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FOREWORD

Pelcome to the 10th Edition of the Sambus Geospatial Newsletter a milestone that reflects our collective journey in advancing geospatial intelligence across West Africa and beyond.

In this edition, we reaffirm who we are and what we stand for as a company our mission, values, and regional footprint. We also spotlight the industry transformative shifts through insightful editorials, thought leadership articles, and technological innovations shaping the future. From AI in business strategy to remote sensing for environmental monitoring, we aim to inspire geospatial application across sectors.

You'll also find links to our recent webinars, a call to share your story in future editions, and a preview of key events in the geospatial calendar.

A special highlight of this edition is our Map Gallery, which captures critical visualizations from Ghana protected forest zones to Nigeria's real-time emergency dashboard-proving once again that location intelligence is not just data, but actionable insight. Thank you for being part of this journey. Here's to envisioning tomorrow together.

Warm regards,

Akua Ahoahea Ahoah
Managing Director - Sambus Geospatial





ambus Geospatial is a leading GIS solutions provider delivering end-to-end Geospatial technologies and services across diverse industries. With more than 33 years of operational experience, we design and implement innovative location intelligence solutions that enable organizations to streamline workflows, optimize resources, and make informed decisions.

Our strategic partnerships with global geospatial leaders including Esri, Trimble, NV5 Geospatial, and Wingtra Drones allow us to integrate world-class technologies into tailored solutions that address local challenges. From data collection and mapping to advanced analytics and visualization, Sambus empowers governments, businesses, and institutions to harness the full potential of spatiality intelligence.

Sambus Geospatial Offices

Sambus Geospatial operates in Ghana, Nigeria, Liberia, Gambia, Gabon, with operational offices in Ghana and Nigeria. We are also supported by resellers and partners across our operational regions. Operating with a compelling urge to empower the needs of Africa using State-of-the

art geographical standard technology, Sambus Geospatial remains the most preferred mapping and geospatial solution provider in West Africa. The organization has qualified staff who develop and deploy tailor-made solutions for all our clients to gain optimum benefit and satisfaction.

Vision statement

To be the preferred geospatial innovator in West Africa.

Mission statement

To become a distinguished organization in the ap plication and advancement of geospatial knowledge and technology for effective planning, operations and enhanced decision making in West Africa.

Core Values

Trust (T): Every business transaction is implicitly a relationship of trust as parties to any transaction have the assurance that they will receive value from the engagement. Trust is the starting point for Sambus with confidence in our staff to deliver value

to our stakeholders as we trust that our stakeholders will do the same.

Service (S): Sambus does not just sell, we Honesty (H): Honesty and transparency in serve. We serve our clients and stakeholders and support them in reaching their objectives. There is an intrinsic reward in being of service to another, and we live by that at Sambus. We want all our stakeholders, from staff to business partners and

clients to remain loyal to the Sambus brand, and it is through quality service that we achieve that.

Innovation (I): At Sambus Geospatial, we embrace innovation as a driving force for progress. We continuously explore new ideas, cutting-edge technologies, and creative solutions to enhance our services and deliver effective, relevant, unparalleled value to our stakeholders.

Respect (R): Organizations are made of people, and every person is unique and special regardless of their rank and status in life. Respect for people

is an integral part of the Sambus culture and it

is our hope that this is reciprocated by all our stake holders.

dealings and transactions are what we stand





Editorial

The Evolution of Geospatial Technology: Past, Present, and Future

eospatial technology has come a long way. It started with simple maps and now includes advanced tools like satellites, drones, and smart sensors. This article explains how it all began, where we are today, and what the future looks like highlighting the important roles played by companies like Sambus Geospatial, Esri, Trimble, Wingtra, NV5 Geospatial, and HERE Technologies.

The Past: Where It All Began

People have been creating maps for thousands of years. Early maps helped with navigation, farming, and land division. Civilizations like the Babylonians, Greeks, and Romans used basic maps for managing their cities and empires.

A major change came in the 20th century with aerial photography, especially during World Wars I and II. This gave people a bird's-eye view of the land. It also led to photogrammetry measuring things from photos which helped improve map accuracy.

