

# GIS: Definition and Development

A world map with a grid overlay, showing numerous data points in blue, green, and yellow colors scattered across the continents, representing GIS data.

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# What is it?

- A Geographical information System (GIS) is a system of computer software, hardware and data, personnel that make it possible to enter, manipulate, analyze, and present data, and the information that is tied to a location on the earth's surface.
- This system comprises of Software, Hardware, Data, and Personnel (User).
- Sometimes, it is also termed as **Spatial Information Systems** as it deals with located data, for objects positioned in any space, not just geographical, a term for world space.

# Definitions

- “A powerful set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world” (Burrough, 1987).
- A GIS is also defined as follows (Aronoff, 1989):
  - A GIS is a computer-based system that provides the following four
  - sets of capabilities to handle geo-referenced data:
    - Input,
    - data management (data storage and retrieval),
    - manipulation and analysis, and
    - Output.

- Thurgood (1995) defined GIS as “a computerized system for capture, storage, retrieval, analysis and display of spatial data describing the land attributes and environmental features for a given geographic region, by using modern information technology”.
- According to this definition, a GIS includes not only computing capability and data, but also managers and users, the organization in which they function and institutional relationships that govern their management and use of information.

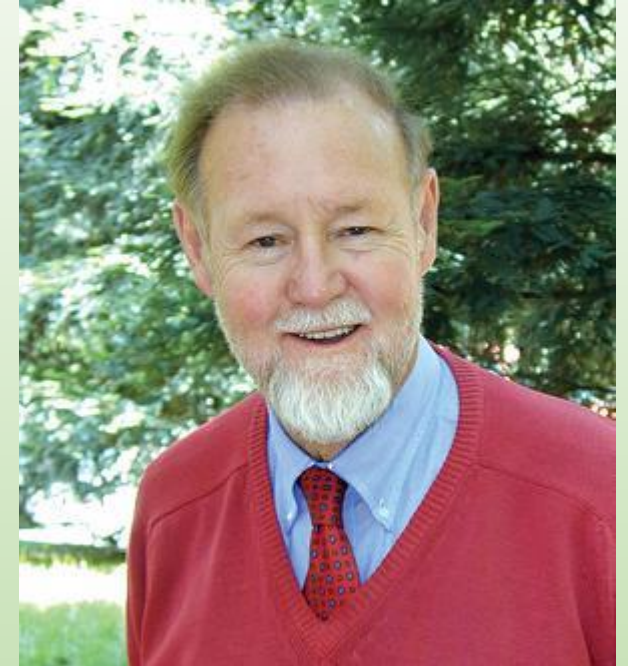
# History and Development

- The GIS history dates back to 1960 when computer based GIS have been used and their manual procedures were in life 100 years earlier or so.
- The initial developments originated in North America with the organizations such as US Bureau of the Census, The US Geological Survey and The Harvard Laboratory for computer graphics and Environmental Systems Research Institute (commercial).

- Canadian Geographic Information Systems (CGIS) in Canada, Natural Experimental Research Center (NREC), Department of Environment (DOE) and other notable organizations in U.K. were involved in early developments.
- The laboratory for Computer Graphics and Spatial Analysis of the Harvard Graduate School of Design and the State University of New York at Buffalo achieved worldwide recognition. Commercial agencies started to develop and offer GIS software. Among them were today's market leaders ESRI, Intergraph, Laserscan, Autodesk etc.

# Roger Tomlinson – the father of GIS

- It was during Roger Tomlinson's tenure with the Canadian government in the 1960s when he initiated, planned and directed the development of the Canadian Geographic System (CGIS).
- This was a key time in the history of GIS because many consider CGIS as the roots of Geographic Information Systems.



**Roger F. Tomlinson**

(17 November 1933 – 7 February 2014)

- CGIS was unique because it adopted a layer approach system to map handling.
- Because of the vast amount of territory Canada occupies, the idea for a Canadian Land Inventory was developed in 1964. But it wasn't until 1971 that it became fully operational.
- The Canadian Land Inventory used soil, drainage and climate characteristics to determine land capability for crop types and forested areas.
- Over the years CGIS had been modified and improved to keep pace with technology.



# Development in India

- In India the major developments have happened during the last one decade with significant contribution coming from **Department of Space** emphasizing the GIS applications for **Natural Resources Management**.
- Notable among them are Natural Resource Information System (NRIS), Integrated Mission for Sustainable Development (IMSD) and Bio-diversity Characterization at National Level.
- IIRS is also playing a major role in GIS through education and training programs at the National and International level.

- Recently the commercial organizations in India have realized the importance of GIS for many applications like natural resource management, infrastructure development, facility management, business/market applications etc. and many GIS based projects according to the user organization requirements were developed.

Thank You