



# User Guide

September 2024

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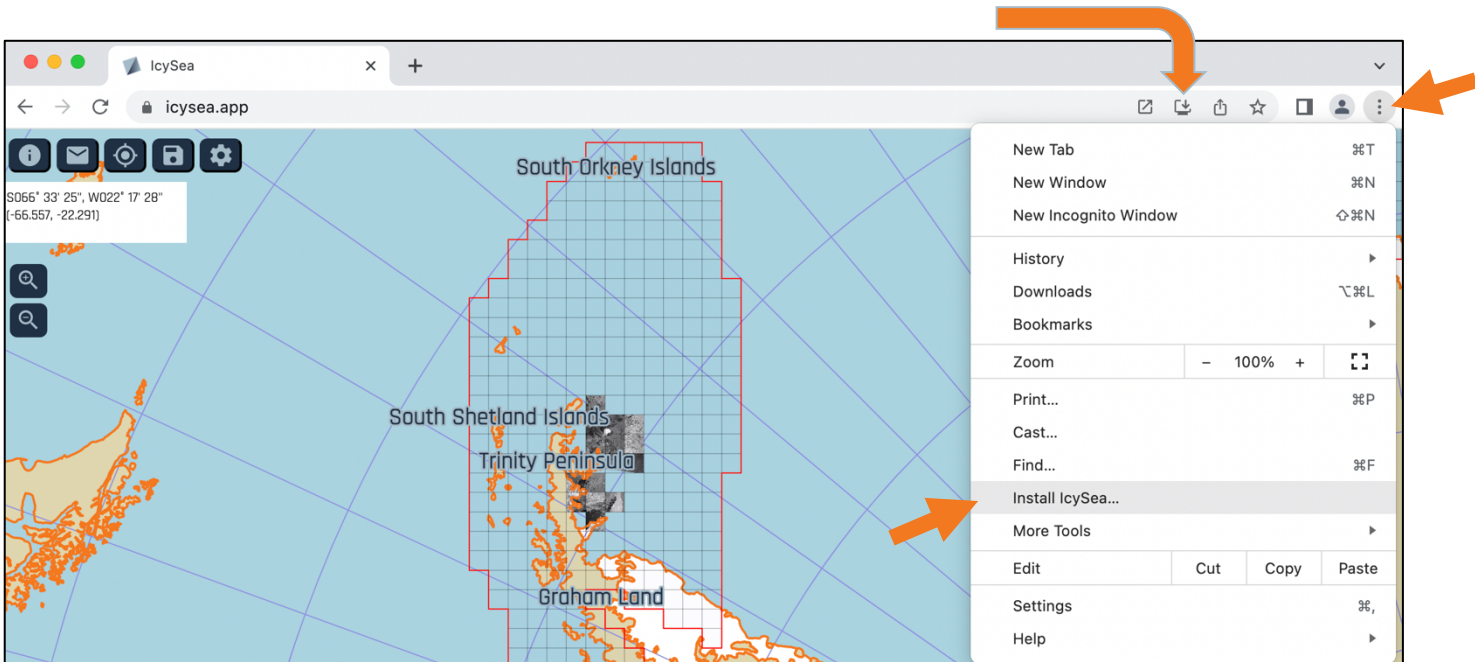
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## Installation

- Access IcySea via <https://icysea.app> in your preferred browser (we recommend CHROME or EDGE)
- After registration install IcySea as a 'Standalone App' on your device (see image below)
  - either click the 'Install' symbol in the browser bar
  - or click on the vertical dots and select 'Install IcySea...'



## Buttons



Get more information **about IcySea** and **check for Updates**



Get in **contact** with the Drift+Noise team for feedback or support



Show your current **GPS position** in IcySea



**Export** your data from IcySea



Open '**Settings**' menu:

- *Switch between Arctic and Antarctic*
- *Manage your subscription*
- *Select source for GPS position*



Rotate the map to **North**



Data layer **guidelines** and **interpretation help**



**Refresh** data layer (get latest updates)



Check **age of satellite image** tiles (Radar and Optical images)



**Delete** outdate image tiles (Radar and Optical images)



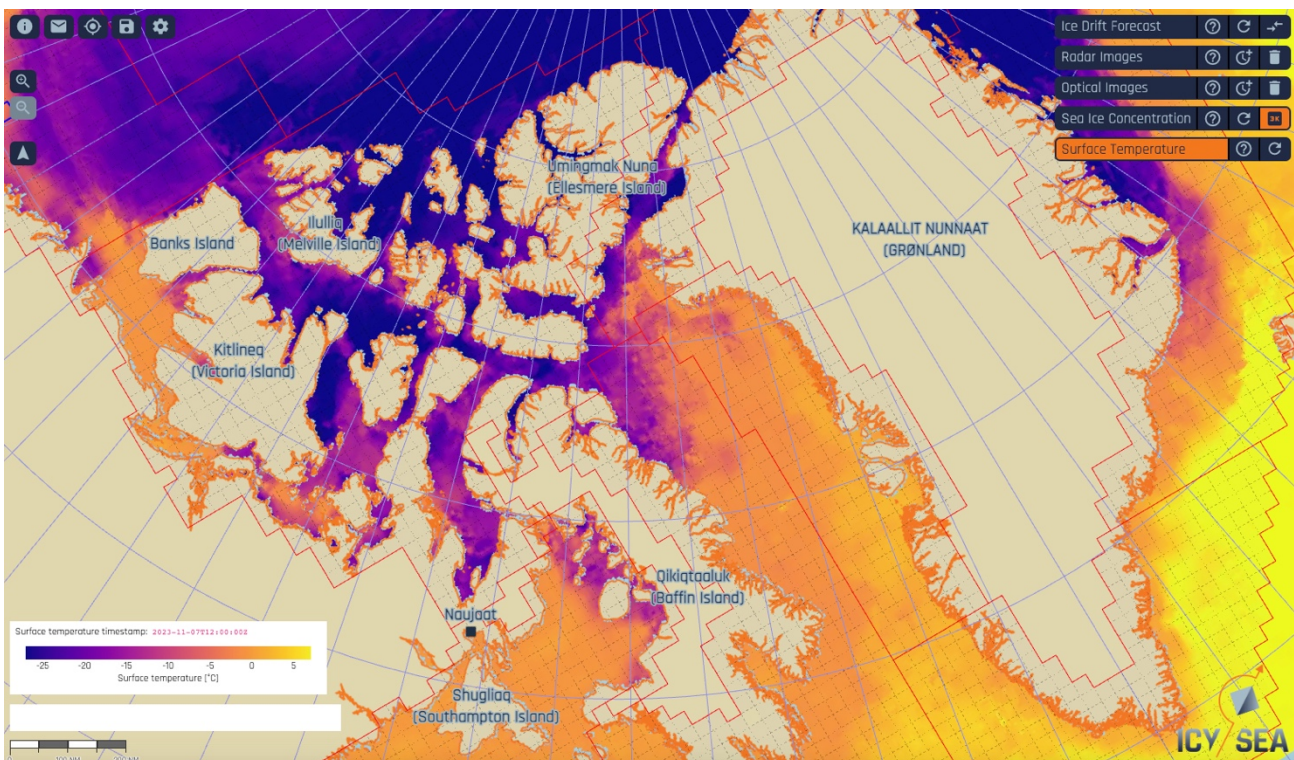
Select **sea ice concentration** layer with **3.125 km resolution**

