

# UGOU022-SCAN023 PreSTM 2 and PreSTM 3 Report

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

16 DECEMBER 2020

Energie Beheer Nederland B.V.

2D Seismic PreSTM Processing, Onshore Netherlands

- This report documents the results of running the PreSTM 2 and PreSTM 3 migrations.

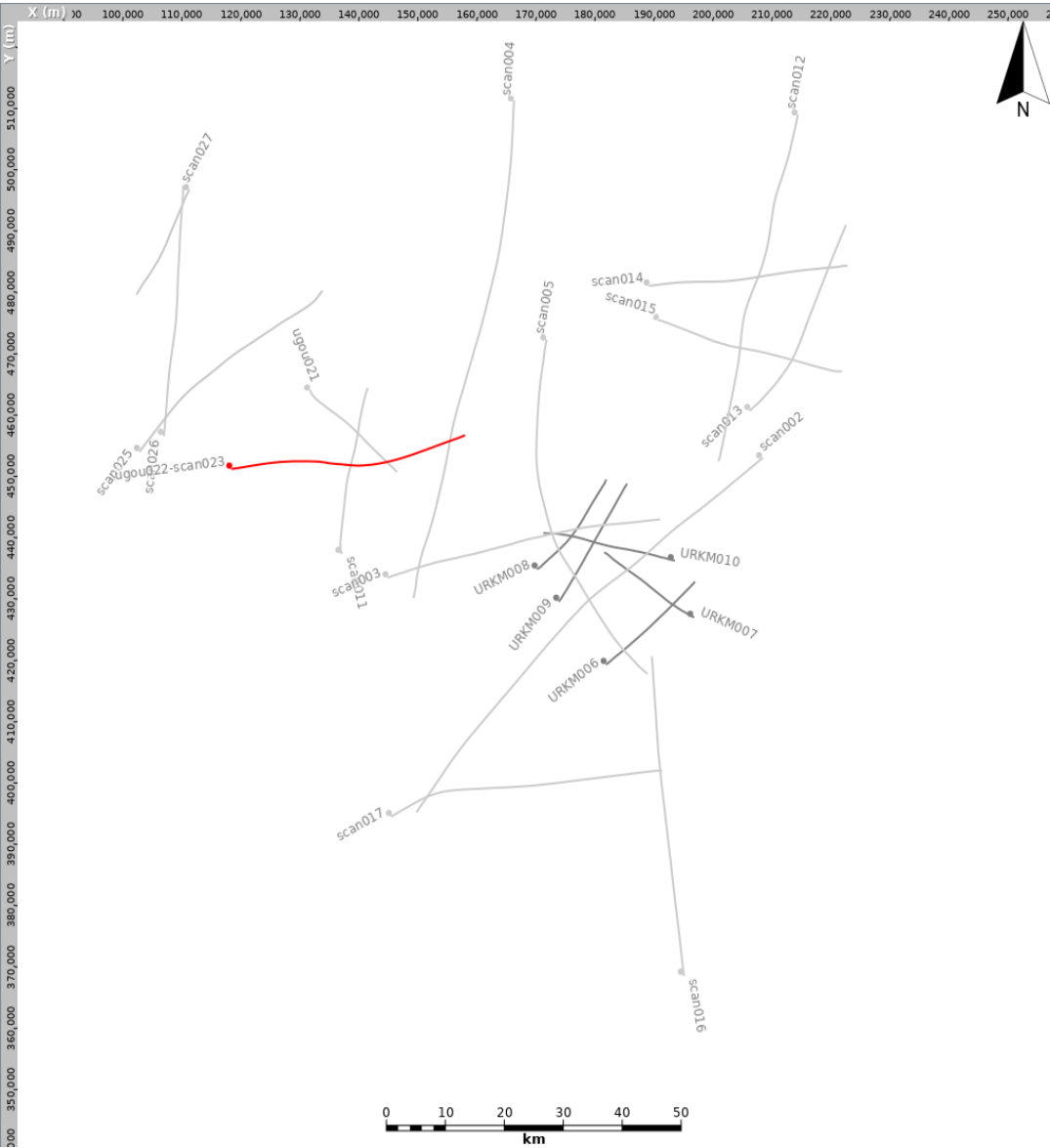
## Processing sequence

- 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: Delay time using  $V_0 = 1000$  m/s  $V_R = 1700$  m/s  $SRD = NAP$
- Refraction statics: +/- 1250 m/s Weiner dip filter
- Noise attenuation: Kill invalid shots and receivers
- Edits: Despiking
- Noise attenuation: Wavelet (D20) transform filter (muting the largest 10% of coefficients by 90% in scales 6-10)
- Noise attenuation: Source and receiver designed on NMO corrected gathers over 200-2200 ms
- SCAC 1: TFDN
- Noise attenuation: Q = 100 phase and amplitude using 40 Hz reference frequency and 12 dB gain stabilisation
- Inverse Q: Surface consistent with 160 ms operator length with 16 ms predictive gap
- DBS: 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
- SCAC 2: Source and receiver designed on NMO corrected gathers over 200-2200 ms

## Processing sequence (continued)

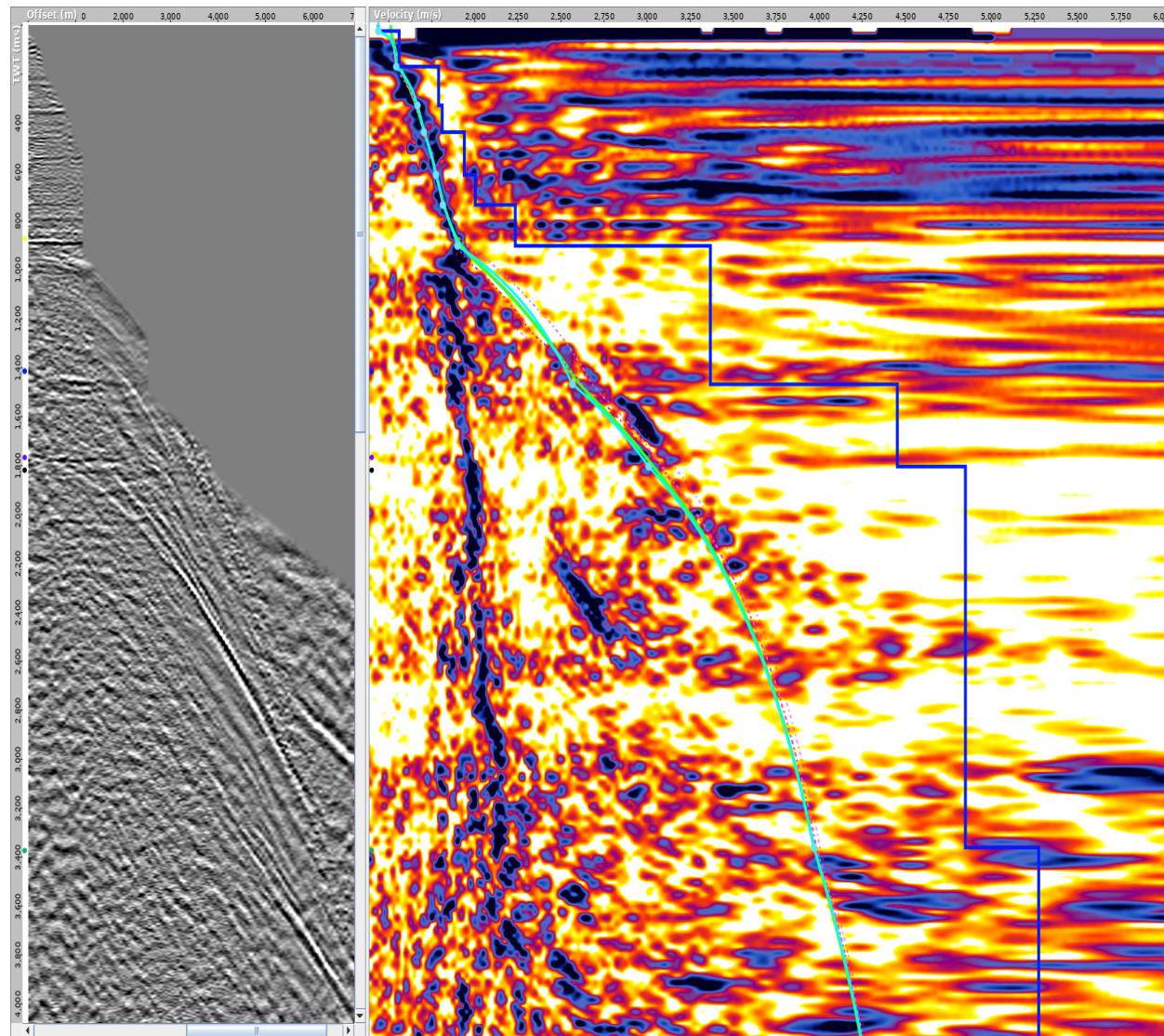
- Remove spherical divergence: T
- Low cut filter: 2.5 Hz low cut filter
- Migration (PreSTM 1): Isotropic 4th order curved ray Kirchhoff using smoothed (5000-300-3) stacking velocities
- Velocity analysis: Remove PreSTM 1 velocities and pick 2nd order velocities at 1 km intervals and 500 m where required  
Effective Eta picked automatically every 250 m
- Migration (PreSTM 2): Kirchhoff VTI migration using smoothed (2000-200-10) 2nd order picked velocities and auto picked effective Eta
- Migration (PreSTM 3): Kirchhoff VTI migration using smoothed (500-100-2) 2nd order time-tomography and auto picked effective Eta
- Conversion to zero phase:
- Trace drop: Far offsets dropped to match migration input gather
- Stack: 1/N (1/vN for scaled stacks) with 45° mute
- Bandpass filter: 2-6-120-150 Hz on selected stacks only
- Scaling: 1000 ms AGC on selected stacks only
- Migration parameters: 3 km aperture  
TV dip: 0-45° 1250-45° 2500-30°  
Anti-alias constant = 2
- Smoothing parameters: Horizontal half width (m) – vertical half width (ms) – relative weight at max time



