



Digital Earth
AFRICA

DE Africa Quarterly Progress Report

July - September 2022

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About Digital Earth Africa

Our vision

DE Africa will provide a routine, reliable and operational service, using Earth observations to deliver decision-ready products enabling policy makers, scientists, the private sector and civil society to address social, environmental and economic changes on the continent and develop an ecosystem for innovation across sectors.

Our mission

DE Africa will process openly accessible and freely available data to produce decision-ready products. Working closely with the AfriGEO community, DE Africa will be responsive to the information needs, challenges and priorities of the African continent. DE Africa will leverage and build on existing capacity to enable the use of Earth observations to address key challenges across the continent.

About this report

This Quarterly Progress Report provides a snapshot of DE Africa Phase II progress made between July and September 2022, as aligned with DE Africa's 2022 Annual Work Plan.

**Open and Free Data**

- Interoperability
- Privacy and Integrity

**Operational Service**

- Continental-scale
- Sustainable
- Domain expertise

**Accountability and transparency**

- Responsive to African priorities
- Agile, nimble and actions oriented

**Diversity and inclusion**

- Multi-sector perspectives
- Span data communities
- Foster collaboration

The governance of DE Africa is guided by several key principles

DE Africa outcomes - our work has impact

- **Countries are empowered**, with Earth observation data about land, water resources and human settlements enabling them to make evidence-based policy decisions.
- **Lives are improved**, through access to information that empowers governments, individuals and communities to make informed choices.
- **Development activities are more effective** through access to information that provides insights to better understand the root cause of issues and develop impactful solutions. Development of decision ready products, and analysis ready services to support African Union Agenda 2063 and the UN SDGs.
- **Digital transformation is advanced** through industry uptake and innovation using products and services from DE Africa. Increased economic development and job creation, through access to data for commercial products and services development.
- **Over \$2bn USD of benefits to the African continent** are possible through accelerated industry growth, improvements in agricultural productivity and the detection and prevention of unregulated mining.

\$2.3bn

Even under conservative assumptions, the impact of Earth Observation could be higher than **\$2 billion** (USD) per year

Three key areas



"The analysis estimates that an overall socio-economic impact of approximately USD 540 million could be achieved per year while keeping the conservative assumption of a 10% application."

*Source; World Economic Forum Report '[Unlocking the Potential of Earth Observation to Address Africa's Critical Challenges](#)'

July - September 2022 Highlights

Celebrating DE Africa's Third Birthday!



Digital Earth Africa celebrated the 3rd anniversary of Digital Earth Africa Day, first held on the 11th August 2019. We welcomed many messages from over the globe wishing us a very Happy 3rd Birthday, and celebrated with a range of social media posts exploring the development of the platform.

Read more [here](#)



Governance

Dr Xaba and her new leadership team have taken program Governance onboard and in their stride by hosting TAC-12 alongside the Australian team and preparing for TAC-13, the first face-to-face Technical Advisory Committee meeting since the beginning of the COVID-19 pandemic.

The PMO leadership has engaged an organisational expert to review and advise on improving the governance framework for Digital Earth Africa. This process includes plans to review the Terms of Reference of the Technical Advisory Committee. It will also ensure continued strong governance with engaged Governing Board members and position the PMO to have the best organisational structure for long-term sustainability.



Program transition to Africa

The appointment of Dr Thembi Xaba as Managing Director of Digital Earth Africa on July 1st marked the transition of the organisation to be fully Africa owned and run.

“I am delighted to be a part of the journey of growth for Digital Earth Africa, leading the organisation from our Program Management Office here in Pretoria,” says Dr Xaba.

Geoscience Australia continues support Digital Earth Africa in an advisory role and continue to provide international support for initiatives that further climate action on the Africa continent.

The PMO team continued to grow this quarter, and we are pleased to welcome the following people to the DE Africa team:

- Dr Lisa-Maria Rebelo, Lead Scientist, Sri Lanka.
- Maud Nale, Communications Lead, South Africa.
- Mmakgotha Rakuba, Program Administration Officer, South Africa.
- Marjorie Moloi, Executive Assistant to the Managing Director, South Africa.
- Joseph Tuyishimire, User Engagement Manager, Rwanda.

The team is also activating recruiting for an Earth observation Data Scientist.



