



PanAfGeo

Pan-African Support
to Geological Sciences and
Technology Africa-EU Partnership

Appui panafricain aux géosciences
du partenariat Afrique-UE

Apoio pan-africano às geociências
da parceria África-UE

Call for Applications

for PanAfGeo-2 Training Session

Training “WP-G – Geoscientific Information Management”

Module WPG4a-EN: “GIS Interface and Spatial Data infrastructure – Database modelling and management – Interoperability standards – Data dissemination”

Advanced Level

1. MAIN CONTEXT OF PANAFGEO

“PanAfGeo” for “Pan-African Support to Geological Sciences and Technology Africa-EU Partnership”, is a project which supports the training of geoscientific staff from African Geological Surveys through the development of an innovative training programme that includes the acquisition and development of important professional skills that complement their qualifications and technical skills. The training programme is implemented by world-class geoscientific experts coming both from African and European Geological Surveys. PanAfGeo-2 is a continuation of the well-established PanAfGeo Project.

PanAfGeo is co-funded by the European Commission (Directorate-General for International Partnerships) and by a Consortium of eleven European Geological Surveys coordinated by the French Geological Survey (BRGM).

This programme allows trainees to acquire a state-of-the-art tool kit that contains methods and/or field work from eight geoscientific domains:

- WP-A – Geoscientific Mapping
- WP-B – Mineral Resources Assessment
- WP-C – Artisanal and Small-Scale Mining
- WP-D – New frontiers in Geosciences (Geoheritage and Geothermal energy)
- WP-E – Geohazards & Environmental Management of mine
- WP-F – Georesources Governance & OAGS/GSOs Institutional Strengthening
- **WP-G – Geoscientific Information Management**
- WP-H – Communication, Dissemination and Dialogue

The “PanAfGeo Charter for Trainees” provides the general quality framework for selection of trainees who will attend the training sessions carried out in the frame of the PanAfGeo Project. This Charter is awarded for the full duration of the PanAfGeo Project. Implementation of the Charter will be monitored and violation of any of its principles and commitments may lead to its withdrawal by the PanAfGeo Project Coordination.

One of the overall objectives and impacts of PanAfGeo is to improve the governance and sustainable use of African mineral resources and related infrastructures. The specific objective and outcome is to strengthen the knowledge and skills in Africa’s mining sector and specifically of African Geological Surveys, to make them able to contribute – in their respective countries – with their expertise and data to informed decision-making and good governance as well as sustainable use of mineral resources and reinforcing the capacity of the Organisation of African Geological Surveys (OAGS).

2. CONTENT & METHODOLOGY OF THE “WP-G – GEOSCIENTIFIC INFORMATION MANAGEMENT” TRAINING

Geological data, including maps and mineral resources inventories are the essential basis for assessing the potential for mineral projects and granting exploration and mining licenses. Thus, comprehensive geological and mineral databases provide governments with informed decision-making options and the capacity to negotiate sustainable mineral development contracts with local and foreign investors. The information technology (IT) equipment and staff support the spatial data infrastructure, which enables each Geological Survey Organisations to fulfil its missions regarding the geoscientific information. These include (i) collect, (ii) store and manage, (iii) valorise, and (iv) ensure the availability of reliable georeferenced data to several target groups i.e. other government organisations, national and regional communities, planners, private sector, education and citizens.

As part of the PanAfGeo Project, “WP-G – Geoscientific Information Management” aims to improve and/or strengthen capabilities among the staff employed by the African Geological Survey Organisations (existing and recruited) in the field of geoscience information management and related information technologies at operational level, with adaptation to the local context and the sustainability potential.

“WP-G – Geoscientific Information Management” is coordinated by the Geological Survey of France (BRGM) in collaboration with the Geological Survey of Burkina (BUMIGEB). Along with a close technical and scientific assistance, the training support is provided by BRGM, the Geological Survey of Denmark and Greenland (GEUS), the Geological Survey of Slovenia (GeoZS) and the National Laboratory of Energy and Geology (LNEG) in Portugal.

This session is organised jointly by BRGM and the Geological Survey of Namibia (GSN).

- Number of attendants: max 18
- Duration: 10 days
- Trainers: 3 European trainers + 2 African co-trainers

The WP-G programme proposes several modules:

- GIS Interface and Spatial Data infrastructure – Database modelling and management – Interoperability standards – Data dissemination (Basic - English)
- **GIS Interface and Spatial Data infrastructure – Database modelling and management – Interoperability standards – Data dissemination (Advanced - English)**
- Database management, handling of spatial data and GIS interface (Portuguese and French)
- Data modelling – Interoperability standards – Data dissemination (Portuguese)
- Geological data management and multilayer data modelling using a dedicated geoscience software (French)

IMPORTANT NOTE: The field of “Geoscientific information management” being rather wide, WP-G training scheme proposes different modules instead of one general overview in order to offer an in-depth coverage of each of the themes. Each module aims at strengthening the operational skills of dedicated professionals, e.g. database managers, SDI architects, database developers, geoscientists, GIS specialists, 3D modelling geologists. Then, these independent modules are not meant to be applied for by the same trainee profiles.

