



Digital Earth
AFRICA

DE Africa Quarterly Progress Report

October - December 2023

Contents

- 01.** Highlights
- 02.** Governance & Operations
- 03.** Diversity & Inclusion
- 04.** Platform and Data
- 05.** Science
- 06.** Capacity Development
- 07.** Growing User Community
- 08.** Latest Use Cases and User Stories
- 09.** Projects with Partners
- 10.** Communications Impact
- 11.** Events and Engagements

About Digital Earth Africa

Our vision

Digital Earth Africa (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 progress made between October and December 2023, as aligned with DE Africa's 2023 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

Program Goals



Livelihood strengthening

EO data will support more informed decision making at government, sectoral and other levels, contributing to direct and indirect benefits for individuals and communities.



Economic development and job creation

Through access to data for commercial products and services development, DE Africa will support new business development and employment opportunities.



Digital transformation is advanced

Through industry uptake and innovations, DE Africa will help to fuel the ongoing evolution of the digital economy in Africa.



Development activities are more effective

Support enhanced understanding of development challenges and solutions, and in so doing, strengthen collective impact and ability to assess progress towards national priorities, African Union's Agenda 2063 and the UN SDGs

Phase III | Strategic Priorities



Enhance Country Engagement

We and our Implementing Partners will embed DE Africa products and services to **enhance and scale regional activities across Africa**.

Our team will create a roadmap for country engagements that will ensure consistent support for countries.



Ensure our Sustainability

We are committed to delivering on funding partners' strategic goals and strengthening Technical Advisory Committee and Governing Board roles to **ensure sustainable governance**. We will operate efficiently, diversify income sources and **deepen key partnerships** for long-term sustainability.



Enable Climate Action

We will empower climate action by **developing in-country knowledge and skills**. We will ensure decision-ready products are well placed to enable policymakers, scientists, the private sector and civil society to better address climate adaptation, mitigation and reporting.



Engage the Community

We will address user needs, provide excellent support, increase platform use, continue to capture user impact, and increase visibility of platform champions.

We will serve an **audience that meets our diversity and inclusion strategy and** explore bridging science and community action.

2023 Annual Plan - Strategic Priorities

The Governing Board approved the following Strategic Priorities for the year:

- **Embed in Africa:** The DE Africa team and Implementing Partners will embed DE Africa products and services to support regional activities across Africa. The DE Africa team shall create a roadmap for country engagements that will ensure consistent support for countries.
- **Ensure our sustainability:** We shall strengthen the roles of the Technical Advisory Committee and Governing Board to ensure sustainable governance in the future. We maintain our commitment to delivering on the strategic goals of our funding partners.
- **Empower Climate Action:** We aim to empower climate action by developing in-country knowledge and skills. We will ensure decision-ready products are well placed to enable policymakers, scientists, the private sector and civil society to better address issues of climate adaptation, mitigation and reporting.
- **Enhance Community Engagement:** We need to understand our users, and their needs and provide excellent support that increases use of the platform. We must continue to capture the impact our users have and increase the visibility of the champions of the platform.

2023 Outcomes and Activities

Sustainment

1. Strong and effective ***governance and program operations***
2. Efficient and effective Pan-African ***program delivery***
3. Supportive stakeholders and enabling ***partnerships***
4. Sustainable business model developed, and ***future funding*** secured
5. World leading ***technical capability***, responsive to African priorities

Uptake and impact

1. African ***government/ country level*** engagement and support
2. DE Africa services customised to meet diverse in-country ***user needs***
3. Effective ***capacity building*** targeting diverse cross-sector user groups
4. Rapid continental wide growth in DE Africa services ***uptake and usage***
5. Diverse, cross-sector ***use cases and impact studies***, demonstrating DE Africa's *social, environmental and economic value*

October - December 2023 Highlights



Enhance Country Engagement

DE Africa participated in face-to-face engagements in Zimbabwe, Rwanda, Kenya, South Africa and Senegal.

We participated in 4 virtual engagements aimed at developing the capacity of our users.



