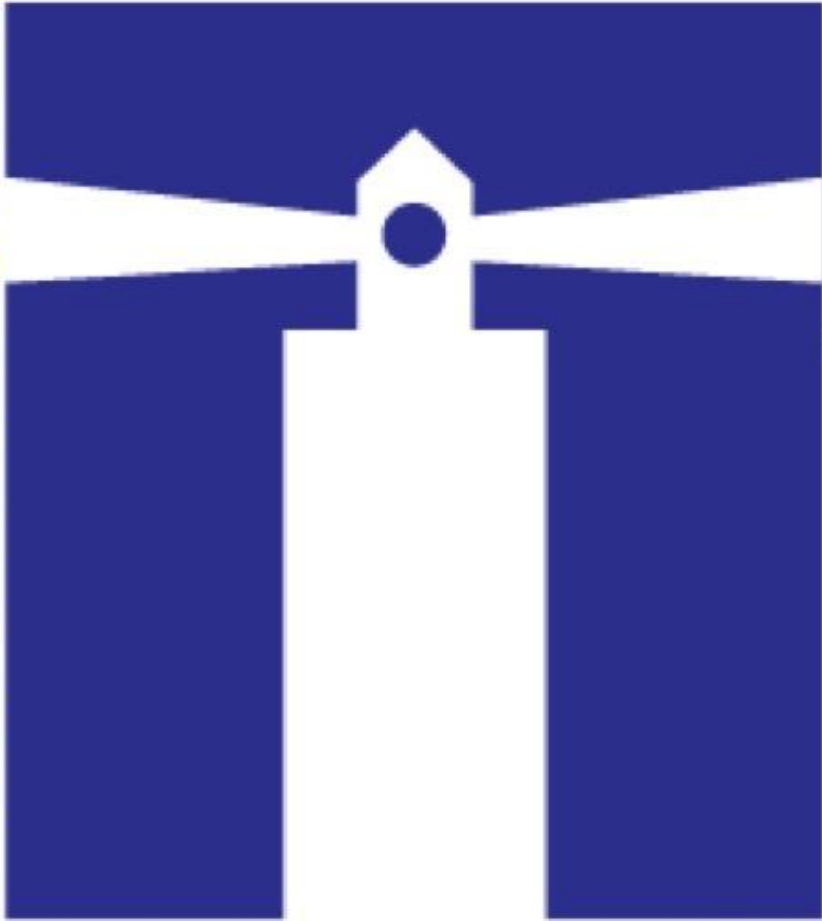


FORUM OF ARCTIC RESEARCH OPERATORS



faro-arctic.org, faro-arctic@bios.au.dk

F A R O



Updates from Poland

ASSW 2023

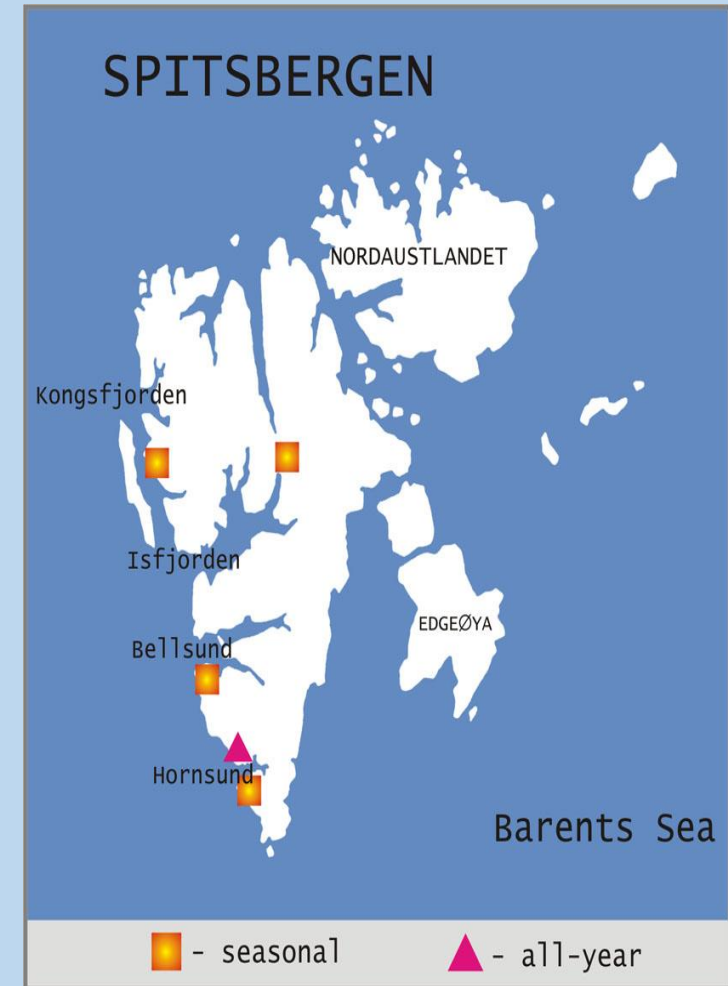
FARO Annual Meeting, Vienna 17 February 2023

