

Geovisualization in Research and Education: Experience with a GeoWall

Abstract for Oral Presentation at

Joint Workshop on
Visualization and Exploration of Geospatial Data
Stuttgart, Germany
June 27-29, 2007

Marguerite Madden, Thomas Jordan and Richard Smith
Center for Remote Sensing and Mapping Science (CRMS)
Department of Geography, University of Georgia
Athens, Georgia USA
mmadden@uga.edu

Understanding three dimensional (3D) spatial relationships is a fundamental requirement in many disciplines. Good examples are landforms, clouds and buildings and transportation networks in the urban environment (i.e., urban morphology). It is essential to the study of Earth Sciences including geography and geology, while 3D spatial data collection, analysis and display also are fundamental to geographic technologies used in research such as remote sensing, GIS, geovisualization, cartography, GPS, geocomputation and spatial modeling. Traditional teaching methods have strongly relied on two-dimensional (2D) representation of images, drawings, maps and profiles. Although most geographers and geologists are trained to understand 3D structures from such representations, the extrapolation requires spatial thinking skills that are difficult to learn and often form a stumbling block for students at the introductory level. The University of Georgia Department of Geography recently installed a GeoWall to facilitate instruction and research involving 3D spatial relationships and visualization. Developed at the University of Illinois' Electronic Visualization Laboratory, the GeoWall was designed to broaden the use of scientific visualization tools for Earth Science research and education by the use of low-cost virtual reality visualization devices. The current GeoWall hardware is based on Access grid augmented virtual environment (Agave) technology which appends a low-cost PC-based graphics workstation to an access grid node that can be used to project 3D stereoscopic computer graphics and allow viewers to share 3D content of the display on a classroom wall-size screen. This presentation will include use and reception of the GeoWall by the UGA Geography and Geology Departments, faculty use of the GeoWall in their lectures and the impact of the delivery of 3D course materials on student learning, performance and perception of 3D visualization. Development of GeoWall demonstrations for use as interpretive materials by the U.S. National Park Service for landscape visualization and exploration also will be discussed.