National Research Tomsk State University

Welcome to the Third International Summer School for Students and Young Scientists

"Natural and human environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers, biota and life style of native ethnic groups in a rapidly changing climate"

05-17 July 2015, Tomsk-Aktru (Russia)

Earth & environmental sciences – the view from the Highland Altai

The Third International Research-Educational Summer School *"Natural environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers and biota as indicators of climatic changes"* will start in the cosy city of Tomsk. This famous cultural centre has been named "the Siberian Cambridge". There will be 3 days for the field excursion to the High Altai (1200 km South from Tomsk). This will cross different landscape zones, such as south taiga, sub-taiga, forest-step, step, mountain taiga, mountain meadow, mountain tundra, glacial and periglacial area. Participants can observe different geographical provinces, such as West-Siberian Plain, Piedmont Altai, High North Altai, High Central Altai and High South-East Altai. All this will provide an opportunity to become acquainted with a great variety of landscapes, different types of relief and paleogeographical relics, well-expressed geological structures and evidences of earthquakes, amazing biodiversity in ecosystems, unique archaeological objects and the dynamic variety of nomadic populations.

The main part of the School (3 days) will be at the Aktru Research Station of the National Research Tomsk State University. The Station was founded by M.V. Tronov, the distinguished scientist and Professor of the Tomsk State University, who is a founder of the Siberian Glaciological Scientific School. There will be various field excursions as well as lectures at the Station and in its surroundings.

The two-day journey back to Tomsk will repeat trans-zonal excursions. Other interesting places will then be seen and elucidated in the lectures.

Location:

Tomsk is situated in Western Siberia at the very geographical centre of Eurasia: an ideal meeting place for analytical minds! Tomsk is on the Tom River in the southwest of Siberian Federal District, Russia, the administrative centre of Tomsk Oblast. One of the oldest towns in Siberia, Tomsk celebrated its 400th anniversary in 2004. There are many beautiful ancient wooden buildings there. With a population of half a million, Tomsk is a city of students: 100,000 students (every fifth citizen) in 6 universities. Neither Moscow nor St-Petersburg has such a large proportion of students and scientists as Tomsk (http://en.wikipedia.org/wiki/Tomsk).

Tomsk State University (TSU), which was established in 1878 by Tsar Alexander II as an Imperial Siberian University, is the first higher educational institution in the Asian part of Russia. Now it is one of the leading Russian National Research Universities (http://inter.tsu.ru/en/index.php).




Aktru Research Station which belongs to Tomsk State University is located in the highest alpine South-East part of the Altai Republic near the border with Mongolia, 2150 metres above sea level. The most striking geographical aspect of the Republic of Altai is its mountainous terrain. The Republic is situated within the Russian part of the Altai Mountains system, which covers a large part of the Republic and continues into neighboring Kazakhstan, Mongolia and China. The region continues to experience periodic notable seismic activity, which is visually made apparent through the mountains' characteristically high and rugged mountain ridges, separated by narrow and deep river valleys. The Republic's highest peak, Mount Belukha (4,506 m), is the highest point in Siberia. Since 2011 Aktru Research Station is observer member of INTERACT - International Network for Terrestrial Research and Monitoring in the Arctic (http://www.eu-interact.org/field-sites/stations-with-observer-status/aktru-scientific-research-station/).

How to get to Tomsk?

Moscow - Tomsk

There are 4 direct 4-hours flights from Moscow to Tomsk, by different Airlines: S7 and Transaero from Domodedovo airport, Utair from Vnukovo airport and Aeroflot from Sheremetyevo airport. There is also a direct train Moscow-Tomsk named "Tomich" , along the famous Trans-Siberian Railway. This takes 2 and a half days.

Air Company (Airport)	Moscow-Tomsk Flight number & time (departure - arrival)	Tomsk-Moscow Flight number & time (departure - arrival)
S7 (Domodedovo)	811 (23:30 – 06:45)	812 (07:50 – 09:35)
Transaero (Domodedovo)	153 (22:20 – 05:30)	154 (07:25 – 09:00)
Utair (Vnukovo)	439 (22:20 – 05:30)	449 (07:00 – 08:10)
Aeroflot (Sheremetyevo) Terminal D	SU 1530 (22:40 – 05:45)	SU 1531 (06:55 – 08:20)

Novosibirsk - Tomsk

by plane – approximately 40 minutes (Tomk-avia Air Company, flight 5004, departure 17:00, arrival 17:45, 3 times a week – Monday, Wednesday, Friday)

by train - approximately 5 hours

by bus or by car - approximately 4 hours (300 km)

Both Moscow and Novosibirsk have regular international airline connections with a number of cities all over the world.

Who can participate?

