Crooked-line seismic data processing at Castle-mountain

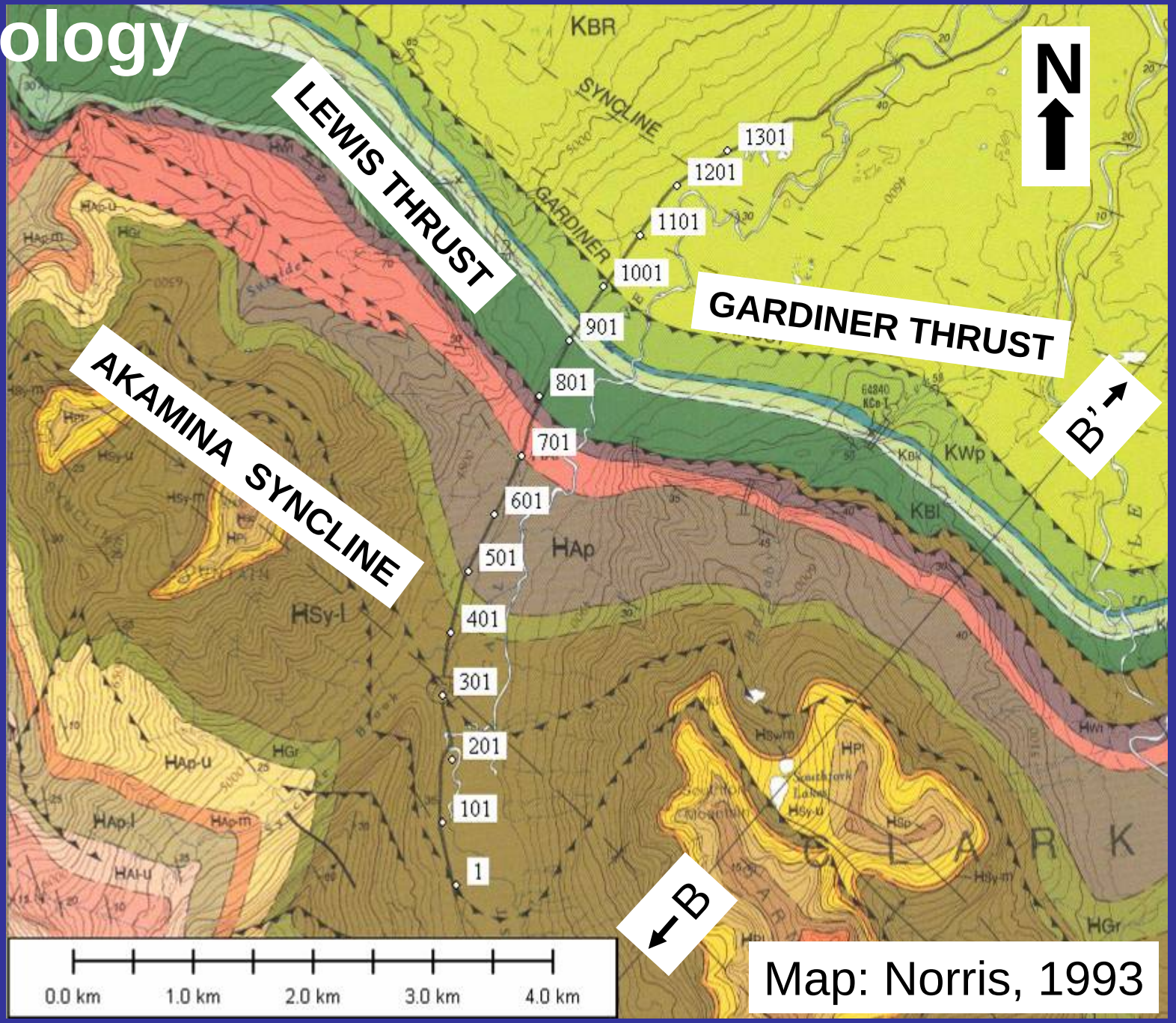
Kevin W. Hall, Hanxing Lu,
Gabriela M. Suarez and
Robert R. Stewart

Acquisition

Recording System	ARAM
Source	Single vertical vibrator (IVI EnviroVibe)
Source Array	Stationary at 5 m VP interval, 4 sweeps per VP. Diversity stacked in the field.
Sweep	8-120 Hz over 16 s with 4 s listen time
Receivers	I/O SM24 10Hz single component at 5 m spacing. 400 live channels per shot; rolling spread.
Receiver Array	Single sensor per station.

