



Theme Strategic Plan for Cadastral Data

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Theme Lead Agency: Bureau of Land Management (BLM) - Cadastral Survey/Geosciences

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NGDA Datasets in ***Cadastral Data***:

'Theme Name' NGDA Dataset	Dataset Manager Agency
U.S. Army Corps of Engineers Civil Work Land Data	DOD-USACE
BIA Indian Lands Dataset (Indian Lands of the United States)	DOI-BIA
Public Land Survey System (PLSS) Dataset Catalog	DOI-BLM
Department of Defense Land Parcels and Sites	DOD-AT&L
BLM National Surface Management Agency: Area Polygons, Withdrawal Area Polygons, and Special Public Purpose Withdrawal Area Polygons	DOI-BLM
FS National Forest Dataset (US Forest Service Proclaimed Forests)	USDA-USFS
FWS Interest	DOI-FWS
NPS National Parks Dataset	DOI-NPS
Outer Continental Shelf Active Renewable Energy Leases	DOI-BOEM
Outer Continental Shelf Block Aliquots	DOI-BOEM
Outer Continental Shelf Lease Blocks - Alaska Region NAD83	DOI-BOEM
Outer Continental Shelf Lease Blocks - Atlantic Region NAD83	DOI-BOEM
Outer Continental Shelf Lease Blocks - Gulf of Mexico Region NAD27	DOI-BOEM
Outer Continental Shelf Lease Blocks - Pacific Region - West Coast NAD83	DOI-BOEM
Outer Continental Shelf Official Protraction Diagrams - Alaska Region NAD 83	DOI-BOEM
Outer Continental Shelf Official Protraction Diagrams - Atlantic Region NAD 83	DOI-BOEM
Outer Continental Shelf Official Protraction Diagrams And Lease Maps - Gulf Of Mexico Region NAD27	DOI-BOEM
Outer Continental Shelf Official Protraction Diagrams - Pacific Region - West Coast NAD 83	DOI-BOEM
Protected Areas Database of the United States (PAD-US) - Combined: Version 1.4	DOI-USGS

The data set managers for these themes have been contacted to participate in this plan.

This plan does not intend to duplicate the existing and ongoing agency mission, goals, and work plans. Many agencies have cadastral and land related activities as part of their normal course of business. Because the cadastral data are maintained across many land management agencies, the data sets that individual agencies maintain for their business operations are identified by agency in Goal 4. The offshore cadastral data sets objectives and actions are listed in Goal 3. In other objectives action items that are specific to an agency's normal course the agency is indicated in parenthesis. This plan has 6 goals.

Goal 1: *Cadastral Reference - Including the Public Land Survey System (PLSS) and Others*

Goal 2: *Public Lands Surface Agency Management*

Goal 3: *Federal Subsurface Management Areas - Including offshore and continental*

Goal 4: *Land Management Agency Coordination*

Goal 5: *Parcel Data - Including Federal Rights and Interests and coordination of non-federal data sets*

Goal 6: *Coordination*

Goal 1: Cadastral Reference - Including the Public Land Survey System (PLSS) and Others

Identify state and federal data stewards for Cadastral Reference, coordinate and support the effective collection and maintenance of the Cadastral Reference National Geospatial Data Asset (NGDA) Datasets, facilitate sharing and data availability socialization of the Cadastral Reference data sets, and provide outreach and communication mechanisms for data stewards.

Accomplishments:

- Completed 29 of 30 standardized PLSS data sets and published link to existing standardized cadastral reference data on data.gov.
- Commercial off the shelf package (Esri Parcel Fabric has been selected for cadastral reference maintenance. This eliminates the need for custom programming and makes maintenance and publication tools accessible for all data stewards.
- Completed PLSS maintenance and publication training materials including an established CadNSDI You Tube channel and publication of supporting materials on nationalcad.org web page.
- Established a PLSS editing and maintenance community forum on GeoNet.

Objective 1.1 Complete PLSS Data Steward Program

A commercial off the shelf software package has been selected for PLSS maintenance and publication. This objective is to complete the identification of data stewards(s) for all 30 PLSS states including edge matching at state boundaries, publication schedule, shared custodianship, if needed, and feedback and socialization.

