



Department of Anthropology

ARCL 309: Archaeology of Collapse and Sustainability

Year: 2020 – 2021 (Term 2)

Course Schedule: Tuesday and Thursday 15:30-17:00 pm

Location: Online Zoom via Canvas

Instructor: Professor Zhichun Jing

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Office Location: Online Zoom Office via Canvas

Office Hours: Online Tuesday and Thursday 11:00 – 12:00 pm or by appointment

Course Description

Among the challenges facing humanity today is the sustainability of our coupled ecological and social systems. With its insights into tens of thousands of years of human activities in all parts of the globe, archaeology can provide unique and invaluable understandings of the sustainability of human societies. The archaeological record encodes hundreds of situations in which societies were able to develop long-term sustainable relationships with their environments, and thousands of situations in which the relationships were short-lived and mutually destructive. This course discusses the challenging issues of sustainability and collapse from an archaeological perspective. Following the discussion of fundamental concepts, issues and perspectives on resilience, vulnerability, adaptation, collapse, and reorganization, an array of alternative conceptual models and analytic approaches will be introduced to investigate coupled social and ecological systems in the past. We will examine selected cases of collapse and resilience among diverse kinds of ancient societies from American Southwest, Mesoamerica, the Mediterranean, Angkor, and Easter Island, assessing the interacting societal and environmental factors in transforming societies during the period of radical change often termed “collapse”. The discussion will emphasize the multi-causality of prehistoric and historical collapses, the diversity of human responses to environmental and societal crises, and the regeneration of complex societies after periods of decentralization and collapse.

Course Objectives

1. Students will become acquainted with basic concepts, diverse models and perspectives to define and explore research questions of human-environmental interactions in past societies.
2. Students will develop analytical skills to examine archaeological and ecological data, and to evaluate interacting factors contributing to the resilience and vulnerability of ecological, social and political systems in the past.
3. Students will improve their abilities to work together as a team and to demonstrate excellent written and oral skills in presenting an archaeological case study.

4. Students are expected to build up a fundamental understanding and deep appreciation of long-term perspectives that can inform contemporary sustainability issues and debates.

Prerequisite

There is no prerequisite for this course, and it is open to students from any major. However, either ARCL 103 Introduction to Archaeology or ARCL 203 Archaeological Methods are recommended prior to this course.

Course Format and Assessment

This course is a mix of lectures (50%) and group discussion sessions (50%). You are required to attend all the lectures and participate in group discussion. For most Thursdays, lecture is given to contextualize major themes and case studies to be discussed in the following week. Each lecture will be followed by group discussions on most Tuesdays. For group discussions, we will randomly divide the class into a number of groups, each consisting of 6 to 8 students, on a weekly basis.

Students must complete the assigned readings and come to the group session prepared for substantive discussion and debate with written “discussion points”. For discussion, talking in general terms rather than focusing on the assigned readings is simply not desired, particularly when you haven’t studied any readings for the subject to be discussed. Each student in the class will be asked to serve as a leading discussant twice throughout the whole term. Leading discussant(s) will be responsible for leading group discussions on the readings and asking questions of their fellow students. When you are a leading discussant, you must prepare a written synthesis (2 single-spaced pages) of main points or arguments, assumptions, and key concepts expressed in the assigned readings, as well as your own opinions or critiques on the subjects. Each written synthesis is counted as one of two required assignments for the class. You are required to revise the written synthesis based on the reactions from other students in your group, and the revised synthesis must be completed and submitted online by the following Tuesday.

