

SUB-COMMITTEE ON NAVIGATION,
COMMUNICATIONS AND SEARCH AND
RESCUE
5th session
Agenda item 3

NCSR 5/3/7
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ROUTEING MEASURES AND MANDATORY SHIP REPORTING SYSTEMS

Establishment of two-way routes and precautionary areas in the Bering Sea and Bering Strait

Submitted by the Russian Federation and the United States

SUMMARY

<i>Executive summary:</i>	This document contains a proposal to establish six recommendatory two-way routes and six precautionary areas in the Bering Sea and Bering Strait
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.4
<i>Output:</i>	5.2.4.1
<i>Action to be taken:</i>	Paragraph 29
<i>Related documents:</i>	SOLAS regulation V/10; resolution A.572(14), as amended; MSC.1/Circ.1060 and MSC.1/Circ.1060/Add.1.

Introduction

1 This document is a proposal by the United States and the Russian Federation to establish six two-way routes and six precautionary areas in the Bering Sea and Bering Strait off the coast of Chukotskiy Peninsula and Alaska. These waters are expected to see increased traffic due to rising economic activity in the Arctic. Use of the proposed routes is intended to be voluntary for all ships of 400 gross tonnage and above.

2 Details of the proposed two-way routes and the precautionary areas are provided as follows:

- .1 general description of the two-way routes, precautionary areas and chartlet are provided in annex 1;

- .2 the names, numbers, editions and geodetic datum of the reference charts used to delineate the two-way route are provided in annex 2; and
- .3 the geographical coordinates that define the two-way routes and precautionary areas are provided in annex 3.

Summary

3 The objectives for submitting the proposed two-way routes and precautionary areas are to:

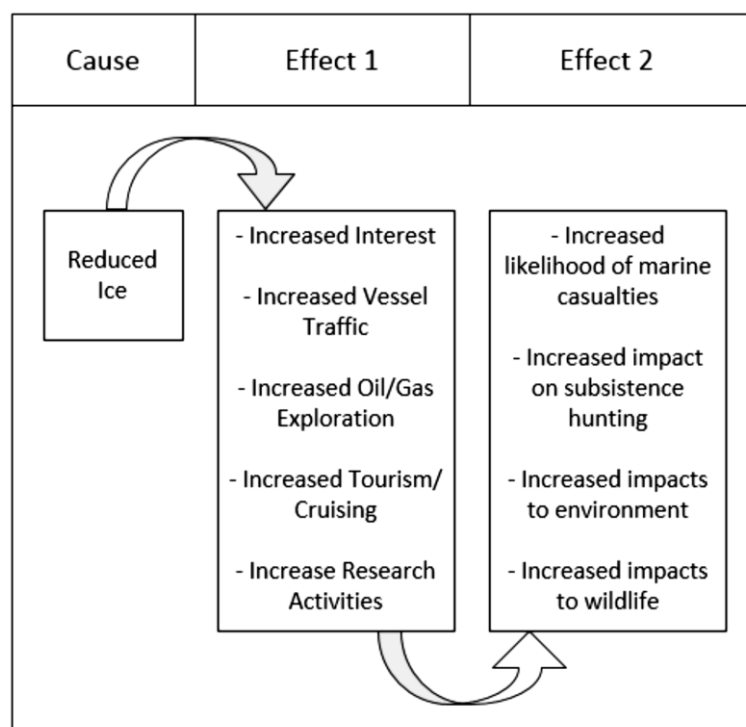
- .1 organize the streams of ships passing the Bering Strait and along United States and Russian coasts in the Bering Sea;
- .2 reduce the risks of collision and to provide adequate sea room for ships executing collision avoidance measures;
- .3 provide ships with a maximum amount of flexibility in avoiding ice when present;
- .4 focus limited survey resources in areas of greatest concentration of shipping;
- .5 help ships avoid numerous shoals, reefs and islands that lie close outside the two-way routes, particularly where the area has not been surveyed thoroughly;
- .6 enable better monitoring of a ship's transit through the region and allow more time for intervention in case a ship suffers a breakdown of its propulsion machinery;
- .7 allow ships to follow well-defined routes, thereby enhancing the safety and efficiency of navigation;
- .8 prevent and reduce the risk of pollution or other damage to the marine environment, including national and international recognized habitat and species; and
- .9 avoid the key areas of fishing activities and avoid the areas of subsistence activities by local indigenous communities.

4 The recent developments of economic activity in the Arctic will lead to an increased impact on the natural environment of the Arctic region. At the same time, potentially increased commercial shipping in the Arctic waters may represent a significant risk of contamination of the sensitive marine environment. Therefore, the establishment of new recommendatory two-way routes aims to reduce the potential negative impact on the environment of the Arctic and the risks of environmental accidents and disasters in consequence of marine casualties.

5 The demonstrated need for the establishment of the proposed routing measures is determined by the fact that over the preceding decade the United States and the Russian Federation have observed and responded to a steady increase of interest in Arctic shipping activities which can be attributed to a climatic trend towards reduction of ice in the Arctic Ocean and Chukchi Sea.

6 During the summer of 2007 a record was set for a minimum sea-ice coverage in the Arctic which spawned increased interest in the Arctic and Sub-Arctic regions. Since then, international attention has been focusing on a changing Arctic climate and the potential for increased natural resource exploration as well as the possibility that shorter transit shipping routes could become more viable. The minimum summer sea-ice coverage record was broken again in 2012, furthering interest in natural resource exploration in the Arctic, as well as commercial and recreational use of the Bering Sea and Bering Strait as the main access route to or from Arctic waters.

