
ANNUAL REPORT 2014



UNIS

The University Centre in Svalbard

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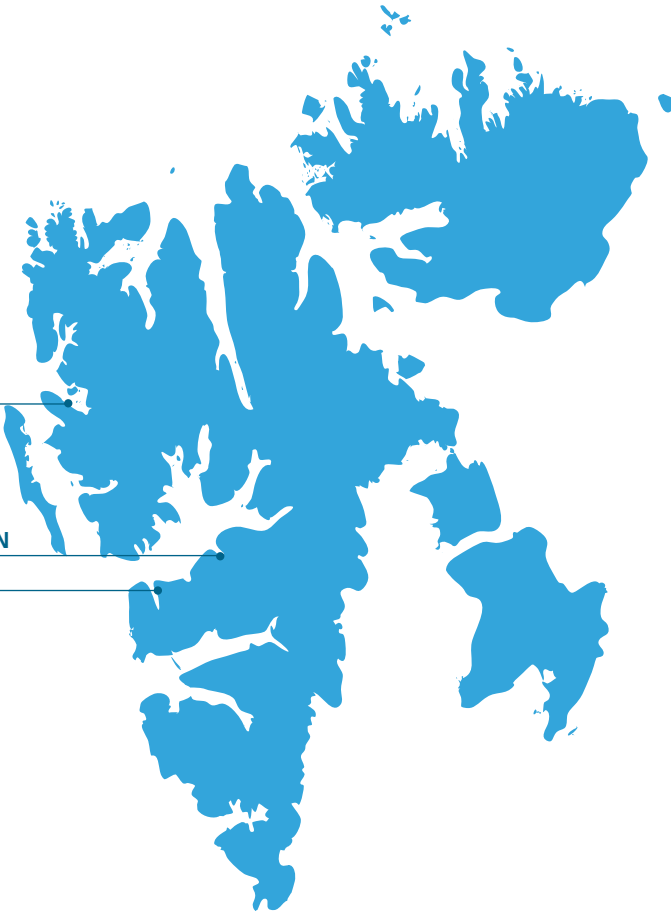
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Guest lecturers 2014

NY-ÅLESUND

LONGYEARBYEN

BARENTSBURG



SVALBARD



FROM THE DIRECTOR

UNIS continues a rather linear development in research and educational activity. A new strategy is being implemented through action plans for the respective departments. The new strategy focus on consolidation and developing UNIS further as the internationally leading centre in the High Arctic for research-based higher education in close cooperation with the Norwegian universities.

599 students from 44 countries were admitted to 88 UNIS courses in 2014. This gives a production of 190 student years. If all courses were filled completely, a production of 220 student years would have been possible, which is the target student year production the Ministry has set for UNIS.

BioCEED, the new Centre of Excellence in Biology Education led by University of Bergen in collaboration with UNIS, opened in April 2014. We are already a partner in SAMCoT, Centre for Research-based Innovation in Sustainable Arctic Marine and Coastal Technology (led by NTNU) and the Birkeland Centre of Excellence for Space Science (led by University of Bergen). These centre partnerships, acquired in public competitions, show that UNIS is recognised as a high quality institution within Arctic science and education.

Towards the end of 2014, the cornerstone business of Longyearbyen and for Norwegian settlement in Svalbard, Store Norske Spitsbergen Kulkompani, reported severe economic difficulties, and started reducing its activity. In this situation, UNIS has signalled the possibility of taking a larger role in Svalbard. UNIS is in a favourable position through our close cooperation with the eight Norwegian universities. In addition, UNIS is also active in other infrastructure initiatives such as a new floating harbour in Longyearbyen, and the Svea Arctic Research Infrastructure (SARI).

The development at UNIS necessitates an expansion of the Svalbard Science Centre. New activities and new establishments, like the Svalbard Integrated Earth Observing System (SIOS), mean that the current building is completely full.

UNIS is a unique institution within the international family of academic institutions. Our vision, *Research-based education of the next generation of Arctic experts*, proves that we see our work in a holistic context. The interest from society and the political level is considerable, and many prominent guests visit us.



November 2014: Prime Minister Erna Solberg is shown around the UNIS logistics hall by UNIS director Ole Arve Misund. Photo: Eva Therese Jenssen/UNIS.

Former Prime minister of Norway, now Secretary General of NATO, Jens Stoltenberg visited in May, when he gave a public lecture on his work as a special climate change envoy to the Secretary General of the United Nations.

As part of the preparation for the 2015 Climate Conference in Paris, ministers of Foreign Affairs from Norway and France, Børge Brende and Laurent Fabius, visited us in July. Norwegian Prime minister Erna Solberg accompanied by ministers Anders Anundsen and Bent Høie, came in November. The Prime minister said she has seen UNIS grow over the years to become one of the cornerstones of Longyearbyen.

I appreciate the privilege to take part in realizing the potential of this fine institution, and I see it as my responsibility that UNIS continue developing as a leading centre for Arctic science and higher education.

Ole Arve Misund
Managing director

EXCERPT FROM THE BOARD OF DIRECTORS' REPORT 2014

In 2014 the flow of students to UNIS increased. There were more externally financed research projects. UNIS became a partner of BioCEED Centre of Excellence in Biology Education, which was opened in April 2014. The collaboration between UNIS and the eight universities in mainland Norway was followed up through the action plan that operationalizes the collaboration agreements, and UNIS has in 2014 had major focus on efforts involving quality assurance. In order to implement a new strategic plan for 2014–2020, plans of action have been drawn up for each department. The Board of Directors notes that the financial situation is in good shape, with strengthened shareholder equity and a good system for managing the company's values. This is accompanied by good research results in several areas.

The University Centre in Svalbard AS (UNIS) was established as a state-owned limited corporation on 29 November 2002. This company replaced the original foundation established in 1994 by the Norwegian University of Science and Technology (NTNU), the University of Bergen (UiB), the University of Oslo (UiO) and the University of Tromsø (UiT). As of 2011, UNIS AS has an identical collaboration agreement with the eight universities on the Norwegian mainland, and five members of the Board of Directors come from NTNU, UiB, UiO, UiT and the Norwegian University of Life Sciences (NMBU). The company's objective is to provide tuition and engage in research based education on Svalbard's geographic location in the High Arctic and the special advantages this offers. The educational provision shall act as a supplement to the tuition offered at the universities and form part of the ordinary programmes of study that culminate in degrees at Bachelor, Master or PhD level. The educational provision shall have an international profile, and all tuition shall be given in English.

EDUCATION

In 2014 UNIS continued the four fields of study:

- Arctic Biology (AB)
- Arctic Geology (AG)
- Arctic Geophysics (AGF)
- Arctic Technology (AT)

In 2014 UNIS offered 88 different courses. A total of 599 qualified students were admitted to courses in 2014, which follows the trend of an annual increase in the student mass. In

addition to the course students, 58 Master's students were at UNIS for all or part of 2014 to work on their Master's theses. A total of 190.3 student-labour years was produced in 2014. Of this, 21.9 student-labour years constitutes the production by guest Master's students.

THE STUDENT MASS

A total of 599 students from 44 countries took courses at UNIS, which represents an increase of more than 100 students compared to the previous year (497 students from 36 countries in 2013). A total of 58 Master's students (52 in 2013) worked on UNIS-related Master's theses during the year. Of the student mass 51% were women and 49% men.

In 2014 there were 270 Norwegian degree students at UNIS. This accounted for 45% of the student mass*.

These were divided as follows between the Norwegian universities:

88 students from NTNU (32.6%)

58 students from UiT – The Arctic University of Norway (21.5%)

56 students from the University of Bergen (20.7%)

34 students from the University of Oslo (12.6%)

18 students from the University of Stavanger (6.7%)

10 students from NMBU (3.7%), 4 from the University of Nordland (1.5%) and 2 from the University of Agder (0.7%)

In addition to the Norwegian degree students listed above, the majority of the institutions also have students via exchange agreements. As has been the case previously, all international students who do not have an exchange agreement with a university on the Norwegian mainland are registered at UiT – The Arctic University of Norway.

In 2014 a total of 192 Norwegian citizens took courses at UNIS (32%). Of the international students, the largest groups were from Germany (13%), the Nordic countries (15%), the United Kingdom (7%), and Russia and USA (5%).

COOPERATION WITH THE UNIVERSITIES - THE QUOTA SCHEME

Following a longstanding wish from the Norwegian universities regarding quota places on courses at UNIS,

* As of 2014, UNIS is stating the Norwegian proportion based on the student's programme affiliation at the Norwegian universities and not only Norwegian citizenship.



November 2014: "Exercise Svalbard", a national health and rescue exercise, was held in Billefjorden. More than 500 people participated in the exercise, many of them from UNIS. Photo: Stefan Claes/UNIS.

a quota scheme was established in 2014 for the parties in the collaboration agreement with UNIS (NTNU, UiO, UiB, UiT The Arctic University of Norway, NMBU, UiS, UiA and UiN). The background for the introduction of the quota scheme was the wishes from the universities and the conditions for the operation of UNIS, laid down by the Ministry of Education and Research, which states that there should be a balanced proportion of international students and students from Norwegian programmes of study. The purpose of the quota scheme is to create greater predictability in admission to UNIS courses for students admitted to programmes of study at the Norwegian universities, strengthen the implementation of UNIS courses in programme descriptions at the universities, as well as facilitate that the proportion of students at UNIS from programmes of study at the Norwegian universities meets the Ministry's target. The quota scheme entered into force during the admission process to UNIS courses offered in the spring semester in 2015.

RESEARCH

The research activity at UNIS continues to grow. Examples of central projects from the departments follow below. More detailed information about the research is contained in each of the department's reports in this annual report.

A study implemented by UNIS researchers and collaborators (UiB, Institute of Marine Research) demonstrates major changes in the sea ice cover north of Svalbard. The observations were made by satellites that have monitored sea ice in the Arctic since the late 1970s. The study shows that the sea ice north of Svalbard has reduced in every month of the year, but the greatest reduction of sea ice is in the winter.

This is in contrast to changes in the more central parts of the Arctic, where the reduction is greatest in summer. Consequently, over the past 30 years, the ice edge north of Svalbard has moved north-eastwards as a result of increased water temperatures in the Atlantic Ocean. The ocean west of Svalbard is dominated by warm salty water from the Atlantic. Some of this water continues northwards and transports large amounts of heat into the Arctic.

UNIS is part of the Birkeland Centre for Space Science and in 2014 our researchers have been actively involved in instrument development and have started on the construction of the new SuperDARN (Super Dual Auroral Radar Network) radar on the Mine 7 mountain.

The Kjell Henriksen Observatory (KHO) is the laboratory and field station for the Space Physics Group and is an important piece for educating candidates for future careers in space physics and for the research engaged in by the Birkeland Centre. KHO had a central role during NASA's rocket campaign and the Cusp Region Experiment (C-REX) project in 2014.

Extreme weather events have impacted on the biological observations in recent years, and unusual climatic events on land have resulted in new publications. An article published in *Environmental Research Letters* in 2014 about the effects of mild weather and rain in winter on the conditions for reindeer on Svalbard gained local, national and international media coverage.

Based on a marine data series stretching back more than 30 years, we documented similar changes in the ocean and



pointed out that we expected the species composition to be able to continue to live here in the years ahead. The research is characterized by the importance of understanding how the ecosystems adapt to climate change.

