

# NEWSLETTER

3rd Edition | June 2021

**LEADING**

**GREAT DISCOVERIES**

NANA ADUSEI POKU - GHANA NATIONAL PETROLEUM CORPORATION

**EMBRACING**

**GEOSPATIAL**

**INFRASTRUCTURE**

OKLA ROSEMARY - GHANA GEOLOGICAL SURVEY AUTHORITY

**BEST MAPS DEVELOPED BY**

**GIS PROFESSIONALS FOR**

**VARIOUS INDUSTRIES**



# The M.D's Foreword

It is with great pleasure to welcome you once again to this edition of our newsletter. This newsletter features important applications of GIS Technology in different industries.

GIS Technology involves the visualization of spatial data, as well as pinpointing trends and correlations that result in actionable information. The technology takes advantage of Geographic Information System (GIS) tools to offer data-driven insights that cover various use cases.

Sambus Geospatial Limited (SGL) continues to work towards becoming a distinguished organization in the application and advancement of geospatial knowledge and technology for effective planning, management, operations, and enhanced decision making in West Africa. Our products are being utilized by experts in creative ways to find solutions to problems, enhance performance, and to protect life and property.

This third edition of the Newsletter showcases the various ways different industries are leveraging on location intelligence to visualize and analyze geospatial data to gain understanding, and insight. This helps businesses to make informed decisions and make intelligent predictions.

My deepest appreciation to the geospatial community for their continuous support in the development of the newsletter.

Warm Regards



**Akua Aboabea Aboah**  
**Managing Director**  
  
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# UK 2021

## WE'RE BRINGING THE ESRI USER CONFERENCE TO YOU AGAIN

July 12-15, 2021 | Virtual Event

Join the global GIS community for our virtual Esri User Conference. Watch the plenary Session live, explore libraries of technical sessions and user presentations, and engage with peers and Esri experts - all from anywhere in the world. Registration is complimentary for users currently on maintenance and submissions, as well as recent graduates and current students.

Sign up at [esri.com/uc](https://esri.com/uc)





# INTERVIEW SESSION



**NANA ADUSEI POKU**

Head of GIS and Mapping Unit  
Ghana National Petroleum Corporation (GNPC)

**Kindly tell us about yourself and your company?**

I am the head of the GIS and mapping unit at Ghana National Petroleum Corporation (GNPC). It is the national oil company for the Republic of Ghana in charge of exploring, appraising, production, and decommissioning of hydrocarbons onshore and offshore

**Can you share your insight on your role in the company as a GIS advocate?**

My role involves a lot of presentations and pushing the management and leadership for opportunities to show what GIS can do to improve our processes during surveys, data processing, analytics and beyond

**What informed your company to settle and incorporate Location Intelligence Systems their workflows?**

80% of our data has a geospatial component. My leadership is aware of that and hence using ArcGIS products and solutions came naturally. The product is also flexible and can fit into many other systems and solutions

**Kindly enlighten us on any Project your team undertook using GIS tools.**

Assessing And Proposing New Oil Blocks for Licensing in Ghana's First Oil & Gas Bid Rounds.

## "LEADING GREAT DISCOVERIES"

Speaking with Nana Adusei Poku, the Head of GIS and Mapping Unit and Lead Geomatic Engineer at Ghana National Petroleum Corporation.

After the passage of Act 919 in August 2016, government focused on developing strategies to award E&P Rights through the more favored Licensing (Bidding) Rounds System. In line with this aspiration, a committee was commissioned to undertake various technical evaluations, including an assessment of the prospectivity of the offshore area and provide input that will be used to develop strategies for the first block licensing rounds. At this point, ArcGIS was used to conduct graticulation and sub-division of blocks, determining available acreages including forecast of possible relinquish areas, auditing data covering the available acreages, conducting assessment of data gaps in terms of quality and coverage, ranking the prospects on the basis of potential risks and developing a final activity map with demarcation of possible contract areas for licensing

**Elaborate on the main challenge you faced during the utilization of the solution?**

"It was a new and innovative approach to have the entire process done in ArcGIS. Indeed, a lot of presentations and education went into how GIS could bring all this together and make it easier for everyone involved. So, I would say the challenge was "Buy-In". A lot of presentations and updates were needed to give full confidence in the process

**How does your team keep themselves abreast and updated with the newest updates on our GIS infrastructure?**

The user conference (UC) is a great way to keep us updated. Initially, the cost to attend the UC was costly as it involves travelling and other related expenses. But I understand similar conferences are held within Africa UC which may be more affordable to participate in and should be done more frequently. Today, the UC is held Virtually, at no cost at all. This is the best offer we can get to witness all new updates developed within the GIS Infrastructure.

**In your opinion, what is the most important quality a GIS professional needs?**

In my opinion, I would say Adaptability is the most important quality a GIS professional need. GIS alone is not the answer or solution, but the ability to adapt, learn and take on new skills is the difference between survival and thriving in the industry.

**Do you often recommend our solution to other individuals or institutions?**

Oh yes, I do. Ghana Maritime Authority (GMA), Petroleum Commission, among other related industries have all integrated GIS solutions in their operations as a result of direct recommendation from myself.

**Per your experience with Sambus Geospatial, how can we help improve your accessibility to any of our services?**

I think Sambus Geospatial should organize more industry specific workshops, boot camps and other related events. I strongly believe it would boost the public's interest in learning and using GIS.