7 This interest has manifested itself as increased cargo traffic, passenger ship traffic, adventure tourism traffic, oil and gas exploration, and research and scientific activities. This upward trend in ship traffic brings with it an increased likelihood of maritime casualties such as sinking, groundings, collisions, oil discharges and hazardous material releases, which in turn threatens the vulnerable marine environment, which is home to many endangered species and remote indigenous communities that rely heavily on traditional subsistence activities. The following diagram visually depicts the cause and effect sequence identified by the United States and the Russian Federation and validated by a review of the initial round of public comments received as part of studies conducted in the area.



- 8 The proposed two-way routes and precautionary areas are preferred because they:
- .1 are appropriate for domestic and international waters;
 - .2 allow for bi-directional traffic;
 - .3 have a defined width/size and clearly delineated boundaries which helps make it clearer to the navigator where recent hydrographic survey data has been gathered;
 - .4 would not limit access to areas used for either commercial fishing or subsistence activities;

- .5 are suitable for all ship types and sizes; and
- .6 afford more navigational sea room than a traffic separation scheme for ships that need to avoid ice but remain within a properly surveyed navigation corridor.

9 History of incidents in the vicinity of the proposed routeing measures is virtually non-existent owing to the low volume of ships operating in the area.

10 The proposed routeing measures are recommended to be voluntarily applied to ships of 400 gross tonnage and above, as a review of traffic patterns demonstrated these are mostly the ships that will use them.

11 Since the proposed routeing measures are designed to reflect existing traffic patterns in the area, the impact on navigation or on shipping will be minimal.

Description of the area

12 The location of the proposed two-way routes, precautionary areas and associated chartlets are set out in annex 1. The names, numbers, editions, and geodetic datum of reference charts used to delineate the routeing measures are set out in annex 2. The geographical positions of the routeing measures are set out in annex 3.

Cooperation between States

13 The proposal has been developed jointly by the United States and the Russian Federation since the routes in the Bering Strait are located in United States and Russian territorial waters only. Nevertheless, given that the Bering Sea and the Bering Strait are used by a wide variety of nationalities of ships, the United States and the Russian Federation consider it important for the recommendatory routeing measures to gain worldwide recognition through adoption by the International Maritime Organization.

14 The United States and the Russian Federation conducted significant outreach to users of the Bering Sea and Bering Strait and considered the views of maritime community representatives, environmental groups, and other interested stakeholders. The United States coordinated the proposal with Federal State, foreign State agencies (as appropriate) and federally recognized Tribes and Tribal organizations.

Traffic considerations

15 Existing patterns and density of traffic flow are shown based on AIS data collected between full calendar years 2014 and 2015. Annex 4 provides a table of transit segment data for all ships of 400 gross tonnage and above, except fishing vessels, and two relevant maps. Both the maps and the table of transit segments come from the same AIS data set. The first map is a heat map, which generalizes the traffic patterns into a series of graduated colours to show frequency of occurrence. The second map displays all recorded transit segments without any generalization or editing. The unedited map offers visual granularity, but in highly trafficked areas, traffic patterns can become indiscernible. Careful review of both map types will offer the best perspective on transit trends. The accompanying table of data shows the quantity of transit segments recorded for each ship type. A transit segment is not the precise number of ships for that type, but rather the total number of transit segments recorded for the given ship type.

16 There are no existing aids to navigation associated with the proposed routeing measures nor are any proposed at this time.

17 The eastern Bering Sea is a relatively shallow body of water with average depths ranging from 6 to 75 metres. These shallow depths offer minimal under keel clearances as compared to the waters surrounding the western Aleutian Islands and North Pacific Ocean where offshore water depths are well over 900 metres in depth. The shallow depths of the eastern Bering Sea are especially problematic for mariners because some nautical charts for this area are utilizing hydrographic data obtained over 100 years ago with a leadline at spacing intervals in excess of a mile apart. The shallow water of the Bering Sea along with the outdated hydrographic quality caused the United States and the Russian Federation to take a conservative approach in the development of routeing systems for the area.

18 Fishing vessel activity in the Bering Sea region is quite high and stands as the most prevalent use of the waterway. The 60,925 transit segments associated with fishing vessels represent 52% of the total. While fishing vessels do transit all portions of the Bering Sea, the southern and central Bering Sea and Bristol Bay region sees the highest concentrations of fishing vessel activity, which is concentrated on shallower and more productive fishing grounds. The majority of the vessels within the fishing industry are comparatively small to other commercial traffic.

19 There are no existing activities and foreseeable development of offshore exploration and exploitation of the seabed and offshore structures.

20 There are no foreseeable changes in the traffic pattern because of port or offshore terminal development.

Position-fixing in relation to the routeing system

21 The following major visual aids to navigation are available in the area and may be visible based on weather conditions and ships' height of eye:

- .1 Cape Prince of Wales Light: FI W 4s 7M
- .2 Cape Sarichef Light: FI W 2.5s 8M
- .3 Ostrov Ratmanova light: FI(1) W 5s 42m 11M
- .4 Pamyatnik Dezhneva light: FI(1) W 60s 80m 18M

22 The proposed routeing measures are within GPS (NAVSTAR & GLONASS) and AIS coverage.

Marine environmental considerations

23 The following environmental factors may affect the shipping in the vicinity of the proposed routeing measures:

- .1 the possibility of ice conditions in some areas of the Bering Sea and Bering Strait; and
- .2 heavy weather conditions, which could have a negative impact on those ships that lose total or partial mobility owing to a ship casualty such as loss of power.

Recommendatory routeing system

24 The proposal is for recommendatory routeing measures consisting of two-way routes and precautionary areas.

25 The proposed two-way route aims to provide relatively direct and efficient routes, reducing the number of turns and intersections, and provides a maximum distance from the coast, and sensitive environmental and inhabited areas.

26 Precautionary areas are proposed to be established at junctions with crossing traffic and at termination points, as recommended by the *General Provisions on Ships' Routeing*, adopted by the resolution A.572(14), as amended. Proposed precautionary areas do not imply any recommended directions of traffic flow.

