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Brief Introduction on Polar Code (International code of safety for ships operating in polar waters)

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兴船报国　创新超越

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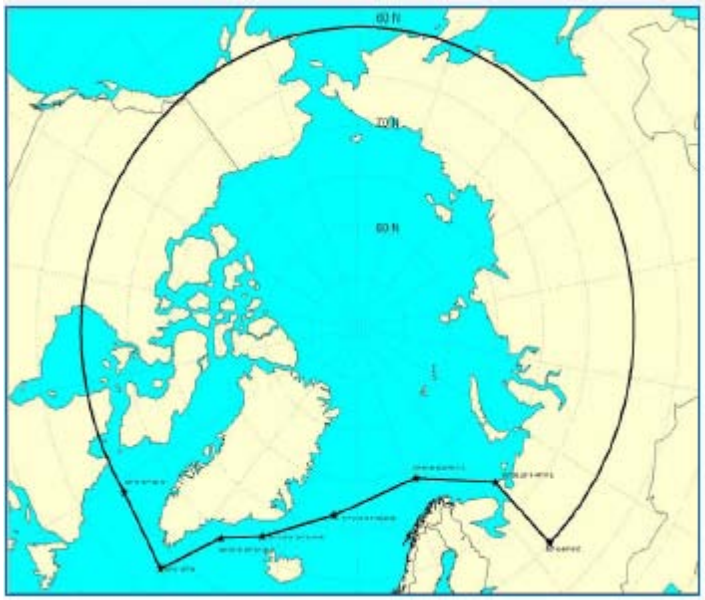
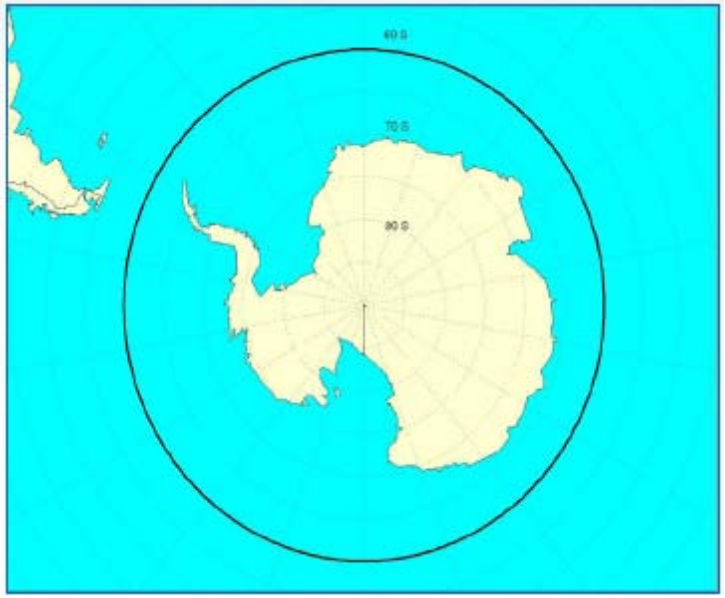
1. Brief Introduction - two poles

1.1 Arctic/Antarctic : Current geographical boundaries





1. Brief Introduction - two poles

1.1 Arctic/Antarctic :

1. Brief Introduction - two poles

1.2 Arctic and Antarctic Waters :

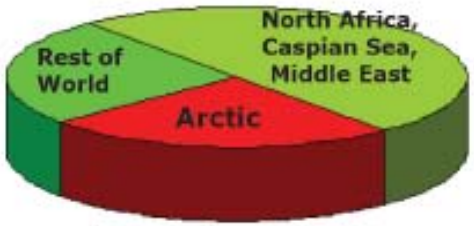
- There is relatively little multi-year ice in the Antarctic. Conversely, a significant amount of multi-year ice in Arctic;
- The Arctic is currently less protected by international law compared to the Antarctic;
- The marine environments of both Polar seas are similarly vulnerable.

1. Brief Introduction - two poles

1.3 Poles resources :

Arctic benefits:

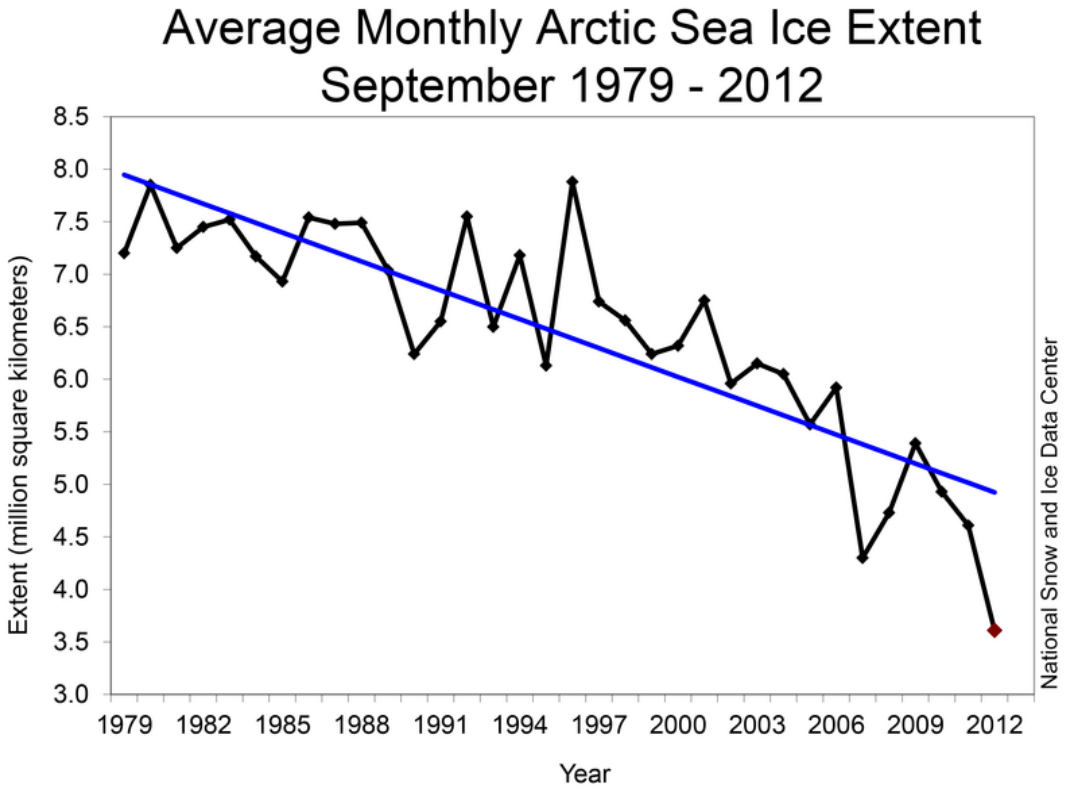
- Huge oil and gas reserves in the Arctic area are estimated up to 25% of the world's undiscovered resources.
  - Kara Sea;
  - Barents Sea;
  - Chukchi Sea;
  - Pechora Sea;
  - Beaufort Sea;
  - North Slope of Alaska;
  - Grand Banks of Newfoundland.



1. Brief Introduction - two poles

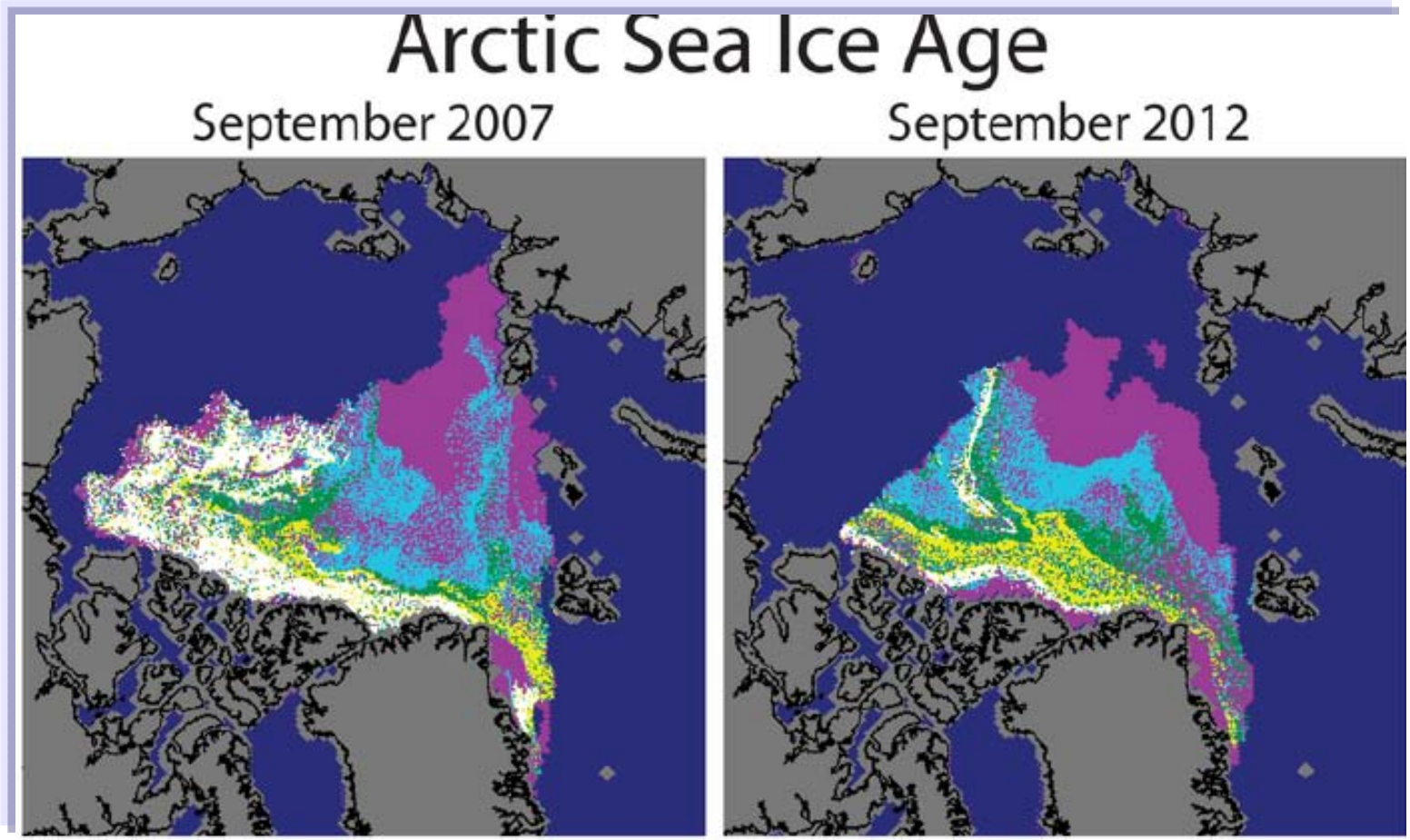
1.3 Arctic Climate Changing:

