

A large red and white icebreaker ship, the Arctic Express, is shown navigating through a field of broken ice floes in the Arctic. The ship is emitting a plume of white smoke from its funnel. The water is a deep blue, and the sky is overcast.

PAME

Protection of the Arctic Marine Environment

Arctic Marine Shipping Assessment

The Arctic Council's Response to
Changing Marine Access

Progress Report
October 2006

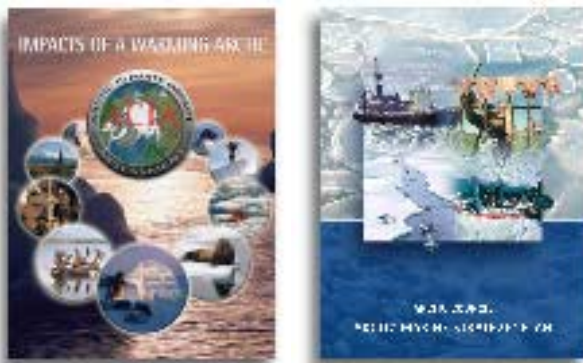
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1) INTRODUCTION

At the Fourth Meeting of the Arctic Council Ministers in November 2004, the Protection of the Arctic Marine Environment (PAME) working group was requested to conduct a comprehensive and integrated Arctic marine shipping assessment.

The Arctic Marine Shipping Assessment (AMSA) is a natural follow-on to two key Arctic Council reports: the Arctic Climate Impact Assessment (ACIA) and the Arctic Marine Strategic Plan (AMSP).



The ACIA report states that the Arctic is now experiencing some of the most rapid and severe climate change on earth. Furthermore, ACIA documents that the Arctic sea cover is undergoing an unprecedented transformation – sea ice thinning, a reduction in extent, and a reduction in the area of multi-year sea ice in the central Arctic Ocean. Also, ACIA sea ice simulations for the 21st century show increasing ice-free areas in the Arctic coastal seas, which suggest plausible increases in Arctic marine access. Of the ten Key ACIA Findings, # 6 addresses this issue: *"Reduced sea ice is very likely to increase marine transport and access to resources."*

AMSP, also approved at the 2004 Reykjavik Ministerial, outlines the Arctic Council's vision for the Arctic marine environment:

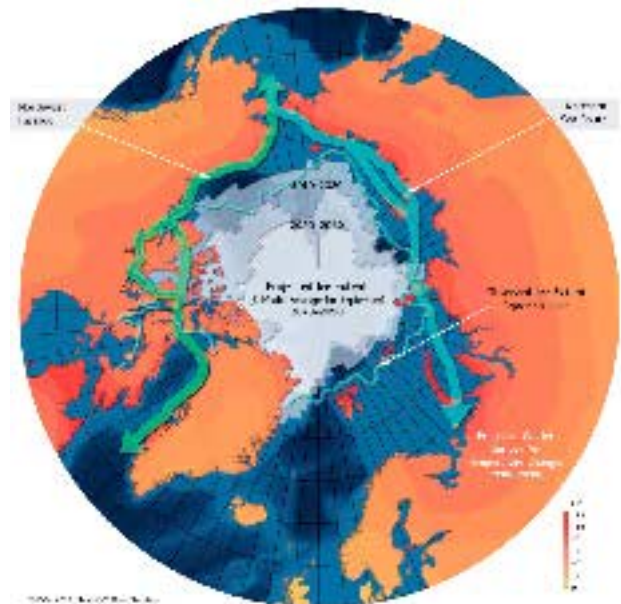
"A healthy and productive Arctic Ocean and coasts that support environmental, economic and socio-cultural values for current and future generations."

One of the significant strategic actions of the AMSP is that a comprehensive assessment of Arctic marine shipping at current and projected levels be conducted.

Reykjavik 2004 Ministerial Declaration:

"Request PAME to conduct a comprehensive Arctic marine shipping assessment as outlined in the AMSP under the guidance of Canada, Finland, and the United States as lead countries and in collaboration with the EPPR working group and other working groups of the Arctic Council and Permanent Participants as relevant."

