

GIS: Basic Concepts

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Definition of GIS?

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. The key word to this technology is Geography.

GIS is basically a computerized information system like any other database, but with an important difference: all information in GIS must be linked to a geographic (spatial) reference (latitude/longitude, or other spatial coordinates). [ESRI]

$$\text{GIS} = \text{G} + \text{IS}$$

Geographic reference + Information system

**Data of spatial coordinates
on the surface of the earth
(Map) – location data**

**Database of attribute data
corresponding to spatial
location and procedures to
provide information for
decision making**

GIS = IS with geographically referenced data

What can we do with GIS?

GIS can be used as tool in both problem solving and decision making processes, as well as for visualization of data in a spatial environment. Geospatial data can be analyzed to determine:

- the location of features and relationships to other features,**
- where the most and/or least of some feature exists,**
- the density of features in a given space,**
- what is happening inside an area of interest (AOI),**
- what is happening nearby some feature or phenomenon, and**
- and how a specific area has changed over time (and in what way)**

COMPONENTS OF A GIS?

Like for any other Information System , creating a GIS involves 4 stages:

- (i) Data input**
- (ii) Data Storage**
- (iii) Data Analysis and modelling, and**
- (iv) Data Output and presentation**