

## ARCHON courses Geoarchaeology 2018-2019

UNIVERSITY of  
STIRLING



Erasmus+

**CLUE+**  
RESEARCH INSTITUTE FOR  
CULTURE, HISTORY AND HERITAGE



**Teachers:** Professor Ian A. Simpson, (i.a.simpson@stirling.ac.uk)  
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*25-26 March 2019, location Vrije Universiteit Amsterdam, Monday room MF-A415 (Medical Building),  
Tuesday HG-0G30 (Main Building).*

**Reading Soils and Sediments: Global Geoarchaeology** (2 days), 2 ects

**Monday 25 March room MF-A415 (Medical Building)**

9.00 Introduction

Session 1: Seminars, reading global soils and sediments

Session 2: Geoarchaeology field examples I

Session 3: Guided preparation of student presentations, 17.00 end

**Tuesday 26 March room HG-0G30 (Main Building)**

9.00 Session 4: Geoarchaeology field examples II

Session 5: Guided preparation of student presentations, mini-presentations of teachers

Session 6: Student presentations on research projects with a geoarchaeological focus, 17.00 end.

**Assignment:** To build a presentation relating archaeological research problem to geoarchaeology methods

**Assessment:** 50% presentation, 50% final exam

**Introduction:**

Geoarchaeology is a growing and evolving research discipline at the intersection between geomorphology, environmental history and archaeology (Butzer, 2008). Geoarchaeology as a research field continues to grow as analyses and techniques more typically used in earth and environmental sciences are shown to have use in interpreting the archaeological record (Diskin et al, 2013). According to Engel & Brückner (2014) geoarchaeology is ‘the science that studies geo-bio-archives in an archaeological context by also considering historical and archaeological data sources in its syntheses’, and they emphasize its multidisciplinary role, as a sub discipline of geomorphology, between the geosciences and cultural sciences. Geoarchaeology provides important new insights into landscape reconstruction, human behaviour, and cultural processes that are a backdrop to landscape change (Kluiwing et al, 2015).

### **Objectives:**

This course gives theoretical frameworks for interpreting soils, sediments and landscapes as records of the past and provides theoretical training in field and laboratory methods that identify, quantify and evaluate early human activities and environmental imprints. These understandings and skills contribute new landscape histories for Mediterranean and Middle-East regions. This work offers important and challenging perspectives on how people lived with and adapted to environmental change and has resonance with contemporary debates on sustainability, resilience and heritage management.

### **Learning outcomes:**

- Understanding the principles of interpreting landscapes and sediment stratigraphies as records of the past.
- Understanding the contributions of landscape studies and sediment analyses in the interpretation of key aspects of landscape history including site formation processes, early arable land management practices, water management and human niche construction.
- Ability to integrate landscape histories and sedimentary evidence with inter-disciplinary sources, including documentary, archaeological and environmental information, to address broader issues of society – environment change interactions.
- The module provides a foundation for research-based field and laboratory Dissertation topics in geoarchaeology and landscape history.

### **Acquired skills:**

- Competence in the application of science based methods to answer archaeological research questions.
- Competence in the description, analyses and interpretation of soils and sediments from archaeological contexts.
- Competence in cross-disciplinary approaches applied to questions of society-environment interactions.

### **Research – led elements:**

The 2-day module is entirely research led, with each lecture based on a series of research papers and referred to a live, current, research project. The module also leads directly into research dissertation topics with the opportunity to present your own research area in a geoarchaeological context.

### **Seminar programme:**

Files with the seminar presentations as well as the reading lists and other materials will be available beforehand.

#### Monday 25 March, room MF-A415 (Medical Building)

9.00-9.30 hours: Opening; welcome, instructions

##### *Contexts*

9.30-12.00 session 1 – Soil/ sediment stratigraphies in geoarchaeological and landscape history contexts.

12.00-13.00 hours: lunch break

##### *Geoarchaeologies of all regions*

13.00-15.00 hours: session 2 –NW European and Mediterranean geoarchaeology

15.00-17.00 hours: session 3 – Guided preparation of student presentations I

#### Tuesday 26 March, room HG-0G30 (Main Building)

##### *Geoarchaeologies of all regions*

9.00-10.30 hours: session 4 –Middle Eastern and American geoarchaeology

10.30-12.00 hours: session 5 – Guided preparation of student presentations II

12.00-13.00 hours: lunch break

13.00-17.00 hours: session 5 – Student presentations of 15 minutes each.

