



**PAME**  
Protection of the Arctic Marine Environment

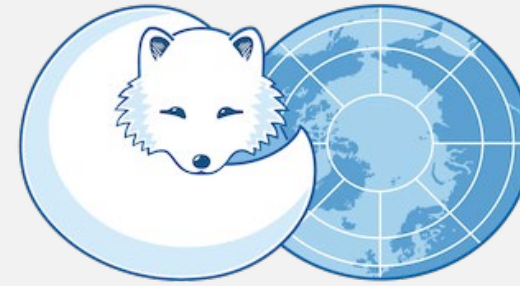
# **SHIPPING IN THE NORTHWEST PASSAGE: COMPARING 2013 WITH 2019**

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ARCTIC SHIPPING STATUS REPORT (ASSR) #3

APRIL 2021





## **This report compares Northwest Passage shipping traffic in 2013 with 2019.**

***These years were chosen as ASTD data is available from 2013 and onwards.***

The waterways surrounding the Canadian Arctic are comprised of approximately 36,000 islands, making it one of the most complex geographies on Earth.

The area is populated by a network of coastal Canadian communities without road/rail transport to the south. The largest settlement in the region is Iqaluit, located on Baffin Island with a population of almost 8,000. While the least populated (and most northern) community is Grise Fiord, located on Ellesmere Island, with just over 100 residents.

*The Northwest Passage is the name given to the various marine routes between the Atlantic and Pacific oceans along the northern coast of North America that span the Canadian Arctic Archipelago.*

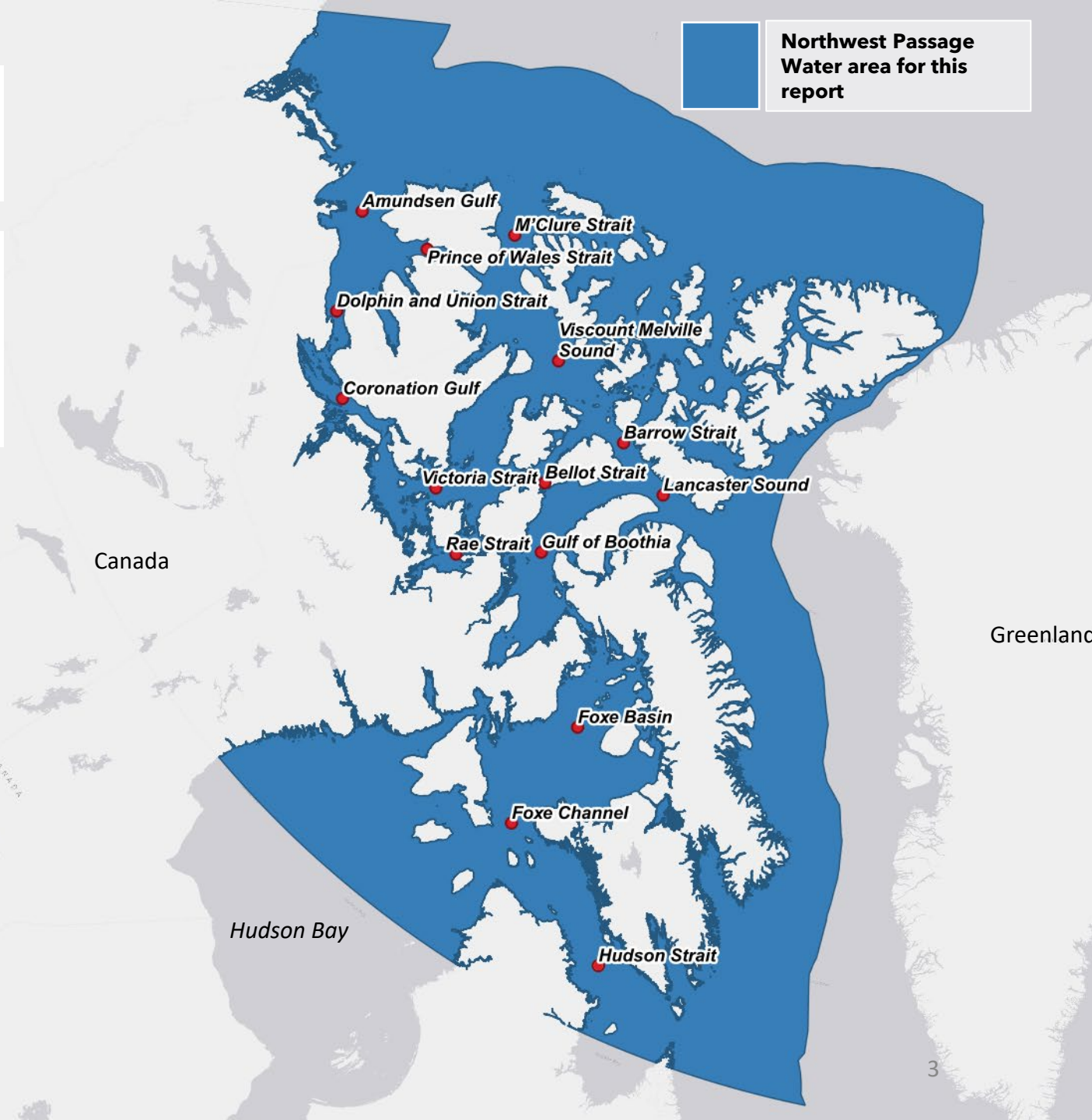
# There is no official definition of the Northwest Passage

**This report instead uses the definition of Arctic Waters, set out under Canada's Arctic Waters Pollution Prevention Act, to establish geographic scope.**

*"Arctic waters means the internal waters of Canada and the waters of the territorial sea of Canada and the exclusive economic zone of Canada, within the area enclosed by the 60th parallel of north latitude, the 141st meridian of west longitude and the outer limit of the exclusive economic zone; however, where the international boundary between Canada and Greenland is less than 200 nautical miles from the baselines of the territorial sea of Canada, the international boundary shall be substituted for that outer limit; (eaux arctiques)"*

