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Essential Protected Lands Data Standards and Best Practices
Chesapeake Bay Program and Chesapeake Conservation Partnership

This document outlines best practices for developing and maintaining geospatial data related to protected lands. An accurate [Chesapeake Bay watershed protected lands](#) geospatial dataset is essential for tracking progress toward multiple Chesapeake Bay Watershed Agreement goals. It is also crucial for ensuring state and local governments and non-governmental organizations have accurate land protection data on which to base the rate of land conservation projections as well as provide interim progress on accounting for growth measures included in Bay TMDL Watershed Implementation Plans. Please direct any questions to Sophie Waterman, Geographer, USGS Chesapeake Bay Program, swaterman@chesapeakebay.net and Coral Howe, Geospatial Analyst, USGS Eastern Ecological Science Center, chowe@usgs.gov

Background:

Since 2010 and every two years after, US Geological Survey staff in the Chesapeake Bay Program have undertaken a comprehensive data collection and aggregation process to create one complete GIS based dataset representing the most recently available data (from authoritative data sources) the permanently protected lands in the Chesapeake Bay watershed. Due to the multiplicity of entities actively protecting land this is no small undertaking. Data is aggregated from multiple Federal, State, and non-governmental organizations and the attribute tables are standardized to have consistent fields. More recent updates rely heavily on the Protected Areas Database (PAD_US) and National Conservation Easement (NECD) databases (now available as a combined dataset) and their advances in the coordination and standardization of protected areas and easement property datasets. However, the Chesapeake Bay Program still relies on obtaining data directly from jurisdictions and other authoritative data sources to supplement national datasets and ensure the most accurate and timely Chesapeake watershed dataset.

This document clarifies standards and best practices for data managers to improve geospatial data and facilitate comparison and aggregation of data from multiple sources.

To reduce duplication of efforts, the Chesapeake Bay Program has *generally* adopted the PAD_US 2.0 standards that seek to define a common protocol for sharing authoritative protected areas data between agencies and organizations. This will ultimately result in a comprehensive and accurate dataset of protected areas for the United States to meet multiple needs at a variety of scales.

Recent developments have made the importance of accurate tracking even more evident. The Chesapeake Bay Program has moved toward crediting conservation and planning in the Bay Total

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Maximum Daily Load (TMDL).[1] To properly "account" for land conservation in the Bay TMDL context, it is imperative that incoming geospatial land conservation data contain key attributes. Of particular importance: data must contain a "Date_Est"**/ "Date of Protection"** field specifying the date the property was legally protected through fee acquisition or conservation easement. This allows CBP modelers and partners to determine an annual rate of land conservation that can be used to forecast the offset of future growth and development and thereby the pollution reduction of associated conserved lands. Further, it helps ensure the most accurate tracking of progress toward land protection goals.

MINIMUM Required Chesapeake Bay Watershed Protected Lands Data Attributes:

A list of the minimum required data attributes for each property included in GIS datasets within the Chesapeake Bay watershed follows table 1. on page 3. All fields bolded and or blue in Table 1 are **required** for the Chesapeake Bay protected lands dataset**.** The "required" attributes represent a subset of the broader set of PAD_US attributes. Completion of all recommended PAD_US attributes is beneficial, but bold/blue represents the minimum standards for the Chesapeake Bay watershed. A simplified table is included for your convenience. Additional details, examples and guidance can be found in the PAD_US Data Manual (Note: there are several useful links on this site, including the PAD_US Data download that will allow you to look through their metadata and the Data Dictionary).

download that will alllow you to look through their meta data, and the Data DIctonary). In addition, a complete Provisional Data Manual Tables and Crosswalks can serve as a reference for specific PAD attribute information. This manual is intended to serve as a quick guide. Additional resources can be accessed through the above links. The complete PAD_US attributes and field properties can be viewed in Table 1.

The CBP attributes and field properties match those of PAD_US. In addition to the PAD_US requirements, there a couple of attributes that the CBP collects for our own accounting and consistency in the display of pop ups in our mapping applications as seen on the Chesapeake Progress web map. These additional fields are marked in blue* text with an asterisk in table 1. below.

