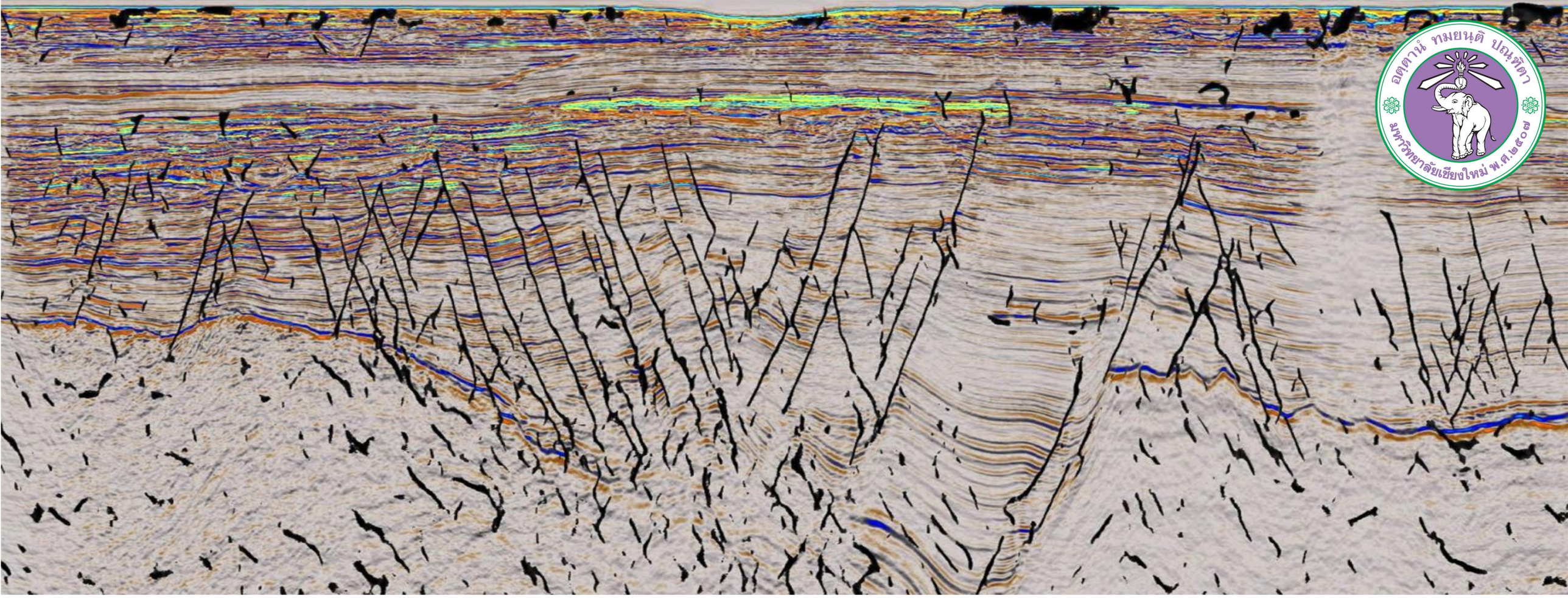


Seismic Stratigraphy Analysis Comparison Study between Parihaka 3D, New Zealand and Brecnock 3D, Australia

Shefa Ul Karim

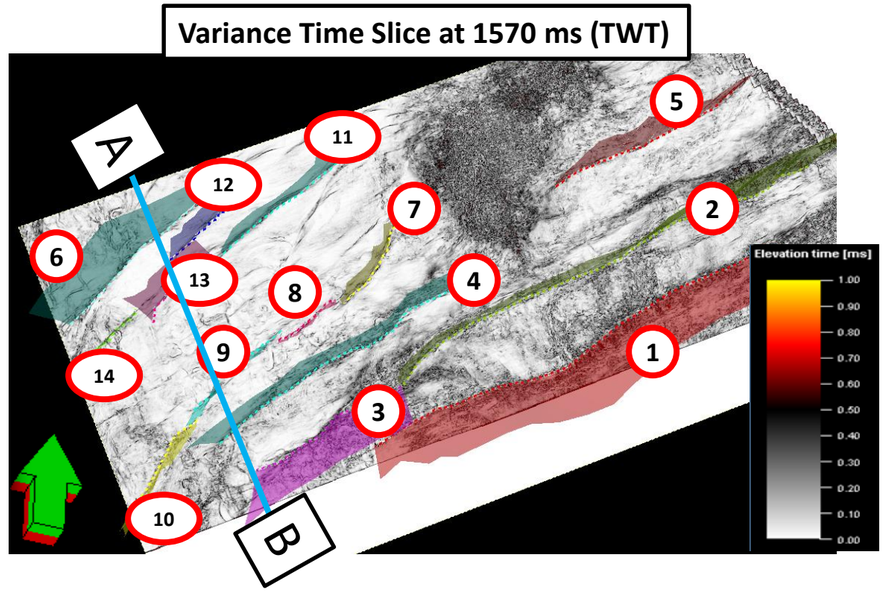
Fault Interpretation in Parihaka

- Fault type: Normal fault
- Orientation: NE-SW trend
- Dipping:

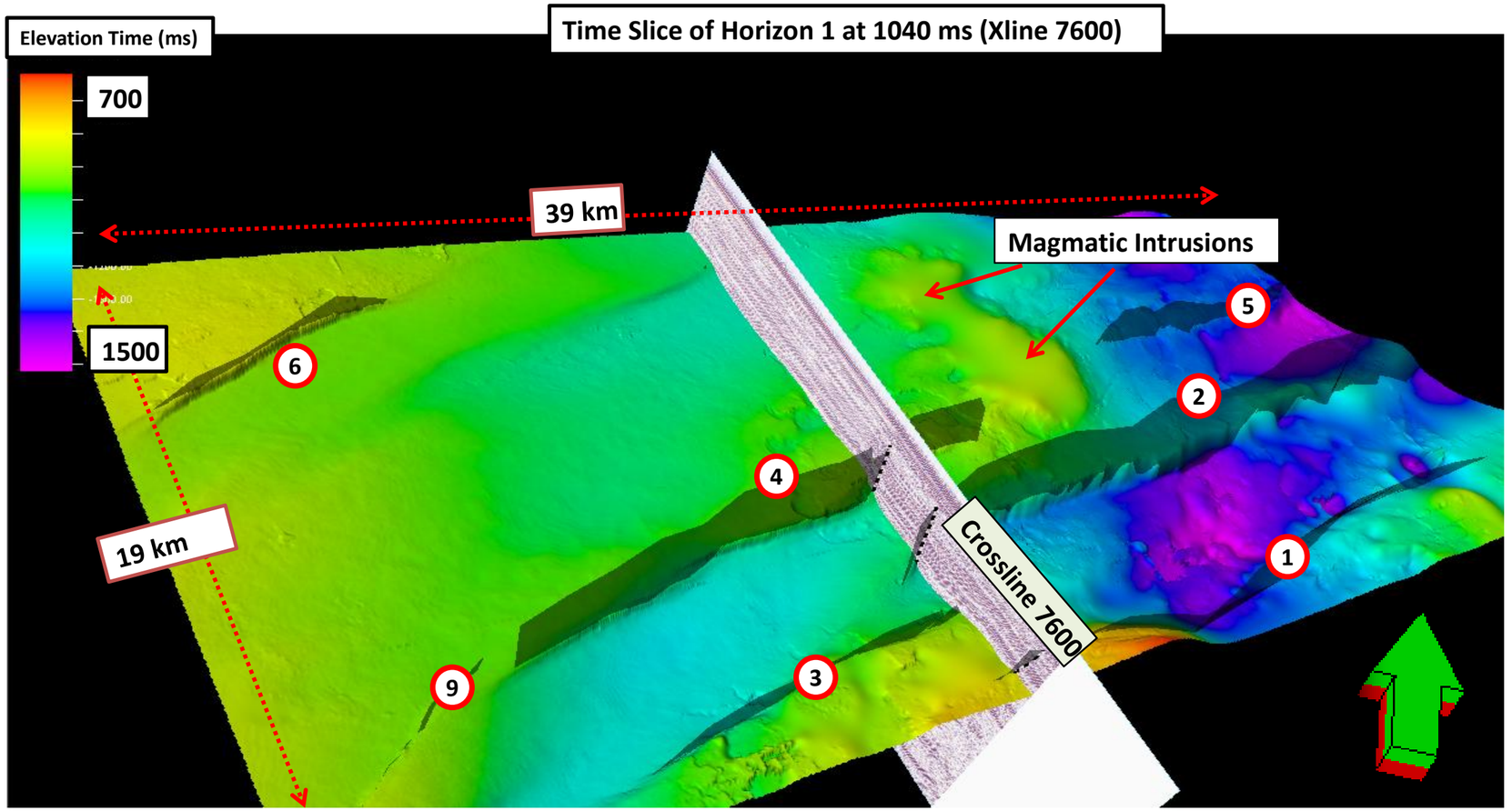
  Southeast (2,4,5,6,11, 12 and 13)
  Northwest (1,3,7,8, 9)
- Length:

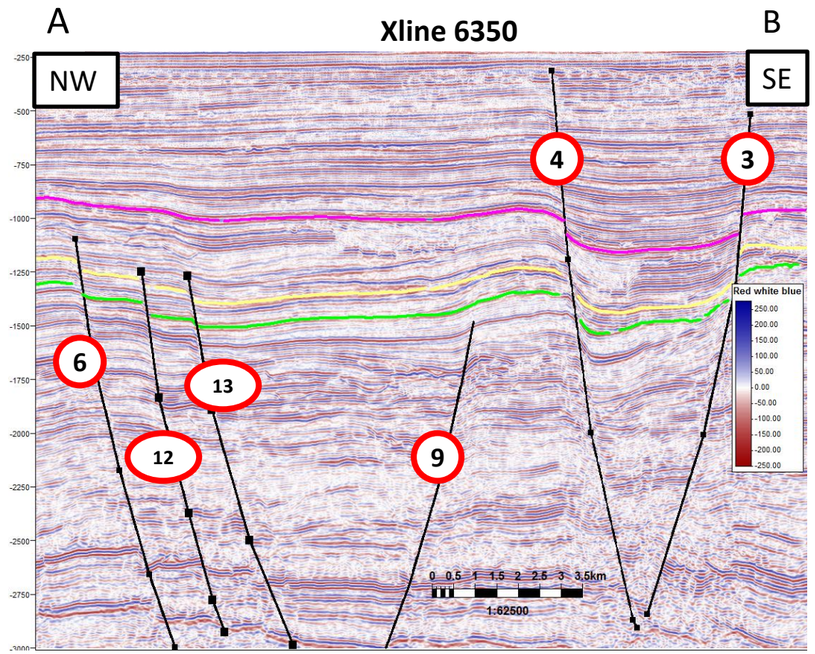
  Faults 1, 2 and 4 have very long length around 20 to 25 Km
  Rest of are about 3 to 12 Km
- Stratal offset:

  Major faults : 100-200ms
  Minor faults : 5-40 ms

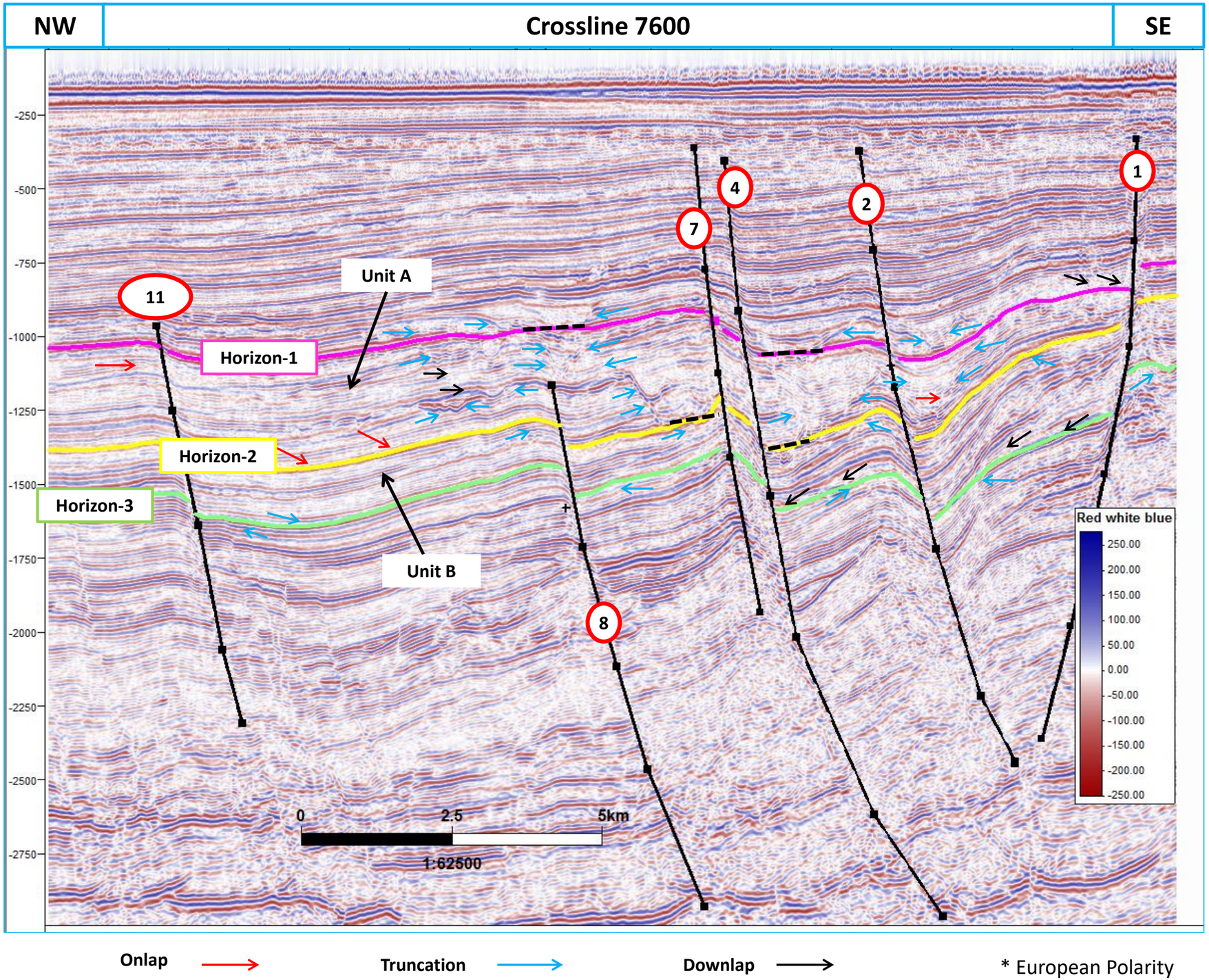


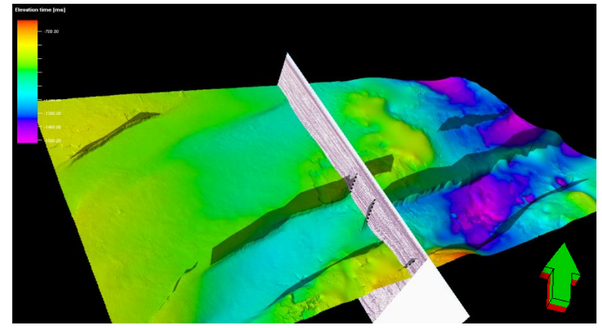
- ❖ Major Faults: 1 to 6
- ❖ Minor faults:7 to 14





Horizon interpretation in Parihaka





Horizon 1: Defined by peak with low continuity, characterized by truncation and downlap.

