PanAfGeo

Geoscientific Knowledge & Skills in African Geological Surveys

The Geological Surveys of Europe

Call for Applications

for a PanAfGeo Training

« WP7 – Geoscientific information Management »

WP7-A Database management, handling of spatial data and GIS interface

20 November - 1st December 2017 – Accra, Ghana

in English

1. MAIN CONTEXT OF PANAFGEO

"PanAfGeo" for *"Pan-African Support to the EuroGeoSurveys-Organisation of African Geological Surveys (EGS-OAGS) 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 carried out by world-class geoscientific experts coming from African and European Geological Surveys.

PanAfGeo is co-funded by the European Commission (Directorate-General of Development and International Cooperation) and by a Consortium of 12 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:

- WP1 – Geoscientific Mapping
- WP2 – Mineral Resources Assessment
- WP3 – Artisanal and Small-Scale Mining
- WP4 – Environmental Management of Mines
- WP5 – Geohazards
- WP6 – Geoheritage
- WP7 – Geoscientific Information Management
- WP8 – Communication and Promotion

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.

The overall objective and impact 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 *"WP7 – 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, "WP7 – 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.

"WP7 – Geoscientific Information Management" is coordinated by the Geological Survey of France (BRGM) in collaboration with the Geological Survey of Burkina Faso (BUMIGEB) and the Geological Survey of Djibouti. Along with a close technical and scientific assistance, the training support is provided by BRGM, the Geological Survey of Denmark and Greenland (GEUS) and the Geological Survey of Slovenia (GeoZS).

- Number of attendants: max 20
- Duration: 10 days
- Trainers: 2 European trainers + 2 African co-trainers

The WP7 programme proposes three (3) independent modules:

- **WP7-A: Database management, handling of spatial data and GIS interface;**
- WP7-B: Spatial data infrastructure - Data modelling - Interoperability standards - Data dissemination;
- WP7-C: Multilayer 3D geological modelling using dedicated geoscience software.

IMPORTANT NOTE: The field of "Geoscientific information management" being rather wide, WP7 training scheme proposes three different modules instead of one general overview in order to offer an in-depth coverage of each of the three 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 three modules are meant to be applied for by the same trainee profiles.

WP7-A: Database management, handling of spatial data and GIS interface:

a) Approach and training method

The course will present and describe how to create and manage a relational database and how to efficiently store spatial data in a PostgreSQL / PostGIS database. It will be demonstrated how to connect to the database from QGIS and how to make the data available on web maps through Web Map Services (WMS), Web Feature Services (WFS), and Web Coverage Services (WCS).

The course is aimed at staff from the Geological Survey Organisations including the department of Geology, Hydrogeology, Georesources, Environment and Natural Hazards.

The course will apply an interactive mode of learning through lectures and practical exercises using PostgreSQL, PostGIS, Gaia, QGIS, Tomcat and GeoServer.

b) Course content

Topic 1	***Introduction to PostgreSQL, PostGIS and QGIS***
Topic 1.1: Introduction	• Discuss the scope of the course • Overview and general architecture • Install PostgreSQL with PostGIS • Install QGIS, GDAL and GeoServer
Topic 2	***Basic usage of PostgreSQL, PostGIS and QGIS***

Topic 2.1: Administration	• Basic database administration including:
	  ○ Backup
	  ○ Restore
	  ○ User management and object privileges
	• Import sample GIS data using GDAL

Topic 2.2: GIS	• Storing GIS data in PostGIS • Importing and exporting GIS data
Topic 2.3: Database design	• Development of relational database systems • Distribution/Logical grouping of geological data • Constraints • Code lists • Indexes
Topic 3	***Developing databases and using data from GIS***
Topic 3.1: GIS data	• Storing GIS data in databases • Spatial indexes • Managing projections • Spatial queries
Topic 3.2: Using GIS to view and enter spatial data	• Accessing GIS data via QGIS • Spatial data types • Creating new spatial data sets • Editing spatial data
Topic 4	***Data management***

