ISAP NEWS

The newsletter of the International Society for Archaeological Prospection

Issue 9, October 2006

Contents

Editor's Note P1
Louise Martin

Wrecks on the Seabed Round 2: Search for the Thomas Lawrence P2
Paul Baggaley

Resistance and Magnetic surveying with the MSP40 Mobile Sensor Platform at Kelmarsh Hall P3
Roger Walker and Paul Linford

Update on GPR Licensing Issues P5
Chris Leech

Conference, Seminar and Course Announcements P5

Commercial Advertisements P11

Journal Notifications P12

Editor's Note

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My thanks to this quarter's contributors; it's great to see the range of topics covered by the articles and forthcoming meetings and seminars. I hope you find something of interest in the following pages. There are just a couple of things I'd like to add:

Firstly, congratulations to Chris Gaffney and John Gater on their honorary doctorates! See http://www.brad.ac.uk/acad/archsci/depart/gaffney_gater.php for more details.

And secondly, I am pleased to announce that there will be several bursaries available for the day meeting in December "Recent Work in Archaeological Geophysics" (see page 7 of this newsletter). ISAP student members will have their conference fee sponsored and there will be a £50 prize for the best poster, to be awarded on the day. Further information about the bursaries will be available on the ISAP website http://www.archprospection.org/.

If you would like to submit an article, advert or announcement for the next issue, please email content to me by 19th January 2007.

Wrecks on the Seabed Round 2: Search for the Thomas Lawrence

Paul Baggaley, Wessex Archaeology, UK p.baggaley@wessexarch.co.uk

Wessex Archaeology, funded through the Aggregate Levy Sustainability Fund by English Heritage, are undertaking research into the use of marine geophysical techniques to assess, evaluate and record ship wreck sites. The research aims to trial frameworks for marine archaeological investigations as part of the marine aggregate license application process.

The project has a number of objectives including trialling different geophysical survey specifications and equipment over a variety of charted wreck sites and also over an area thought to contain an ephemeral wreck site; the Thomas Lawrence.

A 2km x 2km area of seabed was selected for an investigation into area survey methods. The survey area was thought to contain the wreck of the Thomas Lawrence, a Danish wreck sunk off the south coast of England in 1862, possibly as the result of a collision. The Thomas Lawrence was a wooden hulled vessel with copper plating and was approximately 24m long and 7m wide and reportedly lying at a depth of approximately 27m according to the United Kingdom Hydrographic Office (UKHO). The wreck was partially excavated and surveyed in 1984 by staff from the National Maritime Museum of Denmark, but it has not been found since despite a number of attempts. Its exact location is uncertain with five recorded positions known for the site, the three most recent of which all lie within 200m of each other.

Figure 1. Klein 3000 sidescan sonar towfish being deployed from vessel.

Sidescan surveys (sss) were undertaken using a Klein 3000 sidescan sonar (Figure 1) at a 50m line spacing, operating at both 500kHz and 100kHz simultaneously. Magnetometer data were also collected but at a 25m line spacing and with the magnetometer towfish kept as close to the seafloor as possible. Finally, multibeam data were collected over the site using a Reson 8125 system. These surveys produced a data set which had a considerably higher resolution than that which would normally be acquired for a marine aggregate licence application and highlighted a number of anomalies which require further investigation of which just two are discussed here.

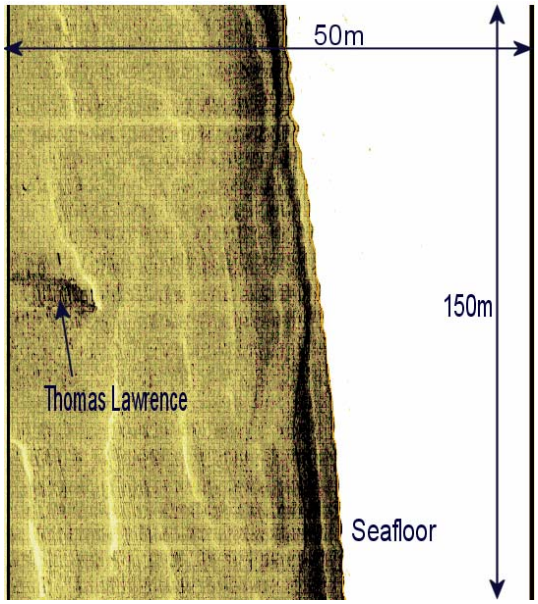


Figure 2. Sidescan sonar data for the area around the Thomas Lawrence.

