

UGOU022-SCAN023 Velocities, Amplitudes and Residual Statics Report Update

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

27 NOVEMBER 2020

Energie Beheer Nederland B.V.
2D Seismic PreSTM Processing, Onshore Netherlands

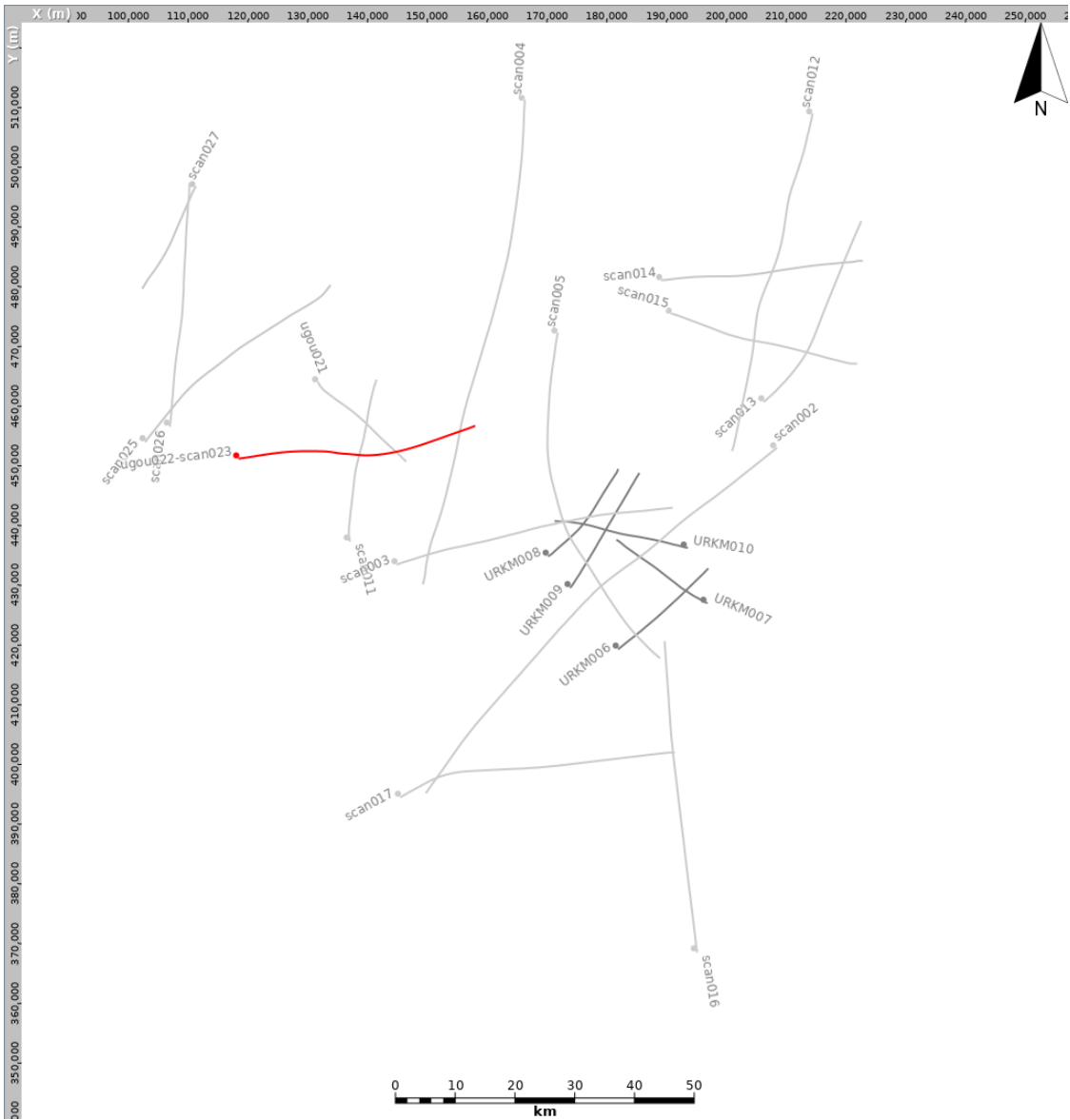
- This report documents results from the the surface consistent residual statics, surface consistent amplitude compensation and velocity analyses.
- The report also includes amplitude spectra taken from the true amplitude stacks at the key processing stages indicated in the processing sequence on the subsequent slides.
- This version of the report has been updated to include SCAC2 calculated using a window of 200-1200 rather than 200-2200. This better balances the section.
- The velocities have also been updated.

Processing sequence

- Data reformat: SEGY to internal format
- Geometry: Crooked line with 2.5 m CDP interval
- Weak shots: 0-500 m offsets only
- Spherical divergence correction: T
- Geophone response correction:
- Refraction statics: Delay time using $V_0=1000$ m/s $V_R=1700$ m/s $SRD=NAP$
- RAW STACK**
- Noise attenuation: +/-1250 m/s Weiner dip filter
- Edits: Kill invalid shots and receivers
- DENOISE 1**
- 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 components designed on NMO corrected gathers over 200-2200 ms
- Noise attenuation: TFDN
- DENOISE 2C**
- Inverse Q: $Q=100$ phase and amplitude using 40 Hz reference frequency and 12 dB gain stabilisation

Processing sequence (continued)

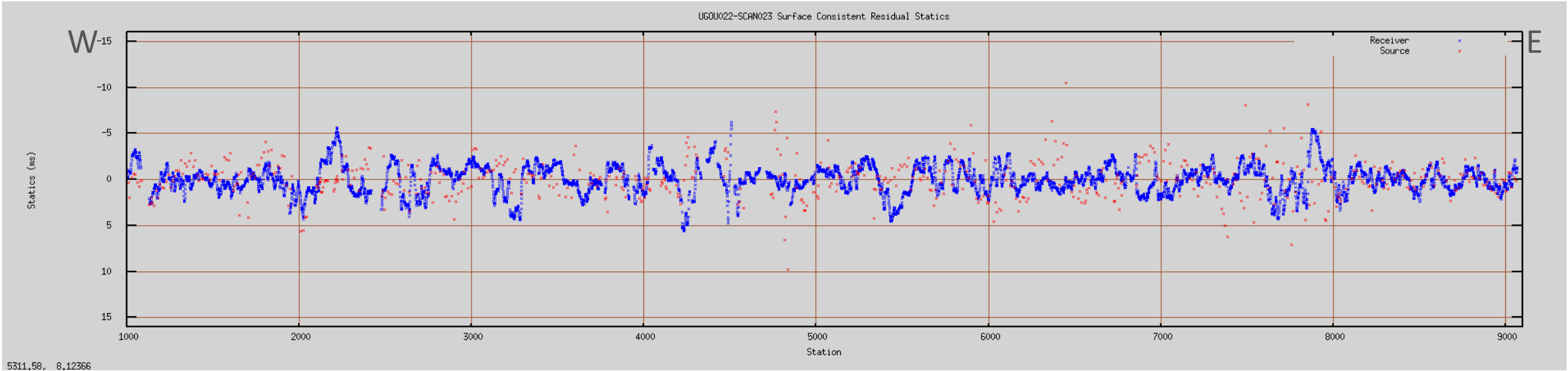
- DBS: Surface consistent with 160 ms operator length with 16 ms predictive gap
0.1% white noise stabilisation - Design window: 200-3000 ms
- **DECONVOLUTION**
- Velocity analysis: 1 km interval
- Noise attenuation: 1.75 ms/tr (2857 m/s) dip filter and wavelet transform filter on shots
- **DENOISE 3**
- Residual statics: Surface consistent using MASTT
- Velocity analysis: 1 km interval
- Residual statics: Surface consistent using MASTT
- SCAC 2: Source and receiver components designed on NMO corrected gathers over 200-2200 ms (updated window for UGOU22-SCAN023 of 200-1200 ms)
- **INPUT TO MIGRATION**
- AGC: 500 ms (scaled stacks only)
- Stack: $1/N$ ($1/\sqrt{N}$ for scaled stacks) with 55° mute
- Static: Static to shift from floating to final datum (NAP) where applicable



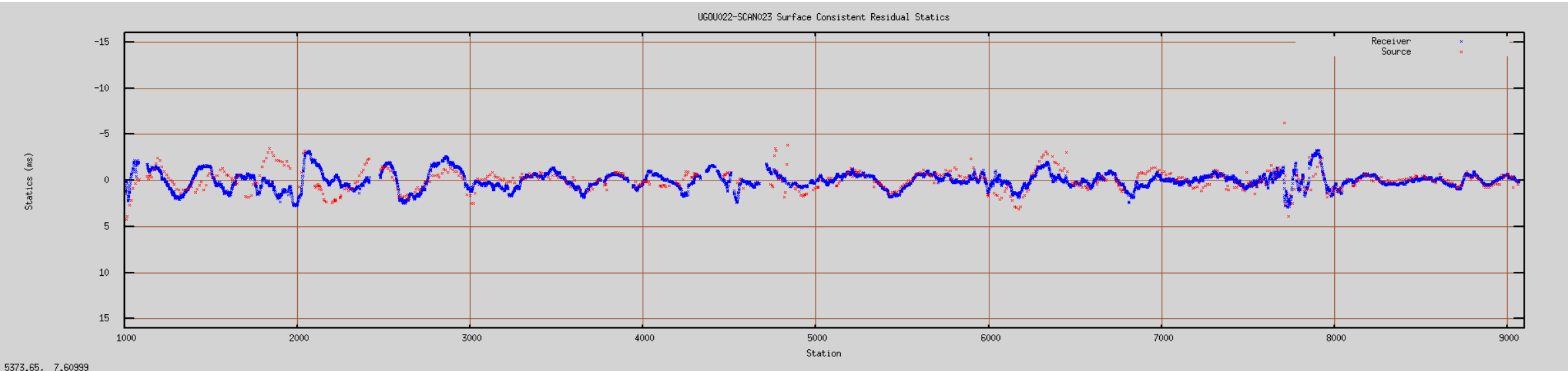
UGOU022-SCAN023 surface consistent residual statics profiles



