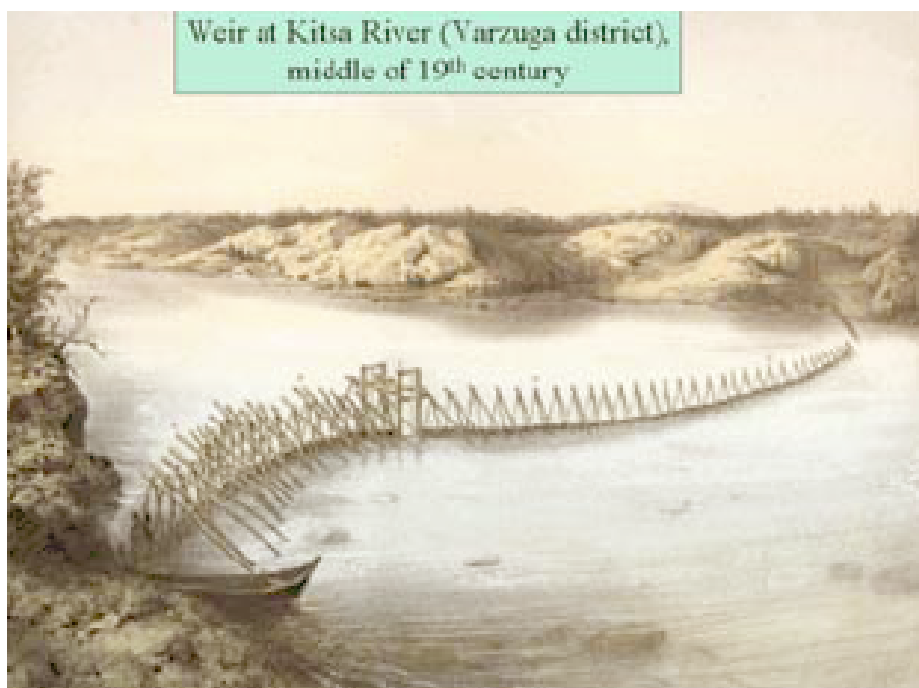


HMAP Dataset 9

North Russian Salmon Catch Data, 1615-1937

Supporting Documentation





Summary

Dataset Title: North Russian Salmon Catch Data, 1615-1937

HMAP Case Study: White & Barents Seas

Large Marine Ecosystem: 20: Barents Sea

Subject: Catch data relating to salmon, northern Russia, 1615-1937

Data Provider: Julia Lajus
European University at St Petersburg
Gagarinskaia ul. 3
191187 St. Petersburg
Russia
email: jlajus@eu.spb.ru

Data Editor: Michaela Barnard, MHSC, University of Hull
m.g.barnard@hull.ac.uk

Extent: 3,193 records

Keywords: salmon catch statistics; History of Marine Animal Populations; White & Barents Seas; Russian archives

Citation:

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(b) Supporting documentation: please cite as follows: J. Lajus et al, eds., 'HMAP Dataset 9: North Russian Salmon Catch Data, 1615-1937, Supporting Documentation', in M.G Barnard & J.H Nicholls (comp.) *HMAP Data Pages* (www.hull.ac.uk/hmap)

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1. HMAP White & Barents Seas: Objectives

Julia Lajus, Alexei Kraikovski, Zoya Dmitrieva,
Dmitry Lajus & Yaroslava Alekseeva

This case study consists of six sub-projects, four of which are designed to identify the factors that condition long-term changes in particular species, while the other two focus on the dynamics of ecosystem development. The sub-projects are:

Atlantic salmon populations, White and Barents Seas;
cod and halibut populations, Barents Sea;
herring populations, White Sea;
marine mammals: Atlantic walrus, white whale, Greenlandic seal;
dynamic change in the White Sea ecosystem;
dynamic change in the Barents Sea ecosystem.

With regard to the first of these sub-projects, attention has focused upon explaining the decline that has occurred in Atlantic salmon populations of northern Russia since the late nineteenth century. The data collected infers that the main two causes were overfishing and dam construction. Contrary to some other parts of the world, chemical pollution did not play an important role in Russia. Also, notable decline in populations occurred much later than in most other locations due to slow population growth in the area.

