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Exploring Digital Stratigraphy using Computational Stratigraphy Explorer

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About the Author

Computational Geoscientist

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Biography

- PhD Electrical Engineering with 7 years experience at Chevron

- Professional Interests: Seismic Interpretation, Computational Geometry, Static Reservoir Modeling, Software Engineering, Artificial Intelligence

Acknowledgements

- Computational Stratigraphy project team members
  - Brett Hern, Tao Sun, Brian Willis, Lewis Li, Rebecca Caldwell
- MathWorks

Motivation

- Computational Stratigraphy is a new technology for creating geologically plausible reservoir analog models.

- The model generation process creates data about the detailed relationships between physical sediment transport processes.

- Geologists need high quality visualizations and quantitative analysis tools to take advantage of this novel data source.

- Existing software had challenges taking full advantage of this novel data source

- MATLAB provides simple and flexible visualization and UI libraries and efficient deployment capabilities for rapid iterative of new products.

Geological Analogs
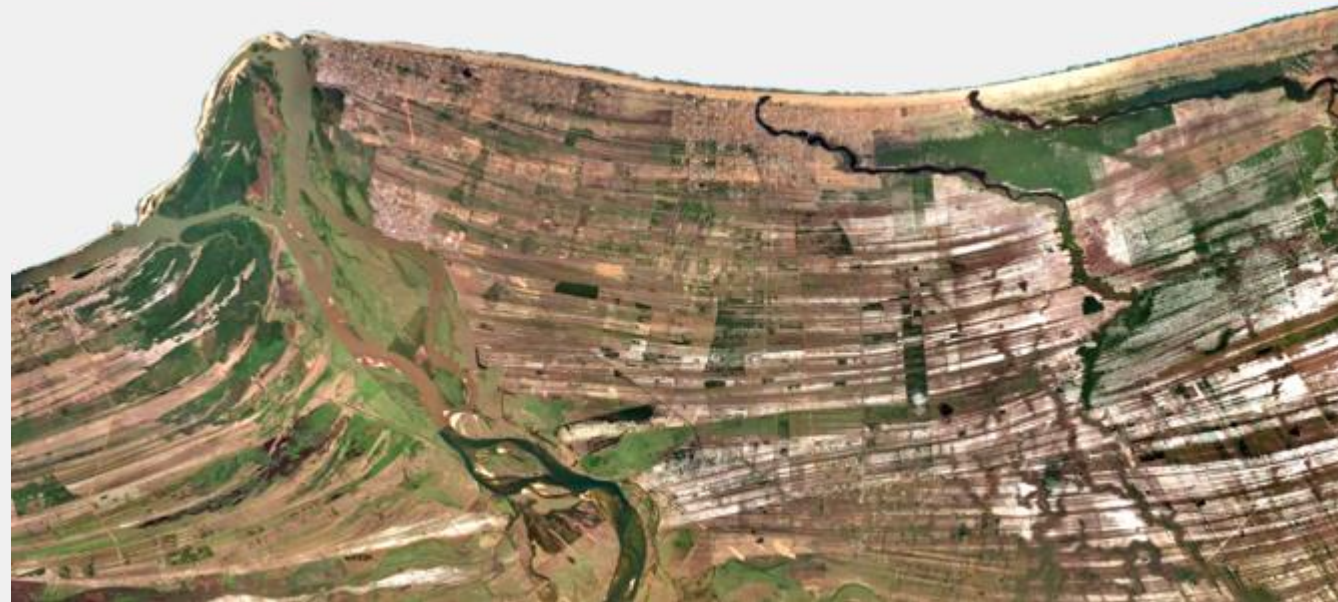
Photo: *USGS, Landsat / Copernicus 12/30/2016*
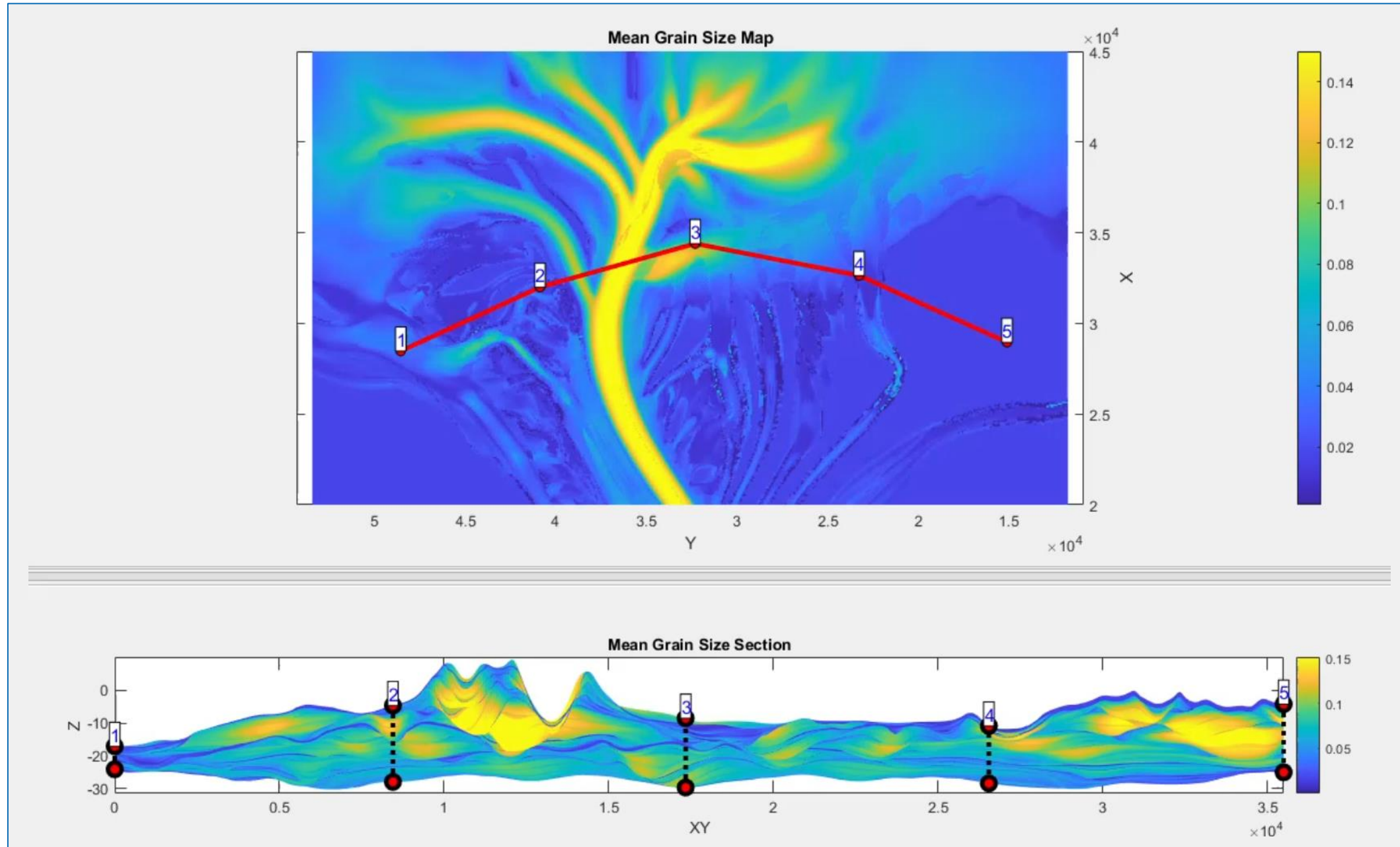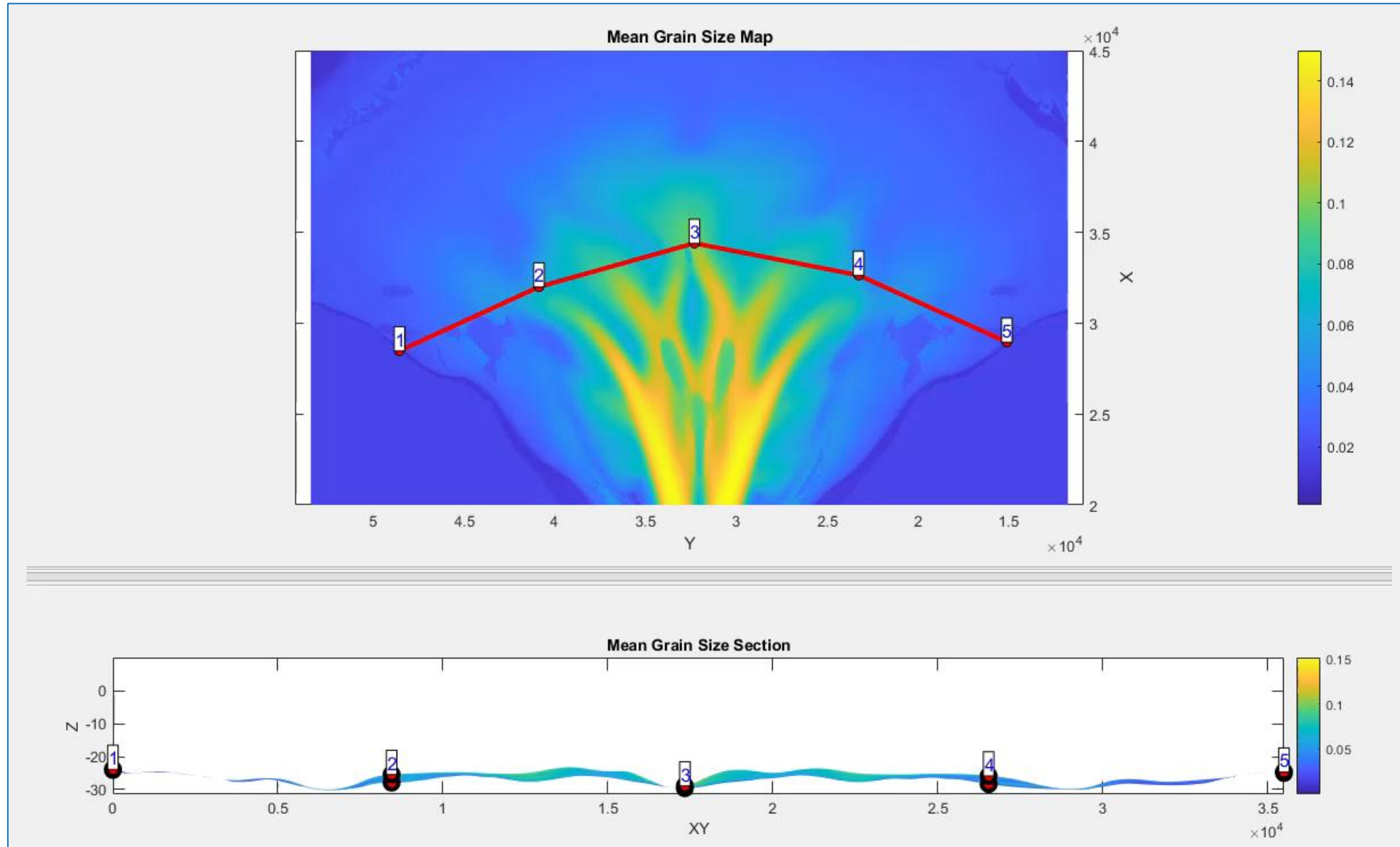Paraíba do Sul River Delta, Rio de Janeiro, Brazil

