



Geohazard Monitoring: Cooperation and partnership for Mitigating the Impact of Disaster in Africa

**African Disaster Mitigation
Research center**

ADMIR

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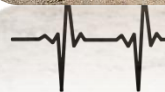


Contents

- History
- Facilities
- Capacity building programs
- Ongoing projects

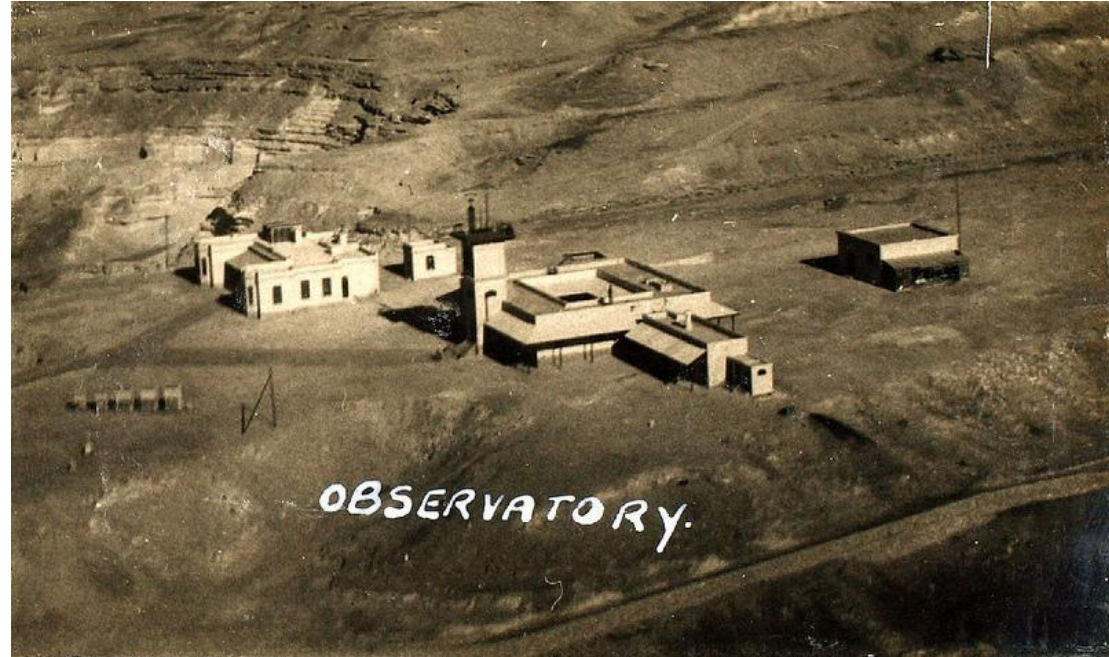


NRIAG is the national astronomical and geophysical research establishment in Egypt with more than 175 years of accumulated Experience, making it the oldest scientific research institute in Africa and Middle East. Serving as international consulting firm in its fields of specialization to support Industry, Educations and Research.



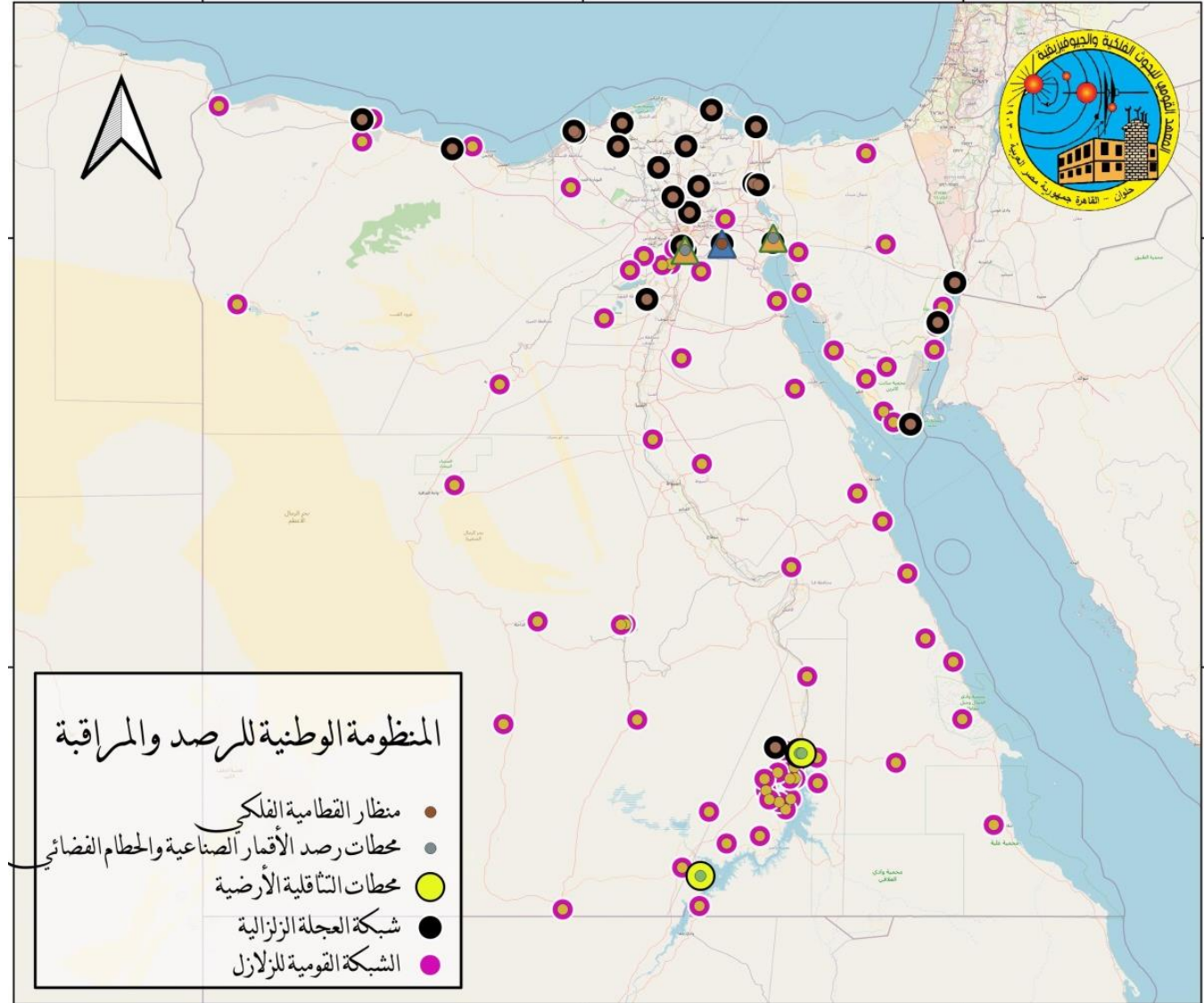
The Observatory

- In 1839 Boulaq Rassdkhana
- In 1865 Abbasiya observatory
- In 1903 Helwan Observatory
- In 1946 Royal Observatory
- In 1953 Helwan Observatory
- in 1960 Helwan Institute of Astronomy and Geophysics (HIAG)
- In 1986 National Research of Astronomy and Geophysics (NRIAG)



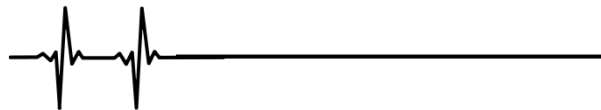
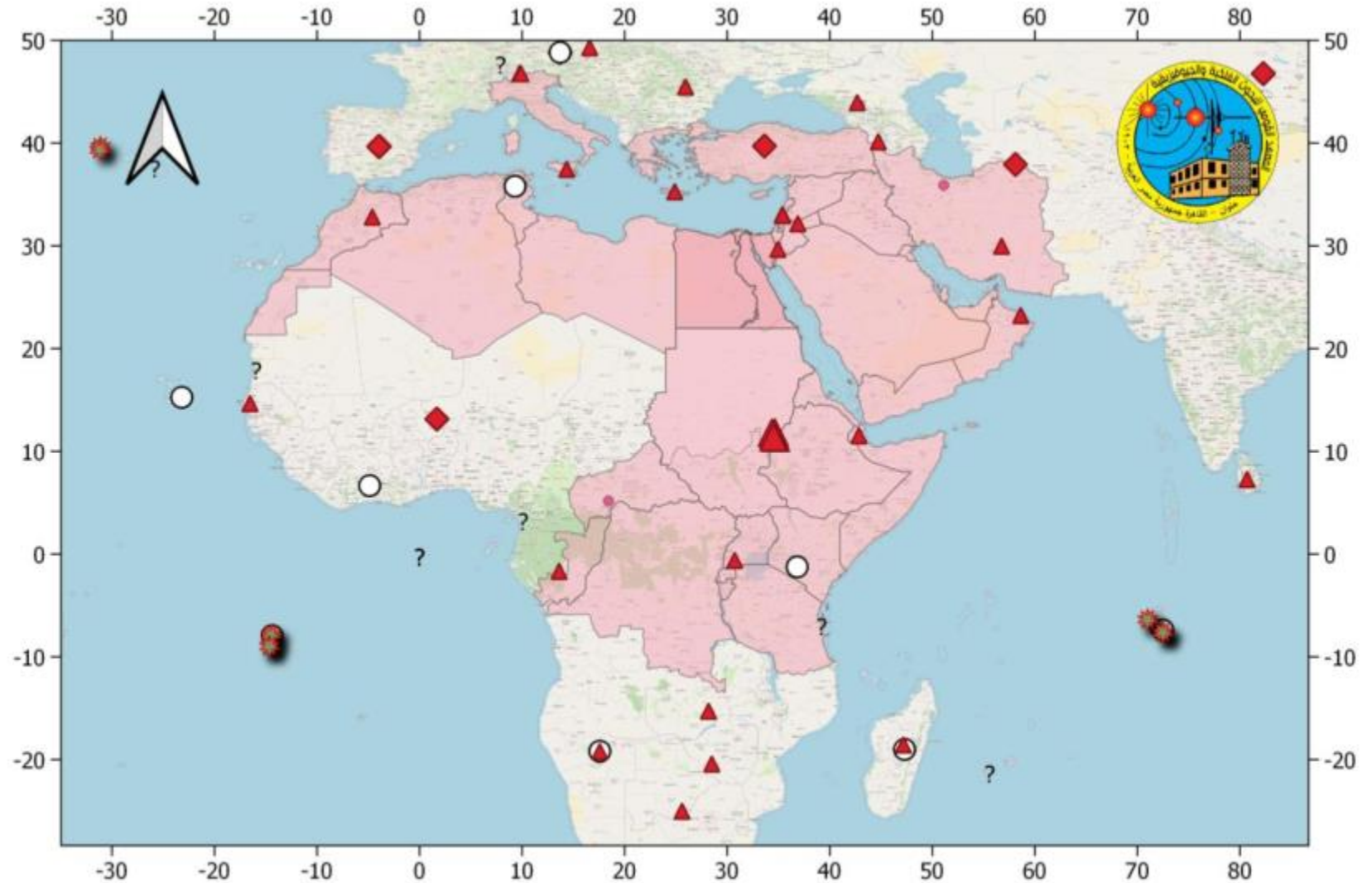


National Observing system





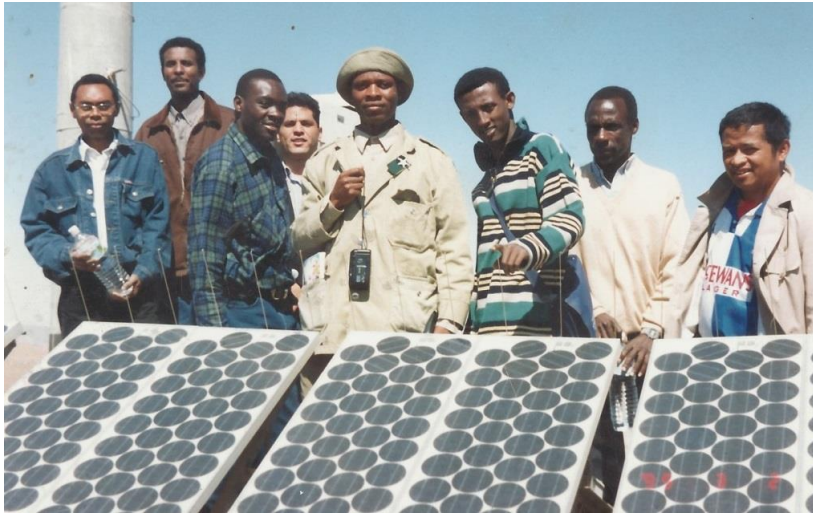
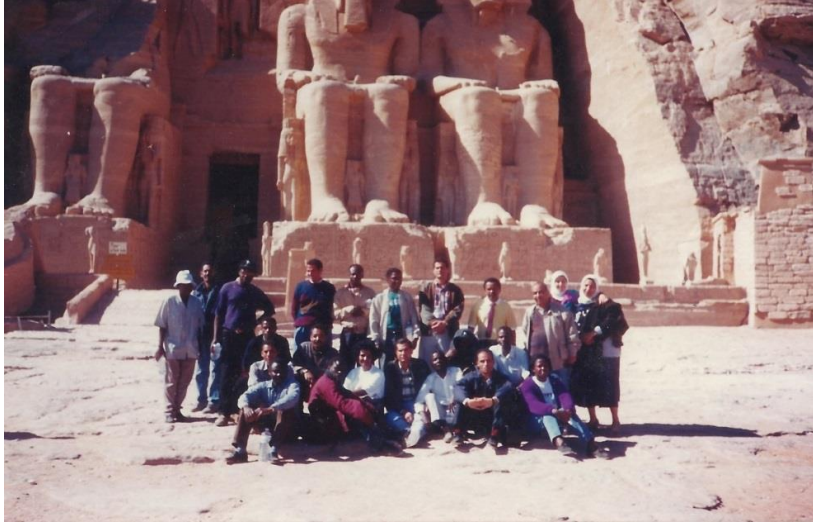
Regional Observing system





NRIAG in the heart of Africa





238 trained Scientists in African countries many of whom are currently responsible for operating their national seismic network or teaching seismology at universities.