A sss anomaly (Figure 2) was found 30m west of the most recent recorded position and was interpreted as the site of the Thomas Lawrence even though it was measured only half of the expected length and showed limited evidence of structure. No magnetic anomaly was associated with this site even though some of the wrecks fittings and cargo are likely to be ferrous.

A similar sss anomaly (Figure 3) was found 600m away to the east, surrounded by even larger sand waves but with an associated magnetic anomaly of 7nT indicating that this site is likely to be another wooden hulled vessel with ferrous cargo or fittings.

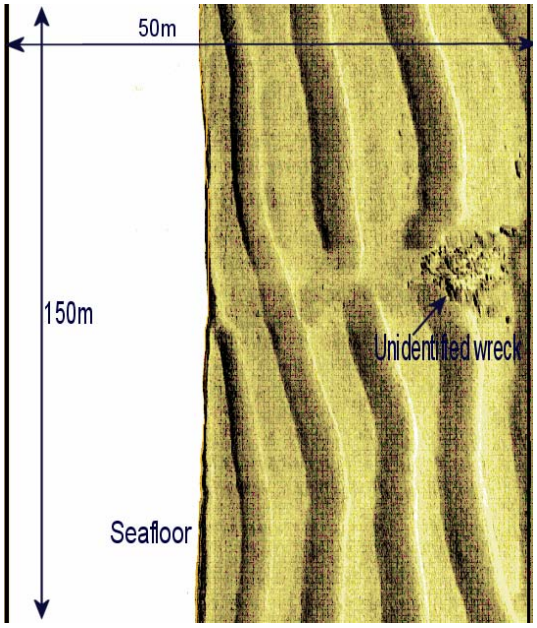


Figure 3. Sidescan sonar data showing the unidentified wreck and surrounding sand waves.

However, there are no reported wrecks at this site and further investigation by either divers or a Remotely Operated Vehicle (ROV) would be required to investigate the true nature of this site and confirm the presence of the Thomas Lawrence.

The high resolution multibeam data acquired over both of these sites did not detect either of them as they were not upstanding from the seafloor, showing that a combination of survey techniques are required to locate and understand such sites.

Resistance and Magnetic surveying with the MSP40 Mobile Sensor Platform at Kelmarsh Hall

Roger Walker, Geoscan Research, Bradford, UK roger@geoscan-research.co.uk
Assistance by English Heritage's Geophysics Team paul.linford@english-heritage.org.uk

Introduction

A large scale geophysical survey undertaken in 2005 by English Heritage (Martin and Payne 2005) at Kelmarsh Hall, Northamptonshire, provided an opportunity to compare the performance of the new MSP40 Mobile Sensor Platform with established survey techniques. The survey site is part of an extensive but now deserted, medieval settlement in the environs of Kelmarsh Hall. An area with visible medieval earthworks was selected for survey which was sheep pasture with short grass. The site lies on slowly permeable, seasonally waterlogged clayey soils of the Fladbury 1 association, developed over Upper Lias Clay.

Survey Method

The site was divided into 30m grids and all traverses were made at 1m separations. A conventional 0.5m Twin-Electrode survey was conducted by English Heritage, with readings being taken at 1m sample intervals. A slightly larger area was then surveyed using the MSP40, which comprises a four-wheeled resistance array, upon which a fluxgate gradiometer is also mounted to collect simultaneous magnetic data, figure 1.

