



LIBERIA 3D BLKS 13 & 14 PSTM & PSDM PRE-STACK TIME & DEPTH MIGRATION MULTI-CLIENT 3D SURVEY, 4047 km²

ACQUISITION PARAMETERS

Acquisition date:	October 2009 – April 2010
Dual Source:	Clustered airgun arrays – 4280 / 4320 cubic inches
Source Interval:	62.5m per subsurface line
Streamer Length:	7200m x 6 / 8100m x 6
Number of Channels:	576 per streamer - 3456 per shot / 648 per streamer - 3888 per shot
Group Interval:	12.5m
Record Length:	13000ms
Sample Interval:	2ms
Multiplicity:	57 fold at 6.25m bin interval / 64 fold at 6.25m bin interval
Recorded Bin Size:	6.25x25m
Primary Navigation:	DGPS for the vessel; RGPS for front and tail buoys
Recording Instrument:	Sercel Seal
Cable Type:	Sercel liquid filled
Cable Depth:	9 meters +/- 1 meter
Filters:	3 Hz (6 dB/octave) – 200 Hz (370 dB/octave)
Gun Depth:	7.5 meters +/- 1 meter
Shooting Direction:	Northeast / Southwest
Acquired By:	M/V BGP Pioneer / BOS Arctic

PRE - PROCESSING

- Input SEG-D data
- Merge navigation with seismic trace headers
- Output navigation merge shot ordered tapes (SEG-Y)
- Apply start of data (SOD) correction
- Debubble and convert to zero phase
- Resample from 2ms to 4ms
- Noise attenuation
- Spatial anti-alias filter, trace drop (25m group interval)
- 2D Surface related multiple elimination (for fast-track only)
- True azimuth multiple elimination (TAME™)
- Output shot ordered TAME™ tapes (SEG-Y)
- Velocity analysis
- High resolution Radon de-multiple
- Spherical divergence gain correction
- Cold water statics
- Output Radon CDP gathers (SEG-Y)
- Noise attenuation
- Fold compensation

TIME MIGRATION and POST STACK PROCESSING

- Fast-track migration, filter and scale (Input 2D SRME stack - Output 12.5x25m, SEG-Y)
- Grid and sum data to 12.5x25m x 27 fold
- Kirchhoff pre-stack curved ray migration velocity analysis
- Output migration velocities
- Kirchhoff pre-stack curved ray migration (Output 25x25m, 27 fold)
- Output 3D bin sorted tapes (SEG-Y) – 27 fold
- Automatic velocity picking update at every CDP location
- Output 3D velocity trace volume (SEG-Y)
- High resolution Radon de-multiple
- Output migrated gathers with NMO & Radon (SEG-Y) – 25x25m; 27 fold
- Mute and stack
- Output raw migration – 25x25m (SEG-Y)
- Post-stack trace interpolation – 12.5x25m (SEG-Y)
- Output angle stacks (Near 0-15, Mid 15-30, Far 30-45 degrees) – 12.5x25m (SEG-Y)
- Noise removal, filter and scaling
- Output processed migration – 12.5x25m (SEG-Y)

TIME DELIVERABLES

- Raw field data – shot ordered
- Field data with navigation in the trace headers – shot ordered, unedited at 2ms
- TAME™ / shot ordered – 12.5x25m, 57 fold
- Radon CDP gathers without NMO – 12.5x25m, 57 fold
- Pre-stack time migrated CDP gathers without NMO – 25x25m, 27 fold
- Pre-stack time migrated CDP gathers with NMO & Radon – 25x25m, 27 fold
- Fast-track migration – interpolated to 12.5x25m
- Raw migration – 25x25m
- Angle stacks (Near, Mid and Far) - 12.5x25m
- Far weighted pseudo-gradient - 12.5x25m
- Processed migration - 12.5x25m
- Migration velocities (ASCII) (500x500m grid)
- Stacking velocities (ASCII) (500x500m grid)
- 3D stacking velocity trace volume – 12.5x25m (SEG-Y)
- 3D ETA velocity trace volume – 12.5x25m (SEG-Y)
- Processed source-receiver navigation (UKOOA)
- Post stack navigation – bin center (UKOOA)
- Workstation-ready tapes available in SMT, Landmark, and GeoQuest



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DEPTH MIGRATION and POST STACK PROCESSING

BUILD INITIAL VELOCITY MODEL

- Estimate VTI anisotropy parameters if applicable
- Build 3D initial model from 3D PSTM velocity volume
- Smooth velocity field

ITERATIONS I & II – Tomography Updates

KIRCHHOFF PSDM

- Input 25x25m, 27 fold, 13 seconds
- Output 50x50m, 27 fold, 12000m depth, 10m depth step
- Migration aperture 6000m
- 2 passes of Tomography to define sediment velocity volume
- Tomography inversions at 200x200x50m

ITERATIONS III – Tomography Update

KIRCHHOFF PSDM

- Input 25x25m, 27 fold, 13 seconds
- Output 50x50m, 27 fold, 12000m depth, 10m depth step
- Migration aperture 6000m
- 1 pass of Tomography to update sediment velocity volume
- Tomography inversions at 100x100x50m

ITERATION IV – Tomography Update

KIRCHHOFF PSDM

- Input 25x25m, 27 fold, 13 seconds
- Output 50x50m, 27 fold, 12000m depth, 10m depth step
- Migration aperture 6000m
- 1 pass of Tomography to define deep velocity field
- Tomography inversions at 200x200x50m

FINAL KIRCHHOFF PRE-STACK DEPTH MIGRATION

- Input 25x25m, 27 fold, 13 seconds
- Partial NMO and sum to yield 12.5x25m, 27 fold, offset increment 200m, 4msec
- Fold compensation
- Migration aperture 6000m, maximum dip 90 degrees, 5m depth step
- Output SEG Y Raw Stack (25x25m)
- Output depth gathers, 25x25m, 28 fold, 12000m depth, 5m depth step
- Noise removal, filter and scaling
- Output SEG Y Processed Stack (25x25m)

DEPTH DELIVERABLES

- Kirchhoff pre-stack depth migrated - raw stack (in depth) – 25x25m
- Kirchhoff pre-stack depth migrated - processed stack (in depth) – 12.5x25m
- Kirchhoff PSDM gathers without residual NMO (in depth) – 27 fold, 25x25m
- Final velocity volume-unsmoothed (in depth) – 12.5x25m
- Interpreted water bottom (WB) horizon (ASCII)



LIBERIA BLKS 13 & 14 3D MULTI-CLIENT 3D SEISMIC SURVEY



Africa-Europe-MESpecSheetMapofLiberia 3D Blocks 13 & 14 Spec Sheet Portrait.mxd

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