Table 1. (Adapted from PAD_US Table 1. Attributes and field properties)

Field Name	Field Abbreviation	Field Type	Filed Length
Aggregator Source	Agg_Src	Text	150
Category	Category	Category Domain	12
CBP Owner Type*	CBP_Own_Type	Text	50

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[1] Land conservation can improve water quality by:
1. Using permanently protected lands as the most reliable substrate for installing, monitoring, and maintaining Best Management Practices (BMPs) (e.g., planting trees in the riparian zone);
2. Reducing the future conversion of land to more polluting land uses e.g., placing an easement on land that would otherwise be developed.
3. Soliciting restoration investments on conserved lands that are strategically located to intercept pollutants before they enter streams and waterways (e.g., precision conservation).

Field Name	Field Abbreviation	Field Type	Filed Length
Comments	Comments	Text	255
Date of Establishment	Date_Est	Text (YYYY)	4
Designation Type	Des_Tp	Text	75
Easement Holder Type (NCED)	EHoldTyp	Text	250
Easement Holder (NCED)	EsmtHldr	Text	50
GAP Status Code	GAP_Sts	Text	95
GAP Status Code Date	GAPCdDt	Text (YYYY)	4
GAP Status Code Source	GAPCdSrc	Text	150
GIS Acres	GIS_Acres	Long Integer	n/a
GIS Source	GIS_Src	Text	200
GIS Source Date	Src_Date	Text(yyyy/mm/dd)	15
IUCN Category	IUCN_Cat	Text	70
IUCN Category Date	IUCNCtDt	Text(yyyy)	4
IUCN Category Source	IUCNCtSrc	Text	150
Local Designation	Loc_Ds	Text	250
Local Manager	Loc_Mang	Text	250
Local Name	Loc_Nm	Text	250
Local Owner	Loc_Own	Text	250
Manager Name	Mang_Name	Text	70
Manager Type	Mang_Type	Text	50
Owner Name	Own_Nm	Text	70
Owner Type	Own_Type	Text	50
Public Access	Access	Text	20
Public Access Date	Access_Dt	Text(yyyy)	4
Public Access Source	Access_Src	Text	150
Property Name*	Property_Name	Text	250
Raster Owner*	RasterOwn	Integer	1
Source Protected Area ID	Source_PAID	Text	100
State Name	State_Nm	Text	50
Unit Name	Unit_Nm	Text (Local Name Standardized)	250
WDPA Site Code	WDPA_Cd	Long integer	n/a

*CBP Data Attributes:

Chesapeake Bay Program Ownership Type: Chesapeake Bay Program office Type can be displayed as one of the following: *Federal, Local, Non-Governmental Organization, Other or Unknown, Private (Under conservation easement),* or *State.*

Property Name: Enter the name that makes the most sense of the data. This is the field that will display on any mapping applications. (generally, Loc_nm is also this name). Private = *Private Landowner*, give all else the name that makes the most sense with the data. Should be cleaned for proper case and consistency. E.g., not privately owned, private landowner and private landowner.

Raster Owner: Raster Owner is the value to populate the 5m raster dataset for acreage calculations toward the indicator. The value entered here shall be one of the following:

Code	Description
1	Federal
2	Joint
3	Local
4	Tribal, Native American
5	Non-Governmental Organization
6	Private
7	State
8	Unknown

Abbreviated Minimum PAD_US Data Attributes for CB Protected Lands dataset:

Access: Level of 'Public Access' permitted, described as: Open requires no special requirements for public access to the property (may include regular hours of availability); Restricted requires a special permit from the owner for access, a registration permit on public land (e.g. self-permitting Wild and Scenic River, backcountry Wilderness registration) or has highly variable times when open to use (e.g. Wildlife Area with seasonal closures to protect winter range or breeding habitat); Closed occurs where no public access is allowed (e.g. land bank property, special ecological study areas, military bases, many easements, etc.); Unknown is assigned where information is not currently available (assumed Closed).

Code	Description	Comments
OA	Open Access	The public can visit.
RA	Restricted Access	Access is restricted (e.g. requires permission to enter).
XA	Closed	Closed to public access.
UK	Unknown	Public access is unknown.

Aggregator source: Aggregator Source' describes the Aggregator (Organization) credited with data aggregation, when the update occurred, feature class name (except when split into multiple feature classes) the data reside in, reference to the original source data file. 'Aggregator Source' is attributed in the format 'organization name featureclass_filename_filetype' (e.g. TNC_SecuredAreas2008.shp)

Category: The general 'Category' for the protection mechanism associated with the protected area. Do not include the following PAD_US categories in the Chesapeake Bay Protected Lands data: Designation, Marine and Proclamation are not considered to be permanently protected lands. 'Designation' is applied to management boundaries not tied to title documents, 'Marine' includes outer continental shelf lands, 'Proclamation' refers to outer boundaries and approved acquisition boundaries.

