



New Challenges in Arctic Shipping

June 18th 2014

ITS Europe, Helsinki, Finland

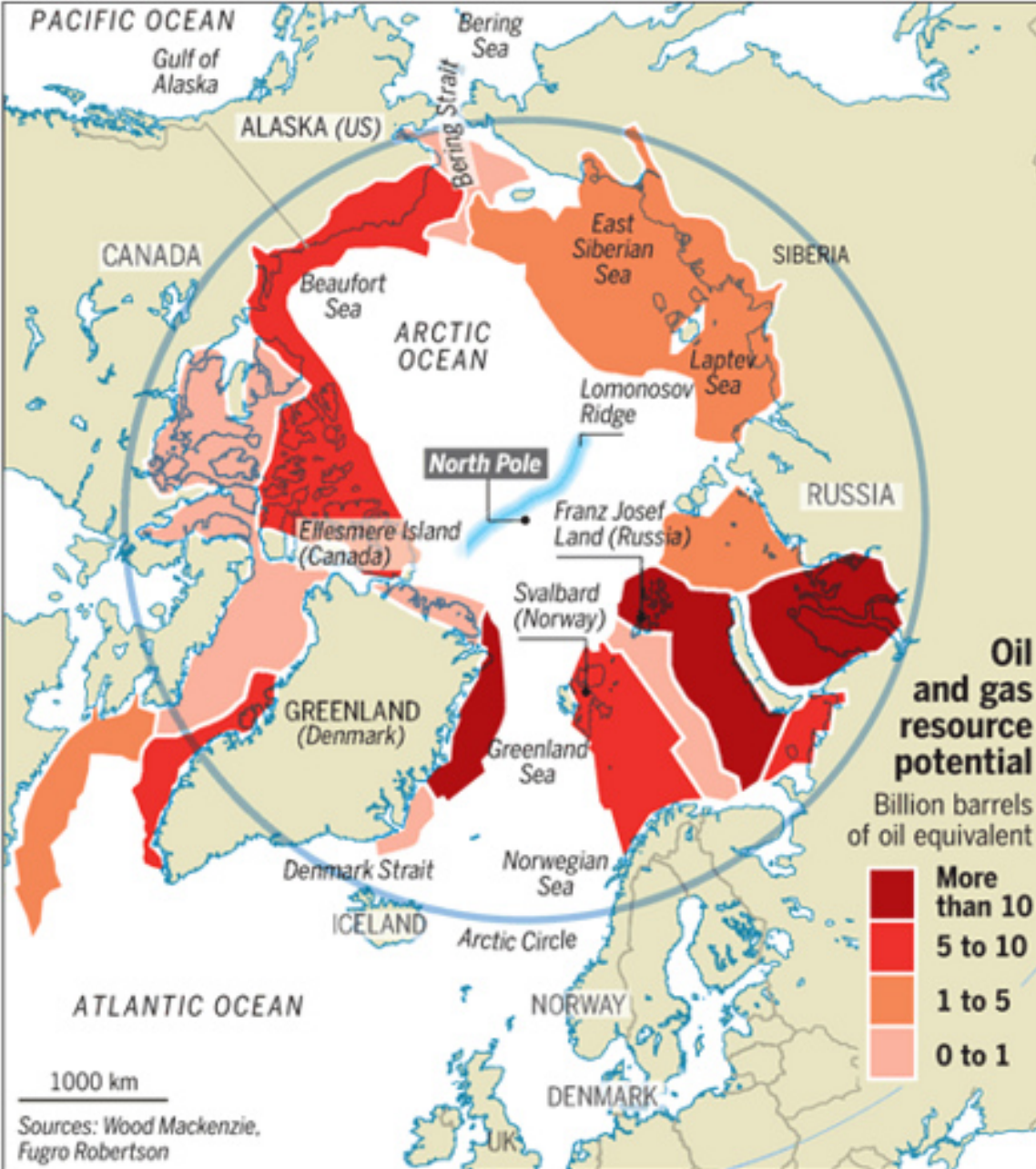
Reko-Antti Suojanen
Managing Director
Aker Arctic Technology Inc

