GEOCHRONOMETRIA 38(2) 2011: 128-137
DOI 10.2478/s13386-011-0018-5

Available online at
www.springerlink.com

RECONSTRUCTION OF LOCAL ENVIRONMENTS OF ANCIENT POPULATION IN A CHANGEABLE RIVER VALLEY LANDSCAPE (THE MIDDLE VYCHEGDA RIVER, NORTHERN RUSSIA)

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Received 21 June 2010 Accepted 25 November 2010

Abstract: In river valleys, both human occupation and subsequent preservation of archaeological sites are affected by active landscape transformation caused by river lateral migration, incision/aggradation cycles and changes of river hydrological regime. In the middle Vychegda River valley (Northern Russia), there are numerous traces of human presence since the Mesolithic. We exploit multi-disciplinary archaeological, geomorphological and geochronological approach to elucidate the environmental preferences of settlements positioning during different epochs of the Holocene. High resolution space image supplemented with data on alluvial stratigraphy derived from bank exposures and hand cores, as well as 51 radiocarbon dates were used to make the geomorphic map showing ages of floodplain/terrace segments and palaeochannels. Using this map together with sediment facial interpretation, position of archaeological sites was analysed in the context of local geomorphic and hydrologic situation. The majority of archaeological sites and modern settlements are found on terraces at river banks or at oxbow lakes which were well connected to the river. Few exceptions from this rule may be explained by seasonal character of dwelling functioning, ritual burial practice or specialization of settlements. Geomorphic situation was used as a background for planning further prospection of different-age archaeological objects.

Keywords: Vychegda River, alluvial geoarchaeology, Mesolithic, Neolithic, Holocene, fluvial geomorphology, palaeochannel, palaeohydrology, geomorphic mapping, radiocarbon dating.

1. INTRODUCTION

Reconstruction of environmental conditions of ancient population is a necessary component of archaeological studies. Much information on adaptation and subsistence of human communities comes from investigations of wetland sites. However, such kind of archaeological sites is seldom in some regions, which depends on geographical peculiarities and characteristics of historical development of a specific territory. The Far North-East of Europe is one of such areas (**Fig. 1**). Most sites and historical settlements here are located on sandy highs of different origin on river floodplains and terraces. Understanding of age and origin of these highs, estimating location of river channel and other landscape features (lakes, bogs) in palaeotimes are necessary both for better planning of archaeological prospecting and for interpretation of results of excavations.

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ISSN 1897-1695 (online), 1733-8387 (print)

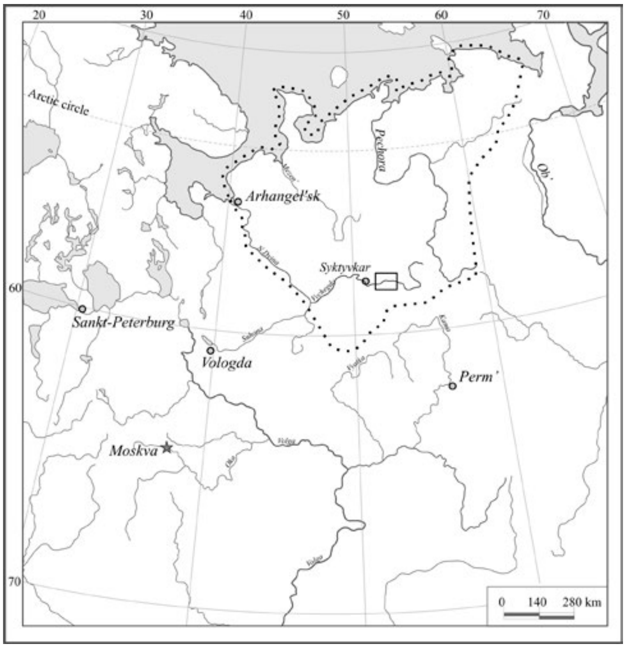


Fig. 1. *Far European North-East (dotted line) and location of the study area (rectangle).*

Archaeological studies in river valleys face with extremely changeable landscapes which could transform greatly between the periods of their occupation by humans. Great diversity of river valley landscapes makes it possible to meet specific preferences for location of settlements that could exist in a given culture. On the other hand, permanent reworking of valley floor, destruction of some areas and construction of other ones, poses limits on preservation of archaeological information. Therefore data on age of different valley floor segments and palaeochannels provides archaeologists with meaningful information for further prospection. Both aspects are long studied in the framework of alluvial archaeology (Howard *et al.*, 2003), geoarchaeology of river valleys (Dobrzanska *et al.*, 2004) and floodplain palaeoecology (Brown, 2003). In the Vychegda River valley, our study is the first one to exploit these approaches after a long time break. The first case of inter-disciplinary investigation in the region was the research by G. Burov near the Sindor Lake (rivers Simva and Vis) at the end of 1950-s. Along with archaeological results, stages of river channel development and local climate variability over the Holocene were evaluated (Burov, 1967). However, the absolute chronology was established by ^{14}C dating of wood samples only (Burov *et al.*, 1972). In the beginning of 2000s, A. Volokitin carried out a research of Mesolithic sites formation and sources of flint raw material exploited by Mesolithic population (Volokitin and Tkachev, 2004).

Our own archaeological investigations have been conducted here since 2001 (Karmanov, 2008). Since 2002 we have been performing radiocarbon dating of samples from archaeological sites and peat bogs in the middle Vychegda River valley, and since 2008 multi-disciplinary field studies have been performed (Volokitin *et al.*, 2006; Zaretskaya *et al.*, 2007; Zaretskaya *et al.*, 2009). In the current work, we describe preliminary results of this research aimed at defining chronology of settling in the Vychegda valley and reconstruction of local landscapes of the settlements. We try to find explanations for the specific location of sites and probably on their seasonal functioning focusing on local palaeotopography and palaeohydrography. For example we took into account features of some Neolithic dwellings situation. They are located at the side of the terrace related to the peat bog and are hidden from it by dunes (**Fig. 3**).

