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# Federal Agency Guidance for Modules 2 and 3 of the Geospatial One Stop Initiative

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## **Introduction**

The President's Management Council has sponsored Geospatial One-Stop as one of 24 electronic-government initiatives to enhance government efficiency. Geospatial One-Stop will build on investments already made to develop a National Spatial Data Infrastructure to encourage greater collaboration and coordination in the use of Geospatial information technologies across all levels of government. The project will ensure that federal Geospatial investments support the applications and business activities of all levels of government.

Geospatial One Stop consists of five modules:

- 1- data standards and cost benefit analysis,
- 2- inventory and documentation of existing framework data,
- 3- inventory and documentation of planned acquisition data,
- 4- establishment of high-quality mapping and map data services, and
- 5- an information portal to locate and access services and data.

More information on the One-Stop project plan is available at:  
<http://www.geo-one-stop.gov/>.

The purpose of this document is to provide guidance to federal agencies to respond to the requirements of Modules 2 and 3 of the Geospatial One Stop Initiative. Federal data holdings and proposed data acquisitions or investments are addressed in the first phase of this guidance. Geospatial One-Stop encourages State and local governments to include their framework data holdings and will forward information regarding their participation in the second phase.

Executive Order 12906 and the statutory requirements addressing federal agency responsibilities to document their data assets and planned data acquisitions as information technology procurements and investments are found in **Appendix A, Background**.

## **Process Steps**

The following describes the processes and tasks to be addressed by federal agencies in order to meet the goals for this initiative.

## **Module 2- Inventory and documentation of existing framework data:**

### Inventory-

A data inventory contains an assessment of an agency's data resources. The inventory serves as an index of the data's production date, quality, geographic coverage, responsible party, etc. and serves as base information for metadata. Many agencies use data inventories as the starting point for metadata creation programs. Executive Order 12906 states that all data created nine months from signing (April 1994) will be documented through metadata. Data developed prior to January 1994 falls under the category of "legacy data", and should be documented in the following order: data critical to agency's mission, data with significant demand, and other data. Those data critical to the agency's mission and with significant demand should receive priority in the agency's metadata plan. Data sets in the "other" category should have metadata created as practicable. Additionally, metadata for older data may not have a full robust content due to information loss over the years but should, however, be as complete as possible.

Many agencies use geospatial data from other data sources that are then minimally augmented prior to integration with data developed by the agency. Examples of such activities such are merging files or tiling images. The metadata requirement for data layers resulting from minor augmentation, in the past, has been an agency determination. At this time, continue with your agency's protocol.

Those agencies creating FGDC metadata but posting to sites other than a NSDI clearinghouse are reminded that EO12906 states that metadata is to be made electronically accessible to the NSDI clearinghouse network.

(<http://www.fgdc.gov/publications/documents/geninfo/execord.html>).

Methodology for participating in the Clearinghouse Network is available at:

<http://www.fgdc.gov/clearinghouse/tutorials/howto.html>

### Documentation-

The FGDC encourages federal, state, tribal, and local governments to create and maintain fully compliant metadata to maintain the organization's internal investment and to provide access to a publicly vested resource, geospatial data. Most federal agencies currently use metadata software to both create metadata and post metadata to an NSDI Clearinghouse node. In the case where an agency has not implemented a metadata inventory and document program, the Geospatial One Stop will provide a minimal content on-line metadata entry page. The on-line metadata interface creates FGDC minimally compliant metadata and will not fully describe the data. The metadata created with this tool is intended only as a temporary substitute to meet the temporal requirements of Module 2. A complete and robust metadata is to be posted by agencies on their respective clearinghouse nodes and thus replacing the temporary metadata posted to Geospatial One Stop.

The metadata entry page is currently in development for the Geospatial One Stop website (<http://www.geo-one-stop.gov/>). The tool's resulting records will be temporarily maintained by the FGDC and the application eventually moved to the Geospatial One Stop Portal.

**Appendix B:** Module 2 Data Dictionary. This appendix contains the non-CSDGM data elements and domain dictionary for Geospatial One Stop Module 2 on-line tool. The on-line tool links the element names to the FGDC-CSDGM document for definitions, etc.

