Program EOL Master Class
University of Ghana – ACCRA – Sept 2021 -

Sunday 3rd October 2021: The cocktail for the presentation of EOL Master Class was honoured by the presence and the support of Prof Kwabena Frimpong Boateng, former Minister of …

From Monday to Friday, the topics developed by the EOL Mlaster class were:

Epistemology and Science (Dr. D. Aslanian – Ifremer):

Your Brain is lying to you… and you are its accomplice!

We all have brains! Wonderful machine whose slow evolution allows us to think, exchange, understand, write, interpret, imagine. But can we always trust first appearances? What traps can we avoid when we are a scientist? You will learn that the most important thing is not to find a good answer but to find the right question and that more important than the solution itself is the way to answer the question…

Plate kinematic and geodynamic (Dr. D. Aslanian - Ifremer) :

Plate kinematic is the art of reconstruction of the dance of continent and micro-plates. But their reconstructions imply to consider the segmentation, structure and nature of the continental and oceanic crusts, the onshore and offshore sedimentary filling, the magmatism, as well as the previous published kinematic models. We will see here why the study of the African margins is essential to understand the break-up of the Gondwana super-continent.

Geophysical tools (Dr. P. Schnurle - Ifremer) :

Geophysical methods and observations are essential tools for understanding the geological history of the sub-marine part of the Earth. Here we will explore the tools for defining marine magnetic anomalies and the gravimetric signature of the Earth. A general approach is provided on seismic profile acquisition and processing as well as on Potential method for deciphering onshore aquifers.

- Wide angle methodology and conventional Multichannel seismic processing
- Passive seismic as non-invasive and environmentally friendly subsurface imaging technique.

Continental basin and passive margin evolution (Dr. D. Aslanian - Ifremer):

Holistic approach and passive margins: a typology and new paradigm.

Sedimentology (Dr. E.Leroux & Dr. R. Pellen from Ifremer – Dr. M. Rabineau from CNRS) :

The Sediments are the Storyteller of the past, present, and future Earth history. However, on a defined tectonic setting multiple internal to external factors control their deposition through time and space. Here we decipher their roles in the evolution of a passive margin, from tectonic-climatic to hydrologic processes and from coastal to deep marine areas. We also approach the different onshore and offshore technics to study the evolution of the couple erosion/sedimentation and tools for its modelling.

- Marine sedimentation and controlling factors
- Seismic and sequence stratigraphy
- Numerical stratigraphic modelling
- Sea level cycles and sedimentary record at different scales
- Overseas Experiences

The Geology of South Africa (Dr. B. Linol, Nelson Mandela Univ.)

*T*he South African geology comprises some of the Earth's earliest fragments of continental and oceanic crust. These different terranes were reworked during the amalgamation of the Rodinia and Gondwana supercontinent and during the formation of Africa. We will briefly

discuss the structure and age of the Precambrian basement: the Kalahari Shield (1 Ga), and the tectonic and climatic evolution recorded in the deposition and deformation of the overlying sedimentary sequences: the Cape and Karoo Supergroups that span more than 300 million years

The Use of passive seismic on a dam. Can we prevent the failure of the dam (as in Brazil) (Thulisile Kunjwa - Nelson Mandela Univ)

Example of a Onshore-Offshore study : **The Gamtoos Basin** (Dr. B. Linol + PhD M. Makuzeni, Nelson Mandela Univ.)

The Gamtoos rift basin along the South African margin is an excellent natural laboratory to study the dynamic of continental break-up and opening of the Indian and South Atlantic oceans. The stratigraphic sequences are well-exposed onshore but poorly dated, whereas offshore they are well-constrained by seismic reflection profiles and deep boreholes. In this presentation, we will make links between the records preserved on land and below the sea in an attempt to reconstruct the complex history of this rift basin.

The Geology of Ghana

• **The Neoproterozoic sedimentary basin of Ghana (**Dr Elikplim Abla Dzikunoo & Jennifer Agbotoamedo – Univ of Ghana)

This lecture explores the lithostratigraphy, internal architecture, evolution and potential mineralization of the Neoproterozoic sedimentary basin of Ghana. There will also be a discussion on its relationship with the sedimentary sequences of the Pan-African Dahomeyide belt and their role in the Paleogeographic reconstruction of the West African Craton in Rodinia

• **The coastal sedimentary basins of Ghana (**Joyce Duku – Univ of Ghana**)**

The coastal belt of Ghana is dotted with several sedimentary basins which evolution recorded the Pre-, syn, and post- opening of the Atlantic oceanic. This lecture will introduce students to the tectonics, structural, lithological and age of these basins

The Volta Basin : a integrated geophysical study (Abigail Enyonam Ayiku – Univ of Ghana**)**

An holistic approach: towards Palaeo-oceanography, Palaeo-climate and Palaeobiogeography reconstructionS (Dr. D. Aslanian - Ifremer)

• **Biogeographic mechanisms involved in the colonization of Madagascar by African vertebrates: Rifting, rafting and runways**

Madagascar's vertebrate fauna shows a complex biogeographic pattern that confounds generalisations developed from other islands. For 80 years popular opinion has held that most of Madagascar's terrestrial vertebrate fauna arrived via transoceanic dispersal (i.e. by rafting or swimming), chiefly from Africa. But there is also the alternative possibility of geodispersal via short-lived land bridges between Africa and Madagascar. We reviewed recent geological results collected in the Mozambique Channel, and compiled three palaeo-sedimentological maps using PLACA4D. Geological data indicate three short-lived land bridges between Africa and Madagascar at 66-60 Ma, 36-30 Ma, and 12-05 Ma.

Integrated Coastal Zone Management and Water Resources (Dr. M. Antona, CIRAD)

• ICZM Integrated Coastal Zone Management: COI Unesco Guide
• IWM (Integrated Water Resources Management): principles and implementation

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• Case Study in the White Volta Basin

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One day and half were devoted to practical studies :

- Interpretation of seimsic profiles (courtoisy of GNPC) in groups of 4-5 (led by French-South African team)
- Serious game on coastal management in groups of 4-5 (led by M. Antona, with the help of the French-South African team)

Two days were devoted to the fieldtrip (P.I. Daniel Kwayisi and Prince Amponsah):

- **The southern part of the Volta Basin**
- **Stratigraphy of the coastal aera along the Accra Margin**.