Event Agenda

2025 SCGIS Annual International Conference

Sunday, June 29, 2025

Registration

4:40 PM – 7:30 PM | Location: Entry Auditorium

We are opening registration for those arriving on Sunday at 4:40pm!

Please visit us to check-in! We will have SCGIS branded Name Tags, Lanyards, as well as drink tickets!

We will be located in the lobby of the main building (Entry Auditorium).

Dinner

5:30 PM – 9:30 PM | Location: Headwaters Lodge

Welcome Reception

7:00 PM – 7:00 PM | Location: Roosevelt Room - Headwaters Lodge

You are invited to join your friends and colleagues for an evening of informal conversation. Reconnect with your colleagues and make new friends

Fire Ring Social

9:30 PM – 11:00 PM | Location: Fire Ring

Don’t miss our SCGIS tradition of an evening around the fire for conversation and connecting with our SCGIS community.

Please find the NCTC fire pit just outside of the John R. “Rick” Lemon Building.

Monday, June 30, 2025

Breakfast

6:30 AM – 9:00 AM | Location: Headwaters Lodge

Breakfast will be served until 9:00AM (hot breakfast items will only be available until 8:30AM)

Bird Walk with Allen Carroll

7:00 AM – 8:00 AM | Location: Headwaters Lodge

Join our Keynote Speaker Allen Carroll for an *informal* bird walk on Monday June 30th at 7am!

Participants will meet outside of the Headwaters Lodge

Registration

8:00 AM – 8:45 AM | Location: Entry Auditorium

Please visit us to check-in! We will have SCGIS branded Name Tags, Lanyards, as well as drink tickets!

We will be located in the lobby of the main building (Entry Auditorium).

SCGIS 2025 Conference Opening Session

9:00 AM – 9:45 AM | Location: Confluence Center Auditorium

Please join us as SCGIS President Jocelyn Tutak opens our conference. She will share important information about the Society for Conservation GIS and our 2025 International Scholarship Program

Keynote Address - David Saah

9:45 AM – 11:00 AM | Location: Confluence Center Auditorium

Advancing Conservation with Geospatial AI: From Earth Observations to Actionable Insights

The rapid evolution of geospatial artificial intelligence (GeoAI) and Earth observation foundation models is transforming how we monitor,

model, and manage landscapes for conservation and community resilience. This keynote will explore cutting-edge advancements in GeoAI, remote sensing, and machine learning that enable scalable, high-resolution environmental monitoring. Highlighting real-world applications—including risk modeling, land-use change detection, and biodiversity monitoring—Dr. David Saah will discuss how these innovations bridge science and decision-making to empower diverse groups in conservation. By integrating satellite imagery, AI-driven analytics, and open-source tools, we can enhance collaboration, improve environmental stewardship, and drive data-driven policy for a sustainable future.

Speaker

David Saah

Managing Principal / Fulltime Faculty and GsAL Director | Spatial Informatics Group, LLC / University of San Francisco

Break

11:00 AM – 11:20 AM

Individual Presentations: Environmental Justice/Heritage Mapping

11:20 AM – 12:05 PM | Location: Confluence Center Auditorium

Mapping Justice: Teaching GIS for Climate Action - Olivia Zhang

11:20 AM – 11:35 AM

Mapping Justice is an educational program that teaches high school students how to use GIS to analyze complex data, tell stories, and raise awareness of issues impacting their communities like food deserts and water pollution. Hosted by the non-profit trubel&co, Mapping Justice has taught over 150 students since 2020. A former student has shared, “Mapping Justice was my first exposure to GIS and bridging together tech and social justice. I absolutely loved both, so I’ve gone on to do a lot of GIS-related work.”

In addition to learning GIS skills, students lead their own projects to inspire community solutions. Attendees can gain insights about how GIS and environmental justice education can empower young people to make a positive community impact. As one student expressed, “This course provided an opportunity to create change in my community. It made me think about what I want to do about climate injustices now.”

Conservation GIS and Social Justice: Mapping Indigenous Displacement in Africa’s Carbon Economy - Daisy Jelagat

11:35 AM – 11:50 AM

The expansion of carbon credit projects in Africa has led to the displacement of indigenous communities under the guise of conservation. My project employed GIS and remote sensing to map land tenure changes, analyze spatial patterns of displacement, and assess the environmental tradeoffs in these regions. By overlaying carbon project boundaries with indigenous land maps and high resolution satellite imagery, I was able to highlight areas of forced relocation and environmental degradation in East Africa. GIS provided a crucial advantage in visualizing large scale land use changes and quantifying socio-environmental impacts. Key challenges included data accessibility and conflicting land ownership records, which were addressed through participatory mapping and open-source datasets. Findings reveal a significant overlap between carbon offset zones and historically indigenous territories, raising concerns over land rights and ethical conservation.

Community Legacy in the Face of Wildfires: Using GIS to Understand the Palisades and Eaton Fire Impacts to Built Heritage - Morgan Quirk

11:50 AM – 12:05 PM

Following the devastation of the January 2025 California wildfires, historic preservationists and community members gathered to understand impacts to built historic resources in the Palisades and Eaton Fire areas. With little public access to the burn areas, GIS became a critical tool to document and assess damage to important historic and cultural sites. While the Palisades Fire area includes data from the multi-year SurveyLA initiative, comprehensive data did not exist for areas impacted by the Eaton Fire—including sites significant to Altadena’s historic African American community. In partnership with local preservation non-profits, city and county agencies, cultural institutions, and residents, extensive data was collected to understand the breadth of historic sites, including those with cultural and architectural significance. This effort culminated in web maps that document the built heritage of these areas, overlayed with publicly accessible Cal Fire data to understand the loss and impacts to historic resources at the parcel level.

Individual Presentations: Invasive Species/Woody Encroachment

11:20 AM – 12:00 PM | Location: 161IW in the Lemon Building

Everything We Don't Know About Woody Encroachment by Maria Zubkova

11:20 AM – 11:32 AM

Many of the world’s grasslands and savannas are transitioning from herbaceous to woody plant dominance, raising concerns about its potential impacts on ecosystem functioning and services, especially the reduction in productivity and the loss of biodiversity. Despite the large number of studies on woody encroachment worldwide, our understanding of this phenomenon is still lacking. There is neither a consensus on a working definition nor agreement on what drives it. Woody encroachment has been attributed to a variety of causes, including an increase in cattle population in rangeland, rainfall variability, exclusion of fire activity, and an increase in atmospheric carbon dioxide levels. This presentation will present current knowledge and demonstrate what data is available to map woody encroachment and analyze its possible causes from the local to the global scale.

Developing Unoccupied Aerial Vehicle (UAV) Technology to Improve Brush Management in Florida's Grazing Lands by Allison Schumacher

11:32 AM – 11:45 AM

Woody encroachment poses a significant challenge to grazing lands globally. A major obstacle for land managers is accurately identifying species and quantifying the amount of woody encroachment. Unoccupied aerial vehicle (UAV) based remote sensing offers a potential solution for species-specific mapping and quantifying woody encroachment across large landscapes. This study assessed the effectiveness of UAV technologies in (1) detecting and (2) identifying brush species across several grazing habitats in south-central Florida. UAV flights were conducted over individually identified plants of seven species using a quadcopter equipped with one of four sensors: lidar, RGB, multispectral, and hyperspectral. We found that woody encroachment could be identified and quantified using a combination of sensors. Overall, this study demonstrates the extent to which UAVs may be utilized to quantify woody encroachment and helps lay the groundwork for a standardized methodology to utilize and process complex data from UAV flights to assist management decisions

Predictive modelling of the current and future distribution of Tephrocactus articulatus (Pfeiff.) Backeb in South Africa: Its implication for Karoo region by Moleseng Moshobane

11:45 AM – 12:00 PM

The impact of climate change on species distribution is widely recognized as a contributing factor to the proliferation of invasive alien species (IAS). Tephrocactus articulatus, commonly known as the " Paper-spined Cholla," is a species of cactus belonging to the family Cactaceae and is native to Argentina, Bolivia, and Peru. This highly adaptable plant can grow in a wide range of habitats, from high-altitude mountain slopes to dry and arid desert environments. In this study, we utilized maximum entropy (MaxEnt) modeling to predict the current and potential future distribution of Tephrocactus articulatus from 2021-2040 and 2041-2060 using occurrence records and bioclimatic variables. The resulting models achieved high levels of accuracy, with a mean Area Under Curve (AUC) of 0.926. Our findings indicate that this species' climatic suitability is mainly within the karoo region, particularly in coastal provinces. This study provides baseline evidence that underscores the importance of effective proactive management of Tephrocactus articulatus in South Africa, with a focus on the karoo region, and highlights the utility of Species Distribution Models (SDMs) in management planning.

