The “Siberian Natural Collider” as a basis for development of Large-scale International Networking Projects
«Сибирский природный коллайдер» как основа для развития крупномасштабных международных сетевых проектов

TSSW

SecNet

INTER⇌ACT

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Aktru Summer School – 2018

Siberia is not just a land, it is the Universe

- Located on the vast territories from the Arctic Ocean coastline to its southern borders with Kazakhstan, Mongolia and China, and from the Urals to the Pacific Ocean, Siberia is a huge expanse for research with a maximum extension of 2500 kilometers from North to South, and more than 7000 kilometers from West to East. Due to its incredible size, in comparison with other regions, Siberia can be called “the Universe” because any project implemented on its territory is by definition of universal scale.

Turquoise Katun-river in Altai highlands

Frozen mound bogs – palsas in West-Siberian Northern Lowlands

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Unique geography

Separate cultural space

A special type of human beings

A unique role in the events of the twentieth century

Diversity of natural, geological and biological resources

Unique natural conditions

Unique historical project, the history of migrations and settlers

Network of cities with a unique destiny

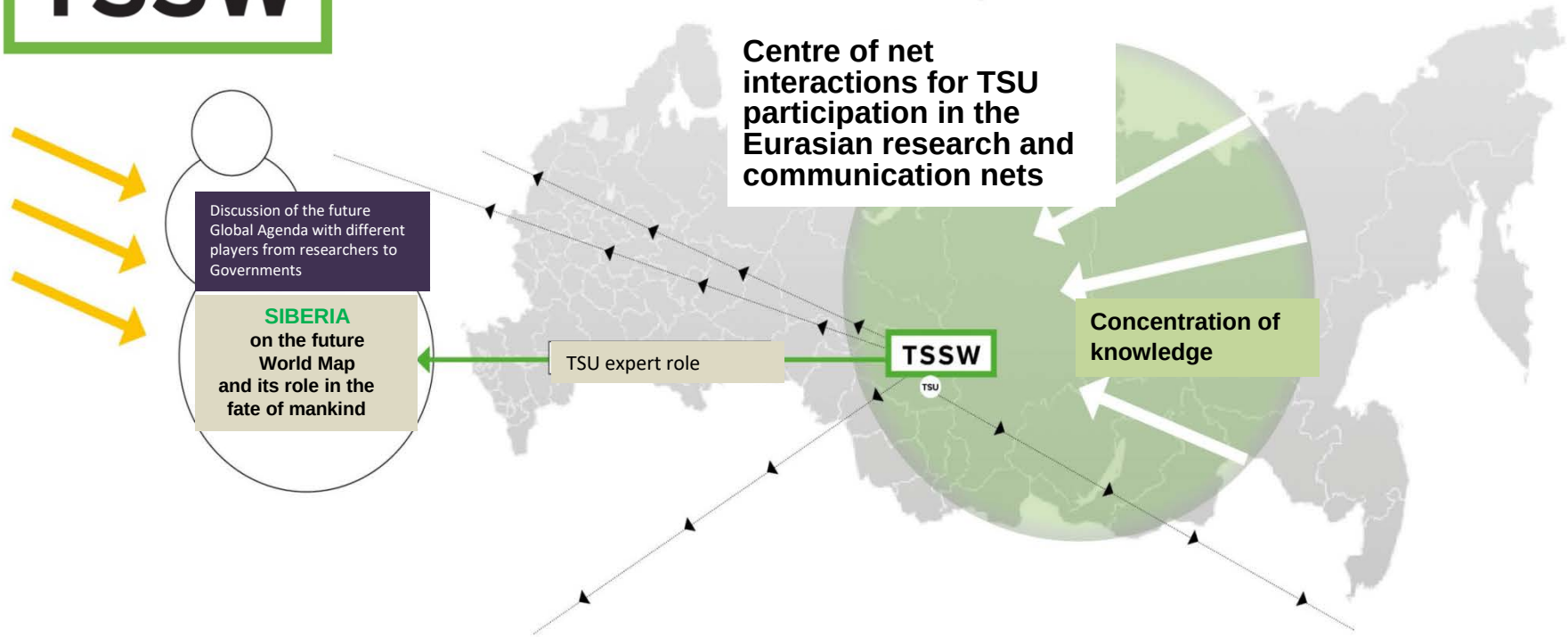
Region of innovative economy formation

Unique network of intelligent hubs

TSSW

Welcome to the Trans-Siberian intellectual journey!

National Research Tomsk State University



Climate, landscape, biodiversity, history, cultural, scientific and innovative potential of this unique macro-region are waiting to be explored in the context of global collaboration. We invite you to see Siberia as a new space for your projects, an area of cooperation, and a source of inspiration and new ideas.

TSSW Mission

To engage Siberia in the World.

