

Impilahti Field course

Introduction

SCOPE

Introduction to ore prospecting geology. Theoretical and practical training in ore prospecting and exploration. Geological mapping and studying magmatic and metamorphic Precambrian rocks.

Theoretical part includes the overview of local geology, structure and mineral deposits, as well as review of modern prospecting and exploration methods (geological structural mapping, soil and bedrock geochemistry, ground geophysics, data interpretation).

Practical part consists of:

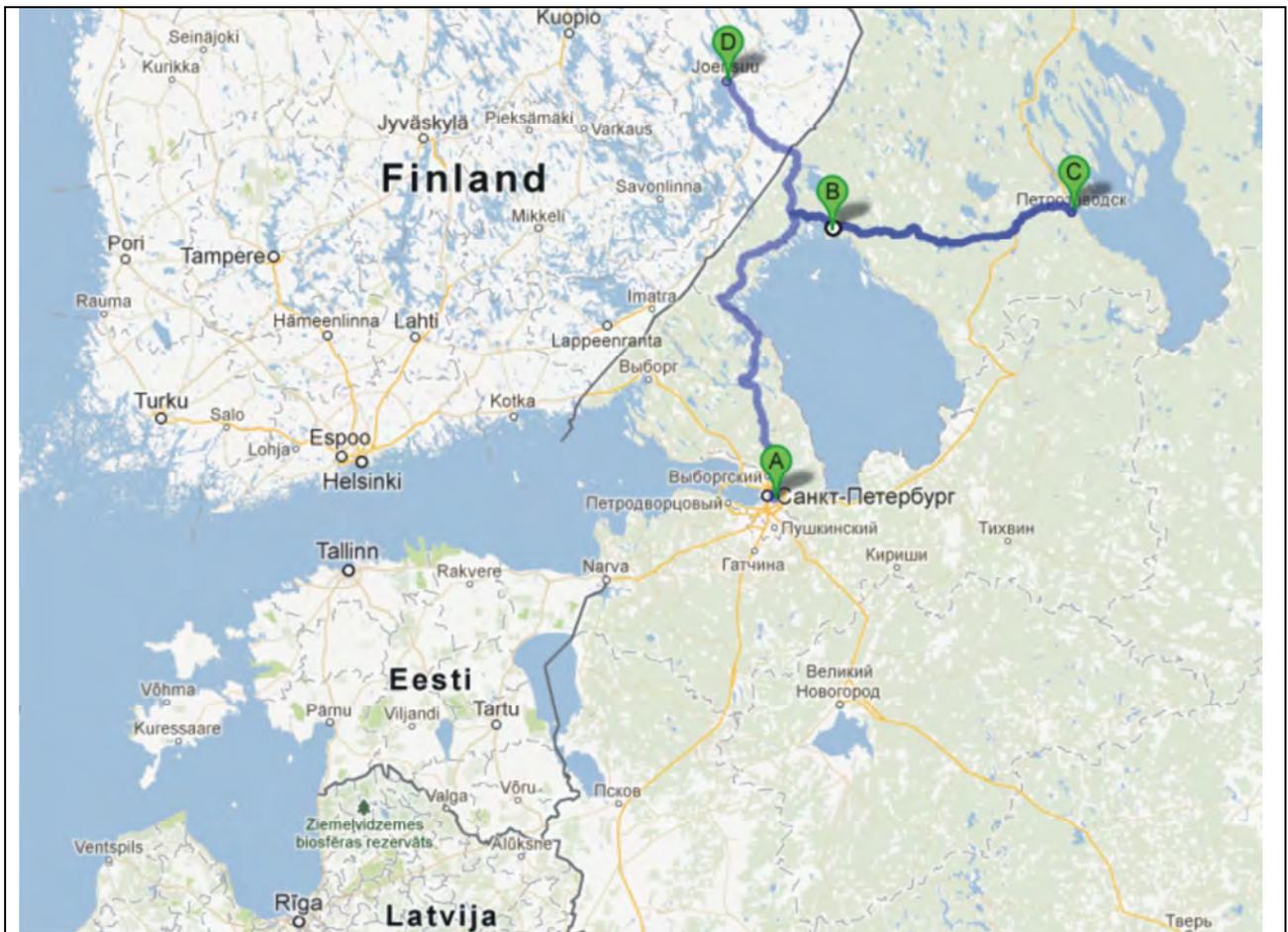
- Bedrock mapping and sampling
- Soil sampling and geochemical analyses using portable XRF-detectors. Field data interpretation. Field geochemistry map plotting

All collected field prospecting data is being analysed and represented as a report. The report includes bedrock geological map, geochemistry maps and prospecting map with localized potential areas for the possible discovery.