2. STUDY AREA

Far North-East of Europe (FNEE) is limited in the north by the Barents Sea coast, in the east – by the Ural Mountains, in the south – by the Severnye Uvaly Upland and in the west – by the Severnaya Dvina River. It is a territory of Komi Republic, Eastern Archangelsk Region (**Fig. 1**). Large latitudinal and longitudinal extent, heterogeneous geological structure and relief resulted in great diversity of natural condition. The extreme northernmost part of the region is located in tundra zone, the west is taiga. Geomorphologically FNEE is separated into two parts: the eastern margin belongs to the Ural mountains and the western part to the Russian Plain. The region is characterized by dense drainage net and is divided between three main river basins: Pechora, Mezen' and Vychegda (North Dvina basin). The area of our investigation is located in the middle Vychegda River valley about 60 km upstream from the Syktyvkar city at the Pezmog and Priozernyj villages (**Fig. 2**).

Vychegda River has latitudinal direction and drains hilly terrain covered by dense coniferous forests with abundant swamps. The climate is humid with long cold winters. The river's hydrological regime is characterized by high spring flood which passes some 60-70% of annual runoff and much lower episodic rainfed floods in summer and autumn. The river has alluvial channel with free conditions for lateral migrations. In the Late Glacial and the Holocene the river has been changing its position on the valley bottom eroding terraces and valley slopes and constructing new floodplain segments. Morphology of these segments depends on channel type and hydrological conditions in the respective time span.

Diverse local landscapes such as peat bogs, dunes and sandy terrace remnants with forest and grass vegetation and oxbow lakes attracted human groups to their natural resources over the Holocene. The majority of archaeological sites and historical settlements are located on erosion remains of sandy river terraces, or so called "forested" terraces. Surfaces of most of them are fixed by well-developed podzolic soil and exhibit negligible artificial disturbance of alluvial stratigraphy. According to archaeological evidence, radiocarbon dating and historical rec-

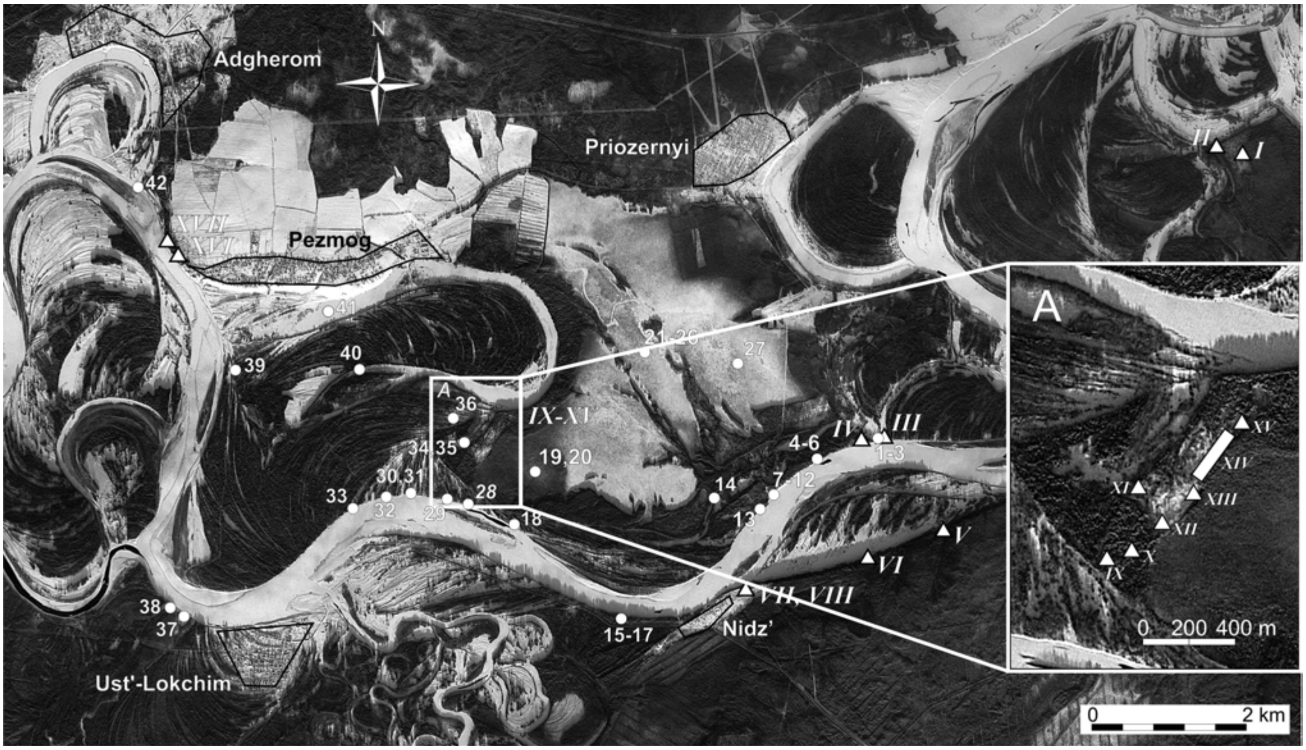


Fig. 2. *Study area: archaeological sites (triangles) and modern settlements (white polygons) on satellite image (Alos Prism, 2.5 m). Results of radiocarbon dating of different generations of flood plain. All dates by GIN-laboratory. Insert A: location of archaeological sites (triangles and rectangle) near Pezmogty lake. Archaeological sites: I, II – Vazhkur'ya 1, 2; III – Pezmog 4; IV – Pezmog 2; V – Mortshuyaty 2; VI – Mortshuyaty 1; VII, VIII – Nidz' 1, 2; IX – Pezmogty 1; X – Pezmogty 2; XI – Pezmogty 3; XII – Pezmogty 6; XIII – Pezmogty 4; XIV – Pezmogskiy burial ground; XV – Pezmogty 5; XVI – Pezmog 3; XVII – Pezmog 1.*

ord, the key region was settled by different cultural and ethnic groups of population in the following periods (**Figs. 2**, **3**):

