SPRING 2021 ISSUE NO. 2

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THE SEMI-ANNUAL NEWSLETTER OF
THE DEPARTMENT OF GEOGRAPHY AND THE ENVIRONMENT

A MESSAGE FROM THE DEPARTMENT CHAIR

BY STEVE WOLVERTON

Wow, what a crazy year. Congratulations to our graduates during the last few semesters who endured the challenges of higher education during the pandemic! We are proud that you are now alumni of our programs. In addition, congratulations to Dr. Feifei Pan for his promotion to Full Professor!

The academic year was busy, and we are excited to wrap it up with this second issue of our departmental newsletter; we look forward to seeing students, alumni, staff, and faculty back in the building this fall and in the main office. In the fall, our new Bachelor's degree in GIS + Computer Science becomes official, as do several new certificates including Water Resources and Health & Medical Geography. Enjoy this newsletter as we enter the summer, and see you next fall!

Steve

PROGRAM NEWS

NEW DEPARTMENT PROGRAM CERTIFICATE

This Spring, we also finalized another undergraduate certificate - Applied Geospatial Analytics, which provides the tools that enable the expanding field of Location Intelligence. Students who complete the 12-credit hour certificate will gain an understanding of how location theory and data analytics can be leveraged to provide a strategic advantage within various domains including data science, the public sector, and non-profit organizations. Coursework includes business and retail geography, health and medical geography, exploratory data analysis, as well as Geographic Information Systems (GIS).

CROSSCURRENTS SEMINAR SERIES

After a long year's waiting, the Department of Geography and the Environment welcomed back our Crosscurrents seminar series. Both seminars were held online, via Zoom, but were engaging nonetheless and drew participants from all over UNT and within our Geography community.

March 26, 2021
Historical Ecology of Cultural Keystone Places of the Northwest Coast
Dr. Dana Lepofsky

Cultural Keystone Places (CKPs) are landscapes that hold particular importance to the identity and well-being of cultural groups today. Two CKPs of coastal British Columbia are Hauyat and Laxgalts'ap (Old Town) (territories of Heiltsuk and Gitga'ata,respectively). Dr. Lepofsky's team brings together the data and knowledge gleaned from interviews, oral histories, ecological, archaeological, and ethnoecological studies to bring forward the deep and recent histories of these cultural landscapes. Archaeological features at each CKP are situated within expansive landscapes transformed by generations of people interacting with their surrounding environments. The team uses websites and apps to share the historical secrets held within the lands, water, and ecosystems of these special places.

Dr. Lepofsky is a professor in the Department of Archaeology at Simon Fraser University. She is interested in past human-environmental interactions and in situating this information in current social and ecological contexts.

April 23, 2021
Understanding Urban Thermal Environments: Their Changes, Impacts, and Mitigation under Climatic Extremes
Dr. Leiqiu Hu

Heat stress is a leading cause of weather-related human mortality in the United States and worldwide. Anchored in research urban heat islands, this talk covers research on how cities can be studied systemically on a global scale to inform policy related to urban thermal environments.

Dr. Leiqiu Hu, Atmospheric & Earth Science, University of Alabama in Huntsville, obtained her Ph.D. in Geography from the University of Kansas in 2014. She was a postdoctoral researcher in the Advanced Study Program at National Center for Atmospheric Research, focusing on urban climatology. Dr. Hu's research centers on land-atmosphere-human interactions in urban and agricultural systems across temporal and spatial scales. Her research has been funded by NASA and USAID.

FACULTY PROFILE: DR. YUTING LI

Dr. Yuting Li is our newest faculty member who began teaching for the Department of Geography and the Environment in Fall 2020. Yuting had worked as a TA for four years during her PhD at Louisiana State University. Before joining UNT, she worked at Purdue University for two years as a Visiting Assistant Professor. Read along to get to know Dr. Li better!

What drew you to UNT and the Dept. of Geography and the Environment? I like teaching and interacting with students from diverse backgrounds. As a lecturer at UNT, I have the opportunity to spend more quality time with students, getting to know them, evaluating their work much more closely, and serving as a mentor. Students are not just a "face in the crowd" in classes. Therefore, I wanted to work at UNT because the school emphasizes good teaching and hands-on learning; I believe I can offer this effectively and successfully. I also note that there are summer field schools available in our department, which is something that really interests me.

What research are you focused on right now? I investigate the processes of source-to-sink sedimentary signal propagation by studying the sedimentary records in the Indus Submarine Canyon. The methods I've been using include radiocarbon dating, Nd and Sr isotopic analysis, clay mineral analysis, provenance analysis using detrital zircon and apatite, major-element geochemistry, grain size analysis, and color reflectance spectral analysis. Recently, I'm working on grain size variability and channel geometry of the Indus Canyon, trying to deepen understanding of deep-water depositional systems through analysis of this critical canyon link in the sediment transport process by providing ground-truthing for models and an analog for examples in the geological record.

What is your teaching philosophy? I've experienced both introductory non-major classes and upper-level major classes that combine lectures, field trips, and labs. I've dealt with both big lecture classes of more than 270 students as well as smaller scale advanced classes of 11 students. My first classes at UNT are entry-level introductory courses. If I use one word to summarize my goal in teaching introductory courses, it is interest. I think it makes a big difference if students have an interest in each of their classes. I find that students' notion of geology is somewhat overwhelmed by the large geologic time scales and often faraway, detached locations of geological events. I try to increase students' interest in geosciences by providing them with an insight into the geologic world in an accessible learning environment. I feel that if students are scared of science or geology, they may not return to it in the future. I know that UNT students take a substantial set of general education courses, so I really value that chance to show them geoscience in a friendly and interesting way. My first two semesters both went quite well. So far, I've experienced both face-to-face classes, online synchronous class, and online asynchronous class. I do have students who took one of my classes in the fall semester and registered again in my other class in the following spring semester. I can also tell from students' course feedback that they gained more interest in geoscience after spending a whole semester with me in the world of earth science.