Topic 4.1: Import-export of data	• Importing data
	  ○ From text files
	  ○ Other databases
	  ○ Web feature services
	• Exporting data
	  ○ Text files
	  ○ Spread sheets

Topic 4.2: Publishing of GIS data	• Publishing data on intranet / internet
	  ○ Web map services and web feature services
	  ○ Making data available on web portals

Topic 5	***Summary and practice***
Topic 5.1: Summary	Summary and refresh of all concepts, according to participants needs
Topic 5.2: Practice	Two days of practice on datasets provided by the trainers and, if possible, using case studies in African context. Participants will work independently to practice and apply most of the concepts shared over the previous days.

c) Exercises

Each topic will be followed by hands-on exercises. The European trainers will propose prepared data model to illustrate the concepts and to be used for building a database. If possible, several data sets may also be prepared in collaboration with the African co-trainers using case studies in the African context.

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 be used to implement the hands-on training sessions of WP7-A:

- LibreOffice
- PostgreSQL
- PostGIS
- PGAdmin
- QGIS
- Tomcat
- GeoServer
- GDAL

d) Languages, locations and dates

WP7 includes three independent modules. Each module will be delivered three times: two in English and one in French. Depending on the number of Portuguese speaking applicants, module WP7-A may be taught in Portuguese in 2019.

The first session of each module is planned as follows:

- WP7-B: mid-October, 2017 – Dar Es Salaam, Tanzania *(in English)*
- WP7-A: mid-November, 2017 – Accra, Ghana *(in English)*
- WP7-C: mid-January 2018 – Dakar, Senegal *(in French)*

Thereafter, it is proposed to hold the six (6) remaining sessions in 2018-2019 in Burkina Faso, Nigeria, Egypt, Cameroon, Kenya, Ethiopia, Zambia, Namibia, Botswana and Mozambique. These, however, have not been confirmed to date.

It is recommended that the applicants consider their language/country preferences when choosing to which of the nine (9) 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 database management, handling of spatial data and GIS interface.

By the end of the course, the participants will be able to:

- Understand the key terms and methods for building, tuning and administrating databases to store relational and spatial data;
- Make data models;
- Build queries and optimize them with data indexing;
- Manage users and object privileges;
- Import and export data;
- Hand coordinates – projections, datum and coordinates;
- Connect to and update spatial data from GIS;
- Make spatial data available on web maps through web map services and web feature services

4. TIME SCHEDULE

Date of training session	From 20 November to 1st December 2017
Location	Accra, Ghana
Application deadline	31 July 2017

5. WHO CAN APPLY?

The PanAfGeo *"WP7 – 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 "WP7-B Spatial data infrastructure - Data modelling - 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:

- Basic knowledge on collecting and storing data,
- Basic knowledge on databases and spatial data,
- Good knowledge of computer work using Windows,
- Basic GIS knowledge (ArcGIS, QGIS or other).

6. FUNDING OF THE TRAINING

The PanAfGeo *"WP7 – 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;
- 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 *"WP7 – Geoscientific information Management"* must complete the documents listed hereafter:

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

Please complete these documents and send them to WP7 Leader Marc URVOIS (BRGM) m.urvois@brgm.fr, WP7 Co-Leader Abdoulaye OUEDRAOGO (BUMIGEB) abdouloued@gmail.com and WP7-A Training Module Leader Martin HANSEN (Geological Survey of Denmark and Greenland, GEUS) mh@geus.dk.

before the **Application Deadline: 31 July 2017**.

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 1st October 2017. The Invitation Letter will be sent out immediately in order to allow time for visa processing and delivery.

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

Questions regarding PanAfGeo should be addressed 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

Questions regarding practical issues on the course should be addressed to the training coordinators via email as follows: m.urvois@brgm.fr, abdouloued@gmail.com, mh@geus.dk.

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