

Sabbatical Leave Report

2017-2018

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Department of Biological Sciences

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Abstract

This Independent Study Sabbatical focused on building three skill sets. First, I learned 3D printing at two off-campus makerspaces and made replicas of significant ancient tools and fossils. Second, I participated as a volunteer scholar in a five-week archaeological field school in Ireland and got hands-on experience in Old World archaeology for the first time. Third, I took a sequence of online courses in Geographic Information Systems (GIS) and produced laboratory activities and teaching materials for our new Archaeology class (ANTH 4). Benefits to the College include my new familiarity with makerspaces and GIS, which is applicable to many disciplines, and my ability to produce replicas of ancient bones the same week that the discovery is published. Benefits to my professional growth and enrichment include seeing recent high-tech archaeology tools in action, finding a new outlets for creativity and becoming more connected to my recent ancestors. I am returning to teaching with renewed curiosity and enthusiasm for science and a new, deep interest in Medieval Europe.

Statement of Purpose

The purpose of this sabbatical was to learn methods and gain experiences to enhance Anthropology classes. The methods included three-dimensional (3D) printing, for making models of fossils and ancient tools; Geographic Information Systems (GIS), for mapping archaeological data; and archaeological field methods relevant to sites with architecture, which were rare in prehistoric California but common worldwide. The experiences included becoming a member of makerspaces and travelling to rural Ireland to participate in an archaeological field school at a medieval castle. The purpose of this Sabbatical Leave Report is to document my experiences, share how they enriched me as a professional, and provide evidence of their value to the College.

Report of Sabbatical Activities

In my 2017-2018 Independent Study Sabbatical, I focused on building skill sets in order to update my teaching of archaeology and human evolution. I completed three proposed sets of activities: (1) replicating multiple copies of significant tools and fossils through 3D printing; (2) participating for five weeks at an archaeological field school in Ireland; and (3) earning a Certificate in Geographic Information Systems (GIS) Specialty by completing five courses. I also produced a GIS lesson plan for the ANTH 4 (Archaeology) lab. In this Sabbatical Leave Report, I describe these activities in detail and state their benefits for the College and for my own professional growth and enrichment.

Activity 1: 3D Printing and Makerspace Experiences

Three-dimensional (3D) printing reads a computer file and produces a three-dimensional object. There are many ways to do this, including with powders and resins cured by laser beams. I learned the most common and inexpensive method, Fusion Deposition Modeling (FDM), in which threads of melted plastic are deposited and fuse to form a model. Each specific plastic material has qualities that lend it to particular applications: rigid or flexible; durable, water-soluble, or biodegradable; food-safe; able to withstand high temperatures. I used mostly Acrylonitrile Butadiene Styrene (ABS), the rigid, food-safe, durable plastic used in Lego bricks.

To visualize FDM, imagine a hot glue gun attached to an Etch-a-Sketch toy. You may remember that an Etch-a-Sketch has two knobs, each of which controls movement of a stylus along one axis (X or Y). Replace the stylus with a hot glue gun that extrudes a thread of melted plastic narrower than 0.5 mm. Now you can make a flat plastic image by moving the extruder along the X and Y axes. To get the vertical Z axis, move the table surface up and down relative to the Etch-a-Sketch. Each new layer of the melted plastic thread fuses to the previous layer, building a model from a series of “slices” determined by software that translates a 3D scan of an item (like an arm bone) into a format the 3D printer can use.

I was particularly interested in printing an arm bone, Lucy’s right proximal humerus to be precise. A 2016 study suggested that a detailed look at the upper arm and shoulder of this *Australopithecus afarensis* individual revealed a fracture pattern that suggested she died after falling from a great height (Kappelman 2016). Accompanying that report in *Nature* was an invitation to download the high-resolution scans and 3-D print them to view the fractures (Callaway 2016). That is why I proposed this sabbatical activity, and I am pleased to have succeeded in printing multiple copies of those bones for student use (Appendix 1).

I had planned (in my sabbatical proposal) to also print models of the oldest known stone tool, but when I learned the scan was no longer available, I received permission to make something else: multiple copies of the oldest known musical instrument, the Hohle Fels flute from Germany (Conard et al. 2009). Made from the radius (wing bone) of a griffon vulture, the flute is from a layer radiocarbon dated to

36,000 to 40,000 years ago. I printed it using a model posted on the 3D printing resource Thingiverse (Reyes 2014).

In the course of making these models, I learned to use two slicing programs and two models of 3D printer. Learning to use a second program and printer was burdensome at first, but I am glad for the broader experience I gained.

I learned these programs, and made the models, at two off-campus makerspaces that operate in different ways. I had been part of the task force behind the Mountie Makerspace, but I had not used a makerspace or seen one from a member's perspective. The differences and similarities may inform further development of the Mountie Makerspace.

First I joined Vocademy, a privately owned, for-profit makerspace in Riverside. Vocademy occupies 15,000 square feet of clean, climate-controlled office space. Its staffed front desk limits access and collects payments. Besides six 3D printers, members have access to a laser cutter, Vacuform (the kind of machine that makes blister packages), computers with Fusion 360 CAD software, and rooms with equipment for sewing, electronics, welding, auto repair, woodworking, and machining. To use any one piece of this equipment, members are required to take at least one formal (and expensive – \$140 for four hours) class; after that, members may use that equipment any time the space is open. Membership fees range from \$58 to \$99 per month, depending on how many months you commit to and whether you pay the total in advance. My receipts are in Appendix 1.

At Vocademy I took the four-course sequence (16 hours total) in 3D printing (3D Printing and Scanning at Vocademy.com):

- 01-205 - 3D Printing 1 - Basic Operation
- 01-210 - 3D Printing 2 - Printing Intent & Design
- 01-215 - 3D Printing 3 - Materials & Machines
- 01-220 - 3D Printing 4 – Printed Part Finishing

The classes had standardized PowerPoint presentations (Appendix 1) that began with slides about the Vocademy safety policies and the specific risks of using the printers. We learned to use Simplify 3D slicing software with Flash Forge Creator V Pro printers, using filaments made of ABS and Polyethylene Glycol (PETG) plastics. I used my three-month membership to practice and begin making models for Mt. SAC, but found the printers frustrating, with long setup procedures including subjective leveling of the bed (Z axis) before every print.

The second makerspace I joined was the Maker, Artist, and Gadgeteer Laboratory (MAG Lab) near Cal Poly Pomona. This is a cooperative, non-profit makerspace occupying just 1,380 square feet in an industrial park. There is no front desk, and members subscribe via PayPal to two tiers of membership: “General” (\$40 per month) and “Keyed” (\$90) (Members at maglaboratory.org). All the equipment was donated or salvaged, and with the exception of an electronics room, all the creative activities occur either in one workshop that resembles a large garage, or just outside it

with the rollup door open. Nevertheless, MAG Lab has well-maintained equipment and materials for 3D printing, auto repair, woodworking, welding, machining, and forging.

There are no formal classes at MAG Lab. Instead, section leaders (3D printing, welding, etc.) mentor and supervise new members closely. Once a new member has demonstrated safe work habits and the relevant skill set, coupled with a readiness to ask for help, he or she may be voted into keyed member status with all-hours access. Keyed members are expected to contribute to MAG Lab by providing open hours, improving the space, or taking a role in governance. My contribution has been moving the facility towards OSHA standards in workplace safety.

At MAG Lab I learned to use a Zortrax M200 3D printer, which uses proprietary slicing software called Z-Suite. The software is less user-friendly than Simplify 3D (which I had learned to use at Vocademy). For example, the “rotate model” button turns into a “mirror image” button with no contextual help popup; you have to watch for a subtle change in the icon. But the printer is a very precise and reliable workhorse with a self-leveling bed. I have used only ABS with the Zortrax printer.

Activity 2: Irish Archaeology Field School

For five weeks in the summer of 2018, I volunteered as a visiting scholar at the Castles in Communities archaeological field school in Ballintober, County Roscommon, Ireland (Archaeology in Ireland at Google sites). The program is directed by an Irish archaeologist and anthropologists at Foothill College in Los Altos, CA, with a staff of

experienced fieldworkers and graduate students. This summer about 35 American undergraduate students participated in the project's fourth field season, investigating a late medieval castle and associated deserted village. They earned 12 units in a rigorous academic schedule that ran 11 to 12 hours a day, six days a week (Appendix 2a).

My role turned out to be different from what I had proposed. The program's application form asked for volunteers able to use a Geographic Information System (GIS), and since that was another sabbatical activity, I thought GIS would be my ticket into the project. As it turned out, while they were generous in sharing GIS data that I can use for ANTH 4, the project directors were much more interested in my previous experience as an environmental archaeologist. They had three staffers who knew GIS, but no one trained or interested in processing a large backlog of soil samples to see what plants the medieval people were using and eating. I was the first paleoethnobotanist to participate in the project, so they asked me to teach students to run a flotation tank for extracting seeds from soil.

I was honored and excited to be asked, and quickly realized that the project needed a record-keeping system specific to environmental data. I set one up and kept a daily log (Appendix 2b) for reference in later seasons. My team of students and I processed 27 buckets of soil (over 160 liters), sorted through about 40 bags or boxes of gravel, and started a reference collection with burned wood and seeds from local wild plants and crops. Finally, I compiled the data from forms I designed (Appendix 2b) with contextual information from previous site reports (Brady et al. 2018) to produce tables

summarizing the data for the next site report (Appendix 2b). Along the way, my team also found the most interesting artifact of the summer.

When archaeologists want to recover evidence of plant use from soil, they do flotation: they pour the soil into a tank of water and save the material that floats, called the light fraction. We found many seeds in some of the light fractions, and I was able to identify some including barley, rushes (which were used as a floor covering and would have shed seeds incidentally from midsummer through autumn), and what looked like grape and apple seeds. We were surprised to find seeds as well in the heavy fractions – the stuff that sank – and when a student suggested that the seeds were heavy because they had been waterlogged in the damp soil, it made sense. Thereafter, I had the students spend more time than usual sorting through the heavy fractions, and in one of those boxes of gravel (recovered from the bottom of the tank and spread out to dry), Mr. Keegan Silveria found a tiny, perfect cube with dots etched on the sides: a bone die (Appendix 5).

It was not the first die found in the castle excavations, and it was not part of an exciting context. There were no other game pieces or drinking vessels or even a room associated with the die; it was in rubble fill under the foundation of one of the castle towers. Still, it was the most intriguing find of the summer for both the students and the villagers. A real person held that die – and lost it, maybe from a hole in a pouch. It wouldn't have had to be a big hole, with the die measuring just 5 mm on a side. I was surprised to learn that dice are not uncommon in medieval sites and that dice games were very popular in Medieval Europe. The symmetrical patterns of “pips” on the sides

go back to Roman times, and contemporary dice still use the configuration of pips on the die that Keegan found: opposite sides add up to seven (5 + 2, 3 + 4, 1 + 6) (Eerkens and de Voogt 2017). The small size, near-perfect cube symmetry, and pattern of sevens, compared with other medieval dice, suggest a date in the 1400s, in line with the historical records of construction of that castle tower.

Activity 3: Certificate in GIS Specialization

Geographic Information Systems (GIS) are computer programs that analyze massive databases keyed to locations on a map. Most people have used a GIS when using Google Earth or Google Maps, and when you use a navigator device while driving, it is combining GIS data (road maps plus real-time traffic) with data about your location from the Global Positioning System satellites (GPS). Analysts use GIS to map ecological communities, voting patterns, natural disasters, agricultural land use, watersheds, refugee populations, epidemics, and more. Archaeologists have been applying GIS to ancient landscapes for decades (e.g., Fedick 1994) and continue to use it to understand the locations of castles and monuments including in Ireland (O-Driscoll 2017). Also, many archaeology job postings require or prefer GIS experience, so I wanted gain proficiency in order to include it in ANTH 4. Therefore I enrolled in a GIS certificate program from UC Davis through the Coursera course delivery platform.

The certificate program comprises five classes:

- Fundamentals of GIS, 4 weeks

- GIS Data Formats, Design and Quality, 4 weeks
- Geospatial and Environmental Analysis, 4 weeks
- Imagery, Automation, and Applications, 4 weeks
- Geospatial Analysis Project (“Capstone”), 8 weeks

I have completed all five classes and the Certificate of Specialization-(Appendix 3).

Benefit and Value to the College

All three of my sabbatical activities benefit the College. First, with 3D printing, I produced models of significant fossils and artifacts for hands-on learning in Anthropology and in those Biology classes that include a human evolution unit (Appendix 1). More importantly, I became proficient at finding, downloading, and printing such models, so that the Department of Biological Sciences now has a low-cost means of replacing damaged and aged casts and adding new, highly accurate models to our teaching collections. For example, I printed a life-sized (10 cm) model of the four-limbed human clitoris for Naluce Ito Rocha Santana’s Human Sexuality classes, and Beta Meyer has asked me about replacing some missing organs in the Anatomy models. Finally, thanks to joining two very different makerspaces with different 3D printers and software, I have more to offer in discussions about the future of the College’s Mountie Makerspace.

Second, my participation in the Irish archaeology field school benefits the College because I have new presentations, data and activities for ANTH 4, Mt. SAC’s archaeology class (Appendix 4). I promoted ANTH 4 this semester with a flyer that shows the die and a GIS image of the castle, and on the first day of class I showed a

PowerPoint presentation about the die as an introduction to the goals and methods of archaeology. I also told all my classes a bit about the castle project when I introduced myself, and those in ANTH 1 (Biological Anthropology) seemed just as excited as the ANTH 4 students that I had actually done fieldwork this summer. They peppered me with questions. I hadn't anticipated what a great icebreaker that would be for the first day of class.

Third, my coursework in GIS has enabled me to produce a detailed lesson plan for the ANTH 4 lab, using data from the Castles in Communities project (Appendix 4). I modeled the lab handout after tutorials provided in the UC Davis program, switching the focus from California watersheds to Ballintober Castle maps and the GIS tools most applicable to archaeology. And Tyler Flisik has asked me for help as he starts to incorporate GIS into his lessons about wildlife conservation.

Finally, my sabbatical activities have value to the College by directly supporting Mt. SAC's Core Values and Mission. Taking classes through Coursera and Vocademy benefits the College because both of these are new models of lifelong learning, one of Mt. SAC's Core Values. Gaining proficiency in GIS and producing relevant laboratory activities for our archaeology students helps me to support the College's Mission to provide quality education and workforce training.

Professional growth and enrichment

I love teaching, but it can start to feel stagnant without a big infusion of new material which, frankly is hard to get during a semester of full-time teaching and service

to the College. This sabbatical allowed me to take the time to develop skills, use my creativity, and immerse myself in experiences that I have already brought to my classroom. I feel refreshed and energized and have lots of ideas and new materials to incorporate this year and beyond. I am grateful to the College for granting me this opportunity.

The sabbatical activities also served as professional development in content and methods. I had not known about the Hohle Fels flute, which had five holes, and making the model led me to journal articles about the German Upper Paleolithic and the pentatonic scale, which I didn't realize is much more common than the octave in world music traditions. I watched Bobby McFerrin lead a TED talk audience to an intuitive understanding of the pentatonic scale and bought MP3s of musicians playing replicas of the flute. Ancient music! What an engaging topic to help students make the connection that these ancient people were *people*.

At the field school I saw some recent high-tech imaging methods that allowed the archaeologists to find the buried remains of a village without digging, and then to determine a couple of places where digging would be particularly informative. I had taught the methods as "remote sensing." Now I understand and can teach about the different capabilities of ground-penetrating radar and magnetometry, and why you might want to do both. And my jaw dropped when the drone archaeologist visited with four different models with different imaging systems. One was fully programmable to fly transects (parallel sweeps) over a site and then return to the base. That is a specialty that didn't exist even ten years ago.

As an environmental archaeologist, I used to spend a lot of time in nature collecting plants. I didn't realize how much I missed that until I did it again in Ireland and started learning a new ecological system both on land (bogs!) and on the water (wild mints!). One of the highlights of the summer was getting to kayak through water lilies on the River Suck as part of the community engagement aspect of the field school, and I wrote it up for a county newspaper at the request of the Irish organizers (Appendix 5).

Finally, spending so much time in Ireland enriched my sense of connection with my ancestors, all of whom emigrated during the Famine. They settled in Rhode Island, forming Irish neighborhoods and maintaining traditions of childhood games, sayings, school uniforms, and recipes that I had not realized were Irish, but saw (or tasted) again this summer. People would hear my last name and say, "Ah, you're Irish!" On my last full day, I visited the Dunbrody Famine Ship and Irish Emigrant Experience. Visitors get a bill of passage with the names of a family who actually sailed on the Dunbrody in 1849 and visit the steerage section of a replica ship. I was stunned to find that seven Lawlors made that voyage, all in the same small bunk with all their possessions (Appendix 5). It doesn't matter that they are not in our known genealogy; it was chilling to realize that only three generations ago, Lawlors were refugees who suffered at sea for two months to escape extreme poverty and get to America.

To the Sabbatical and Leaves Committee, the Board of Trustees, and all those who rearranged their schedules to make this sabbatical possible, I thank you. I have listed only a few of the benefits. They were immeasurable.