Miscellaneous information

27 Both co-sponsoring States conducted a number of consultations and research work which had included the analysis of shipping statistics in the area, analysis of risks to safety of navigation and marine environment related to the potential growth of traffic through the Bering Strait. For example, on behalf of the United States, the United States Coast Guard's Seventeenth Coast Guard District located in Juneau, Alaska, conducted a Port Access Route Study (PARS) of the Bering Sea, Bering Strait and Chukchi Sea to evaluate the applicability and the need for creation of new ship routeing measures. The overarching goal of the PARS is to determine if ship routeing measures can help reduce the risk of marine casualties and their impact on the environment, increase the efficiency and predictability of vessel traffic, and preserve the paramount right of navigation while continuing to allow for other reasonable waterway uses. The PARS considered the following matters:

- .1 hydrographic quality analysis;
- .2 subsistence and cultural significance;
- .3 environmental analysis;
- .4 marine casualty analysis;
- .5 addition of waypoints along the two-way routes; and
- .6 traffic analysis.

Proposed date of implementation

28 It is proposed that the recommendatory two-way routes and precautionary areas as proposed will enter into force 6 months after the adoption by the Maritime Safety Committee.

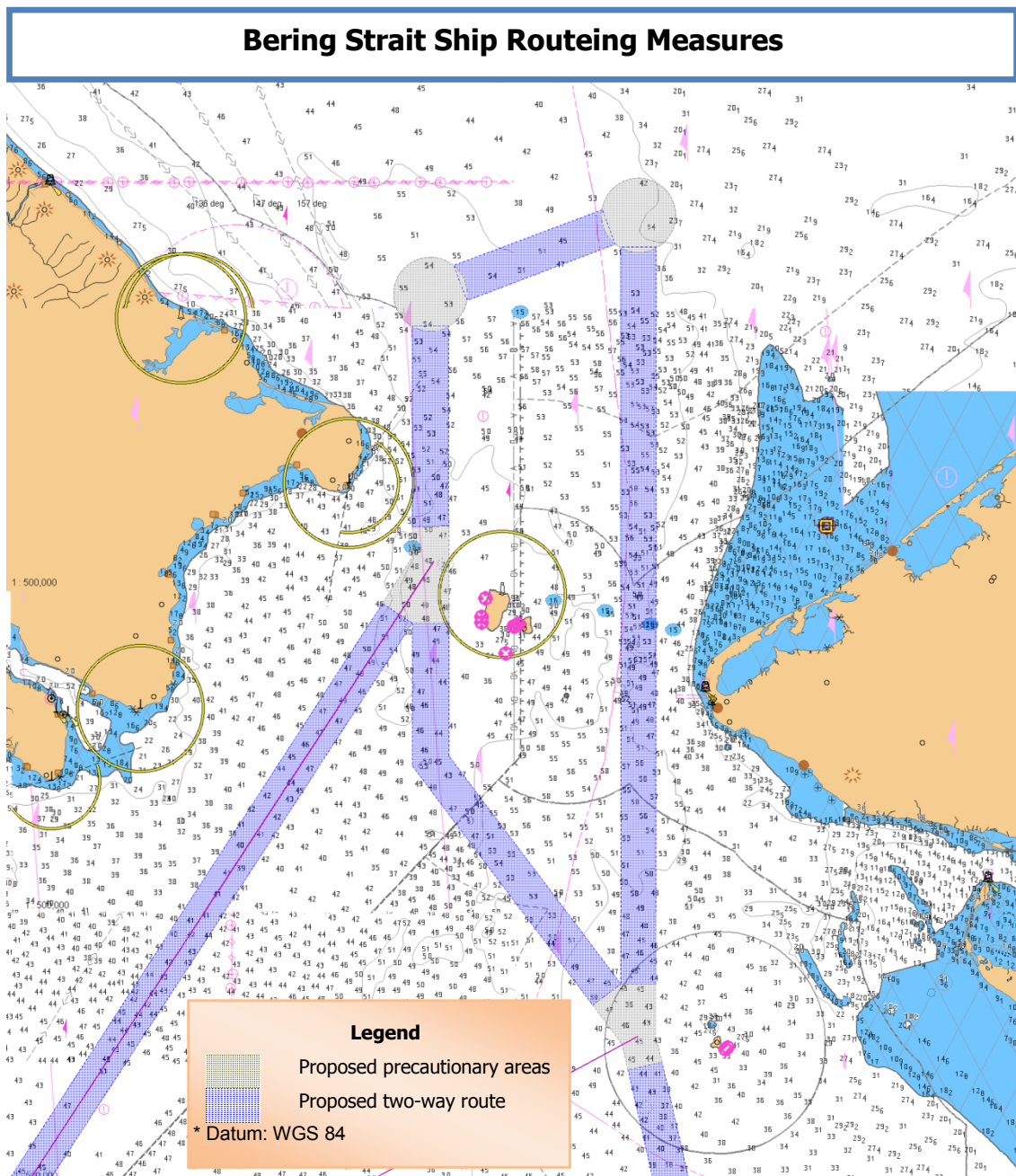
Action requested of the Sub-Committee

29 The Sub-Committee is invited to consider the proposal and recommend it to the Committee for adoption.

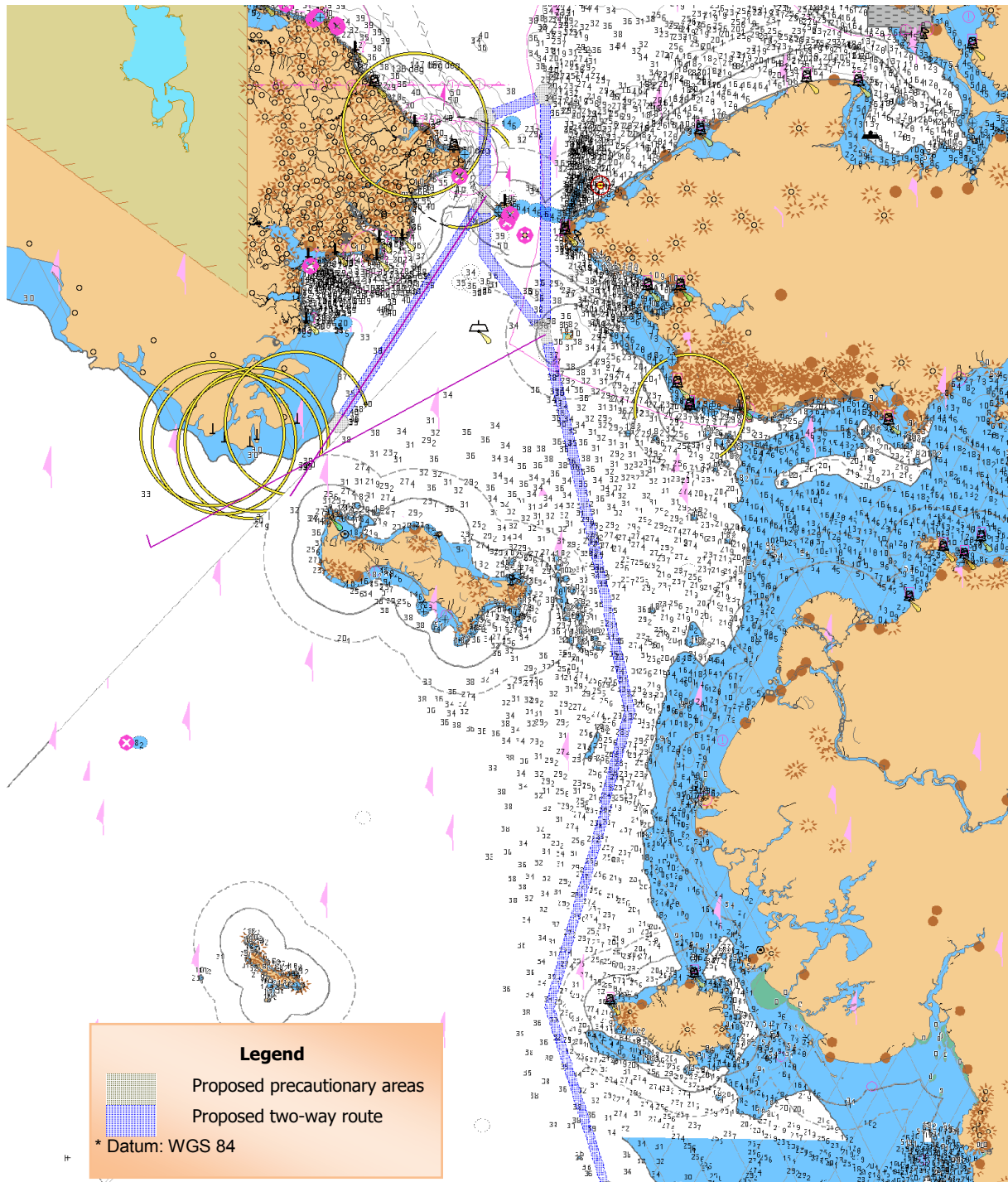
ANNEX 1

