Distribution Mapping and Facies Interpretation of sandstone Reservoir Unit D Using Siesmic Attributes and well log Data in Suphan Buri Basin

Author : Nonglak Pongthow
Advisor : Asst. Prof. Dr. Rattanaporn Fongngern
Department of Geological Sciences, Faculty of Science, Chiang Mai University

RESEARCH SUMMARY

- Integration of 3D seismic data and well-log information was used to interpret seismic facies and map sandstone distribution within Sandstone Reservoir Unit D, Suphan Buri Basin.
- Seismic–well tie analysis improved confidence in horizon interpretation and stratigraphic correlation.
- **Six maximum flooding surfaces (MFS)** were identified and used as sequence boundaries for stratigraphic framework.
- Four seismic facies were classified: **SF1: Prodelta** / **SF2: Delta front** / **SF3: Delta top** / **SF4: Channel**
- RMS amplitude attributes helped highlight sandstone distribution patterns and reservoir geometry.
- **Delta front (SF2) and delta top (SF3) facies** show high sand-to-shale ratios, indicating better reservoir quality for Unit D in Suphan Buri Basin.

INTRODUCTION

The Suphan Buri Basin is a potential site for carbon capture and storage (CCS) due to its deep sandstone reservoirs sealed by shale layers. This study focused on seismic facies interpretation of sandstone reservoirs in Unit D to evaluate reservoir geometry, heterogeneity, and its suitability for long-term CO_2 storage.

OBJECTIVE

- To interpret seismic and petrophysic facies and construct a sandstone reservoir distribution map of Unit D in Suphan Buri Basin using seismic and well log data.

STUDY AREA

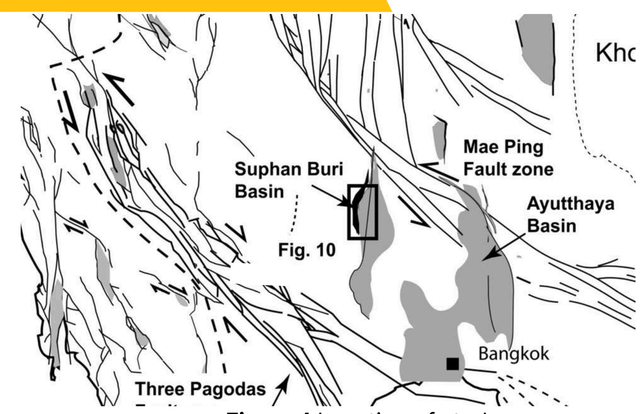
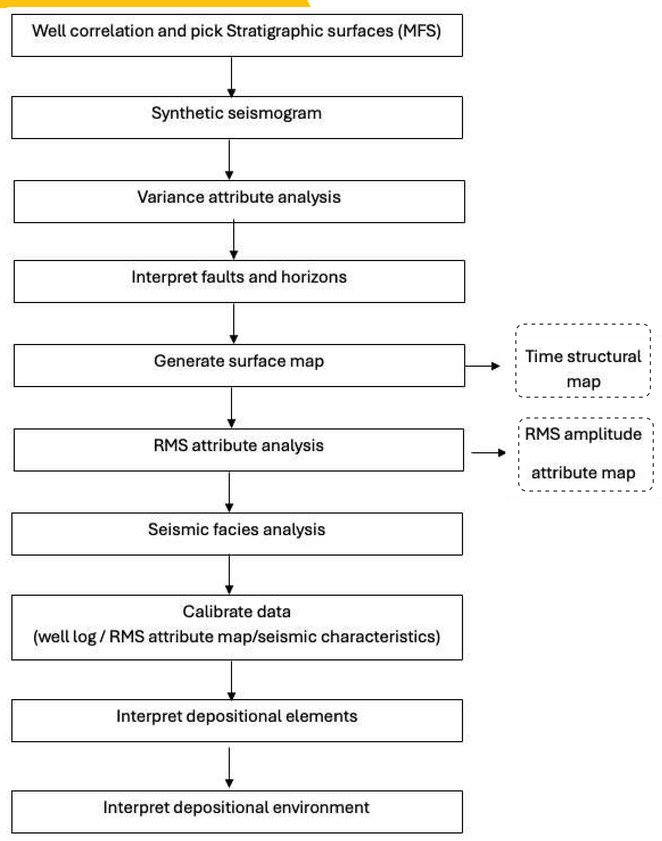