WP-G4a: GIS Interface and Spatial Data infrastructure – Database modelling and management – Interoperability standards – Data dissemination:

a) Approach and training method

The course will present and describe the methods, approaches, tools, procedures and requirements for database, GIS, data modelling, data management, interoperability standards, and data publishing.

The course will apply an interactive mode of learning through lectures and practical exercises on computer using QGIS, QField, PostgreSQL, PostGIS, DbSchema, DBeaver, GeoServer, GeoNetwork.

The course is aimed at staff from the Geological Survey organisations, primarily from the Geo-Information Division. Candidates from the department of Geology, Hydrogeology, Georesources, Environment and Natural Hazards may apply if they can justify skills in digital geoscience such as GIS, databases and web-based technologies (also refer here after).

IMPORTANT NOTE: The present call for application is for a training program at advanced level.

b) Course content

Topic 1	Introduction
Topic 1.1: Introduction	<ul style="list-style-type: none"> Introduction to Module WP-G4a Overview of content of Module WP-G4a
Topic 1.2: Data	<ul style="list-style-type: none"> The different types of geological data How they can be used in data modelling Managing data in GIS software
Topic 1.3: Software	<ul style="list-style-type: none"> Overview of software to be used in the course (QGIS, QField, PostgreSQL, PostGIS, DbSchema DBeaver, GeoServer, GeoNetwork, etc.)
Topic 2	QGIS Advanced
Topic 2.1: QGIS Overview	<ul style="list-style-type: none"> QGIS - introduction, software
Topic 2.2: QGIS Lectures + hands-on exercises	<ul style="list-style-type: none"> Automating & Scaling GIS Workflows (Processing Toolbox, Batch Processing, Graphical Modeller)
Topic 3	QGIS Advanced
Topic 3.1: QGIS Lectures + hands-on exercises	<ul style="list-style-type: none"> Automating & Scaling GIS Workflows (Best Practices for Scaling Workflows and Data, Management) Advanced Vizualisation
Topic 4	QGIS Advanced /QField
Topic 4.1: QGIS Lectures + hands-on exercises	<ul style="list-style-type: none"> Advanced Visualisation (QGIS Expressions, Plugins, Customized Topics)
Topic 4.3: QField	<ul style="list-style-type: none"> QField - mobile app for QGIS, manage your data on a go
Topic 5	Database Modelling
Topic 5.1: Data	<ul style="list-style-type: none"> Data standards (rules, types, formats, collection, integration) Data modelling (from concept to database)
Topic 5.2: Standards	<ul style="list-style-type: none"> Standard for interchanging data (GML, XML, UML, etc.) Standards applied to geoscientific data context <p>These topics will be illustrated through exercises using DbSchema</p>
Topic 5.3: Mapping	<ul style="list-style-type: none"> Mapping of file-based and database-based data into common models using thematic dedicated GML models (GeoSciML, EarthResourceML, etc.) <p>These topics will be illustrated through exercises using DBeaver, PostgreSQL, QField, GeoServer and other software.</p>
Topic 5	Web services
Topic 5.1: Web services	<ul style="list-style-type: none"> Introduction to web services (WMS, WFS, WCS) Introduction to OGC Map Layers Generating web services (publishing) <p>These topics will be illustrated through exercises using GeoServer and QGIS software.</p>

Topic 5.2: GIS applications and map viewers	<ul style="list-style-type: none"> Integration of web services in GIS applications <p>These topics will be illustrated through exercises using OpenLayers and QGIS software. Examples: Boreholes, GSML Lite, etc.</p>
Topic 6	Metadata
Topic 6.1: Overview	<ul style="list-style-type: none"> Introduction Standards used (ISO, INSPIRE, etc.)
Topic 6.2: Editing/Publishing	<ul style="list-style-type: none"> Editing metadata and catalogues using standard methodologies and tools Publishing metadata and catalogues using standard methodologies and tools <p>These topics will be illustrated through exercises using GeoNetwork software.</p>
Topic 7	Summary and practice
Topic 7.1: Summary	Summary and recap of all concepts, according to participants needs
Topic 7.2: Practice	<p>One days of practice on datasets provided by the trainers and, if possible, using case studies in African context**.</p> <p>Participants will work independently to practice and apply most of the concepts shared over the previous days.</p> <p>** supervised by African national/regional experts/trainers</p>

*. The course content may change as it will include lectures by co-trainers of the Geological Survey of Namibia.

c) Exercises

Each topic will be followed by hands-on exercises. The European trainers will propose prepared data sets to illustrate the concepts of building SDI. Should it be possible, several contents may also be prepared in collaboration with the African co-trainers using case studies in the African context (e.g. Topic 2.2., Topic 3.1., Topic 4.1. and Topic 7.2.).

