

Reflection seismic 1 script

Educational Material

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Interpretation

- Structures
- Seismic Sequence stratigraphy
- Seismic Facies-Analysis
- Modeling
- (Interpretation of 2D and 3D Data)

Assumptions by interpretation

- Coherent horizons in the processed data are reflections that are emphasized in the section
- The impedance contrast correspond with the layering in the subsurface
⇒ Reflections reflect this layering
- Seismic details (waveform, amplitudes etc.) have their origin in the lithology

Analysis of geological Structures

Mapping:

Position of the main horizons

Disturbances

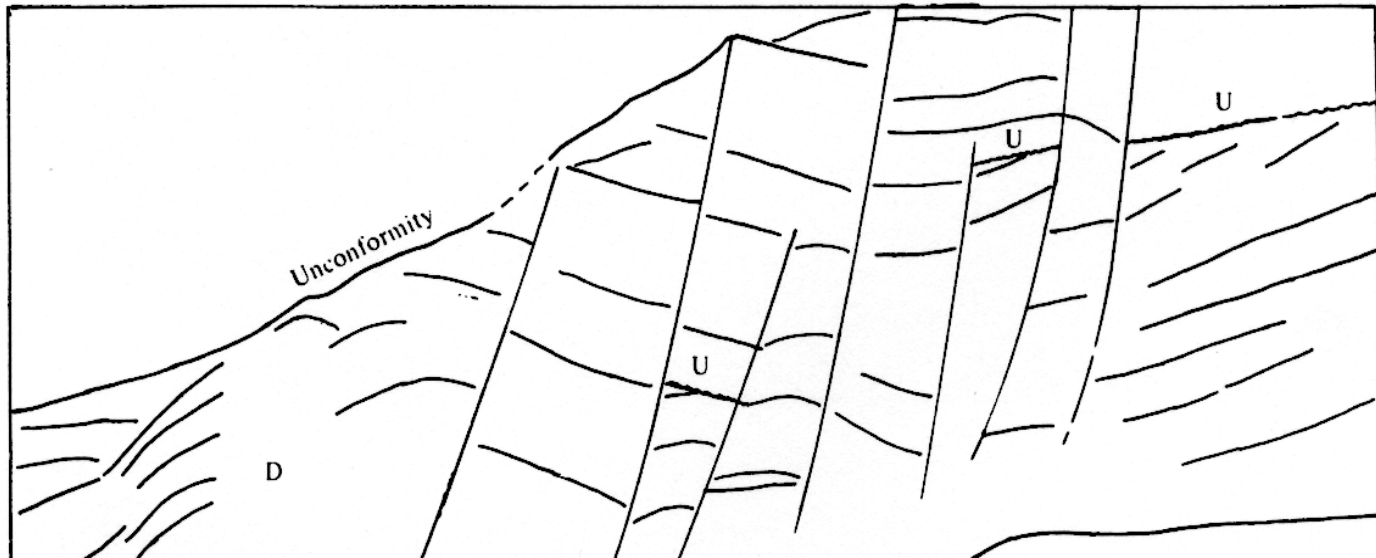
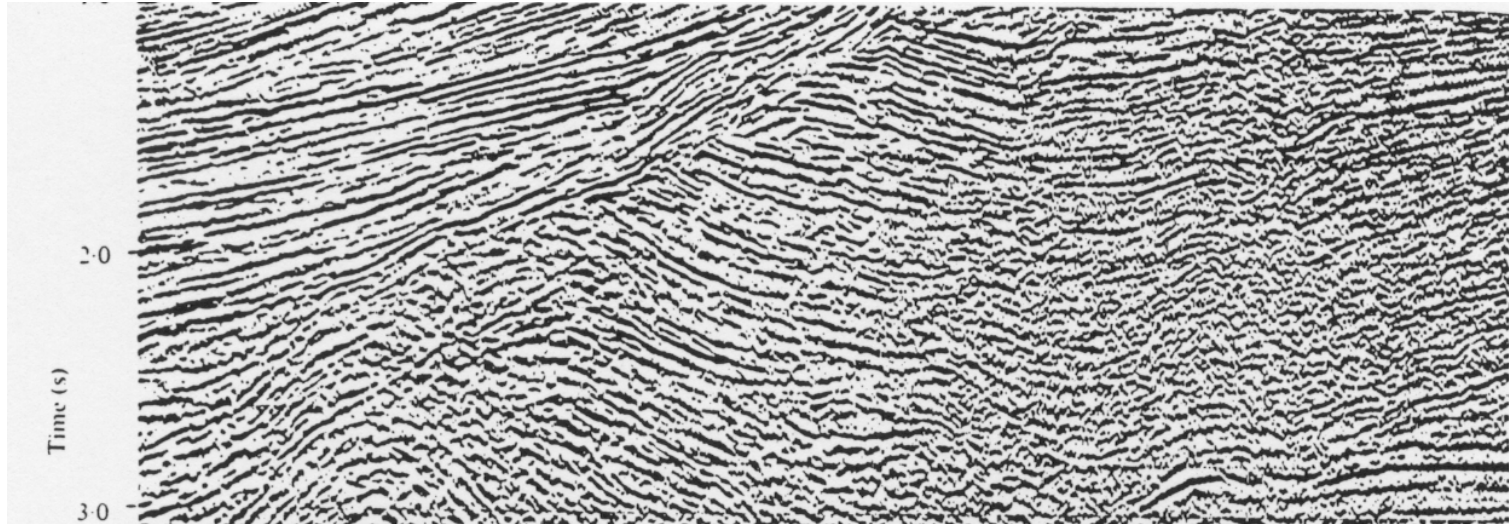
Position and form of faults

Aim:

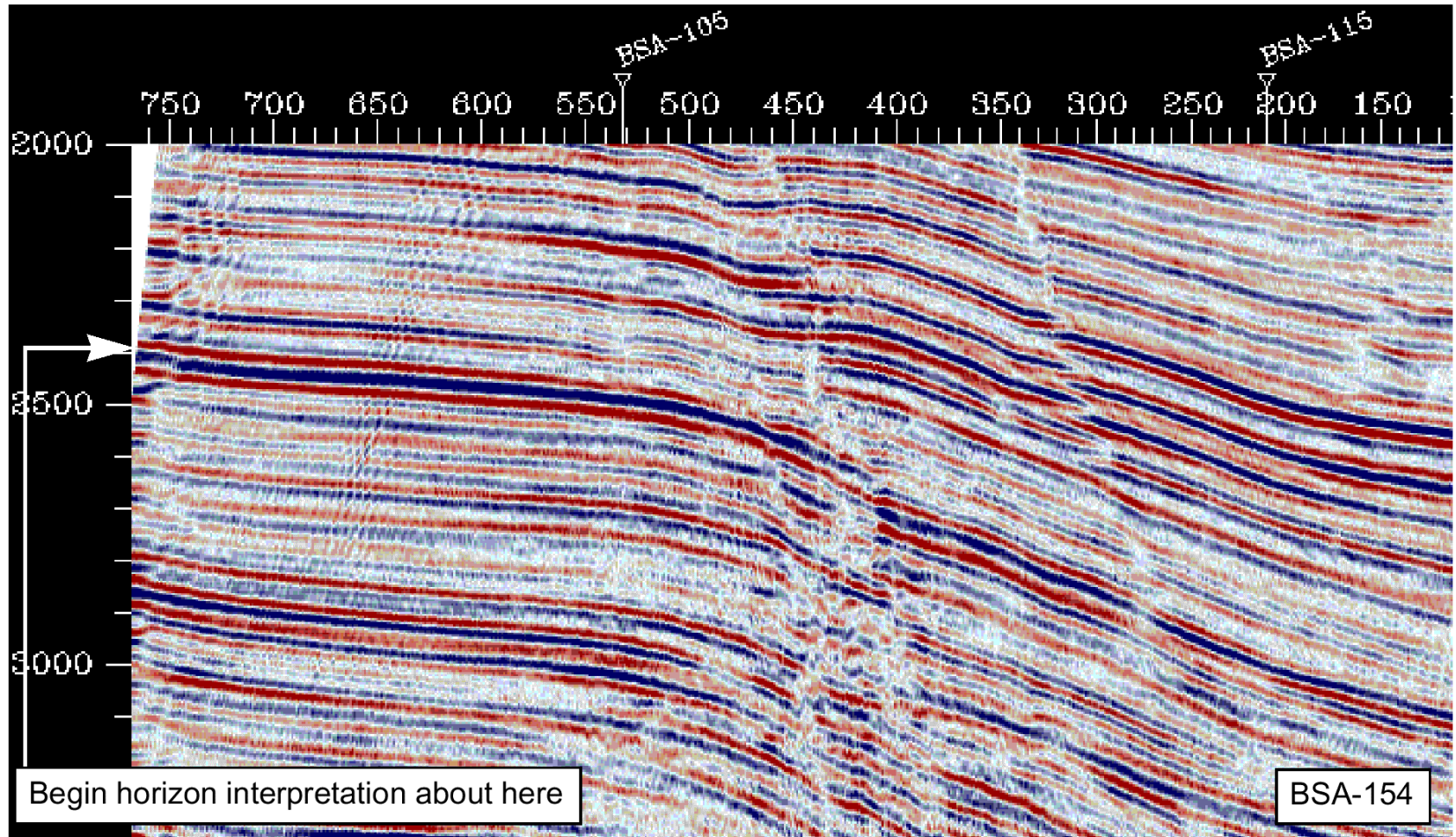
geological Profile

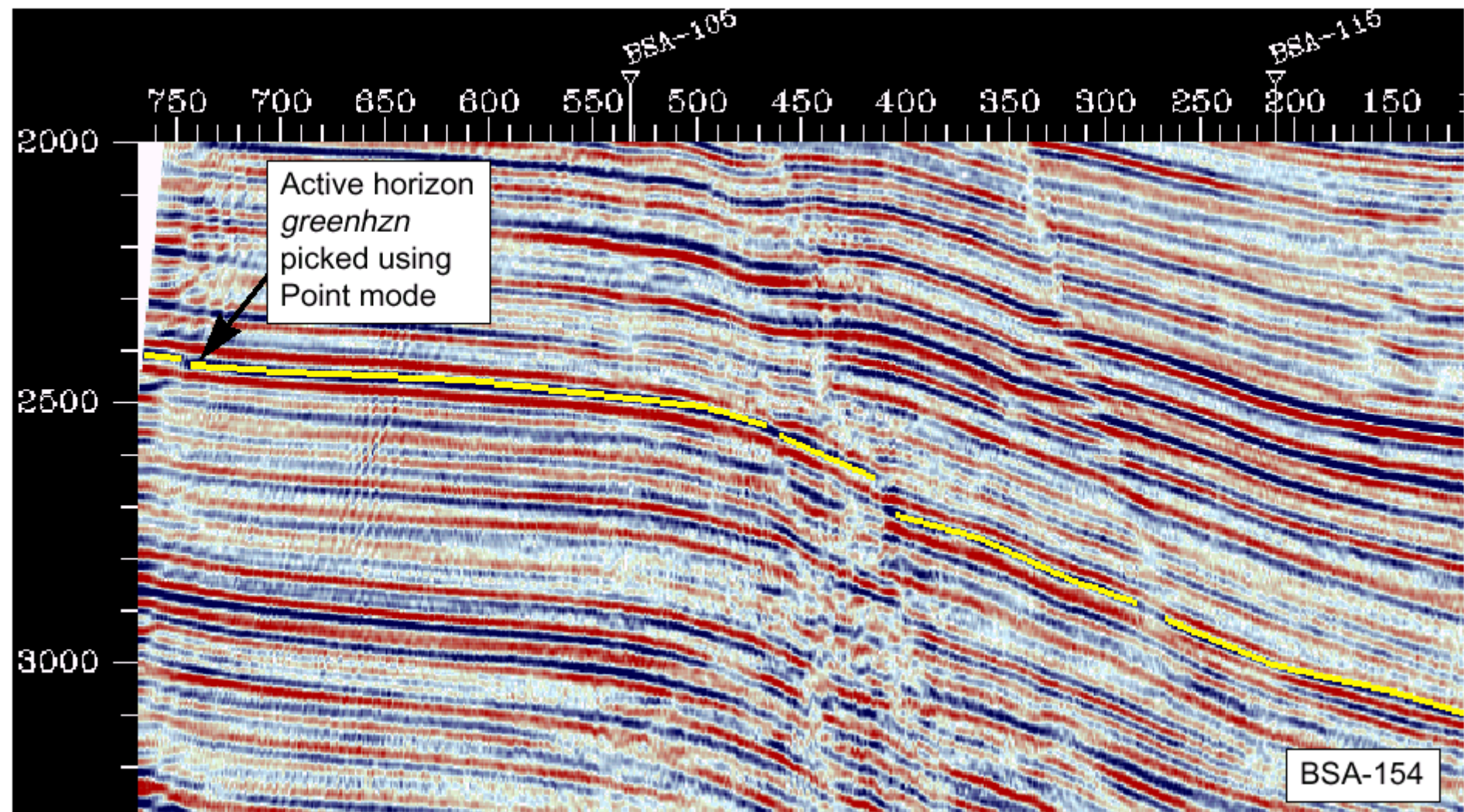
Depth charts of Horizons and Disturbances