Figure 1. MSP40 System

The resistance data were collected in the square array configuration (electrode separation of 0.75m)

at 0.5m sample intervals; two sets of square array data, alpha and beta, were collected simultaneously using a special multiplexer. Gradiometer data were collected with an FM256 at 0.25m sample intervals. An encoder system on one of the wheels was used to trigger data collection. MSP40 traverses were made in zig-zag mode and speed was about 1s/m resulting in each 30m grid being surveyed in about 25 minutes by one person. An earlier prototype of the system is described by Walker, Gaffney, Gater and Wood, 2005.

Results

Figure 2 shows the processed data sets. Resistance data processing included despiking, destaggering and a positional shift to correlate the relative positions of alpha and beta data. Gradiometer data processing included Zero Mean Traverse, a positional shift to correlate the data position with that of the resistance data and interpolation.

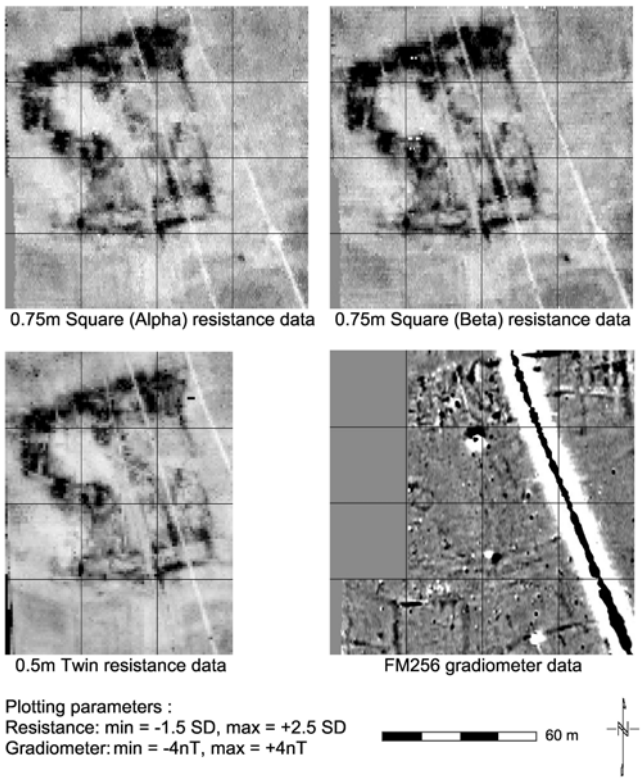


Figure 2. Comparative plots for Square (alpha and beta), Twin and gradiometer.

The resistance data clearly indicate the presence of a range of buildings possibly pointing to an early manor house, preceding the current Hall which lies about 150m away. The extant medieval platforms are visible within the data sets. Three diagonal low resistance anomalies can also be observed which could be interpreted as either field drains or pipelines. It can be seen that there is extremely good overall correlation between the Twin and Square data sets. As has been found on other sites, the alpha and beta data sets show a good overall correlation with one another but there are fine directional differences to be observed. For example the eastern drain/pipeline shows more clearly in the beta data set and other subtle differences can be observed on closer inspection. The gradiometer data set provides complimentary data, and also shows the position of the medieval platforms. Only one of the three diagonal drains/pipelines shows up as a ferrous response, strongly indicating the position of a known pipeline.

Conclusions

The MSP40 made it possible to do a rapid and detailed combined resistance and magnetic survey using just one operator, significantly reducing survey time if both resistance and magnetic data sets are required. Comparison with the Twin data indicates good confidence can be placed in the data and that the square array is a viable alternative to the Twin-Electrode array. Even greater speeds are achievable if the time based sample triggering is used (traverse speeds as fast as 0.7s/m for the same sampling interval). The MSP40 offers the capability of measuring both alpha and beta data sets, which may be combined, and can provide important directional information for near surface structures (Aspinall and Saunders, 2005).

Acknowledgements

The authors are grateful to the Kelmarsh Estate for allowing access to the site and to English Heritage for making this survey comparison possible.

References

Aspinall A, Saunders M, 2005. Experiments with the square array. *Archaeological Prospection* 12(2): 115-129.

