



# German Arctic Expeditions 2016 - 2017

FARO/ASSW, 2017, Prague

**Dirk Mengedoht** (Alfred Wegener Institute, Germany)

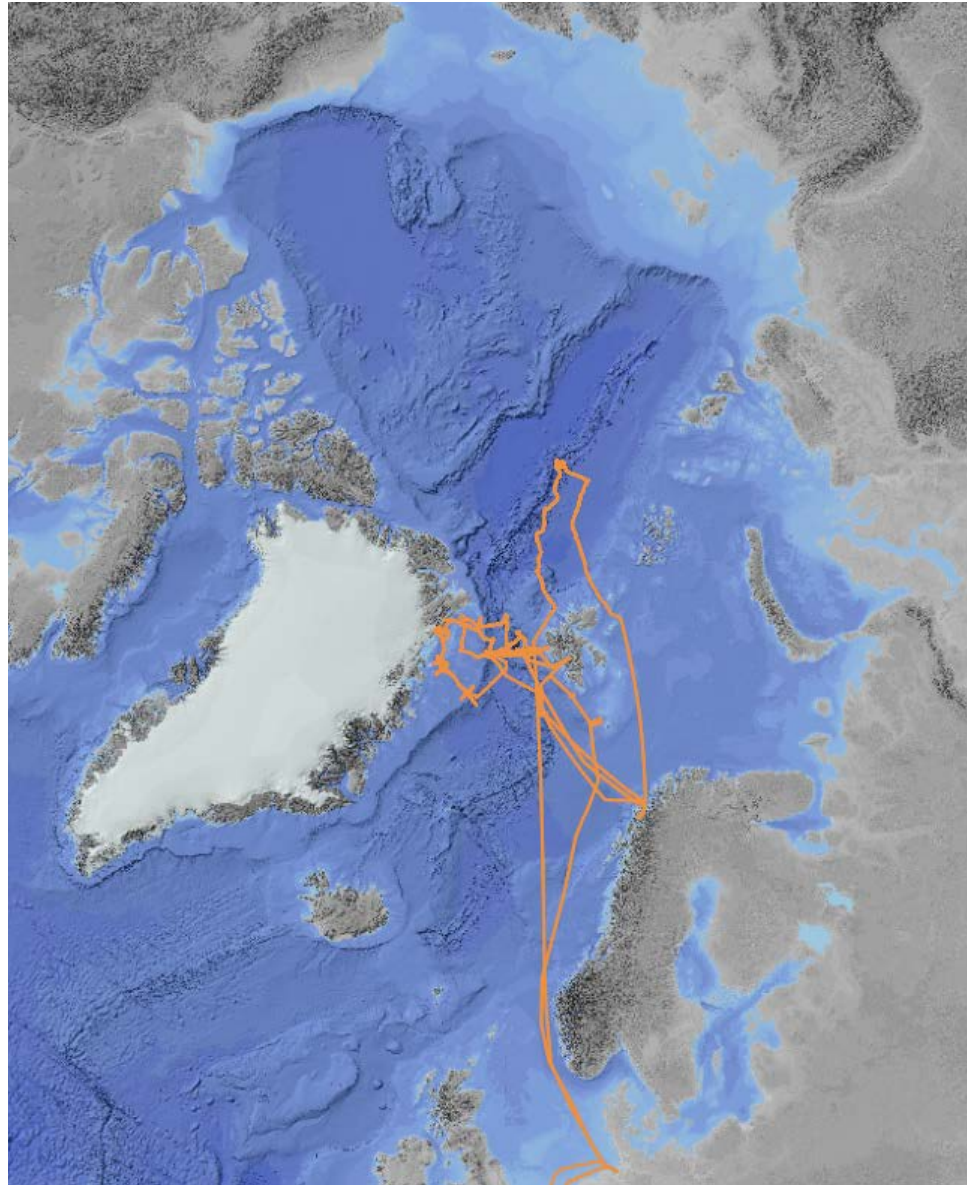


# Polarstern Arctic Expeditions 2016



Leg	Start	End	Mission
<b>PS99.1</b>	13.06.2016 Bremerhaven	22.06.2016 Longyearbyen	Biology / Fram Strait / Hausgarten geo sciences
<b>PS99.2</b>	23.06.2016 Longyearbyen	16.07.2016 Tromsø	Biology / Fram Strait / Hausgarten
<b>PS100</b>	18.07.2016 Tromsø	06.09.2016 Tromsø	East Greenland, biology, oceanography
<b>PS101</b>	09.09.2016 Tromsø	23.10.2016 Bremerhaven	Oceanography / geo sciences / biology / Central Arctic Ocean

