

# UGOU022-SCAN023 Revised Migration Velocity Report

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

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Energie Beheer Nederland B.V.

2D Seismic PreSTM Processing, Onshore Netherlands

- This report documents the results at PreSTM 3 stage from the re-running of the PreSTM workflow with revised velocities.
- The revision of the velocities focused on the Altena unit in the central portion of the line between CDPs 6000 and 9500.

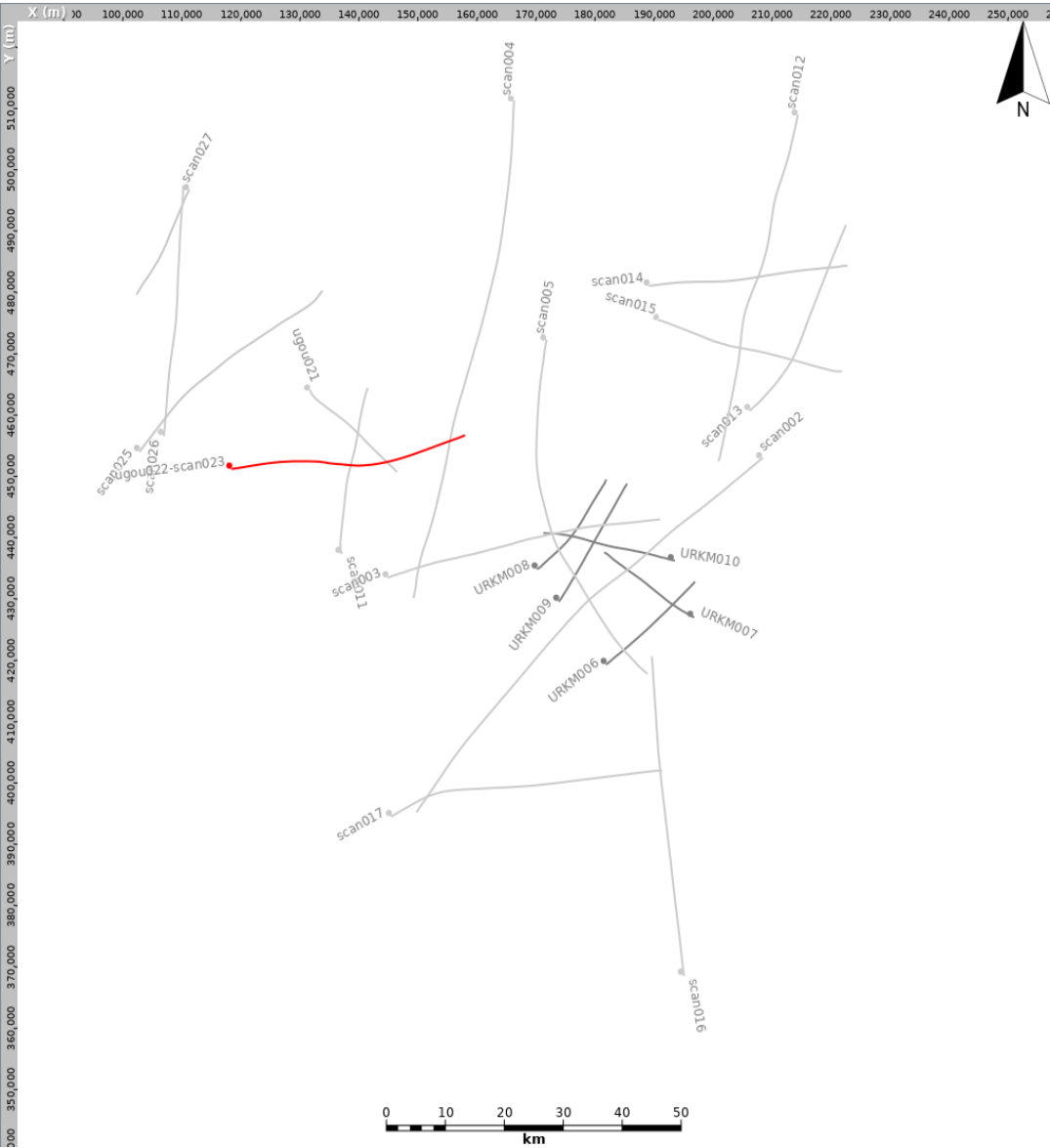
## Processing sequence

- 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: Despiking
- 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
- SCAC 2: Source and receiver designed on NMO corrected gathers over 200-2200 ms