Individual Presentations: Aquatic Systems

11:20 AM – 12:00 PM | Location: Gallery room - Headwaters Lodge

Quantifying and mapping the flood pulse in the Upper Amazon River Floodplains between 2017 - 2023 by Juan Lozano

11:20 AM – 11:32 AM

The flood pulse is important for biodiversity and ecosystem services in Amazonian floodplains, making an understanding of its processes crucial for conservation planning. While remote sensing and modelling have provided insights into mapping and quantifying these processes, they are still limited. In this study, we propose a simple and replicable methodology to estimate flood amplitude, depth, volume, and duration along an 1,800-km stretch of the Upper Amazon River Floodplains between 2018 and 2023. Our approach involves developing flood maps based on satellite-derived water height altimetry and vegetation-corrected Digital Elevation Models (DEMs). We tested the uncertainty of using different DEMs for flood process estimations and checked the robustness of our approach by comparing the results with datasets from previous studies.We observed that flood amplitude grows steadily as the river runs downstream, and that flood depth and duration are more closely related to each other than either is with flood amplitude. We also found large variations in flood process estimates between DEMs, with some processes and regions producing more reliable results. When compared with previous studies, there were low levels of agreement in flood depth and duration between our global DEMs and the high-resolution, locally tailored datasets. In contrast, our estimations of flood amplitude for all DEMs showed moderate agreement with the previous study selected. We discuss that, while remote sensing and modelling approaches are useful for interpreting these natural systems, site monitoring is essential to validate these approaches—especially in a vulnerable region like the Amazon.

Adapting Water Typing Field Protocols to Remote Sensing Workflows for Landscape-Scale Analyses by Leah Nagel

11:32 AM – 11:45 AM

In Washington state, riparian timber harvest restrictions vary depending on the presence of in-stream fish habitat. Water typing surveys traditionally combine electrofishing surveys and field identification of habitat barriers. These techniques are resource-intensive and can negatively impact vulnerable fish populations. We worked with the Washington Department of Natural Resources to develop a remote sensing framework to compare the effects of a proposed methodology aimed at reducing the cumulative amount of streams surveyed on the total amount of stream classified as fish habitat, and the corresponding area and timber volume covered by riparian timber protections. This presentation focuses on the technical workflow involved in the creation of potential habitat breaks (PHBs) under different criteria, and the use of network analysis to compare the relative positions of the different PHBs and split stream networks into fish and non-fish habitat.

Support for Integrated Pest Management in the Lemon Fair Floodplain - Vermont by Bill Hegman

11:45 AM – 12:00 PM

The Lemon Fair Insect Control District is dedicated to reducing nuisance mosquito activity in and around the Lemon Fair River. Using a novel combination of drone imagery and open-source data, the project focuses on identifying high-priority areas for mosquito abatement. High-resolution drone imagery was flown and processed to identify mosquito breeding areas. LiDAR was used for understanding hydrological flow regimes, and extensive fieldwork was employed for verification. Finally, a methodology was developed to support future mosquito abatement projects in similar flood plain areas. Continued work includes the use of a payload drone for the targeted application of a biocide focused on reducing populations in the larval stage.

Lunch

12:00 PM – 1:00 PM | Location: Headwaters Lodge

Panel Session: Geospatial Technology Innovations for Conservation

1:00 PM – 2:30 PM | Location: Confluence Center Auditorium

Technological advances are accelerating in AI, supercomputing, data science, and remote sensing, and there is a growing need to harness these advances toward addressing major issues in conservation and sustainability. This session explores the theme of this year's SCGIS Conference through a panel discussion of experts sharing their perspective through the lens of several critical themes in conservation: Fire, forests, and biodiversity. Join us from 1-2:30 pm on Monday June 30th for a look into the cutting edge of where technology meets conservation in the modern era.

Panelists: Dr. David Saah; Nancy Meyers and Healy Hamilton

Moderator: Bo Wilmer

Speakers

Nancy Harris

WRI

David Saah

Managing Principal / Fulltime Faculty and GsAL Director | Spatial Informatics Group, LLC / University of San Francisco

Healy Hamilton

Chief Scientist | Sustainable Forestry Initiative

Bo Wilmer

Conservation and Public Lands Program Manager | TRC

Coffee Break

2:30 PM – 2:50 PM

Individual Presentations: Conservation Remote Sensing

2:50 PM – 3:50 PM | Location: Confluence Center Auditorium

Application of GeoAI to Map and Characterize natural resources and human use of NJ's coastal zone by Richard Lathrop

2:50 PM – 3:05 PM

As part of a capstone project in the Environmental Geomatics curriculum at Rutgers University, the advanced undergraduate students investigated the application of GeoAI (Machine Learning and AI) to coastal conservation. The students employed various types of high resolution remotely sensed imagery and ArcGIS Pro Deep Learning tools for pixel classification and object detection. A variety of approaches were evaluated to investigate the feasibility and value of AI to replace or complement more traditional visual interpretation and per-pixel multispectral classification techniques. Topics included mapping of high value or problematic habitats such as seagrass, high marsh and Phragmites communities to human uses such as shellfish aquaculture, recreational boat traffic, docks, mosquito ditching and prop scarring. While not every potential application was successfully achieved, the students are now more educated as to the pros and cons of GeoAI and better able to evaluate the hype vs. the hope of AI for coastal conservation.

Remote Detection of Soil Carbon and Nitrogen Through Decomposition of Spectral Signals by Mohammed Braimah

3:05 PM – 3:20 PM

The agricultural field is very complex with varying land cover and soil materials making it difficult to identify unique spectral curves for specific soil constituents. This study used spectral decomposition by varimax of satellite observations to predict the soil percentage of total carbon (%C), percentage of total nitrogen (%N), and permanganate oxidizable carbon (POxC) in agricultural fields. The Sentinel-2-obtained VPCA explained a variance of 46% in shallow soil %C, 42% in shallow soil %N, and 40% in shallow soil POxC. Nutrient simulation results showed minimal effect of farming practices on carbon and nitrogen losses across different farms. The results reveal a novel and universal approach to monitoring soil carbon and nitrogen which is critical for monitoring climate change and agricultural productivity. The work has applications in precision agriculture, climate smart agriculture, soil science and environmental sustainability and climate change.

Use of GIS by spatial analysis to evaluate risks such as deforestation, habitat loss, water source problem and climate change around Ranomafana National Park - Lazasoa Rehodo

3:20 PM – 3:35 PM

The world is affected by climate change, and every country faces its own challenges related to this issue. In Madagascar, Ranomafana National Park is also experiencing the impacts of climate change. As threat; the actual situation is troubling for local people, government and biodiversity. The production is decreasing, there is enough rain, slash and burn still continue to increase. Spatial
analysis of GIS is a way to find the real situation for those problems. This project will present a scientific data, real map of all these hypotheses and to predicts results for future research concerning the threat.