**Any further advice you would like to give to the public on why they should embrace the use of Geospatial tool/ GIS in their projects?**

Absolutely! ... I would advise that the public embraces it because it gives an additional and relevant perspective. The ability to spatially reference something and display it can and may lead to great discovery. Everyday smart phones have given us the ability to map things out and visualize seamlessly. We see how useful it is in our everyday lives such as Google, Bing, Uber, and Amazon. I believe we are in an age of Geospatial and Geographic awareness and all efforts should be made to encourage and promote GIS for the benefits are abound.

# ArcGIS Survey123

Smarter forms, smarter data collection

1

Quickly create powerful surveys

Use the Survey123 website or the Survey123 Connect desktop app to create robust surveys. Both apps publish simple to complex surveys into ArcGIS.

2

Get answers from anywhere

In any environment and with minimal training, use the Survey123 web app and mobile app to record survey answers on the desktop or mobile devices.

3

Analyze results to make better decisions

Analyze answers in real-time to support decision-making. View summary analysis right in the app. Perform deeper analysis of Survey123 data in ArcGIS.

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R12i

- |   |   |   |
|---|---|---|
| <b>8 mm H / 15 mm V</b><br>Real time kinematic precision        | <b>2 cm H / 5 cm V</b><br>CenterPoint RTX precision | <b>Receive &amp; Transmit</b><br>Wideband UHF radio, up to 2 Watt |
| <b>Android &amp; iOS</b><br>Platform support for BYOD workflows | <b>672</b><br>GNSS channels                         | <b>Integrated</b><br>GNSS antenna                                 |

The Trimble R12i delivers unmatched GNSS performance, speed and accuracy to boost your productivity like never before. With improved performance in challenging GNSS conditions and robust IMU-based tilt compensation that lets you forget about leveling the pole, you'll get more done faster than you thought possible.

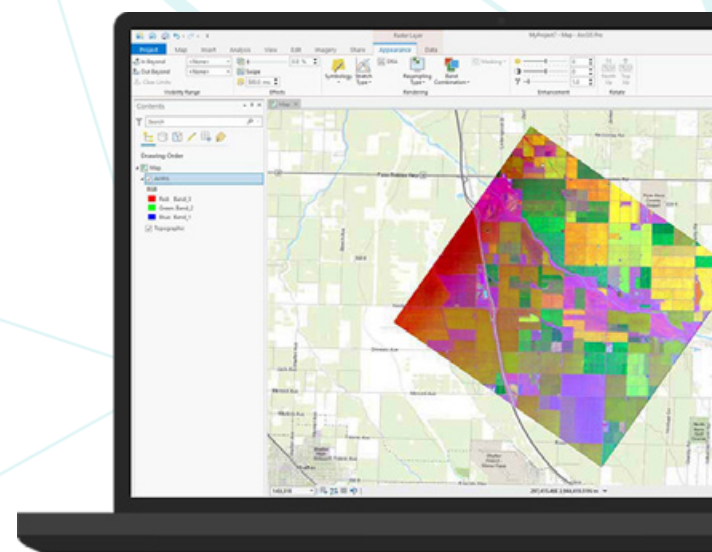
Next Gen Productivity



# Integration with ArcGIS®

ENVI is tightly integrated with Esri's ArcGIS platform and lets GIS users seamlessly access and analyze imagery to solve critical problems with confidence. ENVI analytics can be accessed from within any ArcGIS environment and results can be displayed directly from ArcGIS Pro, ArcMap or via ArcGIS Online. By extending ArcGIS with ENVI analytics you can derive quantitative, actionable results from remotely sensed data, share them across your organization and use the information to make better decisions, regardless of your experience.

With the integration of ENVI's task-based analytics into ArcGIS, it is easy to implement all of the advanced ENVI processing techniques on the desktop or in the enterprise. Additionally, there are automated workflows exposed out-of-the-box in ArcGIS making it easy to deliver expert-level results regardless of image analysis experience.



# Equipped with Features built for surveyors



Discover robust, easy-to-use features  
for the most demanding mapping  
projects





# INTERVIEW SESSION



## OKLA ROSEMARY

**Geographic Information System (GIS) Specialist**  
Ghana Geological Survey Authority.

### "EMBRACING GEOSPATIAL INFRASTRUCTURE"

An interactive session with Okla Rosemary, a GIS Specialist and a Senior geological engineer at Ghana Geological Survey Authority.

#### Kindly tell us about yourself and your company?

Okla Rosemary is a Geographic Information Systems Specialist with a geological engineering background at Ghana Geological Survey Authority since 2001. Her passion for transferring knowledge to others has caused her to be a part-time lecturer at Radford University in Ghana at the earth science faculty, since 2013.

Ghana Geological Survey Authority (GGSA) was founded in 1913 and has since been the main repository of Ghana's geoscience database. GGSA is the curator of Ghana's geoscientific data, has the main task to continuously generate, collect, store and archive relevant geoscientific data, and to disseminate data and information in a user-friendly way to the government, industry and the public at large. Generation of geoscientific data is done by field surveys, research and investigations. GGSA research on both precious and development minerals, site investigation and earthquake monitoring

#### Give us an insight on your role in the company as a GIS advocate?

I work in the information management division, and my main role is to generate maps for field data, create environmental and geological maps of particular areas using ArcGIS. Also, train some staff or attachment students in GIS and part of managing GIS project

#### What informed your GSS to incorporate GIS in their workflows?

The reason is to achieve easy and user-friendly dissemination of geoscientific data and information

