



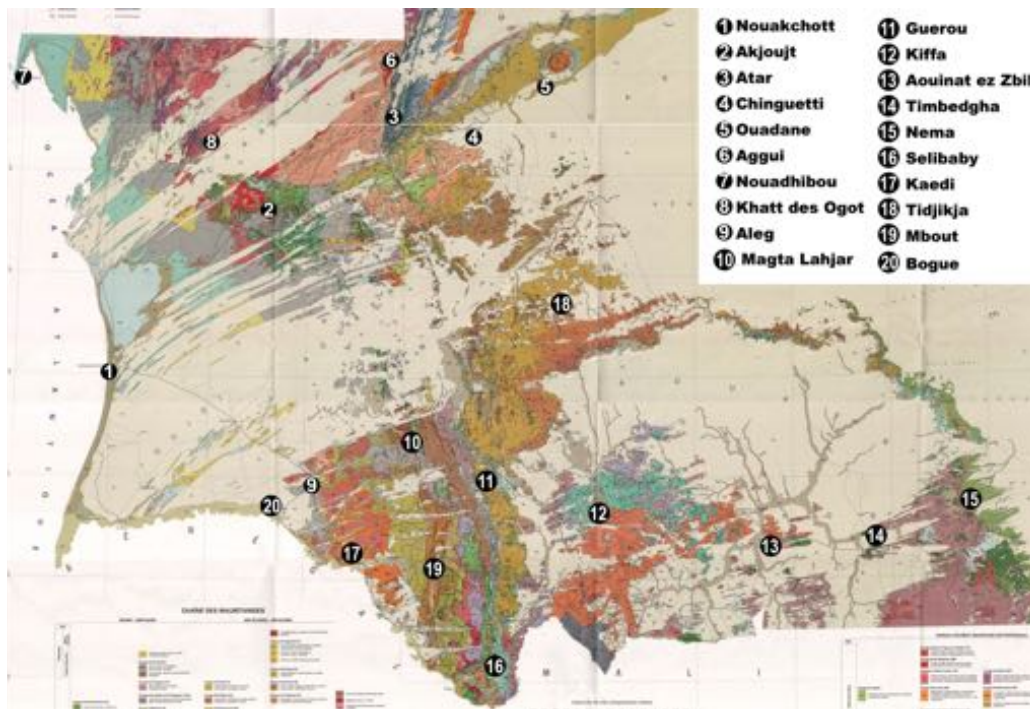
## **Update on NARG Activities in the MSGBC region (Mauritania, Senegal and The Gambia)**

### **Ongoing Research Activities:**

- **The Gambia:** Mr Max Casson has started his PhD with NARG (May 2017) on the Tectonostratigraphic Evolution of the margin. We have access to a 3D survey from TGS in The Gambia, and he will commence interpretation on this, plus building the regional database. Other work includes reviewing the DSDP wells and sampling for improved biostratigraphic control. We also are planning fieldwork with Max to Cap Verde in the next three months to log and sample the Jurassic / Cretaceous sections there. We expect in 2017 to access more regional 2D seismic in Senegal and Mauritania to extend the work north. Other PhDs will be started to support this.
- We have four Petroleum MSc students also working The Gambia data, looking at detailed seismic interpretation of the shelf and basin section, near surface analysis and building a petroleum system model. These could act as pilot studies for future more advanced

### **Mauritania: Exhumation and sediment provenance study in Mauritania**

- In Mauritania, the field sampling of the Mauritanide sections for FT analysis has been completed. We now have good links with the Mauritania authorities and expect to try to build on this with access to subsurface data. The field sampling was organized and undertaken by Prof Giovanni Bertotti and Mohammed Gouiza.
- Nearly 100kg of rocks (22 samples) were collected , and these are now in TuDelft being processed. These represent the first database of this kind from the Mauritanides.
- First data is expected in August 2017. Complete data set ready in January-February 2018. Interpretation and modeling to follow.