The impact of unplanned land conversion on two priority wildlife corridors, Tanzania - Joseph Mteng

3:35 PM – 3:50 PM

Unplanned agricultural expansion is one of the major conservation challenges in Tanzania today, threatening remaining unprotected areas of natural habitat and wildlife populations. With ivory poaching having been brought under control in recent years, elephants are re-establishing historic movements, but their use of key wildlife corridors connecting protected areas is being challenged through the loss of connectivity as a result of agricultural expansion. The improved management of wildlife corridors is therefore an important conservation focus for the Wildlife Conservation Society and community-based approaches are achieving success, while also safeguarding natural resources and ecosystem services as well as helping mitigate human-wildlife conflict. GIS has played a crucial role in tracking patterns of land conversion as the basis for improved land-use planning and the establishment of community forests to safeguard critical areas of connectivity.

Individual Presentations: Coastal/Wetlands Conservation

2:50 PM – 3:50 PM | Location: 161IW in the Lemon Building

GIS-Based Tracking and Preventing Plastic Pollution from Coastal City Drains into Oceans by Princewill Odum

2:50 PM – 3:05 PM

Plastic pollution is a major environmental issue, with coastal city drains serving as key pathways for plastics entering the ocean. Using GIS, this study tracked plastic movement through urban drainage systems by deploying mini GPS tracking devices. GIS enabled the visualization and analysis of flow patterns, identifying blockage points that cause urban flash floods before plastics eventually reach the ocean. This insight supports ecological re-engineering of drains as a preventive measure. GIS proved advantageous in mapping movement trends and assessing intervention effectiveness. Key challenges included inadequate public awareness, weak waste management policies, and regulatory gaps. Findings confirm that coastal city drains significantly contribute to ocean plastic pollution. Effective solutions include banning certain plastic products, implementing buffer zones, and promoting waste separation and 3R (Reduce, Reuse, Recycle) approach at the source. This research highlights practical GIS applications for pollution prevention, providing insights into data-driven strategies for mitigating ocean plastic pollution.

Using Image Classification to Map Estuary Vegetation in the Pacific Northwest by Elizabeth Martin

3:05 PM – 3:20 PM

Columbia Land Trust manages over 2,000 acres of estuary habitat at the mouth of the Columbia River in the northwestern U.S.. Monitoring in the dense vegetation, swampy conditions, and ever-changing tides of coastal estuaries is very time- and energy-intensive work. Standard field monitoring approaches, such as transects and vegetation plots, can only capture a fraction of the area, and it is often impossible to walk a whole site. To more effectively monitor our estuary lands, we are developing a technique that uses multispectral drone imagery and image classification to map plant communities across an entire site. This presentation will cover collecting field data with a Mavic 3 Enterprise drone and Emlid RTK system, processing the data into a multi-band raster and training polygons, training a computer to perform a Random Forest Classification, the results so far, and our plans moving forward.

Marine Conservation in Bangladesh: Biodiversity, ecosystems, threats, and current conservation - Raisa Noor

3:20 PM – 3:35 PM

The marine waters of Bangladesh in the northern Bay of Bengal offer a unique ecosystem, encompassing the world's largest mangrove forest, the Sundarbans, the largest river delta, and a small coral island and characterized by the turbid estuary, estuarine channels, small coastal islands with mangroves, and shifting mudflats. These diverse ecosystems in the northern Bay of Bengal make this a globally significant biodiversity hotspot and support the world’s most diverse populations of dolphins, porpoises, whales, sharks, rays, and marine turtles. Many of these species are at a high risk of extinction by anthropogenic threats and changing climates. A geospatial perspective of these rich ecosystems and biodiversity through GIS mapping can aid in designing effective conservation planning to remove the threats and implement an effective conservation strategy in the marine waters of Bangladesh.

Predictive Modeling of Ghost Net Accumulation in Coastal and Marine Ecosystems Using Machine Learning and Spatial Analytics by Erick Odire

3:35 PM – 3:50 PM

Ghost nets (abandoned or lost fishing gear) pose severe threats to marine life and coastal ecosystems. Despite ongoing cleanup efforts, current approaches remain largely reactive. This study presents a novel predictive model that leverages environmental data (ocean currents, sea surface temperature), maritime activity, and coastal demographics to forecast areas at high risk of ghost net accumulation. Using machine learning algorithms and spatial analytics, the model will be trained on real-world sightings and validated through cross-validation and tuning. The final model will be deployed via an API and visualized using interactive mapping tools, enabling conservation stakeholders to proactively manage ghost net risks. This approach aims to shift marine debris interventions from response to prevention, offering scalable and replicable solutions for ocean conservation.

Curated Session: Leveraging Real-Time GIS for Effective Conservation with EarthRanger - Joshua Krautwurst

2:50 PM – 3:50 PM | Location: Gallery room - Headwaters Lodge

EarthRanger is a nonprofit conservation technology platform that integrates real-time GIS data from diverse sources into one dynamic interface. Serving over 650 organizations across 70 countries, EarthRanger provides zero-cost solutions with indefinite retention of tracking and reporting data. By unifying field observations, patrol reports, sensor feeds, and satellite imagery, EarthRanger makes viewing, comprehending, and acting on critical wildlife and landscape information easier than ever.

This presentation will highlight how we have built a GIS platform with alerting and reporting features to enable conservation managers, research scientists, GIS experts, and field personnel to predict and respond rapidly to threats like poaching, habitat loss, human-wildlife conflict, and more.

Attendees will discover how EarthRanger fosters collaboration, enhances situational awareness, and supports long-term data-driven conservation efforts, while lowering the barriers to entry and use for holistic GIS-driven conservation management tools.

https://www.earthranger.com/

Break

3:50 PM – 4:10 PM

Speed Networking

4:10 PM – 5:10 PM | Location: Confluence Center Auditorium

Join us for an hour to meet and network with fellow attendees!

Break

5:10 PM – 5:30 PM

Dinner

5:30 PM – 7:30 PM | Location: Headwaters Lodge

Map Gallery and Wine Reception

7:30 PM – 9:30 PM | Location: Roosevelt Room - Headwaters Lodge

Please join us and see what new maps your colleagues are making in 2025! Join your friends and colleagues for an evening of informal conversation. Reconnect with your colleagues and make new friends!

Fire Ring Social

9:30 PM – 11:00 PM | Location: Fire Ring

Don't miss our SCGIS tradition of an evening around the fire for conversation and connecting with our SCGIS community. Please find the NCTC fire pit just outside of the John R. "Rick" Lemon Building.

Tuesday, July 01, 2025

Breakfast

6:30 AM – 9:00 AM | Location: Headwaters Lodge

Breakfast will be served until 9:00AM (hot breakfast items will only be available until 8:30AM)

Keynote Address - Allen Carroll

9:00 AM – 10:30 AM | Location: Confluence Center Auditorium

Telling Stories with Maps: Lessons from a Lifetime of Creating Place-Based Narratives

Allen will reflect on a decades-long career of map-based storytelling, dating back through 14 years at Esri and 27 years at National Geographic, and spanning the dawn of the digital age. He'll discuss the special role of maps in weaving tales, and consider how combining maps and multimedia creates exciting storytelling opportunities.

Speaker

Allen Carroll

Program Manager, Storytelling | Esri

Group Photo & Coffee Break

10:30 AM – 11:00 AM | Location: Outside of the Auditorium

Curated Session: From Division to Justice: Reclaiming Mapping for Equity and Belonging - NorthStar of GIS by Clinton Johnson

11:00 AM – 12:00 PM | Location: Confluence Center Auditorium

Maps have long been used as tools of exclusion—drawing lines that separate, displace, and disenfranchise. In this talk, I'll trace the historical use of mapping to reinforce racial and social disparities, and challenge us to transform those same tools into instruments of justice. Grounded in both history and present-day practice, the session explores how GIS professionals can disrupt harmful legacies by reimagining who's in the room, who's represented in our data, and how mapping can be a force for equity, belonging, and liberation.