There are group presentations in Weeks 13 and 14. Students will form groups by themselves, and each group should consist of 4 to 5 students. Each group will select one of case studies discussed in the class for more detailed discussion and analysis. A one-page proposal for each group must be submitted by the 5th of March 2021, detailing the names of group members, the case study selected for presentation, and a list of at least 10 relevant references (academic books and peer-reviewed articles). Each presentation will be limited to 20 minutes; and it can be given by one or more representatives of each group. For each presentation, everyone must submit his or her own written summary of the presentation (in the format of word document online through CANVAS). This written summary is equivalent to the research essay or term paper you would write in other classes. It should be 10 to 12 double-spaced pages, not counting the bibliography and title pages. The written presentation summary must be properly referenced, according to the style of *American Antiquity*. It will be due no later than the 16th of April 2021, and it must be submitted in the format of word document online through CANVAS. The presentation summary will be assessed on the basis of accuracy and relevance of the case to be discussed, your comprehension of research

questions and the approaches and methods utilized to address them, the organization and writing clarity of the summary, citation, and references.

A take-home final examination will be given on the 13th of April 2020, designed to evaluate your understandings of major perspectives and approaches investigating the resilience and collapse of past human societies. It is composed of essay questions. The final exam is due no later than the 20th of April 2021, and you must submit it in the format of word document online through CANVAS.

Grading

Grading will be based on attendance and participation in group discussion (20%), two written syntheses for leading group discussions (20), group presentation and written summary (35%) and take-home final examination (25%).

Extension

Assignment and exam deadline extensions will ONLY be granted with a documented medical excuse or for observance of a religious holiday recognized by the University (which requires the student to provide two-weeks advance notice to the instructor).

Academic Integrity

This course is intended to well serve students from diverse backgrounds. The materials to be discussed in the class are intended to be respectful of gender, age, ethnicity, culture, and perspective. You are expected to respect the opinions and beliefs of others in the class, including your fellow students and instructor.

Plagiarism and cheating are violations of the University of British Columbia Academic Policies and Regulations and carry penalties as severe as dismissal from the University. All students must uphold the University of British Columbia standards of student conduct. Please see the help on Academic Integrity & Plagiarism to understand this serious issue.

Required and Suggested Readings

All required readings will be made available on CANVAS. No specific textbook is required.

Course Schedule, Tentative Topics & Readings

(The schedule, topics and readings may be subject to change during the course of the term; * required readings)

WEEK 1 (12 & 14 January 2021) INTRODUCTION

* Kintigh, K. W., et al.

2014 Grand Challenges for Archaeology. *American Antiquity* 79(1):5-24.

Jackson, Rowan C., Andrew J. Dugmore, and Felix Riede

2018 Rediscovering lessons of adaptation from the past. *Global Environmental Change* 52:58-65.

Kerr, Sarah

2020 The future of archaeology, interdisciplinarity and global challenges. *Antiquity* 94(377):1337-1348.

Rick, T. C., and D. H. Sandweiss

2020 Archaeology, climate, and global change in the Age of Humans. *Proceedings of the National Academy of Sciences of the United States of America* 117(15):8250-8253.

van der Leeuw, Sander

2020 *Social sustainability, past and future: undoing unintended consequences for the earth's survival*. Cambridge: Cambridge University Press (Chapter 2. Defining the challenge, pp. 15-29).

WEEK 2 (19 & 21 January 2021) WHAT IS COLLAPSE?

* Middleton, Guy D.

2017 Understanding collapse: ancient history and modern myths. Cambridge University Press, New York, NY. (Chapter 1. Introducing Collapse, pp. 1-50).

Jacques, Peter

2021 *Sustainability: the basics*. Second Edition. London: Routledge.

Tainter, Joseph A.

2016 Why collapse is so difficult to understand. In *Beyond collapse: archaeological perspectives on resilience, revitalization, and transformation in complex societies*, edited by R. K. Faulseit, pp. 27-39. Southern Illinois University Press, Carbondale, Illinois.

WEEK 3 (26 & 28 January 2021) RESEARCH PERSPECTIVES

* Butzer, K. W. and G. H. Endfield

2012 Critical perspectives on historical collapse. *Proceedings of the National Academy of Sciences of the United States of America* 109(10):3628-3631.

* van der Leeuw, Sander

2020 *Social sustainability, past and future: undoing unintended consequences for the earth's survival*. Cambridge: Cambridge University Press (Chapter 5. The Importance of a Long-Term Perspective, pp. 67-78).