Acquisition

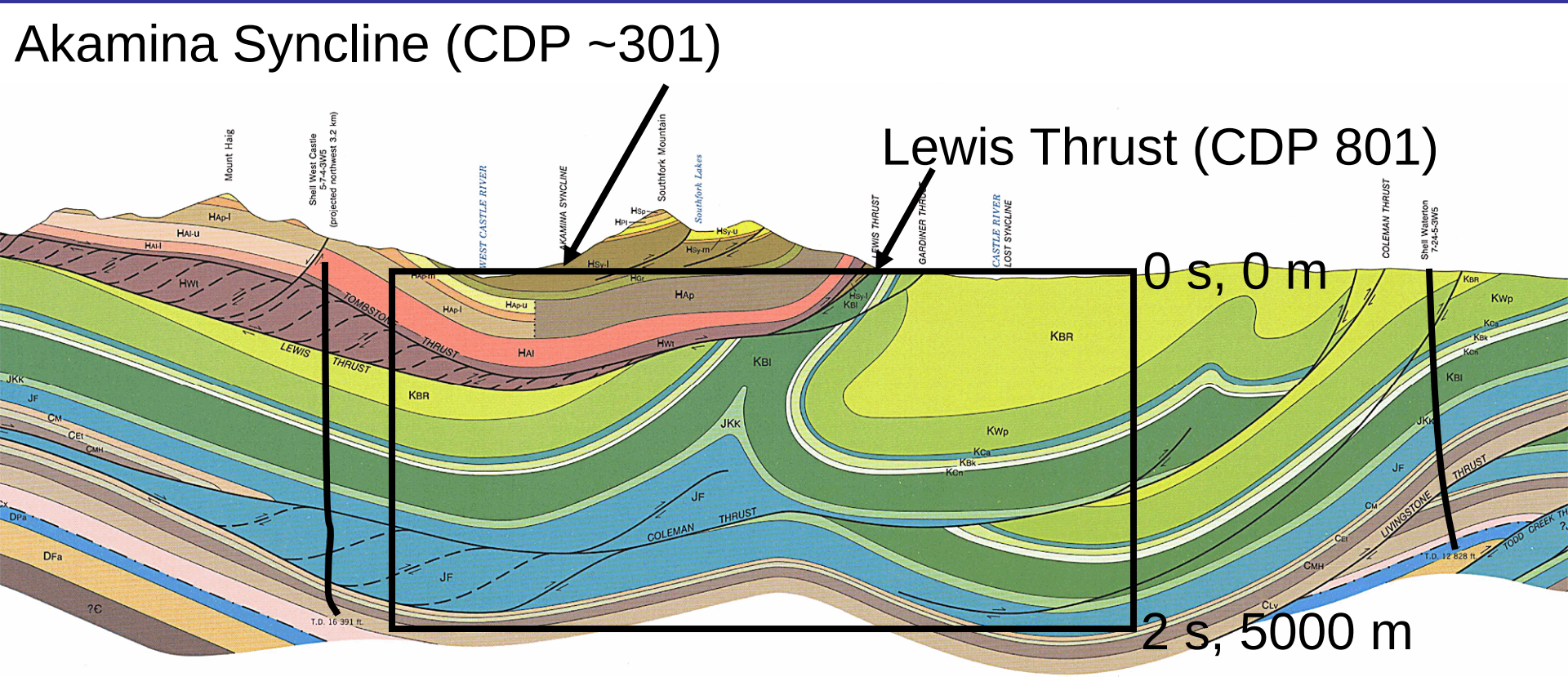
Geology



Map: Norris, 1993

Geology

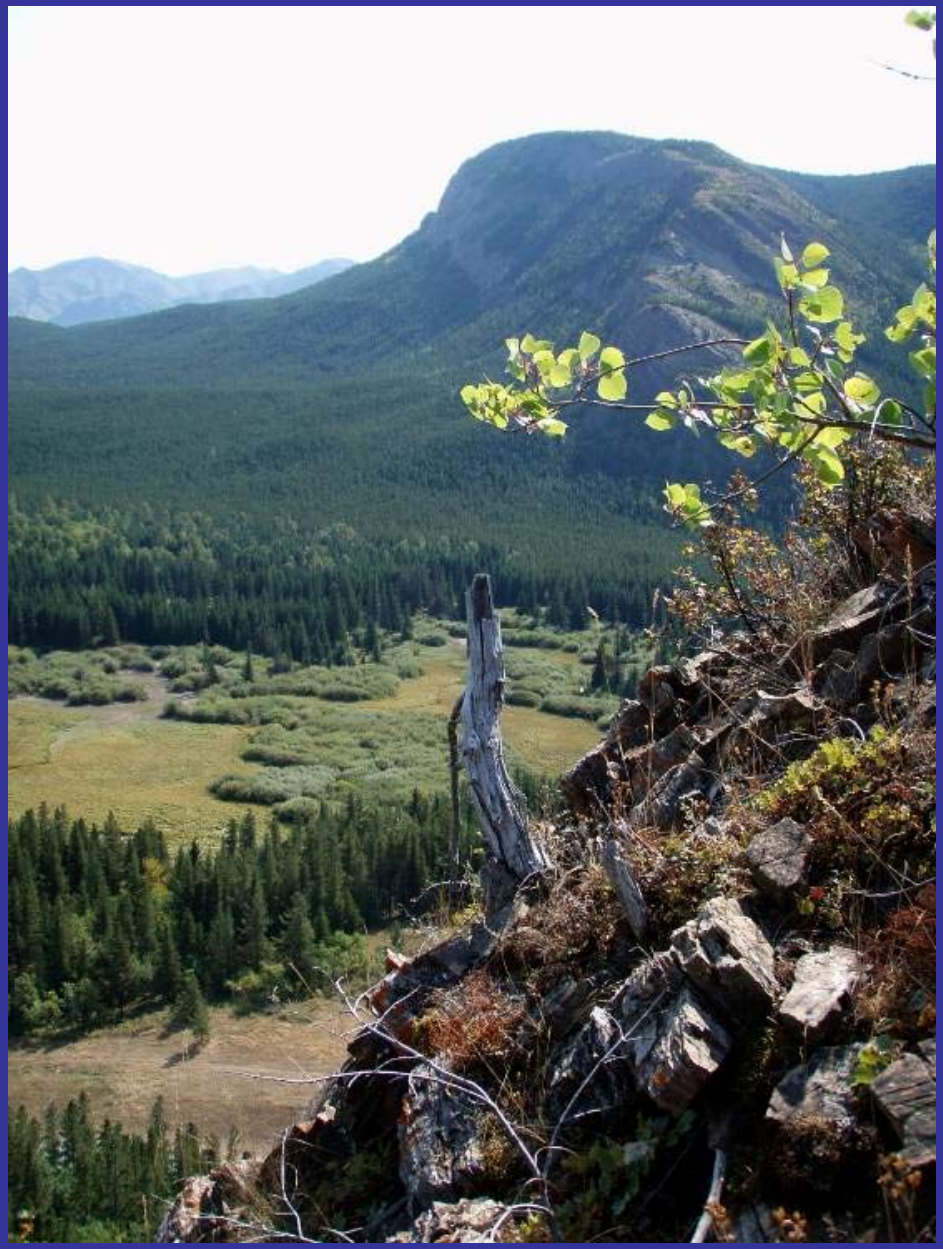
←B B'→



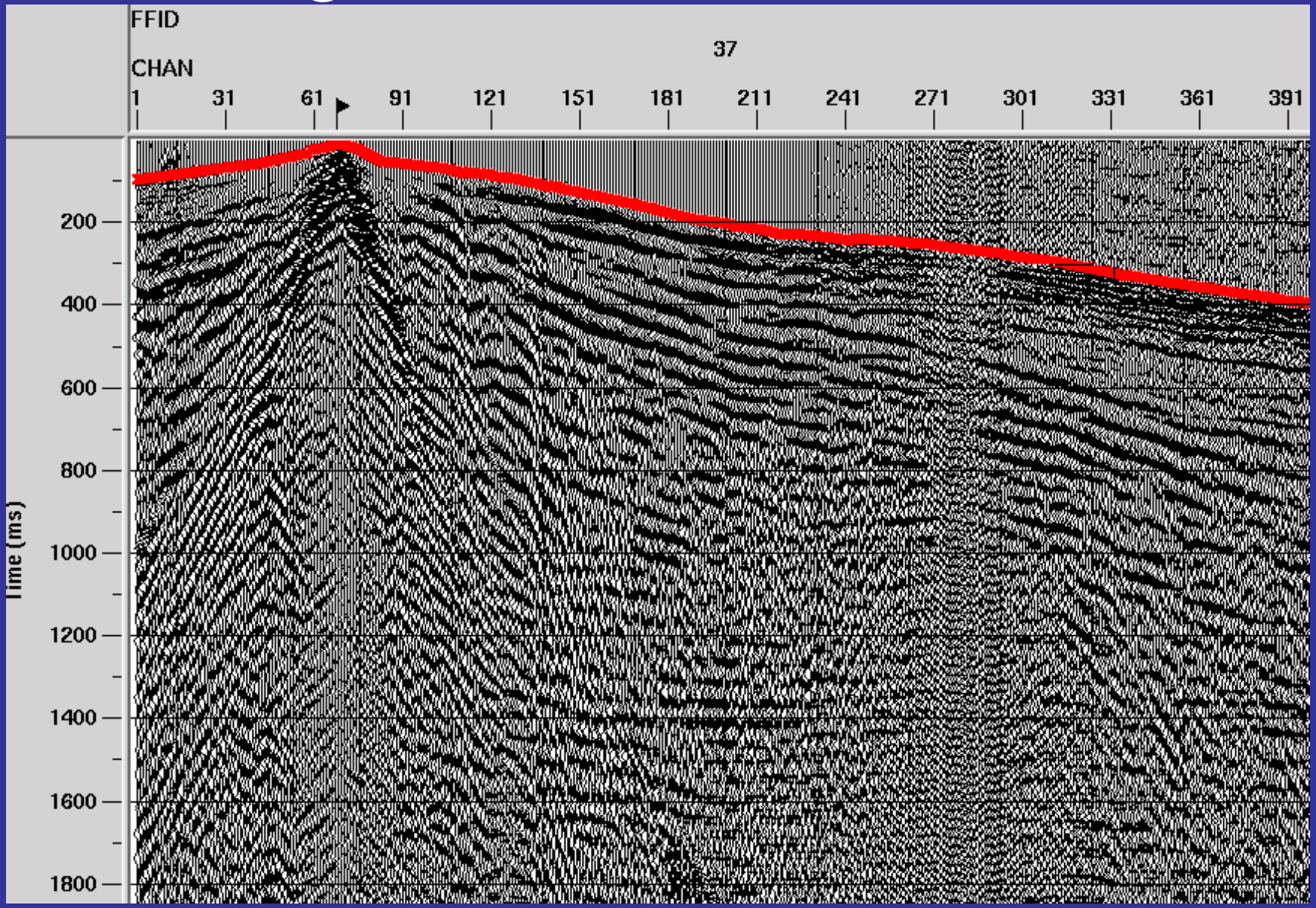
Depth to time conversion assumes constant 5000 m/s velocity