The Arctic is warming up now. the multiyear ice covering the Arctic Ocean has effectively vanished, An increasing number of experts feel the North Pole will be ice free in summer by 2030 at the latest, for the first time in a million years.



1. Brief Introduction - two poles

1.4 Arctic Climate Changing:



1. Brief Introduction - two poles

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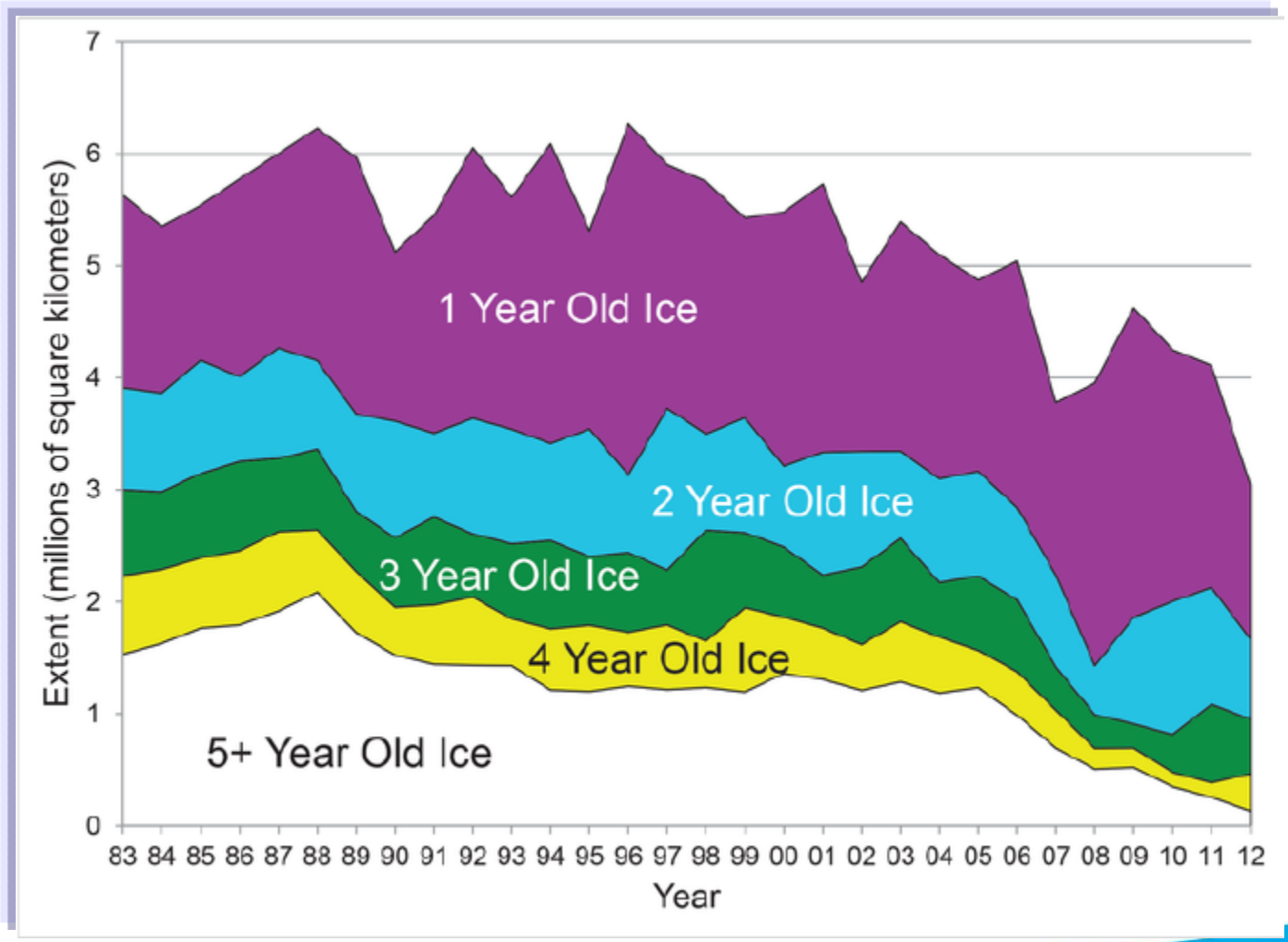


2. Human Activities in poles

2.1 Scientific Investigation & Research

STX Finland Rauma shipyard delivers Antarctic research vessel to South African government on 5.4.2012