DESCRIPTION OF THE PROPOSED TWO-WAY ROUTES AND PRECAUTIONARY AREAS AND ASSOCIATED CHARTLETS IN THE BERING SEA AND BERING STRAIT

The proposed ships' routing measures consist of six two-way routes and six precautionary areas in the Bering Sea and Bering Strait. The measures apply to ships of 400 gross tonnage and above. Chartlets of the proposed measures are based on World Geodetic System 1984 Datum (WGS 84) and are provided below.



Bering Sea and Bering Strait Routeing Measures



ANNEX 2

**NAMES, NUMBERS, EDITION AND GEODETIC DATUMS OF THE
REFERENCE CHARTS**

Name	Type	Title	Producer	Nav. purpose (Scale)	Issue Date	Datum
RU2O9091	SENC	Chukchi Sea and Bearing Sea Chukotskiy Peninsula Senyavin Strait to Netten Point	RU Head Department of Navigation & Oceanography (DNO)	General 1:700000	3-12-2016	WGS 84
RU3O90B9	SENC	Bering Sea – Chukotskiy Peninsula – Ulakhpen Point to Penkigngey Bay	RU Head Department of Navigation & Oceanography (DNO)	Coastal 1:180000	26-2-2011	WGS 84
RU3OE090	SENC	Bering Sea – Chukotskiy Peninsula Nygchigen Point to Litke Point	RU Head Department of Navigation & Oceanography (DNO)	Coastal 1:180000	28-5-2011	WGS 84
RU3OH0B0	SENC	Chukchi Sea. Chukotskiy Peninsula. Dzhenretlen Point to Dezhnyoy Point.	RU Head Department of Navigation & Oceanography (DNO)	Coastal 1:180000	7-4-2007	WGS 84
RU4OH1S0	SENC	Bering Sea – Bering Strait – Diomedede Islands – Approaches to Ratmanov Island	RU Head Department of Navigation & Oceanography (DNO)	Approach 1:22000	28-5-2011	WGS 84
US1BS03M	SENC	Bering Sea Northern Part	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	Overview 1:3500000	31-5-2017	WGS 84
US2AK92M	SENC	Cape Prince of Wales to Pt. Barrow	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	General 1:700000	3-8-2017	WGS 84

