

**2023 Annual Meeting of the
Pennsylvania Geographical Society
Co-Sponsored with the Mid-Atlantic Division of the AAG**

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SALISBURY, MARYLAND



3 November 2023

Hosted by: Salisbury University

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The Commons Dining Hall

2023 Annual Meeting of the Pennsylvania Geographical Society



Hosted by the Department of Geography and Geosciences
Salisbury University

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2023 Meeting Arrangements Committee

Daniel Harris and Brent Zaprowski, Salisbury University

Francis A. Galgano, Villanova University, PGS Executive Director

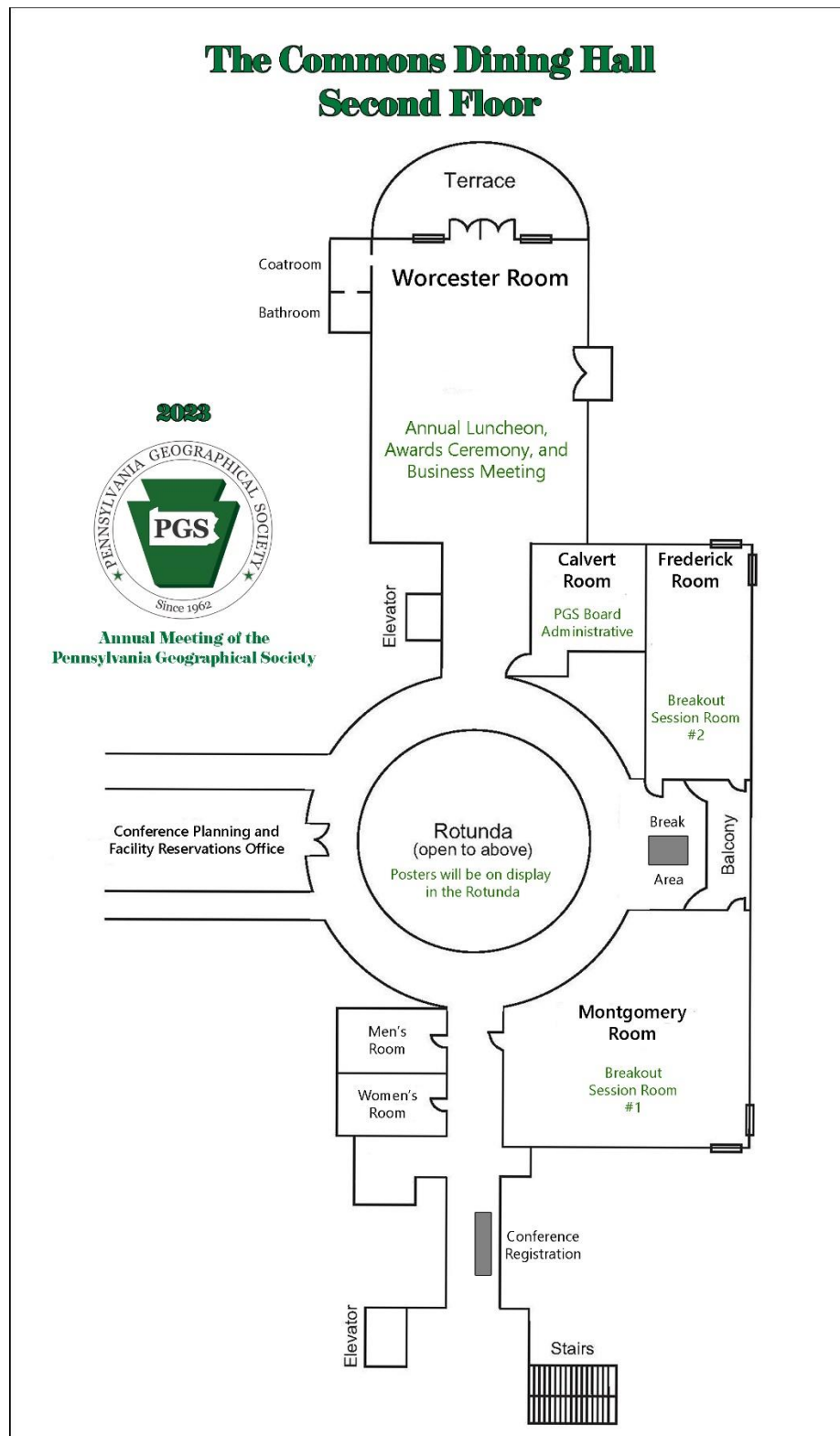
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Schedule of Events