In 1957, the Soviet Union launched Sputnik, the first satellite. Later, the U.S. launched the Landsat program in 1972 to take regular pictures of Earth. This marked the start of remote sensing, a key part of geospatial technology today.

The Present: A Powerful Tool in Everyday Life

Geospatial technology is now used in many areas city planning, farming, disaster response, and even daily navigation. Here's how some key technologies are helping:

• GPS (Global Positioning System):

Originally for the military, GPS is now used in phones, cars, and farming equipment to give accurate locations.

• GIS (Geographic Information Systems):

GIS helps people store and study spatial data. For example, it can show where schools or hospitals should be built. Esri's ArcGIS is one of the most popular GIS platforms in the world.

Remote Sensing:

Satellites and drones collect images that help track land use, forest health, and climate change. NV5 Geospatial uses this data for environmental and industrial insights.

Big Data and Cloud Computing:

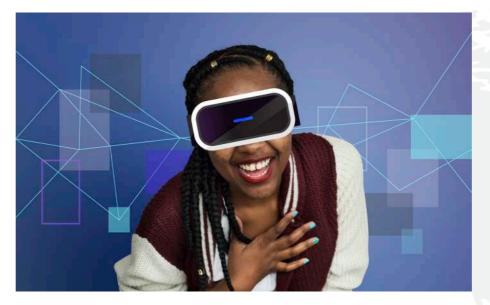
Huge amounts of data from phones, apps, and sensors can now be stored and analyzed using cloud platforms. Trimble uses this to combine GPS and GIS for industries like farming and construction.

• Al and Machine Learning:

These tools quickly analyze complex data. For example, Wingtra uses AI-powered drones to map farmlands and natural areas.

• Location-Based Services:

Apps like Google Maps use this. HERE Technologies makes detailed maps and traffic data used in many navigation systems and even in self-driving cars.



How It's Being Used Today

Geospatial technology is improving lives in many ways:

Smart Cities:

Cities use real-time data to improve transport, energy use, and public safety.

Environmental Monitoring:

Satellites help track things like deforestation or animal movement. NV5 Geospatial supports many of these efforts.

Disaster Management:

After earthquakes or floods, this tech helps emergency teams know where to go. Trimble provides accurate maps and data for quick action.

Farming (Precision Agriculture):

Farmers use drones and GPS to water, plant, and fertilize more efficiently. Wingtra's drones help make smart farming maps.

Transport and Logistics:

GPS and traffic data help companies deliver faster and use less fuel. HERE Technologies powers many of these systems.

The Future: What's Next for Geospatial Technology

New trends are shaping the next generation of geospatial tools:

Autonomous Vehicles and Drones:

Self-driving cars and drones need precise, real-time maps to move safely. Wingtra is leading this with smart drones.

Digital Twins:

These are virtual models of real places like cities or buildings. They help plan new developments and fix problems. Esri's GIS is used to build these models.

AR and VR:

Augmented and Virtual Reality are changing how we view maps like turning your surroundings into an interactive map. HERE Technologies is working on this.

• Edge Computing:

Instead of sending data to a faraway server, edge computing processes it nearby like on a drone or sensor saving time. Trimble uses this in farming and construction.

Blockchain for Data Security:

As geospatial data becomes more valuable, it needs better protection. Blockchain helps make sure data isn't tampered with. NV5 Geospatial is exploring this.

New Technology Integration:

When combined with 5G, quantum computing, or biotech, geospatial tools will become even faster and more powerful. Many leading companies are working on this integration.

Challenges and Ethical Concerns

- Despite all these benefits, there are concerns:
- Data privacy and security are big issues.
- Geospatial data must be used ethically and fairly.

Some parts of the world don't have access to these technologies yet. Bridging that gap is important for global development.

Conclusion: A Connected Future

Geospatial technology has changed the way we understand and manage the world. From early maps to AI-powered drones, it helps solve problems, make smart decisions, and improve lives.

Companies like Sambus Geospatial, Esri, Trimble, Wingtra, NV5 Geospatial, and HERE Technologies have played big roles in this transformation. As the technology continues to grow, we must make sure it is used responsibly, ethically, and in ways that benefit everyone. As geographer Waldo Tobler once said, "Everything is related to everything else, but near things are more related than distant things." Thanks to geospatial technology, we now understand these relationships better than ever.





