Experience of participation of the State University of Land Use Planning in the UI GreenMetric rating for the development of a system of indicators for monitoring "environmentally sustainable development" of the Moscow region

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World Ranking	SI Ranking	EC Ranking	WS Ranking
455	567	228	551
	WR Ranking	TR Ranking	ED Ranking
	673	431	234

Country Ranking	SI Ranking	EC Ranking	WS Ranking
20	32	9	26
	WR Ranking	TR Ranking	ED Ranking
	38	22	12

1. VERIFIED DATA

Category	Point	Percentage of Point to Total Score	Maximum Point	Percentage of Point to Maximum Point
Setting and Infrastructure (SI)	550	12 %	1500	36.67 %
Energy and Climate Change (EC)	1,175	26 %	2100	55.95 %
Waste (WS)	600	13 %	1800	33.33 %
Water (WR)	150	3 %	1000	15.00 %
Transportation (TR)	925	20 %	1800	51.39 %
Education (ED)	1,200	26 %	1800	66.67 %
Total Score	4,600	100 %	10000	46.00 %

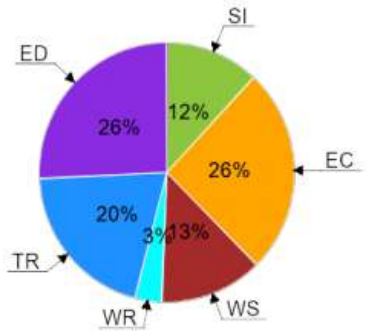


Figure 1.1 Overall Score Diagram

In 2018, the State University of Land Use Planning (SULUP) signed a Declaration of entry and further participation in the Green Metric World University Rankings Network.

Setting and Infrastructure

Indicator		Score
SI.1	The ratio of open space area towards total area	225
SI.2	Area on campus covered in forest	50
SI.3	Area on campus covered in planted vegetation	0
SI.4	Area on campus for water absorbance	0
SI.5	The ratio of open space area divided campus population	75
SI.6	University budget for sustainability effort	200

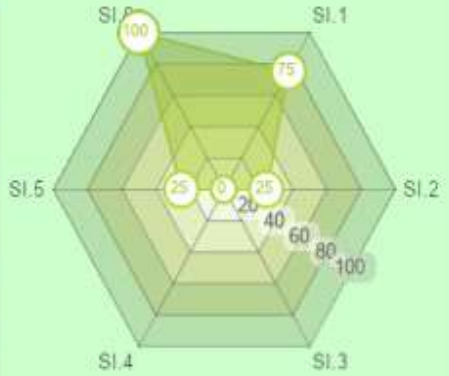
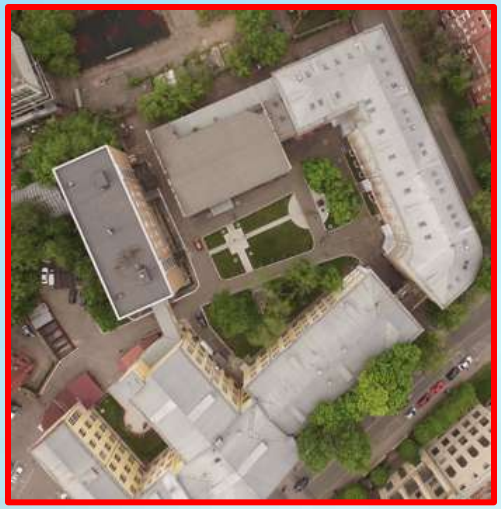


