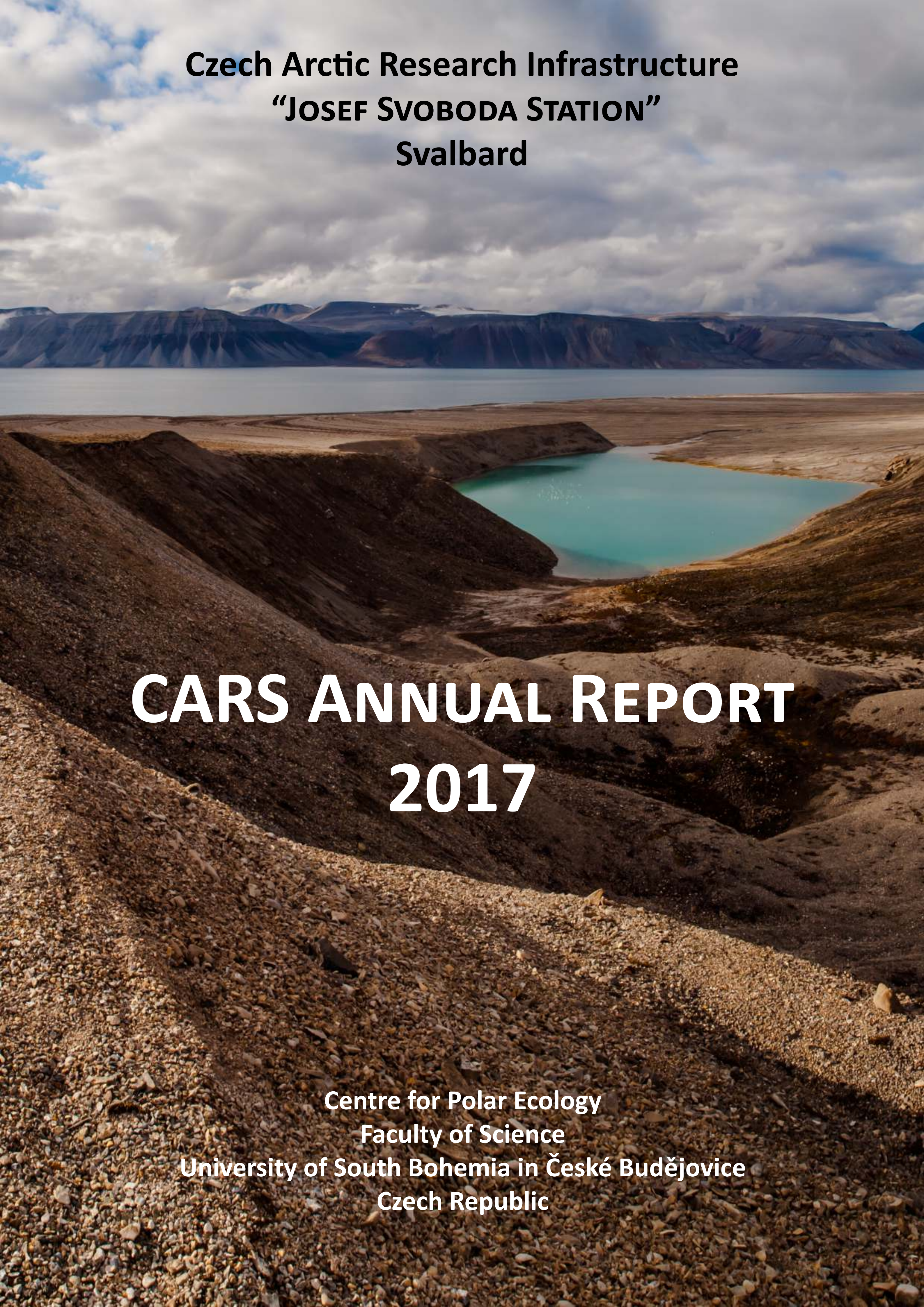
Czech Arctic Research Infrastructure
"Josef Svoboda Station"
Svalbard



CARS Annual Report 2017

Centre for Polar Ecology
Faculty of Science
University of South Bohemia in České Budějovice
Czech Republic

The operation of the Czech Arctic Research Infrastructure “Josef Svoboda Station” (as a part of the Czech Polar Research Infrastructure, CzechPolar2) was supported by the project LM2015078 CzechPolar2 - Czech Polar Research Infrastructure, provided by Ministry of Education, Youth and Sports. The authors would also like to thank to the Czech Arctic Research Infrastructure “Josef Svoboda Station” (as a part of the Czech Polar Research Infrastructure, CzechPolar2) and its crew for their support.

The research reported here has been also supported by the ECOPOLARIS project No. CZ.02.1.01/0.0/0.0/16_013/0001708 provided by the Czech Ministry of Education, Youth and Sports.

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Jihočeská univerzita v Českých Budějovicích
University of South Bohemia in České Budějovice

Josef Svoboda Station
University of South Bohemia in České Budějovice
CENTRE FOR POLAR ECOLOGY

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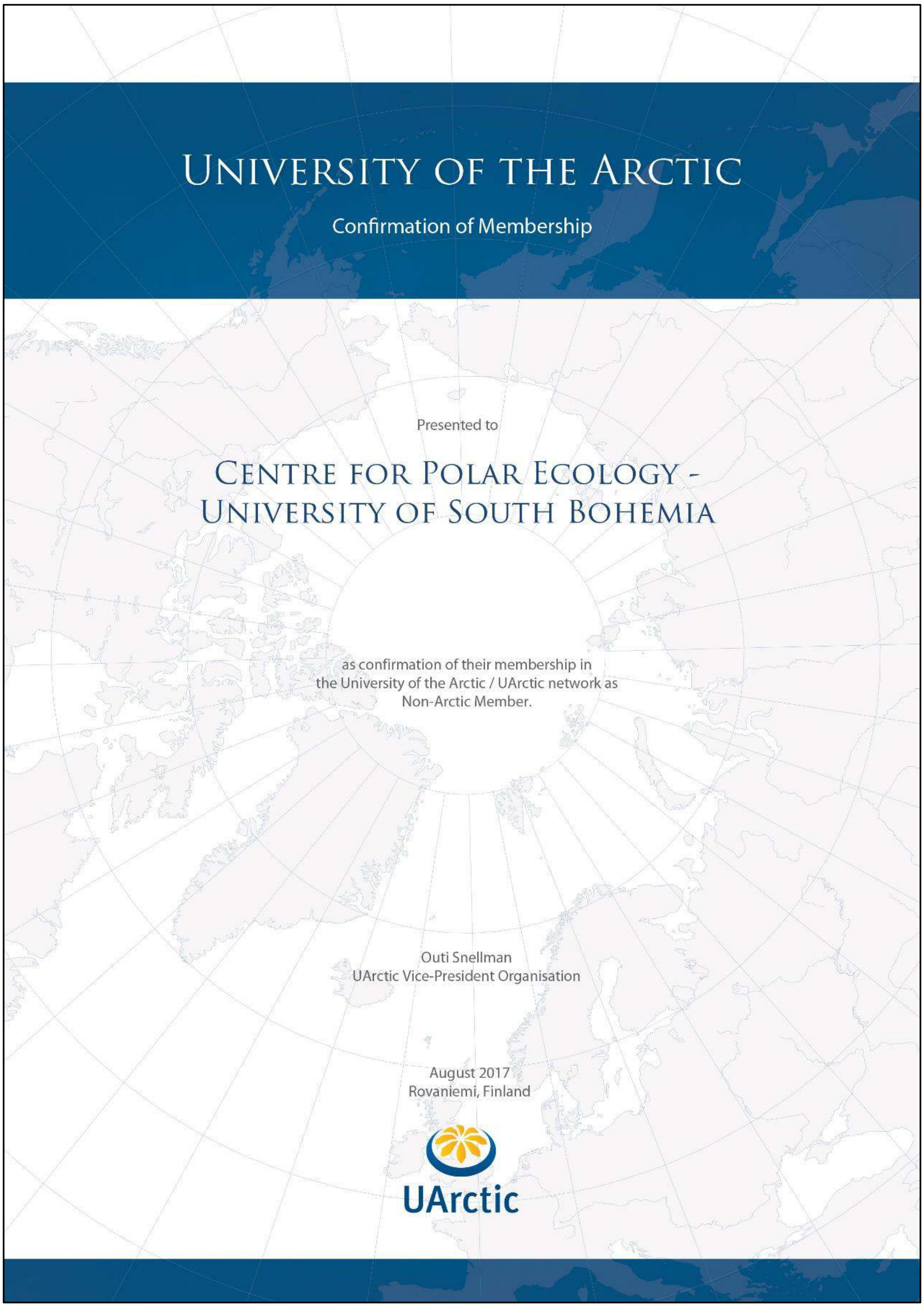
If not mentioned otherwise, the author of photos is the first author of the contributor(s).

2017

Contents

1. Introduction

The year 2017 was the second year of the project CzechPolar2 - Czech Polar Research Infrastructure. In this year, the Centre for Polar Ecology, Faculty of Sciences, University of South Bohemia in České Budějovice, Czech Republic became member of the University of the Arctic.



UNIVERSITY OF THE ARCTIC

Confirmation of Membership

Presented to

CENTRE FOR POLAR ECOLOGY -
UNIVERSITY OF SOUTH BOHEMIA

as confirmation of their membership in
the University of the Arctic / UArctic network as
Non-Arctic Member.

Outi Snellman
UArctic Vice-President Organisation

August 2017
Rovaniemi, Finland

UArctic

As in previous years, we worked in Petuniabukta and Longyearbyen areas. In this year, the RV CLIONE was used for regular transport between Longyearbyen and NOSTOC, and for research activities for the first time for the whole summer season, i.e. from mid-June.

We had the pleasure to welcome many researchers from abroad, and to host several educational courses focused on polar sciences (Fig. 1.1.). Alastair Ruffell, The Queen's University (UK) and Robert Storar, Sheffield Hallam University (UK), worked at the field station NOSTOC in late August as part of the INTERACT programme. For the first time, the JULIUS PAYER HOUSE in Longyearbyen served as a ground station for space communication – our colleagues from Slovakian Organisation for Space Activities (SOSA) established a temporary antenna to track the skCUBE, the first Slovakian satellite.

Katya Pushkareva defended successfully her doctoral thesis at University of South Bohemia (CZ).

For more information, please visit polar.prf.jcu.cz.

