

Arctic Amplification: Climate Relevant  
Atmospheric and Surface Processes, and  
Feedback Mechanisms (AC)<sup>3</sup>

# ACLOUD

May 22 - June 28, 2017

Longyearbyen, Spitzbergen



<http://ac3-tr.de/>

+ KIT + MPI + LaMP + Uni Mainz

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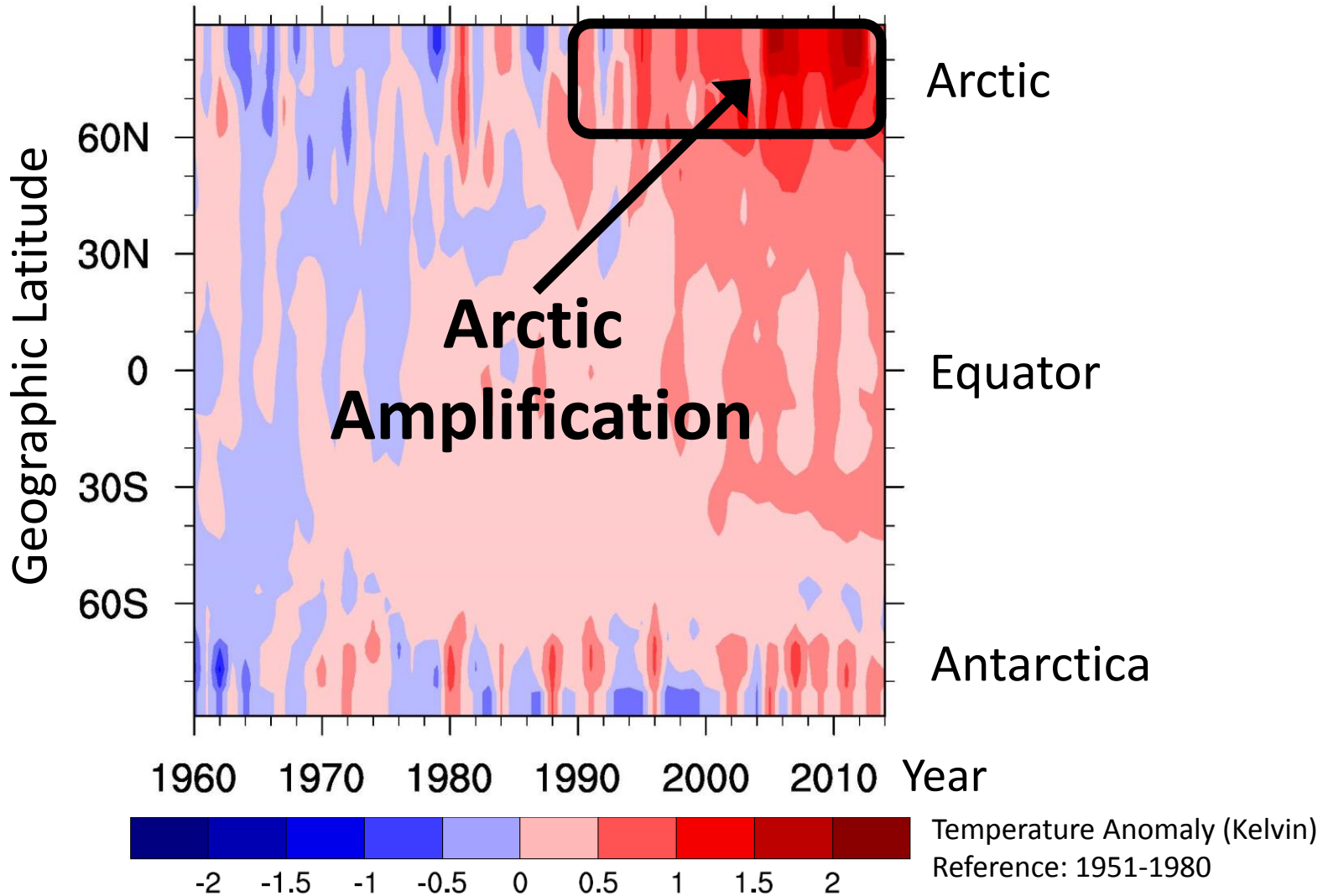


Clouds over the Beaufort-Sea, Northern Territories.  
**RACEPAC 2014** campaign with Polar 5 & 6.

1. Why are we here?
2. What do we want to do?
3. How do we organize ourselves?



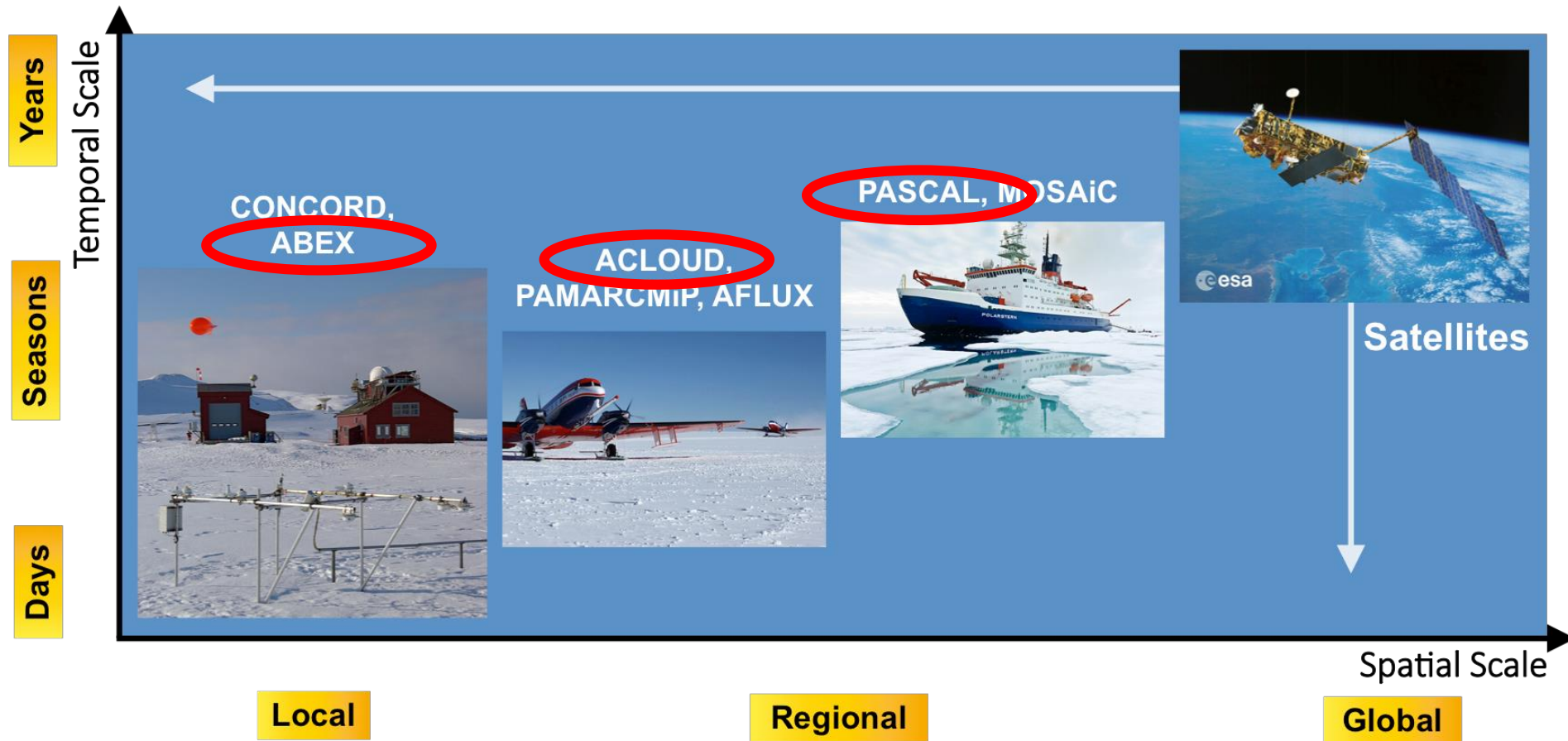
# 1. Why are we here?



Credit: NASA/Goddard Institute for Space Studies

Wendisch et al. (2017)

# 1. Why are we here?



## 2. What do we want to do?



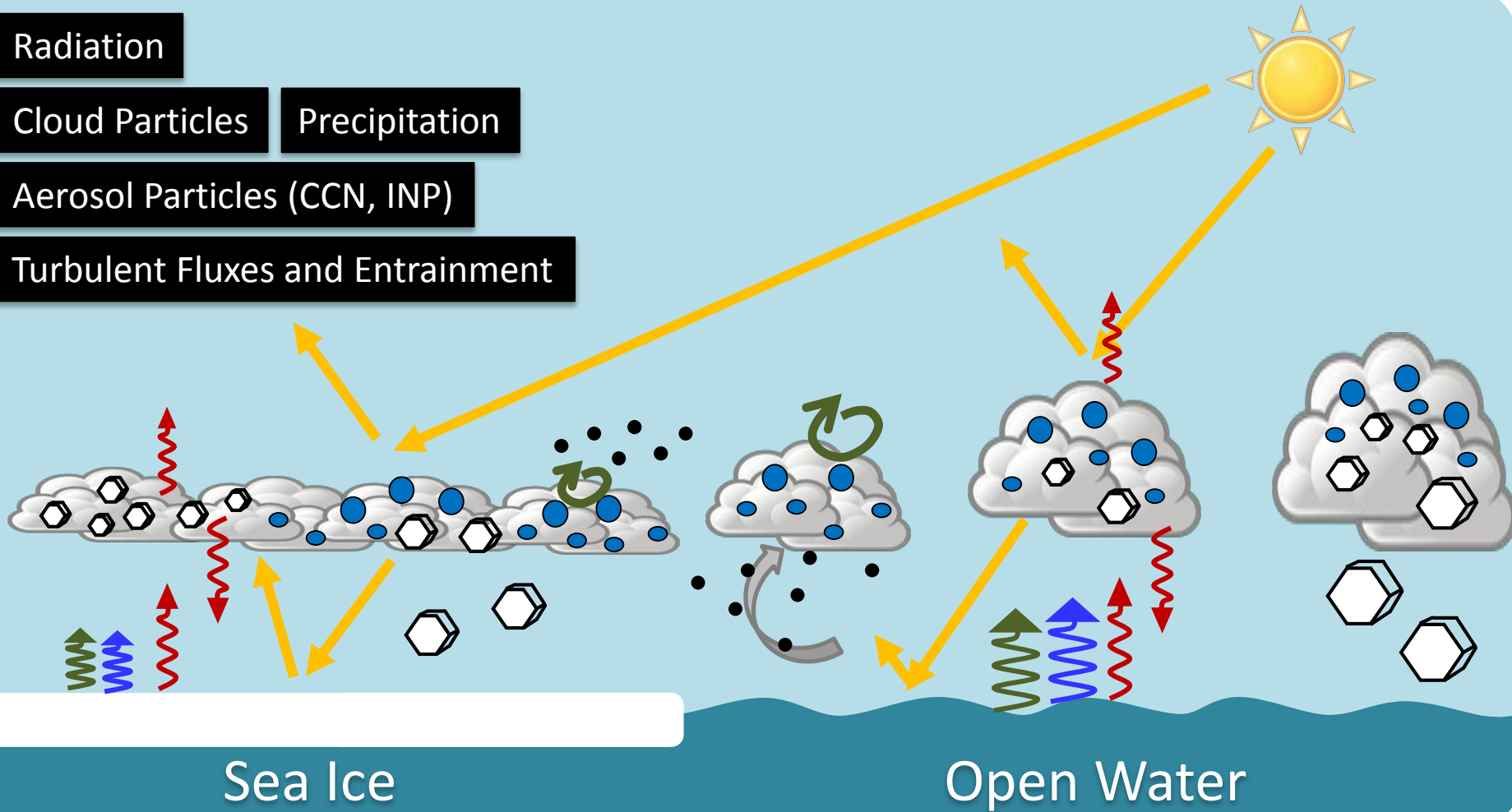
Radiation

Cloud Particles

Precipitation

Aerosol Particles (CCN, INP)

Turbulent Fluxes and Entrainment



Sea Ice

Open Water

Focus on clouds above sea ice

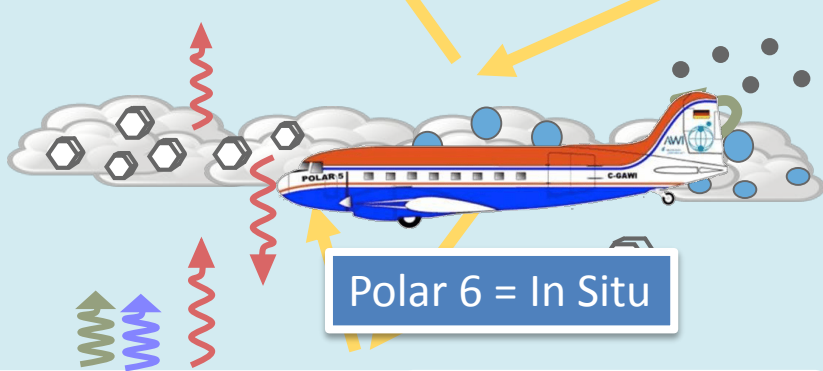
## 2. What do we want to do?



Polar 5 = Remote Sensing



Polar 6 = In Situ



Collocated Measurements

## 2. What do we want to do?

- ✓ 24/5, 12:00 Polarstern (PS) leaves Bremerhaven
- ✓ 31/5, 8:00-12:00 PS in LYR
- ✓ 21/6-23/6 PS in LYR



### 3. How do we organize ourselves?

A mission includes ...



Prep day

Flight  
day

Post-  
flight day

- 13:00 Met
- Then PI meeting (maybe not all)
- 18:00 Discussion of plans with all
- 08:00 Met  
→ Go/NoGo
- Flight
- 18:00 De-briefing meeting
- Flight report



## ACLOUD 2017 / Svalbard

Freitag, 19. Mai 2017

### New Arrivals

Today the first large group of ACLOUD scientists arrived in Longyearbyen. Surprisingly, all in the second commercial flight by SAS. Nobody took Norwegian airline, even if they provide WiFi on board... Also nobody was lost during the stop in Oslo. So we could guide all safely to our hotel, the Coal Miner Cabins.