## Data Layer: Surface Temperature

- Low resolution data layer for strategic planning purposes
- Shows temperature of the ice or ocean surface and complements other layers

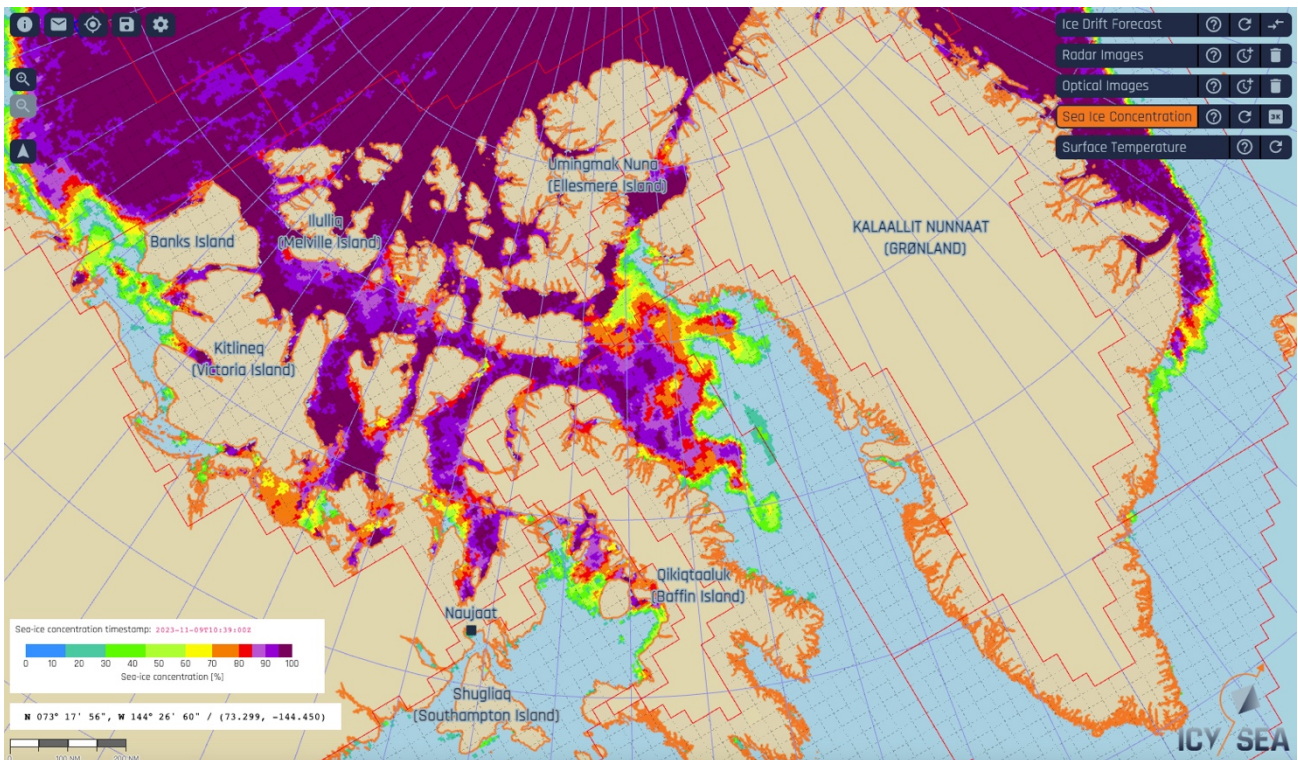
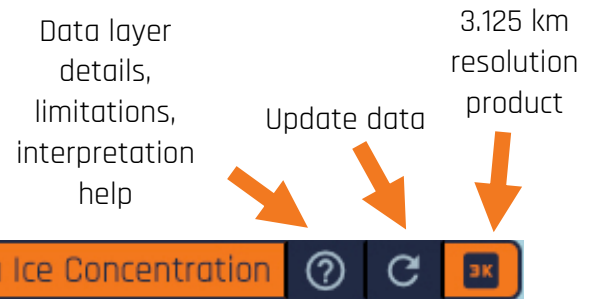
- **Resolution:** 0.05 x 0.05°
- **Coverage:** Arctic
- **Updates:** daily - **manually**
- **Limitations:**
  - only available in the Arctic
  - > **use sea ice concentration data for reference**

Data layer details, limitations, interpretation help      Update data



## Data Layer: Sea Ice Concentration

- Low resolution data layer for strategic planning purposes
- Shows how much of an area is covered with ice (%)
  - **Resolution:** available with 6.25 (default) and 3.125 km resolution
  - **Coverage:** Arctic and Antarctic
  - **Updates:** up to 8 times per day - **manually**
  - **Limitations:**
    - *Coastal Bias:* Ice is indicated close to land, even if there is no ice
    - *10% Rule:* Areas covered with 10% or less sea ice are shown as 'no-ice' areas
- > **use satellite data for reference**



## Data Layer: Official Ice Charts

- Ice charts provide official sea ice information following WMO and IMO Polar Code protocols.
- They are analysed and quality controlled by sea ice experts from the national ice services
- Data layers available via the ice charts: sea ice concentration, stage of development, POLARIS risk index
- Current data sources:

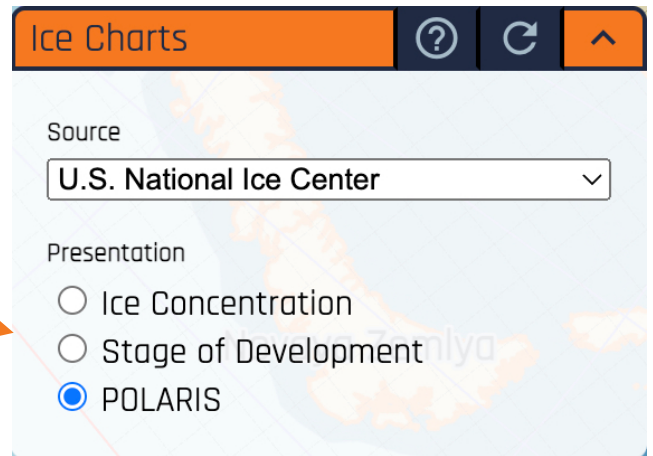
- **US National Ice Center (USNIC):** Arctic-wide, Ross Sea (Antarctica), weekly
- **Danish Meteorological Institute (DMI):** Greenland, every 1-3 days
- **US National Weather Service (NWS):** Alaska, daily
- **Canadian Ice Service (CIS):** Canadian Waters, weekly

