Research LAUNCHER Program

About You

First Name: David Last name: Anomneze

Company/University: Nnamdi Azikiwe University

Check which apply to you: ☒ Student ☐ Non Student ☐ Independent Researcher ☐ Professor ☐ Corporate Research ☐ Other

Primary phone: (+234) 7035836404 Secondary phone: (+234) 8050426797

Address: Department of Geological Sciences, Nnamdi Azikiwe University

City: Awka State: Anambra Zip Code: 234

Country: Nigeria

Email: davanomneze@gmail.com Fax: ( )

Short Bio: (250 words or less)

David Anomneze is a PhD student of Petroleum Geology. He completed a bachelor's degree in Geological Sciences with a Second Class Upper Division and a master's degree in Applied Geophysics, both at the Nnamdi Azikiwe University. During his undergraduate studies, he served as the president of the Nnamdi Azikiwe University NAPE/AAPG Student Chapter. During his master's degree studies, he served as the AAPG Africa Region Student Chapter Subcommittee Lead at the Nigerian Association of Petroleum Explorationists International Conferences in Lagos, Nigeria. He is a recipient of NAPE Grant-in-aid for best Bachelor's dissertation in 2010. Upon completion of his masters, he was engaged in a one year postgraduate internship in the Exploration Department of Shell Petroleum Development Company, Nigeria. He is a member of AAPG, NAPE and SEG. He has published and presented technical papers at AAPG, NAPE and SEG Conferences. His current research interest includes continuous fracture modeling, advance geo-cellular modeling, deeper prospecting, attributes analysis and reservoir optimization techniques.

Project Description

1. Name of project: Quantifying and Predicting Naturally Fractured Reservoirs Behaviour using Integrated Geocellular and Continuous Fracture Models in a Niger Delta Field, Nigeria

2. Brief synopsis/areas of geosciences or engineering (50-75 words)

Structural model is a geometric framework of the reservoir, providing the boundaries for the facies and petrophysical models. This forms a basis for the reservoir simulation grid which is crucial in reserves estimation. In order to create accurate fracture models, there is need to understand the fracture initiation, propagation, interaction and termination. Fractures initiate at points of brittle failure within the rock layer and propagate in directions determined by the local orientation of principal stress. The propagation of a fracture is constrained by the stress field near fracture tips. For two fractures of unequal areas subjected to the same driving stress, the larger joint will meet the propagation criterion first. For joints with equal areas in a spatially varying stress-field, the joint subjected to the greatest driving stress will propagate first. Interactions between nearby fractures influence fracture growth and termination, and consequently the fracture pattern. Interaction between close fractures forces their propagation paths to converge towards each other. This has a significant effect on the connectivity of the fracture pattern which in turn is expected to have a first-order impact on flow. All these fracture relationships will be evaluated and quantified for their possible implication on fracture connectivity, flow direction and concentrations. An added interest in this research will be to focus on fracture prediction around faults. All these, impact positively in reserves additions and reservoir optimization.