Time	Event	Location
Posters will be available for viewing all day in the Rotunda		
8:30 – 9:00 a.m.	Registration and Continental Breakfast	Rotunda
9:00 – 10:40 a.m.	Paper Session 1	Montgomery Room
10:00 – 2:30 p.m.	Posters Available for Viewing	Rotunda
10:30 – 11:00 a.m.	Coffee Break	Balcony of the Rotunda
11:00 – 12:40 p.m.	Paper Session 2	Montgomery Room
12:45 – 2:00 p.m.	PGS Luncheon, Awards Ceremony, and Business Meeting	Worcester Room
2:00 – 2:30 p.m.	Poster Session: Presenters Available for Questions	Rotunda
2:30 – 3:15 p.m.	Careers in Geography	Frederick Room
3:20 – 3:40 p.m.	Presentation of Student Awards	Montgomery Room
TBA	Geo-Bowl	TBA

Please Join Us for Next Year's Meeting
Tentative Date: Friday, 2 November 2024

Conference Floor Plan ★ Commons Dining Hall



THE PENNSYLVANIA GEOGRAPHICAL SOCIETY

Annual Award Recipients



Please join us in recognizing this year's PGS Award winners

DR. WILLIAM B. ("BILL") KORY DISTINGUISHED MENTOR AWARD

Dr. Mitzy L. Schaney, University of Pittsburgh–Johnstown

DISTINGUISHED GEOGRAPHER AWARD

Suzanne McArdle

Cartographic Services Branch, Geography Division, United States Census Bureau

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The Pennsylvania Geographical Society is now accepting nominations for its 2024 Annual Awards
Please go to <https://thepgs.org/awards> for information on award criteria and the nomination process

Summary of Papers and Presentations

Breakout Session 1: 9:00 – 10:40 a.m.	
<p>Montgomery Room</p> <p>† Indicates a Graduate Student Paper Contest Entrant ‡ Indicates an Undergraduate Student Paper Contest Entrant</p>	<p style="text-align: center;">Land Use</p> <p><u>Session Chair:</u> Jennifer Pomeroy</p> <p>9:00 – Mario Cardozo: <i>Socioeconomic Changes, Environmental Sustainability, and Justice in Philadelphia</i></p> <p>9:20 – Moira Conway: <i>From Agriculture to Amazon: Examining the Impacts of Warehousing Development in Berk County, PA</i></p> <p>9:40 – Kierstan Spangler †: <i>Use of an Auditing Instrument to Assess Regulatory Barriers for Affordable Housing</i></p> <p>10:00 – Nora Ormsby †: <i>Registered Sex Offender Prevalence Within Census Tracks</i></p> <p>10:20 – Madison Ramper †: <i>Assessing the Impacts of Agricultural and Urban Land Uses on Stream Water Quality in the Lower Reaches of the Conodoguinet Creek, Cumberland County, Pennsylvania</i></p>
Posters are available for viewing on the Lobby Rotunda: 10:00 a.m. – 2:00 p.m.	
Coffee Break (Lobby on the Balcony): 10:30 – 11:00 a.m.	
Breakout Session 2: 11:00 – 12:40	
<p>Montgomery Room</p> <p>† Indicates a Graduate Student Paper Contest Entrant ‡ Indicates an Undergraduate Student Paper Contest Entrant</p>	<p style="text-align: center;">Human-Environmental Interactions</p> <p><u>Session Chair:</u> Mario Cardozo</p> <p>11:00 – Scott Drzyzga: <i>A New State Plane Coordinate System is Coming in 2005 and It's Not Like What You're Used To</i></p> <p>11:20 – Eliza Gross: <i>The USGS 3D Hydrography Program: Deriving Hydrography from Elevation Data in Pennsylvania</i></p> <p>11:40 – Christopher Schaney: <i>Assessing Sea Level Rise at Saxis Wildlife Management Area, Saxis, Virginia</i></p> <p>12:00 – Tracy Edwards: <i>An Introduction to the MAD Region</i></p> <p>12:20 – Mitzy Schaney: <i>Investigating the Glades: Pedology, Paleoclimatology, Carbon Storage, Hydrology, and Undergrads</i></p>
PGS Annual Luncheon (12:45 – 2:00) Worcester Room	
<p style="text-align: center;">Opening Remarks, Frank Galgano, PGS Executive Director</p> <p style="text-align: center;"><i>Annual Awards Ceremony</i></p> <p style="text-align: center;">Jennifer Pomeroy, President PGS, York College of Pennsylvania</p> <p style="text-align: center;"><i>Distinguished Geographer Address</i></p> <p style="text-align: center;">Suzanne McArdle, Cartographic Services Branch, Geography Division, United States Census Bureau</p> <p style="text-align: center;"><i>Seeing Like an Infrastructural Region: Technology, Industry, and Why the Future Never Arrived</i></p> <p style="text-align: center;"><i>PGS Business Meeting</i></p> <p style="text-align: center;">Frank Galgano, PGS Executive Director</p>	