#### Briefly tell us the about any Project your team undertook using GIS tools.

Ghana Geological Survey Authority (GGSA) tackled on the Ghana-Germany Technical Cooperation Project on Environmental and Engineering Geology Project for Urban Planning in Greater Accra Metropolitan Area. This project used GIS tools to produced Coastal Stability Map, Geological Map for Urban Planning, Constraint Map for Waste Disposal Sites and Hydrogeological Map for Urban Planning. Also, GGSA in collaboration with the Federal Institute for Geosciences and Natural Resources, Germany (BGR), used GIS tools to create the new geological map of Ghana

#### How does your team keep themselves abreast and updated with the newest updates on our GIS infrastructure?

We engage in regular online researches in order to be updated with the newest updates on our GIS infrastructure. We also participate in webinars and other form of virtual GIS events to see how different institutions use the platform. Industries similar to ours get the most attention

#### In your opinion, what is the most important quality a GIS professional needs?

I would say a GIS professional needs understanding and manipulate of spatial data

#### How would you recommend our solution to other individuals or institutions?

I would endorse to other individuals or institutions that, ArcGIS is a user-friendly software and with basic training, it is easy to use. With a good client support system from the distributor, optimum productivity is guaranteed

#### Per your experience with Sibus Geospatial, how can we help improve your accessibility to any of our services?

The accessibility of Sibus Geospatial can be improved by sending updates on trending issues on GIS to clients via the client's emails and organizing a lecture on current trends in GIS for clients

#### Any further advice you would like to give to the public on why they should embrace the use of Geospatial tool/ GIS in their projects?

The public should embrace the use of Geospatial tools in their projects because it helps for easy visualization of projects and simplification of complex data to enhance better decision making



# The Nigeria Geoportal

Inspiring communities through location intelligence

## The Nigeria GeoPortal

The launch of the Nigeria Geoportal is one of the exciting news to the geospatial community in Nigeria in recent times. It was officially announced on the social media pages of the Africa Geoportal and Sibus Geospatial Nigeria Limited on the 8th of April, 2021. The platform is powered by Nigeria's National Statistical Agency, a governmental agency that provides accurate, timely, continuous, and sustainable basis, socio-economic statistics on all facets of development in Nigeria alongside ESRI, the global market leader in providing GIS solutions and products. The platform leverages the ESRI's ArcGIS Hub, an easy-to-configure cloud platform that organizes people, data, and tools to accomplish initiatives and goals as the underlying technology.

### What is a Geoportal and Why We Need One?

Geoportals are web-based portals used to discover, access geospatial data and services, analyse, edit, and visualize spatial data on the internet. Geoportals are important for the effective use of geographic information systems (GIS) and a key element of Spatial Data Infrastructure (SDI).

Over the years, several Governmental Agencies, NGOs, Private Organizations, and MDAs have embarked on data collection exercises with an overarching goal of acquiring location-based data and attributable information that are important for their various use cases. Meanwhile, some of this data already exists in some other organizations' data banks but are sometimes not made open and easily accessible by users in the general populace. Perhaps, due to several constraints, confidentialities, and policies around the use of these data, technical requirements in setting up a fully-fledged and highly efficient data portal, unawareness of existing data portals, poor quality of existing data among other reasons.

However, these data are very crucial in the execution of their development and high-impact projects, hence the need for the data collection exercises can be justified.

This repetitive and continuous effort, that consumes time and human resources suggests the need for a unified open data portal where high-quality data can be contributed to by organizations and individuals for easy access to the users. Why can't we have a unified portal to host local data specific to Nigeria? Why can't we continue to update existing data rather than collecting new data that leads to data redundancy? All these efforts lead to data disconnection, and these are the problems the Nigeria GeoPortal would provide solutions to if embraced and well harnessed.

Mr. Biyi Fafunmi, who is the Head of National Data Archive and spokesperson for the Nigeria National Statistical Agency (NBS) in an interview mentioned that NBS is by law the apex and National Statistics office in Nigeria, NBS is expected to co-ordinate the entire national statistical system, develop, and promote best statistical standards and uses. Not only that, NBS is to develop and maintain a national data bank that will act as a focal point of accessing statistical information. NBS became involved with the Africa Geoportal in less than a year ago prior to their interaction with the Esri team and the aftermath of creating the Nigeria Geoportal.

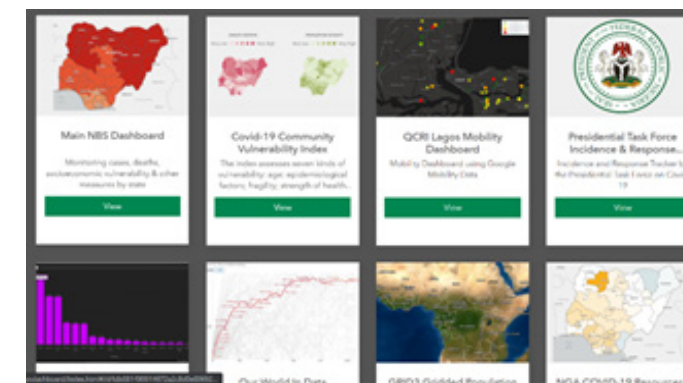
### Benefits of the Nigeria GeoPortal

Mr. Biyi also stated that the Nigeria Geoportal will therefore solve among other problems the issue of having access to geospatial data, reduce the problem of conflicting data, cost of maintaining online geoportal, create opportunities for more people in learning GIS and its applications, data interpretation will be made easy as well as a better understanding of data for decision making and easy sharing of data.