Cross-section: Norris, 1993

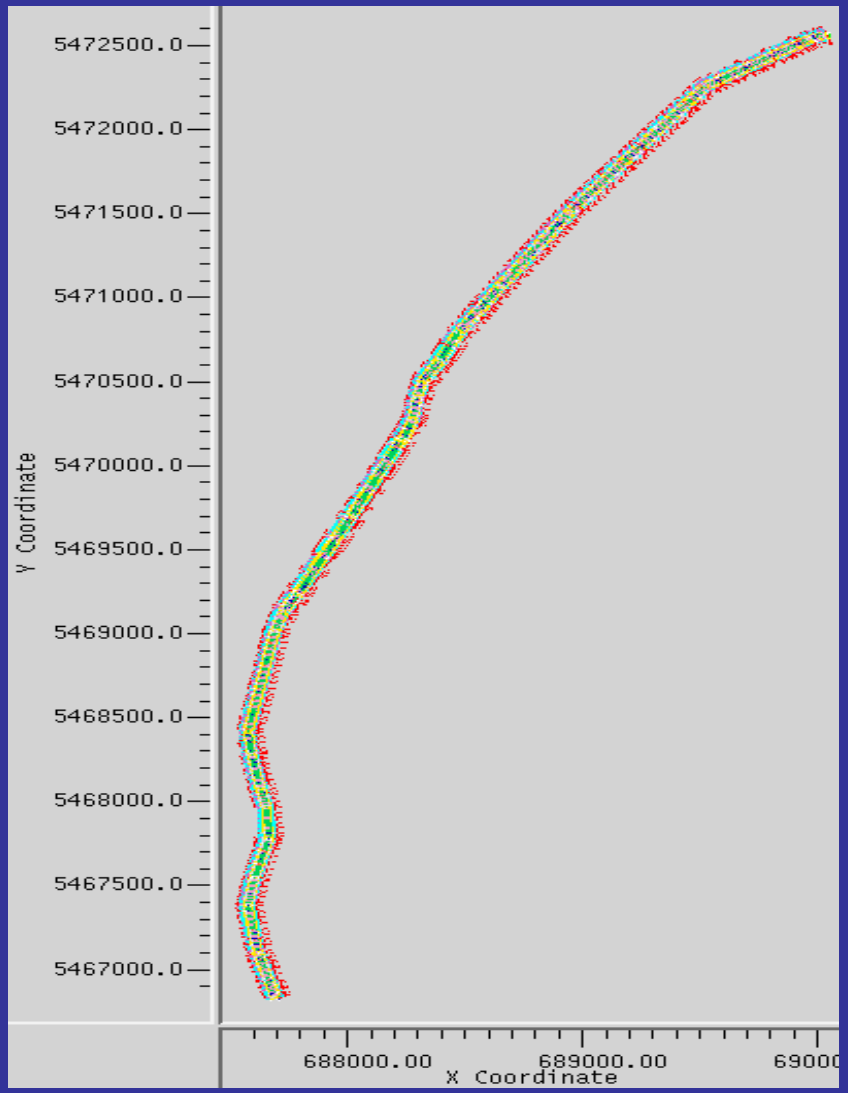
Geology



Processing


FFID
37
CHAN
1
31
61
91
121
151
181
211
241
271
301
331
361
391
200
400
600
800
1000
1200
1400
1600
1800
Time (ms)