Name	Type	Title	Producer	Nav. purpose (Scale)	Issue Date	Datum
US2AK95M	SENC	Bering Sea-eastern part	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	General 1:1534076	3-8-2017	WGS 84
US3AK80M	SENC	Norton Sound Golovnin Bay	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	Coastal 1:350000	30-5-2017	WGS 84
US3AK89M	SENC	Bering Sea St. Lawrence Island to Bering Strait	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	Coastal 1:315350	30-5-2017	WGS 84
US4AK81M	SENC	Port Clarence and Approaches	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	Approach 1:100000	27-4-2016	WGS 84
US4AK8DM	SENC	Bering Strait North	US Office of Coast Survey National Ocean Service. National Oceanic and Atmospheric Administration (NOS)	Approach 1:100000	30-5-2017	WGS 84

ANNEX 3

GEOGRAPHICAL COORDINATES OF THE TWO-WAY ROUTES AND PRECAUTIONARY AREAS IN THE BERING SEA AND BERING STRAIT

(Reference charts: See annex 2.)

Note: All geographical positions are based on World Geodetic System 1984 Datum (WGS 84.)

Note: These routing measures are recommended for ships of 400 gross tonnage and above.

Description of the two-way routes and precautionary areas

The ships' routing system consists of six (6) recommendatory two-way routes and six (6) precautionary areas in the Bering Sea and Bering Strait.

A list of the geographical coordinates of the two way routes and precautionary areas is provided below.

(a) A precautionary area "A" is established, the waters contained within a circle of radius 4.00 miles centred at geographical position 58°45'.00 N, 167°27'.81W.

(b) A two-way route, connecting with precautionary area "A" and precautionary area "B", is established between the following geographical positions:

- | | |
|------------------------------|--------------------------------|
| (1) 58°48'.91 N 167°26'.26 W | (7) 64°55'.19 N 168° 27'.77 W |
| (2) 60°10'.86 N 168°19'.58 W | (8) 63°29'.57 N 167° 42'.57 W |
| (3) 61°29'.47 N 167°35'.89 W | (9) 62°25'.26 N 167° 11'.99 W |
| (4) 62°25'.14 N 167°03'.13 W | (10) 61°30'.52 N 167° 43'.95 W |
| (5) 63°30'.44 N 167°33'.86 W | (11) 60°10'.74 N 168° 27'.94 W |
| (6) 64°56'.08 N 168°18'.60 W | (12) 58°47'.65 N 167° 33'.56 W |

(c) A precautionary area "B" is established, which is bounded by a line connecting the following geographical positions:

- | | |
|-------------------------------|-------------------------------|
| (6) 64°56'.08 N 168°18'.60 W | (16) 65°02'.60 N 168°37'.28 W |
| (13) 64°59'.22 N 168°20'.29 W | (17) 64°58'.14 N 168°29'.36 W |
| (14) 65°05'.00 N 168°20'.30 W | (7) 64°55'.19 N 168°27'.77 W |
| (15) 65°05'.00 N 168°29'.75 W | |

thence back to the point of beginning (6).

(d) A two-way route, connecting with precautionary area "B" and precautionary area "C", is established between the following geographical positions:

- | | |
|-------------------------------|-------------------------------|
| (14) 65°05'.00 N 168°20'.30 W | (19) 66°26'.57 N 168°29'.75 W |
| (18) 66°26'.57 N 168°20'.30 W | (15) 65°05'.00 N 168°29'.75 W |

(e) A precautionary area "C" is established, the waters contained within a circle of radius 4.00 miles centred at geographical position 66°30'.00 N, 168°25'.00 W.

- (f) A two-way route, connecting with precautionary area "C" and precautionary area "D", is established between the following geographical positions:

(20) 66°30'.64 N 168°34'.79 W (22) 66° 20'.83 N 169°11'.21 W
(21) 66°24'.59 N 169°14'.72 W (23) 66° 26'.90 N 168°31'.34 W

- (g) A precautionary area "D" is established, the waters contained within a circle of radius 4.00 miles centred at geographical position 66°21'.50 N, 169°21'.00 W.

- (h) A two-way route, connecting with precautionary area "D" and precautionary area "E", is established between the following geographical positions:

(24) 66°18'.05 N 169°16'.11 W (26) 65°56'.20 N 169°25'.87 W
(25) 66°18'.05 N 169°25'.87 W (27) 65°56'.20 N 169°16'.11 W

- (i) A precautionary area "E" is established, which is bounded by a line connecting the following geographical positions:

(26) 65°56'.20 N 169°25'.87 W (29) 65°45'.52 N 169°25'.87 W
(27) 65°56'.20 N 169°16'.11 W (30) 65°47'.69 N 169°34'.01 W
(28) 65°45'.52 N 169°16'.11 W (31) 65°52'.82 N 169°25'.87 W

thence back to the point of beginning (26).

- (j) A two-way route, connecting with precautionary area "E" and precautionary area "B", is established between the following geographical positions:

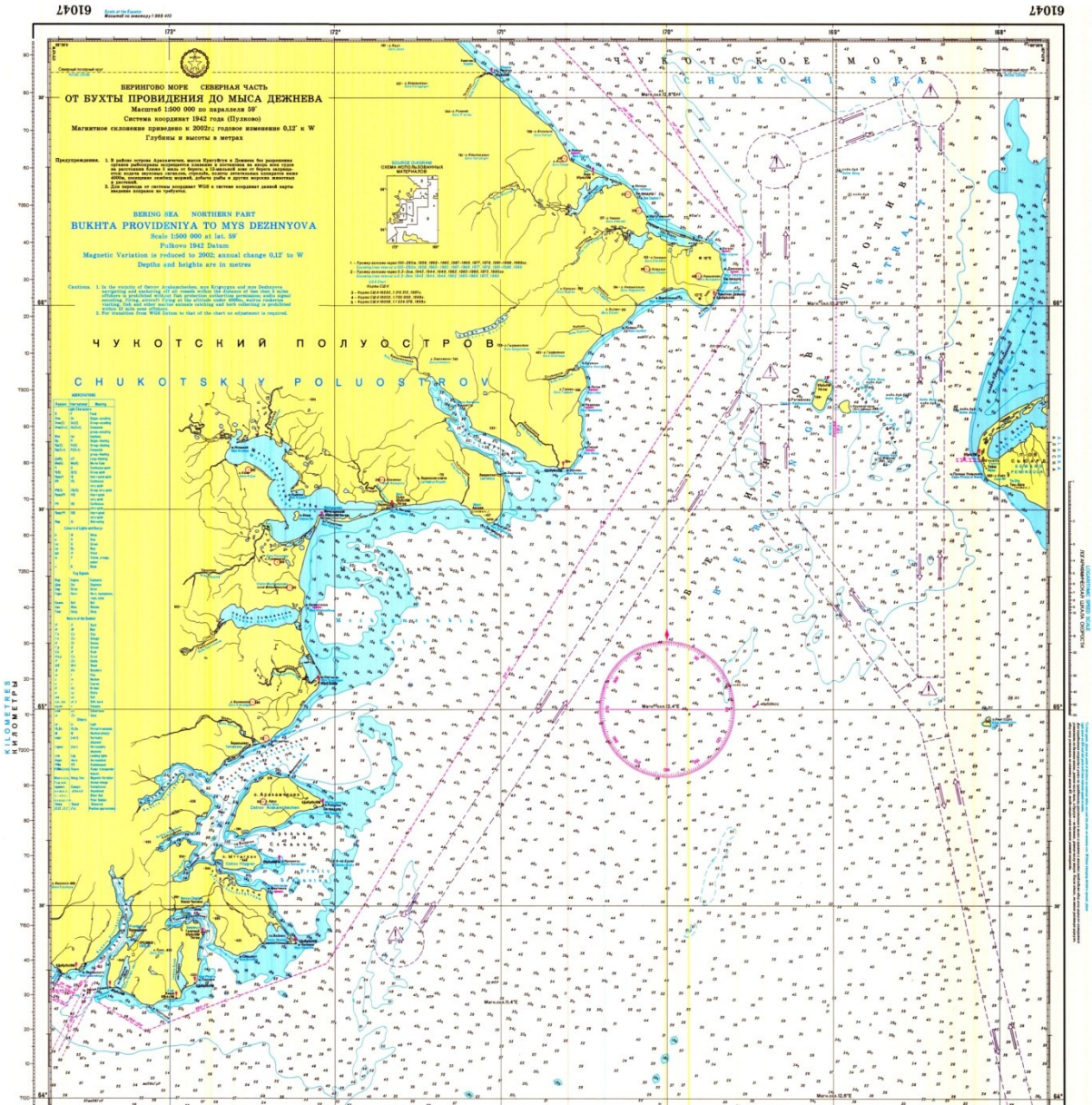
(28) 65°45'.52 N 169°16'.11 W (16) 65°02'.60 N 168°37'.28 W
(29) 65°45'.52 N 169°25'.87 W (15) 65°05'.00 N 168°29'.75 W
(32) 65°29'.65 N 169°25'.87 W (33) 65°30'.71 N 169°16'.11 W

- (k) A two-way route, connecting with precautionary area "E" and precautionary area "F", is established between the following geographical positions:

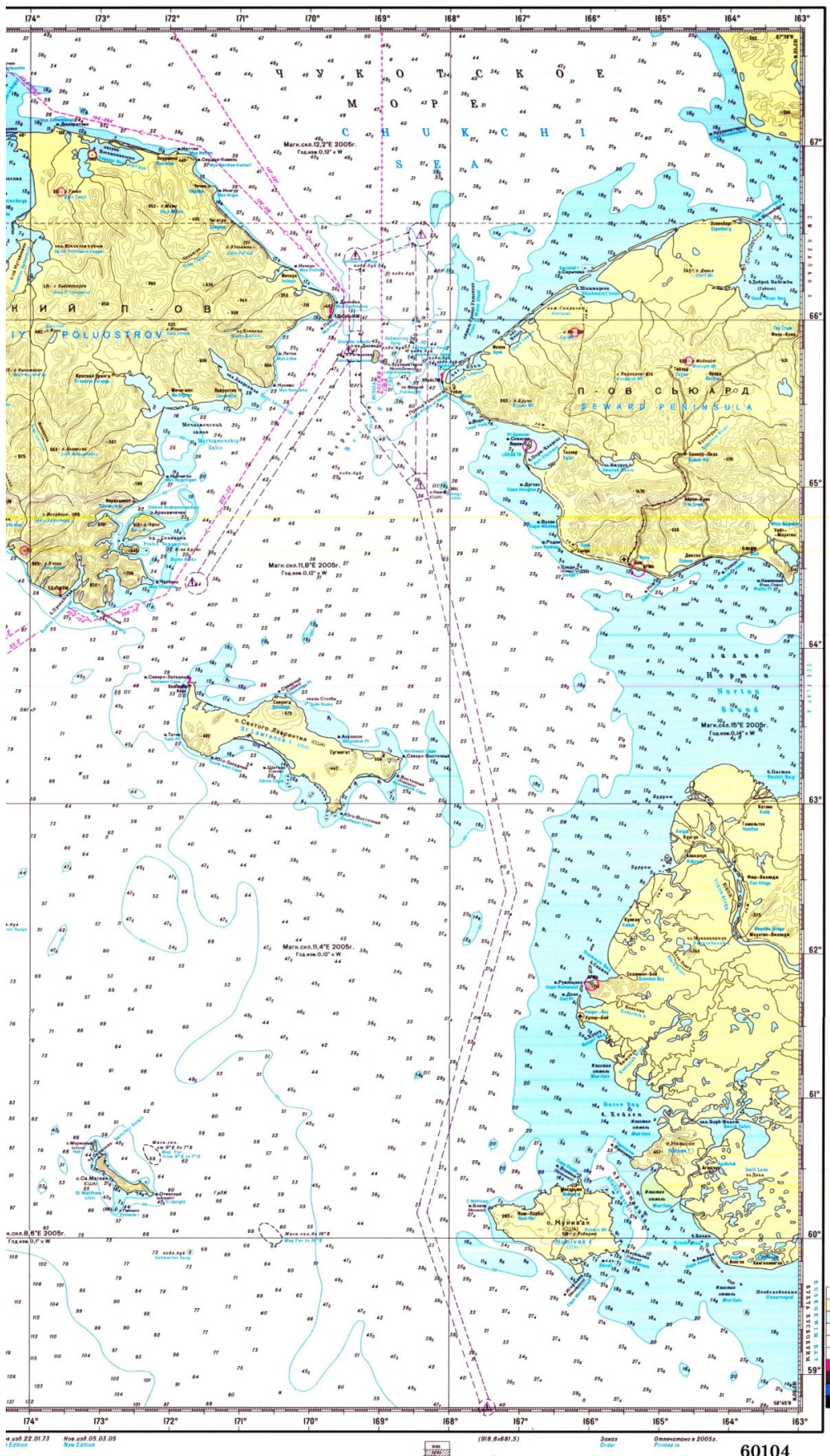
(29) 65°45'.52 N 169°25'.87 W (34) 64°28'.31 N 171°36'.35 W
(30) 65°47'.69 N 169°34'.01 W (35) 64°26'.14 N 171°28'.60 W