FACULTY PROFILE: DR. YUTING LI, CONTINUED

What is your favorite class to teach at UNT? What do you most like about interacting with students? I like both my introductory classes: Earth Science and Physical Geology. They provide me with the opportunity to interact with more students from diverse backgrounds. My favorite class is my new course Earthquakes and Volcanoes; the small class size made more interactions with each student possible. We also held student presentations and in-class discussions more often. What I like most is that instead of me presenting all the lectures, student presentations provide each student the chance to conduct some independent research and to connect what we've learned in class with some spectacular earthquakes and volcanoes in the world. With these small projects, students form educated opinions rather than simply accepting information. They gain practice in communicating scientific findings through oral presentations. We can learn from each other during their presentations.

What do you enjoy most about teaching in general? Interacting with my students from diverse backgrounds. Teaching, to me, is a two-way street with stunning views on both sides.

What are your most recent accomplishments (since your arrival at UNT)? As a new lecturer joining our department, I started my position during the pandemic. It was more difficult and took more time in communication. This was a stressful start of a new teaching role and was an impressive experience for both myself and my students. Despite all the difficulties, I'm glad and proud that we went through this together and my classes got good feedback from my students. I also appreciate the support that my department has given me in this hard time!

Photo credit: University of North Texas

DEPARTMENT FACULTY UPDATES

This past semester, **Dr. Chetan Tiwari** was honored to be nominated for the College of Liberal Arts and Social Sciences Undergraduate Teaching award. In addition, he published three articles with students and collaborators in the following journals: *Ecosystem Services* ("Progress in ecosystem services research: A guide for scholars and practitioners."; *PeerJ* ("Evaluating spatial patterns of seasonal ozone exposure and incidence of respiratory emergency room visits in Dallas-Fort Worth."; and *Computers, Environment, and Urban Systems* ("Evaluation of Heuristics for the P-Media Problem: Scale and Spatial Demand Distribution."). Chetan also has several papers in review and in different stages of development. In other research, he has continued to work with the Denton Police Department and collaborators at Georgia State University on the Sexual Assault Kit Initiative (SAKI) project.

This spring, **Dr. Matthew Fry** continued research into analyzing environmental policies in DFW municipalities. As part of that project, he and Lauren Fischer (UNT Department of Public Administration) submitted a proposal titled "Finding Science in Tree, Landscaping, and Water Conservation Policies in the DFW Metroplex" to the National Science Foundation Build & Broaden 2.0 Program. He also spent the spring semester participating with Dr. Ponette-González and colleagues on the 'Hazy Views over U.S. Public Lands' UNT Team Mentor Grant. In addition, he taught two classes and served as an undergraduate advisor, and he was appointed to the City of Denton's Sustainability Framework Advisory Committee. He plans to spend the summer researching Texas energy landscapes and continuing to analyze urban environmental and sustainability policies.

Dr. Pinliang Dong has been working on producing Panopto videos for Advanced GIS Programming and LiDAR courses this semester. He has also co-authored four papers so far this year in the following journals: *Remote Sensing of Environment*, *Remote Sensing*, *Ecological Processes*, and *Geomatics, Natural Hazards and Risk*. In January 2021, he was interviewed by a journalist from Quartz regarding contributions of LiDAR in various fields. In March 2021, he was interviewed by a staff member who works with the American Association of Geographers' Director of Communications, regarding potential applications of LiDAR on mobile devices such as iPhone 12 Pro and iPad Pro. In the interview, he introduced 12 potential applications of LiDAR on mobile devices in different fields, as well as the remaining issues.

Dr. Paul Hudak taught two introductory geology lecture sections and the lab, along with the capstone course this past semester. He enjoyed working with students and appreciated their insightful discussions and creative projects. Capstone students presented and wrote proposals on: adaptation to earthquake hazards in Nepal; use of microalgae for remediating coal ash waste; media affirmation feeds and extremism; applications of LiDAR to ancient burial mounds; developing permeable parking lots at UNT; COVID-19 trends and adaptation in Europe; micro-gardens and food insecurity in Denton; attitudes toward alternative forms of energy in west Texas; floating litter and microplastics in the Trinity River; soil erosion in Denton County; remote sensing and traffic routing; effects of COVID-19 on real estate; public attitudes toward greenspace in Frisco; developing a bike share program in Prosper; learning about Greek history with gaming platforms; and associations between religious affiliation and attitudes toward sustainability in DFW. In addition, Paul wrote several papers which address suburban heat and dog safety, riparian ecotone fragmentation, and effects of property configurations on groundwater monitoring strategies. In his spare time, Paul enjoys helping neighbors, playing with his three dogs, and gardening. His two puppies are close to one year old and already weigh over 60 pounds. They continue to eat food and furniture. Last Sunday, Paul went on the bluebonnet trail in Ennis and was stunned by their spatial density and striking beauty. They are his favorite flower.

DEPARTMENT FACULTY UPDATES, CONTINUED

In Spring 2021, **Dr. Murray Rice** focused on teaching GEOG 4230/5230 (Location Intelligence) and GEOG 4185/5185 (Statistical Research Methods in Geography). The Statistical Research Methods class represented an interesting challenge for Dr. Rice, as he had taught the class previously but not recently (almost 20 years ago!). Teaching the Location Intelligence class involved extending a semester research project partnership with Kentucky Fried Chicken and one of UNT Geography's stellar BS/MS alumni, Josh Bova, who is a senior market manager on the KFC team. Beyond teaching, Dr. Rice continued to serve as executive director with the Applied Geography Conference. He also presented a paper on small-city economic development at the spring 2021 American Association of Geographers meetings.

