Russian State Hydrometeorological University

RSHU

International Summer School on Freshwater Ecosystems

August 2010

St. Petersburg

Valaam Island (Lake Ladoga)


ASHU
“ Freshwater ecosystems under natural conditions and anthropogenic impact: Lake Ladoga ”
In aspects:
modern and traditional environmentally friendly technologies and approaches for maintaining natural values and securing suitable living standards


• Who
• Where
• What for

Organizer:

Russian State Hydrometeorological University

Venue:

the educational and scientific station at Valaam Island, RSHU

Target Group:

MSc students, 8 people, international

Area of Study:

Freshwater ecology and biology

Attendance documents:

transcripts (ECTS)

Russian State Hydrometeorological University

http://www.rshu.ru/eng/

Fields of study and specialties

- Hydrometeorology
- Physics
- Ecology and Natural Resource Management
- Meteorology
- Hydrology
- Oceanography
- Economics and Management at Environmental Enterprise
- Management of Organization
- Geoecology
- Public Relations in the Environment

RSHU participation in international projects for the last three years

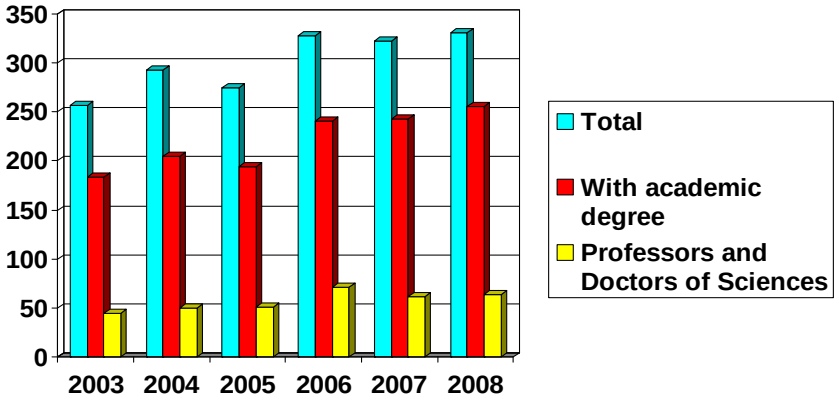
- “Education and training programme of the WMO”
- UNESCO/IOK/HELCOM Project “Baltic Floating University”
- “White Sea Pilot Project”, UNESCO
- IOK/UNESCO “Training, Education and Mutual Assistance, TEMA”
- “Baltic HIRLAM – academic network” (atmospheric modelling), Baltic and Nordic countries

RSHU participation in international projects for the last three years

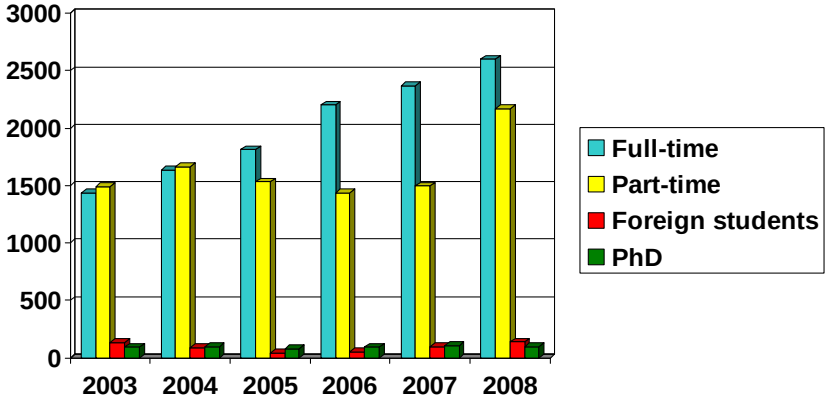
- TEMPUS JEP-10814-1999 – “Coastal Zone Management”
- TEMPUS JEP-25071-2004 – “Creation of University Network of credential evaluators”
- TEMPUS JEP-26005-2005 – “Development of a competency-based two-level curricula in Meteorology“
- TEMPUS-JPHES-159352-2009 – “Development of qualification framework in meteorology”