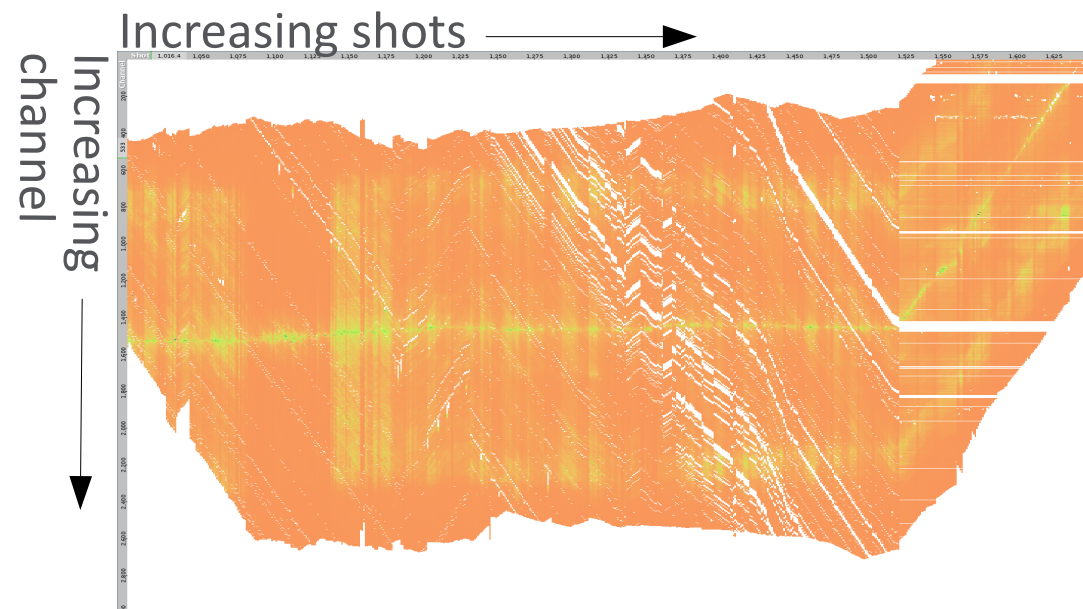
Pass 1



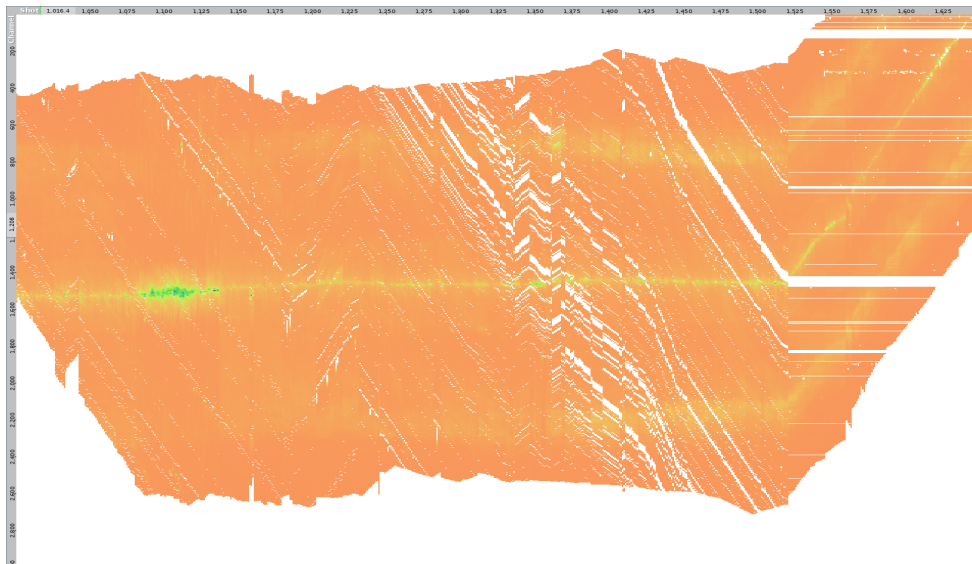
Pass 2



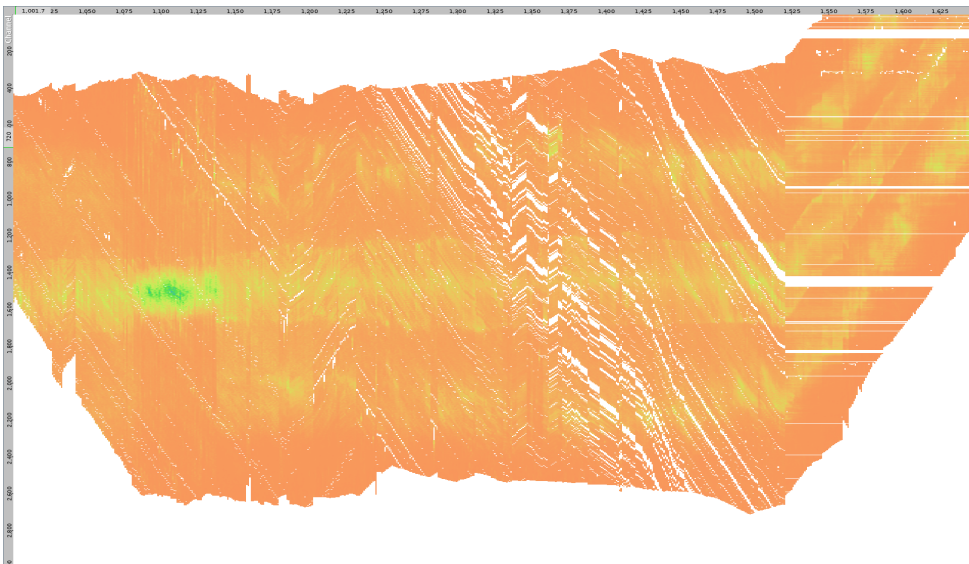
UGOU022-SCAN023 RMS amplitude maps for surface consistent amplitude compensation



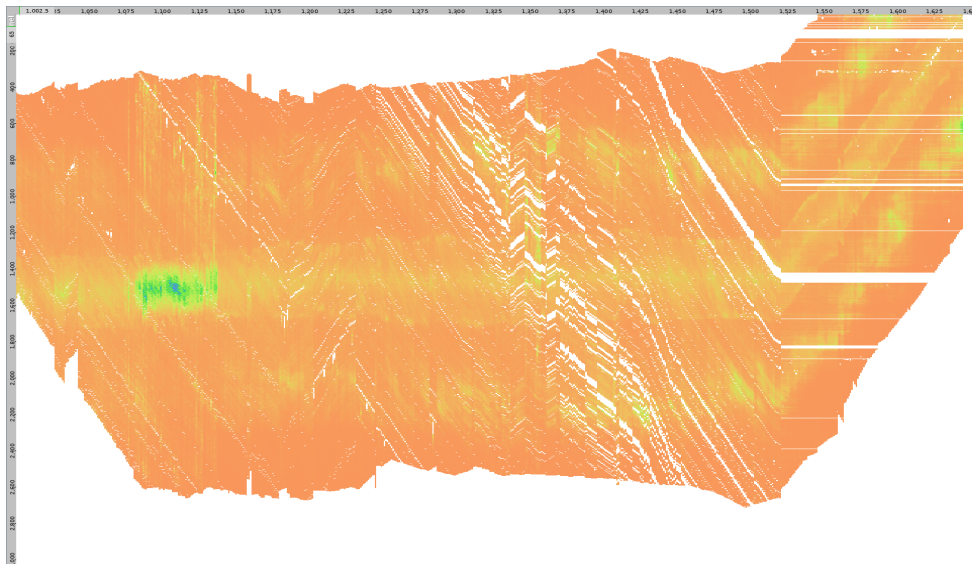
Pre SCAC1



Post SCAC1



Pre SCAC2

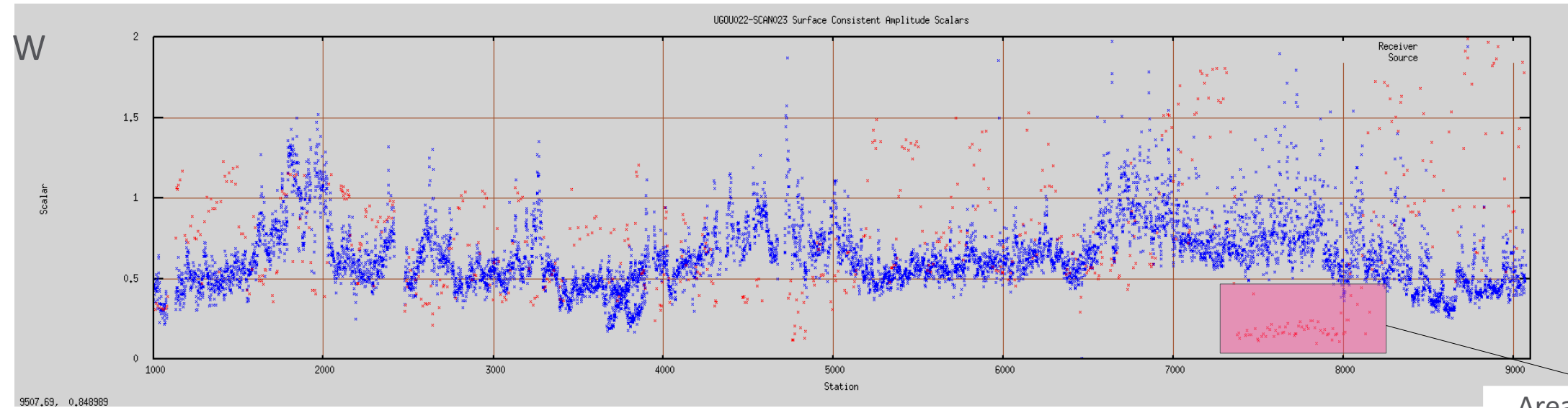


Post SCAC2

UGOU022-SCAN023 surface consistent amplitude scalar profiles

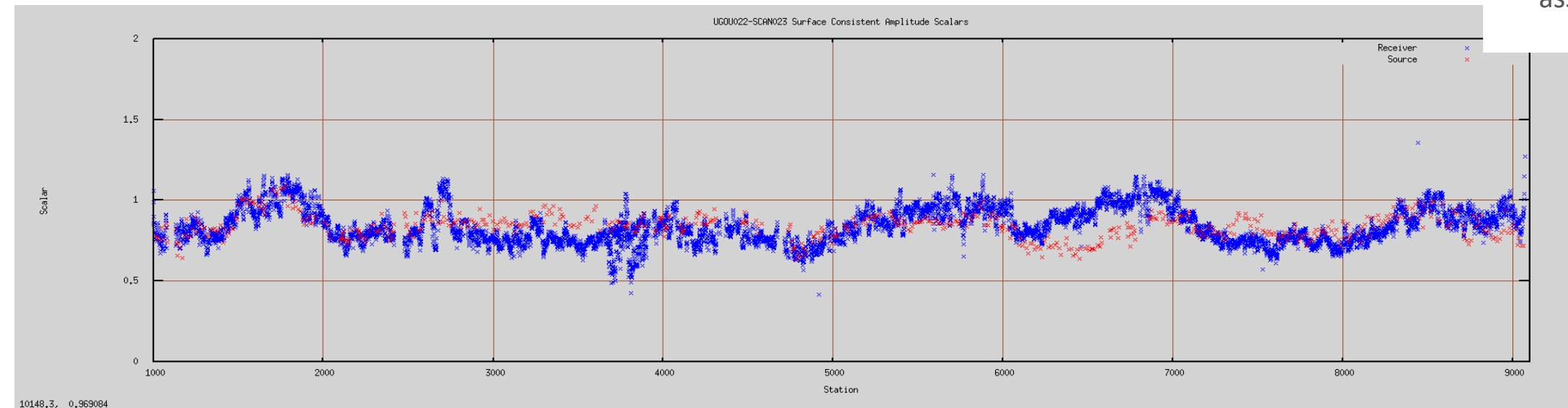


Pass 1



Area of weak shots associated with moraine

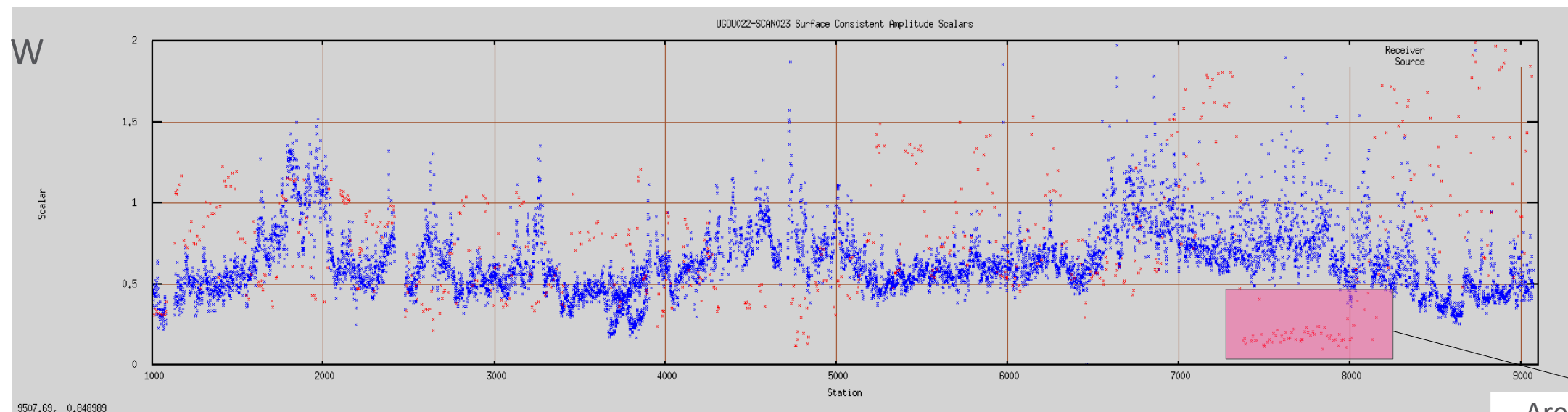
Original
Pass 2
(200-2200 ms)



UGOU022-SCAN023 surface consistent amplitude scalar profiles (updated)

