

Inventory & Monitoring Division

National Park Service



Standard Operating Procedure 2.11.19

Boundary Processing - Protected Area Data

Please cite this as:

Kineth, M. and L. Nelson. 2018. Processing land cover source data to derive landscape dynamics metrics: Protected area data. Inventory & Monitoring Program Standard Operating Procedure NPS/NRSS/IMD/SOP—2.11.19. National Park Service, Fort Collins, Colorado.

Summary

SOP detailing preparation of protected area source data for use in protocol metric calculations.

Contents

	Page
Summary	1
Overview	3
Requirements	3
Processing	3
Protected Areas of the United States (PADUS)	4
Step 1: Download Source Data.....	4
Step 2: Run Protected Areas Tool	4
Step 3: Quality Assurance	5
Step 4: Manage Metadata	5
Post-Processing	5
Step 1: Move Source Data.....	5
Step 2: Incorporate Map Services.....	5
Literature Cited	6
Appendix 1: Data Availability, Data Quality, and Known Issues	7

Overview

Data indicating the conservation protection status on the landscape are processed for use in Environmental Setting Protocol (DeVivo et al. In Review) and may be used in other data preparation and analysis activities (i.e. inventories, managed area datasets).

Data are acquired from vetted sources, organized by processing extent, and subset by protected status and ownership attributes.

It is assumed users of this SOP have prior knowledge of data paths, file locations, and repositories referenced in this SOP.

Requirements

- Internet connection, sufficient disc space for data download
- Zip file extract tool, sufficient storage for data extraction and processing
- ArcGIS
- Data Store permissions

Processing

Processing steps may vary by data source. All processing steps result in protected status and ownership polygons organized by processing extent using the Environmental Setting protocol standard spatial references (Table 1).

Table 1. Standard spatial references by processing extent

Processing Extent	Spatial Reference Name (datum)	Well-known ID (WKID)
North America (US, Canada, Mexico)	USA Contiguous Albers Equal Area Conic USGS (NAD83)	WKID: 102039
CONUS	USA Contiguous Albers Equal Area Conic USGS (NAD83)	WKID: 102039
Puerto Rico and USVI	USA Contiguous Albers Equal Area Conic USGS (NAD83)	WKID: 102039
Alaska	Alaska Albers Equal Area Conic (NAD83)	WKID: 3338
Hawaii	UTM Zone 5N (NAD83)	WKID: 26905
American Samoa	NAD_1983_HARN_UTM_Zone_2S (NAD83 HARN)	WKID: 2195
<i>Transform (if needed):</i>	WGS_1984_(ITRF00)_To_NAD_1983 + NAD_1983_HARN_To_WGS_1984_2	
Guam	WGS_1984_UTM_Zone_55N (WGS84)	WKID: 32655
<i>Transform (if needed):</i>	WGS_1984_(ITRF00)_To_NAD_1983	
CN Mariana Islands	WGS_1984_UTM_Zone_55N (WGS84)	WKID: 32655
<i>Transform (if needed):</i>	WGS_1984_(ITRF00)_To_NAD_1983	

Protected Areas of the United States (PADUS)