Speaker

Clinton Johnson

Executive Director | NorthStar of GIS

Lunch

12:00 PM – 1:00 PM | Location: Headwaters Lodge

SCGIS All Membership Meeting

1:00 PM – 2:10 PM | Location: Confluence Center Auditorium

Please join your fellow SCGIS members in person and online for the 2025 SCGIS members meeting. Hear from members of the SCGIS Board of Directors and the Membership Committee about the major initiative's of the Society, trends in membership, our current financials, and our goals for 2026 and beyond. Get introduced to new SCGIS regional Chapters by the energetic volunteers that organize and lead them. Come to listen, learn, and to share your views on the present and the future of our wonderful and welcoming society.

Break

2:10 PM – 2:30 PM

Training: NASA GIS-ready data and services for conservation -PART 1

2:30 PM – 3:30 PM | Location: Confluence Center Auditorium

The workshop will be led by Leah Schwizer, EGIST Lead and Holly Norton, Open Science Support Scientist. We look forward to

increasing your familiarity and comfort with using various methods to access and use NASA data in primary GIS tools while we walk through 2 interactive use cases based on participant input. We will focus on access and use through GIS services and tools, such as ArcGIS Pro, QGIS, Jupyter Notebooks, ArcGIS Online, to interact with NASA's ECOSTRESS, HLS, SWOT, OPERA, and GPM IMERG data products.

For those of you interested in attending, we advise you to visit thisGoogle drive link to access all the necessary data need to complete the exercises that will be conducted during the workshop.

As a note, you will need to bring your own laptop in order to follow along with the exercises.

Additionally, a NASA Earthdata account will be needed to access some of the workshop resources. Signing up is free and only takes a few minutes to complete. You can find a how-to guide by clicking this NASA link here.

Individual Presentations: Conservation Planning (Part 1)

2:30 PM – 3:30 PM | Location: 161IW in the Lemon Building

Implementing 30x30: Lessons from Country Case Studies by Brian Blankespoor

2:30 PM – 2:45 PM

The publication of nearly 600,000 species occurrence maps derived from the Global Biodiversity Information Facility provides an opportunity to reassess species protection, especially for plants and invertebrates. This aligns with the 30x30 initiative, where 188 governments aim to protect 30% of the planet by 2030. This study identifies protection opportunities in 10 countries across Latin America, Africa, and the Asia-Pacific, emphasizing the importance of local conservation efforts with particular attention to endemic species. A spatial algorithm assigns equal weight to all species, identifying priority areas for new protection to safeguard unprotected species. Findings reveal that existing protection levels and the spatial clustering of unprotected species greatly influence outcomes. Some countries can meet the 30% target, while others may need to exceed it. However, in all cases, spatial clustering enables significant protection gains through modest expansions of protected areas, demonstrating a path forward for enhancing biodiversity conservation within global commitments.

Identifying Habitat Connectivity Priority Areas Utilizing Omniscape and Zonation Conservation Planning Softwares by Mitchell Attig

2:45 PM – 3:00 PM

Utilizing Omniscape and Zonation conservation planning software combined with GIS the Tree For All collaborative set shared 15 year goals for protecting, stewarding and restoring habitat connectivity within the Tualatin river basin. Since Omniscape and Zonation by themselves would not be able to create these prioritization areas themselves, combining them both with simple GIS workflows allowed for a spatially relevant prioritization down to the conservation action recommended. This work helped identify priority areas for the collaborative's member groups to perform strategic land management, acquisition and outreach. This project could provide a roadmap for similar groups who are interested in identifying patterns for habitat connectivity that are not obvious on the ground. The Tree for All partners believe that a healthy Tualatin River Watershed ensures quality of life and will help the region adapt and thrive in the face of climate change by working together on nature-based initiatives through strong partnerships

Mapping The Nature of Fashion by Kellee Koenig

3:00 PM – 3:15 PM

Whether it's the leather in your shoes, the cotton in your T-shirt, or the wool in your sweater — nature provides the raw materials for our clothes. But most of our clothing is not produced sustainably. Deforestation, water use, pesticide pollution and greenhouse gas emissions are just some of the environmental impacts linked to the agricultural practices that underpin fashion. However, agriculture can be transformed to support climate, nature and livelihoods. Recently, the fashion sector has begun to meaningfully convene and coalesce on sustained and concerted actions to change their business-as-usual practices. This presentation will provide an overview of CI's partnership with the fashion sector, and the use of GIS to shine a light on their sourcing and identify opportunities to have a positive impact on nature

Strategic Distribution of Melipona rufiventris for Conservation and Socioeconomic Development in a Quilombo of the Brazilian Cerrado - Eduardo Cerqueira e Silva

3:15 PM – 3:30 PM

Melipona rufiventris, popularly known as the Uruçu Amarela do Cerrado, is a bee endemic to the Brazilian Cerrado biome, threatened with extinction due to habitat loss and the use of pesticides. The Furnas do Dionísio quilombo, located in Jaraguari, Mato Grosso do Sul state, has more than 100 families, of which 75 are farmers and live in harmony with the biome, and is located in a preserved Cerrado forest. Based on GIS, meliponaries (spaces for native stingless bees) with M. rufiventris were strategically distributed among twenty families. The spatial distribution of M. rufiventris is crucial to avoid inbreeding and genetic problems that can lead to the death of colonies. The expected result is to bring socioeconomic gains to the quilombolas with pollination by bees, production of honey and propolis, reproduction of bees, and to provide recolonization of the species in the Cerrado forest preserved around the quilombo area.

Training: Drones for Conservation 101 by Allison Schumacher

2:30 PM – 3:30 PM | Location: Gallery room - Headwaters Lodge

New to drones? Need a refresher? Join this introduction to drones with Allison Schumacher from Archbold Biological Station. The session will cover the types of drones (multirotor, fixed wing, VTOL) and drone sensors (RGB cameras, multispectral/ hyperspectral, thermal, and LiDAR) used for conservation applications. It will include data collection, flight planning, base stations, and data processing tools. Lastly, it will cover some of the challenges and regulations to be aware of when using drones. Come prepared to learn and bring your questions!

Coffee Break

3:30 PM – 3:50 PM

Training: NASA GIS-ready data and services for conservation - PART 2

3:50 PM – 5:30 PM | Location: Confluence Center Auditorium

This is a continuation of the training that begins at 2:30pm

The workshop will be led by Leah Schwizer, EGIST Lead and Holly Norton, Open Science Support Scientist. We look forward to increasing your familiarity and comfort with using various methods to access and use NASA data in primary GIS tools while we walk through 2 interactive use cases based on participant input. We will focus on access and use through GIS services and tools, such as ArcGIS Pro, QGIS, Jupyter Notebooks, ArcGIS Online, to interact with NASA's ECOSTRESS, HLS, SWOT, OPERA, and GPM IMERG data products.

For those of you interested in attending, we advise you to visit thisGoogle drive link to access all the necessary data need to complete the exercises that will be conducted during the workshop.

As a note, you will need to bring your own laptop in order to follow along with the exercises.

Additionally, a NASA Earthdata account will be needed to access some of the workshop resources. Signing up is free and only takes a few minutes to complete. You can find a how-to guide by clicking this NASA link here.

