Research school on cross-disciplinary science in the Arctic and collaboration with local communities

02 – 07 December 2018

UNIS, Longyearbyen, Svalbard

Longyearbyen in winter night www.photosight.org

The research school is organised by the Nansen Environmental and Remote Sensing Center and collaborating partners in the project "Useful Arctic Knowledge: partnership for research and education" (UAK) in collaboration with the H2020 project Integrated Arctic Observation System (INTAROS) and the University Centre in Svalbard (UNIS).

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Introduction

The research school is organised by the Nansen Environmental and Remote Sensing Center under the project **Useful Arctic Knowledge: partnership for research and education (UAK)** funded by the INTPART programme 2018-2020 under contract no 274891. INTPART (International partnerships for excellent education, research and innovation) is funded by the Research Council of Norway and the Norwegian Centre for International Cooperation in Education. The project, which includes partners from Norway, USA and Canada, brings together leading researchers, educators and young scientists working on Arctic science topics described below. The research school is part of the H2020 project INTAROS – Integrated Arctic Observation System, contract no 727890 (http://intaros.eu, http://intaros.nersc.no).

Project partners and contact personnel

Nansen Environmental and Remote Sensing Center (NERSC)	Stein Sandven, Hanne Sagen, Torill Hamre
University of Bergen, Department of Earth Science (UIB-GEO)	Mathilde Sørensen,
Norwegian Meteorological Institute (MET Norway)	Øystein Godøy
Western Norway University of Applied Sciences (HVL)	Kjell Eivind Frøysa
The University of Manitoba (UM)	Søren Rysgaard
University of Calgary, Arctic Institute of North America (UC-AINA).	Maribeth Murray
University of Colorado, Boulder, National Snow and Ice Data Center (UCB-NSIDC)	Peter Pulsifer

Topics for the research school

(1) Studies of natural and human-made hazards in the Arctic addressing problems such as earthquakes, oil spills, slope failures and ice-related hazards. The studies include physical processes and causes behind the hazards, how they can be detected and monitored, and how risks can be minimized and impact mitigated.

(2) Status and change of the ocean acoustic environment is affected by increased shipping, tourism and exploitation of resources in the Arctic regions. The research school will demonstrate how acoustic data is collected, processed and used to study natural processes and human-induced noise.

(3) Cross-disciplinary data analysis and data management is important in order to and build knowledge from the increasing amount of data in the Arctic. The research school will have lectures and practical exercises based on data from topic (1) and (2), satellite data and other data proposed by the students.

(4) Community-based monitoring evolves as an important contribution to an integrated Arctic Observing System, with focus on collaboration and communication between academic research and local communities. The research school will have lectures on such activities in Canada, Alaska and Svalbard.

Daily programme

Sunday 02 December

Room: Lassegrotta (auditorium)

Ca. 1500: Arrival in Longyearbyen and check-in at the Guest House

1700 – ca. 1830: Introductory session

- Introduction to Svalbard and UNIS, by Harald Ellingsen, director of UNIS
- Introduction to the research school, by Stein Sandven, coordinator of the UAK project
- Lecture: "Arctic multidisciplinary science in Canada", by Maribeth Murray, University of Calgary

1830-2000: Tapas dinner at UNIS canteen

Monday 03 December. Topic: Natural hazards in the Arctic

Room: Lassegrotta

0900–1000: Introduction lecture on Arctic data collection, bringing data into a management systems, use of data, data limitations, etc. (the data life cycle), by Peter Pulsifer, University of Colorado and Pedro Goncalves, Terradue

1000-1030: Invited lecture: On permafrost thawing and impact on local community in Longyearbyen, by Hanne Christiansen, UNIS

1030-1100: Coffee break

1100-1230: Short presentations by each student on their ongoing activities related to the UAK project. Max 5 min/5 slides per student (15 students x 5 min = 75 min)

1230-1300: Lunch

1300-1330: Lecture: Overview of natural hazards in the Arctic with focus on seismic hazards and techniques used for data collection and data management, by Mathilde Sørensen, UiB.

