

Castissent DepSim model and PROMISE inversion

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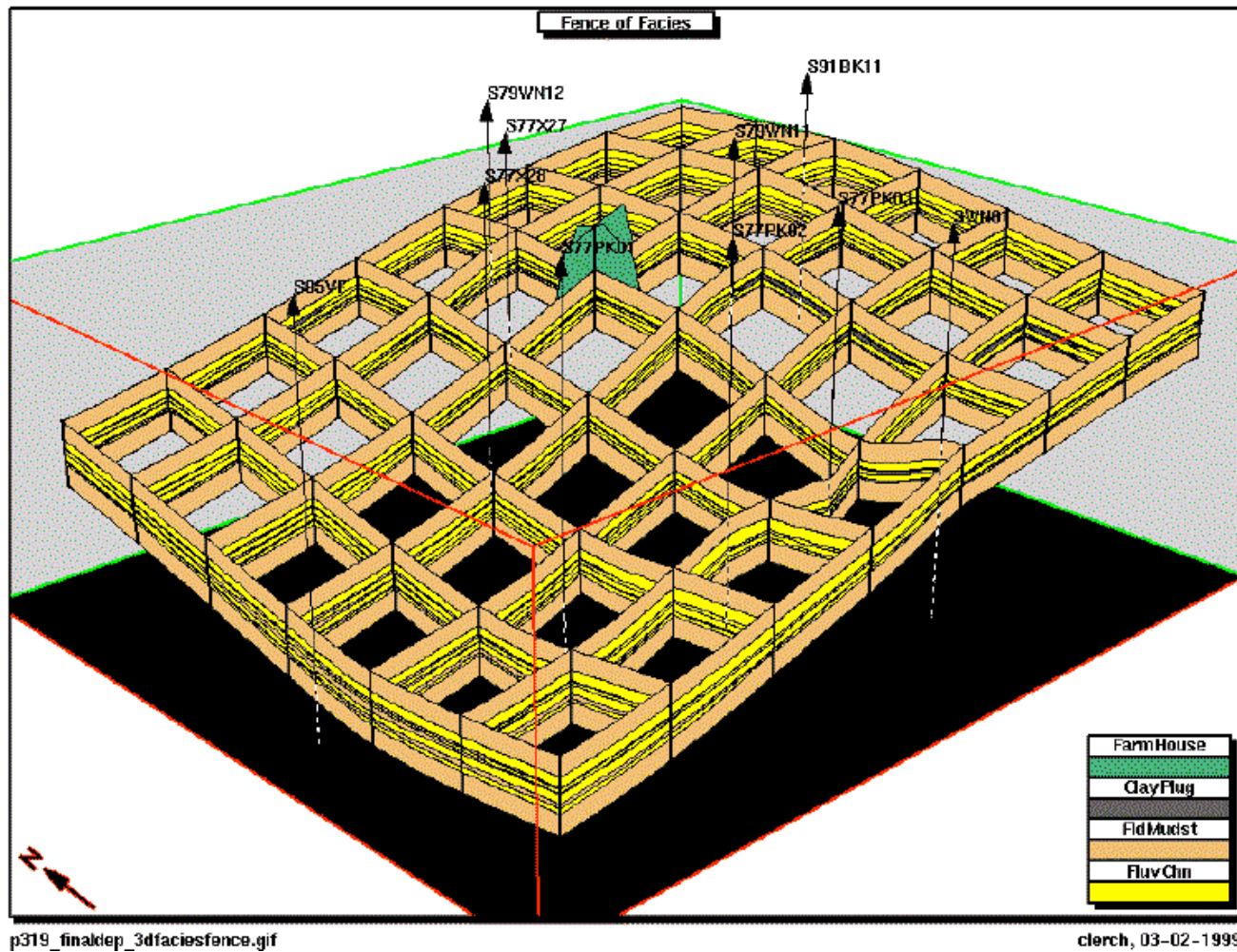


Details of DepSim models constructed

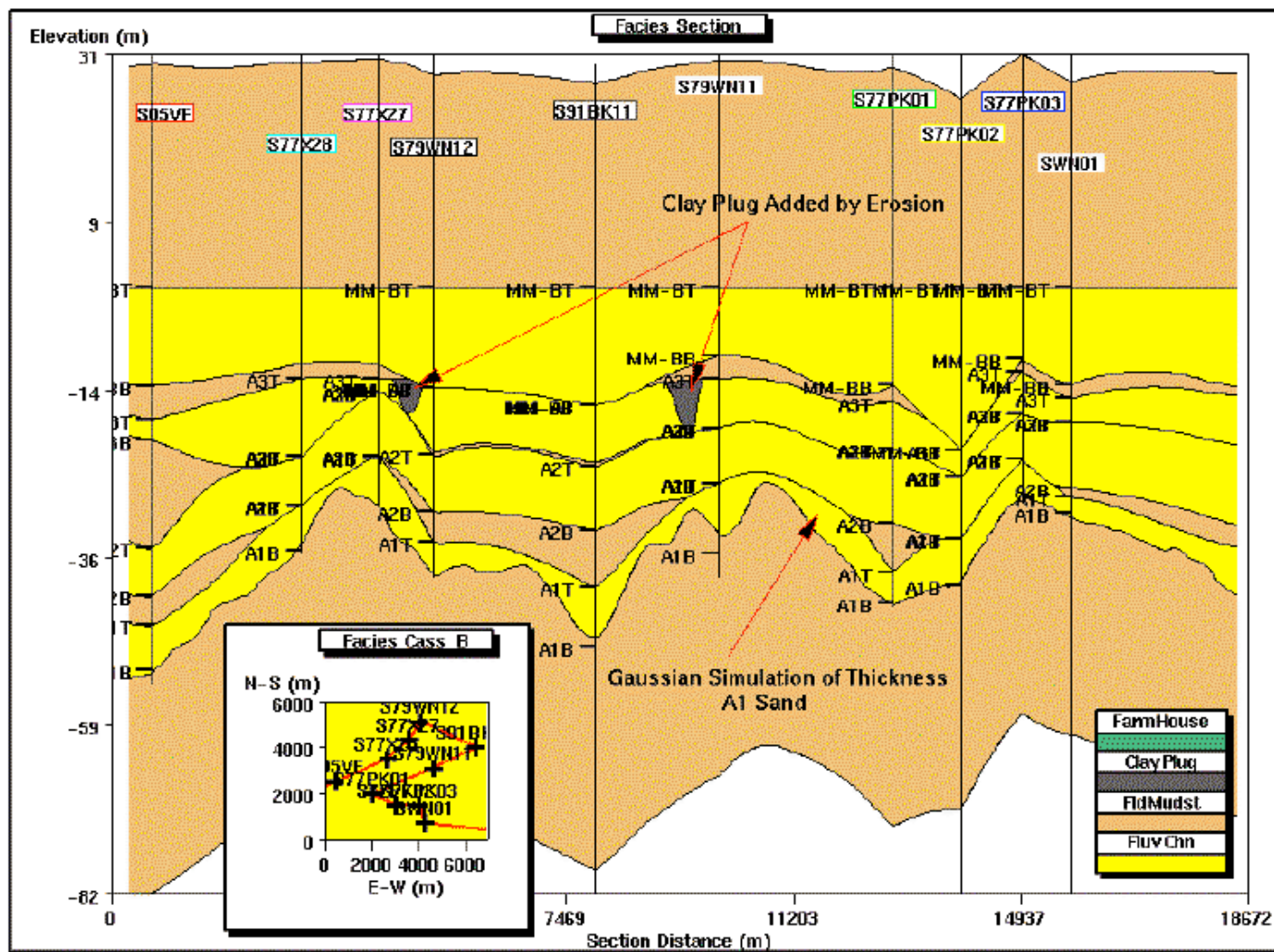


- **Depth model constrained to well data**
 - 10 wells (elevation, thickness, N/G)
 - A1 sand thickness by Gaussian simulation
 - Clay Plug thickness added by erosion
- **“Truth” time model for generation of realistic synthetic VT file**
 - velocities and densities from Postma averaging of N/G end-member trends
 - random noise added to velocities and densities
- **“Seed” time model for Promise inversion of synthetic VT file**
 - velocities and densities as above but no random noise
 - A1 sand thickness not simulated
 - spatial correlated noise added to bounding time structure grids