Individual Presentations: Conservation Planning (Part 2)

3:50 PM – 5:00 PM | Location: 161IW in the Lemon Building

Using Google Earth Engine to develop interactive mapping tools for conservation planning by Jane Kunberger

3:50 PM – 4:05 PM

Recent advances in geographic information systems platforms and increased accessibility of remotely sensed imagery have provided researchers with more opportunities to inform conservation actions at large spatial scales. One such platform, Google Earth Engine (GEE), offers users access to a vast catalog of remotely sensed data and rapid cloud computing capabilities as well as the ability to create web-based mapping tools (GEE Apps) to visualize and share data with a wider audience. We present two case studies demonstrating how researchers can utilize GEE for these purposes. Our first case study focused on the Upper East Gulf Coastal Plain and East Gulf Coastal Plain ecoregions in Louisiana, which includes seven conservation opportunity areas identified in Louisiana's 2015 State Wildlife Action Plan as priority locations for the conservation of Species of Greatest Conservation Need. In our second case study, we focused on Ashe juniper (Juniperus ashei)-oak (Quercus) forests in the Edwards Plateau and Cross Timbers ecoregions in Texas, where several species of conservation concern are at risk due to habitat loss and degradation. In both case studies, we used GEE to quantify changes in land cover and developed GEE Apps that integrate our results with publicly available data. We also included custom functions to examine historic and projected land cover change in areas of interest, providing stakeholders with tools to identify priority conservation areas. Our case studies highlight how researchers can leverage GEE to process large datasets, model land cover, and create user-friendly tools that enhance conservation decision-making and stakeholder engagement.

Geospatial Technologies Supporting Conservation Horticulture by Kayla Flamm

4:05 PM – 4:20 PM

Botanical gardens play a key role in preserving rare and threatened plant species through conservation horticulture. The knowledge gained by horticulturists through plant exploration, research, and propagation trials is critical to ensuring the preservation of plants at risk. At Missouri Botanical Garden, we use geospatial technologies to inform our decisions about what plants to collect and where to collect them from and how to prioritize our limited resources.

This talk will briefly explore how the Missouri Botanical Garden uses Esri technologies to plan and conduct field work and some of the GIS-based proxy methods used for improving diversity of plant collections. The talk will also include a few examples of drone usage for plant census.

GIS-Based Multi Criteria Decision Making Analysis for Solid Waste Landfill Site Selection: A Case of Bahir Dar City, Ethiopia by Hailemariam Misganaw Shiferaw

4:20 PM – 4:35 PM

Solid waste management is one of most serious problems the world facing, specially in developing countries. Landfilling is one of the easiest and economical systems which is commonly utilized for sustainable management of solid waste. Nevertheless, unless scientifically sited and managed properly, it will result in environmental and socio-economic problems. Bahir Dar is currently using random dumping sites that is not sustainable. It is found necessary to study and select new landfill site for the city in sustainable way. This study integrates GIS and multi criteria evaluation (MCE) technique for selecting suitable landfill sites. Slope, depth to ground water table, soil permeability, LULC, road proximity, airport proximity , water well proximity, water bodies proximity, drainage networks proximity were used as factors. GIS based MCE was employed to support the complex spatial decision making. The factor were reclassified and standardized in GIS followed by their suitability. Internal suitability of factors was carried out by giving suitability scale value from restricted to the most suitable and the pair-wise comparison technique in Analytical Hierarchy Processes was used to derive importance weights for factors. More weight was given to environmental and public health related criteria to protect from pollution and contamination due to landfilling effects. Weighted Linear Combination was also used to integrate the factor maps and produce overall landfill suitability map. As a result, 50.97km2(22.22%), 9.06km2 (3.95%), 4.99km2(2.17%) and 164.35km2(71.66%) of the total study area was found to be highly suitable, moderately suitable, poorly suitable and unsuitable for landfill siting, respectively.

Using GIS to guide conservation, fisheries, and land use planning by integrating Marine maps & Land Use Mapping - Kalesi Tuitui

4:35 PM – 4:50 PM

GIS has enabled us to map important conservation areas and critical wildlife corridors within Kenyan Conservancies. through customization and digitization of data collection tools, we have been able to overcome the challenge of inconsistent and sporadic data access and minimise excessive field travels for data collection. Interactive maps and dashboards have enhanced access to information and visualization of real-time data that has enabled informed decision making. Our approach is focused on a collaborative approach that centers on community led solutions. Attendees will learn practical GIS.

Break

5:00 PM – 5:30 PM

Dinner

5:30 PM – 7:30 PM | Location: Headwaters Lodge

Wine Reception

7:30 PM – 9:30 PM | Location: Roosevelt Room - Headwaters Lodge

You are invited to join your friends and colleagues for an evening of informal conversation. Reconnect with your colleagues and make new friends!

Fire Ring Social

9:30 PM – 11:00 PM | Location: Fire Ring

Don't miss our SCGIS tradition of an evening around the fire for conversation and connecting with our SCGIS community. Please find the NCTC fire pit just outside of the John R. "Rick" Lemon Building.

Wednesday, July 02, 2025

Breakfast

6:30 AM – 9:00 AM | Location: Headwaters Lodge

Breakfast will be served until 9:00AM (hot breakfast items will only be available until 8:30AM)

Activity: Bird Walk with NCTC Ornithologist Jim Siegel

6:30 AM – 7:30 AM | Location: Bridges at the Commons

Take a 1-hour bird walk with NCTC ornithologist Jim Siegel, meeting at the Bridge at the Commons, binoculars provided. Wear good walking shoes and a coat. We will walk along NCTC paths through the woods and around Central Pond and back. Birds we will observe by sight and sound include Northern Cardinal, Carolina Wren, Eastern Bluebird, Red- bellied Woodpecker, and Red- winged Blackbird, among others.

Individual Presentations: Conservation Apps, Tools, and Databases - PART 1

9:00 AM – 10:00 AM | Location: 160IW in the Lemon Building

Enhancing the stories and management of our National Forests and Grasslands with geospatial tools by Christina Sabochick

9:00 AM – 9:15 AM

At the National Forest Foundation, we are leveraging geospatial tools for storytelling, data management, analytics, and more. The National Forest Foundation's GIS program is working on fully integrating these tools across the organization to make workflows more efficient, avoid duplication of effort, and tell more powerful stories. This presentation will cover lessons learned in the beginning stages of this transformative work and considerations for the future. We will share specific examples of, and tips and tricks associated with, projects, processes, and products that have already been launched. Whether your GIS program is just starting or more established, we hope our findings will generate ideas that you can directly incorporate into your work.

Building a Public Platform to Monitor 30x30 Conservation Goals by Brendan Jarrell

9:15 AM – 9:30 AM

To promote transparency around the global 30x30 conservation goal, SkyTruth developed the open-access Progress Tracker—a tool that brings together key spatial datasets to evaluate how much of the planet is truly protected. Leveraging GIS, we combined dozens of global data layers related to land and ocean protections and conservation value into a single, easy-to-use platform designed for non-experts. This process involved standardizing data formats, resolving spatial overlaps, and creating clear, intuitive visualizations. The resulting system enables policymakers, advocates, and communities to explore protection status by country or habitat, pinpoint conservation gaps, and monitor progress over time. In this presentation, we'll share the vision behind the platform, its current development, and our approach to making complex geospatial data accessible to the public

Leveraging the Cloud-Native Geospatial Stack for Conservation GIS by Christian Gass

9:30 AM – 9:45 AM

Once GIS work is completed, one challenge we often face pertains to the delivery of data products over the short- and long-term: how do we ensure that the geospatial-based information is available for broad public audiences, while simultaneously ensuring that raw data are available for future efforts to build from? How do we deliver data at web speed and keep expenses low? With conservation GIS analyses often performed at broad scales using raster data and large data sets, balancing delivery and cost can be particularly challenging.