Mapping the truth in the shadows of conflict.

eet Mansir Muhammed – Newsroom specialist in GIS and open source intelligence - HumAngle In a country where conflict often goes unreported or misunderstood, Mansir Muhammed stands at the intersection of technology and truth.

Mr. Muhammed, a GIS and open-source intelligence specialist at HumAngle Media has been using satellite imagery, spatial analysis, and open data to uncover hidden truths about Nigeria's long-running insurgency and humanitarian crises.

His maps tell the stories left behind by over 16 years of conflict in the Lake Chad region a region where more than two million people have been displaced, and entire villages wiped off the map. Muhammed's work has visualized everything from violent raids to the destruction of communities, helping to expose the real human cost of terrorism and government inaction.

One of his most moving projects involved mapping the escape route of Madam Hannatu, a woman who fled an overnight attack that killed 30 people in her village. With her children in tow, she walked over 10 hours through dangerous terrain to reach safety in Cameroon. Muhammed recreated her journey using GIS, capturing every threat she faced from gunfire to venomous snakes and turning her harrowing story into a visual testimony of survival.

But his work goes beyond documenting violence it's also a powerful tool for accountability. When a dam near Lake Alau collapsed due to neglect, Muhammed used satellite imagery to reveal how the resulting floods destroyed thousands of homes in Maiduguri, displacing over 400,000



people and killing more than 150. Despite funds being allocated for maintenance, no repairs had been made and Muhammed's maps helped raise public pressure on officials to act.

His most groundbreaking investigation focused on mass graves near Maiduguri. Using synthetic aperture radar (SAR) and archival imagery, he uncovered evidence of extrajudicial killings and clandestine burials, tied to the mass arrests and disappearances of civilians between 2012 and 2015. This meticulous work combining geospatial data, eyewitness reports, and forensic mapping earned him the Sigma 2024 Data Journalism Award.

Today, Mansir not only continues his investigative work but also trains fellow reporters in GIS techniques, inspiring a new wave of data-driven journalism. "GIS isn't just a tool," he says. "It's how we make the invisible visible to tell the stories that matter most."

Read the full story here: https://esriis.sharepoint.com/sites/successstories/ Lists/Customer%20Story/DispForm.aspx-?ID=2771&e=nPe5pO





The Digital Harvest: How Action Aid & Sambus Geospatial Are Boosting Liberian Farm Productivity

Action Aid International is championing a significant leap forward for Liberian farmers, aiming to scale up their productivity through the power of digital technology. Central to this initiative is IT expert Michael Doyah, a dedicated partner of Action Aid International and a fervent advocate for Esri's ArcGIS solutions since 2020. Recognizing the software's potential for streamlined data collection and enhanced collaboration, Doyah was instrumental in bringing Action Aid on board to leverage these transformative tools.

This year, Action Aid International is embarking on a pivotal project designed to revolutionize how local farmers manage and understand their agricultural output. The core of this project involves utilizing ArcGIS Survey123 Connect for detailed data gathering and ArcGIS Dashboards for insightful visualization. To bring this vision to life, Action Aid will empower farmers directly, teaching them to embrace digitalization to refine their production cycles and activities, starting with documenting their yields using intuitive survey applications.

To ensure the Action Aid team was fully equipped for this ambitious un-

dertaking, Sambus Geospatial, a trusted partner for innovation and transformational GIS solutions, stepped in to provide specialised, intensive training. Building on the team's existing proficiency with ArcGIS Pro, Sambus Geospatial delivered a comprehensive five-day program focused on mastering ArcGIS Survey123, Survey123 Connect, and ArcGIS Dashboards.



Figure 1: ActionAid's Survey123 form

The intensive training guided the Action Aid team through the nuances of Web GIS with ArcGIS Online, advanced form design principles in Survey123—including offline data collection and synchronization—and sophisticated Survey123 Connect workflows using XLS Form for



Figure 2: Data visualization on ArcGIS Dashboards

custom designs and conditional logic. The curriculum culminated in empowering the team to design and deploy dynamic, interactive ArcGIS Dashboards, transforming raw field data into clear, actionable insights through compelling charts, maps, and indicators.

