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Committee for Nature Use,
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Climate change and its impact on the city of St. Petersburg. What are we doing….

Ph. D Ivan A. Serebritsky
Deputy Chairman,
Committee for Nature Use,
Environmental Protection
and Ecological Safety,
City of St. Petersburg
serebr@kpoos.gov.spb.ru

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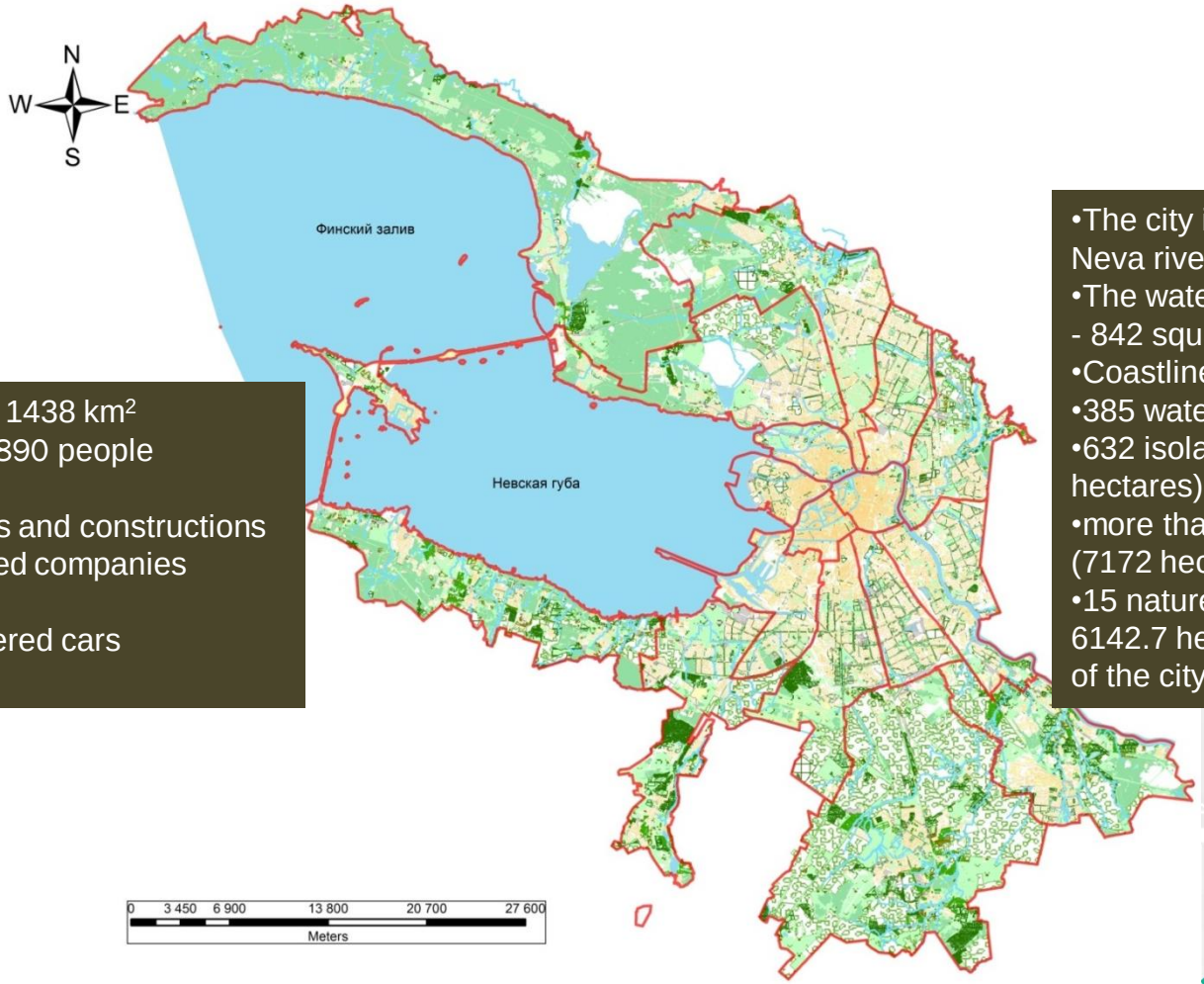
St. Petersburg



Occupied area - 1438 km^2
Population 5383890 people (01.01.2019)
127 000 buildings and constructions
345 277 registered companies (01.01.2018)
1 972 333 registered cars (01.01.2019)

- The city is located in the delta of the Neva river
- The water area of the Gulf of Finland - 842 square meters
- Coastline - 260 km
- 385 watercourses (788 km)
- 632 isolated water bodies (3284 hectares)
- more than 2000 green plantations (7172 hectares)
- 15 nature protection areas occupy 6142.7 hectares, which makes 4.3% of the city's total territory.

Управление Роспотребнадзора по Санкт-Петербургу

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The quality of ambient air in St. Petersburg is one of the priority issues of ensuring the safety of the population in an urban environment and reducing the risk to health.
The population risk to the health of the citizens of St. Petersburg, calculated according to the official methodology, from the quality of ambient air is **more than 2 million** people.

