USGS
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tribal, State, and Federal partners to improve and deliver topographic information for the Nation.

The readily accessible, consistent geographic framework of *The National Map* enables users to pursue place-based analyses of diverse types of information, to monitor changes and detect trends, and to discover relations between seemingly independent phenomena and processes. Publicly available geographic information from *The National Map* is used for a multitude of purposes in science, business, land management, education, and emergency response. When enhanced and extended, geographic information from *The National Map* forms the basis for a wealth of commercial products. See *http://nationalmap.gov*.

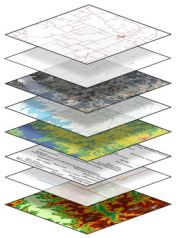
The USGS, the lead Federal civil mapping agency, continues to be responsible for ensuring the availability of complete, consistent, and current base geographic information. The authoritative accuracy of this information effectively serves the Nation by providing a common starting point of geographic knowledge for government, industry, and public uses. After 125 years, the national mapping mission of the USGS remains as vital as ever to the American people in the 21st century.

U.S. Department of the Interior
U.S. Geological Survey

April 2010

1990s Mapping with computers

2000s Mapping with the Internet

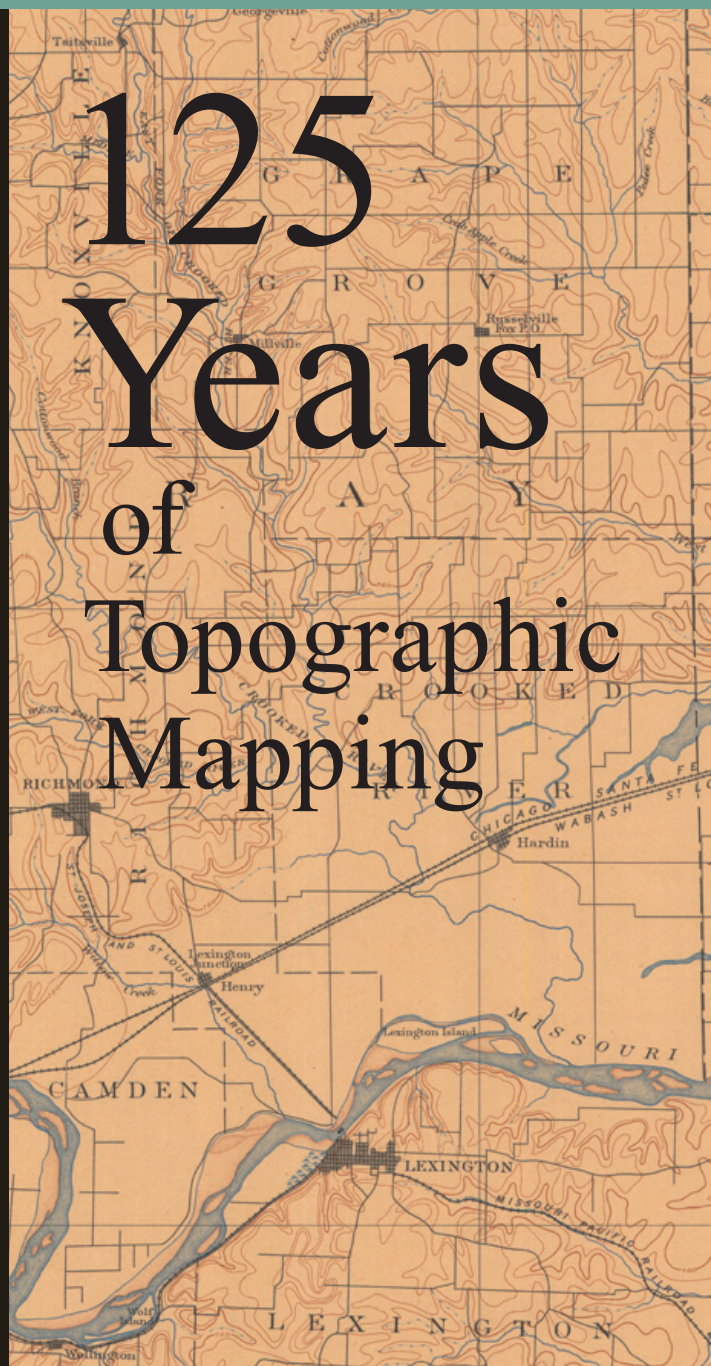


The Explorer and the Maps

A Union artillery officer in the Civil War, Powell lost his right arm at the Battle of Shiloh in 1862. He became a national hero in 1869 when his party successfully navigated, and mapped, the Colorado River through the Grand Canyon.