To engage the World

in the development of Siberia

Research priorities of TSSW and possible key subjects

Earth and natural sciences

Arctic system
Climate change and water recourses
Biodiversity

Medicine and man

«Siberian health»
«Healthy food»

Materials and technology

Materials for extreme conditions
Intellectual and natural resources of Siberia

History, Archaeology, Ethnography

Migration and resettlement
Indigenous peoples
Gulag and World War II

Anthropology, language, culture

Ethnic and religious relations
Russian language and traditional culture

Economy and agriculture

The struggle for resources
Environmentally friendly products

Urbanity and creative industries

Cities strategies
Becoming a knowledge-based economy

The main activity of TSW focused on creating

— scientific

— educational

— intellectual (analytical)

— infrastructural

— innovation

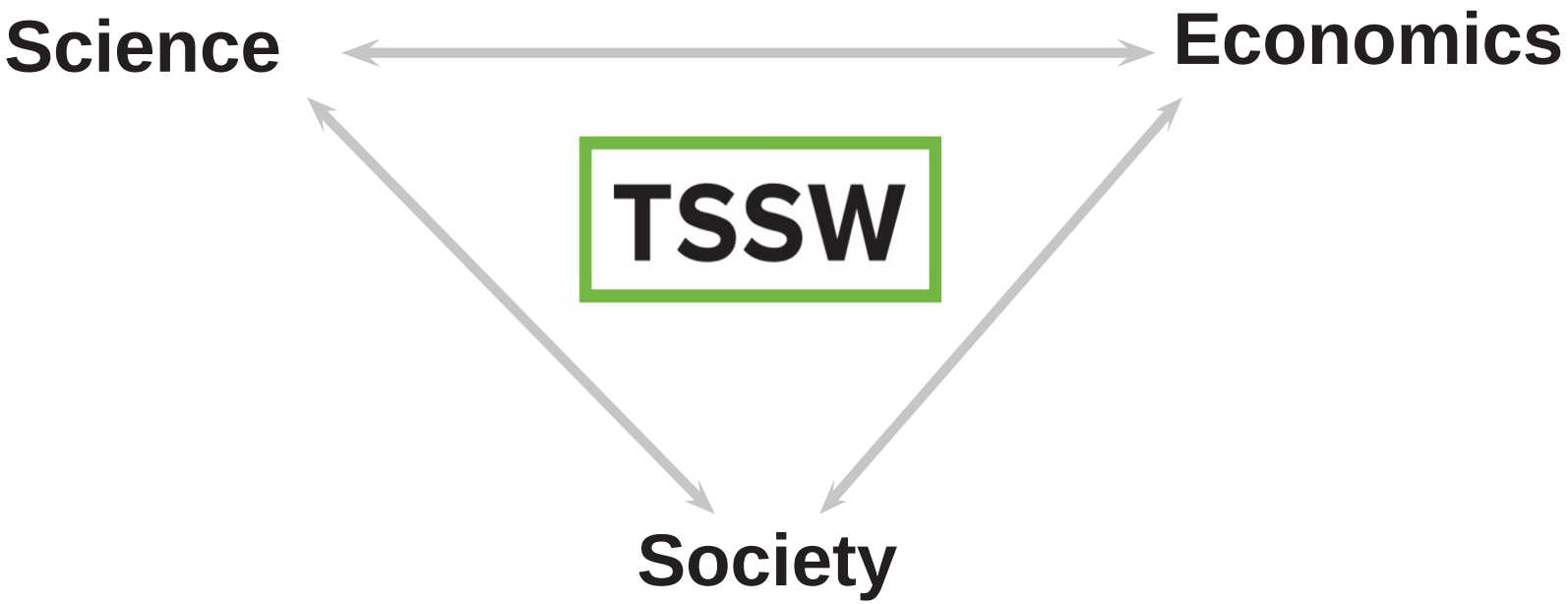
and media

products

Formation of integrated interdisciplinary educational programs

transfer of knowledge and technology

Master programs
“Siberian and Arctic Studies” and “Siberia: modern development, culture, history (Russian Studies: Siberia)” both in Russian and in English



Affiliate networks

National Research Tomsk State University

INTERACT

neon | NATIONAL ECOLOGICAL OBSERVATORY NETWORK

ARCTIC COUNCIL

SAON SUSTAINING ARCTIC OBSERVING NETWORKS

ISAC

WWF

IASC

AMAP

GEO

DAVIS CENTER for Russian and Eurasian Studies Harvard University

europeana think culture

FUEN

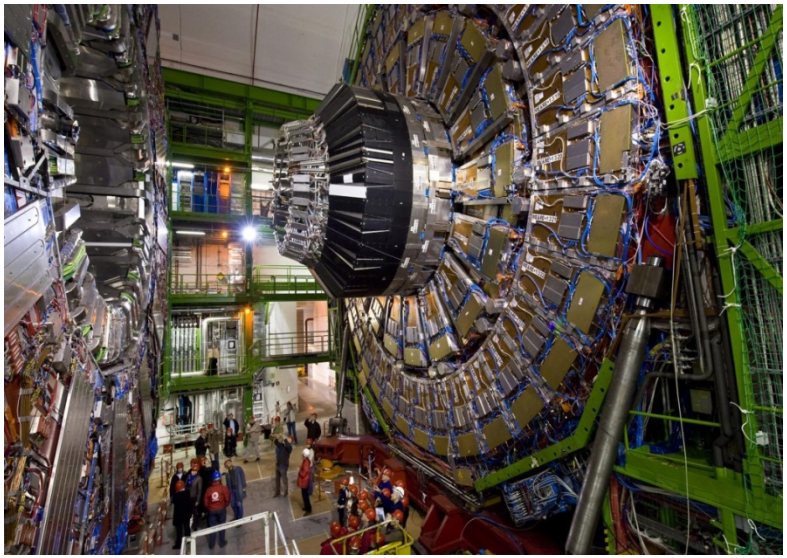
IFLA

Research nets and collaborations

Mega-science and mega-facilities

The concept of "mega-science" is usually applied in the field of physics. Extremely expensive and incredibly complex equipment are usually developed for mega-science. It is so expensive that neither one country in the World, even the richest one, can pay for its installation and even work on it. Therefore, different countries and leading scientific centers unite their resources for the development of mega-science. Scientific consortiums are being formed to work on mega-facilities.

