

MOSAiC

Multidisciplinary drifting Observatory for the Study of
Arctic Climate

adventure and challenge

<https://www.youtube.com/watch?v=69OsRXEO7y4>

physical requirements/suitability:

- medical checks (blood sample, stress ECG, audiometry, eye test, etc.)
- dentist

meteorological requirements:

- internal licence for maritime forecasts
- internal licence for meteorology in polar regions
- internal licence for aviation weather at research stations
- environmental seminar at AWI (operating with RV Polarstern, RV Sonne, RV Meteor)

additionally for MOSAiC:

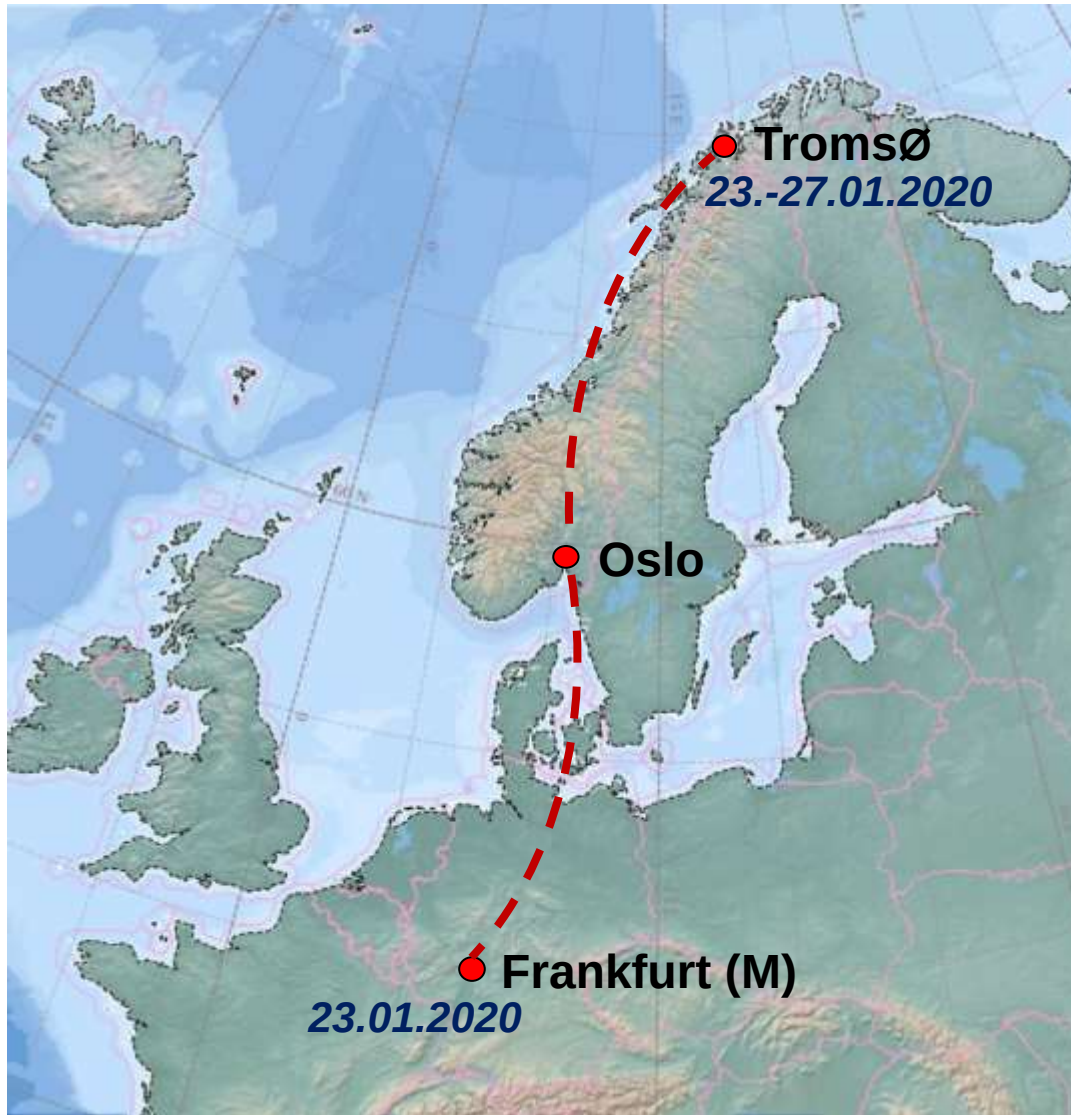
- Shooting training for polar bear watch
- basic safety (first aid, evacuation at seas, fire-extinguisher, ...)





<https://www.youtube.com/watch?v=87NVYQvMRsQ>

small talk (Tromsø)











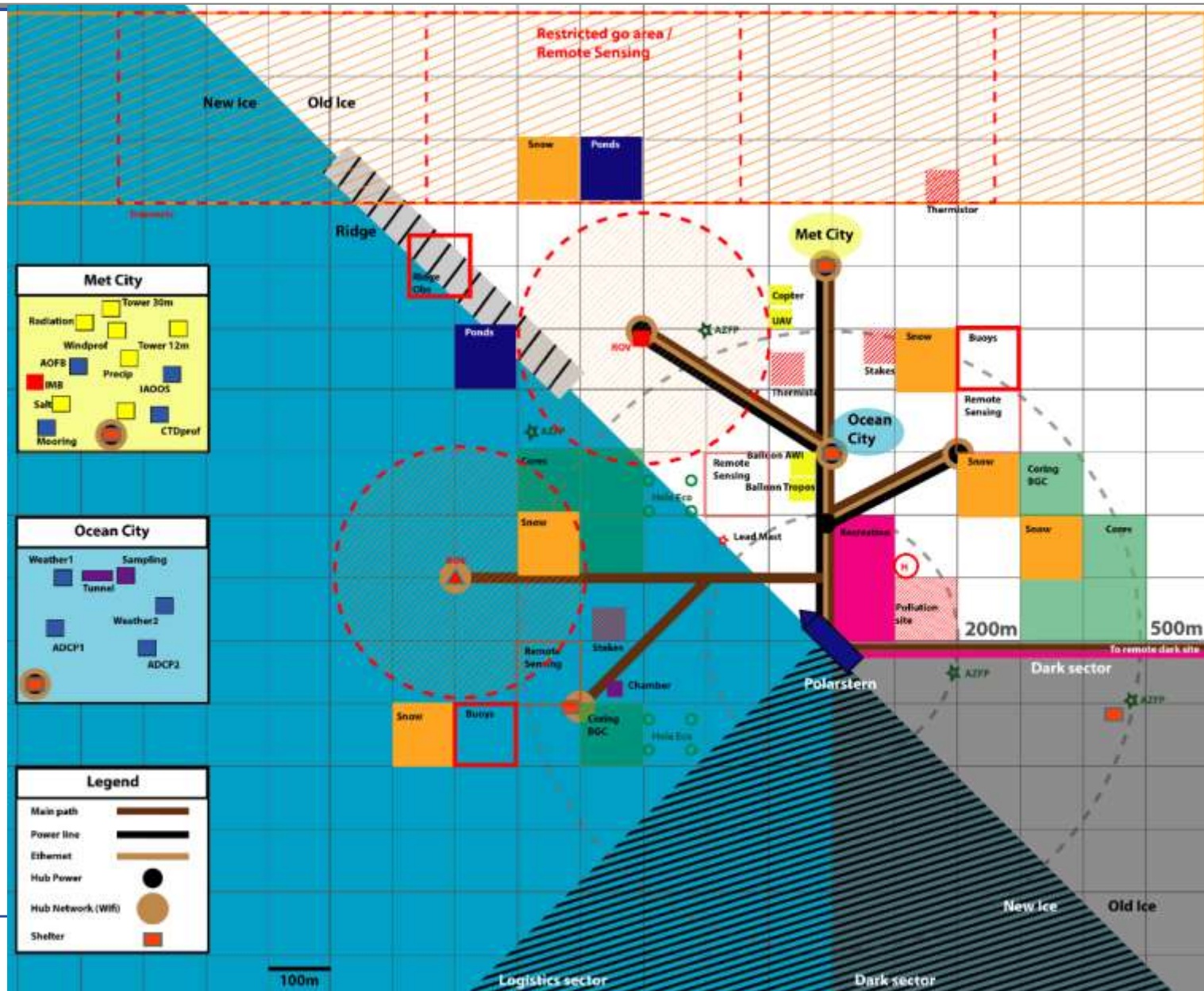


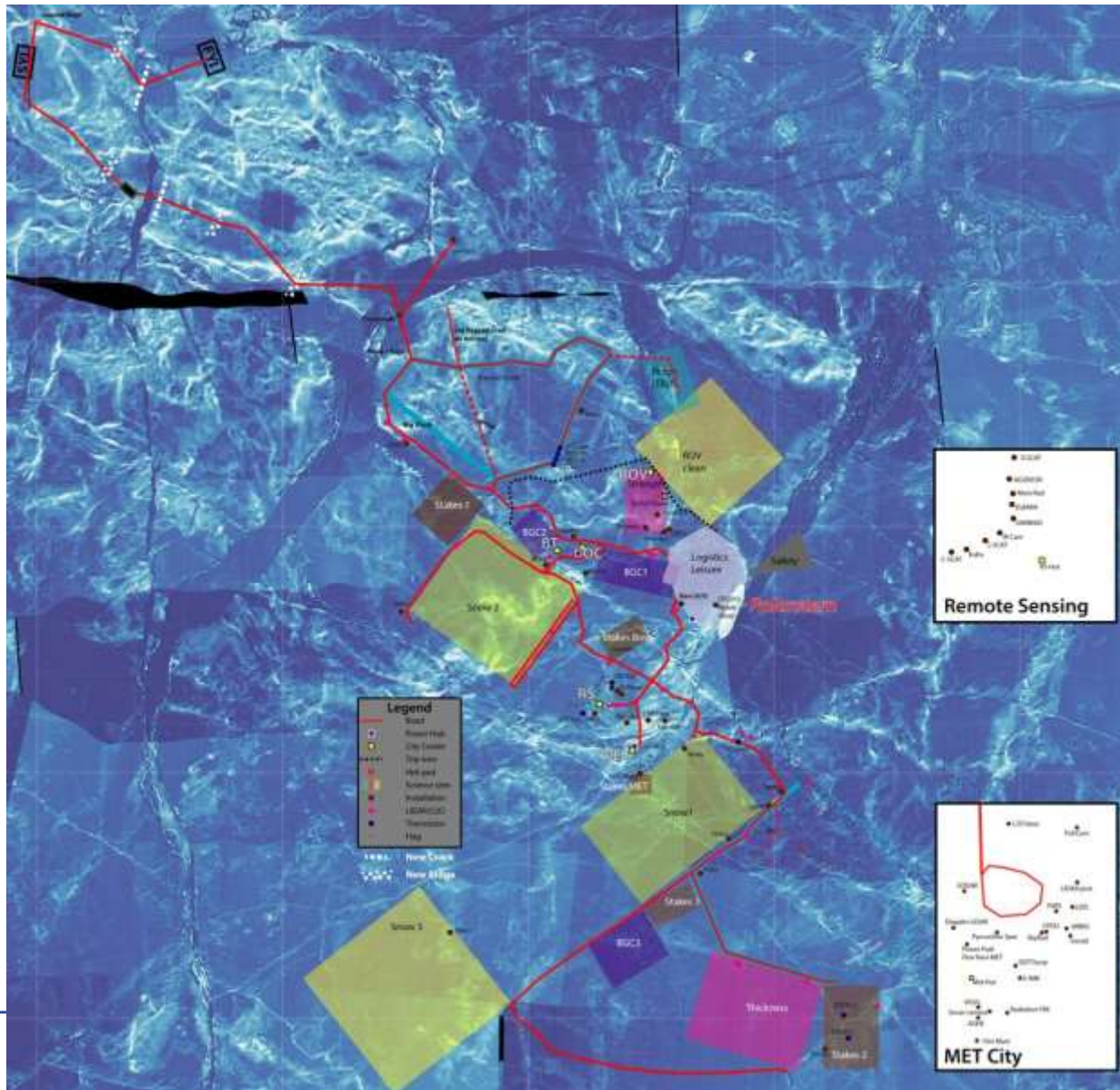
Challenges and Hazards



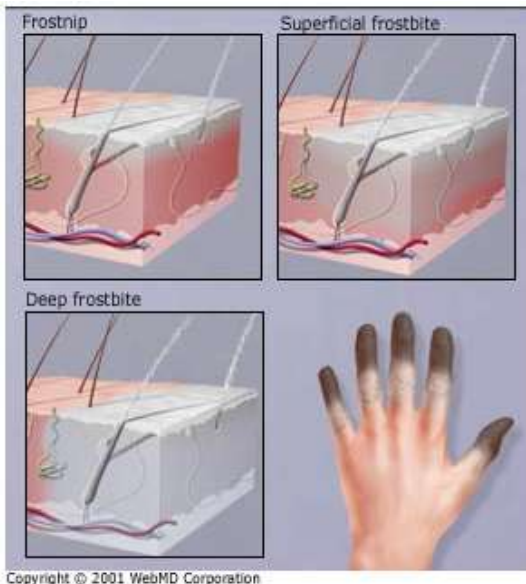
- Desorientation
- Bad visibility
- Low temperatures
- Storm
- Hypothermia, frostbite
- Darkness
- Sea Ice
- Dynamic Ground
- Wildlife

General set up of the ice floe





freezing



	Frostnip	Frostbite	Frostbite	Frostbite
	First degree	Second degree	Third degree	Fourth degree
Image				
Layers involved	• Epidermis	• Epidermis • Dermis	• Hypodermis	• Skin, muscles, tendons, and bones
Signs and symptoms	Erythema and edema	Hard edema and clear blisters	Hemorrhagic bullae, pale grey extremity	Insensate, black/grey
Rewarming	Minimal pain with rewarming	Mild to moderate pain with rewarming	Severe pain with rewarming	Painless during rewarming

First aid kits:

- In every shelter (big first aid kit)
- With every bear guard (small first aid kit)
- In emergency backpack (small first aid kit)
- In emergency box (big first aid kit)



- Indicate numbers separately
- For spelling always use NATO alphabet

Example

360°

“three six zero degrees”

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

leaving the area II , further than 3nm:
it needs even more:
Communication and orientation

+



1 Iridium Sat-Phone + spare battery

+



**1 Gps mapping device with
Inreach communicator**

+



2 VHF radios



Survival Box

Instead of



Emergency Backpack

















Transit (Dranitsyn)