We expect to receive about 30 international students and young scientists (age range: 18-35 years old).

Summer School fee

Summer School fee for 2015 is 650 Euro: field trip expenses, accomodation, carriage, campings, food and registration fee are included.

IMPORTANT! Personal outfit

Taking into account the high-mountain field conditions for the Summer School, personal sleeping-bags and tents as well as proper field clothing and shoes are desirable. If you have any problems in these respects, please let us know.

Publication of School Materials

Participants have to prepare presentation of their own investigations, survey paper or just essay in the framework of Summer School thematic.

The lectures/papers of distinguished scientists as well as papers of students and early carear scientists will be published in the "Bio-Geo-Clim" Journal.

Contacts

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Sergey N. Kirpotin E-mail: kirp@mail.tsu.ru, +7(3822)529902

School coordinator

Sergey N. Kirpotin – Professor, Doctor of Sciences, Director of "Bio-Clim-Land" Centre of Excellence, National Research Tomsk State University, 36 Lenin Ave., Tomsk, Siberia, 634050 RUSSIA. Tel.: +7 (3822)529902 Fax.: +7 (3822)529902 E-mail: kirp@mail.tsu.ru Internet: http://biogeoclim.tsu.ru/ru/

Certificate

School graduates will obtain the Certificate from the National Research State University of Tomsk

Application form

Surname
Name
Second name
Date of birth
Name of organization (full name)
Student, master (select necessary)
For students of full-time tuition :
Course (select necessary): I, II, III, IV, V, VI
Specialty
For students of correspondence study
Specialty
For Ph.D candidate of full-time tuition

Course: 1, 2, 3
Specialty
For Ph.D candidate of correspondence study
Specialty
Contact telephone (with city code)
E-mail
Address (with postal index)
Young scientists
Young specialist
Young teacher
Scientific degree, position for advanced researchers

Contact telephone (with city code)
E-mail
Address: (with postal index)
Title of report (small letters)
Form of report: oral, stand (select necessary)
Form of participation: full-time, correspondence (select necessary)
Order hotel
Personal invitation

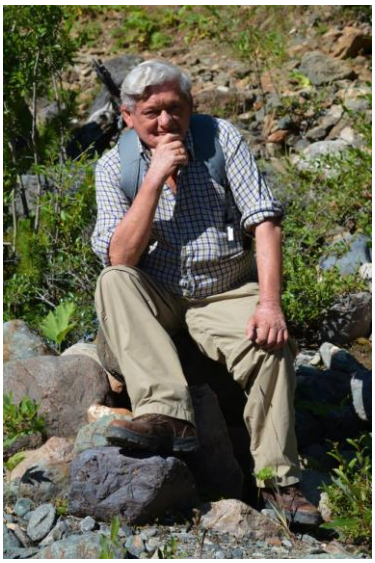
Official invitation

For the official invitation, we require the following data: scanned copy of passport, an official place of study/work and position, and also the postal address to which originals of invitations will be sent.

Deadlines

- **30 April 2015** Notification of acceptance of abstract for oral or poster presentation.
- **31 May 2015** Last day for submission of applications.

Distinguished Visitors



Terry V. Callaghan – Royal Swedish Academy of Sciences Distinguished Professor; Professor of Arctic Ecology, University of Sheffield, UK; Honorary Doctor of Tomsk State University, RF, Lund University, SE and Oulu University, FI ; Head of the SCANNET/INTERACT Network. Terry Callaghan has worked on Arctic ecology for 45 years in all 8 Arctic countries as well as working in the Sub Antarctic. He played a fundamental role in establishing a British research base on high Arctic Svalbard and co-ordinated its first research programmes. His research focuses on the relationships between the Arctic environment and the ecology of Arctic plants, animals and ecosystem processes, including ecological responses to changes in climate, atmospheric CO_2 concentrations, and UV-B radiation. Terry Callaghan was a member of the United Nations Environment Programme's expert panel on Stratospheric Ozone Depletion Effects for many years, and was a lead