For any research organization it is incredibly prestigious to become a member of such a consortium.



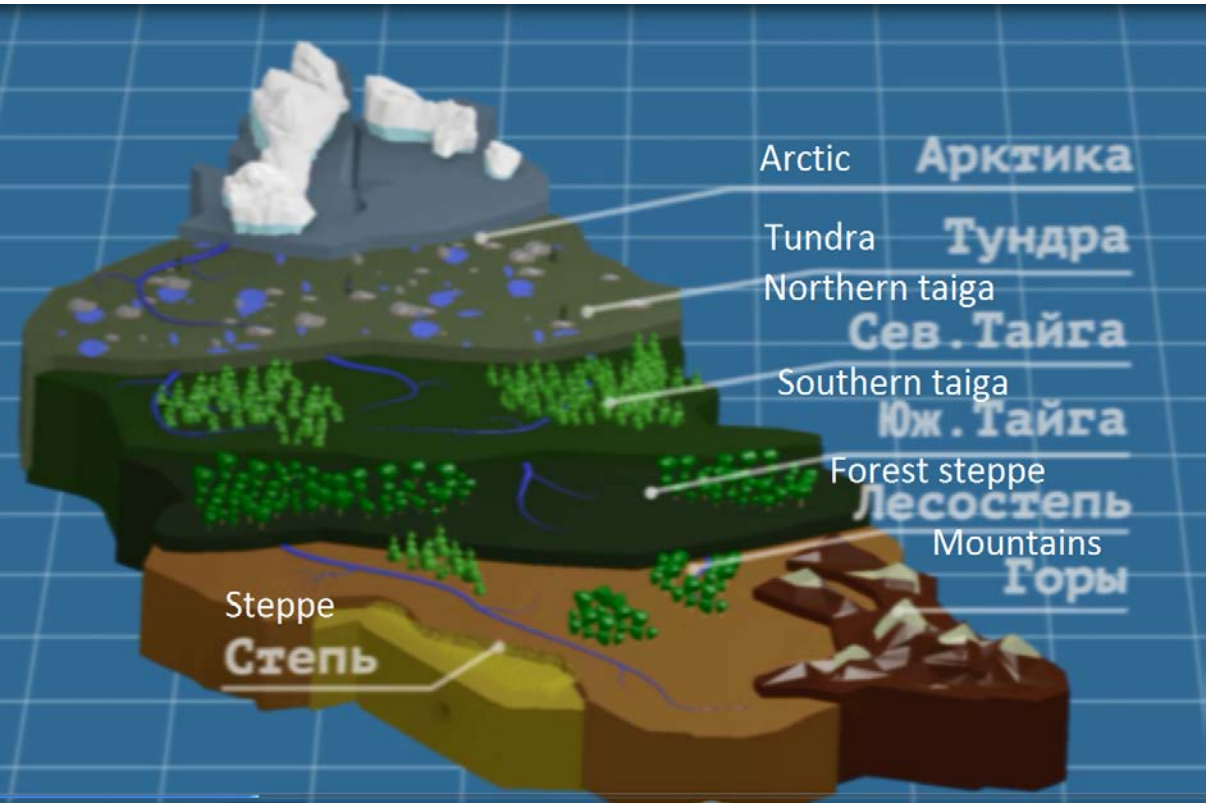
Large Hadron Collider (*LHC*) in Switzerland

Western Siberia as a unique wetland area

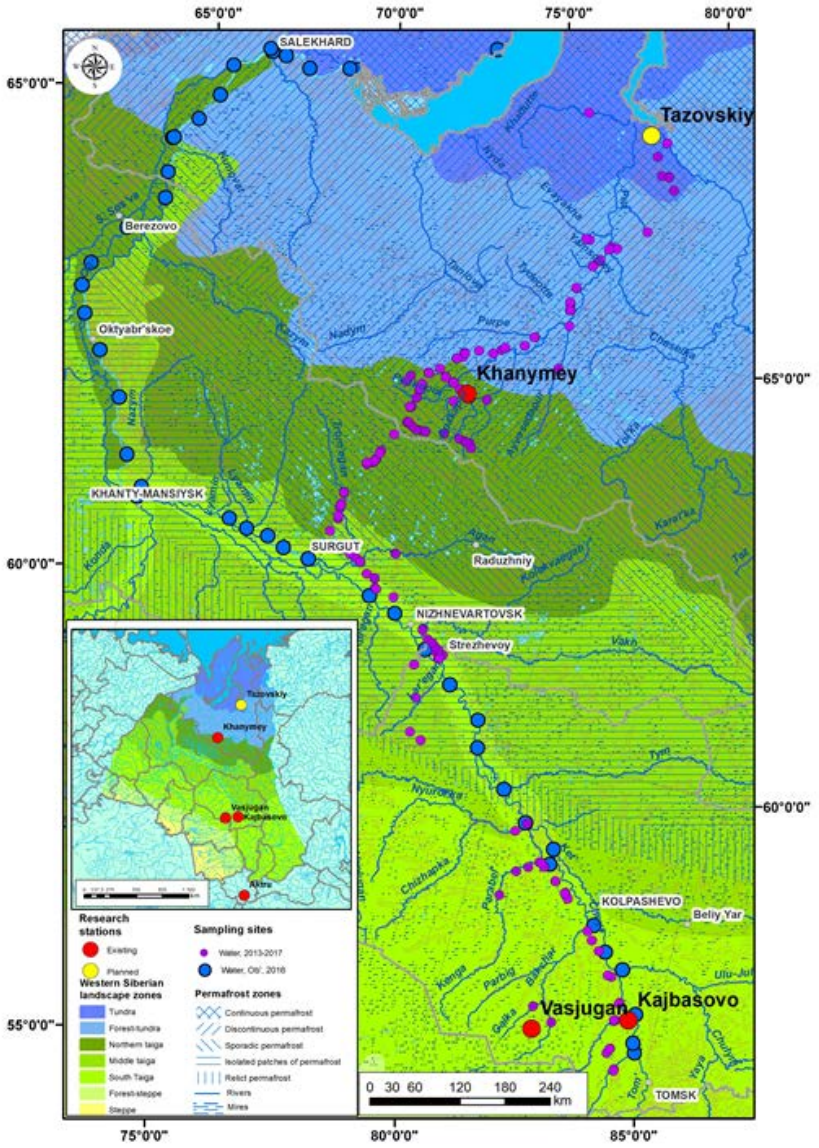
- unique wetland area;
- the world's largest mire Great Vasyugan (area of 7.5 million hectares);
- 40% pristine wetland landscapes of the planet;
- ¼ carbon stored by the terrestrial ecosystems of the planet kept in Western Siberia;
- Global climate-regulation function;
- mega- profile (ecological corridor) with a length of 2500 km;
- infrastructure and unparalleled access to the region;
- all-seasons sampling (spring, summer, autumn, winter), 5-6 expeditions per year;
- a combination of methods of ground and remote monitoring, access to the study of genomic research and fine chemical mechanisms of transformation of organic matter;
- attractiveness to the international scientific community;
- formation of network projects and research consortia.

