

**USDA Service Center Initiative
Geospatial Data Acquisition, Integration and Delivery
Business Re-engineering Project**

Data Themes - Outline - GNIS Concise

I. Acquisition

A. Data Source

1. Producer Information

a. Name

The Geographic Names Information System (GNIS) is produced by the United States Geological Survey (USGS).

b. Location of Headquarters

US Geological Survey
523 National Center
Reston, VA 20192 USA

c. Internet Address

www.usgs.gov

2. Publisher Information

a. Name

The GNIS is published by the USGS. It is available through the National Geospatial Data Clearinghouse.

b. Location of Headquarters

Branch of Geographic Names
US Geological Survey
523 National Center
Reston, VA 20192 USA

c. Internet Address

The internet address of the USGS is www.usgs.gov

The internet address of the clearinghouse is www.nsd.usgs.gov

3. Acquisition Information

a. Delivery Media

Published gazetteers, and computer generated national and State listings are available on bound paper. National, state, and thematic GNIS digital data sets are available on 9-track magnetic tape or 8-mm cartridge in ASCII code. The standard GNIS State and territory digital data sets are also available via anonymous file transfer protocol (ftp). The GNIS Feature Names Data Base is available on one CD-ROM.

b. Download URL

<http://mapping.usgs.gov/www/gnis/gnisftp.html>

c. Projected Data Availability Schedule

The Geographic Names Information System (GNIS) database is currently organized by individual State and Territory files. The database is being compiled in two phases.

The first phase is complete for all States and Territories, and captured feature names from USGS large-scale topographic maps, U.S. Forest Service maps, National Ocean Service charts, Federal Aviation Administration files, Federal Communications Commission files, and files of the Army Corps of Engineers.

The second phase of compilation is complete or in progress for about 65 percent of the United States, and captures names from State, locally, and privately published current and historical maps, charts, and texts. The status of States and territories for phase II is available at <http://mapping.usgs.gov/pub/gnis/OOREADME.html>. The status at the time of writing is listed below:

Complete	In progress	Not Started
Alabama	California	Alaska
Arizona	Illinois	American Samoa
Arkansas	Iowa	Connecticut
Colorado	Massachusetts	Guam
Delaware	Minnesota	Hawaii
District of Columbia	North Carolina	Kentucky
Florida	Oklahoma	Maine
Georgia	Wisconsin	Michigan
Idaho		Micronesia
Indiana		New Hampshire
Kansas		Puerto Rico
Louisiana		Rhode Island
Maryland		Texas
Mississippi		Vermont
Missouri		Virgin Islands
Montana		
Nebraska		
Nevada		
New Jersey		
New Mexico		
North Dakota		
Ohio		
Oregon		
Pennsylvania		
South Carolina		
South Dakota		
Tennessee		
Utah		
Virginia		
Washington		
West Virginia		
Wyoming		

Two thematic extracts of the data base are also available. The **U.S. Populated Places File** lists information about all cities and towns throughout the United States that are described in the data base. The **U.S. Concise File** lists information about major

physical and cultural features throughout the United States that are described in the data base.

B. Standards Information

1. Geospatial Data Standard

a. Standard Name and Steward Information

None. Data is tabular. Coordinates are listed as degrees, minutes, and seconds of longitude and latitude.

b. Standard Version

None. Data is tabular.

c. Standard URL

None. Data is tabular.

2. Metadata Standard

a. Standard Name and Steward Information

Content Standards for Digital Geospatial Metadata version 19940608

The metadata contact is:

US Geological Survey
508 National Center
Reston, VA 22092 USA

b. Description of Metadata Captured

The metadata is available online at <http://nsdi.usgs.gov/wais/maps/gnis.html>
The sections of metadata include:

Identification Information
Data Quality Information
Spatial Data Organization Information
Spatial Reference Information
Entity and Attribute Information
Distribution Information
Metadata Reference Information

c. Metadata Accuracy and Completeness Assessment

The metadata is complete. Additional information is available in the

U.S. Department of the Interior, U.S. Geological Survey, 1987 Geographic Names Information System--Data Users Guide 6; Reston, Virginia Softcopy in hypertext format is available at:

http://mapping.usgs.gov/www/ti/GNIS/gnis_users_guide_toc.html

C. Acquired Data Structure

1. Geospatial Data Format

a. Format (raster, vector, etc.)

