

PEISAJUL ARHEOLOGIC

Perspective, Istorie, Evoluții




Muzeul Național de Istorie a României

Proiect cultural finanțat de

ADMINISTRAȚIA FONDULUI CULTURAL NAȚIONAL



MINISTERUL CULTURII
INSTITUTUL NAȚIONAL AL PATRIMONIULUI

PARTENERI

„ArchaeoLandscapes Europe” - ArcLand



Institutul Național al Patrimoniului



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„General de Divizie Constantin Barozzi”



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DESCRIERE PROIECT

PEISAJUL ARHEOLOGIC

Perspective, istoric, evoluție

Proiectul *PEISAJUL ARHEOLOGIC. Perspective, istoric, evoluție*, finanțat de către Administrația Fondului Cultural Național în sesiunea *Proiecte culturale 2014*, aria tematică *Patrimoniu cultural*, s-a născut ca o inițiativă locală a unui demers european: proiectul european *ArchaeoLandscapes Europe (ArcLand)*, finanțat de Comisia Europeană prin programul *Culture 2007-2014*. Dacă proiectul european are ca obiectiv principal utilizarea regulată a tehnicilor de documentare aeriană și *remote sensing* în cadrul unei rețele europene pentru promovarea înțelegerii, conservării și aprecierii publice a peisajelor și patrimoniului arheologic, proiectul nostru local și-a propus în principal promovarea conceptului de arheologie a peisajului, aproape necunoscut în câmpul arheologic, istoriei sau managementului cultural din România. Ca urmare activitățile care s-au realizat au fost pe cât de diverse și aparent distincte pe atât de necesare în atingerea obiectivului propus.

Una din cele mai importante activități desfășurate a fost documentarea în teren prin cartarea și fotografierea a diverse locuri, spații sau monumente în contextul lor natural, antropic sau combinat. Astfel membrii echipelor au străbătut diverse regiuni unde au înregistrat riguros tot ceea ce se încadra în categoria peisaj, înțeles ca bun de patrimoniu. Zonele vizitate au fost: Istria, jud. Constanța, unde s-a documentat teritoriul cetății antice Histria în relație cu mediul înconjurător (Lacul Sinoe); Câmpulung, jud. Argeș, unde s-a avut în vedere castrul roman Jidova; defileul Oltului (Cozia-Căciulata-Călimănești, jud. Vâlcea) unde scopul urmărit a fost surprinderea elementelor comune ale unui spațiu în egală măsură religios și militar, definit de mănăstirile medievale Cozia, Turnu, Ostrov și castrul roman Arutela; Drăgănești-Olt și Slatina, jud. Olt, unde documentarea s-a concentrat pe localizarea siturilor arheologice aflate pe terasa Oltului și a monumentelor istorice din Drăgănești-Olt și Slatina, ca reminiscențe ale unui trecut supus atât schimbărilor condiționate de natură cât și de politic și social; Sultana (jud. Călărași) care a permis participarea la o cercetare riguroasă și de lungă durată a unui sit eneolitic care și-a construit o identitate aparte în relație cu râul Mostiștea, dar a cărui distrugere se datorează aceluiași râu, ce îl erodează sistematic, reducându-l la o treime din vechea întindere; Hațeg, jud. Hunedoara unde s-a înregistrat potențialul turistic al unui peisaj natural și istoric, iar mai nou religios, așa cum s-a revalorificat după organizare de pelerinaje sistematice la mănăstirea Prislop; Valea Mostiștei, jud. Călărași și Ilfov, care oferă o posibilitate unică de



a analiza la o scară istorică foarte lungă schimbările și dinamica peisajului începând din preistorie (neolitic timpuriu și terminând cu anii '90 ai sec. XX); jud. Tulcea unde deși peisajul pare imuabil necesitățile energetice contemporane l-au supus schimbării rapide: aici în mod special s-a realizat o hartă cuprinzătoare a fenomenului funerar tumular, ce a clădit de-a lungul a câteva mi de ani un peisaj religios remarcabil; jud. Prahova unde creșterea imobiliară și numărul foarte mare de turiști a determinat atât o modificare radicală a peisajului istoric, dar și o cunoaștere mai bună a monumentelor istorice și arheologice. Iar exemplele mai pot continua cu regiuni din Moldova precum Tecuci și Botoșani, Muntenia precum Oltenița și Radovanu sau Ilfov unde s-au completat hărțile arheologice sau cele ale patrimoniului arhitectonic.

O altă activitate de lungă durată a constat în valorificarea arhivei de fotografii aeriene realizate de CIMEC-Institutul de Memorie Culturală între anii 2007-2010 pentru promovarea acestei metode de documentare, dar și pentru înregistrarea schimbărilor de peisaj și completarea Repertoriului Arheologic Național. Peste 2000 de fotografii aeriene au fost trecute prin operații specifice în vederea publicării on-line: identificare, localizare, editare, selecție, înregistrarea într-o bază de date special realizată, iar ulterior s-a purces la descrierea obiectivelor ce erau surprinse în imagini, dar mai ales la marcarea schimbărilor de peisaj prin comparații cu alte surse cartografice sau imagistice. Rezultatul este accesibil on-line pe site-ul web al proiectului și a fost încărcat și în biblioteca digitală europeană-Europeană (www.europeana.eu).



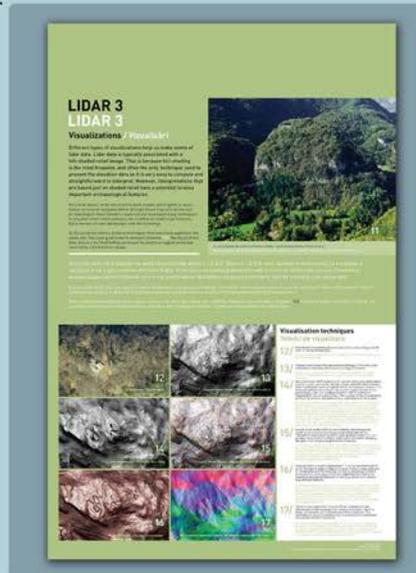
Subsumat aceleași intenții de a face publice resurse ce slujesc documentarea și analiza peisajelor istorice sau arheologice, am realizat și digitizarea altor resurse cartografice precum hărți topografice, administrative, turistice și planuri topografice. În mod special la îndeplinirea acestui deziderat trebuie să remarcăm calitatea deosebită a parteneriatului cu Direcția Topografică Militară „General de Divizie Constantin Barozzi”, care prin persoana reprezentantului său, domnul colonel inginer Marin Alniței, ne-a susținut în toate demersurile noastre. Astfel, având ca fundament legal și protocolul de colaborare semnat între Ministerul Apărării și Ministerul Culturii, semnat la inițiativa Institutului Național al Patrimoniului și al Direcției Topografice Militare, am inițiat un schimb de date cu caracter geografic necesare gestionării patrimoniului cultural. Am primit astfel spre folosire două seturi de date excepționale: ortofotoplanurile ce acoperă toată țara, realizate între 2010-2012, precum și harta topografică militară la scara 1:25,000, ediția a II-a (1970-1980). Importanța acestor resurse în analizele de peisaj și cercetarea arheologică este incontestabilă. În prezent Ministerul Apărării a acceptat ca cele două resurse să fie expuse on-line pe site-ul web ale Institutului Național al Patrimoniului și să fie accesate atât de specialiști cât și de publicul larg, ceea ce reprezintă un succes al acțiunii noastre.

EXPOZITIE

TRACES OF THE PAST & IMAGINI ALE PEISAJELOR ARHEOLOGICE

22 OCTOMBRIE - 15 DECEMBRIE 2014

Expoziția tematică este organizată ca unul din cele două evenimente finale ale proiectului, alături de conferința *ABORDĂRI ALE PEISAJELOR ARHEOLOGICE - Instrumente, metodologie și studii de caz în domeniul patrimoniului arhitectural și arheologic european*. Evenimentul expozițional este vernisat în prima zi a conferinței, pe data de 22 octombrie 2014, pentru a-i asigura o audiență cât mai mare între participanți, dar și pentru a susține atingerea obiectivului general al proiectului, acela de a promova conceptul de peisaj arheologic în rândul specialiștilor.



