



# Frequency Dependent Amplitude Correction for Spatial Amplitude

## NZ 3D Processing

21 July 2021

[cgg.com](http://cgg.com)



INSTITUTE FOR GEOPHYSICS



Passion for Geoscience

1. Convert to CGG Internal Format
2. Nav merge / trace edit
3. Low Cut Filter
4. Time Variant Scaling (TVS) & Resample to 4ms
5. Swell Noise Attenuation (SNA)
6. Debubble
7. Linear Noise Attenuation (LNA)
8. Tidal Statics Correction
9. Water Column Statics Correction
10. Shot & Channel Scaling
11. Receiver Motion Correction (RMC)
12. Joint Deghost & Designature
13. Residual Bubble Removal
14. Source Sensor Datum Correction
15. Shallow Water Demultiple
16. Surface Related Multiple Elimination (3D SRME)
17. Simultaneous Subtraction of MWD & SRME
18. Residual Linear Noise Attenuation (residual LNA)
19. Trace Regularization & Interpolation
20. Velocity Analysis
21. Radon Demultiple
22. Footprint Removal
23. Diffracted Multiple Removal
24. Common Offset Denoise
25. Q Analysis and Compensation
26. Final TTI Kirchhoff Migration
27. Convert from Depth to Time Domain
28. High Density Automatically Velocity Analysis
29. Radon Demultiple
30. Trim Static Correction
31. Post Migration Denoise
32. Q Compensation (Amplitude)
33. Spectra Offset Balancing
34. Angle Mute & Full Stack
35. Residual Noise Attenuation
36. Frequency Dependent Amplitude Correction for Spatial Amplitude

- **Objective:**

To further balance spatially variant amplitude (apply to full stack only).

- **Procedure:**

- Covert data to time domain.
- Compute the modelled attenuation scalars using the spectral ratio method for Q-estimation.
- Apply spatial variant residual Q compensation.

- **Display:**

Selected subline and crossline in depth domain.

- **Observation & Recommendation:**

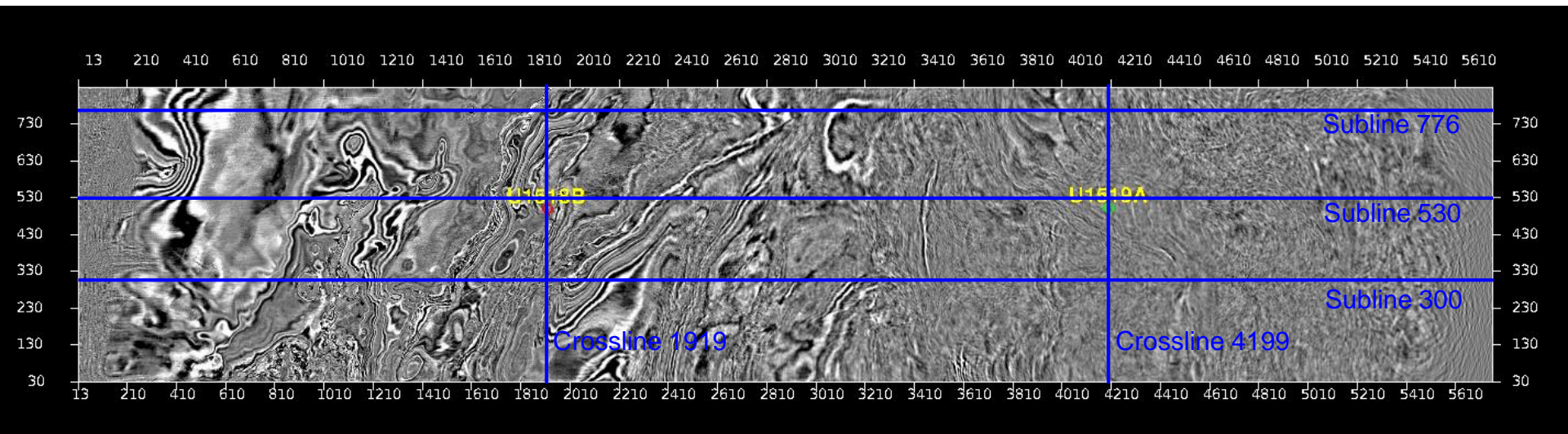
- Spatially variant amplitude anomalies is compensated by residual Q compensation and data interpretability is improved.
- Recommend apply amplitude correction to full stack production.