Geology versus Seismic

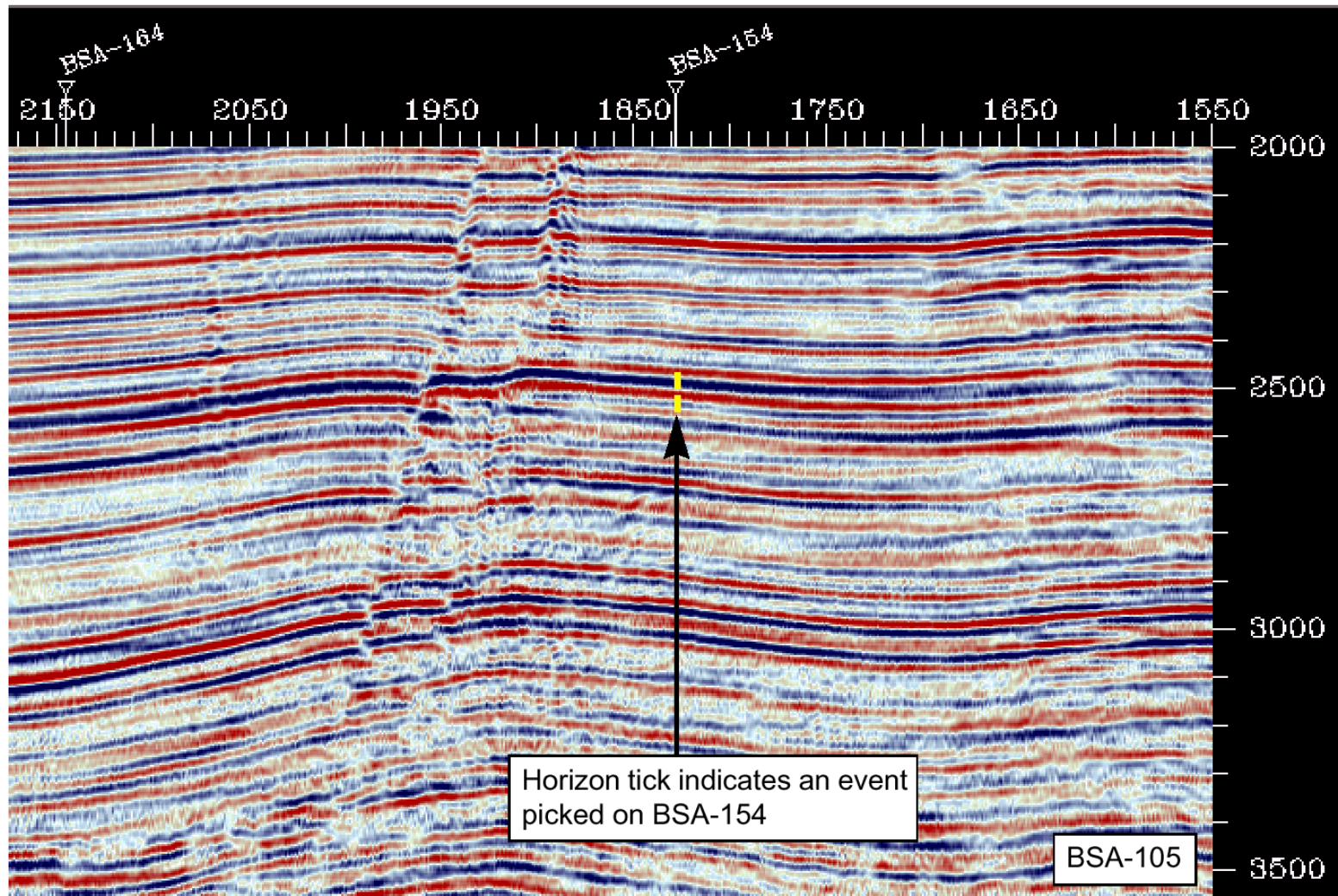


Horizon 1

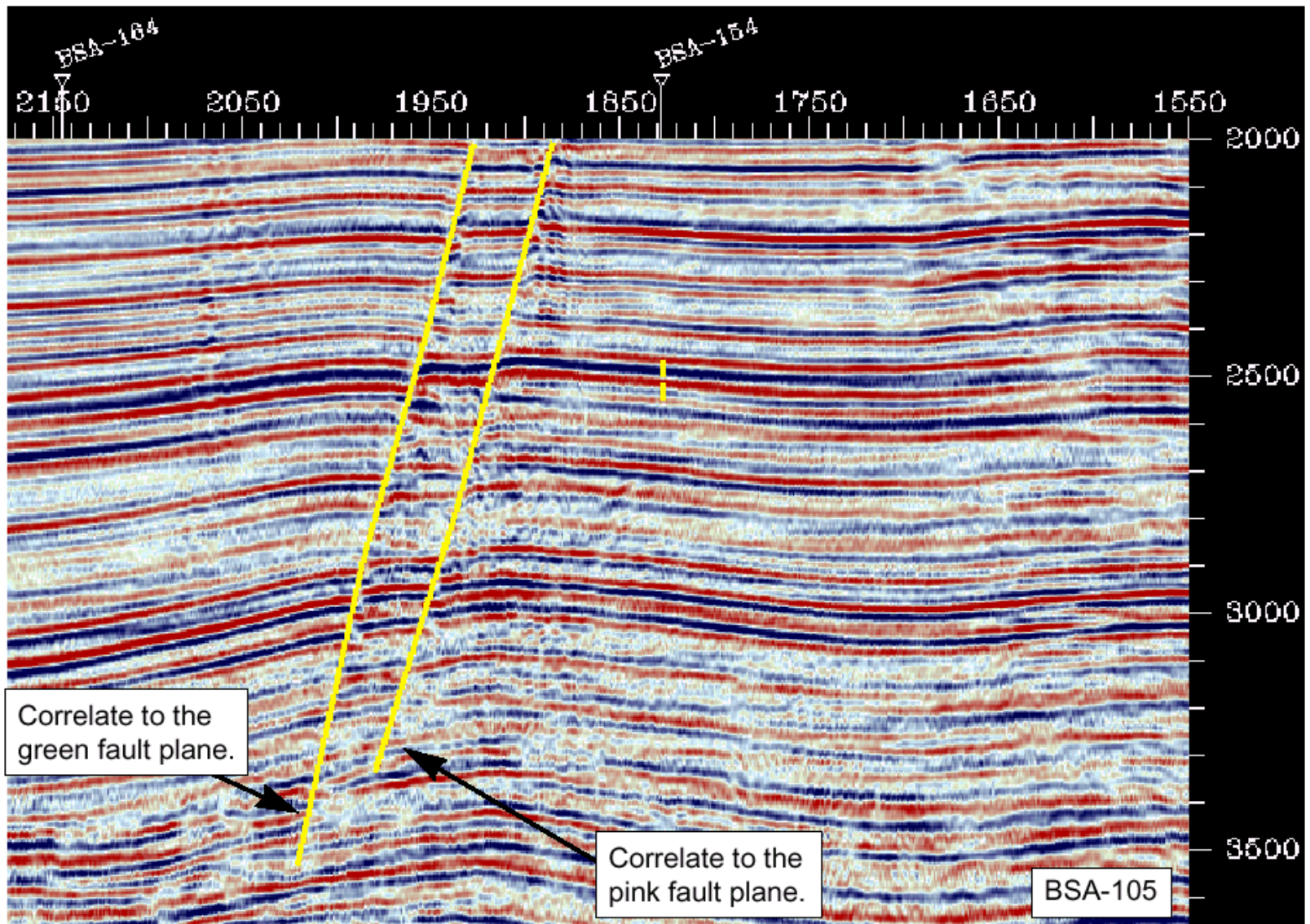




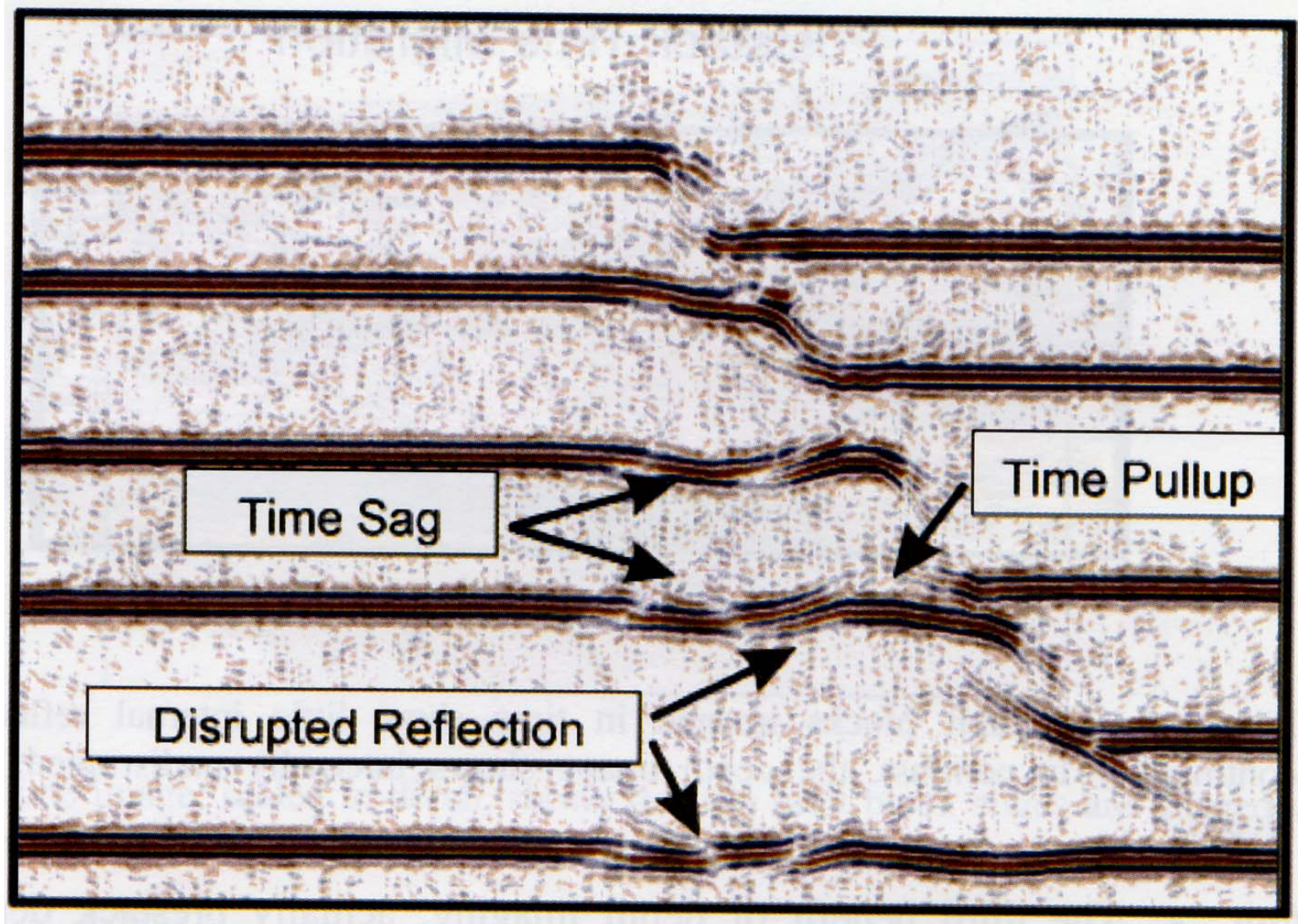
Fault



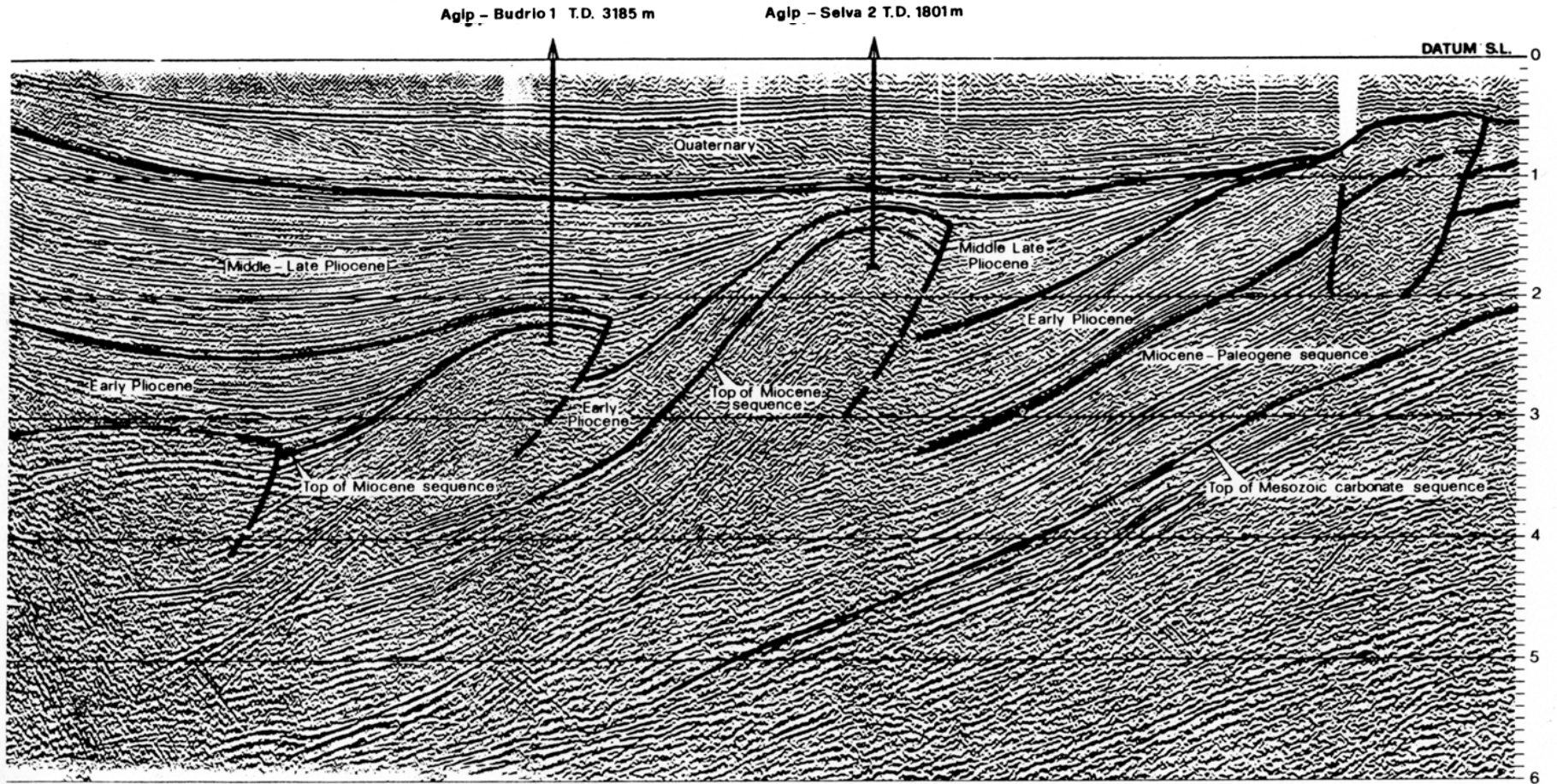
Fault 2



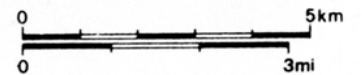
Problem with „picking“ of Disturbances

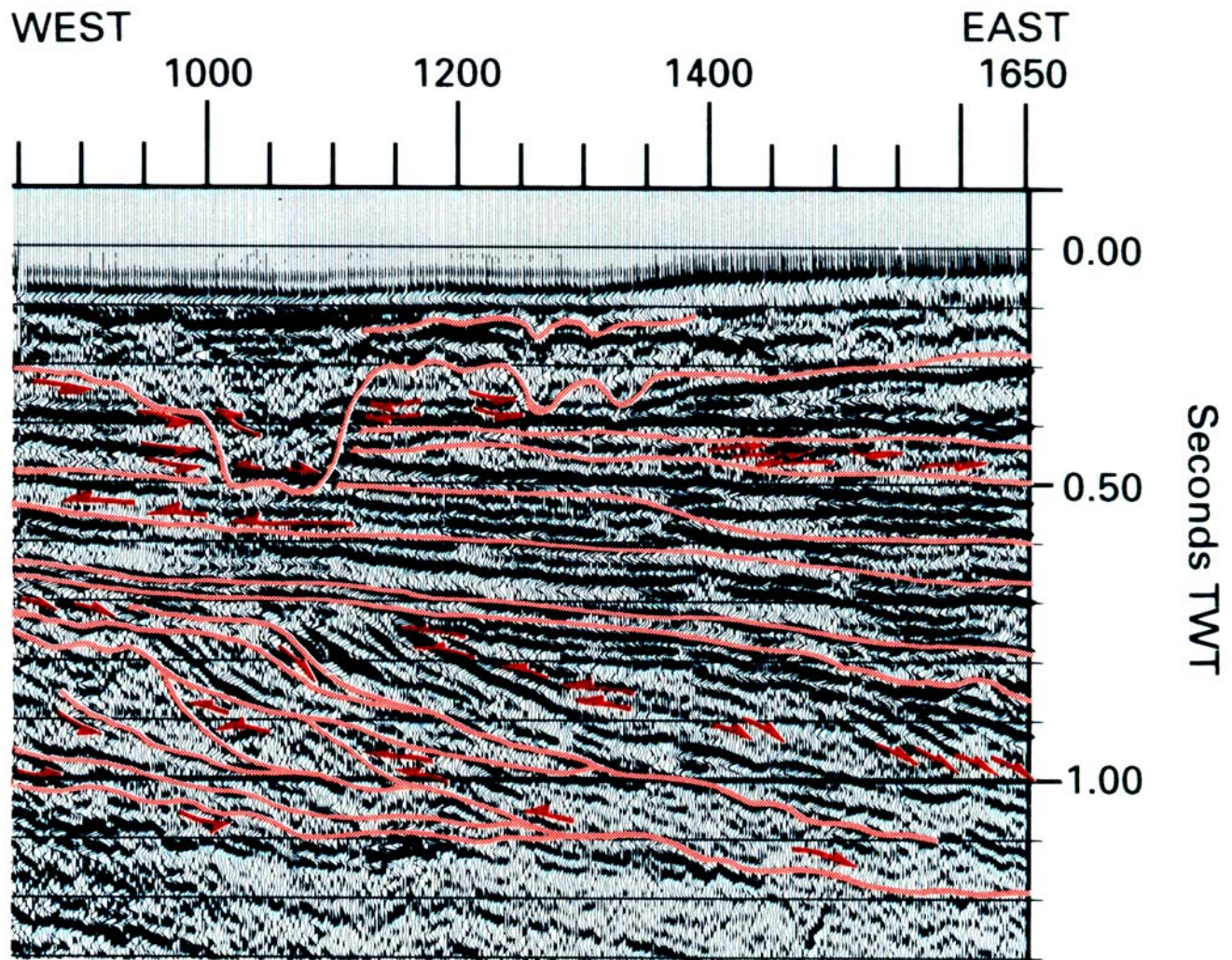


Interpretation of seismic data