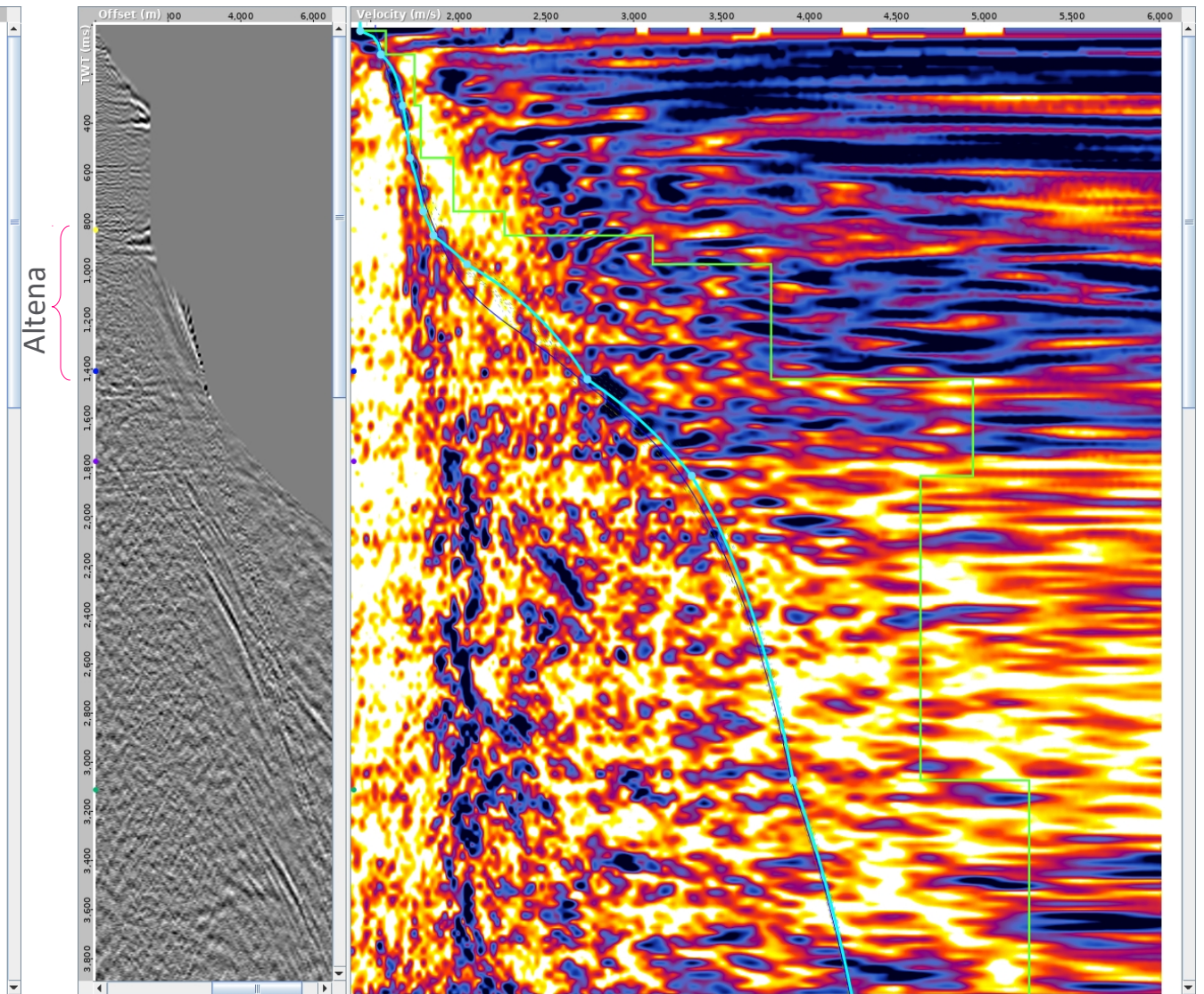
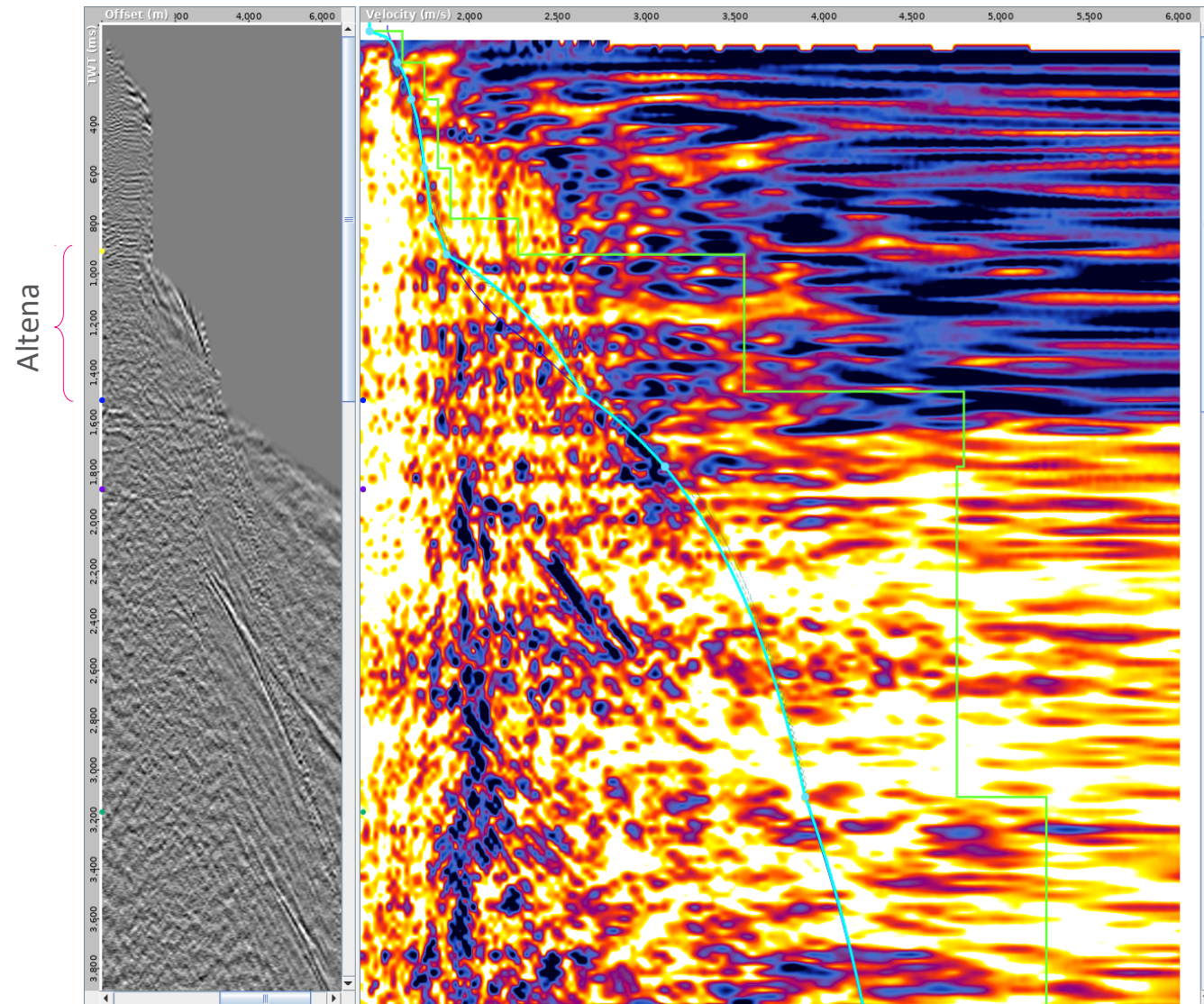
## Processing sequence (continued)