Figure 1 Location of study area

METHODOLOGY



RESULTS

Well correlation

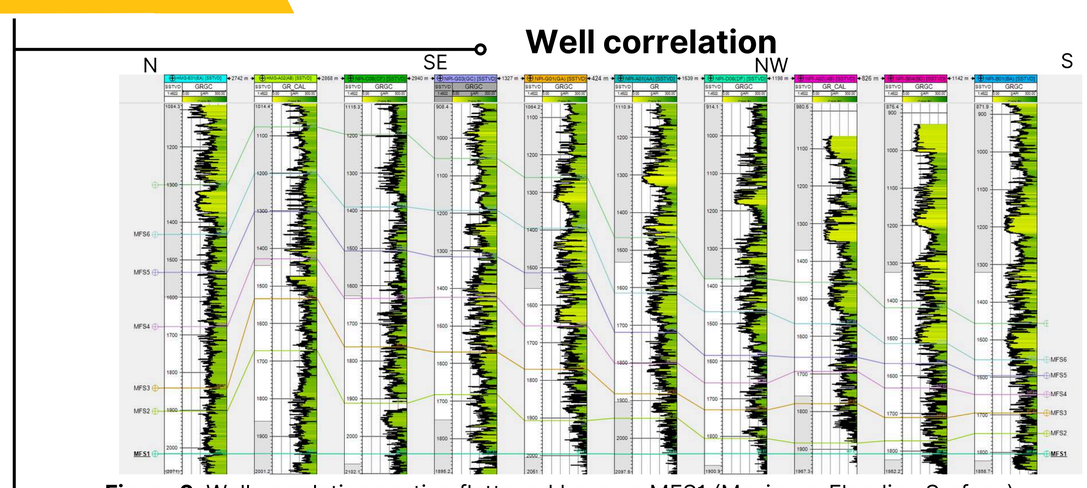


Figure 2 Well correlation section flattened base on MFS1 (Maximum Flooding Surface)

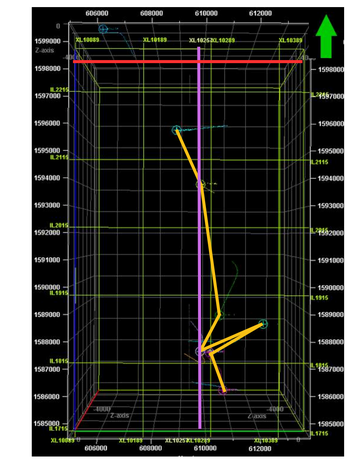


Figure 3 Map of 2D seismic volume and wells location including well correlation section (yellow line), Inline 2284 (red line), and Xline 10200 (purple line)

