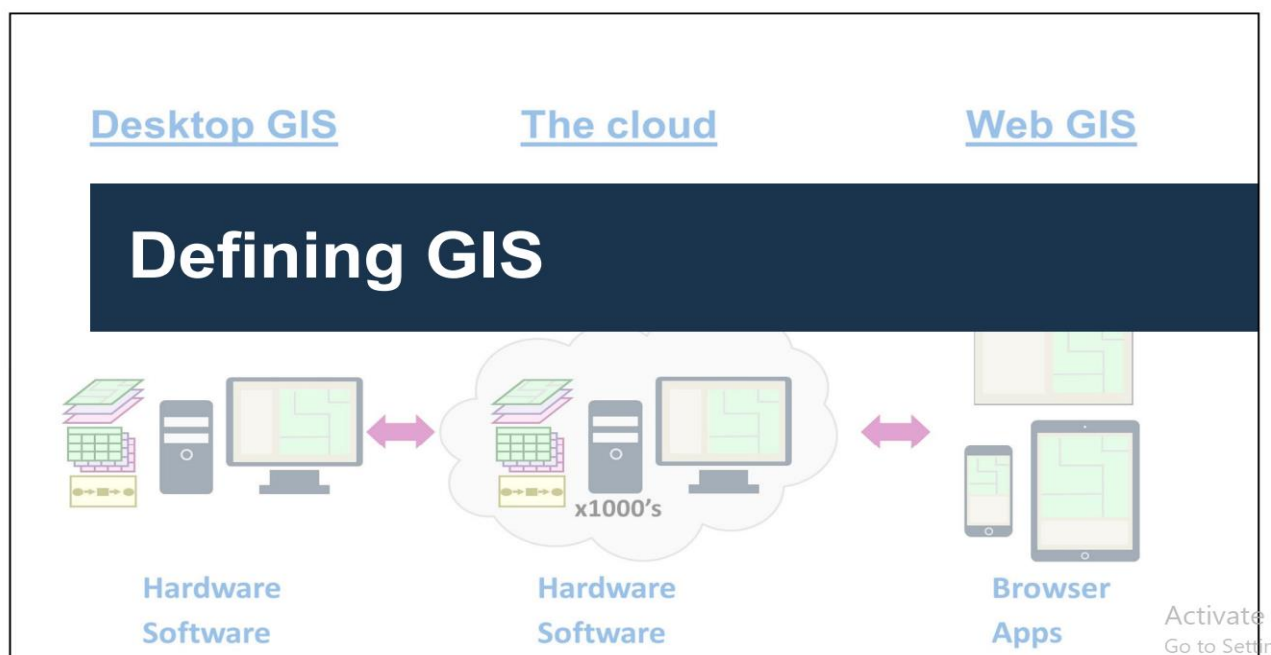




Introduction to Geographic Information System



Defining GIS

A GIS is a computer system capable of capturing, assembling, storing, manipulating, analyzing and displaying geographically referenced information. With GIS, users can create interactive queries, analyze spatial information, edit data, integrate maps, and present the results of these tasks. GIS can be used to solve the location-based questions such as “What is located here” or Where to find particular features? GIS user can retrieve the value from the map, such as what proportion is the vegetation cover in a land use/land cover (LULC) map. This can be done using query builder tools.

