ANT4930/ANG6930 APPLYING GIS IN ARCHAEOLOGICAL RESEARCH

Course Information

Fall 2020

T 9:35a - 10:25a Th 9:35a - 11:30a

Online

Instructor: Dr. Daniel Contreras

Office: B346 Turlington Phone: (352)294-6880

email: <u>daniel.contreras@ufl.edu</u>
Office Hours: TBA and by appt

Course Description

Anthropology is at root the study of human variation, and archaeology might be characterized as the study of human variation in the past: how much diversity of human behavior/beliefs was there at any given time and place, and how different was that from the present? Both practically and theoretically, a key component of that variation is *spatial* variation: for example, in human behavior, material culture, language, demographic attributes, or resources. Archaeological method and theory have to grapple with recording and analyzing spatial variation. As a result, geospatial technologies generally and Geographic Information Systems (GIS) in particular are increasingly recognized as critical tools. In this course we will examine the use of GIS for management and analysis of geospatial data in anthropological contexts, both experimenting with methods and critically examining case studies.

We will cover both methodological approaches (collecting data in the field and finding publicly-available data as well as integrating and querying it in a GIS) and theoretical implications (the nature of spatial data as well as scales and topics of analysis). We will also examine selected case studies and consider critiques that have been leveled at GIS in particular and spatial analysis in general.

The course emphasis is on working with concrete data, and software use will be an integral part of the process. We will use free and open-source (FOSS) software, primarily QGIS (https://www.qgis.org/en/site/). If you are already familiar with ArcGIS you are welcome to use that throughout the course instead (or, for that matter, GRASS or Saga [other FOSS alternatives]), but it will be up to you to figure out how to do the things for which I'll give detailed instructions in QGIS. Students are encouraged to work with their own data, though a pre-existing research project is by no means a prerequisite. Background in using GIS will be very helpful, but is not strictly necessary; students with no background should expect to invest significant time learning the mechanics of GIS. The course will culminate in the production of a poster presentation using GIS to address a specific research question.

Course Objectives

In completing this course, students will develop:

- Theoretical background on the applications of spatial variation, geospatial technologies, and GIS in archaeology.
- Fluency with geospatial methods, particularly the use of GIS, and a foundation from which to further self-teach.
- Familiarity with the acquisition (particularly of publicly-available data), management, and analysis of archaeological data that have a spatial component.
- Ability to produce polished products (including, but not limited to, maps) that communicate arguments based on geospatial data.

Course structure

This course combines lectures, discussions, and lab exercises in a hybrid seminar-lab format to facilitate peer instruction and hands-on learning. The two class sessions each week will be broken into three segments. The first segment (Tues 9:35a – 10:25a) will follow a seminar format during which time a designated lead student will facilitate discussion of the previous week's assignment (lab exercise and/or readings). In the second segment (Th 9:35a:40a – 10:30a), the instructor will review a new technique through lecture and demonstration. During the third segment (Th 10:30a – 11:30a), students will be given time to begin applying the new technique to solve the lab assignments, in consultation with one another and the instructor.

Participation

All students must participate in weekly discussions (10% of final grade). Participation includes attendance, active listening, and constructive contributions to discussion. We will also experiment with shared annotation of course readings; to the degree that we adopt this practice, your engagement with this discussion-in-the-margins will also constitute part of your participation in the course.

Lab Exercises

All students enrolled in the course must complete *all* of the assigned problem sets (30% of final grade). Problem sets are due the Tuesday after they are assigned and must be uploaded to Canvas *before the start of class* on the day that they are due.

The specific outputs of each problem set will be specified with each exercise, and will include some combination of data and reflection on the utility of those data and the process of producing them. Problem sets will generally emphasize questions rather than methods, and your answers should *employ* methods to address questions, rather than simply demonstrating methodological competence. You should strive to be clear about what procedures you have used, what the results demonstrate, and what you conclude.

<u>Note</u>: All students are invited, for any problem set, to instead use their own data and address their own questions, in which case a brief statement (½ page maximum), explaining which data are used and how they are analogous to the assigned problem set, should accompany the assignment.

Facilitation

All students must facilitate a proportional share of the class discussions presenting case studies and reporting on lab assignments (30 case studies + 6 labs divided among the total number of enrolled students; **15%** of final grade).