The main pollutants that determine the health risk and exceed hygienic standards: **nitrogen oxides, suspended substances, benz(a)pyrene**.
Dust is the leading cause of increased risk of morbidity of the population.

In recent years, actions aimed at protecting the atmospheric air have been implemented in St. Petersburg:

1. Dozens of industrial facilities are relocated to the reserve areas of industrial zones	2. Thousands of technical gas cleaning devices have been installed from small objects - sources of pollution	3. Sanitary protection zones have been established from 769 air pollution sources	4. Deduced from the impact of emissions of about 280 thousand people

Structure of the greenhouse gases of St.Petersburg

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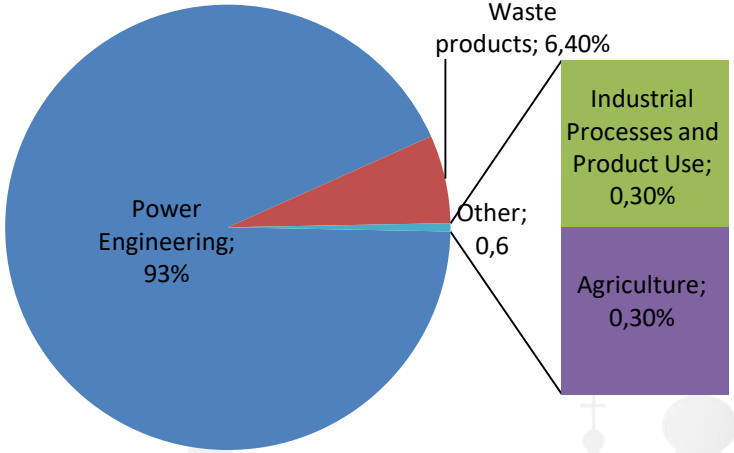
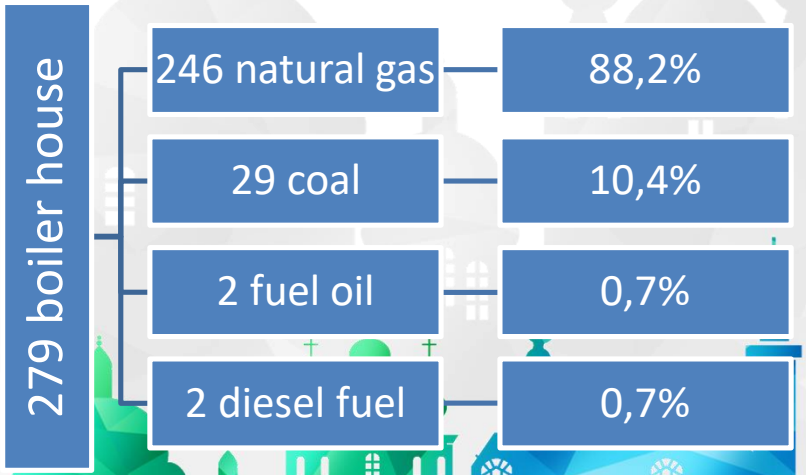


The composition of total greenhouse gases emissions for 2016 consisted of:
92% carbon dioxide,
6.6% methane
1.2% nitrous oxide.

Max for 2011-2016 period of **greenhouse gases** emission was in 2012 - **33,6 thousand tons**.
Emissions of pollutants into the air from stationary and mobile sources in the city of St. Petersburg in 2012 - 488,2 **thousand tons** include greenhouse gases – 6,8% (2017 – **559,5 thousand tons**).

Heat power engineering of St. Petersburg (March 2018)



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Emissions of greenhouse gases by source categories and their contribution to total emissions, thousand tons of CO2-eq.

Выбросы парниковых газов по категориям источников и их вклад в суммарные выбросы, тыс. т CO_2-экв.

Sources	2011	2012	2013	2014	2015
Power engineering	30471,673	31474,342	30171,845	30146,760	30007,715
contribution, %	93,59	93,52	93,42	91,93	92,90
Industrial processes and product use	110,092	113,636	108,157	95,497	99,224
contribution, %	0,34	0,34	0,33	0,29	0,31
Agriculture	107,467	106,846	98,319	90,265	89,519
contribution, %	0,33	0,32	0,30	0,28	0,28
Waste products	1868,273	1959,298	1919,648	2460,298	2103,573
contribution, %	5,74	5,82	5,94	7,50	6,51
Total	32557,504	33654,122	32 297,968	32792,820	32300,031

In 2008-2011 in St. Petersburg implemented projects for the reconstruction and modernization of generating energy sources and boiler houses. As a result, dozens of coal and fuel oil boilers have been closed (Petrogradsky district - 101, Kurortny district 52, Petrodvorets district - 18). The total emission of pollutants decreased by 5.6 times compared with 2007, emissions of sulfur dioxide and soot particles decreased by more than 5000 times.

For 2013-2017 years on the objects of "GUP TEK SPb" emissions of pollutants in the amount of 1856,686 tons were reduced.