Poster Session (Presenters Available for Questions): 2:00 – 2:30 p.m. Rotunda
Careers in Geography Panel: 2:30 – 3:15 p.m. (with coffee) Sponsored by the Mid-Atlantic Division of the AAG Frederick Room
Student Awards Presentation: 3:20 – 3:40 p.m. Montgomery Room
Geo-Bowl Sponsored by the Mid-Atlantic Division of the AAG Time and Location: to be announced

DISTINGUISHED GEOGRAPHER

Suzanne McArdle from the Cartographic Services Branch, Geography Division, United States
Census Bureau



Suzanne McArdle is a team leader in the Cartographic Products and Services Branch in the Geography Division of the U.S. Census Bureau. She began her career with the agency in 2008 as a cartographer. Suzanne leads the generalization team that produces generalized boundary files to support mapping and data dissemination. She also leads the team that maintains the Census Automated Map Production System (CAMPS), which is a batch mapping system that produces large- and small-format maps to support various Census Bureau programs. More recently, Suzanne has led several web map application development teams including the team responsible for the Response Outreach Area Mapper (ROAM).

PAPER ABSTRACTS

† Indicates an entrant in the Graduate Student Paper Competition

‡ Indicates an entrant in the Undergraduate Student Paper Competition

Cardozo, Mario L. (Kutztown University), *Socioeconomic Changes, Environmental Sustainability, and Justice in Philadelphia*

People living in cities are particularly vulnerable to outdoor heat and other hazards, especially in areas that urbanize in unsustainable ways. Factors like dense population, a built-up environment, and less vegetation may contribute to making urban areas significantly hotter and more prone to flooding. Generally, easy access to green areas has long been correlated with higher levels of quality of life and healthier urban communities. Thus, the amount of impervious cover and the extent of green areas have become increasingly important indicators of social equity and environmental justice. In the present study, I compare GIS-based data from Philadelphia, Pennsylvania, regarding demographic variables (population, income, ethnicity) and physical factors (impervious cover, land cover, tree density, infrastructure improvement) across several dates. I apply spatial overlay operations and simple spatial statistical tests to compare said variables across the city. Results underscore patterns of demographic and physical changes relevant to discussions on the sustainability of urban renewal and inequalities in the distribution of basic environmental amenities.

Conway, Moira A. (Kutztown University), *From Agriculture to Amazon: Examining the Impacts of Warehousing Development in Berks County, PA* [Co-Author: Alison Conway]

During the last ten years, Berks County, Pennsylvania has seen significant growth in warehousing and distribution, which has been accelerated by the COVID-19 pandemic. The low-cost land, highway access, and proximity to urban centers of the US East Coast have made it an attractive location for e-commerce-related development. Distribution center development creates new employment opportunities; however, at the same time, it frequently requires land uses changes and generates a number of community impacts, including traffic congestion, noise, air pollution, and safety risk. In this first phase of our project, we seek to understand both the concerns identified by the community and the economic impacts of this growth. We conduct a content analysis of news articles to examine the concerns identified by the community about warehousing development and examine employment trends during the time-period 2010-2020 in warehousing-related industries. Results from this study can be informative to local and regional agencies to inform relevant planning decisions.

Drzyzga, Scott (Shippensburg University), *A New State Plane Coordinate System is Coming in 2025 ... and It Is Not Like What You're Used To.*

The National Geodetic Survey is preparing America for changes to our horizontal and vertical datums in 2025. The North American Datum of 1983 (NAD83) will be superseded by the North American Terrestrial Reference Frame of 2022 (NATRF2022). With these datum changes come changes to the dependent State Plane Coordinate System (SPCS). The new SPCS also takes advantage of map projection concepts that are seldom presented in textbooks. The purpose of this paper is twofold: 1) to present the changes from a Pennsylvania perspective; and 2) to discuss the implications for teaching students about geodesy, map projections, and projected coordinate systems.