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### ACLOUD



### Blog-Archiv

- ▼ 2017 (7)
- ▼ Mai (6)
- New Arrivals
- Polar 5 and 6 are on the way
- Alternate Office

ACLOUD Blog:

<https://acloud2017.blogspot.com/>

(AC)<sup>3</sup>:

<http://ac3-tr.de/>

# Weather briefing

ACLOUD Longyearbyen, Svalbard

Sun 04 June 2017 – **Mon 05 June** – Thu 8 June 2017

## Summary

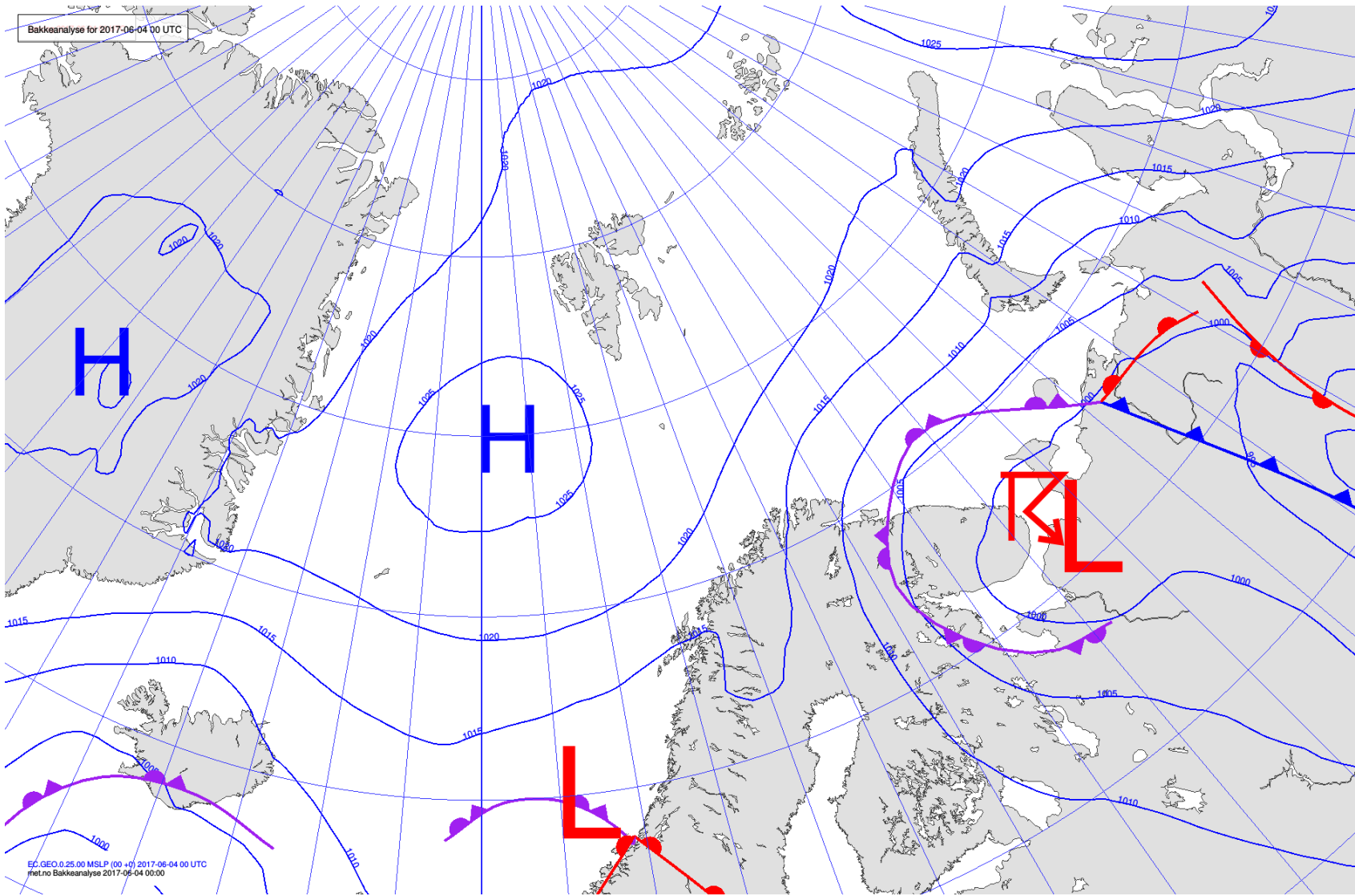
The high pressure system has shifted north to the direct west of Spitsbergen and brings us northerly winds over the open water west. In the fjord wind speeds are low and vary from west to southwest. Low clouds can be found near the coast, stretching north. Some cirrus above.

Tomorrow low clouds can still be found north of Spitsbergen, while clouds in all levels come closer from the south, transported by a low.

The front will reach us approximately Tuesday morning.

Position of Polarstern (semi stationary) 81.95° N, 10.46° E

# Analysis 04 June 2017 @ 12 UTC

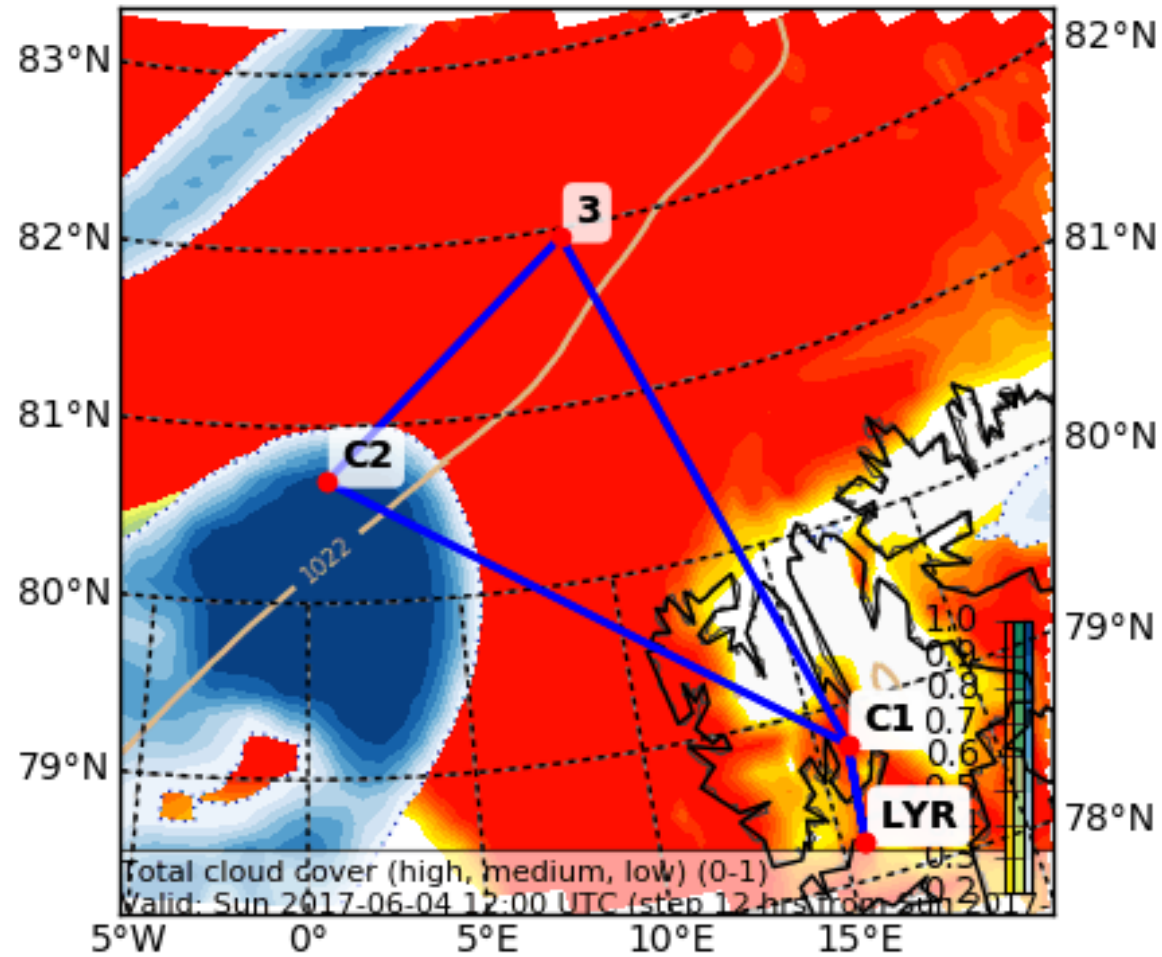


# Clouds

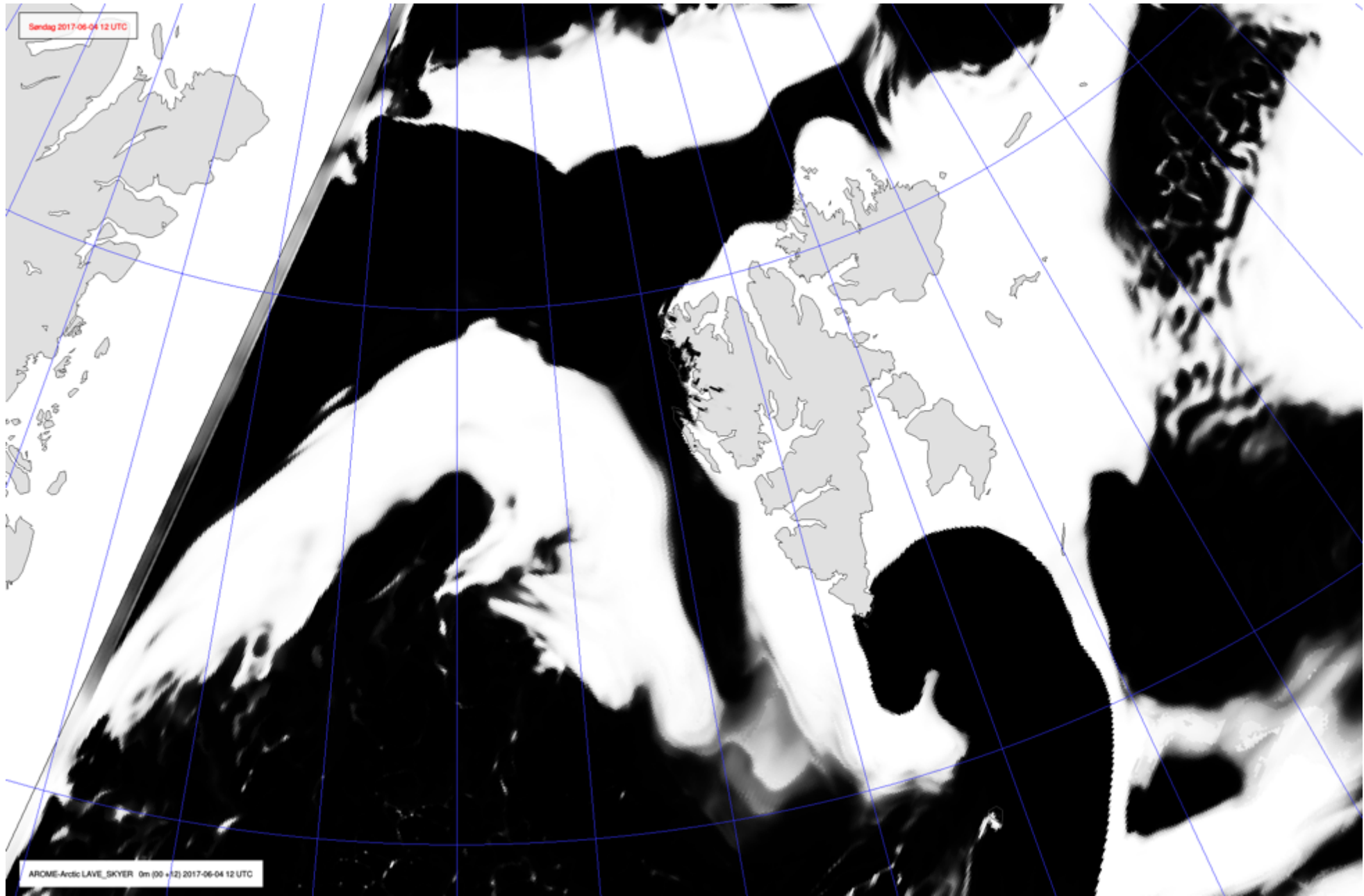
## Today 12 UTC

Cloud Cover (0-1) (Total Cloud Cover)

Valid: Sun 2017-06-04 12:00 UTC (step 12 hrs from Sun 2017-06-04 00:00 UTC)