[Arctic Waters Pollution Prevention Act:](https://laws-lois.justice.gc.ca/eng/acts/a-12/page-1.html#h-5662)

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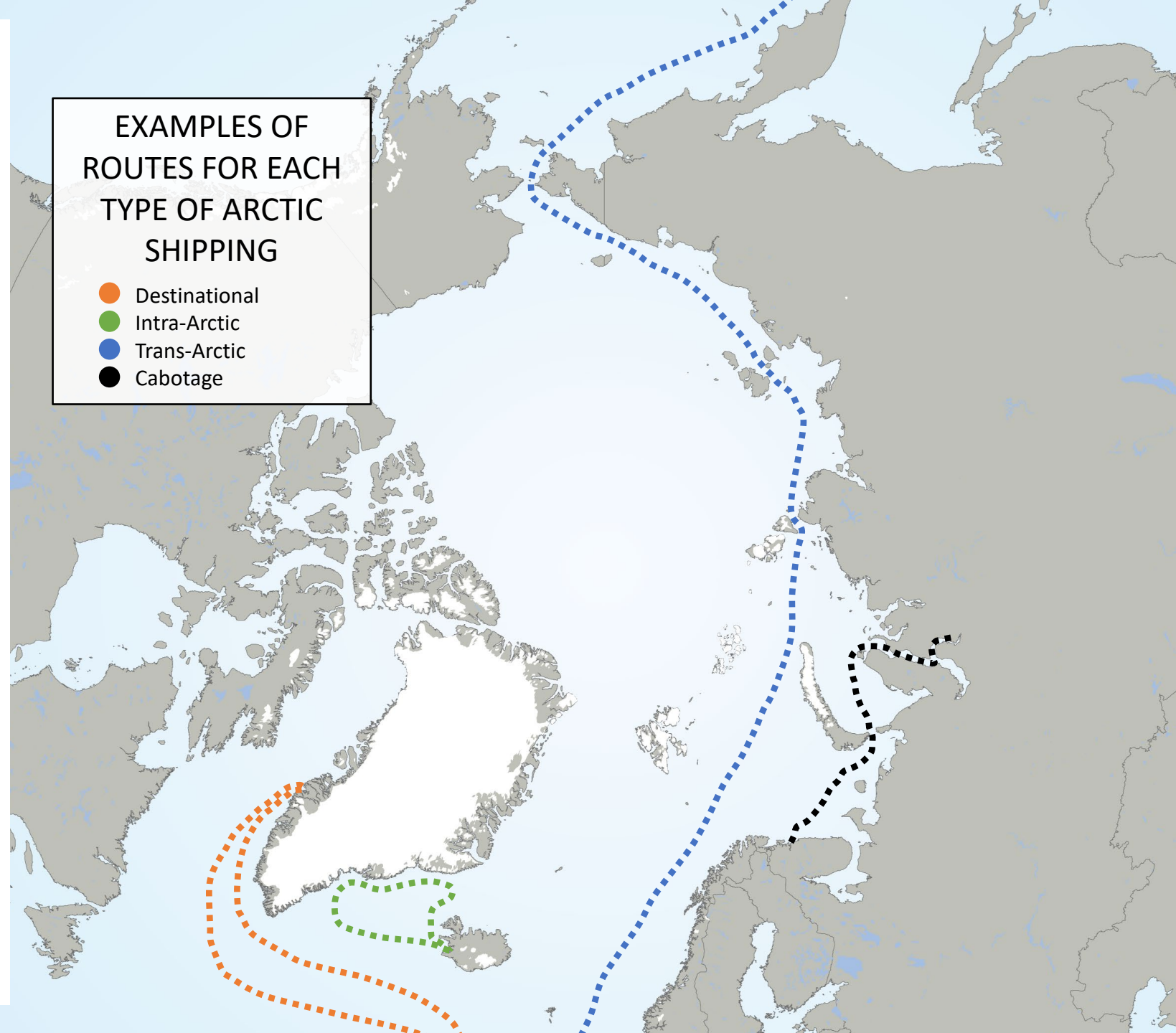
# ARCTIC SHIPPING

PAME's 2009 Arctic Marine Shipping Assessment (AMSA) Report identified four types of Arctic Shipping:

- Destinational transport, where a ship sails to the Arctic, performs some activity in the Arctic, and sails south.
- Intra-Arctic transport, a voyage or marine activity that stays within the general Arctic region and links two or more Arctic States.
- Trans-Arctic transport transit voyages which are taken across the Arctic Ocean from the Pacific to Atlantic Oceans or vice versa.
- Cabotage, to conduct trade or engage in marine transport in coastal waters between ports within an Arctic State.

PAME: AMSA 2009 Report. Page 12.

Arctic shipping refers to all shipping activities within the area in question, unless otherwise stated.



# Arctic Ship Traffic Data

All data in this report is from PAME's Arctic Ship Traffic Data (ASTD) System ([www.astd.is](http://www.astd.is))

The type of information contained in the ASTD System and its sources are described in the ASTD Data Document, available here:

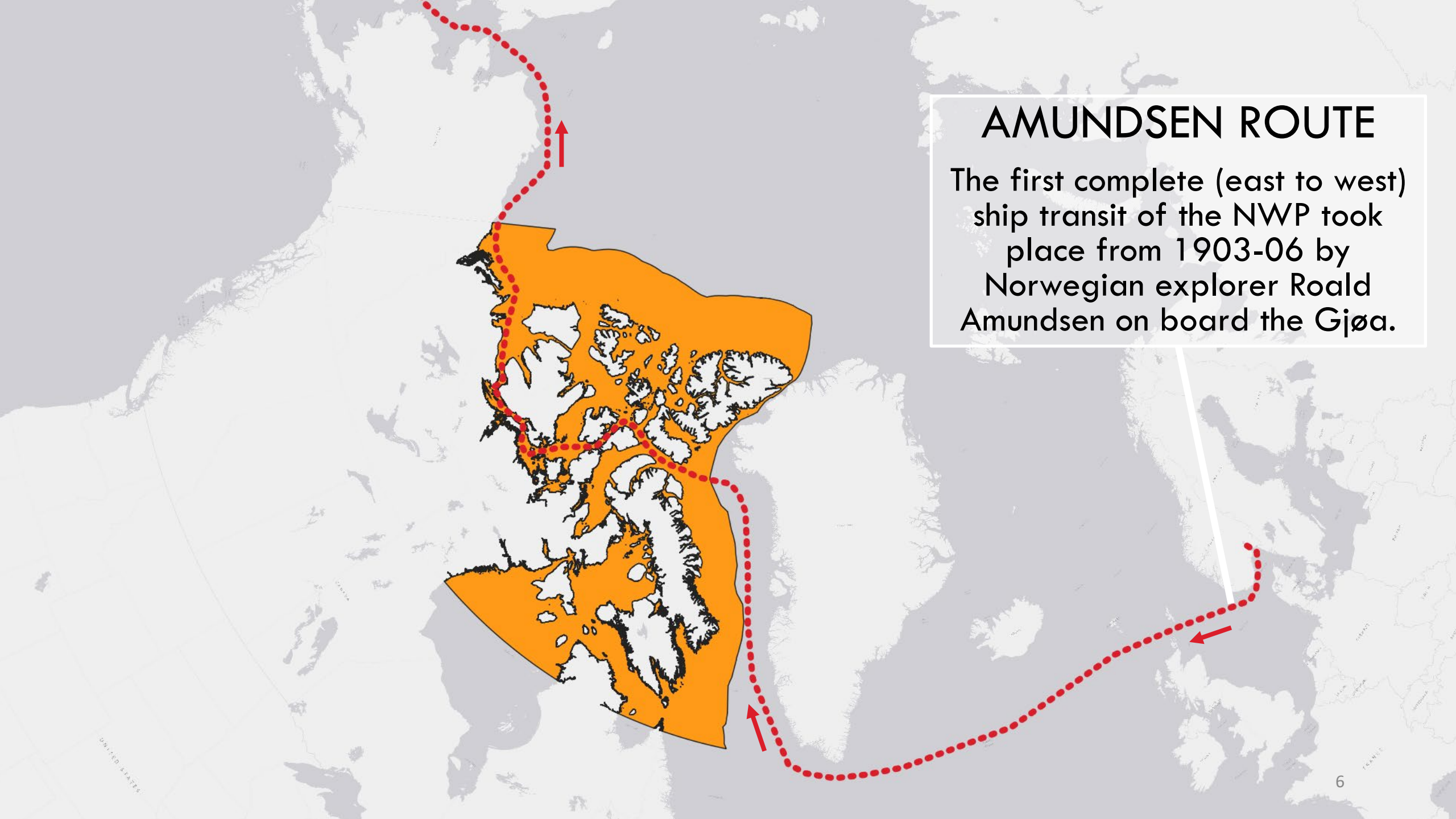
[https://pame.is/images/03\\_Projects/ASTD/ASTD\\_Data\\_Document.pdf](https://pame.is/images/03_Projects/ASTD/ASTD_Data_Document.pdf)