Ensure our Sustainability

DE Africa is ensuring its sustainability by developing a rigorous Monitoring, Evaluation and Learning Framework for Phase III of the program.

This will ensure the program meets its expected short and long term outcomes.



Enable Climate Action

Prototyped “Waterbodies”, a new continental service that maps around 700,000 individual water features across Africa.

We worked with implementing partners to test the prototype in East and West Africa.



Engage the Community

The French language Coastlines training course was released, ensuring all 7 DE Africa training courses are available in both English and French.

A Youthmappers Live Session was held to disseminate and discuss the findings of the challenge winners.

Governance and Program Operations

During the final quarter of 2023, DE Africa noted the departure of the Managing Director, Dr Thembi Xaba. We thank Dr Xaba for her time with Digital Earth Africa and wish her the best in her future endeavours.

Program Operations and Annual Planning

Late this quarter the team have been focused on 2023 annual reporting, including a reflect and refocus session to acknowledge achievements throughout the year as well as lessons learned. This is a fundamental part of the DE Africa reporting cycle and allows the team time to see how much we have accomplished over the calendar year.

There was also significant work developing the DE Africa Phase III Monitoring, Evaluation and Learning Framework. This underpins effective management and implementation of the program to ensure it meets or exceeds its expected outcomes.

DE Africa commenced work on the 2024 Annual Plan which will include a focus on in-country engagement. We intend to engage with countries of opportunity to partner with national and regional governments to use the platform to address key challenges.



The DE Africa global team members at GEO Week with HE Tegan Brink, Australian High Commissioner to South Africa, and Maree Wilson from Geoscience Australia

Diversity and Inclusion

This quarter saw the DE Africa team host and/or sponsor three key events to support diverse and inclusive stakeholders.

DE Africa sponsored the 7th Space Generation Advisory Council (SGAC) in Harare, Zimbabwe in November which was attended by over 100 young space professionals. Our User Engagement Manager, Joseph Tuyishimire, presented an overview of the platform and led a thematic working group on the issues and opportunities around space and sustainability. The Australian Ambassador to Zimbabwe, Minoli Perera, presented the keynote address.

DE Africa hosted a face to face introductory workshop for over 70 students in December for the University of Harare and other interested stakeholders.

DE Africa also partnered with Innovate UK on the Next Gen Space Challenge (South Africa). The winner, Michaela Davids, a fourth year Aeronautical Engineering student from University of Witwatersrand, attended a study tour to the UK which facilitated a knowledge exchange between key African stakeholders and global collaborators including key space sector stakeholders from Kenya, Rwanda and South Africa.



Above: 7th SGAC attendees

Right: 7th SGAC working group identifying existing initiatives, challenges, opportunities and solutions for sustainability



Right: Winner of the South Africa UK ITN / DE Africa Next Gen Spcce Challenge Michaela Davids