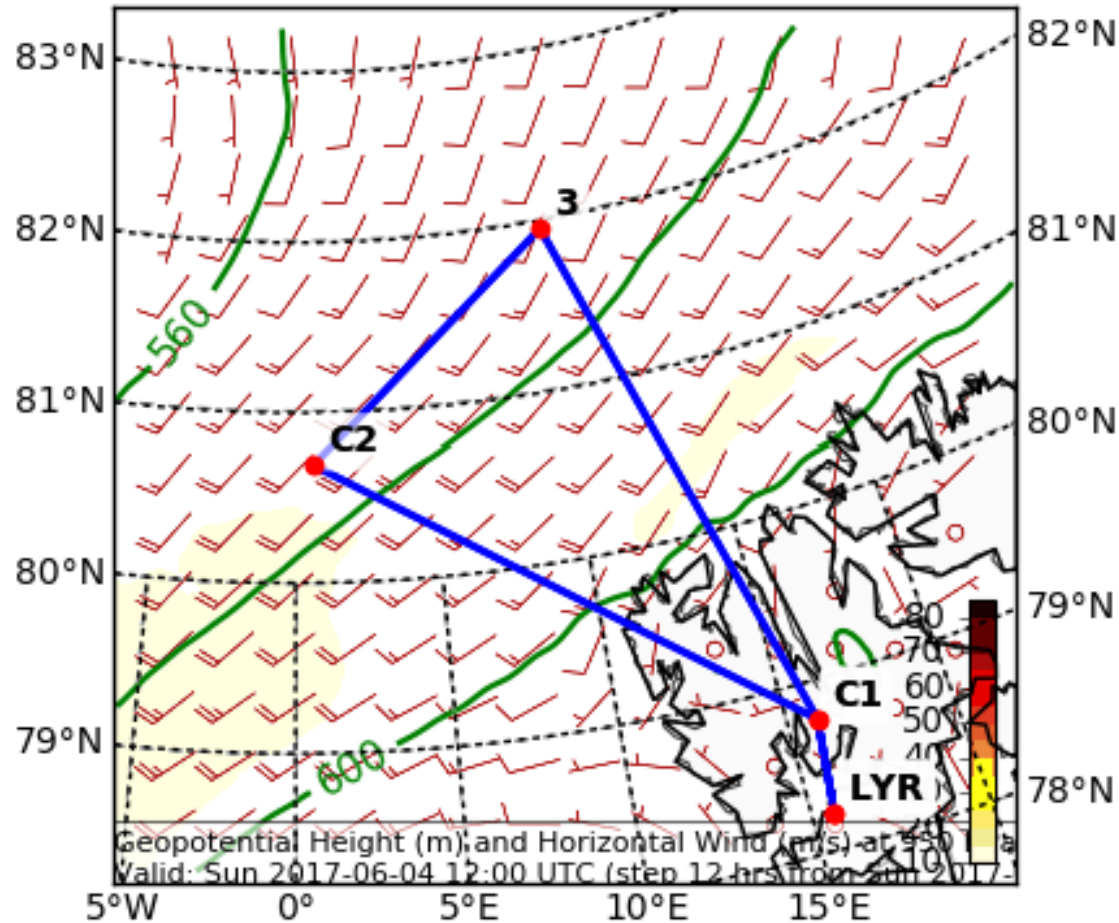
# Cloud 04 June 2017 @ 12 UTC



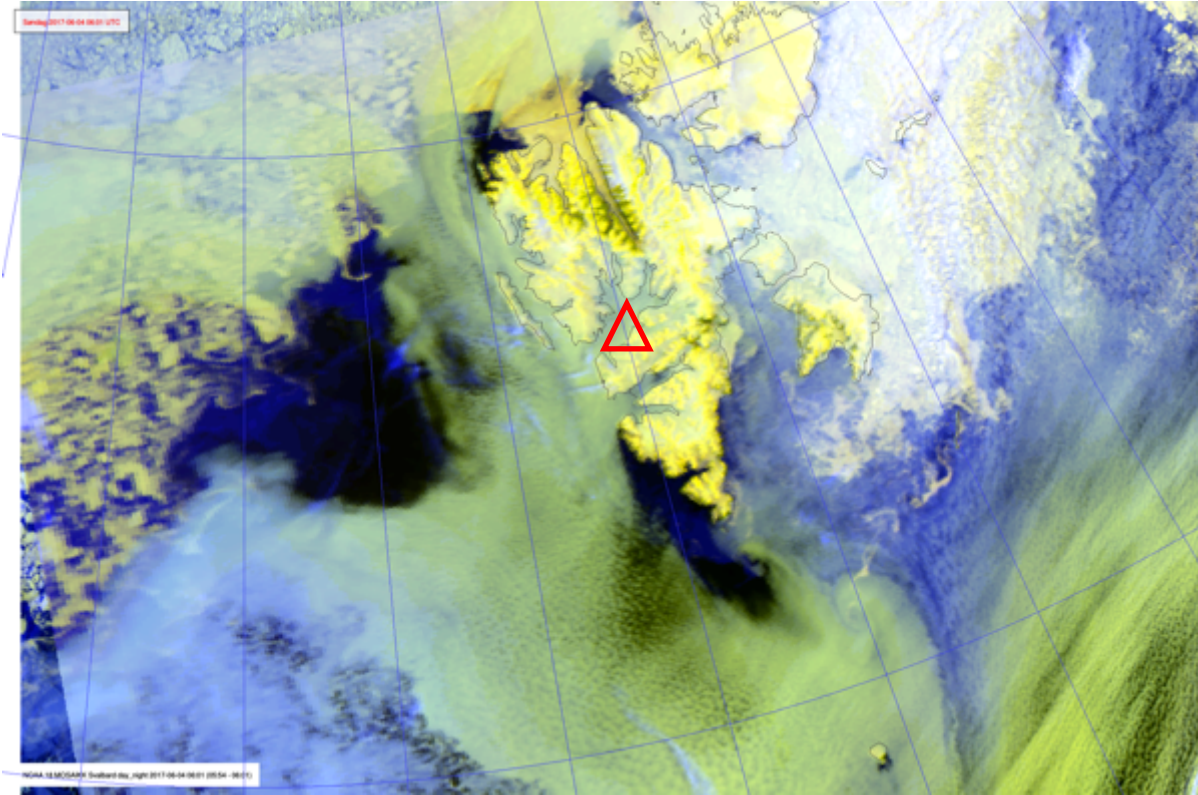
# Wind

## Today 12 UTC

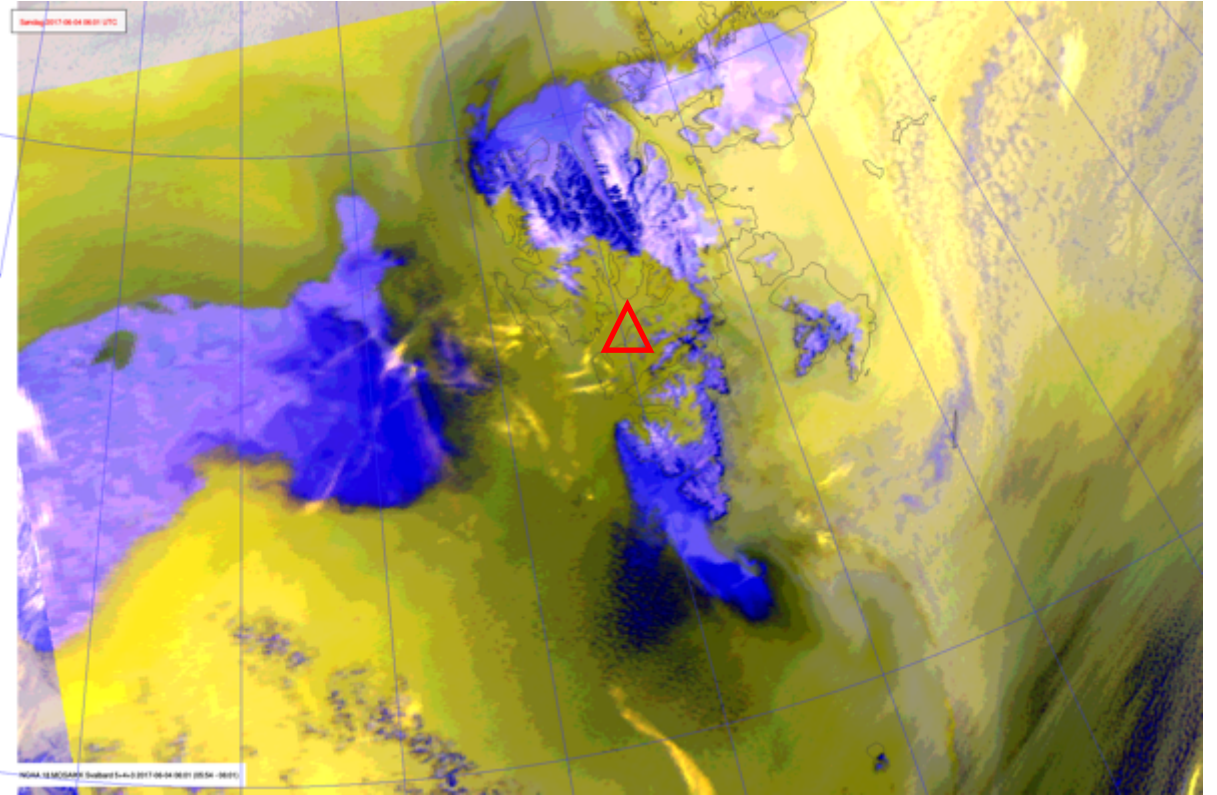
Geopotential Height (m) and Horizontal Wind (m/s) (Wind Speed 10-85 m/s) at 950 hPa  
Valid: Sun 2017-06-04 12:00 UTC (step 12 hrs from Sun 2017-06-04 00:00 UTC)



# NOAA-19 04 June 2017 @ 0601 UTC



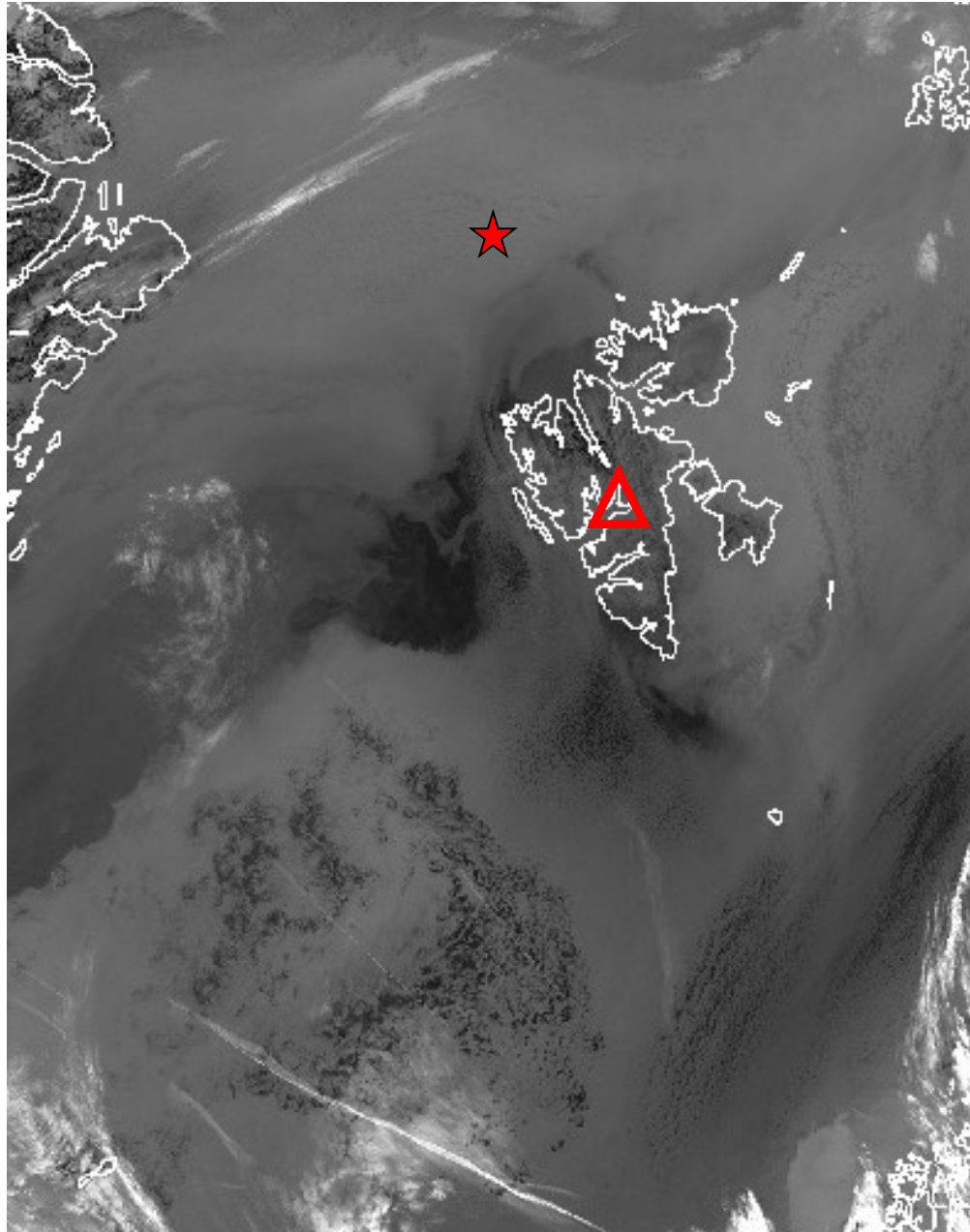
**10.8  $\mu\text{m}$**



**IR, Ch 5+4+3**



# NOAA-19 04 June 2017 @ 0751 UTC



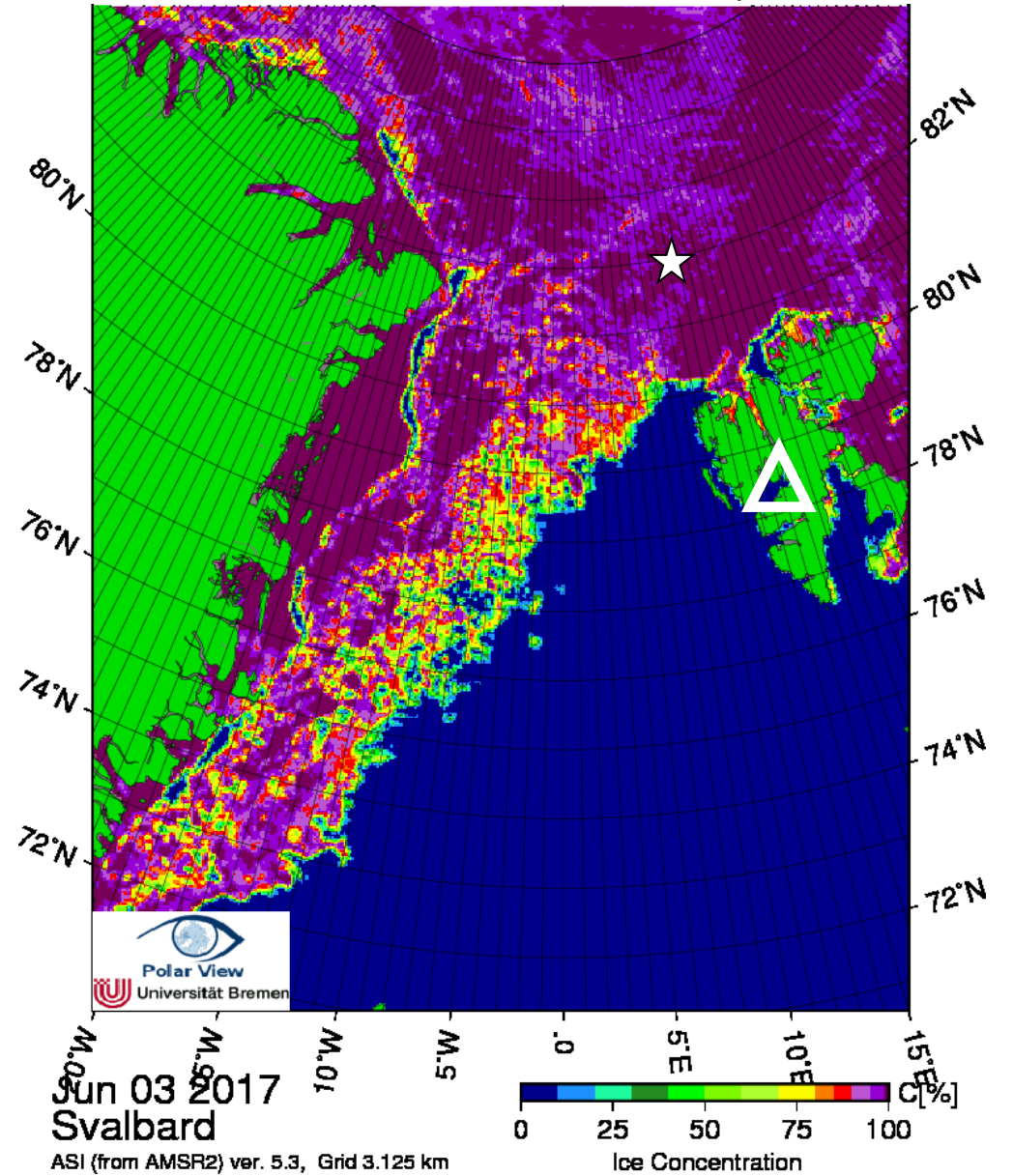
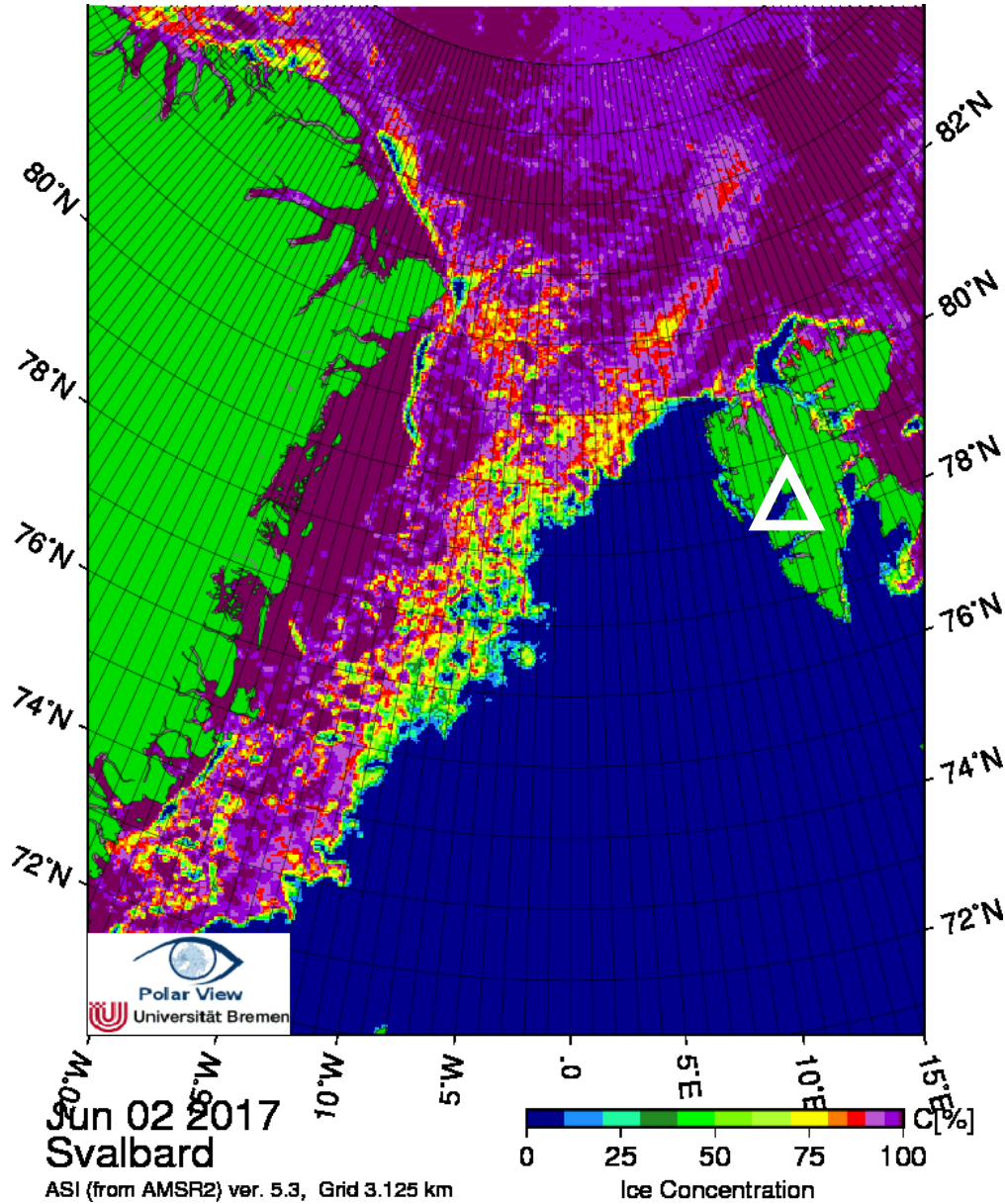
★ RV Polarstern (81.95° N, 10.46° E)

