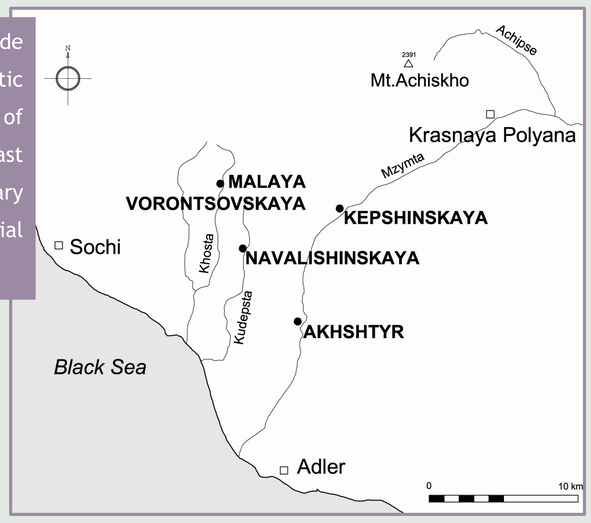
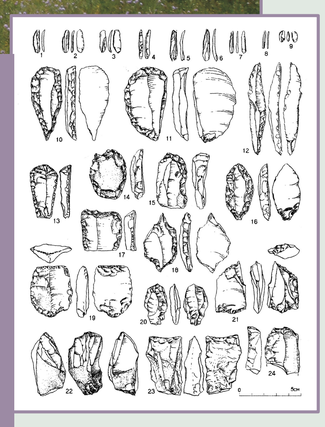
Neanderthal Climate Preferences and Tolerances: the need for a better chronology

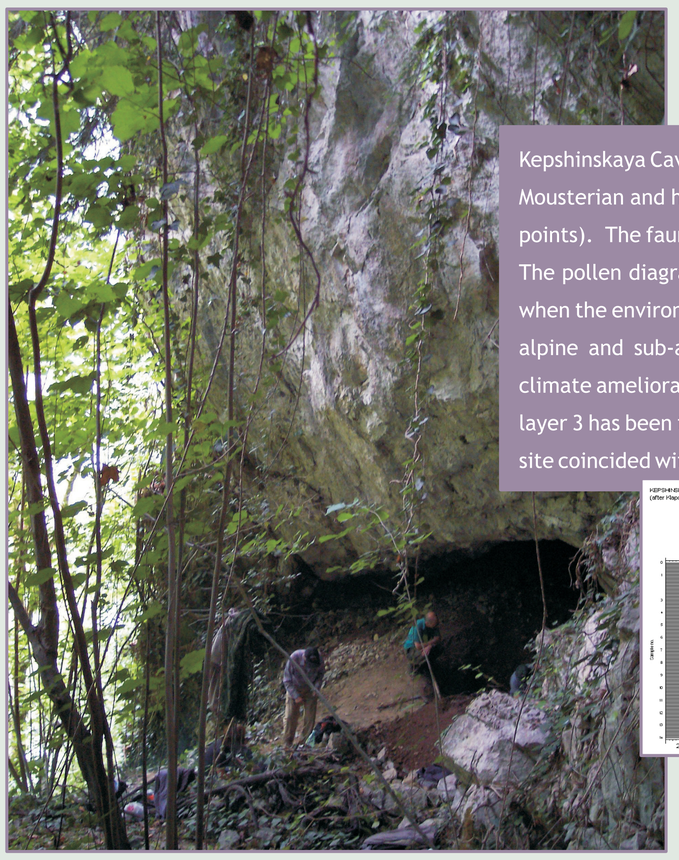
North-south the project's study area stretches from the Middle Don Region south of Voronezh to North Ossetia in the central Caucasus Mountains, and extends as far west as the Crimea.

Cave pollen studies from rock shelters in the Caucasus provide environmental proxy data which enables local climatic reconstructions to be made. This map shows the position of archaeological sites in the Sochi Region near the Black Sea coast from where pollen studies have been made. Selected summary pollen diagrams illustrate oscillating stadial and interstadial cycles.