Edwards, Tracy L. (Villanova University), *An Introduction to the MAD Region*

I recently took on the role of Chair of the Middle Atlantic Division of the American Association of Geographers - affectionately referred to as MAD. This position encourages my learning more about our region. I will share info about MAD in this presentation. I welcome all MAD members and any interested in learning more about the structure of AAG's nine different regions.

Gross, Eliza L. (United States Geological Survey), *The USGS 3D Hydrography Program: Deriving Hydrography from Elevation Data in Pennsylvania*

The United States Geological Survey (USGS) has established the 3D Hydrography Program (3DHP) to modernize the mapping of the Nation's inland waters. As of September 2023, high-resolution light detection and ranging (lidar) elevation data have been collected across 90 percent of the conterminous US (CONUS) through the 3D Elevation Program (3DEP). These 3DEP lidar data will be used in CONUS as the source to derive a positionally accurate and detailed stream network. In Pennsylvania, the USGS and Natural Resources Conservation Service have partnered to support two elevation-derived hydrography projects encompassing 8,666 square miles within six watersheds. These two projects are among the first 3DHP projects that the USGS has undertaken in CONUS. This presentation will provide (1) background information on the USGS 3DHP, (2) a synopsis of the two 3DHP projects in Pennsylvania, and (3) a general overview of the USGS elevation-derived hydrography data evaluation methods with examples specific to Pennsylvania.

Ormsbee, Nora † (Shippensburg University), *Registered Sex Offender Prevalence Within Census Tracts*

Registered Sex Offenders (RSOs) have committed a sex offense and are required to register with the state. Upon registration, their home, work, and school addresses are publicly listed. Previous evidence suggests that RSOs reside in areas of high population concentration. This study attempts to identify the prevalence of RSOs in specific areas of central Pennsylvania. In addition to identifying demographic characteristics relating to RSO prevalence, using the PA state website, US Census Data, ArcGIS Pro offender prevalence, and demographic patterns will be analyzed in great detail. Prevalence analysis shows 9 high tracts and most of the state coming in below the state prevalence of 16.32 RSOs per

10,000 people. Through additional characterization, data suggests that tracts with higher RSO prevalence have a lower per capita income and numbers of individuals with a high school diploma. Communities and home life have been seen to possess a connection to recidivism, which is defined as the likelihood of an offender to reoffend within three years. The information in this study can be used as the foundation of criminal behavior studies, public education, and police efforts, and can express the importance of processing data correctly to get the necessary information for research.

Ramper, Madsion † (Shippensburg University), *Assessing the Impacts of Agricultural and Urban Land Uses on Stream Water Quality in the Lower Reaches of the Conodoguinet Creek, Cumberland County, Pennsylvania*

This study examines the potential impacts of land use on the water quality of the Conodoguinet Creek, a major tributary stream that drains a vast area of Cumberland County (Pennsylvania) into the Susquehanna River. The study was designed to determine if agricultural and urban land uses enhance nutrients (nitrates & phosphates) and heavy metal concentrations in the creek. It comprised three main components: in-situ water quality assessments, monthly sampling, and laboratory analysis of samples for nutrients and heavy metal concentrations. Results indicate a general correlation between agricultural land use and the creek's water quality. Particularly, phosphate concentrations exceeded the EPA's maximum contaminant level of 1.0 mg/L during the growing season at all nine sites assessed. A Mann-Kendall trend test on phosphate data from December 2022 – August 2023 returned a significant ($\alpha = 0.05$) positive trend at all sites, indicating increasing concentrations in the growing season. Results of the nitrates and heavy metals, though insightful, were less predictive. The findings of this study contribute to the general efforts by the Chesapeake Bay Foundation to better understand the nutrient loading capacities of tributary streams of the Susquehanna River.