07:51

10.8 μm

# Arctic sea ice 2 June & 3 June 2017

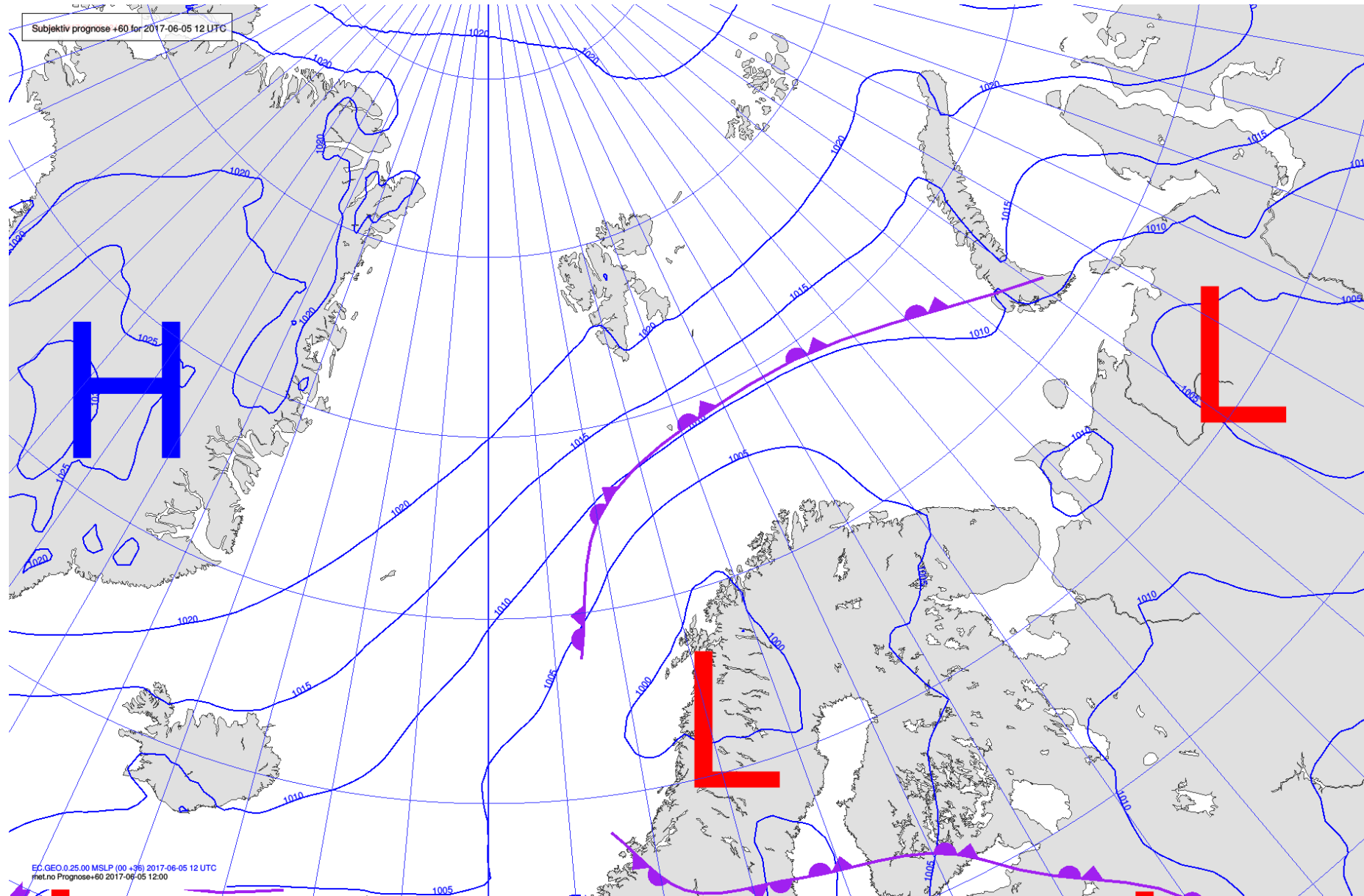
☆ RV Polarstern 4 June 81.95° N, 10.46° E



# Flight Day

**Sun 04 June 2017**

# General Situation Mon 05 June 2017 – 12 UTC

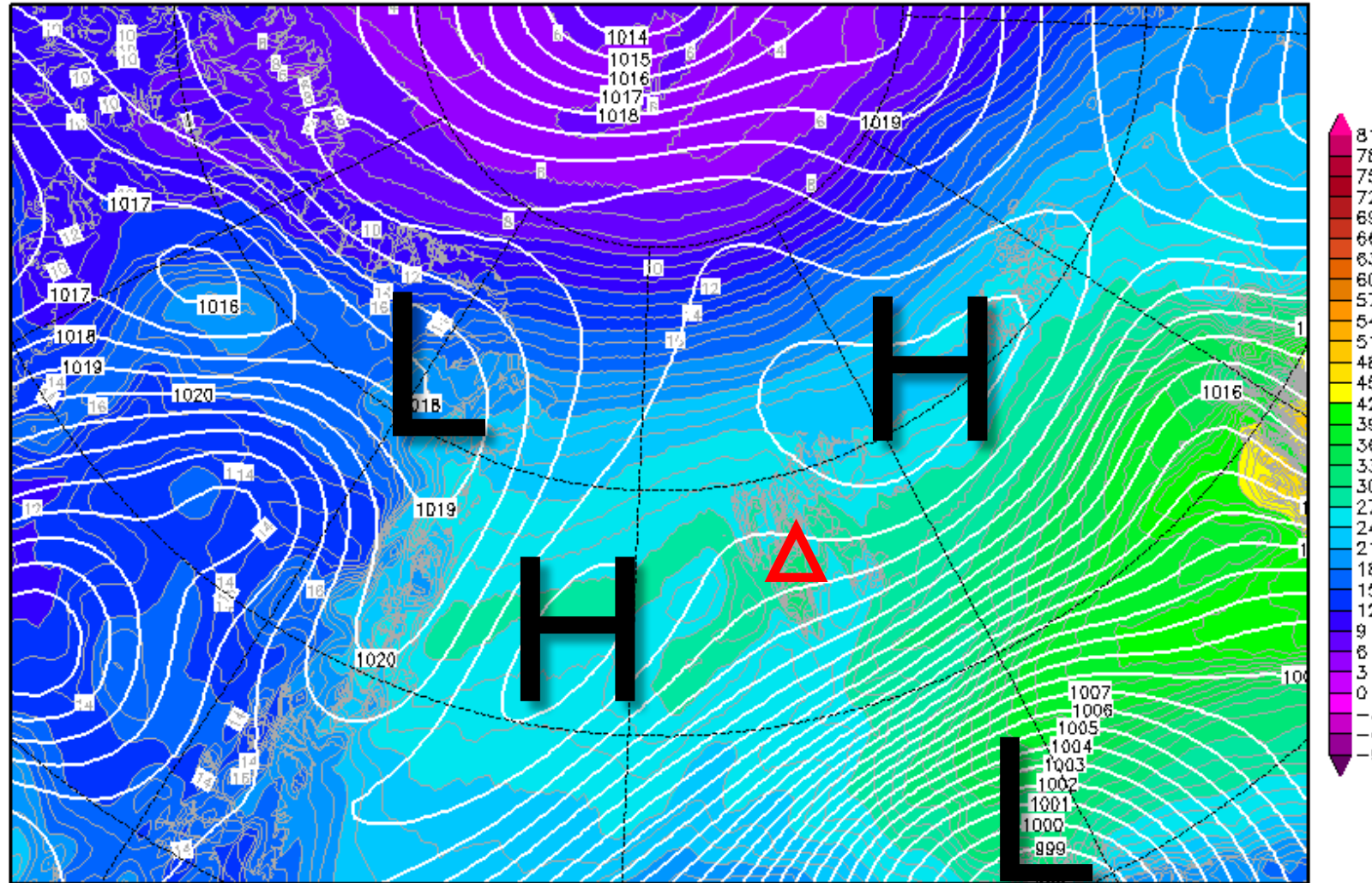


# 850-hPa Theta Equiv. 05 June 2017 @ 12 UTC

Init : Sun,04JUN2017 00Z

Valid: Mon,05JUN2017 12Z

*Bodendruck (hPa) und 850 hPa Aeq.Pot.T. (Grad C)*

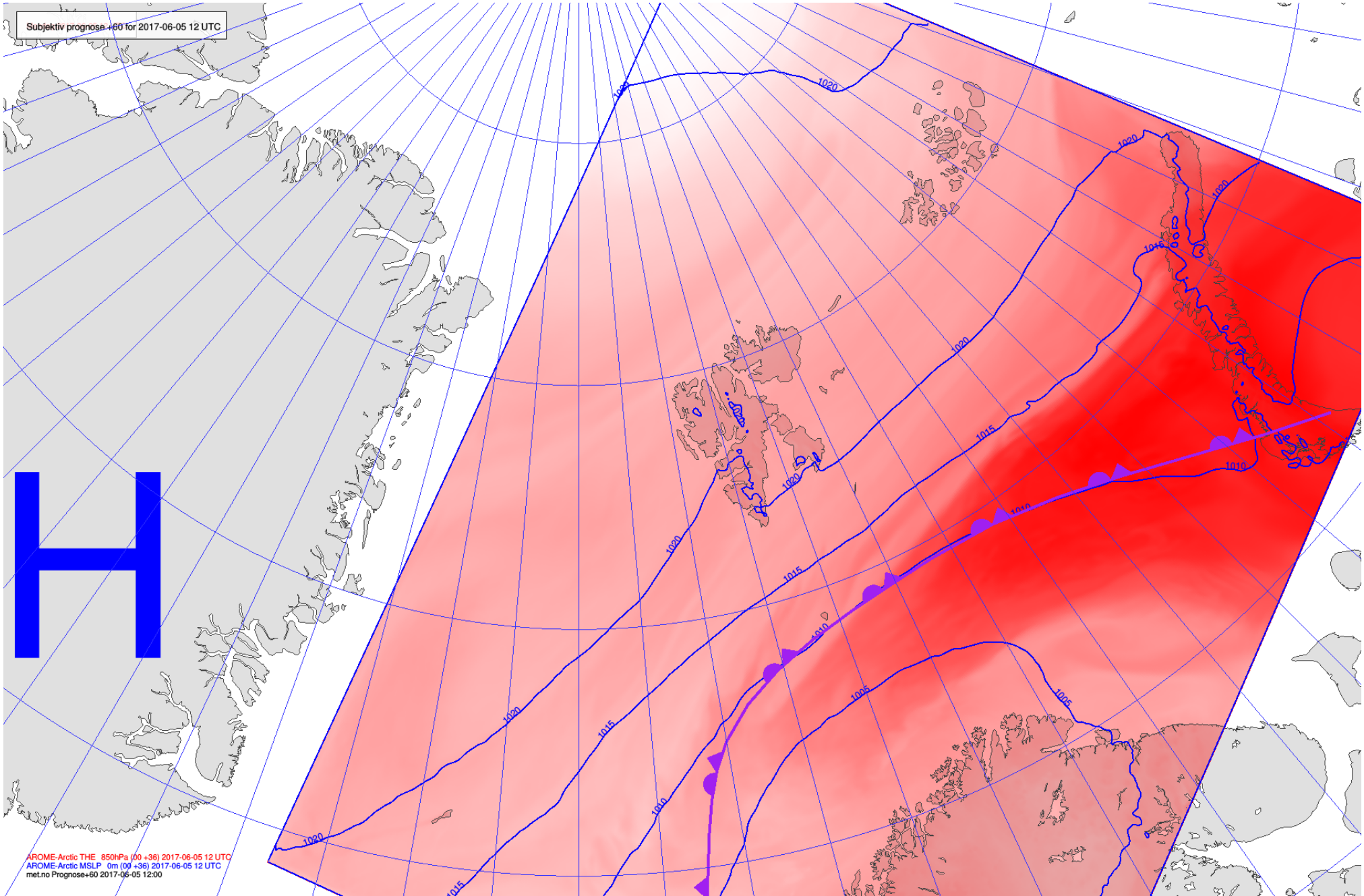


Daten: GFS-Modell des amerikanischen Wetterdienstes

(C) Wetterzentrale

[www.wetterzentrale.de](http://www.wetterzentrale.de)

# Theta Ae 850hPa Mon 5 June 2017 12 UTC



Subjektiv prognose +60 for 2017-06-05 12 UTC

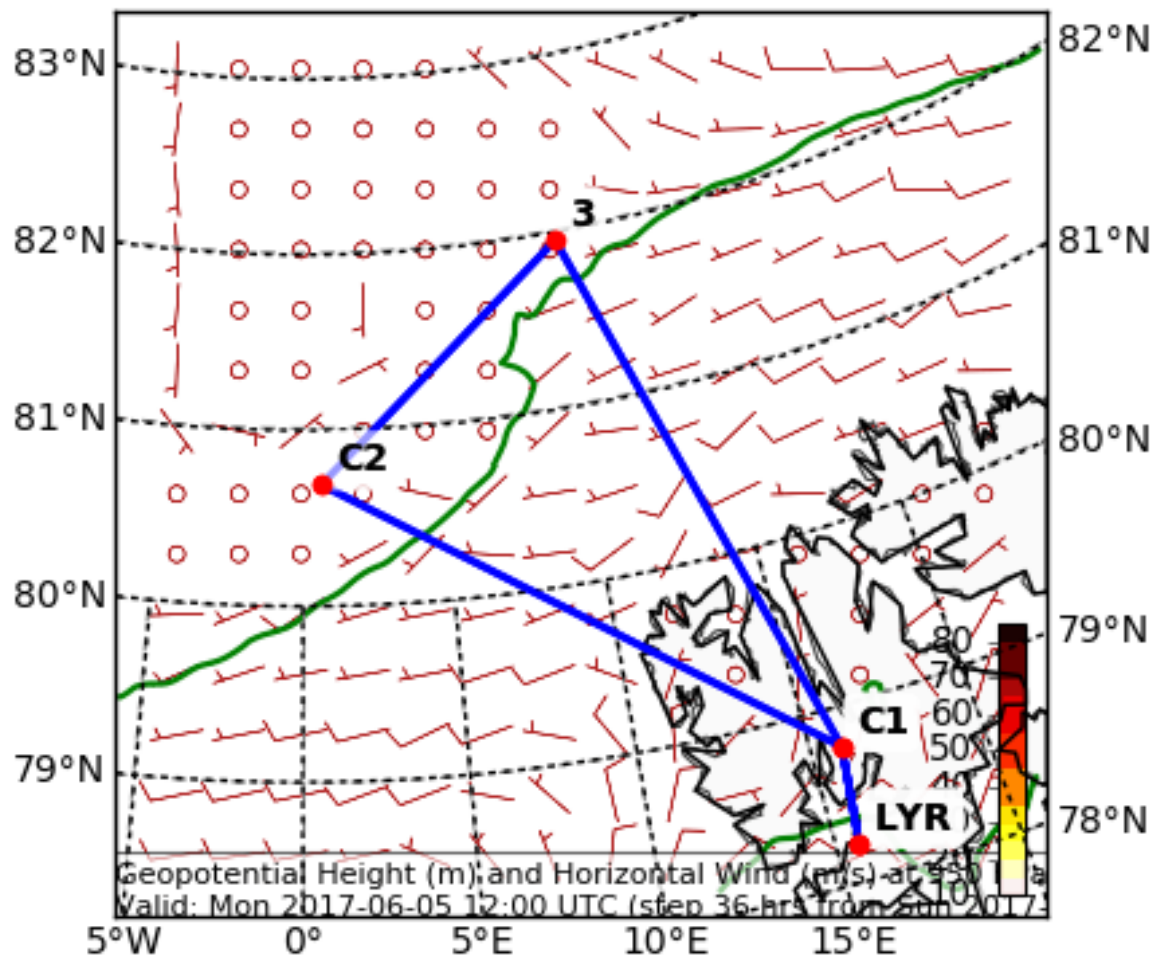
H

AROME-Arctic THE 850hPa (00 +36) 2017-06-05 12 UTC  
AROME-Arctic MSLP 0m (00 +36) 2017-06-05 12 UTC  
met.no Prognose+60 2017-06-05 12:00

