

Historical Analysis of the Settlement Development in the Space of Russia: Urban Planning Perspectives

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Abstract—The article is devoted to the study of the space-time development of settlement system in the European part of Russia in the basins of the main rivers. The model developed by the authors shows the role of the river network in the formation of the historical structure of the settlement system. The special case is considered on the example of the Voronezh region. Perspectives and issues of improving the resettlement system are identified.

Keywords—settlement system; civilization; urban planning; historical cities; geoinformatics; rivers of Russia; roads; resettlement factors; urbanization; history of Russia

I. INTRODUCTION

Any analysis of the historical and cultural situation — settlement, urbanization, the formation of statehood, mono and / or polytechnic identification is based on the knowledge of the characteristics of the formation and further development of civilizational integrity in the space of the planet. The concept of “Civilization” (civil, state) also refers to the culture of urban planning and to the culture of the organization of the territories of a city.

Comparison of different spatial and different tribal civilizations makes it possible to identify their universality and at the same time originality. The peculiarities of the territory of the historical space of the European part of Russia favored the formation of a unique Russian civilization that entered the history of the world as the Great River Civilization [1].

Natural conditions favored the birth and development of Russian Civilization based on river integrity. The uniqueness of the basin structure of the main river systems:

the proximity of the sources of the Volga, Dnieper, Don, Zapadnaya Dvina, became the basis of the transport network known as the system of portages. It contributed not only to the process of resettlement but also to the contacts between peoples. This feature of the Russian civilization was indicated by historians S.M. Soloviev and V.O. Klyuchevsky. They always stressed that Russia is “expands its boundaries” in other words: the process of resettlement and the development of new lands is one of the determining factors in national history [2].

The flat terrain and the absence of significant obstacles to the migration of the population also helped to shape civilizational integrity. Documentary evidence confirms the temporal stability of the sites of many historical settlements (Genius Loci). Even later settlements often include them in a new city line. Such trends are also registered by researchers of the spatial-temporal dynamics of settlements. Settling as a process of developing the territory is always related to roads. Rivers and their valleys were the main roads. This is confirmed by the geography of the historical settlements.

II. METHODS FOR ANALYZING THE HISTORICAL DEVELOPMENT OF SETTLEMENTS

An analysis of the dynamics formation of a settlement network in the river basins of the European part of Russia was made on the basis of statistical and cartographic materials.

The resulting cartographic database includes:

Firstly, maps of river basins showing the main settlements in a specific time period.

Secondly, the heat maps (spatial density maps) constructed to use the method of “Multivariate kernel density estimation” are derived using the same information. They give an idea of the density of settlements in river basins. (Fig. 1)

Thirdly, analytical tables of quantitative indicators including the quantity of numbers in each river basin in a specific time period. In “Fig. 2” they are presented as three-dimensional diagrams.

All maps are made according to the results of geo-information analysis of the spatial and temporal dynamics of the settlement system in the river basins of the European part of Russia. In addition to maps, a curve of relative fluctuations in air temperature with resolution of 1.5°C has been derived. Material and written sources indicate that in the VIII-XIII centuries the climate was relatively warm. However, “after a small climatic optimum, a cooling began, which continued with some fluctuations until the middle of the 19th century. This cooling is called the Small Ice Age [3].

For analysis of dynamics of development of settlements in time, a step of 100 years was set. The time period from the 10th to the 18th centuries was considered. Since various networks of land communications were established by the 18th century, rivers as highways ceded their role to land transport between settlements.

This time-varying spatial configuration revealed the place and role of river basins in the establishment of a settlement system in a new way.

III. ANALYSIS OF THE SPATIAL AND TEMPORAL DYNAMICS OF THE COURSE OF SETTLEMENT

According to historical documents, the transfer of Prince Oleg’s residence from Novgorod to Kiev dates back to 882, and the time when Novgorod was mentioned as a settlement belongs to 799 (VIII century) and by the middle of the 10th century a certain system of transport routes directly oriented along river basins was formed.

