

Geography of the Ob-Irtysh River Basin and River Shipping:

a Curriculum Guide

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Introduction: The Ob-Irtysh River Basin is home to many of Russia's largest cities outside of European Russia. Rivers were the dominant transportation arteries for people and heavy goods prior to the introduction of rail and highway infrastructure to the region. This lesson affords students the opportunity to learn the basic geography of the region as well as the importance of river transportation. Ideally, maps will be used extensively in introducing the rivers and cities of this region prior to a discussion of river transportation, which will be based around an article provided in the appendices.

Goals of Curriculum for Students: The first goal of this curriculum is to familiarize students with the basic human geography of the region surrounding the Ob-Irtysh River Basin in western Siberia. Students should come away from this lesson with a general knowledge of the region's cities, the names of the tributaries of the Ob, Irtysh, and Tobol Rivers, and the significance of this area for Russia. The second goal of this curriculum is to introduce students to the importance of river transportation in western Siberia (corresponding to the Ob-Irtysh Basin). Students will have a greater appreciation for the indispensable role played by river transportation in an environment which does not possess an extensive network of ground transportation infrastructure.

Design of Lesson Plan: The instructor should first use an atlas or an online map such as Google Maps to identify the geographic features listed above and read the news articles listed below prior to the in-class lesson. Suggested Activities 1 and 2 will familiarize students with the rivers and cities of the region. It is suggested that students should read the article "Fording the River" provided in Appendix 2 prior to the lesson so that a discussion may be held. The two suggested activities will prepare students for a discussion of the article provided. Students will then either profile a city of the region, or write a response to one of the discussion questions below, expanding upon the points raised in class.

Suggested Activity 1: Using a detailed map of the region (either a large physical map or a digital map using a projector), point out some of the tributaries of the Ob-Irtysh Basin. The Ob-Irtysh River Basin can be divided into three major areas for the purposes of this activity: the Ob River Basin, the Irtysh River Basin, and the Tobol River Basin (forming a tributary of the Irtysh, which is itself a tributary of the Ob). This activity seeks to provide a convenient spatial structure around which students can be introduced to the basic human geography of the region represented by cities through further study.

Suggested Activity 2: Using a detailed map of the region (either a large physical map or a digital map using a projector), point out the major cities found within the Ob, the Irtysh, and the Tobol basins. This activity will prepare the students for engaging with the interview found in Appendix 2 from a geographic perspective.

Discussion of Article: Students should read the article, “Fording the River”, found in Appendix 2. It is an interview with the CEO of the Tomsk Shipping Company, the largest firm providing river shipping in western Siberia. The contents of this interview not only relate to the basic geography of the region, but also to the vital role played by river transportation in the regional economy. The following questions should be discussed in the class:

1. How is river transportation vital to the region? Remember that river transportation tends to carry heavy bulk materials such raw mining materials instead of refined or finished products. However, extremely heavy finished products such as pipe sections or machinery may also be transported to remote areas.
2. Conversely, how vital is the Trans-Siberian Railway as a transportation link within the vast expanse of the Russian interior? What about other fixed transportation links (railways, roads, airports)? Does the absence of these fixed infrastructural links necessitate river transportation in some areas?
3. How devastating could a drought be for river transportation? Flooding?
4. Being as the rivers are frozen for much of the year, what level of organization would be necessary for ensuring that the maximum amount of cargo can be moved in the few months where the rivers are navigable?
5. How is the success of river shipping vital to the Russian economy in this region?

Suggested Student Assignment 1: Students should be asked to profile one of the cities listed in the appendices for the next class session. Profiles could be delivered either orally or in writing (1/2 page to a full page). Ideally, any profile should include information on demographics, economics, political structures, and cultural aspects of a given city. Students should tie issues discussed in the news articles with these profiles. This information can be easily found on the Internet and will further familiarize students with this region.

Assessment of Suggested Student Assignment 1: Creating brief profiles for major cities in western Siberia is meant to help students further engage with this important region of Russia. The amount of easily accessible information in English may vary from city to city, but students should easily be able to find general economic, demographic, and historical information on the Internet. The instructor should have wide latitude in determining what is sufficient for a good grade on a brief assignment of this nature.