(b)





Scale:

1 km

-  Seismic surface
-  Reflection termination

Fence Diagram


Seiscom Delta
ISOMETRIC DISPLAY

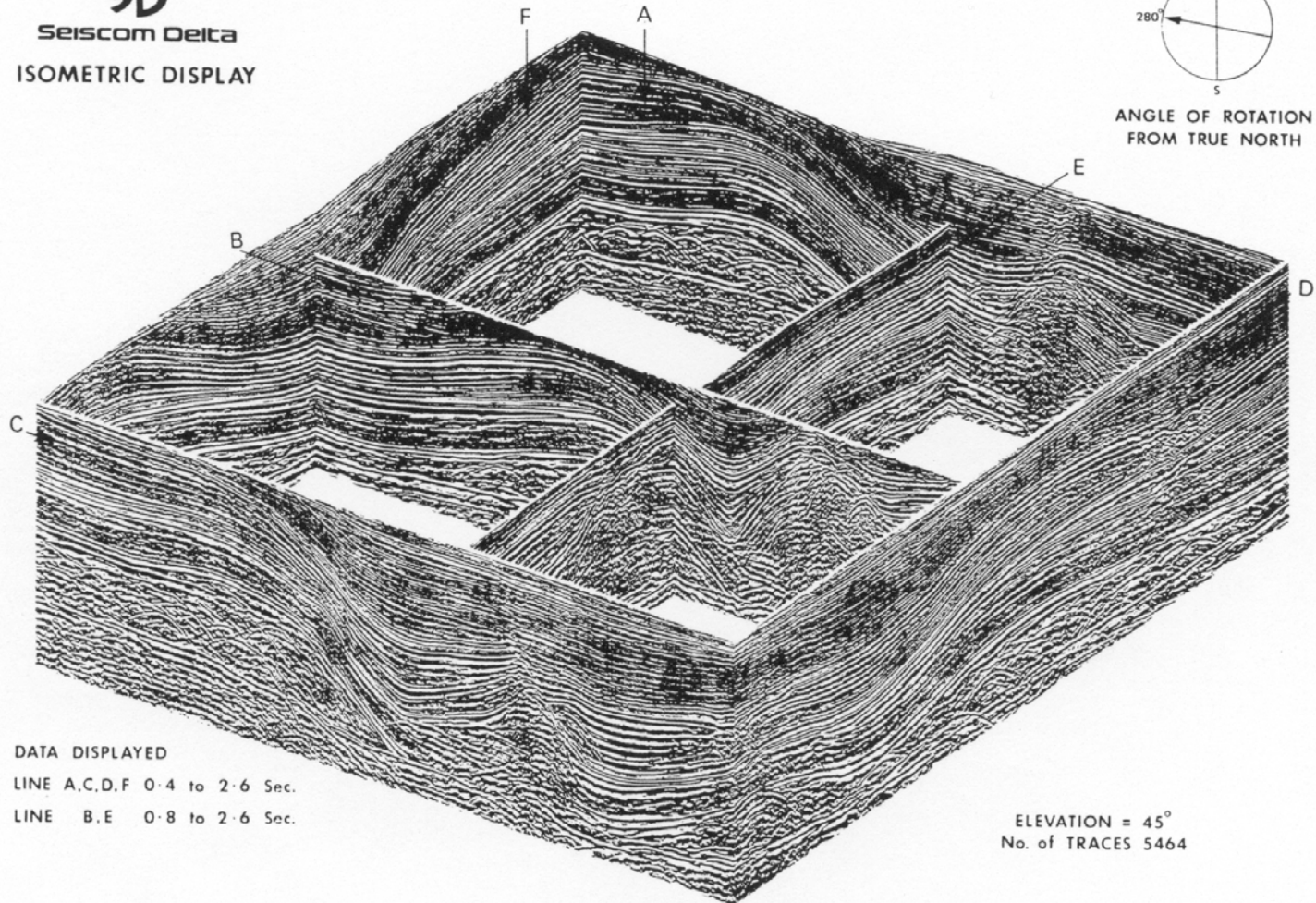
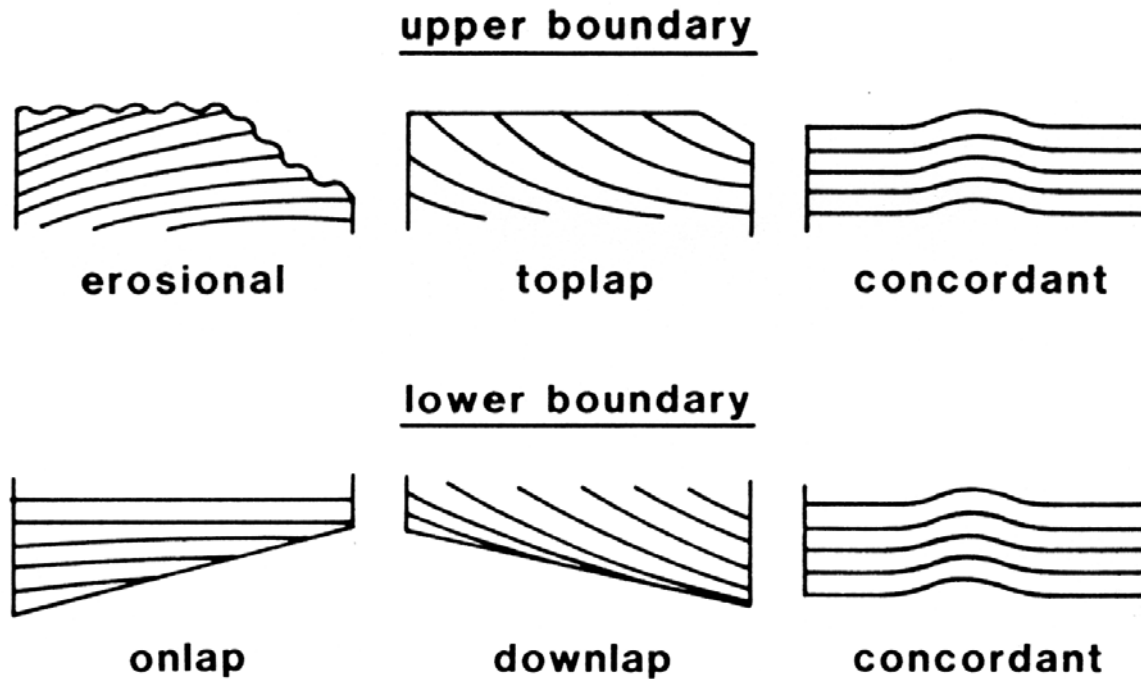


Figure 6/8 Isometric section projection of a group of seismic 'loops' prepared to aid three-dimensional comprehension of a structurally complex area (Courtesy: Seiscom Delta).

Seismic Sequence-Analysis

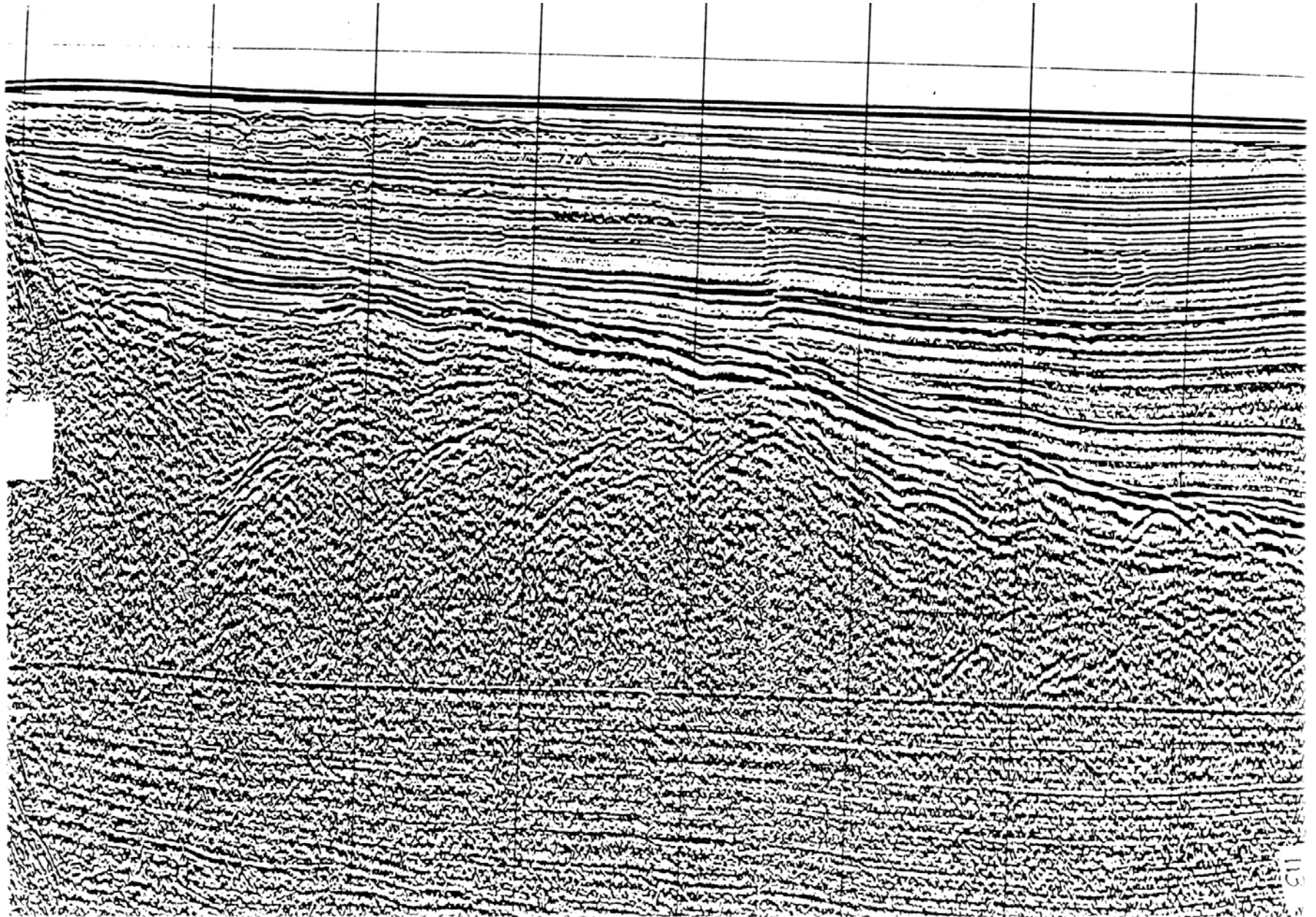
The procedure of picking unconformities and correlative conformities on seismic sections so as to separate out the packages involved with different time depositional units

Unconformities



Sequences are terminated by unconformities or a concordant

Onlap

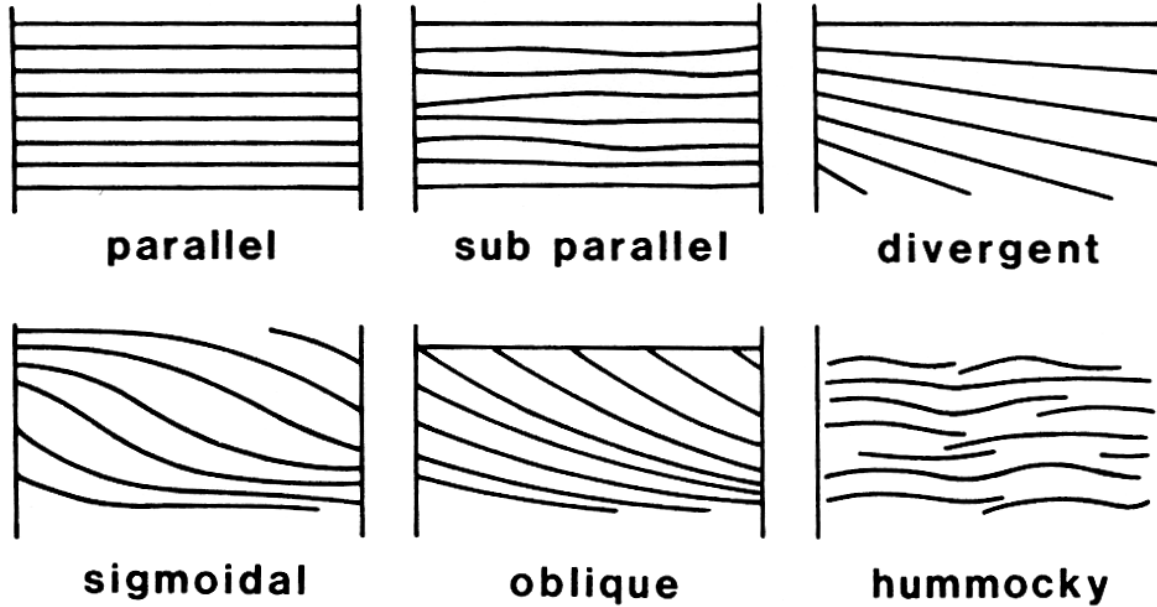


Seismic Facies-Analysis

Aim:

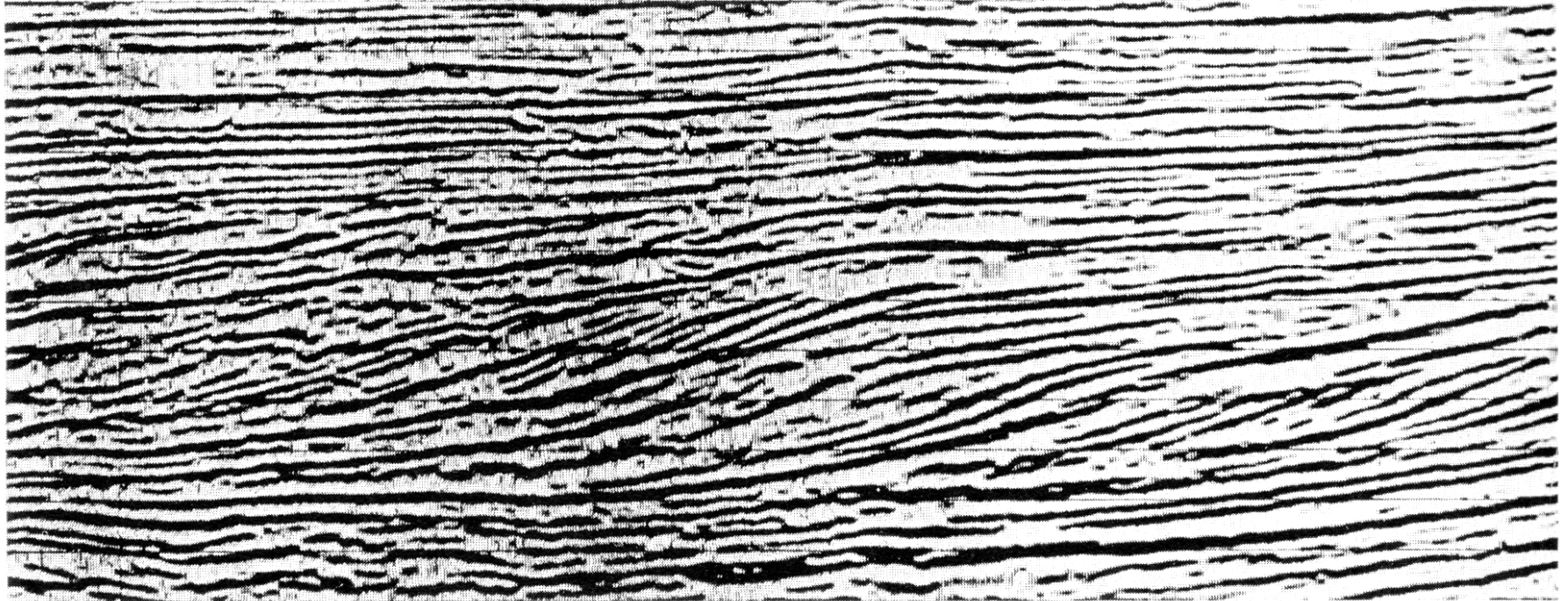
**Analysis of the character of the reflections
(amplitude, continuity, continuity and configuration)
inside a seismic sequence
to
predict the depositional environment**