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http://www.infoeco.ru/cliplive/index.php?id=23

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The manifestations of climate change that affect the development and security of St. Petersburg, studied in the framework of the CLIPLIVE project:

Factors of long-term changes

• ↑ average annual temperature atm. air;
• emergence "Waves of heat / cold";

• ↑ average annual amount of precipitation and intensity of their deposition;

•change of snow cover

• ↑ the level of the Baltic Sea and the Gulf of Finland

Dangerous natural phenomena

• ↑ frequency and intensity of overt and flood floods

•↑ intensity of abrasion of the shores of the Gulf of Finland;
•↑ probability of flooding

Input to the Climate Change Adaptation Strategy development:

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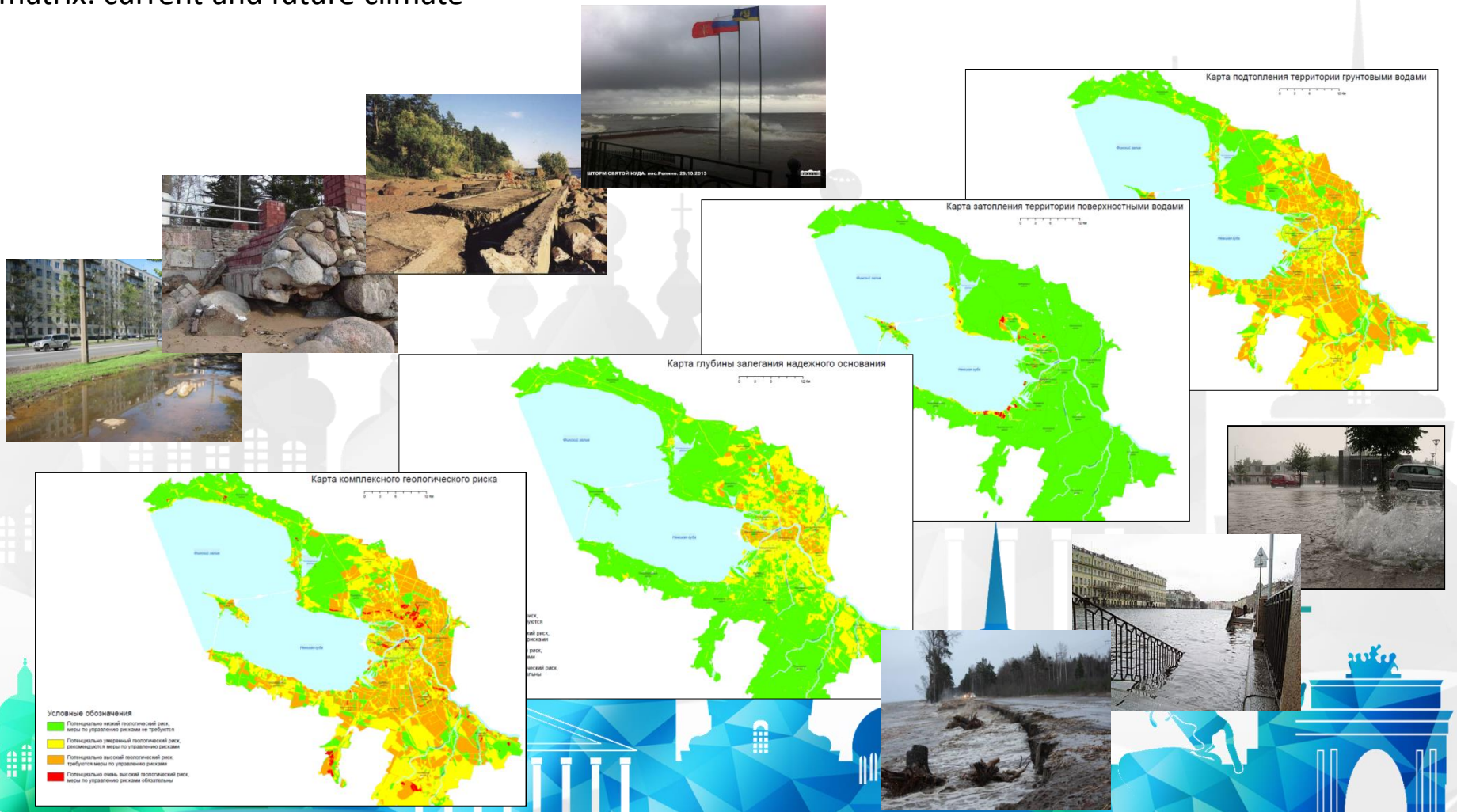
Climate-dependent geological risk maps (incl. integrated risk) based on risk matrix: current and future climate



The intensity of coastal erosion over a long period of time from remote sensing and field observations (Kotlin)