Martin L, and Payne, A, 2005. Kelmarsh Hall, Northamptonshire: Report on Geophysical Surveys, May and August 2005. *English Heritage Research Department Report* 66/2005.

Walker R, Gaffney C, Gater J, Wood E, 2005 Fluxgate gradiometry and square array resistance survey at Drumlanrig, Dumfries and Galloway, Scotland. *Archaeological Prospection* 12(2): 131-136.

Update on GPR Licensing Issues

Chris Leech, Chairman, EuroGPR trade association chairman@eurogpr.org

As promised, here is an update to the licensing of GPR systems.

As of 1st September 2006 Ofcom have now initiated a licensing regime, which costs £50. I have appended a link here to the relevant Ofcom page. It is a simple form to fill in, and you can either pay on-line or print off the form and send a £50 cheque to Ofcom.

There are the following stipulations of use:

- The user must be a professional and trained person.
- You must adhere to a code of conduct in the use of the equipment which is the same code as the EuroGPR code of ethics.
- You must keep a log of usage of the GPR, which could be demanded by Ofcom at any point in case of interference issues
- You cannot use it within 4km of a radio astronomy site (a map showing the locations and exclusion zones is shown on the Ofcom site, there is a small exception to this rule, but for anyone doing an archaeological survey it would not apply unless special permission is granted from Ofcom.
- You must get specific permission for use at any airport and any Prison facility
- The instrument must be in a non-transmitting state when not actually in survey use.

The web link is:
http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/rlans/gprlicences/

This gets you to the page where you can download all relevant information

Note, this only applies to UK usage, negotiations are still ongoing at a European level, and it will be the case that each national licensing body will require separate licensing, at this point we do not expect that a user can get a pan European GPR licence.

Conference, Seminar and Course Announcements

Visualisation and Remote Sensing: The Launch of an Internet based Seminar Series Anywhere in the World, from 25th October 2006

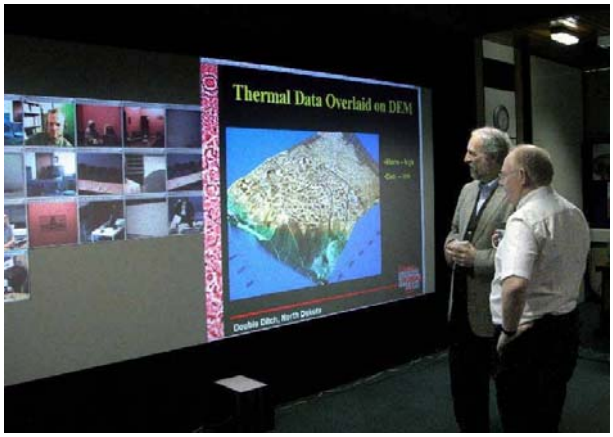
During the last year or so the HP VISTA labs in Birmingham have organised a number of seminars on remote sensing in archaeology across the Access Grid.

For those who are unaware of the Access Grid it is way to support multi-site interactive conferencing over the Internet and is especially valuable for collaborative projects spanning many sites, regardless of location. Some pertinent features of this system are:

• Internet based - no setup or conference costs
• Scalable from studio nodes using commercial software to desktop nodes using free client software
• Sophisticated compression – low latency and can be used over broadband
• Collaborative features include shared PowerPoint presentation, whiteboard and chat facilities
• Can be used alongside Virtual Network Computing to provide direct access to analytical or other software in real time.

Essentially, this is an ideal way to share information, host interactive seminars and generally keep up to date at a low cost and at the international level. What do you need to tap into the Access Grid? There are different levels of access, but a the most basic level (a personal node) you just need:

•A broadband internet connection – at least 1 Mb
•A good web cam
•Speaker system
•Microphone or headset



Vince Gaffney and Ken Kvamme setting up for a seminar using Grid Access

The HP Vista labs have acquired funding to set up a new seminar series on Visualisation and Remote Sensing. This activity is now being supported by the AHRC ICT Methods Network (http://www.methodsnetwork.ac.uk/index.html) which is providing funds to support administration of the seminars. The goal of the seminars is to bring academics, practitioners and hardware and software suppliers together to discuss any aspect of remote sensing methodology or applications. Clearly this is at the core of ISAP's members' activity.