- For case studies, the facilitator will be responsible for guiding the class in detailed discussion of that paper, including producing and distributing a ½-page précis of the article (at least 24 hours ahead of time, beginning in Week 10). Discussion should focus on how geospatial data were produced, why they were produced, and what kind of data (raster, vector, tabular, etc) were involved, what analyses/synthesis did they subsequently do, and how did they mobilize the results into an argument? Is that argument compelling? Could the results have been achieved without GIS (or at least without geospatial data)...and was it all worth it (in terms of interpretive payoff). Where readings are not case studies but reviews or critiques, discussion should focus on identifying and assessing the key points of the argument.
- In addition to walking everyone through their solution to the assigned lab exercise, the
 facilitator should emphasize how the application of this particular technique solved the
 specific research problem at hand, as well as outlining the limitations and appropriate
 uses of such analysis. Relating this to your own research or adding analogous examples
 related to your own interests is encouraged but not required.

Term Project:

All students must complete a term project (in four parts throughout the semester, combining for 45% of final grade). The project should address a clearly formulated question using original analyses based on the skills learned in class. Students must formulate a research question by Week 3 (18 Sept; 5% of course grade), identify the data and analyses needed to answer the question by Week 8 (23 Oct; 10% of course grade), and present their preliminary results in Week 14 (December 1/3, 10% of course grade). Final projects will take the form of a poster, due in the poster session at the end of the course (week of 14 Dec, date TBD) and comprising 20% of your course grade.

Course Requirements

- 30% Six lab exercises (to be stored on your own computer or USB drive; you'll want at least 1 GB, and don't forget to back up your data; you'll only turn in summary results). We will start these in class on Thursdays, and they will be due by 9:30a (before class) on the Tuesday of the following week.
- 10% Complete weekly readings and participate in class discussions
- 15% Seminar facilitation
- Project Prospectus: A one-page proposal of your final project. This should articulate a clear research question, explain why GIS is useful and significant in addressing that question, and outline your data sources. Due at the end of Week 3 (18 Sept).
- 10% Project outline: A one-page description of what data you will bring use in your project and a description of how you will mobilize those data to make an argument that addresses your question. Due at the end of Week 8 (23 Oct).
- 20% Final Project: A conference-quality poster using GIS to address a clearly-articulated research question. Due at the class poster session, date TBD (in digital form; you need not print these out unless you wish). For tips on poster presentation, see:

http://www.sas.org/posterguide.pdf and http://www.saa.org/Portals/0/SAA/publications/SAAbulletin/14-5/SAA10.html.

Consult also: http://www.public.asu.edu/~kintigh/Kintigh2005WritingArchaeology.pdf

10% Final Presentation: A 10-15 minute presentation of your research to the class (this may incorporate your poster itself if you wish). Presentations will be in class during the penultimate week of the semester, so that you may incorporate any feedback into the final version of your poster.

Office hours:

You are welcome in my office hours either individually or in groups, and may use that time either to ask specific questions or simply to work with the benefit of someone available to help you through roadblocks. You are in no way required to come, but please note that this should be considered part of the education available to you, not a last resort.

Attendance Policy, Class Expectations, and Late Assignments

Attendance

This course is primarily a seminar; since attendance is fundamental to the learning goals, it is required. Of course, life may sometimes intervene, in which case you are expected to notify the instructor ahead of time or as soon as practical afterwards. More than two absences will already constitute >10% of the course, and you should consult with the instructor about appropriate make-up activity. Excused absences must be consistent with university policies in the <u>Graduate Catalog</u> and require appropriate documentation. Additional information can be found in Attendance Policies.

Zoom

A virtual seminar is more challenging than an in-person one: it's harder for everyone to get and stay engaged, it's more difficult for me to tell if you are engaged (or not), and can be exhausting to feel surveilled. At the same time, it places the burden where it belongs: it is up to you to stay engaged, rather than up to the instructor to police you. Please keep in mind that we (humans) are not good at multi-tasking, however much we think we are, and resist the temptation to check email/social media/news even though no-one will know.

Assignments

Assignments in this course comprise lab exercises, project milestones, and responsibility for facilitating seminar. Because lab exercises will form the basis of part of our seminar discussion, they *must be submitted on time* (it would be unfair for some people to get to complete the lab post-discussion). Due dates for project milestones are intended to motivate you to start those projects, and are based on the need to give you feedback with sufficient time for you to react to it. As such, they can be negotiable, as long as you ask in advance. If you are scheduled to facilitate a seminar and for any reason will not be able to, please both notify the instructor as far ahead of time as possible and attempt to find another student with whom you can swap dates.

Course Texts

There is one required text, which we will supplement with several articles and book excerpts (listed below and available on Canvas).

Conolly, J. and M. Lake

2006 Geographical Information Systems in Archaeology. Cambridge Manuals in Archaeology. Cambridge University Press, Cambridge.