2. Human Activities in poles

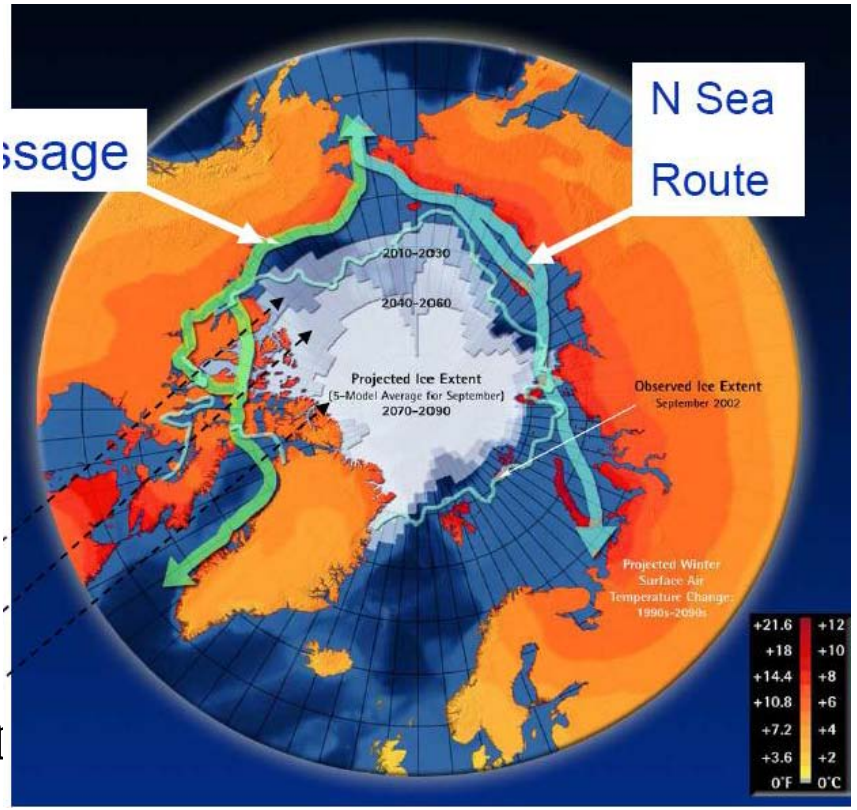
2.1 Scientific Investigation & Research

Snowdragon pass through Arctic on 26 July 2012

2. Human Activities in poles

2.2 Marine transportation

Arctic ice melting in recent years, The projected decline of sea ice extend and concentrations has raised more and more attention about Arctic shipping routes.



Two main routes: Northwest Passage (NWP) and Northern Sea Route (NSR)

2. Human Activities in poles

2.2 Marine transportation

Northern Sea Route:

- **Defined by Russian legislation**
- **From the Atlantic Ocean to the Pacific Ocean specifically running along the Russian Arctic coast from Murmansk on the Barents Sea, along Siberia, to the Bering Strait and Far East.**
- **The entire route lies in Arctic waters and parts are free of ice for only two months per year**

The NWP lies within the centre of the Canadian Arctic Archipelago and is in fact a collection of possible routes trough the Canadian Arctic. In the west th

2. Human Activities in poles

2.2 Marine transportation

Northwest Passage:

- The NWP lies within the centre of the Canadian Arctic Archipelago
- A collection of possible routes through the Canadian Arctic.
- In the west there are three feasible paths: M'clure Strait, Prince of Wales Strait and Peel Sound.
- In the East, the passage is traditionally limited to Lancaster Sound.
- The Beaufort Sea region generally becomes ice free in August-September, while M'Clure Strait can remain blocked with Old Ice in most years

2. Human Activities in poles

2.2 Marine transportation

- Short routes for the international trade (Northern Sea Route and North-West Passage), though subject to ability to operate in severe ice conditions and very cold climate

- Rotterdam – San Francisco
  - 6700 miles vs. 7300 miles
- Rotterdam – Yokohama
  - 7350 miles vs. 11250 miles

2. Human Activities in poles

2.2 Marine transportation

Northern Sea Route Shipping:

In 2008, ice-strengthened heavy lift vessels *Beluga Fraternity* and *Beluga Foresight* commenced an East-to-West passage of the Northern Sea Route in August

In 2009, as part of a small convoy escorted by the Russian nuclear icebreaker *NS 50 Let Pobedy*, westward through the Bering, Sannikov, and Vilkitskiy Straits. The president of Beluga Shipping claimed the voyage saved each vessel about 300,000 euros, compared to the normal Korea-to-Rotterdam route by way of the Suez Canal

2. Human Activities in poles

2.2 Marine transportation

Northern Sea Route Shipping:

In 2009, the first two international commercial cargo vessels traveled north of Russia between Europe and Asia

In 2011, 34 ships made the passage up from a total of 6 ships in 2010

2. Human Activities in poles

2.2 Marine transportation

NorthWest Passage Shipping:

In 2009 sea ice conditions were such that at least nine small vessels and two cruise ships completed the transit of the Northwest Passage

Setting sail from Nome, Alaska, USA on 18 Aug 2012 and reaching Nuuk, Greenland on 12 Sept 2012, *The World* became the largest passenger vessel to transit the Northwest Passage.The ship, carrying 481 passengers, for 26 days and 4,800 nautical miles at sea