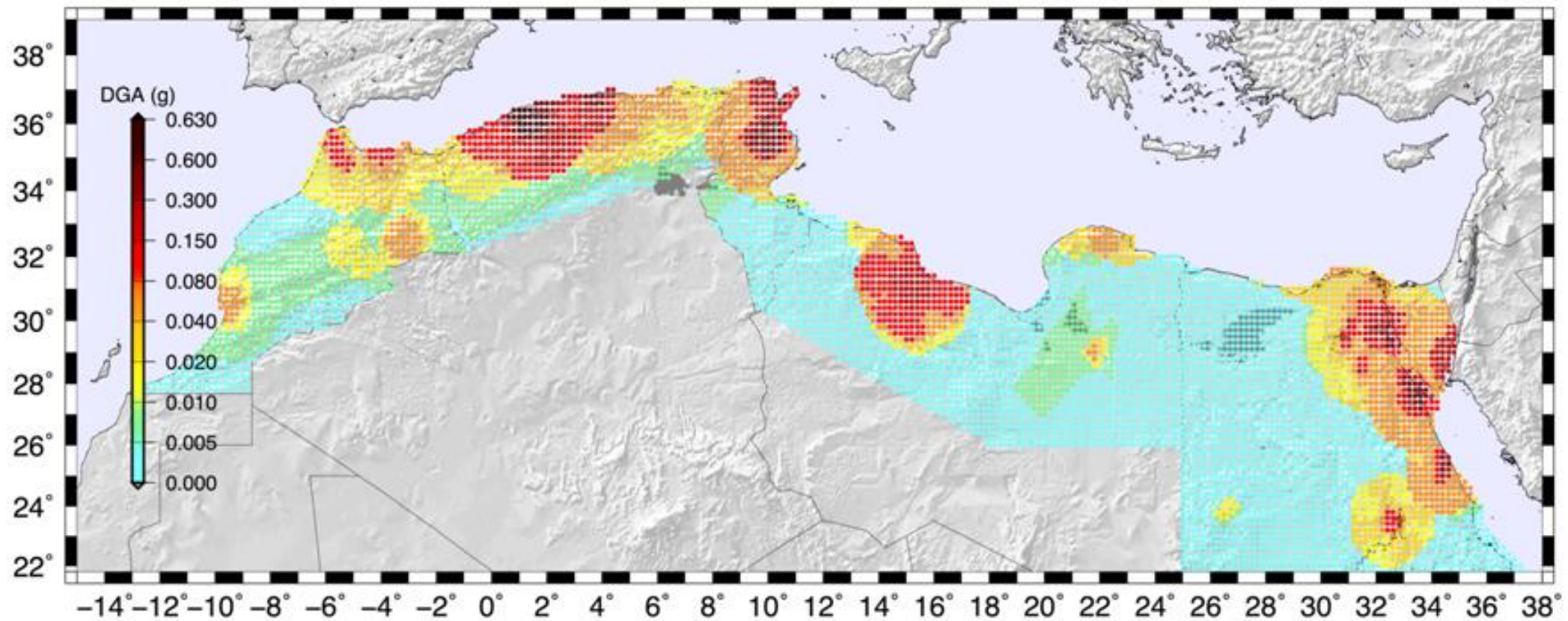


Summer and winter schools in Astronomy & Space



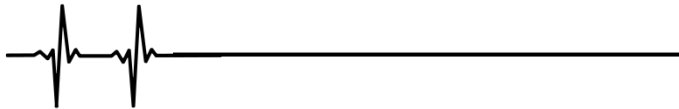
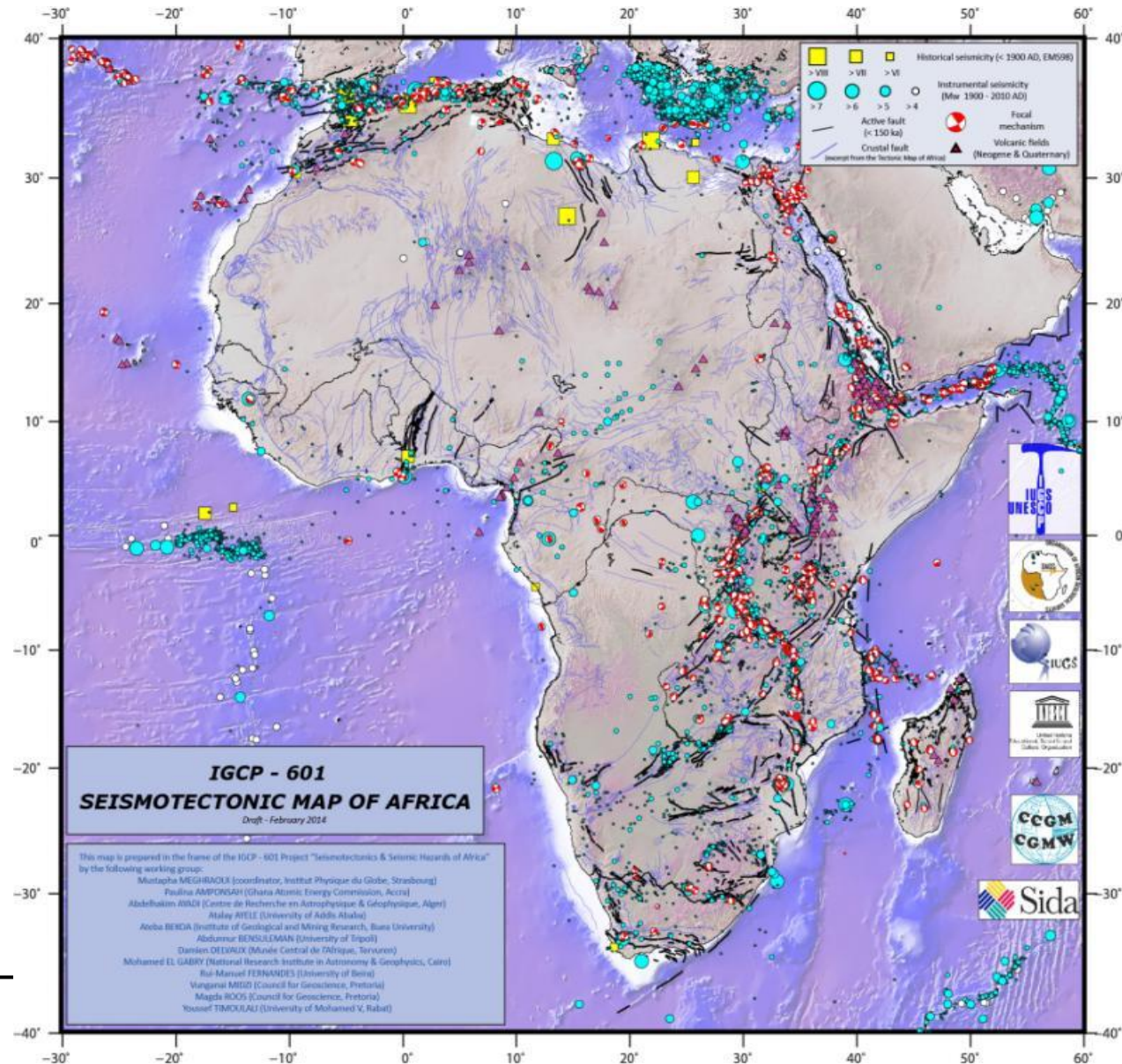


Seismic Hazard Map of North Africa



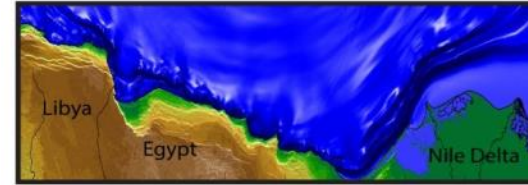
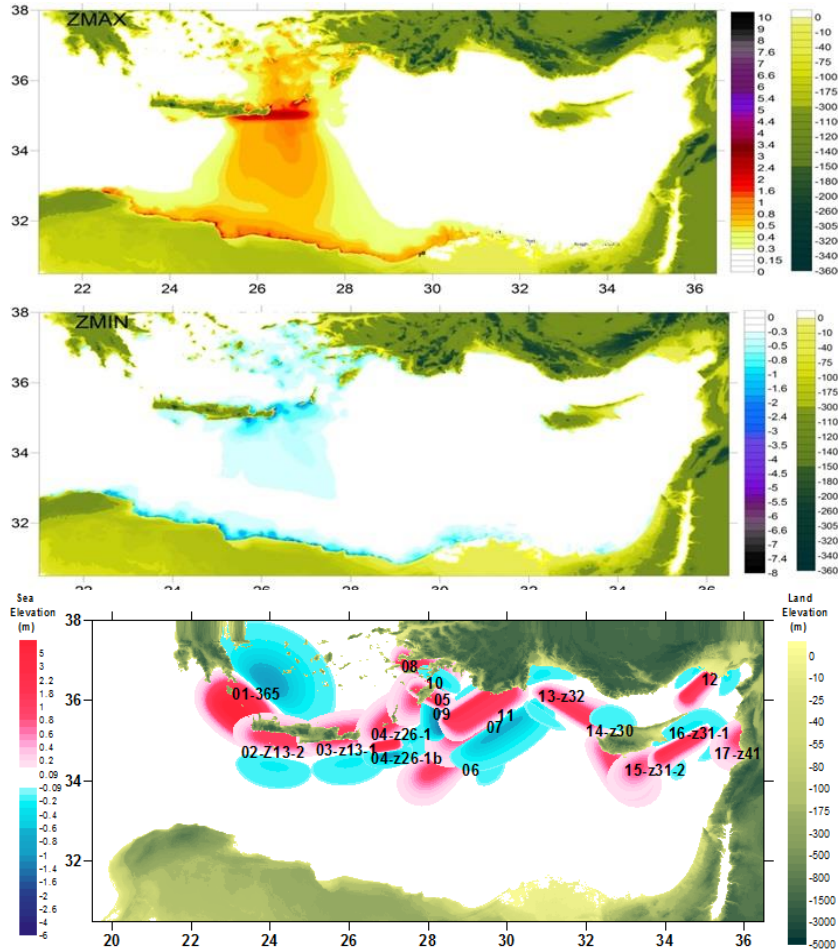


Seismotectonic Map of Africa





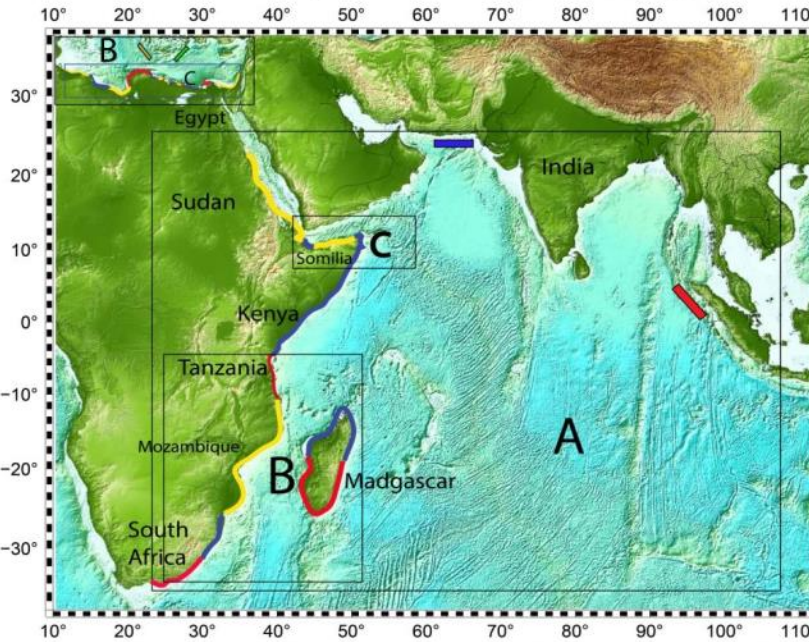
Tsunami Hazard map of Africa 2021



a) Tsunami wave hit the majority of Egyptain coast at 60 minutes with maxmium wave height 2-4 m in scenerio (3)



b) Tsunami wave hit Somilia coast after 234 minutes from scenerio (2).



c) Tsunami hazard map for the eastern part of Africa with mamium wave heights from tsunamigenic zones