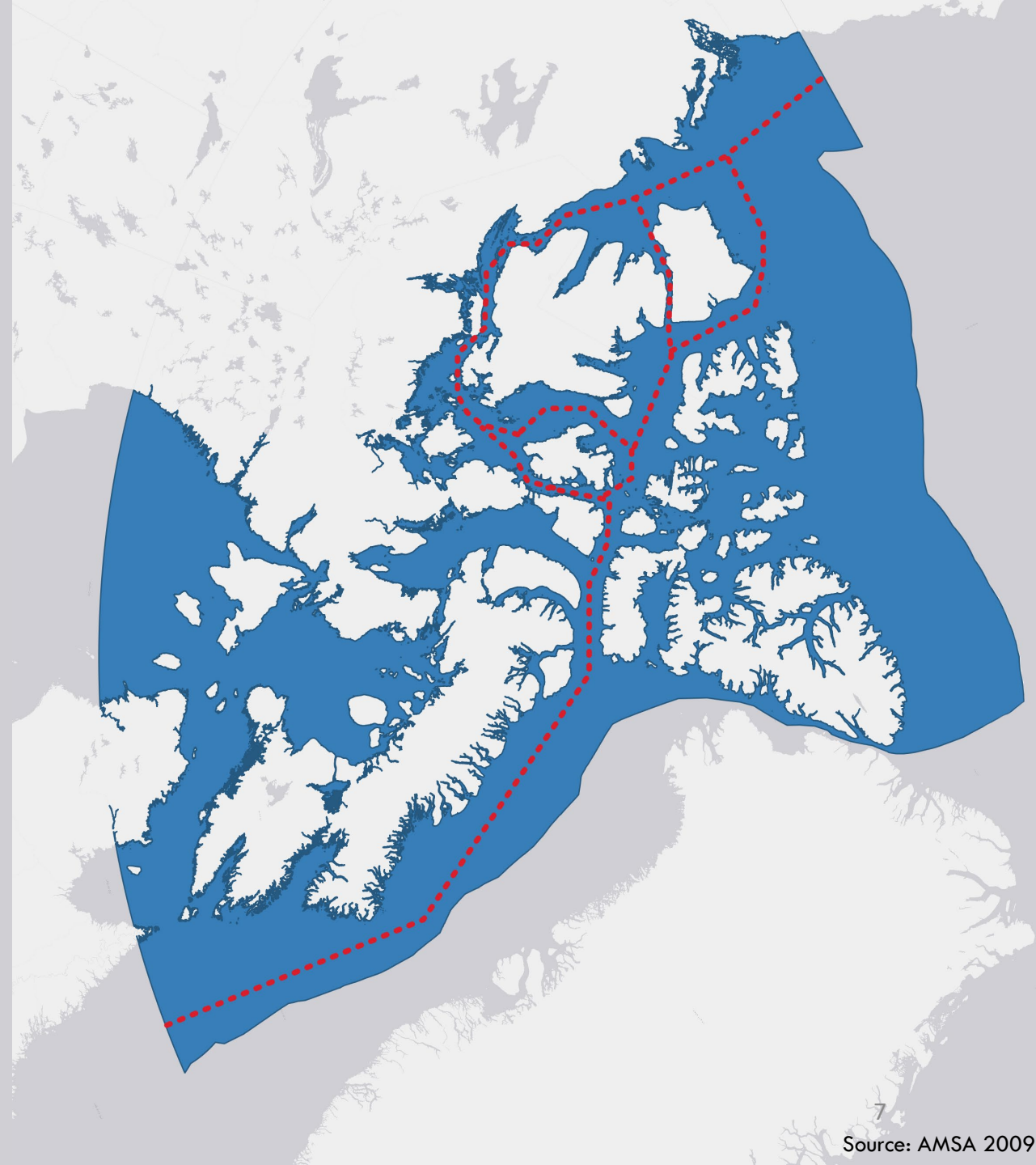
## AMUNDSEN ROUTE

The first complete (east to west)  
ship transit of the NWP took  
place from 1903-06 by  
Norwegian explorer Roald  
Amundsen on board the Gjøa.



# PAME'S 2009 ARCTIC MARINE SHIPPING ASSESSMENT IDENTIFIED 6 PRIMARY ROUTES --- OF THE NORTHWEST PASSAGE

*Of the various passages, routes 1 and 2 (see next pages) are considered deep water ones, while the others are shallow due to limiting shoals and rocks restricting the draught of vessels to less than 10 meters.*



# SHIP DRAUGHT:

*The distance between the ship's keel and the waterline of the vessel.*

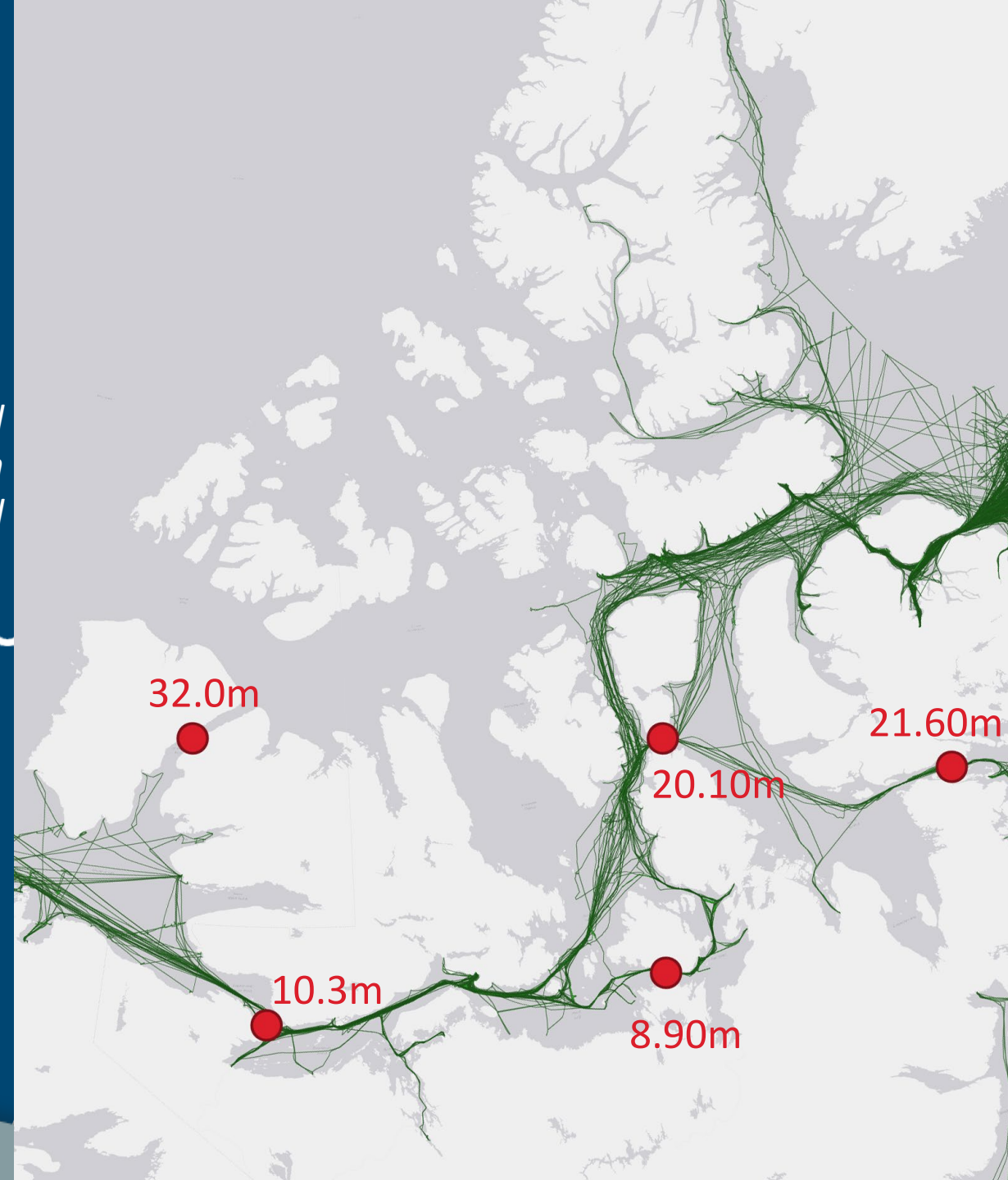




# LIMITING DEPTHS IN THE NWP

*Image shows AIS tracks in 2019 for all ships alongside examples of known chokepoints, with their associated depth in meters.*

OCEAN  
DEPTH



# ROUTE 1

Lancaster Sound – Barrow  
Strait – Viscount Melville  
Sound – Prince of Wales  
Strait – Amundsen Gulf.

NWP POSSIBLE  
ROUTES



# ROUTE 2

Same as 1 but substitute  
M'Clure Strait for Prince of  
Wales Strait and  
Amundsen Gulf.  
Collectively Lancaster  
Sound – Barrow Strait –  
Viscount Melville Sound is  
known as Parry Channel.

