A Web-Based Symbol Store for Sharing Map Symbology

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Motivation & Approach

Application Design

Current Progress

Next Steps
Motivation & Approach
Motivation

- Diverse DHS organizations produce and use maps
  - Audiences range from geospatial analysts to general public
- No consistent set of map symbols used across DHS
  - Even if we just look at point symbols
- ANSI INCITS 415-2006 intended for emergency management mapping
  - Poorly adopted by practitioners
- Initial Objective: Develop process for symbol standardization
- Secondary Objective: Develop mechanism for symbol interoperability
ANSI Standard

• **Point symbol set designed for emergency response**
  – Goal was to facilitate common situational awareness, support point symbol interoperability

• **Federal/state/local stakeholders took part in the process**

• **Symbols designed to work in black & white**
  – Outline shapes used to distinguish between symbol types (incidents, natural events, operations, infrastructure)

• **Evaluation conducted online with first responders**
  – Made use of an “accept” or “reject” methodology, partially following the ANSI guidelines
Other Standards

• We discovered that most mission areas had their own, ‘in house’ standards

• These were developed on an ad hoc basis, usually by one cartographer

• Collections of ESRI markers and whatever else they could scrape together

• Such ‘standards’ are passed around to new employees and are promoted as default option
Standardization Process

• Distributed, web-based activities through a customized Drupal site

• **Phase 1: Needs Assessment**
  – Review current symbology, identify new symbol needs, problems with current symbols

• **Phase 2: Initial Standard Development**
  – Develop symbol categories, vote on changes to current symbology

• **Phase 3: Standard Refinement**
  – Discuss, refine & vote on final categories

• **Phase 4: Implementation & Quality Control**
  – Test new symbology in exercise, submit standard for graphical refinement by cartographers

• **Methods feature**
  – Round-based discussion & voting (modified Delphi)
  – Card-sorting activities (using webspot.com)
  – Anonymized participation
Motivating Questions

• What happens once a group has completed the process?

• How can cartographers in different mission areas check out these ‘in house’ standards?

• What can we do to better understand what these various standards have in common?

• How can we encourage cartographers to share their symbols more widely?
Approach

- Develop web-based solution for sharing / browsing point symbols

- Simple design – aim to support one key task really well

- Symbols that have gone through our standards process can receive special tags

- Iterative development process -> static mockup, dynamic prototype, refined prototype, final version
Application Design
Back-end

- **ArcObjects** is used to parse ESRI style files and generate preview images of the styles

- **Lucene index for text content**
  - Quick text searching and retrieval of large amounts of content
  - Ranks hits based upon user searches
  - Weights search criteria to improve search results

- **.NET web service** supports read/write to the Lucene index and read/write for .style files

- **All content stored in the Lucene index or files on the server (style files and image preview files)**
  - This may be improved in the future by parsing the style files and storing that information in a RDBMS
Development Details

• Interface built using Flash Catalyst (converts AI & other art into UI objects)

• Functionality connected to interface using Flash Builder 4 (formerly Flex)

• Flash Builder used to get results from the web service
  – User function calls can be made through ActionScript and results are sent back to the client as text strings or JSON strings

• Flash plugin required for web browsers, but otherwise works broadly across platforms
Current Progress
Progress to date

- Developed interactive prototype based on static mockup + sponsor feedback
- Prototype supports basic symbol search and browsing
- Successfully demonstrated that a .style file can be contributed, parsed, searched on, and constituted differently for download
Progress to date

Demonstration
Next steps
Another Brewer?
Evaluation Plans

• Presenting prototype to DHS mapmakers in late October for quick feedback

• Full version due mid-Winter, will evaluate using distributed methods with mapmakers

• Will be able to incorporate feedback before project ends in May 2011

• Wider dissemination? Hopefully…
Next Steps

• Integrate portions of our symbol standardization process into the Symbol Store

• Develop support for other technical standards (SLD, for example)

• Extend tools to handle dynamic / multi-scale point symbols

• Explore Symbol Store usage patterns to identify frequently used symbols, cross-organizational commonalities, etc...
Thanks for your attention!

for more information:

http://www.geovista.psu.edu/symbology/