Interdisciplinary cooperation between marine biologists, glacial geologists and glaciologists from the departments of Arctic Geology and Arctic Geophysics has led to new knowledge about the evolution of landforms on the seabed from current and several former surges from the Tunabreen glacier in Svalbard. The extent and ice movement directions in Svalbard's Barents Sea ice shield, which covered Svalbard between 32,000 and 11,000 years ago, were studied on the island of Kongsøya in August. Fieldwork in the Flowerdalen valley in August 2014 led to several major finds. Two bone layers of marine reptiles dating from the Early Triassic were found. The most exciting was a layer of seven Ichthyosaurs skeletons on the mountain Marmierfjellet dating from the Middle Triassic. All three findings are planned excavated in August 2015.

One of the world's northernmost permafrost drilling operations took place when two boreholes were drilled with UNIS' permafrost drilling rig at the new Villum research station at Station Nord in the north of Greenland in August. This is only a two-hour direct flight from Longyearbyen.

The centre for research-based innovation project SAMCoT has been evaluated by the Research Council of Norway, and received approval for another four-year period. UNIS is responsible for WP 1 (collection of data on the ice conditions in the Arctic) and is also involved in WP 6 (coastal erosion processes). The main focus has been excursions on the research

vessel RV Lance to study the ice drift and pack ice formations in the Fram Strait and the north-western areas of the Barents Sea. During the excursions in the Arctic, other tasks have included the placing of buoys to map ocean currents around Svalbard and the measuring of sea temperatures in the depths and the effect of the temperature conditions on the drift ice. Considerable attention has been devoted to the current conditions in the strait Akselsundet due to the shipping traffic to Svea and this will be intensified in 2015.

Locally, avalanche zones in the Longyeardalen valley have been mapped with risk assessment for the building development in Longyearbyen in mind, while preparatory work for an avalanche warning system in the locality of Longyearbyen has been carried out.

In 2014 researchers at UNIS published 102 articles in peer reviewed journals, of which 30 were at the highest level. (The final deadline for reporting is 15 April, so the final figure will be slightly higher.)

DISSEMINATION

UNIS continues to make a solid effort to disseminate our activities both locally and nationally. There were a total of around 150 national and international media reports in 2014 in publications ranging from *Nikkei Asian Review* and *National Geographic* to *Frankfurter Allgemeine Zeitung* and the Indian newspaper *The Hindu*. The latter covered the Indian state visit to Norway during which the Indian president talked with our Indian PhD candidates via video link from Oslo.

UNIS is popular among the delegations which visit Longyearbyen. In 2014 we were visited by around 70 national

and international groups. Worthy of special mention are the visits by the United States Secretary of Navy Ray Mabus, NATO's Secretary General Jens Stoltenberg and the French Minister of Foreign Affairs Laurent Fabius. Norwegian Prime Minister Erna Solberg visited UNIS with the Minister of Justice and Public Security Anders Anundsen and the Minister of Health and Care Services Bent Høie in November.

Considerable resources are devoted to dissemination locally. The annual Svalbard Seminars, which are offered to the local population of Longyearbyen during the Polar Night, were well attended. Staff from UNIS often visit the local kindergartens and schools to talk about the exciting research we conduct. The Svalbard Course and Studietur Nord were run during the summer of 2014 and received positive feedback. UNIS has strengthened its position in social media with increased focus on Twitter, Instagram, YouTube and LinkedIn in addition to our already strong following on Facebook.

In October the staffing level at our information unit doubled from one to two, which will lead to a significant increase in our dissemination activities in the future.

SOCIAL RESPONSIBILITY

UNIS shall be a resource for the local communities in Svalbard. This applies to the staff, students and the knowledge we possess. The staff shall live and work in Longyearbyen and contribute to the development of the institution and the community. All shall engage themselves in the community's social and cultural life rather than starting their own clubs or societies. The relationship with the Russians in Barentsburg is being developed through regular contact, increased scientific collaboration and due to the fact that the number of Russian students and staff is increasing.

STAFF

As of 31 December 2014, the academic staff at UNIS comprised 10 professors, 16 associate professors, nine post docs, 28 PhD candidates, five project positions and 38 with adjunct professor/associate professor attachments. The technical staff comprised 16 full-time equivalent work years, while the administrative staff (including academic affairs) comprised 22 work years. Women accounted for 47% of the technical and administrative positions, 33% of the academic positions (including PhD candidates and post docs) and 51% of the students. Five of the 10 members of the Board of Directors were women. The Board of Directors is not aware of discrimination of any form taking place at UNIS.

HEALTH, SAFETY AND ENVIRONMENT

Absence due to illness at UNIS in 2014 was 3.3%. The institution has an agreement with Longyearbyen Hospital regarding occupational health services and is certified as an IA enterprise. HSE at UNIS is systemised in order to implement all activities for students and staff in a safe manner. We have a particular focus on implementing fieldwork and cruise activities in Arctic areas with small margins in a manner that is as safe as possible. One serious injury was registered in 2014 involving a student who fell off a snowmobile and broke a leg.

UNIS is unaware of contamination of the wider environment to any significant degree as a result of the company's operations. UNIS is working continually to limit the environmental impact of its activities.

ECONOMIC DEVELOPMENT

Funds for operation and investments at UNIS are appropriated in the budget of the Ministry of Education and Research. In 2014 appropriations from the Ministry totalled NOK 117,935,000, of which NOK 87.5 million constituted base funding, NOK 6.3 million investments in equipment and NOK 22.7 million rent/operation of the science park and KHO. Of the allocation, a sum of NOK 1.4 million has been set aside as postponed income or strategic investments.

Income over and above the appropriations from the Ministry of NOK 61.9 million comprises NOK 47 million in external project income for research and NOK 14.9 million in income from consultancy services and rentals. UNIS has also experienced an increase in external funding for research from 8% of its gross income in 2001 to 39.8% in 2014. The Board of Directors is extremely satisfied with the increase in external income.

UNIS has gross operating income of NOK 171.3 million. Direct project expenses and other operating expenses constitute NOK 169.2 million.

The annual accounts for UNIS for 2014 show an operating surplus of NOK 2,091,358. After financial items, the figure is NOK 2,104,947, which was transferred to other equity.

UNIS' total capital as of 31.12.14 was NOK 96,470,142, of which NOK 38,369,057 comprises institutional buildings. The company's total shareholder equity amounts to NOK 21,571,598. The company's non-distributable equity amounts to NOK 19,517,573. The group's total capital as of 31.12.14 was NOK 98,585,248. The group's shareholder equity amounts to NOK 21,571,598.

In 2014 a salary of NOK 1,011,003 was paid to the Managing Director. The Chair of the Board of Directors received a fee of NOK 75,000, the Deputy Chairperson NOK 41,500 and the other members of the Board of Directors each received a fee of NOK 37,500.

The accounts were audited by PricewaterhouseCoopers A/S.

INFRASTRUCTURE AND HOUSING

At year-end 2014, UNIS owned a total of 53 housing units. In addition, UNIS leases the UNIS Guest House, which contains 52 small studio apartments for guest lecturers and guest researchers. UNIS has signed a contract covering all the apartments, which runs until 2021. Further, cooperation has been established with Leonard Nilsen Spitsbergen AS and Store Norske Boliger AS regarding the rental of smaller apartments for the PhD candidates.

At year-end 2014, UNIS' combined housing loans total NOK 23.6 million. Interest and instalments on the loan as well as inventory for the apartments must be financed from the operational budget.

The Arctic Student Welfare Organisation of Norway currently offers a total of 230 studio apartments to students. The construction of 88 new studio apartments for students was completed in 2014. This will contribute to more easily being able to realise the goal of increased student numbers at UNIS. UNIS is in continual contact with the student welfare organisation and is cooperating in order to contribute further new studio apartments for students being able to be realised as quickly as possible.

RISK AND INTERNAL CONTROL IN CONNECTION WITH FIELDWORK, CRUISE AND LABORATORY ACTIVITIES

UNIS' location in the High Arctic provides special challenges in the entire HSE spectrum. In particular it is important to take a proactive approach in our responsibility for the safety of our students and staff when travelling in the Svalbard nature. Safety is the number one priority at UNIS.

In 2014 UNIS was heavily involved in the national health exercise, Exercise Svalbard, which was implemented in November in Billefjorden. UNIS was responsible for the volunteer casualties, logistics and safety. The headquarters for the exercise was also located at UNIS. More than 500 people participated in the exercise, which was completed without any actual injuries. A significant number of students and staff at UNIS had leadership roles or acted as volunteer casualties.

All students and staff at UNIS must undergo thorough safety training before they are allowed to embark on fieldwork. Quality assurance of the planning and implementation of field-based projects is implemented in a structured manner with strict requirements for work procedures and methods.

Work at UNIS' laboratories is subject to the same quality assurance as work in the field. Students and staff must undergo necessary training and supervision before they gain access to the laboratory areas, in addition to HSE/risk analyses before the laboratory work commences.

UNIS is reliant on confidence from the management authorities that our activities have as little negative impact on the natural environment as possible. UNIS cooperates closely with the local management at the office of the Governor of Svalbard and the Longyearbyen Community Council in order to find good solutions, particularly in connection with UNIS' activity in the field. Moreover, it is decisive for the institution that we still manage to implement our activities without serious injury to students or staff.

BOARD OF DIRECTORS AND ANNUAL GENERAL MEETING

The Board of Directors held four meetings in 2014, one of which was in Longyearbyen. A total of 85 items were officially discussed. The Annual General Meeting was held in Oslo on 19 June 2014.

THE PATH FORWARD

UNIS has experienced good economic development in 2014. The expenses are under control and operation is in line with the budget. The level of debt is significantly reduced and the shareholder equity ratio is over 20%.

The collaboration with the universities will be of high priority in the future. This will occur in accordance with the collaboration agreement with the universities in mainland Norway through the appurtenant plans of action. The Board of Directors has high expectations for this process and believes it will be a win-win situation for all parties.

From the Board of Directors' perspective, UNIS has taken new steps towards achieving its overall goal of being a leading international centre for Arctic studies. The Board of Directors would like to thank all the staff for their good effort in 2014.

19 June 2014


Håvard Kjelvik
Styremedlem


Julie Nygaard
Styremedlem


Martin F. L.
Styremedlem



Eivind Sten
Styremedlem


Stein Edvin By
Styremedlem


Pernille Bronken Eide
Styremedlem


Rolf Sten
Styremedlem


Eivind Sten
Styremedlem


Martin F. L.
Styremedlem


Arvid R. Rasse
Styremedlem


Ole Gunnar H.
Styremedlem

EDUCATIONAL QUALITY

By Ane Hammervoll Bjørsvik, Department of Academic Affairs

QUALITY ASSURANCE WORK

The purpose of UNIS' quality assurance system is to secure and develop the quality of UNIS' courses at all levels: bachelor, master and PhD. Quality assurance comprises all the processes and activities that affect the quality of courses, from information provided to potential applicants to the completion of their courses. The effort to improve UNIS' courses is a continual process. All UNIS course descriptions are revised annually in accordance with the National Qualifications Framework. Internal course evaluations are being conducted electronically by students and course responsible.