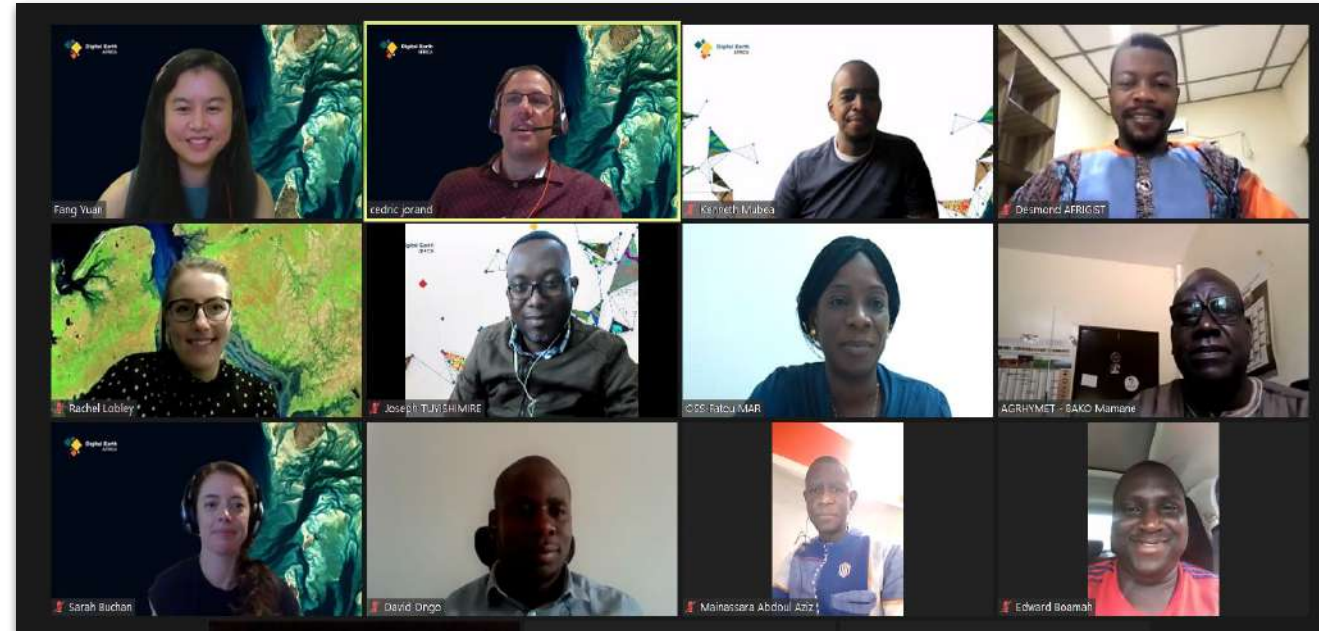
Dr Xaba and Dr James Johnson, CEO of Geoscience Australia

Program delivery transition

The **Operations Transition Plan** is in progress, key items to be concluded are the Platform Transition In Plan and the Standard Operating Procedure (SOPs) manuals for each functional area. All Standard Operating Procedure manuals are over 70% complete, with Communications being the first area to complete the transition with handover completed to the Communications Lead by end of August.

Implementing Partners

- All Implementing Partners signed novation of Partnership agreements, this now awaits SANSA signature.
- Implementing Partners completed the Phase 1 projects in July and August.



DE Africa Implementing Partner program management team



Sustainment

In August, the DE Africa PMO Leadership Team engaged DevGlobal and DevAfrique to support developing the sustainment strategy for the next six months. These partners have helped add the following organisations to the funding pipeline: Kellogg Foundation, African Development Bank, Rockefeller Foundation, Bezos Earth Fund and the World Bank.

The Sustainment support team researched and outlined the Green Climate Fund Accreditation Process and the PMO is to review its suitability to apply for funding through the Green Climate Fund.

In September, the PMO with the support of the Global Advisory team shared the forward sustainment strategy with the Leona M. and Harry B. Helmsley Charitable Trust grants team. Sharing the forward strategy with a key partner was to garner feedback on the organisational objectives and feasibility of sustainability strategy.