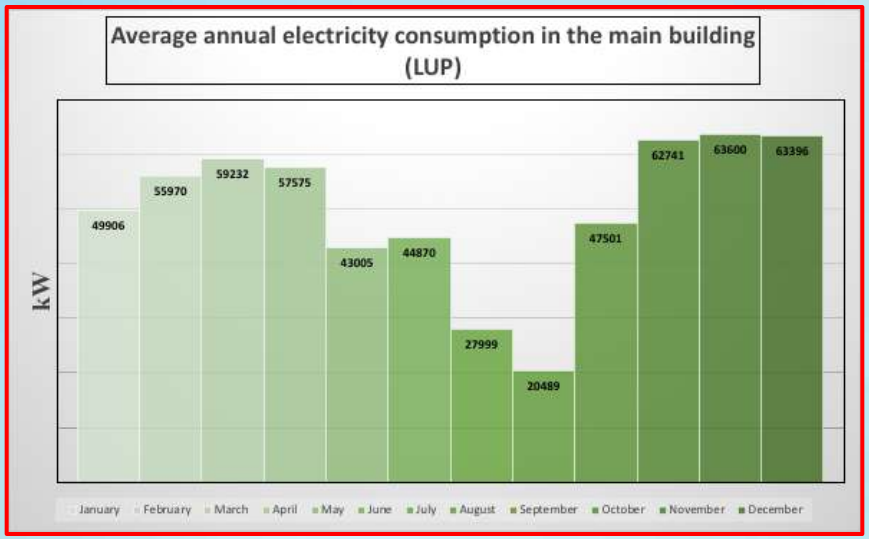
Figure 5.1 Percentage of Score to Maximum Score for Setting and Infrastructure



Energy and Climate Change

Indicator		Score
EC.1	Energy efficient appliances usage	150
EC.2	Smart building program implementation	300
EC.3	Number of renewable energy source in campus	0
EC.4	The total electricity usage divided by total campus population	300
EC.5	The ratio of renewable energy production towards total energy usage per year	0
EC.6	Element of green building implementation	150
EC.7	Greenhouse gas emission reduction program	50
EC.8	The ratio of total carbon footprint divided campus population	225

Figure 5.2 Percentage of Score to Maximum Score for Energy and Climate Change



Waste

Indicator		Score
WS.1	Recycling program for university waste	75
WS.2	Program to reduce the use of paper and plastic in campus	75
WS.3	Organic waste treatment	75
WS.4	Inorganic waste treatment	75
WS.5	Toxic waste treatment	75
WS.6	Sewerage disposal	225

Figure 5.3 Percentage of Score to Maximum Score for Waste

Water

Indicator		Score
WR.1	Water conservation program	0
WR.2	Water recycling program	0
WR.3	The use of water efficient appliances	0
WR.4	Piped water consumed	150

Figure 5.4 Percentage of Score to Maximum Score for Water

Transportation

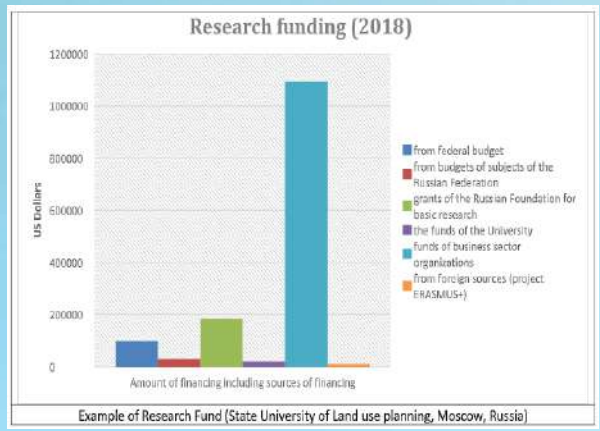
Indicator		Score
TR.1	The ratio of total vehicles (cars and motorcycles) divided by total campus population	200
TR.2	Shuttle services	300
TR.3	Zero Emission Vehicles (ZEV) policy on campus	0
TR.4	The ratio of Zero Emission Vehicles (ZEV) divided by total campus population	0
TR.5	Ratio of parking area to total campus area	150
TR.6	Transportation program designed to limit or decrease the parking area on campus for the last 3 years	50
TR.7	Number of transportation initiatives to decrease private vehicles on campus	0
TR.8	Pedestrian policy on campus	225

Figure 5.5 Percentage of Score to Maximum Score for Transportation

Education

Indicator		Score
ED.1	The ratio of sustainability courses towards total courses/modules	225
ED.2	The ratio of sustainability research funding towards total research funding	225
ED.3	Sustainability publications	300
ED.4	Sustainability events	225
ED.5	Sustainability student organizations	75
ED.6	Sustainability websites	150
ED.7	Sustainability report	0

Figure 5.6 Percentage of Score to Maximum Score for Education



Example of Research Fund (State University of Land use planning, Moscow, Russia)

In General, the University at 7 faculties on October 1, 2018 enrolled 4078 students, including 2826 full-time (69.3 %), part-time 1176 (28.9%), part-time 76 (1.8).

