DRIFT+NOISE
Polar Services

ICY SEA

User Guide
February 2025

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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...' from the dropdown menu
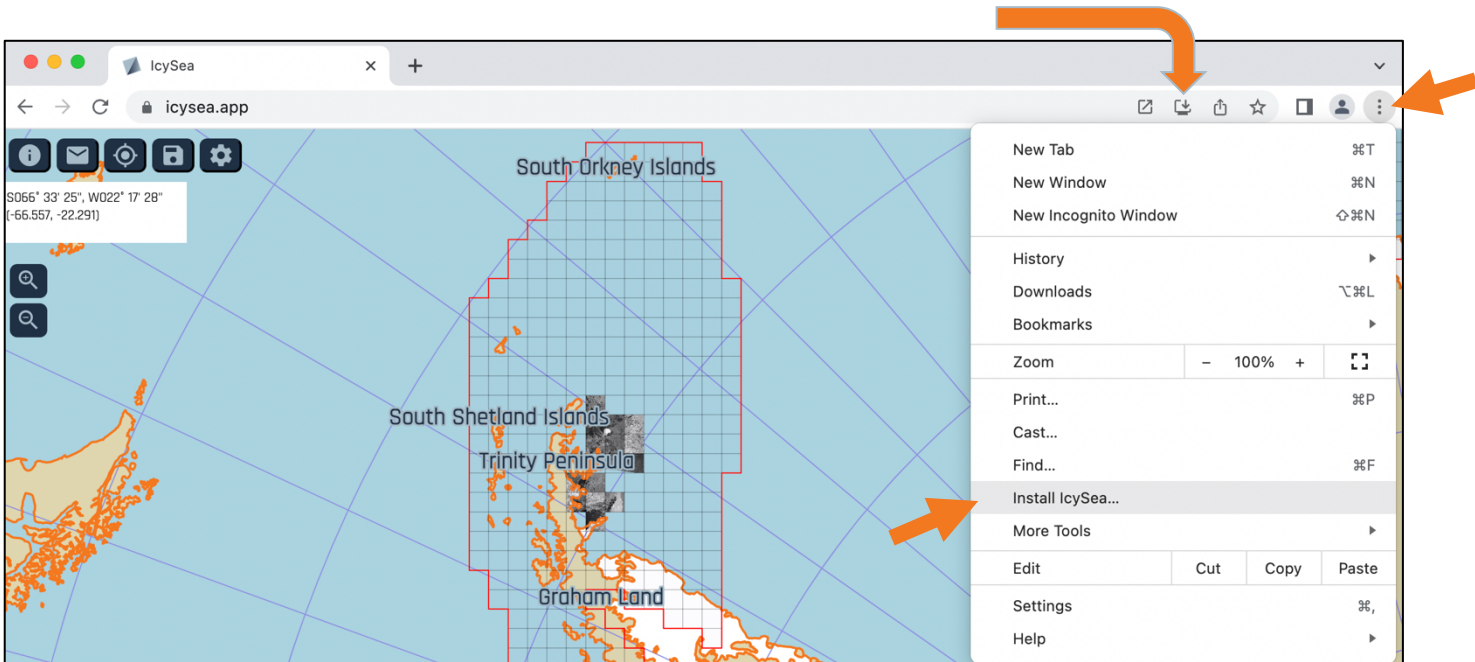
Buttons

|	
(i)	Get more information **about IcySea** and **check for Updates**
(envelope)	Get in **contact** with the Drift+Noise team for feedback or support
(GPS)	Show your current **GPS position** in IcySea
(save)	**Export** your data from IcySea
(settings)	Open '**Settings**' menu: *- Switch between Arctic and Antarctic* *- Manage your subscription* *- Select source for GPS position*
(compass)	Rotate the map to **North**
(?)	Data layer **guidelines** and **interpretation help**
(refresh)	**Refresh** data layer (get latest updates)
(clock+)	Check **age of satellite image** tiles (Radar and Optical images)
(trash)	**Delete** outdate image tiles (Radar and Optical images)
3K	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
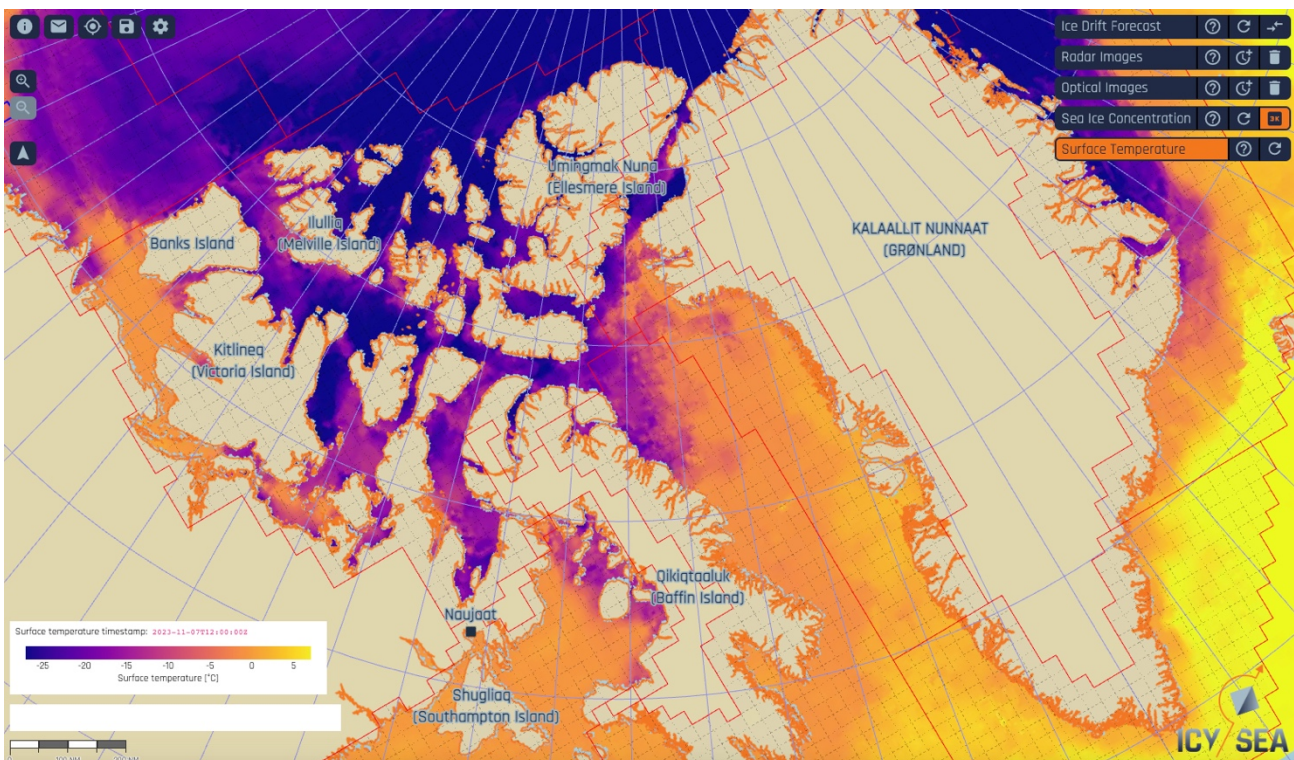
Data Layer: Sea Ice Concentration

