



## **GIS Naming Conventions**

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Effective date: August 3, 2005

### **Purpose**

This document describes guidelines for naming of Geographic Information Systems (GIS) folders, files, attribute tables, and fields for the North Coast and Cascades Network (NCCN) and helps to fulfill the requirements for GIS deliverables developed as part of Inventory and Monitoring (I&M) Program natural resource studies.

The primary objective of these guidelines is to improve GIS data quality and usability by establishing a consistent file-naming convention within the NCCN for working and final shared, geo-referenced data sets. These guidelines propose clear filename creation methods in order to minimize confusion, errors, and unnecessary support when GIS data are exchanged among users. Two competing objectives need to be balanced: to make a dataset name easily understood and as short as possible for use in various software systems. Longer field names, sometimes resulting from long dataset names and sometimes created by users, are often truncated during data exchange or format conversion, which could unintentionally create non-unique or unintelligible field names.

These guidelines will:

- promote consistency in GIS layer and attribute (variable or field) naming
- provide guidance to data stewards and data contributors
- advance a clearer understanding of the information within the files, tables, and fields via appropriate names
- facilitate discovery of GIS data sets by users
- facilitate links between spatial and non-spatial databases

### **Scope and Applicability**

These guidelines apply to all NCCN staff, contractors, and cooperators responsible for generating and submitting data for permanent retention. Compliance with these guidelines is required for all I&M project data sets (including geospatial databases), and for other projects as stipulated by project study plans, cooperative agreements, contracts, or research permits. Specifically, all data that will be maintained on one of the NCCN file servers, or submitted to any of the NPS national databases/clearinghouses, will be subject to these guidelines. Beyond these requirements, it is hoped that these guidelines will be adopted by others as a way to increase operational efficiency and compatibility among data sets. NCCN staff and cooperators creating and/or submitting GIS-related data should work closely with NCCN GIS staff throughout all stages of project development and implementation and should refer to guidance in this document.

### **Definitions and Acronyms**

#### *Attribute table*

A tabular file containing rows and columns. Attribute tables are normally associated with a class of geographic features. Each row represents a geographic feature. Each column represents one attribute of a feature. Feature attribute tables for shapefiles are restricted to dBase (.dbf) format. For geodatabases, attribute tables are contained within the

	geodatabase folder and cannot be separated from the remainder of the data set other than by an export function.
<i>Database</i>	A collection of data organized according to a conceptual structure describing data characteristics and relationships among corresponding entities. For example, a GIS database includes data about the position and characteristics of geographical features.
<i>dBase</i>	First widely used database management system for microcomputers by Ashton Tate Corporation. The dBase format for storing data has become a de facto standard, and is supported by nearly all database management and spreadsheet systems. Even systems that do not use the dBase format internally are able to import data in dBase format.
<i>ESRI</i>	Environmental Systems Research Institute, Inc. of Redlands, CA. Makers of ArcGIS® software, including ArcMap, ArcCatalog and ArcToolbox.
<i>Geodatabase</i>	The ESRI name for ‘geographic database’. The Geodatabase model is an ArcGIS version 8.0 and above data format. A geodatabase represents geographic features and attributes as objects and is hosted inside a relational database management system (DBMS).
<i>GIS</i>	Geographic Information Systems. A computer system for creating, storing, checking, integrating, manipulating, analyzing, and displaying spatial data.
<i>Foreign key</i>	A field in a relational table that matches the primary key column of another table. The foreign key can be used to cross-reference tables.
<i>I&amp;M</i>	Inventory & Monitoring Program of the National Park Service
<i>Lookup table</i>	A special table that provides a list of values to choose from when entering data. This makes data entry easier and ensures the consistency of the data in that field.
<i>Normalization</i>	The process of organizing the fields and tables of a relational database to minimize redundancy and dependency. Normalization usually involves dividing large tables into smaller (and less redundant) tables and defining relationships between them. The objective is to isolate data so that additions, deletions, and modifications of a field can be made in just one table and then propagated through the rest of the database using the defined relationships.
<i>NPS</i>	National Park Service
<i>NCCN</i>	North Coast and Cascades Network <a href="http://science.nature.nps.gov/im/units/nccn/">http://science.nature.nps.gov/im/units/nccn/</a>
<i>Primary key</i>	A tabular field that uniquely identifies each record in a relational table. It can either be a normal attribute that is guaranteed to be unique or it can be generated by the DBMS (such as a globally unique identifier, or GUID, in Microsoft SQL Server). Primary keys may consist of a single attribute or multiple attributes in combination.
<i>Shapefile</i>	An ESRI GIS data format that stores non-topological geometry and attribute information for the spatial features. The geometry for a feature is stored as a shape comprised of a set of vector coordinates. Shapefiles can support point, line and area features.
<i>Special character</i>	A character not in the standard 7-bit ASCII character set, such as the copyright mark (©) or the ampersand (&).

