United Nations E/CONF.98/121/Add.1

Economic and Social Council

Distr.: General

3 July 2007

Original: English

Ninth United Nations Conference on the Standardization of Geographical Names
New York, 21 - 30 August 2007
Item 12 (d) of the provisional agenda*
Toponymic data files:
Automated data-processing systems

The Geographic Names Information System of the United States of America

Submitted by the United States of America**

* E/CONF.98/1.

** Prepared by Dwight Hughes (USA).

THE GEOGRAPHIC NAMES INFORMATION SYSTEM OF THE UNITED STATES OF AMERICA

The Geographic Names Information System (GNIS) is the Unites States Federal standard for geographic nomenclature. The U.S. Geological Survey (USGS) developed the GNIS for the U.S. Board on Geographic Names as the official repository of domestic geographic names data; the official vehicle for geographic names use by all departments of the Federal Government; and the source for applying geographic names to Federal electronic and printed products.

The GNIS contains information about physical and cultural geographic features of all types in the United States, associated areas, and Antarctica, current and historical, but not including roads and highways. The database holds the Federally recognized name of each feature and defines the feature location by State, county, USGS topographic map, and geographic coordinates. Other attributes include names or spellings other than the official name, feature designations, feature classification, and historical and descriptive information. The database assigns a unique, permanent feature record identifier, the Feature ID as the standard key for accessing, integrating, or reconciling feature data across multiple data sets.

In addition to being a Federal standard, the GNIS is becoming a national standard. The American National Standards Institute (ANSI) Committee for Information Technology Standards has approved a proposal for the GNIS feature identifier, official name, and official point location to become ANSI standards. The draft standard is expected to be approved in 2007. The same elements are included in the U.S. Federal Geographic Data Committee (FGDC) draft Address Standard, and as top level optional attributes in the U.S. Department of Homeland Security Geospatial Data Model. The GNIS is a critical element in the National Spatial Data Infrastructure and the USGS *The National Map*. It is part of a national gazetteer development project, and the subject of continuing coordination with U.S. National Geospatial Intelligence Agency data collection programs.

The GNIS provides data to all levels of government, to numerous applications, and to the public through a web query site <http://geonames.usgs.gov>, web map, feature, and XML services, file download services, and customized files upon request. Major Federal systems supported include *The National Map* <http://nationalmap.usgs.gov>, *The National Atlas* <http://nationalatlas.gov>, and the National Hydrography Dataset <http://nhd.usgs.gov>. The GNIS is linked to the National Elevation Dataset <http://ned.usgs.gov> for query and display of feature elevation data, and increasingly is accessed dynamically by other federal, state, local, and private systems for feature names data.

The Geographic Names Information System utilizes relational and geospatial database, geographic information system, and Internet technology to deliver its many services. It is resident on Sun Solaris servers with an Oracle Spatial database. Web services are

provided through the Oracle Internet Application Server, ESRI Spatial Data Engine (SDE) and an ESRI ArcIMS map service. Applications are programmed using the Oracle Applications Express toolset in the Oracle PL/SQL language.* The database contains approximately two million records.

Starting in 1976, feature name and attribute data were collected from the largest-scale U.S. Geological Survey topographic maps available, primarily 1:24,000-scale, as well as from records of the U.S. Board on Geographic Names, U.S. Forest Service 1:24,000-scale topographic maps and visitor maps, and National Ocean Service charts. In a second phase of collection starting in 1982, large amounts of data are being compiled under contract from official state and local sources and other approved sources including historical maps and documents. This process is almost complete.

Additions and corrections to the feature data in the GNIS are accepted for consideration from any source, and upon validation, are entered into the database. However for primary data maintenance, the GNIS now collects data from a broad program of partnerships with federal, state, and local government agencies and other authorized contributors. The latest information technology tools and methodologies are applied to ensure that local data are properly represented in the GNIS and through the GNIS to all federal agencies and to the public.

Authorized contributors have access to web based transaction entry and edit forms, which submit data directly to the GNIS for review and inclusion in the database. Partners also submit batch files in most standard formats and coordinate with the Geographic Names Project to develop joint services, processes, and applications for greatest efficiency. Data entered into the GNIS is validated to ensure compliance with the requirements of the U.S. Board on Geographic Names for national names standardization. The data becomes immediately available to all web services and applications dependent on it.

Federal partners include agencies concerned with geographic information, population, ecology, and management of public lands such as the U.S. Forest Service, Office of Coast Survey, National Park Service, Bureau of Land Management, Fish & Wildlife Service, National Oceanic & Atmospheric Administration, General Services Administration, and Office of Personnel Management. Several States have recognized the GNIS as the official state names database and are actively contributing data. Partnerships with other State, County and local agencies are being developed.

Since 2004, the Geographic Names Information System completed a thorough redesign of the database and development of entirely new web applications. The relational database design was simplified, data inconsistencies and anomalies resolved, and greater efficiency achieved. It was spatially enabled to become a full-service geodatabase with the capability to store, manage, and display geospatial data. Applications were reprogrammed to take advantage of emerging technology and to provide expanded and more efficient services.

Technically the trend has been toward more distributed processes using web technology and integration of traditional text and numeric applications with graphic and geographic capabilities. Personnel of the USGS Geographic Names Project are performing less actual data compilation and entry and more validation of data submitted by partners using the new tools, which is necessary given the sheer volume of the data and its rate of change. Partners increasingly are correlating their federal, state, and local feature datasets with the GNIS in order to produce a consistent, current, and accurate national picture, particularly with respect to standardized name usage.

One major mission of the GNIS when first developed was to perform the role of valuator and integrator of feature names data in support of the USGS Topographic maps, until recently the only consistent national geographic representation in existence. With the new technology and the demand for instant, accurate information, this role is even more important.

The Geographic Names Information System has always been a geographic information system in the sense that it contained, managed, and displayed locative information. It is therefore natural that new geographic information system (GIS) data management and display functions be applied to the system. The GNIS has evolved in collaboration with other major USGS programs such as, *The National Map* and Geospatial One-Stop, as a major contributor to the 21st century's electronic version of the topographic map.

For the future, the GNIS intends to continue applying the emerging technology in support of its mission and the mission of the U.S. Board on Geographic Names. The trends described above are expected to continue. The immediate goals are to achieve better and more efficient web services and improved integration with geographic data manipulation and display functions.

Feature names data must be widely, quickly, and reliably available to any system or citizen needing them. In addition, they must be kept current, complete, consistent, and accurate through distributed partnerships using efficient and reliable information technology tools. These services are critical with respect to national security, emergency preparedness and response, regional and local planning, site selection and analysis, cartographic applications, environmental problem-solving, tourism, and all levels of communication.

For additional information on the GNIS and related web map and feature services, visit the Geographic Names web site <http://geonames.usgs.gov> and the Geographic Names Community in Geospatial One-Stop <http://gos2.geodata.gov/wps/portal/gos>, the USGS portal for Federal, State, and local geographic data. Communications concerning the system should be addressed to <gnis_manager@usgs.gov>.

*The citation of trademarks or brand names in this paper does not imply endorsement or any type of recommendation by the U. S. Geological Survey.