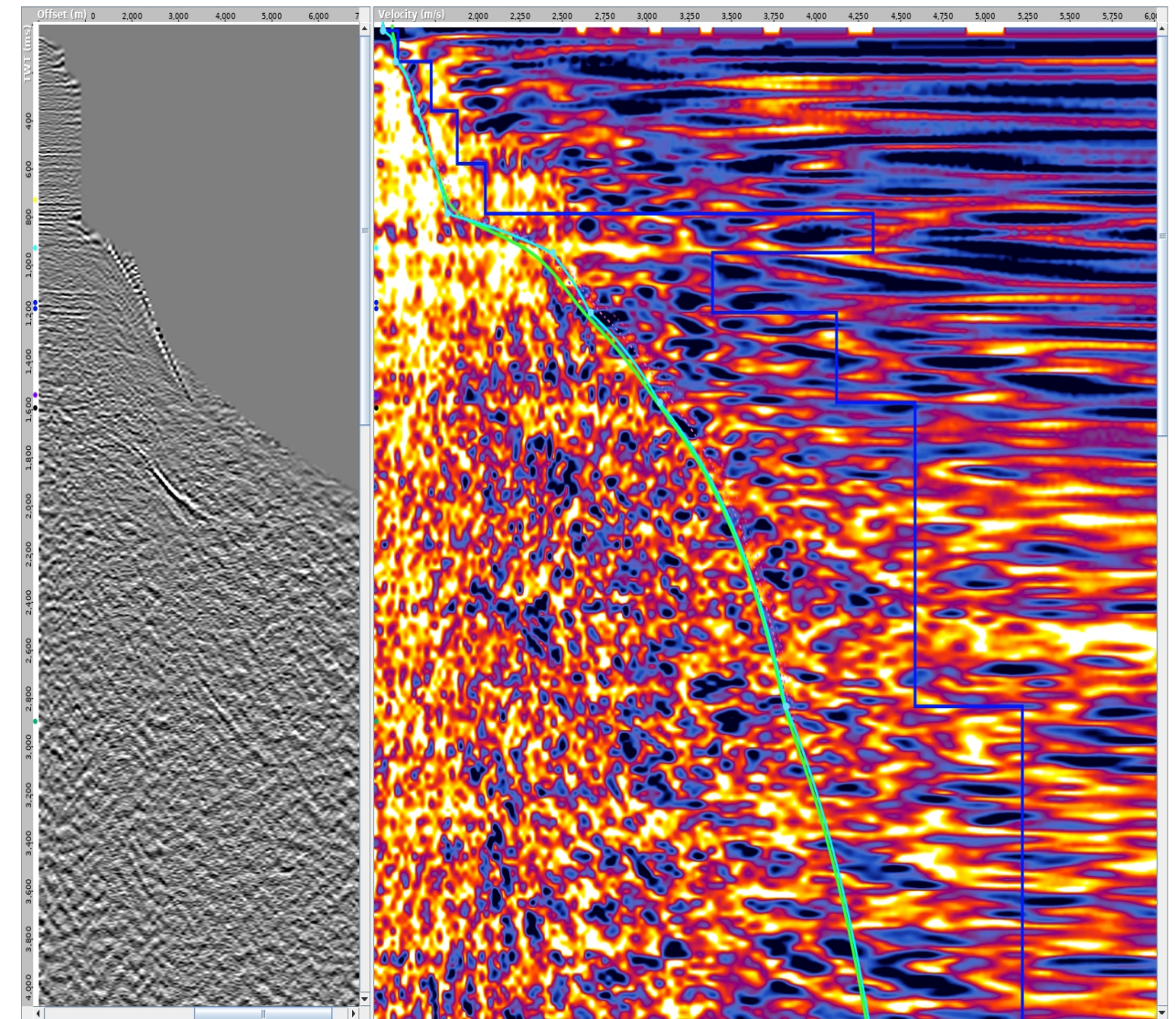




# UGOU022-SCAN023 post migration velocity analyses – CDP 4,800 / 12,000



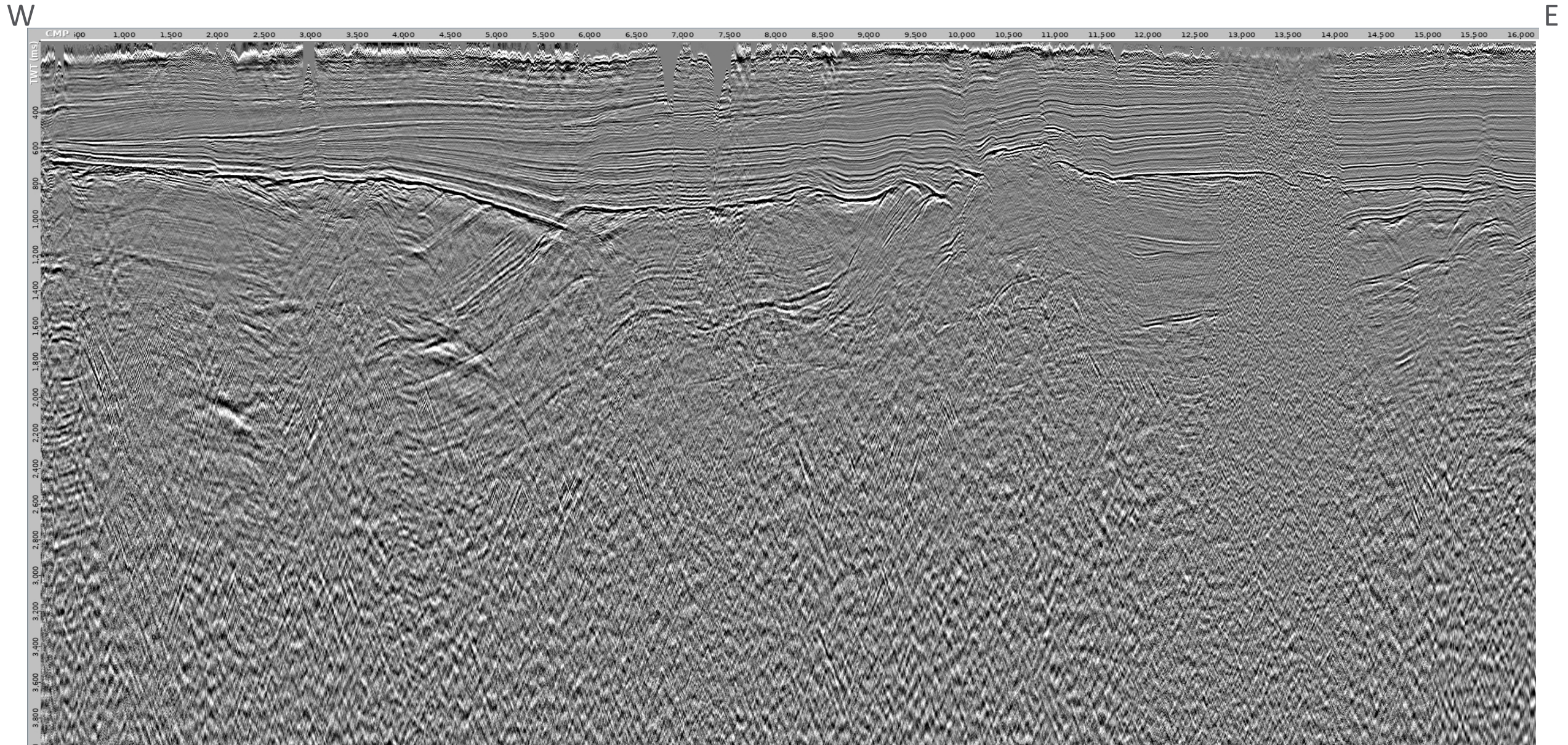
PreSTM 1 velocity function  
Post PreSTM1 RMS velocity picks (Corresponding interval velocity)