1) Mesolithic (8310-7980 calBC). Evidence consists of remains of temporary hunter-gatherers' camps (Pezmog 1, Pezmogty 6) on the aeolian dunes or surface of the 1st and 2nd fluvial terraces (Burov, 1967);
2) Early Neolithic (5800-5710 calBC). Artefacts of hunter-gatherers' camp (Pezmog 4) were found in the buried oxbow deposits (**Figs. 2** and **4**);
3) Middle Neolithic (4710-4600 calBC). Remains of hunter-gatherers' dwellings (**Figs. 2a**, **3**) (Pezmogty 1, 3, 4, 5 sites) were excavated at the base of aeolian dunes on the 1st terrace surface (Karmanov, 2008);
4) Early Bronze Age (3940-2500 calBC). Flint workshop (Pezmogty 2) was studied on the deflation hollows on the 1st terrace. Settlement with dwellings (Mortshuyaty 1) was discovered on the surface of 2nd terrace (Korolev, 2005);
5) Medieval Ages (ca XII-XIII AD). Burial (Pezmog burial ground) of ancestors of modern komi occupied the aeolian dunes of 1st terrace (Korolev, 1980);
6) Late Medieval (end of XVI c. AD). Foundation of komi farmers' village (Pezmog) took place on the 2nd terrace (Zherebtsov, 2001);

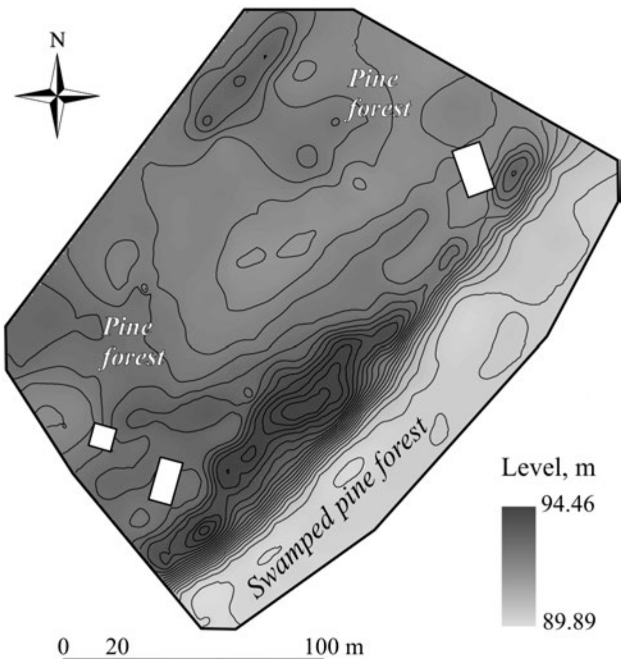


Fig. 3. *Example of Neolithic dwellings situation (Pezmogty 3, 4 sites; 5840±100 BP (GIN-11914). White square and rectangles mark excavations.*

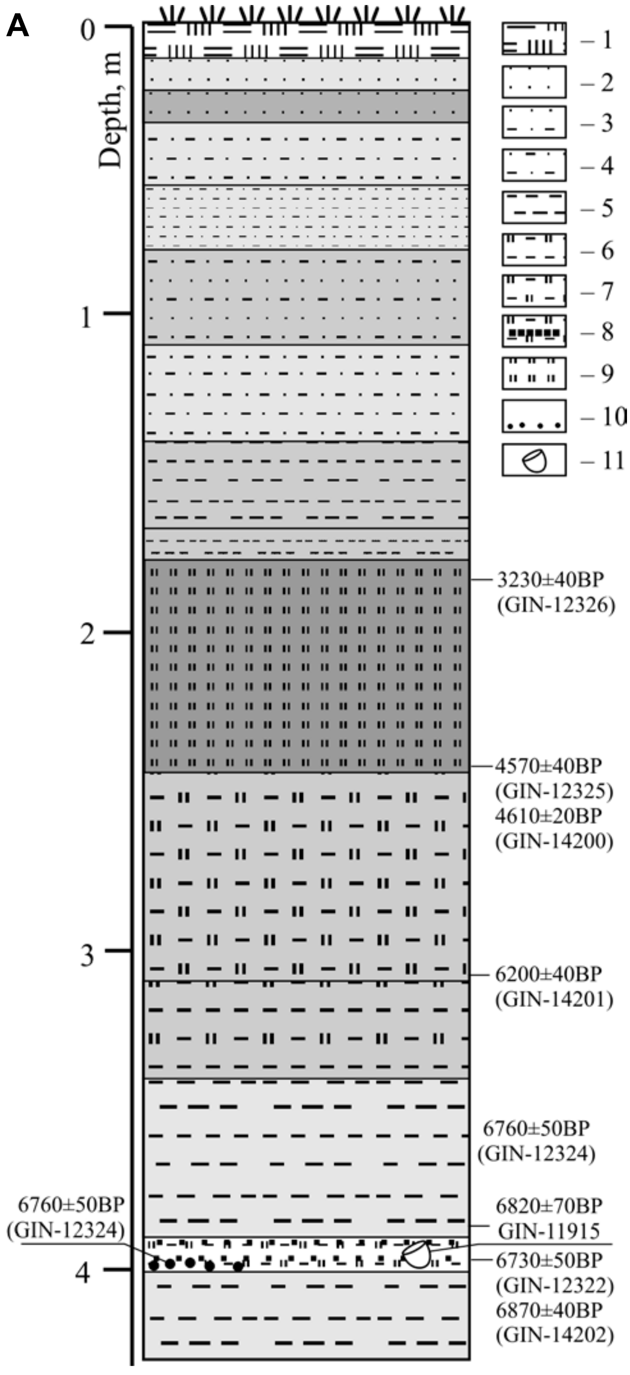


Fig. 4.