The GNIS data is acquired as an ASCII, tabular file. The files have been compressed with the GNU gzip utility. If you do not have access to gzip, the FTP server will uncompress the file as you retrieve it.

b. Format Name

ASCII

c. Data Extent

The United States and its territories. Covers -180, -12 degrees SW to 172, 72 degrees NE.

d. Horizontal and Vertical Resolution

Horizontal resolution is one decimal second.

Vertical resolution is one foot.

e. Absolute Horizontal and Vertical Accuracy

Accuracy of these digital data is based upon the use of source graphics that are compiled to meet National Map Accuracy Standards. Comparison to the graphic source is used as control to assess digital positional accuracy.

f. Nominal Scale

1:24,000

g. Horizontal and Vertical Datum

The horizontal datum is the North American Datum (NAD) 83. The vertical datum is mean sea level.

h. Projection

None

i. Coordinate Units

Degrees, minutes, and decimal seconds

j. Average Data Set Size

The average record is 200 bytes. There is a very wide range of records per state and territory, from approximately 1 Kb to 2.2 Mb in size.

k. Symbology

None

2. Attribute Data Format

a. Format Name

Fixed format ASCII

b. Database Size

The GNIS database contains approximately 1.5 million records, averaging 200 bytes in length.

3. Data Model

a. Geospatial Data Structure

None

b. Attribute Data Structure

See below.

c. Database Table Definition

State and Territory Files

Columns	Contents
1-100	Feature Name
101-109	Feature Type
110-144	County
145-149	State/County FIPS Code
150-164	Geographic Coordinates
165-179	Source Coordinates of Linear Features
180-185	Feature Elevation
186-239	Topographic Map

d. Data Relationship Definition

Because there is only a single table, there are no data relationships to define.

e. Data Dictionary

Feature Name

The Federally recognized name of the physical or cultural feature.

Feature Type

One of the following types of features:

airport - manmade facility maintained for the use of aircraft (airfield, airstrip, landing field, landing strip).

arch - natural arch-like opening in a rock mass (bridge, natural bridge, sea arch).

area - any one of several areally extensive natural features not included in other categories (badlands, barren, delta, fan, garden).

arroyo - watercourse or channel through which water may occasionally flow (coulee, draw, gully, wash).

bar - natural accumulation of sand, gravel, or alluvium forming an underwater or exposed embankment (ledge, reef, sandbar, shoal, spit).

basin - natural depression or relatively low area enclosed by higher land (amphitheater, cirque, pit, sink).

bay - indentation of a coastline or shoreline enclosing a part of a body of water; a body of water partly surrounded by land (arm, bight, cove, estuary, gulf, inlet, sound).

beach - the sloping shore along a body of water that is washed by waves or tides and is usually covered by sand or gravel (coast, shore, strand).

bench - area of relatively level land on the flank of an elevation such as a hill, ridge, or mountain where the slope of the land rises on one side and descends on the opposite side (level).

bend - curve in the course of a stream and (or) the land within the curve; a curve in a linear body of water (bottom, loop, meander).

bridge - manmade structure carrying a trail, road, or other transportation system across a body of water or depression (causeway, overpass, trestle).

building - a manmade structure with walls and a roof for protection of people and (or) materials, but not including church, hospital, or school.

canal - manmade waterway used by watercraft or for drainage, irrigation, mining, or water power (ditch, lateral).

cape - projection of land extending into a body of water (lea, neck, peninsula, point).

cave - natural underground passageway or chamber, or a hollowed out cavity in the side of a cliff (cavern, grotto).

cemetery - a place or area for burying the dead (burial, burying ground, grave, memorial garden).