Data relating to seventeenth- and eighteenth-century salmon catches has also been assembled from archival sources in the Russian Archives for Ancient Documents (RGADA, Moscow), the State Archives of Arkhangelsk Region (GAAO, Arkhangelsk), and the Archives of the St. Petersburg Institute of History, Russian Academy of Sciences (SPb IRI RAN, St. Petersburg). These data enhanced the database and offer a longer term perspective on the development of the salmon population, as well as providing information to inform biological and socio-economic analyses of the salmon fisheries of North Russia.

The next stage in this research effort is the collection and analysis of data relating to salmon, cod and halibut prices in the seventeenth and eighteenth centuries. Preliminary work on the abundance of archival evidence that is now available in Russian repositories indicates that the price of salmon had a significant negative correlation with the level of catches. Relating price and catch data in this fashion – and comparing it to similar time-series pertaining to salmon fisheries in North America - will enhance knowledge and understanding of the balance of natural (especially climatic) and socio-economic factors in the development and health of salmon populations.

2. North Russian Salmon Catch Database: Sources

(a) general remarks

Fishing for salmon in the White and Barents Sea basins took place in rivers, river mouths and in adjacent marine coastal zones. Catches were reported based on a variety of different geographical units such as monastic properties, administrative authorities, whole rivers, parts of rivers (e.g. mouth, upstream, one tributary) and several rivers combined together. Catches by fishermen from particular villages or towns were also reported. Such diversity poses many difficulties in establishing a coherent and consistent dataset, particularly with regard to spatial matters. In defining relevant grounds, we have tried to be as faithful to the original source as possible. However, for biological analysis, it is important to also locate catches in geographical units such as rivers which appear as units in modern literature for salmon catch statistics. Accordingly, the GROUND field of the Dataset represents the geographic unit stated in the original source, whilst the REGION field represents the modern larger unit. A GIS file illustrating these matters will be available for download at the HMAP Data Library web page.

Very traditional methods of salmon fishing were utilized during most of the period under study (METHOD field), including fishing with weirs and different kinds of nets - fixed (nevod, garva, riuzha) or floating (poezd). The fishing effort involved (EFFORT field) is shown by the number of fishers employed where this information is available.

When translating the terms we tried to find English equivalents for Russian terms if possible. The term “tonia” (traditional place for fishing) we translated as “station”, which is shortened from “fishing station”. The terms “volost” and “uyezd” referring to administrative units, we translated as “district (volost)” and “district (uyezd)” respectively.

(b) account books, Novgorodskaya Chetvert' department (White Sea basin)

Russian State Archives for the Ancient Statements (RGADA)

F. 137 – The books of boyars and towns, 1624-1688. Data extracted by Alexei Kraikovski.

The archive includes the books of prikazes – the central government bodies of Russia of the 16th and 17th centuries. The prikazes were responsible for tax collecting. The prikaz (department) of the Novgorodskaya Chetvert' was in charge of collecting payments from the Russian North. Data on taxes and other duties were registered in the credit books (op. 1, d. 15, 28, 117, 123).

Among numerous items of income in the books of this prikaz can be found the “tenth fish”, a fisheries duty on all salmon areas. This meant that fishermen had to give ten percent of their catches “for the Tzar's use”. It is important to note that the “tenth fish” meant one tenth of the actual catches. The source points out that “they collect for the Tzar... one tenth of the red fish called salmon, depending on how much there has been caught every year”. Records concerning the “tenth fish” in the credit books of

the Novgorodskaya Chetvert' lasted till 1690, after which the recording of these data was discontinued. This may have been due to changes in the place of the fish delivery.

Possibly, from 1690 the recording task was transferred to the Food Office ("Kormovoi Dvoretz"), the archives of which have unfortunately not survived.

Published sources

We have also used the following documents published by Novgorodskaya Chetvert department:

Russkaia Istoricheskaiia Biblioteka, vol. 28. Prikhodo-raskhodnye knigi moskovskikh prikazov (Debit and credit books of the Moscow State departments), Vol. 1, Moscow, 1912.

