Sikuliaq Ice Support

Michael Lawson
National Weather Service Anchorage
Alaska Sea Ice Program
UNOLS meeting 1/14/26

Introduction

Who am I?

Private Sector Meteorology
Transportation meteorologist: 2007-2011

National Weather Service Anchorage
General Forecaster: 2011-2018

Alaska Sea Ice Program Fill-in: 2015-2018

Alaska Sea Ice Program(NWS Anchorage)
Sea Ice Meteorologist: 2018-present

Introduction

Who am I?

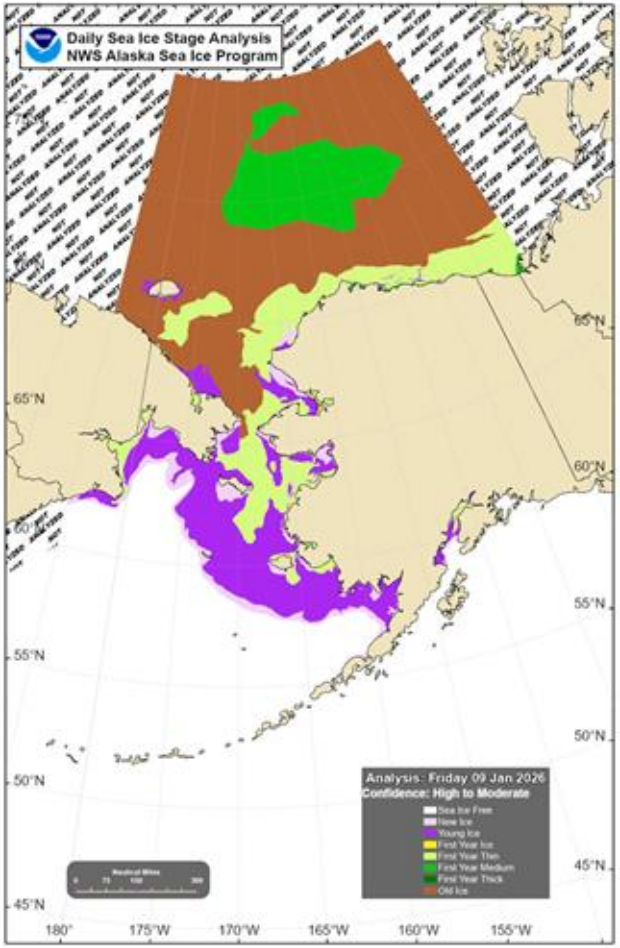
Deployment as in ice analyst onboard the R/V Sikuliaq

- October-November 2023 (5 weeks)
- September-October 2024 (3 weeks)
- October-November 2025 (3 weeks)

Department of Commerce | National Oceanic and Atmospheric Administration

Why embedded support?

- Connection to the crew and science mission
- Invaluable professional experience and development
- NWS push for face-to-face stakeholder support
- Broad scale overview vs targeted small-scale analysis
- ASIP analysis, while detailed, has the synoptic scale overview while the ship operates in the mesoscale



ArcGIS StoryMap

For a more detailed look at support, follow along the 2023 AMOS cruise:

ArcGIS Story Map: https://storymaps.arcgis.com/stories/4cf4a55566dc434796b989d1ba2367d4

Virtual Alaska Weather Symposia: https://uaf-accap.org/event/decision-support-high-arctic/

AMOS 2023

Challenges:

