Felix H. Tschudi

Tschudi Shipping Company

Centre for High North Logistics

Developments in Arctic Shipping and Logistics

Seminar on Economic Risks and Opportunities in the Arctic
Reykjavik, 22.11.2012

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TSCHUDI SHIPPING COMPANY

The Tschudi Group with roots back to 1883 **(www.tschudishipping.com)** is an offshore, shipping and logistics group with particular focus on the east-west trades of cargoes and projects involving the Baltic, Russia and the CIS countries including the High North of Russia and Norway.

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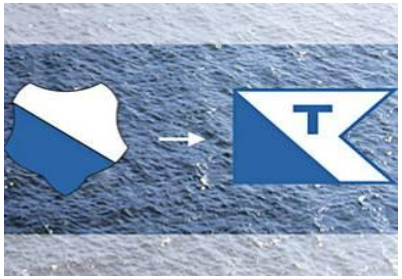

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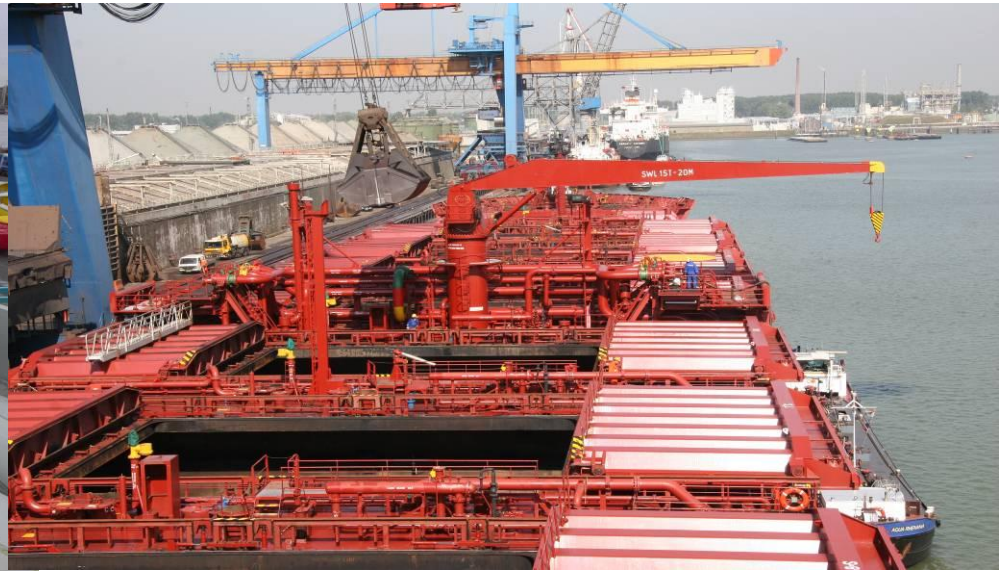
CONVENTIONAL SHIPPING

ICE CLASS MULTIPURPOSE CONTAINER VESSELS
PROJECT CARGOES

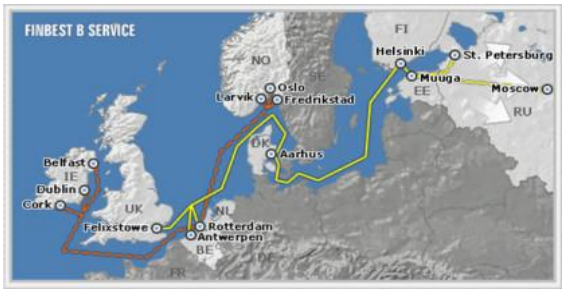
TANKERS, BULK AND COMBINATION CARRIERS
COMMODITY SHIPPING



OFFSHORE

- **Anchorhandling tug supply vessels**
- **Ocean going tugs**

TSCHUDI LOGISTICS



East – West logistics between western Europe, Russia and the Central Asian Republic

- Container lines
- Door – door transportation
- Project cargoes
- Rail and road forwarding

Including **Tschudi Northern Logistics** based in Kirkenes and Murmansk, specialising in cross border transportation and custom clearance

The TSC rationale for focusing on logistics in the High North is:

- **Energy and Mineral Resource development in the High North is accelerating**

✓transport solutions are key to its realisation!

- **This development is possible due to :**

  - ✓ **climate change - ice reduction**
  - ✓ **technological developments - resource extraction/ice operations**
  - ✓ **active interest from Russia and a general cooperative spirit**
  - ✓ **but most importantly; high commodity prices**

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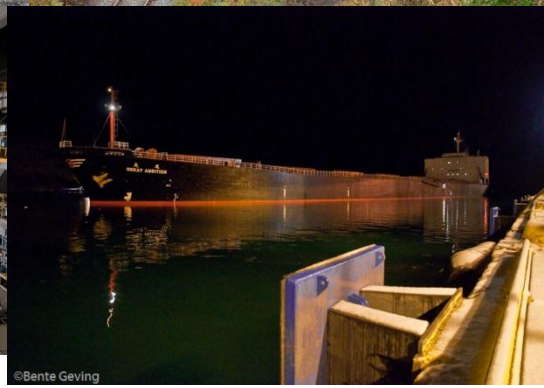
Sydvaranger Gruve – Northern Iron

In 2006, the closed down Sydvaranger iron ore mine in Kirkenes, Northern Norway was acquired in order to gain access to arctic port facilities.

In November 2009 the first vessel was loaded for China with 75 000 of iron ore concentrate.



During 2010 all shipments went to China

The company Northern Iron (**www.northerniron.com.au)** is listed on the Australian stock exchange (ASX) Tschudi controls 20% of the outstanding shares today.

Kirkenes
9 days from the Pacific Ocean
9 days from the Mediterranean

April 2010 - From Discussion to Action

CHNL workshop in Kirkenes – Bulk shipping via NSR

Cargo owners
Ship owners
Traders
Icebreaking company
Brokers
Insurance
CP & law
Classification society
Public authorities
Research institutes

Relevant participants in the value chain from Russia and Norway gathered around one table in a case study to identify and discuss the critical issues involved in bulk transportation from northern Scandinavia and the Kola Peninsula to the Far East via the Northern Sea Route

www.chnl.no

NSR PROJECT 2010

NORTHERN SEA ROUTE TRANSIT

For the first time ever, a bulk carrier with non-Russian flag is using the Northern Sea Route as a transit trade lane, when transporting iron ore from the Northern part of Norway to China via Arctic and Russian waters.

NORDIC BULK CARRIERS A/S

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NORTHERN IRON

gard

In September 2010 the MV Nordic Barents transited the NSR with 40140 mt of iron ore concentrate from Kirkenes to China

Northern Sea Route 2010 - 2011- 2012

•2010 - 4 passages – 111 000 mt - 2011- 34 passages – 821 000 mt

•2012 – 46 passages – 1 260 000 mt of carried cargo and about 600 000 dwt in ballast, including the first LNG shipment from Hammerfest, Norway to the Far East

•2011 - Largest vessel ever, 162 000 dwt Suezmax tanker loaded with 120 000 mt of gascondensate, speed record, 14 knots and 8 days

•2011 first international Cruise vessel and first seismic vessel saving 8 days mobilising to New Zealand from Hammerfest

•2012 – 7 vessels repositioned via NSR –2 Finnish icebreaking offshore supply vessels returning from offshore operations during the summer season in Alaska and the Chinese icebreaker Xue Long mobilising to Iceland. In addition 4 Russian operated offshore vessels transited.

•2011 largest bulkcarrier, 75 000 dwt Panamax loaded with iron ore – 4 such shipments this year

•2011 first vessel using the NSR with cargo both ways - gascondensate from Russia to China and Jetfuel from Korea to the Continent.