- (l) A precautionary area "F" is established, the waters contained within a circle of radius 4.00 miles centred at geographical position 64°24'.36 N, 171°36'.61 W.

**Two-Way Routes and Precautionary Areas in the Bering Sea and Bering Strait
plotted on paper charts**



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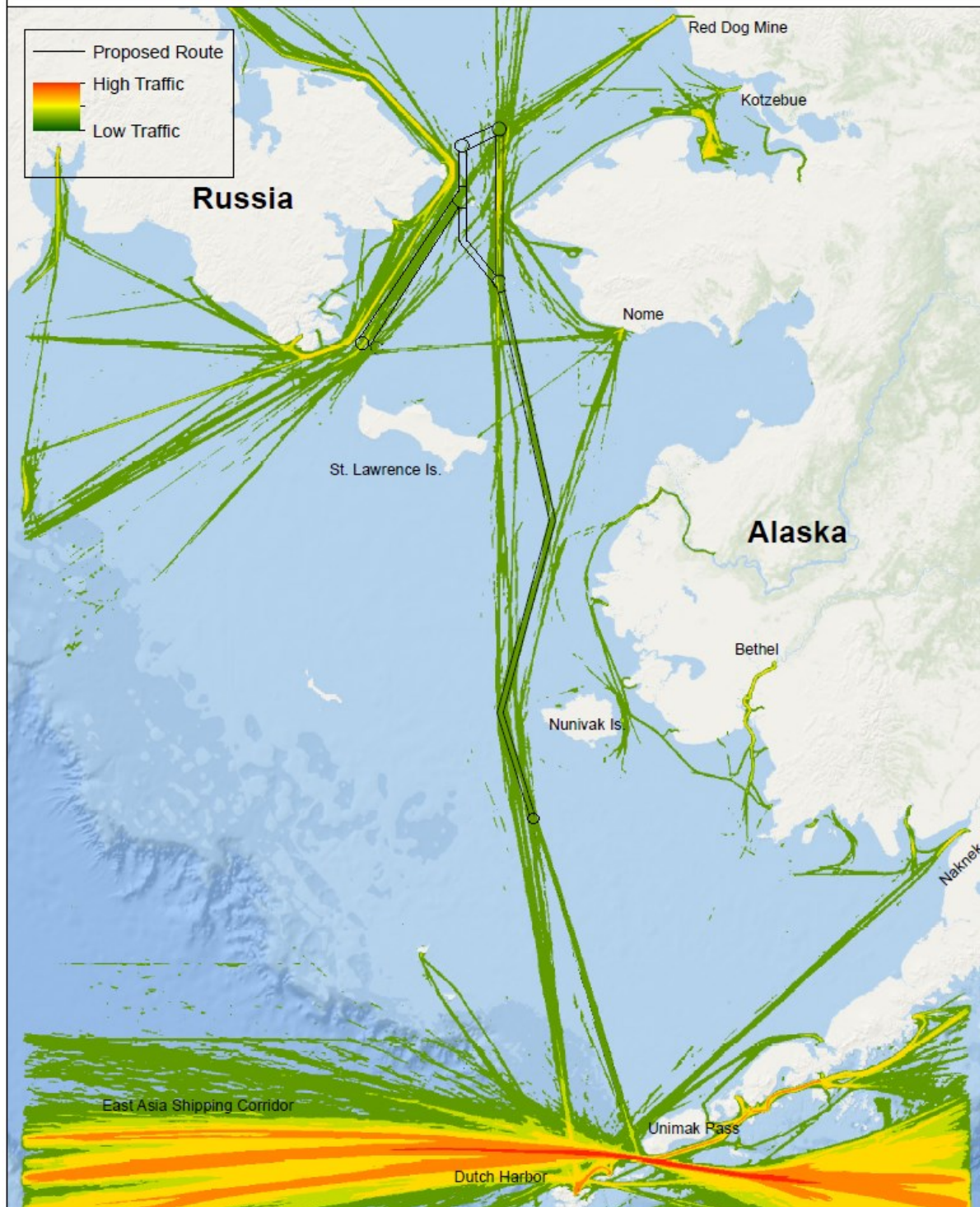
ANNEX 4