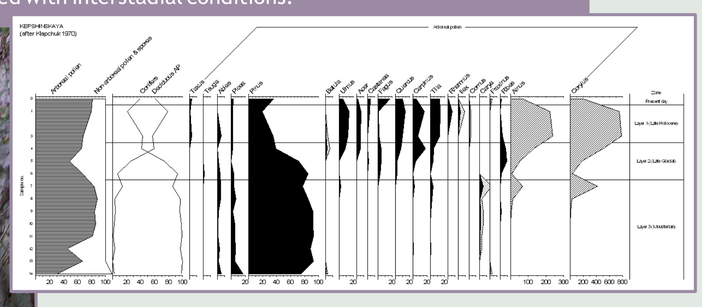


The Kostenki-Borshchevo area has some of the earliest Upper Palaeolithic in European Russia. Considerable attention has focused on chronology with a wide range of methodologies (radiometric and AMS ^{14}C, IRSL, OSL, tephrachronology and magneto-stratigraphy) being applied. A trachytic volcanic ash is known from a number of locations in the area. It is believed to represent the 39.3 ka Campanian Ignimbrite eruption in the Phlegrean Fields, Italy. Below the ash is a magnetic anomaly conventionally believed to correlate with the Laschamp magnetic excursion which is currently dated (elsewhere) to 40.3 - 4.17 ka. Many Early Upper Palaeolithic cultural horizons are to be found above and below these key chronological markers. There is an extensive pollen record for both Kostenki 12 and 14.

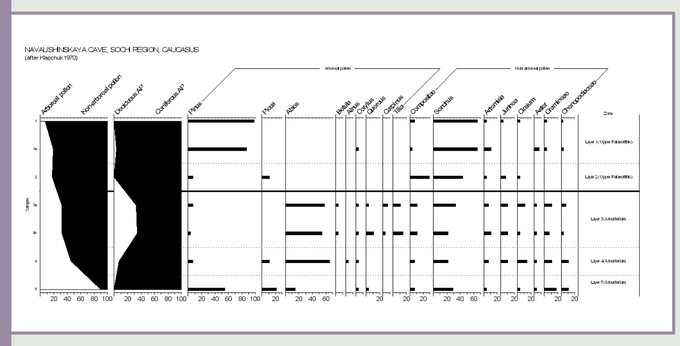


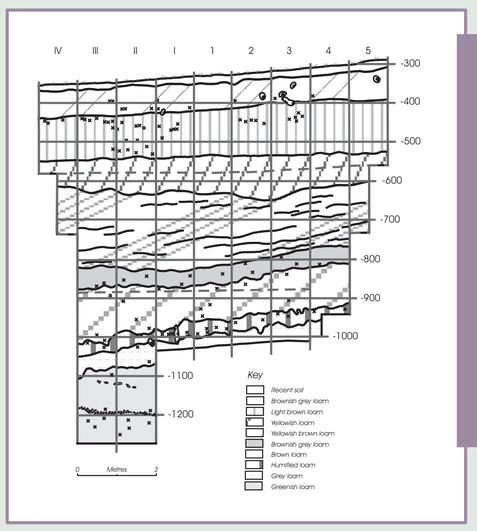


Kepshinskaya Cave is a gallery cave situated at 250 m altitude. Layer 3 is Mousterian and has a small lithic industry (30 tools including 2 Levallois points). The fauna is dominated by Ursus spelaeus and Capra caucasica. The pollen diagram shows that Mousterian occupation began at a time when the environment was cooler than today. Initially coniferous forest alpine and sub-alpine vegetation surrounded the cave but later the climate ameliorated and deciduous trees appeared. Although the top of layer 3 has been truncated the impression is that Neanderthal use of the site coincided with interstadial conditions.