EXPOZITIE

TRACES OF THE PAST & IMAGINI ALE PEISAJELOR ARHEOLOGICE

22 OCTOMBRIE - 15 decembrie 2014

Expoziția ilustrează peisaje arheologice atât din România cât și din Europa precum și tehnicile și metodele de studiu ale acestora. Nucleul de bază îl constituie exponatele ce provin din evenimentul similar organizat sub egida proiectului european Archaeo-Landscapes Europe (ArcLand), în care Institutul Național al Patrimoniului este partener, puse la dispoziție cu multă amabilitate de către curatorii irlandezi. Această expoziția a fost concepută în 2012 din imagini și texte depuse de 61 de parteneri din 26 de țări europene, combinate pentru a forma un tot unitar de către designerii Ian McCarthy și Ciaran Fitzpatrick. Alături de componeta internațională, căreia i s-a păstrat structura nealterată, am adăugat peste 70 de imagini de peisaje arheologice din România obținute prin activitățile de documentare desfășurate de către partenerii proiectului. Exponatele sunt formate în majoritate din fotografii aeriene, dar și din hărți istorice, cărți poștale, stampe și instrumente pentru măsurători topografice. Expoziția va avea loc la Muzeul Național de Istorie a României în perioada 22 octombrie- 15 decembrie 2014.

Alături de proiectul ArcLand, partenerii care au participat la organizarea evenimentului au fost: Muzeul Național de Istorie a României, Institutul Național al Patrimoniului, proiectul european 3D Icons, Direcția Topografică Militară „General de Divizie Constantin Barozzi” și Arhivele Naționale ale României.



CONFERINȚĂ

ABORDĂRI ALE PEISAJELOR ARHEOLOGICE

22 - 23 OCTOMBRIE 2014

Conferința *ABORDĂRI ALE PEISAJELOR ARHEOLOGICE- Instrumente, metodologie și studii de caz în domeniul patrimoniului arhitectural și arheologic european* este alături de expoziția *TRACES OF THE PAST & IMAGINI ALE PEISAJULUI ARHEOLOGIC* unul din cele două evenimente finale ale proiectului. Conferința reunește cercetători din domeniul arheologiei, istoriei, geografiei și specialiști în teledetecție care abordează ca subiect al studiilor lor peisajul arheologic și instrumentele de analiză al acestuia.

Evenimentul se desfășoară de-a lungul a 2 zile, peste 30 de comunicări fiind prezentate de către 31 de vorbitori din 8 țări europene: Austria, Franța, Germania, Marea Britanie, Norvegia, Polonia, Turcia și România. Numărul mare de participanți români și străini dovedește că scopul proiectului de a promova conceptul de “archaeological landscape” a fost îndeplinit cu succes.

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Metadata for 3D Models

by Sheena BASSETT

Project Manager 3D Icons, Romania

3D-ICONS is a three year project that is creating and supplying over 3,000 3D models of historically significant monuments and sites and associated smaller objects for Europeana. The Project has established a process pipeline which provides recommendation for a number of different approaches that may be used for the digitisation and processing required to produce the 3D model. However, this is not the only task; Europeana takes metadata so that end users can search and find the content that is of interest to them. This is in the format of the Europeana Data Model or EDM which consists of a number of mandatory and recommended fields. This is a fairly generic and basic schema as it has to cover a wide variety of content of different digital formats. On the other hand, for metadata to be useful for users of 3D models who include archaeologists and researchers as well as the general public, a much more detailed schema is needed.

The CARARE schema provided a good starting point as this was designed for archaeological items and could be adapted specifically for 3D content to meet the requirements of information about provenance, equipment and methods used for the processing and production of the model as well as any hypotheses used in the creation of the 3D model (known as “paradata”).

The CARARE2 schema is being used by 3D-ICONS to record metadata about the models as well as associated images, videos, texts etc. A mapping has been developed to the EDM to allow the ingestion of the metadata into Europeana – this is intrinsic to the tools (MINT2 and MoRE2) that can be used to map existing metadata repositories to CARARE 2 and then to EDM. Alternatively, a Metadata Editor tool has been developed which enables direct data entry without any technical knowledge of the schema or XML and has useful facilities such as allowing records to be duplicated and edited (for similar objects) and templates to be stored of repeatedly used data. This presentation concludes with some examples of how metadata is used by both Europeana and by the 3D-ICONS Portal which is able to utilise a much wider range of metadata fields from CARARE 2.

GIS methodology in the case study of historical plans of Craiova

by Dalina BĂDESCU

Faculty of History, University of Bucharest, Romania

The study aims to analyse the urban development of the south-west section of the city of Craiova (the canal Rîului) using the historical city plans and also the information from the written historical sources from the archive of the City Hall of Craiova, using georeferencing and analysis methods of comparative mapping. The beginning of the XXth century brought important changes to the morphology of the city of Craiova, being a time of prosperity and economic growth. The mayor of Craiova, Nicolae Romanescu ordered the first general plan of the city, that shows the modern perspective of urban planning, but also the challenges of organising a disfunctional network of streets and the attempt to block the expansion of the city.

The analysis is based on two historical maps dating from 1888 and 1905, propriety of Dolj County Library " Alexandru and Aristia Aman".

The related materials that were used are the Craiova Municipality's archive documents, written reports from the architects and construction engineers involved in the making of the plans, surveyors and also doctors and artists. For the detailed understanding of the morphology of the land, the main sources used are the current and historical road networks and socio - geographical material from the public library and OCPI Dolj.

Ontology Driven GIS for historical research

by Dalina BĂDESCU

Faculty of History, University of Bucharest, Romania

Romania has an enormous treasure in its vast number of large-scale historical maps from a period of hundreds of years made for different purposes, that we call map series. The maps are also very time and regional dependent with respect to their concepts. A large scanning project by the National Institutes, in time, will make most of these maps available as raster images, as it happened in most of the western countries.

During the last decade or two, it has been more and more common to use data from historical maps in GIS-analysis. When dealing with a knowledge domain like historical maps, where a semantic and conceptual analysis is needed in depth, it is a better method to create an ontology rather than an ordinary conceptual model, given the fact that an ontology is richer in semantics and the tools developed are more suited for the semantic analysis. The term ontology is used in the meaning of an ontological static model of a domain (much like a conceptual model). The used model describes the concepts, slots (relations and attributes), axioms, etc., of the domain.

The structure of the ontology is mainly focused on the nature of geo-objects and their representation and meaning. It is aimed at the geographic objects as such and to reach a common understanding about the specifics in the GIS-community.

In this state-of-the-art presentation I am focusing mainly on the application of ODGIS in cartography and urban planning as a tool for the study of landscape archeology.

Humans and animals in landscape. The case of the Hamangia Culture in Romania

by Adrian BĂLĂȘESCU (1), Marie BALASSE (2), Valentin RADU (1), Carlos TORNERO(2), Stephanie BREHARD (2), Valentina VOINEA (3)

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Archaeozoology deals with the study of faunal remains recovered from archaeological excavations. Faunal studies from various Hamangia settlements (VI-Vth millennium BC) in Romania (Ceamurlia de Jos, Cernavoda, Cheia, Golovița, Hamangia and Techirghiol) allowed to observe the relations that were established between humans and animals, which are closely related to the environment.

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All species identified whether invertebrates (bivalves, snails, etc.) or vertebrates (fish, reptiles, birds and wild mammals), are part of a taxonomic spectrum established under standard environmental requirements. This information allowed us to determine the characteristics of the environment in which they live (animal and plant associations). Preferences for breeding of certain domestic animals are also valuable sources to the landscape reconstruction around to prehistoric settlements.