The main areas of settlement in the era of X-XII centuries were the basin of the Dnieper and the Southern Bug (as shown in “Fig. 1”). The historic road “from the Varyags to the Greeks” passed along the Dnieper through Smolensk (863) and its “Sputnik” Gnezdovo and connected the northern lands on the Baltic Sea and the southern (Byzantium) on the Black Sea.

Novgorod was also included into this system via a network of portages. Approximately 17 settlements were associated with the Black Sea in the basins of the Dnieper, the Don and the Southern Bug.

The formation of portages in the 10th century also had a favorable effect on the settlement in the Volga basin. Rostov Velikiy (912) strengthens its walls, also the cities of Vladimir (990) and Suzdal (999) rise on the tributaries of the Oka.

By the end of the 10th century, stable settlement centers had been established in the Dnepr basin, in the Volga region along the portages to Novgorod and the Oka basin.

A special role in the X century befell the settlements in the Western Dvina basin. These were not only graveyards and settlements along the Dvina, Lovat to the Dnieper, for instance along the western “Branch” of the route “from the Varyags to the Greeks”, but also a “strip” of fortifications against predatory raids from the Baltic Sea. Pskov became a fortress already at the turn of IX and X centuries.

In the XI century, the path along the Dnieper was an important link of the North-South link, but thanks to Novgorod it became the “crossroad” of East-West. Novgorod on the lake Ilmen becomes the main trading center in the East of the European Union of trade cities, known as the Hansa. Through Novgorod and the system of portages, the Hanseatic guests got into the Volga basin and further downstream into the Caspian Sea.

On the banks of the Volga, the walls of the cities of Kazan and Yaroslavl rise in 1005 and 1010, city of Rybinsk became the outpost of the promotion of Christianity in the Northern Territory since 1071. On the banks of the Oka rises the city of Ryazan.

The portages between the Volga and the Don rivers, located approximately where many centuries later the Volga-Don Canal began to operate, made it possible to get to the Sea of Azov and the Black Sea from the Volga by following the Don. By the middle of the 11th century, the fortress of Azov was built in the lower reaches of the Don (1067).

According to archaeological data, representatives of the peoples of the Urals, who coexist with local residents, Finno-Finns, as well as natives of Arab and Persian lands, began to settle in the Kama basin by the beginning of the XII century. In the vicinity of the town of Elabugi (1036), the Bulgars (Bulgaria) inhabited the land.

Comparison of climatic data and indicators of population density (Fig. 1) shows that by the top of the maximum of the climatic optimum, the lands have already been intensively developed not only along the “beaten” roads of the basins of the Dnieper, Volga, Zapadnaya Dvina and the Southern Bug, but are settled on lands in the Kama basin. Also, during this period, the development of the Northern Corridor to the White Sea along the Onega, Northern Dvina, Mezen, Pechora rivers begins. On the banks of the Onega River, the fortresses of Onega and Olonets (1137) were built, and later Kargopol in 1146. On the river Sukhona the walls of Totma (1137), and after 10 years Vologda and Veliky Ustyug (1147) raised. By the middle of the XII century, Kandalaksha was laid on the White Sea (1150).

The roads to the White Sea are already “Over the Portages” roads. The unique transport system “Voloika (Portages)” — “Zavolochye (over the portages)” was born and successfully developed in the space of European Russia. It gave access to the north to the White Sea, to the south to the Caspian Sea and the Azov-Black Sea basin, to the West to the Baltic. The central “dispatcher” of this system is

Volokolamsk, known since 1135 as the “Main Volok (main portage) [4].