Arctic Climate Impact Assessment. Key Finding #6:



"Reduced sea ice is very likely to increase marine transport and access to resources."

AMSP calls for ecosystems-based management to meet its four goals:

- 1) *Reduce and prevent pollution in the Arctic marine environment.*
- 2) *Conserve Arctic marine biodiversity and ecosystem functions.*
- 3) *Promote the health and prosperity of all Arctic inhabitants.*
- 4) *Advance sustainable Arctic marine resource use.*

AMSA is to be a circumpolar assessment, yet regional and local in focus where the social, economic and environmental impacts can be greatest. It is also to be inclusive, involving a host of key actors: the Arctic states; Permanent Participants; the Council working groups and observers; the international maritime industry including the ship classification societies; the International Maritime Organization (IMO); maritime research organizations; and many non-Arctic stakeholders (examples include interests in Japan, UK, Germany and others). AMSA is led by a team from the three lead countries ~ Canada, Finland and the United States. The AMSA project team engages PAME at key decision points and organizes the conduct and elements of the overall assessment.

AMSP Key Strategic Action:

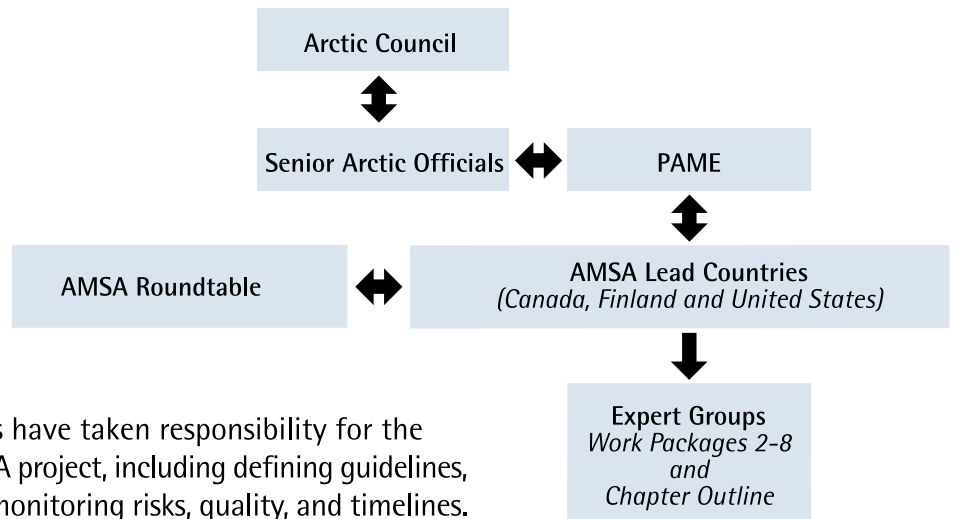
"To conduct a comprehensive as Assessment of Arctic marine shipping at current and projected levels."



2) ACCOMPLISHMENTS

A) Organization and Planning:

The PAME Working Group has the formal responsibility for the Arctic Marine Shipping Assessment (AMSA) as organized under a 'Lead Country' system. Canada, Finland, and the United States serve as joint lead countries for the AMSA project, however, input from all eight Arctic states and the Permanent Participants remains critical to the success of AMSA.



The lead country representatives have taken responsibility for the business associated with the AMSA project, including defining guidelines, work plans, report chapters and monitoring risks, quality, and timelines.

B) Project Plan Development:

The AMSA Work Plan consists of eight Work Packages. Analyses of Work Packages 2 – 7 will provide critical input into AMSA.

C) Roundtable Established:

A group of independent experts covering relevant subject areas and/or disciplines has been established. Experts on the roundtable have been drawn from different countries and organizations with the main qualifications being that they can make a significant contribution to AMSA. This advisory body reports to the lead countries.