- 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 details, limitations, interpretation help

Update data

3.125 km resolution product
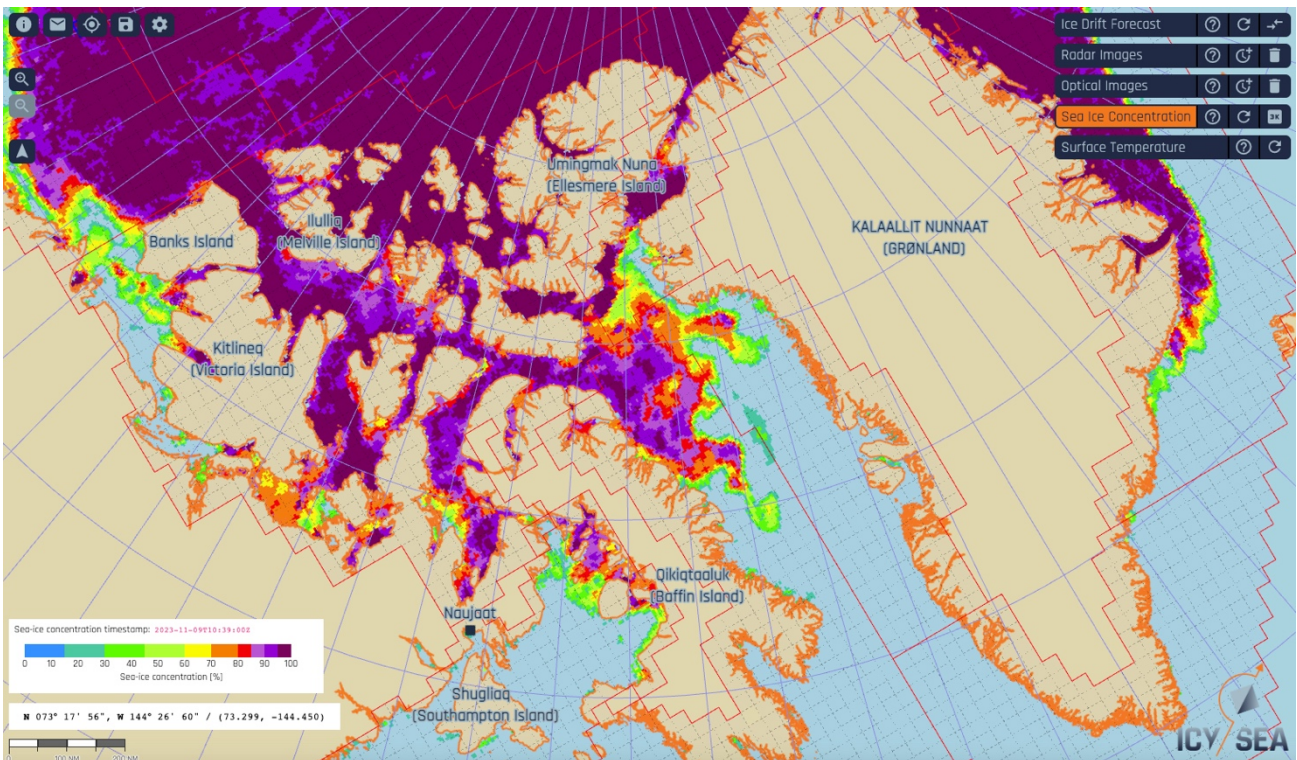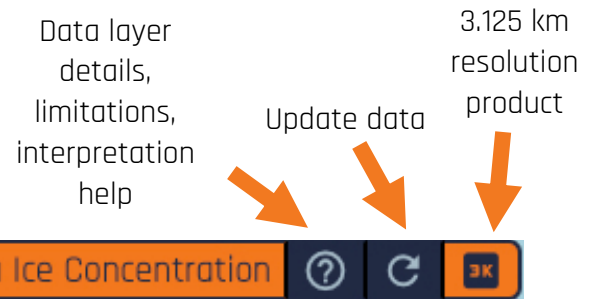
Data Layer: Official Ice Charts

- 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
    - **Argentinian Naval Hydrographic Service (SHN):** Western Antarctic, weekly
    - **Norwegian Meteorological Institute (MetNo):**
        - Arctic Atlantic sector, week days
        - Western Antarctic, weekly