Processing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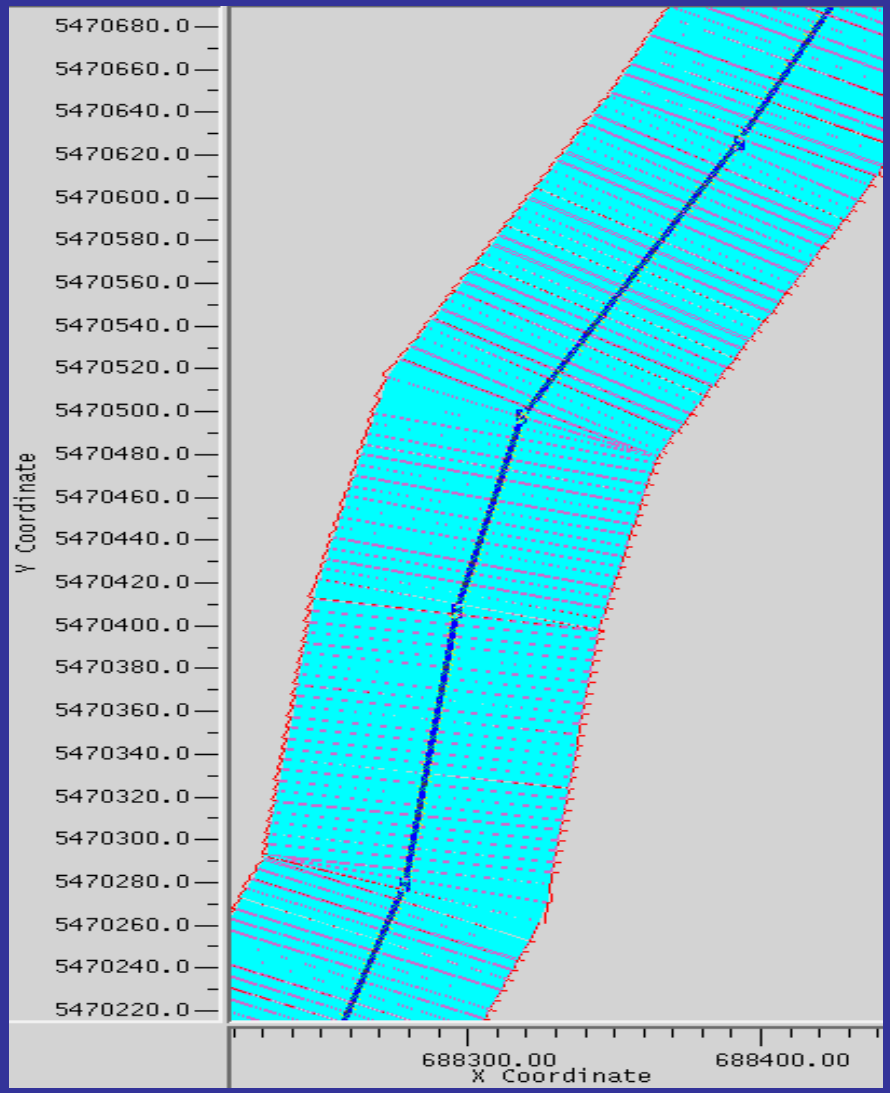
5472000.0
5471500.0
5471000.0
5470500.0
5470000.0
5469500.0
5469000.0
5468500.0
5468000.0
5467500.0
5467000.0
Y Coordinate
688000.00
689000.00
X Coordinate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5470660.0
5470640.0
5470620.0
5470600.0
5470580.0
5470560.0
5470540.0