LOCATION

The field course is held in the North Ladoga region. Nearest towns are Impilahti, Pitkaranta and Sortavala. Saint-Petersburg State University has good establishment in Impilahti which is used as a field base for the field course. This base has enough space to accommodate up to 40 persons. Also it has all necessary field equipment. Impilahti village is connected with Saint-Petersburg (340 km) and Petrozavodsk (200 km) by roads, where international airports, railway stations and bus stations are situated. Also Impilahti village is 100 km far from Vyartsilya where Russian-Finnish border could be easily crossed by cars and buses. The nearest Finnish city is Joensuu.



Location map: A – City of St.Petersburg; B – Impilahti village; C – Petrozavodsk; D – Joensuu.

DATING

Annual field course is held on 1-18 of June and on 15-30 of September for different student groups.

TEACHING STAFF



Dr. Ivan A. Alexeev - associated professor within department of mineral resources, PhD. Specialization – ore prospecting and exploration, bedrock and ore geology, minerageny. Field of research – ore-forming systems, modern prospecting and exploration methods, geology and mineral deposits of Precambrian rocks.



Dr. Sergey V. Petrov - associated professor within department of mineral resources, PhD. Specialization – applied and economic geology, exploration, mining and ore processing, mineralogy



Dr. Alexandr V. Sergeev - associated professor within department of geochemistry, PhD. Specialization – prospecting geochemistry, bedrock and ore geology.



Dr. Alexandr S. Voinov - associated professor within department of mineral resources, PhD. Specialization – ore prospecting and exploration, bedrock and ore geology, minerageny. Field of research – geology and mineral deposits of Fennoscandian region, metalogeny of the Baltic shield.

STUDENTS GROUPS

Field course is organized for 3rd year students (bachelors) who specialize in ore geology, structural geology, petrology, geochemistry. Also this course could be useful for Masters students who have necessary geological background. Common number of students - 10 – 30 person per course.

General Information

HISTORICAL OVERVIEW

Pitkäranta region is well known for its mineral deposits and natural monuments. History of geological studies have several hundred years. Geologically, the landfill includes a variety of Precambrian metamorphic and igneous complexes, as well as related mineral deposits. St. Petersburg State University conducts various case studies in the region, and student field practices for last 50 years. During this time, extensive knowledge of the geology of the region and metallogeny was accumulated. In the last 6 years educational practice and research focuses on the study of geology and mineral resources using modern prospecting methods. As a result, a holistic approach was developed, to solve local problems of prediction and detection of ore occurrences and mineral deposits of the study area. Now the Field Course simulates all major stages of prospecting/exploration project - from planning and organization, throughout field-work, to prediction, evaluation and reporting.

GEOLOGY

The geological structure of the territory involved a variety of igneous and metamorphic complexes in complex structural relationships.