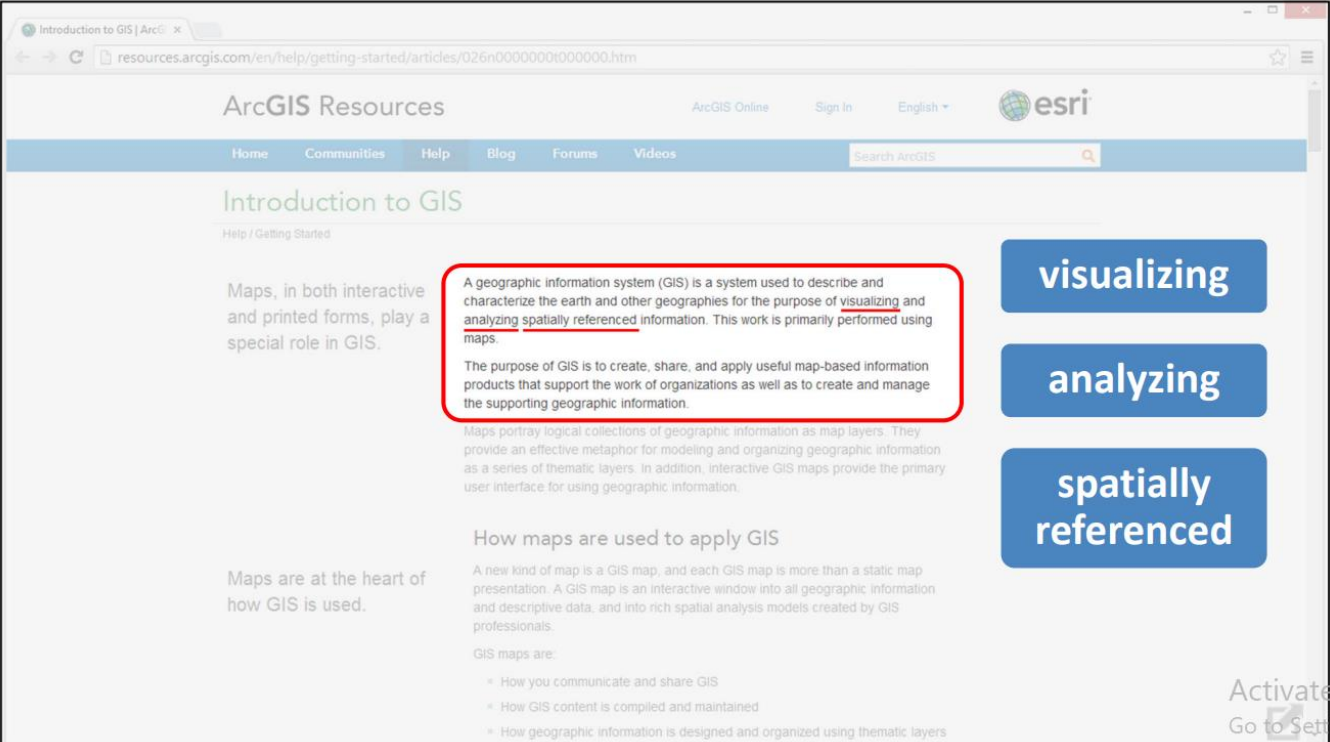
geographic information system

(not a proper name, so it's not capitalized)

GIS

(acronym, so it's capitalized, with no periods)

Activate
Go to Sett



Introduction to GIS | ArcGIS

resources.arcgis.com/en/help/getting-started/articles/026n00000000000000000000.htm

ArcGIS Online Sign in English esri

Home Communities Help Blog Forums Videos Search ArcGIS

Introduction to GIS

Help / Getting Started

Maps, in both interactive and printed forms, play a special role in GIS.

A geographic information system (GIS) is a system used to describe and characterize the earth and other geographies for the purpose of visualizing and analyzing spatially referenced information. This work is primarily performed using maps.

The purpose of GIS is to create, share, and apply useful map-based information products that support the work of organizations as well as to create and manage the supporting geographic information.

Maps portray logical collections of geographic information as map layers. They provide an effective metaphor for modeling and organizing geographic information as a series of thematic layers. In addition, interactive GIS maps provide the primary user interface for using geographic information.

How maps are used to apply GIS

A new kind of map is a GIS map, and each GIS map is more than a static map presentation. A GIS map is an interactive window into all geographic information and descriptive data, and into rich spatial analysis models created by GIS professionals.

GIS maps are:

- How you communicate and share GIS
- How GIS content is compiled and maintained
- How geographic information is designed and organized using thematic layers

visualizing

analyzing

spatially referenced

Activate
Go to Sett

Defining GIS

A geographic information system (GIS) lets us **visualize, question, analyze, and interpret data** to understand relationships, patterns, and trends. (ESRI)

In the strictest sense, a GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information (that is data identified according to their locations). (USGS).

Next important feature of GIS is the capability to combine different layers to show new information. For example, you can combine elevation data, river data, land use data and many more to show information about the landscape of any area. From map, you can tell where is high land or where is the best place to build house, which has the river view. GIS helps to find new information.