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5470500.0
5470480.0
5470460.0
5470440.0
5470420.0
5470400.0
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5470360.0
5470340.0
5470320.0
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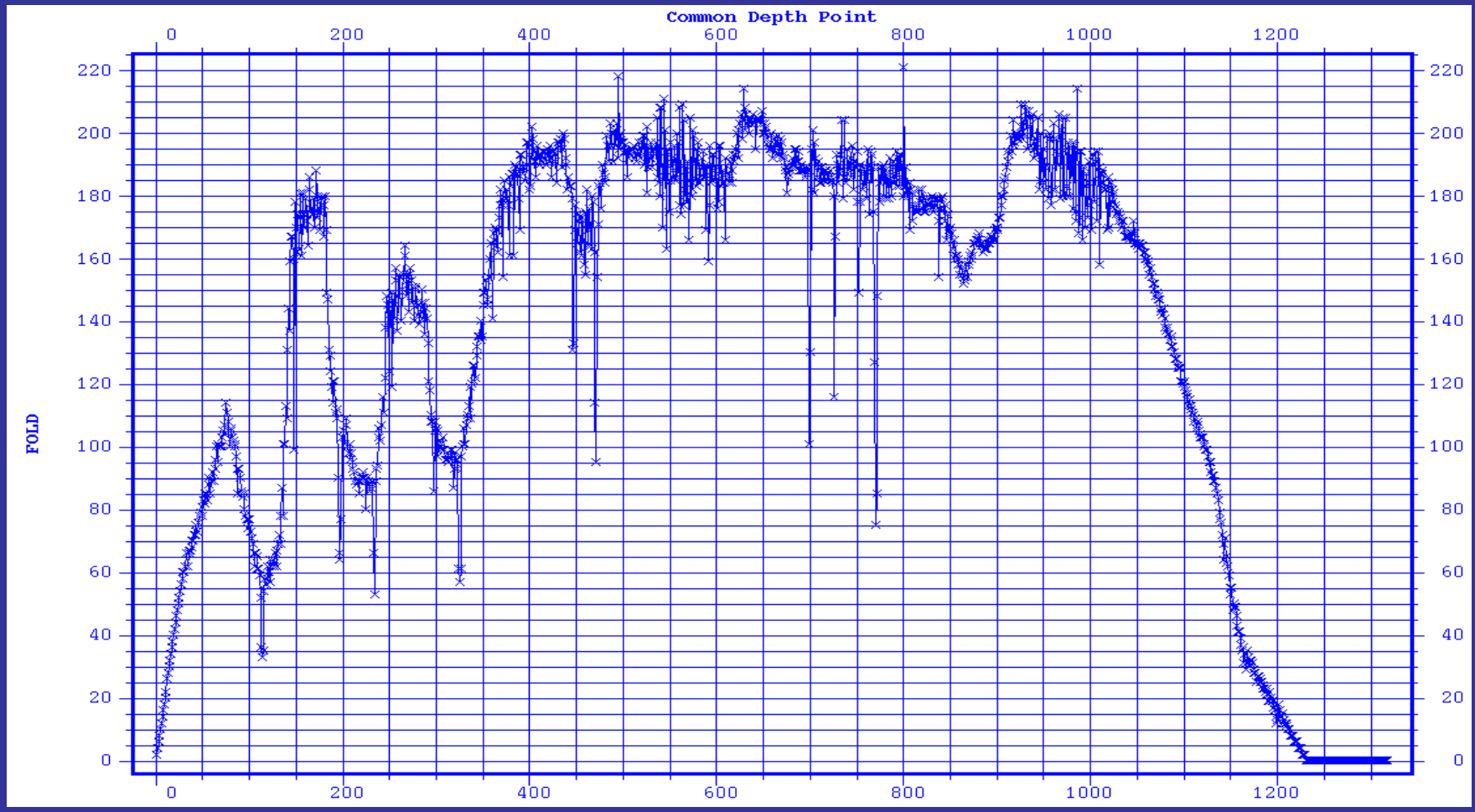
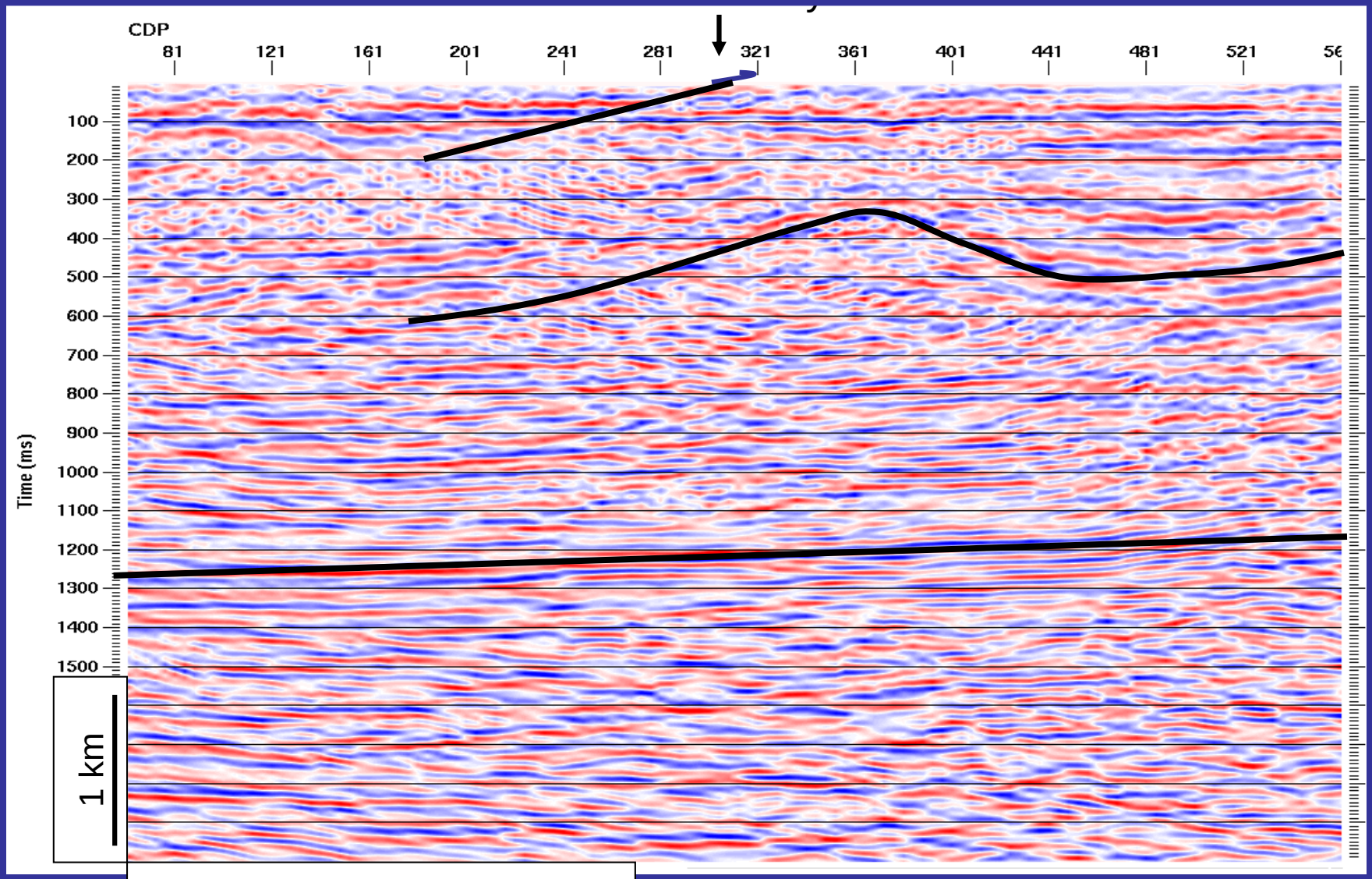
5470220.0
Y Coordinate
688300.00
688400.00
X Coordinate