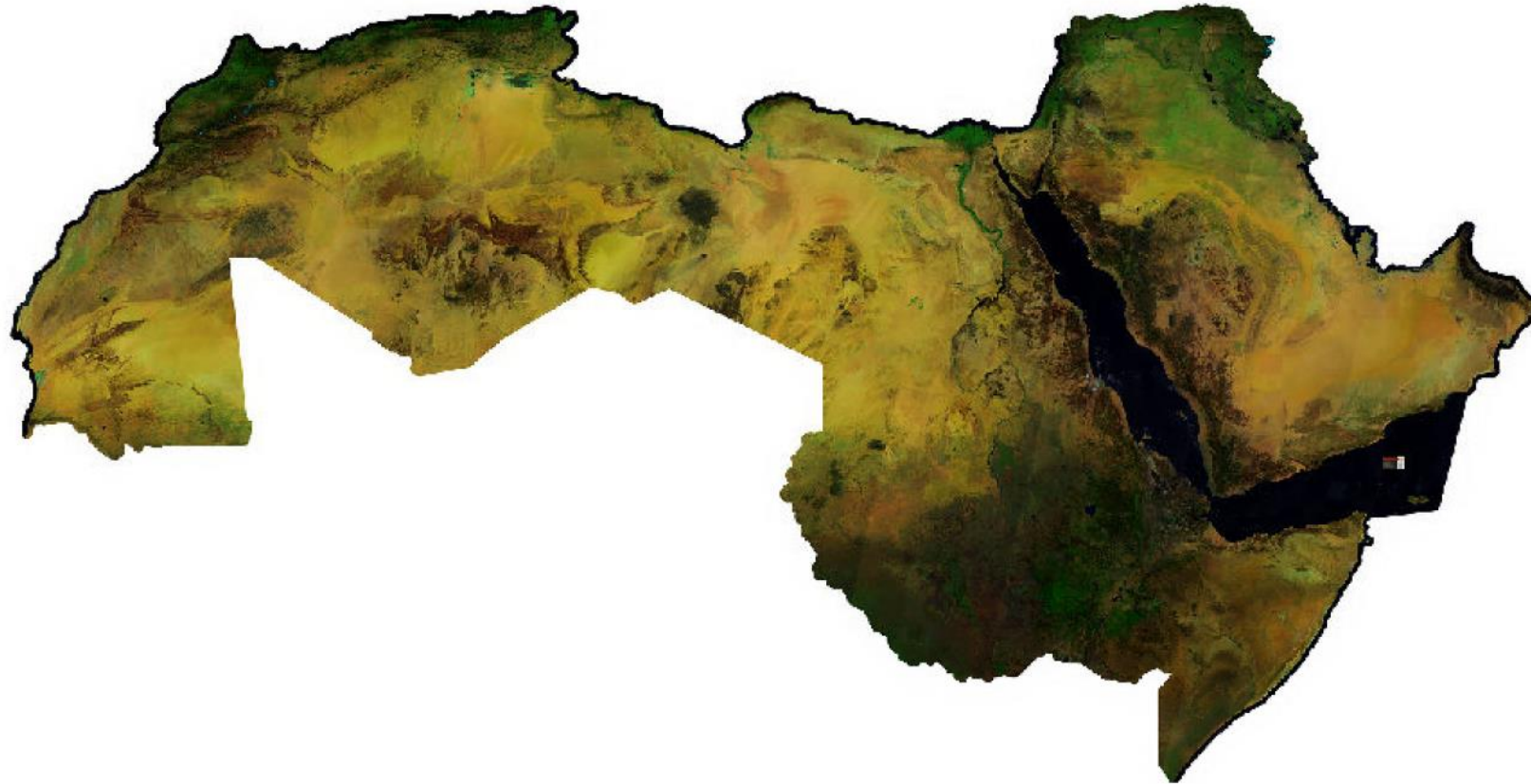


d) Tsunami wave hit Egypt & Libya after 76 minutes resulted from scenerio (4)



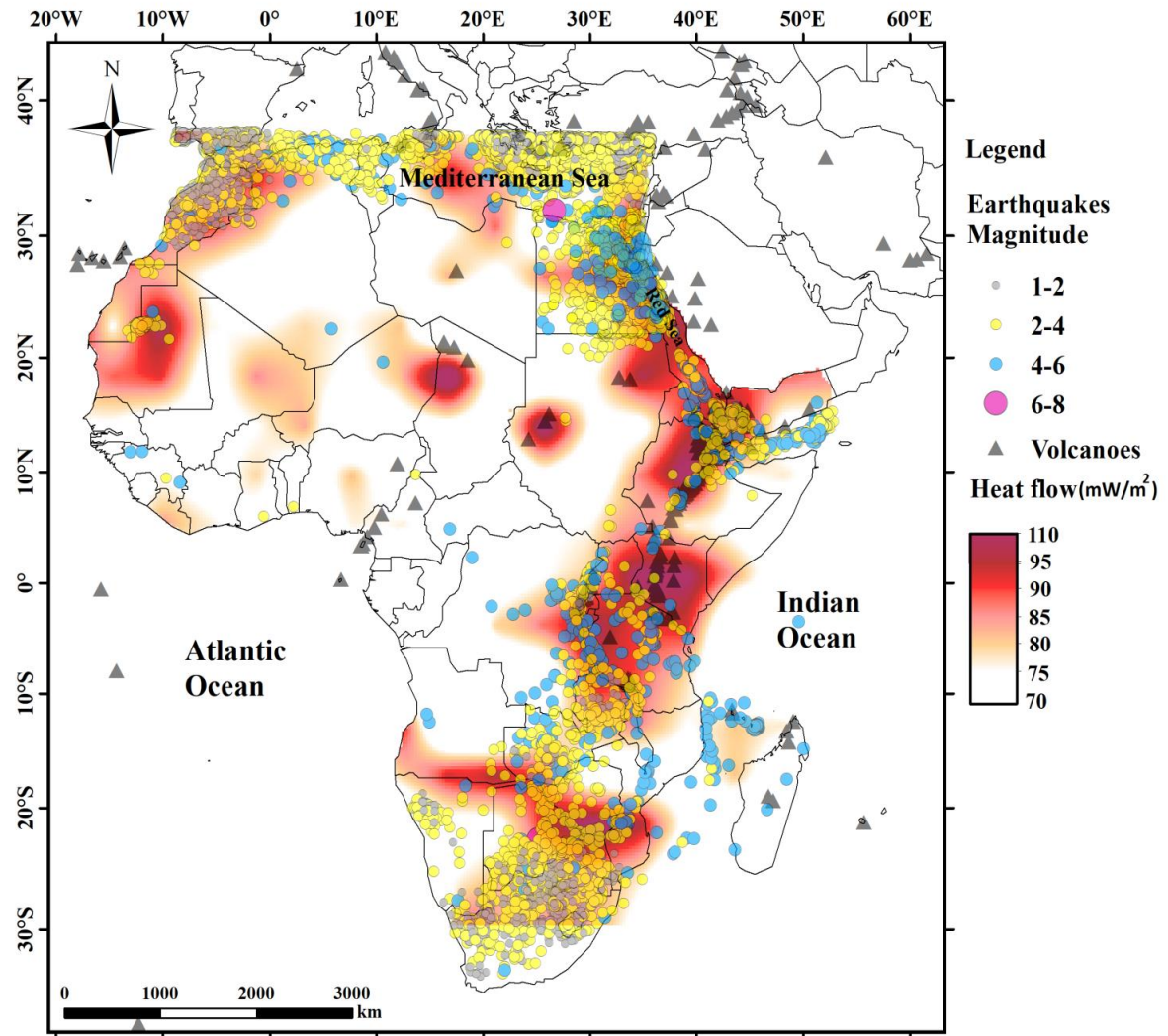


Atlas on natural hazards in the Arab Region: a tool for socio-ecological systems resilience and adaptation





Geothermal Map of Africa 2021



National Research Institute of Astronomy and Geophysics

Partnership for Mitigating the Impact of Disasters in Africa



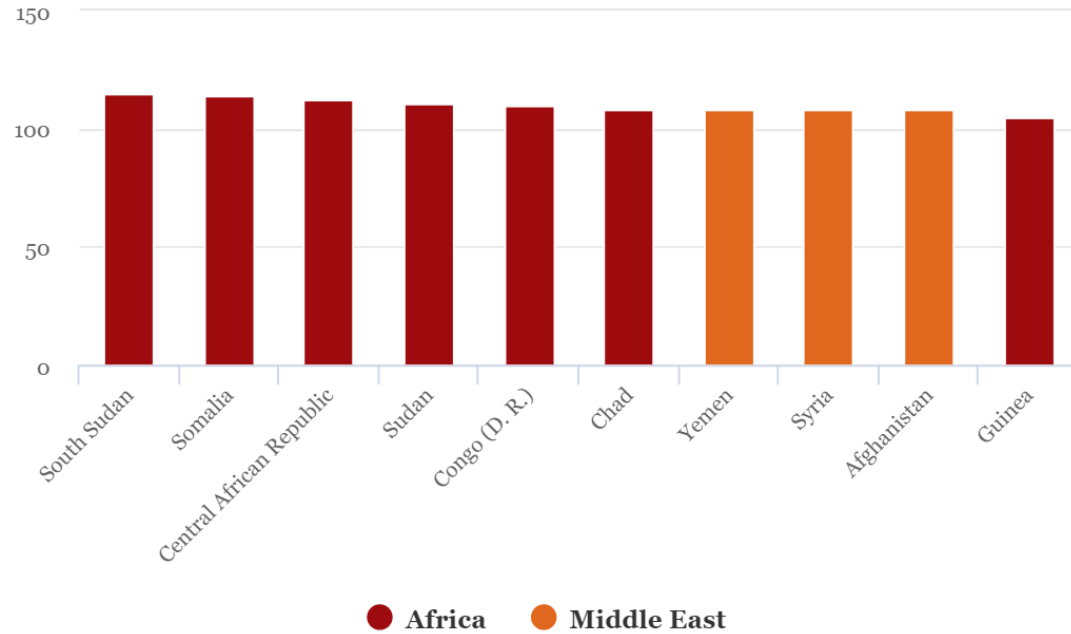
National Research Institute of Astronomy and Geophysics

Partnership for Mitigating the Impact of Disasters in Africa



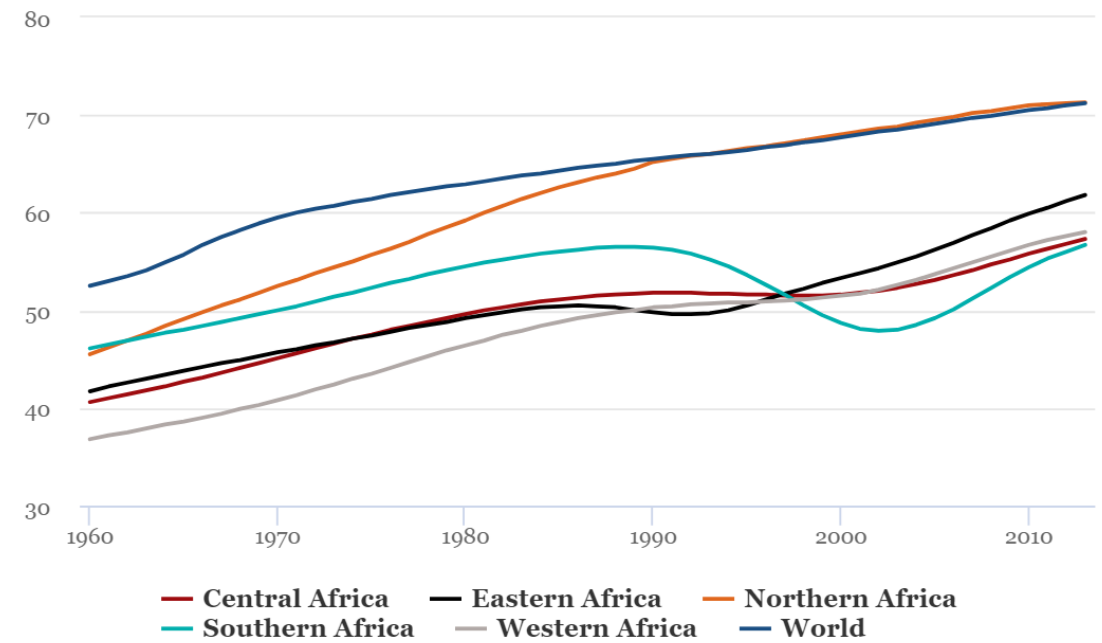
Early Career Seismologist Training Course 14-17 October

