

ISSUE | 04

AUGUST 2021

THE

# SPATIAL TIMES

FREE

THEME

GEOSPATIAL TECHNOLOGY  
FOR HUMANITARIAN AID



Issue | 04



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## FEATURED

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# THE EDITORIAL

The Spatial Times | 04

## This Issue's Editor



Kumbirai N Matingo

BSc Surveying & Geomatics Student  
(Zimbabwe) | Founder of African  
Surveyors Connect | GIS Developer

Hello once again.

From myself and the crew behind these pages, we would like to Welcome you to our 4th Issue of **The Spatial Times** magazine.

Every publication of this community magazine would not have been possible without the community behind it. All the support, motivation and inspiration that you provide from day to day has brought us this far. Thanks a million.

In this issue our main focus is on Humanitarian action and AID that the geospatial community provides.

We will also be introducing some new things onto our platforms which we hope the community will love and will continue to be active participants.

We hope you enjoy this issue and many others to come.

Cheers.

A photograph showing a stack of several cardboard boxes. The word "AID" is printed in large, bold, black capital letters on the side of the top box. Below the main stack, another box is visible with the letters "A" and "D" printed on it.

AID

# The Intervention Stage

Every year natural and man-made disasters cause mass population displacement, loss of lives, and human suffering. Thanks to Non-Governmental Organizations and Non-Profits, efforts have been put in place in order to provide rescue and aid to the families of the affected all over the world. These events take place in different places and different times world-wide and Geographic Information Systems (GIS) has proven to be an indispensable tool in the humanitarian sector.

Because of the importance of geospatial information the UN has established highly skilled...



...departments with their core focus on GIS and geospatial intelligence. Major geospatial data sources for the humanitarian relief sectors includes UNOSAT (UN Operational Satellite Applications Programme) and Relief Web.

UNOSAT coordinates the procurement, processing and analysis of satellite imagery which is then made available to all other UN agencies. It collaborates with other geospatial and space agencies and its end products are used primarily for three main goals: humanitarian and relief coordination, human security and humanitarian law, and territorial planning and monitoring.

In a humanitarian setting, various geospatial tasks can be performed in order to solve the mess that these disasters create and moreover to even counter them before they even take place and make sure no-one suffers the effects.

We have managed to list out some of these tasks and provide a brief description too:

## CARTOGRAPHY AND HUMANITARIAN INTELLIGENCE

Rapid Assessment, Presentation of information, visualization, land use, infrastructure and facility mapping, remote sensing for monitoring and evaluation.

## CRISIS SIMULATION AND IMPACT MODELS:

Analyzing what if scenarios and consequences of disaster, incident modeling, forecasting.

## RISK ASSESSMENT

Identification of “hot spots,” combination of vulnerability and hazard assessment to evaluate at risk populations.

## VULNERABILITY ASSESSMENT:

The integration of socio-economic and environmental data to serve as an early warning alert.





## DECISION MAKING SUPPORT

Network and location analysis for resource allocation and optimization.

## SURVEYING AND COMMUNICATIONS

Citizen Participation and Crowd-sourcing, status reporting, program assessment.

Each of these different tasks have a greater importance in one phase of the disaster stage over the others. For example, risk assessment, impact models and vulnerability assessment have greater application in the preparation phase while surveying and communications as well as decision making support are of particular importance in the response phase.

Engineering and environmental planning are activities commonly associated with the reconstruction phase of a disaster (a stage in disaster relief).

It is important to note that such activities can also be found as a form of continuous aid which seeks to improve living conditions in a given region and serves as a form for sustainable development.

Ever wondered why Unmanned Aerial Vehicles (UAVs) are just flying all over the place after an earth-quake or storm occurs? They are not just looking for survivors only, the initial stage of the Engineering and Environmental planning work has already began.

# INTRODUCING THE GEOSPATIAL PODCAST



BRIDGING THE BORDERS BETWEEN



## August Announcement

The Podcast programs aims at airing out the voices of the young and experienced professionals

**WATCH THE SPACE**

## Who? When? How?

Anyone, Anytime and Anyhow can be able to share, discuss and debate on issues surrounding the profession.

