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Norwegian Mapping Authority

Arctic Hydrography, improving the knowledge baselayer

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IHO

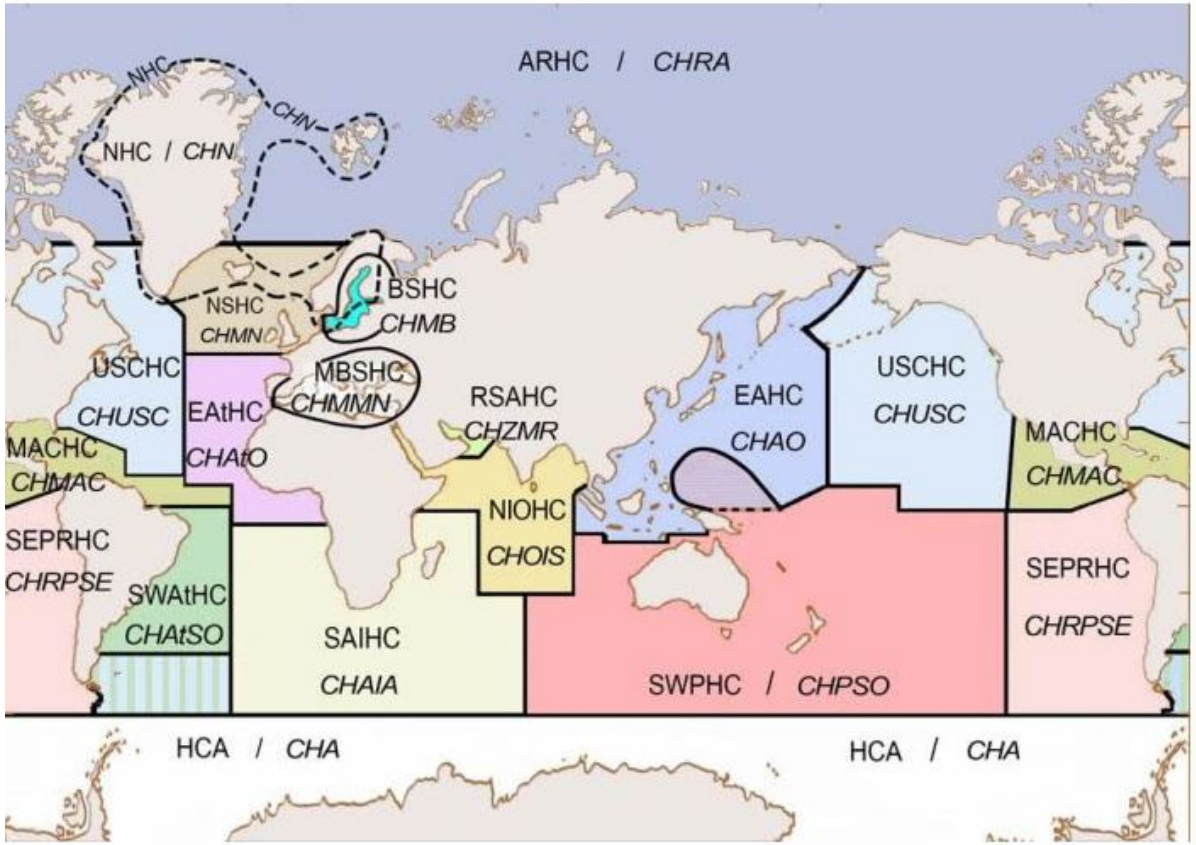
A principal Aim of the IHO is to ensure that all the world's seas, oceans and navigable waters are surveyed and charted.

The **Mission** of the IHO is to create a global environment in which States provide adequate and timely hydrographic data, products and services and ensure their widest possible use.

The **Vision** of the IHO is to be the authoritative worldwide hydrographic body which actively engages all coastal and interested States to advance maritime safety and efficiency and which supports the protection and sustainable use of the marine environment.