This talk describes the use of cloud-first and cloud-native geospatial formats and technologies to efficiently serve up broad-scale conservation mapping analyses, such as Cloud-Optimized GeoTiffs, TiTiler, Spatio-Temporal Asset Catalogs (STAC), and cloud-based Object Stores. We showcase a few example conservation mapping projects that use this technology.

Leveraging GIS for Large Carnivore Conservation in the Greater Kafue Ecosystem by Blessing Samalesu

9:45 AM – 10:00 AM

As Panthera, an organization with a mission to ensure a future for wildcats, we leverage GIS technology to support the monitoring of carnivore species such as Lions, Leopards, and Cheetahs. GIS-based spatial analysis plays a crucial role in designing our camera trap surveys and spoor transects, which are key methods for estimating Lion and Leopard population densities and analyzing species distribution within Kafue National Park and its surrounding Game Management Areas. This data is crucial for informing ecological baselines, guiding ecologists to set sustainable trophy hunting quotas, and prioritizing areas for anti-poaching patrols and resource allocation. Additionally, we deploy GPS telemetry collars to track the movements of Lions, Cheetahs, and Wild Dogs, enabling the estimation of their home ranges and habitat use and encouraging collaborative protection strategies among conservation partners operating in the landscape. Altogether, Panthera contributes significantly to an adaptive management approach that supports more informed and responsive conservation.

Individual Presentations: Ecosystem Restoration

9:00 AM – 10:00 AM | Location: 161IW in the Lemon Building

Mapping and Prioritizing Freshwater Mussel Conservation and Restoration in the Virginia Chesapeake Bay Watershed by Shiva Torabian

9:00 AM – 9:15 AM

Freshwater mussels are important components of biologically diverse aquatic communities, yet they are the most imperiled group of animals in North America due to habitat alteration, pollution, exotic species, and other factors. Freshwater mussels play critical roles in aquatic ecosystems by filtering water, cycling nutrients, providing food sources, and maintaining habitats. Identifying suitable mussel habitats and prioritizing areas for conservation and restoration are essential for protecting these species and the ecosystem services they provide, which is why the Virginia Natural Heritage Program (VNHP) developed mapping tools to guide these efforts.

Potential Freshwater Mussel Richness (PFMR) layer represents predicted habitat diversity of 19 native freshwater mussel species within the Virginia portion of the Chesapeake Bay watershed. By integrating species-specific habitat models, the PFMR offers a comprehensive view of mussel richness and serves as a key resource for guiding conservation and restoration efforts. This layer is closely related to the Flow Buffers Prioritized for Conservation and Restoration layer, which utilizes the PFMR to delineate flow buffers for targeted conservation and restoration efforts. Buffers of different widths were established based on topographic flow paths, stream sources, and soil sensitivities, and were strategically prioritized based on mussel richness and rarity, nutrient loading, and land cover characteristics to ensure that interventions are placed where they will have the most impact on water quality and mussel habitat enhancement. Together, these layers serve as strategic planning tools for resource managers, conservation organizations, and policymakers to prioritize efforts that maximize ecological benefits and support freshwater mussel population recovery.

Industry in Decline: Using LiDAR to identify Highwall mining operations and evaluate the true cost of ecosystem restoration by Christian Thomas

9:15 AM – 9:30 AM

Despite the political clamor to "bring back coal", the coal production has been declining since 2008. As the industry declines, a key focus for environmental advocates and local communities is assessing the extent to which federally required bonds are adequate for restoring mined lands in instances where operators fail to do so. For surface mines in Appalachia, highwall operations constitute the most expensive portions of mines to reclaim; therefore identifying these features is critical in the evaluation of bond efficacy. Join us, to learn how SkyTruth is using LiDAR data to create the first regional dataset of highwall operations, how this dataset is used to estimate the true cost of ecosystem recovery, and how it can be leveraged to hold mine operators accountable for their required restoration efforts.

From Erosion to Restoration: Addressing Land Degradation Challenges in the Ethiopian Highland by Afework Mekeberiaw Worku

9:30 AM – 9:45 AM

Severe land degradation in the Ethiopian Highlands has long threatened food security and ecosystem stability. This study leverages GIS to document and quantify the impact of extensive Soil and Water Conservation (SWC) and afforestation efforts over the past two decades. Using spatial data from the Ministry of Agriculture and the InVEST model, we analyzed changes in forest cover, bare land reduction, and soil erosion rates. Findings show a remarkable restoration of 28 million hectares, with forest cover doubling and soil erosion on cultivated land reduced by more than half. GIS enabled precise measurement and visualization of these changes, providing invaluable insights for sustainable land management. This study demonstrates the power of geospatial analysis in tracking environmental restoration and offers attendees practical methodologies for landscape-scale conservation planning

Anthropogenic pressures on South American flamingos by Nicolás Lois

9:45 AM – 10:00 AM

We assessed the vulnerability of South American flamingos: the Chilean flamingo (Phoenicopterus chilensis), the Andean flamingo (Phoenicoparrus andinus), and the James flamingo (Phoenicoparrus jamesi). Using all available eBird records and two reproductive time series spanning the past 50 years, we analyzed the effects of climate change in north-central Argentina and the expansion of lithium mining in the high Andes. The projected increase in lithium extraction, with at least 30 new projects planned in Argentina over the next six years, will primarily impact Andean and James flamingos due to their dependence on high Andean wetlands. In contrast, Chilean flamingos, which breed in both Andean and lowland wetlands, face greater exposure to pressures such as urban expansion and agricultural development. Climate change models predict increased winter precipitation in central Argentina, with significant spatial variability and uncertainty in trends through 2070. The high mobility of Andean and James flamingos across wetlands in Argentina, Bolivia, and Chile highlights the urgent need for coordinated international conservation strategies. Despite their ecological significance, knowledge gaps persist for all three species. We underscore the critical role of the Mar Chiquita salt lake as a key habitat and conservation stronghold, and advocate for the implementation of evidence based conservation programs in this recently designated national park.

Individual Presentations: Deforestation & Reforestation

9:00 AM – 10:00 AM | Location: Gallery room - Headwaters Lodge

Analyzing Deforestation in Three DR Congo World Heritage Sites Using Global Forest Watch Alerts by Joel Masselink

9:00 AM – 9:15 AM

Monitoring forest loss in tropical regions is difficult due to the lack of freely available data, persistent cloud cover, and various human activities driving deforestation. We used Global Forest Watch's Integrated Deforestation Alerts to study patterns of forest clearing over time in three UNESCO World Heritage Sites in the Democratic Republic of the Congo. We developed a workflow to transform raw alert data into visualizations showing where and when deforestation was most intense. This helped us better understand pressures from agriculture expansion, mineral extraction, and fuelwood harvesting. These near real-time alerts help conservation practitioners see forest changes as they happen, potentially improving their ability to respond. Conference attendees will learn practical tips for using these alerts to create useful evidence for protecting similar threatened forests worldwide.

Finding unmapped old forests in Vermont using a novel application of MaxEnt habitat suitability modeling by Alex Vanko

9:15 AM – 9:30 AM

Vermont is one of the most forested states in the U.S., but only a small fraction of it consists of "old forest" - mature, undisturbed stands over 150 years old. To protect these rare and important ecosystems, we must first find them. Wildlands Network, in partnership with the Vermont Fish and Wildlife Department, created a predicted old forest map covering the entire state of Vermont. We used a novel application of maximum entropy modeling to predict the presence of the old forest ecotype itself, rather than an individual species. Using several environmental and forest structure datasets as predictors, the MaxEnt model searches for stands with similar structure to known old forests already mapped by VFWD. We then partnered with researchers at the University of Vermont to test the map in the field and successfully map unknown old forests. This method promises to help field practitioners target their efforts more efficiently when working with rare ecosystems.