**READY?**





## LAUNCH OF PHASE II OF THE MOOC ON THE “GEOSPATIAL APPLICATIONS FOR DISASTER RISK MANAGEMENT”

by United Nations Office for Outer Space Affairs (UNOOSA)

Phase II of the Massive Open Online Course (MOOC) on the “Geospatial Applications for Disaster Risk Management” was launched on 1 June 2021 by the United Nations Office for Outer Space Affairs (through its UN-SPIDER programme) and the Centre for Space Science and Technology Education for Asia and the Pacific (affiliated to the United Nations). The MOOC provides free and flexible online training to everyone who wishes to enhance their capabilities related to the use of geospatial and Earth observation technologies in disaster risk management.

Phase II is a continuation of Phase I of the MOOC, which was launched in 2020. It offered a much needed learning tool for capacity building during...

the challenging times of the COVID-19 outbreak. It received an overwhelming response from 29,727 participants from 104 countries. Phase II brings an enhanced version of the MOOC based on the feedback received from the participants.

Phase II of this MOOC aims to strengthen the knowledge of disaster management professionals, experts, and students in understanding the role of Earth observation and geospatial information in order to achieve the targets of the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2030 Agenda for Sustainable Development and the Paris Agreement, stemming from the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC).

The inaugural ceremony was carried out by Ms Simonetta Di Pippo (Director, UNOOSA), Mr. Shantanu Bhatawdekar (Director of Earth Observation Programme of Indian Space Research Organisation), Dr. Prakash Chavan (Director, CSSTEAP), and Dr. Nancy Searby (Chair of the CEOS Working Group on Capacity Development). The focal points of this Phase II of the MOOC are Dr. Shirish Ravan from UNOOSA and Mr. C.M. Bhatt from CSSTEAP.

The registration for MOOC is open from 1 June to 15 August 2021 and will be offline on 31 August 2021.

Individuals can register on this address:

<https://isat.iirs.gov.in/mooc.php>



# *Geospatial Applications for Disaster Risk Management*

WRITTEN BY  
ALFRED TARIRO MUSAVENGANA

Climate change has increased the severity and frequency of disasters hence this has resulted in integrated efforts to effectively address disasters. A disaster is a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies and ecosystems.

Global efforts to address disasters have been implemented through the Hyogo framework for action (2005-2015) and the Sendai framework for disaster risk reduction (2015- 2030). The Sendai framework currently in use recognises disaster risk as a major threat to development and human life. Disaster risk arises when hazards interact with physical, social, economic and environmental vulnerabilities (Basabe, 2013) . It calls for the use of technology and space satellite information in risk assessment and disaster response. This has led to the adoption of geospatial technologies in all the stages of disaster risk management that is risk identification, risk mitigation, response and also recovery.



It is important to note that the disaster management cycle is a continuous process which never stops hence this also means that geospatial support is also required continuously to ensure that loss of life and destruction of infrastructure is reduced. A good disaster management starts with use of geospatial technology within an incident command system (ICS) that is multidisciplinary to effectively manage all important elements during disaster. Efforts to effectively manage disasters using geospatial technology have been promoted internationally by the International Charter 'Space and Major Disasters' which is an international body offering free geospatial support to various states around the globe. It is a geospatial hub with earth observation data acquired from various geospatial resources from different space agencies such as the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the United States Geological Survey (USGS).

The Charter allows resources and expertise to be coordinated for rapid response to major disaster situations; thereby helping civil protection authorities and the international humanitarian community to implement informed decisions on disaster management. The Copernicus emergency management services and Sentinel Asia also provides on demand mapping services for various emergencies such as veld fire, flooding, earthquakes, tsunamis and drought among others.