- Founded in 2005 as independent company from Kvaerner Masa-Yards arctic research and development organisation
- Employs today about 40 experienced naval architects with annual turnover about 7 million Euros
- Aker Arctic's shareholders today:

| | |
|---------------------------------|--------|
| Finnish Industry Investment Inc | 66,4 % |
| ABB Oy, Finland | 16,8 % |
| Aker Solutions ASA, Norway | 16,8 % |

- We are working globally with major oil companies, shipyards, shipowners, classification societies and emerging industries as clients
- Main services are ice going ship design and engineering, ice model testing and arctic consultation and engineering

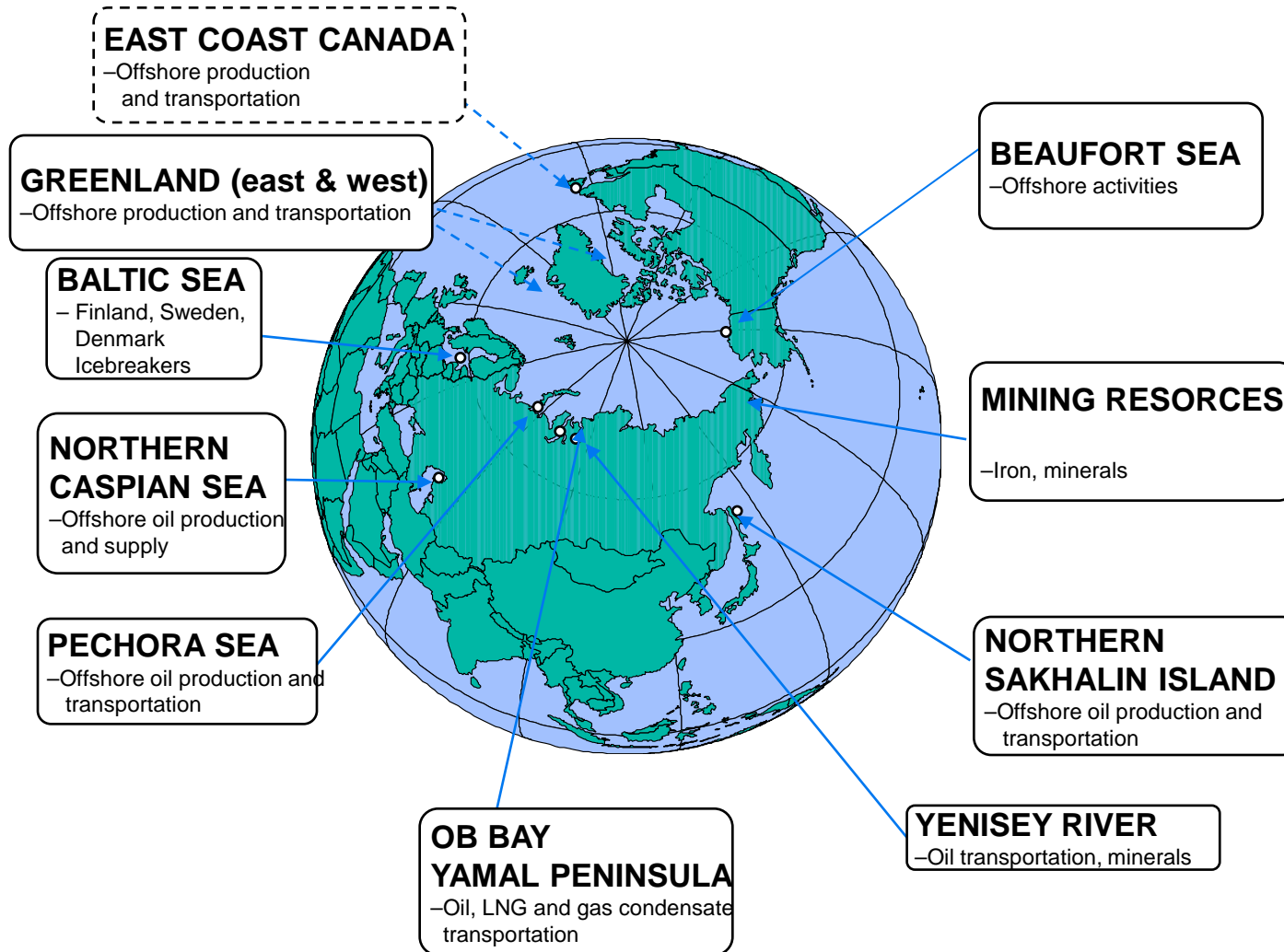
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Energy and mineral resource production and transportation potential in the Arctic