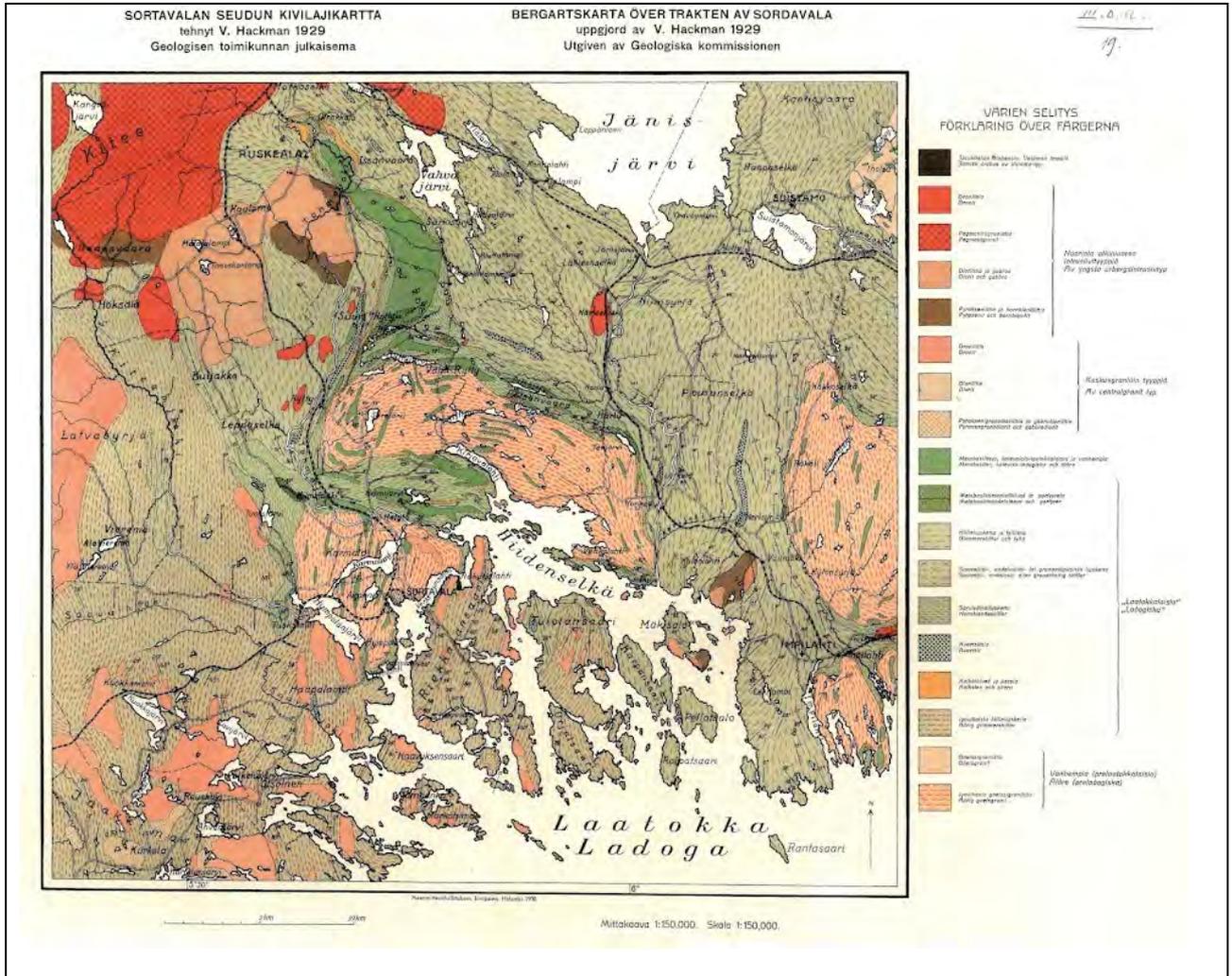
1. Archean granitic-gneiss domes AR. Very interesting geologically formation representing beigt domed structures AR (2,7 Ga). Granite composition varied: banded plagiogneisses and plagiomigmatites turning into a plagioclase-microcline, plagioclase, microcline and leucocratic microcline granite with banded textures and gneisses. Includes many mafic dikes converted to amphibolites and gabbro-amphibolites. Granite composed of quartz, plagioclase, microcline and some non-ferrous minerals. These structures include amphibolites inside.