Butzer, K. W.

- 2012 Collapse, environment, and society. *Proceedings of the National Academy of Sciences of the United States of America* 109(10):3632-3639.
- Cumming, G. S. and G. D. Peterson
2017 Unifying Research on Social-Ecological Resilience and Collapse. *Trends in Ecology & Evolution* 32(9):695-713.
- Hegmon, Michelle, ed.
2017 *The give and take of sustainability: archaeological and anthropological perspectives on tradeoffs*. Cambridge: Cambridge University Press.
- Peregrine, Peter N.
2018 Social Resilience to Climate-Related Disasters in Ancient Societies: A Test of Two Hypotheses. *Weather, Climate, and Society* 10(1):145-161.
- Riede, Felix, and Payson D. Sheets, eds.
2020 *Going forward by looking back: archaeological perspectives on socio-ecological crisis, response, and collapse*. New York: Berghahn.
- Rockman, Marcy, and Carrie Hritz
2020 Expanding use of archaeology in climate change response by changing its social environment. *Proceedings of the National Academy of Sciences of the United States of America* 117(15):8295-8302.
- Turchin, Peter, and Sergey A. Nefedov
2009 *Secular cycles*. Princeton: Princeton University Press.
- Yoffee, Norman, ed.
2019 *The Evolution of Fragility: setting the terms*. Cambridge: McDonald Institute for Archaeological Research.

WEEK 4 (2 & 4 February 2021) COUPLED SOCIAL AND ECOLOGICAL SYSTEMS

- * Fitzhugh, Ben, Virginia L. Butler, Kristine M. Bovy and Michael A. Etnier
2019 Human ecodynamics: A perspective for the study of long-term change in socioecological systems. *Journal of Archaeological Science: Reports* 23:1077-1094.
- Ferraro, P. J., J. N. Sanchirico, and M. D. Smith
2019 Causal inference in coupled human and natural systems. *Proceedings of the National Academy of Sciences of the United States of America* 116(12):5311-5318.
- Kirch, Patrick Vinton and Karl S. Zimmerer
2011 Dynamically Coupled Human and Natural Systems - Hawai'i as a Model System. In *Roots of conflict: soils, agriculture, and sociopolitical complexity in ancient Hawai'i*, edited by P. V. Kirch, pp. 3-30. 1st ed. School for Advanced Research Press, Santa Fe, N.M.
- Liu, Jianguo, et al.
2007 Coupled Human and Natural Systems. *AMBIO: A Journal of the Human Environment* 36(8):639-649.
- Quinn, John E, and Courtney E Quinn
2020 Coupled Human and Natural Systems: a Review and Anthrome Case Study. In *Encyclopedia of the world's biomes*, Volume 5. M.I. Goldstein and D.A. DellaSala, eds. Pp. 266-275. New York: Elsevier.

WEEK 5 (9 & 11 February 2021) COMPLEX ADAPTIVE SYSTEMS

* Holling, C. S.

2001 Understanding the complexity of economic, ecological, and social systems. *Ecosystems* 4(5):390-405.

* van der Leeuw, Sander

2020 *Social sustainability, past and future: undoing unintended consequences for the earth's survival*. Cambridge: Cambridge University Press (Chapter 7. The Role of the Complex (Adaptive) Systems Approach, pp. 100-117).

Bradtmoller, Marcel, Sonja Grimm and Julien Riel-Salvatore

2017 Resilience theory in archaeological practice - an annotated review. *Quaternary International* 446:3-16.

Folke, Carl

2006 Resilience: the emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16: 253-267.

Fraccascia, Luca, Ilaria Giannoccaro and Vito Albino

2018 Resilience of Complex Systems: State of the Art and Directions for Future Research. *Complexity* 2018:1-44.

Gunderson, Lance H. and C. S. Holling (editors)

2002 *Panarchy: understanding transformations in human and natural systems*. Island Press, Washington, DC. (Chapter 1. In quest of a theory of adaptive change, pp. 3-24; Chapter 2. Resilience and adaptive cycles, pp. 25-62; Chapter 3. Sustainability and panarchies, pp. 63-102; Chapter 4. Why systems of people and nature are not just social and ecological systems, pp. 103-119; Chapter 8. Dynamic interaction of societies and ecosystems - linking theories from ecology, economy, and sociology, pp. 195-239).

