

# **PS Seismic Geomorphology and Stratigraphy of Coalescing Slope Apron in Taibei Depression, East China Sea\***

**Rui Guo<sup>1</sup>, Chuncheng Liu<sup>1</sup>, Jianshe Liang<sup>1</sup>, Zhigang Zhao<sup>1</sup>, and Curwu Wang<sup>1</sup>**

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<sup>1</sup>CNOOC, Beijing, China ([guorui3@cnooc.com.cn](mailto:guorui3@cnooc.com.cn))

## **Abstract**

Coalescing slope aprons are fan shaped depositional wedges fed from a continuous source with multiple feeders. A group of Paleocene linear-sourced slope aprons propagated from the northwestern margin to the Taibei depression, East China Sea. Six lobes were covered by two 3-D seismic volumes of 1,063 km<sup>2</sup>. The reservoir geometry of gas bearing sand at the top of the lobe is exceptionally clear with the hidden of the synsedimentary prodelta shale and overlying condensed section in the 3-D visualization environment.

Six lobes share the similar scale, geometry, and have been relatively confined by the fault-controlled ramp. The fan size is 30-120 km<sup>2</sup> compared with the 500-1,500 km<sup>2</sup> of the present configuration along the California borderland. The fan body has concave upward top-surface in profiles along the drainage direction; and convex upward top-surface and Lateral pinch-out geometry with bi-directional downlap in axial seismic profiles. The maximum erosion depth in the root of the depositional lobe is about 160 m, which developed near the fault of the Cretaceous basement.

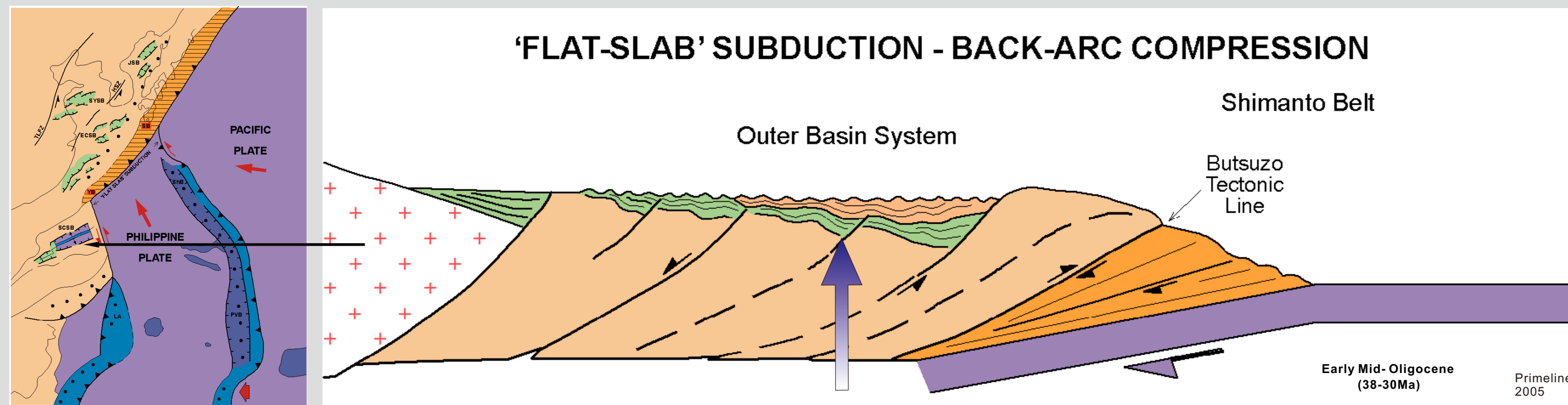
The absence of a large river-submarine canyon system backward in 2-D seismic lines resulted from continuously active meandered channel and natural levee in the fan system. The cored sections include reservoir quality massive sands with sharp upper contacts, slumped sands and debris flow sands; and muds, laminated muds. Vertical stacking of facies forms a succession of not well-defined coarsening-upward cycle with rare normal grading and predominantly mud-rich in the base.