Reflection patterns on seismic sections



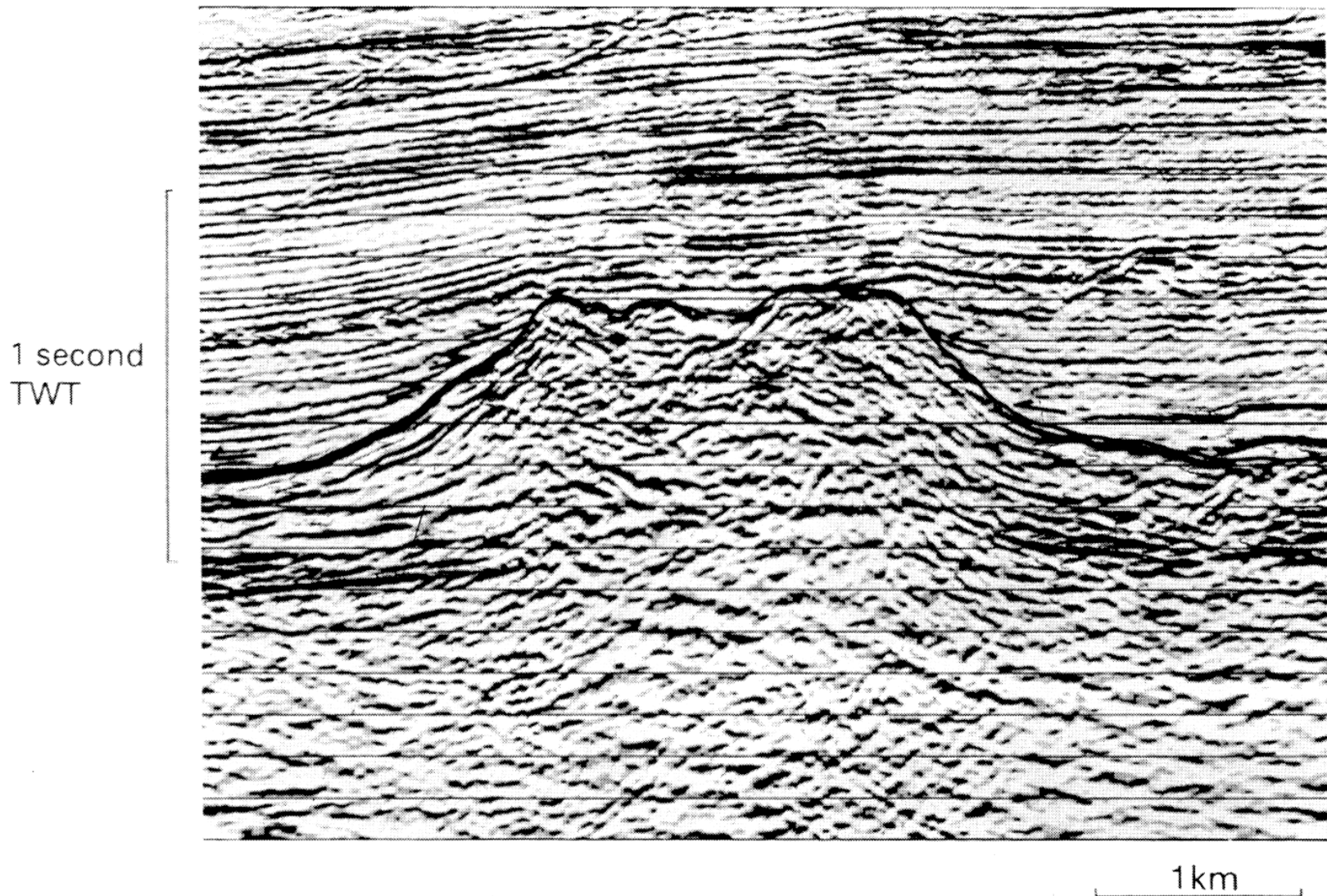
Internal Structures

Sigmoidal sequence

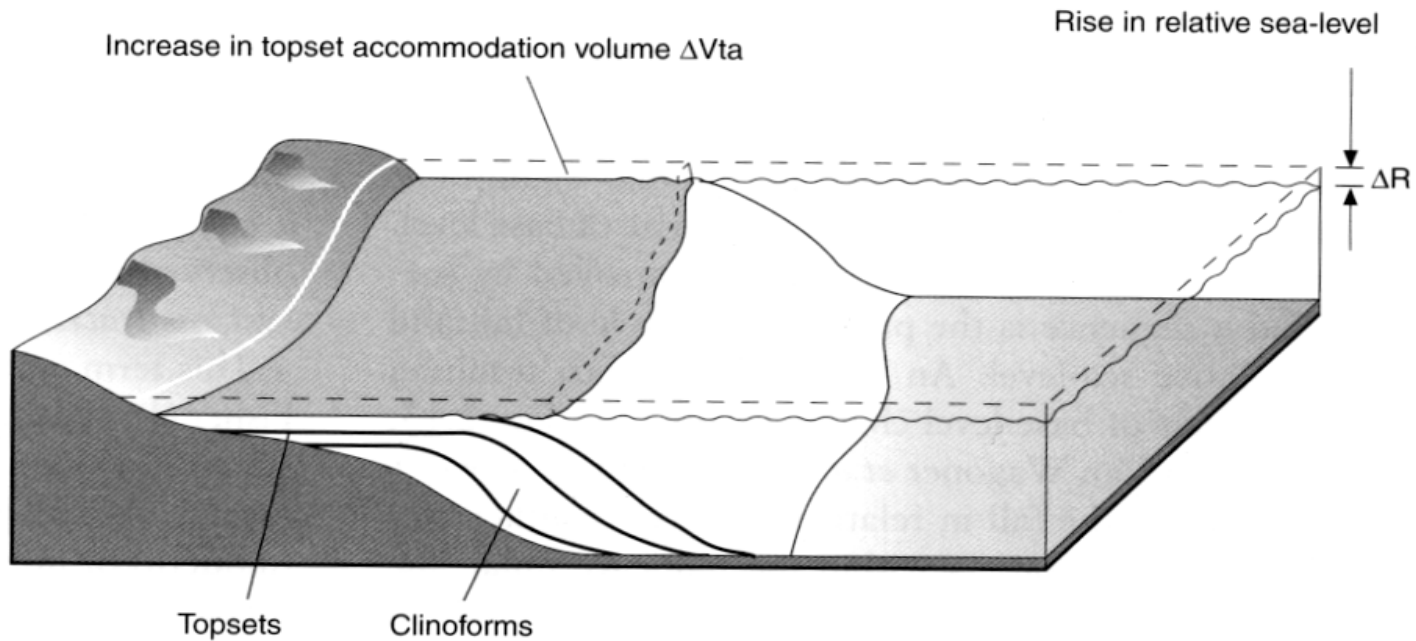


0 1 2 3 4 5 km

Hummocky sequence

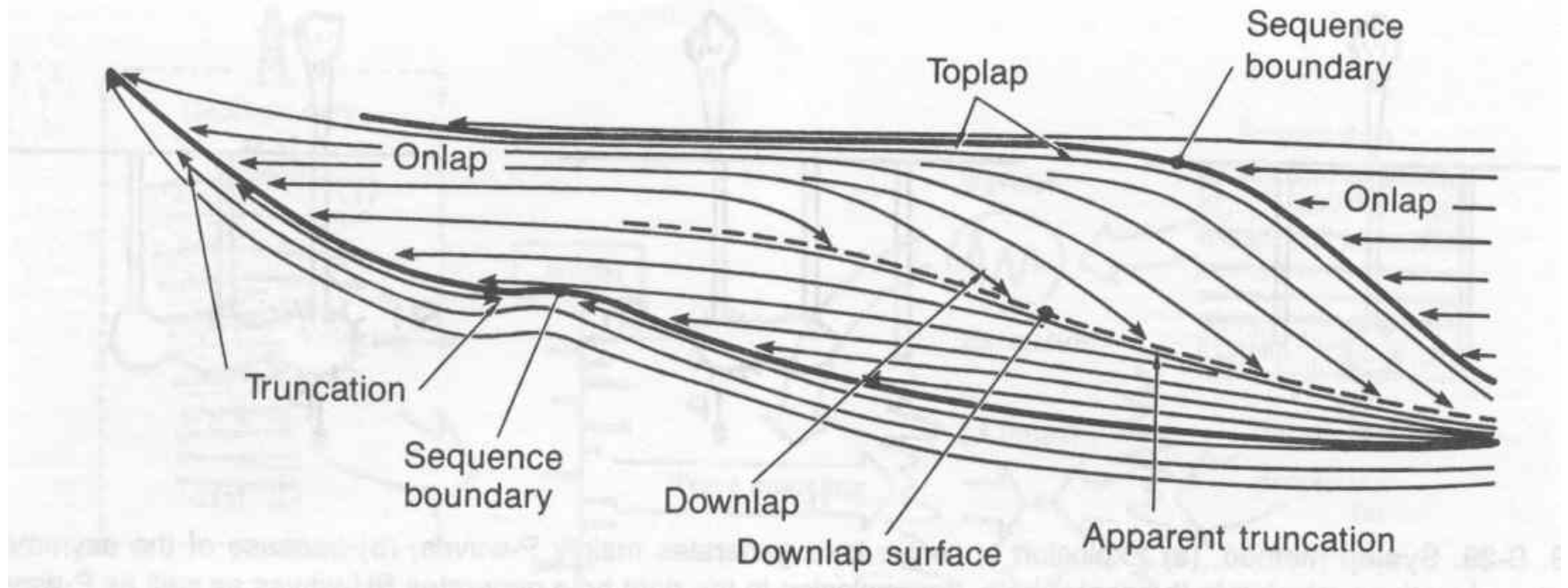


Transgression

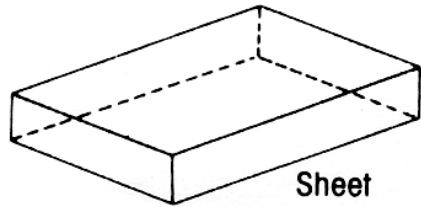


The increment of topset accommodation volume ΔV_{ta} caused by a rise in relative sea-level ΔR is equal to the product of ΔR and the topset area

