

**Forest Service Handbook  
National Headquarters - Washington Office  
Washington, DC**

**Forest Service Handbook 6609.15 – Standards for Data and Data Structures Handbook  
Chapter 30 - Geographic Information System (GIS) Core Data Structure Standards**

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**Responsible Staff:**

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**Digest:** Following is an explanation of the changes throughout the directive by section.

**30.3:** Adds additional policy which states that the North American Datum of 1983 (NAD83) is the standard horizontal datum for the Forest Service. All Forest Service geospatial data must be referenced to NAD83.

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This chapter establishes standard linkage structures between Forest Service data about geographic features in the Forest Service geographic information system (GIS), and the tabular data about the same features stored in Forest Service relational database management systems (RDBMS). The chapter also establishes the GIS Core Data Dictionary as the agency's official source of information about these linkages for Forest Service data that have been classified as "core"; that is, data necessary to answer questions posed at the scale of a National Forest or Grassland, questions that cross National Forest or Grassland boundaries, and questions posed at scales larger than a National Forest or Grassland.

### 30.2 - Objectives

1. To ensure the use of consistent, accurate data in Forest Service programs by use of standard structures for linking descriptive and spatial information that is stored in the Forest Service geographic information system (GIS) about categories, components, themes, layers, coverages, features, and attributes, with the same type of information stored in Forest Service relational database management systems (RDBMS).
2. To ensure that the core data structures are established in compliance with standard specifications for spatial parameters, such as projection, area extent, accuracy requirements, and resolution.
3. To ensure the appropriate core attribute data are collected for the geographic features that define the agency's core geographic data.
4. To ensure valid values are adhered to in collecting the core geographic attribute data associated with the core geographic features.

### 30.3 - Policy

1. Use the INFO Attribute Tables, the ORACLE Views, and the associated coding and domains established in the GIS Core Data Dictionary, located at <http://fsweb.wo.fs.fed.us/im/standards/gis/coredata/index.html>, for all new data formats and structures developed, and all new data collected in these formats and structures, for categories, components, themes, layers, coverages, features, and attributes.
2. Adhere to the spatial data sources and horizontal accuracy specified in the GIS Core Data Dictionary in new GIS data collection and GIS data structure development.
3. In all cases, construct a complete ArcInfo projection file for new GIS data collection and data structure development.
4. Conform to the definitions of terms set out in this Handbook and the GIS Core Data Dictionary. If a discrepancy exists between the definition of a term that appears in the data dictionary and also in this Handbook, the definition in this Handbook takes precedence as the official Forest Service definition of the term.

5. The North American Datum of 1983 (NAD83) is the standard horizontal datum for the Forest Service. All Forest Service Geospatial data must be referenced to NAD83. All Forest service geospatial data that is referenced to the North American Datum of 1927 (NAD27) or another datum must be converted to NAD83. The federal standard transformation method is embodied in the North American Datum Conversion (NADCON) software tool developed by the National Geodetic Survey. Procedures and conversion tools are available at the Forest Service Geospatial Portal (FSGeoportal) intranet site.

### 30.5 - Definitions

Control Number. A number generated by a standard Forest Service relational database management system (RDBMS) or GIS routine that uniquely identifies, across all RDBMS and GIS instances, an occurrence of an entity type about which information is collected in the agency. For example, if the entity type were TRAIL, then different control numbers should always be assigned to information about different trails.

Coordinate System. The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies. (Source: Content Standards for Digital Geospatial Metadata, Federal Geographic Data Committee, 1995.)

Coverage. A specific Forest Service GIS product incorporating some or all of the information within a GIS layer. For example, the Heritage Resource Sites GIS layer has three coverages corresponding to heritage resources best represented by a point (buildings, for example); heritage resources best represented by a line (roads, trails, railroads, and so forth); and heritage resources best represented as polygons (areas greater than one acre).

Datum. The identification given to the reference system used to define the coordinates of points (horizontal datum) or the elevation of points (vertical datum). A datum specifies a set of parameters defining a coordinate system, and a set of control points whose geometric relationships are known, either through measurement or calculation. Commonly used examples are:

- a. Horizontal datum: North American Datum of 1927, North American Datum of 1983; and
- b. Vertical datum: National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988.

Domain. The set of allowed (valid) values for a data element or data field.

Forest Service GIS Core Data. The geographically referenced data collected and maintained by the Forest Service in order to answer questions posed at the scale of a National Forest or Grassland; questions that span National Forest or Grassland boundaries; and questions posed at scales larger than those of a National Forest or Grassland.