The gas bearing sands were penetrated in well 1 and well 2 but do not extend (up the depositional dip) to sheet sands of well 3 of the same lobe, indicating the sand body dies out about half way between. The noncommercial well drilled out of the structural trap reveals the sealing risk of the lobe system as the lithologic trap.



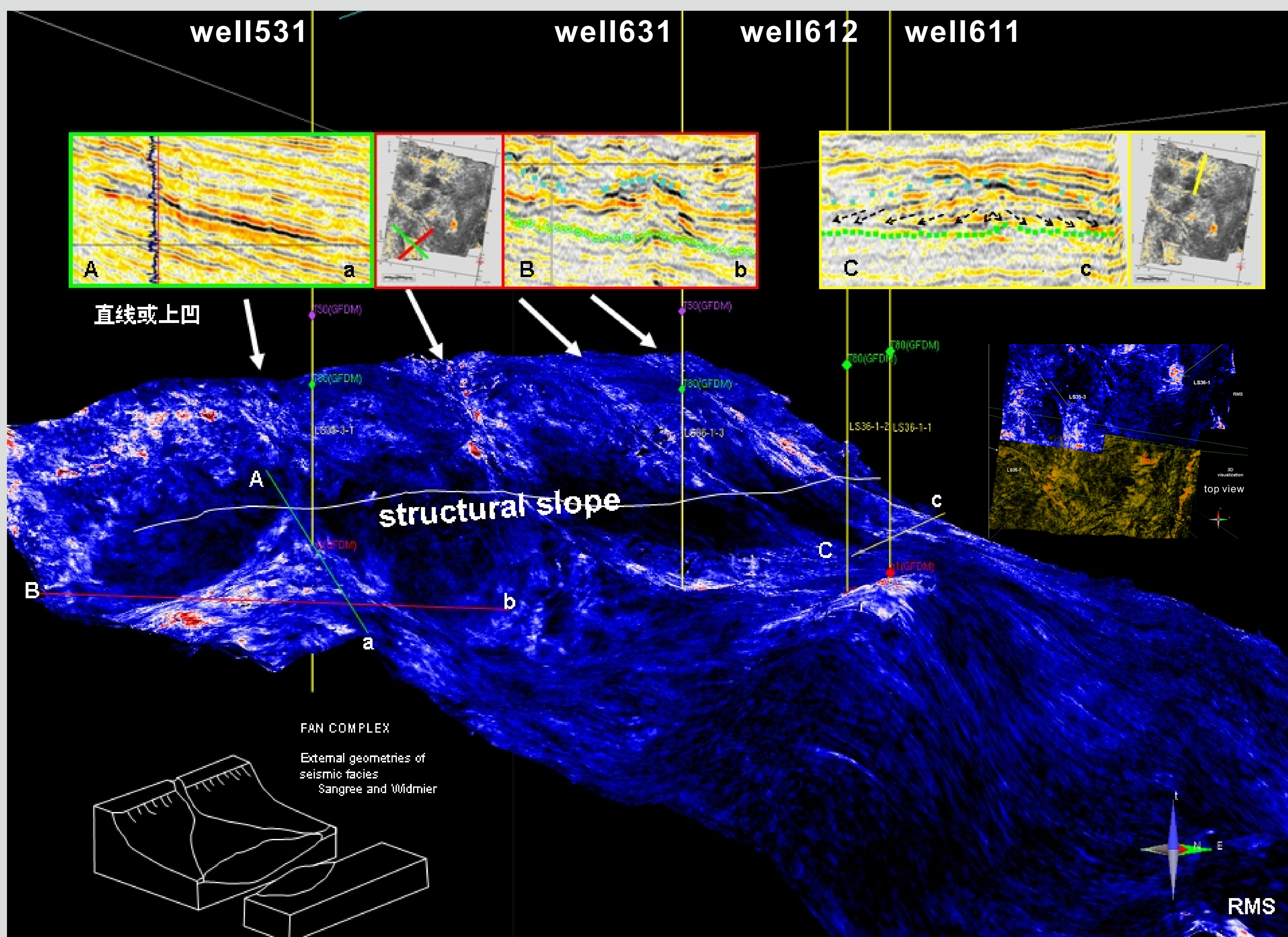
## 1 Geological settings

Coalescing slope aprons are fan shaped depositional wedges fed from a continuous source with multiple feeders. A group of Paleocene linear-sourced slope aprons propagated from the northwestern margin to the Taipei depression, East China Sea. Six lobes were covered by two 3D seismic volumes.