# UGOU022-SCAN023 pre-migration true amplitude stack (not zero phase)

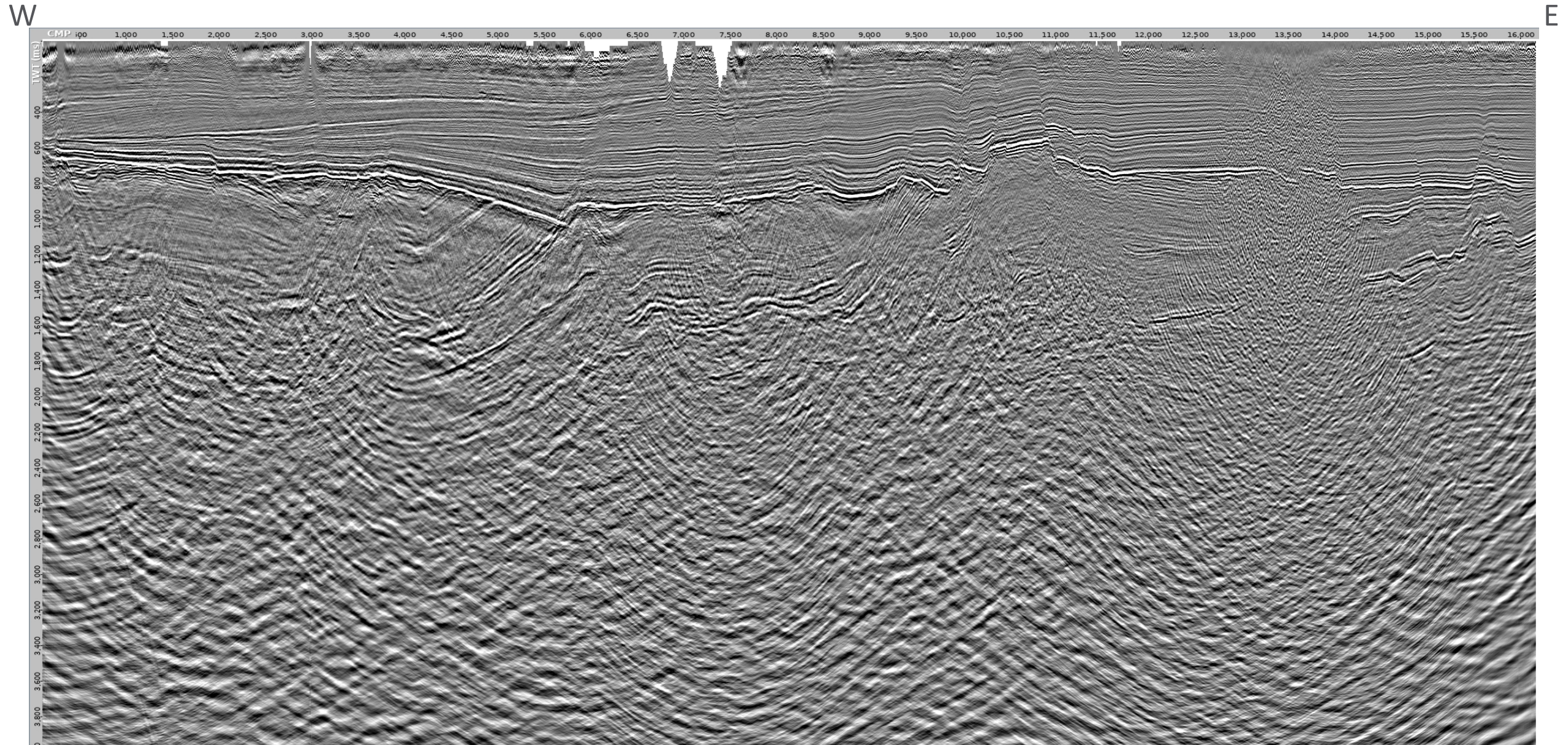
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





# UGOU022-SCAN023 PreSTM 1 true amplitude stack

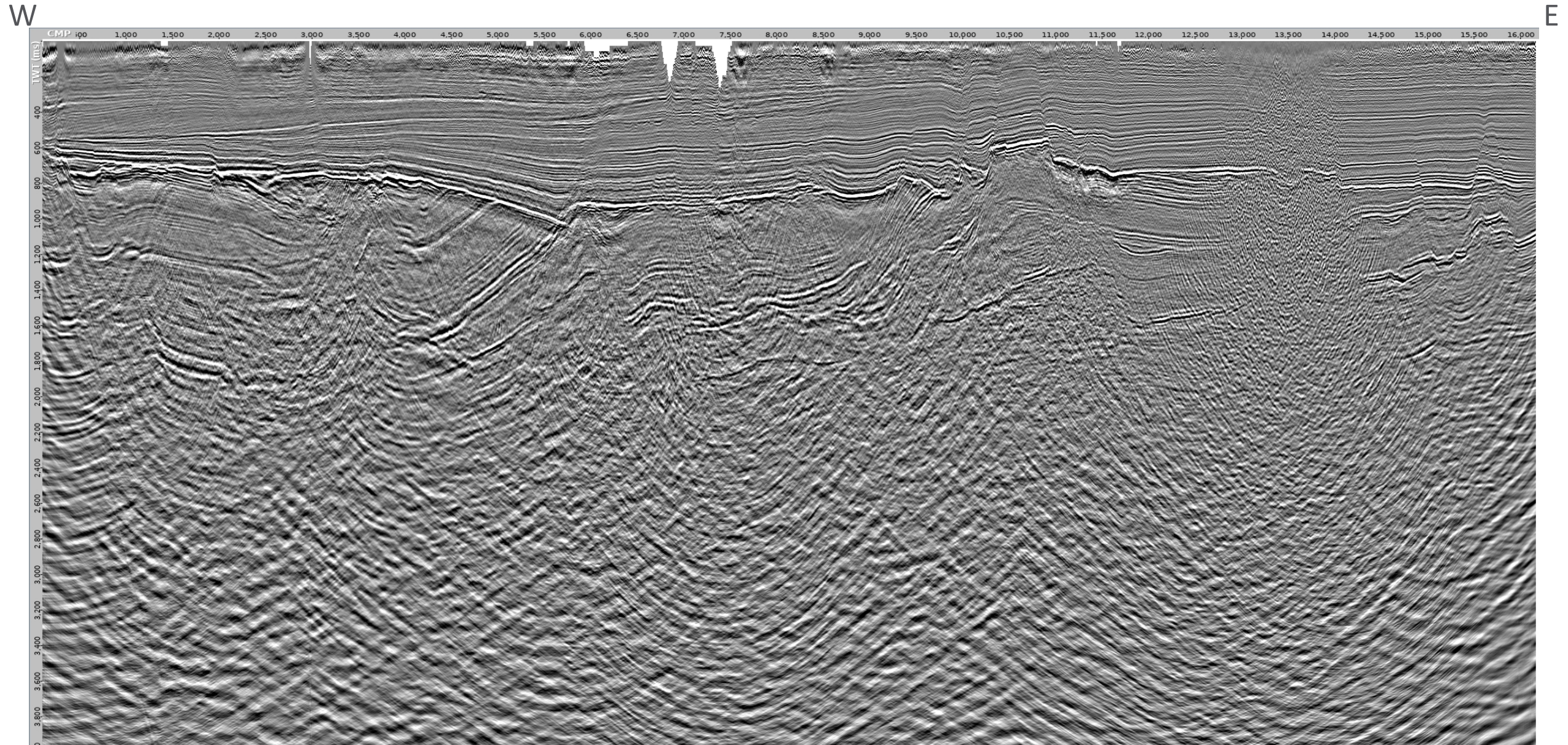
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