fault and horizon interpretation

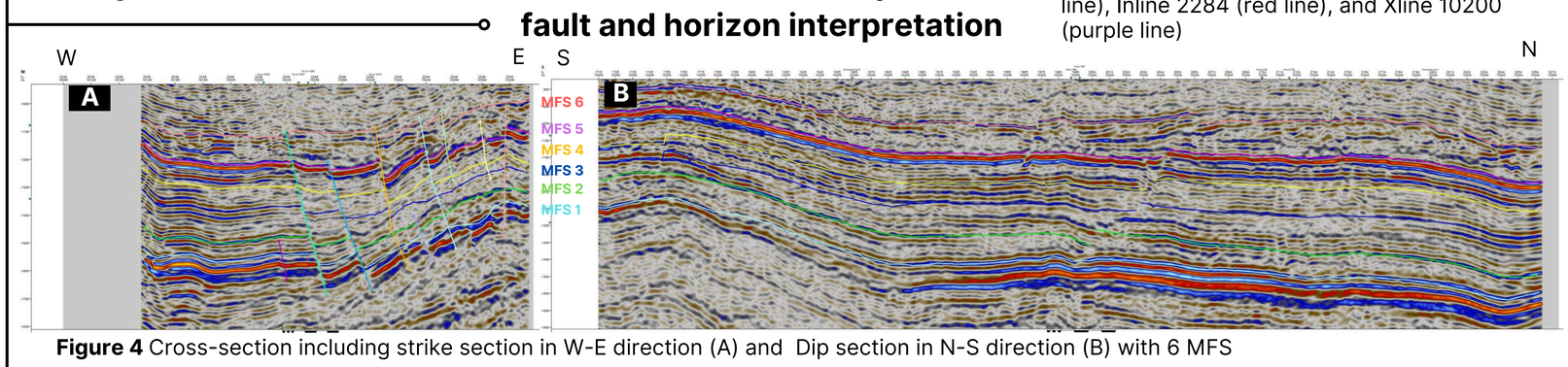


Figure 4 Cross-section including strike section in W-E direction (A) and Dip section in N-S direction (B) with 6 MFS

Time- structural map

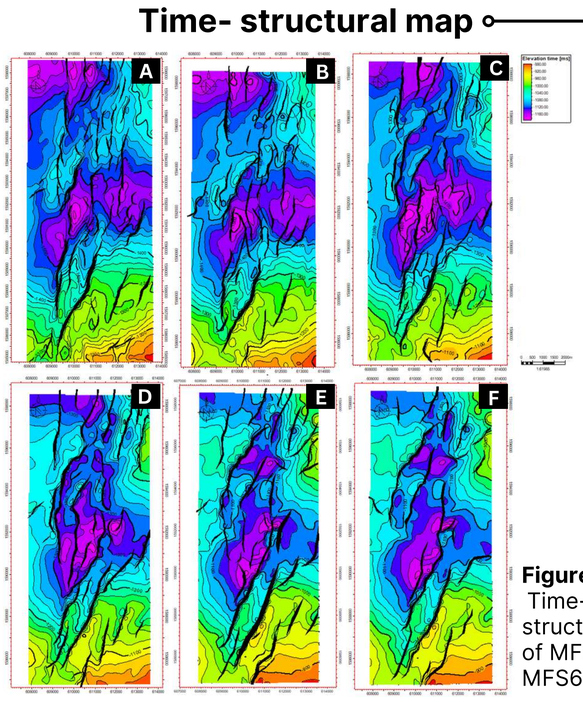


Figure 5 Time-structural map of MFS1 - MFS6

RMS amplitude attribute map

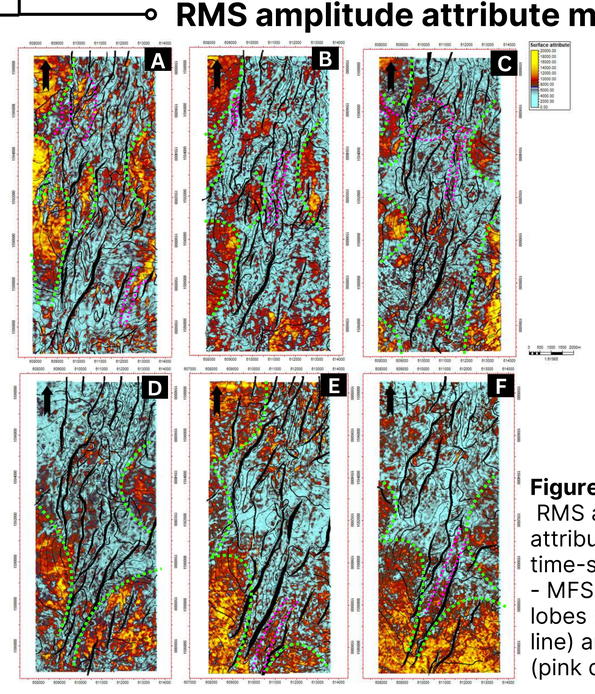


Figure 6 RMS amplitude attribute overlay with time-structure of MFS1 - MFS6 identified as lobes (green dashed line) and channels (pink dashed line)