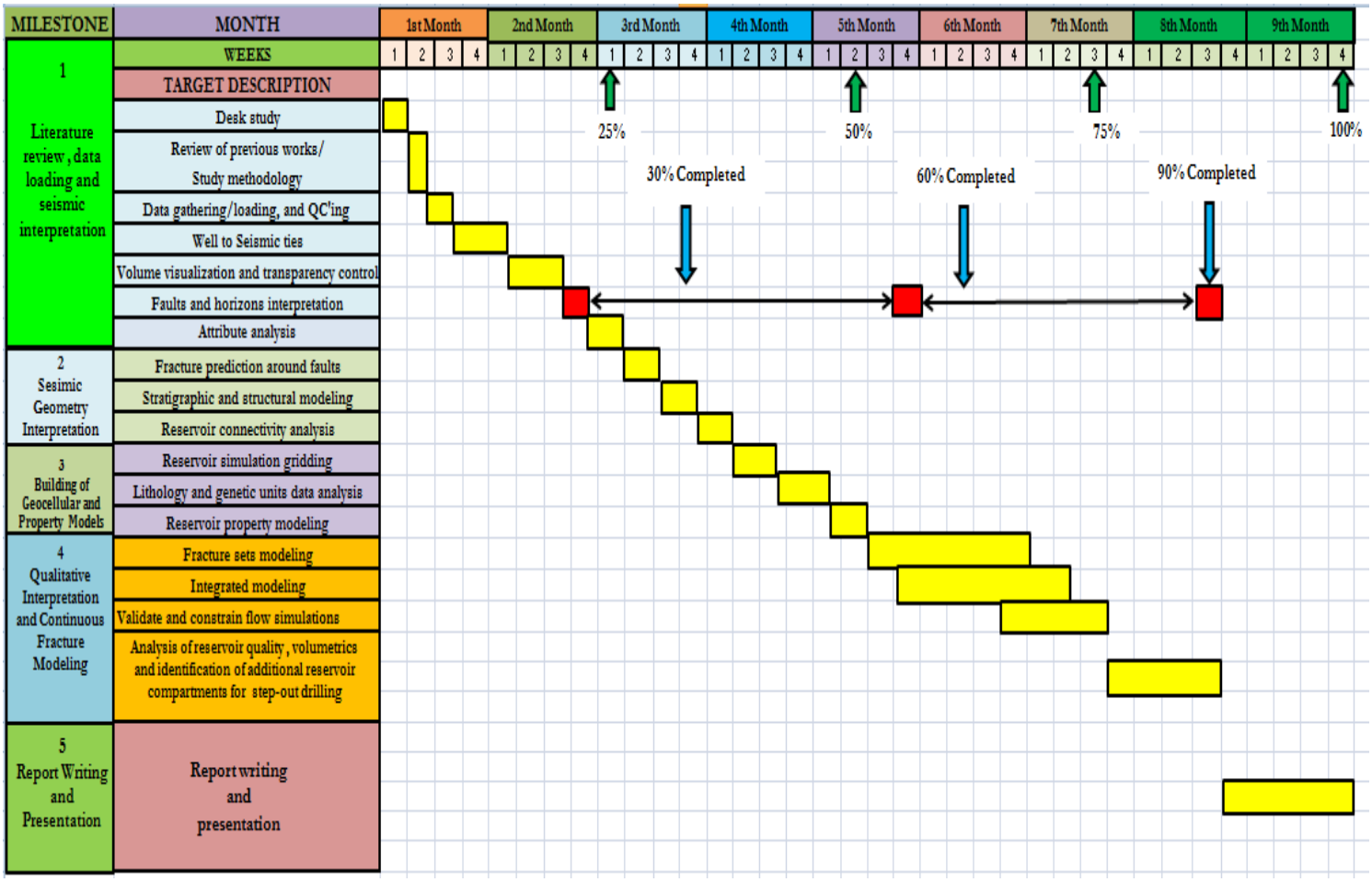
3. Bullet list of 5-7 main outcomes/goals.

- Assess the reservoir characteristics in the study area
- Create models of fracture initiation, growth, interaction and connectivity
- Evaluate the fracture spacing variation inside fractured areas to determine the imbibitions rate
- Understanding and quantification of the fracture system which will help to mitigate risks via improved flow forecasting and optimal well placement and design
- Fracture prediction and flow forecasting in all parts of the reservoir
- Document data availability, methodologies, applications and result obtained from dual effect of geocellular and continuous fracture models application and their effect

4. In two or three sentences, describe why your research is important. Please mention who will benefit from your work.

Published research on fracture modeling and advance geo-cellular modeling in Fields within West Africa has been limited over the years. This research is important because all fracture relationships within reservoirs in a Niger Delta field will be evaluated and quantified for their possible implication on fracture connectivity, flow direction and concentrations. This research will analyze the challenges and advances needed to produce better reservoir models. This research will benefit the International Oil Companies (IOC) operators, Marginal Field Operators, and Reservoir Development Servicing Companies who depend on reserves additions through finding oil in older fields and it will also benefit researchers and students as it will document methodologies, applications and results from this research for usage and further study.

5. Timeline with milestones (12 month/18 month) _____



6. Funding amount needed to achieve first basic goals within 12 months. Please provide a brief summary overview of your budget. List costs of 5-10 main items.