Depth model - 3D facies fence



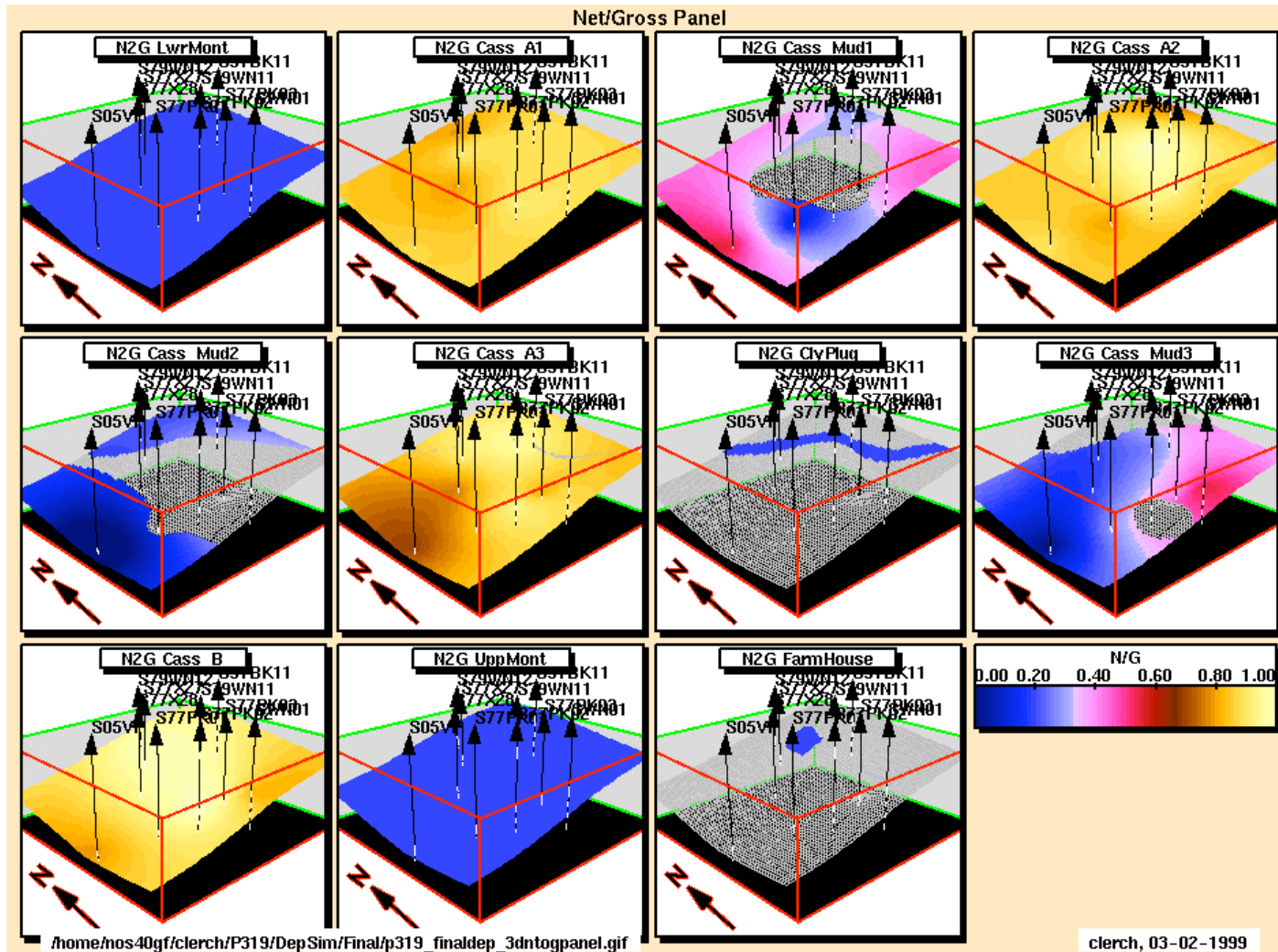
Depth model - facies traverse through well control



p319_finaldep_faciesxsec.gif

clerch, 03-02-1999

Depth model - kriged N/G maps



Petrophysical trends



clean wet sand:

$vp(\text{in m/s}) = 3660 \pm 30$

$\text{porosity} = 0.20 \pm 0.002$

mudrock:

$vp = 2740 \pm 30$

$\text{density}(\text{in gm/cc}) = 2.45 \pm 0.025$

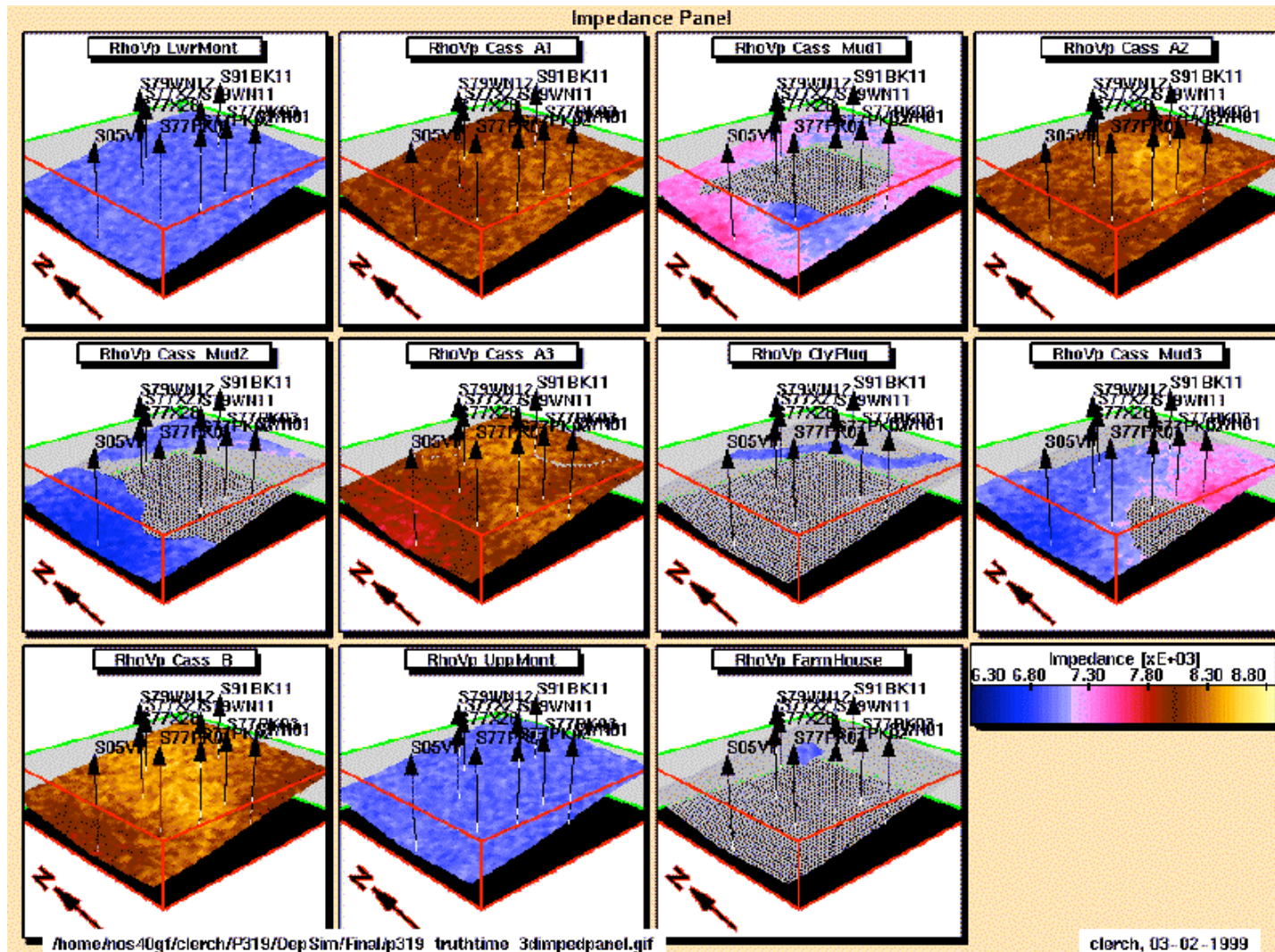
brine:

$vp = 1525 \text{ m/s}$

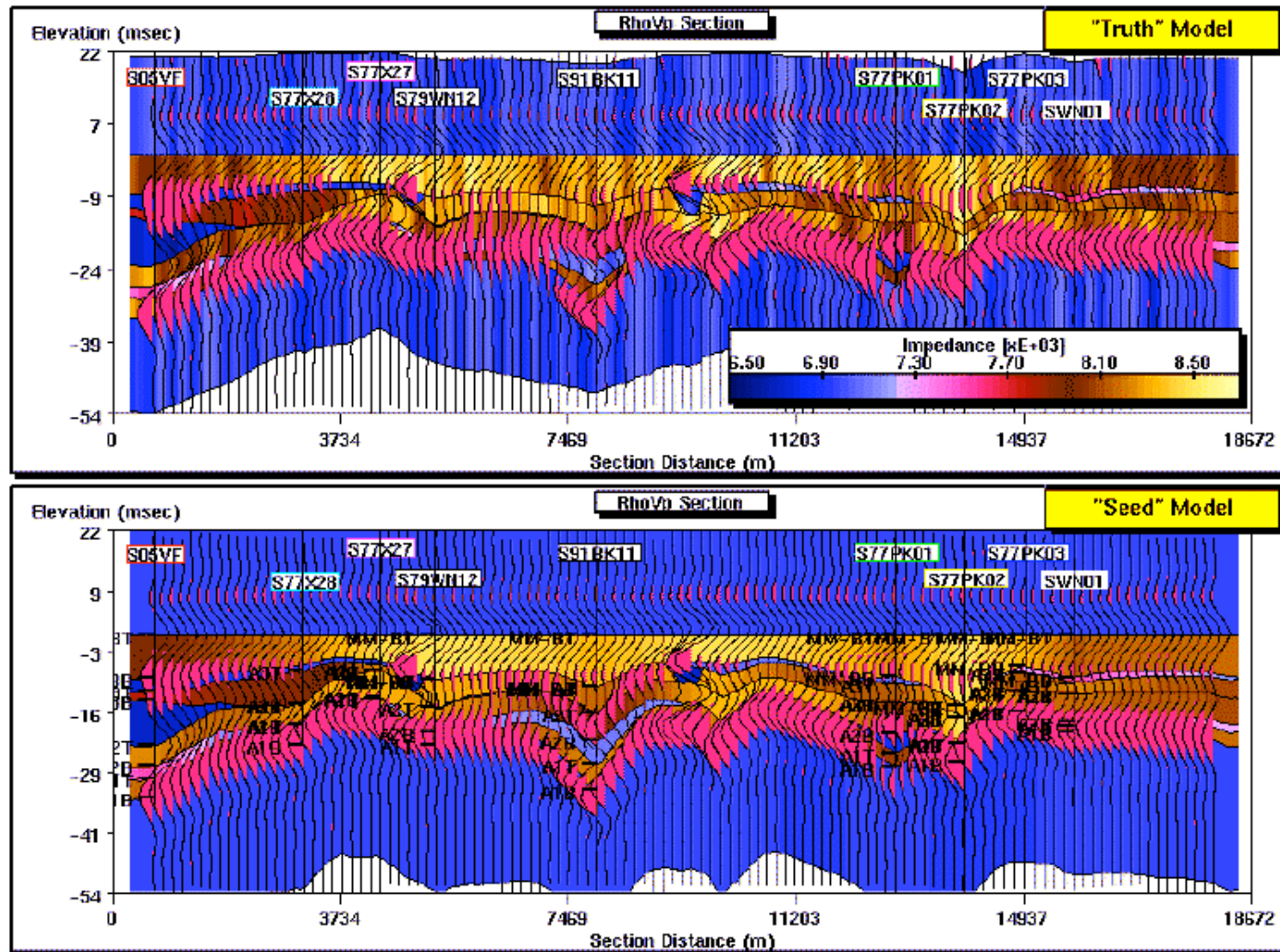
$\text{density} = 1.0 \text{ gm/cc}$

N/G: from DepSim seed model ± 0.04

“Truth” model - impedance maps with random noise



“Truth” vs “Seed” models - impedance traverse through wells



/home/mos40gf/clerc/P319/DepSim/Final/p319_truthvsseed_impsec.gif_1

clerc, 03-02-1999

Details of the inversion



DepSim model constructed from:

2 interpreted horizons

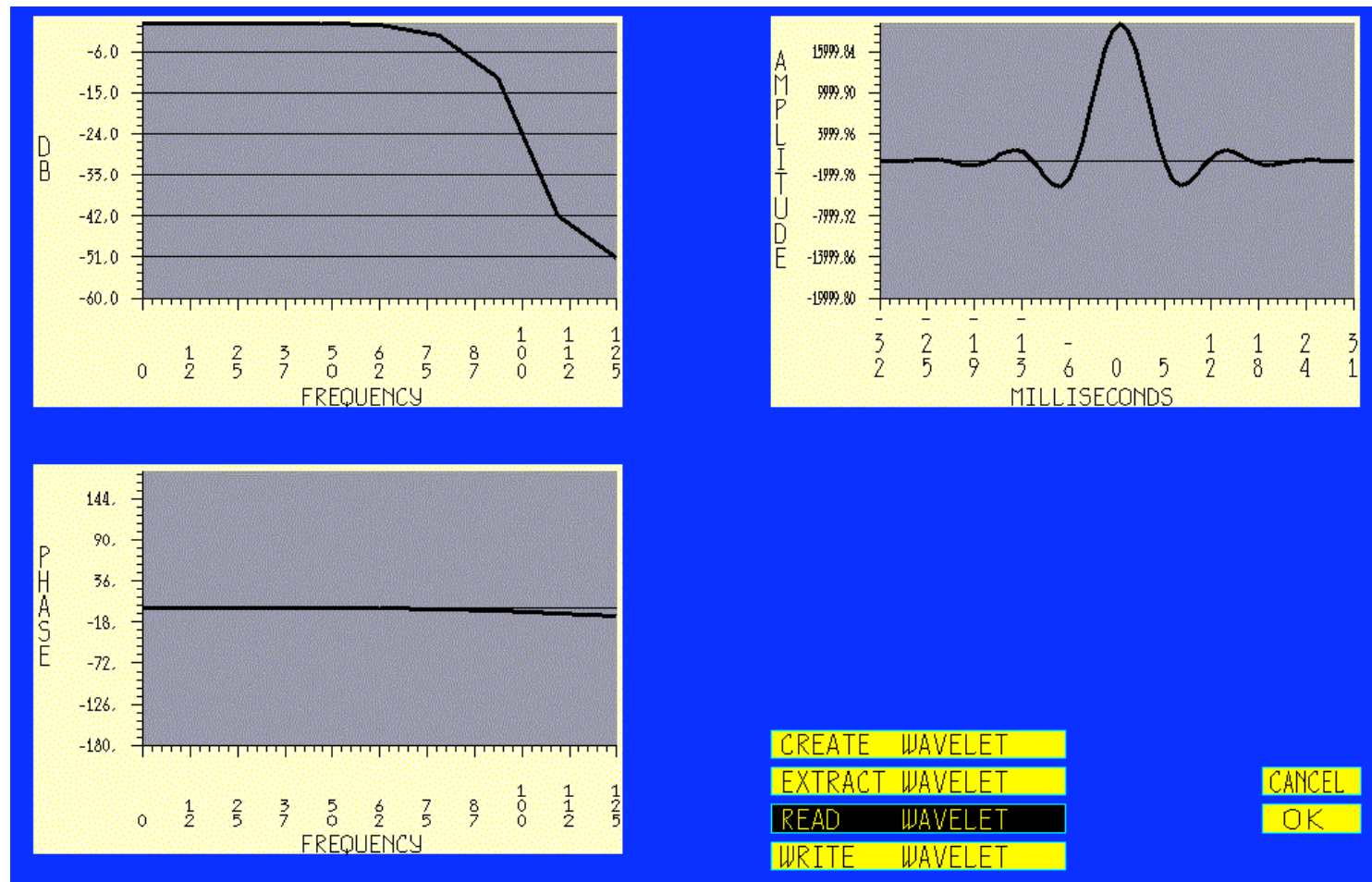
10 wells (thickness, N/G)

10 layers in model (+ 2 for farm house)

