

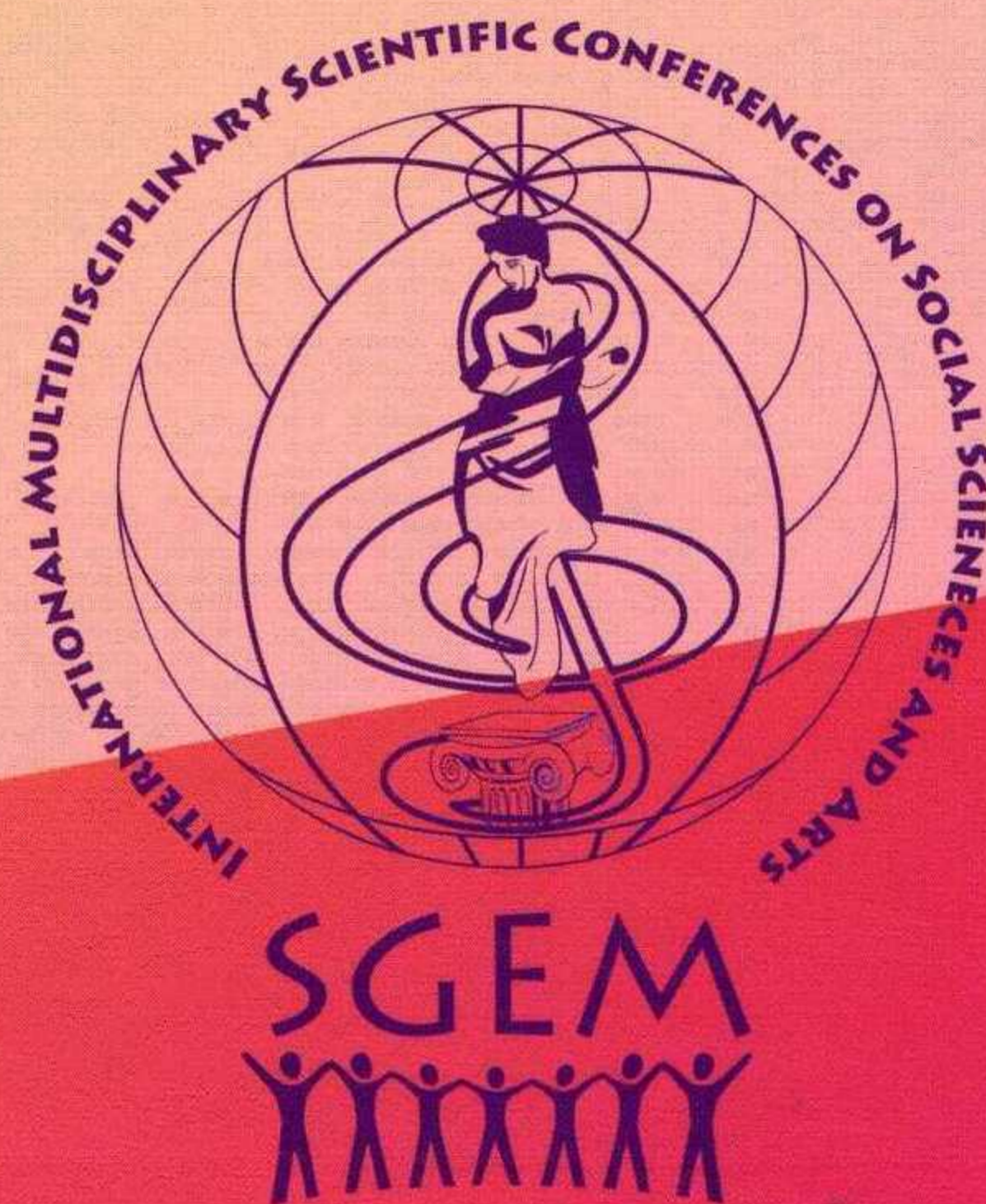
3<sup>RD</sup> INTERNATIONAL MULTIDISCIPLINARY  
SCIENTIFIC CONFERENCE ON  
**SOCIAL SCIENCES & ARTS**  
**SGEM 2016**

CONFERENCE PROCEEDINGS

**BOOK 3**

ANTHROPOLOGY, ARCHAEOLOGY,  
HISTORY AND PHILOSOPHY

**VOLUME II**



ANTHROPOLOGY, ARCHAEOLOGY  
HISTORY, PHILOSOPHY

## ARCHAEOLOGY

---

- 32. AN INTEGRATED APPROACH FOR MEDIEVAL HILLFORTS STUDY (REPUBLIC OF TATARSTAN, RUSSIA),** Iskander Gaynullin, Alexey Kasimov, Petr Khomyakov, Bulat Usmanov, Kazan (Volga Region) Federal University, Russia.....247
- 33. ARCHEOLOGICAL DATA REGARDING THE FOUNDATION OF STARAYA RUSSA: TO THE PROBLEM OF RUSSAN MEDIEVAL TOWNS EMERGENCE,** Elena Toropova, Sergey Toropov, Kirill Samoylov, Novgorod State University, Russia.....255
- 34. CHARACTERISTICS OF THE MANUFACTURING TECHNOLOGY OF THE MULTILAYER SILVER COINS OF 9TH-10TH CENTURIES OF VOLGA BOLGARIA,** PhD Shaykhutdinova E., PhD Khranchenkova R., Prof. Sitdikov A., Institute of Archaeology Tatarstan Academy of Science, Russia .....263
- 35. NORTHERN LOCAL VARIANT OF THE PAZYRYK CULTURE OF GORNY ALTAI ACCORDING TO THE MATERIALS OF THE BARANGOL NECROPOLIS IN THE LOWER KATUN AREA,** Andrey Borodovski, Altay State University, Russia.....273
- 36. POST-MEDIEVAL GLASS WORKSHOP FROM THE EXCAVATION IN THE KAZAN KREMLIN,** PhD Rezida Khranchenkova, DSc Prof Airat Sitdikov, Alexei Kaisin, Institute of Archaeology Tatarstan Academy of Science, Russia .....277
- 37. VIRTUAL REALITY AS A TOOL FOR RECONSTRUCTION OF CULTURAL HERITAGE,** Prof. Dr. Vladimir Nemtinov, Assoc. Prof. Dr. Andrey Borisenko, Assoc. Prof. Dr. Alexander Gorelov, Assoc. Prof. Dr. Yulia Nemtinova, Ing. Serg Tryufilkin, Tambov State Technical University, Russia.....287

## HISTORY

---

- 38. RADICAL ISLAMIC MOVEMENTS IN WEST AFRICA: THE GENESIS, CHARACTERISTICS AND PROSPECTS OF DEVELOPMENT,** Sergey Voronin, Elena Zueva, Elena Bazanova, Andrey Kudelin, Peoples Friendship University of Russia, Russia.....297
- 39. "TRAVEL JOURNALS" MISSIONARIES FROM 1860-1863 AS A SOURCE ON THE HISTORY OF MISSIONARY ACTIVITY AMONG OLD BELIEVERS OF TOBOLSK EPARCHY,** Assoc. Prof. Ludmila Suslova, Irina Yarkova, Tatyana Eikhman, Tyumen State University, Russia.....305
- 40. A NEW IDEA OF PROPERTY. POLITICS FOR CULTURAL HERITAGE MANAGEMENT IN THE EASTERN EUROPE (1945 - 1989),** Andrea Ragusa, Interuniversity Centre for the History of Social Change and Innovation, Italy .....315

## AN INTEGRATED APPROACH FOR MEDIEVAL HILLFORTS STUDY (REPUBLIC OF TATARSTAN, RUSSIA)

**Iskander Gaynullin**<sup>1</sup>,  
**Aleksey Kasimov**<sup>1</sup>,  
**Petr Khomyakov**<sup>2</sup>,  
**Bulat Usmanov**<sup>2</sup>

<sup>1</sup> Khalikov Institute of Archaeology, Kazan, **Russia**

<sup>2</sup> Kazan Federal University, Institute of Environmental Sciences, Kazan, **Russia**

### ABSTRACT

Integrated approach now is a priority in archaeological sites study. In this paper, we consider the possibility of modern methods usage to estimate archaeological hillforts condition on the territory of the Republic of Tatarstan. In our view, the analysis of medieval fortified settlements of X-XIII centuries, the most common in the territory of the Republic of Tatarstan, has the highest priority. Because always the main criteria for the selection of favorable place to settle was the closeness of the water and the presence of natural fortifications, most of the archaeological sites usually located on the banks and terraces of small rivers, where influence of fluvial and exogenous processes is possible. Intensive territory development (plowing, irrigation, active construction, etc.) also led to a significant change in exterior of monuments and often – to their complete disappearance. So, the main task of our investigation is to provide both historical data and operational information about the current state of archaeological sites. This article gives an example of modern techniques application to study hillforts that exposed to different types of negative impacts. The complex method including GIS, multitemporal remote sensing data and GNSS survey provides not only assessment of the risk of study sites damage, but also archaeological data updating and development of specific measures for historical and cultural heritage conservation.

**Keywords:** Fortified settlements, exogenous processes, anthropogenic impact, remote sensing

### INTRODUCTION

A large number of archaeological monuments, exposed to various forms of impact determined the selection of the Tatarstan Republic territory for remote monitoring of cultural heritage objects. Now in Tatarstan actually identified 4278 objects of archeology, 2758 of them are exposed to destruction [1], [2].

Republic of Tatarstan is situated in the eastern part of the East European Plain, near the confluence of Volga and Kama rivers (Fig. 1). The area of the republic is 68,000 square kilometers, and its surface is an undulating plain. With an average altitude 170 m above sea level, some parts of republic territory rise up to 300-350 m. East European Plain gradually rises from the Volga River to the spurs of the Ural Mountains, where the Bugulma-Belebey upland formed. At the same time, significant areas are the lowlands, where the height does not exceed the level of 100 m.