Sundstrom, Shana M. and Craig R. Allen

2019 The adaptive cycle: More than a metaphor. *Ecological Complexity* 39:1-11.

Walker, Brian

2019 *Finding resilience: change and uncertainty in nature and society*. CSIRO Publishing, Clayton South VIC.

WEEK 6 Mid-term Break (15-19 February 2021)

WEEK 7 (23 & 25 February 2021) CASE STUDY - MAYA

* Lentz, David L., Nicholas P. Dunning, Vernon L. Scarborough and Liwy Grazioso

2018 Imperial resource management at the ancient Maya city of Tikal: A resilience model of sustainability and collapse. *Journal of Anthropological Archaeology* 52:113-122.

* Lucero, Lisa J., and Jean T. Larmon

2018 Climate Change, Mesoamerica, and the Classic Maya Collapse. In *Climate changes in the Holocene : impacts and human adaptation*. E. Chiotis, ed. Pp. 165-181. New York: Routledge.

Dunning, N. P., T. P. Beach, and S. Luzzadder-Beach

2012 Kax and kol: Collapse and resilience in lowland Maya civilization. *Proceedings of the National Academy of Sciences of the United States of America* 109(10):3652-3657.

Evans, N. P., T. K. Bauska, F. Gazquez-Sanchez, M. Brenner, J. H. Curtis and D. A. Hodell
2018 Quantification of drought during the collapse of the classic Maya civilization.
Science 361(6401):498-501.

Kennett, Douglas J.
2012 Development and Disintegration of Maya Political Systems in Response to
Climate Change. *Science* 338(9):788-791.

Middleton, Guy D.
2017 *Understanding collapse: ancient history and modern myths*. Cambridge University
Press, New York, NY. (Chapter 10. The Classic Maya Collapse, pp. 244-275).

Scarborough, Vernon L.
2009 The Archaeology of Sustainability: Mesoamerica. *Ancient Mesoamerica* 20:197-
203.

Turner, Bethany L and J. A. Sabloff
2012 Classic Period collapse of the Central Maya Lowlands: Insights about human-
environment relationships for sustainability. *Proceedings of the National Academy of
Sciences of the United States of America* 109(35):13908-13914.

WEEK 8 (2 & 4 March 2021) CASE STUDY - EASTER ISLAND

* Diamond, Jared M.

2005 Collapse: how societies choose to fail or succeed. Viking, New York. (Chapter 2.
Twilight at Easter, pp. 79-119).

* Hunt, Terry L. and C. P. Lipo

2010 Ecological catastrophe, collapse, and the myth of "ecocide" on Rapa Nui (Easter
Island). In *Questioning collapse : human resilience, ecological vulnerability & the aftermath of
empire*, edited by P. A. McAnany and N. Yoffee, pp. 21-44. Cambridge University Press,
New York.

* Rull, Valenti

2020 Contributions of paleoecology to Easter Island's prehistory: A thorough review.
Quaternary Science Reviews 252:106751.

Boersema, J. J.

2015 *The Survival of Easter Island : Dwindling Resources and Cultural Resilience*. New
York, NY: Cambridge University Press.

Cardinali, Sonia, Kathleen B. Ingersoll, Christopher M. Stevenson and Daniel W. Ingersoll
(editors)

2017 *Cultural and environmental change on Rapa Nui*. Routledge, Abingdon.

Lima, M., et al.

2020 Ecology of the collapse of Rapa Nui society. *Proceedings of the Royal Society, B*
287(1929):20200662.

Middleton, Guy D.

2017 *Understanding collapse: ancient history and modern myths*. Cambridge
University Press, New York, NY. (Chapter 13. The Incredible Survival of Rapa Nui, pp.
317-338.