# Test Lines location

4

- Subline 300, 530 and 776
- Crossline 1919 and 4199

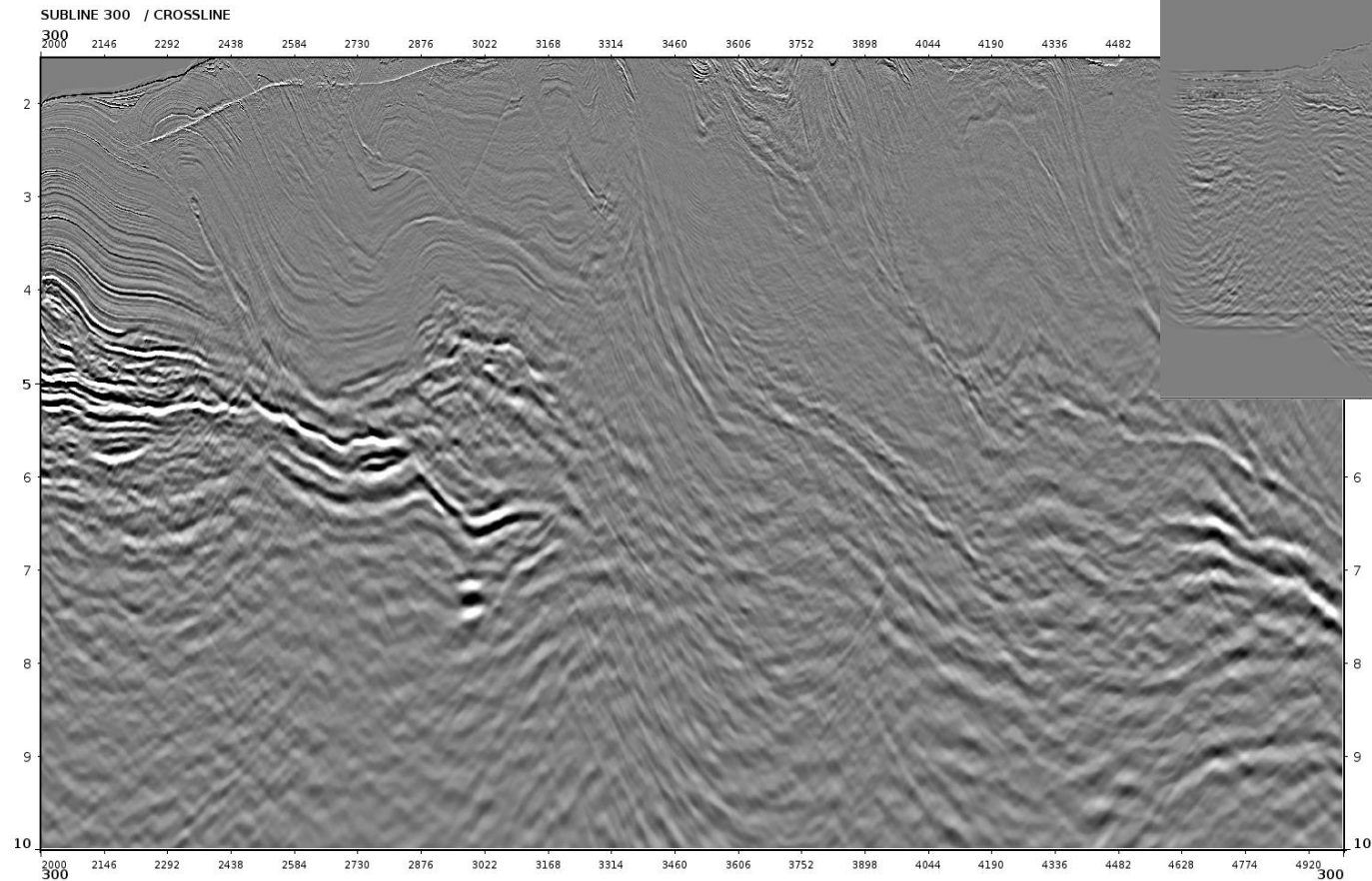






