

UGOU021 Post Migration Mute Report

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

19 JANUARY 2021

Energie Beheer Nederland B.V.

2D Seismic PreSTM Processing, Onshore Netherlands

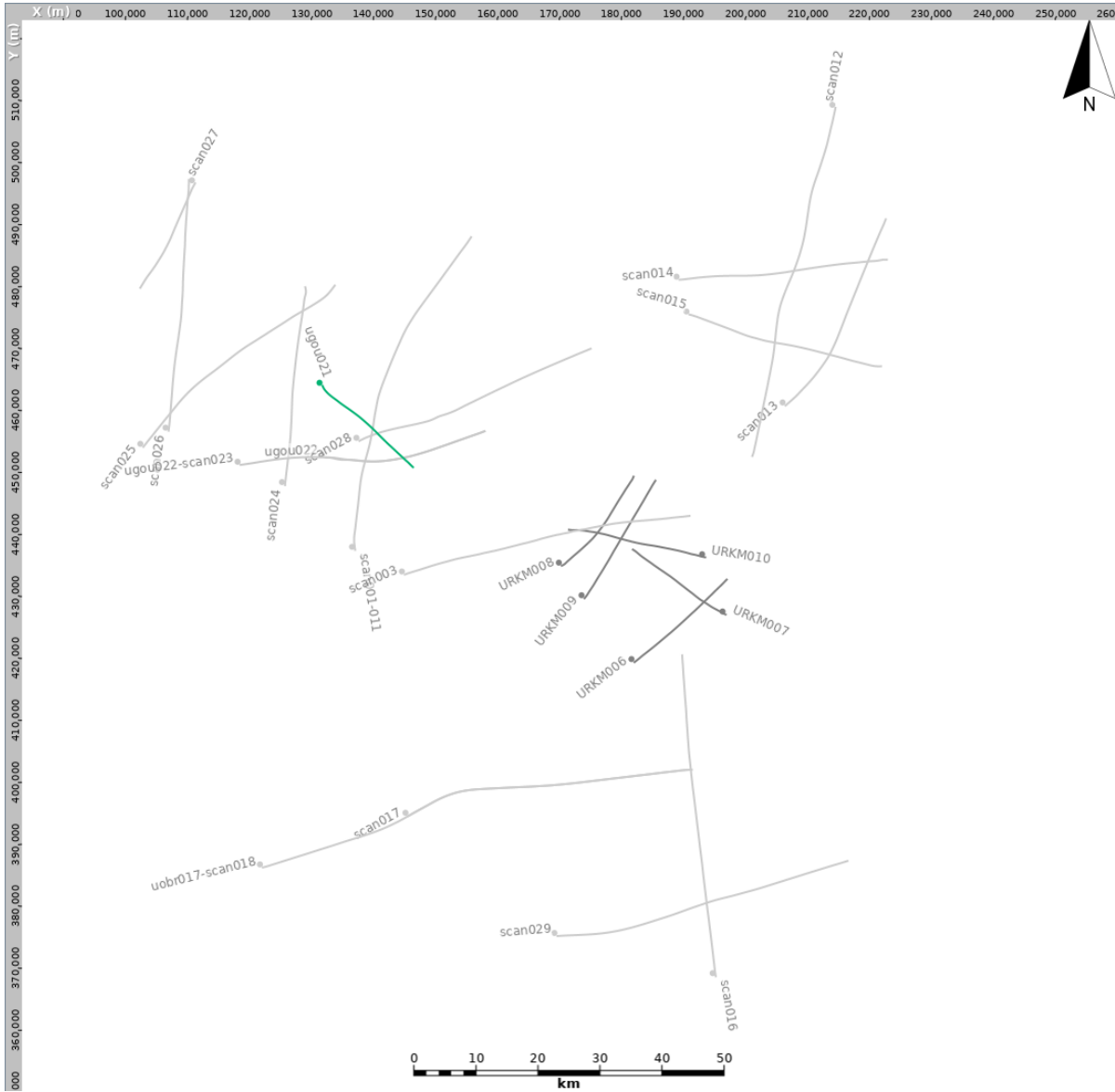
- EBN noticed that in some areas of the stack (CDPs 1250-2500, TWT 1300-1500 ms) the events on the fast-track appeared sharper.
- Re-picking the mute in this area was suggested as a method for improving the stack.

