

Pre-Migration Noise Attenuation Report

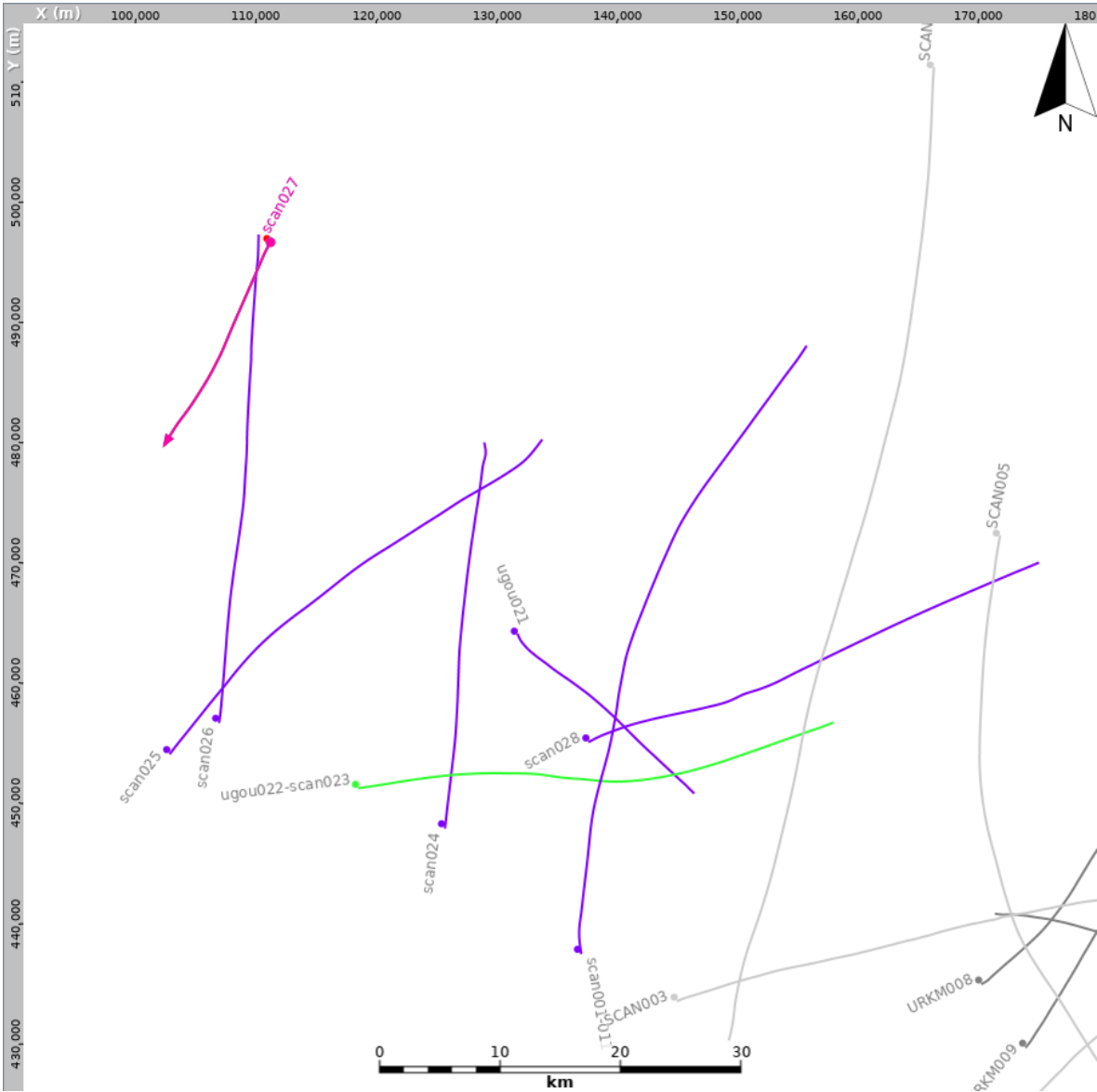
GTO-19-C031-02 SCAN Acquisition Seismic Processing Order #2

31 DECEMBER 2020

Energie Beheer Nederland B.V.

2D Seismic PreSTM Processing, Onshore Netherlands

- This report documents the results from applying additional pre-migration noise attenuation on lines UGOU022-SCAN023 and SCAN027 to address specific noise issues.
- SCAN027 also has the 2 previously approved additional noise attenuation processes applied.



SCAN027

Processing sequence

- Data reformat: SEGY to internal format
- Geometry: Crooked line with 2.5 m CDP interval
- Weak shots: 0-500 m offsets only (not applied for 016)
- Spherical divergence correction: T
- Geophone response correction:
- Refraction statics: Delay time using $V_0 = 1000$ m/s $V_R = 1700$ m/s $SRD = NAP$
- Noise attenuation: +/- 1250 m/s Weiner dip filter
- Edits: Kill invalid shots and receivers
- Noise attenuation: Despike
- Noise attenuation: Wavelet (D20) transform filter (muting the largest 10% of coefficients by 90% in scales 6-10)
- SCAC 1: Source and receiver designed on NMO corrected gathers over 200-2200 ms
- *Noise attenuation:* TFDN (3 passes)
- Inverse Q: $Q = 100$ phase and amplitude using 40 Hz reference frequency and 12 dB gain stabilisation
- DBS: Surface consistent with 160 ms operator length with 16 ms predictive gap
0.1% white noise stabilisation - Design window: 200-3000 ms
- Velocity analysis: 1 km interval
- Noise attenuation: 1.75 ms/tr (2857 m/s) dip filter and wavelet transform filter on shots
- *Noise attenuation:* **Wavelet transform filter and TFDN on shots**
- Residual statics: Surface consistent using MASTT
- Velocity analysis: 1 km interval
- Residual statics: Surface consistent using MASTT

