Arctic Ship Traffic Data

UPDATE AND NEXT STEPS

PAME-II 2019 meeting

Reykjavík, Iceland

www.astd.is

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Arctic Ship Traffic Data (ASTD)

- First comprehensive Arctic shipping activity database
- Detailed statistics on multiple aspects, including:
  - Ship emissions
  - Number of ships in the Arctic
  - Types of ships in the Arctic
  - Fuel use and consumption of fuel
  - Traffic in specific areas in the Arctic (EEZ's, LME's, Polar Code Area etc).
  - Number of ships in Arctic Ports
- **Download of data a crucial aspect**

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User Administration Status

- 16 applications have been approved to date
  - 11 from Arctic Council member states (4 from USA, 3 from Iceland, 3 from Norway and 1 from Kingdom of Denmark)
  - 3 from Observers (Republic of Korea, WWF, Germany)
  - 1 from a recognized research institute (National Geographic)
  - 1 from an accredited academic institution (University College London)
  - No application has been rejected
- In total, 68 people have been given access
  - (34 on Level 2 and 34 on level 3).
  - Some have never logged in, some have downloaded and used the data.
  - No application for level 1 data has been received.
- In addition, dozens of enquiries have been answered.

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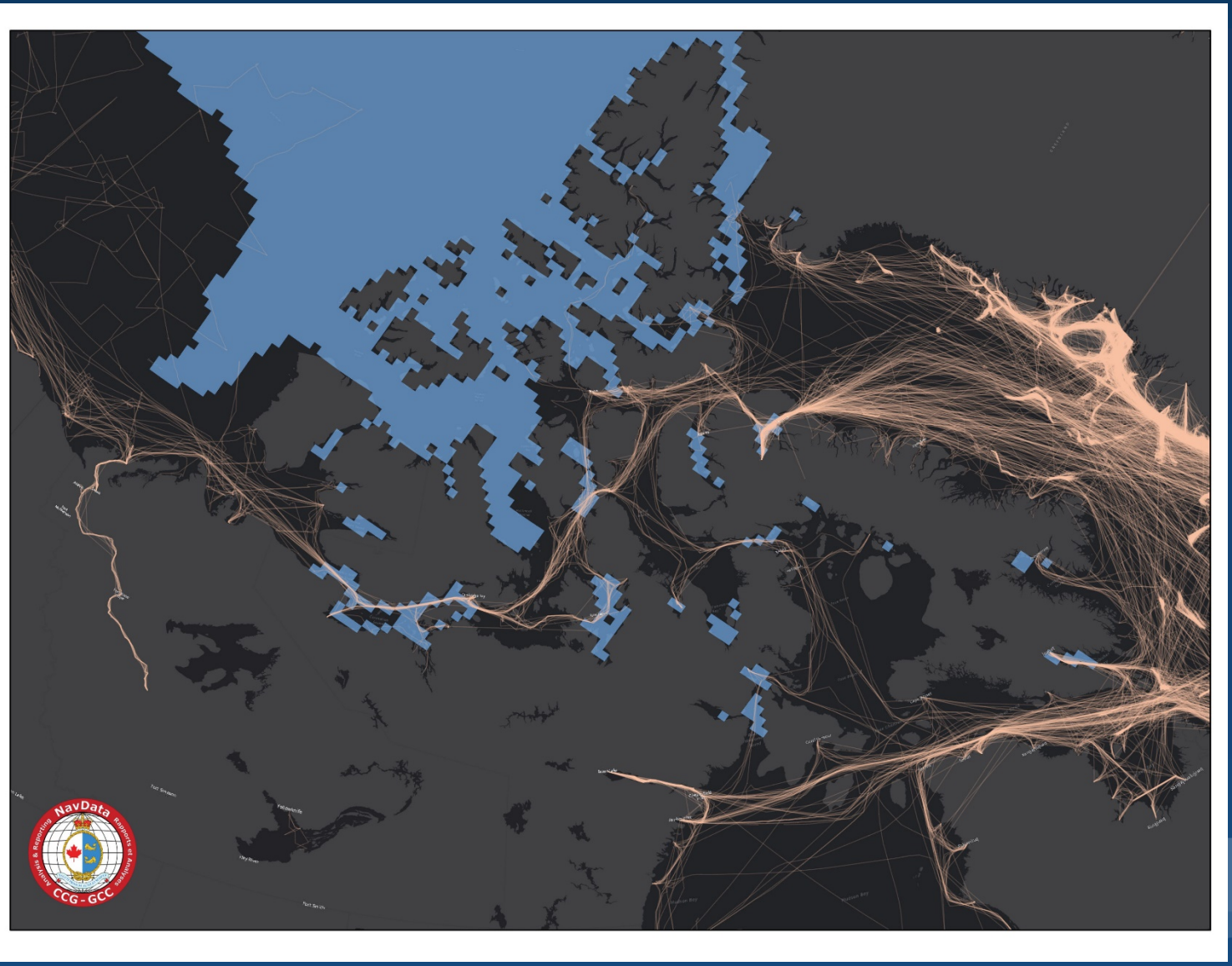
Traffic Patterns and Minimum Sea Ice Data - 2017



Source: S-AIS data from PAME – Arctic Ship Traffic Data. October 2018. Retrieved from ASTD.is
Minimum Sea Ice coverage: National Snow & Ice Data Center NOAA. Monthly Sea Ice Extent. September 2017.