Suggested Student Assignment 2: Students should be asked to expand upon the discussion of the article in class by writing a response (1/2 page to a full page) to one of the questions above or another question of their choosing which is pertinent to the article. Students may locate additional information on the Internet or using other sources. However, this would not be absolutely necessary for the success of this assignment.

Assessment of Suggested Student Assignment 2: Students should be expected to incorporate geographic thinking into their responses. Geographic thinking can be demonstrated by discussing features of place, such as rivers and cities or transportation links into their writing. Although the instructor has wide latitude in determining exactly how these responses should be graded, it is important that students demonstrate a basic familiarity with the geography of the region, the importance of transportation in shaping this geography (*how* and *why*), and finally, how and why this topic is relevant to the study of Russia. Students' justifications for their responses should ideally be the primary basis on which they are graded for this assignment.

Easily Accessible Materials:

Google Maps

Wikipedia

Other Internet Resources

Suggested Background Reading for Instructor:

Blinnikov, Mikhail, *A Geography of Russia and Its Neighbors*, New York: The Guilford Press 2011.

- “Ch. 2. Relief and Hydrography”, pp 9-21.
- “Ch. 21. Infrastructure and Services”, pp 317-336.
- “Ch. 26. The Urals: Metallurgy, Machinery, and Fossil Fuels”, pp 383-390.
- “Ch. 27. Siberia: Great Land”, pp 391-399.
- “Ch. 28. The Far East: The Russian Pacific”, pp 400-407.

Mikhailov, Vladimir. “Perekhodim etu reku vbrod” (in Russian) in *Ekspert* no. 32 (340), August 13, 2012. <http://expert.ru/siberia/2012/32/perekhodim-etu-reku-vbrod/>.

Zachesov, V. P., I. A. Ragulin, and E. N. Tumanik. *Entsiklopedia Sibiri*. “Rechnoy Transport”. (in Russian). <http://russiasib.ru/rechnoj-transport/>.

Appendix 1: Geographical Features

Tributaries of the Ob

Left Tributaries (from South to North)	Right Tributaries (from South to North)
Peschanaya River	Chumysh River
Anuy River	Berd River
Charysh River	Inya River
Aley River	Tom River
Barnaulka River	Chulym River
Kasmala River	Ket River
Shegarka River	Tym River
Chaya River	Kievsky Egan
Parabel River	Vakh River
Vasyugan River	Vatinsky Egan
Yugan River	Tromyogan River
Salym River	Pim River
Irtys River	Lyamin River
Sosva River	Kazim River
Schuchya River	Polui River
Synya River	

Main Cities of the Ob River Basin

Cities of the Ob River System	River Location
Barnaul	Before Confluence of Ob and Chumysh
Kamen-na-Obi	Ob
Novosibirsk	Confluence of Ob and Inya Rivers
Tomsk	Tom River before Confluence with Ob River
Nizhnevatovsk	Ob near Confluence with Vakh River
Khanty-Mansiysk	Irtys near Confluence with Ob
Surgut	Ob
Salekhard	Ob

Main Cities and Tributaries of the Irtysh

Cities of the Irtysh River System	River Location
Fuyun (China)	Source of Irtysh
Burquin (China)	Irtysh
Öskemen (Kazakhstan)	Confluence of Irtysh and Ulba
Semey (Kazakhstan)	Irtysh
Pavlodar (Kazakhstan)	Irtysh
Omsk	Confluence of Irtysh and Om River
Tara	Confluence of Irtysh and Tara River
Tobolsk	Confluence of Irtysh and Tobol
Khanty-Mansiysk	Confluence of Irtysh and Ob

Rivers of the Great Vasyugan Swamp between the Ob and the Irtysh

Tributaries Flowing to Irtysh	Tributaries Flowing to Ob
Om River	Shegarka River
Tara River	Chaya River
Tartas River	Parabel River
Demianka River	Vasyugan River
	Great Yugan River