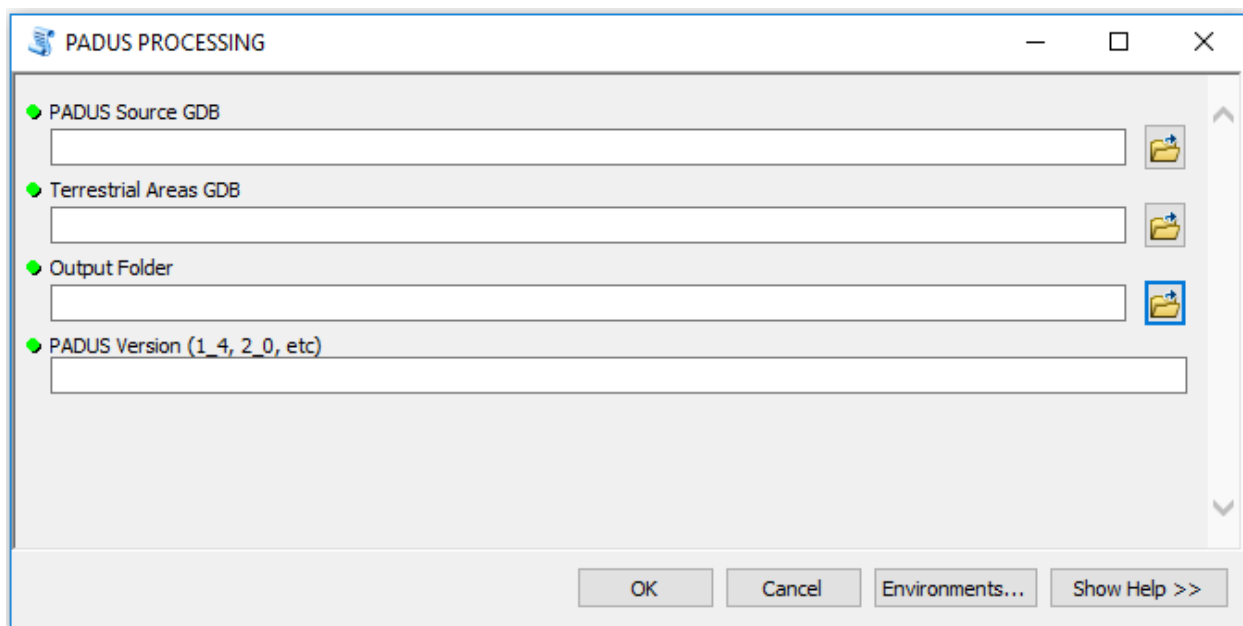
The PADUS dataset contains polygons indicating protected status (GAP) and land ownership. Update to the PADUS source necessitate running these procedures and using the outputs to re-run associated protocol metrics and dependent inventory datasets or products.

Step 1: Download Source Data

Download PADUS from the USGS' National Gap Analysis Project (GAP) Protected Areas Data Portal (<https://gapanalysis.usgs.gov/padus/data>).

Step 2: Run Protected Areas Tool

General Processing Steps: Extract PADUS datasets by geographic extent; project, and repair geometry to create seamless feature classes.



Step 3: Quality Assurance

1. Visually check polygon position and spatial neighbors; overlay the PADUS datasets with state, county and NPS boundaries.
2. Intersect PADUS datasets with NPS boundaries or areas of analysis (AOAs) and summarize by PADUS category (protected status or ownership) to determine usability.

Step 4: Manage Metadata

1. Import Metadata
2. Upgrade and edit metadata.

Post-Processing

Step 1: Move Source Data

1. Copy the final datasets to the
X:\ProjectData\LandscapeDynamics\ConservationStatus\Products\Seamless folder.
2. Make sure downloaded data is in
X:\ProjectData\LandscapeDynamics\ConservationStatus\SourceData

Step 2: Incorporate Map Services

Add PADUS Map Service(s) (externally hosted from USGS-GAP) to Landscape Dynamics Viewer. Go to Landscape Dynamics Viewer Maintenance SOP (SOP 2.11.18; Kinseth 2018) for details.

Literature Cited

DeVivo, J. C., L. Nelson, M. Kineth, T. Philippi, and W. B. Monahan. In Review. Protocol for monitoring environmental setting for National Park Service units: Landscape dynamics, climate, and hydrology. Natural Resource Report NPS/IMD/NRR—2018/XXXX National Park Service, Fort Collins, Colorado.

Kineth, M. 2018. Maintenance and management of the landscape dynamics data viewer for use as part of the IMD Environmental Settings Protocol. Inventory & Monitoring Division Standard Operating Procedure NPS/IMD/SOP—2.11.18. National Park Service, Fort Collins, Colorado.

