



Geography

Geography Newsletter

March/April 2019

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April Happenings

Can you believe it? Finals are just about a month away – and that’s no (April Fool’s) joke! So much to do, so let’s get to it:

There are two colloquia this month, both occurring next week due to scheduling issues:

- Wednesday, April 17, **2:30 PM**, Classroom Building 106B. **Dr. Leonid Vyazov**, from Russia’s Kazan Federal University & Tatarstan Academy of Sciences, will give a talk titled “Early human-environment interactions in small river sediment archives in the forest-steppe region of Eurasia.” Please note the earlier-than-usual starting time.
- Friday, April 19, 3:30 PM, Noble Research Center 207. MS student **Chris Krieger** will give a talk titled “Stillwater’s Gated Communities: Triangulating a Landscape Approach.”

Several students are defending their theses/creative components this month:

- Friday, April 12, 10 AM, Keso Room – MS student **Shelby Rider** – Creative Component title: “Does Uncle Sam Really Want You? An Analysis of Oklahoma National Guard Recruiting Patterns.”
- Monday, April 15, 3 PM, Keso Room – MS student **Catherine Shropshire** – Thesis title: “The Importance of Geographic Realism in Genre Fiction: How Landscape in Robin Hobb’s *Assassin’s Quest* Inspires Social Criticism”.
- Friday, April 19 – 1:30 PM, Keso Room – MS student **Tessa Cook** – Thesis title: “The Impacts of Public-Private School Choice on Public Schools in the St. Louis Area.”

Upcoming Events

The schedule is so packed, we need a whole other page for events! Try to catch 'em all...

- Wednesday, April 10, 6 PM – Student Union Ballroom – **2019 College of Arts & Sciences Awards Banquet.**
- Friday, April 12, 3 PM – Keso Room (MUR 327) – **Geography Club Elections** for 2019-20 Officers.
- Wednesday, April 24, 2:30 PM – Student Union Council Room (SU 412) – **Graduate College Awards Ceremony.** Several Geography graduate students are nominated for awards – we'll see if they win!
- Saturday, April 27, 2 PM – Boomer Lake Shelter #4 (SE side) – **Geography Club end-of-year cookout.**
- Friday, May 3, 5:30 PM – Murray Hall Parlor – **2019 Geography Awards Gathering.** See next page for details.
- Friday, May 10, 7 PM – Gallagher-Iba Arena – **2019 Spring Graduate Commencement and Hooding Ceremony.**
- Saturday, May 11, 3-5 PM – Murray Hall Parlor – **2019 Geography Senior Graduation Party.**
- Saturday, May 11, 6 PM – Gallagher-Iba Arena – **2019 Spring Undergraduate Commencement (College of Arts & Sciences).**

News from Around the Department

BS degree candidate **Racine Swick** competed at the undergraduate 3-Minute Thesis competition, placing 2nd overall but also receiving the People's Choice Award. This is, we believe, the first time Geography has competed in the undergraduate competition. Way to go, Racine!

PhD student **Ben Hemingway** was recently awarded a 2019 Holistic Science Prize Award from OSU. He splits the \$3,000 award with another recipient.

PhD student **Colton Flynn** was recently selected to serve as a Fulbright Ambassador and has started fulfilling his duties in said position. This month he was chosen to attend the Philadelphia Fulbright March where 127 Fulbrighters from over 70 different countries came to Philadelphia to share their various experiences and develop further understanding of the use of Big Data in social (and spatial!!) context. Colton's next stop, in mid-May, will be in Washington D.C. where he will be meeting with congress/senators and other political figures to aid the Fulbright program in obtaining funding for future Fulbrighters. CAS recently featured Colton and his Fulbright Ambassadorial duties here: <https://cas.okstate.edu/news/student-spotlight/1715-flynn-travels-to-ethiopia-for-research-opportunities>

In other **Colton**-related news, he recently published his ninth article overall, and first from his dissertation, in *Computers and Electronics in Agriculture*. The article was titled "Site suitability analysis for tef (*Eragrostis tef*) within the Contiguous United States." On that note, Colton successfully defended his dissertation on February 19 under Dr. Carlos Cordova (committee chair).

Faculty members **Don Colley, Jon Comer, Allen Finchum, and Steve Stadler** were in Norman on the OU campus on March 29 to participate in the Oklahoma State Geographic Bee finals, determining the state champion who will represent the state in Washington, D.C. later this spring in the national championship. This was Don Colley's first time, but the others have been doing it for a long time and the editor found out that Jon Comer's first bee was in 1998, and he has since participated in 17 of the past 22 Bees.

GIS Day at the Capitol

The OSU Department of Geography was extremely well-represented at the 2019 GIS Day at the Capitol, the 25th year for the event, on March 5. A large number of OSU staff and students was on hand to answer questions about the department's degree programs, the GIS certificate program, and information about our student organizations.



Pictured above (L-R) – Back: Michael Larson, Lauren Wood, Giovanni Penna, Sam Brander, Amanda Lind, Clay Barrett, Matthew Burton, and Parker J. Smith. Front: Diane Johnson, Jing Wang, Katie Shropshire, and Haley Best. Not pictured is Changheng (Hank) Yang.