**Appendix C:** Data Inventory Sheet (example). In the case of non-existing framework theme metadata one may query data creators using questions such as those provided in Appendix C. The content of this example should be aligned with the agencies geospatial mission. This inventory can assist in the development of minimal content metadata recorded in the on-line metadata creation tool for Module 2. Remember, metadata created in the Module 2 on-line metadata tool must be replaced with a detailed metadata at a later date.

#### Framework Data Access-

Geospatial One Stop Portal website (and eventually the Portal) will implement a search interface to query those FGDC registered federal clearinghouses hosting framework data from the extended FGDC Clearinghouse node registry. The interface will only select Clearinghouse Nodes that are "flagged" as holding framework theme data. Framework theme data are classified as: Digital Orthoimagery, Cadastral Data, Geodetic Control, Elevation, Hydrography, Transportation, and Government Units.

Clearinghouse administrators are requested to use the "Modify" function in the NSDI Clearinghouse Registry (<http://registry.fgdc.gov/registry/>) to "flag" their sites as providing framework content data. In addition, the individual FGDC metadata records maintained by organizations that describe framework data content must also include special theme keywords to be made readily discoverable in the Clearinghouse. Instructions on inserting this thematic information into metadata are provided in **Appendix D**.

The One Stop Clearinghouse interface will include a notice indicating the data discovered through the interface may not meet Geospatial One Stop data standards, until such time as the standards are approved. Once the One Stop data standards have been approved, agencies will then certify if their data is conformant with Geospatial One Stop data standards, and will note such conformance in their online metadata

## Module 2 Performance Requirement:

All framework category data has completed metadata that is accessible and searchable through the NSDI Clearinghouse Network.

OMB Circular A-11 requires all federal data sets with a replacement value exceeding \$1 million be documented in FGDC metadata and the metadata be posted on a NSDI clearinghouse node by February 10, 2003.

## **Module Three- Inventory and Documentation of Planned Data Collection Activities: Geospatial One Stop Market Place**

Module 3 requires agencies to inventory and document all FY-04 proposed data collection activities funded at \$1 million and greater. Any proposed geospatial data collection project with budgets less than this threshold that could benefit from partnered funding should still consider posting their planned project information. However, agencies should focus on documenting activities funded at \$1 million and greater at the initial rollout of this project.

Module 3 Market Place information extends the metadata content found in Module two. Module 2 information is extended by information regarding data investment:

- Type of funding
  - Incremental
  - Recurring
  - Other
- Costs
  - Projected
  - Budgeted
  - Other
- Partnered funds
  - Partner Agency
- Timing
  - Estimated start date
  - Projected completion date

A web-based entry form for planned data acquisition is under development for Geospatial One Stop and once completed will be found at <http://www.geo-one-stop.gov/>. The entry form allows entry of project information (geographic extent, scale, etc); project contact, and estimated investment or the planned acquisition's estimated dollar value. The creation of web searchable information on planned acquisitions will produce a project "Market Place" to attract project partners and to leverage funds.

Agencies utilizing project management applications will be able to upload XML or comma-delimited project metadata documents into Geospatial One Stop.

Specific instructions for preparing documents for uploading will be issued in a later document.

Agencies not using project management software may use the on-line-information entry page to document the agency's projects. The on-line tool will allow the user to reuse contact information fields for subsequent project documentation. Submitted metadata will be parsed to assure completeness.

A search interface provides users with a simplified search capability. Searches may be performed by agency, geography, and keyword.

Module 3 will undergo further development to meet user needs. One planned feature would allow exporting completed projects information into an XML tagged files. The exported file may be imported into a metadata creation tool for additional documentation.

Module 3 Performance Requirement:

All FY04 data collection activities, in excess of \$1 million, are documented using the metadata described in Appendix C and the corresponding metadata is accessible and searchable in the NSDI Clearinghouse network by February 10, 2003.

Appendix E: Data Dictionary: Module 3- contains a data dictionary and the domain definitions Module 3 which is an extension of Module 2.

## **Appendix A- Background**

The following provides brief descriptions and excerpts from Executive Order 12906 and statutory requirements addressing federal agency responsibilities to document their data assets and planned data acquisitions as information technology procurements and investments.