National Research
Tomsk
State
University

Western Siberia as a natural mega-facility: “Siberian Natural Collider”



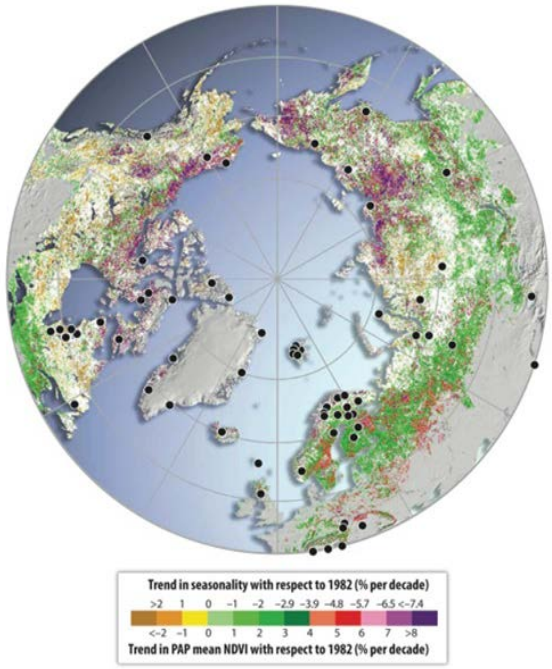
New Mega-facility in Western Siberia developed by Tomsk State University, a member of INTERACT



Unique mega-transect unparalleled anywhere in the World with an advanced cluster of field stations for conducting surveys, monitoring, sampling, live experiments, and manipulations was founded, extending 2500 km from the high mountain region of Altai in the south and to the deep Arctic Region in the north.

National Research Tomsk State University

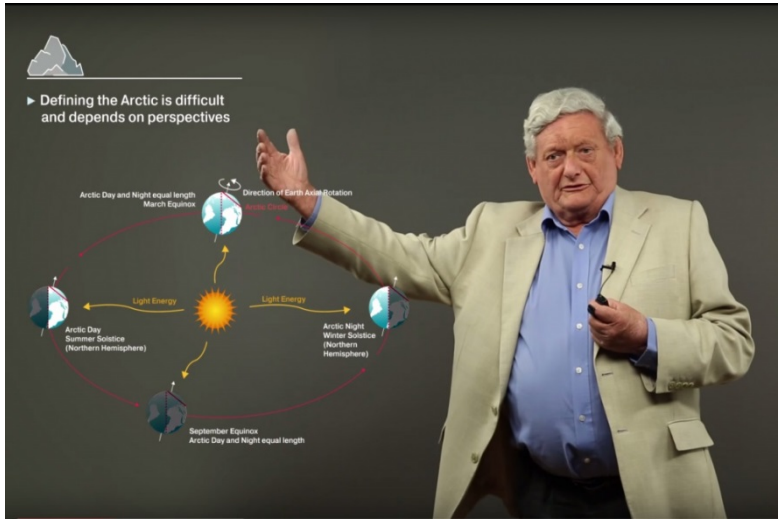
INTERACT



INTERACT is an infrastructure project, a circumarctic network of currently 93 terrestrial field bases in northern Europe, Russia, US, Canada, Greenland, Iceland, the Faroe Islands and Scotland as well as stations in northern alpine areas. INTERACT specifically seeks to build capacity for research and monitoring in the European Arctic and beyond, and is offering access to numerous research stations through the Transnational Access program.

National Research Tomsk State University

Founder of INTERACT Professor Callaghan also adopted the concept called the 4Ms, Monitoring, Manipulation, Modeling, and Management that represents three research angles that in a joint effort are pivotal for better understanding environmental changes and to better predict future changes.