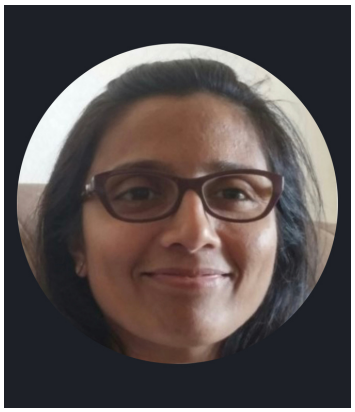
This semester, **Dr. Feifei Pan** taught Surface Water Hydrology and Weather & Climate (a new course). To enhance students' understanding of meteorological concepts and theories, after the class finished each chapter of their textbook, he went over every review question with students. The four exams were all open-book and open-notebook, because he wanted to emphasize that understanding rather than memorizing is the most important thing in learning new knowledge. Feifei's paper, titled "A Constrained Stochastic Weather Generator for Daily Mean Air Temperature and Precipitation" and co-authored with Drs. Nagaoka, Wolverton, and Atkinson, was published in *Atmosphere*. Using the method in the paper, he has been working on extracting the growing season length and mean air temperature and precipitation in the growing season for each year between 1000-1400AD in the Mesa Verde region from stochastically generated daily mean air temperature and precipitation based on tree-ring reconstructed annual mean temperature and precipitation. In addition, Feifei's graduate student Beatrice Arce was offered a Water Quality Data Management Internship by the U.S. Fish & Wildlife Service Directorate Fellows Program in Anchorage, Alaska in Summer 2021. She will be developing a protocol for managing water quality data that makes data discoverable, publicly accessible, and facilitates its use in resource management decision making. This internship is particularly relevant to Beatrice, as her thesis focuses on impacts of urbanization and climate change on sediment yield and water quality in the North America.

This spring, **Dr. Lu Liang**'s lab collaborated with the City of Lewisville to expand the air quality monitoring network to an underserved Triangle Community. They will obtain first-hand, fine resolution air pollution data that will lead us further investigating the environmental justice issues. Lu is also participating in a National Geographic grant that will provide GIS training under the context of air pollution to 50 in-service and pre-service teachers this summer. She has published her sole-authored paper "Calibrating low-cost sensors for ambient air monitoring: techniques, trends, and challenges" in *Environmental Research*. Lu's first master's student Sean Hickey graduated this spring, and she is very proud of what he has achieved at UNT.

This spring was a lot of fun for **Dr. Steve Wolverton**. He and Drs. Pan and Nagaoka published a paper on a "weather generator" for the archaeologists working in the Mesa Verde region, and he, Dr. Johnson (formerly UNT Biology), and Argentine colleagues published a new paper on ancient DNA of guanaco (the wild ancestor of llama). Both articles represent years of collaboration. They will publish more work out of both projects. Steve also had the pleasure to reconnect with his PhD major professor to author a book chapter on quantitative methods in zooarchaeology and archaeobotany, which will come out next year. He is also proud of several former graduate students who finished their PhDs and are moving on to post-doctoral positions (congratulations Jon, Laura, and Traci!). And, one of the department's former students (Alex) led and finished a giant field archaeology project related to Bois d' Arc Lake in northeast Texas. Finally, Steve collaborated again with colleagues who helped produce the *Sushi in Cortez* book (2015) this year. They met and worked on several new initiatives including thesis committees, articles, and shared lectures.

FALL 2020-SPRING 2021 TEACHING ASSISTANTS

In last semester's newsletter, we featured four of our new Teaching Assistants. Please read on to learn more about some of our other TAs, who have worked so hard to help this academic year be successful for our faculty and students.



Rajshree Rege (TA for GEOG 2110, 4170, 5185)
Major professor: Dr. Pinliang Dong
Area of Interest: Remote sensing including LiDAR remote sensing, sand dunes, data & pattern analysis
Fun facts: I like reading stories, I like to see places, and I can speak 4 languages (English & 3 Indian languages). I am a proud mom of an 11-year-old.

Jacqueline Torrecillas (TA for GEOL 1610)
Major professor: Dr. Paul Hudak
Area of Interest: GIS, Water Resources, Hydrology, and Environmental Science
Fun facts: I hiked a 12,000-foot mountain in Yosemite National Park and I ran a half marathon in hilly San Francisco, California.

Ciara Mason (TA for ARCH 2800)
Major professor: Dr. Steve Wolverton
Area of Interest: Applied Zooarchaeology - freshwater mussel ecology
Fun facts: I have a wide variety of interests from the whole spectrum of anthropology (primatology, linguistics, cultures, etc.), cars, cooking, anything that gets me outside like hiking, camping, yard work, bird watching, mushroom hunting, walking my dogs, etc. Most importantly though, I LOVE sharing all of these things with my 4-year-old daughter.

STUDENT HIGHLIGHTS

We are proud of all our students as they have tackled their academic careers and furthered their studies during the pandemic. Read below to see what some of our students have accomplished this Spring 2021 semester!

Jack Linehan (Senior, B.A. Geography) continued working as a research assistant with Dr. Fry, but also advanced his undergraduate research into tree preservation and urban forestry ordinances in DFW. He presented some of his findings at UNT Scholar's Day (see page 11) and plans to conduct interviews and participant observations around DFW this summer. Jack received the Department of Geography and the Environment's 2021 Schoolmaster Outstanding Undergraduate Award, a monetary award of $1,000.

Ashley Green (Senior, B.A. Geography) spent the Spring semester participating with Dr. Ponette-González and colleagues on the Hazy Views over U.S. Public Lands UNT Team Mentor Grant. As part of the project, she is working with Dr. Fry using past and present photography to study place, change, experience, and imaginaries in Texas Parks. As part of the research, she built a photograph archive and conducted preliminary field work at several parks around the state.