Main Cities and Tributaries of the Tobol River Basin

Cities Tobol River System	River Location
Yekatarinburg (Ekaterinburg)	Iset River
Chelyanbinsk	Miass River
Tyumen	Tura River
Tobolsk	Confluence of Irtysh and Tobol

Appendix 2: Translated News Article with Commentary

Below is an English translation of an interview from the Russian journal "Эксперт" (Ekspert) published on August 12, 2013. The journalist, Vladislav Mikhailov, interviewed Vladimir Antonovich Knoll, the head of the *OAO Tomsk Shipping Company*, about recent difficulties faced by his company. This article is an excellent illustration of both river transportation in Russia, referencing a great deal of information related to geography and industry of which non-Russians should be aware when being introduced to the geography of Siberia, especially western Siberia. *All footnotes* have been added by the translator in order to bring the context of this article to the forefront, highlighting the connections to relevant to this curriculum. The translation begins below:

Fording the River

By Vladislav Mikhailov, *Expert Siberia* No. 32 (340), August 13, 2012, 00:00

Tomsk Shipping Company - the largest river carrier Siberia - suffers losses from the heat wave. But it does not hurt the consolidation of Tomsk's status as a capitol of river transport.

Until recently Tomsk, which has been historically removed from all major transportation arteries¹, did not claim the status of a major logistics hub. However, the situation has changed markedly as a result of greater business activity in recent times, which have seen Tomsk becoming quite prominent in the freight transportation market with the creation of the new *Siberian Logistics Center*. Moreover, no one expected Tomsk to be so fortunate. Tomsk does not have a strong potential for the development of air, rail, or road transportation, so instead it has made a breakthrough in the development of water transportation. It has not only become a major transit point for river traffic in Siberia, but it has also become a leader in the transportation of goods on rivers.

In recent years, the flagship of the shipping industry around Tomsk, *OAO² Tomsk Shipping Company* (part of the holdings of the *Siberian Logistics Centre*) was able to reorient a number of large freight flows and conduct a sustained modernization of its existing fleet. The core belief for the company's development has been the acquisition of its own fleet and a bet on transit. In line with its business strategy, last year *Tomsk Shipping Company* acquired the assets of the *OAO West Siberian River Shipping Company*, its former parent company. After this deal, the *OAO West Siberian River Shipping Company* formally ceased to exist, with the sole exception of a

¹ Tomsk does not sit directly on the Trans-Siberian Railway. Instead, it is connected by the short (around 50km) Taiga-Bely Yar Line to the Trans-Siberian. It is worth remembering that most large cities in Siberia and the Russian Far East did not attain a large size until after the Trans-Siberian was largely completed in the late 1910s.

² OAO is a Latinization of the Russian acronym *Открытое Акционерное Общество* meaning "Open Joint-Stock Company". As is the custom when referring to international companies, the acronym from the language of the country in which the company was incorporated is used in the official name of the company in English.

repair and maintenance base in Novosibirsk³ and the remaining non-liquid assets of the fleet. People from Tomsk bought the entire working fleet, which allowed them to become industry leaders staying ahead of other large river shipping companies in Siberia.

However, this year unforgiving weather has stood in the way of the serious ambitions of the people of Tomsk. Because of the two-month heat wave, the water in many rivers has fallen to a critical level, which has made much of the river traffic virtually impossible. Nevertheless, abnormal weather conditions have not stopped the rivermen. With us here to discuss how they are overcoming these difficulties, we have the CEO of *Tomsk Shipping Company*, Vladimir Knoll.

- Vladimir Antonovich⁴, experts have called the current conditions for navigation nearly catastrophic due to weather and low water levels in rivers. How can a shipping company operate in these conditions?

- There has certainly been an abnormally difficult situation this year. According to historical records, the Tomsk region has not seen water levels this low for 180 years. A close examination of the headwaters of the Ob revealed that the water level was more than four meters below the long-term average. The same observation was made regarding the Tom River. In the fifty-five years in which the reservoir on the Ob between Novosibirsk and the confluence with the Tom has existed, these conditions have never been seen! Naturally, this situation explains all of the problems with conducting navigation in 2012.