RSHU

The number of the lecturers is 330 including 64 Doctors and Professors and 255 teachers with academic status



About 5000 students (incl. foreign students) are involved in educational process



- Faculty of Meteorology
- Faculty of Hydrology
- Faculty of Oceanography
- Faculty of Ecology and Environmental Physics
- Faculty of Economics and Social and Humanitarian Sciences
- Faculty of Learning by Correspondence

Faculty of Ecology and Environmental Physics

The faculty consists of 5 Departments:

- Department of Physics
- Department of Higher Mathematics and Theoretical Mechanics
- Department of Environmental Chemistry
- Department of Ecology
- Department of Applied Ecology

Faculty of Ecology and Environmental Physics

International activity

- Baltic Floating University
- HELCOM
- “Gulf of Finland Year”
- “Interoceanmetal”
- “Integrated Strategies for the Management of Transboundary Waters on the European fringe” (MANATRA - EAST);
- 5 international summer schools
- workshops on the Resorts and Ecological Tourism

Faculty of Ecology and Environmental Physics

Student practical training

- Training base of the RSHU in Daimische
- Practical training on the Gulf of Finland
- The White Sea, the Barents Sea, the Black Sea
- Field practice at the Valaam archipelago
- The nature park “Vepps’ Forest”
- at the rivers Okhta and Okkervil in the St. Petersburg area

Field practice at the Valaam Archipelago (Lake Ladoga)

The aims of the field practice are to help the students to assimilate theoretical knowledge obtained during courses in ecology and nature management and to acquire field research skills.

The practice focuses on **aquatic ecosystems.**

Field-work of RSHU were conducted since **1998 till 2007** on the basis of St.Petersburg Naturalists Society (Scientific Center “Valaam”)

The main tasks of the School are:

1. **to familiarize the students with the limnogenesis types of North Russia water bodies,** using as an example the water system of the Valaam Archipelago;

2. **to present to the students the range of natural fluctuations of the limnological parameters within which the normal regime** of ecosystem functioning is maintained, using as an example lakes with various degrees of acidification and humification;

The main tasks of the School are:

3. **to demonstrate the connection between the main limnological parameters on the basis of the field materials collected;**

4. **to inculcate the idea about the lake being a important component of the landscape;**

5. **to compare the great lakes and small one (in example of Ladoga Lake);**

The main tasks of the School are:

6. **to teach the students how to perform ecological certification of water bodies;**

7. **to develop students' skills of planning and organisation of field research**.

The programme of the practice consists of the following sections: **lectures, complex field ecological investigations and laboratory work.**

The field practice is held since 1998

Educational-Scientific Station

In 2005, the construction of the laboratory building started. The building was partly put in operation in 2008. In the same year, the Educational-Scientific Station of the RSHU was founded.
The newly-built station has a well-equipped laboratory and the facilities necessary for conducting lectures and seminars at the modern level.
From 2009 it includes more than 7 buildings.

The main tasks of the Station are:

- **the organisation of:**

field practice of the University students;

material collection for students' papers, Master theses and PhD theses;

research of students and post-graduate students;

The main tasks of the Station are:

- **the monitoring of the coastal zone and the small forest lakes of the Valaam Archipelago for the purpose of supplying material for courses in natural sciences;**

- **scientific research at the Valaam Archipelago, Lake Ladoga and the northern Ladoga region with participation of students and post-graduate students.**

Why Valaam?

The main reasons underlying the choice of the Valaam Archipelago for the field practice in ecology of aquatic ecosystems:

- The Valaam Archipelago is situated in the heart of the Ladoga, the largest lake in Europe and one of the most interesting lakes in the world

- The coastal zone of the Archipelago is characterised by a considerable depth range and a high diversity of biotopes (open and closed bays, channels between islands, open coastal areas etc.)

Why Valaam?

- The islands of the Valaam Archipelago possess a number of unique natural features associated with their position in the central part of a large deep lake and with their geological history

- The ten lakes of Valaam Island, the main island of the Archipelago, belong to different types and can serve as excellent examples of lakes in the Ladoga catchment area

Why Valaam?