Anticipated Outcomes. *Maintained PLSS data sets for all 30 public domain states, updated at least annual as needed, establishing a single authoritative PLSS data set for each state.*

Action 1.1.1 *Continuous update of PLSS data sets (BLM Cadastral Survey)*

Action 1.1.2 *Publish updates of PLSS data to NGDA services*

Objective 1.2 Complete non-PLSS Cadastral Reference Data Set Definitions

Using the same commercial package as the PLSS, develop, review, and adopt a cadastral reference system for each of the 20 non-PLSS states.

Anticipated Outcomes. *Maintainable published cadastral reference data set for each of the 20 non-PLSS states with data documentation.*

Action 1.2.1 *Establish a non-PLSS cadastral reference Geonet community*

Action 1.2.2 *Develop and socialize draft non-PLSS cadastral data set to gather input from non-PLSS data stewards.*

Action 1.2.3 *Finalize non-PLSS cadastral reference data set with documentation and publish to nationalcad.org*

Objective 1.3 Complete cadastral reference supplemental training materials.

Anticipated Outcomes. *Educational videos published on the CadNSDI You Tube channel and supporting materials provided on nationalcad.org web page.*

Action 1.3.1 *Create videos and publish to You Tube Channel (BLM Cadastral Survey)*

Action 1.3.2 *Write supporting documentation and videos and publish to nationalcad.org (BLM Cadastral Survey)*

Goal 2: Public Lands Surface Agency Management

Coordinate with the US Geological Survey (USGS) in developing the Protected Areas Database of the US (PAD-US), a representation of federally owned lands and management designations. Provide BLM managed surface lands updates to PAD-US, while continuing to develop the land title and land records based data set for the Surface Management Agency (SMA), support the publication of PAD-

US database and data sets to NGDA services, facilitate sharing and data availability socialization of the SMA and PAD-US information, and provide outreach and communication mechanisms for data stewards.

Accomplishments:

- Coordinated with the FGDC National Boundaries Group (NBG) to establish the former Cadastral Federal Parcels Working group as the Federal Lands Working Group under the NBG.
- Participated in NBG meetings and Federal Lands Working Group.
- Adopted the PAD-US as an interim best representation of the SMA. BLM continues to provide the BLM managed lands to PAD-US. Over time the BLM will evolve and extend the SMA data set to reflect federal rights and interests, land title documents, and chain of title (status). Acknowledging the value and content of the PAD-US reduces duplication and provides a valuable interim product. The timeline for completing the SMA reflecting federal rights will depend on available resources.
- USGS has identified the short term and long-term customer needs for PAD-US as well as a sustained maintenance workflow.

Objective 2.1 *Standardize BLM Submissions to the PAD-US*

PAD-US is working with all federal land agencies as well as state and non-governmental agency data stewards (Trust for Public Lands, Ducks Unlimited, The Nature Conservancy, etc.) to compile an annual representation of public open space and other protected areas.

Anticipated Outcomes. *An automated and consistent workflow and data submission for PAD-US updates on an annual basis from BLM National Operations Center (NOC).*

Action 2.1.1: Document data submission requirements for BLM State Offices

Action 2.1.2: Review current BLM land management (SMA) data sets, update and maintenance and submission procedures. Identify a BLM lead office for coordination and submissions.

Action 2.1.3: Identify sources in BLM records systems and GIS data for submissions

Action 2.1.4: Develop data extraction tools and deploy in BLM State Offices to provide for BLM managed lands data in the PAD-US schema, in coordination with USGS.

Activity 2.1.5: Document and adopt an authoritative geodatabase submission process from BLM to USGS for PAD-US to provide a sustainable and institutionally acknowledged submission workflow.

