

**SOFTWARE VALIDATION TEST FOR
ARCVIEW, VERSION 3.1**

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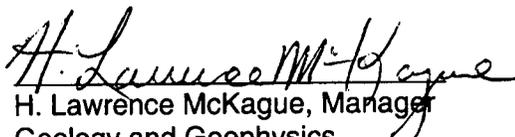
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1 SCOPE OF THE VALIDATION

This document establishes the Software Validation Test for validating the functionality of the code ArcView, Version 3.1, through comparisons of digitally created data with known mapping data available in the literature. ArcView, Version 3.1, is a standard geographical information system (GIS) program that is used by many government, industrial and research agencies to create, display, query and analyze geographic data. Data sets are maintained in discrete data files; attributes can be assigned geographic coordinates that reference common spatial coordinate systems. To ensure that the ArcView, Version 3.1 program is correctly maintaining geospatial relationships for digital data, which is the primary function of the GIS software, validation testing of contour locations and coordinate systems was done.

2 REFERENCES

Environmental Systems Research Institute, Inc. "Using ArcView GIS." Redlands, California. 1996.

3 ENVIRONMENT

3.1 Software

ArcView, Version 3.1, is commercial software developed by Environmental Systems Research Institute (ERSI). Version 3.1 runs in Windows NT 4.0 operating system. The following software items are required to perform the testing activities:

- (i) ArcView, Version 3.1 software
- (ii) Windows NT 4.0 operating system

3.2 Hardware Requirements

The software validation tests for ArcView, Version 3.1, were performed on a Pentium or higher Intel-based microprocessor PC, with a minimum of 32Mb of computer memory, VGA graphics capability, and at least 17Mb of swap space. Input information is in existing raster file format and ArcView shape files. Output information is saved on the computer hard drive. No peripherals (e.g., tape drives, printers, plotters) are necessary to perform testing activities.

4 PREREQUISITES

Running ArcView, Version 3.1, requires installation of the commercially available software, per the developers' User's Manual.

5 ASSUMPTIONS AND CONSTRAINTS

The user of ArcView, Version 3.1, is assumed to be familiar with GIS and geospatial data sets.

6 TEST CASES

The test cases described in this section involve comparisons of maps provided by the United States Geological Survey (USGS) to electronic data coverage provided by the USGS.

6.1 Test Case 1 – Contour Locations

The contour locations for a detailed vector coverage map from the USGS was compared with a digital raster graphic 7.5-minute (7.5') quadrangle map purchased from the USGS on a CD-ROM.

6.1.1 Test Input

The USGS-produced digital line graph (DLG) vector coverage is of the Crater Flat 7.5' quadrangle detailed 20-foot contour locations (file: cf20cont). The USGS digital raster graphic is of the Crater Flat, Nevada, 7.5' quadrangle map (file: O36116g5.tif).

6.1.2 Test Procedure

After opening ArcView, a copy of the USGS created vector data coverage containing 20-foot interval contour lines for a detailed map of Crater Flat (file: cf20cont) was opened. A digital raster graphic of the Crater Flat, Nevada, 7.5' quadrangle map was then opened. The USGS control map was overlain by the contour coverage.

6.1.3 Test Results

Once the two coverages were overlain, elevation contour lines were compared. No visually apparent discrepancies in the contours were noted.

6.2 Test Case 2 – Verifying Coordinate System

The coordinate system of a detailed map created from ArcView was compared with a digital raster graphic 7.5' quadrangle map purchased from the USGS on CD-ROM.

6.2.1 Test Input

The USGS-produced DLG vector coverage is of the Crater Flat 7.5' quadrangle detailed 20-foot contour lines (file: cf20cont). The USGS digital raster graphic was received in UTM coordinate system and is of the Crater Flat, Nevada, 7.5' quadrangle map (file: O36116g5.tif).

6.2.2 Test Procedure

After opening ArcView, a copy of the USGS vector coverage of 20-foot interval elevation contours of Crater Flat (file: cf20cont) and the USGS digital raster graphic map (file: O36116g5.tif) for the same 7.5' quadrangle were opened. In ArcView, the View window was opened in a printing view, called a Layout. A coordinate grid, selected in the same coordinate system as the raster and vector coverages, was added to the layout utilizing the Graticules and Measured Grids extension.

6.2.3 Test Results

The coordinate grid tic marks on the USGS vector coverage map were compared to the USGS digital raster map's UTM grid. No visually apparent discrepancies in the coordinate grids were noted.