• Because of its certain morphology and a hydrological mode, northern deep-water zone of Ladoga lake is less mentioned by the polluted waters of the rivers. It contains the main stocks of pure water. The control of hydrobiological, hydrochemical and other parameters is especially important, as loss of water quality in this area will inevitably cause degradation of Lake Ladoga ecosystem.

From this point of view coastal zone around Valaam Archipelago may be considered as an ideal area for monitoring anthropogenic effects such as eutrophication and pollution.

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Why Valaam?

- The Archipelago is very well studied, with over **550 papers** being available on various aspects of its geography, geology and biology. Current scientific research at the Archipelago is carried out by several leading research organization such as

Karelian research centre RAS;

Scientific-Research Centre (SRC) "Valaam“,

Russian State Hydrometeorological University

Why Valaam?

- absence of industrial production on islands
- missing of strong anthropogenic impacts
- The Valaam Archipelago is a protected area (Nature Park of the Republic of Karelia). Nature conservation issues may be discussed in the course of the practice

The Valaam archipelago is fine modeling object of Northwest region nature

Lake Ladoga is the unique natural object and the greatest fresh-water lake in the Europe.

Surface area – **17 891 km²**

Volume - **837 km³**

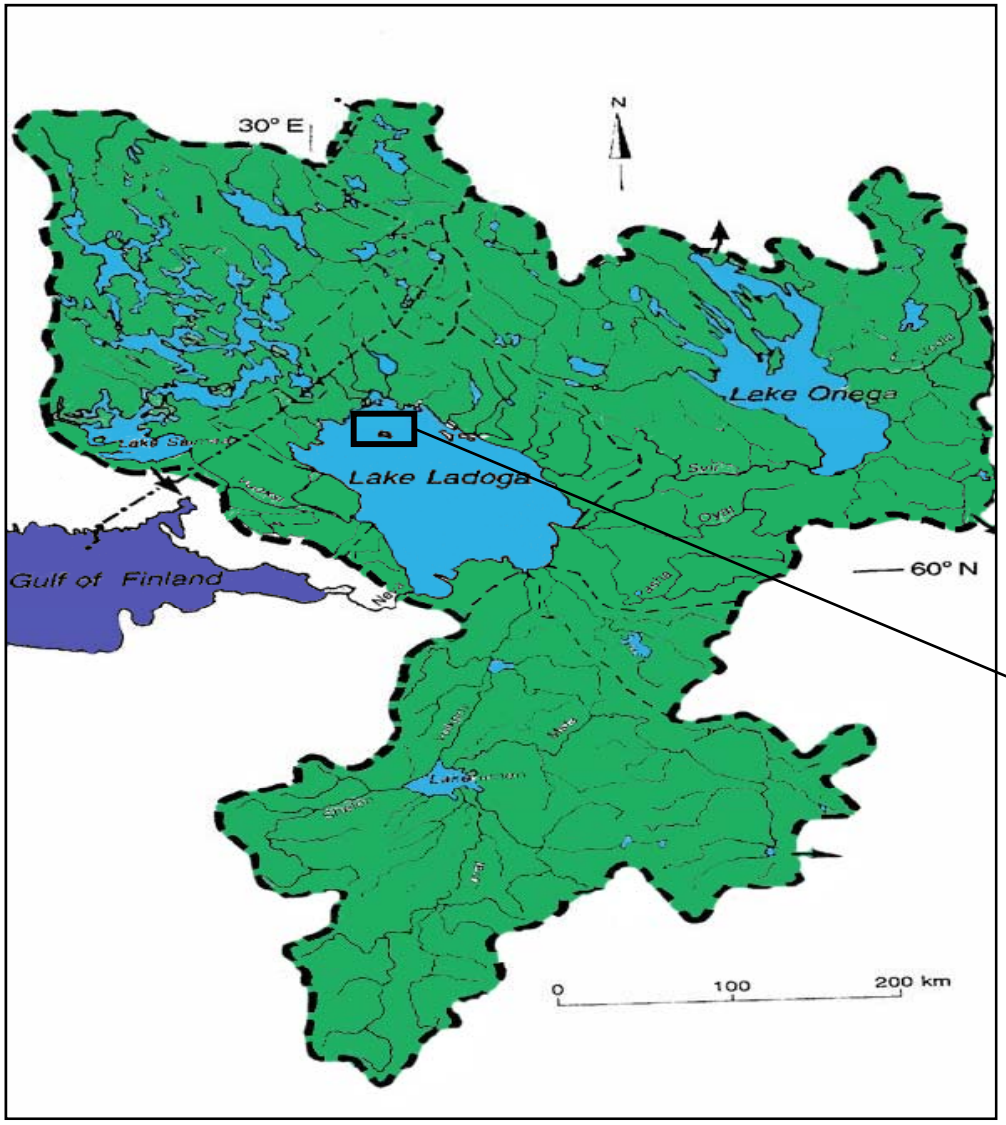
Mean depth - **46.8 m**

Maximum depth - **230 m**

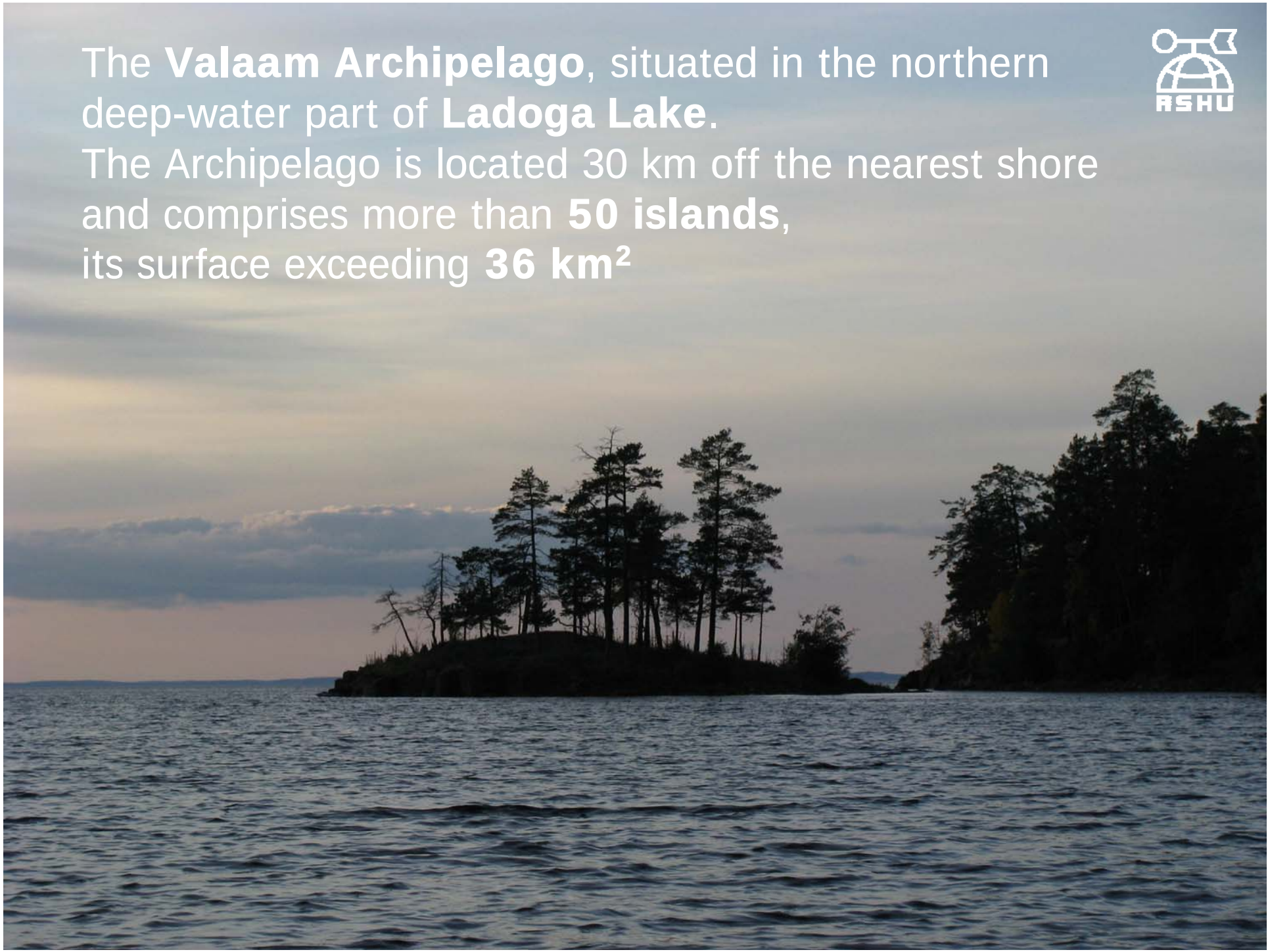
Lake Ladoga is included into 20 greatest lakes of the world