2. Human Activities in poles

2.2 Marine transportation

NorthWest Passage Shipping:

The World

2. Human Activities in poles

2.3 Increased tourism in Polar areas

A Chilean Air Force handout photo the shows some crew members and passengers of the cruiser MV Explorer arriving to Bahia Fildes port in the Antartic's Chilean naval base, in Nov 2007

3. Problems Arised by Human Activities in poles

3. Problems Arised by Human Activities in poles

Challenges for response in polar regions:

1). Environmental conditions (e.g. Ice, temperatures)

2). Latitudes (e.g. remoteness, communications issues)

3). Environmental sensitivity (e.g. slow recovery from damage)

4). Human element (e.g. Mental and physiological effects of polar conditions)

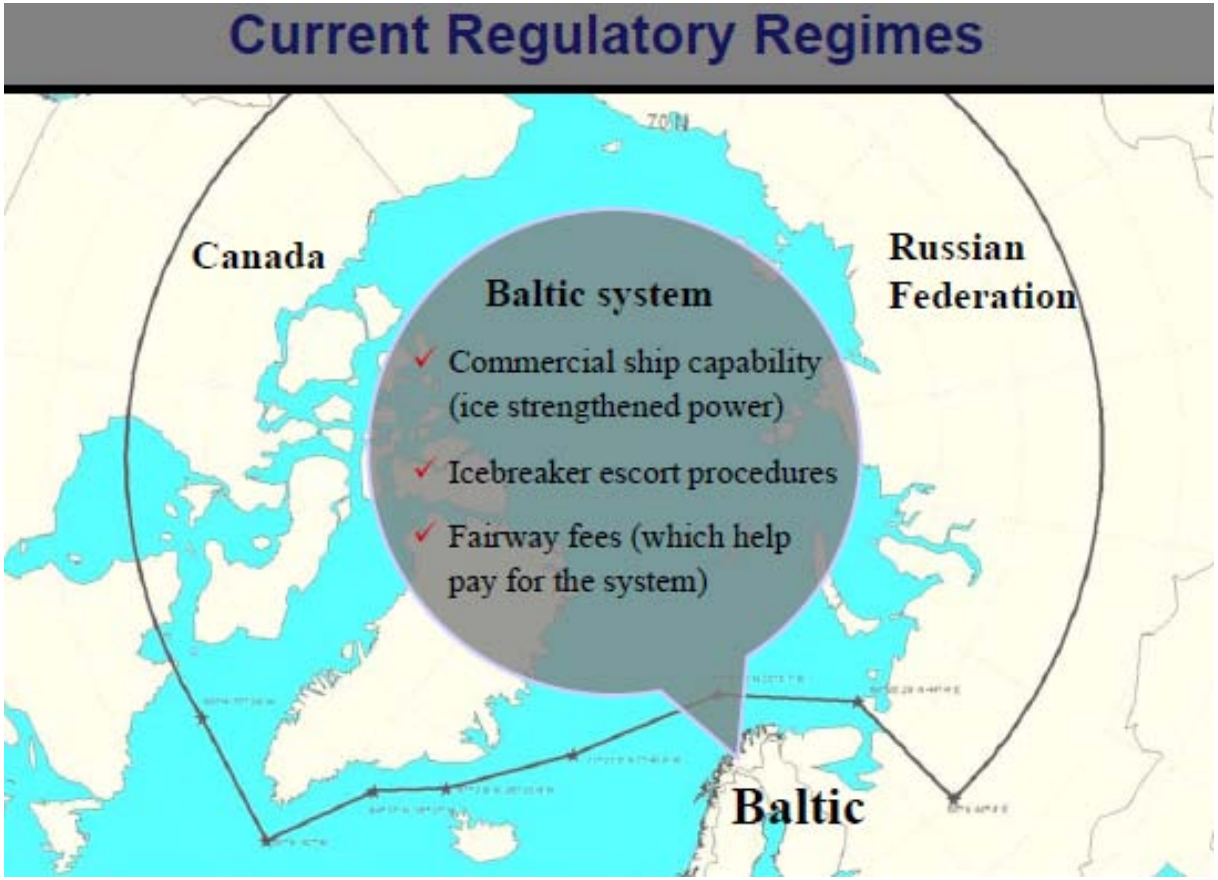
3. Problems Arised by Human Activities in poles

Threats on Polar region environment

- Spill
- Operational discharges
- Ship air emissions
- Black carbon emissions
- Introduction of alien invasive species
- Ship strikes on marine mammals
- Anthropogenic noise
- Loss of containers with packaged dangerous goods
- Anti-fouling systems which release biocides

