

AN ARCGIS FEDERAL LANDS DATA MODEL

NILS conceptual model

The NILS implementation is based on a conceptual model comprising three tiers. The foundation is the survey fabric—networks of measurements, computations, coordinates, and survey points. The survey fabric is used to construct and maintain the legal description fabric, containing Public Land Survey System (PLSS) boundaries, and other surveys such as metes and bounds. The legal description fabric forms the building blocks for the parcel fabric.

Parcel fabric
Feature datasets with ownership parcels, rights, segregations, use authorizations, and land status.

Legal description fabric
Feature datasets with corners and boundaries, Public Land Survey System, special surveys, and unsurveyed features.

Survey fabric
Survey datasets with projects containing measurements, computations, coordinates, and survey points.

Topology rules
Survey links

Simple feature class <state abbr>_Case									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes						Contains M values	No
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
verified_by	String	Yes					255		
verified_date	Date	Yes				0	0	8	
PID	String	Yes					255		
case_id	Long integer	Yes					0		
serial_nr_full	String	Yes					17		
case_group	String	Yes	999	CaseGroup			3		
case_type	String	Yes					2		
case_part	String	Yes					2		
case_disp	String	Yes	99	CaseDisposition			30		
legal_description	Blob	Yes					0	0	0
admin_agency	String	Yes		BLM ManagingAgency			0	0	8
stored_acreage	Double	Yes					0	0	0
edit_geom_flag	Short integer	Yes					0		
edit_attr_flag	Short integer	Yes					0		
system_id	Long integer	Yes					0		
is_nominally_located	String	Yes					1		
l2000_system_id	String	Yes					2		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

Polygons that represent the geometry and attributes of case parcels.

Name of individual who created feature.
Date of feature creation.
Name of individual who last modified feature.
Date of last feature modification.
Link to external document.
Name of individual who manually verified feature.
Date of last feature verification.
ID created for each serial number.
Unique internal case identifier.
Case serial number.
First two characters of case type.
First six digits of case type.
Last two digits of case serial number, used for indices.
Current status of case.
Text legal description of case in XML format.
Agency that has jurisdiction over case.
Acronym for case parcel.
Flag for whether geometry has been manually edited.
Flag for whether attributes have been manually edited.
BLM system identifier.
For cases without precise location, whether on aliquot.
Identifier for LR2000 system.

Coded value domain CaseDisposition		Field type	String
Code	Description	Split policy	Default value
99	Unknown		
5	Authorized		
2	Pending		
9	Closed		
59	Authorized and Closed		
9C	Acquired Parcel		

Coded value domain CaseGroup		Field type	String
Code	Description	Split policy	Default value
999	Public administration procedures		
18	Land resource management/Designated areas		
22	Acquisitions (including easements)		
23	Exchanges		
23	Withdrawals		
24	Land Classification		
25	Dispositions: occupancy and use		
26	Dispositions: grants		
27	Dispositions: sales		
28	Use: Right-Of-Way		
29	Use: leases and permits, easements granted		
31	Oil and gas leasing		
32	Geothermal resource leasing		
34	Coal Management		
35	Solid minerals other than coal		
37	Multiple use mining		
38	Mining claims		
386	Mineral patents		

Relationship class <state abbr>_CaseToRight		Type	Simple
Cardinality	One to many	Forward label	Right
Notification	None	Backward label	Case
Origin feature class	Name <state abbr>_Case	Destination feature class	Name <state abbr>_Right
Primary key	case_id	Foreign key	case_id

Relationship class <state abbr>_CaseToSegregation		Type	Simple
Cardinality	One to many	Forward label	Segregation
Notification	None	Backward label	Case
Origin feature class	Name <state abbr>_Case	Destination feature class	Name <state abbr>_Segregation
Primary key	case_id	Foreign key	case_id

