

## **Geographic Chronicles**

# 2022 CGS Annual Conference Award Winners

## JOE BEATON POSTER AWARDS

Undergraduate:

FIRST PLACE:

Katharine Mackay, UC Santa Barbara, “Evaluation of NDVI and EVI as Measures of Food Availability for Fruit-eating Monkeys”

SECOND PLACE (tie):

Alondra Olagues, CSU San Bernadino, “Yellow Fever Found in Golden Tamarin Monkeys Causing Population Decline”

SECOND PLACE (tie):

Otto Schmitt, Cal Poly Humboldt, “The Effects of Rising Sea Levels in Humboldt County on FedEx Ground”

## PAPER OR ANALOG CARTOGRAPHY AWARDS

Undergraduate:

FIRST PLACE:

Yuichi Ambiru, Cal Poly Humboldt, “Iceland, the Island of Volcano and Glacier”

## DIGITAL CARTOGRAPHY AWARDS

Undergraduate:

FIRST PLACE:

Angela Valladares, Cal Poly Humboldt, “The Great Earthquakes of September 19<sup>th</sup>”

SECOND PLACE:

Denise Allen, CSU Fullerton, “The Writing is on the Wall: Murals, Artists, and Community in Long Beach, California”

## TOM MCKNIGHT PAPER AWARDS

Undergraduate:

FIRST PLACE:

Midori Gonzales, CSU Fullerton, “Bea-utility: Exploring the Utility Box Murals of Glendale, California”

SECOND PLACE:

Jessica Ledesma, CSU Dominguez Hills, “Understanding the Impact of Climate Change on Treeline Ecotone of the White Mountains in California Using Geospatial Technology”

Graduate:

**FIRST PLACE:**

Aliza White, CSU Fullerton, “Analyzing the Relationship Between Climate, Mule Deer Population, and Tree Rings in California from 1948-2009”

**GEOSYSTEMS AWARDS**

Undergraduate:

Anthony Lucero, Cal Poly Humboldt, “Drone Photogrammetry: Using an Unmanned Aerial Vehicle (UAV) to Represent the Underrepresented”

Graduate:

Angelo De Guzman, CSU Dominguez Hills, “Post-wildfire Vegetation Response Lidar Analysis of the Wildland-urban Interface: A Case Study of the 2009 Station Fire”

**DAVID LANTIS SCHOLARSHIP**

Graduate:

Andrew Wallace, CSU Fullerton

**SOCIAL JUSTICE AWARD**

Emilio Espinal and Eduardo Villanueva-Gonzalez, Cal Poly San Luis Obispo, “Housing Segregation in the United States: A Review of *The Color of Law*”

## 2022 CGS Annual Conference Proceedings

**FACULTY OR PROFESSIONAL PAPER PRESENTATIONS**

**Raju Bista, CSU Dominguez Hills, “Recent Climate Has Contrasting Influence on Radial Growth of Co-occurring Birch and Fir in Dhorpatan, Nepal”**

Abilities of species to face the changed environmental conditions depend on their trait variabilities. *Abies spectabilis* (Himalayan Silver Fir) and *Betula utilis* (Himalayan Birch) are co-occurring tree species in many sub-alpine forests of the Nepal Himalayas. To assess the climatic influence on species-specific growth trends, tree ring-width chronologies of both species—from Dhorpatan Hunting Reserve, Nepal—were correlated with temperature and precipitation. Correlations revealed contrastive temporal changes in radial growth of these species. Significant warming that occurred after the 1970s coincided with the divergent growth rates. While climate sensitivity of fir growth has been shown weakened, birch radial growth has been declining with increasing temperature, especially due to spring being warmer and drier. In summary, recent warming has been unfavorable for birch, and fir growth appears to surge. The contrasting growth trends may imply that changing climate will likely alter community dynamics in the area.

**Parveen Chhetri, CSU Dominguez Hills, “How are Treelines of the Nepal Himalayas Responding to Climate Change?”**

The alpine treeline ecotone is an important component of the mountain ecosystems of the Nepal Himalayas, playing a vital role in the livelihood of indigenous people and provides ecosystem services. We applied remote sensing (RS), geographic information science (GIS), and field-based dendroecological approaches to investigate factors controlling the treeline ecotone. Topography and disturbance are the main factors controlling the treeline at the landscape scale. At the local scale, poor regeneration was observed at the treeline ecotone. Low regeneration at the treeline ecotone suggests site-specific biotic and abiotic controlling factors. Seedling and sapling establishment at the treeline is limited by a lack of moisture, the absence of suitable microsites, and the presence of herbivores. Most treelines we studied are not advancing or will not advance in the near future because of topography, human disturbances, and low recruitment.