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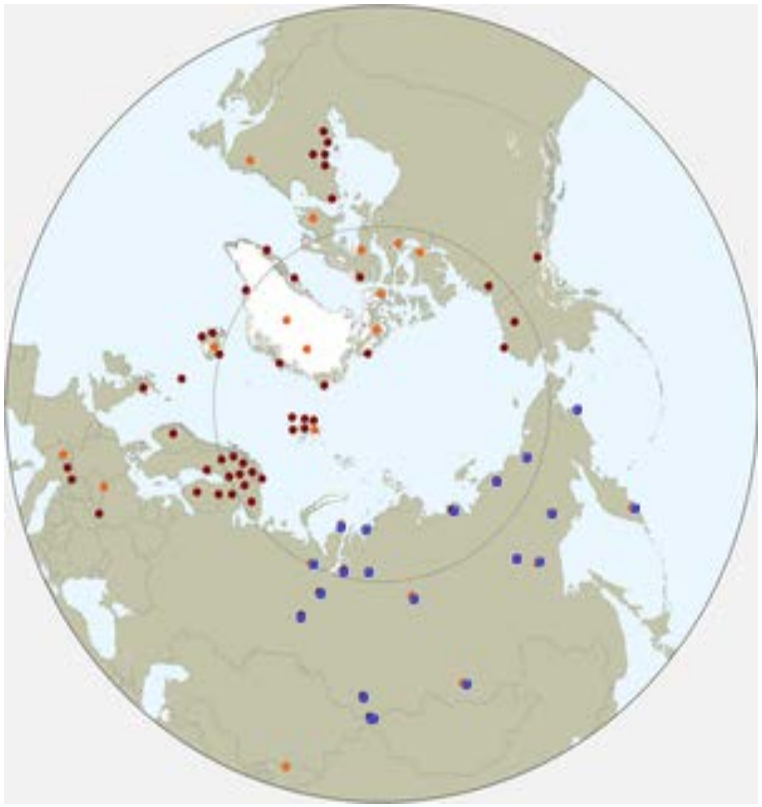
Siberian Environmental Change Network (SecNet)

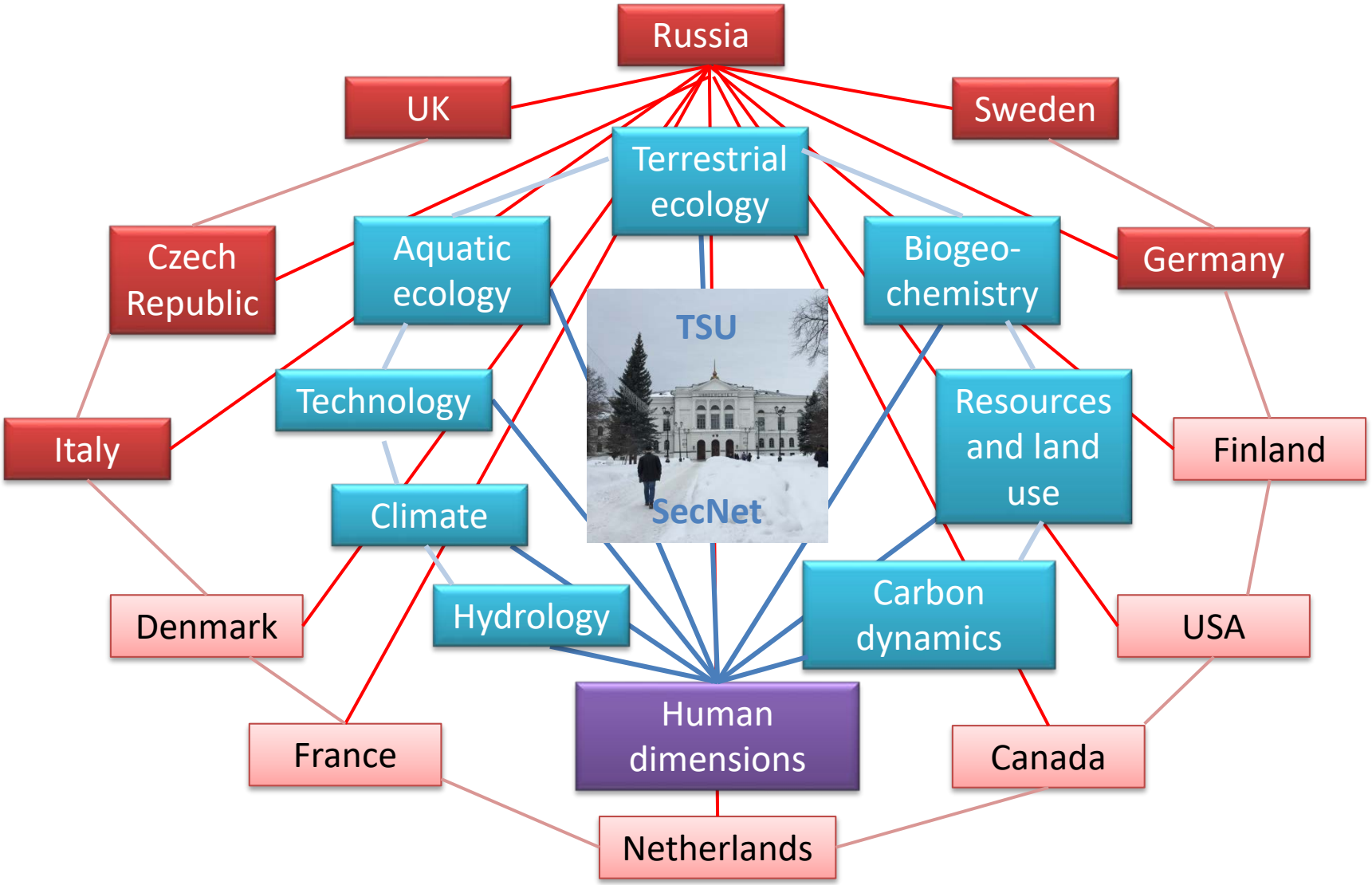


- Blue – Siberian stations

Siberian Environmental Change Network (SecNET) established in 2016 is an open community of educational institutions, research organizations, scientific groups and individual scientists united by the common goal of promoting sustainable development of the northern and polar regions by accumulating comprehensive experience and comprehensive knowledge of the human and natural environment of Siberia and using them to understand and predict socially significant changes and prevention of negative consequences of anthropogenic impact.