Location of sampling already undertaken in Mauritania



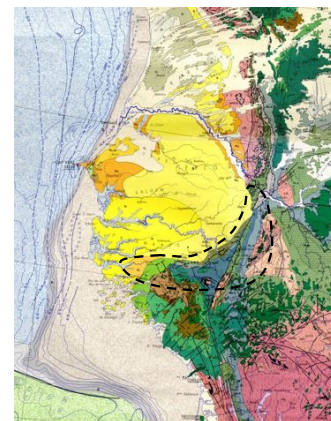
Nearly 100kg of rocks (22 samples) representing the first data base of this kind  
 First data expected in August 2017. Complete data set ready in January-February 2018. Interpretation and modelling following

TU Delft

The strategy:  
 20-30 samples along the basement rocks E and S of the Senegal Basin  
 (ideally also from wells)

2 weeks mission inclusive of 1 week of contacts, discussions etc, and 7-10 days of field work

TU Delft



Details of the sampling undertaken and plans for continuation into Senegal.

**The next step:**

- We intend to extend the FT study and database to Senegal, and are already in talks re collaboration with UCAD (University of Dakar) and planning fieldwork in November.
- The sections in Senegal have a comparable overall tectonic setting

- There is currently little to no low-temperature exhumation data from this entire region.
- We will undertake fieldwork to take 20-30 samples along the basement rocks E and S of the Senegal Basin. Ideally we will also be able to sample wells onshore.
- 2 weeks mission inclusive of 1 week of contacts, discussions etc. and 7-10 days of field work

Further details will be provided in a dedicated update from Prof Bertotti shortly.

## New Research Activities

### Senegal:

#### Building links with Petrosen / Petrogaz and Universities (UCAD) in Senegal

- We hosted a visit of Petrogaz to Manchester in March 2017, where we showcased our research capabilities. This was attended by the Mr Ousmane NDIAYE Permanent Secretary of the Strategic Orientation Committee for the Oil & Gas (COS-PETROGAZ) and Mr Mamadou Fall KANE, Assistant to the Permanent Secretary, Professor Cheikh DIENG, Senegalese Ambassador to UK and the UK Ambassador to Senegal, H.E. George Hodgson.



*Petrogaz delegation visits Manchester University in March 2017.*

#### **NARG visit to Senegal June 26<sup>th</sup> to 30<sup>th</sup> 2017**

We have followed up the visit by Petrogaz to Manchester with our own visit to Dakar, led by Prof Jonathan Redfern and Dr Luc Bulot, to work towards establishing collaboration agreements with Petrosen and academic institutions in Senegal, and commence the NARG research projects. Below is a brief summary of activities:

- We held meetings with Petrosen, with the General Manager Dr Mamadou Faye and Mamoudou KA, their Data Centre Manager, in Petrosen's office. We discussed

establishing an MOU to formalize the links and discussed a range of possible research projects. Dr Faye was very supportive and suggested we should be able to undertake joint studies and access subsurface data. He agreed to seek approval to establish the agreement by the end of July.

- We had meeting with Mr Mamadou Fall KANE of Petrogaz, held at the Presidency, where we discussed their plans for the Petroleum Institute, that are progressing well, and our links with Petrosen and research ideas. The Petroleum Institute plans to offer a Petroleum Engineering Masters course starting in October, probably run by the IFP School, but opportunity for other teaching / training links welcomed and Manchester will pursue this opportunity. A workshop may be held soon with all interested parties.
- Petrogaz are very supportive of the NARG collaborative research and Mr Fall Kane said he would help to facilitate the collaboration with Petrosen. High level research is seen as a key component, both for the data it derives and the potential to create capacity and the future advanced Senegalese researchers / trainers etc.
- We also had a number of meetings with academics at the University of Dakar (UCAD) and held a research seminar in UCAD on Thursday 29<sup>th</sup> July, with 20 plus students and staff attending. They are keen to collaborate with Manchester and NARG and there is a lot of potential. Facilities in UCAD are limited, but they have some petroleum expertise (also through a linked Institut Geosciences de Dakar (IGDK). IGDK also offer a full range of undergraduate to masters courses, and the Earth Science Institut.
- We have also been in discussions with the UCAD Faculty Committee set up to promote collaboration and oil and gas research training. Links there are through Prof Serigne Faye in the Geology Dept,
- Finally we had a short reconnaissance field visit on Friday 30<sup>th</sup> June with Prof Mamadou Fall and colleagues, looking at some of the outcrops of the Cretaceous sections near to Dakar. We sampled for biostratigraphy and some reservoir samples, and obtained GPS locations etc for future studies.