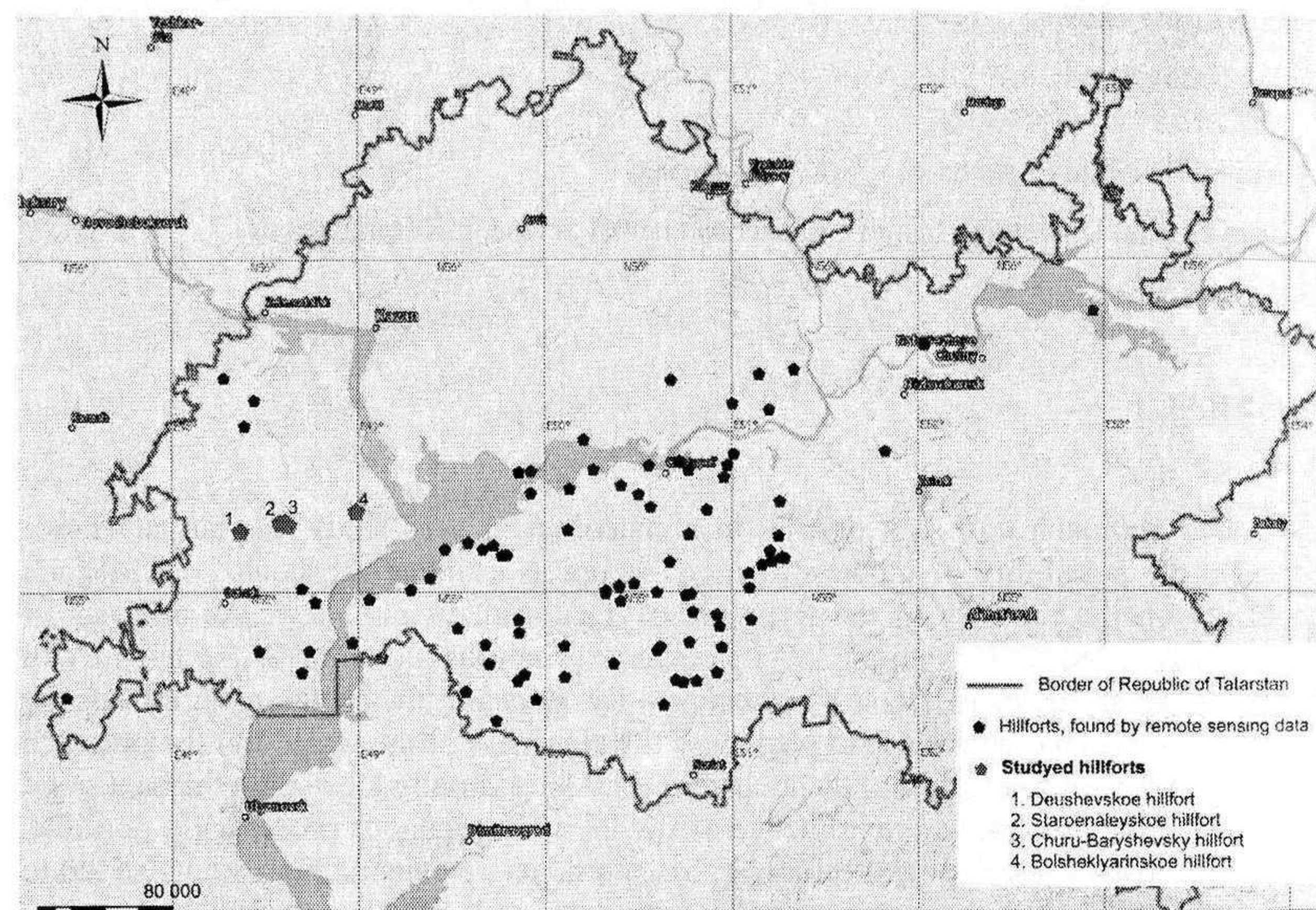


Figure 1. Bolgar hillforts detected on remote sensing data

Forms of relief created by flowing water are widely distributed in Tatarstan, especially gullies and ravines, dissecting the slopes of uplands and river valleys. Besides the four large rivers – Volga, Kama and its confluents Belaya and Vyatka, approximately 500 small rivers over 10 km long flows on republic territory. Kuibyshev reservoir filled in 1955-1957 is one of the biggest reservoirs in the world and the largest on Volga River. Its main purpose – Volga and Kama flow regulation and Volga Hydroelectric Power Station support [3].

The main part of the territory of Tatarstan is represented by agricultural lands – 46301 km<sup>2</sup> (68.2%), forest areas occupy only 16.8%. The high degree of plowing at low forest coverage are prerequisites of active erosion processes. As a result, the area of erosion-hazardous agricultural lands in republic is 21689 km<sup>2</sup>, or 47% (2014 yr). High economic development of territory and the large proportion of erosion areas raise the risk of damage and destruction of monuments and associated historical environment.

In this case monitoring of archaeological monuments, that exposed by intense negative anthropogenic and/or exogenous influence is very important for preservation of cultural heritage of Republic of Tatarstan.

In this paper, aerial photos received in the last century (1950, 1970-80-ies.) used as the main source of information for medieval hillforts condition study in Republic of Tatarstan, Russian Federation. Research potential in archaeology, which provides computer processing and deciphering of 40-50-year-old aerial and space imagery can hardly be overestimated. In fact, we can talk about their re-introduction into scientific process at a new level of research technologies [4], [5]. The range of scientific tasks solved with the help of computer processing of archive remote sensing data is very broad [6], [7].

In addition, the processing of remote sensing data allows in a great extent to specify the shape of the monument in comparison with existing plans, to correct their area and location in landscape, to restore original appearance of destroyed cultural objects, to carry out an accurate coordinate referencing for further use of these data in archaeological geoinformation systems [8], [9].

## METHODOLOGY

In our study we used modern methods of geoarchaeology aimed at natural physical geomorphological process study that affect archaeological sites.