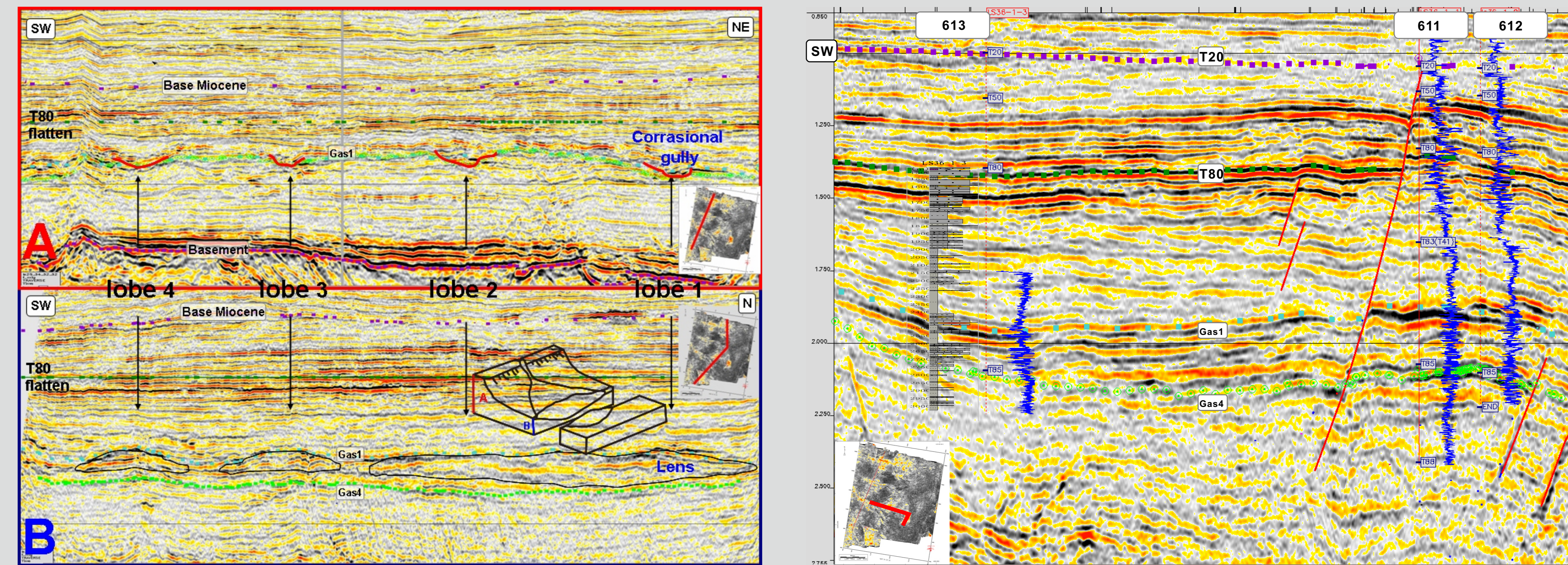
## 2 characteristics of coalescing slope aprons

Six lobes share the similar scale, geometry, and have been relatively confined by the fault controlled ramp. The fan size is 30-120 square km<sup>2</sup> compared with the 500-1500 square km<sup>2</sup> of the present configuration along the California borderland. The maximum erosion depth in the root of the depositional lobe is about 160m, which developed near the fault of the Cretaceous basement.