Aker Arctic



NW Russia has active transport systems with the DAS™ concept



© 2007 Europa Technologies
Image NASA
Image © 2007 TerraMetrics

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Streaming ||||| 100%

Eye alt 2908.36 km

Pointer 73°13'13.98" N 47°44'38.91" E

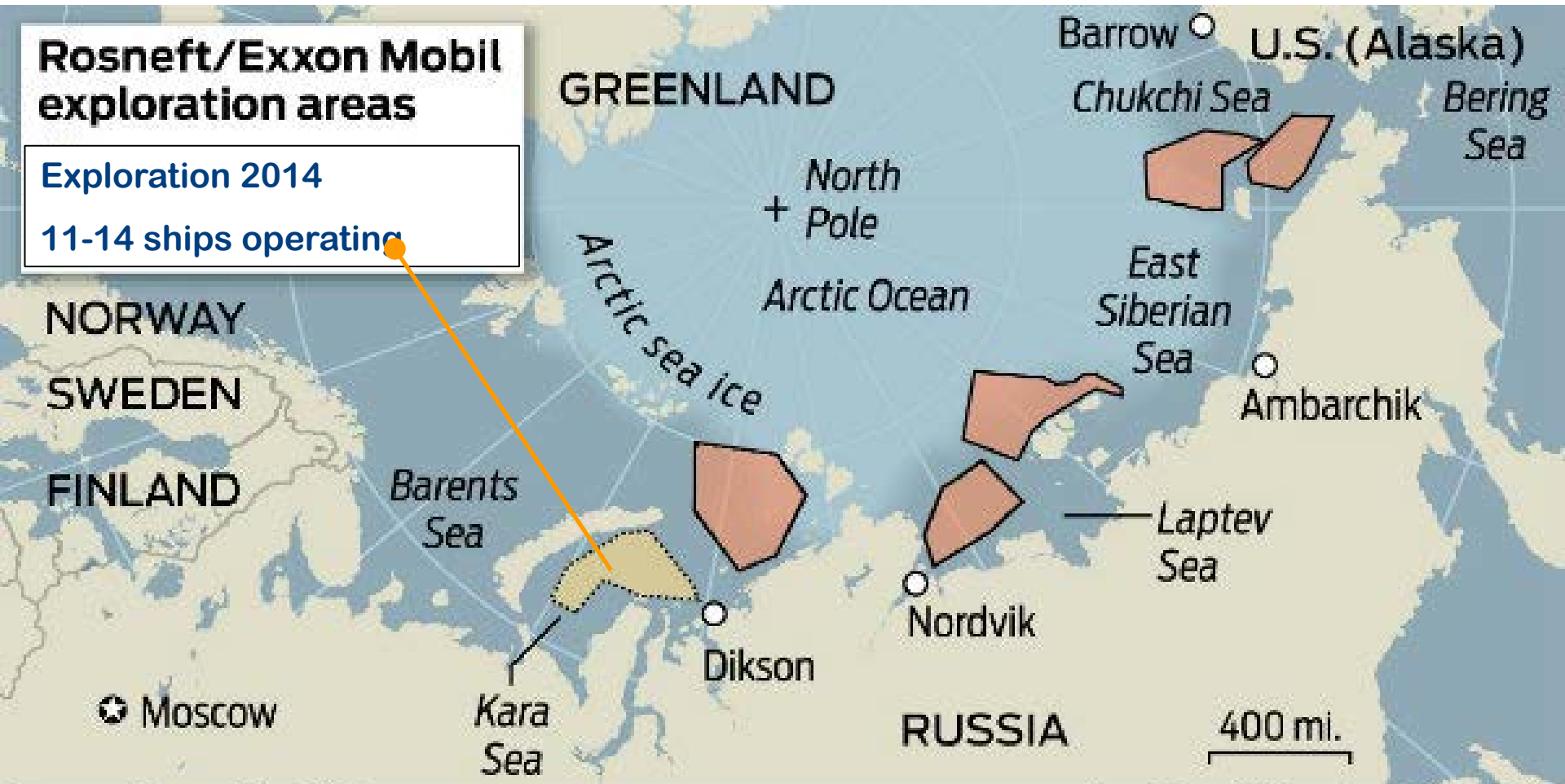
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19-Jun-14

Rosneft/Exxon Mobil exploration areas

Exploration 2014

11-14 ships operating



Source: Exxon Mobil Corp.