Data layer details, limitations, interpretation help

Update data

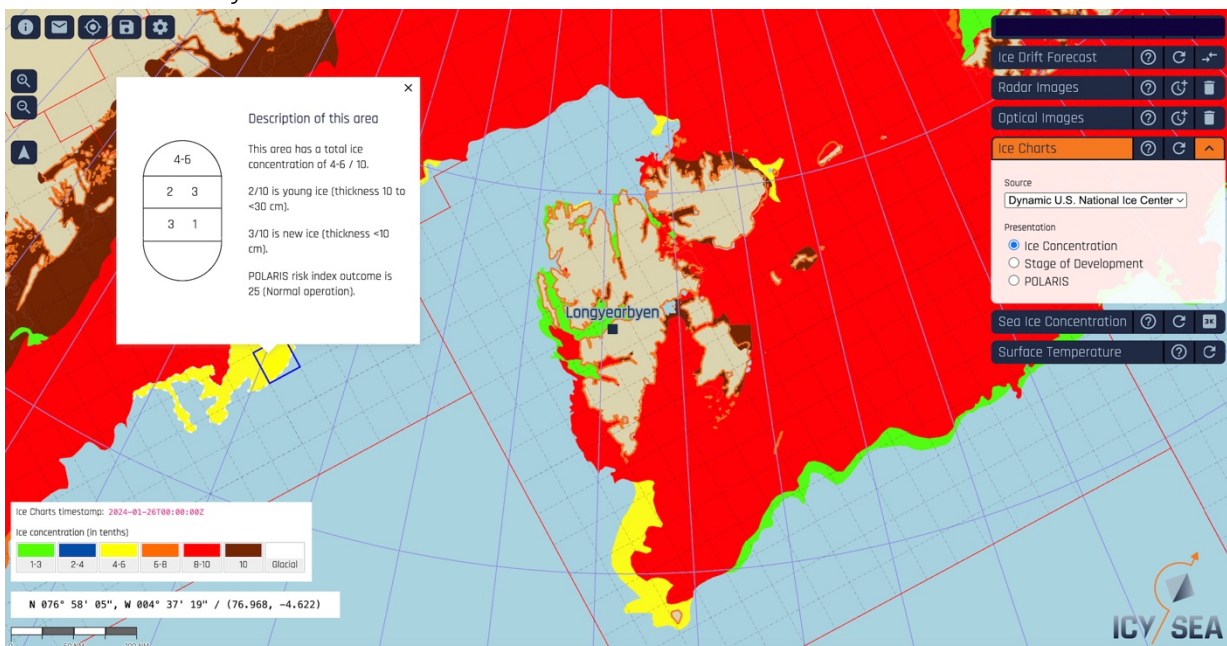
Select preferred data source

Select relevant data layer

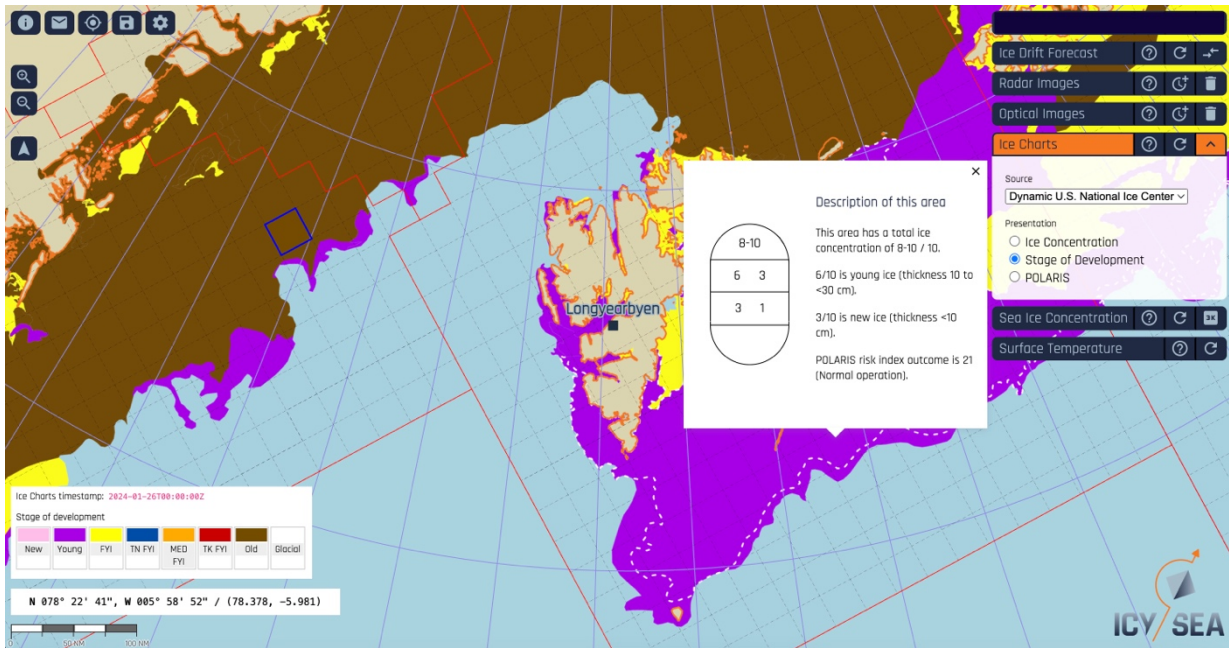


- '**LEFT CLICK**' on a polygon to receive additional information via the official **Egg Code**

Sea ice concentration layer:



Stage of development layer:



## POLARIS Risk Index Outcome (RIO)

- Customize the POLARIS risk index layer by providing the characteristic ice class for your ship via the 'Settings/Ship Properties' menu:



### Ship properties

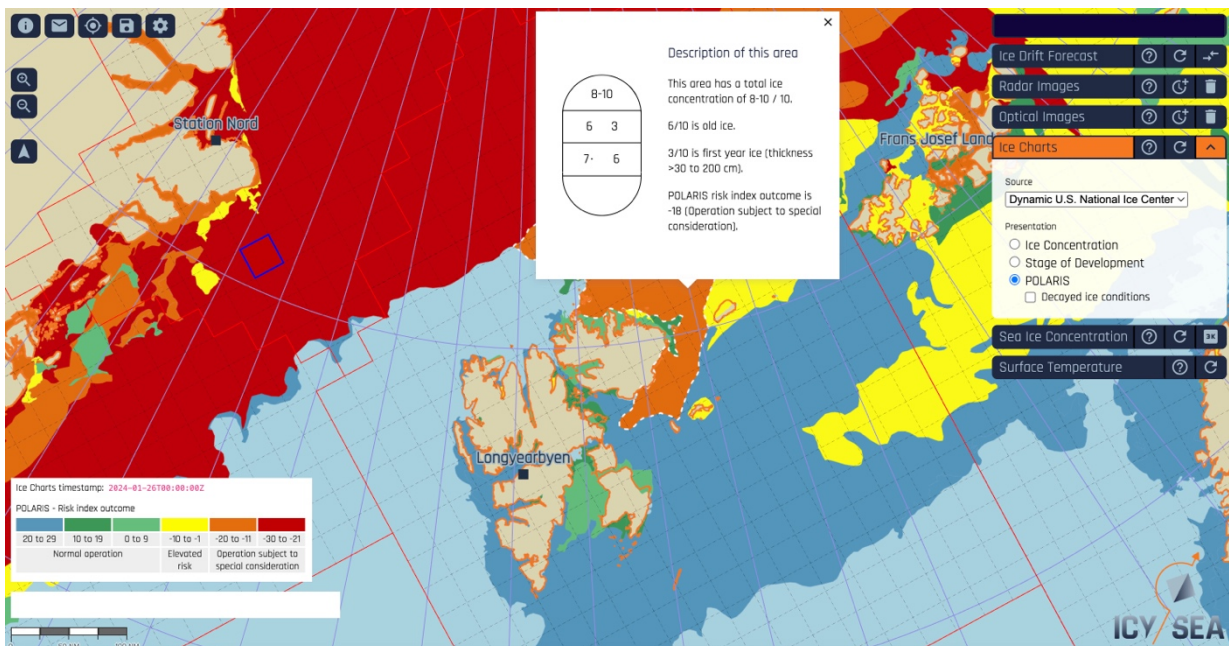
#### Ice class

Please select the ice class of your vessel to automatically calculate POLARIS risk index outcome in the ice charts layer.

PC3: Year-round operation in second-year ice, which may include multi-year ice inclusions. ▾

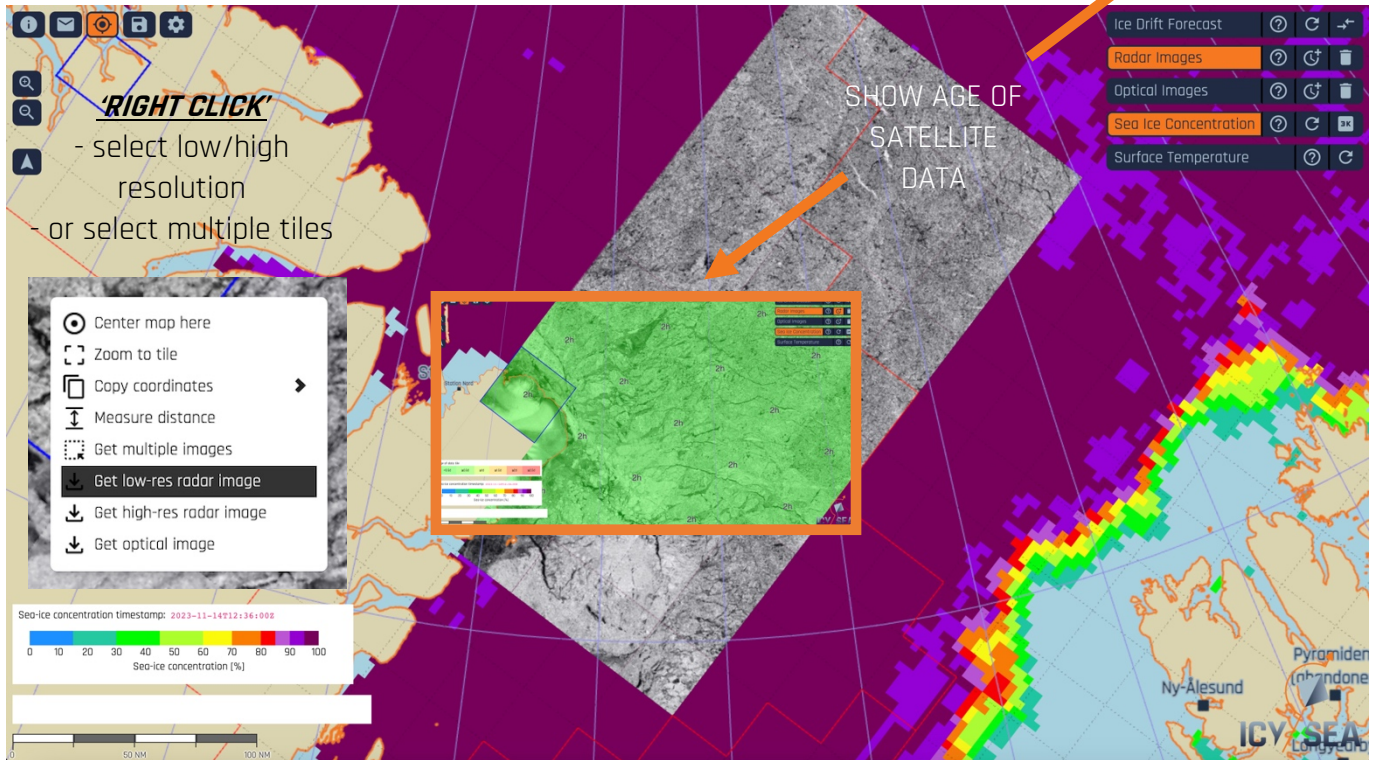


Select your ship's ice class



## Data Layer: Satellite Radar Images

- Radar satellite images are able to show individual ice feature, floes and open water areas
  - Radar images in IcySea are a merged product using Sentinel-1 (ESA) and RCM (CSA) imagery
  - Radar images are available 1-2 hours after satellite recording
  - Images **NEVER SHOW CLOUDS**
    - **Resolution:** high (30 meter), low (300 meter)
    - **Coverage:** Arctic and Antarctic
    - **Updates:** every 1 - 5 days - **manually**
    - **Limitations:**
      - *Interpretation:* different grey scales can be confusing
      - *Data coverage:* depending on where you are images are taken every 1 to 5 days, RCM covers the Arctic every day
- > **use optical satellite data for reference**



- Please contact us at [support@driftnoise.com](mailto:support@driftnoise.com) for radar image interpretation help