2012 - 10 voyages wit return cargoes (8 tankers and 2 bulkers) – one panamax returning with coal from Canada and one with a mixed bulk cargo

Number of NSR passages by 20.11.2012

Cargo	# of vessels	Cargo volume, mt	displacement, mt
Liquid	26	894 079	
Bulk	6	359 201	
Fish	1	8 265	
General Cargo	0		
In ballast	6		472 075
Repositioning	7		78 531
total:	**11**	**1 261 545**	**550 426**

Number of vessels by destination:

Eastbound – 25; Westbound – 21

Russian flag: 18

Other flags: 28 (Panama, Finland, Norway largest)

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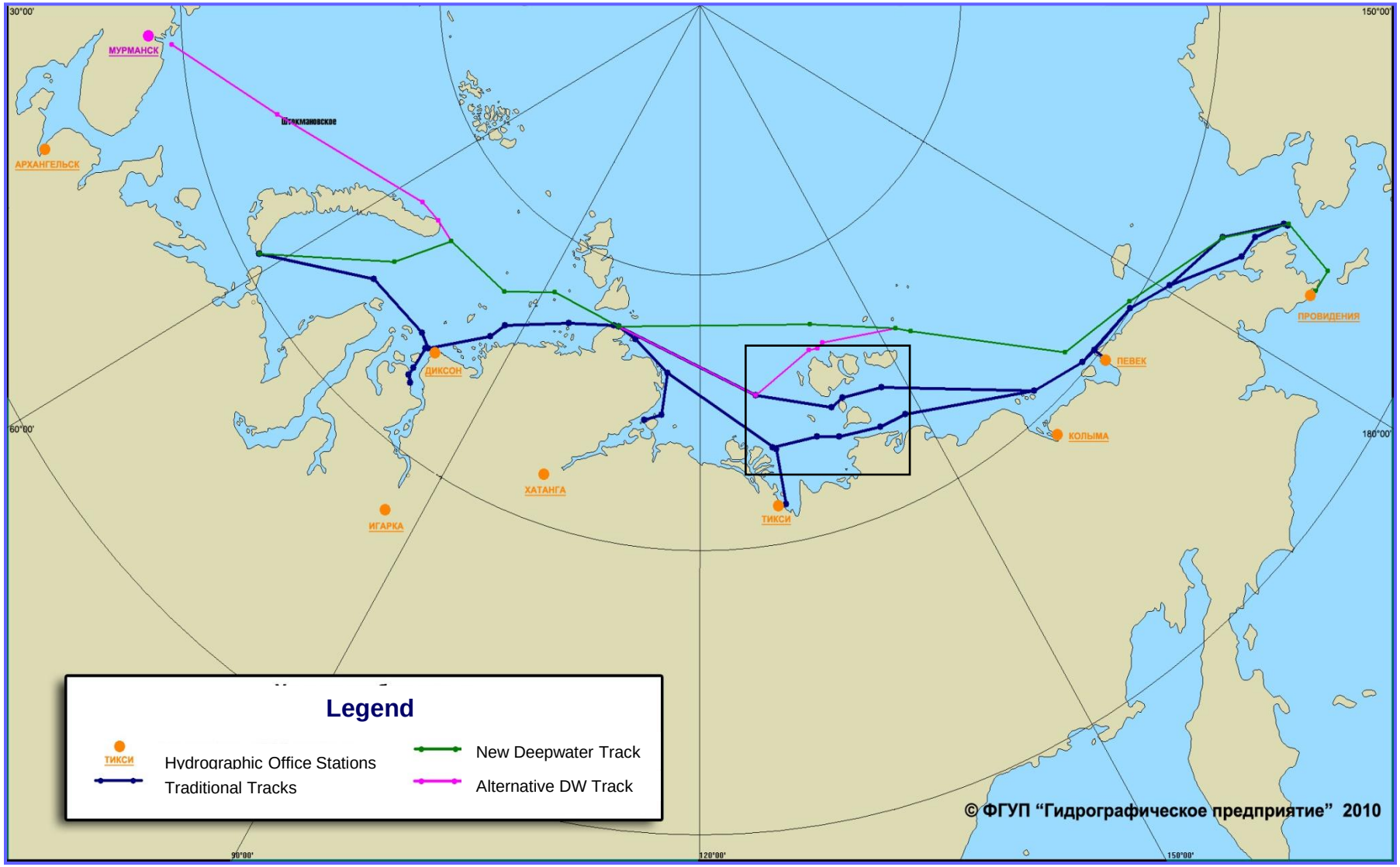
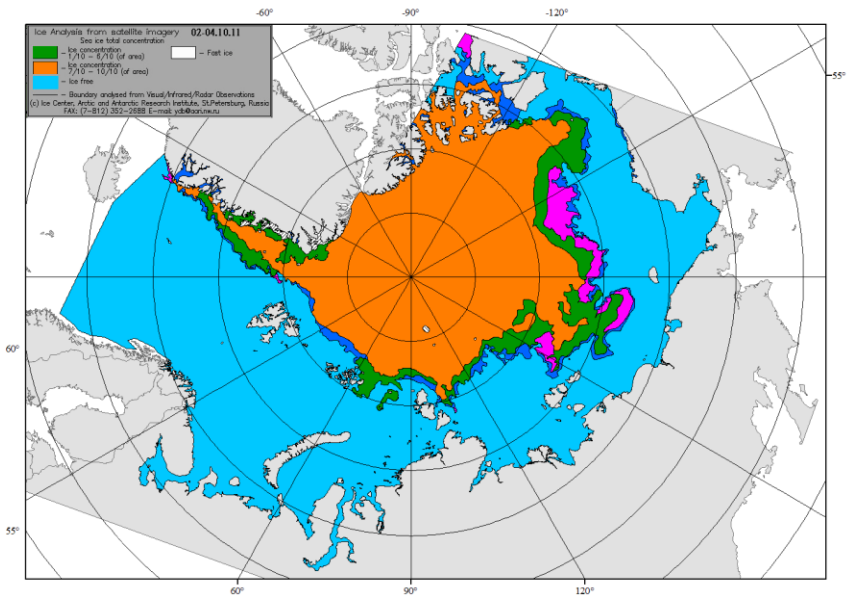
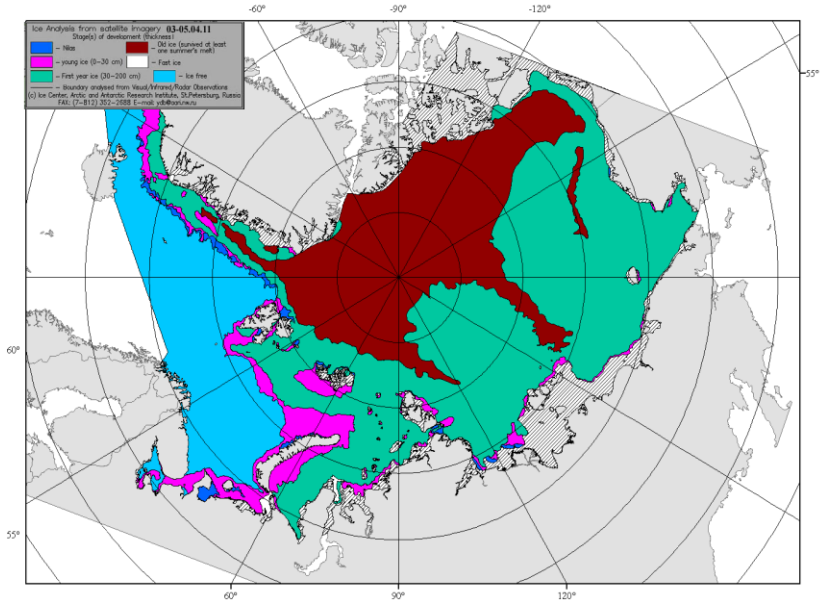
During the 4-5 months NSR season - not much ice but depths decide the different routes and the size of the vessels



Current operational challenges on the NSR





During the NSR navigational season

- Varying presence of ice
- Often fogs in summer period
- Flat coastal surface
- Remoteness

During the winter season

- Harsh ice conditions
- Extremely low temperatures
- Polar night
- Possible icing of vessels

Weather conditions. Pushing-off and pushing-to winds

THOUGHTS ON EMERGENCY PREPAREDNESS AND COOPERATION

- The best safety measure against accidents is the **Russian mandatory ice breaker escort** and regulatory requirements.
- The Arctic Council agreement on developing a **joint framework for SAR** is important as these countries are the ones with an interest in developing the resources of the region while keeping potential negative effects at a minimum ie. sustainable development.
- The increased **economic activity in the region will improve the general preparedness** to respond to potential accidents due to higher availability of vessels, equipment and people **provided necessary coordination is facilitated.**
- **WARNING** – the development of the shorter transportation (= reduced emissions) via the NSR **can be stopped in its infancy if too costly regulations** are imposed too early as the direct economic benefit is limited at this stage eg. IMO Polar Code development.