In disaster management geospatial technologies have been used for water depth and extent covered by water to analyze floods and create flood inundation maps. Geospatial technologies have also been used for early warning monitoring of floods through flood modelling and time series analysis while it has also been used for site suitability analysis in flood response and recovery for relocation of flood victims. For veld fire management it has also been used for fire forecasting and near real-time fire mapping and vegetation regeneration analysis for effective rangeland management. In earthquakes, geospatial technologies have been used for ground motion and damage assessment and active fault mapping among other uses. The same goes for other disasters such as landslides, drought and heatwaves. With that being it is clear to note that geospatial technologies are a vital component of disaster management as they are cost effective and not labour intensive while they also help identify underlying risks in an emergency situation.

In recent years COVID 19 is one pandemic that has limited disaster management initiatives due to its restrictions in movement as a result of fear of transmission. Therefore, in order to minimise risk of transmission whilst trying to manage another disaster such as flooding response, geospatial technologies through overlays and spatial analysis can identify COVID 19 risk areas such that caution and proper equipment is disbursed according in responding to another disaster.

Geospatial technology also reduces the personnel needed to respond to an emergency hence this makes it a very important element in disaster management. However, the utilization of geospatial technologies should be promoted particularly in developing countries which still lag behind in terms of geospatial infrastructure, expertise and even the will to merge geospatial technologies into policies that try to achieve objectives of the Sendai framework.





# YouTube AFRICAN SURVEYORS CONNECT



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# PREDICTING AND MANAGING CHAOS: HOW GIS HAS TRANSFORMED NATURAL DISASTER RELIEF

*Education Spotlight*



## USC - UNIVERSITY OF SOUTHERN CALIFORNIA

Hurricanes, wildfires, mudslides and other natural disasters can cause considerable chaos — damaging the environment, affecting communities and complicating rescue/relief efforts. But thanks to GIS, emergency management professionals are better equipped than ever to help communities prepare and recover.

From tracking and predicting disasters to assisting in rescue, recovery and relief efforts, GIS is mitigating risk and damages, and saving lives.

USC's online graduate programs in GIST can equip you with the future-focused spatial expertise to manage disasters — and more accurately and thoroughly prepare for them before they happen.

## DID YOU KNOW?

You can be an expert in Disaster Management with Geographic Information Systems through USC programs in GIST

Visit the web-page to get started today:

<https://gis.usc.edu/>



# Humanitarian Surveying - The New Role for Surveyors

WRITTEN BY TIM BURCH

Like most land surveyors in the world, the role has been well-defined for generations. We establish and/or reestablish parcel boundaries (that is, original or retracement surveys). While our duties have expanded based upon technology, the central responsibility of the surveyor has been established as an expert measurer and provider of boundary information.

In the 200+ years since the expansion and formal establishment in most parts of the world, the role of the surveyor

has evolved into more of a commercial purpose. A surveyor's principal responsibility is to protect the public, but that meaning has much different connotations in lesser developed countries.

In the recent past, surveying efforts in many developing countries have been like the early General Land Office surveyors in the 1800s. A surveyor in these regions is out in front of development of unclaimed lands, observing natural and manmade boundaries to guide the decision-making process in establishing parcel rights. The methods and procedures used to date in many lesser developed countries are much like 19th-century surveying — primitive instruments and crude maps sketch property claims with little to no authority.

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**Surveying: The Next Generation.** Here is where the concept of the community or humanitarian surveyor comes into the picture. A new generation of surveyors is using modern technology not just to map existing boundaries and improvements, but also to collect additional data that will be analyzed to help improve living conditions. With the introduction of GNSS technology, establishment of parcel boundaries now takes an accurate and precise shape in GIS databases created for improving conditions in these areas.

Additional attributes are collected to determine utility needs, communication availability and access to medical care. The easy solution seems to be that, as a larger part of the surveying community, we send teams of surveyors to these countries to locate and establish boundaries as well as perform site studies to determine living conditions and potential improvements. If it were just that easy...