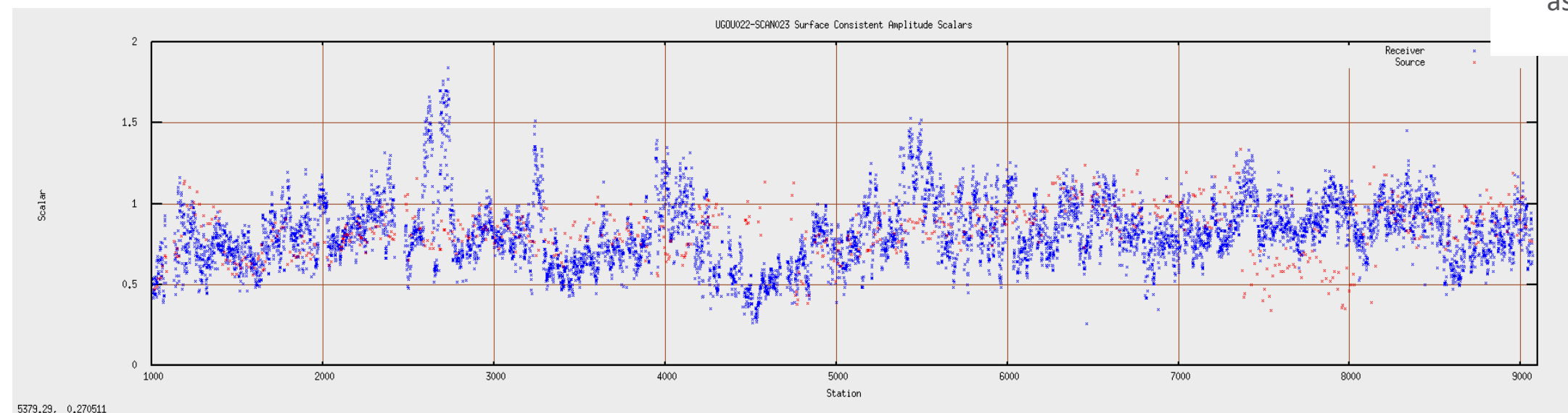


Pass 1



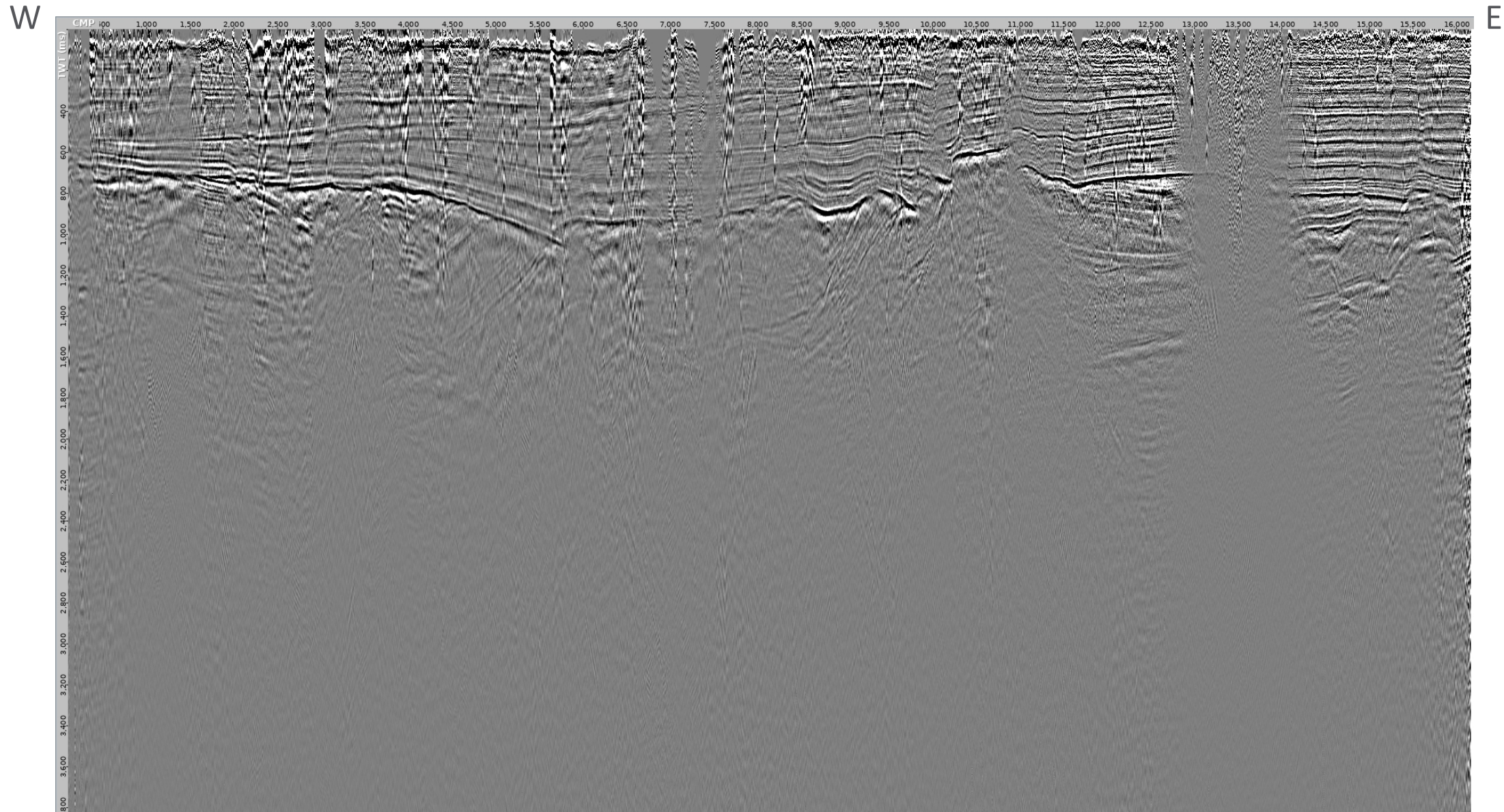
Area of weak shots associated with moraine

Updated
Pass 2
(200-1200 ms)



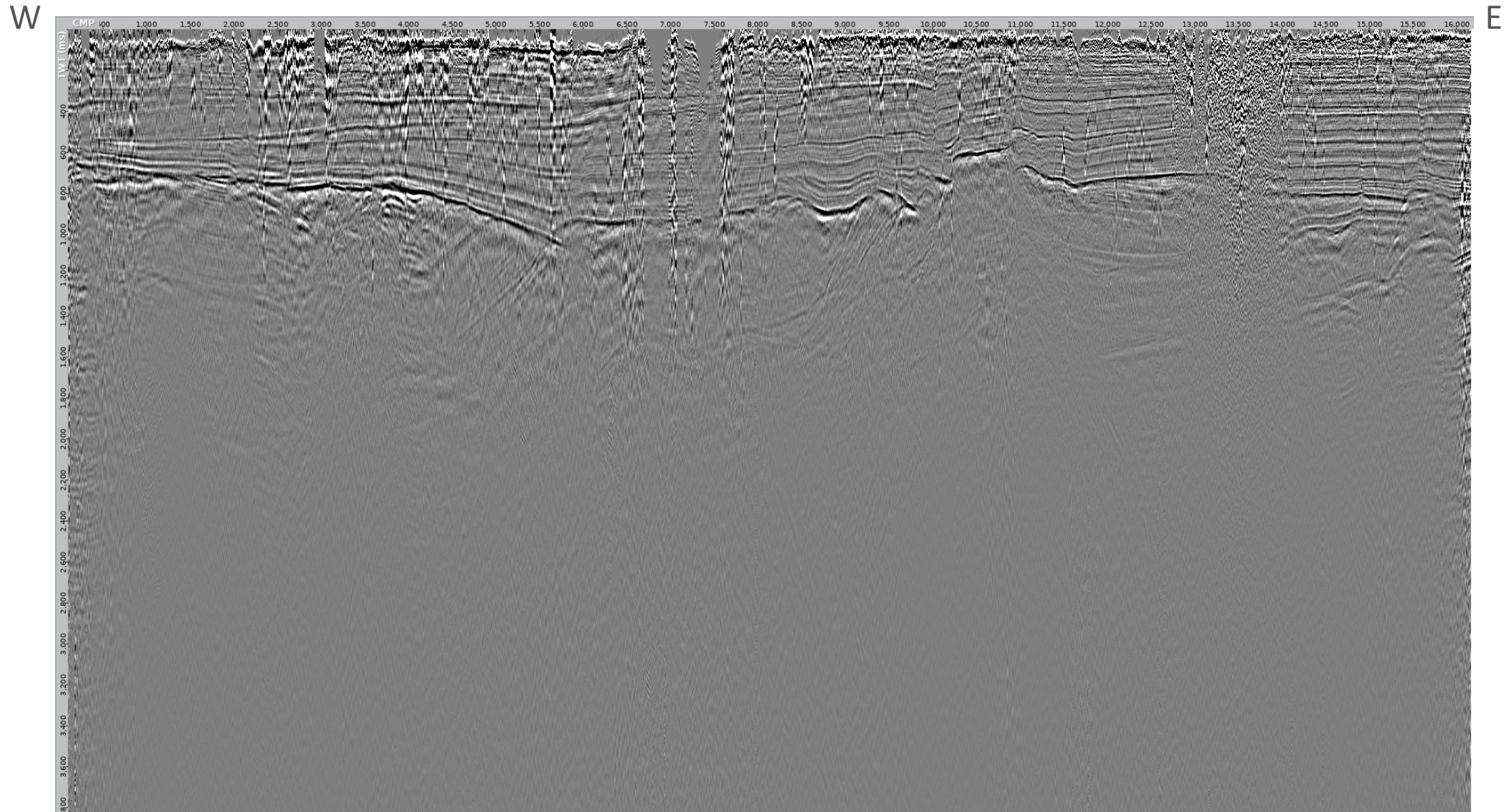
UGOU022-SCAN023 stack before SCAC1

At floating datum with 2-6-150-170 Hz filter

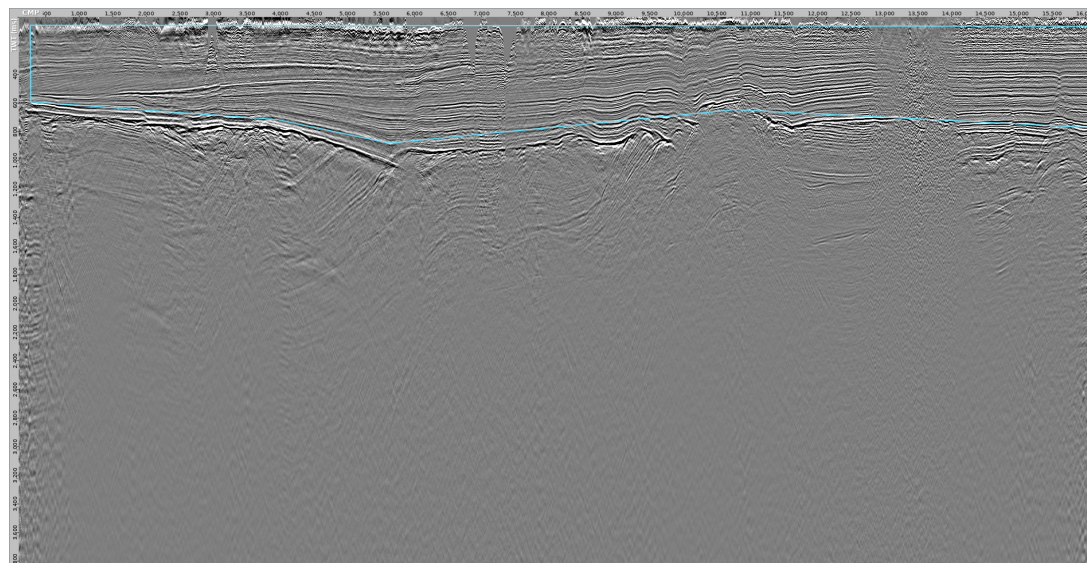


UGOU022-SCAN023 stack after SCAC1

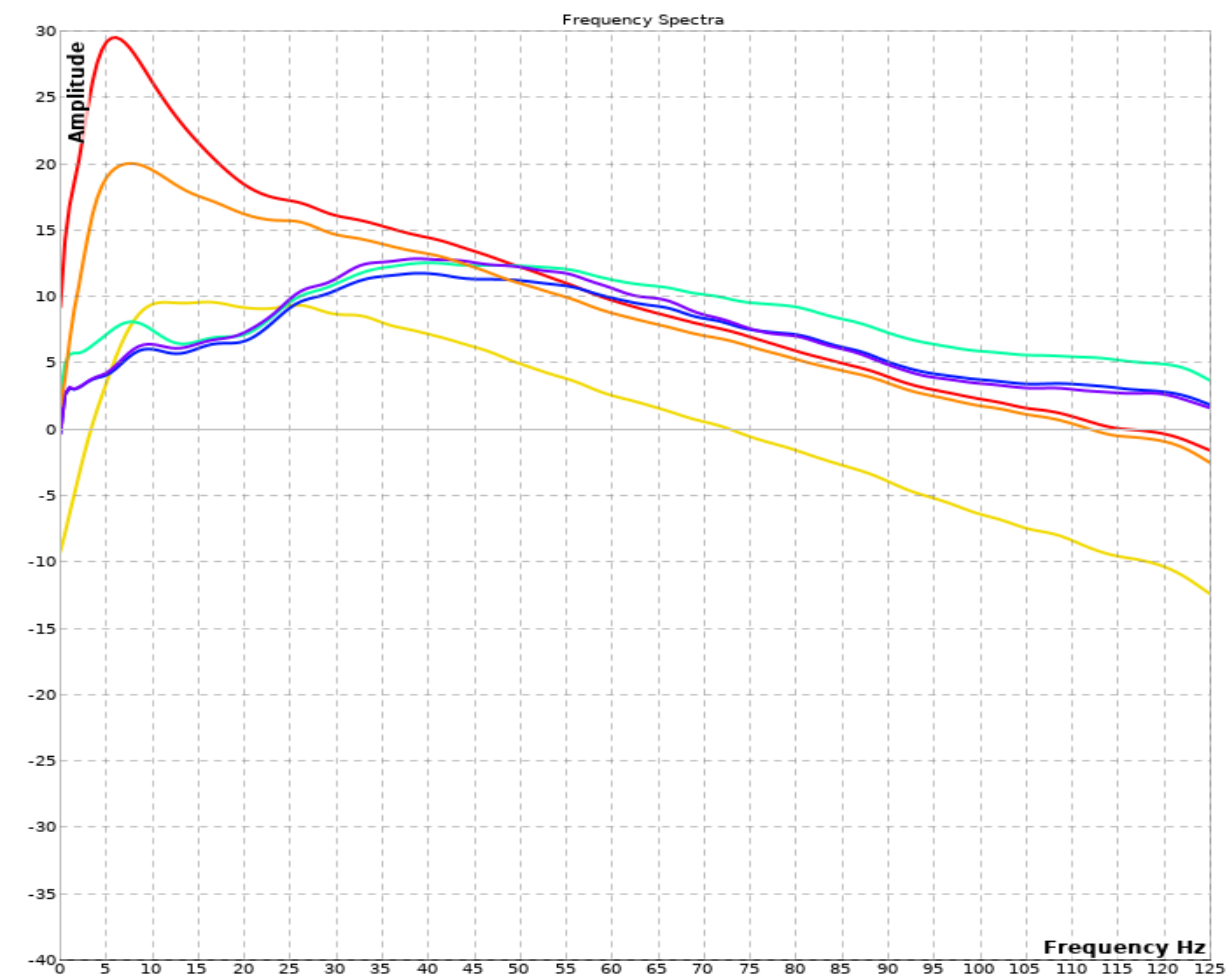
At floating datum with 2-6-150-170 Hz filter