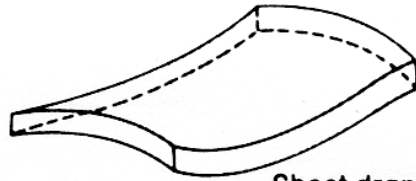
Seismic patterns that indicate sealevel changes



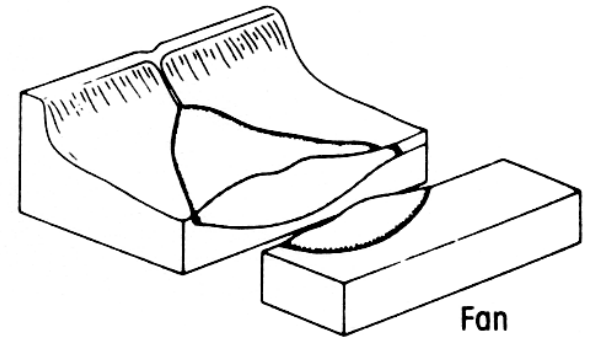
Three-dimensional shapes of seismic facies units



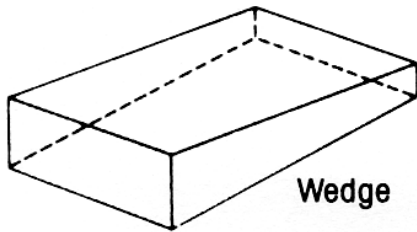
Sheet



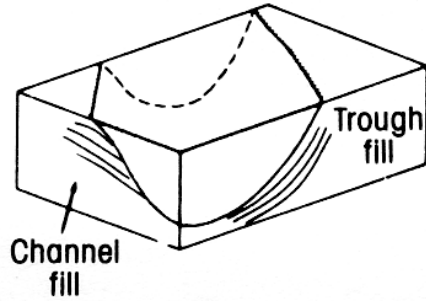
Sheet drape



Fan

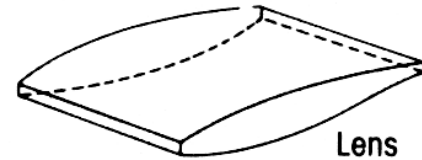


Wedge

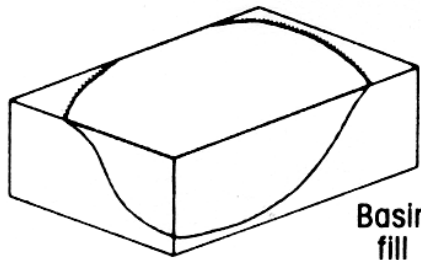


Trough fill

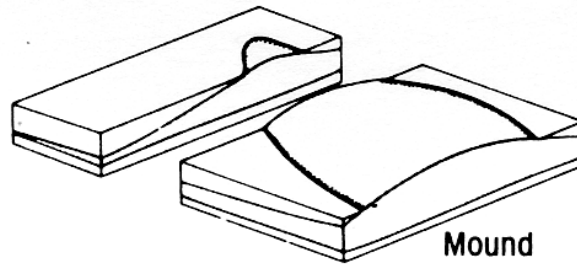