- 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 7200 / 8200



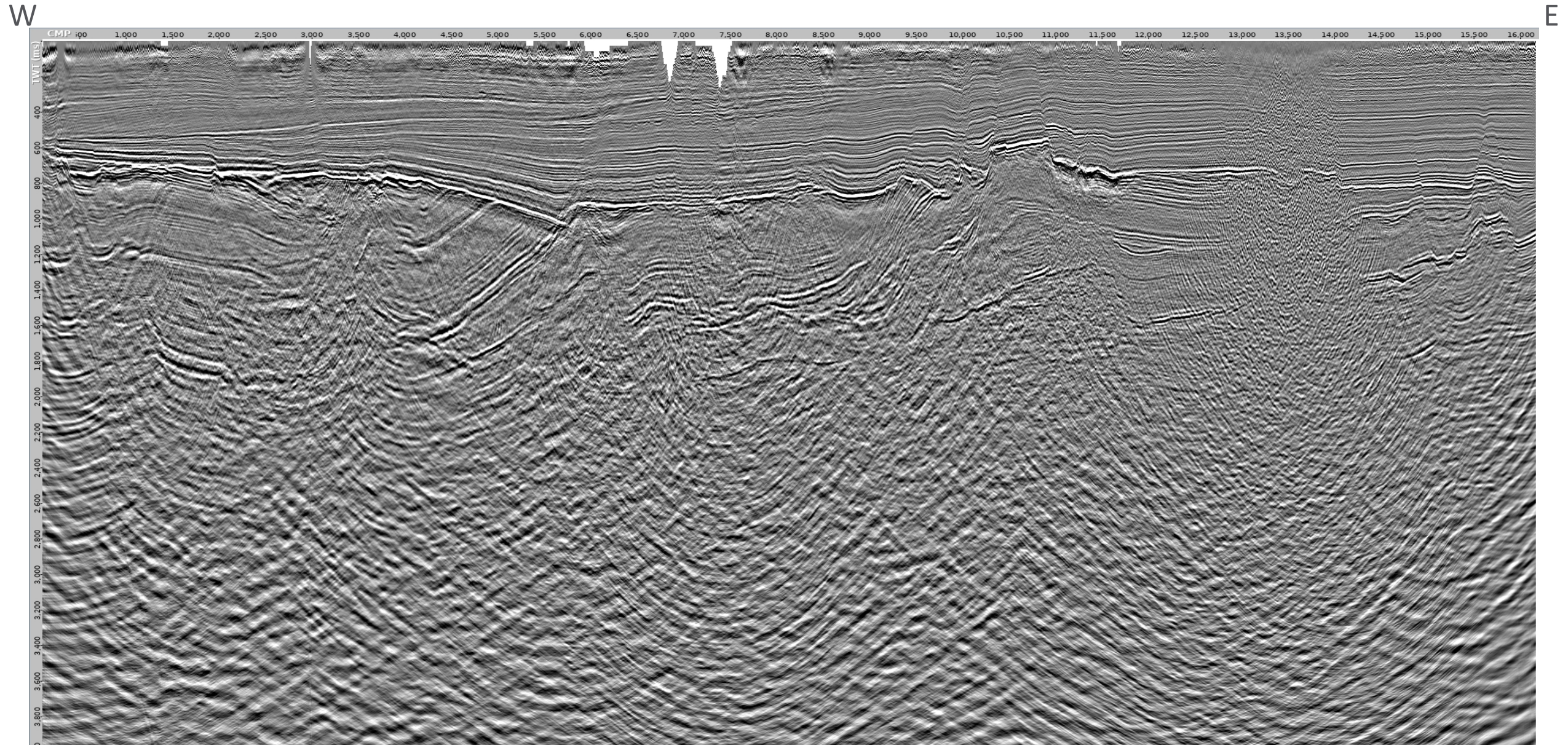
PreSTM 1 velocity function

Post PreSTM1 RMS velocity picks (Corresponding interval velocity)



# UGOU022-SCAN023 PreSTM 3 true amplitude stack

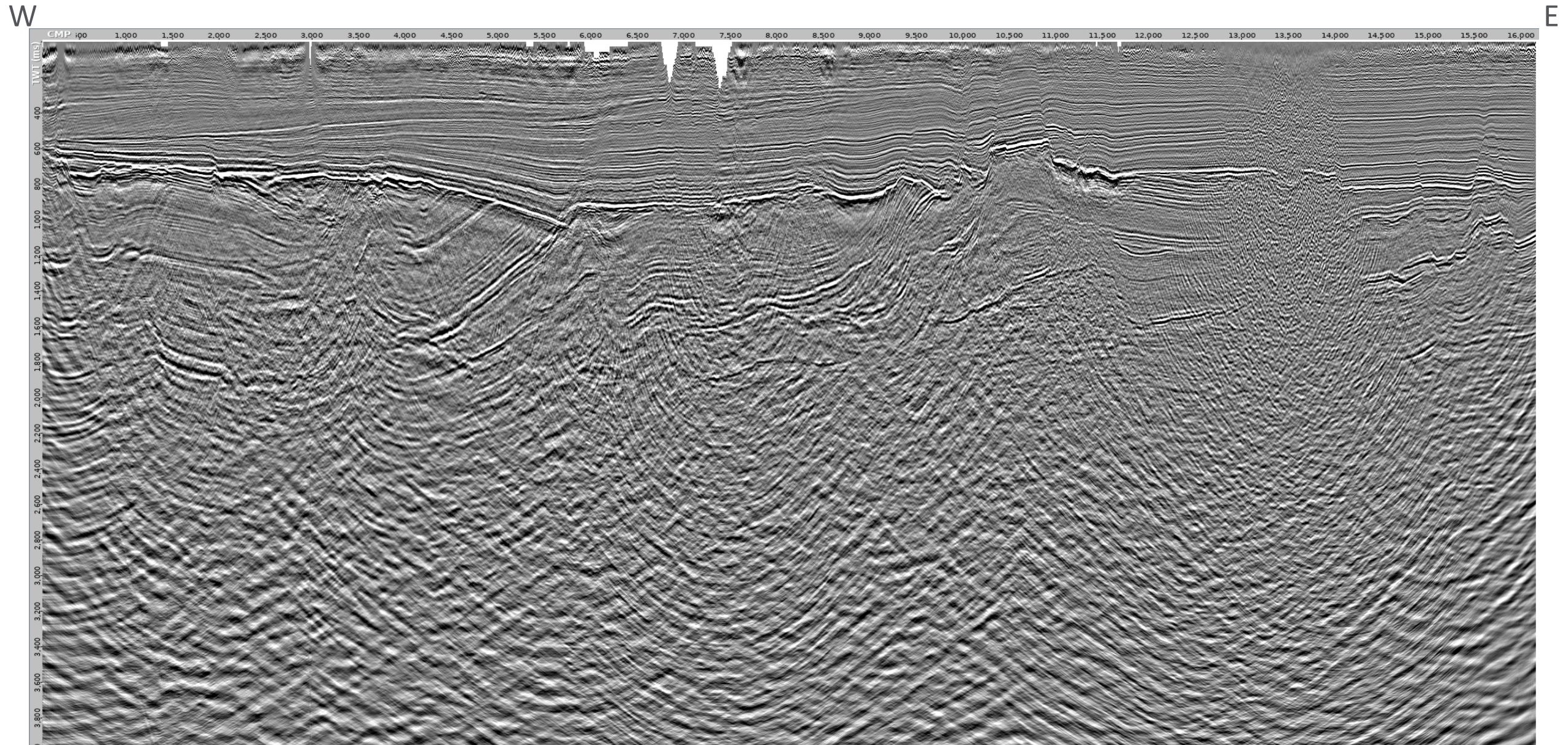
At floating datum with 2-6-120-150 Hz filter and 1000 ms post-stack scaling