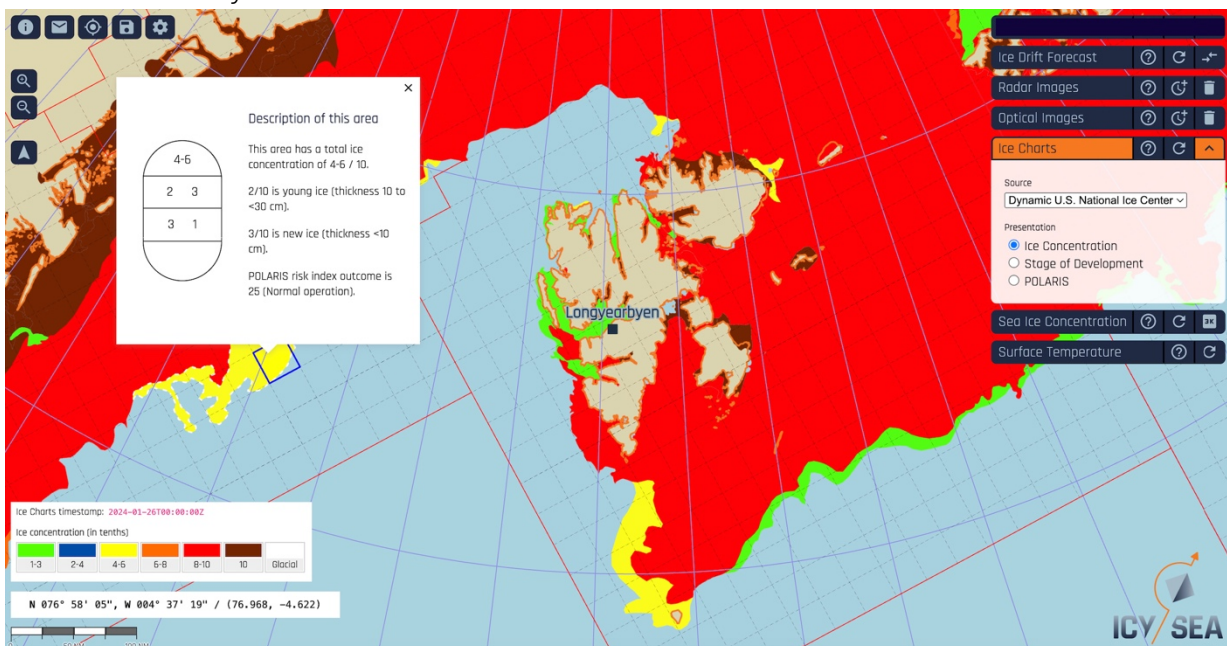Data layer details, limitations, interpretation help