channel - linear deep part of a body of water through which the main volume of water flows and is frequently used as a route for watercraft (passage, reach, strait, thoroughfare, thoroughfare).

church - building used for religious worship (chapel, mosque, synagogue, tabernacle, temple).

civil - a political division formed for administrative purposes (borough, county, municipal, parish, town, township).

cliff - very steep or vertical slope (bluff, crag, head, headland, nose, palisades, precipice, promontory, rim, rimrock).

crater - circular-shaped depression at the summit of a volcanic cone or one on the surface of the land caused by the impact of a meteorite; a manmade depression caused by an explosion (caldera, lua).

crossing - a place where two or more routes of transportation form a junction or intersection (overpass, underpass).

dam - water barrier or embankment built across the course of a stream or into a body of water to control and (or) impound the flow of water (breakwater, dike, jetty).

falls - perpendicular or very steep fall of water in the course of a stream (cascade, cataract, waterfall).

flat - relative level area within a region of greater relief (clearing, glade, playa).

forest - bounded area of woods, forest, or grassland under the administration of a political agency (see woods) (national forest, national grasslands, State forest).

gap - low point or opening between hills or mountains or in a ridge or mountain range (col, notch, pass, saddle, water gap, wind gap).

geyser - eruptive spring from which hot water and (or) steam and in some cases mud are periodically thrown.

glacier - body or stream of ice moving outward and downslope from an area of accumulation; an area of relatively permanent snow or ice on the top or side of a mountain or mountainous area (icefield, ice patch, snow patch).

gut - relatively small coastal waterway connecting larger bodies of water or other waterways (creek, inlet, slough).

harbor - sheltered area of water where ships or other watercraft can anchor or dock (hono, port, roads, roadstead).

hospital - building where the sick or injured may receive medical or surgical attention (infirmery).

island - area of dry or relatively dry land surrounded by water or low wetland (archipelago, atoll, cay, hammock, hummock, isla, isle, key, moku, rock).

isthmus - narrow section of land in a body of water connecting two larger land areas.

lake - natural body of inland water (backwater, lac, lagoon, laguna, pond, pool, resaca, waterhole).

lava - formations resulting from the consolidation of molten rock on the surface of the Earth (kepula, lava flow).

levee - natural or manmade embankment flanking a stream (bank, berm).

locale - place at which there is or was human activity; it does not include populated places, mines, and dams (battlefield, crossroad, camp, farm, ghost town, landing, railroad siding, ranch, ruins, site, station, windmill).

mine - place or area from which commercial minerals are or were removed from the Earth; not including oilfield (pit, quarry, shaft).

oilfield - area where petroleum is or was removed from the Earth.

other - category for miscellaneous named manmade entities that cannot readily be placed in the other feature classes listed here.

park - place or area set aside for recreation or preservation of a cultural or natural resource and under some form of government administration; not including National or State forests or Reserves (national historical landmark, national park, State park, wilderness area).

pillar - vertical, standing, often spire-shaped, natural rock formation (chimney, monument, pinnacle, pohaku, rock tower).

plain - a region of general uniform slope, comparatively level and of considerable extent (grassland, highland, kula, plateau, upland).

ppl - (populated place) place or area with clustered or scattered buildings and a permanent human population (city, settlement, town, village).

range - chain of hills or mountains; a somewhat linear, complex mountainous or hilly area (cordillera, sierra).

rapids - fast-flowing section of a stream, often shallow and with exposed rock or boulders (riffle, ripple).

reserve - a tract of land set aside for a specific use (does not include forests, civil divisions, parks).

reservoir - artificially impounded body of water (lake, tank).

ridge - elevation with a narrow, elongated crest which can be part of a hill or mountain (crest, cuesta, escarpment, hogback, lae, rim, spur).

school - building or group of buildings used as an institution for study, teaching, and learning (academy, college, high school, university).

sea - large body of salt water (gulf, ocean).

slope - a gently inclined part of the Earth's surface (grade, pitch).

spring - place where underground water flows naturally to the surface of the Earth (seep).