## 3 Seismic facies

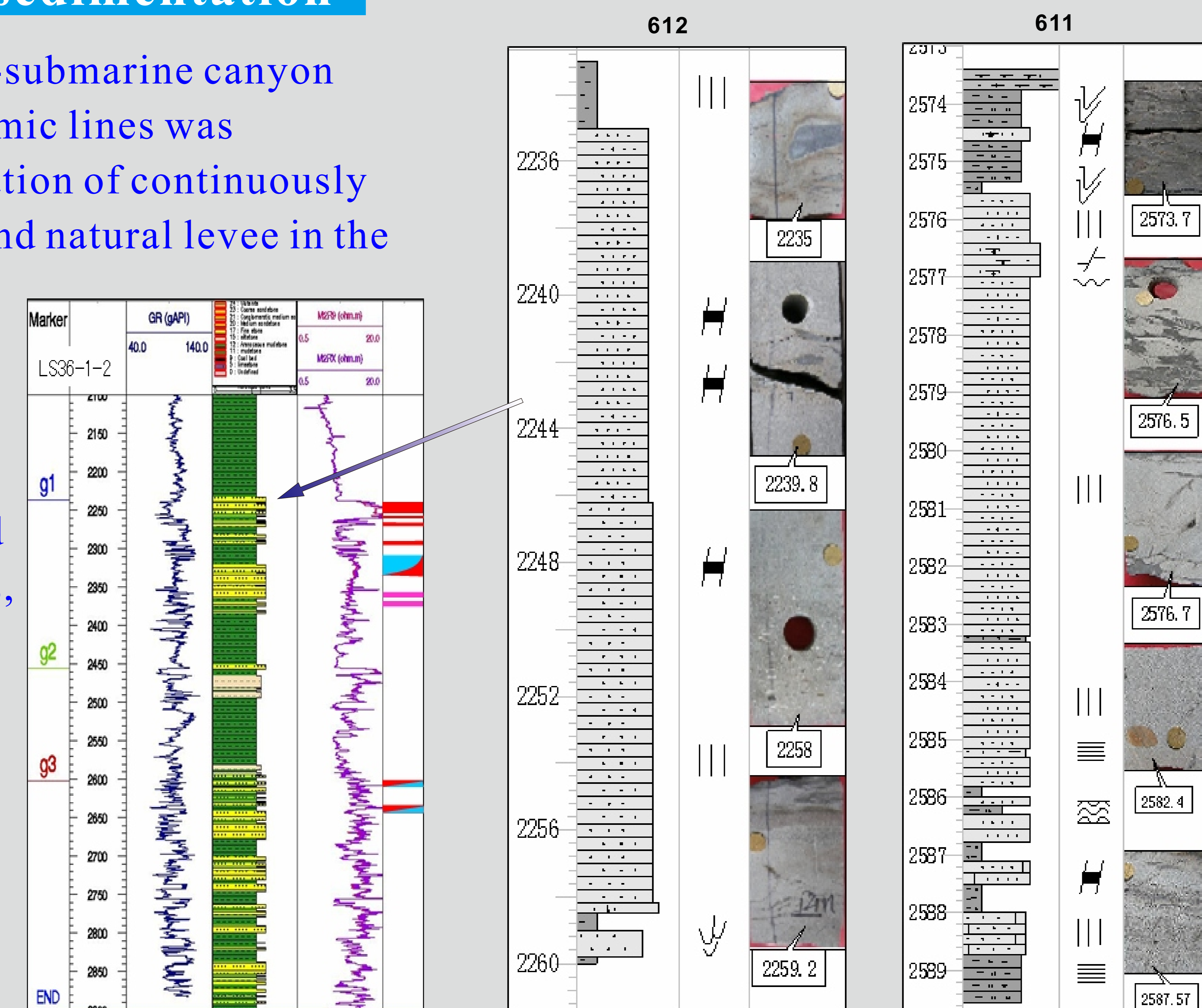
The fan body has concave upward top-surface in profiles along the drainage direction; and convex upward top-surface and Lateral pinch-out geometry with bi-directional downlap in axial seismic profiles. The maximum erosion depth in the root of the depositional lobe is about 160m, which developed near the fault of the Cretaceous basement.