In autumn 2014, a Student Council initiative was implemented at UNIS, namely the mid-term bachelor course evaluation. This is a student-led process within each scientific department, which aims to detect any course-related issues that can be addressed and improved instantaneously. This means that improvements will benefit not only future students, but also the students addressing the issues.

LEARNING ENVIRONMENT

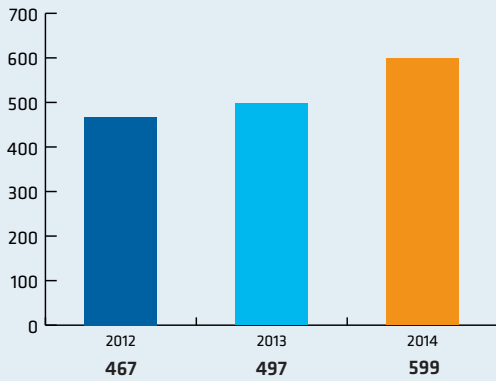
Guest master- and guest PhD-students at UNIS are assigned an office space and a computer at UNIS, but there are no reading rooms available for students attending courses at UNIS. However, the UNIS library has extended their opening hours until early evening during weekdays, providing extended access both to library resources and to group rooms and reading areas located within the library.

Students report on the learning environment through the UNIS course evaluation system. UNIS aims to detect shortcomings related to the facilities and services students make use of in the academic context. In general, UNIS receives positive feedback on the learning environment from the students' evaluations. The overall conclusion is that the UNIS students are highly satisfied with their experiences and outcomes from the field based education at UNIS.

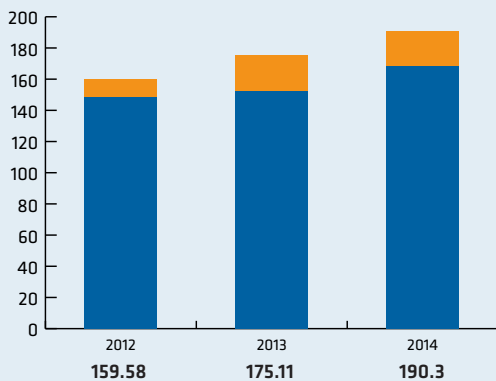


STATISTICS

TOTAL NUMBERS OF STUDENTS



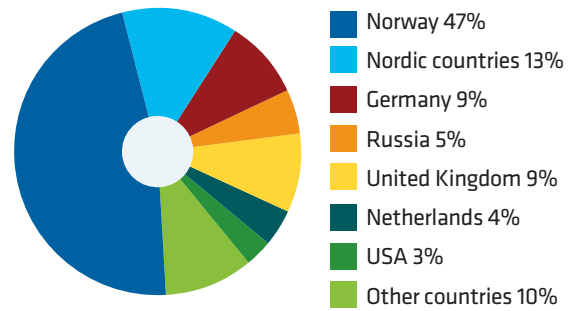
PRODUCTION IN STUDENT-LABOUR YEARS (1 YEAR = 60 ECTS CREDITS)



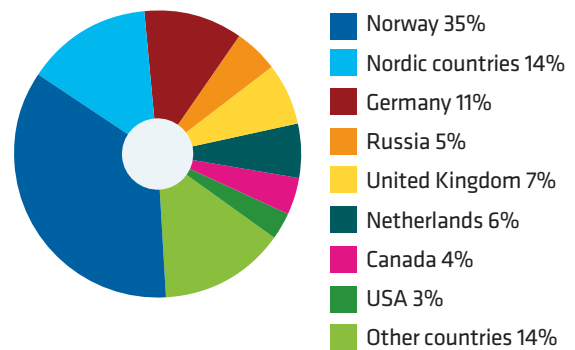
■ Course ECTS ■ Master ECTS

Note: UNIS registers ECTS by 1) course production and 2) master students attendance

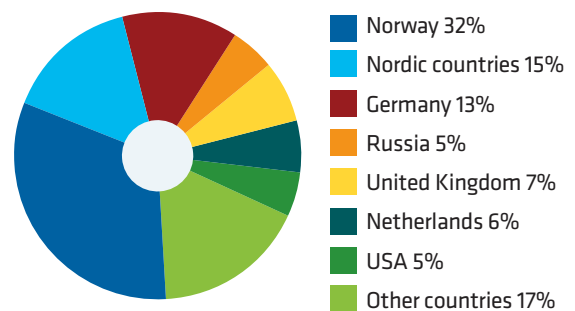
STUDENT NATIONALITY 2012



STUDENT NATIONALITY 2013



STUDENT NATIONALITY 2014



PROFIT AND LOSS ACCOUNT 2014

GROUP*			University Centre in Svalbard AS	
2014	2013		2014	2013
		OPERATING INCOME		
116 535 000	107 217 000	Operating grant from the Ministry	116 535 000	107 217 000
-6 290 808	-3 617 605	Appropriation for investments	-6 290 808	-3 617 605
110 244 192	103 599 395	Operating grant from the Ministry	110 244 192	103 599 395
46 214 814	47 768 001	External project income	46 968 441	49 000 337
12 624 308	10 894 927	Operating grant from sponsors	0	0
13 587 137	13 385 452	Other incomes	14 087 024	13 862 696
182 670 451	175 647 775	Gross operating income	171 299 657	166 462 428
39 043 251	41 773 197	Direct project expenses	39 043 251	41 773 197
143 627 200	133 874 578	Net operating income	132 256 406	124 689 231
		OPERATING EXPENSES		
62 875 489	55 118 067	Salary and related expenses	60 991 422	51 678 690
7 748 827	11 374 661	Fieldwork and cruise	7 748 827	11 374 661
9 068 897	5 018 131	Consultancy services	0	0
36 549 212	33 088 642	Buildings	36 549 212	33 088 642
22 858 909	23 890 194	Other operating expenses	22 356 145	23 074 850
2 519 441	2 480 453	Depreciation	2 519 441	2 480 453
141 620 776	130 970 148	Sum operating expenses	130 165 048	121 697 296
2 006 424	2 904 430	OPERATING SURPLUS	2 091 358	2 991 935
		FINANCIAL INCOME AND EXPENSES		
1 326 968	1 292 268	Financial income	1 233 105	1 201 206
1 228 445	1 355 962	Financial expenses	1 219 516	1 352 405
98 523	-63 694	Net financial items	13 589	-151 199
2 104 947	2 840 736	Net profit for the year	2 104 947	2 840 736
		Information about appropriations to:		
		Transferred to other equity	2 104 947	2 840 736
		Sum transfers	2 104 947	2 840 736

* The UNIS group consists of the University Centre in Svalbard AS and the subsidiary company UNIS CO₂ Lab AS.

BALANCE SHEET 31.12.2014

GROUP*			University Centre in Svalbard AS	
2014	2013		2014	2013
		FIXED ASSETS		
		Fixed assets (tangible)		
38 369 057	40 888 498	Buildings	38 369 057	40 888 498
38 369 057	40 888 498	Sum tangible fixed assets	38 369 057	40 888 498
		Fixed assets (financial)		
0	0	Investments in subsidiary company	100 000	100 000
0	1	Shares in Svalbardhallen	0	1
0	1	Sum financial fixed assets	100 000	100 001
38 369 057	40 888 499	Sum fixed assets	38 469 057	40 988 499
		CURRENT ASSETS		
1 154 242	0	Inventory	1 154 242	0
4 657 558	5 033 068	Accounts receivable	7 918 566	5 603 643
1 682 951	8 070 519	Other short-term receivables	602 270	8 070 519
52 721 440	57 842 152	Cash and bank deposits	48 326 007	51 975 813
60 216 191	70 945 739	Sum current assets	58 001 085	65 649 975
98 585 248	111 834 238	SUM ASSETS	96 470 142	106 638 474
		EQUITY		
		Accumulated equity		
2 054 025	2 054 025	Share capital	2 054 025	2 054 025
0	0	Other accumulated equity	0	0
2 054 025	2 054 025	Sum accumulated equity	2 054 025	2 054 025
		Retained equity		
19 517 573	17 412 624	Other equity	19 517 573	17 412 624
19 517 573	17 412 624	Sum retained equity	19 517 573	17 412 624
21 571 598	19 466 649	Sum equity	21 571 598	19 466 649
		LIABILITIES		
		Allowances for liabilities		
8 293 552	15 714 451	Deferred income	6 864 421	11 068 649
8 293 552	15 714 451	Sum allowances for liabilities	6 864 421	11 068 649
		Other long-term liabilities		
23 621 154	26 140 595	Housing loan	23 621 154	26 140 595
23 621 154	26 140 595	Sum other long-term liabilities	23 621 154	26 140 595
		Short-term liabilities		
9 460 423	14 777 515	Trade creditors	8 774 448	14 250 857
5 603 541	5 146 472	Public fees and duties	5 603 541	5 146 472
30 034 979	30 588 556	Other short-term liabilities	30 034 979	30 565 252
45 098 944	50 512 543	Sum short-term liabilities	44 412 969	49 962 581
77 013 650	92 367 589	Sum liabilities	74 898 543	87 171 825
98 585 248	111 834 238	SUM EQUITY AND LIABILITIES	96 470 142	106 638 474

* The UNIS group consists of the University Centre in Svalbard AS and the subsidiary company UNIS CO₂ Lab AS.

ARCTIC BIOLOGY

The department conducts research in arctic ecology and provides a full one-year curriculum of undergraduate studies including a summer course on identification of arctic terrestrial species as well as nine Master/PhD level courses.





By Ole Jørgen Lønne, Head of Department

PEOPLE

At the end of the year the department consisted of 2 professors, 4 associate professors, 5 PhD students, 8 adjunct professors, 2 postdocs., and 1 project position. Tina Dahl was hired this year in a full position to coordinate our efforts within BioCEED and Øystein Varpe accepted a position as associate professor in our department. Kevin Newsham started in an adjunct position in Arctic mycology, and Knut Sunnanå in an adjunct position in ecosystem based management of Arctic marine ecosystems.

EDUCATION

BioCEED, Centre of Excellence in Biology Education (<http://www.bioceed.no>), officially started on April 1st 2014.

BioCEED is a consortium between the Department of Biology at University of Bergen (UiB), Department of Arctic Biology at UNIS, Department of Education at UiB, and the Institute of Marine Research (IMR). An important priority in the first year has been to get the centre into the operation phase, including appointing the bioCEED leadership, steering committee and work package leaders, ensuring good collaborative relations, getting the formal structures in place, setting up the physical and virtual infrastructure, and filling vacancies.

UNIS employees hold positions as the Deputy leader (Pernille Bronken Eidesen) and as leaders for two of the work packages. A vacant position as a teaching executive officer was filled with startup in January 2015. New learning activities were introduced in our bachelor courses in the fall, and a number of activities improving student learning are planned for 2015.

One of the aims in bioCEED is to develop a close link between education and research. This year a project on the Arctic Winter Ecology course (AB-329) resulted in an online first paper in *Journal of Thermal Biology*; "Survival of rapidly fluctuating natural low winter temperatures by Arctic soil invertebrates".