27.01.-15.02.2020 (planned)





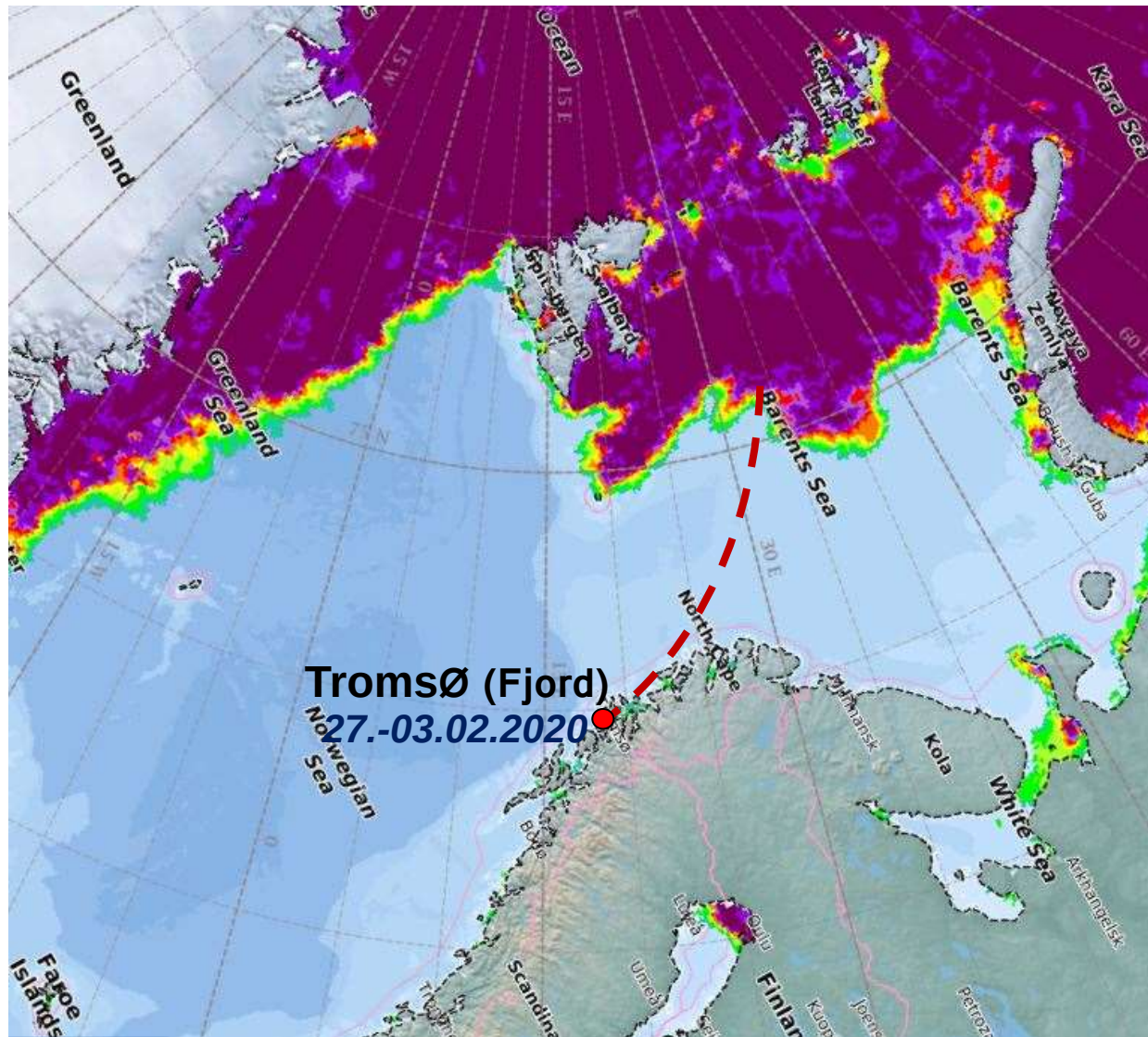




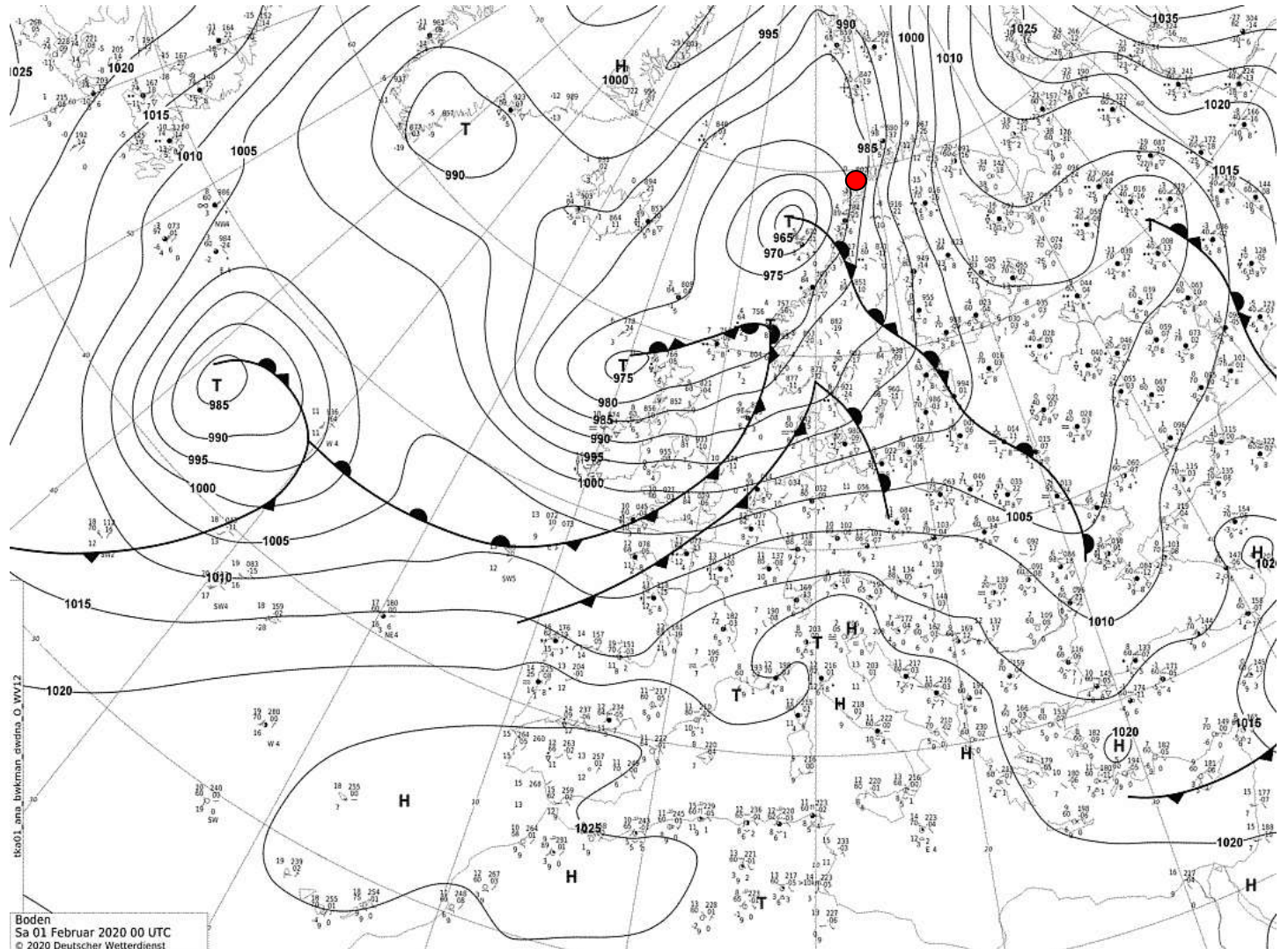








Wetterlage













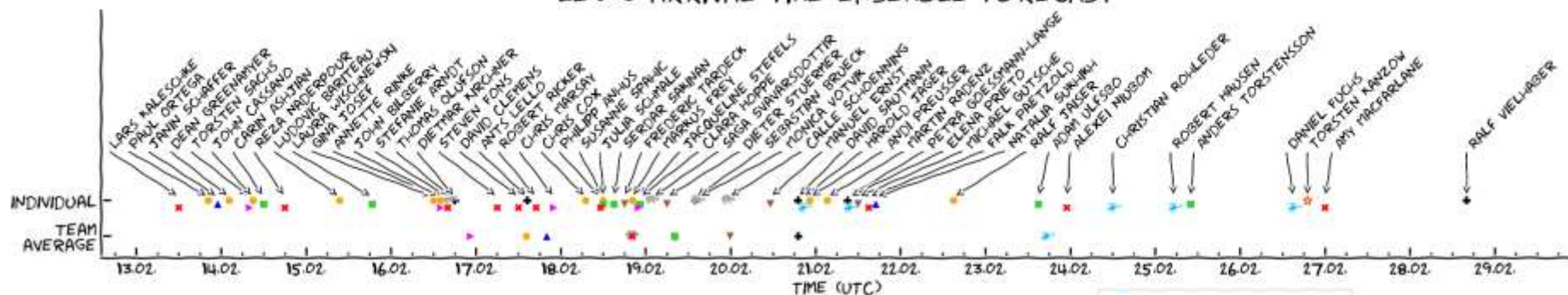








LEG 3 ARRIVAL TIME ENSEMBLE FORECAST



AVERAGE ALL: 19.02. 08:13 MEDIAN: 18.02. 20:14 (MARKUS FREY)

CLOSEST GUESSES:
SUSANNE SPAHIC (18.02. 12:00) - JULIA SCHMALE (18.02. 12:00)
ANNETTE RINKE (16.02. 14:00) - JOHN BILBERRY (16.02. 14:00)
JACQUELINE STEFELS (18.02. 22:00) - CLARA HOPPE (18.02. 22:22)
PETRA GOESSMANN-LANGE (21.02. 09:00) - ELENA PRIETO (21.02. 09:30)

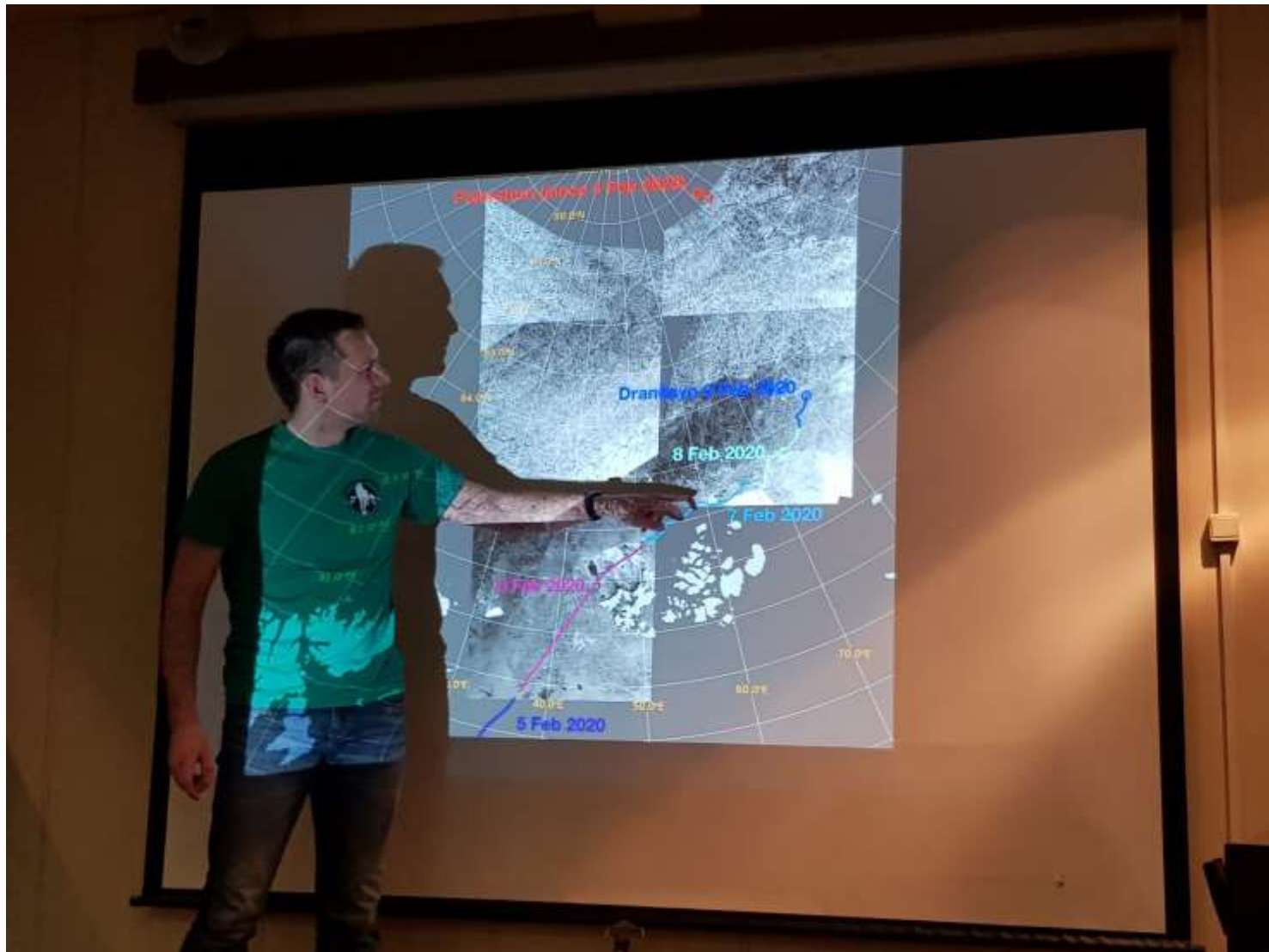
SHORTEST WINDOW: THOMAS OULFSON (10 HOURS) LONGEST WINDOW: RALF JAEGER (23.0 HOURS)