Appendix 1: 3D Printing and Makerspace Experiences

Color plates showing 3D-printed models

Receipts for 3D Printing Classes

Makerspace Memberships

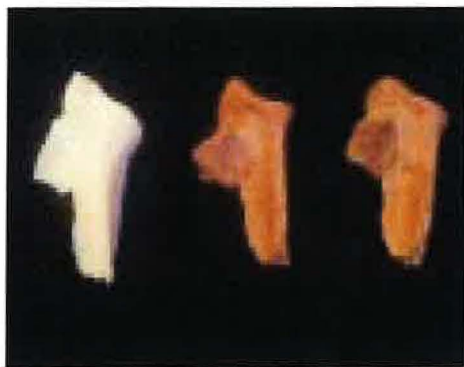
Color plates showing 3D-printed models



A. Containers made during Vocademy classes 3 and 4. Left: Klein bottle (three-dimensional Moebius strip) in red PETG, about 4 inches tall. Right: three-sided twisted vase in ABS after finishing. The finishing process alternated sanding with Bondo auto body repair putty, primer, coats of red and silver enamel spray paint and clear coat.

B. Model of Lucy's right proximal humerus in ABS, with supports and the raft that anchored it to the bed. Minimizing the supports makes for a cleaner print (with less to trim away). The challenge was to position them to not cover the fine details of Lucy's perimortem fracture (Kappelman 2016).

C. Models of the Hohle Fels flute (Reyes 2014), the oldest known musical instrument (Conard et al. 2009), in ABS. I printed it in two pieces to eliminate the need for supports, then used an acetone-based glue and did more finishing treatments. Most of these have printing errors but are suitable as replicas for student timeline activities.



D. Three models of Lucy's right glenoid fossa (shoulder socket), a fragment of the scapula (shoulder blade). Left: 3D print in ABS, unfinished. Center: 3D print in ABS, finished (smoothed and painted). Right: urethane cast from Mt. SAC's anthropology teaching collection. The unfinished print has the best detail, but the painted print shows up better in a photo.



E. Two copies of Lucy's proximal humerus in ABS, showing different stages of finishing. Left: sanded before and after a light application of Bondo. The red putty is filling in fine spaces between ridges formed by the printing process. Right: after a light coat of primer, important details have been lost. In the interest of maintaining the fracture details, I reprinted this model and left it unfinished. The two shown here will still be useful for hands-on lab activities.



F. The same models, rotated, further demonstrating the loss of detail after a light coat of primer.

Receipts for 3D Printing Classes

Receipts for classes 1 and 2 are on a separate sheet. I paid in person, and the receipts are aged, so here are emails from Vocademy showing that I took the classes.

DeskStaff 001 Vocademy <deskstaff001@vocademy.com>

11/04/17 at 4:23 PM

To lawlorb@sbcglobal.net

Hey Betsy,

Hope you enjoyed the class today. I have attached the student PowerPoint file for 3D printing 1. If you have any questions, please contact us and I am sure we will be able to assist you.

Thanks!

--Shehriyar

Vocademy Staff

Vocademy - The Makerspace

1635 Spruce Street

Riverside, CA 92507

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deskstaff001@vocademy.com

www.VOCADEMY.com



2x

DeskStaff 001 Vocademy <deskstaff001@vocademy.com>

To lawlorb@sbcglobal.net

Hey Betsy, attached are the powerpoints for 3D Printing 2 :)

Have a great day!

-- Shay

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DeskStaff 001 Vocademy <deskstaff001@vacademy.com>

To lawlorb@sbcglobal.net

Hey Betsy! I have attached the student powerpoints for 3D printing 3.

Happy Holidays!

-- Shehriyar

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VOCADEMY
THE MAKERSPACE

Briana Osorio <briana.osorio@vacademy.com>

To lawlorb@sbcglobal.net

Betsy Lawlor
422 Campus View Dr

Riverside, CA 92507

Sale Date 11/22/2017

Sale ID 16222

Sold By Briana Osorio

Rep: Shehriyar Khan

QTY	DESCRIPTION	PRICE
1	Account Payment	\$5.00
1	3D Printing 3 - Materials & Machines	\$140.00

Subtotal \$145.00

Tax \$0.00

Total \$145.00

Payment Method: Visa/MC (\$145.00)

We appreciate your business!

DeskStaff 001 Vocademy <deskstaff001@vacademy.com>

To lawlorb@sbcglobal.net

Betsy,

As requested, attached are the PowerPoints for 3D Printing 4.

Looking forward to seeing you here soon!

-- Shay

Vocademy Staff

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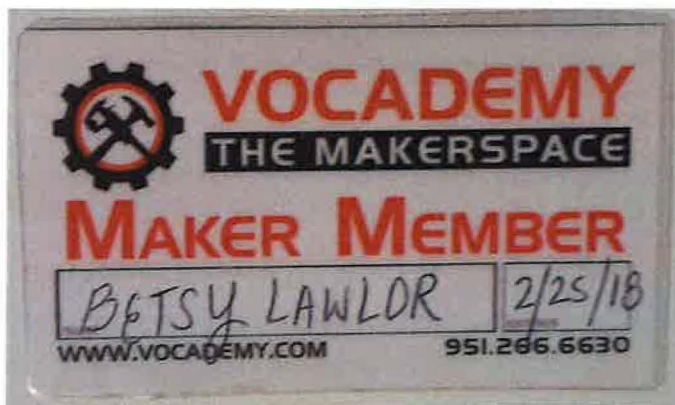
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THE MAKERSPACE

Makerspace Memberships



Makers Artists and Gadgeteers Laboratory, Inc.

\$90.00

Last payment on Aug 12, 2018

Status ACTIVE Cancel

Payment method **MasterCard ****7202**
 We'll use your balance first

Payments will be made every month

Start date Apr 12, 2018

AUG 12 Makers Artists and Gadgeteers Laboratory, Inc. - \$90.00
 Donation Associations

Paid with
 MasterCard x-7202
 You'll see "PAYPAL "MAKERSARTIS" on your card statement.

Sent to
 Makers Artists and Gadgeteers Laboratory, Inc.
 626-262-4522
<http://maglaboratory.org/>
contact@maglaboratory.org

Manage Makers Artists and Gadgeteers Laboratory, Inc. payments

Category
 Associations

Transaction ID
 8VW57425V92025516

Purchase details

Purchase amount	\$90.00
Total	\$90.00

[Print details](#)

Appendix 2: Irish Archaeology Field School

2a: Examples of Program Materials

Program Description

Individual Course Descriptions

Weekly schedule (Week 4)

2b: Examples of Produced Materials

Flotation processing record. Draft form, with data

Flotation processing record. Final form for use next season

Draft results. Cutting 1 (First excavation in castle)

Draft results. Cutting 2 (Second excavation in castle)

2a: Examples of Program Materials

**Foothill College
Department of Anthropology
Ireland Field Program Summer 2018**

Castles in Communities: Medieval Ireland Past and Present

**July 1 – August 2, 2018
County Roscommon, Ireland**

Program Description

The Foothill Ireland Program is an intensive, 4 ½ week/11-12 unit combined archaeological/anthropological field school and cultural immersion experience in the heartland of the Republic of Ireland. The program weaves together, on a day-to-day basis, lectures, discussions, readings, fieldwork activities, excursions and hands-on practice & service learning in the fields of archaeology, cultural anthropology and applied anthropology. The program also integrates opportunities for immersion into the communities and natural surroundings of County Roscommon in Ireland.

During your 4+-week stay in Ireland, you will have the opportunity to:

- Join the Foothill College Castles in Communities (CIC) project in the surveying, excavation and artifact analysis of the medieval landscape of Roscommon.
- Practice and utilize ethnographic fieldwork techniques to learn about cultural heritage and traditional life of Ireland, and explore the impact of archaeology, globalization, tourism, and economic development in the Roscommon region.
- Interact with and hear lectures from Irish and American anthropologists and archaeologists, local historians and culture experts, local artisans, youth groups, and other local community leaders, who have dedicated their lives to preserving and promoting the cultural heritage of the region.
- Experience daily life in the small towns and surrounding farmlands of Roscommon, Castlerea and Ballintober.
- Participate in service learning projects.
- Visit the cultural and natural wonders of the surrounding region in Ireland.

Program Instructors of Record

Kathryn Maurer, PhD.
Daniel Cearley, M.A.

PROGRAM SCHEDULE

Weekly Overview

Week 1 Introductory Days (July 1– July 8)

- Arrival, Orientation & Acclimation
- Introduction to program & course components, requirements & expectations, safety & health
- Introductory lectures on Ireland archaeology
- Local orientation & welcome events in Ballintober and Castlerea
- Introductory lectures, visits and exploration of Ballintober Castle and other nearby sites of archaeological interest including Sligo, Rothcroghan
- Introduction to archaeological & anthropological fieldwork theories & techniques
- Sunday July 8 – free day

Week 2 (July 9 – July 13)

- Break into groups for archaeological & anthropological field training and service learning rotations.
- Field trips to archaeological sites, other research projects in the area, towns & villages, natural surroundings.
- Class lectures & discussions
- Individual exploration, reading, writing and study.
- Field Trip to Country Life Museum, Pilgrimage walk to Ballintober Abbey

Free Weekend: July 14 – July 15

- “Free” weekend (starting the evening of July 13) for students to travel (at their own cost/own arrangements) to a destination of their choice or remain in Ballintober/Castlerea for free time.

Week 3 (July 16 - July 22)

- Archaeology/Anthropology field days, focusing on in the field hands-on learning and participation in the research.
- Ballintober Heritage Weekend (July 21-22)

Week 4 (July 23 - July 29)

- Archaeology/Anthropology field days, focusing on in the field hands-on learning and participation in the research
- Sunday July 29 – free day

Week 5 Final Days (July 30 – August 2)

- Student Independent Pilot Projects (SIPPS)
- Prep for archaeological site closure and program departure
- Program debrief, wrap-up and evaluation

- Good-byes and final logistics
- August 2nd – students depart Roscommon independently

STANDARD DAILY SCHEDULE

Monday - Thursday

- 7:00 Breakfast – *self prepared (houses provided with food)*
 7:45ish Transportation (by foot, car or bus depending on housing location) to field sites
 8:30 Arrival at assigned field location to begin workday
 12:00 Break for tea & lunch – *self prepared & packed at home*
 4:00 Field day Clean-up and Data Back-up
 5:30 Dinner begins (served for 1 hour) – *prepared group meal*
 6:30 Daily Group Debrief
 7:00- 8:30 Start of evening activity/lecture (if scheduled for that day – 3/week)
 8:30 Return to houses

Fridays

- 7:00 Breakfast – *self prepared (houses provided with food)*
 7:45ish Transportation (by foot, car or bus depending on housing location) to field sites
 8:30 Arrival at assigned field location to begin workday
 12:00 Break for tea & lunch – *self prepared & packed at home*
 4:00 Field day Clean-up and Data Back-up
 5:00 Return to houses
 Evening Dinner – *self prepared (group meals by houses encouraged)*

Saturdays and Field Trip Days

- 8:00 Breakfast – *self prepared*
 8:40ish Transportation (by foot, car or bus depending on housing location) to field sites OR field trip meeting point
 9:00 Ready to start activities
 12:00 Break for tea & lunch – *self prepared & packed at home*
 5:00 Return to houses
 Evening Dinner – *self prepared (group meals by houses encouraged)*

Sundays (with the exception of July 22nd)

Free time/Group fieldtrips – *meals on own*

ACADEMIC OBJECTIVES, EXPECTATIONS AND GRADING

Castles In Communities is part of the Foothill College Department of Anthropology's Summer Field Programs which includes Ecuador and the Pambamarca Archaeology Project. These two programs, Ecuador and Ireland, are taught in a collaborative manner with the same course listings, objectives, expectations, and format. Below are

the Foothill College classes being offered as part of the Ireland and Ecuador field schools for summer 2018.

Course	Units	Course Name	Instructor(s) of Record
Anth 12	4	Applied Anthropology	Cossin/ Maurer
Anth 16L	1	Basic Archaeology Lab	Gonzalez/ Cearley
Anth 51	2	Archaeology Survey	Gonzalez/ Cearley
Anth 52	4	Archaeological Methods	Connell/ Cearley
Anth 71R	2	Independent Study	Connell/ Maurer
Anth 72R	3	Independent Study	Maurer
Anth 73R	4	Independent Study	Connell/Maurer
Sosc 79	1	Intro to Community/Civic Engagement	Maurer

Enrollment

All new students in Ireland enroll in 11-12 units depending on interest and prior enrollments. Students may select from a combination of the following courses, ensuring minimum enrollment requirements are met:

The recommended schedule for all **new students** is:

Core Courses

Anth 12 Applied Anthropology	4 units
Anth 16L Basic Archaeology Lab	1 unit
Anth 51 Archaeology Survey	2 units
Anth 52 Archaeological Field Methods	4 units
SOSC 79 Introduction to Community/Civic Engagement	1 unit
Total:	12 units

If a **new student** has already taken one of the above courses they may substitute 2-4 units from the Anth 71R-73R series.

Returning students are required to take a minimum of 4 units:

The recommended schedule for all **returning students** who have already taken the Anthropology field courses is as follows (returning students are first encouraged to enroll in any of the above courses that they have not yet completed):

SOSC 79 Introduction to Community/Civic Engagement	1 unit
AND	
ANTH 71R 1-3 units or Any combination of the core courses	3 units
	Total: 4 units

COURSE OBJECTIVES AND STUDENT LEARNING OUTCOMES

The course objectives and your learning opportunities for each of the above courses (provided in detail below) are woven together day-to-day, often in an integrated and holistic fashion. It is absolutely essential to be present (both physically & mentally) to the best of your own individual abilities at every activity, lecture, discussion, etc., in order to receive credit for each of the courses in the program. You will also be expected to complete readings and other assignments for the above courses. If you have concerns about your ability to participate in any individual or group assigned activity, or complete one of the assignments, you must notify one of the project directors immediately. Every opportunity for flexibility and individual adaptation will be given for legitimate concerns.

It is also important to understand that while academic credit is granted on an individual basis, you are part of a larger group of faculty & students participating in multi-year research projects in a host country. You (and the group) are guests in the country of Ireland. Your own behavior and participation *will* impact (positively or negatively) both the faculty and other students on the 2018 project, as well as future Foothill research projects and field schools. Please take this opportunity and responsibility seriously!

The primary academic course objectives for the Foothill Ireland Program 2018 are the following:

- Prepare students to operate in a field archaeology environment anywhere in the world by exposing them to methods of site reconnaissance, surveying, excavation techniques, data recording, photography and drawing, and artifact analysis (ceramic typology and stone tool production experiments) in a laboratory environment;
- Demonstrate to students how we interpret the past from what we find in the present by laying the groundwork for understanding the links between method and theory in archaeology;
- Expose students to the Medieval period of Ireland, specifically the period of Anglo-Norman incursion and local Irish resistance, thus contributing greatly to their understanding of imperial and colonial processes in the ancient and

modern worlds.

- Raise students' awareness of the implications, politics and economic impact of archaeological research, discovery, analysis and interpretation on modern communities adjacent to archaeological sites.
- Introduce students to the skills necessary to conduct basic ethnographic/anthropological fieldwork techniques including observation, participant observation, mapping, interviewing, photography & video, and written documentation, and ensure ethical practice of anthropological fieldwork;
- Introduce students to how and why cultural anthropologists use ethnographic fieldwork methods to analyze and write about local communities and cultural heritage; and how these methods and analyses can be applied to assess community needs and support community and economic development;
- Become familiar with the different languages, cultures and people of Ireland;
- Learn and successfully implement skills of cultural exploration, immersion and adaptation.

EXPECTATIONS AND GRADING

As mentioned above, **active** (enthusiastic, engaged, and full of your best effort), **respectful** (of the local people and places, as well as fellow program participants and staff) and **consistent** (present and on time every day/every activity) **participation** is absolutely essential in order to maintain successful standing in the program, and receive credit for each of the courses. All students are required to read and sign an agreement for adhering to program rules at the start of the program, and successful completion of the academic courses are contingent upon appropriate behavior throughout the field season.

In addition to participating in all fieldwork, lab work, lectures, excursions, group discussions and cultural explorations, you will also be required to complete a set of program assignments. These assignments include the following:

1. **An archaeological and laboratory field log** – *all students take scientific notes on fieldwork, such as excavations and survey findings.*
2. **A practical demonstration** of key archaeological excavation and survey techniques – *all students will be evaluated on basic field tasks by the professors of record.*
3. **A practical demonstration** of key laboratory techniques – *all students will be evaluated on basic lab tasks by the professors of record.*
4. **A cultural fieldwork notebook** – *all students will make entries into a designated cultural fieldwork notebook that will provide an opportunity to document and reflect on the field and service learning experiences. A minimum number of entries (see separate field notebook handout) will be required for credit.*
5. **Short exercises and assignments** – *students will be responsible for*

completing short exercises and assignments related to the archaeological and anthropological field experiences.

6. **Student Independent Pilot Projects** - *Everyone will carry out a Student Independent Pilot Project (SIPP). These projects are developed by the students during the field program and the investigation and analysis takes place in the field. Students give oral presentations about their findings to the group in the final days of the program, and then write-up and submit a short final paper (5 pages), which is due one week from the end of the field season. Students are asked to consider a topic for research in the field and then will be asked to formulate a research plan which can be carried out during the program. The data needs to be presented in report form and will serve as a jumping off point for future research in their lives. One of our greatest assets as a project has been our openness about letting students come up with individual projects.*

You will receive a distinct letter grade for each of the courses in which you are registered, based on successful completion of all required assignments, and full participation in all activities. All grading follows this general rule:

Fieldwork, Labwork & Written Assignments	60 pts
Participation	<u>40 pts</u>
Final Course Grade	100 pts

Participation points are based on the overall involvement and contribution of the student in all aspects of the field project. Grades will be tallied based on your total points. Final grades will use +/- and will be done on the standard 90, 80, 70% scale (e.g. .98>=A+, .93-.97=A, .90-.92=A-). There are no predetermined number of As and Bs.

Required Text Materials

- 1) Foothill Ireland Program Reader shared in country.

