

SurfSeis[®]

Surface Wave Processing Software

for use with Microsoft[®] Windows[™]

SurfSeis[®] software was developed as a product of our research at the Kansas Geological Survey (KGS). It was written to process both active and passive seismic data to obtain shear-wave velocity (V_s) models, using the multichannel analysis of surface waves (MASW) method, which was also originally conceived and developed at the KGS.

Surface waves have historically been the bane of near-surface reflection seismologists. With the development of MASW has come a global explosion in research and use of the MASW method for application to engineering, groundwater, and environmental problems. Use for S_H -reflection statics. Our fifth generation (**SurfSeis[®] 5.0 – 5.3**) provides industry-leading features and capabilities.

Active and Passive MASW

Dispersion Curve Imaging

- Phase-shift method
- Advanced
- HRLRT

Inversion of the surface waves for V_s

- Fundamental mode
- Higher modes

2-D V_s Imaging

Research Tools

- Multi-mode Monte-Carlo (a.k.a. “effective/apparent” mode) Inversion
 - Maximum-energy multi-mode models
- Modeling
 - Dispersion-curve estimations from layer models (check if V_p matters)
 - Comparison of calculated dispersion-curve values to dispersion-curve images (“effective/apparent” mode)

Seismic Data General Processing

- Bandpass filter
- Fk filter

SurfSeis[®] Capabilities

- Mute
- AGC
- Trace-by-trace frequency spectra

Seismic Data Utilities

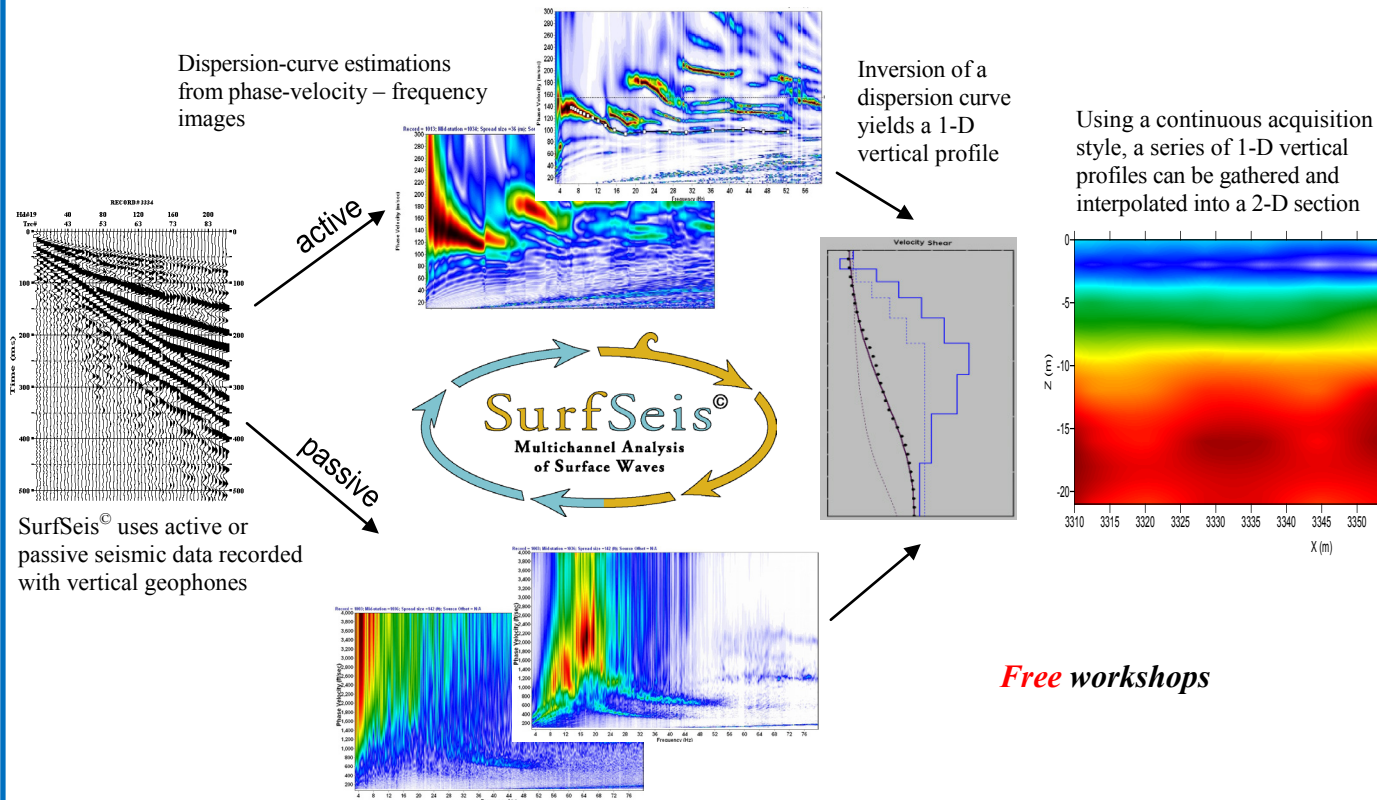
- Data conversion
 - SEG2 to KGS
 - SEG Y to KGS
 - KGS to SEG Y
- Geometry assignment
- Extract/resample records/traces
 - Roll-along from a fixed spread
- Assemble walkway records into one
- Seismic data display (b/w and color)