Geographic information system

A computer system for:

capturing

storing

filtering

analyzing

visualizing

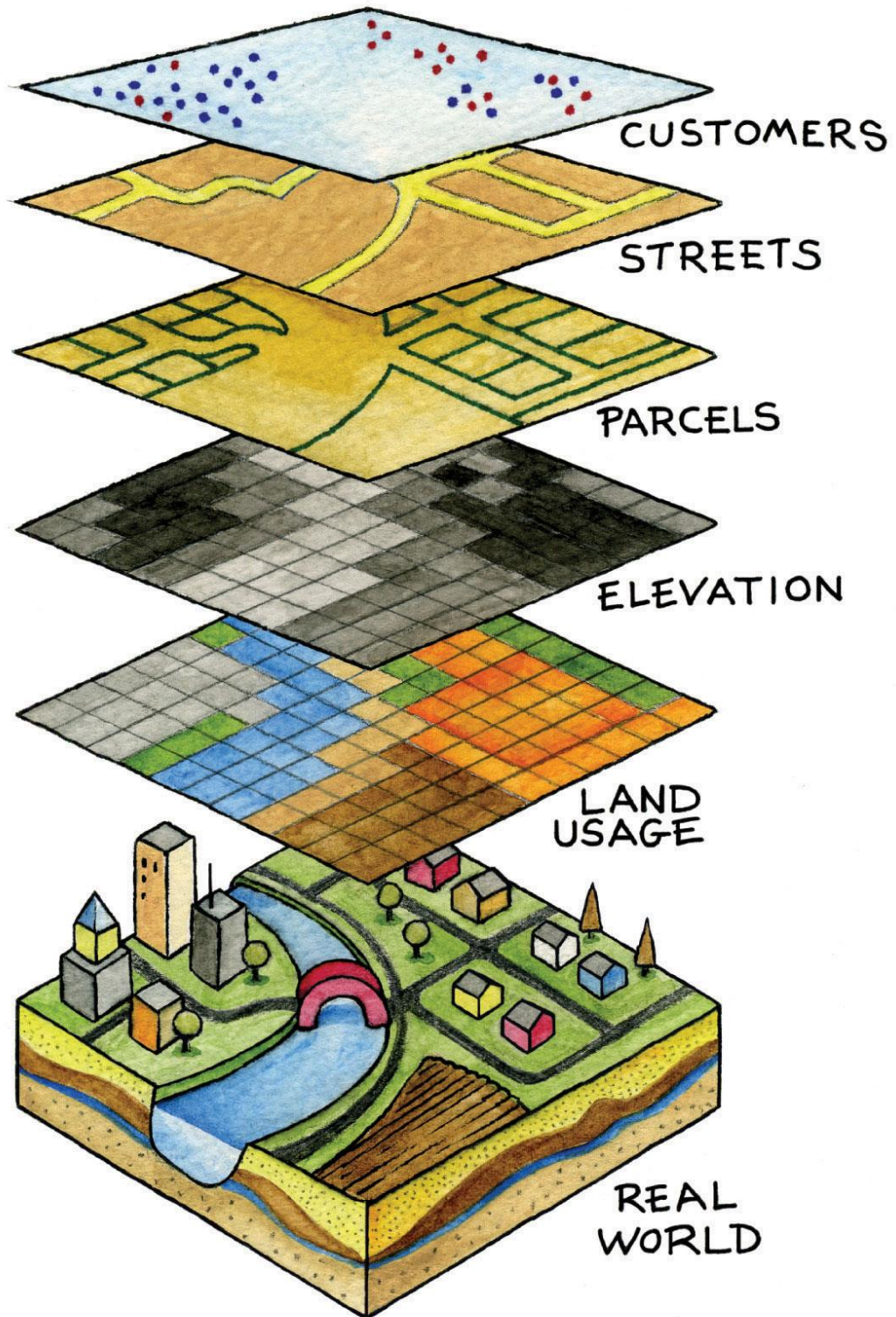
geospatial data

What a GIS can do



Activate
Go to Settings
(Chang, 2014)