Individual Course Descriptions

ANTH 12: APPLIED ANTHROPOLOGY**4 Units**

Instructors of Record: Zev Cossin (Ecuador) & Kathryn Maurer (Ireland)

Overview:

Applied anthropology focuses on the use of anthropological theories, perspectives and fieldwork methods to more deeply understand problems affecting local communities in this country and abroad, which have arisen in a postcolonial, globalized and modern world. Applied anthropologists work in real world contemporary contexts of practice, problem-solving and service, and engage with local communities to inform research, develop solutions and set policy.

This course is an introduction to applied anthropology often called the “5th field” of anthropology (the other four fields being Physical Anthropology, Cultural Anthropology, Archaeology and Linguistic Anthropology), or also known as the “2nd dimension” of anthropology (the first dimension being the “academic”). The content and skills associated with this course are designed to help you learn how to see the world through an anthropological lens. Activities will include guided fieldwork, service learning, policy development and problem-solving. You will learn what it means to *apply* and *practice* anthropology, and discover the immense value this application and practice has for you as an individual, a community member and a global citizen.

Additionally, you will learn what careers are available for students who major in anthropology with an applied focus. Applied anthropologists work in a multitude of settings including international development, advocacy and human rights, cultural and land management, tourism and cultural heritage preservation, museums, healthcare and social services, business and organizational culture, technology and product design, marketing and communication, education and law, and many other fields! In this class embedded in our field programs, you will be exposed first-hand to many of these applications.

The Student Learning Outcomes are as follows:

- Students will practice cultural relativism and apply understandings of global diversity in a practical and applied form.
- Students will critically analyze and interpret anthropology data so that it can be used to apply to real-world issues.
- Students will apply anthropological principles for solving human problems on the local, regional and world scales.

Foothill College GE Area: Social & Behavioral Sciences
Transferability: CSU and UC; Not Repeatable.

Course assignments Specific to Anth 12 (see above for detail)

1. An archaeology and lab field log
2. A cultural fieldwork notebook
3. Short exercises and assignments
4. Student Independent Pilot Project (SIPPs)
5. Participation

Point Breakdown:

Archaeology field log	10
Cultural notebook	10
Exercises and assignments	10
Independent Study Project Paper (SIPP) & Presentation	20
Independent Study Project Presentation	40
Total Points	100

ANTH 16L: BASIC ARCHAEOLOGY LABORATORY 1 Unit

Instructors of Record: Ana Gonzalez (Ecuador) and Dan Cearley (Ireland)

Overview: An introduction to basic laboratory methods and techniques of archaeology using the scientific method, including cataloging, care and analysis of artifacts, bone recognition, and archaeological excavation. This class will introduce concepts within an anthropological research framework. In addition to gaining expertise in laboratory research, students will examine, discuss, critique and write about the techniques, tools, laboratory terminology and processes of laboratory research at a basic level. Students will use archaeology vocabulary in verbal and written class reports.

The Student Learning Outcomes are as follows:

- Students will learn how to critically analyze and interpret archaeological data, including laboratory data, gathered from fieldwork and field survey.
- Students will practice and apply understandings of archaeological laboratory methods and techniques of archaeology, including cataloging, care and analysis of artifacts, bone recognition, and archaeological excavation.

Transferability: CSU and UC

Repeatability: Not Repeatable.

Course Assignments Specific to Anth 16L (see above for detail)

1. An archaeology and lab field log
2. A practical demonstration of key laboratory techniques
3. Short exercises and assignments
4. Participation

Point Breakdown:

Archaeology and lab field log	15
Practical demo of laboratory techniques	10
Exercises and assignments	35
Active, Respectful and Consistent Participation	40
Total Points	100

ANTH 51 ARCHAEOLOGY SURVEY**2 Units**

Instructors of Record: Ana Gonzalez (Ecuador) and Dan Cearley (Ireland)

Overview: An introduction to basic laboratory methods and techniques of archaeology using the scientific method, including cataloging, care and analysis of artifacts, bone recognition, and archaeological excavation. This class will introduce concepts within an anthropological research framework. In addition to gaining expertise in laboratory research, students will examine, discuss, critique and write about the techniques, tools, laboratory terminology and processes of laboratory research at a basic level. Students will use archaeology vocabulary in verbal and written class reports.

The Student Learning Outcomes are as follows:

The student will be able to:

- Students will learn how to critically analyze and interpret archaeological data gathered from field survey.
- Students will practice and apply understandings of field survey in archaeology.
- Students will apply anthropological principles for solving human problems on the local, regional and world scales.

Transferability: CSU and UC

Repeatability: Not Repeatable.

Course Assignments Specific to Anth 51 (see above for detail)

1. An archaeology and lab field log
2. A practical demonstration of key laboratory techniques
3. Short exercises and assignments
4. Participation

Point Breakdown:

Archaeology and lab field log	15
Practical demo of laboratory techniques	10
Exercises and assignments	35
Active, Respectful and Consistent Participation	40
Total Points	100

ANTH 52 ARCHAEOLOGICAL FIELD METHODS**4 Units**

Instructors of Record: Sam Connell (Ecuador) and Dan Cearley (Ireland)

Overview: Introduction to archaeological field methods at an archaeological site in Ecuador or Ireland. Field methods taught in this course include: locating different types of archaeological sites with field survey; methods of field excavation; study of local artifact types and lab techniques for artifact cleaning and identification; selection of archaeological sites; mapping, excavation, and preparation of artifacts; written analysis; working, living and collaborating with local communities.

The Student Learning Outcomes are as follows:

- Students will practice and apply understandings of directed readings, discussions and projects in anthropology.
- Students will learn how to critically analyze and interpret anthropological data.
- Students will apply anthropological principles for solving human problems on the local, regional and world scales.

Transferability: CSU and UC
 Repeatability: Not Repeatable.

Course Assignments Specific to Anth 52 (see above for detail)

1. An archaeology and lab field log
2. A cultural fieldwork notebook
3. Short exercises and assignments
4. Student Independent Pilot Project (SIPPs)
5. Participation

Point Breakdown:

Archaeology field log	10
Cultural notebook	10
Exercises and assignments	10
Independent Study Project Paper (SIPP) & Presentation	20
Independent Study Project Presentation	10
Active, Respectful and Consistent Participation	40
Total Points	100

SOSC 79 INTRODUCTION TO COMMUNITY/CIVIC ENGAGEMENT**1 Unit**

Instructors of Record: Kathryn Maurer (with oversight from Sam Connell for students in Ecuador)

Overview: Introduction to community service as it relates to community organizations, businesses or civic institutions allowing students to gain skills in advocacy and civic engagement through community service experiences, research and reflection. Students

explore experiential education, theories of service and service learning, strategies for facilitation and effective practice. The course integrates a practical experience in leading service learning projects. The course allows students to balance action with critical reflection in service learning practice.

The Student Learning Outcomes are as follows:

The student will be able to:

- Describe social, cultural and political forces that impact communities.
- Identify and assess the basic components of effective service learning.
- Assess community service opportunities as a strategy for creating more just communities and preparing students for lifelong community participation.
- Describe the essential elements of designing high quality service learning projects.

Course Assignments Specific to Anth 52 (see above for detail)

1. A cultural notebook
2. Short exercises and assignments
3. Participation

Point Breakdown:

Cultural notebook	20
Exercises and assignments	20
Active, Respectful and Consistent Participation	60
Total Points	100

Castles in Communities 2018

Weekly Schedule – Week 4

Week of Monday 23rd of July – Sunday 29th of July

Monday, 23rd of July

*Important notes: House captains provide food shopping lists for the week

- 8:00 Bus from Clonalis to Ballintober
- 8:30 **Gather at Schoolhouse: Group Check-In/Debrief**
- 9:00 Begin field day (Transport by cars to lab at Clonalis)
- 12:00 Lunch
- 12:45 Return to field sites
- 17:00 Bus from Clonalis to Ballintober
- 17:30 Dinner at Kenny's
- 19:00 **Lecture at the Schoolhouse: Other Ologies**
- 20:30 Bus to Clonalis/Return to Homes

Tuesday, 24th of July

SUCK VALLEY WALK FROM BALLINTOBER TO DUNAMON 4-8 P.M.

- 7:45 Bus from Schoolhouse to Clonalis (those assigned to lab)
- 8:00 Bus from Clonalis to Ballintober
- 8:30 Gather at field sites
- 12:00 Lunch
- 12:45 Return to field sites
- 14:45 Bus from Clonalis to Ballintober (TBD)
- 15:00 EARLY DINNER AT KENNY'S**
- 16:00 Suck Valley Walk from Ballintober to Dunamon (optional)
- 18:30 Pride of Place Preparations at Schoolhouse (optional)
- 20:30 Bus to Clonalis/Return to Homes

Wednesday, 25th of July – PRIDE OF PLACE

(No one at lab at Clonalis)

- 8:00 Bus from Clonalis to Ballintober
- 8:30 Gather at Schoolhouse – Group Check-In
- 12:00 Medieval Costume Parade at Castle Green** (weather permitting)

- 13:00 Picnic Lunch Castle Green** (weather permitting)
 13:45 Return to field sites

 17:00 Bus from Clonalis to Ballintober
 17:30 Dinner at Kenny's
 18:30 Irish lessons at Garvey's
 19:15 Ballintubber Heritage Events: Irish Dancing with Mildred at
 Garvey's followed by Ceoltas session
 21:00 Bus to Clonalis/Return to Homes

Thursday, 26th of July

*Important note: House captains provide food shopping lists for the weekend

- 7:45 Bus from Schoolhouse to Clonalis (those assigned to lab)
 8:00 Bus from Clonalis to Ballintober
 8:30 Gather at field sites
 12:00 Lunch at Schoolhouse
 12:45 Return to field sites
 17:00 Bus from Clonalis to Ballintober
 17:30 Dinner at Kenny's
 18:30 Group Debrief at Schoolhouse
 19:00 **Community Invited Lecture at the Schoolhouse: Sharing
 Results of 2018 CIC Season**

 20:30 Bus to Clonalis/Return to Homes

Friday, 27th of July

SUCK VALLEY CANOING 7 P.M. FROM DUNAMON TO CASTLECOOTE

2.5 HOURS

- 7:45 Bus from Schoolhouse to Clonalis (those assigned to lab)
 8:00 Bus from Clonalis to Ballintober
 8:30 Gather at field sites
 12:00 Lunch at Schoolhouse
 12:45 Return to field sites
 17:00 Bus from Ballintober to Clonalis/Return to Homes
 Evening Dinner self-catered at homes
 18:30 Canoe trip leaving from Ballintober – location TBD
 21:00ish Ballintubber Heritage Event (optional but recommended): 8 Ball
 Pool Competition Irish vs. Americans at Kenny's

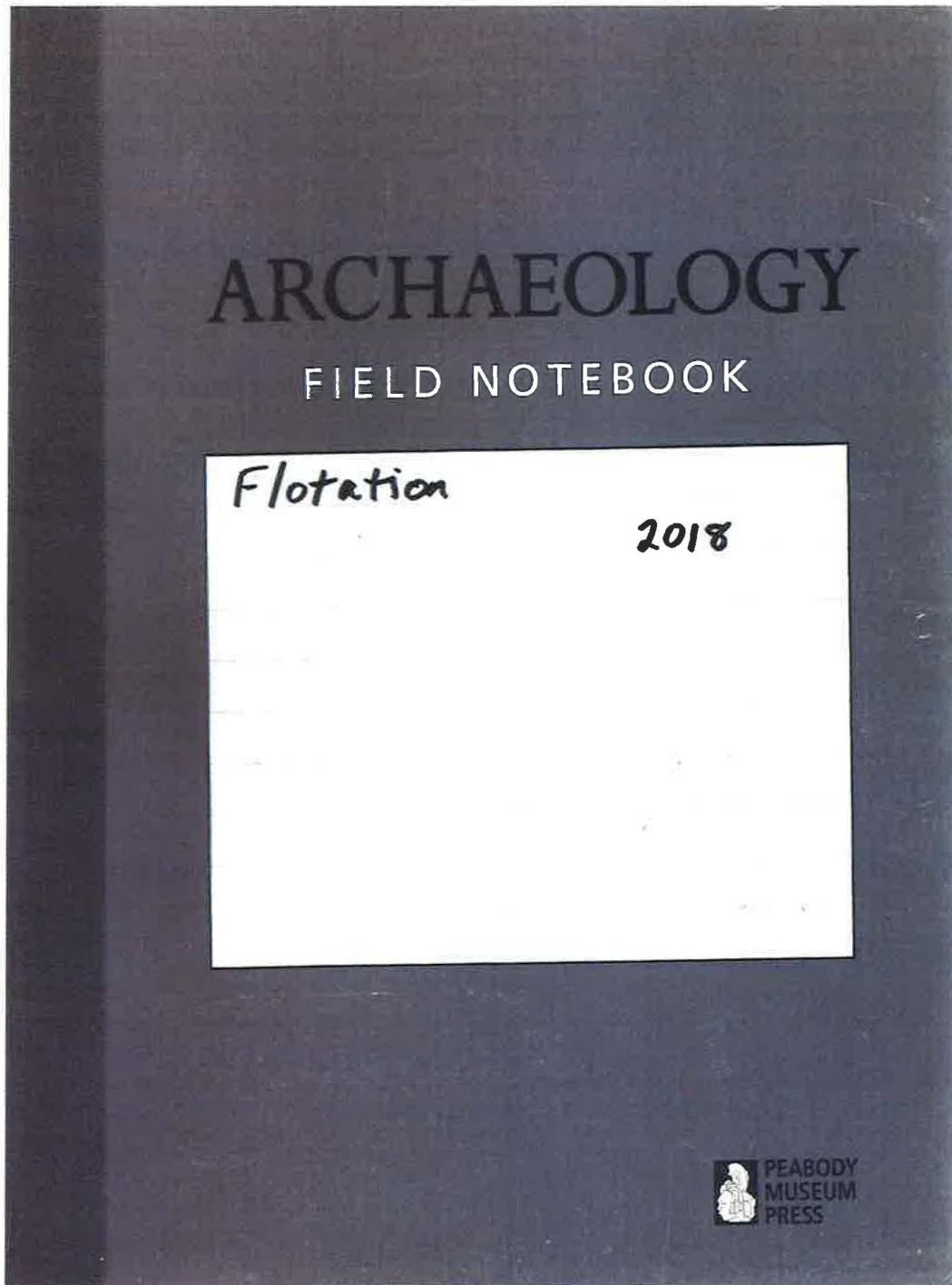
Saturday, 28th of July

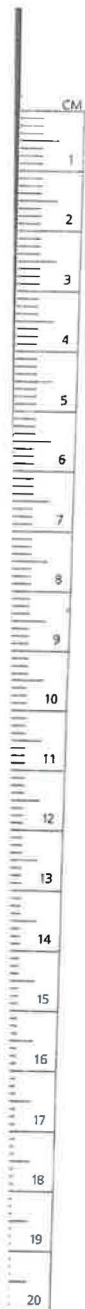
- 8:30 Bus from Clonalis to Schoolhouse
8:45 **Bus from Schoolhouse to Local Sites – Final Field Trip
(Rathra, Roscommon Castle, Roscommon Abby, etc.)**
- 13:00 ish Return to Clonalis/Homes
18:00 Bus from Clonalis to Schoolhouse
18:30 **Stakeholder Party – BBQ at the Old Schoolhouse**
- 21:00ish Ballintubber Heritage Event (optional but recommended):
Kenny's & Garvey's various event
22:00 Bus from Ballintober to Clonalis/Return to Homes

Sunday, 29th of July

- Free day – all meals self-catered at homes
Evening Ballintober Heritage Event (optional but recommended): Kenny's
Farewell Party/Evening with band Fireblade

2b: Examples of Produced Materials
Archaeology field notebook (excerpts)





Questions?



