SurfSeis©

Surface Wave Processing Software

for use with Microsoft® Windows™

SurfSeis© software was developed at the Kansas Geological Survey to process seismic data using the multichannel analysis of surface waves (MASW) method.

Surface waves have historically been the bane of near-surface reflection seismologists. With the development of MASW at the Kansas Geological Survey has come an explosion in research and use of the MASW method for application to engineering, groundwater, and environmental problems. Scientists from around the world have shown the utility of surface waves as signal rather than noise on multichannel seismograms. Our third generation (***SurfSeis 3***©) will be released soon with industry-leading features and capabilities.

SurfSeis© Capabilities

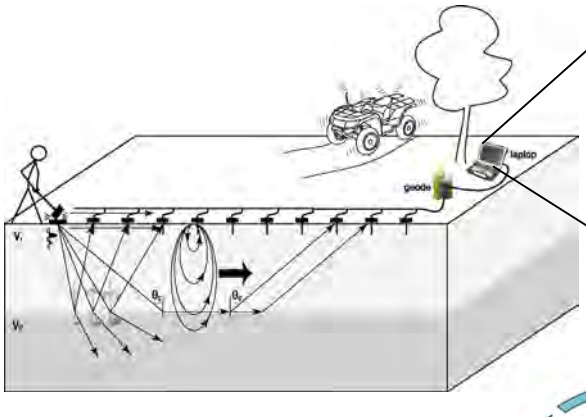
Data conversion
- –SEG2 to KGS
- –SEGY to KGS
- –KGS to SEGY

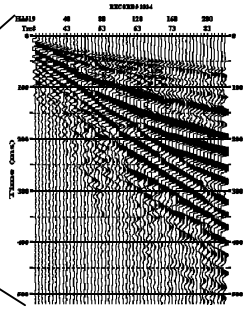
Headers (edit)
Resample
Geometry Assignment
Analysis
- –Spectra
- –Overtone
- –Velocity (linear)
- –Dispersion curve best fit

Display
- –Wiggle trace variable area
- –Wiggle only
- –Trace-by-trace spectra

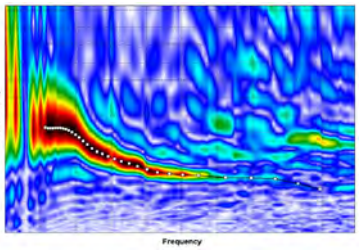
Processing
- –Filter (trapezoid, F-k, velocity)
- –Mute
- –AGC

Dispersion Curve
Inversion
- –1-D
- –2-D



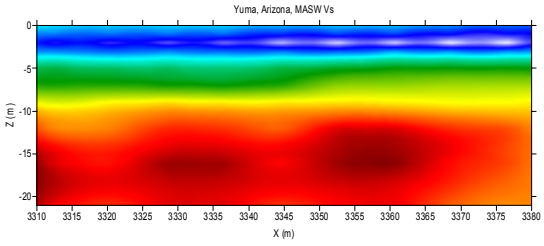


SurfSeis© uses passive or active seismic data recorded with vertical geophones

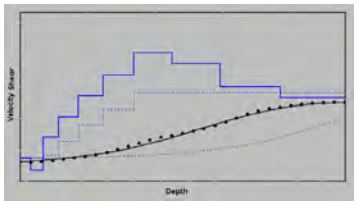


Dispersion-curve estimations are phase velocity plotted against frequency

SurfSeis©
Multichannel Analysis of Surface Waves



Using a continuous acquisition style, a series of 1-D vertical profiles can be gathered and interpolated

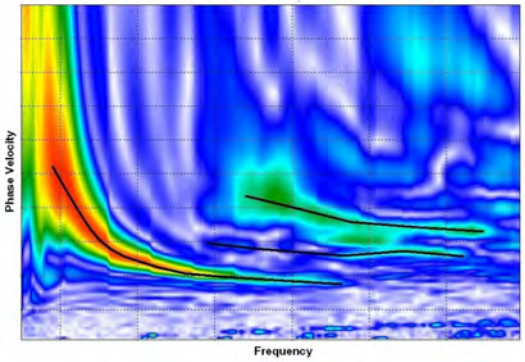


Inversion of dispersion curve yields 1-D vertical profile

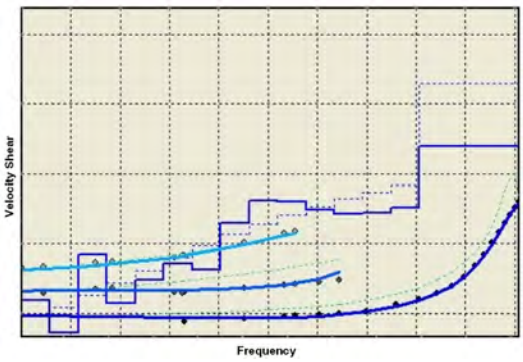
SurfSeis 3©

Only commercial software capable of handling higher modes.

Overtone Analysis



1-D Inversion



Available in *SurfSeis 3*©

- Fundamental and higher mode observation
- Inversion using higher modes – greater resolution
- Inversion using *a priori* density information
- New menus and friendly dialogs complementing existing interface; smoother operation; faster code
- Improved compatibility with other KGS seismic software (i.e., WinSeis, SeisUtil, seismodeler)
- Hardware key (USB dongle)

Suggested Reading on Higher Modes

Xia, J., R.D. Miller, C.B. Park, and G. Tian, 2003, Inversion of high frequency surface waves with fundamental and higher modes: *Journal of Applied Geophysics*, v. 52, no. 1, p. 45-57.

SurfSeis 3.0© ***Release:*** July 2010

Upgrade from SurfSeis© v1 or v2—$750; new purchase—$3,750. Appropriate shipping and handling costs apply. Upgrade pricing available with current serial number.

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