Lecture 1



How GIS Works

Visualizing Data: The geographic data that is stored in the databases are displayed

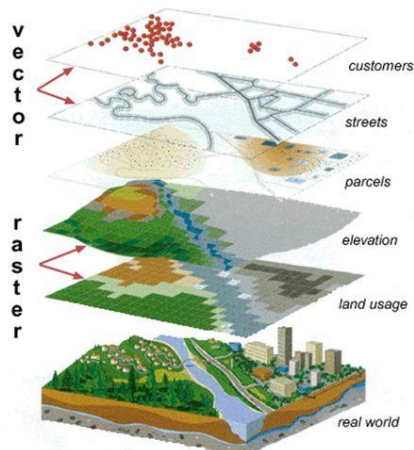
in the GIS software.

Combining Data: Layers are combined to form a map of desire.

Building Query: To search the value in the layer or making a geographic query.

How GIS Works

- Information is stored in layers.
- Similar data types or "themes" are stored in each layer.
- Data queries are given in terms of what layers are desired
- Data are then displayed by overlaying all data requested on a single map.



1/16/2016 GLY560: GIS

History of GIS

Modern GIS has seen series of development. GIS has evolved with the computer system.

Lecture 1

Sagar Mozumder,
Part-time Faculty, ESDM, DIU

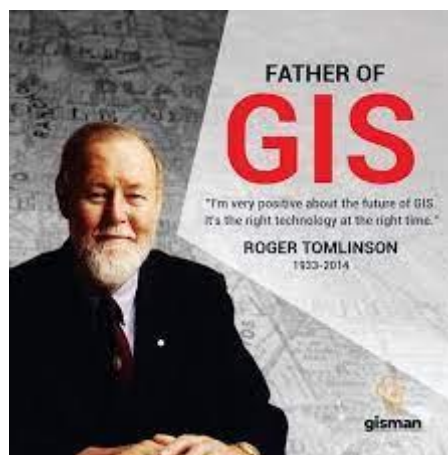
Department of Environmental Science and Disaster Management, DIU

Year 1854 – The term GIS that used scientific method to create maps was used by John Snow in 1854. He used points on London residential map to plot outbreak of Cholera.

Year 1960 – Modern computerized GIS system began in the year 1960.

Year 1962 – Dr. Roger Tomlinson created and developed Canadian Geographic Information System (CGIS) to store, analyze and manipulate data that was collected for the Canada Land Inventory (CLI). This software had the capacity to overlay, measurement and digitizing (converting scan hardcopy map to digital data). It is never provided in commercial format but Dr. Tomlinson is the father of GIS.

Year 1980 – This period saw rise of commercial GIS software's like M&S Computing, Environmental Systems Research Institute (ESRI) and Computer Aided Resource Information System (CARIS). These all software were similar to CGIS with more functionality and user-friendliness. Among all the above the most popular today is ESRI products like ArcGIS, ArcView which hold almost 80 % of global market.





"Data for Decision"
National Film Board, 1968
https://www.nfb.ca/film/data_for_decision/

Roger Tomlinson

- Canada Land Inventory
- Canadian Geographic Information System
- "Father of GIS"

Canada is big!