2016



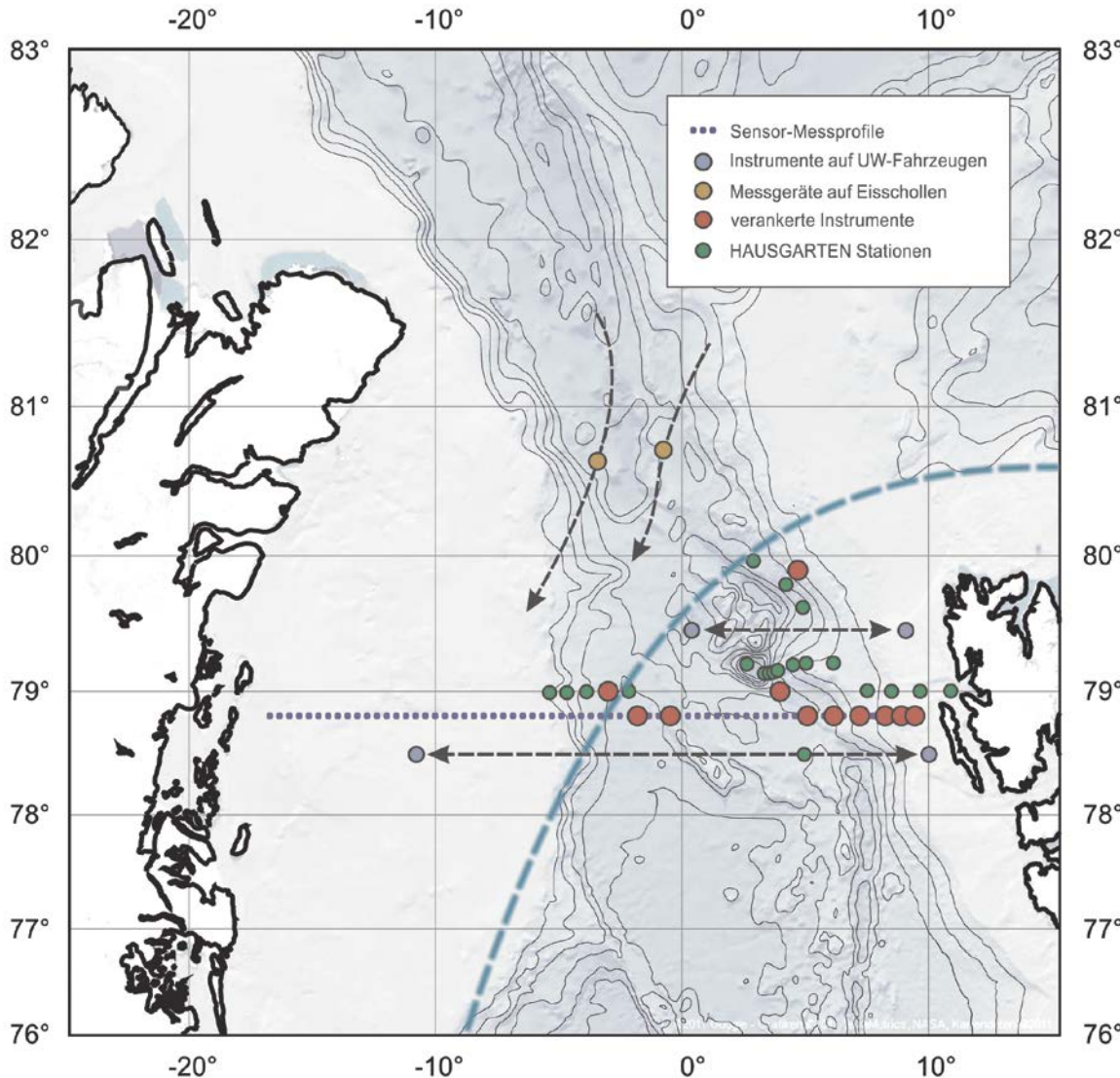
Polarstern

# Polarstern Arctic Expeditions

planned in 2017

Leg	Start	End	Mission
<b>PS106</b>	24.05.2017 Bremerhaven	20.07.2017 Tromsø via Longyearbyen	Air physics und chemistry, biology / Fram Strait and around Svalbard
<b>PS107</b>	23.07.2017 Tromsø	18.08.2017 Tromsø	Biology / Fram Strait / Hausgarten
<b>PS108</b>	22.08.2017 Tromsø	09.09.2017 Tromsø	Fram Strait, ROBEX
<b>PS109</b>	12.09.2017 Tromsø	14.10.2017 Bremerhaven	Oceanography / geo sciences / biology East Greenland shelf

## Ocean Observing System FRAM





# Heincke Arctic Expeditions



planned in 2017

Leg	Start	End	Mission
<b>HE492</b>	29.07.2017 Trondheim	17.08.2017 Longyearbyen	Biology / Svalbard
<b>HE493</b>	20.08.2017 Longyearbyen	08.09.2017 Bremerhaven	Geo sciences / biology / oceanography Svalbard / Norwegian Sea





