Open Government, Open Data, Open Architecture and Open Source Software

GIS Policy for U.S. Army Installation Management:
Thursday, 9 September 2010
Jaymes Cloninger
Outline

- Government GIS Policy
- Federal Government policies and portals
- Department of Defense policies and portals
- Department of the Army policies and portals
- Army Installation Geospatial Information & Services (IGI&S) policies and portals
- Conclusion
Memorandum on Transparency and Open Government

Government should be transparent.
- “Transparency promotes accountability and provides information for citizens about what their Government is doing.”
- “Information maintained by the Federal Government is a national asset.”

Government should be participatory.
- “Information maintained by the Federal Government is a national asset.”

President Obama January 21, 2009
"The three principles of transparency, participation, and collaboration form the cornerstone of an open government."

"With respect to information, the presumption shall be in favor of openness."

"To the extent practicable and subject to valid restrictions, agencies should publish information online in an open format that can be retrieved, downloaded, indexed, and searched by commonly used web search applications."

"Within 60 days, each agency shall create an Open Government Webpage located at http://www.[agency].gov/open ..."
In January 2009, President’s Obama’s first executive action was to sign the Memorandum on Transparency and Open Government.
open.gov Executive Dashboards

"Executive departments and agencies should harness new technologies to put information about their operations and decisions online and readily available to the public"

– President Obama, March 9, 2009

Courtesy of FGDC, Ivan B. DeLoatch, Executive Director
U.S. Army Non-Classified Data Restriction Classifications:

- Public, subject to a Freedom of Information Act (FOIA) exemption;
- Non-Public, Nonpublic geospatial data may be shared for official purposes within the DoD;
- FOUO (Sensitive)
- Geological & Geophysical (Sensitive)
- Unclassified Controlled Nuclear Information

- Very limited geospatial data available for the Department of Defense (DoD);
- Main reason is that “public” data used within the DoD is not derived from DoD
- Most DoD-authored data falls under FOIA Exemption Numbers 2 or 9
What’s Happening Now?

- More collaboration and participation with the public
- Social interaction and discussion
- Implementation of new technologies (e.g. outbound web services, service catalog and RSS feeds)
- Centralized metadata authoring / management
- More Data visualizations
- Mash-ups and applications from the data on Data.gov
- Linked Open Data

Courtesy Jerry Johnston PhD, US EPA GIO
Data.gov Catalogs

Use the Data.gov catalog below to access U.S. Federal Executive Branch datasets. Click on the name of a dataset to view additional metadata for that dataset. By accessing the data catalogs, you agree to the Data Policy. Data.gov offers data in three ways: through the "raw" data catalog, using tools and through the geodata catalog. The "Raw" Data Catalog provides an instant download of machine-readable, platform-independent datasets while the Tools Catalog provides types of links which may lead to agency tools or agency web pages that allow you to mine datasets.

Name (click for metadata and to rate tool) | Rating | Category
--- | --- | ---
OLG Analog Derived Lightning Data Set | ☀☀☀☀☀ | Atmospheric and Climatic
DMSP Total Ozone, Calibrated Radiance and Total Ozone Grid Point Data Archived at NCDC | ☀☀ | Atmospheric and Climatic
Idaho Elevation | ☀ | Atmospheric and Climatic
SSMI Pathfinder ocean wind speed level 2 (NOAA, NASA, NSPO, World), Product R004 | ☀ | Atmospheric and Climatic
SSMI Pathfinder gridded ocean wind speed level 3 (NOAA, NASA, NSPO, World), Product R004 | ☀ | Atmospheric and Climatic
SSMI Derived Global Ocean Surface Wind Components (Atlas et al.) Product R070 | ☀ | Atmospheric and Climatic
recovery.gov

- Select a State to zoom to the region
- View locations of Contracts, Grants, Loans
- Filter by type, agency, amount
- Select a site to view award summary information
“In almost all cases, OSS meets the definition of ‘commercial computer software’ and shall be given appropriate statutory preference”

“Since OSS typically does not have a per-seat licensing cost, it can provide a cost advantage in situations where many copies of the software may be required, and can mitigate risk of cost growth due to licensing in situations where the total number of users may not be known in advance.”
Open Technology Development Roadmap Plan” – Apr 2006

Three goals:
1. Leverage open source infrastructure and technologies
2. Apply open source collaborative technologies
3. Change the default acquisitions and development behavior to default to technology services vs. products