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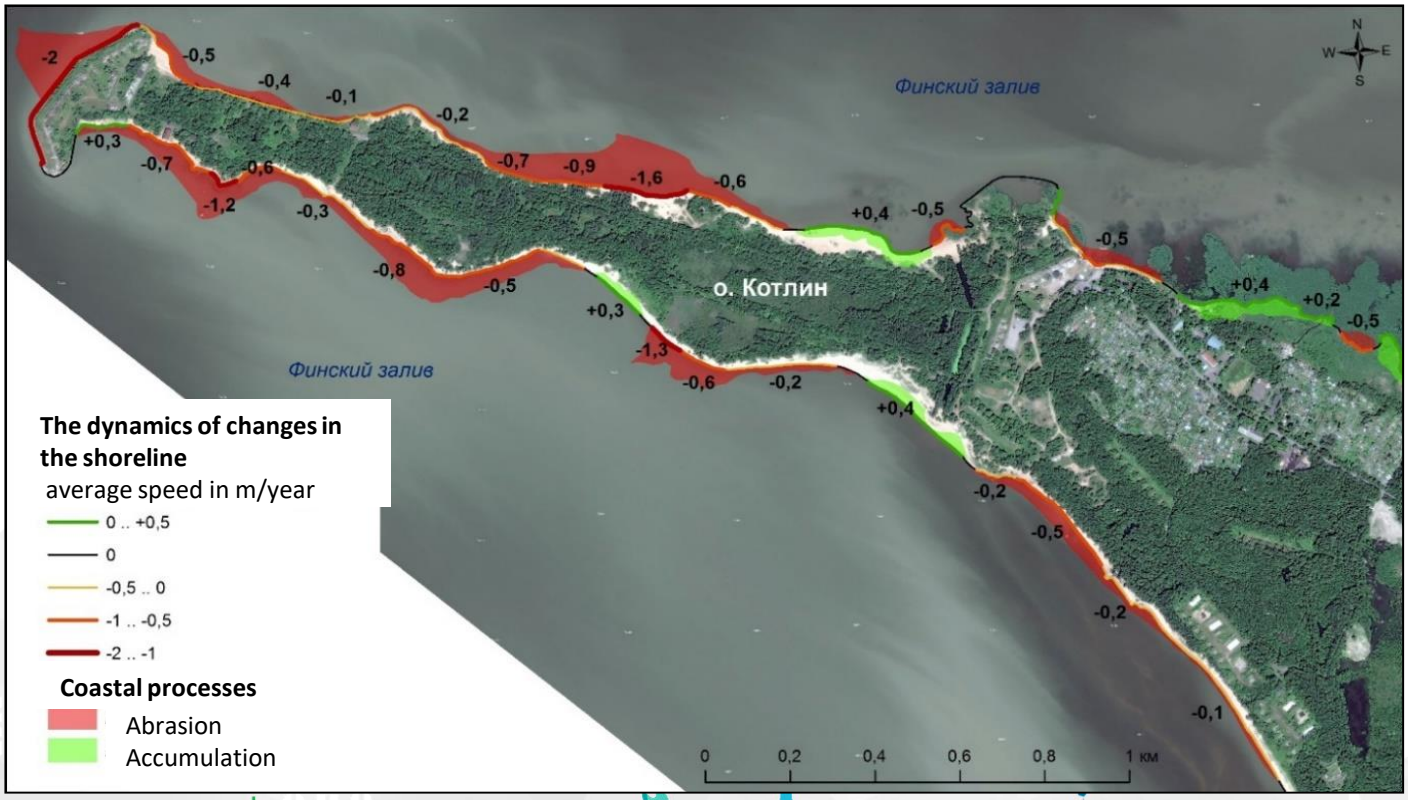

1939 to 2005
accumulation 394.5 m², erosion of 1719 m².
2005-2016
accumulation 319.4m², erosion of 4571.7 m².
During the last decade the annual accumulation has decreased, and the magnitude of the erosion of the shores has significantly (more than 2 times) increased.

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The main problems of the coastal zone, investigated in 2015-2016, are caused by a sharp deficit of sedimentary material.

