IceGIS: A near real time ice information system for FS Polarstern

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Introduction

To support ship navigation, station planning, and scientific data evaluation, a new near real time sea-ice information system was installed onboard FS Polarstern during summer 2016. After installation works during PS98 the full product was available on PS101, when all components of the system were tested and used for the first time.

The different datasets are downloaded automatically using FTP from the various data providers. The files are saved on a local directory on board the ship, where they are accessible for postprocessing and import into a GeoServer.

The IceGIS package provides helpful software

Conclusions

- Sentinel-1 radar images are very helpful in identifying fast transit routes through the ice
- The IceGIS package provides helpful additional information for navigational decision making
- Some adaptations are necessary to increase usability for bridge officers
- On ship sea-ice drift-forecasts provide useful information for targeted deployment of deep sea exploration gear
- Dynamic display of current buoy positions improves drift-estimate and enables easy location for recovery operations
- Data delivery with a delay of less than 15 minutes for buoy data and on average 4 for SAR images.

References

Park, H.-S. and Stewart A. L.; An analytical model for wind-driven Arctic summer sea ice drift; The Cryosphere, 10, 227-244, 2016, doi:10.5194/tc-10-227-2016

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Sentinel-1 SAR image delivery

Sentinel-1 (S1) images are automatically acquired from ESA and cropped according to predefined static regions of interest or following dynamic ship and buoy positions.

On average, Sentinel-1 images are ready for pickup at the data provider (Drift&Noise) 135 minutes after acquisition. Due to delays mostly caused by the ships internet it takes on average additional 122 minutes until the image is displayed on board. This could be improved down to 30 minutes by better bandwidth management of the internet connection.

Conclusion