A second text is recommended, especially for graduate students, students with prior experience in GIS, and students intending to pursue careers in archaeology:

Gillings, Mark, Piraye Hacıgüzeller, and Gary Lock (eds.).

2020 Archaeological Spatial Analysis: A Methodological Guide. Routledge.

Course Schedule

Week	Theme	Dates	Readings	Lab Exercise
1	Thinking	1 Sept	Course Introduction	Install QGIS
	Spatially			
		3 Sept	Conolly & Lake Ch.1,2	Seeing Beneath Stonehenge
			Aldenderfer 1996	
			Gregory 2005 Ch.1	
			Goodchild 1996	
			Kvamme 2017	
			McCoy interview on ArchaeoTech	
			podcast	
2	Why GIS?	8 Sept	Conolly & Lake Ch.3	
			Gillings et al. 2020:Ch.1	
			Orengo 2015	
			Verhagen 2018	
	Data	10	Conolly & Lake Ch. 5 (to p.77)	
	Types	Sept	Wheatley and Gillings 2002:Ch.2	
	and			
	Acquisiti			
	on			
3		15	Luo et al 2019	
		Sept	McKinnon et al. 2016	
	Digitizing	17	Conolly & Lake Ch.5 (pp77-89)	Exercise 1 assigned
	and	Sept	QGIS manual on digitizing	
	Georefer			
	encing			
		18	Project Prospectus due	
	1	Sept		
4		22	Welham et al. 2015	Exercise 1 due
		Sept		
	Gatherin	24	Conolly & Lake Ch.4, 13	Exercise 2 assigned
	g and	Sept	McCoy & Ladefoged 2009	
	Incorpor			
	ating			
	Field			
	Data			

5		29	Bogacki et al. 2010	Exercise 2 due
		Sept		
	Surface	1 Oct	Conolly & Lake Ch.6	Exercise 3 assigned
	Models		Wheatley & Gillings 2002 Ch.5, 9	
6		6 Oct	Katsianis 2004	Exercise 3 due
	DEM	8 Oct	Conolly & Lake Ch.9, 10, 11	Exercise 4 assigned
	Derivativ		Gillings et al.2020 Ch.17-18	
	es		van Leusen 2002	
			Gandalf: Navigator?	
7		13	Marsh & Schreiber 2015	Exercise 4 due
		Oct	McCoy et al 2011	
	Spatial	15	Conolly & Lake Ch.7, 8	Exercise 5 assigned
	Analyses	Oct	Gillings et al. 2020:Ch.4	
	and EDA		Wheatley & Gillings 2002:Ch.6	
	/ Zonal			
	analyses			
	/ Point			
	pattern			
-	analyses	20	D 1 2012	- · - ·
8		20 Oat	Bevan et al. 2013	Exercise 5 due
	Thinking	Oct	Williams et al. 1990	Fyansiaa C assigned
	Thinking	22 Oct	Kvamme 1999:181-185 Barceló & Pallares 1998	Exercise 6 assigned
	Socially	Oct 23		
		Oct	Project Outline due	
9		27	Llobera 2012	Exercise 6 due
		Oct	Supernant & Cookson 2014	
	Location	29	Gillings et al. 2020:Ch.12-13	
	al/Predic	Oct	Kvamme 2006	
	tive			
	Modellin			
	g			
10		3 Nov	Cook Hale & Garrison 2017	Shift gears – labs end because
			DiNapoli 2019	foundations established;
			Verhagen & Whitley 2011	effort should shift to projects.
				Thursday sessions become
				longer seminars, with a focus
				on how/if the additional
				methods and applications
				considered address critiques
				of GIS
	Cartogra	5 Nov	Dent 1998	
	phy and		Lock and Harris 2002	
	Presenta		Howland et al. 2020	
	tion			

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12			Nov	·	
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Readings

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University Policies

Grading

Information on UF grading policy may be found at: <u>UF Graduate Catalog</u> and <u>Grades and Grading Policies</u>.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the <u>Notification to Students of FERPA Rights</u>.

Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing <u>online evaluations</u>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students on the <u>Gator Evals page</u>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The

Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact <u>umatter@ufl.edu</u> or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the

University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Academic Resources

<u>E-learning technical support</u>, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

<u>Career Resource Center</u>, Reitz Union, 392-1601. Career assistance and counseling. <u>Library Support</u>, Various ways to receive assistance with respect to using the libraries or finding resources.

<u>Teaching Center</u>, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <u>Writing Studio</u>, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints Campus

On-Line Students Complaints