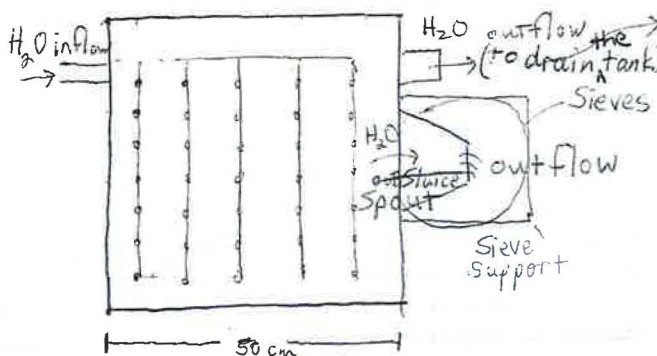
Local ecological consultant:
 Kathryn Turner, Ph.D. gammaus10@gmail.com
 Riverview Cottage
 French lawn
 Castlereagh, Co. Roscommon, Eire F45 KT35 1

(the Treacy's
 old place)

Lawlor Sabbatical Report 2017-2018 Appendix, Field notebook, abridged notation
 Daily Log marks are in glossary, p. 36

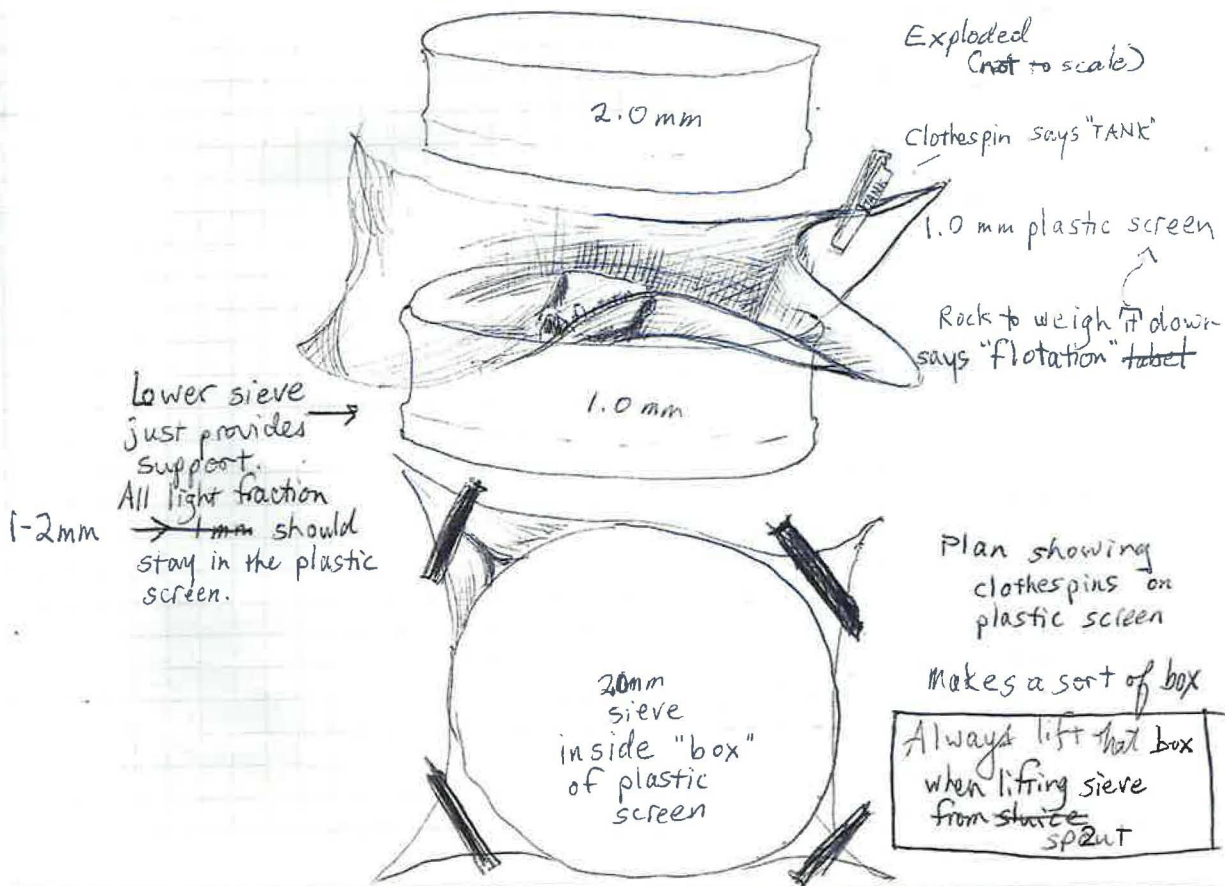
6 July 2018 (Friday) Running 1st sample as trial run before students start rotations.

Tank: 50 x 50 cm "SMAP" with 5 circulation arms/sprayers
 x 26 cm D (to sluice) to level of sluice



Short length of 1/2" hose
 = "yellow hose" "Outflow"
 5" = in glossary
 Stuck into long
 250 mm "green hose"
 No seal required to
 hold any pressure at
 out flow.

Sieves supported on tank: 2 20-cm nesting geological sieves

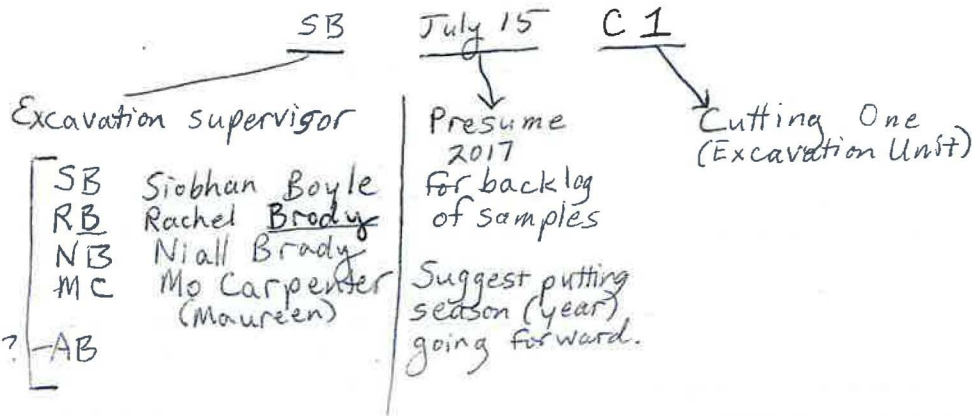
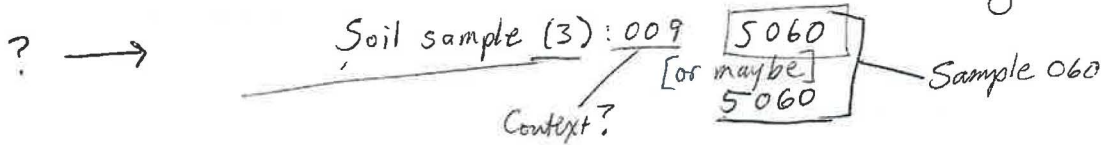


5

6 July 2018, ~~continued~~ ^{Lawlor Sabbatical Report 2017-2018}

Appendix, Field notebook, abridged

Processed 2L sample with label I (BL) didn't understand completely.



Made 3 labels on scratch paper (failed print jobs)

"Flot. Label" [] - Same as bucket label

Collected 15 July 2017

One of these. { Light fraction 1mm → Revised to >1mm
 Light fraction 2mm → Revised to 1-2mm
 Heavy fraction

~~Process~~

Floated 6 July 2018

BL (Betsy Lawlor)

<p>Final Label format:</p> <p>15EØ232 (site#)</p> <p>C Ø 35 (context) Soil</p> <p>(collected →) 27 July 2017</p> <p>(floated →) 23 July 2018</p> <p>(fraction →) Heavy</p>	<p>D52 Cutting (or C1, C2, etc.)</p> <p>S110 (sample #)</p> <p>SB</p> <p>BL</p>	<p>3</p>
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6 July 2018 continued Lawlor Sabbath School Report 2017-2018 Appendix, Field notebook, abridged

6

To measure volume, we (Sean McMillan, BL) ~~put~~ poured soil into graduated bucket. = "grad. bucket"

Fix method →

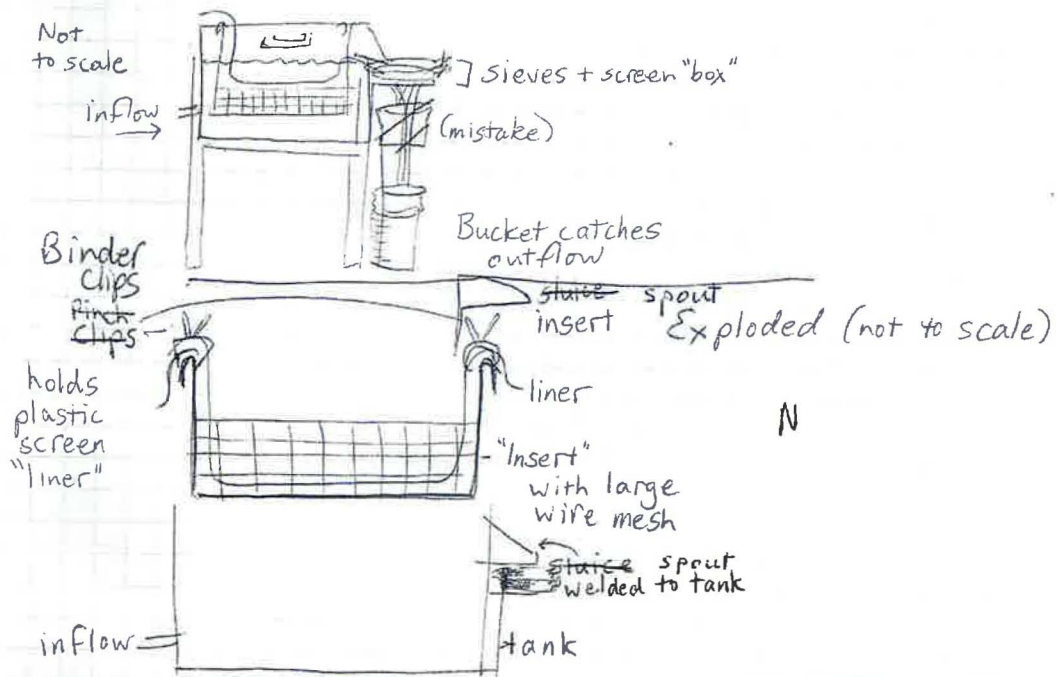
Went flying - maybe 500 ml missed the bucket. Glad table was clean below it.

Sample had big chunks of rubble. Pulled them out + set ~~on~~ in bowl-shaped sieve = "pasta sieve"

Recorded volume of sample sans rubble. Poured sample into tank. Then put rubble in tank.

I think no need to measure volume of rubble going forward.

Soil in tank. Turned on tap. (Tank already full + set up like this:



15E0232	Soil	DS2
C2018	5 July 2018	RB
10 July 2018	Light > 2mm	BL

A bad label

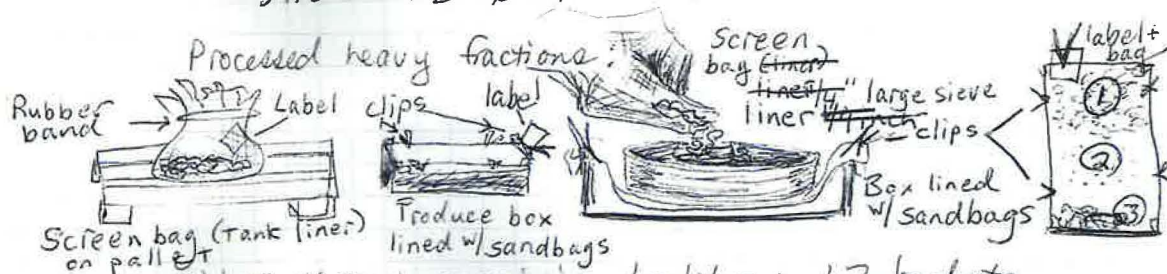
A good label →

15E0232	Soil	DS2
C2111	30 July 2018	RB
	30 July 2018	BL
	Light > 2mm.	

20 July 2018
Lawlor Sabbatical Report 2017-2018 Appendix, Field notebook, abridged

Processed 4 samples w/ Keegan Silveria

- 52629 RB Ctxt 2102 DS2 So: caught up w/ 2018
- 5115 NB Ctxt C035 DS2? sample
- 52628 RB 2101 DS2
- 5116 NB 049 CI



Went through remaining backlog: 12 buckets
(not floated today)

Sorted by cutting and context number and referred to Hart's matrices to see what priorities might be. None were from ditch.

Sorting heavy fractions (see above right).
Most efficient done systematically.

- ① Unsorted.
- ② Being eyeballed.
- ③ Done with sorting.

(Niall had said priority.)
Expect to find those in
previously floated samples
up in the dry lab.

23 July 2018 What we still have to float (of the backlog):

Cutting	Superv.	Context	Sample #	Date we floated
1	SB	C 034	S 104	23 July
	SB	C 035	S 110	23 July
	SB	C 037 (peat)	S 105	23 July
2	RB	C 210		
	RB	C 214	S 248	24 July
	RB	C 215	S 257	23 July
	RB	C 211	S 235	23 July
			C 228 or 225?	
			C 229	
			C 245	
		C 250		

At end of day, we had 6 backlog samples left.
Also sieved all heavy fractions from previous days.

15

2019 will start with backlog for wet lab; Appendix, Field notebook, abridged
 Lawlor Sabbatical Report 2017-2018

6 from previous to 2018 (mostly cutting 2)
 21 from DS 2
 27 Total / 5 per day (optimistic)

to float (Do we even get 12 full workdays?)
 At least 6 full days, with 6 interstitial days to transfer from screen to bag + sort heavies.

Dry Lab = Examining light fractions with magnifying glasses + microscope; photographing reference collection seeds and plants; collecting + cooking + burning more reference plants; setting up data recording; tabulating and analyzing results.

2019 will start with backlog from for dry lab:

Expect ~10-45 minutes per sample at first. It gets faster with familiarity with seeds.

ALL lights + heavies 2015 - 2018!

Schedule time for students to just play with reference coll; ~~Get~~ need time at scope to get used to depth of field issues and finding what they're poking at in field of view. Then need to recognize common seeds + wood.

Will not get half

done in 2019 without daily dry lab workers.

Also schedule local ecology walks as part of program.

- Bog cutting day → What is a bog?
 Plant community.
 Ecosystem
 Soil formation
 Plant ID in peat

- Cave of Cats → Rushes, Intro,
 How many other plants are here?
 Plant community.
 Demo plant press.

- Suck Valley Way → Not an event as in an epic journey.
 Need willow wood for collection. (Wattle + daub)
 Slow walk + exploration.
 Riverine community.
 Talk about coppicing. Visit old mill.
 Do some; check next yr. 6

Lawlor Sabbatical Report 2017-2018 Appendix, Field notebook, abridged (36 marks)

(In order of use.)

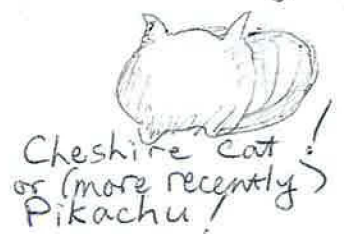
Page 4
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11

- Yellow hose 1/2" inch or 1.25 cm. hose, used for water from tap to tank and outflow
- Outflow In 2018, short length of yellow hose + green hose
- Green hose 2.50 mm hose with spiral ridges. Directs outflow far from
- SMAP Shell Mound Archaeological Project - type tank
- TANK Watson, Patty Jo 1976 or so. Our Founding Mother. Things with "TANK" label stay with screens + sieves
- flotation rack Rock with "flotation" label; holds 1mm screen down.
- grad. bucket Blue bucket marked at 2L, 4L, 6L, 8L
- pasta sieve Bowl-shaped sieve.
- box (of plastic screen) Screen between 2mm and 1mm sieves.
- flot. label Approx. 10x10 cm scrap paper. Need 3 per sample.
- ~ Approximately
- " Inches (rare); Ditto (same as line above); "see this list" (glossary)
- @ At
- turd test - handful of sample. Add some H₂O. If it can form a turd,
- HF Heavy Fraction The part of the sample that doesn't float and is larger than the 1mm mesh screen lining the flotation tank.
- LF (Light Fraction) The part that floats and is larger than the finest sieve used. In 2018 at CIC, our smallest LF was > 1mm. We also saved LF of 1-2mm.
- Eyeballed - Looked it over with no magnification.

Turd test, continued. If you can shape it like a turd, and it holds its shape, the soil sample is "clay-y".



If you can form a little animal whose ears stay up, the soil sample is mostly clay.



These of course are highly specialized scientific terms.

Mostly clay soil

Flotation processing record. Draft form, with data

CASTLES IN COMMUNITIES Ballintober Castle 15E0232

Flotation Processing Record

Add info from bucket label before processing.	Sample number S f 248 Date collected July 14, 2016 by RB				
	Date processed (floated) July 24 2018 by BL				
	Area	Cutting 2	Context 214	Context type	Feature
	Volume collected		Volume processed (usually same as collected) 7 L		
Damp or dry? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Mold or mildew apparent? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Rubble <input type="checkbox"/> gravel <input checked="" type="checkbox"/> sand <input type="checkbox"/> loam <input type="checkbox"/> silt <input checked="" type="checkbox"/> clay <i>little bit</i> <i>largely</i>					
Sample provenience					
Add info from Harris matrix during processing	Adjacent to (before, behind, between, above, below, as warranted)				
	Context _____ Context type _____		Context _____ Context type _____		
	Context _____ Context type _____		Context _____ Context type _____		
Sample handling					
Add info while processing.	Deflocculant				
	<input checked="" type="checkbox"/> None CaCO ₂ (Baking soda) Other Amount (mL) Effectiveness				
	Light fraction				
Okay to just circle the suggested conditions or methods.	Lots of seeds Grape? Barley → Apple seeds Equisetum segment + scoop Wheat				
	Sieved before <input checked="" type="checkbox"/> Sieved on outflow <input checked="" type="checkbox"/> Stirred Scraped with spatula <input checked="" type="checkbox"/> Herded with hand				
Circle as many as apply.	Heavy fraction				
	Probably should toss. Water sieved <input checked="" type="checkbox"/> Eyeballed Saved for scope sort Sent to artifact lab Tossed				
Other comments / Mishaps / Challenges					
most heavy fraction < 1 mm mesh screen cloth					
Didn't sort much + think I see: (No ref coll. + have put away scope for the season.) Grape <i>Vitis</i> Barley (distorted by fire) <i>Hordeum</i> Apple <i>Prunus</i> Wheat <i>Triticum</i> Segment of horsetail - used for scrubbing pots (<i>Equisetum</i> sp.)					

Have fun whoever takes this on! -BL

Form: 12 July 2018

Rush ()
 Won't fit stay in pill box - there are gaps.
 put in corner of poly bag, snipped bag
 put that in pill box.