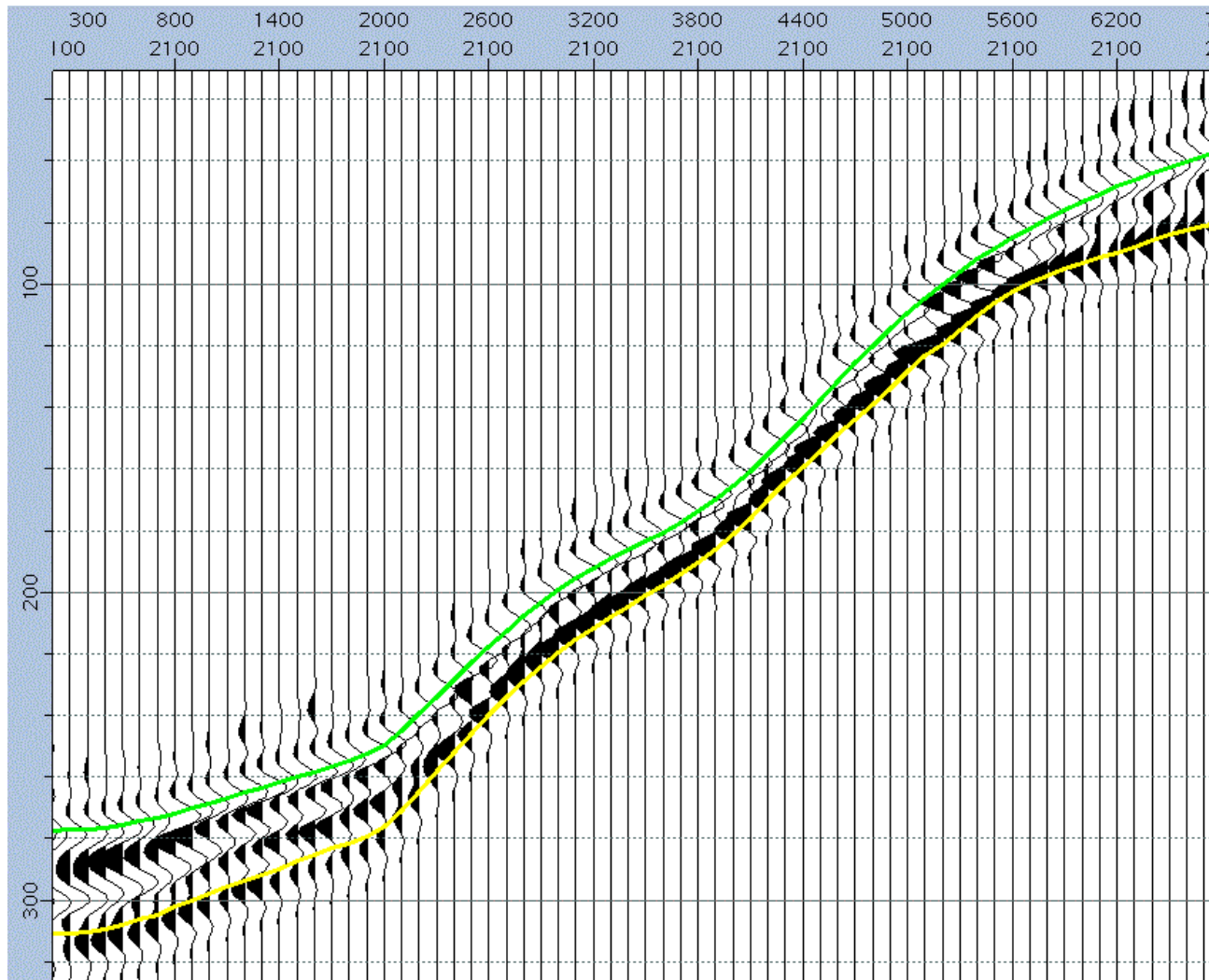
top Cass_B and bottom Cass_A1 constrained to ± 2 ms

thicknesses constrained $\pm 40\%$

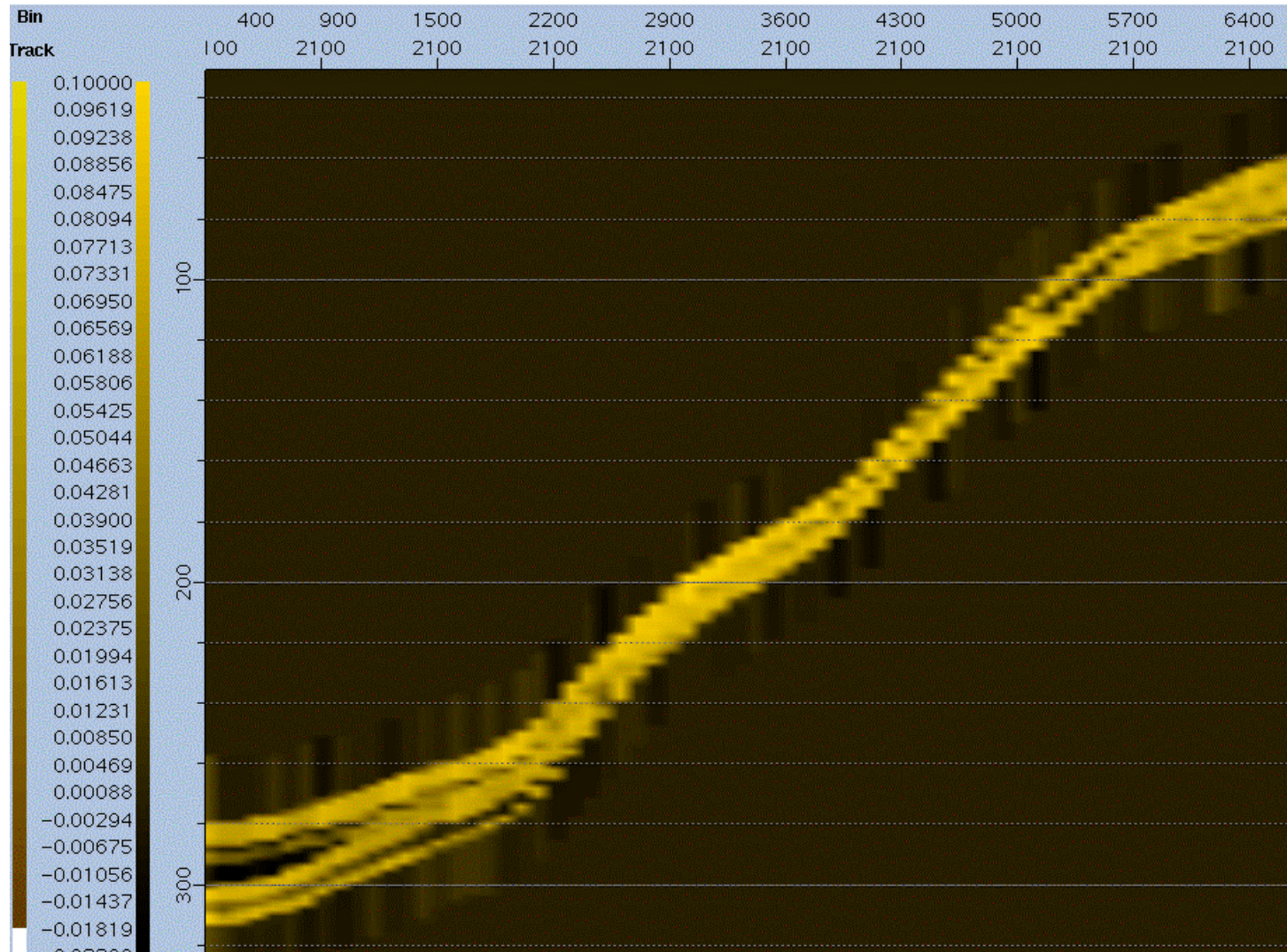
Wavelet used to generate synthetic and to do PROMISE inversion



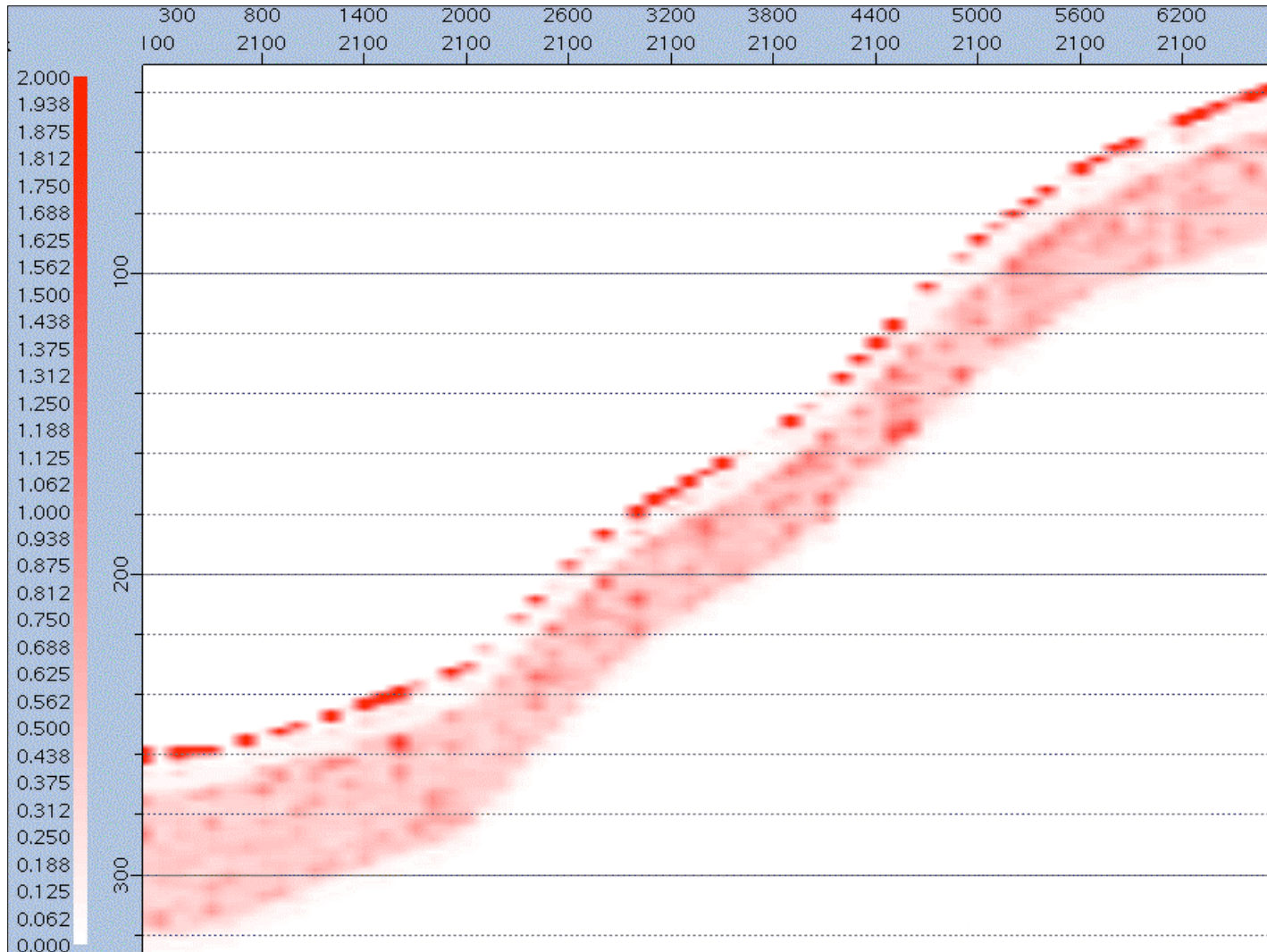
Seismic for TRK 2100 with 2 interpreted events



