

Geographic Information System(GIS) E-Learning Package



Introduction and Overview of the E-learning Package



Module 1: Introduction to GIS.



Module 2: Quantum Geographic Information System (QGIS) Software Basics.



Module 3: Spatial Data Visualisation



Module 4: Map production QGIS



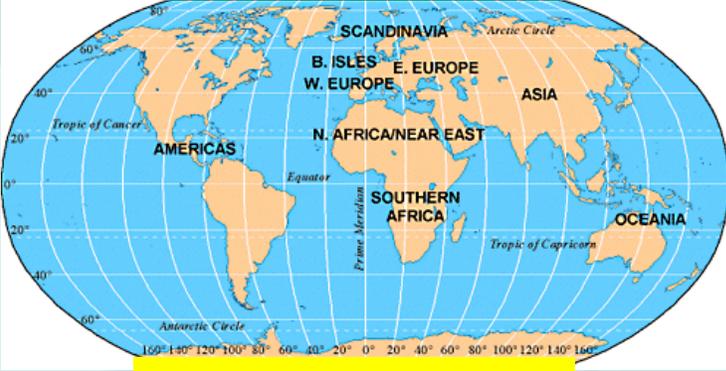
Module 1: Introduction to GIS

1. What is a GIS?
2. Key components & functions.
3. Data models and how it is implemented in GIS Applications.
4. How these data are stored and accessed to use in mapping.

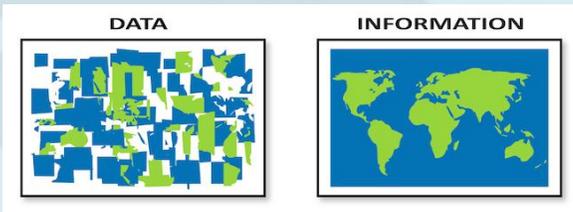
Learning Objectives



G.I.S – What is it?



Geographic Position



Information System

G = Geographical

- related to Geography - or the study of the earth

I = Information

- data

S = System

- a group of related computer hardware units and software programs.