1330-1500: Workshop: "Visualization and interpretation of natural hazard data", organised by Mathilde Sørensen

1500-1530: Coffee break

1530-1700: Workshop: "Visualization and interpretation of natural hazard data", cont.

Rooms: Lassegrotta and Kapp Wijk (classroom)

Tuesday 04 December. Topic: Ice and oil spill related hazards in the Arctic

Room: Lassegrotta

0900-0930 Lecture: Decreasing ice - increasing ice hazards, by Søren Rysgaard, Univ. of Manitoba and Aarhus University

0930-1000 Lecture: Fate of oil spills in Arctic environments, by Leendert Vergeynst, Aarhus University

1000-1030 Invited lecture: Cruise tourism in the Arctic – risks and impact, by Frigg Jørgensen, AECO

1030-1100: Break

1100-1130 Lecture: EO data applications in the Arctic, by Pedro Gonçalves, Terradue

1130-1200 Lecture: How to discover, access and process EO data for a simple snow and ice classification, glacier velocity and multi-temporal composites, Pedro Gonçalves, Terradue

1200-1300: Lunch

1300-ca. 1700: Workshop on ice and oil spill related hazards, including student work

1500-1530: Coffee break

Rooms: Lassegrotta and Kapp Wijk (classroom)

Wednesday 05 December. Topic: The Ocean Acoustic environment

Room: Lassegrotta

0900-0930 Lecture: Sound for survival, pleasure and exploitation, by Hanne Sagen, NERSC

0930-1000 Lecture: The need for ocean acoustics data in Canada, for planning and monitoring ship traffic, and legislation around offshore development and marine species co-management, by Maribeth Murray, University of Calgary

1000-1030 Lecture: Handling of acoustic data in integrated data management systems, by Torill Hamre

1030-1100: Break

1100-1130: Invited lecture: Presentation of Arctic Safety Centre, by Ann Christin Auestad, UNIS.

1130-1140: Information about Svalbard Science Forum and funding possibilities, by Karoline Bælum, Svalbard Science Forum.

1140-1200: Lecture: Instrumentation in ocean acoustics, by Kjell Eivind Frøysa

1200-1300: Lunch

1300 – 1330: Introduction to processing and visualisation of acoustic data, by Espen Storheim

1330 - 1500:

Practical Exercise:

Where to find and use background material and data for ocean acoustics. Hanne Sagen (NERSC), Maribeth Murray (UCalgary) and Torill Hamre (NERSC).

Hands-on use of instruments, listen and look at data, by Kjell Eivind Frøysa, HVL, and Espen Storheim, NERSC

1500-1530: Coffee break

1530 – 1700: Continuation of practical exercise.

Rooms: Lassegrotta and Kapp Wijk (classroom)

Thursday 06 December: Topic – Community-based observing and communication

Room: Møysalen (auditorium)

0900-0920 Lecture: Working with and knowledge exchange among types of experts and representatives from the Longyearbyen community, by Lisbeth Iversen, NERSC

0920-1940 Lecture: Communication and knowledge transfer to end users of information – types of communication media, cautionary use of certain media types, dealing with sensitive topics, by Maribeth Murray, University of Calgary

0940-1000 Invited lecture: The role of information sciences in Arctic research and knowledge production, by Marthe Tolnes Fjellestad, University of Bergen, University library.

1000-1030 Invited lecture: A citizen science project in Svalbard, by Børge Damsgaard, UNIS

1030-1100 Break

1100-1130 Invited lecture: Examples of citizen science activities using NASA cloud observer and CASTAWAY CTD for temperature and salinity measurements, by Hilde Fålund Strøm, Hurtigruten Svalbard

1130- 1500 Student work on own projects

1200-1300: Lunch

1500-1530: Coffee break

1530 – 1800: Dialogue café with invited participants from Longyearbyen, led by Lisbeth Iversen (INTAROS) and Alexandra Meyer (NUNATARYUK)

Room: Møysalen. Also Templet (classroom) is available for student work, etc.