1 km

Proximal Mouth Bar
Brian Willis, Chevron

- Geologists study aerial or satellite photos and cliff faces to better understand how sediments are deposited by natural processes
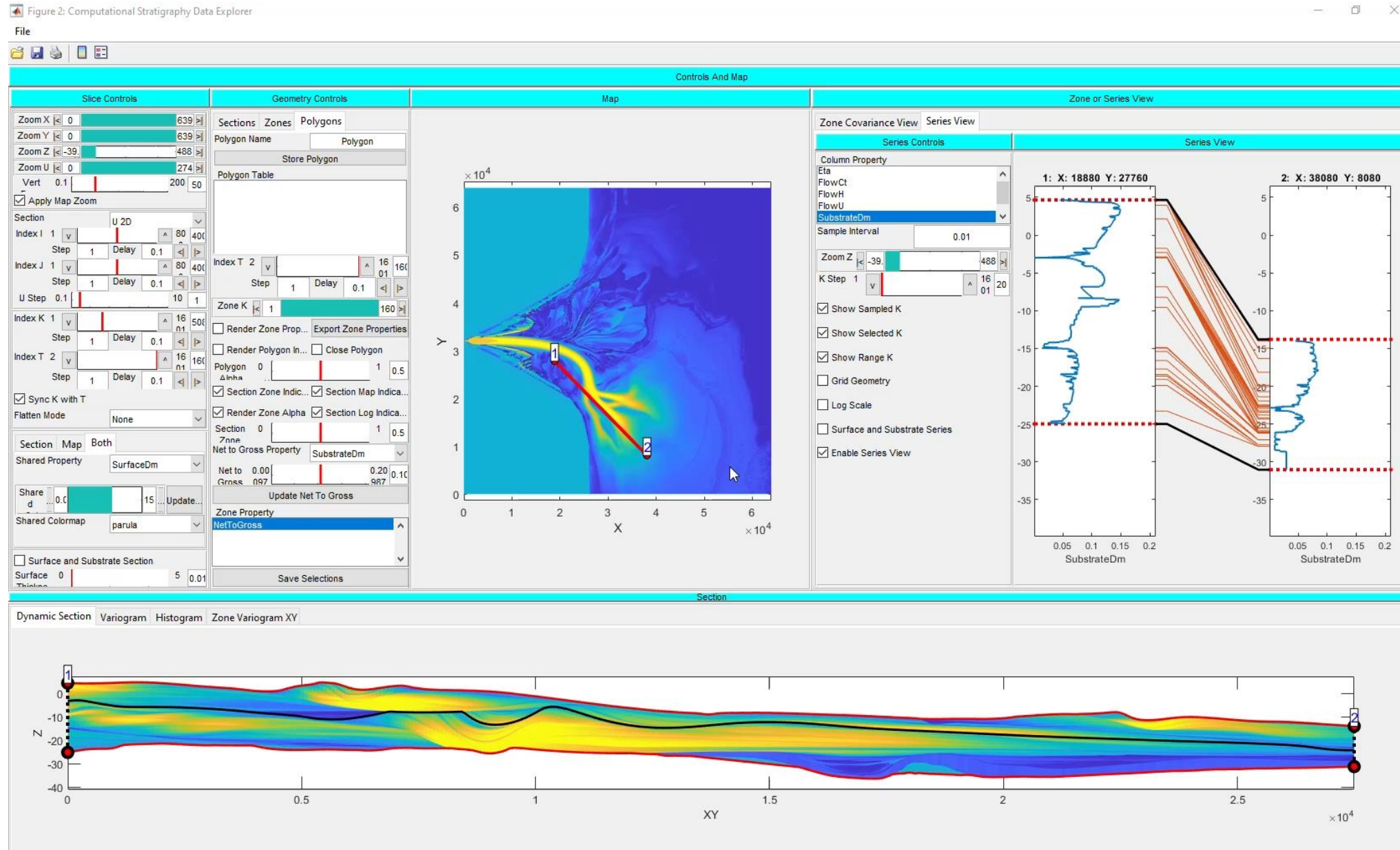
Computational Stratigraphy Analog