At present the line up for the seminar series is still to be formalised, but you can be sure that this seminar series will contain a great deal for every member of our society. The main source of further information on the series is held at http://www.iaa.bham.ac.uk/Computing/HP_VISTA/Seminars/access_grid_seminars.htm. However, updates will be posted on the ISAP Forum and in our Newsletter. Although the programme is still to be finalised, the Inaugural Seminar will be:

Geophysics and Remote Sensing: their role and future within Archaeology. Dr Chris Gaffney October 25th 5:15pm (UK time).

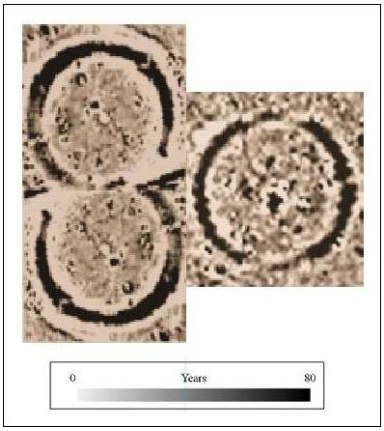
If you have the technology then please join me at the HP VISTA Virtual Venue. If you are interested in attending this or any other seminar or require any information on accessing the Virtual venue, please mail Helen Goodchild at H.Goodchild@bham.ac.uk.

As part of the funding from the Methods Network group have also provided a small amount of funding to provide webcams and echo-cancelling microphones for institutional participants. Sadly, it will not be possible to sort out this funding before the inaugural seminar, but I will let the membership know how to apply for a small grant for this hardware in due course. If there are any questions I can help you with then please mail me at c.gaffney@yahoo.com.

Dr Chris Gaffney, Vice Chair ISAP and Seminar Organiser

From Artefacts to Anomalies: Papers inspired by the contribution of Arnold Aspinall. University of Bradford, UK, 1st & 2nd December 2006

In order to mark the recent 80th birthday of one of ISAP's first Honorary Members, Arnold Aspinall, friends and colleagues will meet in Bradford later this year for two days of celebrations.



As you will all know Arnold has been a mainstay in archaeological geophysics for about 40 years. Those who have read the ISAP citation (Newsletter 5) will know that he had his fingers in many pies during the formative years of archaeological science and a whole generation of Bradford graduates have benefited from his vision of archaeology as a scientific subject. The papers that will be presented in his honor will cover much of the full field of Arnold's interests and the speakers will be looking as much to the future as the past.

Those participating in the celebrations include Prof Mark Pollard, Prof John Hunter, Dr Keith Manchester, Prof Carl Heron, Dr Armin Schmidt, Dr Steve Dockrill, Dr Julie Bond, Prof Peter Addyman , Prof Rosemary Cramp, Dr Andrew David, Dr Paul Spoerry, Dr Roger Walker, Dr Tim Sutherland, Dr Sue Ovenden-Wilson, Dr Chris Gaffney, Prof Vince Gaffney and Dr John Gater.

The organizing committee warmly welcomes ISAP members to this celebration. For more details: http://www.brad.ac.uk/archsci/conferences/aspinall/

EIGG and Forensic Geology Group Day Meetings. London, UK: 19 and 20 December 2006

RECENT WORK IN ARCHAEOLOGICAL GEOPHYSICS, GEOLOGICAL SOCIETY, BURLINGTON HOUSE, LONDON, 19 DECEMBER 2006

Lecture Programme:

0930-1000 Registration and Coffee.

1000-1005 Introduction.

1005-1025 *Magnetic surveying of the archaeological sites in the Nile Delta, Egypt*: Tomasz Herbich.

1030-1050 *The Corridor of the Great Hunting Scene, Villa del Casale (Piazza Armerina)* P.L. Cosentino, P. Capizzi, G. Fiandaca, G. Graziano, R. Martorana, P. Messina, L. Pellegrino, I. Razo Amoroz, E. Scalone.

