Visualization Considerations with GeMS Data and Maps

DMT Lite 2021
06 Dec 2021

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Classic Map Production & Use

The mapmaker is in complete control of the visualization process.
Fundamentals of Map Design

Principles of Map Design

• Ensure Legibility
• Ensure Visual Contrast
• Consider Figure – Ground
• Employ Visual Hierarchy
• Maintain Balance

Controls of Map Design

• Geographic Reality
• The Audience
• Purpose of Map
• Available Data
• Map Scale Options
• Conditions of Use
• Technical Limitations

Graphic Variables

Position | Size | Shape | Color | Pattern

Hue | Value | Saturation
The Map Design Process

1. Identify Map Requirements & Constraints
2. Consider Geographic Phenomena Characteristics
3. Data Acquisition
4. Design
5. Draft Assess & Test
6. Refine
7. Publish

Each Mapped Phenomena (aka Layer)
- Select Data
- Generalize
- Symbolize
- Label
- Design Page Layout

Fundamentals of Map Design

Audience
“The distinction between map data and their symbolization is important. Storing map data in a GIS—as opposed to its symbolization in a drawing program—facilitates machine-assisted analyses of the data, gives greater flexibility for alternate symbolization, and eases reuse of the data at different scales.”

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Traditional Map Production & Use with GIS - ArcMap

Create Static Map

Geologist

GeMS DB

.mxd

.style

Data download

Viewer can Change

• Visibility
• Layering
• Label Placement
• Scale
• other

Viewer

Thick Client ArcMap

Symbolizing a GeMS Geodatabase (presentation), DMT 2021
https://dggs.alaska.gov/pubs/id/30826

Symbolizing AK GeMS Symbology: A Description of the AK GeMS Style File
https://dggs.alaska.gov/pubs/id/30584
Modern Map Production & Use with GIS - Arc Pro & Services

Geologist Viewer

Create Static Map

Geologic Map Production & Use

Geologic DB

Thick Client ArcPro

Thin Client Browser

Thin Client Mobile

Service

Viewer can Change
- Visibility
- Layering
- Label Placement
- Scale
- other

Data download

Multimap GeMS DB

Dictionary

Raster Geologic Map

Vector tile cache

Service

Viewer
AK GEMS DATA DICTIONARY: A DESCRIPTION OF THE AK GEMS DATABASE SCHEMA, MP 170
- Report
- Data Dictionary
- Entity-Relationship Diagram
- XML Workspace Document

AK GEMS SYMBOLOGY: A DESCRIPTION OF THE AK GEMS STYLE FILE, MP 167
- Report
- AK_GeMS_symbology_documentation_ver_1.xls (Excel)
- AK_GeMS_symbology_ver_1.style (Style File)
Some Opportunities and Challenges

• Transition from ArcMap to ArcPro
  • Increased capability of the Stylx format
  • Vector Tile Caches
  • Dictionary Symbology

• Sharing Data as Services
  • Different results with:
    • Feature Services versus Map Image Services
    • Thick Client (ArcPro) versus Thin Clients (Web Map)
  • Multilayers Symbol (example – most faults) Support Issues with Services
  • Symbol Rotation Issues
  • Maintaining Drawing Speed

• Multimap visualization
  • Layer order with multiple products
  • Label placement

• Variable Symbology Issues
  • Example: concealed contact, what should the symbol be when the surficial layer is removed in a visualization?
  • Example: orientation point as single view versus multiple
Question?