NWP POSSIBLE  
ROUTES

# ROUTE 3

Lancaster Sound – Barrow Strait – Peel Sound – Franklin Strait – Larsen Sound – Victoria Strait – Queen Maud Gulf – Dease Strait – Coronation Gulf – Dolphin and Union Strait – Amundsen Gulf.

NWP POSSIBLE  
ROUTES



# ROUTE 4

A variation of 3. Rather than following Victoria Strait on the west side of King William Island, the route passes to the east of the island following James Ross Strait – Rae Strait – Simpson Strait.

NWP POSSIBLE  
ROUTES

# ROUTE 5

Similar to 3. Rather than following Peel Sound on the west side of Somerset Island, the route passes to the east of the island through Prince Regent Inlet and Bellot Strait.

NWP POSSIBLE  
ROUTES



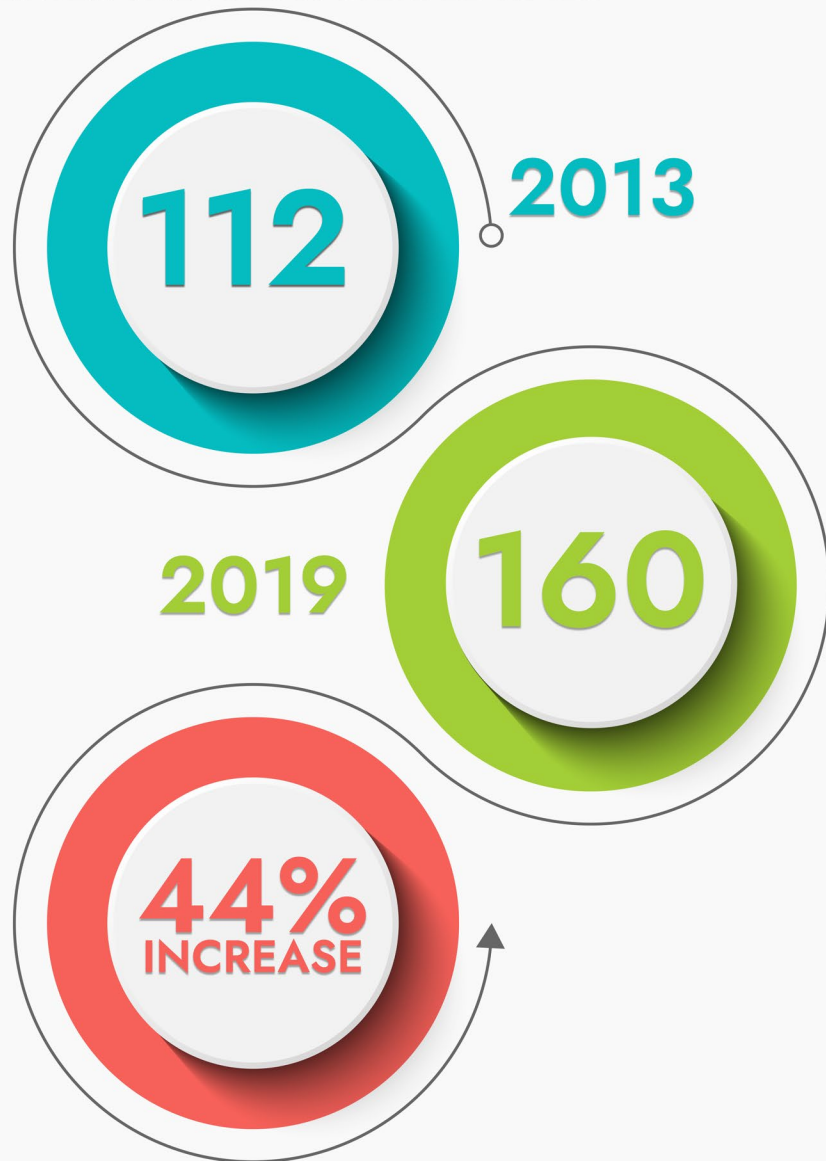
# ROUTE 6

Hudson Strait – Foxe  
Channel – Foxe Basin –  
Fury and Hecla Strait –  
Gulf of Boothia – Bellot  
Strait – remainder via  
routes 3, 4 or 5.

