

# **Processing of the 2010 field school 3D and 2D-3C seismic data from Priddis, Alberta**

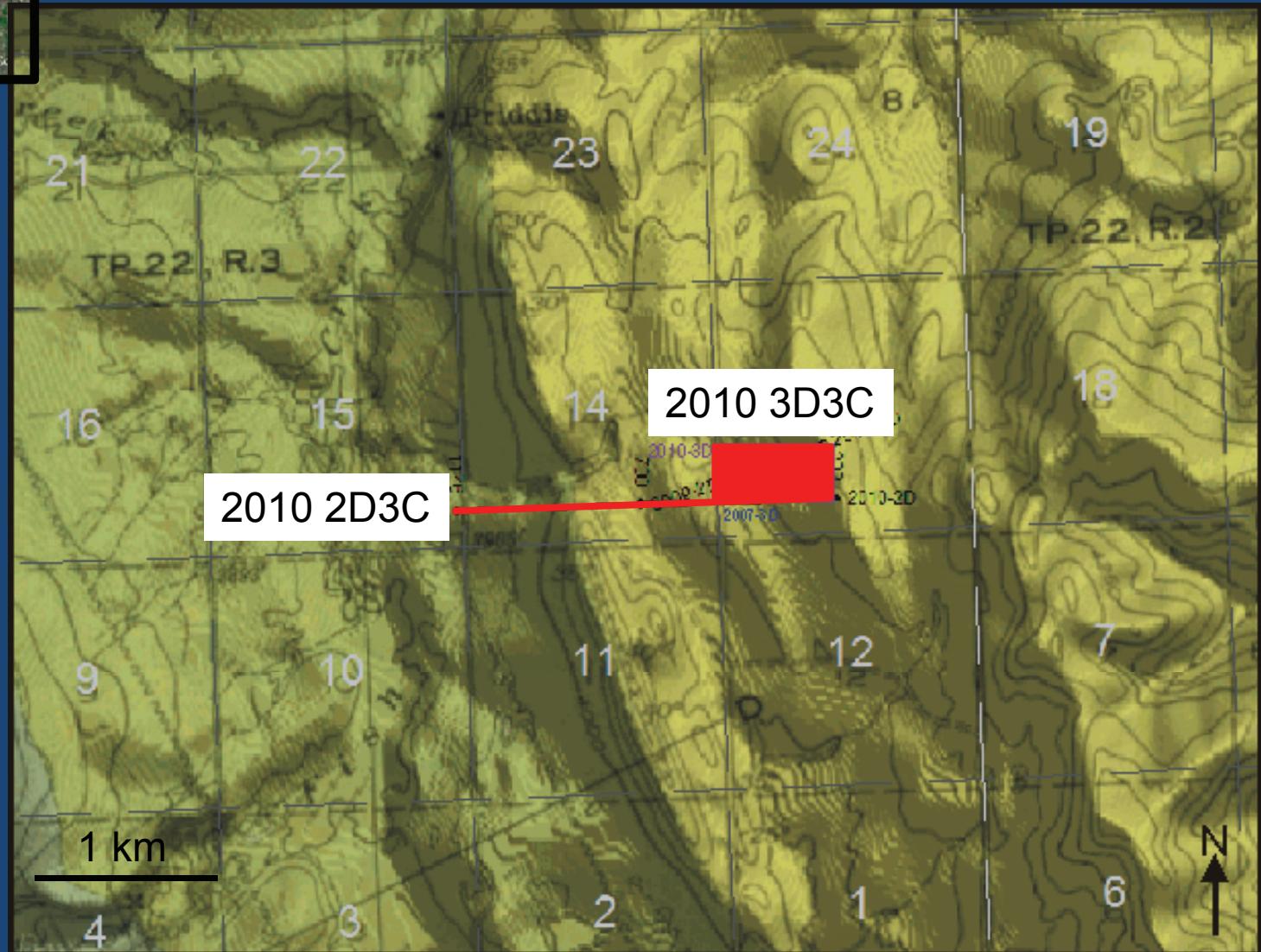
J. Helen Isaac and Don C. Lawton



# Outline

- Field acquisition of 3D3C and 2D3C data
- Processing of 3D vertical component data
- Processing of 2D vertical component data
- Playing around with 2D stacks
- Quick look at the 2D radial component data
- Summary

# Study area



Map and digital elevations courtesy GSC, graphics Global Mapper

Chris and Virginia examine  
the outcropping sand  
(while avoiding ants)



Surface dip 35°

# 2D3C acquisition August 2010



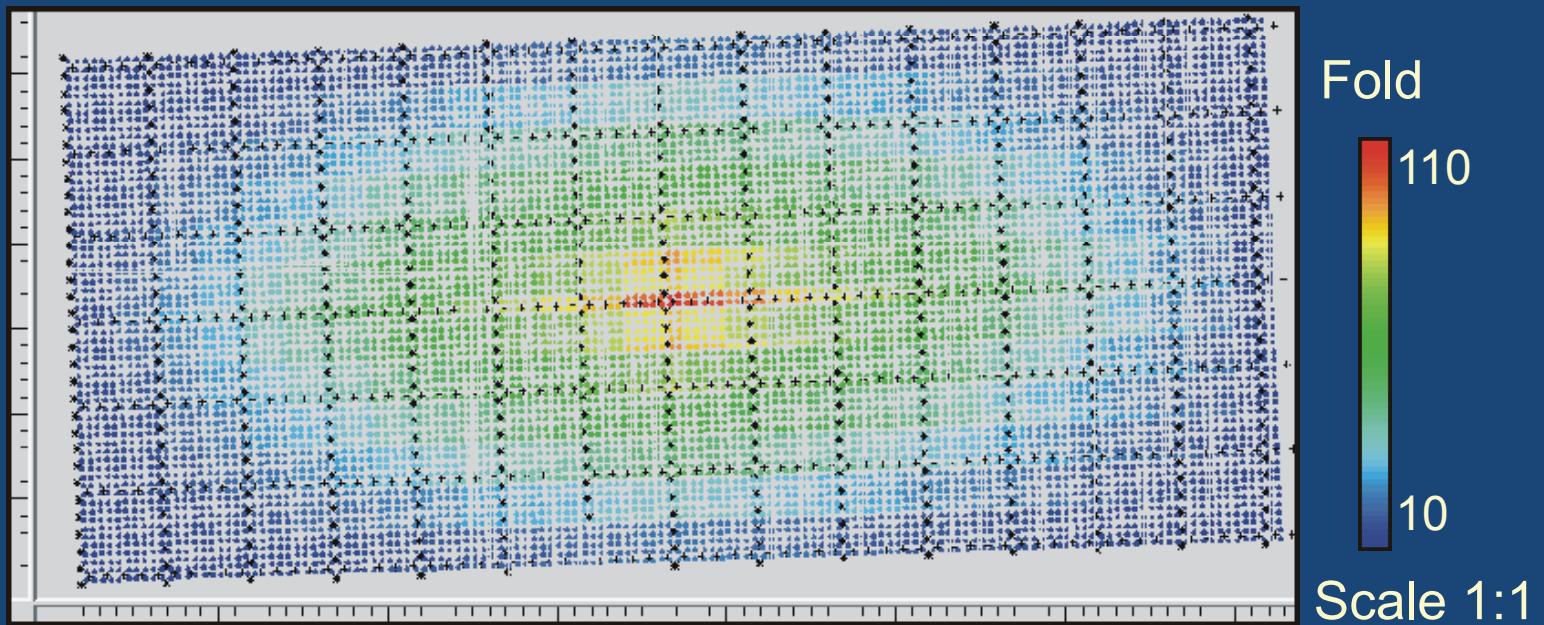
## Issues:

- Long grass, shrubs, steep hill
- Location of vibrator
- Surveying

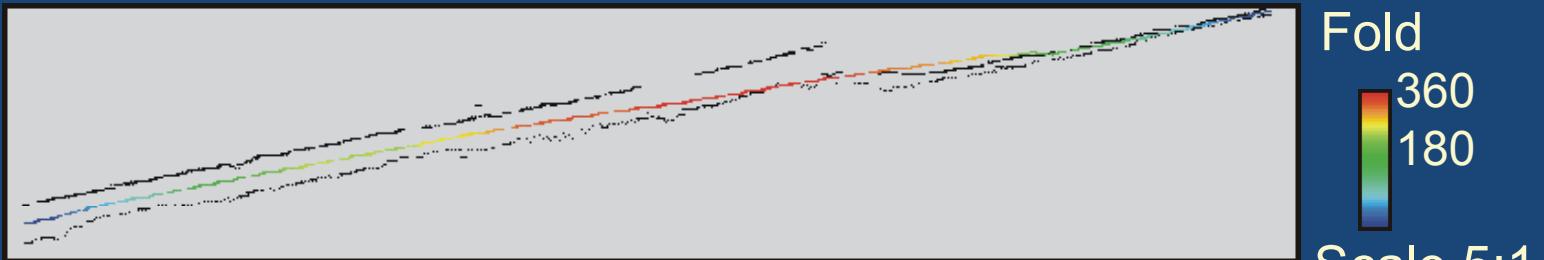


# 3D field layout and fold

3D



2D



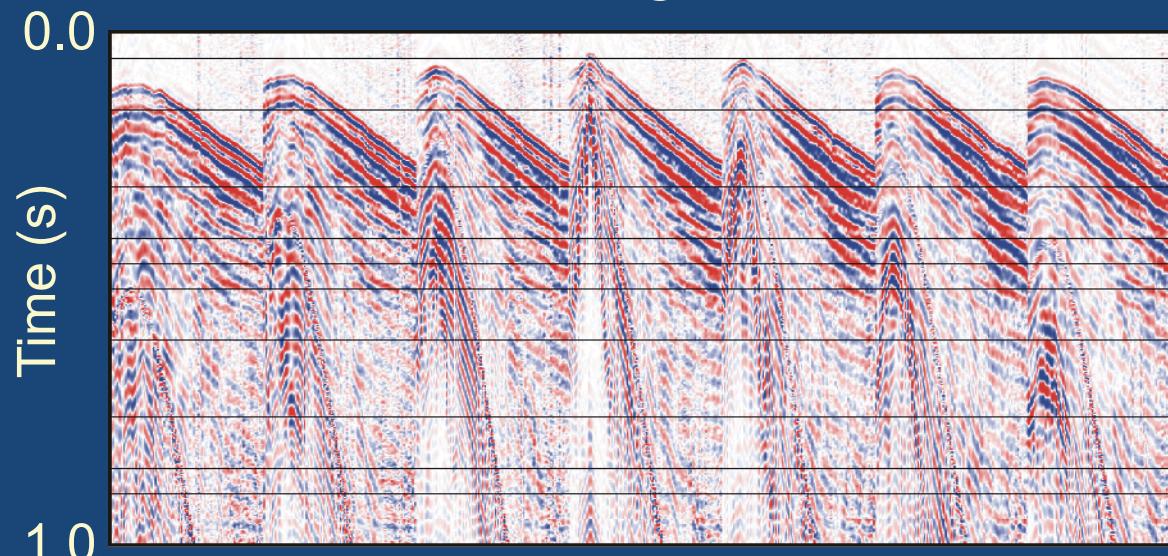
Shot and receiver spacing 5 m

3D lines 50 m apart

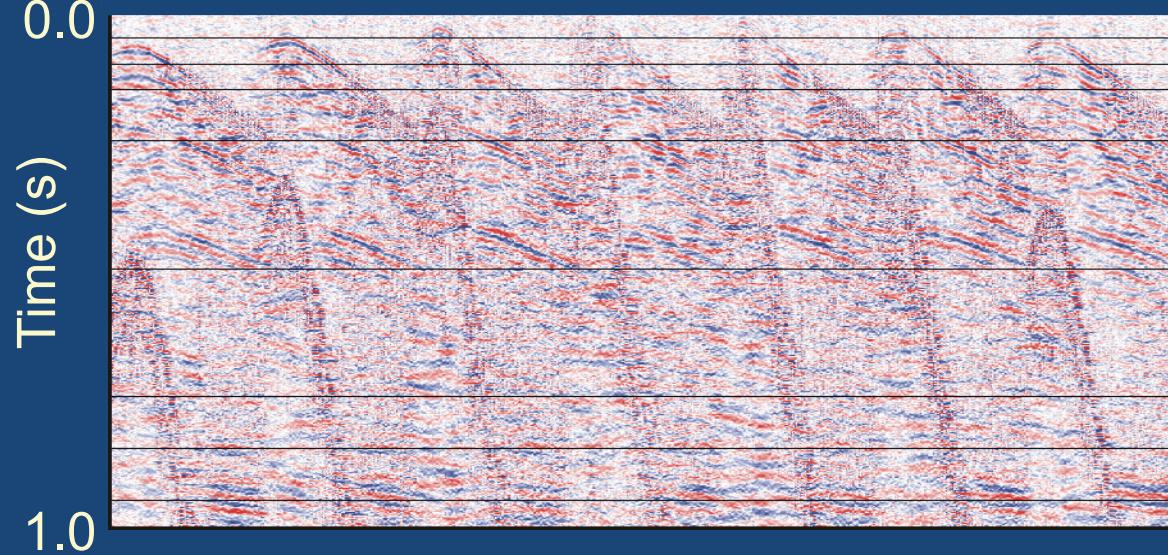
# 3D shot gather

## 3D Processing

- Geometry
- Elevation and refraction statics
- Geometric spreading
- Surface consistent amplitude scaling
- Surface wave noise attenuation
- Air blast attenuation
- Predictive deconvolution
- Q-compensation
- Gabor deconvolution
- Spectral balancing
- Bandpass filter 5/10-90/100 Hz
- Velocity analysis
- Residual statics
- Stack
- Migration:
  - poststack time
  - prestack time
  - prestack depth