It should be remembered that our busy delivery schedule for this year had been already been decided. Our company has had to carry two million tons more than usual this year. According to the schedule and plan, all in all it is 6.3 million tons. Generally speaking, our cargo consists of non-metallic building materials, concrete, coal and so on. This is due to the fact that most of the assets of the *West Siberian Shipping Company* became the property of the *Tomsk Shipping Company* at the end of last year. And today we do not have a single vessel in the fleet which is idle. This explains the planned increase in volumes. But in the end, having prepared a delivery schedule with an almost 30 percent volume increase over 2011 and having accumulated the required amount of winter goods, we unfortunately found ourselves in a trap sprung by mother nature.

In fact, two problems arose. First, we could not reach our quarries for nonmetallic building materials. So today the company has found itself in a very difficult situation for ensuring the delivery of essential materials for construction sites and roadways in the Tomsk Oblast. Usually, we provide 90-95 percent of the materials needed for these industries for the year ahead, but this time there were problems. I had to take a series of extraordinary measures, and now we are

³ Novosibirsk is the largest city in Siberia, located upstream on the Ob River from the confluence with the Tom River, on which Tomsk is located.

⁴ In Russian, it is considered polite and proper to address most individuals by their first and patronymic name (derived from their father's first name) in sequence. This is not considered to be informal.

trying to minimize the losses that are occurring in this area. The second problem was that 1.2 million tons of goods were made ready for shipment on the docks in Novosibirsk during the winter. Due to shallow waters, it turned out that we could not move these volumes, which had been procured under contracts with oil companies such as *Surgutneftegas*, *Lukoil*, *Rosneft*, *TNK*, *Yuganskneftegaz*, among others. Of the 1.2 million tons of goods, currently just 300,000 tons have been transported. We must operate in extremely difficult conditions because in the shallow areas of the river, the maximum allowable vessel draft is 180cm (less than 6 feet), which is calculated to be about half as much as is needed for the carrying capacity of our fleet. As a result, we must decrease individual loads by 50 percent and take the goods to the mouth of the Tom, where ships can be loaded at full capacity and take tonnage further north, to the areas of Surgut, Khanty-Mansiysk and so on. Naturally, this produces higher costs, but in the absence of any alternative, it is necessary to fulfill the terms of the contracts, because exceptions (force majeure) based on shallow water are not provided for in the contracts.

- So it turns out that the company was completely held hostage by nature this summer?

- I would not be that dramatic! The situation is certainly not completely hopeless. There is a small backlog of between 5-6 per cent, just cargo accompanied by large financial costs. An under-loaded fleet leads to a decrease in traffic volume; however, the costs are the same as when fully loaded.

We are not expecting much in the near future, because only increased rain can improve this situation. It is a bad situation for us. Naturally, the drought compounds the difficulties of navigation insofar as the fleet load being less than 50 percent of carrying capacity is indeed tragic. But there are positive things. In accordance with the decision of the Water Commission of the Novosibirsk Hydroelectric Facility, water was discharged from the reservoir in June, which allows for keeping the level of 180cm on the stretch of Ob River from Novosibirsk to the mouth. In July, decent rain showers passed through the Altai Mountains, and the commission has increased water discharge from 1.2 thousand cubic meters per second to 1.75 thousand. This allowed us to increase the draft load of the fleet by another 20cm through additional freight. Naturally, this is not quite as much as we wanted, but it's better than it was. It allowed for the draft of ships to be increased to 65-70 percent of full capacity, and not 50 percent as it was before.

- Can you specify which measures are being taken today the company to minimize costs?

- Although we are operating today from Tomsk at full draft (that is 260 cm on the ship), we have taken a number of compensatory measures to increase the volume of goods arriving through Tomsk. Every day we try to take at least 100 freight cars off of our moorings in the harbor in order to offset the costs that are occurring in the Novosibirsk area. Now we are marshalling the small fleet of other companies in the Ob-Irtysh basin, and contracting them to transport goods in shallow areas of the river systems. We are resolving the needs for additional fleet vessels near

both Khanty-Mansiysk and Nizhnevartovsk, as well as working on capacity issues for Tyumen and Tobolsk. I think it will help us to minimize losses. And by the way, they are already quite noticeable. Today the unfulfilled orders constitute a future income of about 40 million rubles. Thus it is necessary to build up a "fat layer" for the winter, to repair ships, and prepare for the next navigational season. Additionally, there are various commitments and loans to consider. So this is definitely a situation which will affect the preparation for navigation in 2013. Generally, there are a lot of issues.