Horizon 2: Defined by peak with moderate to low continuity, characterized by truncation and onlap.

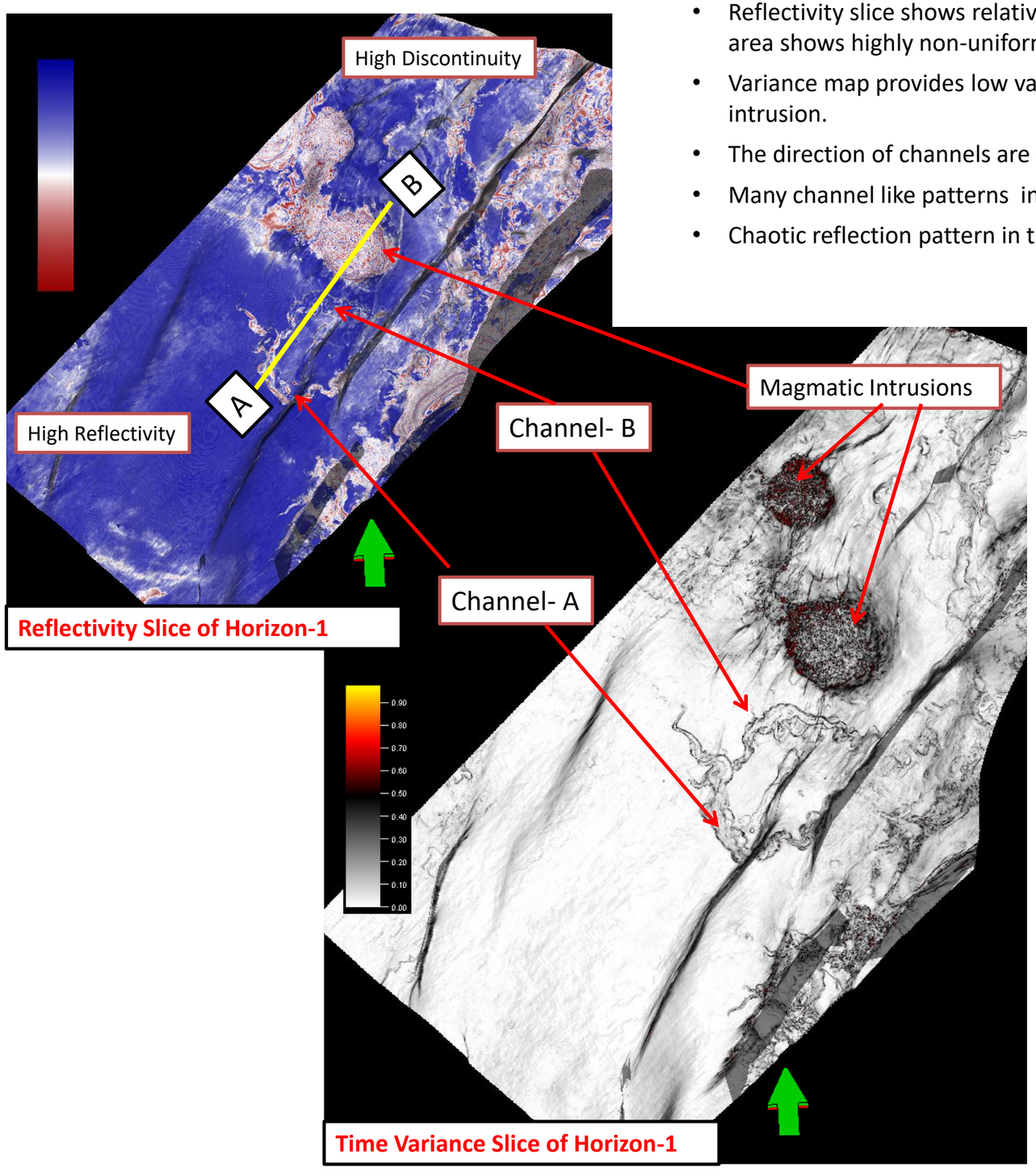
Horizon 3: Defined by peak with moderate to low continuity, characterized by truncation and downlap.