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 $SRD = NAP$
- 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
- 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 require
Effective Eta picked automatically every 250 m
- Migration (PreSTM 2): Kirchhoff VTI migration using smoothed (2000-200-2) 2nd order picked velocities
- Migration (PreSTM 3): Kirchhoff VTI migration using smoothed (500-100-2) 2nd order picked velocities and auto picked effective Eta
- Radon: Using polygon subtraction
- Noise attenuation: Dip filter on CDPs
- Trim statics: 12 ms correlation length
- Noise attenuation: Cadzow rank-reduction on CDP-offset (time-variant matrix)
- Noise attenuation: Common offset dip filter
- Zero phase filter: Statistical filter, trough polarity
- Trace drop: Limited to the offset range input to the migration (501 CDP smoother on fars, 51 CDP minimum and 10 CDP smoother for near offsets)
- Scaling: 2000 ms AGC on scaled stacks only
- Stack: 1/N ($1/\sqrt{N}$ for scaled stacks) with picked mute (45 degree mute used in testing)



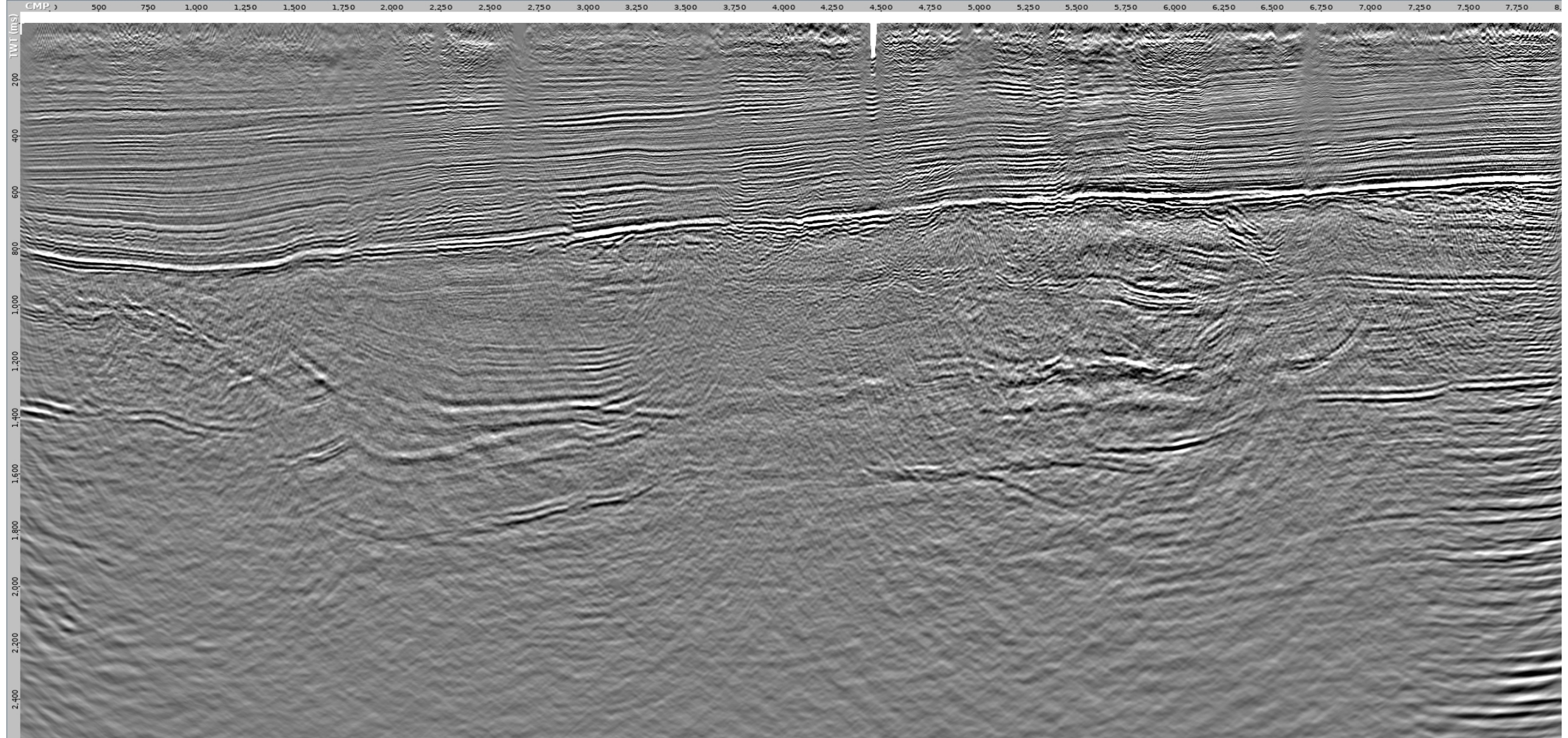
UGOU021 stack using 45 degree mute as used in testing