# UGOU022-SCAN023 PreSTM 2 true amplitude stack

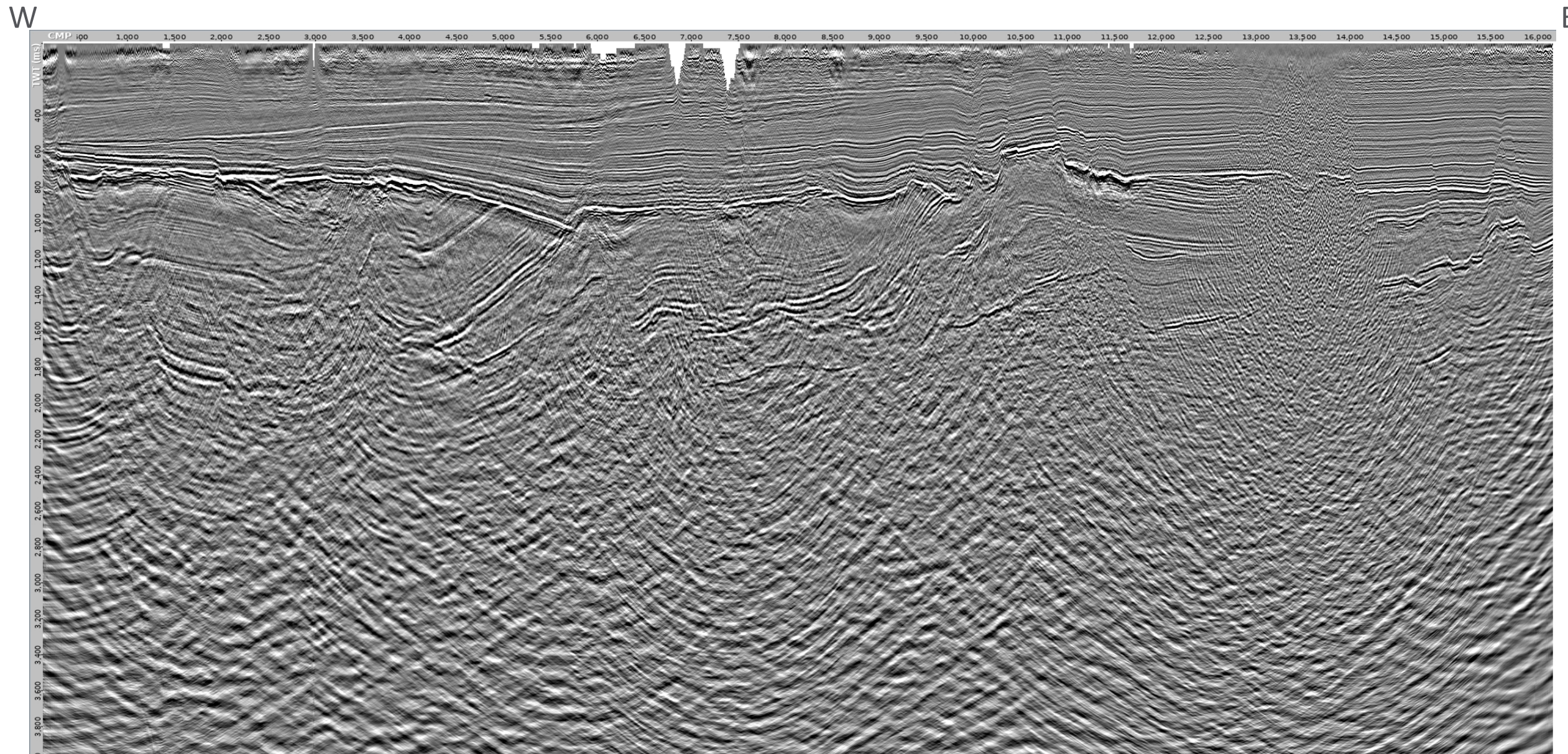
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





# UGOU022-SCAN023 PreSTM 3 true amplitude stack

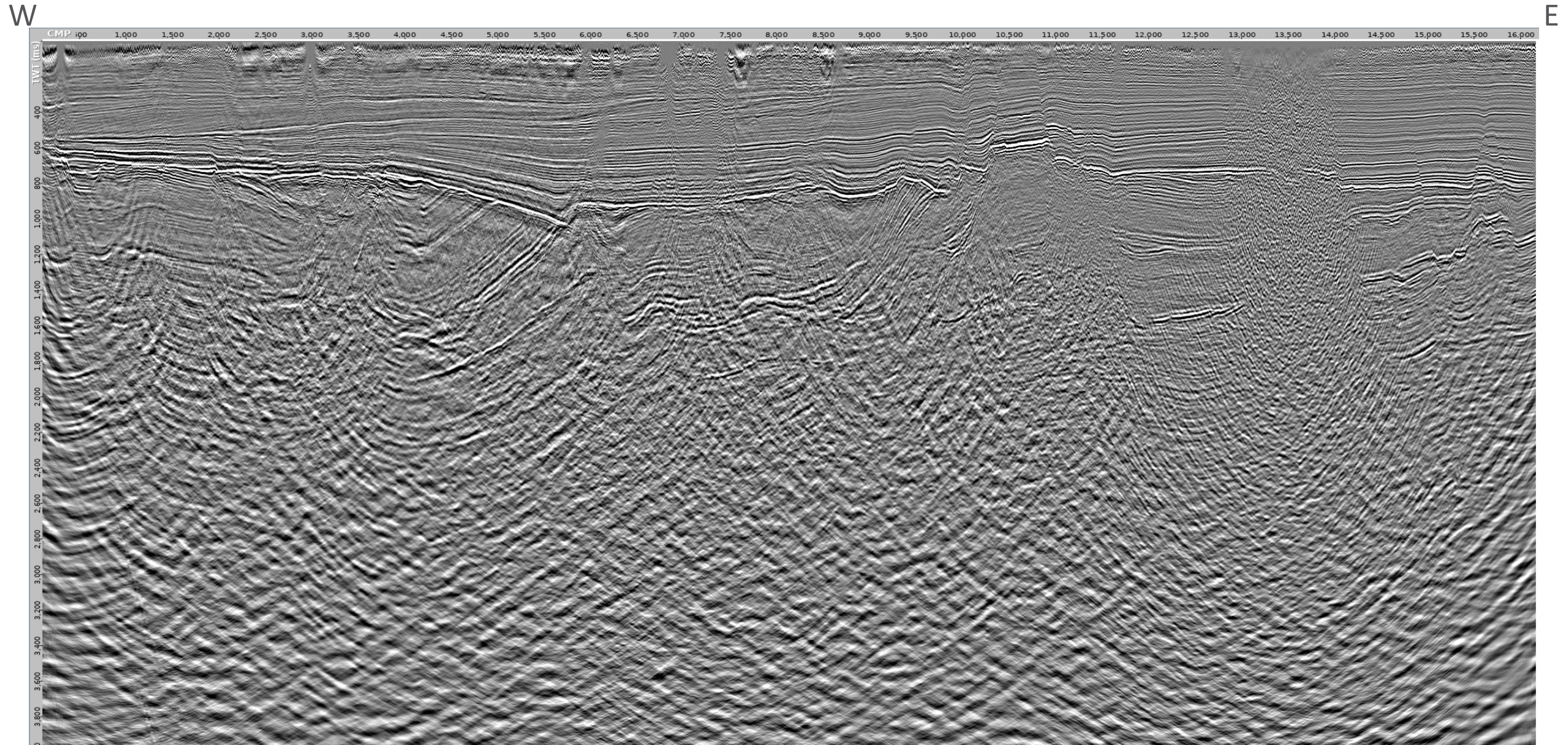
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