Funding Applications have been submitted

- Lacuna application - application has gone to the next stage.
- CLARE Application - proposal was declined
- WFP Innovation Challenge - ongoing

DE Africa Managing Director, Dr Xaba, was also invited as a panelist to the SatSummit, which was held in Washington DC, supported by Digital Earth Africa Lead Scientist, Dr Lisa Rebelo. Over and above conference engagements, the team had sustainment discussions with the following funding partners: Bill and Melinda Gates Foundation, USAID and the World Bank.



Dr Thembi Xaba, Dr Meghan Halabisky and Dr Lisa-Maria Rebelo at SatSummit 2022

Diversity and inclusion

Digital Earth Africa is proud to support the YouthMappers Technical Challenge. YouthMappers chapters and students have been invited to submit proposals addressing a societal challenge using the Digital Earth Africa platform. DE Africa was also proud to continue its growing relationship with African Women in GIS this quarter as we finalised our mentor program collaboration and DE Africa Technical Challenge to solve a societal problem. Our continued relationship with both YouthMappers and AFWGiS highlights our commitment to engaging and supporting young professionals.

PMO Program Manager, Farrah Naidoo, has begun co-chairing the Diversity and Inclusion Working Group, and is engaging in discussions on introducing new organisations to the group to further the inclusion of diverse groups of stakeholders.

The Digital Earth Africa team is a technical partner of the [African Earth Observation Challenge](#). By the end of September over 80 applications from across the continent had been received. The goal of the challenge is to identify the most promising innovators, entrepreneurs and early-stage businesses across Africa and develop them into sustainable companies and to build capacity around the use of the DE Africa Products and Services.



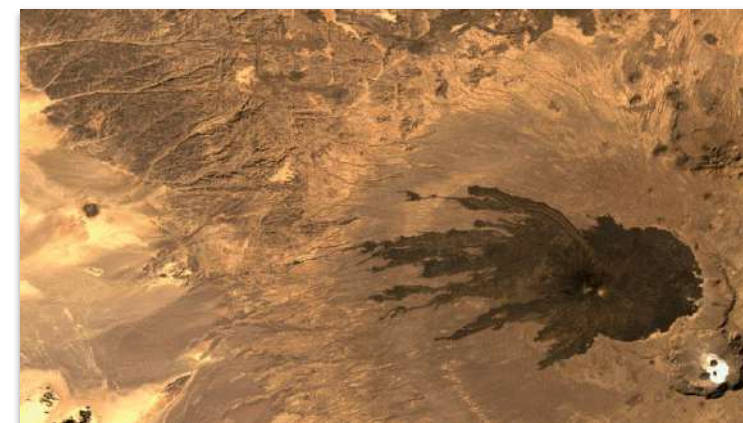
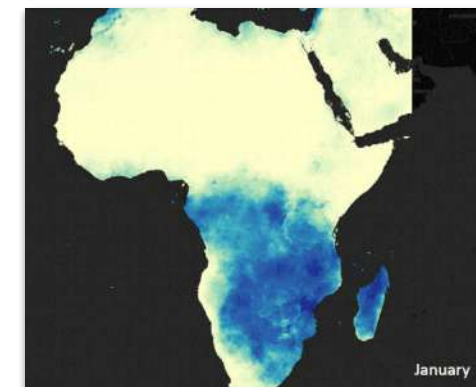
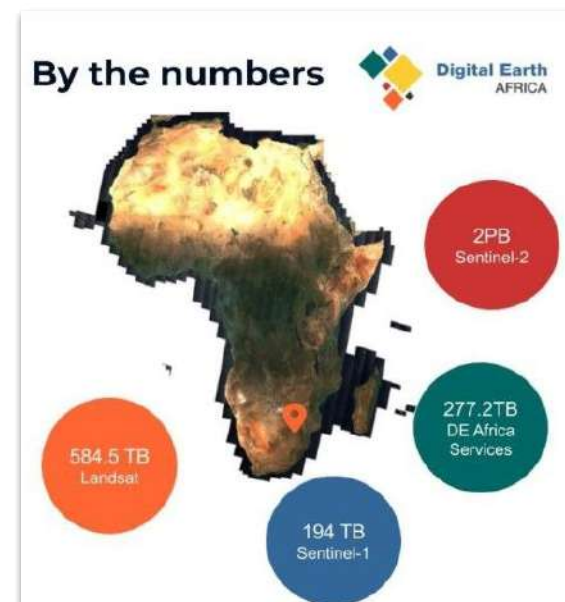
Platform and data

This quarter marked the complete transition of platform management to Africa, with the South African National Space Agency talking on the role of platform host. The SANSA team designed a dedicated landing zone for the DEAfrica AWS accounts, which is now in full operation. This transition continues our strong collaboration with AWS, who provided dedicated support during transition times.