1055-1115 *Survey on Rome's Northern Frontier: results from the Antonine Wall*: Richard Jones, Alan Leslie and Chris Nelson.

1120-1150 Coffee

1150-1210 *Seabed Prehistory*: Louise Tizzard.

1215-1235 *Wrecks on the Seabed*: Paul Baggaley.

1240-1300 *Underwater GPR*: Alastair Ruffell.

1305-1420 Lunch

1420-1440 *Hod Hill Reappraised – A multi-method geophysical analysis to assess the effects plough damage and implications for the investigation of hillfort settlement zonation using magnetic methods*: Dave Stewart and Paul Cheetham.

1445-1505 *A SQUID-based system for fast and sensitive geomagnetic archaeometry*: Volkmar Schultze, Sven Linzen, Tim Schüler, Andreas Chwala, Ronny Stolz, Marco Schulz, Hans-Georg Meyer.

1510-1530 *Ground penetrating radar for multi-hectare archaeological prospection*: Tim Archer.

1535-1605 Tea

1605-1625 *Slack Roman Fort: Making sense of magnetic noise*: Armin Schmidt, Rob Vernon, Roger Walker, Lieven Verdonck and Arnold Aspinall.

1630-1650 *Geophysical Investigation 17th Century Copper Workings at Levers Water Mine, Cumbria, UK*: Jack Walpole, Phil Meredith & Ruth Siddall.

1655-1715 *Buckingham – Holyroodhouse – Windsor. Investigations at three Royal Palaces*: GSB Prospection and Geoscan Research.

1720-1740 *It's been a long walk - 1000 hectares of magnetic surveying in the Vale of Pickering*: James Lyall.

1745 Conclusion

1800 Depart

1800-1900 ISAP AGM (to be confirmed)

Posters:

In the Shadow of the Hill: Geophysical investigations of the environs and moat area of the prehistoric mound at Silbury Hill: Neil Linford, Paul Linford, Louise Martin and Andrew Payne.

A ground penetrating radar survey at Gayton Thorpe, Norfolk: Tim Dennis, M de Bootman, J Simmons and J Shepherd.

Where is It? Using Multiple Geophysical Techniques and GIS Data Enhancement in the Search for a 18th Century Paper Mill, Lisburn, N.Ireland: Paul McCarthy, Alastair Ruffell, Steve Trick, Lorraine Barry, Alison Muir, John McKinley, Jennifer McKinley.

Improving definition: GPR investigations at Westminster Abbey: Erica Utsi.

Electrical Fast Imaging for Wide Areas, Test Over an Archaeological Site and Application Over a 50ha Site (in less than a month). M. Dabas, A. Favard.

Using multi-sensor surveys for archaeological applications: case studies using different sensors, and different survey modes: Ian Hill and Chris Leech.

Geophysical prospection at the Pre-Roman site of Satricum (central Italy): the multi-scale applications of electrical resistivity tomography for geo-archaeological investigations: R Abdul Fattah.

The Greenhouse Effect: the addition of nutrients to clay soils and its Influence on resistivity survey: Michiel Dekker

Intra-site Magnetic Susceptibility - survey of a Herefordshire Enigma: Martin and Anne Roseveare

Ground Penetrating Radar in Urban Areas - Friars Lane, Great Yarmouth: Ken Hamilton

Three-Dimensional, Multi-Offset GPR Imaging of Archaeological Targets: Groundwell Ridge, Swindon: Adam Booth

Magnetometry Near the Equator. Jorg Fassbinder et al.

Commercial displays:
Allied Associates Geophysical Ltd.
Geoscan Research Ltd.
Stratascan Ltd.
Geomatrix Earth Science Ltd.

Attendance at the Meeting will be free to members of the Geological Society and JAG. All others must pay an entrance fee of £20.00 (£10.00 for students). For those wishing to attend the subsequent day's meeting on Geoscientists at Crime Scenes the fees for both days will be £30 (£20 for students). Lunch is provided for speakers only.