Transportation cost to and from Shell and Baker Hughes Office in Lagos and Port Harcourt for 9 months --------- $4050
Cost of Computer time spent in Shell and Baker Hughes workstations---------- $4500
Cost of Computer time in working out algorithms on MATLAB and FORTRAN in AfriHub Computer Institute - $1800
Shelter for the estimated number of days I will be working in the Lagos and Port Harcourt Office---------- $3600
Manuscript Preparation---------- $350
Total---------- $14,300

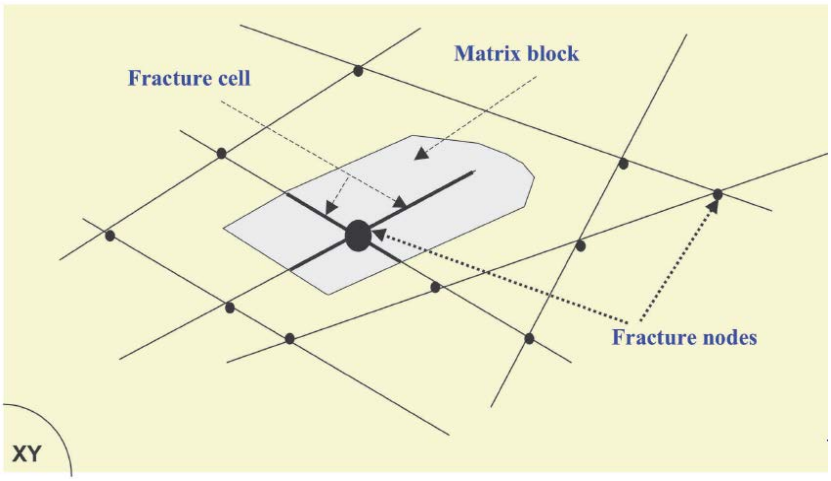
7. In the process of gaining background knowledge in the field of your proposed research, who did you find to be the top two or three researchers? What are the main concepts that are being explored? Please briefly describe.

a. Bourbiaux, B., Basquet, R., Cacas, M., and Daniel J., 2003, An integrated workflow to account for multi-scale fractures in reservoir simulation models: Implementation and benefits: ATC 2003 Conference and Oil Show, 3-5 October 2003, Islamabad, pp. 1-16.

b. Sliz, K., and Al-Dossary, S., 2014, Seismic attributes and kinematic azimuthal analysis for fracture and stress detection in complex geologic settings: Interpretation Journal, vol.2, No.1, pp. 67-75.

The main concept explored by Bourbiaux et al., 2003 was the modeling of complex internal structures in a field using an advance simulation workflow.
The main concept explored by Sliz and Al-Dossary, 2014 was focused on a fracture and compressional stress detection methodology using 3D scanning of azimuthally dependent residual move-out volumes constrained by fracture-sensitive seismic attributes.

8. Please provide a photo of yourself and a photo related to your proposed project. It will be very helpful in publicizing your project and potentially securing funding.



9. Who will benefit? This research will benefit the International Oil Companies (IOC), Marginal Field Operators and Reservoir Development Servicing Companies who depend on reserves additions through finding oil in older fields and it will also benefit lecturers, researchers and students as it will document methodologies, applications and results from this research for usage and further study.

AAPG Research LAUNCHER supporters receive

The opportunity to work directly with you and receive reports, information, and findings, depending on the level of support.

The Deal

The researcher agrees to:

- Develop a brief public presentation on the research to be made available to AAPG
- Share an annotated bibliography and review of relevant published articles
- Present research findings on project at an AAPG Forum, GTW, or Research Symposium
- Write a detailed report on the results of your research to be made available to LAUNCHER supporters ❖

Write a extended abstract on the results of your research to be made available to AAPG

*

Thank you for submitting your research proposal to the AAPG Research LAUNCHER Program. Your proposal will be reviewed and upon acceptance you will be contacted by AAPG Education/Research. If your proposal is accepted, we will publicize your proposal and encourage funders to contact you directly. AAPG does not guarantee funds nor have any connection with the success or failure of the endeavor. The goal is to support scientific research in the petroleum geosciences and engineering and launch the next generation of geological advances.

Anomneze, David Ogechukwu	05/05/2014		
Research Candidate (print)	Date	AAPG Education/Research (print)	Date
	05/05/2014		
Research Candidate (sign)	Date	AAPG Education/Research (sign)	Date

AAPG Education/Research
P.O. Box 979 |Tulsa, Oklahoma 74101, USA
Phone: 918-560-2650 | Fax: 918-560-2678
Email: educate@aapg.org
www.aapg.org