4. Main Rules/Regulations for Poles

4.1 Current Regime:
Rules by Arctic costal states :



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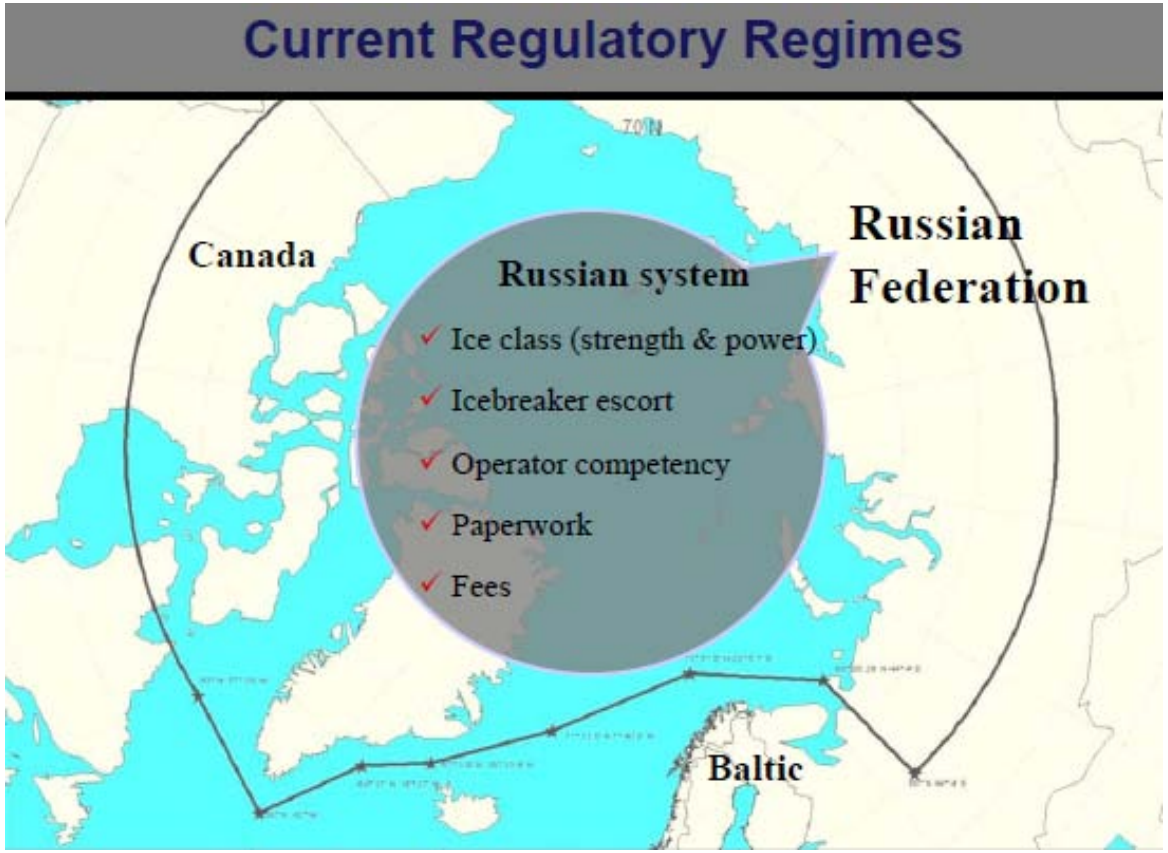

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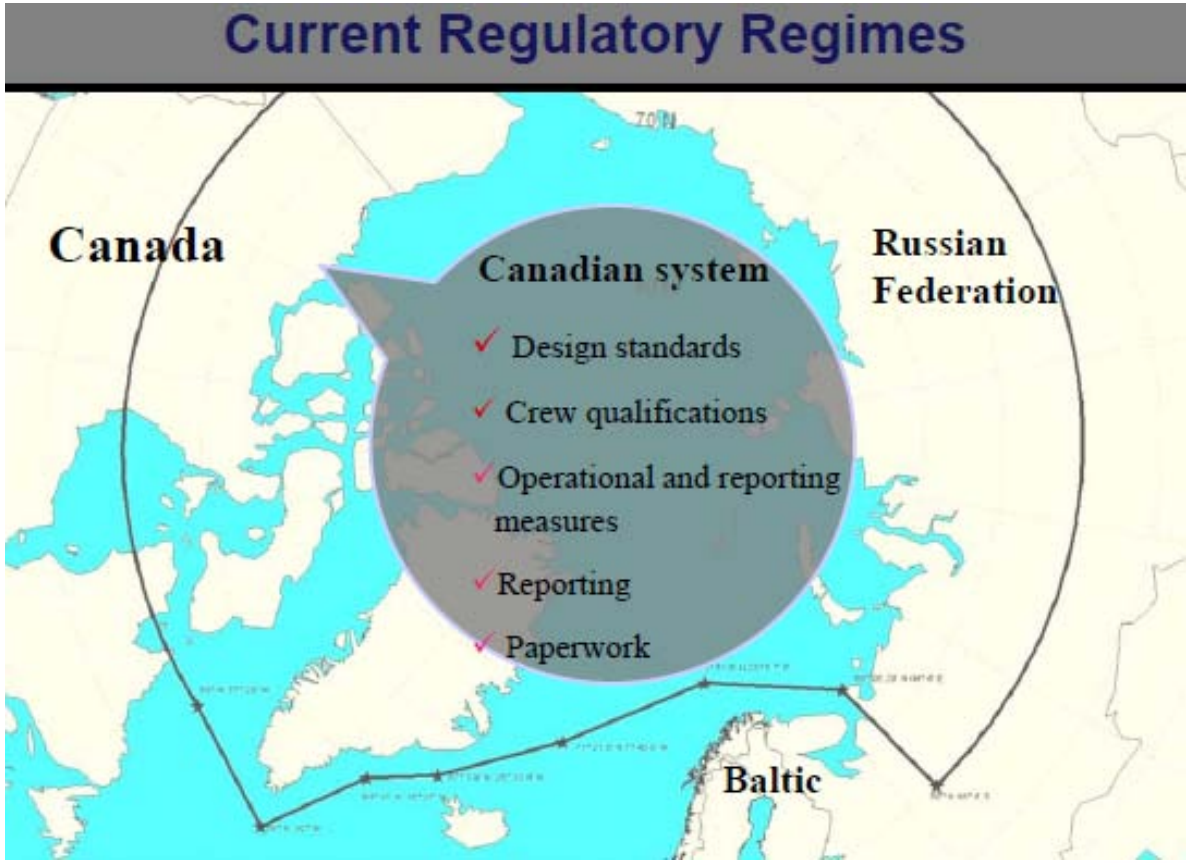