stream - linear body of water flowing on the Earth's surface (anabranh, awawa, bayou, branch, brook, creek, distributary, fork, kill, pup, rio, river, run, slough).

summit - prominent elevation rising above the surrounding level of the Earth's surface; does not include pillars, ridges, or ranges (ahu, berg, bald, butte, cerro, colina, cone, cumbre, dome, head, hill, horn, knob, knoll, mauna, mesa, mesita, mound, mount, mountain, peak, puu, rock, sugarloaf, table, volcano).

swamp - poorly drained wetland, fresh or saltwater, wooded or grassy, possibly covered with open water (bog, cienega, marais, marsh, pocosin).

trail - route for passage from one point to another; does not include roads or highways (jeep trail, path, ski trail).
tower - a manmade structure, higher than its diameter, generally used for observation, storage, or electronic transmission.
tunnel - linear underground passageway open at both ends.
valley - linear depression in the Earth's surface that generally slopes from one end to the other (barranca, canyon, chasm, cove, draw, glen, gorge, gulch, gulf, hollow, ravine).
well - manmade shaft or hole in the Earth's surface used to obtain fluid or gaseous materials.
woods - small area covered with a dense growth of trees; does not include an area of trees under the administration of a political agency (see forest).

County

County name

State/County FIPS Code

Combination of the 2 character state FIPS code and 3 character county FIPS code. Includes leading zeros. For example, 08069 is Larimer County, Colorado.

Geographic Coordinates

Coordinates locate the approximate center of an areal feature or the mouth of a linear feature. Coordinate units are degrees, minutes, and seconds, ranging from 180W to 180E longitude, and 90S to 90N latitude.

Source Coordinates of Linear Features

Geographic coordinates that locate the source or heading of linear features

Feature Elevation

Elevation of the feature in feet above mean sea level, listed when available.

Topographic Map

The name of the USGS 1:24,000 topographic map on which the feature is located is listed.

D. Policies

1. Restrictions

a. Use Constraints

None. Some of the data provided were derived from sources outside of the U.S. Geological Survey. All data and information contained in any of the data files are provided without guarantee as to their completeness or correctness. Any conclusions drawn from these data and information are the sole responsibility of the user.

b. Access Constraints

None.

c. Certification Issues

None.

2. Maintenance

a. Temporal Information

Database is re-published monthly with additional data.

b. Average Update Cycle

Unknown. Documented as “as needed” in the metadata.