In addition, the trainees are strongly encouraged to bring their own data sets. Before the training session starts, they can contact the co-leaders to inquire about the acceptable contents and formats.

d) Computer equipment

The training room will be equipped with adapted computer hardware (Windows 10) and selected software. Only Open Source software is proposed to implement the hands-on training sessions of WP-G4a-EN:

- | | |
|---------------|---------------|
| • LibreOffice | • DBeaver |
| • PostgreSQL | • Notepad ++ |
| • PostGIS | • Web browser |
| • QGIS | • GeoNetwork |
| • QField | • GeoServer |
| • PDF reader | • OpenLayers |

e) Return-to-work plan

During the session, each trainee will have to prepare and present a Return-to-Work Plan. It is to design a short-term application of the newly acquired knowledge through a project of interest for the Geological Survey and to be possibly implemented over a period of 6 months to 1 year after the training (e.g. reorganising the existing data sets into newly created databases and SDIs, multi-criteria data

processing applied to a geoscientific research project, training and raising the awareness internally and in connection with the Earth Sciences department at university, etc.).

f) Languages, locations and dates

WP-G includes several modules to be delivered in three languages. The last ones are planned as follows:

- WPG4a-EN: early October, 2023 – Windhoek, Namibia (*in English*)
- WPG5-PT: Quarter 1 2024 – Location to be confirmed (*in Portuguese*)
- WPG6-FR: Quarter 2 2024 – Location to be confirmed (*in French*)

It is recommended that the applicants consider their language/country preferences when choosing to which of the training sessions they apply for.

3. MAIN EXPECTED LEARNING OUTCOMES OF THE COURSE

The overall objective is to train the participants through theory and practice on GIS tools and interface, spatial data infrastructure, data modelling, as well as interoperability standards and data dissemination.

By the end of the course, the participants will have a basic level of knowledge on:

- Understanding the advanced principles and workflows of GIS tools and spatial data infrastructure,
- Modelling of databases to store relational and spatial data,
- Data modelling: main concepts and practice in data standards, data modelling, standards for interchanging data (Shapefile, GeoPackage, GML, XML, UML, etc.),
- Different types of interoperability concepts, standards and methodologies and their use in the field of geology,
- Metadata,
- Visualisation of data in GIS applications,
- Use standard web services for publishing public spatial data on Internet.
- Using QField as mobile application solution

4. TIME SCHEDULE

Date of training session	From 2 October 2023 to 13 October 2022
Location	Windhoek, Namibia
Application deadline	17 July 2023 at 17h00 GMT

5. WHO CAN APPLY?

The PanAfGeo “WP-G – Geoscientific Information Management” training session is open to all persons who are eligible according to the conditions of the “**PanAfGeo Charter for Trainee**”.

Moreover, in order to be able to follow the proposed training in WPG4a-EN “GIS Interface and Spatial Data infrastructure – Database modelling and management – Interoperability standards – Data dissemination” and fully benefit from the new knowledge and skills delivered over the ten day-course, the applicants **must justify of the required education and experience level** as follows:

- Knowledge of, and skills in, working with GIS (ArcGIS, QGIS or other), databases (SQL or other) and web (HTML).
- Good practice of computer using Windows.
- Good practice of Excel software will be appreciated.
- Basic knowledge on geology (recommended).

6. FUNDING OF THE TRAINING

The PanAfGeo “WP-G – Geoscientific Information Management” training session is supported through funds of the European Commission.

The following expenses will be covered for each trainee:

- Travel costs: flight and ground travel in Africa, according to the programme of the training
- Entrance visa fee against a receipt (*original receipt with the trainee’s name*)
- Accommodation, breakfast, catering and joint meals during the training session
- A daily training allowance of 30 EUR

7. APPLICATION AND SELECTION PROCEDURE

In order to be considered, applicants for the PanAfGeo Training Session entitled “WP-G – Geoscientific information Management” must complete the documents listed hereafter:

- 1 - Application Form for a PanAfGeo Training,
- 2 - Letter of Motivation,
- 3 - Letter of Commitment signed by your employer.

After filling out these documents, please register here: <https://panafgeo.eurogeosurveys.org>
and upload them **in form of 3 separate files (PDF format only - label of all application files must include the applicant’s first name in latin letters)**

before the **Application Deadline: 17 July 2023 at 17h00 GMT**

The selection process will take into account regional-national representation and a gender balance following the aim of strengthening skills of African Geological Surveys geoscientific staff.

All applicants will be informed about the result of the selection process approximatively on 25 July 2023. The Acceptation Letter will be sent out immediately in order to allow time for visa processing and delivery.

Questions regarding practical issues on the course should be forwarded to the training coordinators via email as follows: spela.kumelj@geo-zs.si, matija.krivic@geo-zs.si, fsc@geus.dk, m.urvois@brgm.fr, soulzoundi@gmail.com

Information about the PanAfGeo Programme can be found via the internet address:
<http://panafgeo.eurogeosurveys.org>

Questions regarding PanAfGeo should be forwarded to EuroGeoSurveys via the email address:
info@eurogeosurveys.org

Or to the Organisation of African Geological Surveys (OAGS) via the email address:
oags@geoscience.org.za

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