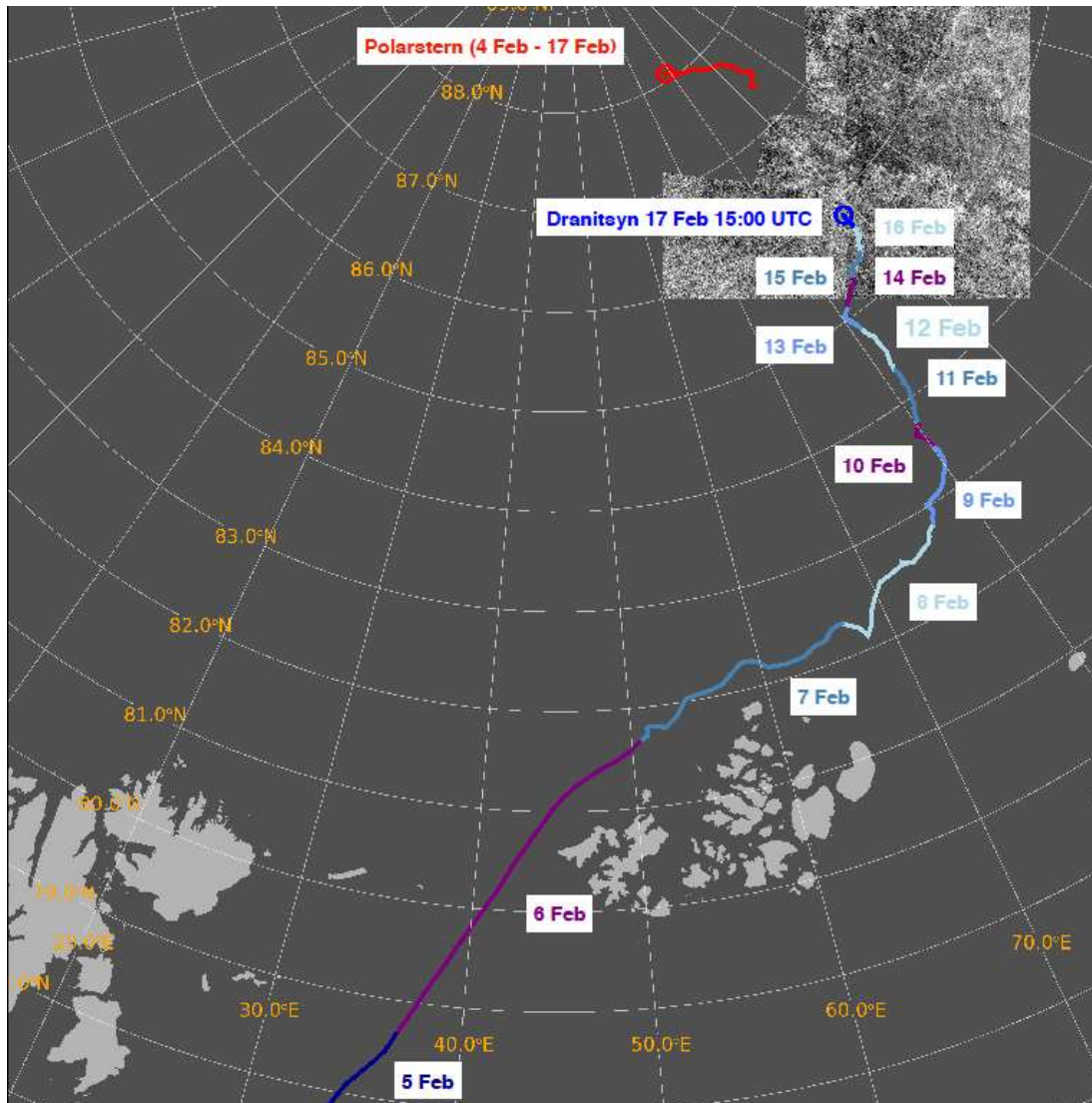


RUN: 2020-02-04-1943Z DATA: SAGA ANALYSIS: MARTIN

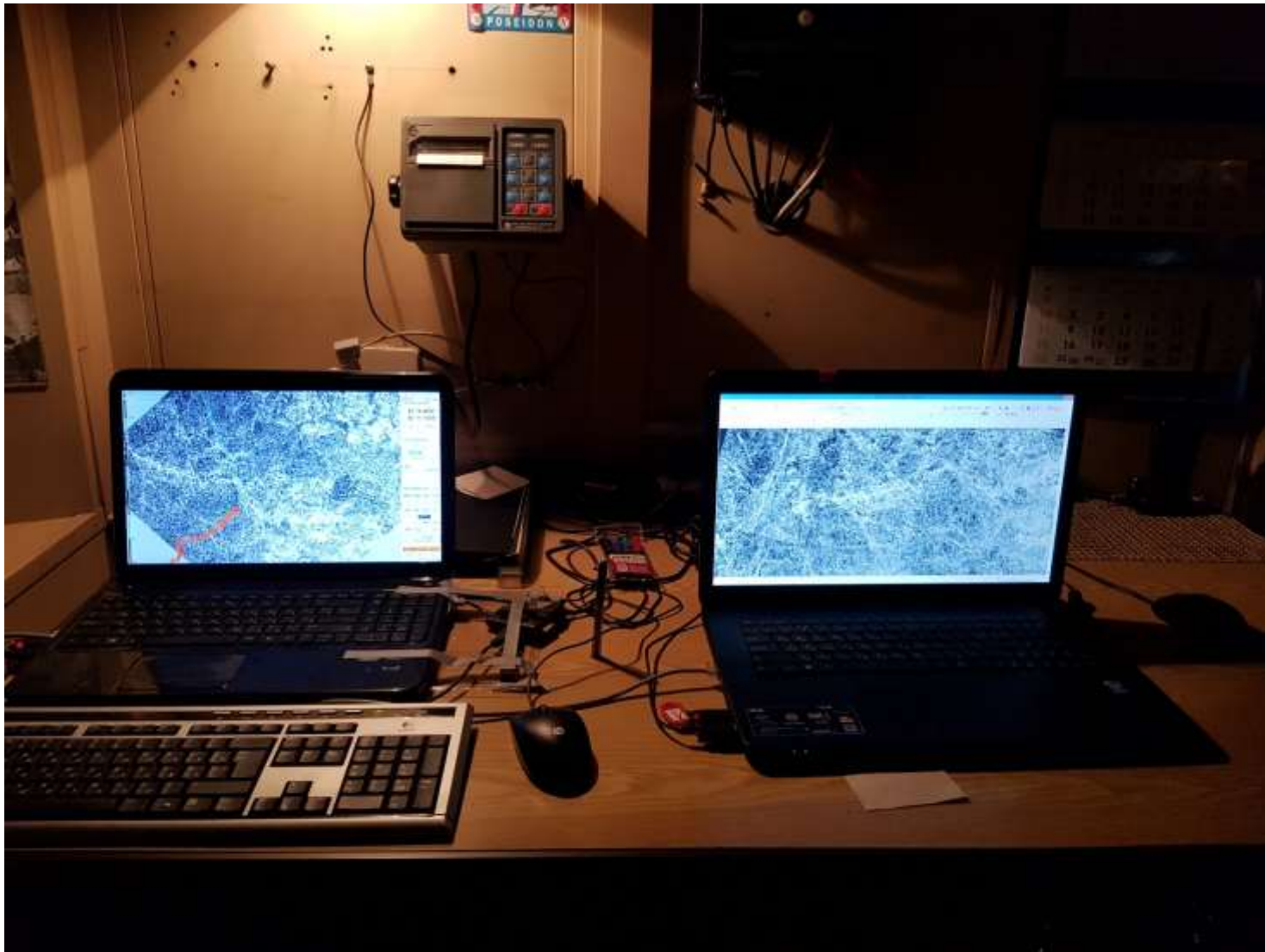






























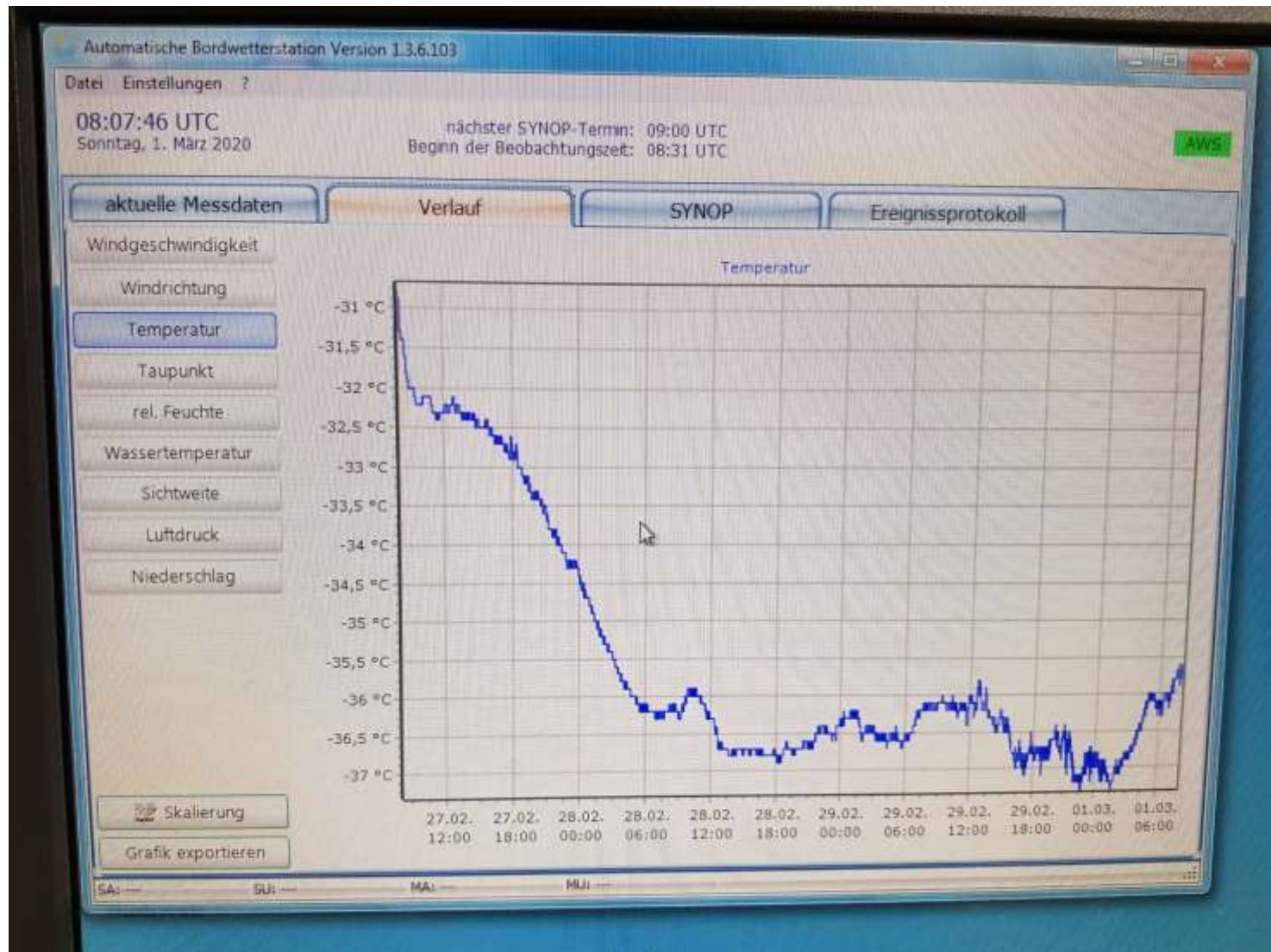




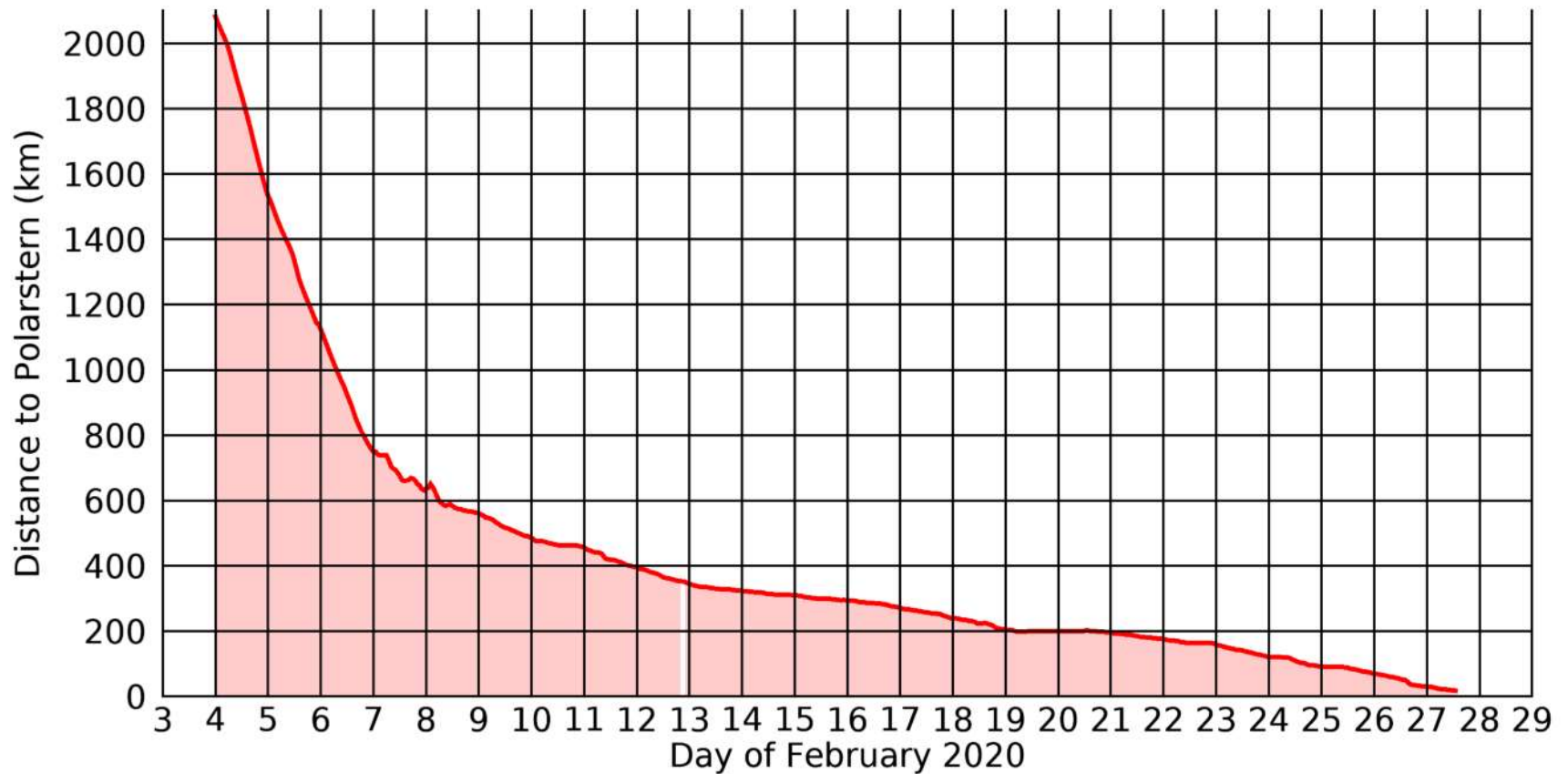




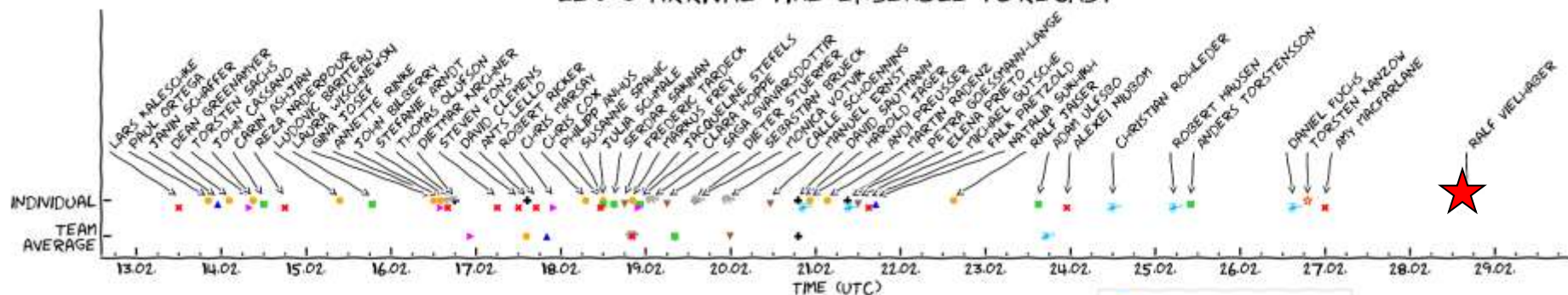








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RUN: 2020-02-04-1943Z DATA: SAGA ANALYSIS: MARTIN