## Local government: Friend or foe?

Often, these surveyors are going into regions where the local or national governments do not agree with empowering their citizens with property rights and allowing them access to basic utilities. Part of the humanitarian surveyor's role is to get to know the "lay of the land" when it comes to local order. Many remote places are controlled by local gangs, tribes or other factions. These groups forbid the population around them to own their property. Even though it may seem like these physical parcel boundaries exist, most of these people do not have title or land tenure rights. This is partly because of the local control situation, but can also be due to the lack of sophistication within the local or national government.

### Communication hurdles.

Another hurdle for the humanitarian surveyor has nothing to do with their professional capability — it relies solely on appearance, body language and ability to bridge a communication gap. For example, most first-world nations rely strictly on communication skills and the competence to effectively work with other people. We often easily trust those who present evidence of competency with no previous interaction.

In third-world countries, however, locals do not trust outsiders and place competency on those who have built long-term relationships with them. They also rely heavily on body language and facial expressions to convey trust. Local citizens in these areas are less likely to trust visiting older generations who are not able to understand these visual cues.

Combining the factors of trust of the local citizens with the unsteadiness of government and/or lawlessness, the humanitarian surveyor must also be able to determine common property lines, locate lines of occupation, and remain neutral in providing guidance to adjacent neighbors. These conditions often include areas for crops and livestock, as well as places for food growth and development.

With little to no money and lack of commerce available, many of these regions are food poor. Locals are forced to harvest their own food, so having a plot of land to grow these crops is critical.

In more established areas, it can be challenging to determine land tenant rights with many shanties and lean-tos being joined structurally. It is equally difficult to determine if any common utilities exist in these areas, such as stormwater channels to help with rainfall.

Add to these improvement location duties the need for better census data to help with government analyzation of population to apply for aid from other countries.

The good thing is that technology has progressed in creating tools for geographically locating all these entities, including population, with a multitude of attributes to complete proper analyzation.

But there is a catch.

## Technology challenges worldwide

One of the biggest issue surveyors face when providing services in these areas is the lack of advanced technology and computers. These areas may not have reliable utilities, such as electricity or running water, much less viable internet or Wi-Fi. If computers do exist with local government, they are often years behind in computing power and software. Even operating systems like Windows are a rarity in many of these countries.

**Networking accuracy needed.**

Most humanitarian surveyors will bring their own equipment and computers, so that problem can be averted. But what about geographical locations? Yes, GNSS constellations are available worldwide, but accuracy using just satellite signals is not sufficient for location of parcels and improvements.

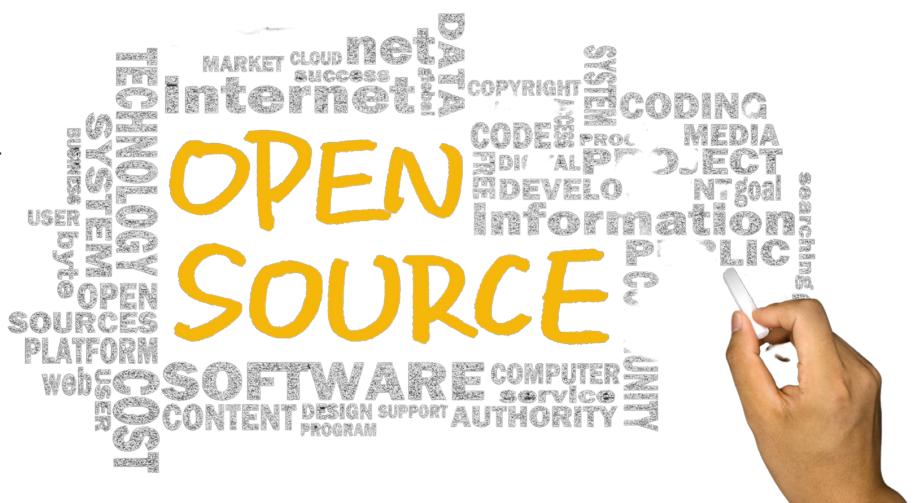
To get survey-grade accuracy, the surveyor will typically utilize a correction service or base station on a known value. Most of these corrections are based on Continuously Operating Reference Stations (CORS) or similar established reference stations, so creating a georeferenced datum for the surveyed location takes time and knowledge. Once the network is established, lots of work and oversight is necessary to provide quality control on the data being located.