# Wind

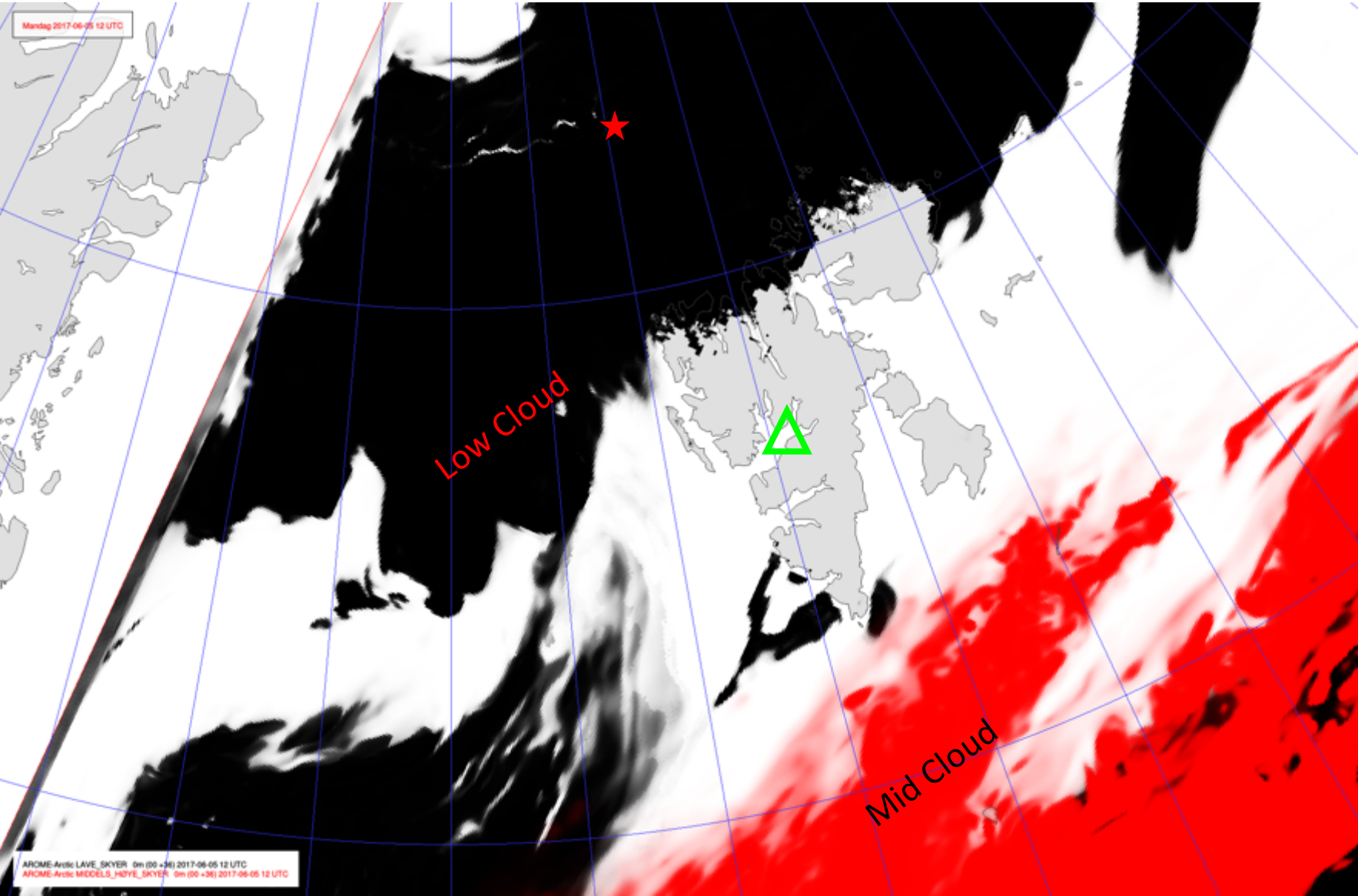
## Tomorrow 12 UTC

Geopotential Height (m) and Horizontal Wind (m/s) (Wind Speed 10-85 m/s)  
Valid: Mon 2017-06-05 12:00 UTC (step 36 hrs from Sun 2017-06-04 00:00 UTC)



# Low-level cloud cover 05 June 2017 @ 12 UTC

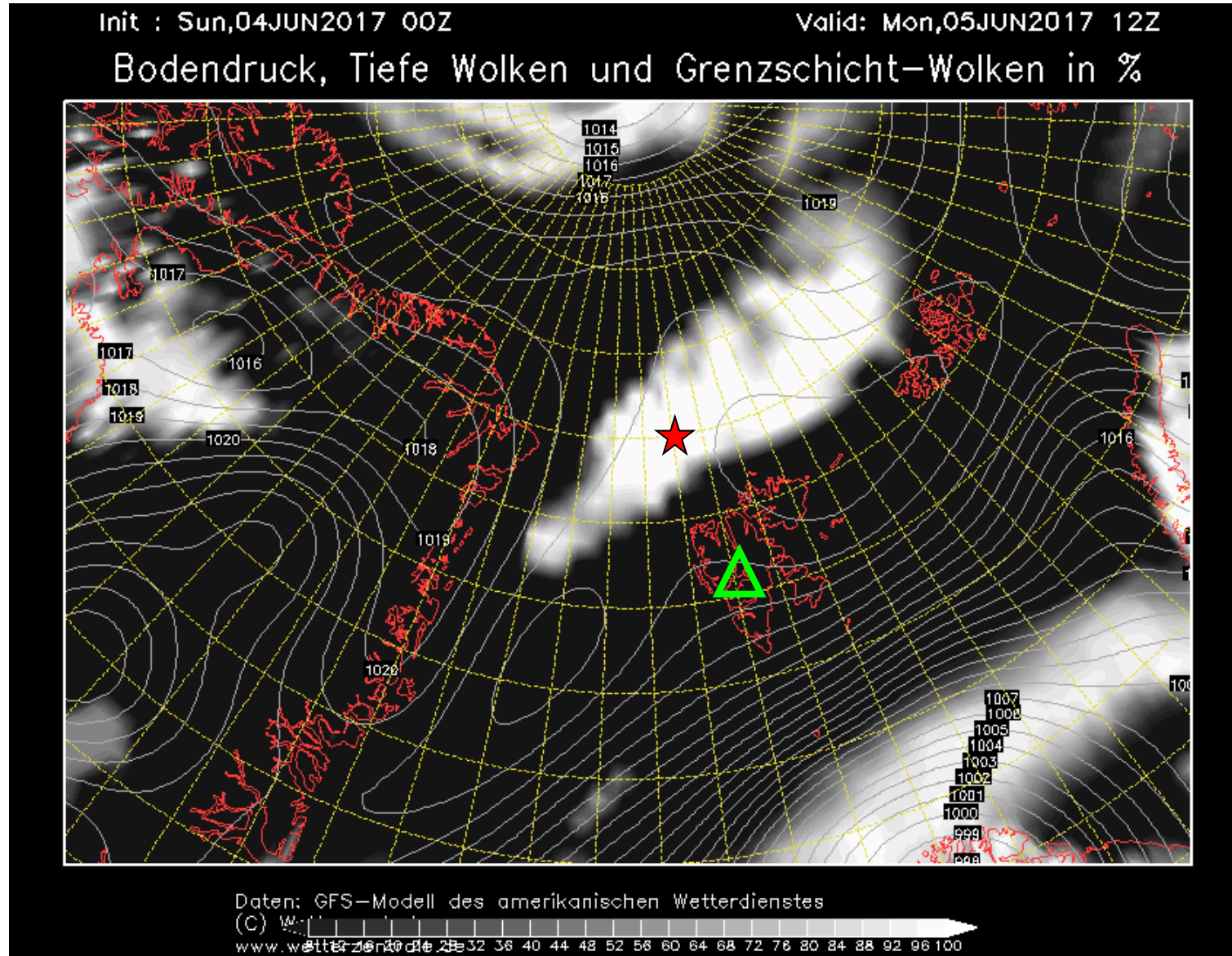
★ RV Polarstern (81.95° N, 10.46° E)





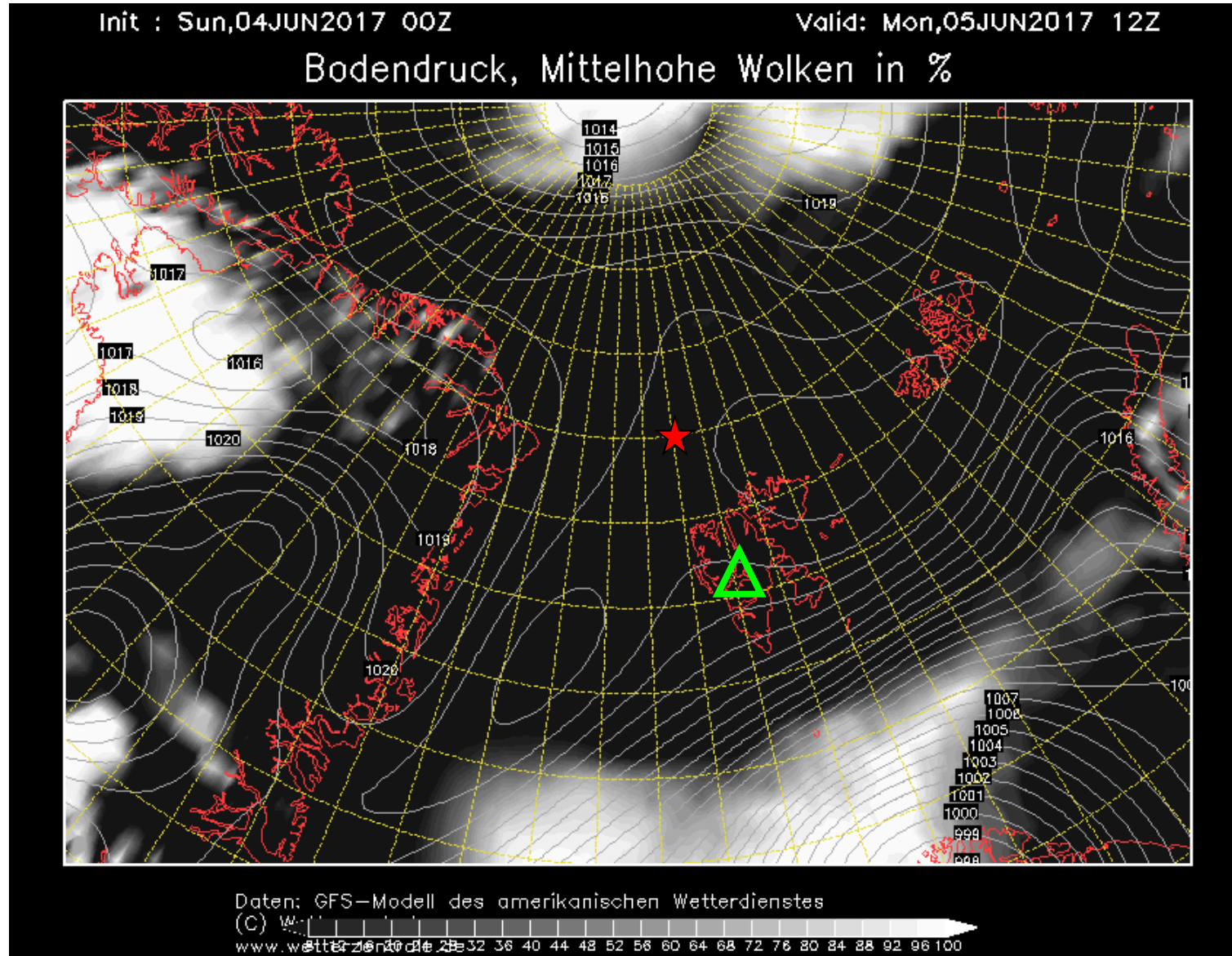
# Low-level cloud cover 05 June 2017 @ 12 UTC

★ RV Polarstern (81.95° N, 10.46° E)



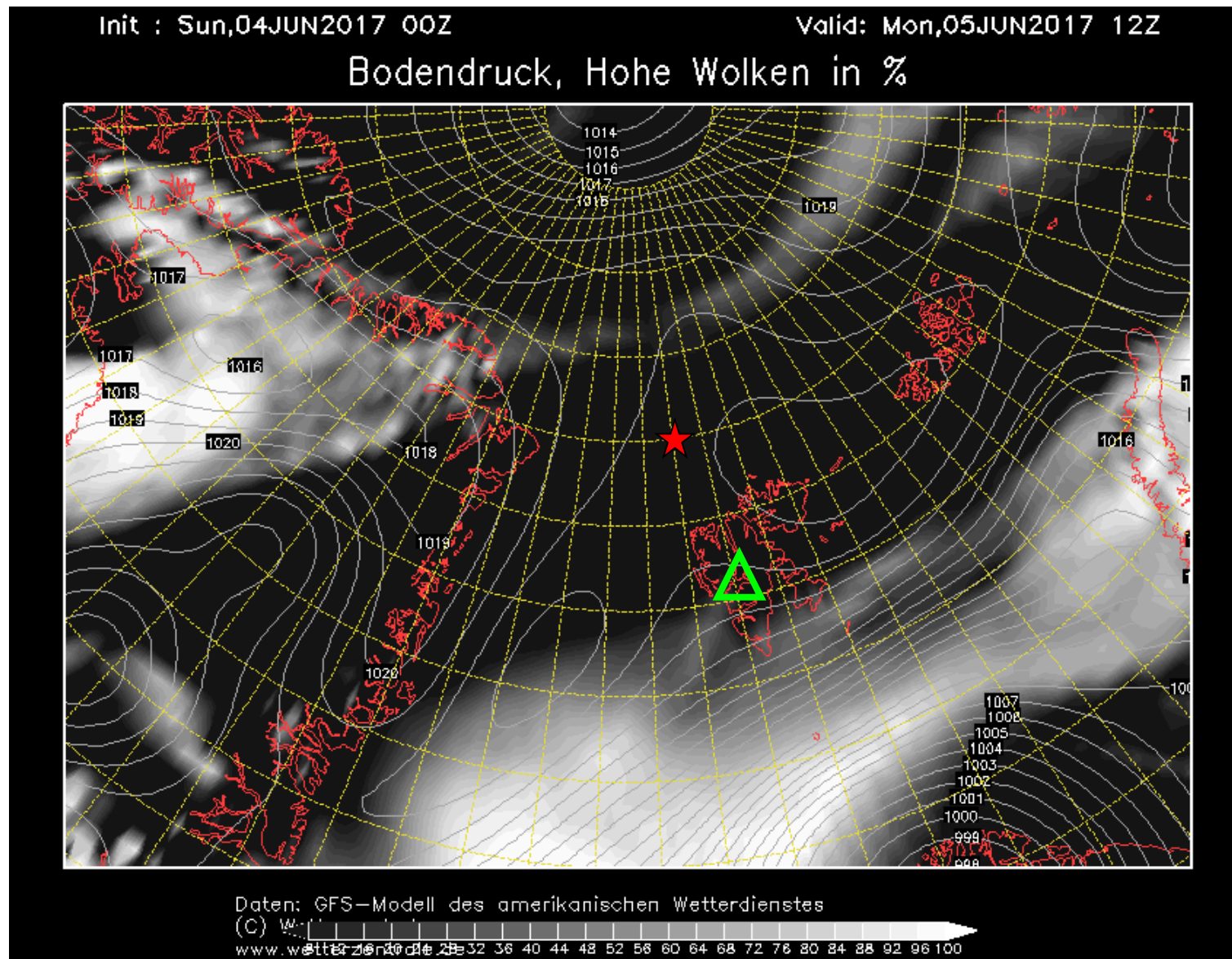
# Mid-level cloud cover 05 June 2017 @ 12 UTC