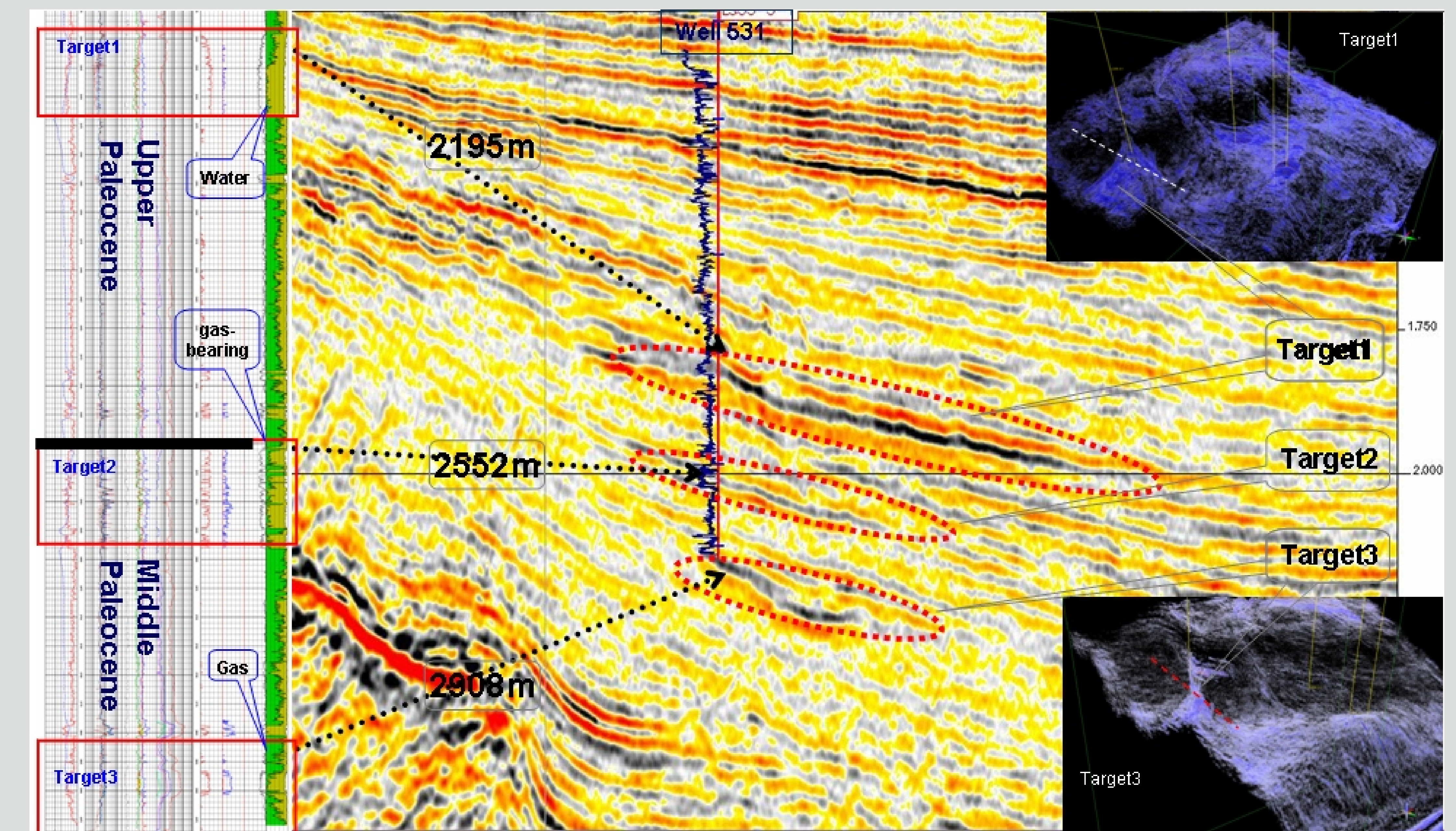
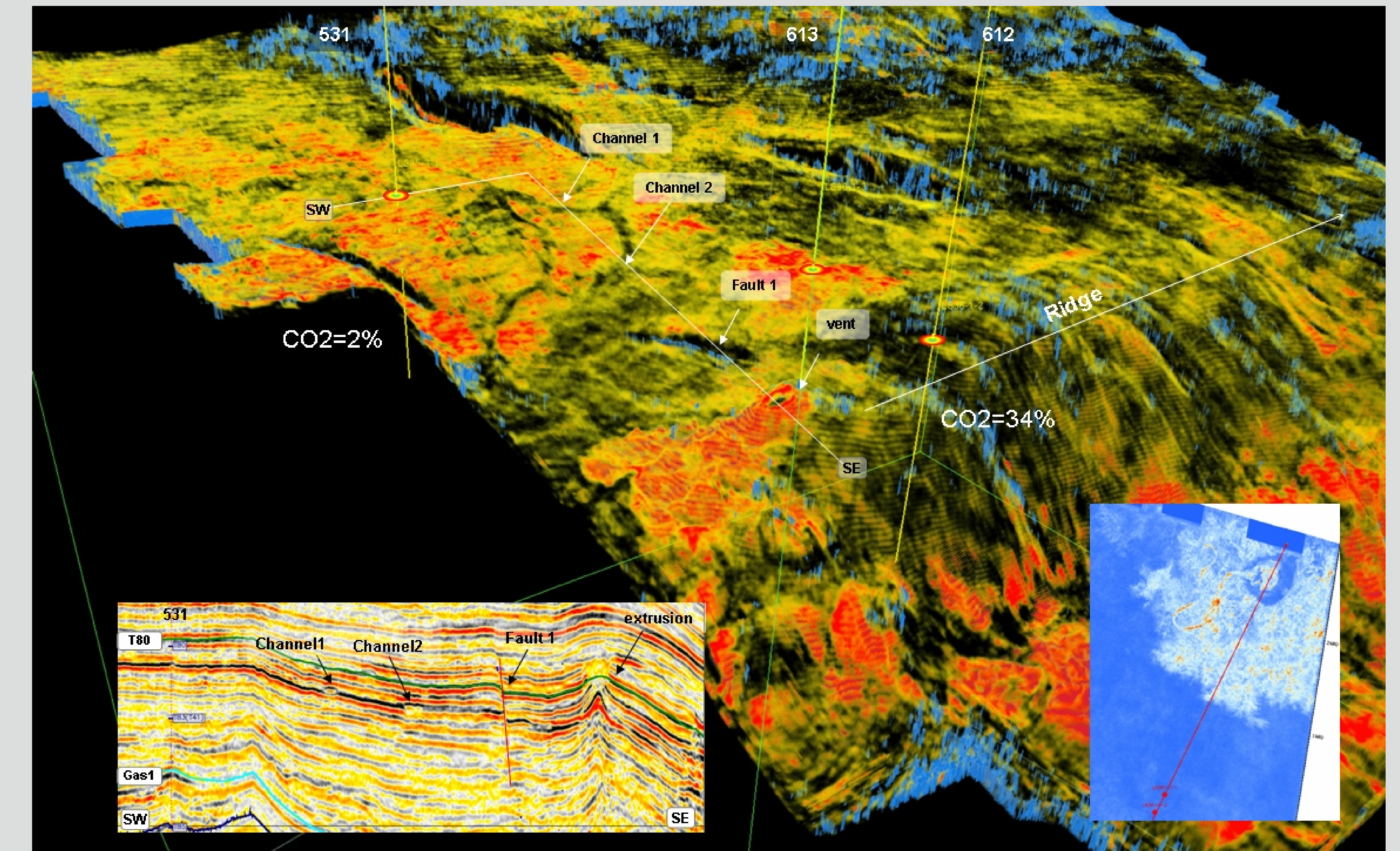
## 4 stratigraphy and sedimentation

The absence of a large river-submarine canyon system backward in 2D seismic lines was evidenced by the no observation of continuously active meandered channel and natural levee in the fan system.

The cored sections include reservoir quality massive sands with sharp upper contacts, slumped sands and debris flow sands; and muds, laminated muds. Vertical stacking of facies forms a succession of not well-defined coarsening-upward cycle with rare normal grading and predominantly mud-rich in the base.



## 5 Exploration significance



The gas bearing sands penetrated in the well 631 and well 632, but do not extend (up the depositional dip) all the way to sheet sands of the well 3 of the same lobe, indicating the sand body die out about half way between. The noncommercial well 531 drilled out of the structural trap reveals the sealing risk of the lobe system as the lithologic trap.