Machine Learning-Driven Estimation of Forest Aboveground Biomass Using GEDI LiDAR and Multi-Sensor Earth Observations by Hamdi Zurqani

9:30 AM – 9:45 AM

Accurate monitoring of forest carbon stocks is essential for understanding the global carbon cycle and promoting sustainable forest management. However, obtaining reliable ground-based measurements for spatially continuous aboveground biomass density (AGB) maps remains challenging. This study integrates open-access GEDI LiDAR data with optical and microwave satellite observations to improve AGB estimation. Using machine learning (ML) on Google Earth Engine, four models—Gradient Tree Boosting (GTB), Random Forest (RF), Classification and Regression Trees (CART), and Support Vector Machines (SVM)—were evaluated. GTB outperformed others, achieving an R^2 of 0.77, MAE of 22.27 Mg/ha, and RMSE of 37.78 Mg/ha using Sentinel-2 spectral bands and topographic data. RF followed closely (R^2 = 0.74), while CART showed moderate performance (R^2 = 0.68). SVM performed poorly (R^2 = 0.37). Results highlight that combining spectral bands, vegetation indices, topography, and canopy height significantly enhances AGB estimation. GTB emerged as the most reliable model, demonstrating its potential for operational forest biomass mapping. Integrating remote sensing data and advanced ML techniques improves biomass assessments, offering better insights into forest carbon dynamics and supporting informed forest management decisions.

Reforestation feasibility from regional to local parcel-level scales: an example workflow to assist outreach and program design by David Richardson

9:45 AM – 10:00 AM

Reforestation, planting trees on formerly cleared lands, represents a powerful opportunity for carbon sequestration while also expanding wildlife habitat, improving terrestrial connectivity, restoring ecological function, and providing clean air and water to local communities. Within a reforestation demonstration region in New York, USA, The Nature Conservancy (TNC) has used GIS to identify specific locations where intensive agricultural activity no longer occurs but where natural forest regeneration may be limited. Spatial filters aid in targeting outreach activities towards areas where reforestation is compatible with other conservation goals and away from potential conflicting land uses (like early successional habitat conservation areas or renewable energy siting). Other filters assist in locating larger acreage parcels with challenging soils and unenrolled lands inside agricultural districts. These mapping efforts aid landowner outreach, illuminate locally specific conditions for reforestation efforts, support discussions with local partner organizations, and provide a framework for scaling these efforts to other geographies

Coffee Break

10:00 AM – 10:20 AM

Individual Presentations: Conservation Apps, Tools, and Databases - PART 2

10:20 AM – 11:20 AM | Location: 160IW in the Lemon Building

Democratizing Access to Spatial Information for Enhanced African Conservation Decision-making & Collaboration by David Williams

10:20 AM – 10:35 AM

Africa is both the world's fastest developing continent and most vulnerable to climate change threatening its natural heritage and conservation assets. We believe that business intelligence (BI) tools can help unlock the conservation potential of the spatial data explosion, enabling agile, targeted evidence-based decision-making. This presentation will show our findings that BI tools can empower non-technical stakeholders to make smarter, faster conservation and development decision-making for scaled impact across the phases of planning, management, and monitoring/evaluation. By placing various stakeholders, often including multiple government sectors, on the same page, these tools facilitate a common understanding and streamline effective collaboration. Multi-sectoral partnerships are crucial to scale application and impact. While BI systems lower barriers to spatial information and insights for stakeholders, capacity development and internet constraints remain challenges. This talk will provide attendees insights into what is possible from a dedicated, multi-year effort to harness BI tools for conservation.

GIS Transforming Community-Led Conservation: Innovative Spatial Approaches for Kenya's Conservancies - Nancy Neema

10:20 AM – 10:35 AM

GIS has enabled us to map important conservation areas and critical wildlife corridors within Kenyan Conservancies. through customization and digitization of data collection tools, we have been able to overcome the challenge of inconsistent and sporadic data access and minimise excessive field travels for data collection. Interactive maps and dashboards have enhanced access to information and visualization of real-time data that has enabled informed decision making. Our approach is focused on a collaborative approach that centers on community led solutions. Attendees will learn practical GIS.

Enhancing Patrol Coverage through Grid-Based Mapping in the West Lunga Ecosystem by Shirley Mashewani

10:35 AM – 10:50 AM

When I started creating patrol coverage maps for the West Lunga ecosystem, I discovered that our teams were not covering as much area as possible; they would leave out information. So, I came up with a way to divide our protected areas into grids with centroid coordinates to help our teams reach areas that they could not before and discover new entry points for poachers and water bodies. This has been so used to the entire area's management unit (AMU), the patrol coverage improved, and we can get more results from field patrols. This can also help others better understand their areas.

Individual Presentations: Land Cover Change

10:20 AM – 11:20 AM | Location: 161IW in the Lemon Building

Deforestation and Land Use/land Cover patterns at critical mineral industrial parks in Indonesia by Molly Schreier

10:20 AM – 10:35 AM

Since 2009, Indonesia has mandated the development of domestic mineral processing capabilities as a form of commodity downstreaming. However, these activities may pose increasing risks to the land sector, particularly by contributing to deforestation and land use land cover (LULC) change. In this study, we utilize our Indonesian industrial parks (IP) dataset, which documented land acquisition disputes and negative environmental impacts associated with nickel, aluminum, and copper IPs. We focus on 19 critical mineral IPs in Indonesia, employing a combination of open-source materials, Google Earth and 2024 Sentinel imagery to assess their environmental footprint. We also examine spatial relationships between IPs and mining areas, land clearing mechanisms within IP polygons from 2009 to 2024, and patterns of LULC change in surrounding buffers. We expect to find evidence of land banking and indirect LULC impacts surrounding critical mineral IPs, highlighting the broader environmental consequences of Indonesia's industrialization policies.

The Effects of Urbanization on the Barbados Landcover and Ecology by Grahame Niles

10:35 AM – 10:50 AM

Through use of earth observation data and established geospatial processing routines, a comprehensive analysis can be established to identify land-use trends and quantify the extent of categorical land-use changes over a specified period. Earth observation data provide a cost-effective means to support this goal due to their extensive spatial coverage and scalability, varied spatiotemporal resolution, and spectral complexities.

This research investigates the dynamics of land cover change in Barbados and its impact on the viability of ecosystems and biodiversity. Using remote sensing techniques, we classify and identify the conversion of natural landscape into urban infrastructure and agricultural areas. Using spatial analysis, we then attempt to identify and quantify key trends, including the loss of vegetated areas. More importantly, our efforts will emphasize the linkages between land cover/land-use change analysis, and establishment of decision-making frameworks for national policies on sustainable development and resilience in small island developing states such as Barbados.

Mapping Global Human Modification by Zachary Simek

10:50 AM – 11:05 AM

Human-caused habitat change is the leading driver of the global biodiversity crisis and poses a significant challenge to achieving ambitious climate and conservation goals. This talk will introduce innovative approaches developed by The Nature Conservancy (TNC) and partners to globally map ecosystem modification and conversion risks. We will describe the recent development of comprehensive, high-resolution maps of human modification (HM) that measure cumulative threats to terrestrial ecosystems from industrial human activities that have occurred from 1990 to 2022. Using readily available global datasets, we mapped the location and intensity of 16 threats, organized into 8 threat classes. Overall human modification (H) was calculated across a full gradient from 0 (unmodified or "wild") to 1 (highly modified or developed) at a 300m resolution. In 2022, 43% of terrestrial lands had very low levels of modification, while 27%, 20%, and 10% had low, moderate, and high modification, respectively. These HM maps are used to assess global trends in ecosystem extent and condition and forecast potential future habitat loss.