Catchment area involves the essential

of north-western region of Russia and part of Finland.



Valaam Archipelago


The **Valaam Archipelago**, situated in the northern deep-water part of **Ladoga Lake**.
The Archipelago is located 30 km off the nearest shore and comprises more than **50 islands**,
its surface exceeding **36 km²**

New Summer School
in ecology of aquatic ecosystems:

- New program

- New resources

- New facility

- Wide experience

The main ideas of practice

- to assess the structure of freshwater ecosystems of Lake Ladoga (in example of the Valaam Archipelago) under natural conditions and under conditions of anthropogenic load.

to test modern and traditional environmentally friendly technologies and approaches for maintaining natural values and securing suitable living standards for people in Europe

The main tasks of the practice are:

- **to familiarize the students with the limnogenesis types of North Russia water bodies**, using as an example the water system of the Valaam Archipelago;

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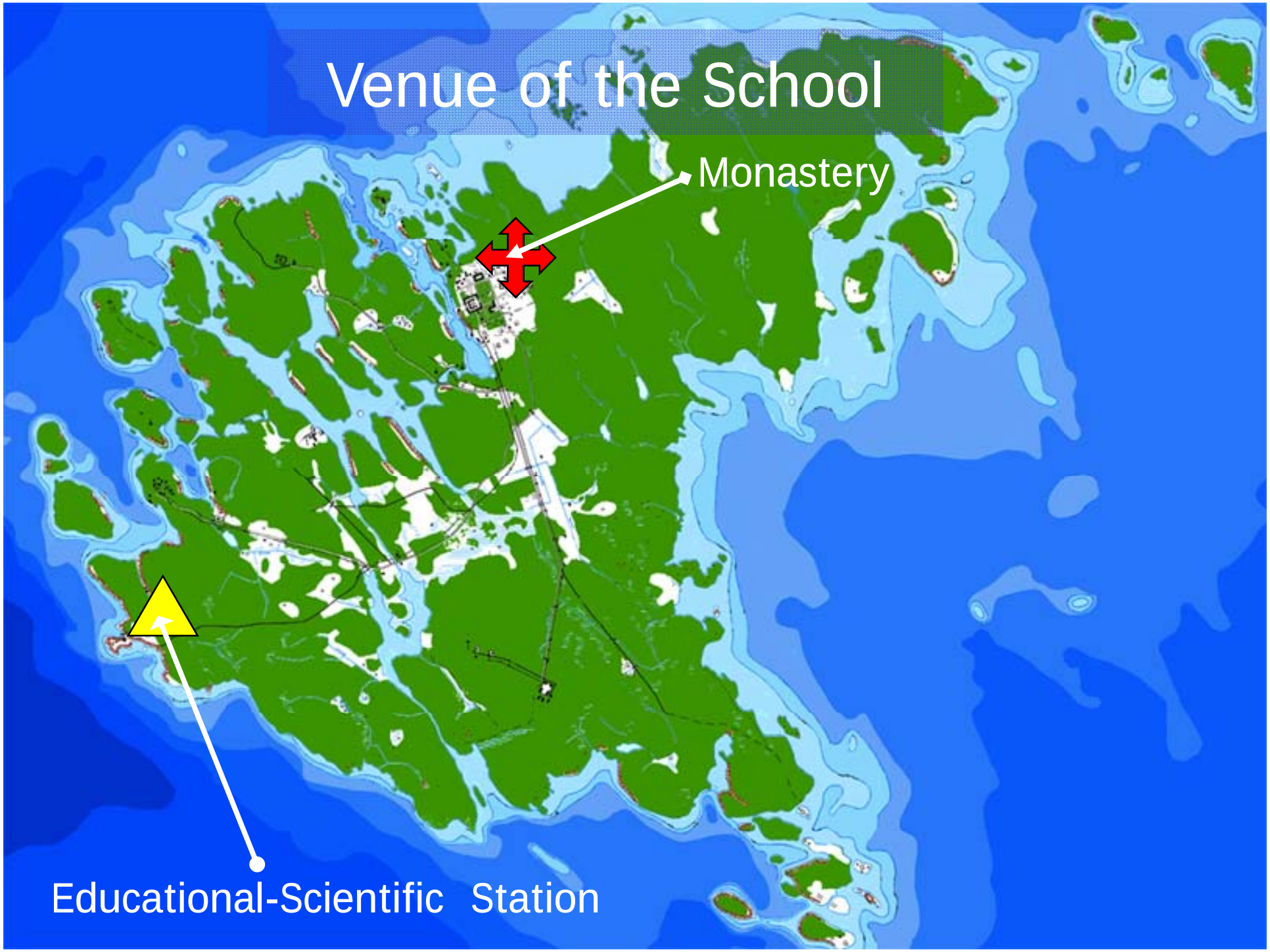
Venue of the School
Monastery
Educational-Scientific Station