NWP POSSIBLE  
ROUTES

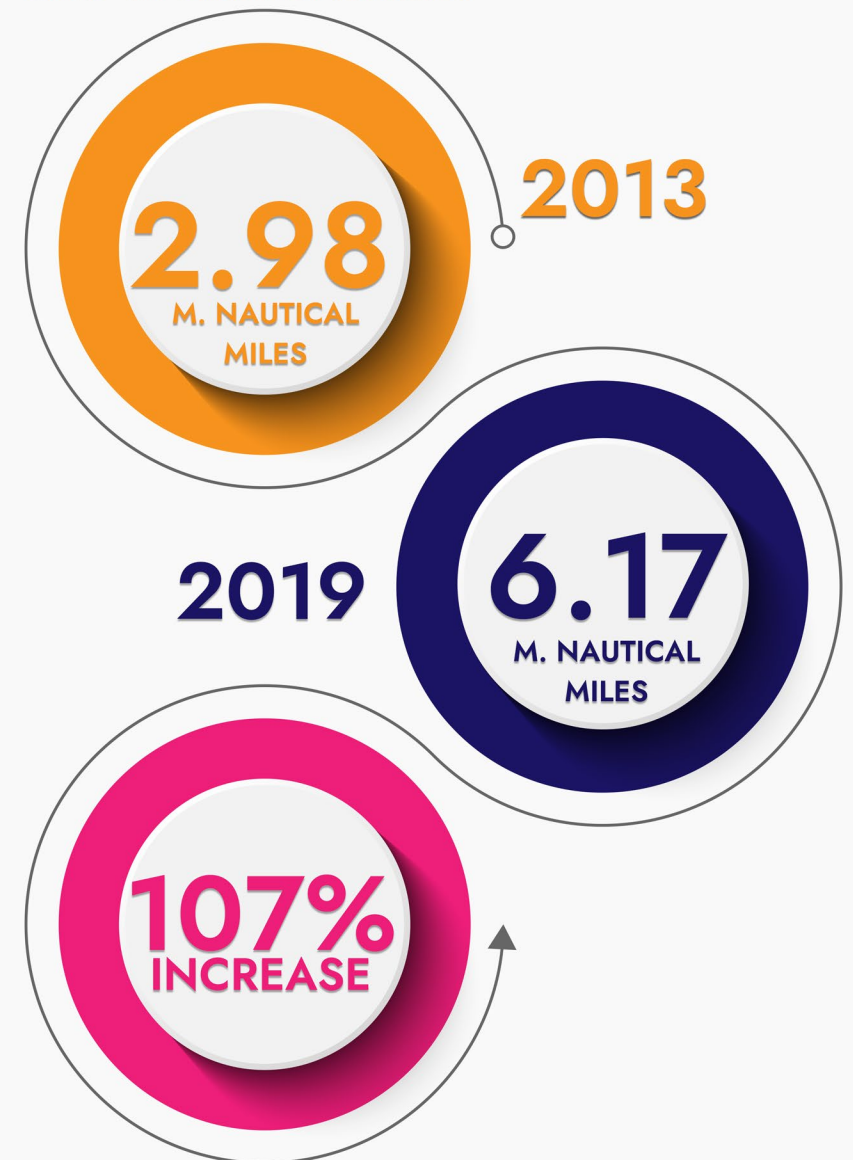
# UNIQUE SHIPS

EACH SHIP IS ONLY COUNTED ONCE BUT  
CAN ENTER THE AREA MULTIPLE TIMES



# DISTANCE SAILED

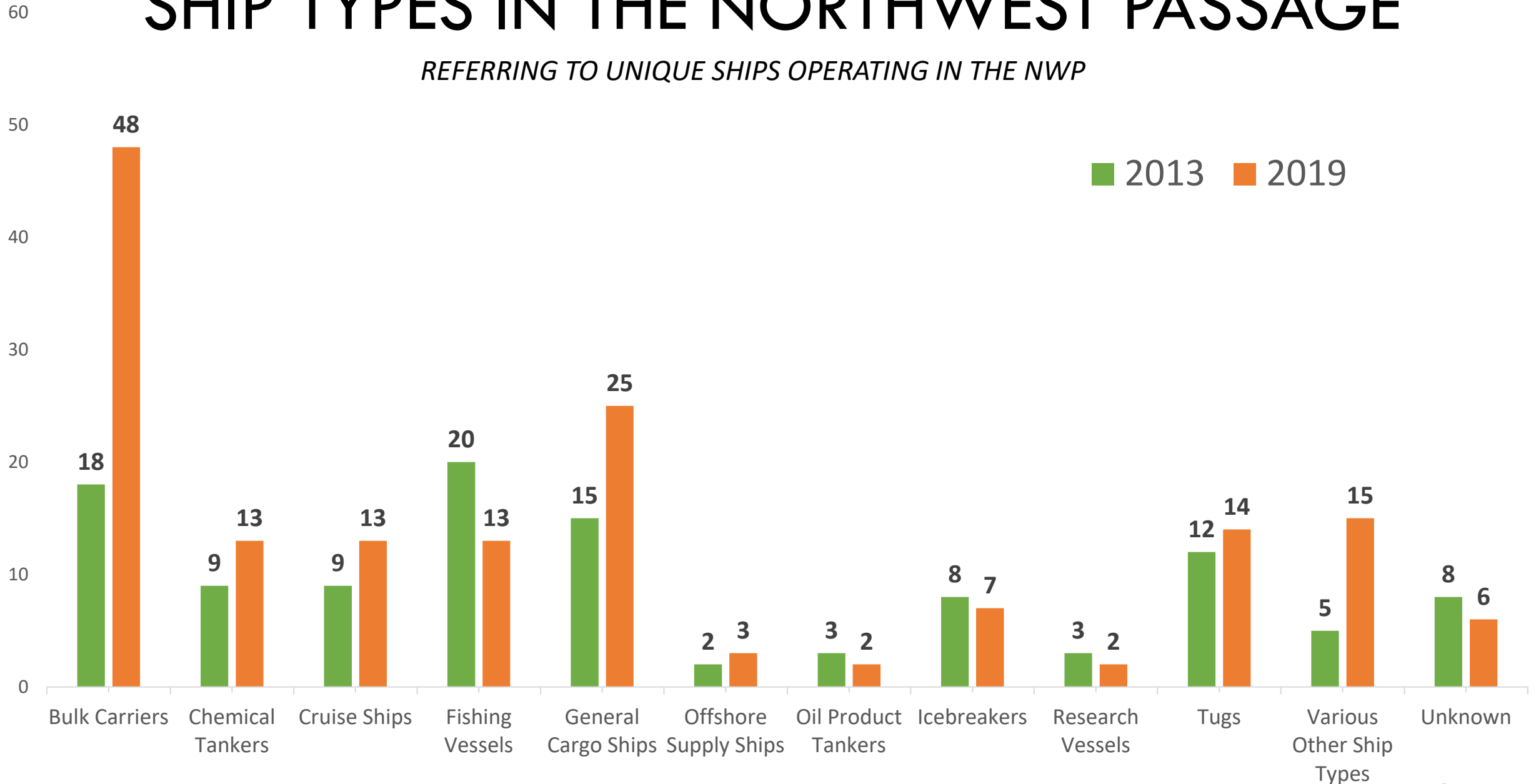
DISTANCE SAILED AGGREGATED FOR EACH  
SHIP IN NAUTICAL MILES





# SHIP TYPES IN THE NORTHWEST PASSAGE

*REFERRING TO UNIQUE SHIPS OPERATING IN THE NWP*

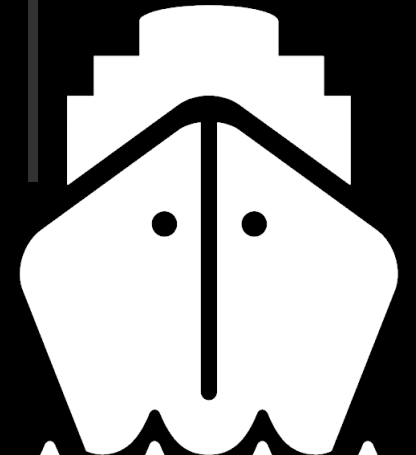


# SHIP REGISTRATION

Ship registration plays a critical function for the safety and security of maritime transport and contributes to the protection and preservation of the marine environment.