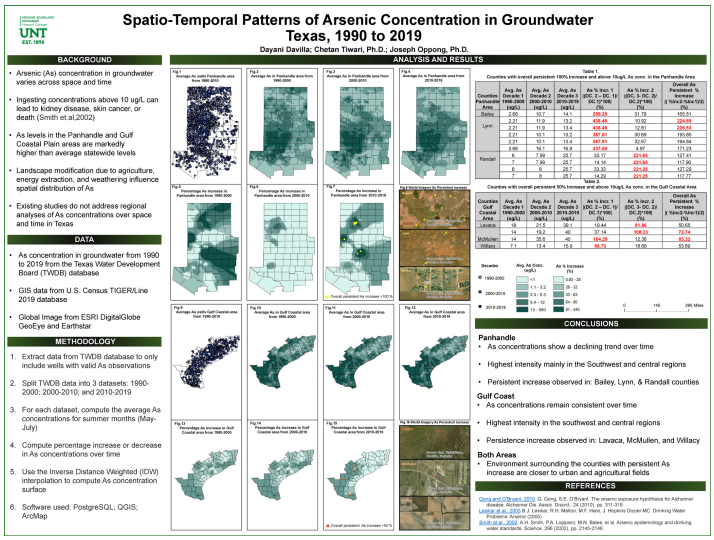
Zachary Tabor, first year MS student and Earth Science TA, received the 2021 CAPE Field Study Award from the Cultural and Political Ecology Specialty Group of the American Association of Geographers (AAG). Zach is the first University of North Texas student to win this monetary award of $1,000 that will defray travel expenses for his fieldwork this summer. Zach's MS thesis research asks: How do Texans contend with Chronic Wasting Disease (CWD) in white-tailed deer herds and unmanaged feral hog populations? And how do these strategies compare? To identify these strategies, this summer Zach will conduct in-person or Zoom interviews with hunters, landowners, game ranch managers, Texas Parks and Wildlife Department employees, and game wardens in Brewster, Hardeman, Palo Pinto, Mason, Anderson, Jasper, Jefferson, and Dimmit counties. He will ask questions about CWD, feral hogs, local impacts, engagement with experts, local land uses, personal ethics, and the ways deer and hog management policies affect human interactions with these animals. After completing a B.S. in Geography and the Environment at UNT, his passion for the outdoors and conservation brought him back to pursue a master's degree focused on wildlife.

Sean Hickey graduated with his M.S. in Geography this spring. In March 2021, Sean successfully defended his thesis titled "Using Machine Learning to Develop a Calibration Model for Low-cost Air Quality Sensors Deployed During a Dust Event" to his committee members Dr. Lu Liang, Dr. Chetan Tiwari, and Dr. Pinliang Dong. Over the last two years, Sean worked with Dr. Liang to calibrate low-cost air quality sensors to help establish the first organized community air monitoring network in Denton, Texas. The knowledge and skills Sean acquired through his coursework and research at UNT helped him land his first job out of graduate school this spring. Sean will be working as a data analyst with the Dallas Independent School District, where he will utilize his newly developed geographic skillset to help visualize and analyze student testing data for the district. Sean is also this year's Schoolmaster Outstanding Graduate Student award winner and received a $1,000 scholarship.

UNT SCHOLARS DAY

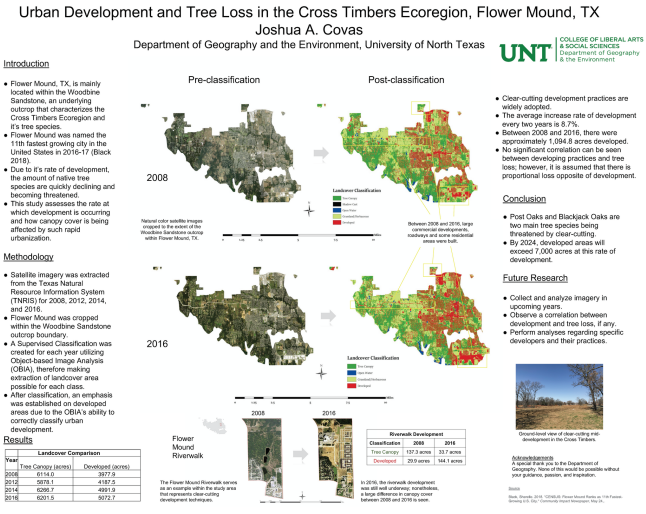
This year, UNT Scholars Day was held virtually. Take a moment to peruse the posters below - many of our undergraduate majors and minors were among the presenters!

Dayani Davilla (Mentor: Dr. Chetan Tiwari)



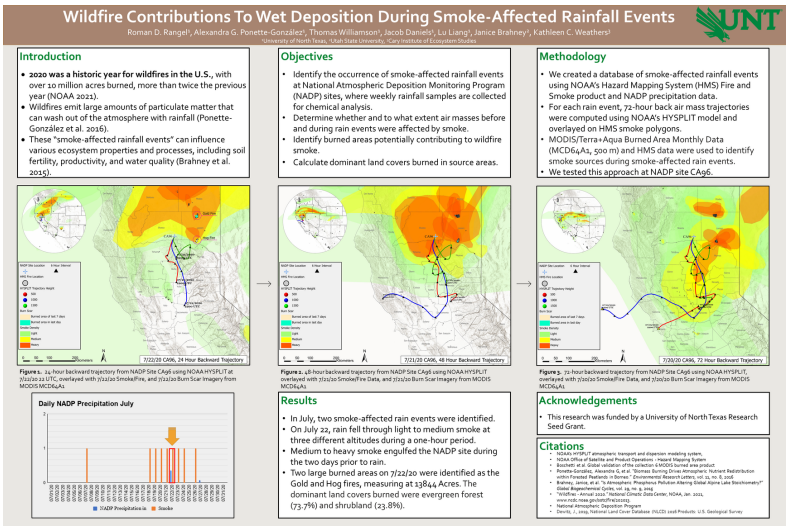
Abstract: *Arsenic concentration in groundwater varies across space and time and may increase or decrease with geological processes and/or human activity. There is a need to identify areas with historically elevated values of Ar in groundwater as well as those with persistent increase. Developing maps of existing and emerging risk of exposure will help guide health care intervention efforts for diseases that are commonly associated with Ar. The first map identifies those areas that are consistently in the top one-third of Ar concentration between 1990 to 2019. The second map identifies those areas that show persistent increases in Ar concentrations over 5-year increments for the same time period. For each 5-year increment, a Kriging model was developed to estimate Texas-wide Ar concentrations in groundwater using well data from the Texas Water Development Board's groundwater quality database. Areas of persistent increase were computed by comparing estimates over successive time increments. The results show several areas of concern especially in the panhandle and gulf coast regions, where Ar concentrations exceed the 10 ug/L levels that studies show may contribute to an elevated risk of several diseases including kidney disease, skin cancer or even death.*

Joshua Covas (Mentor: Dr. Lisa Nagaoka)



