

PLSS Standardization Decision Document

Decision Topic: Metadata

Documentation Date: January 25, 2011

***Problem/Issue Summary:***

The metadata for the NOC to distribute the standardized PLSS has to be complete metadata in each feature class and all of the look up tables.

***Decision Summary: (January 2011)***

CADNSDI -

There will be on metadata across all of the records, a national template for BLM metadata records for the PLSS.

If the data will be distributed by state would there still be individual state metadata files that would have differences for the data contacts and stewards and metadata creator and geography keywords?

The current content we have is close we just need to add all of the basic information to each feature class including keywords, process steps description and purpose.

Each feature class has to have a full complement of metadata in Arc Catalogue.

The data stewards will be responsible for updating their metadata. Initially this is going to be each state as a standard alone data set.

The looks up tables need to have a full complement of metadata as well and the National Operations Center preferred that the look up tables be imported as domains.

Coded fields need to have the codes in the metadata. For the code fields where we have an accompanying text we do not need to insert the codes into the metadata because the explanation of the code is with the data set.

Table of Contents

Version 1.0 Metadata ..... 3  
    Section One: Identification ..... 3  
    Section Two: Data Quality..... 6  
    Section Three: Spatial Data Organization Information ..... 8  
    Section Four: Spatial Reference Information ..... 9  
    Section Five: Entity and Attribute Information ..... 9  
    Section Six: Distribution Information –**This be the NOC** ..... 9  
    Section Seven: Metadata Reference –**Completed by the State Data Steward** ..... 10  
Keywords ..... 11  
Conference Call January 25, 2011 ..... 12

## Version 1.0 Metadata

The items in **Blue** will be state specific, Items in **Red** will be added by NOC at time of publishing

### Section One: Identification

**Originator** – BLM Cadastral Survey – XX Version 1.x for example BLM Cadastral Survey – CA Version 1.1. XX is the two digit administrative state name, for version numbering 1.x reflects data structure version 1 and processing version is numbered with the .x for example version 1.1.

NOTE – The originator on the citation for the Look up tables is the FGDC Cadastral Subcommittee and the version is 1.0 for the look up tables. These are national standards and will not likely be incremented.

*Citation Title* - Cadastral PLSS Standardized Data – Feature Class or Table

**Publication\_Date** - YYYYMMDD

**Title** - Cadastral PLSS Standardized Data - California

**Abstract** – This data set represents the GIS Version of the Public Land Survey System including both rectangular and non-rectangular surveys. The primary source for the data is cadastral survey records housed by the BLM supplemented with local records and geographic control coordinates from states, counties as well as other federal agencies such as the USGS and USFS. The data has been converted from source documents to digital form and transferred into a GIS format that is compliant with FGDC Cadastral Data Content Standards and Guidelines for publication. This data is optimized for data publication and sharing rather than for specific "production" or operation and maintenance. This data set includes the following: PLSS Fully Intersected (all of the PLSS feature at the atomic or smallest polygon level), PLSS Townships, First Divisions and Second Divisions (the hierarchical break down of the PLSS Rectangular surveys) PLSS Special surveys (non rectangular components of the PLSS) Meandered Water, Corners and Conflicted Areas (known areas of gaps or overlaps between Townships or state boundaries). The Entity-Attribute section of this metadata describes these components in greater detail.

**Abstract** (In each feature class and table)

This feature class is part of the Cadastral National Spatial Data Infrastructure (NSDI) CADNSDI publication data set for rectangular and non-rectangular Public Land Survey System (PLSS) data set. The metadata description in the Cadastral Reference System Feature Data Set more fully describes the entire data set.

Short description of the feature or table

**Purpose** – The CADNSDI or the Cadastral Publication Data Standard is the cadastral data component of the NSDI. This is the publication guideline for cadastral data that is intended to provide a common format and structure and content for cadastral information that can be made available across jurisdictional boundaries, providing a consistent and uniform cadastral data to meet business need that includes connections to the source information from the data stewards. The data stewards determine which data are published and should be contacted for any questions on data content or for additional information. The cadastral publication data is data provided by cadastral data producers in a standard form on a regular basis. Cadastral publication data has two primary components, land parcel data and cadastral reference data. It is important to recognize that the publication data are not the same as the operation and maintenance or production data. The production data is structured to optimize maintenance processes, is integrated with internal agency operations and contains much more detail than the publication data. The publication data is a subset of the more complete production data and is reformatted to meet a national standard so data can be integrated across jurisdictional boundaries and be presented in a consistent and standard form nationally.

