INVESTIGATOR 3D SEISMIC FLOWS

SETUPS IN: /proj/Woodside/1999-035D-EH/setups/MASTERS_6(8)CABLE

1. SEG_D Copy (run for each non DNP SEG-D Field Tape)

- Input SEG-D
- Output Copy SEG-D Tapes
- Output Raw Shots (every 100th shot)
- Output Near Traces (Traces 1, 3, 5, 7, 9, 11, 13, 15, from each cable)

2. EOL (End of Line)

- Input SEG-D Copy
- Renumber traces to 1-2208 of cables 1-6 (1-2944 of cables 1-8)
- Resample to 4ms zero phase anti-alias filter 75% Fnq

1. Brute Stk Input:
    - Select single sub-surface line (1 cable, 1 source) rotating through line by sequence
    - Output for brute stack input
2. For RMS SIGNAL:
    - Apply Zero-Phase Low-Cut Filter;
        - Low-Cut Frequency : 6 Hz.
        - Low-Cutoff Slope : 18 dB/octave
    - Signal Analysis (using hyperbolic window starting at 2000 ms with length 500 ms, moveout velocity 1730 m/s)
        - Output to disk
        - Terminal Display
3. For RMS NOISE:
    - Noise Analysis (using linear window 4000-4500 ms)
    - Output to disk
    - Terminal Display

3. NEAR TRACE PROFILE

- Input Near Traces
- Select the first trace from a single cable rotating by sequence
- Resample to 4ms zero phase anti-alias filter 75% Fnq
- Apply Zero-Band-Pass Filter;
    - Low-Cut Frequency : 6 Hz.
    - Low-Cutoff Slope : 18 dB/octave
- Sort in source order
- Output SEG-Y
- Output QCViewer and CGM File

4. SPECTRAL ANALYSIS

- Input Raw Shots

1. Shot gathers selected every 100 files
    - Apply Exponential Gain of .5 dB
    - F-K Analysis
    - Terminal Display for F-K Analysis
2. Spectral Analysis (using hyperbolic window starting at 0 ms with length 1000 ms, moveout velocity 1512 m/s)
    - Stack the spectra to give an average for line
    - GRAPH Output for Spectral Analysis
3. Term display of 1 shot record for QC.

5. SIGNOISE

- Input Signal and Noise Analysis

1. Stack the signal analysis to give an average for the line
    - Terminal Display for Signal Analysis
2. Output RMS Signal Plots:
    - CGM signal file output from SEISPLOT
    - QCViewer signal file from OUTPUT_QCVIEWER
3. Stack the noise analysis to give an average for the line
    - Terminal Display for Noise Analysis
4. Output RMS Noise Plots:
    - CGM noise file output from SEISPLOT
    - QCViewer noise file from OUTPUT_QCVIEWER
5. Calculate ratio of Signal versus Noise using divide operator.
    - Output the S/N ratio
    - Terminal Display for Signal/Noise ratio
6. Merge Signal and Noise Analysis Data
    - Get Average rms for noise and signal
    - Get ABS_PEAK_AMP
    - Output_Seisstat for Reflex

6. Linear Moveout (LMO)

- Input Near Traces, trace length 1000 ms.
- Select the first trace from each cable
- Apply Zero-Band-Pass Filter;
    - Low-Cut Frequency : 4 Hz.
    - Low-Cutoff Slope : 24 dB/octave
- Input Final P1/90 UKOOA and Generate Omega format geometry database
- Geometry Update - add positional information in the seismic trace header.
- Supersample traces to 1 ms to improve moveout resolution.
- Apply trace balancing to normalise RMS amplitudes to 2000.
- Apply low cut filter 4 Hz, 24db/oct slope
- Shift data to 50 ms. to make allowance for the direct arrival.
- Perform Linear Moveout Analysis using 1512 m/s (1514m/s from S024 on) water vels from TS dip.
- Sort by FLD_CABLE_NUM and IDENT_NUM
- Output QCViewer and CGM File

7. BRUTE STACK

- Input single sub-surface line
- Assign geometry from database created in LMO step
- Grid define to apply 3D cell ordering based on the survey area grid
- Wide cell grid assign a 2D pseudo CMP locations based on a single crossline whose width is the full width of the prospect area
- Apply differential hyperbolic moveout before summing
- Edit bad traces
- Weight and sum every two adjacent traces within the gathers in non-surface consistent mode
- Apply Geometric spreading (V**2T) Compensation
- Apply Exponential Gain 0.5dB/s
- Sort in CMP order
- Apply Predictive Deconvolution;
    - Autocorrelation Half-Length: 200 ms
    - Autocorrelation Windows:

1. Delay/Overlap Constant: 100
    - Constant Window Length: 2000
2. Delay/Overlap Constant: 500
    - Constant Window Length: 4500

    - White-Noise Percent: 0.01
    - Prediction Distance: 32
- Apply Normal Moveout using Interpolated 3D velocity field.
- Apply Outside Mute
    - Offset/Time 350/0; 2600/2332 4700/4300
- Stack
- Apply static correction for source/cable depths; 7 ms
- Output SEG-Y
- Apply Zero-Band-Pass Filter;
    - Low-Cut Frequency : 8 Hz.
    - Low-Cutoff Slope : 36 dB/octave
    - High-Cut Frequency: 80 Hz.
    - High-Cutoff Slope : 72 dB/octave
- Apply compensation for residual amplitude decay
- QCViewer and CGM Output

8. NTC_BITMAPS (Near Trace Cube)

- Input near traces, trace length 4608 ms.
- Edit bad traces
- Assign geometry from database created in LMO step
- Output progressive bitmap file

8A. NTC_STACK (Near Trace Cube)

- Input near traces, trace length 4608 ms.
- Edit bad traces
- Assign geometry from database created in LMO step
- Apply Zero-Phase Low-Cut Filter;
    - Low-Cut Frequency : 8 Hz.
    - Low-Cutoff Slope : 36 dB/octave
- Apply Geometric spreading (V**2T) Compensation
- Apply static correction for tidal variations
- Apply Normal Moveout using average velocity function.
- Outside trace mute
- Stack progressive bitmap file
- Output SEG-Y

9. NTC_MERGE (Near Trace Cube)

- Input progressive stack files
- Merge output data
- Output seismic data
- Select inline, crossline and time slice sections
- Output SEG-Y
- QCViewer and CGM Output

10. MIGRATION

- Input Brute Stack
- Programmed gain to taper edge amplitudes
- Velocity Conversions to Minimum Velocity
- Extended Stolt 2D Migration using minimum velocity function taken from the relevant sub-surface line of the supplied velocity field

1. Output SEG-Y
2. Apply Zero-Band-Pass Filter;
    - Low-Cut Frequency : 8 Hz.
    - Low-Cutoff Slope : 36 dB/octave
    - High-Cut Frequency: 80 Hz.
    - High-Cutoff Slope : 72 dB/octave

- Apply compensation for residual amplitude decay
- QCViewer and CGM Output