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New shipping opportunities – new environmental challenges can become a major obstacle if not addressed properly

What are the "real issues" which need to be addressed? The Arctic development is suffering from "**myths"** and misunderstandings based on lack of knowledge and sometime, political intent. The **environmental risks from activity** in the Arctic must be identified, understood and defined. These risks should then be addresses by the IMO Polar Code and other instruments.

The primary means to meeting new environmental challenges should include:

1.An **holistic approach** where the environment and economic development is integrated in a balanced way taking into account seasonal and geographical variations.

2.Necessary infrastructure and tools to enhance environmental management should be required for large scale new developments.

Key environmental risks which should be evaluated in a balanced way:

- use of heavy fuel oil
- black carbon and other emissions
- ballast water
- routing measures and speed reductions
- particularly sensitive areas and places of refuge
- emergency response
- discharge of garbage and pollutants

What are the uncertainties? What dynamics influence the short term use of the NSR?

- **Main factor** - the freight market level for different shipping segments
- **Type of cargo** – price differences in asian and western markets eg. LNG - time sensitivity of markets and cargoes
- **Time required for passage** - ice conditions and waiting time. Ice free season now 4 - 5 months
- Draft limitations determine the size of the vessels and tracks – ongoing hydrographic surveying
- Availability of ice class tonnage in different segments and sizes – ice class 1A is required at the time being - repositioning cost of vessels
- **Cost elements:** Bunker prices – slow steaming - Insurance - NSR Transit versus Suez canal tarifs
- Piracy threat – cost of insurance and protection – risk of non-delivery of cargo.
- **LONG TERM: CLIMATIC CONDITIONS – IMO POLAR CODE REQUIREMENTS**

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Economic opportunities in the Arctic related to the NSR:

- Shipbuilding Industry
  - Construction of specialised ice class vessels for arctic operations
  - Production of modules and structures serving offshore oil and gas and mining in the Arctic
  - Using the NSR for cost efficient and time saving positioning for ship repair, conversions and of new buildings between the Pacific and the Atlantic
- Shipping Companies
  - The NSR offers a new and shorter transit route between the Pacific and the Atlantic markets
  - Shipping resources into and out of the Arctic
  - Repositioning via the NSR
- Industry / Cargo owners
  - A new closer source of industrial rawmaterials
  - New arctic energy resources
  - Potential for industrial involvement in projects
  - A shorter trade route for imports/exports between the North Atlantic and the North Pacific

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NSR – Our Objective

The objective is that the NSR will be considered a safe and predictable commercial alternative to the Suez Canal, the Cape route and the Panama Canal during the ice free season.

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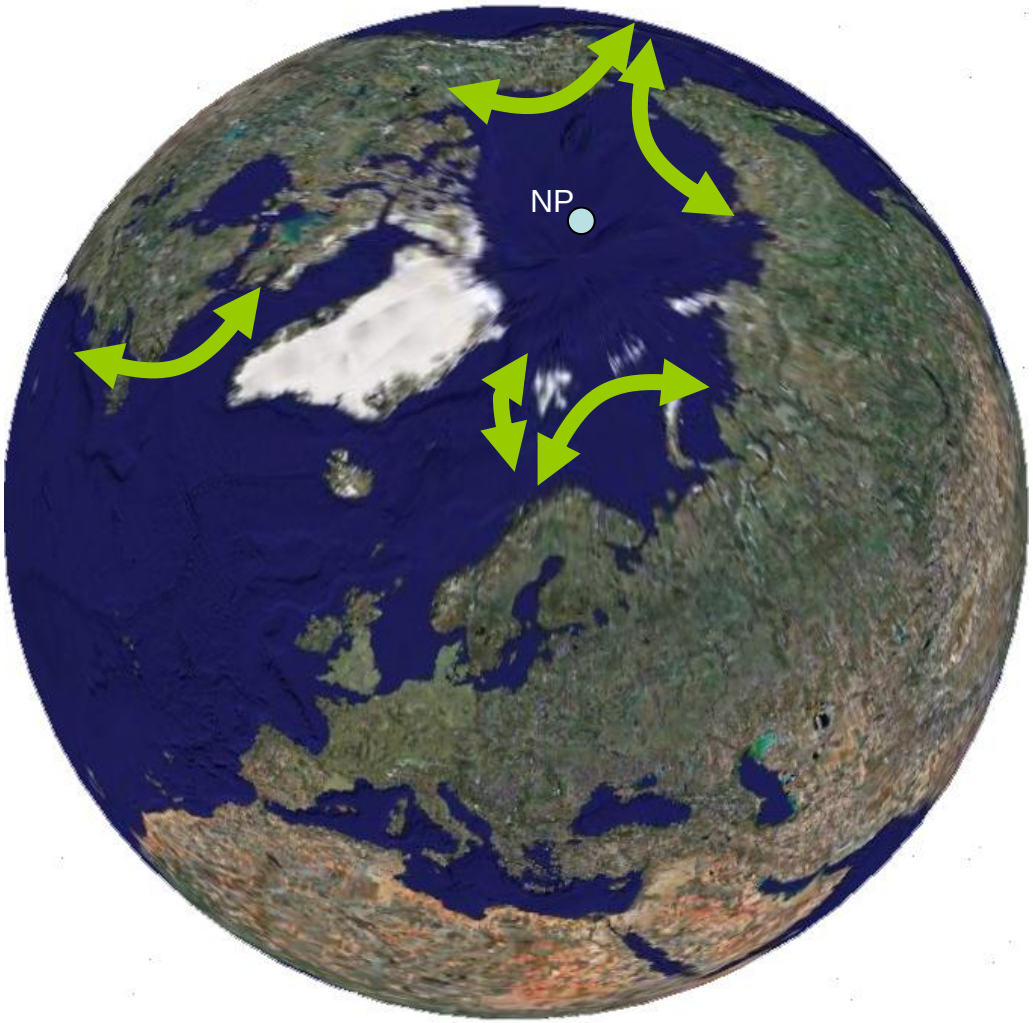
In the medium term – we believe regional destinational shipping and logistics will be the most relevant activity in the NSR



Transport of oil, gas, minerals and equipment by:

- Specialised shuttle multipurpose vessels
- Shuttle tankers
- Shuttle LNG carriers
- Shuttle bulkers
- Purpose built offshore vessels
- Seasonal liner services

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VOYAGE OF “MONCHEGORSK” VIA THE NORTHERN SEA ROUTE TO THE FAR EAST IN 2010

26.09
7 am

CAPE OF CHELUSKIN

CAPE MEDVEZHIY

27.09
6.30 pm

DUDINKA

23.09
11.45 pm

02.10 am

PROVIDENIYA

BUSAN

ETA 13.10

SHANGHAI

ETA 17.10

Карское море

Море Лаптевых

Баренцево море

Восточно-Сибирское море

Финляндия

Россия

Охотское море

Монголия

Китай

Япония

Южная Корея

Восточно-Китайское

Берингово море

Оман

Мьянма (Бирма)