Michael Doyah is ecstatic about seeing transformation in Liberian farming. According to him, the Action Aid team is well poised to share the knowledge and skill with local farmers, creating tailored surveys and dashboards that will be instrumental in enhancing local agriculture. He is confident that these tools will enable the team to effectively support farmers in documenting their yields and making data-driven decisions to improve their livelihoods.

The results speak for themselves. The Action Aid team successfully developed and published a functional Survey123 form and designed a linked ArcGIS Dashboard, demonstrating clear profi-

ciency in survey management and data visualization. They are now outstandingly well-equipped to roll out their project, bringing the benefits of spatial data collection and analysis directly to the agricultural community in Liberia. Further practice and real-world application will undoubtedly see Action Aid's impact grow, fostering a new era of digital agriculture in Liberia.

Sambus Geospatial looks forward to the project being fully rolled out and to hearing the success stories that will come from Liberia through Action Aid International.



Monitoring Environmental Change With Remote Sensing

eospatial analytics and artificial intelligence are transforming environmental consulting with timely, accurate, and actionable information.

Remote sensing technology has been a boon to environmental consultants. Imagery captured by satellites, aircraft and unmanned aerial vehicles (UAVs) can be used to detect even the most subtle changes to the natural environment. The relative ease with which valuable information can now be extracted from these image data sets allows environmental experts to spend more time determining and mitigating the root causes of identified changes.

The value of remote sensing in environmental preservation and remediation has multiplied exponentially in recent years. A proliferation in commercial imaging platforms makes it possible to find environmental issues anywhere on Earth and to monitor their impacts on habitats and other natural resources on a yearly, monthly and even daily rate. Software automation supported by Artificial Intelligence (AI) has put complex image processing and analysis capabilities within reach of every environmental scientist.

There are many environmental applications of remotely sensed data, but analysis of change – whether good or bad – in land use and land cover is still among the most valuable. For example, environmental consultants are routinely contracted to monitor large development projects and energy extraction sites. They are charged with ensuring regulatory compliance by spotting anomalies that might indicate activities that are causing stress to surrounding habitats.

The beauty of modern imaging sensors is they can 'see' things the naked eye can't. Infrared data collected along with visible bands can uncover anomalies in vegetation and water before a human on the ground notices anything. And imaging sensors aren't the only things flying overhead. Lidar elevation scanners are now ubiquitous on aircraft and UAVs. Likewise, radar systems, with the ability to peer through clouds and darkness, capture their own valuable data sets from satellites and aircraft.

In addition to keeping an eye on regulated activities recognized to negatively impact the natural landscape, these remote sensing platforms are cost-effective methods of finding pollution and other forms of environmental damage that are otherwise unknown and unexpected. This information enables environmental scientists to determine the cause of previously undiscovered problems and trace them back to their sources.

More Remotely Sensed Data Than Ever Before

For the environmental consultant, this may be considered a Golden Age of remote sensing. The commercial availability of remotely sensed data has never been greater than it is today thanks to dramatic technological advances in sensors and the platforms that carry them.

SMALLER SATELLITES

The miniaturization of propulsion, stabilization and power subsystems has reduced the size of satellites to the point where entire constellations can be built and launched for less than the cost of a single legacy platform like Landsat and SPOT. These multi-satellite constellations have become the norm for new commercial Earth observation systems. The upshot is that several small satellites can be configured in orbit to capture repeat data over a given point on Earth at a rate of at least once per day. Even the most rapidly evolving environmental events can be monitored in near real-time.

ACCESSIBLE RADAR

Unlike passive optical sensors that can only operate in daylight, synthetic aperture radar (SAR) systems have their own power sources allowing them to capture data day or night, through clouds and in most weather conditions. The radar emissions reflect off the Earth's surface and return valuable information to the sensor. This data can be processed into images that reveal details of the composition, shape, configuration and other characteristics of surface features. For decades the power sources required to operate these systems limited SAR systems to use in large satellites or aircraft. However, recent breakthroughs have put SAR sensors in small satellites – most notably Finland's ICEYE – and in smaller aircraft. As a result, more SAR data is becoming available for use in environmental monitoring.