Our links with UCAD are strong, with lots of interests from many of the Professors (such as Prof Mamadou Fall, Prof Papa Malick NGOM, and Prof El Hadji SOW) for some joint projects and to start collaborative research.

- We hope to sign a similar MOU with UCAD and start further collaboration.

#### **Establishing New Research Programmes:**

- Our plan is to commence with a series of linked PhD projects, some run by NARG in UK / TU Delft, and some in Senegal in UCAD, with some under joint supervision. **UCAD are in need of some financial support from operating companies in Senegal for PhD costs and access to better hardware and software.** The link with NARG and Manchester would ensure these funds would be directed and have a clear set of deliverables, plus support to fully utilize any software etc.

- The University of Manchester could also offer support with academic visits (both from Manchester and hosting academics from UCAD in Manchester), and also linking PhDs and offering some access to facilities in Manchester. Again funds to facilitate this would be welcome and sought from operating companies in Senegal
- This is a great opportunity to establish early links, and build some very important research, plus train up some bright Senegalese graduates.
- **MOU:** We have a draft of a Memorandum of Understanding (MOU) that could be used to formalise our collaboration between the North Africa Research Group (NARG) with Petrosen (Petrogaz) and with UCAD. The original in English, also translated into French (it may need some corrections). I hope we can get this agreed in the next month.

This would be the same document we have signed with ONHYM in Morocco, which has allowed us to have a very strong collaboration, that continues to this day (we have extended the MOU an number of times), and allowed ONHYM to provide us with subsurface data for research and facilitated collaboration with joint research projects, visits, workshops and also having some of their staff train on MSc courses at Manchester.

- **Timing:** Research collaboration for regional projects aims to start in Sept 2017 and we have the funding internally in NARG to start these (PhDs in UK and some support for linked PhDs in UCAD). We think these regional studies will prove to be very important for Senegal in years to come and the sooner we start them the sooner we get meaningful results.
- **Link to new Petroleum Institute in Dakar:** The University of Manchester would also be very supportive of any collaboration on training needs in Petroleum Geoscience / Engineering / Environment, related to the new Petroleum Institute and also capacity building in UCAD in geoscience and other related subjects (Environmental and Atmospheric Science, Petroleum Engineering etc.). We are happy to provide advice and support.

## Visit to Senegal June 2017



*Research Seminar at UCAD, given by Prof Jonathan Redfern and Dr Luc Bulot, attended by Professorial staff and students. Dr Bulot explains importance of robust biostratigraphy, using our work in Morocco as a case study. Many students undertaking masters and keen on further PhD or MSc research*



*Prof Mamadou Fall who kindly took us out for a day to undertake reconnaissance of the sections near Dakar. Example from Cretaceous sections at Cap de Naze. Dr Bulot sampling for biostratigraphy*

## Forward plan:

1. Follow up with Petrosen / Petrogaz and UCAD re formalizing relationship and establishing broad MOU
2. Signing ceremony in Dakar in late July?
3. Petroleum Institut workshop in July/August?
4. Firm up research titles and once agreed advertise PhDs, plus linked PhDs in Senegal (with support from operating companies to Senegal)
5. Visit to access subsurface data (wells and seismic data)
6. Initial results from Gambia MSc projects in Sept 2017
7. Fieldwork in Cap Verde Sept / October 2017
8. Commence new PhD research projects Sept – Jan 2017
9. 2 weeks fieldwork and sampling of Mauritanide sections in November
10. Attend MSGBC Conference in November – Dakar. Possible booth for NARG / Manchester?

## For further information contact:

**Prof Jonathan Redfern, Director of Research**

Tel: +44 (0)161 275 3773 Email: [jonathan.redfern@manchester.ac.uk](mailto:jonathan.redfern@manchester.ac.uk)

School of Earth and Environmental Sciences, The University of Manchester  
Williamson Building, Oxford Road, Manchester, UK, M13 9PL

## For Mauritania study:

**Prof Giovanni Bertotti**

Tel: +31 (0) 15 2786033 Email: [g.bertotti@tudelft.nl](mailto:g.bertotti@tudelft.nl)

## Web page:

<http://www.narg.org.uk>

## Sponsors:

