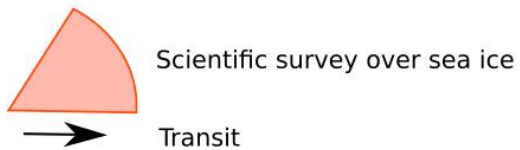


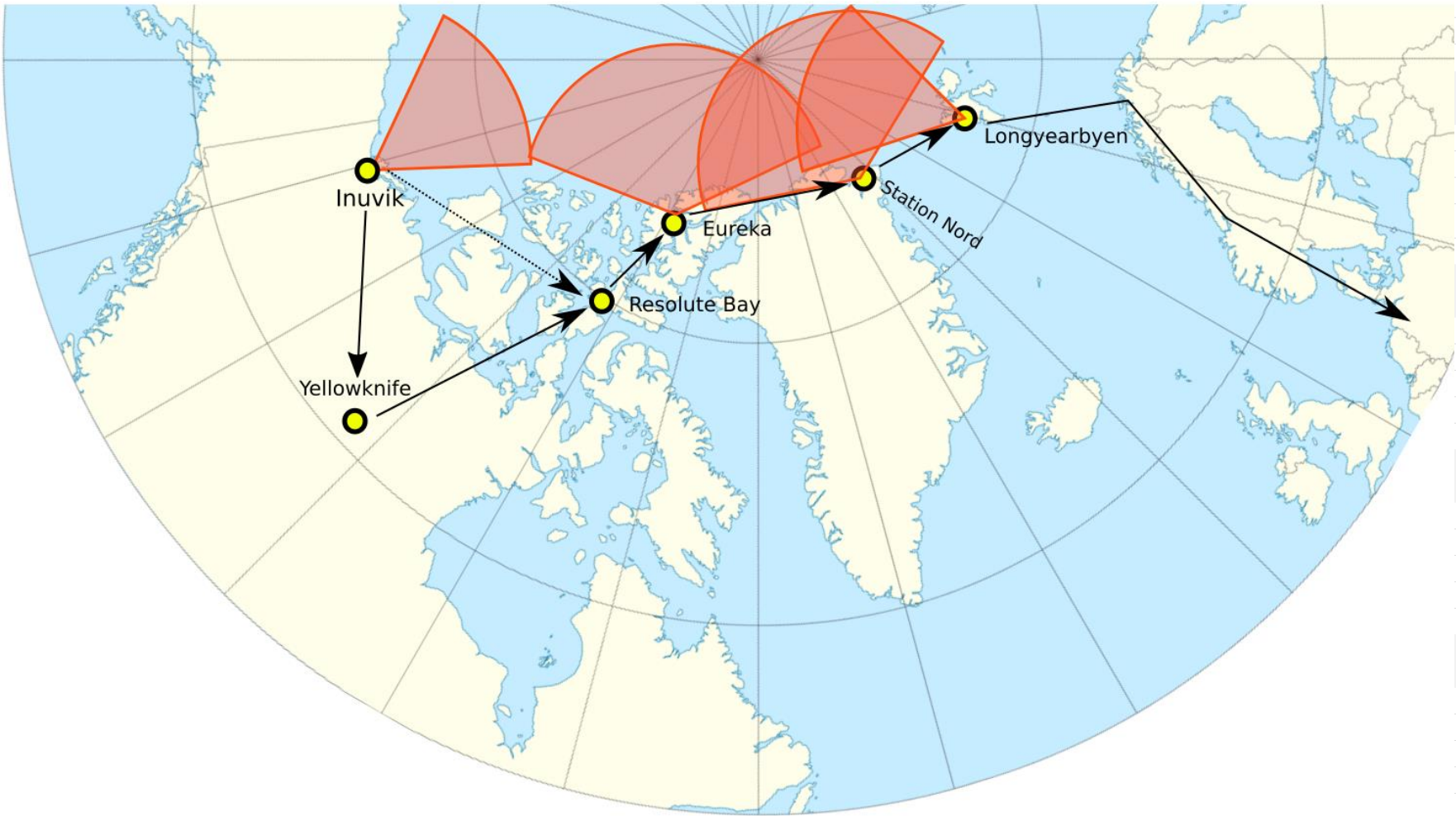
Leading Airborne Program for Direct Sea Ice Observations