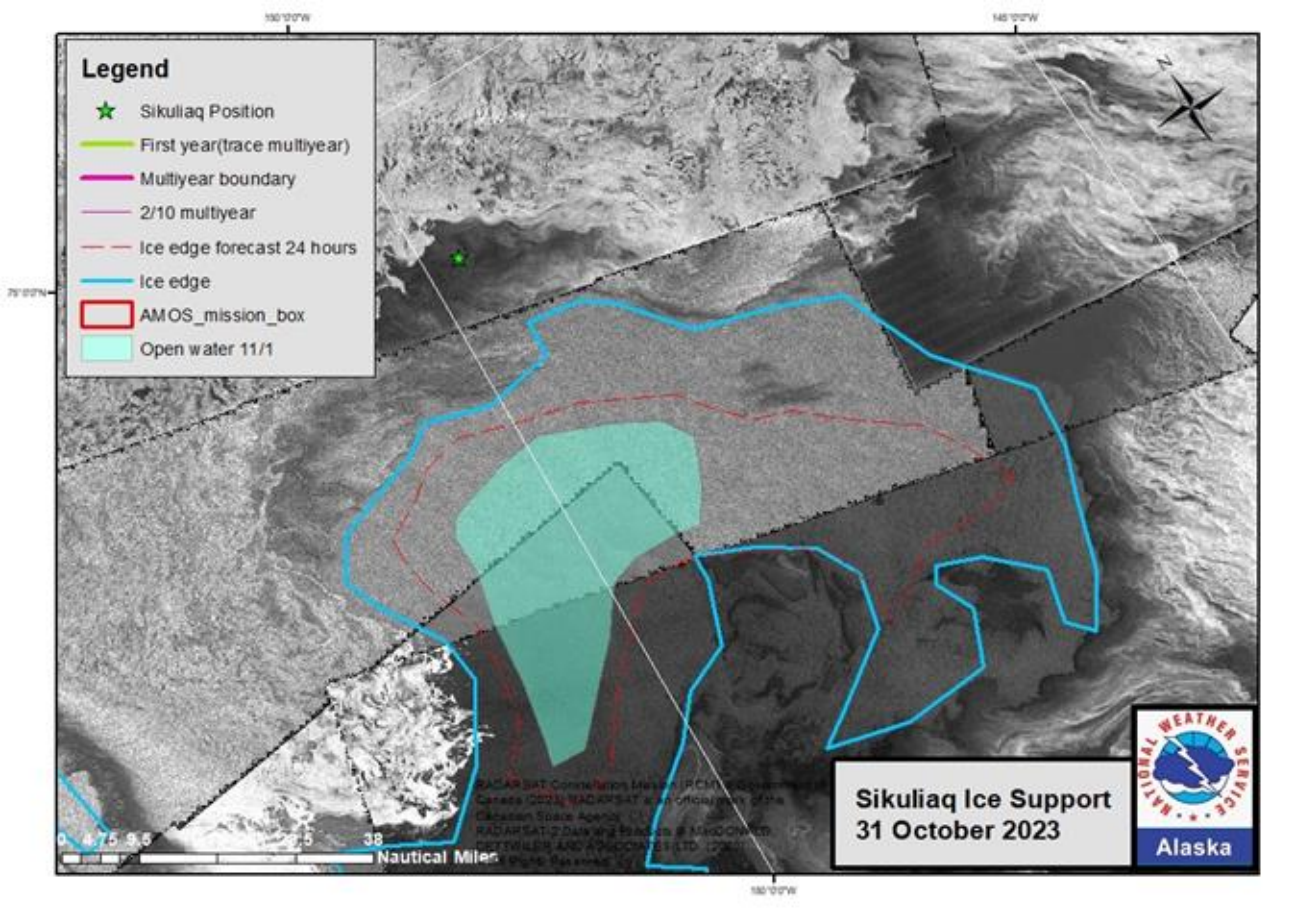
Unprecedented for ASIP/NWS

IT issues

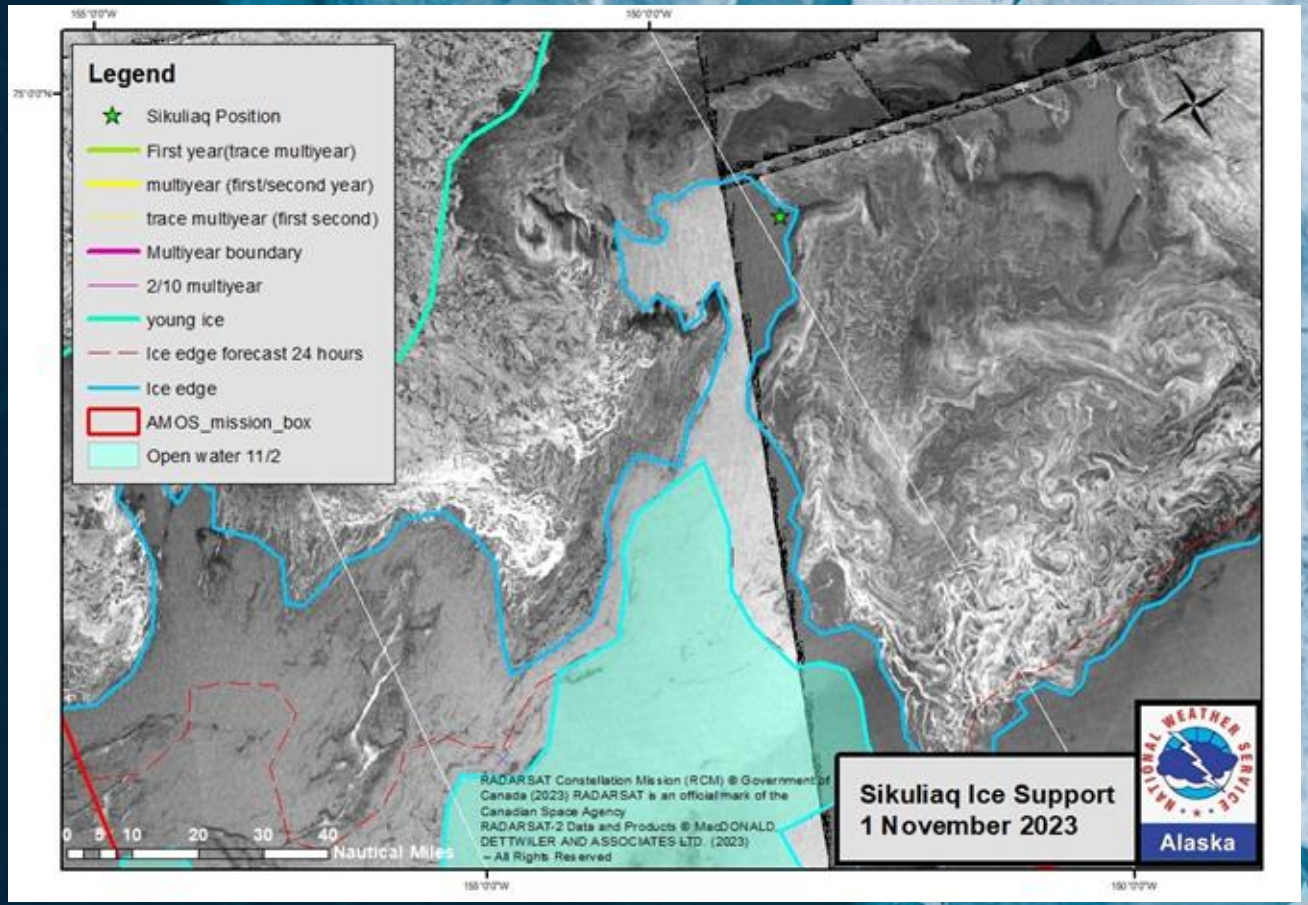
Ship delays

Sikuliaq first time w/o their in-house ice analyst

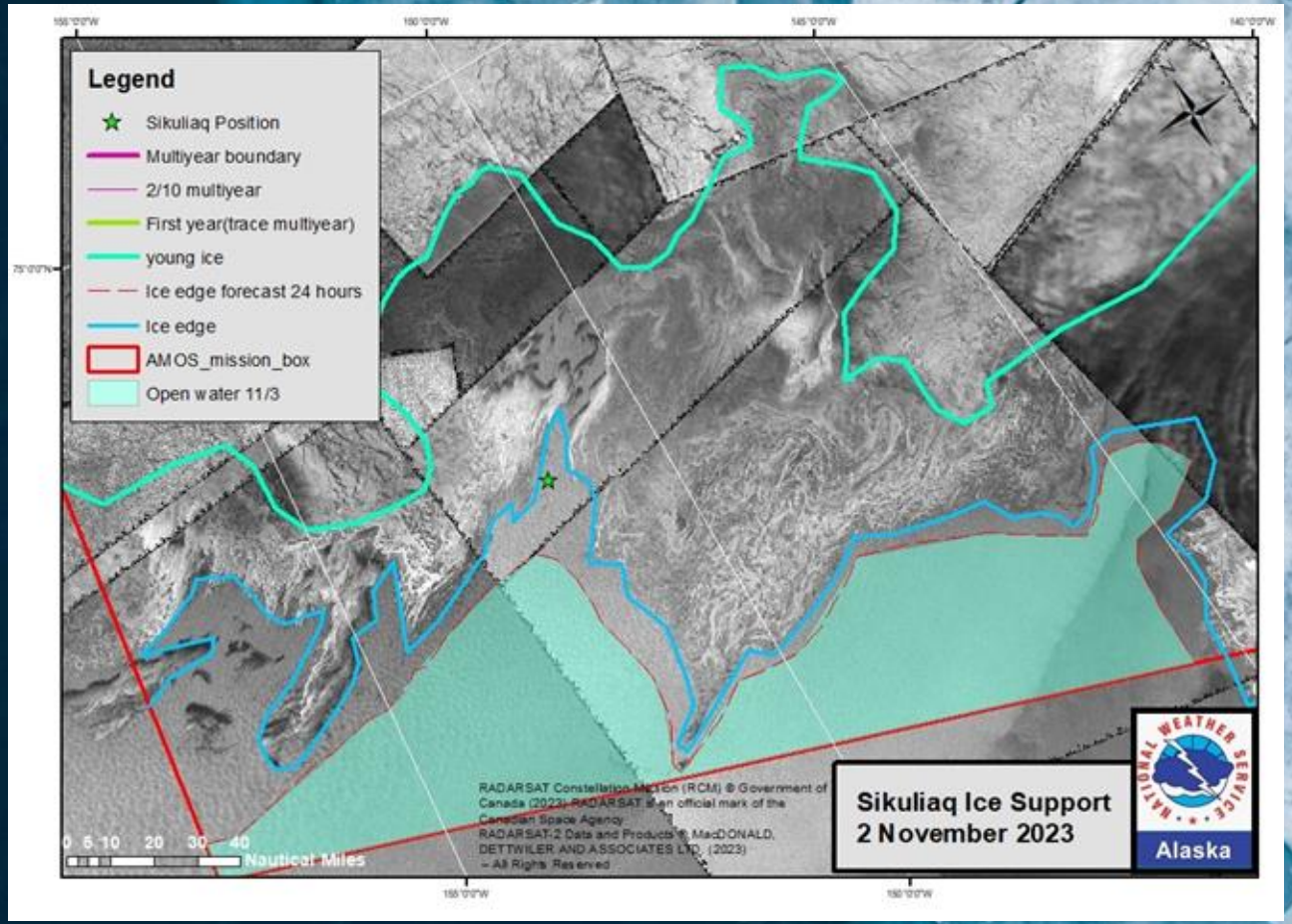
AMOS 2023


Legend
Sikuliaq Position
First year(trace multiyear)
Multiyear boundary
2/10 multiyear
Ice edge forecast 24 hours
Ice edge
AMOS_mission_box
Open water 11/1
Sikuliaq Ice Support
31 October 2023
Nautical Miles
Alaska