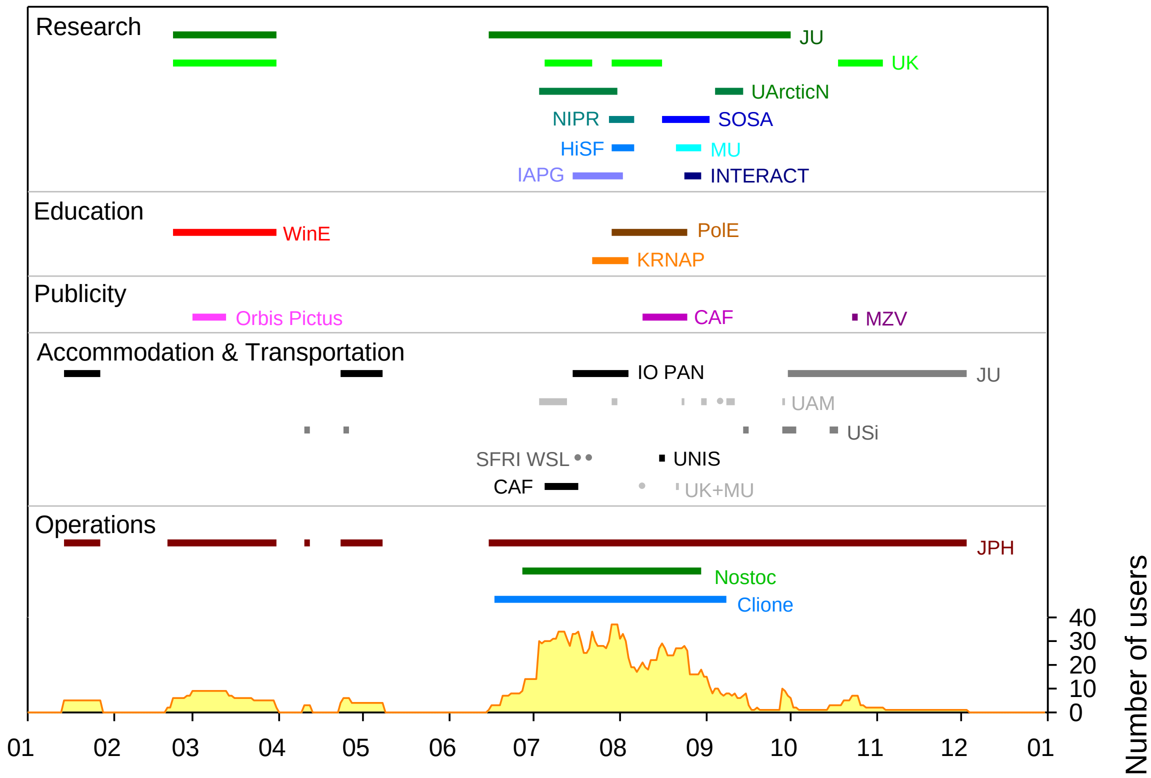


Fig. 1.1. The CARS utilization in 2017.

Course abbreviations: KRNAP – Training Course organized by the Krkonoše National Park; PolE – field part of the Polar Ecology Course organized by the University of South Bohemia; WinE – Winter Arctic Ecology course organized by the University of South Bohemia and the University Centre in Svalbard (UNIS).

For institution abbreviations, see Tab. 2.3.

1.1. Research station JULIUS PAYER HOUSE in Longyearbyen

The JULIUS PAYER HOUSE in Longyearbyen was used for research, education (Fig. 1.2.) and as short-term base accommodation for researches and students (usually after arrival and before departure to the field station or RV CLIONE) during the year 2017. In this year, two radiometers were installed at the rear part of the house in August (See chapter 3.3.1.). The facility utilization is shown in Fig. 1.3.

Fig. 1.2. Snowmobiles are in winter Photo credit: Marie Šabacká.

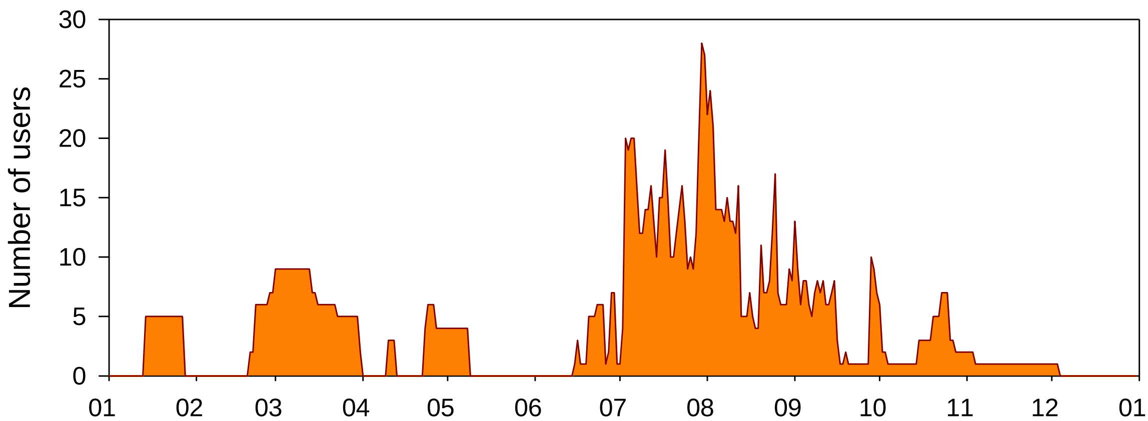


Fig. 1.3. The utilization of the JULIUS PAYER HOUSE in Longyearbyen, Svalbard in 2017.

1.2. Field Station NOSTOC in Petuniabukta

The field station NOSTOC is designed for during summer-only use, however short stays in winter are possible. The facility was used during summer (01/07-26/08) for research and education (Figs. 1.4. and 1.5.).

Fig. 1.3. Panorama of , Petunabukta, Svalbard – common view from the Field Station NOSTOC. Photo credit: Martin Luláк.

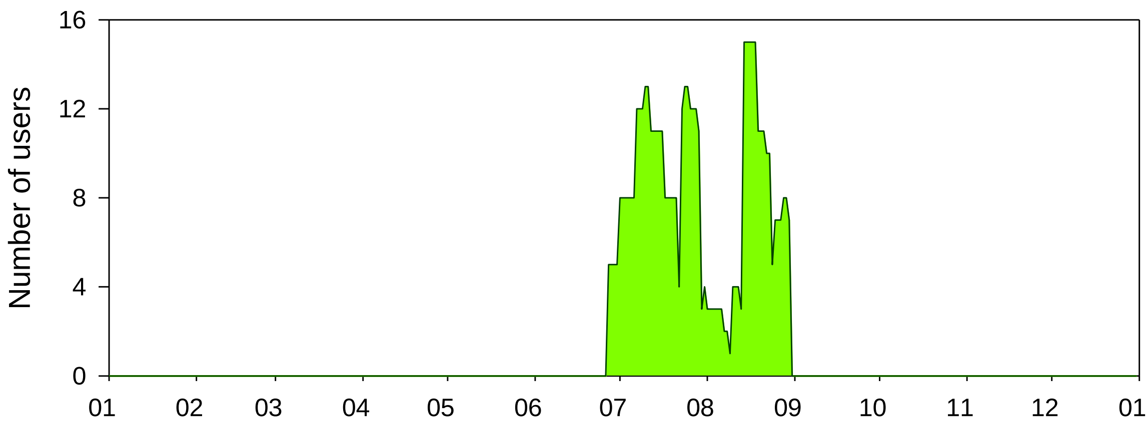


Fig. 1.4. The utilization of the field station NOSTOC in 2017.

1.3. RV CLIONE

During relatively complicated preparation for the season and during season itself, some defects and not-finished items that limited or prevented full-scale operation of the RV CLIONE were eliminated. Operations during the season proved the functionality of RV CLIONE in local conditions during long-term cruises and many daily transports of persons, animals and instrumentation (Fig. 1.6. to 1.8.).

Before the start of the next season 2019, other modifications of the RV CLIONE must be accomplished before launch, e.g. front depth sensor housing and surface treatment of the submerged body parts show signs of premature wear. Other works and modifications will be discussed, and it is necessary to find feasible solution in frame of time and financial capabilities of the CPE.

Total mileage covered in 2017 was 2470 Nm.

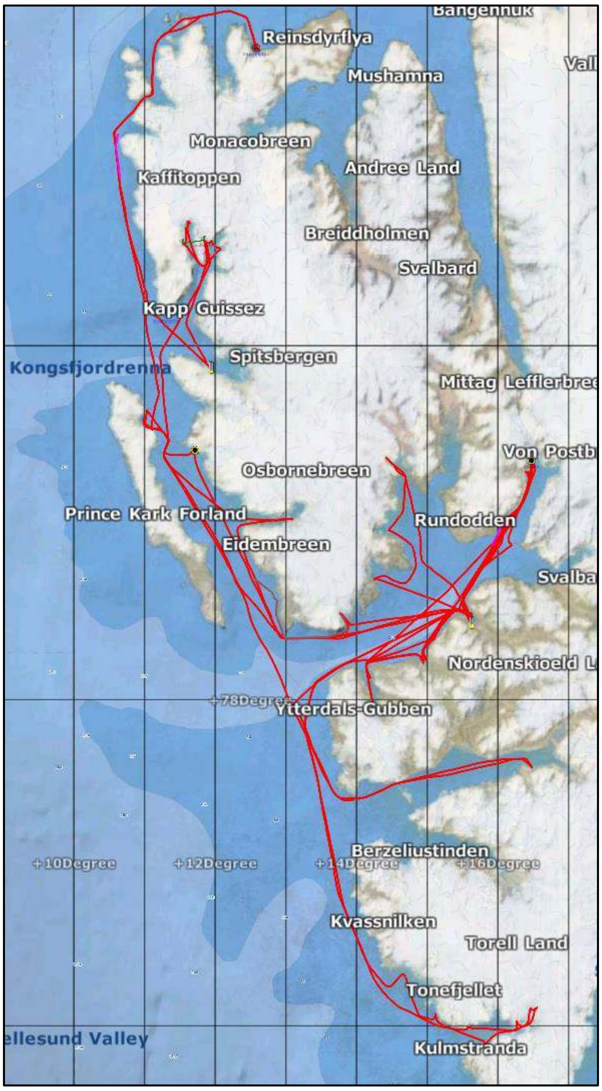


Fig. 1.6. Map of RV CLIONE cruises in 2017. Source: Jan Pechar.

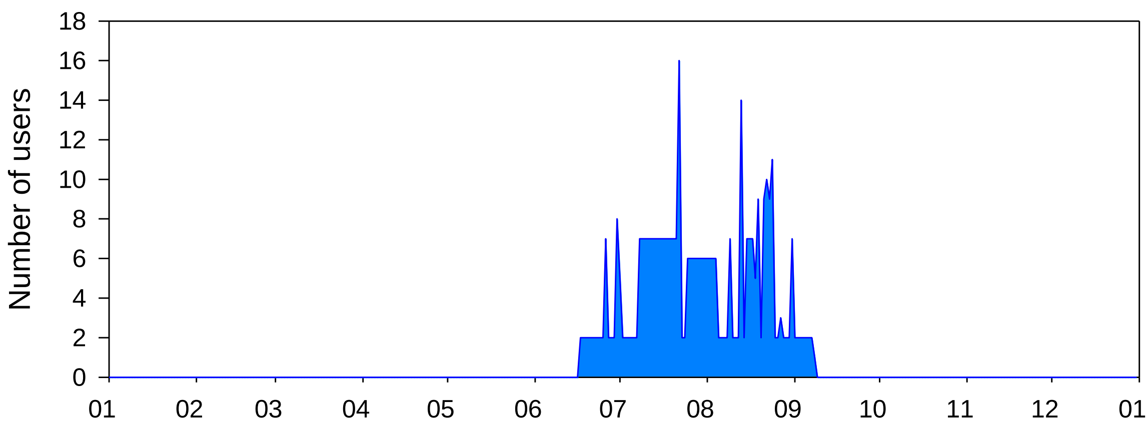


Fig. 1.7. The utilization of the RV CLIONE in 2017.

Fig. 1.8. Seals are spotted regularly during cruises. Photo credit: Martin Lulák.

2. Year 2017 Programme

The Winter Arctic Ecology course was organized jointly by Centre for polar Ecology, Faculty of Sciences, University of South Bohemia and the University (22/02 – 31/03). The summer field research season started on June 15, 2017, and was completed on September 15, 2017. The lists of Infrastructure users from the Centre for Polar Ecology (CPE users) and from other institutions (external national and international users), their periods of stay are summarized in Tabs. 2.1., 2.2. and 2.3.

Tab. 2.1. List of internal CARS users with their affiliations, their periods of stay, their CARS utilization and person-day numbers. Refer to Tab. 2.3. for abbreviations explanations.