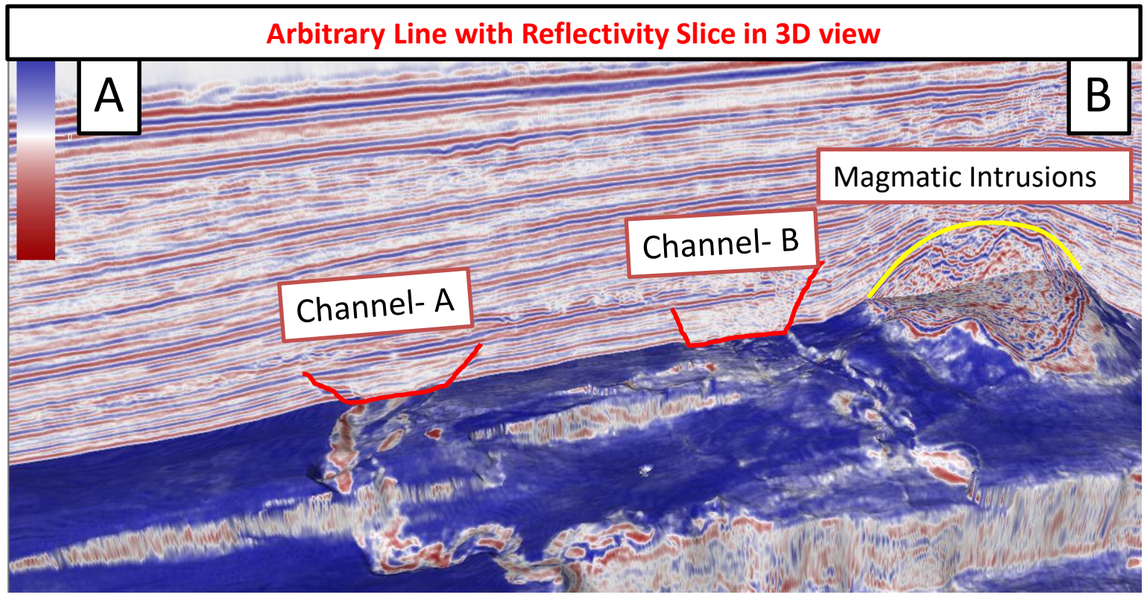
- **Unit A:** Reflections are low amplitude with moderate to low frequency and low continuity. The internal configuration is sub-parallel and chaotic.

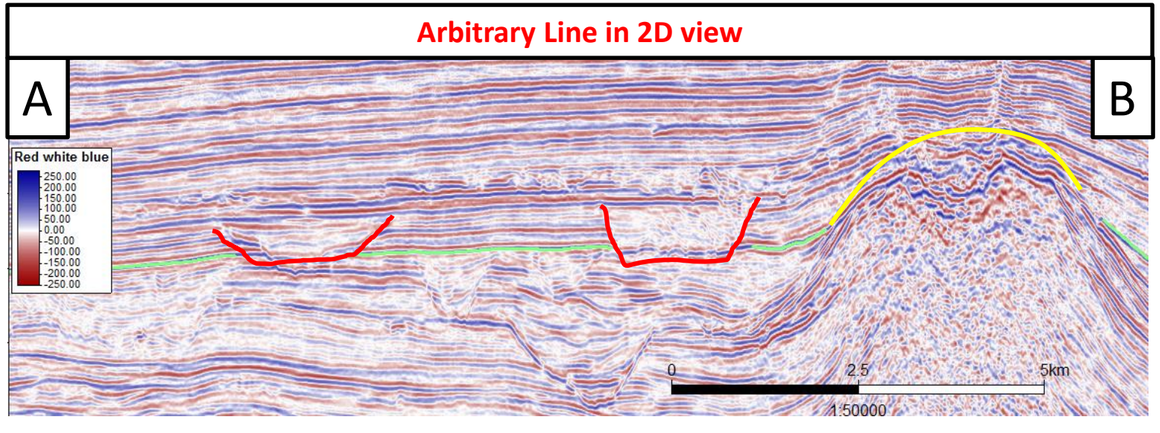
- **Unit A**: Reflections are moderate amplitude with relatively high frequency and low continuity. The internal configuration is sub-parallel and contourted.

Horizon Slice Display (Parihaka)

- Reflectivity slice shows relatively uniform in the SW zone which represent the high reflectivity zone and center to NE area shows highly non-uniform value which represents high discontinuity zone.
- Variance map provides low variation in high reflectivity area and two circular shape with high variance value as result of intrusion.
- The direction of channels are controlled by the structure.
- Many channel like patterns induced at the center to SE area of the survey area.
- Chaotic reflection pattern in the arbitrary line is because of magmatic intrusion.