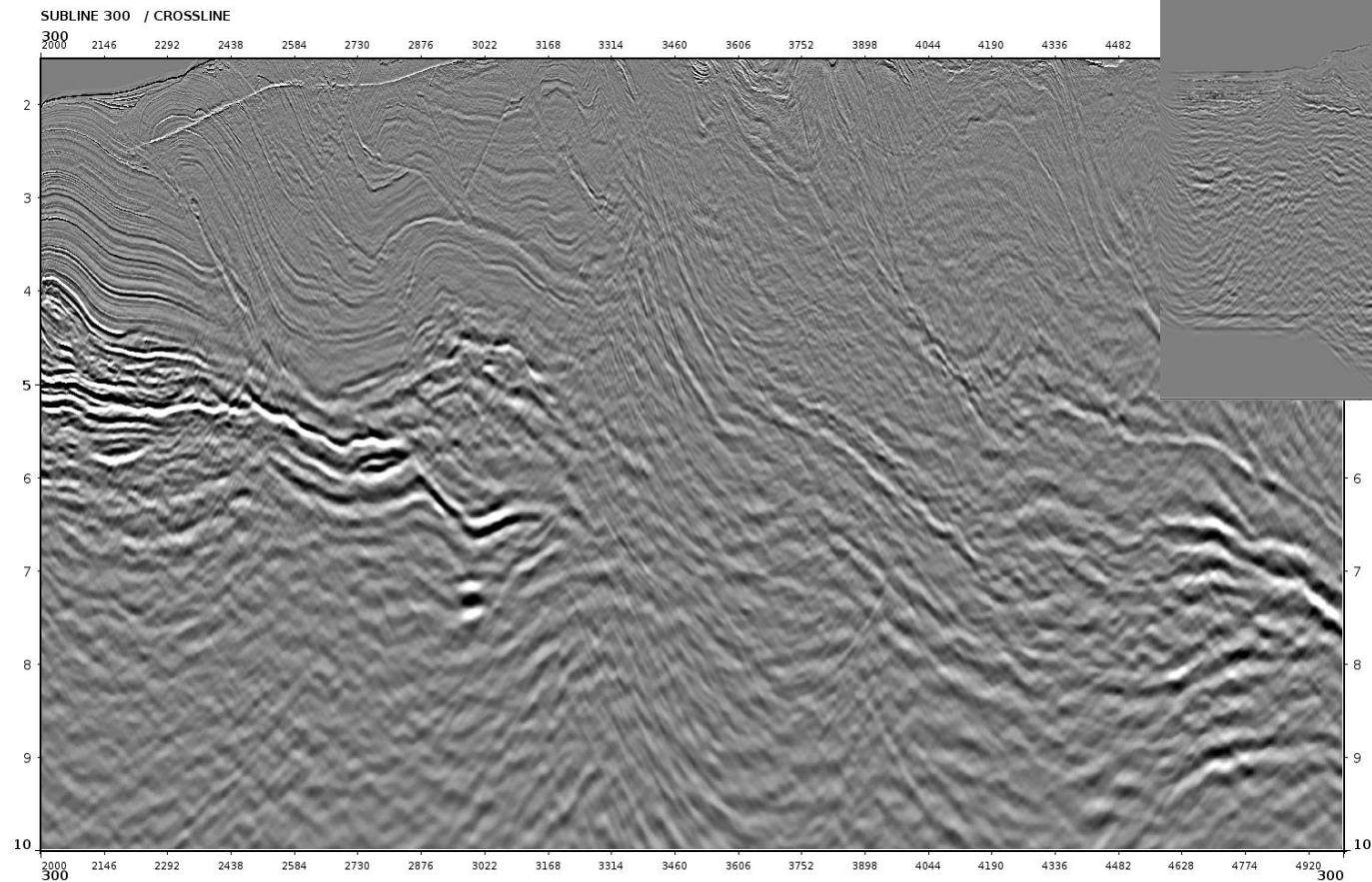
# Subline\_300: before amplitude correction