Some taxa, such as bivalves and fish, provide interesting information regarding the evolution and transformation of aquatic landscape (wetlands and coastline evolution), thereby helping to better understand the significance and the reasons for which they have been exploited and managed for millennia by these prehistoric communities.

Also, the classical archaeozoological studies are compared with isotopic results in order to obtaining detailed data about economical behaviours of past humans and seasonality patterns.

Establishing environmental characteristics of Neolithic period allows us to understand the environmental exploitation strategies used by the Hamangia communities.

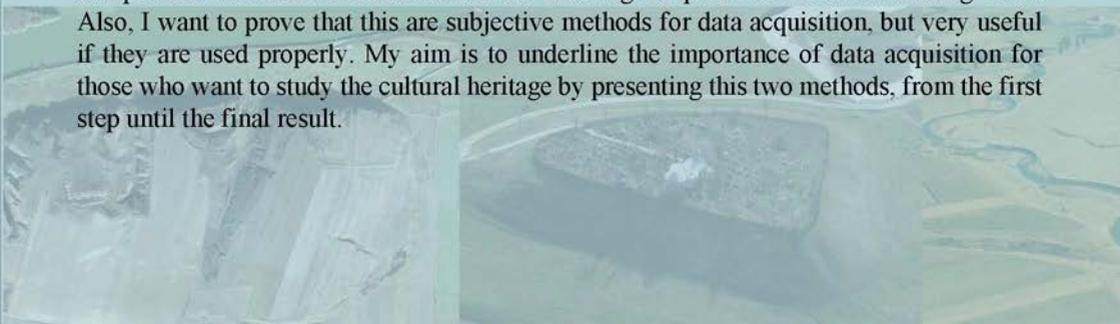
This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-II-ID-PCE-2011-3-1015 and SIANHE (ERC project).

Photogrammetry and archaeological drawing. Two methods for data acquisition in the field of cultural heritage

by Alexandra BIVOLARU

The National History Museum of Romania

Registering data is one of the most important steps during the archaeological investigation and also in the field of the cultural heritage. Nowadays there are used many methods for data acquisition and I choose to present two of them, which in my opinion are complementary: photogrammetry and archaeological drawing. In this presentation I will make a comparison between this two methods for showing the pros and the cons of using them. Also, I want to prove that this are subjective methods for data acquisition, but very useful if they are used properly. My aim is to underline the importance of data acquisition for those who want to study the cultural heritage by presenting this two methods, from the first step until the final result.



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Landscape evolution analyses using digital surface models

by Florentin BODA

Military Topographic Directorate, „General de Divizie Constantin Barozzi”

The purpose of this paper is to present the analog and digital aerial photographs data base of Military Topographic Directorate and its potential in landscape evolution of Romania from early 1950s to present. Application presented shows how value is added to analyses by integrating digital surface models (DSMs) in processes. Models are obtained using existing aerial images and INS/GNSS orientation parameters, which means they describe terrain and natural/artificial objects from flight period. Using digital surface models, true orthophotos are generated, which offer better results in automatic spectral classifications. Also, height information is very important because quantity indicators of the evolution could be generated.

Towards GIS integration of the salt production sites in Transylvania

by Valeriu CAVRUC(1), Magdalena ȘTEFAN(2), Dan ȘTEFAN(2)

(1)The National Museum of Eastern Carpathians, Sfintu Gheorghe, Romania

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A very distinct group of the Late Bronze Age salt production sites is spread in Maramureș and northern half of Transylvania. These sites have provided a very specific set of evidence – wooden structures, installations and artifacts (troughs, leaders, shovels, and mining tools). All of them are associated with rock salt deposits lying at shallow depth. Most of the evidence uncovered within these sites dates between ca. 1600 and 800 cal BC. Some scholars presume that these sites show a high scale industrial salt production.

The geospatial integration of these sites suggests that this kind of salt production was aimed for a long distance salt trade to the Tisza-Danube Interfluvium and even Balkans. Thus, all of them are situated exclusively in the areas, which provide proper natural connections with the major navigable rivers of the region: Tisza, Someșul Mare, Someșul Mic, Someș, and Mureș, which served as important exchange routes between Transylvania and Great Hungarian Plane. On the other hand, many very rich and accessible rock salt deposits situated far from such connection networks, were not exploited during Bronze Age. The most relevant data concerning the Late Bronze Age salt production and exchange was investigated within the compact area around the Beclean town. Here, in the valley of the Someșul Mare river, in the area of ca. 11 x 5 km, three salt production sites - Baile Figa, Sasarm and Caila - were investigated. They have provided many wooden structures, troughs etc. All of them are naturally connected with the Someșul Mare river.

In addition, in the same area, downstream of these sites, a fortified port Coldau (ca. 16th - 14th centuries BC) is located. All this highly suggest that Coldau port served as the main 'salt trade station' of the area.

The above seem to match a broader context. Thus, the high concentration of exotic goods, rich deposits and fortified sites along Tisza, Someșul Mare, Someșul Mic, Someș, and Mureș highly suggests that these rivers were intensively used as the long distance exchange routes during the time span between ca. 1600 and 700 BC.

3D Modelling and Close-Range Photogrammetric methods applied to archaeological sites

by Irina CARLAN, Bogdan DOVLEAC

GISBOX Romania

State of the art of close-range photogrammetry reveals new methods for creation of 3D models for heritage and archaeological objects and sites. Effective and competent methodologies have been developed for surveying and modeling archaeological sites and thus provide high quality and accurate realistic textured models for better research, preservation, education and monitoring projects. A specific methodology was applied to produce a scale 3D model of "Căciulata Roman Castrum" in a digital environment where geometry and texture are complementary, creating a complex product. The accurate geometric and appearance details (size, shape, position and texture) can be used for a proper documentation, preservation and restauration applications.

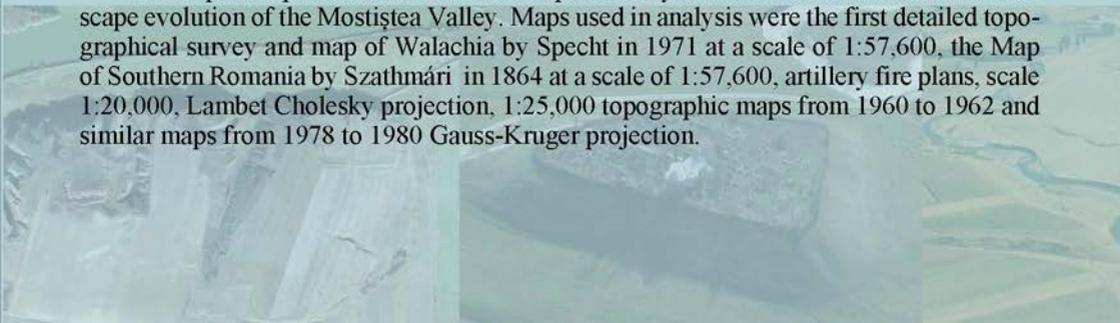
Historic land use across the Mostiștea Valley

by Ionela CRĂCIUNESCU

The „Vasile Pârvan" Institute of Archaeology of the Romanian Academy

Landscape as we are seeing it today is changing and is adapting all the time. For example, woodland growth should implicate slow changes, almost invisible to the eyes, while new housing schemes are quick in developing. By examining the landscape we can observe the differences that appear through time. The historic land use across the studied area that is overlapping the eastern part of Romanian Plain, the Mostiștea Valley project's digital map shows the extent of the changes that have occurred, from the 18th century until the present day. Traces belonging even to the prehistoric land use are recorded as well, because they have also left their mark upon the landscape.