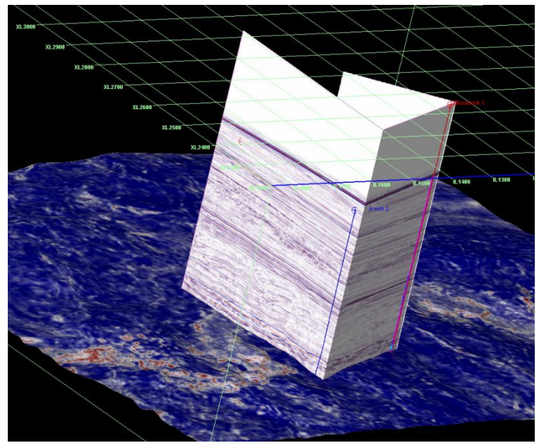




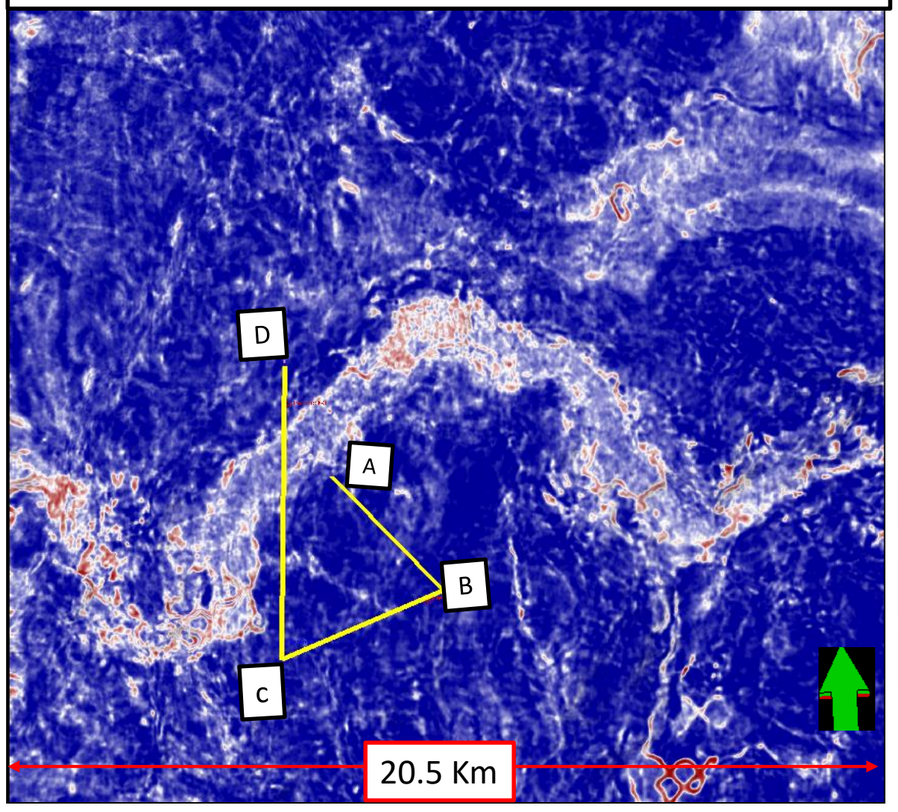


Horizon Interpretation in Brecknock

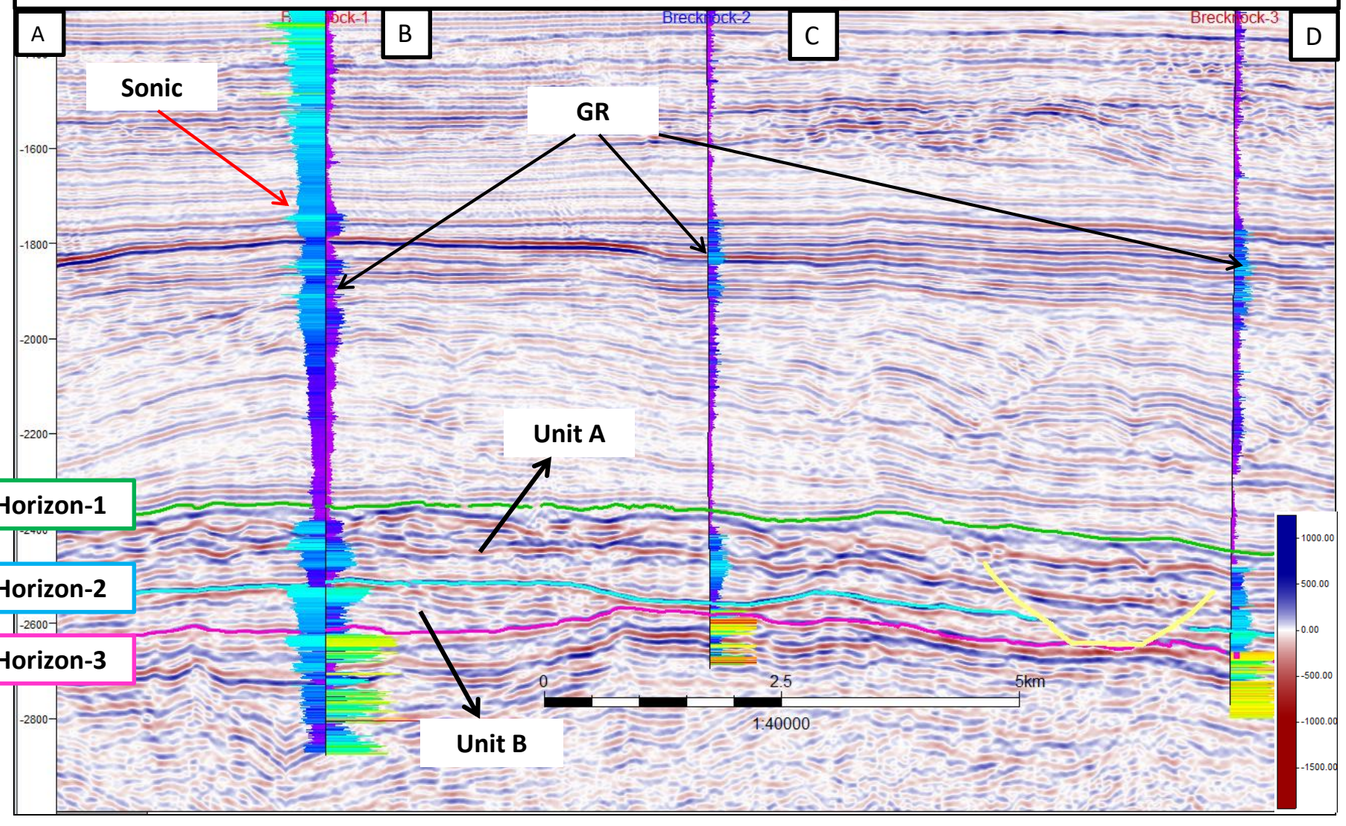
- Horizon 1 is defined by trough with Moderate to high continuity and Horizon 2 & 3 are defined by peak with low continuity.
- **Unit A:** Reflections are high to moderate amplitude with low to moderate frequency and low continuity. The external structure is mound and Internal structure are hummocky and chaotic.
- **Unit B:** Reflections are low amplitude, low frequency and low discontinuity. The Internal reflections may be chaotic or Contorted.
- Reflection Slice Shows relatively low uniform because Horizon-2 truncated by channels and reflections configuration is highly discontinuous.

