

AfricaArray: Network reports

Managing Data from Seismic Networks Workshop
August 20-26, 2017



by

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Network manager



AfricaArray Background

- **Started in 2004**
 - founding partners: Penn State, Univ. of the Witwatersrand (Wits), Council for Geoscience (aka Geol. Survey of South Africa (CGS) (+ IRIS support)
- **Initial meeting: Andy Nyblade with Paul Dirks (Oct. 2003)**
- **Dec. 2003**

AfricaArray: Training a Scientific Workforce for Africa's Natural Resource Sector

(This is a concept paper written to gauge the level of interest on the part of funding agencies for establishing a public-private partnership to support this initiative.)

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Summary

Highly trained scientists in fields allied to natural resource exploitation are needed in government, industry and academic institutions throughout Africa who are dedicated to building the African scientific community, and who can play pivotal roles in the development and management of Africa's vast mineral and petroleum wealth, and water and geothermal resources.

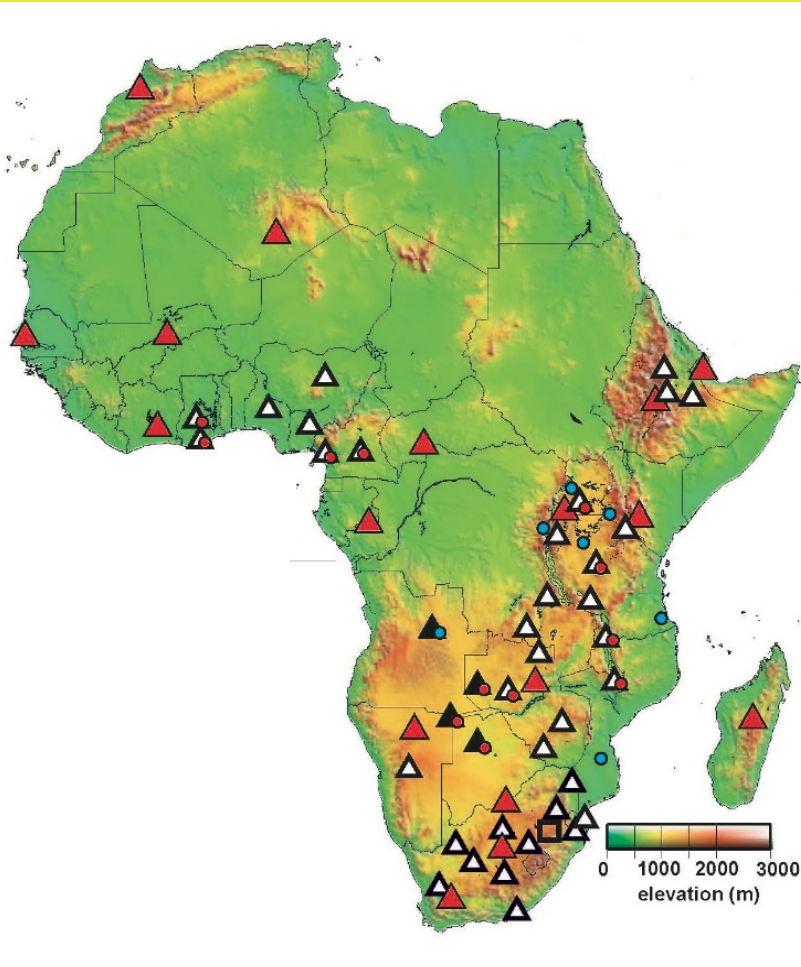


AfricaArray Background

- **Goal: establish a public-private partnership to support capacity building and research in the geosciences (Earth, Atmospheric and Space sciences) in Africa, with an initial focus on solid earth geophysics**
- **“AfricaArray” = array of training programs + array of research projects + array of partnerships and collaborations + array of scientific observatories (networks)**
- **Key components to a multifaceted initiative:**
 - 1) seismic, GPS, weather networks in Africa**
 - 2) Undergraduate and postgraduate research and education programs (Africa and US)**
 - 3) Project based funding**