Update data

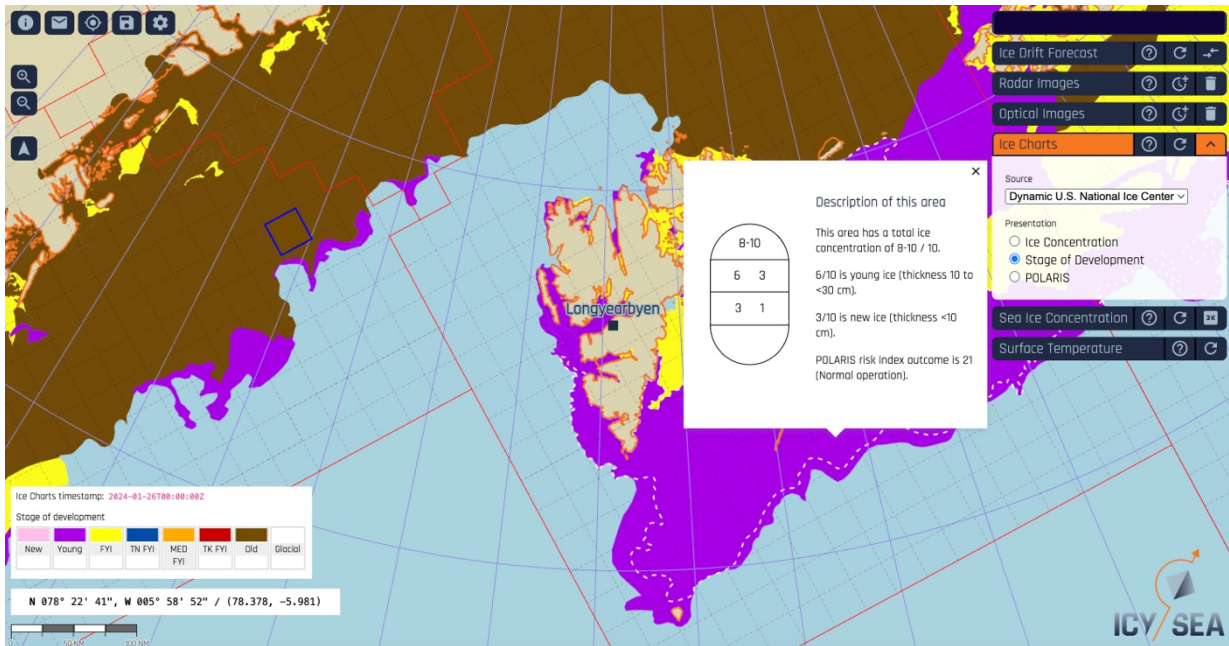Select preferred data source

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:
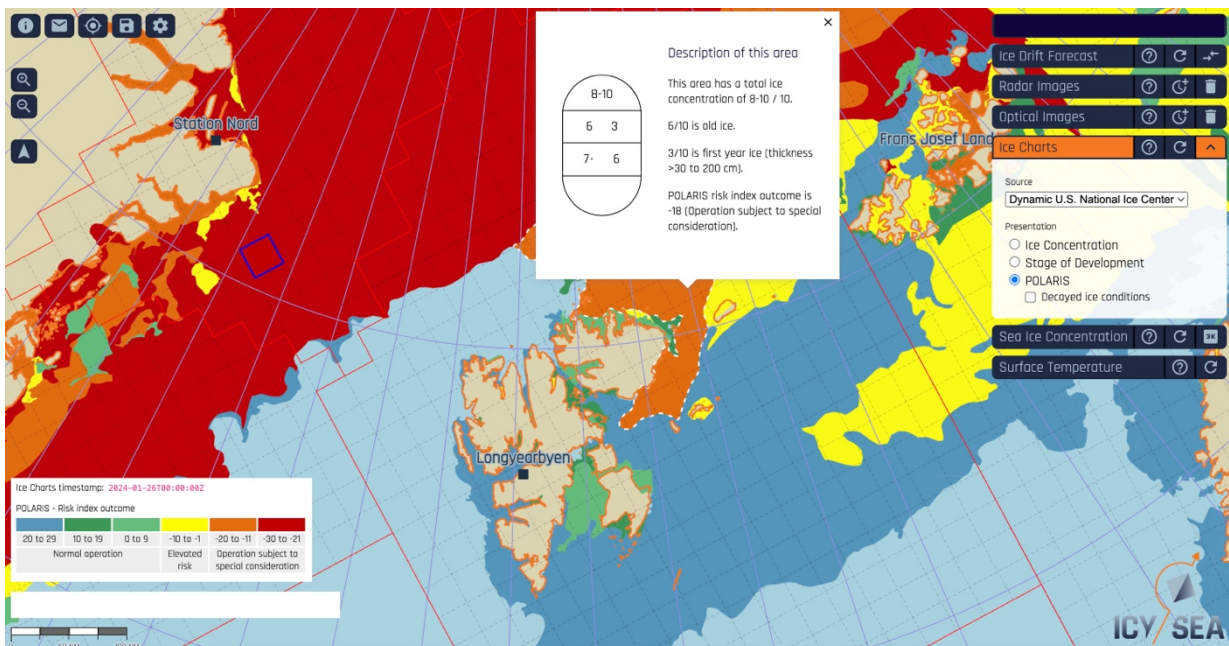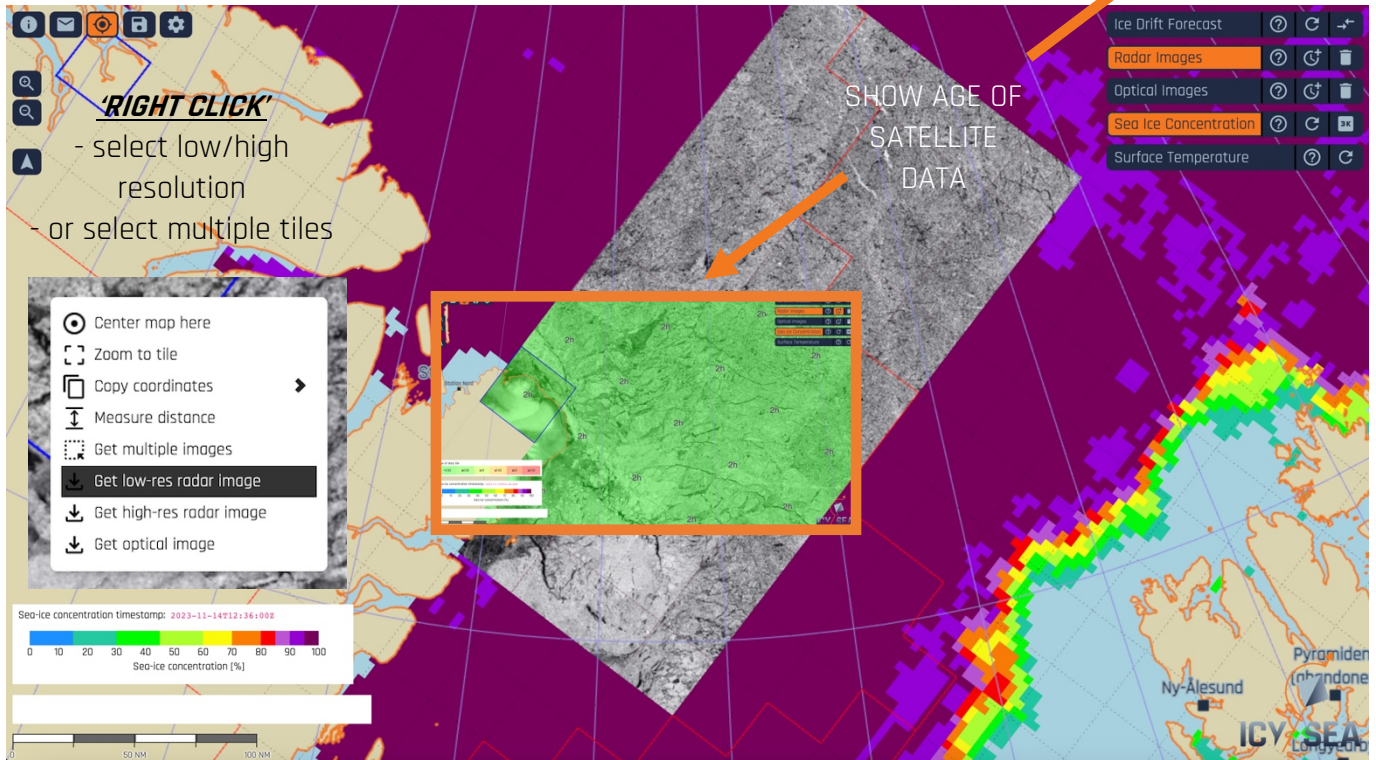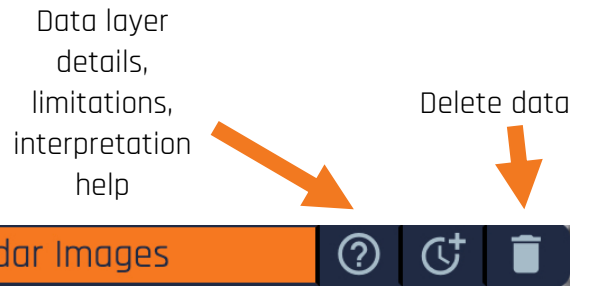