As USGS Director from 1881-94, Powell's championing of one geodetic system and one topographic system marked the continuing importance of what is still today a core function of Federal mapping: the development of consistent national standards. Powell's understanding that more detailed mapping would be required by future generations eventually led to the nearly national (save Alaska) 1:24,000-scale topographic map series. The large-scale standard topographic series was essentially completed for the conterminous United States in 1991. Approximately 33 million person hours and $1.6 billion were invested in this national effort, a remarkable engineering feat. The 57,000 topographic quadrangles were printed with many of the same techniques described by Powell in 1885.

125 Years of Topographic Mapping



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125 Years of Topographic Mapping: 1884–2009

The complex geography of the entire United States is vividly portrayed by more than 57,000 U.S. Geological Survey (USGS) topographic maps. Charting every river, lake, and wetland; every valley, mountain, and plain; each city and railroad, village and stream, these maps have become a signature product of the USGS because the public has found them to be a thorough, yet accessible tool for closely reading the sweep of the Nation's land.

Mapping the breadth of the Nation in such meticulous detail has been a demanding challenge for USGS mapmakers since 1884. For 125 years, this ambitious goal has spurred USGS cartographers to invent new instruments, devise new methods, and apply the most modern technology to improve the accuracy, utility, and efficient production of geographic information. Innovations by the USGS in topographic mapping, in geographic information systems (GIS), and in the public provision of maps, images, and digital geographic data have helped advance the United States as a leader in today's geographic information industry.

For more information about the history of topographic mapping at the USGS, please visit *http://nationalmap.gov/ustopo/history*.

The Beginning

Sound geographic knowledge is essential for effective government. In the United States, the requirement for national mapping is demonstrated historically by the early appointment of a Geographer of the United States in 1781 and the establishment of many Federal expeditions in the 1800s to survey Western lands.

The USGS has a proud tradition of mapping the Nation, a heritage that was largely established by John Wesley Powell, its second Director (1881–94). In a bold, visionary statement to Congress on December 5, 1884, Powell announced, "A Government cannot do any scientific work of more value to the people at large than by causing the construction of proper topographic maps of the country."

Previously, topographic (from the Greek words *topos*, place, and *graphē*, writing) mapping had been conducted as needed to support ongoing USGS investigations in geology, geography, and hydrology. After 1884, with Congressional support, comprehensive mapping at relatively large scales was viewed as a distinct element of the USGS mission and quickly became the largest part of the USGS program.

From the 1880s until the advent of computers and geographic information system (GIS) software, topographic maps served as the essential instrument for the integration and analysis of place-based information. USGS mapping techniques evolved in the course of 125 years from field surveys through photogrammetry to the computer-based data and GIS analysis currently in widespread use.

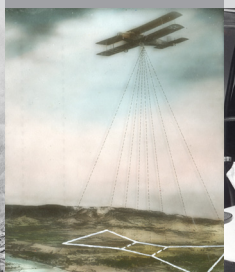
The Present and the Future

Today, the tools of geographic science are broadly available and more affordable than ever. Coalescence of the Internet, global positioning satellite (GPS) technology, broadband wireless communications, and inexpensive, highly capable, easily portable computers means that geospatial analysis and data capabilities are no longer limited to centralized government or corporate entities. Rather, the challenges to the geospatial community are in managing the quantity and quality of available information, synthesizing that information to ensure completeness and consistency, making this information readily available and interoperable, and developing business models that stimulate data sharing and commitments to long-term information stewardship.

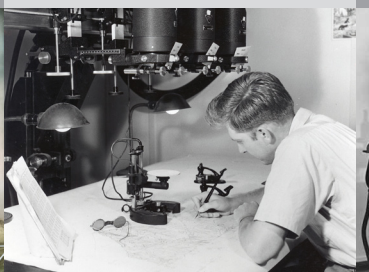
To advance its mapping vision and meet customer requirements in the computer age, the USGS has developed *The National Map*, a collaborative effort that brings together digital geographic data from local,

1880s Field sketching

1930s Aerial photography



1940s Mapping from stereophotography



1950s Increased precision with photogrammetry

1970s Electronic instrumentation

1980s Earth observing satellites