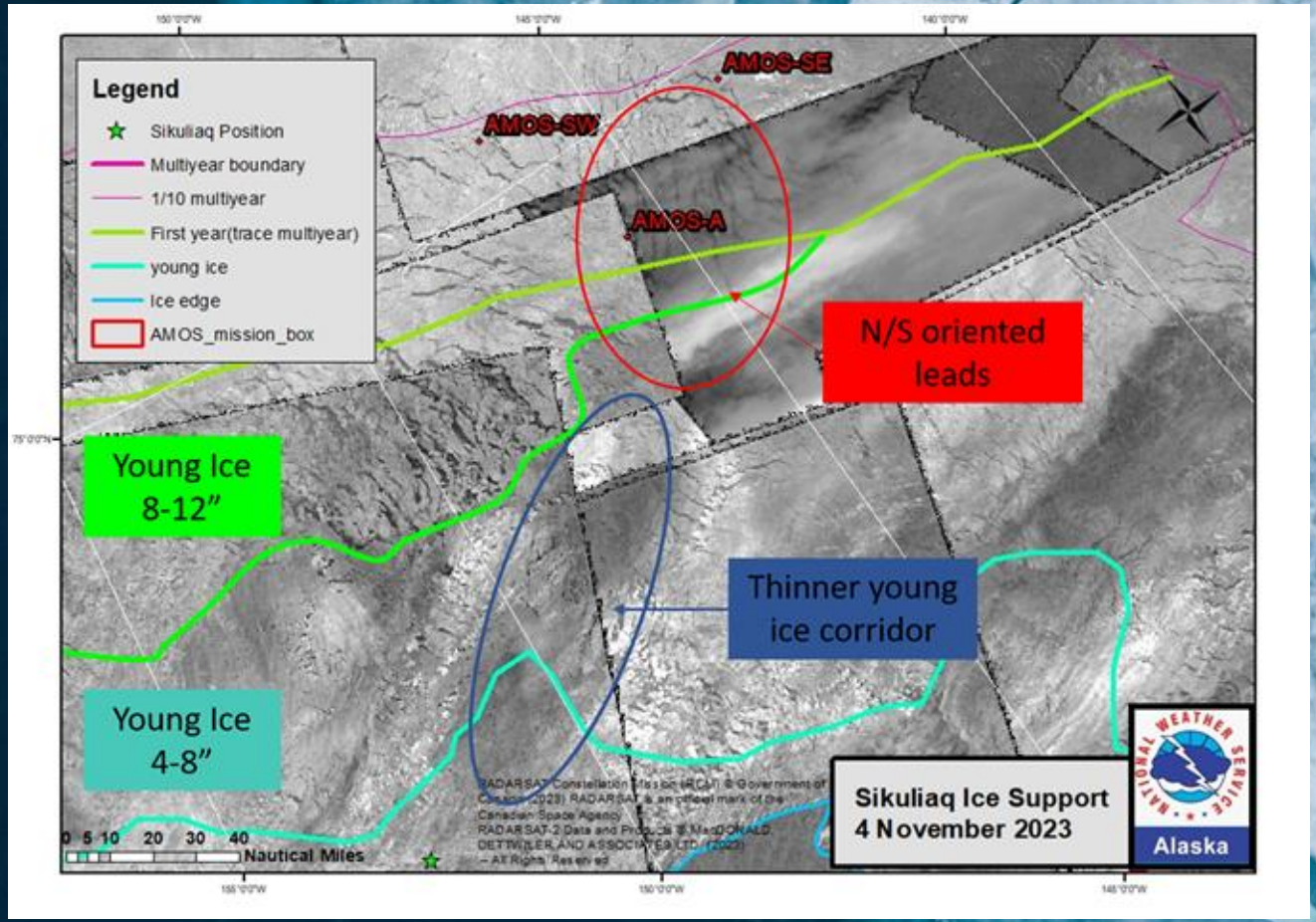
AMOS 2023


Legend
Sikuliaq Position
First year(trace multiyear)
multiyear (first/second year)
trace multiyear (first second)
Multiyear boundary
2/10 multiyear
young ice
Ice edge forecast 24 hours
Ice edge
AMOS_mission_box
Open water 11/2
0 5 10 20 30 40
Nautical Miles
RADARSAT Constellation Mission (RCM) © Government of Canada (2023) RADARSAT is an official mark of the Canadian Space Agency
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2023) – All Rights Reserved
Sikuliaq Ice Support
1 November 2023
NATIONAL WEATHER SERVICE
Alaska

AMOS 2023

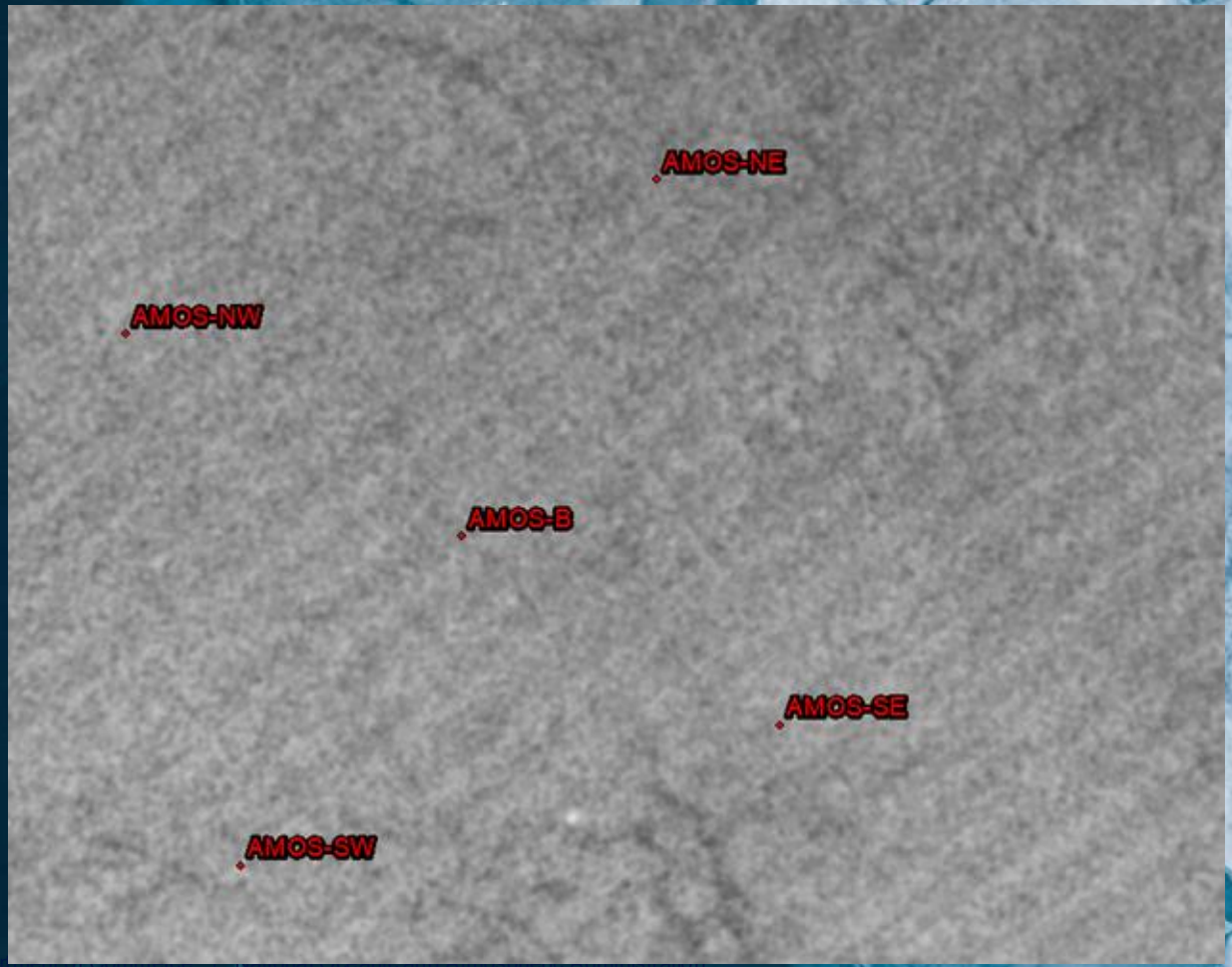

Legend
Sikuliaq Position
Multiyear boundary
2/10 multiyear
First year(trace multiyear)
young ice
Ice edge forecast 24 hours
Ice edge
AMOS_mission_box
Open water 11/3
0 6 10 20 30 40
Nautical Miles
RADARSAT Constellation Mission (RCM) © Government of Canada (2023). RADARSAT is an official mark of the Canadian Space Agency.
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2023) – All Rights Reserved
Sikuliaq Ice Support
2 November 2023
NATIONAL WEATHER SERVICE
Alaska