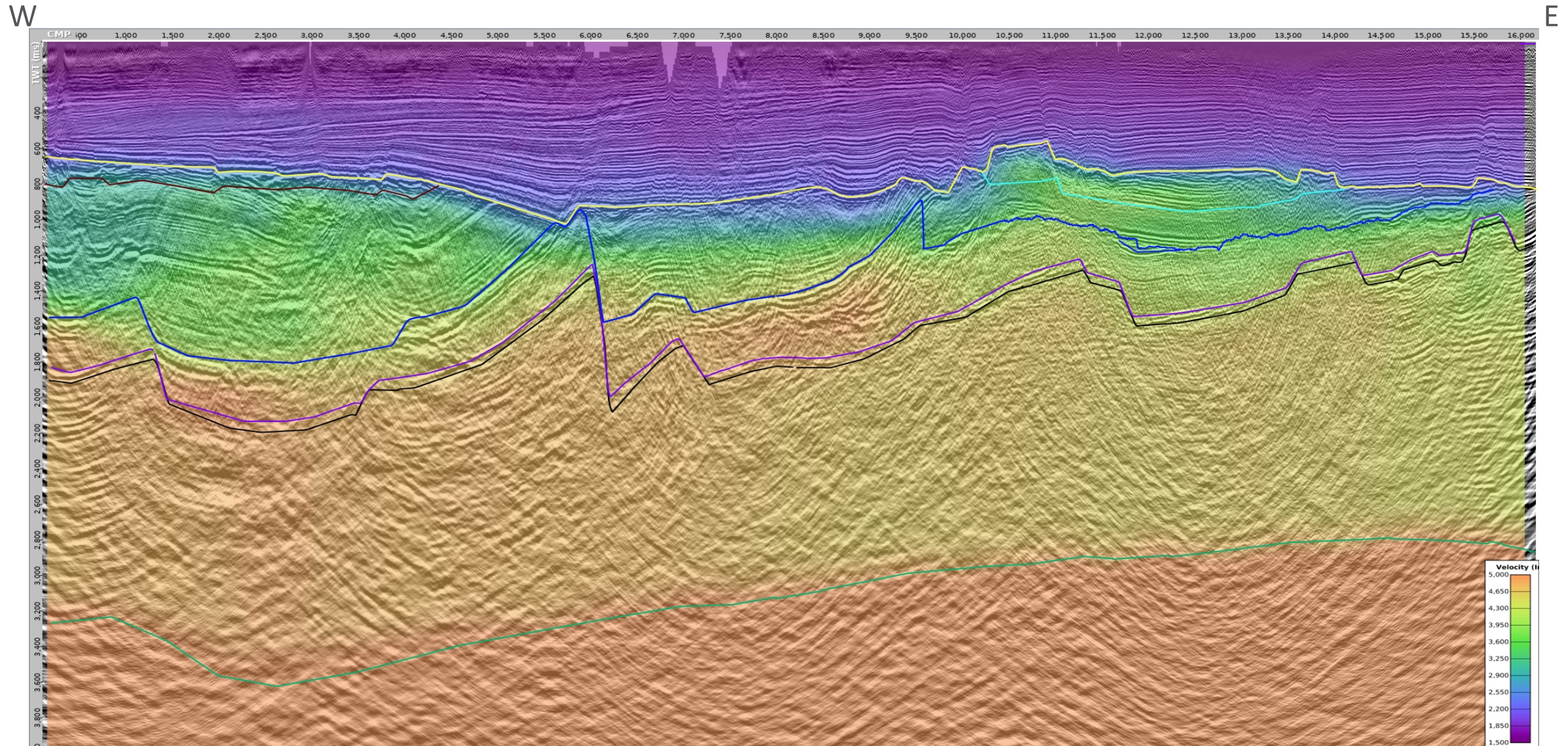
# UGOU022-SCAN023 PreSTM 3 true amplitude stack – revised velocities

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





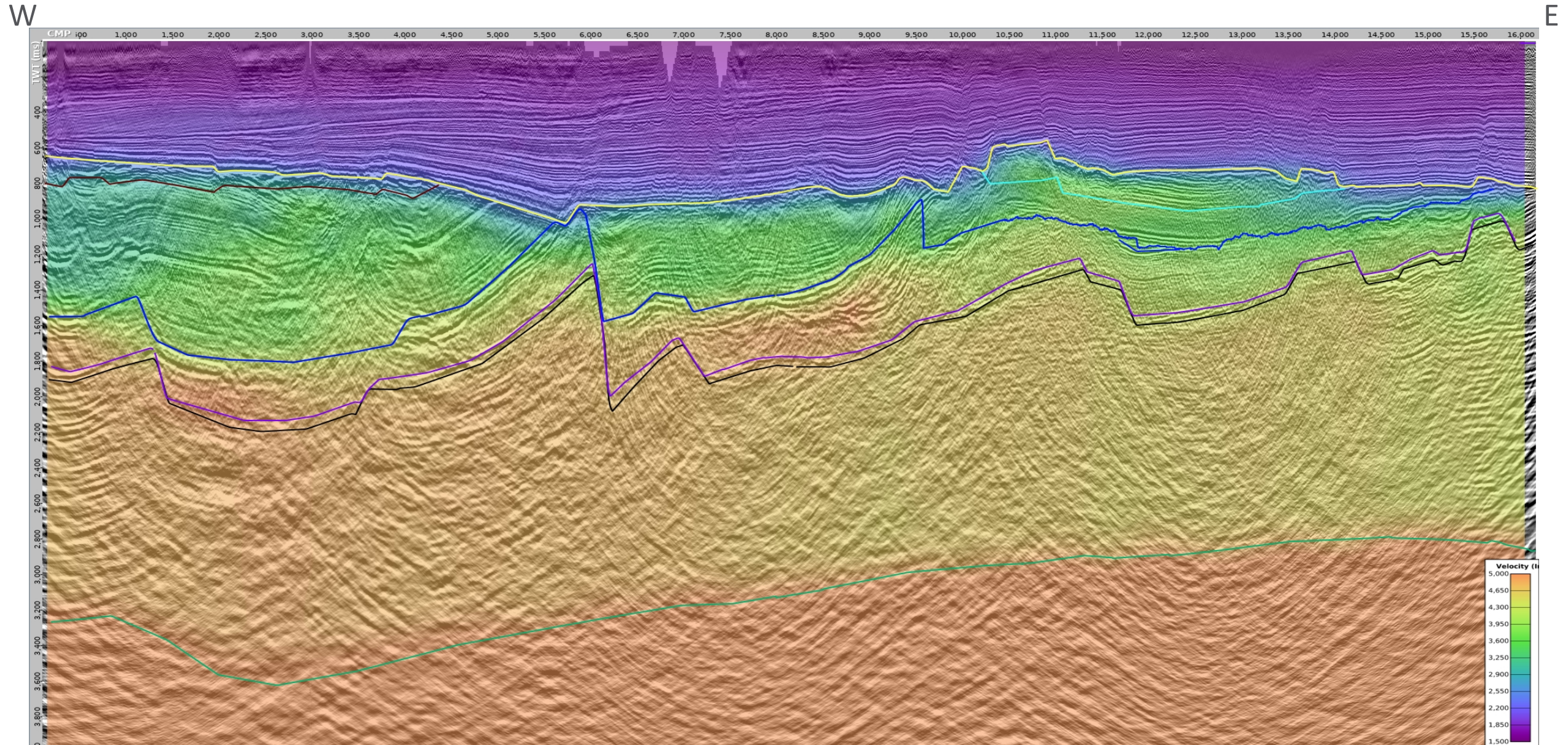
At floating datum - stack has 500 ms pre-stack AGC applied





