

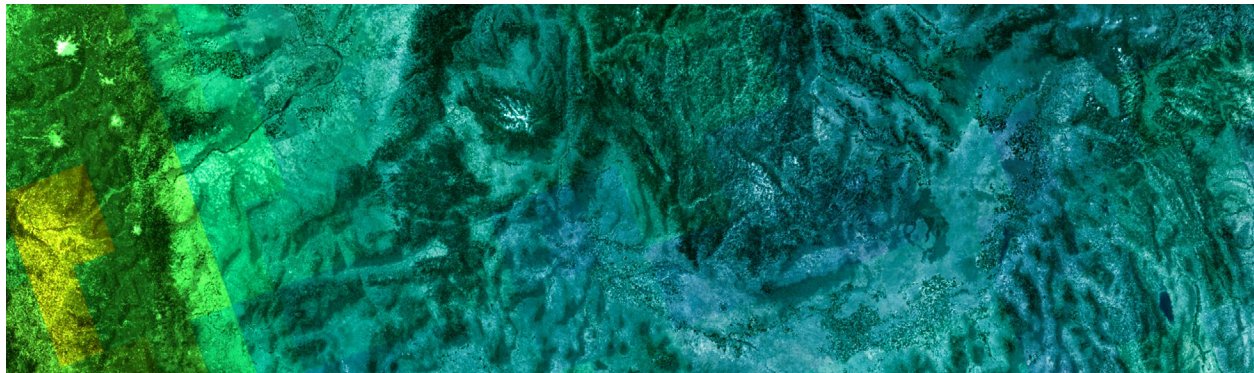


# The History of GIS



## Timeline of the evolution of GIS

Many people, organizations, and technology advancements have helped make GIS what it is today. The following are some key milestones in the history of GIS.



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-	<b>The first maps</b>	The roots of GIS go back hundreds, even thousands of years in the fields of cartography and mapping. Early maps are used for exploration, strategy, and planning.
1854	<b>Early spatial analysis</b>	In London, physician John Snow maps Cholera cases to trace the origin back to one water source.
1960	<b>Geographic computer science emerges</b>	Throughout the 1960s, computers advance significantly in technology, speed, and design, with IBM leading the way. Early concepts of quantitative and computational geography begin to develop.
1963	<b>The first GIS</b>	Geographer Roger Tomlinson begins a national land use management program for the Canadian government, inventorying natural resources. Tomlinson first coins the term geographic information system (GIS) and becomes known as the “father of GIS”.

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1965	<b>Harvard Lab explores spatial analysis</b>	Architect Howard Fisher establishes the Harvard Laboratory for Computer Graphics and Spatial Analysis, where some of the first GIS software, such as ODYSSEY, is invented and computer mapping applications explored. GIS pioneers such as Jack Dangermond, Carl Steinitz, Scott Morehouse, Allan Schmidt, and Allen Bernholtz participate.
1969	<b><i>Design with Nature</i> published</b>	Ian McHarg's influential book champions a holistic, environmentally conscious approach to landscape architecture and urban planning. He introduces the "layer cake" method of stacking information that becomes fundamental to modern map overlays in GIS.
1969	<b>Esri is founded</b>	With inspiration from the Harvard Lab and <i>Design with Nature</i> , Jack and Laura Dangermond form Environmental Systems Research Institute (E.S.R.I.), now known as Esri. They begin project work, helping land use planners make better decisions with an emphasis on protecting the environment.
1972	<b>First Landsat satellite</b>	Inspired by photographs taken from space during NASA's Gemini IV mission, the US government launches the first of many Landsat satellites for Earth observation. The program provides current satellite imagery of the whole world, tied to geographic points. This becomes a major data input for GIS and begins the era of remote sensing—changing how we see the Earth.
1978	<b>First GPS satellite</b>	The US launches its first GPS satellite, Navstar I, and achieves full global coverage with GPS in 1994. Other nations develop similar Global Navigation Satellite Systems (GNSS). With global coverage, virtually any object can report its position, and the amount of spatial data begins to grow exponentially.

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**1981**      **First Esri User Conference**

Sixteen users attend the first ever meeting of Esri technology users, held in Redlands, California. Attendees represent 11 organizations across the US, such as Woodward-Clyde Consultants, the US Army Corps of Engineers, Pennsylvania Power and Light, Kentucky Department of Natural Resources, and the Riverside County Planning Department.

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**1982**      **ARC/INFO is released**

Esri builds on early GIS tools such as Polygon Information Overlay System (PIOS), GRID, and GRID/TOPO. Scott Morehouse, who worked in the Harvard Lab on ODYSSEY, moves to ESRI in 1981 and plays a key role in the development of ARC/INFO. This comprehensive commercial GIS product provides a standardized methodology for implementing GIS broadly, beginning Esri's transformation into a software company.

