

Information on Doctoral thesis of Fellows Nguyen Dinh Nguyen

1. Full name: Nguyen Dinh Nguyen

2. Sex: Male

3. Date of birth: 30th August 1971

4. Place of birth: Ha Noi

5. Admission decision number: No. 1691/QĐ-SDH signed on 7/5/2009 by President of Vietnam National University, Hanoi.

6. Changes in academic process: changing from Petrology, major, code: 62.44.57.01 to Geology major, code: 62440201 by decision No. 790/QĐ-ĐT date of 15th March 2013 of Director of Vietnam National University, Hanoi. Thesis title adjusted: Studying sequence stratigraphy of Kainozoi sedimentary in Red River basin and petroleum significant. No. 634/QĐ-SDH-TN signed on 5th June 2010 of Rector Hanoi University of Science.

7. Official thesis title: Studying Pliocene - Quaternary sequence stratigraphy in Red River basin

8. Major: Geology

9. Code: 62440201

10. Supervisors: Prof. Trần Nghi

11. Summary of the new findings of the thesis

- The dissertation showed the principles of sequence stratigraphy and the pre-eminence of the method in comparisons with traditional stratigraphy. The suitable model of sequence stratigraphy for the study area was selected basing on the models in the world and in Vietnam.

- Pliocene-Quaternary sediments in Red River basin had the symmetric structure and composed of 8 sequences in corresponding to 8 cycle of sea level change in the continental shelf and 7 sequences on land.

- On land: 3 sequences in Pliocene: $S_1(N_2^1)$, $S_2(N_2^2)$ và $S_3(N_2^3)$, 4 sequences in Quaternary: $S_4(Q_1^1)$, $S_5(Q_1^{2a})$, $S_6(Q_1^{2b})$, $S_7(Q_1^{3a})$ và $S_8(Q_1^{3b}-Q_2)$.

- In the continental shelf: 3 sequences in Pliocene: $S_1(N_2^1)$, $S_2(N_2^2)$ and $S_3(N_2^3)$; 5 sequences in Quaternary: $S_4(Q_1^1)$, $S_5(Q_1^{2a})$, $S_6(Q_1^{2b})$, $S_7(Q_1^{3a})$ and $S_8(Q_1^{3b}-Q_2)$.

- A sequence was bounded by 2 strong reflectors which were erosion surfaces created by rivers. Above the surface, there were the lithofacies which were in lowstand system tracts (LST) and were fining upward in alluvial section and coarsening upward in deltaic and marine sections in regression. The

weak reflector between the two strong reflectors was transgressive erosion surface. This surface divided sediments into lowstand system tracts (LST) under and transgressive system tracts (TST) above.

- Each system tracts includes series of the lithofacial integration in causal relation to eustasy. Integrating the relationship between the lithofacial series and system tracts is following:

- Lowstand system tracts (*LST*):

$$\text{-LST} = \text{arLST} + \text{amrLST} + \text{mt/amrLST} + \text{mrLST}$$

- Transgressive system tracts (*TST*):

$$\text{TST} = \text{Mt} + \text{amr/amtTST} + \text{mtTST}$$

- Highstand system tracts (*HST*):

$$\text{HST} = \text{arHST} + \text{amrHST} + \text{mt/amrHST} + \text{mrHST}$$

- Pliocene-Quaternary sediments in Red River basin evolves in 8 cycle of the evolution in corresponding to 8 cycle of sea level change in effects of 8 glacial-deglacial periods in the world.

- In each Pliocene-Quaternary sequence, there are two system tracts in corresponding to placer prospects:

- Lowstand system tracts (*LST*): *buried alluvial and tidal flat placers* transgressive system tracts (*TST*): *buried tidal flat placers above ravinement surface, buried coastal dune placers.*

12. Practical applicability:

The result is a contribution to establishing the axioms for exploring minerals and underground water in Pliocene-Quaternary sediments.

13. Further research directions, if any:

Applying sequence stratigraphy on exploring gas hydrate.

14. Thesis-related publications:

1. **Nguyen Dinh Nguyen**, Pham Minh Truong, Hoang Huu Hiep (2008), "Structural features and models of water-bearing structure in Cat Ba island", *Journal of geology*, A (308), pp 49- 58.

2. **Nguyen Dinh Nguyen**, Pham Nguyen Ha Vu, Phan Thanh Tung (2010), "Effect of applying the high resolution shallow seismic system to survey on shallow sea". *Journal of geology*, A (320), pp 326-335.

3. Tran Nghi, Dinh Xuan Thanh, Tran Thi Thanh Nhan, Nguyen Thi Huyen Trang, **Nguyen Dinh Nguyen**, Nguyen Dinh Thai, Giap Thi Kim Chi, Nguyen Van Kieu (2011), "An analysis of the

relationship between sequence stratigraphy, lithofacies and Cenozoic depositional cycles of the Red River basin”, *VNU Journal of Science, Earth Sciences* 27 (IS), pp.1-10.

4. Pham Nguyen Ha Vu, Nguyen Thanh Hung, **Nguyen Dinh Nguyen** (2011), “A study on submarine landslides in the Central continental shelf of Vietnam”, *VNU Journal of Science, Earth Sciences* 27, (IS), pp. 69 -76.