Implementation strategy:
Crawl: Open standards, interfaces, data
Walk: Open source & concept methodology
Run: Service/DoD/Industry source repositories
“DoN commands will treat OSS as COTS when it meets the definition of a commercial item... This will allow the DoN to utilize ass throughout the enterprise when acquiring capabilities to meet DoN business and warfighter requirements.”
DoD Open Government

* Office of the Secretary of Defense/Joint Staff Freedom of Information Act (FOIA) Logs
* Federal Voting Assistance Program
* Service Member Demographic Data

No geospatial data available yet.
DISDI Portal

Defense Installation
Spatial Data
Infrastructure

- Limited content; planning level views
- Federated (distributed) architecture
- Data accessed from Service holdings and Federal sources
- Data available to any user within the DoD
Forge.mil enables collaborative development and use of FOSS and DoD community source software behind the DoD firewall.

- Multinational Information Sharing
- Private Project Collaboration

Goal is to enable rapid development and deployment of DoD products and services on the Global Information Grid (GIG).
U.S. Army IGI&S Program
Use of ‘open source’ software (for example, Red Hat Linux) is permitted when the source code is available for examination of malicious content, applicable configuration implementation guidance is available and implemented, a protection profile is in existence, or a risk and vulnerability assessment has been conducted with mitigation strategies implemented with DAA and CCB approval and documentation in the C&A package. Notify RCIOs and the supporting RCERT/TNOSC of local software use approval.”
Installation Geospatial Information & Services

Army Regulation 115-x, draft

“All installation, garrison, region and virtual installation geospatial data is Army data.”

“Army Mapper data will be readily accessible, available and secure for all authorized users when they need it.”
“The Army’s goal is to preserve geospatial data in persistent formats that will enable access to authentic geospatial data indefinitely into the future. An ideal persistent format would be self-describing and validating in accordance with open, nonproprietary standards.”

“The system must accommodate geospatial data regardless of data type or format.”
IGI&S Program Drivers

**EO 12906** – Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure
Purpose: Through coordination with the National Spatial Data Infrastructure (NSDI), all spatial (GIS and CADD) data will be *shared to avoid wasteful duplication* and that the data is effectively and economically managed. All federal agencies are required to participate in the NSDI as per this Executive Order.

**OMB A-16** – Coordination of Geographic Information and Related Spatial Data Activities
Purpose: Provides guidance for federal agencies that create, maintain or use spatial data directly or indirectly through the establishment of NSDI and the Federal Geographic Data Committee (FGDC). The Revised version discusses the need for all federal agencies to *coordinate and share* geospatial data.

**DoD Directive 8320.2** – Data Sharing in a Net-Centric Department of Defense
Purpose: Discusses the need for *coordinating, sharing, and integrating data* across DoD.

**Defense Installation Spatial Data Infrastructure (DISDI) Memo** – Installation Geospatial Information and Services Guidance
Purpose: Describes how strategies and standards for IGI&S will be coordinated across DOD and that IGI&S shall conform to SDSFIE standards and have appropriate metadata.

Bottom Line: These Drivers Direct Data Sharing and Data Standardization
Army Mapper

Available at: https://mapper.army.mil

- Enterprise solution for geospatial data management, viewing, mapping, and analysis
- Platform for migration of existing Armysystems and tools
- Web mapping services for data sharing across the Army and DoD
# Army Mapper Components

<table>
<thead>
<tr>
<th>Army Mapper Web Map Viewer</th>
<th>Army Mapper Desktop Tools</th>
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<tbody>
<tr>
<td>• Supports broad user base - no GIS training required</td>
<td>• Provides ESRI ArcGIS, Bentley Microstation, ERDAS via the web; no desktop software installation and maintenance required</td>
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<tr>
<td>• Access to common data for all integrated installations</td>
<td>• No current FOSS4G Desktop tools available</td>
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<tr>
<td>• Interactive navigation and data display</td>
<td>• Users can save/retrieve map documents and design files, perform standard functions, add-in toolboxes, and use</td>
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<tr>
<td>• Buildings query within an installation</td>
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<tr>
<td>• Platform to host business tools</td>
<td></td>
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<tr>
<td>• Currently MapServer and ArcGIS Server versions</td>
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**Army Mapper Web Map Viewer**

![Web Map Viewer Screenshot](image1.png)

**Army Mapper Desktop Tools**

![Desktop Tools Screenshot](image2.png)
DoD Business Enterprise Architecture

Guiding Principles:

“Support Use of Open Source Software: The BOE will use open source software solutions on an equal footing with regular commercial offerings, with due consideration given to support and proven reliability. This will allow DoD to realize benefits in cost and source availability that can come from open source software.”