Old maps and postcards are used as complementary resources to reconstruct the landscape evolution of the Mostiștea Valley. Maps used in analysis were the first detailed topographical survey and map of Walachia by Specht in 1971 at a scale of 1:57,600, the Map of Southern Romania by Szathmári in 1864 at a scale of 1:57,600, artillery fire plans, scale 1:20,000, Lambert Cholesky projection, 1:25,000 topographic maps from 1960 to 1962 and similar maps from 1978 to 1980 Gauss-Kruger projection.



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Through the medium of Mostiștea Valley map of historic land use we can understand the process of inhabit and spot semnificant landscapes and try to preserve them.

The idea of studying historic land use across the region of Mostiștea Valley was developed during my Doctoral Research at the Institute of Archaeology "Vasile Pârvan" from Bucharest in 2014 and funded by MINERVA/POSDRU159/1.5/S/137832.

Deconstructing the landscape whether it is an object of study

by Philippe FAJON

*Service Régional de l'Archéologie DRAC Haute-Normandie
UMR 7041 ArScAn - CNRS - Paris I et X / Equipe archéologies environnementales*

In a short time, we'll try to know how the landscape could be an object of study, or not. Using a theoretical approach, we'll analyze together the landscape notion with the bases of the « archéologie du savoir », following M. Foucault. Archeogeography places the dynamics of the forms in the center of its concerns and places the memory formation of an ecumene at the same level than the recovery of specific sequences of former past occupation. Landscape is typically a place where you can find plenty of forms of hybridization between social achievements and natural environments, development forms, and dynamics of self-organized forms. Studying the past, the functions of the landscape components and territories, in their rhythms, their dynamics, their continuities and ruptures, can offer development patterns, broad principles of regional or local planning through ages without to forget that landscape is first a perception, a feeling for the observer.

Two examples of inherited landscape organization in France and in Romania

by Philippe FAJON

*Service Régional de l'Archéologie DRAC Haute-Normandie
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The case of the landscape surrounding Rouen shows that, if the beginning of the landscape drawing need to be placed in gaulish period, lots of alteration come after to try to erase the reminds of the past. It's not a dot-mapping of archaeological places, but also the first step of networking of them in a long term period. We'll try also to add few datas about vegetation and social structure.

Beginnings of landscape organizing in Olt valley is not so different than the Seine valley, but the story of the alterations and modifications of the landscape heritage went through real collapses. We'll try to go back through these times and get a perception of the old local landscape dynamics.

Landscape changes, archaeological survey and GIS in the Mostiștea Valley, Romania

by (1)Mihai FLOREA, (1)Ionela CRĂCIUNESCU, (1)Cătălin LAZĂR,
(2)Theodor IGNAT

(1)National History Museum of Romania

(2)Bucharest Municipal Museum

The main aim of this paper is to present the human adaptation and strategies in the use of the landscape, but also to observe changes in landscape morphology, understood not only as an archaeological landscape, but also as an environmental context.

From the geological point of view, Mostiștea is a typical plain river located in the south-eastern Romania areas, in the Bărăgan Plain. It is part of the geomorphological subregion Argeș - Sărății Valley - Mostiștea, a transition between the high plains of western and eastern low. It contains the largest plain ramble and transition zone towards the hills. The Mostiștea river basin is one of the most anthropogenic hydrological systems in the Eastern Romanian Plain and Mostiștea river has a length of 92 km. The main course defines Bărăgan in east and Vlăsia in the northeast that link directly to a small portion and with its tributaries drains the field in an area of 1734 km². To the West is bordered by Pașărea basin, a Dâmbovița river tributary, to the south, with an interbasinal area towards Argeș basin, and in the northwest the watershed follows the scarp of Ialomița terrace.

From the archaeological point of view, Mostiștea valley has been inhabited since ancient times. So far are certified 150 archaeological sites from the Neolithic period to the Middle Ages (fig. 1). In the Mostiștea Valley has been identified 30 sites belonging to Boian and Gumelnița cultures. The archaeological sites have been identified along the middle and lower Mostiștea Valley claim so. The archaeological sites consist in tell settlement, open settlements and cemeteries.

To determine the changes of the landscape we'll use the old cartographic documents (for 18th and 19th centuries) and the bibliographical data, but also military topographic maps (at the scale 1:5000 and 1:25,000) and 2005-2008 edition of Romanian orthophotoplans. Also we'll use geological maps (scale 1:200,000), the aerial photographs and satellite images.

The integration of the archaeological, geological, cartographical and topographical data has been achieved through the GIS software.

Remote sensing approaches to archaeological landscapes in Romania: case studies from Transylvania and Dobrogea

by (1)William HANSON, (2) Ioana OLTEAN

(1)University of Glasgow, United Kingdom

(2)University of Exeter, United Kingdom

Four case studies, two from Transylvania and two from Dobrogea, will be used to showcase different remote sensing approaches to the study of Iron Age and Roman landscapes. These involve the application of traditional aerial survey in the study of settlements (vici) surrounding Roman auxiliary forts; the use of LiDAR to identify settlement

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dispersal in a forested upland zone; the examination of historical, non-archaeological photography in the identification of complex Roman frontier remains; and the integration of historical photography, new reconnaissance and satellite imagery in the identification of burial clusters and their use as a key to missing settlements.

Creating Landscapes During the Transition to Sedentism in the ANE

by Erica HUGHES

Koç University Research Center for Anatolian Civilizations, Turkey

This presentation investigates the practice of ritual depositions and the significance the practice held for the participants in these acts in terms of territoriality, ownership and the domestication of spaces.

Some theorists hold that the meaning of depositional activity is related to the need of humans to alter, affect or personalize their environment. Most of these approaches have a very narrow focus on the built environment, and rarely make the initial distinction between nature, wilderness, environment, land, landscape and place. Through a careful examination of the use of these terms in conjunction with publications about the ritual practices during the transition to sedentary behaviours in Neolithic Mesopotamia and Anatolia, the assumptions entailed in lay definitions can be identified, eschewed, and re-created as useful for archaeological analysis.

Exposing Aerial Photography in the European Digital Library (europeana.eu) : a plan

by Dan MATEI

National Heritage Institute

Currently, Europeana exposes ridiculously few aerial archaeological images: under 100 (out of more than 28 million digital items). Our plan is to expose in a few month our 1,000+ aerial photographs (taken within the European project "ArchaeoLandscapes Europe") in europeana.eu.

The presentation outlines the mapping of the images metadata to the Europeana ontology, EDM [Europeana Data Model] and the issues with the preservation of the data granularity. Also it presents the design decisions taken in order to secure a reasonable persistence of the online visibility of the collection for the next 10 (?) years.

Landscape in involution. A diachronic analysis of anthropical landscape modifications in Timis County

by Dorel MICLE

West University of Timișoara

The Banat plain has been and has remained one of Romania's regions that has underwent some of the greatest landscape changes over time. The areas of divagations between the Bega River and Timiș, but also between Mureș and Aranca have represented, during different historical periods, vast marshes with specific vegetation and fauna.

Climatic oscillations from prehistory until now have made the groundwater levels decrease or increase, making marshes disappear and then reappear after some centuries. Hillocks and mounds naturally created by old river beds, but also the sand dunes characteristic to the western part of this area, have been locations favourable to human habitation in all historical periods.

Thus, although at first sight it appears to be inappropriate for habitation, the Banat plain presents an extraordinary density of archaeological sites. Many of them have been destroyed by the anthropic modifications of the last three centuries, starting with embankments, drainages and systematizations made by the Habsburgs, until the communist ones in the 70's and those caused by the great landowners of our time. Our study tries to present the evolution (or more likely the involution) of landscape during the last centuries, due to the human's brutal intervention, and its implications on the preservation of Timiș's archaeological heritage.