World's 10 most fragile states
Fragility Index Score



Source: Fragile States Index

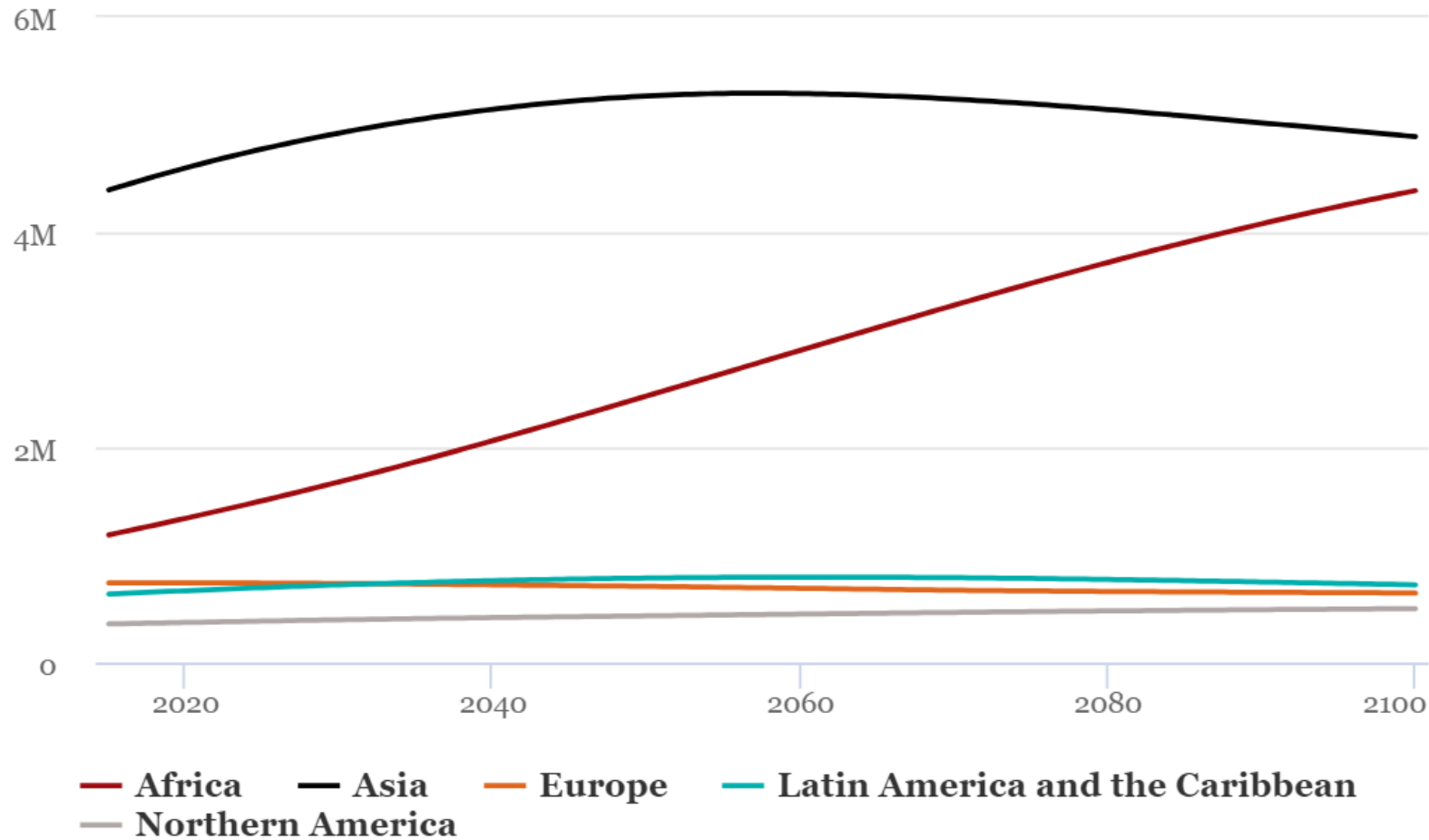
Life expectancy: Africa compared to the world
Years expected to live



Source: World Bank

Continent populations: The rise of Africa

People (000s)





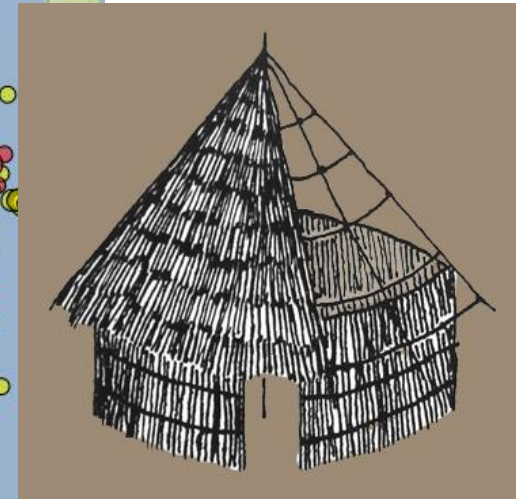
Alamein, Egypt



Accra, Ghana



Addis Ababa, Ethiopia





AFRICAN UNION

SCIENTIFIC, TECHNICAL AND
RESEARCH COMMISSION



UNION AFRICAINE

COMMISSION SCIENTIFIQUE,
TECHNIQUE ET DE LA RECHERCHE

Ref: AU/ASRIC 01.03/23.ED-NRIAG

Date: 27th March, 2023

Prof. Gad El-Qady
Coordinator on the ASRIC Flagship Project on Disaster Management Research

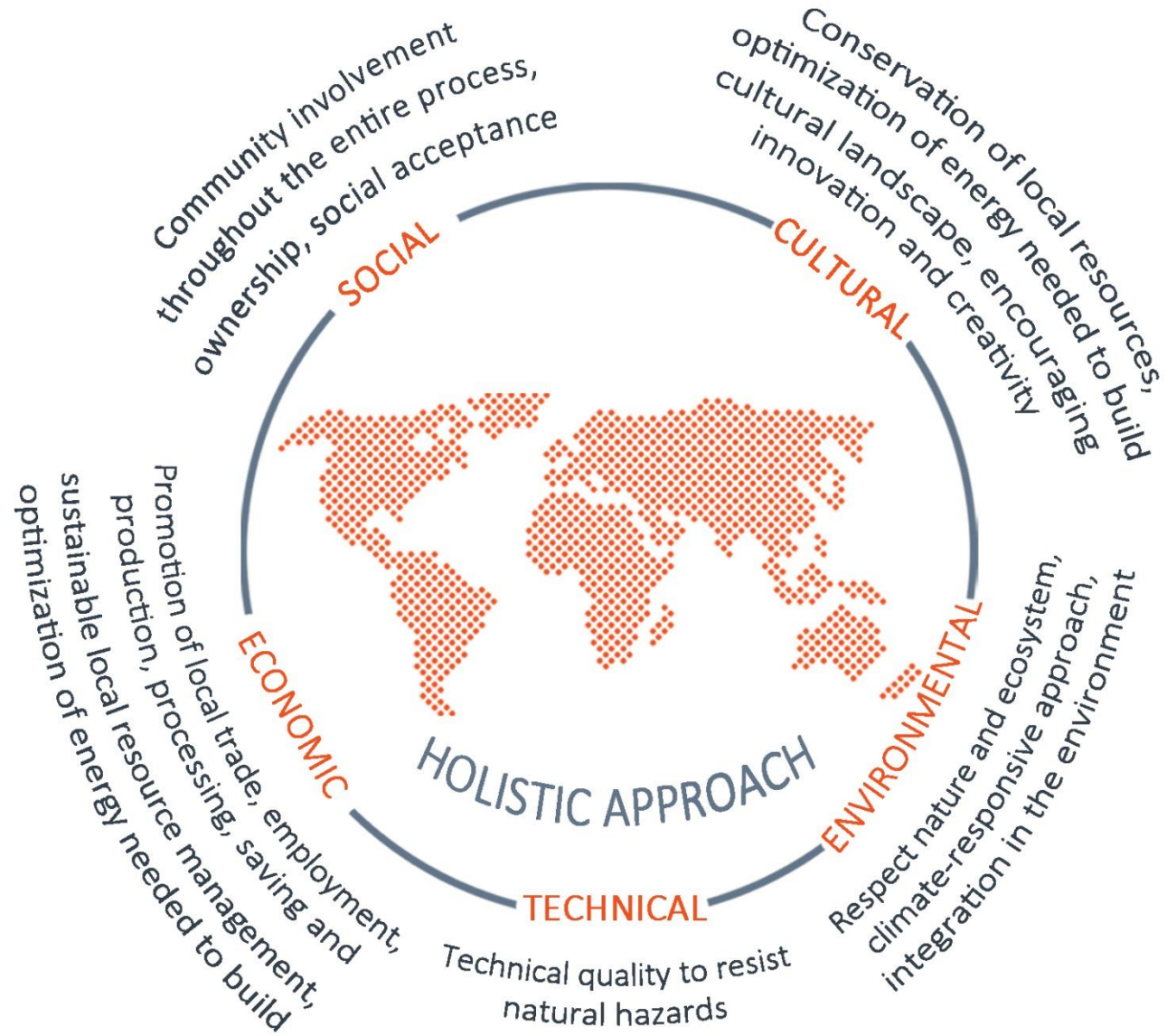
Dear Sir,

NOTIFICATION ON THE DECISIONS FORM THE 5TH ASRIC CONGRESS

8 & 9 MARCH 2023 MOMBASA, KENYA

“The Congress Recognizes the African Disaster Mitigation Reference Centre (ADMIR) as an ASRIC Centre of Excellence aimed at facilitating collaboration among scientists from diverse fields across Africa, including Natural, Biological, and Technological Hazards, as well as Economics, Social Science, and Diplomacy.

In addition, the Congress Appreciates and Applauds the gesture and generosity of the National Research Institute of Astronomy and Geophysics (NRIAG) of Egypt for availing the needed resources and Head Quarters for this Centre and Calls upon the secretariat to work with NRIAG to identify the ways and modalities that to maximize the benefits of its Members from ADMIR”.





ADMIR Objectives

- Operate an online monitoring system that merges climatic and geophysical data.
- Developing climatic and geophysical models for future projections.
- Environmental assessment for mega projects
- Assess the current natural resources.
- Propose best practices for sustainable management of human activities that impact natural resources.
- Explore new sources of underground water, mineral resources, and renewable energy.
- Building a scientific network of experts to foster cooperation and promote knowledge transfer in Africa.
- Disseminate results by encouraging the inter-availability of data.



Activates in 2023

Building Capacity

The Capacity Building Program for Natural Disaster Monitoring and Risk Reduction in Africa

Building Capability

African Seismological Center

DR. Congo

Sudan

Equatorial Guinea Seismic Network

International Partnership

UNESCO

China Earthquake Administration

Research Projects

Protecting Cultural Heritage from Natural and Human-Induced Risks.