1900: Dinner at Stationen

Friday 07 December: 0900-1200: Wrap-up of the research school

Room: Lassegrotta

0900-1030: Summary of the work from Monday-Thursday, 15 min on each of the topics:
(1) Natural hazards with focus on seismic hazards, by M. Sørensen
(2) Ice and oil spill related hazards, by L. Vergeynst/S. Rysgaard
(3) The ocean acoustic environment, by H. Sagen/M. Murray
(4) Community-based observing and communication, by L. Iversen/M. Murray
(5) Cross-disciplinary data collection, management and usage, by P. Pulsifer/Ø. Godøy
Comments and questions

1030-1100: Break (including check-out from UNIS Guesthouse)

1100-1200: Discussion of follow-up activities including future workshops and internships.

1200-1300: Lunch

1300: Departure to airport. The airport bus departs from UNIS at about 1300 for the SAS flight. (For the Norwegian flight there is an airport bus ca 2 hours earlier).

Lecturers

Stein Sandven Nansen Environmental and Remote Sensing Center (NERSC): Stein is the leader of the UAK proposal and the coordinator of the INTAROS project.

Hanne Sagen (NERSC): Hanne has expertise in ocean acoustics and has been leader of several projects on ocean acoustics in the Arctic.

Torill Hamre (NERSC): Torill has expertise in computer science and has been working with data processing and data management in many projects related to Arctic and marine research

Lisbeth Iversen (NERSC): Lisbeth is a social scientist working with Community based monitoring – projects/political and socio-economic approach.

Mathilde Sørensen, University of Bergen. Department of Earth Science (UIB-GEO). Mathilde has a leading role and provides education in earthquake seismology, seismic hazard, tsunami hazard and seismo-tectonics.

Øystein Godøy, Norwegian Meteorological Institute (MET Norway). Øystein will contribute with expertise in Arctic data management.

Kjell Eivind Frøysa, Western Norway University of Applied Sciences (HVL). Kjell Eivind has expertise and provides education in underwater and subsea instrumentation as well as ocean acoustics at HVL.

Søren Rysgaard, University of Manitoba and Aarhus University. Søren has wide expertise in cross-disciplinary Arctic research and will contribute to education in community-based observing, human and natural hazards, and data integration.

Odile Crabeck, University of Manitoba (postdoc) has expertise in sea ice biogeochemistry and multidisciplinary topics related to sea ice

Leendert Vergeynst, Aarhus University, postdoc, expertise in Ice hazards and oil spills

Maribeth Murray, Arctic Institute of North America, University of Calgary (AINA/UC). She will contribute to education in natural and human hazards, ocean acoustics and community-based observing.

Peter Pulsifer, National Snow and Ice Center, University of Colorado, Boulder (UCB). Peter will contribute with expertise and education in data management and integration as well as in community-based observing.

Pedro Gonçalves, Terradue, expertise in EO data processing, management, interoperability

Marthe T. Fjellestad, academic director at the University of Bergen Library Picture Collection.

Invited lecturers from UNIS and Longyearbyen

Ann Christin Auestad, UNIS. Ann Christin will give a presentation of the newly established Arctic Safety Centre at UNIS.

Børge Damsgård, UNIS. Børge is professor in marine biology, Vice Dean of Research and the departmental leader of the UNIS Arctic Biology department.

Hanne Christiansen UNIS. Hanne is professor in physical geography, Vice Dean of Education and department leader of UNIS Arctic Geology department.

Frigg Jørgensen, Executive Director of AECO - Association of Arctic Expedition Cruise Operators

Hilde Fålund Strøm, Product manager, Hurtigruten Svalbard. Local inhabitant of Svalbard working with tourism and role as "citizen scientist"