Schaney, Christopher R. (Indiana University of Pennsylvania), *Assessing Sea Level Rise at Saxis Wildlife Management Area, Saxis, Virginia* [Co–Author: Mitzy Schaney]

Saxis Wildlife Management Area (SWMA) is located in Accomack County Virginia on the Chesapeake Bay. SWMA is mostly comprised of tidal wetlands encompassing 5,678 acres of land bordered by brackish waters of Beaseley Bay, Pocomoke Sound, and Messongo Creek. Impacts of climate change have increased Chesapeake Bay water temperature by 1.2° F and have raised sea level 30 cm over the past century. Sea level is projected to rise an additional 39 cm – 1.5 m within the next 100 years. Less than 2 m above sea level, SWMA and the nearby town of Saxis are feeling the impact of rising seas. This project uses remote sensing and Uncrewed Aerial Vehicles (drones) to map and measure dynamic point landforms at the mouth of Messongo Creek. This research will use historic aerial photography and current drone imagery to identify changes in landforms at Green, Dicks, and Drum Points as they are impacted by rising bay level. This research will enable an understanding of land inundation rates associated with these landforms and will lead to insights on the future of this dynamic environment.

Schaney, Mitzy L. (University of Pittsburgh at Johnstown), *Investigating the Glades: Pedology, Paleoclimatology, Carbon Storage, Hydrology, and Undergrads* [Co–Authors: Rebecca Adams and Christopher R. Schaney]

Appalachian peatlands are unique ecosystems of high conservation value; The Glades is a Nature Conservancy peatland in the Appalachian Mountains of Garrett County in westernmost Maryland. Incorporating undergraduates at every level of this scientific endeavor, we have begun investigating The Glades peatland. Introducing students to field science, soil samples were collected for radiocarbon dating and carbon content as well as collecting hundreds of data points on peat depth. Focusing on the peat soil itself, we have already described multiple soil profiles in the field and completed the pedological classification in the classroom. Laboratory analysis and GIS will calculate the total amount of carbon stored within this bog. Further field mapping and drone imagery will elaborate upon complex surficial hydrology with potential for isotopic analysis. Research participation and field experience are assets for undergrads and prepares them for admission into grad school and the very competitive job market.

Spangler, Kierstan † (Shippensburg University), *Use of an Auditing Instrument to Assess Regulatory Barriers for Affordable Housing*

Housing affordability is an important and urgent matter for all stakeholders, including planning specific stakeholders such as municipalities, counties, the development community, and housing advocacy groups. Regulatory barriers are one factor that may be responsible for higher housing costs. These relationships between these regulatory barriers and housing affordability, however, are poorly understood. Generally, planning ordinance audits are one method of broadly assessing the effectiveness of land use regulations. This research reviews and evaluates the evolution of such audit tools, with the purpose of designing an audit instrument to assess a community’s regulatory barriers to housing affordability. Ideally, such an audit tool will be useful to municipalities in reviewing and possibly revising their zoning ordinance, subdivision regulations, comprehensive plan, and related documents to reduce regulatory barriers. For purposes of this research, Dover Township, York County, Pennsylvania is used as a test case to calibrate the audit instrument. From the test case, the audit instrument may be modified to improve its efficacy.

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POSTER ABSTRACTS

⊕ Indicates an entrant in the Elaine Bosowski Student Poster/Map Contest

↓ Indicates a recipient of the 2023 PGS Student Research Grant

Alexander, Caitlyn and Adelynn York ⊕ (University of Pittsburgh at Johnstown), *Baseline Vegetation Survey of Dicks Green and Drum Points in Saxis, Virginia Tidal Marshes*


The tidal marshlands of Saxis Wildlife Management Area in Virginia are dynamic landscapes uniquely adapted to life in flux. Brackish marshes are habitats that provide critical ecosystem services. Vegetation communities and species abundance within these marshes will shift in the coming years due to sea-level rise. Monitoring coastal vegetation now can yield data to reference for similar monitoring in the future, tracking real life changes in vegetation due to sea level rise. That is the purpose of this baseline survey: to collect data on the abundance, distribution, and patterns of the brackish marsh vegetation in Saxis Wildlife Management Area so as to reference in the years ahead and track changes due to sea-level rise. This survey was conducted on three separate landforms, showing the minor differences and major similarities of vegetation patterns in a close, yet varied range. Plant species were identified in the field via Seek by iNaturalist and were later verified by referencing botanical information from Assateague Island Visitor Center. Vegetation is the foundation of these ecosystems, as the vegetation communities change, so will the species interactions of the various animals that utilize these landforms.