Processing sequence (continued)

- SCAC 2:
 - ***Targeted high-pass filter:***
 - Stack:
- Source and receiver designed on NMO corrected gathers over 200-2200 ms
15-18 Hz low cut
 1/N with 45° mute

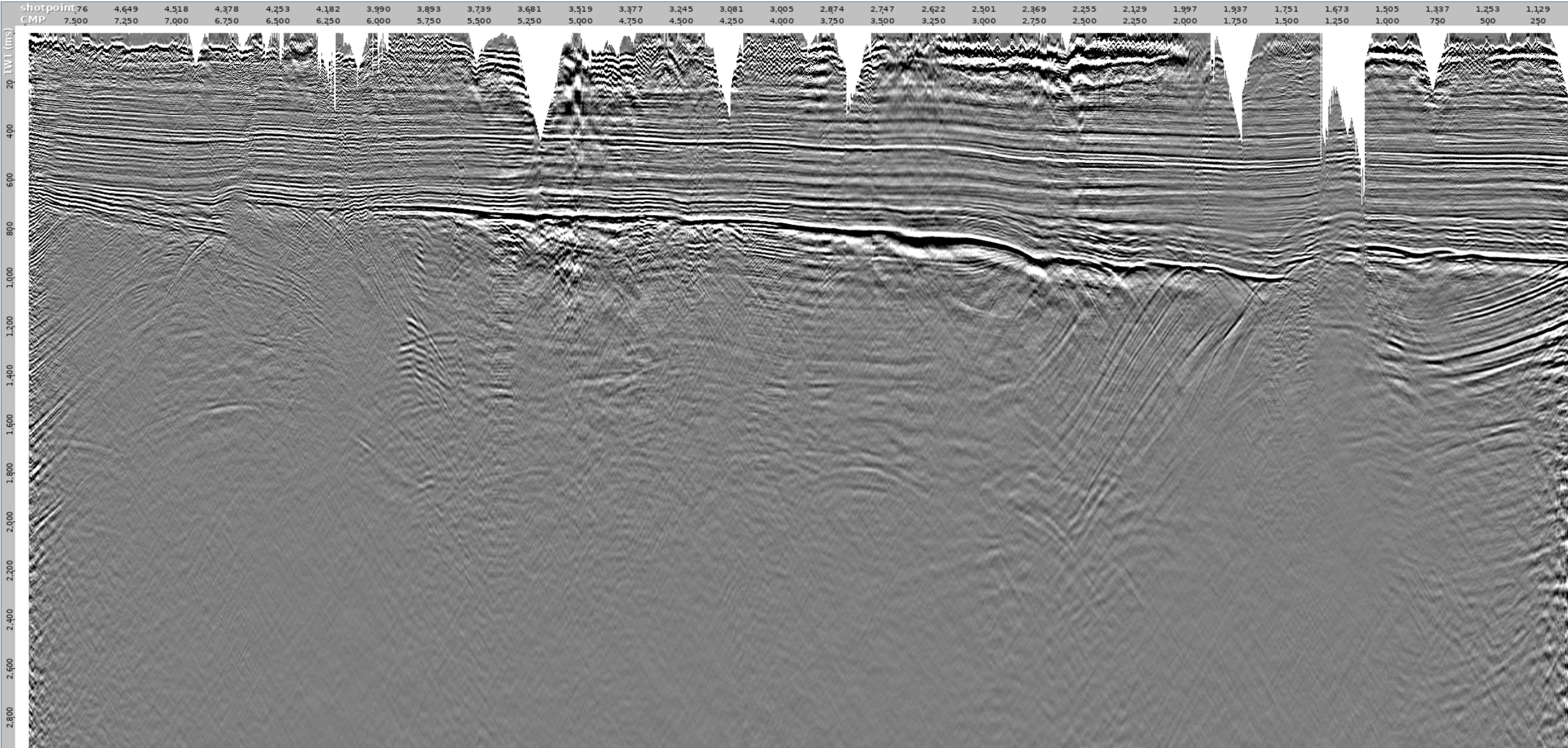
SCAN027 pre-migration TA stack