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**1982**      **GRASS develops**

US Army Corps of Engineers begins development of GRASS (Geographic Resources Analysis Support System). This open-source GIS software broadens access to GIS and is still available today.

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**1986**      **In-car navigation**

Etak develops the first in-car navigation concepts. Mazda's Eunos Cosmo is the first car with an automatic navigation system. Later, real-time GIS capabilities will enable the possibility of self-driving cars from companies such as Tesla.

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**1988**      **NCGIA is established**

The National Center for Geographic Information and Analysis (NCGIA) is formed as a center for research in geographic information and its related technologies. Michael Goodchild directs the project and emerges as a thought leader in GIS.

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**1990**      **TIGER is completed**

The US Census Bureau completes the Topologically Integrated Geographic Encoding and Referencing (TIGER) spatial database. The first nationwide digital map of roads, boundaries, and water, TIGER lays the groundwork for countless business applications.

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1991	<b>GIS goes mainstream</b>	GIS experiences a turning point, becoming crucial to many workflows. Publications like Forbes, Fortune, and Business Week start writing about GIS.
1995	<b>Britain digitizes its maps</b>	UK Ordnance Survey, founded in 1791 and still a leader in GIS and mapping, achieves coverage of the entire United Kingdom in a GIS database, digitizing 230,000 maps. Britain becomes the first country to complete a large-scale electronic mapping program.
1999	<b>First GIS Day</b>	Jack Dangermond, Dr. Roger Tomlinson, and students celebrate the first GIS Day at Murch Elementary School in Washington, DC. Dangermond credits Ralph Nader as the person who inspired GIS Day, now celebrated worldwide on the third Wednesday in November during Geography Awareness Week.
2001	<b>1 million GIS users</b>	Esri reaches 1 million licensed software seats and about 100,000 organizations using GIS. The GIS marketplace is estimated at \$7 billion.
2004	<b>National Geospatial Agency (NGA)</b>	In the United States, the National Imagery and Mapping Agency (NIMA) is renamed to NGA to emphasize the growing importance of geospatial intelligence, reflecting a broader convergence of imagery, mapping, and other geospatial information in GIS.
2004	<b>Web 2.0</b>	The web becomes a more interactive platform, laying the foundation for GIS to move to the web. GIS can now be delivered as SaaS in addition to desktops.
2005	<b>Google Maps</b>	With the advent of mapping apps like Google Maps and Google Earth, everyone can now interact with and benefit from GIS technology and it begins to become embedded in our everyday lives.

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2006	<b>Cloud computing</b>	Amazon Web Services is released, bringing cloud data storage to many organizations. Cloud computing had been developing for decades but is now freely available, allowing organizations to scale online operations and store larger amounts of data.
2007	<b>First iPhone</b>	Apple's iPhone launches the smartphone industry. Our phones can now be both computers and mobile GPS devices, allowing GIS to be used anywhere by anyone, and for data to be easily collected on mobile apps.
2009	<b>Digital data libraries proliferate</b>	The US government shares authoritative, open datasets publicly on Data.gov. Anyone can use these datasets in GIS, shortening the time and effort to do geospatial analysis. Esri's ArcGIS Living Atlas of the World curates thousands of ready-made datasets like these.
2012	<b>ArcGIS Online is released</b>	Esri releases ArcGIS Online, the first cloud-based version of the company's GIS software. The system supports better collaboration and changes the way many GIS and technology professionals leverage mapping in their organizations.
2018	<b>AI and GIS come together</b>	The AI team at Esri begins actively bringing together the fields of GIS and AI in a pilot project, pioneering the discipline known as GeoAI. Machine learning capabilities had been introduced in ArcGIS as early as 2009. On October 7, 2020, the first deep learning pre-trained AI model is publicly released within Esri's ArcGIS Living Atlas of the World, a repository now containing more than 75 pre-trained models. AI-driven spatial workflows excel at automation and making sense of large datasets, especially imagery.

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<b>2020</b>	<b>GIS supports COVID-19 response</b>	Johns Hopkins University creates an ArcGIS-powered COVID-19 tracking dashboard that receives over a trillion views. The online dashboard becomes the go-to resource for monitoring the global health crisis. It inspires thousands of similar dashboards and helps people understand the pandemic, bringing GIS to the forefront of public knowledge.
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<b>Today</b>	<b>GIS is everywhere</b>	GIS is more powerful and important than ever. People make billions of maps every day using GIS. More than 95 percent of universities offer a GIS course or program. Most Fortune 500 companies, national and local government agencies, and nonprofit institutions deploy GIS.
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