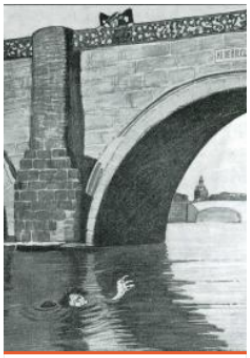
"Commanding, Sovereign Stream": The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers

Gertrud Haidvogl, Alexei Kraikovski, and Julia Lajus

The exhibition aims to reveal and visualize the power of mighty rivers so crucially important for the history of St. Petersburg and Vienna—the major imperial centers of continental Europe in the modern era.

The Rivers and the Cities: A Brief Introduction

Fisheries & Fishers



Pollution & Industrialization

Changing Landscapes

Fish Consumption

About the Exhibition

Authors & Acknowledgements

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Table of Contents

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.

About the Exhibition

The idea for this exhibition emerged from the joint Russian-Austrian research project "The Long-Term Dynamics of Fish Populations and Ecosystems of European Rivers." During their investigation of historical fish populations in the Neva in St. Petersburg and the Viennese Danube, the research teams discovered numerous links between the cities and their rivers. For the project, we searched for visual and material objects as sources, in addition to the written documents. With a few exceptions, this material could only be mentioned in our scientific publications. With this exhibition, we hope to reach the public as well. It visualizes the interrelations between two great European rivers and two imperial capitals, between circa 1700 and 1914, and reveals some hidden sides of the urban life, especially related to fisheries.

The chapters of this virtual exhibition focus on specific themes, presented in a comparative slider, allowing the reader to switch between the to cities. In the five chapters we provide a general introduction to the history of the rivers and the cities ("The Rivers and the Cities – A Brief Introduction "). In "Fisheries, Fishers, and Fish Trading in the Urban Environment" we describe the economic and social role of fisheries, fishermen, and fish trading in Vienna and St. Petersburg. Fish populations and subsequently fisheries in both rivers were considerably modified by changes in the riverine landscape but also by industrialization and pollution. This is presented in "Changing Landscapes and River Control" and "Pollution and Industrialization of the Austrian and Viennese Danube in the 19th and Early 20th Centuries." The final chapter ("Fish Consumption") describes the role of fish in city dwellers' diets and cultures.

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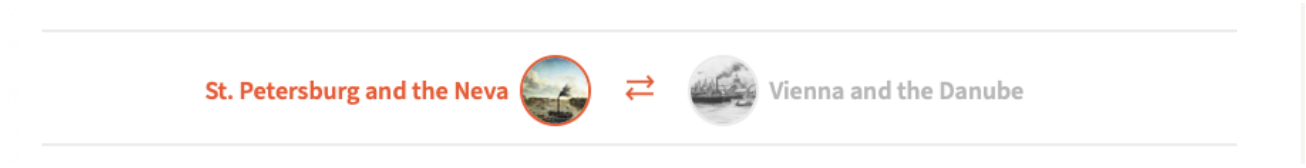
The Rivers and the Cities: A Brief Introduction

Both the Neva and the Viennese Danube are metropolitan rivers of two great empires. St. Petersburg and Vienna, as imperial capitals, were centers of politics, commerce, religion, and culture, and the flagship cities of empires. In each case, the role of the river—Pushkin's "commanding, sovereign stream"—was decisive in the formation and development of urban space. However, the spatial relationships of the two cities with their rivers were quite different. St. Petersburg grew from the very beginning on both banks of the Neva and its many branches. The river was transformed into a major part of the city's infrastructure and water supply, while its frozen surface became a central space of the city in winter. In contrast, medieval Vienna developed on the right bank at some distance from the main river, which nevertheless played a major role in transportation, fisheries, and other economic activities. In this section of the exhibition, we present and discuss how the rivers made two cities into flourishing and representative capitals, impressive for visitors and inspiring for the locals.

The original virtual exhibition includes the option to switch between the cities St. Petersburg and Vienna within the individual chapters (see screenshot below).
Here we present the subchapters one after the other.



St. Petersburg and the Neva

The wet and marshy lands of the Neva river delta were poorly populated for centuries until the Russian Tsar Peter I gained control over this territory during the Great Northern War against Sweden and, on 27 May 1703, created a fortified port, which eventually became the Baltic metropolis and one of the greatest urban centers in the world. The development of the big city on the islands was very unusual for Russia and the new city appeared to be very European and modern in its structure, in comparison with Moscow and other Russian cities, and the importance of the Neva as a pillar of this space of modernity can hardly be overestimated.

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Chapter: The Rivers and the Cities: A Brief Introduction
Source URL: http://www.environmentandsociety.org/node/6577
PDF created on: 27 April 2021 11:14:49

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Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 1 of 10. © The State Hermitage Museum. Used by permission.

Panorama of St. Petersburg: Part 1 of 10

The Imperial Residence is clearly connected to the Neva. The pier can be seen in the drawing (right-hand side) as well as numerous boats, including quite luxurious ones.
Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 1 of 10.

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Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 2 of 10. © The State Hermitage Museum. Used by permission.

Panorama of St. Petersburg: Part 2 of 10

The Admiralty shipyard—the cradle of the Russian Navy. Everything here is delivered by water through the network of canals under the arches.
Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 2 of 10.
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PDF created on: 27 April 2021 11:14:49

Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 3 of 10. © The State Hermitage Museum. Used by permission.

Panorama of St. Petersburg: Part 3 of 10

Open spaces (squares and yards) are connected to the Neva creating a remarkable feeling of vastness.
Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 3 of 10.
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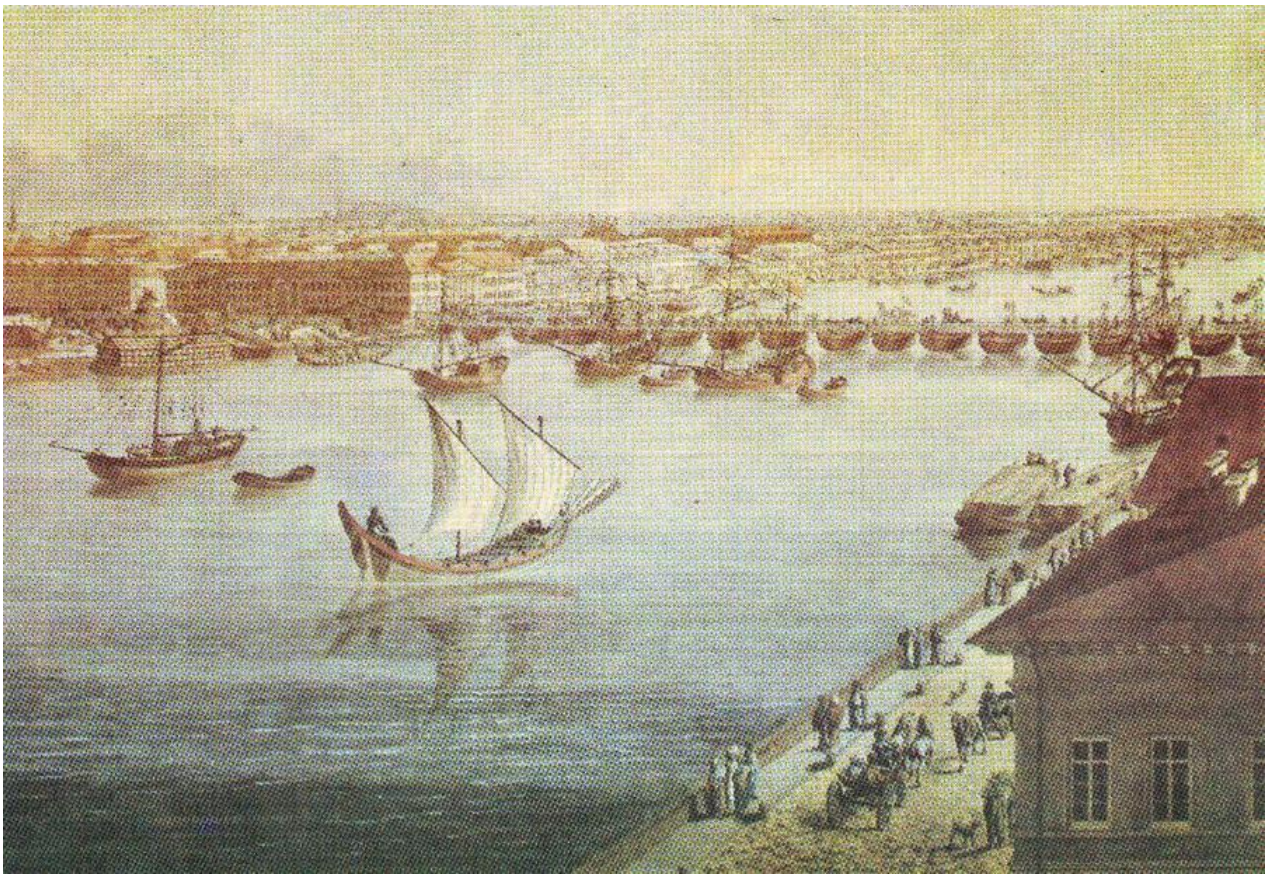

Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 4 of 10. © The State Hermitage Museum. Used by permission.

Panorama of St. Petersburg: Part 4 of 10

Floating bridges across the Neva appeared in 1727 and until the mid-nineteenth century no connection was possible between the banks during the ice flow. Only later would advanced permanent constructions change the situation.
Angelo Tozelli, *Panorama of St. Petersburg*, 1820. Part 4 of 10.

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PDF created on: 27 April 2021 11:14:49

E. Y. Vinogradov and M. I. Makhayev, *View of the Neva Downstream between the Winter Palace and the Academy of Sciences*, 1753. © The State Hermitage Museum. © The State Hermitage Museum. Used by permission.

View of the Neva Downstream between the Winter Palace and the Academy of Sciences

The fortress provided military control of the Neva—obviously the most important strategic object of the city.
Efim Grigorievich Vinogradov and Mikhail Ivanovich Makhayev, *View of the Neva Downstream between the Winter Palace and the Academy of Sciences*, 1753. Etching with line engraving and watercolor, 51.2 x 136.84 cm.
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PDF created on: 27 April 2021 11:14:49

Johan Georg Mayr, *The View of Winter Palace from Vasilievski island*, 1796. © The State Hermitage Museum. Used by permission.

View of Winter Palace from Vasilievski island

The world-famous granite embankments of the Neva started as endless wooden piers. All the city transportation of both humans and commodities was based on the Neva. The Neva used to be, and still is, the favorite promenade for the representatives of all layers of the city's population.

Johan Georg Mayr, *View of Winter Palace from Vasilievski Island*, 1796. Oil on canvas, 77 x 117 cm.

St. Petersburg was formed on the islands of the southern part of the Neva delta, with its main center on the islands of Admiralteiskii, Kazanskii, Spasskii, and Vasilievskii, in the eighteenth and nineteenth centuries. Traditionally, the central districts, which were home to palaces, mansions, and public buildings, were situated on the banks of the Neva, and the river itself served as the city's main public space both in summer and in winter. The northern part of the delta became an important recreational area, with parks and summerhouses that belonged to wealthy and noble families. This was the territory of a pleasant but to a great extent "artificial" environment and the Neva there was an important part of a charming landscape. This man-made paradise existed until the late nineteenth and early twentieth centuries, when this area became the major zone of middle-class recreation.

As a result, the Neva, with its smaller rivers and canals, came to form something like the skeleton of the city's urban structure. To some extent, we can say that the Neva in St. Petersburg is everywhere and almost any activity

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Source URL: http://www.environmentandsociety.org/node/6577

PDF created on: 27 April 2021 11:14:49

connected to the development of the city included some arrangements concerning the river, either as an obstacle to be overcome or as an opportunity to be exploited. As a result, the residents of the city have changed the river network as much as they adapted to it.

> The original virtual exhibition features a dynamic GIF that visualizes the changing landscape of St. Petersburg and the Neva River between 1700 to 1849.

St. Petersburg in 1700, 1705, 1725, 1738, 1756, 1777, 1799, 1840, and 1849. Maps by Sostavleny N. Tsilovym.

Maps by Sostavleny N. Tsilovym.

In this part of the exhibition we tried to visualize the importance of the river in the general structure of the city, demonstrating the spatial links between the representative view of the northern capital of Russia and the picturesque bustle of city life on the one hand, and the majestic river on the other.

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PDF created on: 27 April 2021 11:14:49

Vienna and the Danube

Map showing Vienna and the Danube in the 1770s.
Unknown cartographer.

Vienna was founded in Roman times on the banks of the southernmost river arm of the Danube, today known as the "Donaukanal," which translates as "Danube Canal." The city was located on a Pleistocene terrace and was thus protected against floods. Because of the high fluvial dynamics, the riverine landscape remained—with one exception, the Unterer Werd—free of urban settlements until the mid-nineteenth century. Urban expansion was concentrated in the south and in the hilly west. An urban waterfront existed only on the right-hand banks of the Donaukanal. While for many centuries the Danube marked a clear boundary for the city's development, it was at the same time the main transport route and a source of economic growth: most goods and commodities entering or leaving the city were traded on the river.

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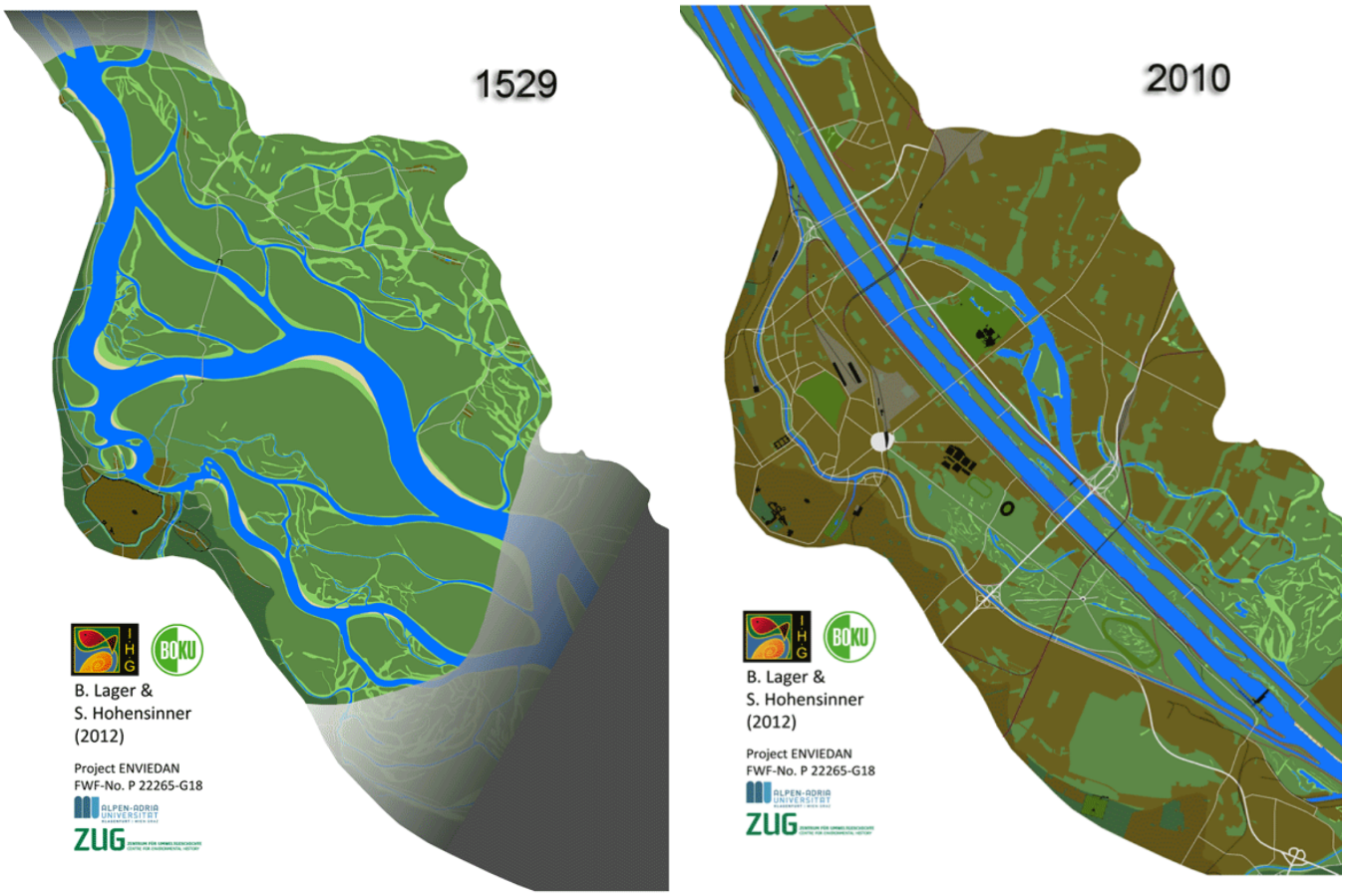
PDF created on: 27 April 2021 11:14:49

From the eighteenth to the twentieth centuries, the city and the river, as well as their relationship to each other, changed fundamentally. Until the river was channelized in the 1870s, aquatic and terrestrial areas were constantly shifting. The inhabitants of Vienna lived with their river, and the regular floods affected all the residents along the Donaukanal and in the Unterer Werd. The channelization stabilized the river and its floodplains. The latter were properly integrated into the city. A large part of today's urban area is located on the former Danube floodplains and depends on the maintenance of a complex and costly flood protection system.