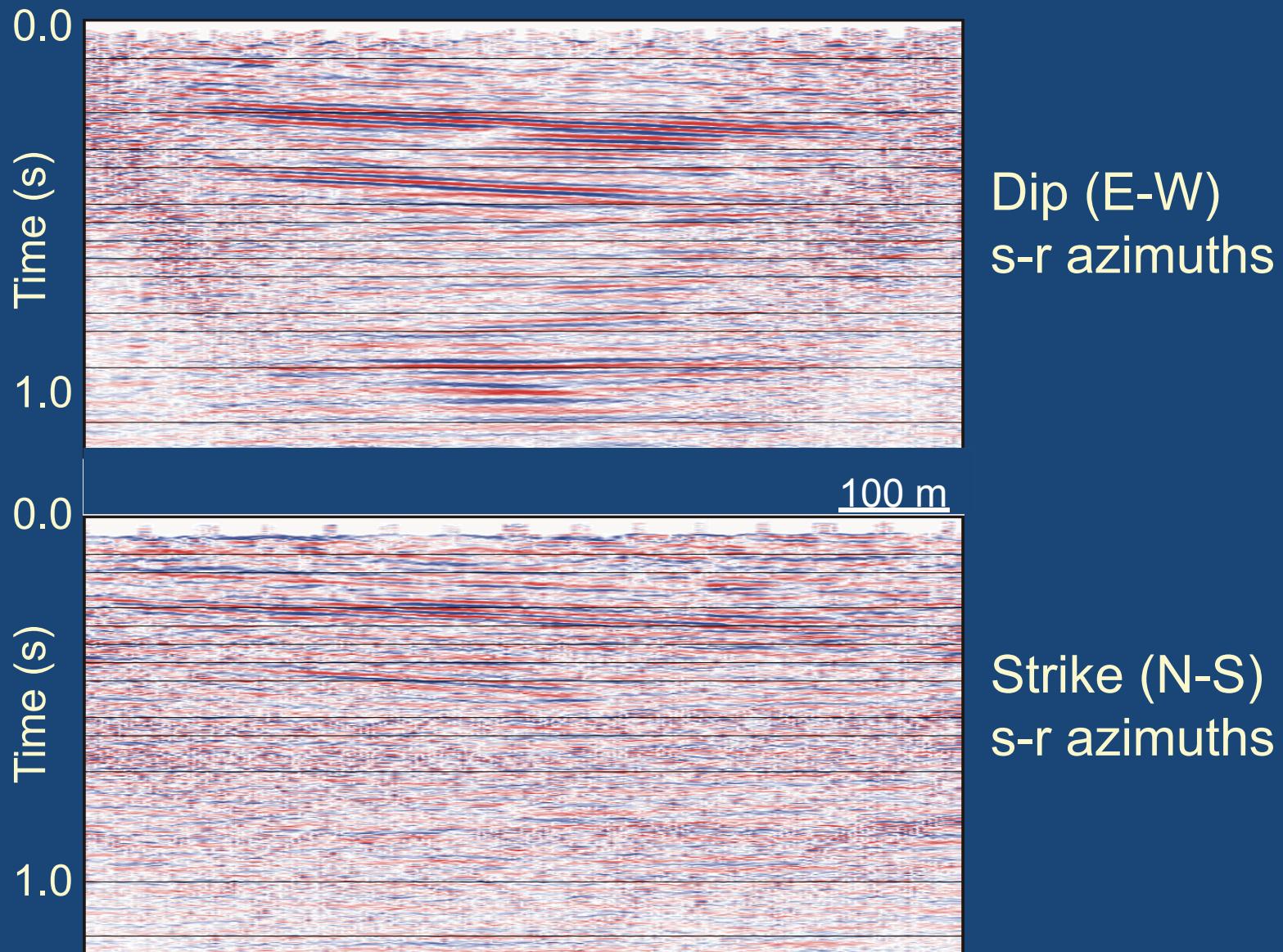


Field shot

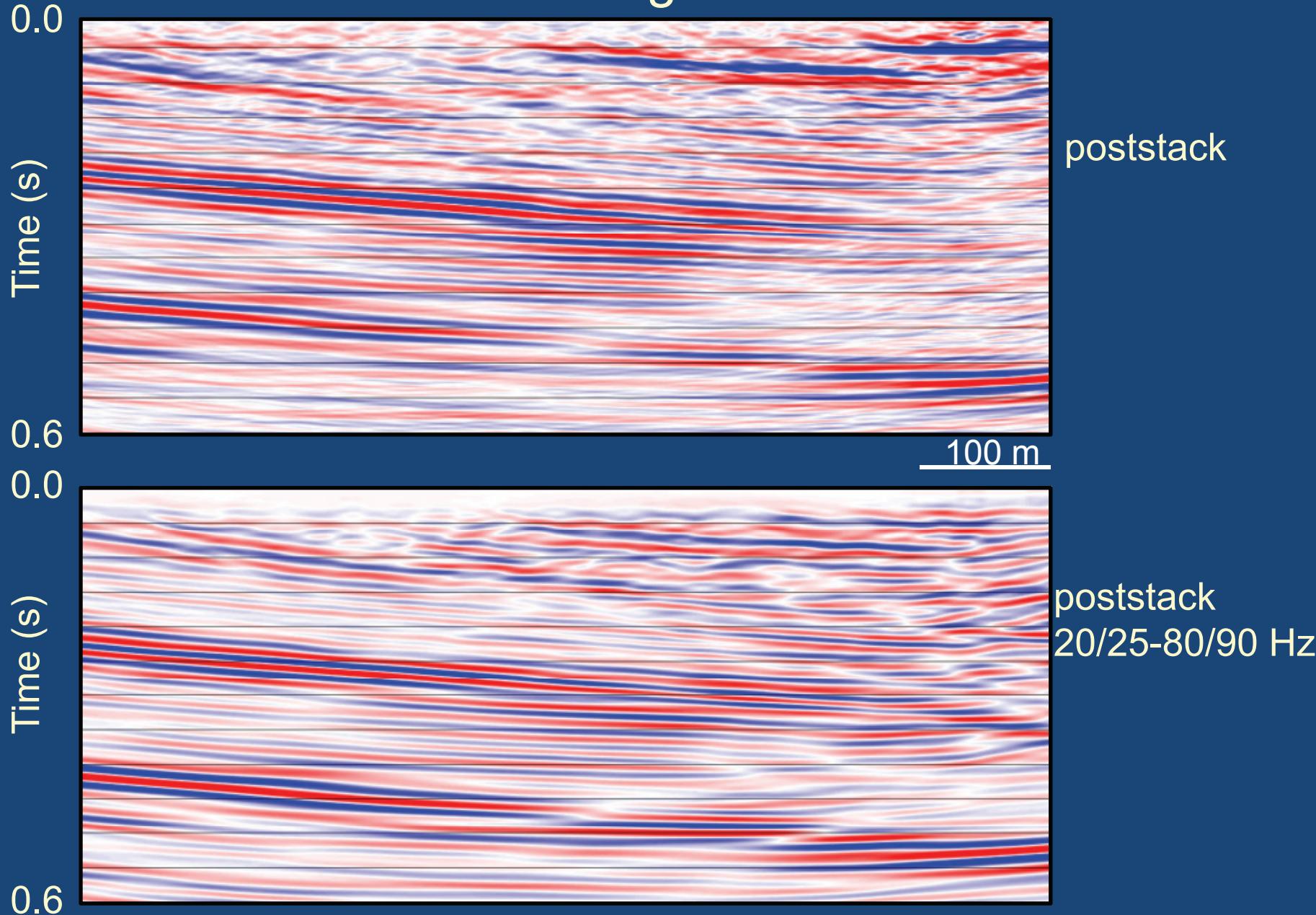


Processed shot

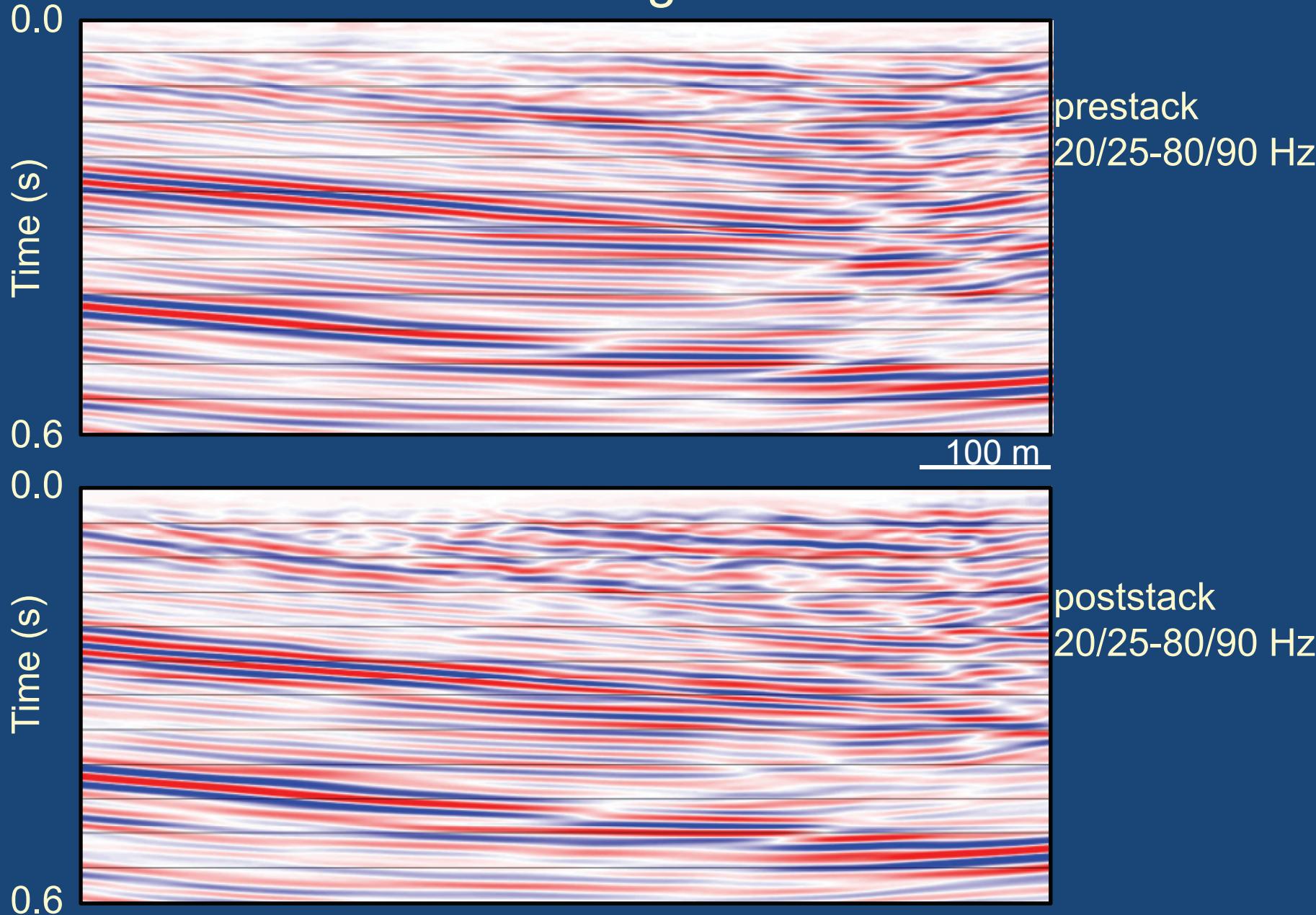
# 3D inline 30 stacks



# 3D inline 30 migrations



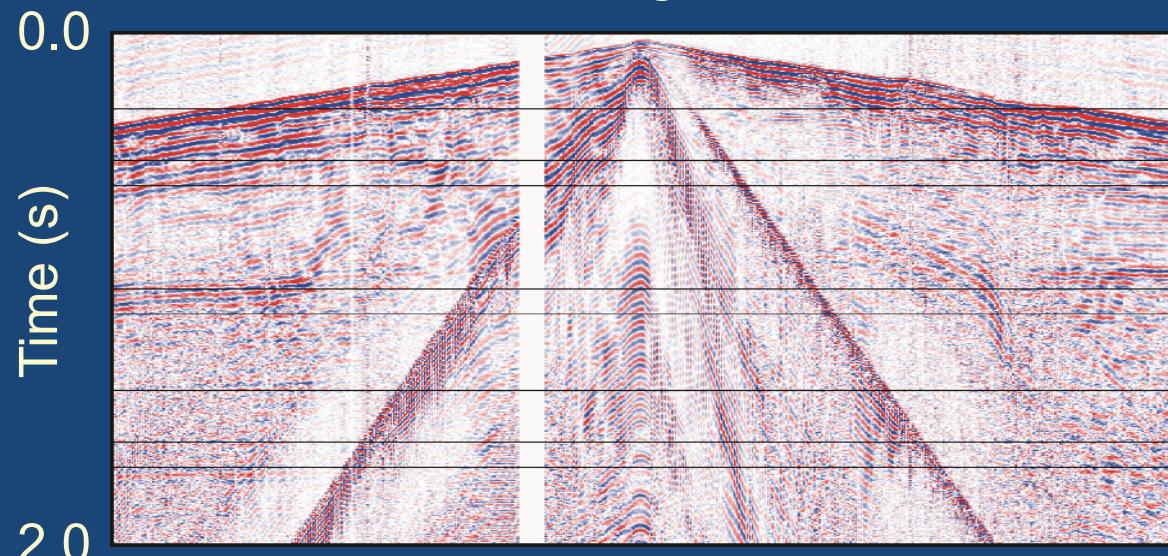
# 3D inline 30 migrations



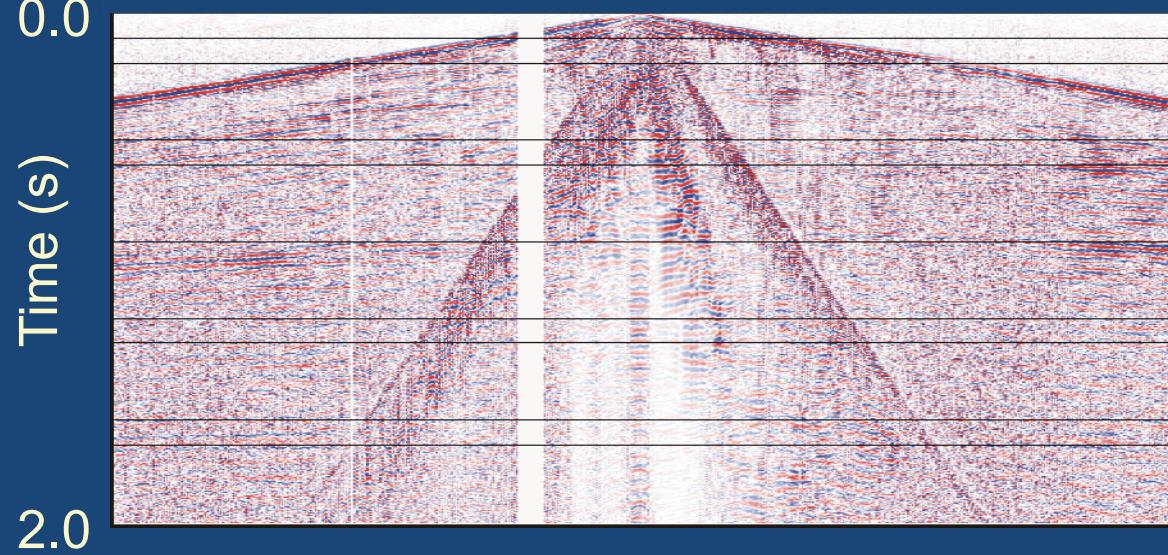
# 2D shot gather

## 2D Processing

- Geometry
- Elevation and refraction statics
- Geometric spreading
- Surface consistent amplitude scaling
- Surface wave noise attenuation
- Air blast attenuation
- Spike and noise removal
- Predictive deconvolution
- Q-compensation
- Gabor deconvolution
- Bandpass filter 5/10-90/100 Hz
- Velocity analysis
- Residual statics
- Stack
- Migration:  
poststack time  
prestack time