AMSA Work Packages:

- WP 1 – Project Planning & Management
- WP 2 – Determination of Current Level of Arctic Marine Activity (Two tiers: Database collection and traditional marine use ~ Member States)
- WP 3 – Projected levels of Arctic Marine Activity in 2020 & 2050 (Plausible Future Scenarios ~ ACIA Sea Ice Projections and Regional Economics)
- WP 4 – Environmental Impact of Today's Arctic Marine Activity
- WP 5 – Environmental Impact of Arctic Marine Activity in 2020 & 2050
- WP 6 – Risk Analyses
- WP 7 – Social and Economic Impacts
- WP 8 – Analysis & Recommendations

D) Data Collection: The Complete AMSA Dataset

The Complete AMSA Dataset provides a basis for:

- *Defining baseline (2004) marine activity (extrapolations to 2020 and 2050);*
- *Risk assessments (pollution and safety);*
- *Environmental impact assessments;*
- *Indigenous use impacts (broken ice tracks/underwater noise, etc.); and*
- *Social and economic impact assessments (infrastructure requirements, trade patterns, icebreaking activity).*

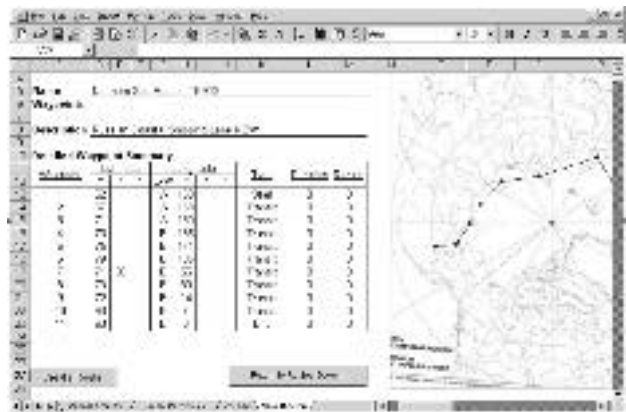
Every effort has been made to ensure that AMSA be based on data that is consistent, accurate, and sufficiently comprehensive in order to address the environmental, social, and economic issues that are of current and potential future significance.

The Complete AMSA Dataset includes four databases:

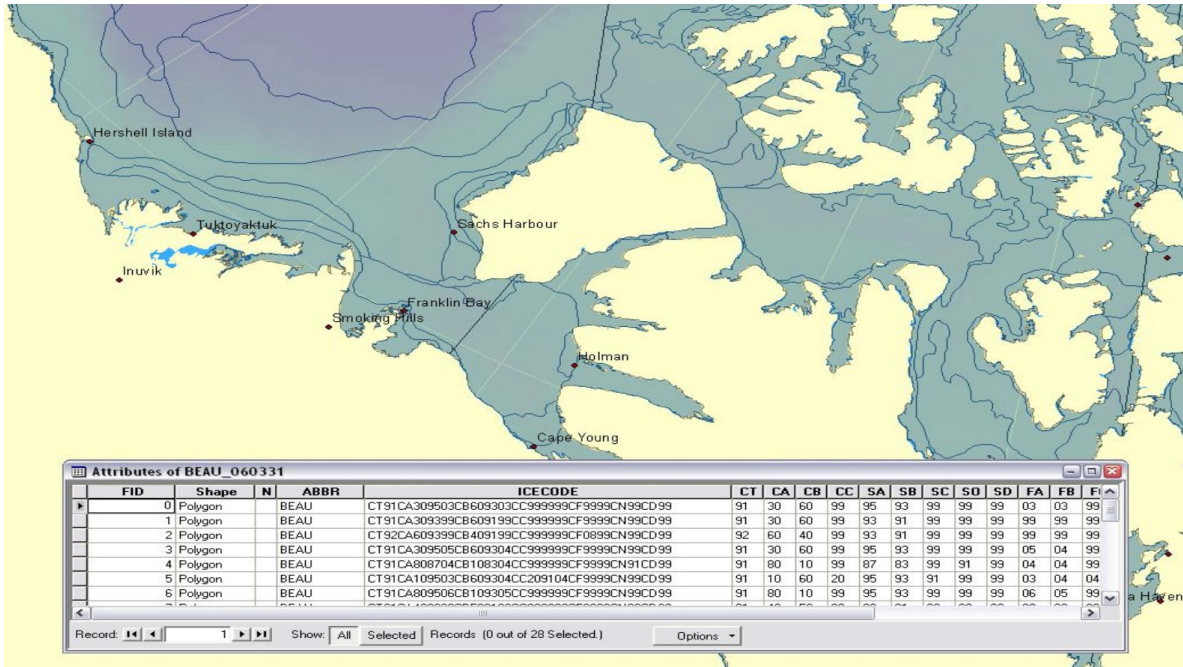
- 1) *Shipping Activity Database (electronic survey): Types of ships; Routes/dates taken; cargo volume/type; etc.*
- 2) *Traditional (Indigenous) Marine/Ice Activity Database: Location; dates; type of activity*
- 3) *Accident Database: Type (fire, grounding, collision, mechanical failure); Location; Severity*
- 4) *Ice Conditions Database (2004)*