AMOS 2023

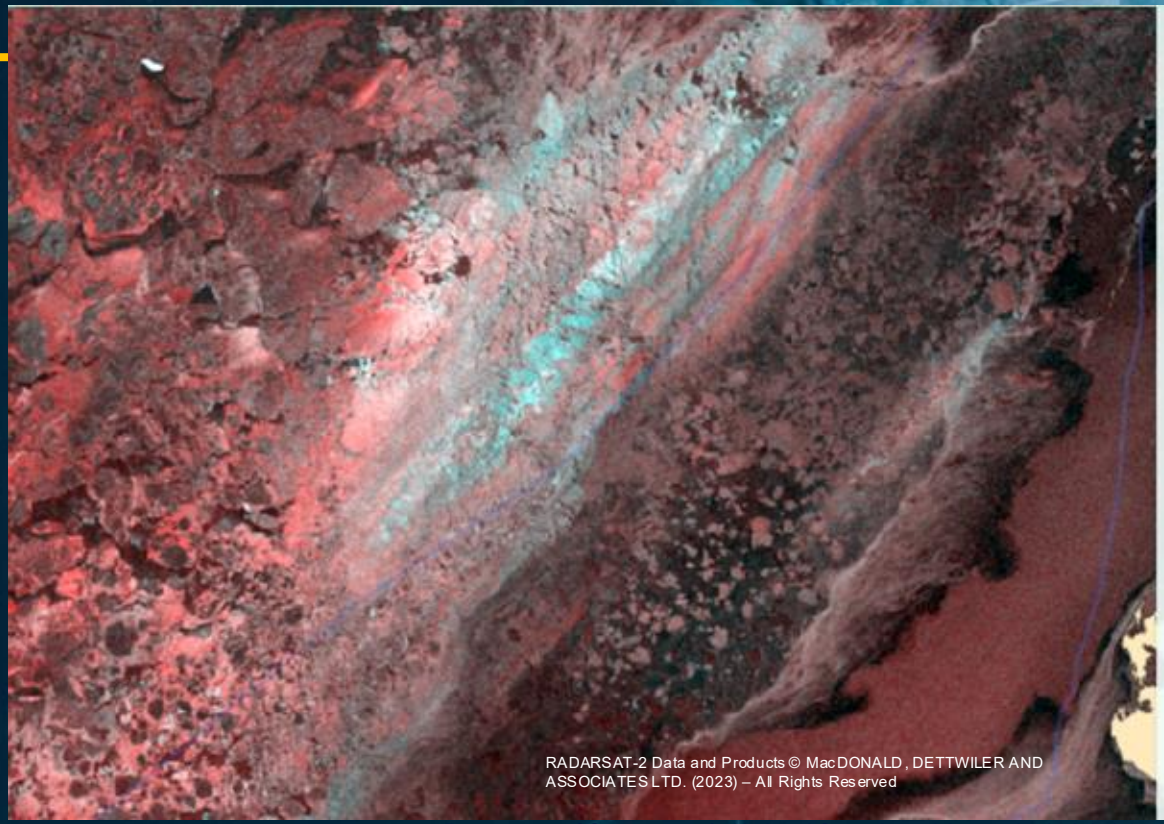

Legend
Sikuliaq Position
Multiyear boundary
1/10 multiyear
First year(trace multiyear)
young ice
Ice edge
AMOS_mission_box
AMOS-SE
AMOS-SW
AMOS-A
N/S oriented leads
Young Ice 8-12″
Thinner young ice corridor
Young Ice 4-8″
0 5 10 20 30 40
Nautical Miles
Sikuliaq Ice Support
4 November 2023
NATIONAL WEATHER SERVICE
Alaska

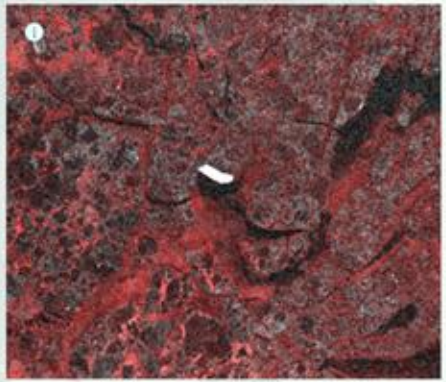
AMOS 2023

Day Night Band (Near Constant Contrast) animation



AMOS 2023

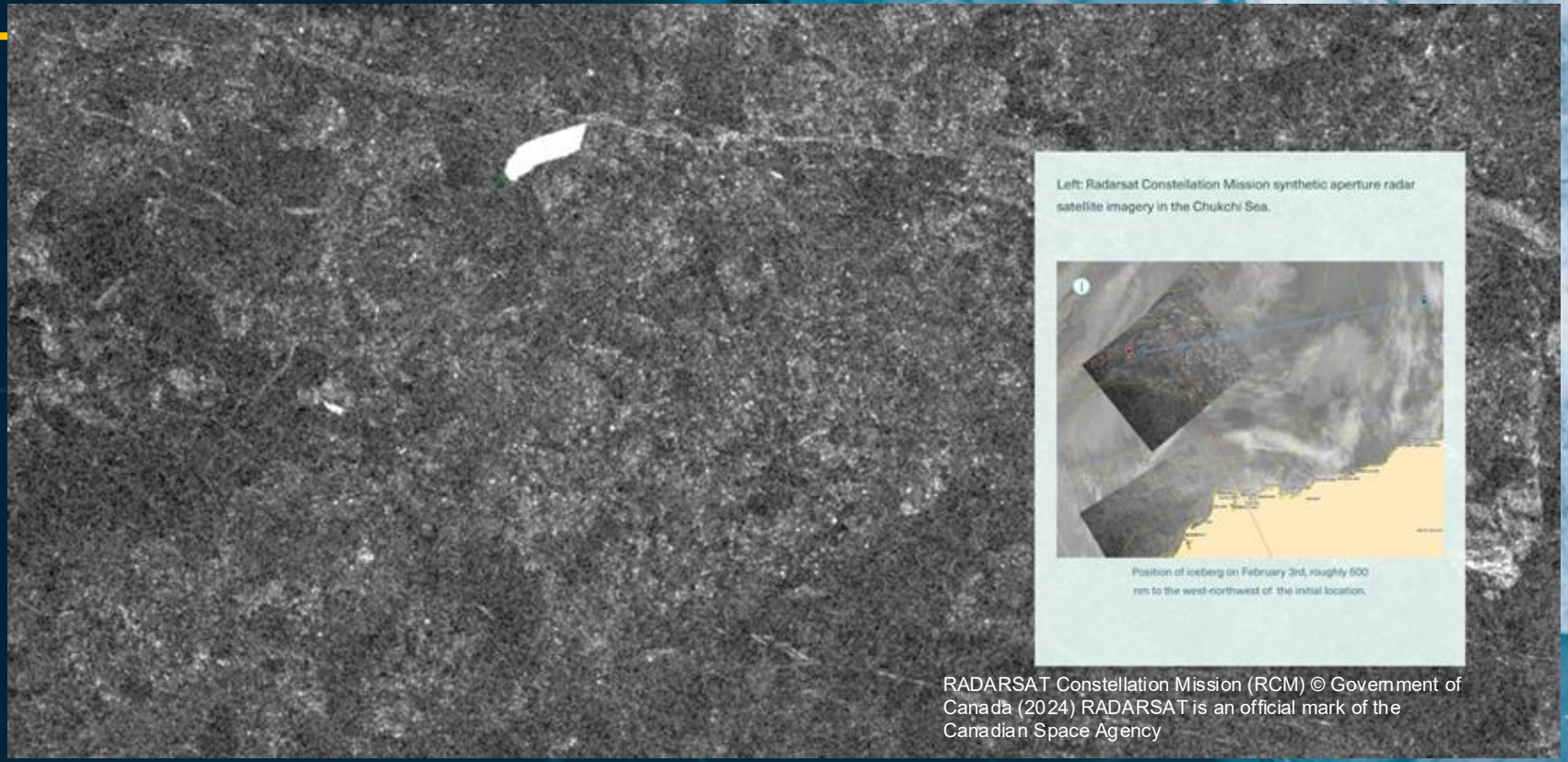




Land-based ice from the Milne Ice Shelf collapse in 2020.