E. Acquisition Cost

1. Cooperative Agreement

a. Description of Agreement

None

b. Status of Agreement

N/A

2. Cost to Acquire Data

None

II. Integration

A. Value Added Process

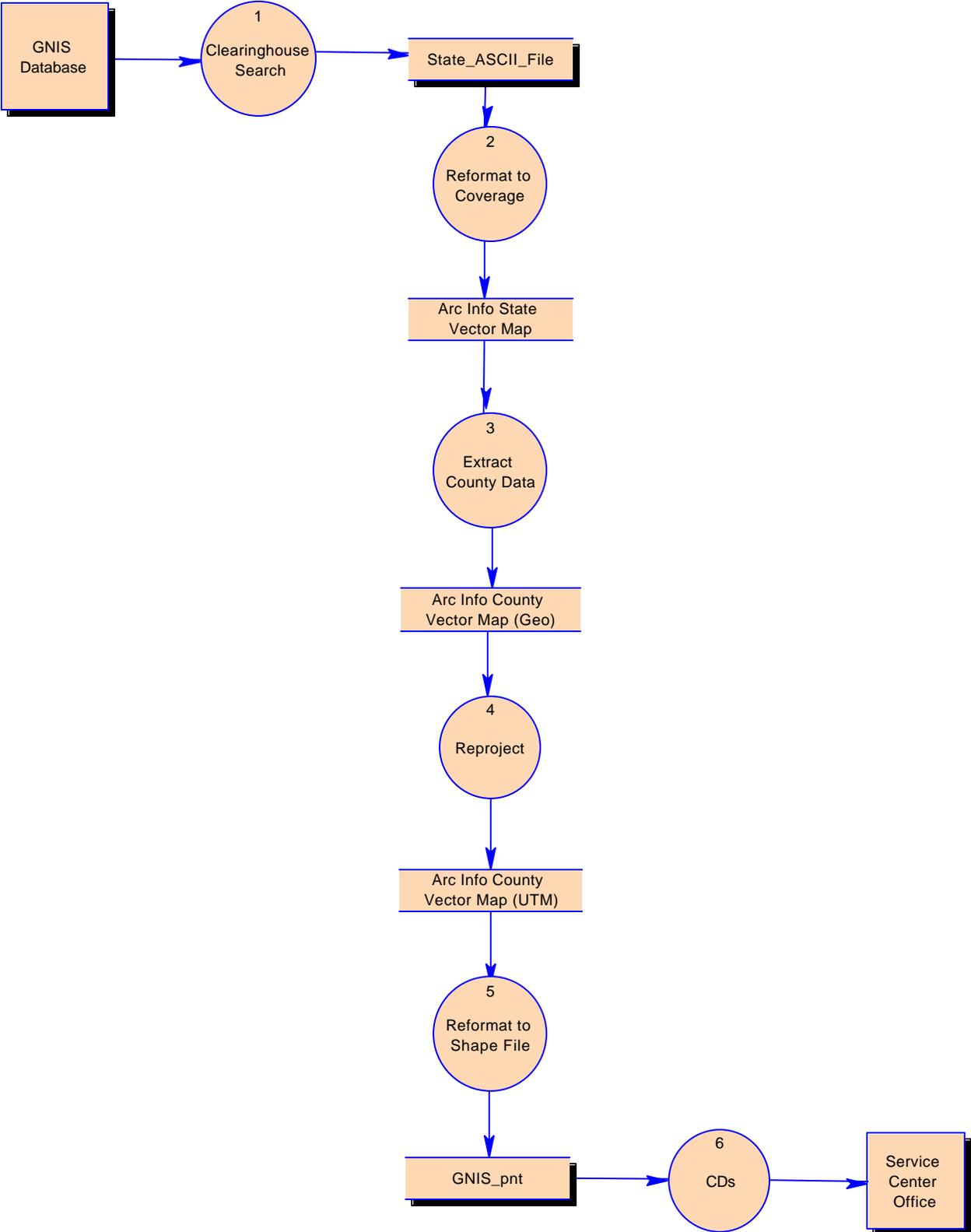
1. Benefit to the Service Center

The GNIS ASCII, tabular data is converted to a vector map. Without this, the GNIS data cannot be displayed or analyzed with other geospatial data. If a Service Center wanted to use the GNIS data, it would have to perform the conversion.

2. Process Model

a. Flow Diagram

Process Model		
Project : Data AID		
Model : GNIS Process Model		
Author : Jean Maloney	Version 1.0	12/15/98



b. Process Description

- The GNIS ASCII file is downloaded from the USGS ftp site for the appropriate state
- The GNIS ASCII file is converted to an Arc/Info vector map
- The Arc/Info vector map is converted to a shape file.
- The GNIS points which are located within the specified county are selected and saved as a separate shape file
- The county shape file is reprojected from geographic (lat/long) to the correct UTM zone for that area.

3. Technical Issues

a. Tiling

Original data is tiled by state or territory. This is changed to a county tiling scheme. The only time this may be a problem would be when the data in multiple counties is projected into different UTM zones and the entire dataset must be analyzed.

b. Compression

None.

c. Scale

The GNIS locations are taken from 1:24,000 scale maps. Therefore, the data should not be used at a scale larger than this.

d. Tonal Matching

Not applicable.

e. Edge-matching

Not applicable. Information is point data. When a point is located exactly on a county boundary, it will be located at the identical coordinates on the adjacent county. An exception might arise when adjacent counties are located in different UTM zones.