capture

Manage

Analyze

Display



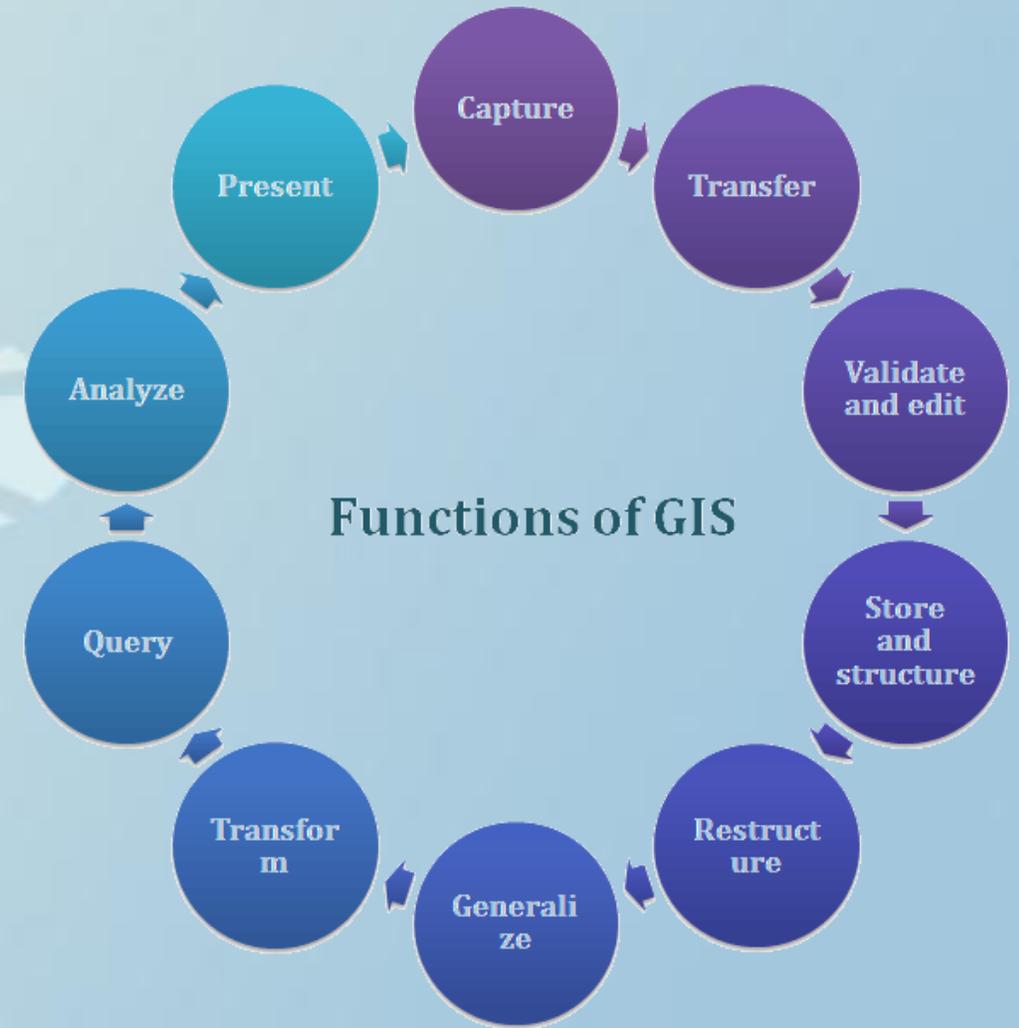
Components of GIS

1. **Data** - Surveys, Sensors, maps, records
2. **Hardware** - Computer, scanner, GPS, etc.
3. **Software** – ESRI, QGIS, Web-based apps
4. **Applications /Methods** – Route finder, overlaying, etc.
5. **People** - Data manager, analyst, users etc.



Functions of a GIS

1. **Data capture** - Tools and methods for integrating data into a common format to be analyzed.
2. **Data Management** - Store and manage data with effective data management.
3. **Spatial Analysis** - allows interpolating, buffer & overlay operation across places.
4. **Outputs /Results** - Visual presentations of outputs.



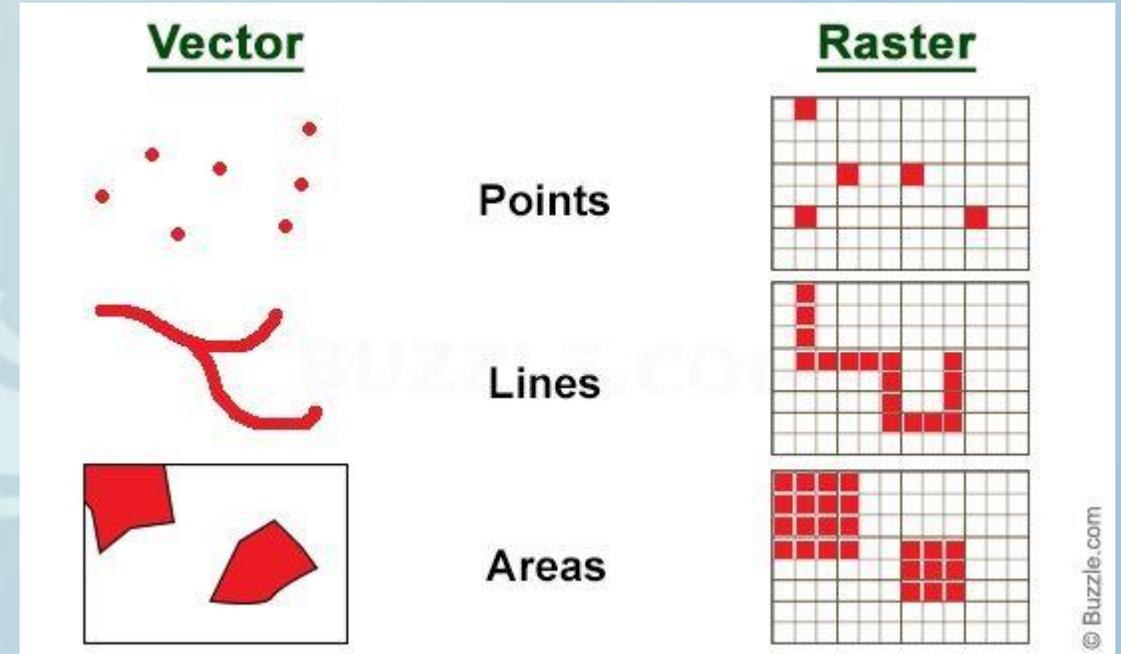
Spatial Data Representations

1. Raster Data Models

- Images stored as rows and columns of numbers for each cell.
- Units are represented as square grid cells that are uniform in size.

2. Vector Data Models

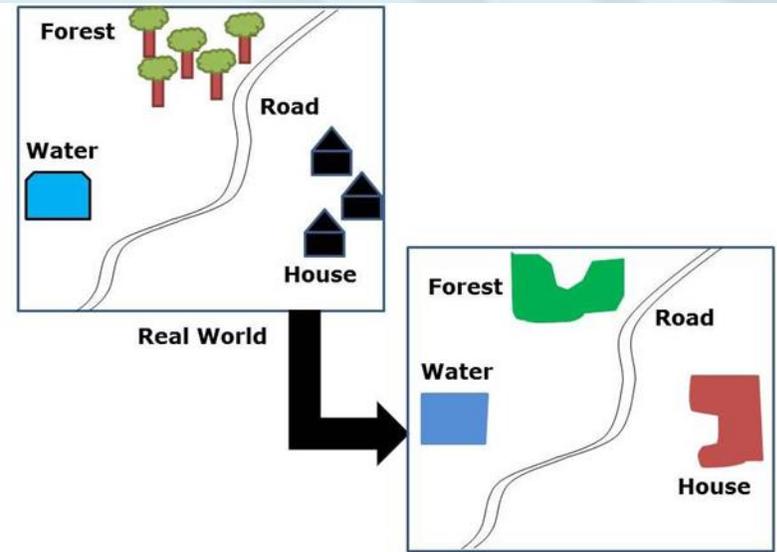
- Objects are represented as three distinct spatial elements