At the expense of the Federal budget study: for undergraduate and specialist part – 1514 people, and the absentee – 710, master's degree programme part – 203 in absentia to 20 people.

Training of specialists with higher education is for 8 large groups of professions:

05.00.00 – Earth Science;

07.00.00 – Architecture;

20.00.00 – Technosphere safety and environmental engineering;

21.00.00 – Applied Geology, mining, oil and gas engineering and geodesy;

35.00.00 – Agriculture, forestry and fisheries;

38.00.00 – Economics and management;

40.00.00 – Law;

54.00.00 – Fine and applied arts.

The University implements 1 program of specialty, 9 directions of bachelor's degree, 6 directions of master's degree, 7 programs of training of scientific and pedagogical personnel in postgraduate study.

Foundation of SEB Gornoye: 1963
Location: sett. Spas-Doschaty, Zaraisky district, Moscow region.

The place combines ***unique physical-geographical and agricultural features*** necessary for educational and industrial practices; scientific work for the staff and students of the Department of Soil Science, Ecology and Nature Management of the SULUP.

SEB «Gornoye» The scientific base is a **unique natural object:**

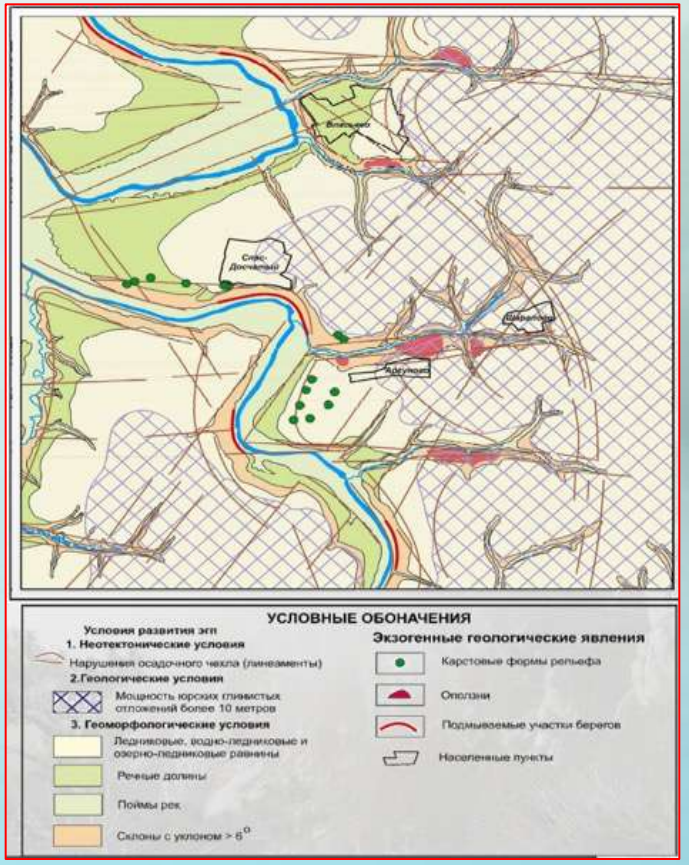
- unique combination of landscapes of the valley complex of the Osetr River and watershed areas;
- location on a semi-mountainous forested area;
- varied soil cover;
- a unique combination of different types of plant communities;
- rich flora and fauna;
- picturesque areas of the semi-mountainous and flat stream of the meandering river Osetr;
- the presence of various and diverse natural complexes, and their elements (soils, relief, rocks, fauna and flora, etc.) with low anthropogenic impact, a unique drainage basin of the Osetr River.