4. Main Rules/Regulations for Poles

4.1 Current Regime:

Polar Class by IACS:

Polar Class	Ice Description (based on WMO Sea Ice Nomenclature)
PC 1	Year-round operation in all Polar waters
PC 2	Year-round operation in moderate multi-year ice conditions
PC 3	Year-round operation in second-year ice which may include multi-year ice inclusions.
PC 4	Year-round operation in thick first-year ice which may include old ice inclusions
PC 5	Year-round operation in medium first-year ice which may include old ice inclusions
PC 6	Summer/autumn operation in medium first-year ice which may include old ice inclusions
PC 7	Summer/autumn operation in thin first-year ice which may include old ice inclusions

4. Main Rules/Regulations for Poles

4.1 Current Regime:

Specific Guidelines for the polar regions by IMO:

- **Guidelines for Ships Operating in Arctic Ice-Covered Waters - 2002 (MSC. Circ 1056/ MEPC Circ 399 of 23 Dec.2002)**

- **Guidelines for Ships Operating in Polar Waters – 2009 (Resolution A 1024(26)), with decision to proceed directly towards risk-based mandatory measures by 2012, pertaining to both polar regions**

The Guidelines are recommendatory

4. Main Rules/Regulations for Poles

4.1 Current Regime:

- Other Class Societies have their own ice class or polar class.

- Harmonized, mandatory Polar Code by IMO is urgently needed for safety and environmental protection.

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

- Approved as a new agenda item by MSC 86 in May 2009.
- The Sub-Committee of Ship Design and Equipment (DE) coordinates the work.
- MSC MEPC tasked DE in 2010 following A 26

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 53 [Feb 2010]

Agreed on the principles for the Code:

- **Additional requirements to existing IMO legislation (add on code)**
- **Risk based**
- **Functional requirements Supported by deterministic requirements where necessary**
- **Ensure same level of safety for persons, the environment and the ships as in other waters**
- **A correspondence group was formed to progress the work.**

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 54 [Otc 2010]

- **Preliminary agreement on the geographical boundaries of application.**
- **Agreement that there should be a number of elements in the design criteria**
- **The structure of the Code is agreed (based on elements from Goal Based Standard, tier 1 and 2)**
- **Development of hazard identification (additional hazards in polar waters/areas)**
- **A correspondence group was formed to progress the work**

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 55 [Mar 2011]

	Category	Decription	
A	Polar ice covered	Ships that may operate in ice-covered waters with 10% or more of ice	Polar class or equivalent
B	Polar open water	Ships that may operate in ice-covered waters with less than 10% ice, where it may pose a structural risk	Assessment/ ice-strengthening or other mitigating measures
C	Polar open water including ice-free waters	Ships that may operate in waters with zero to 10% ice cover, where it does not pose a structural risk	No ice-strengthening

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 56 [Feb 2012]

- **Application and Structure of the Polar Code**

➢ **Goal-based requirements: goals (Tire I), functional requirements (Tier II), verification process (Tier III)**

➢**Draft Polar code would be mandatory for SOLAS passenger and cargo ships as a first approach; Fishing vessels to be discussed by SLF Sub-Committee.**

➢**……**

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 56 [Feb 2012]

- **Hull, ice-strengthening and equipment**

➢ **Particular hazards: low temperature, ice on water , remoteness and high latitude**

➢ **Hull integrity**

➢**Functional requirements should be flexible and navigation in ice should not be limited by coastal States.**

➢**……**

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 56 [Feb 2012]

- **Polar Water Operational Manual and navigational matters**

➢ **IMO requirements, e.g. the EEDI requirements should be taken into account.**

➢ **Support for Voyage planning to avoid ship strikes with cetaceans.**

➢**……**

4. Main Rules/Regulations for Poles

4.2 IMO Polar Code Progress:

Progress DE 56 [Feb 2012]

- **Environmental issues**

➢ **Proposing to include a provision in the Polar code prohibiting the use of HFO by ships in Arctic waters, equivalent to the environmental protection presently afforded in Antarctic waters**

➢ **Hard, non-biocidal, inert, abrasive resistant coatings would, when entering polar regions, present a significant risk of importing invasive species to these regions, if not properly cleaned.**