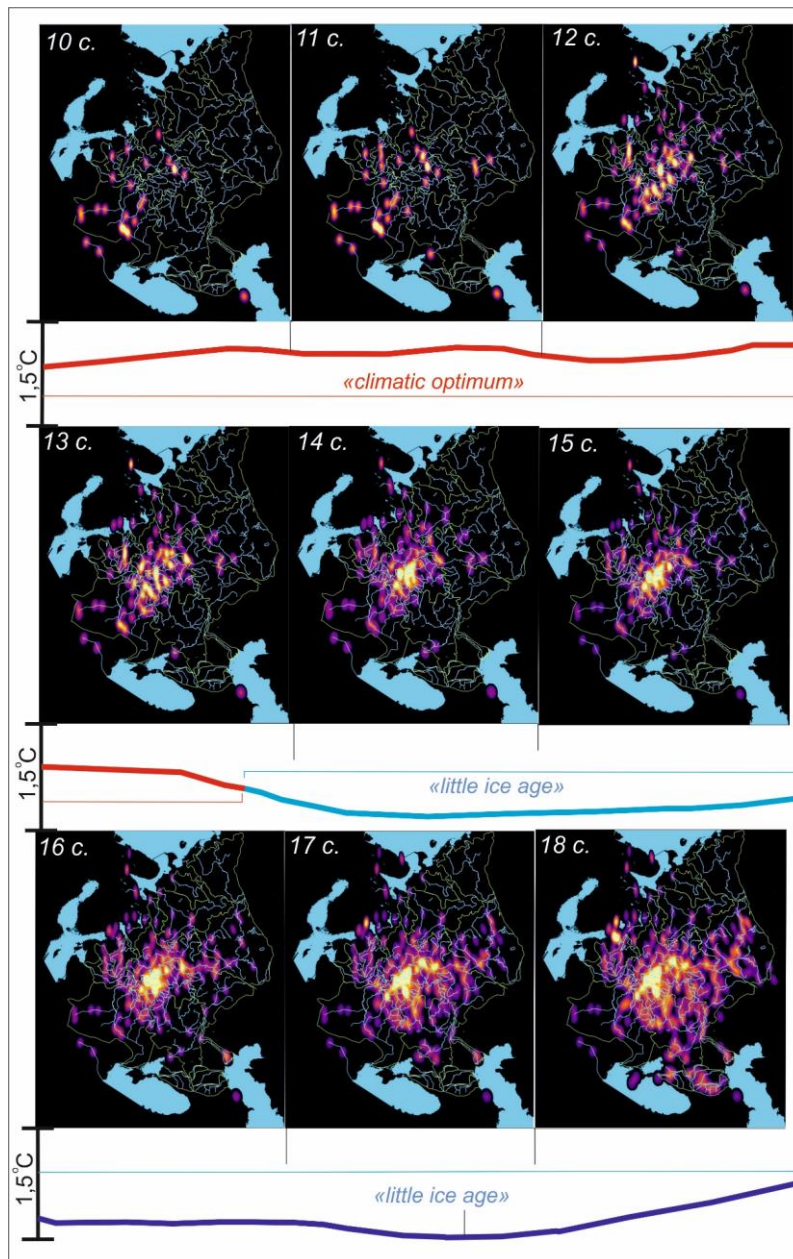


Fig. 1. The historical course of settlement in the river basins of the European part of Russia.

However, the climatic optimum, which reached its maximum in the XII century, in the XIII century not only weakened its positions, but also shifted into the opposite, known as the “Small Ice Age”. Cold winters, prolonged torrential rains or long droughts and crop failures — all this to some extent prompted the search for new places to live. The Oka and Volga valleys and the Oka-Volga interfluvium were successfully settled. The walls of Nizhny Novgorod

(1221) are laid on the Volga and Oka junction (1221). Nerekhta (1214), Rzhev (1216), Mozhaysk (1231) are surrounded by outposts. But a particular alarm during this period caused neighbors in the Northwest. Novgorod’s Knyaz (Prince) Alexander, known by the name of Nevsky, begins construction of a number of defensive fortresses. One of the first among them in 1234 was the fortress of Porkhov. The fortress of Vyborg was built only in 1293.

