Sea ice and snow thickness transect data collected on Nansen Legacy seasonal cruises during 2018-2022.

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1. Data summary

The data set presents results of snow and ice thickness surveys along walked transects from five Nansen Legacy cruises conducted during 2018-2022 with the Norwegian ice-going research vessel *Kronprins Haakon* (KPH) to the northern Barents Sea, area north of Svalbard and further into the central Arctic, namely Nansen and Amundsen basins.

Data on snow thickness along the track were collected with a SnowHydro LLC Magnaprobe (MP), a semiautomated GPS snow probe. Total (ice and snow thickness) were measured with a Geonics EM31 or Geophex GEM2 multifrequency electromagnetic sounder (GEM2). For accurate positioning various GPS receivers were used. The data are representative of local ice and snow thickness variations in the area of sea ice stations.

For more details on the Nansen Legacy project (*Norwegian: "Arven etter Nansen"*), research goals, sampling strategy and the associated activities please follow the link https://arvenetternansen.com/.

The cruises where a dedicated program on sea ice physics was conducted, including the study of ice and snow thickness distribution along transect lines, are listed in **Table 1** below.

Table 1: Nansen Legacy cruises that involved a significant sea ice physics-directed component. For more details on the cruise program and timelines please see the respective cruise reports (links provided).

Cruise ID	Dates	Cruise report DOI
Joint Cruise JC1-2	06.08 - 23.08.2018	https://doi.org/10.7557/nlrs.5628
Seasonal Cruise Q1	02.03 - 24.03.2021	https://doi.org/10.7557/nlrs.6464
Seasonal Cruise Q2	27.04 - 20.05.2021	https://doi.org/10.7557/nlrs.6689
Arctic Basin Joint Cruise JC2-2	24.08 - 24.09.2021	https://doi.org/10.7557/nlrs.6413
Winter Gaps Joint Cruise JC3	19.02 - 11.03.2022	https://doi.org/10.7557/nlrs.6685

2. Ice stations

Nansen Legacy followed a strategy of consistent sampling in the same locations throughout the entire project duration (see **Table 2** below for a list of Nansen Legacy stations and Figure 1 as an example for ice station's locations for the 2021 cruises). Most of the multidisciplinary activity was conducted during the so-called Process stations labelled P1 to P11 and sometimes on shorter stations (NLEG-stations) in between the P-stations. The sea ice physics work related activity was generally confined to a subset of stations dictated by the actual cruise plan and sea ice conditions. Since Barents Sea features a seasonal ice cover with high interannual variability in both ice extent and concentration, the number of ice stations made varied between the cruises and years. Note also that due to sea ice drift, the actual locations for sea ice sampling activity could deviate from the locations indicated below.

Table 2. Locations of Nansen Legacy stations. Main stations for multidisciplinary process studies are also denoted *P (for "Process study")*-stations. Note the stations PICE1, SICE2b and SICE3 are the stations of the JC1-2 cruise in August 2018 only. Ice station "Kvitøyrenna" (Sice-K) was conducted only on the Winter Gaps JC3 cruise.

Nansen Legacy Station ID	Latitude	Longitude
P1 (NLEG01)	76	31.22
NLEG02	76.5	31.22
NLEG03	77	34
P2 (NLEG04)	77.5	34
NLEG05	78	34
NLEG06	78.5	34
P3 (NLEG07)	78.75	34
NLEG08	79	34
NLEG09	79.25	34
NLEG10	79.5	34
P4 (NLEG11)	79.75	34
NLEG12	80	34
P5 (NLEG13)	80.5	34
NLEG14	81	34
NLEG15	81.3098	31.3487
NLEG16	81.3822	31.2933
NLEG17	81.4107	31.2468
NLEG18	81.4318	31.1448
NLEG19	81.458	31.0775
NLEG20	81.5025	30.9618