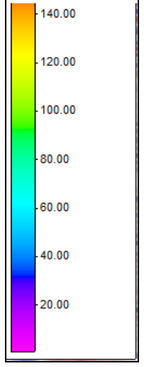


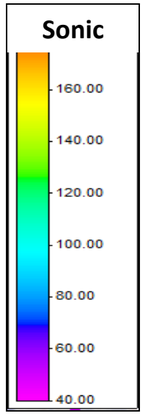
Reflectivity Slice of Horizon-2



Arbitrary Line with Well Logs



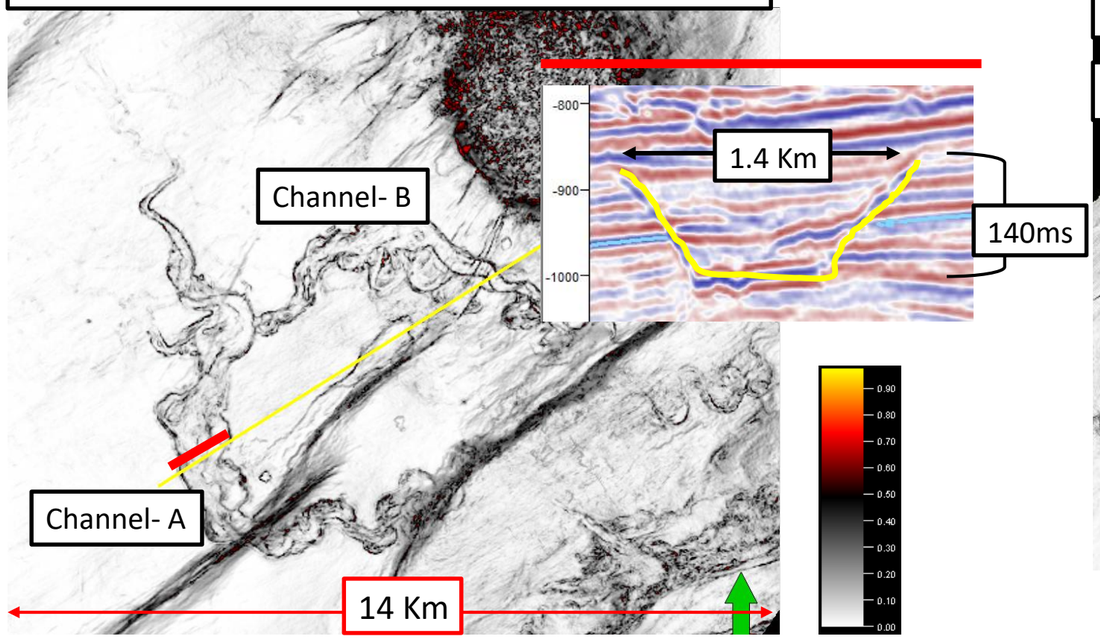




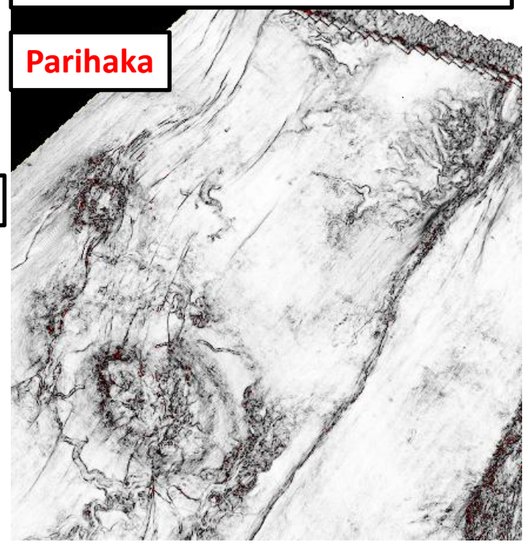
* European Polarity

Pahrihaka Vs Brecknock

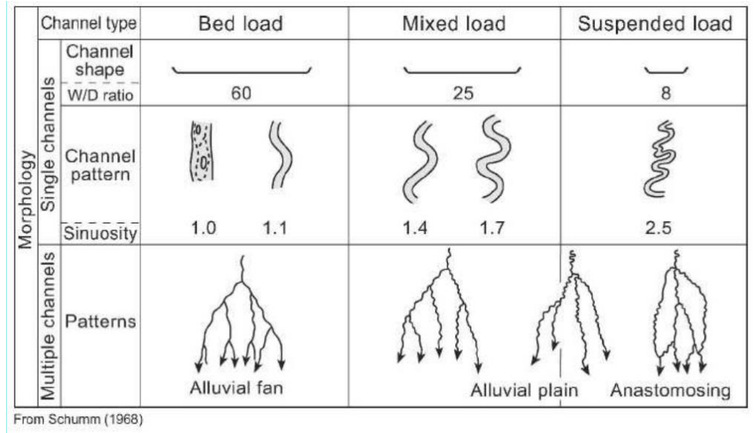
Time Variance Slice of Parihaka (1040ms/ Horizon-1)



Variance at 830 ms in Parihaka



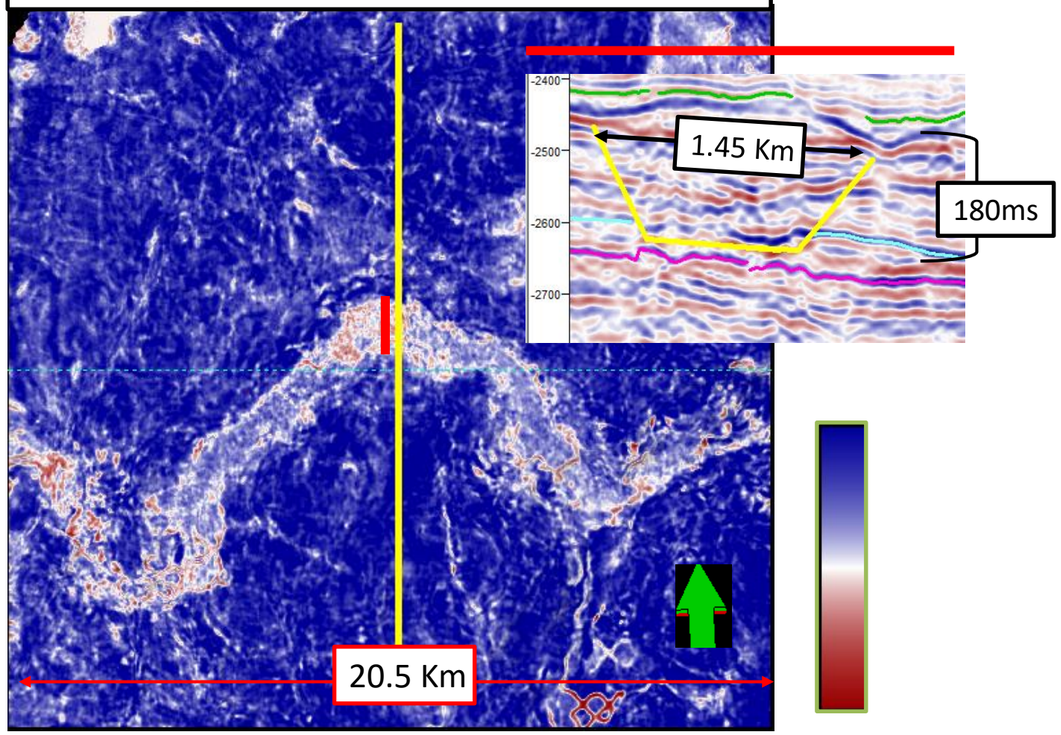
Parameter	Parihaka	Brecknock