PROFESSIONAL UAVS

The cost of unmanned aerial vehicles, or drones, with the stability and power to carry mapping-grade imaging sensors and laser scanners (Lidar) has transformed the remote sensing industry. UAVs are now performing imaging and elevation mapping missions over small areas of interest at a cost and speed not possible for manned aircraft. They can also fly much closer to surface objects, getting incredibly detailed views of features. In addition, some drones are almost considered disposable, capturing data in conditions too hazardous for aircraft, such as volcanic eruptions and wildfires. Overall, this proliferation of affordable UAVs is making an enormous volume of high-resolution image data available for environmental applications.

ADVANCED SENSORS

Optical imaging sensors have gotten smaller and more sophisticated. Flying on small satellites, these digital cameras are capturing optical images with spatial resolution below a half meter (50 cm) and with discrete spectral capabilities spanning a multitude of visible, near infrared and shortwave infrared portions of the spectrum. This means that vegetation damage or water contamination – whether visible or not – can be detected in small areas. And these sensor enhancements aren't limited to those on satellites. Airborne sensors have become more advanced and affordable, allowing aircraft to gather larger volumes of data faster and more economically than ever before.

Read Full Article here: https://bit.ly/4jGMj5S

The Al Capability Business Leaders May Be Overlooking

xecutives might be overlooking some of Al's most valuable uses, according to a recent article in Harvard Business Review (HBR).

While generative Al gets headlines for boosting productivity, analytical Al like machine learning and deep learning often delivers clearer business benefits, says HBR. Its particularly effective for forecasting outcomes from the structured data that drives key business decisions, from sales figures to asset values to inventory levels. Leaders rely on such data to make decisions with bottom-line impact in areas from risk management and market expansion to capital investments.

Whats more, many companies already have analytical AI in their existing systems. For example, geographic information system (GIS) software uses geospatial AI, or GeoAI, to map and analyze business data about store locations, supply chains, and logistics.

As businesses increase AI spending, HBR recommends using the two types together: analytical AI to process data, and generative AI to make those insights accessible through natural conversation.

Analytical AI, Generative AI: Getting the Best of Both

HBR describes how a major telecommunications company built a custom generative AI tool that answers questions about company data by automatically generating and running statistical analysis code.

Enterprise systems like GIS could provide this capability without requiring custom solutions. GIS has long excelled at harnessing GeoAI to answer critical business questions by examining large datasets, identifying trends, and modeling outcomes. For example, it can analyze historical climate data to predict weather pattern crucial for understanding physical risk in industries like insurance or utilities. Or, it can produce sales forecasts by interpreting data like storefront locations, customer transactions, and local demographics and psychographics.

Historically, running GeoAl analyses has required GIS or data science expertise. Visualizing the findings involved making maps professional specialty of its own. Now, GIS incorporates generative Al interfaces, allowing nontechnical users to query data and make effective maps, freeing up GIS professionals for more strategic projects.

Generative AI, HBR points out, is particularly useful for enhancing productivity in creative tasks. Through generative AI, users can ask for analyses and interact with the output, adding or removing datasets and emphasizing key findings speeding up time to insight.

Generative AI Accelerates Adoption and Democratizes Data

The HBR article notes that while analytical AI delivers measurable value, generative AI helps build support for it. Leaders interviewed by the authors said the attention on generative AI actually helped them gain backing for other AI projects, especially since nontechnical stakeholders now better understand AI potential.

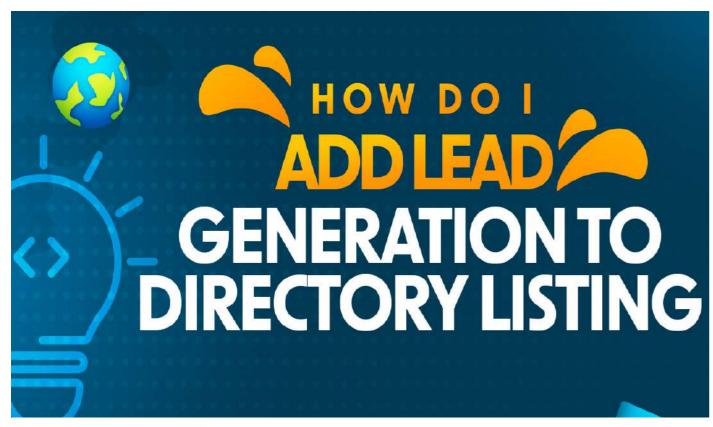
Ultimately, the two types of AI play complementary roles. Analytical AI works behind the scenes, while generative AI raises the technology profile, powering interfaces that extend the value of AI analyses to more end users.