Rayleigh waves – Love waves – Scholte waves

Dispersion-curve estimations from phase-velocity – frequency images

Inversion of a dispersion curve yields a 1-D vertical profile

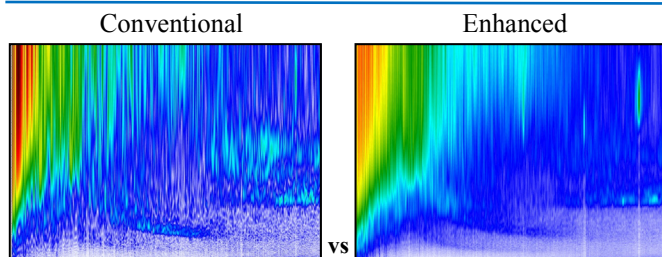
Using a continuous acquisition style, a series of 1-D vertical profiles can be gathered and interpolated into a 2-D section



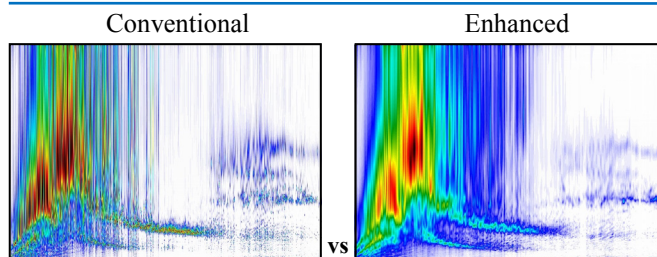
Free workshops

SurfSeis[®] 5

Enhanced **passive** data dispersion-curve imaging
(Introduced in SurfSeis 4.0)

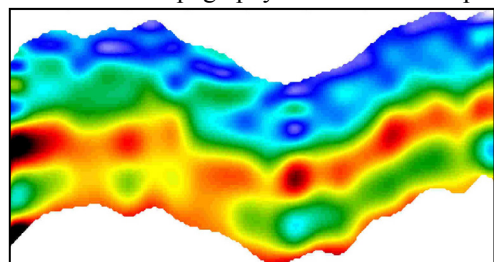


HRLRT applied to **passive** data
(New with SurfSeis 5.2)

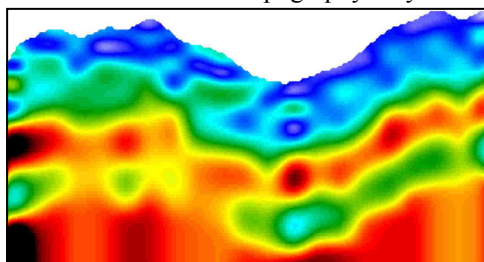


Initial models and final 2-D results displayed with or without variable **topography**
and maximum-depth inversion (New with SurfSeis 5.0)

With variable topography and maximum depth



With variable topography only



Rayleigh-
Love-
Scholte- **waves**



HRLRT **Multi-mode**
inversion

New to SurfSeis[®] 5

- 2-D initial model and final results displayed with or without varying topography or maximum depth.
- Maximum-depth inversion based on each dispersion-curve data set.
- Love-wave modeling and inversion (optional, new in v5.1).
- HRLRT's better (sharper) dispersion-curve imaging and mode separation (and interpretation), can be useful with multi-mode inversion (accessible since v3.0); it is now available for use with passive data and works jointly with enhanced passive imaging (optional in v5.2).
- Scholte-wave (i.e., underwater MASW) modeling and inversion.
- Expanded modeling and random inversion on dispersion-curve images (a.k.a., "effective/apparent" mode).
- Display old 2-D results with elevations and other improvements.

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surfSeis 6

expected release – March 2017

Check for **free** workshops,
publications, and new exciting
features at our website

SurfSeis[®] 5.0 – SurfSeis[®] 5.3

Contact us for pricing and visit our webpage for more information (email and web address below).
Upgrade pricing available with current serial number.

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When you ask for a quote, please tell us which version suits you best —

SurfSeis 5.0 is our standard software (no modules)
SurfSeis 5.1 includes the Love-wave module
SurfSeis 5.2 includes the HRLRT module
SurfSeis 5.3 includes both modules

To read about our successful application
of both modules, see Ivanov et al., 2015, at
www.kgs.ku.edu/software/surfseis/publications.html.