Polarstern

01.03.-04.04.2020

(planned)







MOSAiC Basis-Dienstplan Bordmet (Stand: 08/2019)

<u>Deadline</u>	<u>Bericht</u>	<u>Erläuterungen</u>
[Bordzeit]		
06:00	Einarbeitung	
08:00	Frühbericht de/en	bei Seefahrt gewohnte Form; bei Eisschollenposition Übergang zu Vorherageparametern Bewölkung, Niederschlag, 2m-Temperatur, Windchill, Mittelwind/Böen incl. Schneefegen/ Schneetreiben, Kontrast/ Horizont/White Out; Versorgung externer Flugkampagnen & luftgestützter DBLK-Versorgung per Mail
08:15	Colourfest-Landewetter-Mittelfrist	Mittelfrist-Landewettereinschätzung für das POLARSTERN-Umfeld (Datei „colourfest DBLK.xls“ mit readme-Tabellenblatt). In pdf-Datei drucken und per Mail an Fahrleiter, Kapitän, Heliservice senden, bedarfsweise an externe Flugkampagnen & luftgestützte DBLK-Versorgung; im Intranet einpflegen?
08:15	Flugbriefing Bordwetterwarte	Schwerpunkt auf aktuellem Tag und Nacht incl. umfassender individueller Flugwetterberatung der Piloten unter Anwendung des Flugwetter-Wortschatzes/PAF-Syntax; wichtig ist konkreter Ausblick auf Tage 2 und 3, Colourfest-Bezug, bei Seefahrt alternative Fahrtgebiete einbeziehen
06:00-20:00	Arbeitszeitpausen	(i.d.R. max. 10h Regelarbeitszeit, mit Begründung ab und zu bis 13h mgl., nur im Notfall >13h)
	Flugwetterberichte de/en /PAF/METAR/ Wetterüberwachung	für Bordhelis, SAR; An Tagen mit geplanten Anflügen für DBLK-Ablösungen und für externe Flugkampagnen (v.a. Mitte 03/20-09/20) Übergang zu fortlaufenden englischen 6h-Flugwetterberichten/ PAF's → innerhalb von 12 Stunden können theoretisch 3 Berichte ausgegeben werden, die 18 Stunde des Tages fortlaufend abdecken, METAR-Frequenz nach Bordmet-Ermessen. ACHTUNG: Keine Zuständigkeit für Basisflugfeld Longyearbyen/Station Nord/Streckenberatung der Forschungsfleger!
	Landewettermeldungen	Alle 6 Stunden; aber nur an geplanten Flugtagen während Flugkampagnen und DBLK-Ablösungen, mittels Datei „DBLK-Landing_Conditions.dotm“; bei tatsächlichen Anflügen Erhöhung der Meldefrequenz auf 3-stündlich, auf Anforderung auch kurzzeitig stündlich oder halbstündlich; In pdf-Datei drucken und per Mail an Fahrleiter, Kapitän, Funker und externe Flugkampagnen senden.
	Wetervortrag für Meeting erstellen	maximal 5-10min, englisch, kein Entertainment mit Musik/Fotos/Heimatwetter/Spezialthemen, klare Beschränkung auf Wetterlage, geeignete meteorologische Grafiken/Hintergrundinfos, Vorhersage Nacht+1.Folgetag, Tendenz Folgetage 2+3, grober Outlook für Tage 4+5, geeignet sind v.a. Zeitreihen und/oder tabellarische Zusammenfassungen am Ende des Vortrages
	Zusatzaufgaben	(vgl. Tabelle '190327-MOSAIC-Zusatzaufgabenabfrage DWD.pdf)
	individuelle Beratung	MOSAiC-Aktivitäten incl. Versorgungsschiffe, Notfälle, externe Flugkampagnen
18:00	Abendbericht de/en	(vgl. Frühbericht)
18:30-18:45	Meeting/Wetervortrag	für alle Fahrtteilnehmer
18:45-19:30	Science Board Meeting	Entscheidungsfindung für kommende 24h, beteiligt sind nur Entscheidungsträger und Bordmet
19:30-19:45	General Meeting	für alle Fahrtteilnehmer, Verkündung der Pläne für die nächsten 24h, Diskussion



Expedition: PS122 Leg 3

Position: 88°08' North - 30°27' East
MOSAIC floe

Report No. 017

Tuesday 03.03.2020, 18:00 Ships time

Weather situation today 15 UTC:

A high pressure system near the north pole is moving under intensification towards Nowaja Semlja and will continue to dominate our weather situation - probably until Friday. In that calm and clear conditions we will remain in a relatively dry and cold airmass.

Forecast until Wednesday morning:

Nordwest 2-3 Bft, shifting to Southwest, a few diamond dust, mainly good vis, in 30 m around -34 degrees, on the flow around -40 degrees, wind chill -50 degrees

Forecast until Wednesday evening:

Southwest 3 Bft, a few diamond dust, mainly good visibility, in 30 m around -35 degrees, on the ice around -40 degrees, wind chill -50 to -60 degrees

Outlook until Thursday

Southerly winds 3 Bft, a few d

Trend until Friday evening

South 3 Bft, backing to the E as possible, diamond dust, "mild degrees



colourfcst

(Colour table for DBLK-landing conditions)

issued 09.03.2020

08:15 Local Time

date weekday probability of detection	Landing conditions for DBLK-environment					
	09.03.20 Monday	10.03.20 Tuesday	11.03.20 Wednesday	12.03.20 Thursday	13.03.20 Friday	14.03.20 Saturday
	90%	80%	70%	60%	trend	trend

destination	day-period						
DBLK-environment	00-12 a.m.	n	p	p	n	n	p
	12-00 p.m.	n	p	p	n	n	p

Remarks:

> g = good m = marginal p = poor n = nil (whiteout)

> Individual assessment reflects only the prevailing day state and not a continuing day state.

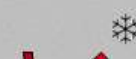
> Maximum 1 step offset for successive time intervals.



Wettervorhersage: Zusammenfassung

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



		Abends/ Nachts	Morgen (Mittwoch)		Trend	
			Vormittag	Nachmittag	Donnerstag	Freitag
	Richtung					
	Bft	5-6 ↘ 4	4 ↗ 5	5 ↗ 6	7-8	7
	m/s	7-11	6-9	8-12	15-18	13-17
						
	10-30 %					
		1-3 km	1-4 km	1-2 km	50 m	50 m
	10-30 %	< 500 m	< 500 m	< 500 m		
	°C	-38 ↗ -33	-30 bis -33	-27 bis -30	-27 bis -32	-25 bis -30
	/ 30m ☾ ★					
	°C	-50 bis -55	-40 bis -50	-40 bis -50	-45 bis -50	-45 bis -50
	70 - 90 %					

MOSAiC Leg 3

2020-03-10

Bordwetterwarte Polarstern

Meteorologe: Robert Hausen

 	
Expedition: PS122-3	Position: 84.8° N 13.7° E , MOSAIC-Flow
Flight Weather Report	03.04.2020, 12 UTC valid until: 16 UTC 14 Ship's time valid until: 18 Ship's time
No.: 27	Ship course/expected position at the end of PAF-validity: Drift with speeds of 0.4kt towards Southwest
	Sunrise: alway Ship's time Sunset: vis Ship's time

Wind observations and forecasts in unit knots 'kt' and respecting TRUE NORTH, TN !

1. Weather situation:

The low north of Franz-Josef-Land loses further influence on our weather and high pressure gains the upper hand in the course of the day from Northeast. A cold, but increasingly drier airmass will be advected.

2. Flight weather area forecast:

Clouds and Weather:

Remnants of FEW/SCT SC with bases between 1500 and 3000 FT AGL. Otherwise no significant clouds. During take-off and landing enhanced risk of whiteout due to fresh fallen snow.

Visibility:

Prevailing very good with 30-40 km. PROB30 TEMPO limiting to about 5 km with patches of mist in a few directions.

Wind:

Near Surface around 20kt from North-Northeast, in 500-1000 ft AGL 25-30 kt from Northeast.