4. Quality Control

a. Procedures

A random sample of 10% of the entries in the system were visually verified against the compilation source data (large-scale USGS topographic maps) to ensure an accuracy rate of at least 95. Locative references (geographic coordinates, topographic map, and county) are cross-checked for logical consistency.

b. Acceptance Criteria

See above.

5. Data Steward

a. Name and Organization

Currently, the data steward for the integrated GNIS data is:
National Cartography and Geospatial Center
Natural Resources Conservation Service
US Department of Agriculture
501 Felix Street, Building 23
P. O. Box 6567
Fort Worth, Texas 76115-0567 USA

If the integration procedure can be automated, the steward would optimally remain:

Roger L. Payne
US Geological Survey
523 National Center
Reston, VA 20192 USA

b. Responsibilities

The USGS National Mapping Program maintains the system. Each regional mapping center of the USGS, as well as the U.S. Forest Service and National Ocean Service, compiles and electronically transmits names data to the GNIS staff for review and entry into the system. The U.S. Board on Geographic Names transmits information directly to the system concerning new names and the resolution of geographic names that are in conflict on Federal sources. A series of checks and balances ensures integrity and security so that all users can retrieve and use data with confidence.

If the responsibility of the GNIS data set becomes that of USDA, we will be responsible for updating the USDA version of the data on a periodic basis. This includes re-integrating the data.

B. Integrated Data Structure

1. Geospatial Data Format

a. Format (raster, vector, etc.)

Vector

b. Format Name

ESRI Shape file and Arc/Info coverage formats

c. Data Extent

Individual county

d. Horizontal and Vertical Resolution

Same as source data.

e. Absolute Horizontal and Vertical Accuracy

Same as source data.

f. Nominal Scale

Same as source data.

g. Horizontal and Vertical Datum

The horizontal datum is the North American Datum (NAD) 83. The vertical datum is mean sea level.

h. Projection

Universal Transverse Mercator (UTM), North American Datum (NAD) 83

i. Coordinate Units

Meters

j. Symbology

Gris	
·	a i r p o r t
Y	c e m e t e r y
æ	c h u r c h
÷	c i v i l
P	h o s p i t a l
Ö	p l
Ü	s c h o o l
z	s t r e a m
È	t o w e r
:	b u i l d i n g
=	c a n a l
ú	d a m
J	p a r k
ñ	p o
ü	r a n g e
B	r e s e r v o i r
r	s u m m i t
=	v a l l e y

2. Attribute Data Format

a. Format Name

Dbase V, as part of an ESRI Shape file

b. Database Size

The data per county ranges from approximately 100 to 1000 records

3. Data Model

a. Geospatial Data Structure

Shape Files	
map shp	shp file
map dbf	dbf file
map shx	shx file
map sbn	sbn file
map sbx	sbx file

- b. Attribute Data Structure
See below.
- c. Database Table Definition

GNIS_pnt	
<u>Gnis_id</u>	I
Shape	N11,5
Area	N11,5
Perimeter	N11,5
Gnis_	I
Name	A100
Type	A9
County	A35
Fips	A5
Coordinate	A15
Source_coo	A15
Elevation	A6
Topo_map	A54
Y_d	A3
Y_m	A2
Y_s	A2
X_d	A3
X_m	A2
X_s	A2

- d. Data Relationship Definition

There is a single table. The cities theme is a subset of all populated places from the GNIS theme.

- e. Data Dictionary

Gnis_id

A unique identifier for each feature. A remnant of Arc/Info data processing. Not required.

Shape

A mandatory field for all shape files. Will appear as the string point for each point feature.

Area

The area of polygon features. A remnant of Arc/Info processing. Not required. Always the value 0.0 because the data are point features.

Perimeter

The perimeter of polygon features or length of linear features. A remnant of Arc/Info processing. Not required. Always the value 0.0 because the data are point features.

Gnis_

A unique identifier for each feature. A remnant of Arc/Info data processing. Not required.

Name

The Federally recognized name of the physical or cultural feature.