Presented by Piotr Glowacki



Current Polish infrastructure in the Arctic

- **Polish Polar Station in Hornsund at Svalbard**
(operating all year round since 1978)
- **Research vessel OCEANIA**
(operating around Svalbard seas June-August since 1987)
- **Scientific-Training vessel HORYZONT II**
(operating in Svalbard seas June-September since 2000)
- **Adam Mickiewicz University Polar Station in Petuniabukta**
(seasonal station June-September since 2015)
- **Nicolaus Copernicus University Polar Station in Kaffioyra**
(seasonal station May-September since 1975)
- **University of Wroclaw Polar Station BARANOWKA**
(seasonal station May-October since 1971)



Polish Polar Station Hornsund in 2022

- Winter crew – 9
- Technical staff – 6 persons (June - September)
- 13 research groups - spent 1110 person-days
- Polish scientists – 31 persons
- Foreign scientists – 24 persons

(Czech Republic, France, Finland, India, Italy, Netherlands, Norway, Pakistan, Switzerland, UK, USA)

Seasonal station at Kaffiøyra (Oscar II Land)

owner: Nicolaus Copernicus University in Torun

15 June – 15 September 2022

13 scientists from Poland, 3 from Norway, 10 from Taiwan

**Changes of cryosphere, glaciology, hydrology, geomorphology,
seismology, biology**

Leader: Ireneusz Sobota



Seasonal station *BARANOWKA* (Wedel Jarlsberg Land)

owner: University of Wroclaw

2 weeks in July 2022

2 scientists from Poland



Cryology research

Leader: Marek Kasprzak

Old Calypsobyen Cabin - Researchfjorden, Bellsund, (used by Marie Curie-Sklodowska University in Lublin)

XXX Polar Expedition to Calypsobyen

17 June – 1 September 2022

21 scientists from Poland

r

**Climatology, permafrost geomorfology,
dynamics of the coastal zone**

Leader: Piotr Zagórski

Seasonal station in Petuniabukta
owner: Adam Mickiewicz University in Poznan

Billefjorden: 39 scientists from Poland + 1 from Nederland/Swiss
1 from Brazil, 2 form Czech Republik, 3 from Estonia