# POLAR 5/6 2016



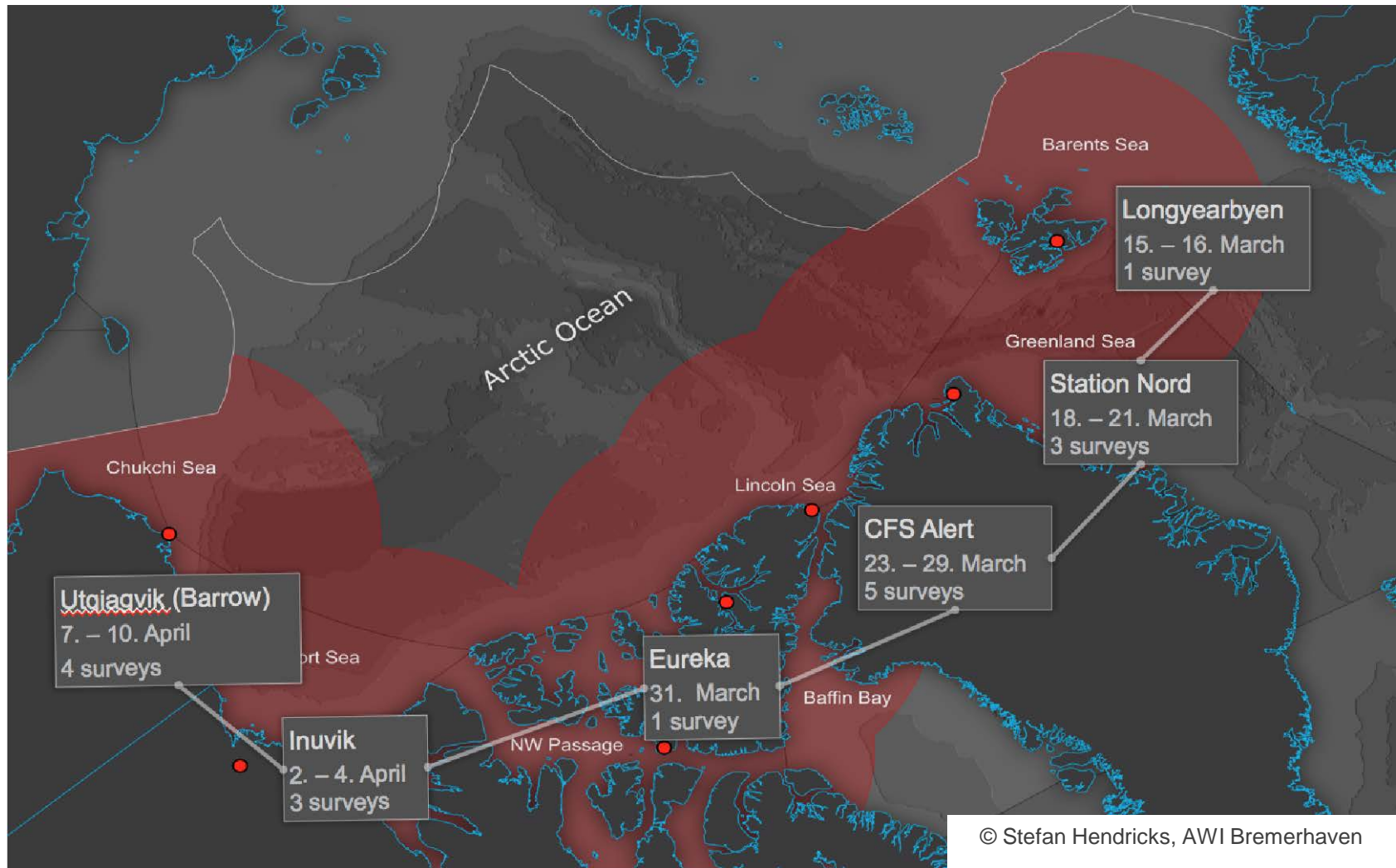
Leg	Start	End	Pers. Days	Institutions	Programme name	Mission
<b>UWB/M</b>	Apr 12	May 18		AWI	Ultra wind band radar system / microwave ultra wind band radar system	Continuation of test of new ice penetrating multi channel radar system and first application for mapping glaciers in West Greenland.
<b>RESURV79</b>	Jun 21	Jun 29	45	AWI	Re-survey of the 79° Glacier	Geometry and basal melt channels of the floating tongue of the 79° glacier, as well as ice thickness and surface elevation (change) of the region at and upstream the grounding line
<b>TIFAX</b>	Jul 22	Aug 03	60	AWI	Thick Ice Feeding Arctic Export	Sea ice thickness and atmosphere studies north of Svalbard, Greenland and Canada
<b>AIRMETH</b>	Aug 21	Sep 22	242	AWI, GFZ Potsdam	Airborne Measurements of Methane	

# POLAR 5/6 2017



Leg	Start	End	Pers. Days	Institutions	Programme name	Mission
<b>PAMARCMIP</b>	Mar 14	Apr 15	240	AWI, U Mainz m FZ Jülich	Polar Airborne Measurements and Arctic regional Climate Model Project	Sea ice thickness and atmospheric Study in the Arctic
<b>ACLOUD</b>	Mai 22	Jun 29	592	U Leipzig, AWI,	Arctic Cloud Observations Using airborne measurements during polar Day	Measurements of turbulent and radiative energy fluxes above, in, and below Arctic boundary layer clouds for different meteorological and sea ice conditions
<b>Logistics iGRIFF</b>	Jul 21	Jul 29	24	AWI	micro version of ice based part of Greenland Ice-Ocean Interaction and Fram Strait Fluxes	Removing equipment from Station Nord
<b>MABANG</b>	Aug 16	Aug 18	18	AWI	Mass balance of glaciers in North Greenland	Elevation changes of glaciers in north Greenland
<b>TIFAX</b>	Aug 19	Sep 05	108	AWI	Thick Ice Feeding Arctic Export	Sea ice thickness and atmosphere studies north of Svalbard, Greenland and Canada