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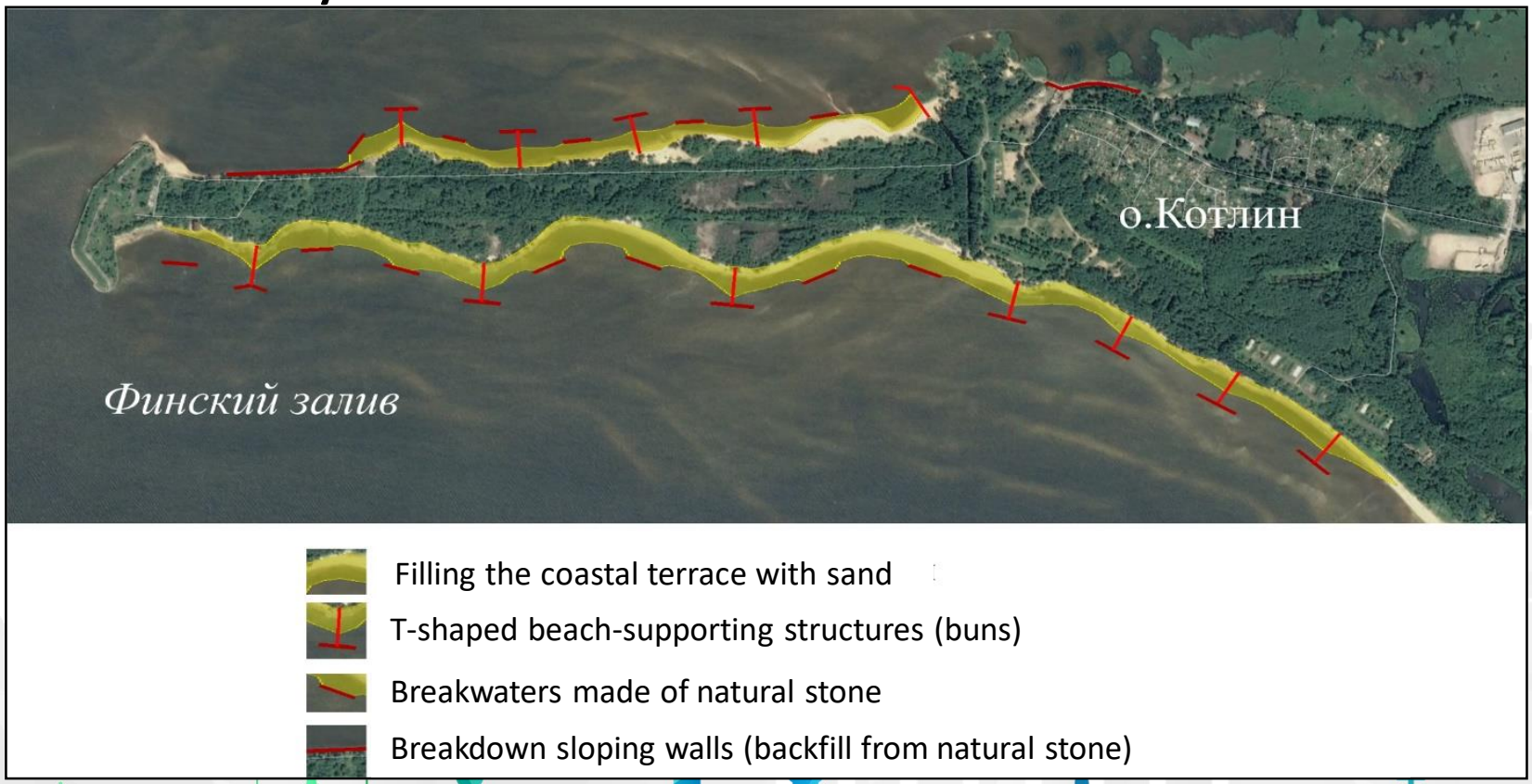

The recommended facilities for both banks of western Kotlin are artificial sandy beaches in combination with beach-retaining structures in the form of buns with transverse breakwaters and additional breakwaters between them.

Draft outline of the coast protection of the Gulf of Finland in the coastal areas of St. Petersburg

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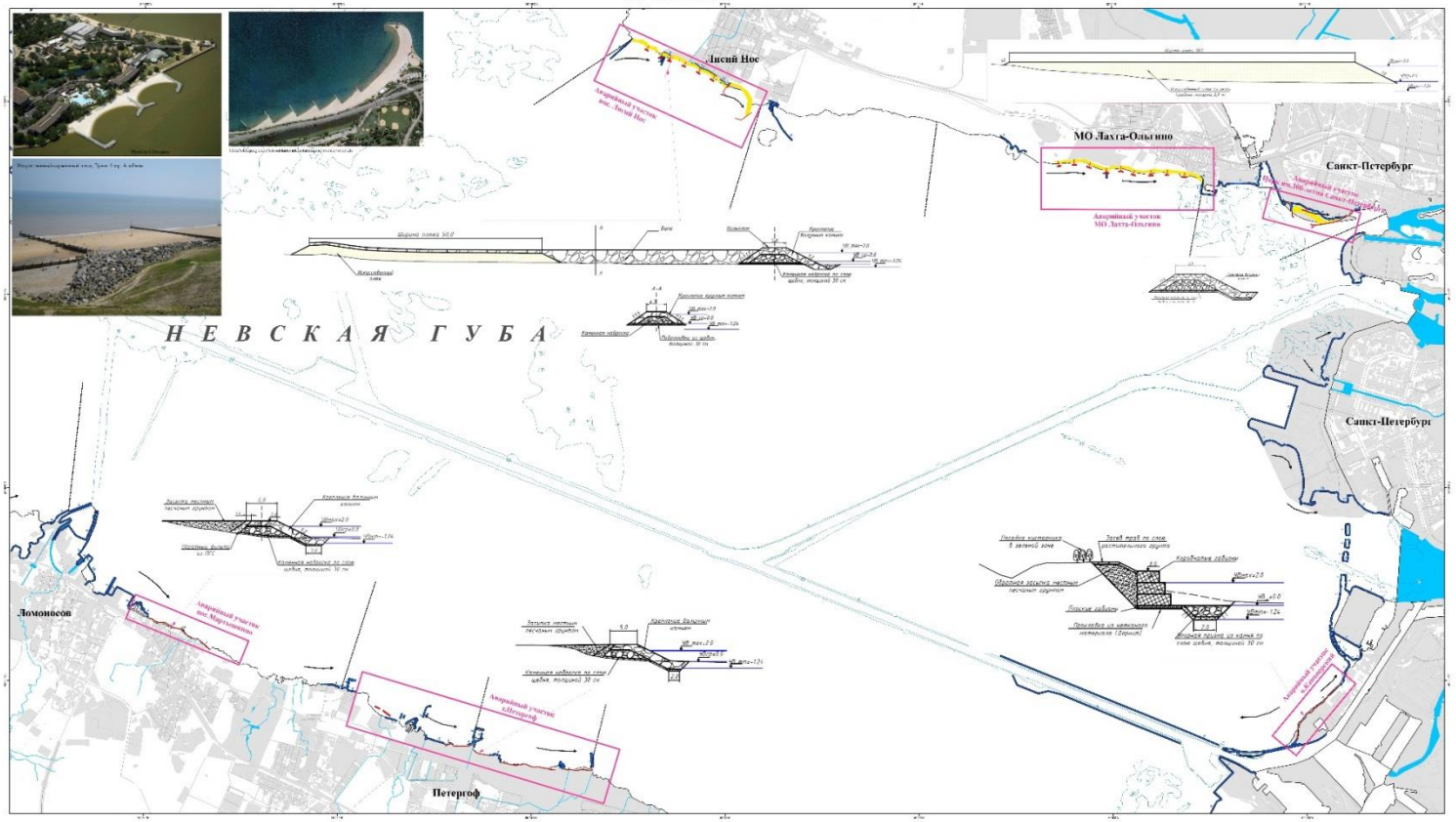
Эскизный проект берегозащиты побережья Финского залива в границах Приморского, Петроградского, Василеостровского, Кировского, Красносельского и Петродворцового районов Санкт-Петербурга