3D-ICONS Project – general overview

by Corina NICOLAE

The National History Museum of Romania

3D Digitisation of Icons of European Architectural and Archaeological Heritage (3D-Icons) project is a pilot project funded under the European Commission's ICT Policy Support Programme, built on the results of CARARE and 3D-COFORM. The implication of the Romanian National History Museum in this project, as a full-time member, gave us the opportunity, for the first time, to test and implement the 3D technology in a public institution, such as a museum. In this paper, we would like to present the impact that 3D-Icons project had on our understanding of the value of these technologies for cultural heritage. Presented as a study-case, the Romanian experience within 3D Icons project will focus on the technologies used for obtaining 3D models, the outcome and the ways of promoting them via the web.

UAV Photogrammetric Archaeological Survey: Vitanești Magurice Tell

by Corina NICOLAE, Mihai BOZGAN,
Katia MOLDOVEANU, Marius AMARIE

The National History Museum of Romania

Unmanned Aerial Vehicles (UAVs) used for archaeological survey represent an integrated method of investigation nowadays. The present paper will focus on the experience achieved in 3D Icons project related to photogrammetric surveys and will present as study case the prehistoric settlement from Vitănești Măgurice, Teleorman county, Romania. The study will present data acquisition which was performed with an UAV, while processing and post processing was made with open source and low cost photogrammetric software.



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Landscape in the Danube river valley- Balta Ialomitei. A study case

by (1)Dragomir Nicolae POPOVICI, (2,1)Constantin HAITĂ, (1)Adrian BĂLĂȘESCU, (3)Roman HOVSEPYAN, (4)Mihaela DANU

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(2) *National Center of Pluridisciplinary Researches „Alexandra Bolomey”, Romania*

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(4)*Faculty of Biology, Alexandru Ioan Cuza University of Iași, Romania*

The relations between environment and humans are a part of the interactions and relationships between natural and human/cultural forces across the time.

The rivers valleys and the floodplain are very specific and the characteristics of human evolution in this type of area can help us to reconstruct and to understand the interactions who acted in time. This environment is highly sensitive and require a multi-disciplinary approach if we wish to understand or to reconstruct his evolution in a more general context in which the human evolution is only a part.

An understanding of the fundamental processes of floodplain evolution is essential for the interpretation of the archaeological sites in alluvial context and can yield insights into human-environment evolution. But, in the same time, is necessary to understand that an multidisciplinary approach must operate

The area of Balta Ialomitei was not an important subject of a intensive research concerning the relationship between anthropic occupations through time and the environment till last few years. Our main aims were to study the interplay between Danube dynamics and the archaeological records.

That suppose to obtain a diagnostic concerning, the impacts of changes of floodplain environment on the human occupation and the consequences of the river erosion and sedimentation for the topography of this area.

The sedimentological researches in the large island-like floodplain area between Danube and Borcea River, show important changes of the natural landscape from Chalcolithic to Iron Age and Middle Ages. The stratigraphy of alluvial deposits from the Chalcolithic period riches up to 9 m, as reflected by ¹⁴C dating on core sediments and documents different sedimentary ambiances. On the basis of 5 percussion corings located on a transversal transect, a preliminary model of sedimentological evolution is drawn for this zone. The detailed micromorphological analyses, in thin section, of two sedimentary successions, provide important environmental data and a correlation is drawn with the specific zones of anthropic activities.

All the archaeozoological sites provided a large amounts of bones (fish, mollusc and mammal) evincing the significance of the different activities like husbandry, hunting, fishing etc. Concerning the bivalves gathering detailed studies realized for two of the most importants tell settlements in that area (Bordușani Popină and Hârșova), demonstrate a strong correlation between the river level variations and accessibility of such food source. Regarding fishing the most profitable periods are in the spring coinciding with the reproduction and the flooding but also at the low level of the river water when the ponds dry and concentrate all the fish.

The existence of seasonal and complementary food supply strategies is very likely at Hârșova tell and Bordușani-Popină: fishing and gathering activities were the most profitable, from spring to early autumn and would have kept small livestock especially for the winter.

This work is carried out within the framework of the project IDEI Landscape and human co-evolution patterns in the wetland area of Balta Ialomitei (PN-II-ID-PCE-2011-3-0982)

Archaeolandscapes Europe Project

by Irina OBERLÄNDER-TÂRNOVEANU

The National Heritage Institute, Romania

The target of the ArchaeoLandscapes project (2010-2015) is to address existing imbalances in the use of modern surveying and remote sensing techniques across Europe. The network of partner institutions from 26 countries is both a cooperation framework for the experienced ones and a stimulus for the beginners. As in any other large European project, there is a hard core of strong universities and organisations with already existing programmes and projects in the field, able to carry on and further develop actions in research, surveys, methods, higher education courses and training, the exploration of existing air photo archives, laser scanning experiments and 3D modelling, based on their own budgets. For them the project is a framework for cooperation and promoting their on-going work. For many other small partners, including us, ArchLand is the opportunity to learn, meet, get advice and some support for small scale remote sensing projects otherwise not supported by the cultural heritage or research budgets in our countries. The general budget of the project looks well but the European grant for each institution is modest and goes mainly for meetings, dissemination and additional costs. Each partner must cover 50% of its project budget by co-financing which may be a problem if you depend on austerity budgets. Without political will and proper financial support in each member country, the results cannot be but uneven. That being said, we have to emphasize the benefits of being in such a project. Without ArcLand and the previous European project we participated in, Landscapes of Europe: Past, Present and Future (2004-2007), we can hardly imagine any progress of our team in using air photos for inventory and protection of archaeological heritage, from training courses to flight surveys. We took over 7,000 photos in 12 flights, digitised the most important old maps and enriched the National Archaeological Record database, available online (ran.cimec.ro). We work to publish online for public use the photo archive and to enhance the co-operation with other Romanian organisations and persons for better knowledge and protection of our heritage.

Corpus Limitis Imperii Romani. A Research Programme of the Romanian Academy Based on Non-Invasive Field Surveys of the Roman Frontiers of Dacia

by Coriolan H. OPREANU, Vlad-Andrei LĂZĂRESCU

Institute of Archaeology and Art History of the Romanian Academy, Cluj-Napoca

CLIR is the 79th research programme adopted by the Union Académique Internationale, Romanian Academy being a foundation member. The main objectives of CLIR is to provide a Catalogue and a comprehensive study of the military sites on the Roman frontiers according to a common structure about the whole limes, to enhance international research of the limes and to publish its elements on a common and coordinated base. Among the research methods to be used remote sensing and geophysical surveys represent the main techniques taken into consideration. The Institute of Archaeology and History of Art Cluj-Napoca of the Romanian Academy assumed the coordination position for investigation the frontiers of Roman Dacia. On the key-site from the north-western frontier at Porolissum a landscape archaeology approach was performed during the last years.

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Here, the fort, the town and the advanced defense system of the limes were surveyed by geophysical methods, aerial photographs and LiDAR, all offering better understanding and important new contribution to the archaeological topography of the area. Other forts of the limes, as Românași, Romita, Sutor, Tihău were also investigated with the same techniques.

Results of this research are also useful for the scientific file of a future intention to propose Roman limes of Dacia on UNESCO world heritage list.

Roman landscape in Moesia Inferior. Case Study: Histria

by Adriana PANAITE

The „Vasile Pârvan” Institute of Archaeology of the Romanian Academy

An essential component of the archaeological research is the study of landscape. The systematic study of it began to take shape in the 70s of last century, when it was launched the concept of "landscape archeology". Behind this is actually the connection between field research and the changes of the environment at a certain moment of time. In other words the archaeological landscape should be seen as the result of the interaction of natural and anthropogenic factors.

The arrival of the Romans and the introduction of the Lower Danube area within the borders of the Roman Empire, as the province of Moesia Inferior lead to a radical change of the landscape. This space is conquered and reorganized primarily by the Roman army, but this action is accompanied by civil measurements, resulting on the one hand, the integration of existing settlements (local and Greek cities of the Black Sea) in the new administrative body, but also the appearance of the new ones.