Relationship class <state abbr>_CaseToAuthorization		Type	Simple
Cardinality	One to many	Forward label	Authorization
Notification	None	Backward label	Case
Origin feature class	Name <state abbr>_Case	Destination feature class	Name <state abbr>_Authorization
Primary key	case_id	Foreign key	case_id

Simple feature class <state abbr>_Right									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes						Contains M values	No
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
verified_by	String	Yes					255		
verified_date	Date	Yes				0	0	8	
PID	String	Yes					255		
case_id	Long integer	Yes					0		
subtype_rights	Long integer	Yes	1				0		
edit_geom_flag	Short integer	Yes					0		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

Subtypes of <state abbr>_Right			
Subtype field	Subtype Description	Field name	Default value
Default subtype 1			
1	Right_Surface	No values set	
2	Right_Subsurface	No values set	
3	Right_neither	No values set	

Simple feature class <state abbr>_Segregation									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes					255		
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
verified_by	String	Yes					255		
verified_date	Date	Yes				0	0	8	
PID	String	Yes					255		
case_id	Long integer	Yes					0		
subtype_segregation	Long integer	Yes	1				0		
edit_geom_flag	Short integer	Yes					0		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

Subtypes of <state abbr>_Segregation			
Subtype field	Subtype Description	Field name	Default value
Default subtype 1			
1	Segregation_Surface	No values set	
2	Segregation_Subsurface	No values set	

Simple feature class <state abbr>_Use_Authorization									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes						Contains M values	No
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
verified_by	String	Yes					255		
verified_date	Date	Yes				0	0	8	
PID	String	Yes					255		
case_id	Long integer	Yes					0		
subtype_authorization	Long integer	Yes	1				0		
edit_geom_flag	Short integer	Yes					0		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

Subtypes of <state abbr>_Use_Authorization			
Subtype field	Subtype Description	Field name	Default value
Default subtype 1			
1	Authorization_Surface	No values set	
2	Authorization_Subsurface	No values set	
3	Authorization_neither	No values set	

Simple feature class <state abbr>_PLSSSecondDiv									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes						Contains M values	No
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
verified_by	String	Yes					255		
verified_date	Date	Yes				0	0	8	
PID	String	Yes					255		
case_id	Long integer	Yes					0		
SecondDivDesignator	String	Yes					3		
SecondDivSuffix	String	Yes					2		
SecondDivType	String	Yes		Quarter			30		
SecondDivDUPCode	String	Yes					1		
FirstDivisionDesignator	String	Yes					3		
FirstDivisionFraction	String	Yes					1		
FirstDivisionDUPCode	String	Yes					16		
Township	String	Yes					16		
AreaSize	Double	Yes					0	0	
AreaUnit	String	Yes		AreaUnit			16		
AreaSource	String	Yes		AreaSource			16		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

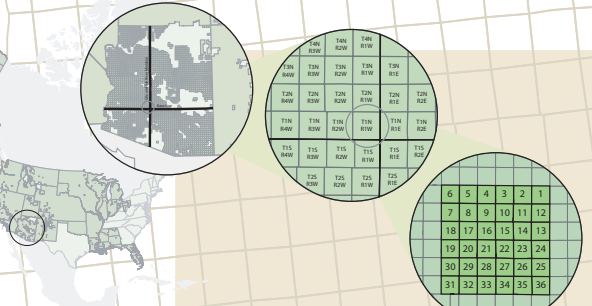
PLSS second divisions are normally quarter sections. A quarter section is nominally a half mile by a half mile and contains 160 acres.

The name of the user or process that created the feature.
The date on which the feature instance was created.
The name of the user who updated the feature.
Date feature was updated and posted to the enterprise database.
Used for ArcMap hyperlinking capabilities.
The primary key field.
Letter, number, or combination that identifies second division.
Optional indicator for duplicate second divisions.
Optional flag for duplicate values.
Letter, number, or combination identifying first division.
Optional fraction designator code.
Optional flag for duplicate values.
Concatenated tier and range name.
Area of the second division.
Units of the area measurement.
Source of the area.