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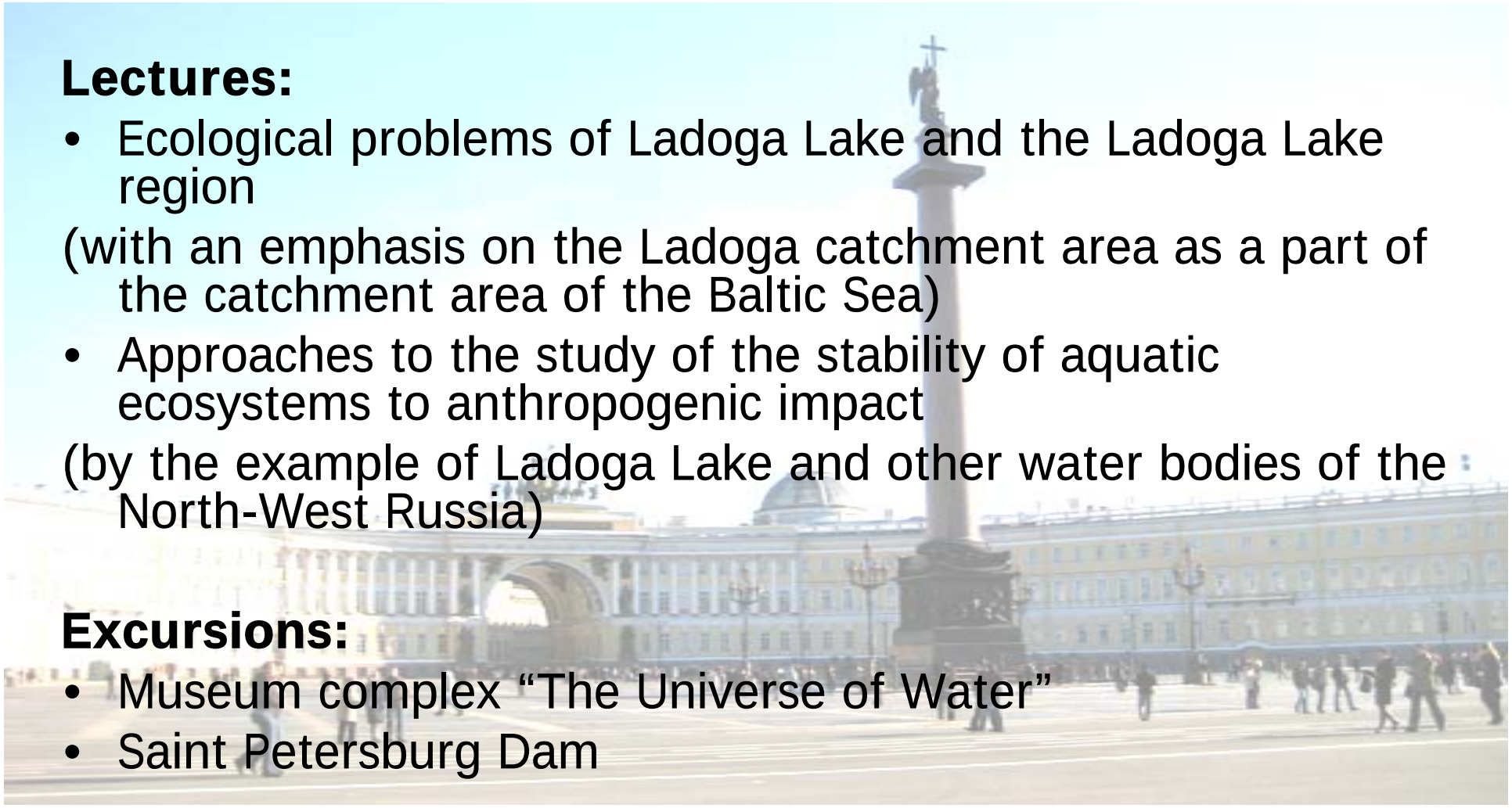
St. Petersburg
Programme