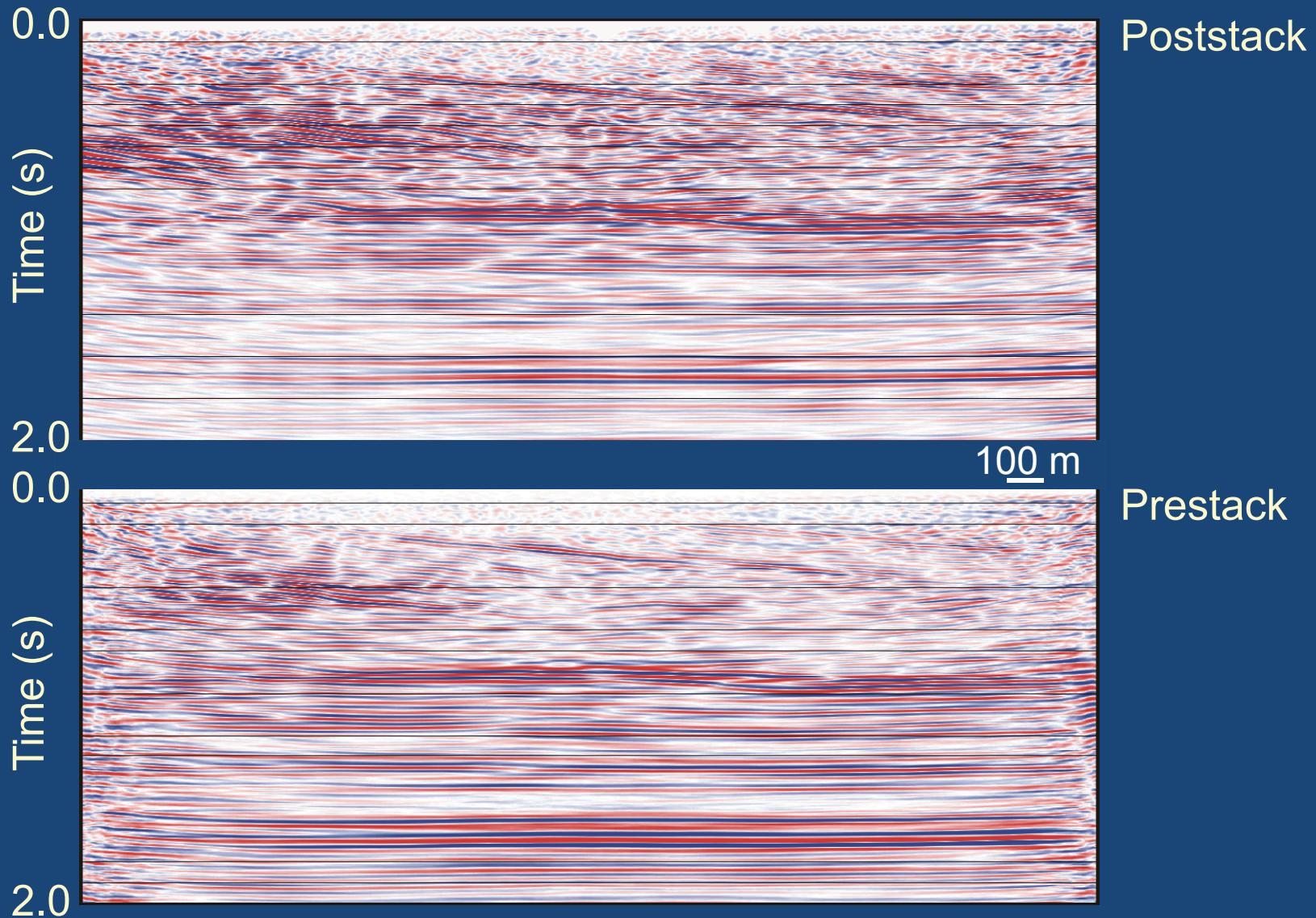


Field shot

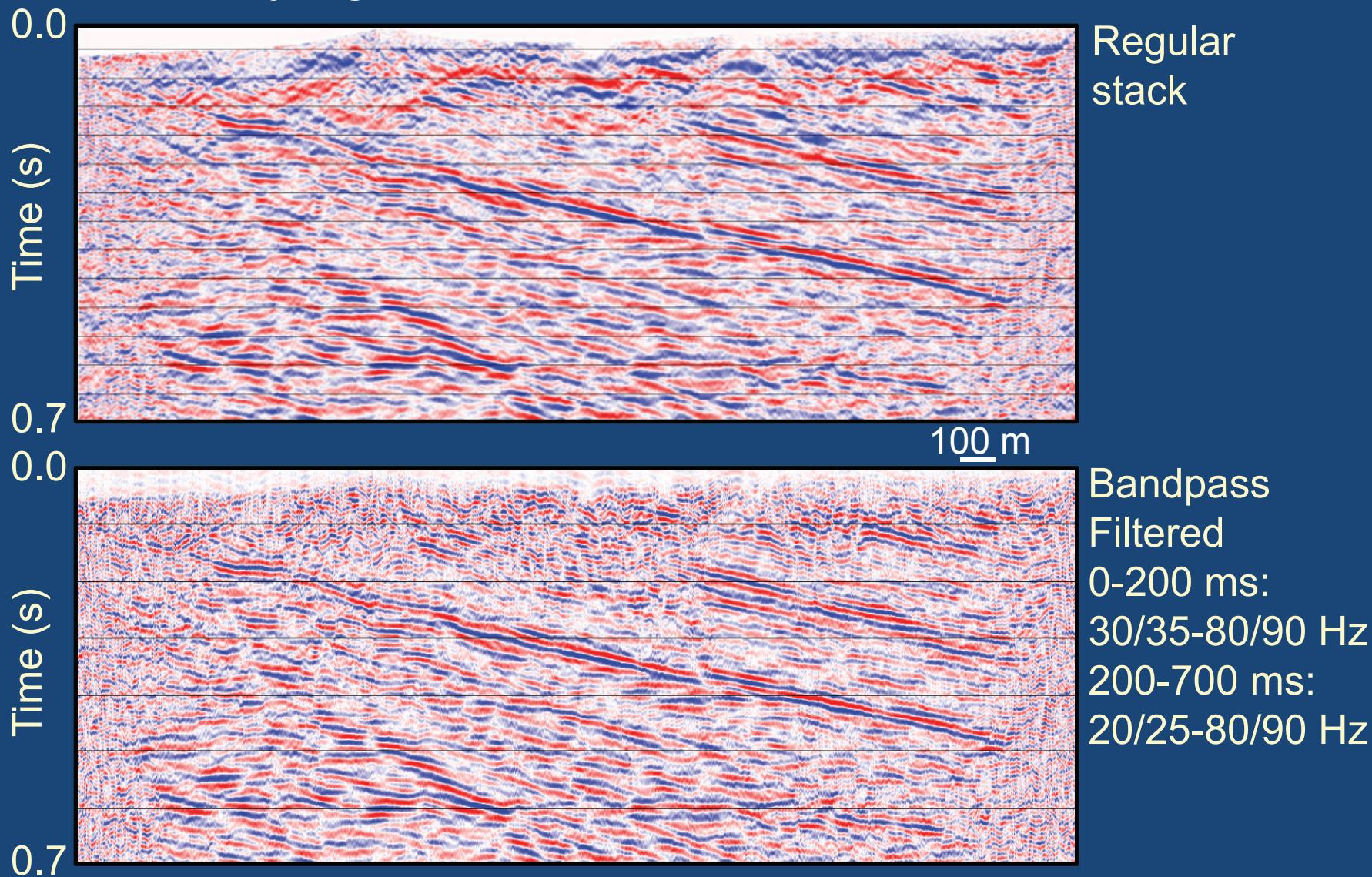


Processed shot

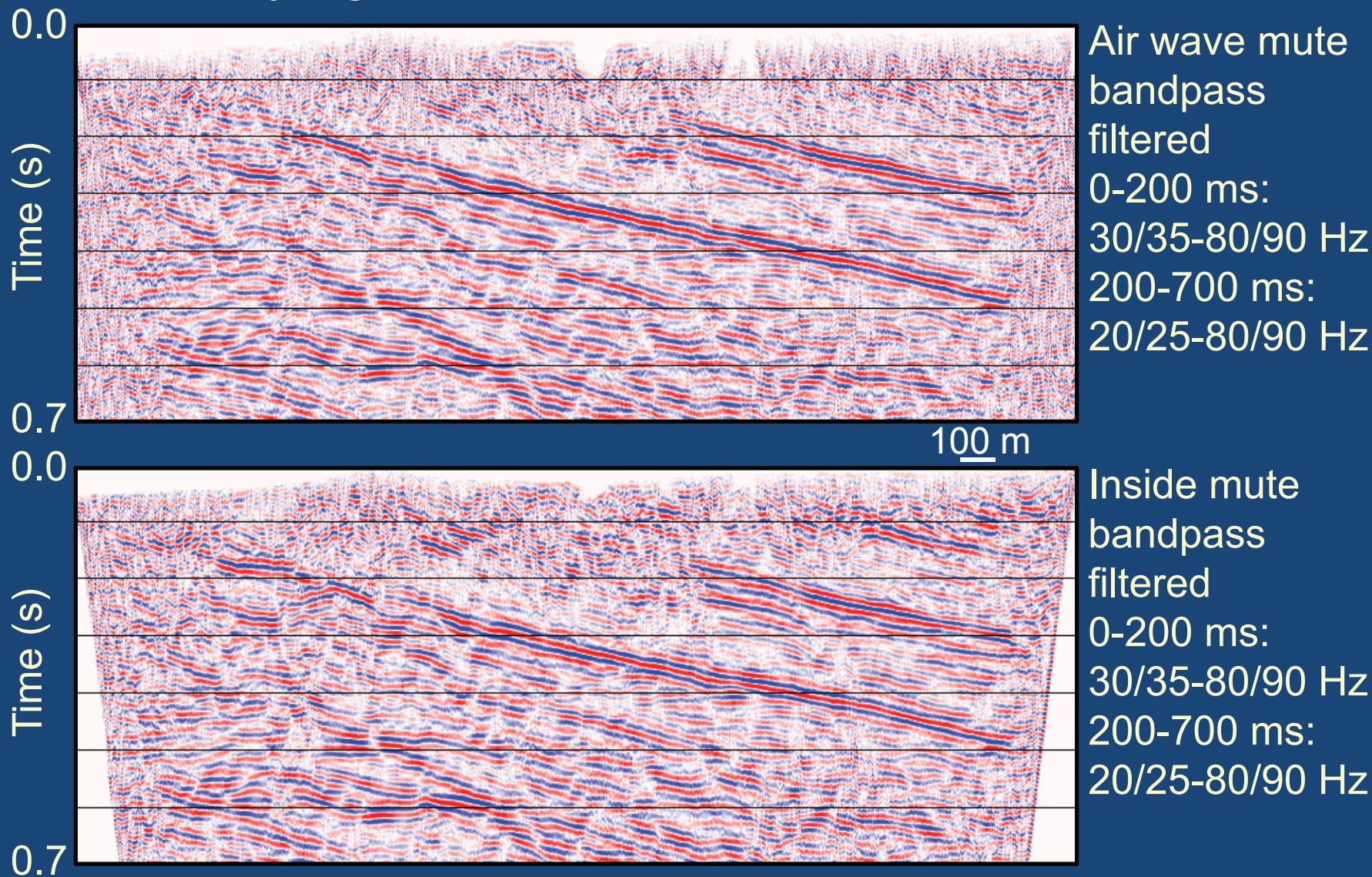
# 2D migrations



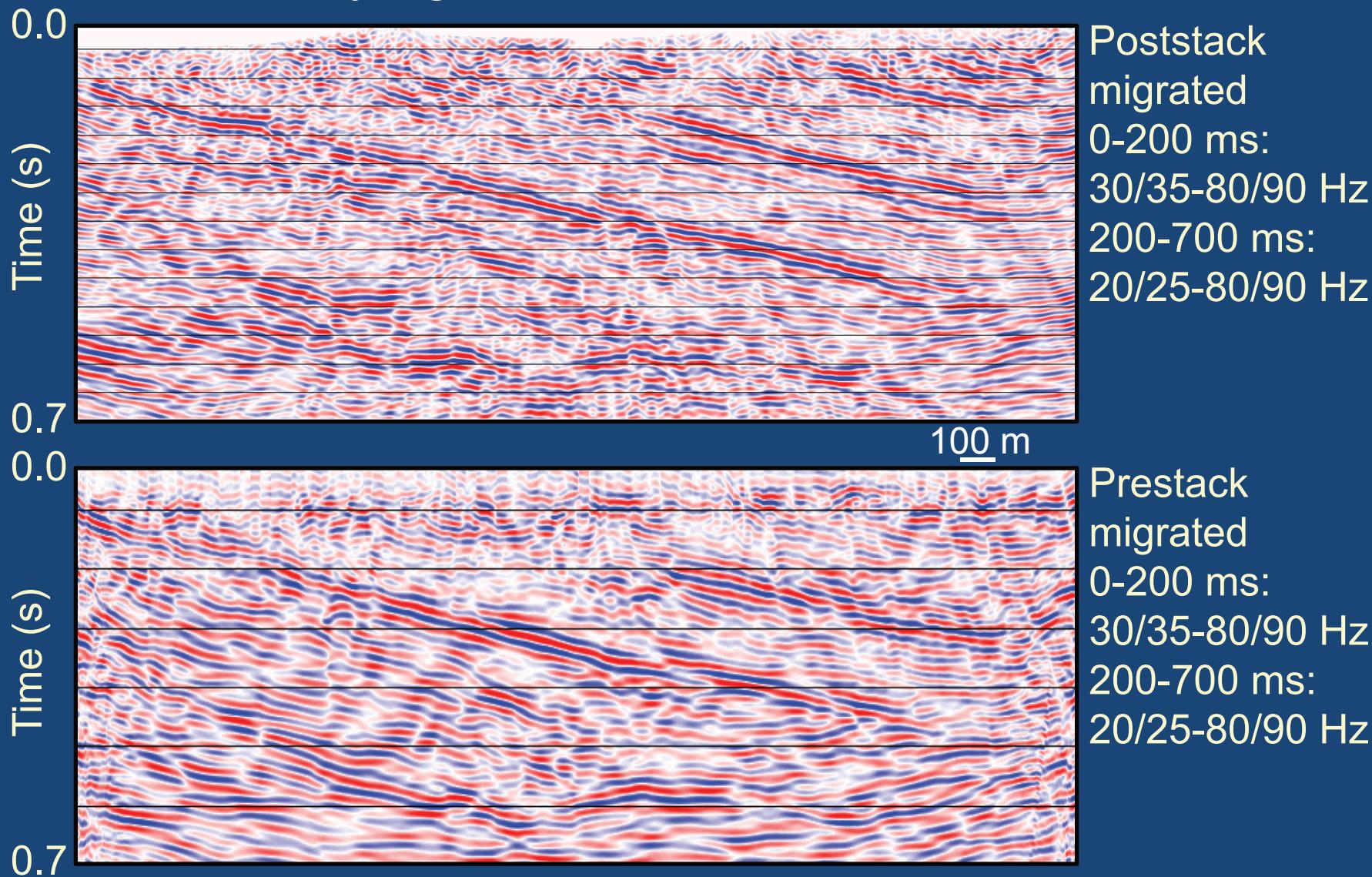
# Playing around with 2D stacks



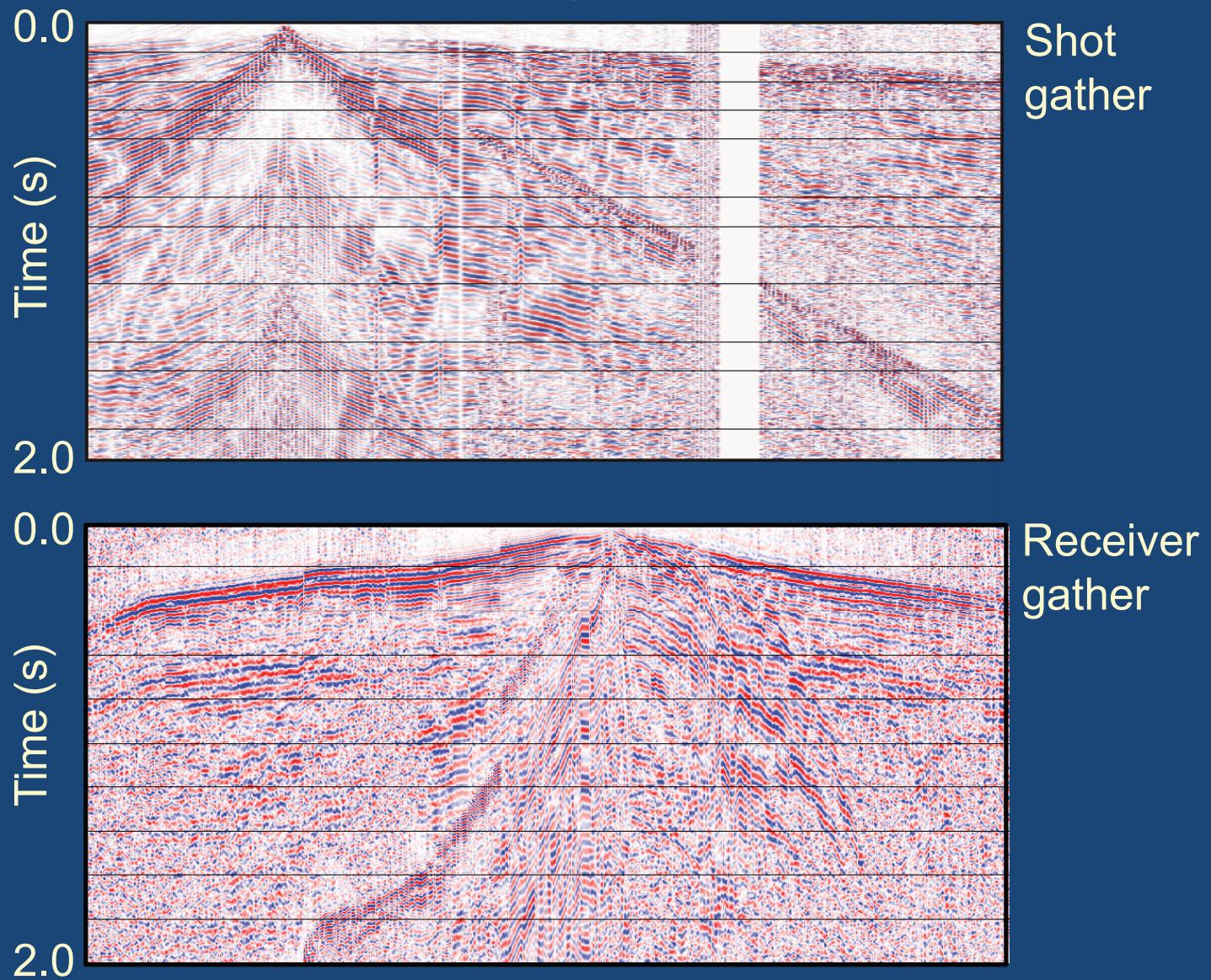