Executive Order 12906 requires federal agencies or project partners to create digital geospatial data and statistical databases, at the agencies discretion, to create FGDC-compliant metadata and subsequently post the metadata on an NSDI Clearinghouse node for those projects funded in whole or in part with federal funds. Section 6 explicitly addresses data acquisition and underpins Module 3 as follows:

Section 6. Partnerships for Data Acquisition. The Secretary, under the auspices of the FGDC, and within 9 months of the date of this order, shall develop, to the extent permitted by law, strategies for maximizing cooperative participatory efforts with State, local, and tribal governments, the private sector, and other nonfederal organizations to share costs and improve efficiencies of acquiring geospatial data consistent with this order.

OMB Circular 119 Revised OMB Circular A-119 establishes policies on federal use and development of voluntary consensus standards and on conformity assessment activities. Pub. L. 104-113, the "National Technology Transfer and Advancement Act of 1995," codified existing policies in A-119, established reporting requirements, and authorized the National Institute of Standards and Technology to coordinate conformity assessment activities of the agencies.

The Clinger-Cohen Act of 1996 (CCA) requires federal agencies to focus more on the results achieved through IT investments while streamlining the federal IT procurement process. Specifically, this act introduces increased rigor and structure into how agencies approach the selection and management of IT projects. Among other things, the head of each agency is required to implement a process for maximizing the value and assessing and managing the risks of the agency's IT acquisitions. Specific sections of the Clinger-Cohen Act, related to IT investments include:

CCA 5112(b) - The Director, Office of Management and Budget (OMB), is to promote and be responsible for improving the acquisition, use, and disposal of IT to improve the productivity, efficiency, and effectiveness of federal programs.

Government Performance and Results Act of 1993 (Public Law 103-62)

The Government Performance and Results Act (GPRA) requires agencies to set goals, measure performance, and report on their accomplishments. An agency's IT investments should directly support the accomplishment of these goals.

OMB Circular A-11 provides detailed instructions and guidance on the preparation and submission of agency budget requests and related materials, including program performance information. Part 2 of the circular provides specific instructions on the preparation and submission of agency strategic plans, as required by GPRA. Part 3 provides guidance on the planning, budgeting, and acquisition management of major fixed assets and requires agencies to provide information on all major fixed asset projects included in their budget submissions to OMB.

#### Section 51.13 Geospatial data acquisitions

Agencies must provide a list of all geospatial data acquisitions budgeted for FY 2004 that are greater than \$1 M for a specific program. For each budget request, indicate whether or not the planned data buy will be in accordance with approved Federal Geographic Data Committee (FGDC) data standards. If the data buy will not be consistent with an approved FGDC standard, you must explain why not. You must also document whether the planned buy will be processed by a major system listed on the agency information technology investment portfolio (see Exhibit 53).

In February 2003, agencies must post information on all geospatial data acquisitions in excess of \$1M planned for FY 2004 on the FGDC clearinghouse, characterized using the FGDC metadata standard, taking care to specify the geographic area and scale to which the data layer is proposed to be collected.

Further, A-11 states:

All agencies currently owning geospatial data whose replacement value is in excess of \$1 mil shall characterize that data using applicable metadata as specified by FGDC

OMB Circular A-16, Revised August 19, 2002- provides for improvements in spatial data coordination and for the use of geographic data. Spatial data refers to information about places or geography, and has traditionally been shown on maps. This Circular promotes the effective and economical use and management of spatial data assets in the digital environment for the benefit of the Government and the Nation. A-16 Appendix E provides a list of NSDI data themes and lead agencies. Lead agencies have the responsibility for coordinating the national coverage and stewardship of specific spatial data themes.

## Appendix B- Non-CSDGM data elements

Element Names	Definition	Conditional Obligation	Domain	Domain Code
<b>Language</b>	Language(s) used within a dataset	M	Character String	ISO-639-2 default English-American
<b>Date</b>	Reference date for the cited resource	M		Creation Publication Revision
<b>Scope</b>	Commonly used term to describe geographic extent of the data... such as: National, state-wide, regional, local, Western US, Coastal US, etc	M	Free Text	
<b>DatasetTopic Category</b>	Main theme of the dataset Framework themes shown in <b>bold</b>	M	Base Maps, Scanned Maps Farming Biota <b>Boundaries</b> Climatology, Meteorology Atmosphere Earth Surface Characteristics, Land Cover Economy <b>Elevation</b> Environment	200 001 002 003 004 201 005 006 007