Филиппинское

Таблица 2.2.3.4

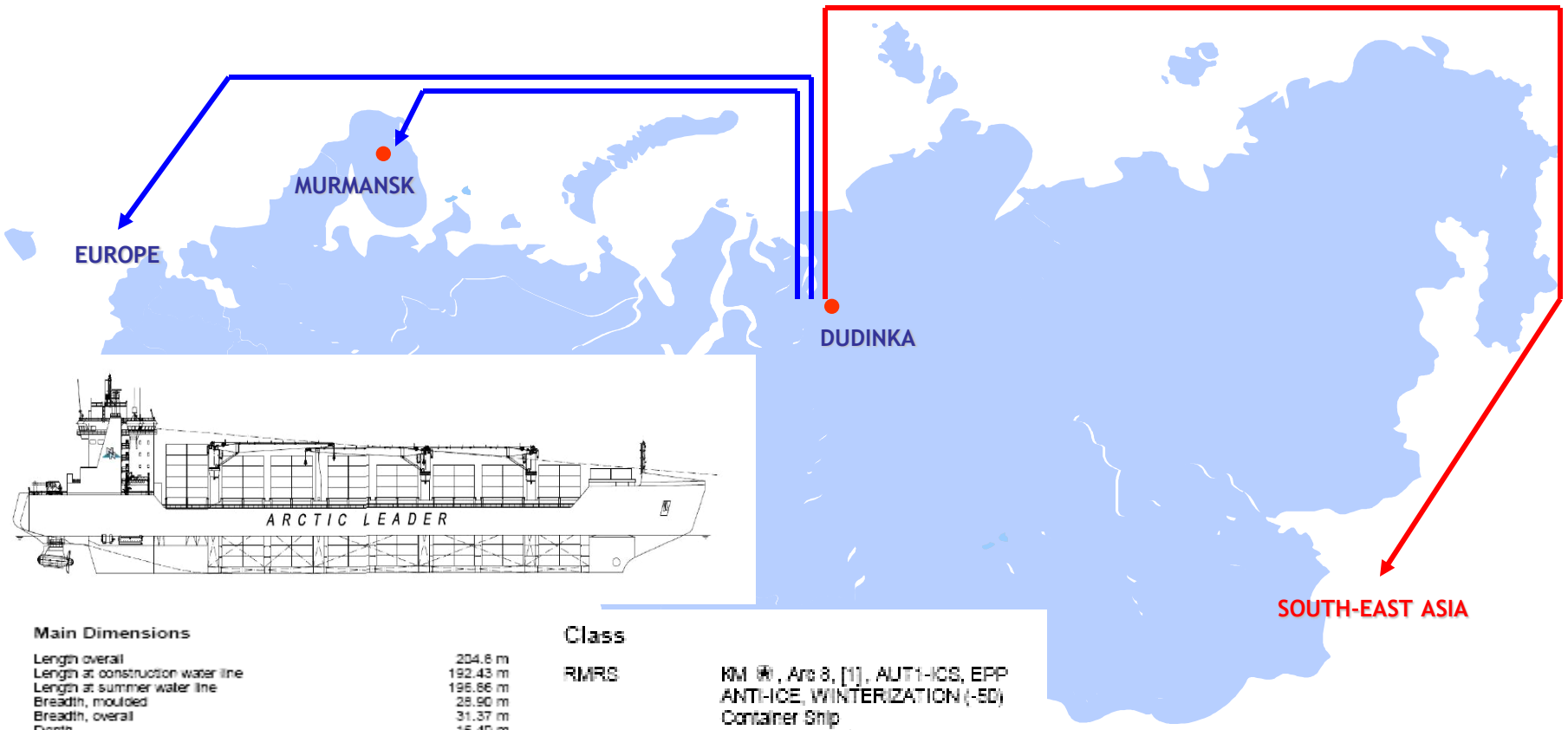
Районы и условия эксплуатации судов арктических категорий

Категория ледовых усилений	Способ ледового плавания	Зимне-весенняя навигация в морях					Летне-осенняя навигация в морях				
		Баренцевом	Карском[1]	Лаптевых	Восточно-Сибирском	Чукотском	Баренцевом	Карском	Лаптевых	Восточно-Сибирском	Чукотском
		ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ	ЭТСЛ
Arc4	СП	– – – +	– – – –	– – – –	– – – –	– – – –	+ + + +	– – – +	– – – +	– – – +	– – – +
	ПЛ	– • + +	– – – +	– – – –	– – – –	– – – •	+ + + +	• + + +	– – – +	– – – +	– • + +
Arc5	СП	– – – +	– – – +	– – – –	– – – –	– – – –	+ + + +	– – + +	– – – +	– – – +	– – – +
	ПЛ	• + + +	– – • +	– – – +	– – – +	– – • +	+ + + +	• + + +	• + + +	• + + +	• + + +
Arc6	СП	• + + +	– – – +	– – – +	– – – +	– – – +	+ + + +	+ + + +	– + + +	– + + +	– + + +
	ПЛ	+ + + +	•• + +	– •• +	– •• +	– • + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
Arc7	СП	+ + + +	– – + +	– – – +	– – – +	– – + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
	ПЛ	+ + + +	+ + + +	• + + +	• + + +	• + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
Arc8	СП	+ + + +	+ + + +	– • + +	– • + +	• + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
	ПЛ	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
Arc9	СП	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
	ПЛ	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +

Условные обозначения:
СП — самостоятельное плавание;
ПЛ — плавание под проводкой ледокола;
+ — эксплуатация допускается;
– — эксплуатация не допускается;
• — эксплуатация связана с повышенным риском получения повреждений;
Э — экстремальная навигация (со средней повторяемостью один раз в 10 лет);
Т, С, Л — тяжелая, средняя, легкая навигация (со средней повторяемостью один раз в 3 года).

Примечание:
[1]Для судов с категорией ледовых усилений **Arc7** допускается самостоятельное (СП) круглогодичное плавание в юго-западной части Карского моря при типах навигации Э, Т, С, Л.

ARCTIC CONTAINER SHIP - ICE CLASS ARC 8



Main Dimensions

Length overall	204.6 m
Length at construction water line	192.43 m
Length at summer water line	196.66 m
Breadth, moulded	28.90 m
Breadth, overall	31.37 m
Depth	16.40 m
Draught design, ice class/scantling	9.50/10.50 m
Deadweight (draught 9.5/10.5 m)	25,950 t, 21,000 t
Gross tonnage	28,600
Cargo capacity	41,100 m³
Container capacity (TEU)	
In holds, tween deck hatch covers open	790
on deck	630
total	1,420
Special containers	
10 ft. feinstein containers	728
Sockets for reefer containers	100
Tank capacity: HFO	3,400 m³
Speed (draught 9.5 m, calm water)	17 kn
Ice breaking capability with full shaft power	2 m level ice
Radius of action (draught 9.5 m)	max. 14,000 nm

Class

RMRS	KM ✠, Arc 8, [1], AUT1-ICS, EPP ANTI-ICE, WINTERIZATION (-50) Container Ship
Flag of Registry:	Russian Federation

Machinery

AC Diesel electric machinery

4 main diesel engines – total output:	34,800 kW_{each}
2 habour diesel engines – total output	2,700 kW_{each}
2 pod propulsion units 4 blade propeller, with fixed pitch	2 x 13,000kW
Voltages for electrical equipment	6,600/400/230/24 V, 50 Hz
2 steam boilers – capacity: 2 exhaust gas boiler:	2 x 5,000 kg/h total: 5,500 kg/h

The Varandey offshore terminal in the Pechora Sea serving the Conocophillips/Lukoil JV, Naryanmarneftegaz, with 3 Sovcomflot operated 70 000 dwt double acting ice breaking crude oil tankers (Aker Arctic design) shuttling to a storage vessel in Murmansk. More than 250 operations so far.

Yamal LNG – to Atlantic - and Asian markets.

Flexible logistic model

- Year-round LNG shipments from Yamal Peninsula to Atlantic markets
- LNG shipments via Northern Sea Route (NSR) to Asian Pacific markets
  - In 2010, NOVATEK successfully delivered an Aframax tanker of stable gas condensate to China via the NSR
  - Time to Asian Pacific markets was reduced by ~50%
  - NSR is capable of handling vessels with up to 15 meters of draft

NOVATEK

RUSSIA'S LEADING INDEPENDENT NATURAL GAS PRODUCER

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Russian Rivers offer other logistical solutions