# ACTUAL ACTIVITY: PAMARCMIP 2017

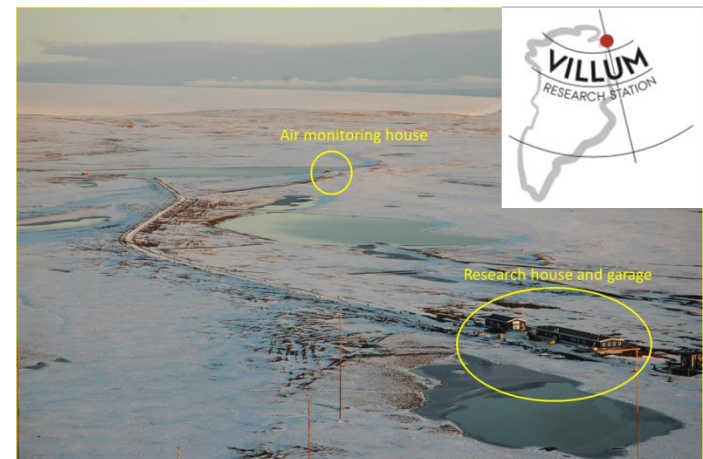


Airborne mission (March 13, - April 15, 2017), with operation area for sea ice / atmospheric study

# PLANNED ACTIVITY: PAMARCMIP 2018



- **PAMARCMiP 2018** campaign is planned from 9th of April to 4th of May 2018 from VILLUM / Station Nord, Greenland (within the DFG Transregio Project Arctic Amplification – AC\*3)
- **Airborne Activity**
  - Leipzig Institute for Meteorology
  - AWI Bremerhaven / AWI Potsdam
  - University of Tokyo / University of Nikiita
  - JGU Mainz / MPI Mainz / FZ Jülich
  - University of Utrecht - IMAU
- **Ground-based activity**
  - Leipzig Institute for Meteorology, TROPOS
  - AWI Bremerhaven
  - Aarhus University



# Land based Arctic activities 2016 (extract)



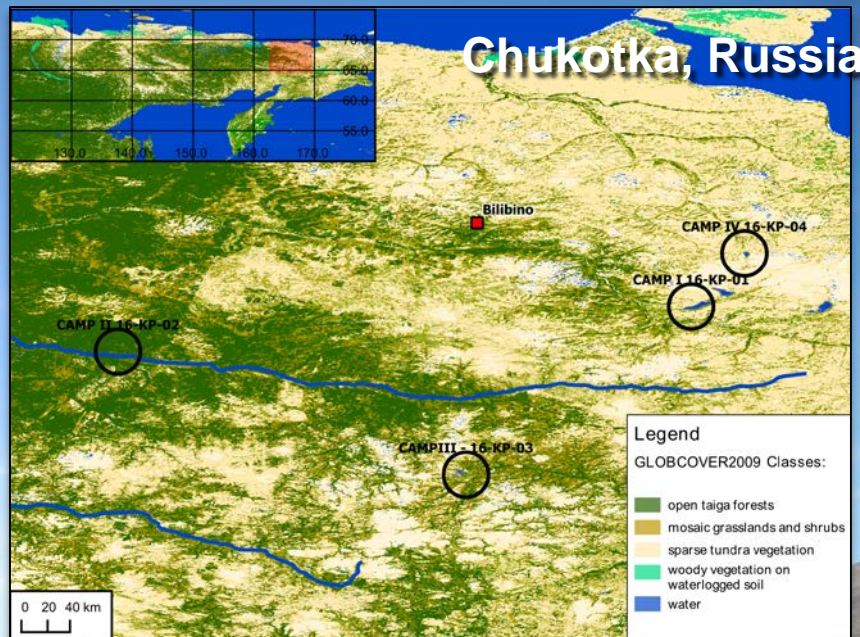
Leg	Start	End	Pers. Days	Nations	Mission
LENA 2016	April 01	Sep 30	1530	Russia Germany	- Long-term studies of energy and water balance, carbon turnover, greenhouse gas emissions in permafrost ; - hydrological, geomorphological and biological dynamics of permafrost landscapes ; - geocryological and palaeoecological investigations for reconstruction of permafrost, climate and landscape evolution
Keperveem 2016	June 25	Aug 10	276	Russia Germany	Degrading permafrost landscapes; carbon, energy and water fluxes, Isotope and biomarker analysis of sedimentary organic matter; Quantitative environmental reconstruction using transfer functions; Pollen and plant macrofossil analysis
PETA-CARB 2016	July	August	322	USA, Russia, Germany	Collecting lake and permafrost cores, Soil carbon inventory in permafrost landscapes, Carbon quality analyses of Yedoma exposures, Survey and monitoring subsidence in permafrost, installing temperature loggers, Establishing digital elevation model Field regions: Lena Delta + Western Alaska