Arctic Regional Hydrographic Commission (ARHC)

- Established under the umbrella of the IHO in 2010
- Core members: Canada, Denmark, Norway, Russian Federation, USA
- Associate members: Finland, Iceland, Italy
- Cooperation on improving collection and dissemination of hydrographic knowledge for the benefit of the mariner and other stakeholders
- Relevant status of hydrography and nautical cartography provided to PAME since 2013



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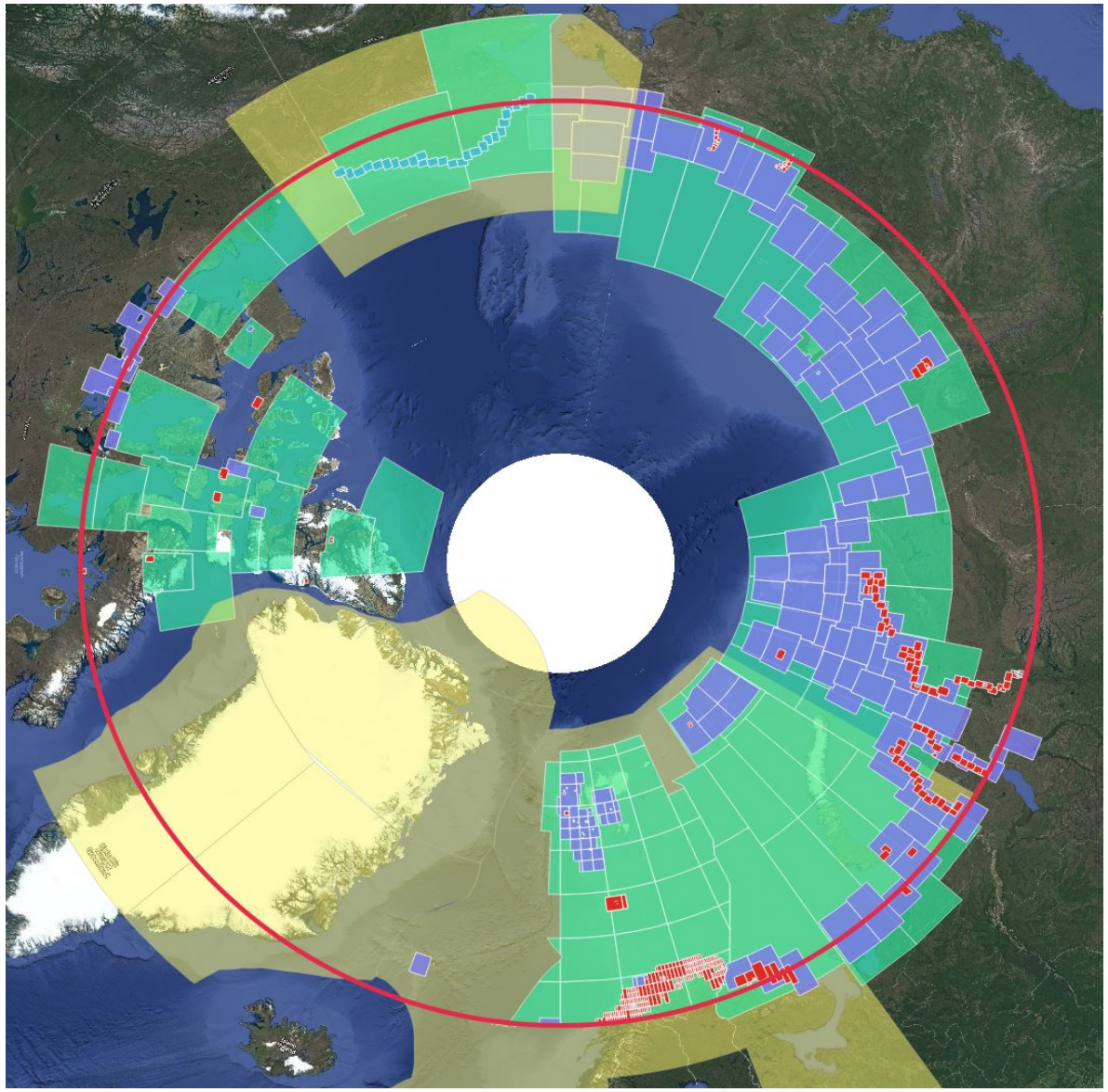
ARHC contribution to PAME

- Chart Adequacy Assessment
- Contribute to thematic datasets in PAME ASBPIF portal (such as Hydrography, Ice & Weather, Ports, etc)
- Improve access to marine geospatial information for the Arctic marine and ocean areas for the Arctic Council WG's (AMAP, CAFF, EPPR and PAME)

ARHC - ENC Coverage

But:

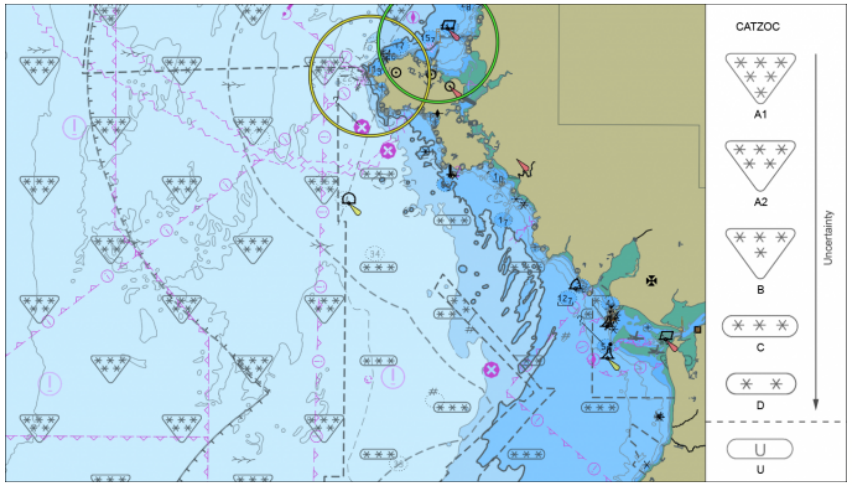
ENC ≠ good data



Overview	6
General	81
Coastal	157
Approach	339
Harbour	132
Berthing	22

ENC quality ≈ status survey data

CATZOC = Category Zone of Confidence. Informs the mariner about reliability of depth data, combined with horizontal position accuracy.



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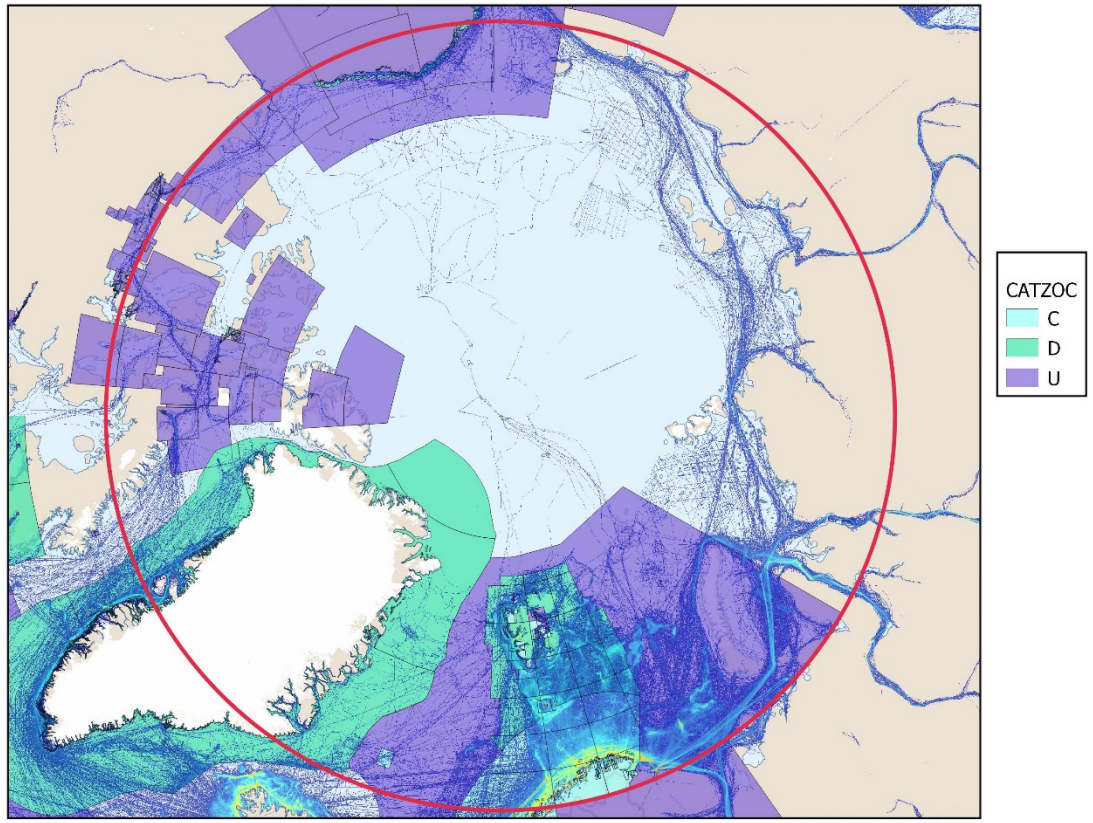
Ship traffic + survey data quality, an example

- Ship traffic based on AIS
- CATZOC C means older data (< 1950)
- CATZOC D means unreliable source
- CATZOC U means unassessed
- Russian data lacking in this example

CATZOC C, D and U and AIS



How Adequate are Arctic Charts?