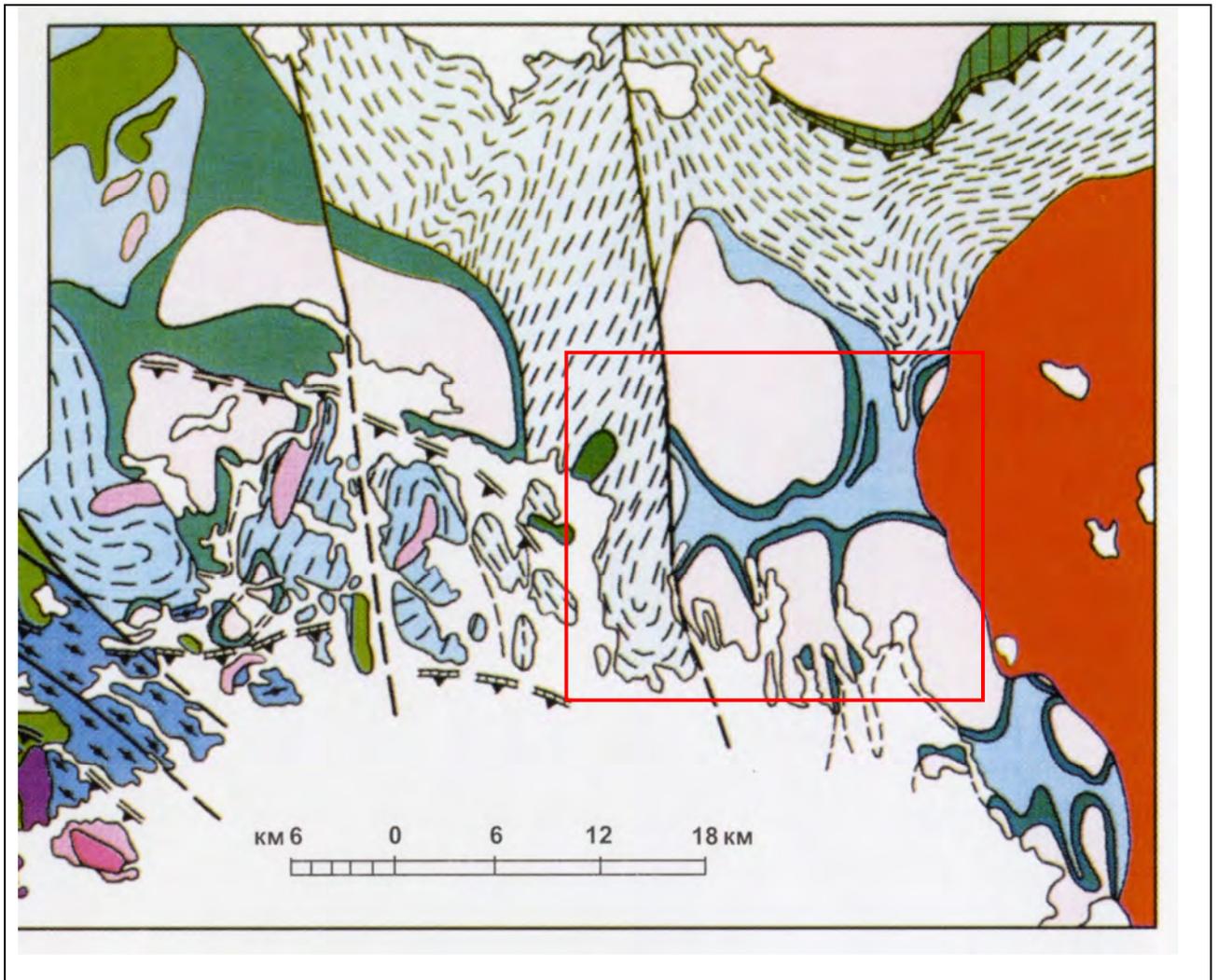
2. Stratified formations PR. Form a complexly folded structures. At the site are represented as rocks of Sortavala and Ladoga series. This variety of quartzite, marble, amphibolite, schist, garnet-biotite schists, staurolite schist, sillimanite schist, biotite carbonaceous shales, quartzitic sandstones.

3. Magmatism. Magmatic intrusions within the study area are a wide range of formations - from wehrlites and pyroxenite to granite pegmatites. Represented as pretty big intrusions as well as small dikes.

- Tholeiite-basalt complex - metamorphosed high magnesian basalts, komatiites, tholeiites, andesites.
- Gabbro-diorite-tonalite complex - Välimäki massif (olivinites, wehrlites, clinopyroxenite, chalk-, meso- and leucocratic gabbro and gabbro-diorite and diorite) and plagiogranites - cape of Impiniemi.

- Granite-pegmatite complex - pegmatoid granites and ceramic pegmatites, albite and rare-metal granites and tourmalin pegmatites. Granite pegmatites are known as individual bodies, groups and sometimes form large clusters with the formation of deposits.