With both types of AI available in systems like GIS, employees at all levels of the business can be empowered to make more informed decisions, share insights, and drive innovation.





WATCH THIS VIDEO ON



How do I Add Lead Generation to Directory Listing?

Partner benefits of enabling directory lead generation:

- Increased visibility to prospective customers
- Possibility of enhanced collaboration by connecting and collaborating with other partners
- Improved customer engagement and lead generation By leveraging this partner benefit, you can enhance your business growth, improve customer engagement, and maximize the value of your partnership with Esri. Questions regarding lead generation can be submitted through a discussion group post or by creating a Case.

Enable lead generation on your partner directory listing HERE

Benefits for Partners Enabling Partner Directory Lead Generation

At EPC 2025 partners meeting with the EPN team at the Partner Experience Center were informed about a new lead-generation tool available to them. The Partner Directory Referral program is a feature within the Esri Partner Community that allows partners to receive lead data directly from potential customers.

How it works:

- Partners create and maintain their find a partner listings in the Partner Directory via the My Organization > Partner Directory link on the main navigation
- Ensure your listing is up-to-date or create a new listing on the Partner Community
- Check the acknowledgment checkbox indicating your organization's willingness to receive lead data from the "Find a Partner" email capture form. This will enable the "Contact Partner" button on your listing
- Provide a URL link or PDF link to your organization's privacy policy (To participate
 in the referral program, partners must acknowledge their willingness to receive
 lead data and provide a URL link or PDF link to their organization's privacy policy)
- Provide the contact information (email address) for your organization's designated point of contact to receive the lead generation data
- By following these steps, you can effectively participate in the Partner Directory Referral program and leverage the lead generation opportunities it provides – lead generation is now enabled!
- Once these steps are completed the Partner Directory listing will include a "Contact Partner" button (see image below) that potential customers can use to connect with partners by submitting a form.





Fast and accurate survey data every time



Your exceptional choice for professionals in the mapping, surveying, and aerial data collection industries. Revolutionizing their workflows and delivering unparalleled results.





WingtraOne

GEN //

An easy-to-use mapping drone for fast and accurate photogrammetry data every time

2-14x

more coverage than with a multicopter drone

0.3 in/px

resolution

30 x

faster data capture than traditional surveying

Down to

0.3 in

accuracy





https://bit.ly/44iSEiZ

Our Industry Webinar Series explores various sectors where geospatial technologies are transforming industries and impacting lives.