- As far as is known, the Tom has always had a low water level; the river is shallow. Why then has its current shallowness proved to be an unpleasant surprise?

- Usually the period of shallow water occurs in the second part of the navigation season which begins around August 1st. Normally, we are always ready for this and make our operational plans in light of this hydrology.

But this year, it turned out that simultaneously with the opening of navigation; the situation began to develop according to the scheme in late September. We work very closely with federal agencies, but nevertheless this year they decided to not allocate funds for the area from Novosibirsk segment (from Novosibirsk to the confluence with the Tom) because is pointless to dredge there. Dredging was carried out from the mouth of the Tom downstream. Today we are trying to maintain the depth at such a level as could be maintained in August. And if the water level falls further below the projected level, we are not able to maintain that level. Unfortunately, the only high water to be found within the Ob-Irtysh basin was on the Vasyugan and we were able to ensure freight delivery to the north of Tomsk region. The conditions on the rest of the rivers were terrible. For example, in there are generally imposing shallow areas within the Khanty-Mansi Autonomous District.

- How would you describe the current state of the company as a whole?

- In 1992, we split from the *West Siberian Shipping Company* and embarked on independent shipping activity. At that time, the activity of the company was limited to the production of non-metallic materials and loading operations, but gradually we began to engage in transportation activities, because it is more cost-effective. In the end, we created the new *Tomsk Shipping Company*, which began with a cargo volume of 100 thousand tons and in 2011 transported almost four million tons. In autumn 2011, a final decision was made on the acquisition of fixed assets of the *West Siberian Shipping Company*. I must say that we have been heading towards this consolidation for some time, but the 2009 crisis prevented making this deal. Nevertheless, we still have combined all of these assets into a single entity, allowing for managing the entire process more economically. The *Tomsk Shipping Company* fleet consisted of about 130 vessels at the end of 2011, but today consists of more than 400 vessels. And they all are working condition! It was very difficult to achieve this because the vessels belonging to the *West Siberian* fleet and the way in which they were allocated left much to be desired. Unfortunately,

some of its fixed assets were no longer in a normal condition. And we had to work hard in the winter to rebuild and re-launch the whole fleet. Today we have a team of 1600 men; the fleet is running and it is fully staffed.

In general, our ideology is the following: he, who owns the cargo flows, controls the situation. In Soviet times, the *West Siberian Shipping Company* was transporting 32 million tons of cargo a year. However, this was a time when the Samotlor oil field was being tamed with the construction of new cities and oil pipelines. Today, the total river traffic volume in Western Siberia is close to 15 million tons. The volume is not greater. And he, who owns these 15 million tons of cargo, controls the situation. For many years we have managed to direct the main bulk of river cargo through Tomsk, through our shipping company. Not through Omsk, Tyumen, Tobolsk or even through Novosibirsk, but through Tomsk! And today we are continuing to further develop in this direction. We have a very good base (for our business model), and it would be wrong not to use it.

The *AO Tomsk Shipping Company*: (94.2% of shares belonging to *AO Siberian Logistics Center*) transports goods on rivers the Ob-Irtysh basin in the areas of the Tomsk and Novosibirsk regions, Khanty-Mansi and Yamal-Nenets Autonomous Districts, and also provides modal transfers of freight, in addition to producing a large amount of building sand and gravel. The company has licenses for mining of sand and gravel in various sites located in the Tomsk region, including: Vershininsky , "Kazansky Yurts" Aydakovsky, Chernorechenskaya, "Dikaya Kosa", and Changarinsky sites with general proven reserves of 2.086 million tons. Currently, the company possesses a fleet of more than 400 vessels, about 270 of which were purchased in the winter of 2011-2012.

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