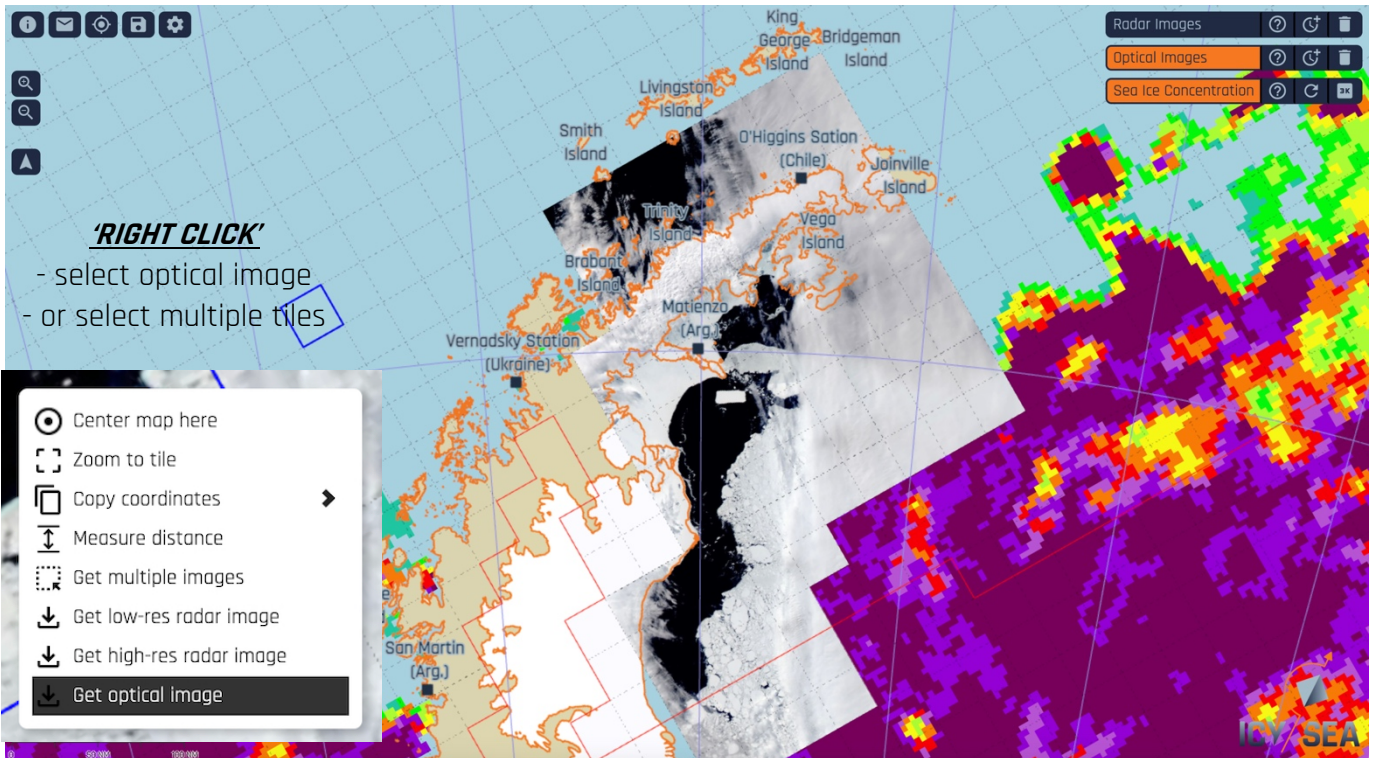


## Data Layer: Satellite Optical Images

- Low resolution optical satellite images (NASA) are able to show individual ice features, floes and open water in cloud-free conditions

- **Resolution:** 250 meter
  - **Coverage:** Arctic and Antarctic
  - **Updates:** daily - **manually**
  - **Limitations:**
    - *Clouds:* when your area of interest is covered by clouds, ice won't be visible
    - *Night:* in darkness (e.g. polar night) the surface is not visible
- > **use radar data for reference**

Data layer details, limitations, interpretation help      SHOW AGE OF SATELLITE DATA      Delete data