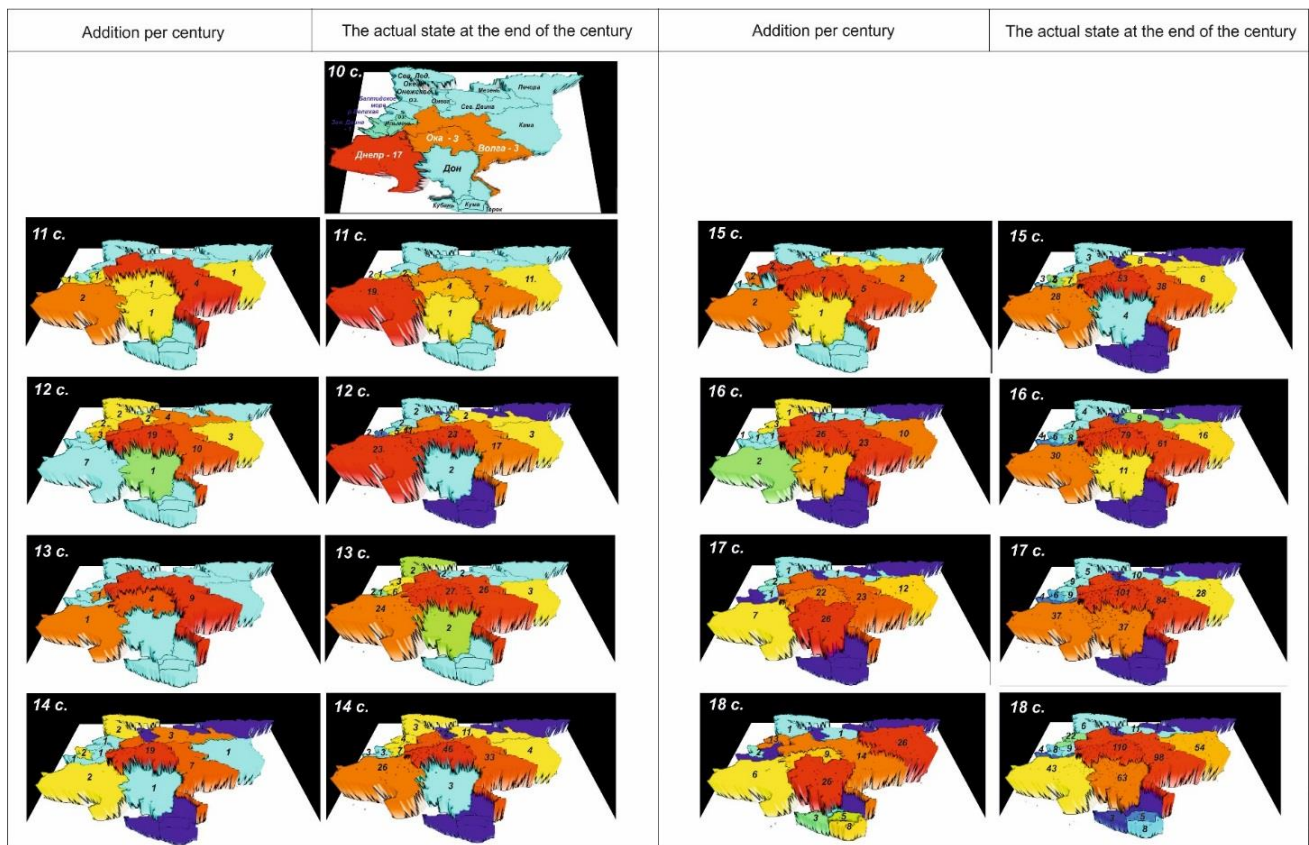


Fig. 2. Number of main settlements in river basins by centuries.