Ob/Irtyish
Novosibirsk to Novy Port

Yenisey
Krasnoyarsk to Dudinka

Lena
Baikal to Tixi

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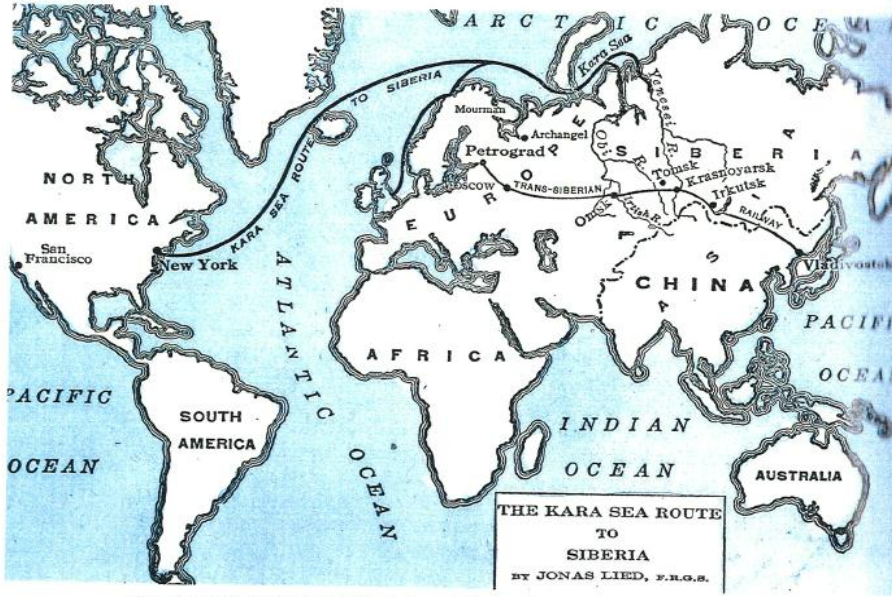
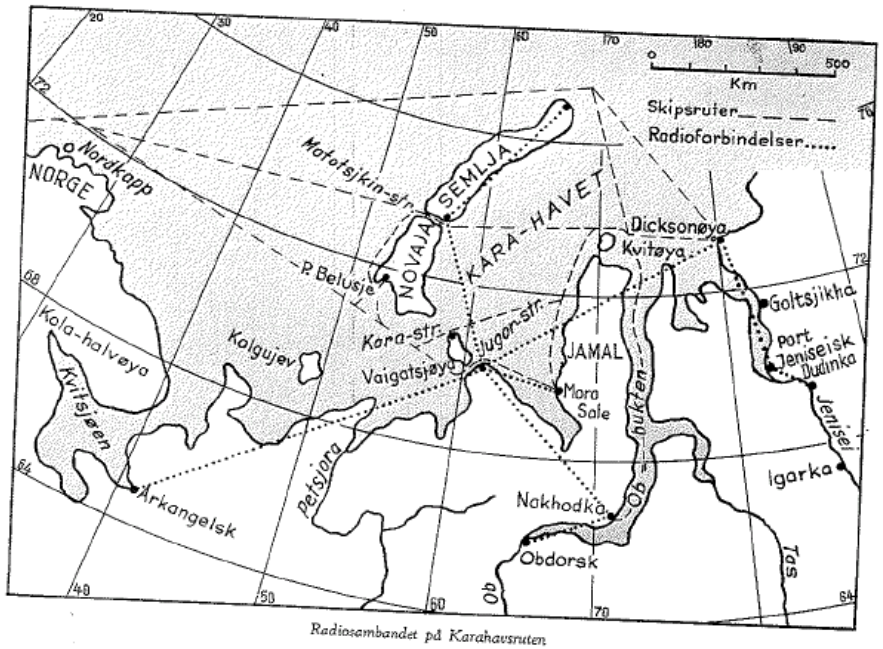
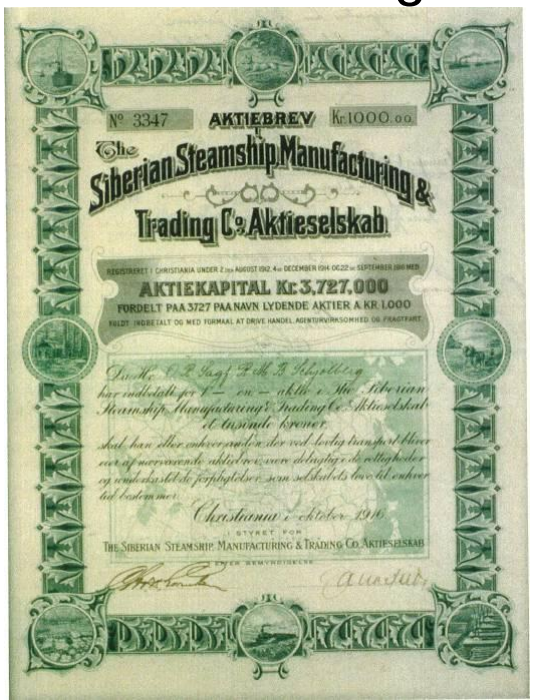


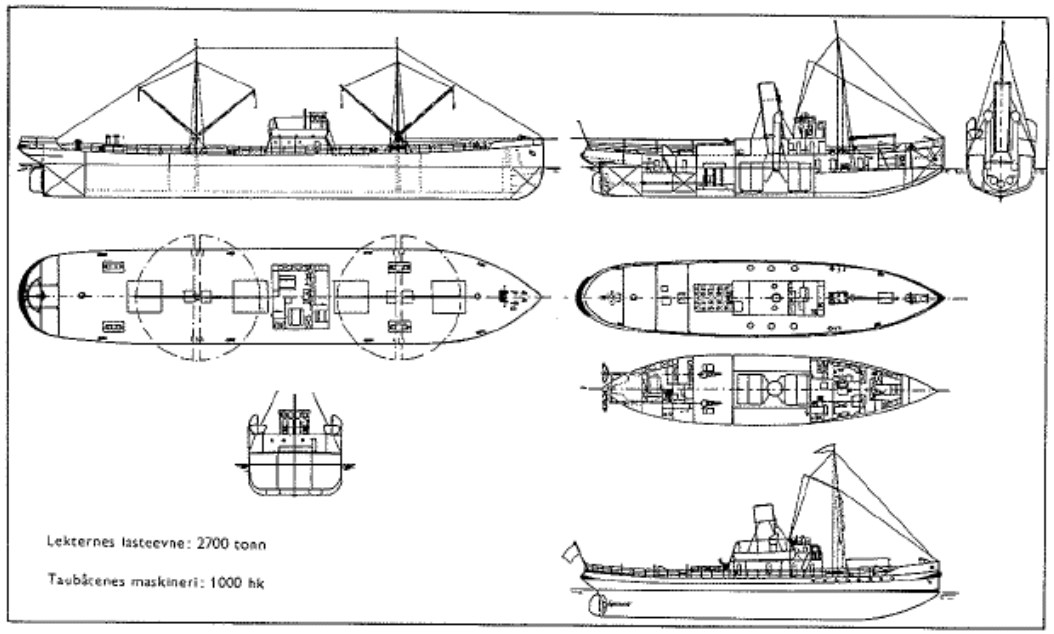
Ill. 51. Map of the Kara Sea Route to Siberia, from the brochure *The History of LIED Incorporated*, published by Jonas Lied in New York in December 1918. The Siberian Company was nationalized by the Bolsheviks in March 1918, but Lied hoped to continue the sea route by his new firm.