3. Weather at landing site:

METAR = Meteorological Aerodrome Routine Report

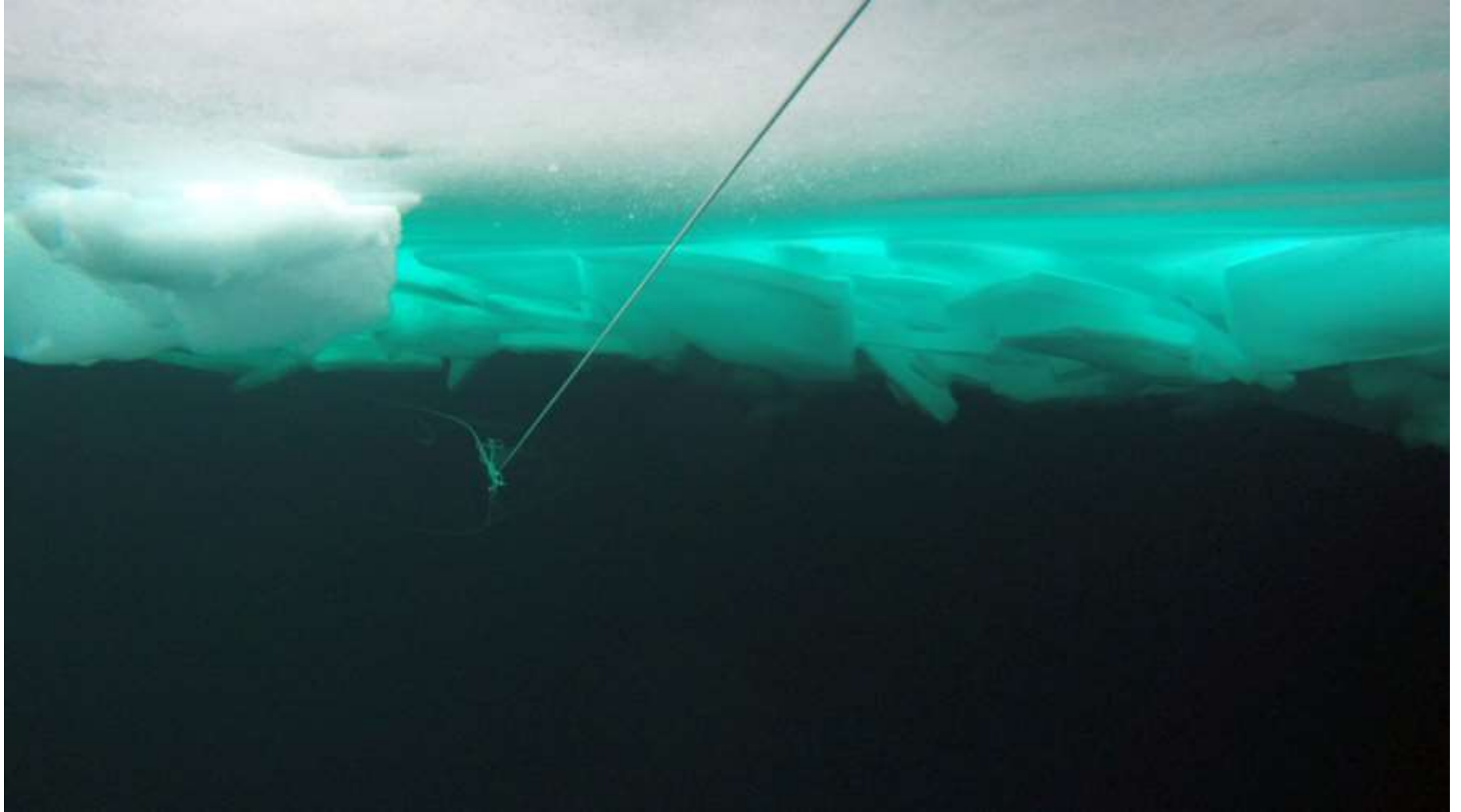
PAF = Polarstern Airfield Forecast

METAR DBLK 031050Z 01021KT 8000 DRSN VCFG FEW008 M26/M28 Q1011

**PAF DBLK 031120Z 0312/0316 03020KT 9999 DRSN SCT030
PROB30 TEMPO 0312/0316 5000 BR SCT015**





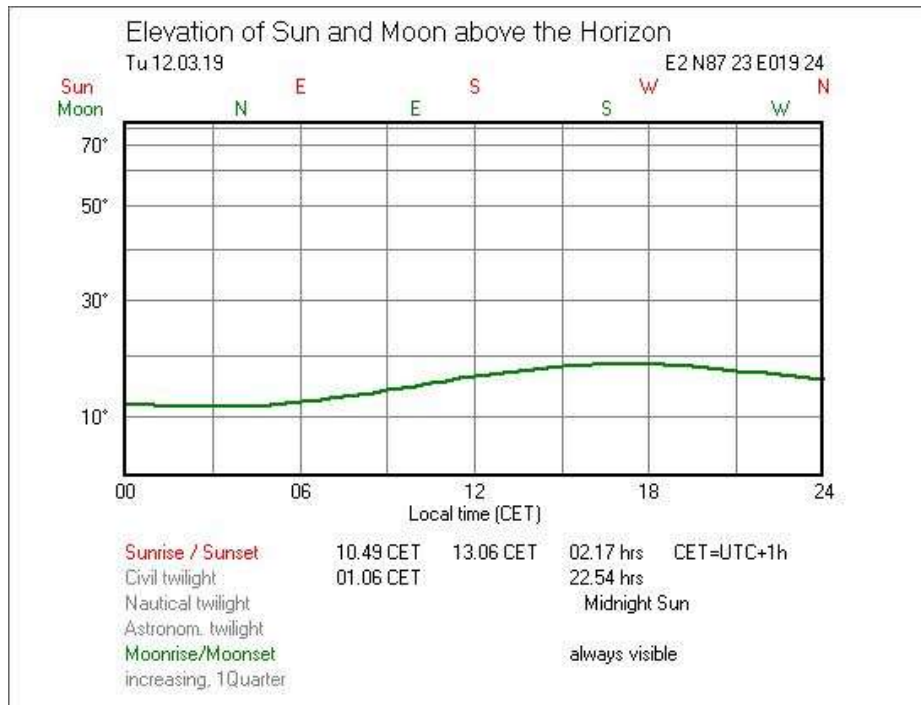






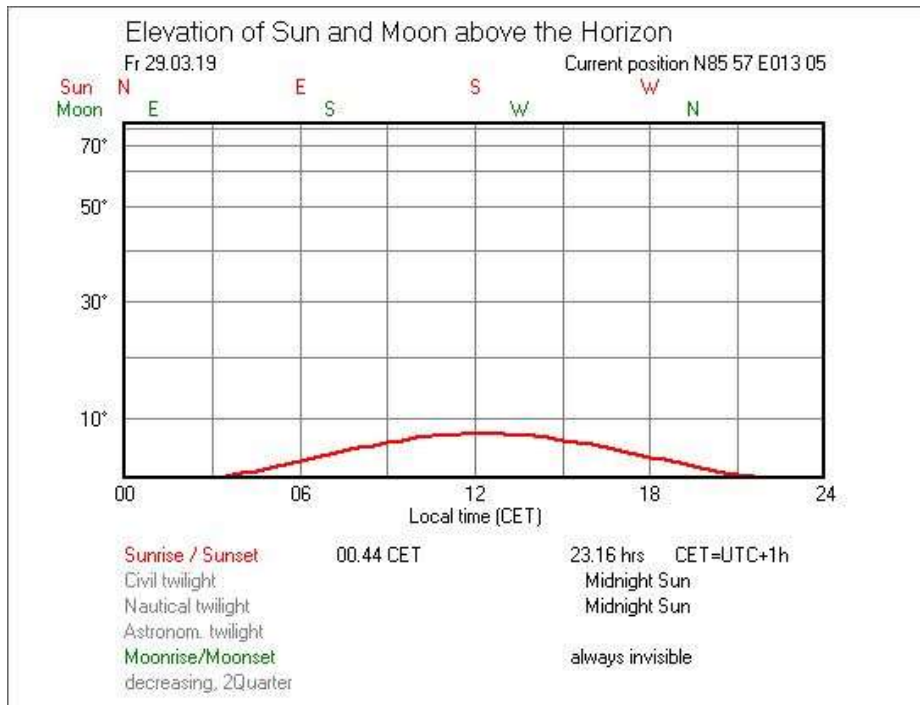
first sunrise

Tuesday, 12.03.2020



last sunset

Friday, 29.03.2020











(A) Scenarios for the whole team

Scenarios described here can be combined with those for few individuals described under (B)

(A.1) Flight operations

(A.1.1) With AN74 via Svalbard

- Svalbard closed due to Corona crisis (date 14 March)
- Runway (extended 1,2 km) not available (info Chief scientist / Capt. Date XXX)



(A.1.2) Original backup (a): Long distance helicopters via fuel depot at Cape Baranov

- Russia closed due to Corona crisis (date 18 March)



(A.1.3) Original backup (b): Long distance helicopters via Longyearbyen

- Svalbard closed due to Corona crisis (see above)



(A.1.4) Original backup (c): Combined operation of AN74 plus helicopter via Svalbard and Camp Barneo

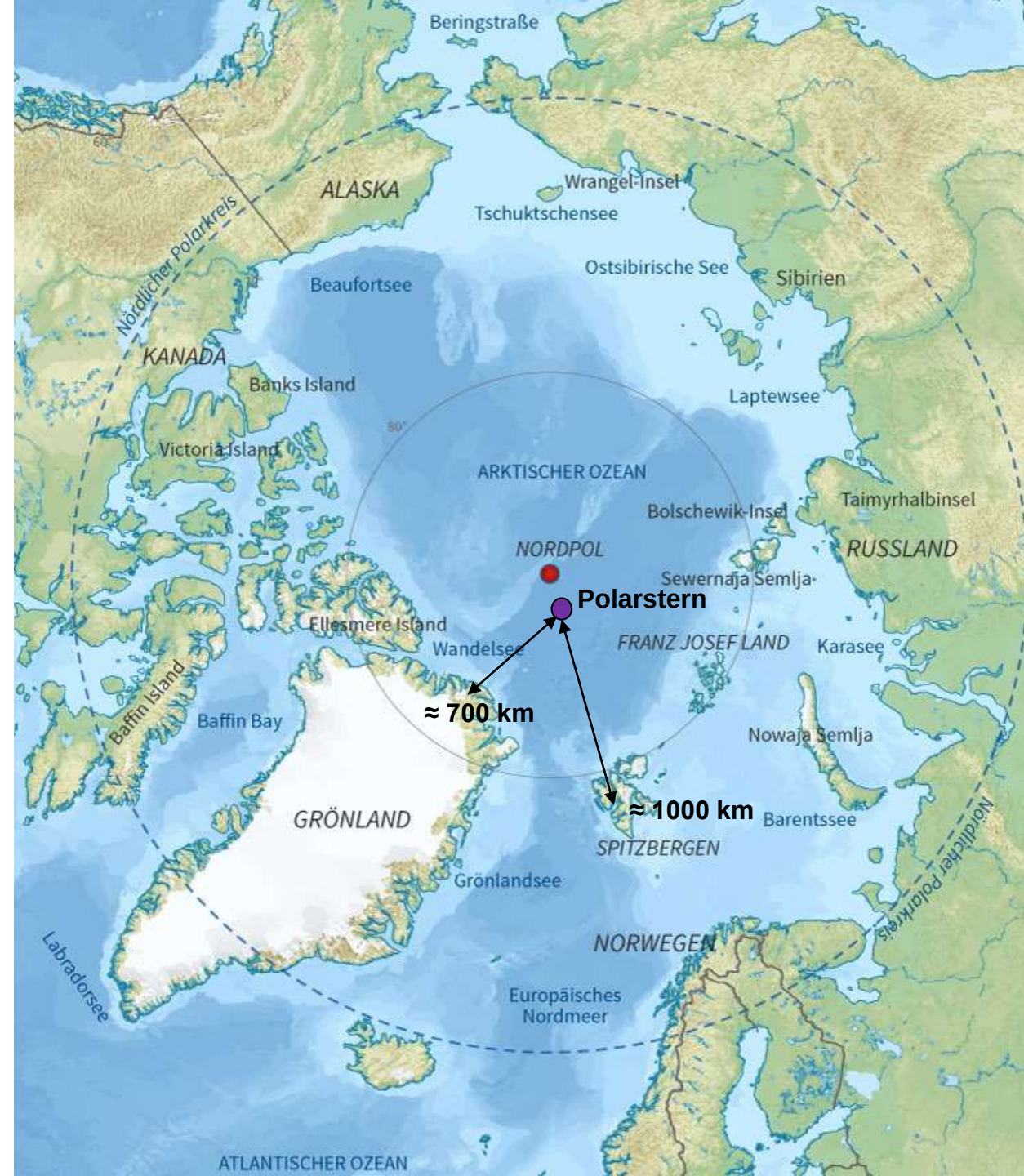
- Svalbard closed due to corona crisis (see above)
- Camp Barneo operation was cancelled (date 18 March)