# Past and present vegetation dynamics at the most eastern extension of the Siberian boreal treeline

*Inferred from lake sediments  
& vegetation surveys*



28.06. - 26.07.2016



Vegetation analysis



Lake sediment core sampling

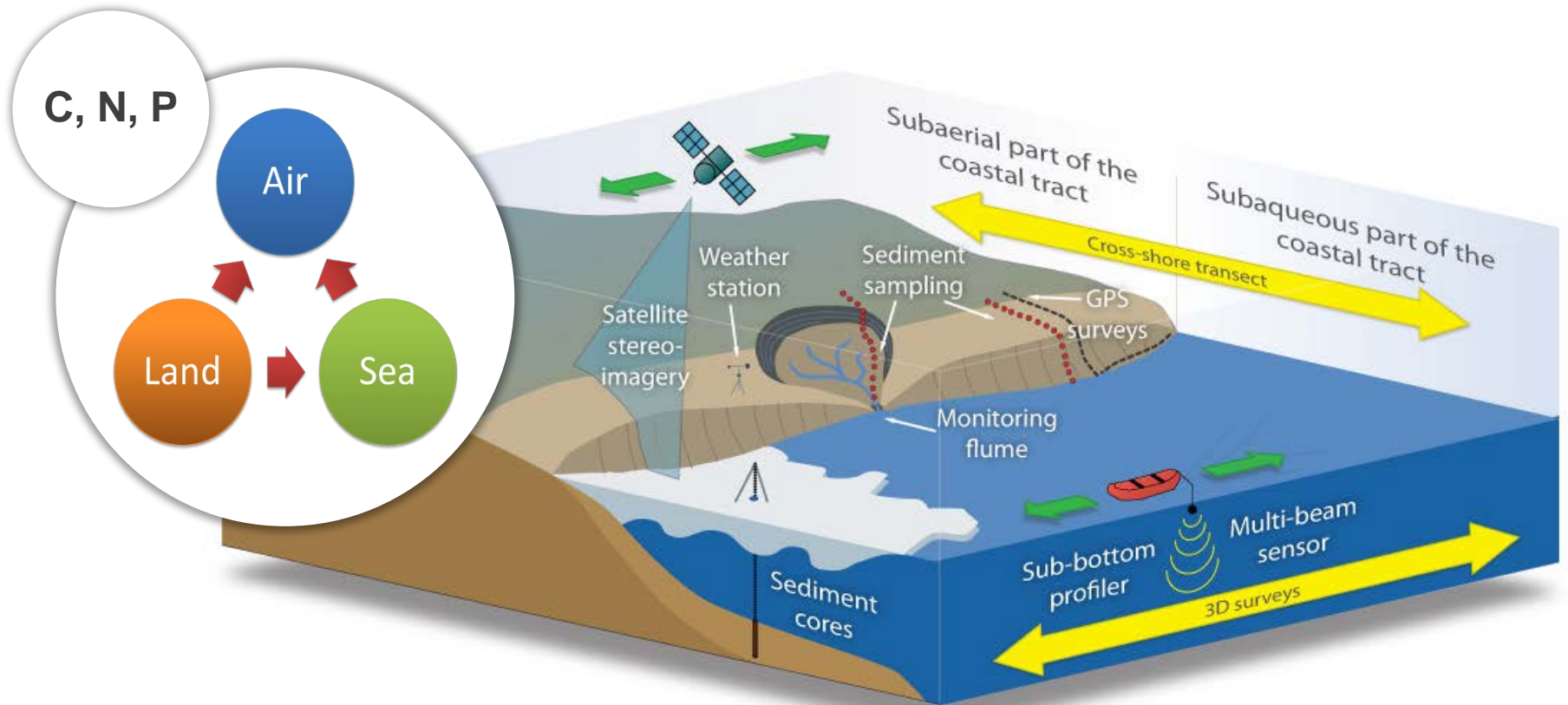
# Land based Arctic activities 2016/ 2017



Leg	Start	End	Pers. Days	Nations	Mission
LENA 2017	April 01	Sep 30	~1700	Russia Germany	<ul style="list-style-type: none"> <li>- Long-term studies of energy and water balance, carbon turnover, greenhouse gas emissions in permafrost ;</li> <li>- hydrological, geomorphological and biological dynamics of permafrost landscapes ;</li> <li>- geocryological and palaeoecological investigations for reconstruction of permafrost, climate and landscape evolution</li> </ul>
Yukon Coast 2016	April 10	Aug 25	411	Canada, Germany, Poland	<ul style="list-style-type: none"> <li>• Coastal erosion and permafrost geomorphology</li> <li>• Land-ocean sediment, carbon and nutrient fluxes</li> <li>• Organic carbon origin and degradation</li> <li>• Vegetation and land cover change</li> </ul>
Yukon Coast 2017	Jul 17	Aug 28	200	Canada, Germany, Netherl., UK	<ul style="list-style-type: none"> <li>• Coastal erosion and permafrost geomorphology</li> <li>• Land-ocean sediment, carbon and nutrient fluxes</li> <li>• Organic carbon degradation and pathways</li> <li>• PermaSAR, Inuvik/Trail Valley Creek</li> </ul>



# COPER - Coastal permafrost erosion, organic carbon and nutrient release in the Arctic nearshore zone



# EastGRIP\*



East Greenland Ice Core Project (2016-20)

Total ~10 nations

\* AWI as partner under lead of CIC (Kopenhagen, D. Dahl-Jensen)

First physically motivated deep drilling in an ice sheet at the onset of the NEGIS ice stream