Radiosambandet på Karahavsruten

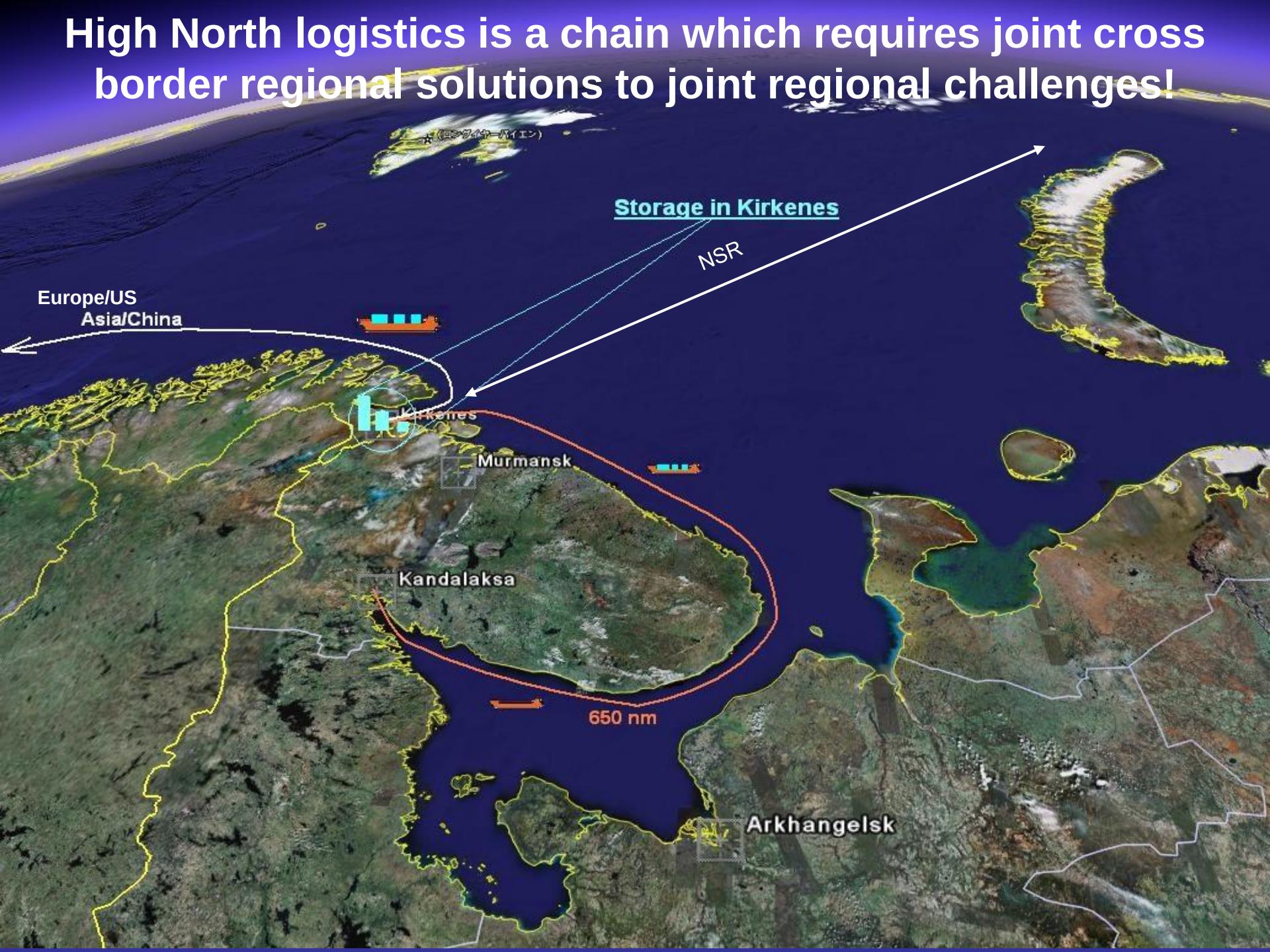
The Norwegian Jonas Lied and the Kara Sea Route 1912 - 18





Prosjekterte lektere og taubåter.

High North logistics is a chain which requires joint cross border regional solutions to joint regional challenges!



Ship to Ship transshipment of Russian oil products in Norway offers trading opportunities to Asia via NSR

Sovcomflot Suezmax 162 000 dwt. mt Vladimir Tikhonov, transhipping Russian gas condensate close to North Cape in Norway before using the NSR via Murmansk to Thailand

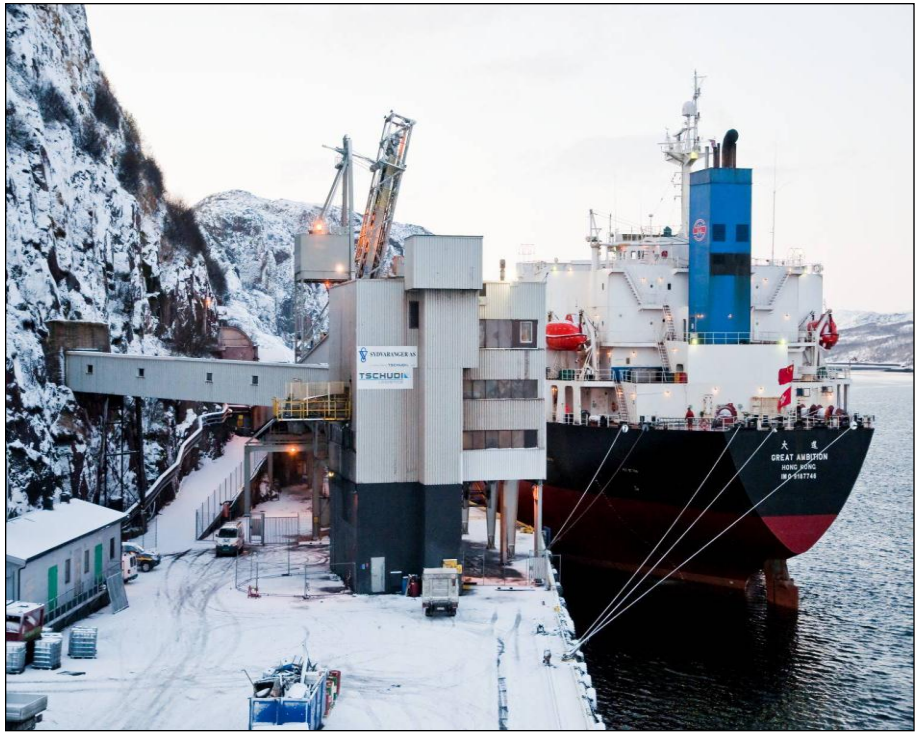
Tschudi Arctic Transit, has 5 years experience in transshipment of Russian oil products in northern Norway.

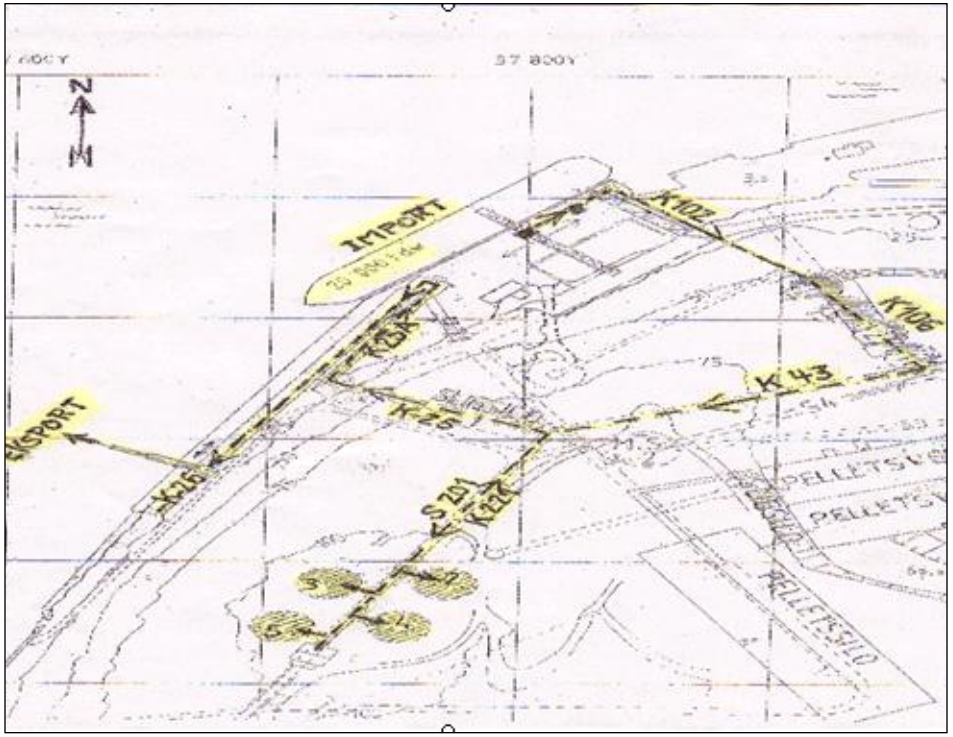
TSCHUDI ARCTIC TRANSIT

BULK LOGISTICS IN NORTHERN NORWAY

The Tschudi Bulk Terminal in the ice free port Kirkenes facilitates vessels up to 100 000 dwt with a plan to increase this to 170 000 dwt.