To add to these issues, most of the staff necessary to complete the surveys must be brought in due to the lack of education at the location. The role of the humanitarian surveyor will also be to teach the craft of surveying to locals, who will continue to expand the area cadaster after the volunteer surveyor has left.

## Open-Source Software.

However, affording the necessary equipment, computers and software to continue the newly established system is also a hurdle for the community. While the price of computer hardware has greatly reduced over time, the advancement of software and cost of upkeep provides a greater monetary challenge.

Enter open-source software, based upon Linux and other free computer operating systems. This software has been developed with these situations in mind. It allows for customization to each user's specific need. There are several GIS and data-collection platforms to fit the needs of these budding communities and countries. Open-source and public-domain software allow even the most basic of cadaster needs to be completed efficiently.



# YOUNG SURVEYORS NETWORK TO THE RESCUE

VOLUNTEER COMMUNITY SURVEYOR PROGRAM PARTICIPANTS



The FIG Young Surveyors Network (FIG YSN) was initially established in 2006 as a working group, and upgraded in 2009 to network status due to its rapid growth. This group of young professionals and practitioners worldwide has worked with groups such as the United Nations, World Bank, National Society of Professional Surveyors (NSPS) and Council of European Geodetic Surveyors (CLGE) to promote the profession, increase opportunities for young professionals, and be an agent for social and climate change.



WRITTEN BY

TIM BURCH

From a technology standpoint, it makes sense that the FIG Young Surveyors Network began this program to help underdeveloped nations begin to create simple cadasters for assessing their property and improvement needs. The younger generation has grown up with technology and can easily teach someone how to embrace it and trust the results.

This younger generation is also the developer of open-source software and tools and sees the value in providing low-to no-cost applications to those who need it most. While the hard part is collecting the data and working with the locals to establish common boundaries, count the population, and determine the utility needs, they take pride in being part of a solution for a segment of the world that may not have any other chance or choice.

One of the interesting portions of the workshop was the breaks between segments. While it was a time to step away from the computer/tablet/phone, the organizers broadcast videos of musical groups from around the world and encouraged the participants to stand up and dance, with their cameras on. While I did not partake in the dancing (it was 4 a.m. at my home), I applaud the Young Surveyors for providing a welcoming atmosphere where each person could be themselves. Several of the participants were in Africa and Asia on cellphones, so creating a workshop environment that worked for all levels of engagement was fascinating.





# Data Processes for Participatory Policy Processes

BY KUDA MADZIVA

The responsibility of assigned/elected decision makers means acting in the interest of the represented, in a manner responsive to them.

To this end, Data Processes are paramount in Participatory Policy Processes as it involves and informs the public to allow those affected by a decision to have an input into that decision and also those making the policies to have a better understanding of the people being affected by the policies they will be making

## Factors affecting policy making

- Inclusion of all affected parties (this includes women, children, persons with disabilities, etc.)
- Inclusion of all affected aspects (service delivery and access to services, health, environment, social policies, economics, etc.)
- Strategic view, logical and consistent layout and implementation over longer periods;
- Possibilities to (re)adjust the policies based on feedback and evaluation, etc

- Data and Data Processes

## Data & Inclusive Development Decisions and Policies

Disaggregated data can play an important role in identifying social groups and regions characterized by concentrated marginalization. Data has a vital role to play in providing an evidence base for developing targeted interventions and wider policies.

## Understanding Data

In order to understand the data and required data processes for policy formulation, we need to understand the GOALS and OBJECTIVES. These can be seen from different points of view, depending on the required outcome

A current situation can be characterized by comparison with standard values when goals have been laid down in an earlier stage.

## **Deprivation and Marginalization Datasets.**

In measuring marginalization, Household surveys and other data provide insights into the relationship between poverty, ethnicity, health, parental literacy and other characteristics.