Objective 2.2 *Complete, maintain, and distribute the authoritative PAD-US. The US Geological Survey (USGS) Gap Analysis Program is the lead for this data set and this objective. Anticipated outcomes require the provision of additional resources through partnerships and / or new investment. This objective is directly related to and coordinated with the Governmental Units Strategic Plan - Objective 3.3 - The Federal Lands Subgroup (FLS) develops a data standard and the organizational strategies for federally managed lands. Action items identified here reflect the cadastral component of this multi-agency data set.*

Anticipated Outcomes. *A complete inventory of all public open space and other protected areas available by 2020 to support conservation, recreation and public health assessments, planning, research, policy and management.*

Action 2.2.1 Federal data: Automate federal land updates and improve quality (completeness, attribute compatibility, overlaps) in PAD-US, by providing agencies with the tools and guidance needed to submit authoritative data in the PAD-US format, through actions of the NBG FLS.

Action 2.2.2 Resources: Increase the resource base needed to fully support PAD-US and National Conservation Easement Data (NCED) development through matching and / or financial contributions.

Action 2.2.3 State data: Complete the state and local / regional land inventory and improve attributes. Collaborate with federal or state agencies and non-government organizations (NGOs) to “catch up” to complete the inventory.

Action 2.2.4 State lands leadership: Coordinate and lead the PAD-US State Data Steward Network through a new State Lands Working Group (SLWG) under the NBS Charter.

Action 2.2.5 Build state capacity: Maintain authoritative annual state updates by provisioning additional resources, through matching partnerships and/or new investors, to build the PAD-US State Data Steward Network community.

Action 2.2.6 Agency name database: This action is identified in the Governmental Units Theme Strategic Plan - See Objective 3.3 Action 3.3.4.

Action 2.2.7 Biodiversity Measures: Review and improve biodiversity measures in the PAD-US geodatabase (GAP Status Code, IUCN Category) for federal and state lands.

Action 2.2.8 Design: Implement the “Version 2” series of PAD-US, with improved data base structure (to better manage overlaps), core technology and data standard.

Action 2.2.9 Outreach: Host PAD-US overview and technical support webinars for data stewards and users.

Goal 3: Federal Subsurface Management Areas - Including offshore and continental

There are two federal agencies responsible for federal subsurface rights management, the BLM on continental lands and Bureau of Ocean and Energy Management (BOEM) for offshore lands. Develop an effective aggregation and publication of BLM subsurface records and coordinate with BOEM offshore subsurface records, facilitate sharing and data availability socialization of the Subsurface Management Areas data sets, and establish ongoing coordination mechanisms.

Objective 3.1 *Develop an onshore (continental) nationwide federal subsurface rights data set. Establish the standards of achievement in terms of a proportionate improvement in the existing condition. Objectives should be specific, measurable, audience- or issue-directed, realistic, and time-bound.*

Anticipated Outcomes. *A nationwide data set that delineates lands where there is a federal interest in the minerals or other subsurface continental or onshore resources.*

Action 3.1.1: *Develop a core or essential data set content for subsurface rights.*

Action 3.1.2: *Identify the source data and quality of source data for a national subsurface data set*

Action 3.1.3: *Develop sample or pilot data sets for eastern (non-PLSS) and western (PLSS) and Alaska data sets and distribute for review and feedback.*

Action 3.1.4: *Complete a first draft of a nationwide subsurface interests data set with quality and source indicators and identify deficiencies for updates and enhancements.*

Objective 3.2 *Develop an offshore nationwide federal subsurface rights data set for publishing and access through the NGDA services. This effort is the responsibility of BOEM. The following are the NGDA data sets and activities.*

Anticipated Outcomes. *A nationwide data set that delineates lands where there is a federal interest in the minerals or other subsurface offshore resources*

Action 3.2.1: Import NAD27 Outer Continental Shelf (OCS) Lease Blocks for the Gulf of Mexico Region into geodatabases and publish.

Action 3.2.2: Generate and publish WGS84 OCS Lease Blocks and Official Protraction Diagrams of the principal islands of Hawaii.

Action 3.2.3: Update Official Protraction Diagrams to reflect the 200 nautical mile boundary (Exclusive Economic Zone boundary).

Action 3.2.4: Generate and publish WGS84 OCS Leases Blocks and Official Protraction Diagrams of Guam and the Northern Mariana Islands.

Action 3.2.5: Generate and publish NAD83 Official Protraction Diagrams of Puerto Rico and the U.S. Virgin Islands.