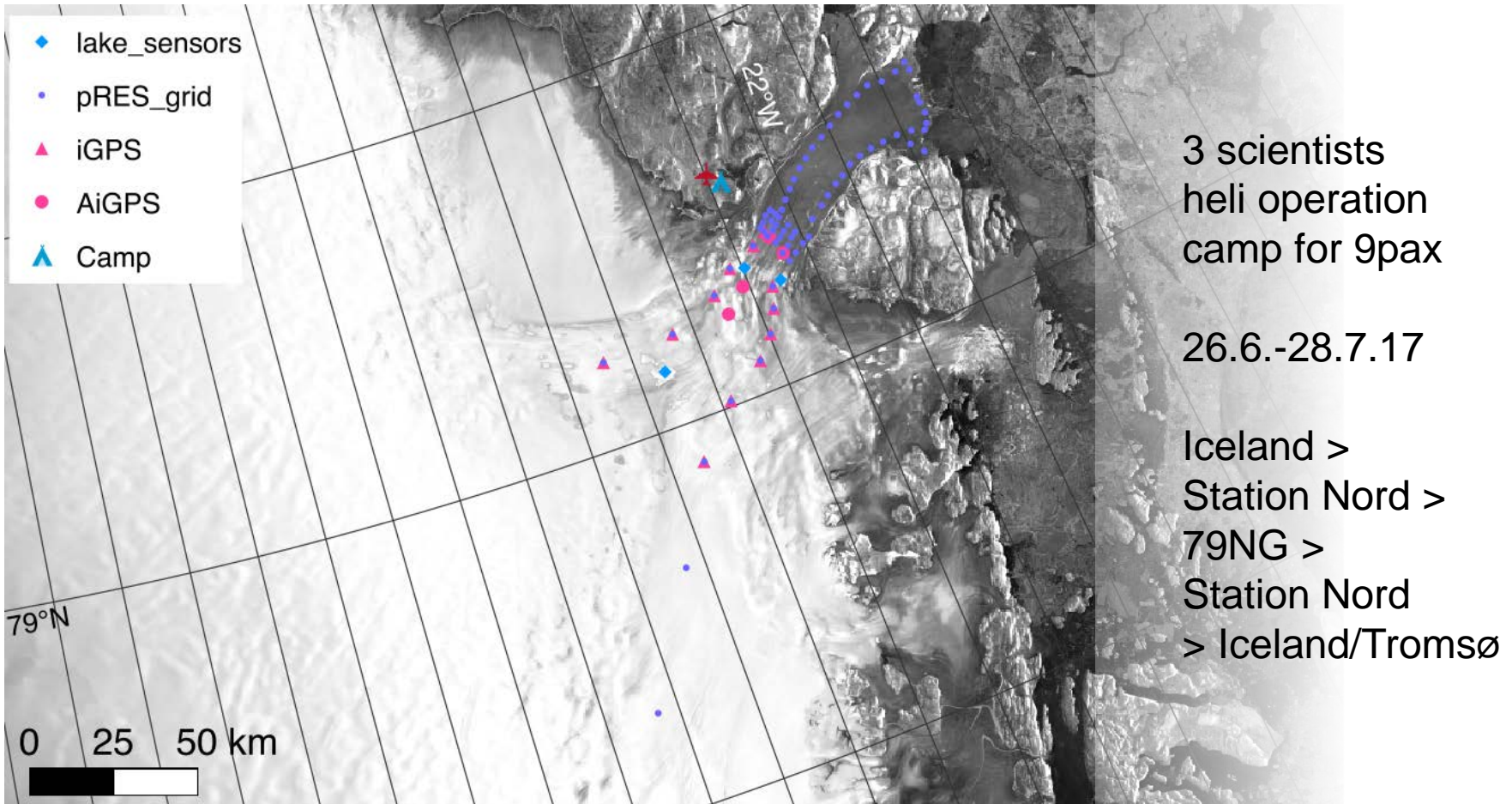
	2016	2017
activities	Camp installation, infrastructure, field glaciology, shallow drilling	Deep drilling, core processing and measurements, field glaciology
AWI personell	2 (ca. 480 man days)	11 (ca. 1350 man days)

- Angelika Humbert & GRIFF team



iGRIFF 2017

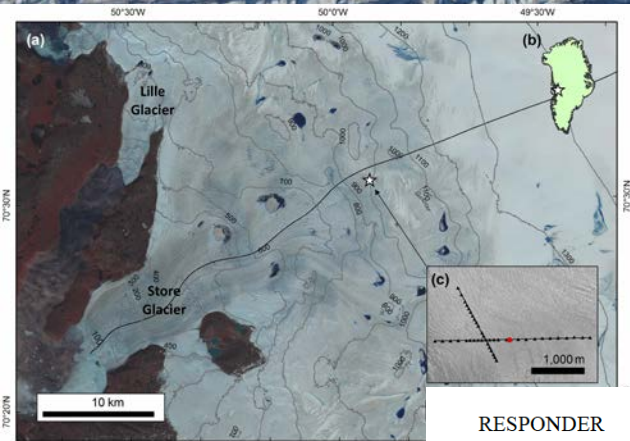
# Basal melt rates, tidal forcing and supraglacial lakes of the 79°N Glacier



# RESPONDER

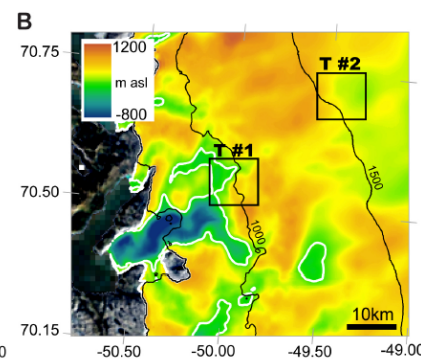
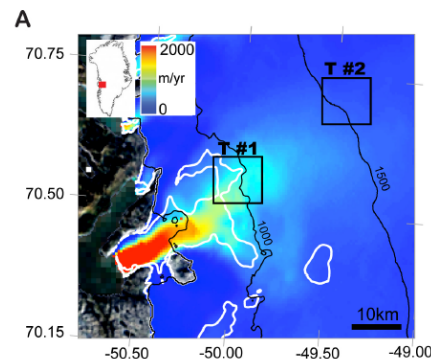
July 2017, 2018