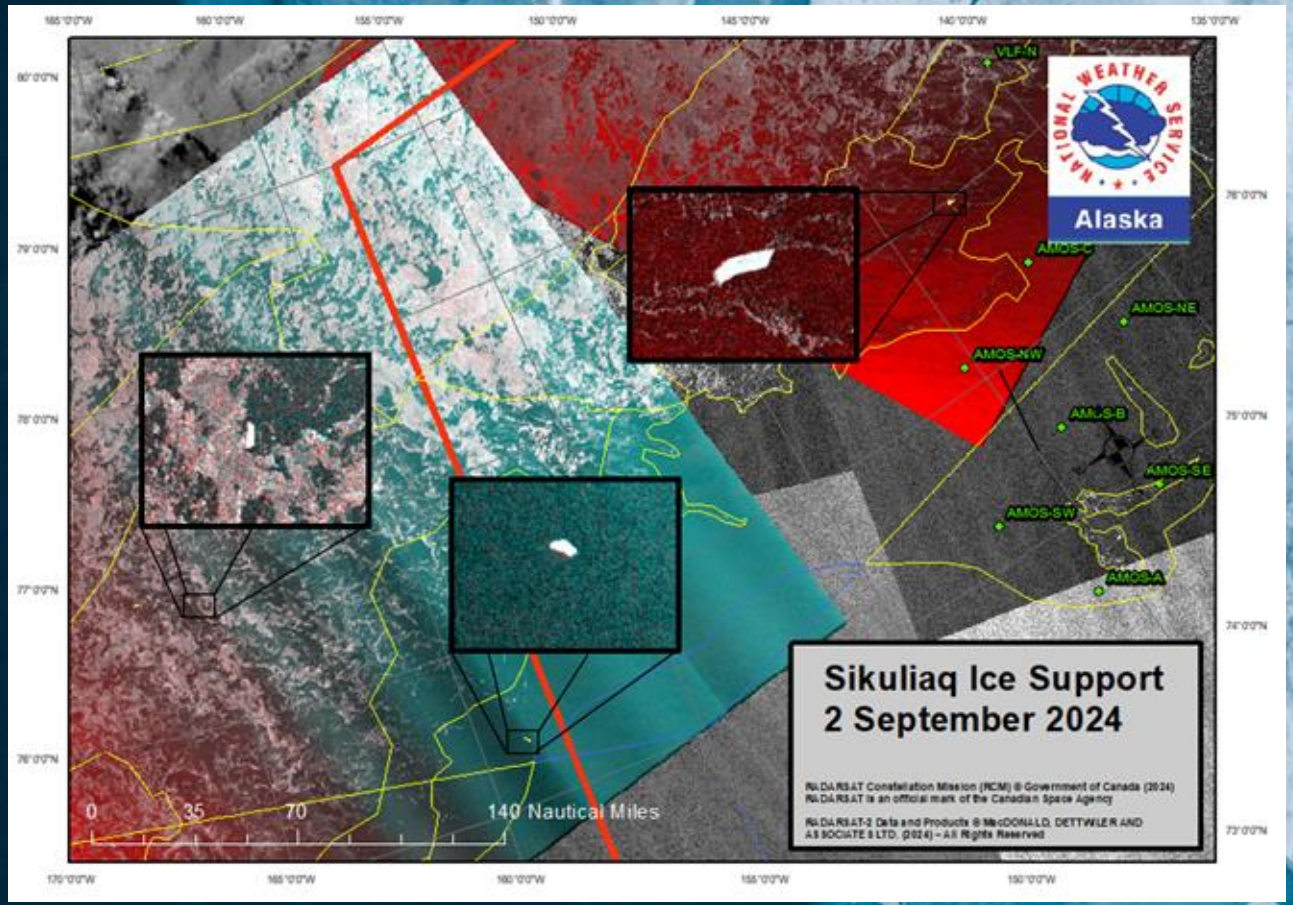
Ice island position in the Canadian Beaufort Sea.

Expecting the unexpected

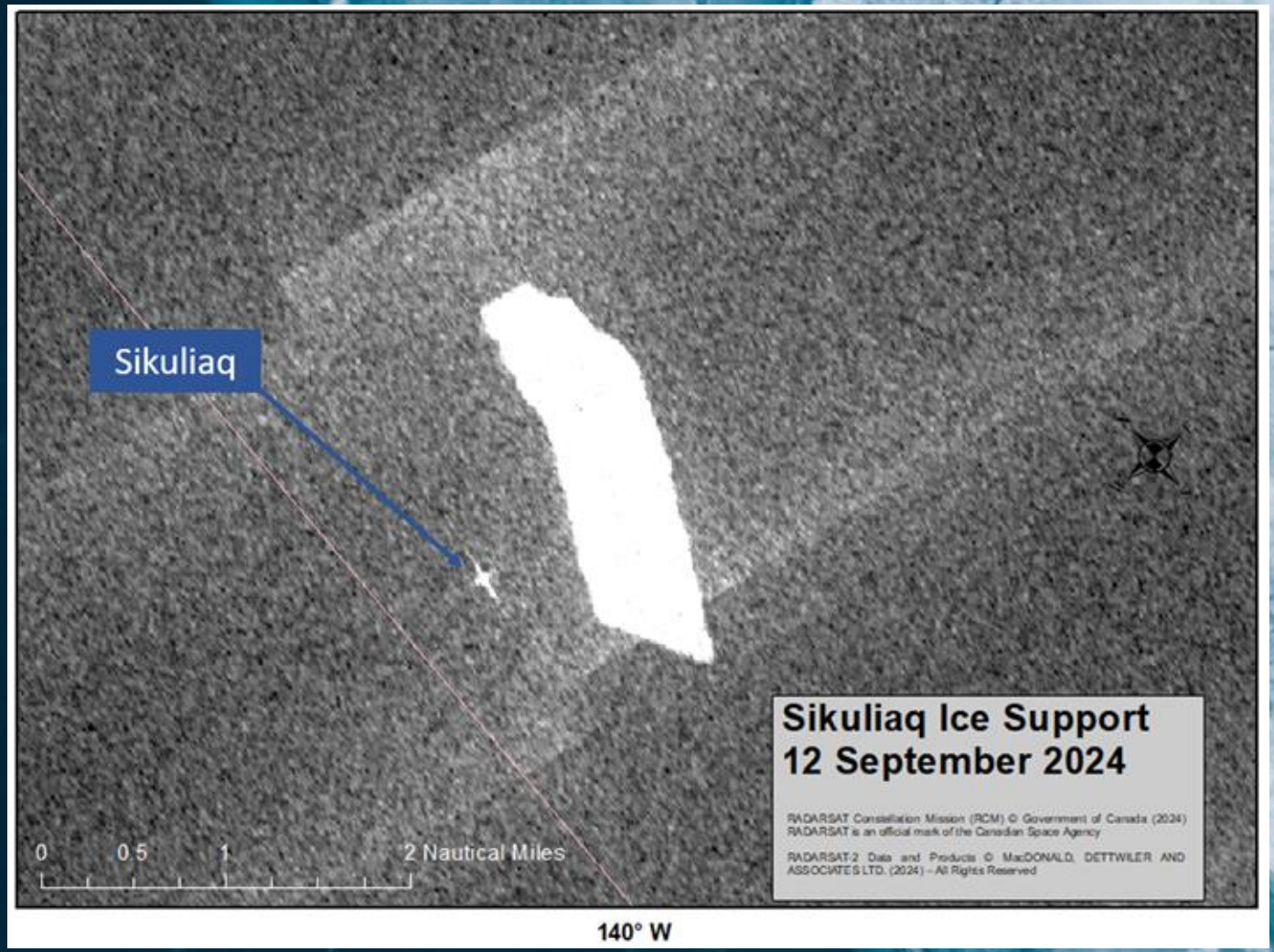


RADARSAT Constellation Mission (RCM) © Government of Canada (2024) RADARSAT is an official mark of the Canadian Space Agency

AMOS 2024


VLF-N
Alaska
AMOS-C
AMOS-NE
AMOS-NW
AMOS-S-B
AMOS-SE
AMOS-SW
AMOS-A
Sikuliaq Ice Support
2 September 2024
RADARSAT Constellation Mission (RCM) © Government of Canada (2024)
RADARSAT is an official mark of the Canadian Space Agency
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2024) – All Rights Reserved
0
35
70
140 Nautical Miles