## Procedures and General Requirements

1. General requirements
  - A. Do not use spaces.
  - B. Do not use special characters.
  - C. Use only letters, numbers, and underscores (to separate words within a single name).
2. Folder names
  - A. Limit name to 20 characters.
  - B. Use clear and meaningful names that convey the subject of the data.
  - C. Use upper case for the first letter and lowercase for the rest of the name.
3. File and attribute table names for GIS products
  - A. Shapefile, geodatabase, and table names must not exceed 20 characters, including the extension. Additionally, one should consider including the following:
    - i. A 4-character prefix for park or network code is required (Table 1).
    - ii. A 5-character project code, if applicable (Appendix 1).
    - iii. A brief description of file contents. For example, a shapefile of transects for the NCCN Landbird Monitoring project might be called NCCN\_BDa02\_transect.shp.
    - iv. Date when features in the data set were collected or data set version. For example, a shapefile containing 2013 GPS locations collected for the Landbird Monitoring project at Mount Rainier National Park might be called MORA\_BDa02\_site\_2013.shp

Table 1: North Coast and Cascade Network Park Codes for I&M GIS data:

Park Name	Park Code
Ebey's Landing National Historical Reserve	EBLA
Fort Vancouver National Historic Site	FOVA
Klondike Gold Rush National Historical Park-Seattle Unit	KLSE
Lewis and Clark National Historical Park	LEWI
Mount Rainier National Park	MORA
North Cascades National Park Service Complex	NOCA
Olympic National Park	OLYM
San Juan Island National Historical Park	SAJH
North Coast and Cascades Network	NCCN

4. Field names
  - A. Contact an NCCN Data Manager for all NCCN required standard field names and formats or use Natural Resource Database Template provided by the I&M Program (<http://science.nature.nps.gov/im/datamgmt/applications/template/index.cfm>).
  - B. For non-required field names, limit names to 10 characters or less to conform to dBase naming limitations (Cxxxxxxx, where "C" is an alpha character and "x" is alphanumeric). Even though file geodatabases feature classes allow field names that are longer than 10 characters, limiting the field names to dBase format allows smooth transition between geodatabase and shapefile formats without loss of information.
  - C. Use clear and meaningful names that convey the subject of the data.
  - D. Use uppercase for the first letter and lowercase for the rest of the name.
  - E. Always include measurement units in a field name, and abbreviate where appropriate. For example, use "Elev\_m" instead of "Elevation."
  - F. If abbreviation is necessary, use common abbreviations. For the list of abbreviations commonly used in NCCN see Appendix 2. For international abbreviations used in GIS see

- the following websites: [Dictionary of Abbreviations and Acronyms in Geographic Information Systems, Cartography, and Remote Sensing](#) (Hoehn et al. 2004) or [ESRI's GIS Dictionary](#).
- G. Normalize fields to at least first normal form, i.e. use only one item of data for each field. Item selection should be driven by how the data will be displayed, queried, and analyzed. Data entry, validation, and retrieval are easier when each cell in every field contains a single, independent item. For example, use four fields (Street, City, State, and Zip\_code) instead of one to contain an address.
  - H. Use the suffix '\_ID' for primary keys. For example, Site\_ID, Plot\_ID, or Station\_ID. Use the same field name for foreign keys, i.e. Site\_ID will relate to Site\_ID in another table.
  - I. Make nouns singular. For example, use Life\_stage rather than Life\_stages.
  - J. Avoid a field name that is a word reserved for use by a database server or GIS software program. In some cases, it may be sufficient to suffix an underscore to the reserved word (for example, Year\_).