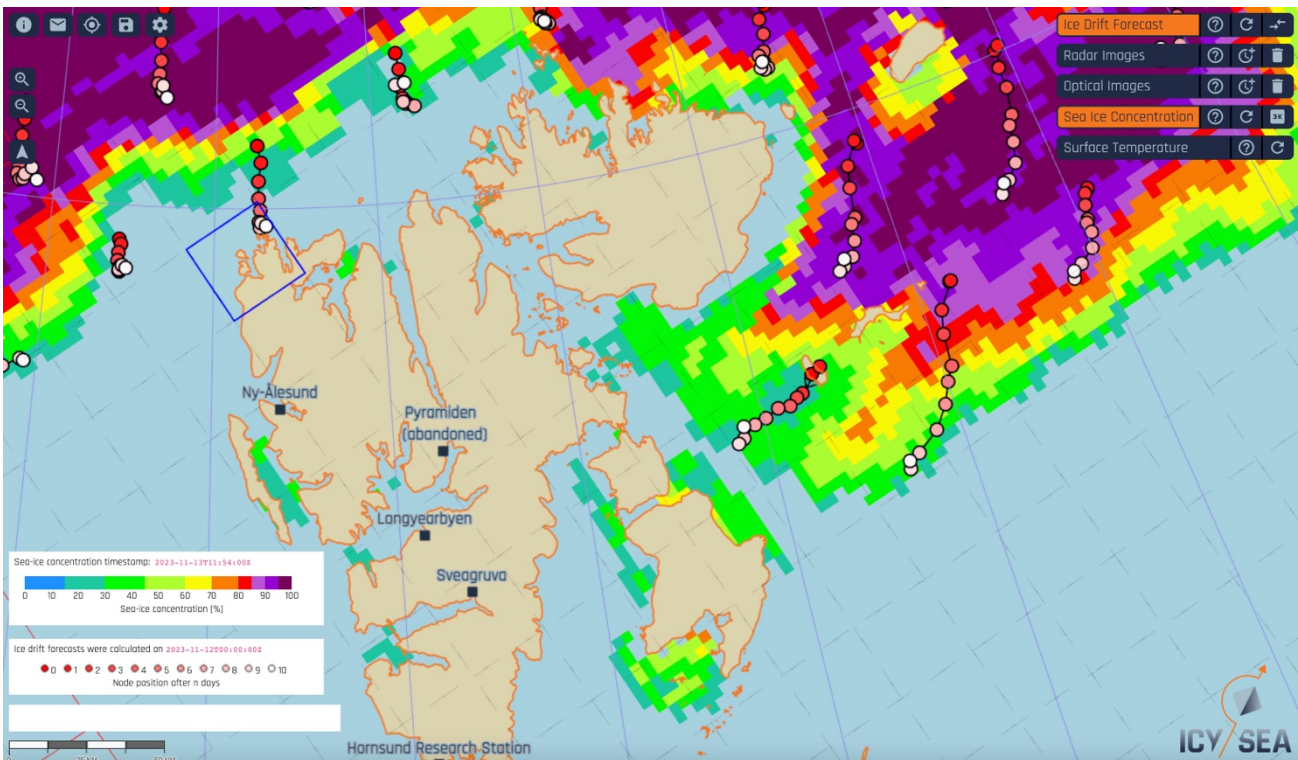


## Data Layer: Sea Ice Drift Forecast

- Predicted pathways of an imaginary ice floe over the next days
- Each dot shows where ice is predicted to be in 1, 2, 3, 4,..., 10 days
- Distance between two points gives the predicted drift over one day
  - **Resolution:** distance between dots shows drift over one day
  - **Coverage:** Arctic-wide
  - **Updates:** daily - **manually**
  - **Limitations:**
    - *Model uncertainties:* model forecasts come with uncertainty, the longer into the future the ice drift prediction the larger the uncertainty
- > **update daily to confirm predictions**

Data layer details, limitations, interpretation help

Update data



## Data Layer: Classified Optical Image

- Experimental data set from ongoing research
- Automatically classified sea ice types from optical image (Sentinel-3)
- Add data layer/button via 'Settings' menu:




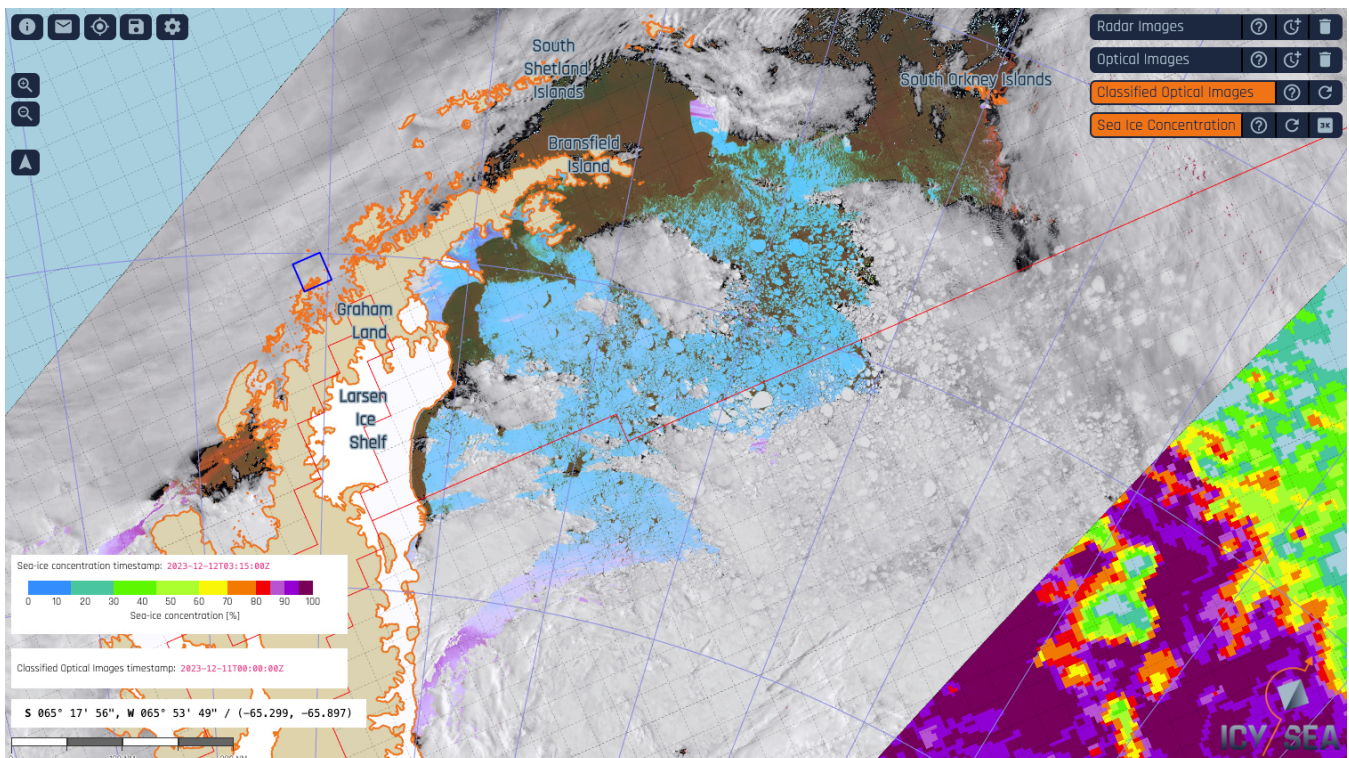
### New data products

- Show new data products which are not yet operational, i.e. which are not yet updated regularly.

- **Resolution:** 450 meter
- **Coverage:** Antarctic Peninsula
- **Updates:** daily - **manually**
- **Limitations:**
  - *Ongoing research:* images are classified automatically, still being validated
  - *Clouds:* when your area of interest is covered by clouds, ice won't be visible
  - > **use radar images for reference**