RESEARCH

Based on the new UNIS 2014–2020 strategic plan, and the apparent similarity in many research questions regarding e.g. seasonality, biodiversity, winter ecology, metagenomics and metatranscriptomics and sharing of competence as well as laboratory facilities between the terrestrial and marine research groups, there is a strategic move towards focusing on overriding research questions common to the two groups.

Arctic ecosystem processes are direct consequences of the complex behaviours and interactions between organisms, many of which are driven by the physical environment. Accordingly, a classical paradigm in Arctic marine ecology suggests that most biological processes stop during the polar

night at high latitudes due to low food availability and the lack of light. Research in the department has challenged this assumption by presenting evidence of both diel vertical migration (DVM) of zooplankton as well as bioluminescence levels indicative of biotic activity hitherto assumed to be absent during the polar night. Although the polar night at high latitudes is perceived as total darkness, new data indicate that Arctic organisms nevertheless may respond to light levels undetectable by the human eye.

Winter ecology of Arctic marine systems is a largely new field of science with the potential for radically altering our fundamental perception of basic Arctic ecosystems processes, current state of the ecosystem and connections between the biosphere, hydrosphere and cryosphere within the Polar Region. Circa, a FriMedBio project funded by the Research Council of Norway (2012–2015) focuses on the patterns of diel vertical migrating zooplankton in the polar night period, and how this behaviour ultimately affects the exchange of CO₂ between the ocean interior and the atmosphere.

The RCN funded CLEOPATRA II (2012–2015) is a follow-up of one of UNIS' two IPY projects, and focuses on overwintering strategies of one of the most important copepod species in the high Arctic – the small but dominant *Calanus glacialis*. Field and laboratory investigations are combined with model development to ultimately arrive at an improved understanding of the physiological and life history adaptations of Arctic zooplankton. A central element of our approach is to move towards individual-based zooplankton ecology where states, such as lipid reserves, are measured at the level of individuals. Long-term data-series acquired through previous projects are continued in CLEOPATRA II and will allow the inclusion of inter-annual variability and different ice-cover scenarios in the investigations. In 2014, the main focus was on analysing data and write up the results, as well as presenting new findings at international conferences.

The project COPPY “Fate of copepod secondary production in a changing Arctic” (RCN POLARPROG, 2013–2016) promotes Norwegian-Russian cooperation. PhD student Galina Abyzova, P.P. Shirshov Institute of Oceanology, Moscow visited UNIS in November–December, studying the degree of hybridization between the two closely related species *Calanus glacialis* and *Calanus finmarchicus* in Svalbard by molecular tools.

The RCN funded “Big Black Box: Marine ecological processes during the polar night” aims to establish a synergetic cooperation between leading Norwegian and American research environments. In February, a two day workshop in Fairbanks, Alaska was organized where 20 scientists and students participated. This was a very fruitful workshop on polar night ecology and trophic interactions, and money for a follow-up workshop was applied for from IASC (International Arctic Science Committee) in spring 2014.

The ConocoPhillips/Lundin oil funded MicroFun project is co-lead by both marine and terrestrial researchers. The project utilises modern high-throughput sequencing technology to

enable a new understanding of the diversity and function of microbial Arctic organisms and the environmental drivers that influence the changes in microbial diversity and processes. Sampling and data analysis have been the main activities in 2014.

Highlights from these projects can be followed at www.mare-incognitum.no

The RCN funded project AVIFauna (Avian Vectors of Invertebrate Faunas) was completed in the spring. This project brought together researchers from Russia, Poland, the Netherlands, and Norway to investigate the role of migrating birds in dispersing flightless terrestrial invertebrates to the Arctic using the Svalbard archipelago as a model. The focus of the study was how the invertebrate communities of the Arctic arose following the retreat of the ice at the end of the last glacial maximum and how new invertebrate species may arrive and colonise in the future. Fieldwork was undertaken in Ny-Ålesund, Barentsburg and Pyramiden. Adult birds, nests, and the nest habitats were examined or sampled for invertebrates and collected material exchanged between institutions for specialist identification. Soil invertebrates of various taxa were obtained from under the plumage of several bird species. Spin-off projects from this study have resulted in publications on the parasite fauna of sea birds, mite taxonomy, and the alien invertebrate species imported to Barentsburg and Pyramiden. For Barentsburg, 23% of the soil invertebrates identified to species were considered to have been introduced.

In the spring, a review paper with 38 co-authors summarising the terrestrial and freshwater invertebrate fauna of Svalbard, Franz Josef Land and Novaya Zemlya was published in *Soil Biology and Biochemistry*.

APPOINTMENTS

Tove Gabrielsen was appointed member of the RCN Polar programme. She also serves as work-package leader in BioCEED.

Janne E. Søreide finished her seven month research stay at the School of Fisheries and Ocean Science, University of Alaska Fairbanks (UAF). New, highly relevant research collaborations were established during her stay.

Pernille Bronken Eidesen started her research stay at the Department of Botany, University of Otago, New Zealand in August.

Øystein Varpe serves as work-package leader and as assistant leader in BioCEED, in Pernille Bronken Eidesen's absence.

Steve Coulson has represented Norway in the Terrestrial Working Group of International Arctic Science Committee, and represented UNIS in the Ny-Ålesund Science Managers Committee (NySMAC).

Ole J. Lønne represented UNIS on the continuation of the Nansen's legacy project that has developed a national scientific

research plan to increase our understanding of the marine bio- and geosphere in the central and northern parts of the Barents Sea. He also served as guest editor for a polar night special issue in *Polar Biology*, where the department was represented with several papers. Lønne was appointed as member of the international scientific board of Centre for Polar studies, a Polish leading national Centre.

GRADUATES 2014

PHD DEGREE:

JOHANNA HOVINEN

Foraging, reproduction and survival of the zooplanktivorous seabird Little Auk (*Alle alle*) in the Arctic in relation to climatic and environmental variability

LORNA LITTLE

The Polar Palette: The role of flower colour in Polar regions

SANNA MAJANEVA

Understanding the biodiversity and ecological importance of ctenophores – Lessons from Arctic and Baltic *Mertensia ovum*

DANIEL VOGEDES

Calanus spp. in the Arctic ecosystem – a story on predation, distribution and morphology

MASTER DEGREE:

ANNE KIRSTINE D. ANDERSEN

Impacts of area-based management on the population of northern shrimp, *Pandalus borealis* (Krøyer, 1838), in Isfjorden and Kongsfjorden, Svalbard

LARISSA TERESA BEUMER

Feeding behaviour and diet quality of high-Arctic wild reindeer in response to changes in snow-ice conditions during winter

MELISSA BRANDNER

Seasonality of bivalve larvae within a high Arctic fjord

ZOFIA BURR

Breeding later at higher latitudes: Explaining seabird reproductive timing in the north eastern Atlantic

MAJA KAROLINE HATLEBAKK

Capital or income breeder: the role of lipids and fatty acid composition for successful reproduction in *Calanus glacialis*

HELGA BÅRDSDATTER KRISTIENSEN

Characterization of marine fungal communities using next generation sequencing techniques

LENE LUND

Morphological diversity in *Laminaria digitata* – different species or different phenotypes?

IDA KESSEL NORDGÅRD

Microbial winter and spring bloom dynamics in a high Arctic fjord

KATRINE NORDVIK

Phylogeography of *Phycodrys rubens* (Linnaeus) Batters form mainland Norway and Svalbard based on nuclear and mtDNA sequences and microsatellites

ELODIE TERWAGNE

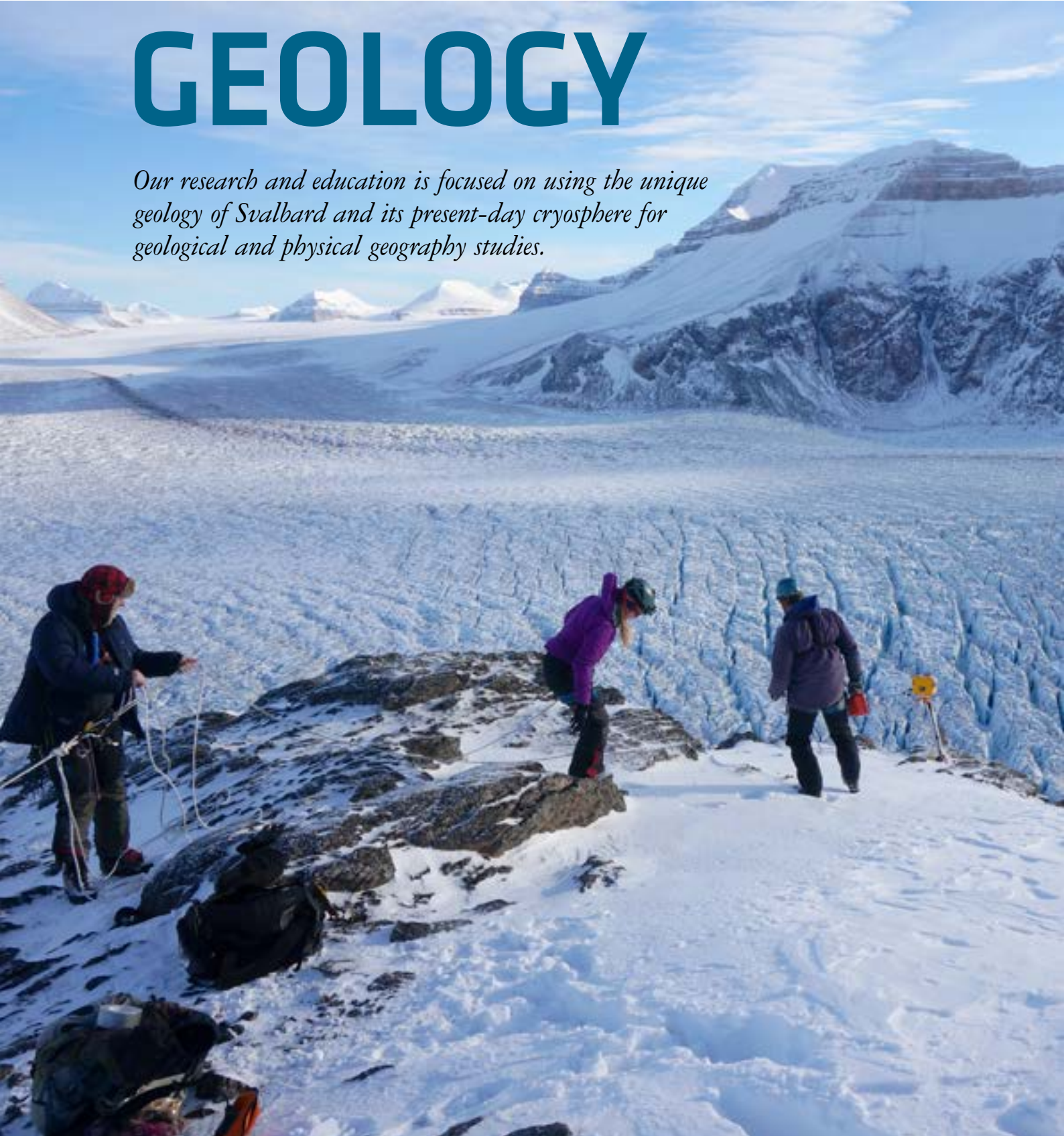
Seasonality of the haptophyte *Phaeocystis puchetii* in Adventfjorden, western Spitsbergen and Balsfjorden, northern Norway

STUART THOMSON

Seasonal abundance of parasitic Marine Alveolate Group II (MALV II) in an Arctic fjord, Svalbard

ARCTIC GEOLOGY

Our research and education is focused on using the unique geology of Svalbard and its present-day cryosphere for geological and physical geography studies.