E) Shipping Activity Data Collection: (Electronic Survey)

The Marine Activity Database Questionnaire (electronic survey) remains the main component of the Complete AMSA Dataset. The questionnaire was sent out to all Arctic Council member states on 6 February 2006 with the request to respond by 15 June 2006. Although not all Arctic states have fully completed the task, some preliminary analysis of the shipping data currently inputted has taken place.

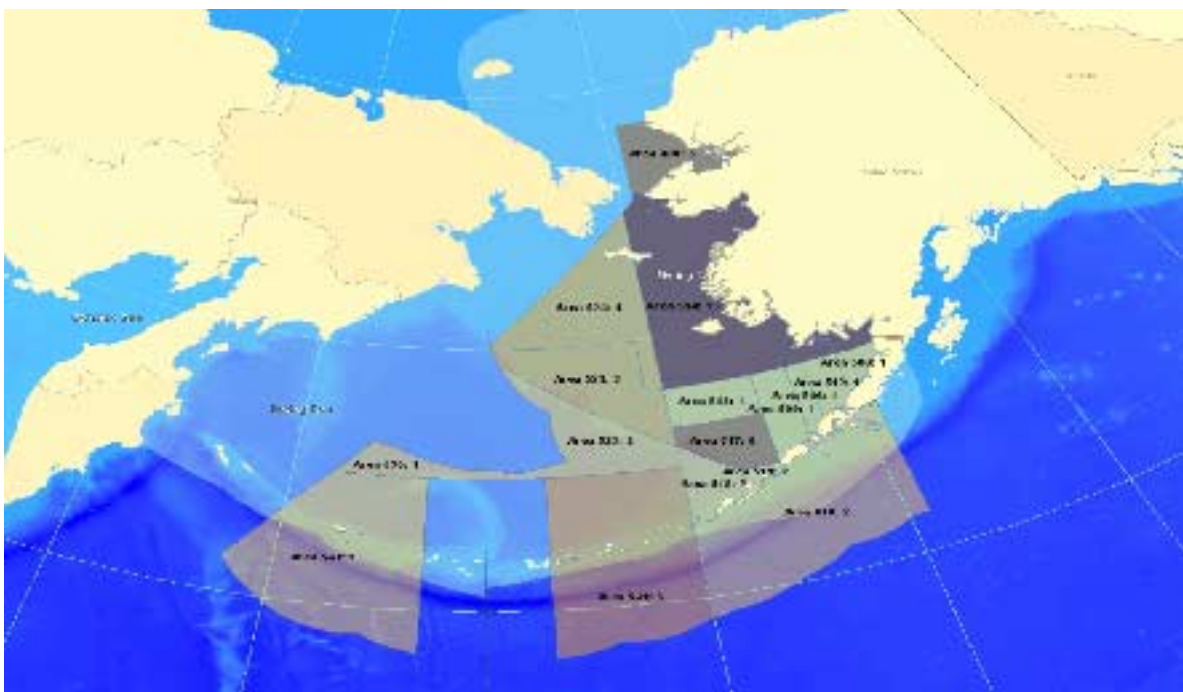


Real AMSA data in GIS Overlay:



Ice concentration contours plotted with active Arctic ports can help estimate seasonal economic trends.