# Playing around with 2D stacks



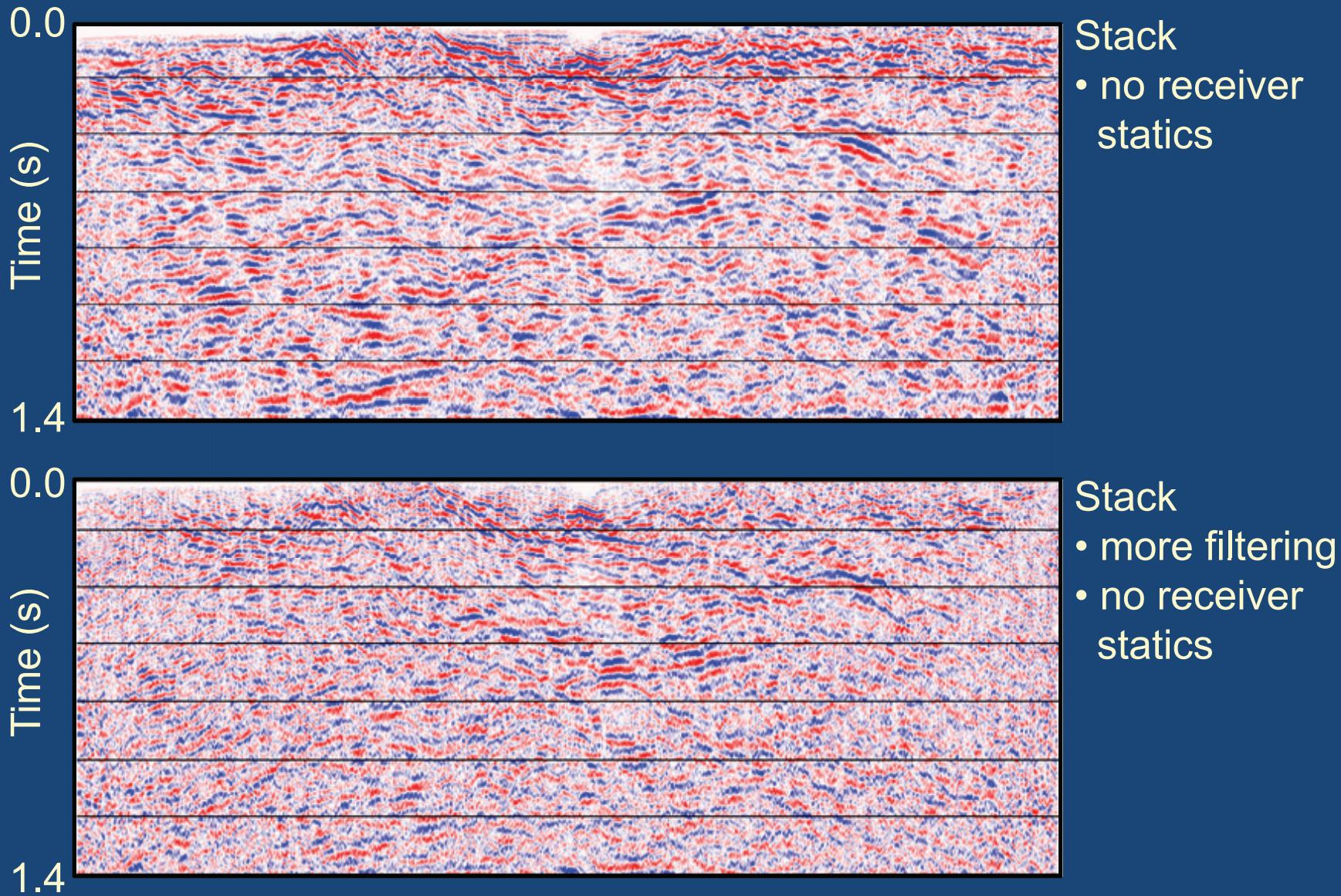
# Playing around with 2D



# 2D radial component data



# 2D radial component data



# Summary

- Standard processing of 2D and 3D data gave good results for vertical component
- High fold of 2D data alleviated any issues with shot locations
- Playing around with retro stack processing provided quick images of very near surface
- Bandpass filtering to exclude low frequencies helped the very near surface imaging
- Radial component data are particularly challenging

# Acknowledgements

- CREWES sponsors
- Staff, faculty and students who acquired the field school data in 2010
- Landmark Graphics (ProMAX)
- Hampson-Russell (GLI3D)
- GSC
- Global Mapper