For further information on the programme of lectures for The Geoscientist at Crime Scenes on the 20th December: http://www.geolsoc.org.uk/template.cfm?name=FG349574

Whilst it is possible to turn up on either day and pay at the door, we'd encourage people to register in advance using the attached form, please.

ENVIRONMENTAL AND INDUSTRIAL GEOPHYSICS GROUP

EIGG

Environmental & Industrial Geophysics Group

Two day meetings at Burlington House, Piccadilly, London: 19th–20th December 2006

I would like to register for attendance at the following day meeting(s):

19th December: *Recent Work in Archaeological Geophysics* ☐

20th December: *Geoscientists at Crime Scenes* ☐

Participant details:

Title *First name* *Surname*

Address:

Telephone number:

Email address:

Method of payment: (unfortunately we cannot accept credit/debit card payments)

I am enclosing a cheque (made payable to EIGG). I understand that this will not be cashed until after the day meetings have taken place. ☐

I wish to pay on the day (by cash or cheque) ☐

Registration fee:

Geological Society member – membership number:	Free	☐
Non-member – 1 day	£20	☐
Non-member – 2 days	£30	☐
Student – 1 day	£10	☐
Student – 2 days	£20	☐

Signature: Date:

Please return to: Louise Martin, English Heritage, Fort Cumberland, Eastney, Portsmouth, PO4 9LD, UK by 1st December 2006.

National Park Service's 2007 Archaeological Prospection Workshop. HAMMER Training Center, Richland, Washington, May 14-18, 2007

The National Park Service's 2007 workshop on archaeological prospection techniques entitled Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century will be held May 14-18, 2007, at the HAMMER Training Center, Richland, Washington. Lodging will be at the Guest House on the Pacific Northwest National Laboratory campus, Richland, Washington. This will be the seventeenth year of the workshop dedicated to the use of geophysical, aerial photography, and other remote sensing methods as they apply to the identification, evaluation, conservation, and protection of archaeological resources across this Nation. The workshop this year will focus on the theory of operation, methodology, processing, interpretation, and on-hands use of the equipment in the field. There is a tuition charge of $475.00. Application forms are available on the Midwest Archeological Center's web page at http://www.cr.nps.gov/mwac/.

For further information, please contact Steven L. DeVore, Archeologist, National Park Service, Midwest Archeological Center, Federal Building, Room 474, 100 Centennial Mall North, Lincoln, Nebraska 68508-3873: tel: (402) 437-5392, ext. 141; fax: (402) 437-5098; email: steve_de_vore@nps.gov

Commercial Advertisements

Journal Announcements

Archaeological Prospection

The last issue of the year of Archaeological Prospection provides data and interpretation on a diverse range of prospecting techniques in alluvial environments. Guest Editors, Keith Challis and Andy Howard, have collected a number of papers that will expand your knowledge of a part of archaeology that has often been seen as a challenging area for all forms of ground based and more remote sensing. Among the papers are

Keith Challis and Andy Howard. 'A Review of Trends within Archaeological Remote Sensing in Alluvial Environments'.

Chris Carey et al. 'Predictive modelling of multi-period geoarchaeological resources at a river confluence: a case study from the Trent-Soar, UK.'

Simon Crutchley. 'Lidar in the Witham Valley, Lincolnshire: An assessment of new remote sensing techniques.'

Benjamin R. Vining and James Wiseman. 'Multispectral and SAR remote sensing-based models for Holocene coastline development in the Ambracian Gulf, Epirus, Greece.'

Dominic Powlesland et al. 'Beneath The Sand; Remote Sensing, Archaeology, Aggregates and Sustainability: A case study from Heslerton, the Vale of Pickering, North Yorkshire, UK.'

David Passmore et al. 'Enhancing the evaluation and management of river valley archaeology; geoarchaeology in the Till-Tweed catchment, northern England.'

Margaret Watters. 'Geovisualization: an example from the Catholme Ceremonial Complex'

As usual details of the massive reduction in a personal subscription to Archaeological Prospection can be found in the 'for members' section of the ISAP website.

Dr Chris Gaffney