Real AMSA data in a GIS overlay:



USA Fishing vessel distributions – Darker colors represent higher vessel traffic

Next steps will consist of completing data input; review and 'clean-up' data (more route information and vessel details required); convert input into GIS data; develop databases and maps; and, finally, post and share information.

F) LMEs:

All data collected will be placed within the context of the (LME) framework ongoing within PAME.

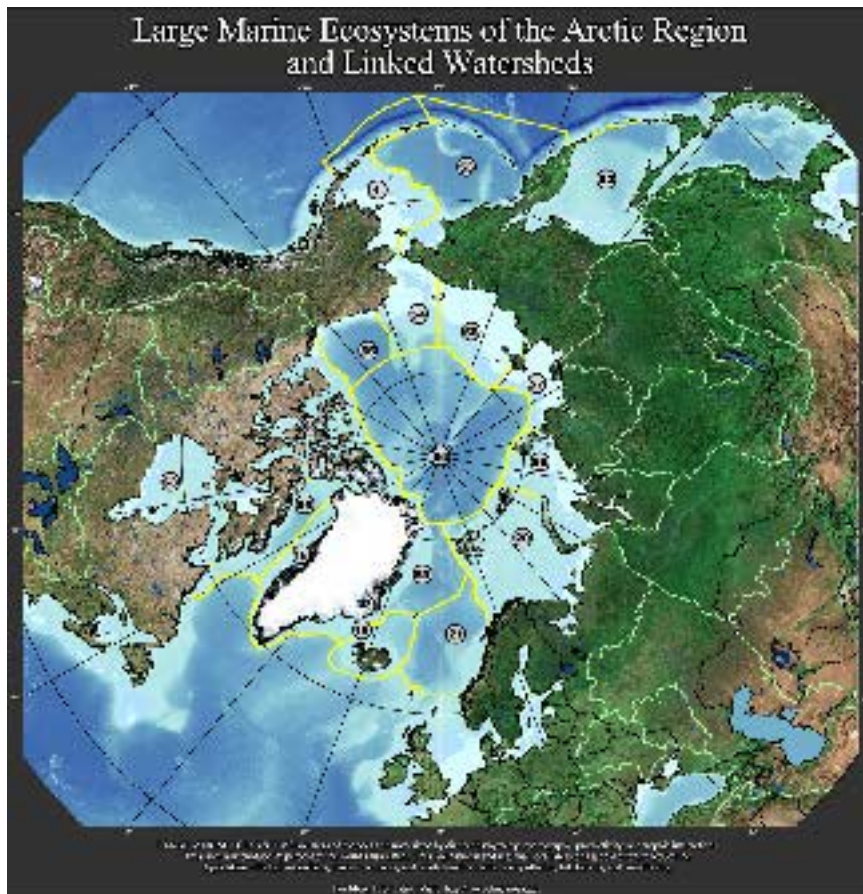
Definition: LMEs are regions of the ocean characterized by distinct bathymetry, hydrography, productivity, and trophic interactions.

The Arctic Marine Strategic Plan calls for adoption and application of an integrated, ecosystems-based approach to managing the Arctic marine environment. One of the fundamental tools of this management approach is the use of Large Marine Ecosystems, or LMEs, as a geographic framework.

A PAME experts group has been working since 2005 to better define the LMEs for the Arctic Ocean and their efforts will complement the AMSA project.

Arctic LME's will be useful for AMSA as geographic regions in which to measure the environmental impacts of marine activities such as ship transits, tourism and regional fishing.

Marine activities within the various LMEs affect Arctic residents. In order for the AMSA Team to further establish and understand the impacts increased marine activities may have on the residents of the Arctic, several Town Hall meetings have taken place.



G) Town Hall Meetings:

Outreach with Permanent Participants and Arctic communities through Town Hall Meetings is ongoing. For example, one such meeting took place in the western Canadian Arctic Hamlet of Tuktoyaktuk (with several others in the planning stages).

Furthermore, the AMSA Team, in collaboration with the Permanent Participants and PAME representatives, are in the process of planning Town Hall Meetings to be held in each Arctic state.