# UGOU022-SCAN023 fast-track PreSTM true amplitude stack

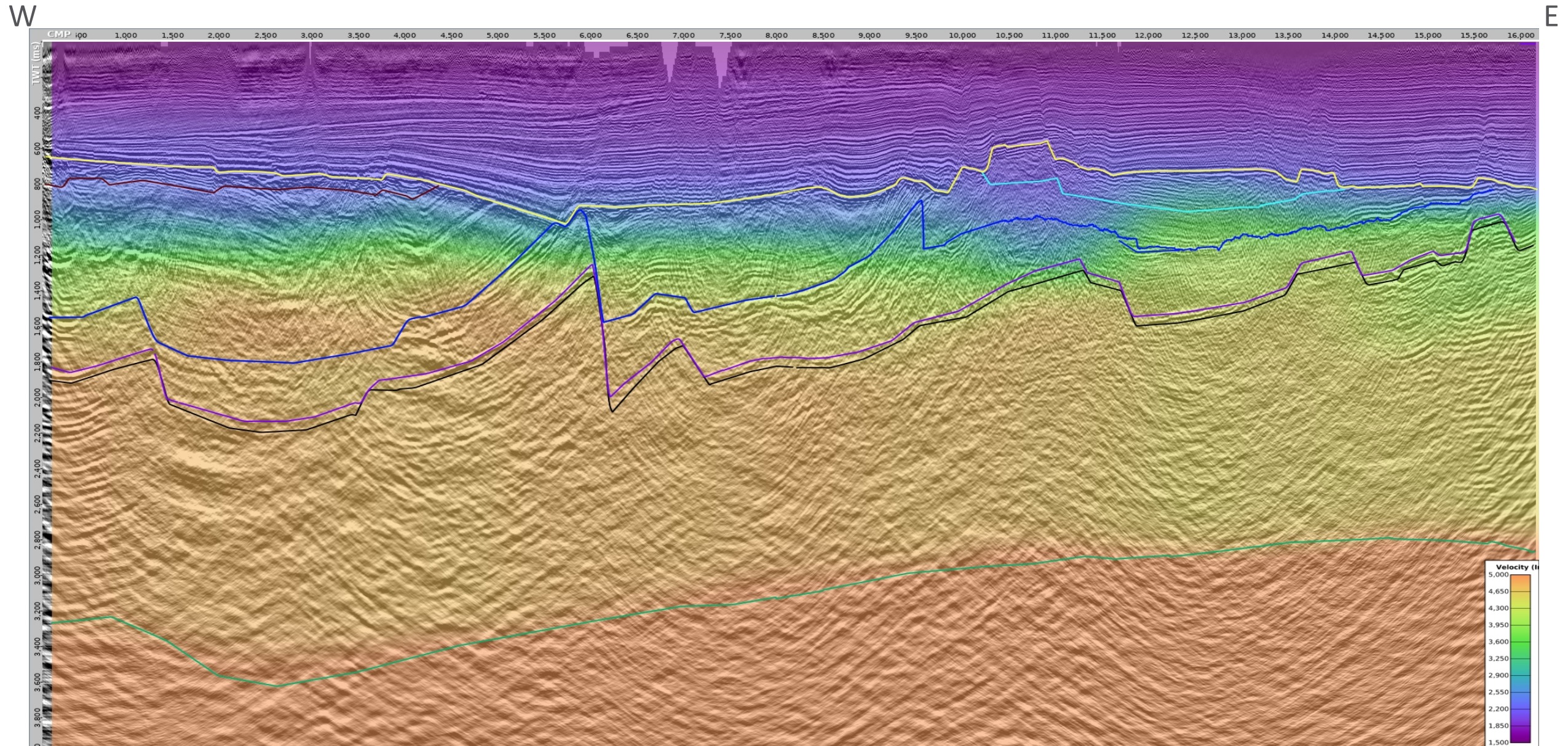
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





# UGOU022-SCAN023 PreSTM 1 stack with interval velocity overlay

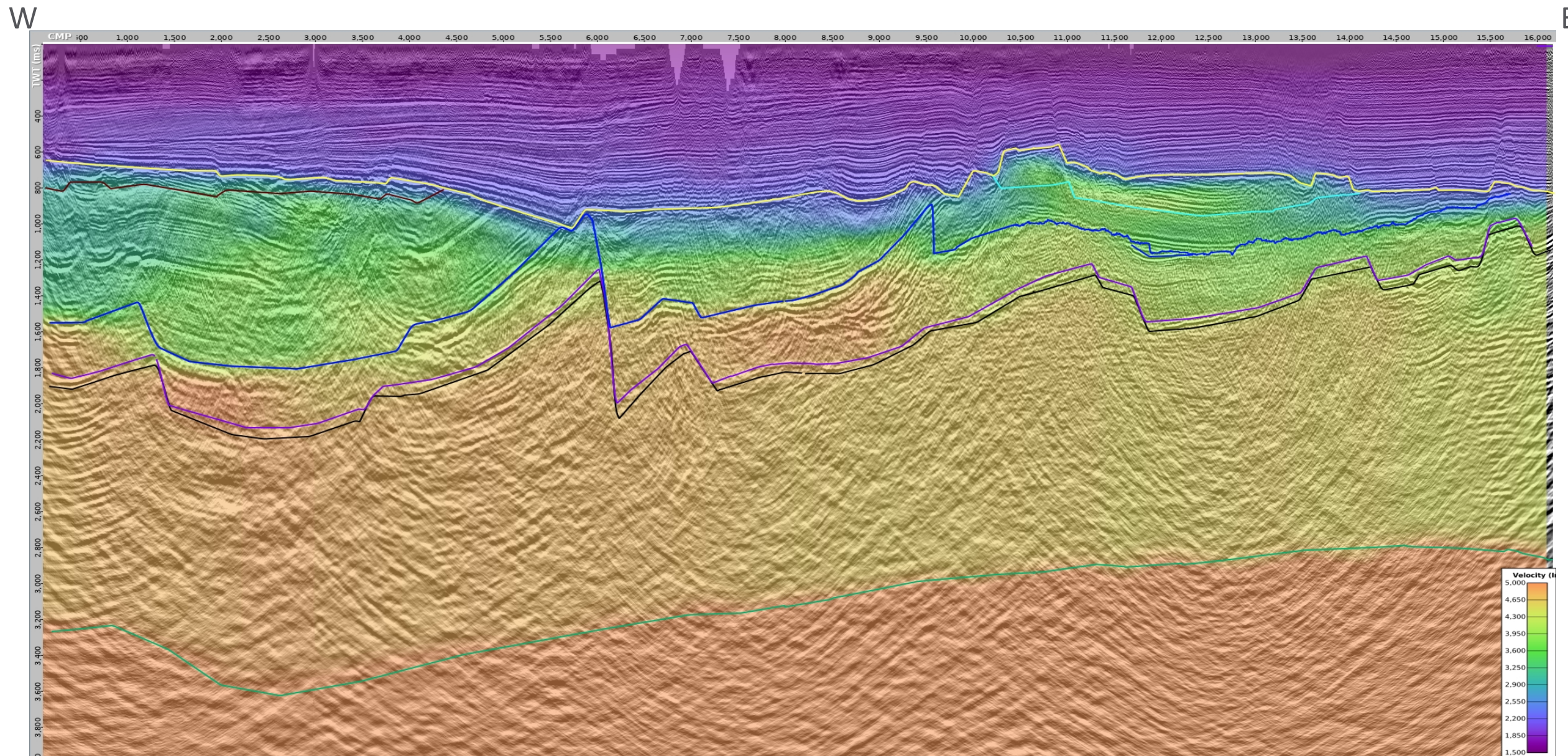
At floating datum - stack has 500 ms pre-stack AGC applied