For more information, photos and information about past events, and other matters relating to the Oklahoma Geographic Information Council (which puts on the event), visit their website:

http://okmaps.onenet.net/GIS_day.htm

2018-19 Awards Gathering

On May 3, the annual Geography Awards Gathering will take place in the Murray Hall Parlor. Light refreshments will be served starting at 5:00 PM, with the Awards Ceremony starting at 5:30 and Gamma Theta Upsilon inductions immediately thereafter. Nearly \$10,000 of awards and scholarships will be distributed:

2018-19 Recognition Awards:

- John F. Rooney, Jr., Scholarship for Outstanding Junior
- A&S Outstanding Senior
- Robert E. Norris Memorial Scholarship for Outstanding 1st Year MS Student
- Jerry Croft and Family Award in Geographic Education
- ConocoPhillips GIS Certificate Enhancement Scholarship (NEW)
- Susan Shaul Medal for Excellence in Teaching

2019-20 Travel Awards:

- Alyson L. Greiner Undergraduate Travel Scholarship
- Norris Conference Travel Award

Other awards and honors earned by students, staff, or faculty (on campus or off) will be recognized, so if you received some type of award or scholarship in the past year, please let [Jon Comer](#) know so he can add it to the list to be announced at the Gathering.



**2018-19
GEOGRAPHY
AWARDS
GATHERING**

WHEN: FRIDAY, MAY 3, 2019, 5:00-7:00 PM
(Awards presentation and GTU initiation will begin at 5:30)

WHERE: MURRAY HALL PARLOR

LIGHT SNACKS AND SOFT DRINKS WILL BE PROVIDED

AAG 2019 Happenings

Dr. Carlos Cordova was recognized as the winner of the Ellen Mosley Thompson Award for the best publication on paleoenvironments as a result of his recent book, *Geoarchaeology: A Human-Environmental Approach*. The award was given at the Paleoenvironmental Change Specialty Group Business Meeting at the AAG meetings in Washington, D.C. on April 5.

PhD student **Jesse Andrews** was named the Most Valuable Player in the World Geography Bowl competition that took place at the AAG meetings on April 4.

MS student **Christina Woehrle** tied for third place in the Pix4D student poster competition. She looks thrilled...

Three-dimensional characterization of grapevine canopy using UAV-SfM point clouds
Christina Woehrle
Department of Geography, Oklahoma State University, Stillwater, OK

GEOSPATIAL VITICULTURE
There are many factors that can contribute to the quality and quantity of winegrapes. The size and shape of the vine canopy are two metrics that can help determine health and performance of the vine. Different canopy shapes can determine characteristics of the berry, such as anthracnose, while the structure and density of the vine canopy can be used to estimate both fruit yield and vine performance. Measuring the canopy in 3D has various applications, such as yield estimation, pesticide application, general vine health, and estimating grape quality. Using precision viticulture (PV) to obtain highly detailed geospatial datasets (e.g., point clouds, aerial imagery), the structure and density of the canopy can be assessed and analyzed.

REMOTE SENSING
Though many methods of PV exist, most are cost-prohibitive to vineyard managers. Satellite and manned aircraft can produce high-resolution imagery, but at an expense higher than is practical for utilization. In recent years with implementation of UAV technology, these PV methods have become both cost and user friendly enough to be implemented by vineyards in their management plans. Given the quality of these high-resolution data sets, management at the parcel level is possible. Studies have shown that digital cameras carried by UAVs can create a Structure from Motion (SfM) point cloud with comparative levels of accuracy to laser methods. Using this SfM point cloud, the canopy shape and density can be estimated.

METHODS
Image collection took place on 3 separate days in July and August. Each day consisted of 6 flights collecting nadir facing images, oblique images at 45°, and oblique images at 60° all taken from a height of 25m and 50m. For each day there were also LAI estimates collected with a ceptometer. 3 readings per vine.
Imagery was imported into Pix4D where 3 point clouds were created. 3 for each day. These were then manually georeferenced with 7 ground control points (GCPs) throughout the vineyard. Point clouds were then exported as .las files and imported into ArcGIS Pro for analysis.

DATA PROCESSING AND ANALYSIS
Once imported, .las files were classified and extraneous points were removed. Z-values were normalized to represent above ground level heights instead of elevation. Polygons 3m² were created over each of the vines and point statistics were extracted from each polygon. The point statistics were then run in a regression with the LAI estimate averages for each of the 148 vines.
Imagery and LAI estimates collected
Images processed
SfM point clouds and canopy points from polygons
Run regression on point statistics with average LAI values

STUDY SITE
Commancher Valley Research Station (CVRS) - Stillwater, OK

OBJECTIVES
1. To determine the optimal data collection procedure to model via SfM winegrape canopy in three dimensions
1. Following Mathews and Jensen (2013), assess the repeatability of winegrape canopy structure/density estimations from SfM point clouds

PRELIMINARY RESULTS
After processing both the LAI and point cloud data collected on one of the vine sites, a relationship appears to exist between the point densities and the LAI estimates. Processing needs to be replicated for the other 2 days of data collection and the .las files analyzed for the other point statistics.

ACKNOWLEDGEMENTS
Thesis Committee: Dr. Greiner, Dr. Comer
Tom Cox, Victoria Natale, and Lindsay
Shelby Church

A full list of OSU participants at AAG begins on page 8. Thanks to Dr. Alyson Greiner for compiling the list!

AAG 2019 Images



Next year's meeting:
April 6-10, 2020 – Denver