author of the Intergovernmental Panel on Climate Change (IPCC 2007) Polar and Ecosystems Chapters as well as the Millennium Assessment of Ecosystems' Polar Chapter. He made major contributions to the Arctic Climate Impacts Assessments ACIA and SWIPA including outreach in the media, and briefings at all levels from primary schools and families to politicians, religious leaders of the world, Governments and Royalty. During this process, he was formally commended by Arctic Indigenous Peoples' organisations for including their knowledge and addressing their concerns. He has initiated and chaired many international research groups within the International Arctic Science Committee (IASC) such as FATE (Feedbacks from Arctic Terrestrial Ecosystems), Dynamics of the Tundra Taiga Interface and the International Conferences on Arctic Research Planning (ICARP I and II), and is co-ordinator of SCANNET-INTERACT that includes 44 research stations throughout the Arctic. Terry Callaghan has supervised about 30 PhD students and has produced about 400 scientific publications with over 400 colleagues from about 40 countries. He is included in the web of sciences' list of "most frequently cited researchers" world-wide. In 2006 he was included in the group award of the Zayed International Prize for the Environment to the authors of the Millennium Ecosystem Assessment and in 2007 he was included in the group award of the Nobel Peace Prize as one of the Lead Authors of the IPCC that was jointly awarded the prize with Al Gore. Also in 2007, he hosted and addressed 27 Ministers of Environment and 50 Ambassadors from around the world and in 2009 hosted Climate Negotiators from the EU countries prior to the 2009 climate meeting in Copenhagen. He was awarded the Vega Medal by the King of Sweden in 2011 and will be awarded the Polar Medal by the Queen of England in 2013.

Vladimir Romanovsky – Professor, Permafrost Laboratory, Geophysical Institute, University of Alaska Fairbanks. Professor Romanovsky is an internationally renowned permafrost researcher who has greatly strengthened this research field. He has been actively building up the network of observation stations for permafrost studies in Alaska and in the circum-Pacific north. These observation networks are instrumental in collecting baseline data on permafrost and will lay the foundation for further research by other scientists in collaboration with Dr. Romanovsky (Nicolsky et al, 2009; Groisman et al, 2009; O'Donnel et al, 2009; Walker et al, 2009; Panda et al, 2010; Shiklomanov et al, 2010; Jones et al, 2013). One reason for the success and broader impact of Professor Romanovsky's work is the interdisciplinary approach to permafrost research that he is promoting. His research collaborators come from several fields such as biology, soil science, hydrology, biogeochemistry, marine science, climatology, atmospheric science, and remote sensing. Professor Romanovsky maintains a strong externally funded research program where he is currently a PI on four funded projects and Co-PI on another 9 funded projects. Professor Romanovsky's strength is also in numerical modeling. Results from field data integrated with such modeling have provided predictions of the thermal state of the permafrost. Since 2009, Professor Romanovsky has authored or co-authored nearly 60 peer reviewed scientific papers. Dr. Romanovsky has extensive experience in coordinating joint projects with Russia. He and his students have worked a lot in the Siberian Arctic. Recently, Dr. Romanovsky is a visiting professor and associate Ecology Department of the Research Institute of Biology and Biophysics, National Research Tomsk State University. As a result Dr Romanovsky's research there is a larger body of knowledge on permafrost and a better understanding of this phenomenon in the context of the Arctic System.

Vladimir Golovanevskiy – Professor, Mining Engineering and Metallurgical Engineering, Curtin University, Australia. Professor Vladimir Golovanevskiy holds a PhD in Materials Technology/Thermophysics from the Ukraine Academy of Sciences and Masters (Machine Design) and BEng (Mechanical) degrees from Kharkiv Polytechnic University, Ukraine. He has over 30 years experience in fundamental and applied research, teaching, industry, management and consultancy activities. Professor Golovanevskiy worked in a variety of roles in Australia, Russia, Ukraine and Germany in a range of industries from heavy engineering for underground mining to International Space Program to composite materials structures to artificial gems manufacture to cryogenics. He has published over 30 papers in international scientific journals and conference proceedings, written over a 100 confidential reports on materials-related

matters for various Australian and overseas industry groups, and authored international patents in diverse fields including composite materials manufacturing processes, thermophysics, and ore sorting technologies. Professor Golovanevskiy has global professional networks, with research interests in advanced materials, engineering design, strong magnetic fields and wear management. He is actively engaged in building long-term, sustainable collaborative relationships with industry and research partners nationally and internationally.

Clowacki Piotr – Head of the Polar and Marine Department, Institute of Geophysics, Polish Academy of Sciences, Warsaw. Member of the Committee of Polar Research, Polish Academy of Sciences – since 1990 and Deputy of Chair of this Committee – since 2012.

Member of National Committee for Cooperation with International IGPB Programme – Global Change – in 1994-2007. Secretary of the Polish Branch of International Glaciological Society - in 1994-1997. Member of the Scientific Council of Biebrza National Park – since 2000. Polish representative of Forum of Arctic Research Operators – since 2002. Member of Scientific Board in Institute of Geophysics of the Polish Academy of Sciences – since 2008. Member of the Scientific Board of Network "Satellites Geophysics" established by Ministry of Sciences and High Education – since 2007. Polish representative of Svalbard Science Forum – since 2005. Member of Steering Committee of EU project Svalbard Integrated Arctic Earth Observing System (SIOS). Coordinator of Polish part of the 6 Framework EU "Strategic Coordination and Networking of European Polar RTD Programmes" - EUROPOLAR Contract ERAC 517842 – since 2005. Coordinator of the Scientific Network „Multidisciplinary Investigation of the Geobiosystems in the Polar Regions" – since 2007. Member of Terrestrial Working Group International Arctic Science Committee (IASC) – since 2011.