Nigerian Seismic Building Code





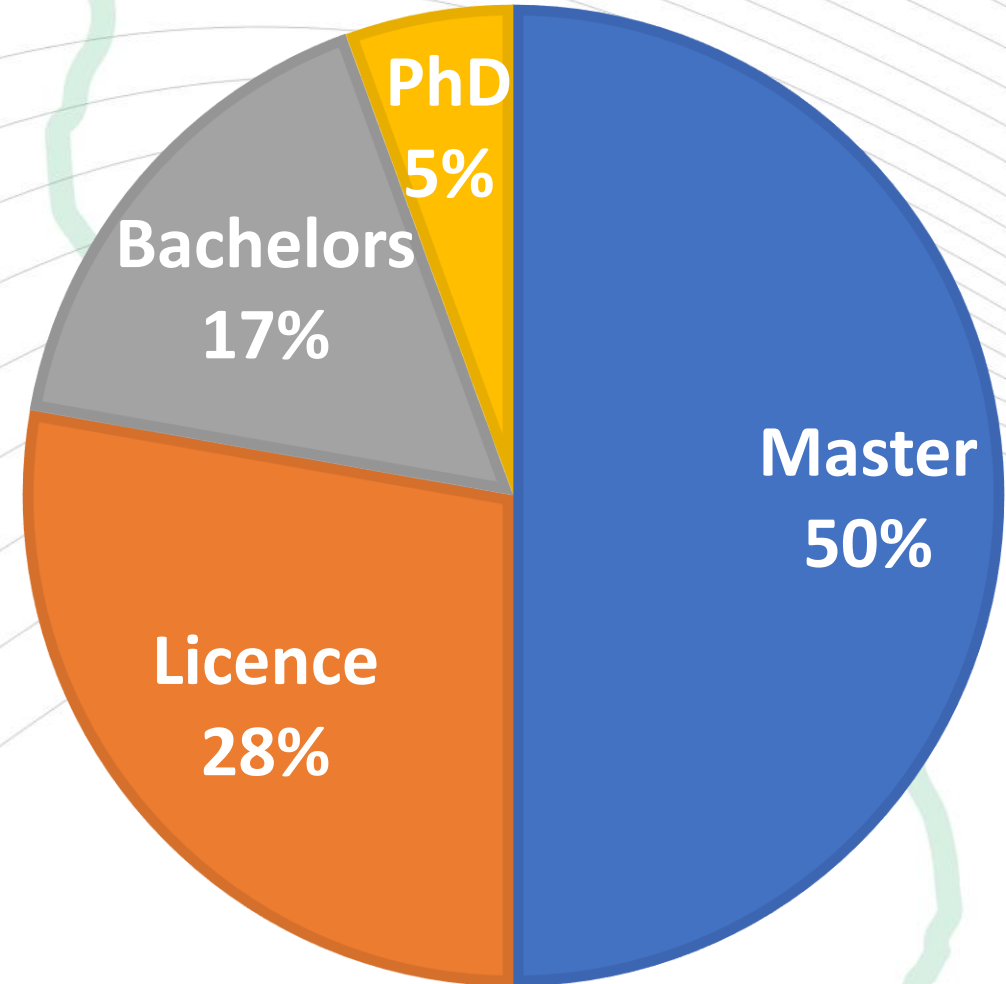
Building Capacity





DEGREE

■ Master ■ Licence ■ Bachelors ■ PhD





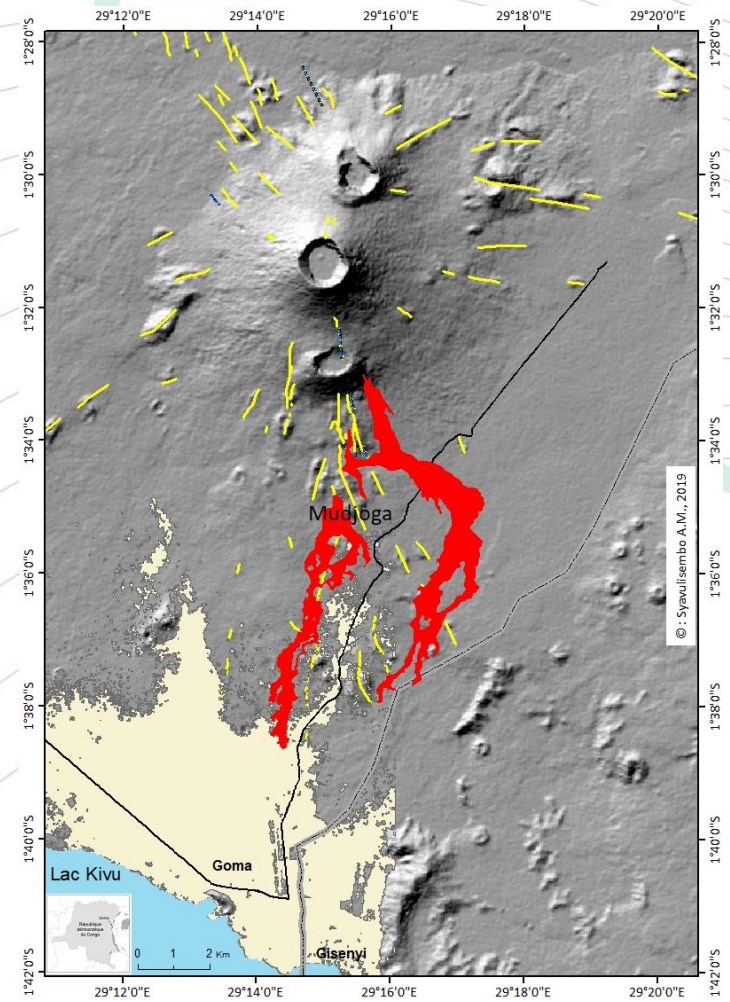
Building Capability



Goma, May 2021



Cooperation with Goma Volcano Observatory, Congo DR





Equipment to Goma Volcano Observatory

No.	Item	Quantity
1	Posthole mini-Broadband Triaxial Orthogonal Seismometer MBB2-	1
2	Ultra Low Power High Resolution Seismic Data Acquisition System Q330	1
3	Infrasound Sensor with differential pressure	4
4	Recording System with Timing unit	4
5	High Temperature Probe	1

Equipment to Centre de Recherche en Science Naturelles (CRSN, Lwiro)

No.	Item	Quantity
1	Posthole mini-Broadband Triaxial Orthogonal Seismometer MBB2-	1
2	Ultra Low Power High Resolution Seismic Data Acquisition System Q330	1

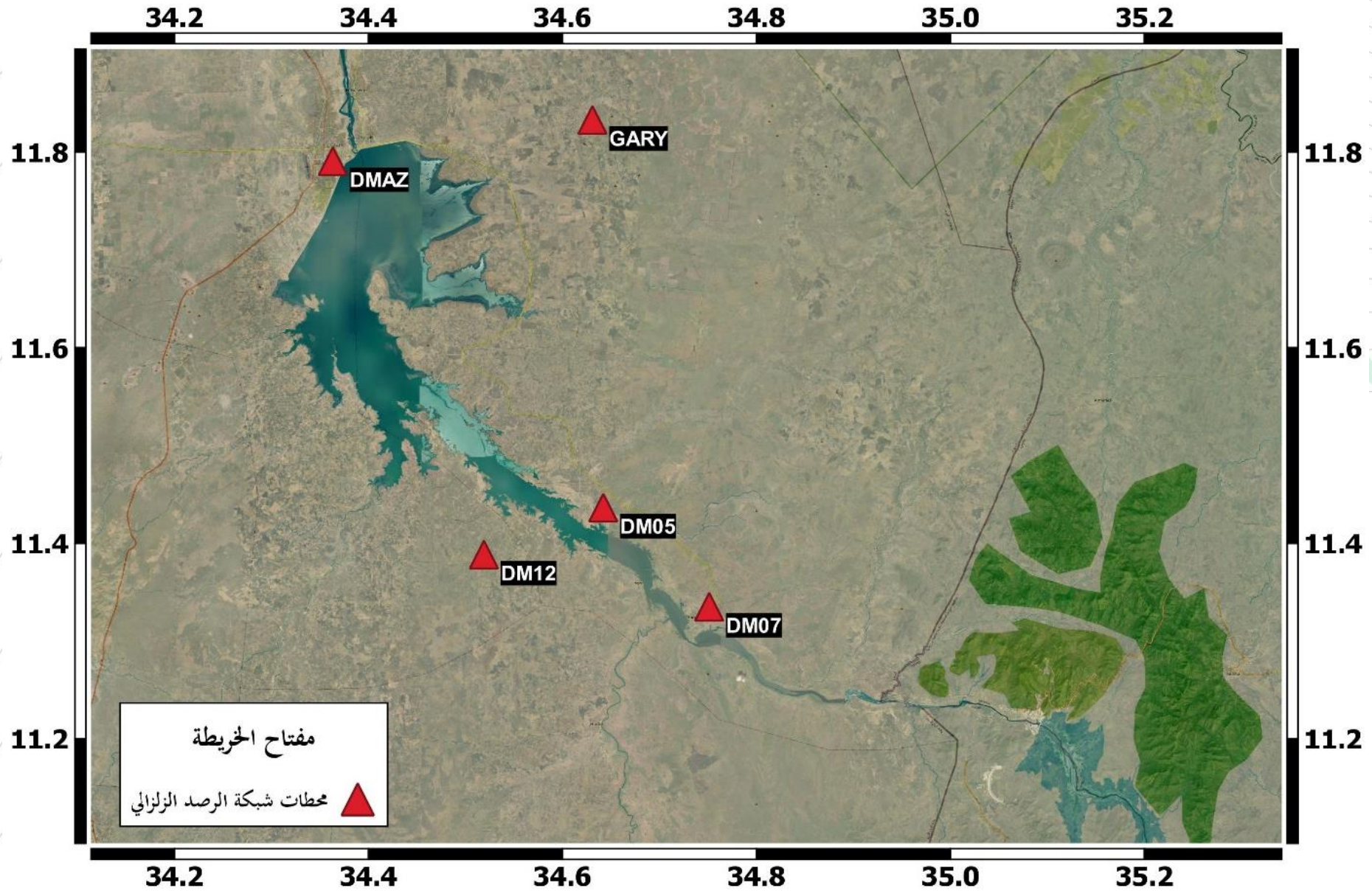
Package Dimension
90cmx90cmx50cm
Weight ~35 Kg







Sudan Seismic Network



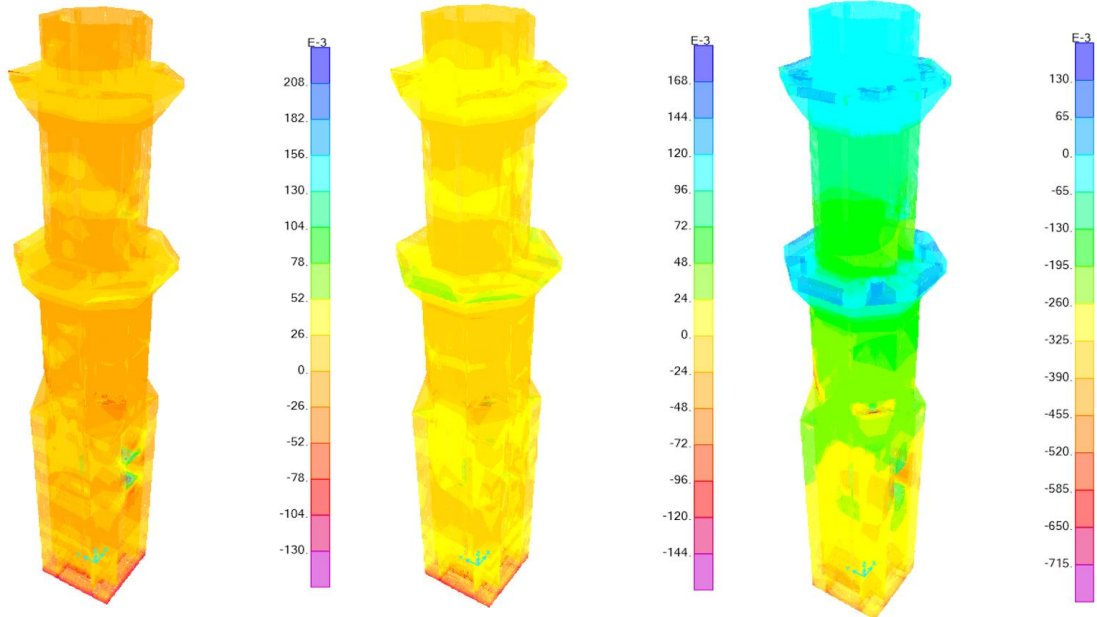
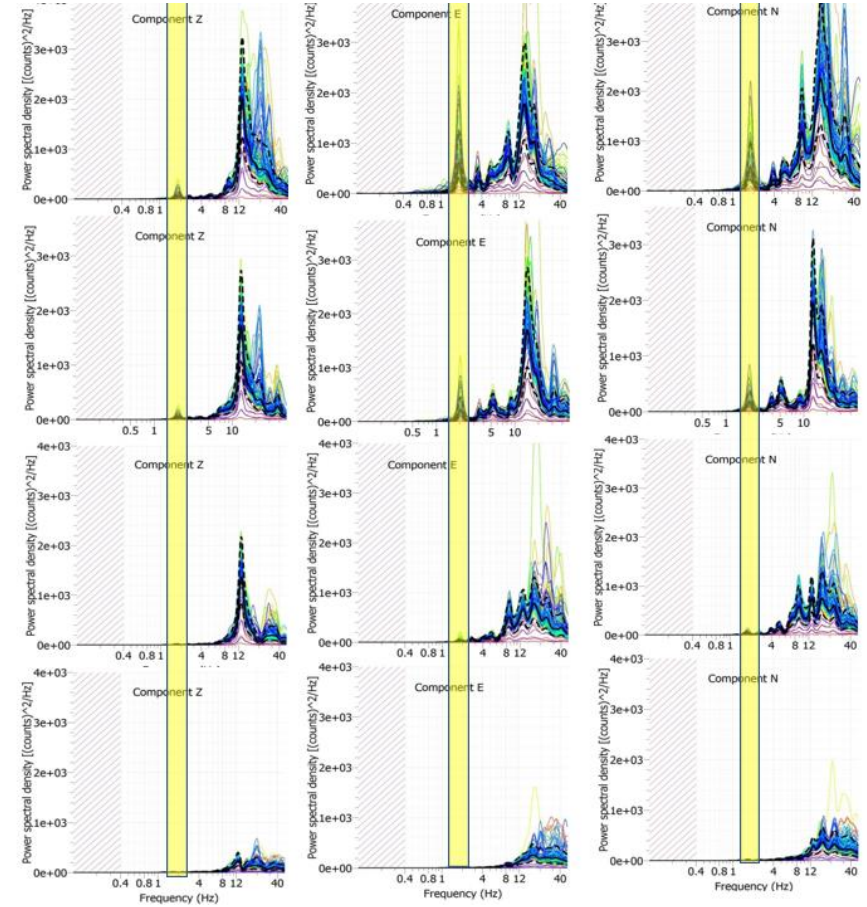
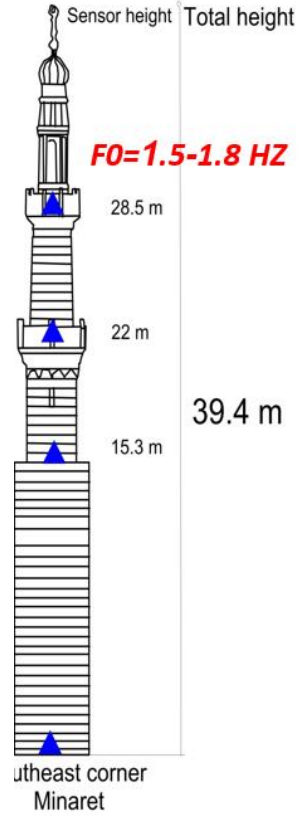
African Seismological Center AFSC (IUGG)