Prikhodo-raskhodnye knigi moskovskikh prikazov 1619-1621 gg. (Debit and credit books of the Moscow State departments from 1619 to 1621), Moscow, 1983.

These cover the period 1615-1620, though with gaps. The data were extracted by Alexei Kraikovski.

(c) account books, "tenth fish" collectors (White Sea basin)

Russian State Archives for the Ancient Statements (RGADA)

F. 1195, Krestny Onezhsky monastery. Op. 1, files 158, 190, 204, 234, 273, 289, 311, 323, 324, 334. These cover the period 1669-1704, though with gaps. Data extracted by Alexei Kraikovski.

The archives of Krestny Onezhsky monastery contain one of the principal sources on salmon catches, being a number of books of "tenth fish" collectors from 1669 to 1704. The monastery had under its control a large territory in the lower course of the Onega River, and it was privileged to collect the "tenth fish" from the local fisheries. Catches were recorded separately for each fishery: Podporozhskaya "volost'" [district], Porozhskaya volost' and "fishing grounds". It is important to note that these records only listed the names of fishermen who were "showing the salmon in the catches", while those fishermen who did not have salmon catches were not registered. This means that the number of fishermen mentioned in the credit books does not reflect the actual fishing effort. It can be assumed that in fact the whole male population of the area was engaged in salmon fisheries, and in order to estimate the actual fishing effort we need to turn to other sources, especially to the cadasters.

(d) account books, Solovetskii monastery, Chebot weir, Vyg River (White Sea basin)

Russian State Archives for the Ancient Statements (RGADA)

F. 1201. Solovetsky monastery. Op. 5, files 3715, 3786, 4390, 4747, 4808, 4867, 4908, 4921, 4933, 4970. These cover the period from 1759 – 1772, though with gaps. Data extracted by Alexei Kraikovski.

In the archives of the Solovetsky monastery there are a number of documents concerning catches at the Chebot weir. These provided a major part of the salmon catches from the lower part of the Vyg River, which flows into the White Sea on its western shore. The records made by monastery clerks, who supervised the fisheries, are especially informative.

Analysis of the ledgers has to be conducted with care because each clerk apparently had his own principles of accounting and only rarely were those principles stated openly. In most cases we cannot say whether the whole catch or only the half due to the monastery was being recorded in the ledgers. Therefore, for the years in which there is no direct indication of accounting methods we cannot estimate actual catches based on these records. In order to do so we need to know the share in total catches enjoyed by the monastery and this requires documents showing the distribution of property in the area. Another difficulty is that, after secularization of the monastery estates in 1764, the former cloister fisheries were placed under state control, with the monastery becoming merely purchasers of the fish.

(e) documents, Solovetsky monastery, Varzuga fisheries (White Sea basin)

Russian State Archives for the Ancient Statements (RGADA)

F. 1201. Solovetskii monastery. Op. 2. Dd. 493, 515, 524, 542a, 806, 970, 983, 1002, 1292, 1344, 1363, 1717, 2214, 4538. The period covered is 1625–1763, though with gaps. Data extracted by Zoya Dmitrieva.

The most significant of these documents are the “tonnye knigi” which regulated the salmon fisheries in Varzuga. They provide a list of all fishing places divided into four parts, were composed every four years, and were the main documents reflecting the results of re-distribution of fisheries sites. There are several kinds of documents showing annual accounting at the fisheries:

1. Accounting books, which recorded catches of salmon at various fisheries. They listed various tonias by their names and show the numbers of fish caught. At times, they give the amounts from several tonias at once (e.g. “from Kammennykh from four tonias”). The number of fish could be shown in total, without the payment to the hired fishermen which was usually 20-25 percent of the total catch.
2. Books of records of the hired fishermen for the season, showing the amount of food and gear given out, and the records of fish delivered. These books give very detailed, narrative accounts concerning the sending of hired fishermen to the fishing sites of Varzuga volost’. Each record ends with the number of the fish caught.
3. The memoranda of service clerks concerning fish delivered to the monastery. These are the most common relevant documents from the 18th century, but only give the most general information on catches. They show separately the number of fish caught at the Varzuga estates, and at the Kachkaransky and Tochilensky tonias. The data on the Kashkaransky and Tochilensky tonyas appears only from 1716 in the documents of the Varzuga volost’ fisheries service. It is possible that before 1716 the catches from these sites were recorded separately. In the memoranda, data on the summer and autumn fish often were given together. There is often also an indication of total catch weight and cost. Catch weight started to be recorded from the 18th century.