List of participants

Name	Inst. Country	Background - competence
Trygve Halsne (MSc, res. scientist)	Meteorological Inst. Norway	Remote sensing, data management, Sea ice algorithms
Joshua Jones (MSc, researcher III)	Univ. Alaska, Fairbanks, USA	Sea ice and hazards, CBM, AAOKH (linked to INTAROS)
Kent Spiers (PhD student)	Univ. of Calgary, Canada	Coastal and marine socio-ecological systems
Takuya Nakanowatari (researcher)	NIPR, Japan	Sea ice modelling and forecasting, Arctic navigation
Zeinab Jeddi (postdoc)	Univ. of Bergen, Norway	Seismology, earth quakes, data processing, works on INTAROS
Henrik Hellem (MSc student)	Univ. of Bergen, Norway	Processing and analysis of acoustic data
Bjørnar H. Røsvik (MSc student)	Univ. of Bergen, Norway	Processing and analysis of acoustic data
Jan Michalek (senior engineer)	Univ. of Bergen, Norway	Seismic data processing, visualization and management
Sascha Schjøtt (PhD student)	Aarhus Univ., Denmark	Marine ecosystems. Also at Greenland Inst. of Nat. Resources
Samantha Jones (PhD student)	Univ. Calgary, Canada	Lakes, rivers, ecosystems, hazards, CBM work
Oliver Bartlett (PhD student)	Univ. of Exeter, UK	Hazardous glaciers, remote sensing, GIS
Delphine Collin (MSc student)	Sorbonne Univ., France	Cross-disciplinary environmental studies, hazards, GIS,
Agata Grynczel (PhD student)	IOPAN, Poland	Oceanography, sea ice
Morgan Ip (PhD student)	Oslo School Arch. and Design, Norway	Ethnographic data, cultural landscape, data management tools
Thomas Tuesen (PhD student)	Univ. of Bergen, Norway	Natural hazards: flooding and slope failure, cross-disciplinary
Alexandra Meyer (PhD student)	Univ. of Vienna, Austria	Social scientist, working on the H2020 NUNATARYUK project

Practical information

Flights Oslo- Longyearbyen

From Oslo to Longyearbyen				
Date	Airline	Departure from Oslo	Arrival in Longyearbyen	
Friday 30 Nov	Norwegian	0845	1145	Non-stop
Friday 30 Nov	SAS	1115	1410	Non-stop
Sunday 02 Dec	SAS	1000	1410	Via Tromsø
Monday 03 Dec	Norwegian	0950	1250	Non-stop
Monday 03 Dec	SAS	1125	1420	Non-stop

From Longyearbyen to Oslo				
Date	Airline	Departure from Longyearbyen	Arrival in Oslo	
Friday 07 Dec	Norwegian	1230	1530	Non-stop
Friday 07 Dec	SAS	1455	1750	Non-stop
Sunday 09 Dec	SAS	1455	1910	Via Tromsø
Monday 10 Dec	Norwegian	1335	1635	Non-stop
Monday 10 Dec	SAS	1505	1800	Non-stop

(SAS has also flights on Tuesday and Thursday. There are no flights on Wednesday and Saturday)

Transport from/to airport: there is a bus to/from UNIS, the hotels and UNIS Guest House for each arrival/departure (cost 75 NOK).

Accommodation: will be in the UNIS Guest House, located near UNIS (see map). You will receive a key upon arrival from the airport. Each of you will have a small apartment with kitchen.

Food - restaurants: For breakfast it is recommended to buy own food in the grocery store. It is also possible to buy a full breakfast at the Radisson Hotel or in other restaurants. Lunch is available in the UNIS canteen from 1100 – 1300 at a price of 125 NOK. Coffee and refreshments are provided by the organisers during the morning and afternoon session. For dinner there are several restaurants in town, but they can be expensive. It is fully possible to prepare own dinner in the apartments. There will be a sponsored dinner Sunday evening in the UNIS canteen and a conference dinner in restaurant STATIONEN on Thursday evening. More information about restaurants is found at https://www.tripadvisor.com/Restaurants-g503715-Longyearbyen_Spitsbergen_Svalbard.html

Clothing: Normal winter clothes for Arctic climate. Remember to bring indoor shoes. For weather statistics, see https://www.yr.no/place/Norway/Svalbard/Longyearbyen/statistics.html

Credit cards: most credit cards can be used in all shops, restaurants and the UNIS cantina.

WiFi: there is wifi in both UNIS and the Guest House

Own laptop: It is recommended to bring own laptop/iPad for the student work.