Data layer details,  
**Classification Legend**

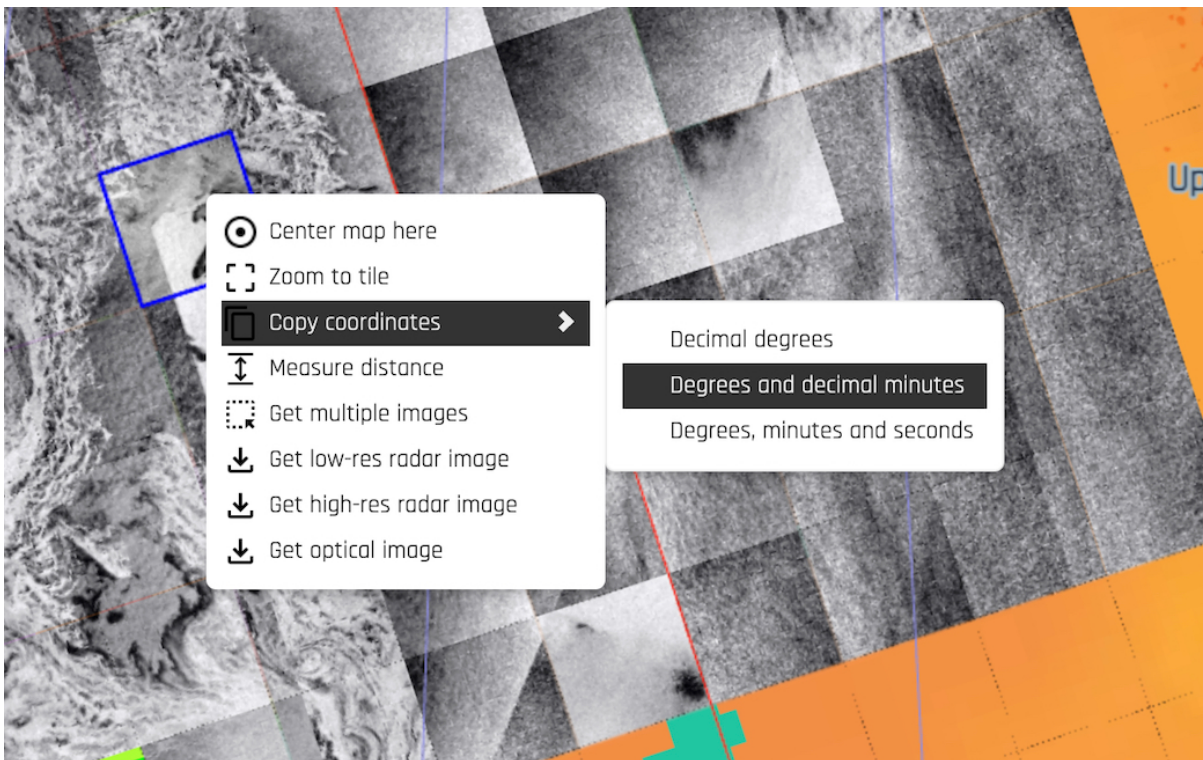
Update data

## Functions: Adjust Map and Positioning

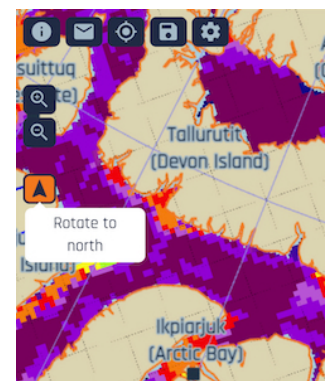
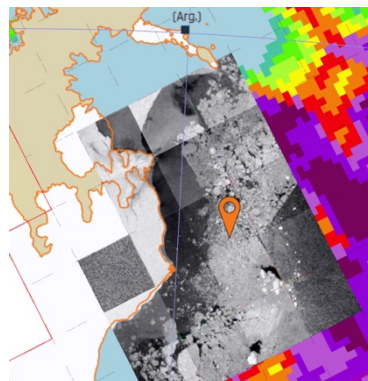
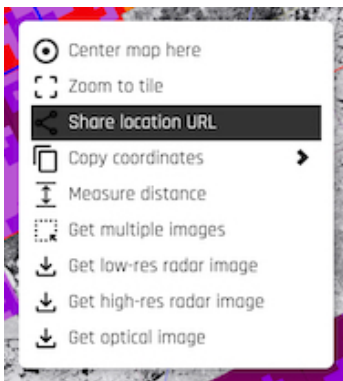
**'RIGHT CLICK'** to open the **'Dropdown Menu'**:

- **'Center Map'**: - centers map around point of the **'RIGHT CLICK'**
- **'Zoom to Tile'**: - zooms into the selected tile
- **'Copy Coordinates'**: - copy coordinates from the point of **'RIGHT CLICK'**  
- paste coordinates wherever you need them



Select **'Share location URL'** to share an exact location with another user:

**'Rotate Map to North'**:



**'User Position':** displays your current position in IcySea:

- open 'Settings' menu and select the source for your GPS Position
  - 'Location Services' for mobile devices (phones and tablets)
  - External GNSS sensor when using a plug-in GPS sensor or the ship's GPS:

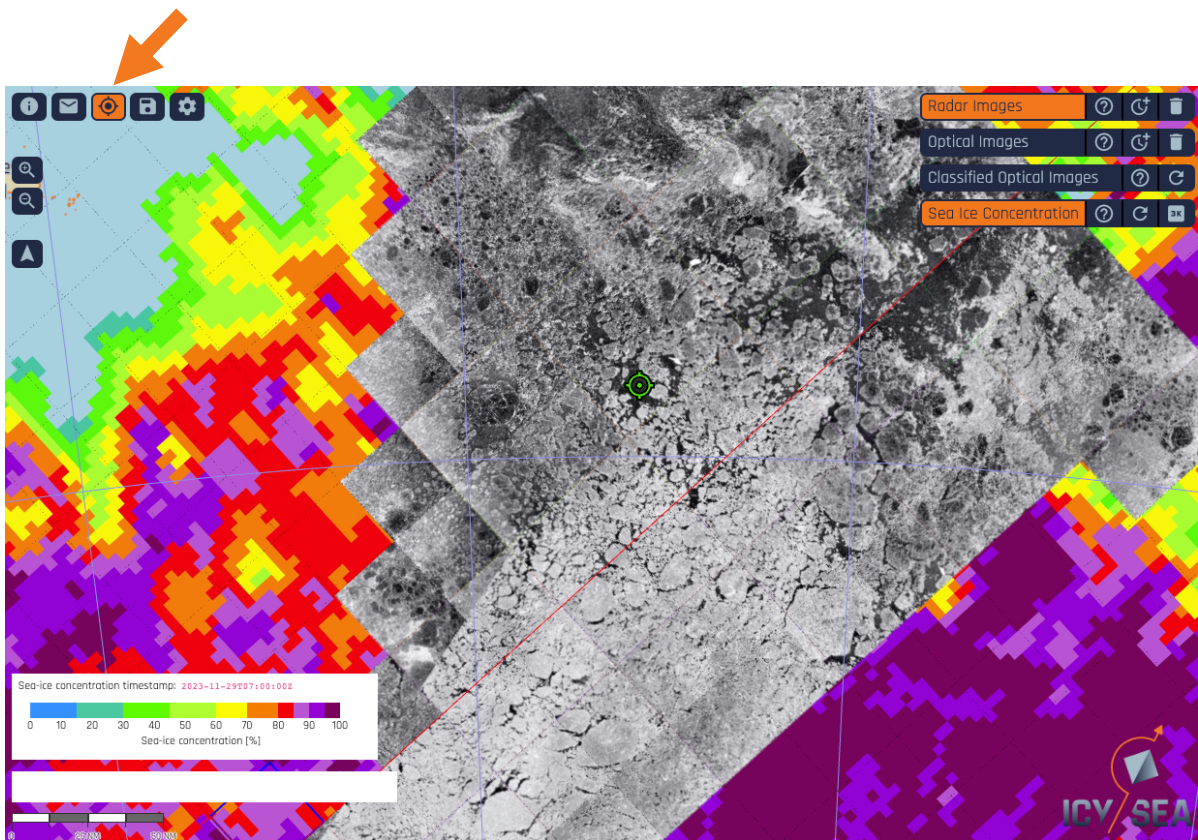


### User position

Please select a location provider which should be used for displaying the user position on the map:

- Location services on your mobile device.
- Use external GNSS device via a (virtual) serial port. Baud rate:

After selecting the GPS data source click the **'User Position'** button to display the position on the map:



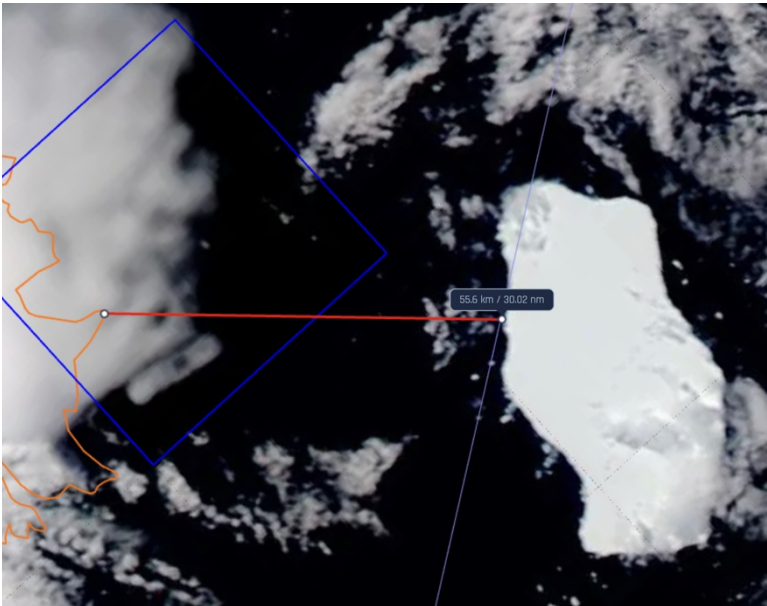
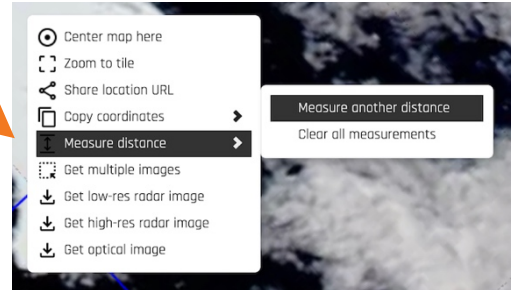
## Functions: Measure Distance Tool

Distance measurement starts at position of **'RIGHT CLICK':**

1. **'Straight line'** measurement
2. **'Free-hand'** measurement

Finish measurement with **'DOUBLE LEFT CLICK'**

- distances shown in *km* and *nm*
- measurements available until deleted
- multiple measurements can be displayed at the same time
- distance measurements can be exported (see section data export)



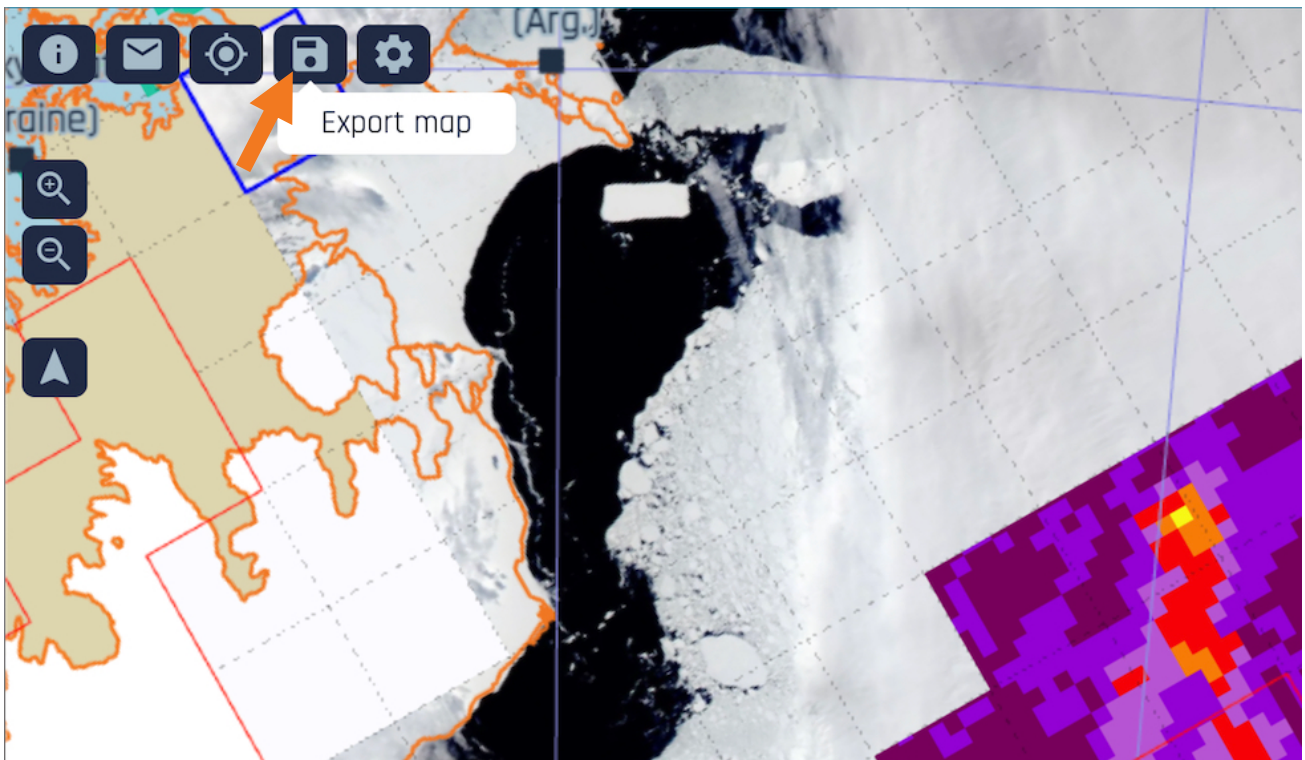
**'Straight line'** measurement with **'LEFT CLICK'**



Hold **'SHIFT + LEFT CLICK'** for **'Free-hand'** measurement

## Functions: Data Export

- The data you download via IcySea can also be exported and used in various GIS applications
  - data is exported in *png* format with an associated *aux* file that contains the georeference information
  - *png* and *aux* files need to be saved to easily 'drag and drop' the *png* image into your GIS project
  - distance measurements created for route planning purposes can be exported in *Geojson*, *kml* and *rtz* format and integrated in your onboard navigation system



Take Part in the Development!

Please share IcySea with your colleagues.

Test the app and

SEND US YOUR FEEDBACK!

[support@driftnoise.com](mailto:support@driftnoise.com)



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