

GEO WEEK & MINISTERIAL SUMMIT 2023



Digital Earth Africa; A Climate Action Toolkit

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#TheEarthTalks



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



GEO WEEK
2023 MINISTERIAL
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The Digital Earth Africa Vision

To 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



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

Land degradation

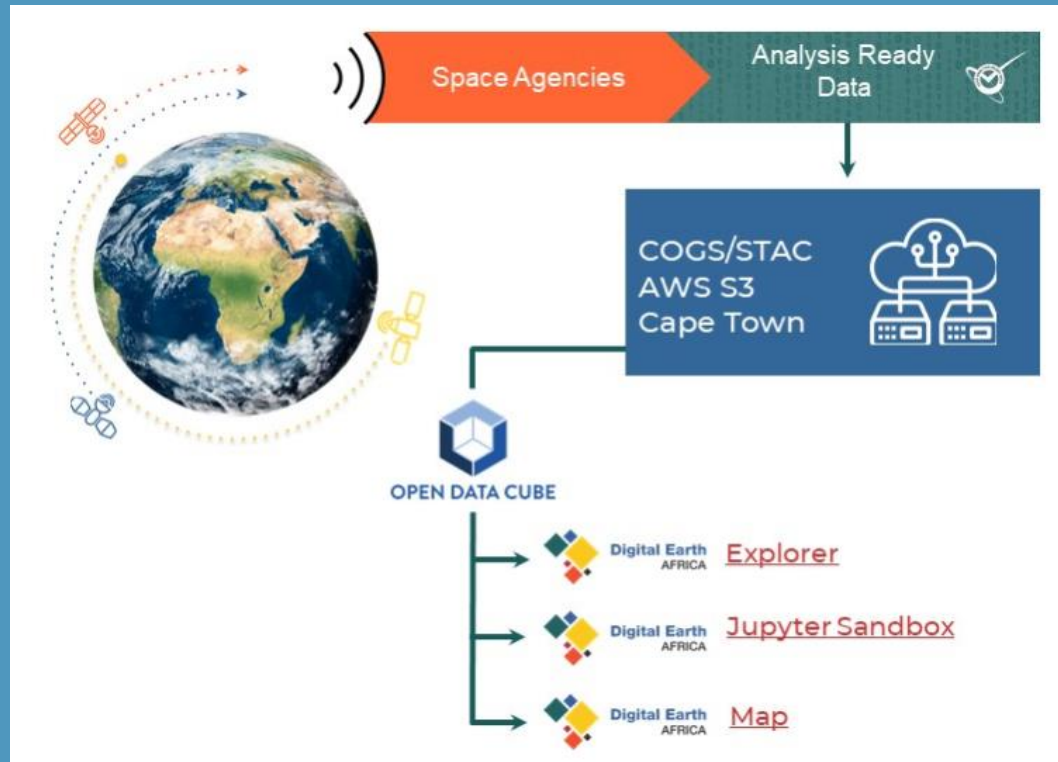
Coastline changes

Urbanisation

Water resources and
flood risks

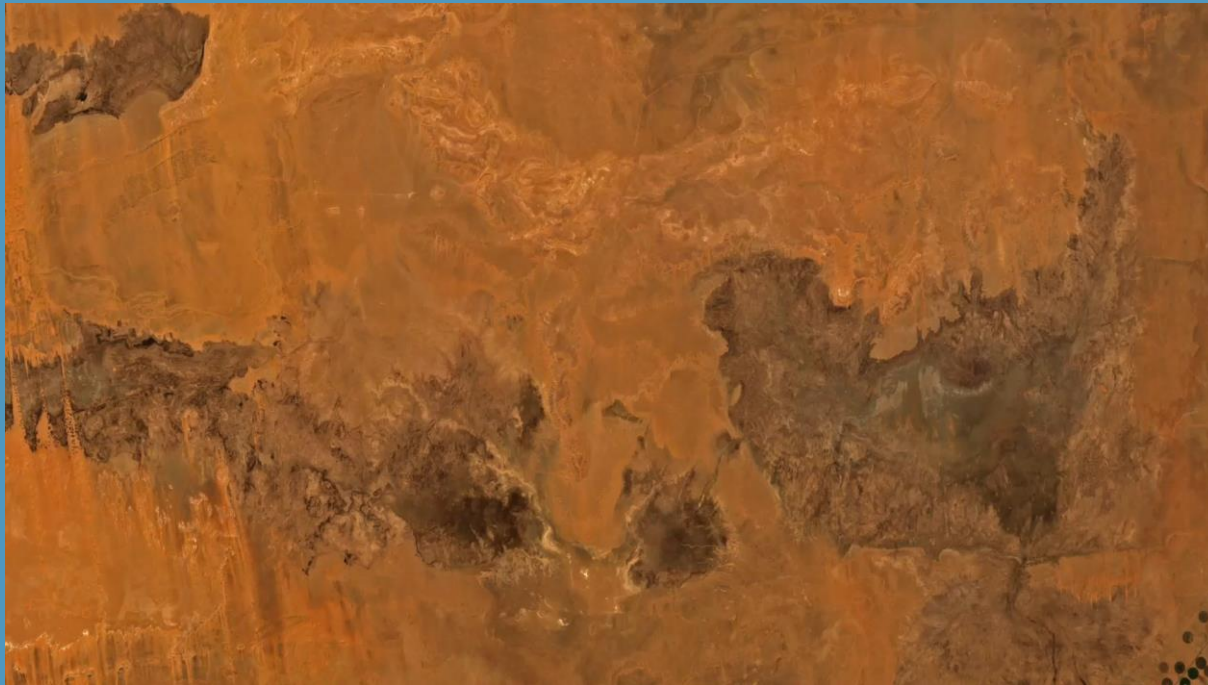
Agriculture and food
security

Digital Earth Africa: Satellite data and platforms



- Largest global Open Data Cube implementation; entirely cloud native
- Continental scale satellite archive; Landsats, Sentinel 1&2, CEOS ARD