Code	Description
Fee	'Fee' simple is the most common way real estate is owned.
Easement	A conservation 'easement' creates a legally enforceable land preservation agreement between a landowner and government agency or qualified land protection organization (i.e. land trust).
Other	'Other' types of protection include leases, agreements, or deed restrictions
Unknown	There is a good degree of certainty that the parcel is protected but the exact mechanism is unknown.

Date Established: Date of Establishment. The Year (yyyy) the protected area was designated, decreed or otherwise established

Easement Holder: Where the 'Category' of protection code (above) is listed as "Easement", name of the entity managing or holding the easement (spelled out, not abbreviated)*.* For example, Virginia Outdoors Foundation, Eastern Shore Land Conservancy, etc.

Easement Holder Type: Where the 'Category' of protection code (above) is listed as "Easement", this field must specify the type of holder of the easement, standardized as follows. Type of entity holding the easement. This attribute is brought over from NCED. The metadata and documentation is on Sciencebase.

Code	Description
FED	Federal
TRIB	American Indian Lands
STAT	State
DIST	Regional Agency Special District
LOC	Local Government
NGO	Non-Governmental Organization
PVT	Private
JNT	Joint

GIS Acres: Acres calculated for each polygon converted from the Shape_Area field using field calculator "!shape.area@acres!"

GIS Source: The original source of GIS spatial and attribute information the aggregator obtained (e.g. WYG&F_whmas08.shp) for each record. Preferably, this should reference the authoritative data provided by the land manager. Files names should match original source data to facilitate future updates.

GIS Source Date: This represents the date (yyyy/mm/dd) GIS data was published or obtained (in the case of infrequently updated files) by the data aggregator. If month or day is unknown, the date is yyyy/00/00

Local Owner: The ***actual name of the owner of the fee interest*** (spelled out, not abbreviated) to complement the standardized 'Owner Name' above. For example, if "State Fish and Wildlife" is the standardized 'Owner Name' "Pennsylvania Fish & Game Commission" would be a possible "Local Owner" name. Note: it is not necessary to identify the actual owner's name for privately held properties; just use "Privately owned". PAD_US is working to standardize this information. Table 7 of the data manual provides a crosswalk. In addition, some python scripts have been developed to help with the process.

Owner Type: General landowner type ***of the fee property interest***, standardized for the US. Note, TERR, Territorial and DESG Designation are not considered permanently protected lands for the purposes of the CBP PL indicator

Code	Description	Comments
FED	Federal	Fee interest owned by the federal agency.
TRIB	American Indian Lands	Fee interest owned by tribal government.
STAT	State	Fee interest owned by the state agency.
DIST	Regional Agency Special District	Fee interest owned by a regional agency or water district not bound by a specific jurisdiction.
LOC	Local Government	Fee interest owned by city, township or county agency.
NGO	Non-Governmental Organization	Fee interest owned by non-governmental organizations such as land trust, conservancy etc.
PVT	Private	Fee interest privately held by an individual or corporation; e.g. privately owned lands conserved through an easement held by another entity like a state or NGO.
JNT	Joint	Fee interest held by more than one type.
UNK	Unknown	Unknown owner.

Owner Name:
Landowner or holding agency (e.g. 'Forest Service', 'State Fish and Wildlife', 'City Land', 'Non-Governmental Organization') standardized for the U.S. See PAD-US Data Manual or geodatabase 'Agency Name' lookup table for full domain descriptions.

Source Protected Area ID: The 'Source Protected Area Identifier' (Source PAID) includes the persistent identifier (e.g. numbers, letters, or combinations of each) associated with each protected area, when

available in source data. The intention is to maintain a reliable connection to join authoritative source data to previous versions.

State Name: Name of state spelled out in Proper Case. (Maryland, Virginia, West Virginia, Washington DC, Delaware, Pennsylvania, New York)

Unit Name: The name of the land management unit or protected area (Local Name standardized) standardized to Proper Case with acronyms spelled out (e.g. Shenandoah National Park not NP). This means the management unit with which the property is affiliated or managed. For example: Tuckahoe State Park, Bald Eagle State Forest, Pyfer Nature Preserve. Note: some private lands under conservation easement may not be associated with any formally named land management unit.