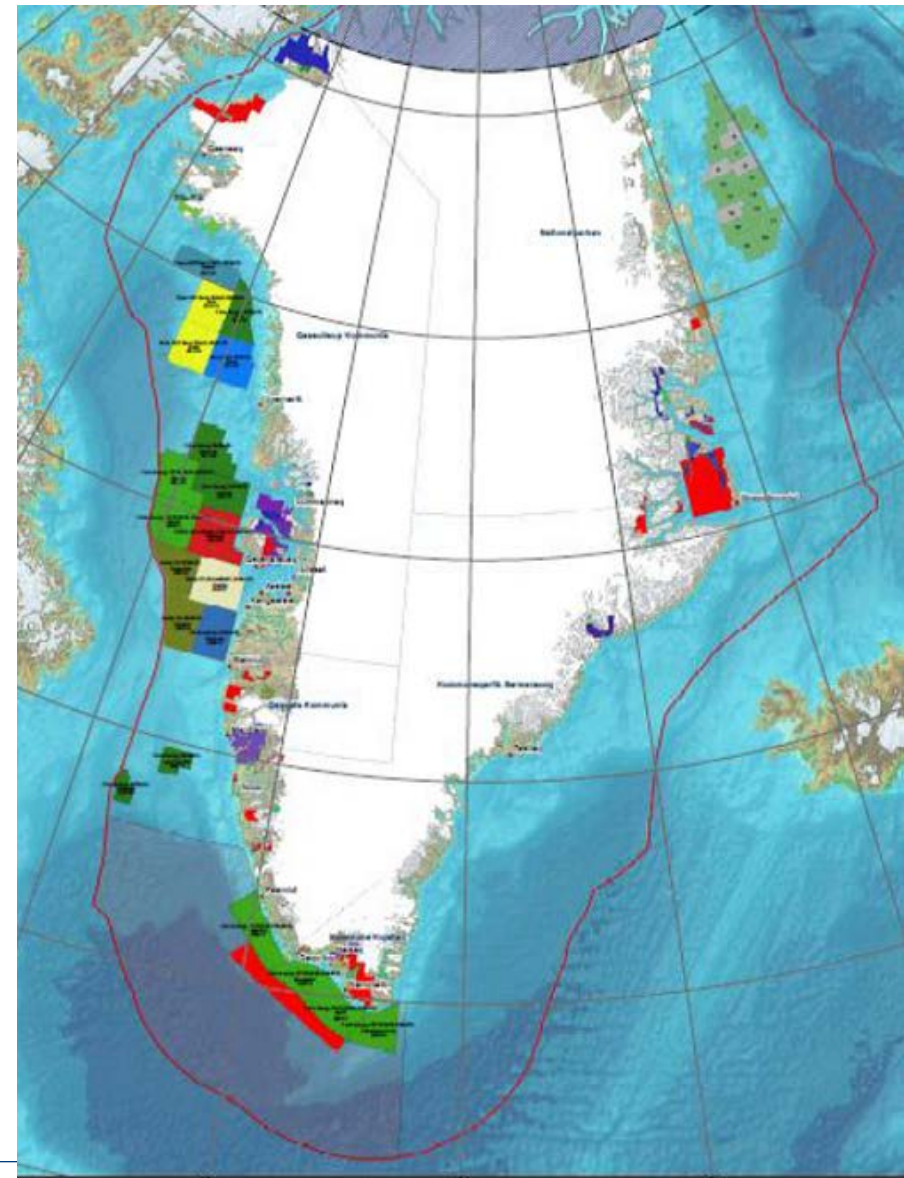
Jay Carr / Houston Chronicle

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Greenland

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At present there are (2013):
19 prospecting licenses
69 exploration licenses
seven small-scale mining licenses