The Nigeria GeoPortal hosts data that are uploaded by organizations and individuals on a single portal for access to analysts, researchers, and interested organizations that want to use data for projects that require spatial analysis to inform decision-making.

In the case that a portal like the Nigeria GeoPortal existed earlier, many of the data collection exercises being carried out would have been abolished, as most of the required data about Nigeria are found on the platform which would have saved a lot of resources. A registration on the platform has been made easy with a click here to have full access on the platform. The below are some of the interesting things you can do on the Nigeria Geoportal:

1. Access To Varieties of Open and Quality Datasets  
On the platform you can discover a reliable collection of focused geospatial data collected from Esri, Esri partners, governments, and existing open data. You can also share your data and enrich the collection.



While it is important to have a unified data portal, the quality and integrity of the data is more important to the GIS practitioners. This was in the picture in the entire process of the platform development and the topic was also discussed during the 2020 GIS day event organized by the Sibus Geospatial Limited. It was ascertained that the data on the platform are of high quality as they are required to pass through quality and integrity checks before approval on the platform.

### 2. Access To Varieties of Geospatial Tools

Using the portal, you can have free access to the best geospatial tools, make maps, perform spatial analysis, and create web applications. Use the data on the platform, bring your own, or combine them.

### 3. Access to Varieties of Learning Resources

You can make the most of the free geospatial tools with online resources. Introductory to expert resources available and a community of like minds that are willing to always help provide answers to any of your questions.

### Why Open Data Matters

To see the changes we all desire, we need to embrace open data and encourage the sharing of data for use by problem solvers. As GIS is data-driven, little or nothing can be done without access to the right data. Having access to these data would not only unlock innovations but also spark ideas that can solve pressing problems and cause the change needed as a Nation. This was the key takeaway from the discussion in the webinar hosted earlier by the Sibus Geospatial Nigeria Limited on the Open data day event in March 2020. The webinar recordings can be accessed on the YouTube page or with a click on the link here.

Moreover, NBS encourages all members within the Nigeria National Statistics system to join the Nigeria Geoportal by sharing their geospatial data and analysis on the portal as done on their earlier established COVID-19 Datahub.

Finally, Mr. Biyi noted that the NBS is ready to share their GIS resources in the portal and build capacity where necessary. He advised that the users of the Nigeria Geoportal should keep on using the portal as frequently as possible, give feedback to better improve the portal, share citations to better enrich the portal, and always visit the portal for a new update. The Nigeria GeoPortal has been developed for use. It is our responsibility to put it to good use by sharing quality data on the platform and spreading the word to the GIS professionals and gatekeepers in our network.

Esri launched Nigeria Geoportal on Africa Geoportal recently with support from the Nigeria National Statistical Agency - NBS. The Nigeria GeoPortal is a one-stop-shop for open geospatial datasets in the Nation. It's a subsection of the Africa Geoportal, an initiative by Esri and it's free for everyone to use for various projects. Having an account on the portal avails you the opportunity to access a variety of geospatial tools, open data, training, and learning resources to help you grow your geospatial skills and enrich the existing resources via contribution



## "IT IS IMPERATIVE FOR ALL ORGANIZATIONS TO ADOPT THE USE OF GEOSPATIAL TOOLS"

Senior Data Analyst of Palladium-Data.FI speaks to Sambus Geospatial about the essence of GIS in decision making for every industry.

SEYI ABOLARIN

### Tell us a brief history of your organization.

To be precise, Palladium-Data.FI works in collaboration with eight (8) USAID Implementing Partners across 16 states in Nigeria to harness the power of data analytics, health informatics solutions, as well as real-time geospatial analysis to curb the spread of HIV in Nigeria.

### Give us an insight on your role in the company as a GIS advocate.

My role is focused on building and maintaining the organization's GIS databases. It also entails the use of GIS application to analyze all spatial and non-spatial information relating to the organization.



**SEYI ABOLARIN**  
Senior Data Analyst at  
Palladium-Data.Fi ,  
Nigeria

### Briefly tell us about any major Project your team undertook or currently undertaken using GIS tools?

We recently built an ArcGIS online dashboard to easily visualize the Key Performance Indicators of the eight USAID Implementing partners across 16 states of operation in Nigeria

### What do think, is the most essential trait a GIS professional needs?

I would say, GIS professionals need to have wide knowledge base on the use of GIS tools, its application methods and most importantly, the ability to run very insightful spatial analyses.

### How would you recommend our solution to other individuals or institutions?

ArcGIS tools are quite easy to use and I consider it to be very affordable per the value it gives you as a user/professional. Plus, the Sambus Geospatial's support team tends to be on stand-by to provide technical related assistance always. Therefore to me, in terms of recommendation, I would not mind convincing fellow professionals or related institutions to Adopt it in their workflows.

### Per your experience with Sambus Geospatial, how can we help improve your accessibility to any of our services?

So far, Sambus Geospatial is really doing well. The technical team have been very supportive and the time taken to respond to any enquiry is super-fast..

### Any further advice you would like to give to the public on why they should embrace the use of Geospatial tool/ GIS in their projects?

GIS is a powerful decision-making tool for any business or industry since it allows the analysis of health, environmental, demographic, and topographic data. Data intelligence compiled from GIS applications help companies and various industries, and consumers, make informed decisions, and as such, it is imperative for all organizations to adopt the use of geospatial tools

## UPCOMING EVENTS

Participate in a series of geographic information system (GIS) events as you discovering new insights in various immersive learning programmes to learn more about the latest geospatial technology. See all upcoming events and make a date with us.

July 12 - 15,  
2021

### Esri User Conference

Organized to help you learn to use the latest ArcGIS tools in and Applications in different industries.

Register - [esri.com/en-us/about/events/uc/](https://esri.com/en-us/about/events/uc/)

August 10,  
2021

### Sambus Geo-User Conference

A collaborative virtual event organized to display rich GIS projects undertaken by various organizations in West Africa.

October 26 - 28  
2021

### Esri Infrastructure Management & GIS Conference

A crossover virtual event, provided learning opportunities to users from infrastructure sectors

Register - <https://www.esri.com/en-us/about/events/imgis/>

November 17,  
2021

### World GIS Day

Celebrating the initiation of GIS by Spatial Analytics World Leader, Esri

April - December,  
2021

### Sambus Geoworld

An educational initiative developed by Sambus Geospatial to Improve GIS knowledge and Awareness.

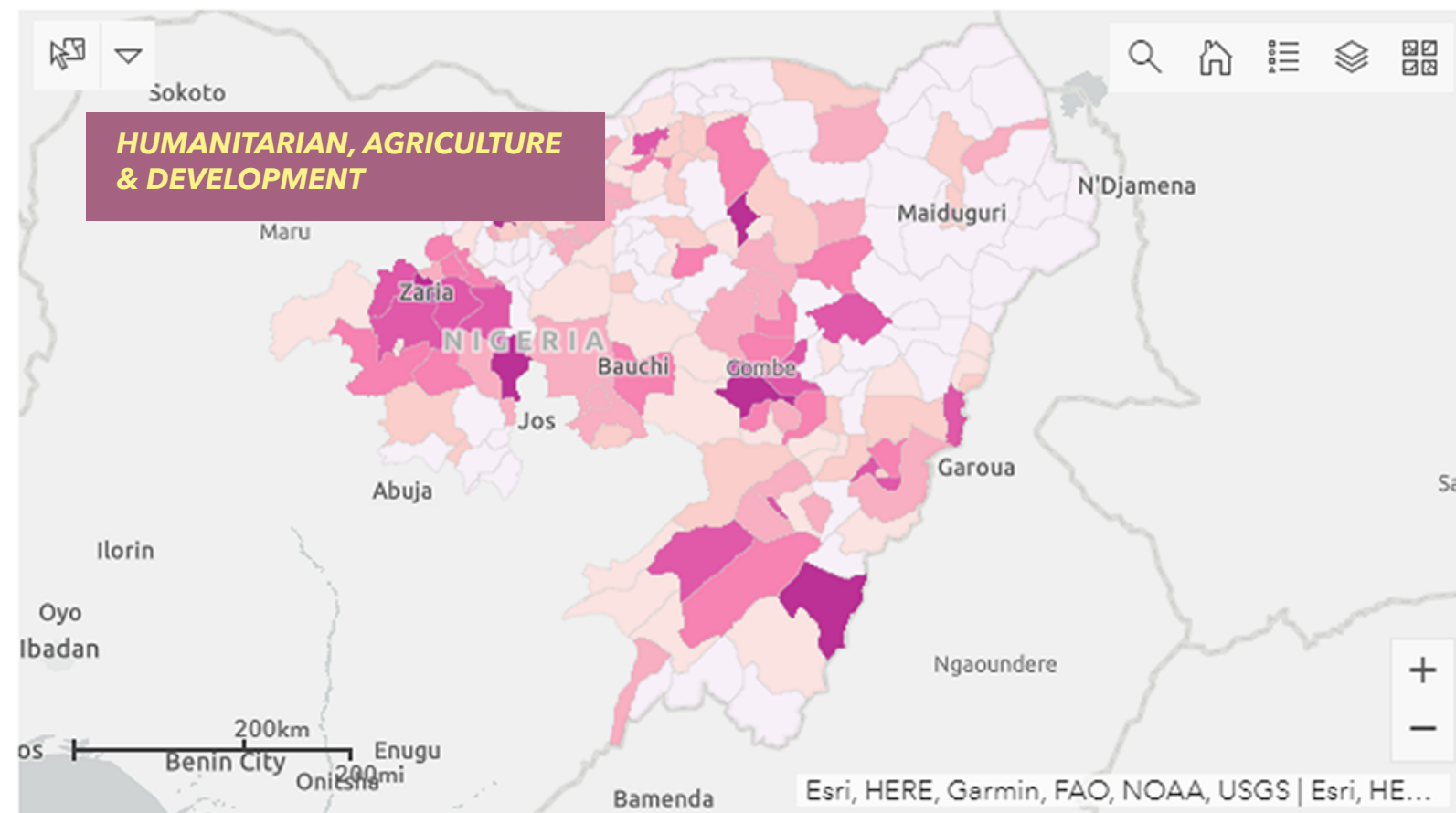




# ***MAP GALLERY***

**SEE THE BEST MAPS DEVELOPED BY  
GIS PROFESSIONALS FOR VARIOUS  
INDUSTRIES**



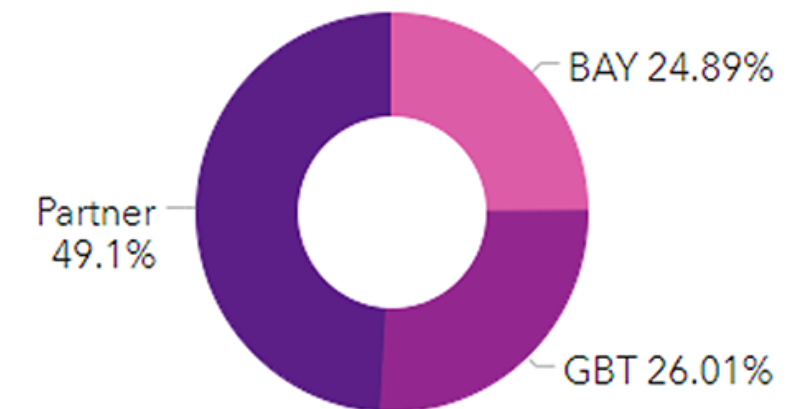


### PM Extension Outreach 2020

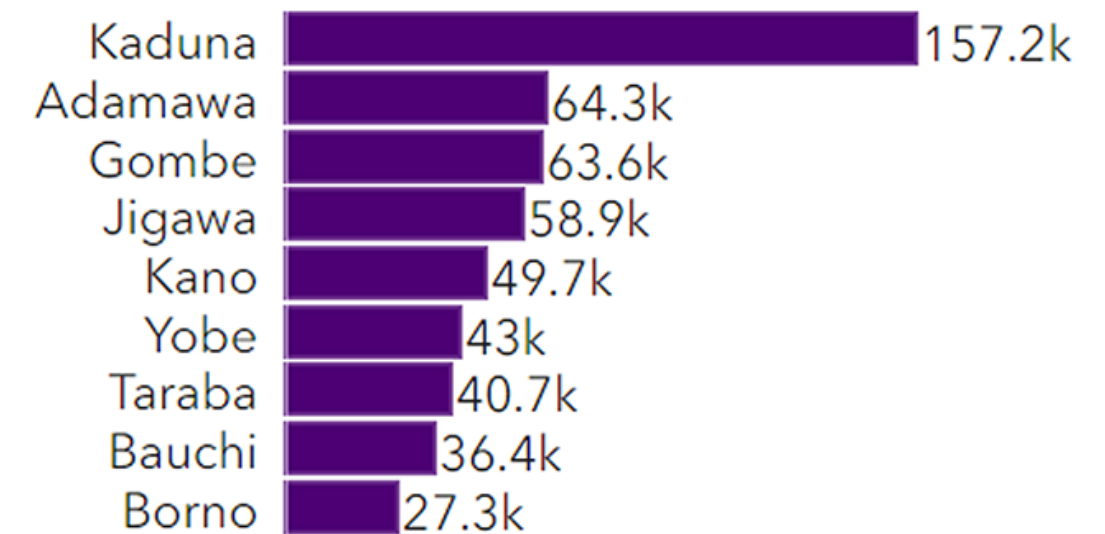
#### TOTAL



### Result by Tier:



### Result by State:



## PROPCOM MAI-KARFI GIS DASHBOARD

Propcom Mai-karfi (PM) uses cost-effective tools to manage assets, human resources, and office and field operations. One of these tools is Geographic Information Systems (GIS). GIS is used to plan, monitor, and manage infrastructure more effectively. It is also used to determine capacity enhancements, improve operations, and identify the most strategic methods for environmental management, agricultural interventions, and development.

GIS offers a framework to collect and analyse information PM needs to strengthen its core goals and mandate. Hence, a comprehensive GIS supports PM to integrate agency-wide information to achieve better operational efficiencies in results measurement, monitoring and management.

PM's GIS dashboard is used to store, analyse, manage, and display important programme information from multiple data sources based on results from interventions and markets. The dashboard will allow users to convey information by representing location-based analytics using intuitive and interactive location data visualisation on a single screen. The dashboard URL is the link that gives everyone access to the dashboard. Visit [bit.ly/36l4U33](https://bit.ly/36l4U33) to interact with the dashboard on any web browser.

### Contact

Nur Azam (Results Director) | Joshua Okeke (GIS Manager)  
[mnazam@propcommaikarfi.org](mailto:mnazam@propcommaikarfi.org) | [jokeke@propcommaikarfi.org](mailto:jokeke@propcommaikarfi.org)  
Propcom Mai-Karfi: 20 Port Harcourt Crescent, off Gimbiya Street  
Area 11, Garki - Abuja, Nigeria