Silo storage capacity of 370 000 m3 offers the possibility of storage and transshipment of bulk minerals from Russia and northern Scandinavia both in direction the Atlantic and the NSR





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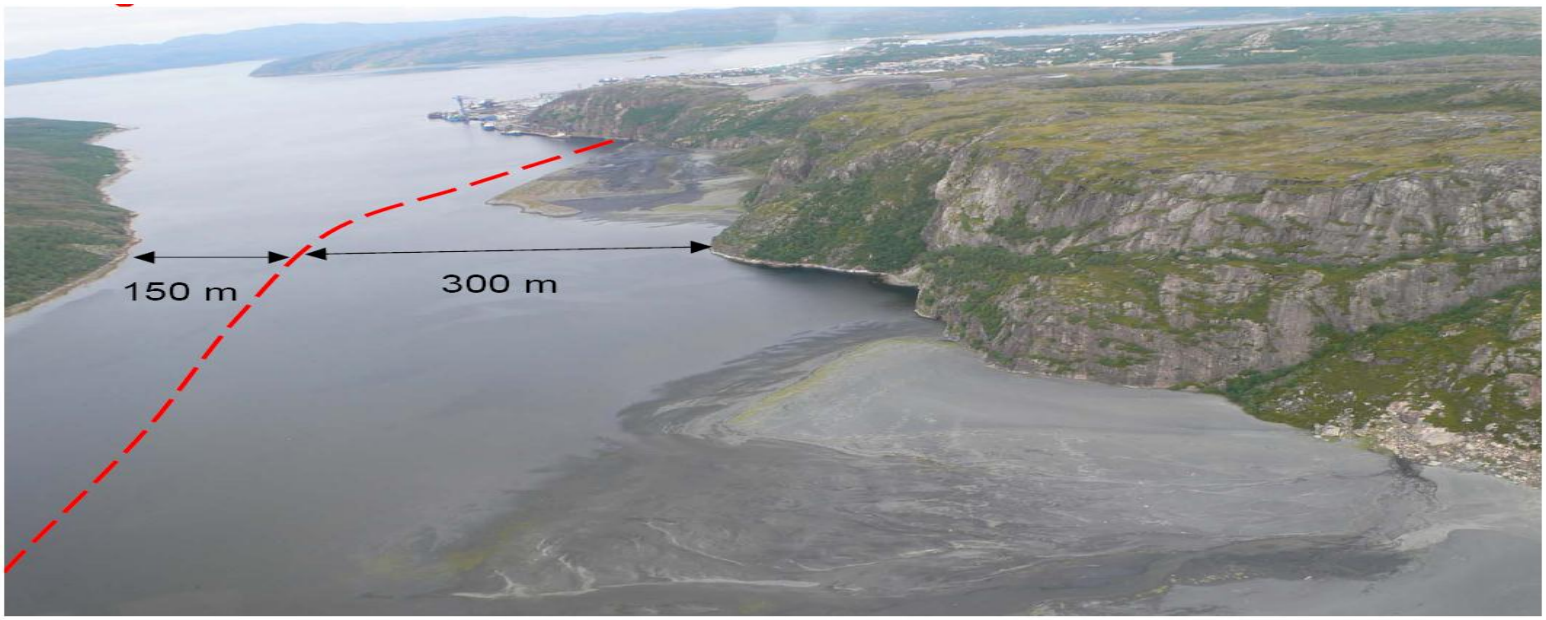
BULK TERMINALS

Potential Port Development:
Kirkenes Industrial Logistics Area - KILA

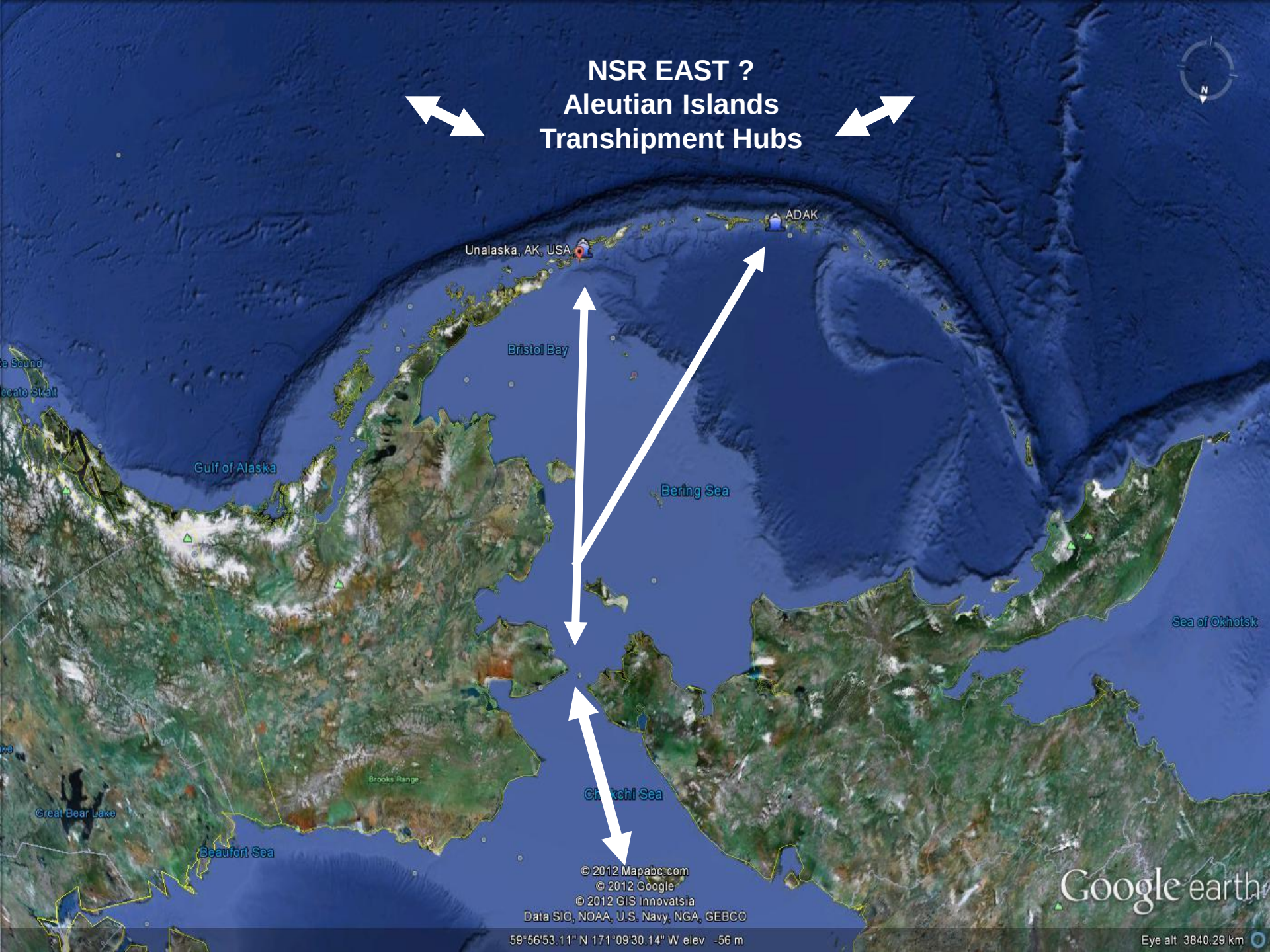


1 000 000 m^2 to be developed for port, transshipment and industrial purposes

Western transhipment hubs – Kola Peninsula, Murmansk, Arkhangelsk, Northern Norway, Kirkenes and/or Iceland? Eastern entry point?

Also geographically well suited for stationing emergency response vessels for the Arctic

TSCHUDI KIRKENES


NSR EAST ?
Aleutian Islands
Transhipment Hubs
ADAK
Unalaska, AK, USA
Bristol Bay
Gulf of Alaska
Bering Sea
Sea of Okhotsk
Brooks Range
Great Bear Lake
Beaufort Sea
© 2012 Mapabc.com
© 2012 Google
© 2012 GIS Innovatsia
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
59°56'53.11" N 171°09'30.14" W elev -56 m
Google earth
Eye alt 3840.29 km