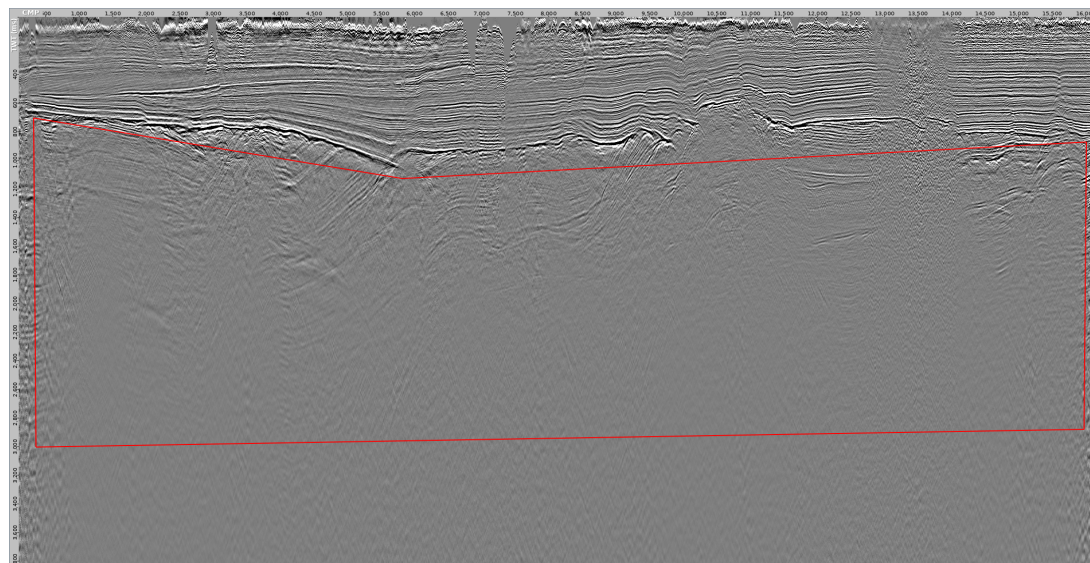
UGOU022-SCAN023 shallow window amplitude spectra (dB)



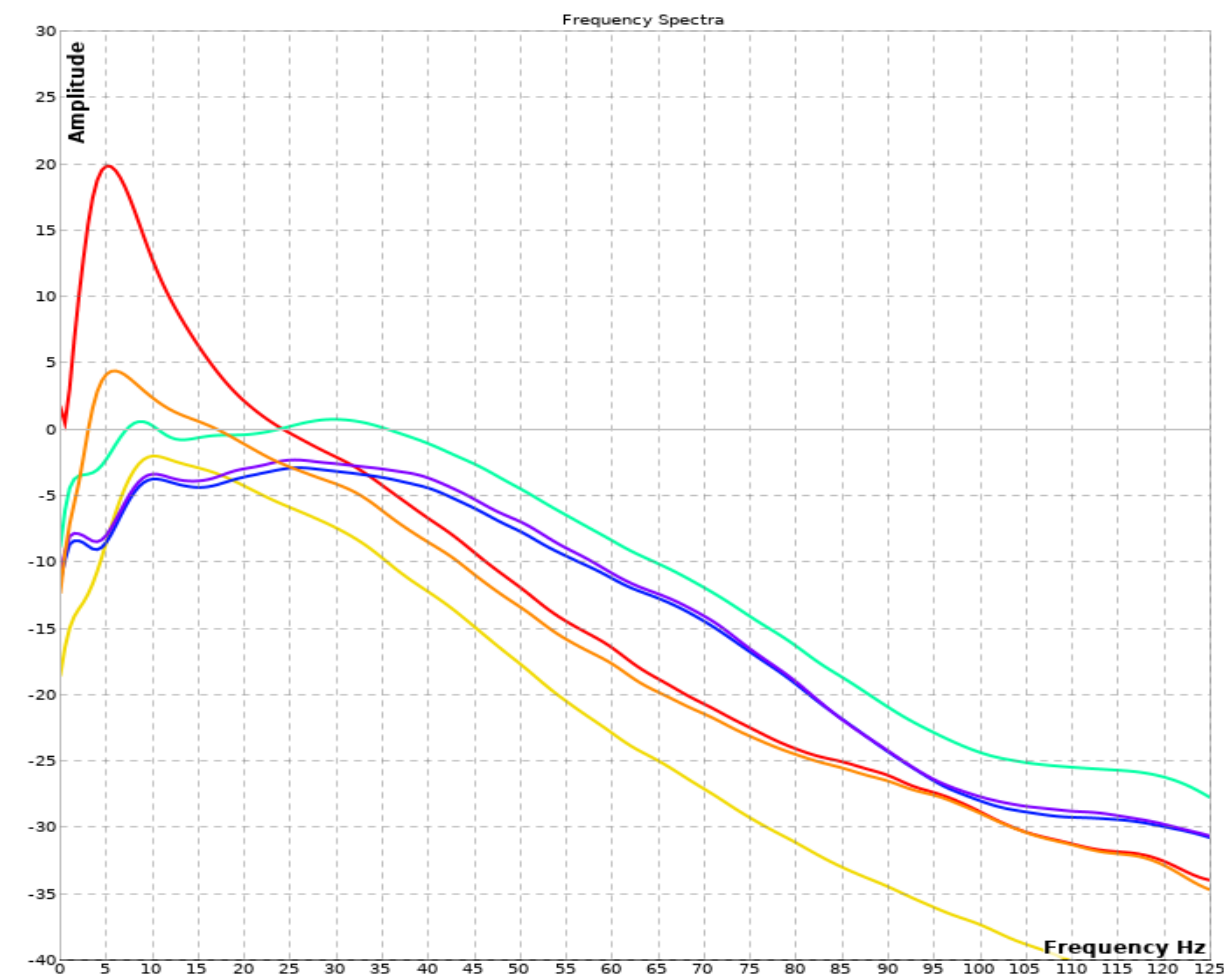
- Raw
- Denoise 1
- Denoise 2c
- Deconvolution
- Denoise 3
- Input to migration



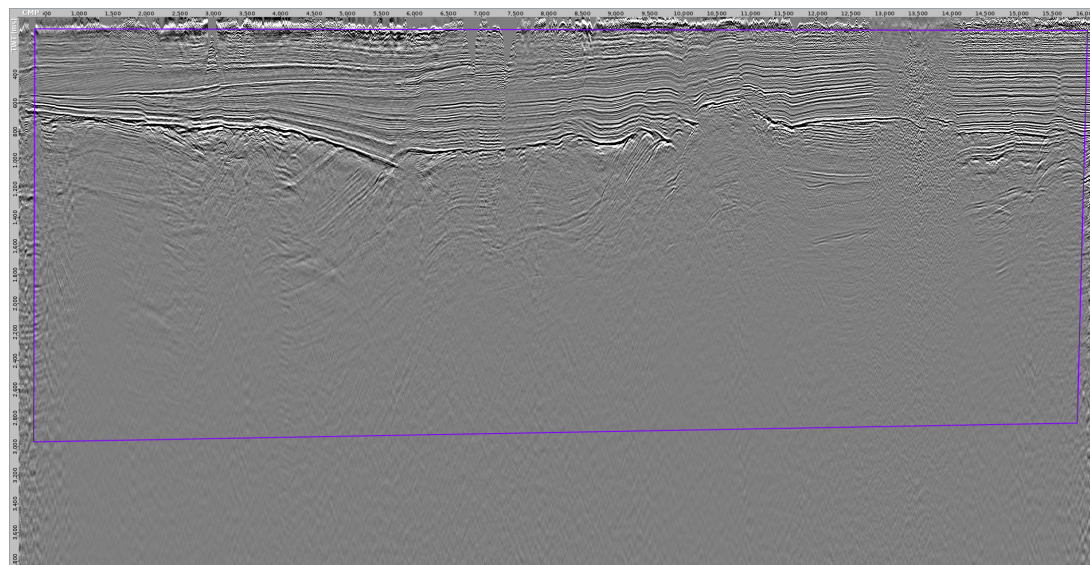
UGOU022-SCAN023 deep window amplitude spectra (dB)



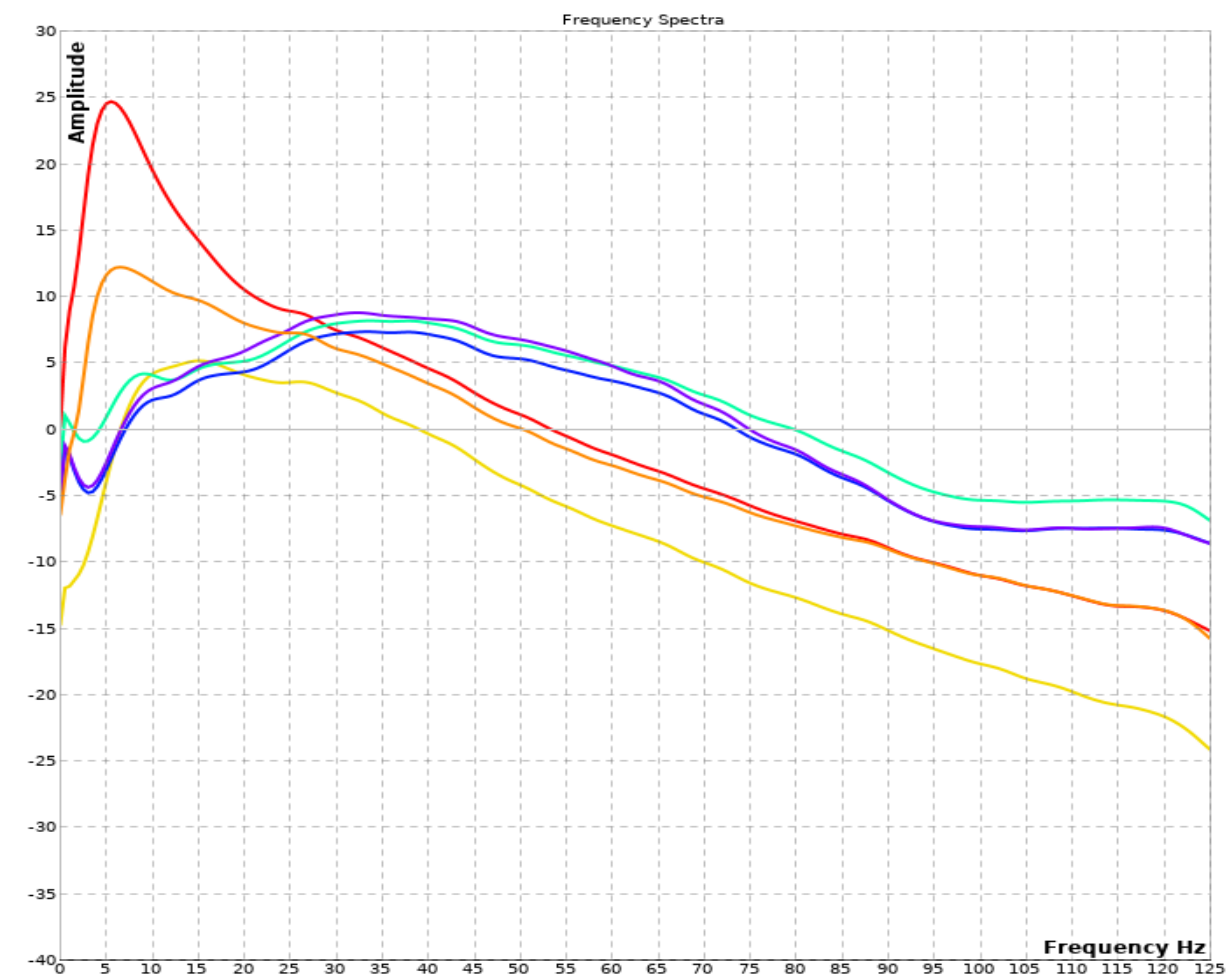
- Raw
- Denoise 1
- Denoise 2c
- Deconvolution
- Denoise 3
- Input to migration



UGOU022-SCAN023 long window amplitude spectra (dB)