Examples of what we heard in Tuk:

- *"Times are changing and so too is our use of the marine environment...but...we adapt...we are a people that know how to survive...our past can attest to that!"*
- *Our populations are increasing. That means we need more food, supplies, building materials and fuel. These come by ship. With less ice, maybe more ships can come now. If more ships come then maybe it will be cheaper for us.*
- *Increased shipping activity could result in more jobs in transportation, marine tourism, fishing and associated industries.*
- *We need to consider the impact of increased shipping on marine mammals and, if necessary, regulate shipping in order to protect these resources.*
- *Ships breaking tracks in ice can disrupt traditional travel on the ice.*
- *Many extraneous variables affect Arctic shipping...*
 - *fuel costs and demand;*
 - *climate change (reduced sea ice/inability to establish ice roads);*
 - *possibility of a shorter route (as opposed to the Suez or Panama Canals);*
 - *geopolitical ramifications (Canal and NSR fees, political instability, upgrade capabilities, etc.);*
 - *changes in ship design/technology;*
 - *changes at the community level (such as an increased reliance on imported goods); etc.,*

...which makes it difficult to make predictions with certainty. That being said, an increase in Arctic shipping is inevitable.

Questions we will be using at town hall meetings:

- 1) *What are the two most significant driving forces that will likely influence Arctic marine activity by 2020?*
- 2) *What are the environmental impacts of shipping that concern Arctic residents?*
- 3) *What are the economic impacts of shipping (both positive and negative) for Arctic residents?*
- 4) *How will increased marine activities affect your life?*
- 5) *How will reduced sea ice change your use of the marine environment?*
- 6) *Are there other concerns and impacts (both positive and negative) that we need to be aware of?*



"The way of life as our forefathers knew it is disappearing like the ice."



"Times are changing and so too is our use of the marine environment ... but ... we adapt ... we are a people that know how to survive ... our past can attest to that!"



It is our children who will be affected by these 'water visitors' the most

H) Outreach to Maritime Venues

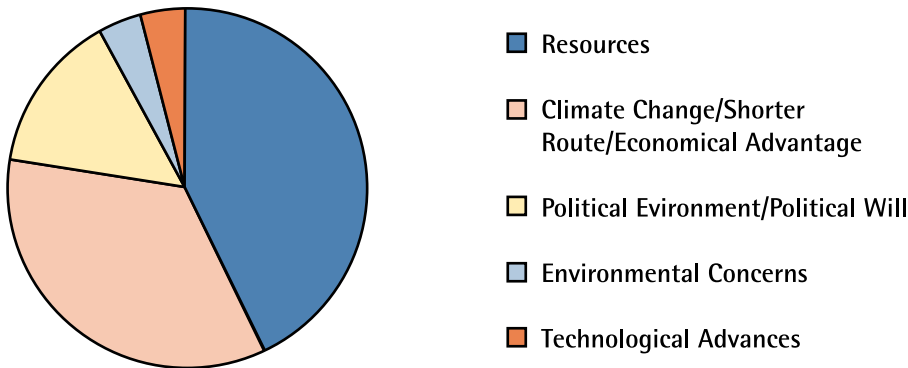
Coupled with Town Hall meetings, the AMSA Team has capitalized on opportunities to gather information from groups of Arctic technology professionals at various maritime venues. For example, at ICETECH06 held in Banff, Canada, the AMSA Team was granted the opportunity to hold an AMSA Workshop within the Conference. Participation in this workshop provided the AMSA Team insight into what the Arctic marine technological community is thinking about future uses of the Arctic Ocean.

To following web link contains a list of AMSA's presence at various maritime venues:

<http://www.pame.is/sidur/sidur.asp?id=70>

An Informal AMSA Survey of Future Arctic Marine Development Administered at ICETECH06:

1) *What do you believe are the two most significant driving forces that will likely influence Arctic marine activity by 2020?*



2) *I would be surprised in 2050 that Arctic development and marine transportation would be.....*

(Participants fill in their personal view about the future).

The AMSA Workshop during ICETECH06 provided a broad perspective on future Arctic Development.