Hillforts, most often with the system of defensive fortifications (shafts, ditches), selected as objects of this research, because they are easily identified by aerial survey data. At this stage, information is gathered about the medieval fortified settlements of Bulgarian culture (X-XIII centuries), the most common in the territory Tatarstan – 161 settlement of this period [2]. Considering the large number of examined archaeological sites, this article describes 4 typical objects affected by various negative factors situated in Predvolzh'e of Tatarstan. This region characterized by very high level of agricultural development with 76, 4 % of plowed and 40 % eroded lands [1]

The study included: 1. Analysis of cartographic and multi-temporal remote sensing data; 2. Field survey; 3. Office processing and preparation of the GIS.

Remote sensing data of maximum possible time spectrum over the past 60 years were selected to obtain information about archaeological monuments condition. Old aerial imagery (1: 17000 scale) from special fund of Kazan Federal University library and modern high-resolution satellite imagery from public resources were taken.

Search for fortified settlements on aerial photographs carried out with the help of descriptions based on the results of field survey of past years. Further overlapping aerial images were scanned and georeferenced in ArcGIS software to align it with the space imagery data.

Field study included description of anthropogenic impact and modern geomorphologic situation, photographing and reference points organization with further coordinates fixation with GNSS Receiver Trimble Geoplotter 6000 XH in WGS84 coordinate system.

The next step was to estimate the fortified settlements condition. Monuments exposed by anthropogenic (plowing, construction, quarrying, etc.) and natural (gully erosion, landslides, rockslides, rivers meandering, etc.) processes were subsumed to separate categories. Fortified settlements without visible effects of impact and completely destroyed monuments of archeology, with a description of possible causes of extinction, stands apart in this classification.

In addition, comparison of the existing fortifications schemes with their image on remote sensing data carried out, for further correction of monuments plans.

## RESULTS

Currently our team found 95 Bulgarian period (X-XIII ct) fortified settlements by using remote sensing data (Fig. 1) and most of them exposed to different forms of impact. Considering the large number of examined archaeological sites, this article describes the most typical objects affected by following negative factors:

1. *Human impact.* The main factor that increases the importance of historical remote sensing data in anthropogenic influence context, is widespread process of plowing, irrigation, active construction, etc., that starts at the middle of the XX century. Intensive territory development led to a significant change in exterior of monuments and often – to their complete disappearance.
2. *Dangerous exogenic processes.* The first priority in this aspect is to provide information about the current state of archaeological sites in the areas of *intensive processes* of coast transformation (sea, large water reservoir) and dangerous exogenous processes (landslides, debris, etc.), where the threat of destruction is maximized. Also important, because always the main criteria for the selection of favorable place to settle was the closeness of the water and the presence of natural fortifications, to study archaeological sites located on the banks and terraces of small rivers, where influence of fluvial and exogenous processes is possible.

### Anthropogenic factors

Intensive *agricultural development*, which began at the territory of the Republic of Tatarstan in 1970-1980 years, endanger the existence of many archaeological monuments, including the fortified settlements of Middle Ages. As a result of plowing monuments lose their external features that complicates detection of fortifications remains on modern satellite images. Old aerial pictures deciphering helps in this situation to restore the exact fortifications shape of hardly recognized and completely destroyed monuments and to estimate their area.

For example, Staroenaleyskoe hillfort, known since the XIX century, currently is completely plowed (Fig. 2b). Part of the fortifications destroyed in the north-western part by gully and unpaved road extends through monument. It can be assumed that at this moment archaeological site is destroyed due to anthropogenic impacts. It's possible reconstruct the shape of ancient settlement and its defensive system by 50th years of last century image (Fig. 2a), as well to estimate the anthropogenic damage. Field studies approve the absence of main part of hillfort, except short remains of rampart at western part.