## Subglacial properties of Store Glacier, West Greenland using active seismics:



RESPONDER

ERC-2015-CoG





## Svalbard activities 2016



Projects	Start	End	Pers. Days	Nations	Mission
9	April	Sept.	In total	France	Atmospheric sciences
40	Jan.	Dec.	~2490	Germany	Seismology, Gravity
3	April	Aug.	(w/o station personnel)	Netherlands	Glaciology, Marine Biology

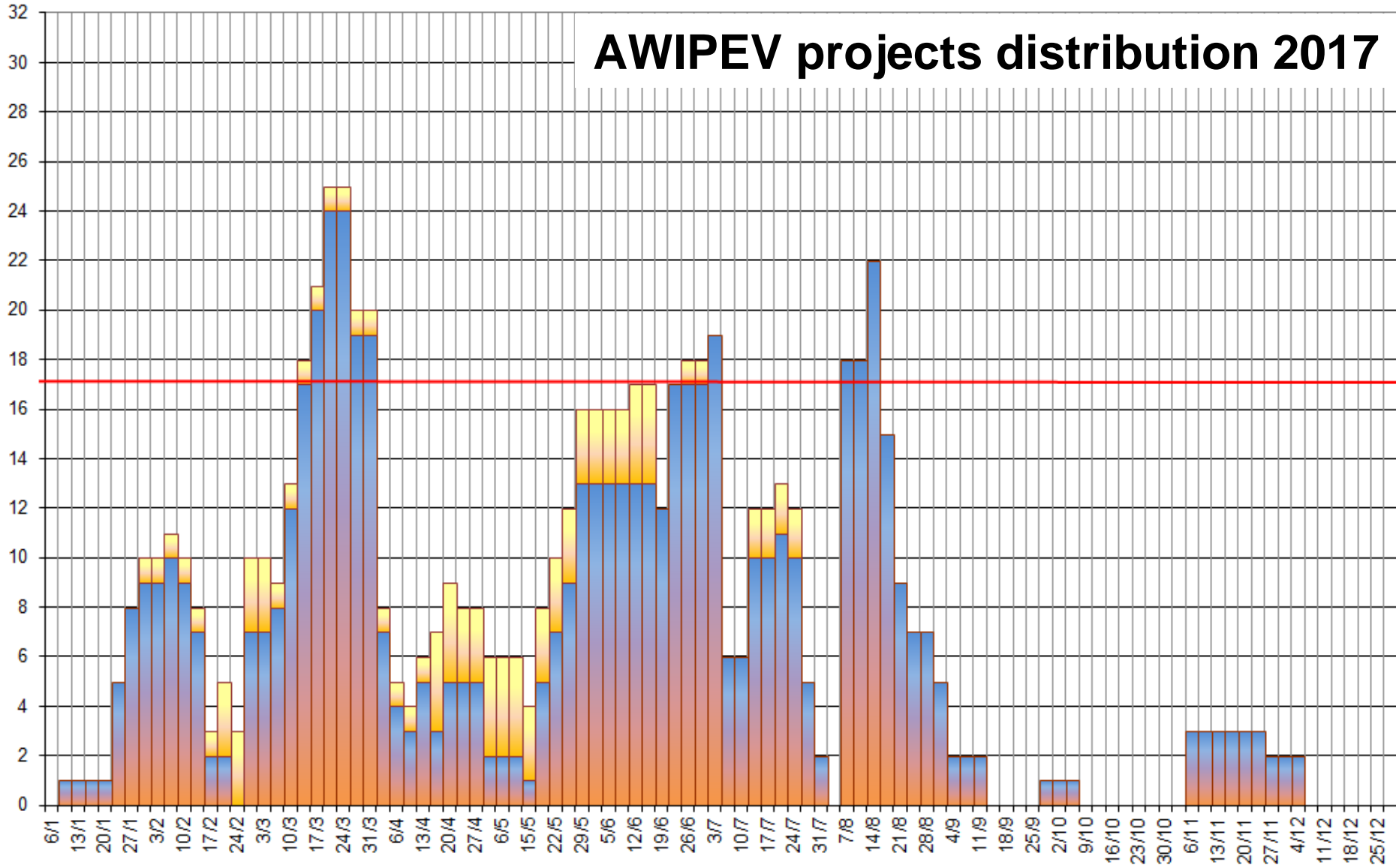


## Svalbard activities 2017

Projects	Start	End	Pers. Days	Nations	Mission
14	April	Sept.	In total	France	Atmospheric sciences
36	Jan.	Dec.	ca. 2500	Germany	Seismology, Gravity
3	April	Aug.	(w/o station personnel)	Netherlands	Glaciology, Marine Biology