### Software

Software: ArcGIS Pro 2.5

### Result by Gender:

**371,398**  
Male

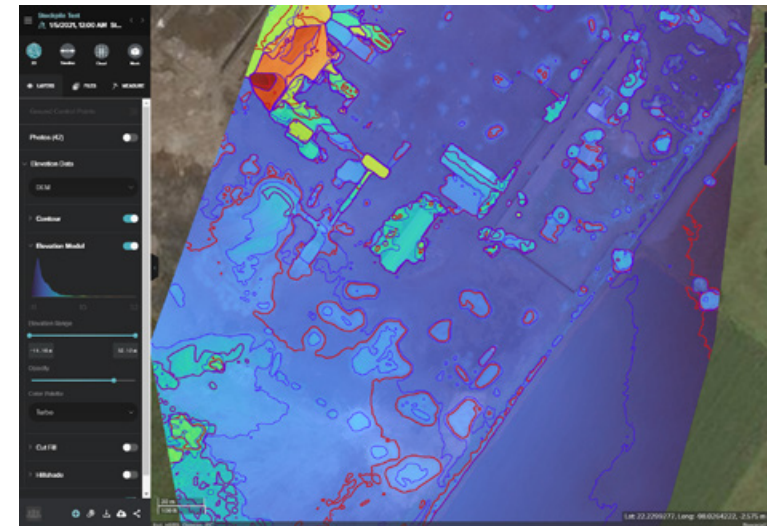
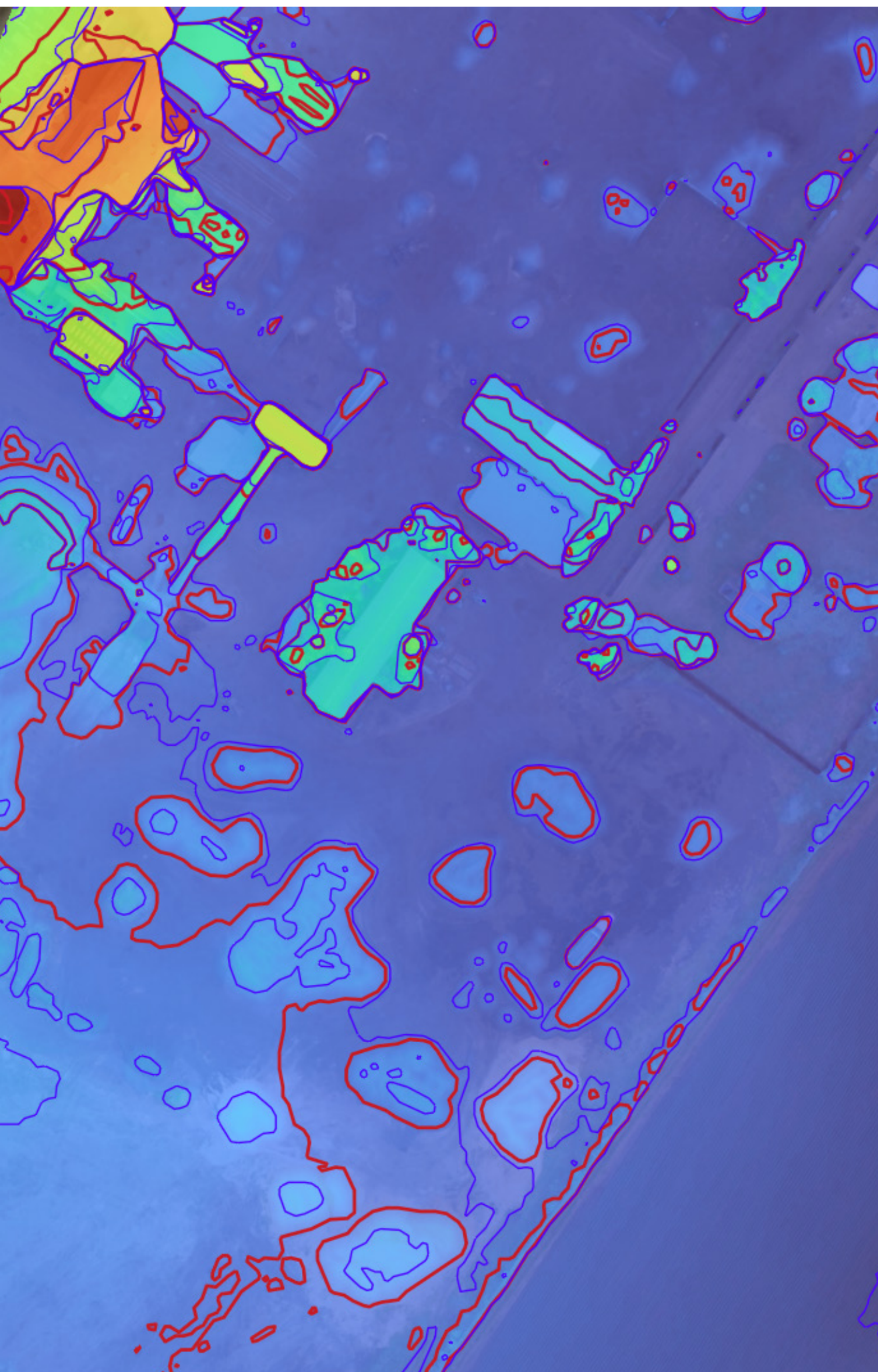
**169,728**  
Female

## About Propcom

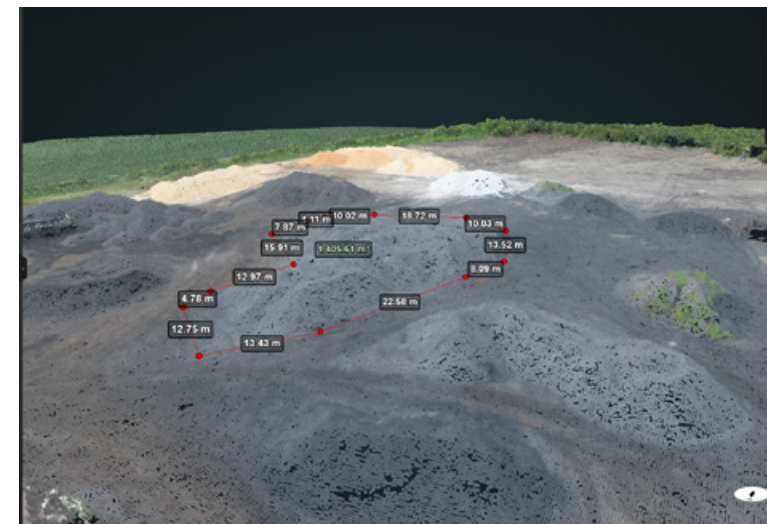
Propcom Mai-karfi is a rural and agricultural markets development programme funded by the UK government. Our goal is to increase incomes for the rural poor by reviving and facilitating access to agricultural and rural markets in nine locations in Northern Nigeria; including the six post-conflict North-East states.

