



McDonald Institute for
Archaeological Research



Universidad
de La Laguna

International workshop on GIS, Remote Sensing and Geoarchaeology

14-19 November 2019

Department of Archaeology, University of Kerala

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In recent years the study of **past archaeological landscapes** has experienced an unprecedented improvement thanks to the advances in quality and resolution of scientific instruments. From remote sensing-based studies covering **large areas** to the **microscale observations** of geoarchaeological investigations, archaeologists have today access to a range of distinct but complementary techniques and data analyses. The integration of **interdisciplinary** methods has become a key aspect in archaeological research, as well as the inclusion of multi-proxy, multi-scalar and multi-temporal data.

Within this perspective, the workshop aims to provide a basic introduction into the broad discipline of landscape archaeology. A selection of talks will reflect the expertise of the invited speakers in different **archaeological contexts** (ranging from Neolithic pastoral contexts, the Indus Civilisation, the classic Mediterranean world or the nomadic empires in Mongolia) and distinct **ecological settings** (including dry deserts, green steppes, mountains and caves).

Hands-on exercises will focus on the multi-scale applications of 1) **GIS and remote sensing**, including geospatial analyses and data visualisation, and 2) **geo-ethnoarchaeology**, including applications of soil micromorphology and soil biochemistry. The workshop intends to offer a starting point for students wishing to expand their current research into a more quantitative landscape approach.

INVITED SPEAKERS

Francesc C. Conesa, *McDonald Institute for Archaeological Research, University of Cambridge*

Arnau Garcia-Molsosa, *McDonald Institute for Archaeological Research, University of Cambridge*

Natalia Égüez, *Archaeological Micromorphology and Biomarker Research Lab, University of La Laguna*

COLLABORATORS

Cameron Petrie, *McDonald Institute for Archaeological Research, University of Cambridge*

Hector Orengo, *Catalan Institute for Classical Archaeology*

Adam Green, *McDonald Institute for Archaeological Research, University of Cambridge*

Agustin Lobo, *Spanish National Research Council*

ORGANIZERS

Rajesh S. V., *Department of Archaeology, University of Kerala*

Abhayan G.S., *Department of Archaeology, University of Kerala*

WORKSHOP PROGRAMME

Thursday 14

- 9:30-11h** **Introduction to workshop** (FC)
 Introduction to Landscape Archaeology and GIS (AG)
- 11-11:30h* *Tea break*
- 11:30-13h** **Introduction to remote sensing** (FC)
 Landscape archaeology and water management in deserts (FC)
- 13h-14h* *Lunch break*
- 14-16:30h** **QGIS practical**
 1. Forms and data collection using mobile platforms (GisCloud)
 2. Georeferencing historical maps (Survey of India)
 3. Feature extraction from maps (topography, hydrology, land cover)
 4. Data visualization and evaluation
- 16:30-17h* *Tea break and Q&A*

Friday 15

- 9:30-11h** **Presentation of case studies:**
 1. Rivers and settlements (Punjab/Catalonia) (AG)
 2. The Cholistan Desert (FC)
 3. Advances in UAVs and automated field survey (AG)
- 11-11:30h* *Tea break*
- 11:30-13h** **Explore online spatial datasets**
 1. How to get open access data (e.g. DIVA GIS, Bhuvan, Earth Engine, Sentinel Hub) (FC)
- 13h-14h* *Lunch break*
- 14-16:30h** **Earth Engine and QGIS practical**
 1. Basic GEE coding: visualise and download DEMs and satellite data
 2. Kerala dolmens database
 3. QGIS integration
 Tea break and Q&A

Saturday 16

- 9:30-11h** **QGIS practical**
 1. Site visibility and cost analyses (Kerala dolmens)
 2. Map composer and landscape interpretation
- 11-11:30h* *Tea break*
- 11:30-13h** **3D photogrammetry practical**
 1. Agisoft Photoscan
 2. DEMs and orthophotos from Khatiya
- 13h-14h* *Lunch break*
- 14-16:30h** **Supervisions and Q&A**
- 16:30-17h* *Tea break*

Sunday 17

- 9:00-14h** Field trip to archaeological site (Department of Archaeology)

Monday 18

9:30-11h Explore spatial and archaeological data with R

1. Datasets in R
2. Basic description and graphics (plots)

11-11:30h Tea break

11:30-13h R and QGIS practicals

1. Geospatial datasets
2. QGIS mapping

13h-14h Lunch break

14-16:30h R and QGIS practicals*

Case studies from MA and PhD students
Supervisions

16:30-17h Tea break and Q&A

Tuesday 19

9:30-11h Current approaches to geoarchaeology and ethnoarchaeology (NE)

11-11:30h Tea break

11:30-13h Presentation of case studies:

1. Mobile pastoral sites from the Sahara to Mongolia (NE)
2. Prehistoric palimpsests: from fire technology to dung deposits (NE)
3. Ethnoarchaeology in high-mountain environments (AG)

13h-14h Lunch break

14-15h Geoarchaeology practical

1. How to interpret soil profiles, thin sections... and poo!

15h-16h Presentation of group exercises and Q&A

1. GisCloud map presentations
2. Showcase of ongoing research from students

16h-16:30h Final remarks and Q&A

16:30-17h Tea

*Other hands-on training depending upon time:

- Expand **GEE** data visualisation and analyses (e.g. band combination, SMTVI indexes, classification)

Required software

Links of latest open-source software versions to be distribute to participants shortly before the workshop. All exercises and training data will be hosted online in GitHub.



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