The aims of SecNet development are to identify, model and forecast the climate-caused changes in the Siberian environmental state in order to achieve synergy in forming the ecologically friendly management of natural resources, creating new materials and technologies for improving the quality of human life in the region and beyond.

We have brought experts together from throughout Russia and abroad who study many different fields.



Many others will contribute later

SecNet strategy

Link world-class international and Russian institutes researching Siberia

Link multiple disciplines and approaches

Provide a “one-stop-shop” for information on Siberia

Communicate knowledge to educators, researchers, policy-makers and the public

SecNET

Siberian Mega-transect

(work in progress)

variation in space from the 100 km to 10 m scales

Conceptual pathway

- Identifying landscape units
- Identifying past changes, characterising baseline conditions, projecting future changes
- Identifying drivers of change
- Quantifying consequences of change
- Identifying challenges and opportunities and Innovation

Desert

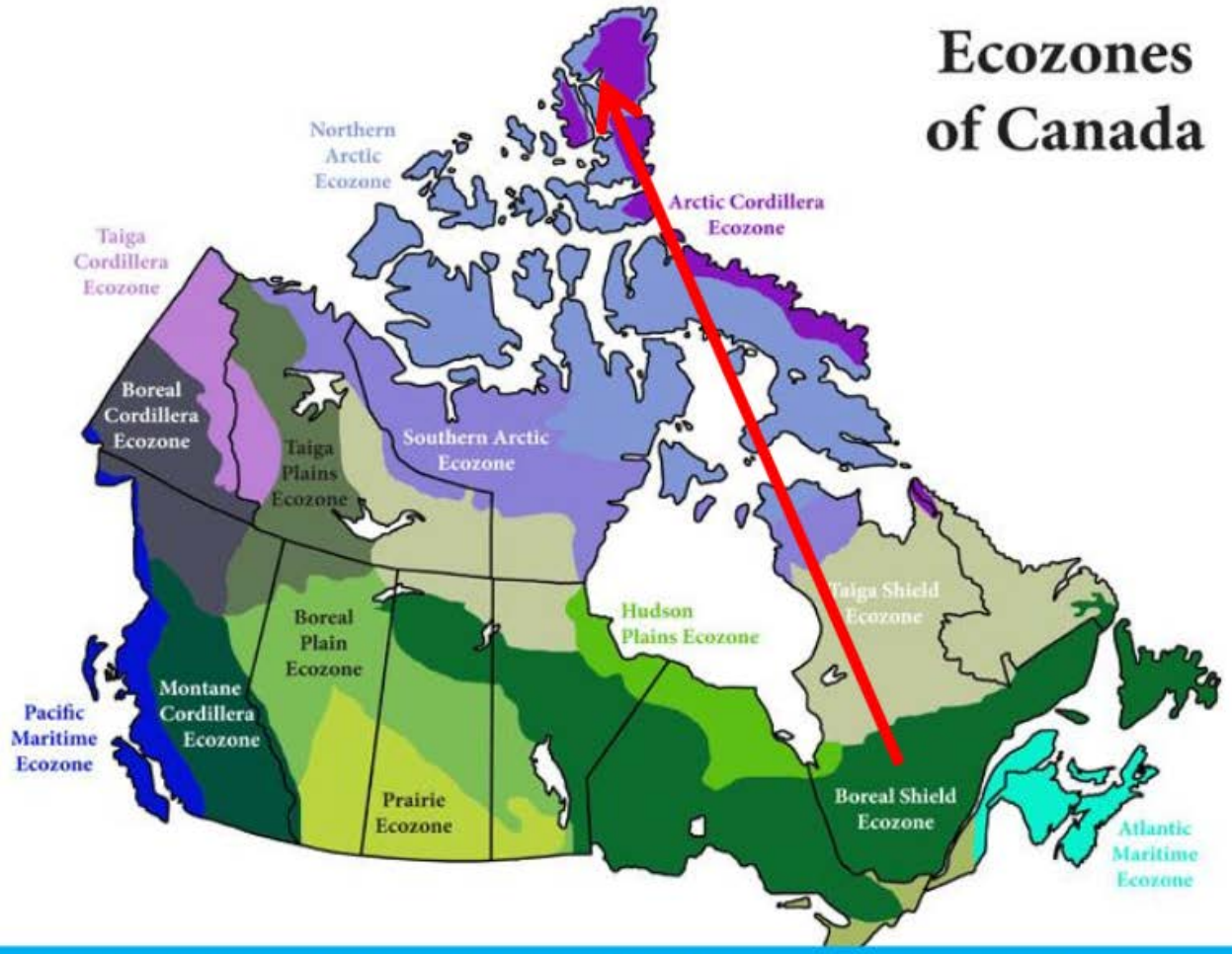
Steppes

Mountain

Taiga

Tundra

The latitudinal gradient covered by the CEN network in Eastern Canada offers opportunities to study and predict the impacts of global change



We can take advantage of the natural variability along this gradient to improve our understanding of the structure and functioning of natural ecosystems and geosystems