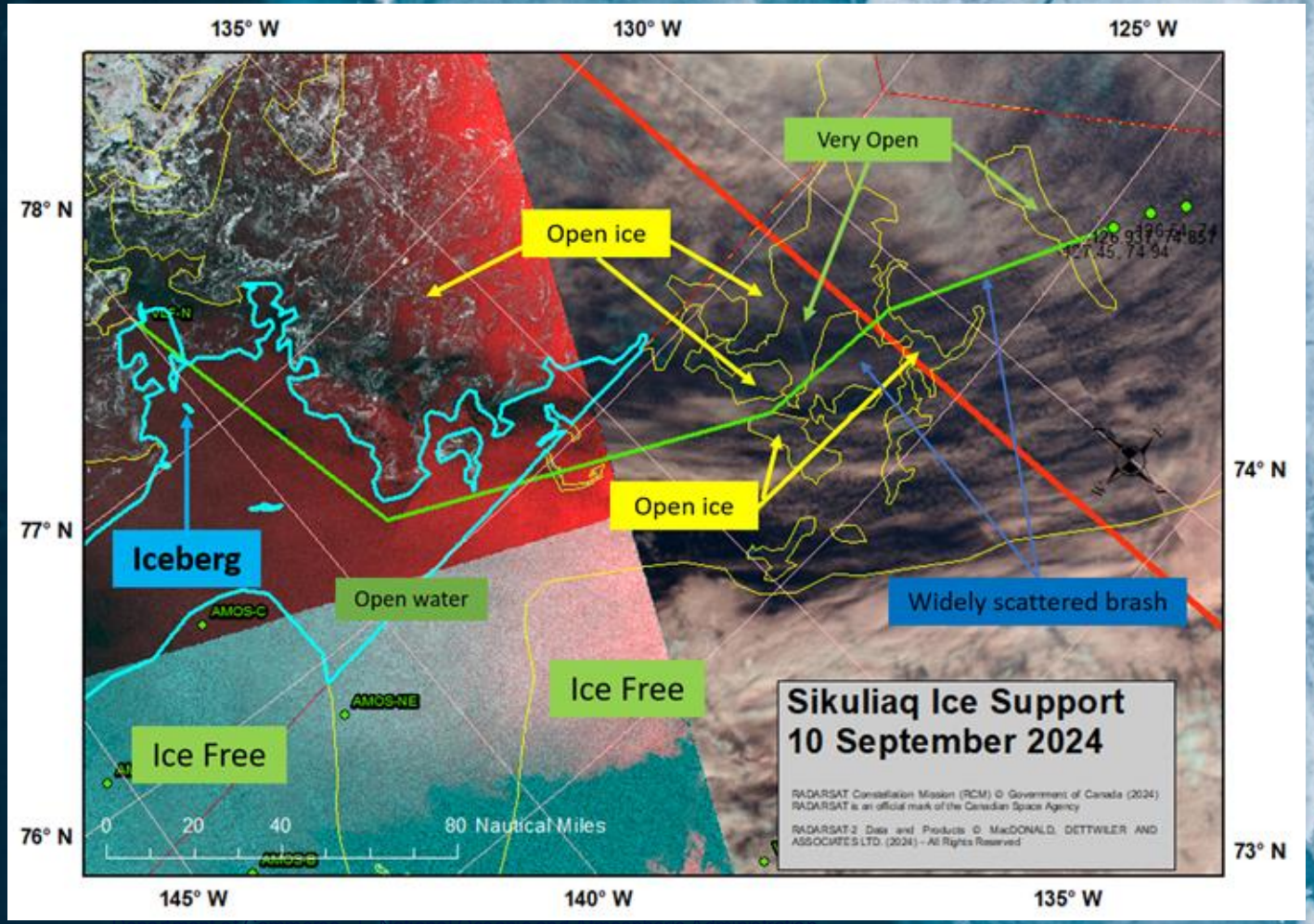
AMOS 2024


Sikuliaq
Sikuliaq Ice Support
12 September 2024
RADARSAT Constellation Mission (RCM) © Government of Canada (2024)
RADARSAT is an official mark of the Canadian Space Agency
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2024) – All Rights Reserved
0
0.5
1
2 Nautical Miles
140° W

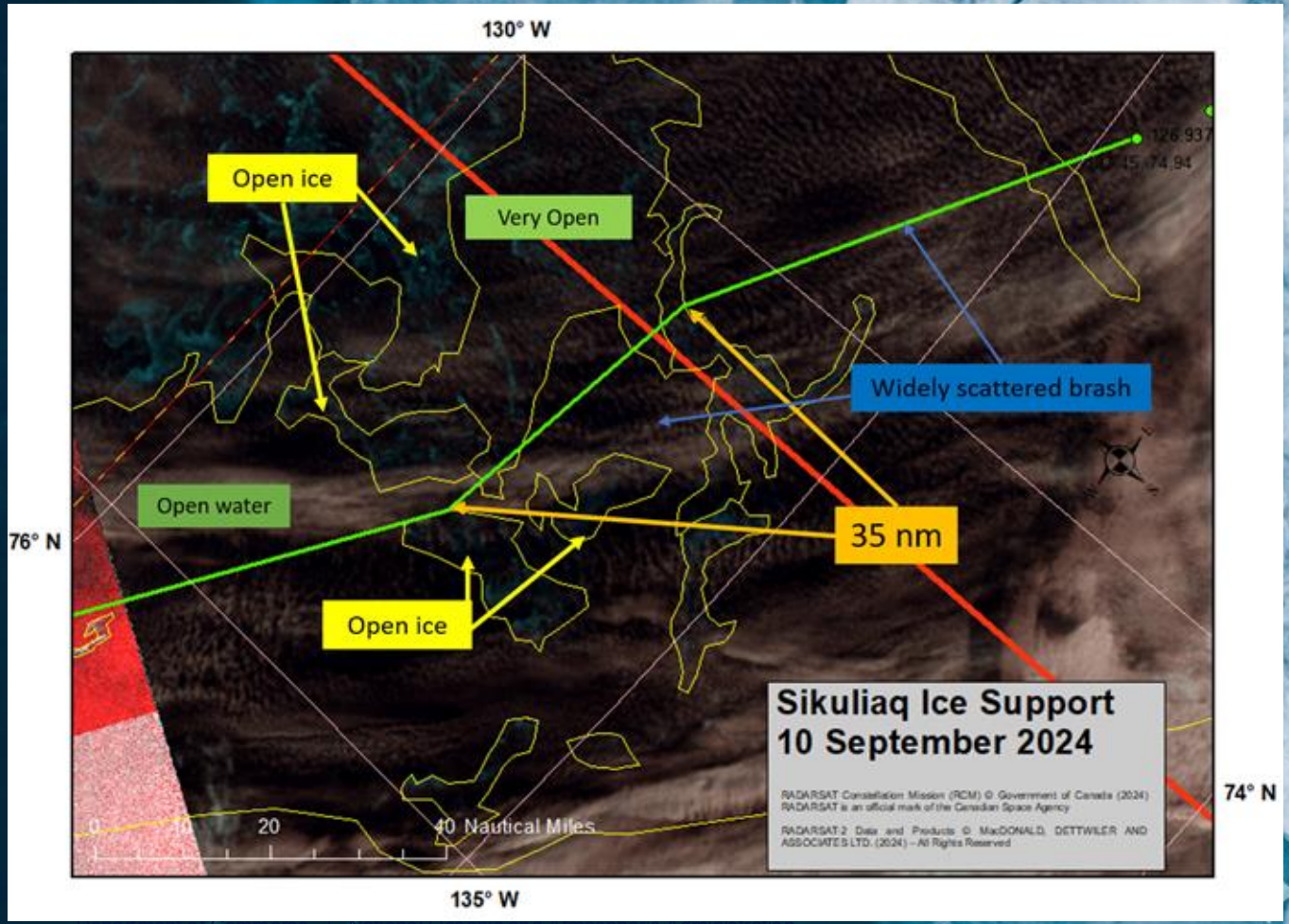
AMOS 2024


USNIC
U. S. NATIONAL ICE CENTER
MISSION: R/V SIKULIAQ
PRODUCED: 13 SEP 2024
N
W
E
S
141°45'W
77°N
77°N
Image Displayed:
ICEYE.....09 SEP 2024 || 02:21 Z
.....Imaging Mode - Stripmap
.....Ground Resolution - 3 Meters
ICEYE Product and Derivatives© 2024 ICEYE Oy. Copyright in all ICEYE Products and Derivatives is and will remain held by ICEYE Oy.
0
0.25
0.5
1
NM
141°45'W