- Data Center Hosting
- Computational Power
- Data Storage
- Software Support





PSD St.1

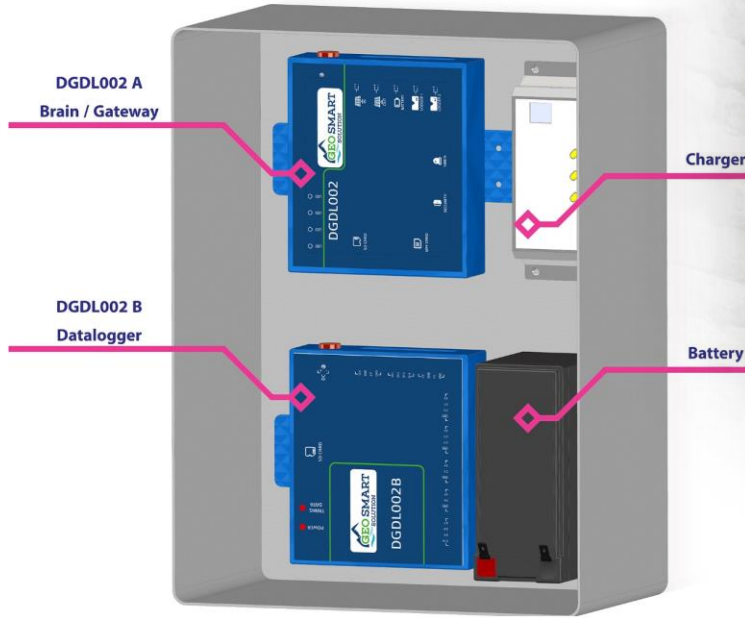




Low cost sensors



التركيب في الموقع



Security



Door Lock



Tamper Detection



GPS Location



Siren Alarm

خصائص النظام



مقاوم للطقس الخارجي



عرض لحظي
ومستمر للبيانات



نسخ احتياطي داخلي
مزدوج للبيانات



تحديث النظام عن بعد



نظام استعادة البيانات
بعد انقطاع الاتصال



Door
Lock



Tamper
Detection



GPS
Location



Siren
Alarm

أنظمة حماية وامان متعددة ومتطورة



لوحة تحكم لضبط الإعدادات
في الموقع بدون اتصال



تنبيهات قابلة
للتخصيص



Cellular

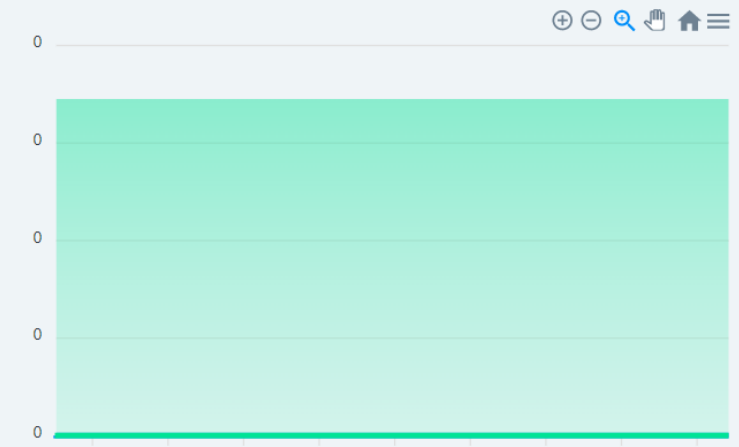
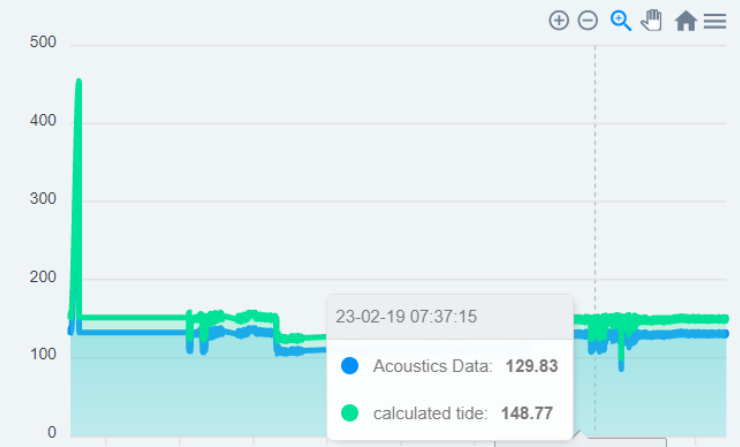
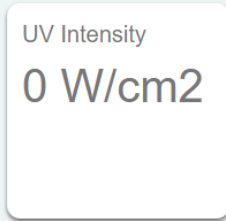
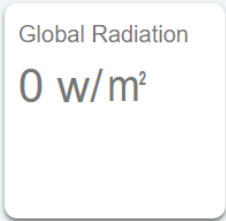
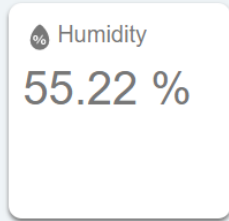
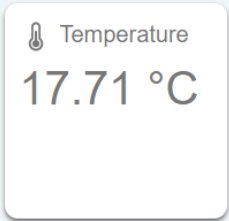
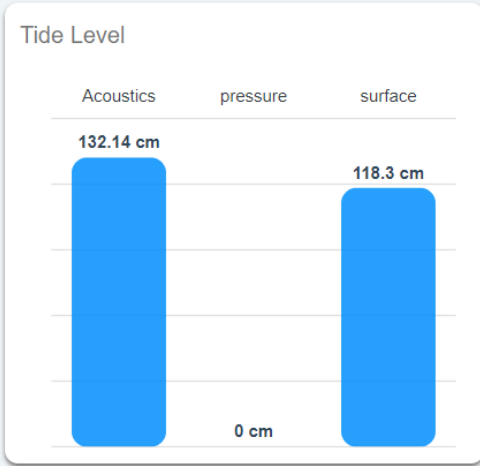
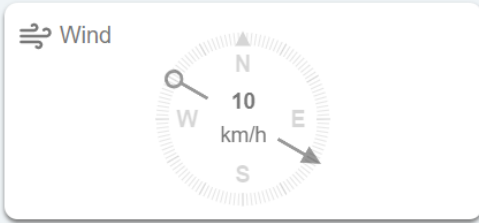
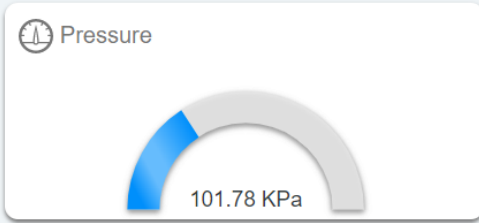


Ethernet



WiFi

دعم متنوع لشبكات الاتصال

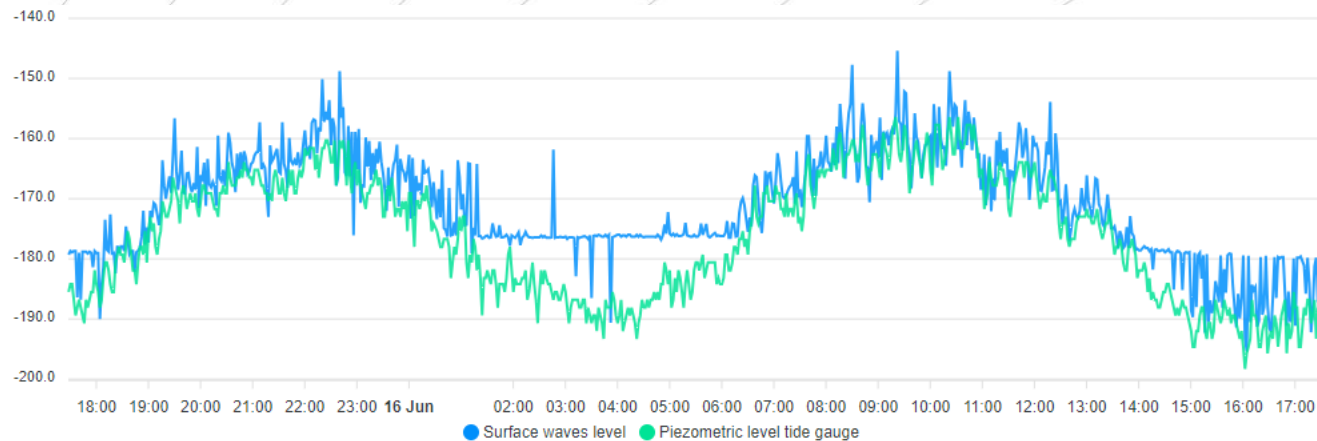
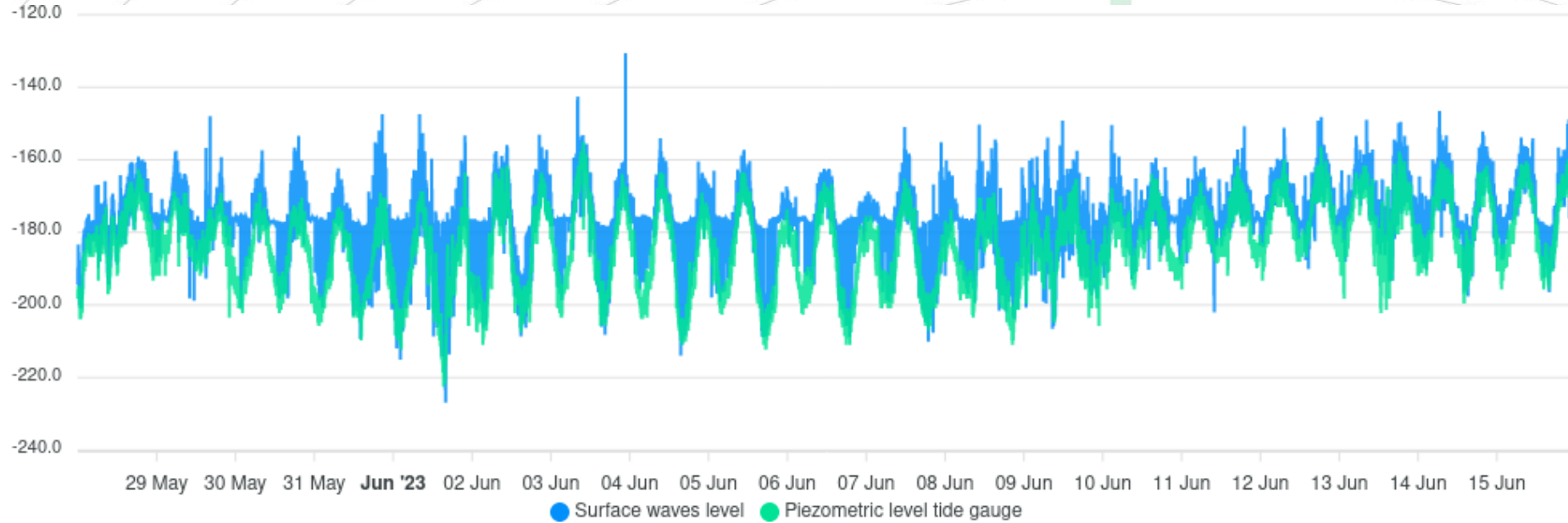