FEATURE IN OUR NEXT NEWSLETTER

Send your projects and articles to events@sambusgeospatial.com

GEOINT 2025

18 – 21 May 2025 Geo Business 2025

4 – 5 June 2025 Esri User Conference

9 – 14 July 2025

UP GEOSPATIAL EVENTS

Explore some events to boost your career and network goals

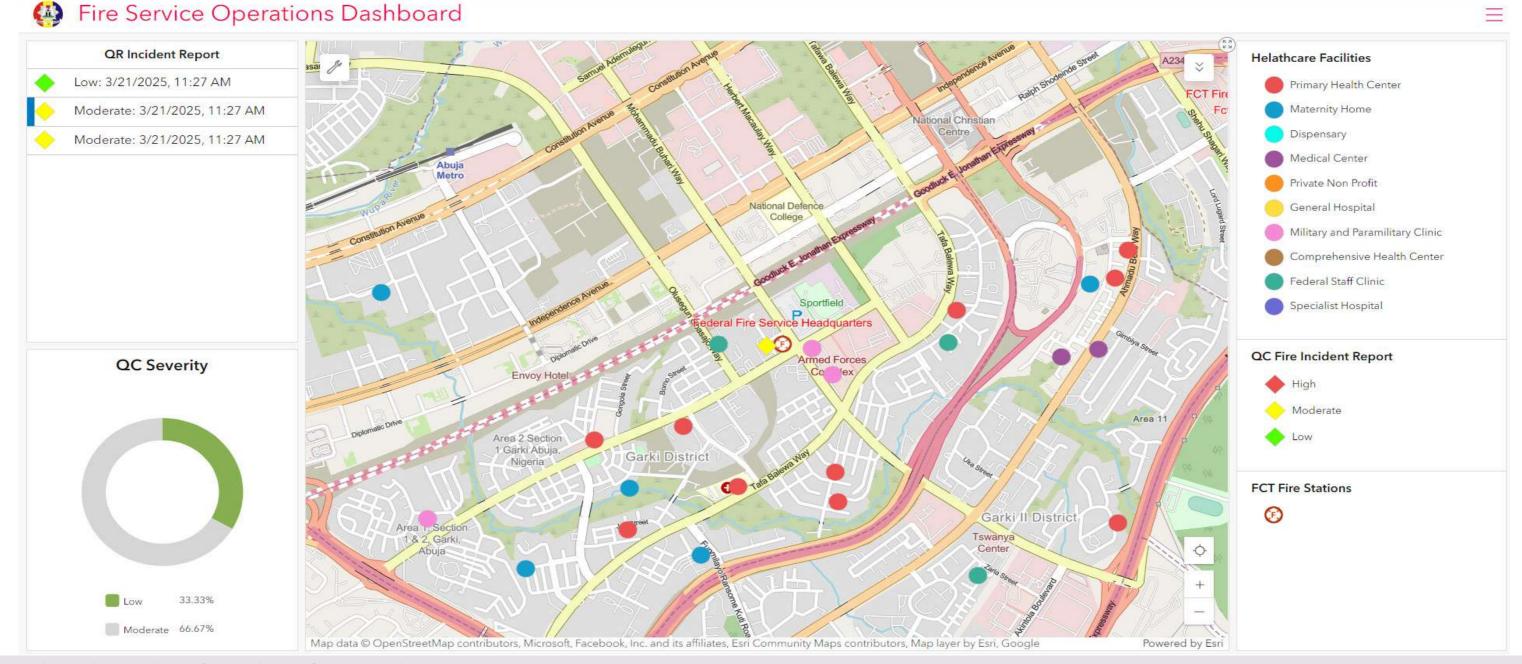
SSTD 2025

25-27 August 2025

SIGSPATIAL 2025

3-6 Nov. 2025





Nigerian Fire Service Operations Dashboard

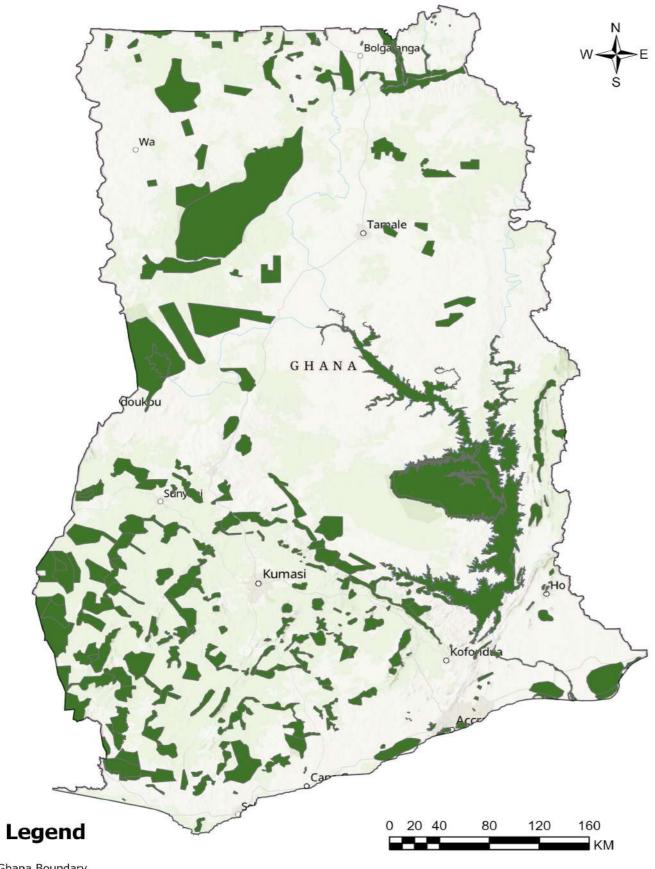
This interactive dashboard provides a real-time overview of fire incident reports, seamlessly integrating spatial intelligence to support emergency response and decision-making.