Together these sources enable a general picture of the salmon catches in Varzuga, as well as at various fishing stations (tonias) to be drawn.

(f) custom accounts, Kola

Russian State Archives for the Ancient Statements (RGADA)

F. 829. Custom office. Op.1, file 908. The period covered is 1719. Data extracted by Alexei Yurchenko.

Most of the records made by tax collectors and custom officials in Kola, the main centre of the Russian Barents Sea fisheries, have been lost. We found only a few such records in the Russian State Archive of the Ancient Statements. These date from the first half of the 18th century and contain some data on salmon catches at the rivers which flow into the Barents Sea at the Murman coast. The most detailed is from 1719. It appears in the "Accounts book of the custom taxes and revenue from the public houses of the Kola customhouse" and accounts for salmon caught throughout the year by the inhabitants of Kola and the indigenous people (Saami) in its vicinity. There is also the information on fisheries sites and the cost of salmon.

g. state archives, Arkhangelsk region

State Archives of the Arkhangelsk region (GAAO)

Here we searched for data covering the 19th century before 1875, when the dataset from the Arkhangelsk Statistical Committee begins. We found important snapshots for 1824-25 (GAAO, f.1367, op.1, d. 362); 1828-29 (GAAO, f.1, op. 12, d. 26) and 1866 (GAAO, f. 6, op.2, d.18). Data extracted by Ruslan Davydov.

(h) reports, Arkhangelsk Statistical Committee

(1) Otchet Arkhangel'skogo Statisticheskogo Komiteta [Reports of the Arkhangelsk Statistical Committee] on the year 1876. Arkhangelsk, 1878; on the year 1878. Arkhangelsk, 1880;. Otchet o deistviakh i zaniatiiakh Arkhangel'skogo gubernskogo statisticheskogo komiteta, 1881, on the year 1882, Arkh. 1884; on the year 1883. Arkh., 1885; on the year 1884. Arkh., 1887, on the year 1885. Arkh. 1887; on the year 1886 Arkh. 1888. On the year 1887 Arkh. 1889; on the year 1890 Arkh., 1892; on the year 1891. Arkh., 1893; on the year 1892 Arkh., 1893; on the year 1894. Arkh., 1895; on the year 1895 Arkh., 1896; on the year 1896 Arkh., 1897.; on the year 1897 Arkh., 1898; on the year 1899, Arkh. 1901, on the year 1902 Arkh 1904; on the year 1903 Arkh., 1904; on the year 1904 Arkh., 1906; on the year 1905 Arkh. , 1908.

(2) Obzory Arkhangel'skoi gubernii [Reviews of the Arkhangelsk province]. Years 1905 – 1915. Arkhangelsk.

The period covered is 1875-1915, annual. Data extracted by Ruslan Davydov.

Systematic collection of catch statistics in Russia started in the second half of the 19th century. The data published by Arkhangelsk Gubernia Statistical Committee represent the main source of statistical information on the Russian North for this period. Annual reports on fisheries were published from 1875 to 1915 in the newspaper Arkhangelskie gubernskie vedomosti and the journal Izvestiia Arkhangel'skogo obschestva izucheniiia Russkogo Severa and in separate brochures as well (for

example, *Statisticheskoe opisanie sel'skogo naseleniia i ego promyshlennosti v Arkhangel'skoi gubernii, 1875*, Golubtsov N.A. *Pamiatnaia knizhka Arkhangel'skoi gubernii na 1912g.* and others). They contain data on catch sizes, number of fisherman and gear, prices of fish, and time of fishing in some parts of the White and Barents Seas. The main commercially important fish species such as Atlantic cod, Atlantic salmon and herring were described separately, whereas other species were described in a general section. Different columns indicated pooled data (catch sizes, number of fishermen and gear) for marine species and for freshwater species. Weight was measured in "pood" (16.38 kg).