At floating datum



SW

NE



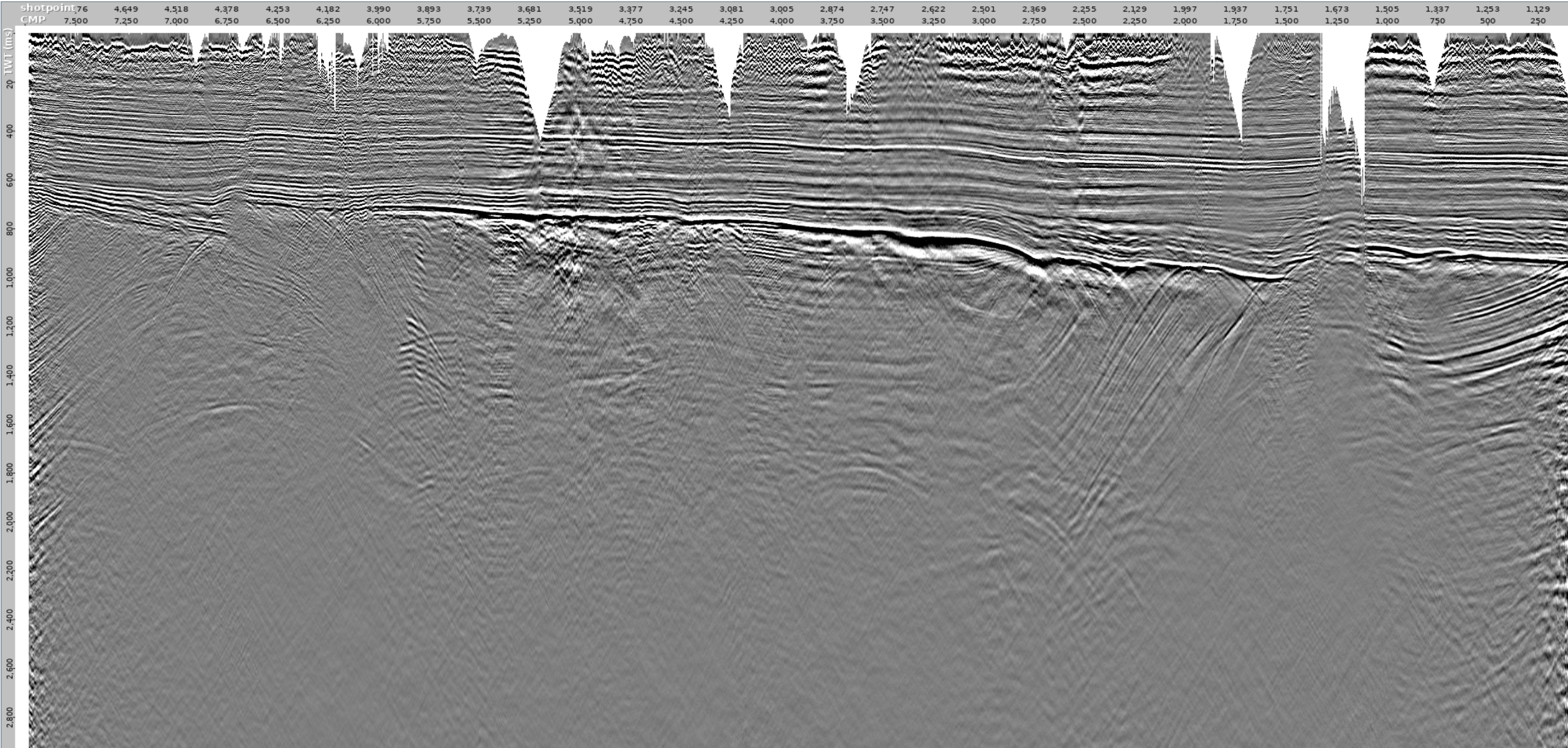
SCAN027 pre-migration TA stack with targeted bandpass filter on shots

At floating datum



SW

NE



SCAN027 pre-migration TA stack difference after targeted bandpass filter on shots