TRAFFIC TRANSIT DATA (2014-2015)

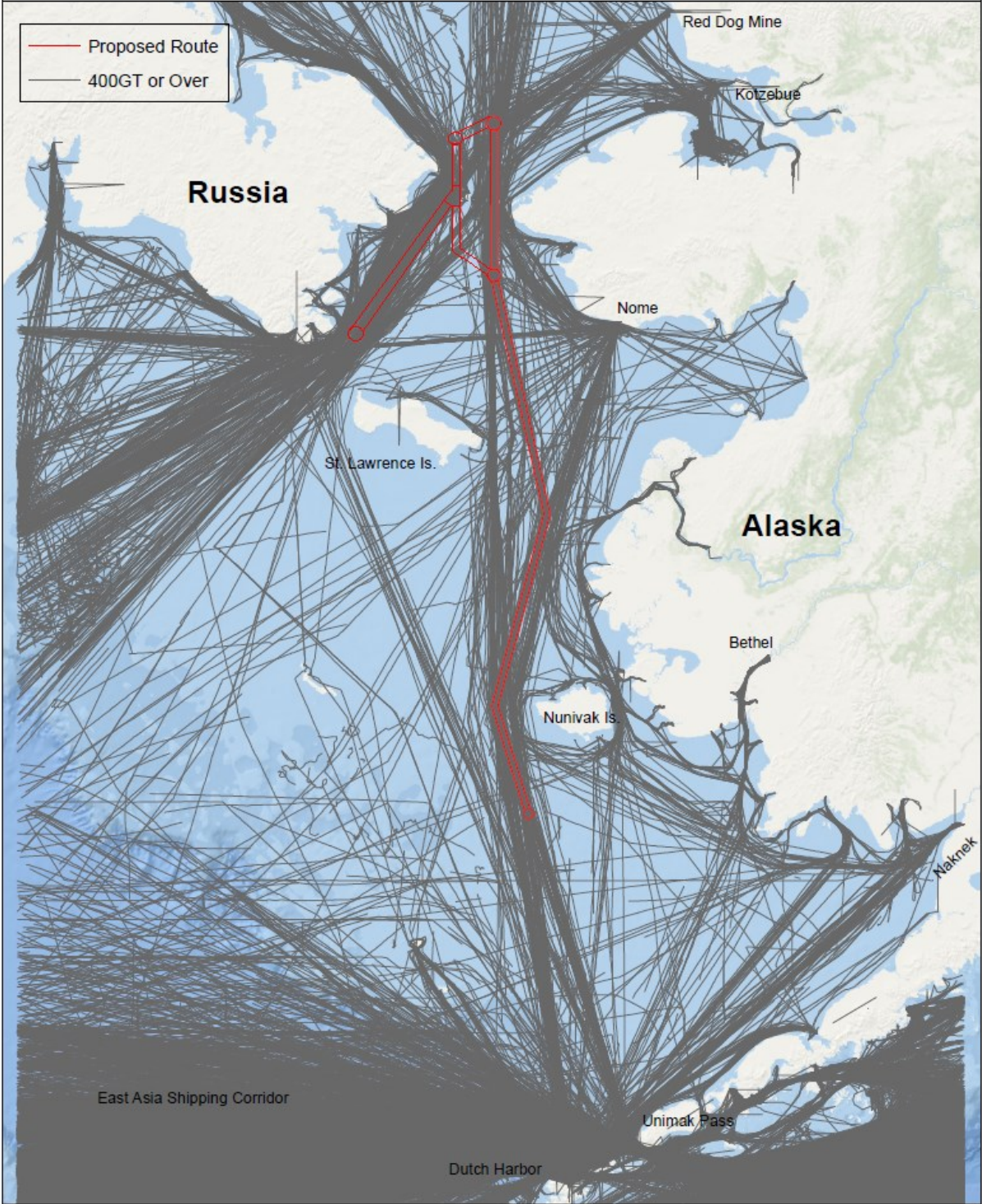
The following list and map products show all vessel types with a regulatory weight of 400 GT and above. Fishing vessels have been excluded from the dataset for clarity reasons. The resulting profile shows that ships 400 GT and above are more likely to operate in the vicinity of the proposed routes, and thus more likely to follow the proposed routing measures and accrue the risk mitigation benefits of doing so.

<u>Vessel Type</u>	<u>Transit Segment</u>
Bulk Carrier	20120
Container Ship (Fully Cellular)	15228
Refrigerated Cargo Ship	4234
Vehicles Carrier	2829
General Cargo Ship	1927
Open Hatch Cargo Ship	1387
Chemical/Products Tanker	1196
Tug	1003
Products Tanker	498
Wood Chips Carrier	362
Landing Craft	271
Research Survey Vessel	258
Crude Oil Tanker	235
Anchor Handling Tug Supply	159
Passenger/Cruise	147
Buoy Tender	130
Icebreaker	116
Platform Supply Ship	116
Chemical Tanker	112
General Cargo Ship (with Ro-Ro facility)	87
Passenger/Ro-Ro Ship (Vehicles)	78
LPG Tanker	70
Crude/Oil Products Tanker	69
LNG Tanker	57
Pollution Control Vessel	48
Standby Safety Vessel	40
Asphalt/Bitumen Tanker	38
Drilling Ship	38
Yacht	36
Icebreaker/Research	33
Articulated Pusher Tug	31
Drilling Rig, semi submersible	23
Livestock Carrier	23
Bulk Carrier, Self-discharging	21
Other Vessel Types with less than 20 transit segments	122
Total Transit Segments	51142

Vessels 400GT or Greater Excluding Fishing Vessels 2014 - 2015



Vessels 400GT or Greater Excluding Fishing Vessels 2014 - 2015



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