# UGOU022-SCAN023 PreSTM 3 stack with interval velocity overlay – revised velocities

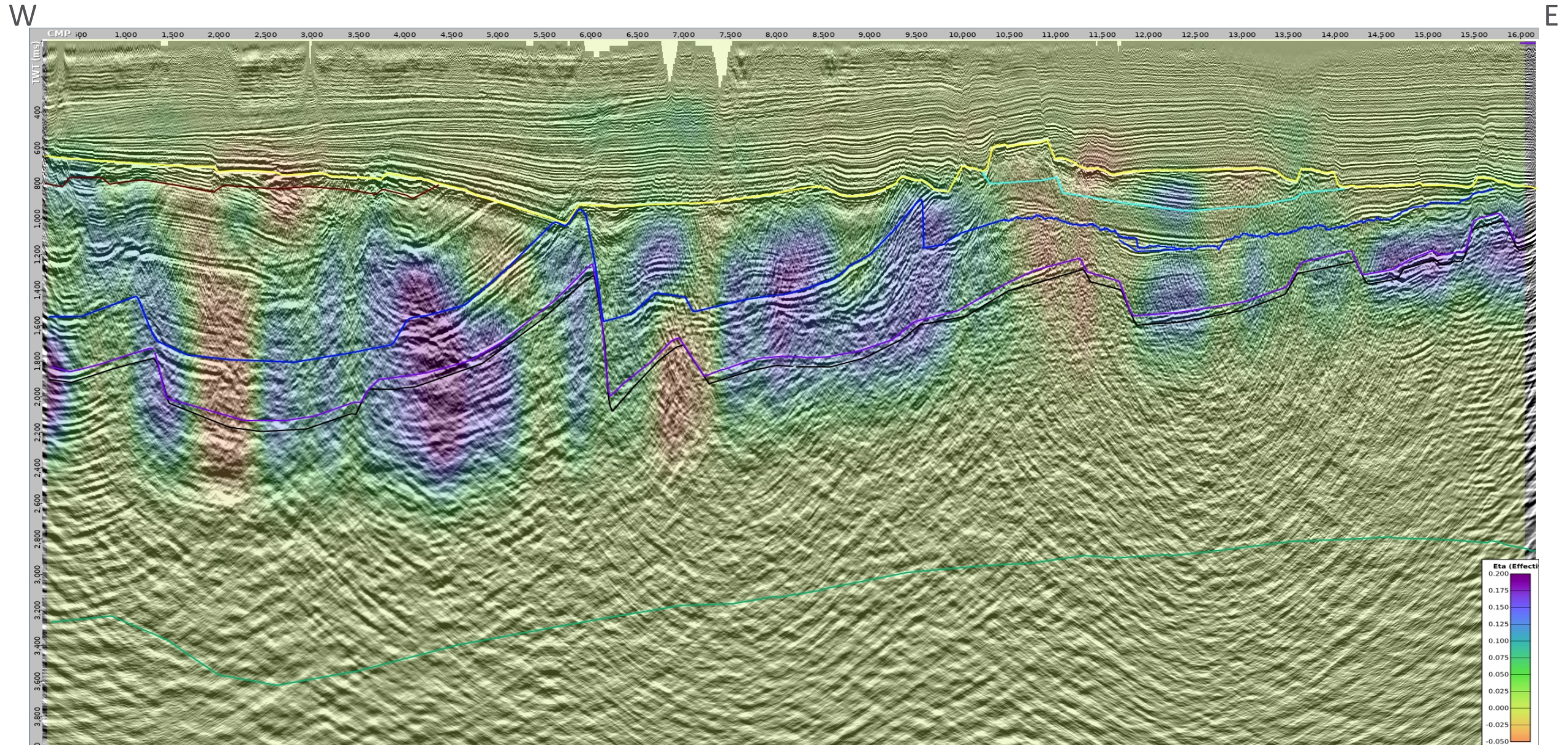
At floating datum - stack has 500 ms pre-stack AGC applied