#### 5. Field values

- A. Whenever possible, use lookup tables to populate field values.
- B. Use consistent case (Title Case or lowercase recommended).
- C. Use consistent names for field values when referring to the same entity. For example, Diobsud Creek and Diobsud Cr. refer to the same stream, and one name should be used for both field entries.

#### Responsibilities

- Project leads, data managers, cooperators, and contractors working on NCCN I&M projects are responsible for consulting with NCCN GIS specialists in advance of GIS data development.
- NCCN GIS specialists are responsible for providing support to all parties requesting information on I&M GIS data development within the network.
- NCCN GIS specialists will verify that all submitted GIS layers adhere to the format outlined in this document.

#### Credits

Common GIS file abbreviations were adapted in part from the following NPS programs: Geologic Resource Evaluation Program available at <http://www2.nature.nps.gov/geology/inventory/>, Tallgrass Prairie National Preserve GIS, and Base Cartography Inventory available at <http://science.nature.nps.gov/im/inventory/basecarto/index.cfm>.

#### Recommended Citation

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## Reference Documents

### Related Guidance

- Boetsch, J. R., B. Christoe, and R. E. Holmes. 2009. Data management plan for the North Coast and Cascades Network Inventory and Monitoring Program (2005). Natural Resource Report NPS/NCCN/NRR—2009/078. National Park Service, Fort Collins, Colorado. Available at: <http://science.nature.nps.gov/im/units/nccn/datamanagement.cfm>

### Other Citations and References

- Association for Geographic Information (AGI). 2005. GIS Dictionary – List of Acronyms. AGI. United Kingdom.
- ESRI. GIS Dictionary. Definitions for GIS terms related to operations such as analysis, GIS modeling and web-based GIS, cartography, and Esri software. Available at: <http://support.esri.com/en/knowledgebase/GISDictionary/term/abbreviation>.
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- Microsoft Access Database Solutions. 2003-2009. Database Design and Normalization. Available at: [http://www.databasedev.co.uk/database\\_normalization\\_basics.html](http://www.databasedev.co.uk/database_normalization_basics.html)

## Revision History

Revision Date	Description of Change	Author	Effective Date
Feb 03, 2010	Updated links and contact information	Natalya Antonova	Feb 10, 2010
Nov 29, 2013	Updated links and contact information Updated GIS file format to exclude ArcInfo coverages and include geodatabases	Natalya Antonova	Dec 19, 2013

**Appendix 1. NCCN Inventory and Monitoring Project Codes**

<b>Project Name</b>	<b>Project Code</b>
<i>Inventories</i>	
Amphibian EBLA	ARa01
Amphibian LEWI	ARa02
Amphibian FOVA	ARa03
Amphibian MORA	ARa04
Amphibian NOCA	ARa05
Amphibian SAJH	ARa06
Amphibian OLYM	ARa07
Landbird OLYM	BDa02
Landbird EBLA	BDa04
Landbird LEWI	BDa05
Landbird FOVA	BDa06
Landbird MORA	BDa07
Landbird NOCA	BDa08
Landbird SAJH	BDa09
Intertidal Fish OLYM	FIa01
Intertidal Fish SAJH	FIa03
Freshwater Fish MORA	FIa04
Stream Fish MORA NOCA	FIa05
Freshwater Fish OLYM	FIa06
Intertidal Fish EBLA	FIa07
Freshwater Fish LEWI	FIa08
Freshwater Fish FOCL	FIa09
Forest Carnivore OLYM	MAa01
Small Mammal LEWI	MAa05
Small Mammal FOVA	MAa06
Forest Carnivore MORA	MAa07
Forest Carnivore NOCA	MAa08
Small Mammal Bat SAJH	MAa10
Coastal Wetland Plant OLYM	PLa01
Vascular Plant EBLA	PLa02
Vascular Plant FOVA	PLa03
Vascular Plant MORA	PLa04
Vascular Plant NOCA	PLa05
Vascular Plant SAJH	PLa06
Exotic Plants NOCA MORA OLYM	PLa09
Vegetation Classification	VCa01
Vegetation Mapping	VCa10
<i>Monitoring</i>	
Mountain Lakes	ACa02
Landbirds	BDa03
Climate	CLa01
Fish Assemblages	FIa10
Glaciers	HYa01
Landscape Change	LPa01
Elk Aerial	MAa12
Elk LEWI	MAa19
Intertidal	MIa01
Forests	VCa02
Prairies	VCa03