Range of operating helicopter on board:
Max. ≈ 350 km



Range of military Super Puma:
Max. 1000 km

























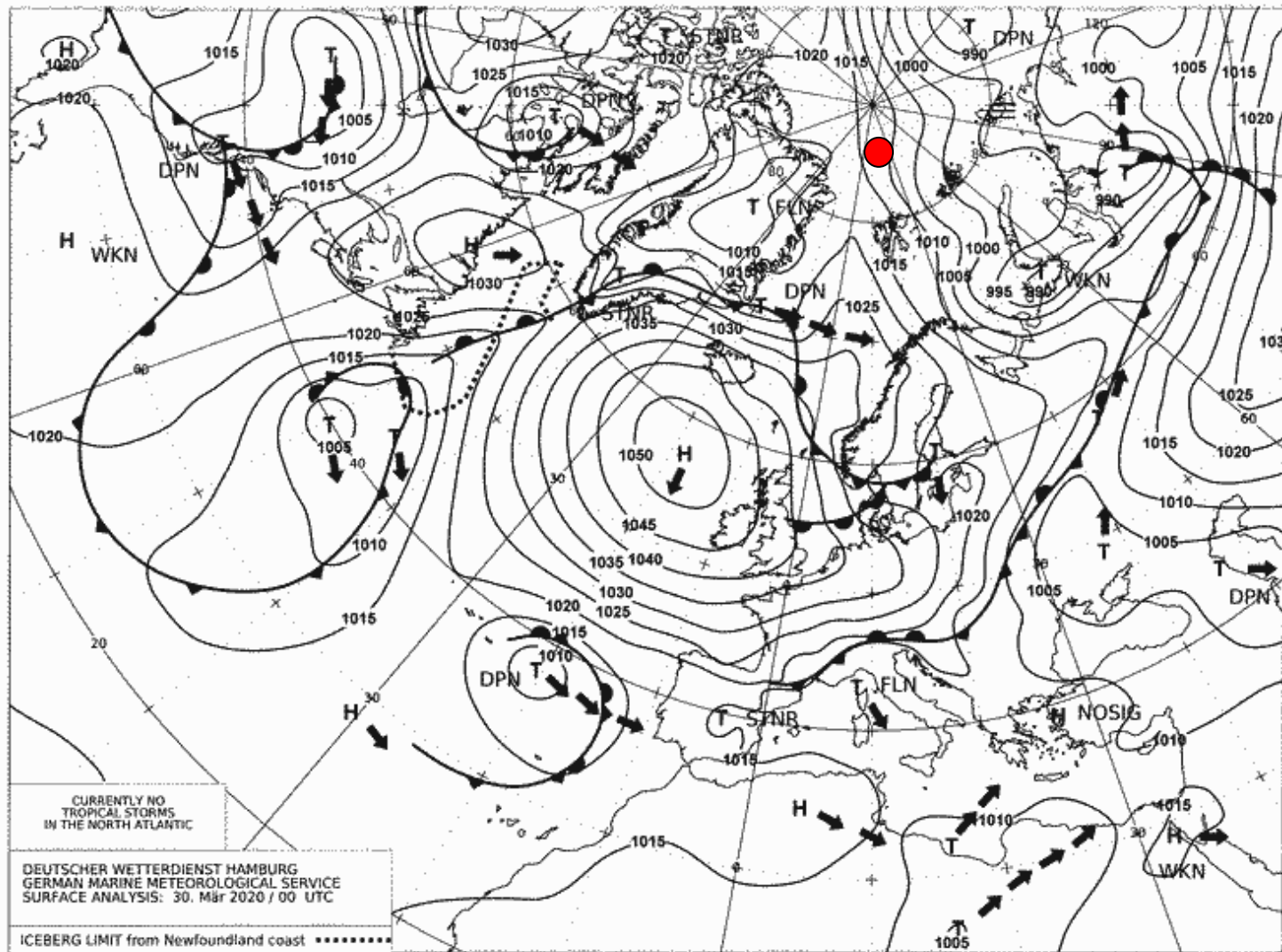


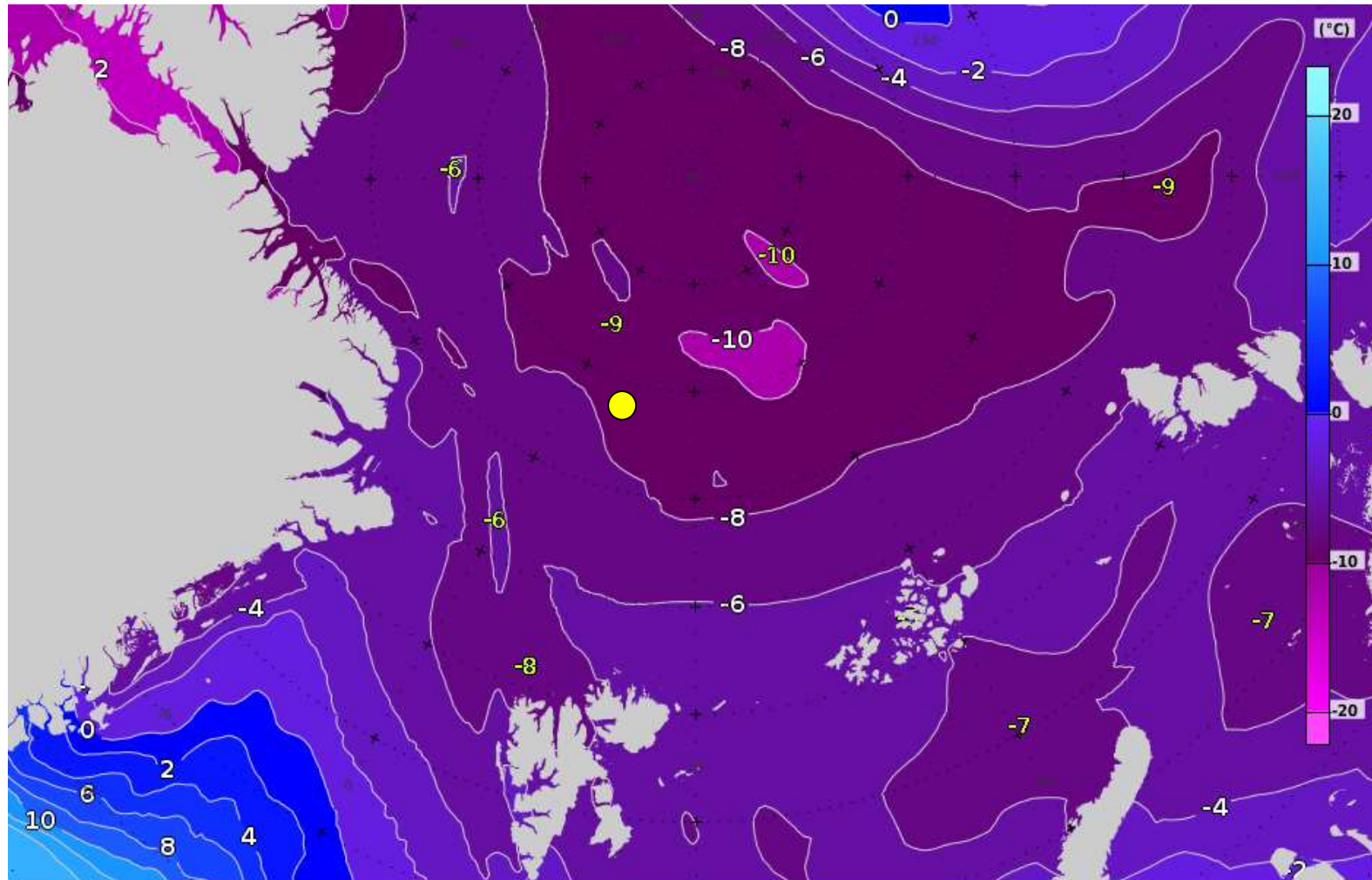




weather situation

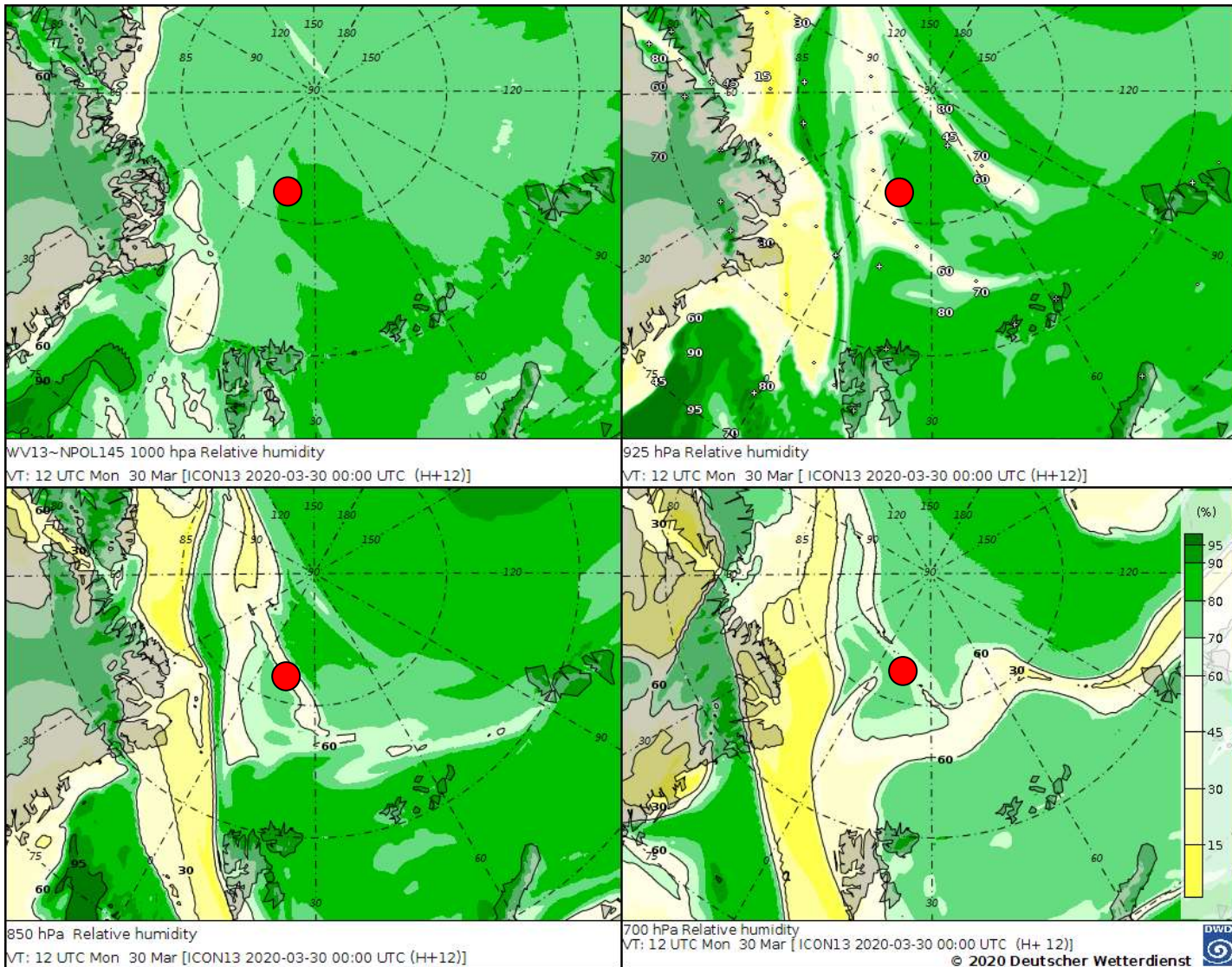
30.03.2020

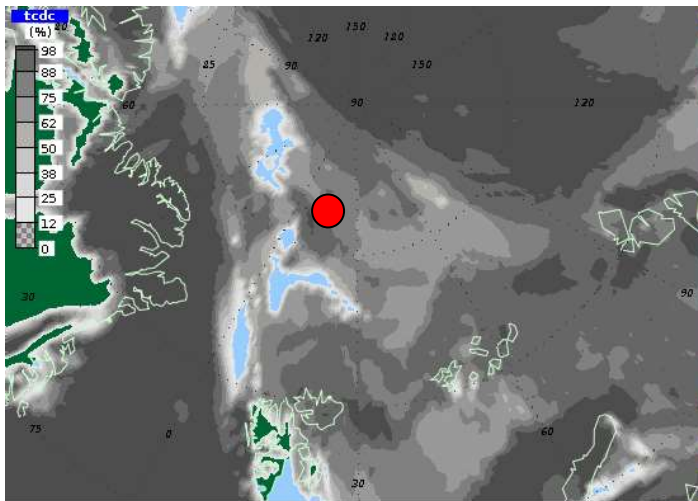




WV13~NPOL145 Equivalent potential temperature, 850 hPa
VT: Monday, Mar-30-2020 12 UTC [ICON13 2020.03.30 00:00 UTC +12]

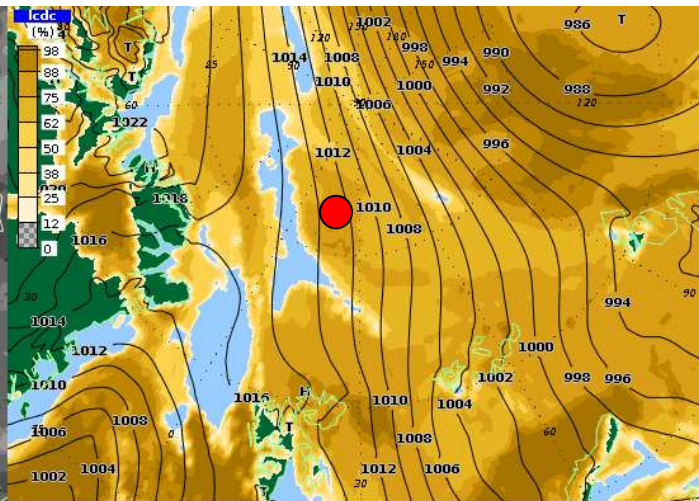
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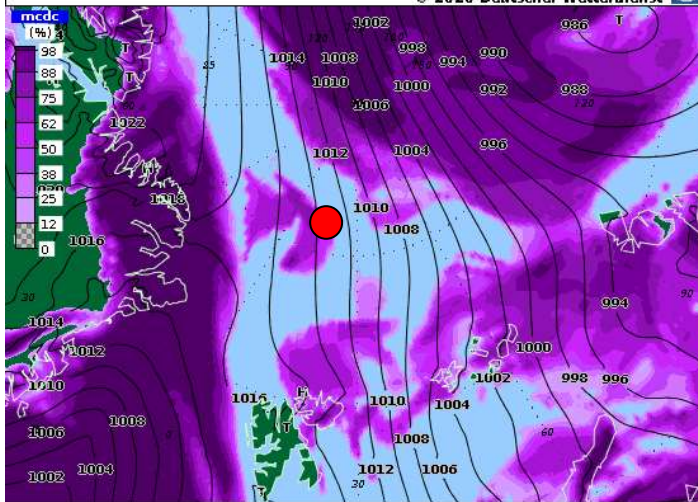
WV13~NPOL145: Total cloud cover
VT: Mon. 30.Mar 2020 12:00UTC [ICON13 00 +12h]

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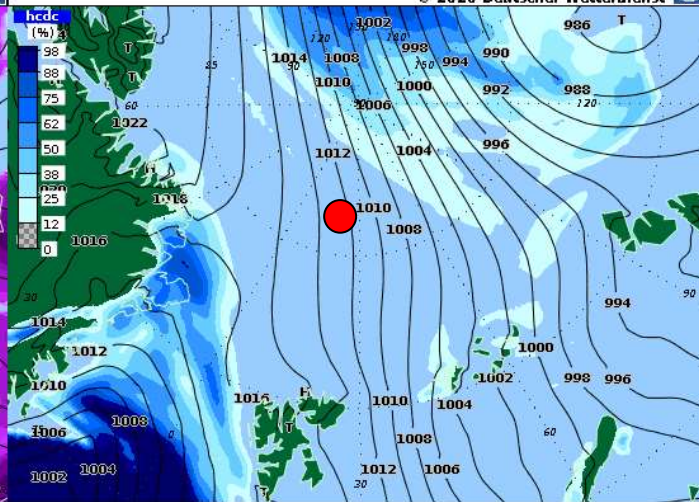
Low level cloud cover, Pressure reduced to MSL
VT: Mon. 30.Mar 2020 12:00UTC [ICON13 00 +12h]

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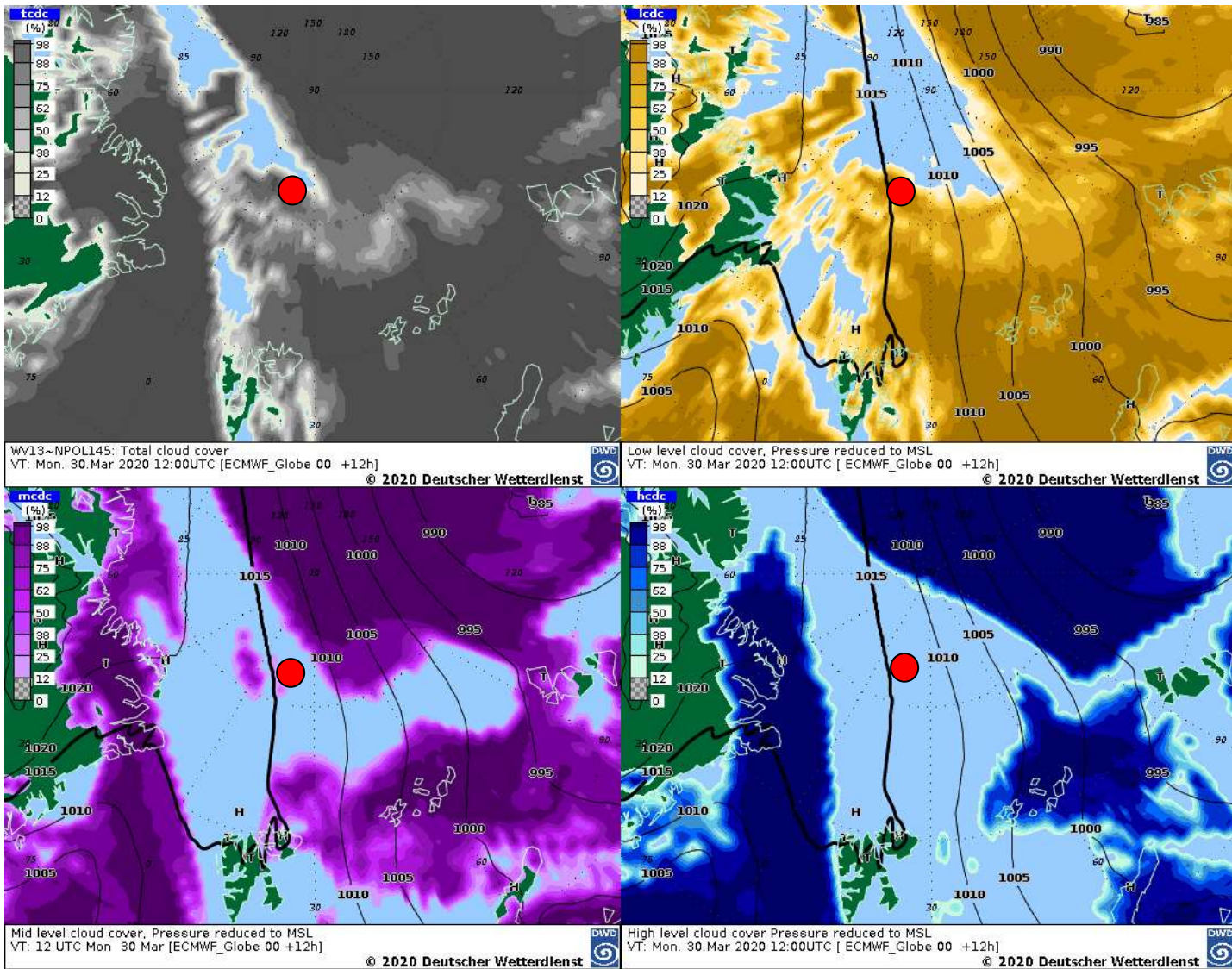
Mid level cloud cover, Pressure reduced to MSL
VT: 12 UTC Mon. 30 Mar [ICON13 00 +12h]