The general mechanism for establishing a ship's nationality and for regulating shipping under international law is through registration of the ship in a particular State. By linking a ship to a State, the “Flag” can exercise regulatory control over vessel with respect to safety, pollution prevention, and equipment and crew certification.

Each country sets its own laws and regulations on the registration of ships.





CANADIAN FLAGGED SHIPS COMPRISED  
THE MAJORITY OF COMMERCIAL SHIPS  
OPERATING WITHIN THE NWP IN BOTH  
2013 AND 2019

2013

61

2019

72

CANADA

FLAG	2013	2019	<i>continued</i>	2013	2019
Marshall Islands	7	18	Malta	0	2
Panama	3	9	Estonia	0	1
Bahamas	8	9	United Kingdom	1	1
Netherlands	2	9	Iceland	0	1
Liberia	2	7	Sweden	0	1
Hong Kong, China	0	5	USA	2	1
Antigua & Barbuda	2	4	Jamaica	0	1
Portugal (Mar)	0	4	Cyprus	2	0
Norway (Nis)	2	3	Kingdom of Denmark (Dis)	4	0
Singapore	1	3	France (Fis)	3	0
Cayman Islands	1	3	Gibraltar	1	0
Finland	0	2	Greece	3	0
France	2	2	Russian Federation	1	0
Malta	0	2	South Korea	1	0
			Unknown	3	3

OTHER

## ASTD DATA CONTAINS INFORMATION ON THE SIZE OF SHIPS IN GROSS TONNAGE

**Gross tonnage (GT)** is a function of the volume of all of a ship's enclosed spaces (from keel to funnel) measured to the outside of the hull framing.

### ASTD Size Groups:

<1000 GT  
1000-4999 GT  
5000-9999 GT  
10.000-24.999 GT  
25.000-49.999 GT  
50.000-99.999 GT  
>= 100.000 GT

## NORTHWEST PASSAGE

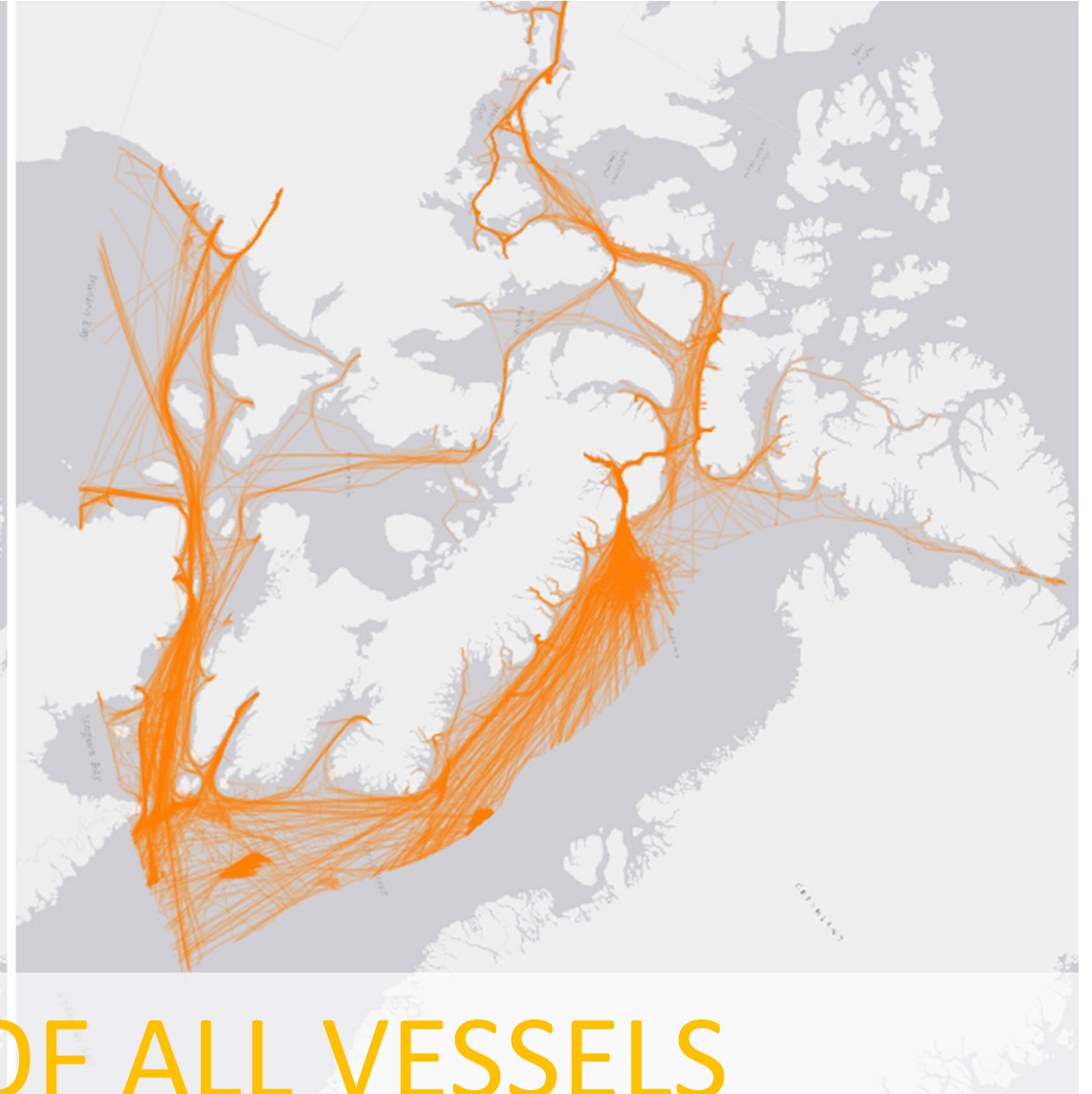
Size group	2013	2019
< 1000 GT	20	23
1000 - 4999 GT	25	19
5000 - 9999 GT	25	28
10.000 – 24.999	22	32
25.000 – 49.999	10	48
Unknown	10	10

No ships in the two biggest size groups (50.000-99.999 GT >= 100.000 GT) were present – showing that the ships operating within the NWP are comparatively smaller to ships operating elsewhere.