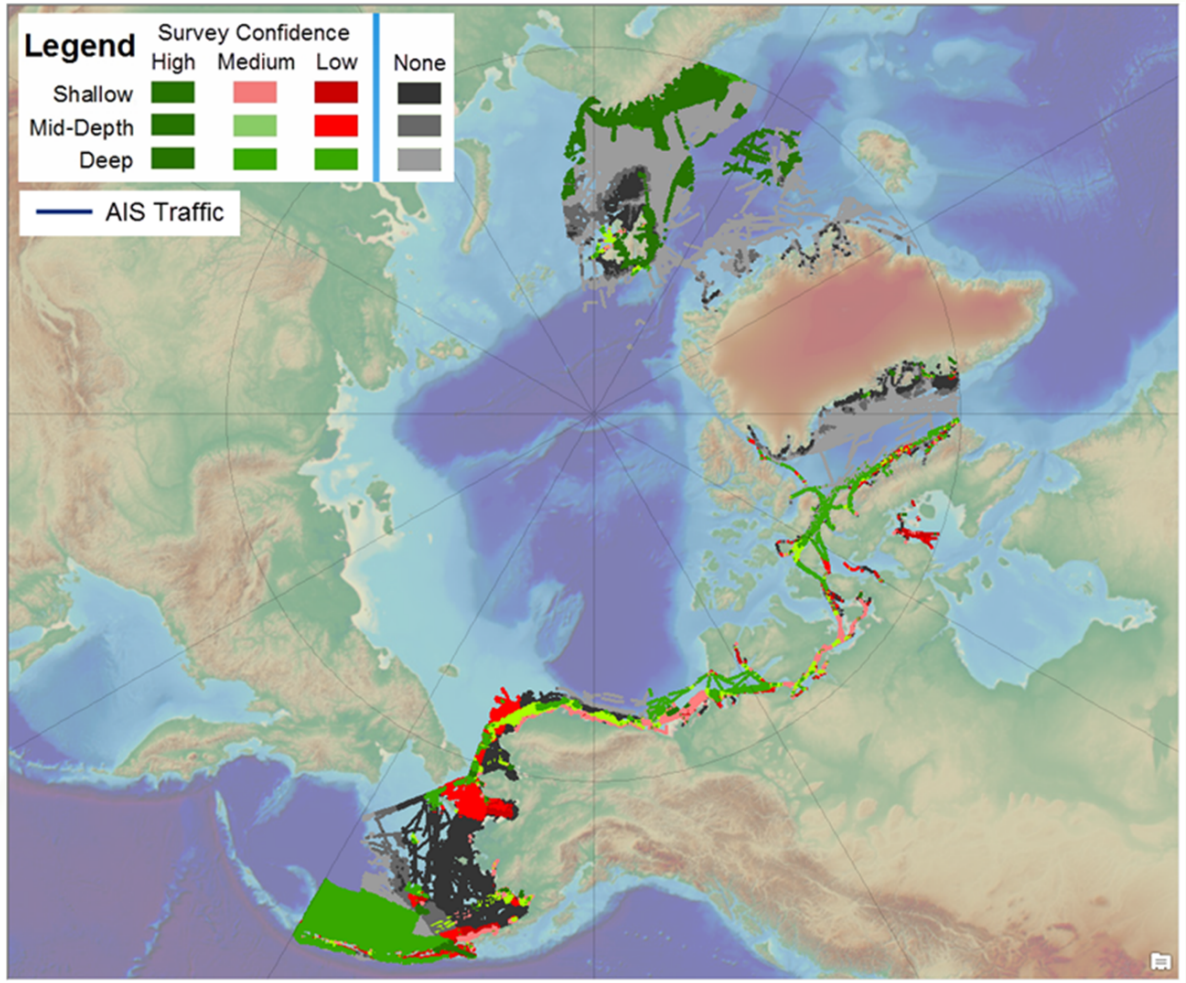
ARHC study in 2015* used AIS traffic, survey confidence (based on survey vintage and survey technology), water depth, and seafloor type to highlight areas of particular navigation concern.