Flotation processing record. Final form for use next season

Cutting _____

CASTLES IN COMMUNITIES Ballintober Castle 15E0232 Flotation Processing Record

Add info from bucket label before processing.	<small>Sample</small>	S _____	<small>Date collected</small>	by _____
	<small>Context</small>	C _____	<small>Date processed (floated)</small>	by _____
	<small>Volume collected</small>	<small>Volume processed (usually same as collected)</small>		
	<small>Soil sample condition</small>			
YES NO Damp or dry? Mold or mildew apparent? Rubble / gravel / sand / loam / silt / clay?				
Sample context <small>(descriptions and/or interpretations from project report)</small>				
Can't do this for current season's samples, only for backlog. Usually done at dry lab.	<small>About this context</small>			
	<small>About associated contexts (before, behind, between, above, below, as warranted)</small>			
	C _____	Interp	C _____	Interp
	C _____	Interp	C _____	Interp
Sample handling				
Deflocculant? <small>(substance added to help disperse clay soils, not usually added)</small>				
None CaCO ₂ (Baking soda) Other Amount (mL) Results				
Add info while processing.	Light fraction methods and preliminary results			
	Sieved on outflow Hand-stirred deep in tank Herded with hand Scooped with net Rinsed off spout insert			
Please Circle the suggested conditions or methods.	Heavy fraction methods and preliminary results			
	Water sieved Dry sieved Eyeballed Stuff saved for scope sort Items bagged for artifact lab Tossed			
Circle as many as apply, and add more info as needed.	Other comments / Mishaps / Challenges			

Draft results. Cutting 1 (First excavation in castle)

Sample No.		Context	Context Interpretation	Date collected	Date floated	Observations
S001		001	A-horizon topsoil.	13072015		
S016		004	Base of topsoil.	22072015		
S021		005	Cut for robber's trench C012.	23072015		
S040		009	Poss. explosion.	05072016?		
S070		017	Occupation surface.	18072016		
S071		017	Occupation surface.	18072016		
S059		009	Poss. explosion.	15072016	06072018	No seeds or charcoal.
S060		009	Poss. explosion.	15072016	06072018	Bird bone, talon, burnt and raw bone.
S078		020	Poss early occupation.	19072016		Possible backlog. Could be the pre-2018 bucket with no label.
S104		034	Fill of builder's trench.	24072017	23072018	No seeds or charcoal. Small amount of bone fragments.
S105		037	Poss. moat or ditch.	24072017	23072018	No seeds or charcoal.
S110		035	Fill.	27072017	23072018	Sparse. Possible seeds or rodent feces.
S115		035	See Appendix 1 of the present report.	18072018	20072018	No materials recovered.
S116		049	See Appendix 1 of the present report.	18072018	20072018	No materials recovered.

Draft results. Cutting 2 (Second excavation in castle)

Sample No.	Context	Context Interpretation	Date collected	Date floated	Observations
S203	201	Topsoil at base of sod.	14072015		
S212	204	Described as friable yellow clay.	23072015		
S233	210	Fill of foundation trench C209.	06072016	18072018	Seeds: grains? <i>cf. Oxychilus</i> sp. (glass snails)
S234	213	Collapse from destruction of wall C208.	06072016		
S235	211	Fill of foundation trench for construction of wall C203. Same as C221.	06072016	23072018	Very productive. Seeds: <i>Juncus</i> sp. (rush); <i>cf. Vitis</i> (grapes); <i>cf. Hordeum</i> (barley), burned; probably others.
S238	206	Described as yellow boulder clay.	07072016		
S244	226	Upper level of foundation plinth C227.	13072016		
S246	223	Historic fill episode contemporary with C206, represented by wall C203.	14072016		
S247	225	Fill of foundation trench for wall C208.	14072016		Backlog.
S248	214	Occupation level, probably medieval in date.	14072016	24072018	Very productive. Seeds: <i>cf. Vitis</i> (grapes); <i>cf. Hordeum</i> (barley) burned; <i>cf. Malus</i> (apple), <i>cf. Triticum</i> (wheat) or <i>Avena</i> (oat); <i>cf. Juncus</i> ?sp. (rush). Stem: <i>cf. Equisetum</i> (horsetail).
S249	228	Part of occupation level associated with C214, C222.	14072016		Backlog.
S252	22 [sic]		15072016		
S253	229	Soil level associated with destruction of wall fragments C203, C208.	15072016		Backlog.
S256	232	Fill of posthole C231.	15072016		

S257	215	Possible evidence for a burning episode predating wall C203.	18072016	23072018	Very productive. Many seeds: <i>cf. Triticum</i> (wheat) or <i>Avena</i> (oat); <i>cf. Hordeum</i> (barley). Small amount of small, unidentifiable bone frags discarded. <i>Oxychilus</i> sp. (glass snail).
S261	216	Trench feature pre-dating wall fragments, overlain by C214-C222.	20072016		
S263	216	Trench feature pre-dating wall fragments, overlain by C214-C222.	21072016		
S282	245	Castle debris/scree fall.	21072017	18072018	Sparse. <i>cf. Hordeum</i> (barley) seed. Very slender bones – fish? Tooth enamel from large grazer. Burnt large bone frags. <i>Oxychilus</i> sp. (glass snails).
S352	271	See Appendix 1 of this report.	25072018	27072018	Sparse light fraction. Saved heavy fraction as backlog in 2 bags.

Draft results. Deserted Settlement 2 (Outside castle)

Sample No.	Context	Context Description		Date collected	Date floated	Observations
S2018	2101			11072018	NA	Collected as an ecofact rather than a soil sample. Fragment of cf. <i>Prunus</i> (plum?) pit.
S2021	2101			16072018	18072018	Tiny charcoal fragments. Live worms and beetles.
S2028	2102	Soil taken from Ev 6 and 9.		18072018	20072018	Not productive. Live earthworm.
S2029	2102	From above hearth feature 2103. Ev 5.		18072018	20072018	Productive. Should be sorted, but also had green rhizomes, leaves and beetles. 2 burned bone frags.
S2038	2107			23072018	27072018	No seeds. Possibly identifiable charcoal.
S2039	2105	West half of bisected pit feature. Taken from the first 5 cm.		23072018	27072018	Very productive. High priority for scope sort. Possibly identifiable charcoal.
S2040	2110	Furrow, same as C2106 and C2111		24072018	27072018	Mostly rootlets. Could be seeds. Worth a scope scan.
S2046a	2115			24072018	27072018	Very productive. High priority for scope sort. Stored light fraction damp, in paper envelope in toilet paper tube.
S2046b	2103	Hearth feature taken at depth 36 to 38 cm.		25072018	27072018	Very productive. High priority for scope sort. Grains, achenes (<i>Asteraceae</i>). Some seeds removed to pill box. Stored light fraction damp, in paper envelope in toilet paper tube. Came in from field with bag in bucket with cylindrical object I now think was a crinoid (fossil common in local Carboniferous limestone).
S2048	2111			26072018	30072018	Very productive. High priority for scope sort. Cf. <i>Hordeum</i> , removed to pill box. Heavy fraction stored with backlog.

S2049	2111					Backlog.
S2050	2106					Backlog.
S2051	2119	Hearth				Backlog.
S2052	2119	Hearth		27072018	30072018	Rootlets, seeds, possibly identifiable charcoal.

S2060	2119	Hearth			Backlog.
S2061	2120	Hearth			Backlog.
S2062	2119	Hearth			Backlog.
S2063	2119	Hearth	27072018	30072018	Nearly unproductive. 1 grain seed or glumes. Damp when stored; bagged in paper envelope. Heavy fraction stored with backlog.
S2064	2120	Hearth	27072018	30072018	Very productive for possibly identifiable charcoal. Damp when stored. Bagged in paper envelopes in toilet paper tube and one poly bag. Many bone frags. Heavy fraction sorted, not stored with backlog.
S2065	2120	Hearth			Backlog.
S2066	2120	Hearth			Backlog.
S2070	2109				Backlog.
S2071	2120	Hearth			Backlog.
S2072	2120	Hearth			Backlog.
<p>Niall, the following were collected in sandbags and delivered as we finished floating the final sample of the season. I didn't take the time to record the sample numbers or collection dates. (Focus was on organizing instructions for lab take-down.) It would be very useful to your project going forward to add that info from Rachel's sample log to this table. BL</p>					
	2119	Hearth	31072018		Backlog.
	2119	Hearth	31072018		Backlog.
	2119	Hearth	31072018		Backlog.
	2120	Hearth	31072018		Backlog.
	2120	Hearth	31072018		Backlog.
	2120	Hearth	31072018		Backlog.
	2120	Hearth	31072018		Backlog.
	2121		31072018		Backlog.
	2125		31072018		Backlog.
<p>Note: C2119 and C2120 were collected 100% as soil samples. Each bucket or sandbag was designated with a unique sample number.</p>					

Appendix 3: GIS Certificate Program

UCDAVIS

09/26/2017

Elizabeth Lawlor

has successfully completed

Fundamentals of GIS

an online non-credit course authorized by University of California, Davis and offered through Coursera



Nicholas Santos
Geospatial Applications Developer
UC Davis Center for Watershed Sciences

**COURSE
CERTIFICATE**



Verify at coursera.org/verify/CKN5FYDEYDSZ
Coursera has confirmed the identity of this individual and their participation in the course.

UCDAVIS

03/28/2018

Elizabeth Lawlor

has successfully completed

GIS Data Formats, Design and Quality

an online non-credit course authorized by University of California, Davis and offered through Coursera



Nicholas Santos
Geospatial Applications Developer
UC Davis Center for Watershed Sciences

**COURSE
CERTIFICATE**



Verify at coursera.org/verify/487BWM8TJ9HG
Coursera has confirmed the identity of this individual and their participation in the course.

UCDAVIS

06/04/2018

Elizabeth Lawlor

has successfully completed

Geospatial and Environmental Analysis

an online non-credit course authorized by University of California, Davis and offered through Coursera



Nicholas Santos
Geospatial Applications Developer
UC Davis Center for Watershed Sciences

**COURSE
CERTIFICATE**



Verify at coursera.org/verify/WLQKU7RTKCYS
Coursera has confirmed the identity of this individual and
their participation in the course.

UCDAVIS

11/08/2018

Elizabeth Lawlor

has successfully completed

Imagery, Automation, and Applications

an online non-credit course authorized by University of California, Davis and offered through Coursera

**COURSE
CERTIFICATE**



A handwritten signature in black ink, appearing to read 'Nicholas Santos'.

Nicholas Santos
Geospatial Applications Developer
UC Davis Center for Watershed Sciences

Verify at coursera.org/verify/9682GQ8WBYN6
Coursera has confirmed the identity of this individual and their participation in the course.

UCDAVIS

11/06/2018

Elizabeth Lawlor

has successfully completed

Geospatial Analysis Project

an online non-credit course authorized by University of California, Davis and offered through Coursera



Nicholas Santos
Geospatial Applications Developer
UC Davis Center for Watershed Sciences

**COURSE
CERTIFICATE**



Verify at coursera.org/verify/PUYXY7GMW94J
Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses

Fundamentals of GIS

GIS Data Formats, Design and Quality

Geospatial and Environmental Analysis

Imagery, Automation, and Applications

Geospatial Analysis Project



11/08/2018

Elizabeth Lawlor

has successfully completed the online, non-credit Specialization

Geographic Information Systems (GIS)

In this Specialization, learners gained the skills to act as professional GIS analysts and communicate with others. The Specialization covered the technical aspects of GIS including: gathering and sharing geographic data, managing spatial data, projections, geoprocessing and spatial analysis, Model Builder, data creation, data formats, and imagery. Learners also gained the advanced cartography skills to present their findings through professional quality maps. The Specialization culminated in a capstone where learners conducted a spatial analysis from conception through analysis and presentation to demonstrate earned skills.

Nicholas Santos,
Geospatial Applications
Researcher, UC Davis
Center for Watershed
Sciences
Jeff Loux, Chair,
Department of Science,
Agriculture and Natural
Resources & Associate
Adjunct Professor

Verify this certificate at:
coursera.org/verify/specialization/ZZE6RYTVDRI/

Appendix 4: Benefit and Value to the College

Flier for Anthropology 4 (new Mt. SAC Archaeology class)

Classroom Presentation Slides: Medieval Die from Ballintober Castle

GIS Lesson Plan (ANTH 4 Lab Handout)

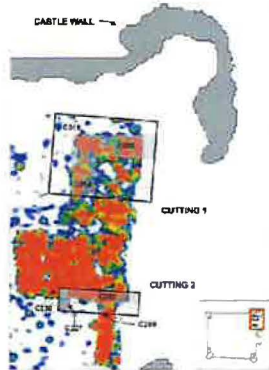
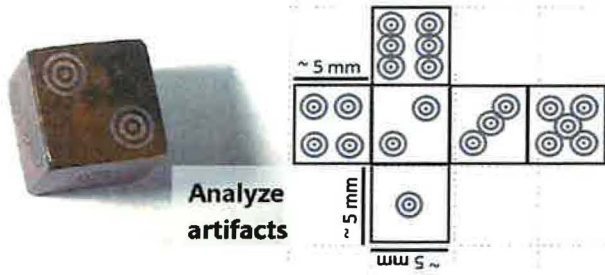
Flier for Anthropology 4 (new Mt. SAC Archaeology class)

Hey! Wanna do some

ARCHAEOLOGY

this semester?

ANTH 4: Archaeology
Lecture MW 11:30 - 12:40
Lab W 3:00 - 6:10
Room 60-2620
CRN 23223



Core requirement for AAT – Anthropology
Transferable to CSU
Elective for AAD1 and ASD1 - U.S. History & American Institutions



Classroom Presentation Slides: Medieval Die from Ballintober Castle

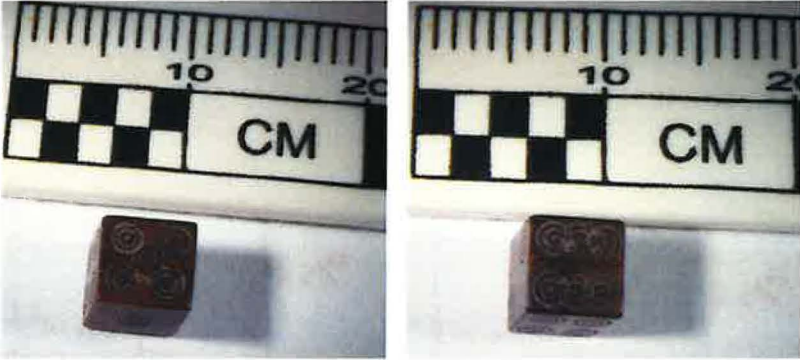
 Castles In Communities

Medieval Die
from Ballintober Castle,
Co. Roscommon, Ireland



1300 – 1600s

Photo: Caroline Stasulat



Photos: Caroline Stasulat

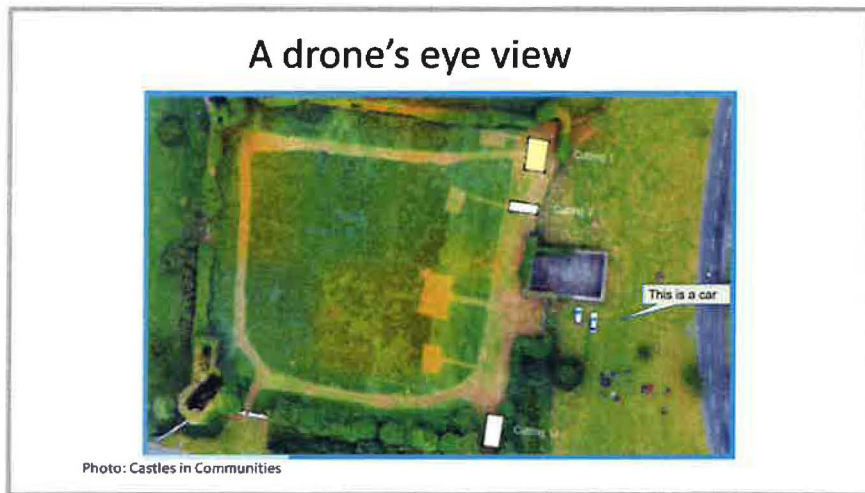
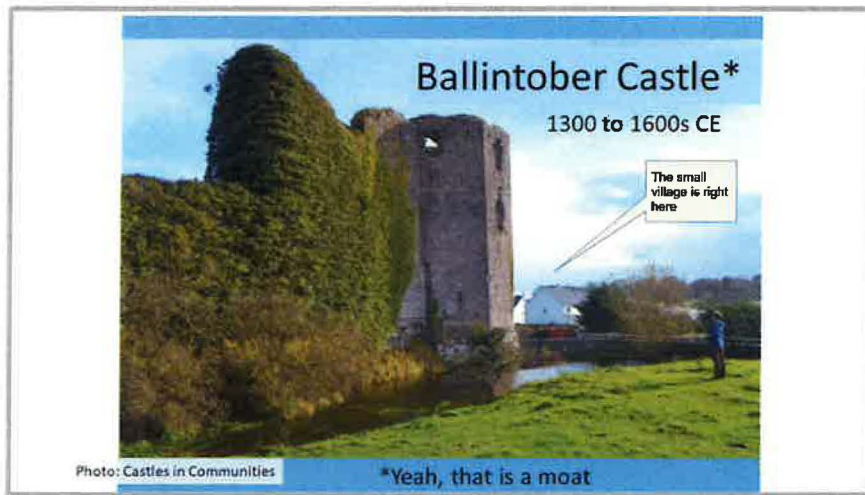
Where's it from?

Western Ireland

County Roscommon

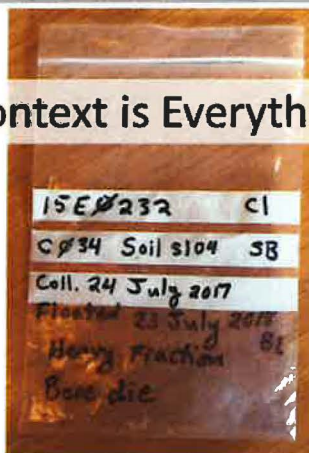
Ballintober village





Context is Everything!