AfricaArray Observatory Network

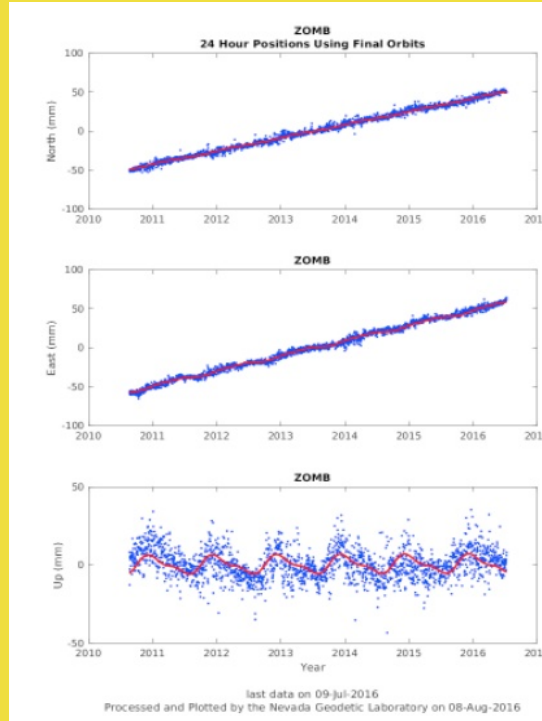


- **Total of 53 stations**
 - . 29 seismic stations only
 - . 20 collocated seismic, GPS and weather stations
 - . 2 collocated GPS, weather
 - . 1 collocated seismic, GPS
 - . 1 weather station only
- **17 countries**
- **Continuous recording**
- **Data recovery 70-80%**
- **Data availability: IRIS and UNAVCO**
- **Data retrieval:**
 - . A few countries - real-time using cell modems
 - . Elsewhere – monthly
- **Data policy:**
 - . AA releases all data after 3 yrs through IRIS



AfricaArray Station: Zomba, Malawi

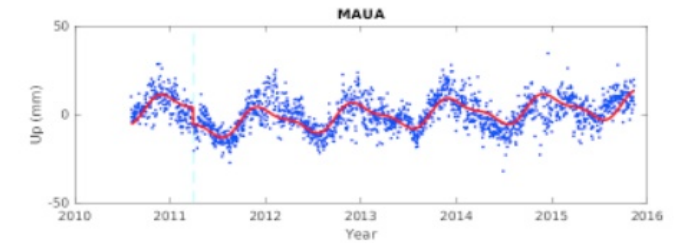
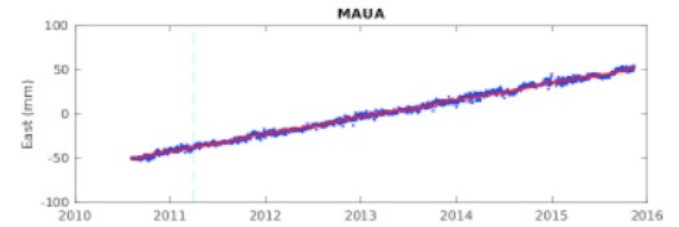
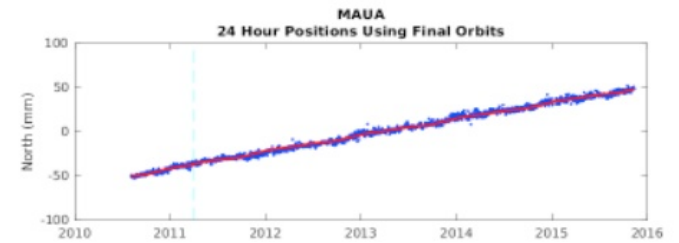
Seismic Station