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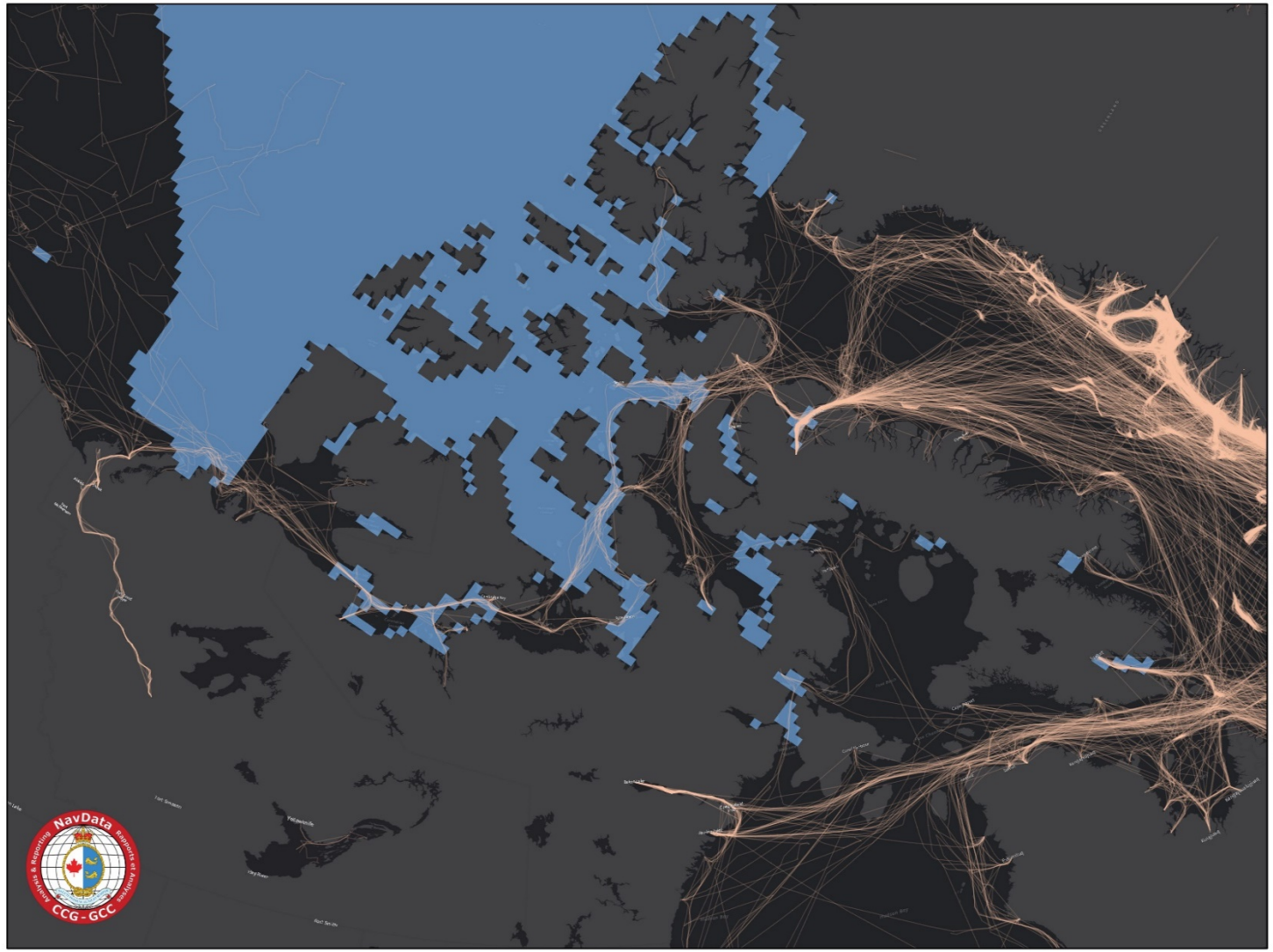
Traffic Patterns and Minimum Sea Ice Data – 2018



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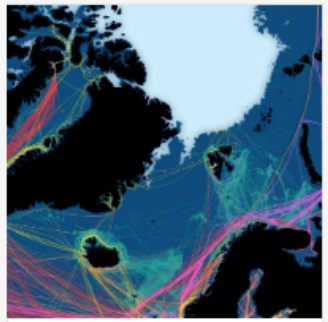
MAGAZINE

SEPTEMBER 2019 ISSUE

THE ARCTIC IS HEATING UP

North of the Arctic Circle, our planet is covered by an implacable frozen mass—a sea, as it turns out—that humans have long struggled to explore, understand, and ultimately subdue. From our pursuit of the Arctic's unique animals to our attempts to sail its icy passages to our obsessive quest to reach its desolate pole, we have found the Arctic irresistible and unyielding. Until now. Scientists say that by the middle of this century, rising temperatures could strip away the Arctic's fortress-like ice each summer, unlocking resources and shipping lanes while increasing political tensions, affecting people and animals, and potentially speeding up climate change. We sent writers and photographers to document how this enigmatic region is changing, who and what will feel the impact, and why it matters.