Riku Paavola – Dr., station manager of Oulanka research station, Thule institute, University of Oulu, Finland. Dr. Paavola is an internationally known researcher in freshwater ecology, specializing in boreal running waters and the community ecology of benthic macroinvertebrates. He has also worked on the ecology of stream fish, algae and bryophytes. He holds a PhD degree in Limnology and Hydrology from the University of Jyväskylä, Finland and an MSc degree in Animal Ecology from University of Oulu, Finland. He has 20 years of experience in freshwater research, teaching and in conducting field studies in areas that range from Fennoscandia to Canada, New Zealand and NW Russia. He is also an active member of the EU FP7 arctic and subarctic research infrastructure project INTERACT. Recently he has also concentrated in developing climate change research related infrastructure at Oulanka research station, developing automated water quality measurement systems for year-around operation in subarctic lake conditions and on projects combining photography and science to visualize northern environmental changes for purposes of outreach and popularization of science.

Preliminary Program:

05 July 2015 (Sunday)

05.30 – 10.00 Arrival and settling
13.00 – 13.50 Lunch
14.00 – 18.30 Free time
19.00 – 21.00 Arrival dinner

6 July 2015 (Monday)

09.00 – 10.00 Registration (Conference-hall, TSU Scientific Library)
10.00 – 12.30 Plenary session of School (Conference-hall, TSU Scientific Library)
13.00 – 13.50 Lunch at cafe «Minutka» (TSU main building, 36 Lenina Pr.)
14.00 – 18.30 Excursion to TSU (Botanical Garden, Museum of Mineralogy, Museum of Paleontology, Herbarium, Zoo museum, Museum of Archeology and Ethnography)
Excursion around Tomsk by car accompanied by the guide, interpreter - Nina K. Rozhanovskaya
19.00 – 21.00 Dinner

07 July 2015 (Tuesday)

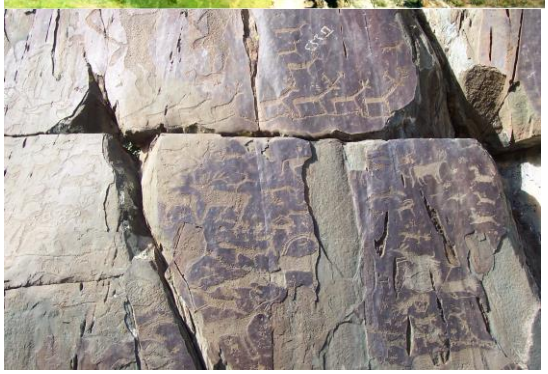
08.00 – all day. Departure from Tomsk. Bus excursion to Barnaul-city (400 km from Tomsk). Stay, excursion and overnight stop in South-Siberian Botanical Garden at Altai State University, Barnaul.

08 July 2015 (Wednesday)

08.00 – all day. Departure from Barnaul. Bus excursion to the bank of Katun-river near of Gornyi-Altaisk city (450 km from Barnaul). Stay, excursions and overnight stop in tent camping at the bank of Katun-river.

09 July 2015 (Thursday)

08.00 – all day. Departure from the Katun tent camping. Bus excursion to the Yaloman village in Central Altai (260 km from the Katun tent camping). Stay, excursions and overnight stop in Yaloman tent camping.



10 July 2015 (Friday)

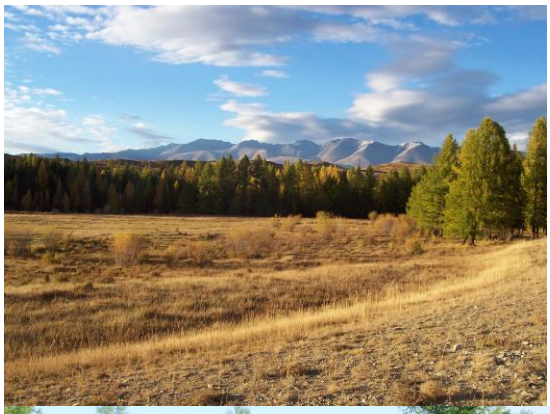
08.00 – all day. Stay, excursions and overnight stop in Yaloman tent camping.

11 July 2015 (Sunday)

08.00 – all day. Departure from the Yaloman tent camping. Bus excursion to the tent camping in Kurai intermountain step basin (200 km from the Yaloman tent camping). Stay, excursions and overnight stop in Kurai tent camping.