# UGOU022-SCAN023 PreSTM 3 stack with effective Eta overlay

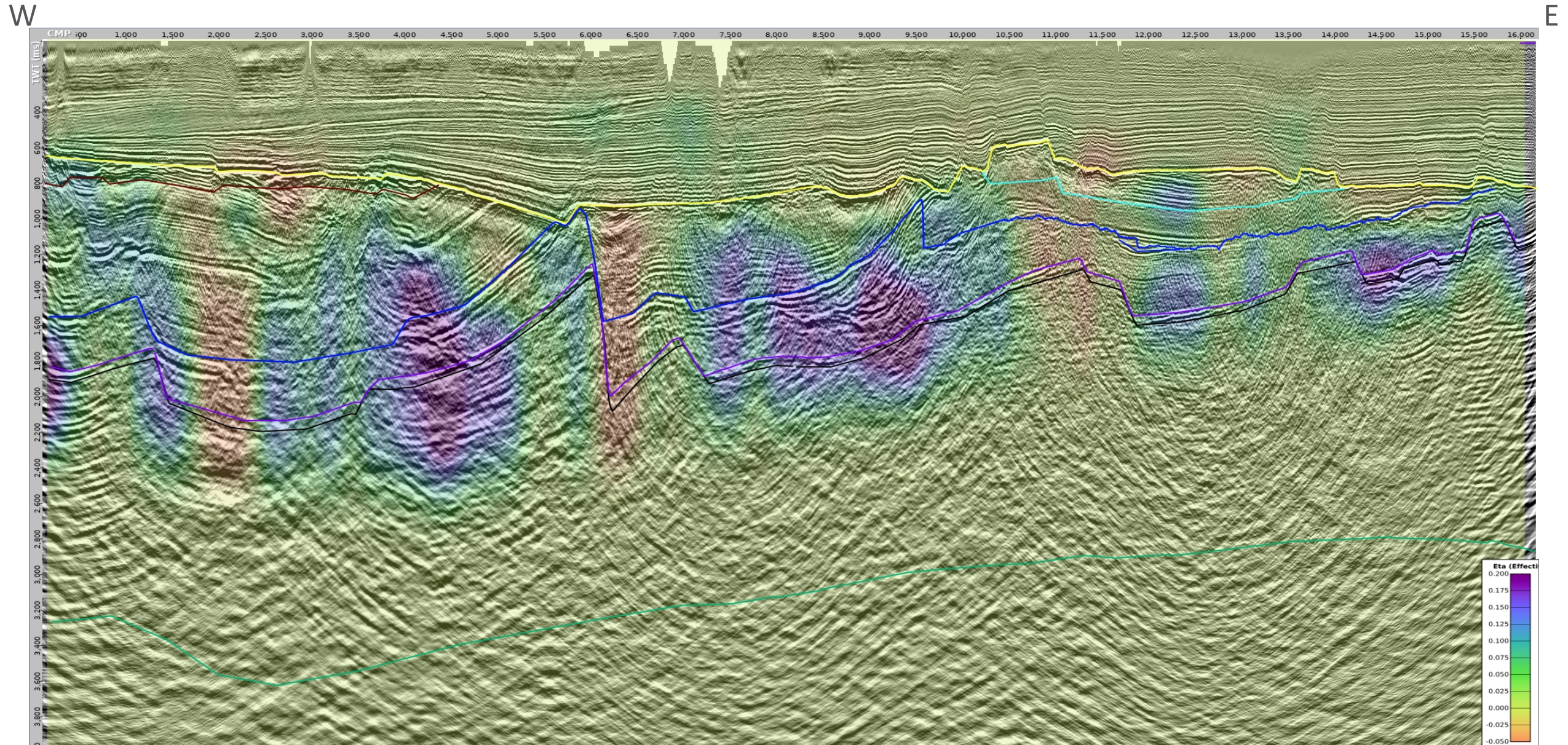
At floating datum - stack has 500 ms pre-stack AGC applied





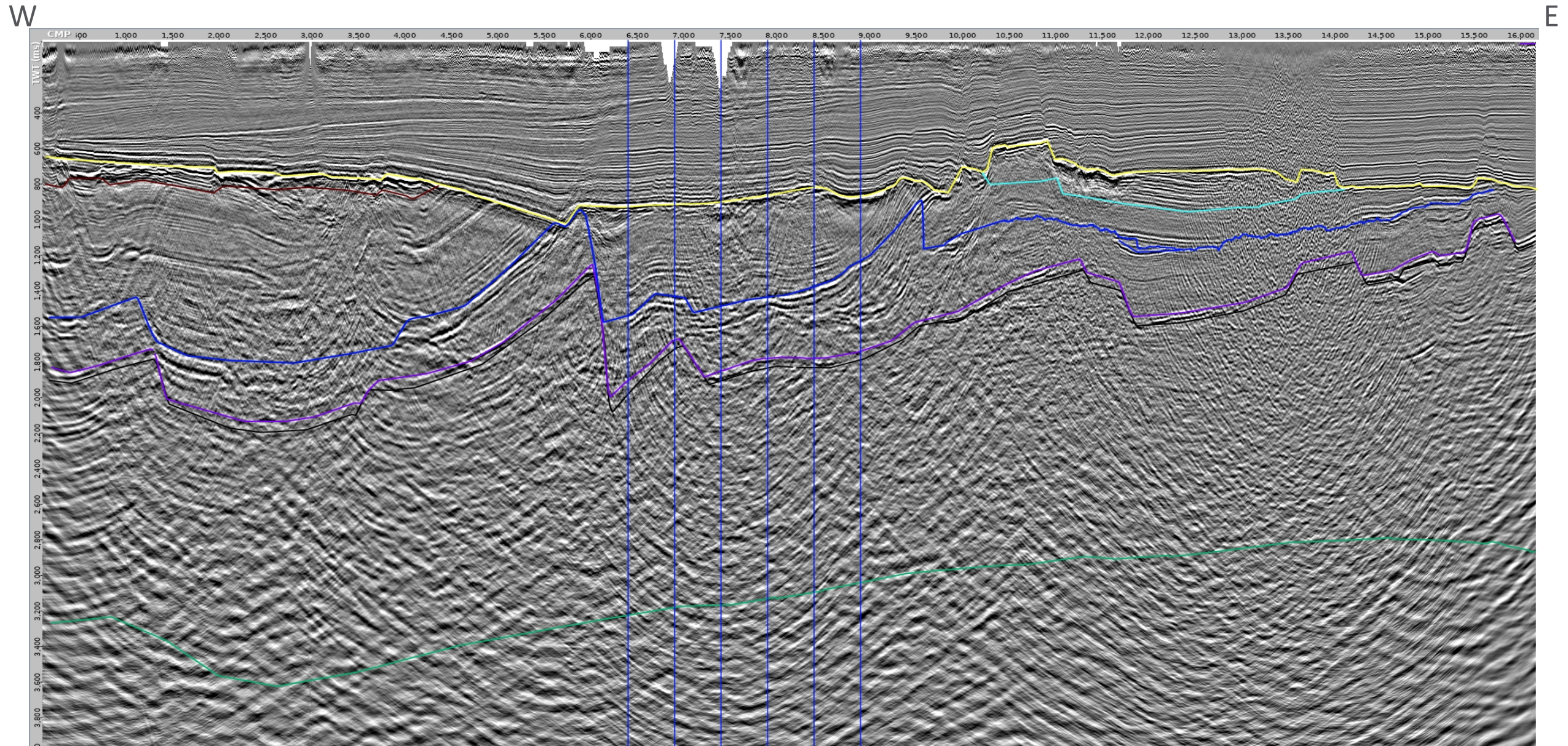
# UGOU022-SCAN023 PreSTM 3 stack with effective Eta overlay – revised velocities