Facies association analysis

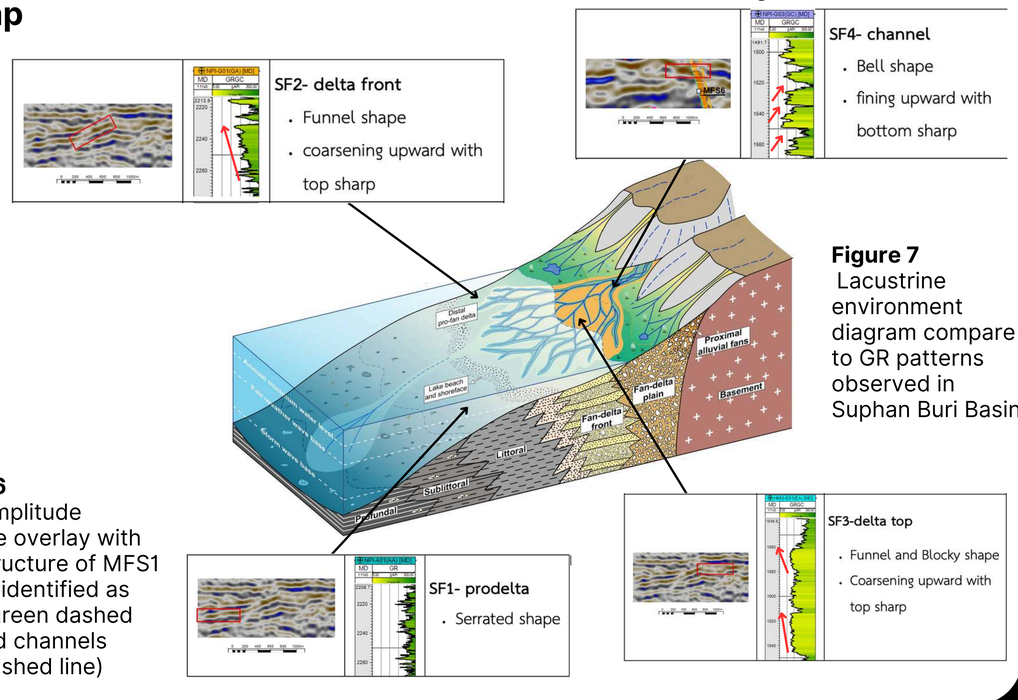


Figure 7 Lacustrine environment diagram compare to GR patterns observed in Suphan Buri Basin

CONCLUSION

Four seismic facies (SF1–SF4) were identified within Unit D, representing depositional environments ranging from prodelta to channel systems. SF1 corresponds to prodelta deposits, while SF2 and SF3 represent delta front and delta top, respectively. SF4 indicates channel deposits. Among these facies, the delta top (SF3) and delta front (SF2) show higher sand-to-shale ratios, suggesting favorable reservoir quality.

ACKNOWLEDGEMENT

I would like to thank PTTEP and the Subsurface Data for U program for providing the 3D seismic and well log data used in this study of the Suphan Buri Basin. Their contribution was essential to the successful completion of this project

- Morley, C. K. 2009. Geometry and evolution of low-angle normal faults (LANF) within a Cenozoic high-angle rift system, Thailand: Implications for sedimentology and the mechanisms of LANF development. Tectonics, 28, TC5001.
- Wang, Q., et al., 2025. Lacustrine and fan-delta sediments in syn-rift lake basins. The Depositional Record, 11, 857–892.