P6 (NLEG21/NPAL15)	81.5463	30.8548
NLEG22	81.5895	30.7667
NLEG23	81.6165	30.6647
NLEG24	81.6828	30.5258
P7/ NLEG25	81.8027	30.8846
P7 (NLEG25/NPAL16)	82	30
NLEG26	82.4703	29.5359
NLEG27	82.9469	27.9103
NLEG41	83.1549	-9.6042
NLEG28	83.3821	26.878
NLEG40	83.8515	-9.5361
P8/ NLEG29	83.8994	25.4114
NLEG30	84.1782	22.0896
NLEG31	84.496	17.9159
NLEG32	84.8254	12.3426
P9/ NLEG33	85.3707	7.4551
NLEG34	85.747	-2.5438
NLEG35	86.0051	-10.6921
P10/ NLEG36	86.5052	-16.7077
NLEG39	86.6043	-11.1007
NLEG37	87.0041	-21.5252
P11/ NLEG38	87.5009	-17.3716
PICE1	83.3321	31.5402
SICE2b	83.3310	29.4329
SICE3	83.2321	25.6739
Kvitøyrenna (SIce-K)	80.1205	29.2725

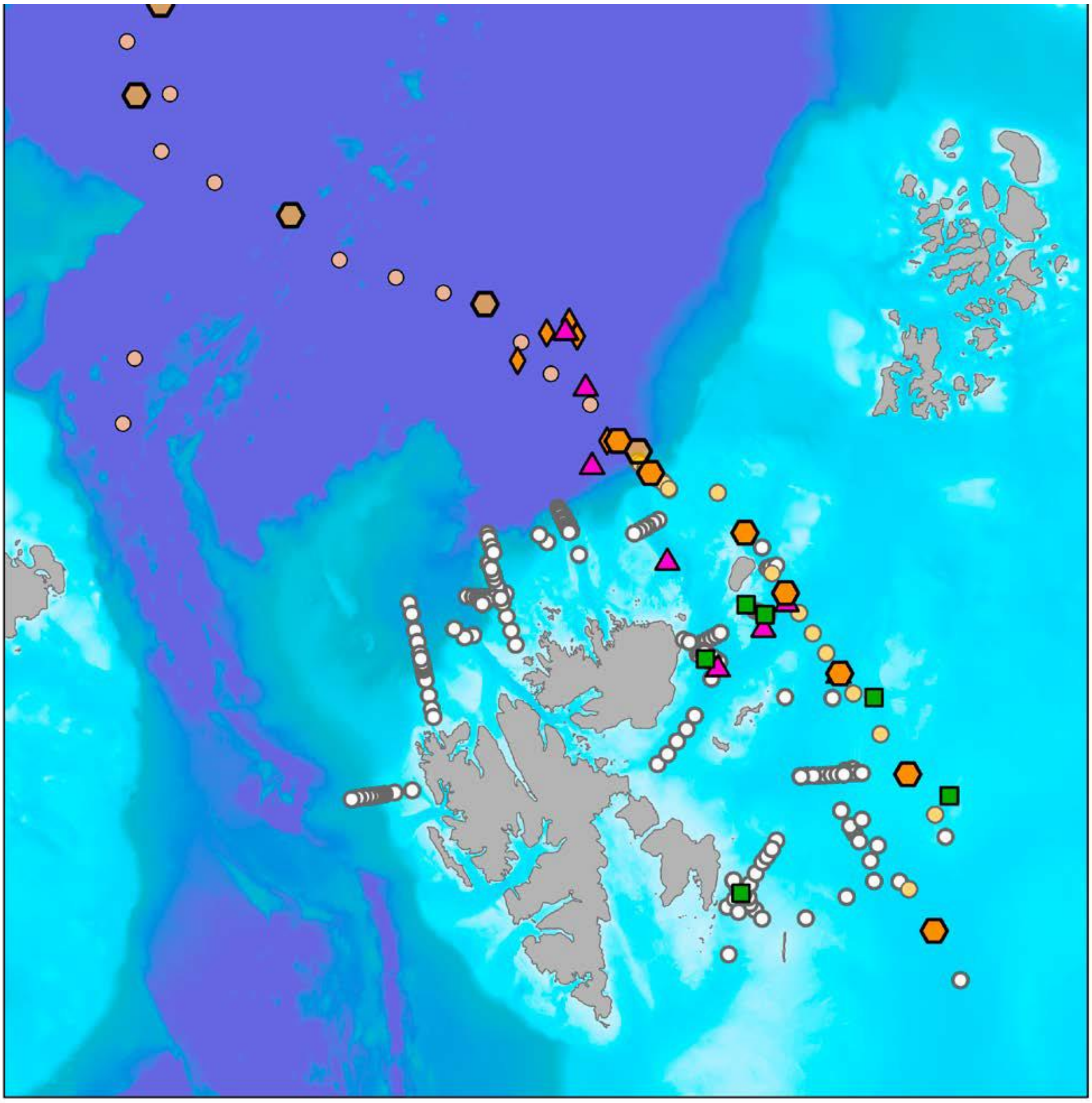


Figure 1*: Sampling locations during 2021 Nansen Legacy cruises. Hexagons represent process stations with cross-disciplinary sampling including large-scale sea ice stations where on-ice sampling and research program for sea ice physics was conducted. Map: Ingeborg Reigstad; from Nansen Legacy annual report 2021 (https://doi.org/10.7557/nlrs.6547).*

3. Local scale snow and ice thickness surveys along transect lines

3.1 Method overview

The concept of studying sea ice and snow properties along the lines on the ice with a specific sampling resolution, or "transects", enables the acquisition of data of interest on local spatial scales from tens of meters to a few kilometers. Haas et al., (1997) gives a general overview and principles of the electromagnetic (EM) sounding for ice and snow thickness surveys while Itkin et al. (2023) also provides some specific details on the method application.