		Geoscientific Information	008
		Health	009
		<b>Imagery and Aerial Photographs</b>	202
		ImageryBaseMapsEarth Cover	010
		Intelligence Military	011
		<b>Inland Waters</b>	012
		<b>Location</b>	013
		Oceans	014
		<b>Planning Cadastre</b>	015
		Society	016
		Structure	017
		Tourism and Recreation	203
		<b>Transportation</b>	018
		Utilities, Communication	019

	<b>Module 2 Domain Code Definitions</b>		
<b>Module 2 Data Table</b>	<b>Domain</b>	<b>Domain Code</b>	<b>Domain Definition</b>
Date	Creation Publication Revision	001 002 003	Date identifies when the resource was brought into existence Date identifies when the resource was issued Date identifies when the resource was revised
DatasetTopic Category  Framework themes shown in <b>bold</b>	Farming Biota <b>Boundaries</b> ClimatologyMeterology Atmosphere Economy <b>Elevation</b> Environment GeoscientificInformation Health <b>ImageryBaseMapsEarth Cover</b> IntellegenceMilitary  <b>InlandWaters</b>  <b>Location</b>	001 002 003 004 005 006 007 008 009 010 011 012 013 014 015	Rearing of animals and/or cultivation of plants Flora and/or fauna in natural environment Legal land descriptions Processes and phenomena of the atmosphere  Economic activities, conditions and employment Height above or below sea level Environmental resources, protection and conservation Information pertaining to earth sciences Health, health services, human ecology, and safety Base maps: land cover, topographical maps, imagery, unclassified images, annotations Military bases, structures, activities Inland water features, drainage systems, and their characteristics Positional information and services: addresses, geodetic networks, control points, postal zones and services, place names Features and characteristics of salt water bodies Information used for appropriate actions for future use of land including cadastral

	Oceans <b>Planning</b> Cadastre	016	surveys
		017	Characteristics of society and culture
	Society	018	Man-made construction
	Structure	019	Means and aids for conveying persons or goods
	<b>Transportation</b>		Energy, water and waste systems and communication infrastructure services
	Utilities Communication		

## Appendix C. Sample Data Inventory Sheet

The following is an example of a questionnaire to discover information regarding organizational data assets. The questionnaire should be edited and augmented to meet agency needs. Information acquired by such an inventory may contribute towards metadata created through the on-line metadata tool developed for Geospatial One Stop Module 2.

### Electronic Metadata Interview

1. Have you already prepared metadata for this data set?
  - a. If yes, please send a copy of the documentation or a reference to where it can be found and skip to item **17**.
2. What is the title of the data set?
3. Who is the originator(s)/ owner of the data set? (Include address and telephone number)
  - a. If someone else should answer questions about the data, please list the name, address, and telephone number.
  - b. Are there other organizations or individuals who should get credit for support, funding, or data collection and analysis?
4. Is the data set published or part of a larger publication?
  - a. If so, what is the reference?
5. Include a brief (no more than a few sentences) description of the data set.
6. Why were the data collected in the first place?
7. What is the time period represented by the data set?
8. Were the data developed primarily through:
  - a. Field visits
  - b. Remote instrumentation (*i.e.* temperature recorders, etc)
  - c. Existing data sources
9. What is the status of the data set you are documenting? – *complete, in progress, planned*
  - a. Will the data set be updated? If so, how frequently?
10. Where were the data collected? Include description and coordinates, if known.
11. List some keywords to help search for this data set.
  - a. Thematic, Place, Temporal, Strata, Taxonomy
  - b. If a controlled vocabulary was used, what is the reference?
12. List any related data sets that could be documented for cross-reference.