At floating datum



NW

SE



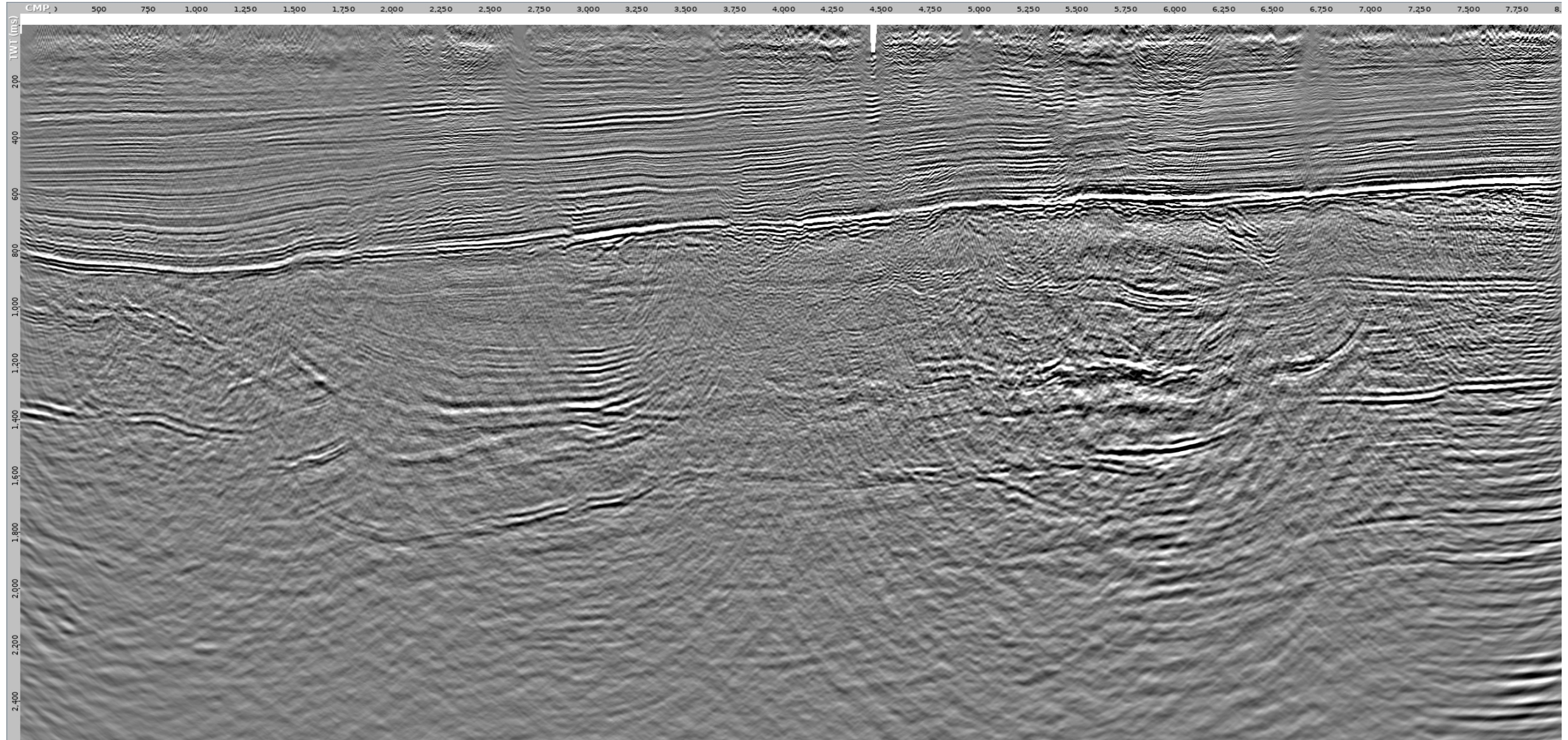
UGOU021 stack using original picked mute