★ RV Polarstern (81.96° N, 10.19° E)



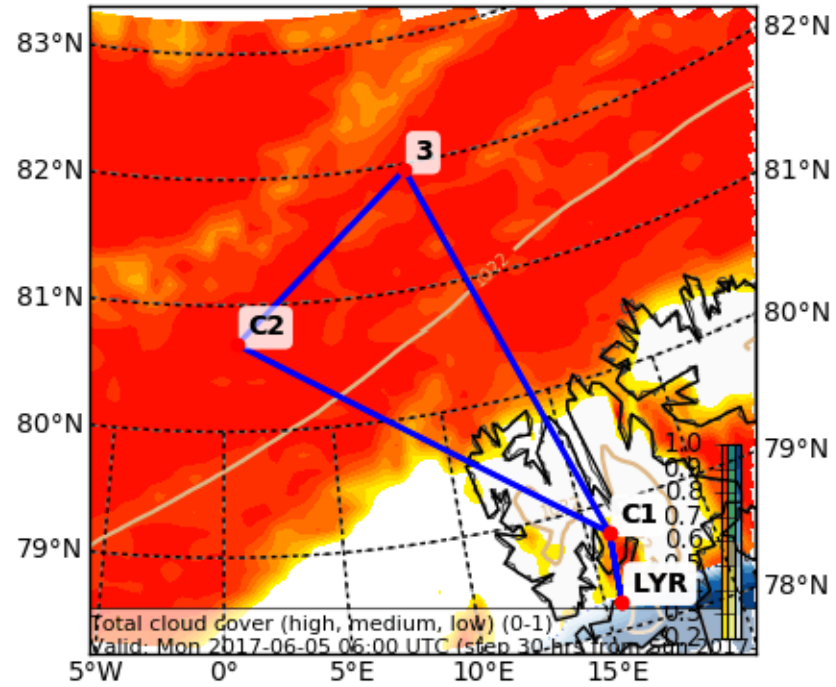
# High-level cloud cover 05 June 2017 @ 12 UTC

★ RV Polarstern (81.96° N, 10.19° E)

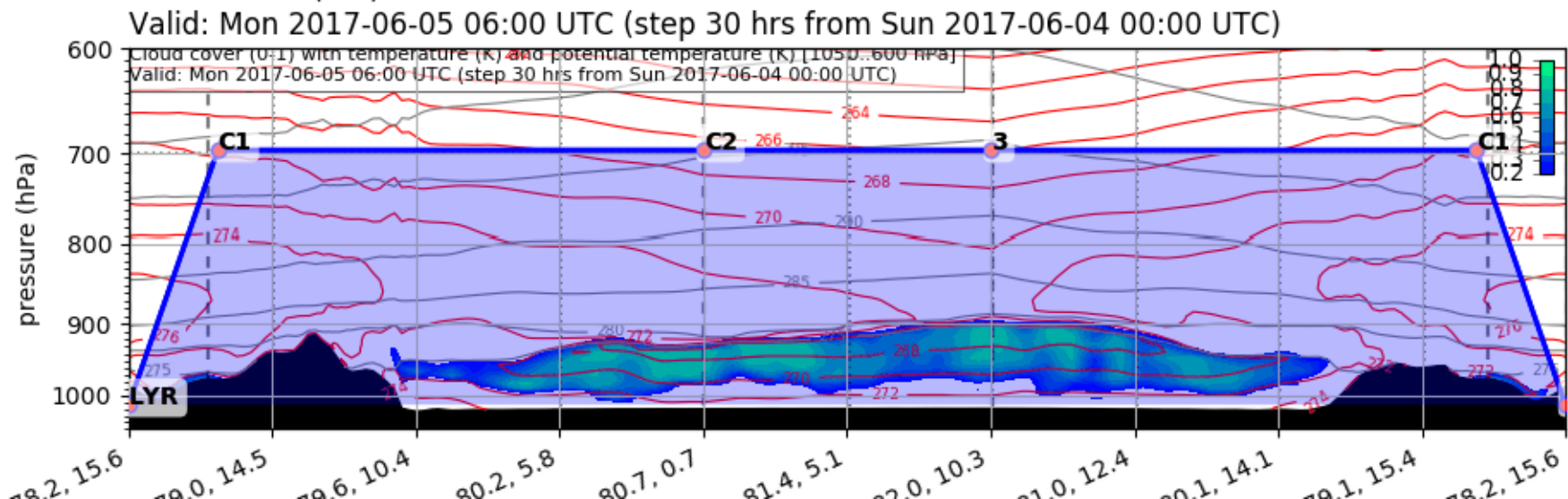


# Forecast Tomorrow 06 UTC

Cloud Cover (0-1) (Total Cloud Cover)  
Valid: Mon 2017-06-05 06:00 UTC (step 30 hrs from Sun 2017-06-04 00:00 UTC)

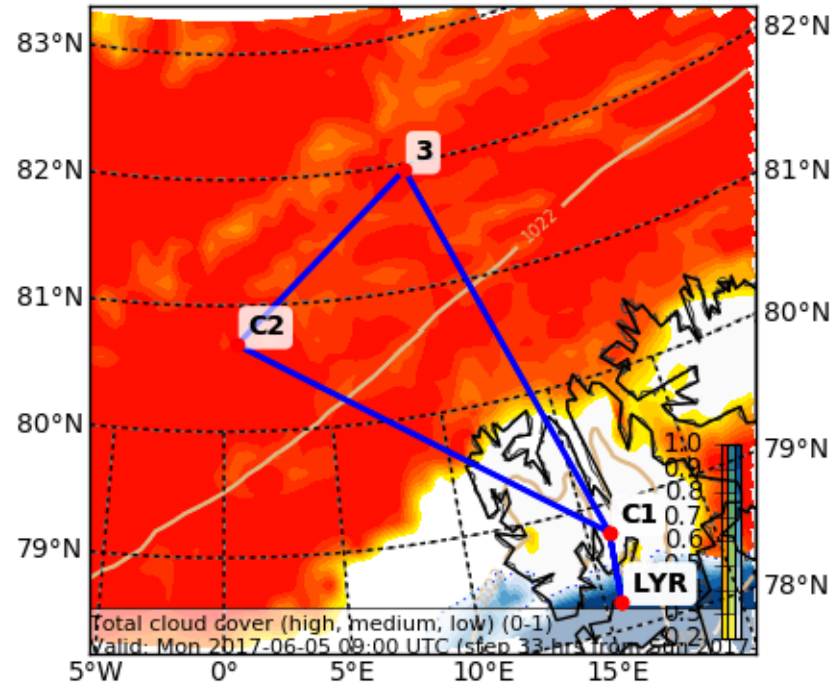


EPSG:77790000

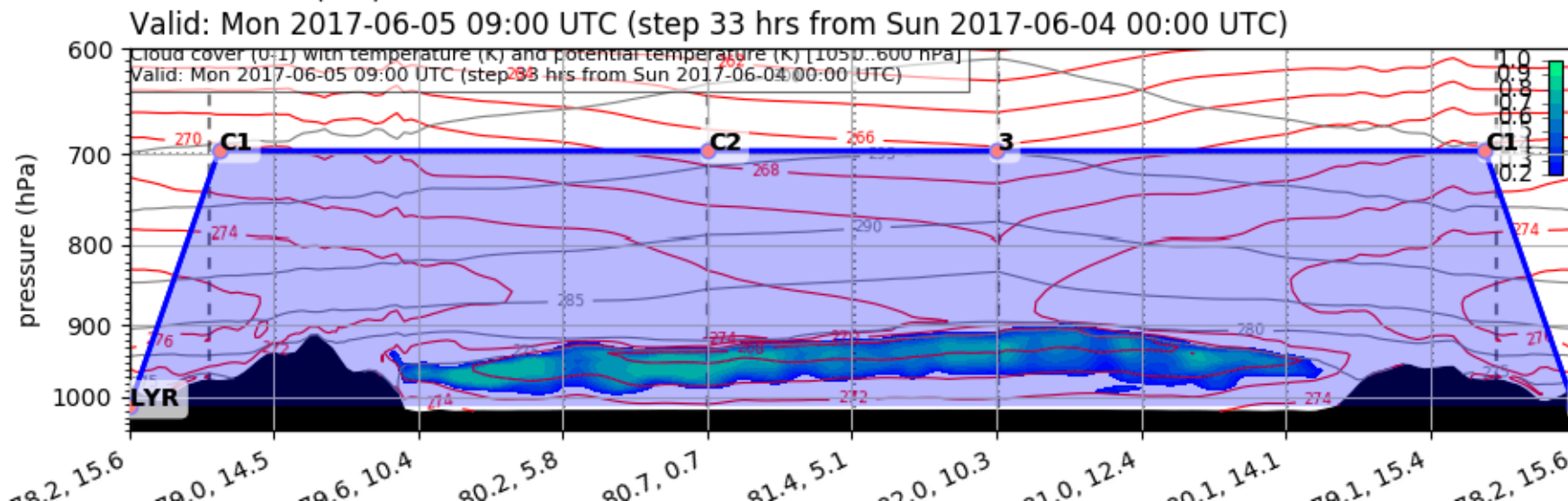


# Forecast Tomorrow 09 UTC

Cloud Cover (0-1) (Total Cloud Cover)  
Valid: Mon 2017-06-05 09:00 UTC (step 33 hrs from Sun 2017-06-04 00:00 UTC)

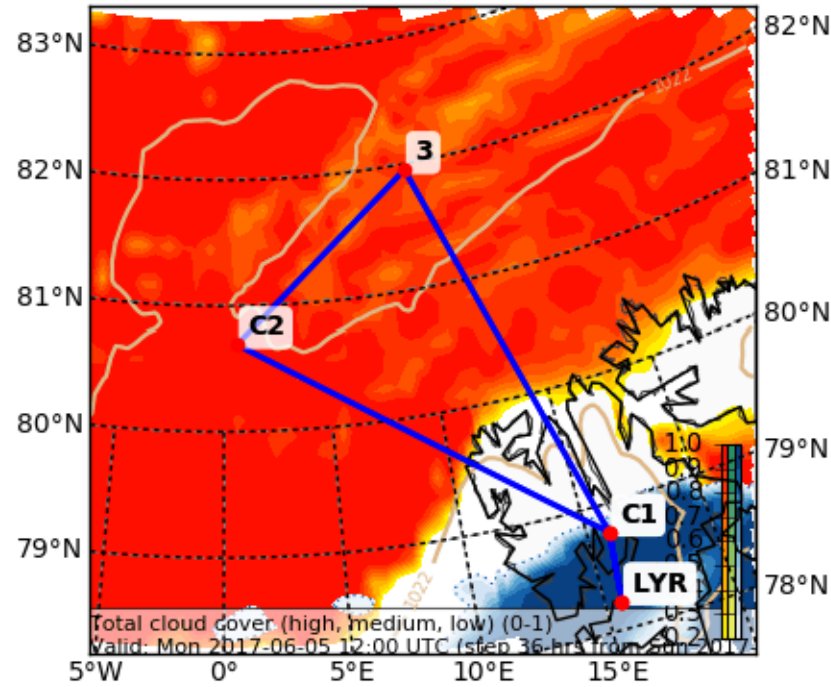


EPSG:77790000

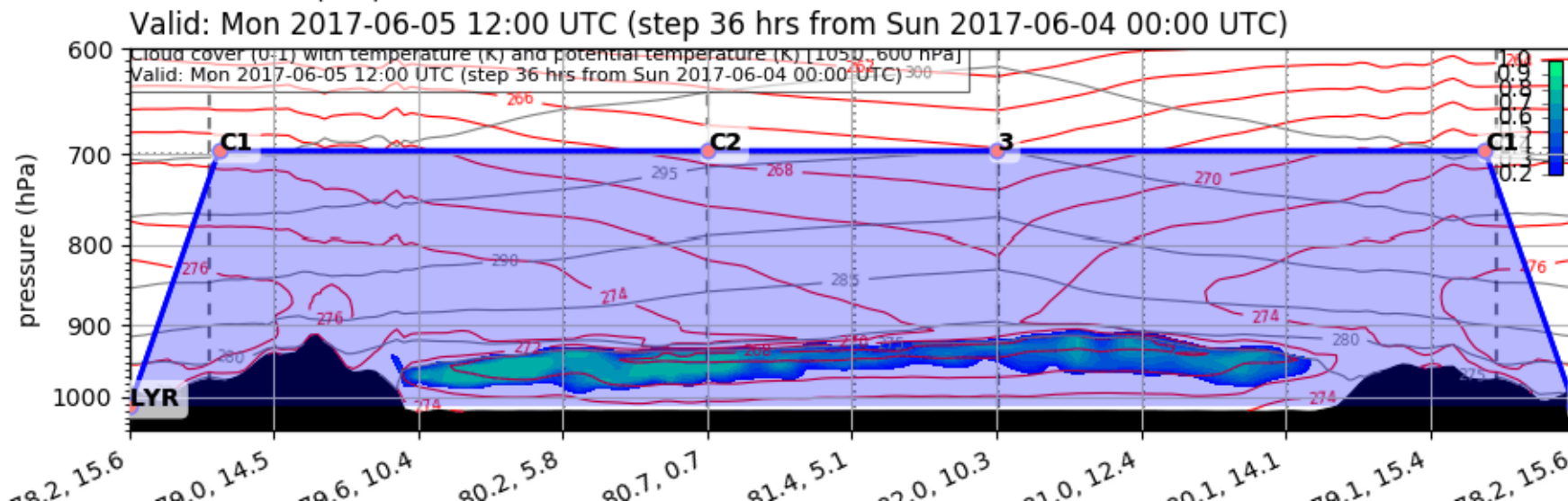


# Forecast Tomorrow 12 UTC

Cloud Cover (0-1) (Total Cloud Cover)  
Valid: Mon 2017-06-05 12:00 UTC (step 36 hrs from Sun 2017-06-04 00:00 UTC)

