



MISSISSIPPI STATE UNIVERSITY:  
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*IMAGE OF RESEARCH*

# 2022 IMAGE OF **RESEARCH**

*Union Art Gallery  
March 21 to April 1, 2022*

The Image of Research competition gives students the opportunity to engage creatively with their research, share behind-the-scenes views of their research processes, or portray their academic study in visual form.



MISSISSIPPI STATE UNIVERSITY™  
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# DESTROYED BUT NOT FORGOTTEN: ARMENIANS IN AZERBAIJAN

Cultural Genocide is Genocide. The systematic Azerbaijani state sponsored destruction and removal of people and artifacts continues the legacy of the marginalization of Armenians who are still struggling to grapple with their horrific collective memory. Witnessing the continued destruction of historic Armenian sites, such as the Medieval Cemetery of Julfa in the current Nakhchivan Autonomous Republic of Azerbaijan, has left the Armenian population within Armenian Republic and throughout the Diaspora struggling to cope with their crumbling heritage once again. Keeping a digital record of the sites which have been destroyed, or are under threat of either neglect, usurpation, or destruction is critical to establishing a connection which may be lost due to continual Azerbaijani State sponsored removal. Therefore, my research is critical for chronicling stories and documentation of these lost or endangered sites so that when they are lost, they will not be forgotten.

Name: Larra M Diboyan

Level: Master's

Department: Anthropology and Middle Eastern Cultures





# ROLE OF MYCOLACTONE IN THE ECOLOGICAL PERSISTENCE OF MYCOBACTERIUM ULCERANS

Mycolactone's role in the ecological persistence of *Mycobacterium ulcerans*. *Mycobacterium ulcerans* (MU) is an environmental pathogen that causes Buruli ulcer. Disease transmission is unclear but is associated with slow-moving water bodies. MU produces a toxin, mycolactone associated with disease pathogenesis in susceptible hosts, however, the role of this toxin in MU ecological habitat is unknown. To study this, glass slides of mycolactone were placed inside plexiglass chambers at different aquatic habitats. Nitrocellulose membranes were used to cover the external surfaces of the chambers and then covered loosely with mesh to prevent disturbance. Water (50mL) from the respective location were loaded into chambers. Chambers were immersed in quiet areas of sampling sites, where the flow is less than 15cm/s. Heavy fishing line was used to suspend the chambers from sturdy trees to allow some rotational movement within the water. This picture above is an MU positive site in French Guiana, South America where chamber slides were deployed.

Name: Magdalene Dogbe

Level: PhD

Department: Biological Sciences





# ADDRESSING FOOD REFUSAL

Pediatric food refusal occurs when a child fails to consume an adequate amount or variety of food (e.g., eating foods of a certain texture, brand, etc.) needed to thrive and meet their developmental milestones. Mealtimes, which are often times for relaxation and enjoyment, can be the most stressful parts of the day for individuals and families of a child presenting with food refusal. In the Pediatric Feeding Disorders Lab at MSU, these concerns are addressed from a behavior analytic lens. The image shows a typical meal presented during the treatment of food refusal and depicts how mealtime has transitioned into the clinical setting. For individuals who do not have food refusal, this looks like an unremarkable meal. For a child or parent of a child with food refusal, this meal can be a struggle. This image highlights the different perspectives when it comes to addressing food refusal.

Name: Rita Druffner

Level: PhD

Department: Counseling, Educational Psychology, and Foundations



# THE G. O. A. T.

While goat milk is still relatively new in the United States, it makes up about 2% of the world's milk production and has been essential to the wellbeing of millions of people worldwide. Demand for goat milk continues to increase as people realize it's less allergenic, has high nutritional values, and is easier to digest. The Nubian doe pictured represents just one breed of these highly efficient and relatively low-maintenance dairy goats. My research is focused on raw goat milk to examine the prevalence of common microbial indicators to identify deficiencies and opportunities for improvement in food safety through management practices. As these milk products become more popular, we want to make sure the proper hygienic measures are in place on the farm to reduce contamination and produce a high-quality milk product safe for consumption.