		Affiliation(s)	Field of research	Dates	CARS utilization	Number of person-days
Alexandra Bernardová	C	JU		20-25/10	L	6
Marek Brož	CR	JU	ZOO	20/06-01/09	CLN	74
Miloslav Devetter	R	JU + ISB	ZOO	23/06-18/07	CLN	26
Oleg Ditrich	EIR	JU	ZOO	02-25/08/17	CLN	24
Josef Elster	CEIR	JU + IBOT	MICRO	22/02-22/03 29/07-25/08 19-25/10	CLN	64
Tereza Hromádková	R	JU	ZOO	20/06-31/07	CLN	42
Jana Kvíderová	R	JU	MICRO	12/08-01/09	CLN	21
Martin Lulák	CR	JU + MU	GEO	20/06-15/09	CLN	88
Petr Macek	R	JU	BOTA	28/06-02/08	CLN	36
Maike Nesper	C	JU		30/09-03/12	L	65
Jakub Ondruch	CR	JU + MU	GEO	15/06-01/10	CLN	109
Václav Pavel	CR	JU + UPOL	ZOO	20/06-23/07	CLN	34
Jan Pechar	C	JU		27/02-15/03 16/06-11/09	CL	103
Petra Polická	CR	JU	MICRO	20/02-30/03 29/07-05/09	CLN	78
Marie Šabacká	CR	JU	CLIMA	20/02-30/03 28/06-06/08	CLN	87
Jiří Štojdl	C	JU		16/06-11/09	CL	88
Tomáš Tyml	CR	JU + MU	ZOO	08/05-15/09	CLN	39

Tab. 2.2. List of national CARS users (based on affiliation, with exception of CPE employees) with their affiliations, their periods of stay, their CARS utilization and person-day numbers. Refer to Tab. 2.3. for abbreviations explanations.

		Affiliation(s)	Field of research	Dates	CARS utilization	Number of person-days
Adam Bednařík	E	KRNAP		22/07-03/08	CLN	13
Martins Briedis	R	CAF	ZOO	05-17/07	L	13
Michaela Bryndová	R	JU + ISB	ZOO	28/06-18/07	CLN	21
Alžběta Čejková	E	KRNAP		22/07-03/08	CLN	13
Ondřej Daněk	S	UVPS	ZOO	09-25/08	CLN	17
Jiří Dvořák	E	KRNAP		22/07-03/08	CLN	13
Jiří Flousek	E	KRNAP		22/07-03/08	CLN	13
Esther Frei	R	JU + UBC	BOTA	15-28/07	LN	14
Daniela Glůzová	E	KRNAP		22/07-03/08	CLN	13
Tomáš Hájek	R	JU	BOTA	05-18/07	LN	14
Martin Hanáček	A	MU		09/08 21-22/08	L	3
Josef Harčařík	E	KRNAP		22/07-03/08	CLN	13
Eva Hejdukova	R	UK	MICRO	22/02-31/08 29/07-16/08 18/10-03/11	L	74
Mr. Hendrich	C	Lloyd		02-05/09	CL	4
Tomáš Janata	E	KRNAP		22/07-03/08	CLN	13
Karel Janko	R	IAPG	ZOO	15/07-02/08	CLN	19
Veronika Jílková	R	ISB	ZOO	28/06-17/07	CLN	21
Matouš Jimel	S	UK	MICRO	22/02-31/03 08-25/08	CLN	56
Jiří Kolbaba	P	CAF		09-25/08	CLN	17
Petr Kotas	R	JU	MICRO	05-18/07	LN	14
Kamil Láska	R	MU	CLIMA	21-30/08	CLN	10
Margeritha Lucadello	S	JU + UAg	ZOO	27/06-25/08	CLN	60
Zdeněk Lyčka	P	MZV		23-25/10	L	3
Anna Mácová	R	JU	ZOO	02-25/08	CL	24
Jan Materna	E	KRNAP		22/07-03/08	CLN	14
Orbis Pictus user 1	A			01-13/03	L	13
Orbis Pictus user 2	A			01-13/03	L	13
Mr. Paleček	C	Lloyd		02-05/09	CL	4
Anna Polášková	R	JU	MICRO	22/02-30/03	L	37
Barbora Procházková	A	UK		09/08 21-22/08	L	3
Milan Rek	C			11-15/09	L	5
Patrick Saccone	R	JU	BOTA	28/06-02/08	CLN	36
Zdenka Sokolíčková	R	UHK	BOTA	08-22/07	CL	15
Claude-Eric Souquieres	S	JU	MICRO	29/07-01/09	CLN	35
Thomas Stehrer	S	JU	MICRO	29/07-01/09	CLN	35
Alois Suchánek	A	CAF		05-17/07	LN	13

Tereza Šamšulová	S	UK	MICRO	05-23/08	CLN	19
Arnošt L. Šizling	R	UK	BOTA	05-22/07	CL	18
Eva Šizlingová	R	UK	BOT	05-22/07	CL	18
Matyáš Turna	A	CAF		05-17/07	LN	13
Petra Vinšová	R	UK + WNUAS	MICRO	29/07-10/08 15-16/08	CL	15
Miroslav Wanek	P	MZV		23-25/10	L	3
Kamila Weissová	S	UK	ZOO	12-25/08	CLN	14
Jakub Žárský	R	UK	CLIMA	05-22/07	CL	18

Tab. 2.3. List of international CARS users (based on affiliation) with their affiliations, their periods of stay, their CARS utilization and person-day numbers.

		Affiliation(s)	Field of research	Dates	CARS utilization	Number of person-days
Piotr Bałazy	A	IO PAN		14-27/01 23/04-08/05 15/07-04/08	L	51
Kathrin Bender	R	UArcticN	BOTA	03-31/07	l	29
Jakub Beszczyński	A	IO PAN		23/04-08/05	L	16
Marcin Bidas	A	UAM		03-04/07 29-31/07	L	5
Małgorzata Błaszczyk	A	USi		15-16/09 30/09-01/10	L	4
Eva Breitschopf	R	UArcticN	BOTA	04-14/09	L	11
Radosław Brzana	A	IO PAN		14-27/01	L	14
Leo Decaux	A	USi		28-30/09	L	3
Marek Ewertowski	A	UAM		03-13/07 23-24/08 30/08-01/09	L	16
Beat Frey	A	SFRI WSL		17/07	L	1
Aline Frossard	A	SFRI WSL		21/07	L	1
Mariusz Grabiec	A	USi		10-12/04	L	3
Maciej Grubiak	A	IO PAN		21/07-04/08	L	15
Maciej Chełchowski	A	IO PAN		15/07-04/08	L	21
Dariusz Ignatiuk	A	USi		10-12/04 24-26/04 14-16/09 28/09-03/10 15-18/10	L	19
Zlatica Kalužná	R	SOSA	GEO	18/08-02/09	CLN	16
Michał Kamiński	A	UAM		03-04/07 28-29/09	L	4
Sebastian Kendzierski	A	UAM		03-04/07	L	2
Piotr Kukliński	A	IO PAN		14-27/01 23/04-05/08 15-23/07	L	39
Tomasz Kurczaba	A	UAM		28/09	L	2
Michal Laska	A	USi		10-12/04 24-26/04	L	6
Libor Lenža	R	SOSA	GEO SPACE	16/08-02/09	CLN	18
Jakub Malecki	A	UAM		06/09 19/09	L	2
Patrycja Michałowicz	A	USi		15/09 30/09-01/10	L	3

Martin Morsdorf	R	UArcticN	BOTA	03-31/07 04-14/09	L	40
Marcin Mosiewicz	A	UAM		03-04/07 28-29/09	L	4
Michaela Musilová	R	SOSA	MICRO SPACE	16/08-02/08	CLN	18
Fumino Nishimura	R	UArcticN	BOTA	03-26/07	L	24
Mateusz Obst	A	UAM		03-04/07 10-12/07 28-29/07	L	7
Bartosz Piasecki	A	UAM		03-13/07	L	11
Kacper Polus	A	UAM		03/07 10-12/07 28-29/09		6
Grzegorz Rachlewicz	A	UAM		10-11/09	L	2
Karel Raška	S	DC	ZOO	12-25/08	CLN	14
Magdalena Raška	S	DC	ZOO	12-25/08	CLN	14
Marta Ronowicz	A	IO PAN		14-27/01	L	14
Alastair Ruffell	R	QU	GEO	24-30/07	P	7
Grzegorz Rymer	A	UAM		03-04/07 08-09/09	L	4
Krzysztof Rymer	A	UAM		03-04/07 10-12/07 28-29/09	L	7
Anton Sedlak	A	USi		28-29/09 15-17/10	L	5
Niklas Schaaf$^{+3\ \mathrm{pers}}$	A	UNIS		15-17/08	C	$3^{\times 4}$
Sławomir Sitek	A	USi		15/09 30-31/09	L	3
Robert Storar	R	SHU	GEO	24-30/08	P	7
Tadeusz Stryjek	A	IO PAN		14-27/01	L	14
Aleksandra Tomczyk	A	UAM		03-13/07	L	16
Masaki Uchida	R	NIPR	BOTA	28/07-08/08	L	12
Katariina Vuorinen	R	UArcticN	BOTA	03-31/07	L	29
Tomotake Wada	R	NIPR	BOTA	28/07-08/08	L	12
Agata Wedmann	A	IO PAN		23/04-08/05	L	16
Maria Włodarska-Kowalczuk	A	IO PAN		28/07-04/08	L	8
Jacob Yde	R	HiSF	CLIMA	29/07-06/08	CL	9

Abbreviations:

- Purpose of the stay:
  - A – accommodation and equipment use only
  - C – construction, operation or management of the Svalbard infrastructure
  - E – scientific education (with exception of Polar Ecology course organized by the Centre for Polar Ecology)
  - I – instructor of the Polar Ecology course
  - R – research
  - P – publicity
  - S – student of the Polar Ecology course
- Affiliations:
  - CAS – Czech Antarctic Fund, Poděbrady (CZ)
  - DC – Dartmouth College, Hanover (US)
  - HiSF - Høgskulen i Sogn og Fjordane, Sogndal (NO)
  - IAPG – Institute of Animal Physiology and Genetics AS CR, Liběchov (CZ)
  - IBOT – Institute of Botany CAS, Třeboň (CZ)
  - IO PAN – Institute of Oceanology, Polish Academy of Sciences, Sopot (PL)
  - ISB – Institute of Soil Biology, Biological Centre CAS, České Budějovice (CZ)
  - JU – University of South Bohemia, České Budějovice (CZ)
  - KRNAP – Krkonoše National Park, Vrchlabí (CZ)
  - Lloyd -
  - MU – Masaryk University, Brno (CZ)
  - MZV – Ministry of Foreign Affairs of the Czech Republic, Prague (CZ)
  - NIPR – National Institute of Polar Research, Tokyo (JP)
  - PARU – Institute of Parasitology, Biological Centre CAS, České Budějovice (CZ)
  - QU – The Queen's University, Belfast (UK)
  - SFRI WSL - Swiss Federal Research Institute WSL, Birmensdorf (CH)
  - SHU - Sheffield Hallam University, Sheffield (UK)
  - SOSA – Slovakian Organisation for Space Activities, Bratislava (SK)
  - UAM - University Adam Mickiewicz, Poznań (PL)
  - UAg – University of Algarve, Faro (PT)
  - UBC – University of British Columbia, Vancouver (CA)
  - UHK – University of Hradec Králové, Hradec Králové (CZ)
  - UK – Charles University, Prague (CZ)
  - UArcticN - The Arctic University of Norway, Tromsø (NO)
  - UNIS - University Centre of Svalbard, Longyearbyen, Svalbard
  - UPOL – Palacký University, Olomouc (CZ)
  - USi - University of Silesia in Katowice, Katowice (PL)
  - UVPS - University of Veterinary and Pharmaceutical Sciences Brno, Brno (CZ)
  - WNUAS - Western Norway University of Applied Sciences, Bergen (NO)
- Field of research:
  - BOTA - botany/plant physiology
  - CLIMA - climatology/glaciology
  - GEO - geology/geomorphology
  - HYDRO - hydrology/limnology
  - MICRO - microbiology/phycology
  - SPACE – space sciences
  - ZOO - zoology/parasitology.
- CARS utilization:
  - C – RV CLIONE
  - L – JULIUS PAYER HOUSE (Longyearbyen)
  - N – field camp NOSTOC (Petuniabukta)

3. Research activities

3.1. Space sciences

3.1.1. Ground station for skCUBE

Michaela Musilová, Libor Lenža & Zlatica Kalužná

During the SOSA research expedition's stay in the CARS station in Longyearbyen, a ground station for capturing satellite data was established. The ground station was focused on receiving data from the first Slovak satellite, skCUBE. The station was successfully installed (Fig. 3.1.1.), however the cold and wind at the station caused the connections within the antenna to get damaged. Thus, after a few days of excellent performance, the antenna stopped working properly and only a small amount of data was received. The SOSA team plans on learning from this experience and perfecting the antenna's systems, so that it will work better in the future. In an ideal case, an antenna and small ground station will be installed at the CARS station all year round sometime in the future.