Length	10.5 Km	27 Km
Width	1.5 Km	2.7 Km
Incision Depth	90-170 ms	130-240 ms
W/D ratio	About 13	About 18
Sinuosity Index	1.8	1.4



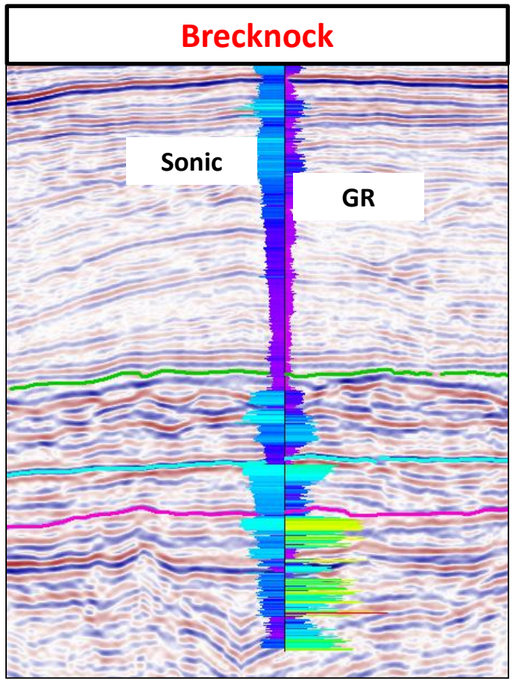
From Schumm (1968)

*Breack Knock sedimentary load may be mixed load
*Prihaka sedimentary load may be suspended load

Reflectivity Slice in Brecknock (2620ms/Horizon-2)



Brecknock



Similarity:

- ❑ Channel geometry are same (meandering).
- ❑ Depositional Environment may be shallow marine.

Thank You