

Geographic Information Systems: A Basic Science Success Story

Fundamental research by the National Center for Geographic Information and Analysis (NCGIA) underpins modern geographic information systems. The Center - comprised of the University of California, Santa Barbara; the State University of New York at Buffalo; and the University of Maine - developed methods to identify spatial data errors, create better interfaces for GIS applications, and educate teachers and students in the emerging new industry. Other projects, such as the Center for Spatially Integrated Social Science, focused on applying spatial analysis to social challenges such as crime, poverty, and public health. Current research focuses on cyber-GIS, an interdisciplinary field combining GIS and spatial modeling with advanced cyberinfrastructure, such as high-performance cloud-based computing and data storage.



1963

Canadian geographer Roger Tomlinson coins the term "geographic information system" to describe a computerized system he developed to manage provincial natural resources.



1965

Architect Howard Fisher establishes the Harvard University Laboratory for Computer Graphics and Spatial Analysis, which develops some of the first digital mapping applications.



1990

NCGIA develops a core GIS educational curriculum that is eventually translated into eight languages and distributed to over 70 countries.



1992

Michael Goodchild, director of the NCGIA at Santa Barbara, describes the concept of geographical information sciences, which transforms the field by incorporating digital spatial analysis.



1994

NCGIA researchers enhance the industry-standard Structured Query Language (SQL) to access large spatial databases.



2003

Economist Luc Anselin develops GeoDa, an open-source application for spatial data analysis, widely used for research and education.



2010

Computer engineer and geographer Shaowen Wang introduces a framework for cyber-GIS.



2015

GIS is routinely used throughout the public health sector for disease mapping, disaster mitigation, enhanced 911, and other services.



2020

Market research firm GeoBuiz estimates the GIS market value at \$88 billion

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