Type	One of the types of features listed above under Source Data.
County	County name
Fips	Combination of the 2 character state FIPS code and 3 character county FIPS code. Includes leading zeros. For example, 08069 is Larimer County, Colorado.
Coordinate	Coordinates locate the approximate center of an areal feature or the mouth of a linear feature. Coordinate units are degrees, minutes, and seconds, ranging from 180W to 180E longitude, and 90S to 90N latitude.
Source_coo	Geographic coordinates that locate the source or heading of linear features
Elevation	Elevation of the feature in feet above mean sea level, listed when available.
Topo_map	The name of the USGS 1:24,000 topographic map on which the feature is located is listed.
Y_d	The degrees of the feature's latitude.
Y_m	The minutes of the feature's latitude.
Y_s	The seconds of the feature's latitude.
X_d	The degrees of the feature's longitude.
X_m	The minutes of the feature's longitude.
X_s	The seconds of the feature's longitude.

C. Resource Requirements

1. Hardware and Software

To acquire the GNIS data, it requires a UNIX or NT machine with approximately 1 GB of disk.

2. Staffing

It requires one staff member for approximately ½ day to acquire the entire GNIS database from the USGS ftp site.

D. Integration Cost

1. Hardware and Software

In order to reformat, reproject, and sub-sample the data, the USDA requires:
 Arc/Info on UNIX or NT platform
 ArcView on NT platform
 5 GB disk

2. Staffing

The procedure is currently not 100% automated. If it was automated, this procedure would require personnel only to check the results of the procedure. To generate maps for

the US and territories with no automation, it would require approximately 2 staff members, familiar with ESRI software, for 2 weeks.

III. Delivery

A. Specifications

1. Directory Structure

- a. Folder Theme Data is Stored In

Geographic Names Information System (V 6.0)

2. File Naming Convention

- a. List of Theme Files and The File Naming Convention (V6.0, non 8.3 compliant)

\gnisnnnnn.dbf
\gnisnnnnn.shx
\gnisnnnnn.shp

where nnnnn = <StFIPS>< CtyFIPS>, e.g. gnis18143.shp from State FIPS 18, County FIPS 143.

B. User Information

1. Accuracy Assessment

- a. Alignment with Other Theme Geospatial Data

Will be 100% aligned with the cities data theme. The GNIS locations will be aligned well with other themes captured at the source scale for the populated places. It should be noted by the data user that the largest scale maps available were used during Phase I compilation and the majority of the names were compiled from the 1:24,000-scale, 7.5-minute USGS topographic maps. For areas where no published or advanced 1:24,000-scale maps existed, the 1:62,500-scale maps were used; where there was no coverage by either series of maps, the 1:250,000-scale maps were used. Therefore, the positional accuracy of the GNIS data will vary, depending on the maps available at the location of each feature.

- b. Content

Because the place names are determined by the U.S. Board on Geographic Names, they are the most standard names available in the U.S.

2. Appropriate Uses of the Geospatial Data

- a. Display Scale

The original data source scale or smaller, usually 1:24,000.

- b. Plot Scale

The original data source scale or smaller, usually 1:24,000.

- c. Area Calculations

Not applicable. GNIS data is point data.

- d. Decision Making

The GNIS feature locations are the approximate centroids of area features, and the start location of linear features. The coordinates should not be used only for approximate calculations.

C. Maintenance and Updating

1. Recommendations and Guidelines

a. Frequency of Updates

In order of preference:

- Extract the data from the USGS clearinghouse node at the time of request for the data. Perform the data integration in an automated fashion. Therefore, no updates are required as USDA would not be the data stewards.
- To coincide with USGS updates, if notification is a possibility
- At a regular interval of 3 months, 6 months or 12 months, depending on budget

b. Location for the Theme Data to be Maintained

In order of preference:

- At the USGS, with USGS as the data steward
- At the USDA data warehouse, potentially in Fort Worth

c. Maintenance and Updating Procedures Overview

Follow the integration procedure listed above for each update if it is not done at the time of request of the data.