Our approach is targeted, collaborative, inclusive and climate-smart. We work in nine locations in Northern Nigeria: Adamawa, Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Taraba, and Yobe States. Read more at [www.propcommaikarfi.org](https://www.propcommaikarfi.org).

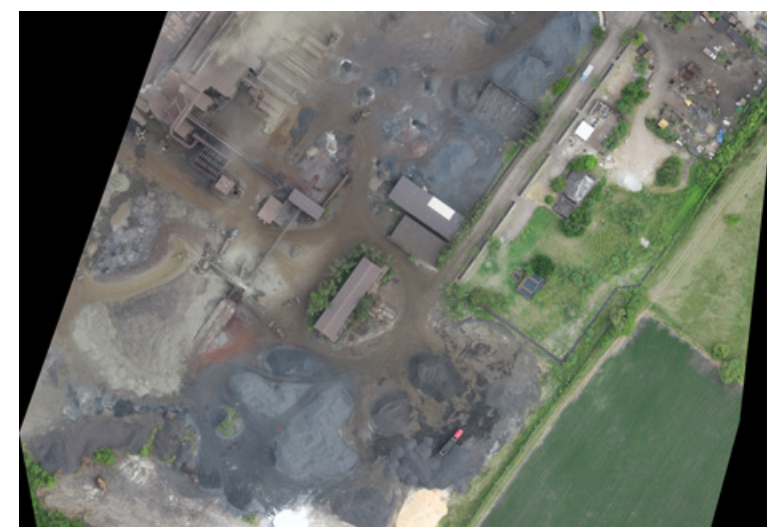




DEM and Contours



3D Point Cloud with Area.



Stockpile - Orthomosaic

## STOCKPILE VOLUMETRIC ANALYSIS USING UAVs AND SITESCAN FOR ARCGIS

Stockpiles are storage locations for bulk materials, forming part of the bulk material handling process. They are used in many fields such as in ports, refineries or manufacturing facilities, mining sites and are usually created by stackers. In the mining field, stockpiles are simply used to make up the difference to the plant to provide a steady feed rate. These stockpiles are also available as a short-term emergency supply if, for some reason, the mine is shut down (Anon).

Stockpiles are formed by machinery dumping material into a pile, either from dump trucks, pushed into heaps with bulldozers or from conveyor booms and are measured in cubic meters. Stockpiles are storage locations for bulk materials, forming part of the bulk material handling process. They are used in many fields such as in ports, refineries or manufacturing facilities, mining sites and are usually created by stackers. In the mining field, stockpiles are simply used to make up the difference to the plant to provide a steady feed rate. These stockpiles are also available as a short-term emergency supply if, for some reason, the mine is shut down (Anon).

Stockpiles are formed by machinery dumping material into a pile, either from dump trucks, pushed into heaps with bulldozers or from conveyor booms and are measured in cubic meters. During the process of the volume estimation, the base surface used to compute the volume was a Model (DTM). The base of the stockpile was digitized, serving as the base plane. The mean level was used in the volume estimation, and it computed the cut, fill, net volume, and total area. The fill refers to the volume of materials below the base plane, the cut refers to the volume of materials above the base plane. The net volume is the difference between the cut and fill. The highest and the lowest elevation of the stockpile could be determined by the colour palette of the Digital Terrain Model (DTM).






### Contact

GERALD BEMPONG (Technical Support)  
info@sambusgeospatial.com  
Sambus Geospatial Limited

### UAV and Software

UAV system (WingtraOne)  
Sitiescan for ArcGIS



-  Non-penetrating Obstacles
-  Penetrating Obstacles
-  Approach Surfaces
-  Runway Centerline
-  Runway

## OBSTACLE ANALYSIS WITH ARCGIS PRO

For demonstration purposes, dummy obstacle datasets were generated using Nnamdi Azikwe International Airport, Abuja as the study area.

This map shows an approach OIS surface and analyzed obstacles in 3D for a runway at the airport. After digitizing the runway features and Airport center elevation point, Obstruction Identification Surfaces (OIS) were created using the FAA FAR 77 (Aviation) tool. Obstruction identification surfaces are multipatch or polygon features that represent the clearance between an aircraft in the air and obstacles on the earth's surface. This tool creates obstruction identification surfaces (OIS) based on the FAA Part 77 specification. This regulation establishes standards and notification requirements for objects affecting navigable airspace. The type, function, and dimension of a surface differ by its runway classification. This tool creates surfaces as a polygon or multipatch features. The Analyze Runway Obstacles (Aviation) tool was afterward used to analyze the obstacle data against the obstruction identification surfaces (OIS) to determine if obstacles are penetrating or not.

The OIS generated includes the approach, conical, horizontal, primary, and transitional surfaces. For this analysis, we were only interested in obstacles at the end of runway RW/2204 therefore, we only analyzed the approach surfaces after hiding other surfaces using a Definition Query. The result as seen shows the airport's major features, the OIS, and the obstacles classified into penetrating and non-penetrating obstacles. The penetrating obstacles would ideally be passed to the planning department for proper mitigation efforts such as evacuation or height reduction.

### Contact

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### Software

Software ArcGIS Pro 2.8.0 with Aviation Airports and Aviation Charting Extensions.

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