Carino, Hailey ⊕ ↓ (Villanova University), *Historical Analysis of Environmental Benefits Using GIS* [Co–Authors: Emma Witanowski and Jennifer Santoro]

This study assesses the ecological, historical, and educational value of the historic and woodland property, Oakwell, located in Villanova, Pennsylvania using ArcGIS tools to marry historical data and maps to modern technology. Recent development plans have targeted Oakwell as a potential property to be clear-cut and paved with the intention of creating a sports field complex. Nearly 80% of trees (6-inch diameter or greater) will be removed under current development plans. To understand the consequences of altering the state of the original landscape of this wooded property, high resolution scans of maps of the landscape from the 1920s (complete with detailed locations of buildings, trees, and other vegetation) were geo-referenced to 2023 imagery taken with a DJI Mavic 2 drone. Historic and contemporary tree points were digitized (with added diameter at breast height (DBH) and species attribute data) and overlaid with digitized proposed field plans to assess composition of “at-risk” trees and potential carbon loss. The results depict a severe loss of carbon sequestration with the removal of 471 trees, and the destruction of several historic properties. This research reveals the impacts the destruction of a small property can have on a community.

Cinko, Jayden (University of Pittsburgh), *Road Salt Impacts in Western Pennsylvania: Climatological and Site Factors*

Streams throughout the world are impacted by anthropogenic processes. These processes vary depending on where the stream is located within the landscape and what the nearby land- uses are. Streams are commonly found in low lying landforms such as valleys. The valleys slopes become highways for pollutants to enter streams. In addition, nearby land has varying uses of human activities that can create pollutants. One anthropogenic process commonly found in the northeastern United States is the spreading of road salt and brine on public roadways for the purpose of de-icing. The salt on roadways eventually makes its way to nearby streams by mixing with melt water from snowfall and infiltration into groundwater. For this research, five testing locations were set up to collect samples throughout the winter and into the summer months. The samples collected measure various amounts of data including the concentration of chloride (Cl⁻) and sodium (Na⁺), temperature, precipitation, and if nearby roads had salt or brine spread on them within the 24 hours of testing.

Frizzell, Hannah  (University of Pittsburgh at Johnstown), *Are Superfund Sites Increasing Baseball Player's Risk of Cancer in Washington County, Pennsylvania?*

Pennsylvania citizens have been voicing concerns of abnormal diagnosis of Ewing's Sarcoma in baseball players residing in Washington County. The overall purpose of this research was to analyze any environmental carcinogens potentially influencing Ewing's Sarcoma diagnosis rates within the county. In-person interviews with victims of the cancer were first performed, later permitting an identification of the baseball field commonly played upon by nearly all victims. This study included a large qualitative analysis of superfund sites within a one-mile radius of the baseball field. By utilizing the Geographical Information Systems through the Department of Environmental Protection in Pennsylvania website, potential superfund sites were able to be identified. Those superfund site pollutants were recognized, and further analysis of the heavy metals was performed to associate any possible carcinogenic influence on the cancer.

Goldyn, Nicholas (University of Pittsburgh), *Exploring Ecological Succession Sensitivity to Invasive Flora*

Invasive plants are known to hinder an area's natural progression of succession and cause biodiversity loss. This research investigates the complex relationship between invasive species and the various stages of ecological succession with an emphasis on the ecological succession area's sensitivity to invasive plants and invasive plants' disruptive impact. By investigating three plots of land undergoing varying stages of ecological succession stages, this study highlights the effects, composition, and variety of plants in these plots. Each plot is a fifteen-meter rectangle. Plot A is located on a farm field that has been left fallow for the past ten years. Plot B is found on a discarded cow pasture that has been left to grow for twenty-six years. Plot C is in a forest that has not been timbered for the past fifty years. This study extends its findings from a climax community (Plot C) to communities transitioning (Plot A & B) to find if more established areas are indeed less susceptible to invasive species compared to areas in the early stages of ecological succession.

Marepally, Samhitha and Kylie Wolfe ✉ (University of Pittsburgh at Johnstown), *Rising Sea Levels Affecting Graves in Saxis, Virginia*