5



# Subline\_300: after amplitude correction

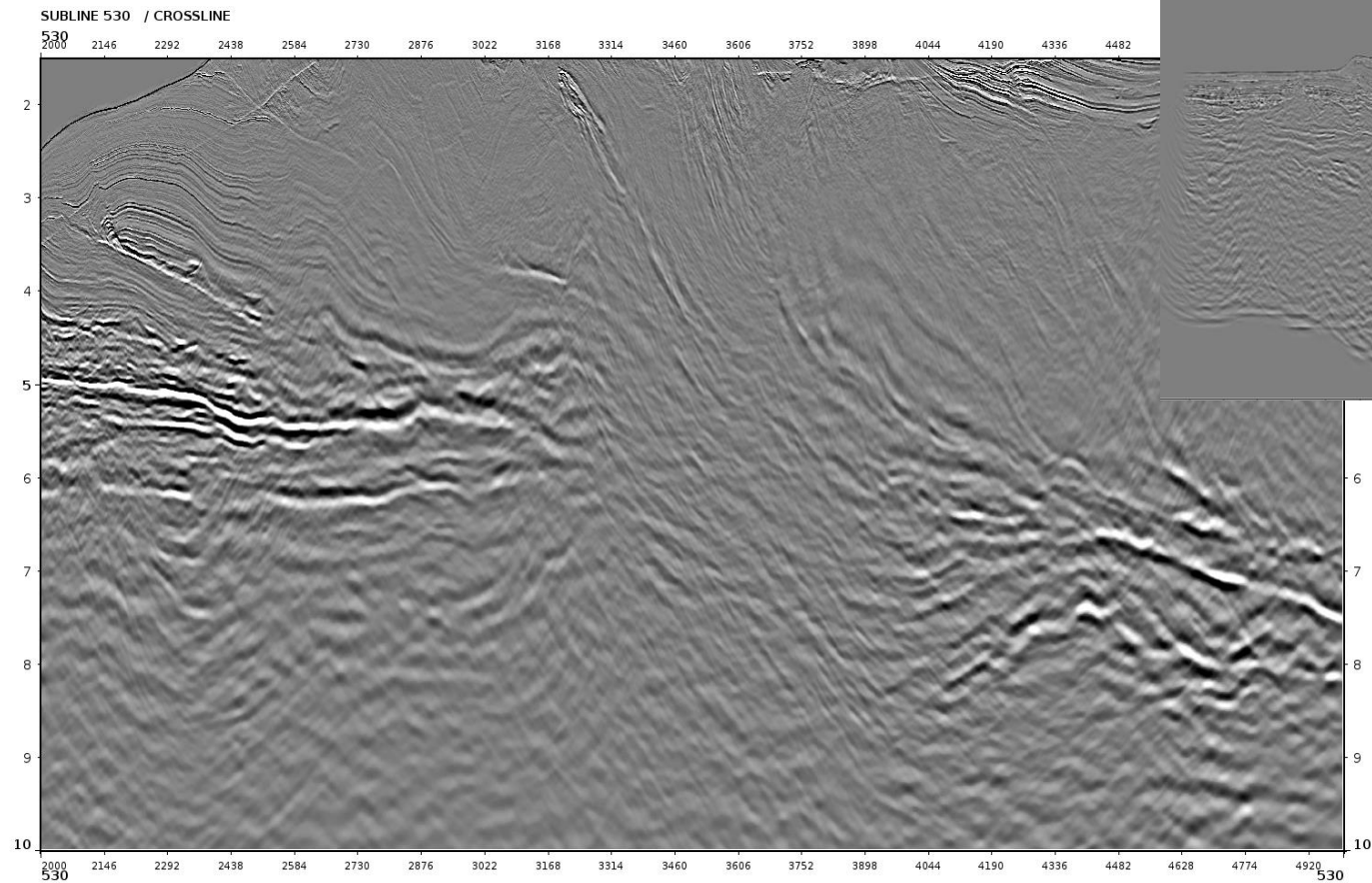