At floating datum



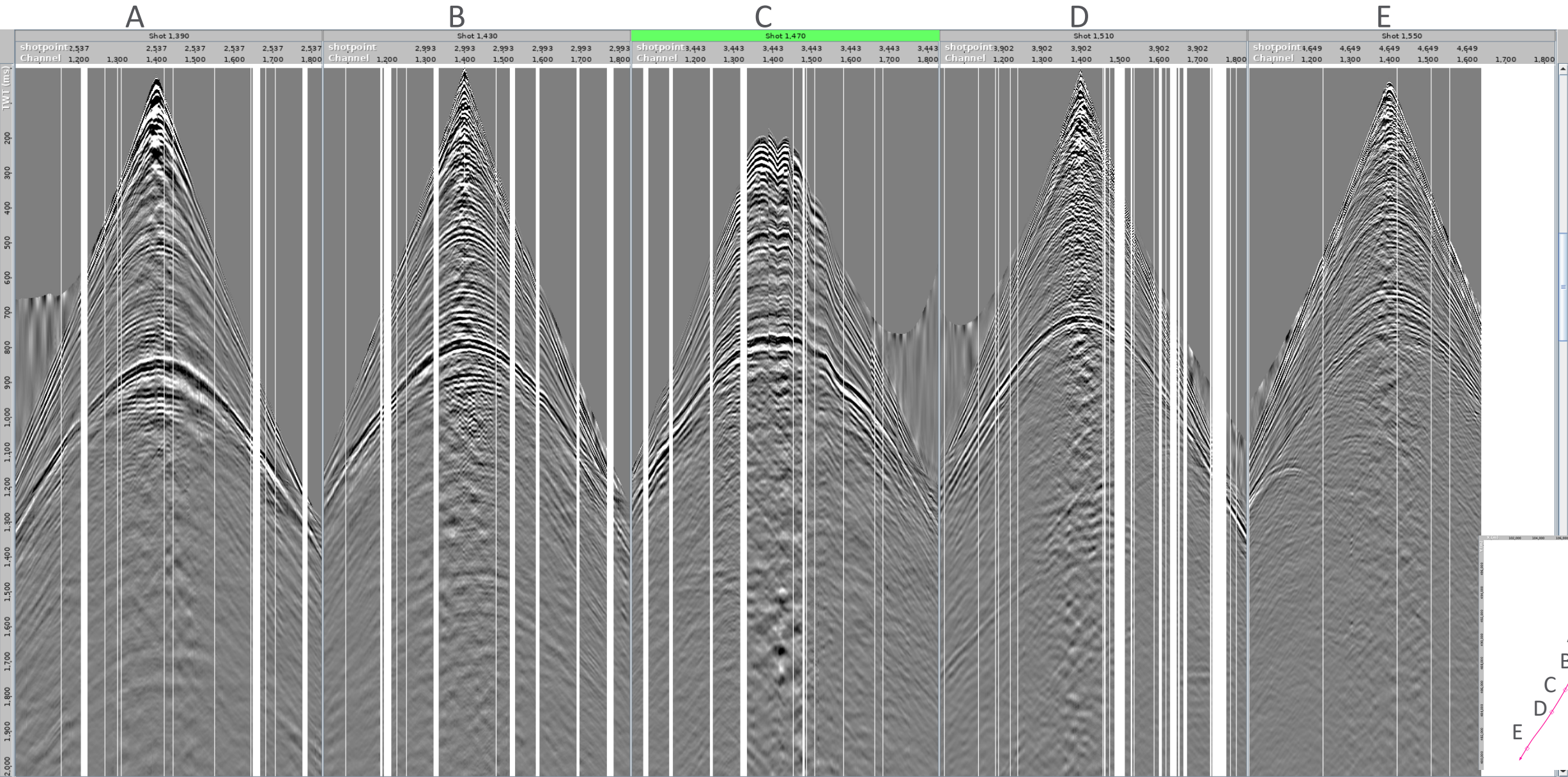
SW

NE



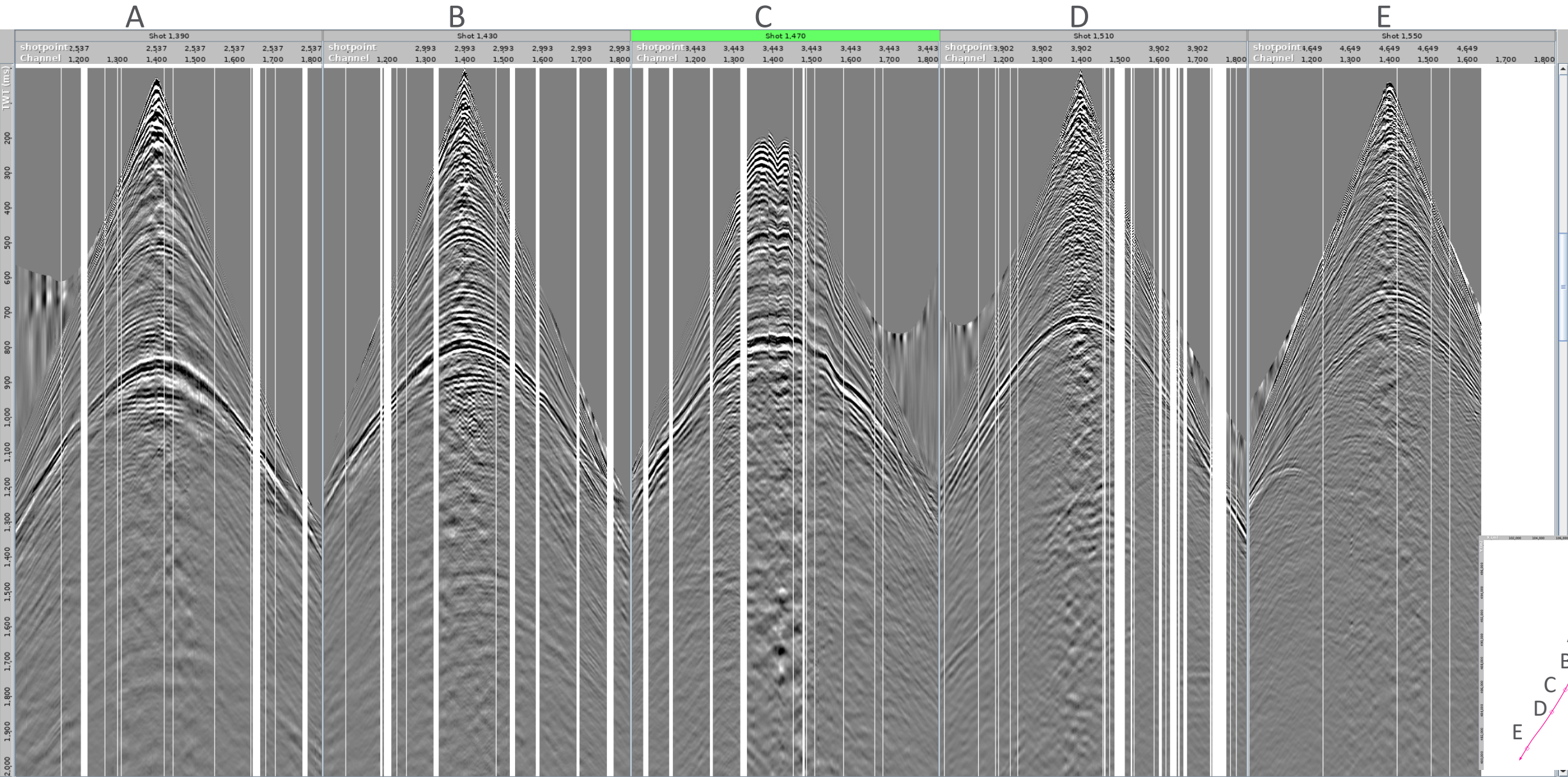
SCAN027 pre-migration TA shot gathers

At floating datum



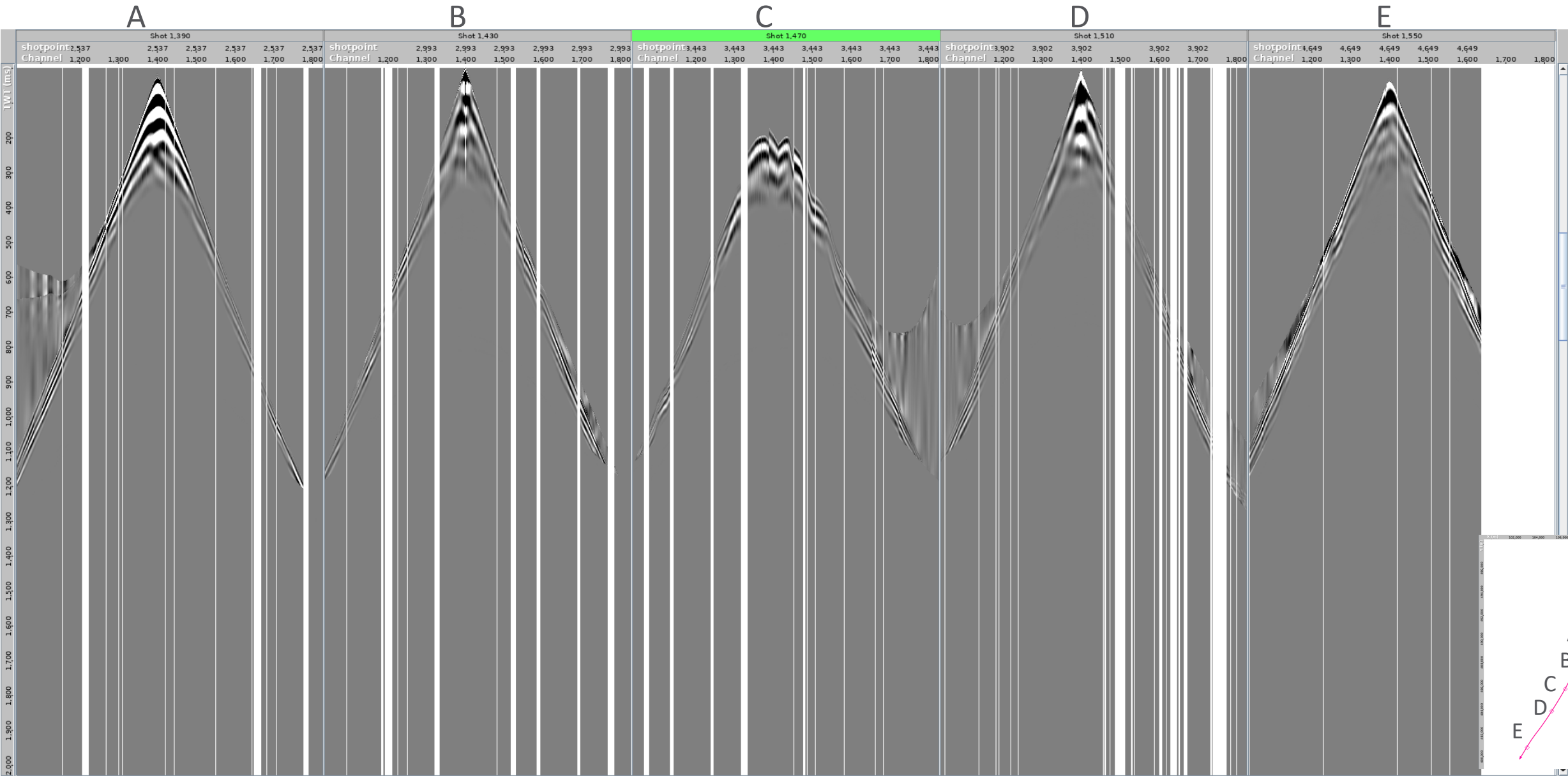
SCAN027 pre-migration TA shot gathers with targeted bandpass filter

At floating datum



SCAN027 pre-migration TA shot gathers showing difference after targeted bandpass filter

At floating datum



UGOU022-SCAN023

Processing sequence

- Data reformat: SEGY to internal format
- Geometry: Crooked line with 2.5 m CDP interval
- Weak shots: 0-500 m offsets only (not applied for 016)
- Spherical divergence correction: T
- Geophone response correction:
- Refraction statics: Delay time using $V_0 = 1000$ m/s $V_R = 1700$ m/s $SRD = NAP$
- Noise attenuation: +/- 1250 m/s Weiner dip filter
- Edits: Kill invalid shots and receivers
- Noise attenuation: Despike
- Noise attenuation: Wavelet (D20) transform filter (muting the largest 10% of coefficients by 90% in scales 6-10)
- SCAC 1: Source and receiver designed on NMO corrected gathers over 200-2200 ms
- Noise attenuation: TFDN
- Inverse Q: $Q = 100$ phase and amplitude using 40 Hz reference frequency and 12 dB gain stabilisation
- DBS: Surface consistent with 160 ms operator length with 16 ms predictive gap
0.1% white noise stabilisation - Design window: 200-3000 ms
- Velocity analysis: 1 km interval
- Noise attenuation: 1.75 ms/tr (2857 m/s) dip filter and wavelet transform filter on shots
- Residual statics: Surface consistent using MASTT
- Velocity analysis: 1 km interval
- Residual statics: Surface consistent using MASTT