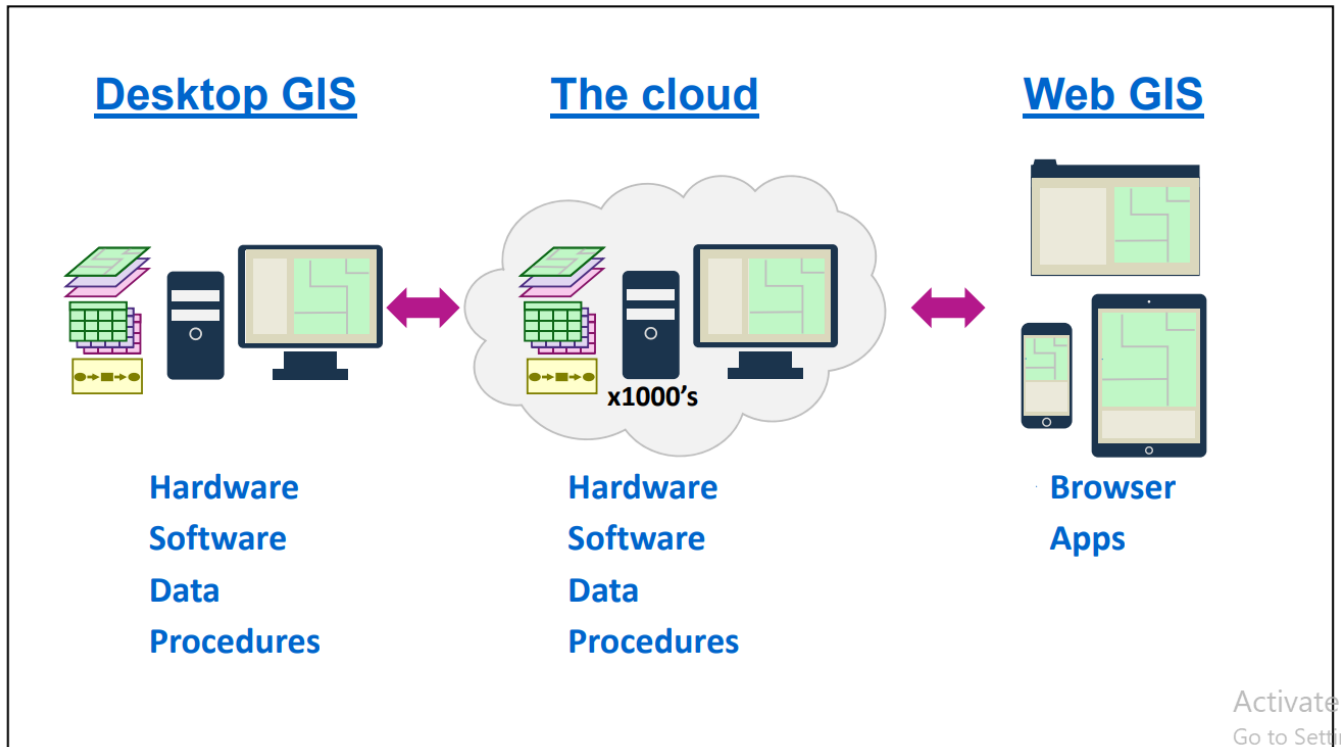
Activate
Go to Settings

Components of a GIS

- Hardware
- Software
- Geospatial data
- Procedures (data management and analysis)
- People.

What a GIS is made of

Activate
Go to Settings



Components of GIS

Hardware: Hardware is the physical component of the computer and GIS runs on it. Computer can be standalone called desktop or server based. GIS can run on both of them.

Software: GIS Software provides tools and functions to input and store spatial data or geographic data. It provides tool to perform geographic query, run analysis, model and display geographic data in the map form. GIS software uses Relational Database Management System (RDBMS) to store the geographic data. Software talks with the database to perform geographic query.

ArcGIS Desktop

A collection of programs:



ArcMap: Creating and analyzing maps



ArcCatalog: file management



ArcScene: 3D visualization



ArcGIS Pro: Eventual replacement for above



ArcGIS Earth: Earth viewer.