During 5 cruises a combination of EM and snow thickness measurements was used to infer sea ice and snow thickness variability in the area of sea ice stations. This activity was conducted primarily during the longer (so-called "Process") ice stations.

During the first Nansen Legacy JC1-2 cruise we used a Geonics Ltd EM31SH instrument, while for the latter occasions, when the transect work was conducted, a Geophex GEM-2 EM sounder was used instead. In contrast to a single frequency Ltd EM31SH sounder, the GEM-2 is a broadband sensor that can transmit multiple configurable frequencies in the kHz range simultaneously and record the EM response of the ocean at a sampling rate of 20 Hz. The sensor setup used 5 frequencies with approximately logarithmic spacing throughout the frequency range of the sensor (0.450,1.530, 5.310, 18.330 and 63.030 kHz).

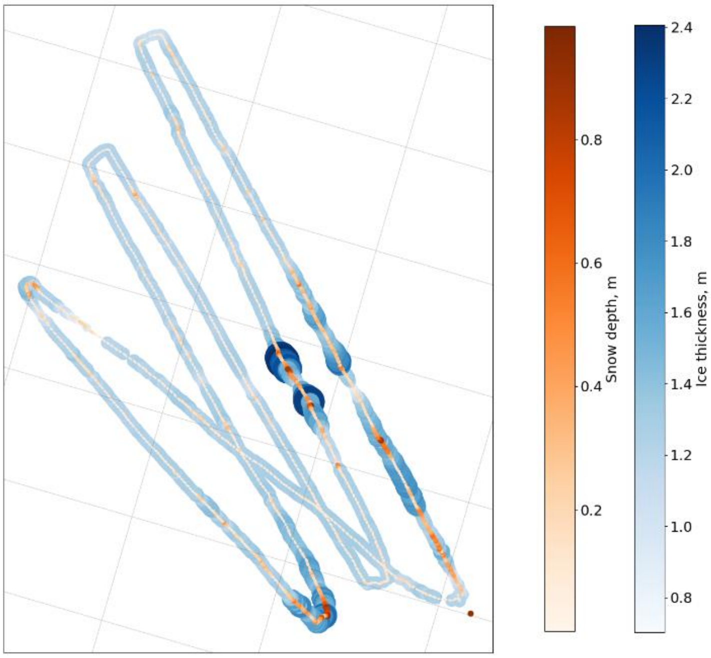
Both EM systems make use of the principles of electromagnetic induction at the sea water/sea-ice interface to estimate the height of the sensor above the bottom of the ice. The EM instrument is placed in a mobile sled on top of the snow or weathered ice surface and moved along the transect conducting measurements with a 1-2 sec interval and a footprint size of up to approximately a factor 4 applied to a total (ice+snow) measured thickness (**Figure 2**). The instruments include a real-time data processing unit with a GPS receiver which communicates with a pocket PC that operates the sensor and records the EM and GPS data streams.