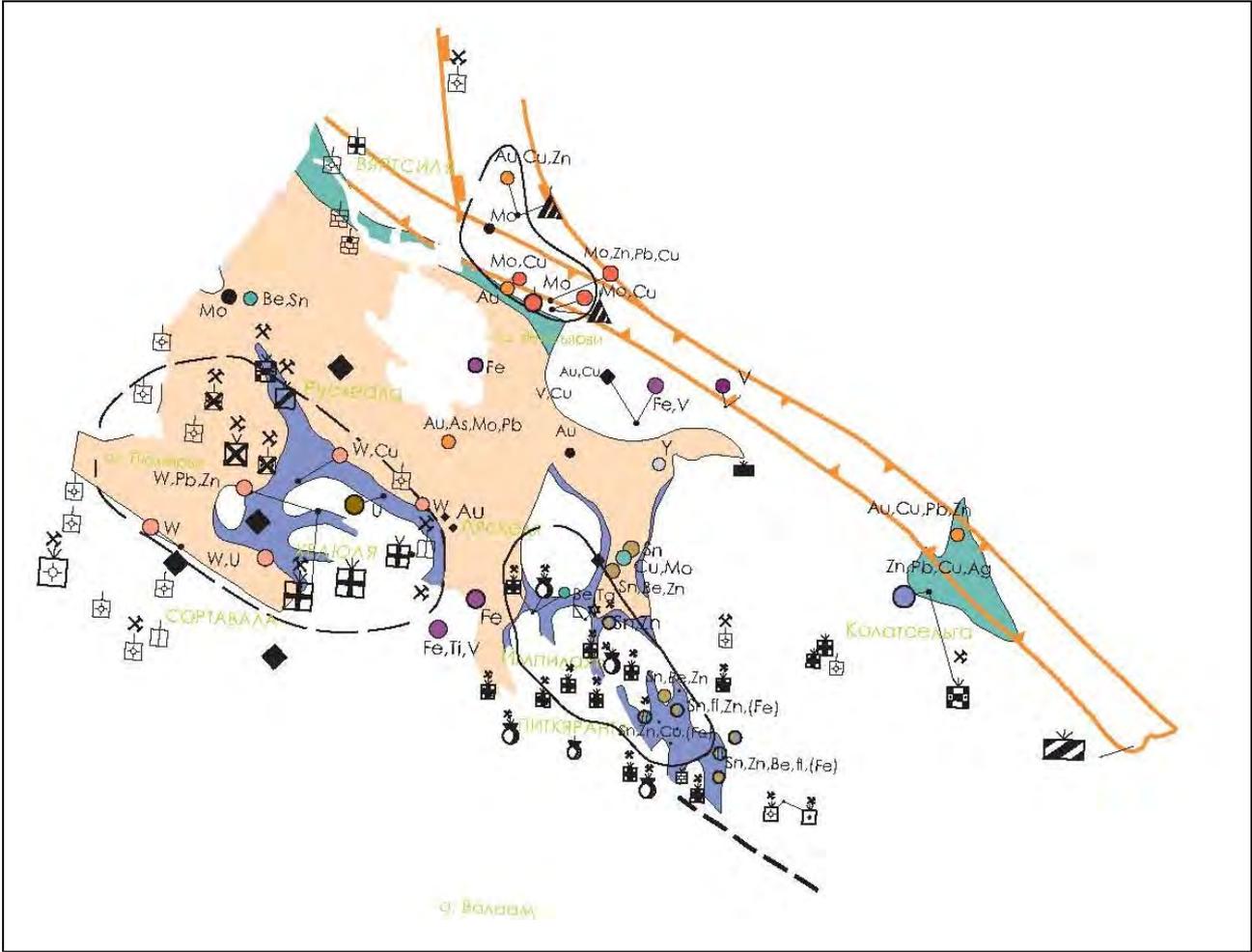


MINERAL DEPOSITES

Ore and mineral deposits of the region are extremely diverse. Known deposits are: Metals (Fe, Ti, V, Sn, Zn, Cu, Be, Ne, Ta, Au + U, P) - are located in a variety of types of deposits: skarns, greisens, low-temperature quartz veins, igneous complexes, etc. Non-metallic minerals, building stone, etc.