While these are all characteristics associated with marginalization, in most cases the marginalized are often persons with disabilities, poor and female, and from an ethnic minority living in a remote rural area.

Deprivation and Marginalization Data Set is a statistical tool that helps chart the dimensions of marginalization and identifies patterns of individual and group disadvantage.

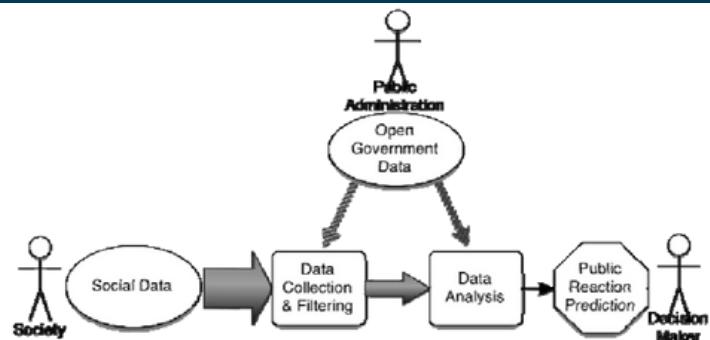
The data is drawn from Demographic and Health Surveys conducted by different service providers, CSOs and Government departments.

## Data Processes

To improve our knowledge of the poor and the marginalized we need to fill gaps within the data by exploring how existing methods and new technologies can fill in those gaps.

To make better policy, we also need to know more what is important to the marginalized people, what they think, as well as what they have. Ultimately this will feed into better policies that improve their lives.

Data on marginal groups can be sub categorized into:



- 1.education
  - 2.housing
  - 3.employment
  - 4.healthcare
  - 5.civic engagement
  - 6.democratic participation
  - 7.due process

## Data Collection

The primary sources of data include:

- Demographic Health Survey
  - Multiple Indicator Cluster Survey
  - Living Standards and Measurement Survey
  - Census

Together with the secondary sources which include:

- Government data
  - Assessments
  - Available researches
  - Information from partners

A black and white photograph of a magnifying glass with a dark frame and handle. The lens is focused on the word "DATA" written in a bold, sans-serif font. The background consists of a grid of binary digits (0s and 1s) arranged in rows, similar to a computer screen or data sheet. The magnifying glass is positioned such that its circular frame encompasses the central letters of the word "DATA".

## DATA

## About the Author

*Kudakwashe Madziva*

# Geospatial Technology | GIS Systems & Applications | Custom Software Development | Mapping | ICT4D for Humanitarian Work

The text was delivered as a presentation by the author during a Workshop in Binga, Zimbabwe

You can get the full presentation online:

<https://bit.ly/3eSmobV>

## HUMANITARIAN ORGANISATIONS

## *Career Outlook*



# UNITED NATIONS VOLUNTEERS

The United Nations Volunteers programme is a United Nations organization that contributes to peace and development through volunteerism worldwide.



# WORLD FOOD PROGRAM

The food-assistance branch of the United Nations. It is the world's largest humanitarian organization, the largest one focused on hunger and food security, and the largest provider of school meals.



**FOOD AND  
AGRICULTURE  
ORGANIZATION**

A specialized agency of the United Nations that leads international efforts to defeat hunger and improve nutrition and food security.

Essential as a member of the Geospatial community, there is no limit as to which career path you can take. One can decide to focus their skills in humanitarian efforts in any of the Humanitarian Organizations that exist in today's modern world who's main initiative is to improve the lives of people.

There is no limit as to what one can be.

Looking to focus your career on humanitarian work? Check out these Organizations websites and keep an eye out for opportunities.



# LOOKING FOR YOUTH VOLUNTEERS



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AFRICAN SURVEYORS CONNECT  
IS LOOKING FOR

# GEOSPATIAL PODCAST PRODUCER(S)



Do you want to meet new people, engage in professional conversations, share views, produce content and be heard? Are you ready to join our team?