Appendix 1: Data Availability, Data Quality, and Known Issues

The following issues are relevant to all published versions of PADUS; some issues may lessen as updates to PADUS are made, but all issues listed are still valid and should be considered in PADUS data interpretation and use.

Data Availability

The source dataset (PADUS) is collected state-by-state, agency-by-agency, and variability and completeness in polygon features and attribution will occur across state and/or agency boundaries. One noticeable difference occurs when one state generated polygons for private land while a neighboring state did not. These areas will display as distinct divisions in output layers and maps.

Definition of Protected Area

For the purposes of this SOP, in PADUS-sourced data Protected Area is defined as any PADUS polygon with a GAP Status Code attribute value of '1 – managed for biodiversity – disturbance events proceed or a mimicked' or '2 – managed for biodiversity – disturbance events suppressed'. Polygons with these attributes are visually aggregated for display layers and their areas are added when PADUS_CAP statistics are calculated.

Discrepancies between PADUS and NPS Administrative Boundaries

Federal boundaries provided to PADUS for inclusion in the layer may represent older, inaccurate versions that differ from the most current boundary data.

Data Quality: Topological Errors, Sliver Polygons, and Duplicate Polygons

The PADUS feature class layer is an aggregate of data from multiple federal, state, NGO, and city/county/local sources and because of this, it is not 100% topologically correct. There is varying degrees of polygon overlap across the extent of the layer (Figure A-1), and/or sliver polygons where various boundary lines are not coincident. This issue has lessened over time, but is still present due to the nature of the data source(s).

Sliver polygons occur when boundaries do not coincide between data sources, either within PADUS, or between PADUS and other data layers. Each release of PADUS will inevitably produce sliver polygons in processing, particularly in areas near NPS units. These slivers can alter statistical outputs, resulting in records with very small PCT_AREA values that may or may not be accurate.

There is significant and high potential for protected areas not under Federal Ownership to have duplicate and/or overlapping polygons with different GAP Status and/or land ownership recorded (Figure A-1). These duplicate/overlapping features will be retained from the source and may skew resulting summary statistics by counting a polygon area, or part of an area, more than once. Users of PADUS data should be aware of this likelihood, and take appropriate steps to mitigate for errors in any reports or management decisions based on these data.

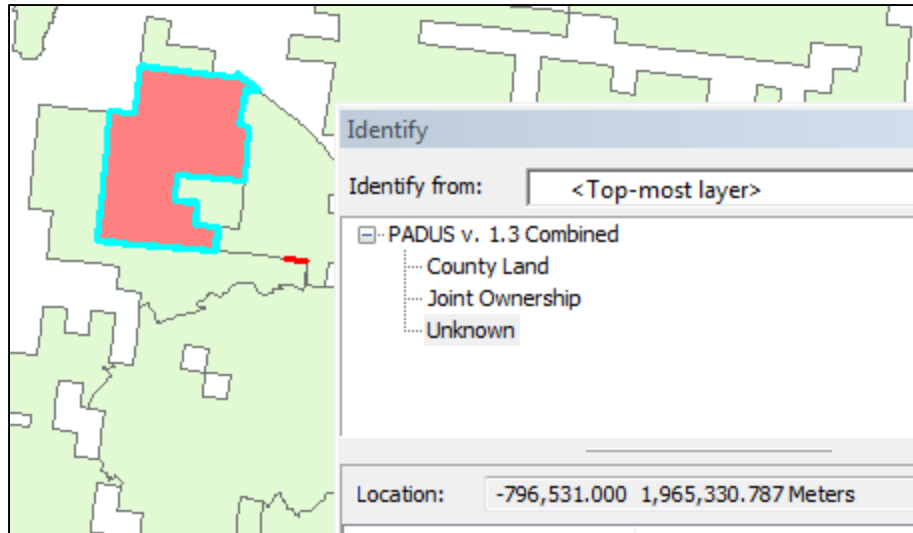


Figure A-1. Example of coincident, overlapping polygons in PADUS v1.3.