Computational Stratigraphy Analog
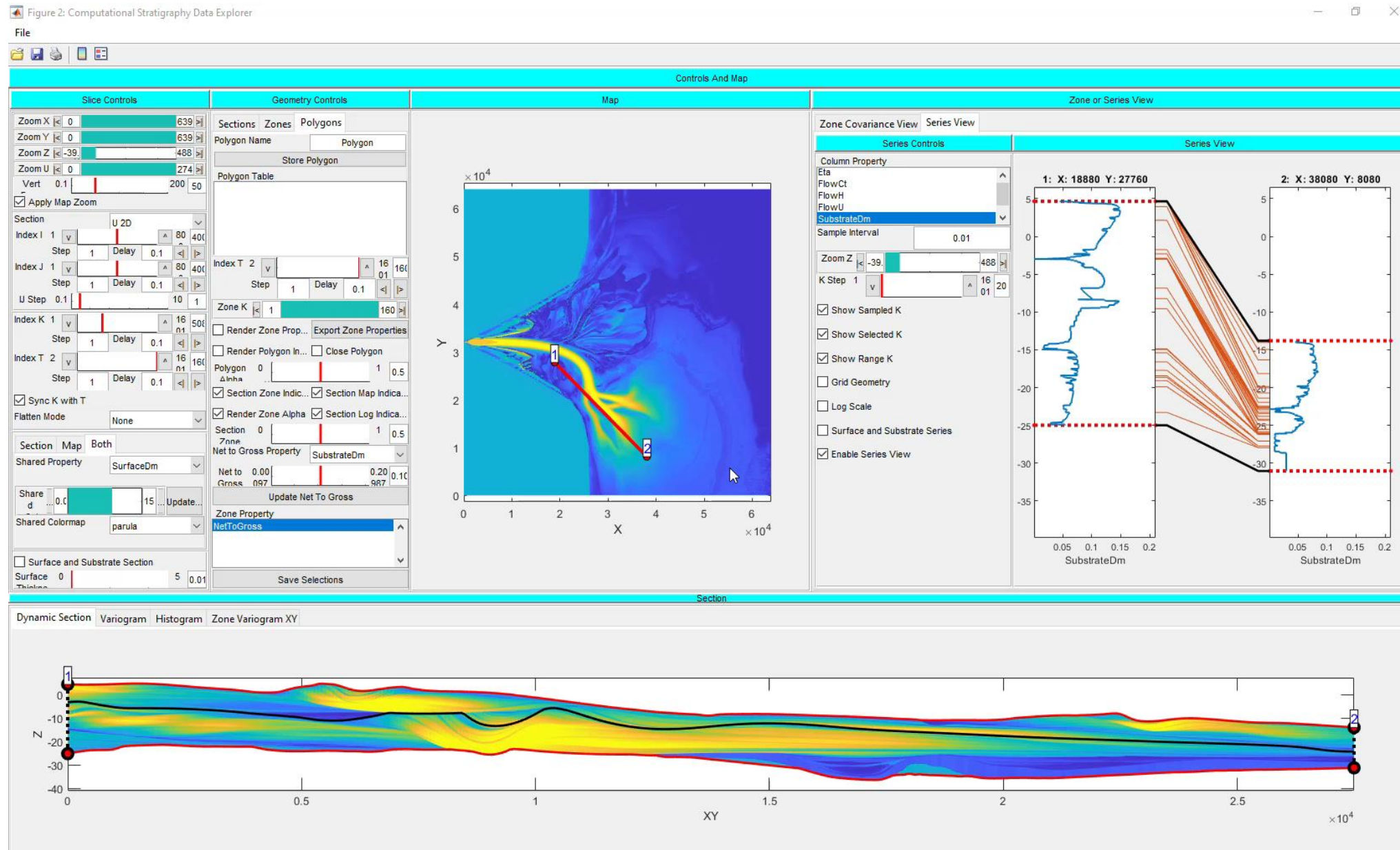
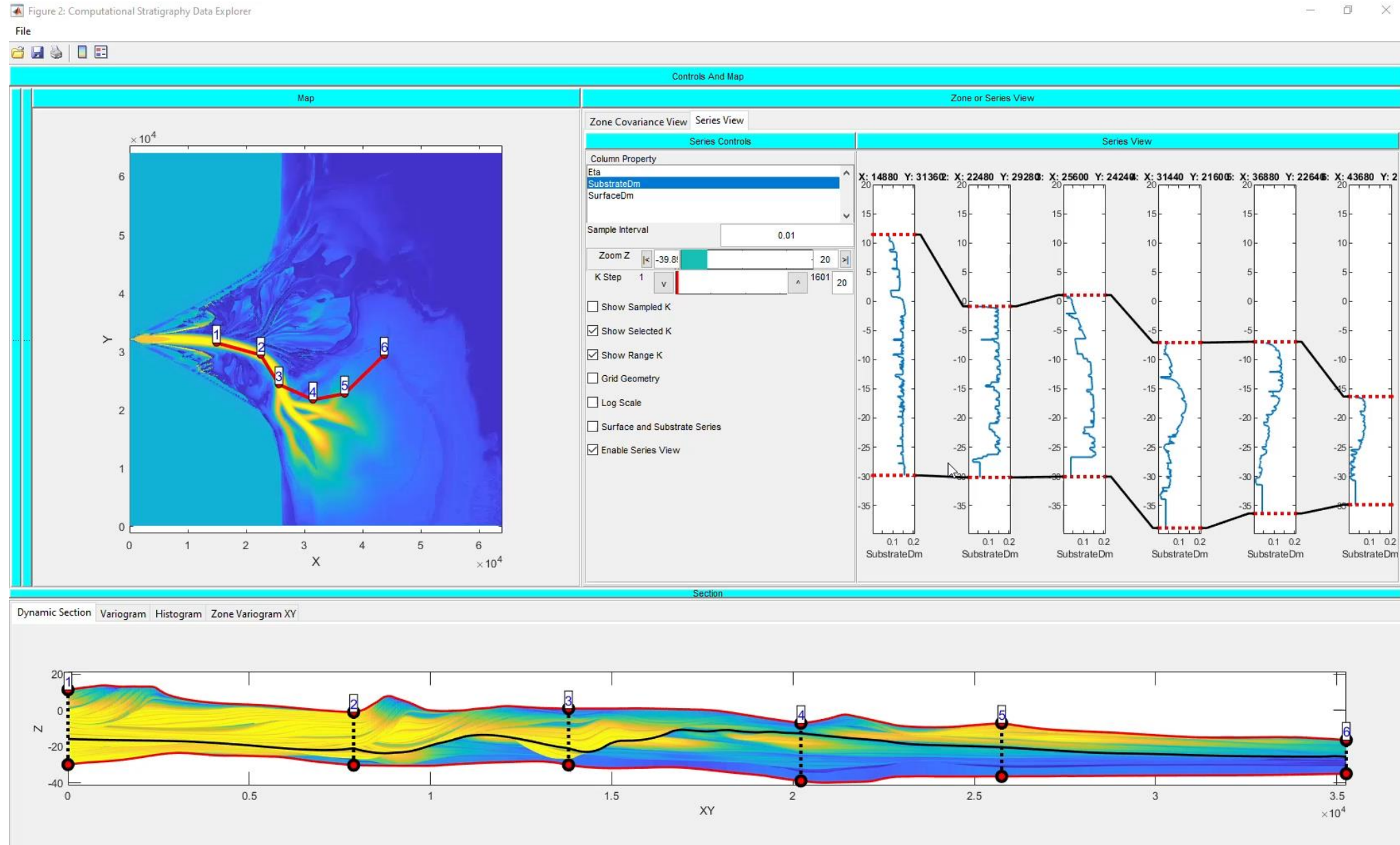# Computational Stratigraphy Explorer