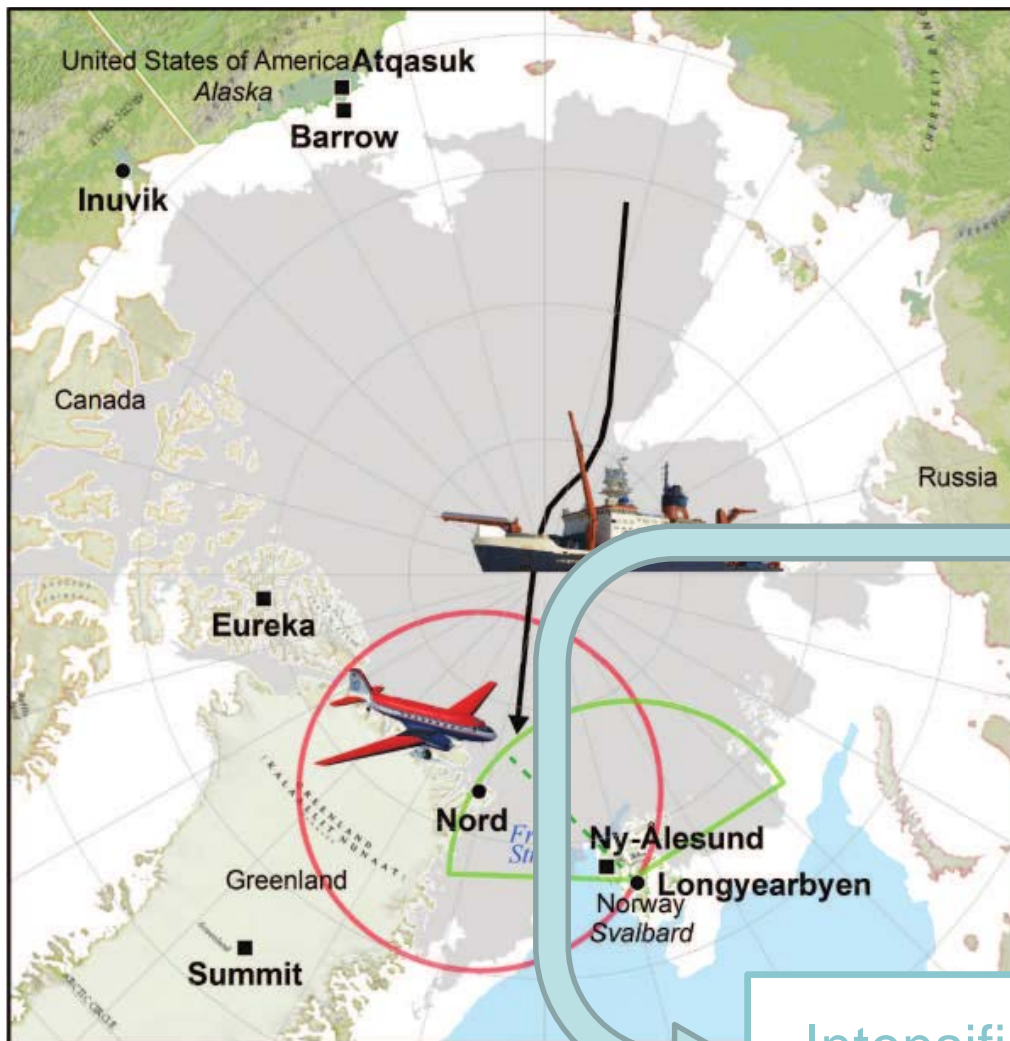


## AWIPEV projects distribution 2017





# Ny-Ålesund Integrative Aspects



## 2017 campaigns

PASCAL (*Ship*)  
ABEX (*Balloon*)  
ACLOUD (*Aircraft*)

## Ny-Ålesund

- Long-term observations of relevant climate parameters
- Observational fix point for campaign activities over the Arctic ocean

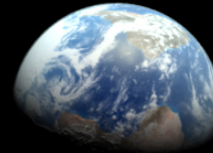
Intensified Radiosonde Campaign  
24 May – 22 June

# Ny-Ålesund Integrative Aspects

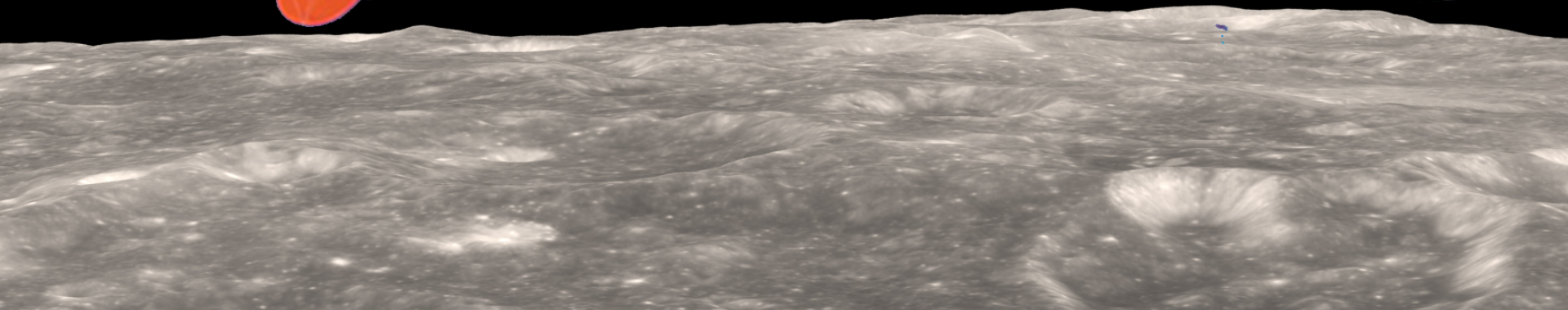


Meanwhile, far far away ...

Finally!  
I thought we would  
never make it.



Mission complete,  
let's celebrate !





# German Arctic Office to act as consultant to politics and industry

The Alfred Wegener Institute has set up the first cross-institutional centre of excellence for questions about the Arctic at the Potsdam site, by January 2017



Neutral science partner for  
decision-makers in politics  
and industry



ALFRED-WEGENER-INSTITUT  
HELMHOLTZ-ZENTRUM FÜR POLAR-  
UND MEERESFORSCHUNG



Thank you!