The melting Arctic is now open for business

EXPLORE

A thawing Arctic is heating up a new Cold War

READ

See which nations are claiming parts of the melting Arctic

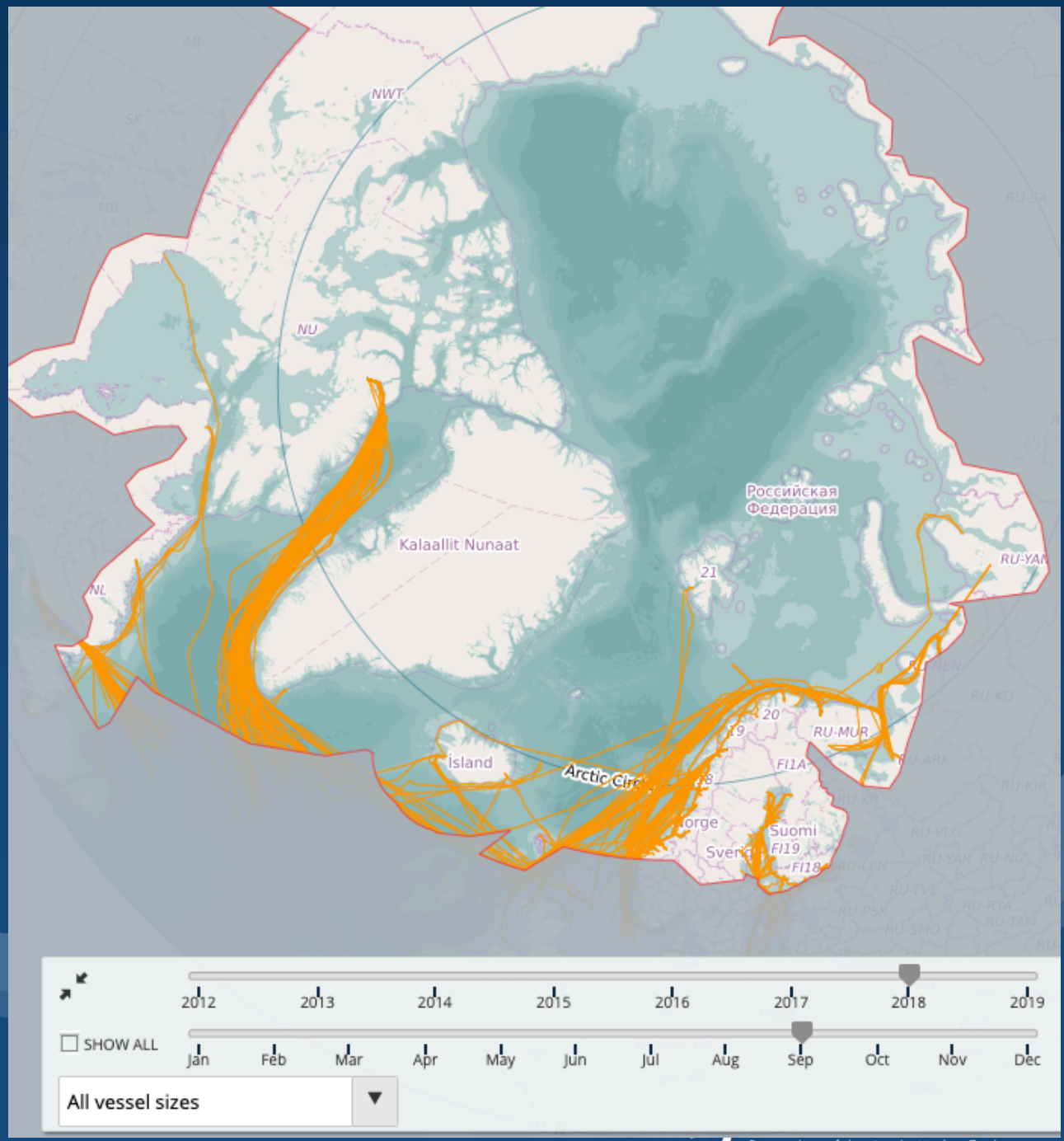
EXPLORE

AS ARCTIC WATERS BECOME RELIABLY OPEN, MORE SHIPS ARE VENTURING OUT ON NEW ROUTES

Russia's Yamal Peninsula is thought to have the world's largest natural gas reserves. Ten ice-breaking tankers are exporting Russian gas to Europe and Asia, with five more under construction.

A French icebreaker cruise ship is aiming for the North Pole by 2021, and dozens of ships intended for polar cruises are scheduled to launch by 2023.

