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THE GEOGRAPHIC NAMES INFORMATION SYSTEM, U.S. GEOLOGICAL SURVEY

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U.S. GEOLOGICAL SURVEY**

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The attached milestone list provides a historical synopsis of the development of the Geographic Names Information System (GNIS) that is the umbrella processing system for the National Geographic Names Data Base (NGNDB), the geographic names depository of the United States. Research and development over the past 2 years have been diverse in scope and nature.

GNIS is resident on an IBM-compatible mainframe computer, using MVS/SP as the operating system and TSO as the teleprocessing monitor. Management and processing of GNIS data are accomplished through software designed for sophisticated manipulation of textual data. The latest version of this software will soon be implemented, allowing greater analysis capability and more efficient data management techniques. Additional software is employed for a variety of attendant uses including report formatting, user assistance, and data input. GNIS data bases are currently contained on three direct access high-density disks, yielding a total storage capacity of one billion characters. The data bases are always online and available interactively throughout North America via the GEONET Communications Network.

To insure viability and currency, a maintenance program was implemented in October 1987, whereby U.S. Geological Survey (USGS) Mapping Centers at Denver, Colorado., Rolla, Missouri., and Menlo Park, California., electronically provide newly collected names and corrections directly to the GNIS data base. This maintenance program was expanded to include as contributory sources two other Federal mapping agencies—the U.S. Forest Service and the National Ocean Service.

Similarly, the staff of the U.S. Board on Geographic Names (BGN), Domestic Names Committee, provides additions or corrections on a monthly basis. Data input software designed and written by the GNIS staff specifically to facilitate the maintenance program was distributed for use by all participating parties. The software incorporates error checking routines to maximize data integrity. The same software is used by contractors providing data compilation services for GNIS.

Research was initiated to determine the applicability of geographic names processing in mini- and microcomputing environments. Initially, this research effort arose as a result of a requirement to automate the activities of the staff of the BGN's Domestic Names Committee. Additional applications have been identified, including establishing a PC version of the official USGS Topographic Map Names Data Base and providing a feasible method of automated geographic names processing to participating members of the Pan American Institute of Geography and History.

Because the primary purpose of GNIS is to provide support to the National Mapping Program of the United States, GNIS staff members are working with other USGS offices to

accomplish preliminary research toward establishing and implementing the necessary link between GNIS and the National Digital Cartographic Data Base (NDCDB). Additionally, GNIS staff members are investigating various automated graphic display systems to portray names data visually. Research is also being conducted into the utilization of names data as an integrated layer of geographic information system (GIS) applications.

History of the Development of GNIS

- **1960 --** Development of one of the first automated data handling systems for the storage and retrieval of geographic names (paper tape)
- **1961 --** Publication of BGN docket and decision lists using automated procedures (paper tape)
- **1963 --** Branch of Geographic Names sponsorship of a conference on the use of the computer for the storage and retrieval of toponymic data for standardization, water and geologic records and publications, and for map production
- **1964 --** Development of a system for the storage and retrieval of geographic names using the Burroughs 220 computer in basic name record format
- **1965 --** Publication of USGS Bulletin 1242 (Delaware Place Names) using ADP methods
- **1968 --** Decision to use the University of Oklahoma's General Information Processing System (GIPSY) for the handling of geographic names for the planned
NGNDB

- **1968 --** Work begun on pilot program to collect Massachusetts toponymic data for storage using the Burroughs 220 computer and data conversion for retrieval using GIPSY
- **1968 --** Conversion to the Burroughs 283 computer
- **1969 --** use of the Burroughs 283 computer for data input, with the storage, maintenance, and retrieval of data handled by the IBM 360 series computer housing the GIPSY
- **1970 --** Research in the use of computer graphics with the University of Maryland's IBM 7094 computer housing the SYMAP program.
- **1974 --** Completion and distribution of a prototype automated file (Massachusetts)
- **1975 --** Conversion of Dictionary of Alaska Place Names digital form
- **1976 --** Initiation of a pilot study for collecting names and associated information in digital form from USGS topographic maps (Kansas to Colorado)
- **1978 --** Completion of a favorable analysis of pilot project
- **1978 --** Development of a Rhode Island compilation as a test to write technical specifications for nationwide compilation
- **1978 --** Award of a contract for nationwide compilation
- **1981 --** Completion of a nationwide compilation from topographic maps
- **1981 --** Establishment of interactive access to GNIS
- **1981 --** Extension of interactive access to USGS mapping centers
- **1982 --** Initiation of the National Gazetteer program initiated with compilation from other Federal, State, local, and historical materials
- **1982 --** Completion of training for National Cartographic Information Centers (NCIC) and Public Inquiries Offices

- **1982 --** Publication of first volume of the National Gazetteer
- **1983 --** Redesign of the extensive "front-end" for better interactive access
- **1984 --** Training of advanced techniques provided to NCIC headquarters personnel
- **1984 --** Incorporation of GNIS into Earth Science Information Network
- **1985 --** Completion of ISD GNIS system analysis—mainframe operation
- **1986 --** Establishment of BGN direct input to GNIS
- **1986 --** Generation of all products turned over to NCIC
- **1987 --** Initiation of referred for information (RFI) for a possible conversion to dedicated machine
- **1987 --** Aquisition of the responsibility for Federal Information Processing System 55 National file
- **1987 --** Full participation in GNIS maintenance program by USGS mapping centers
- **1988 --** Interactive accession for other Federal agencies
- **1988 --** Design of a plan for complete automation of BGN
- **1988 --** Preparation of a draft report by GNIS staff and system integrator regarding GNIS relationships to NDCDB