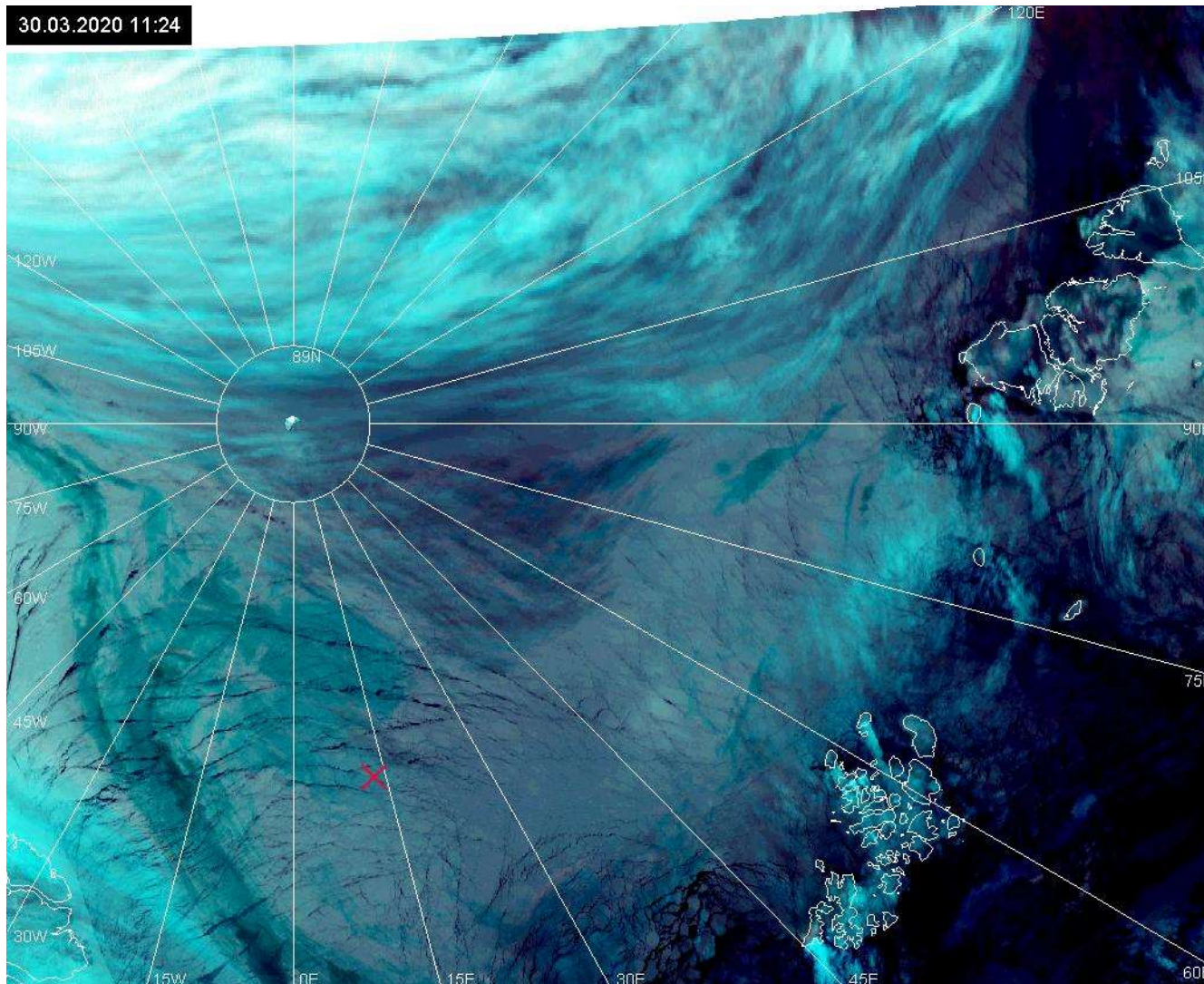
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High level cloud cover Pressure reduced to MSL
VT: Mon. 30.Mar 2020 12:00UTC [ICON13 00 +12h]

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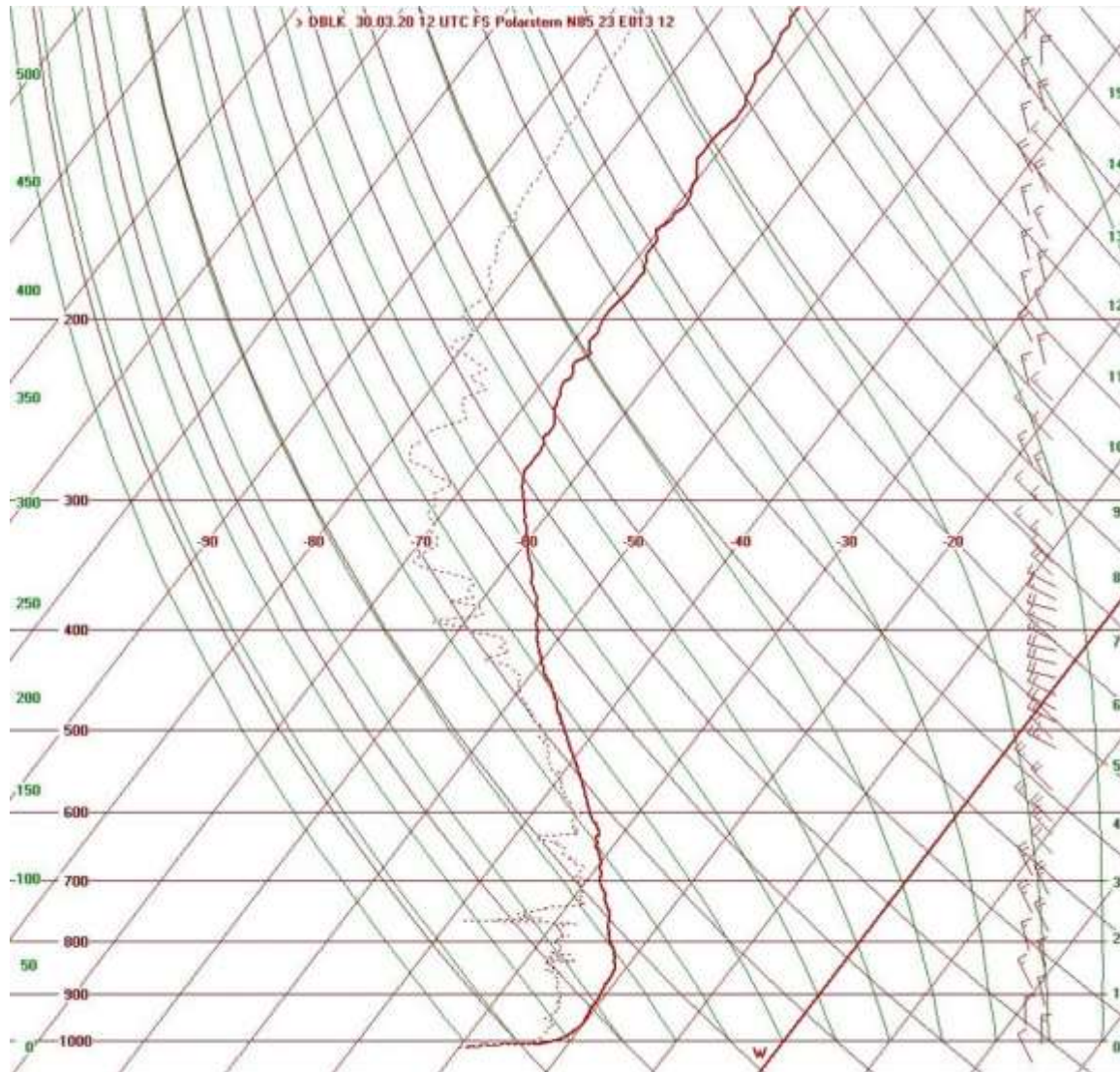










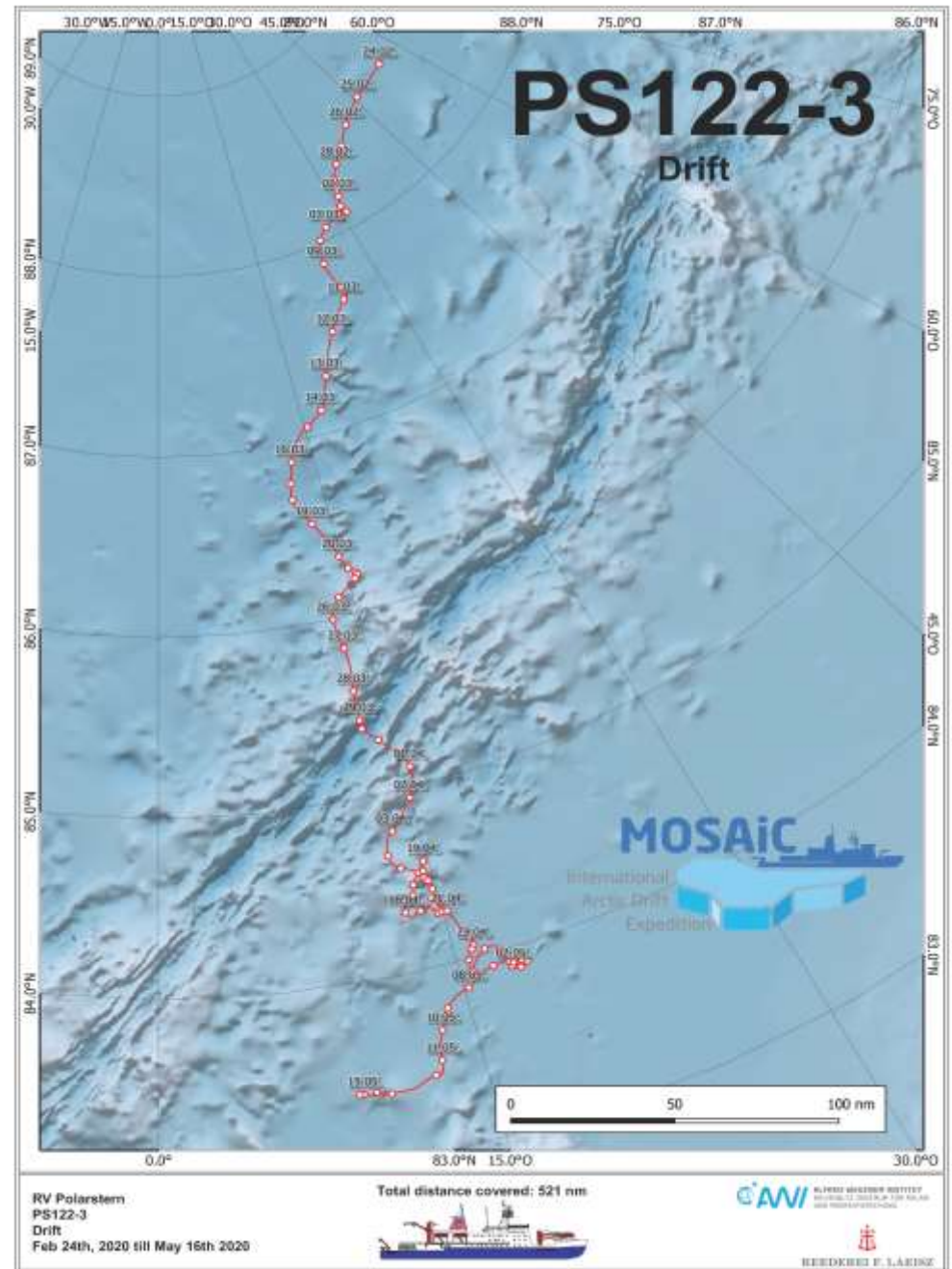


Snow for David. Clouds at 200ft for Team Atmos.



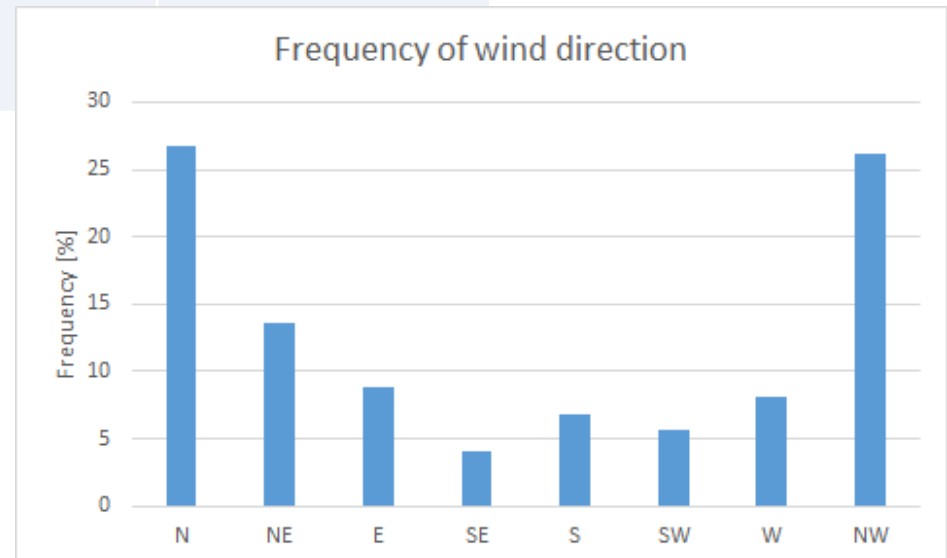
statistics Leg 3

- drifted distance: 521 nm
- highest drift speed: 0.97 kn = 1.8 km/h (13th May)
- helicopter flight hours total: 120
- maximum time of flight hours per day: 8 Std 27 Min