2013

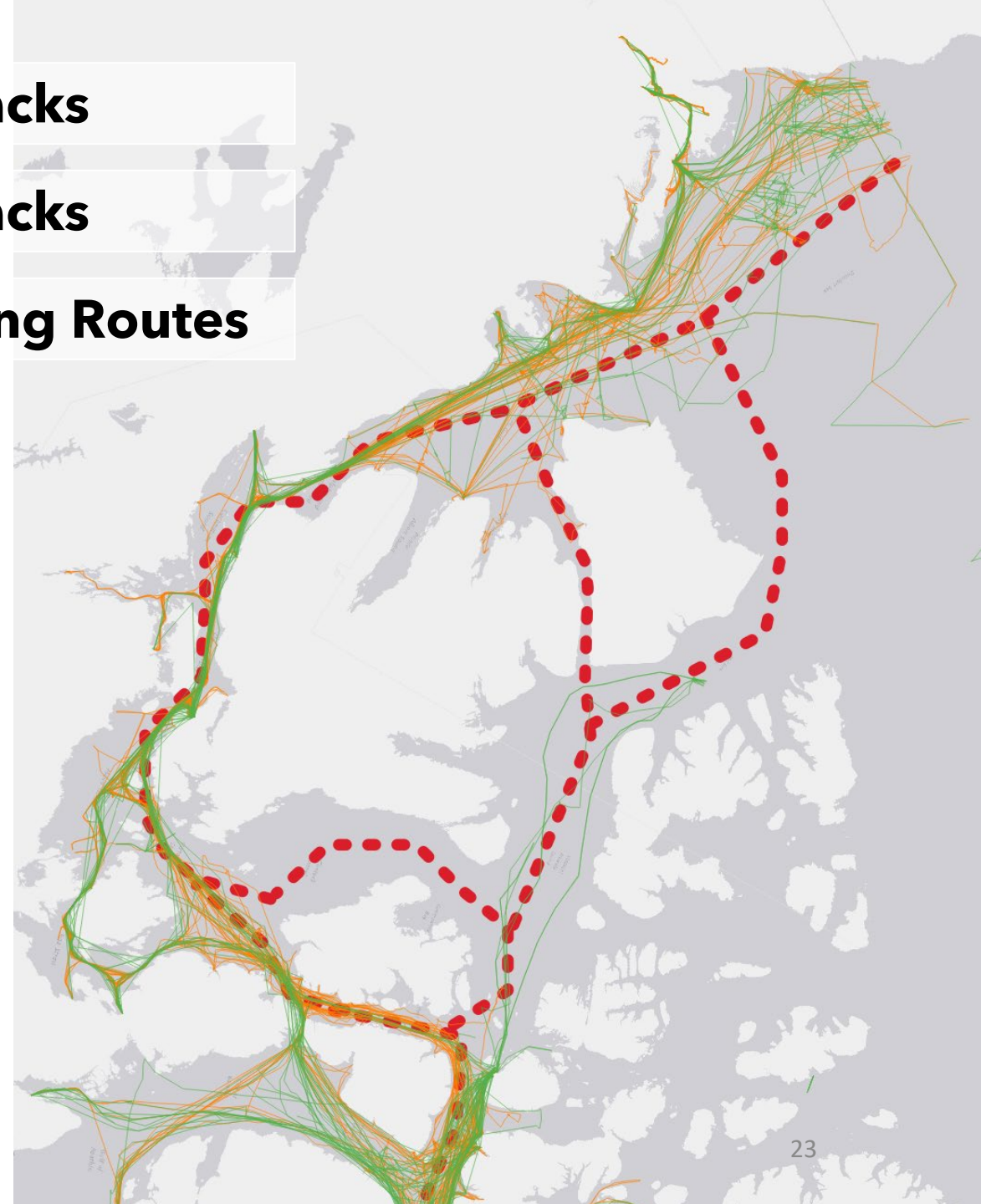
2019



SHIP TRACKS OF ALL VESSELS

# SHIP TRACKS IN THE NWP AND THE 6 AMSA SHIPPING ROUTES

- 2013 Ship Tracks
- 2019 Ship Tracks
- AMSA Shipping Routes





# ABOUT THIS REPORT

*This is the third report generated by PAME's Arctic Ship Status Report (ASSR) Project. The goal of the ASSR Project is to use PAME's Arctic Ship Traffic Data (ASTD) System to highlight topical issues related to shipping in the Arctic. Launched in 2019, the ASTD System is PAME's database for Arctic shipping activities.*

*All use of this report is allowed. Please cite PAME – Arctic Shipping Status Report #3 and provide a link to this report.*

*Due to data updates and slight differences in analytical methodologies, the overall number of ships may differ slightly from ASSR to ASSR.*

*Special thanks to Ian Hanna, LCDR, Waterways Risk Assessment and Support Division CG Navigation Center.*

*The project gratefully acknowledges funding from the Nordic Council of Ministers.*



**Nordic  
Co-operation**

**PAME**  
Protection of the Arctic Marine Environment

## **Sources:**

- [ASTD](#) – Arctic Ship Traffic Data
- [AMSA Report \(PAME 2009\)](#)
- [IMO: Registration of Ships](#)
- [Arctic Voyage Planning Guide \(DFO\)](#)
- [Arctic Waters Pollution Prevention Act](#)