There are now over 3.4 PB of data hosted in the AWS Cape Town Region supported by the Amazon Sustainability Data Initiative (ASDI).

The platform team has been collaborating with the Brazilian Open Data Cube team to enable R in the Sandbox. R is a programming language for statistical computing and graphics that you can use to clean, analyze, and graph your data. R is an alternative programming language to Python, the language that is currently used on the platform. An R image was deployed in dev in August, and there are future plans to develop R examples with our Brazilian collaborators.

August also marked the deployment of Geoserver in the dev environment. Geoserver is a open source server for sharing geospatial data designed for interoperability. The server was configured and tested in dev, and deployed into the production environment in September. This server is required for the delivery of the new coastlines product.



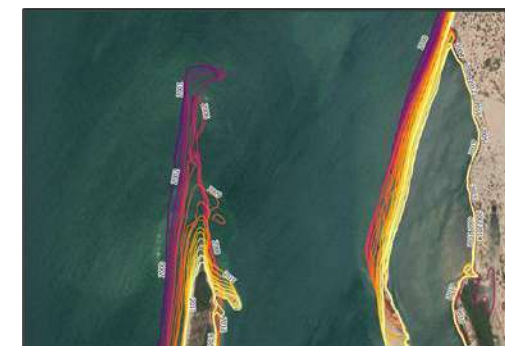
Services and analysis tools

This quarter the team was heavily focused on development of a new continental wide coastline monitoring service. The provisional product will be officially release at the GEO Blue Planet event in Ghana in October.

This coastline monitoring service uses satellite data to map the typical location of the African coastline, and allows users to examine coastal erosion and growth trends annually, at both local and continental scale.

The coastline monitoring service covers more than 60,000 km of coastline around Africa, and is available as annual coastlines from the year 2000 onwards, including change rates and identification of hot spots. The service also shows how coastlines respond to drivers of change, including extreme weather events, sea-level rise or human development. This data will empower decision makers to prioritise and evaluate the impacts of local and regional coastal management based on historical coastline change.

DE Africa now has 100 notebooks available which support 7 SDGs and 16 indicators. Examples of new analysis tools (Jupyter Notebooks) which have been developed include land degradation, drought indices, permanent and seasonal water bodies, and floating marine plastics.



Digital Earth Australia Coasts



Digital Earth Africa Coasts

Capacity development

On the 19th September, User Engagement Manager Joseph Tuyishime participated in the 4th South Africa AfriCultuReS Users Workshop, and presented on lessons from Earth Observation for food security projects undertaken. Thanks to PMO host SANSA for organising the event and inviting Joseph to attend!

Digital Earth Africa also launched their first Learn ArcGIS lesson in collaboration with Africa GeoPortal. The lesson details how to use the Digital Earth Africa Explorer web app, what Earth Observation imagery is and how to use it, all based on real-life examples. In addition, Esri presented on the Digital Earth Africa - Africa Geoportal collaboration in their live session in English on the 14th September, with a French session to be held on 5th October.

Technical Manager, Edward Boamah provided support for Implementing Partners in their work plans on wetlands, coastal erosion, and crop type mapping.

- In August, he provided training to AFRIGIST on the services on the DE Africa Sandbox and Learning Platform.
- At the end of August he was at RCMRD to provide training on using the platform and supporting the RCMRD team in the production of services in wetlands, coastal erosion, and crop type mapping.