A: *Pezmog IV site. Section. Results of radiocarbon dating.*

1 – turf;

2 – sand;

3 – sandy loam/sand;

4 – sandy loam;

5 – clayey loam;

6 – loam with low content of peat;

7 – loamy peat;

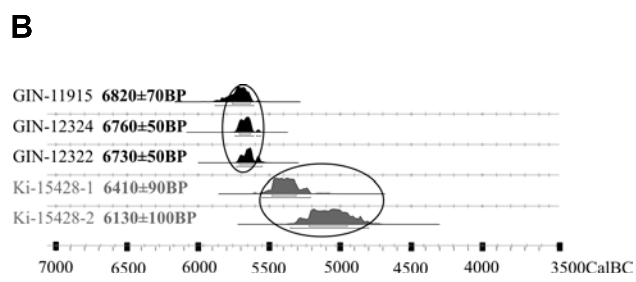
8 – loamy peat with sand (cultury-bearing layer);

9 – peat;

10 – charcoal fragments;

11 – vessel fragments

B: *Pezmog 4. Results of radiocarbon dating. The results of direct dating of pottery are marked by grey*



7) Modern times. In the middle of XX c. the loggers' settlements (so called special settlements of GULAG system) were organized on the bank of river and ox-bow lakes on the flood plain segment (Ust'-Lokchim) and 1st (Adzherom, Priozernyj) and 2nd (Nidz') terraces (Zherebtsov, 2001).

In general, the history of region settling is characterized by periodic occupation. We can define periods when the territory wasn't habited and even in the present time it is a region with low density of population (Zagainova, 2001). Continuous habitation started at the beginning of 2nd m. AD and people is regarded as ancestors of modern komi who were settling over the river valleys right up to XIX c.

3. METHODS

In this research, we focus on development of river channel as the main factor of valley floor formation which defined the possibility of valley occupation by humans. Reconstruction of river history requires to study both, the valley bed morphology and the alluvial stratigraphy. When relative and absolute ages of the valley topography are established, they may be used for palaeoenvironmental evaluation at settlement locations. Given that methods of both fluvial geomorphology and archaeology can get "floating" chronological scales, absolute chronology of different phases of floodplain development and settlement functioning is necessary.

Given the above, the programme of inter-disciplinary research included the following:

1) Mapping of archaeological objects and modern settlements of different age;
2) Analysis of satellite images and topographic maps, making preliminary geomorphic map showing different age generations of palaeochannels, floodplain segments and fluvial terraces;
3) Field studies: a) visual detection of important landscape features, namely dunes, palaeochannels, levee-hollow floodplain systems, etc.; b) studying alluvial stratigraphy by coring and outcrop observations; c) obtaining organic samples from certain stratigraphic positions important for reconstruction of palaeoenvironmental history, especially from bases of peat layers (beginning of bog development) and palaeochannel infills (dating the moment of palaeochannel abandonment); d) sampling for spore-pollen and botanic analysis and OSL dating; f) georadar survey to study morphology of palaeochannel bottoms and stratigraphy of sand terraces.
4) Radiocarbon dating of samples from different generations of floodplain;
5) Verification of relative ages of floodplain segments established by fluvial geomorphology methods, by radiocarbon dates and correction of the preliminary geomorphic map.
6) Palaeoenvironmental evaluation of known settlements based on their geomorphic position and stratigraphic data.

Except for commented specially, ages are given in radiocarbon years.

4. RESULTS

Two terraces (9-11 and 25-30 m high) and seven generations of floodplain (3-6 m high) are found in the valley floor (**Fig. 5**). Dated by ^{14}C were 51 organic samples (**Table 1**, **Figs. 2**, **4**). From the point of environmental history two groups of dates are of primary importance. First, the dates that can be interpreted to closely represent the creation time of correspondent geomorphic units – palaeochannels, leve-hollow sequences, etc. Palaeochannels are postdated by the age of alluvial infill that accumulated after palaeochannel abandonment. In cores, this infill is rather clearly distinguished by small grain size (silt, loam) compared to underlying active channel alluvium (sand). In floodplain segments with levee/hollow topography which were constructed by lateral accretion of convex meander banks, peat lenses are often enclosed into the hollows. Finish of point-bar sedimentation, which may be regarded as indicator of geomorphic completion of the site, is post-dated by the start of organic sedimentation. In both cases, the time elapsed between the end of active channel sedimentation and oxbow/overbank/organic sedimentation fixed by dated sample may vary and depends both on stratigraphical context and on local conditions. Therefore a series of dates within the same floodplain segment is needed to provide an age control. Terrace sands do not contain any radiocarbon datable matter. Where found, they are pre-dated by organic-rich loams buried under active channel sands. In these cases the youngest dates are most representative of terrace geomorphic age. Second group of dates includes those ones that date important environmental events such as transformation of fluvial into lacustrine, lacustrine into marshy environment. The most typical situation in the area is appearance of bogs indicated by peat sedimentation (dates on base of peat layers).

Fragment of the oldest (7th) floodplain generation was found at a single place, which does not allow reconstruction of the position of the river channel. The 6th floodplain generation formed in the Early Atlantic period (6560-6430 cal BC) is characterized by gentle curvature of levees. It was formed by low-sinuosity channel. In the 5th floodplain generation (Middle Atlantic, 5800-5710 cal BC) traces of river channel are poorly preserved. Nevertheless it is possible to establish that channel curvature was greater than it was in the previous period.

In the last floodplain generation channel traces are well pronounced which permits reconstruction of channel development since the beginning of the Subboreal till nowadays. The highest sinuosity is detected in the Early Subatlantic period (3rd generation, about 760-370 cal BC). The end of the 3rd generation formation was marked by chute cut-off of several steep meanders due to probably one or a series of extreme hydrological events. Generations 2 and 1 mark growing of new meanders which have greater steps and channel width compared to the previous periods.

5. DISCUSSION

Putting archaeological sites and modern settlements on the geomorphic map provided information on palaeoenvironment conditions during the existence of certain groups of population and correspondence between historical and environmental development (**Fig. 6**).

1) Formation of the 1st fluvial plain took place during the Younger Dryas (11370-9400 cal BC) in the cold

conditions. That time the terrace was not forest-covered and was being reworked by aeolian action. The question we still cannot answer is when this surface had become stable and was occupied by vegetation. To solve it OSL dating of terrace and dunes is promising.