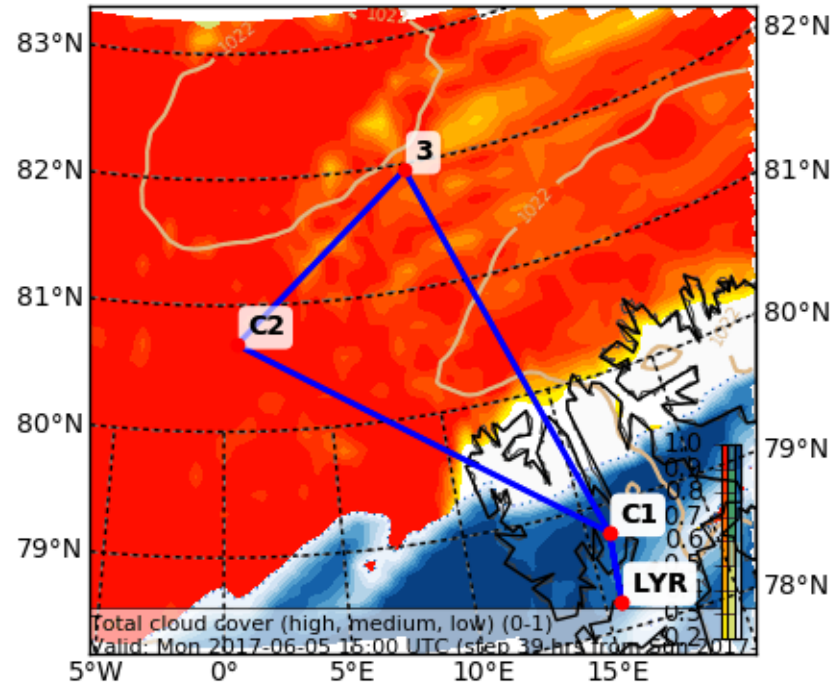


EPSG:77790000

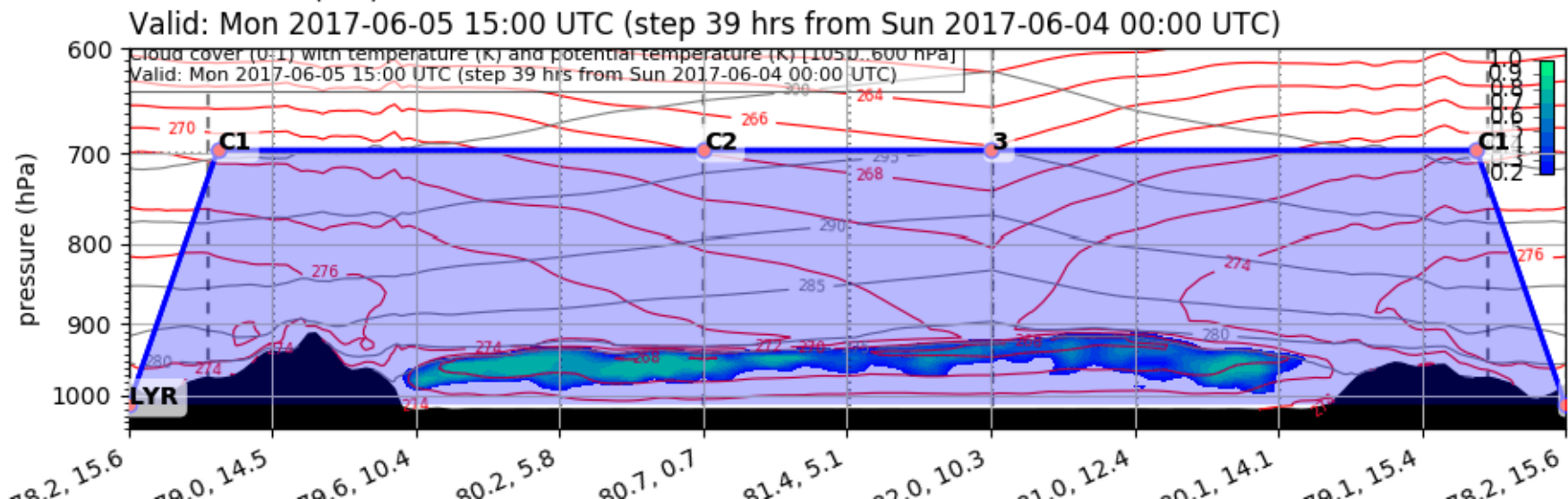


# Forecast Tomorrow 15 UTC

Cloud Cover (0-1) (Total Cloud Cover)  
Valid: Mon 2017-06-05 15:00 UTC (step 39 hrs from Sun 2017-06-04 00:00 UTC)

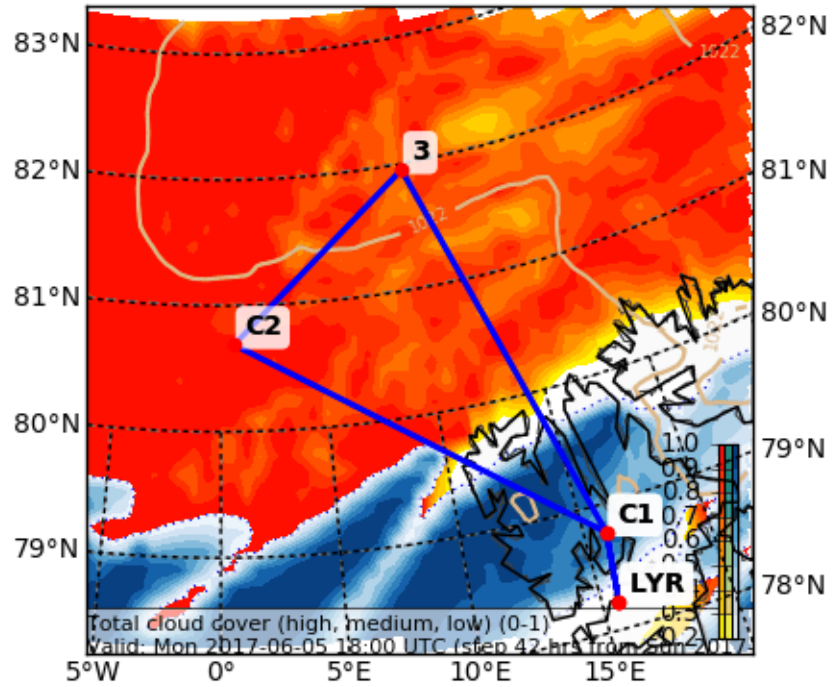


EPSG:77790000

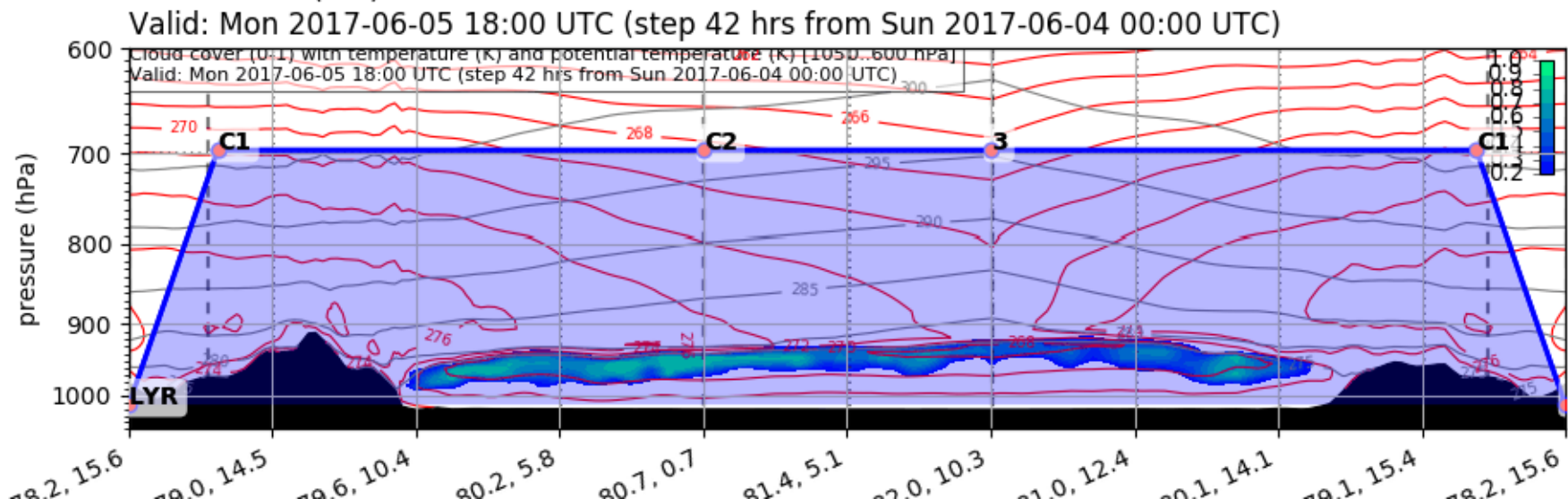


# Forecast Tomorrow 18 UTC

Cloud Cover (0-1) (Total Cloud Cover)  
Valid: Mon 2017-06-05 18:00 UTC (step 42 hrs from Sun 2017-06-04 00:00 UTC)