Processing

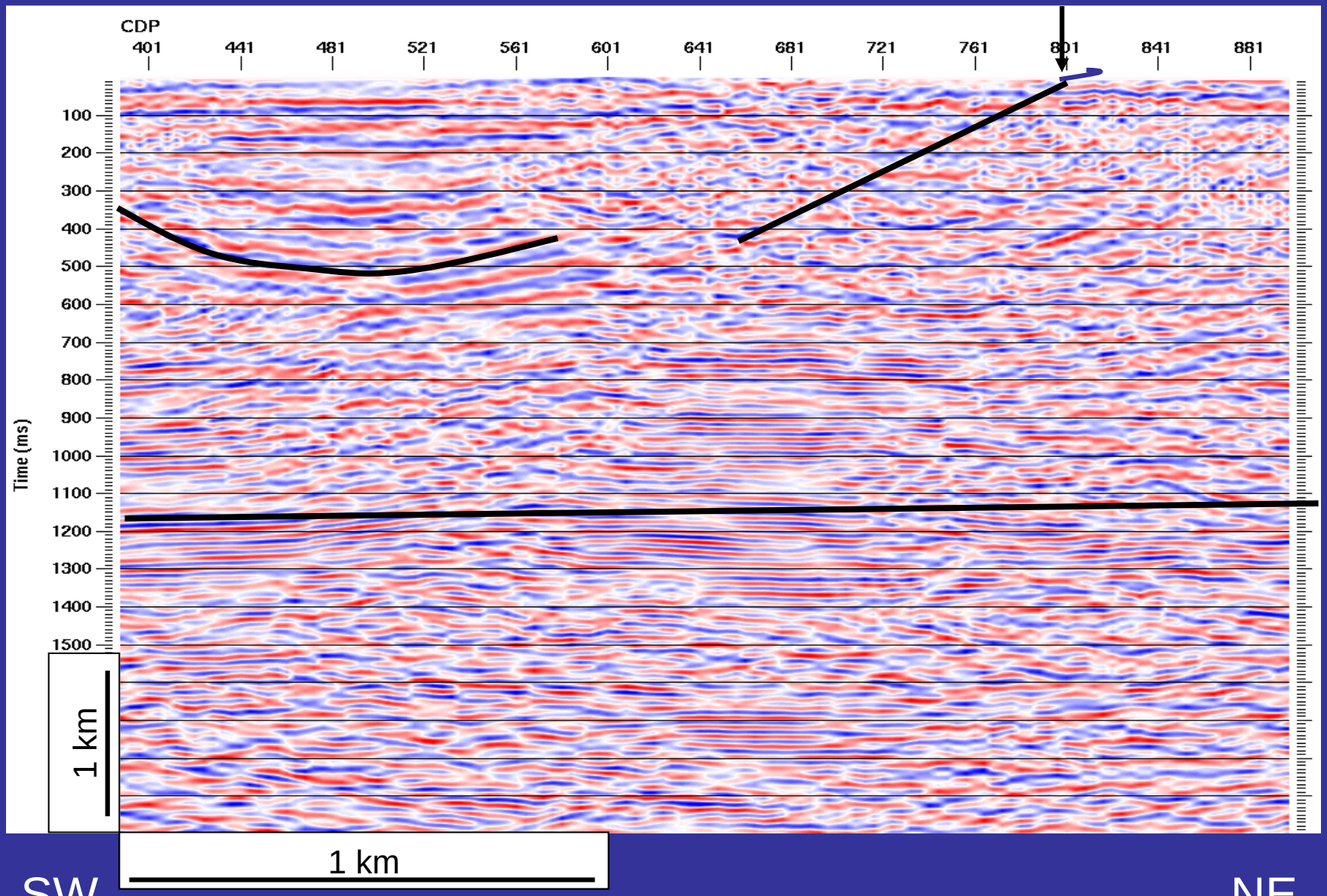


CDP fold for 5x100 m bins; ARAM data.

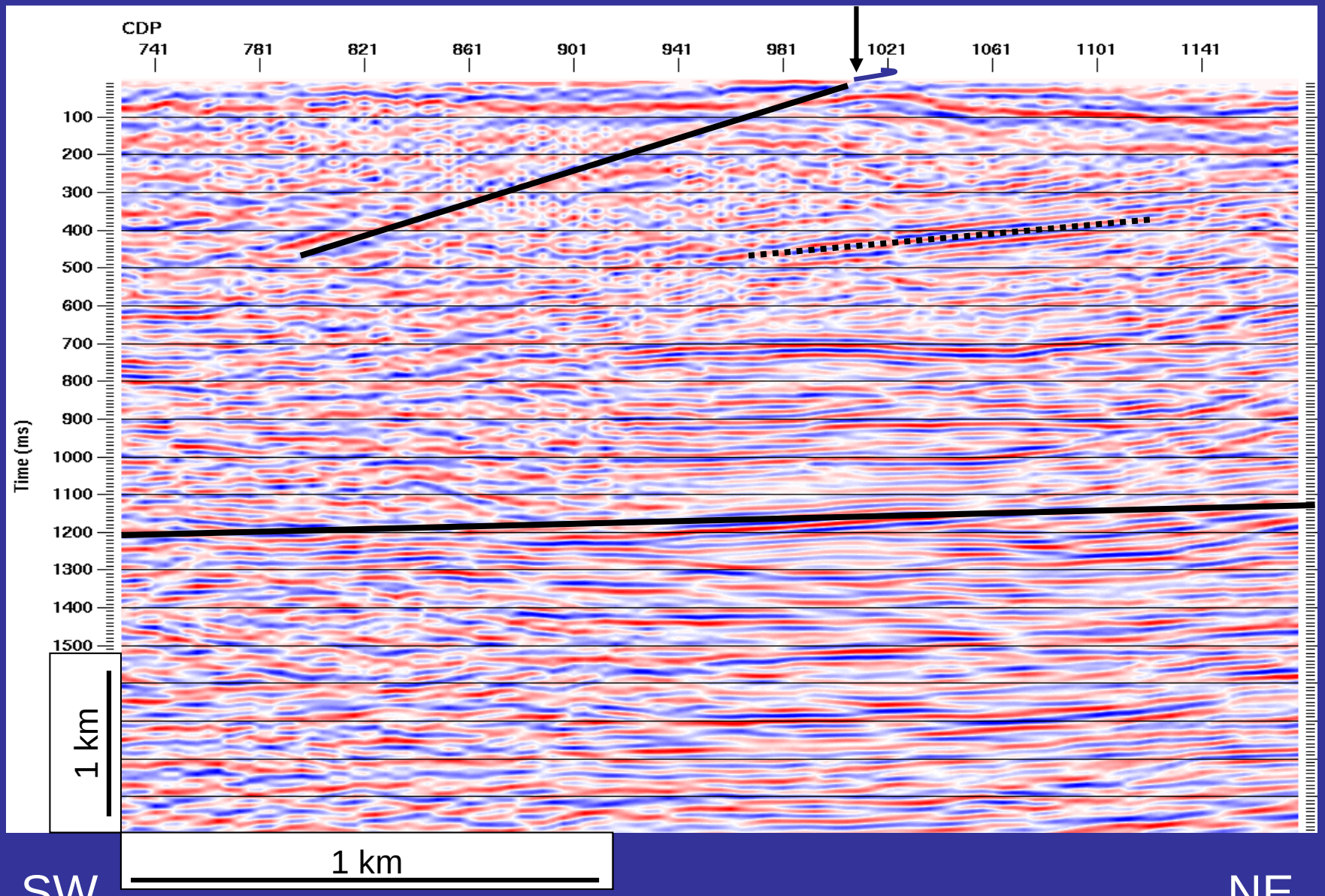
Results


Akamina Syncline
CDP
81
121
161
201
241
281
321
361
401
441
481
521
Time (ms)
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1 km
1 km
SW
NE