The research is based on how the rising sea levels affect the unique burial practices in Saxis, Virginia. Saxis is a tiny town on the coast of Virginia with only about 169 residents as of 2023. They have been dealing with the environmental obstacle of rising sea levels for hundreds of years. This research revealed a generational divide in burial choices, with younger islanders increasingly opting for off-island burials. At the same time, older generations choose to be interred on the island, symbolizing a desire to remain connected to their disappearing homeland. An intriguing historical aspect is the treatment of the graves, often relegated to the back of records, except for the efforts of one individual, MK, who documented them comprehensively. With rising sea levels, graves have become an issue for this small town. With an estimated two hundred to three hundred bodies buried on the island, the maintenance of graves is a pressing concern, and many younger inhabitants are pushing to get off the sinking area and have their cemeteries elsewhere. However, with many more inhabitants, which is not an option. A significant preference for burying in the north end of the island, where the land is higher, is noted, and the tight-knit nature of the small town means that nearly all graves have some familial or social connection. The research uncovers the island's oldest gravestone from the 1800s, marked with white rather than the traditional gray. It discusses the unique concrete covers with metal cleats to secure them, a feature introduced around 1900-1920. The research also explores cracked graves, such as the one of Manie C. Martin, resulting from water pressure during storms and their impact on the community. The rising sea level and its effects on the island's resilience are highlighted, emphasizing the community's need to adapt to these changing environmental conditions. Additionally, standard practices of backyard burials and using bricked-up graves for reinforcement are revealed, providing a comprehensive overview of Saxis Island's distinctive burial traditions.

Roxby, Baylee ✉ (University of Pittsburgh at Johnstown), *Geographical Comparisons and Impacts of Sun-Grown Versus Shade-Grown Coffee Productions*

Coffee production is a cornerstone of the global agricultural economy, with significant environmental and socio-economic implications. This research dives into the geographical differences and ecological impacts of sun-grown and shade-grown coffee productions, unraveling the advantages and disadvantages associated with each cultivation method. In this study, coffee plantations from regions worldwide are analyzed, examining factors such as yield, quality, and environmental impact on birds. Sun-grown coffee typically yields higher quantities of beans but is often associated with increased pesticide use and habitat loss, while shade-grown promotes biodiversity and ecological resilience, albeit at the expense of lower yields. This research underscores the importance of geography in determining the suitability of these cultivation methods. Multiple research projects are referenced, highlighting essential information presented by a combination of GIS, high resolution arial imagery, and remote sensing, validated by ground surveys. The findings presented contribute to the understanding of the spatial dynamics of coffee agriculture, offering insights for sustainable land use planning, conservation strategies, and improved coffee quality. It underscores the importance of tailored approaches to coffee cultivation based on geographic location and promotes more environmentally friendly and socially responsible practices within the coffee industry.

Ruzewski, Julia ☯ (University of Pittsburgh at Johnstown), *Saxis, Virginia Wildlife Assessment*

The research being conducted is a baseline study of assessing the wildlife that inhabit the area of Saxis, Virginia. The study is being conducted because of concerns about sea-level rise and how it will affect the wildlife that uses coastal marshlands. The method that was used to conduct this study was to set up four game cameras along game trails, ponds, and rivers to assess how many animals use that land. The game cameras were set up at these points because they were areas with high potential for wildlife use. During camera setup, taking notes of the ground and assessing the crustaceans and mollusks of the area. The results from the game cameras being set up resulted in multiple animals being captured in different quantities like birds, raccoons, foxes, river otters and other wildlife. The hope is for this study to be repeated in five years to continue the assessment of wildlife in Saxis, Virginia.

Scelsi, Nicholas ☯ (University of Pittsburgh at Johnstown), *Lead Testing in Soils of Prince Gallitzin State Park Gun Club*

Shooting ranges and gun clubs are a primary pathway for the introduction of lead pollution into the ecosystem. Not only does lead bioaccumulate in the trophic levels of terrestrial and aquatic ecosystems, but it is a serious threat to brain development in children. This research analyzes the presence of lead in the soil at the former shooting range in Prince Gallitzin State Park. Natural weathering processes break down lead pellets and soluble lead begins leaching deep into the soil. Soil samples were collected from the first and second soil horizons at 10 locations down range in the shooting range. This study compared the presence and abundance of lead and the average size of the lead pellets to a previous study conducted at this site. A better understanding of how these pellets have weathered and at what rate they have been weathered provides information on the amount of lead that has precipitated into the soil. With the collection of lead levels within different soil horizons and the comparison of a previous study, trace metals in the samples and the analysis of the pellet's diameter help the determination of migration and fluctuating weathering rates of the lead observed at the sample locations.