6





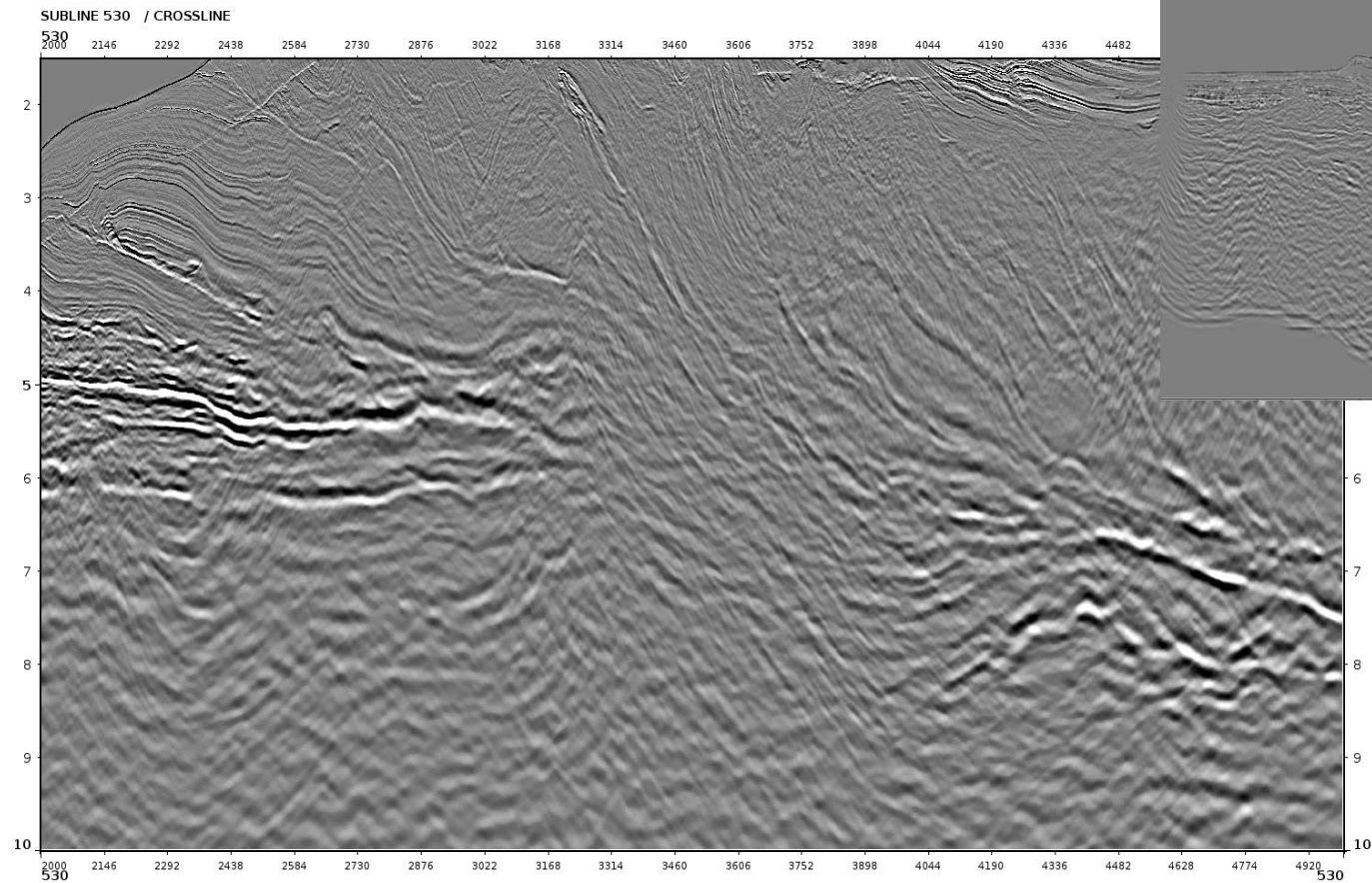
# Subline\_530: before amplitude correction