## Tasks and Objectives:

- produce Geospatial Podcasts for our Podcast section (at least twice a month)
- Organize interviews, chat sessions, educational sessions with professionals and students in the Geospatial profession
- Responsible for managing the Podcast platform and organizing content

## Requirements

- Any youth or individual below the age of 30 years.
- Have knowledge and understanding of the Geospatial industry and profession
- Ability to speak good English and conduct interview sessions
- Capability of handling, managing and using online platforms as a tool for production.

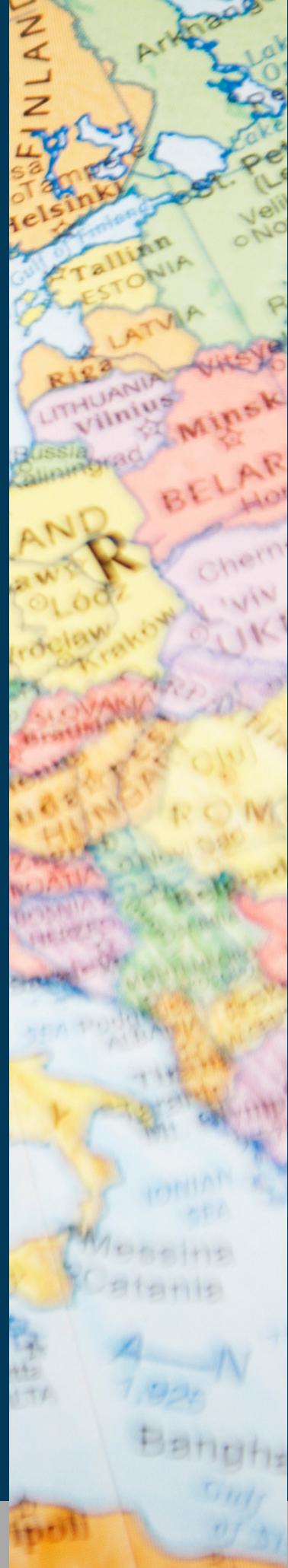
## Benefits

As a Geospatial podcast producer you will:

- have an opportunity to network and create a name for yourself
- work on your communication and professional skills
- expand your knowledge base by learning from professionals you meet
- Have an opportunity to be heard with the Geospatial community

**PLEASE NOTE: THIS IS A VOLUNTARY ROLE  
AND THERE WILL BE NO RENUMERATION**

Interested individuals can send in their motivation letters via Email to: [careers@africansurveyors.net](mailto:careers@africansurveyors.net) on or before 15 August 2021



# GEOSPATIAL INTEL



## GEOINT Careers

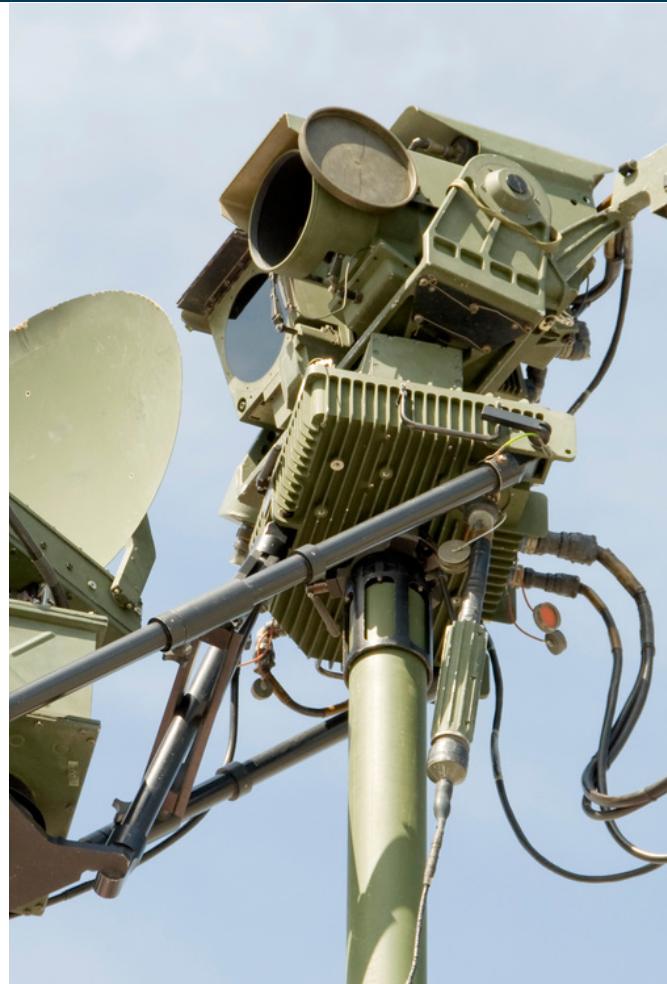
- Disaster Relief
- Disaster & Threat Response
- Military Operations
- Disaster Projection Analysts