Processing sequence (continued)

- SCAC 2:
 - ***Targeted noise attenuation:***
 - Stack:
- Source and receiver designed on NMO corrected gathers over 200-2200 ms
TFDN on CDP gathers
 1/N with 55° mute

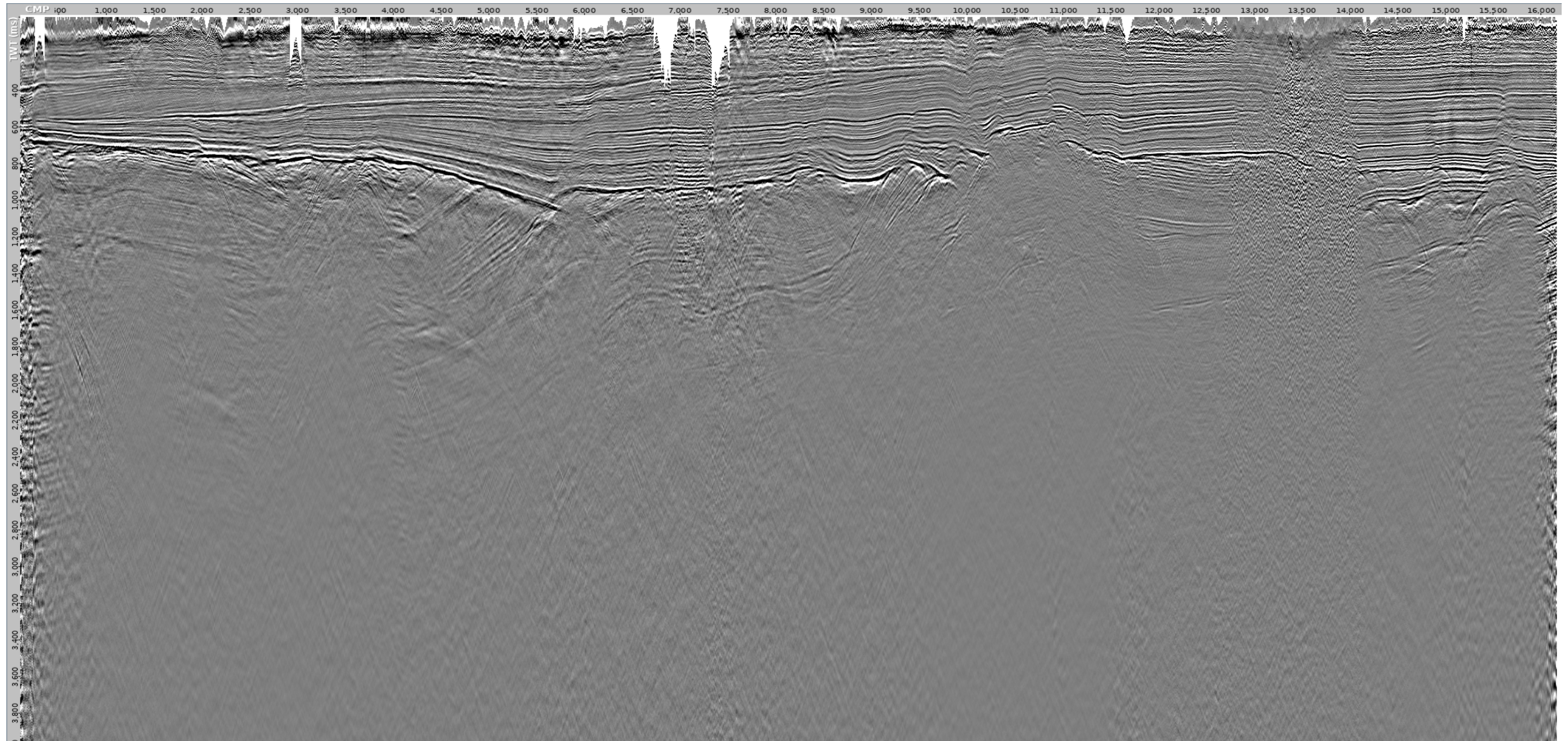
UGOU022-SCAN023 pre-migration TA stack

At floating datum



W

E



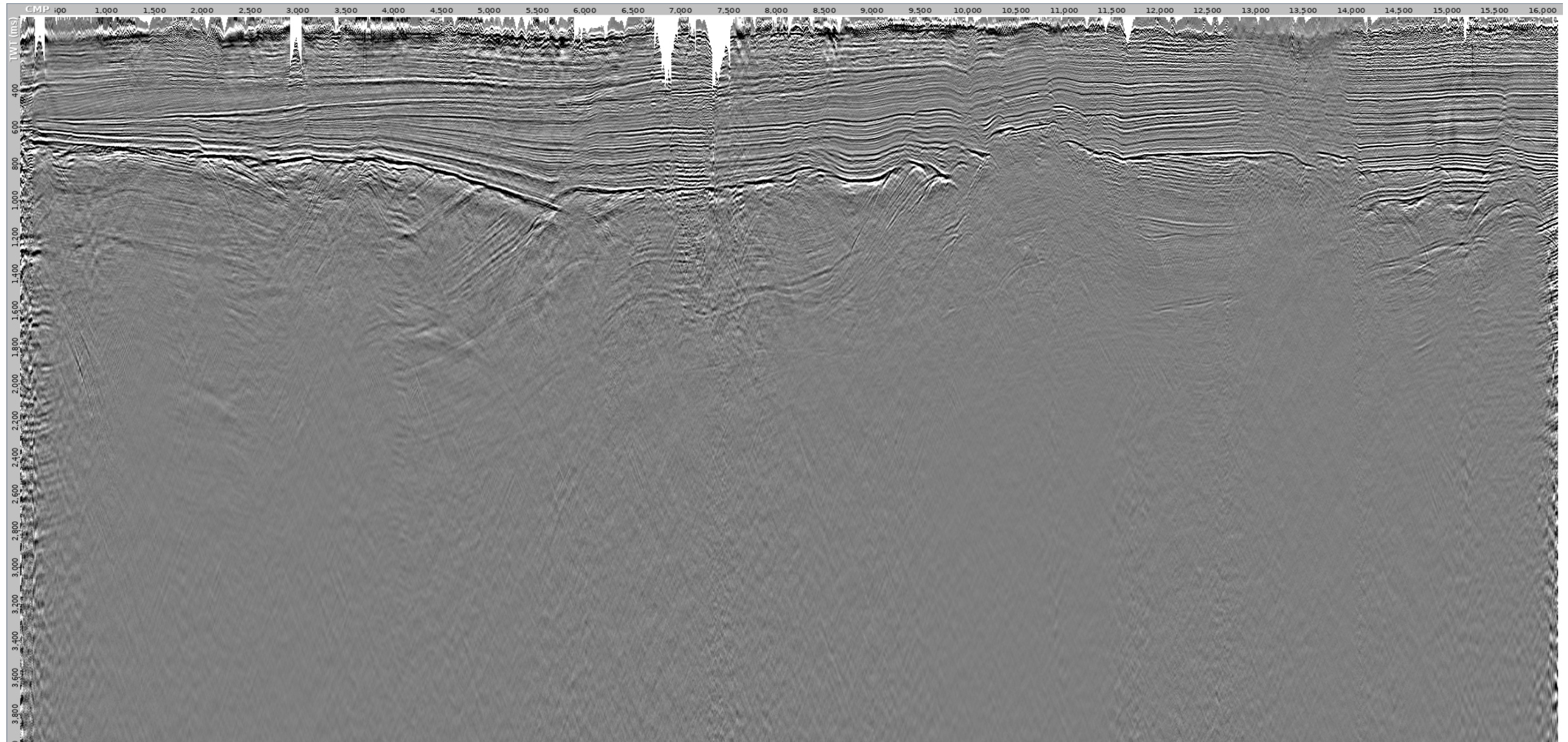
UGOU022-SCAN023 pre-migration TA stack with targeted TFDN applied