The original virtual exhibition features a dynamic GIF that visualized the transformation of the Viennese Danube river landscape between 1529 and 2010 (see screenshot below) .



Transformation of the Viennese Danube river landscape between 1529 and 2010. The brown areas in the animation above highlight urban areas. Map by Bernhard Lager and Severin Hohensinner.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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Source URL: http://www.environmentandsociety.org/node/6577
PDF created on: 27 April 2021 11:14:49

Fisheries, Fishers, and Fish Trading in the Urban Environment

Big imperial metropolises are usually considered as political, industrial, and cultural centers, but not as rich fishing grounds. However, due to the central role the Neva and Danube Rivers played in urban structure, one finds numerous places for fisheries, as well as fishers and fish traders, right in the centers of the imperial capitals and in their immediate vicinities. This section of the exhibition describes fish resources in St. Petersburg and Vienna and their role in urban life from different perspectives. Fisheries constituted an important part of local economic activities and fishers—both poor professionals and wealthy leisure anglers—were very visible in the cities' crowds, at their markets, and on the banks of their rivers and canals.

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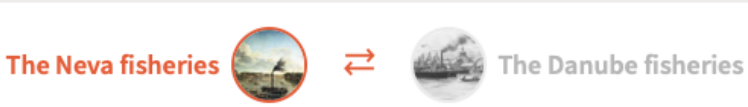

The Neva fisheries

The Neva River (along with Lake Ladoga) and the Gulf of Finland were known as productive fishing grounds long before St. Petersburg was founded. Valuable fish—including Atlantic sturgeon (*Acipenser sturio*), Atlantic salmon (*Salmo salar*), and whitefish—were abundant in the river and historical records show a well-developed fisheries infrastructure, including fish weirs and fishing stations in the Neva at the location of the future city center. When the fortified port was founded, thousands of workers came to the marshy islands, and ensuring enough food for them was one of the major problems facing the administration. The fish from the Neva and its branches was apparently the only food resource that was available directly in situ and the importance of this resource can hardly be overestimated.

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Fisherman and Game Peddler. Illustration from the journal *Volshebnyi Fonar* in 1817.

Unknown illustrator.
Volshebnyi Fonar, 1817: 87.

As a result, fishers were part of the imperial capital's growing population since its earliest days and they were visible in various spots along the Neva, be it upstream from the city, right in the center, not far from the emperor's palace, or downstream on the islands of the Neva delta. Fisheries became part of the local urban economy and culture.

Overfishing and the worsening of spawning conditions in the Neva and in the Neva Bay of the Gulf of Finland were the most important drivers of the decline in fisheries as the city grew. This decline went hand in hand with the overall decline in the abundance of commercial migratory fish species in the Baltic Sea in general, and was in

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Chapter: Fisheries, Fishers, and Fish Trading in the Urban Environment
Source URL: http://www.environmentandsociety.org/node/6844
PDF created on: 27 April 2021 11:14:50

large part caused by it. Large sturgeon were only caught occasionally in the Neva River in the nineteenth century, and in the twentieth century it became extinct. The number of fishing stations along the Neva in St. Petersburg indicates the shrinking importance of the river as a local source of food: for 1831, 38 fishing stations were listed; by 1850 their number had decreased to 15, and in 1876–77 to 11; by the time of the First World War, only six remained. Fisheries to a large extent moved to the Neva Bay and to Lake Ladoga.

Atlantic salmon (*Salmo salar*) were the most valuable commercial fish in the Neva River until the late nineteenth century. Atlantic salmon come for spawning in mid-June, and this was the heyday of the season for both fishers and fish traders. Citizens used to keep a close eye on the salmon spawning and newspapers informed the capital's inhabitants about the start and the end of the season, as well as the prospects of catches and the possibilities for buying fresh delicacies. In the 1870s, between 3,500 and 7,000 fish were caught annually and this was most probably a historical maximum. Late July was considered the peak of the salmon spawning run. Whitefish were abundant in that period, but both these species already began to decline at the end of the nineteenth century.

The original virtual exhibition includes an interactive gallery of images. View the images on the following pages.

Ivan Ivanov, *Aleksandro-Nevskaja lavra so storony Nevy* [Alexandro-Nevsky Monastery from the Neva], 1815. Public domain.

Alexandro-Nevsky Monastery from the Neva

Fishing grounds were located in the most central and picturesque parts of the imperial capital and were controlled by private owners and institutions. The Alexandro-Nevsky Monastery owned a significant portion of the Neva fisheries.

Ivan Ivanov, *Aleksandro-Nevskaja lavra so storony Nevy* [Alexandro-Nevsky Monastery from the Neva], 1815. Colored engraving. Public domain.

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Chapter: Fisheries, Fishers, and Fish Trading in the Urban Environment

Source URL: http://www.environmentandsociety.org/node/6844

PDF created on: 27 April 2021 11:14:50

A. Bogolyubov, *Letnjaja noch' na Neve u vzmor'ja* [Summer Night on the Neva by the Seaside], 1875. Held by the State Tretyakov Gallery. Public domain.

Summer Night on the Neva by the Seaside

The fishing grounds are situated near the industrial city center, yet the water pollution was still moderate enough to allow for a significant fish population in the river. A rack for the nets can be seen in the drawing. The fishermen are working hard during the busiest season when salmon and whitefish swim upstream for spawning.
Alexey Bogolyubov, *Letnjaja noch' na Neve u vzmor'ja* [Summer Night on the Neva by the Seaside], 1875. Oil on canvas, 48 x 73 cm. Held by the State Tretyakov Gallery, Moscow, Russia.

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Source URL: http://www.environmentandsociety.org/node/6844
PDF created on: 27 April 2021 11:14:50

Lev Lagorio, *Ryboloveckie toni* [The Fishing Stations], 1875. Held by the Saransk Art museum. Public domain.

The Fishing Stations

Fishermen use a capstan to pull the nets. The cheerful company decided to finish the White Night holiday (mid-May to mid-July) with a visit to the fishing grounds.
Lev Lagorio, *Ryboloveckie toni* [The Fishing Stations], 1875. Oil on canvas, 60 x 100 cm.
Public domain.

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Source URL: http://www.environmentandsociety.org/node/6844
PDF created on: 27 April 2021 11:14:50

Karl Beggrov, *Vid na Fontanku s Obuhovskogo mosta* [The Fontanka near Obuhovskii Bridge], n.d. Public Domain.

The Fontanka near Obuhovskii Bridge

The suburban fishermen delivered their catch to the fishponds in specially constructed boats with a water basin inside. The Neva and smaller rivers were grounds for recreational fishing. The Fontanka midstream region was mainly settled with commoners, represented by the fisherman in this painting.
Karl Beggrov, *Vid na Fontanku s Obuhovskogo mosta* [The Fontanka near Obuhovskii Bridge], n.d. Lithography, 28.3 x 41 cm.
Public domain.

At the same time, catches of another migrating fish, smelt (*Osmerus eperlanus*), quickly grew. This little migrating fish, which has become a symbolic fish for the city, enters the Neva for spawning in spring. It was in high market demand and by the end of the nineteenth century smelt fisheries became the most important commercial fisheries in the Neva River. The journalists of St. Petersburg newspapers stressed that smelt was very popular among city dwellers and thus it was the main target for spring fisheries—and if the weather was bad, fishers faced serious financial problems.

St. Petersburg's populace considered Neva fisheries to offer an important summer pastime. Fishing itself was a popular recreational activity. Amateur fishers could be seen in all parts of the city and they belonged to all social strata. Even Tsar Alexander the Third was known to be a passionate fisherman, although he fished predominantly in the Gulf of Finland. Noble anglers were also seen on the banks of smaller rivers in close

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PDF created on: 27 April 2021 11:14:50

proximity to the city, such as the Izhora River, a left tributary of the Neva. There they caught the local trout, which was quite the vivid experience. Another recreational activity was a visit to the fishing station, with the opportunity to have a bowl of fresh fish soup and to make a bet on the catch resulting from the next attempt to cast a net was an important part of the local urban culture.

Bottom gear fishing in the Izhora river downstream from Tsarskaia Slavianka. Nineteenth-century illustration by Nikolai Liberich.

Fish was one of the most important commodities in the growing city since its early days. The city did not have a specialized fish market (just special fish lines at the common markets) until the late nineteenth century, when a special market for fish products, known as the Gorstkin market (named after the owner of the land and the buildings), was opened on the bank of the Fontanka River and became an important center for fish supply. Another part of fish-trading infrastructure included the floating fish shops known as fish ponds. Live fish transported from the areas around the city in special boats were available there. Street vending also occupied an important place in fish distribution in St. Petersburg for centuries. Both fishers and small middlemen used to sell the fresh catch on the streets. They could be seen in all corners of the city with a tub filled with water on their heads and loudly touting for buyers, praising the quality and freshness of the fish.

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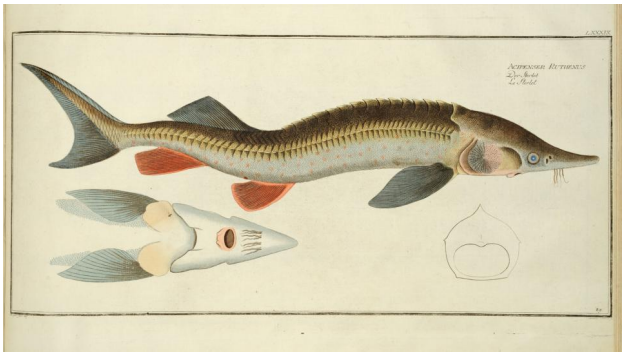
PDF created on: 27 April 2021 11:14:50

The Danube fisheries

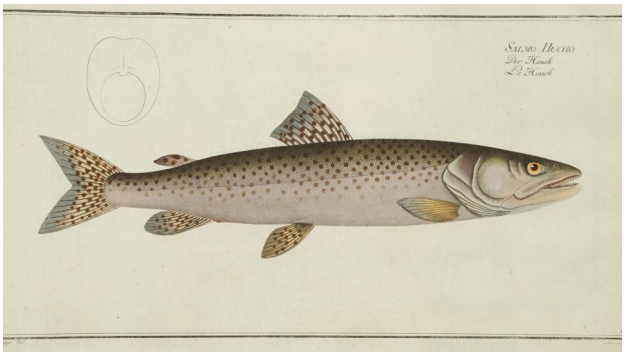
Fisheries in the Viennese Danube benefited from a high diversity of fish. In the Austrian river section, 57 species are considered to be native. This high fish biodiversity reflects the river's biogeographical history and the large variability of habitats, in particular prior to river channelization.

Many species contributed to the diets of urban residents. Catch reports, delivery registers, and Viennese fish-market statistics from the eighteenth and nineteenth centuries list about 25 species which probably came from the urban river section or its immediate vicinity. Impressive because of its size was the European catfish (*Silurus glanis*). Among the most preferred were pike (*Esox lucius*), pike-perch (*Sander lucioperca*), or Danube salmon (*Hucho hucho*), an endemic salmonid species of the Danube basin, found only in this area. These four fish are predators and therefore less abundant than the smaller cyprinids which were caught in large numbers, such as tench (*Tinca tinca*), crucian carp (*Carassius carassius*), or barbel (*Barbus barbus*). The wild form of the common carp (*Cyprinus carpio*) was reported occasionally. The carp eaten by urban dwellers or monks came mostly from fish farms. In the early eighteenth century the largest Danube fish, the great sturgeon (*Huso huso*), still migrated from the Black Sea to the Austrian river section on its spawning runs, although it was already less frequent than in previous centuries.



The sterlet belongs to the family of sturgeons. In contrast to the diadromous Beluga sturgeon, it is a pure freshwater fish and still inhabits the Austrian Danube. Illustration by George Bodenehr and Krüger, late eighteenth century.

Originally published in Bloch, Marcus Elieser. *Allgemeine Naturgeschichte der Fische*. Berlin: Morino, 1782–95. Plate 89.



The Danube salmon is a fish species endemic to the Danube catchment. Illustration by George Bodenehr and Krüger, late eighteenth century.

Originally published in Bloch, Marcus Elieser. *Allgemeine Naturgeschichte der Fische*. Berlin: Morino, 1782–95. Plate 100.

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Chapter: Fisheries, Fishers, and Fish Trading in the Urban Environment
Source URL: http://www.environmentandsociety.org/node/6844
PDF created on: 27 April 2021 11:14:50

Fishers and fishing gear

The fishing gear used by the Viennese fishers' guild and other fishers' organizations was as diverse as the fish community. These organizations included the Klosterneuburg monastery north of Vienna and others in surrounding municipalities which at that time were not yet part of Vienna. They used seine nets, lift nets, traps, or lines. The monastery of Klosterneuburg also had special permission to erect fish weirs: this type of gear had already been banned elsewhere along the Austrian Danube under a fisheries law from 1506 because it was considered to be especially harmful to fish.

In engravings and paintings of the eighteenth and nineteenth centuries, fishers often appear with a fishing rod. Such gear was, however, mainly used by early recreational fishers. It only became more common along the Viennese and Austrian Danube in the late nineteenth century.

The original virutal exhibition includes an interactive gallery of images. View the images on the following pages.

Joseph Wohlmuth, *Blick gegen die Taborbrücke*, around 1820. © Österreichische Nationalbibliothek/Wien, LW 75.021-C. Used by permission.