September 2014: The UNIS glaciology group collects the time-lapse cameras installed above Kronebreen in inner Kongsfjorden. The cameras, deployed in May 2014, recorded glacier motion and calving activity. Photo: Heïdi Sevestre/UNIS.



[By Hanne H. Christiansen, Head of Department](#)

We study the geological evolution of Svalbard as recorded in spectacular geological sequences spanning the Precambrian to the Cenozoic, and overlain by Quaternary glacial and interglacial deposits. Easily accessible outcrops make it possible to do research in the interplay of continental drift with tectonic, glacial, periglacial, coastal, fluvial and marine sedimentary processes. The close proximity of present-day geological, glacial, periglacial, marine and terrestrial processes provides an exciting field laboratory as the basis for our research and education.

PEOPLE

During 2014 the department reached nine full time faculty positions; four professors and two associate professors, twelve adjunct positions, while we had three permanent positions open. Five externally funded postdocs have been part of our department in 2014. We had nine PhD students working full time in Svalbard, while as many external PhD students also collaborated with us in 2014.

EDUCATION

Six bachelor courses, ten master courses and nine PhD courses were taught in our department in 2014. Our courses were on average filled to 92%, and we had only one student failing the exam. In addition 29 master students worked on their master theses with us. We had quite large numbers of qualified applicants for most of our courses, and thus operated with waiting list for several courses.

RESEARCH

Glaciology

Major progress was made on the understanding of calving glaciers by the ConocoPhillips-Lundin funded CRIOS project led by professor Doug Benn together with adjunct professors Nick Hulton and Adrian Luckman, external PhD student Penelope How, UNIS master students Silje Smith-Johnson and Ingunn Farsund and UNIS PhD student Heïdi Sevestre. In May 2014, an array of time-lapse cameras was installed above Kronebreen, which yielded season-long records of glacier motion and calving activity in unprecedented detail. Analysis of the data is in progress, and will enable the team to derive fully quantitative models of the dynamics and calving activity of the glacier. Time-lapse movies made from the data series are available on the UNIS YouTube channel.

CRIOS research has also benefitted residents and visitors in Svalbard, by providing information on the location of glacier crevasses from satellite images. Crevasses are a major hazard for travelers in Svalbard. Warnings about dangerous areas have improved glacier travel safety for UNIS parties, tour companies and private tour groups.

In December, Doug Benn gave an invited talk to the American Geophysical Union in San Francisco on "Orbitally forced climatic fluctuations in Snowball Earth". The talk reported the results of GAINS project (Glacial Activity in Neoproterozoic Svalbard) led by Ian Fairchild (University of Birmingham, UK), concerning the global significance of Late Precambrian glacial rocks in Svalbard.

Permafrost and periglacial geomorphology

Detailed cryostratigraphical and sedimentological analysis of 60 m of Quaternary sediments obtained from a permafrost core from lower Adventdalen was finished in spring as part of the UNIS CO₂ Lab activities. An international workshop was held at the Centre for Permafrost, CENPERM, University of Copenhagen in May, involving 11 geology and biology scientists all working on different studies of the 60 m core. Graham Gilbert started as PhD student in cryostratigraphy and ground temperature analyses as part of the DEFROST, Nordic Centre of Excellence project in autumn 2014.

In collaboration with CENPERM and University of Aarhus, Denmark our permafrost drill rig and PhD students Graham Gilbert and Wesley Farnsworth, together with Ulrich Neumann from Geokolibri, travelled to northernmost Greenland and drilled two boreholes down to 20 m and installed ground thermal monitoring in the holes in summer. This will be part of the basic monitoring programme of the new Villum Research Station located at Station Nord, 81°36' N. Cores were recovered from parts of the boreholes for cryostratigraphical studies. Using the local Lufttransport Dornier plane it only takes 2 hours to fly from Longyearbyen to Station Nord enabling increased collaboration across the largest climatic gradient of the high Arctic.

We held for the first time the AG-218/219 International Bachelor Summer Field School as part of the University of the Arctic Thematic Network on Permafrost activities. The course was taught together TNP permafrost colleagues from USA, Russia, Japan, Germany and Denmark. 25 students attended the three week long course in June/July, and submitted individual essays in the end of the autumn term.

PhD student Stefanie Cable (EU PAGE21 project) continued studying permafrost cores from Adventdalen and Zackenberg, NE Greenland. She also finished an update to the geomorphological map of Adventdalen including geocryological information, and developed the first geomorphological and geocryological map of the Zackenberg area, partly together with AG-833 colleagues, who all studied in the Zackenberg area in summer 2013, and finalised their project reports in 2014 as part of a joint UNIS, PermaNordnet and University of Copenhagen activity.

Terrestrial Quaternary geology

Ólafur Ingólfsson's studies on the morphological fingerprints of Neoglacial oscillations as expressed by glacial landforms and sediments, both terrestrial and marine, were continued with fieldwork at the foreland of Nordenskiöldbreen. The focus was on the subglacial landsystem, sediments and landforms

exposed by the retreating glacier. Nordenskiöldbreen is a polythermal glacier, and one of the very interesting features being exposed in its forefield is a small drumlin field. Two master students, Nina Friis and Lis Allaart, worked at Nordenskiöldbreen. Nina Friis did a sedimentological study on glacial landforms (drumlins, flutes, crag-and-tails) for elucidating the dynamics of their formation, and Lis Allaart mapped the geomorphology of the forefield. Nina Friis submitted her thesis at Copenhagen University in December.

Ingólfsson also worked with Professor Alexander P. Wolfe of University of Edmonton, Canada, on the coal bearing sediments at Pyramiden, Billefjorden. The aim of that work is to study Carboniferous atmospheric composition through geochemical studies of ancient amber. In December, a new PhD student, Wesley Farnsworth, started working with Ingólfsson. He will be conducting his studies under the project "Holocene history of Svalbard ice caps and glaciers", focusing on meltwater signals in lake-sediment archives.

Anne Hormes did fieldwork for the ConocoPhillips/Lundin "Post-glacial uplift project" in Hornsund, Bellsund and Kongsøya in spring and summer. She received a Svalbard Science Forum Strategic Grant and performed fieldwork in Kongsfjorden together with master students.

Marine geology

The marine geological research focused on the studies of seafloor morphology and sediment structure in the Arctic Ocean, on the continental shelf of the northern Barents Sea and in the fjords of Svalbard.

A considerable part of 2014 was spent on the exciting SWERUS-C3 expedition on the Swedish icebreaker Oden, that sailed from Norway to Alaska across the shallow shelves of Barents, Kara, Laptev, East-Siberian and Chukchi Seas mapping and sampling the seabed to study the huge natural methane seep areas on the Siberian shelf. Riko Noormets was leading the geophysical seafloor mapping work package on the first leg of the expedition. UNIS adjunct professor Martin Jakobsson was the Principle Investigator of the second leg sailing from Alaska back to Norway along the continental slope and through the deeper waters of the Arctic Ocean, investigating the key physiographic features such as Herald Canyon and the Lomonosov Ridge. First results of these investigations have already been submitted for publication and there are much more new, exciting results on the linkages between climate, cryosphere (mainly sea ice and coastal permafrost) and carbon release from the sediments to follow over the coming years.

The research on the reconstruction of the glacial processes and deglaciation history of Svalbard-Barents Sea Ice Sheet in the northern Barents Sea focused on the shelf and fjords in the northern and eastern Svalbard, and on the associated paleoceanographic changes along the northern continental slope of Svalbard. This work was carried out by PhD students Teena Chauhan, Anne Flink and Oscar Fransner. In addition, UNIS-affiliated PhD student Katharina Streuff from the

University of Durham spent two months in the autumn at UNIS collecting and analysing data for her PhD thesis on the processes at the tidewater glacier margins. These results have been presented on annual Past Gateways and GLANAM network meetings, where we have been active partners over the past years.

The successful two-year collaboration project GlaReBo “Improving understanding of the last deglaciation of the Barents Sea Ice Sheet and its effects on glacioisostatic rebound history in Svalbard” between the Scott Polar Research Institute, University of Cambridge and UNIS (funded by the Svalbard Science Forum’s Strategic Grant program) came to an end producing a new ice thickness and distribution dataset over the whole of modern Svalbard, as well as new geological data important for constraining the ice dynamics and deglaciation history from poorly known eastern Svalbard. This data is being used in developing a new generation ice sheet models together with researchers from the Bolin Centre for Climate Research, Stockholm University and the Department of Scientific Computing, Uppsala University within a new collaborative project FROZEN “Frozen landscapes in transition: improving predictions of ice sheet stability in a warming world by numerical modelling”.

The “Barents Sea Source Rocks and Hydrocarbon Seeps” project, that is part of the ConocoPhillips/Lundin Northern Area Program, continued investigations on the natural hydrocarbon seeps in the Svalbard fjords. In September, a post-doctoral fellow Dr. Martin Liira started as part of this project to work on the geochemistry of the hydrocarbons in the sediments and pore water of the pockmarks around Svalbard. PhD student Srikumar Roy is in the final stage of his thesis work studying the pockmarks in the Isfjorden and their links to the bedrock geology and structures.

Professor Bernie Coakley, a marine geophysicist, from the University of Alaska Fairbanks spent three months at UNIS as an US Fulbright Arctic Chair 2014 to Norway. It was our pleasure to host a distinguished geophysicist, who has worked on the evolution of the Arctic Ocean for decades, and have him contribute to research and teaching at UNIS.

Basin analyses and resources in the Arctic

Snorre Olaussen and Alvar Braathen’s focus this year has been on further developing major projects such as the UNIS CO₂ Lab and the “Geological Input to Carbon Storage” together with colleagues from UNIS and other research groups. A new two year Gassnova/Industry project was initiated: “Improved delineation of an unconventional reservoir in Adventdalen for future CO₂ injection tests”. Nine publications were given in a separate volume in *Norwegian Journal of Geology*.

The four-year project; “Lower Cretaceous clastic wedges in the Northernmost Atlantic” (LOCRA - locra.uv.uio.no), which is a joint R&D project between UNIS and University in Stavanger, is supported by 20 oil companies. Three postdoc and four PhD positions are hitherto recruited. These positions are currently covering the topics; biostratigraphy, sequence

stratigraphy, geophysical mapping of the greater Barents Sea, basin fill in the Barents Sea and the conjugate north Atlantic margins and plate reconstruction. In addition there are five master students linked to the project. Fieldwork was also carried out in East Greenland in summer 2014.

Snorre Olaussen is responsible for one of the five work pages; WP2 Petroleum Systems, within the new Center for Arctic Petroleum Exploration (ARCEX; www.arcex.no), hosted by University of Tromsø. This is a joint R&D project with Norwegian universities, research institutions and international partners, strongly supported by the industry. Post Doc Sten-Andreas Grundvåg is appointed as adjunct associate professor at University in Tromsø, within the ARCEX project.