يمكن التحكم في معدل التغيرات
حسب الرغبة

Plotting Live Data in Real-Time

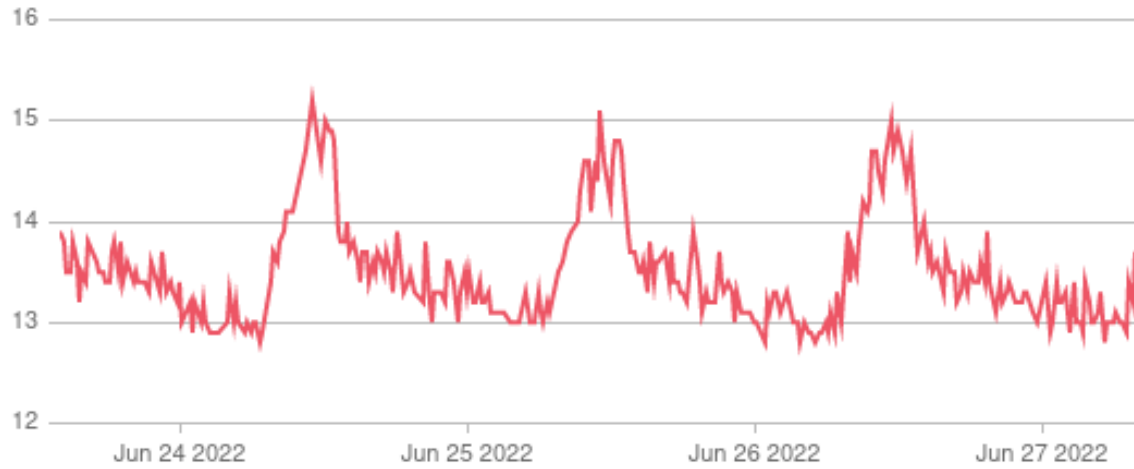
Figures





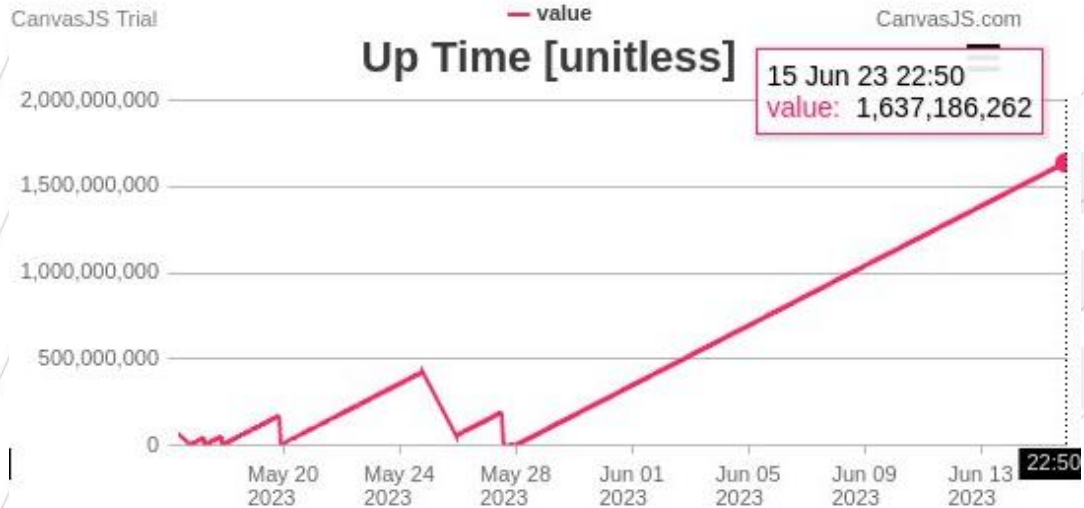
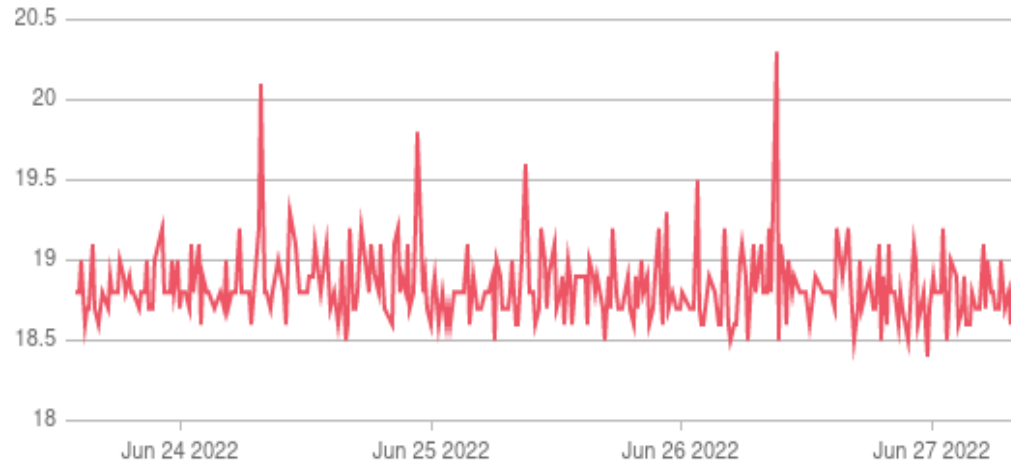
State of Health "ECHOAQ100"

solarvolt [unitless]

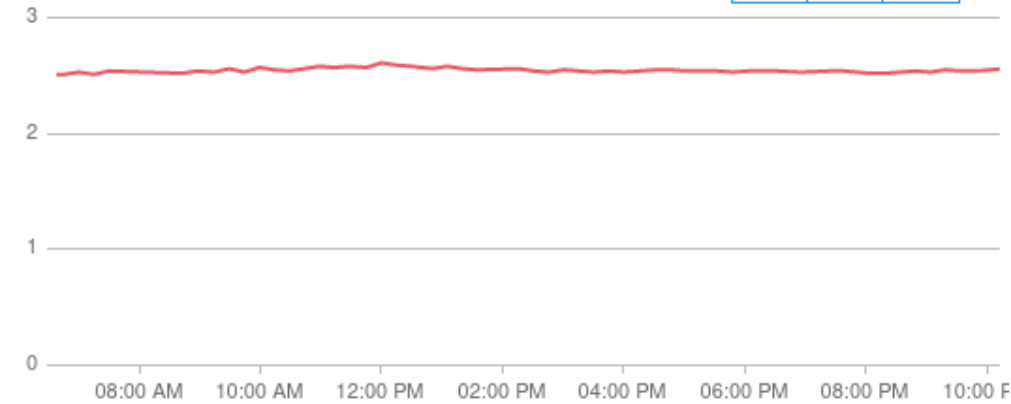


تقارير للحالة الفنية للجهاز واندازات فشل النظام

battery Volt [unitless]



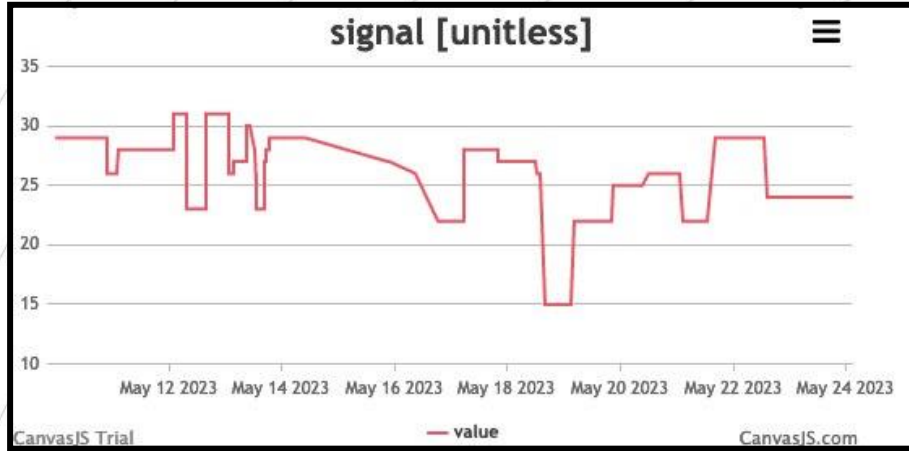
board Amp [unitless]



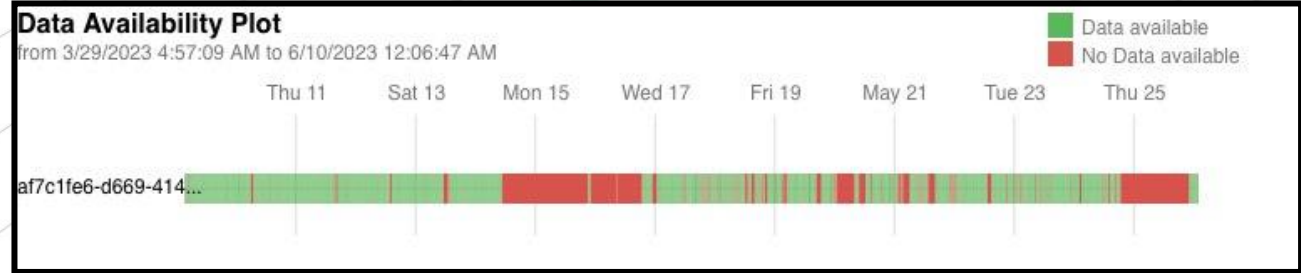


State of Health "ECHOAQ100"

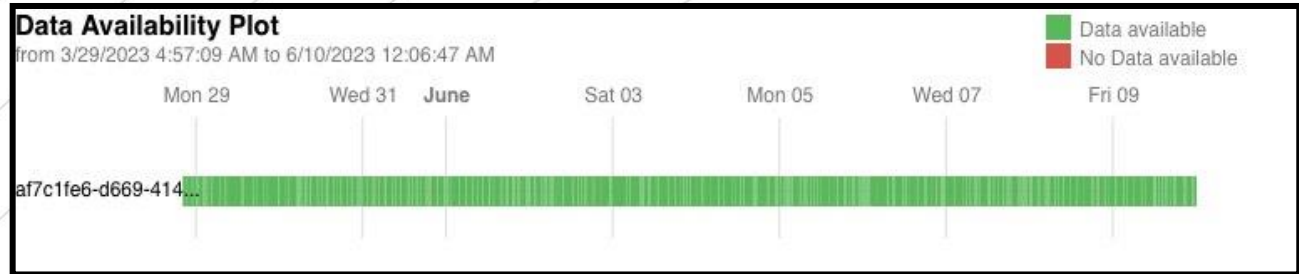
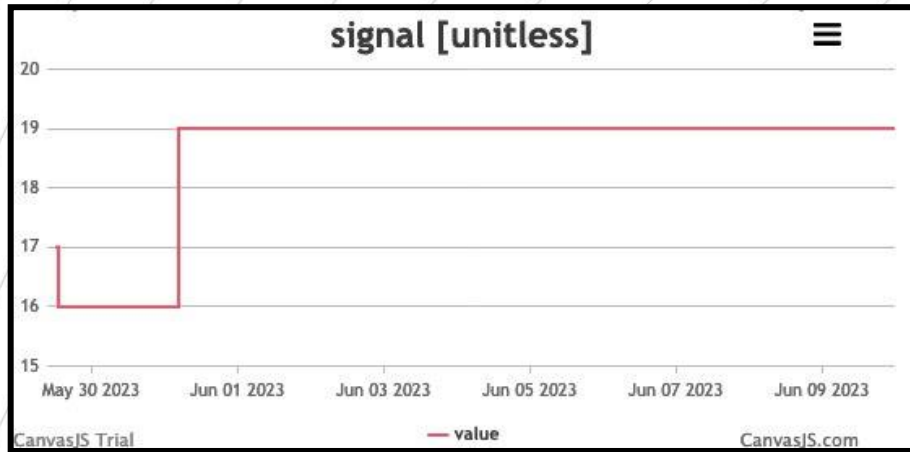
تقارير للحالة الفنية للجهاز وانذارات فشل النظام

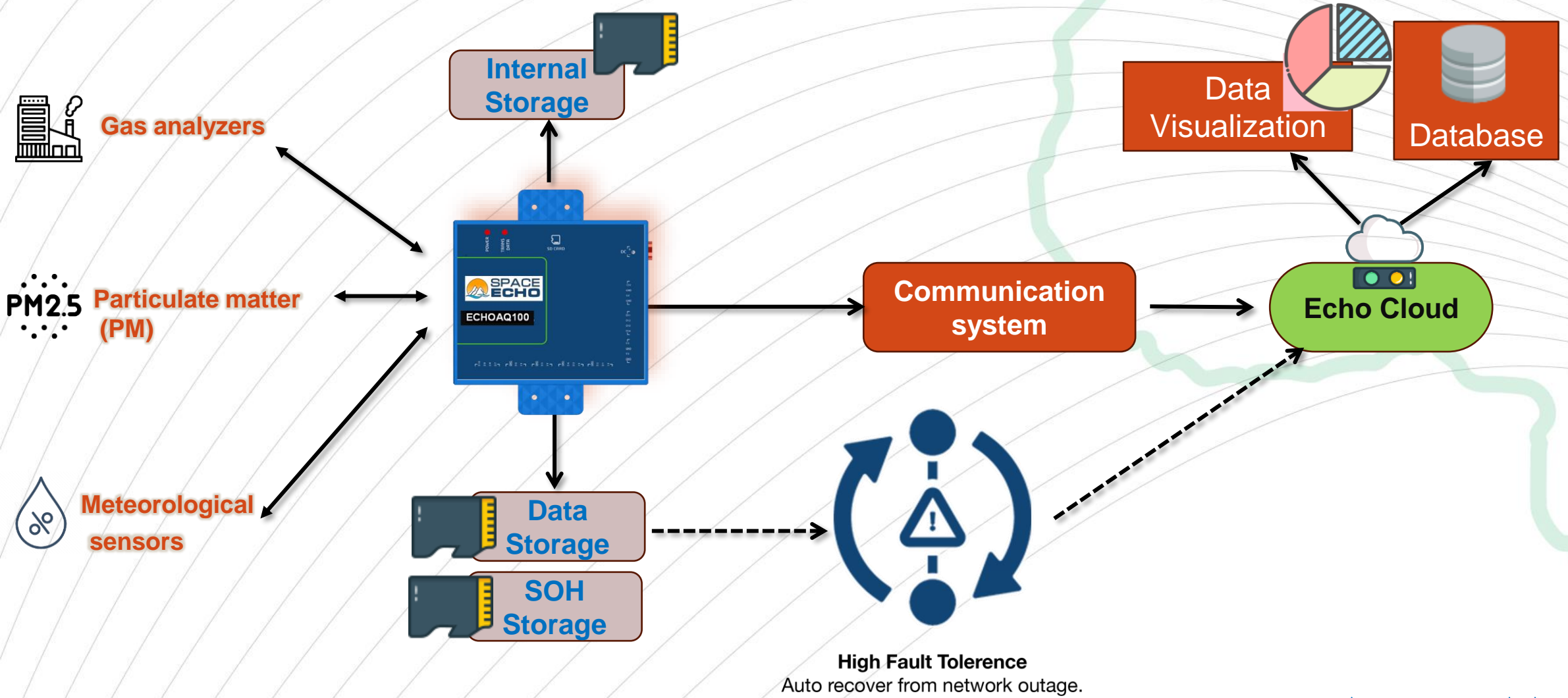


band 900



band 1800





مخطط عمل النظام



Air Quality Sensors Comparison

Parameter	Range					
	All-in-One WQX12		Electronics Sensors		Chemical Sensors	
O ₃ (Ozone)	0 - 5	ppm	0 - 20	ppm	0 - 20	ppm
SO ₂ (Sulfur Dioxide)	0 - 5	ppm	0 - 20	ppm	0 - 100	ppm
NO ₂ (Nitrogen Dioxide)	0 - 5	ppm	0 - 20	ppm	0 - 30	ppm
H ₂ S (Hydrogen Sulfide)	N/A		0 - 50	ppm	0 - 200	ppm
CO (Carbon Monoxide)	0 - 10	ppm	0 - 500	ppm	0 - 10000	ppm
CO ₂ (Carbon Dioxide)	0 - 5000	ppm	N/A		N/A	
O ₂ (Oxygen)	N/A		N/A		0 - 25	%
Cl ₂ (Chlorine)	N/A		N/A		0 - 20	ppm
NH ₃ (Ammonia)	N/A		N/A		0 - 1000	ppm
NO (Nitrogen Monoxide)	N/A		N/A		0 - 250	ppm
PM 2.5	0 - 1000	µg/m ³	0 - 31000	µg/m ³	N/A	
PM 10	0 - 1000	µg/m ³	0 - 31000	µg/m ³	N/A	