Blick gegen die Taborbrücke

Life along an arm of the Viennese Danube with fishers, ship mill (on the right-hand side in the foreground) and the main bridge (the Tabor Bridge) crossing the Danube in Vienna. In the background is St. Stephen's Cathedral, Vienna. Ship mills were typical constructions for hydropower production on the Danube.

Joseph Wohlmuth, *Blick gegen die Taborbrücke* [View toward the Tabor Bridge], around 1820.

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Chapter: Fisheries, Fishers, and Fish Trading in the Urban Environment

Source URL: http://www.environmentandsociety.org/node/6844

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Franz Caucig, *Fischer im Prater*, n.d. © Kupferstichkabinett der Akademie der bildenden Künste, Wien. Used by permission.

Fischer im Prater

Fishing with small lift-nets was typical along the Danube.
Franz Caucig, *Fischer im Prater* [Fisherman in the Prater], n.d. Feather in bistre and brush in ink, 23 x 35 cm.
© Kupferstichkabinett der Akademie der bildenden Künste, Wien. Used by permission.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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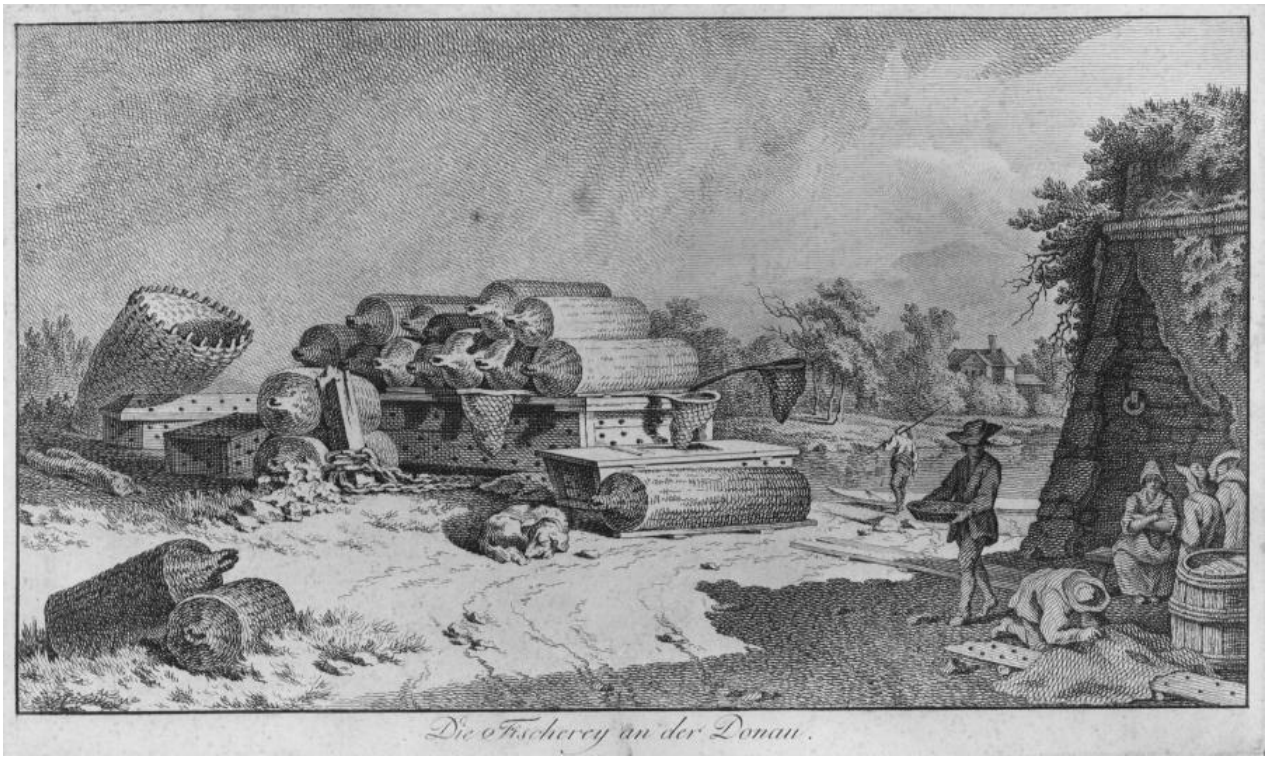

Friedrich August Brand, *Die Fischerei an der Donau*, n.d. © Wien Museum, 81547. Used by permission.

Die Fischerei an der Donau

Fishtraps were also common, especially on floodplain water bodies. Fish were later stored and transported in wooden tanks.
Friedrich August Brand, *Die Fischerei an der Donau* [The Fishing on the Danube], n.d.
© Wien Museum, 81.547. Used by permission.

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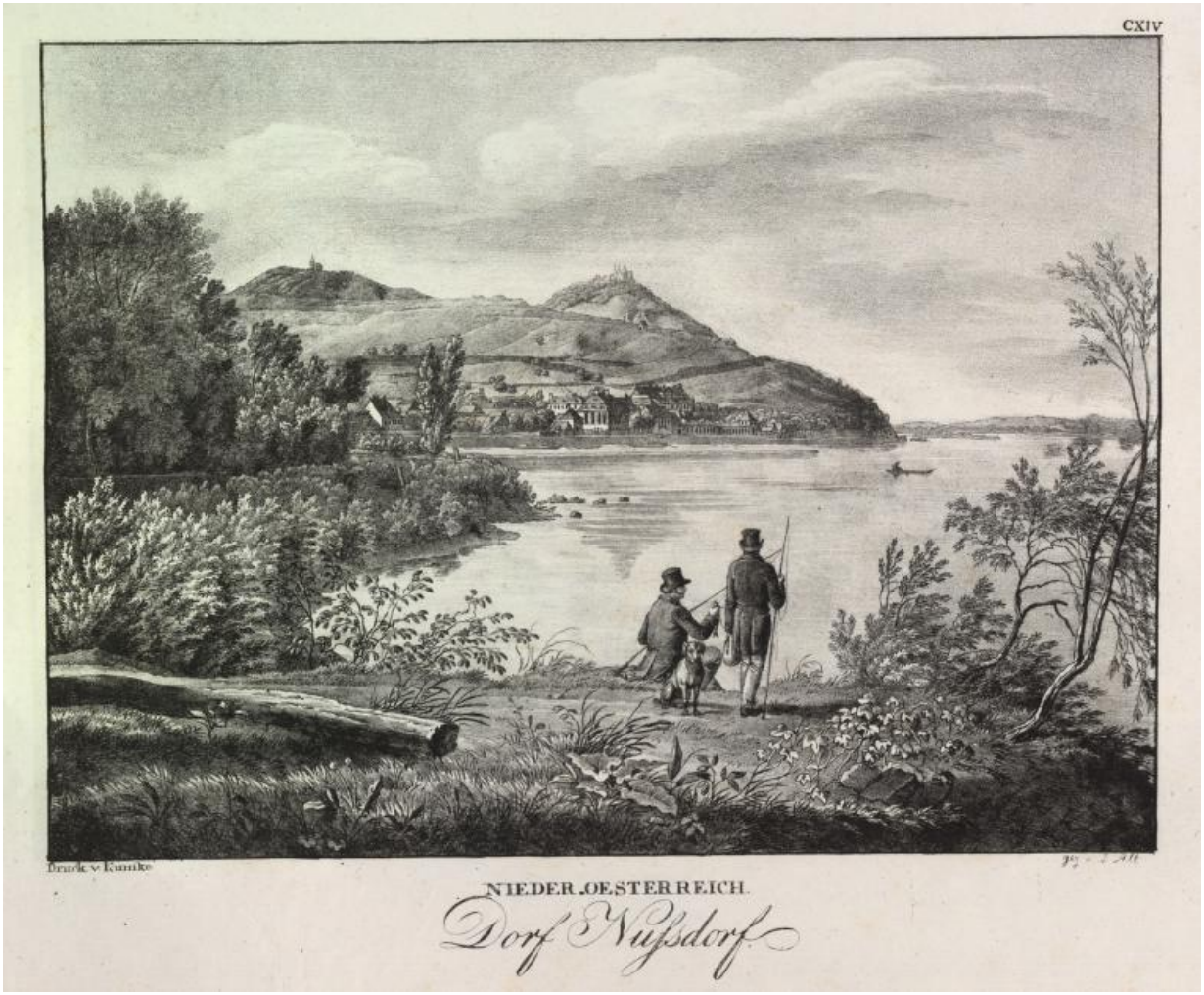

Adolf Kunike, *Dorf Nussdorf*, 1826. © Wien Museum, 105.081/117. Used by permission.

Dorf Nussdorf

Recreational fishing with fishing rods was still rare at the beginning of the nineteenth century. Two small hills, Kahlenberg and Leopoldsberg (seen in the background), were preferred places to view and paint the Viennese Danube landscape. Recreational fishers are seen in the foreground with fishing rods at the Danube banks in Nussdorf, upstream from Vienna.
Adolf Kunike, *Dorf Nussdorf* [Nussdorf Village], 1826.
© Wien Museum, 105.081/117. Used by permission.

The Viennese fish market and fish supply

Fish were sold at different places in Vienna, but the main location was the central fish market. For centuries it was located at Hoher Markt in the city center. Thereafter, it was moved to the city's fortification walls in 1753, and to the banks of the Danube Canal after the walls were destroyed in 1858. Fish were often sold live and, from the fourteenth century, various laws were enacted to guarantee the supply of fresh fish. Until the nineteenth century, fish was often rotten because of long transport distances or inadequate storage. In the late nineteenth century, the pollution of the Danube Canal—from which the water needed to keep fish alive and fresh was taken—had an adverse effect on fish supply.

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PDF created on: 27 April 2021 11:14:50

Danube fish played an important role in the diet of urban residents, but despite the richness of Danube fish species and their abundance, local waters could not satisfy urban demand. In a description of Vienna from 1547, Wolfgang Schmeltzl mentions more than 50 species that he found at the fish market. A large proportion of fish was, however, imported, sometimes by boat on the Danube and often also by cart.

Until the late nineteenth century, only few marine species were sold, such as herring or flatfish. In the 1890s, the city organized campaigns to promote marine fish, which were brought in increasing quantities to Vienna, especially after 1899, when the German company "Nordsee" established fish sales in Vienna.

The original virutal exhibition includes an interactive gallery of images. View the images on the following pages.

Illustration by Johann Fischer von Erlach and Johann Adam Delsenbach, 1719. Courtesy of Universitätsbibliothek Wien, AC06593649. CC BY-NC 2.0 AT.

Prospect des Hohen Marckts zu Wien

Until 1753 the Viennese fish market was in the center of town at Hoher Markt. Beluga sturgeon were delivered by carts (see left-hand side in the foreground).

Illustration by Johann Fischer von Erlach and Johann Adam Delsenbach. Originally published in Fischer von Erlach, Johann, and Johann Adam Delsenbach. *Prospecte und Abrißе einiger Gebäude von Wien*. Vienna: 1719: 24.
Courtesy of Universitätsbibliothek Wien, AC06593649, CC BY-NC 2.0 AT . Accessed on 17 January 2019. Click here to view source.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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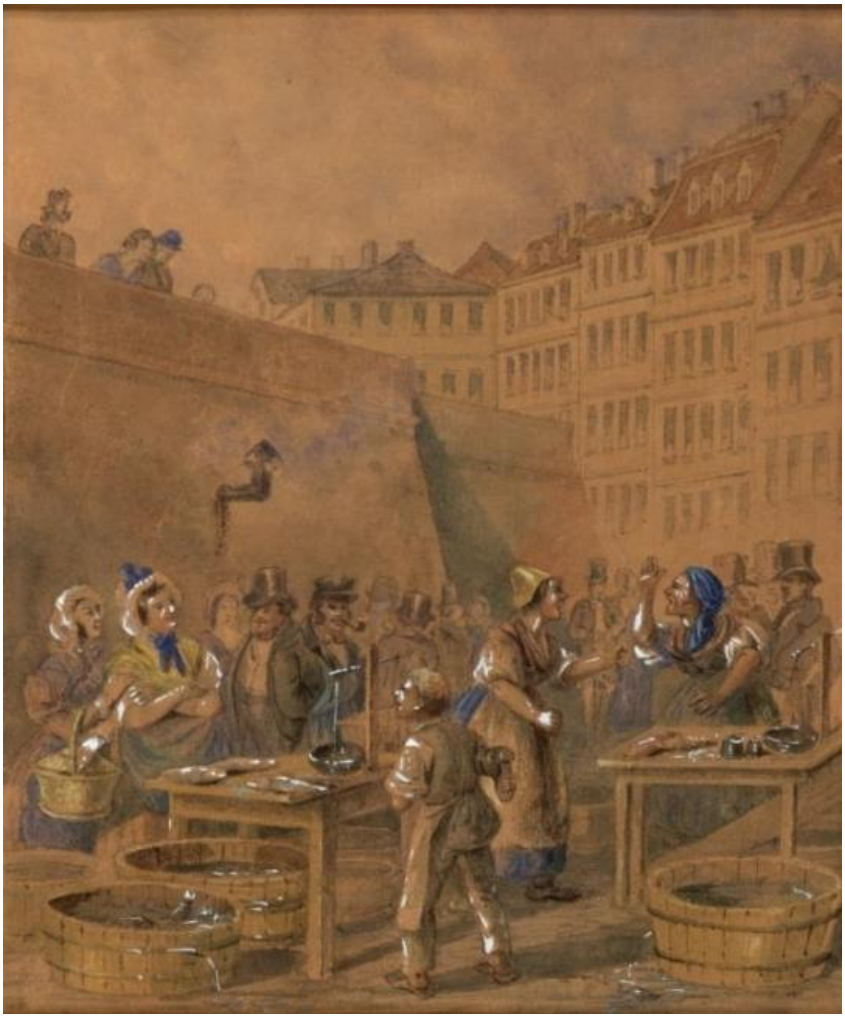

Unknown painter, *Der Fischmarkt*, before 1858. © Österreichische Nationalbibliothek/Wien, Pk 299, 16. Used by permission.

Der Fischmarkt

In 1753 the Viennese fishmarket was relocated to the fortification walls. Water supply remained difficult and fish were kept in tubs (right-hand side in the foreground).
Unknown painter, *Der Fischmarkt*, before 1858.
© Österreichische Nationalbibliothek, Wien. Pk 299, 16. Used by permission.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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PDF created on: 27 April 2021 11:14:50

Franz Poledne, *Franz-Josefskai-Am Schanzl*, n.d. © Wien Museum, 61.302. Used by permission.

Franz-Josefskai-Am Schanzl

After the fortification walls were destroyed in 1858, the fish market was moved to the Donaukanal where it remained until 1972. Fish could have been stored here in tanks (right-hand side in the foreground), which were put into the water.
Franz Poledne, *Franz-Josefskai-Am Schanzl*, n.d.
© Wien Museum, 61302. Used by permission.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
Chapter: Fisheries, Fishers, and Fish Trading in the Urban Environment
Source URL: http://www.environmentandsociety.org/node/6844
PDF created on: 27 April 2021 11:14:50

Obere Donaustraße, Fischmarkt am Franz-Josefs-Kai, 1899. Unknown photographer. © Österreichische Nationalbibliothek/Wien, L 25387 – B. Used by permission.