Fig. 3.1.1. Slovak satellite ground station. Credit: Michaela Musilova (SOSA).

3.2. Geology and Geomorphology

3.2.1. Palaeoecology of nearshore environments during the Pleistocene/Holocene transition on central Svalbard

Martin Lulák

Important records of the Late Pleistocene geologic history of Svalbard archipelago represent raised marine terraces. They expose sediments of several glacial advances, which provide basis for the reconstruction of an evolution of archipelago during Pleistocene and Holocene times. Every depositional cycle begins with glacigenic sediments from advancing phase of glaciations. Marine, deltaic and coastal sediments from deglaciation phase lie above glacigenic sediments. These deposits have been the main focus of geological and palaeontological research of our group.

Palaeontological remains within the glacimarine sediments, such as fossil molluscs, are valuable indicators of palaeoecological/environmental conditions. This project aims to reconstruct these conditions with the use of palaeoenvironmental proxies hidden in organic remains, mainly fossil molluscs.

This year I was mainly focused on gathering samples from our four primary locations. Three of these localitons lie in Mimerdalen valley and are pictured in Figs. 3.2.1. and 3.2.2. I revealed around 300 sub-fossil marine shells (mainly *Mya truncata* species) for further laboratory analyses (such as delta ^{18}O and lithophile element ratio) and for better understanding of species composition within all studied sites. Some of them were revealed in living position (Fig. 3.2.2) for ^{14}C dating. I also worked on Kapp Ekholm locality, which is the most important stratigraphic locality of Svalbard for last four glacial maxima. At Kapp Ekholm site I also collected sub-fossil marine shells for the same analyses.

Fig 3.2.1. Three main localities of my thesis (source: toposvalbard.npolar.no).

Fig 3.2.2. The Bertil 1 site near Pyramiden settlement. This locality is the oldest one which I study.

Except the work on my Ph.D. I also helped other colleagues (mainly Jakub Ondruch and Tereza Hromádková) on their projects: Also, I provided service for our AWSs (Automatic Weather Station) net around Petuniabukta and took a part of the service of the NOSTOC field station for summer season.

3.3. Climatology and Glaciology

3.3.1. Meteorological and climatological observations in Svalbard

Kamil Láska

The meteorological measurements and observations were performed in Longyearbyen and the coastal ice-free zone of Petuniabukta (northern branch of Billefjorden) in the second half of August 2017. The main objectives of summer field campaign and related research activities were:

- Creating a new measuring site for solar UV radiation monitoring in Longyearbyen
- Microclimate and local climate monitoring in Petuniabukta
- Maintenance and calibration of selected meteorological stations in Petuniabukta

In the frame of UV *Intercomparison and Integration in a High Arctic Environment* project (No. 270644/E10, Research Council of Norway and Svalbard Science Forum), two radiometers were set up on the roof of Julius Payer House, Czech Research Station in Longyearbyen. A broadband UVS-E-T radiometer (Kipp & Zonen, The Netherlands, Fig. 3.3.1.) provided erythemal UV irradiance, while short-wave global irradiance was measured using a CM11 pyranometer (Kipp & Zonen, The Netherlands) at the same site. The radiometers were connected to EMS V12 datalogger (EMS Brno, Czech Republic) and data were sampled at 5-s intervals from which 1-min averages were computed. To protect radiometers from snow accumulation and icing, the instruments were equipped with a heater and ventilation system. With regards to the construction of the UVS-E-T radiometer, it is necessary to point out that the erythemal UV irradiance can be used for estimation of the potentially harmful effects of UV radiation and calculation of commonly known UV index.

Fig. 3.3.1. The broadband UVS-E-T radiometer (Kipp & Zonen) with the ventilation unit installed on a special platform at the Julius Payer House in Longyearbyen.

Part of the fieldwork was devoted to studying the microclimate and local climate conditions of various types of vegetation surfaces and bare ground. The monitoring was performed in different altitudinal zones along the western coast of Petuniabukta. Measurements of short-wave incoming and reflected radiation, surface temperature, air temperature and relative humidity, ground thermal and moisture conditions will be used to evaluate how the vegetation cover influences the ground thermal regimes. Moreover, the effect of vegetation on the surface energy balance components will be analysed and further compared with the LANDSAT summer scenes. Together with the individual experiments we carried out the maintenance, calibration and replacement of the meteorological instruments at all sites. At the same time, data downloading and quality control of the individual meteorological parameters were performed before further data processing.

Eight automatic weather stations (hereafter AWS) have been operated along the western and northwestern coast of Petuniabukta (Fig 3.2.2.) in the following locations:

- AWS1 – old marine terrace at the altitude of 15 m a. s. l. (operated since 2008)
- AWS2 – old marine terrace at 25 m a. s. l. (since 2008)
- AWS3 – foreland of Hørbyebreen at 67 m a. s. l (since 2008, Fig. 3.3.3.)
- AWS4 – mountain ridge of Mumien Peak at 475 m a. s. l. (since 2008)
- AWS5 – top of Mumien Peak at 770 m a. s. l. (since July 2013)
- AWS6 – top of Pyramiden Peak at 935 m a. s. l. (since 2009)
- AWS7 – Bertilbreen at 464 m a. s. l. (since 2011)
- AWS8 – Bertilbreen at 280 m a. s. l. (since 2014)

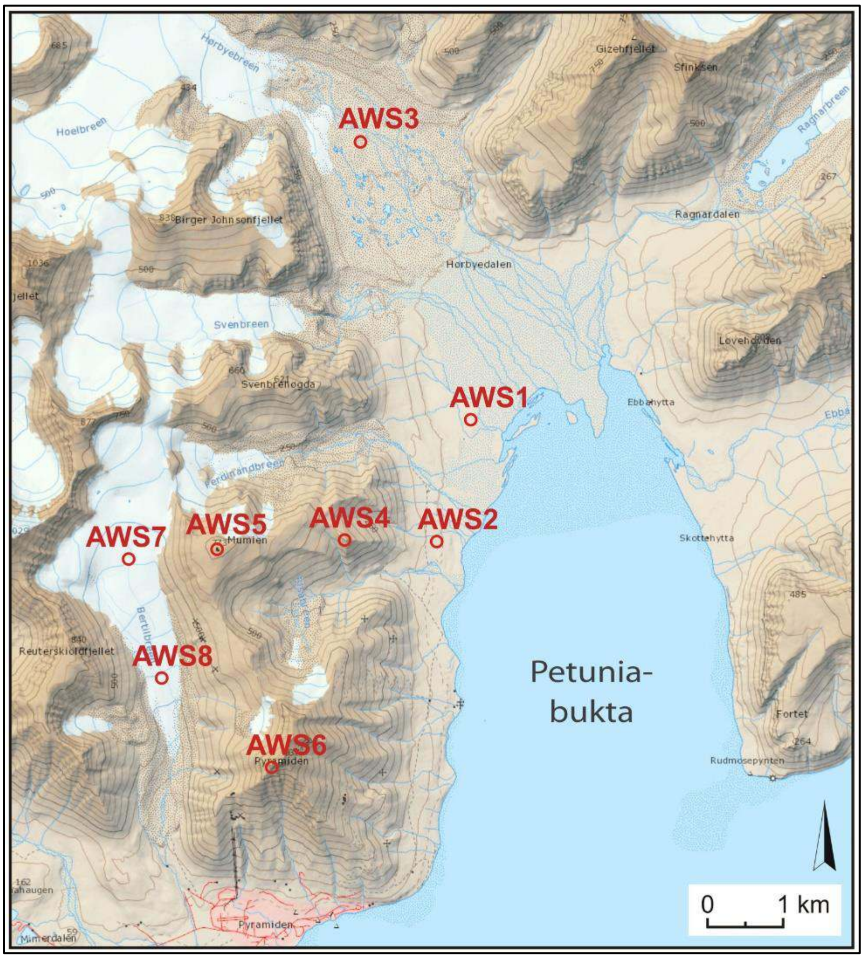


Fig. 3.3.2. Location of the automatic weather stations (AWS) in the vicinity of Petuniabukta (Billefjorden, central Spitsbergen) in August 2017. The modified map of Petuniabukta is based on the Svalbardkartet data, Norwegian Polar Institute.

Fig. 3.3.3. Automatic weather station (AWS3) complemented with the Open Top Chamber system providing both local climate and microclimate data on the foreland of Hørbye Glacier.

3.3.2. Glacial studies

Margherita Lucadello, Miloslav Devetter, Marie Šabacká, Karel Janko & Jakub Ondruch

We studied small animals living in cryoconites of surrounding glaciers and found regular populations of bdelloid rotifers and tardigrades. Margherita encounted the abundance in populations and correlated them with the size and shape of cryoconite, and the amount and quality of sediment (Figs. 3.3.4. and 3.3.5.). The sediment from cryoconites was sampled, dried and is subjected to genetic analyses.

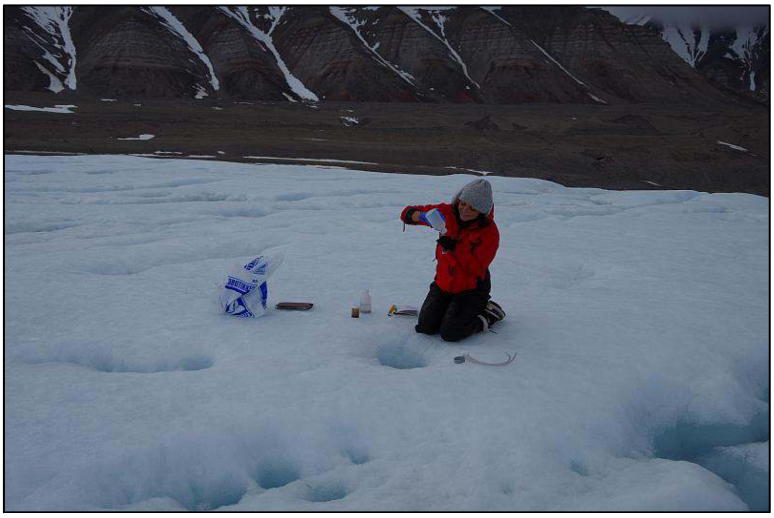


Fig. 3.3.4. Sampling or cryoconites.

Fig. 3.3.5. Cryoconite.

3.3.3. Microbial community development during the glacial-proglacial ecosystem transition

Petra Vinšová, Petra Luláková, Marie Šabacká & Jacob C. Yde

The rapid disappearing of glacial ice has no foreseen slowdown, as glaciers are not in balance with the current climate and the shrinkage will continue even without any further temperature rise. As a result, new habitats (referred to as 'proglacial habitats') exposed by glacial retreat are rising in both number and size. These proglacial habitats are colonized by microbes of various sources and, thus, potentially distinct metabolic activities and community structures. These sources are yet to be clarified. The specific objectives of our field mission were threefold:

1) identify glaciers possible to sample for cryoconite and supraglacial debris at the glacier surface and freshly exposed subglacial sediments;

2) sample these glaciers for both distinct ecosystems and for initial soils allocated in their respective proglacial sites;

3) transport these sediments in amounts sufficient for the analyses and for the following laboratory incubation experiments simulating the glacial-to-proglacial ecosystem transition.

