The Landscape of Open Science in Africa

African Open Science Platform

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WDS Data Repositories Day
9 November 2018
• ROARMAP OA Policies
  • Eastern Africa (Burundi, Kenya, Tanzania, Zimbabwe): 17
  • Northern Africa (Algeria): 3
  • Southern Africa (South Africa): 9
  • Western Africa (Ghana, Nigeria): 2

• Agreements e.g. Dakar Declaration on Open Science in Africa

• IRs: openDOAR lists 165 IRs from African countries (Eastern Africa 60; Middle Africa 1; Northern Africa 30; Southern Africa 44; Western Africa 30)

• ASSAf - in collaboration with the AAU - have developed IR criteria for a trusted IR, to guide IRs. High quality IRs are being harvested through DATAD-R (AAU).
AOSP Phase 1 (2016 – 2019)

- Funded by SA Dept. of Science & Technology
- Landscape Study
- Database
- Creating Awareness, Advocate
- Frameworks – 4 focus areas:
  - Policy
  - Infrastructure Services
  - Incentives
  - Capacity Building/Skills
- And: Research Data Management
<table>
<thead>
<tr>
<th>Organization/Project</th>
<th>Website</th>
<th>Data Catalogue</th>
<th>Sector</th>
<th>Country/Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONAFASTOA</td>
<td><a href="#">Link</a></td>
<td><a href="#">Link</a></td>
<td>Ocean</td>
<td>Angola, Benin, Cameroon, Comoros, Congo, Côte d’Ivoire, Democratic Republic of the Congo, Egypt, Gabon, Ghana, Guinea, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, Tunisia</td>
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<td><a href="#">Link</a></td>
<td><a href="#">Link</a></td>
<td>Agriculture</td>
<td>Kenya</td>
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<td>NARSIS Geoportal</td>
<td><a href="#">Link</a></td>
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<td>Remote Sensing</td>
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<td>SADSI</td>
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<td>Spatial Data</td>
<td>South Africa</td>
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<td>Spatial Data</td>
<td>Botswana, Burundi, Cameroon, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe, Benin, Burkina Faso, Cape Verde, Chad, Ivory Coast, Comoros, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Togo</td>
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<td>WAICCAL</td>
<td><a href="#">Link</a></td>
<td><a href="#">Link</a></td>
<td>Climate</td>
<td>Benin, Burkina Faso, Ghana, Côte d’Ivoire, Mali, Niger, Nigeria, Senegal, Togo</td>
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<td>HSAfrica</td>
<td><a href="#">Link</a></td>
<td><a href="#">Link</a></td>
<td>Genomic Data Bioinformatics</td>
<td>Tunisia, Morocco, Mali, Niger, Nigeria, Ghana, Egypt, Sudan, Uganda, Kenya, Tanzania, Mozambique, South Africa, Mauritius</td>
</tr>
</tbody>
</table>

**Landscape Study**
Site Raw Data

The links below enable you to download large amounts of the science data files for the SKA in raw data format.

Please be aware that these are very large files indeed, and before you download them you should check whether your local file system will be able to handle them; FAT file systems are restricted to a maximum single file size of 4GB, and other file systems may have similar limits.

It is recommended that you use a suitable FTP or similar client application if you wish to obtain these files, as most web browsers may have issues with data this size.

These files are aimed at members of the scientific community who wish to have a local archive of all of the papers relating to how the SKA has historically come about, ranging from site surveys, to scientific studies.

The files you can download from this location break down in to three key areas:

- The description and theory of the approach used to calibrate the data for the site selection process is available here.
- The research and scientific studies behind the location of the SKA high and mid frequency telescopes in Southern Africa Data (8.7GB zip file)
- The research and scientific studies behind the location of the SKA low frequency telescopes in Australia Data (16GB zip file)
This site can’t be reached

www.africacentre.ac.za took too long to respond.

Search Google for africa centre ac za

ERR_CONNECTION_TIMED_OUT

Reload
Create Awareness on Requirements

- CoreTrustSeal
- OAI-PMH Compliant, open international standards (FAIR)
- IP (Copyright), Open Licenses (FAIR)
- Ethics & Endangered species
- Open file formats (non-proprietary) (FAIR)
- Error management: missing data, misnamed files, mislabelled variables, incorrectly formatted values, corrupted files
- File naming
- Version control
• ORCiDs
• DOIs
• Comprehensive metadata
• README file to accompany data package: clear and concise description of all relevant details about data collection, processing, analysis
• And many more
Priority Interdisciplinary Programmes

E.g. **Climate Change**, Agriculture, Hydrology, Resilient Cities, Disaster Risk Reduction

**UN-REDD Programme**
United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation

**WASCAL**
West African Science Service Centre on Climate Change and Adapted Land Use

**THE NILE PROJECT**
Climate & Water

**WCRP**
World Climate Research Programme

**AMMA (African Monsoon Multidisciplinary Analysis) Land surface Model Intercomparison Project phase 2 (ALMIP2)**
Collaborative Initiatives

Square Kilometre Array

H3ABioNet Genomics Data

GBIF Biodiversity Data
Towards Interdisciplinary Data Repositories
The BioShaDock use cases. The Docker repository acts as a platform that facilitates the dissemination of bioinformatics tools by providing ready to use Docker images.
The Research Data Curation Lifecycle