The Petromaks2 project “Triassic North” (2014–2017), is coordinated by University of Oslo. Other partners are University of Bergen and UNIS, in collaboration with institutes and international universities, and backed by Norwegian industry.

The last two field seasons adjunct professor William Helland-Hansen and Sten-Andreas Grundvåg have been studying the Eocene-Oligocene Aspelintoppen Formation through three MSc projects. The Aspelintoppen Formation is one of the least studied formations on Svalbard, and represents an important analogue to subsurface anastomosing fluvial systems.

Sedimentology

Maria Jensen’s research focused on geometry and facies in modern and ancient coastal deposits. Monitoring of the high Arctic tidal flat in Braganzavågen, inner Van Mijenfjorden continued and time-lapse cameras were put up in collaboration with department of Arctic Technology. The aim of this work is to investigate how arctic climatic conditions influence facies and stratigraphy in tidal and coastal systems.

PhD student Berit Husteli continued her work on heterogeneity in tidally influenced reservoirs, based on data from the Triassic De Geerdalen Formation and examples from the Paleogene central basin. Other studies on central basin deposits comprise two MSc projects on Firkanten - and Aspelintoppen Formation. The latter project contributes to the ongoing work on facies variations and climate signals in the Aspelintoppen Formation.

Appointments

Hanne Christiansen has since June 2014 been the Senior Vice President of the International Permafrost Association.

GRADUATES 2014

PHD DEGREE:

HAROLD LOVELL

Geologic signatures of glacier surges

MASTER DEGREE:

TORE AADLAND

A sedimentological, stratigraphical and petrographical analysis of the Dalkjegla Member, Carolinefjellet Formation, Spitsbergen, Svalbard

MARIT ANN BOXASPEN

Sedimentologi av den alluvielt dominerte øvre trias De Geerdalenformasjonen på den sentrale delen av Spitsbergen og eksempler på sammenlignbare facies i den ekvivalente Snaddformasjonen i Barentshavet

GRAHAM L. GILBERT

Sedimentology and geocryology of an Arctic fjordhead delta (Adventdalen, Svalbard)

ALEXANDER HOVLAND

Late Quaternary environmental reconstruction using foraminifera and sedimentary stratigraphy from Kapp Ekholm, Svalbard

HENRIIKA KIVILÄ

Late Holocene climate development of Bjørnøya, Svalbard, based on chironomid analysis

EIRIK ROSSELAND KNUTSEN

Sedimentology of the Offshore- to Tide-Dominated Upper Triassic De Geerdalen Formation on Central Spitsbergen and Examples of Comparable Facies in the Equivalent Snadd Formation

MIKKEL KRISTIANSEN

Spatial variability of snow and avalanche conditions along a climatic gradient in Central Spitsbergen, Svalbard

OLAV A. NAURSTAD

Sedimentology of the Aspelintoppen Formation (Eocene-Oligocene), Brogniartfjella, Svalbard

MARION PERAL

The response of benthic foraminifera to postglacial Atlantic Water inflow on the north Svalbard shelf

GEIR SANDAL

Sedimentological facies models and distribution within an early synrift Billefjorden Trough, Svalbard

SARA SANDVIK

Description and Comparison of Lower Cretaceous deposits from Svalbard and the southern Loppa High

JORINA SCHÜTT

Numerical modelling of Svalbard's ice cover: Case studies and comparison to spatial reconstructions

VALENTIN ZUCHUAT

A Sedimentary Investigation of the Lower Triassic Formations and their Underlying Permo-Carboniferous Units across Spitsbergen, Svalbard

September 2014: AG-211 students on board RV "Helmer Hanssen" examine core samples from the ocean floor. Photo: Riko Noormets/UNIS.





April 2014: Quaternary geologists conducting fieldwork on Slyngfjellet, north of Hornsund. Photo: Anne Hormes/UNIS.



July 2014: Panorama view of UNIS a midsummer's night.
Photo: Endre Før Gjermundsen/UNIS.



ARCTIC GEOPHYSICS

The Arctic Geophysics department seeks to introduce students to the entire vertical column, from the deep of the oceans up to the outermost boundary of the atmosphere, as a dynamic system with a large variety of processes going on inside each layer as well as interactions between them. In order to offer relevant full term combinations of courses within the department, and to strengthen the research strategies, we have two dedicated research groups within the department: The Space Physics Group and the Air-Cryosphere-Sea Interaction Group.



April 2014: AGF-211 students and staff collecting water samples in Dicksonfjorden, as part of their cruise with RV "Lance".
Photo: Ragnheid Skogseth/UNIS.



[By Frank Nilsen, Head of Department](#)

PEOPLE

The department has in total eight full time faculty positions, and conducts research within physical oceanography, chemical oceanography, cryosphere, meteorology, middle- and upper polar atmosphere. The department also consists of eleven adjunct professors, as well as one researcher (oceanography), one postdoc (middle polar atmosphere) and four PhD students (upper polar atmosphere, middle polar atmosphere, cryosphere and physical oceanography).

EDUCATION

Teaching was conducted at both the undergraduate and graduate level, with six courses in each level. An important part of all courses is the fieldwork, which allows the students to actively carry out research in the field. During 2014 the department has carried out several courses with teaching of field method on glacier, in the surface boundary layer over land and sea ice, at the Kjell Henriksen Observatory (KHO) and on two scientific cruises around Svalbard. The data collected are then typically used in course reports, giving the students valuable experience in analysing and presenting scientific data in a coherent manner.

RESEARCH

The Space Physics (SP) Group

The SP group is a part of the Birkeland Centre for Space Science (BCSS). Through this centre, three new positions in the SP group were announced in 2014. One postdoc in upper atmospheric physics, one engineer for KHO and SuperDARN and one research position in middle atmospheric physics. The postdoc position was filled by Dr. Pål Gunnar Ellingsen who started at UNIS in November 2014. The two other appointed staff will start their work at UNIS in March 2015.

According to the research plan, the SPEAR facility was dismantled after 10 successful years. During the facility's lifetime, research groups from nine different countries conducted experiments in collaboration with scientists from the SP group.

Work on the new SuperDARN radar is progressing as planned, with building permission for the facility awarded in May 2014. The antenna masts are currently in storage at UNIS and will be deployed on site in summer 2015. The foundations for the masts were drilled into the site in October 2014. Work on the transmitters also started in May 2014, and they should arrive in Svalbard during summer 2015.

In May/June 2014 the SP group hosted Norway's first international SuperDARN meeting. There were 50 upper atmospheric/auroral scientists from 11 countries attending the meeting.

The Kjell Henriksen Observatory (KHO) operated 25 optical and 10 non-optical instruments during 2014. A detailed description of the performance and scientific objective of the each instrument can be found at the KHO home page: kho.unis.no.

Twenty-one different institutions from nine nations were present at KHO in 2014. Out of the 29 optical instrument domes only four are not in use currently. KHO was used by four courses as part of their fieldwork in 2014. There were also a large number of presentations, visits and interviews conducted at the observatory during 2014.

KHO was also part of a NASA sounding rocket mission named C-REX (the Cusp Region Experiment). The rocket was launched from Andøya Space Centre on 24 November 2014. The rocket released 24 canisters containing a mixture of Barium and Strontium into the upper atmosphere, creating visible artificial clouds that are used to track both neutral winds and movement of ionized particles in the altitude above 200 km.

A new high frequency (HF) transmitter was deployed at the Polish station in Hornsund during 2014. A receiver will be installed at KHO during 2015. The DOPE project (Doppler Pulsation Experiment) will study small scale magnetic oscillations and gravity waves in the upper atmosphere.

The Air-Cryosphere-Sea Interaction (ACSI) Group

The ACSI group treats the three most dominant geophysical components in the Arctic climate system in Svalbard. The Arctic is characterized by extremes in both weather and climate, and significant interactions between the atmosphere, ocean, sea ice, glaciers, and land ice take place in the region that affect the weather on a global scale. These types of interaction studies are conducted through field-based research projects. We seek to strengthen the existing competence within the ACSI group by consolidating the existing staff composition and in September 2014 Christopher Borstad started as an associate professor in Snow and Ice Physics with the aim of linking glaciers and snow properties to changes in the atmosphere and ocean. Chris will use existing and future observations to develop and test models for glacier evolution, iceberg calving, and ice-ocean interaction for tidewater glaciers in Svalbard.

A paper published in *Tellus* by AGF researchers and co-workers (UiB, IMR) demonstrates large changes in the sea ice cover north of Svalbard. The Arctic sea ice area has been measured, using satellites, since 1979. Analyses of the sea ice area data started as a scientific report task in the UNIS Master and PhD course AGF-311/811 "Air-Sea-Ice Interaction II" during autumn 2012. The new study shows that the ice cover north of Svalbard is decreasing for all months, with largest ice reduction during winter. This is in contrast to the observed changes in more central parts of the Arctic Ocean, where largest ice decline is happening during summer. Warm and saline water from the Atlantic dominates the area west of Svalbard. Observations of the Atlantic water temperature show

a gradual warming during the last decades. The study shows that the sea ice has retreated above the pathway of the Atlantic water north of Svalbard. This indicates a direct influence from the Atlantic water on the sea ice conditions.

Warm and cold currents flowing northwards through the Fram Strait are monitored by direct measurements in the ocean combined with altimeter satellites from space through the UNIS led RCN project "Remote Sensing of Ocean Circulation and Environmental Mass Change" (REOCIRC) and other partner projects (AWAKE2, Arctic Ocean Under Melting Ice). The ultimate goal is to improve transport estimates of heat, mass and freshwater entering the Arctic Ocean and to explain the effect this have on the Arctic sea ice cover.

During 2014 there have been several activities within meteorology combining research and course activity. A significant meteorology component was added to the masters and PhD course AGF-311/811. During both AGF-350/850 and AGF-311/811 a large amount of meteorological measurements were made in the vicinity of Longyearbyen to probe and explore the predominantly stable atmospheric boundary layer in the region. Especially in AGF-311/811 the focus was on the differences between the land-based and the marine-based boundary layer.

During both aforementioned Masters and PhD courses, the unmanned aerial vehicle SUMO was employed yielding promising results on atmospheric, vertical fluxes of momentum and heat using a new 5-hole probe flow-measuring instrument. Moreover, a small measurement campaign was conducted in the autumn over two weeks during which a tethered balloon was operated in Adventdalen to measure the structure of the atmospheric boundary layer. These measurements were performed at the same time as additional balloon measurements were made in Hornsund and Ny-Ålesund.

GRADUATES 2014

PHD DEGREE:

JEFF MORGAN HOLMES

The Protonics project: Distributed observations of auroral dayside Doppler-shifted hydrogen emissions

MASTER DEGREE:

KINGA ALBERT

Svalpoint: A multi-track optical pointing system

HÅVARD MUUS FALCK

A quantitative description of the West Spitsbergen Current by combining hydrography, altimetry and in-situ current meters



November 2014: AGF-311/811 students sending up a weather balloon outside Longyearbyen. Photo: Aki Vähä/UNIS.

ARCTIC TECHNOLOGY

The Arctic Technology Department offers courses and research opportunities in Arctic Engineering as well as in Arctic Environmental Technology and Chemistry.



April 2014: A polar bear walks by the field site for the Arctic technology science group in Storffjorden. Photo: Petr Chistyakov.