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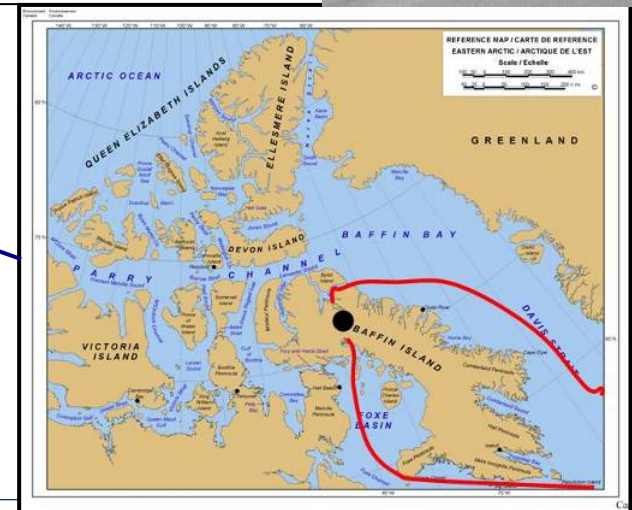
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Mineral Exploitation Licenses
OWNERS
Mærsk McKoy-Danholm AS
NAMA Coal Ltd
NAMA Greenland Ltd
Angel Mining (Ltd)
Øst Nord
Exclusive Licences
June 2013

Amauligak was discovered in 1984. Amauligak lies approximately 75 kilometres northwest of Tuktoyaktuk under about 30 metres of water in the Beaufort Sea. Conoco is currently studying the plans for the development.

SOURCE: <http://www.conocophillips.ca>

Baffinland iron ore project.



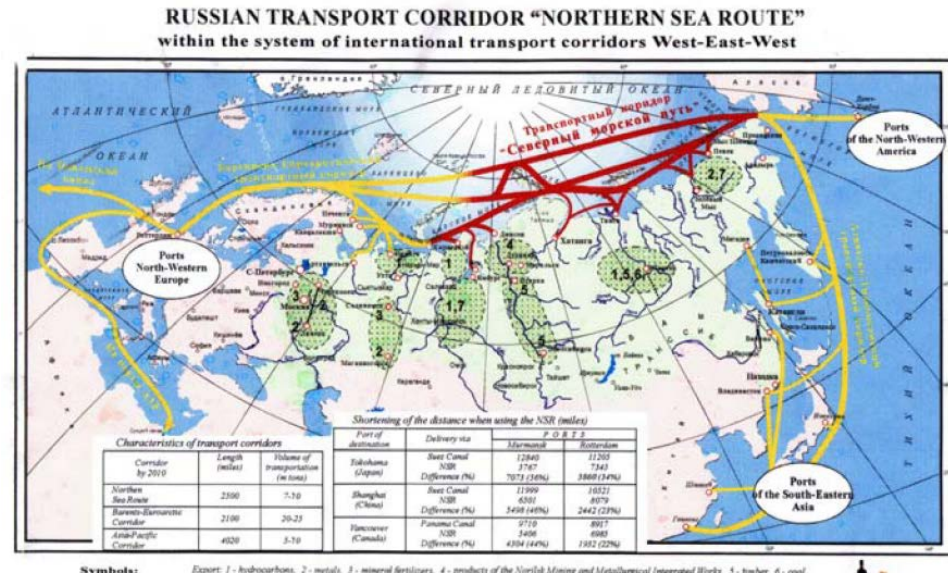
Alaska

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Traffic modes

- To the area
 - transportation of equipment and material during building time
 - supply for operation
- From the area
 - Raw material
 - Oil
 - Gas
 - Coal
 - Minerals
 - Timber
- Transit
 - transit East and transit west have different requirements for cargo
 - How to find cargo in both directions to increase efficiency?



Northern Sea Route is the highway to European and Asian markets

Oil and Gas from Murmansk

| State | through Suez Canal | | through NSR | | +/- days |
|----------------------|--------------------|--------------|---------------|--------------|----------|
| Japan (p. Kobe) | 12291 miles | 37,1 days | 6010 miles | 18,1 days | -19 |
| Korea (p. Busan) | 12266 miles | 37 days | 6097 miles | 18,4 days | -18,6 |
| China (p. Ningbo) | 11848 miles | 35,8 days | 6577 miles | 19,9 days | -15,9 |