2) On one of the dunes, the Mesolithic camp (Pezmogty 6, Srednevychegodskaya culture, about 8310-7980 cal BC) was abandoned by people. Probably, they inhabited the bank of river during the warm season only (**Fig. 6a**).
3) At the Pezmog 4 site (Kamskaya culture), the culture-bearing layer is buried within clay and peat deposits (**Figs. 4a**, **b**). According to geomorphic data, the early Neolithic people occupied the bank of an oxbow lake, probably a promontory at the lake-river connection (**Figs. 5**, **6b**). Series of dates from the culture-bearing layer, including the date of soot from pottery fragments (**Fig. 4**), shows that the Kamskaya culture population habited this area about 5800-5710 cal BC and the dated ceramics is one of the oldest pottery findings in Northern Russia.
4) The Middle Neolithic habitants (Pezmogty 1, 3, 4, 5, Lyalovskaya culture, 4710-4600 cal BC) built the dwellings on the side of terrace adjacent to overgrowing lake. Nevertheless, both the shoreline of the lake and the river were rather far from known sites, so they existed relatively far from water sources (**Fig. 6c**). Probably this gives evidence that the dwellings were used during the winter season only. If this unexpected fact is confirmed by further research, it will make a new feature in our understanding of the subsistence of Neolithic population and its settling of Northern Russia.
5) The Bronze Age flint workshop (about 3940-2500 cal BC) was organized in deflation hollows in the same relation to river channel as Neolithic dwellings (**Fig. 6c**). Such location looks quite reasonable for a specialized processing site with a short-term exploitation period.
6) During Medieval Ages (XII-XIII c.), a burial ground with 19 studied graves functioned in the dune field at the east side of the terrace near swampy forest. The burial ground is assumed to have operated rather shortly, and the synchronous settlement has not yet been found. Geomorphic data and radiocarbon dating

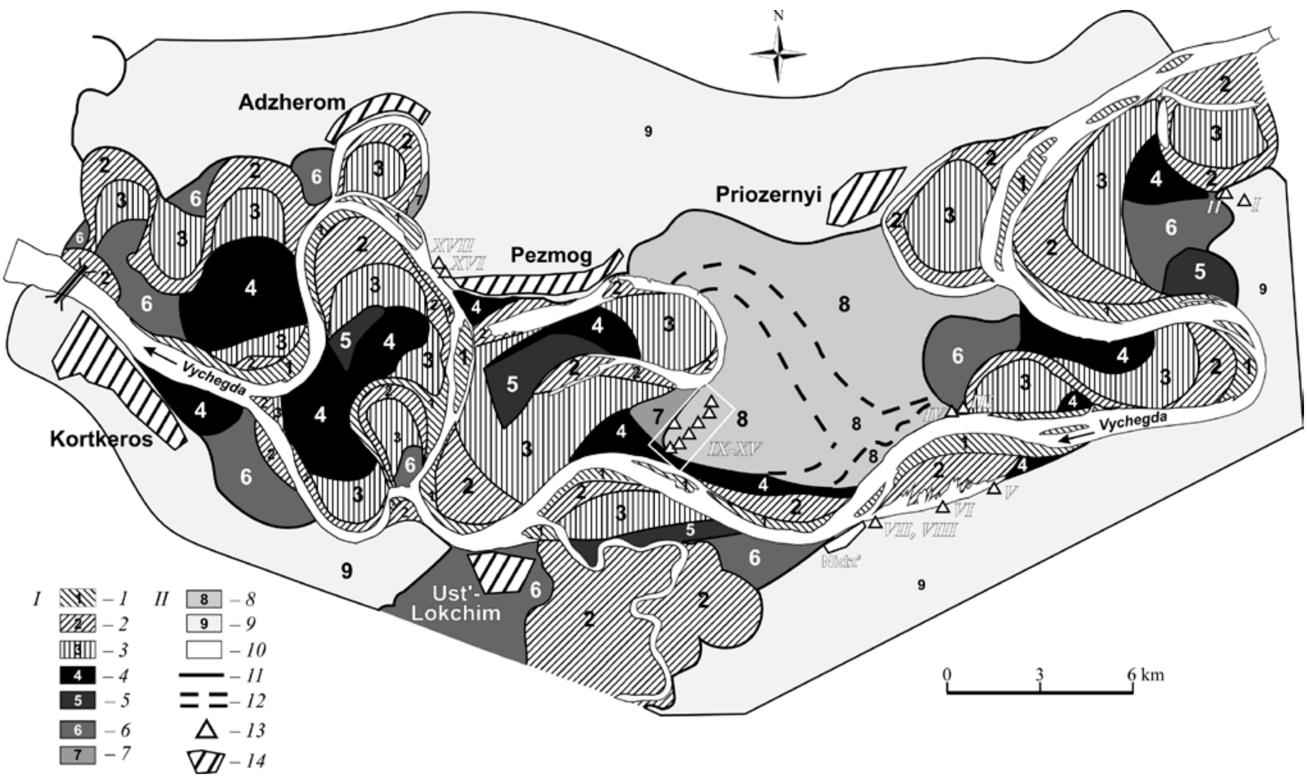


Fig. 5. *Geomorphic map of the Vychegda River valley. I – Floodplain segments: 1 – modern (late SA); 2 –middle SA; 3 –early SA; 4 – SB; 5 – middle AT; 6 – early AT; 7 – early Bo; II – Fluvial terraces: 8 – 1st (8-10 m, Late Glacial, end of OIS 2); 9 – 2nd (30-35 m, end of Moscow (Varta) glaciation, OIS 6); 10 – modern river channel and oxbow lakes in the floodplain; 11 – cliffs of terraces; 12 – palaeochannels on the 1st terrace; 13 – archaeological sites; 14 – modern settlements.*

Archaeological sites: I, II – Vazhkur'ya 1, 2; III – Pezmog 4; IV – Pezmog 2; V – Mortshuyaty 2; VI – Mortshuyaty 1; VII, VIII – Nidz' 1, 2; IX – Pezmogty 1; X – Pezmogty 2; XI – Pezmogty 3; XII – Pezmogty 6; XIII – Pezmogty 4; XIV – Pezmogskiy burial ground; XV – Pezmogty 5; XVI – Pezmog 3; XVII – Pezmog 1.