Field name	Default value	Domain
NominalLocation		NominalLocations
Quarter		QuarterDomain
AreaUnit		AreaUnit
AreaSource		AreaSource

Each of the subtypes also share these default values and domains for the fields shown.

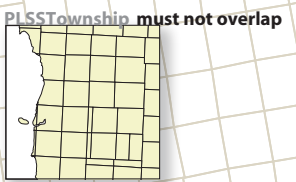
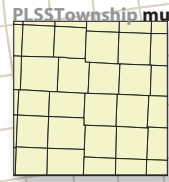
for the U.S. Bureau of Land Management



PLSS first divisions are normally sections, square tracts of land nominally measuring one mile by one mile and containing 640 acres.

Simple feature class <state abbr>_PLSSFirstDiv									
Field name	Data type	Allow nulls	Default value	Domain	Prec-ision	Scale	Length	Geometry	Polygon
OBJECTID	Object ID	Yes						Contains M values	No
Shape	Geometry	Yes						Contains M values	No
CreatedBy	String	Yes					255		
DateCreated	Date	Yes				0	0	8	
ModifiedBy	String	Yes					255		
DateModified	Date	Yes				0	0	8	
DocumentHyperlink	String	Yes					30		
PLSSFirstDivID	String	Yes					3		
FirstDivisionDesignator	String	Yes					3		
FirstDivisionFraction	String	Yes					1		
FirstDivDUPCode	String	Yes					16		
Township	String	Yes					1		
FirstDivisionType	String	Yes	5				1		
AreaSize	Double	Yes					0	0	
AreaUnit	String	Yes		AreaUnit			255		
AreaSource	String	Yes		AreaSource			1		
Shape_Length	Double	Yes					0	0	
Shape_Area	Double	Yes					0	0	

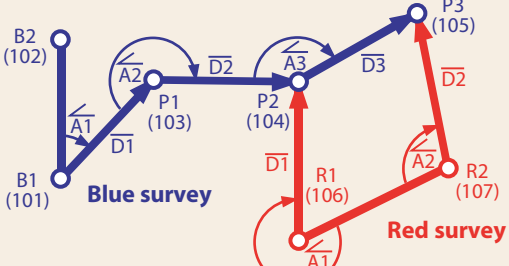
The name of the user or process that created the feature.
The date on which the feature instance was created.
The name of the user who updated the feature.
Date feature was updated and posted to the enterprise database.
Used for ArcMap hyperlinking capabilities.
The primary key field.
Letter, number, or combination that identifies first division.
Optional fraction designator code.
Optional flag for duplicate values.
Concatenated tier and range name.
Type of division.
Area of the first division.
Units of the area measurement.
Source of the area.



survey to GIS

Survey dataset

A survey dataset holding key survey measurements and information is managed as an integrated data layer in the geodatabase in a set of DBMS tables.



A survey project represents a unit of work and manages a group of measurements, points, coordinates and computations.

Survey projects

Project ID	Name	Coordinate System
1	Blue	NAD_1927_UTM_Zone_12N
2	Red	NAD_1927_StatePlane_Arizona_Central

Measurements

Project ID	FromTo	Type
1	B1-B2	Reference Direction
1	B1-P1	Angle
1	B1-P1	Distance
1	P1-B1	Reference Direction
1	P1-P2	Angle
1	P1-P2	Distance
1	P2-P1	Reference Direction
1	P2-P3	Angle
1	P2-P3	Distance
2	R1-R2	Reference Direction
2	R1-P2	Angle
2	R1-P2	Distance
2	R2-R1	Reference Direction
2	R2-P3	Angle
2	R2-P3	Distance

Survey points

Project ID	Point Name	GIS Coordinate	ID
1	B1	(x, y, z)	101
1	B2	(x, y, z)	101
1	P1	(x, y, z)	103