To generate this material, the Arkhangelsk Statistical Committee collected reports from heads of the smallest territorial units, the "volost", and therefore these are the units for which catches were represented. For some years nothing appears for volost in the published reports, and we sought them elsewhere. Only a few gaps were filled in this way, for example for the years 1898–1901 a set of data for the nine regions (volost or towns) on the western coast of the White Sea were found in the Russian State Historical Archives (RGIA, f. 22, op. 5, d. 7).

(i) other published reports and papers

The period covered is 1897-1937. Data extracted by Yaroslava Alekseeva.

We have included data from scientific publications because Russian literature is not easily available for the international community and scientific publications for the pre-1939 period often provide statistical data, gathered by scientists from local documentation, which would otherwise be lost. Scientists, working on salmon fisheries, knew very well the situation and often corrected the official statistical data.

(j) list of publications used in the construction of this data resource:

Dobrokhotov, V.I. & Pravdina, M.A. (1936). Materials on hydrology and fisheries of the Kovda river In: *Rybnoe khoziaistvo Karelii* 3: p.167, 195.

Engelhardt, A. P. 1899. *A Russian Province of the North*. Tr. from Russian by Henry Cooke (Original title *Russkii Sever*, 1897). Archibald Constable and Company, Westminster.

Erofeichev, I. (1925). *Fisheries of the Arkhangelsk region* [*Promysly Arkhangel'skoi gubernii*]. Arkhangelsk.

Efimenko, P.S. (1862) *Collections of peasants' juridical customs* [*Sbornik narodnykh iuridicheskikh obychaev Arkhangel'skoi gubernii*]. Kn.1. Arkhangelsk: p.143.

Golubtsov, N.A. (1910). *Fisheries of Arkhangelsk region*. In: *Vestnik rybopromyshlennosti* 9: 362.

Golubtsov, N.A. (1912). *Fisheries of the Arkhangelsk region*. In: *Reference book on the Arkhangelsk province in 1912* [*Pamiatnaia knizhka Arkhangel'skoi gubernii na 1912 g.*]. Arkhangelsk.

- Iakobson, R. P. 1913. Statistical and economical studies at the coast and fishing grounds of the Onega Bay between Kem' and Onega in 1911 [Statistiko – ekonomicheskoe obsledovaniie poberezh'ia i rybolovnykh ugodii na Onezhskoi gube mezhdou Kem'iu i Onegoi v 1911 godu]. In Materialy k poznaniuu russkogo rybolovstva t. 2, v. 5. St. Petersburg.
- Iakobson, R. P. 1914. Report on the inspection of fishing grounds in rivers of Kem' and Vyg in the fall 1911. [Otchet po obsledovaniuu rybolovnykh tonei na rekakh Kemi i Vyge osen'iu 1911 goda]. In Materialy k poznaniuu russkogo rybolovstva, 2, v. 9. St. Petersburg.
- Issatchenko, V. L. (1931). Studies on the Atlantic salmon, its fishery and investigation of the places in the northern rivers suitable for its artificial breeding. In Izvestiia Leningradskogo Nauchno – issledovatel'skogo Ikhtiologicheskogo Instituta, v.13, N. 2: 31 - 59.
- Izvestiia Vsesoiuznogo Nauchnogo Instituta Ozernogo i Rechnogo Rybnogo Khoziaistva [Bulletin of the Institute of Fresh-Water Fisheries. Vol. XX. The Northern Salmon, its biology and industry]. Leningrad, VNIORKh, 1935.
- Izvestia Arkhangel'skogo Obschestva Izucheniiia Russkogo Severa [Bulletin of the Arkhangel'sk Society for Study of the Russian North], 1910, №22.
- Knipowitsch, N. M. (1897). About marine fisheries and hunting [O morskikh i zverinykh promyslakh]. St. Petersburg.
- Krysanov A. A. 2000. Pomorskie promysly. Onezhskii uezd 1861 – 1916 gg. [Fisheries of Pomors. Onega district in 1861 - 1916]. Onega: Onezhskii istoriko – memorial'nyi musei: 105 pp.
- Nikolskii, V. V. (1927). Life and fisheries of the local population of the western coast of the White Sea (Soroki – Kandalaksha). Based on the materials of the studies in summer 1921. [Byt i promysly naseleniia zapadnogo poberezh'ia Belogo moriia (Soroki – Kandalaksha). Po materialam issledovaniia letom 1921 goda]. Moscow.
- Novikov, P. I. (1936). Salmon of Kem' river. In: Rybnoe khoziastvo Karelii 3: 158-168.
- Rozov, V.E. (1913). About fisheries in village Kovda and neighbour villages on the coast of Kandalaksha bay. [O rybnom promysle v selenii Kovda i sosednikh seleniakh na beregu Kandalakshskoi guby]. St. Petersburg.
- Soldatov V. K. 1924. Ryby reki Pechory. [Fishes of the Pechora River]. In Trudy Severnoi nauchno – promyslovoi ekspeditsii, vyp. 17. Petrograd
- Varpakhovskii, N. (1902). Fisheries in the Arkhangel'sk province in 1899. [Rybnye promysly v Arkhangel'skoi gubernii v 1899 godu]. St. Petersburg.