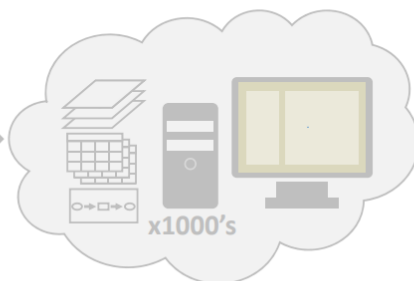
Activate
Go to Sett

Desktop GIS



Hardware
Software
Data
Procedures

The cloud



Hardware
Software
Data
Procedures

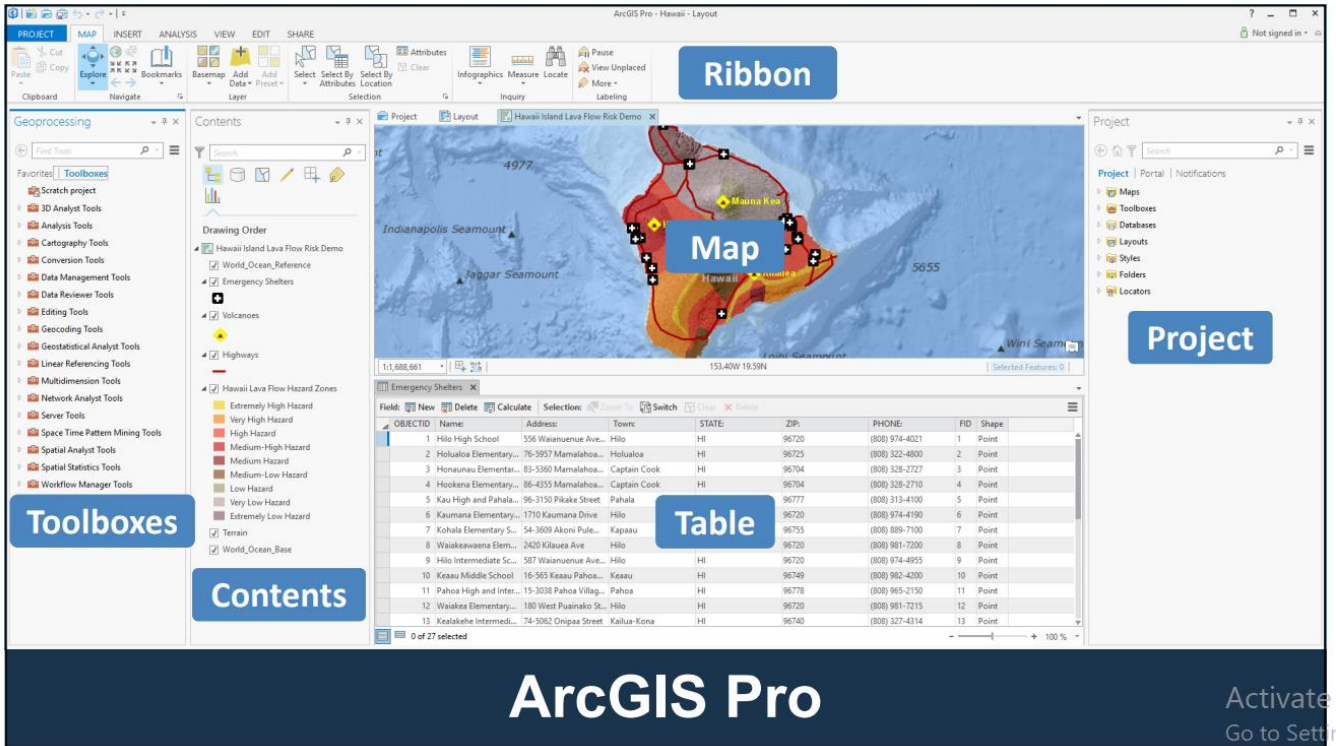
Web GIS



Browser
Apps

Activate
Go to Sett

Lecture 1



Ribbon

Map

Project

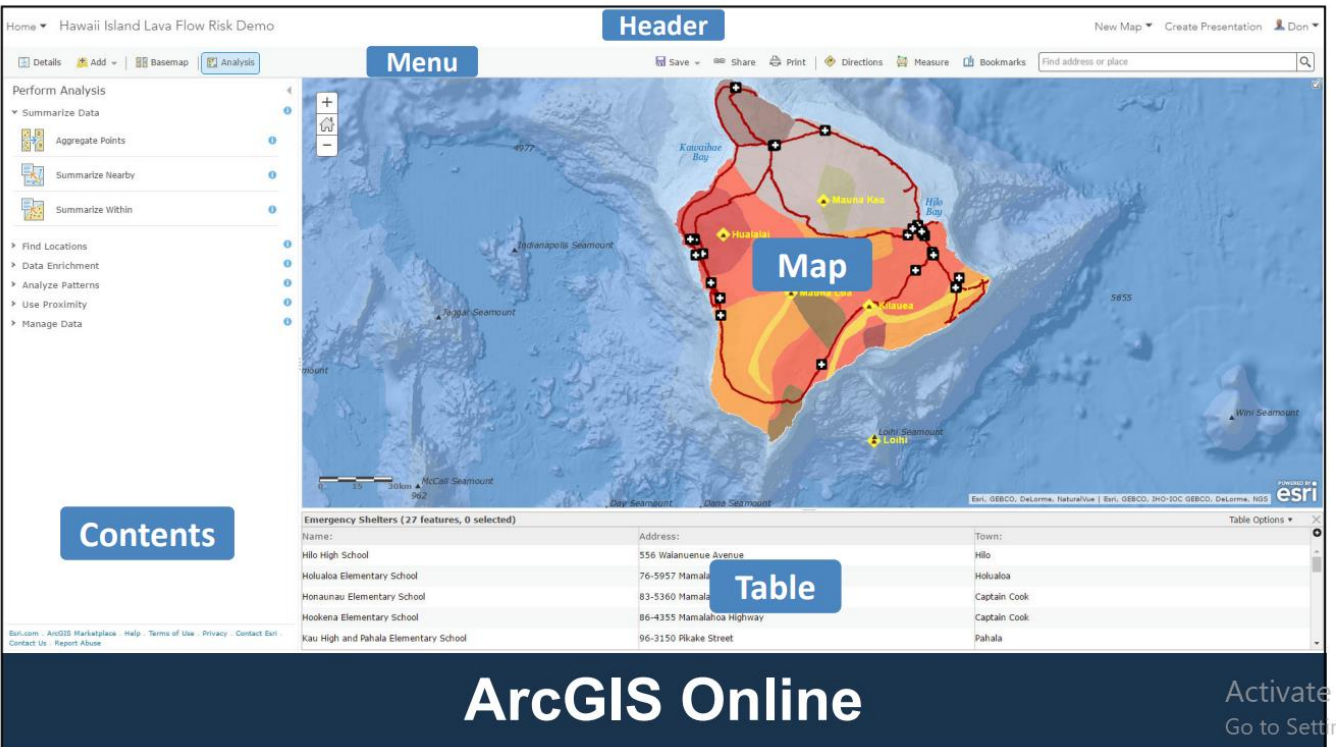
Toolboxes

Contents

OBJECTID	Name	Address	Town	STATE	ZIP	PHONE	FID	Shape
1	Hilo High School	556 Waiuanue Ave...	Hilo	HI	96720	(808) 974-4021	1	Point
2	Holualoa Elementary...	76-5957 Mamalahoa...	Holualoa	HI	96725	(808) 322-4800	2	Point
3	Honauau Elementary...	83-5360 Mamalahoa...	Captain Cook	HI	96704	(808) 328-2727	3	Point
4	Hookena Elementary...	86-4355 Mamalahoa...	Captain Cook	HI	96704	(808) 328-2710	4	Point
5	Kau High and Pahala...	96-3150 Pkake Street	Pahala	HI	96777	(808) 313-4100	5	Point
6	Kaunama Elementary...	1710 Kaunama Drive	Hilo	HI	96720	(808) 974-4190	6	Point