7



# Subline\_530: after amplitude correction

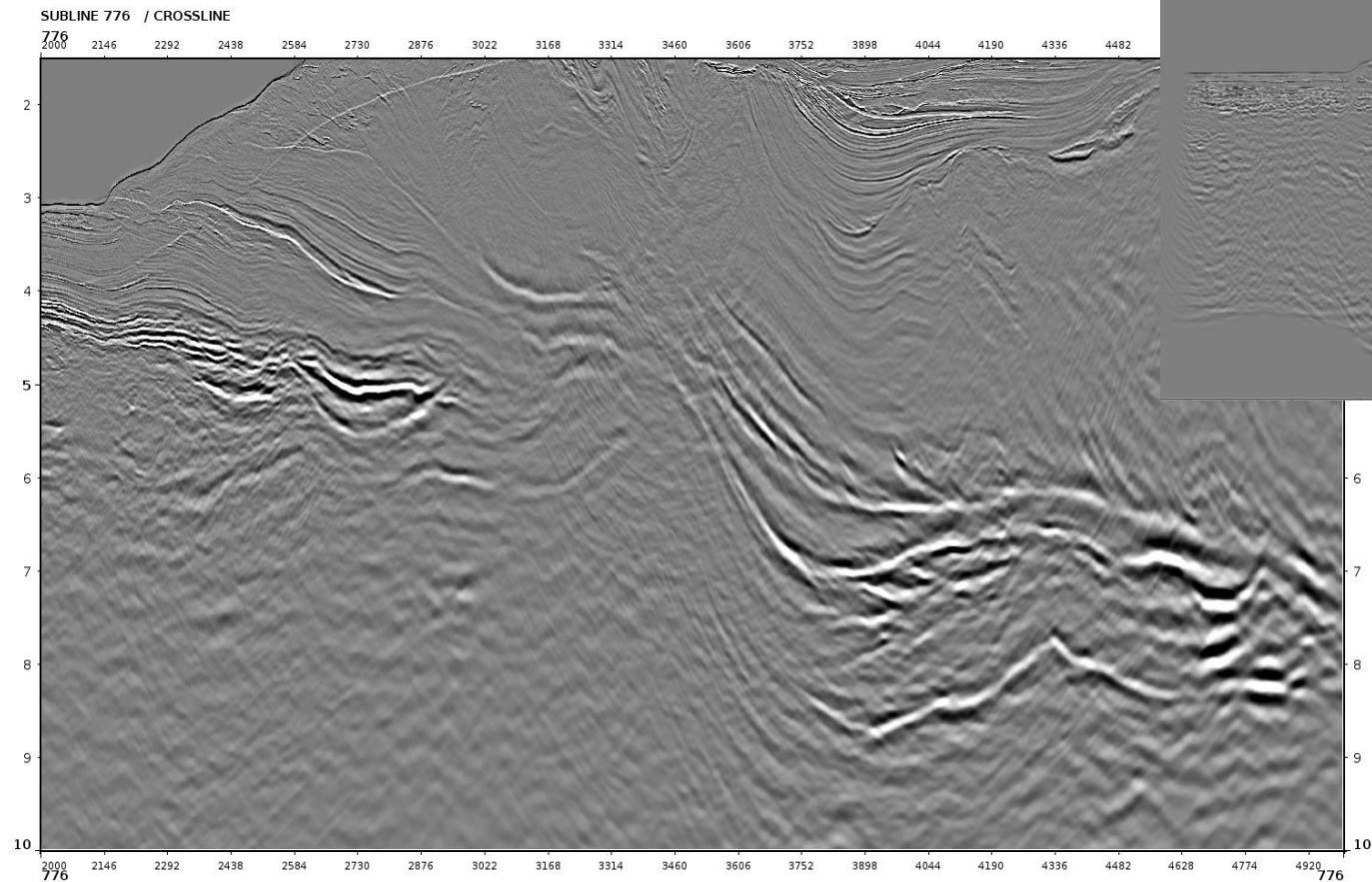