Масштаб 1:25 000



Условные обозначения

Берегозащитные сооружения

Предлагаемые берегозащитные сооружения

Элементы топографической основы

Литодинамические элементы береговой зоны

Конструкции сооружений берегозащиты разработаны ООО «Ленморпроект»

Карта составлена в Федеральном государственном бюджетном учреждении «ВСЕРОССИЙСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ГЕОЛОГИЧЕСКИЙ ИНСТИТУТ имени А.П. КАРПИНСКОГО» (ФГБУ «ВСЕГЕИ»)

Авторы: Д.В. Рябчук, А.Ю. Сергеев

Электронное оформление: А.Ю. Сергеев, И.А.Невин

2016 год

Identification of the boundaries of flooded areas, flooding in the territory of St. Petersburg

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1. Zones of flooding shall be identified in relation to:
 a) territories that are adjacent to unregulated watercourses, flooded during floods and floods of 1% supply or as a result of ice congestion and gluttons;
 b) territories adjacent to estuaries of watercourses flooded as a result of surging phenomena of calculated security;
 c) territories adjacent to natural water bodies;
 d) territories adjacent to reservoirs;
 e) territories adjacent to the regulated watercourses in the lower reaches of the waterworks.
2. Within the boundaries of flood zones, the following areas shall be identified:
 a) areas of severe flooding;
 b) areas of moderate flooding;
 c) areas of weak flooding.

Grounds for development: Decree of the Government of the Russian Federation of April 18, 2014 No. 360.

Scheme of zones of flooding of the territory of St. Petersburg (M 1: 70000)

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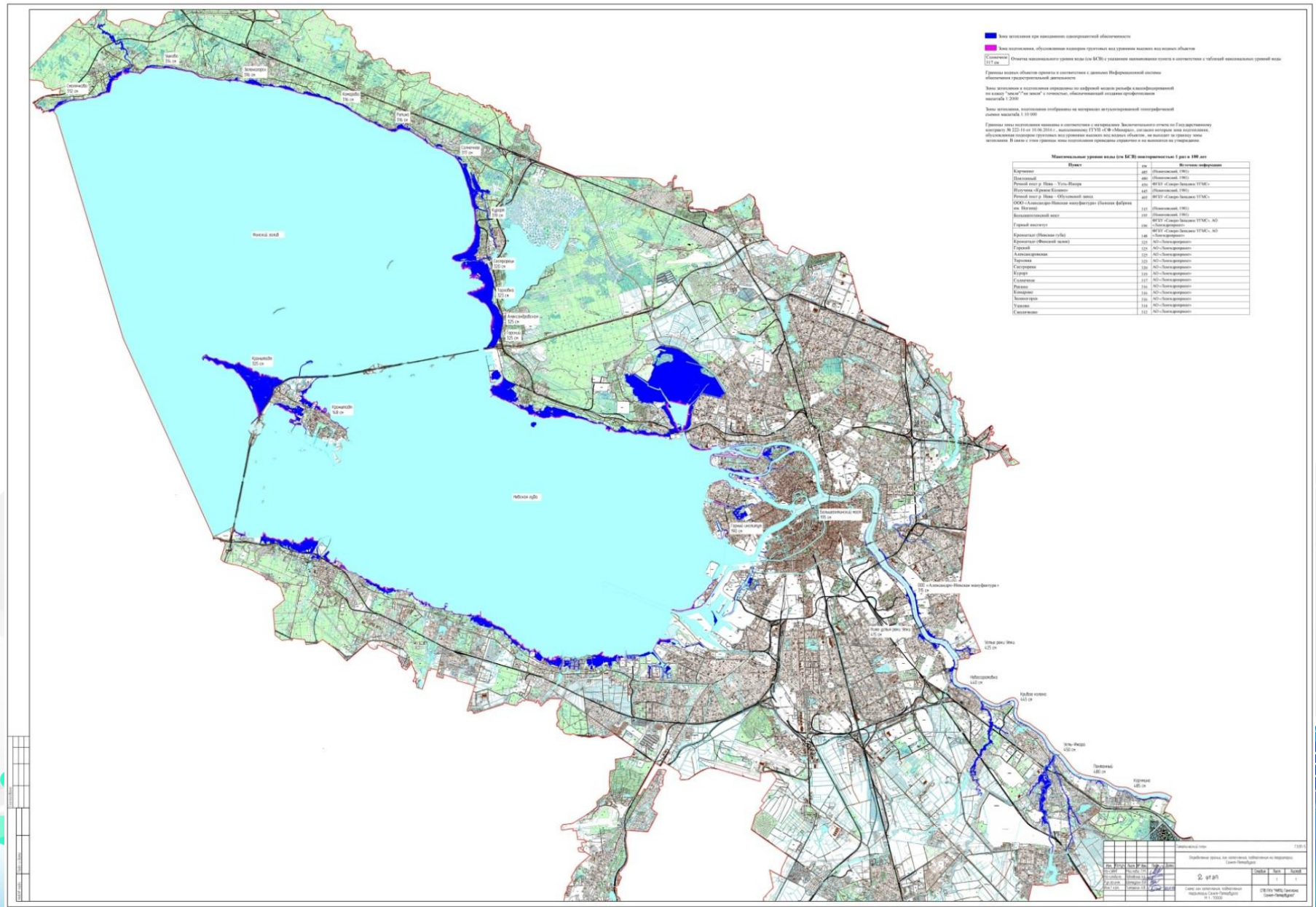