- Completely free, even for commercial use, with optimized EO data for web processing
- Co-designed continental scale services with complete visibility from the data to the product
- Extensive library of analysis tools and training materials to support climate action
- Different interfaces for different needs, and a free online learning platform & helpdesk

Digital Earth Africa for water management

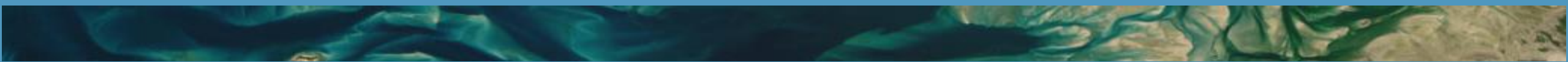


Earth Observation data are a critical tool for water resources monitoring, particularly for large, remote or inaccessible locations;

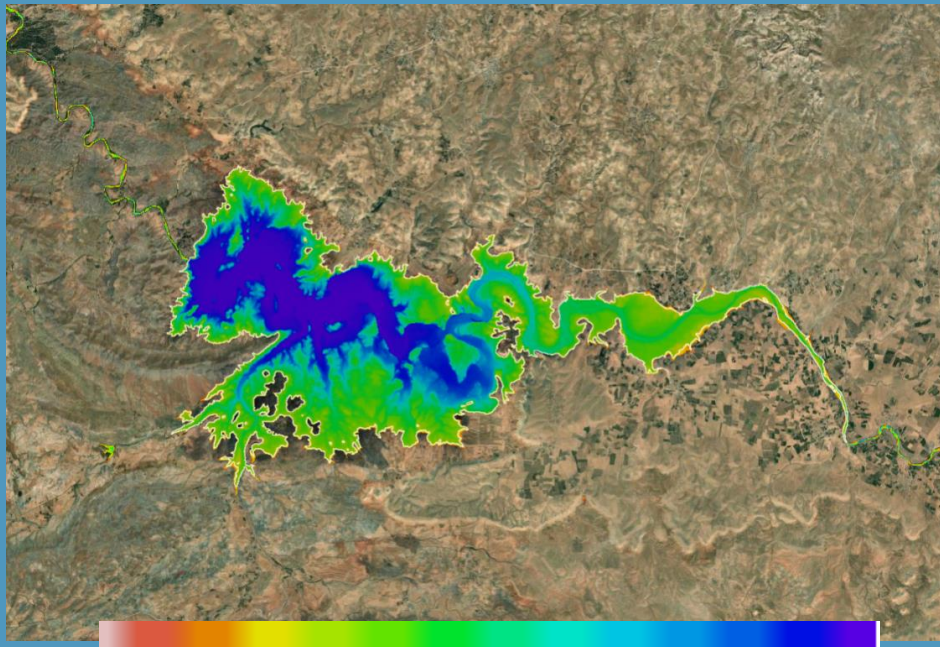
- identify terrestrial surface water presence
- monitor how this changes through time
- understand both short- and long-term patterns of water availability due to seasonal variations, extreme climate events such as droughts and floods, and longer-term changes in climate