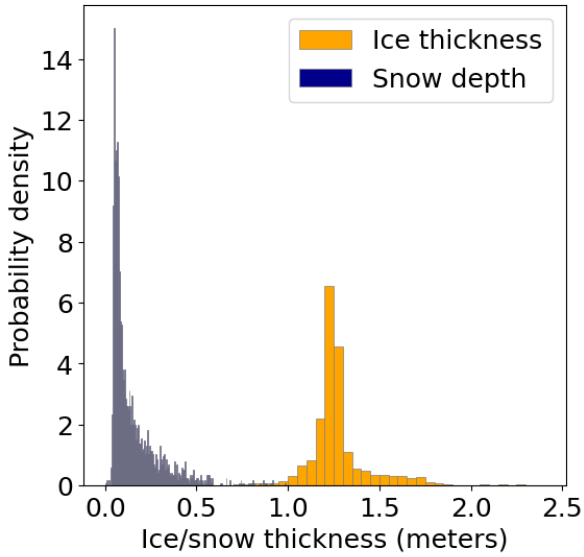
For the two instruments different calibration techniques to convert raw EM data to a total thickness were used. The EM31SH data were calibrated using a series of spatial drill hole measurements made with as broad as possible range of thicknesses, and then processed following Haas et al. (1997). For the GEM-2 EM sounder a single site ladder-based calibration approach emulating a set of different distances to the conductive environment was applied instead. The benefits and limitations of the method as well associated uncertainties are discussed in Itkin et al., (2023).

Along the same track as an EM survey, snow depth observations were made with a spatial increment of about 1.0 - 1.5 m using an automated snow depth probe Magnaprobe (MP) by SnowHydro LLC (Sturm and Holmgren, 2018). The instrument is equipped with a data logger that records snow depths, GPS coordinates, measurement timestamps, and several other auxiliary data, enabling efficient collection of about 1000–1500 point snow depth measurements per hour. The maximum snow depth measurable by MP is 1.2 m which was sufficient in most of the cases. The precision of the measurement depends on the softness of the air snow and snow–ice interfaces, but as a rule in winter the uncertainty does not exceed 0.01 m.

Since sea ice is typically in a nearly constant motion, correction of survey track coordinates for sea ice drift is necessary to put the survey into the ice floe -linked coordinate system. Drift of ice station sea ice floe was typically logged by the GPS tracker placed on the ice at the very start of ice station. The handheld Garmin 64s tracker was enclosed in a small plastic box which would be fixed to the ice using an ice screw to prevent it from accidental relocations. The tracker was set to a spatial mode of position recording with an increment of 10 m and typically kept logging continuously. During some longer ice stations on Q1, Q2 and JC2-2 cruises two Leica Viva GS10 GNSS base stations were deployed on the ice some 150-200 meters apart from each other. This would ensure a high accuracy of ice floe motion tracking. Details on the GNSS data analysis are found in Divine et al., (2024a).

Figure 2: *Conducting snow and ice thickness survey using GEM-2 and Magnaprobe instruments. A person in the front pulls a sled with the EM instrument (in this case GEM-2). Snow thickness measurements along the same track are conducted using the MP instrument by another person that keeps the distance from the EM operator to ensure the electromagnetic measurements are not biased by proximity of large metal objects. Photo taken during the Seasonal Q1 cruise, Station P5 on 12.03.2021. Photo: S. Gerland (NPI).*