3. Outputs

The data have been used to inform a number of analyses, including:

- Lajus Ju.A., Lajus D.L., Dmitrieva Z.V., Kraikovsky A.V., Yurchenko A.Yu., Alexandrov D.A. 2004. "Historical records of the 17-18th century fisheries for Atlantic salmon in Northern Russia: methodology and case studies of population dynamics". in T, Saat (ed), *Abstract Volume, XI European Congress of Ichthyology*. September 6-10, 2004. Tallinn, Estonia, p.48.
- Lajus Ju.A., Lajus D.L., Dmitrieva Z., Kraikovsky A., Alexandrov D.A. 2004. "Historical evidences of the influence of climate on some commercial fish populations of the Barents and White Seas". *Book of Abstracts, ICES Symposium on the Influence of Climate Change on North Atlantic Fish Stocks*. 11-14 May 2004, Bergen, Norway. Book of Abstracts, p.50.
- Kraikovski A. V. "The cod and halibut fisheries on the Kildin island in the 18 - 19th centuries". in *Ushakovskie chteniia. Materials of the regional historical conference in memory of Professor I. F. Ushakov*. Murmansk, 2004. 65-70 [in Russian].
- Alexeeva Y.I., Chernetskiy A.D. "The data of the harvest of belugas (*Delphinapterus leucas*) and harp seal (*Histophoca groenlandica*) in the Russian North from the 18 century till the 1930s", in *Morskije mlekopitaiuschie Holarctiki*. Collection of scientific papers of the Third International conference. Koktebel, Oct. 11 – 17, 2004 [in Russian].
- Lajus, D.L., Lajus, J.A. Dmitrieva, Z.V., Kraikovski, A.V., Alexandrov, D.A. in press, 2005. "The use of historical catch data to trace the influence of climate on fish populations: examples from the White and Barents Sea fisheries in 17th - 18th centuries". *ICES Journal of Marine Sciences*.
- Lajus Ju.A., Lajus D.L., Dmitrieva Z.V., Kraikovsky A.V., Yurchenko A.Yu. 2007. "Atlantic salmon fisheries in the White and Barents sea basins: dynamic of catches in the 17 - 18th century and comparison with 19-20th century data". *Fisheries Research: HMAP Special Issue*, vol. 87 (2-30).

The latter paper provides data on catches of Atlantic salmon, *Salmo salar*, recorded in historical documents from the 17 and 18th centuries in four locations in the basins of the White and Barents Seas. Atlantic salmon was one of the most valuable products of the local economy in the 17–18th centuries in the northern Russia. Therefore, catches were well recorded in the account books of state departments and monasteries. Salmon were fished mostly in the lower parts of rivers, using weirs which technologically were not changed over the centuries. This makes fishing effort commensurable and allows comparison of historical catch data of the 17-18th centuries (published in Lajus et al., 2005) with statistical data available since the last quarter of the 19th century. Notable fluctuations of catches, average weight and ratio of different seasonal forms of salmon were revealed. Decreasing catches tended to coincide with relatively colder periods. Comparison of historical and statistical data has shown that catches Atlantic salmon and therefore changes in size of their populations were most probably driven by natural factors before the mid-20th century.