Key questions explored were as follows:

Plenary Topic:

1) *How will technological advances influence marine activity in the Arctic Ocean during the first half of the 21st century?*

Break out Topics:

2) *Will future Arctic shipping be transit (trans-Arctic), or destination (regional) in nature?*

3) *Is Arctic climate change (and increasing marine access) or global economics the dominant factor driving Arctic development?*

4) *Are the roles of ice information and ice navigation (ice piloting & training) more significant than other factors such as ship technology in the success of Arctic marine transportation?*

I) Report Outline Formed:

A draft of the AMSA Final Report Structure (Chapter Outline) has been formed with writing on several of the chapters to begin in the near future.

J) Communications:

Accomplishments of the AMSA Team's communication efforts are visible and reflect the Arctic Council's principles of inclusiveness and transparency. In all areas, the AMSA team strives to obtain the involvement and participation of all stakeholders – including the Arctic residents, Member States, the Permanent Participants, the scientific community, the maritime community, and the Arctic Council working groups.

In an effort to obtain involvement and participation, AMSA brochures and posters have been developed, printed, translated (into English, French, Russian, and Inuktitut), and distributed.

Furthermore, all AMSA materials can be downloaded from the PAME website that houses all AMSA resources.

Finally, all AMSA efforts are communicated to the PAME Working Group who ensures AMSA is progressing appropriately.

AMSA Final Report Structure (Chapter Outline):

Chapter 1: Introduction

Chapter 2: Geography and History of Arctic Marine Use

Chapter 3: Current (2004) Levels of Arctic Marine Use

Chapter 4: Use of the Arctic Ocean by Indigenous People

Chapter 5: Scenarios of Future Arctic Ocean Marine Activity for 2020 and 2050

Chapter 6: Environmental Impacts at Current and Future Marine Activity (information from Work Packages 4, 5 and 6)

Chapter 7: Social and Economic Impacts at Current and Future Levels (information from Work Packages 6 and 7)

Chapter 8: Current Arctic Infrastructure and Anticipated Needs

Chapter 9: Findings of the Assessment (information from Work Package 8)

Appendices, Research agenda



AMSA Website: <http://www.pame.is>

3) UPCOMING PLANS

Following the October 2006 Arctic Council Ministerial meeting, the AMSA lead countries will be pursuing the following near term tasks so that AMSA progresses appropriately:

- (a) **Arctic Town Hall Meetings** - Organize Arctic Town Hall Meetings with the Permanent Participants in concert with the PAME representatives of the Arctic states. Conduct meetings in select communities in each Arctic state to listen to issues and concerns about future Arctic marine activity.
- (b) **Working Groups of the Arctic Council** - Continue engagement with SDWG, CAFF and AMAP, and work closely with EPPR to address issues of spill response, and search and rescue infrastructure requirements.
- (c) **Data Collection** - Complete the 2004 shipping activity baseline survey. Collect 2004 Arctic sea ice data from the national ice centers working with the International Ice Charting Working Group. Initiate collection of information on indigenous Arctic marine use. Collect recent (5-10 year) incident and accident data where possible.
- (d) **Analysis of Shipping Data** - Initiate analysis of the AMSA survey data and develop circumpolar maps of Arctic marine shipping use for 2004. Plan for the integration of additional data and information on Arctic sea ice, indigenous use, and incidents.
- (e) **Scenario Building** - Initiate a study of plausible futures of Arctic marine shipping for 2020 and 2050 by integrating climate and economic projections for the future. Determine the key driving forces and assumptions behind future marine use of the Arctic Ocean.
- (f) **Form Expert Groups** - Working with the PAME representatives, the Permanent Participants, and other working groups, identify and select experts to serve as lead authors and panel members for the AMSA work package and AMSA Final Report Chapters.
- (g) **Communications** - Results of the Town Hall Meetings will be communicated in a timely manner using the PAME web site. Initial analysis and results of the 2004 AMSA shipping survey will be communicated to the Arctic Council. AMSA progress updates will be provided to the PAME representatives and Senior Arctic Officials.



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