Stevenson, C. M., et al.

2015 Variation in Rapa Nui (Easter Island) land use indicates production and population peaks prior to European contact. *Proceedings of the National Academy of Sciences of the United States of America* 112(4):1025-1030.

WEEK 9 (9 & 11 March 2021) CASE STUDY - AMERICAN SOUTHWEST

* Kintigh, Keith, W. and Scott E. Ingram

2018 Was the drought really responsible? Assessing statistical relationships between climate extremes and cultural transitions. *Journal of Archaeological Science* 89:25-31.

* Sedig, Jakob W.

2016 The Decline and Reorganization of Southwestern Complexity: Using Resilience Theory to Examine the Collapse of Chaco Canyon. In *Beyond collapse: archaeological perspectives on resilience, revitalization, and transformation in complex societies*, edited by R. K. Faulseit, pp. 237-261. Southern Illinois University Press, Carbondale, Illinois.

Bocinsky, R. Kyle and Timothy A. Kohler

2016 Complexity, Rigidity, and Resilience in the Ancient Puebloan Southwest. In *Viewing the future in the past : historical ecology applications to environmental issues*, edited by T. Foster, L. M. Paciulli and D. J. Goldstein, pp. 86-105. The University of South Carolina Press, Columbia, South Carolina.

Diamond, Jared M.

2005 *Collapse: how societies choose to fail or succeed*. Viking, New York. (Chapter 4. The ancient ones: the Anasazi and their neighbors, pp. 136-156).

Hegmon, M.

2008 Social transformation and its human costs in the prehispanic U.S. southwest. *American Anthropologist* 110(3):313-324.

Nelson, Margaret C.

2012 Long-Term Vulnerability and Resilience: Three Examples from Archaeological Study in the Southwestern United States and Northern Mexico. In *Surviving sudden environmental change : understanding hazards, mitigating impacts, avoiding disasters*, edited by J. Cooper, P. D. Sheets and D. A. Abbott, pp. 197-220. University Press of Colorado, Boulder.

Torvinen, Andrea, Michelle Hegmon, Ann P. Kinzig, Margaret C. Nelson, Matthew A.

Peple, Colleen Strawhacker, Karen G. Schollmeyer and Laura Swantek

2016 Transformation without Collapse: Two Cases from the U.S. Southwest. In *Beyond collapse: archaeological perspectives on resilience, revitalization, and transformation in complex societies*, edited by R. K. Faulseit, pp. 262-286. Southern Illinois University Press, Carbondale, Illinois.

Wilcox, Michael

2010 Marketing conquest and the vanishing Indian: an indigenous response to Jared Diamond's archaeology of the American Southwest. In *Questioning collapse: human resilience, ecological vulnerability & the aftermath of empire*, edited by P. A. McAnany and N. Yoffee, pp. 113-141. Cambridge University Press, New York.

WEEK 10 (16 & 18 March 2021) CASE STUDY - The Mediterranean

* Cline, Eric H.

2014 *1177 B.C.: the year civilization collapsed*. Princeton University Press, Princeton (Prologue, pp. 1-3; Chapter three, pp. 73-101; Chapter four, pp. 102-138; Chapter five, pp. 139-170; Epilogue, pp. 171-176).

* Middleton, Guy D.

2017 *Understanding collapse: ancient history and modern myths*. Cambridge University Press, New York, NY. (Chapter 5. The End of Minoan Crete, pp. 109-128; Chapter 6. The Kingdoms of Mycenaean Greece, pp. 129-154; Chapter 7. The Hittites and the Eastern Mediterranean, pp. 155-181).

Demand, Nancy H.

2011 *The Mediterranean context of early Greek history*. Wiley-Blackwell, Chichester. (Chapter 7. Late Bronze Age Maritime Networks, pp. 162-192; Chapter 8. The late Bronze Age collapse and its aftermath, pp. 193-220).

Bachhuber, Christoph and R. Gareth Roberts (editors)

2009 *Forces of transformation: the end of the Bronze Age in the Mediterranean*. Oxbow, Oxford.