Fischmarkt am Franz-Josefs-Kai

An early photograph of the Donaukanal and the fish market. In 1899 fish were already stored in permanent tanks in the water.
Obere Donaustraße, Fischmarkt am Franz-Josefs-Kai, 1899. Unknown photographer.
© Österreichische Nationalbibliothek, Wien, L 25.387-B. Used by permission.

Websites linked in image captions:

- https://phaidra.univie.ac.at/view/o:60151

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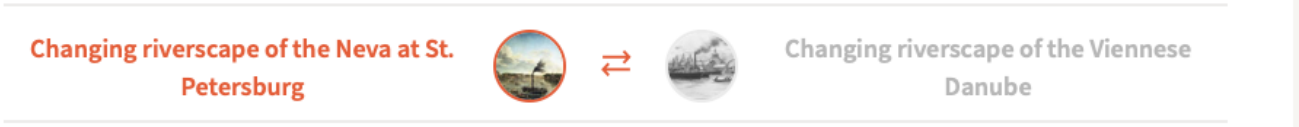
PDF created on: 27 April 2021 11:14:50

Changing Landscapes and River Control

Unchannelized rivers are a dynamic environment where water and land constantly move. Living close to or even within riverine landscapes poses complex challenges. The river determines people's lives to a great extent, shaping them spatially and temporally. In turn, societies have modified rivers considerably to secure their own needs and to overcome the risk of flooding. During the period of modernization in particular, new technologies offered unprecedented opportunities to change the nature of rivers. As important centers of technical expertise, Vienna and St. Petersburg eventually created almost new landscapes. This is particularly true for the history of the Viennese Danube. This section visualizes the changes in riverscapes essential to both capitals.

The original virtual exhibition includes the option to switch between the cities St. Petersburg and Vienna within the individual chapters (see screenshot below).

Here we present the subchapters one after the other.



Changing riverscape of the Neva at St. Petersburg

St. Petersburg could not develop without significant changes to the waterscape. At least 80 hydrological objects appeared, disappeared, or were significantly changed between the early eighteenth and late twentieth centuries. This work required thousands of working hands, and a significant number of the workers who came to the new capital each year were involved in the building of canals and embankments. These were initially made of wood and later of granite. (This enormous work continues to the present day and seems unlikely to ever be totally completed.)

As a result, the rivers became significantly narrower (the Neva lost between 50 and 250 meters of width). The shallows were finally replaced with almost vertical granite walls, which undoubtedly affected the fish population.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
Chapter: Changing Landscapes and River Control
Source URL: http://www.environmentandsociety.org/node/6845
PDF created on: 27 April 2021 11:14:52

Map of St. Petersburg water objects, eighteenth–nineteenth centuries.

Unknown cartographer.

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Chapter: Changing Landscapes and River Control
Source URL: http://www.environmentandsociety.org/node/6845
PDF created on: 27 April 2021 11:14:52

While there were several permanent projects to change the riverine network in St. Petersburg, none can be called a "decisive" or "turning" point in its story. We can only list the most important projects: the transformation of the River Krivusha into the Ekaterininski Canal (now the Griboyedova Canal) in 1764–1790; the construction of the Obvodnyi Canal (1769–1833); the permanent raising of the ground level in almost all of the city throughout the eighteenth and nineteenth centuries; the construction of granite embankments on the Neva and the smaller rivers and canals (in the second half of the eighteenth and nineteenth centuries); the construction and backfill of drainage canals and ponds; and the development of a network of bridges—made initially of wood and later of granite and steel.

The wooden bridges gradually disappeared in the nineteenth century and do not exist in the city anymore. Granite embankments appeared in the second half of the eighteenth century. Andrey Yefimovich Martynov, *View of the Moika River by the Imperial Stables*, 1809. Watercolour and Indian ink, 60 x 86 cm.

Water control in St. Petersburg required the skills of numerous experts and it was therefore one of the most important spheres of Russian-European technological transfers in the eighteenth and nineteenth centuries. Dutch and Venetian engineers were invited in the early days of the city and Russian students were sent abroad for training. Later, many French and German hydroengineers worked in St. Petersburg, as well as the graduates of the technical institutes created in the city itself. By the early twentieth century, St. Petersburg had itself begun to export hydrotechnologies abroad.

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Chapter: Changing Landscapes and River Control
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PDF created on: 27 April 2021 11:14:52

Water transportation

Water routes, both natural and artificial, became the basis for St. Petersburg's transportation system early on in the life of the city. Ground transportation was almost impossible due to the poor quality of the few available roads. Barges delivered food for workers and construction materials for buildings, as well as commodities for the growing commercial seaport. Water transportation very soon became an important branch of business in the city and throughout the imperial period: the Neva and its branches were dotted, from April to November, with

private boats as well as big transportation vessels. In addition to the privately owned vessels, many city administrations possessed boats for their officials, and this was an important part of the urban transportation system, too.

The original virtual exhibition includes an interactive gallery of images. View the images on the following pages.

Weierman, *Dredge on the Fontanka*, Ilustration from the journal Vsemirnaia illustraciia, 1869. Public domain.

Dredge on the Fontanka

The Anichkov Bridge was rebuilt several times between the early eighteenth and mid-nineteenth centuries. Steam-powered dredges appeared in the middle of the nineteenth century; previously the rivers had been cleaned manually.
Weierman, *Dredge on the Fontanka*, 1869. Illustration from the journal *Vsemirnaia illustraciia,* 1869.
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PDF created on: 27 April 2021 11:14:52

T. A. Vasiliev, *The Islands of the Neva*, 1820. © The State Hermitage Musum. Public Domain.

The Islands of the Neva

This painting depicts St. Petersburg nobility's recreational zone with numerous impressive mansions and richly decorated pleasure boats. The steamboats seen in the painting were used in the first half of the nineteenth century to serve as transportation inside the city and in the Gulf of Finland.

T. A. Vasiliev, *View of Islands in St Petersburg*, 1820. Oil on canvas, 83 x 114 cm.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.

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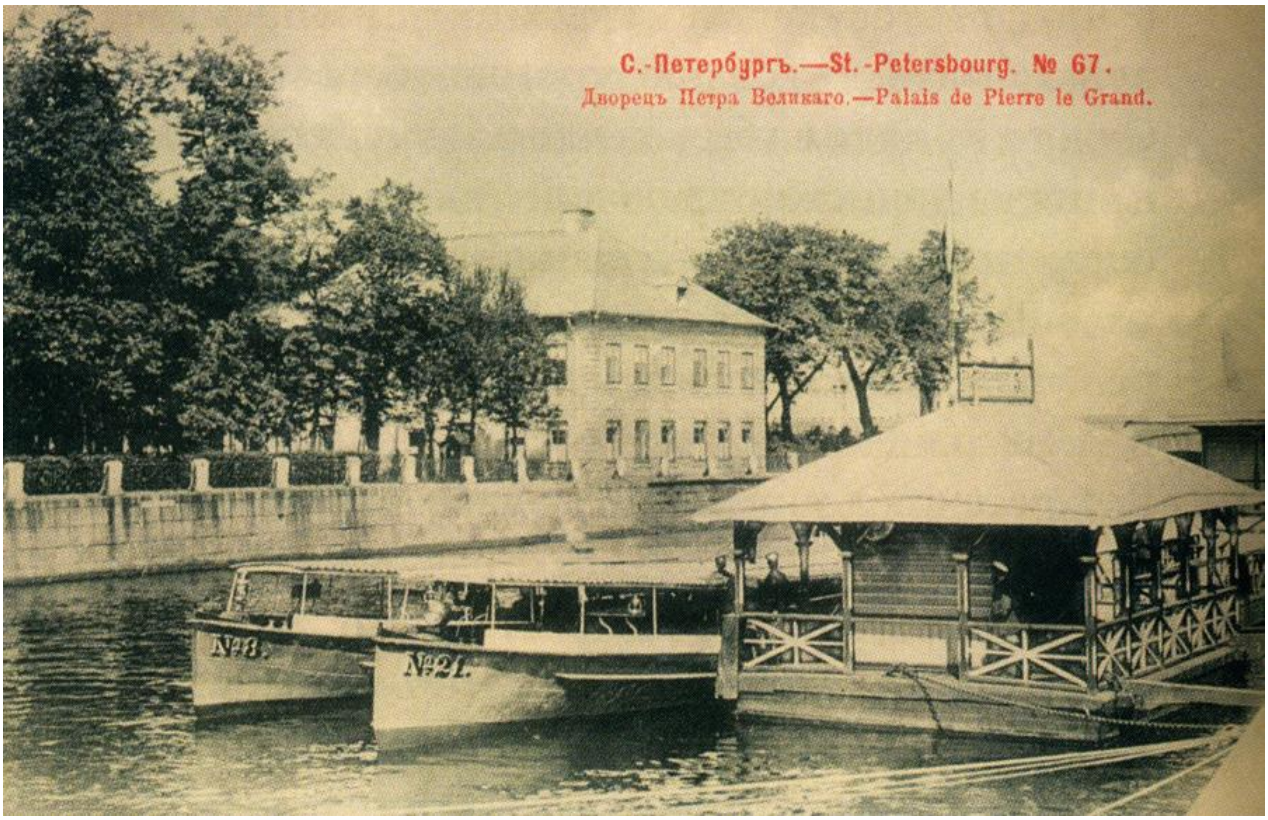

Postcard of Steamboats on the Fontanka, near the Summer Garden, Early Twentieth Century. © The State Museum Reserve "Peterhof", 2 Razvodnaya Str., Peterhof, Petrodvorets district, Saint Petersburg 198516, КП 69900/39. Used by permission.

Postcard of steamboats on the Fontanka, near the Summer Garden, early twentieth century

This pier no longer exists, and public transportation in this part of the city is no longer available.
Postcard of steamboats on the Fontanka, near the Summer Garden, early twentieth century.
© The State Museum Reserve “Peterhof,” 2 Razvodnaya Str., Peterhof, Petrodvorets district, St. Petersburg, 198516. КП 69900/39. Used by permission.

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Source URL: http://www.environmentandsociety.org/node/6845
PDF created on: 27 April 2021 11:14:52

Postcard of the Fontanka near the Anichkov Bridge, early twentieth century. ©The State Museum Reserve "Peterhof", 2 Razvodnaya Str., Peterhof, Petrodvorets district, St. Petersburg 198516, КП 70172/58. Used by Permission.

Postcard of the Fontanka near the Anichkov Bridge, early twentieth century

This postcard shows barges, a tugboat, and steamboats near the Anichkov Bridge. Barges delivered thousands of tons of commodities to the city, including fuel timber, which was very important for the northern city. Tugboats were used for the transportation of commodities within the city. Steamboats were an important part of public transportation for millions of passengers annually.

Postcard of the Fontanka near the Anichkov Bridge, early twentieth century.

In the nineteenth century, new technologies came to the city. In November 1815, the first steamboat, *Elizaveta*, initiated a new era in the history of St. Petersburg’s water transportation. From that moment until 1917, the smoke from numerous steamboats became a characteristic part of the city’s atmosphere. These vessels were built in the city and delivered to St. Petersburg from the shipyards of central Russia, as well as from abroad. Steamboat transportation expanded the borders of St. Petersburg and made certain territories easily accessible, which were otherwise quite remote in the eyes of eighteenth-century citizens.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. “‘Commanding, sovereign stream’: The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers.” Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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PDF created on: 27 April 2021 11:14:52

Floods

The Neva floods constitute an important part of the St. Petersburg collective memory materialized in numerous heritage objects throughout the city. This stone tablet on the wall demonstrates the water level during the most catastrophic flood in the St. Petersburg history that took place in November 1824. These tablets are still quite visible in the central part of the city and therefore the space of urban memory is still very much shaped by the centuries of threat from the unpredictable stream. Photograph by BiOBER.

Accessed via Wikimedia on 27 November 2018. Click here to view source.

The Neva is quite a self-willed stream with very unstable water levels. The downstream is strongly affected by the Gulf of Finland. In autumn, low atmospheric pressure combines with stormy wind from the west to form cyclones. As a result, enormous masses of water enter the mouth of the Neva from the sea and the river floods the city. The most catastrophic flood took place on 7 November 1824, when the water level rose 4.21 meters above the norm. For centuries, floods have been an important part of local culture and identity, hanging over the city like the Sword of Damocles. To a great extent, the idea of flood protection has been the driving force behind waterscape changes since the eighteenth century. Engineers tried to develop canal networks in order to prevent water stagnation, which was considered to be the major reason for floods; however, it was only in the twenty-first century that a dam was built across the Neva inlet, radically changing the eastern part of the Gulf. The threat has thus been eliminated as no water can now enter the mouth of the river from downstream.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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PDF created on: 27 April 2021 11:14:52

Changing riverscape of the Viennese Danube

Like many urban rivers, the Danube served as the main emporium supplying the city with goods. Hinterlands located up- and downstream delivered grains, animals, meat, vegetables, fruits, or commercial goods such as wood and various other items. The Danube and its urban tributaries also served as locations for waste disposal and sewage discharge. Its waters powered ship mills along the northern river arm on the riverbanks opposite the urban center.

It is difficult to speak about the "Viennese Danube" as such prior to the great Viennese Danube regulation. Until then, the river consisted of several arms, along with many islands and flat riverbanks that were not stable, but moved and changed their location with each larger flood.

The greatest hive of activity was concentrated on the river canal next to the city center. Today, it is known as the "Donaukanal," or "Danube Canal." This was the main river arm until early modern times, but because of natural processes, the whole river system shifted towards the north. Intensive technical and financial efforts to keep the main canal in the city were abandoned in the eighteenth century. Until the great Danube regulation, the Donaukanal remained the town's main and most vibrant river arm.

The original virtual exhibition includes an interactive gallery of images. View the images on the following pages.

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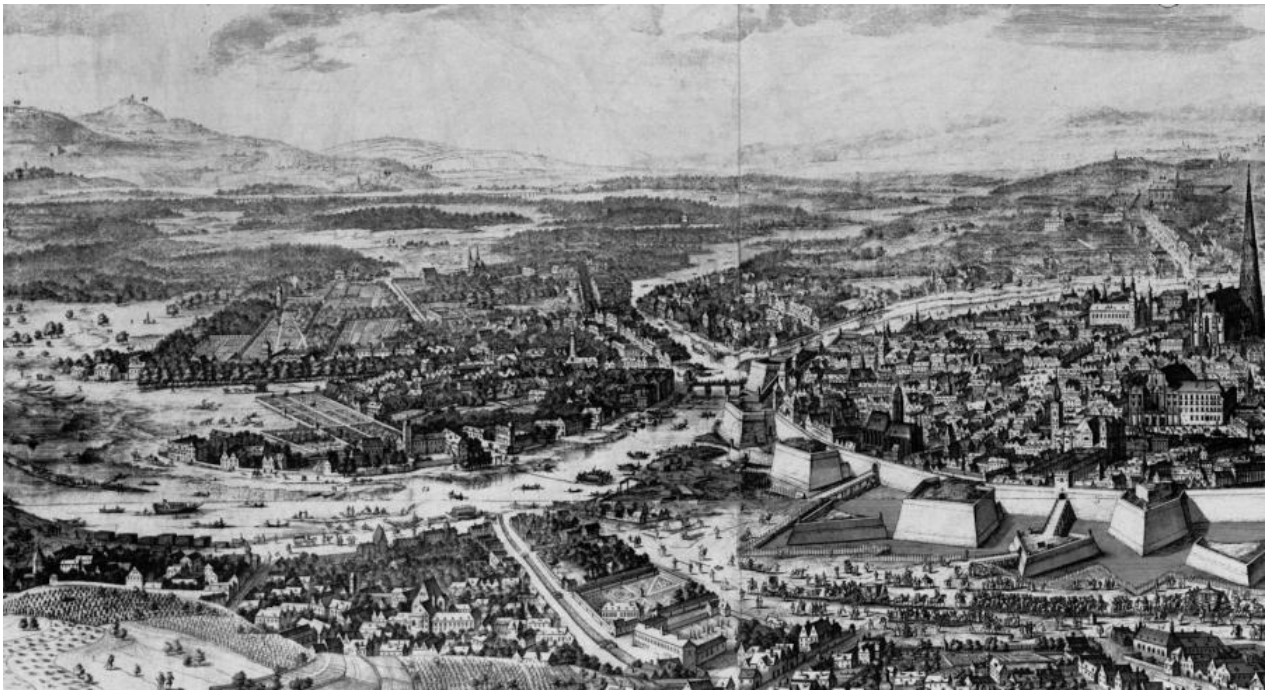

Folbert van Alten-Allen, *Vogelschau der Stadt Wien und Umgebung*, around 1683. © Wiener Stadt- und Landesarchiv, Pläne und Karten: Sammelbestand, P1: 1856. Used by permission.