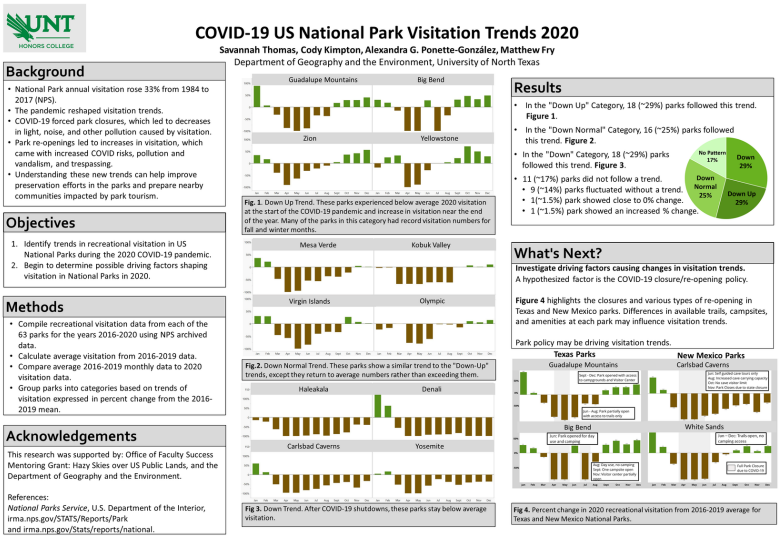
Abstract: *Flower Mound, TX, located in the Cross Timbers Ecoregion, has experienced rapid urban development for decades. At such great rates, the native tree species are dwindling quickly. By utilizing GIS and Remote Sensing techniques, performing an assessment of landcover changes is made possible. In this study, a Supervised Classification was created for 2008, 2012, 2014 and 2016 using Object-based Image Analysis (OBIA). Once classified, the area of each landcover type was measured in acres based on the number of each class's pixel count. Developed areas in Flower Mound include residential, commercial, transportation, and mixed-use developments. There are increases in each of them between 2008 and 2016. Clear-cutting, a common development practice, continues to greatly diminish the native tree species of the Cross Timbers. Developers will continue to have a tremendous effect on the biodiversity if the rate at which their clear-cutting persists. This study is a comparative analysis of landcover change between 8 years of rapid urbanization and how native vegetation is being affected.*

STUDENT HIGHLIGHTS - UNT SCHOLARS DAY, CONTINUED

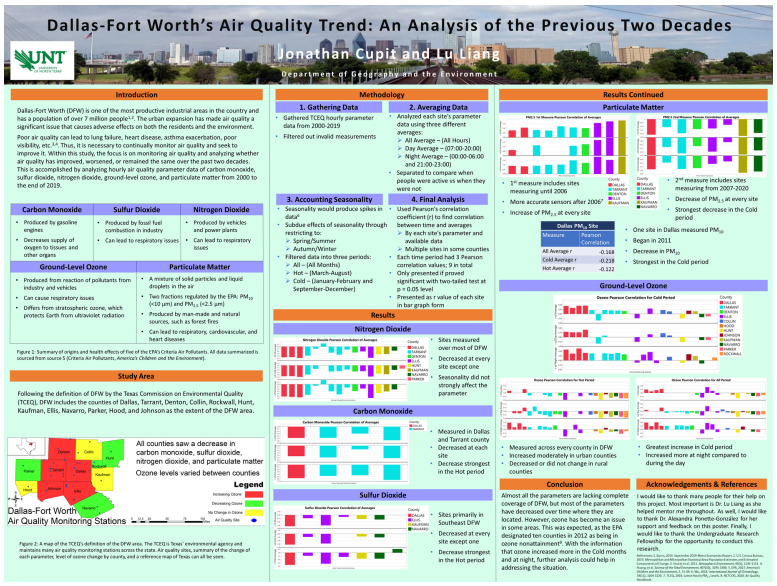


Roman Rangel (Mentor: Dr. Alexandra Ponette-González)
Abstract: *In 2020 over 10 million acres burned, more than twice the previous year (NOAA 2021). Wildfires emit large amounts of particulate matter that can then wash out of the atmosphere with rain (i.e., "smoke-affected rainfall events"). We developed an approach to identify smoke-affected rainfall events and the burned areas potentially contributing smoke during these events. We identified one major smoke-affected rainfall event at the site with two fires, burning 13,844 acres and primarily evergreen forest (73.7%) and shrubland (23.8%). Future research will employ this approach to better understand how smoke affects the chemical composition of rain.*

Savannah Thomas and Cody Kimpton (Mentor: Dr. Alexandra Ponette-González)
Abstract: *The COVID-19 pandemic reshaped visitation trends in U.S. National Parks. COVID-19 forced park closures, which led to decreases in light, noise, and other pollution caused by visitation. Park re-openings led to increases in visitation, which came with increased COVID risks, pollution and vandalism, and trespassing. By identifying trends in recreational visitation in U.S. National Parks during the 2020 COVID-19 pandemic, possible driving factors can be determined. Understanding these new trends can help improve preservation efforts in the parks and prepare nearby communities impacted by park tourism. Using visitation data from National Park service archives, four visitation trends were identified.*