GPS Station



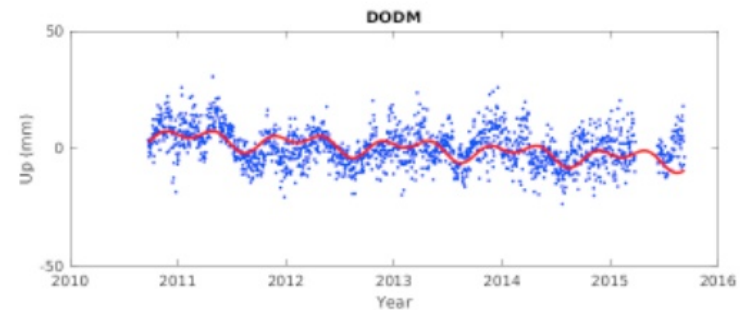
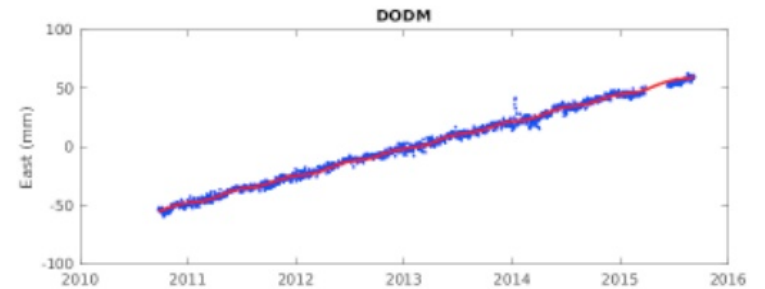
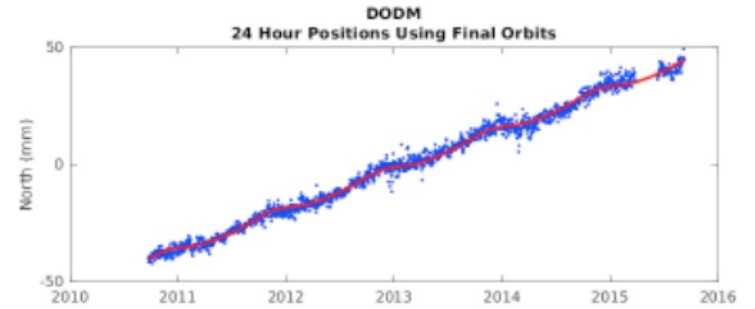
AfricaArray Station: MAUN, Botswana



gray dashed line = time of nearby earthquake
cyan dashed line = time of known equipment change
last data on 11-Nov-2015
Processed and Plotted by the Nevada Geodetic Laboratory on 08-Aug-2016



AfricaArray Station: DODOMA, Tanzania



last data on 08-Sep-2015
Processed and Plotted by the Nevada Geodetic Laboratory on 06-Aug-2016

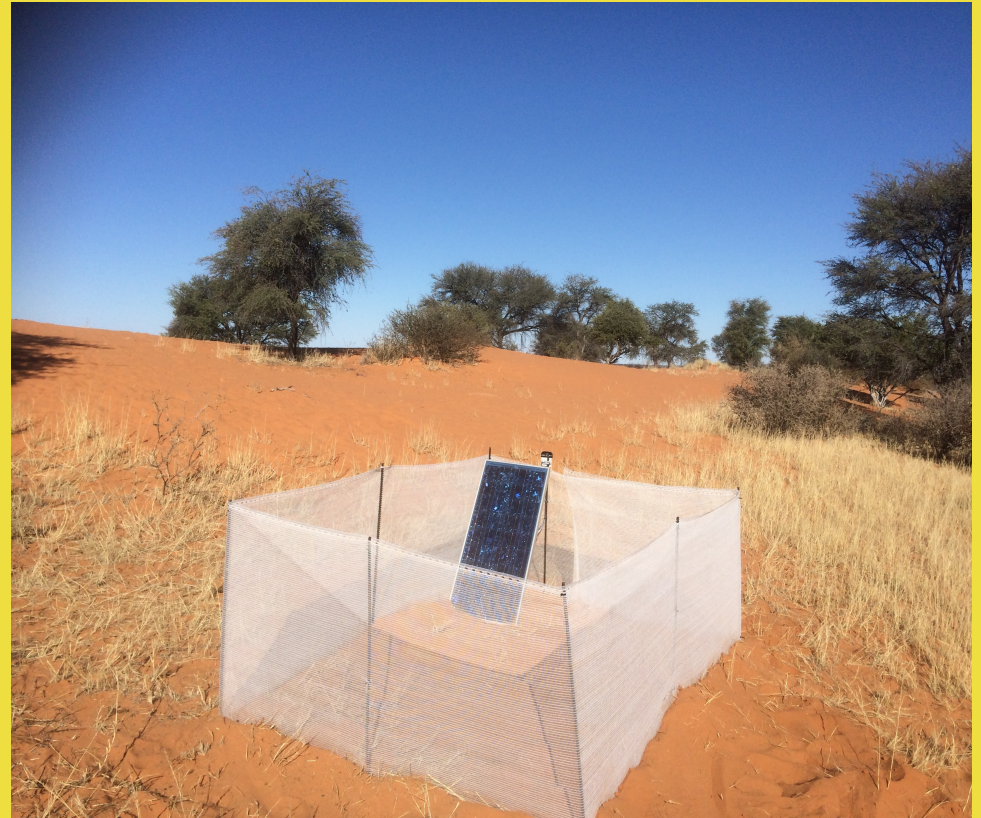


AfricaArray current temporary networks

- 2013-2017 Botswana – 20 stations**
- 2015-2018 Northern Namibia – 10 stations**
- 2017-2018 Southern Namibia – 10 stations**
- 2015-2017 Bushveld Complex, S. Africa - 5 stations**
- 2017-2018 Bushveld Complex, S. Africa - 25 stations**
- 2017-2018 NE Uganda, 9 stations**