EPSG:77790000



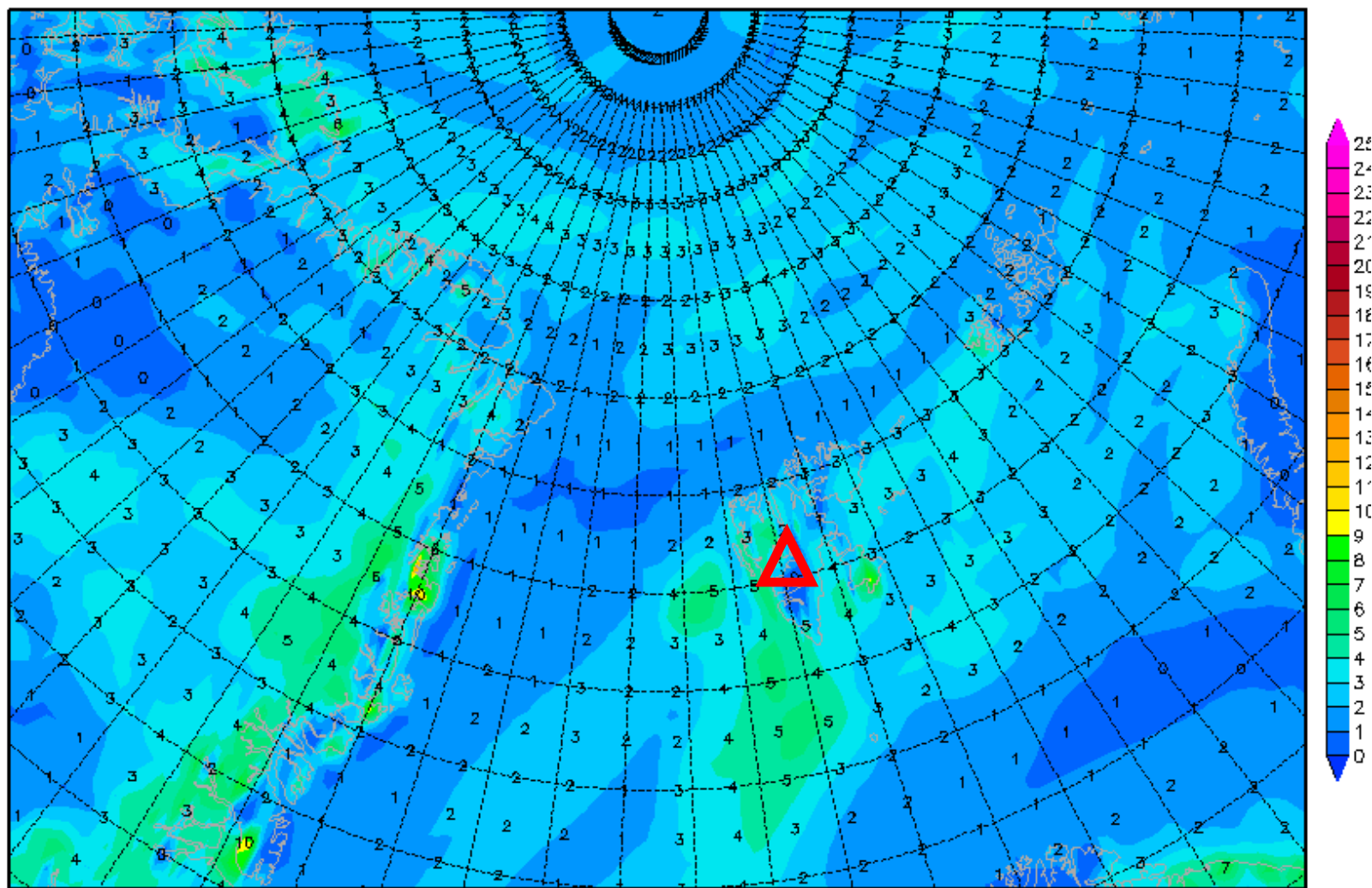


# 2-m dew point diff. 5 June 2017 @ 12 UTC

Init : Sun,04JUN2017 00Z

Valid: Mon,05JUN2017 12Z

*2m (Temperatur-Taupunkt)*

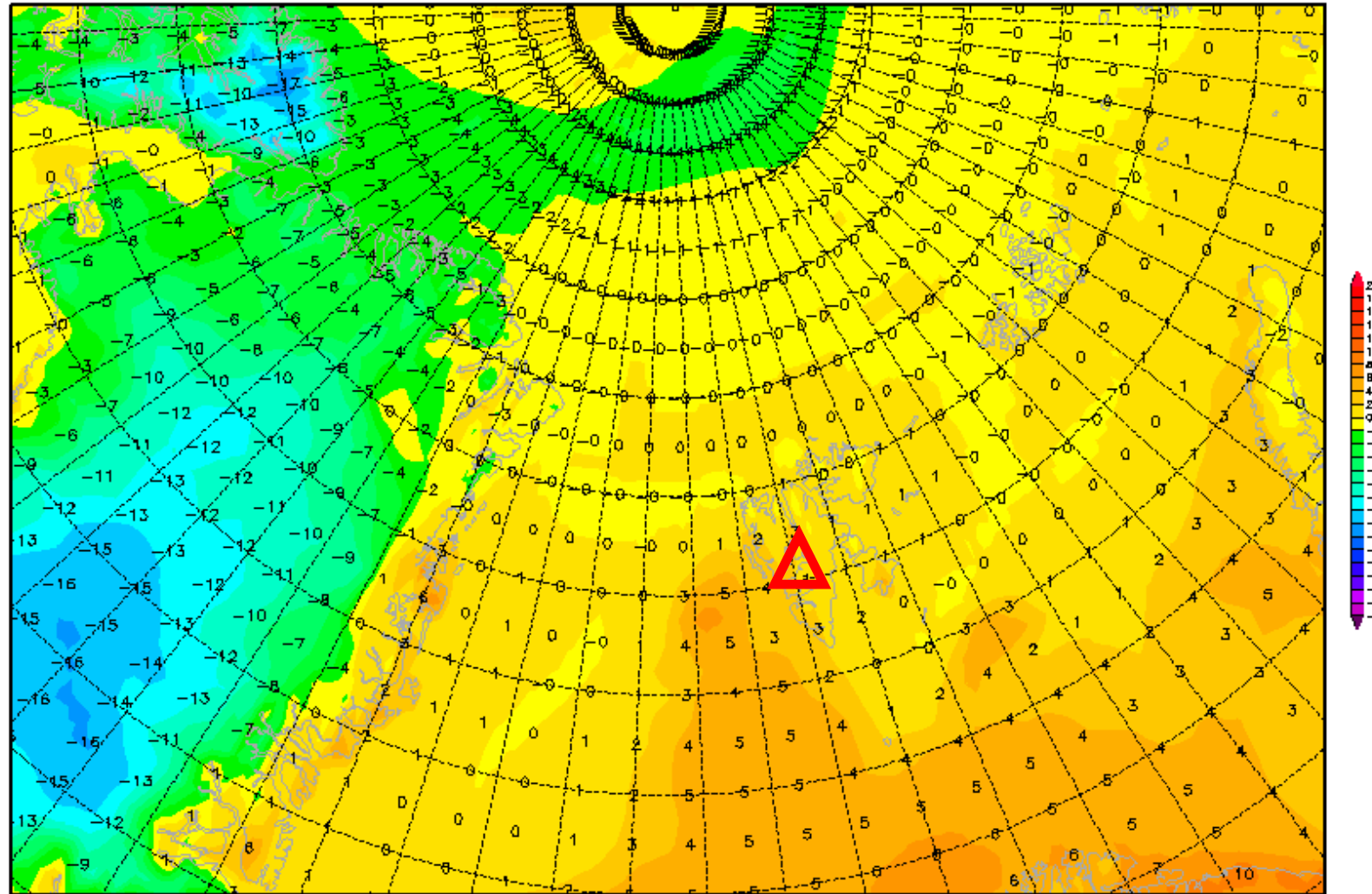


# 2-m temperature 5 June 2017 @ 12 UTC

Init : Sun,04JUN2017 00Z

Valid: Mon,05JUN2017 12Z

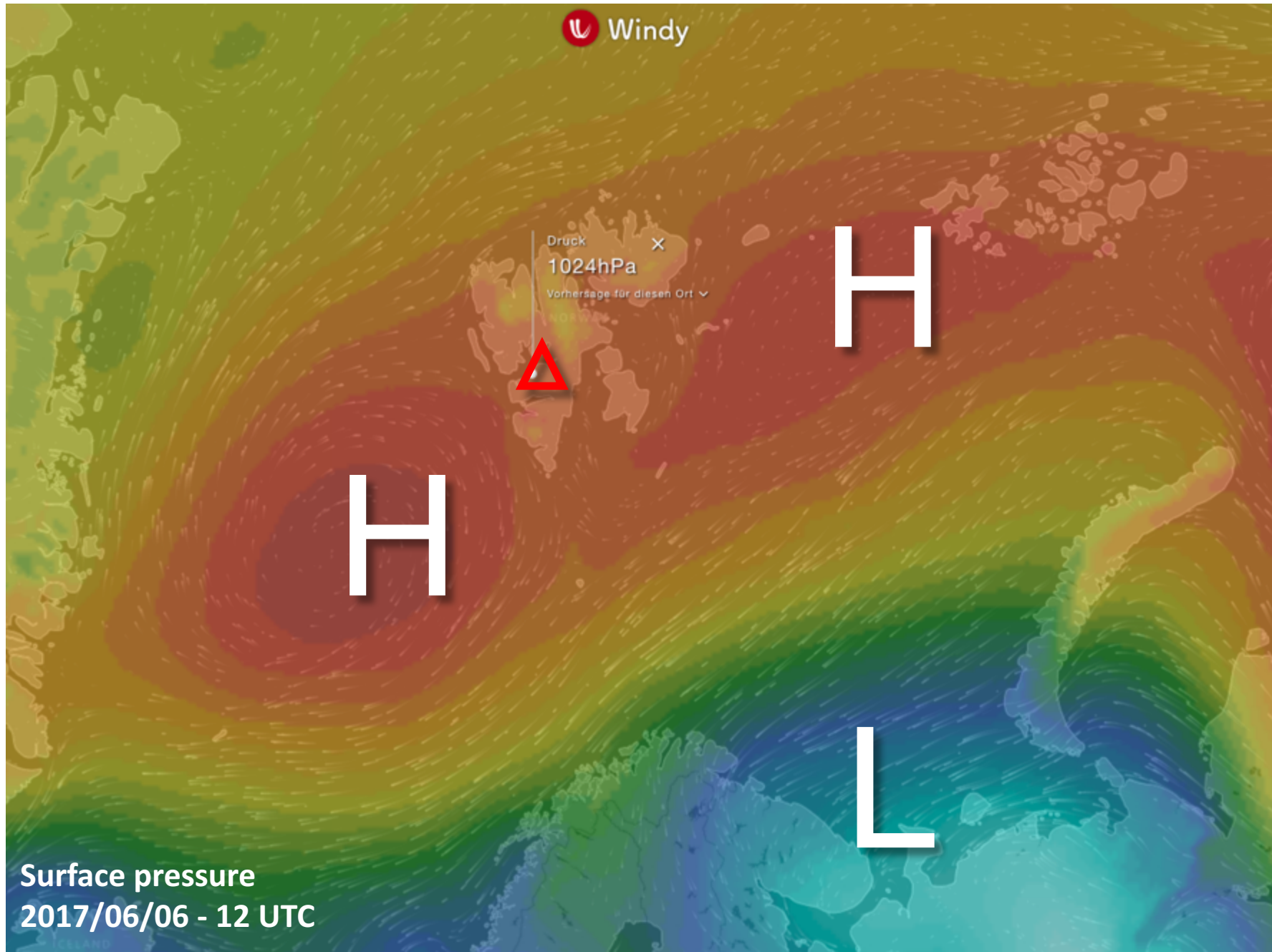
*2m Temperatur (°C)*

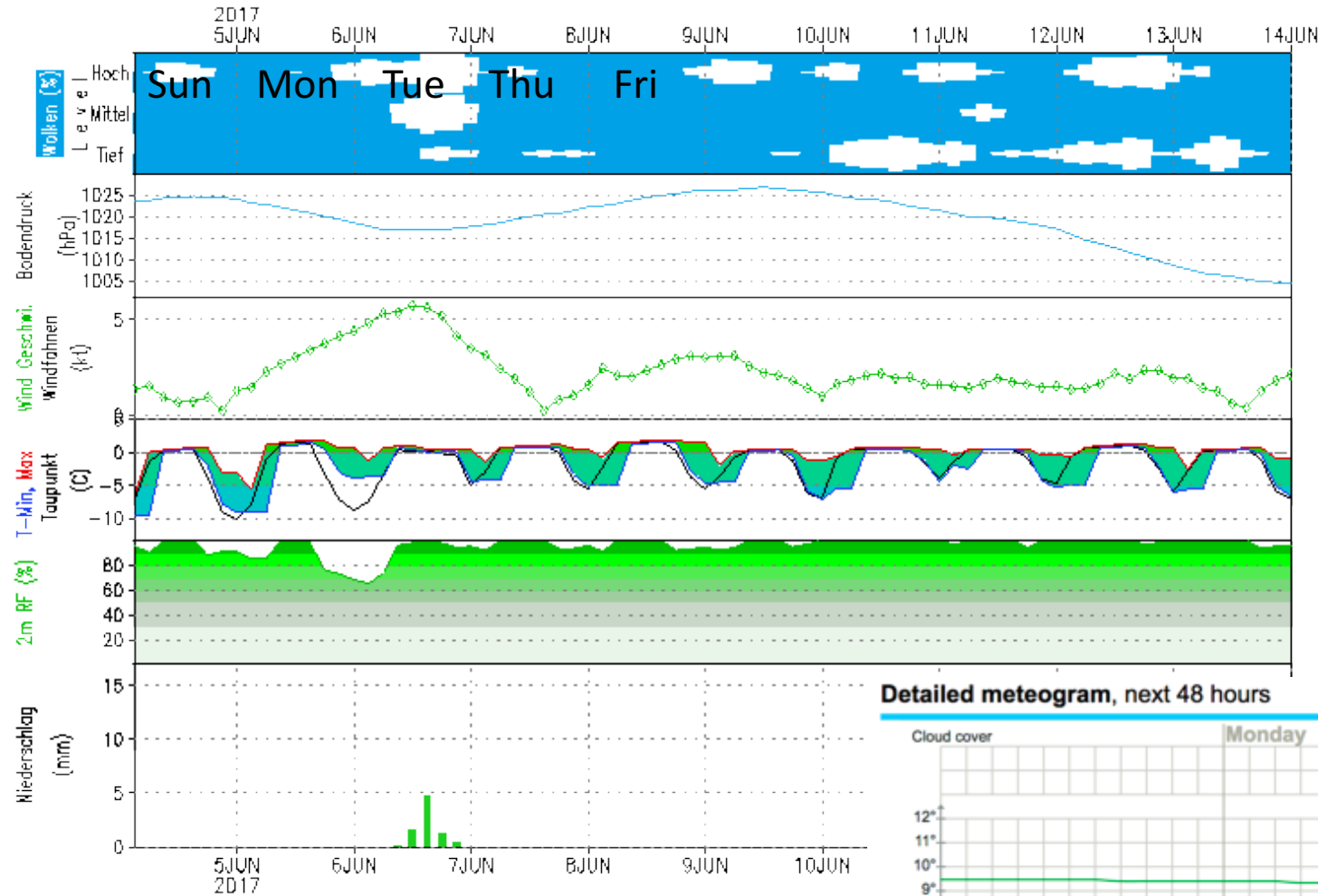


# Outlook

**Tue 6 June – Thu 8 June 2017**

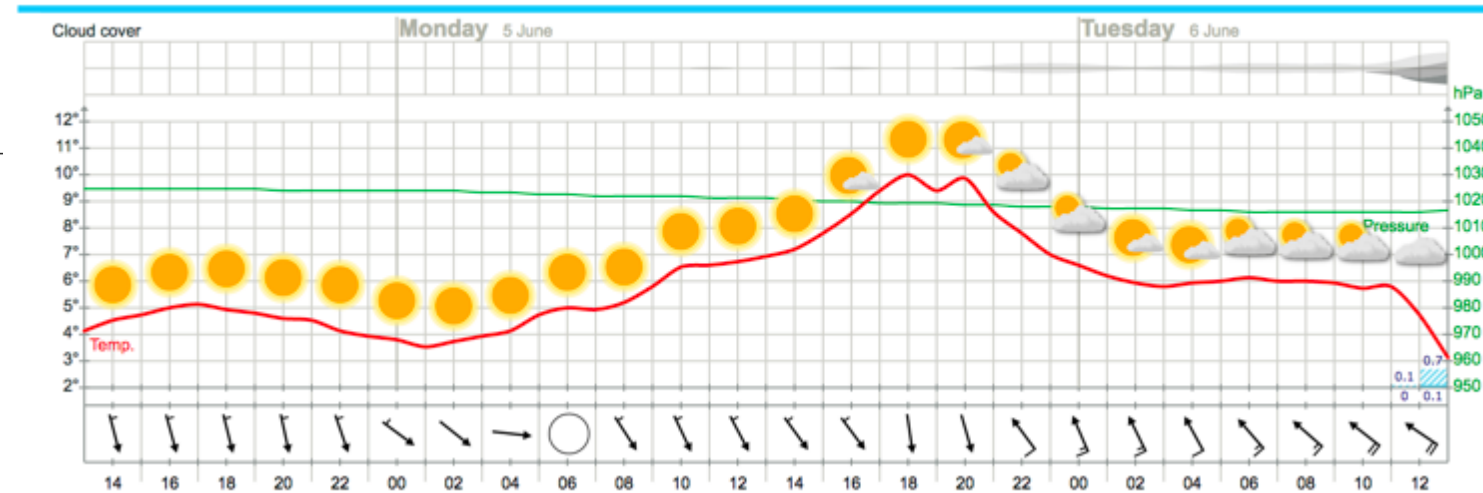
# General Situation Tue 6 June 2017





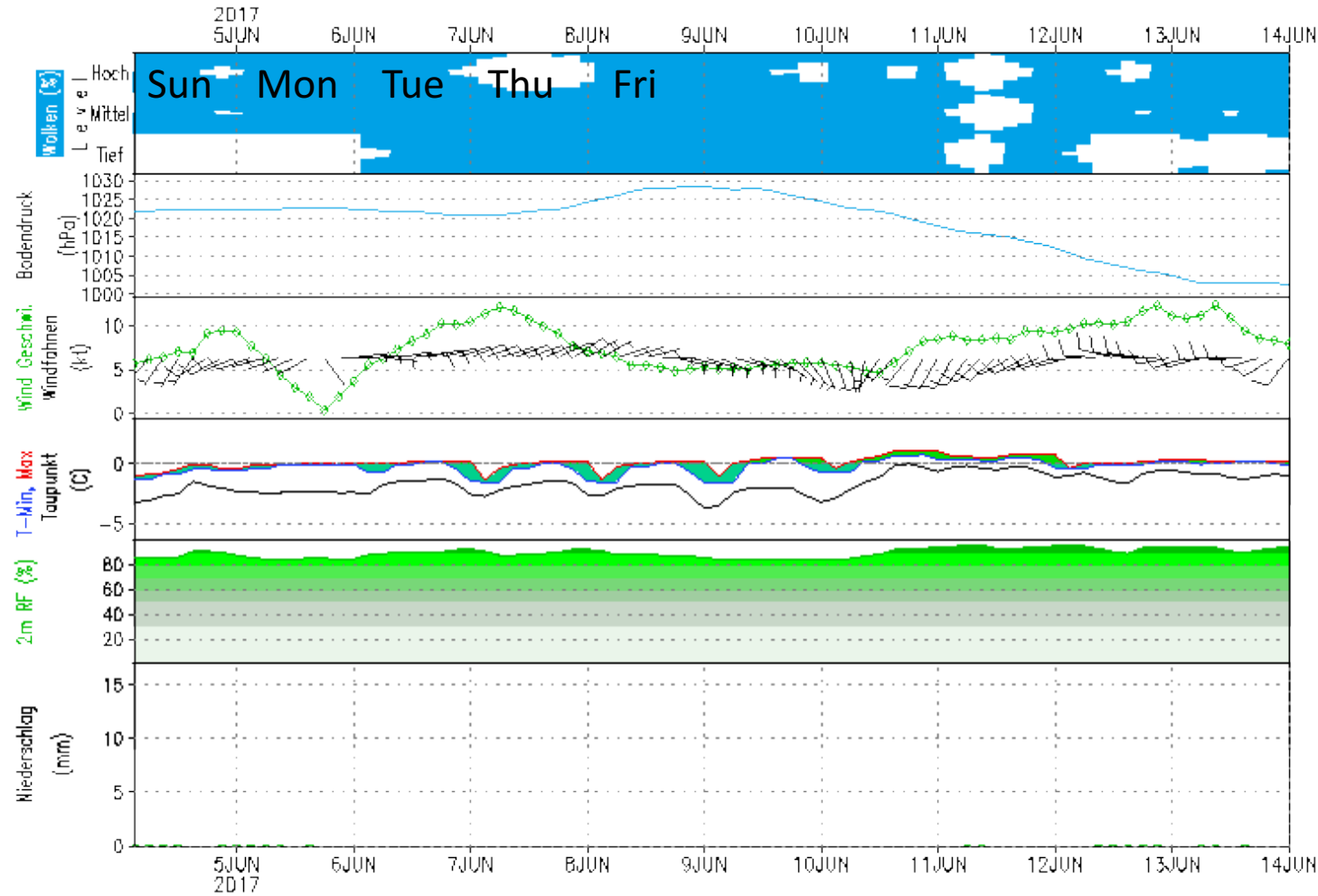
Heute kein Sonnenaufgang  
Heute kein Sonnenuntergang

Detailed meteogram, next 48 hours



YR.no

Lauf: 00Z



Heute kein Sonnenaufgang  
Heute kein Sonnenuntergang

## ACLOUD 2017 / Svalbard

Freitag, 19. Mai 2017

### New Arrivals

Today the first large group of ACLOUD scientists arrived in Longyearbyen. Surprisingly, all in the second commercial flight by SAS. Nobody took Norwegian airline, even if they provide WiFi on board... Also nobody was lost during the stop in Oslo. So we could guide all safely to our hotel, the Coal Miner Cabins.

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