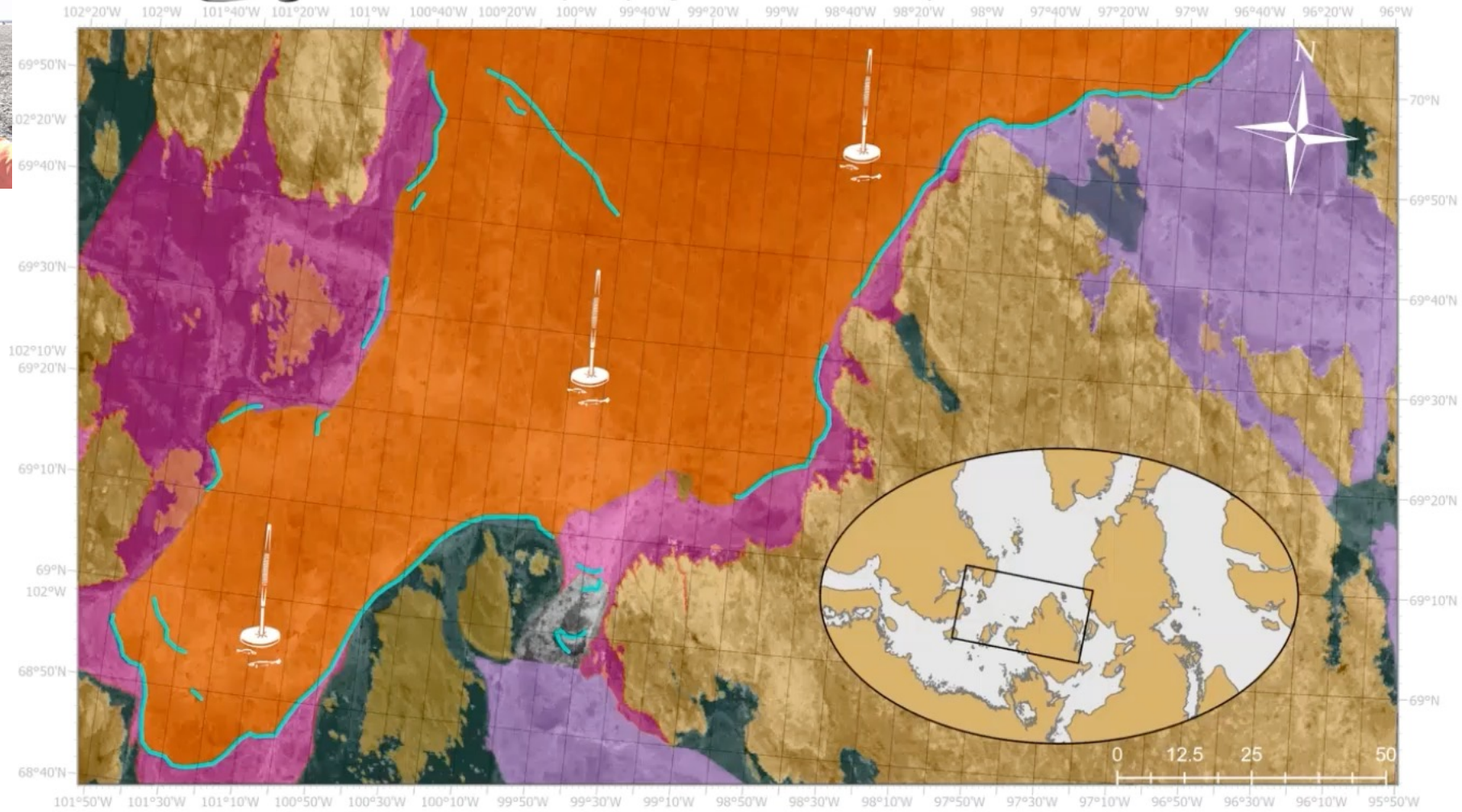
This map indicates sea ice conditions around Nain on April 21, 2022. Ratties, shown in red, are increasing in size in Spring. The orange line was the extent of the observable outer limit of the sea ice. This is meant to be a guide and not a safety map. Please exercise care when traveling on the sea ice. If unsure of ice thickness, check manually with your harpoon, always carry an emergency communication device. Be aware of the ice conditions when traveling and don't travel alone.
Cartographer: Sherrill Dickson



East Floe Edge

- ★ Mittimatalik
- Sinaa - FloeEdge
- Manila - Rough Ice
- Attannaujannaqtuq - Dangerous
- Aukkanniq - Polynia





- Cracks
- Moving Ice
- Caution
- Rougher Ice
- Safe Smoother Ice
- Land

This is a map indicating ice conditions for areas West of Gjoa Haven on February 8 2022. Take extreme caution if traveling in these areas. Area filled with cracks, open water and moving ice. Please be aware of surroundings. Use a Harpoon to check the ice conditions in these areas.