## A Career in Geospatial Intelligence

While geographic information science (GIS) requires specialized knowledge to be successful, the discipline is full of varied opportunities. Geospatial intelligence (GEOINT) represents one of the dynamic areas where professionals can further evolve their GIS careers, pursuing opportunities with the government, military or with humanitarian organizations.

For example, the most world armies and secret agent organizations (i.e. CIA, KGB, Mossad) rely heavily on geospatial intelligence to protect civilians and better understand the complex issues facing the nation, from military threats to natural disasters. At the same time, humanitarian organizations (i.e. UNAID, USAID, UNOOSA) use GEOINT for mitigating damage caused by a range of events and factors, as well as for effectively sending aid to populations facing crises.

Individuals who go into geospatial intelligence careers often refer to it as a calling rather than a job, making it an ideal career for GIS professionals who have a passion for protecting people and mitigating damage to critical services and infrastructure. Moreover, with the way GIS technology has evolved to take advantage of the digital age, the GEOINT field is benefitting from rapid advancements in technology that make it an exciting time to get involved.





# GIZA NECROPOLIS, EGYPT

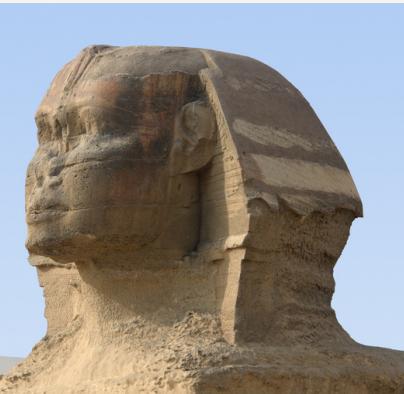
## THIS ISSUE'S DESTINATION

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The Giza Pyramid Complex, also called the Giza Necropolis, is the site on the Giza Plateau in Greater Cairo, Egypt that includes the Great Pyramid of Giza, the Pyramid of Khafre, and the Pyramid of Menkaure, along with their associated pyramid complexes and the Great Sphinx of Giza.

**Periods:** Early Dynastic Period to Late Period

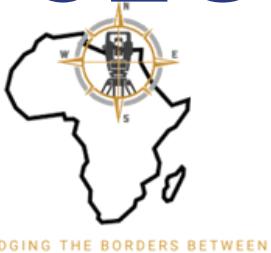
**Region:** Middle Egypt



# INFO SECTION

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WhatsApp: +(263)-71-8-870-810



Resources and Information that you might be interested in knowing more about

## Coronavirus Hub (Zimbabwe)

<https://covid19.africansurveyors.net/>

## Blog

<https://africansurveyors.net>

## Suggestion Box

<https://africansurveyors.net/suggestion-box/>

## Career (Job Portal)

<https://africansurveyors.net/jobs/>

## Previous Publications

<https://africansurveyors.net/category/publications/>

**"WE CANNOT STOP NATURAL DISASTERS BUT  
WE CAN ARM OURSELVES WITH  
KNOWLEDGE: SO MANY LIVES WOULDN'T  
HAVE TO BE LOST IF THERE WAS ENOUGH  
DISASTER PREPARDNESS"**

~ Petra Nemcova

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