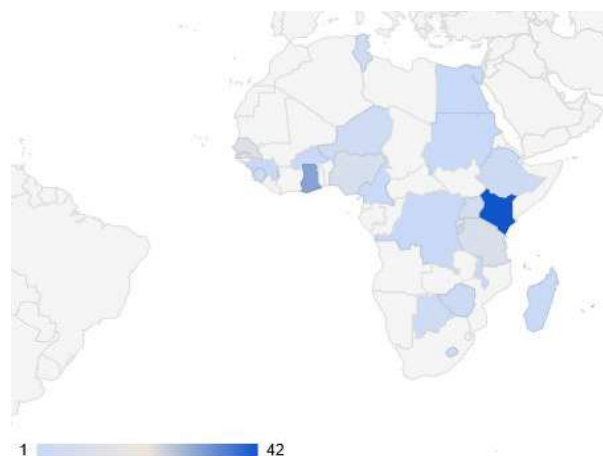


Growing user community - by the numbers

Weekly live sessions

102

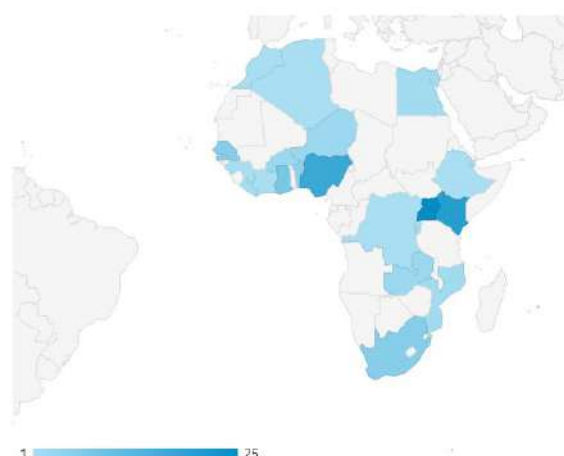
now in EN and FR -249
unique attendants from 31
countries



Online training

600
+12%

Certificates of completion



Users

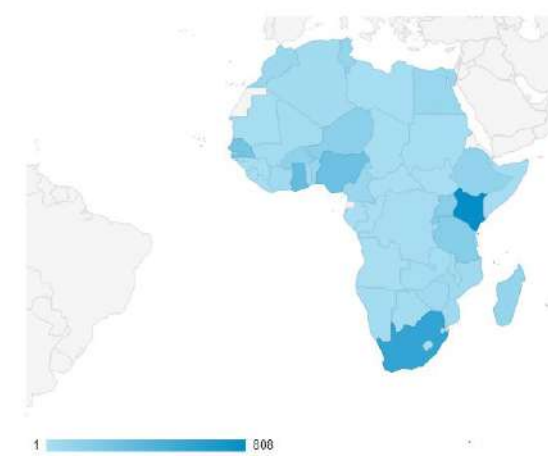
2500
+18 %

Registration in Sandbox

Users

11,500
+19 %

Unique DE Africa map users



Monitoring Coastal Erosion at Saly Portudal resort, Mbour-Senegal

Centre de Suivi Écologique (CSE)

Experts from CSE have been working with the Digital Earth Africa team to validate a tool that enables users to monitor the coastline across the African continent, with the focus area for the validation the seaside resort of Saly Portudal in Mbour-Senegal.

The site is being impacted by unsuitable infrastructure and seafront works, such as breakwaters, which are blocking the natural movement of the water and sediment. This is resulting in the shifting of the shoreline, affecting local businesses.

CSE have validated the coastline tool against reference coastlines generated from very high spatial resolution multi-spectral satellite images. The notebook scripts in the sandbox were compared with reference data to analyse the coastlines over specific years and study areas. The level of precision was between $\frac{1}{3}$ and $\frac{1}{4}$ of a Landsat pixel (30m), and scientifically satisfactory for monitoring coastal erosion. These results have contributed to improvements in the coastlines algorithms in order to improve the quality of the reference data and improve the extraction of coastlines with great precision from Landsat images





Projects with Aligned Programs

Information for agriculture and food security (ACIAR)

This project is supporting consultations with relevant African agricultural agencies to identify priority information services from the DE Africa platform to support Africa's agricultural sector, and create a strategy to develop and implement these services. This work is being conducted in partnership with the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA). Work for the ACIAR project commenced this quarter, with commencement and coordination meetings held with our partners in the project. Currently consultations are underway and on track, with further in country engagements planned for this quarter.

Zambia Crop Type Mapping (Tetra Tech)

RCMRD in partnership with DE Africa and FrontierSI have completed a project collecting ground truth data in Zambia, using the newly developed Enabling Crop Analytics at Scale (ECAAS) ODK toolkit. The result is an open-source framework that allows for future innovation in the development of Earth Observation solutions for increasing food security, that can be extended and scaled to other regions in Africa through the PDTT and the Digital Earth Africa user network.