AMOS 2024


135° W
130° W
125° W
78° N
77° N
76° N
74° N
73° N
145° W
140° W
135° W
Very Open
Open ice
Open ice
Iceberg
Open water
Widely scattered brash
Ice Free
Ice Free
AMOS-C
AMOS-NE
AMOS-E
0 20 40 80 Nautical Miles
Sikuliaq Ice Support
10 September 2024
RADARSAT Constellation Mission (RCM) © Government of Canada (2024)
RADARSAT is an official mark of the Canadian Space Agency
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2024) - All Rights Reserved

AMOS 2024


130° W
Open ice
Very Open
Widely scattered brash
Open water
35 nm
Open ice
76° N
74° N
135° W
Sikuliaq Ice Support
10 September 2024
RADARSAT Constellation Mission (RCM) © Government of Canada (2024)
RADARSAT is an official mark of the Canadian Space Agency
RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2024) – All Rights Reserved
0
10
20
40 Nautical Miles

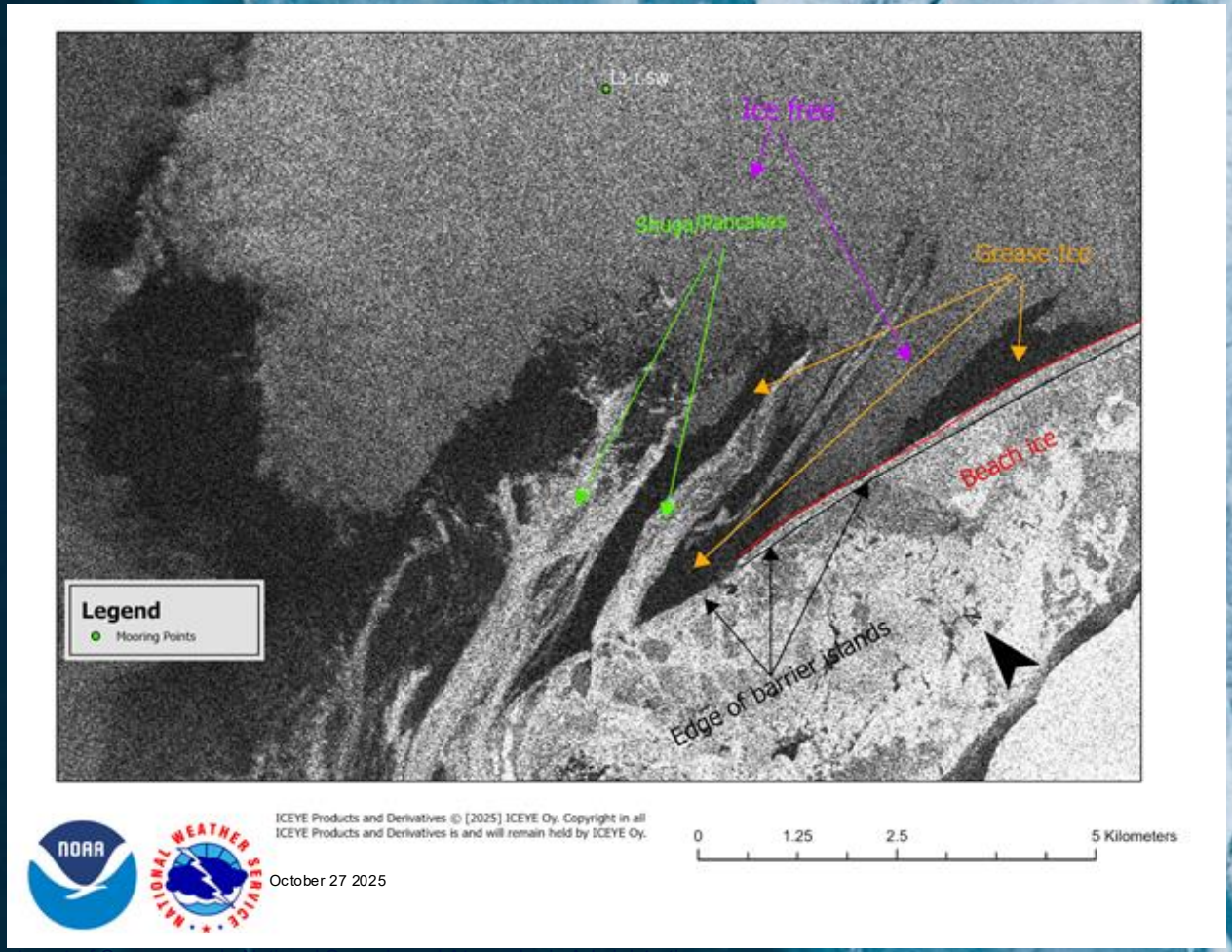
COASTAL FREEZE 2025

- Ship delays
- IT issues
- Later than normal freeze-up of shorefast ice
- Warm temperatures and stronger northeast winds kept open water (and waves) across the research area

Coastal Freeze 2025

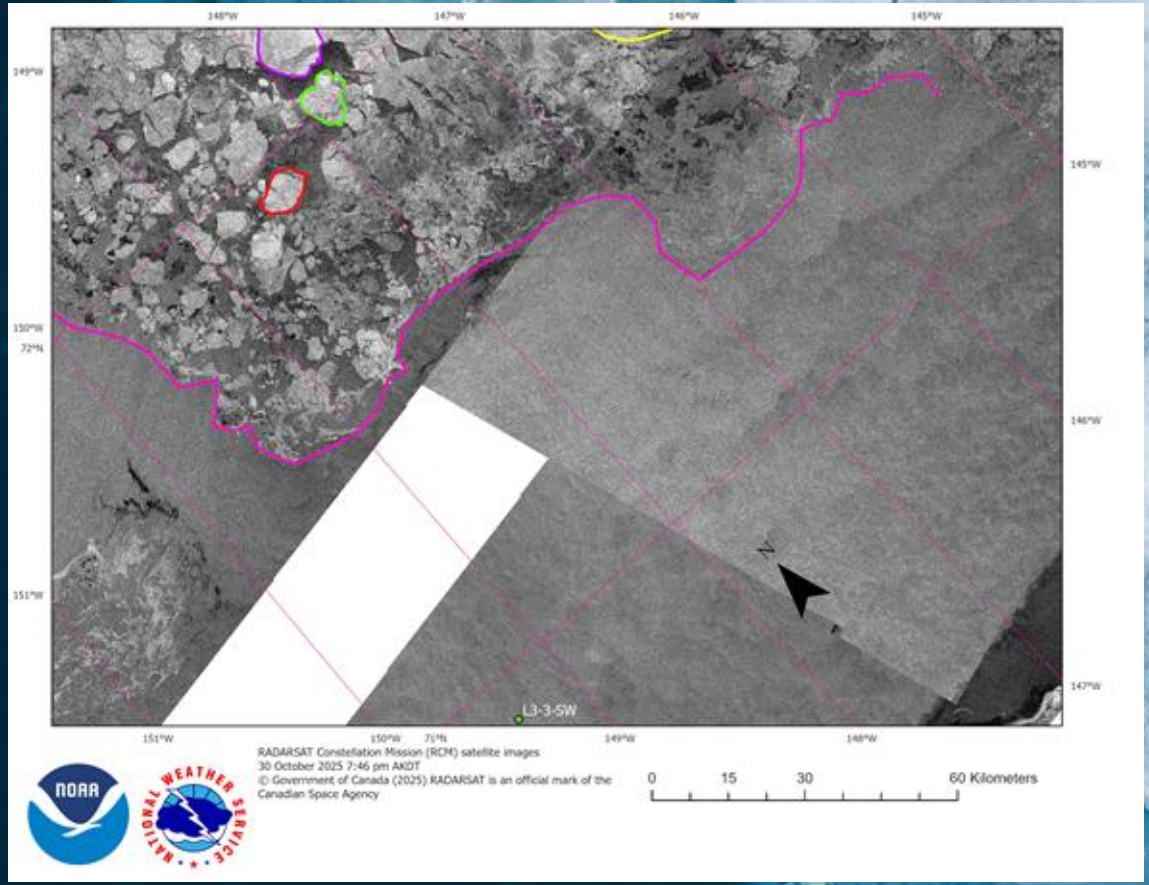
I put together a last minute graphic for landing craft ops today. ICEYE image from 0640Z last evening. Ice has likely continued to drift eastward with winds and currents.