**John Menary, CSU Dominguez Hills, “World Geography and the Quest for A.I.”**

Well documented are the diverse ways that artificial intelligence [A.I.] surrounds us. Its causes are clear, but the consequences are controversial, now being described and explained. What is to be its impact on geography is less well understood, though A.I. has accompanied geospatial technology. This paper is a futuristic journey into artificial intelligence’s pathway and place in educational geography. Discussion centers on World Geography and the training of preservice geography teachers working toward a Social Studies credential.

**Irene Naesse, Orange Coast College, “Korean Dramas: What I Learned During Quarantine”**

Korea is everywhere. From our cars to our appliances to the containers and ships that transport these goods to our shores. K-pop fans organized a phantom ticket purchasing scheme that undermined a campaign event in the 2020 presidential election. How did this happen? Korean dramas provide a clue. Join me for a journey through Korea using the lens of the Korean drama. Economic inequality, generational trauma, reunification, and globalization are just some of the topics we will examine. Gamsahamnida!

**GRADUATE STUDENT PAPER PRESENTATIONS**

**Angelo De Guzman, CSU Dominguez Hills, “Post-wildfire Vegetation Response Lidar Analysis of the Wildland-urban Interface: A Case Study of the 2009 Station Fire”**

Past wildfires were Mother Nature’s method of promoting biodiversity and maintaining a functioning ecosystem. In spite of this, climate change and human disturbances have altered fire regimes, which impact vegetation recovery after wildfires. There is a direct threat to human populations at the wildland-urban interface (WUI), where vegetation encroaches on roads and houses. Using prediction models such as elevation, soil burn severity, post-fire soil erosion, and spectral indices including the NDVI and nDBR, a review of the Station Fire (2009) was carried out. Above-ground biomass (AGB) was then compared with visual accounts to detect differences in vegetation rebound between WUI and non-WUI regions. Despite having similar regeneration patterns, WUI and non-WUI areas had similar AGB, and vegetation recovery rates were slower in WUI. To better understand wildfire regeneration patterns, future work should account for slope and aspect.

**Aliza White, CSU Fullerton, “Analyzing the Relationship Between Climate, Mule Deer Population, and Tree Rings in California from 1948-2009”**

This study aims to evaluate whether tree rings can be utilized as an accurate proxy for the reconstruction of deer population trends in California. I investigate whether a relationship exists between mule deer population, soil moisture, and tree rings in the state of California between the years of 1948 and 2009. Proxies such as tree rings would be invaluable for the management of wild ungulates, which is crucial for maintaining ecosystem health. Correlations were calculated using existing deer harvest variables, climate, and tree-ring data. The results observed indicate that the initial hypothesis was not entirely supported and that a reconstruction would not be possible because deer harvest was not well correlated with tree rings. The findings suggest that mule deer populations are affected by climate indirectly and that the response is delayed. Further research is needed to determine whether dendrochronology could be used to monitor other species for the purpose of conservation.

**UNDERGRADUATE CARTOGRAPHY**

**Denise Allen, CSU Fullerton, “The Writing is on the Wall: Murals, Artists, and Community in Long Beach, California”**

In cities across California and the United States, public art has been utilized for a range of purposes, including beautification, economic development, and community cohesion. Long Beach’s Cambodia Town is home to the largest concentration of Cambodians outside of Southeast Asia. This map focuses on the Cambodia Town Mural Project, a collection of eight public murals created by a local art nonprofit, presenting the murals, highlighting the artists, and revealing their perspectives on this project. The map, an interactive mixed-media presentation, reveals the value of studying public art not just as a product but as a process.

**Yuichi Ambiru, Cal Poly Humboldt, “Iceland, the Island of Volcano and Glacier”**

**Angela Valladares, Cal Poly Humboldt, “The Great Earthquakes of September 19<sup>th</sup>”**

Mexico City, known as the “sinking city,” has been greatly impacted by two major earthquakes. Many deaths have been caused by these catastrophes, and city planners are trying to prevent this from happening again. By being able to map regions that are more susceptible to structural collapses, there will be a better understanding of possible solutions. The use of maps could hopefully save the people of Mexico City in the case of another natural disaster.

## UNDERGRADUATE STUDENT PAPER PRESENTATIONS

### **Brenda Aguirre, Cal Poly Humboldt, “Keystone Species: Why Should We Care About the Sea Stars?”**

Keystone species are organisms that are essential and helpful to the environment because they define the entire ecosystem. The main points of my research are discussing what makes the sea star a keystone species, what their diet consists of, and the significance of their die-offs, as well as highlights how severe the disease Sea Star Wasting Syndrome is because many researchers are unable to come up with a concrete answer. This paper focuses on the California location and will be discussing how the climate in Southern California and in the northern part will affect the sea star population, making them susceptible to the Sea Star Wasting Syndrome.