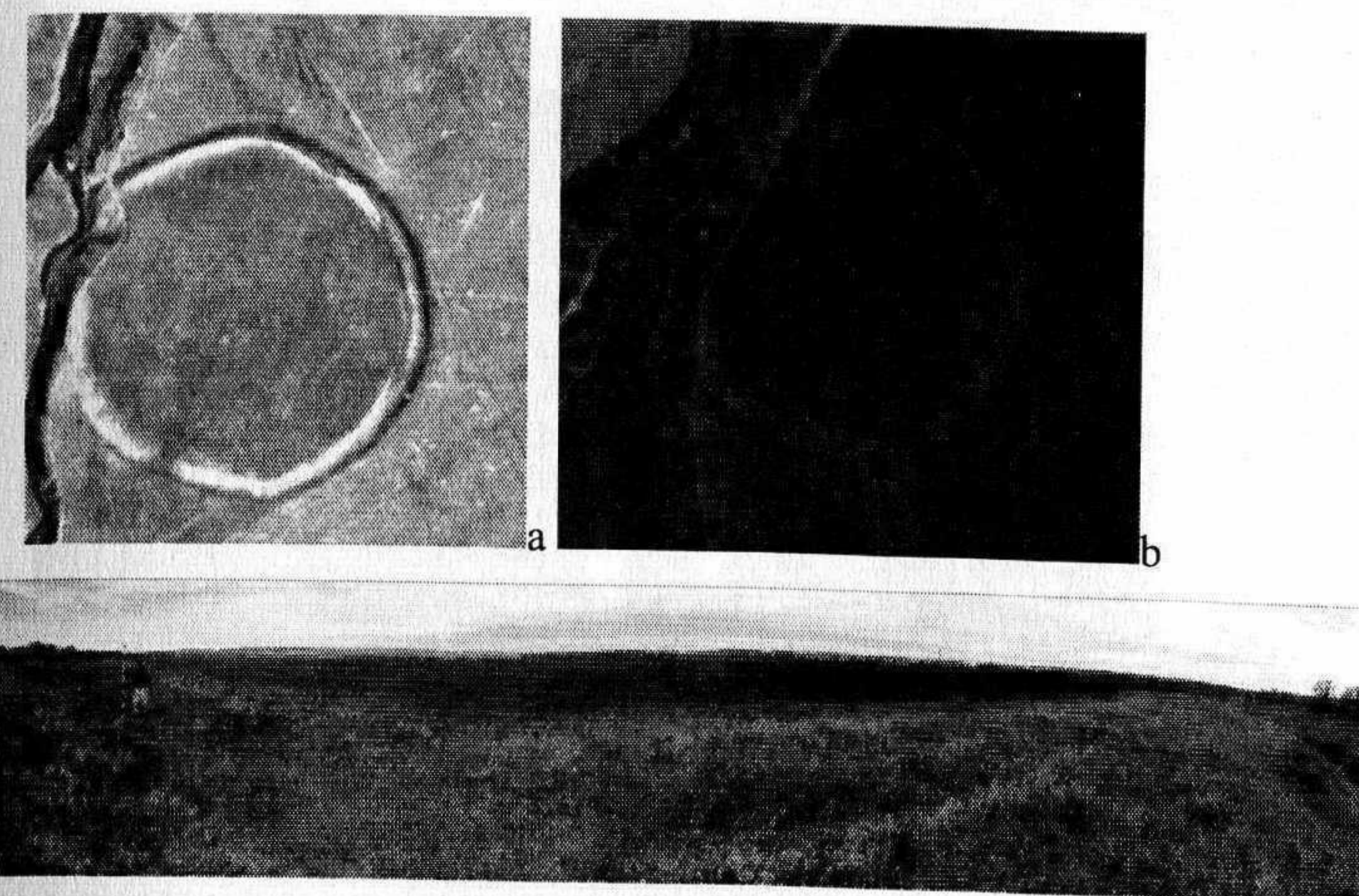


Figure 2. Staroenaleyskoe hillfort in 1958 (a), 2014 (b) and nowadays (c).

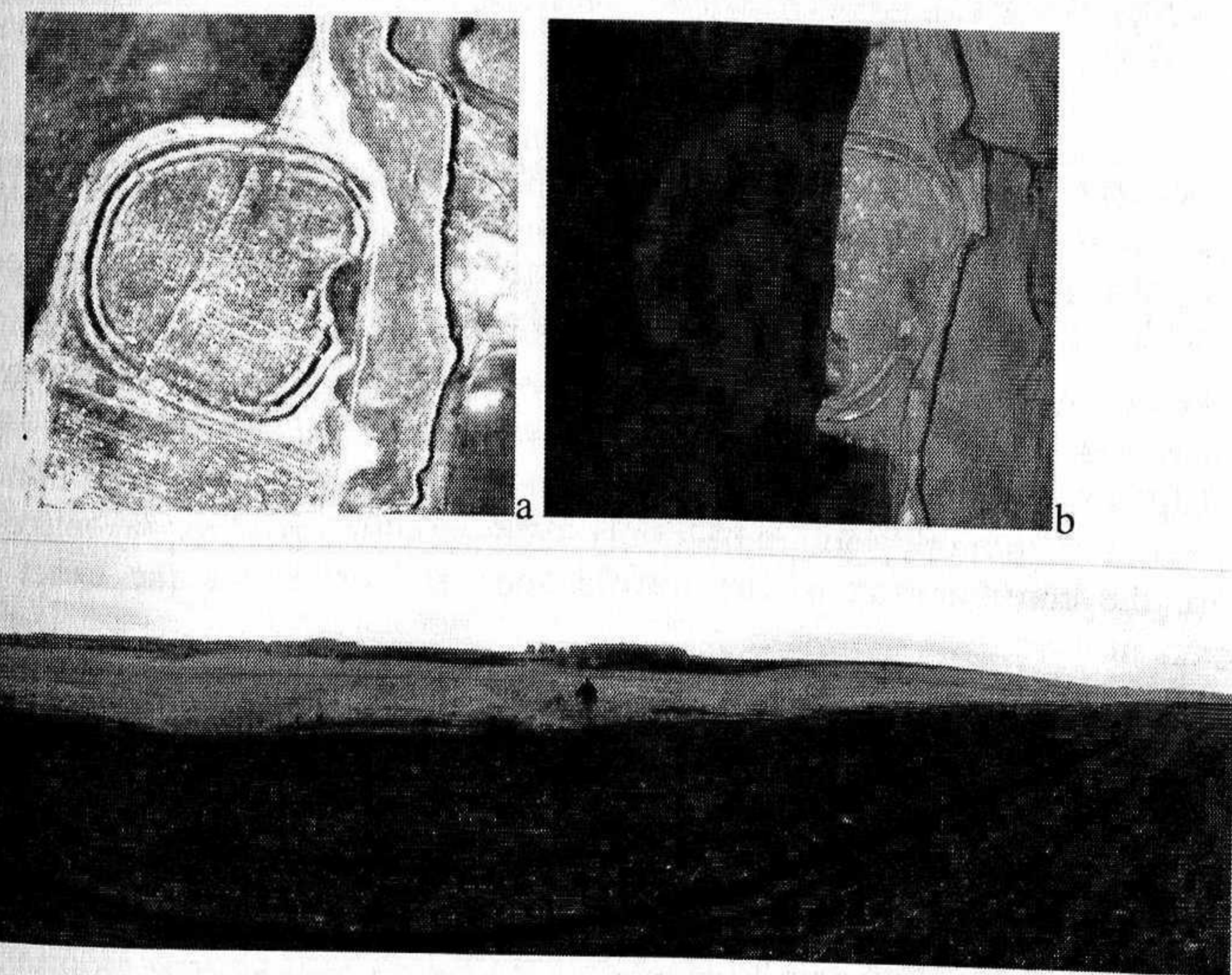


Figure 3. Bolsheklyarinskoe hillfort in 1958 (a), in 2014 (b) and nowadays (c).