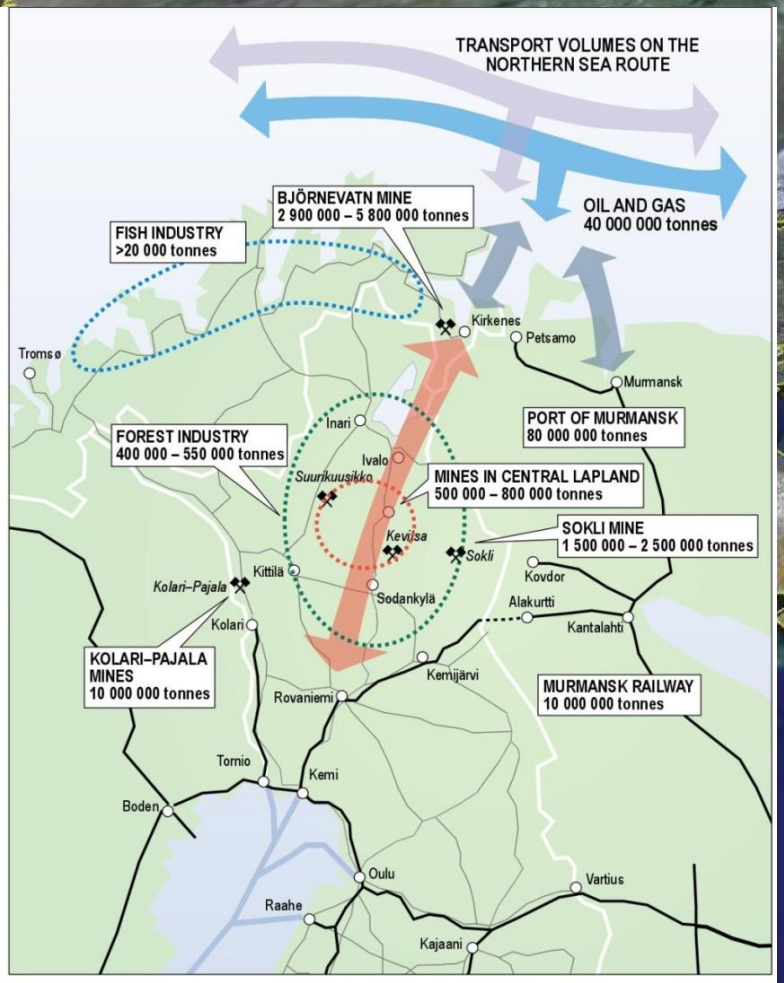
The Arctic - an area for future industrial value creation

NGU
Geologi for samfunnet siden 1858

GTK

TSCHUDI

An example: With increasing mining activity on the Kola peninsula and in northern Finland and Sweden the establishment of railway connections for direct export of rawmaterials in bulk or for processing could become a reality. Opens the possibility for import of LNG as a source of energy but also as an industrial input factor.



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IN THE FOCUS

NSR Demonstration Project 2010

CHNL was involved in a

The ARCTIS Database

The Centre for High North Logistics is currently working on establishing an online database - a knowledge hub

ARCLIO (www.arctic-lio.com)

CHNL's Arctic Logistics Information

Logistics operations in the High North

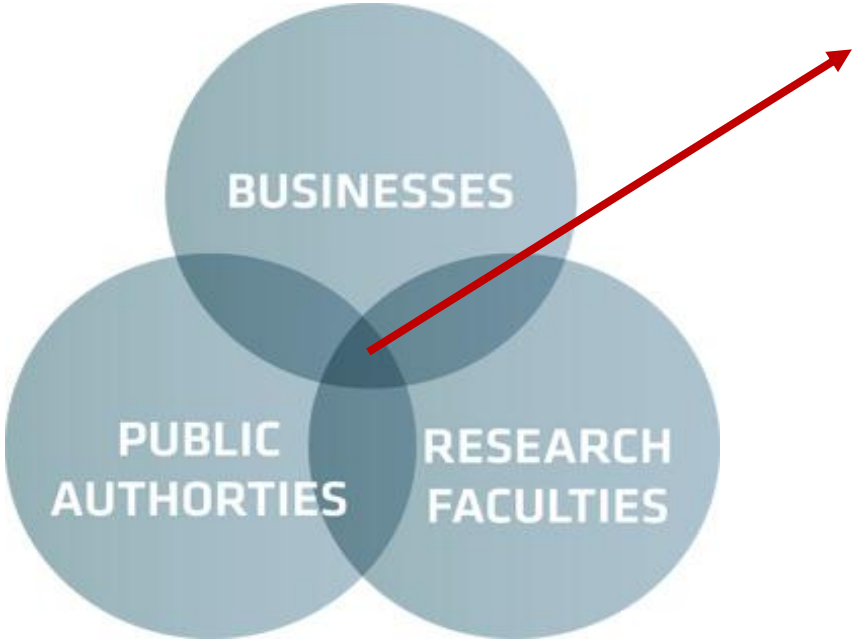
The resources are in the Arctic but

CHNL's Workshops

CHNL's International Conference in Murmansk on the 14 February 2012 on Transit Navigation on the Northern

www.chnl.no

Acts as a knowledge network for contributing to the development efficient and sustainable logistics solutions for the High North.



The gateway to complete and up-to-date information about resources and logistics in the High North provided through the ARCTIS, the Arctic Resources & Transportation Information System and the ARCLIO, the Arctic Logistics Information Office dynamic databases.

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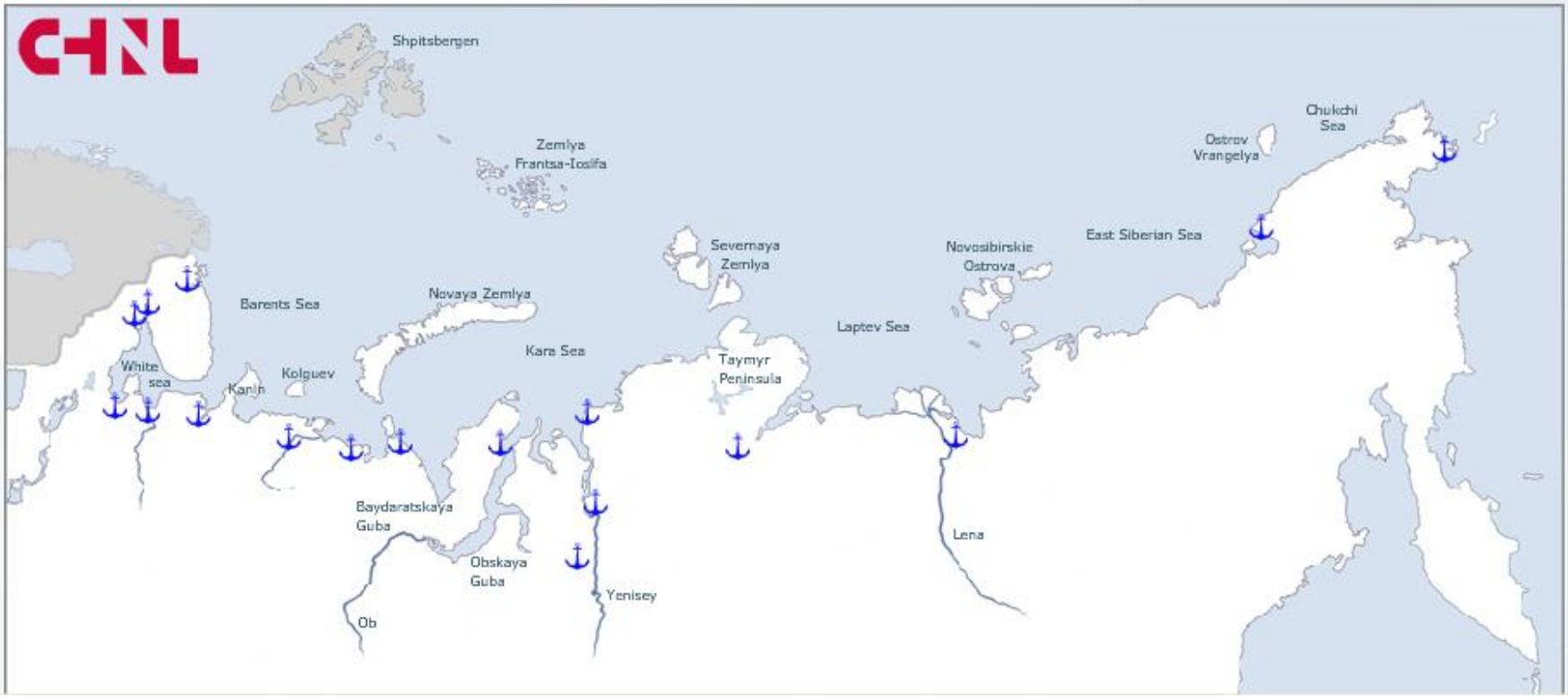

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Welcome to ARCTIS

Would you like to develop your knowledge, expand your international network and take part in the business opportunities in the High North? Would you like to meet and discuss with companies, research institutes and politicians and to participate in workshops where you can develop practical knowledge and expand your network? Then you should join ARCTIS "The international gateway to relevant knowledge about logistics in the High North".

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And if anyone still doubts that the Arctic is changing, please look up: Northern passage 2010 – Børge Ousland and his team around the North Pole in 3 months - www.ousland.no/blog