

The following was presented at DMT'08  
(May 18-21, 2008).

The contents are provisional and will be  
superseded by a paper in the  
DMT'08 Proceedings.

See also earlier Proceedings (1997-2007)  
<http://ngmdb.usgs.gov/info/dmt/>

# ESRI Cartographic Representations for the FGDC Digital Cartographic Standard for Geologic Map Symbolization

Peter Kasianchuk  
Cartographic Product Engineer

Charlie Frye  
Manager, Cartographic Research Group  
ESRI, Inc.

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# Project overview – ‘problem’

- Support automation in ArcGIS for producing geologic maps with consistent symbology
- “FGDC Digital Cartographic Standard for Geologic Map Symbolization”
  - Very large symbol set
  - Many complex symbols
  - Detailed, specific symbol specifications (i.e. sub-millimeter)



## Project overview – ‘solution’

- Cartographic geodatabase with representations
  - single “master” source for all FGDC symbols
  - more flexible control over data organization
  - ability to create complex symbols and effects
  - leverage native geodatabase functionality (i.e. domains, subtypes)
- Maplex for ArcGIS 9.3
  - Strike and dip labeling problem solved
  - New solution for labeling contours
- Documentation for using representations for geologic mapping
- Now possible to create high-quality geologic map with more automation for major mapping tasks

# Introduction to Cartographic Representations

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- Better quality symbology
- Method to store feature symbols in the geodatabase
- Stored as feature class attributes and related tables
- Generic resources in ArcGIS Desktop Help

# Introduction to Cartographic Representations

- Better quality symbology
- Method to store feature symbols in the geodatabase
- Stored as feature class attributes and related tables
- Generic resources in ArcGIS Desktop Help
- Additional information on ESRI Mapping Center

<http://mappingcenter.esri.com>

The screenshot shows the ESRI Mapping Center website. At the top, there is a navigation bar with links for Home, Blog, Ask A Cartographer, Maps, ArcGIS Resources, and Other Resources. The main content area features a welcome message and a search box. A sidebar on the right contains a 'Mapping Center Web Site' section with links to 'About Mapping Center', 'About the Mapping Center Team', and 'Getting Started'. The footer of the page includes a 'Current News Feeds' section.

ESRI.com | Support | EDN | Training | More ESRI Sites...

**ESRI Mapping Center** Welcome! [Login](#)

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Welcome to Mapping Center

Mapping Center is about ***the use of ArcGIS in the graphic delivery of geographic information***. Its goal is to help you make great looking maps by using the same cartographic concepts and techniques that professional cartographers use.

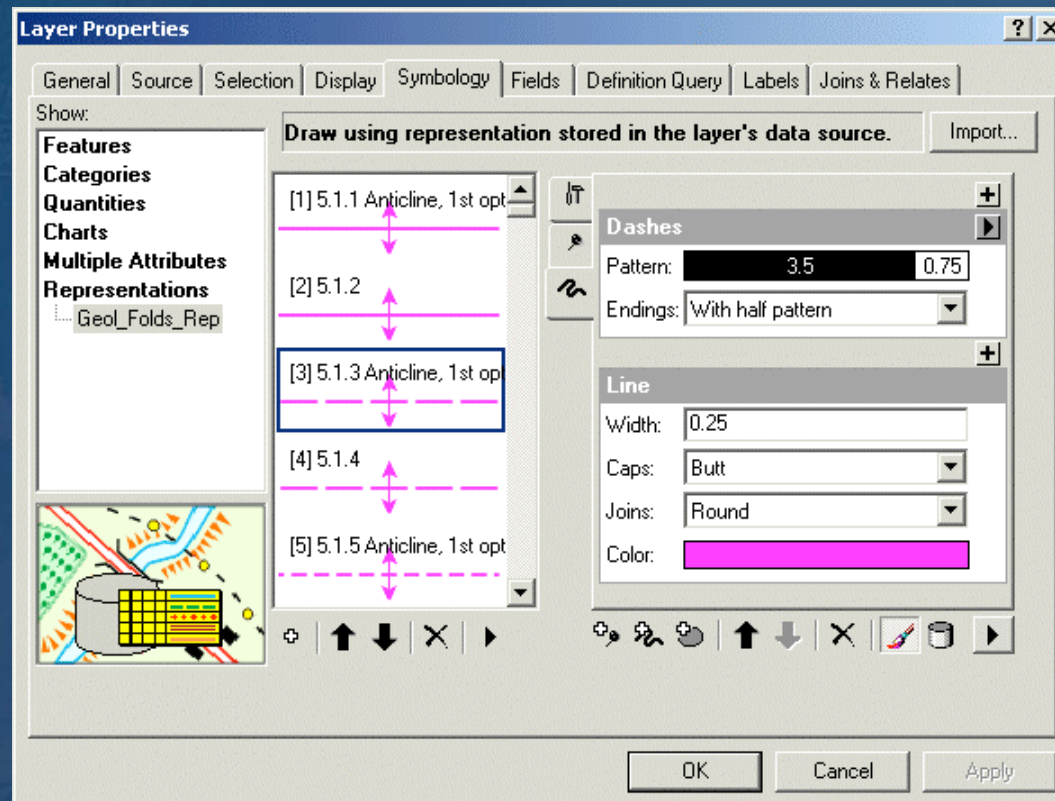
[Current News Feeds](#)