7	Kohala Elementary Sc...	54-3009 Aloni Pule...	Kapau	HI	96755	(808) 889-7100	7	Point
8	Waialealana Elem...	2420 Kilaua Ave	Hilo	HI	96720	(808) 981-7200	8	Point
9	Hilo Intermediate Sc...	587 Waiuanue Ave...	Hilo	HI	96720	(808) 974-4955	9	Point
10	Keaua Middle School	16-565 Keaua Pahoa...	Keaua	HI	96749	(808) 982-4200	10	Point
11	Pahoa High and Inter...	15-3038 Pahoa Villag...	Pahoa	HI	96778	(808) 965-2150	11	Point
12	Waialeka Elementary...	180 West Puainako St...	Hilo	HI	96720	(808) 981-7215	12	Point
13	Kealahou Intermedi...	74-5062 Onipaa Street	Kailua-Kona	HI	96740	(808) 327-4314	13	Point

Table

ArcGIS Pro



Header

Menu

Contents

Name	Address	Town
Hilo High School	556 Waiuanue Avenue	Hilo
Holualoa Elementary School	76-5957 Mamalahoa Highway	Holualoa
Honauau Elementary School	83-5360 Mamalahoa Highway	Captain Cook
Hookena Elementary School	86-4355 Mamalahoa Highway	Captain Cook
Kau High and Pahala Elementary School	96-3150 Pkake Street	Pahala