8





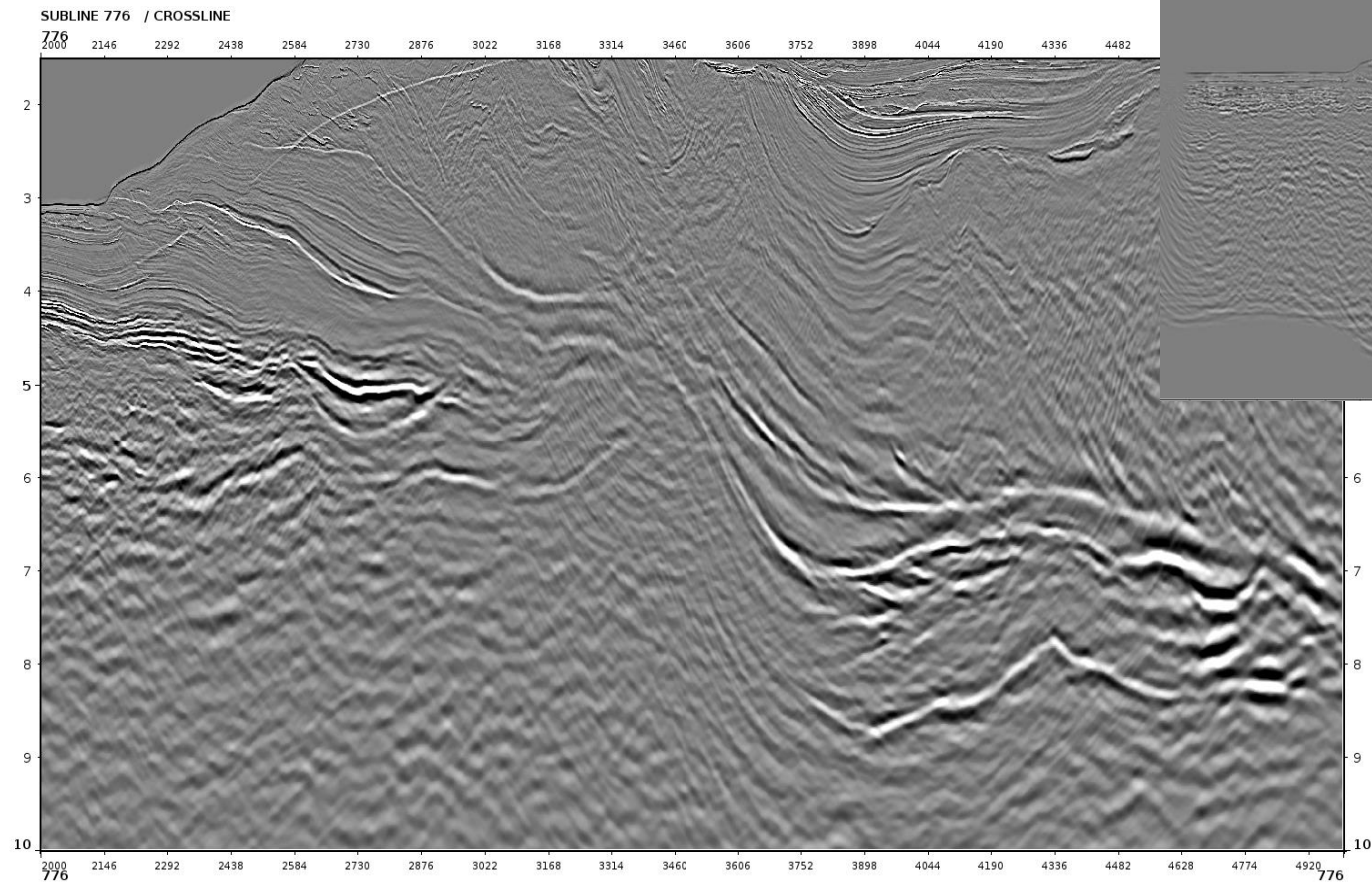
# Subline\_776: before amplitude correction