**Mapping Center Web Site**

- [About Mapping Center](#)
- [About the Mapping Center Team](#)
- [Getting Started](#)

# Why use representations?

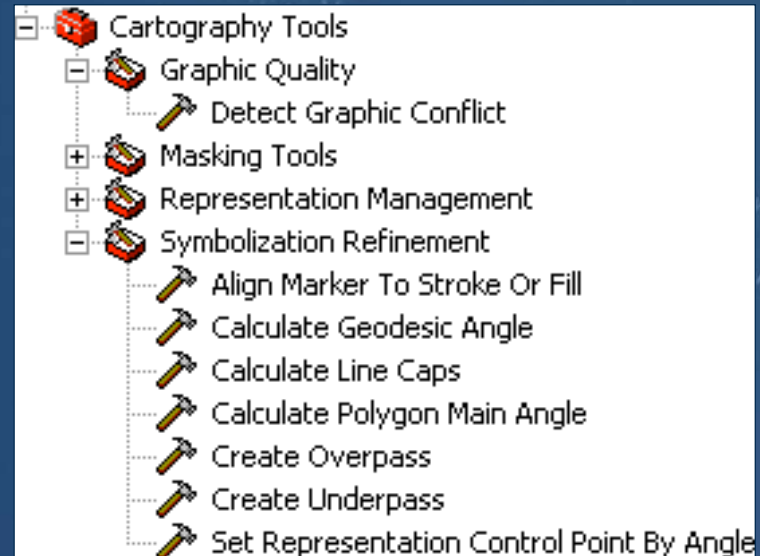
- Share data = share symbols
- Eliminate reliance on layer files, map documents, fonts
- Easier-to-navigate symbol management user interface





# Why use representations?

- Share data = share symbols
- Eliminate reliance on layer files, map documents, fonts
- Easier-to-navigate symbol management user interface
- Use geoprocessing tools for feature symbol QA/QC
  - Geoprocessing tools to create cartographic effects
  - Supports graphics-based workflows in GIS environment



# Using representations

- Data must be stored in a geodatabase (9.2 or later)
- Representations can be created from existing symbols
- Feature class can have multiple representations to support:
  - Different map types
  - map scale – e.g. inset / overview
  - hierarchies – e.g. province, terrane, unit
  - functions – e.g. surficial, sub-surficial