Bulk carriers transport materials from northern mines, such as zinc from Alaska's Red Dog mine and iron ore from Canada's Mary River Mine. Currently only accessible in summer, the ports serving these mines could be more active for longer periods as sea ice declines.



ASTD in PAME's 2019-2021 Work Plan

- ”To further augment and refine the information contained in the ASTD as well as enhance its analytical and report generating capabilities. The ASTD was publicly launched on 7 February 2019 and the project will continue to strengthen and debug the database in response to empirical experience and user feedback.”
- *Leads: USA, Norway, PAME Secretariat*

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Today and next steps

- All required functionality to track ship activity and changes in the ship activity level in the Arctic has been established according to the project description and specification.
- Regular air emission data from ships sailing in the Arctic is included in ASTD (not accidental spill emissions)
- ASTD has great potential for incorporating additional functionality into the system
  - Such functionality is proposed to be included in 2020, when the system has been tried and tested and “de-bugged”
  - This presentation outlines the first ideas for possible new functionality that is possible to incorporate in ASTD

Proposed new functionalities - Possibilities

- All ASTD agree upon system capabilities have been delivered, users established and a capability management process for future capabilities established.
    - Marine litter component
    - Daily Sea Ice maps
    - Environmental and resource layers (advisory group would be formed, e.g from other AC Working Groups and Observers)
    - Spill and accident capability

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New #1: Marine litter component

- Each country to insert yearly information on coastline clean-ups
- Easy to insert information, including coastline area information
  - Amount of litter, type, etc. Will show what countries are doing to clean up marine litter
- Easy to make maps to show how we are cleaning up the Arctic
  - Including a time-series of clean-up
- **Next step:** SEG/PAME Secretariat to introduce to marine litter expert group for input.

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New #2: Sea Ice maps

- Consider if it is possible to set up a service with daily sea ice maps available for download, including indication of one year and multiple year sea ice if such information is readily available.
- A free historic sea ice service is widely sought after by industry, scientists, researchers and university students etc.
- **Next step:** ASTD expert group to look into sea ice map information sources (e.g. NSIDC, IIP, NOAA, Norwegian Polar Institute etc.) and report to SEG/PAME

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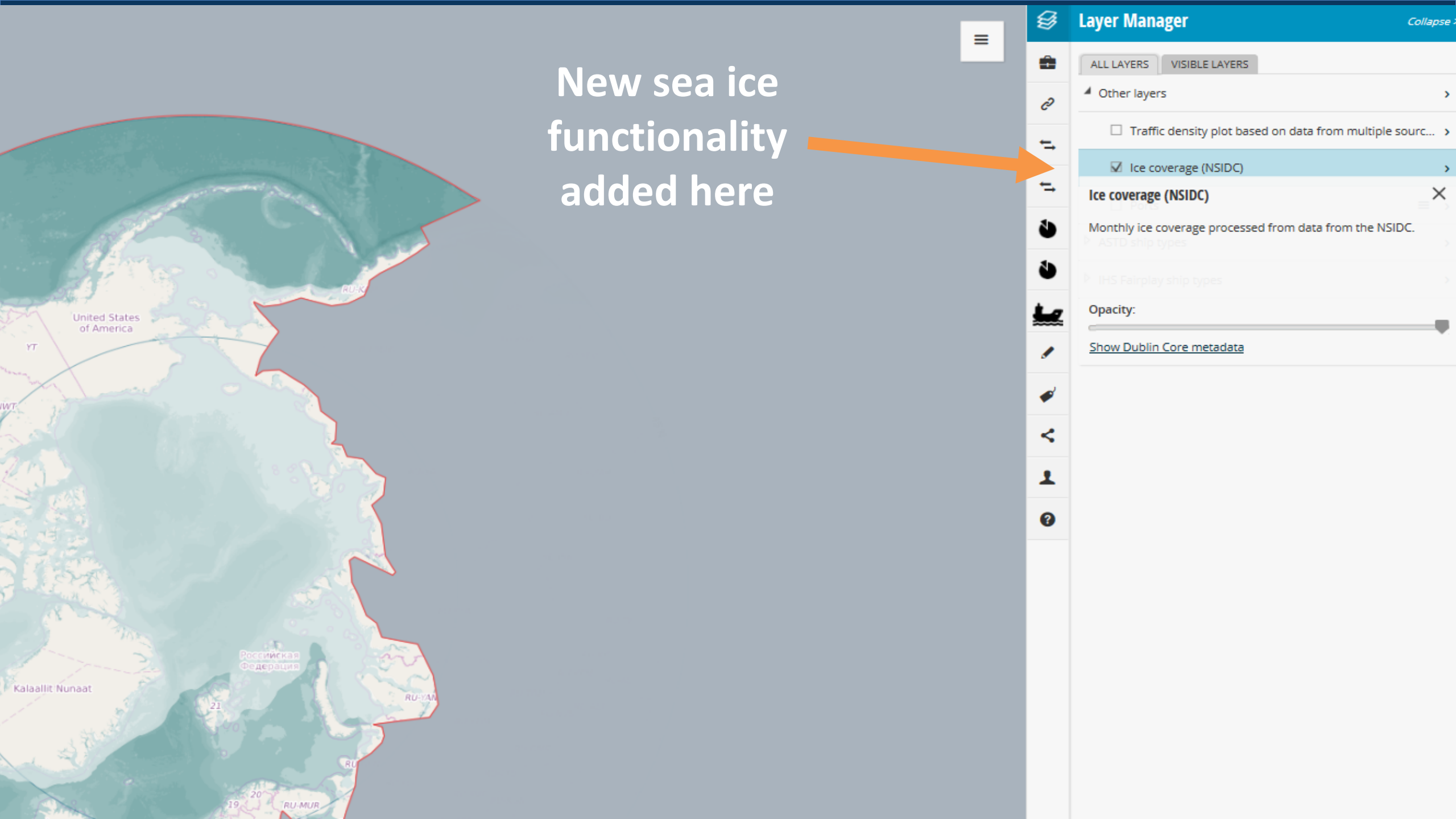
New sea ice functionality added here
Layer Manager
Collapse
ALL LAYERS
VISIBLE LAYERS
Other layers
Traffic density plot based on data from multiple sourc...
Ice coverage (NSIDC)
Ice coverage (NSIDC)
Monthly ice coverage processed from data from the NSIDC.
ASTD ship types
IHS Fairplay ship types
Opacity:
Show Dublin Core metadata
United States of America
Российская Федерация
Kalaallit Nunaat
RU-MUR