15 June – 31 August 2022

**Interdisciplinary scientific research focusing on monitoring of the
natural environment,**

Leader: Krzysztof Rymer



Scientific - training vessel *Horyzont II* on Svalbard in 2022



**First trip (6 – 28 June)
at Svalbard 14 -20 June**

**16 crew
20 students
21 members from expeditions**

**Second trip (22 August – 20 September)
at Svalbard 30 August - 6 September**

**16 crew
17 students
12 members from expedition**

s/y OCEANIA AREX 2022

Svalbard 15 June - 15 September

Crew 14 persons + 5 scientific groups

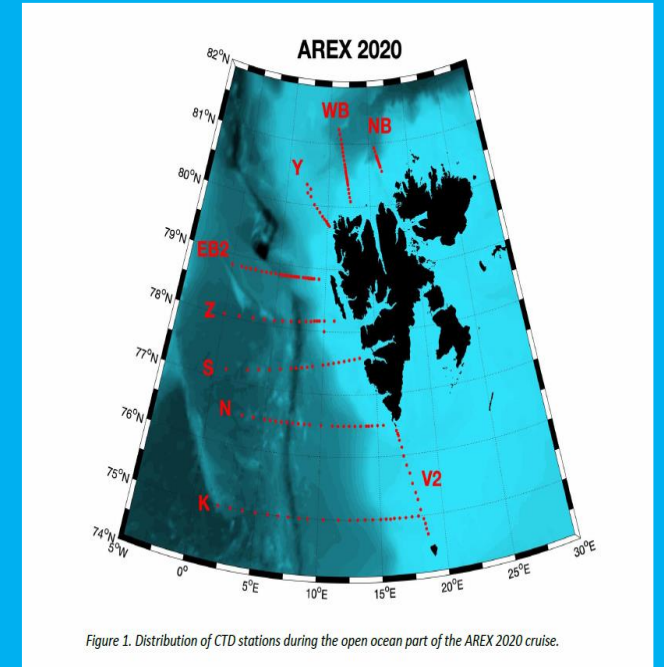
(57 scientists from Poland and 2 from USA and, Italy,
+ 1 from Norway, Vietnam, Sri Lanka and India)



Cruise coordinator:
Dr. Agnieszka Beszczyńska- Moller

Several international, Norwegian and Polish research projects covering all disciplines of basic marine science.

Additionally land based teams at Hornsund, Isfjorden and Kongsfjorden cooperating with OCEANIA.



Other Polish activity at Svalbard in summer 2022

Bear Island

2 - 25 July

6 Polish scientists (2 ornithology + 4 divers)

University of Gdansk

Leader – Dr. Katarzyna Zmudczyńska-Skarbek

Nordauslandet

(Murchisonfjorden, Wahlenbergfjorden, Sorgfjorden, Lomfjorden)

1 – 22 September

3 Polish scientists + 1 from UK)

Institute of Geophysics PAS

Leader – Prof. Krzysztof Michalski

North Spitsbergen (Northern Andreland)

2 weeks in August

- 1 researcher from UWr and 6 researchers from Germany, Netherlands, Canada, Czechia, Norway

Spitsbergen (Bellsund and VanMijenfjorden)

10-day cruise in August

- 2 researchers from Uwr and 3 partners from Czechia

Uniwersity of Wroclaw

Leader – Dr Mateusz Strzelecki

South Spitsbergen (Brepolen)

Four 10-day cruises in June, July, August, and September

- 7 researchers in each fieldwork.
- Cooperation with 4 scientists from Italy and 1 from Finland and USA