From Rotterdam to the Asian markets

| State | through Suez Canal | | through NSR | | +/- days |
|----------------------|--------------------|--------------|---------------|--------------|----------|
| Japan (p. Kobe) | 10969 miles | 33,1 days | 7610 miles | 23 days | -10,1 |
| Korea (p. Busan) | 10754 miles | 32,5 days | 7697 miles | 23,2 days | -9,3 |
| China (p. Ningbo) | 10336 miles | 31,2 days | 8177 miles | 24,7 days | -6,5 |



Total of Transit Voyages in 2010-2013

| | 2010 | 2011 | 2012 | 2013 |
|----------------------------------|-----------------------------|-------------------------------|-------------------------------|-------------------------------|
| Total Volume of Transit Cargo, t | 111 000 | 820 789 | 1 261 545 | 1 355 897 |
| Total Number of Transit Voyages | 4 (2 of them in ballast) | 34 (10 of them in ballast) | 46 (13 of them in ballast) | 71 (22 of them in ballast) |

NSR Transit 2013 Cargo

| Cargo Type | Number of Vessels | Volume, t | Displacement, t | Cargo Volume Eastbound, t | Cargo Volume Westbound, t |
|---------------|-------------------|------------------|-----------------|---------------------------|---------------------------|
| Liquid | 31 | 911 867 | | 588 659 | 323 208 |
| Bulk | 4 | 276 939 | | 203 439 | 73 500 |
| LNG | 1 | 66 868 | | 66 868 | |
| General | 13 | 100 223 | | 36 846 | 63 377 |
| Ballast | 15 | | 469 703 | | |
| Repositioning | 7 | | 38 027 | | |
| Total: | 71 | 1 355 897 | 507 730 | 895 812 | 460 085 |

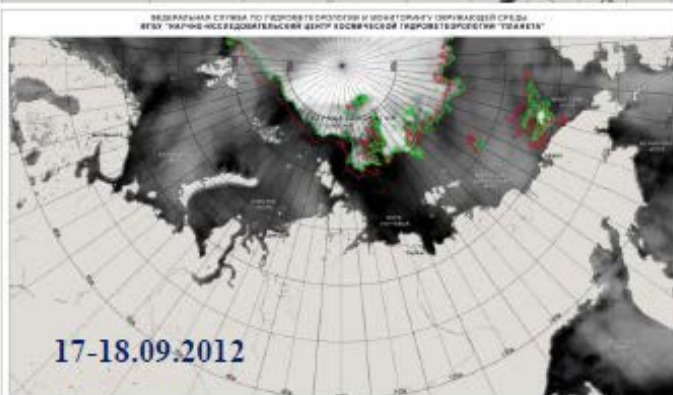
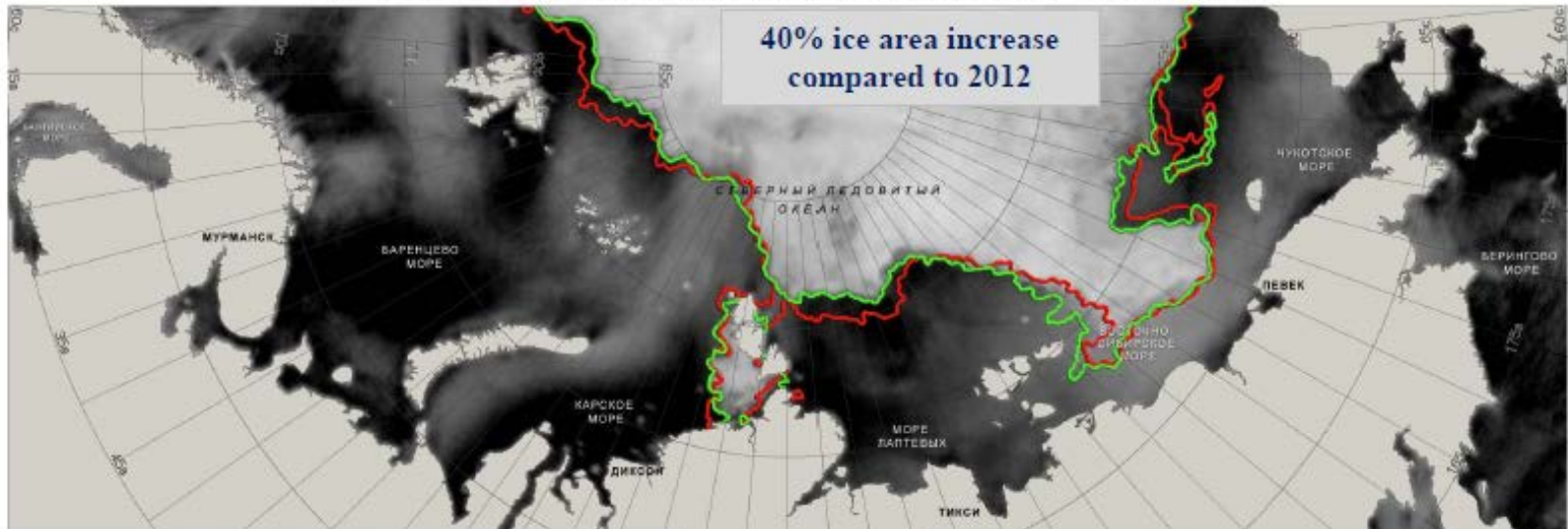