Land Use Change Monitoring: A Rupununi Perspective by Mia Pierre

11:05 AM – 11:20 AM

The Rupununi is a landscape that has been long recognized for its biodiversity and intact ecosystems. One of the major contributing factors to the preservation of the landscape is the presence of indigenous peoples. However, with growing interest from investors in expanding mining operations and agricultural intensification, there is a growing need for monitoring land use change in the Rupununi. Building on Guyana's successful national forest monitoring system (MRVS) that utilizes satellite imagery and GIS dashboards, we will implement a methodology integrating cloud-based satellite imagery, and participatory mapping with local stakeholder groups. The study will: (1) quantify deforestation/degradation patterns using Sentinel-2 and RADAR data to overcome cloud cover; (2) analyse competing land claims. Expected outcomes include a publicly accessible dashboard tracking land changes and policy recommendations for sustainable management of the landscape. This work directly responds to the Rupununi's unique ecological status.

Scholar's Presentations (Recordings)

10:20 AM – 11:50 AM | Location: Gallery room - Headwaters Lodge

Assessing freshwater bird community composition considering environmental variables effects using GIS-based analysis - Georgina Squartini

10:20 AM – 10:35 AM

Freshwater bird community composition in southwestern Santa Cruz, Argentina
has not been explored yet. In the global context, climate change and habitat fragmentation are currently some of the major menaces to bird species. Using GIS analyses and a dataset of waterbird bird community monitoring surveys, I evaluate the relationships between species composition and environmental and climate variables such as temperature, precipitations, macrophyte cover, water quality, among others. The main findings show a description of how community parameters change along different variables and how climate shapes the freshwater bird community. The results will contribute to stakeholders information when re-evaluating conservation areas and national park ranger efforts. This information will also help researchers to plan more accurate conservation plans and focus areas for bird studies.

Developing conservation and management options for the Western Highlands of Cameroon: the GIS approach - Rodrigue Nodem Fomene

10:20 AM – 11:50 AM

Within the framework of the project: "Removing barriers to biodiversity conservation, land restoration and sustainable forest management through Community Based Landscape Management _COBALAM", Rainforest Alliance developed options for biodiversity conservation and sustainable management of the Mounts Bamboutos and Mounts Bana-Bangangté-Bangou Landscapes (the Western Highlands of Cameroon). The methodology involved consultations with The Landscape Management Board (a platform for exchange and consultation between the councils, chiefdoms, communities), land Scale and geospatial approaches for diagnostic, delineation, assessment of natural resources and other potentialities of the landscapes. As results, Land Use and Land cover/ change maps, figures, graphics and illustrations were designed and degraded areas identified. Areas where afforestation is needed have also been
estimated to optimize management options and inform decision making of the landscapes. This work presents the Geospatial contributions in the process.

Mapping Roots and Routs: a GIS exploration in Balakhop Village, Semjong Geog under Tsirang Dzongkhag - Bhuwan Kafley

10:20 AM – 11:50 AM

This study explores the feasibility for agricultural land development at Balakhop village at Semjong Geog (Block) under Tsirang Dzongkhag (District) located in the southern part of Bhutan, with the objective of enhancing food security, promoting rural livelihoods, and supporting sustainable land use practices. The study assesses the suitability of selected fallow land proposed by community for developing for agricultural purposes by analyzing key factors such as water availability, topography and accessibility. By using GIS tool, the feasibility of Agricultural land development will be determined in the proposed area. The findings show which land areas will be feasible to be improved and additionally it will determine the investments in land improvement and capacity building for the local farmers. The proposed agricultural development is both technically feasible and socio-economically beneficial. The study concludes with recommendations for implementation in other project sites, stakeholder engagement, and sustainable management strategies to ensure long-term success.

From the classroom to the schoolyard and beyond: measuring the effects of ecological restoration on increasing habitat connectivity for butterflies through the use of geoapps - Gimena Pizzarello

10:20 AM – 11:50 AM

Anthropovicariance is a phenomenon characterized by human generated selective
pressures that force populations to become isolated through the effects of landscape fragmentation. While cities disrupt the fluid movement of species within landscapes, conservation actions such as the planting of native host plants and nectar resources for pollinators may restore connectivity within urban settings. Community science empowered through the use of geoapps offers larger scale information sharing, which is vital for measuring the effects of these types of conservation actions on wildlife populations.

Rediscovery and update of Galictis vitatta (Mustelidae) for Huila Colombia - Carolina López-Castañeda

10:20 AM – 10:35 AM

Greater Grison Galictis vitatta is an agile, medium-sized carnivore distributed from
southern Mexico to northern Argentina. In the Huila - Colombia the only published
record is from 1903. However, there is anecdotal information about its presence. The research group EBE - Universidad Surcolombiana and the Natural History MuseumMaría Belén Rivera Gualy collected information with local observation groups and social networks. They were able to collect 17 records confirming their presence in the communities of 9 contries, many of them in areas with anthropic activities. In addition, these data confirm their presence in different ecosystems and their ecological relevance in population dynamics.

Understanding Elephant Movement Patterns in the Mosi-Oa-Tunya Wildlife Dispersal Area: Home Range Dynamics and Seasonal Variations - Kevin Zisadza

10:20 AM – 11:50 AM

Within the Mosi-Oa-Tunya Wildlife Dispersal Area, part of the Kavango Zambezi Trans-Frontier Conservation Area (KAZA TFCA), wildlife dispersal and movement patterns are key components crucial for the conservation and protection of community livelihoods. This research investigates the movement patterns and home ranges of elephants within the Mosi-Oa-Tunya Wildlife Dispersal Area, part of the Kavango Zambezi Trans-Frontier Conservation Area (KAZA TFCA). Utilizing tracking data from collared elephants, the study employs a mixed-methods approach to analyse spatial and temporal dynamics. Findings reveal that female elephants predominantly inhabit protected areas, while males often overlap with human settlements. Additionally, home ranges are significantly smaller during the dry season compared to the wet season. The research highlights that core areas, where elephants concentrate, closely correspond with regions of high resource availability, particularly water and forage, especially along river lines and artificial water points

Mapping Community Conservation Areas - Jacob Kimagl

10:20 AM – 11:50 AM

Lunch

11:30 AM – 1:00 PM | Location: Headwaters Lodge

Activity: Sacred Heart Herbal Sanctuary (Off-Campus)

2:00 PM – 3:00 PM

Join SCGIS conference attendees for a tour of Sacred Roots Herbal Sanctuary from 2-3pm on Wednesday, July 2nd. Located just a 15 minute drive from NCTC, Sacred Roots is a woman owned, community run, small scale, people powered medicinal herb farm located in the rolling hills outside of Shepherdstown, West Virginia. Our guided tour is a unique opportunity to touch, nibble and sniff our way through the gardens when they're at their most abundant.

Logistics:
- limited to ~15 people. Sign up here.
- fee of $8/person made in cash or via Venmo on the day prior.
- meet our guide at Visitor Parking (1799 Persimmon Ln, Shepherdstown, WV 25443)

Sign-up here: https://docs.google.com/spreadsheets/d/1VcjP7bRDFR_6SzKq345e7IrKJBTl0Q6QHMt07ajZK-o/edit?usp=sharing

Activity: Cornhole Tournament

3:30 PM – 5:00 PM | Location: Between Headwaters & Gym (open grass area)

Join your friends and colleagues for a Cornhole Tournament!

Break

5:00 PM – 5:30 PM

Dinner

5:30 PM – 7:30 PM | Location: Headwaters Lodge

Activity: Tree Walk with NCTC Guide

5:30 PM – 6:30 PM | Location: Headwaters Lodge Patio

Take a walkabout to learn about native trees and wildflowers of the season and their connection with this historic land on the Potomac River. Wear appropriate foot and outerwear.

Meet at the Headwaters Lodge Patio