As can be seen from aerial image (Fig. 3a), another hillfort, Bolsheklyarinskoe settlement area has been used for fruit and berry crops cultivation at the middle of last century. It has intensively plowed since the 1980s, now as a result about 70% of ancient settlement occupied by arable land (Fig. 3b, 3c). In the eastern part, fortifications are partially destroyed by old river channel.

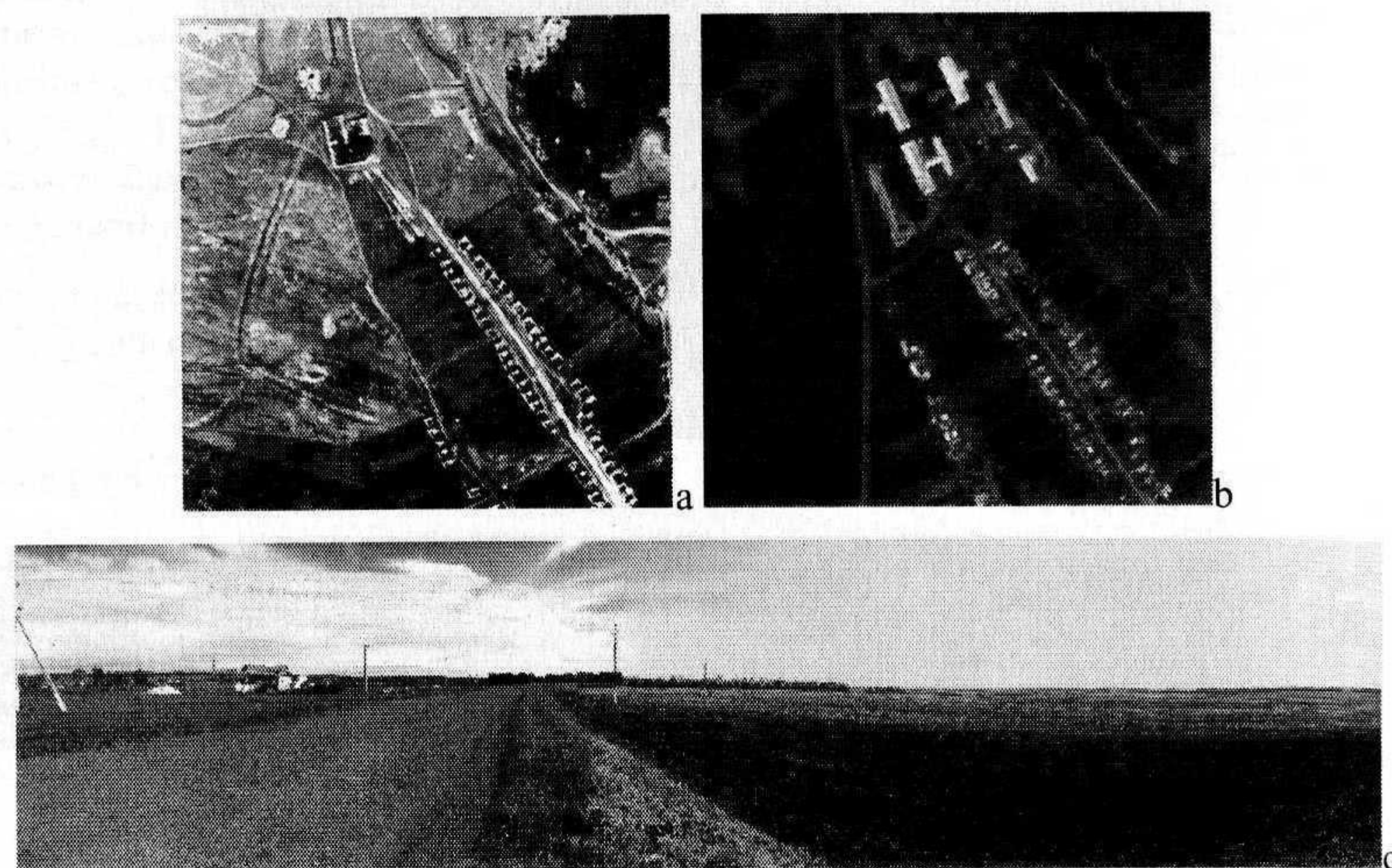


Figure 4. Deushevskoe hillfort in 1958 (a), in 2014 (b) and nowadays (c).

Another negative anthropogenic factor, destroying archaeological monuments, is the **construction of industrial and residential buildings** since the 1970s. Thus fortified settlements, getting under construction, often almost completely destroyed, including cultural layer, which makes their further study impossible.