Vogelschau der Stadt Wien und Umgebung

View of Vienna and the Donaukanal around 1683. Wooden ships and rafts can be seen on the former main canal of the Danube, now called the "Donaukanal." A ferry connected the banks.

Folbert van Alten-Allen, *Vogelschau der Stadt Wien und Umgebung* [Bird's eye view of the city of Vienna and surroundings], around 1683. © Wiener Stadt- und Landesarchiv, Pläne und Karten: Sammelbestand, P1: 1856. Used by permission.

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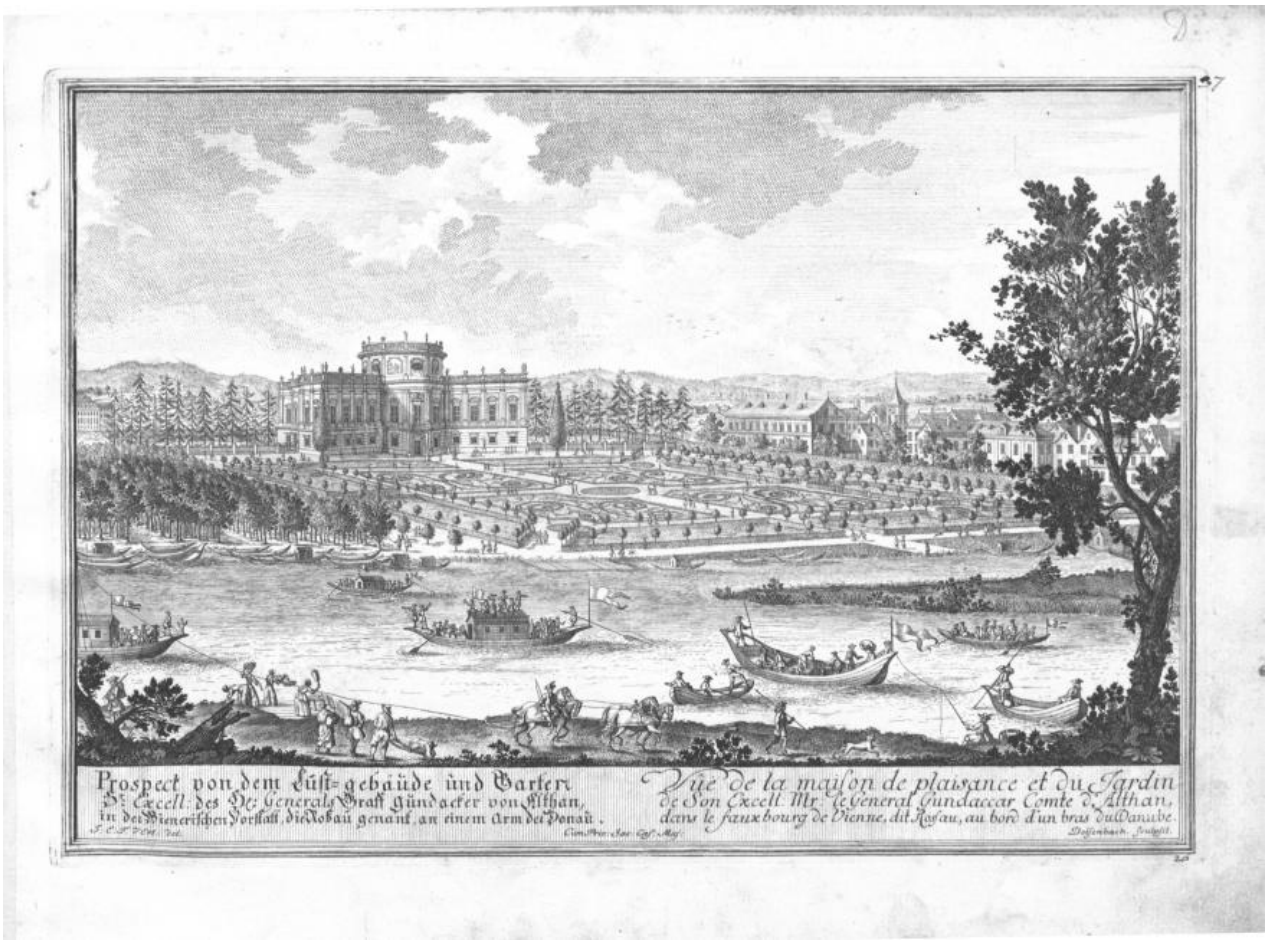

Illustration by Johann Fischer von Erlach and Johann Adam Delsenbach, 1719. Universitätsbibliothek Wien, AC06593649, http://ubdata.univie.ac.at/AC06593649. CC BY-NC 2.0 AT .

Prospecte und Abrisse einiger Gebäude von Wien

Palaces and parks were built on the banks of the Donaukanal, as for instance the Palais Althan. In the center of the foreground, horses are pulling a ship upstream.
Illustration by Johann Fischer von Erlach and Johann Adam Delsenbach. Originally published in von Erlach, Johann Fischer, and Johann Adam Delsenbach. *Prospecte und Abrisse einiger Gebäude von Wien*. Vienna, 1719: 33.
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Johann Ziegler, *Ansicht des Schanzels an der Donau*, 1779. © Wien Museum, 185.809. Used by permission.

Ansicht des Schanzels an der Donau

The Donaukanal was Vienna's main supply route for wood, among other commodities.
Johann Ziegler, *Ansicht des Schanzels an der Donau*, 1779.
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Friedrich Alois Schönn, *Obstmarkt am Schanzl*, 1895. © Wien Museum. Used by permission.

Obstmarkt am Schanzl

In addition to fish, also fruits, vegetables, and animals were sold along the Donaukanal. Imported from villages upstream, these goods were sold directly on the river banks. In the late eighteenth and nineteenth century several bridges were built to cross the Donaukanal (see background).
Friedrich Alois Schönn, *Obstmarkt am Schanzl*, 1895.
© Wien Museum. Used by permission.

Despite the various riverine benefits, Danube floods were a permanent threat to the riparian residents and their infrastructures. Floods occurred due to heavy rainfall or due to fast-melting snow upstream. The regular ice jam floods in late winter were particularly destructive. Flood protection dykes had already been erected in the late eighteenth century, but proved to be insufficient. At that time, people relied mainly on passive practices. When a flood was expected, boats were readied to evacuate people, and wood was prepared for catwalks and to brace houses. Bakers, butchers, and commercial food traders in threatened places were obliged to store flour, wood, and water. When floods were believed to be imminent, house owners were ordered to ensure that elderly and ill people were moved to upper floors. Likewise, animals had to be taken to safe locations. During floods, soldiers were obliged to observe the water level and report houses at risk of collapse.

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A devastating flood hit people and their houses in 1830. Eduard Gurk, *Überschwemmung in Wien* [Flooding in Vienna], 1830.

Ice floods and ice jams were typical for the unchannelized Danube. Adolf Obermüller and Alexander Bensa, *Der Donaueisstoß bei Wien im Januar 1880* [The Danube ice jam near Vienna in January 1880], 1880.

These flood protection practices changed throughout the nineteenth century. Projects for a systematic channelization of the Danube were developed beginning in 1815. They linked flood protection and the improvement of shipping, as well as the erection of stable bridges crossing all Danube arms. Financial constraints and disagreements between engineers and decision-makers hampered all these projects for several decades.
Finally, between 1870 and 1875, the great Danube regulation was implemented in Vienna. It transformed the dynamic riverine landscape into a straight riverbed, thereby also changing fish habitats. The Donaukanal remained as a river arm, although it was not sufficient for larger ships, particularly steamships, which had more challenging technical requirements than the old wooden rowing ships and rafts. Shipping and landing places had to be transferred to the new main Danube riverbed.

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PDF created on: 27 April 2021 11:14:52

View of the Danube River from Nussdorf before the Great Danube Regulation. Unknown painter, *Die Donau bei Nussdorf*, n.d.

View of the Danube River from Nussdorf after the Great Danube Regulation. Anton Hlavacek, *Die Kaiserstadt an der Donau*, 1884.

The newly stabilized terrestrial areas in the Viennese Danube floodplains became an important land resource in the fast-growing and industrializing city. In the following decades, the districts located here showed the highest growth rates of urban land and population. Flood events of the 1890s, along with increasing knowledge about the hydrology of the river, proved that the measures implemented in the 1870s were insufficient to protect urban residents from floods.

A continuous effort was made to improve flood protection measures from the second half of the nineteenth century. Additional projects continue to be implemented today.

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The Donaukanal remained important for Vienna's food supply, also after the Great Danube Regulation. Franz Poledne, *Franz Josefskai – Fischmarkt am Schanzl*, 1895.

Websites linked in image captions:

- https://commons.wikimedia.org/wiki/File:Flood_StPetersburg_1824.jpg
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Source URL: http://www.environmentandsociety.org/node/6845
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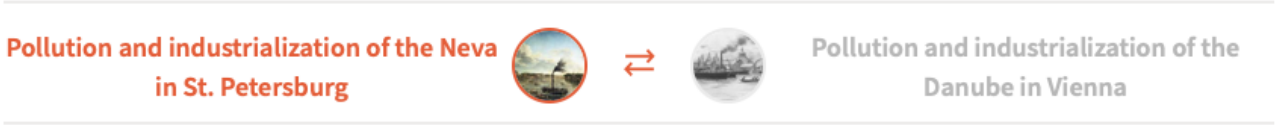
Pollution and Industrialization of the Neva and Viennese Danube in the Nineteenth and Early Twentieth Centuries

Rapidly growing cities of the eighteenth and nineteenth centuries were full of environmental risks and problems. They were often overcrowded, industrialized, and equipped with quite primitive sanitary technologies. Urban dwellers used to dump their waste into their rivers. During the first decades of the nineteenth century, urban populations started to consider pollution a problem. In this section we describe similarities and differences in the history of water supply, pollution, and waste management in St. Petersburg and Vienna. Both cities faced similar problems, though St. Petersburg used the Neva as a source of drinking water while Vienna started to tap Alpine rivers as sources of drinking water in the 1870s.

The original virtual exhibition includes the option to switch between the cities St. Petersburg and Vienna within the individual chapters (see screenshot below).

Here we present the subchapters one after the other.



Pollution and industrialization of the Neva in St. Petersburg

The water of the Neva is naturally of excellent quality and the people of St. Petersburg were accustomed to enjoying pure and fresh drinking water from the city's beginnings. Moreover the river has very strong currents and it was therefore able to clean all sorts of waste for some time. But the growing city eventually became a problem too great even for such a large body of water. This was even more true for the smaller branches and canals.

The network of rivers and canals was considered to be a perfect natural sewage system by the dwellers of St. Petersburg. All the city's waste, including the dwellers' excrement, was collected in sinkholes and a significant part of it was ultimately discharged into the rivers and canals due to a quite primitive system of waste

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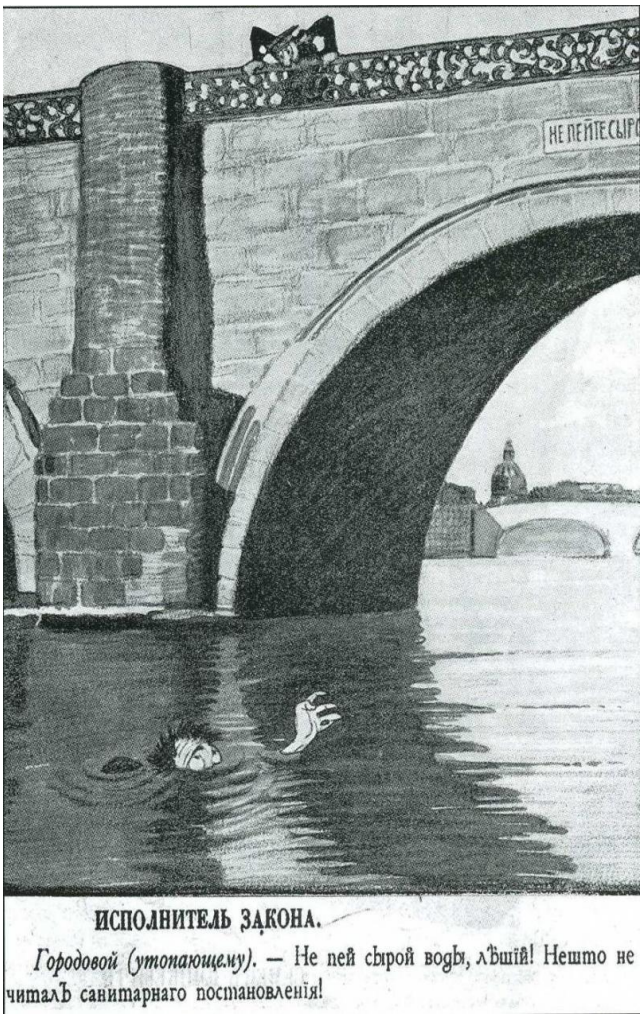

A policeman warns a drowning person that he shouldn't drink the water—as if this were a greater danger than drowning. Caricature from the journal *Satirikon*, 1908. Illustration by Re Mi.

Courtesy of the State Museum of the History of St Petersburg

management. The city police struggled against this habit tirelessly but unsuccessfully. Several times in the eighteenth and nineteenth centuries, the city administration cleaned the small rivers and canals, but still the water quality there was considered rather poor in comparison to the Neva. The water of the main river channel in the city, on the contrary, had a superb reputation throughout the entire eighteenth and the first half of the nineteenth century. Even the imperial residence, the Winter Palace, to say nothing about ordinary citizens, was supplied with water directly from the Neva without any purification during this period. A legend (which is definitely not true) says that Empress Alexandra Fedorovna (the wife of Nikolas II) used to exclusively drink the water of the Neva and allegedly even required this water to be delivered to her in barrels when she was traveling inside and even outside Russia. In general, the Petersburgers used a lot of water due to their habit of frequently visiting public baths, which was normal even for the poorest people.

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Postcard of the Obvodnyi Canal, early twentieth century. © The State Museum Reserve "Peterhof," 2 Razvodnaya Str., Peterhof, Petrodvorets district, St. Petersburg 198516, КП 74035/37. Used by permission.