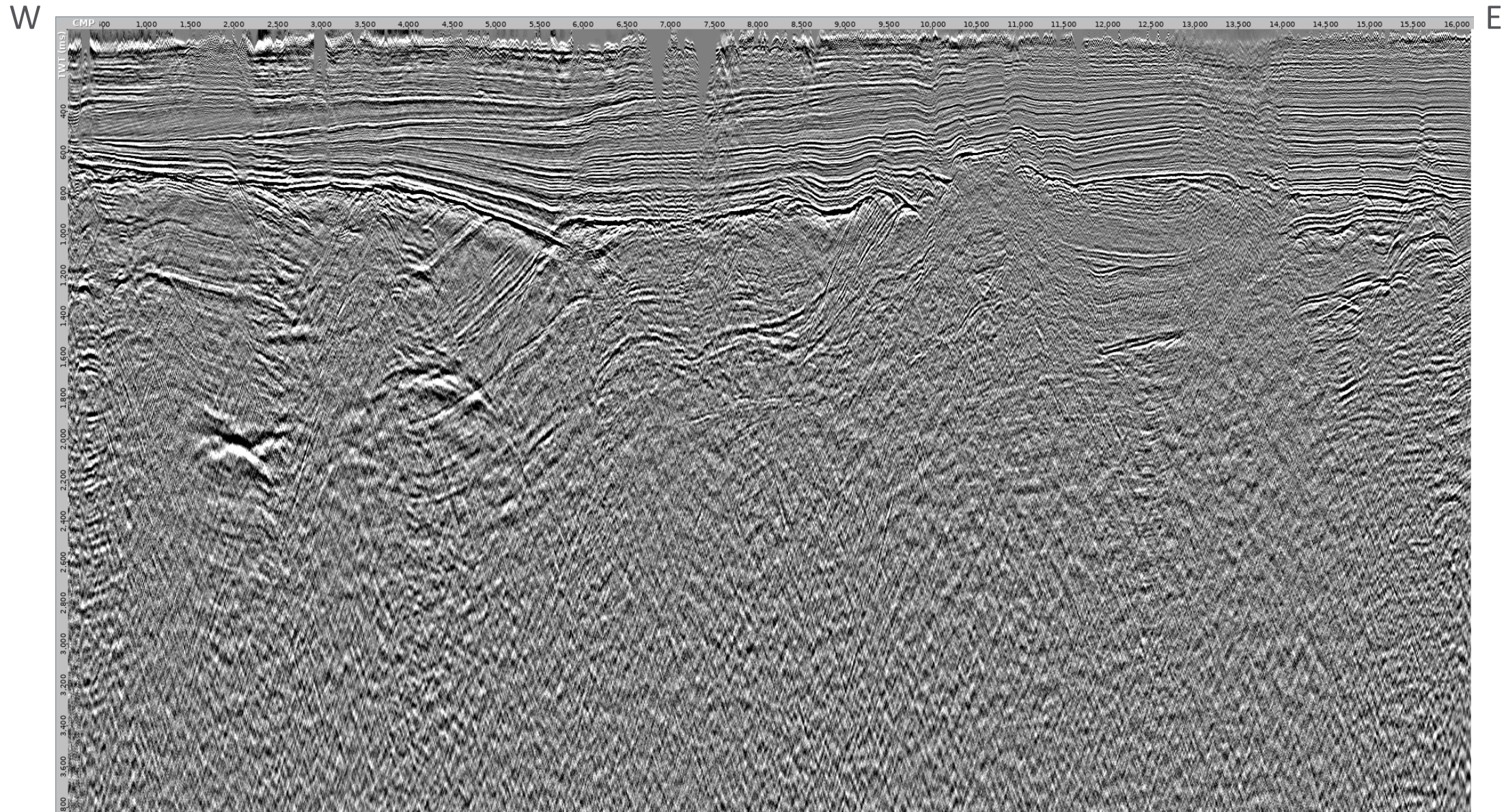


- Raw
- Denoise 1
- Denoise 2c
- Deconvolution
- Denoise 3
- Input to migration



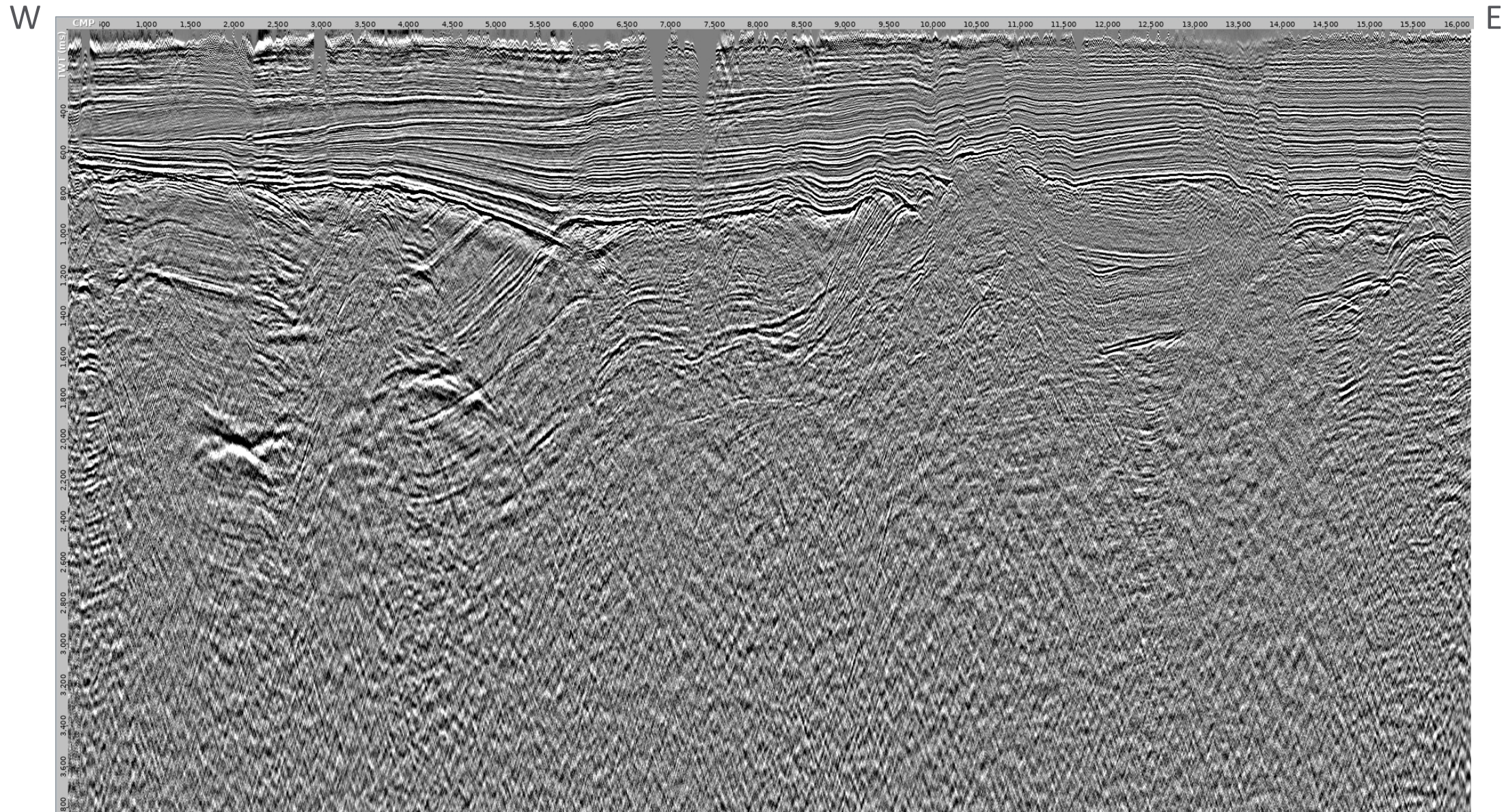
UGOU022-SCAN023 initial velocity stack

At final datum with 2-6-150-170 Hz filter



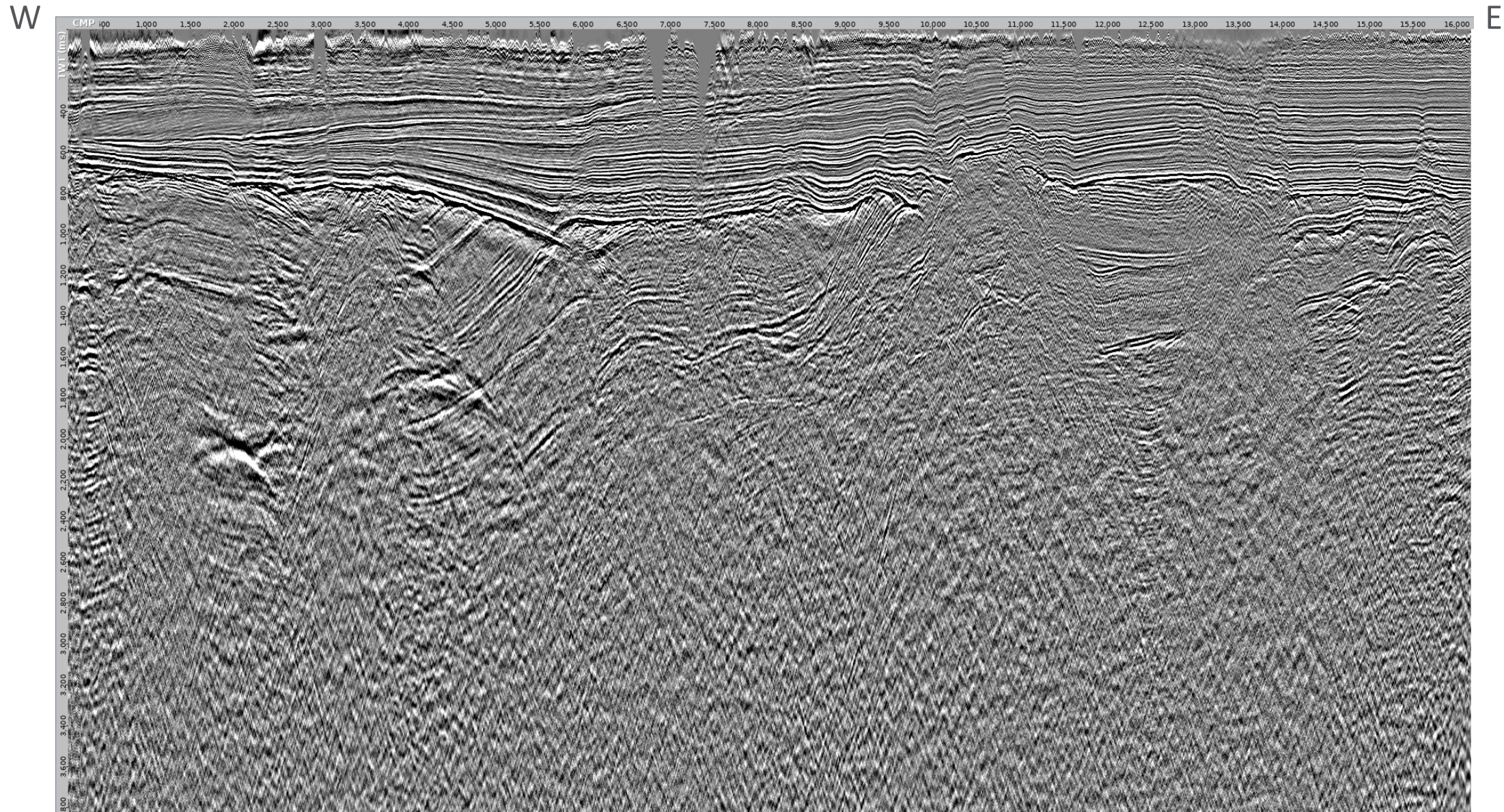
UGOU022-SCAN023 initial velocity and residual statics stack