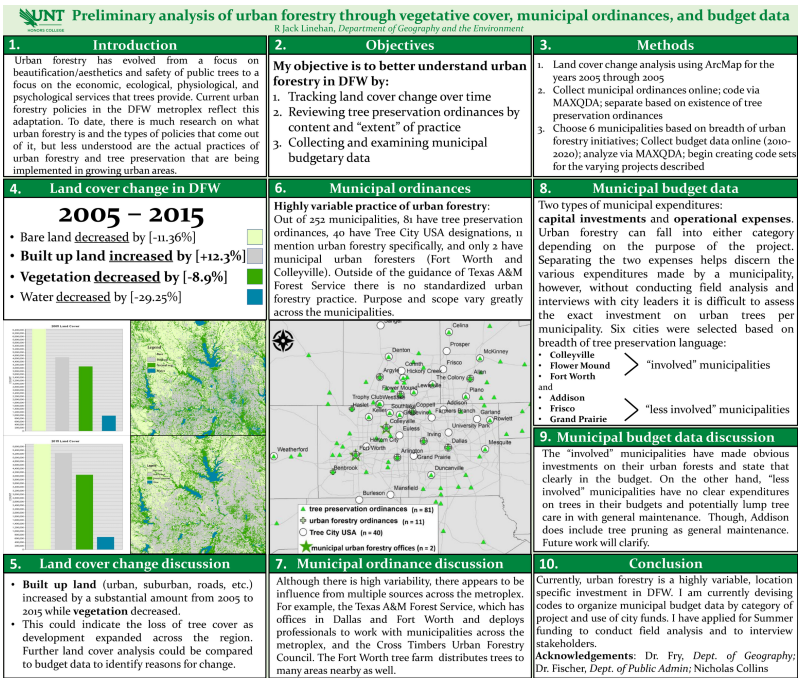


STUDENT HIGHLIGHTS - UNT SCHOLARS DAY, CONTINUED



Jonathan Cupit (Mentor: Dr. Lu Liang)
Abstract: *This study uses data from the Texas Commission on Environmental Quality to analyze the change in air quality parameters in Dallas-Fort Worth from 2000-2019. Data was filtered to measure the difference between day and night and through the seasons. Using Pearson correlation, analysis found that carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter all decreased. Ozone varied between counties, with urban counties increasing or remaining stagnant and rural counties improving.*

R. Jack Linehan (Mentor: Dr. Matthew Fry)
Abstract: *Urban forestry has evolved from a focus on beautification/aesthetics and safety of public trees to a focus on the economic, ecological, physiological, and psychological services that trees provide. Current urban forestry policies in the DFW metroplex reflect this adaptation. To date, there is much research on what urban forestry is and the types of policies that come out of it, but less understood are the actual practices of urban forestry and tree preservation that are being implemented in growing urban areas. I seek to understand urban forestry in practice through land cover change, municipal ordinances, and budget data.*

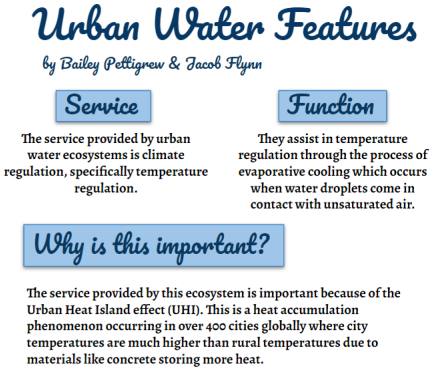


STUDENT ECOSYSTEMS PROJECTS

This Spring semester, Dr. Alexandra Ponette-González taught Ecosytems, GEOL 4710. Students in Ecosystems examine interactions between organisms and the physical environment as an integrated system and the factors that regulate the quantity and flow of materials and energy through ecosystems. They also discuss current topics and methods in ecosystem science. The class did a project where they presented their findings via Instagram. Below and in the next several pages, you can see some of the projects submitted by Dr. Ponette-González's students.

Cecelia Rountree and Kate Samson *(picture on the left)*
"Over the past year, we have been observing the ecosystem around the Goolsby chapel on the UNT campus. We started this observation in January, during this time we've watched the leaves grow and flowers bloom. The structure of this ecosystem consists of 39 trees, lots of shrubs, a few flowers. It covers about 39,000 square feet, 1.129 of our ecosystem can fit into an acre. The function involves the emission and sequestration of greenhouse gases - the filtration of air pollution. The net primary productivity is high in this area due to the high levels of vegetation and photosynthesis occurring. Lastly, the service of this ecosystem involves: the filtration of air pollution, being an important habitat for plants, animals, and insects, providing shade and the benches provide an area for students to sit and relax between classes. Our ecosystem also helps reduce runoff on campus."

Marisa Stallworth *(picture on the right)*
"The trees and grasses in my ecosystem limit runoff and regulate how fast water infiltrates the ground both before it contributes to runoff and contributes more to the groundwater available. Trees contribute to the groundwater in the area which would overall influence and contribute to the drinking supply available in Denton."



Bailey Pettigrew and Jacob Flynn
(picture on the left)
"Our urban campus ecosystem is the water feature found in the Library Mall outside of Willis Library. Urban water ecosystems assist in climate regulation through evaporative cooling and are crucial to mitigating the effects of the Urban Heat Island. Evaporative cooling from urban water bodies has been found to have a cooling effect of 1-3 degrees C for a surrounding area of about 35m."

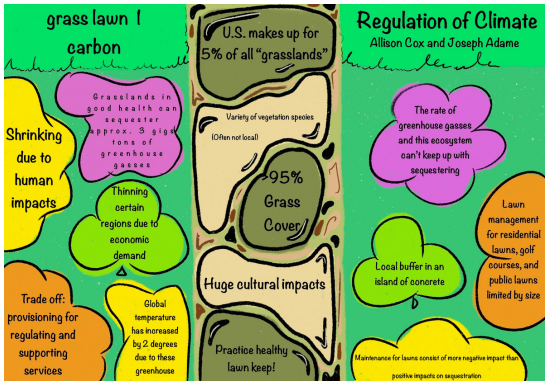
STUDENT ECOSYSTEMS PROJECTS

Natalie Nava and Mia Trevino
(picture on the left and below)