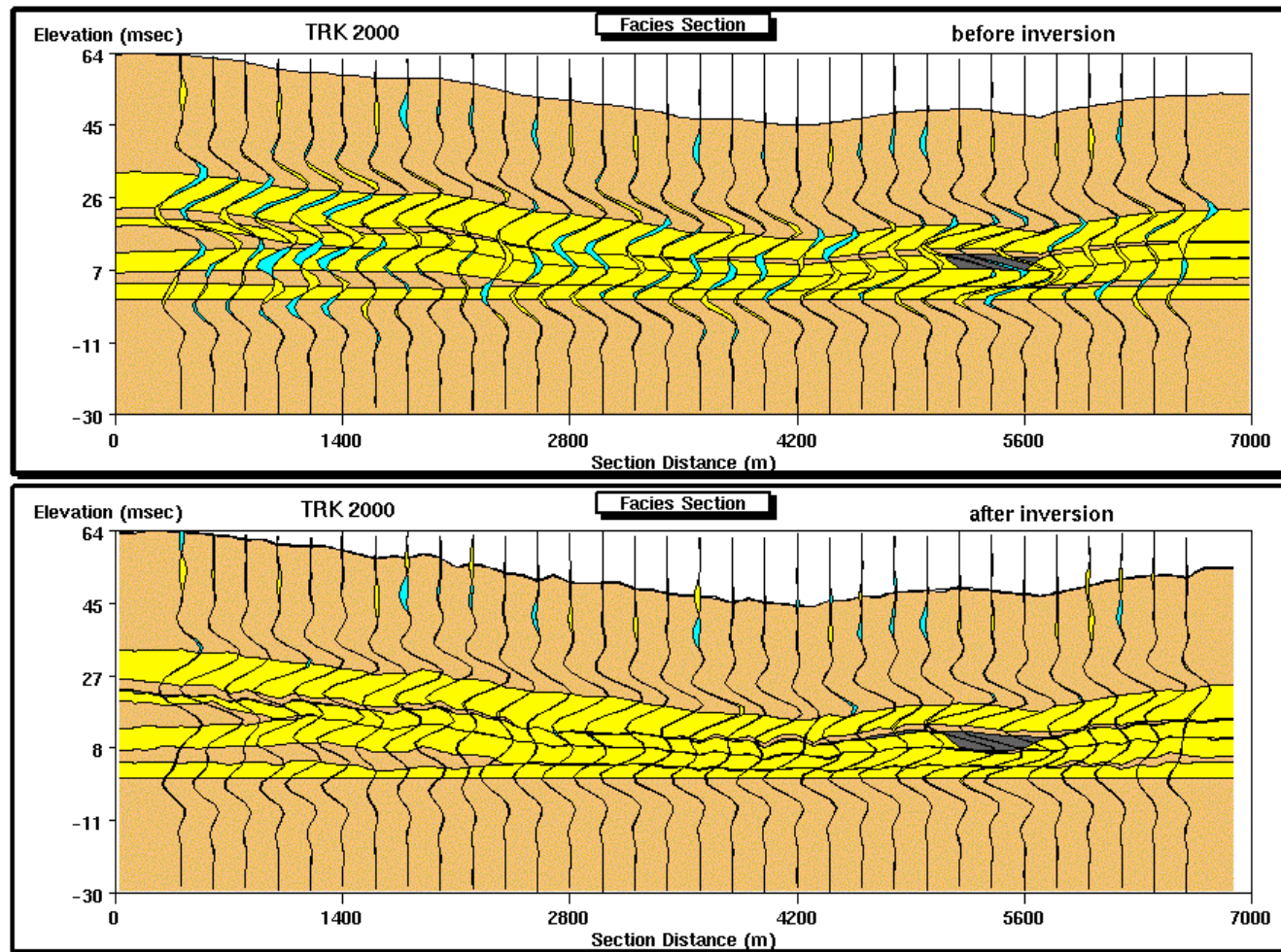
Log rho-v section after inversion for TRK 2100