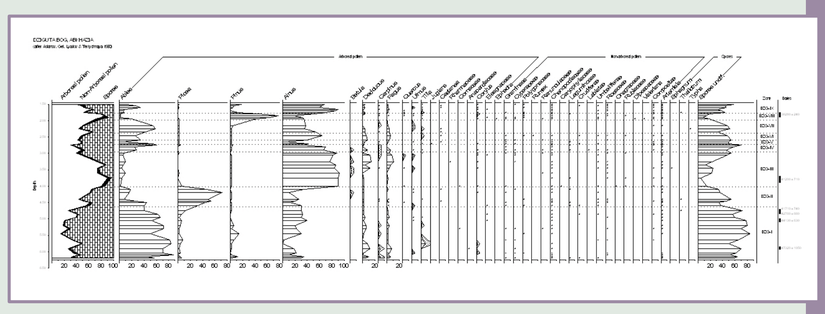


Navalishinskaya Cave, like Kepshinskaya, is also in the Sochi region. It is a karst cave situated at 200 m above sea level. Three brief Middle Palaeolithic occupation horizons are present (base of layers 3, 4 and 5). The lithic industry is small and has been classed as Denticulate Mousterian. Fauna is overwhelmingly cave bear (Ursus spelaeus). The pollen by Klapchuk shows that Neanderthals were present when the local environment mainly supported taiga forest (Pinus-Picea-Abies) indicating a lowering of the vegetation belts by around 1200-1400 metres. The warming trend observed at Kepshinskaya is repeated here in that thermophilous deciduous taxa reach a maximum in layer 3. There is a hiatus at the top of layer 3.



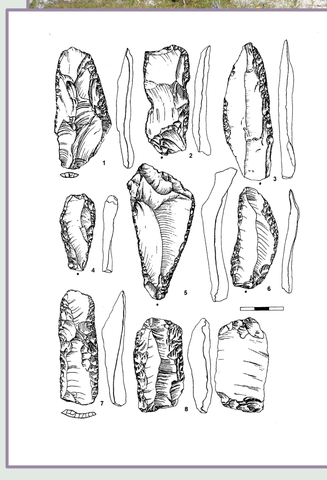


Biriuchya Balka is an open air workshop site with a number of cultural horizons attributed to the Middle and Upper Palaeolithic, although there is some debate where the boundary between them is located. Its importance lies in its geographical position between the anatomically modern humans in the Kostenki-Borshchevo area and the Neanderthals in the south. There is a magnetic anomaly near the base which has been tentatively correlated with Kargopolovo but this remains to be confirmed.



The key reference pollen diagram for OIS 3 in the western Caucasus is Dziguta, a spring-fed peat bog in Abkhazia on the Black Sea coast south of the main Caucasus ridgeline. Studied in the 1970-80s, it is well dated by radiometric ^{14}C ages to the period c.50 - 37 ka uncal ^{14}C BP. The area was clearly a refugium for many species of plants, reflected in the large number of exotics, and is important for providing a long continuous regional proxy climate record.

On present evidence it appears that late Mousterian Neanderthal populations continued to survive in the Crimea long after anatomically modern humans had arrived in the Middle Don region. There are a number of typologically distinct Middle Palaeolithic lithic industries from both the Crimea and the north-west Caucasus (e.g. the Western Crimean Mousterian at Kabazi II; and the Gubs "culture" from Monasheskaya Cave). Kabazi II has an 11 metre deep stratigraphic record covering the period from c.130 - 40 ka, numerous archaeological horizons, a well-studied pollen record, and has been the subject of multi-technique dating. This makes it a crucial reference site in our study.



This project has been challenging and ambitious; over 300 kg of samples have been obtained from 16 sites distributed over a large area. The laboratory work has been difficult methodologically, with problems with the non-zeroing of the OSL signal in the cave samples to poor density separation of the tephra. Within our area, the general impression is of temporal overlap between late Mousterian Neanderthals and early Upper Palaeolithic anatomically modern populations, but with clear geographical separation into distinct territories. Where Upper Palaeolithic horizons overlie Middle Palaeolithic ones, the pattern is for a considerable or unknown time interval between the end of the Neanderthal occupation and the arrival of anatomically modern humans. This suggests direct interaction between the two populations was not significant and that the two populations either prospered or failed to survive independent of each other.

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