Channel fill



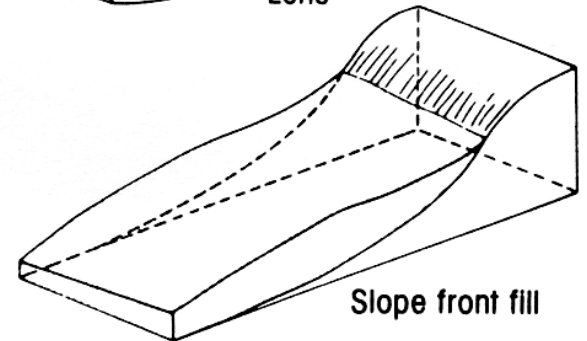
Lens



Basin fill

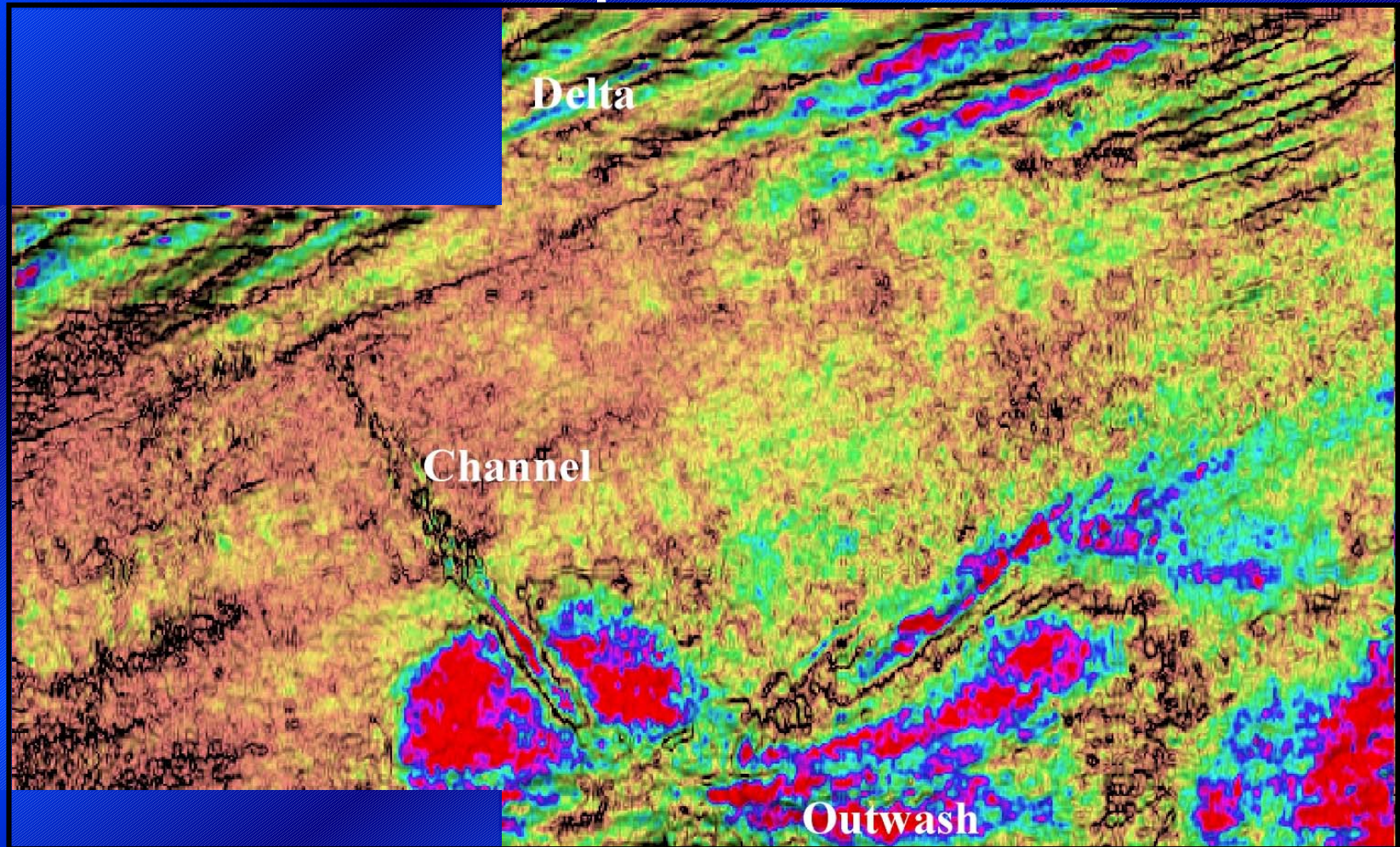


Mound

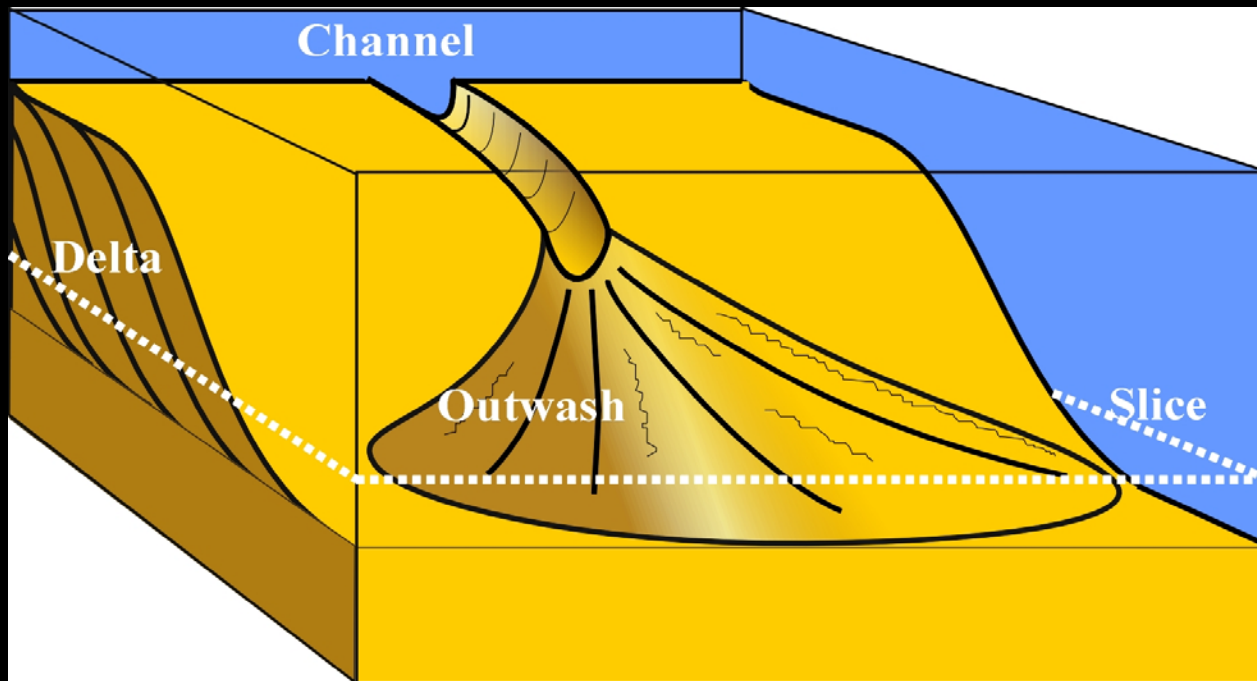


Slope front fill

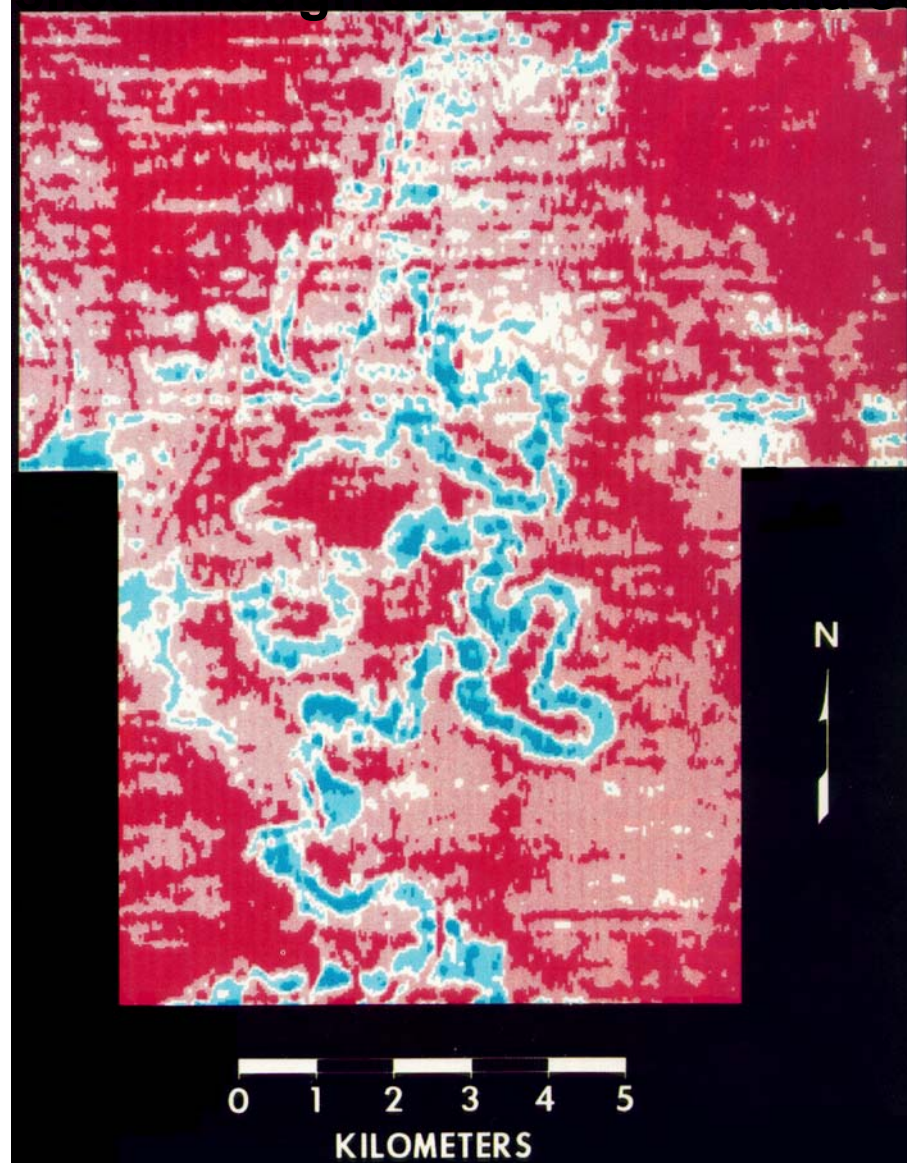
Depth slice



Geological interpretation

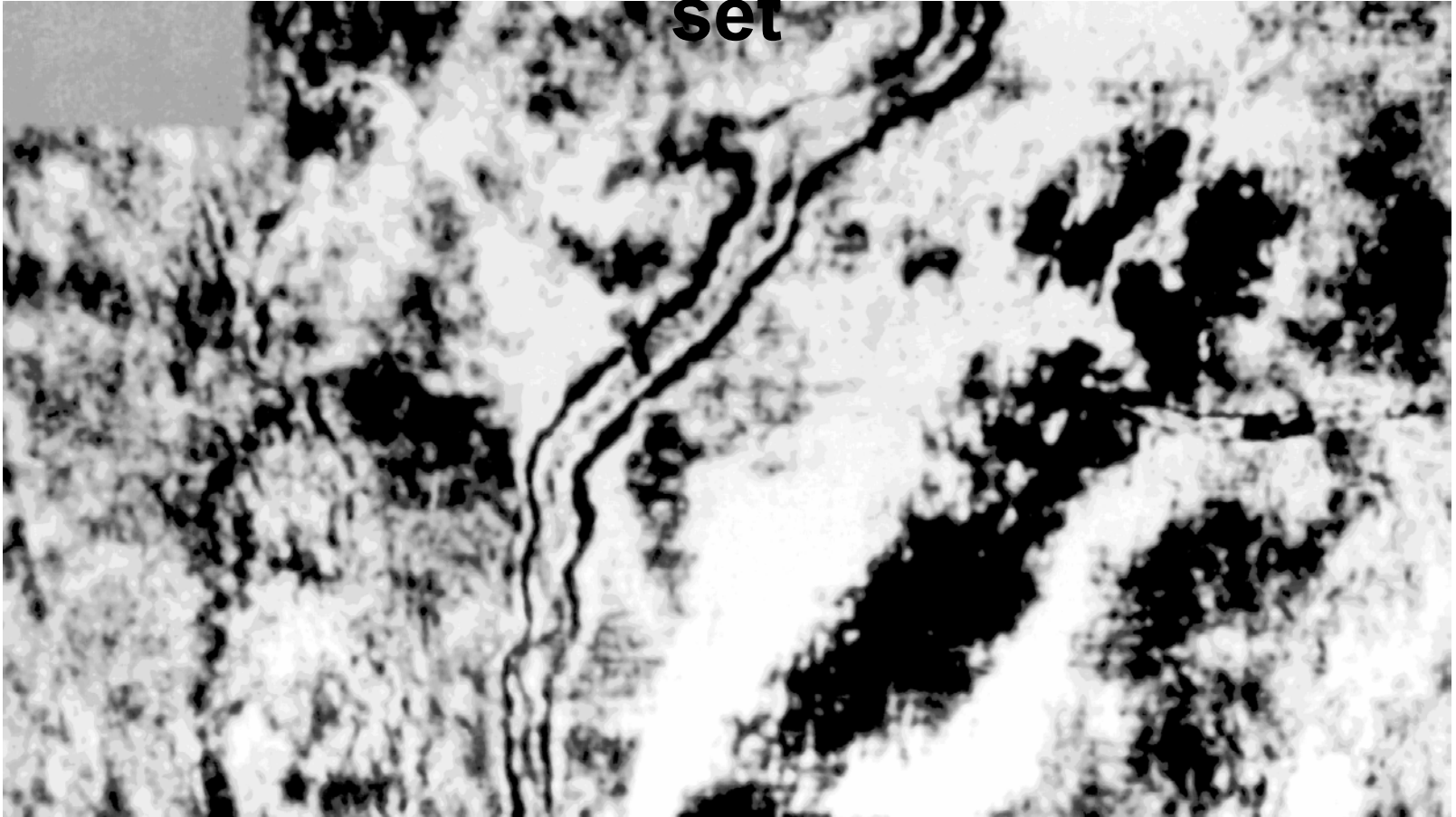


Time slice through a 3D seismic data set



(from Kearey and Brooks, 1991)

Time slice through a 3D seismic data set



(from Brown, 1991)