New #3: Environmental and resource layers

- It is proposed to establish an expert group that propose layers to be presented in ASTD.
  - The layers should be chosen on the basis of important and vital information for Arctic understanding.
  - It is important not to overflow the system with information as it will make the system complicated and difficult to use.
- Add additional layers with important Arctic environment and human footprint information:
  - Monthly environmental values and distribution (fish, birds etc)
  - Natural environment
    - Marine habitat types
    - Marine conservation plan
    - Currents
    - Sea Ice
    - Coral reefs
    - Particular valuable areas
- Valuable areas for humans and industry
  - Oil fields
  - Mining
  - Fishing banks

PAME Projects
- Marine litter
- REDEG

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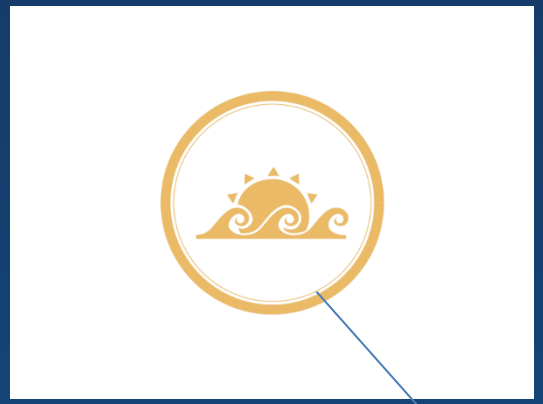
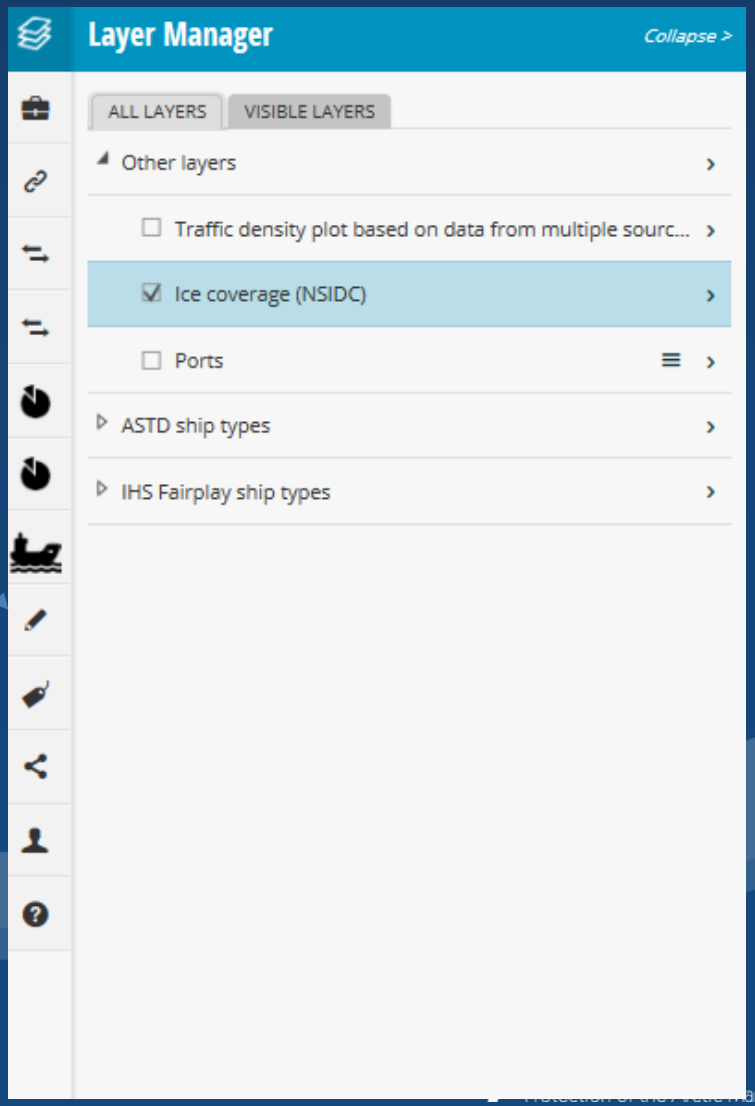
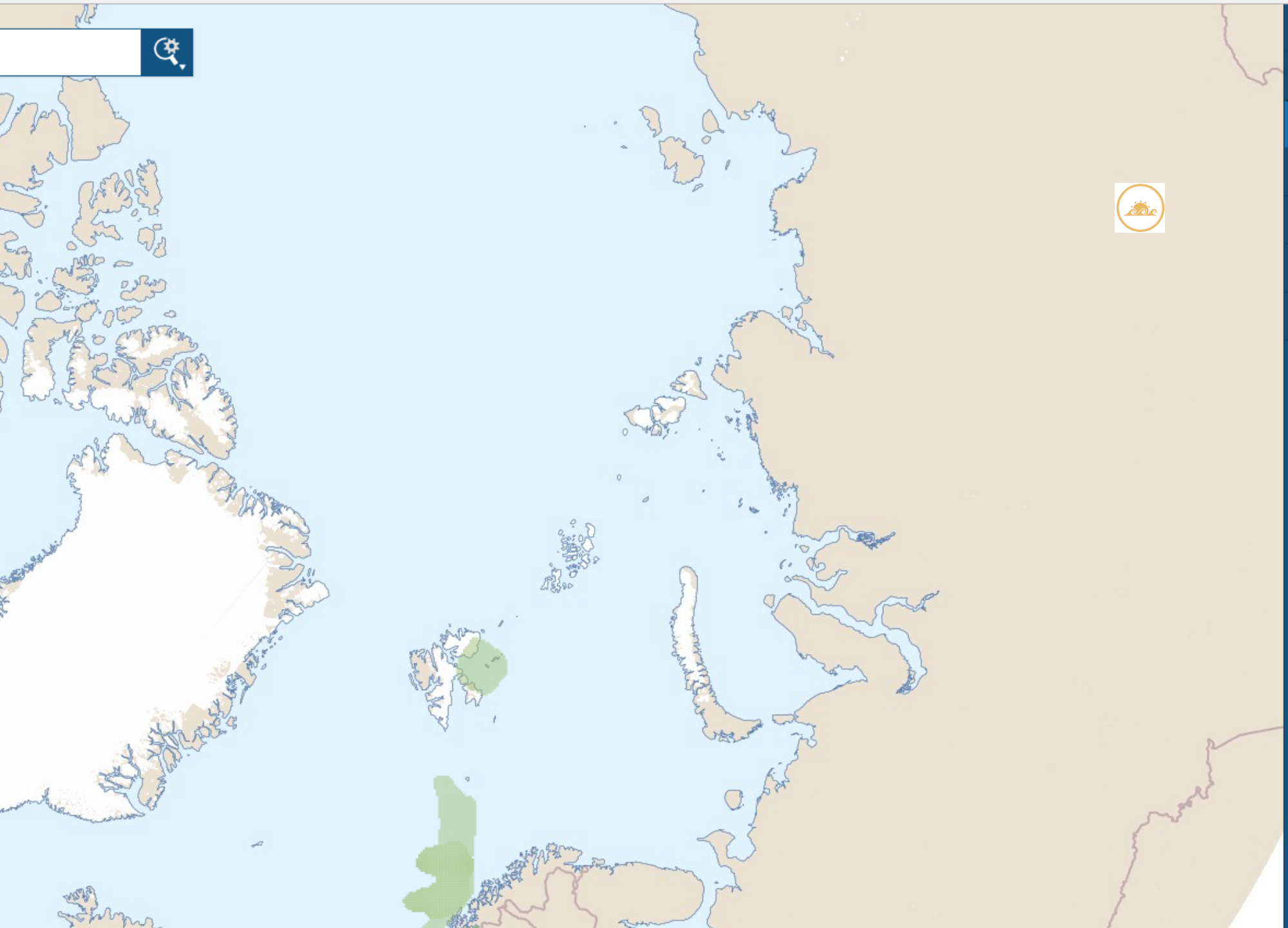
Proposed Environmental and resource layers

- New environmental layer icon inserted in the ASTD menu.
- Expandable classes of information with underplaying information layers.
- It will be possible to combine layers under this icon with ship traffic and sea ice etc.
- Possibility to download data layers should be included.