Survey Activities for Winter 2023

PI: Thomas Krumpen



Expedition flight route



Date			Activity
MI	22	March	Departure Bremen, Germany
DO	23	March	Transit Inuvik, Canada
FR	24	March	Transit Inuvik, Canada
SA	25	March	Arrival Inuvik/Setting up aircraft
SO	26	March	
MO	27	March	
DI	28	March	
MI	29	March	Survey over sea ice/ocean
DO	30	March	Ferry to Yellowknife, Canada
FR	31	March	
SA	1	April	Quarantine
SO	2	April	
MO	3	April	
DI	4	April	
MI	5	April	Ferry to Eureka via Resolute Bay
DO	6	April	
FR	7	April	Survey over sea ice/ocean
SA	8	April	
SO	9	April	
MO	10	April	
DI	11	April	Ferry to Station Nord, Greenland
MI	12	April	
DO	13	April	Survey over sea ice/ocean
FR	14	April	
SA	15	April	
SO	16	April	
MO	17	April	Survey over sea ice/ocean
DI	18	April	Ferry Longyearbyen, Svalbard
MI	19	April	
DO	20	April	
FR	21	April	
SA	22	April	Survey over sea ice/ocean
SO	23	April	
MO	24	April	Ferry Longyearbyen - Bremen, German
DI	25	April	Ferry Longyearbyen - Bremen, German

Scientific program

The aim of Ice Bird is to conduct sea ice surveys over different ice regimes when sea ice is close to its maximum and minimum extents. The project is designed to collect detailed measurements and trace the evolution of such changes from year to year. Sea ice thinning and retreat are expected to continue as a result of climate change with a major uncertainty introduced by long-term natural climate variability. The project will use a specially modified DC-3 research aircraft, owned by the Alfred Wegener Institute, fitted with scientific instruments that will be used to collect data. The surveys contribute to a sea ice observation program that spans the western part of the Arctic Ocean from the Fram Strait to the Western Beaufort Sea. The scientific instruments include a towed electromagnetic-induction system (EM-system) for estimation of ice thickness, an airborne laser scanner for high-resolution surface roughness and a snow radar for snow depth on sea ice. In addition, a set of air-launchable buoys will be used to mark flight tracks over the drifting sea ice for re-visits by follow up surveys. These instruments will be used to collect data and samples during a series of planned high altitude and low altitude flights. Airborne observations and data will be collected while based at four different locations across the Arctic: Inuvik, Northwest Territories; Eureka, Nunavut; Station Nord, Greenland and Longyearbyen, Norway. At each location, research flights will be conducted with a range of approximately 300km. The planned flight altitudes are between 60m and 600m, with low altitude flights only making up approximately 20 minutes of each flight. The Ice Bird campaign is building on the heritage of data collected at previous sea ice surveys (PAMARCMiP). The existing data record has documented the decline of summer sea ice thickness north of Greenland in the past decade and demonstrated the variability of sea ice conditions during spring. The results will be published in English in international peer-reviewed papers and communicated at international conferences. We also plan to conduct science communication via social media channels during and shortly after the field campaigns.

Airborne sensors



Snow Radar (UWBM)
Laser Scanner (ALS)
Str. Therm. (KT19)
Nadir Camera (CAM)
Buoy launcher

EM-Bird (AEM)

Particulars of methods and scientific instruments	Methods to be used	Instruments to be used
Types of samples and data	Measurements of sea ice thickness and snow depth	EM-Bird, Laserscanner, Buoy drops, FMCW snow radar

Flight pattern