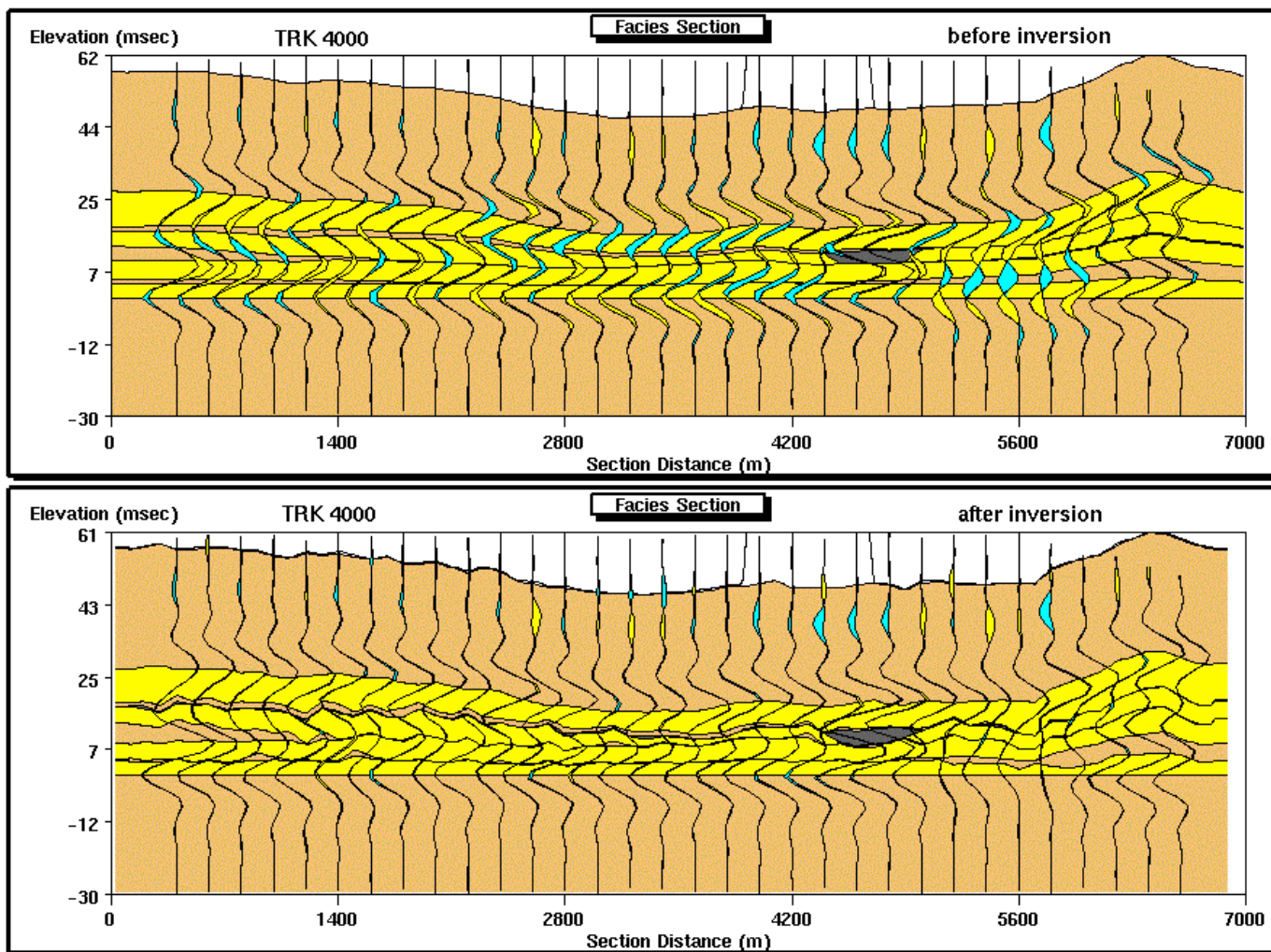
Chi-squared image for TRK 2100



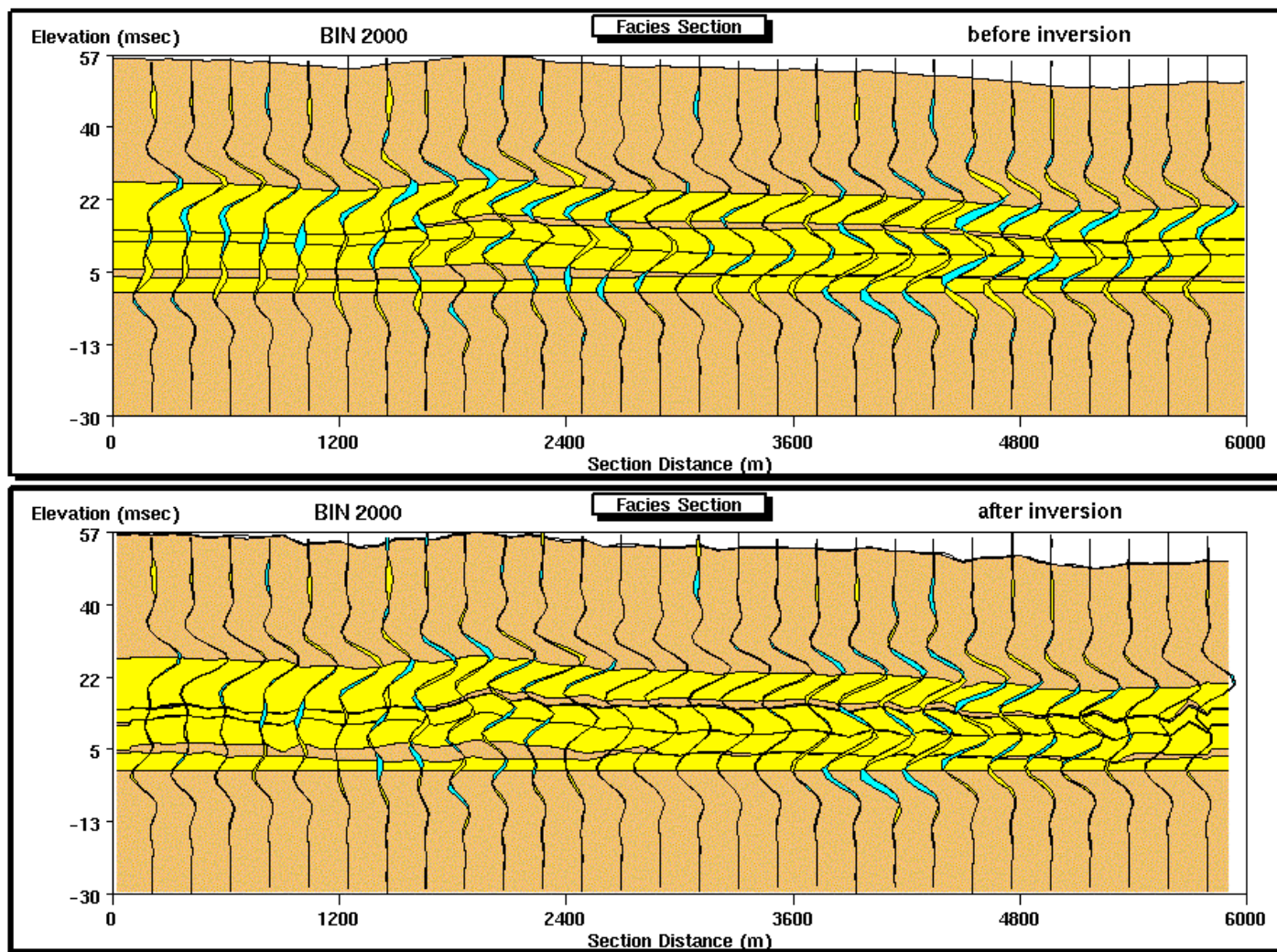
PROMISE inversion for W-E TRK 2000



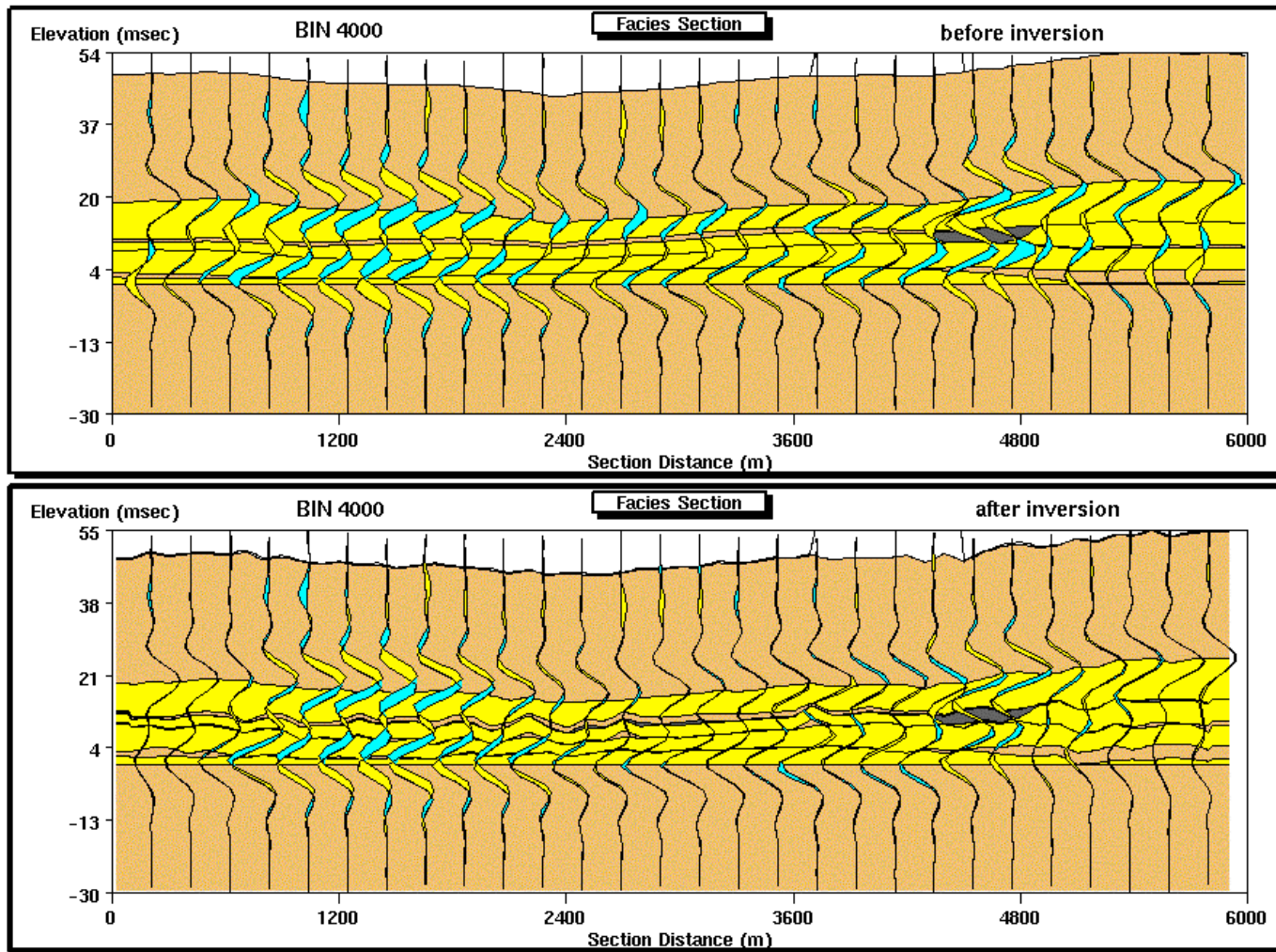
PROMISE inversion for W-E TRK 4000