**Purpose** (in each feature class and table)

The purpose of this feature class is to inform PLSS CADNSDI users on ...

**Time\_Period\_of\_Content** – Date of last update

**Currentness\_Reference** - publication date

**Publication Date** –

**Progress** - Complete

**Maintenance\_and\_Update\_Frequency** – As needed

**West\_Bounding\_Coordinates**

**East\_Bounding\_Coordinates**

**North\_Bounding\_Coordinates**

**South\_Bounding\_Coordinates**

**Theme\_Thesaurus** - FGDC Cadastral Data Content Standard and ISO 19115 Topic Category

**Theme\_Keywords** -

planningCadastre

Thesaurus

ISO 19115 Topic Category

Cadastral

Thesaurus

FGDC Data Content Standard

Public Land Survey System

PLSS

Cadastral Reference

Township  
Section  
PLSS Divisions  
PLSS Special Surveys  
PLSS Corners  
Data Steward  
Meandered Water  
Conflicted Area  
Survey System  
Subdivision  
Condominium

**Place\_Keyword\_Thesaurus:** Geographic Names Information System

NOTE: Places are not added for look up tables

**Place\_Keywords** – State Name and USA and United States

**Access\_Constraints** – none

**Use\_Constraints** – This data is for GIS and mapping purposes and is not intended to support or replace land survey data or the information provided by land survey. The version number indicates the data structure version. The .x component of the version indicates a change in the processing rules for the data. For example version 1.1 has the same data structure as version 1.0 but has used updated processing rules for generating the PLSS Special Surveys. Data content changes are NOT reflected in version numbers. The publication date and the revised data in the feature level metadata document data content changes.

*Point\_of\_Contact* - The individual or organization that is knowledgeable about the data set and should be contacted with questions.

**Contact Person**

**Contact\_Organization** BLM Cadastral Survey

*Contact position GCDB Manager*

**Address\_Type** – Indicate if this is a ‘mailing’, ‘physical’ or ‘mailing and physical’ address.

**Address**

**City**

**State\_or\_Province**

**Postal\_Code**

**Contact\_Voice\_Telephone**

• If data are available online:

*Online\_Linkage*

## Section Two: Data Quality

### Logical\_Consistency\_Report -

**PLSSIntersected** - This feature class data set is topologically structured with nodes at all intersections. Labels representing the legal land description are assigned to each land unit. Polygons may overlap in this feature class.

**Other Feature Classes** - The spatial features in this feature class were derived from the PLSSIntersected feature class. The topology rules for this feature class are re-checked after the dissolve process. The polygon edges in this feature class overlay the polygon lines in the PLSSIntersected feature class.

**PLSSPoints** - This feature class data set is topologically structured with nodes being constructed from the PLSS Points and hence points being coincident with nodes at all intersections.

### Completeness\_Report

**All Feature Classes** - This feature class represents all available geographic coordinate database (GCDB) at the time of publication. Every attempt was made to complete the rectangular Public Land Survey System (PLSS) to at least the First Division (section) level and to capture the outside boundary of non-rectangular PLSS features. Gaps or holes in the data that are known areas of conflict are presented in the ConflictedAreas feature class. If there are other gaps it is where data has not been automated, was not available from the data steward or was not of sufficient quality to be included.

### Process\_Description -

#### *PLSS Intersected*

*Process\_Step:*

*Process\_Description:*

BLM Cadastral Survey using the computational programs of either GMM or PCCS has generated the data where BLM Cadastral is the identified data steward. For both programs the first step is to compile survey input data from the best and most current survey records. Control points are identified, evaluated and entered into a control database

With GMM the survey data, measurements abstracted from survey plats, and control stations extracted from the control database are manually entered with weighting factors into GMM software. Compass rule and least squares adjustments are performed using weighting factors assigned to both control stations and survey line data, based on survey methodologies and vintage of survey.

With GMM, section subdivision is performed to achieve land unit detail to at least the forty acre (1/16<sup>th</sup>) level. Instructions for calculating non-regular and minor subdivisions are persistently stored during collection and rerun after every new adjustment in order to achieve the detail necessary to delineate all lines required for depicting federal rights, interests, restrictions, and encumbrances. Coincident lines

and lines identified as non-boundary lines are removed from the data set used for final land unit constructions. Line intersections are computed and given unique identifiers and land units are constructed.