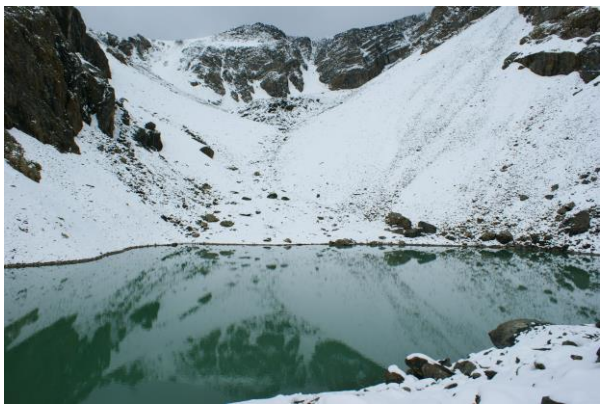
12 July 2015 (Monday)

Rising to Aktru Research Station using special off-highway vehicle. Settling in and familiarization with Station.



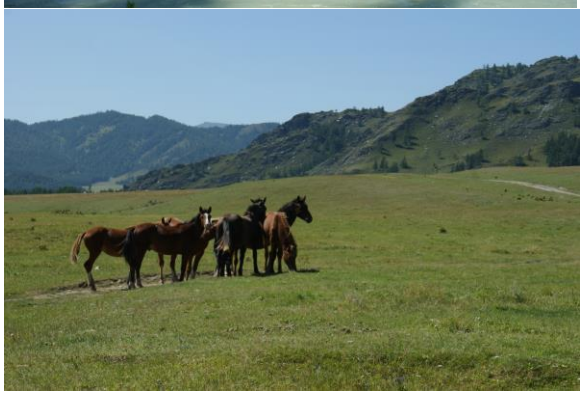
13 July – 14 July (Tuesday - Wednesday)

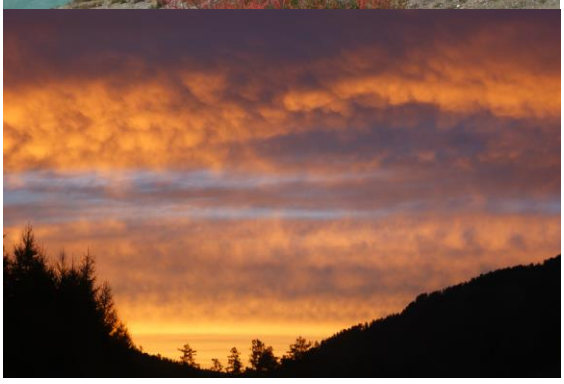
Lectures of TSU and invited lecturers, field excursions in Aktru Research Station Campus.



15 July – 16 July (Thursday – Friday)

Way back to Tomsk with excursions and stops in interesting places.





17-20 July

Departure from Tomsk.

IMPORTANT! Possible alterations

Taking into account weather conditions some changes could be made in the field-excursion Program.

Summer School Web-site

will be open on 15 January

Films about First and Second Aktru Summer Schools:

http://www.youtube.com/watch?v=CQ1u4P-S2tE
http://www.youtube.com/watch?v=CD7e9k8iiNg

Success Story

Responses about the First International Aktru Summer School 2011

To cite this article: Terry V. Callaghan (2012): A journey through space and time: the First
International Aktru Summer School in the Altai Mountains, International Journal of Environmental
Studies, DOI:10.1080/00207233.2011.641233

REPORT

A journey through space and time: the First International Aktru Summer School in the Altai Mountains

TERRY V. CALLAGHAN

Royal Swedish Academy of Sciences, Stockholm SE-114 18, Sweden and Department of Animal and Plant Sciences, Alfred Denny Building, University of Sheffield, Western Bank, Sheffield S10 2TN, UK

Between the 4 and 19 of July 2011, the Tomsk State University in Siberia held its first international summer school for students and young researchers at its field station, 'Aktru' in the Altai Mountains, close to the southern border of Siberia and the northern border of Mongolia. The summer school was multi-disciplinary and examined the theme of the 'Natural environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers and biota as indicators of climatic changes'.