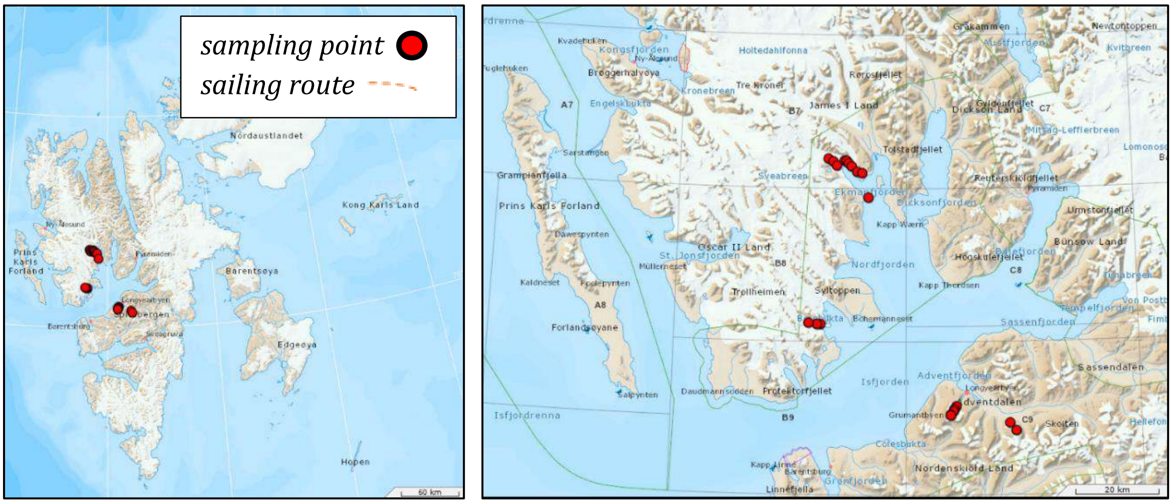


Fig. 3.3.6. Map of the sampled glaciers (Sefströmbreen, Nansenbreen, Longyearbreen, Foxfonna) during the 2017 field mission.

Our field group used RV CLIONE to get to different parts of Isfjorden (Fig. 3.3.6). Two glaciers were sampled for three distinct ecosystems here (Sefströmbreen Fig. 3.3.7a, Nansenbreen Fig. 3.3.7b). The Sefströmbreen proglacial site was sampled not only for the initial soils, but also for older soils using a chronosequence approach, in order to better understand the spatio-temporal development. Two additional glaciers (Foxfonna, Longyearbreen) were sampled during this mission for supraglacial debris and for initial soils only, as there was no freshly exposed subglacial material to be found (these glaciers are cold-based). The first laboratory work took place at Czech Research Station in Longyearbyen (subsampling, sieving, leaching, decanting).

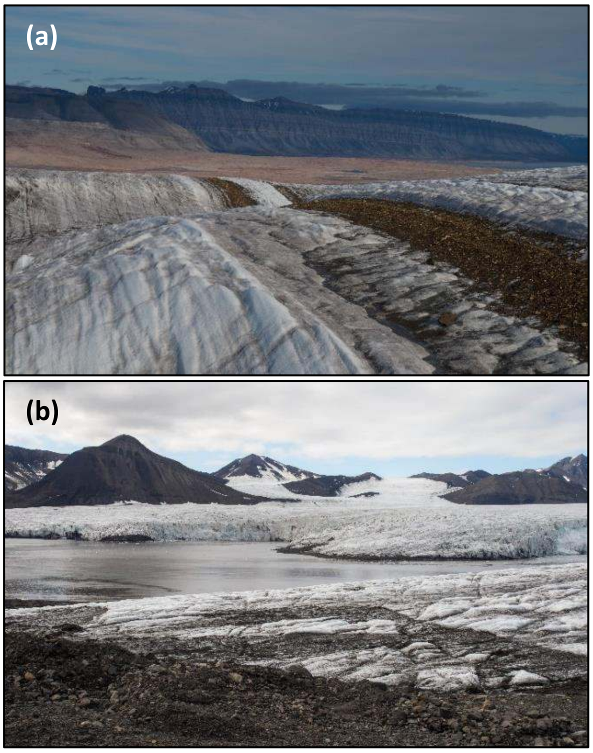


Fig. 3.2.7. Overview of glaciers sampled for three distinct ecosystems: **(a)** Sefströmbreen with its fancy-colored forefield, and **(b)** Nansenbreen.

At all study sites, the supraglacial ecosystem was assessed by sampling cryoconite and supraglacial debris on 20 × 20 m patches. Supraglacial debris was sampled using spatula and/or by a hand-pump. The easiest way to sample subglacial sediments was found to either access the basal ice or the freshly exposed subglacial deposits at the glacier front (Fig. 3.3.8a). Thanks to the anaerobic pockets present in these sediments, an original microbial community can be assessed. Proglacial sampling included initial soils at all sites, and older soils at Sefströmbreen (estimated to be ice-free for about 20, 30, 50, 80-90 and 120 years - the latter one is located at the outlying island Flintholmen, which was half-overridden during the last surge event; Fig. 3.3.8b). Additionally, PL took samples from Nordenshieldbreen's supraglacial and initial sites in late summer for our comparison study.

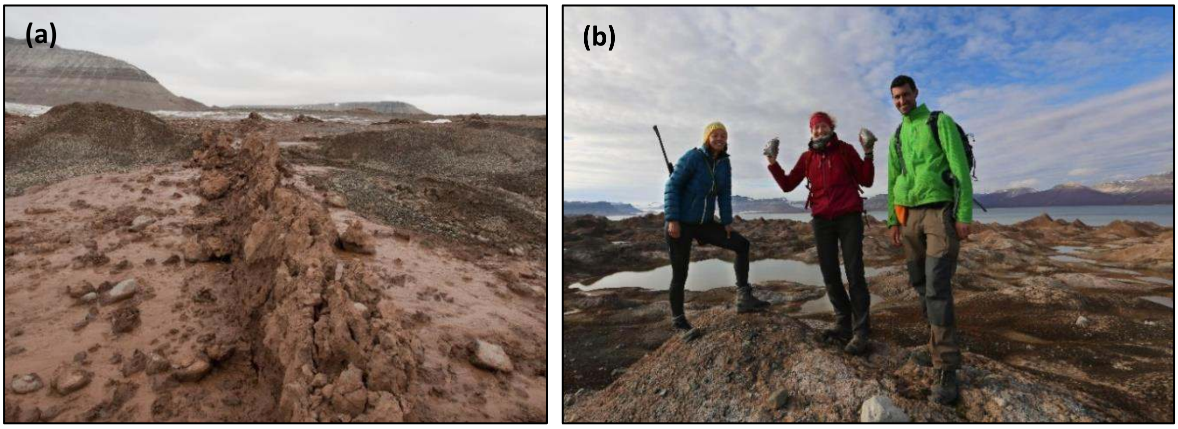


Fig. 3.3.8. (a) Freshly exposed subglacial sediment overlying ice at the margin of Sefströmbreen; and **(b)** field team members Petra Vinšová, Petra Luláková and Jacob C. Yde standing on the highest point on Flintholmen island, which was half-overridden by the last surge of Sefströmbreen. This island now presents a unique border between thousands of years old tundra on the distal side, and a degrading dead-ice landscape (visible behind the team members) on the proximal side.

It was possible to store samples refrigerated or to put them into a freezer immediately after each return from the field to Clione or Czech Research Station. Extra microbial samples (small amounts of sediment preserved by LifeGuard) to assess 16S rRNA/rDNA were taken in the field and immediately frozen. Samples were sieved, different subsamples were dried and leached for subsequent chemical analyses, and subsamples for cell counts and enzymes analyses were taken in Eppendorf tubes/small zip-locks and immediately frozen. Other microbial characteristics to be assessed – CNP microbial biomass, EFM; chemical analyses include elemental soil analysis, pH, TOC, TN, DOC, DN, available forms of inorganic nitrogen (NO_3^-, NH_4^+), and available PO_4^{3-}. Samples of subglacial sediments and proglacial soils along the Sefströmbreen chronosequence were used in incubation experiments with nutrient addition (C,N,P) and respiration rates measurements followed by biomass quantification, in order to assess nutrients possibly limiting microbial communities inhabiting this High Arctic forefield.

ACKNOWLEDGEMENTS: This field campaign was funded by Research Council of Norway (Arctic Field Grant 2017 Project No 269951/E10, RiS ID 10645) awarded to PV & JCY. Results will be reported also through our website (http://cryoeco.eu) and twitter page (@CryoEco).

3.4. Microbiology and Phycology

3.4.1. Microbiology for astrobiology

Michaela Musilová, Libor Lenža & Zlatica Kalužná

The extreme ecosystems on Svalbard are a great analogue for similarly extreme environments, which exist elsewhere in the universe. Therefore, potential life in those extraterrestrial places could be similar to the lifeforms found in Svalbard. A team from the Slovak Organisation for Space Activities (SOSA) studied two different environments in Svalbard, from an ecological, geological and microbiological perspective and their relevance to extraterrestrial conditions. The expedition was part of a cooperation between several Czech and Slovak universities and organisations.

The aim of this project was to perform in-situ analyses of these environments and then to sample small representative amounts of microorganisms that live in these environments for the purpose of studying them in more details in laboratories in the Czech Republic and Slovakia. Samples of extremophiles were collected from the surface of various glaciers near Longyearbyen and the NOSTOC station by Pyramiden, from August to September 2017 (Fig. 3.4.1.). Specifically, several types of cryoconite samples, mosses and lichens were collected from the glacier surface and the surroundings of six glaciers and seven valleys near Longyearbyen, and four glaciers and six valleys near the NOSTOC station. The samples were then frozen and transferred frozen back to Slovakia.

Fig. 3.4.1. Michaela Musilová performing field work on a glacier in Svalbard. Credit Margherita Lucadello.

The sample analysis has started in SOSA, in cooperation with the Faculty of Electrical Engineering and Information Technology of the Slovak University of Technology and the

Faculty of Natural Sciences of the Comenius University in Bratislava. Further biochemical and genetic analyzes are planned, as well as experiments during which the extremophiles will be exposed to extraterrestrial conditions. Furthermore, these studies and samples will be provided to high school and university students in Slovakia for educational and outreach purposes. Students will be able to study the survival of these extremophiles in different simulated planetary conditions and use them for their bachelors, masters and PhD degree projects. One project, for example, is focused on nano-material research and how certain materials behave when exposed to extreme conditions. The student is interested in seeing whether extreme microbes provide any extra protection to some of the material, which she is studying. She would like to make this a part of her PhD research. In the mean time, a bachelor‘s project has also been prepared, with the title: "Biology of extremophile plants in cold and Arctic environments." The bachelor’s thesis work will start in 2018.

3.4.2. *Vaucheria* – a xanthophycean alga from intertidal zone

Claude-Eric Souquieres, Jana Kvíderová & Josef Elster

The study of the polyextrmophilic xanthophycean alga *Vaucheria* sp. forming dense microbial mats in the estuary of the Adventelva, Longyearbyen, Svalbard, continued during August 2017. In this year, we focused on

- detailed description of the environment
- sampling for genetical analyses of different *Vaucheria* sp. populations from marine and freshwater environments
- *in situ* and *ex situ* measurements of the photosynthetic activity

The measurements of the physical and chemical environmental variables (pH, temperature, salinity) were performed in three transects (Fig. 3.4.2.). Water and sediment samples were analyzed in laboratory for silica, nitrogen, and phosphorus contents. The sediment was further analysed for organic carbon, granulometry and colloidal carbohydrates.