# UGOU022-SCAN023 PreSTM 2 stack with interval velocity overlay

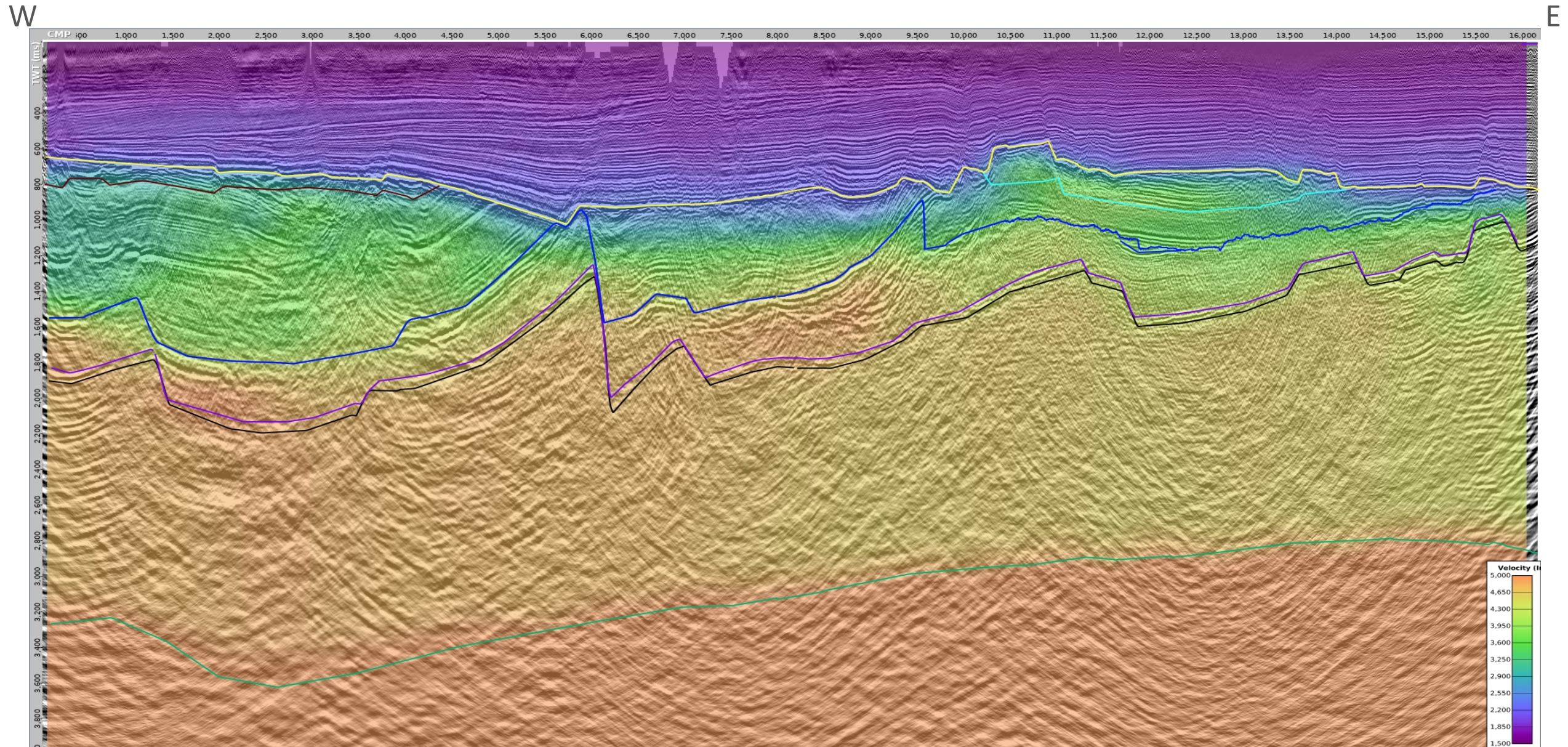
At floating datum - stack has 500 ms pre-stack AGC applied





# UGOU022-SCAN023 PreSTM 3 stack with interval velocity overlay

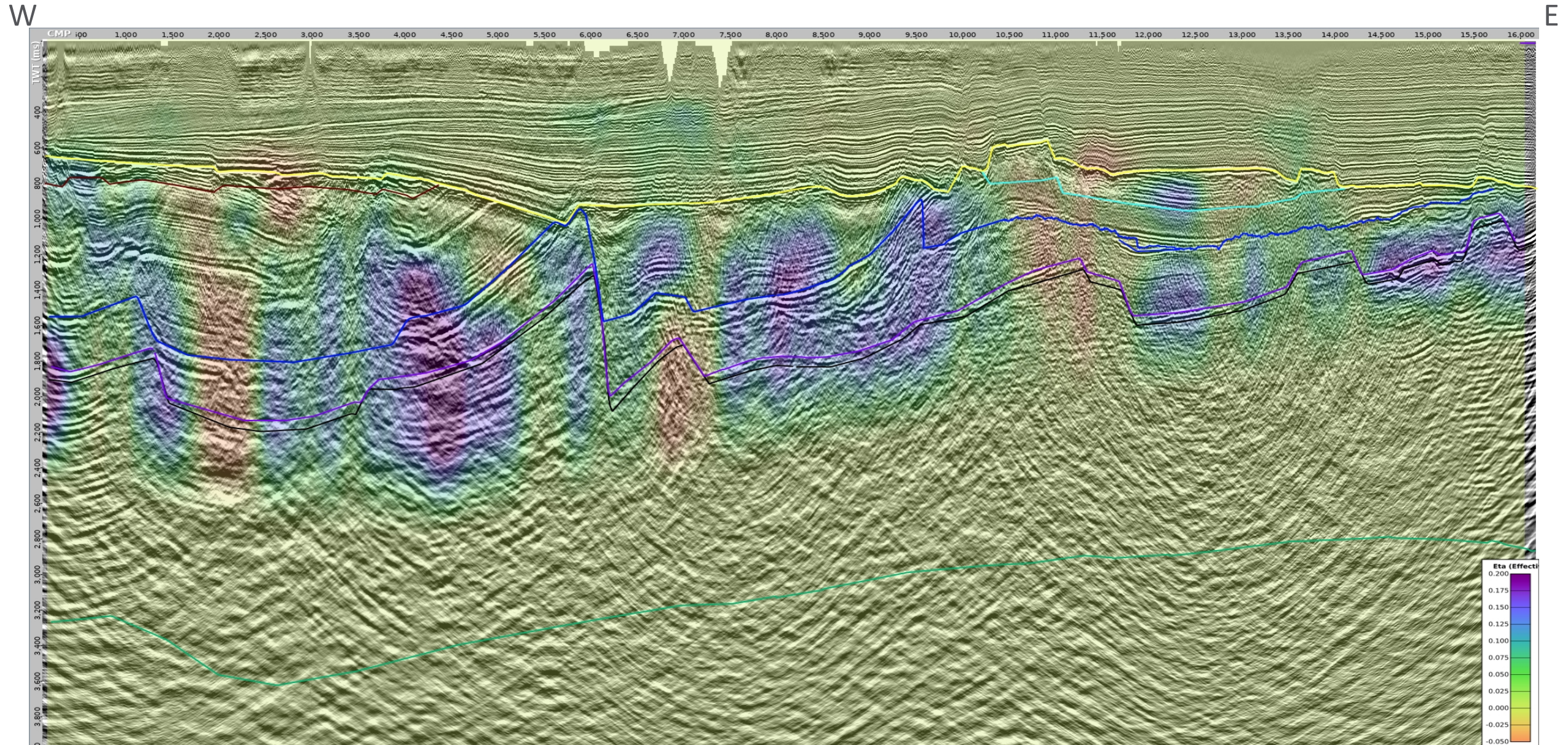
At floating datum - stack has 500 ms pre-stack AGC applied





# UGOU022-SCAN023 PreSTM 2 stack with effective Eta overlay

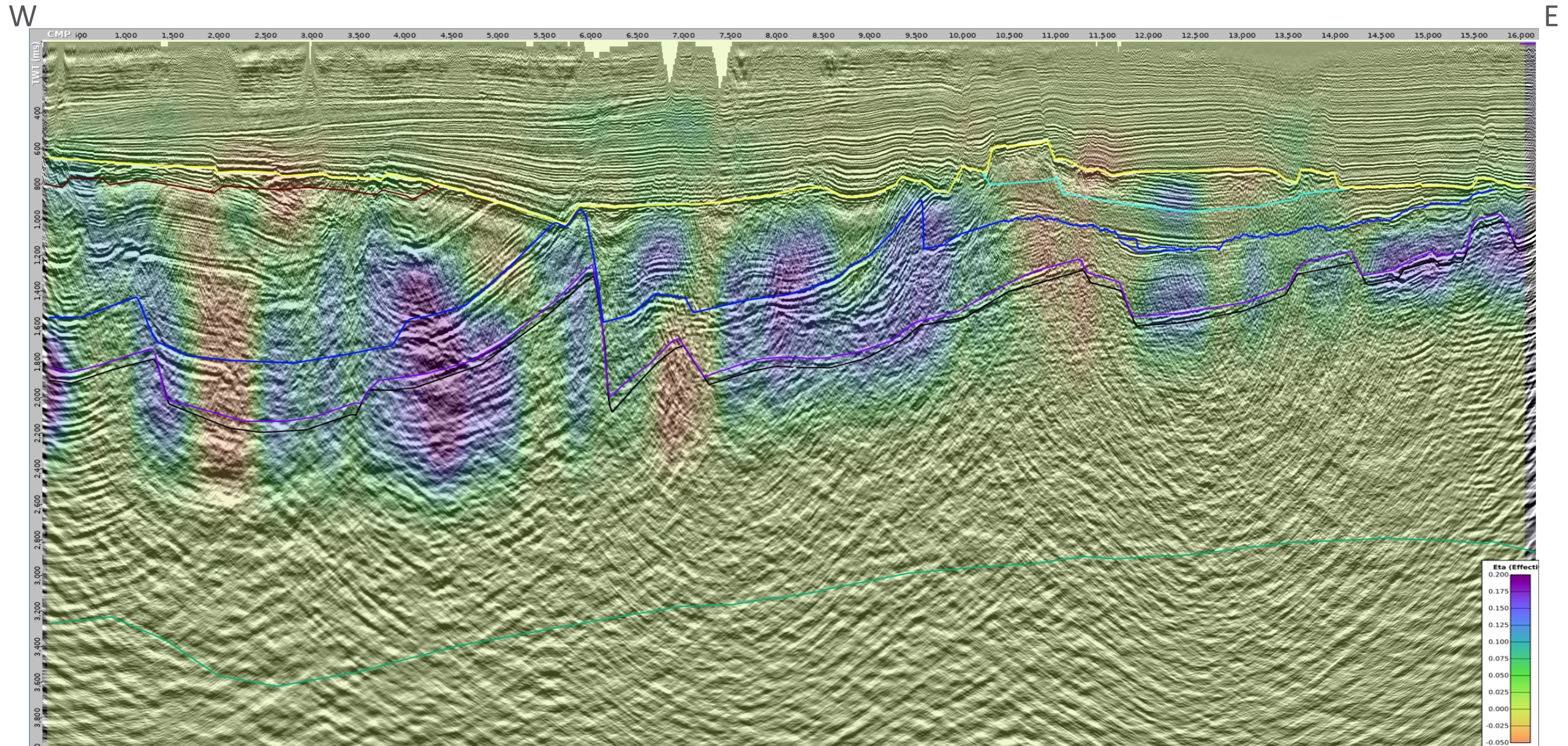
At floating datum - stack has 500 ms pre-stack AGC applied