Table 1. *Radiocarbon dates from the middle Vychegda River valley (see location of particular No at* ***Fig. 2****). Bold: dates that correspond well to geomorphic age of floodplain/terrace unit; Italic: dates corresponding to local beginning of bog formation.*

No.	Geomorphic position	Lithology, stratigraphy	Depth (m)	Dated material	Lab (GIN) code	^{14}C date, BP	Calibrated age range, 1σ (68.2%)	Calibrated age range, 2σ (95.4%)
1	Floodplain palaeo-channel, Pezmog 4 site	Palaeochannel infill	2.54-2.57	Loamy peat	14200	4610±20	5220(8.8%) 5200BC 5180(59.4%) 5060BC	5300(95.4%)5040BC
2	Floodplain palaeo-channel, Pezmog 4 site	Palaeochannel infill	3.25-3.28	Loamy peat	14201	6200±40	3490(38.6%)3470BC 3380(29.6%)3360BC	3500(54.1%)3450BC 3380(41.3%)3350BC
3	Floodplain palaeo-channel, Pezmog 4 site	Palaeochannel infill	3.58-3.90	Loamy peat	14202	**6870±40**	5800(68.2%)5710BC	5850(95.4%)5660BC
4	1st terrace, younger part	Clay, active channel pool facies	12.5	Peaty loam (bulk)	14189	**10530±80**	10740(68.2%)10440BC	10850(95.4%)10200BC
5	1st terrace, younger part	Hard clay loam interlayering with fluvial sands	12.8	Clay loam with organic (bulk)	14190	12560±80	13030(63.9%)12620BC 12590(4.3%)12540BC	13150(95.4%)12300BC
6	1st terrace, younger part	Hard clay loam interlayering with fluvial sands	13.2	Clay loam with organic (bulk)	14192	13890±50	14810(68.2%)14390BC	15000(95.4%)14200BC
7	1st terrace, younger part	Clay, active channel pool facies	7.6-7.7	Wood	14019	**10360±30**	10400(12.3%)10360BC 10350(6.3%)10320BC 10290(49.6%)10150BC	10440(95.4%)10120BC
8	1st terrace, younger part	Clay, active channel pool facies	6.78-6.8	Peat	14023	11430±40	11375(68.2%)11290BC	11430(95.4%)11250BC
9	1st terrace, younger part	Peaty clay loam underlying fluvial sands	12.5	Peaty clay loam (bulk)	14193	11000±40	11005(68.2%)10930BC	11090(95.4%)10910BC
10	1st terrace, younger part	Logs in clay loams	12.5	Wood	14194	**10480±50**	10690(57.3%)10480BC 10470(10.9%)10430BC	10750(95.4%)10200BC
11	1st terrace, younger part	Logs in clay loams	12.5	Wood	14195	**10300±50**	10290(4.8%)10250BC 10220(63.4%)10030BC	10450(92.0%)10000BC 9950(3.4%)9850BC
12	1st terrace, younger part	Logs in clay loams	10.8	Loam (bulk)	14198	11560±50	11500(68.2%)11370BC	11600(95.4%)11320BC
13	Floodplain hollow	Base of cover peat	1.08	Peat	14199	**5150±30**	4035(1.8%)4025BC 3990(66.4%)3940BC	4040(8.7%)4010BC 4000(72.8%)3930BC 3880(14.0%)3800BC
14	Palaeochannel on the 1st terrace, younger part	Base of palaeochan-nel infill	3.55-3.7	Peat	14039	**10400±150**	10700(68.2%)10050BC	10900(95.4%)9800BC
15	Floodplain hollow	Overbank facies	4.40	Loamy peat	14203	6550±30	5525(68.2%)5475BC	5610(1.0%)5590BC 5560(94.4%)5470BC
16	Floodplain hollow	Overbank facies	4.9	Loamy peat	14204	**7640±40**	6560(0.9%)6550BC 6510(67.3%)6430BC	6590(95.4%)6430BC
17	Floodplain hollow	Overbank facies	5.95	Wood log	14205	6420±140	5520(60.4%)5280BC 5270(7.8%)5220BC	5650(95.4%)5050BC
18	Inter-levee hollow covered by peat	Base of cover peat	1.38-1.4	Loamy peat	14044	**4100±30**	2850(14.6%)2810BC 2680(53.6%)2570BC	2870(21.9%)2800BC 2760(72.2%)2560BC 2520(1.3%)2500BC
20	1st terrace, older part, peat bog	Base of Holocene peat	3.0-3.6	Peat	14025	*8900±30*	8210(16.6%)8160BC 8120(51.6%)7980BC	8230(95.4%)7960BC
19	1st terrace, older part, peat bog	Holocene peat	2.1-2.2	Peat	14027	5970±20	4900(29.5%)4865BC 4855(26.0%)4825BC 4815(12.7%)4800BC	4940(95.4%)4790BC
21	Palaeochannel on the 1st terrace, older part, peat bog	Holocene peat	2.15-2.25	Peat	14035	3970±40	2570(37.1%)2510BC 2500(31.1%)2460BC	2580(95.4%)2340BC
22	Palaeochannel on the 1st terrace, older part, peat bog	Holocene peat	2.8-2.9	Wood	14033	4690±40	3520(15.0%)3490BC 3470(53.2%)3370BC	3630(14.9%)3580BC 3540(80.5%)3360BC
23	Palaeochannel on the 1st terrace, older part, peat bog	Holocene peat	3.15-3.25	Peat	14036	5020±30	3940(37.5%)3870BC 3810(28.5%)3760BC 3730(2.2%)3710BC	3950(95.4%)3700BC