At floating datum



W

E



UGOU022-SCAN023 pre-migration TA stack difference after targeted TFDN

At floating datum



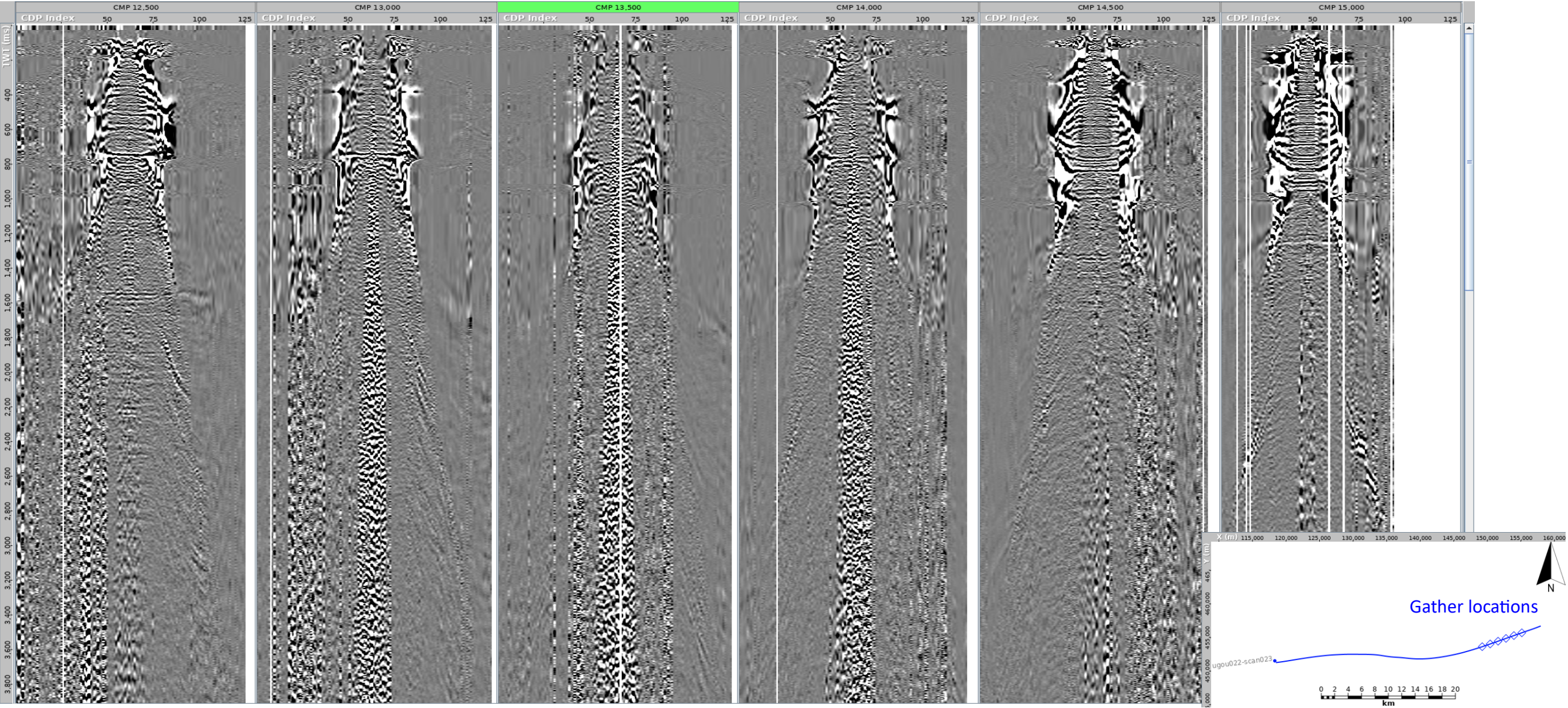
W

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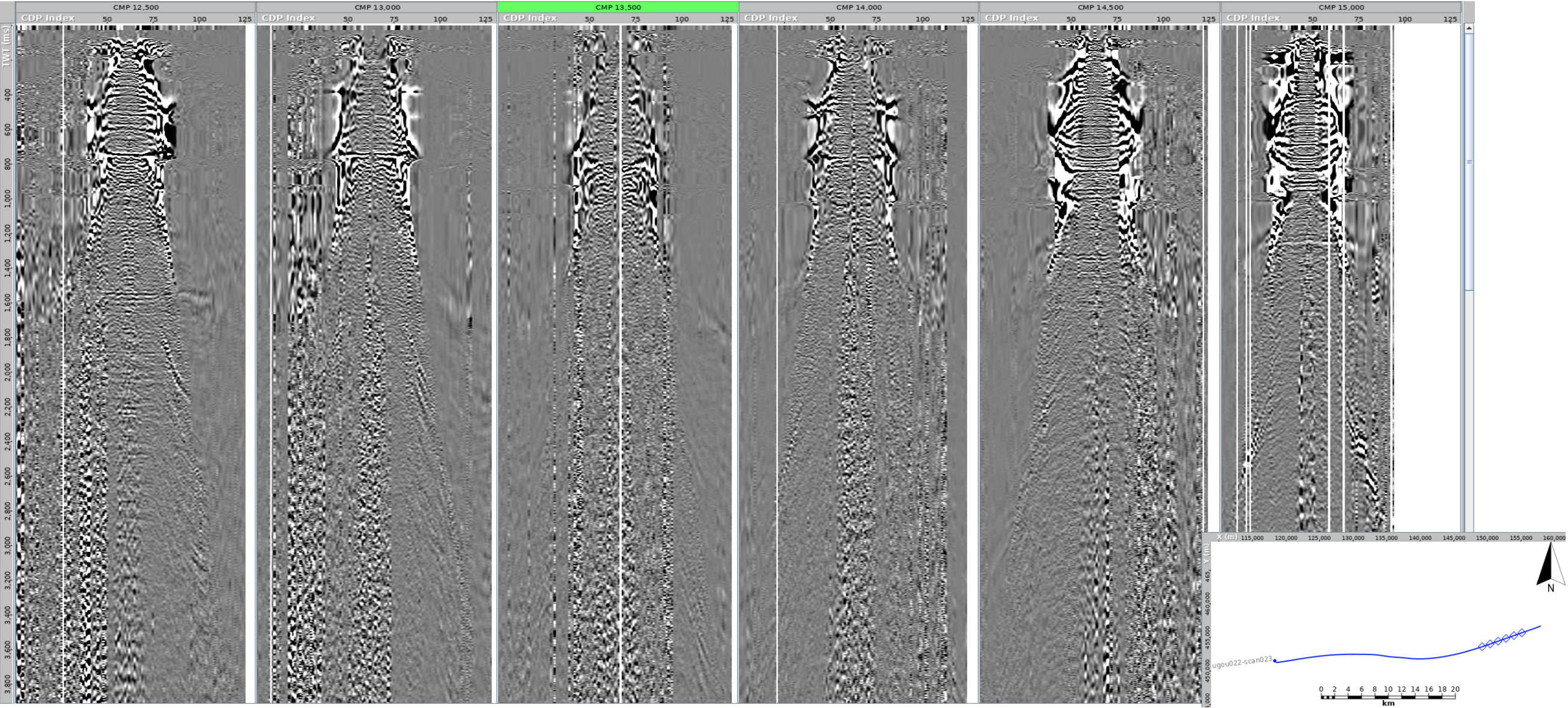
UGOU022-SCAN023 pre-migration TA CDP gathers

At floating datum



UGOU022-SCAN023 pre-migration TA CDP gathers with targeted TFDN

At floating datum



UGOU022-SCAN023 pre-migration TA CDP gathers showing difference after targeted TFDN

At floating datum