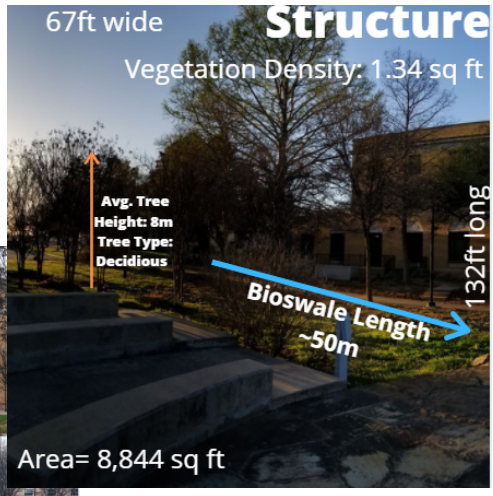
Marisa Stallworth *(picture near bottom right)*
"Residential lawns are familiar areas to many people, generally consisting of a single tree standing over lush green turfgrass. 163,800 square kilometers of US land consisted of lawns in 2005, and that amount is steadily growing with increased suburbanization. To keep up these idealized lawn appearances, a lot of lawns rely on the input of chemical fertilizers, especially those based on nitrogen- either in the form of nitrate or ammonium. Though some fertilizer will be taken up as plants or stored in the soil, extra nitrogen enters the ecosystem and exits as leachate, entering local water supplies where levels can exceed the safe level of nitrogen in drinking water of 10 mg per liter. 20-40% of nitrogen fertilizer applied to lawns (160 kg per hectare every year!) drains through soil to become leachate. Water-soluble rapid-releasing fertilizers are the most likely to cause pollution, with 15% of those lawns having leachate that contains an unsafe level of nitrogen. In order to reduce the impact of chemical fertilizers on water sources, choosing the right timing, type, and application amount of fertilizer is important. Best practices include testing lawns before fertilizing, not overwatering in conjunction with fertilizing, and applying fertilizer from late spring to early fall when grass is actively taking up nitrogen to grow. All of these can help boost the productivity and appearance of lawns while reducing pollution in local water sources. If managed properly, soils in residential lawns can actually become nitrogen sinks and create healthy ecosystems."

STUDENT ECOSYSTEMS PROJECTS

Cody Kimpton and Sciara Segura *(picture on the right)*
"Tree grove 2 is located at the bottom of a hill in between the General Academic Building (GAB) and Hickory Hall. This ½ acre plot is covered with grass and trees, with the trees reaching heights of about 20-40 feet tall. The grove's function is to filter nitrogen in both the water and atmosphere in its ecosystem. Where the trees take up the nitrogen through the soil and prevents the nitrogen from becoming runoff and causing health problems to other organisms in the environment. Providing the overall service of filtering nitrogen in the water and atmosphere in the ecosystem where the trade-off is reduced pollution, an increase in beauty, and an increase in the shade provided by the grove."



Allison Cox and Joseph Adame
(picture on the left)



Johnny Croker and Morgan Beck
(pictures on the right)

Jessica Davis and Jack Linehan *(picture on the left)*
"Street Trees and effects on air quality: Street trees are increasingly recognized for their mitigation of the many negative effects of urbanization. In regards to air quality, street trees capture harmful particulate matter (PM) ranging from dust to toxic emissions. Thanks to the ability for tree leaves to capture these particles, trees are actually filtering the air. This small ecosystem of 10 trees can filter hundreds of thousands of cubic meters of air every year."

ALUMNI PROFILE: CARL WHITAKER

Carl, from a recent camping trip to Glacier National Park in Montana

Carl Whitaker is an Eagle through and through - he graduated in 2012 from UNT with his Bachelor of Arts degree in Social Science with a Secondary Teaching Certification and he received his Master of Science degree in Applied Geography in 2015. As a graduate student, his major professor was Dr. Murray Rice. Carl has said how Dr. Rice is fantastic and credits him with helping navigate grad school and kickstart his career. Carl's Master's Thesis focused on Small Town Retail Change in East Texas. Read on to learn more about Carl, his time at UNT, and what he has been up to since!

How did your experience in the Department of Geography and the Environment set you apart from your peers educated at other institutions? Great question. I would say the holistic approach to the program's curriculum. I've always been an "applied" person, meaning that I tend to struggle with highly theoretical concepts. I liked that the UNT program - and especially Dr. Rice's students - had a very applied, translatable course load with the professional world . . . in turn, that application has been massively beneficial in my career thus far. Beyond that, the theoretical concepts that were presented by a number of other professors (like Dr. Ahmed & Dr. Fry) were extremely challenging at first. When I look today though, those classes helped shape my worldview in the best way possible. They challenged my status quo and helped teach me to think critically. It's probably no coincidence that geography is global learning in two ways: in a physical sense and in the sense that it helps you think from all possible angles (a 360 degree learning approach). So to summarize, the balance between the applied concepts and the theoretical concepts in the graduate program were incredibly impactful. I'm not sure I could have had the same experience anywhere else really.

How did your bachelor's/master's degree from UNT influence your career path? Another testament to Dr. Rice and his exceptional guidance - he helped me land my first summer internship with a local Dallas economic consultant (Catalyst Commercial). I worked there for a year or so before moving to a company that Catalyst Commercial subscribed to for data (Axiometrics, which was then purchased by RealPage, a 'software as a service' company).

Current place of employment, role and duties: I've been at Axiometrics/RealPage for five years now. I'm the Senior Manager of Market Analytics - I provide market and economic commentary to our client base (multifamily professionals, primarily multifamily developers, investors, and owner/operators) through individual and consultative discussions and presenting market and economic updates at industry conferences. I model and forecast future market and neighborhood performance through demographics, economics, and qualitative understanding of local marketplaces. I also manage a team of six analysts and economists.

What message do you have for current students? Work closely with your professors - they'll help you out a lot along the way! Enjoy your time in Denton - it's such an amazing town and I'd be willing to bet you'll look back at your time there fondly. Go out and explore the city, the campus, etc.!

Fondest memories in the Geography Dept. & in Denton: I remember working late one evening and had my office door cracked and began hearing music. I could tell it was coming from the main foyer so I went down to check it out (side note, I'm a huge, huge music fan so I had to go check things out . . . before the pandemic I was going to two or three music festivals a year all around the country such as Bonnaroo in Tennessee, Crssd in San Diego, and M3F in Phoenix). Turns out that the music was part of a Diwali celebration! I remember walking around and seeing all the wonderful outfits, seeing everyone so happy in celebration and was also treated to some wonderful food. Beyond that specific instance, I'd say working as an Eagle Ambassador throughout my undergrad was my fondest memory. I met some amazing people - many of whom are still among my closest friends - and the program really helped me break me out of my "small town kid" shell. I still credit the program with helping me even today as I'm presenting to the public essentially every day.

ALUMNI UPDATES IN SPRING 2021

Geography and the Environment alumni often contact us to let us know they are doing (we would love to hear from you so drop us a line at geog@unt.edu). Here are some of our other alumni and the amazing work they are contributing to the world!