9



# Subline\_776: after amplitude correction

10



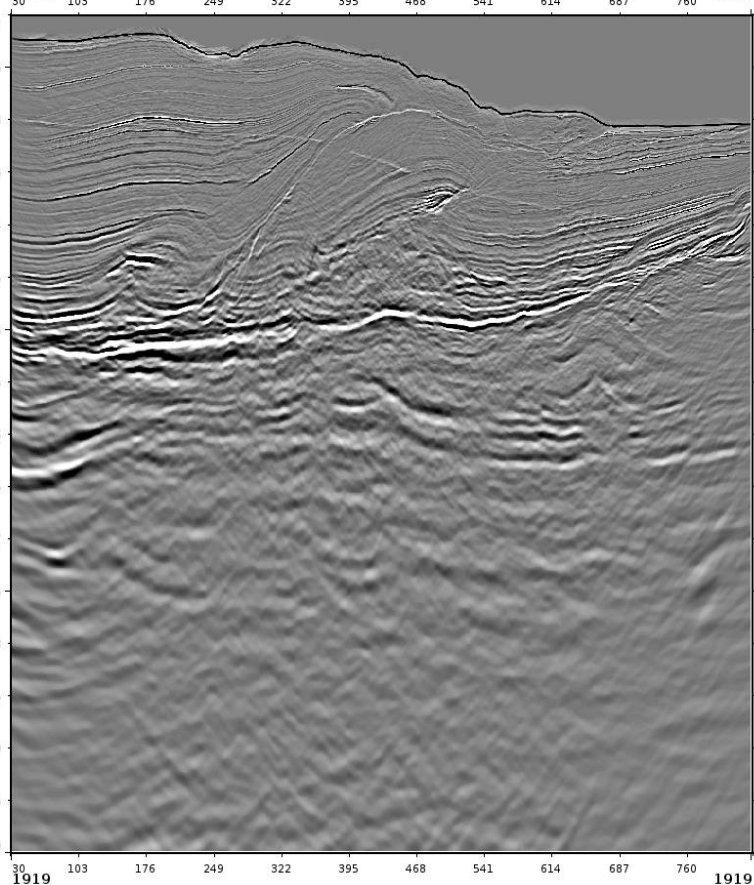


# Crossline 1919 and 4199: before amplitude correction

11

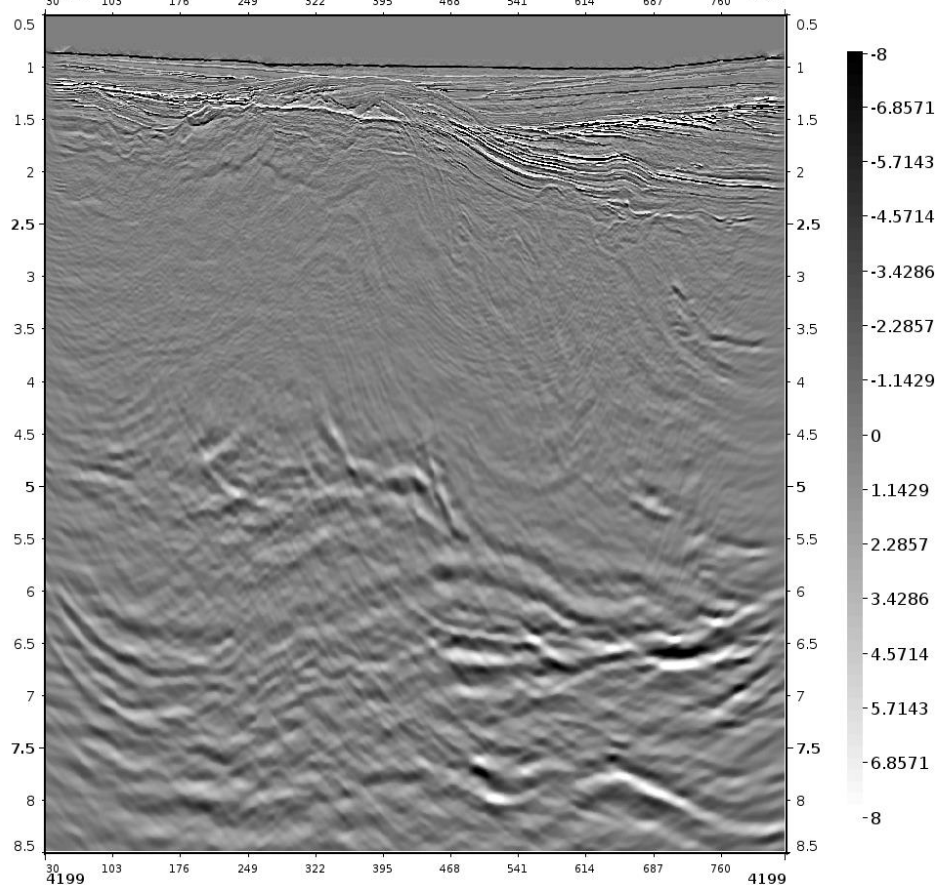
CROSSLINE 1919 / SUBLINE

1919 30 103 176 249 322 395 468 541 614 687 760 1919



CROSSLINE 4199 / SUBLINE

4199 30 103 176 249 322 395 468 541 614 687 760 4199





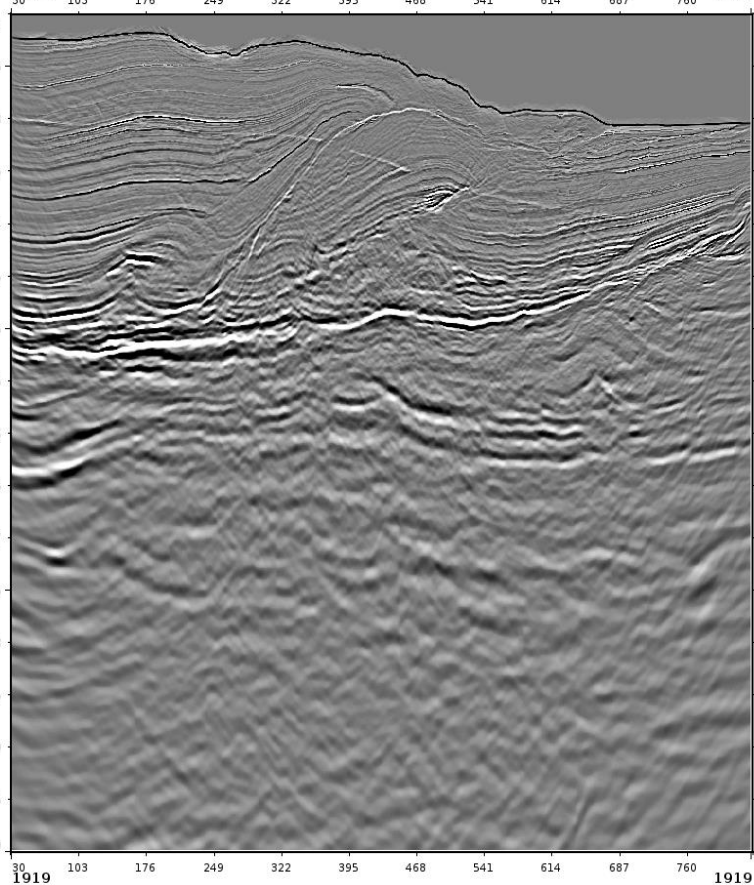


# Crossline 1919 and 4199: **after** amplitude correction

12

CROSSLINE 1919 / SUBLINE

1919 30 103 176 249 322 395 468 541 614 687 760 1919



CROSSLINE 4199 / SUBLINE

4199 30 103 176 249 322 395 468 541 614 687 760 4199