### **Denise Allen, CSU Fullerton, “Abusive Agriculture: Examining the Exploitation of H-2A Visa Guest Workers in the United States”**

Commercial agriculture in the United States has a variety of adverse environmental and social impacts, with particular impacts on agricultural guest workers. H-2A visas provide a mechanism for non-citizens to come to the United States and work in the agricultural sector on a temporary basis. Most H-2A guest workers employed in the United States come from Mexico and have low levels of formal education and English language attainment compared to the U.S.-born agricultural workers. These characteristics make H-2A agricultural guest workers even more susceptible to exploitation. This paper provides an overview of the H-2A program and examines some of the physical and financial ways that H-2A agricultural guest workers are exploited, including underpayment, poor housing conditions, and human trafficking. The paper then outlines potential solutions and concludes with a call for action.

### **Midori Gonzales, CSU Fullerton, “Bea-utility: Exploring the Utility Box Murals of Glendale, California”**

This paper explores spatial and thematic patterns of murals on utility boxes in Glendale, California, to understand the interactions between people and public art in this diverse city. As part of a public art program, Glendale annually commissions various local and regional artists to paint murals on utility boxes. Over 150 utility boxes were field surveyed, photographed, mapped, and analyzed thematically and spatially. Demographic data and information from Glendale’s Arts and Culture Commission were used to provide context for results. The majority of the murals on Glendale’s utility boxes are in commercial areas. Most of the boxes feature art depicting two general types of elements: nature and people. Although murals are a

particularly ephemeral feature of cities, analyzing the themes and locations of utility box murals provides insight into how this unique and understudied form of public art functions in an urban environment.

### **Jessica Ledesma, CSU Dominguez Hills, “Understanding the Impact of Climate Change on Treeline Ecotone of the White Mountains in California Using Geospatial Technology”**

The alpine treeline environment is an important component of high-altitude mountain ecosystems. California has one of the highest positioned treelines in the US. Recent studies have indicated treelines are advancing due to recent temperature increases. Though significant scientific studies have been carried out regarding treelines of California, there is still a lack of consistent data on treeline position, nature, and dynamics at individual mountains and range scales. Therefore, I will apply geographic information systems (GIS) to address the following: What is the current treeline position of the White Mountains, what is the role of topographic factors in controlling the treeline spatial pattern, and how has climate affected the region’s treeline? The information obtained through this study would be useful in predicting the future directions of vegetation changes at the treeline ecotone. The major contribution of this research will be to address the treeline and climate change-related research gap in California.

### **Anthony Lucero, Cal Poly Humboldt, “Drone Photogrammetry: Using an Unmanned Aerial Vehicle (UAV) to Represent the Underrepresented”**

Rural geographic communities tend to be in places that lack access to high-quality imagery, unlike their more populated counterparts. These areas are often overlooked, leaving data acquisition in the hands private sector remote sensing professionals. High-resolution topographic surveying is often related to high costs by use of expensive equipment and requires fundamental skills to operate the equipment effectively. This research explores how relatively inexpensive consumer-grade aerial imagery devices can fulfill the data demand for underrepresented communities. Combining photogrammetry, structure-from-motion, and computer vision techniques I create ultra-high-resolution imagery, digital surface models, and a 3D scene reconstruction from multi-view aerial photography. Through these remotely sensed methods, I create a dataset with a ground resolution of 2.3 cm and a latitude/longitudinal RMS of 4.7 cm. The methods and results outlined in this research demonstrates how in-house data acquisition can be used to create an individualized high-quality dataset to represent the underrepresented.

**Alina Medina, Cal Poly Humboldt, “Climate Change Effects on Coastal Sitka Spruce and Western Hemlock”**

Studies have shown that climate change is affecting coastal fog and snowmelt, which coastal trees like Western Hemlock and Sitka Spruce rely on. These trees are only found along the west coast ranging from Alaska to Northern California. What we do not know is how the trees located in the southernmost point are reacting to the climate compared to trees located further north. This research project will investigate how these two species are reacting to the changing climate in different locations. My objective is to document and analyze Sitka Spruce and Western Hemlock core samples from Mendocino and Humboldt counties by making a map and charts showing what areas are being affected. Using a methodology that incorporates field research, archives, and different data sets, my research will address what changes are already occurring, where they are occurring, and whether the trees further south are showing any signs of stress.

**Eduardo Villanueva-Gonzalez, Cal Poly San Luis Obispo, “Housing Segregation in the United States: A Review of *The Color of Law*”**

Richard Rothstein’s *The Color of Law* (2017) is an investigation into how the U.S. government deliberately imposed and supported racial segregation in cities across the nation. Rothstein rejects the common notion of de facto segregation, segregation from private practices and individual decisions, and argues that public policy was systematically put in place by all levels of government to ensure the separation of African Americans from whites, making it de jure segregation. Issues such as FHA/VA support of suburban housing, restrictive covenants, redlining, racial zoning, public housing, interstate freeway systems, and other policies were instrumental in exploiting and geographically separating African Americans. The purpose of this paper is to review *The Color of Law* and identify these key issues from the book and explain their significance both past and present. Additional research is also done, highlighting examples from California as they relate to the issues addressed in the book.