In the XIV century, the tendency to move to the North was preserved, and rich lands were developed along the Northern Dvina River. Already not in individual territories, but in the settlements a special way of life was formed for the inhabitants of the Olonets region. Natives of Novgorod became pomors in this Northeastern Territory. But a special role in the formation of the settlement system in the XIV century begins to play the Volga-Oka interfluvium, where new cities and settlements are already associated with political and spiritual centers. Nineteen new settlements were built on the banks of the Oka and, seven were built on the banks of the Volga. The city of Klin was founded in 1317, Ruza in 1328, Aleksandrov in 1357, Ostashkov in 1365, Kaluga in 1375. It is during this period the watershed between Oka and Volga rivers become the spiritual center. In 1328 Pavlovsky Posad was founded, and in 1337 Sergiev Posad. The increasing consolidation of land around Moscow led to a more compact settlement in the already limited territory and, consequently, to an increase in the density of settlement. (see “Fig. 2”, 14th century)

The trend of land consolidation around Moscow continued through the 15th century; the density of settlement in the basin of the Volga and its tributaries Kama and Oka also continued to increase. As shown by the data on the main settlements on the Volga, their number in overall was already close to 100. This trend is emphasized in terms of population density (see “Fig. 2”). By the middle of the XV century a list of then long-living settlements was formed. Bronnitsy near Moscow was mentioned for the first

time in 1453, Kubinka in 1456, Lytkarino in 1456, Mytishchi in 1460. Despite the fact that the importance of land connections between river valleys increases, the significance of the rivers themselves remains relevant. Therefore, the place of the main “bundle” of river sources in Valdai improves its status: Vyshny Volochek was considered a city since 1471.

However, despite the centralization of the Moscow region, the task of defending the western borders still remains. OPOCHKA, which since 1414 has become one of the supporting settlements in the chain of defense fortresses, is being rebuilt and strengthened on the Pskov land. The Pechora became the spiritual center of the Pskov region in 1473.

The main gates of Muscovy in the 15th century are the valleys of the Northern Dvina and Onega. The coast of the White Sea from the mouth of the Onega River to the north and the mouths of the Northern Dvina and Mezen are mastered by the Pomors. Even according to the most modest information, the number of settlements in this harsh region exceeds 11.

An analysis of the spatial dynamics of settlement in the 16th century showed that the North-South corridor was stable in time on the basis of river systems: From Arkhangelsk in 1584 to Astrakhan in 1558. While the White Sea was surrounded by the already established system of settlements with a special coast, then The Caspian Sea and the Northern Azov Sea region formed an unconventional

structure of settlements. An unusual city grew up on the land of the ancient Khazaria, in which people from the Caspian lands, the banks of the Don, the lower reaches of the Volga and the Aral region lived nearby. During this period, in the Volga basin, Laishevo and Khvalynsk (both since 1556) strengthened their urban status. Volzhsk (1565), Bogorodsk (1570), and Tetyushi (1578) raised their walls on the banks of the middle Volga. In the lower reaches of Volga Samara was built up from 1586, and since 1589 the fortified settlement known as Tsaritsyn exists.

In the same century, the wave of settlement reached the headwaters of the Kama and briefly stopped in 1596 at Vyatskiye Polyany, and at the start of the 17th century Usolye (1606) is developed. Also, a wave of settlements rolled along the Don and the Lower Dnepr. Their interfluvial area, which became part of the folklore as "walking the field," was developed not least by Cossack freemen. From the first years of the 17th century, Lebedyan (1605), Zadonsk (1615) and Uryupinsk (1618) have stated their descent. Not much "younger" are Tambov (1636) and the village of Oboyan (1639).

The coast of Ladoga and the Baltic for many years remained a "bone of contention" between the northern countries — primarily Sweden and Finland. The military events and the need to strengthen the borderlands led to the fact that settlements were re-erected in this area, including Pikalevo in 1620, Kirishi in 1693 and Lakhdenpokhya 1600.

The end of the northern war and the annexation of the Baltic coast radically changed the vector of settlement in the 18th century in the space of European Russia. The founding of the new capital, St. Petersburg, has brought about a vigorous exploration of not only the environs of the capital, but also the lands of the North-Western sector of the country. The capital functions of the new city of St. Petersburg required the creation of a security structure. Directly along the shores of the Gulf of Finland and adjacent areas, new settlements began to rise, which led to an increased density in the zone of influence of the metropolitan region. (see Fig. 2, 18 century).