Lectures:

- Ecological problems of Ladoga Lake and the Ladoga Lake region

(with an emphasis on the Ladoga catchment area as a part of the catchment area of the Baltic Sea)

- Approaches to the study of the stability of aquatic ecosystems to anthropogenic impact

(by the example of Ladoga Lake and other water bodies of the North-West Russia)

Excursions:

- Museum complex “The Universe of Water”
- Saint Petersburg Dam

Excursions:

1. Museum complex «The Universe of Water”

The museum complex of SUE “Vodokanal of St. Petersburg” includes the following:

- classic exhibition "The Water World of St. Petersburg" in the building of the old water tower is dedicated to the history of water supply and wastewater discharge in the world, in Russia and in St. Petersburg;
- multimedia exhibition "The Underground World of St. Petersburg" displays the route of water from the water intake through pipelines into apartments and back to the sewage treatment plants;
- multimedia exhibition "The Universe of Water" located in the former clean water reservoir displays water in all its manifestations, both constructive and destructive, with all its mysteries, enigmas and legends.

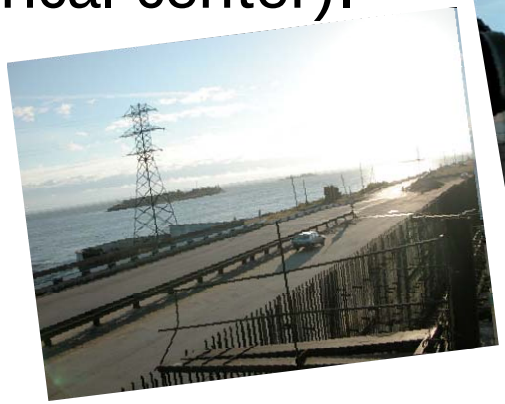
Excursions:

2. Saint Petersburg Dam

The dam has been planned with two purposes:

- Protection of Saint Petersburg against flooding.

- As a part of a belt line (to unload city from autos, especial lorries which go now through the historical center).



Saint Petersburg Dam
should connect southern coast of a gulf with northern one (Oranienbaum with Gorskaya)
through

Kronstadt town.