AfricaArray temporary station





AfricaArray seismic sensor





AfricaArray Data Access and Archiving

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AfricaArray

A public-private partnership supporting training & research in earth, atmospheric, & space sciences in Africa

ABOUT AFRICAARRAY

ACADEMIC PROGRAMMES

RESEARCH PROGRAMMES

DIVERSITY PROGRAMMES

STATIONS & DATA

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[Seismic Data Access](#)

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[Temporary Observatories](#)

[Technical Training Programme](#)

PEOPLE

PARTNERS

PUBLICATIONS

STATIONS AND DATA

Seismic Data Access and Availability (new policy beginning February 2011)

Seismic data from the AfricaArray observatories are being archived and distributed by the IRIS Data Management Center under the network code AF. The data can be viewed at: <http://www.iris.edu/mda/AF> and can be obtained using standard data request tools at IRIS.

Beginning February 2011, all data for the following stations are open immediately:

SHAI, KUKU, IFE, YNDE, AAUS, TEBE, NBI, RUSH, GETA, DODT, MBEY, MTVE, MZM, ZOMB, LBB, TETE, TEZI, RUDU, WIN, POGA, SOE, SVMA, SKRH

For the remaining stations, the data are openly available after three years. The first open release was in October 2009 for data collected in 2005 and 2006. Data collected in 2007 was released in October 2010. In-country network operators can release data from their stations to anyone during the three year holding period.

Before archiving data from some stations, it must first be processed for timing corrections and reformatted. Therefore, for some stations, there is a lag between when data are collected and made available at IRIS.



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IRIS DMC MetaData Aggregator

Network summary (1 time span)

Network AF :: Africa Array :: [AF Network Map :: DOI](#)
Start Year 2004
End Year 2500

Stations for AF network (46 stations) :: [Click column title to sort](#)