13. The FGDC Biological Profile includes the means to document tabular data sets, taxonomy, field methods, and the use of analytical tools or models.
- a. Was your data set developed using a model or other analytical tool?
    - i. If so, what is the reference
    - ii. If the model or tool is available include a contact and/or URL
  - b. Does the data set contain biological information? If no, skip to item **14**.
    - i. What species or communities were examined?
    - ii. Did you use a taxonomic authority or field guide for identification?
      1. If so, what is the reference?
    - iii. Briefly summarize your field methods (cut&paste from other documents!)
      1. If you used existing protocols or methods, list the references
14. Is your data set archived in a databank or data catalog? If yes, please include a reference to the documentation and skip to item **15**. If No:
- a. What measures did you take to make certain that your data set was as nearly correct as possible?
  - b. Were there any things that you excluded from your data collection? *i.e.* stems less than a certain diameter or streams without surface flow
  - c. What is the form of your data set? - *spreadsheet, ascii file, gis layer, database, other*
  - d. What is the filename for your data set?
    - i. For each file or table, list the fields in the data set and for each field list:
    - ii. The definition of the field
    - iii. If the data are coded (Enumerated Domain), list the codes and the definitions
    - iv. If the codes come from a published code set (Codeset Domain), list the reference.
    - v. If the data are measured (Range Domain), list the units and the minimum and maximum allowable values (“no limit” is acceptable).
    - vi. Otherwise, the domain is unrepresentable. Include a brief description of what is in the field
15. Is this a GIS data set? If no, skip to item **16**.
- a. Send a copy of the ArcInfo export file, an ArcView shapefile, or an ArcCatalog exported metadata file (txt or xml).
    - i. Include projection parameters, if necessary.

- b. List any source data sets you used. For each source list:
    - i. Source name, originator and publication date
    - ii. Source time period and scale
    - iii. Source presentation form and media type
    - iv. Contribution of source to your analysis
  - c. List the processing steps you used to create your data set, including the approximate date of processing.
16. Is the data set available for distribution? If no, go to **17**
- a. Are there legal restrictions on who may use the data?
  - b. Do you have any advice for potential users of the data set?
  - c. What are your distribution instructions?
  - d. Is the data set available according to open-standard access protocols such as OGC Web Map Service, Web Feature Service or Web Coverage Service? <sup>1</sup>
17. You are done. Send a text file containing the responses to this interview to your metadata coordinator.

<sup>1</sup> 16 d. Added by GOS module lead.

(Provided by George Lienkaemper, USGS Forest and Range Ecosystem Science Center).

## Appendix D: Reserved Thematic Keywords for insertion into FGDC Metadata

The following names and codes are required for use in the Theme Keyword field when describing Framework theme data. FGDC metadata permits the reference to multiple themes of information, this must be one of the thematic classifications used to expedite discovery in the Clearinghouse. The Theme Keyword Thesaurus value to be used shall be "FGDC Framework Themes."

<u>Description</u>	<u>Theme Keyword Value</u>
Cadastral	FWCADASTRAL
Elevation	FWELEVATION
Geodetic Control	FWGEODETTICCONTROL
Governmental Units	FWGOVERNMENTALUNITS
Hydrography	FWHYDROGRAPHY
Orthoimagery	FWORTHOTHIMAGERY
Transportation	FWTRANSPORTATION
Air	FWAIR FWTRANSPORTATION
Rail	FWRAIL FWTRANSPORTATION
Roads	FWROADS FWTRANSPORTATION
Transit	FWTRANSIT FWTRANSPORTATION

Example in FGDC XML format:

```
<theme>  
    <themekt>FGDC Framework Themes</themekt>  
    <themekey>FWELEVATION</themekey>  
    <themekey>FWORTHOTHIMAGERY</themekey>  
</theme>
```

<b>Appendix E- Module 3 Data Dictionary</b>					
<b>Element Names</b> Alternate ISO elements names in ( ) if different from FGDC	<b><u>Definition</u></b>	<b>Condi-tional-ity</b> <b>Obliga-tion</b>	<b>Domain</b>	<b>Domain Code</b>	<b>Information Format</b>
<b><u>/Project/ Investment Information</u></b>					
Type of funding		M	Incremental Recurring Other	001 002 998	
Costs		C	Projected Budgeted Other	001 002 998	
Partnered funds	Percentage of funds from outside reporting agency	C			
<b>/Partner/ Agency name</b>		C	Free Text		
Timing		C			
Estimated start date		C			

<u>Projected completion date</u>		C			
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<b>Module 3 Data Table</b>	<b>Domain</b>	<b>Domain Code</b>	<b>Domain Definition</b>
Type of funding			
	Incremental	001	Short term or undetermined longevity funding
	Recurring	002	Required and occurring on a consistent and long-term basis
	Other	998	
Costs	Projected	001	Total costs of the project
	Budgeted	002	Amount budgeted for the project
	Other	098	