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





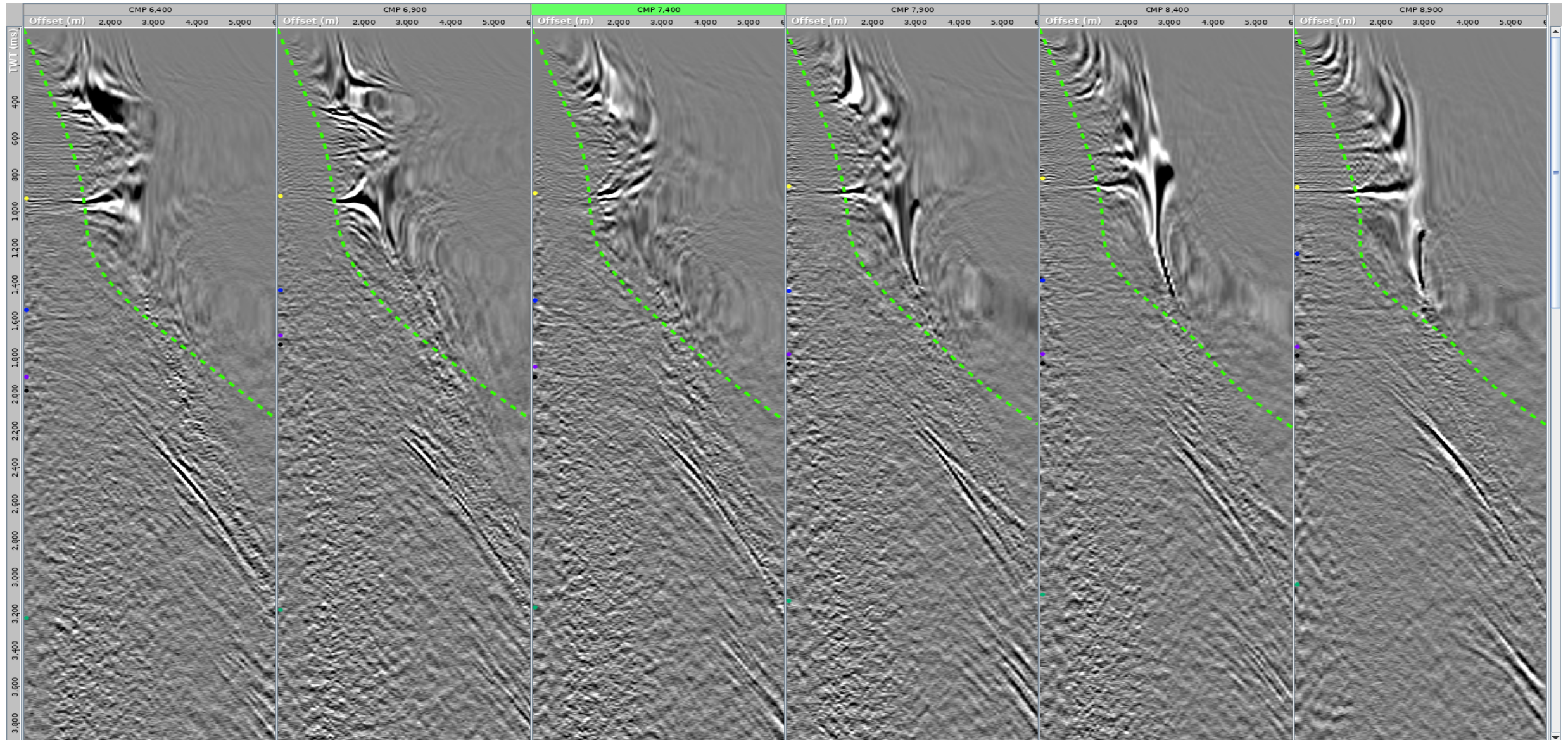
# UGOU022-SCAN023 gather locations for subsequent slides