As we can see (Fig. 4b, 4c) Deushevskoe settlement (X-XIII century) is completely destroyed as a result of two negative anthropogenic factors combination – plowing and building. A small part of fortifications remained intact only in the garden of nearby house. As a result of anthropogenic impact only 1958 aerial image (Fig. 4a) makes possible to restore the configuration of the fortifications and determine the exact area of the monument.

#### Dangerous exogenic processes

Slopes very often surrounds ancient settlements. This fact makes possible their destruction by modern exogenous processes, many of which may occur with catastrophic speed. Therefore, different erosion forms and processes study in the area of archeological monument location is necessary to prevent its destruction.

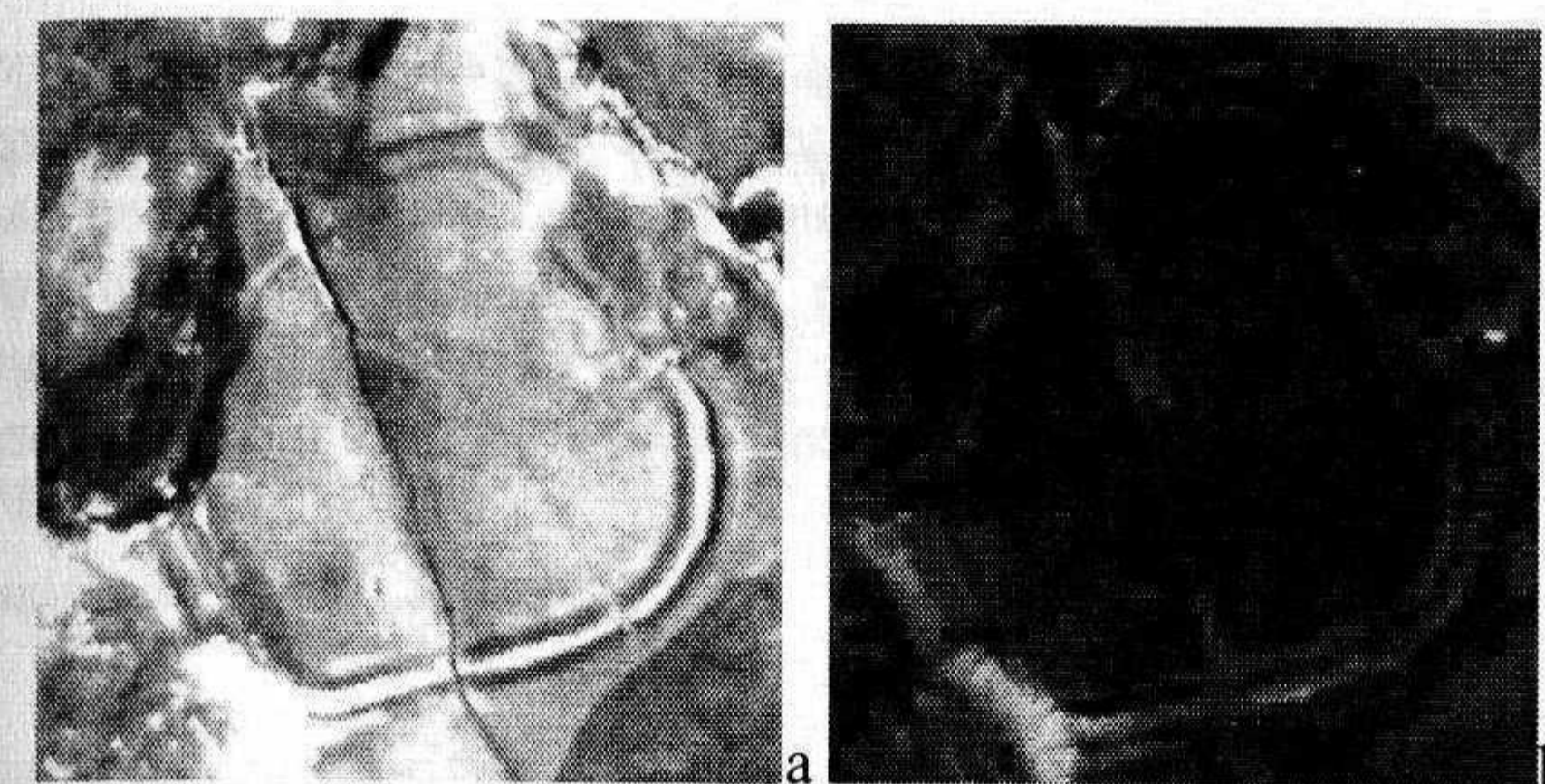


Figure 5. Churu-Baryshevsky hillfort in 1958 (a), 2014 (b) and nowadays (c).

Churu-Baryshevsky fortified settlement (Fig. 5), has a circular shape and has been known since the XIX century. Natural barriers provides by high terraces slope, artificial – by double system of ramparts and moats to the north-west and single from the southeast. The territory of ancient settlement damaged by whole set of exogenous processes due to its location on high cape shaped ledge. It is destroyed by landslides (Fig. 5c) in the western and north-eastern part developing on the slopes of cold exposure. It also intersects by gully running along the bottom of ancient ravine. The further growth of gully was luckily stopped due to the underlying bedrock. Field survey shows except described processes, damage of fortifications by talus on the slopes of southern exposure.

#### CONCLUSION

As a result of archaeological sites study based on the analysis of multi-temporal aerial and satellite images three main directions revealed for remote sensing data use in the study of cultural heritage objects located on the territory of the Republic of Tatarstan.