The summer school was a great success and provided unique opportunities to young researchers from many countries. Together with several eminent researchers in various fields and from different countries, the young researchers and students travelled through environmental space across major eco-regions. The summer school started with introductory lectures at the host institution, Tomsk State University (with national research status), that is situated in the taiga coniferous forest region. The group then went by bus into the southern taiga, characterised by mixed deciduous birch and coniferous forest and through the semi-arid steppe region to the foothills of the Altai Mountains. The group then climbed by all-wheel-drive ex-military vehicles through the mountain coniferous forests to the Aktru station that is located at the upper altitudinal tree-line. Within a short walking distance, the group was able to access alpine meadows and fell-fields and finally, glaciers and the nival environment. There are few places on Earth where it is possible to go through such diverse environmental space within a short time and with such ease. The young researchers also travelled through time: from fascinating lectures and field excursions that explained the formation of a landscape following a mega-tsunami some 25,000 years ago to compelling evidence of climate change in action at a location where a dynamic tree-line is above glacier snouts and glacial retreat has been recorded for about 100 years, and intensively for about 50 years. In the vicinity, there was also an impressive area where a large palsa plateau (a peatland with a permafrost core) was rapidly degrading into a thermokarst lake and mire while trees were establishing in small thaw depressions.

The scale of the various phenomena was enormous: the expanses of the taiga forest were vast; the palsa plateau was an analogue of what Fennoscandian palsa plateaus might have looked like at the start of the Holocene. The mountains rose from the semi-arid steppes to around 4000 m into a climate regime that supported glacier formation; and the after-effects of the mega-tsunami such as huge silt bars and 'ripple lines' on the steppes were of staggering proportions. Furthermore, the diversity of ecosystems was impressive and Aktru is in the centre of a biodiversity hot-spot as the region in general is host to many endemic species, some of which are threatened by extinction.

The young researchers and students had access to experts with knowledge on geomorphology, hydrology, permafrost, glaciology and ecology. Not only was the knowledge of these experts accessible to the students, the experts themselves were very accessible as a result of their friendliness and the 'mixing-pot' format of the summer school. Consequently, senior researchers as well as young scientists left the Aktru summer school wellinformed about topics within and outside their professional fields of interest.

The foreign students and young researchers were welcomed to a remote and unique environment that would be almost impossible to access without help and support from Russian colleagues and the very positive interactions among participants will lead to future collaborations. In fact, all the ingredients were present: good teachers were brought together with interested and able young researchers in a unique and fascinating physical environment and within a good infrastructure with a friendly social environment. An immediate benefit is that Aktru has now joined an international network of cold-region research stations (SCANNET-INTERACT) and Tomsk State University and Aktru can now contribute within this circum-arctic network.

It is hoped that this Summer School will be the start of many.

Earth and Space Sciences | UNIVERSITY OF WASHINGTON

29 August 2011

Dr. Sergey N. Kirpotin, Vice-Rector for International Affairs
Professor, Doctor of Sciences
National Research Tomsk State University
36 Lenin Ave., Tomsk, Siberia 634050, RUSSIA
kirp@ums.tsu.ru
Re: International Summer School: "Natural environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers and biota as indicators of climatic changes" 4 – 19 July 2011

Dear Dr. Kirpotin:

This letter is an evaluation of the 2011 summer school offered by the University of Tomsk and Curtin University in Australia. I was a participant in the Summer School and so had a good view of its functioning.

Most of the students attending the school were from Australia and Russia, but some were from Germany, Netherlands, France, and the USA. The level of the students was in general undergraduate. The students were exposed to preliminary lectures in Tomsk, and also a tour of Tomsk itself. Thus the introductory material was both scientific and cultural. After Tomsk, the students were shown the glaciated Altai range near the Mongol border via two walking treks following a bus transect across the ecozones of Siberia. At the end, the students made brief presentations to each other of their own studies.

The initial presentations by the faculty were a good introduction to the landscape and environment of the field trip. The treks exposed the students, close up, to glaciated landscapes and glaciers that few had had the opportunity to see before.

The school seemed to me to be very successful, especially for an inaugural effort. The school was very well run. An unavoidable emergency arose (a family emergency for one student), and it was handled well. The food – in Tomsk, on the road, and at the Aktru Research station – was quite good. The students seemed to be happy and enthusiastic. I think the students benefitted from the general exposure to the Siberian countryside as well as to the formal lectures. The format seems to be very good, and I can see no changes necessary for the second year.

In any new situation some changes may be in order. In this case, it appears that most of the students were in engineering, but the focus of the school was scientific and environmental. Perhaps a different focus would have been of greater interest to the students, although I suspect the value of exposure to natural sciences in a natural setting is probably of high value to all. If the natural sciences format is to be maintained, I think it might be of value to provide students before they board the airplane for Tomsk with a handout outlining the basic terms and concepts they will be dealing with during the school itself.

Overall, the summer school was an excellent experience.