Action 3.2.6: Generate NAD83 OCS Lease Blocks for Extended Continental Shelf areas.

Goal 4: Land Management Agency Coordination

Provide coordination with other land management agencies and support collection, maintenance, standardization, access, and publication within the scope and responsibilities of A-16. The objectives and action items are identified and are the responsibility of the lead agency listed in the objective.

Anticipated Outcomes. *Coordination with other federal and tribal land management agency to support standardization and access to published data sets. This goal is NOT intended to interfere with any agencies internal programs and missions. This goal aimed at providing advice on possible maintenance solutions that have been successful, providing guidance on data contents and standardization for published or public data that can be shared beyond the internal agency, and supporting vertical integration (common points of control) across and between agency common boundaries.*

Objective 4.1 National Park Service (NPS)

NPS is committed to providing regular updates to the best available geospatial data representing both the legislative boundary and parcel ownership information for all park system areas. NPS will continue efforts to improve the maintenance and standardization of this authoritative data in support of efforts like the Protected Areas Database for the US (PAD-US) and, over time the land title based SMA. NPS will continue to actively participate in inter-agency groups whose goal is to improve communication and coordination of multi-agency cadastral data.

Accomplishments: NPS has created translation software in order to facilitate inclusion of their authoritative boundary and ownership data into PAD-US. NPS worked with the Fish and Wildlife Service (FWS) to extend this capability to them. This inter-agency coordination made both NPS and FWS translators more consistent and the data more efficiently incorporated by the USGS Gap Analysis Program.

Action 4.1.1: NPS will continue to publish a national set of NGDA boundaries on Geoplatform.gov along with a data collection record containing links to ownership data layers and park specific metadata for each individual NPS unit.

Action 4.1.2: NPS will continue to provide park specific downloads of legislative boundaries, primary ownership data, and park specific metadata on the NPS data clearinghouse, (IRMA). (<https://irma.nps.gov/Portal>)

Action 4.1.3: NPS will continue to update this NGDA data quarterly as well as provide notification to the Federal geospatial data community whenever the data is updated.

Action 4.1.4: NPS will continue work with FWS and USGS Gap Analysis Program to refine PAD-US translation routines as necessary. NPS will work with FWS to finalize and distribute documentation of this effort in order to provide potential guidance to other agencies.

Action 4.1.5: NPS will continue to be an active participant in inter-agency groups that are dedicated to the sharing and standardization of cadastral data like the NBG, the FGDC Cadastral Subcommittee, and the FLS.

Objective 4.2 Department of Defense (DoD)

Action 4.2.1: USACE Develop and maintain the boundary limits of Army Military Land Tracts and Civil Works Land Data. Data are accessible to DOD with limited availability to outside agencies and organizations.

Action 4.2.2: The Geospatial Information Officer (GIO) for DoD Energy, Installations, and Environment coordinates a Department-wide land parcel submission to the Geospatial Platform (and similar data sources such as PAD-US). The GIO for DoD will also develop a coordinated approach for controlling sensitive portions of such parcel data.

Action 4.2.3: DoD will continue to be an active participant in inter-agency groups that are dedicated to the sharing and standardization of cadastral data like the NBG, the FGDC Cadastral Subcommittee, and the FLS.

Objective 4.3 Forest Service (FS)

Action 4.3.1: Continue to provide updates to FS managed lands to PAD-US, for citizen access on web sites, and other agencies or requesters.

Action 4.3.2: Continue to maintain the FS Land Status Record System (LSRS) data sets.

Action 4.3.3: FS will continue to be an active participant in inter-agency groups that are dedicated to the sharing and standardization of cadastral data like the NBG, the FGDC Cadastral Subcommittee, and the FLS.

Objective 4.4 Fish and Wildlife Service (FWS)

Action 4.4.1: Continue to provide updates to FWS managed lands to PAD-US, for citizen access on web sites, and other agencies or requesters.

Action 4.4.2: Continue to maintain the FWS lands data sets.