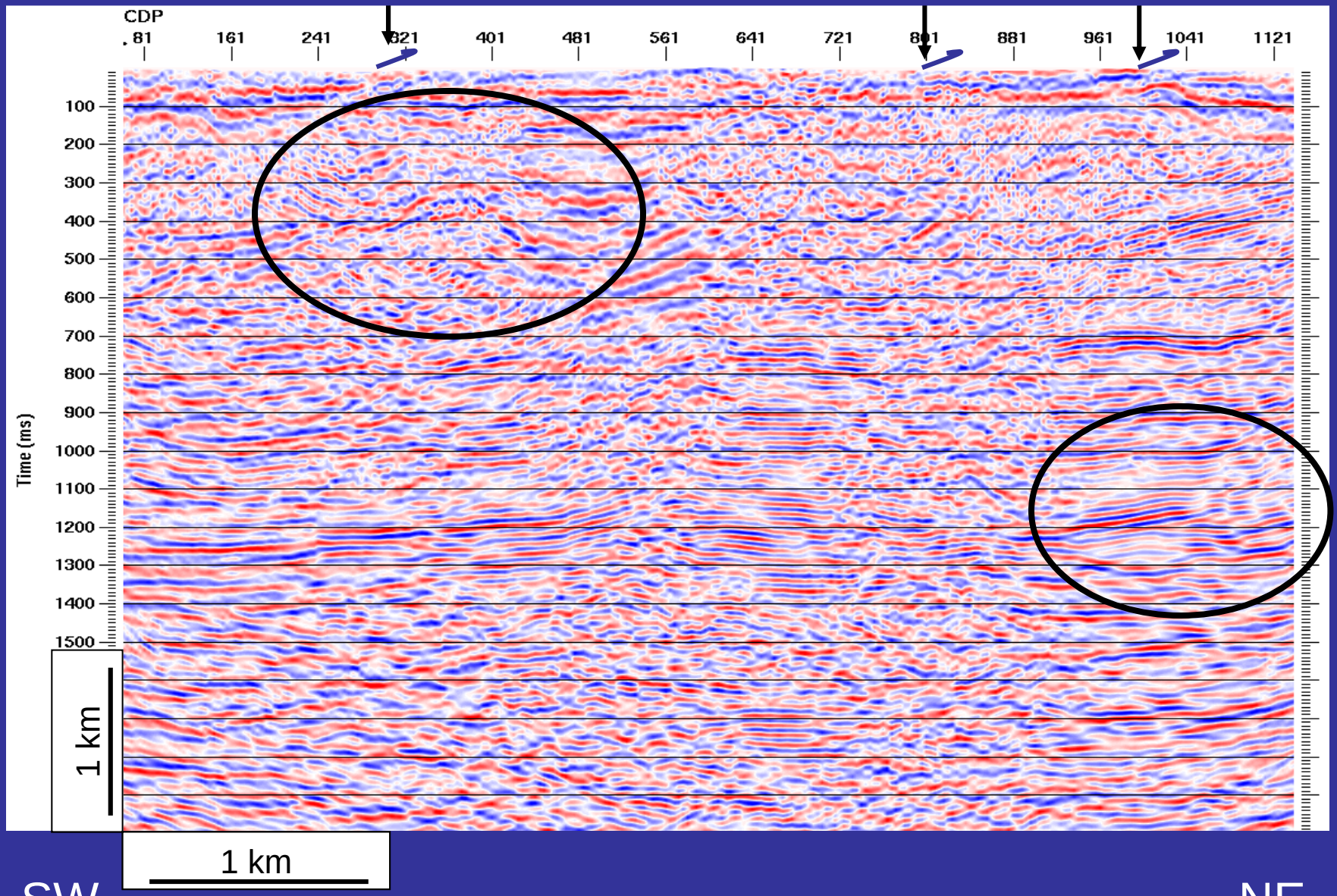
Results


Lewis Thrust
CDP
401
441
481
521
561
601
641
681
721
761
801
841
881
Time (ms)
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1 km
1 km
SW
NE

Results


Gardiner Thrust
CDP
741
781
821
861
901
941
981
1021
1061
1101
1141
Time (ms)
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1 km
1 km
SW
NE