Select your ship's ice class

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
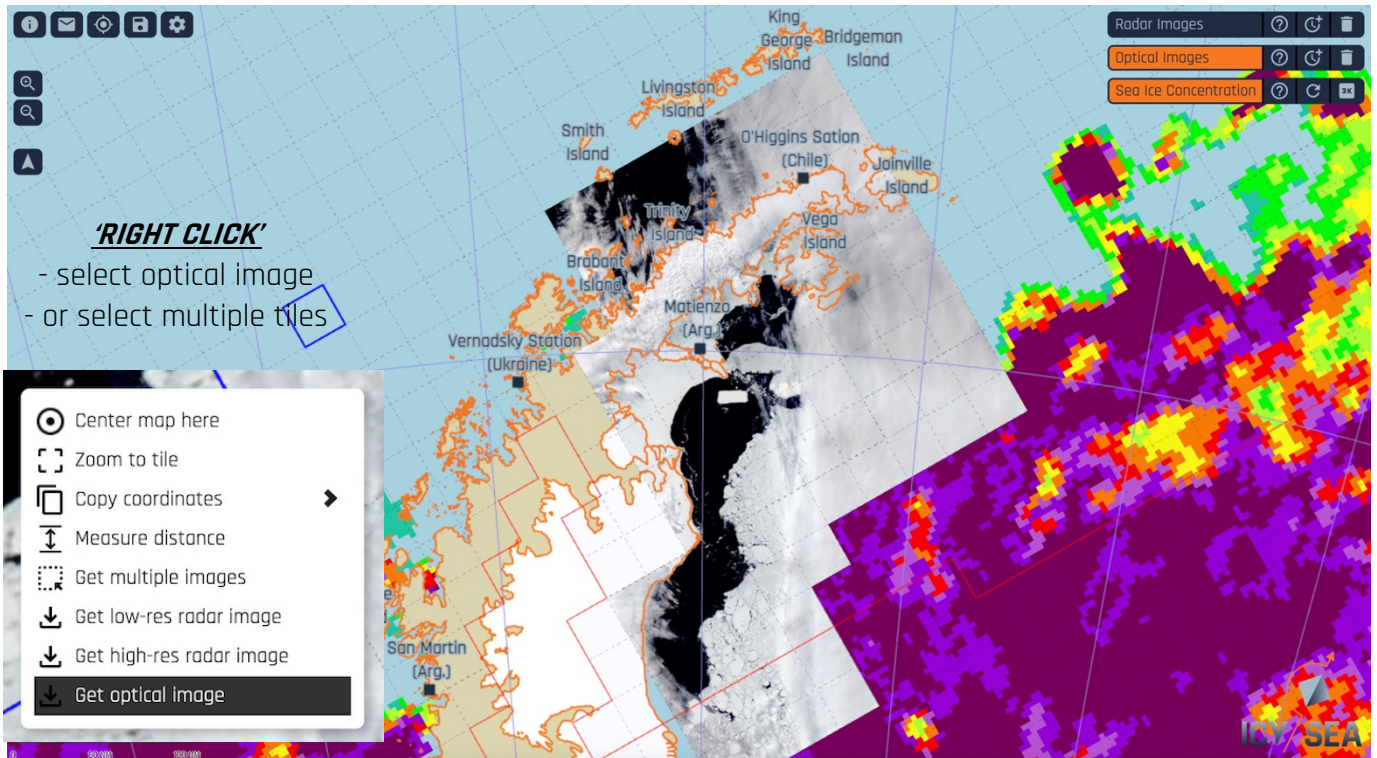   - > **use optical satellite data for reference**

Data layer details, limitations, interpretation help

Delete data

'RIGHT CLICK'
- select low/high resolution
- or select multiple tiles

SHOW AGE OF SATELLITE DATA

- Please contact us at 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

Optical Images ⑦ ⟲⁺ 🗑

'RIGHT CLICK'
- select optical image
- or select multiple tiles

Center map here
Zoom to tile
Copy coordinates
Measure distance
Get multiple images
Get low-res radar image
Get high-res radar image
Get optical image

Data Layer: Sea Ice Drift Forecast

- Predicted pathways of an imaginary ice floe over the next days
- Two data sources:
    + 9-day forecast from TOPAZ model (Arctic only)
    + 4-day forecast based on wind-forced ice drift (ICON wind model)
- Each dot shows where ice is predicted to be in 1, 2, 3, 4,..., 9 days
    - **Resolution**: distance between two dots shows drift over one day
    - **Coverage**: Arctic-wide (both forecasts) and Antarctic-wide (ICON wind-based drift only)
    - **Updates**: daily - **manually**
    - **Limitations**:
        - *Model uncertainties*: model forecasts come with uncertainty, the longer into the future the ice drift prediction the larger the uncertainty
        - Wind-based forecast neglects ocean currents
        > **update daily to confirm predictions**

Data layer details, limitations, interpretation help

Update data
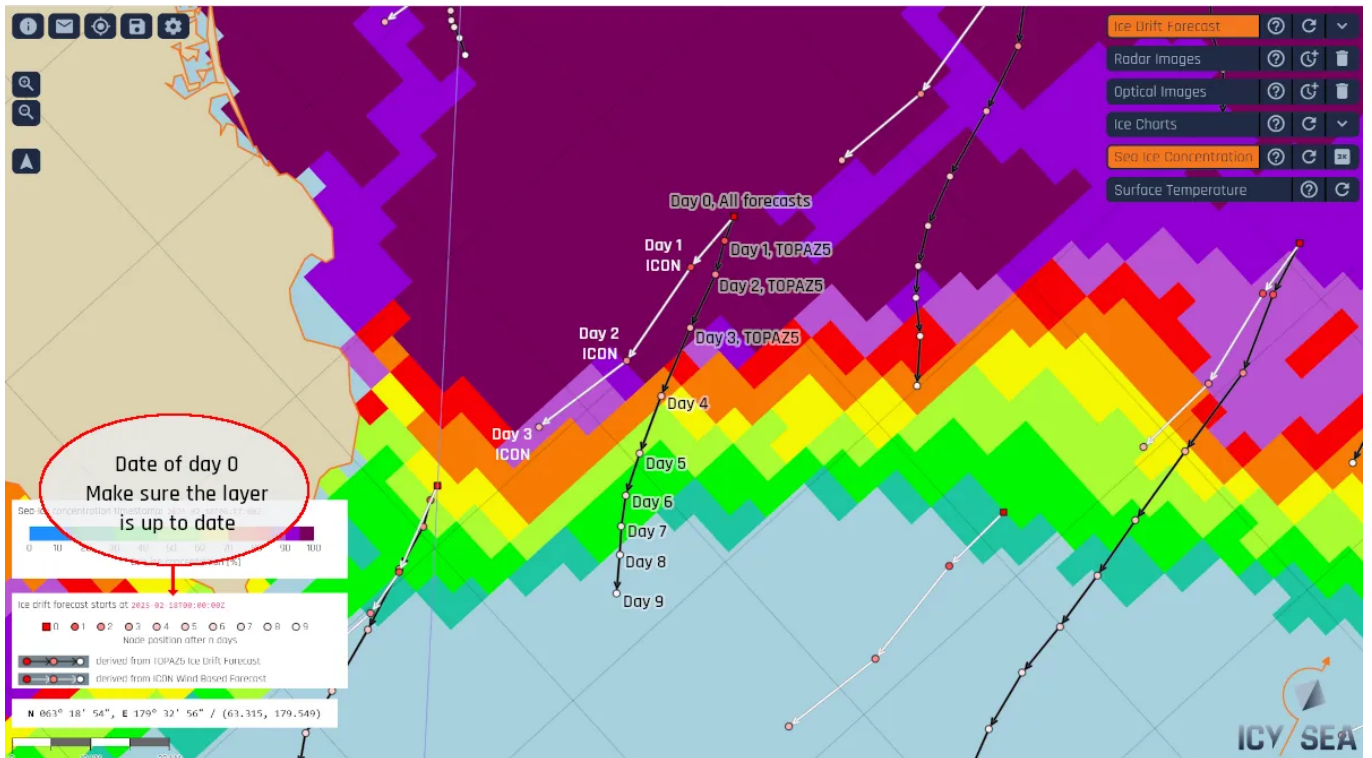
Data Layer: Classified Optical Image