CENTRE D'ÉTUDES NORDIQUES
CEN Centre for Northern Studies

Stations de recherche

QAUJISARVIK

Field stations

Stations de recherche – Research stations

Ward Hunt 83°N

Bylot 73°N

Salluit 62°N

Boniface 58°N

Umiujaq & LEC 56°N

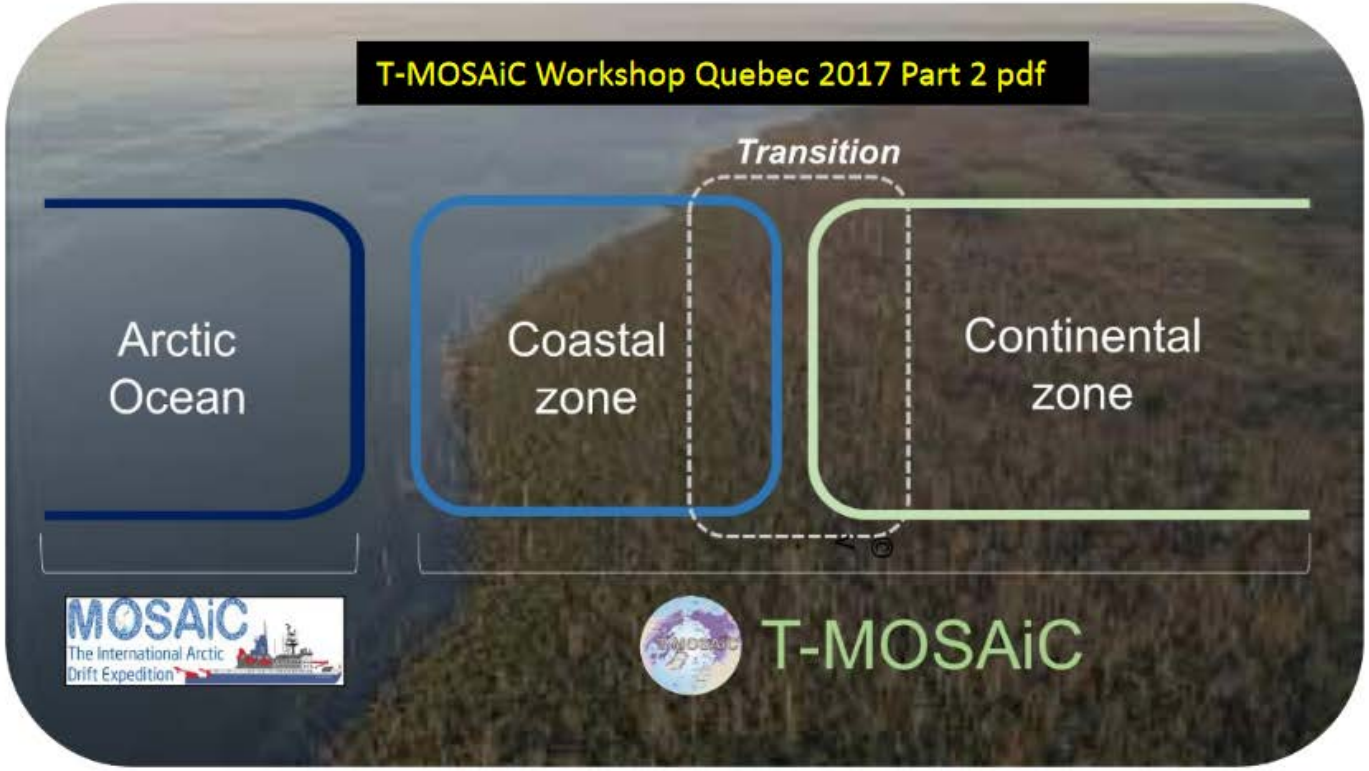
Kuujjuarapik-Whapmagoostui 55°N

Radisson 53°N

Louis-Edmond-Hamelin 46°N

In addition, we collaborate with agencies maintaining infrastucture along the gradient

T-MOSAiC Presentations
Summary slides (PM)