Cross Section Selection
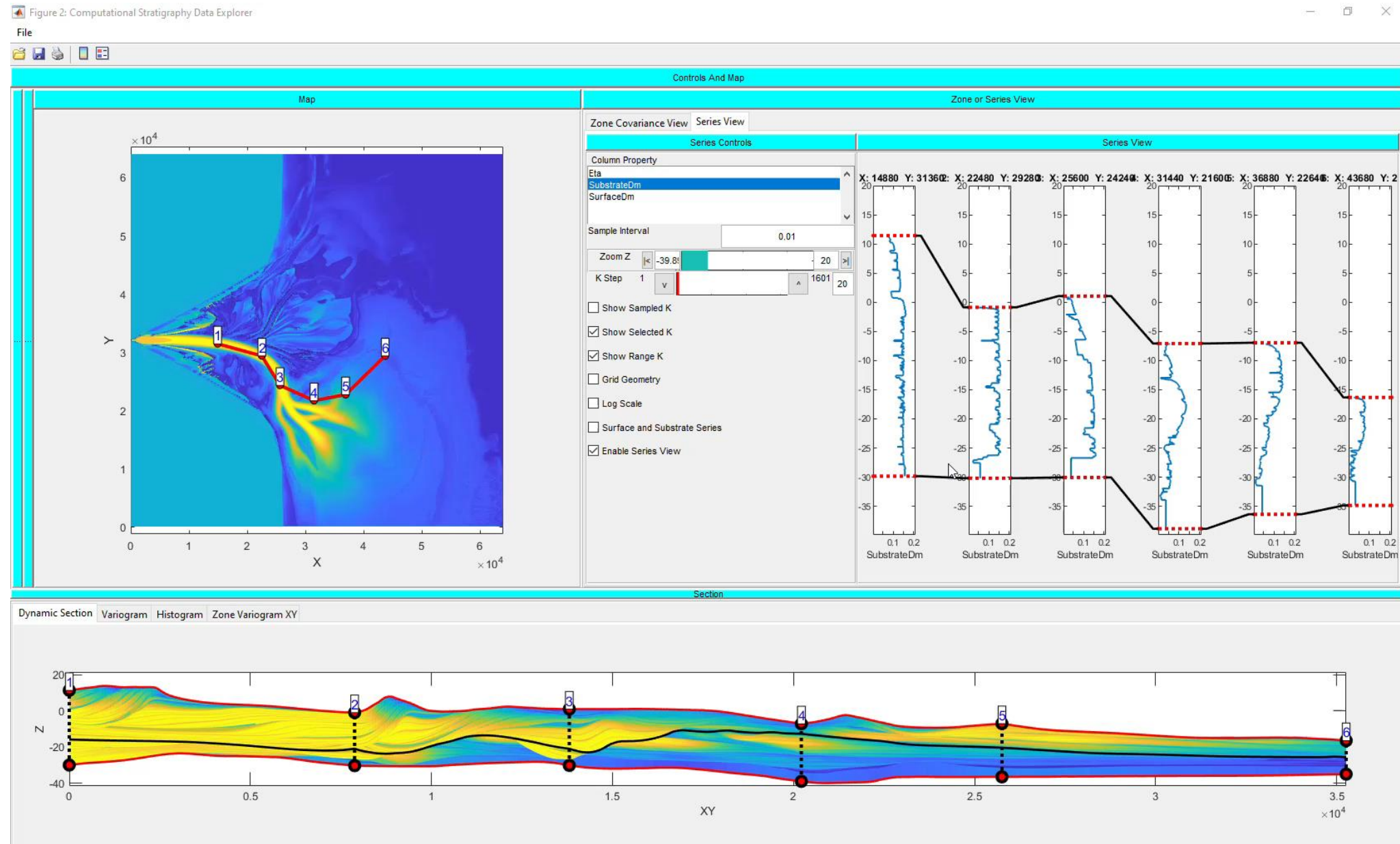
Computational Stratigraphy Explorer
Cross Section Selection