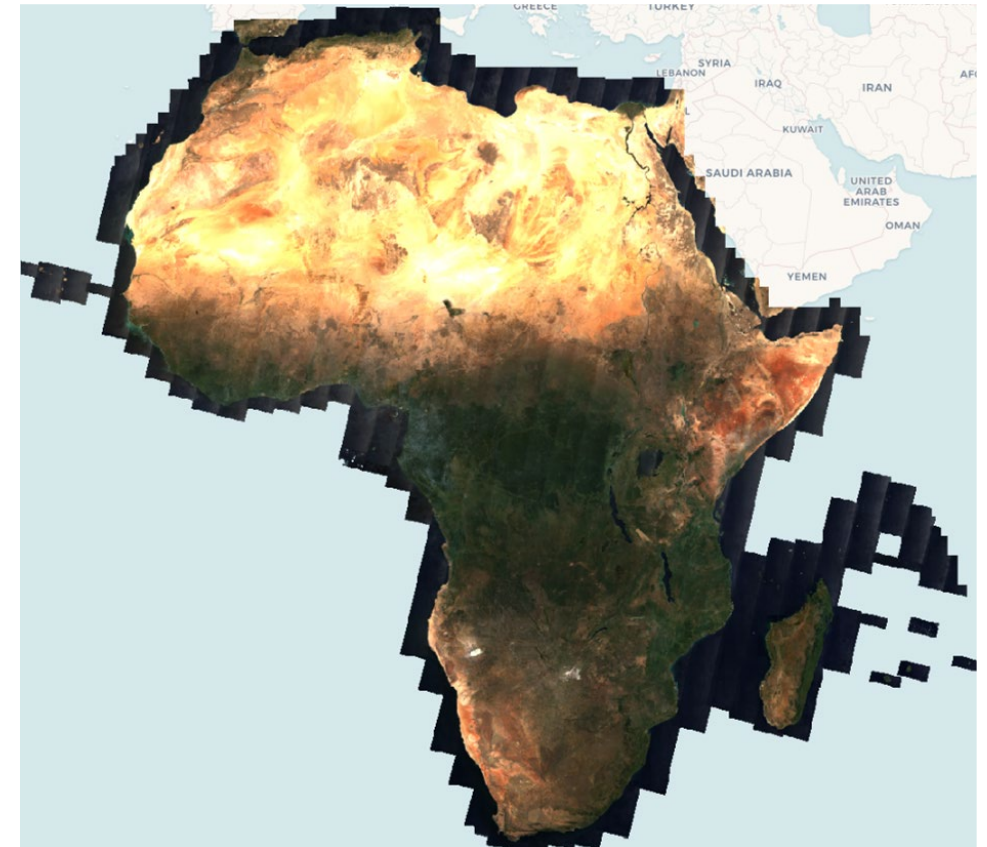
Platform

Amazon Web Services continues to provide in-kind support through the Amazon Sustainable Data Initiative (ASDI) that now exceeds 4 Pb of Data. During the quarter the platform had over 99% availability, with the platform support team attending to any issues in a timely manner. Some disruptions in product and service pipelines were experienced but are being resolved as the team becomes more familiar with optimisation procedures for available computational resources, and focuses on working towards innovative solutions. A significant system analysis and cost review was conducted by the Geoscience Australia support team with recommendations for improved processing approaches to be put in place for increased efficiencies.

The Platform team successfully upgraded the Elastic Kubernetes Service (EKS) to version 1.25, enhancing the performance and security of our platform. This included improvements to various supporting services. Additionally, there were upgrades to monitoring tools (Prometheus, Grafana, and Loki) across all environments, ensuring we can closely track and maintain the quality and reliability of our geospatial services.

We conducted a review of our AWS users on both the Development and Production accounts, aligning with best practices. We also updated our OGC Web Services (OWS) to the latest release and introduced the prototype of the Waterbodies service on GeoServer, expanding our capabilities to provide even more comprehensive geospatial solutions.

These efforts underline our commitment to delivering high-quality services while constantly improving our technology for a better user experience.



DE Africa's Rolling Monthly Geomedian Continental Service released in Q3.

Science

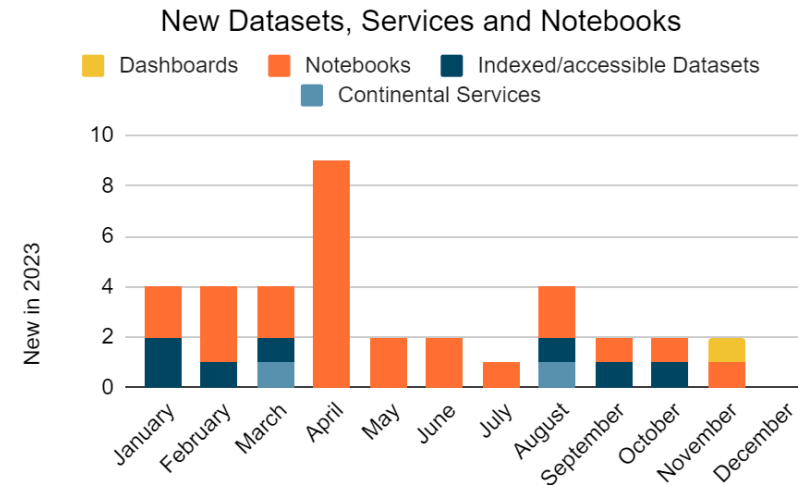
This quarter saw the prototyping and development of a new DE Africa continental service. Building on the Water Observations from Space (WOfS service), the waterbodies service identifies around 700,000 individual water features across the continent, and provides information on change in surface water within these over the past 3 decades. The service is being designed to allow users to:

- View and analyse time series of surface water extent for individual water features,
- Understand changes in water bodies over the past three decades and today,
- Monitor and understand the impact of extreme events and plan appropriate action.

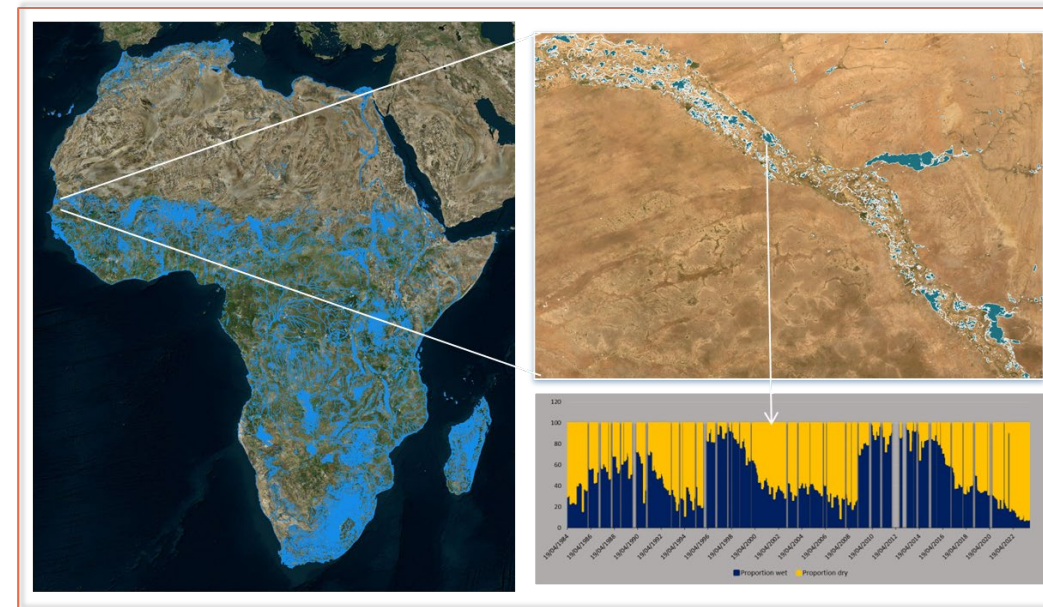
The World Settlement Evolution external dataset was made available for users of the DE Africa platform.

Two new notebooks were released, one for loading and visualizing the the World Settlement Footprint Evolution dataset, and one for loading the Waterbodies prototype dataset.

Work also began on new user interfaces, summarizing the DE Africa Coastlines service continental data at the country scale, and producing national statistics on coastline change and impact. This will be made available as a dashboard on the ESRI Africa Geoportal in 2024.



Left: Number of new datasets, continental services, and notebooks developed and/or made available through DE Africa



Left: Prototyping the new Waterbodies Continental Service, identifying around 700,000 unique water bodies and their change in water over 3 decades