The data can show where lakes may be retracting or expanding due to a disturbance or increased human use, and can assist in planning for water resources extraction for human consumption, irrigation, or livestock/wildlife watering

► **Effective management of water resources requires consistent and regularly updated data across the continent**



Digital Earth Africa's Water Observations from Space

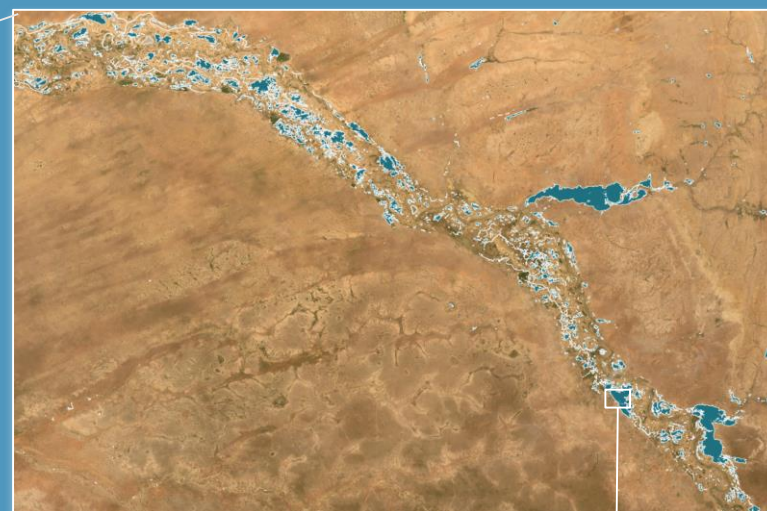


Water always
detected

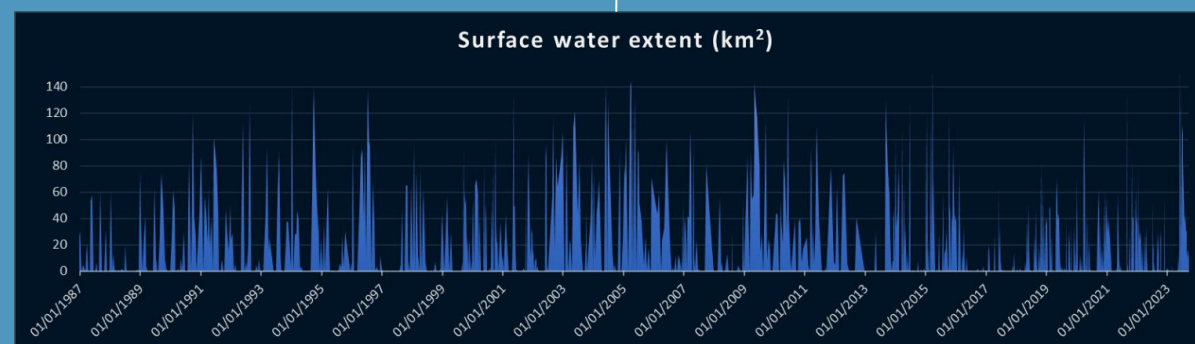
Water rarely
detected

- ▶▶ WoFS Continental service provides valuable insights into surface water dynamics over the past three decades
- ▶▶ Provides continental coverage to identify patterns of water availability at a local, regional, and country level
- ▶▶ But further analysis is required in order to make the information more accessible to decision makers
- ▶▶ Co-designed with users, the DE Africa **Waterbodies** service is designed to address this need
- ▶▶ Building on the presence/absence information provided by the WOfS service, Waterbodies enables users to analyze water dynamics within individual water bodies and discrete areas