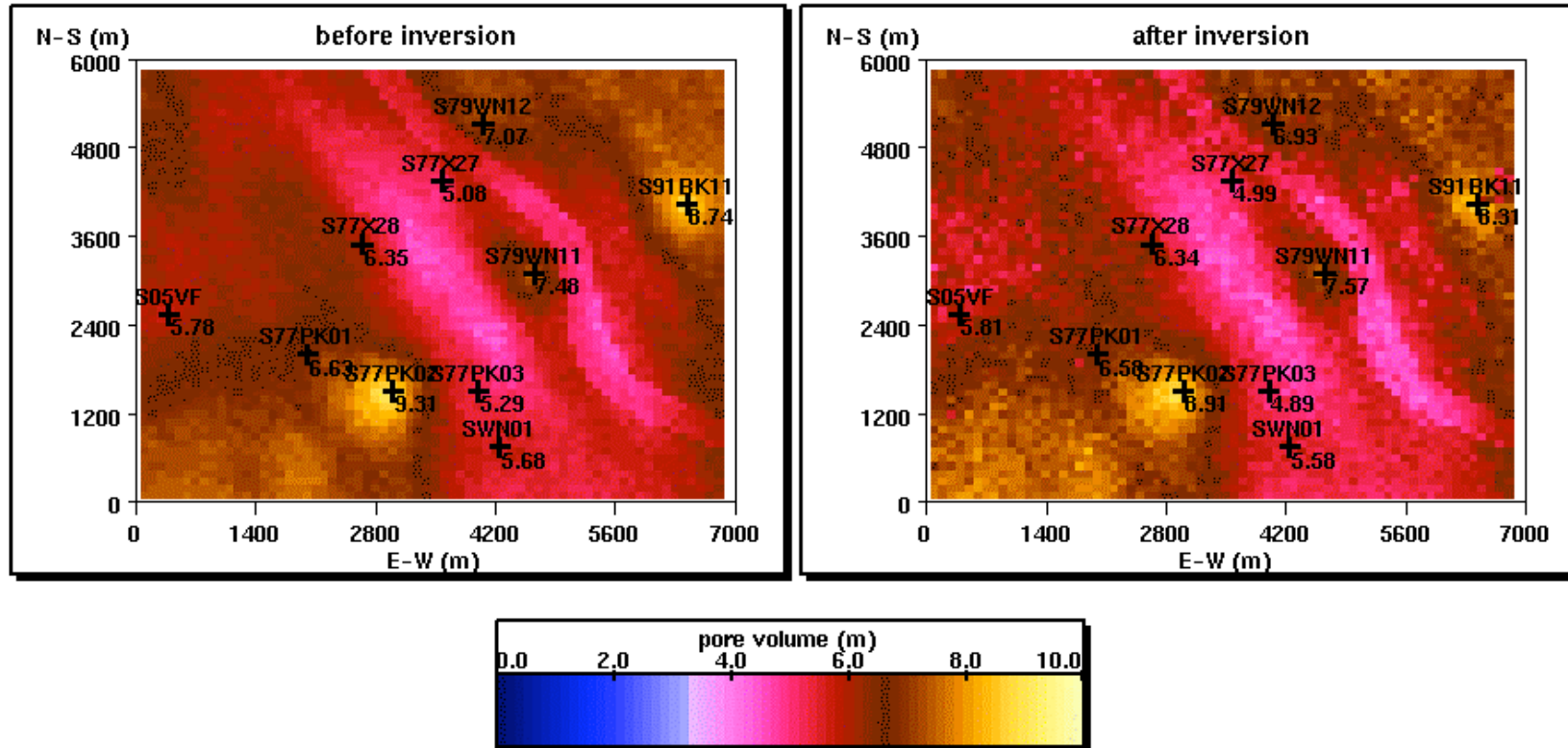
PROMISE inversion for S-N BIN 2000



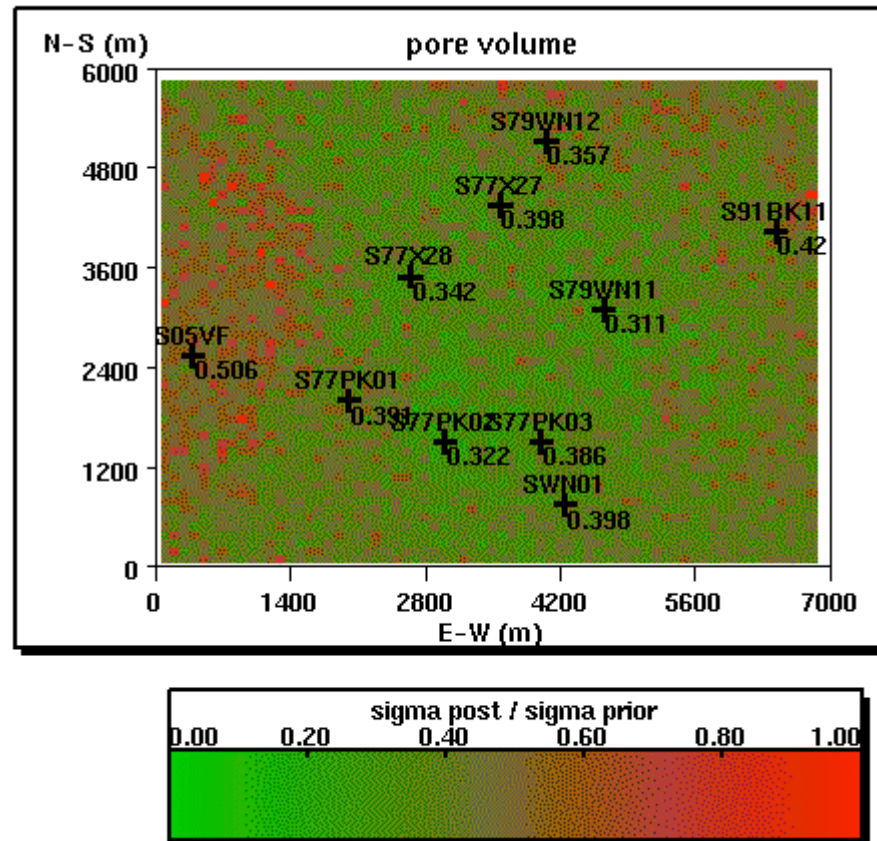
PROMISE inversion for S-N BIN 4000



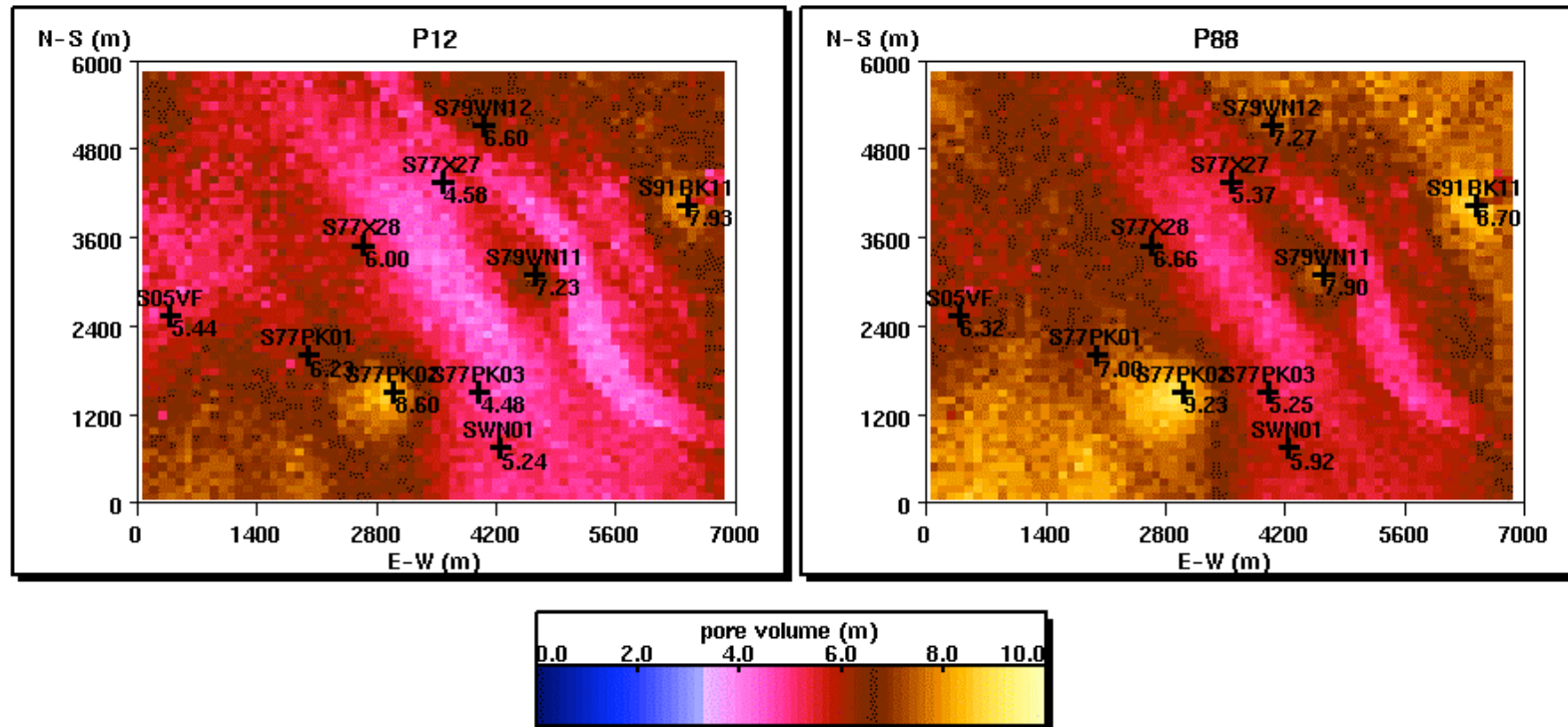
Small changes made to median pore volume