This map is generated as part of the Sikumik Qaujimajjuti project to provide additional sea ice information to communities. Ice conditions are mapped through interpretation of radar satellite imagery with ground observations and sea ice IQ, but please use careful judgement when travelling on the ice. This is the tenth map for Gjoa Haven following freeze up. Cartographer; Leanne Beaulieu



Impacts of SmartICE data on safe ice travel in Mittimatalik according to the SmartICE Community Management Committee



ARCTIC
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Governor General's
Innovation Awards



MOMENTUM
FOR CHANGE



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**SmartBUOY
sensor ideas to
support safe
travel**

- Visibility sensor
- SOS button
- Current meter
- Others????

A snowmobile is pulling a wooden sled across a vast, flat, snow-covered landscape. The sled is loaded with various pieces of equipment, including a blue and white mat, a red and white container, and other gear, all secured with black straps. The snowmobile is a Ski-Doo model, as indicated by the text on its side. The background shows a range of snow-capped mountains under a clear sky. The ground is covered in a thick layer of snow with patches of ice and snowdrifts.

**New sensors for ice
travel hazard mapping**

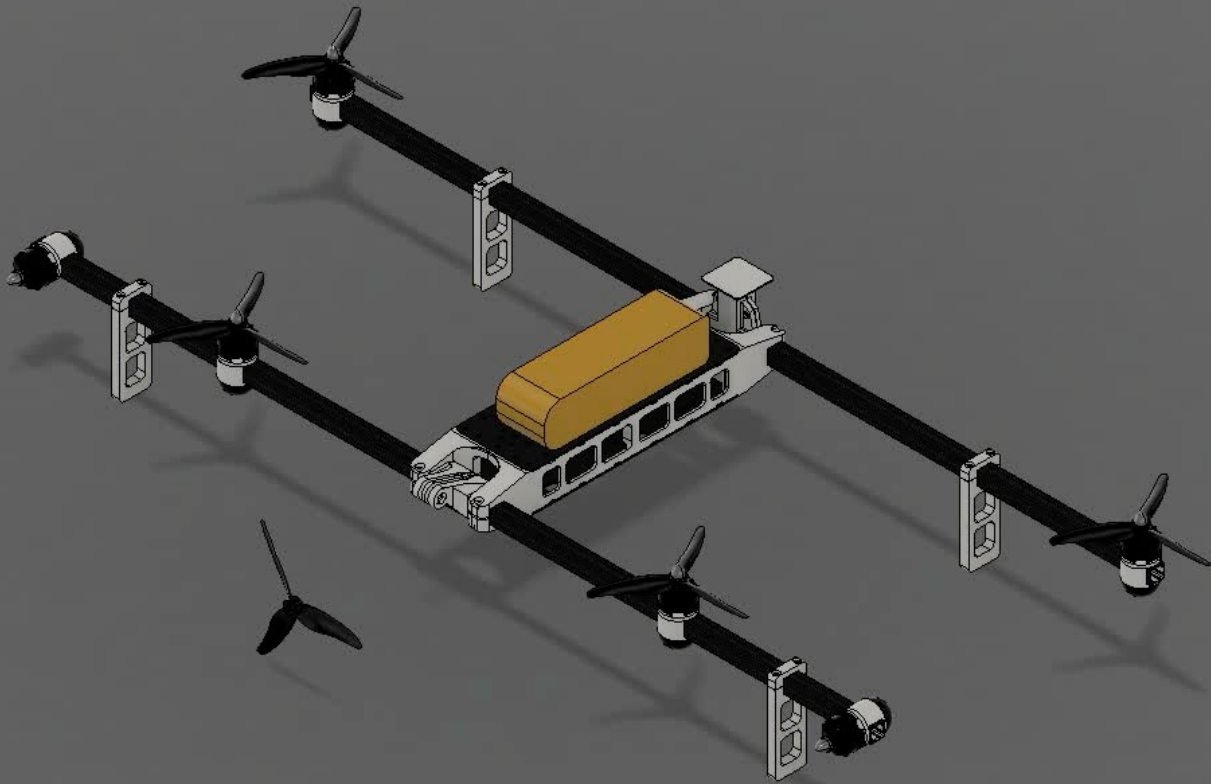
In spring, unexpected pockets of **slush** can stall snowmobiles, potentially leaving ice users wet, cold and stranded many hours from safety



Travel over **rough ice** is damaging to snowmobiles, costly in time and fuel, and more dangerous than smooth ice



Drone Development and Pilot Training





ARCTIC
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Innovation Awards



MOMENTUM
FOR CHANGE



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