Sincerely,

Alan Gillespie

Professor, Earth and Space Sciences

University of Washington

Seattle, WA 98195-1310 USA

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CRICOS Provider Code 00301J

12 September 2011

Professor Georgy V Mayer
Rector – Tomsk State University
36 Lenina Avenue
634050 TOMSK RUSSIA

Dear Professor Mayer,

International Summer School

As you might be aware, Curtin University recently participated in the Inaugural International Summer School organised by the Tomsk State University (TSU) at its Aktru Mountain Station in the Altai Mountains this July. Follow-on from a research seminar between Curtin University and TSU in Tomsk in October 2010, this Summer School was the latest achievement and next step in building successful relationships between our universities.

The event, with the overarching theme of *Natural Environment of Arctic and Alpine Areas: Relief, Soils, Permafrost, Glaciers and Biota as Indicators of Climatic Changes* was the result of a very significant effort by many TSU staff, led by Professor Sergey Kirpotin and brought together over 50 participants from eight countries. This included a group of 10 Curtin undergraduate students from the Faculty of Science and Engineering, PhD students from Russia, Germany, the US, France and the Netherlands, and world-renowned global climate change researchers from England, Germany, Russia, the US and Israel. The calibre of senior researchers participating in the School was exceptional, including a Nobel Prize Laureate Professor Terry Callaghan.

The School program included plenary sessions and lectures, undergraduate and postgraduate students' presentations, 1200 kilometre journey through the Altai Mountains region, a stay at the Aktru station and guided tours of environmental hotspots etc, and has received extensive media coverage in Tomsk, including several newspaper articles and a series of TV programs.

Our students and staff had an amazing life changing experience and have made many friends within the Tomsk and other international academia and students. TSU hospitality has been excellent and the friendships made by our students and staff will, I am sure, last a lifetime. All this will help to further strengthen successful relationships between our universities.

I would also like to take this opportunity in thanking Professor Vladimir Golovanevskiy, Director of the Rio Tinto Centre for Materials and Sensing in Mining at Curtin University for his outstanding contribution towards this project, without which would not have been as successful.

Curtin University is intending to conduct a similar international event and we are hoping to be able to welcome TSU staff and students next year in Perth.

Professor Andris Stelbovics
Pro Vice Chancellor

cc: Prof Sergey N Kirpotin
Prof V Golovanevskiy

Geographisches **I**nstitut der **U**niversität **B**onn

Physical **G**eography

Geography, Meckenheimer Allee 166, D-53115 Bonn, Germany

Prof. Dr. Jürgen Herget

To whom it may concern

Comments on summer school Tomsk & Aktru, July 2011 - "Natural environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers and biota as indicators of climatic changes"

I had the honor and pleasure to participate in the summer school in Tomsk and Aktru as foreign visiting professor. My personal experiences with the area and topic are based on more than 10 years field work in the Altai Mountains around Aktru station and scientific cooperation with scientists of Tomsk State University since 1999.

According to my impression, the summer school was successful. It is a real challenge to bring, guide and coordinate a group of students of different levels and different disciplines to Siberia and run a trip with new impressions to everyone. This problem was solved successfully due to the productive efforts of Prof. Kirpotin and his team. Also the support by Tomsk State University has to be thanked as the financial but especially also the logistical support was remarkable and made the first impressions of Tomsk and even Russia for all first-comers positive. Compared with previous trips, I was positively surprised about the smooth and well organization and management of the visit in Tomsk and the travel and stay in Aktru. I have not experienced such a comfortable, easy and enjoyable travel before.

In general, I would like to congratulate Tomsk State University for the successful summer school and the significantly improved visibility on the international level. Several scientists on different levels – students, candidates, aspirants up to established professors – now can confirm the good reputation of TSU by personal experiences.

Prof. Dr. Juergen Herget

International Journal of Environmental Studies

http://www.tandfonline.com/loi/genv20

Nature that is thawing before our eyes: the diary of the second International Aktru Summer School in the Altai Mountains

Yana Pchelintsevaa, Irina Temnikova & Sergey Kirpotin

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Published online: 29 Apr 2014.