Table 1. *Continuation.*

No.	Geomorphic position	Lithology, stratigraphy	Depth (m)	Dated material	Lab (GIN) code	^{14}C date, BP	Calibrated age range, 1σ (68.2%)	Calibrated age range, 2σ (95.4%)
24	Palaeochannel	Palaeochannel infill	3.4-3.5	Loamy peat	14031	5230±50	4230(4.4%)4200BC 4160(7.8%)4130BC 4060(56.1%)3960BC	4230(9.2%)4190BC 4180(86.2%)3950BC
25	Palaeochannel on the 1st terrace, older part, peat bog	Holocene peat	4.0-4.1	Peat	14037	5900±40	4830(5.5%)4810BC 4800(62.7%)4720BC	4900(1.8%)4860BC 4850(93.6%)4680BC
26	Palaeochannel on the 1st terrace, older part, peat bog	Base of Holocene peat	4.35-4.45	Peat	14038	*8550±40*	7595(68.2%)7550BC	7595(68.2%)7550BC
27	1st terrace, older part, peat bog	Base of peat	3.8-3.9	Peat	14034	*7880±60*	6910(4.2%)6880BC 6830(64.0%)6640BC	7030(95.4%)6600BC
28	Inter-levee hollow covered by peat	Base of cover peat	1.03-1.05	Loamy peat	14043	1720±20	250(34.3%)300AD 320(25.5%)350AD 360(8.5%)380AD	250(95.4%)390AD
29	Floodplain	Overbank facies, buried palaeosoil	0.42-0.44	Humus	14182	840±40	1160(68.2%)1255AD	1040(7.4%)1090AD 1120(2.1%)1140AD 1150(85.8%)1280AD
30	Floodplain hollow	Middle of peat layer enclosed into the hollow	0.6	Peat	14184	1700±30	260(12.9%)280AD 320(55.3%)400AD	250(95.4%)420AD
31	Floodplain hollow	Base of peat	0.95	Loamy peat	14185	**3200±40**	1505(68.2%)1430BC	1610(2.7%)1570BC 1540(92.7%)1390BC
32	Inter-levee hollow covered by peat	Base of cover peat	0.75	Loamy peat	14041	2270±40	400(33.5%)350BC 290(34.7%)230BC	400(39.6%)340BC 330(55.8%)200BC
33	floodplain hollow	Overbank facies	1.45-1.55	Charcoal	14186	940±40	1033(5.5%)1054AD 1078(62.7%)1153AD	1019(95.4%)1185AD
34	Palaeochannel	Base of palaeochannel infill	3.0-3.1	Peat	14029	**9490±50**	9120(9.5%)9070BC 9060(8.3%)9010BC 8840(49.6%)8710BC 8670(0.8%)8650BC	9130(26.5%)8990BC 8930(68.9%)8630BC
35	Flood plain, hollow	Overbank facies	1.67-1.82	Loamy peat (bulk)	14189a	8860±70	8210(63.6%)7910BC 7900(4.6%)7870BC	8240(95.4%)7740BC
36	Inter-levee hollow	Base of overbank facies	3.15-3.25	Loamy peat	14030	**2380±130**	760(13.0%)680BC 670(55.2%)370BC	800(95.4%)150BC
37	Inter-levee hollow covered by peat	Base of cover peat	1.55	Loamy peat	14048	3240±40	1610(6.5%)1580BC 1540(61.7%)1440BC	1620(95.4%)1430BC
38	Inter-levee hollow covered by peat	Base of cover peat	1.43-1.45	Loamy peat	14047	3720±70	2270(2.6%)2250BC 2210(63.8%)2020BC 2000(1.8%)1980BC	2340(95.4%)1910BC
39	Flood plain, hollow	Overbank facies	1.8	Wood	14187	1820±110	70(68.2%)340AD	50(95.4%)550AD
40	Floodplain palaeochannel	Palaeochannel infill	0.82-0.94	Plant macrofossils	14183	860±70	1050(13.2%)1090AD 1120(4.1%)1140AD 1150(50.9%)1260AD	1050(13.2%)1090AD 1120(4.1%)1140AD 1150(50.9%)1260AD
41	Pezmogty oxbow lake	Base of palaeochannel infill	2.9-3.0	Gyttja	14039a	**2170±100**	370(68.2%)110BC	410(95.4%)30AD
42	Floodplain hollow	Overbank facies	0.15-0.24	Wood twigs	14206	**9460±40**	1020(6.4%)1060AD 1070(51.8%)1160AD	1010(95.4%)1190AD

of the base of oxbow deposits (no. 41 in **Table 1** and **Fig. 2**) provide the evidence that modern lake Pezmogty already existed at that time. Therefore the lake shoreline has been stable over the last 2000 years, and the required settlement is probable to be found at the lake shores in the vicinity of the burial place (**Fig. 6d**). It should be noted that the position of Pezmogskiy burial ground is typical for medieval burials of European North-East and confirms the peculiarity of ritual practice of komi' ancestors once more.

7) Formation of the modern oxbow lake Pezmogty took place about 370-110 cal BC. Therefore the Pezmog village – the first historical settlement founded at the end of XVIth c. was initially located at the bank of oxbow lake rather than at the river bank as it is reflected in folklore of native people. Good connection of the lake to the river must have been a positive factor promoting selection of the place (**Fig. 6d**).
8) Further period of human settling was connected with GULAG-system and foundation of so called special settlements for logging (Adzherom, Priozernyj and Nidz') and timber floating (Ust'-Lokchim). Major factors of settlement location were proximity to woodlands and access to the river as a transport route for timber (**Fig. 2**).