17.00-19.00 hours Final Exam

### **Assessment:**

50% examination (2 questions; 2 hours, 25% each) / 50% presentation. Students are encouraged to use their own research and dissertation projects. The minimum grade to obtain a pass for a module is a 60% score

### **Admission, logistics**

Students can administer for this course by contacting the ARCHON office at [secretary@archonline.nl](mailto:secretary@archonline.nl).

Any questions relating to the content of the course can be sent to Sjoerd Kluiving, [s.j.kluiving@vu.nl](mailto:s.j.kluiving@vu.nl).

The course will finish with a final exam to be completed in the course. The location of the course is in room MF-A415 (4<sup>th</sup> floor of Medical Building) on Monday and in room HG-0G30 (ground floor Main Building at the VU University Amsterdam, De Boelelaan 1079-1085, 1081 HV Amsterdam, see for route and travel descriptions <http://www.vu.nl/en/about-vu-amsterdam/contact-info-and-route/route-description/index.asp>

## Reading:

Reading for this unit is found as general texts on geoarchaeology and environmental history giving context to the module, and as research papers. It is **strongly recommended** that the references are read prior to the lecture / seminar session as a foundation for discussion.

### 1. Soils, sediments and environmental history

Anderson, D.E., Goudie, A.S. and Parker, A.G. (2013). *Global Environments through the Quaternary*. 2nd Edition, ISBN: 978-0-19-969726-7. Oxford University Press.

Goldberg, P. and Macphail, R. I., (2006). *Practical and Theoretical Geoarchaeology*. ISBN: 978-0-632-06044-3. Blackwell.

Roberts, N., (2014). *The Holocene: An Environmental History*. 3rd Edition, ISBN: 978-1-4051-5521-2 Wiley-Blackwell.

Waters, C.N., Zalasiewicz, J.A., Williams, M., Ellis, M.A., and Snelling, A.M. (Eds.) (2014). *A Stratigraphic basis for the Anthropocene*. Geological Society, London, Special Publication 395. <http://sp.lyellcollection.org/content/395/1/1.full>

### 2. Geoarchaeology, general

Kluiwing, S.J., Engel, M., Heyvaert, V.M., Howard, A.J., 2015. Where earth scientists meet Cleopatra: Geoarchaeology and geoprospection of ancient landscapes. *Quaternary International*, 1-3.

Butzer, K.W., 2008. Challenges for a cross-disciplinary geoarchaeology: the intersection between environmental history and geomorphology. *Geomorphology* 101, 402-411.

Diskin, S., Heyvaert, V., Pavlopoulos, K., Schütt, B., 2013. Geoarchaeology: a toolbox of approaches applied in a multidisciplinary research discipline. *Quaternary International*, 1-3.

Engel, M., Brückner, H., 2014. Late Quaternary environments and societies: progress in geoarchaeology. *Zeitschrift für Geomorphologie, Supplementbände* 58, 1-6.

### 3. Mediterranean Geoarchaeology

Carrozza, J.M., Puig, C., Odier, T., Valette, P. & Passarrius, O. (2012). Lower Mediterranean plain accelerated evolution during the Little Ice Age: Geoarchaeological insight in the Tech basin (Roussillon, Gulf of Lion, Western Mediterranean). *Quaternary International*, Volume 266, pages 94–104,

Ghilardi, M, D. Psomiadis, S. Cordier, D. Delanghe-Sabatier, F. Demory, F. Hamidi, T. Paraschou, E. Dotsika, E. Fouache (2012). The impact of rapid early- to mid-Holocene palaeoenvironmental changes on Neolithic settlement at Nea Nikomideia, Thessaloniki Plain, Greece, *Quaternary International*, Volume 266, 17 July 2012, Pages 47-61, ISSN 1040-6182, <http://dx.doi.org/10.1016/j.quaint.2010.12.016>.

