Developing Interactive 3-D Presentations and Publications for Multidimensional Geoscience Research

John R. Andrews, Lesli J. Wood, and James C. Gibeaut

Bureau of Economic Geology, The University of Texas at Austin, University Station, Box X, Austin, TX   78713-8924

ABSTRACT

Advances in computer hardware and software are enabling scientists to investigate and visualize complex 3-D geologic data on relatively inexpensive workstations, desktop computers, and even laptops. Generally speaking, however, these advances are under-utilized when the time comes for scientists and research groups to share the results of their findings with colleagues and/or the public at large. It is true that PPT, HTML and PDF documents may employ telling images and 2-D animations—along with text—to convey research findings adequately, but geologists and other earth scientists often struggle to elucidate the realities of their 3-D and 4-D research using these conventional 2-D media. Two research groups at the Bureau of Economic Geology are overcoming this limitation through the use of VRML (Virtual Reality Modeling Language). An open-standards programming language, VRML is ideal for bringing multidimensional research into mainstream publication and presentation environments.

The process used for making our interactive VRML presentations is:

1. First, each of the data layers to be included in a final 3-D project—*e.g.*, seismic information, stratigraphic horizons, DEMs—must be converted from its native format to VRML using numerous data conversion utilities that have been written in house.

2. Next, a comprehensive, multi-columnar list of these data is created. Included with each data listing are attributes defining how a given data element will be displayed in the final product. Additional attributes define how various widgets—buttons, slider bars, panels—will be displayed and how they will interact with the data.

3. Finally, we have written a program that reads this list and generates an interface file which, when loaded into a web browser, displays both the data and their respective widgets.