For the Greek city of Histria several studies related to landscape analysis have been made in the past, especially for Greek era. In the present communication we will focus on the components of the Roman territory of Histria (settlements, roads, fortifications, aqueducts, quarries etc) in an attempt to identify the landscape's characteristics of the area.

Research funded by the "MINERVA - Cooperation career elite doctoral and post-doctoral research" Contract Code: POSDRU / 159 / 1.5 / S / 137832, financed from the European Social Fund through the Sectoral Operational Programme Human Resources Development 2007-2013 .

The Reconstruction of Landscape Perception through Fuzzy Logic

by Cătălin POPA

Topoi Excellence Cluster / Freie Universität Berlin, Germany

This paper introduces a method that employs environment data to reconstruct the way people perceived their landscape. Since studying the landscape involves describing the world as it is perceived by humans, it is difficult to access this dimension with the measuring tools that we employ when investigating the environment. This difficulty stems from two essential factors. Firstly, there is a difference in terms of precision. While our measurements today provide accurate data for our studies, people's knowledge of their surroundings is based mainly on the vague information coming from their senses.

Secondly, there is a data type discrepancy. The methods deployed when studying the environment provide us with numerical data, but the information that humans employ in their daily lives is exclusively categorical in nature. We approach this issue of non-correspondence between environment and landscape knowledge with the help of fuzzy logic. The numerical data describing two environment characteristics, slope and modified topographic index, are split each into three sets: small, moderate and high. These sets have fuzzy borders, incorporating a certain degree of overlap, which allows for the information recorded using modern measurement tools to be connected with the observational capacities of the senses. The fuzzy sets are then merged into combination classes and further fused into four landscape categories: flat wet, steep dry, flat dry and gradual moist. These four categories have direct correspondence in the real world and can be observed by humans through simple perception, thus serving to reconstruct the way people perceived their landscape.

Landscape Perception and Settlement Patterns. Three case studies from the Middle East and the Balkans

by Cătălin POPA

Topoi Excellence Cluster / Freie Universität Berlin, Germany

In this paper we investigate how people perceived their surrounding landscape in three regions: one from Western Turkey, another from Northern Syria and one from Eastern Serbia. Taking digital elevation models of today's surface as starting data, slope and modified topographic index are calculated, after which, using a fuzzy logic modelling procedure, the possible categorization of the three areas is computed. Each of the areas is described using four landscape categories: flat wet, steep dry, flat dry and gradual moist. This categorization of the landscape is afterwards compared against the record of human settlements. The Western Turkey case study produced excellent results with predictive qualities, revealing the effectiveness of the method in identifying the landscape preferences of prehistoric people. In Eastern Serbia the output is less clear. Although gradual moist areas would be best suited for settling, these contain only 36% of all sites. This apparent miss-correspondence can be caused either by poorly resolved data, which would explain why the majority of settlements are situated close but not actually inside gradual moist areas, or by chronological changes in landscape perception and preference, since the settlements span over a large time period. Lastly, the case study from Northern Syria indicates the relative character of the employed landscape categories. In this example flat wet areas are greatly favored over gradual moist ones. People chose to settle the wettest parts of the landscape since water is a significant problem in that region.

Orheiul Vechi Archaeological Landscape

by (1) Gheorghe POSTICĂ, (2) Valeriu CAVRUC

(1) Ministry of Culture- Republic of Moldova Government

(2) The National Museum of Eastern Carpathians, Sfintu Gheorghe, Romania

The Orheiul Vechi Archaeological Landscape is located in central-eastern part of the Prut-Dniestr Interfluvium and lies along the gorge of the lower course of the Răut River. It resembles a hemispherical amphitheater of 3,500 m x 1,500 m, one that is defined by the Răut's steep and high banks.

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The location occupied by Orheiul Vechi was both very defensible and highly strategic. The defensive conditions were given by the natural escarpments and by higher elevation than the wide surrounding areas.

On the other hand, the landscape is naturally connected with close and remote areas. Thus, the Răut river ensures the connection with central and northern Moldova, and with the Dniestr river, which links Carpathian Basin with Black Sea. That is why, the density of archaeological evidence is unusually high within the Landscape. Moreover, during Iron Age and Medieval period, the Landscape was occupied by powerful political, military, commercial and religious centers: the *Butuceni* and *Mășcăuți* Getaean fortresses, the capital of the Golden Horde *Shehr al Cedid*, and Moldovan town *Orhei*.

The Orheiul Vechi Archaeological Landscape includes three distinct archaeological sites: “Peștere”, “Butuceni”, and “Mășcăuți”. Within the above-mentioned sites a number of occupations were attested:

- 25 settlements dating from Paleolithic to modern times;
- 7 earth and stone fortification systems, 5 of which date from Early Iron Age and 2 from Middle Ages;
- 2 medieval towns;
- 6 cemeteries, 1 of which dates from Early Iron Age and 5 from the Middle Ages;
- 177 caves and dug during Middle Ages and Modern Period in the limestone banks of the Răut River. They were used for religious and cult practices (monk cellars, churches, hermitage-monasteries).

All these cover Late Palaeolithic, Eneolithic, Iron Age, and Middle Ages. It is worth mentioning that the landscape was not occupied during two major periods – the entire Bronze Age and the first half of the 1st millennium BC.

In conclusion, the Orheiul Vechi Landscape is one of the most outstanding archaeological resources in southeast Europe, both for further research and tourism.

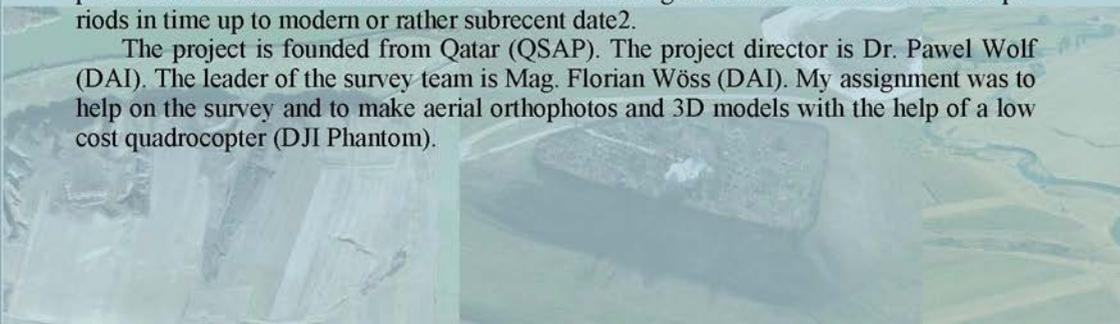
Air prospection in Hamadab & Meroe (Northsudan)

by Gerald RAAB

Crazy eye perspectives, Austria

The first full survey connected with the HMD-QSAP Project, started in September 2013, was carried out between January 14th and March 3rd 2014. The Work displays the first out of two planned archaeological survey-campaigns comprising a more or less comprehensive surface documentation related on archaeological remains of all subsumable periods in time up to modern or rather subrecent date.

The project is founded from Qatar (QSAP). The project director is Dr. Pawel Wolf (DAI). The leader of the survey team is Mag. Florian Wöss (DAI). My assignment was to help on the survey and to make aerial orthophotos and 3D models with the help of a low cost quadcopter (DJI Phantom).



Dynamic past landscapes: data, theories, archaeologists and interpretations

by Włodzimierz RACZKOWSK

Uniwersytet im. Adama Mickiewicza w Poznaniu, Institute of Prehistory, Poland

Landscapes are the same for everyone in our common sense understanding and even they are in the processes of changing (natural and anthropogenic) we are able to get the knowledge about them and communicate it to others. Modern technologies, especially remote sensing, support this kind of thinking. Current philosophical trends question that way of thinking on the world and its investigations. Consequently we have to accept that each scientific discipline will describe and explore landscapes in variety of ways, using specific own methods, tools, theories and forms of narratives.