These unique geological formations and ore-bearing complexes are accessible to direct observation and sampling in many outcrops, in pits, in the dumps of old closed mine workings.

Additional information: <http://impilahti.museums.spbu.ru/> (in Russian)



FIELD COURSE METHODS AND APPROACH

1. Theory part

- An overview of the geological structure and history of formation and ore deposits
- An overview of today's complex geological prospecting solutions used in this and similar areas for the detection and localization of mineral deposits (remote sensing, structural and bedrock geology, detail geological mapping, soil and bedrock geochemistry, ground magnetics geophysics)
- Health, Safety & Environmental (HSE) outlines in prospecting/exploration activities

2. Field part

- Geological mapping, bedrock sampling and cross-sections developing, visual outcrops description using GPS, topomaps, geological compass during geological routes.
- Soil sampling by defined grid using GPS and sample taking equipment
- Field chemistry analyses using portable XRF-detectors (InnVox system), including drying, sieving and analyzing soil sample in a field base. As a result, field geochemistry maps with anomalies are created.

3. Interpretation and reporting

- Complex data interpretation including analyzing of collected geological, structural and prospecting results. Developing final geological map with cross-sections including information about discovered mineralization and other positive prospecting data.
- Geological interpretation of geochemistry data. Final complex geochemical map developing with localized anomalies and prioritized perspective areas for possible deposit discovery.

RESULTS

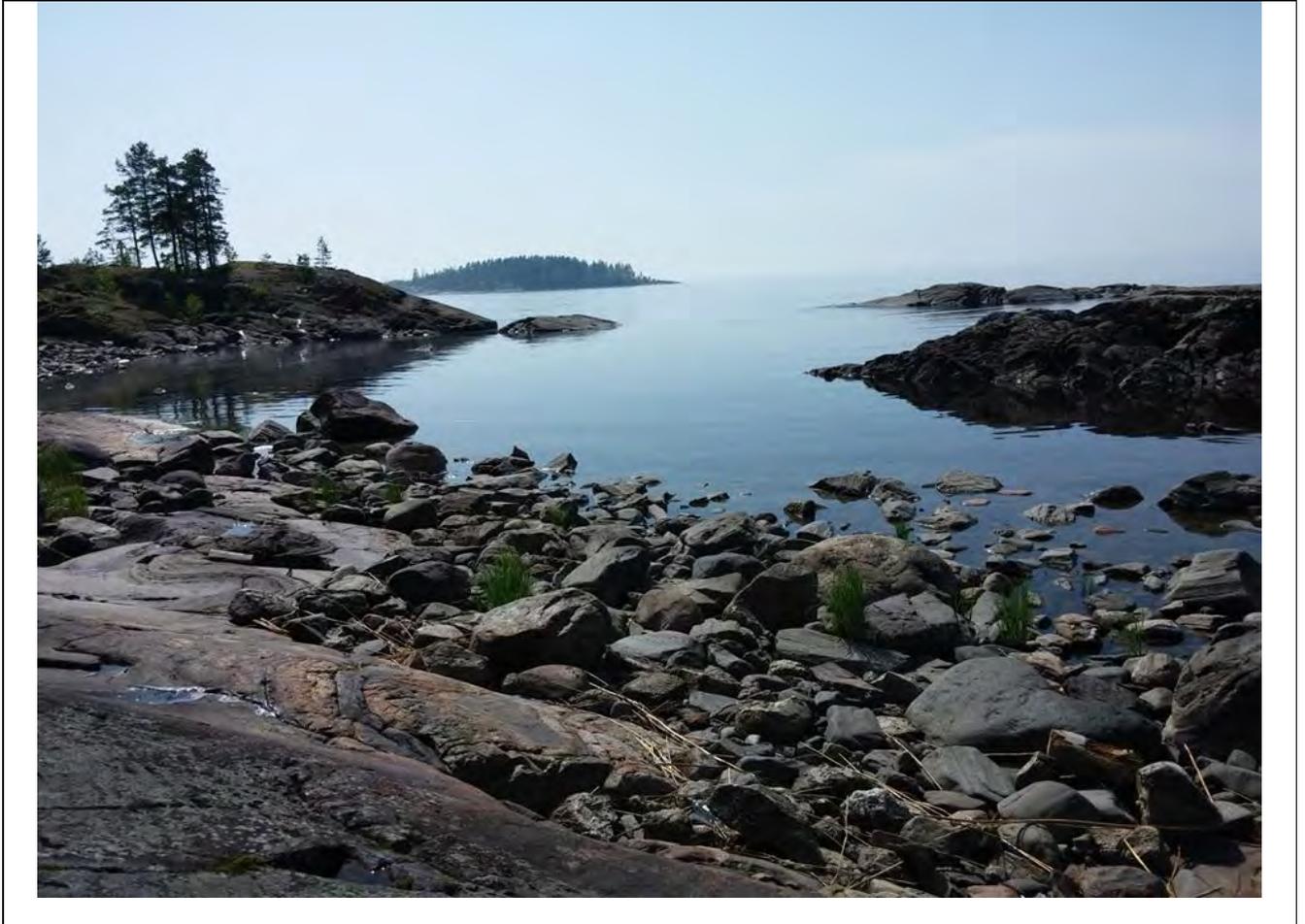
As a result, prepare consolidated prognosis geological map of area in the selected scale, containing reasonable perspective sites and other useful prospecting data. All results obtained are presented in the form of a report containing the entire volume of the resulting geological information and interpretation, as well as recommendations for the direction of further detailed survey and assessment work.