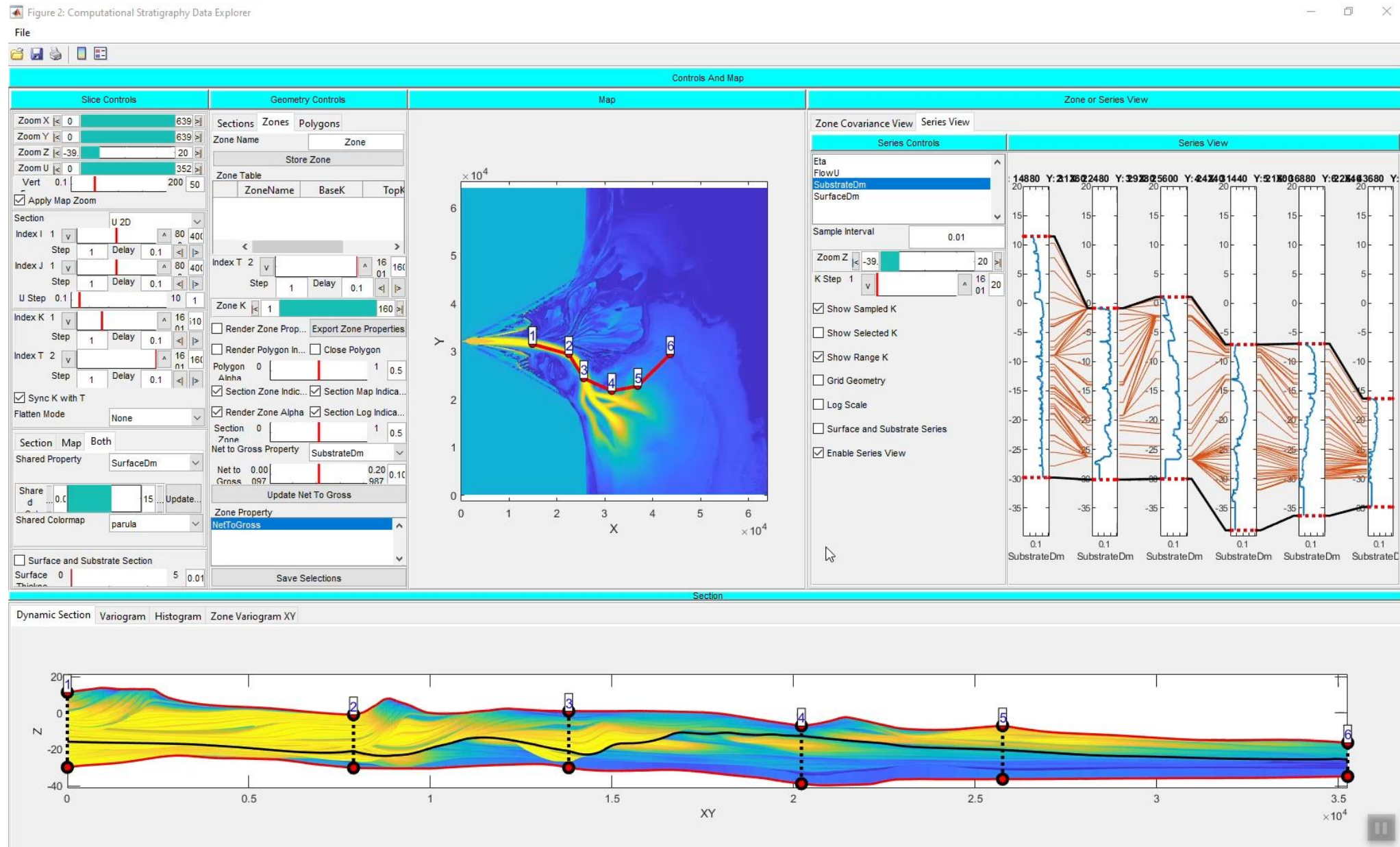# Computational Stratigraphy Explorer Synthetic Log Analysis