Different approaches to landscapes studies in archaeology (and not only) provide varieties of narratives on past landscapes and cannot be treated exclusively as description of their material, physical dimensions. The question appears: do convictions on objective investigations based on new techniques allow us to get more universal image of past landscapes? Do new technologies introduced allow us building common platform for research and interpretations?

Critique thoughts on above issues allow me to identified four main analytical categories which are in interrelations and got impact on our understanding of past landscapes: data, theories, archaeologists and interpretations. When thinking on them each generates important questions and provide to critique reflections. One of them is the relation between remote sensing data and the past. Another one touches the problem of relation between data and archaeologist.

The experience based on introducing new types of data (mostly remote sensing) and their visualisations leads to conclusion that the concept of... dynamic of past landscapes relates to subject of research (archaeologist) rather than to the object of investigations (past landscapes). We create past landscapes through the processes of choosing and eliminating data (processed data). So past landscapes are projections of our imaginations on the past.

Challenges concerning cultural heritage in woodland seen from a Norwegian perspective

by Ole RISBØL

The Norwegian Institute for Cultural Heritage Research

In large parts of Europe, a comprehensive exploitation of a wide range of out-field resources in the past have resulted in the existence of a very large number of cultural remains and versatile traces from human activity throughout all periods of history. These are evidences showing the importance of mountainous areas and woodlands as vital scenes for human action in the past. To what extent this is recognized today varies but generally a severe lack of archaeological surveys of such areas is a reality in many European regions. Poor inventories cause implication for landscape understanding and management and consequently influence the awareness and protection of cultural remains situated in out-field areas. That woodlands tend to be comprehended as natural more than cultural landscape is part of the explanation and it prevents a competent understanding of the cultural history of areas and regions dominated by forests. In addition the lack of good inventories brings about challenges for cultural resource management with their responsibility for

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safeguarding cultural heritage in all parts of the landscape. This paper will focus on challenges connected to the understanding and management of cultural heritage in woodlands from a Norwegian perspective and call attention to airborne laser scanning (LiDAR) as a suitable method for improving the situation.

Remote or connected? Modelling networked landscapes in the Second Iron Age Northern Dobrogea. Telița- Celic Dere Project

by (1,2)Valeriu SÂRBU, (2)Magdalena ȘTEFAN, (3)Dan ȘTEFAN

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The difficulty in surpassing the biased perspective over prehistoric or ancient landscapes due to general modern habits of understanding transportation routes and natural features, often translates in a certain static and limited reconstruction of past communities. For the modern traveller, the site from Celic Dere, located remotely in the middle of a huge forest, in the Niculițel Hills, far away from any modern roads or villages, appears as a peculiar occurrence, especially if considering its cultural diversity and chronological span revealed by extensive former excavations (6th-3rd cs. BC settlement and necropolis with both flat and tumuli graves, mixing elements of early Iron Age type of material culture with later, so called Getae, type of discoveries; Greek imports, North-Pontic influences; research 1985-2001 by G. Simion).

For the last ten years, in a new project, a meticulous combination of excavations in key areas, detailed topographic or photogrammetric recording of archaeological structures, various types of geo-physical survey, landscape archaeology and surface surveys was implemented in order to recover, integrate and extend the scale of known archaeological elements and, finally, to shift interpretative perspective from disparate elements to micro-regional models of networked communities.

Contributions of L.I.D.A.R. and archaeological data in the study of old landscapes: Archaeogeographical analysis of the peri-urban forests of Rouen (Normandy)

by Jérôme SPIESSER

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The development of L.I.D.A.R. in France revealed the presence of fossilized plots under several forest massifs. The first one to have been highlighted is located under the forest of Haye, in Meurthe-et-Moselle. It is in a form of plots of lands organized according to the road network, one more than 50 Km². Dating these ancient fields stays a delicate stage. It is that by the confrontation of these land patterns with archaeological data that it is possible to insight into the territorial organizations of the past chronology.

Recently, a statement L.I.D.A.R. was made on the lower valley of the Seine, meanders of which are at present occupied by forest. In the objective to identify the Roman territorial organization, an archaeogeographical study was realized on these two meanders (Forests of Roumare and Londe/Rouvray). It divides in two stages. At first, an orientation study of fossil and actives lineaments allows to identify various land patterns. It can be made only by G.I.S. to computerize the orientations calculations. Secondly, the various territorial organizations were dated. On the one hand, by relative chronology will be made possible by the steppings of micro-reliefs fossilized under forest. On the other hand with the terminus post quem supply by numerous archaeological excavations. However, the consideration of the data L.I.D.A.R. in the archaeogeographical study of landscapes is recent. It is thus advisable to presents this methodology to discuss the contributions but also various biases which it can introduce in understanding old landscapes.

Archeological Landscape. Outlook. History. Evolution. General overview

by Bogdan ȘANDRIC

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The project Archeological Landscape. Outlook. History. Evolution financed by Administration of the National Cultural Fund, in the Cultural Projects 2014 session, is a local initiative which is linked to the european project ArchaeoLandscapes Europe (ArcLand), financed by the European Comission through the Culture 2007-2014 program.

The main objective of this project is to promote the concept of archeology of the landscape and of the analysis methods to the specialists in the domains of research and protection of the cultural heritage.

The main activities of the project were diverse, ranging from maping and photographing of some areas and monuments (archaeological sites, religious monuments, historical buildings), using the archive of aerial photography made by CIMEC Institute of Cultural Memory between 2007-2010, on-line publishing of some cartographical resources with the support of the Military-Topographic Service Division General Constantin Barozzi, making available for the general public of the various resources created with web GIS applications, organizing the international conference „Approches to Archeological Landscapes. Tools, Methodology, and Case Studies in European Architectural and Archeological Heritage” and of the exhibition „Traces of the past”.

Assessment of Land-Cover Changes Using Landsat Satellite Time Series in the Southern Carpathians, Romania

by Ionuț ȘANDRIC(1,2), Laura STUMBEA(1), Florin DUMITRĂȘCU (2), Florin MIHAI (2), Camelia SEMEN (2), Alexandru VASILE (2), Petre URSARU (2), Roxana CUCULICI (1), Radu IRIMIA(1), Zenaida CHIȚU (3)

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The increasing availability of the Landsat image archive and the development of approaches to make full use of these data provide novel insights into the drivers and dynamics of land use systems change. Assessment of forest disturbance history is essential for understanding forest fragmentation conditions and terrestrial and atmospheric carbon flux. In this study we focused on spatial and temporal patterns between socialist and post-socialist periods in Romania, over a time period 1974-2013, by processing over 300 Landsat MSS, TM, ETM and L8 scenes.

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Unfortunately, the availability of such multi-seasonal cloud-free image dates is often limited and we had to use compositing algorithms in order to obtain reliable images for the entire crops seasons. For our case study – Southern Carpathians, Romania - Vegetation Change Tracker model was used to address the sensitivity of vegetation structure and carbon fluxes to disturbance. The predominant identified mechanisms for forest disturbance are land conversion, clear cuts, wind damage, pests and fire. The study demonstrates the value of the Landsat archive and highlights that trajectory-based change detection approaches can be highly beneficial for gaining insights on the effect of land use patterns.

Historical Monuments on Mostiștea Valley, Romania

by Done ȘERBĂNESCU

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Mostiștea Valley is located in central Romanian Plain and extends over a length of 92 km from the NW to the SE, pouring into the Danube. The region offered since antiquity optimal conditions of existence of human communities due to soil fertility and the constant flow of the river. In the last three decades of the twentieth century land reclamation works and the construction of fish ponds resulted in raising the water level of the lakes which caused erosion and flooding emphasis, causing damage, threatening cultural heritage monuments and changing landscape.