Science engagement: data for urban resilience

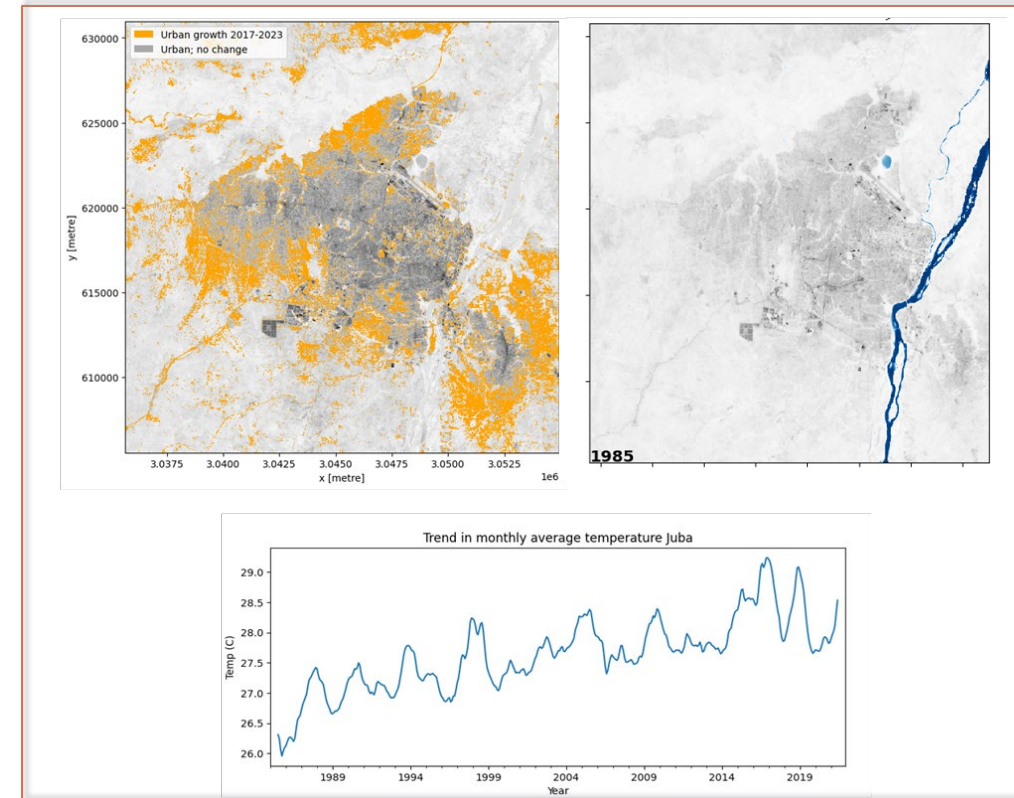
DE Africa was invited by UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) to give a presentation on **operational systems for climate monitoring for Least Developed Countries**, at Earth Information Day in plenary at COP28, with a focus on urban resilience.

Africa is undergoing an unprecedented urban and climate transition, and EO datasets, such as those available through the DE Africa provide a cost-effective and accurate means of mapping the urban extent and evolution of cities.

High resolution data is available through DE Africa for all African cities, which can be used to:

- Monitor change in urban extent,
- Assess and analyse changes in surface temperature,
- Map green spaces.

The image on the right demonstrates the evolution of urban expansion for the town of Juba in South Sudan on an annual basis over a 30 year period, from 1985. To the left of this is a more detailed analysis of where expansion has occurred over the past 5 years; and accompanying the images in the chart at the bottom is the change in mean monthly land surface temperature for the city over the past 20 years.



Capacity Development

The State University of Zanzibar successfully completed activities for the DE Africa sponsored SUZA Industrial Training Program. The annual program prepared students with industrial geospatial skills and competence needed to empower climate action by enhancing community engagement.

This quarter DE Africa hosted and/or attended more than 6 face-to-face and 4 virtual capacity development and user engagement workshops across different countries. They included:

- GEO Dialogue series (online),
- Centre for Effective Global Action (online),
- Innovate UK and DE Africa Next Gen Space Challenge - South Africa ,
- Empowered WASH Systems at District-level in Africa (online),
- Awareness session with the Department of Agriculture, Land Reform and Rural Development (DALRRD) - South Africa,
- University of Rwanda GIS Day - Rwanda,
- University of Nairobi GIS Day - Kenya,
- GEO LDN demonstration session - South Africa,
- Regional workshop on monitoring coastal indicators - Saly Portudal Senegal,
- Space Generation Advisory Council Conference - Zimbabwe,
- One day workshop with the University of Harare - Zimbabwe,
- Meeting with the Forestry Commission of Zimbabwe to discuss future areas of collaboration.