- 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

Classified Optical Images ⑦ ↻
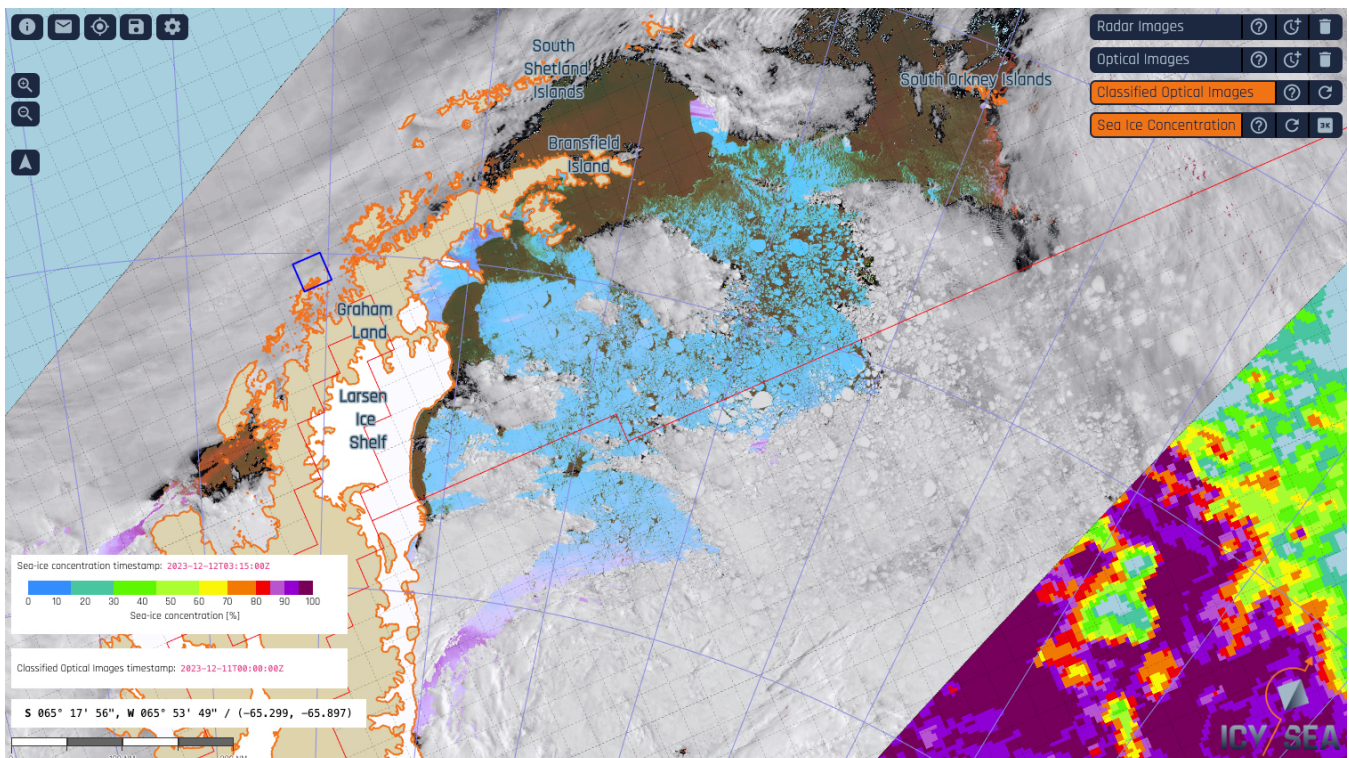
Functions: Adjust Map and Positioning

'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
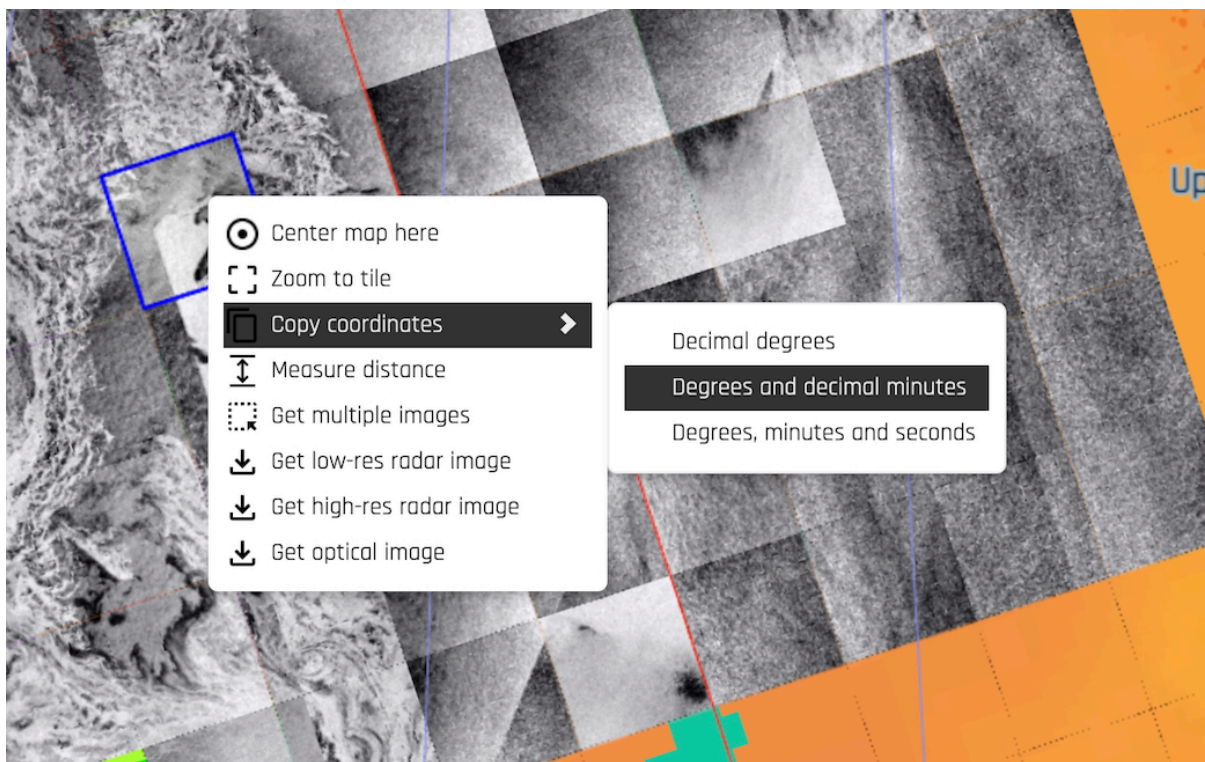
Select '**Share location URL'** to share an exact location with another user:
(more details below)