The peculiarities of settlements distribution character along rivers in the XVIII century include the stability in time of the settlements of the Cossacks. Initially militarized, they began to represent the protective belt of the state. The main areas of settlement of the Cossacks were, above all, the border areas. This was recorded in the names of the Cossack border troops: Don (Rostov-on-Don, 1749), Kuban (Krasnodar, 1793), Terek (Nalchik, 1724, Vladikavkaz, 1784), Astrakhan Cossacks (Astrakhan, 1717). On the Ural River Yaik Cossacks (Orenburg, 1743) carried military service. So, the nine-century long period of development of the European part of Russia ended.

The places of settlements that are now for us — the cultural value of the history of our country in the open territories of Eurasia, are of particular interest for urban planning. As before, now these places are essentially launch sites in the settlement network. This phenomenon, called the "genius of the place," was pointed out by Aristotle in his book *Politics*. But over time, in most cases, there is a change

of circumstances and the former factors that contributed to the development of the settlement, and lose their power. The task of the town planner is to find new ways to reorganize the territory, taking into account future global and regional changes. Nowadays, a large role in the European part of Russia as a historical and spiritual center is played by the restoration of the territories adjacent to the monuments of historical and cultural heritage. These are time-tested places.

It is no coincidence I.E. Grabar, referring to the urban culture of Russia, in 1928 urged the citizens of Novgorod, Pskov, Vladimir, Suzdal, and Rostov to take care of their monuments. He made an appeal: Take care of them, because when they come to us, just as they are going to Italy now, and this time is not far off — they will be the sources of your well-being and fill your heart with pride.

The dense river network of Russia has always served as a source of energy and a natural ecological basis for life on the territory. Rivers are a unique infrastructure resource for the development of Russia.

However, in recent decades, these important functions for ensuring the security and development of the country of the river network of Russia have been forgotten.

One of the examples of the preservation of historical and cultural heritage in the European part of Russia was the capital of the Black Soil Region, Voronezh. It was founded in 1585 as a defensive fortress on the banks of the Voronezh River, and later grew to the Don River. However, today due to the spontaneous building up and expansion of the city, as well as the thereby caused pollution and shallower rivers, and in connection with this ongoing transformation of the urban landscape, some historical characteristics are lost.

Tourism and recreational and natural resources are underutilized as an economically efficient activity. Therefore, it is necessary to form a system of places of interest, taking into account the leading role of the urban district of the city of Voronezh, which will serve as the basis of tourist and recreational activities. The system of places of interest offers a wide range of topics: from the Petrovsky fleet, spiritual centers of Divnogorye Orthodox shrines to literary Voronezh (Bunin, Platonov, Nikitin, Koltsov, Mandelstam, etc.). Perspective variants of interregional routes together with Lipetsk appear promising. So Zadonsko-Yelets zone is genetically related to Voronezh.

Tourism and recreation systems should be addressed as a single structure at the regional and interregional level. This system can be characterized by a wide variety of routes by length, by thematic scenarios and historical brands [5].

In the section "Analysis of the strategic potential of the region and the external environment" of the Strategy for the socio-economic development of the region until 2020, there are no constructive proposals for preserving cultural heritage in the Voronezh Region, — 70% of historical and cultural monuments are in an unsatisfactory state. There are no regulations governing the construction of historical centers. Architectural appearance of historic cities, including Voronezh, is distorted.

IV. CONCLUSION

The settlement structure established in the course of the centuries-old development is an intangible monument of historical and cultural heritage. Its dynamics reflects the character and principles of the Russian civilization, and the spirit of the people. Studying on the principles of historical modeling, on the basis of new information technologies is an important task not only of the state, but also of the world level [6].

Restoration of monuments of historical and cultural heritage, as the reference points sustainable over time, is of great importance in the development of the settlement system.

Due to changes in a number of global and regional factors affecting the course of resettlement and technological transformations, it is necessary to search for new solutions for the development and development of territories. To ensure the security and progressive development of the state, like the important defensive fortifications of outposts, the centers of creative development of the population with great environmental and creative potential are necessary.

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