At floating datum



NW

SE



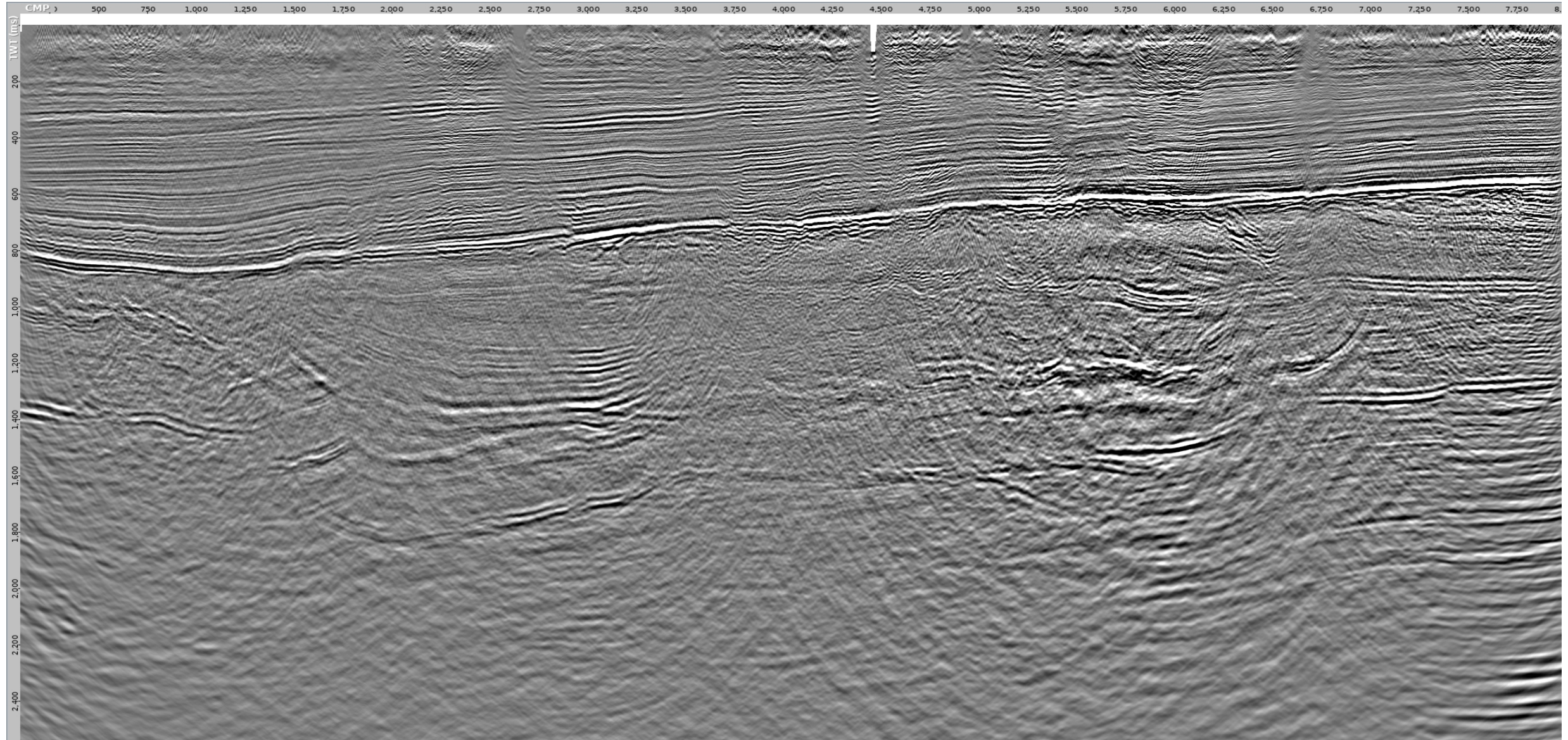
UGOU021 stack using revised picked mute

At floating datum



NW

SE



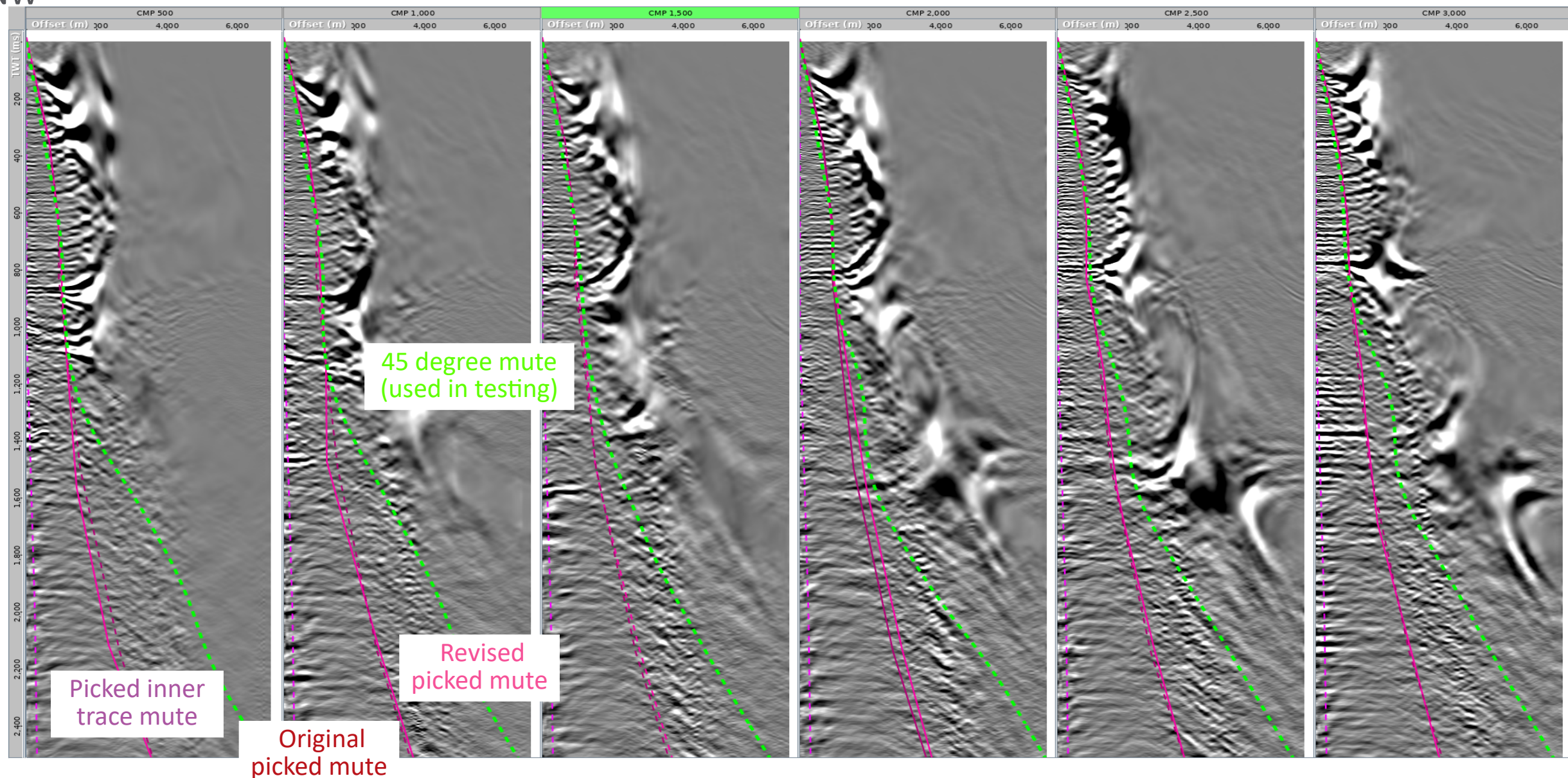
UGOU021 CDPs with Cadzow on CDP-offset and dip filters, with mute overlay (part 1)

At floating datum



NW

SE



UGOU021 CDPs with Cadzow on CDP-offset and dip filters, with mute overlay (part 2)

At floating datum



NW

SE