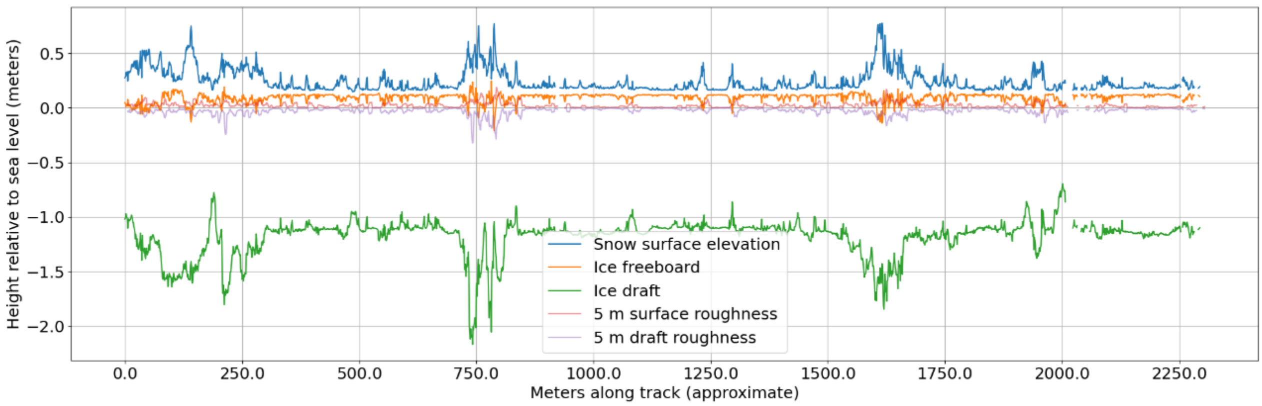


Figure 3: *Example of ice and snow thickness survey from Seasonal Q2 cruise, Station P7 Transect 2 on 13.05.2022. Top panel: transect configuration with calculated sea ice thickness and snow depths indicated by colors and symbol size; Middle panel: histograms of derived sea-ice thickness and snow depth for the transect; Bottom panel: along-the-track values of snow and ice thickness, ice draft and freeboard, 5-m running average surface and draft roughness. Ice draft, and freeboard are calculated assuming a local hydrostatic equilibrium and typical values of snow and sea ice density of 350 and 915 kg/m^3, respectively.*

The dataset presents the processed data from 27 transects made on 5 cruises**.** The list of transects is presented in **Table 3** and includes the transect length together with the calculated mean ice and snow thicknesses. For a few transects where snow thickness was not measured a total thickness is shown instead. The transects cover a broad range of sea ice classes and surface conditions from winter to summer. Transect lengths and patterns varied between the cruises and stations, dictated by ice and weather conditions as well as time constraints of the respective cruise plans. Typically, a transect length would be a bit longer than 1000 m, though longer than 2000 meter long transects were also conducted a few times.

Figure 3 presents an example of the data derived from the ice and snow thickness survey conducted on 13.05.2021, station P7 during Seasonal Q2 cruise. The 2.3 km long transect of a meander shape was conducted on mainly level 1.2-1.3 m thick first-year ice with on average 15 cm thick snow cover.

A few ridge crossings are manifested as relatively short areas/parts of the transect with elevated ice thickness.

Table 3. List of snow and ice thickness surveys conducted during the Nansen Legacy project cruises. See **Table 2** for approximate coordinates associated with ice stations. The approximate transect length is calculated based on the aggregate distance between the individual snow depth measurements after the correction for ice drift was applied. The mean ice thickness at each measured snow depth spot is calculated from the median GEM-2 total ice and snow thickness within the 5 m circle centered at the respective Magnaprobe snow depth measurement after collocation of the drift-corrected walked tracks.

Cruise number and station name	Survey date	Instruments	Transect length, m	Mean ice/snow thickness, m
JC1-2 PICE1	17.08.2018	EM31SH	1430	1.0 (--)
JC1-2 SICE2b	19.08.2018	EM31SH	787	1.4 (--)
JC1-2 SICE3	20.08.2018	EM31SH	1282	1.5 (--)
Q1-P4	10.03.2021	GEM-2/MP	1030	0.55(0.18)
Q1-P5	12.03.2021	GEM-2/MP	1480	0.64(0.15)
Q1-P6	14.03.2021	GEM-2/MP	950	0.40(0.13)
Q1-P7	17.03.2021	GEM-2/MP	1180	0.73(0.1)
Q2-P4	05.05.2021	GEM-2/MP	2850	0.25(0.08)
Q2-P5	08.05.2021	GEM-2/MP	1850	0.55(0.14)
Q2-P6	09.05.2021	GEM-2/MP	2000	1.21(0.2)
Q2-P7-1	13.05.2021	GEM-2/MP	1400	1.89(0.3)
Q2-P7-2	13.05.2021	GEM-2/MP	2300	1.28(0.15)
JC2-2-P8-1	01.09.2021	GEM-2/MP	230	1.46(0.06)
JC2-2-P8-2	02.09.2021	GEM-2/MP	590	1.13(0.03*)
JC2-2-P8-3	03.09.2021	GEM-2/MP	690	1.44(0.03*)
JC2-2-P8-4	03.09.2021	GEM-2/MP	2750	1.46(0.04*)
JC2-2-P9-1	07.09.2021	GEM-2/MP	1500	1.73(0.06*)
JC2-2-P9-2	07.09.2021	GEM-2/MP	2600	1.8(0.02*)
JC2-2-P10-1	12.09.2021	GEM-2/MP	1200	1.21(0.09*)
JC2-2-P10-2	12.09.2021	GEM-2/MP	4800 (3050)**	1.61(0.04*)
JC2-2-P11-1	16.09.2021	GEM-2	300	1.01***
JC2-2-P11-2	17.09.2021	GEM-2	3350	1.68***
JC3-P5	28.02.2022	GEM-2/MP	1100	0.43(0.09)
JC3-P7-1	02.03.2022	GEM-2/MP	1150	0.78(0.23)
JC3-P7-2	03.03.2022	GEM-2/MP	1300	0.74(0.23)
JC3-P7-3	04.03.2022	GEM-2/MP	2700	0.74(0.2)
JC-3 Kvitøyrenna	08.03.2022	GEM-2/MP	1150	0.45(0.16)