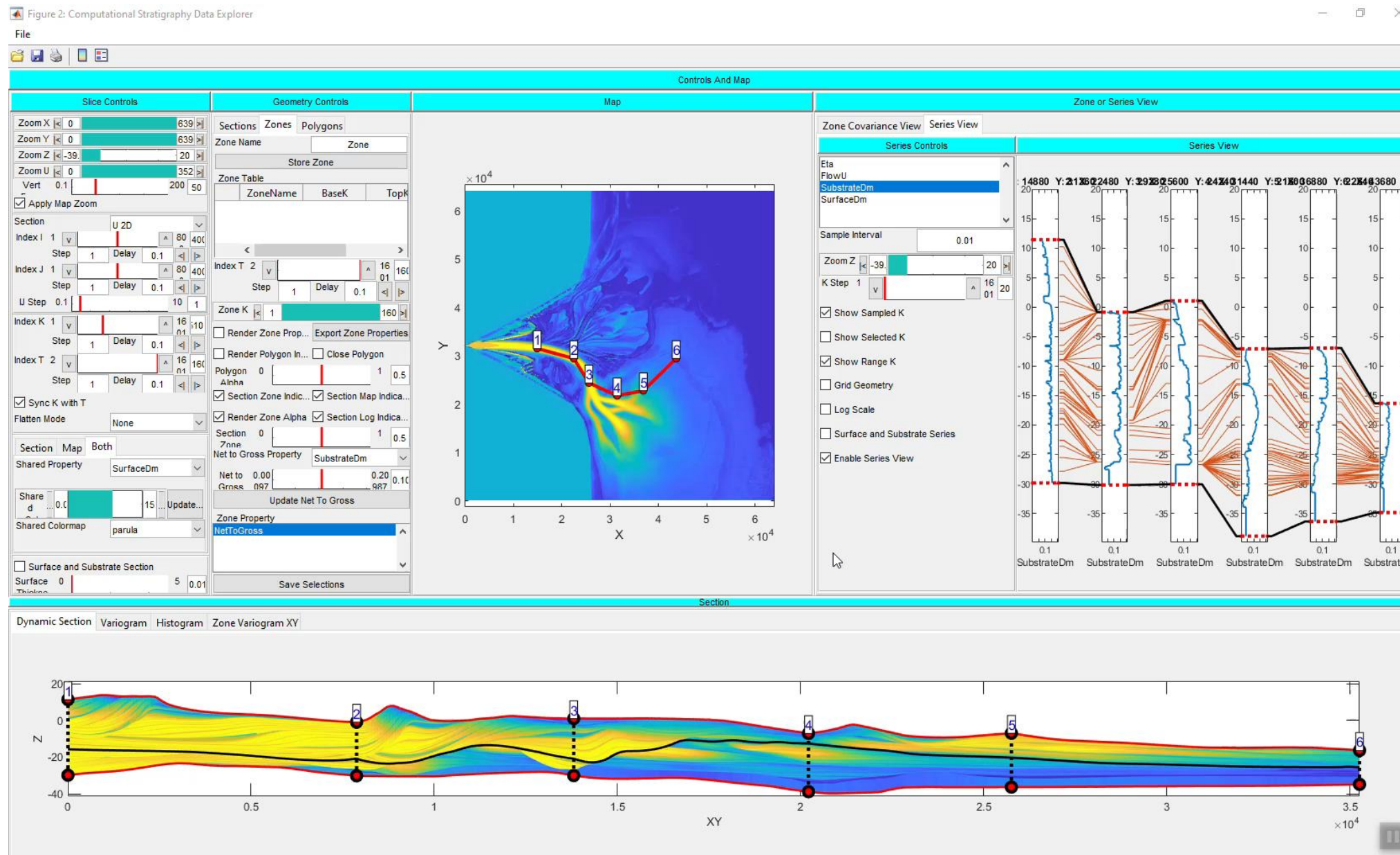# Computational Stratigraphy Explorer
Synthetic Log Analysis
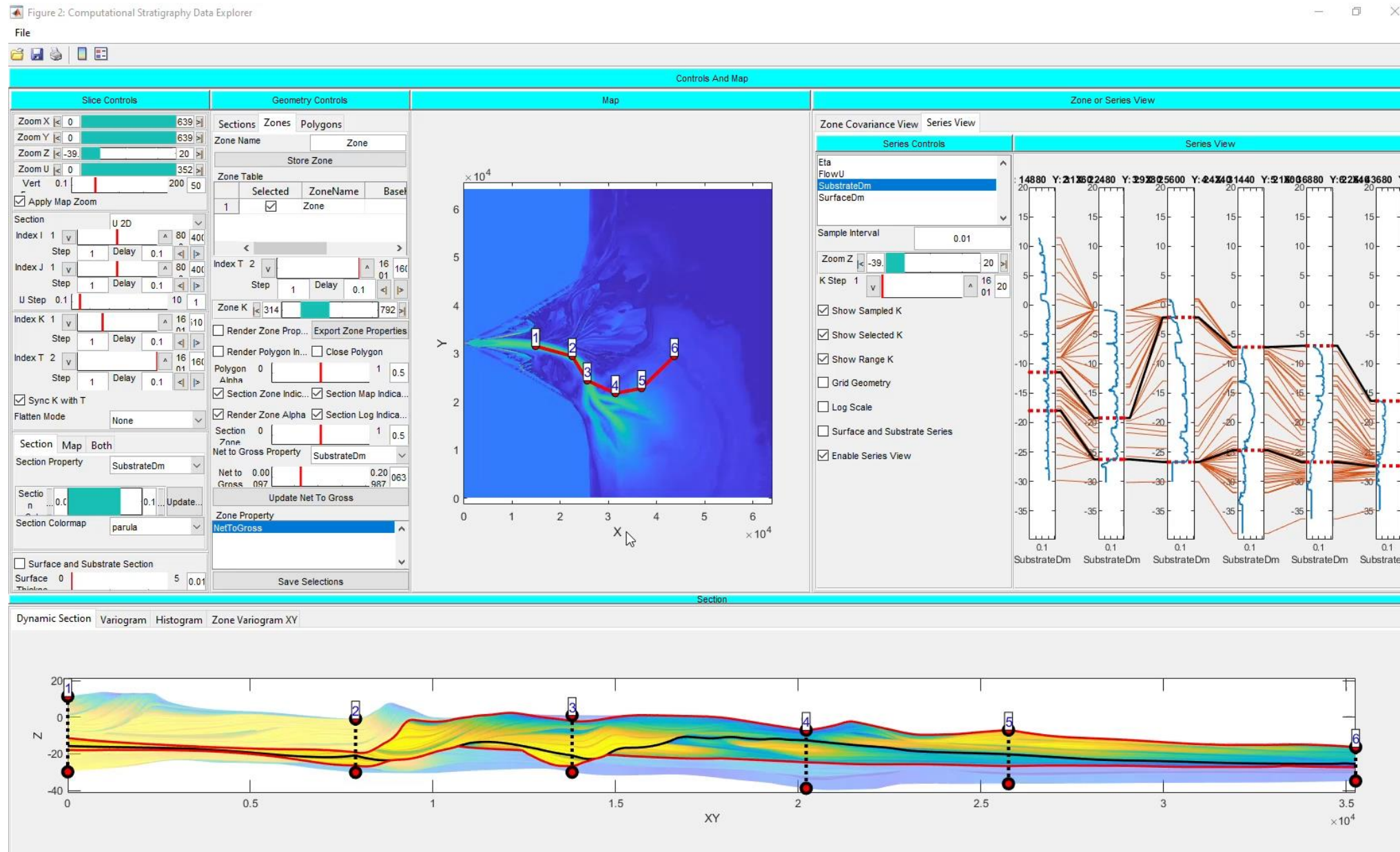
Computational Stratigraphy Explorer
Zone Selection
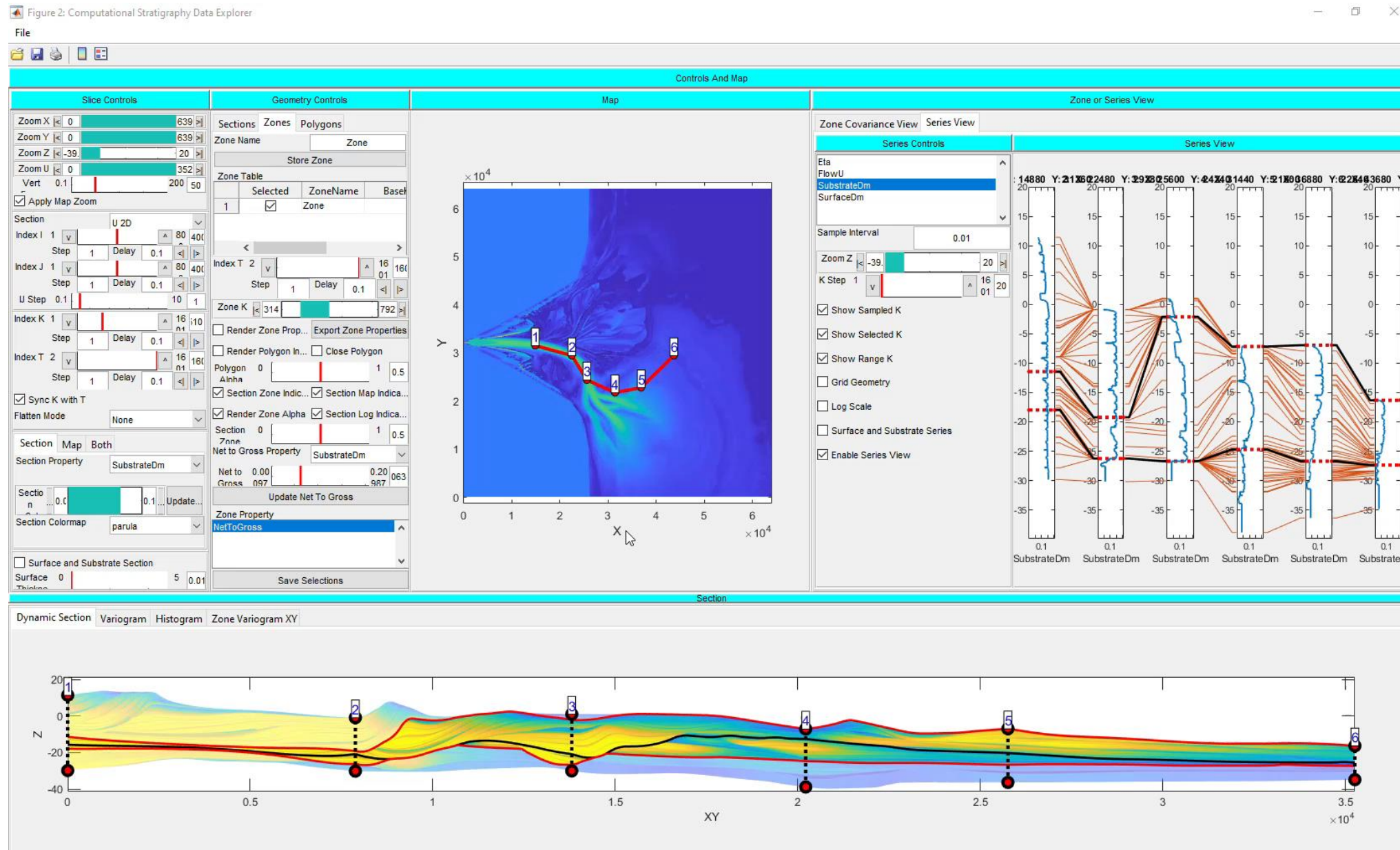
Computational Stratigraphy Explorer
Zone Selection
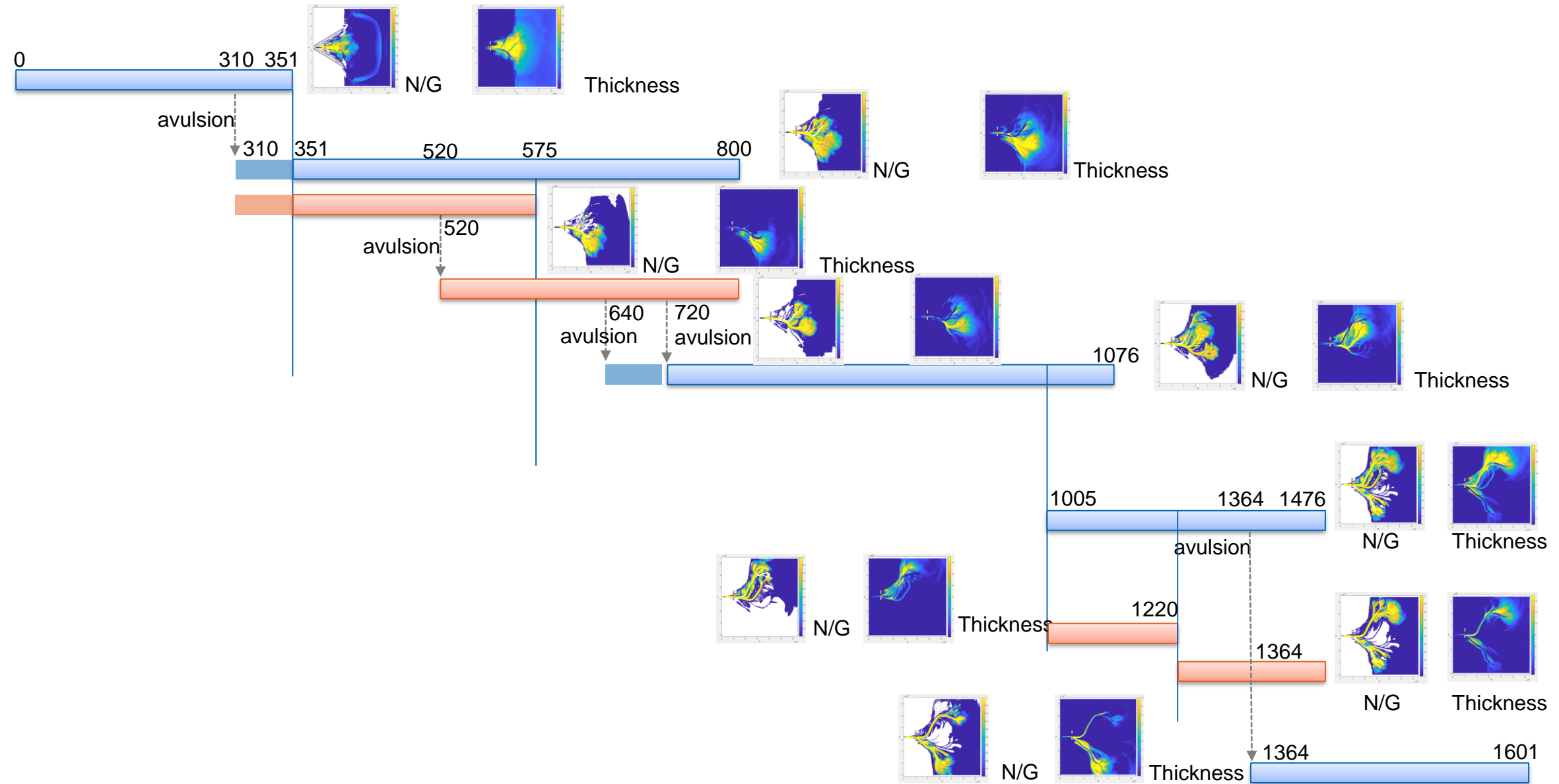
Computational Stratigraphy Explorer
Zone Properties

Computational Stratigraphy Explorer
Zone Properties

Computational Stratigraphy Explorer

- Computational Stratigraphy Explorer enables detailed analysis of the formation of a reservoir analog

Conclusions

- Computational Stratigraphy is a new technology which creates complex and informative digital reservoir analogs with novel information about the formation of a reservoir

- Computational Stratigraphy Explorer provides geologists with flexible visualizations and stratigraphic analysis workflows

- Contact me at Brett.Hern@chevron.com to learn more about creating and innovative tools and algorithms for geoscientists