'Rotate Map to North':

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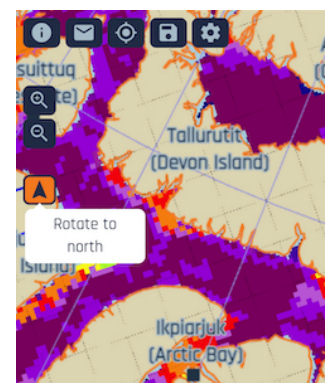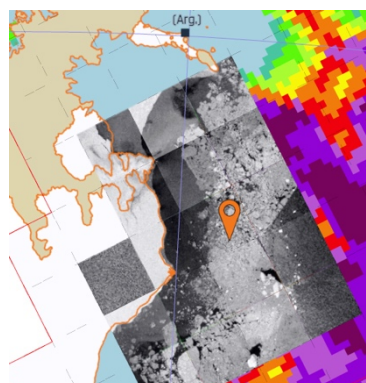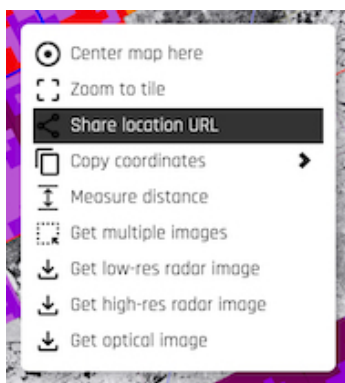
'User Position': displays your current position in IcySea:

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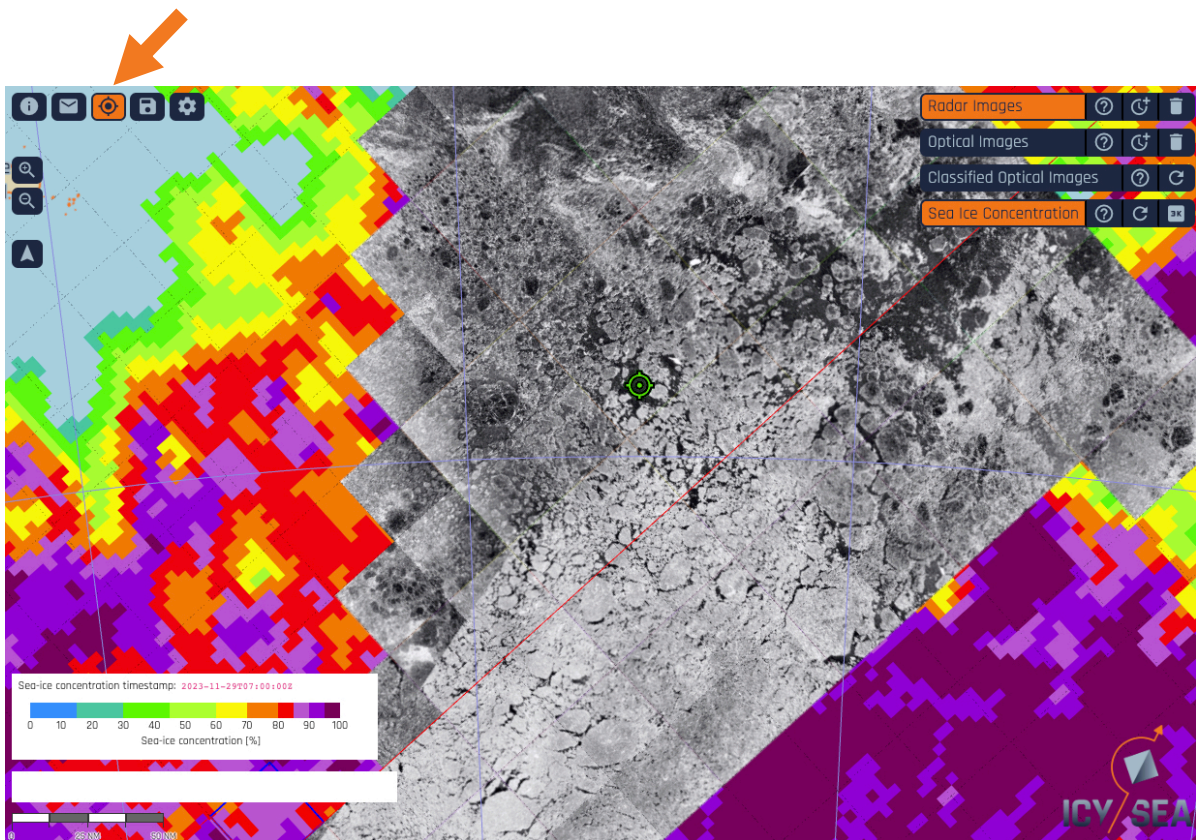 - External GNSS sensor when using a plug-in GPS sensor or the ship's GPS:

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)
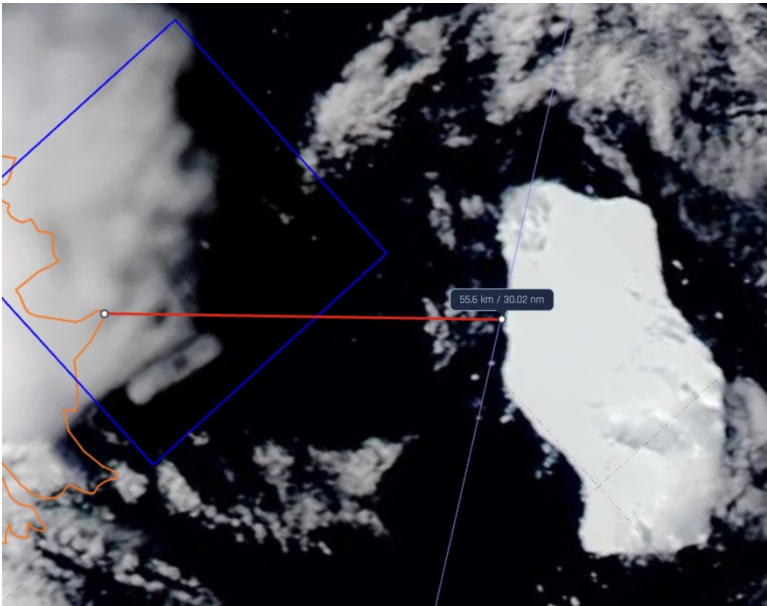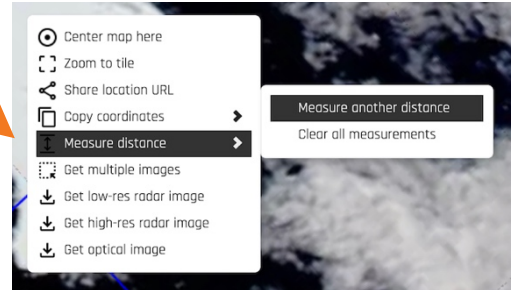
'Straight line' measurement with _'LEFT CLICK'_

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
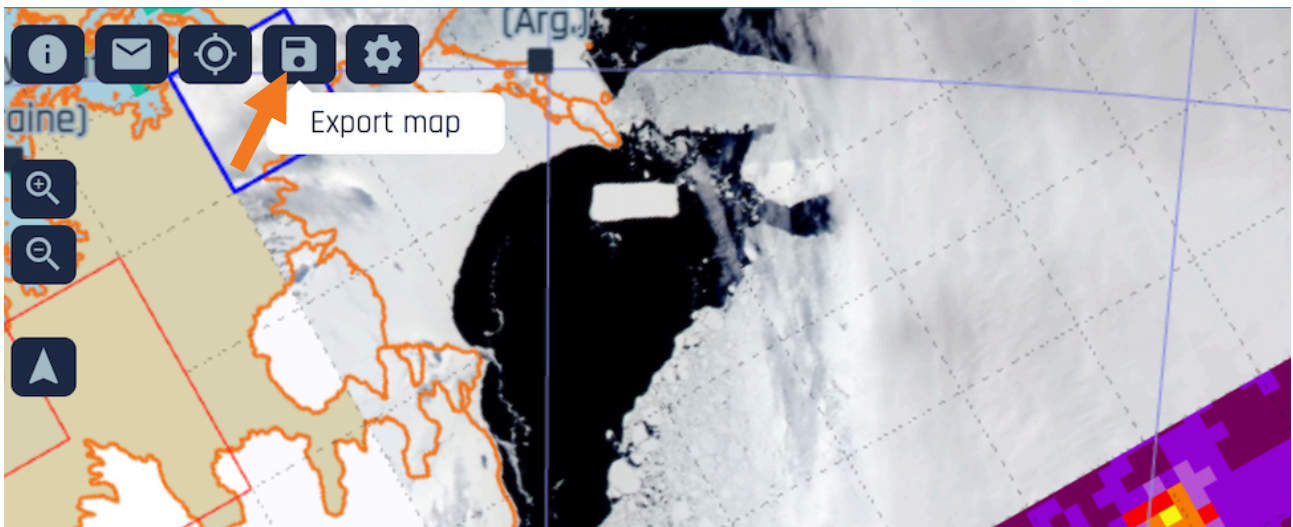
Functions: Share location URL

- Mark ice features and share the location URL with colleagues or the IcySea support team for assistance
- Select feature, *__'RIGHT CLICK'__* and select **'Share location URL'**, paste link into a messenger and share it
- Recipients can paste the link into their browser to see a pin at the position you marked in IcySea
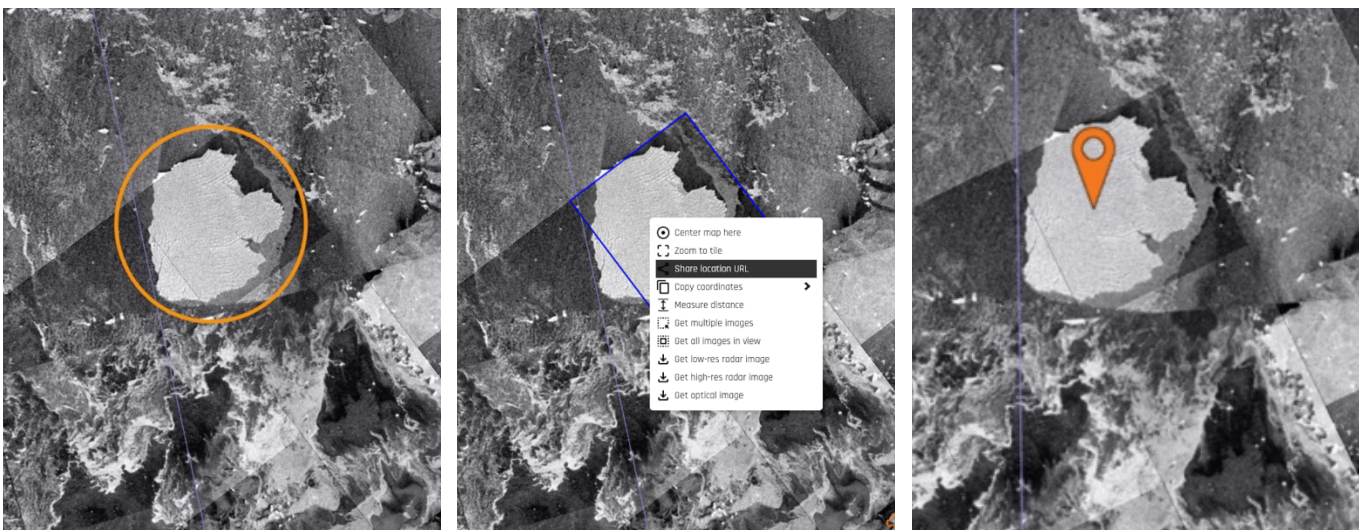
Take Part in the Development!

Please share IcySea with your colleagues.
Test the app and
SEND US YOUR FEEDBACK!
support@driftnoise.com