Horizontal Accuracy. The maximum allowable difference between a feature's location, as represented in a GIS (or on a map), and the true location of this feature on the Earth.

Horizontal accuracy takes into account a feature's complexity and sinuosity, relative to a given scale, in the maximum allowable difference specifications.

Horizontal Integration. A condition achieved within a GIS when the topology of the coverages for adjacent areas represented in a GIS, connect (or edge-match) correctly.

INFO Attribute Table. A tabular description of the record layout for a feature in the Forest Service Arc/Info GIS.

Layer. A Forest Service GIS product incorporating some or all of the information within a theme (defined in sec. 20.5). For example, the theme, Water, is composed of three layers: Stream, Water Body, and Watershed.

ORACLE View. A combination of data from multiple tables in an RDBMS represented as a resultant, virtual table. In the GIS Core Data Standards, for each feature included therein, views are defined that assemble, in one virtual table, all the attributes in the RDBMS related to that feature.

Projection. The systematic representation of all or part of the surface of the Earth on a plane or developable surface.

Topology. The spatial relationship between connecting or adjacent coverage features. Topological relationships are built from simple elements into complex elements; for example, points are built into arcs (connected points) and arcs are built into polygons or areas (connected arcs). Topology, for the purposes of GIS use, represents information about connectivity, adjacency, proximity, contiguity, and containment characteristics of geographic, spatially locatable features

Vertical Integration. A condition achieved in a GIS when the representations of features that possess partial or total common logical spatial alignments and that are portrayed on different GIS layers, are captured with identical coordinates for those common logical spatial alignments.

### **31 - Procedures for Proposing Changes, Additions, and Deletions to GIS Core Data Dictionary**

#### **31.04 - Responsibility**

##### **31.04a - GIS Data Administrator, Information Resources Management Staff, Washington Office**

The GIS Data Administrator, Information Resources Management Staff, Washington Office, has the responsibility to:

1. Ensure that those employees having GIS data administration responsibility in the National Forest System, State and Private Forestry, and Research and Development Deputy Areas receive a copy of any change proposal to the GIS Core Data Dictionary.

2. Obtain agreement among the Deputy Area GIS Data Administrators on the time frame in which to reach consensus on the disposition of the change proposal following review of the proposal by an appropriately wide range of representatives of those affected by the change.
3. Perform the role of editor to incorporate changes agreed upon by the Deputy Area Data Administrators pursuant to the review process set out in this chapter.
4. Refer to the Geospatial Executive Board, or other appropriate committee, any issue that cannot be resolved by the GIS Data Administrators and prevents timely disposition of a change proposed to the GIS Core Data Dictionary.

### **31.04b - Deputy Area GIS Data Administrators, Washington Office**

The Deputy Area GIS Data Administrators for National Forest System, State and Private Forestry, and Research and Development have the responsibility to:

1. Ensure that change proposals are reviewed by subject matter experts in the communities affected by the change.
2. Resolve change proposal related issues that arise between the Deputy Areas.
3. Override or refine editorial changes made by the GIS Data Administrator, Information Resources Management Staff, if the editorial changes affect the substance of the standard in question.
4. Work with the GIS Data Administrator, Information Resources Management Staff, to ensure the change management process is timely and responsive to the needs identified by the communities subject to the standards.

### **31.1 - Proposals for Changes, Additions, and Deletions to GIS Core Data Dictionary**

Send proposals for changes, additions, and deletions to standards in the GIS Core Data Dictionary (including, definitions, linkages, spatial parameters, coding, and domains) to the Washington Office, Information Resources Management Staff, to the attention of the GIS Data Administrator. With the proposal, include:

1. An explanation of the position of the standard affected in the National Geographic Information Structure as described in chapter 20, as well as an explanation of the position of the item in the GIS Core Data Dictionary.
2. A description of the issue or gap the change addresses. Explain the change in terms of the business or technological need addressed, indicate the urgency of the request, and include the reason(s) it is appropriate for the change to be adopted at the national level.
3. Contact information and an indication, if appropriate, as to the community of interest supporting the change request.

4. An impact analysis describing, for example, the number of databases or national applications that will have to undergo modification for the change to be implemented.

### **32 - Standard Practice for Use of GIS Control Numbers**

Regardless of where a GIS control number is first generated, it is standard agency practice to ensure that the control number used for a feature in the Forest Service RDBMS agrees in value with the control number used for the feature in the Forest Service GIS.