(*) marks the transects where the quality of the snow depth measurements can be compromised by a poor performance of the Magnaprobe during the JC2-2 cruise.

(**) due to GEM-2 malfunction, part of the transect data could not be processed. The length of the transect is 4800 m (Magnaprobe data), while only 3050 m of GEM-2 data were acquired.

(***) due to malfunctioning Magnaprobe, the respective transect snow depth data from P11 stations are not reliable and not included in the dataset. The provided thickness is a total thickness of snow and ice. For the typical snow depth measured at ice station see Divine et al., (2024a) and Divine et al., (2024b)

3.2 Routines for data processing

Routines for raw data coping from the GEM-2 and MP instruments followed the "Data Copying Procedure After Transect (GEM-2 & MagnaProbe), checklist&manual" (Itkin&Hendricks,2021; manual included in this dataset).

The following set of processing routines for the GEM-2 and MP data was then applied (Itkin et al., 2023).

1. GEM-2 data converted to total (ice+snow) thickness using an empirical exponential approach. This step uses on-ice calibration measurements (total thickness from drill holes and respective EM measurements) and fitted empirical inverse logarithmic expression to derive total thickness from measured strength of the secondary EM field. For a multifrequency GEM-2 instrument a total thickness was calculated for every channel. Since 5.310 kHz channel showed best correlation with direct observations, the calculated values of the total thickness namely for this channel were used as a reference throughout this dataset.
2. Spurious measurements/control measurements and possible data duplicates are eliminated from the MP data.
3. The GPS coordinates measured by both instruments during the transect are corrected for ice drift to the timing of the transect start. As a reference for the drift, we used the data from a GPS tracker or a GPS base station placed on the ice (see Divine et al., 2024a for details on GNSS data acquisition and processing).
4. The calibrated series of total thickness are quality controlled to eliminate individual spikes. Data for the periods when instruments were in the same position relative to the ice are averaged.
5. Since GPS positioning uncertainty does not enable a one-to-one fit of the tracks from two instruments, tracks sometimes had to be semi-manually adjusted by translation to ensure a maximum overlap.
6. For each MP transect point the algorithm finds all GEM-2 data within the 2.5 m search radius and calculates the median of GEM-2 points (total thickness) found in that radius.
7. MP snow depth measurements are then subtracted from the median of GEM2 points falling into the search radius to yield the local ice thickness value.
8. For several transects the median GEM-2 ice thicknesses, MP snow depth, and typical snow/ice density observations were also used to estimate sea ice draft and freeboard based on assumption of the local hydrostatic equilibrium. Those points/track segments where the drift correction applied still could not ensure the tracks overlap were skipped in the final calculation of these variables.

Note that for the GEM-2 raw data calibration and processing (step 1) a set of processing routines available in the Python package `gem2-seaice-toolbox` was used (https://gitlab.awi.de/sitem/gem2-seaice-toolbox). For further data analysis (steps 3-8) the GEM2 and MP data processing routines were further combined into the Python processing jupyter notebooks, one for each transect, available at https://gitlab.com/npolar/aen/sea-ice/-/tree/main/jupyter-notebooks. These jupyter notebooks contain all essential details on the processing steps for the individual transects.