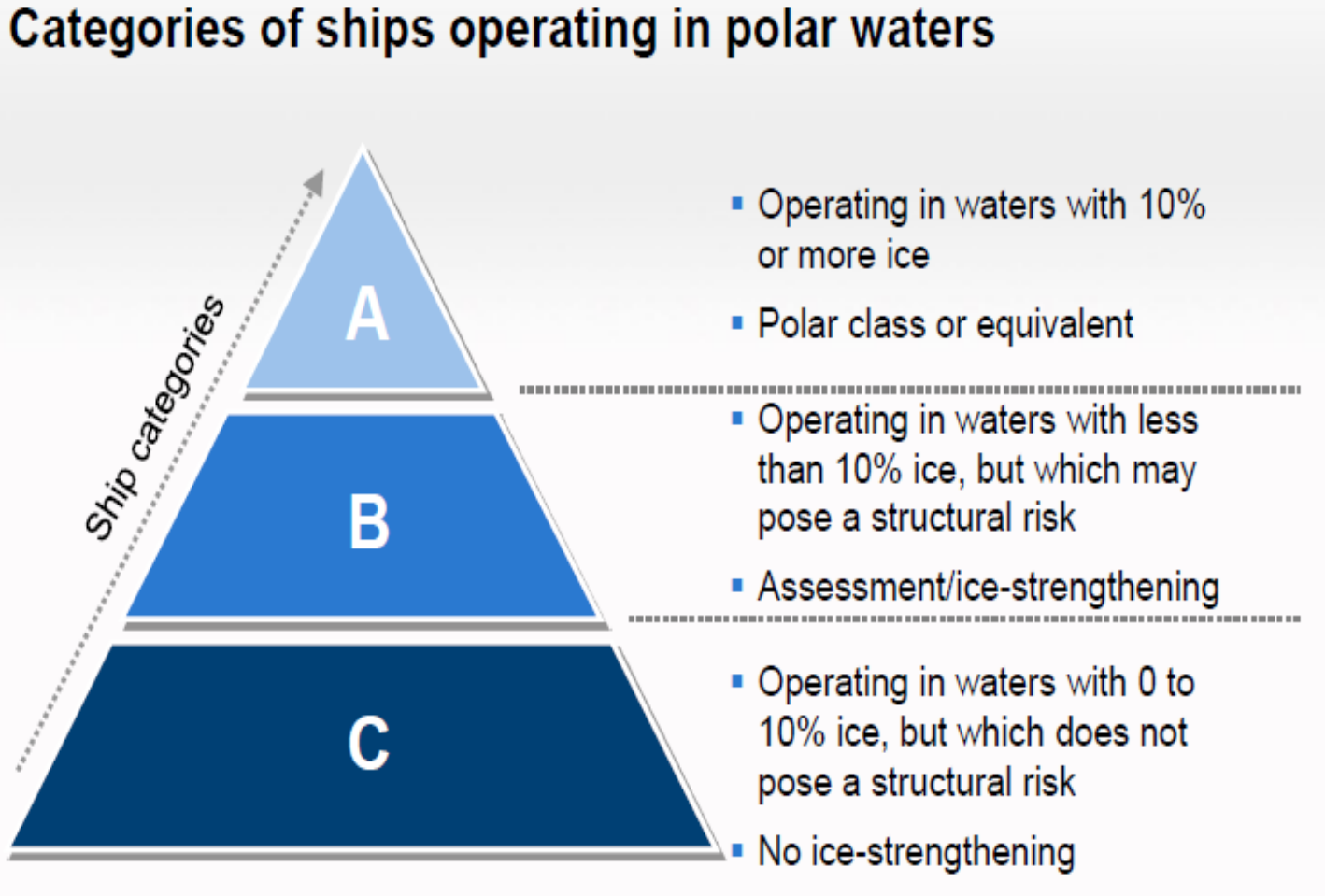
4. Main Rules/Regulations for Poles

4.3 Polar Code Content:

Chapter	Content
1	General
2	Structural and Integrity
3	Stability (intact and damage) and sub-division
4	Wateright and weathertight integrity
5	Machinery
6	Habitability (accommodation and emergency escape measures)
7	Fire Safety/Protection
8	Life-saving appliances and arrangements
9	Navigation
10	Communication
11	Substitution Design
12	Operating Requirements
13	Certification and training

4. Main Rules/Regulations for Poles

4.3 Polar Code Content:



4. Main Rules/Regulations for Poles

4.3 Polar Code Content:

The Code addresses:

–Certification

–Design

–Equipment and systems

–Operation

–Environmental protection

–Manning and training

5. Summary

- What are acceptable levels of risk/safety?
- What is necessary level of environmental protection?
- Applicability of measures to different vessels/voyages
- Application to existing vessels
- Training and certification required for polar-going crews
- Polar Waters Operations Manual Contents
- Control and enforcement measures
- Best option for bringing into force

5. Summary

It is very necessary for human being to explore , investigate, research and develop polar.

Under ensuring safety of people and property, human being has responsibility and obligation to protect polar environment.

Shipbuilding industry should strengthen cooperation and address a reasonable polar code.

Thank you for your attention