The results of this project have been encouraging, with the workflow being extended into Niger by the AGRHYMET, led by Digital Earth Africa champion and TAC member Bako Mamane and with Technical Manager Edward Boamah running training on adapting the workflow for Niger.

The final report on the Tetra Tech project has made recommendations on next steps, which will be discussed for future work plans.



ACIAR Project meetings with ASARECA



AGRHYMET collecting data on the identification of crop types in the commune of Boboye, in the Dosso region

Projects with Aligned Programs

Somalia Engagement on the Use of EO Data

DE Africa has partnered with Global Partnership for Sustainable Development Data (GPSDD) to trial in-country engagements on use of EO Data with the following objectives:

- Supporting Somalia to address the environmental challenges highlighted above and facilitate the formation of development policies and investment that are informed by the most up to date environmental data and information.
- Use the experience gained in Somalia, we aim to develop a model for DE Africa to engage with other countries in the region to provide tailored tools and solutions.

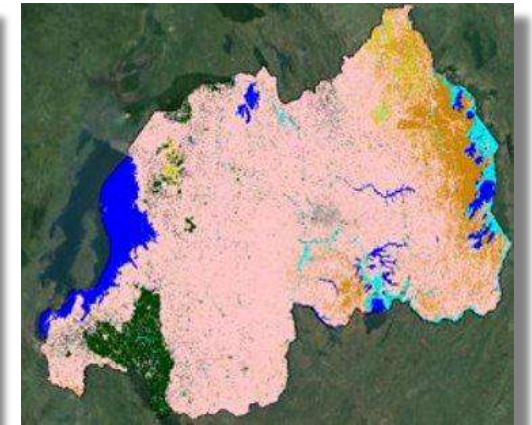
Land Cover Mapping with the UNFAO

Funded by UN Food and Agriculture Organisation, the FrontierSI and DE Africa team are working to upscale existing work from the FAO in land cover and crop mapping. Using DE Africa's platform, services and experience, the project aims to produce tools that can be used by National Statistics Offices across Africa and in the FAO's Hand in Hand Initiative.

Land cover mapping workflows have been established as a series of Python notebooks that can be adapted for different countries and run in DE Africa sandbox Prototype Maps for Rwanda and Mozambique have been generated and in country user engagement has started. Webinar and training sessions are being planned. In the next phase, the project will produce prototype crop mapping for agriculture statistics.



Digital Earth
AFRICA



Prototype land cover maps for Mozambique (left) and Rwanda (above)



Community engagement

The Digital Earth Africa team attended the 7th National Adaptation Plans (NAP) Expo, hosted in Gaborone, Botswana. The NAP Expo formed part of the Botswana Global Adaptation Week, and was graced by officials from the Government of Botswana. The President of the Republic of Botswana, H.E. Dr Mokgweetsi Masisi visited the GEO and DE Africa booth, citing that Botswana is considering using big data to address sustainable mapping of its resources, including EO data.

From the 6th-8th September, members of the team attended the 5th RCMRD International Conference in Nairobi, Kenya. Partnering as gold sponsors, the team were included in key sessions and side events. The team were also honoured to meet Mr Andre Nonuierma from the UN Economic Commission for Africa, and Mr Meshack Nderitu from the African Union Commission.

Team members were also able to attend the Africa Down Under (ADU) conference held in Perth, Western Australia from the 31st August - 2nd September. With a focus on Mining relationships between Australia and the African continent, the conference was a great opportunity to engage with industry. Digital Earth Africa was honoured to be featured in the opening address by the Hon Tim Watts, Assistant Minister for Foreign Affairs, Australia, and in Governing Board member, Hon Samuel A. Jinapor, Minister of Lands and Natural Resources Republic of Ghana, address. The team were honoured to meet with Minister Jinapor and his colleagues to discuss next steps in collaborating with the Government of Ghana.



President of the Republic of Botswana, H.E. Dr Mokgweetsi Masisi, with the DE Africa and GEO team



RCMRD International Conference in Nairobi, Kenya



DE Africa team with Hon Tim Watts, Assistant Minister for Foreign Affairs, Australia

Community engagement

Early in August, User Engagement Manager, Joseph Tuyishimire, visited the College of Science and Technology-University of Rwanda. He gave a presentation to an audience of 91, who were highly engaged. Audience members have requested additional training and support for their final research projects, and researchers are keen to utilise Digital Earth Africa in their studies.