<b>Project Name</b>	<b>Project Code</b>
<i>Monitoring</i>	
Alpine Subalpine	VCa08
Large Lakes	WCa02
Water Quality	WCa01

**Appendix 2. NCCN Common GIS Abbreviations**

<b>Code</b>	<b>Description</b>	<b>Code</b>	<b>Description</b>
amp	Amphibians	gag	Water gages
ap	Aerial photographs	gap	Gap Analysis Program
aq	Aquatic	geo	Significant geologic features
asp	Aspect	glc	Glaciers
bat	Bats	grv	Gravel pits
bc	British Columbia	grz	Grizzly Bears
bdr	Bedrock	gt	Goats
bld	Buildings	hlp	Helipads
blk	Blocks	hps	Hypsography (contours)
bmi	Benthic Macroinvertebrates	hsh	Hillshade
bnd	Administrative boundaries	hst	Historic
bop	Bird observation points	hu	Hydrologic Units
br	Bears	hyd	Surface hydrology
brd	Borders	ice	Ice
brg	Bridges	imp	Impacts
brt	Bird transects	ins	Insects
buf	Buffer	int	International
clf	Cultural features	inv	Invertebrates
clm	Climate	ivmp	Interagency Vegetation Mapping Project
clp	Clipped	lc	Land cover
cls	Cultural sites	lk	Lake
clv	Culverts	lmk	Landmarks
cmp	Camps	lnd	Landforms
cnd	Canada	lnx	Lynx
cnt	Contours	log	Logging
crn	Carnivores	lsv	Located survey markers
crw	Crown	lu	Land use
ctch	Catchments	lw	Lower
dcw	Digital Chart of the World	mm	Mammals
deg	Degrees	mn	Mines
dem	Digital Elevation Model in meters	nfd	National Fire Danger Rating System
dlg	Digital Line Graphic	nffl	National Forest Fire Laboratory Fuel Model
dmp	Dump	nps	National Park Service
dns	Density	or	State of Oregon
doq	Digital Orthophoto Quads	own	Ownership
doqq	Digital Orthophoto Quarter Quads	pcp	Precipitation
drg	Digital raster graphics	pct	Percent
egl	Eagles	PCT	Pacific Crest Trail
elv	Elevation	pk	Peaks
epl	Exotic plants	pl	Pools
fire	Fire	plss	Public land survey system
fld	Floodplains from HUD maps	pmr	Pacific Meridian Resources
fma	Fire Management Areas	pnd	Ponds
fsh	Fish	pll	Pollution
fsr	Fishers	ppl	Pipes and Transmission Lines

Code	Description
prv	Private
pst	Pastures
qd	Quads
qr	Quarries
rd	Roads
riv	Rivers
rml	River Miles
rna	Resource Natural Areas
ros	Rain-on-snow zones
rpl	Rare plants
rpr	Riparian
rpt	Repeaters
rrd	Railroads
rst	Ranger Stations
rw	Right-of-way
scl	Seattle City Light
sgn	Signage
slp	Slope
smp	Sampling
snw	Snow
soil	Soils
spr	Springs
spw	Spotted Owls
sshp	Salmon and Steelhead Habitat Inventory Assessment Program
stc	Structures
ste	Stehekin
str	Stream
strl	Social Trails
swp	Swamp
tln	Treeline
tm	Landsat Thematic Mapper (TM) images
trb	Tributaries
trh	Trailheads
trl	Trails
trn	Transportation
trsh	Trashcans
up	Upper
us	United States of America
usfs	United States Forest Service
utl	Utilities
veg	Vegetation
vsp	Vegetation sample plots
vu	Visitor use
wa	Washington State
wbp	Whitebark Pine
wch	Water chemistry
wld	Wilderness

Code	Description
wlf	Wildlife
wlr	Wolverines
wlv	Wolves
wq	Water quality
dot	Department of Transportation
wsh	Watersheds
wtl	Wetlands
zn	Zones