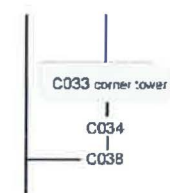
Site #
Context 034
Soil sample #
From tank bottom
Artifact type



Cutting 1
Excav. supervisor
Date collected
Date floated
Flot. supervisor

Photo: Caroline Stasulat

Context 034



From Harris matrix

Context No.	Description	Interpretation
033	Length of walling made up of shaped limestone blocks, mortared together. It was observed extending from the north bank of the 2017 cutting extension. It appears to terminate at the eastern bank and runs west-wards under collapse C029. The wall is aligned E-W. A length of 180cm, a height of 60cm and a depth of 33cm was exposed. The exposed portion is straight-sided.	The footing for the exterior of the NE corner tower.
034	Very dark-coloured gravelly soil fill of C038, lying next to wall C033, measuring 140cm long by 18cm wide.	Fill of builder's trench associated with construction of the NE corner tower.
038	Trench cut measuring 140cm long as exposed, and 18cm deep, lying next to wall C033 and filled with C034.	Builder's trench associated with construction of the NE corner tower.

Quiz later.

Dice games were very popular.



<https://www.lostkingdom.net/medieval-gambling-games-dice/>

2,000 years of dice



<https://www.lostkingdom.net/medieval-gambling-games-dice/>

Egypt → Rome → Europe



Various dice from the Netherlands, a) Roman die from Vechter; b) Medieval die from Nimoges; c) Post-Medieval die from Sasquien; d) 17th-century die from the Netherlands.

<https://theverybesttop10.com/facts-you-might-not-know-about-dice/>
<https://www.atlasobscura.com/articles/dice-evolution-fate-fairness-archaeology>

What's wrong with this picture?



<https://www.livescience.com/62273-cheating-medieval-dice-norway.html>

GIS Lesson Plan (ANTH 4 Lab Handout)

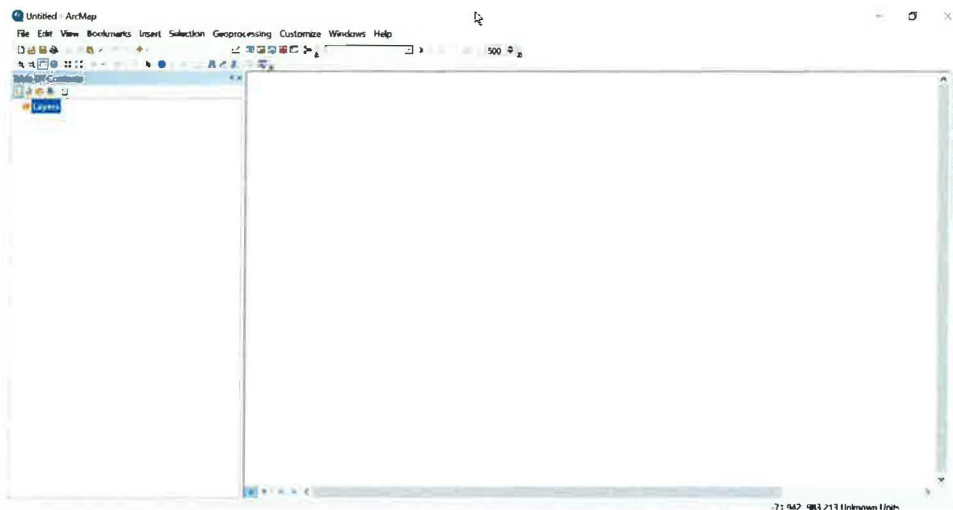
ANTH 4 Lab: GIS

In the Natural Sciences Computer Lab, all of your GIS lab data folders are inside a folder named C:\GIS. Whenever we reference data in this lab, the path will be relative to C:\GIS. If you put it into a different folder, you'll need to figure out where it is on your own.

Please ask for help! You can ask me or another student.

1. Open ArcMap (shortcut on desktop or see below)

Lower left corner of screen / Windows icon / ArcGIS / double-click ArcMap



2. Look around a bit

"What do you notice about the ArcMap interface? What kinds of *conventions* is it using? It has menus -what can you do with them? It also has *toolbars* with icons and *windows/panes* that can attach to different sides of the screen. Take some time to look through the menus and hover your mouse on the toolbar items to see what they do."

3. Open ANTH4_lab.mxd

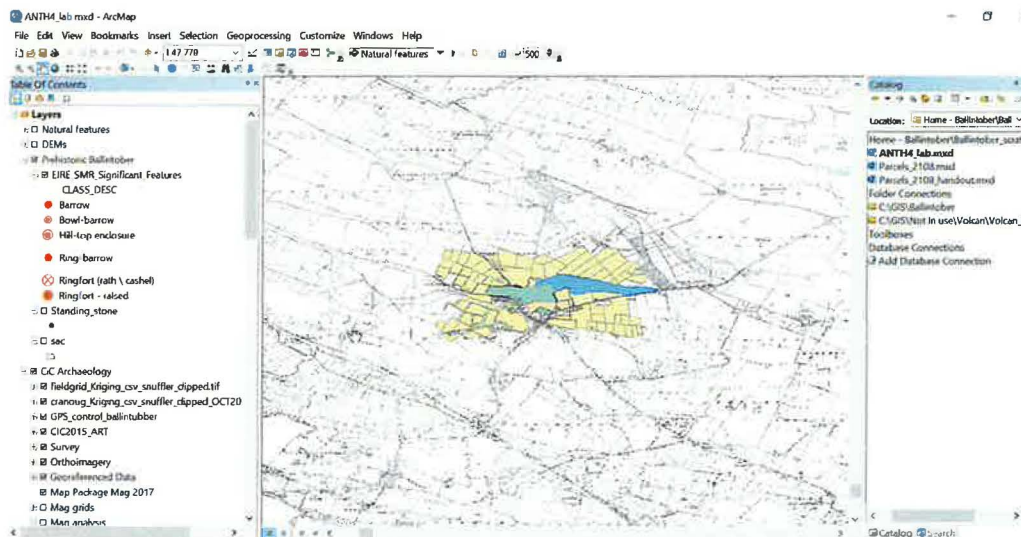
It's in the Catalog pane on the right.

ANTH 4 Lab: GIS

4. Play with the layers

Take some time to explore the map. Try turning the layers on and off in the Table of Contents (sidebar on the left). It may be slow to reload your view -- one sign that underlying this map is a huge database!

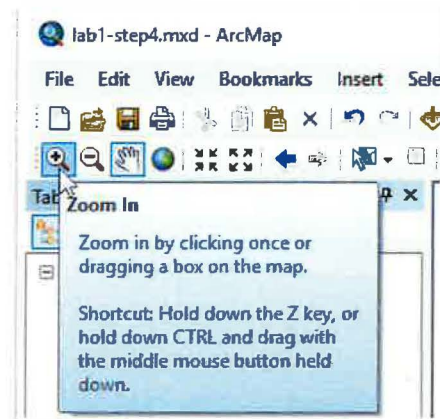
Do you see any layers related to archaeological methods we have covered?



5. Play with zooming

Try the zoom tools (toolbar at top of screen, left-hand side). There are many ways to zoom.

Activate the zoom tool by clicking on the magnifying glass with the plus sign on the tool bar. Scrolling with a mouse wheel also works.

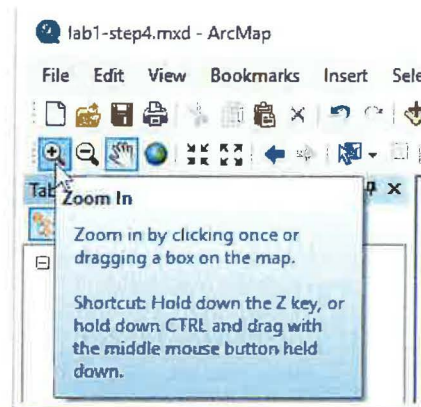


ANTH 4 Lab: GIS

5. Play with zooming

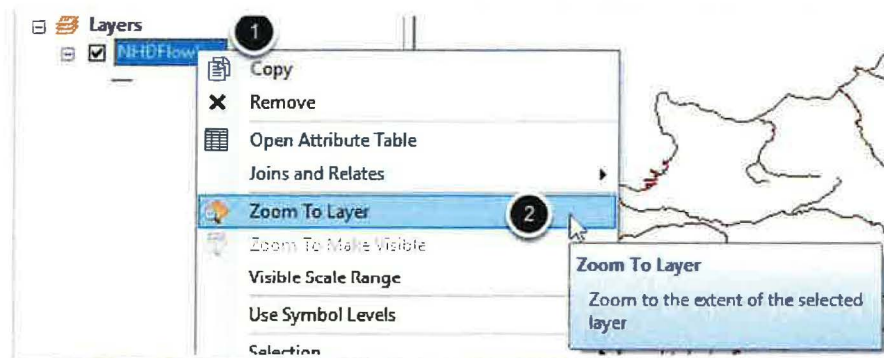
Try the zoom tools (toolbar at top of screen, left-hand side). There are many ways to zoom.

Activate the zoom tool by clicking on the magnifying glass with the plus sign on the tool bar. Scrolling with a mouse wheel also works.



6. Zoom to Layer: the easiest way to zoom

Right-click on the layer in the Table of Contents, then click *Zoom to Layer*.



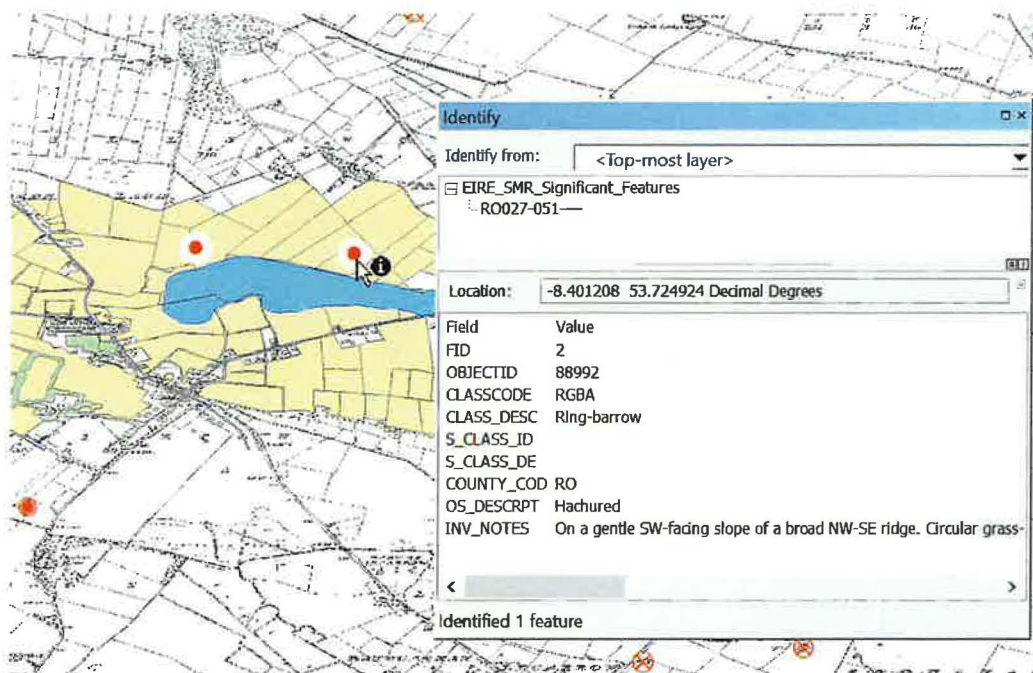
ANTH 4 Lab: GIS

7. Identify features

Now that we are zoomed in, what exactly are the orange dots? We can see in the Table of Contents that they're different kinds of prehistoric sites, but let's confirm by inspecting the data.

"Activate the *Identify* tool by clicking the *i* in a blue circle on the toolbar (1). The identify tool helps us quickly answer the question "what am I looking at on the map." When you are using that tool and click on something (2), you will get a popup pane (3) with *attribute information* for that *feature*."

In this screenshot, I've clicked on the dot with a white ring just north of the seasonal lake. You will probably click on a different feature, so your screen will look different, but click on a few features and explore the data a bit. Zooming in farther makes it easier to select the feature you want info about.



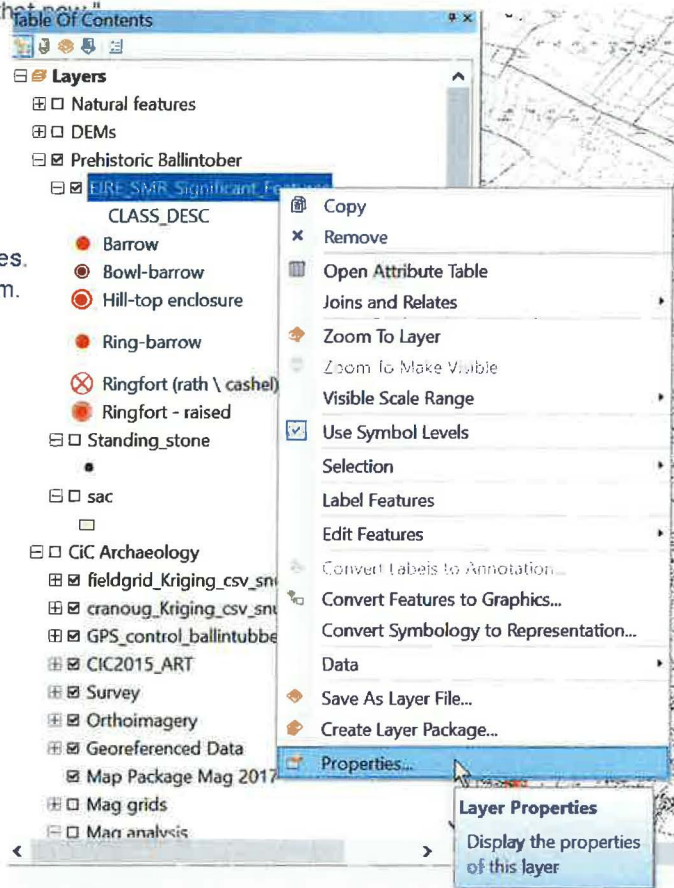
ANTH 4 Lab: GIS

8. Play with symbology

These orange spots don't add much to the look of the map. Let's make them look better. To do this, we deal with the part of cartography called *symbology*. There are multiple ways to accomplish this in ArcMap with different options, but for now, we'll use the fastest method.

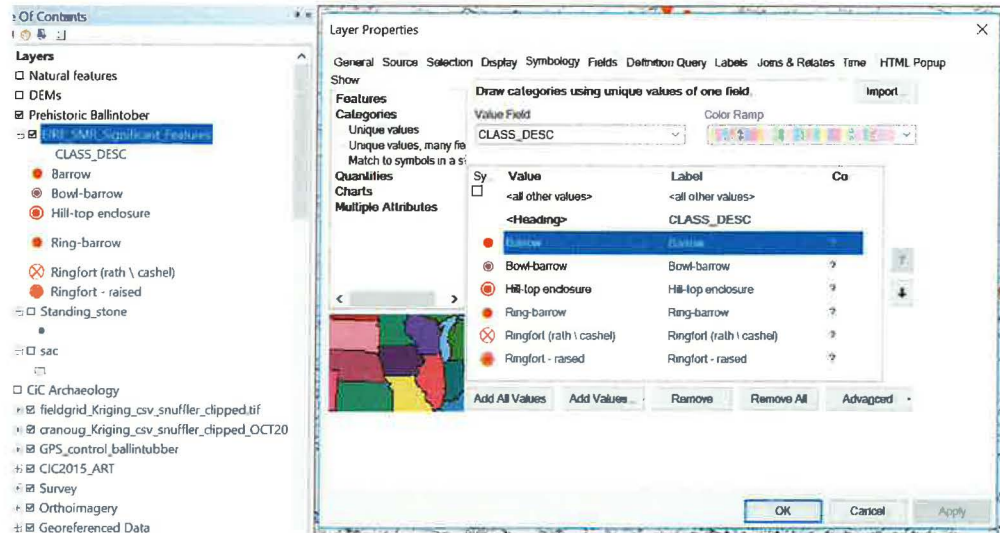
"Symbology is concerned with how we choose to display out GIS data - there is no one way to represent any GIS dataset - you as the analyst and cartographer choose how to show it to the viewer and have the responsibility of choosing something that makes sense and conveys the information appropriately. As such, ArcGIS provides great flexibility to you to change how your data appears. Let's quickly do that now."