ARHC now updating analysis with:

- new survey confidence data (CATZOC)
- updated AIS traffic
- including data for Northern Asia

Delivery at ARHC-8 (September 2018)

Additional Information: Samuel.Greenaway@noaa.gov



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* Gonsalves, M., Brunt, D., Fandel, C., Keown, P. A Risk-based Methodology of Assessing the Adequacy of Charting Products in the Arctic Region US Hydro 2015 National Harbor, MD, USA 16-19 March 2015

CAUTION REQUIRED WHEN USING NAUTICAL CHARTS OF ARCTIC WATERS

28 June 2017

As members or associate members of the Arctic Regional Hydrographic Commission (ARHC) and as Member States of the International Hydrographic Organization (IHO), the government Hydrographic Offices of Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, and the United States of America wish to highlight the significant limitations and risks associated with marine navigation in the Arctic.

While official nautical charts are produced by government hydrographic offices and are based on the latest information available, substantial areas still rely on limited, outdated, or insufficient depth and other data.

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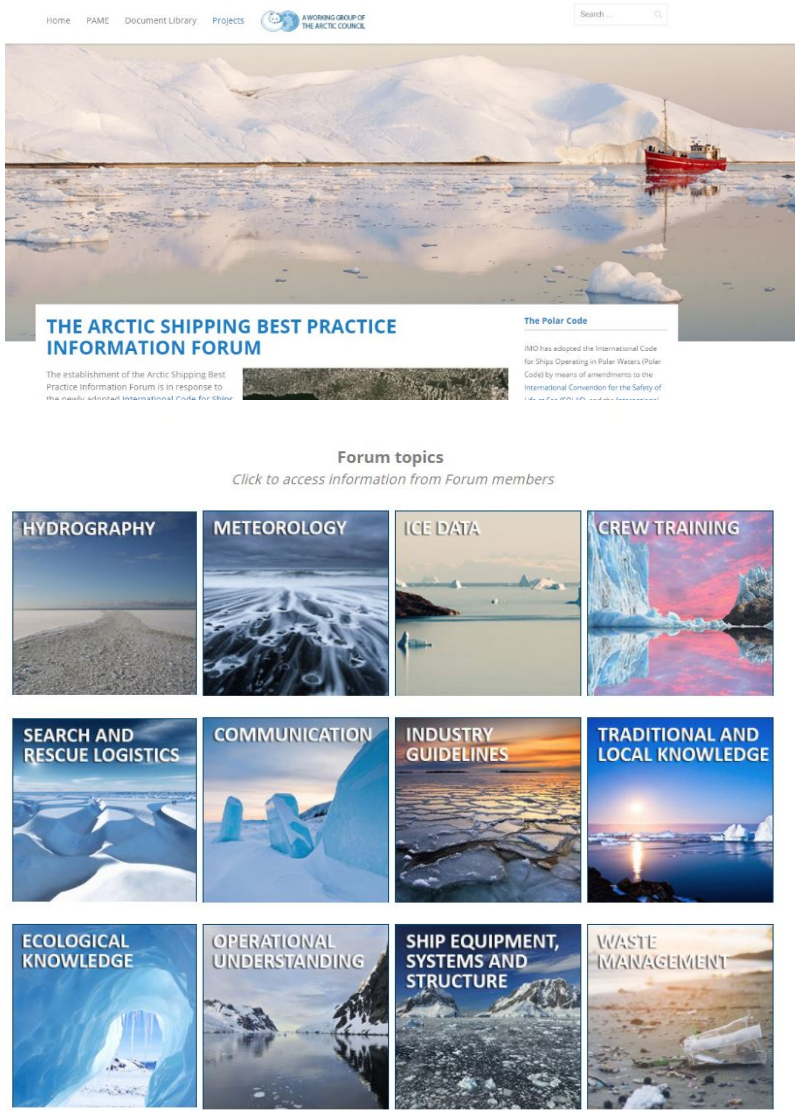
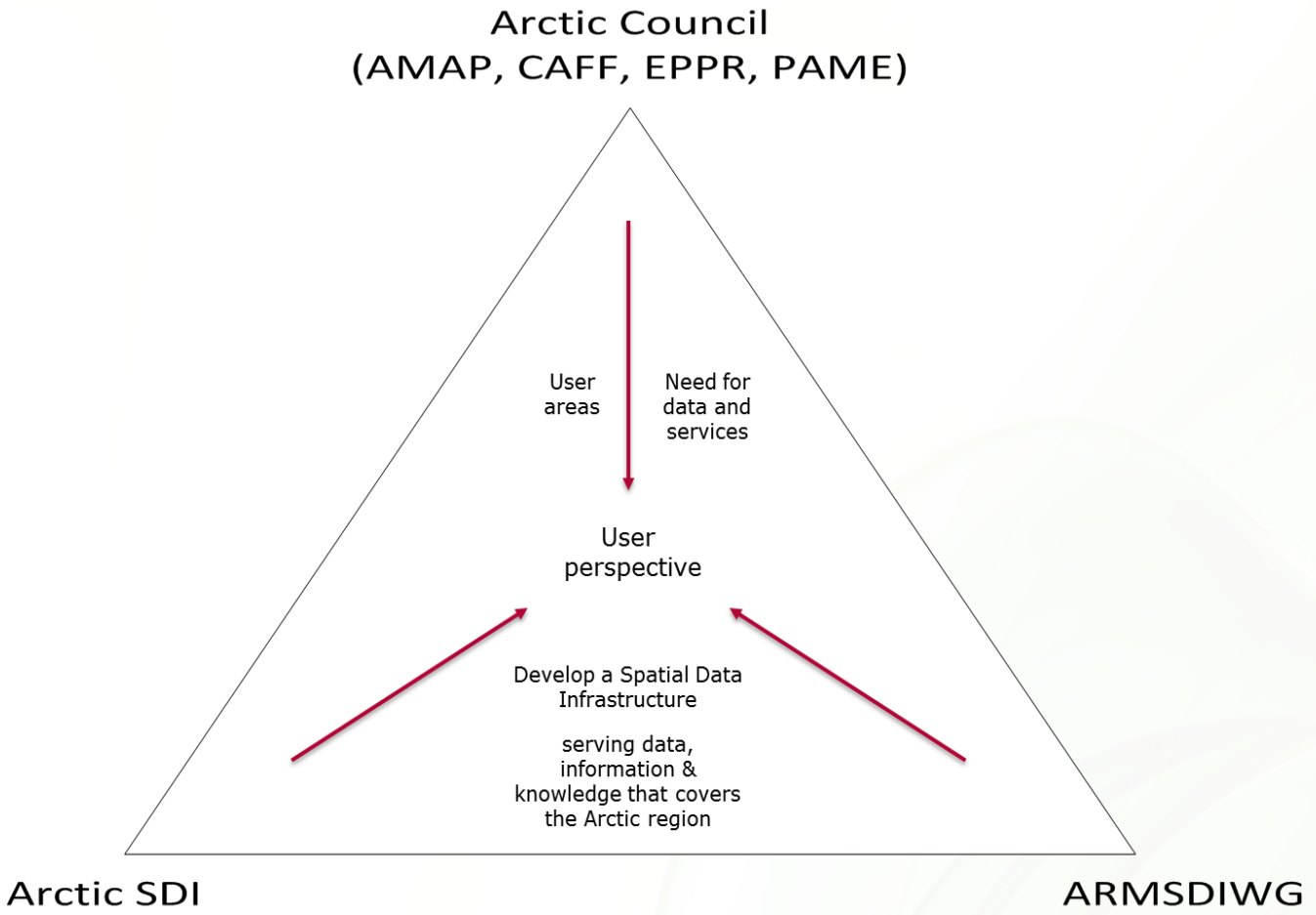
Arctic Shipping Best Practices Information Forum



ARHC identifying value content to support Arctic Voyage Planning & Chapter 11 of the Polar Code

- ice & weather
- chart information
- aids to navigation
- Ports indices
- Governance and authorities
- Etc…

Better data and services through improved cooperation



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Norwegian project

The project will prepare an overview, a guide and a plan **how to improve access to marine geospatial information for Arctic marine and ocean areas for Arctic Council WG's**, with Arctic Spatial Data Infrastructure (Arctic SDI) as a common platform for data sharing.

Improving cooperation between ARHC, Arctic SDI (representing the 8 Arctic national mapping agencies) and Arctic Council WG's AMAP, CAFF, EPPR and PAME