The work results are presented as presentations, followed by discussion and evaluation.

Field course participants receive theoretical information about the geology and mineral resources of the area, the methods of field work, as well as the experience of exploration.

EXCURSIONS AND CULTURAL PROGRAM

Traditionally, the field course excursions include a visits to geological monuments, a variety of key outcrops, cross-sections, ore occurrences, old mine sites. The purpose of geological excursions is to increase the overall outlook and familiarity with the geological and ore formations represented in the study area.





Field Course area is different and picturesque natural geographic features, the beautiful nature of South Karelia. Excursions include a visit to the local attractions and beautiful places of Lake Ladoga northern shore. The study area is a pearl of southern Karelia, widely known as a place tourists attraction, abound natural landscape monuments, waterfalls, canyons, Ladoga Skerries, pristine forests, lakes and rivers. Also possible to visit the historical and ethnographic objects, the local history museum and other sights to explore the fascinating history of the region.

UPCOMING 2015 FIELD COURSE

The nearest field course will be held on **1-18th of June 2015**

Field course preliminary scheduler

01/06/15 - arriving at Impilahti.

Bus transfer from St.Petersburg or by own cars from Petrozavodsk or Finland.

02/06/15 - safety induction. General introduction. First theory lecture.

03/06/15 – 04/06/15 - Theoretical lectures.

05/06/15 - Excursions

06/06/15 - 11/06/15 - Field work in groups

12/06/15 - 13/06/15 - Excursions, field work

14/06/15 - 15/06/15 - Data interpretation, analyses

16/06/15 - Reporting day

17/06/15 - 18/06/15 – Departure

ADDITIONAL INFORMATION

Location

Impilahti village is connected with Saint-Petersburg (340 km) and Petrozavodsk (200 km) by roads, where international airports, railway stations and bus stations are situated. Also Impilahti village is 100 km far from Vyartsilya where Russian-Finnish boarder could be easily crossed by cars and buses. The nearest finnish city is Joensuu.

Transportation options

- a. University bus from Saint-Petersburg State University (Saint-Petersburg, University embankment 7/9) - 7 hours
- b. Train from St. Petersburg Ladozhsky Railway Station to Pitkaranta - 10 hours
- c. Airplane to Finland and then through Joensuu and Finnish-Russian boarder by car

Accommodation

The house gets 4 hostel rooms for 5-8 persons. Each room equipped with beds, tables, chairs and mirrors. Bedclothes are given at arriving, but you can also take your own bedclothes or use sleeping bag.

There is a banya (Russian sauna). Also there is a shower.

Meals (breakfast and dinner) are provided. Lunch is taken in the field.