Standard Data Services across the Business Mission Area:

A key aspect of the BMA Federation Strategy is the establishment and utilization of service-oriented architecture (SOA) at the Enterprise level.
Spatial Data Standard for Facilities, Infrastructure and the Environment (SDSFIE)

- Initially built as graphical standards for CAD/GIS in 1993 for Intergraph Modular GIS Environment (MGE) and later ESRI ArcInfo (Browser & Generator);
- Currently SDSFIE 2.6.1 is a physical data model (PDM), with 1585 features;
- Managed by the Defense Installations Spatial Data Infrastructure (DISDI) Group and the U.S. Army Corps of Engineers;
- Re-engineered SDSFIE 3.0 will be an “adaptable” logical data model (LDM), tailored to defense business requirements with approximately 220 features;
- SDSFIE 3.0 will become enterprise data standard in DoD BEA;
- At v3.0 will become an integral part of the National System for Geospatial-Intelligence (NSG).
SDSFIE 3.0

What is Adaptation?

Adaptation allows authorized users or organizations to tailor the SDSFIE to their mission needs while remaining compliant. Adaptation will be accomplished using the web-based tool to be available starting with once SDSFIE 3.0 is released. The process of Adaptation involves profiling and extension.
Geospatial Data Layer

Quality Assurance Plans (QAP)

- Features definition, category codes, and descriptions of features to be included in a particular feature class
- How features should be represented geographically
- The minimum frequency at which a data layer must be validated
- Potential source materials used in creating or maintaining the data layer
- Where the data layer should reside within SDSFIE
- Required attribute fields populated and their acceptable values
- Applicable business systems
- Steps utilized to validate the data layer
Why are GDL QAPs Needed?

- **Reduce Attribute Variance (i.e. Installation ID = 27682 vs. Camp Swampy)**
  - Specifies required attributes
  - Provides acceptable values
  - Provides an attribute example

- **Identify Acceptable Sources of Data (Survey vs. Hard Copy Digitization)**
  - Identifies a ranking of preferred sources

- **Minimize Redundant Data Collection**
  - Specifies office in charge of data collection
  - Identifies Headquarters Business Systems (Authoritative Data Sources) that already contain the data elements

- **Increase Data Sharing for Informed Decision Making**
  - Data will be able to be aggregated into a single database without costly standardization
Successes

The only Military Service in U.S. DoD with a vendor neutral platform – More data editors than all of the other military services using at least 4 different Desktop GIS platforms

Implemented MapServer and OpenLayers with the support of US Army Corps of Engineers, Mike Smith et al

“Open Source technology may be changing the relationship between democracy and expertise, affording an opportunity to improve competence by making good information available for better governance.” (Census 2010, whitehouse.gov)
Challenges

People actually have to review the code and the data.
- More contributors, more review – who is reviewing? Are they qualified?

CoN (Certificate of Networthiness) & Certification & Accreditation - Federal regulations require all applications to be certified as being compliant with information technology (IT) security requirements.

Contracting Office Unfamiliarity with FOSS4G
Vendor/Service Provider Unfamiliarity with FOSS4G

The Army’s World
- 1626 sites
- 13,652,096 acres
- 148,102 buildings
- $208,215,642,721.10 Plant Replacement Value
Opportunities

The economic reality requires rethinking how software, systems, architecture and data are acquired and maintained – DoD budget for R&D virtually frozen for the next few years. *Spend less and get more.*

Industry-wide acceptance of open source solutions - Government is typically several years behind commercial interests, however when the Government jumps in, it makes a big splash

All of DoD moving toward a more data-intense environment

DoD BEA hints at a purple horizon

"Instilling habits of restraint, of subtracting as well as adding, of elevating affordability on a par with desirability, is a project of years in the making.” - Defense Secretary Robert Gates, August 10, 2010
Conclusion

DoD and Federal Government have adequate standards in place – current standards pave the way for more openness.

Open Data is a challenge in the DoD – the first step is data sharing between data stewards and data consumers.

Desktop GIS Users in DoD are a large community with deep roots.

Open Architecture (within the Army) is one possibility for better coordination between Army Mapper and installation personnel.

**The best way to maintain high quality installation management data is by sharing it with as many business users as possible.**

Government procedures and policies are not enough – it takes people.