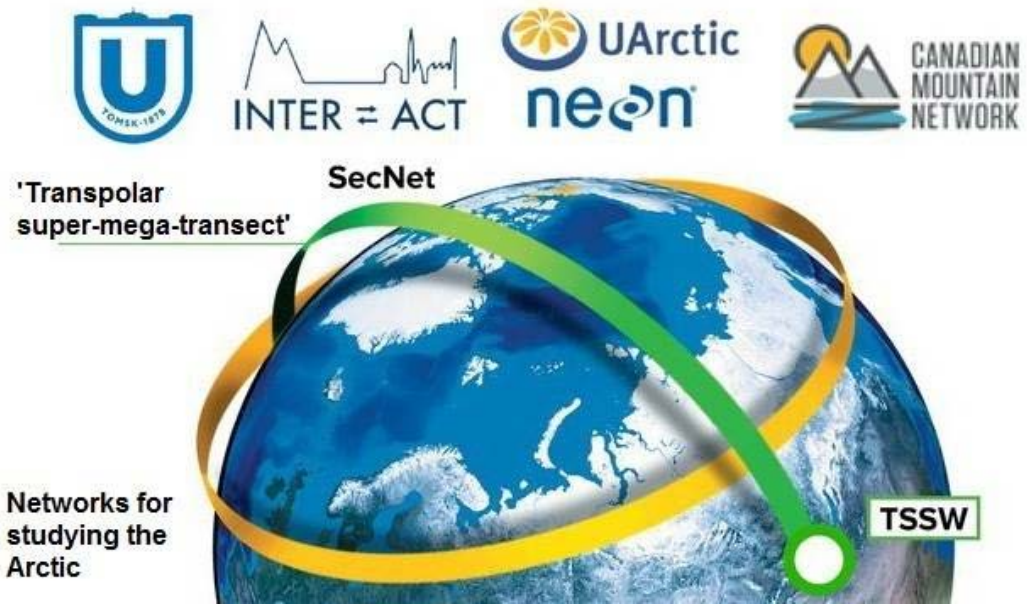


T-MOSAiC – discussions initiated by IASC

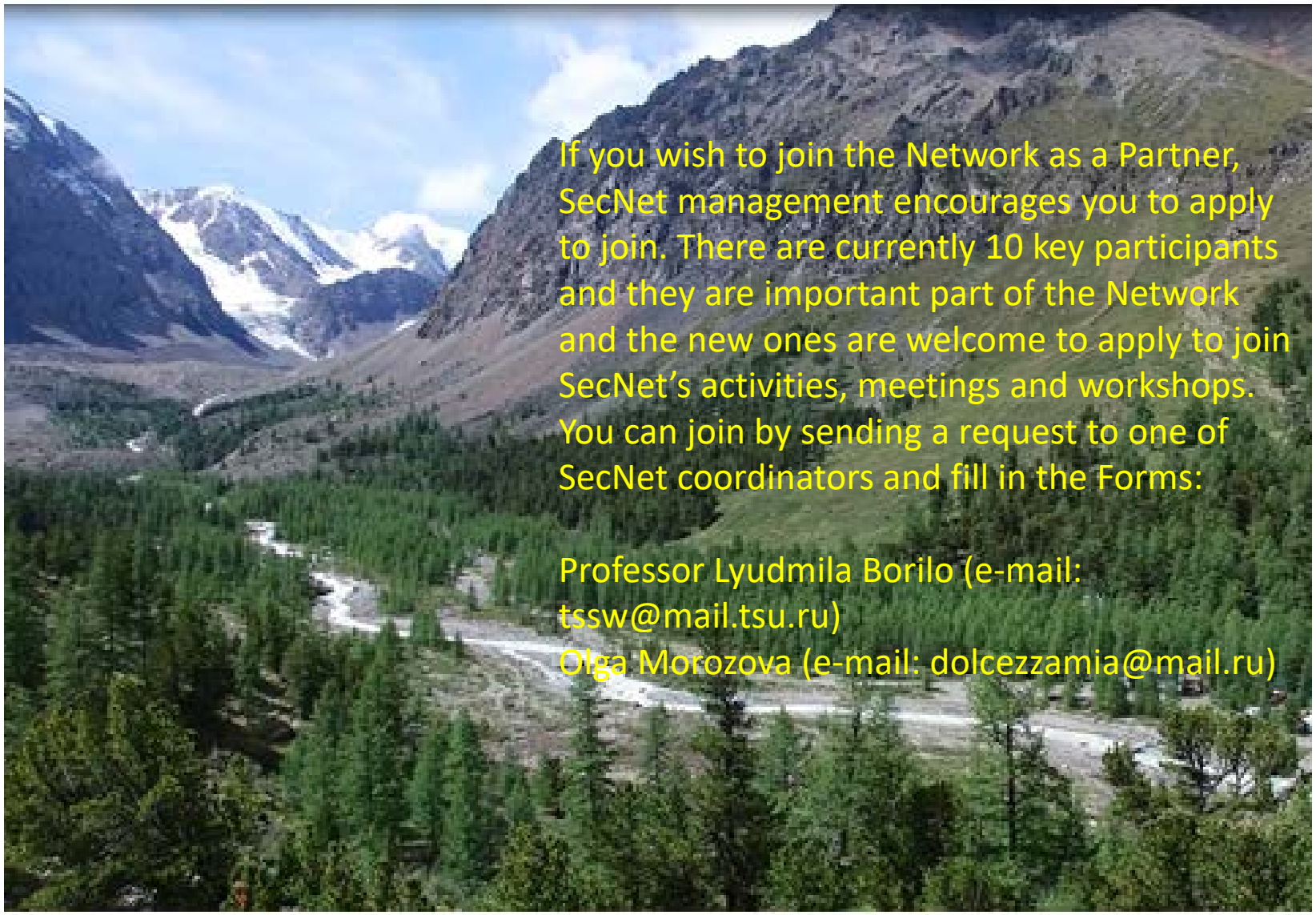
T-MOSAiC aims to coordinate complementary activities that could both aid and benefit from MOSAiC by extending the work to the lands surrounding the Arctic Ocean and to the northern communities who live on those lands

T-MOSAiC program

The meeting of participants of the new global T-MOSAiC program was in Quebec. This meeting was supported by International Arctic Science Committee (IASC). At this meeting, TSU introduced its mega-transect - a network of research stations for studying global climatic environmental changes. In 2017, Canadian scientists started to create a similar structure called the Canadian Northern Gradient. Russian and Canadian scientists decided to connect these two mega-transects at a meeting in Quebec. The connection took place at the meeting in Quebec.



Join SecNet



If you wish to join the Network as a Partner, SecNet management encourages you to apply to join. There are currently 10 key participants and they are important part of the Network and the new ones are welcome to apply to join SecNet's activities, meetings and workshops. You can join by sending a request to one of SecNet coordinators and fill in the Forms:

Professor Lyudmila Borilo (e-mail: tssw@mail.tsu.ru)
Olga Morozova (e-mail: dolcezzamia@mail.ru)

Thank you and welcome to TSSW –

Mega-system for studying boundless Universe named “Siberia”