

INFORMATION ON DOCTORAL THESIS

1. Full name of PhD student: Tran Ngoc Dien; 2. Sex: Male

3. Date of birth: 24/07/1970 4. Place of birth: Hung Yen Province

5. Decision No. 3890/QĐ-ĐHKHTN dated November 21, 2018 of the Principal of the University of Sciences, Vietnam National University, Hanoi.

6. Changes in the training process: Decision on extending training and thesis defense for graduate students No. 231/QĐ-ĐHKHTN dated January 27, 2022 of the Principal of the University of Sciences, Vietnam National University, Hanoi. Decision on extending training and thesis defense for graduate students No. 151/QĐ-ĐHKHTN dated January 17, 2023 of the Principal of the University of Sciences, Vietnam National University, Hanoi.

7. Thesis name: Research on paleogeography-facies and the Late Pleistocene – Holocene sequence stratigraphy of the coastal area Red River Delta.

8. Major: Geology; 9. Code: 9440201.01

10. Supervisors: Assoc.Prof. Dinh Xuan Thanh
Assoc.Prof. Nguyen Tai Tue

11. Summary of the new findings of the thesis

1) Verified 04 sedimentary facies in the delta and linked them with sedimentary facies on the delta in space and time, proven by borehole stratigraphic columns, high-resolution shallow seismic tapes, and detailed analysis of lithological composition, sedimentary environment and absolute 14C age.

2) Verify the aluvi components that fill the ancient river bed in the post-Pleistocene-Early Holocene period at a depth of up to 70m. Thereby, establishing the status of transgressive aluvi sediments and the main flow direction of the ancient Red River of the Pleistocene period is flowed in the Ba Lat estuary area.

3) The last Quaternary sedimentary cycle in the tropical Red River Delta has an age of post-Holocene Pleistocene (Q_1^{3b} - Q_2) corresponding to 03 stages: 1) Dead Pleistocene marine regression stage, the dead part (Q_1^{3b}); 2) Late Pleistocene transgressive phase - Early-Middle Holocene (Q_1^{3b} - Q_2^{1-2}) and 3) Middle-Late Holocene transgressive phase (Q_2^{2-3} -present).

4) Research on rock facies - paleogeography and diversity stratigraphy of late Pleistocene sediments, the late part - Holocene of the Red River delta coast in relation to sea level changes is the basis for identifying the future development trend of the coastal zone, contributing to planning and socio-economic development for sustainable development of the coastal strip of the Red River Delta.

5) The thesis contributes to clarifying the material composition characteristics and distribution rules of Upper Pleistocene - Holocene sedimentary facies in the coastal area Red River Delta.

6) The thesis has clarified the evolutionary history of the upper Pleistocene - Holocene sediments sea level changes in the coastal area Red River Delta.

7) Over the past hundred years, changes in the alluvial plains of the coastal Red River Delta have been characterized by (1) sedimentation zones dominated by rivers and waves in the alluvial plains of Ba Lat estuary area and Nghia Hung alluvial plain, (2) tidal and river sedimentation zones dominate the Kim Son alluvial plain and (3) wave erosion zones dominate the Hai Hau alluvial plains.

8) The research results of the thesis are the basis for identifying future development trends of the coastal area, contributing to planning and socio-economic development for the sustainable development of the coastal area Red River Delta.

12. Further research directions

The research results of the thesis have clarified the rules of development of upper Pleistocene-Holocene sedimentary formations in the coastal area Red River Delta based on the result of the onshore sediment research, material composition, radiocarbon (14C) in a borehole at 10m water depth and high resolution shallow seismic sections. In addition, the thesis focus mainly on the period from about 13,000 years BC to today. The results in the period from 30,000 to about 15,000 years BP are still rule-based, rarely proven, rarely explained in detail, and especially interpreted in the direction of diversified stratigraphy. It is necessary to carry out detailed studies such as: deep drilling to take samples for petrographic analysis, micropaleontology, radiocarbon (14C), and stratigraphic linkage in the underground delta. As the results, the implementation of tasks linked to the mainland of the Red River Delta has been more comprehensive.

Hanoi, July 24, 2024

Instructor's signature

Supervisor 1

Supervisor 2

PhD student's signature

Assoc.Prof. Dinh Xuan Thanh Assoc.Prof. Nguyen Tai Tue