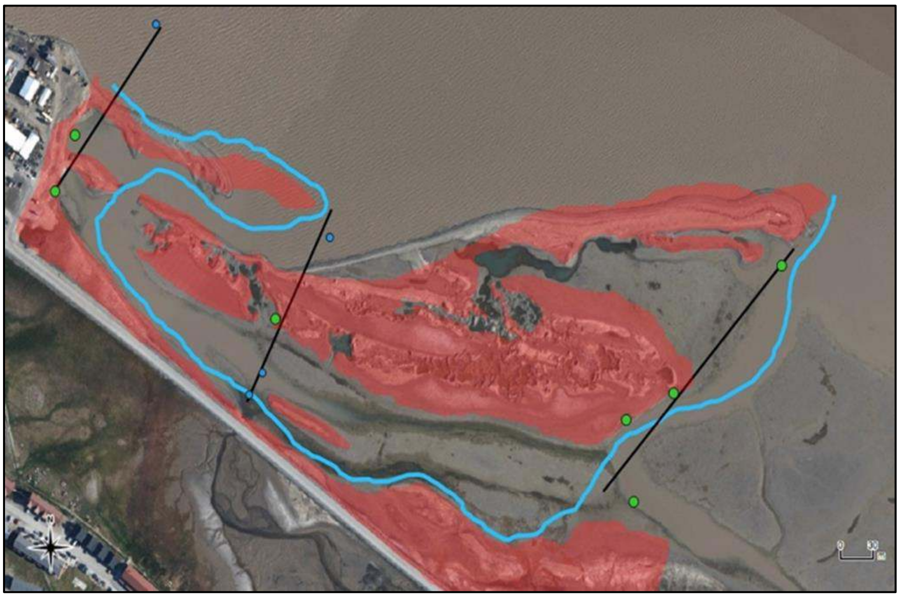


Fig. 3.4.2. Sampling area with Transects I, II and III from left to right. Sampling sites along the transect are numbered from 1 to 3/4 from down to up. The red zone delimits the high tide front. In blue the low tide channel is represented. Sampling site in green refers to the presence of *Vaucheria* communities in the close surroundings.

The samples of *Vaucheria* populations were taken from different microenvironments and genetical analyses were performed in co-operation with Matouš Jimel, Faculty of Sciences, Charles University in Prague.

The photosynthetic activity of *Vaucheria* community was measured using variable chlorophyll fluorescence and gasometry approaches. The fluorescence measurements were performed directly in the field and *ex situ* using exposition chambers. The gasometric measurements were performed only *ex situ* (Fig. 3.4.3.).

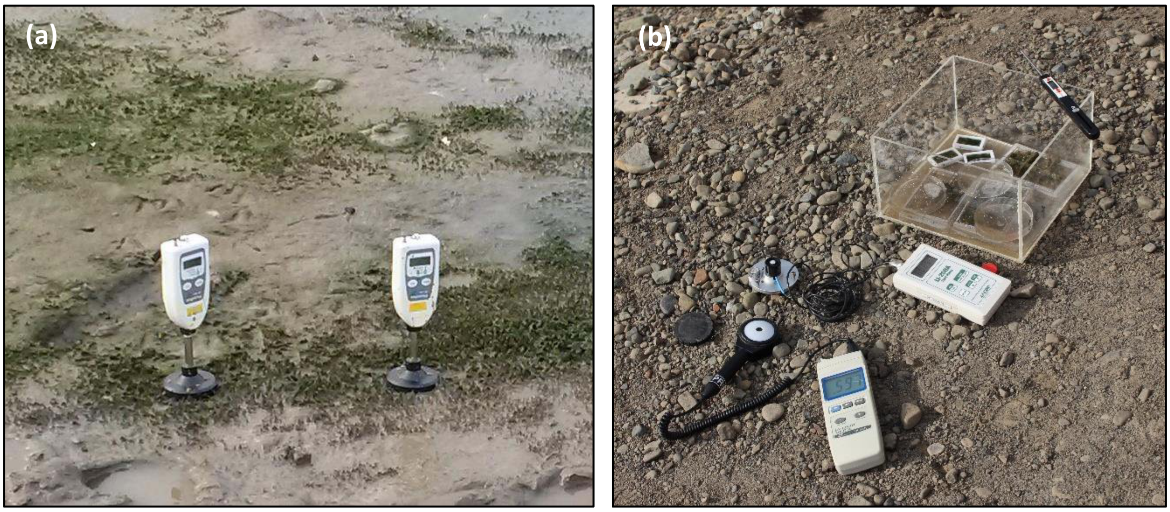


Fig. 3.4.3. (a) Measurement of the variable chlorophyll fluorescence in the field and **(b)** exposition chamber for ex situ measurements.

For detailed description, see report on Polar Ecology course at http://polar.prf.jcu.cz/docs-reports.

3.5. Botany and Plant Physiology

3.5.1. TRAPA – TRaits And Processes in the Arctic

Petr Macek, Miloslav Devetter, Patrick Saccone, Alexandra Bernardová, Franc de Bello, Tomáš Hájek,Petr Kotas & Petra Luláková

During June and July, we have taken samples and analysed traits for research project Linking functional traits of three organism levels as driving mechanisms of ecosystem functions in the Arctic. All most common types of terrestrial communities have been measured and sampled for microflora, fauna and vegetation. Various field and lab experiments have been established (Figs. 3.5.1. and 3.5.2.).

Fig. 3.5.1. Field measurements.

Fig. 3.5.2. Sample for analyses.

3.5.2. The SnoEco project - Effects of snow depth and snowmelt timing on Arctic terrestrial ecosystems

Martin A. Mörsdorf, Elisabeth J. Cooper, Lennart Nilsen, Nigel G. Yoccoz, Frans-Jan W. Parmentier, Philipp Semenchuk, Hans Tømmervik, Stein-Rune Karlsen, Bo Elberling, Anders Michelsen, Per L. Ambus

The SnoEco project is run by researchers at UiT, The Arctic University of Norway, with collaborators from the Norwegian Institute for Nature Research (NINA), the Northern Research Institute (NORUT) and the Center for Permafrost in Copenhagen. The projects main aim is to investigate the effects of climate change on a range of ecosystem characteristics within the High Arctic Tundra. In an experimental setup, we test the effects of deeper winter snow and warmer summer temperatures on soil microbial processes, nutrient availability, growing season length, plant- and invertebrate community characteristics. Since 2006, we use snow fences to increase winter snow depth and to delay the onset of growing season. During two growing seasons, we used Open Top Chambers (OTCs) for increasing atmospheric temperatures during the summer time (Fig. 3.5.3.).

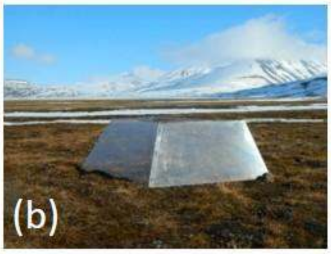


Fig. 3.5.3. The SnoEco Experiment. **(a)** Fences accumulate snow during the wintertime, leading to a deeper snow regime than in ambient conditions and later melt out date. (b) OTCs are used during the summer to simulate increased growing season temperatures.

In addition to the experiment, we use optical methods to monitor the development of vegetation in the surrounding landscape. We installed several camera racks throughout Adventdalen valley where the experiment is situated. Those racks were also equipped with NDVI sensors and soil temperature/moisture probes, in order to relate vegetation changes to the abiotic soil environment. We additionally use field cameras, which are installed on the surrounding mountains to monitor vegetation based on a larger spatial scale (Fig. 3.5.4). Imagery information is used in concern with other remote sensed information (e.g. drone, or satellite images), to investigate up/down – scaling issues around vegetation monitoring in the High Arctic.

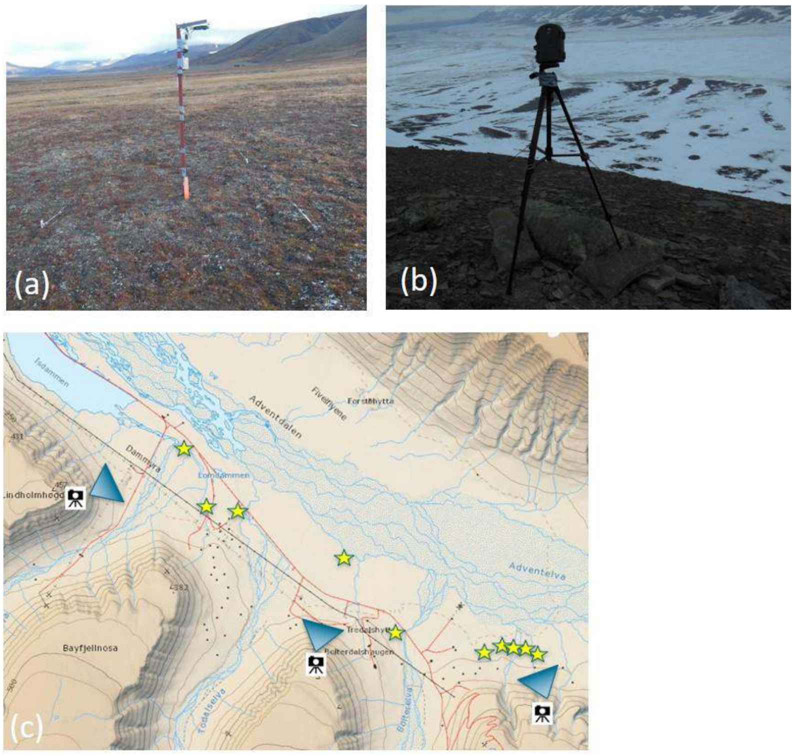


Fig 3.4.4. The SnoEco monitoring activities using optical devices. (a) Racks are equipped with field cameras, NDVI sensors and soil temperature/moisture sensors; (b) cameras on the surrounding mountain sites are used to monitor vegetation on a larger spatial scale. (c) Shows the location of racks (stars) and cameras on the mountain sites.

During summer 2017, we used the "Josef Svoboda Station" (CARS) as a base camp for our field activities. Amongst others, we measured snow profiles and took snow samples before, during, and after the melt out period (Fig. 3.5.5.). This sampling was conducted within a range of snow depth regimes, which are created by the snow fences in Adventdalen. Samples will be analyzed for their nutrient content, and the results will contribute to our current understanding of nitrogen cycling within this ecosystem.

Fig 3.4.5. Snow sampling during the melt out period 2017.

During July 2017, we recorded the plant diversity in all plots of our experiment, in order to assess long-term (11 years) effects of an altered snow regime on a range of plant community properties (Fig. 3.5.6). Finally, we buried tea Bags during September 2017, in order to assess rates of microbial decomposition in different snow regimes throughout the wintertime. The results will be published during the coming years in a choice of scientific journals.

Fig 3.4.6. The SnoEco Field campaign during summer 2017. (a) Plant diversity within the experiment was recorded using the Point Intercept Method. (b) Tea bags were buried at the end of growing season to compare microbial decomposition under different snow regimes during the wintertime.

3.5.3. Species-abundance distribution under pressure of soil disturbances

Arnošt Šizling, Eva Šizlingová & Jakub Žárský

We collected data on spatial scaling in Species-Abundance Distribution (SAD), and compared the mechanisms underlying this pattern. In simple, SAD is a pattern of ecology that shows the proportion of common and rare species in terms of their abundance, and this pattern has been shown to be sensitive to soil disturbances[1,2]. In particular, we have shown that SAD is driven by spatial autocorrelation of abundances[3], but it is still unclear which of two mechanisms actually works in nature. The data from Svalbard would resolve this question.

Remote parts of Svalbard are the best environment to resolve this question, as (i) they never been managed by people, (ii) there are plant assemblages with various degrees of disturbances and (iii) arctic ecosystems are simple and thus it is much easier to uncover the mechanisms that drive the pattern in focus, that is, SAD.