Key features include:

- **Fire Incident Reports:** Captured directly from field personnel using QuickCapture for rapid, one-tap reporting and Survey123 for more detailed, form-centric data collection.
- **Proximity Analysis:** For every reported incident, the dashboard displays the nearest hospital and fire service station, enabling quicker response and resource allocation.
- Severity Level Mapping: Each incident is categorized by severity, helping prioritize high-risk areas and deploy resources efficiently.
- Smart Integration: Combines the speed of QuickCapture with the depth of Survey 123 to ensure both quick alerts and comprehensive incident documentation. This dashboard is designed to support operational decision-making for fire services, enhancing situational awareness and improving emergency response times.

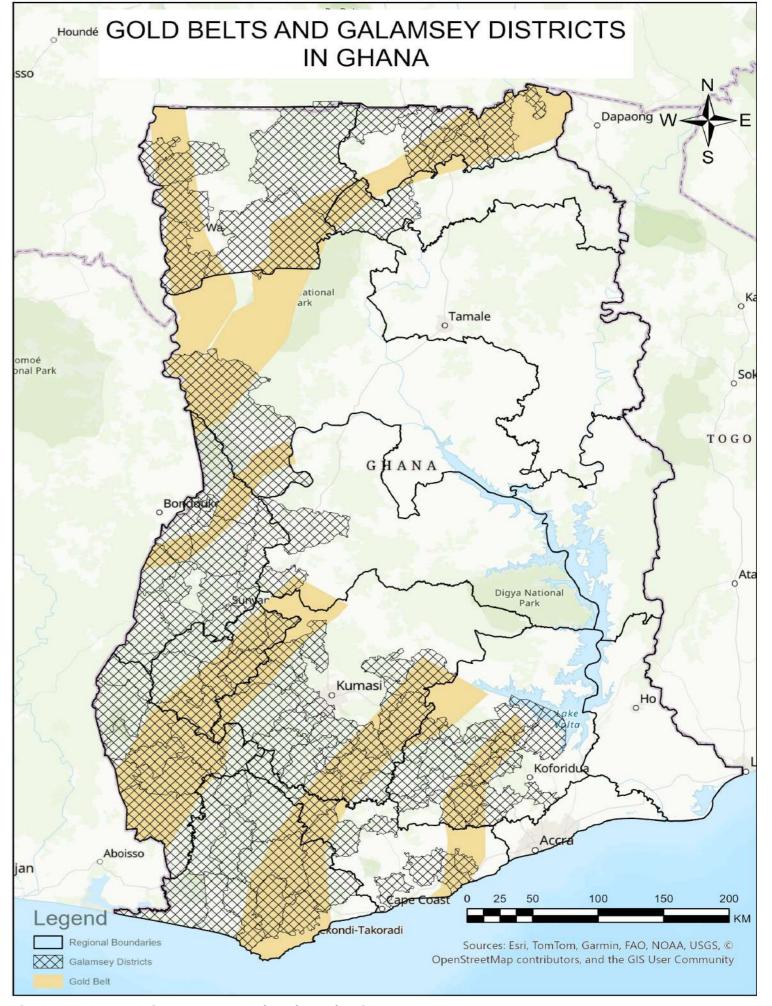
The **Forest Reserve and Protected Areas in Ghana** map layout was created using **ArcGIS Pro.** The map is designed to be informative and visually appealing, ensuring that the key information about Ghana's forest reserves is easily identified. The use of color coding and spatial data effectively highlights the distribution and extent of these protected areas across the country.

FOREST RESERVE AND PROTECTED AREAS IN GHANA





Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Gold belt and Galamsey Districts in Ghana, was designed using **ArcGIS Pro**, it illustrates the distribution of Gold belts and Galamsey (illegal mining) districts in Ghana. It incorporates regional boundaries, gold-rich zones, and Galamsey-affected areas.