At final datum with 2-6-150-170 Hz filter



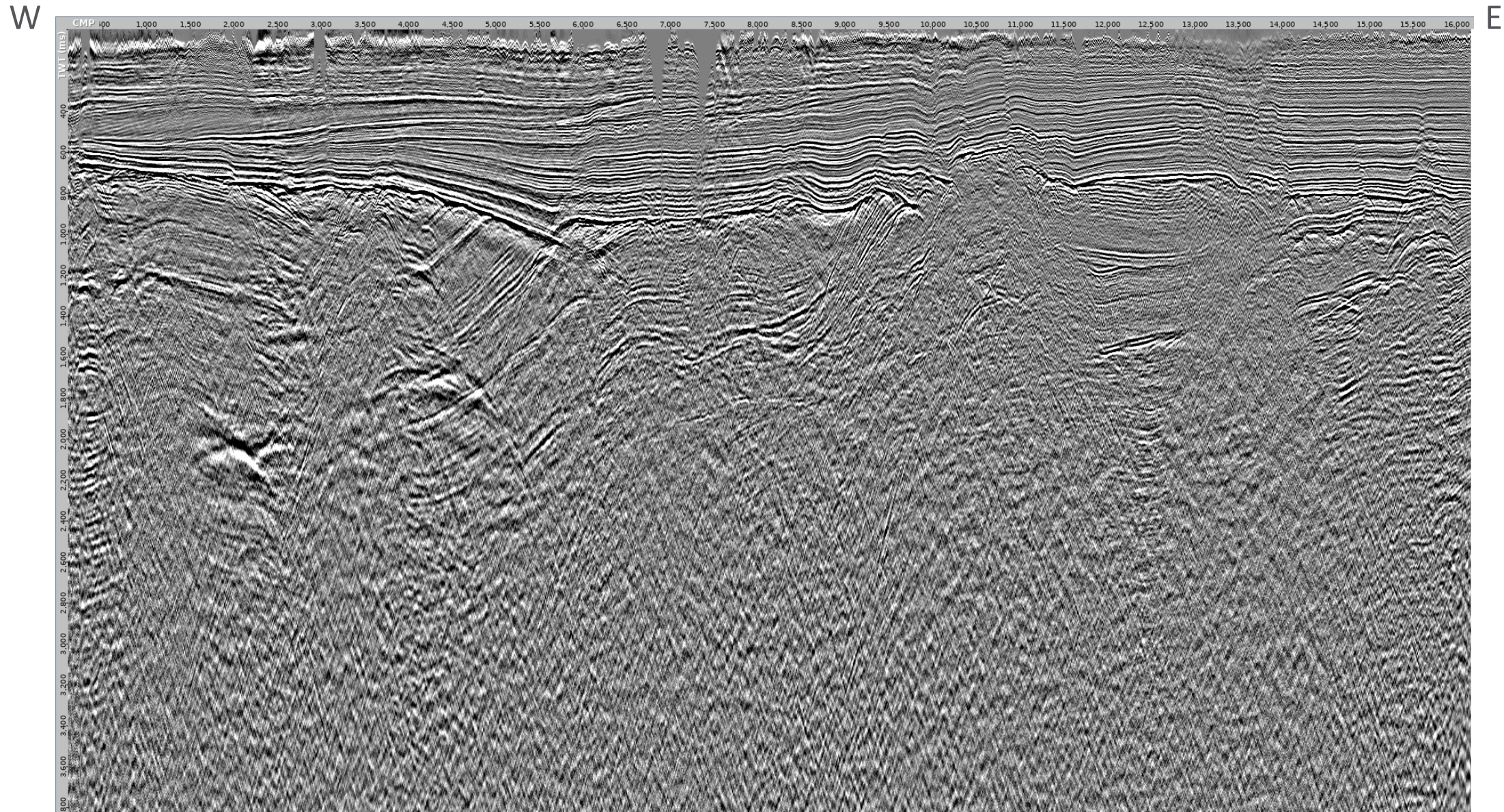
UGOU022-SCAN023 2nd pass velocity stack

At final datum with 2-6-150-170 Hz filter



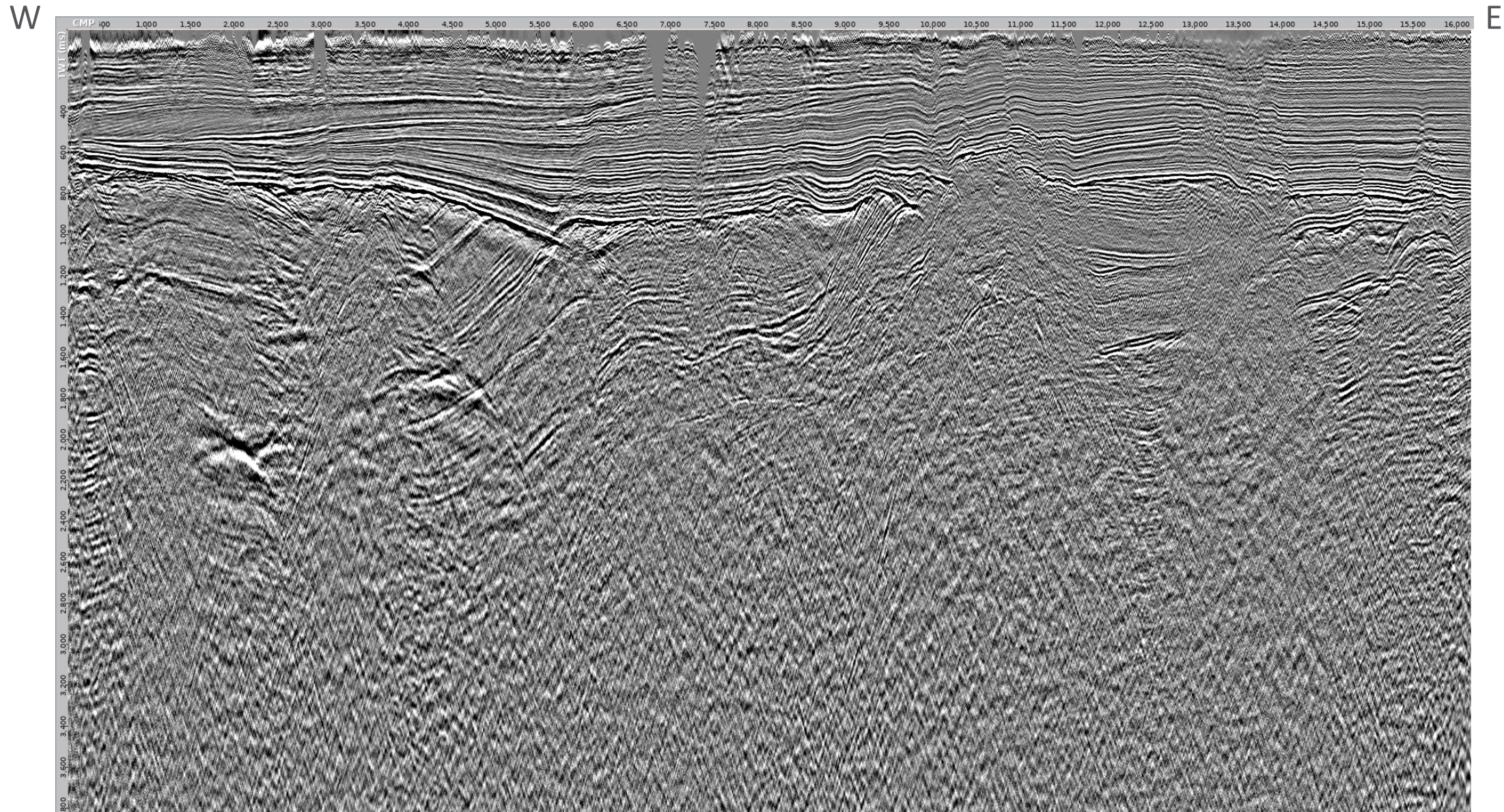
UGOU022-SCAN023 2nd pass velocity and residual statics stack

At final datum with 2-6-150-170 Hz filter



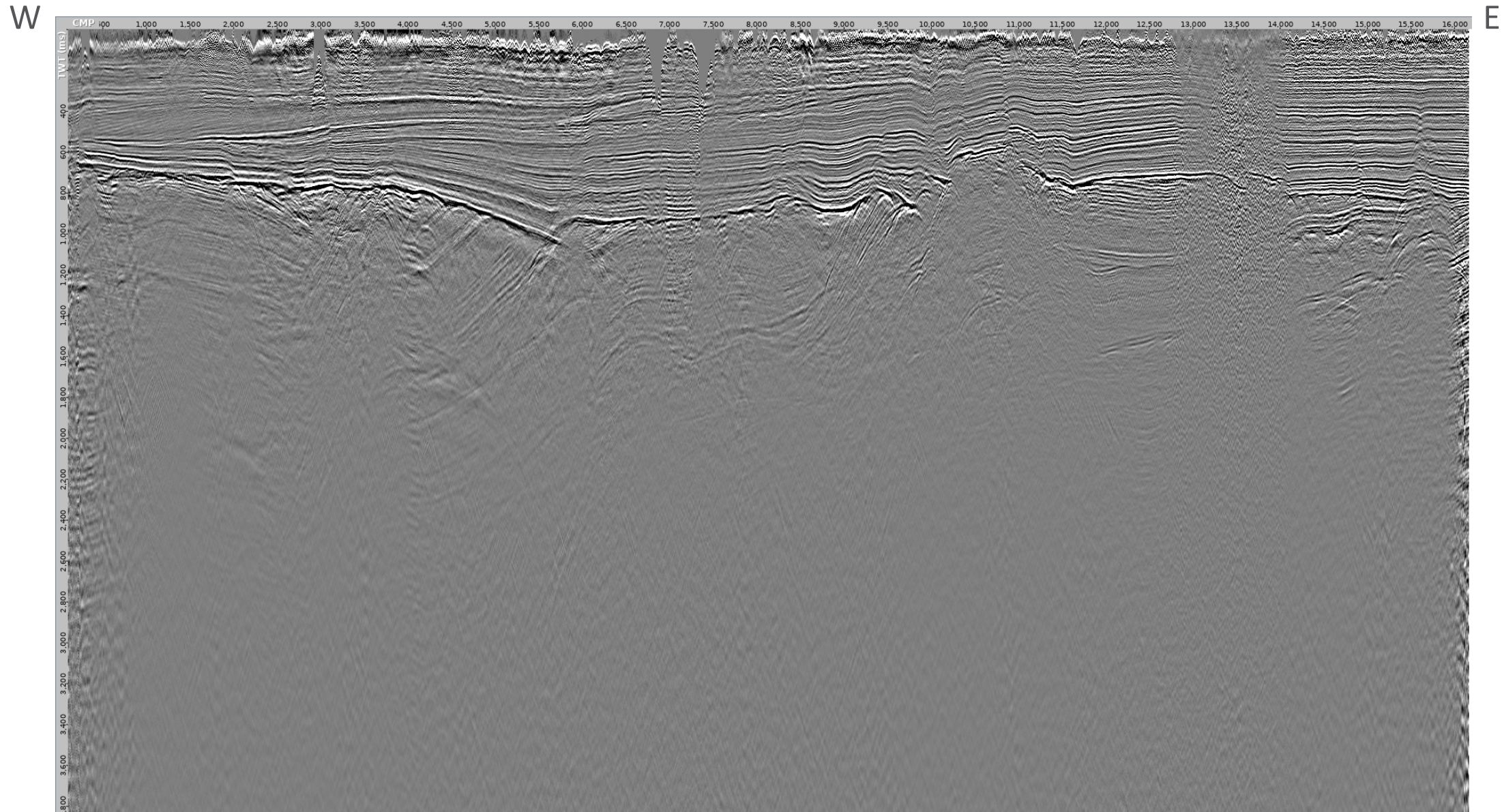
UGOU022-SCAN023 2nd pass velocity and residual statics stack with updated velocities