We used non-destructive method, which consisted in making lists of species and their covers at several squares (standard botanical sampling). The squares had various distances between themselves and were placed in environments with various degrees of disturbances.

Our team is grateful to the Center for Polar Ecology for a possibility to use their equipment and experiences with research in Svalbard.

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3.6. Zoology and Parasitology

3.6.1. Migration of Arctic terns (*Sterna paradisaea*) from Svalbard

Tereza Hromádková, Martins Briedis & Václav Pavel

Arctic terns *Sterna paradisaea* breed in the northern hemisphere. When the northern winter comes Arctic terns migrate to the area of Antarctica where theirs wintering areas are located. The longest migration path yet recorded for one year was around 90 000 km. Thus, they belong to the longest flyers among birds. For tracking routes of Arctic terns, we use small devices called geolocators (Fig. 3.6.1.). Geolocator continuously records the ambient light intensity (and thus, sunrise/sunset times), which through astronomical algorithms, can be converted into geographical positions of the bird.

The main aim for 2017 season was to equip 30 Arctic terns breeding in Svalbard with geolocators. According to studies from previous years we chose an urban colony in Longyearbyen for mounting geolocators. In the first half of July we caught 30 terns, measured main body characteristics (weight, long of tarsus, wing, tail, bill, head-bill, depth of bill; Fig. 3.6.2.), took blood samples and faecal swab for parasitological research and mount geolocators to theirs leg (Fig. 3.6.3.).

This study will continue also in the next season when will be crucial to recapture equipped Arctic terns in order to gain data from geolocators.

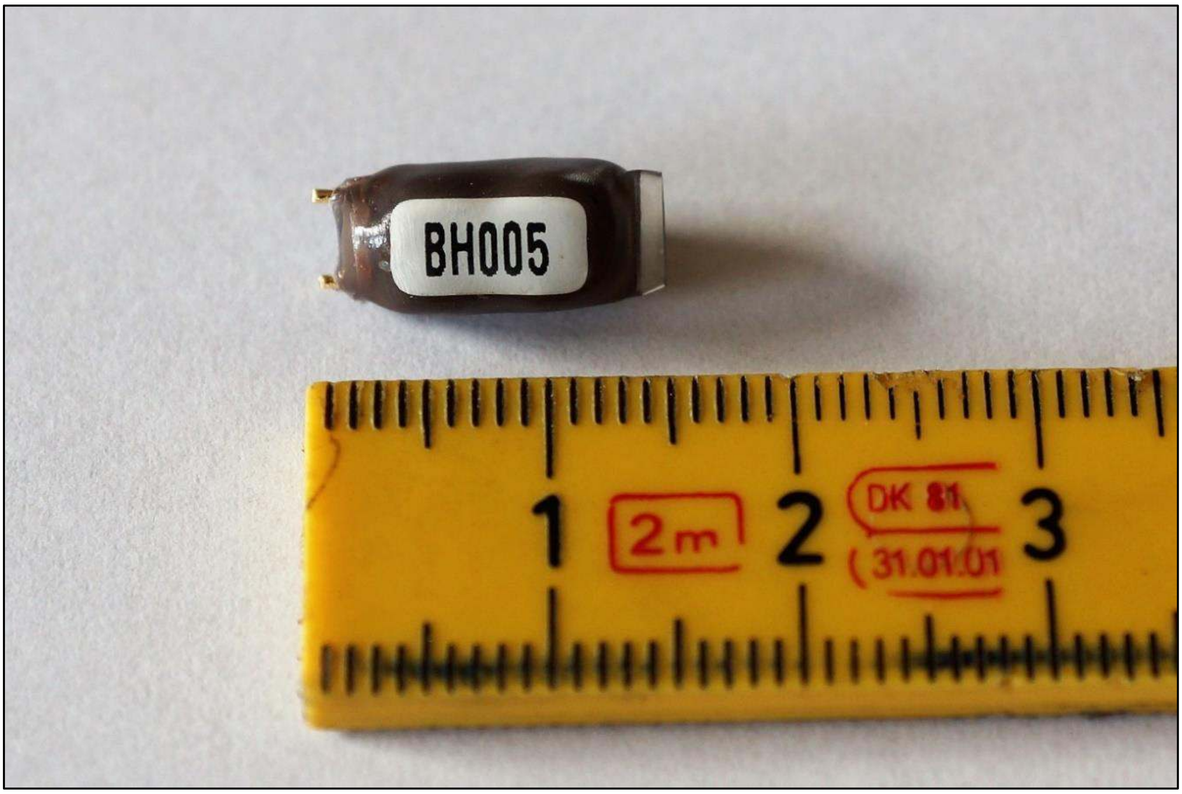

Fig. 3.6.1. Used type of geolocator (Intigeo-W65A9-SEA/Migrate Technology Ltd.).

Fig. 3.6.2. Measuring of the length of bill-head parameter.

Fig. 3.6.3. The Arctic tern *Sterna paradisaea* with the geolocator on the leg.

3.6.2. Vertical studies of soil fauna under bird cliff

Miloslav Devetter

In Skansbukta, a series of vertical traps for soil fauna has been installed. In the next year, when communities will be adapted for disturbance, quantitative samples of meso- and macrofauna from different layers will be taken and analysed also for genetic differences.

Fig. 3.5.4. Installaton of a vertical trap in Skansbukta.

3.6.3. Flies, bugs and other insects of Svalbard

Anna Mácová

The goal of my stay was to explore the insect diversity in Svabard. During three weeks, I performed insect collections in 7 localities: northern part of the Petunia bay, Nybyen (Longyearbyen), Mine 4 (Longyearbyen), Bjorndalen, Grumantbyen, Rusanovoden and Colesbukta. Samples were gathered in the following way: sweeping, collecting individuals, beer traps and yellow pan traps.

The majority of the obtained insect belongs to Diptera.

Obtained families:

Trichoceridae: 25 ex., at least two morphospecies.

Mycetophilidae: 115 ex., more than 5 morphospecies.

Sciaridae: 27 ex., more than one morphospecies.

Culicidae: 2 ex. of *Aedes nigripes* (Zetterstedt, 1838), from Petunia and Mine 4.

Chironomidae: 80 ex., several morphospecies.

Heleomyzidae: 23 ex., *Neoleria prominens* (Malloch, 1919) from Colesbukta and *Heleomyza borealis* (Boheman, 1865) from Grumantbyen.

Sphaeroceridae: 2 ex., subfamily Copromyzinae.

Scathophagidae: 180 ex., *Scathophaga furcata* (Say, 1823).

Anthomyiidae: 5 ex.

Muscidae: 18 ex., several morphospecies, probably genus *Spilogona*.

Calliphoridae: 12 ex. *Boreellus atriceps* (Zetterstedt, 1845) from Colesbukta, *Cynomya mortuorum* (L., 1761) from Grumantbyen and *Protophormia terraenovae* (Robineau-Desvoidy, 1830) from Rusanovoden.

The most interesting findings were in the family Calliphoridae. *Boreellus atriceps* was previously recorded from Svalbard only in 1928, and since then it hasn't been confirmed. Cynomya mortuorum is a new record for Spitzbergen (previously recorded from Jan Mayen Is. and Bjornoa Is.).

There is also an interesting material of other groups, e. g. several specimens of Diapriidae (Hymenoptera), the family previously unknown from Svalbard. I also gathered samples of Coleoptera (family Staphilinidae), and from non-insect groups several exemplars of Collembola (*Sminthurides malmgreni* (Tullberg 1876)), Acari (Mesostigmata, oribatid mites, prostigmatid mites – families Rhagidiidae, Bdellidae, Penthaleidae) and Araneae. Samples were sent to specialists to species determination (Máca J., Makarova O., Preisler J., and others).

4. Educational activities

4.1. Winter Arctic Ecology

Organizers: University of South Bohemia & UNIS

February 22, - March 31, 2017

Students (Fig. 4.1) of the Winter Arctic Ecology course participated at lectures, seminars and field trips at UNIS. During the course, they worked on five different projects

- germination capability of frozen plants
- measurements of respiration of frozen plants
- evaluation of reindeer food quality
- reindeer population structure study
- viability of microalgae during winter

Fig. 4.1. Participants of the Winter Ecology Course in February – March 2017.

The reports from Winter Arctic Ecology course are available at http://polar.prf.jcu.cz/.

4.2. KRNAP training course

Organizer: Krkonoše National Park (KRNAP)

July 22 – August 4, 2017

The employees of the KRNAP focused on comparison of polar and alpine tundra. During the course, the participants visited several localities in Svalbard.

4.3. Polar Ecology course

Organizer: University of South Bohemia

July 29- August 25, 2017

The Polar Ecology course consisted of theoretical and practical parts in Svalbard. During the theoretical part, students got basic information on the biology of the Polar Regions. During the practical parts, students visited several localities to see the environment diversity, and worked on their own projects.

The student projects included

- heavy metal and PAH contamination assessment in soil around Longyearbyen
- cyanobacterial and microalgal biodiversity in and around Billefjorden, Svalbard
- diversity of freshwater green algae (Chlorophyta) in Svalbard lakes
- ecology of *Vaucheria* sp. (Xanthophyceae) from the intertidal zone
- metazoan fauna in cryoconite holes of Svalbard: genetical and ecological features
- gastrointestinal nematodes of thorny skate (*Amblyraj radiata*)
- effect of polar day on melatonin level and clock gene expression among polar researchers

The preliminary results were presented at a student seminar at Centre for Polar Ecology in České Budějovice on December 20, 2017.

For detailed information, see report on Polar Ecology course at http://polar.prf.jcu.cz/docs-reports.

5. Outputs in 2017

5.1. CPE employees (present)

5.1.1. Journal articles

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5.1.2. Abstract Books

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5.1.3. Book chapters

Devetter M., Přikryl I. (2017) Rotifera. In: Hejda R, Farkač J, Chobot K (eds) Červený seznam ohrožených druhů České Republiky. Bezobratlí. Příroda, Praha, 36, 1-612.

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5.1.4. Theses

Brož, M.: Střevní paraziti savců introdukovaných na Svalbard [Intestinal parasites of mammals introduced to Svalbard]. BSc. thesis, Faculty of Sciences, University of South Bohemia in České Budějovice, 2017.

Muchová, K.: Závislost společenstev půdních vířníků (Rotifera) na gradientu vlhkosti v polárních podmínkách [Rotifer communities on water-terrestrial gradient of central Svalbard wetlands]. MSc. Thesis, Faculty of Sciences, University of Ostrava, 2017.

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5.1.5. Conference contributions

Bernadrová, A., Šabacká M., Elster, J., Callaghan T.V. (2017): The Red phone: rapid response to environmental emergency alerts. In: International Arctic Change Conference, Quebec, Canada, 11.-16.12.2017.

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Devetter, M., Tajovský, K., Šustr, V., Jílková, V., (2017): Vliv jeskynních žížal na transformaci substrátu a organické hmoty v Amatérské jeskyni [The influence of cave earthworms on transformation of subrstrate and organic matter in "Amatérská jeskyně" cave]. In: Výskum, využívanie a ochrana jaskýň. 11. vedecká konferencia. Liptovský Mikuláš, Slovakia, 25.–26. 10. 2017.

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Elster, J., Ditrich, O., (2017) Czech Arctic „Josef Svoboda Station" in Svalbard. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 207. Prague, Czech Republic, 31.3. –7.4.2017.

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Lulák, M., Hanáček, M., Nývlt, D., Nehyba, S. (2017): Paleoekologie zátoky Mimerbukta (centrální Svalbard) na přelomu pleistocénu a holocénu podle subfosilních společenstev mořských bezobratlých [Paleoecology of Mimerbukta (central Svalbard) during Pleistocene/Holocene transition according to subfossil communities of marine invertebrates]. In: Ivanov, M. et al. (eds.): 23. Kvartér – Sborník abstrakt, ÚGV PřF, Masarykova Univerzita, s. 34–38, Brno, 1.12.2017.