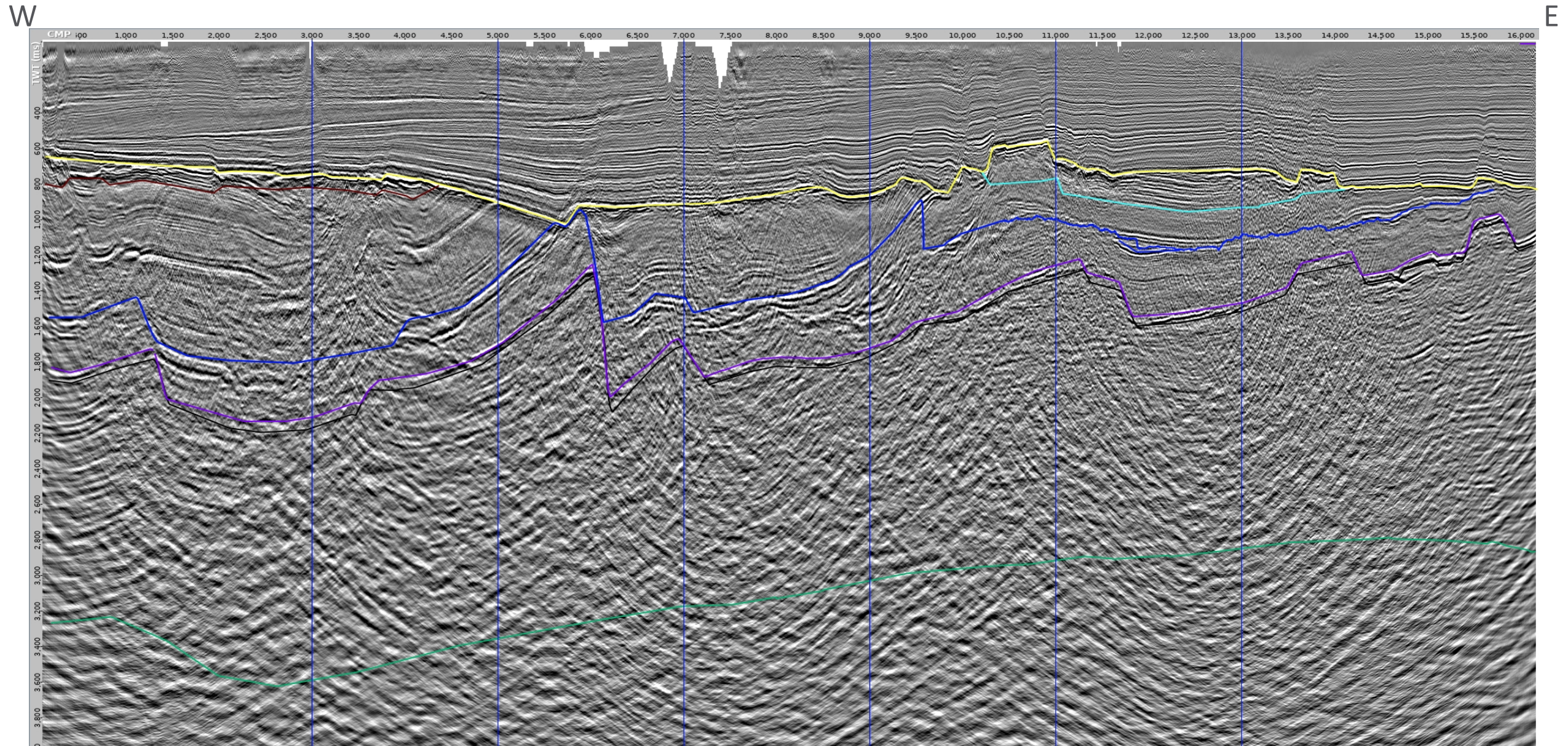
# UGOU022-SCAN023 PreSTM 3 stack with effective Eta overlay

At floating datum - stack has 500 ms pre-stack AGC applied





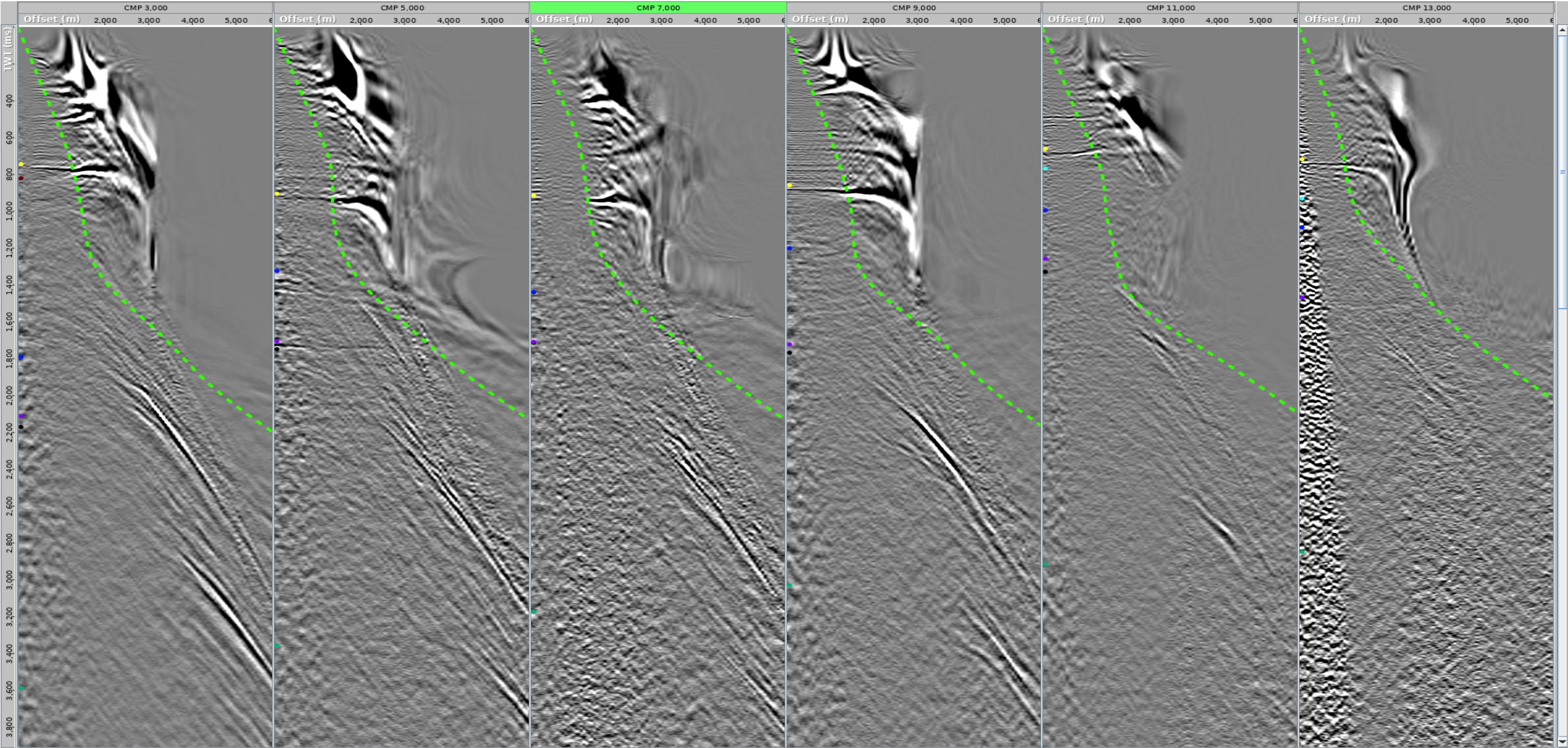
# UGOU022-SCAN023 gather locations for subsequent slides