II. Ice Conditions in the Russian Arctic

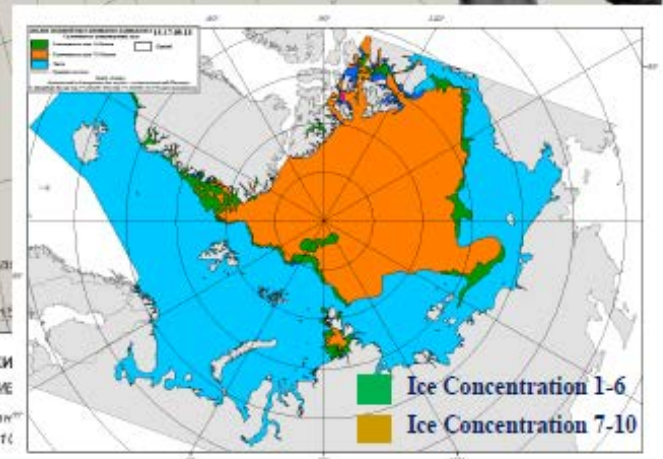
Satellite Image of Ice Conditions in the Russian sector of Arctic dd. 17.09.2013

ФЕДЕРАЛЬНАЯ СЛУЖБА ПО ГИДРОМЕТЕОРОЛОГИИ И МОНИТОРИНГУ ОКРУЖАЮЩЕЙ СРЕДЫ
ФГБУ "НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ЦЕНТР КОСМИЧЕСКОЙ ГИДРОМЕТЕОРОЛОГИИ "ПЛАНЕТА"

40% ice area increase
compared to 2012



Условия ледовой обстановки
в СЕВЕРНО-ВОСТОЧНОМ ПОРЯДКЕ
еще льда (сплаченностью 1-10)