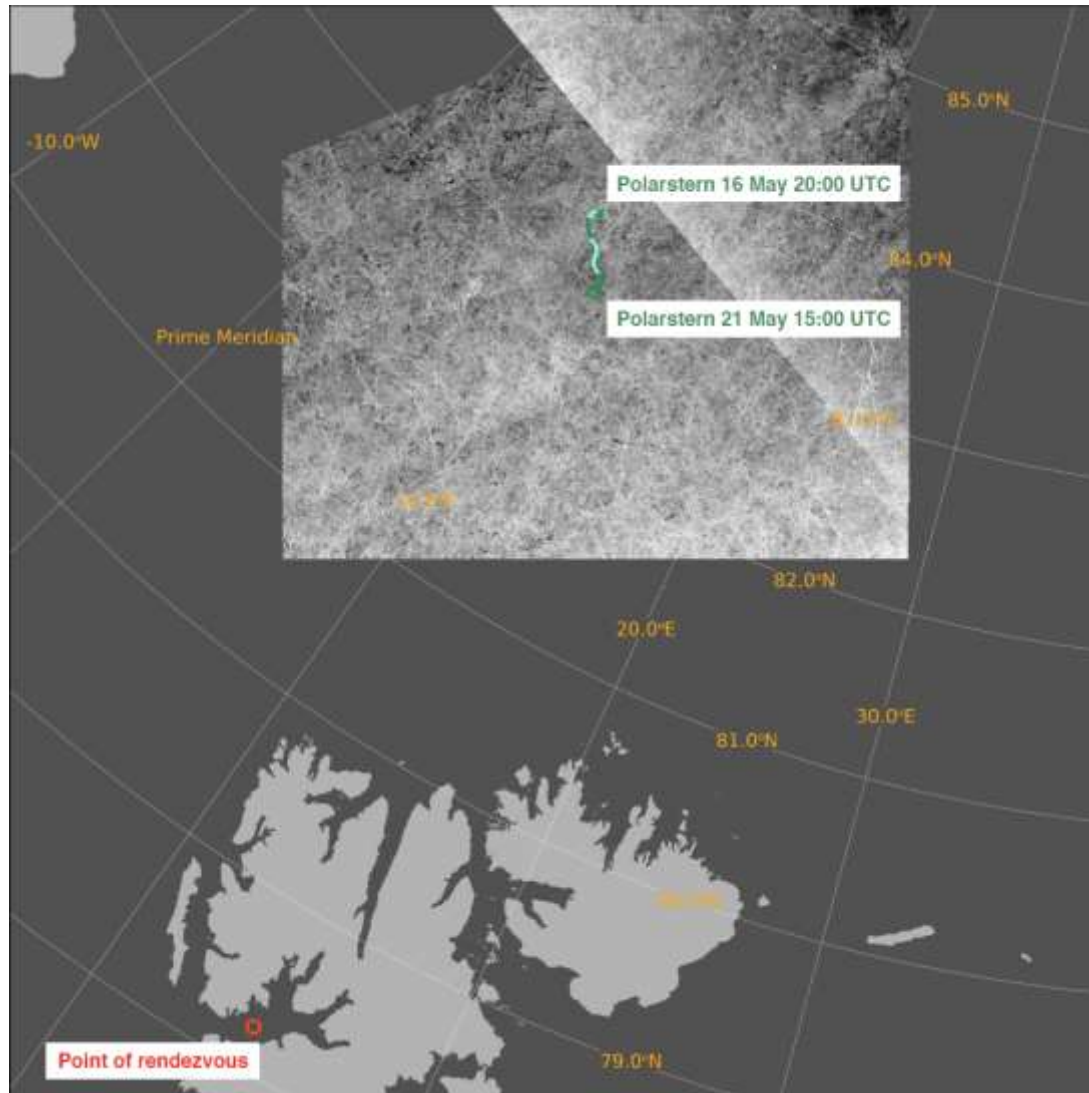
Meteorological statistics Leg 3

parameter	Min	Max	Ø
temperature	-42.3°C	0.0°C	-21.6°C
windchill	-61.2°C	-2°C	-34°C
pressure	973.9 hPa	1030 hPa	-
Wind speed (10min- average)	0.1 m/s	25.1 m/s	8.9 m/s

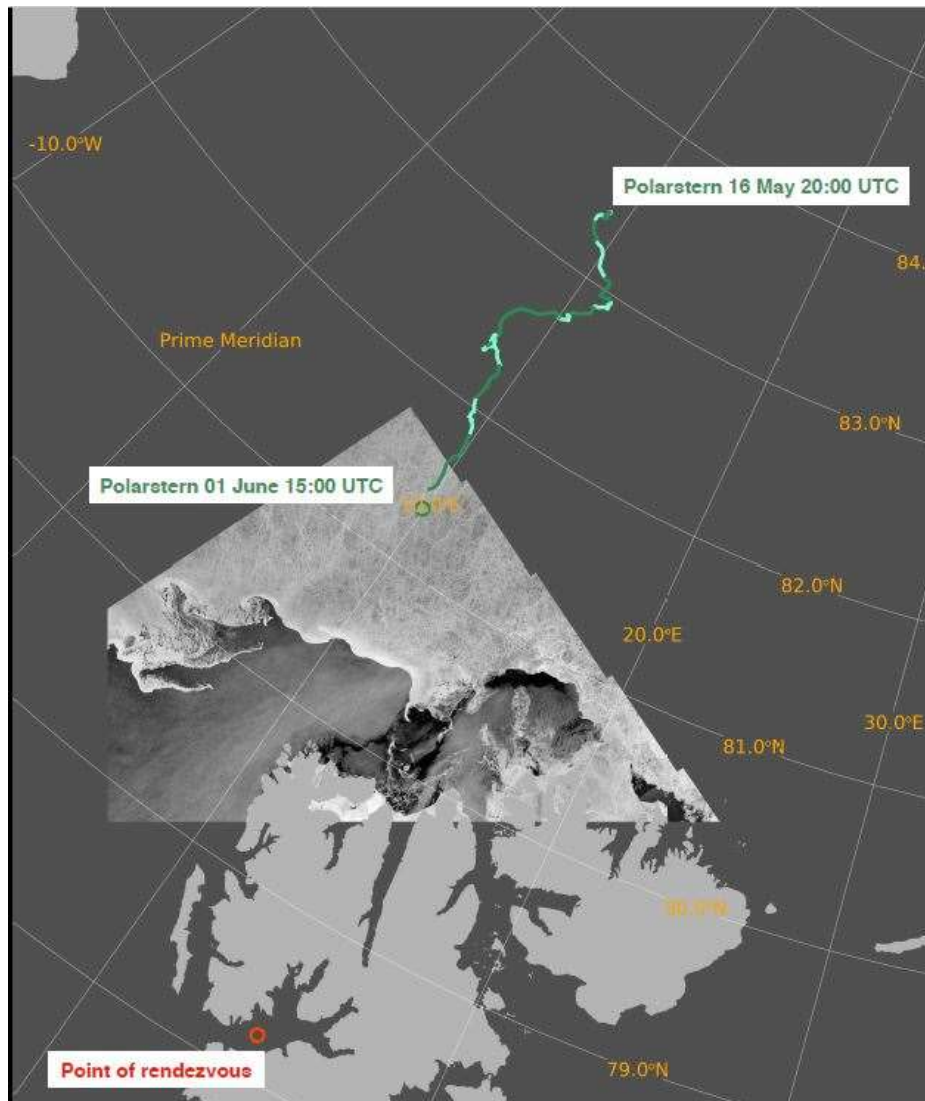


return journey Polarstern-Isfjord

15.05.-20.05.2020 (planned)

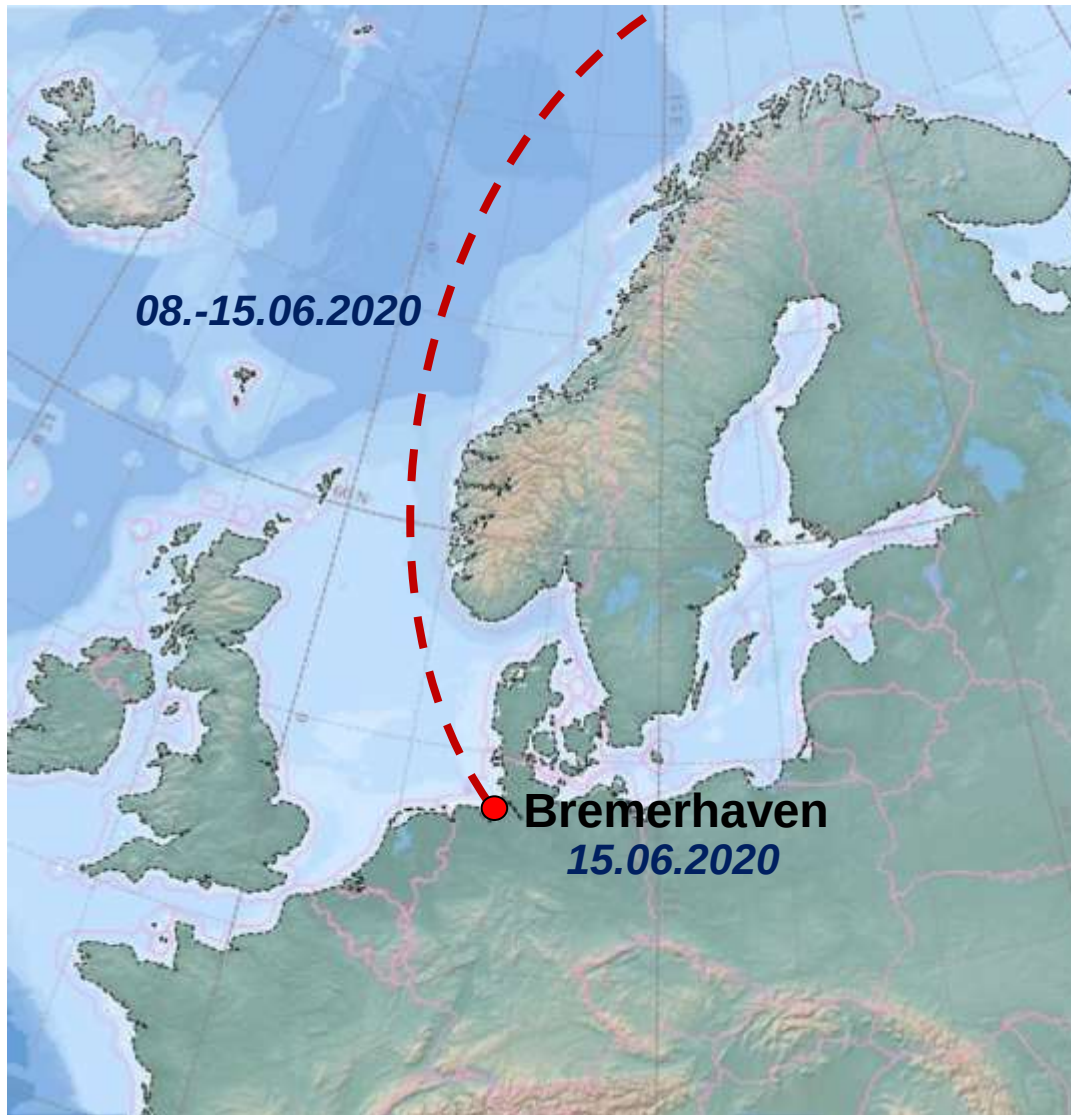




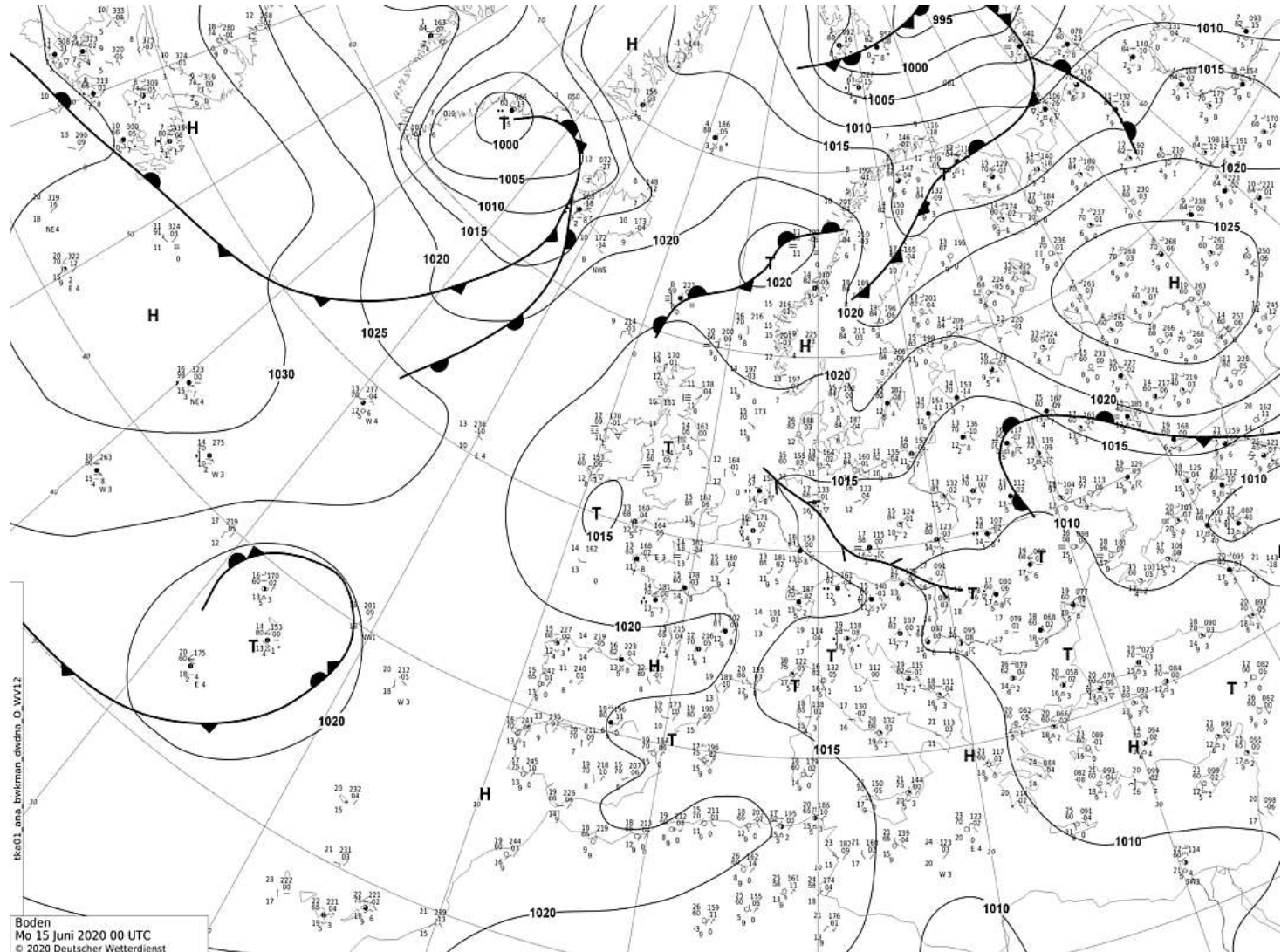








Weather situation









1100 kg



1040 kg



9600



1960 kg



1440 l



76

***Thank you very much for
your attention!***

robert.hausen@dwd.de