Field practice - *mandatory element of the educational process in the system of higher education in the natural sciences, aimed at expanding and deepening the knowledge of students obtained in the process of theoretical study of the material.*

They contribute to the formation of an ecological worldview and aesthetic education of students, give a visual representation of natural phenomena and their relationship, teach to register facts and analyze them, generalize what they see and draw conclusions.

Educational field practices on a SEB «Gornoye» are the basic basis of professional training and an obligatory element of the training program for professional environmentalists-users of natural resources. For students, there are several specialized practices in: hydrology, hydrochemistry, General ecology, landscape science, meteorology and climatology, Geoecology.

The uniqueness of the SEB «Gornoye» with a variety of landscapes, tracts, facies allows master's and postgraduate students to test their knowledge gained during training and further apply it in their profession.



Map of the distribution of exogenous geological processes and their development conditions

..... And an endless range of possibilities for various scientific research and writing scientific articles.

In order to assess the current ecological state of individual components of the natural environment in the surveyed territory, geo-ecological monitoring activities have been carried out in the period from 2015 to the present, which include the following set of studies:

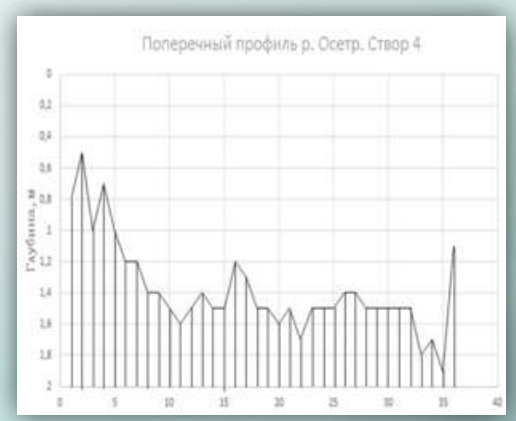
-air condition assessment;

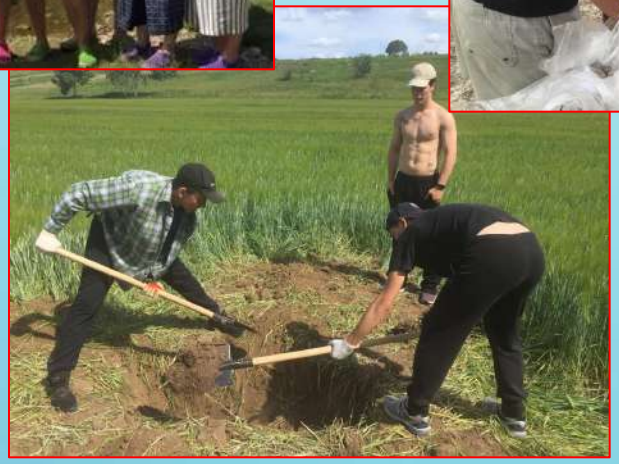
-radiation inspection of the site;

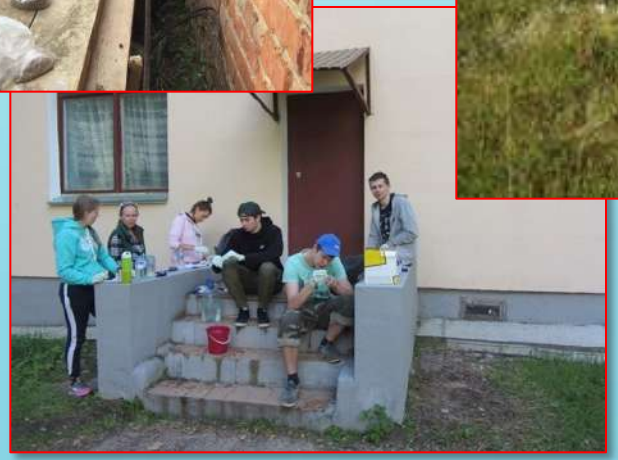
-measurement of noise and electromagnetic radiation;

- ecochemical and microbiological testing of soil from surface horizons and soils from geological wells for the presence of heavy metals and organic pollutants;

- study of surface and ground water quality.