Valaam

Programme

Lectures:

- Physical-geographical characteristics of Lake Ladoga
- Hydrological regime of Lake Ladoga
- The main elements of Ladoga ecosystem
- Eutrophication of Lake Ladoga
- The role of macrophytes in Lake Ladoga ecosystems

An experience of harmonious coexistence of man and nature (the Valaam Monastery in the 18th and the 19th century)

Valaam

Programme

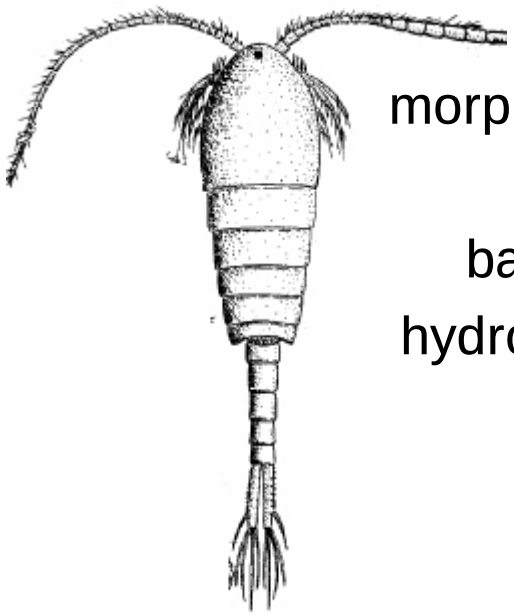
Excursions:

- Microlandscape diversity of Valaam Island
- The unique fauna and flora of the Valaam Archipelago
- The Ladoga ringed seal (with a visit to the summer haul-out sites at the distant islands of the Archipelago)

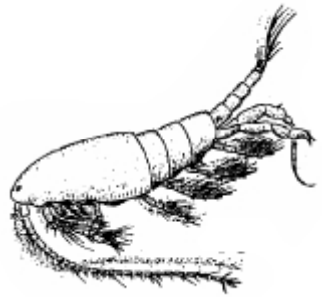
Valaam

Programme

- **Field investigations comprise the study of:**



morphometric parameters,
thermal regime,
basic hydrochemical
hydrophysical parameters



phytoplankton,
zooplankton,
macrophytes,
macrozoobenthos

and the primary production of plankton

The unique fauna and flora of the Valaam Archipelago


Living conditions

Eco-friendly living
at the Valaam station

- Ecological water usage (replacement of detergents of high PAV with ecological friendly washing agents)
- Power economy politics
- Waste management
- Room/ 4 persons

Preliminary deadlines

Application deadline is 15 June 2010

- June, 2010 – closing application period, announce of participant list
- **28, July – 9, August 2010** – summer school

Lecturers

- Prof. Mikhail Naumenko, the head of the laboratory of hydrology, Institute of Limnology Russian Academy of Sciences ; RSHU
- Prof. Vasiliy Dmitriev, Faculty of geography and geoecology, Saint Petersburg State University; RSHU
- Dr. Anastasia Stepanova, associate professor of the Department of Applied Ecology,head of the educational and scientific station at Valaam Island, RSHU
- Dr. Ekatherina Voyakina, senior researcher of the department of eco-chemical investigations of the St. Petersburg Scientific Center of the Russian Academy of Sciences (SPb Research Centre of Ecological Safety RAS)
- Dr. Nadezhda Zueva, Department of Applied Ecology, RSHU
- Dr. Ekatherina Primak, Department of Applied Ecology, RSHU RSHU
- Dr. Olli-Pekka Penttinen, University of Helsinki
- Babin Alexandr, junior staff member, Department of Applied Ecology, RSHU
- Gulnara Sharafutdinova, junior staff member, Department of Applied Ecology, RSHU

Practical training leaders:

- PhD student Nadejda Lebedeva, RSHU
- PhD studentn Evgenia Ivanova, RSHU

Contacts:

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migulin@rshu.ru	**Denis Migulin, local organizer, RSHU**

Useful links:

Russian State Hydrometeorological University	http://www.rshu.ru/eng/
St. Petersburg Scientific Research Center for Ecological Safety Russian Academy of Sciences	http://valaam.org.ru/ (only in Russian)
Museum complex "The Universe of Water"	http://www.vodokanal.spb.ru/content/info/universe/eng/
St. Petersburg dam	http://www.semiotic.ru/d/index.html
Saint Petersburg Scientific Center of the Russian Academy of Sciences (SPbRC RAS)	http://www.spbrc.nw.ru/
Saint Petersburg State University	http://spbu.ru/e
Institute of Limnology	http://www.limno.org.ru/engl.html


Thank you for your attention !