# UGOU022-SCAN023 PreSTM 1 gathers

At floating datum

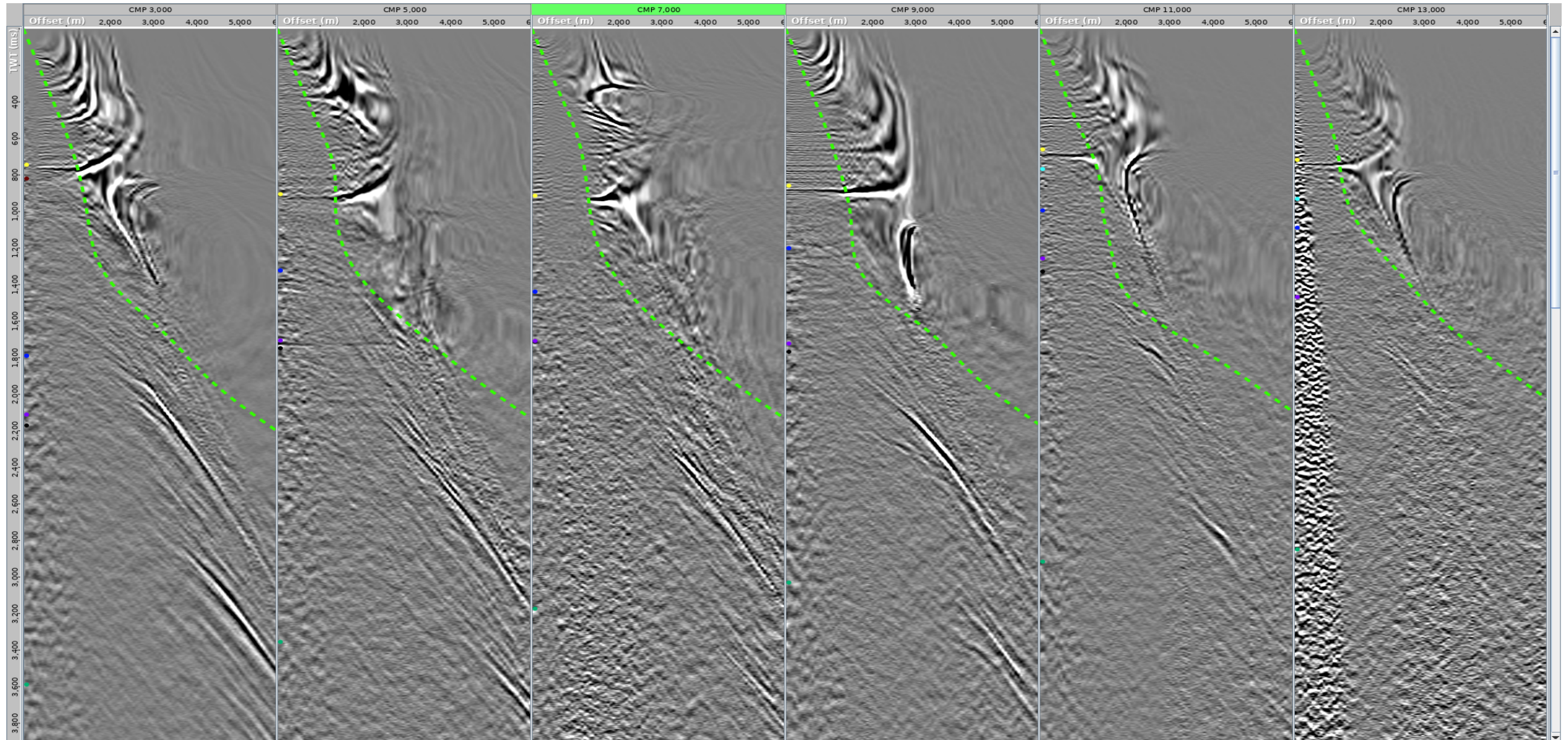


45°



# UGOU022-SCAN023 PreSTM 2 gathers

At floating datum

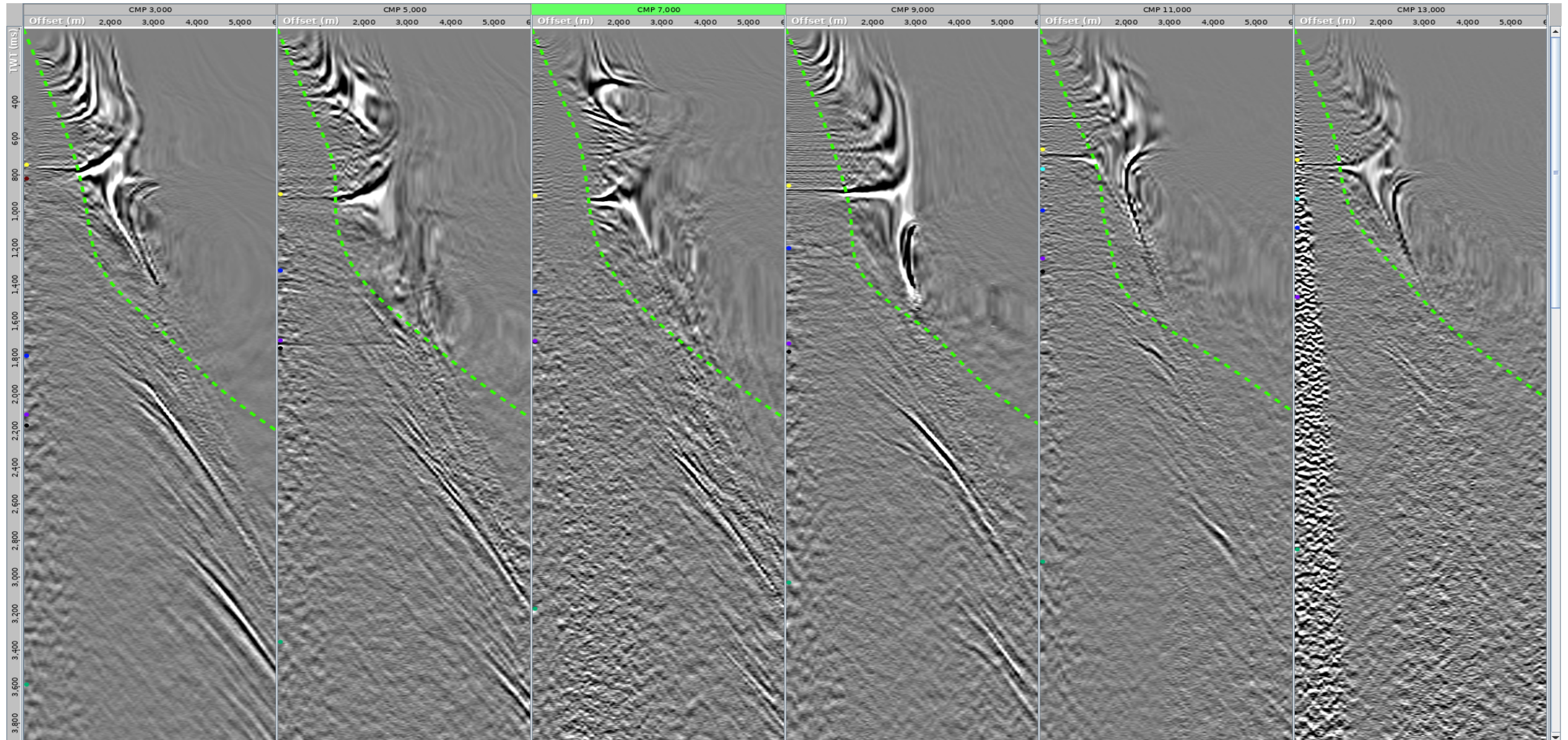


45°



# UGOU022-SCAN023 PreSTM 3 gathers

At floating datum



45°