Postcard of the Obvodnyi Canal, early twentieth century

The barges delivered tons of raw materials every day and took finished goods as well as waste on board. The factory produced gas for street lamps using coal and water from the canal. Waste water from the factories contributed to the waste and dirt that accumulated on the banks.

Postcard of the Obvodnyi Canal, early twentieth century.

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Postcard of the Obvodnyi Canal, early twentieth century

The sunken barges were significant sources of waste. The banks of the canal looked very much like a huge scrapyard.
Postcard of the Obvodnyi Canal, early twentieth century.
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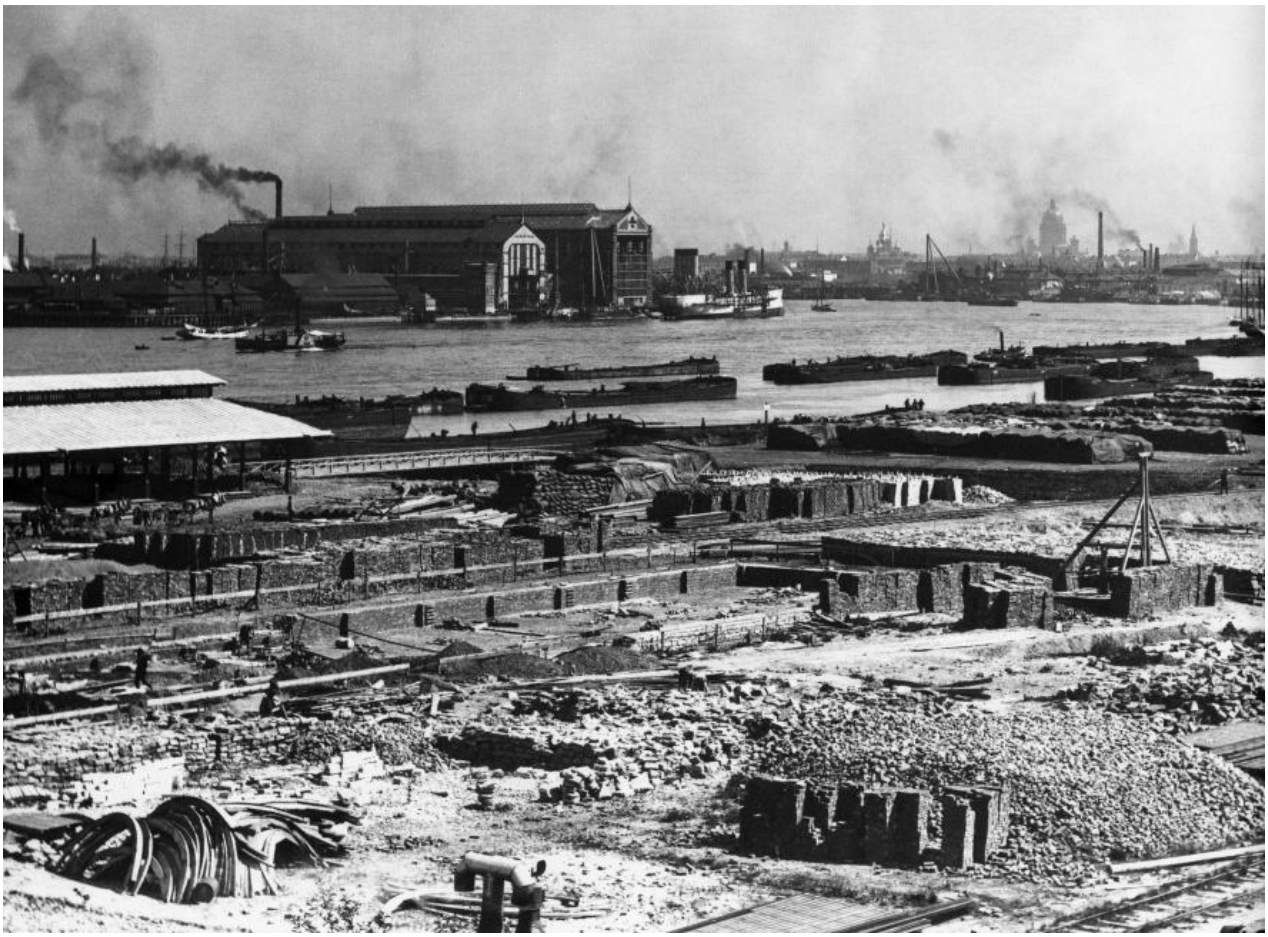

Industrial zone downstream of the Neva, early twentieth century. Courtesy of the State Museum of the History of St Petersburg. Public domain.

Industrial zone downstream of the Neva, early twentieth century

The shipyards on the banks of the Neva such as the Baltic wharf polluted both air and water. Big vessels drained the used fuel from the steam engines into the water and were among the biggest environmental problems of the city.
Industrial zone downstream of the Neva, early twentieth century. Unknown photographer, n.d.
Courtesy of the State Museum of the History of St Petersburg. Public domain.

The rivers also became an important part of industrial infrastructure. Industrialization in the modern sense of the word started in St. Petersburg in the late eighteenth century. Since the early period of the city's history, the downstream stretch of the Neva had been used for storage, piers, and wharfs, including the Admiralty shipyard. It is therefore very understandable that this area became one of the city's earliest industrial zones. Later, plants and factories also occupied the Neva's banks upstream from the city center, as well as the northern coast of the Big Nevka and the banks of the Obvodnyi Canal. The Neva's water was used in all stages of the technological process and the waste produced, together with the dirty water, was ultimately dropped into the rivers and canals.

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Source URL: http://www.environmentandsociety.org/node/6846
PDF created on: 27 April 2021 11:14:53

Billboard of the Company for the Health of the Cities, early twentieth century. The company "For the Healthy Cities" was involved in the construction and management of water cleaning and sewage systems. It is worth noting the proposal to erect buildings that required special water treatment technologies: laundries, hospitals, schools, markets, butcheries, ice storage, etc. Unknown illustrator.

As a result, as early as the 1830s even the Neva—to say nothing about the smaller rivers and canals—was rather dirty, much worse than its reputation. In 1831 cholera came to St. Petersburg for the first time and some residents accused Polish rebels of poisoning the water of the Neva as the river itself could absolutely not be dangerous in their eyes. But in reality the water became more and more dangerous, and cholera became one of the capital's major problems until the twentieth century.

The purification of the water in the city became one of the most discussed issues in the journals and newspapers. Public concern about the pollution of the city in general and of the water in particular was very visible. Sanitary technologies were demanded and became the basis for a specific branch of business. A public water supply system was introduced in the 1860s, but it was only in the 1870s that the first water filtration system appeared. It was quite primitive and the companies providing additional water purification found a large market in St. Petersburg in the late nineteenth and early twentieth centuries.

The problem of waste water was even harder. The first plans for a more-or-less modern sewage system were drawn up by the engineer Griboyedov in 1912, but it was not completed because of the First World War and the Revolution. A sewage system was not constructed until the Soviet era, although the problem of waste water in St. Petersburg continues to this day.

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Chapter: Pollution and Industrialization of the Neva and Viennese Danube in the Nineteenth and Early Twentieth Centuries

Pollution and industrialization of the Danube in Vienna

As in many large cities, industrialization in Vienna was also closely linked to population growth and urbanization. These events changed the role of the Viennese Danube as an urban transport route and as a sewage carrier, causing pollution in the nineteenth and early twentieth centuries.

One of the major driving forces behind the Danube's channelization was the need to support new means of river transport. The fixation of the main river canal was the focus of river channelization in Lower and Upper Austria. In Vienna, accommodating the needs of navigation was combined with building a flood protection system as early as the 1870s.

In 1830 the first steamship set off downstream to Budapest. This journey marks the beginning of a new river transport technology on the Austrian and Viennese Danube. In contrast to the common wooden ships, the larger steamships needed deeper channels and could not navigate well around narrow bends; they were also more prone to damage in the unregulated Danube system with its many shallows. In particular, the Donaukanal (Danube Canal) was inadequate for steamship navigation, which was thus transferred to the main arm of the Danube. Freight was unloaded in a harbor far away from the urban center and had to be brought there with carts and later by local railways.

For centuries, transport on the Danube supplied Vienna, as the capital of a large empire, with fuel and wood for construction. After the 1850s, coal gained importance in Vienna as a new energy source. Although food and other goods remained important ship freight throughout the nineteenth century, the shift to coal changed the river's role. No natural waterway connected Vienna with the main coal mines in the northern parts of the empire (Moravia, Silesia). Several projects to build artificial canals were developed, although building new railway lines ultimately seemed to offer better opportunities.

Interestingly, the first railway line built in Vienna in 1837, the Northern Railway, was also closely connected to the Danube. The main station was situated on an island in the Danube and the railway bridge that crossed the northern arm of the Danube was regularly destroyed by floods. In such cases, rail connections were interrupted until maintenance work was completed.

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Wilhelm Bernatzik, *Shiffsverkehr auf der Donau*, before 1886. © Österreichische Nationalbibliothek, Wien, pk 1131,98. Used by permission.

Shiffsverkehr auf der Donau

After the completion of the Great Danube Regulation in 1875, the main navigation route moved to the newly built main arm of the Danube. The Rotunda, a landmark built for Vienna's 1873 World Exposition, can be seen at in the background.
Wilhelm Bernatzik, *Schiffsverkehr auf der Donau* [Ship traffic on the Danube], before 1886. Watercolor.
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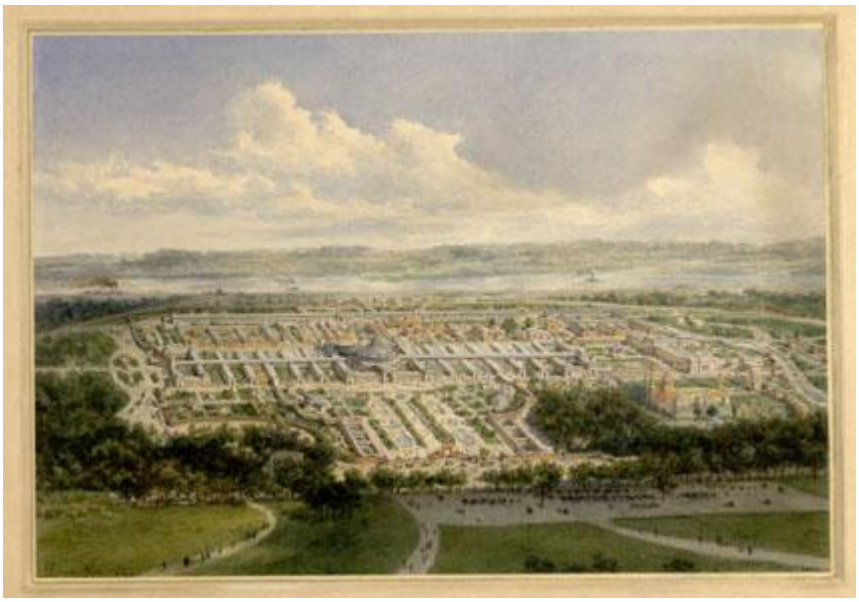

Franz Alt, *Wien, Weltausstellung 1873*, 1873. © Albertina, Vienna, 28931. www.albertina.at . Used by permission.

Wien, Weltausstellung 1873

The 1873 World Exposition took place in Vienna in the floodplains of the Danube. During this time the Great Danube Regulation was made.
Franz Alt, *Wien, Weltausstellung 1873* [Vienna, world exposition 1873], 1873.
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Danube Canal

The Donaukanal remained important for passenger transport.
Photograph by Carl von Zamboni, 1890.
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Heinrich Grave, *Wien und Vororte*, 1874. ©Wiener Stadt- und Landesarchiv, Pläne und Karten: Sammelbestand, P1: 756G. Used by permission.

Vienna and suburbs

The Danube floodplains became an important land resource in the fast growing town. In this map from 1874, the new Danube River and the envisaged expansion of the city in the former Danube floodplains is seen.
Vienna and suburbs. Map by Heinrich Grave, 1874.

While the river's role in transporting the food and goods required for everyday life declined throughout the nineteenth and twentieth centuries, its function as a sewage disposal site increased. In 1800, Vienna had about 200,000 inhabitants; by the mid-nineteenth century the number had more than doubled. In the 1870s the milestone of one million was passed and, at the beginning of the twentieth century, more than two million people lived within what are now the town limits. The growing population increased the organic input to the

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Danube and its tributaries. Potential nitrogen input from private households into the Donaukanal rose by a factor of seven between 1830 and 1910. This was accompanied by an as yet unreconstructed amount of industrial organic and inorganic waste.

By 1830 more than 80 percent of the Viennese households within the contemporary tax boundary were connected to sewers. The small brooks seemed to be an optimal solution for removing excrement and waste. They were therefore integrated into the urban sewage infrastructure right from the beginning. The inefficiency of this sewage system resulted in serious water pollution, especially in the small tributaries with their low water discharge. This triggered several epidemics. The first cholera outbreak in Vienna occurred in 1830–31. The bad sanitary situation prompted the development of a central waterborne sewage system. It was completed at the turn of the nineteenth to the twentieth century by opening one central outlet to the Donaukanal. An important prerequisite was that the city could be supplied with sufficient water from Alpine sources south of Vienna. The "Erste Wiener Hochquellwasserleitung," Vienna's first Alpine water supply system, was opened in 1873.

The stench from the polluted rivers was the subject of various satirical cartoons. Caricature in *Wiener Luft*, Supplement to *Figaro* 37, 15 September 1888. Unknown illustrator.

Although the discharge of the Donaukanal was much higher than that of the small tributaries, water quality was often assumed to be insufficient, in particular for keeping fish fresh in wooden barrels to be sold at the central fish market. Written sources from the 1890s document the debates between fish traders arguing for sufficient water quality in the Donaukanal and urban dwellers complaining about the bad taste of fish. The situation improved after the new central fish market was built in 1904.

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Francis II, Holy-Roman Emperor

The Wienfluss was the largest tributary of the Viennese Danube and suffered from severe pollution. Sewage canals were built after the first cholera epidemic in 1830 and 1831. In the middle in the foreground, Emperor Franz II is shown visiting the construction site.
Franz Wolf and Johann Josef Schindler, *Franz II., römisch-deutscher Kaiser* [Francis II, Holy-Roman Emperor], 1831.
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Photograph by R. Lechner, 11 October 1898. © Wien Museum, 49.049/41. Used by permission.