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Myšková, E., Fuglei, E., Unnsteindóttir, E.R., Schmidt, N.M., Ditrich O., (2017): Foxy parasites of the North. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 112. Prague, Czech Republic, 31.3. –7.4.2017.

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(Svalbard). In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 107–108. Prague, Czech Republic, 31.3. –7.4.2017.

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Pushkareva, E., Kvíderová J., Šimek M., Elster J., (2017): Cyanobacterial community composition and associated ecological processes in Arctic soil crusts. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 108. Prague, Czech Republic, 31.3. –7.4.2017.

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Souquieres, C.-E., Kvíderová, J., Elster, J., (2017): Vaucheria sp. – a xanthophycean alga from Svalbard intertidal zone. Year 2. In: Biosciences in polar and alpine research. Brno, Czech Republic, 21.11.2017.

Šustr, V., Giurginca, A., Devetter, M., Tajovský, K., Kavková, M., Zikmund, T., Kaiser, J., (2017): Combination of SEM and nano CT technics in the morphological study of Mesoniscus graniger mouthparts (Crustacea, Oniscidea). In: 10th International Symposium on the Biology of Terrestrial Isopods. Budapest, Hungary, 27.–30.8. 2017.

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5.1.6. Conference organization

The Arctic Science Summit Week 2017, 31.3.–7.4.2017, Praha. 712 účastníků.

5.1.7. Popularizing articles

Elster, J., Ditrich, O. (2017): Příběh vzniku české arktické vědecké stanice [Story about foundation of the Czech Arctic research station] . Vesmír, 96, 160–163.

5.1.8. Presentations in media

28.12. ČRo: Host do domu. Josef Svoboda. Kriminál byla univerzita prvního řádu, říká světově uznávaný polární botanik [A guest to the house: Josef Svoboda. Jail was the first-class university, the world-renowned polar botanist says]

11.12. ČRo: Odpolední host: V Budějovicích máme Centrum polární ekologie. Host: Martin Lulák z Přírodovědecké fakulty Jihočeské univerzity [A guest in the afternoon: In České Budějovice, we have the Centre for Polar Ecology. Guest: Martin Lulák forn the Faculty of Science, University of South Bohemia]

08.12. Úřad vlády České republiky, Sekce místopředsedy vlády pro vědu, výzkum a inovace: Vědci pod mikroskopem, díl 3. Marie Šabacká (Centrum polární ekologie, JU v Č. Budějovicích) [Scientists in the microscope, part 3. Marie Šabacká (Centre for Polar Ecology, University of South Bohemia in České Budějovice)]

27.11. ČRo: Odpoledne s dvojkou [Afternoon with Two] (all day records, from 13:16)

15.06. ČRo: Snažíme se vytvořit chladnomilnou biotechnologii, popisuje výzkum polárních botaniků Josef Elster [Josef Elster describes research of polar botanists: We are trying to make up low-temperature biotechnology]

15.06. ČRo: Magazín Leonardo. Čím jsou pro vědu zajímavé řasy a sinice za polárním kruhem? [Magazín Leonardo: Why are the algae and cyanobacteria beyond the polar circle interesting for science?] (11:40 - 26:50)

25.05. National Geographic Czech Edition (Editors/Czech News Agency): Stane se Česko arktickou velmocí? Polární ekologové tam hledají budoucnost [Will the Czech Republic become Artic superpower? Polar ecologists are searching future there]

21.04. ČRo: Páteční host: Ptákařův průvodce s bastrubkou v batohu. Ornitolog Václav Pavel a jeho výzkum na Špicberkách [Friday guest: Ornithologist's guide with a trumpet in a backback. Ornithologist Václav Pavel and his research in Svalbard]

31.03. ČT24: Studio ČT24: Téma: Týden arktické vědy [Topic: Arctic Science Summer Week] (16:48-25:38)

22.02. ČT1: Studio 6 - Milion tučňáků v Argentině [Million of penguins in Argentina] (in Czech)21.04. ČRo: Páteční host: Ptákařův průvodce s bastrubkou v batohu. Ornitolog Václav Pavel a jeho výzkum na Špicberkách

5.2. External Infrastructure users

5.2.1. Journal articles

Ambrožová, K., Láska, K., (2017): Air temperature variability in the vertical profile over the coastal area of Petuniabukta, central Spitsbergen. Polish Polar Research, 38(1), 41–60. (IF_{2016}:0.636)

Gabaldón, C., Devetter, M., Hejzlar, J., Šimek, K., Znachor, P., Nedoma, J., Seda, J., (2017): Repeated flood disturbance enhances rotifer dominance and diversity in a zooplankton community of a small dammed mountain pond. Jounal of Limnology, 76(2), 292–304. (IF_{2016}:1.451)

Hellmann, L., Tegel, W., Geyer, J., Kirdyanov, A.V., Nikolaev, A.N., Eggertsson, O., Altman, J., Reinig, F., Morganti, S., Wacker, L., Büntgen, U., (2017): Dendro-provenancing of Arctic driftwood. Quaternary Science Reviews, 162, 1–11. (IF_{2016}:4.797)

Hodson, A., Nowak, A., Cook, J., Šabacká, M., Wharfe, E.S., Pearce, D., Convey, P., Vieira, G., (2017): Microbes influence the biogeochemical and optical properties of maritime Antarctic snow. JGR: Biogeosciences, 122(6), 1456–1470. (IF_{2016}:3.395)

Hodson, A., Nowak, A., Šabacká, M., Jungblut, A.D., Navarro, F., Pearce, D.A., Ávila-Jiménez, M.L., Convey, P., Vieira, G., (2017): Climatically sensitive transfer of iron to maritime Antarctic ecosystems by surface runoff. Nature Communications, 8, 14499. (IF_{2016}:12.124)

Kavan, J., Ondruch, J., Nývlt, D., Hrbáček, F., Carrivick, J.L., Láska, K., (2017) Seasonal hydrological and suspended sediment transport dynamics in proglacial streams, James Ross Island, Antarctica. Geografiska Annaler Series A – Physical Geography, 99(1), 38–55. (IF_{2016}:1.302)

Láska, K., Chládová, Z., Hošek, J., (2017): High-resolution numerical simulation of summer wind field comparing WRF boundary-layer parametrizations over complex Arctic topography: case study from central Spitsbergen. Meteorologische Zeitschrift, 26(4), 391–408. (IF_{2016}:1.989)

Křížek, M., Krbcová, K., Mida, P., Hanáček, M. (2017): Micromorphological changes as an indicator of the transition from glacial to glaciofluvial quartz grains: Evidence from Svalbard. Sedimentary Geology, 358(1), 35–43. (IF2016:2.37).

Nehyba, S., Hanáček, M., Engel, Z., Stachoň, Z. (2017): Rise and fall of a small ice-dammed lake - Role of deglaciation processes and morphology. Geomorphology, 295, 662–679. (IF_{2016}:2.96).

Pinseel, E., Van de Vijver, B., Verleyen, E., Kavan, J., Kopalová, K., (2017) Diversity, ecology and community structure of the freshwater littoral diatom flora from Petuniabukta (Spitsbergen). Polar Biology, 40, 533–551. (IF_{2016}:1.949)

Uxa, T., Mida, P., Křížek, M. (2017): Effect of Climate on Morphology and Development of Sorted Circles and Polygons. Permafrost and Periglacial Processes, 28(4), 663–674. (IF_{2016}:2.81)

5.2.2. Conference contributions

Ambrožová, K., Láska, K., (2017): The Relationship between sea ice and vertical temperature variation in Central Spitsbergen, Svalbard. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 58–59. Prague, Czech Republic, 31.3. –7.4.2017.

Černý, J., Elsterová, J., Mullerová, J., Hrnková, J., Grubhoffer, L., Růžek, D., (2017) Cool viruses from cold climate areas – biology of viruses in Arctic. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 112. Prague, Czech Republic, 31.3. –7.4.2017.

Hejduková, E., (2017): Freezing tolerance of pennate diatoms: polar vs. temperate strains. In: 58th meeting of the Czech Phycological Society. Ostrava, Czech Republic, 18. –20.9.2017.

Kavan, J., (2017): Water temperature dynamics in two High Arctic streams, Svalbard. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 87–88. Prague, Czech Republic, 31.3.–7.4.2017.

Kuklinski, P., Weydmann, A., Walczyńska, K., Bałazy, P., Søreide, J., Gabrielsen, T., Halsband, C., Ronowicz, M., (2017): LARVAE - Linking Annual cycle of Reproduction and recruitment to environmental variables in Arctic Epifauna – overview of the project. In: 14th Larwood Symposium. Vienna, Austria, 25. –27.5.2017,

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Luszczuk, M., Padrtová, B. (2017): The Czech Republic and Poland in the changing Arctic: Scientific activities and political contexts. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 207. Prague, Czech Republic, 31.3. –7.4.2017.

Máca, J., Mácová, A. (2017): Preliminary report on the collection of Diptera in Svalbard. In: The 9th Central European Dipterological Conference. Kostelec nad Černými lesy, Czech Republic, 12. –14.7.2017.

Mörsdorf, M.A., Cooper, E.J. (2017): Long term changes in plant communities with deeper snow and their underlying causes. In: Svalbard Biomass Workshop. Longyearbyen, Norway, 9.–12.10.2017.

Murray, G.R. (2017) Scottish artist and paiting lecturer Georgia Rose Murray. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 213. Prague, Czech Republic, 31.3. –7.4.2017.

Ondráčková, L., Hanáček, M., Nývlt, D. (2017): The role of sediment sources in downstream changes of clast shape characteristics of bedload sediments in proglacial gravelbed Muninelva River, Svalbard. In: Ondráčková, L. et al. (eds.): Proceedings, Students in Polar and Alpine Research 2017, s. 36. Brno, 20.–22.4.2017.

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Ondruch, J., Tejnecký, V., Nývlt, D., Vítková, M., Kavan, J. (2017): Seasonal water and suspended sediment chemistry in proglacial and pronival streams in Petuniabukta, Central Spitsbergen, Svalbard. In: Ondráčková, L. et al. (eds.): Proceedings, Students in Polar and Alpine Research 2017, s. 37. Brno, 20.–22.4.2017.

Pažoutová, M., De Clerck, O., Del Cortona, A., Dauchot, N., Karolína, F., Heesch, S., Košnar, J., Moniz, M.B. J., Peters, A.F., Rindi F., Sherwood A., Smith D.R., Verbruggen H., Rombauts S. (2017) Surprising diversity of Prasiolales from the Arctic and the first insights on *Prasiola crispa* genomics. In: Bernardová, A. Ed. The Arctic Science Summit Week 2017, 107. Prague, Czech Republic, 31.3. –7.4.2017.

Pichrtová, M., (2017): The effect of realistically simulated UV radiation on polar and alpine strains of *Zygnema*. In: 58th meeting of the Czech Phycological Society. Ostrava, Czech Republic, 18. –20.9.2017.

Trumhová, K.: Effect of frost and thaw on seasonal dynamics of Arctic strain of *Zygnema* sp. (Zygnematophyceae). In: 58th meeting of the Czech Phycological Society. Ostrava, Czech Republic, 18. –20.9.2017.

5.2.3. Popularizing articles

Chládová, Z., Láska, K. (2017): Ledové království na ústupu. Vesmír, 96, 292–295.

Hanáček, M. (2017): Za tropickou minulostí Arktidy [On the tropical past of the Arctic]. Vesmír, 96, 220–223.

Kavan, J., Nedbalová, L. (2017): Miliony jezer v pohybu [Ice kingdom on retreat]. Vesmír, 96, 440–443.

Lehejček, J. (2017): Minulost vepsaná v letokruzích Past inscribed in year rounds]. Vesmír, 96, 354–355.

Svoboda, J. (2017): Arktida mladá a živá [Arctic young and living]. Vesmír, 96, 44–46.