1. Right-click on EIRE_SMR_Significant_Features.
2. Click on *Properties* at the bottom.

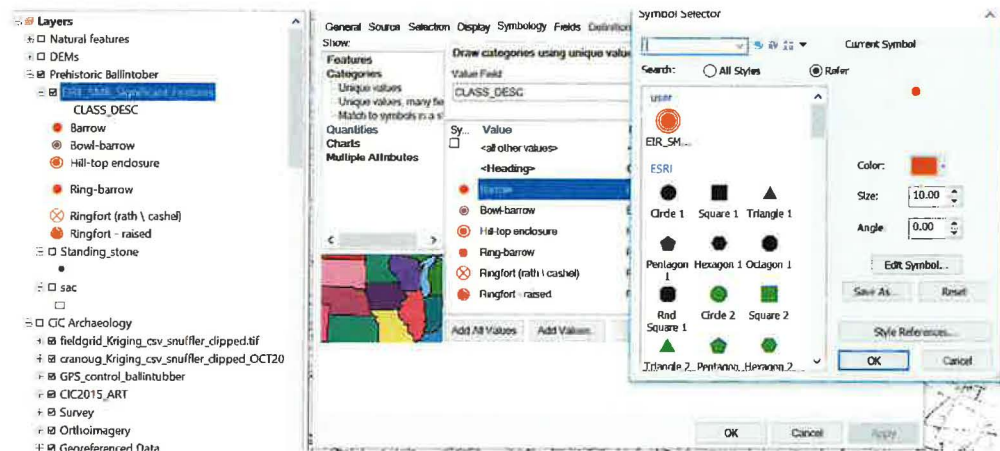


ANTH 4 Lab: GIS

4. Look at all the Properties tags at the top. Click on *Symbology*.



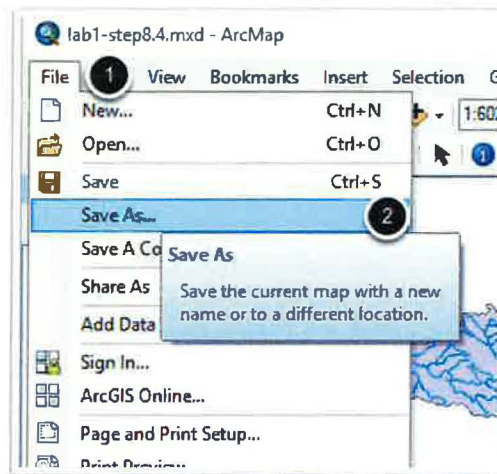
5. Double-click on any symbol and change it however you want.



ANTH 4 Lab: GIS

9. Save your map document

2. First, ignore that there's no number 1 in this list.
3. Save often! ArcMap is known to crash.
4. "Choose *Save As*
5. Follow the normal procedure for saving files - I'd recommend saving in the folder *map_documents* inside your class folder. Navigate to that location and give it a name of your choosing (not shown)."



10. Get up and stretch!

You now have a nicer-looking version of the area around Ballintober Castle "to use in a future analysis - nice work! Make sure to save this map document somewhere that you can find it - you'll use it in the next lab assignment."

ANTH 4 Lab: GIS

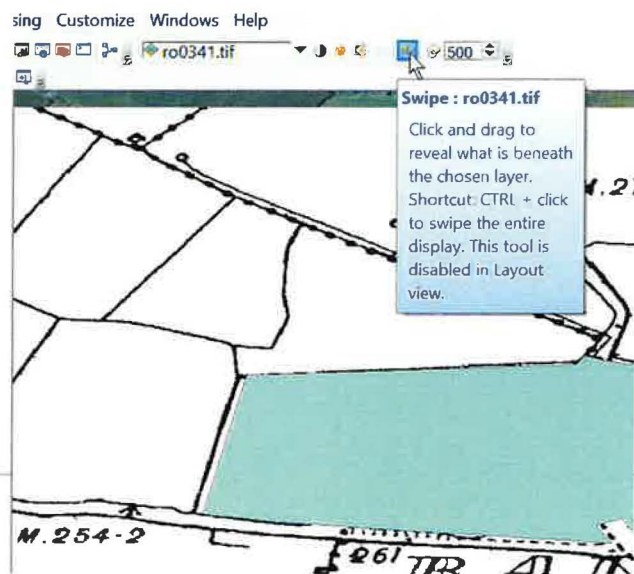
11. Time to blow your mind!

Find the layer *ballintubber composite_transparent_mosaic_group1*.
Right-click on it and Zoom to Layer.



12. Set up Swipe

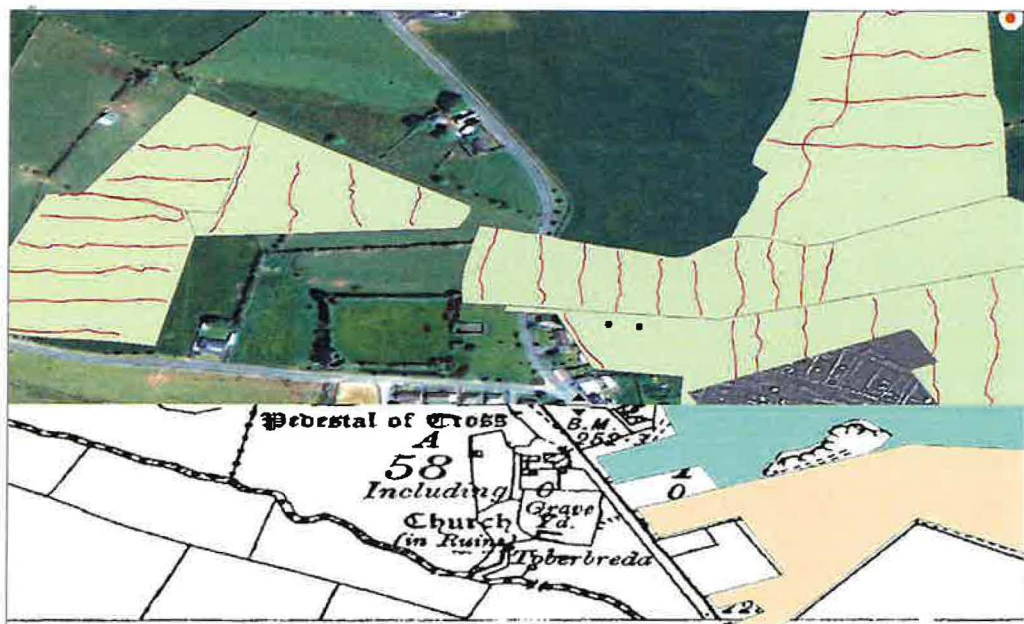
Click the Swipe tool in the toolbar at top. Use the pull-down menu near it to set the layer to ro0341.tif.



ANTH 4 Lab: GIS

13. Swipe to visualize overlays

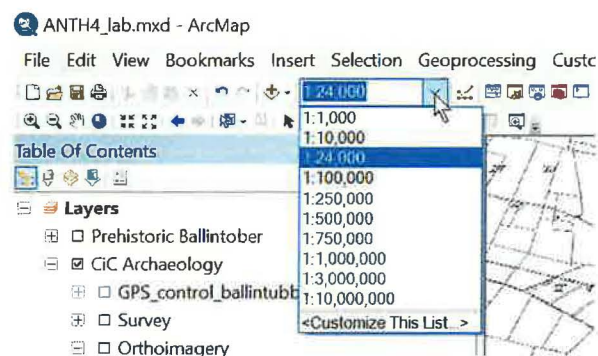
Move your cursor onto the map. Click and hold the left mouse button, and move the cursor to see what happens. Try swiping top to bottom and side to side.



ANTH 4 Lab: GIS

14. Play with the map scale.

Use the scale drop-down menu in the toolbar at the top. Try at least four different scales. (Remember, it may take time to load.) Which scale is most appropriate for looking at data in the town of Ballintober? What about for the Republic of Ireland?



15. Finish the worksheet.

You may already have found the answers to some of the questions. You may need more time exploring the map to answer the rest.

ANTH 4 Lab: GIS

Name _____

Worksheet to hand in at end of lab

Tear this off the handout so you can answer the questions during the lab.

- 1. Which layer shows pedestrian survey transects?**
- 2. How many cuttings have been dug inside the castle walls? Why aren't there more?**
- 3. Name one part of the historic town of Ballintober that was NOT included in the original research license (permit). (Hint: you may need to turn some layers off and others on.)**
- 4. How many ring-barrows are within the town of Ballintober?**
- 5. Which map scale is most appropriate for working with data in the town of Ballintober?
In the Republic of Ireland?**
- 6. Which map scale is the one used on USGS 7.5' topographic quadrangles?**
- 7. Using the Internet, find one archaeology job announcement with GIS as part of the qualifications. Name the employer, position, minimum education, and starting pay.**

Appendix 5: Professional Growth and Enrichment

Draft press release for Suck Valley Way event

Slide Presentation: Dunbrody Famine Ship and Irish Emigration Experience

Draft press release for Suck Valley Way event

By Bike, Hike or Low Water: Storming a Castle on the Suck Valley Way



Paddlers at Glinsk, 24 July 2018. Photo by **Junior Hannon? Tony Waldron?**

<https://plus.google.com/+JuniorHannon>

How do you get from Ballintober to Dunamon Castle without burning fuel? Ask the 68 Irish and Americans who recently biked, hiked, and paddled along the Suck Valley Way as part of Heritage Month festivities. Or ask Michael Morris **[political position]**, a great supporter of the Way who was there for the sendoff.

The speediest were the 12 bicyclists (including **Gardai**), who made it to the castle and back within 90 minutes. The most relaxed were the 26 paddlers on the River Suck for two and a half hours, led by kayaking instructors Junior and Elaine Hannon of **Lanesboro**, who provided the kayaks. (There were also canoes, thanks to Pat and Betty Garvey.)

And the mightiest were the 30 walkers, who covered 18 km in four hours. They crossed the historic stone bridge at Dunamon Castle just as the paddlers passed beneath it. Then they bravely pushed onward to the pub in Cuisle Holiday Centre.

Capping off the event, [names of priests or monks of who greeted us or led tour?] treated the group to a late-hours tour of Dunemon Castle, one of the oldest inhabited buildings in Ireland. The castle is owned and beautifully maintained by SVD Divine Word Ministries.

Just before the paddlers began their journey at Glinsk, Mary and Jimmy Barlow served a generous tea to the whole crowd and introduced the Ballintubber-Americans to [title] Michael Morris. The Barlows and

Mr. Morris [Michael?] were instrumental in making the Suck Valley Way a reality, and the Ballintubbers expressed gratitude and respect, forgiving them for being from County Galway.

Mr. Morris addressed the group briefly and then took some questions. He noted that the rural midlands of Ireland have been overlooked by tourism developers and businesses, but have great untapped potential. "We have a treasure in the Rivers Suck and Shannon. Unlocking it will not be by the likes of me – politicians. It's the local community [used Irish phrase] that makes it happen. We just have to encourage them to take a risk."

[I didn't catch the Irish term.]

And it won't take millions, he noted. "Twenty to forty thousand Euros can make a huge difference to a local community. First, in a small community, people do most of the work themselves. Second, they make sure the money is used wisely and not wasted."

In this way, Mr. Morris said, the government wouldn't be giving communities a handout but a hand up. But there are ways government could make it easier, he said. "One thing communities need is a calendar of funding opportunities sent out at the beginning of the year. There are many programs, but they all have different deadlines and those applying are volunteers who have so much going on. It's hard for them to keep up."

He then had time for a few questions before joining the participants in the kayaks.

Do you see a future for B and Bs in the area?

Yes, but first we must develop potential. We have to provide things for tourists to do. For example, there's no place in Ballymoe to put in a kayak. And for fishing, we have to make sure the resource is pure and healthy for the fish to thrive.

We also need infrastructure, such as the old Garda stations to be given to communities. These could be used for hostels or fishing clubs or kayak clubs. Also, we need to relax some of the regulations about accommodations. A warm welcome is so much more important than a fancy bed. There should be less red tape, less rigmarole.

If someone surprised your office with a few thousand Euro for the area, what is the first thing you'd spend it on?

First impressions count. The look of a town matters. It needs to be tidy, painted up if we don't want people driving through to think, "This is a rough place" and keep driving.

Do you envision having more wildlife interpretation signs?

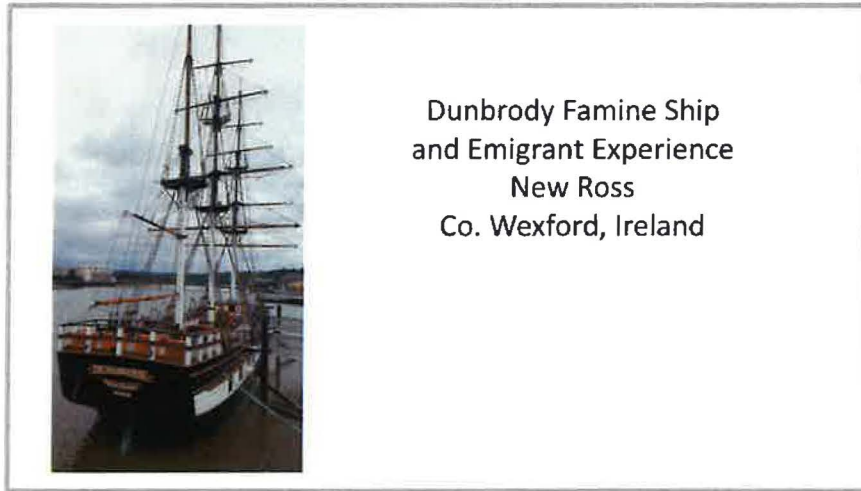
Yes, if we have an expression of interest about that in the area, but making it happen will take money.

Parties instrumental in organizing Suck Valley Way: Inland Fisheries, Roscommon County Council, Gardai, Civil Defense, Pierce (sp?) O'Connor Nash, SVD Divine Word Ministries.

Instrumental in organizing the event: Anthony Waldron and Sean Og Higgins, Balintober. Bryce Beasley, California, third year in Castles in Communities. And particularly for the boat trip, Cian Finan from Ballintober.

Notes by Betsy Lawlor, Castles in Communities

Slide Presentation: Dunbrody Famine Ship and Irish Emigrant Experience



Dunbrody Famine Ship
and Emigrant Experience
New Ross
Co. Wexford, Ireland



Captain's quarters

Replica ticket, steerage, to New York, March 1849

WILLIAM GRAVES & SON
THE QUAY, NEW ROSS

PASSENGERS' CONTRACT TICKET.

I hereby agree that the Passengers herein named shall be provided with such and such as follows:—

Ship Dunbrody of 458 tons register tonnage, to sail from New Ross
for New York on the 5th day of March 1849

I engage that the Passengers herein named shall be provided with Steerage Passage to New York
in the Ship Dunbrody with not less than 10 cubic feet for Steerage for each Adult adult, for the
sum of £ 5.00.0 including Food Money, Wages at the place of
loading, and every other charge; and I hereby acknowledge to have
received the sum of £ _____ in _____
Money and provisions, according to the contract made, will be supplied
by the Ship as required by law, and also Food, and suitable Accommodation for
washing.
Bidding and accounts for resting and drinking used to be provided by the
Passengers.
Signature William Graves
Date _____

No.	NAME	Age	Sex
1	Liam Makasy	20	M
2	Margaret Makasy	25	F
3	Richard Makasy	15	M
4			
5			
6			
7			
8			
9			
10			

Signature William Graves
Date 5/3/49
To be paid at _____
before the 5th March 1849 to the Agent William Graves



Steerage (ex-guano shipping)



Martha Lawlor
Peter Lawlor
Mary Lawlor
Patrick Lawlor
Catherine Lawlor
Biddy Lawlor
Ellen Lawlor

Makes this look luxurious



www.atamy.com - CS0PWK

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Appendix 7: Sabbatical Proposal

SABBATICAL PROPOSAL, ELIZABETH LAWLOR, REVISED, Jan. 2017

Additions to the previous proposal are underlined.

Abstract

I propose to update my skills and then produce laboratory activities and teaching materials using Geographic Information Systems (GIS), 3D printing, resin casting, and five weeks of archaeological fieldwork in Ireland. This Independent Study Sabbatical would enable me to teach students about recent high-tech advances in archaeological methods and provide me with hands-on research experience in the Old World, quite unlike my expertise in the Mojave Desert. Among benefits to the College would be my new familiarity with makerspaces and my ability to print 3D models of ancient bones in the news, such as Lucy's shoulder fracture, as soon as one week after the research is published, for hands-on Q&A sessions open to all on campus. It would boost my own curiosity and enthusiasm for science to be able to share these advances with my students and colleagues.

Proposed Sabbatical Activities

This Independent Study Sabbatical focuses on building my skill sets in order to bring our teaching in archaeology and human evolution up to date. There are three proposed sets of activities:

1. Certificate in Geographic Information Systems (GIS) Specialty. I would become current in GIS by earning a certificate from UC Davis through the Coursera course delivery platform. Then I would produce a set of relevant laboratory activities for my students in ANTH 4, our new archaeology course. GIS is a topic in the COR, and GIS training for me is in PIE for Biological Sciences. I also would apply GIS while in the field in Ireland.

2. 3D Printing And Resin Casting at a Makerspace. I would learn 3D printing at Voademy, a makerspace in Riverside. Then I would augment the Anthropology collection of fossil casts by printing a model of the oldest known stone tool and Lucy's shoulder bones. Voademy also offers classes in silicone molding and resin casting, which I would use to improve the quality of my production of low-cost duplicate casts for student activities.

3. Archaeological Field School in Ireland. I would volunteer for 5 weeks of archaeological field school through Foothill College, with faculty from Ireland, Foothill, and Columbia University. The program's application form asks for staff with GIS capability.

Nature of the Activities

1. Certificate in GIS Specialization

I propose to earn a Certificate in Geographic Information Systems (GIS) Specialization from UC Davis through Coursera, "offered in partnership with ArcGIS developer ESRI" ("GIS Specialization"). Coursera is an online open educational resource (Audsley et al.) that serves as a "platform where anyone, anywhere can learn and earn credentials from the world's top universities and education providers" ("About Coursera"). In addition to general-interest and personal enrichment classes, Coursera provides access to certificate programs and some master's degrees, with faculty employed at partner institutions including UC campuses including Davis; Stanford, Johns Hopkins, Caltech, Princeton, U Penn, Brown, Columbia, and Yale.

The proposed course of study is offered through the UC Davis Extension program. UC Davis is accredited by the Western Association of Schools and Colleges. The UCD Extension website notes that its "Geographic Information Systems Professional Concentration is approved by the UC Davis Department Environmental Science & Policy" ("Geographic Information Systems"). While the Coursera platform itself (like the Canvas course-delivery system) is not accredited, Coursera is the means by which UCD is offering its GIS extension program online. I have corresponded with the instructor, Nick Santos, to inquire whether this online GIS certificate is equivalent to UCD on-campus GIS certificate. He said: "The quick answer is "definitely". The Coursera courses were produced by taking the in person

courses I teach for UC Davis Extension and significantly expanding them” (Santos 3 Jan. 2017).