Concreting of a vaulted ring below the Elizabeth Bridge

The Wienfluss was vaulted at the end of the nineteenth century. In the 1890s it was the main tributary of the Donaukanal.
Photograph by R. Lechner, 11 October 1898.
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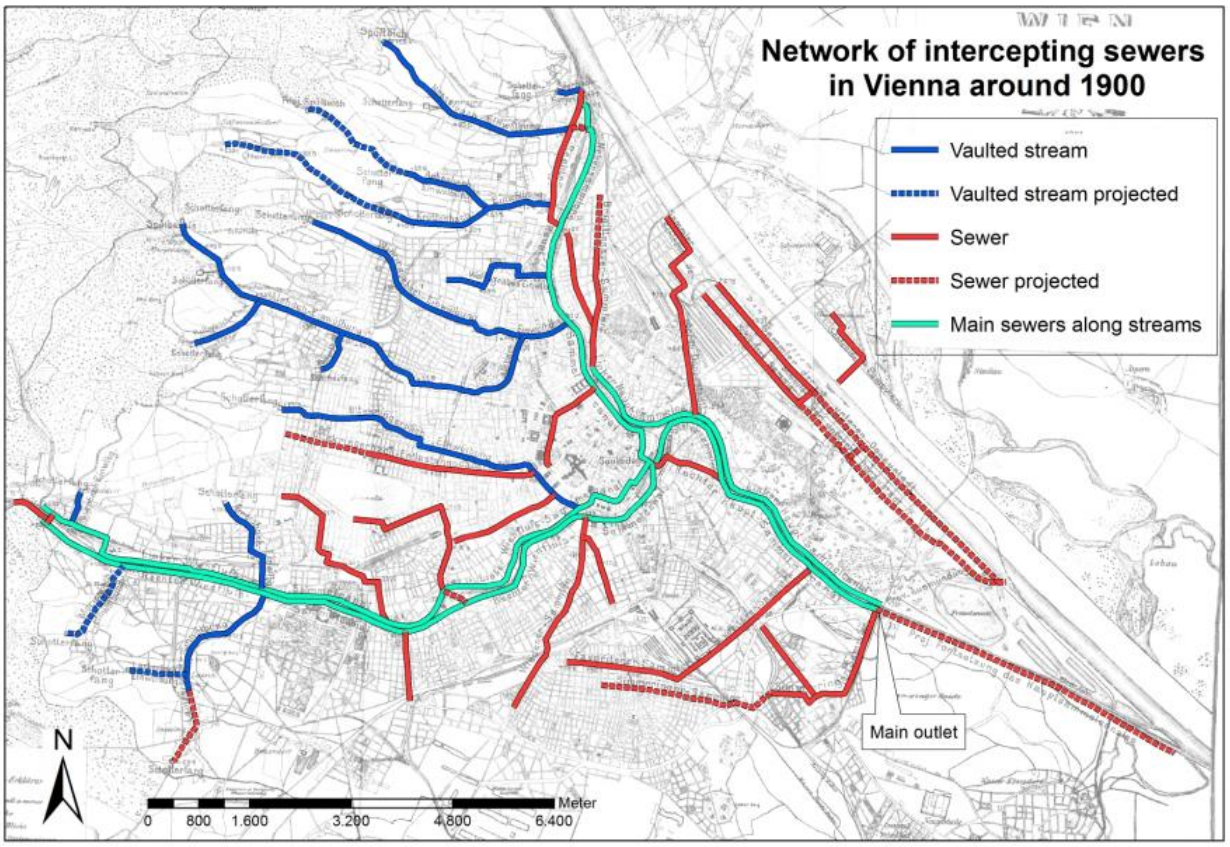

Map by Gertrud Haidvogl based on "Die Entwässerung von Wien" by P. Kortz. CC-BY-NC-SA 4.0.

Die Entwässerung von Wien

Around 1900, Vienna had an elaborate sewage system into which most of the small tributaries were integrated.
Map by Gertrud Haidvogl based on "Die Entwässerung von Wien" by P. Kortz. In Weyl, T., ed. *Die Assanierung von Wien*, edited by T. Weyl. Leipzig: Engelmann, 1902. Plate 3.

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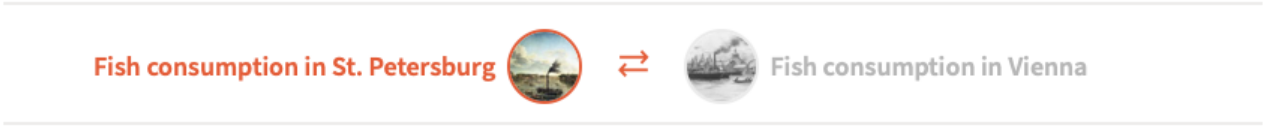
Fish Consumption

Both capitals were major centers of consumption in Europe. The growing population required a lot of food and fish was part of the city dwellers' diets. Vienna and St. Petersburg used both local and imported food resources and often created specific recipes that determined local consumption culture. Significant social stratification led to the clear division between fish commodities for the wealthy and those for poor citizens, though some kinds of fish could be popular among all dwellers, regardless of social differences. The smelt, which became a sort of iconic fish of St. Petersburg, is the best example of this. In Vienna, fish was comparatively expensive and thus mainly consumed by wealthy people, except on special occasions such as Christmas.

The original virtual exhibition includes the option to switch between the cities St. Petersburg and Vienna within the individual chapters (see screenshot below).

Here we present the subchapters one after the other.



Fish consumption in St. Petersburg

The growing population of the young city very soon created a specific local culture of fish and seafood consumption. Peddlers delivered freshly caught fish to every courtyard and consequently this commodity has always been available to all urban dwellers.

As the sturgeon population decreased dramatically in the eighteenth century, salmon, whitefish, lamprey, and smelt became the major local fish species represented in St. Petersburg's food consumption. We can identify several contexts in which the importance of local fish to local food culture and even local identity is evident, most

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Chapter: Fish Consumption
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particularly seasonality.
Smelt enter the Neva for spawning in spring and as a result this small fish became one of the symbols of spring in the city. The specific cucumber smell of this fish in the streets marks the annual revival of nature. Smelt was usually cooked in very simple ways—fried or boiled. Fried smelt could be pickled for long-term storage. Lamprey was another important target species for spring fisheries. Lamprey pickled in vinegar is recommended as a perfect appetizer in nineteenth-century cookbooks.

The original virtual exhibition includes an interactive gallery of images. View the images on the following pages.

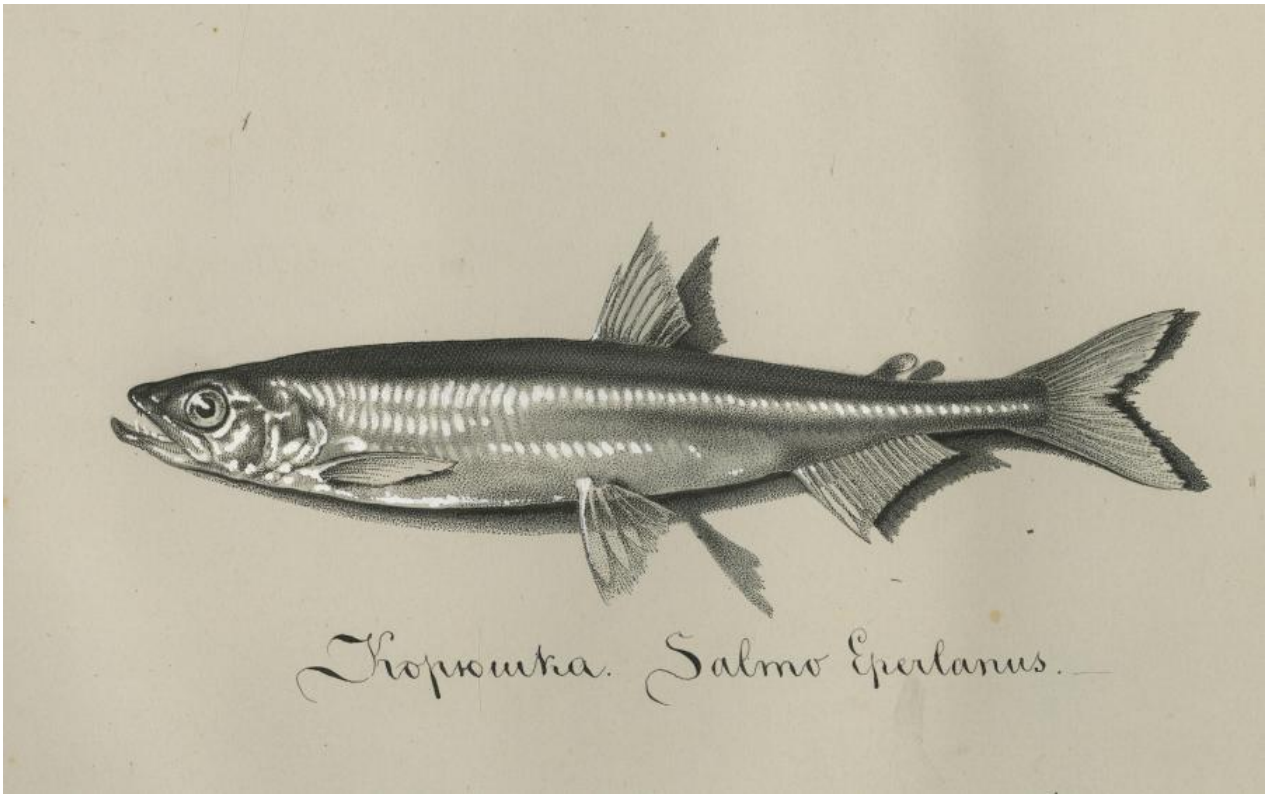

Illustration by Nikolai Liberich. © National Library of Russia. Used by permission.

Smelt

The smelt was (and still is) normally fried in oil, and immediately served hot and crispy. This very simple recipe has been popular during all three centuries of St. Petersburg's history.
Illustration by Nikolai Liberich.
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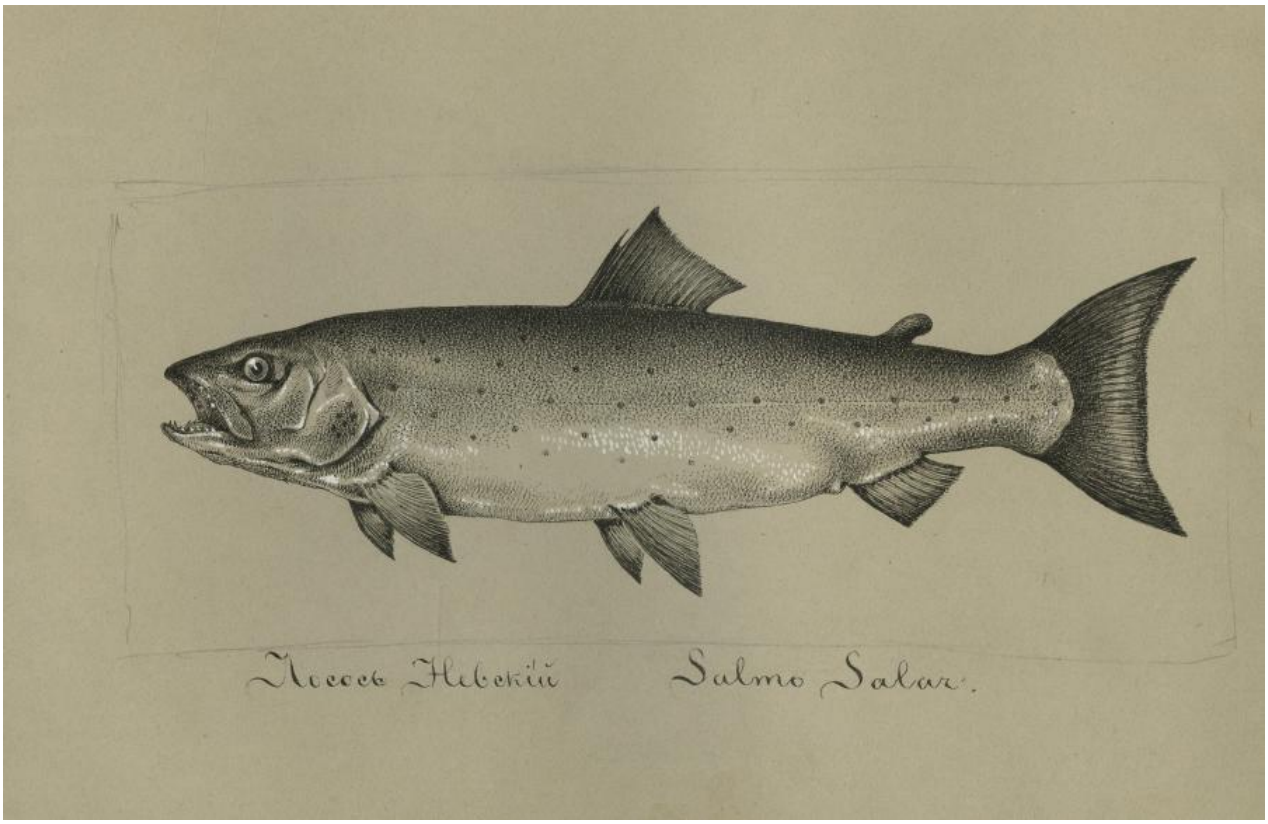

Illustration by Nikolai Liberich. © National Library of Russia. Used by permission.

The Neva salmon

The Neva salmon had a superior reputation among the St. Petersburg fish-eaters. Salmon spawning season was the heyday of the short St. Petersburg summer.
Illustration by Nikolai Liberich.
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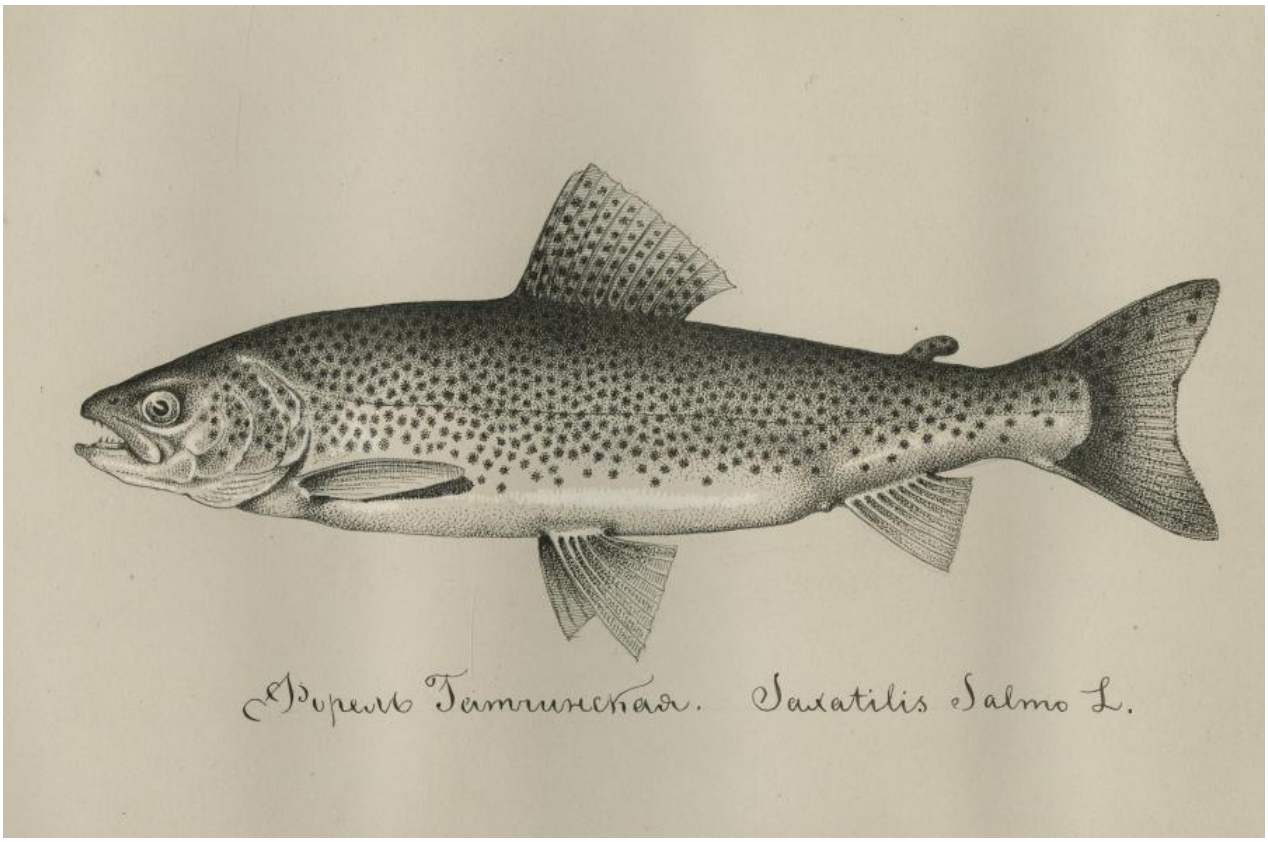

Illustration by Nikolai Liberich. © National Library of Russia. Used by permission.