It is possible that some of the ice flushing out from behind barrier islands is in the 4-6 inch range.

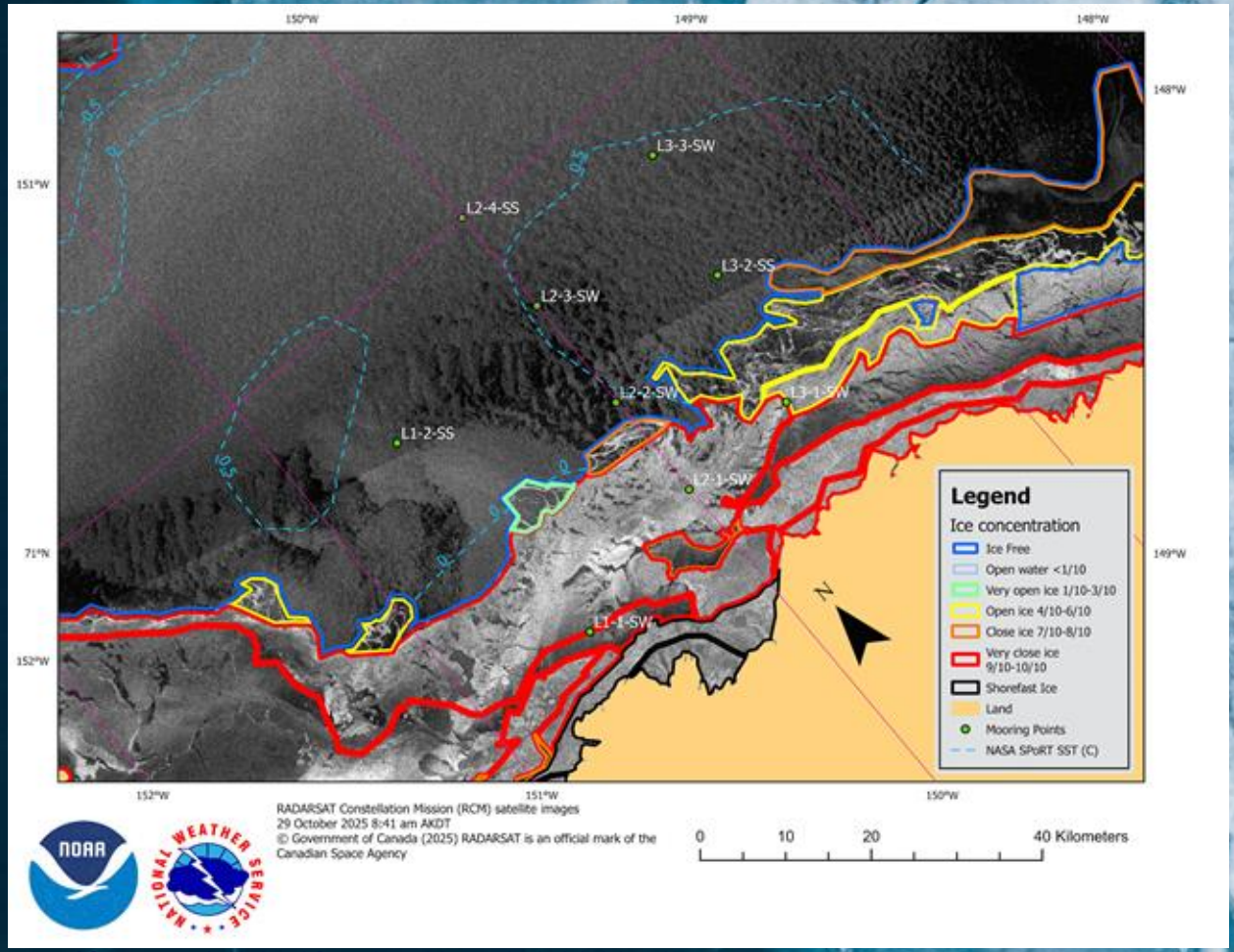


Coastal Freeze 2025

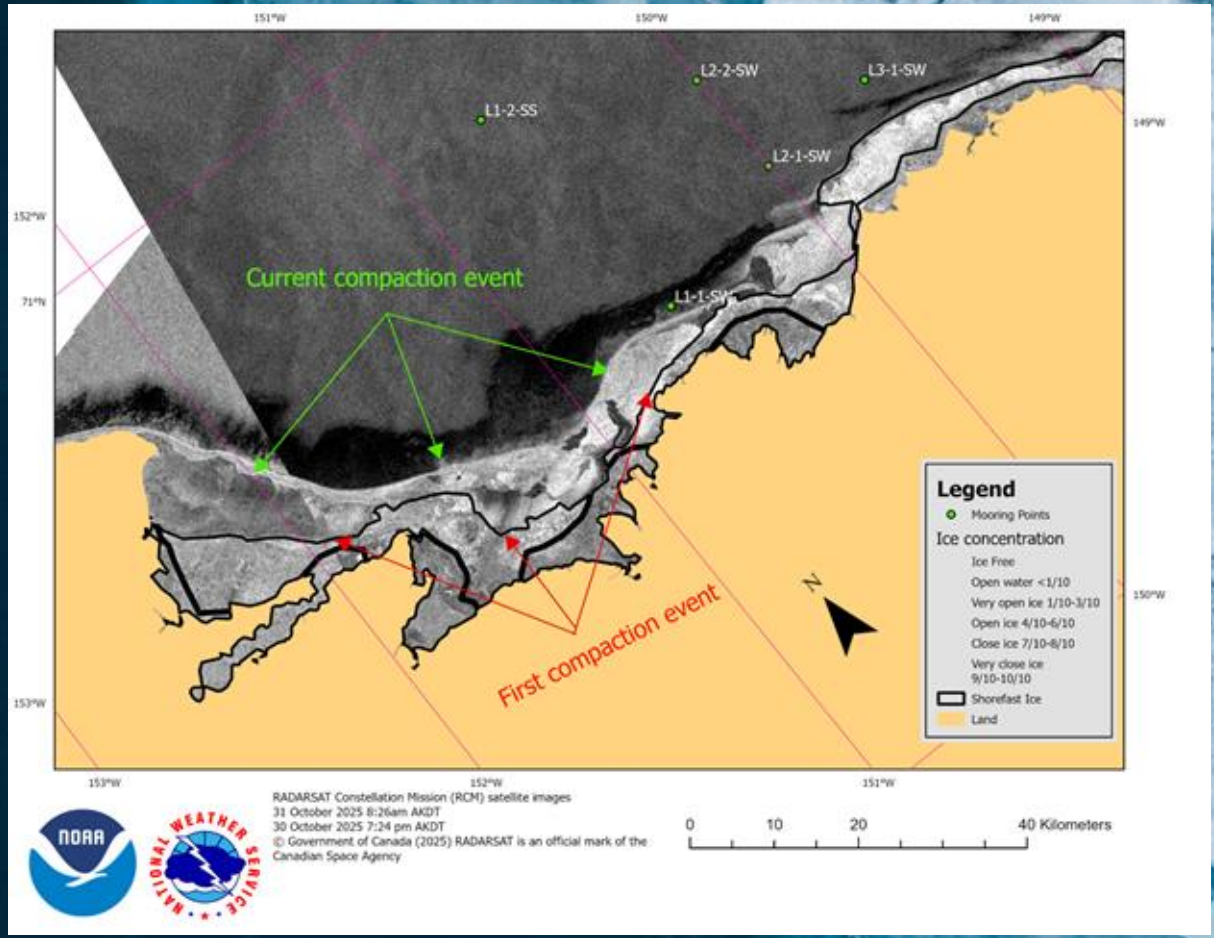
The pack has responded all of the outlined floes below are moving west-southwest around 9-11nm/13 hours. Roughly around 20 nm/day, but much more westward motion today as opposed to yesterday



Coastal Freeze 2025



Coastal Freeze 2025



Questions?

National Weather Service Anchorage
Alaska Sea Ice Program
weather.gov/afc/ice
nws.ar.ice@noaa.gov
(907)-266-5138