Examples of zones of flooding under surging phenomena

Примеры зон затопления при нагонных явлениях

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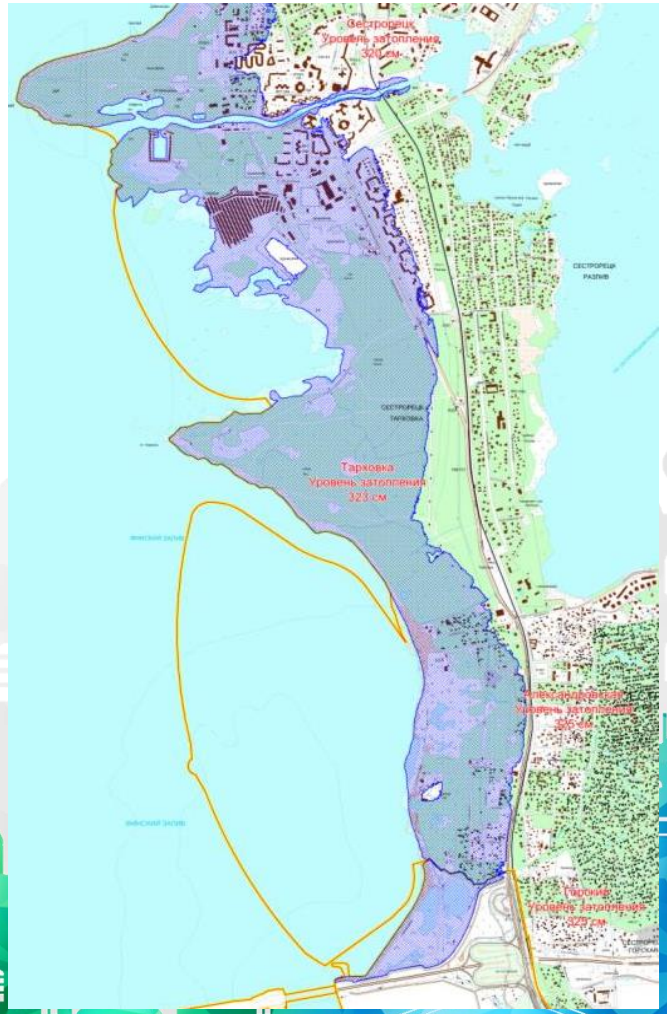

Flooding zones in the Alexandrovskaya area

Flooding zones on the Kotlin island

Identification of the boundaries of flooded areas, flooding in the territory of St. Petersburg

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Flooding area	Area, hectares	Number of buildings, structures, total	Residential buildings	Non-residential buildings, structures
Gulf of Finland, Nevskaya Guba	2595,5	1090	354	736
Neva River	425,3	468	30	438
Sestroretskii Razliv	447,4	25	19	6
Lahtinskii Razliv	1297,5	43	42	1
The area of the flood zone - 4765.7 hectares, 3.3% of the total area of St. Petersburg				
The number of buildings and structures undergoing flooding - 1626 buildings, of them residential 445				
The area of the flooding zone, which does not exceed the boundaries of the flood zone - 343.5 hectares				

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Ecological Policy of St.Petersburg up to 2030
(June, 18th 2013)

feat.