Digital Earth Africa – October - December 2023



SUZA Industrial Training Program participants in the field



Participants at the Monitoring Coastal Indicators Workshop in Saly Portudal, Senegal



GEO LDN Workshop: Stakeholders from Ghana, Kenya, Nigeria, Ethiopia, Senegal, Democratic Republic of the Congo on how to monitor land degradation

Growing user community

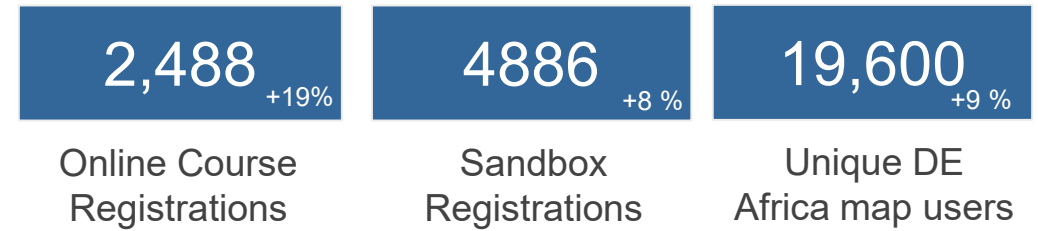
DE Africa's user community continued to grow during quarter four. Online course registrations showed a marked increase of 19% increase, with over 430 people registering for online courses in the quarter. Additionally, the Sandbox platform saw a 8% rise in registrations, with over 398 users accessing the platform in the quarter. DE Africa can now boast over 19,600 unique map users.

10 [DE Africa Live Sessions](#) were conducted this quarter, with a total of 133 participants (28 female). Highlights included:

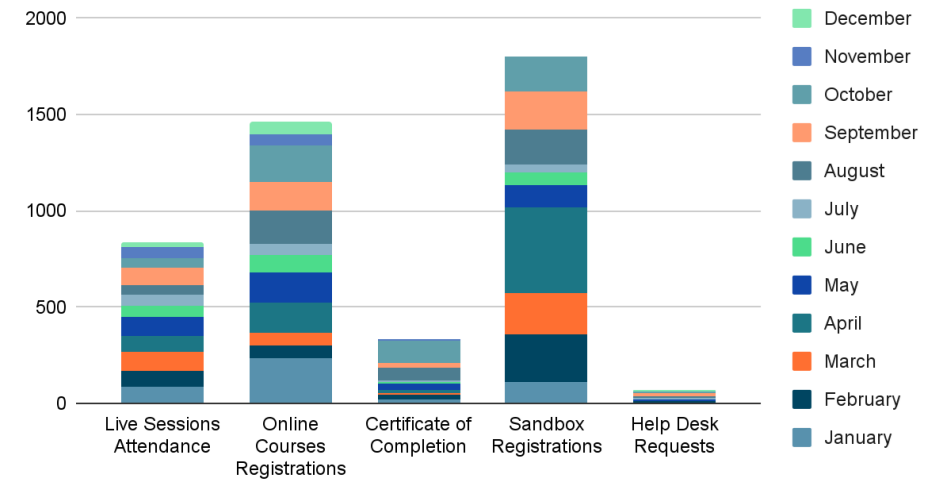
- [The World Settlement Footprint \(WSF\) + High Resolution Population Density Maps](#),
- [Agriculture Monitoring using DE Africa Platforms](#),
- [YouthMappers Technical Challenge Winners Presentations](#).

This quarter saw the launch of a new training course on our learning platform, educating our users on applications of the [DE Africa Coastlines service](#) in French. This course, along with the other new training courses introduced earlier this year, have proven popular with 317 new courses commenced by users this quarter.

All time User Community



2023 Monthly User Engagement Breakdown



Latest use case studies and user stories

Chima Iheaturu highlights the exciting potential for collaboration between researchers and DE Africa. His research is focused on modelling the dynamics of tropical forest patches, exploring new methodologies that address the need for locally tailored, high-resolution forest cover maps for West Africa. “DE Africa’s cutting-edge infrastructure and data resources are opening new doors for research and innovation. I am particularly impressed by the DE Africa Sandbox, which provides a user-friendly platform for accessing and analysing massive datasets”.