Brittany Jandick (BS in Geography, 2018; MA in Philosophy, 2020) recently accepted a position with Travis County in Austin, TX as a Park Supervisor. She has also taken on a new project; she and her husband Eric created an organization called Delphinus Orcastra where they combine his musical talents with her knowledge about whales and dolphins to bring awareness to environmental issues surrounding dolphins and whales through original music and a blog (https://linktr.ee/DelphinusOrcastra). Brittany was also featured last summer on a podcast called Breaching Extinction where she discussed her thesis and gave a shout-out to the geography department! (Podcast link is https://www.breachingextinction.com/copy-of-about, episode 39.

Bradley Rains, who graduated in 2020 from the Masters Program in Applied Geography, now works at a company called Energy Advisors Group in Houston, TX. His position at the company is an Engineering Tech & Geologist. Bradley's daily routine involves making intricate maps that tell a story, using engineering analytics to solve problems, and working with a team to market oil and gas assets. He has learned a lot upon starting this job, like being confident in his ability to absorb information and adapt to the needs of the company.

Jenna Rindy graduated from the M.S. program in 2018 and is now a Ph.D. student at Boston University. She studies urban forest interactions with air pollution, focusing on comparing nitrogen and particulate matter deposition in urban vs. rural forests. Jenna is currently working on writing her first dissertation chapter, planning summer field and lab work, and studying for her qualifying exams. If she has a rare moment of free time she spends it hiking with her dog or indoor or outdoor rock climbing.

Alexandra Younger, right, (MS in Geography, 2019) works in Cultural Resources Management as a Project Archaeologist. For over a year, she directed a massive team of archaeologists to excavate prehistoric sites along the proposed Bois d'Arc Lake Reservoir in Northeast Texas that comprises intermittent occupations of Late Archaic and Early Formative in a portion of the Red River region where little is known. Data generated from these investigations reveal Mima mound houses, deep storage pits with large pots and faunal remains such as bison or deer, large clay cooking pits, a variety of burial practices, and early agriculture with some links to the Caddo culture.

Destinee Williams-Blackshear graduated in December of 2018 with a Bachelor of Science degree. Since graduating she has worked as a Stormwater Consultant with land development and construction companies to help keep them in compliance with EPA, TCEQ, and local government stormwater regulations with the goal of protecting stormwater supply from chemicals, erosion, and pollutants. She has since transitioned into local government and now works in Neighborhood Services and specializes in Property Standards. Her job is to promote and enhance the health, safety, welfare, and overall livability of neighborhoods and to ensure the long term conservation of communities through outreach, education, and code enforcement.

MISCELLANEOUS

The department's Advancement Committee hosted a problem-solving workshop in March. Partnering with several alumni (Nadine Grosse, Joshua Bova, Sarah Luxton, and Webster Mangham), the workshop, titled Geography in Today's World: Problem-Solving, focused on problem-solving vs. exercising-solving. It was highly interactive and included discussion time, problem-solving exercises, and panel segments. Involved alumni provided brief input during these panel segments on how they approach problem-solving in their careers.

On Monday, April 19, the committee also hosted the department's online graduation and awards recognition ceremony. As a live, virtual event, it was an extensive program that honored a cross-section of undergraduate and graduate students, including our Schoolmaster Outstanding Undergraduate and Graduate Student award winners for 2021. Dr. Jean Schaake, Associate Dean for Academic Affairs in the College of Liberal Arts and Social Sciences, provided an opening statement to congratulate participants. Below are the Spring 2021 graduates and Honor Roll recipients of the Geography Department!

Bachelor of Science Graduates:
Tommy Ashley
Saurav Baniya *
Kelsey Cavener-Sumner *
Pamela Clark
Jonathan Croker
Joshua Hardie
Joe Hendrix *
Cassey Llamas
Garrett Locklin
Chelsea Meyer
Anthony Potenti
Christina Simmons
Mia Trevino *
Bryce Workings *

Bachelor of Arts Graduates:
Jonathan Esmonde *
Zachary McCormick
Ginger Sajbel **
Debra Wasson *
Anna Willits **

GPA 3.5 and Higher * (Undergraduate)
Ian McReynolds
Drake Johnson
Michael Matthews
Lauren Christy
Lauren Tyson
Cara Cranor
Megan Purcell
Ryan Shipley
Giselle Arnold
Dayani Davilla
Michael Garza
Maggie McCulloch
Adrienne Marchal
Madison Rutherford
Wise Lubanda
Emma Leary
Joseph Ewton
Nicholas James
Anthony DeFreece

GPA 3.8 and Higher ** (Undergraduate)
Garrett Jones
Natalie Nava
Kyra Shank
Ronney Phillips
Emily Edgar
Alan Roach
Dillon Bannister
Tatyana Broomfield
Kierstin Marchal
Jonathan Cupit
Abigail Rausch
Ashley Green
Jenna Dobyns
Adrianna M. Smart
Hayley Otteson
Hanna Klapprodt
Evangeline Dwell
Katelyn Swenson

2020-2021 Scholarship Award Winners
Jennifer Ellis (Physical Geography Scholarship)
Kerra Unal (Geospatial Technology Scholarship)
Jack Linehan (Schoolmaster Outstanding Undergraduate Student)
Sean Hickey (Schoolmaster Outstanding Graduate Student)

Master of Science Graduates:
Hilary Ansah ++
Chelsea Beaubouef +
Laura Dávila Castro ++
Jennifer Ellis ++
Samantha Espinoza +
Angela Green ++
Sean Hickey ++
Daniel Michel
Kari Northeim
Farrell Stucky +
Devin Taylor ++
Thomas Williamson +

GPA 3.5 and Higher + (Graduate Students)
Leigh Messenger

GPA 3.8 and Higher ++ (Graduate Students)
Kanan Dave
Kerra Unal
Kevin Le Maire
Richard Kirk
Ciara Mason
Anna Grimes
Larry Voice
Richard Furtick

For more information about our department, please visit our website as well as our social media platforms:

Facebook - https://www.facebook.com/UNTGeography
Twitter - https://twitter.com/untgeography
Instagram - https://www.instagram.com/untgeog/