In this paper are presented the historical monuments located along the Mostistea Valley divided into: archaeological sites, arhitectonical and ethnographic and commemorative monuments clasified in the national list of historical monuments in Romania. Over 50 special monuments are described, discussed illustrated and located in order to have a complete map of cultural heritage in the region.

Reconsidering field archaeology through UAVs lenses

by Dan ȘTEFAN

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In the history of interdisciplinary field archaeology methods, aerial survey holds a special place, due to its early implement and constant significance of its results. Traditionally, aerial archaeology has used various acquisition platforms such as airplanes, helicopters, balloons and even kites, while a distinct field of application of archaeological interest has been remote sensing based on satellite missions.

During the last five years or so, we have been the witnesses of a considerable technological breakthrough in the field of digital photography, sensors, photogrammetry and 3D, especially in the consumer and friendlier to use direction. If to these we add the recent emergence of new portable and flexible flying platforms – Unmanned Aerial Vehicles (UAVs), the community should become aware that the game rules for the field archaeologists are about to change, methodologically speaking, but also conceptual, as the scale of the revealed archaeological landscape will very easily increase for each concerned site.

In this presentation, the author will focus on presenting the various practical applications, and technological limits of multirotor flying platforms for archaeology, by presenting the results of several projects undertaken in the last year, in Romania.

Bridging the Lines. A theoretical quest for some Roman Roads

by Eugen Silviu TEODOR(1), Dan ȘTEFAN(2), Magdalena ȘTEFAN (3)

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Romanian archaeology is traditionally focused on digging the forts of the Roman frontier. We know about a dozen of forts for both Limes Alutanus and Limes Transalutanus, but not much actually about their roads. For the frontier running along River Olt, our state of knowledge is not much different than what it was a century ago. For Limes Transalutanus the archaeology did not produce, so far, any relevant information; as about what concerns the connection routes between the two lines of forts, there have been proposed only some sketchy hypotheses, though never tested on the ground.

The research project Limes Transalutanus, granted beginning with July 2014, for the next two years, does not have among its objectives – the identification of roads running along the Roman border during the first half of the third century. For this occasion, however, we will try to build a theoretical frame for hunting the roads connecting the two lines – Limes Alutanus and Limes Transalutanus. The problem is far of being a simple one, if only looking at the next fact: we have to explore a territory of 54139 km², which is the equivalent of an average county. What to do first?

Understanding roads as strategic ancient interpretations of the surrounding environment, we will focus on bringing together data that might reveal this significant relation: archaeological evidence, the toponymic evidence, and, of course, the Geography itself, either seen in historical cartographic data, either modern, quantified with various technologies for field data acquisition and processed in geostatistical analyses. Following this theoretical exploration we will see if we have – or not yet – a feasible hypothesis to be checked on the field.

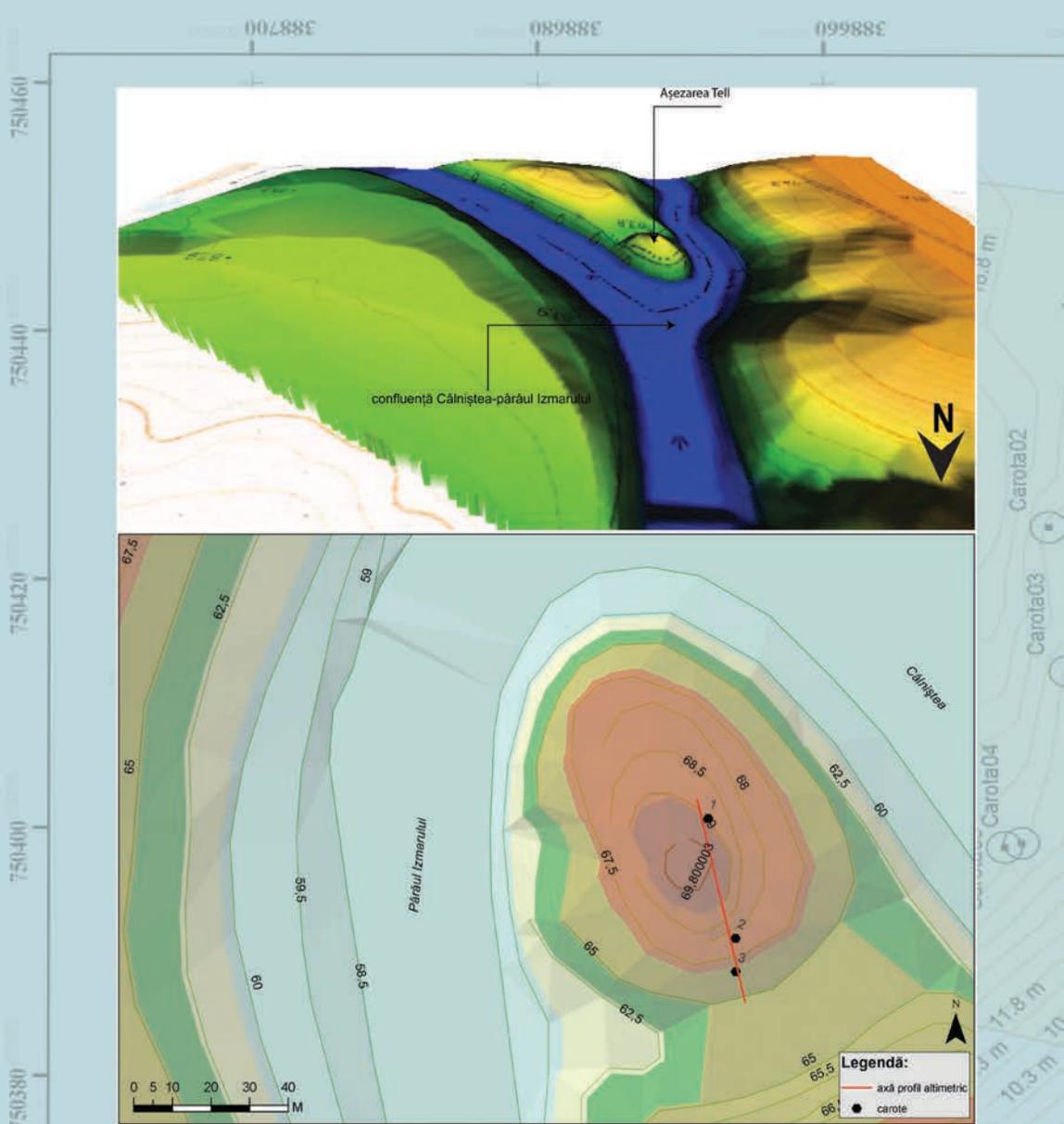
Low cost remote sensing for large-scale high resolution landscape modelling

by Ronny WEBLING

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Crazy eye perspectives*

Conventional satellite or aircraft based remote sensing methods provide data at a scale that is usually sufficient for landscape visualization but not for detailed feature inspection. Modern image collection and image processing techniques offer a low cost approach to construct high resolution and photo-realistic topographic datasets not only of archaeological sites but of wider landscapes. The generated models can be used for general mapping, landscape visualization and spatial analysis, as well as for inspection of relief details and modelling of geomorphological changes.

In this study it is described how UAVs and kites can be applied to create aerial imagery of large areas and how the resulting photographs can be used to construct digital terrain models of the archaeological landscape. Besides imagery capturing and processing workflows, the possibilities but also the limitations of Low Altitude Aerial Photography and Image Based Modeling are illustrated on the basis of different case studies. It is also shown which approaches have been chosen to adapt to the diverse landscapes in terms of wind and light conditions, vegetation, barriers and obstacles. Selected examples demonstrate how to critically interpret the computed 3D-models, e.g. how to recognise artefacts.



Tell-ul neolitic de la Naipu, jud. Giurgiu, ridicare topografică (proiect Chronos, cod 3282, 2008-2011)