For the GIS certificate earned on the UC Davis campus, required Extension classes comprise three 2-unit classes and one 3-unit classes (9 units) plus a 3-unit elective in a specific application (such as Wetland Conservation).
For the GIS certificate earned online using the Coursera platform, there are no assigned units or course hours of credit towards the certificate. The four classes that total 9 hours on campus are presented as four 4-week classes (advertised as “3 – 5 hours / week,” though the instructor says students in this first year have reported needing 10 – 12 hours per week [Santos 21 Nov. 2016]). Taking the place of the elective is a required capstone project of 4 to 8 weeks “in 4 milestones (“GIS Specialization”). Each milestone should take 10 – 20 hours of effort” (“GIS Specialization”). “Courses include recorded video lectures, auto-graded and peer-reviewed assignments, and community discussion forums” (“About Coursera”). These courses are offered, in sequence, on a schedule that cycles year round:

- **Fundamentals of GIS, 4 weeks**
- **GIS Data Formats, Design and Quality, 4 weeks**
- **Geospatial and Environmental Analysis, 4 weeks**
- **Imagery, Automation, and Applications, 4 weeks**
- **Geospatial Analysis Project, 8 weeks**

Why learn GIS in detail? GIS mapping software allows scientists to generate multilayered maps (such as those in Google Earth) from databases. We then “query” the database about some relationship. An early application involved data on ancient Mayan agricultural terraces, elevation, soil type, and aspect (which way a slope was facing). Once the data were entered, Scott Fedick of UC Riverside queried for locations with the same characteristics, except with no known terraces. Thus he produced a map he then took to Belize and discovered ancient terraces where the query predicted they would be (Fedick). GIS is such a powerful and versatile tool in archaeology that by 2003, proficiency with the software was “a criterion in almost all beginning archaeology positions” (Holdaway), making it an essential topic in an introductory class in archaeological methods. In fact, the archaeological field school in Ireland is looking for volunteer staff with GIS capability. Other recent applications include monitoring vulnerable ancient sites in the Middle East (Hritz) and analyzing damage patterns on stone tools used by wild chimpanzees (Benito-Calvo et al.). Undergraduate classes can access a wealth of online databases including the Digital Index of North American Archaeology (Noack Myers).

For these reasons, the COR of our new archaeology class (ANTH 4, not offered yet) includes a laboratory session devoted to GIS-based activities that would be held in the Natural Sciences Division Computer Lab. Mt. SAC has a site license for GIS software, but my last use of GIS was in 2000, when I took a Flex Day workshop in ArcView (a scaled-down GIS) at Santa Monica College. I need experience with the

current software (ArcGIS) to ably teach the ANTH 4 lab activity, so our PIE for Biological Sciences has included GIS training for me for years.

After earning the Certificate, I will develop a set of GIS-based lab activities for ANTH 4 using one of the online archaeology databases such as the Digital Index of North American Archaeology (Noack Myers). I will try the activities myself to test for technical problems and then recruit a few college students (such as my son and his friends) to beta-test them for ambiguity in my instructions. I also will apply GIS while in the field in Ireland.

2. 3D Printing and Resin Casting Three-dimensional (3D) printers use software instructions to build things using plastic such as the durable material used in Lego blocks. Recent applications in anthropology include highly detailed, sturdy replicas of highly significant ancient bones such as the hand (Kivell et al.) of *Homo naledi* (MorphoSource), the new species found deep in Rising Star Cave in South Africa in 2014 (Berger et al.). Likewise, in early September 2016 scientists reported that Lucy (*Australopithecus afarensis*) had shoulder fractures indicating she fell to her death from a great height (Kappelman et al.), and they made 3D scans available so others could examine the shoulder bones immediately (Callaway). One can also print a replica (African Fossils) of the Lomekwi Hammerstone. At 3.3 million years old, this tool is the oldest known by a million years (Harmand) and could have been made by Lucy's species. Its discovery in 2015 changed key facts and interpretations taught in ANTH 1, 1L, and 1H, and reinforced recent approaches to the study of stone tools in ANTH 3 (soon to be replaced by ANTH 4).

The Natural Science Division has access to many 3D printers in Engineering and in Industrial Design and Manufacture. According to Martin Mason (Engineering), these are capable of producing detailed models like those above, using the software files available online. If I knew what I was doing, our students could have their hands on important fossils and tools in the news as early as one week after a discovery is published. Currently we in Anthropology wait two to three years after a discovery, as the cast production company seeks permission from the relevant government or museum, produces a mold, and makes casts available for purchase.

To learn the principles, procedures and caveats of 3D printing, I propose to take a series of classes at Vocademy makerspace in Riverside and then make replicas of Lucy's shoulder and the earliest stone tool for our students in ANTH 1, 1H, 1L, and 4. The series of four-hour classes comprises:

- **01-200 - Intro to 3D Printing**
- **01-205 - 3D Printing 1 - Basic Operation**
- **01-210 - 3D Printing 2 - Printing Intent & Design**
- **01-215 - 3D Printing 3 - Materials & Machines**
- **01-305 - 3D Printing for Educators 1**

The last class (Printing for Educators 1) is in development "is in development and we're working as diligently as possible to bring it to you" (Vocademy). According to Martin Mason, learning these basics is necessary but not sufficient for being able to print a high-quality item, particularly one with fine anatomical details. Mastering the skills requires much trial and error and weeks to months of experience.

Not all instructional replicas need to be printed in high resolution or use the expensive plastic 3D printing requires. Often a reasonable resin cast is good enough to allow students to work in small groups, with each group measuring, describing, and analyzing copies of the same artifacts. For most activities, I try to have enough instructional materials for eight groups of four students. A relatively low-cost way to achieve this is to make a silicone mold of a cast we own and then use resin to produce seven copies. Mastering this skill was one of my goals in a distant self-evaluation cycle, but I grew discouraged because I was trying to learn it on my own. The students have generously overlooked bubbles and seams in my casts (for example, of a Neanderthal pendant made from a bear tooth), but I would like to offer them better verisimilitude so they can imagine they are analyzing authentic prehistoric ornaments or spear points.

We own the silicone and resin materials, bought with Anthro program instructional material funds. I propose to hone my skills by taking two additional four-hour classes at Vocademy:

- **10-205 - Silicone Molding & Resin Casting 1**
- **10-210 - Silicone Molding & Resin Casting 2**

I would then make 7 copies of the 3.3 million-year-old stone tool I plan to print in 3D.

3. Archaeological Field School in Ireland

I propose to participate in an archaeological field school at Ballintober Castle in Roscommon, Ireland, a medieval Anglo-Saxon structure that was surrounded by an indigenous (Gaelic) agriculture-based village. Such cultures, settlements and

structures are typical in Old World archaeology, and are included in ANTH 4. But they are very different from my previous research experiences in the Mojave Desert, and require some different field methods I teach but have not actually used.

The field school is run by Foothill College and directed by faculty from Ireland, Foothill College and Columbia University. It enrolls undergraduates and graduate students for accredited, transferable classes ("Ireland Program"). I would serve as volunteer (paying, not paid) staff, involved in research-related instruction (e.g., demonstration of methods and supervision of students) for five weeks. The program's application form asks for staff with GIS capability, so I would also be applying my newly earned GIS Certificate towards the program's research goals.

For students, faculty and volunteers alike, archaeological field school usually requires 8 hours per day gathering data followed by 2 - 3 evening hours writing field notes, reading academic literature, or attending talks by faculty and visiting archaeologists. In the Foothill field school, volunteer staff members are required to enroll in at least 2 units for insurance purposes. The students are required to enroll in any 12 units from the following:

- **ANTH 12: Applied Anthropology. (4 units).**
- **ANTH 52: Archaeological Field Methods (4 units).**
- **ANTH 67C: Cultures of the World: British Isles (4 units).**
- **ANTH 17L: Archaeology Laboratory (2 units).**
- **ANTH 51: Archaeological Survey (2 units).**

Field schools and other field research opportunities, as a rule, occur during summer breaks due to faculty and student schedules. Thus it would not be possible for me to participate in a field school during the regular academic year. The Foothill Ireland Program is currently seeking applicants for the upcoming field season, July 2 – August 2, 2017. Since the program is seeking someone with capability in GIS, it makes sense for me to participate in the summer 2018 season, after I have earned the GIS Certificate. Currently in its second year, the Ireland Program replaced the previous Foothill field school in Ecuador. That project lasted for 15 years, so it is reasonable to expect the Ireland Program to continue at least through 2018. The director, Samuel Connell, invited me informally in 2015, and I have begun the formal application process, which includes submitting a CV.

Timeline

I understand that as a 10-month employee, I normally would engage in Sabbatical activities only during the Fall and Spring semesters. However, scheduling this Independent Study Sabbatical makes more sense if I continue to develop my skills in GIS, 3D printing, and resin casting through Winter session rather than taking a break. Also, I have planned a lighter schedule than usual during Spring, but will be field school staff for 12 units during Summer 2018.

- September 2017
 - Take **Fundamentals of GIS** (Coursera, 4 weeks).
 - Take **Intro to 3D Printing** (Vocademy Makerspace, 4 hours).

- Take **3D Printing 1 - Basic Operation** (Vocademy Makerspace, 4 hours).
- Start Sabbatical Journal.
- October 2017
 - Take **GIS Data Formats, Design and Quality** (Coursera, 4 weeks).
 - Take **3D Printing 2 - Printing Intent & Design** (Vocademy Makerspace, 4 hours).
 - Take **3D Printing 3 - Materials & Machines** (Vocademy Makerspace, 4 hours).
 - Continue Sabbatical Journal.
- November 2017
 - Take **Geospatial and Environmental Analysis** (Coursera, 4 weeks).
 - Take **3D Printing for Educators (if available)**.
 - Produce a flawless copy of the Lomekwi Hammerstone (African Fossils) via 3D printing. (There are likely to be multiple flawed prints before I achieve acceptable results, according to Martin Mason.)
 - Continue Sabbatical Journal.
- December 1 – 15, 2017
 - Take **Silicone Molding & Resin Casting 1**
 - Take **Silicone Molding & Resin Casting 2**
 - Make silicone mold of best copy of Lomekwi Hammerstone.
 - Start writing Sabbatical Report in outline form, keeping track of relevant documents and completed assignments.

- January 2018 (continuing Sabbatical activities during Mt. SAC winter session)
 - Take **Imagery, Automation, and Applications** (Coursera, 4 weeks).
 - Produce a flawless high-resolution 3D print of Lucy's shoulder bones.
 - Experiment with surface treatments on the flawed prints to simulate the appearance of the ancient bones. Apply to the best print.
 - Produce multiple resin casts of Lomekwi Hammerstone, using previously made silicone mold.
 - Continue Sabbatical Journal.
 - February 2018
 - Begin **Geospatial Analysis Project**
 - **Complete first two milestones** (Coursera, 4 weeks)
 - Experiment with finishing treatments on the flawed resin casts to simulate the appearance of the ancient stone tool. Apply to all the casts.
 - Continue Sabbatical Journal.
 - March 2018
 - Continue **Geospatial Analysis Project**
 - **Complete last two milestones** (Coursera, 4 weeks)
 - Continue Sabbatical Journal.
 - April 2018
 - Produce GIS activity for ANTH 4.
 - Begin reading academic literature for Ireland Program.
- Continue Sabbatical Journal.

- May 2018
 - Continue **Geospatial Analysis Project**
 - **Complete last two milestones** (Coursera, 4 weeks)

Continue Sabbatical Journal.

- June 2018
 - Use Vocado membership
 - Produce Lucy shoulder bones via 3D printing.
 - Take two Vocado classes on silicon molds and resin casting.
 - 10-205 - Silicone Molding & Resin Casting 1
 - 10-210 - Silicone Molding & Resin Casting 2
 - Produce 7 copies of the oldest known stone tool.
 - Recruit Beta testers and give them GIS activity for ANTH 4.
 - Debrief Beta testers over pizza; modify activity as needed.
 - Bribe Gamma testers (friends' kids) to try it after modifications.
 - July:
 - Participate in Irish Archaeology Field School.

Anticipated Value and Benefits

- **Applicant** This sabbatical would rejuvenate me, allowing me to renew my energy for teaching while using my creativity in ways different from classroom teaching. As an avid Do-It-Yourselfer, I have been curious about Riverside's Vocado since I

took a tour shortly after it opened, and the 3D printing just floored me. Additionally, being a student again would improve the quality of my instruction both by infusing new content and instructional materials into my classes and by renewing my awareness of what it is like to be a student. Exchanging ideas with colleagues from Ireland, Foothill College, and Columbia University would improve my understanding of Old World archaeology and infuse my teaching with new approaches. Finally, I would travel to one of the most beautiful places in the world.

Department The Anthropology program is in the Department of Biological Sciences, which would benefit from this project in several ways. New experience with high-tech "remote sensing" methods -- analogous to an MRI for scanning below the surface (Anth 4).

- Experience applying GIS during a project (real-world narratives, video and photos for Anth 4) We would have in-house castmaking capability to produce instructional materials in multiples for group work in ANTH 1, ANTH 1L, ANTH 1H, and ANTH 30. The 3D printing is the most exciting aspect: we would be able to augment our fossil cast collection immediately after a discovery is announced in the news, present it to students right away, and also explain recent fossil discoveries to colleagues. I am 33% of the full-time Anthropology faculty. Department colleagues who teach Biology occasionally ask me about recent discoveries or about human evolution in general, either out of curiosity or because they have an evolution topic in the COR for their

BIOL class. I would be better able to answer their questions with up-to-the-minute models.

In 2005, I provided a departmental Flex Day session about human evolution, at a very general level, that was well received. Following this sabbatical, I would be able to provide a more detailed session about more recent discoveries if the department chose that for its Flex Day activity, or do shorter presentations following news releases, complete with accurate anatomical models hot off the press.

Our department meetings have a long tradition of faculty slide shows about their discipline-related overseas travel – beyond a sabbatical report. I would contribute one about my Irish fieldwork. Our benefits from these vicarious experiences include a renewed sense of unity despite our various subdisciplines.

Last but not least, 3D printing is only getting started and has potential well beyond my sabbatical projects. The Biological Sciences department would have gained a member who knew about the potentials and pitfalls of 3D printing.

- **College** My taking classes through Coursera and Vocademy would benefit the College because both of these are new models of lifelong learning, one of Mt. SAC's Core Values. With the College already exploring the possibility of establishing a makerspace, my experiences, positive and negative, would be useful information to **bring to my service on a College-wide makerspace task force.**

Mastering skills in GIS and producing relevant laboratory activities for our archaeology students would help to fulfill the College's Mission to provide quality education and workforce training. Producing high-quality, timely replicas of ancient fossils and tools also would help to fulfill the College's Mission to provide quality education and promote critical thinking.

Students would benefit from my participation in a current field school by seeing examples of students like them engaged in real research. I would be able to advise them about the Foothill College field school in particular and the current field school experience in general.

The benefit that is the icing on the cake, I think, would be my ability to show and explain the latest scientific discoveries about our ancestors as soon as one week after they hit the news cycles. I have envied my colleagues in Astronomy when they set up telescopes and invite the campus community to come and observe and learn about our world as an event is happening. Whenever I take part, I feel more connected to these colleagues and to the students and staff members waiting in line with me – folks I might not talk with often because of our busy work lives in separate buildings. I would just love to be the anthropologist who engages in the Core Value of Community Building by inviting the College community to come see the cool fossils in this week's news.

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MEMORANDUM

To: The Sabbatical and Leaves Committee

From: Betsy Lawlor

Date: February 19, 2018

Re: SABBATICAL LEAVE, REQUESTED MODIFICATION

Thank you for granting me this sabbatical leave. I am learning a great deal! External factors have prevented me from doing certain activities. With the Committee's permission, I would like to make the following substitutions:

- 3D printing classes. I proposed taking four 4-hour classes at Vocademy Makerspace.
 - Vocademy changed the names of three of the four classes but kept them at 4 hours apiece. I have completed them.
 - ~~Intro to 3D Printing~~ **3D Printing 1 - Basic Operation**
 - ~~3D Printing 2 – Printing Intent & Design~~ **3D Printing 2 – Applied Printing Techniques**
 - 3D Printing 3 - Materials & Machines (no change)

- 3D Printing for Educators, Not available, so I took 3D Printing 4 – Printed Part Finishing.
- 3D model making. I proposed to make a 3D print and then 7 resin casts of the oldest known stone tool, found at a site called Lomekwi.
 - The 3D scans of the Lomekwi tools are no longer available to download. According to africanfossils.org, many files were lost in an attempted transfer to a new computer in Kenya.
 - I have instead printed the model of an ancient harpoon tip made from a hippo tusk, representing a milestone of human behavior.
 - I have also printed a model of the oldest known musical instrument, a 42,000-year-old flute from a site called Hohle Fels, to add to our teaching collection.
 - My plans to print Lucy's shoulder remain unchanged.
- Silicone molding and resin casting. I proposed taking two 4-hour classes at Vocademy Makerspace and then making 7 resin casts of the Lomekwi tool.
 - The classes are not currently offered at Vocademy.
 - I have instead joined the MAG Laboratory makerspace in Walnut, which has a vacuum chamber for this method and experienced members who have offered to instruct me.
 - I have already spent more than 8 hours at MAG Lab.
 - I plan to make 7 resin casts of the hippo tusk harpoon tip.

I hope these changes are acceptable and look forward to your reply.