Read more here: [Spotlight on Chima: A Passionate Geospatial Scientist Championing Forest Conservation in Africa | Digital Earth Africa](#)



Chima Iheaturu



Liban Hassan

Mangroves in Somalia play a vital role in reducing shoreline erosion, as well as providing critical habitats for the area's fauna. With the longest coastline of mainland Africa, Somalia has a total mangrove forest coverage of 48 square kilometers, but this extent has decreased by 1.65 square kilometers between 1996 and 2020. Liban Hassan received training on DE Africa in Feb 2023 and is now using the platform to identify hotspots of change in mangrove coverage using many of DE Africa's products and services.

Read more here: [Timely Monitoring of Mangroves in Somalia | Digital Earth Africa](#)

Communications Impact

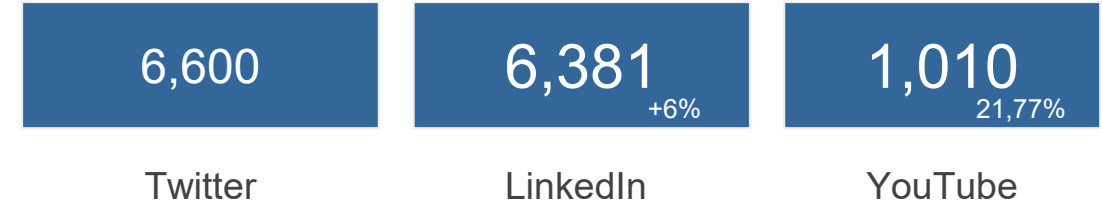
Social media followers have increased across the board. Key metrics:

- LinkedIn - this is our best performing social media platform with 6,381 followers, a growth of 562 followers over the three months,
- X (formerly Twitter) - the team is unable to report on the platform performance, as limited analytics are currently available,
- YouTube - We have experienced great growth of YouTube over the past three months, with a total of 1,010 subscribers, 125 new ones this quarter, 4,161 views and 202,5 watch hours.

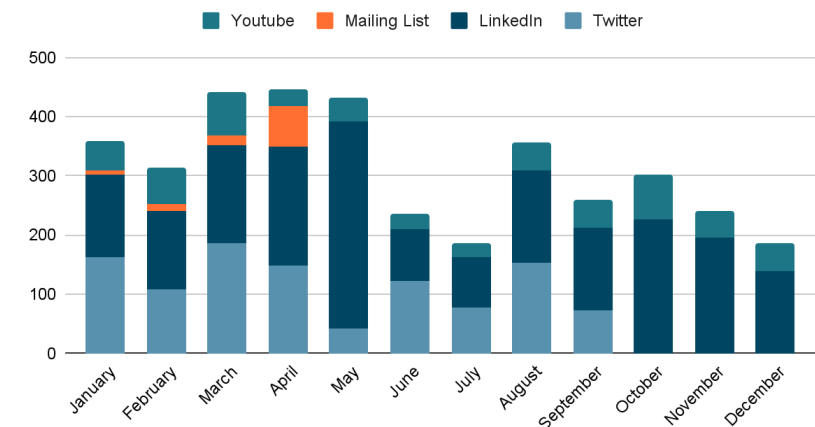
DE Africa received positive coverage in the media and partner blogs:

- [Shared problems become shared solutions: how to unlock data for people and the planet](#) - Digital Impact Alliance, USA,
- [Tidiane Ouattara “The use of space in Africa is essential”](#) - Afrik 21, France,
- [Green Legacy Program critical to sustainably protect water bodies: MoWE Minster](#) - Fana Broadcasting Corporate, Ethiopia,
- [Over the Cloud: The next tech revolution](#) - Geospatial World, India.