Snow, Sarah ☯ ↓ (Kutztown University), *Warehouses' Effects on Vehicular Accidents in Berks County, Pennsylvania*

The ecommerce industry in Berks County, Pennsylvania, has grown extensively in recent years. The expansion has led to the creation of numerous additional warehouses and delivery vehicles occupying the area. Traffic congestion caused by warehouse expansion in the county has become a trend on many routes in the area. The mainly rural county has seen increased use of infrastructure to support the numerous commercial delivery vehicles utilized by warehouses, and as a result, there has been an increase in traffic congestion and vehicular accidents in Berks County. This research investigated the effects warehouse expansion has had on vehicular accidents in Berks County. Commercial vehicles are the main transportation vehicles used for warehouse commerce and consequently, accidents involving this vehicle classification were closely examined. Accident counts of all vehicles and purely commercial delivery vehicles over a ten and two five-year intervals were investigated and mapped. A buffer analysis was also performed at a mile around each warehouse in the county. This analysis was performed to see if there was a concentration of

accidents near warehouses and their primary operations. The results showed an overall increase in all vehicular and commercial vehicle accidents within Berks County over a ten-year period, from 2012 to 2021. This result was expected as road congestion often leads to higher amounts of accidents. As more and more warehouses have been built in the county, vehicular accidents have also risen, leading to more dangerous road conditions. Planning commissions in Berks County can use this research to make beneficial planning decisions in regard to warehouses as well as become informed about the effects warehouses have had on traffic conditions.

Witanowski, Emma ☉ ↓ (Villanova University), *Oakwell Forest: Using 100 Years of History for Ecological Management (Modern Environmental Impacts of Field Construction Using GIS)* [Co–Authors: Haily Carino and Jennifer Santoro]

This project measured pre-development environmental conditions at Oakwell, located in Villanova, Pennsylvania, to determine the ecological value of the property. Oakwell is home to several mature-growth trees (over 100-years-old) and understory species, in addition to wetland habitat. With development plans proposing to clear-cut trees for auxiliary sports fields, assessing the benefits of having an intact woodland amongst a surrounding suburban landscape is essential to understand potential consequences. A 3D drone flight was conducted with a DJI Mavic 2 drone to create a point-cloud model, orthomosaic, and digital elevation model (DEM), and were analyzed via Geographic Information Systems (GIS) (e.g., water accumulation, tree canopy, terrain metrics). Soil sampling sites were selected considering slope, water accumulation, and relative location (under varying tree cover) and were analyzed for heavy metals (V, Cr, Fe, Co, Ni, Cu, Zn, Ga, As, Se, Rb, Sr, Ag, Cd, Sb, Cs, Ba, Tl, Pb, U) using an Inductively Couple Plasma Mass Spectrometer (ICP-MS). The results of the study found that water accumulation directly contributes to three local watersheds (Gulph Creek, Hardings Run, Mill Creek) and that tree canopy covers approximately 40% of the property. This ecological information should be considered before deciding the ultimate fate of Oakwell.

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THE PENNSYLVANIA GEOGRAPHER

The Pennsylvania Geographer publishes articles on a wide variety of geographic themes and invites authors to submit manuscripts. Issues are commonly organized around preannounced themes, but manuscripts dealing with any geographic topics are always considered for publication. Articles should be sent to Ola Johansson (johans@pitt.edu), Editor, *The Pennsylvania Geographer*, Geography Department, University of Pittsburgh at Johnstown, Johnstown, PA 15904. Book reviews and software reviews should be sent to Donald Buckwalter, Department of Geography and Regional Planning, Indiana University of Pennsylvania, Indiana, PA 15705.

Articles submitted for publication in *The Pennsylvania Geographer* will be evaluated for appropriateness and scholarship through a peer review process. To be considered for publication, manuscripts must conform to the following requirements, adopted by the Board of Directors of the Pennsylvania Geographical Society:

1. Deadlines for submitting materials are March 15 for the spring/summer issue and September 15 for the fall/winter issue.
2. Articles of any length will be considered. Book and software reviews should be approximately 2-3 pages in length. Manuscripts should use double line spacing with adequate margins. Please only use a single space between sentences. To aid in the revision process, please insert page numbers on all of the pages.
3. The manuscript text should be submitted as a Word (.doc or .docx) file. Please **do not** insert figures, tables or diagrams directly into the manuscript (see below).
4. For each manuscript, provide a title page including the title of the work, the name and affiliation of the author(s), and the name and address to whom correspondence should be directed. Articles should be accompanied by an abstract of not more than 150 words. No keywords are needed.
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