Name: Jacinda Leopard

Level: Master's

Department: Food Science, Nutrition and Health Promotion





# FROZEN IN TIME; A SNAPSHOT OF AN ENVIRONMENTAL MOMENT

Forests play an important role for the global environment. Trees and forests can reduce pollutants by absorbing them from the soil through their roots, making them less harmful to the surrounding environment. Heavy rains have washed massive amounts of excessive nitrogen from farmlands and other sources along the Mississippi River into the Gulf of Mexico. Excessive nitrogen reduces the amount of oxygen available in the gulf, making it impossible for marine life to survive. By planting combinations of Poplar tree species, we can create environmental conditions where trees work together to absorb this excessive nitrogen before it enters the Mississippi River. We can determine the best condition for absorbing nitrogen through genetics. Pictured here is a frozen leaf sample. By freezing a leaf sample on dry ice, we can analyze the gene expression for nitrogen uptake, providing a "snapshot" of how trees and the environment interact in a given moment.

Name: Macy Gosselaar

Level: Master's

Department: Forestry



# INTERACTIVE DOODLE NOTES

The title of my dissertation is "The development and assessment of student-created interactive doodle notes as an effective teaching strategy in introductory geology courses. My submitted picture represents what interactive doodle notes look like. Doodle notes are super condensed outlines of lectures and powerpoints that focus on the major themes and ideas of a unit. Students fill these out during lectures and interact with the material. My research modeled teacher created doodle notes in class and also asked the experimental group to create their own versions. I hope that my research can contribute to the larger goal of making more students interested in the geosciences while creating more Earth conscious humans.

Name: Karly Lyons  
Level: PhD  
Department: Geosciences





# TO BE WOMANLY ALWAYS, DISCOURAGED NEVER

During the Cold War, the nation participated in Containment Culture. Within this culture communism and sexuality were contained by promoting the American family as the best way to live. Marriage rates at young ages skyrocketed because containment emphasized purity. It was women's responsibility to contain sexuality, meaning they had to attract men while keeping them at bay. One of the many places where couples would meet was on college campuses. To keep their students' sexuality contained, universities had a Dean of Women who distributed guidebooks to coeds that explained what to wear, how to act, and how to date on campus. These guidebooks and organizations like the Chi Omega sorority were used by universities to produce ideal women for returning GIs. For example, Chi O at Ole Miss produced the ideal American woman with their members Mary Ann Mobley and Lynda Mead who were Miss America and Miss Mississippi.

Name: Jordan Wesley  
Level: Master's  
Department: History





# LEARNING FROM THE RESILIENCE OF HERBICIDE-RESISTANT WEEDS

By definition, resistance is the power or capacity to resist. When we apply this concept to herbicide-resistance weeds we can define these plants as species that have developed the ability to survive an application of a herbicide that previously controlled it. This is a natural process of evolution that happens due to the intensive and continuous use of the same herbicide(s) over the years. This photo shows the inflorescence of the *Bidens subalternans* plant resistant to fomesafen herbicide. The plant received an application of fomesafen at the recommended dose to kill it. And even after this application, that plant managed to survive and produce seeds, which will guarantee the reproduction of its offspring. Weeds, even in the worst conditions thrive, showing resilience.

Name: Vanessa Francieli Vital Silva

Level: PhD

Department: Plant and Soil Sciences



# STUDY OF SWEETPOTATO ROOT EXUDATES FOR SUSTAINABLE WEED MANAGEMENT

04.02.2022


I am working to find sweet potato varieties that release some natural compounds from their roots, which can control weeds in the field. We grow different sweetpotato varieties in water using glass jars in our lab. The water from the jar is analyzed every week for any weed-suppressing natural chemicals (allelochemicals) released by the sweetpotato roots. As the root growth increases, allelochemical production also increases, which can lead to better weed suppression. The success of this experiment can find sweetpotato varieties with natural weed suppressing properties, which will help reduce the use of chemical herbicides and also develop varieties for organic farming system.