1. **Data Search / Reuse**
2. **Re-collection**
3. **Data Management Plan**
4. **Description**
5. **Collection**
6. **Analysis**
7. **Data Storage**
8. **Publication**
9. **Gold/Green OA**
10. **Repository**
11. **Plan**
12. **Tools**

Original Research Data Lifecycle image from University of California, Santa Cruz
http://guides.library.ucsc.edu/datamanagement/
AOSP Phase 2

7 Strands

S0: AOSP Register
S1: Cloud Computing & Networked Services
S2: Open Research Data Management
S3: African Data Science Institute
S4: Priority Interdisciplinary Programmes
S5: Network for Education & Skills
S6: Network for Open Science & Dialogue
## Mapping Phase 1 to Phase 2

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<th>Phase 2 Strands</th>
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<td>Policy</td>
<td>S3: Open Research Data Management</td>
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<tr>
<td></td>
<td>S6: Network for Open Science &amp; Dialogue</td>
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<tr>
<td>Skills/Capacity Building</td>
<td>S1: AOSP Register</td>
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<tr>
<td>Infrastructure</td>
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<td>Incentives</td>
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What is the African Open Science Platform doing?
# S0: AOSP Register

## 55 Data Repositories

<table>
<thead>
<tr>
<th>Repository</th>
<th>URL 1</th>
<th>URL 2</th>
<th>Continent</th>
<th>Country</th>
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</thead>
<tbody>
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<td>Ocean</td>
<td></td>
<td></td>
<td>Asia</td>
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<tr>
<td>Angola, Benin, Cameroon, Comoros, Congo, Republic of the Congo, Egypt, Gabon, Ghana, Guinea, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, Tunisia</td>
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<tr>
<td>Kenya Agriculture Information Resource Centre</td>
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<td>Remote Sensing</td>
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<td>Asia</td>
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<tr>
<td>South African Spatial Data Infrastructure</td>
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<td>Spatial Data</td>
<td>Botswana, Burundi, Comoros, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zambian, Benin, Burkina Faso, Cape Verde, Chad, Ivory Coast, Gabon, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Togo</td>
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<tr>
<td>Climate</td>
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<td>KISAfrica</td>
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<td>Africa</td>
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<tr>
<td>Human Reproductive Health in Africa</td>
<td><a href="http://www.keafrica.org">http://www.keafrica.org</a></td>
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<tr>
<td>Togo, Mauritania, Mali, Niger, Nigeria, Ghana, Côte d’Ivoire, Senegal, Togo</td>
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</tbody>
</table>
| 2000 Contacts

![Image of a contact list](image_url)
S1: Cloud Computing & Networked Services

37 countries connected
Level 4 NRENs: HPC, data repositories, data ecosystem (identifiers, metadata), collaborative environments and analysis tools, platform approaches and provision of software/tools/etc

AfricaConnect2 coordinated regions (accessed Sept. 2018)
S2: Open Research Data Management

About DMPonline

Background

Funding bodies increasingly require their grant-holders to produce Data Management Plans (DMP), both during the bid-preparation stage and after funding has been secured. DMPonline has been produced by the UK’s Digital Curation Centre to help research teams respond to this requirement, and any expectations that their institution or others may apply.

The DCC has worked closely with research funders and universities to produce a tool that assists researchers to produce an effective data management plan (DMP) to cater for the whole lifecycle of a project, from bid-preparation stage through to completion.

How the tool works

There are a number of templates within the tool that represent the requirements of different funders and institutions. Users are asked three questions at the outset so we can determine the appropriate template to display (e.g. the ESRC template when applying for an ESRC grant).
S3: African Data Science Institute

The proposed new Wits Institute for Data Sciences will not only provide a “big data” service to many other academic disciplines at Wits University. It will also contribute to the body of academic knowledge in this field. The Institute will be built on the recognition that, in today’s world, collaboration is the most effective way to generate meaningful knowledge. The Institute will seek partnerships locally and globally with universities, governments, corporates and other stakeholders.
Current activities in AOSP are stimulating thinking about the next major data-intensive programmes.

Identified areas where Africa is data-asset rich:
- Hydrology
- Resilient Cities
- Disaster Risk Reduction

Potential to attract collaboration and develop African research base.

These programmes should build on existing activities and critical mass.

AOSP can assist in enabling critical mass and contributing to modern data approaches.
BSc Honours in Big Data Analytics

The School of Computer Science and Applied Mathematics, at the University of Witwatersrand, has developed a BSc Honours course in Big Data Analytics. The course was established in response to the needs of both industry and of the scientific community, where massive demand for highly skilled data scientists has emerged.
S6: Network for Open Science & Dialogue

African Open Science Platform
“79. The creation of an **African platform for research and innovation exchange** will enable the dissemination of goal-relevant African research and innovation to governments and citizens. It could form the **basis for linking researchers and innovators** with the funding required to scale up their work. The proposed platform would **showcase and share** Africa’s efforts to develop goal-relevant research and innovation and could be coordinated with the **Global Innovation Exchange**.”
Thank you!

ina@assaf.org.za

Visit us & join mailing list
http://africanopenonscience.org.za/