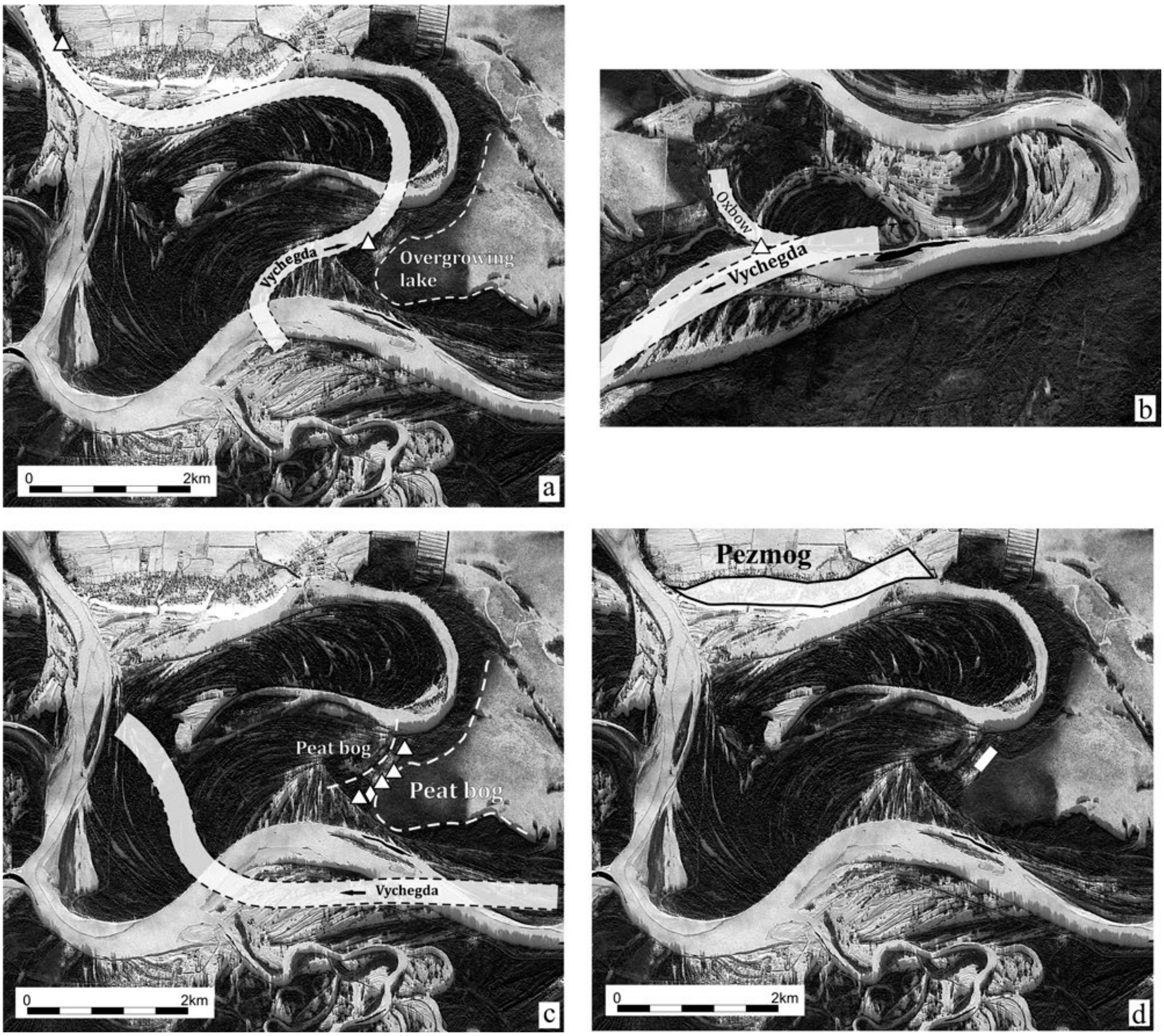


Fig. 6. *Archaeological sites in different periods in the context of synchronous valley. 1 – Mesolithic (temporary camps, about 9.0 kyr BP); 2 – early Neolithic (temporary camp, 6.8 kyr BP); 3 – middle Neolithic (seasonal dwellings, 5.8 kyr BP) and early Bronze Age (flint workshop, 4.0-5.0 kyr BP); 4 – Medieval Ages (burial, XII-XIII c. AD) and modern situation (Pezmog village, date of foundation – end of XVI c. AD).*

6. CONCLUSION AND PERSPECTIVES

According to archaeological evidence and historical records we define seven periods of human settling in the studied part of the Vychegda River valley: 1) Mesolithic; 2) Early Neolithic; 3) Middle Neolithic; 4) Early Bronze Age; 5) Medieval time; 6) Late Medieval; 7) Modern time. All discovered camps and dwellings functioned about one season or less. Even komi farmer' village (Pezmog), founded at end of XVIth c. AD, was once abandoned by people because of bad harvest in the middle of XVIIth c. AD. In modern time the special settlements of loggers loses their specialty and population. Periods of human habitation here were episodic and short-term, and during long time spans the region was unsettled. Between the periods of human occupation, local landscapes were changing because of active fluvial processes. Therefore new settlers discovered somewhat different landscapes than previous ones. To reconstruct these landform changings, geomorphic map was composed showing different age generations of palaeochannels and floodplain segments. It was added by radiocarbon dating of the Late Pleistoscene-Holocene sediments of Vychegda river valley. On this base, spatial-temporal correlation between periods of human occupation and landscape changing events is defined.

Mainly archaeological sites and present settlements were organized on terraces and correspond to synchronous active river channels or oxbow lakes connected to the river. Few exceptions exist which are explained by peculiarity of ritual burial practice (Pezmogskiy burial ground), probable winter functioning of dwellings (Pezmogty 1, 3, 4, 5) or specialization of settlements (Ust'-Lokchim). Due to analysis of geomorphic map directions of further archaeological survey of different-age settlements, especially Palaeolithic and medieval sites, are determined. Undoubtedly reconstruction of local environments of ancient and medieval population improves the quality of archaeological data. The results will serve as the base for the study of subsistence features and adaptation system of human groups in the Russian North. Nevertheless, in some cases interpretation of the results is discussion. It concerns mainly the Neolithic dwellings position far from sources of water as a part of human subsistence. Verification of these data is needed by research of similar objects in the same conditions. More detailed analysis of obtained data and expansion of geographic borders of studied territory are planned also. For instance, correspondence of the above results with spore-pollen and botanic data is needed for reconstruction of local climate changing.

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