

Converting Geologic Maps from Coverages to Geodatabases by Karen Wheeler, Philip Dinterman, Russell Evarts, and Ray Wells

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INTRODUCTION

The Pacific Northwest Urban Corridor Geologic Mapping project is providing digital 1:24000 scale geologic mapping of areas in western Oregon and Washington. Our databases are online, with documentation describing the datasets at: <http://geology.wr.usgs.gov/wgmt/pacnw>.
Online releases from 1995-2002 include:

- 1) Database package—ArcInfo coverage set (.e00), grids, AMLs, symbology, readme and metadata
- 2) PostScript package—Encapsulated PostScript files for printing
- 3) PDF package—Adobe Acrobat PDF files for viewing and printing

In 2002, we began using ArcGIS for database management and map creation. The data structure of our databases followed the Alacarte standard (Fitzgibbon, 1991; Fitzgibbon and Wentworth, 1991; Wentworth and Fitzgibbon, 1991). Our project has converted almost all our pre-existing coverages from Workstation ArcInfo to ArcGIS 8.3 geodatabases. Current packages produced for the website include:

- 1) Geodatabase package—Geodatabase, Metadata, and ArcMap document for viewing and querying
- 2) Shapefile package—Shapefiles exported from Geodatabase
- 3) PDF package—PDFs of the geologic map and pamphlet

We are adding more data to our geodatabases, improving our collection of data with ArcPad, developing styles for ArcMap which make the maps more uniform, streamlining the map production with templates, and improving our metadata. A typical conversion of one geologic map from coverages to a Geodatabase takes about 10 minutes or less.

COVERAGES TO GEODATABASE

1) In ArcCatalog
Specify a New Personal Geodatabase (Fig. 1a). Add Feature Datasets such as geology, locations, and structure (Fig. 1b).

Create a Feature Class in that Feature Dataset or Import coverages into the Feature Dataset as Feature Classes (Fig. 1c).
If desired, specify Domains for tagging in ArcMap (Fig. 1d). A Domain is the range of values allowed for a column in a database.

2) In ArcMap
Create a new Map Document (Fig. 2a). Add data from newly created geodatabase (Fig. 2b).
Use Styles or a previous Layer file for symbology (Fig. 2c).

Export the map at a specified scale, to EPS or to Adobe Illustrator (Fig. 2d). Place exported EPS of map in an Illustrator map template for printing.

Our latest geologic map as a geodatabase is on this poster (Fig. 3). It was originally compiled on mylar and greenlines, scanned, and digitized into Workstation ArcInfo. It was imported into a Personal Geodatabase, edited in ArcMap, and exported to a graphic file for Illustrator.

PUBLISHED GEODATABASES

Our first geodatabases, *Maps showing inundation depths, ice-affected erratics, and sedimentary facies of the Late Pleistocene Missoula Floods of the Willamette Valley, Oregon*, was published in 2003 and is online at: <http://geopubs.wr.usgs.gov/open-file/063-408>. It consists of shapefiles, a geodatabase and metadata, PDFs of maps, and a readme.

Our next two geodatabases, *Geologic Map of the Ariel Quadrangle, Clark and Cowlitz Counties, Washington, and Geologic Map of the Woodland Quadrangle, Clark and Cowlitz Counties, Washington*, are standard 7.5 minute USGS geologic maps, and will be released May 2004 as Scientific Investigations Maps (SIM) at: <http://pubs.usgs.gov/sim/286> and <http://pubs.usgs.gov/sim/287>.

FUTURE DIRECTIONS

We are testing ArcPad on an IPaq PDA with GPS. Forms developed in ArcPad are used to collect point data for sample locations, structural measurements, geologic unit, date, time, and notes. For base maps in ArcPad we use ArcCatalog to export the DRGs to MrSIDs. Having data points in ArcMap as shapefiles saves time digitizing the points. The initial test maps were the first draft stage much faster than they would have been with previous conventional attempts. Existing Geodatabases in ArcMap can be exported to ArcPad and used in the field to add more information, and later reimport the shapefiles. A poster on ArcPad by Evan Thoms and Ralph Hagerud is also presented at this conference.

PEFile, a Windows CE utility, was purchased to view the filename list with extensions, which were otherwise not visible on Windows CE, running on Compaq IPAQs. Cost has been minimal for 2 of these units and PEFile.

ArcSDE is being testing for multuser editing of Geodatabases and managing large image catalogs. It is simple to convert the ArcGIS Personal Geodatabases to ArcSDE databases.

REFERENCES

- Fitzgibbon, T.T., 1991, ALACARTE installation and system manual (version 1.0); U.S. Geological Survey Open File Report 91-587B.
Fitzgibbon, T.T., and Wentworth, C.M., 1991, ALACARTE user interface - AML code and demonstration maps (version 1.0); U.S. Geological Survey Open File Report 91-587A.
Wentworth, C.M., and Fitzgibbon, T.T., 1991, ALACARTE user manual (version 1.0); U.S. Geological Survey Open File Report 91-587C.

Use ArcCatalog to create a Personal Geodatabase

Open ArcCatalog and create a Personal Geodatabase.

Rename the Geodatabase.

Create a Feature Dataset in that geodatabase (right click the name of the geodatabase).

Name the Feature Dataset and click the Edit button to choose a projection.

Type in the Name of the new Feature Class, then click which Type of Feature Class.

Do you might import preexisting coverages or shapefiles to the Feature Dataset as Feature Classes.

Specify Domains in ArcCatalog for tagging in ArcMap.

Start ArcCatalog. Right-click on Geodatabase, select Properties.

Click the Field tab to the right of Field and select a type. Click the Units tab.

Enter the Code values with Description for your tags. Click Apply and OK, and exit from ArcCatalog.

Start ArcCatalog. Open a Map Document, which has the geologic data in it or add the data to it (Fig. 2a and 2b). Right-click the Feature Class to the left of the map. Click the Properties button. Click the Domain tab. On the Domain tab, click Options button, and select Add Field.

Type in the Name of the new feature.

Click the drop arrow to right of type and select Field.

Click to right of Domain and select the Domain previously created in ArcCatalog. Click OK. The attribute table will now have the new field in it for use.

If the frame of the map is lost, click the corner with the arrow tool and drag to the larger size. Then specify map scale in the box at the top.

File > Export. Name the file for exporting. Name the file from the drop arrow. Type of the file (Illustration, dithered, or other). The file will be created, and the file will be added to the Illustrator. If it doesn't work, try other formats for exporting.

Save ArcMap, and then Exit Session.

Click a record to tag, select a tag from the drop menu, and tag Feature.

Save edits. Save ArcMap Document.

Use ArcMap to symbolize a Geologic Map of the Geodatabase and export

Open ArcMap and create a New Map Document.

Right-click the Layers in the Table of Contents frame, and specify the Coordinate System, and scale.

Add data (the yellow button with plus symbol, and select the Geodatabase previously created with ArcCatalog).

Bring up the Layer Properties for the Polygons. Symbology tab, and select Value Field, and Style, and Match Symbol, and Style.

Style are edited using the Style Manager in ArcMap, and may be passed among ArcGIS desktop users. Tools > Styles > Manager. Right-click on the Name, copy and paste, edit new symbols by Properties.

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Most Recent Geologic Map (scaled down 85% for poster)

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