# UGOU022-SCAN023 PreSTM 3 gathers

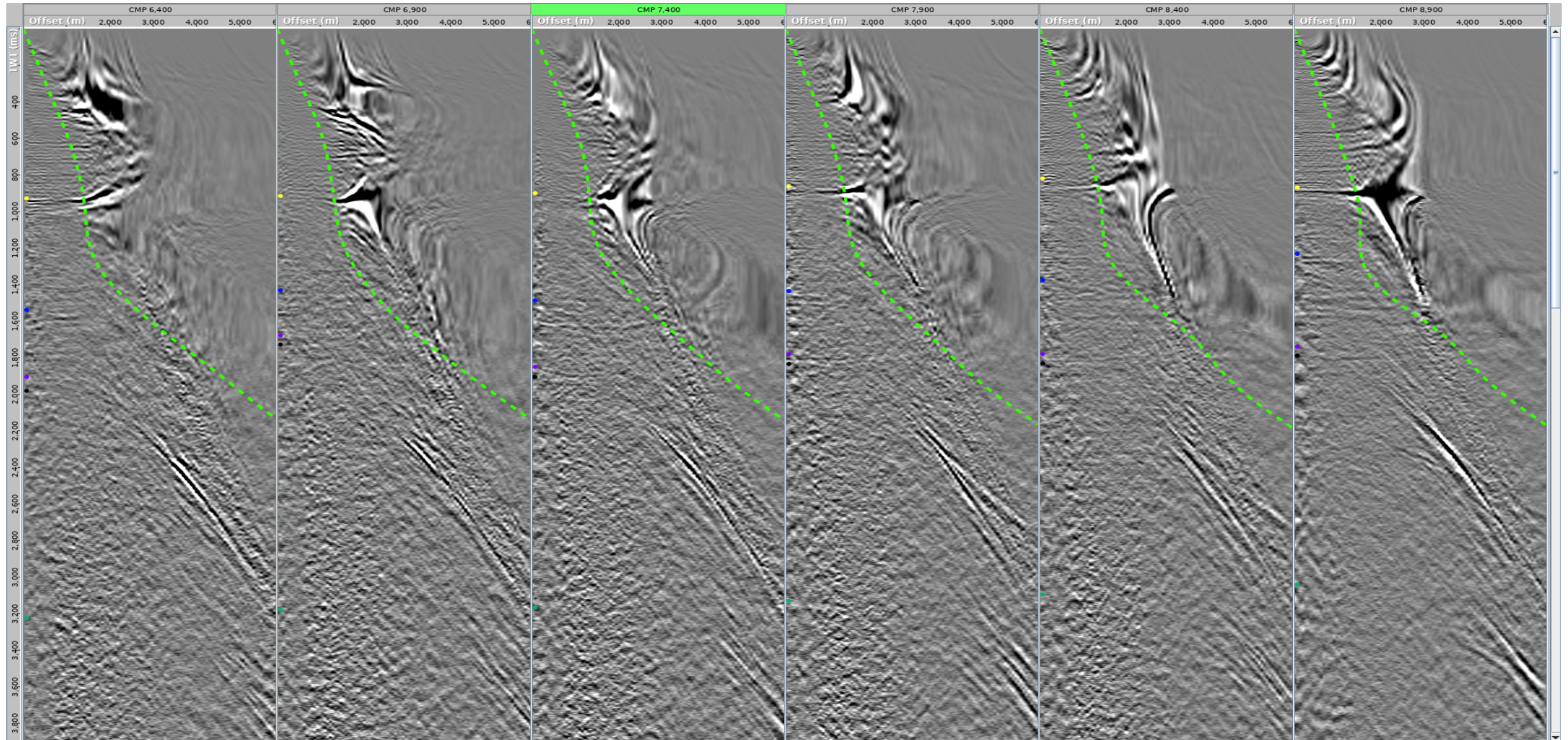
At floating datum





# UGOU022-SCAN023 PreSTM 3 gathers – revised velocities

At floating datum

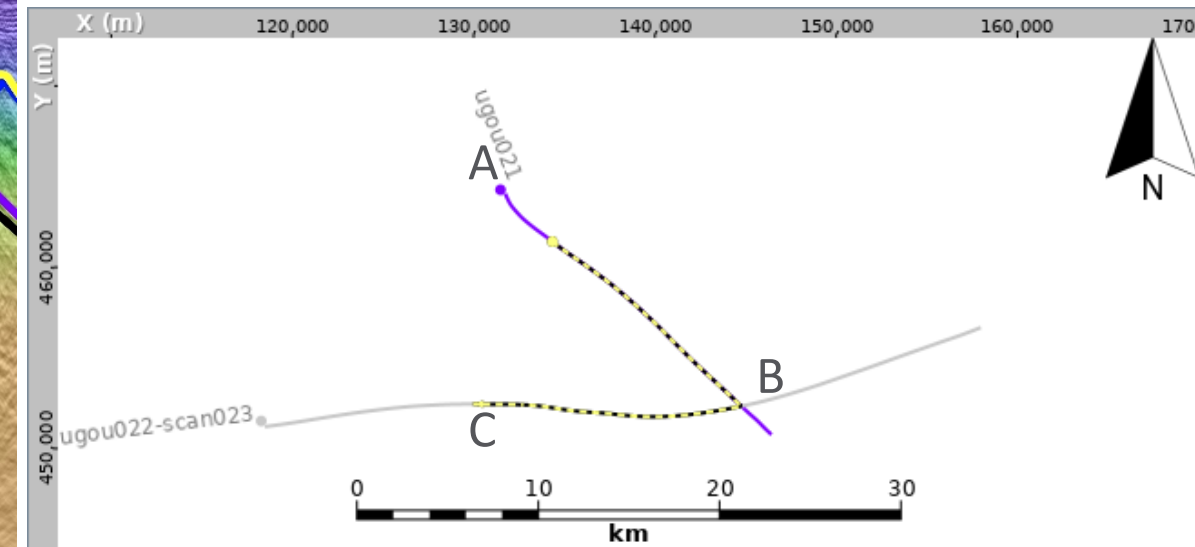
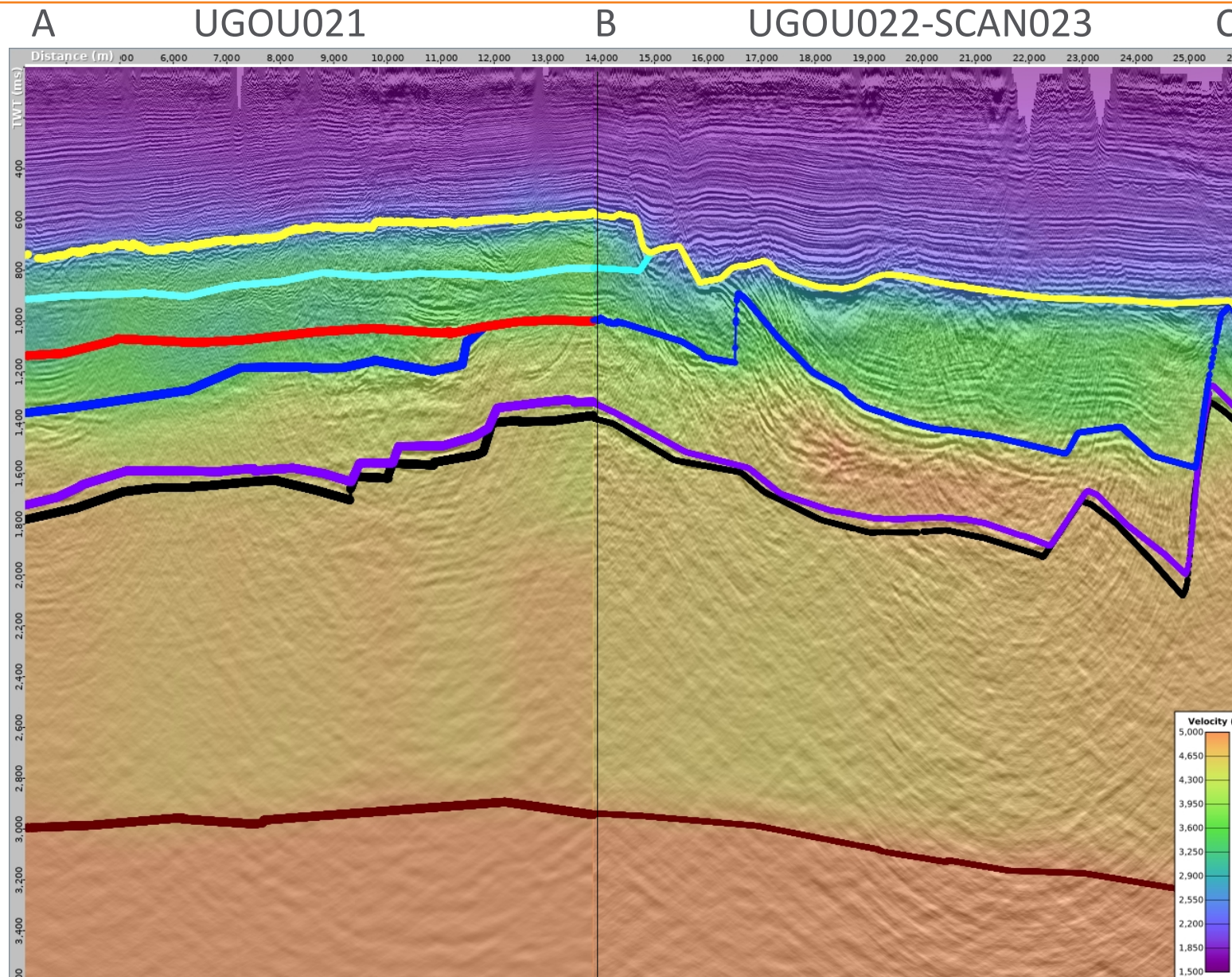


45°



# UGOU021 / UGOU022-SCAN023 PreSTM 3 stacks and interval velocity overlay

At floating datum



- The revised velocity results in an interval model that more closely matches the model expected in the area and gives a slight improvement in the stack and is recommended for the subsequent production.