Climate Doctrine of the Russian Federation
(December, 17th 2009)
and Implementation Plan up to 2020
(April, 25th 2011)

- development and implementation of measures on CC adaptation including considering the climate change factor in the social and economic development programs of SPb;
- development and implementation of the system of prevention of ecological and other (climatic) risks;
- ensuring the effective protection system of SPb area from natural hazards;
- . . .

- state authorities of the RF subjects are recommended to consider climate change when developing social and economic development plans;
- climate policy is based on development and implementation of operative and long-term measures on CC adaptation and mitigation.

- Climate change is one of the most important problems of the 21st century, which covers the environmental, economic and social aspects of sustainable development of territories. One of the tasks in the field of environmental safety is to ensure adaptation to climate change, including minimizing greenhouse gas emissions, creating a coast protection system in St. Petersburg.
- It is necessary to strengthen and develop the information and scientific basis in the field of climate, which ensures the maximum completeness and reliability of information on the state of the climate system, on climate impacts, its current and future changes, consequences, as well as the development and implementation of operational and long-term measures to adapt to changes climate mitigation of human impact on the climate.

LAW OF ST. PETERSBURG
About the Strategy of socio-economic development of St. Petersburg for the period until 2035
(December 19, 2018)

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LAW OF ST. PETERSBURG
About the Strategy of socio-economic development of St. Petersburg for the period until 2035

(December 19, 2018)

The task: "Development and implementation of measures to adapt to climate change, including minimizing greenhouse gas emissions, creating a coast protection system in St. Petersburg."

- To increase the level of protection of vital interests, it is necessary to carry out modernization and technical re-equipment of hydrometeorological observation systems.
- It is necessary to ensure the development of interagency, interregional and international organizational and functional interaction on the implementation of climate policy.
- It is necessary to ensure the improvement of legal regulation and public administration in the field of minimizing and preventing regional climatic threats, which envisage the improvement of legal acts in the field of construction design and operation of buildings and structures, territorial building codes, and the climate factor in the development and updating of territorial planning documents.
- It is necessary to ensure compliance with obligations to reduce greenhouse gas emissions, including those involving the formation of a greenhouse gas emissions inventory in St. Petersburg.
- It is necessary to ensure coastal protection and protection of the coastal territories of St. Petersburg, to improve the warning system of the population and economic entities about possible dangerous climatic phenomena, to change the operating conditions of urban facilities, taking into account their vulnerability to climate risks.
- It is necessary to promote research and development in the field of energy efficiency, the use of renewable energy sources, greenhouse gas absorption technologies and the development of innovative environmentally acceptable technologies, the introduction of innovative technologies based on the use of atomic energy. It is necessary to develop economic and financial mechanisms conducive to the technological re-equipment of enterprises, the introduction of technologies with the potential to reduce greenhouse gas emissions, including enterprises in the fuel and energy complex, transport, industries, the increased use of renewable energy sources, and to increase the use of energy-efficient equipment and technologies.

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TOWARDS HIGHER ADAPTIVE CAPACITY IN URBAN WATER MANAGEMENT (KS1038)

ACRONYM
RAINMAN

LEAD PARTNER
Geological Survey of Finland

TOTAL BUDGET
940 202 €

DURATION
01/01/2019 - 31/12/2021

CBC FUNDING
752 161 €

WEB SITE
http://www.gtk.fi

PARTNERS
City of Mikkeli (FIN) | City of Lahti (FIN) | Helsinki Region Environmental Services Authority HSY (FIN) | Voeikov Main Geophysical Observatory (RUS) | Federal State Budgetary Institution "State Hydrological Institute" (RUS) | State Unitary Enterprise "Vodokanal of St Petersburg" (RUS)

PROJECT DESCRIPTION

The RAINMAN project aims at answering the challenges that climate change and urban development pose to fresh water reservoirs. It focuses on the development of feasible and innovative tools to manage storm water, both in quantity and quality, in order to minimize discharge of nutrients and hazardous substances from urban areas to fresh water resources and the Gulf of Finland.

MAIN ACTIVITIES

Main activities include the mapping of the overall status of urban water management related to climate change challenges in several pilot studies in Finland and Russia; analysing potential impacts on fresh water quantity and quality as well as urban flooding patterns; developing and evaluating tools for storm water management; and integrating feasible solutions into relevant city development guidelines and plans to maintain freshwater resources in a good state, despite a changing climate.

CBC 2014-2020
SOUTH-EAST FINLAND - RUSSIA

Funded by the European Union, the Russian Federation and the Republic of Finland.

1) Raising awareness of residents and decision-makers on the climate change and its impacts;

повышение уровня информированности населения и лиц, принимающих решения, по проблеме изменений климата и их последствий

2) Improvement of legal regulation and public management in the field of minimizing and preventing of regional climate risks;

совершенствование нормативного правового регулирования и государственного управления в области минимизации и предотвращения региональных климатических рисков

3) Development of the region's adaptation potential, taking into account the resource availability;

развитие адаптационного потенциала региона с учетом ресурсной обеспеченности

4) Development and integration of up-to-date tools for managing regional climate risks.

развитие и внедрение современных механизмов управления региональными климатическими рисками

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Thank you for attention!