Cellular network – GSM

Internet connection is available

Weather conditions. The average temperature in June is about 10-20C. Rainy days are mixed with sunny. The field work is connected with swamps, mosquitoes and small snakes, that is why rubber boots and warm protective clothes are required.

Local community. Our house is located in the centre of the Impilahti village. The community works in timber industry. We keep good relationship with the local community, but you should take care about your personal expensive equipment - cameras, laptops, cellphones etc.

What to bring

- writing kit (note, pencils, color pencils, pens, rulers, rubbers, etc.)
- personal lunch kit - bowl, spoon, fork, knife, cup
- backpack
- thermos
- geological hammer
- cameras
- warm clothes, rubber boots, rain coats, hats
- personal first aid kit

There is plenty of fish in local lakes and rivers, so you can bring fishing equipment.

Also there is enough space for sport activity, so you can take sport equipment.

2014

CONTACTS

Geology faculty of Saint-Petersburg State University, Department of mineral deposits

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REVIEWS



John Anäs. Impilahti Field Course 2014.

The Impilahti fieldcourse was a good learning experience in many ways. It was good to get a better view on the local geology in Impilahti and the surrounding region. From the lectures to the excursions and practical fieldwork, we acquired a better understanding of the areas geology and evolution. The locations that we visited on our excursions were quite unique geologically speaking, but also in beautiful terrain.

During the fielddays in which we did practical mapping exercises and soilsampling, we learned how to do practical bedrockmapping and map making. The fieldwork was done in a new way for us and we learned how to better work in the field. The soilsampling and geochemical analysis was done in an interesting and new way. It was also good to see the differences in the way fieldwork and reporting was done in Russia. Overall it was a great learning experience and one of the best fieldcourses I have been on.



Heli Naumanen. Impilahti Field Course 2014.

I took the Impilahti field course about ore prospecting in the Russian Karelia in summer 2014. The village of Impilahti was a beautiful little village in the rural area of Karelia. The nature in the area was beautiful and the surrounding areas were filled with fascinating geology; the rocks in the area were magnificent, unlike anything I have ever seen. During the days at Impilahti we usually first went to field to do some mapping or on an excursion to visit some interesting places. After we returned from the field we wrote reports or draw maps about what we had seen. We also had some free time to do what we wanted e.g. go swimming in the Lake Ladoga nearby or make barbeque and just hang around and chat. I learned a lot about the local geology and its special features, and about how to do sampling and detailed mapping on the field. (And also how to make boxes for the samples. :D) It was a lot of hard work, but I also had a lot of fun and made many new international friends during this course. It was a very special experience and I would recommend this course to any adventurous student who wants to learn new things, see new things and enjoy the beautiful country side of Russian Karelia.



Aigars Antiņš. Impilahti Field Course 2014.

My name is Aigars, i'm a geologist from Latvia and this summer I was participating in St. Petersburg State University's field course Impilahti 2014.

For me it was a great experience, because it was my first time in Russia, it was my first time of mapping Precambrian rocks as well. It was interesting to learn a lot from skilled professors and students. Of course the field days were the most important for me, but I enjoyed lectures too. Everything was perfect and I learned a lot. Besides the lectures and field work, the living was great. Lake Ladoga is a distance of 10 minutes, new and old friends, beautiful nature, interesting geology and so on. It was one of the best field courses I have been.



Alexey Koval. Impilahti Field Course 2013.

Two years ago I was lucky enough to take part in search and survey of geological and geochemical practices in Karelia. Of course, these two weeks have become one of the most vivid memories of that summer. Why? Because, firstly, always nice to be together with friends not in the university, and in nature, secondly, the place of practice is very beautiful, and the atmosphere is always based like on the home.

Our task was to consolidate the theoretical knowledge and practical skills mapping and geochemical sampling of metamorphic complexes using modern GIS technology and the latest methods of research material.

Of course we did not forget about the rest, evening festivities around the campfire, fishing, football and volleyball. Separately, I want to commend the work of teachers, which we constantly monitor, but it was given complete freedom to our actions to solve geological problems. Reasoning and encouraged the introduction of new ideas and methods.

In conclusion, I want to thank all my friends and teachers who made this such a wonderful practice. After all, the summer we have found the first field experiment, which is so necessary in the life of a geologist.