By Aleksey Marchenko, Head of Department

Arctic Engineering concentrates on engineering problems to be tackled when settling in the Arctic environment: living and building on frozen ground that may be subject to landslides and avalanches, Arctic offshore oil and gas exploitation, and potable water supply.

Arctic Environmental Technology and Chemistry concentrates on current and potential pollution problems, environmental impacts and feasible remediation techniques in Arctic areas.

PEOPLE

In 2014 the department consisted of one professor, three associate professors, one research associate, one postdoc, four PhD candidates, six adjunct professors, one staff engineer and one adjunct senior engineer.

EDUCATION

The research activities generate material for courses offered in all areas given at all levels, giving students a good opportunity to study both the theoretical and practical aspects of Arctic technology. In 2014, the department offered altogether 25 courses at the Bachelor, Master's and PhD level.

RESEARCH

Ice mechanics

The ice mechanics section had four full-time researchers during 2014: Professor Aleksey Marchenko, postdoc Aleksey Shestov and PhD candidates David Wrangborg and Renat Yulmetov. Professor Sveinung Løset (NTNU) has an adjunct position.

Professor Løset is the director of the SFI project "Sustainable Arctic Marine and Coastal Technology (SAMCoT)". Aleksey Marchenko is leader of work package 1 "Data collection and process modeling" in SAMCoT and Aleksey Shestov is the deputy leader of WP 1. In addition, Marchenko leads the SIU project "Safety of marine transportation and industrial development in the Arctic (SMIDA)" and the NORRUS project "Field studies and modelling of sea state, drift ice, ice actions and methods of icebergs management on the Arctic shelf (FIMA)". He is also the leader of the UNIS group in Petromaks2 project "Experiments on waves in oil and ice".

In 2014, in-situ tests on indentation, compressive and bending strength of sea ice in the Van Mijenfjorden, in the Barents Sea and freshwater lake ice in Longyearbyen area. Experiments of thermal expansion of saline ice, freshwater ice and frozen soils in cold laboratory were also performed. Professor Erland Schulson from Dartmouth College (USA) participated in fieldwork on land fast ice in Svea. Professor Peter Sammonds from the University College of London with three fellows



September 2014: AT-209 students perform fieldwork on the glacier Bertilbreen in Billefjorden. Photo: Nils Roar Sælthun/UNIS.

and Professor Rocky Taylor from the Memorial University of Newfoundland (Canada) with four fellows joined fieldwork in the Barents Sea in April 2014.

Internal stresses in sea ice in the coastal zone of Van Mijenfjorden and ice pressure on the sheet piling of the coal quay in Kapp Amsterdam have been measured synchronously with tide, ice and water temperature over the winter season. Standard oceanographic measurements (water level, sea currents profiling, CTD, turbulence in ice adjacent water layer and tracking of drifting ice) were performed in Isfjorden, Van Mijenfjorden and in the Barents Sea. Part of the project was also numerical simulations of ice strength tests and thermodynamic consolidation of sea ice ridges. The results of numerical simulations of ice strength tests were used for the reconstruction of failure envelope for saline and fresh ice and for the prediction of wave amplitudes destroying the ice. Mathematical models describing iceberg drift and rotation around vertical axis were formulated. Numerical simulations demonstrating icebergs rotation under combined action of wind and tidal currents were performed. Results of the investigations were presented at the 22nd IAHR International Symposium on Ice in Singapore and at the 33rd International Conference on Ocean, Offshore and Arctic Engineering in San Francisco.

Aleksey Marchenko visited the Memorial University of Newfoundland (St. Johns, Canada) and Dartmouth College (USA) with presentations about UNIS research activity in the Arctic. The visits resulted in a joint application for funding from SIU.

Aleksey Shestov has performed pilot collection and analysis of data on loads in the moorings of the floating quay in Longyearbyen. He has organized and participated in fieldwork in Svea, where he has performed studies on the hydrology in Braganzavågen. The mining company Store

Norske Spitsbergen Kulkompani AS has an interest in the development of coal deposit on the southern shore of Braganzavågen, and the construction of a road crossing from the northern to southern shore of the bay is necessary.

Renat Yulmetov submitted his first journal paper titled “Planar multi-body model of iceberg free drift and towing in broken ice” in July 2014. The paper describes the model and some aspects related to the choice of the coefficients or to the generation of initial ice field are discussed. He has also prepared a second paper that is dedicated to the validation of the model, and a third paper that presents data obtained by the GPS trackers deployed on icebergs in the Greenland Sea. His paper entitled “Kinematic Characteristics of Sea Ice and Iceberg Drift in the Greenland Sea”, co-authored by Dr. Løset, won a best student paper prize on the 22nd IAHR International Symposium on Ice in Singapore.

David Wrangborg has focused on laser scanning of different coastal erosion processes and stress-strain deformation processes in coastal ice. Together with MSc students he has deployed stress sensors in the Svea Bay for the collection of the data on internal stresses in ice over the winter season 2014. The data were analysed and compared with tide measurements. Results of the investigations were published in Proceedings of the 22nd IAHR International Symposium on Ice in Singapore.

Research Associate Nataly Marchenko started as a UNIS representative in a new project entitled “Maritime Preparedness and International Partnership in the High North” (MARPART, 2014–2016). Hosted by the University of Nordland, the project assesses the risk of increasing transport activity and challenges for SAR, management and emergency operations. Nataly prepared an overview of maritime activities and ship accidents in the Svalbard area.



September 2014: AT-209 students measure water levels in a river near Pyramiden in Billefjorden. Photo: Nils Roar Sælthun/UNIS.

She also analysed data of ice trackers and NOAA surface drifters deployed in the Barents Sea. The main goal is an extrapolation of existing data on potential offshore development regions in the Barents Sea.

Environmental technology

The environmental technology section was staffed by two full-time researchers during 2014; associate professor Mark Hermanson and PhD candidate Tatiana Drotikova. Professor Roland Kallenborn at NMBU, professor Bjørn Munro Jenssen at NTNU and Jasmine Nahgang at the University of Tromsø were adjunct professors in the section.

Mark Hermanson joined the MIKON project in 2014. The project, also called “Environmental impacts of industrial activity in the north”, is based at the FRAM Centre in Tromsø. This project will be investigating the distribution of black carbon and associated contaminants, including polycyclic aromatic hydrocarbons and chlorinated dioxins and furans, near industrial sites in the Arctic, and in other Arctic locations affected by long-range atmospheric transport.

Mark Hermanson is also associated with the University of the Arctic Thematic Program on Industry Contaminated Sites based at Umeå University in Sweden.

Mark Hermanson gave presentations in 2014 at the DUST Conference in Taranto, Italy, the Hites Environmental Symposium in Bloomington, Indiana (USA), the 14th Annual Workshop on Brominated and Other Flame Retardants in Indianapolis, Indiana (USA), and attended the EU in the Arctic Workshop in Brussels, and Transatlantic Science Week in Toronto, Canada.

Adjunct professor Bjørn Munro Jenssen performed fieldwork consisted of collecting feathers from snow bunting (*Plectrophenax nivalis*) nest boxes along the mining ropeway

trestle in the Adventdalen for heavy metal analysis. Bird feathers can be applied as a bioindicator to study local sources of heavy metal exposure in the vicinity of Longyearbyen. Snow buntings use both own feathers and feathers from other species as nest building material. The study indicates that most of the feathers in the nests originates from marine birds.

Two NTNU/UNIS MSc students that studied effects of persistent organic pollutants on the stress hormone corticosterone and on thyroid hormones in glaucous gulls (*Larus hyperboreus*) in Svalbard graduated in 2014. Their studies identified disrupting effects of the pollutants on both these endocrine systems. Bjørn Munro Jenssen and Geir Wing Gabrielsen were supervisors.

Adjunct associate professor Jasmine Nahgang initiated a new course at the department entitled “AT-333/833 Arctic Petroleum Sciences” that was approved in the fall 2014 and will run for the first time in August/September 2015. The course covers lectures on petroleum industry dynamics and evolution, High North developments; integrated ocean governance, introduction to petroleum geology and geophysics, principles of risk assessment and management, surveillance and remote sensing, oil spill response (Norwegian system and international law and cooperation, history and methods). Finally the course also covers petroleum chemistry (composition and properties, oil spill weathering and modeling) and environmental impact in Arctic ecosystems (both seismic activities, operational and accidental discharges). The course will include both fieldwork in Svea and experimental work in the seawater lab.

Adjunct professor Roland Kallenborn was granted support for a project submitted to the Svalbard Environmental Protection Fund: “Particulate and gaseous emissions of power generation at Svalbard – AtmoPart”. The project deals with the characterisation of direct emissions from power production

in Svalbard. Within the FRAM centre flagship programme “Environmental pollutants”, UNIS is included as partner in a pilot study on: “Transformation properties and environmental risk associated with pharmaceutical residues in the Arctic (TraPha)”.

PhD student Tatiana Drotikova continued her studies on particle and gas phase characterisations of local atmospheric emissions in Svalbard. She performed electron microscope-based characterisation of atmospheric emissions in samples collected in Longyearbyen, Barentsburg, Svea and Pyramiden. In addition a new trace analytical method for the quantitative determination of polycyclic aromatic hydrocarbons (PAHs) and their major transformation products nitro- and oxy-Pahs is under development using GC/MSxMS separation and characterisation.

External PhD student Anna Abramova from the Moscow State University continued the work she began in 2013, devoted to a comparative analysis of human impact on the environment in Arctic settlements. The fieldwork included an investigation of landscape disturbances in Longyearbyen and Barentsburg, and also the collection of snow, soil, and surface water samples. She also investigated the processes of accumulation and migration of contaminants in the areas. In 2014 the first results were presented at conferences in Tromsø and Murmansk.

Geotechnical Engineering and Natural hazard prevention

The section consists of associate professors Jan Otto Larsen and Anatoly Sinitsyn, and adjunct professor Arne Instanes.

Jan Otto Larsen continued the consulting work for Store Norske Kulkompani in the Lunckefjellet mining project to protect tunnel entrances and rigs on both sides of the Martha glacier. He has also been involved in new guidelines for avalanche and slush flow protection of infrastructures edited by SINTEF Byggeforsk in Oslo, and given input to the cooperation project NIFS (Natural hazards, infrastructures, floods and slides) in Norway.

As a member of the Engineering Geology Committee in the Transportation Research Board in the USA, Larsen has also contributed to international cooperation in natural hazard prevention work. Locally, Larsen has given advice in different aspects of natural hazard prevention as safe planning in Arctic environment and rebuilding of the Museum-road bridge in Longyearbyen.

Anatoly Sinitsyn has continued the research work on coastal erosion processes at Vestpynten (outside Longyearbyen), and participated in data analysis from Varandey (Russia) as part of the SAMCoT project, work packages 1 and 6.

Arctic hydrology

Professor Nils Roar Sælthun has had an adjunct position in 2014 to run the course AT-209. His education and research work has been performed at Kapp Linné, investigating discharge in the river Linnéelva from the glacier Linnébreen.

A model of tides in fjords of West Spitsbergen was elaborated in cooperation with Professor Zygmunt Kowalik from University of Alaska Fairbanks. The model was adopted for the modelling of a navigable window in Akselsundet (Van Mijenfjorden).