Station	Site	Latitude	Longitude	Elevation	First start	Last end
AAUS	Addis Ababa University, Ethiopia	9.034900	38.766500	2437.8	2006/01/10	2599/12/31
ANKE	Ankober, Ethiopia (near Debra Birhan)	9.582700	39.741800	2789.9	2009/05/07	2599/12/31
BLWY	Bulawayo, Zimbabwe	-20.143000	28.611000	1348	2006/01/07	2010/08/02
BLWY	Bulawayo, Zimbabwe	-20.143000	28.611300	1348	2012/01/01	2599/12/31
BOBN	Bobandana, DRC, Africa	-1.660000	29.236660	1529	2012/02/23	2599/12/31
CNG	Changalane Maputo Province Mozambique	-26.291700	32.188300	120	2005/11/03	2599/12/31
CRLN	Carolina, Mapumalanga, South Africa	-25.994900	30.022700	1600	2015/05/14	2599/12/31
CVNA	Calvinia KS2000 Earth data Low gain	-31.482000	19.762000	1050	2006/05/11	2599/12/31
DESE	Dese, Ethiopia	11.118000	39.635000	2538	2006/07/27	2599/12/31
DODT	Dodoma, Tanzania	-6.186000	35.748000	1114	2007/02/11	2599/12/31
EKNA	Ekona, Cameroon	4.234000	9.328000	354	2007/01/23	2599/12/31
GETA	Geita, Tanzania	-2.866000	33.241000	1267	2011/08/02	2599/12/31
GRHM	Hilton Farm, Grahamstown, Eastern Cape, South Africa	-33.276800	26.376600	615	2016/10/11	2599/12/31
GRM	Grahamstown KS2000 Earth data Low gain	-33.313000	26.508000	610	2006/05/10	2599/12/31
HARE	Harare, Zimbabwe	-17.704000	31.009000	1501	2006/01/07	2010/12/31
HVD	Gariep Dam CMG-40T Earth data Low gain	-30.605000	25.497000	1433	2006/04/26	2599/12/31
IFE	Ife, Nigeria, Africa	7.546667	4.456920	283.8	2008/09/26	2599/12/31
KIG	Kigali, Rwanda	-1.963390	30.063320	1545	2008/10/12	2599/12/31
KITWE	Kitwe, Zambia	-12.814000	28.209000	1227.6	2006/01/07	2599/12/31
KUKU	Kukurantumi, Ghana	6.192320	-0.368420	212.4	2009/07/02	2599/12/31
LBB	Lubumbashi, DRC	-11.631000	27.485000	1283	2008/01/16	2599/12/31
MBEY	Mbeya, Tanzania	-8.983000	33.241000	1331	2007/01/30	2599/12/31
MONG	Mongu, Zambia, Africa	-15.150000	23.090000	1046	2010/08/25	2599/12/31
MOPA	Mopani CMG-40T Earth data Low gain	-23.517000	31.398000	362	2006/11/11	2599/12/31
MSNA	Mussina KS2000 Earth data Low gain	-22.449000	30.024000	600	2006/11/09	2015/06/25
MSNA	Mussina, Limpopo, South Africa	-22.449000	30.024000	600	2015/06/26	2599/12/31
MTVE	Mtwara, Tanzania	-10.250000	40.167000	21	2011/08/02	2599/12/31
MZM	Mzuzu, Milawi, Africa	-11.434000	34.035000	1258	2006/01/01	2599/12/31
NBI	Nairobi, Kenya, Africa	-1.273900	36.803700	1713	2011/03/08	2599/12/31
PKA	Prieska CMG-40T Earth data Low gain	-29.670000	22.757000	960	2006/10/16	2599/12/31
POGA	Pongola KS2000 earth data Low gain	-27.346000	31.707000	290	2006/03/27	2014/06/04
POGA	Pongola RT151-120 earth data Low gain	-27.346000	31.707000	290	2014/06/05	2599/12/31
PWET	Pweto, DRC, Africa	-8.280000	28.530000	948	2010/08/09	2599/12/31
RUDU	Rundu, Ovamboland, Namibia	-17.909600	19.764800	1100	2007/01/01	2599/12/31
SEK	Senekal CMG-40T Earth data Low gain	-28.323000	27.625000	1486	2006/04/16	2599/12/31
SHAI	Shai Hills, Ghana	5.881360	0.043890	82.2	2009/07/02	2599/12/31
SKRH	Sakaraha, Madagascar, Africa	-22.827000	44.733000	890	2012/08/16	2599/12/31
SNKL	Senekal, Freestate Province, South Africa	-28.275280	27.771400	1655	2015/12/09	2599/12/31
SOE	Somerset East L4-3D Earth data Low gain	-32.712000	25.562000	820	2008/09/28	2599/12/31
SVMA	Madeira, Sao Vicente, Cape Verde	16.840390	-24.925000	195	2013/01/01	2599/12/31
SWZ	Schweizer Reneke CMG-40T Earth data Low gain	-27.182000	25.332000	1342	2006/02/08	2599/12/31
TBBE	Entebbe, Uganda	0.053600	32.483000	1132	2007/11/14	2599/12/31
TETE	TETE Mozambique, TETE Province	-16.146700	33.576800	153	2015/09/08	2599/12/31
TEZI	Rezhi-izhi, Zambia	-15.747000	26.016000	1115.6	2006/01/10	2599/12/31
UPI	Ujington KS2000 Earth data Low gain	-28.362000	21.253000	845	2006/06/17	2599/12/31
WDLM	Western deep levels CMG-3T Earth data Low gain	-26.424000	27.422000	1680	2009/12/08	2599/12/31
WIN	Windhoek, Namibia	-22.566700	17.100000	1728	2004/09/01	2599/12/31
YNDE	Yaounde, Cameroon	3.870000	11.456000	717	2007/02/08	2599/12/31
ZOMB	Zomba, Malawi	-15.383300	35.350000	885	2006/06/01	2599/01/01

Real-time data availability (see [BUD Tools](#) for access)

Earliest	Latest
2017/06/17 (168) 00:00:00	2017/07/12 (193) 00:00:00

Archive data availability - [Make a batch request for data \(breq_fast\)](#) - [\(data access overview\)](#)



AfricaArray country representatives



AfricaArray Scientific meeting - January 2016

PARTNERS:

- Universities in Africa 15
- Universities in US, Europe, Australia 14
- Gov't organizations in Africa 17
- Gov't organizations outside Africa 8
- Companies 19
- Academic and industry societies 6

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THANK YOU