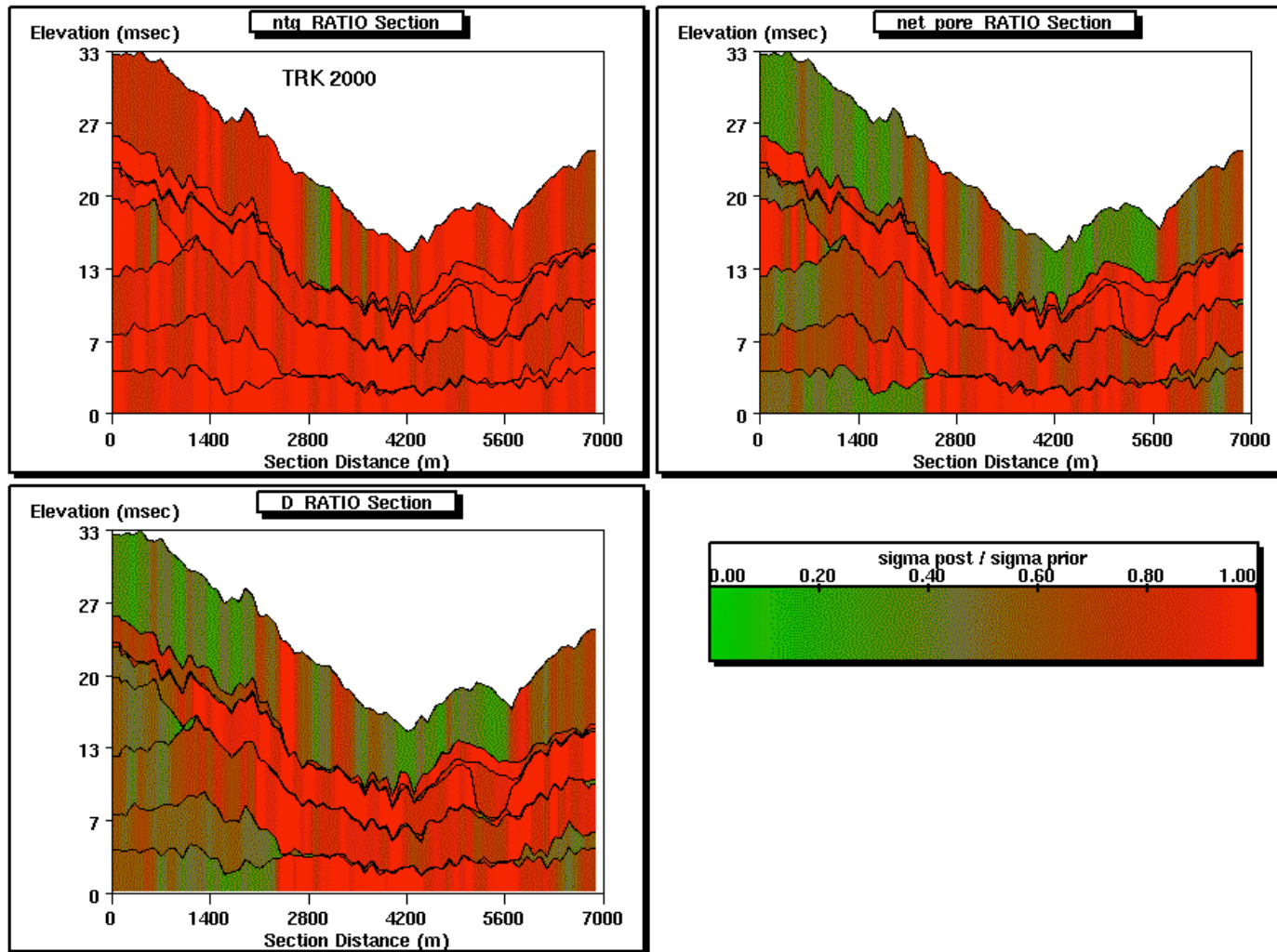
Pore volume standard deviation is improved by inversion



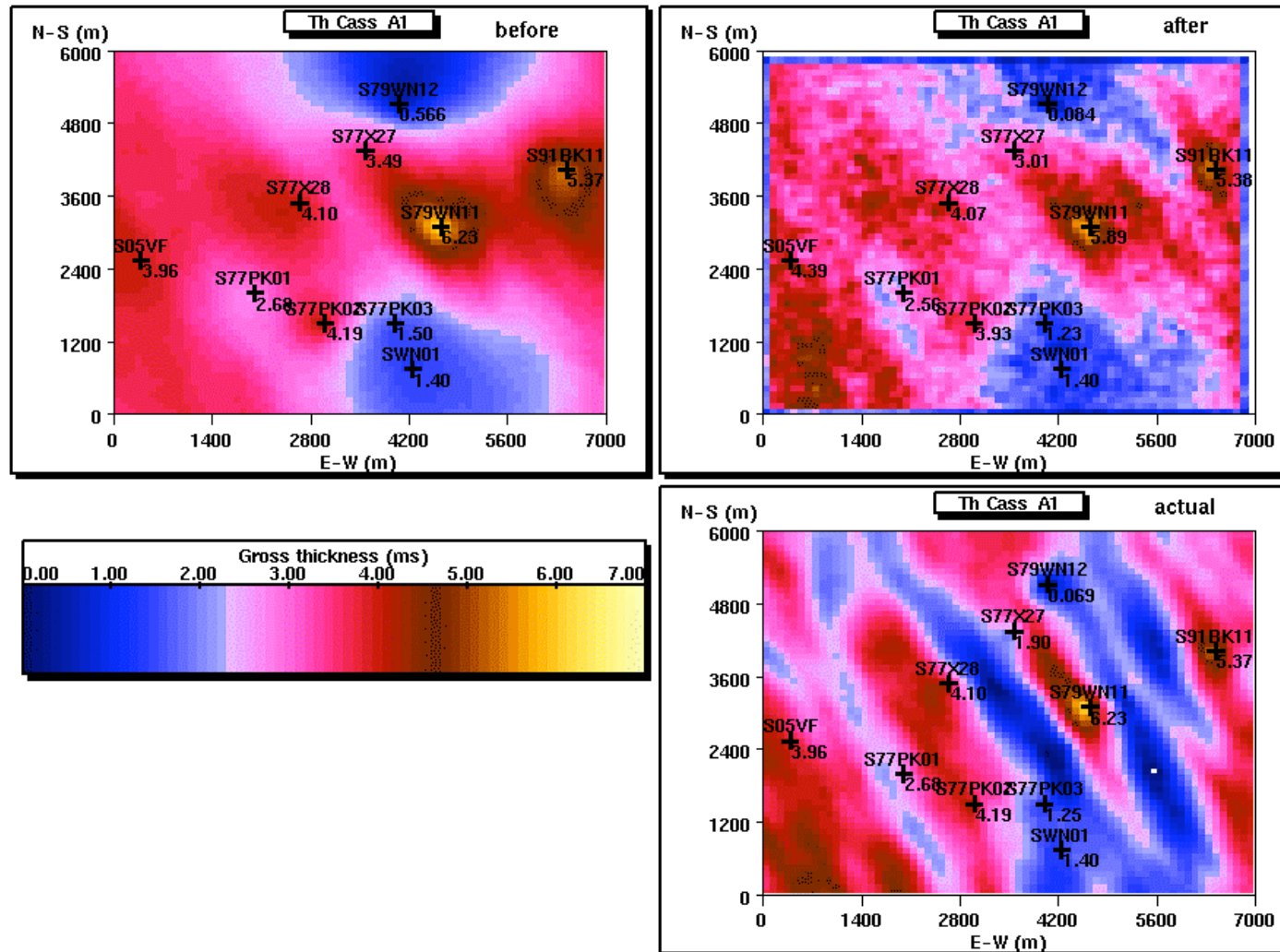
Small range in pore volume estimate after inversion



Improvement in estimate of thickness in selected layers improves pore volume estimate



Inversion refines structure in A1 sand



Structure in A1 sand is significant compared to uncertainty