Groenhuijzen, M.R., Kluiving, S.J. & Gerritsen, F. (2015). Geoarchaeological research at Barcın Höyük: implications for the Neolithisation of northwest Anatolia. *Quaternary International*, 367, 51-61. doi: 10.1016/j.quaint.2015.03.001

Koopman, A., Kluiving, S.J., Holdaway, S.J. & Wendrich, W. (2016). The Effects of Holocene Landscape Changes on the Formation of the Archaeological Record in the Fayum Basin, Egypt. *Geoarchaeology*, 31(1), 17--33. doi: 10.1002/gea.21538

#### 4. Middle Eastern Geoarchaeology

##### *a) Neolithic Urbanisation - Iran*

Kourampas, N., Simpson, I.A., Nashli, H.F., Manuel, M. and Coningham, R. (2013). Sediments, soils and livelihood in a late Neolithic village on the Iranian Plateau: Tepe Sialk. In R. Mathews and H.F. Nashli (Eds.) *The Neolithisation of Iran: The Formation of New Societies*. pp. 189-200.

Maghsoudi, M., Simpson, I.A., Kourampas, N., and Fazeli, N.H. (2014). Archaeological sediments from settlement mounds of the Sagzabad cluster, central Iran. Human induced deposition on an arid alluvial plain. *Quaternary International* 324, 67-83.

Sharafi, S., Fouladvand, S., Simpson, I.A., Barcelo, J.A. (submitted). Application of pattern recognition in detection of buried archaeological sites based on analysing environmental variables: A case study in Khorramabad plain, SW Iran. *Journal of Archaeological Science Reports*.

##### *b) Greco-Roman-Byzantine urban transitions – Jerash Jordan*

Lichtenberger, A. and Raja, R. (2015). New Archaeological Research in the Northwest Quarter of Jerash and Its Implications for the Urban Development of Roman Gerasa. *American Journal of Archaeology*, 119(4), 483–500.

Lichtenberger, A., Lindroos, A., Raja, R., & Heinemeier, J. (2015). Radiocarbon analysis of mortar from Roman and Byzantine water management installations in the Northwest Quarter of Jerash, Jordan. *Journal of Archaeological Science: Reports*, 2, 114-127.

Lucke, B., Kemnitz, H., Bäumler, R. and Schmidt, M. (2014). Red Mediterranean soils in Jordan: New insights into their origin, genesis and role as environmental archives. *Catena* 112, 4-24.

#### 5. American Geoarchaeology

##### *a) Community resiliences: lessons from the past.*

Hegmon, M., Arneborg, J. Comeau, L., Dugmore, A., Hambrecht, G., Ingram, S., Kintigh, K., McGovern, T. Nelson, M., Peoples, M., Simpson, I., Spielmann, K., Streeter, R., Vésteinsson O. (2014). The Human Experience of Social Change and Continuity: The Southwest and North Atlantic in “Interesting Times” ca. 1300. In *Climates of Change: The Shifting Environments of Archaeology*, edited by S. Kulyk, C. Tremain, and M. Sawyer, pp. 53-68.

Nelson, M., Ingram, S.E., Dugmore, A.J., Streeter, R., Peeples, M.A., McGovern, T.H., Hegmon, M., Arneborge, J., Kintigh, K.W., Brewington, S., Speilmann, K.A., Simpson, I.A., Strawhacker, C., Comeau, L., Torvinen, A., Madsen, C.K., Hambrecht, G., Smiarowski, K. (2016). Climate Challenges, vulnerabilities and food security. *PNAS*, 113, 298-303.

Wilson, C., Simpson, I.A. and Currie, E.J. (2002). Soil management in pre-hispanic raised field systems: micromorphological evidence from Hacienda Zuleta, Ecuador. *Geoarchaeology* 17, 261-283.

*b) Landscape evolution, humans and change in domestication speeds and styles*

Beach, T. Sheryl Luzzadder-Beach, S., Thomas Guderjan, T., Krause, S. 2015. The floating gardens of Chan Cahal: Soils, water, and human interactions. *Catena* 132, 151-164.  
<http://dx.doi.org/10.1016/j.catena.2014.12.017>

Kistler, L., Shapiro, B. 2011. Ancient DNA confirms a local origin of domesticated chenopod in eastern North America. *Journal of Archaeological Science*, 38, 3549-3554.

Murphy L.R., Hurst S.C., Holliday, V.T., Johnson, E. 2014. Late Quaternary landscape evolution, soil stratigraphy, and geoarchaeology of the Caprock Canyonlands, Northwest Texas, USA  
*Quaternary International* 342 (2014) 57e72