Action 4.4.3: FWS will continue to be an active participant in inter-agency groups that are dedicated to the sharing and standardization of cadastral data like the NBG, the FGDC Cadastral Subcommittee, and the FLS.

Objective 4.5 Bureau of Indian Affairs (BIA)

The Land Buy-Back Program for Tribal Nations implements the land consolidation component of the Cobell Settlement, signed into law by President Barack Obama through the Claims Resolution Act of 2010. The Settlement provides \$1.9 billion to purchase fractional interests in trust or restricted land from willing sellers at fair market value. Consolidated interests are immediately restored to tribal trust ownership for uses benefiting the reservation community and tribal members. There are approximately 245,000 owners of nearly three million fractional interests across Indian Country who are eligible to participate in the Buy-Back Program. The Program is currently planning to continue the purchase of fractionated interests until the end of 2022; however Secretary Jewell is interested in exploring options for extending the timeframe of the Program. In addition to consolidating fractionated interest, the Program has designated up to \$60 million for the Cobell Education Scholarship Fund.

Action 4.5.1: The BLM will continue executing the mapping project for the Buy Back Program by providing the technical requirements, products, and services for mapping the parcels. The information needed to complement the mapping is provided by the BIA Trust Accounting and Management System (TAAMS). Although the parcel data is supplied by the BIA, the BLM is providing this service because of the BLM's expertise in providing similar mapping functions for the PLSS and the Cadastral National Spatial Data Infrastructure (CadNSDI).

Action 4.5.2: The BLM will continue to work collaboratively with the Buy-Back Program, the Office of Appraisal Services (OAS), the Division of Minerals Evaluation (DME), and the BIA to coordinate the flow of information and services.

Goal 5: Parcel Data - Including Federal Rights and Interests and coordination of non-federal data sets

Federal agencies do not have the authority to collect or maintain parcel data on non-federally managed lands. For non-federal lands facilitate an inventory of available parcel data and facilitate state aggregated standardized data. For federally managed lands (including tribal lands and offshore) coordinate with the managing agency to identify federal rights held or managed and facilitate sharing and data availability socialization of data sets, and provide outreach and communication mechanisms for federal land management agencies.

Objective 5.1 Complete a parcel data web service standard

Web services provide access to data set on a relatively continuous basis and typically originate from the data producers. These services can be defined as a template that includes the expected data elements, security or login requirements, and data download or retrieval limits. Web services can be used to provide authoritative data from local data producers to map services.

Anticipated Outcomes. *A definition and template for parcel web services that could be deployed by data producers (local governments) or data aggregators (state governments).*

Action 5.1.1 Form a working group to refine and scope this effort.

Action 5.2.2 Develop a draft standard for review by data producers and commercial providers

Action 5.2.3 Publish a parcel web services standard

Goal 6: Coordination

Cadastral data by its nature is used by many other themes and also consumes data from other themes. We have identified several coordination agencies and themes and will continue to work with these other themes to ensure consistent standardization, vertical alignment, and appropriate currency.

Objective 6.1 *Inputs - Identify themes that collect data that affect cadastral data*

Anticipated Outcomes. *Continuous improvement and update of cadastral data themes and vertical integration with other themes.*

Action 6.1.1: Identify Updates to International boundaries and incorporate changes in PLSS and cadastral data (International Boundary Commissions)

Action 6.1.2: Identify Updates to withdrawals or authorizations that may impact federal land area definitions (Land Agencies affected by Withdrawals)

Action 6.1.3: Identify Updates to surveys and control points that have been submitted or are available for inclusion. These can come from many sources and the specific source will vary from year to year. (BLM Cadastral Survey)

Objective 6.2 *Outreach - Identify and establish connections with Data Stewards and known and new data users.*

Anticipated Outcomes. *Provide data updates to data users, track how the data are used, identify feedback from users, and provide updates.*

Action 6.2.1: - Coordinate and work with the Government Units Strategic Plan Objective 3.1 Action 3.1.4 and Action 3.1.5 - Collaboration on identifying cadastral and boundary coincidence.