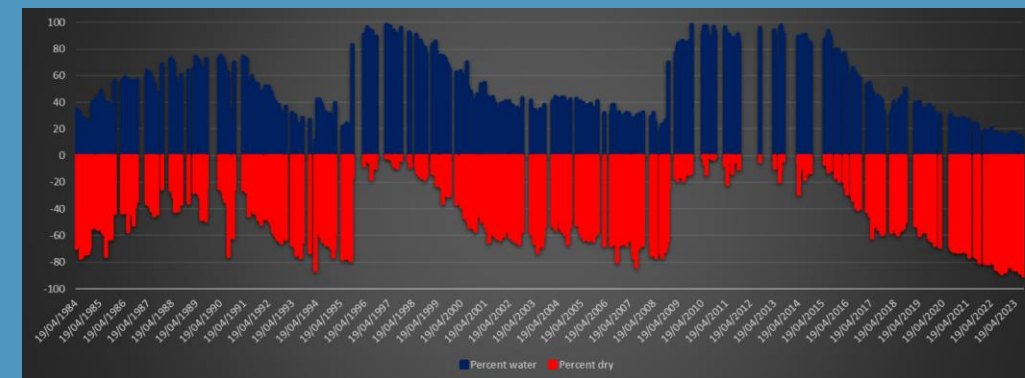
Digital Earth Africa's Waterbodies Service



- A vector (polygon) dataset of waterbodies for the entire continent
- Each water body vector is accompanied by a time series of the number of wet pixels in the water body during the time series of observations
- Users can view individual water bodies and analyze associated timeseries



Digital Earth Africa's Waterbodies Service



Example applications:

- Changing water availability and early warning
- Changing volumes and water storage management
- Water quality analysis
- Nature based solutions for water security

Digital Earth Africa for coastal zone management

Coasts serve as major socio-economic hubs for 38 African countries:

- host half of the 15 African megacities which are fast expanding due to rural-urban migration and population growth
- African blue economy is expected to be worth \$405 billion and employ more than 57 million people by 2030
- vulnerable to the impacts of climate change

Rising sea levels and rates of coastal erosion represents a pressing threat for African coastal communities, infrastructure, agriculture and aquaculture:

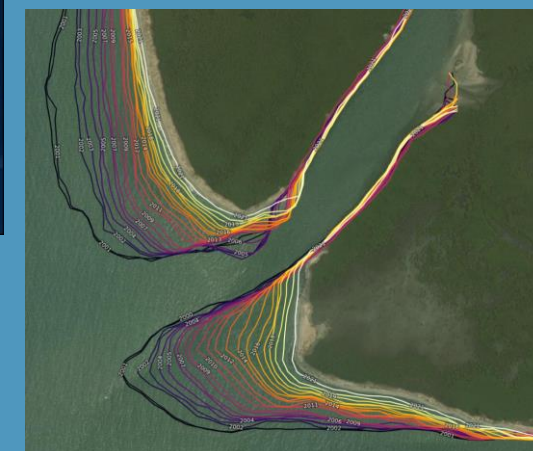
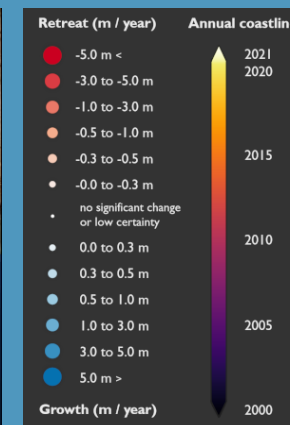
- severe impact on African land and buildings (estimated losses of \$8 billion/yr)
- consequences for fish populations, marine ecosystems and local communities

►► **Effective management of coastal changes and mitigation of risk, as well as sustainable coastal zone management, rely on consistent and regularly updated data across the continent**



Digital Earth Africa Coastlines: CONTINENTAL

- Co-developed and validated with partners and users across the continent
- First Africa-wide Coastlines monitoring service
- Tracks continental changes from 2000 to present
- Monitor more than 60,000 km of coast
- Provides free interactive access to
 - Hotspots
 - Rates of changes
 - Average yearly shorelines
- WMS and WFS links allows direct integration in QGIS, ArcGIS or any OGC Web Service compatible platform



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