One should note that steps 6-7 will result in some GEM-2 data overlap used between the two consecutive Magnaprobe points. However, given the GEM-2 measurement footprint of up to 4 m, this would reflect the reality of how the measurements are collected.

For the EM31SH data from the JC1-2 cruise own Matlab routines were elaborated that included both the instrument calibration using drillhole measurements and the sea ice drift correction routines. 7

4. Data structure/data organization.

All data are arranged by cruises with the data for a single cruise compressed for convenience into one zip file with the folder data structure preserved.

4.1 GEM-2 and MP transects data.

Data from the GEM-2 and MP transects are organized in the following conceptual structure:

\\voyage-name\station-name

This folder stores the results of the analysis, namely along the track sea ice thickness, snow depth, sea ice draft and freeboard calculated based on assumption of the local hydrostatic equilibrium.

AeN_ *cruise_name-YYYY-station-name*-(transect*N*)-(driftcorrected)-snowandice.csv

is a summary csv file containing along-the-track measured values of ice thickness and snow depth and calculated values of ice draft, surface elevation as well as surface roughness estimates. The transect track, corrected for sea ice drift, is provided in both geographical coordinates as well as in the NSIDC North Polar Stereographic projection (EPSG:3413, see https://nsidc.org/data/user-resources/help-center/guide-nsidcs-polar-stereographic-projection for more details on the projection). Note that those ice stations where more than one transect was conducted, regardless of the actual date, the files names are additionally marked as "…_transect1…", "…_transect2…" etc.

The suffix "driftcorrected" in the summary csv file name is optional and emerges for some of the transects. All resulting data are corrected for sea ice drift.

The results of the analysis are also summarized in three image files with the following names:

AeN_*cruise_name-YYYY-station-name*-(transect*N*)-alongtrack-snowandice.png

AeN_*cruise_name-YYYY-station-name*-(transect*N*)-zi-zs-2panelhistogram.png

AeN_*cruise_name-YYYY-station-name*-(transect*N*)-zi-zs-onepanelhistogram.png

The folder also stores Python jupyter notebooks (see https://jupyter.org/ for more details), two per transect:

cruise_name-station-name-drift-correction_(transect*N*).ipynb
and
cruise_name-station-name-(transect*N*)-gem2-mp-to-zi-fb.ipynb

that present the codes used to correct for sea ice drift and to generate the resulting files. Note that for running these codes a respective adjustment of paths for input and output data files will be required.

In each station folder one also finds subfolders with the raw input data for GEM2, Magnaprobe and the GPSdata used for drift correction of the observations/measurements coordinates.

\\voyage-name\station-name\GEM2 stores raw, raw-processed and drift corrected GEM-2 data for this station. The folder contains the following files:

voyage_name-station name-transect-*DDMMYYY*-gem2-531-channel-thickness.csv

- raw-processed transect GEM2 data

GEM2data-driftcorrected.csv
or
voyage_name-station name-transect-*DDMMYYY* -transect*N*-gem2-531-channel-thickness_driftcorrected.csv

- drift corrected GEM2 transect data

Note that those ice stations where more than one transect was conducted, regardless of the actual date (an ice station could last for two-three days), the files names are additionally marked as "…_transect1…", "…_transect2…" etc.

This folder may also contain subfolders with raw GEM-2 survey files and calibration files used for processing the raw GEM-2 data. For more details on these files the user is referred to the GEM2 data processing manual using libraries supplied by Stefan Hendricks at https://gitlab.awi.de/sitem/gem2-seaice-toolbox .

\\voyage-name\station-name\magnaprobe stores raw and drift corrected Magnaprobe data

NPI**.dat
- is a raw survey MP file

MPdata-driftcorrected-datefixed.csv
or
voyage_name-station name-transect-*DDMMYYY* -transect*N*-magnaprobe_driftcorrected.csv
- is a drift corrected MP transect data file

\\voyage-name\station-name\GPSdata accommodates all kinds of positioning data, that were used to correct the original transect tracks for sea ice drift. Depending on positioning data available this can be files from ice floe tracking device (Garmin64s) that was fixed to the ice
\garmin\roaming\ for files from Garmin 64s tracker

and/or

\leica\base3
\leica\base4 for files from Leica base stations stored in folders.