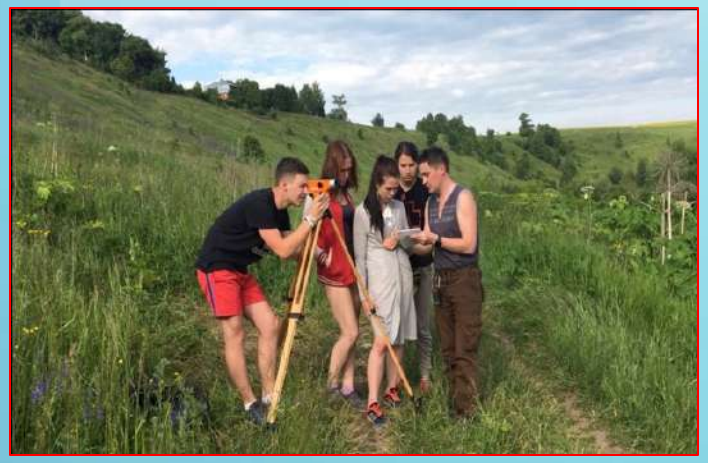


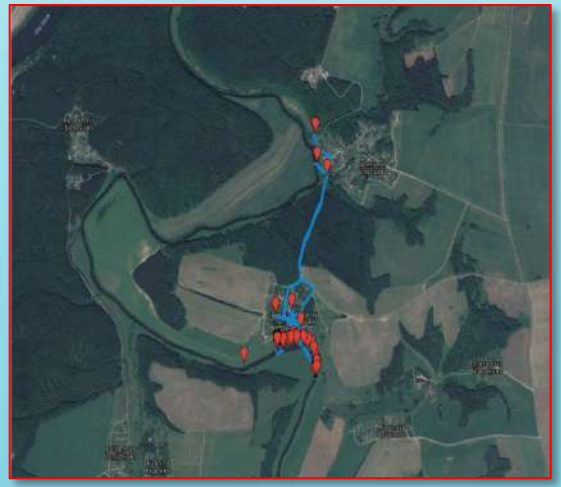
Every year, together with ***the Department of Geodesy and Cartography*** of the State University of Land Use Planning, on the territory of the ***SEB "Gornoye"***, work is carried out on:

- equipping a hydrological post on the Osetr River;
- practical development of the procedure and methods for performing work on water bodies;
- conducting systematic observations of the water regime and meteorological phenomena.

По своим физико-географическим и геоморфологическим характеристикам территория полигона уникальна, достаточно сказать, что перепад высот местности составляет более 100 м.

Наличие четырех населенных пунктов, реки Осетр, разветвленная овражно-балочная сеть, сложный рельеф предоставляют широкие возможности для эффективного проведения учебных практик и научно-производственных разработок по геодезии, аэрофотогеодезии, почвоведению, земледелию и растениеводству, землеустроительному проектированию, ведению кадастрового учета сельскохозяйственных угодий и земель населенных пунктов.





- The number of students at the department has increased
- Possibility of international cooperation

2015

2016

2017

2018

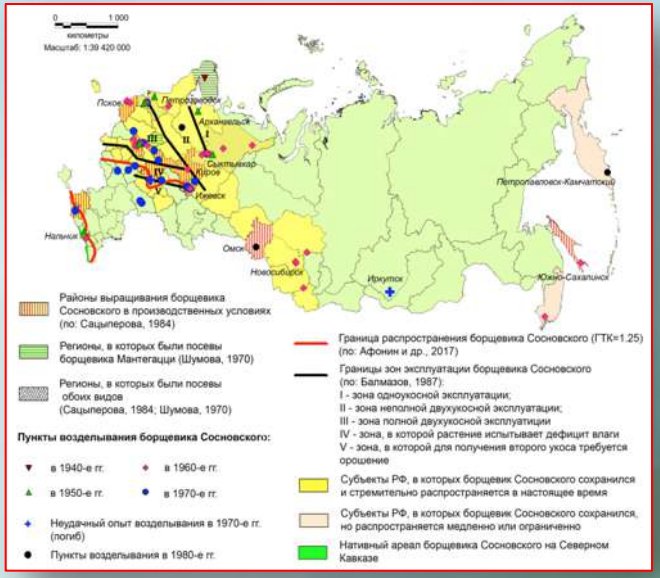
2019

Tempus international school for Erasmus + (2015), Stipendium Hungaricum scholarship program (2016).