Hydrologic studies including CTD and ADCP profiling have been performed near the front of Paulabreen glacier and in the shallow water region Braganzavågen in Van Mijenfjorden.

Rock Mechanics

The Rock Mechanic section consist of associate professor Zongxian Zhang, and in 2014 welcomed new PhD candidate Liyuan Chi.

The section has cooperated with the mining company Store Norske in both research and education. The research mainly covers (i) rock support, (ii) deformation and data treatment, (iii) cuttability in the Lunckefjellet mine.

Zongxian Zhang visited mining companies LKAB in Sweden and Rana Gruber in Norway to explore possible future cooperation between UNIS and the industry. Rana Gruber is very interested in improving rock fragmentation and ore recovery by advanced rock blasting techniques from UNIS.

Zhang signed a contract with Elsevier on publishing a book on Rock Fracture and Blasting. The manuscript delivery began in 2014 and is scheduled completed by the end of year 2015 for publication in 2016.

Rock blasting, dynamic rock fracture, mechanical tunnelling etc. will remain the main fields in research and education in collaboration with NTNU (rock mechanics and blasting), and with Beijing Institute of Technology (detonation and engineering blasting).

PhD candidate Liyuan Chi started his thesis work in 2014. He will measure and investigate the detonation waves and stress waves caused by blasting. The work is very important for improving current blast operations in the world. Chi wrote one paper submitted to the International Conference on Rock Blasting and Fragmentation to be held in Australia in 2015.

GRADUATES 2014

MASTER DEGREE:

LUKA ARGINI

Temperature variations and heat flow in coastal soils in the Arctic

IDA MARI BUEIDE

Freeze-bond strength experiments

NINA GANICHEVA

Engineering structures for pipeline crossings in conditions of arctic coastal erosion on the example of studies in Vestpynten, Svalbard

EKATERINA IGNATIEVA

Ice jams caused by ships motion in navigation channels

ANËLLE KAUFMANN

Snow avalanche hazard prediction and warning procedure in the Arctic environment

IGOR KONSTANTINOV

Influence of soil frozen in confined volume on bounding structures

MARI ENGVIG LØSETH

Levels and effects of Organohalogenes on Corticosterone hormones in glaucous gulls (*Larus hyperboreus*) from Kongsfjorden, Svalbard

KIRSTEN HUSBY MELIEN

A quantitative analysis of Organochlorine pesticides in Svalbard reindeer

MARTE MELNES

Disruptive Effects of Organohalogenated contaminants on thyroid hormone levels in glaucous gulls (*Larus hyperboreus*) breeding in Kongsfjorden, Svalbard

MARINA VERBICKAYA

Experimental and numerical modelling of the interaction of solid cylindrical body with ice

KARL MAGNUS VINDEGG

Stress measurements in land fast sea ice in Van Mijenfjorden, Svalbard



August 2014: Mandatory safety course where students try out survival suits. Photo: Nils Roar Sælthun/UNIS.

STUDENT COUNCIL



May 2014: AB-323/823 students take a midnight swim in Ny-Ålesund. Photo: Geir Johnsen/UNIS.



April 2014: Students Rebekka Steene, Carl Magnus Vindegg and Bård Blæsterdalen participated in the annual sled dog race "Trappers Trail". Photo: Eva Therese Jenssen/UNIS.

By Vincent Carrier (president spring 2014) and Till Hainbach (president autumn 2014)

Students from all over the world come to Svalbard to experience the high Arctic. The small community makes everybody know everybody and there is a close bond between students, staff and the local community. This relationship along with the astounding surroundings, the magic light and the unforgettable excursions make students come back year after year.

The Student Council (SC) members are elected in the beginning of each semester. Several people have specific responsibilities within the SC and are: President; Vice-President; UNIS Board members; Treasurer and Vice-Treasurer.

Additional students form student welfare groups as: Kitchen Equipment Group; Student Equipment Group; Friday Gathering Group; Safety Group; Party Group and Environmental Group. One representative from each group is present at the SC meetings.

In autumn 2013, the SC asked the students to evaluate the level of safety in the Arctic on private excursions. It has been revealed that students do not feel completely safe. Therefore, a new group (the Safety Group) started in spring 2014 semester aiming to develop safety skills of students and be a complement to the UNIS safety information. The safety group launched several activities as additional avalanche training or "snow shelter building".

The academic meetings, including student representatives and department leaders from all scientific departments, first introduced autumn 2013, have been continued and were largely received positively. In autumn 2014 a new format of meetings separately with each department has been introduced.

Social activities are arranged throughout the year, with weekly Friday Gathering, dinners and so on. The Ice-breaker party is arranged in early semester to let new and old students get to know each other. Students have access, free of charge, to a multitude of outdoor equipment and two cabins. The cabins

are unusable at the moment, but new projects with UNIS are being developed to rebuild the cabins. The SC manages and distributes UNIS' annual financial support for new outdoor gear, kitchen supplies and more.

The students are able to get involved within the local community on numerous different levels. In Svalbardhallen many students play in sports teams with other Svalbard residents. UNIS has also provided memberships to selected students for the snowmobile club "To-Taktern". Therefore the students have a garage to maintain their snowmobiles and sledges.

The Environmental Group runs the community thrift store known as "Bruktikken" where fellow residents can reuse old stuff. In autumn 2014, with the support of the Student Council, they arranged the annual Longyearbyen charity flea market "TV-aksjon" at UNIS with the Longyearbyen Community Council.

During both the light and dark period students are involved in the organisation of the Dark Season Blues festival in October, the Polarjazz festival in February and the Sun festival in March. They also participate in different associations such as the Longyearbyen choir, Svalnardo kid's circus and as Svalbard Turn coaches.

The Students Council exists to support the UNIS students and to ensure that the student welfare is maintained. The students have representatives on the UNIS board (board representative and observer) and in the UNIS Leader Group. Representatives act on discussed topics, especially when relevant to students, and provide feedback from the students to the institution.

As a student representative you get an inside view of how UNIS is run and get to participate on most levels. Because of the interaction of past students representatives UNIS has become what it is today, from a student point of view.

UNIS remains a unique experience and a large majority of students would desperately like to come back.



December 2014: The northern lights (aurora borealis) above the student barracks in Nybyen.
Photo: Aki Vähä/UNIS.



SCIENTIFIC PUBLICATIONS 2014

Scientific publications (NVI level 1 and 2) published with UNIS as author address in journals accepted by the Norwegian Association of Higher Education Institutions (UHR).

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Søli	Geir	University of Oslo, Norway
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Brynjolfsson	Skafti	Norwegian University of Science and Technology
Christoffersen	Poul	University of Cambridge, UK
Dowdeswell	Julian	University of Cambridge, UK
Eiken	Trond	University of Oslo, Norway
Faleide	Jan Inge	University of Oslo, Norway
Faucherre	Samuel	University of Copenhagen, Denmark
Folkestad	Atle	Statoil, Norway
Funder	Svend Visby	Natural History Museum of Denmark
Gourmelen	Noel	University of Edinburgh, UK
Grosse	Guido	Alfred Wegener Institute, Germany
Hald	Morten	University of Tromsø, Norway
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Henriksen	Mona	Norwegian University of Life Sciences
Hock	Regine	University of Alaska Fairbanks, USA
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Humlum	Ole	University of Oslo, Norway
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Johnsen	Helge	University of Bergen, Norway
Jonsson	Sverrir Adalsteinn	University of Iceland
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ARCTIC GEOPHYSICS

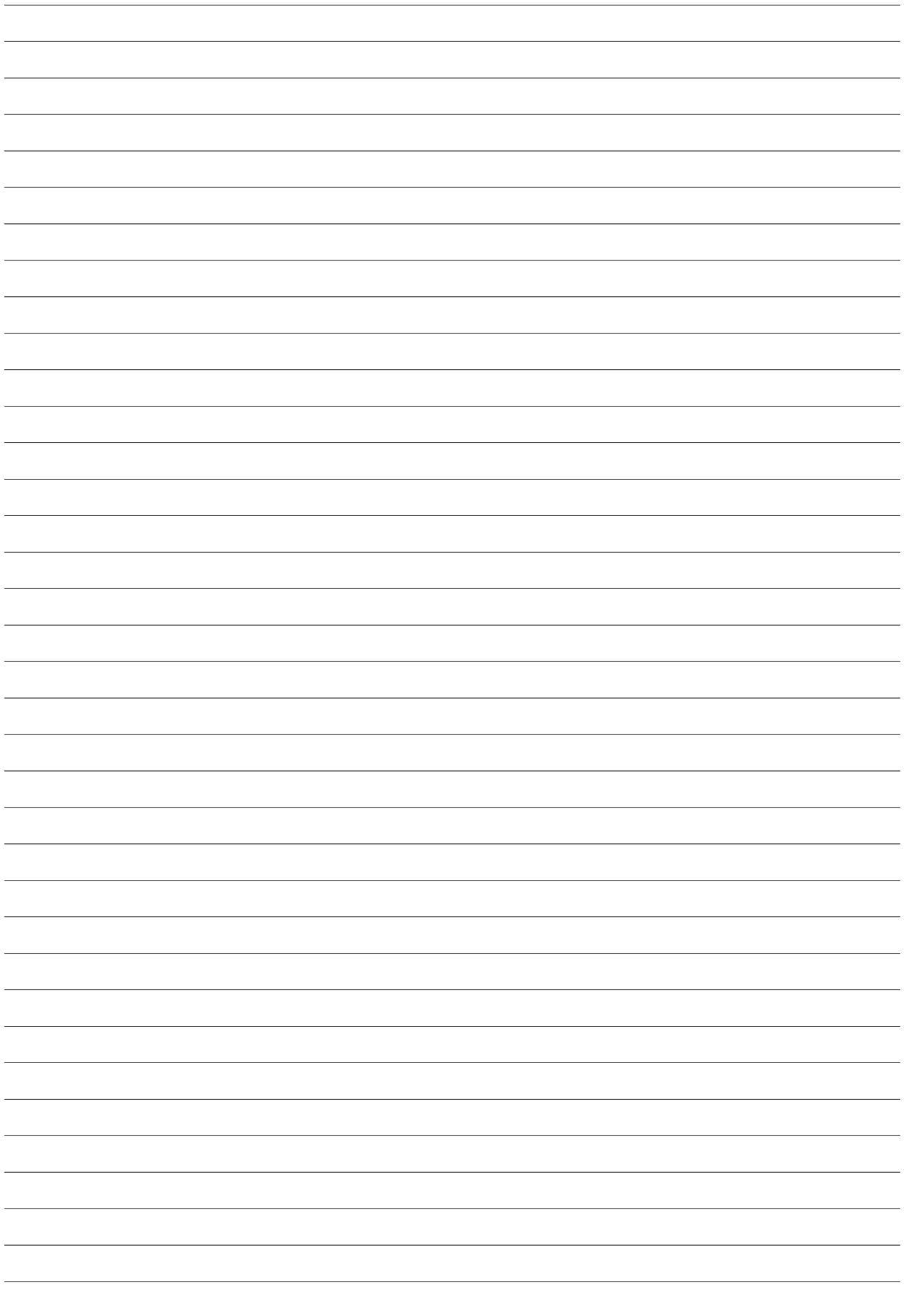
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