Weather Station:

Parameters	Range	Resolution	Accuracy	Remark
TEMP	-40-60°C	0.01°C	±0.3°C (25°C)	AIO
RH	0-100%RH	0.1%	±3%RH	AIO
Wind speed	0-60m/s	0.01m/s	±0.1m/s	AIO
Wind direction	0-360°	1°	±2°	AIO
Pressure	30-110Kpa	0.1Kpa	±0.25%	AIO
Rainfall	0-4mm/min	0.1mm	10%	AIO
Illumination	0-20W LUX	1lux	5%	AIO
Global radiation	0-2000W/m2	1W	5%	AIO
Noise	30-130dB	0.1dB	±1.5dB	AIO
Ultraviolet ray	0-15mW/cm2	0.1 mW/cm2	±10% FS (@365nm,60%RH 25°C)	individual



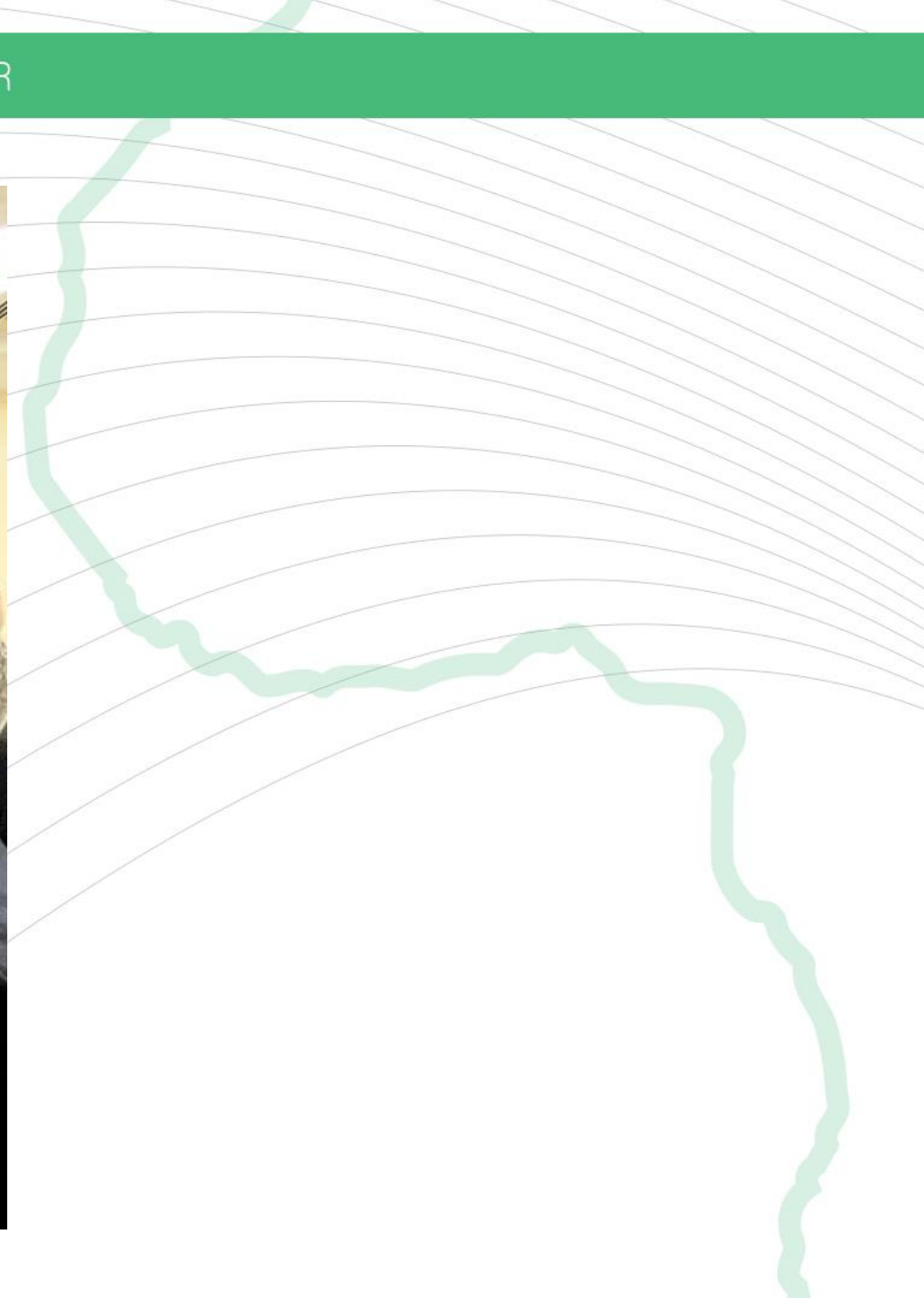


Mohamed I University in Oujda, Morocco

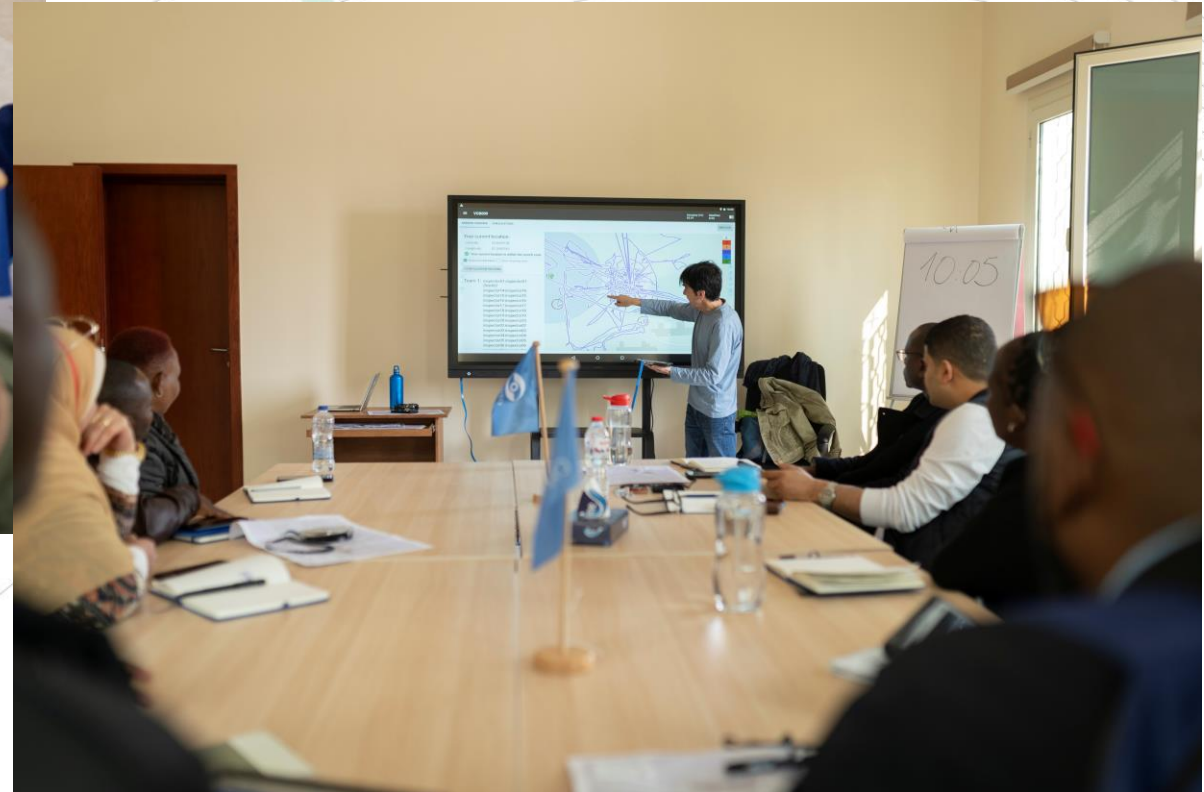




















ADMIR Work Program 2024

1. Capacity Building Program:

- 3-week course: "Natural Disaster Monitoring and Risk Reduction in Africa Capacity Building Program" (Q3 2024)
- 2-week course: "Preserving Our Legacy: Strategies for Safeguarding Cultural Heritage in the Face of Risks" (Q2 2024)

2. Protecting Cultural Heritage from Natural and Human-Induced Risks: NRIAG (Egypt), Mohamed I (Morocco), UNESCO, ICESCO.

- 1 PhD Student, Field measurements in Egypt (January 2024) and Morocco (Summer 2024), Joint Workshop (Summer 2024).

3. Sudan Seismic Network GRAS (Sudan) and NRIAG (Egypt).

- Business meeting (January 2024),
- Asset evaluation and field survey (Q1 -2024).
- Operating a temporary network of 5 stations (Q2-2024). Drafting a strategy for rebuilding the seismic network (Q3-2024).

4. Equatorial Guinea Seismic Network: CGS (Guinea), World Bank, NRIAG (Egypt), Mohamed I (Morocco).

- TBD activities in 2024: Seismic station installation, Noise survey, Training, Site visits.

5. Volcanic Eruption Monitoring: Collaboration with GVO (DR Congo), NRIAG (Egypt).

- Installation of 4 infrasound stations, 2 seismic stations, and 3 GPS stations.
- Training on Geophysical Surveys and Optimizing the seismic network.

6. Nigerian Seismic Building Code: NASDRA (Nigeria), NRIAG (Egypt).

- TBD activities in 2024: Micro zonation studies, Seismic site effect, Drafting the guidelines.

7. African Seismological Center: African Seismological Commission

- Installation of IT infrastructure.
- Software operation.
- Receiving data from Regional stations.

8. Joint Working Group on Neo-Deterministic Seismic Hazard Assessment: African and Asian Seismological Commission (AfSC) and (ASC).

- TBD activities by the scientific council.
- Seismic site effect, and drafting

**برنامج بناء القدرات لرصد الكوارث الطبيعية
والحد من المخاطر في أفريقيا
١-١٩ أكتوبر ٢٠٢٣**

**Capacity Building Program for Natural Disaster
Monitoring and Risk Reduction in Africa
1-19 October 2023**





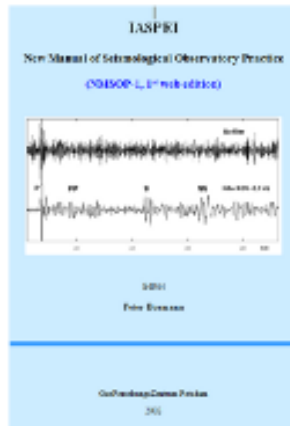
**Tech Resilient Africa
Conference and exhibition**

**Bridging Innovation in Disaster Mitigation
for a Resilient Future**

**ADMiR Headquarters, Cairo
November 2024**

الدليل العملي الجديد لعمليات الرصد الزلزالي

**New Manual of Seismological Observatory Practice (2002),
revised version, electronically published 2009**



Cite electronic version as:

Bormann, P. (Ed.). New Manual of Seismological
Observatory Practice (NMSOP-1), IASPEI, GFZ German
Research Centre for Geosciences, Potsdam, 2009.

See: [Rights](#), [Permissions](#), [Acknowledgments](#) and
[References to NMSOP-1](#)

Overview:

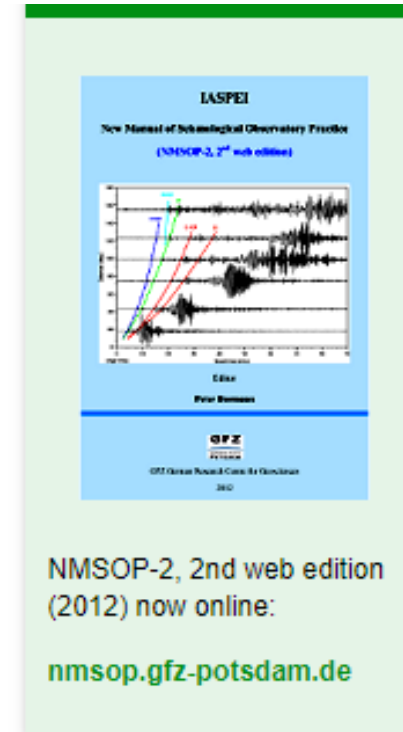
[Chapters](#) - [Datasheets](#) - [Exercises](#) - [Information Sheets](#) -
[Program Descriptions](#) - [Miscellaneous](#)

[Search fulltext and list articles.](#)

[Preface](#)

[Editorial remarks](#)

[Authors](#) (their contributions to the NMSOP and addresses)



NMSOP-2, 2nd web edition
(2012) now online:

nmsop.gfz-potsdam.de



المركز القومي للبحوث
National Centre For Research



ADMIR



African Scientific
Research and
Innovation Council



International
Platform on
Adaptation
Metrics