Study *of the species diversity of plant communities in the Zaraisk district, including the territory of the SEB «Gornoye»*

- have been identified about 178 plant species ;
- have been identified 5 types of forest communities and 3 types of meadows;
- have been investigated the ecological problems of local communities;
- has been determined a list of alien species that threaten the species diversity of communities;
- was signed an agreement with the Tsitsin Main Botanical Garden of the Russian Academy of Sciences.

Scientific research of invasive plant species: Heracleum Sosnovsky



The territory of the SEB "Gornoye" base - "green campus" - compliance with the general requirements for "smart" buildings for 6 construction functions:

- *automation,*
- *security (physical security, presence sensors,video surveillance / CCTV),*
- *energy,*
- *water (sanitation),*
- *internal environment (thermal comfort and air quality)*
- *lighting (lighting, low-power lighting).*

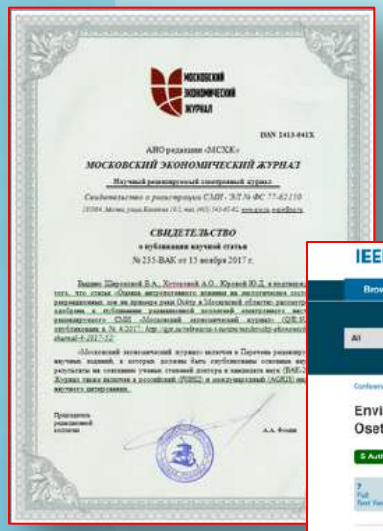
Field		Requirement		Description
B	Automation	B1	BMS	+
		B2	APP	-
S	Safety	S1	Intruder Alarm System	+
		S2	Fire-fighting	+
		S3	Video surveillance	+
		S4	Anti-flooding	-
E	Energy	E1	Monitoring	+
		E2	Management	
A	Water	A1	Monitoring	+
		A2	Recovery	
I	Indoore environment	I1	Thermal comfor	+
		I2	Air quality	+
		I3	Real-time	-
		I4	Passive system	
L	Lighting	L1	LEDs	+
		L2	Sensors	-
		L3	Shielding	-
		L4	Natural light	+

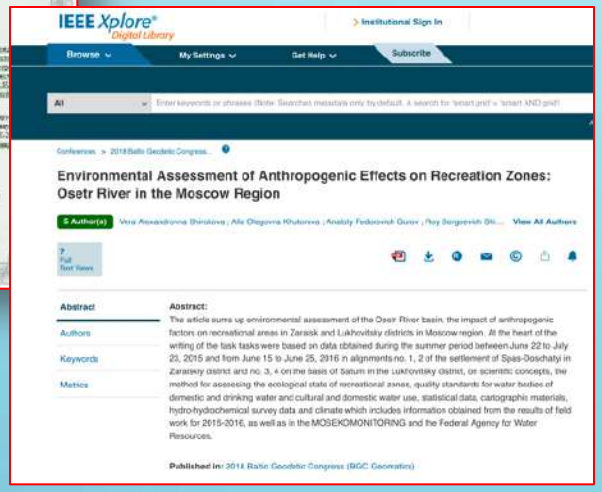
Results

The results of research on the SEB "Gornoe" are used as the basis for scientific reports, articles, final qualification works, dissertations.

Also, the data are actively used in conducting practical exercises in the discipline "Environmental Monitoring", writing research papers, etc.

More information: https://soil-eco.ru/





Perspectives

- the establishment of a number field of integrated geoenvironmental laboratories (hydrochemical, soil, geo-ecological);
- organization and development of ecological trails and water routes for the study of problems of geoecology and nature management;
- geo-environmental monitoring of the basin of small rivers;
- the development of proposals for the improvement of water quality of the Osetr river and the state of the field of recreation;
- as well as training students (collection and processing) to participate not only in the preparation of RFBR (Russian Foundation For Basic Research) and RSF(Russian Science Foundation) bids, but also in contractual work on environmental monitoring.

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