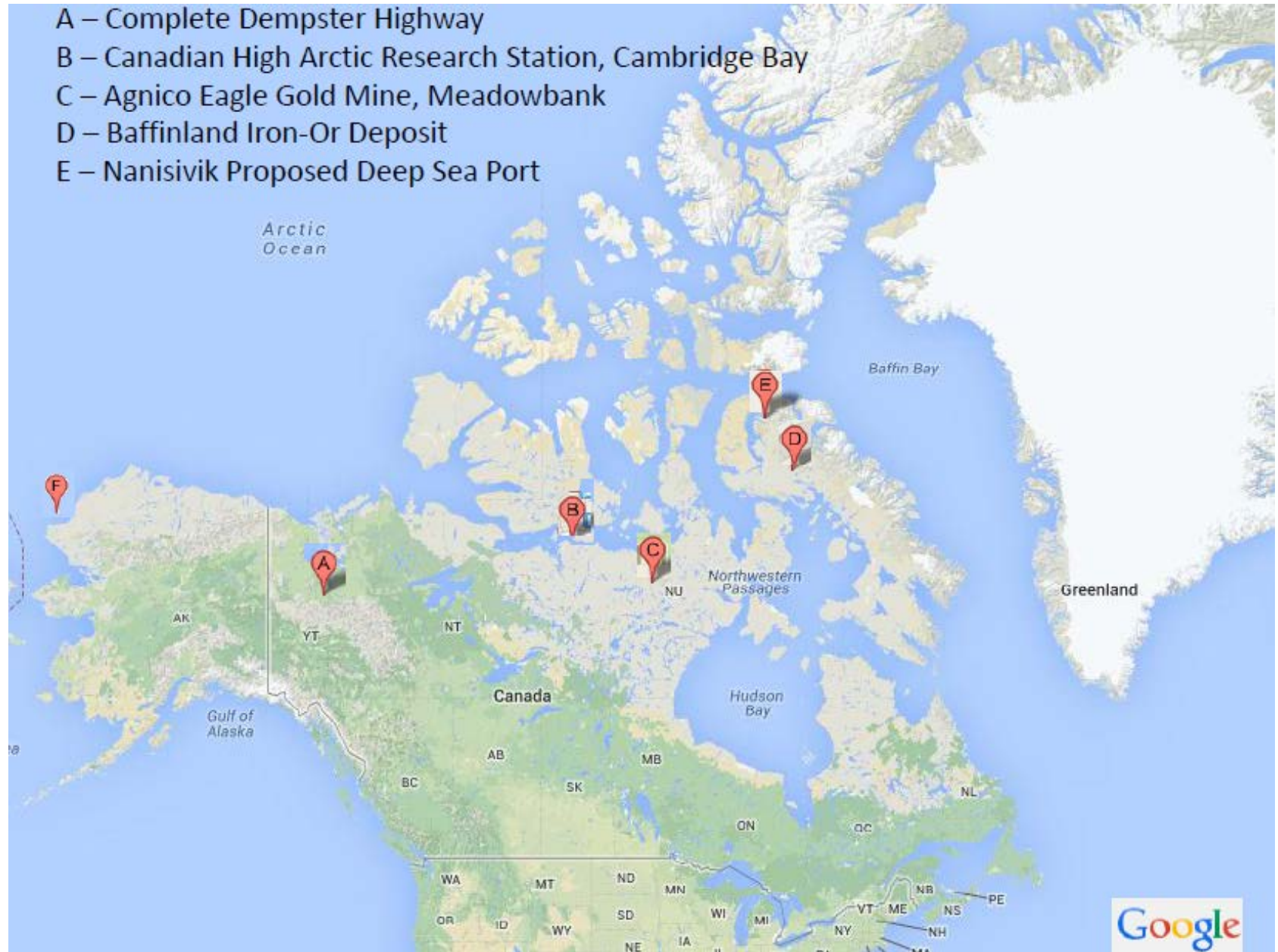
- - -> ROUTE OF THE NORDIC ORION



SOURCE: EXACTEARTH.COM

ANDREW BARR / NATIONAL POST

- A – Complete Dempster Highway
- B – Canadian High Arctic Research Station, Cambridge Bay
- C – Agnico Eagle Gold Mine, Meadowbank
- D – Baffinland Iron-Or Deposit
- E – Nanisivik Proposed Deep Sea Port



Arctic Council

Three activities re: Arctic Shipping

- Oil Spill Prevention
- Sustainable tourism and cruise ship operations
- IMO, Polar Code

Charting in the region is poor.

Safety and rescue operation is challenging.

Communication infrastructure is undeveloped.

Weather forecasting systems are existing but needs to be further improved.

New vessel types for Arctic region

ICEBREAKERS
DRILLING SHIPS
OIL COMBATTING VESSELS
SUPPLY SHIPS
WARESHIPS
TRANSPORT SHIPS
TANKERS, GAS CARRIERS
PORT INFRASTRUCTURES
OFFSHORE CONSTRUCTION

23.10.2007



STCW Training

STCW'10 B-Code states:

“It is important that masters, officers in charge of a navigational watch and officers in charge of an engineering watch on board ships operating in polar waters should have relevant experience and training”.

“Masters and Chief Engineer Officers should have sufficient and appropriate experience in operating ships in polar waters.”

Polar Code will bring additions:

It is still uncertain when new requirements will be applied.

Aker Arctic Ice Simulator in Aboa Mare

Aker Arctic



- The traffic growth in the NSR remains slow
- Less traffic expected in the US/Canadian sector
- Destination traffic is dominating
- Gaps in the navigation infrastructure
- Charting, weather service, rescue, navigational aids
- Icebreaker support availability is not sufficient for growth
- Crew experience and training is important
- Climate change makes only slight improvement

*Towards new joint challenges
Thank You!*



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19-Jun-14

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