Institute of Oceanology PAS

Leader – Dr Agata Zaborska

Other Polish activity in the Arctic in summer 2022

Greenland

June, July September

3 Polish scientists

+ 1 from Australia

+ 1 from India

Institute of Geophysics PAS

Leader – Prof. Monika Kusiak

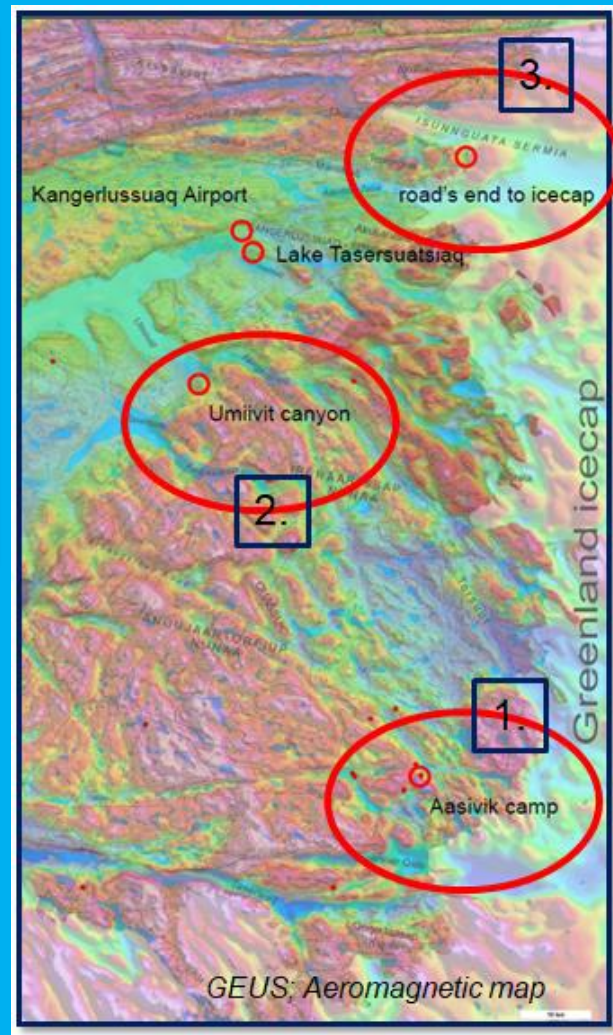


Greenland 2022

3. Icecap

21-29.07

car



2. Umivik canyon

15-20.07

boat



1. Aasivik camp

22.06-7.07

helicopter

New investments and development of the observation network in Svalbard

CRIOS – Cryosphere Integrated Observatory Network on Svalbard

Principle Investigator:

Michał Laska, University of Silesia / Centre for Polar Studies;
michal.laska@us.edu.pl

Project budget: 1 271 625 EUR

Project duration: 18 months (until 30th April 2024)



Iceland 
Liechtenstein  Norway 
Norway grants grants

Partners from Polish Polar Consortium

- University of Silesia in Katowice (UoS) / Centre for Polar Studies (CSP) - Leader
- Institute of Geophysics Polish Academy of Sciences (IG PAS)
- University of Wrocław (UWr)
- Nicolaus Copernicus University in Toruń (NCU)
- Maria Curie-Skłodowska University in Lublin (UMCS)
- Adam Mickiewicz University (AMU)
- Warsaw University of Technology (WUT)



Norwegian Partners

- Svalbard Integrated Arctic Earth Observing System Knowledge Centre (SIOS-KC) – Norwegian Leading Partner
- The Norwegian Polar Institute (NPI)
- The University Centre in Svalbard (UNIS)
- The Norwegian Meteorological Institute (MET.NO)



Objectives

- 1) Create the cal/val system for indirect research, eg. remote sensing, ground penetrating radar survey, others.
- 2) Modernise and expand an automated monitoring network focused on the cryosphere of Spitsbergen.
- 3) Harmonise and expand the monitoring systems in Hornsund, Longyearbyen and Ny-Ålesund (level I stations). Equipping all Research Infrastructures operated by Polish Research units (level II stations) with the newest cryosphere monitoring technologies.
- 4) Choose existing or develop standardised measurement protocols during joint workshops and training sessions based on the SIOS Core Data process.
- 5) Real-time data transfer to the open repositories, following the FAIR principles, for researchers and policymakers.