Kaniewski, David, et al

2019 300-year drought frames Late Bronze Age to Early Iron Age transition in the Near East: new palaeoecological data from Cyprus and Syria. *Regional environmental change*, 20:1-11.

Knapp, A. Bernard

2016 Crisis in Context: The End of the Late Bronze Age in the Eastern Mediterranean. *American Journal of Archaeology* 120(1):99-149.

Middleton, Guy D., ed.

2020 *Collapse and transformation: the late bronze age to early iron age in the Aegean*. Philadelphia: Oxbow Books.

Welberg, Erika, and Martin Finne

2018 Resilience and persistence of ancient societies in the face of climate change: a case study from Late Bronze Age Peloponnese. *World Archaeology* 50(4): 584-602.

WEEK 11 (23 & 25 March 2021) CASE STUDY - ANGKOR

* Penny, D., et al.

2018 The demise of Angkor: Systemic vulnerability of urban infrastructure to climatic variations. *Science Advances* 4(10):eaau4029.

* Stark, Miriam T.

2019 Universal Rule and Precarious Empire: Power and Fragility in the Angkorian State. In *The Evolution of Fragility: setting the terms*. N. Yoffee, ed. Pp. 161-181. Cambridge: McDonald Institute for Archaeological Research.

Buckley, Brendan M. et al.

2010 Climate as a contributing factor in the demise of Angkor, Cambodia. *Proceedings of the National Academy of Sciences of the United States of America* 107(15):6748-6752.

Carter, Alison K., et al.

2019 Temple occupation and the tempo of collapse at Angkor Wat, Cambodia. *Proceedings of the National Academy of Sciences of the United States of America* 116(25):12226-12231.

Evans, Damian

2016 Airborne laser scanning as a method for exploring long-term socio-ecological dynamics in Cambodia. *Journal of Archaeological Science* 74:164-175.

Fletcher, Roland, Brendan M. Buckley, Christophe Pottier and Shi-Yu Simon Wang

2017 Fourteenth to Sixteenth Centuries AD: The Case of Angkor and Monsoon Extremes in Mainland Southeast Asia. In *Megadrought and collapse: from early agriculture to Angkor*, edited by H. Weiss, pp. 275-314. Oxford University Press, Oxford.

Klassen, Sarah, and Damian Evans

2020 Top-down and bottom-up water management: A diachronic model of changing water management strategies at Angkor, Cambodia. *Journal of Anthropological Archaeology* 58:101166.

Middleton, Guy D.

2017 *Understanding collapse: ancient history and modern myths*. Cambridge University Press, New York, NY. (Chapter 12. Angkor and the Khmer, pp. 299-316).

WEEK 12 (30 March & 1 April 2021) BEYOND COLLAPSE

* Faulseit, Ronald K.

2016 Collapse, Resilience, and Transformation in Complex Societies: Modeling Trends and Understanding Diversity. In *Beyond collapse: archaeological perspectives on resilience, revitalization, and transformation in complex societies*, edited by R. K. Faulseit, pp. 3-26. Southern Illinois University Press, Carbondale, Illinois.

* Nicoll, Kathleen, and Andrea Zerboni

2020 Is the past key to the present? Observations of cultural continuity and resilience reconstructed from geoarchaeological records. *Quaternary International* 545:119-127.

Kolata, Alan L.

2006 Before and after collapse – reflections on the regeneration of social complexity. In *After collapse: the regeneration of complex societies*, edited by G. M. Schwartz and J. J. Nichols, pp. 208-221. University of Arizona Press, Tucson, Arizona.

Schwartz, Glenn M.

2006 From collapse to regeneration. In *After collapse: the regeneration of complex societies*, edited by G. M. Schwartz and J. J. Nichols, pp. 3-17. University of Arizona Press, Tucson, Arizona.

WEEK 13 (6 & 8 April 2021) and WEEK 14 (13 April 2021) GROUP PRESENTATIONS