Action 6.2.2: *Provide access to updated data sets on an easily accessible web site. Socialize the availability of updates through social media outlets and direct emailing.*

Action 6.2.3: *Provide updated data to identified the Census Bureau (Boundary Quality Assessment and Review Program (BQARP) and partner states (BLM Cadastral Survey)*

Action 6.2.4: *Identify state level data stewards and their needs and capacity to support updates. (BLM Cadastral Survey)*

Objective 6.3 *Communication and Education - establish communication mechanisms and develop educational materials related to cadastral data themes*

Anticipated Outcomes. *Ongoing communication and educational materials support the establishment of authoritative data and reduce duplication of effort.*

Action 6.3.1: Continue to maintain the PLSS editing Geonet forum including responding to questions and posting updates (BLM Cadastral Survey)

Action 6.3.2: Continue to maintain the CadNSDI Twitter account by posting updates (BLM Cadastral Survey)

Action 6.3.3: Continue to develop and post videos and documentation related to cadastral data content, standards, maintenance, and stewardship. (BLM Cadastral Survey)

External Factors, Challenges, and Opportunities

What important trends could influence the strategic plans implementation - technology, standards, committees, management, workforce, initiatives, policy/legal issues, etc.? What challenges exist? What opportunities exist to support the Theme's goals?

The cadastral data theme has many external factors and challenges that are unique among NGDA data sets and themes.

For cadastral reference data some of these external factors are as follows.

- In the Public Land Survey System (PLSS) states the cadastral reference is typically the rectangular PLSS features, although every state has non-rectangular areas such as land grants. Other than Oklahoma, where the initial aggregation and collection is not complete, and Louisiana, which is complicated with extensive French claims and lots in the southern third of the state, the remaining 28 states have at least a rudimentary PLSS data set in a standardized form.
 - There are often many jurisdictions contributing updated information on PLSS corner locations and surveys. These updates need to be coordinated to provide an authoritative and current PLSS data set.
 - Statewide PLSS data sets are big data sets, approaching 1 gigabyte per state as a zipped file. These are even bigger files when expressed in a maintainable format or in a published feature format.
 - PLSS corner locations are linked to geodetic control and there is a need to have companion data sets with geodetic control that can be linked to the correct PLSS corners
- In the non-PLSS states (20) the land description cadastral reference framework is typically survey-by-survey or parcel-by-parcel. For classification and viewing the reference frameworks are defined by civil division (county, city, town, etc.) and then further divided to subdivisions, condominiums, or tracts. These frameworks provide context and setting for the land description, even if they are not the survey framework found in the PLSS states.

For parcel data some of these external factors are as follows.

- In the U.S. approximately 7,000 separate data producers manage cadastral data. These range in size from New England towns, to counties, to cities, to individual federal land management agencies, and tribes.
- The BLM is neither authorized nor budgetary equipped to manage or direct activities on non-federally managed lands or lands that have another federal agency authorized to manage it, including tribal interest lands.
- The primary parcel data set maintained by local and state agencies is the tax parcel. Tax parcel format, rules, and standards are established by each state. Therefore, aggregating tax parcel data to the state level is a reasonable approach.
- Parcel data changes fairly rapidly. Empirical evidence suggests that between 5 and 15 percent of parcels in any jurisdiction will change hands in any year, averaging about 7 percent nationally. New tax parcels are added at a rate between 3 and 7 percent year depending on the economy, population change, and other growth or decline factors.
- Tax parcel data collection, maintenance, and access are often controlled by local assessors, which are elected officials in many jurisdictions. Local data fees, privacy limitations, or other local data ownership or access policies may limit access to locally produced data.

The opportunities for published, maintained, current cadastral data are numerous. There are applications for cadastral data in nearly every branch of government and in a multitude of applications. The questions for cadastral data have never been how would it be used? The question has always been how do we get it, what attributes does it have, and how current is it?

The real opportunity for cadastral data is to provide a set of web services that source data directly from authoritative producers that can be consumed on an as needed basis by the data users. Because cadastral data changes frequently, stockpiling or building a data warehouse of parcel or cadastral data is less of an opportunity than web based services. There are impediments to universal web services including local data producer resource requirements, local income from data sales, technical resources to support web services, and limitations on source broadband capacity.