At final datum with 2-6-150-170 Hz filter



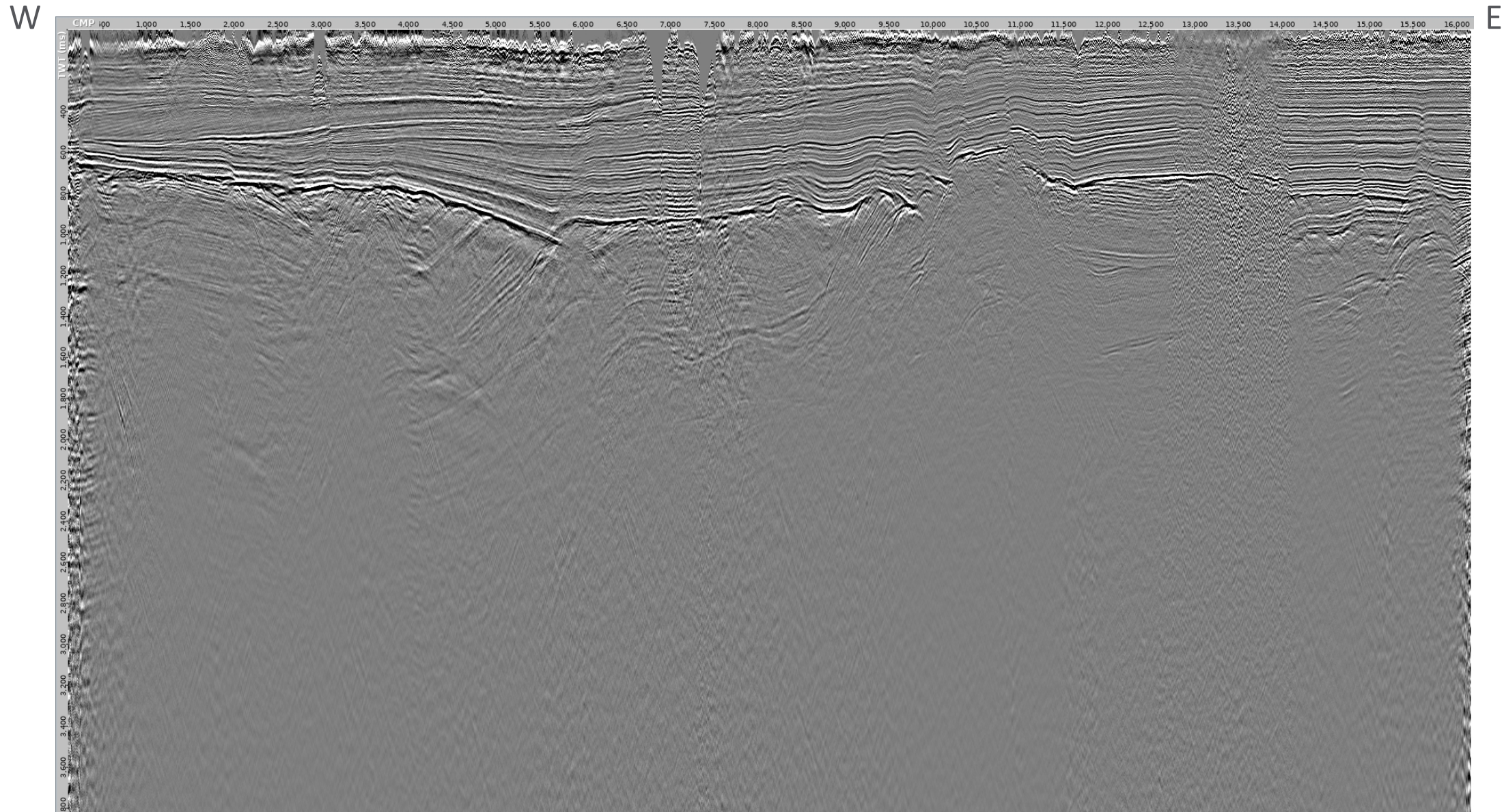
UGOU022-SCAN023 stack before SCAC2

At final datum with 2-6-150-170 Hz filter



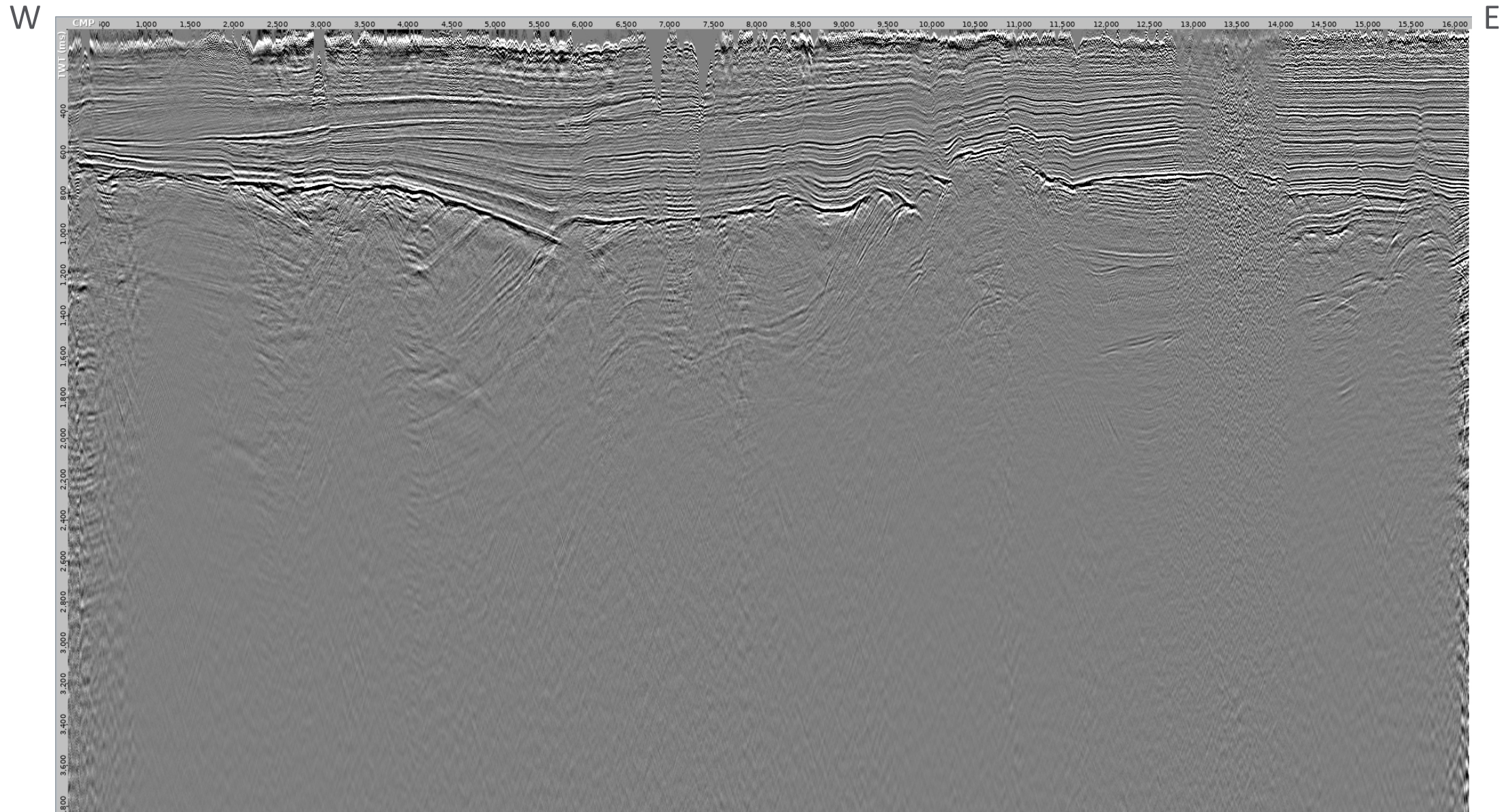
UGOU022-SCAN023 stack after updated SCAC2 (200-1200 ms window)

At final datum with 2-6-150-170 Hz filter



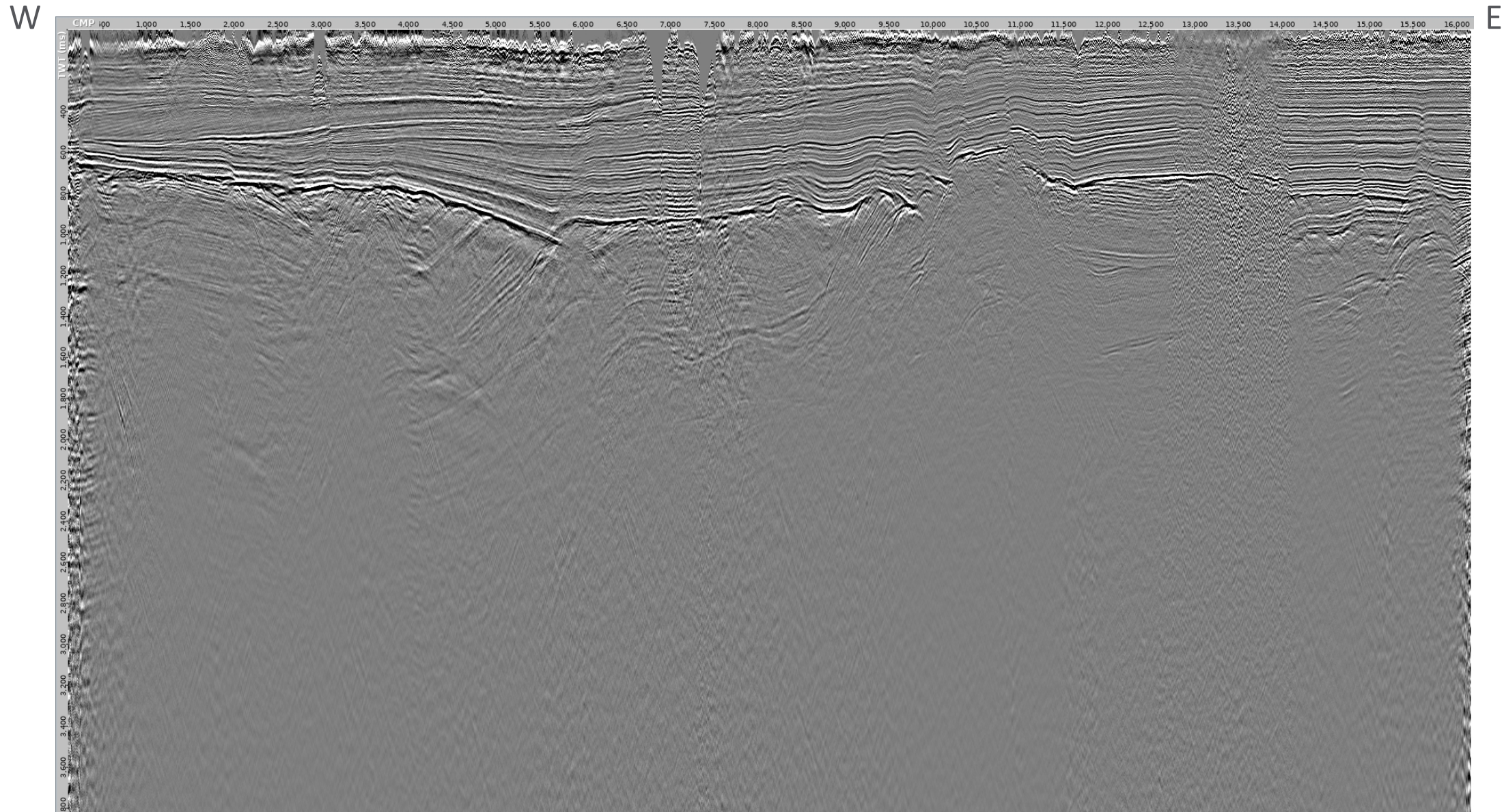
UGOU022-SCAN023 stack after original SCAC2 (200-2200 ms window)

At final datum with 2-6-150-170 Hz filter



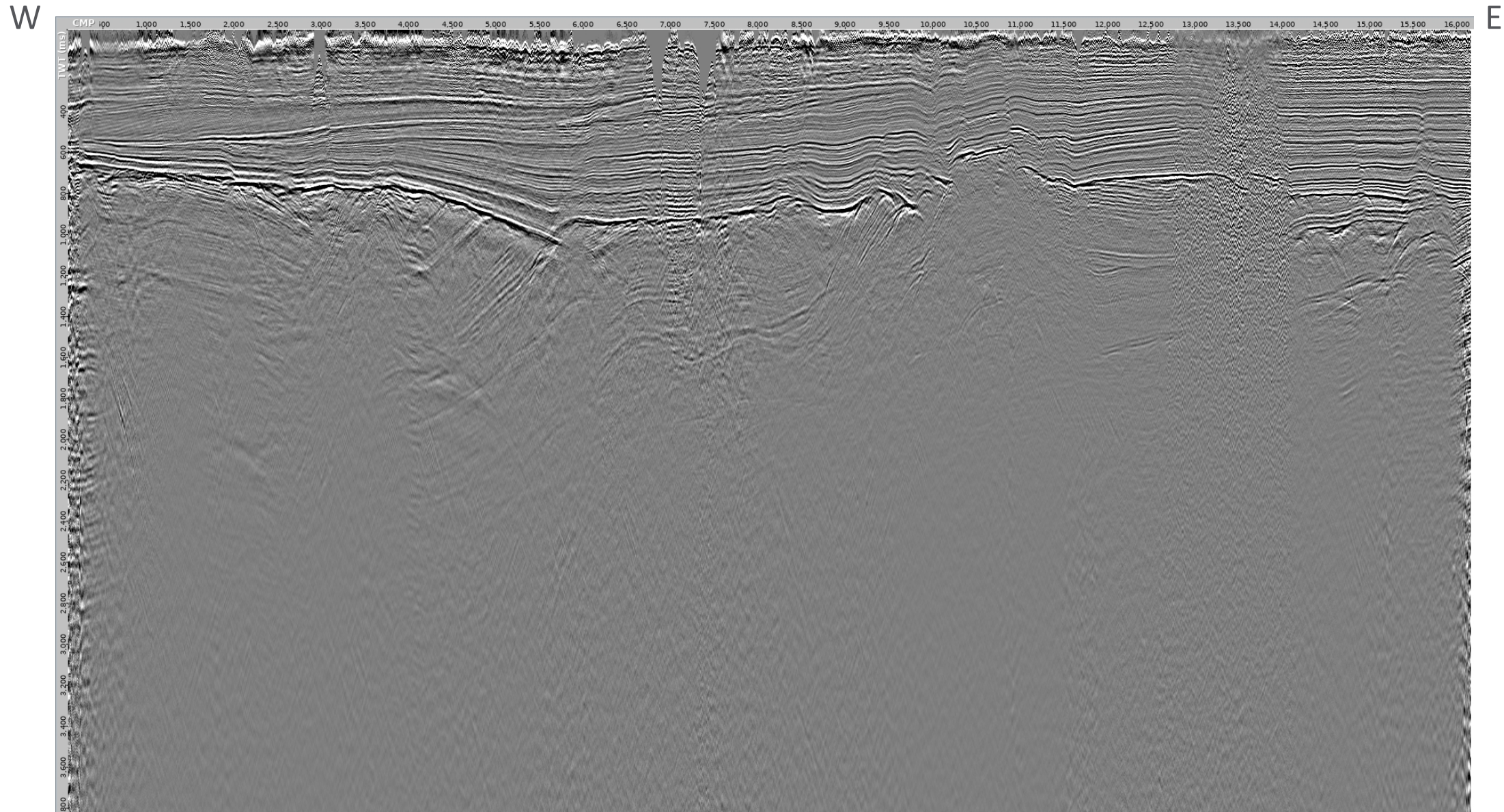
UGOU022-SCAN023 stack after updated SCAC2 (200-1200 ms window) – REPEAT SLIDE

At final datum with 2-6-150-170 Hz filter

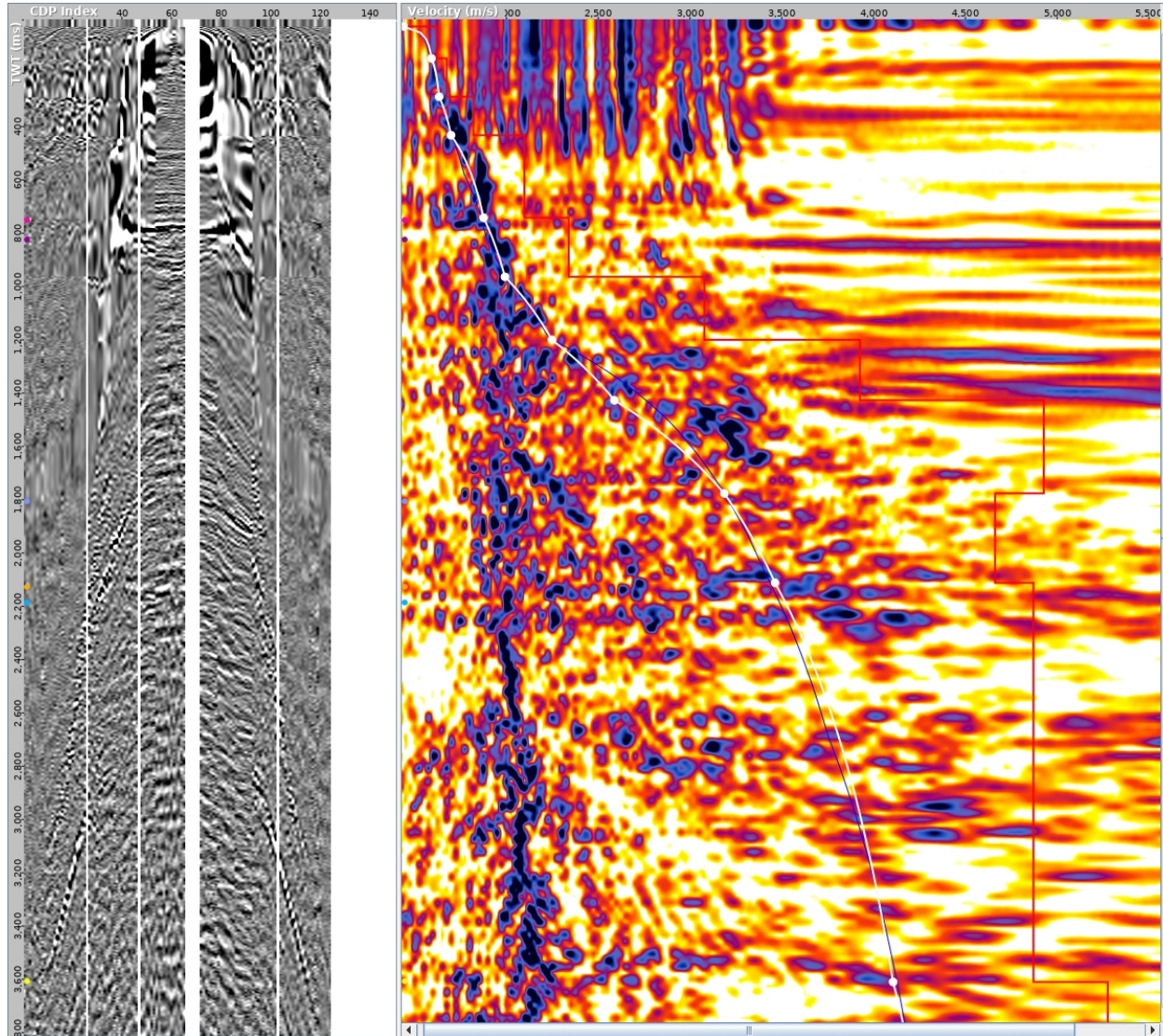


UGOU022-SCAN023 stack after updated SCAC2 (200-2200 ms window) and updated velocity picking