Analysis of remote sensing data showed a high level of anthropogenic and exogenous factors load on archaeological sites located on the territory the Republic of Tatarstan. For example, in the last 50 years almost completely destroyed Staroenaleyskoe, Bolsheklyarinskoe and Deushevskoe hillforts because of total plowing and building. In this case, the use of multi-temporal images allows estimating the damage caused both during economic activities, as well as under influence of natural processes, make an accurate mapping of sites and their separate elements that do not have precise georeference or currently disappeared.

Inclusion of remote sensing data processing results in archaeological GIS will allow not only describing the morphometric characteristics of hillforts, to analyze spatial and attribute information but also to carry out an effective cultural heritage management. In case of human impact – removal of the monument area from land use zone and establishment of conservation boundaries. In case of identifying sites under negative exogenous processes – definition of local areas for urgent protection and rescue operations.

#### ACKNOWLEDGEMENTS

This work was funded by the subsidy allocated to the Kazan Federal University for the state assignment in the sphere of scientific activities.

#### REFERENCES

- [1] State Report. On the state and environmental protection of the Republic of Tatarstan in 2014, 509 p, 2015.
- [2] Study, protection, restoration and use of monuments of history and culture in the Republic of Tatarstan, Archaeological heritage, Russia, issue 4, 2004.
- [3] Yermolaev O.P., Usmanov B.M., Mukharamova S.S., The basin approach and mapping to the anthropogenic impact assessment on the east of the Russian Plain, *International Journal of Applied Engineering Research*, vol. 10/number 20, pp. 41178-41184, 2015.
- [4] Kerscher H., Neue Beobachtungen an bayerischen Denkmalern und Kulturlandschaften durch Prospektion mit ALS-DGM-Daten, *Das Archaeologischen Jahr in Bayern 2012*, pp 179-182, 2013.
- [5] Kerscher H., Eldorado Ostbayern, *Das Archaeologischen Jahr in Bayern 2012*, pp 171-174, 2013.
- [6] Agapiou A., Lysandrou V., Alexakis D.D., Themistocleous K., Cuca B., Argyriou A., Sarris A., Hadjimitsis D.G., Cultural heritage management and monitoring using remote sensing data and GIS: The case study of Paphos area, Cyprus, *Computers, Environment and Urban Systems*, pp 230-239, 2015.
- [7] Airborne Remote Sensing. <https://historicengland.org.uk/research/approaches/research-methods/airborne-remote-sensing/>
- [8] Gaynullin I., Sitdikov A., Usmanov B., Destructive abrasion processes study in archaeological sites placement (Kuibyshev and Nizhnekamsk reservoirs, Russia), *Proc. International Multidisciplinary Scientific Conference on Social Sciences & Arts SGEM*, vol.1, pp. 339-346, 2014.
- [9] Robinson M.H., Alexander C.R., Jackson C.W., McCabe C.P., Crass D., Threatened Archaeological, Historic, and Cultural Resources of the Georgia Coast: Identification, Prioritization and Management Using GIS Technology, *Geoarchaeology: An International Journal*, vol. 25/issue 3, pp 312-326, 2010.

## ARCHEOLOGICAL DATA REGARDING THE FOUNDATION OF STARAYA RUSSA: TO THE PROBLEM OF RUSSAN MEDIEVAL TOWNS EMERGENCE

PhD. Elena Toropova<sup>1</sup>

Sergey Toropov<sup>1</sup>

Teaching Assistant Kirill Samoylov<sup>1</sup>

<sup>1</sup> Novgorod State University, **Russia**

<sup>1</sup> Novgorod State University, **Russia**

<sup>1</sup> Novgorod State University, **Russia**

#### ABSTRACT

The paper is devoted to the problem of the emergence of Staraya Russa (or Rusa until the 16<sup>th</sup> century) – the town in North-Western Russia situated 60 km south of Novgorod the Great. During the Middle Ages it was second largest town in the Novgorod Republic, the center of salt production. The first evidence of Rusa in Russian chronicles dates to 1167/1168 AD, but the archeological records suggest that the urban settlement on this place had been founded much earlier. The questions debated in the paper are the localization and chronology of the earliest settled area of the town. The paper analyses the results of research (the study of finds, stratigraphy and dendrochronological data) obtained on 11 areas in most ancient part of the town that were excavated from 1967 to 2012 by A. Medvedev, V. Mironova and by the present authors. The main conclusion is that the earliest settled area (of approximately 60,000 square metres) is situated between modern health resort and St. Nicholas church (near the intersection of present day streets Mineral'naya and Svaroga). The analysis of early town topography confirms that needs of salt production were the dominant element and essential factor in the town's growth. It is suggested that occupation of this site began at the turn of the 10<sup>th</sup> and 11<sup>th</sup> centuries AD. The rise of Rusa is related to the specific conditions concerning the urbanization of Novgorod territories after the end of Viking Age.

**Keywords:** medieval archeology, Novgorod Land, Staraya Russa, emergence of medieval towns.

#### INTRODUCTION

Staraya Russa (until the 16<sup>th</sup> century - Rusa) was the second largest and most important town of the Novgorod Republic during the Middle Ages. This town is situated 60 km south of Novgorod the Great and 20 km from the southern shore of Lake Il'men, near the merge of the rivers Polist' and Porus'ya. It was the administrative and economic center of a large region south of Il'men. The prosperity of Staraya Russa until the 18<sup>th</sup>