Study sites

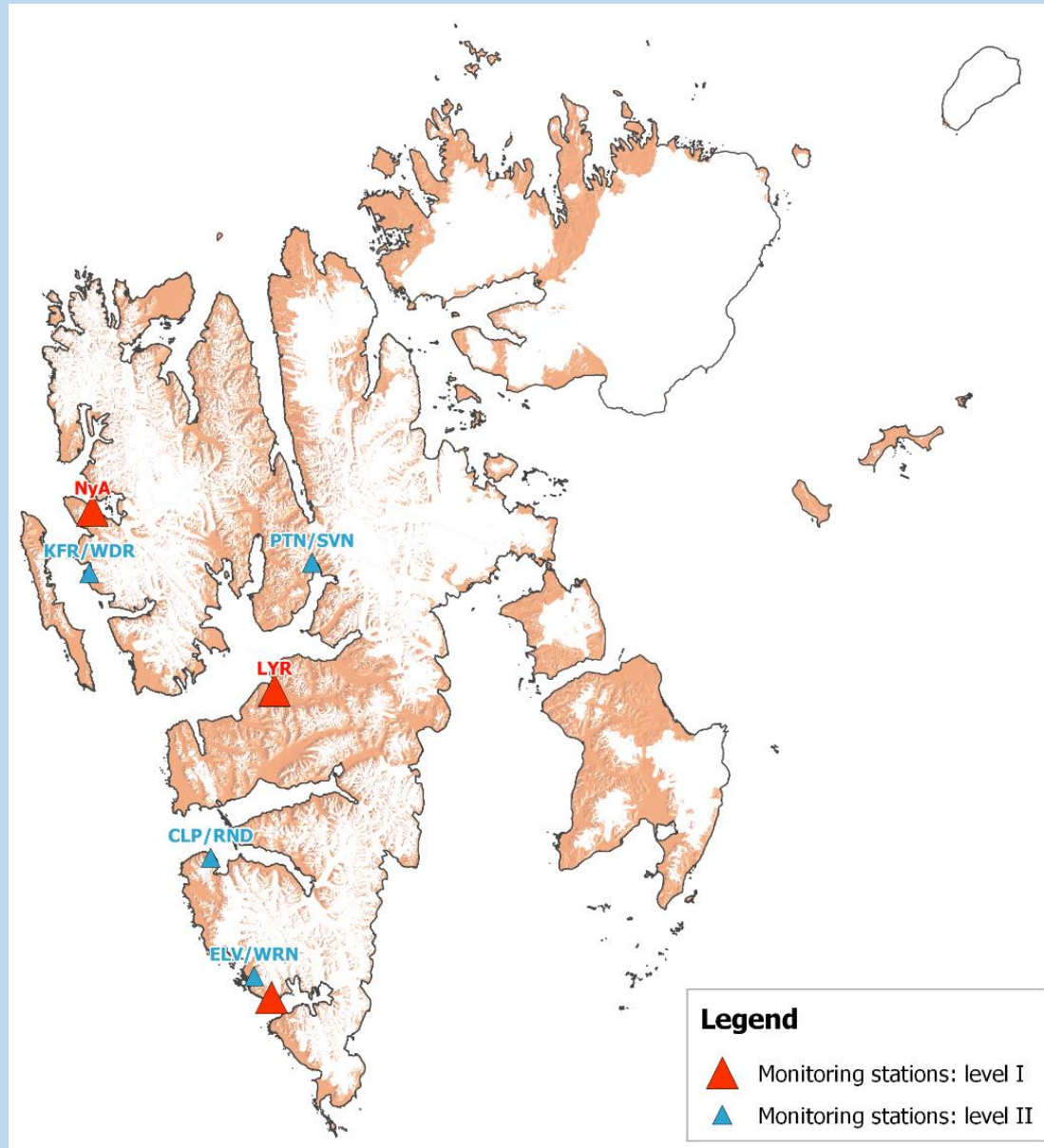
Location of the monitoring sites

Level I (red triangles):

NyA – Ny-Ålesund,
LYR – Longyearbyen,
HOR – Hornsund.

Level II (blue triangles):

KAF/WDR and Waldemarbreen,	–	Kaffiøyra
PTN/SVN and Svenbreen,	–	Petuniabukta
CLP/RND and Renardbreen,	–	Calypsobyen
ELV/WRN and Werenskioldbreen.	–	Elveflya



Meteorological monitoring

Eddy Covariance Towers



LI-COR 7200

High-speed CO₂ and water vapor gas exchange measurements in air using infrared spectroscopy

Measuring:

CO₂/H₂O fluxes

CH₄ fluxes

- 1) Hornsund – maintained by the IG PAS
- 2) Longyearbyen – maintained by the UNIS

Automatic Weather Stations



DataGarrison Satellite Stations with Onset HOBO® Smart Sensors

Measuring:

- Air temperature
- Relative humidity
- Wind speed and direction
- Solar radiation
- Atmospheric pressure

Worldwide Satellite Coverage by the Iridium Network

Glacier and snow monitoring

Glacier mass loss (ablation) and accumulation stations



SPICE A2 Photonic Sensors

Temperature-compensated acoustic snow gauge

Measuring:

- **Snow depth**
- Air temperature
- Relative humidity
- Atmospheric pressure

Local storage SD card
and wireless communication LoRaWAN

Permafrost monitoring



Temperature strings with loggers to monitor the ground thermal state, with storage and wireless transmission of data

Up to 10m borehole drilling

Remote sensing-based monitoring



CRIOS activities in 2023 and 2024



Travel grants (5x) for UNIS courses dedicated to outstanding MSc and PhD students



THANK YOU FOR YOUR ATTENTION