The team also participated in a range of international technical conferences. Edward Boamah and Seffat Chowdhury presented at the FOSS4G 2022 conference in Italy, about how the DE Africa mapping platform was built using world leading Earth observation innovation and data.

Dr Fang Yuan represented DE Africa at the Advancing Earth Observation Forum in Brisbane, Australia, showcasing how earth observations are being used to drive on ground impact in Africa.



Joseph Tuyishimire at the College of Science and Technology, Rwanda



Edward Boamah and Seffat Chowdhury presented at the FOSS4G 2022

Africa-Australia engagement

Geoscience Australia were honoured to host Dr Thembi Xaba for a second time, with the visit focusing on accelerating Dr Xaba's onboarding as Managing Director. While Thembi was in Australia, she, along with Lisa Hall, provided a briefings to various DFAT delegates based in Canberra. This was a great opportunity to introduce Dr Xaba to a colleagues that have supported the Establishment Phase, but also introduce the platform to those new to the department.

Geoscience Australia also welcomed the network of African Ambassadors to Australia to Geoscience Australia for a briefing on the program, introducing Dr Xaba as Managing Director. The briefing was well attended by network members, despite the heavy rain in Canberra on that day. The event initiated some great conversations, and Dr Xaba has many standing invitations to visit embassies across Canberra to further engagement.

Digital Earth Africa invited Australian Heads of Mission, now based across Africa, to a virtual briefing on the program, providing an update on program progress and introducing the new African Leadership team. This took place on the 20th September, and was well attended with great engagement and questions from the attendees.

On the 26 of September, Managing Director Dr Thembi Xaba and Head of Operations Zviko Mudimu were invited to the Australian High Commission in South Africa to discuss the future of Digital Earth Africa and how it can be used to support key sectors across the country and continent.



Dr Xaba and the Australian High Commissioner, HE Gita Kamath



The network of African Ambassadors to Australia with Dr Xaba, at Geoscience Australia

Communication metrics

Twitter

- There are now **over 5,000 Twitter followers** with 474 new followers gained this quarter
- **102K impressions** over the quarter
- **317 link clicks** and **603 retweets** over the quarter

Website

- **7,662 visitors** over the quarter
- **40,310** unique page views this quarter

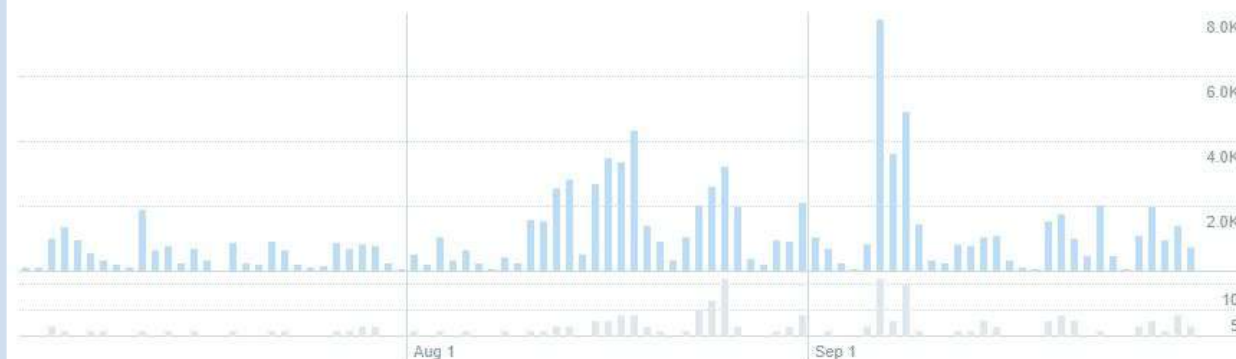
Visitor locations (% users)

USA (17%), Kenya (11.5%), South Africa (7.8%), Nigeria (4.3%) , Rwanda (3%), Australia (6%),

LinkedIn

- There are now **over 3,900 LinkedIn followers** with 577 new followers gained this quarter
- Over 2,000 reactions to posts over the quarter
- A total **80K impressions** and 80 shares over the quarter

Tweet impressions July-September 2022



Acknowledgements



THANK YOU