Table

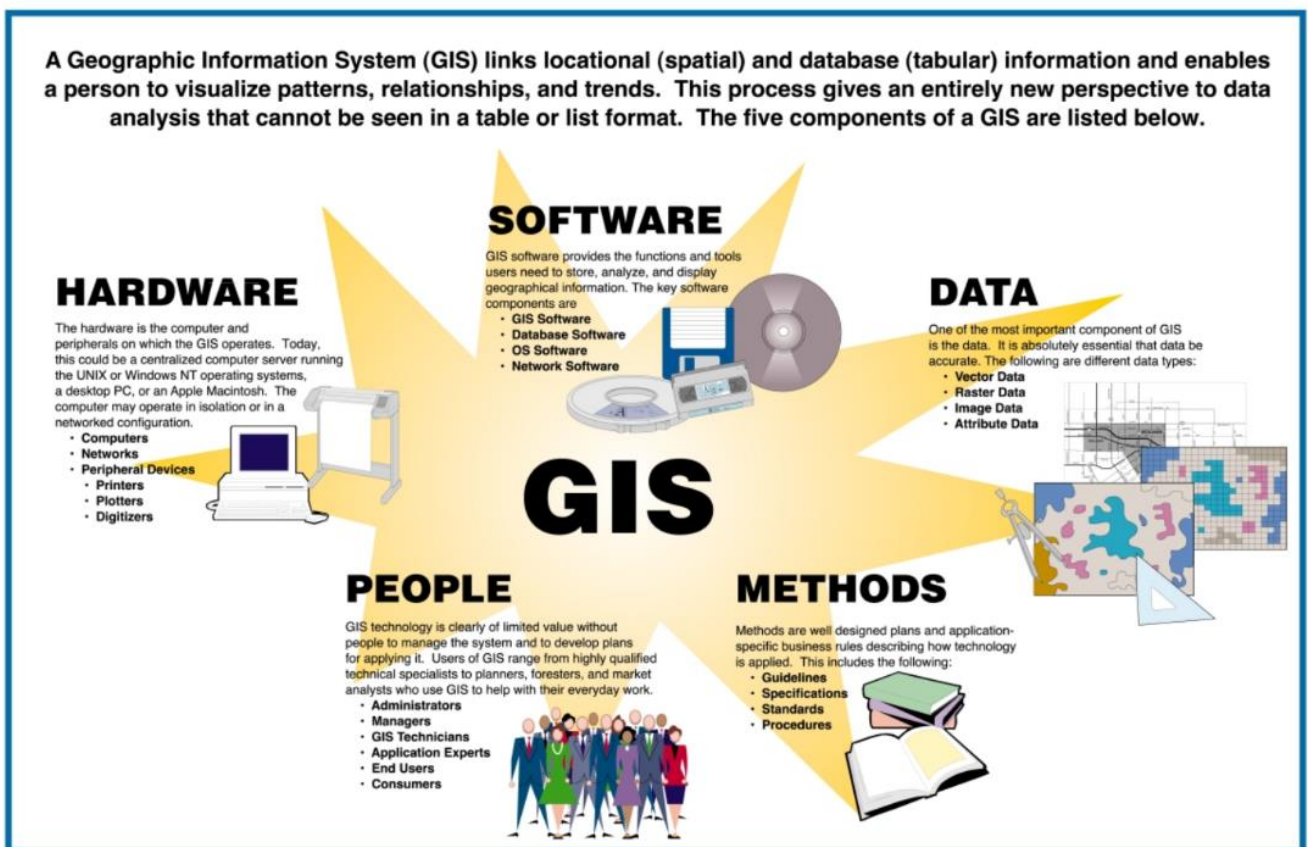
ArcGIS Online

Data: Data are the fuel for the GIS and the most important and expensive component. Geographic data are the combination of physical features and it's

information which is stored in the tables. These tables are maintained by the RDBMS.

People: People are the user of the GIS system. People use all above three components to run a GIS system.

Method: Analysis in GIS platform always follow a standard method to achieve the desired goals and to solve spatial problems.



*thank
you*