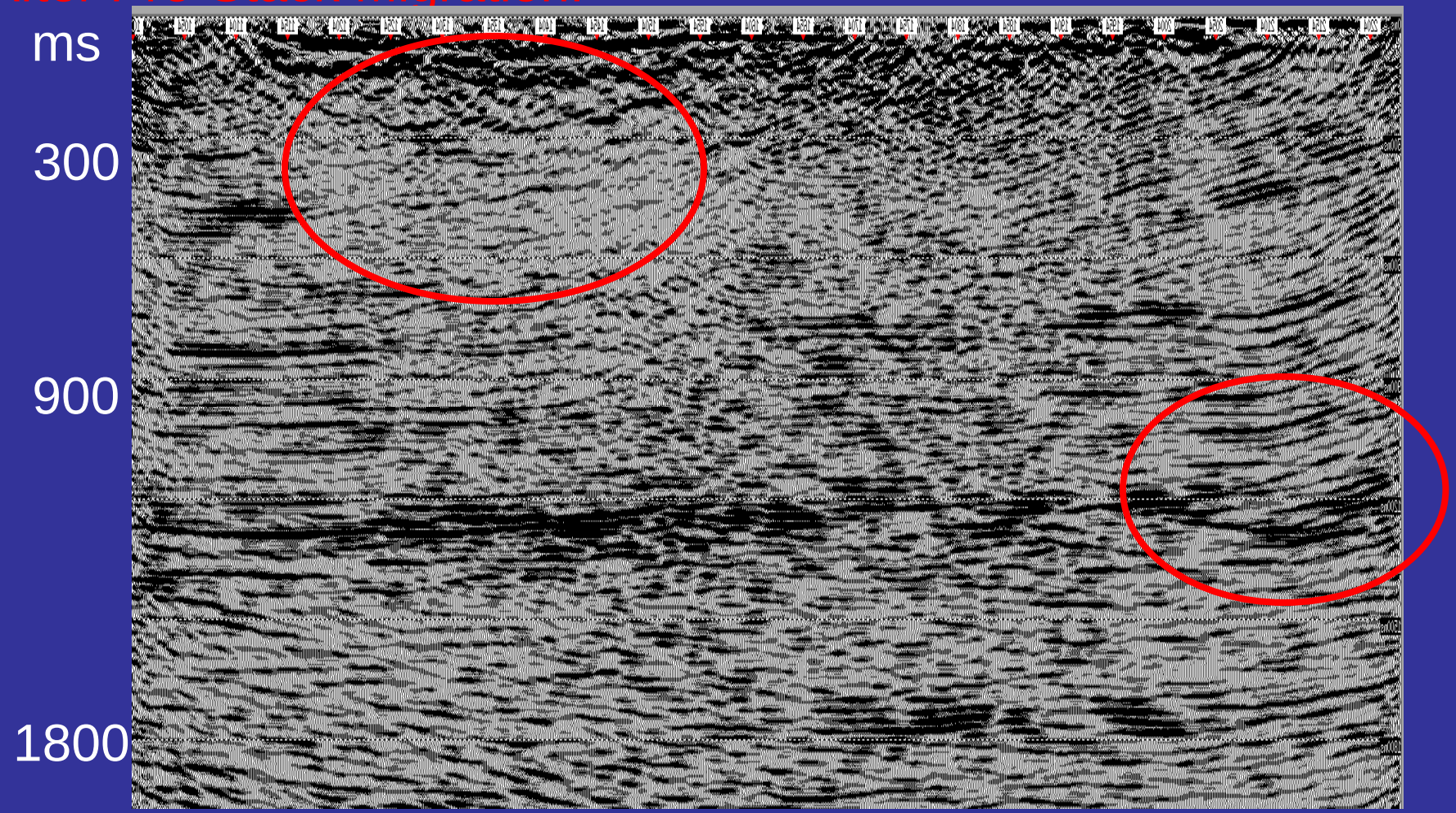
Results


Akamina Syncline
Lewis, Gardiner Thrust
CDP
81
161
241
321
401
481
561
641
721
801
881
961
1041
1121
Time (ms)
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1 km
1 km
SW
NE

Processing Sequence

Pre-Stack time migration

After Pre-Stack Migration:



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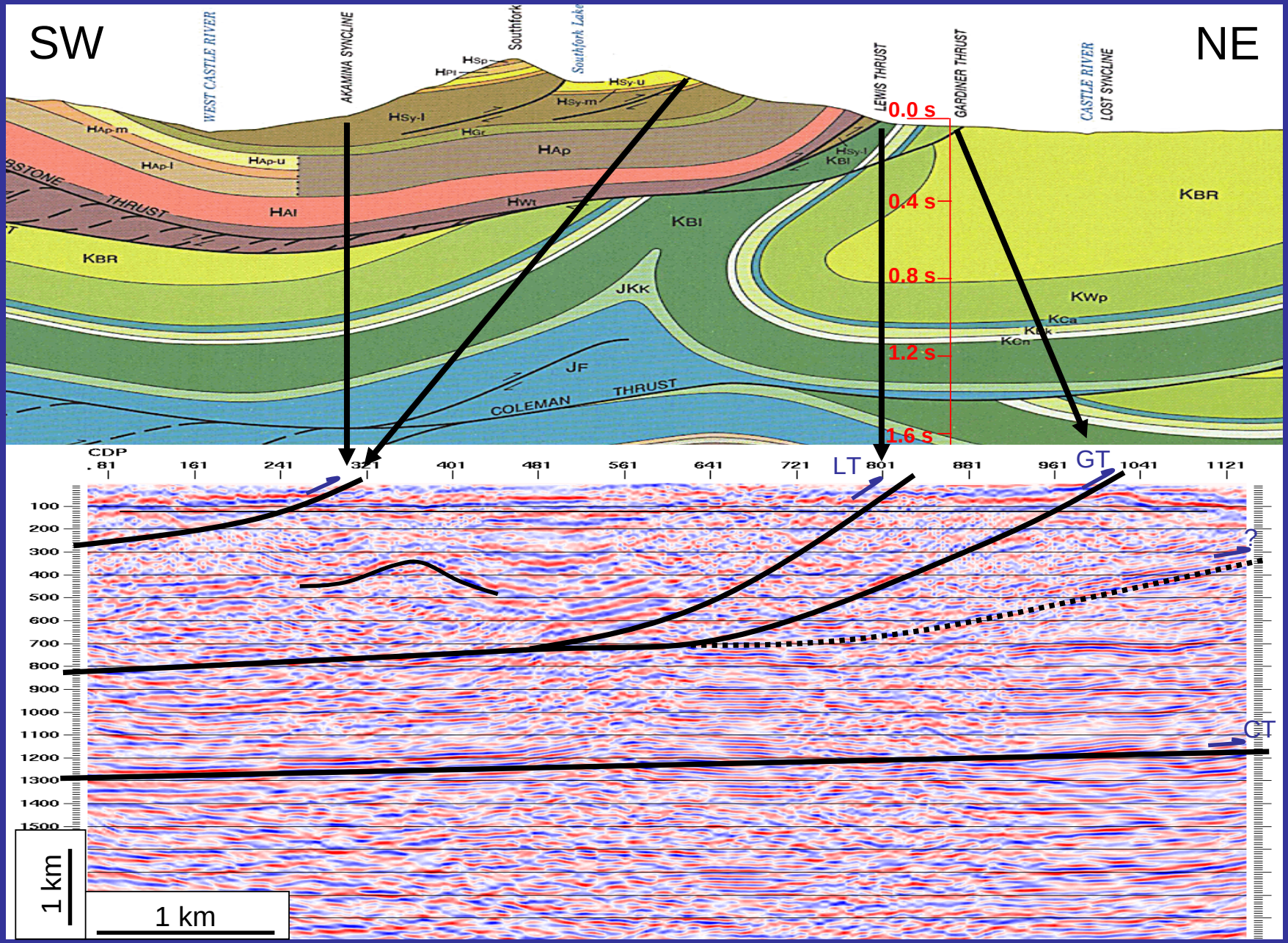
Interpretation



Discussion and Future Work

- Deep reflections (3.5-4.0 km) from small vibe
  - High fold
  - BUT: Small aperture (2 km)

- Migrated sections are interpretable

- Stay tuned for large aperture vertical and radial component sections

References

Norris, D.K., 1993, Geology and structure cross-sections, Beaver Mines (West Half), Alberta-British Columbia; Geological Survey of Canada, Map 1838A, scale 1:50,000.

Acknowledgements

- CREWES sponsors, NSERC
- Landmark Graphics (ProMAX)
- Hampson-Russell (gli3d)
- WesternGeco
- Geophysics field school 2006 crew