Layer Manager

ALL LAYERS | SORT LAYERS

- Reference data
- Plans and regulations
- Commercial activities
- State of the environment
  - Cumulative effects of human activities
  - Environmental value
    - Fish environmental value
    - Environmental value nature
    - Environmental value mammals
    - Environmental value bird
- Distribution of natural resources
- Marine basisdata
- Basemap
- Tema i prosess

Sources of environmental and resource data

- PAME projects
  - Marine litter
  - REDEG (oil and gas maps)
  - Tourism project
  - CASA
  - Others
- Other Arctic Council data for now
  - Other Working Groups
  - PP's
  - Observers
- National and other data added later

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New #4: Accidents and spill data

- Each Arctic state register accidents and spills into a registration window in ASTD.
- Accidents and spills will be available as a separate monthly layer in the ASTD system for download and viewing.
- Data and statistics will be available as monthly datasets or aggregated for the entire year.
- With time this dataset will become a long time series to be used to investigate trends and changes in spills and accidents in the arctic.
- It will become an important dataset for analyzing possible risk reduction measures and for possible transboundary safety and accident response corporation in the Arctic.

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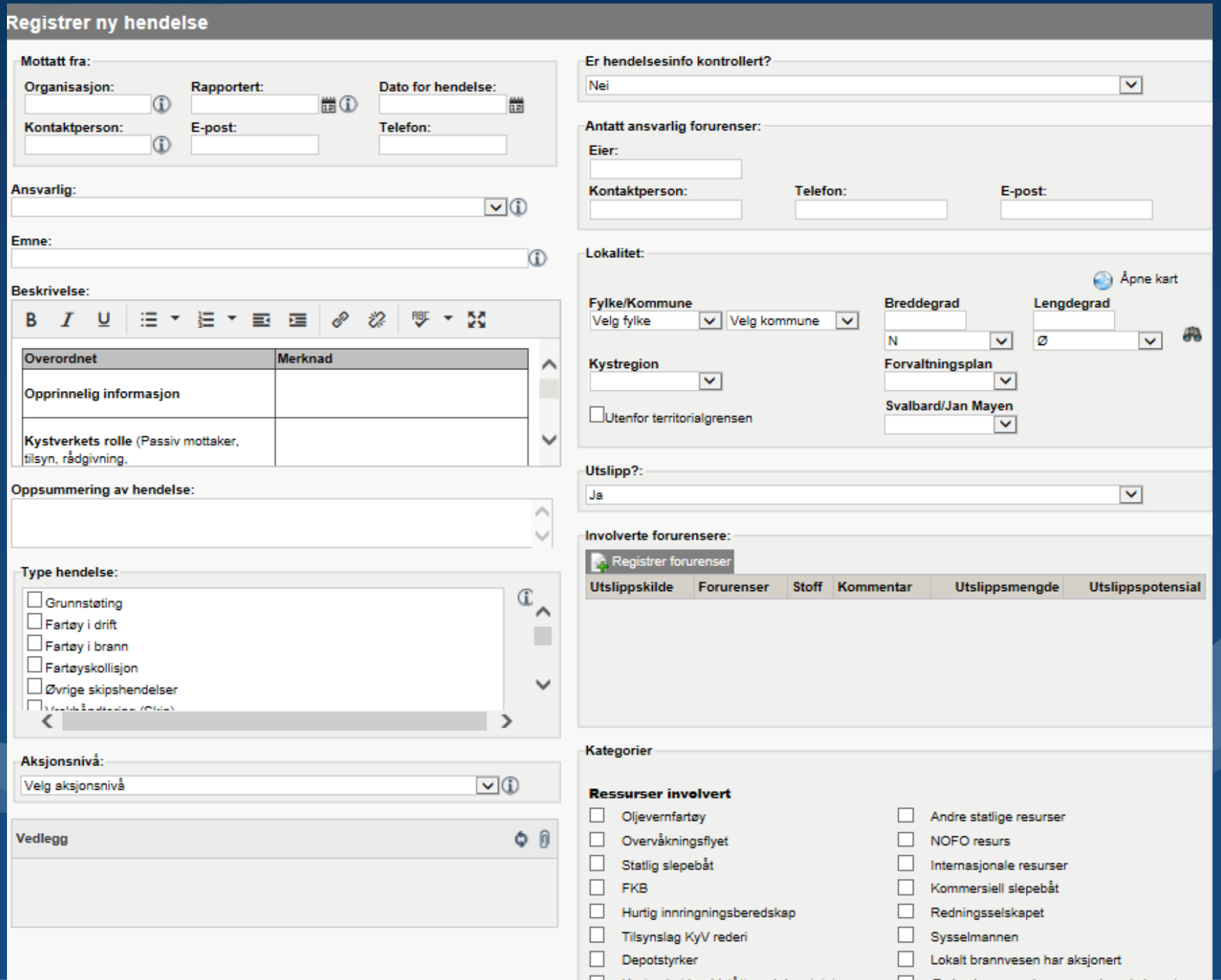
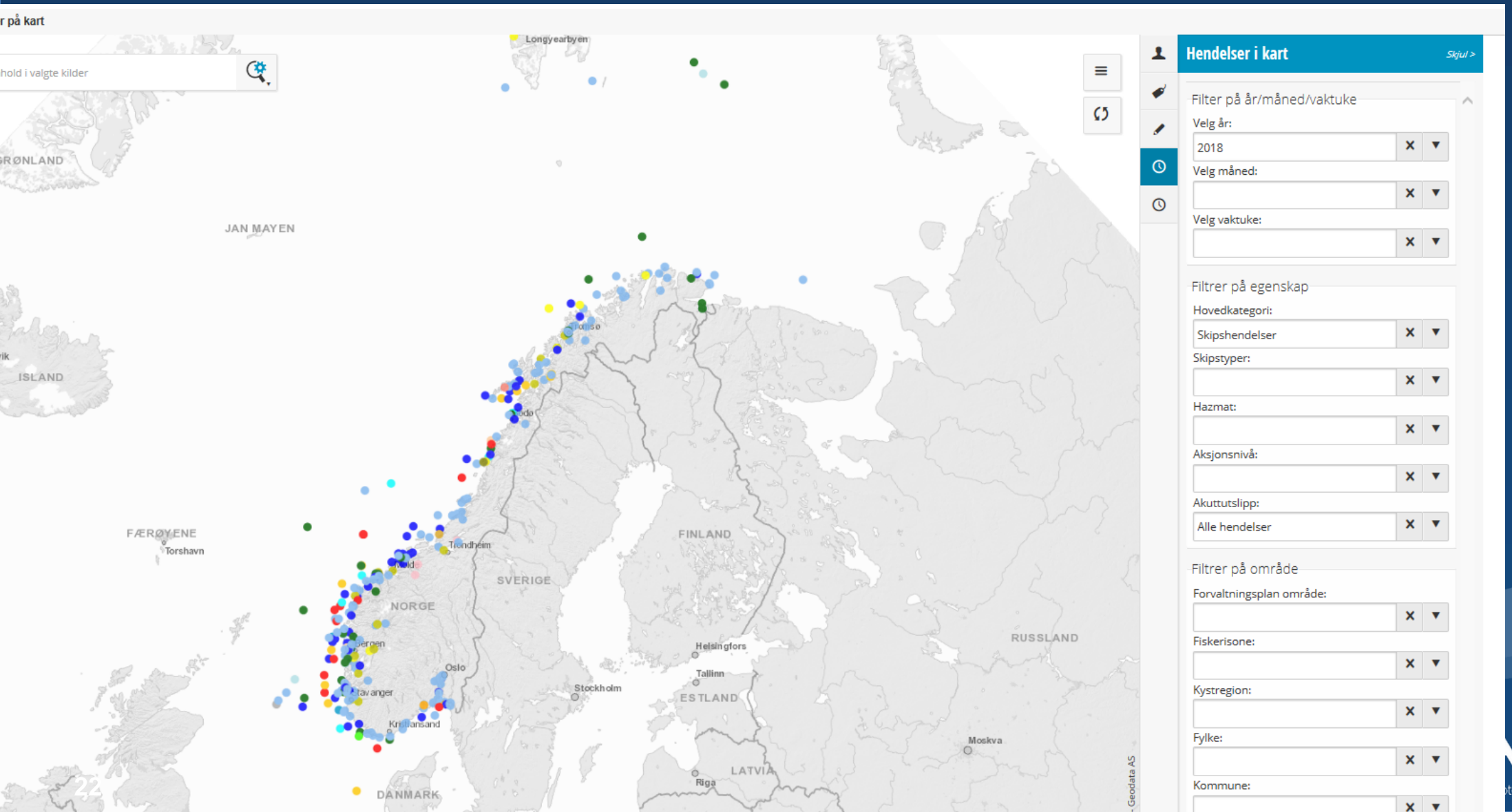
Online accident registration scheme proposed to be developed by an expert group. Cooperation with EPPR?



Accidents and spills

- Registration window with registration of:
  - Geographic coordinates (by clicking in the map or registering coordinates)
  - Accident type (grounding, collision, fire explosion etc – list of Accident types to be agreed)
  - Spill volume
  - Substance spilled (drag down substance list – spill type list to be agreed)
  - Spill source (ship, oilrig, landbased etc)

Accidents on map illustration. Possible to zoom inn. Her showing all ship accidents (with and without spills) in 2018 in Norwegian EEZ. Dynamic filtering options on the right. Data download possible.



Filter:
Choose year
Chose month
Chose week

Filter:
Accident category
Ship type
Hazmat
Acute spill (Y/N)

Filter on Area
Area filters

Cooperative agreement

- Article 6 - Paragraph 6.2:
  - *REVIEW: The Participants intend to review this ASTD Framework at each PAME Working Group annual fall meeting (PAME-II), or at any other occasion as decided by consensus of the Participants.*
- Recommendation to agree to do this review at PAME-I 2020
  - RoD?

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Thank you!

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