Name: Varsha Varsha

Level: PhD

Department: Plant and Soil Sciences





# ASSESSING EFFECTS OF LIVESTOCK PRODUCTION ON STREAM WATER QUALITY

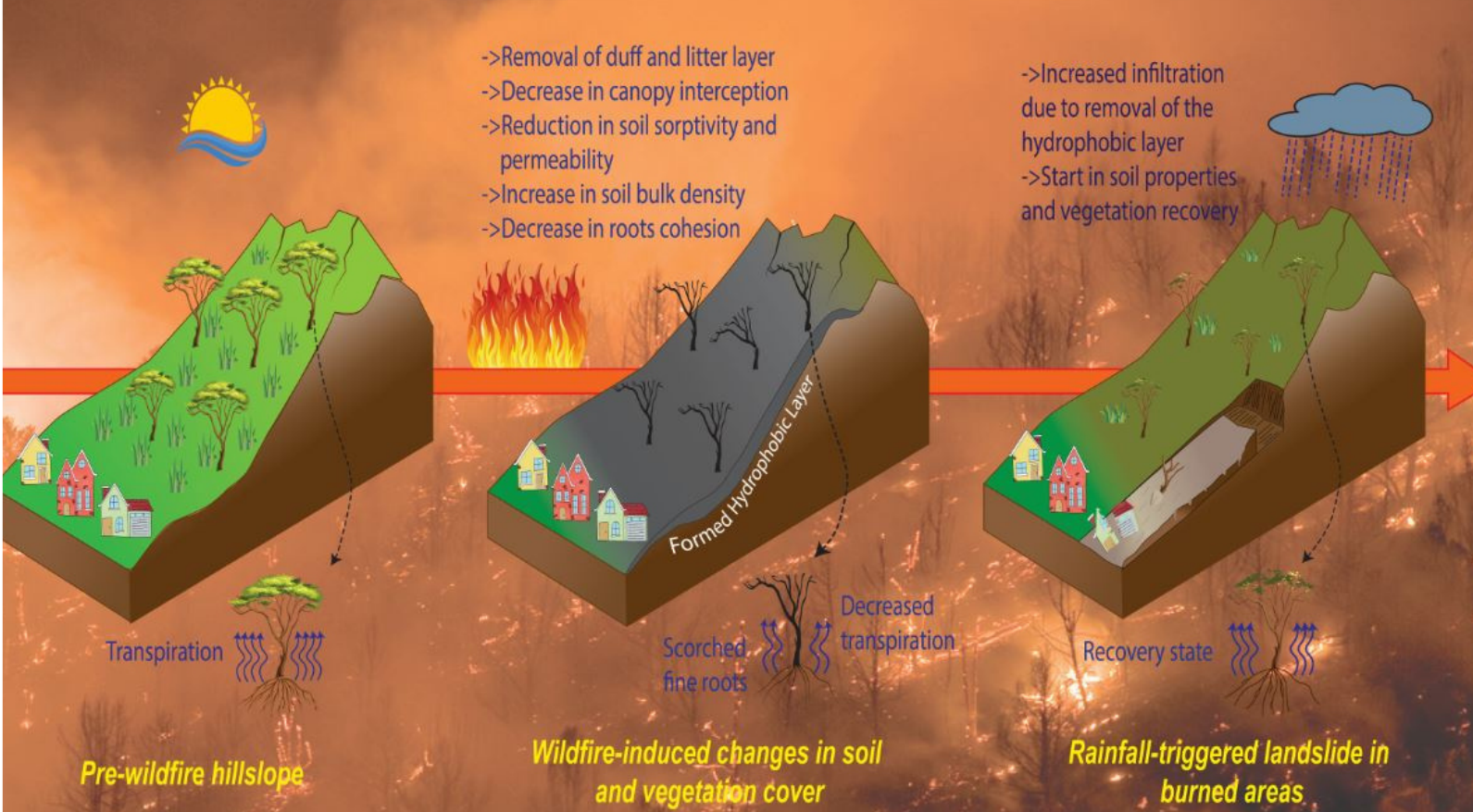
Livestock production is one of the leading causes of impairments of the nation's waters. The accelerated population growth, along with the increased urban development and food production, triggers high runoff volumes with excessive nutrient contributions, sediments, and pathogens that are carried into the streams. The MSU's Joey Bearden Dairy Research Center allows MSU researchers from different colleges and departments, to quantify and evaluate these impacts. The in-situ measurement of water quality parameters is pictured here in a location where the unrestricted stream animal access is evident, allowing the direct contribution of unwanted contaminants. Another form of human intervention is depicted with the culvert pipe, which increases streamflow velocities causing downstream erosion. Under these conditions, the stream has been deteriorated affecting the quality and quantity of water. Research results are expected to contribute management alternatives oriented to decrease its impairment.