Note that actual folder names for Leica base stations may differ between the cruises.

GNSS files are stored in folders
\rinex (data converted to Rinex format)
and
\rtklib-kppp (PPP processed data using TKLIB and precise ephemeris).

4.2 EM31SH transect data from the JC1-2 cruise.

These data are presented in the folder with this voyage name. There are two .csv files per each of three ice stations named:

AeNJC1-2-*station-name-date*_transect-zi_drift_corrected.csv

AeNJC1-2-*station-name-date*_transect-zi_drift_corrected_resampled.csv

The files contain already drift-corrected and drift-corrected and resampled to a 1 m increment total ice thicknesses for each station transect. The files have three columns for degrees latitude, degrees longitude and a total thickness derived from the EM measurements. The first of the two files has also column 4 where a distance walked along the transect is calculated. Note that in the case of the drift corrected and resampled data file points of spatially averaged ice thicknesses are not ordered in time.

The two .png files

AeNJC1-2-*station-name-date*-transect_zi_hist.png

AeNJC1-2- *station-name-date*-transect_track.png

are the image files showing the histograms of spatially resampled ice thicknesses and the corrected walked transect tracks, respectively.

The two files

AeNJC1-2-EM31_callibration_curve.png

All_calibrations_AeN_JC12_EM31SH.csv

Contain the calibration drillings and the plot of the calibration curve, respectively, based on all EM31 calibration measurements made during the cruise.

No systematic snow depth measurements/MP data was collected during this cruise. Snow on sea ice had melted by the time of this cruise and ice surface was covered by scatter layer of some 0-4 cm thick. The calculated total ice thickness is therefore generally very close to sea ice thickness.

5. Data formats

The data, both input and output are available as .csv files. The file structure is self-explanatory.

Main output files:

AeN_ *cruise_name-YYYY-station-name*-(transect*N*)-(driftcorrected)-snowandice.csv

contain a header in Lines 1-14 and a list of variables in Line 15

The variables are:
Timestamp - date and time
easting, northing - for coordinates in the NSIDC North Polar Stereographic projection (EPSG:3413)
latitude, longitude - for geographical coordinates in WGS84
snowdepth - snow depth Magnaprobe measurements
ice_freeboard - calculated ice freeboard based on local hydrostatic equilibrium assumption
ice_thickness – ice thickness calculated after GEM-2 and MP tracks matching by subtraction of individual MP measurements from local spatially averaged GEM-2 total thickness in 5.310 kHz channel
surface_elevation - calculated surface elevation over sea level based on local hydrostatic equilibrium assumption
ice_draft - calculated sea ice draft based on local hydrostatic equilibrium assumption
5m_surface_roughness – calculated surface roughness (as a running standard deviation)
5m_draft_roughness - calculated draft roughness (as a running standard deviation)

If no overlap between the MP and GEM-2 data at a particular MP point was possible, only the MP snow depth value is presented for this point. All values except for time and coordinates are given in meters.

Drift-corrected GEM-2 files have following entries:

time - date and time
record_id - record (count) number from the original GEM-2 file
easting, northing – for coordinates in the NSIDC North Polar Stereographic projection (EPSG:3413)
f[N]Hz_hcp_i – calculated total thickness for inphase channel frequency [*N*] (meters)
f[N]Hz_hcp_q - calculated total ice thickness for quadrature channel for frequency [*N*] (meters)

Drift-corrected Magnaprobe files have following entries:

time - date and time
easting, northing – for coordinates in the NSIDC North Polar Stereographic projection (EPSG:3413)
snowdepth - measured snow depth (meters)

Note that for some cruises/ice stations there are also GEM-2 and MP drift-corrected files with track coordinates available in WGS84 (geographical latitude and longitude). These files are tagged with suffix "_wgs".

6. Contact information

For any further questions regarding the dataset potential users may contact NPI persistent contacts:
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Dmitry Divine, dmitry.divine@npolar.no

7. References

Divine, D.V., Steer, A., Cristea, A., Itkin, P., Gerland, S., Granskog, M. (2024a). Metadata on selected sea ice stations of Nansen Legacy cruises to the northern Barents Sea and the area north of Svalbard during 2018-2022. [Data set]. Norwegian Polar Institute. https://doi.org/10.21334/npolar.2024.d5ee950d

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