The Gatchina trout

The Gatchina trout was considered as perhaps the most delicious of all three species of trout living in St. Petersburg waters.
Illustration by Nikolai Liberich.
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Salmon arrive to spawn in summer and St. Petersburg cooks used to distinguish between the Neva salmon and two kinds of local trout—the Neva trout and the Gatchina trout. The Neva trout was considered superb in terms of quality and taste, and it was recommended that it be cooked very fresh within a maximum of 10 minutes after it was killed. The Gatchina trout was smaller and it was recommended that this fish be killed about eight hours before it was to be cooked. In general, St. Petersburg cuisine included plenty of salmon and trout meals—boiled, salted, pâtés, soups, etc. Whitefish appeared in the catches more or less simultaneously with salmon and had a reputation of being one of the best local delicacies. The cookbooks recommended eating it boiled, fried, baked, stewed, smoked, and also salted. Whitefish pies were also very popular.

Apart from these four kinds of fish, the cookbooks also mention ryapushka (a small form of whitefish), Baltic herring, eel, and all sorts of freshwater fish abundant in the Neva and Lake Ladoga.

At the same time, the capital of an enormous empire, one of the most prosperous and luxurious cities in Europe, enjoyed a plentiful supply of fish from distant places in Russia and abroad. All sorts of sturgeon and sterlet from

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Chapter: Fish Consumption
Source URL: http://www.environmentandsociety.org/node/6984
PDF created on: 27 April 2021 11:14:54

the Don and especially from the Volga formed the most luxurious part of the St. Petersburg fish market. The citizens also consumed a lot of imported herring, cod, and also seafood like oysters. This kind of commerce made visible the links between St. Petersburg, as a big port, and the ocean, as well as Europe, affirming its reputation as the most European city in Russia and at the same time undoubtedly Russian.

Factory dinner menu. Cold Salmon. The date of the dinner (30 September) falls within the period of the autumn spawning run and we may assume that the cooks used the fresh fish from the Neva. Unknown illustrator, 1897.

Courtesy of the State Museum of the History of St Petersburg .

Menu of life-guards regiment. Gatchnia trout had a superb culinary reputation among St. Petersburg's dwellers. The picturesque river, Izhora, not far from the imperial residence of Gatchina supplied delicacies not only to the imperial court but also to the officers of the elite life-guards regiment for the traditional summer reception. Unknown illustrator, 1883.

Courtesy of the State Museum of the History of St Petersburg .

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Fish consumption in Vienna

Until the end of the nineteenth century, the Viennese consumed mainly freshwater fish, which was undoubtedly a consequence of the city's distance from marine environments. Fish prices were fixed until the 1790s and the price regulations provide valuable details about the different species that were eaten. Carp was the most important and was brought in large quantities from Bohemian and Moravian fish farms or from the Tisa in Hungary. Pike, pike-perch, and catfish appear in all price regulations, whereas other species have changed over time. The price regulation from 1632, for example, lists Danube salmon, sterlet, tench, and bream. About 100 years later—in 1736—prices were fixed for Danube salmon, burbot, ide, zingel, and cyprinid species. In 1756 one finds perch, bream, tench, barbel, crucian carp, but also brown and brook trout, which were likely brought from smaller, Alpine tributaries of the Danube; small fish such as bullhead, stone loach, minnow, chub, bleak, and even weather fish complete the list. Since there are no figures for total sales or consumption, it is difficult to identify whether these changes occurred due to a shortage of the larger fish or because of a change in preferences. For marine fish, the price regulations refer in particular to herring, stockfish, and flatfish.

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Illustration by George Bodenehr and Krüger, late eighteenth century. © Naturhistorisches Museum, Wien. Used by permission.

Allgemeine Naturgeschichte der Fische

The European catfish is one of the largest freshwater fish and a preferred food fish.
Illustration by George Bodenehr and Krüger. Originally published in Bloch, Marcus Elieser. *Allgemeine Naturgeschichte der Fische*. Berlin: Auf Kosten des Verfassers und in Commission bei dem Buchhändler Hr. Hesse, 1782–1795. Plate 34.

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Allgemeine Naturgeschichte der Fische

The pike is a widely distributed animal species and was one of the most preferred Danube fish.
Illustration by George Bodenehr and Krüger. Originally published in Bloch, Marcus Elieser. *Allgemeine Naturgeschichte der Fische*. Berlin: Auf Kosten des Verfassers und in Commission bei dem Buchhändler Hr. Hesse, 1782–1795. Plate 32.

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Unknown illustrator, 1902. © Wien Museum, 173.846. Used by permission.

Grußkarte von der Internationalen Fischereiausstellung

This postcard depicting a trout was published on the occasion of the International Fisheries Exhibition in Vienna in 1902.
Unknown illustrator, 1902.
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Unknown photographer, 1993. © Institute of Hydrobiology and Aquatic Ecosystem Management, University of Natural Resources and Life Sciences Vienna. Used by permission.

Beluga Sturgeon

A Beluga sturgeon, one of the most important Danube sturgeon species, caught in the Volga delta in 1993.
Unknown photographer, 1993.

Since the 1880s, detailed figures for fish brought to the central fish market have been available even at the species level. In the 1880s and 1890s, more or less the same fish as those named in the price regulations are found. The start of the marine fish trade in 1899–1900 is clearly visible. In the 1890s, their import became a goal of the urban administration in order to increase the supply of fish, which was considered an important protein source. Several attempts were undertaken to bring fish from the Adriatic Sea. Most, however, failed, mainly because of availability and transport problems. Hence, the largest share always came from the North Sea: the transport was

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easier and the fish stocks much richer. The opening of the "Nordsee Deutsche Dampffischerei-Gesellschaft" (Northsea German Steamfishery Company) in 1899 further encouraged trade in fish from this source.

Advertisement of a Viennese fish trader and seller who was one of the first to offer also marine fish ("Seefische"). Unknown artist, 1900.

In 1900 the proportion of marine fish in the total supply to the fish market rose abruptly to about 42 percent. By the beginning of World War One, the share had increased to more than 60 percent. Over the same period, the total amount of fish brought to the fish market rose from less than 800 metric tons to about 2,250 metric tons.

The total amounts of fish available in the nineteenth century show that the annual per-capita consumption of fish became surprisingly low. Until the 1860s, approximately 2 kilograms were consumed. Based on the amounts at the central fish market, as the main fish-trading place, yearly per-capita consumption dropped to 0.3 kilograms by the end of the nineteenth century. Then, the large-scale import of marine fish enabled the average value to double to 1 kilogram per year by the beginning of the first World War. The largest quantities of fish were sold

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around Easter and Christmas. Like many Austrians, the Viennese definitely preferred carp as a traditional Christmas dish.

One reason for the low consumption rates mentioned in several sources was the high price of fish in Vienna. The high prices reflect many developments, but were clearly also linked to availability. One fish trader reported in 1870 that prices had risen in previous years because many fish ponds had been transformed into arable land and the filling of Danube side arms had adversely affected fish reproduction and growth. In the 1880s, even carp was more expensive than, for instance pork meat; only dried or salted stockfish was cheaper.

In accordance with the information about the fish market, Austrian and Viennese cookbooks from the eighteenth to the late nineteenth centuries contain mainly recipes for freshwater fish. The largest diversity of recipes in all these books was for pike and carp. For the beluga sturgeon, different methods of preparation were suggested until the 1830s; thereafter the number of recipes decreased. Interestingly, this also coincides with the trends in the number of specimens brought to the market. In general, the number of fish species considered in the cookbooks decreased until the late nineteenth century. It increased again around 1900, when recipes for marine fish begin to appear alongside those for traditional freshwater fish.

Websites linked in image captions:

- https://www.spbmuseum.ru/?lang_ui=en
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Further readings

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Related projects

- Environmental History of the Viennese Danube 1500–1890: Understanding Long-Term Dynamics, Patterns, and Side-Effects of the Colonization of Rivers (EINVIEDAN)
- Long-term Dynamics of European Fish Populations (DYNAFISH)
- Oceans Past Initiative, network grown from the now concluded History of Marine Animal Populations (HMAP), which was a project within the Census of Marine Life Programme

Websites linked in this text:

- http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0077059
- http://www.umweltgeschichte.uni-klu.ac.at/index,3560,ENVIEDAN.html
- http://dynafish.boku.ac.at
- http://hmap.sea.ee
- http://www.environmentandsociety.org/exhibitions/neva-and-danube-rivers

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The idea for this virtual exhibition came out of the joint Russian-Austrian research project "The Long-Term Dynamics of Fish Populations and Ecosystems of European Rivers." Analyzing the history of fish populations in the Neva and Viennese Danube, the Russian-Austrian research group discovered numerous links between the great cities and their great rivers, including the fish populations. The project has been supported by the Rachel Carson Center for Environment and Society. Research for the Vienna and Danube sections was conducted with the financial support of the Austrian Science Fund, FWF, DYNAFISH project I 450-B16. Research for the St. Petersburg and Neva sections was partly supported by the Russian Foundation for Basic Research project 10-04-91005-АНФ_а, but initially grew out of a decade-long global program "History of Marine Animal Populations" funded by the A. P. Sloan Foundation. We would like to thank the Department of Prints of the National Library of Russia and the State Peterhof Museum Reserve for assistance with obtaining visual materials. In addition, thanks are due to Michael Stachowitsch for proofreading the chapters about Vienna and the Danube, and to Friedrich Hauer, Christina Gruber, and Ksenia Barabanova for their support in the collection of visuals and obtaining permissions.

About the Authors

Gertrud Haidvogl

Gertrud Haidvogel

Gertrud Haidvogl has a master's degree and PhD in history from the University of Vienna, Austria. As a researcher at the Institute of Hydrobiology and Aquatic Ecosystem Management, University of Natural Resources and Life Sciences Vienna (BOKU), she specializes in the environmental history of rivers with a focus on the development of riverine landscapes, fish, and fisheries. Within her regional focus on the Danube, her main emphasis in recent years has been on two fields of research: first, the role of floodplains in agriculture and urbanization in the pre-industrial and industrial period, and second, long-term changes in fish communities and their relevant drivers.

Alexei Kraikovski

Alexei Kraikovski and Julia Lajus

Alexei Kraikovski has a Candidate of Science degree (Russian PhD degree) from the St. Petersburg Institute of History of the Russian Academy of Sciences. He is Associate Professory of History and Senior Research Fellow at the Laboratory for Environmental and Technological History at National Research University Higher School of Economics. His major research interest is focused on the historical interrelations between society and water environments, and he has studied the history of marine harvesting in different regions (White and Barents Seas, Gulf of Finland, Sea of Azov etc.) and also the history of interrelations between St. Petersburg and the Neva.

Julia Lajus

Julia Lajus has a Candidate of Science degree (Russian PhD degree) from the Institute for the History of Science and Technology, Russian Academy of Sciences. She is Associate Professor of History and Leading Research Fellow at at the Laboratory for Environmental and Technological History at National Research University Higher School of Economics. Her research interests include the environmental history of biological resources, especially in marine and polar areas, and the history of field sciences such as fisheries and oceanography. Julia Lajus served as the vice president of the European Society of Environmental History (ESEH) from 2011–2015.

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After the fortification walls were destroyed in 1858, the fish market was moved to the Donaukanal, where it existed until 1972. Franz Poledne, *Franz-Josefskai – Am Schanzl*, n.d.

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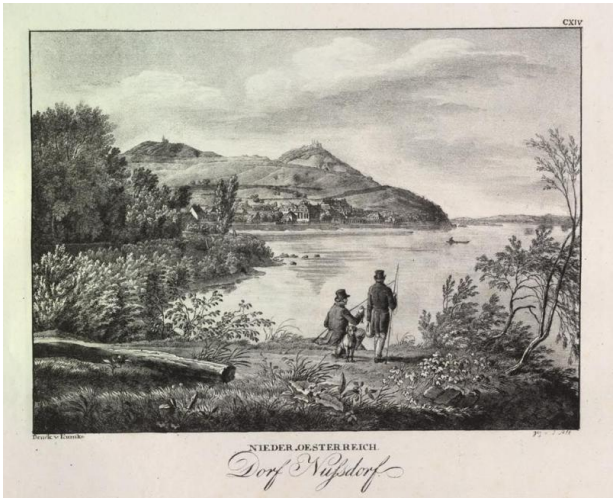

Recreational fishing with fishing rods was still rare in the beginning of the nineteenth century. Adolf Kunike, *Dorf Nussdorf*, 1826.

The sterlet belongs to the family of sturgeons. In contrast to the diadromous Beluga sturgeon, it is a pure freshwater fish and still inhabits the Austrian Danube. Illustration by George Bodenehr and Krüger, late eighteenth century.

Originally published in Bloch, Marcus Elieser. *Allgemeine Naturgeschichte der Fische*. Berlin: Morino, 1782–95. Plate 89.

The wooden bridges gradually disappeared in the nineteenth century and do not exist in the city anymore. Granite embankments appeared in the second half of the eighteenth century. Andrey Yefimovich Martynov, *View of the Moika River by the Imperial Stables*, 1809. Watercolour and Indian ink, 60 x 86 cm.

Bottom gear fishing in the Izhora river downstream from Tsarskaia Slavianka. Nineteenth-century illustration by Nikolai Liberich.

Haidvogl, Gertrud, Alexei Kraikovski, and Julia Lajus. "'Commanding, sovereign stream': The Neva and the Viennese Danube in the History of Imperial Metropolitan Centers." Environment & Society Portal, *Virtual Exhibitions* 2019, no. 1. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/6576.
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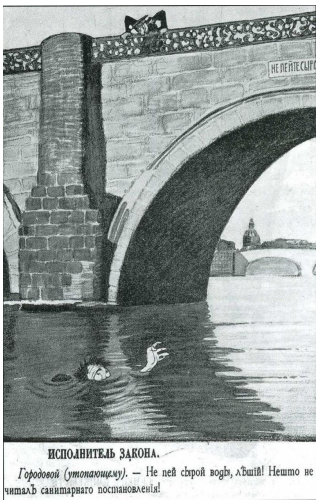

A policeman warns a drowning person that he shouldn't drink the water—as if this were a greater danger than drowning. Caricature from the journal *Satirikon*, 1908. Illustration by Re Mi.
Courtesy of the State Museum of the History of St Petersburg

Advertisement of a Viennese fish trader and seller who was one of the first to offer also marine fish ("Seefische"). Unknown artist, 1900.

Websites linked in image captions:

- http://www.environmentandsociety.org/www.albertina.at

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