*Q: Do you use geodatabase topology? subtypes? domains?*

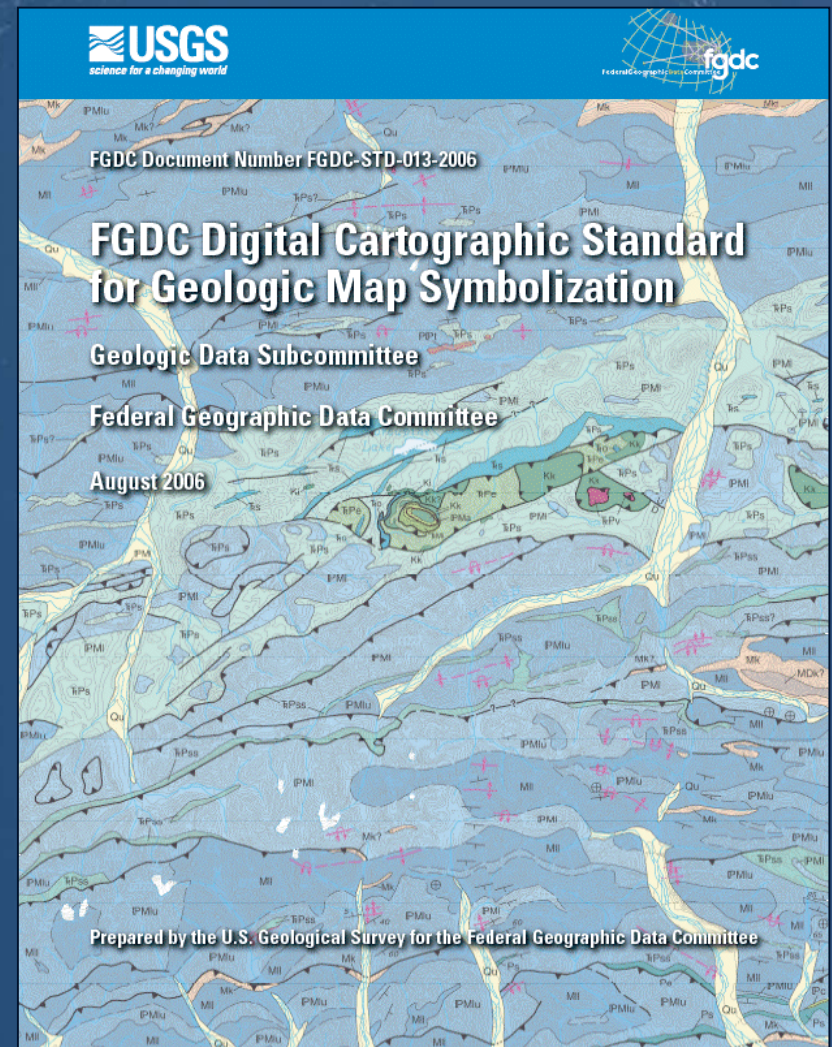
- *these required new thinking for spatial data management*
- *representations are similar = new way to manage symbols*

# Typical implementation workflows

- Convert existing ArcMap symbols
  - use existing geodatabase feature classes, map documents, layer files
- Assign existing representation rules to new data
  - Append new data to existing representation class
  - Copy existing representation rules to new feature class
  - Create new rules from scratch
- Feature-level symbol editing – “overrides”
- **DEMO 1** – Mount Baker 30-by-60 Quad (USGS I-2660)
  - Data retrieved from <http://pubs.usgs.gov/ds/2006/205/>

# FGDC Geologic Map Symbol Standard

- Schema / taxonomy challenge
- Single source document = very large 'flat' table
- Translate the symbols from graphics to representations
- How do geologic feature symbols 'behave' on a map?
  - Base map features
  - Geologic features



# Progress to date

- Prototype schema
  - “Base” and “Geology” feature datasets
  - Geologic feature classes defined
    - representation rule associated with each feature
    - ~10% of symbols defined
- Implementation issues identified by testing:
  - FGDC “RefNo” as text field
  - Incorporating new, local, or modified symbols
  - Consistent symbol / feature type descriptive text
  - Feature class organization
- **DEMO 2** – FGDC ‘MasterSchema.mdb’ cartographic geodatabase

# Future

- How will you move your data to our symbols?
- Plan to migrate your data
  - representations not stored with shapefiles or coverages
  - define your local symbol library
  - add, collect, define feature codes for symbology
- Create Maplex rules for labels
- Initial release – Fall 08
  - Top 500 most commonly used symbols

# Acknowledgements

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- USGS
  - Dave Soller
  - Taryn Lindquist
- Nevada Bureau of Mines and Geology
  - Jordan Hastings
  - Jennifer Mauldin
  - Christine Arritt
  - Heather Armeno
  - Jim Branch

# Interested?

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- Additional symbol completion and workflow testing needed
  - Limited capacity for additional participants
  - Contact David Soller if interested



# Questions?

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ESRI Contacts:  
Peter Kasianchuk  
pkasianchuk@esri.com

Charlie Frye  
cfrye@esri.com