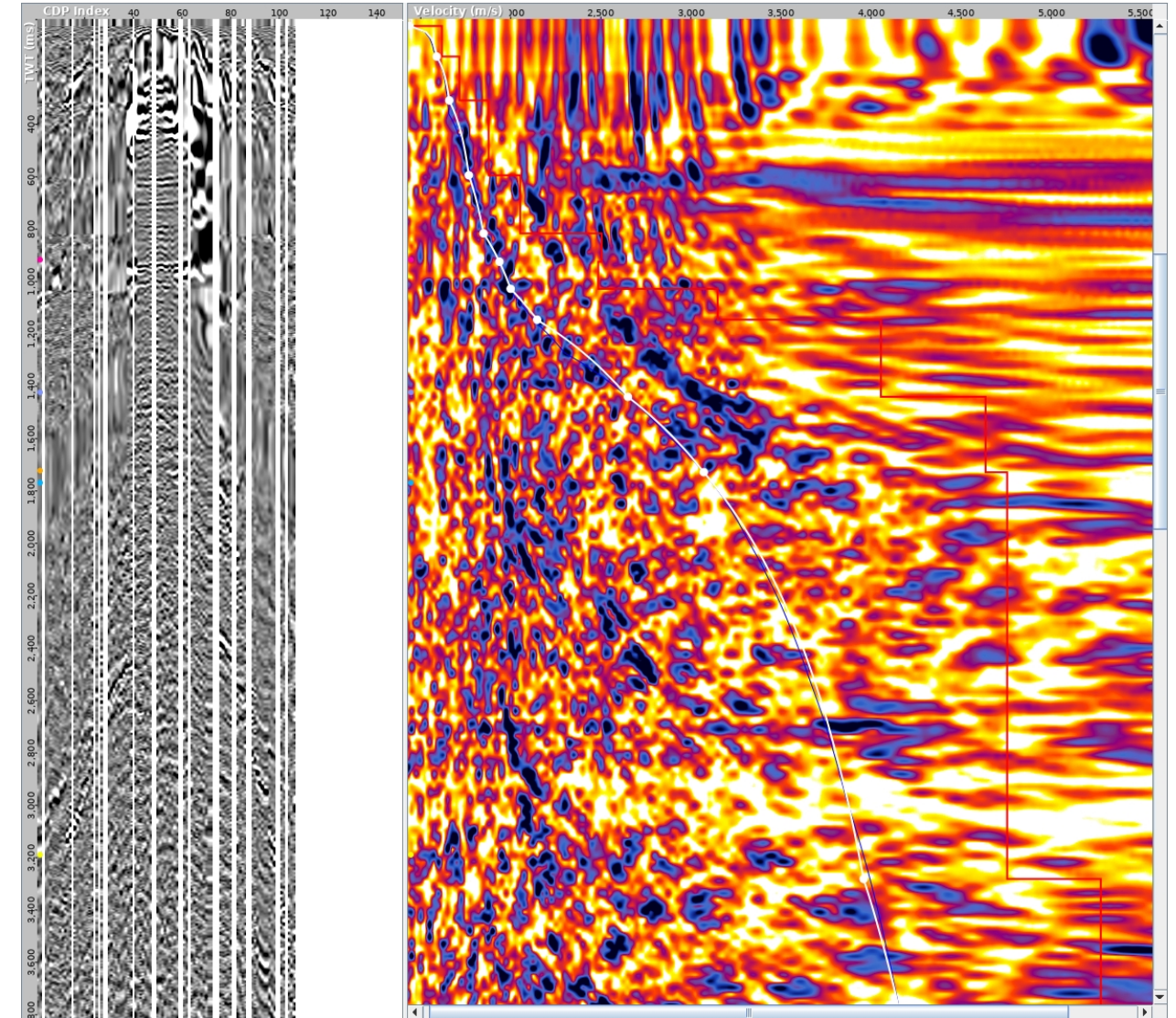
At final datum with 2-6-150-170 Hz filter



CDP 2800

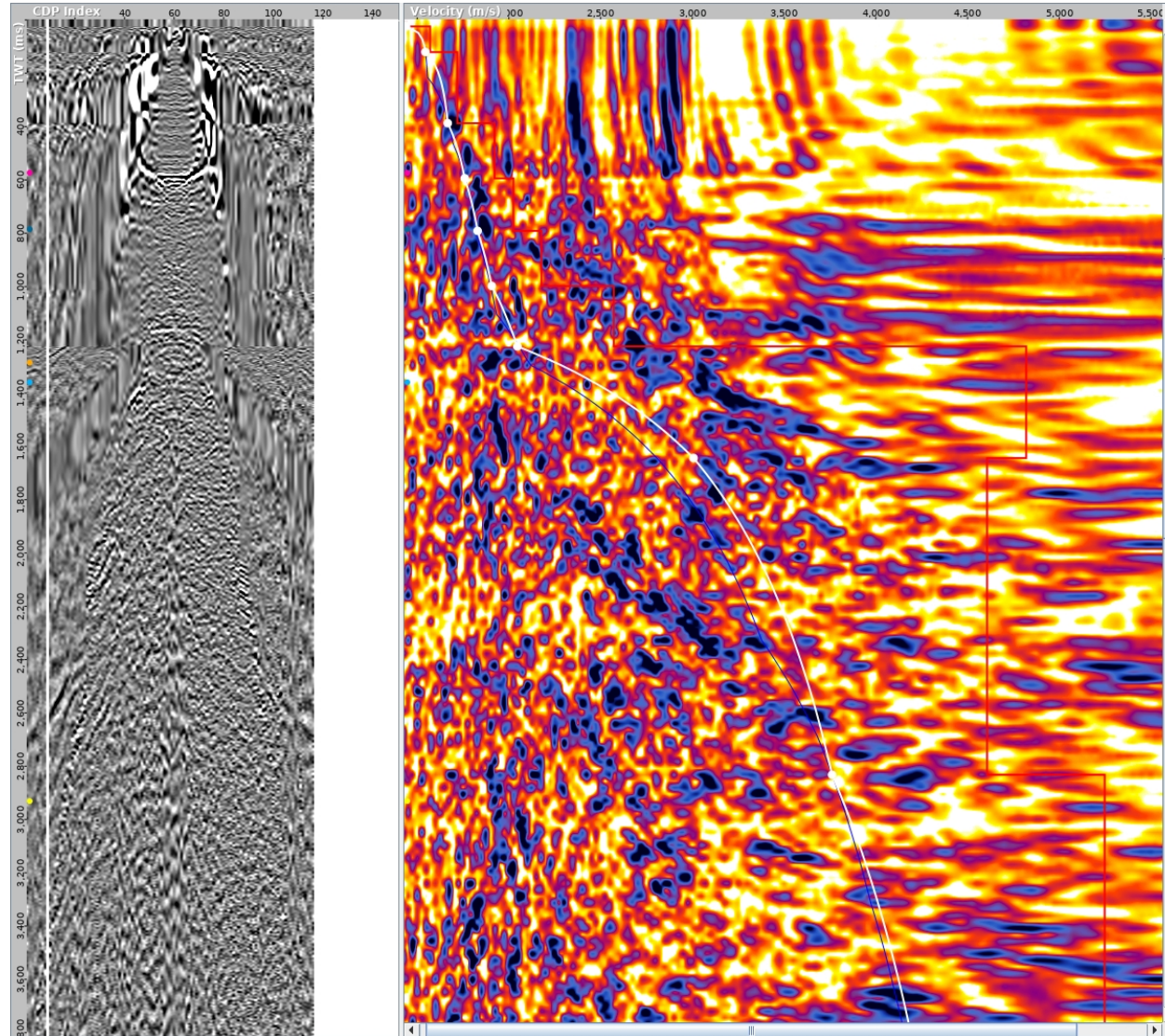


CDP 6800

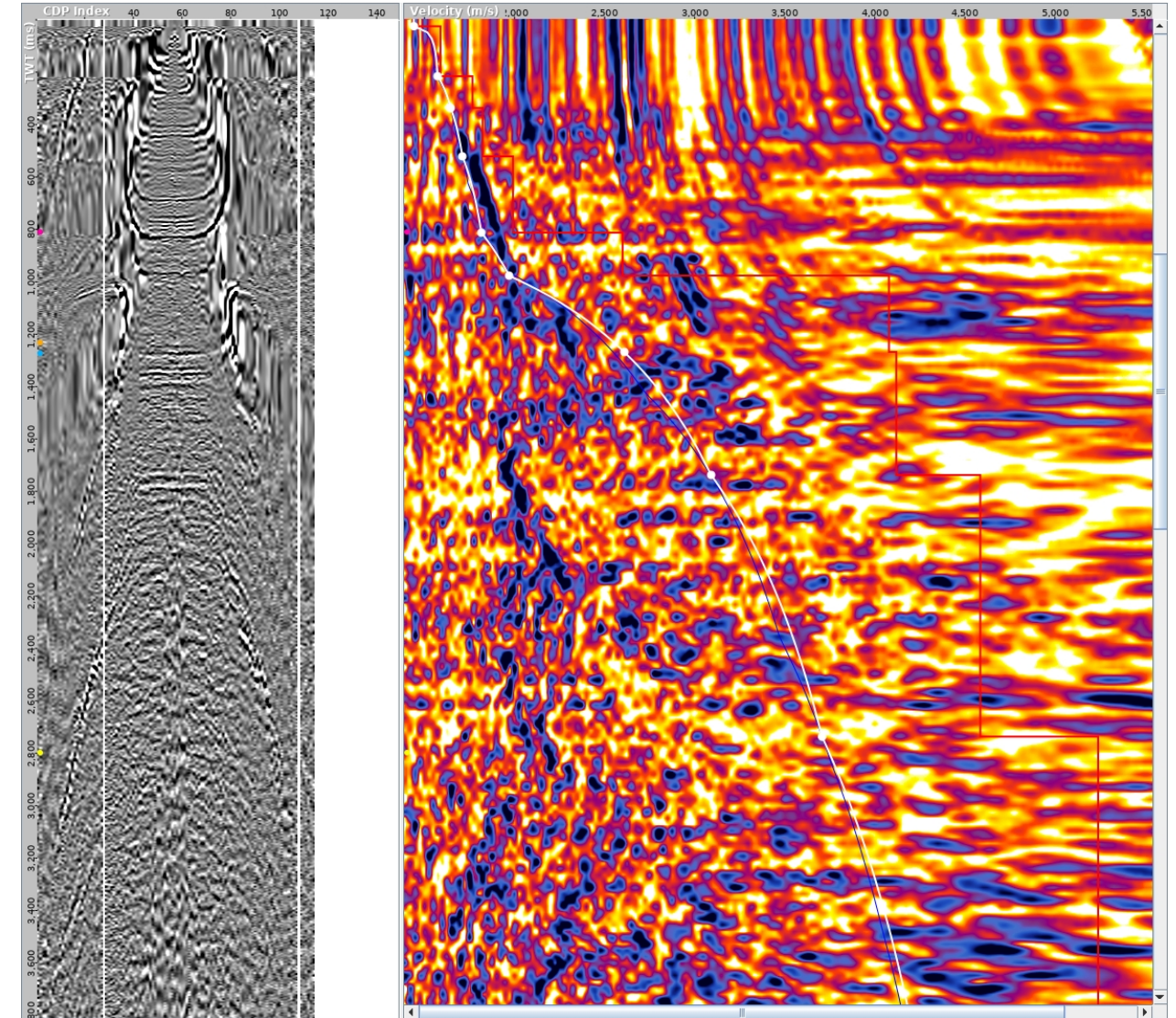


Red = Interval velocities White = Picked velocities Blue = Initial velocities

CDP 10800



CDP 14800



Red = Interval velocities White = Picked velocities Blue = Initial velocities

UGOU022-SCAN023 stack with 2nd pass velocities and residual statics and updated interval velocity overlay

At floating datum



W

E