In the summer of 2013, the Tomsk National Research State University became a meeting place for young and eminent scholars at a summer school devoted to the problems of climate change. For a second time, the international research and educational school ‘Natural environment of Arctic and Alpine areas: relief, soils, permafrost, glaciers and biota as indicators of climatic changes’ was held in the Aktru valley, at the university research station, a member of the international SCANNET/INTERACT. More than 40 participants – students and scholars from Russia, Poland, the Netherlands, Mongolia, the USA and Australia – took part in the school. The experts were leading specialists in the fields of archaeology, social anthropology, hydrology, glaciology, botany, zoology and other related spheres; Nobel prize winner, Professor Terry Callaghan among them. The plenary meeting with reports by leading Russian and foreign researchers took place in Tomsk, a small university town in the south of Western Siberia on July 4–5. On July 6 the bus with school participants left for the ‘Aktru’ Alpine station. The expedition schedule was very rich, and the weather made a surprise for us. Although the school was held in July we saw a lot of snow in the environs of the Aktru ravine and along the Severo-Tchuisky ridge. In July 2011 during the first International Summer School, the scene was completely different. Now, the climate change issues were stated in the environment before our very eyes. The experts from Tomsk who visited the Aktru valley, and who knew the area for several decades, said that they had not seen so much snow in the mountains in the mid summer for a long time. The conditions in the region in July 2013 were those of nature in late spring, not summer. The glacier tongue along which in July 2011 the participants of the summer school had climbed to the Goluboye Lake located at a height of 2800 m above sea level now turned out to be forbidding: it was covered with snow hiding ice traps. The lake in July 2013 was practically covered with ice; whereas 2 years earlier there had been neither ice nor snow near the lake at that time. Many couloirs of the mountain peaks surrounding the Aktru valley remained impassable because of snowdrifts. But, a great amount of snow does not indicate positive dynamics: glaciers continue retreating. The Maliy Aktru glacier, a regular visiting point for the TSU station and a mountaineering camp located nearby, darkened and became smaller in size as compared to the year 2011.

TSU scholars have been doing regular research in the Aktru valley glaciers since 1952. For more than 50-year observation period summer air temperature has increased on aver- age by 0.2 °C per decade. And the process of warming has been accelerating since 1985 everywhere in the Altai Mountains. The researches show that the rate of retreat has increased in recent years. The published data [1] indicate that during the period from 1999 to 2008 annual retreat rate of the

Maliy Aktru increased from 5.4 to 16.1 m per year. There are no precise data concerning the glacier's retreat for the last 2–3 years, but it can be seen that its square and volume of ice have decreased considerably. Moreover, the glacier proper has changed. It used to have a salient shape, which made it possible for water and stones to roll to the mountain slope; now its central part has sunk and the streams flowing down the glacier are washing out the depression. Water brings great changes into the valley landscape. There are now numerous landslides and water inrushes as a result. In 2012 in the neighbouring valley Maashey, the discharge of a large lake of glacier origin took place, caused by moraine failure. And not far from a mountain- eering camp near Aktru, a large waterfall emerged. The expedition schedule was very rich. The first day at the station was devoted to pre- sentations of the researches conducted by young researchers, participating in the school. The researches belong to different spheres – from studying soils in various world regions to radiation features in the Aktru region. The participants were given a serious test, a little mountaineering – they climbed to the plateau Uchitel (3000 m over sea level), where one could find a small glacier not long ago – in 2008 its area was 0.04 km2. In July 2013 the plateau was covered with snow, but there was not a glacier. All these changes in the Aktru valley need monitoring. A weather station of Tomsk State University used to work here, and now it is planned to install new equipment that will be able to record information about environmental conditions and to transmit it on line. This region is a unique place popular among both researchers and tourists, which means that it is necessary not only to observe nature and improve the infrastructure but also continue attempts to give the territory a special conservation status. The issue was dis- cussed during the first and second summer schools at Aktru. After some days at Aktru station the programme of the excursion continued in different natural conditions. Summer school participants went to the steppe near the border with

Mongolia, a dry valley of a small river, the Kyzyl-Chin. In its surroundings students from Tomsk State University – geologists, geographers and archaeologists – have their field practice every year. Scientists and ecotourists are interested in the exceptionally colourful landscape: rocks here are red, yellow and brown. These colours are caused by exposure of the trace elements in the rocks. The territory is also famous for its archaeological and ethnographical findings. You can come across rocks with petroglyphs, revealing the life of ancient people who used to live in the Gornyi Altai (figure 2). There are many burial mounds in the neighbouring steppe giving evidence of the warlike character of the people living in this region in the VI–XIXth century presumably. The remains of one of the burial mounds were near the Summer school camp, and a workshop on finding and copying of the Bronze Age petroglyphs was exciting. The experience of organizing an international summer school has shown that Gornyi Altai is a territory offering a great amount of possibilities for a researcher and a traveller. It is of great interest for the world community. Tomsk State University was the first to investigate the region at the beginning of the previous century, and remains aware of its responsibility for comprehensive studying and conserving these unique natural regions.

Acknowledgements

The Second International Aktru Summer School has been carried out within the grant in accordance with Resolution of the Government of the Russian Federation no. 220 dated April

09, 2010, under Agreement no. 14.B25.31.0001 with Ministry of Education and Science of the Russian Federation dated June 24, 2013 (BIO-GEO-CLIM).

Reference

[1] Narozhniy, Yu. and Zemtsov, V., 2011, Current state of the Altai Glaciers (Russia) and trends over the period of instrumental observations 1952–2008. AMBIO, 40(6), 575–588.