GMM lists all coordinates produced by the compass rule and least squares adjustments and subdivision, with connectivity codes between points and compiles them into a single file for development of Geographic Information Systems (GIS) output.

With PCCS the survey data, measurements abstracted from survey plats, and control stations extracted from the control database are manually entered into the PCCS processing software. A succession of compass rule adjustments is performed on the lines to adjust them to the control points, followed by a least squares analysis. The resulting coordinates are accompanied by indications of positional reliability; the average of misclosures in the data set and the maximum misclosure in the data set.

PCCS lists all coordinates produced by the compass rule and least squares adjustments with connectivity codes between points and compiles them into a single file for development of Geographic Information Systems (GIS) output.

With PCCS, section subdivision is performed to achieve land unit detail to at least the forty acre (1/16<sup>th</sup>) level.

*Process\_Date:* Unknown

*Process\_Step:*

*Process\_Description:*

GCDB data conversion software (also called data prep) verifies correctness of GCDB file formats and content based on the polygon coding and the rules associated with those codes. Verified coordinate, line and label files are converted to GIS coverages using the topology check application. All errors in topology are flagged for editing and correction. If topological errors exist, editing of arc and node data, as well as parcel labels, is performed using either GMM or ArcGIS Interface. Final edits are entered into input files and the process is repeated until all errors are corrected and a successful GIS coverage is created. GIS coverages are edge matched with adjoining township data sets to insure a seamless PLSS data set is created. Topologically correct GIS coverages are modified to use FGDC compliant naming conventions and then loaded into the CADNSDI.

*Process\_Step:*

*Process\_Description:*

The resulting GCDB data sets are imported into a file geodatabase feature class called LADESC and the points are loaded into the PLSSCorners feature class. A series of extract-transfer-load (ETL) routines are run to import the data into the PLSS Intersected feature class. Metadata is loaded and edited.

### ***Other Feature Classes (except PLSS Points)***

*Process\_Step:*

*Process\_Description:*

This feature class is built from the PLSSIntersected feature through a series of SQL selects, dissolves and geoprocessing. The selection uses only the current PLS data

so any polygon labeled with a survey note of R (replaced) will not be used in building derived feature classes. Polygons are combined based on the attributes and rules of combination.

### ***PLSS Points***

*Process\_Step:*

*Process\_Description:*

For points with a BLM Cadastral as the data steward this feature class is built geographic coordinate database (GCDB) point files. All PLSS Points are at the nodes of line intersections and have a unique identifier as well as any applicable alias that represents the point identifier in adjoining townships or adjoining features. For points with county or state data stewards the PLSS corners are imported from geodatabase files provided by the data steward.

*Attribute\_Accuracy\_Report* - The BLM GCDB personnel using software tools such as dataprep and native GS tools in ArcGIS checked the data for attribute accuracy by verifying it against land records databases such as legal land description (LLD) and Case Status databases. There may be instances where information in survey records and LLD and Case do not agree or places where records are missing. If there are questions about the attribution of a polygon contact the identified data steward.

*Horizontal\_(Vertical) Positional\_Accuracy\_Report* -

#### ***For PLSSPoints*** -

Accuracy of the individual points contained in the PLSSPoint Feature Class that were determined using GMM software the resulting accuracy is reported with the point in the feature class. An overall statement of reliability may be provided for points that are derived from the least accurate component of the error ellipse.

Accuracy of the individual points that were determined using PCCS software a carries positional reliability factor for the average of the misclosures in the data set and the maximum misclosure in the data set.

#### ***For Polygon Feature Classes*** -

The polygon lines are built from the PLSS Points. The PLSS points should be at the nodes of the lines. The horizontal accuracy of the polygon lines is derived from the accuracy of the points at the nodes

## **Section Three: Spatial Data Organization Information**

***Direct\_Spatial\_Reference\_Method*** - Any precise method of locating the data without the use of coordinates. Includes:

- Public Land Survey System (PLSS) locations

## Section Four: Spatial Reference Information

**Horizontal\_Datum**  
**Ellipsoid\_Name**  
**Semi-Major\_Axis**  
**Denominator\_of\_Flattening\_Ratio**

### Horizontal Coordinate System (compound element)

If Geographic (Lat/Lon):

**Latitude\_Resolution**  
**Longitude\_Resolution**  
**Geographic\_Coordinate\_Units**

*or*

If Planar (projected) data:

**Planar\_Coordinate\_Encoding\_Method**  
**Abscissa\_Resolution**  
**Ordinate\_Resolution**

**Planar\_Distance\_Units** f Map Projection:

**Map\_Projection\_Name**

< **projection parameters** – *vary with Projection* >

*or*

If Grid Coordinate System:

**Grid\_Coordinate\_System\_Name**

< **coordinate system parameters** - *vary with Coordinate System*>

• Additional elements are required for data maintained using:

***Distance\_and\_Bearing\_Representation***  
***Local\_Planar\_Horizontal\_Coordinate\_System***  
***Local\_Horizontal\_Coordinate\_System***  
***Vertical\_Coordinate\_System***

## Section Five: Entity and Attribute Information

**Entity\_and\_Attribute\_Overview**

and/or

**Entity\_and\_Attribute\_Detailed\_Description**

Documentation of feature classes, Tables and attributes have been entered into the template

## Section Six: Distribution Information –**This be the NOC**

**Distributor\_Contact**

**Contact\_Organization** (*preferred*) or **Contact\_Person**

*Contact\_Position*  
**Address\_Type**  
**Address**  
**City**  
**State\_or\_Province**  
**Postal\_Code**  
**Contact\_Voice\_Telephone**  
**Distribution\_Liability**

**Section Seven: Metadata Reference –Completed by the State Data Steward**

**Metadata\_Date**  
**Metadata\_Contact**  
**Contact\_Organization** – BLM Cadastral Survey - CA  
*Contact\_Position* – BLM GCDB Manager  
**Address\_Type**  
**Address**  
**City**  
**State\_or\_Province**  
**Postal\_Code**  
**Contact\_Voice\_Telephone**  
**Metadata\_Standard\_Name**  
FGDC Content Standard for Digital Geospatial Metadata  
**Metadata\_Standard\_Version**  
FGDC-STD-001-1998

**Keywords**

The following is guidance on keywords provided by NOC. General guidance link could not be accessed from outside the BLM (1/17/2010)  
[http://web.blm.gov/data\\_mgt/guidelines/index.htm](http://web.blm.gov/data_mgt/guidelines/index.htm)

For BLM-Theme  
 Thesaurus:  
 BLM-Theme

Keyword list:

-----+-----			
Air Quality	Lands		
Climate	Minerals		
Cultural Resources	Range		
Fire	Recreation		
Fish	Riparian		
Forestry	Soils		
Framework	Special Management Areas		
Geology	Transportation		
Human Dimension	Vegetation		
Hydrography	Wildlife		
Land Use Planning			
-----+-----			

For BLM-Place  
 Thesaurus:  
 BLM-State

Keyword list:

-----+-----+-----+-----			
Alabama	Illinois	Montana	Rhode Island
Alaska	Indiana	Nebraska	South Dakota
Arizona	Iowa	Nevada	South Carolina
Arkansas	Kansas	New Jersey	Tennessee
California	Kentucky	New Hampshire	Texas
Colorado	Louisiana	New York	Utah
Connecticut	Maine	New Mexico	Vermont
Delaware	Maryland	North Carolina	Virginia
District of	Massachusetts	North Dakota	Washington
Columbia	Michigan	Ohio	West Virginia
Florida	Minnesota	Oklahoma	Wisconsin

Georgia	Mississippi	Oregon	Wyoming	
Hawaii	Missouri	Pennsylvania		
Idaho				
-----+-----+-----+-----				

This is what we use in addition to the ISO 19115 Thesaurus Topic categories name & code. (We have a list of these too)

To summarize, we do keywords in a standard way in the following order:

- 1) BLM-Theme
- 2) ISO 19915 Topic Categories
- 3) BLM-State
- 4) Theme keywords
- 5) Other Place keywords if needed (e.g. John Day Basin)

### **Conference Call January 25, 2011**

Kris  
 Nancy  
 John  
 Janelle

The metadata submitted for review on January 17, 2011 is accepted and will meet the needs of the NOC with the following corrections

1. Add information on the duplicate codes
2. Add the Look Up table names in the coded values descriptions

We also will standardize how the version names are handled.

The master metadata with the instructions on what the states need to update and what the NOC needs to update will be provided to the states and to NOC.

There will be no required changes outside of those noted in this call to meet the needs of the NOC publication of current Cad NSDI data sets.

We discussed shape files versus geodatabases briefly and also some of the future publication strategies for the NOC. These future publication strategies will need to be documented and then the metadata needs addressed.