Name: Lorena Chavarro-Chaux

Level: Master's

Department: Richard A. Rula School of Civil and Environmental Engineering





# HOW WILDFIRE CAN LEAD TO CATASTROPHIC GEOHAZARDS?

There has been an unprecedented increase in severity and frequency of wildfire activities around the world. The major concern following the wildfire is for geohazards threatening the integrity of the communities close to the affected areas. Pictured here, is how wildfire induced changes in soil properties and vegetation cover can lead to shallow landslides.

Over short and long timescale, wildfire influences the hydrology of the affected area by altering the partitioning between interception, evapotranspiration, infiltration, runoff, and subsurface storage. It further, decreases the soil strength by burning the roots and reducing the transpiration rate. My research aims to investigate the factors that impact the slope stability including the resisting and driving forces, the interaction between them, and how and to what extent they are affected by wildfire. The outcome of my research is an analytical framework that can track and predict the potential landslides in the following years after wildfire.

Name: Masood Abdollahi

Level: PhD

Department: Richard A. Rula School of Civil and Environmental Engineering





# BACHMAN'S SPARROW: A FRIEND OF FIRE

Fire suppression, combined with lack of forest thinning and short-rotation monodominant management, has drastically altered the landscape in the southeastern U.S., leading to the loss of open pine ecosystems and associated bird species. Bachman's Sparrows are closely connected with open pine forests as disturbance regimes (e.g., fire and windthrow) reduce canopy cover and promote regeneration of native herbaceous groundcover suitable for nesting, foraging, and concealment from predators. Early successional characteristics suitable for Bachman's Sparrows (2-5 years post fire) are ephemeral in nature, raising questions about how vegetation structural characteristics influence microhabitat selection (resource use). By safely capturing and color banding individuals at Sam D. Hamilton Noxubee National Wildlife Refuge, I was able to assess resource use of this disturbance-dependent species. A better understanding of micro-habitat selection of Bachman's Sparrows may be helpful in guiding conservation and management efforts for this declining open pine forest bird species.

Name: Holly Todaro

Level: Master's

Department: Wildlife, Fisheries, and Aquaculture





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# MOTHER AND CUB: EVIDENCE OF MISSISSIPPI'S RECOVERING BEAR POPULATION

This female black bear (*Ursus americanus*) and cub are part of a population recovery event underway in Mississippi. Black bears were reduced to a mere 12 individuals in Mississippi in the early 1930s due to overhunting, but populations in Louisiana and Arkansas have been growing in the last 30 years, resulting in individuals moving from these populations into western Mississippi. The female and cub have come to a hair snare corral that I built to collect hair samples from them, attracted by a scent lure I have hung within. As the bears enter and exit the corral (made from barbed wire), a tuft of hair is left on the barb, and I collect that hair. The hair is used for genetic analysis, where I identify individual bears and their origin, and a diet analysis that will identify food resources critical for the recovery of this small recolonizing bear population.

Name: Lacy Dolan

Level: PhD

Department: Wildlife, Fisheries, and Aquaculture





# RADIO-COLLARED MISSISSIPPI BOBWHITE

Bobwhite quail populations have been on the decline since as early as the late 1800s. Today, they are still holding on despite ever increasing urbanization and changes in land use. My research is focused on radio-collaring and banding bobwhite in a working agricultural landscape to further understand how we can incorporate wildlife conservation in working landscapes. Agriculture and wildlife conservation are not mutually exclusive.

Name: Olivia Lappin

Level: Master's

Department: Wildlife, Fisheries, and Aquaculture





## A FEELING LIKE NO OTHER

On a calm, hot, and humid summer morning, I woke up knowing that I would be spending the day patiently waiting. The anticipation of not knowing what birds would end up in the mist nets that I had scattered in a cluster of pine trees is sometimes enough to drive me crazy. Happily, on this morning I was successful in capturing several individuals including this Yellow-breasted Chat. I quickly removed the bird from the net, ensuring its safety, and placed a USGS band on its leg. This band contains a number, much like a social security number, that uniquely identifies the bird. This allows us to record metrics specific to this bird which can be compared to other individuals of the same species. This little bird, with its tiny metal band, contributes to the monitoring of our avian communities here in Mississippi and to all bird populations in the US.

Name: Rebecca Bracken

Level: PhD

Department: Wildlife, Fisheries, and Aquaculture