Communications Metrics



New Followers on Communications Platforms



Top 5 Visitor locations (number of users)

United States - 1,090, Kenya - 796,
South Africa - 620, China - 445
Uganda - 387

Events and Engagements

During the quarter the DE Africa team participated in over 8 events and engagements. Highlights of these engagements included COP28 in Dubai, GEO LDN Global Dialogue Forum and GEO Week in Cape Town South Africa

COP28

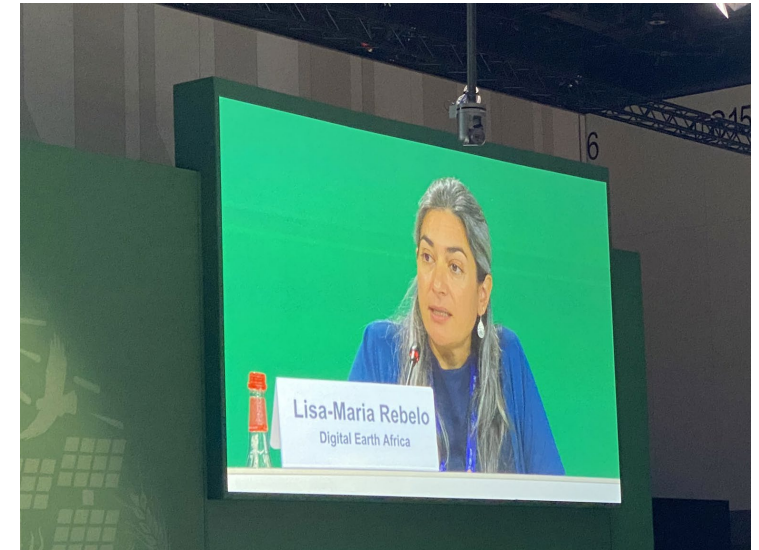
DE Africa was invited to present in the Plenary Session for Earth Information Day; and participated in 2 DE Africa / International Water Management Institute joint sessions, the first in the Ethiopia pavilion, and the second in the Africa pavilion.

GEO LDN and GEO Week

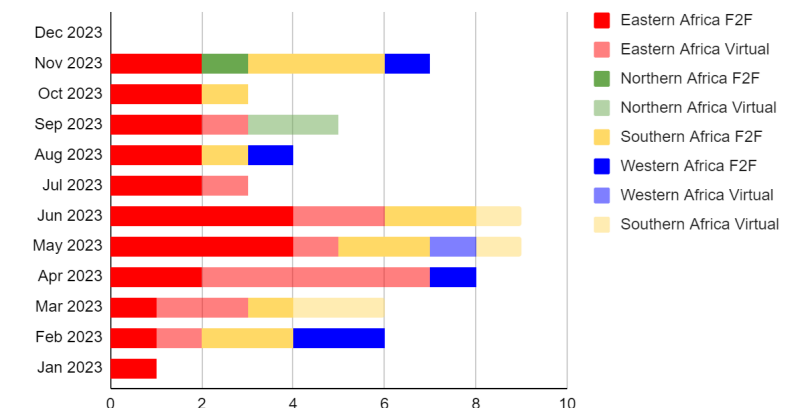
DE Africa presented and hosted a demonstration session at the GEO-LDN Global Dialogue Forum 2023, focusing on land degradation monitoring using the DE Africa platform. The team then presented and participated in multiple sessions at GEO Week 2023, including flash talks and panel discussions on Water Productivity, Water Management, Wetlands, and Diversity & Inclusion.

Other events and conferences

- Rwanda Space Week - Kigali, Rwanda,
- Mobile World Congress - Kigali, Rwanda,
- African Conference on Agricultural Technologies - Nairobi, Kenya,
- RCMRD Governing Council - Nairobi, Kenya,
- GMES and Africa Forum - Sharm El Sheikh, Egypt,
- AGU - San Francisco, USA.



User Engagement Activities in Geographic Areas



Acknowledgements





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Connect with us

- Website: <https://www.digitalearthafrika.org>
- Maps: <https://maps.digitalearth.africa>
- Learning Platform: <https://learn.digitalearthafrika.org>
- User guide: <https://docs.digitalearthafrika.org>

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