**UNDERGRADUATE STUDENT POSTER PRESENTATIONS**

**Brad Ellis, Cal Poly Humboldt, “Significant Cave Nomination: Protecting a Valuable Resource”**

Nominating a cave to be significant through the Federal Cave Protection Act of 1988 is currently the only way to protect a cave and its resources through the Forest Service. As a team of researchers, we explored the Bridger-Teton National Forest to find, research, map, and nominate caves as significant so they could be known to professional land managers. A team of Forest

Service volunteers and employees were able to successfully find a cave named “Forget Me Not” and are in the process of submitting the paperwork to establish it as a significant cave.

**Emilio Espinal, Cal Poly San Luis Obispo, “Housing Segregation in the United States: A Review of *The Color of Law*”**

Richard Rothstein’s *The Color of Law* (2017) is an investigation into how the U.S. government deliberately imposed and supported racial segregation in cities across the nation. Rothstein rejects the common notion of de facto segregation, segregation from private practices and individual decisions, and argues that public policy was systematically put in place by all levels of government to ensure the separation of African Americans from whites, making it de jure segregation. Issues such as FHA/VA support of suburban housing, restrictive covenants, redlining, racial zoning, public housing, interstate freeway systems, and other policies were instrumental in exploiting and geographically separating African Americans. The purpose of this paper is to review *The Color of Law* and identify these key issues from the book and explain their significance both past and present. Additional research is also done, highlighting examples from California as they relate to the issues addressed in the book.

**Neil Gillies, CSU San Bernadino, “Hydraulic Fracturing: The Detrimental Impacts and the Alternatives that Can Protect Our Environment”**

**Katharine Mackay, UC Santa Barbara, “Evaluation of NDVI and EVI as Measures of Food Availability for Fruit-eating Monkeys”**

Estimates of food abundance are central in studies of primate behavior and are usually comprised of visual measurements from the ground, yielding crude estimates of food biomass. This method is time- and labor-intensive, especially in tropical rainforests where most primates live. Remote-sensed data is a powerful alternative for calculating vegetation indices (VIs). We tested two VIs derived from NASA’s Moderate Resolution Imaging Spectroradiometer dataset as estimates of (1) food availability and (2) energy balance for fruit-eating monkeys in western Uganda. We calculated NDVI and EVI for six groups of red-tailed monkeys (*Cercopithecus ascanius*) over four years. There was no relationship between the VIs and fruit production; however, fruit production also did not correspond directly with monkey energy balance. Instead, the interaction between NDVI and fruit production predicted energy balance. These findings indicate that more research is needed to disentangle the relationships among plant reproduction, VIs, and consumer energetic condition.

## **Alondra Olagues, CSU San Bernadino, “Yellow Fever Found in Golden Tamarin Monkeys Causing Population Decline”**

The Golden Tamarin monkey (*Leontopithecus rosalia*), inhabiting the Atlantic coastal region of southeastern Brazil, is rare and endangered. Newly found yellow fever cases are contributing to potential decline of the population. This research was collected through monitoring and observation of the newly absent Golden Tamarin monkeys from their territories. Lure methods such as vocalization recordings were used in the forest to estimate the population size throughout the species' geographic distribution. While reviewing additional contributors, the findings resulting with this disease include a rise in disappearances and positive cases since the first infected Golden Tamarin was discovered in 2018. Documenting the species' population will determine the strategies of conservation efforts. Once at 200 individuals, they now have increased the population to 2,500. Many other species directly or indirectly interconnected with the Golden Tamarin monkey will be affect. Potential vaccines for non-human primates can be foreseen in the future.

## **Otto Schmitt, Cal Poly Humboldt, “The Effects of Rising Sea Levels in Humboldt County on FedEx Ground”**

Due to climate change, polar ice caps are melting at unprecedented rates and causing the sea to rise. One area that is experiencing sea level rise the fastest in the west coast of the United States is Humboldt County. This is due to the Mendocino triple junction off the coast of Humboldt. One company that will be affected in the area is FedEx Ground. Due to rising sea levels, many towns will be affected by flooding roads and drivers will not be able to make deliveries, resulting in possible job loss or relocation. This project illustrates how the areas of Humboldt County along with FedEx Ground will be affected. I create a map using ArcGIS Pro with an overlay of sea level rise predictions and a layout of delivery routes as well as conducting interviews with the drivers/employees whose routes are in the affected areas.