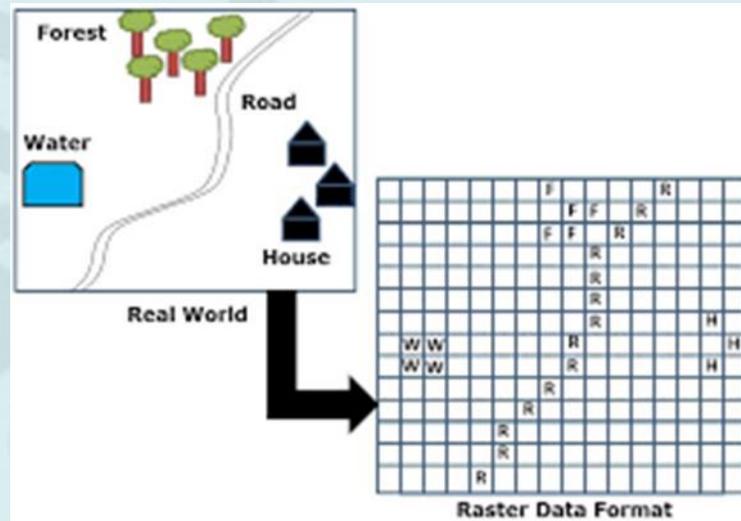
- Points - simplest element,
- Lines (arcs) - set of connected points
- Polygons - set of connected lines



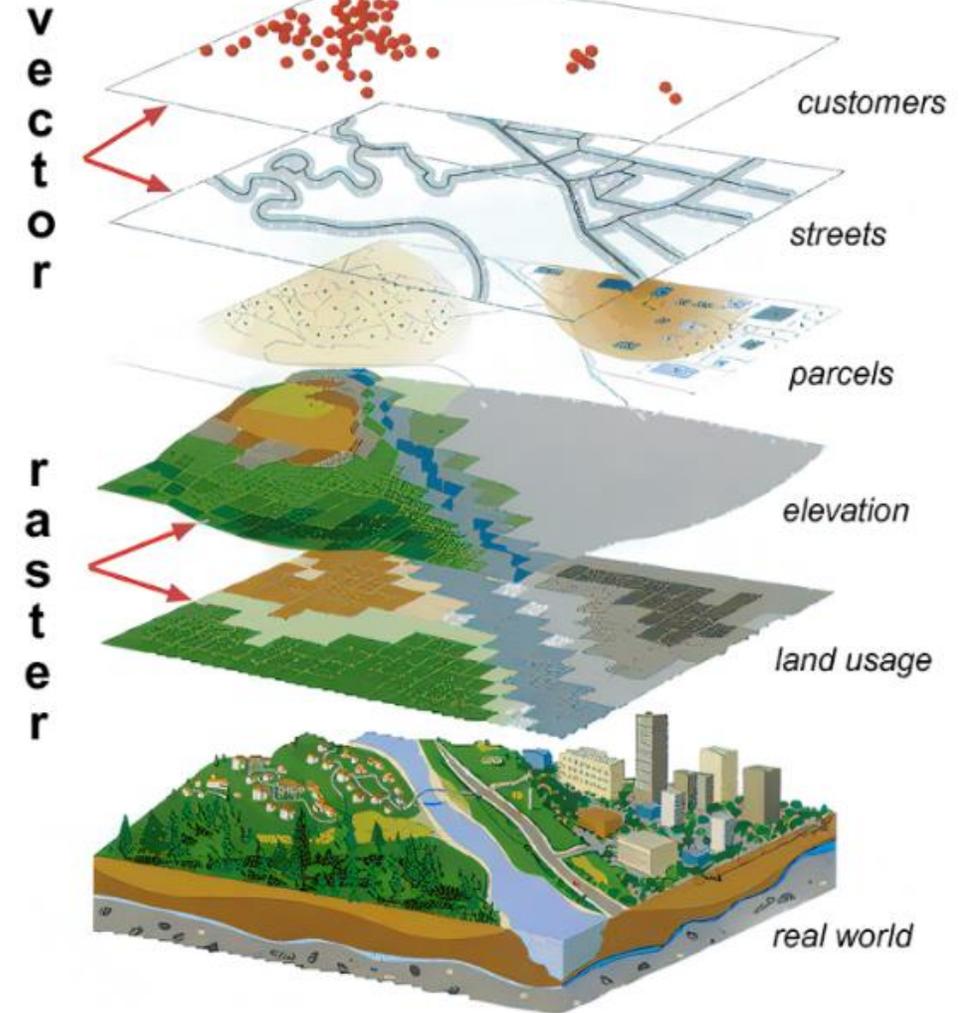
Vector Data Model



Raster Data Model

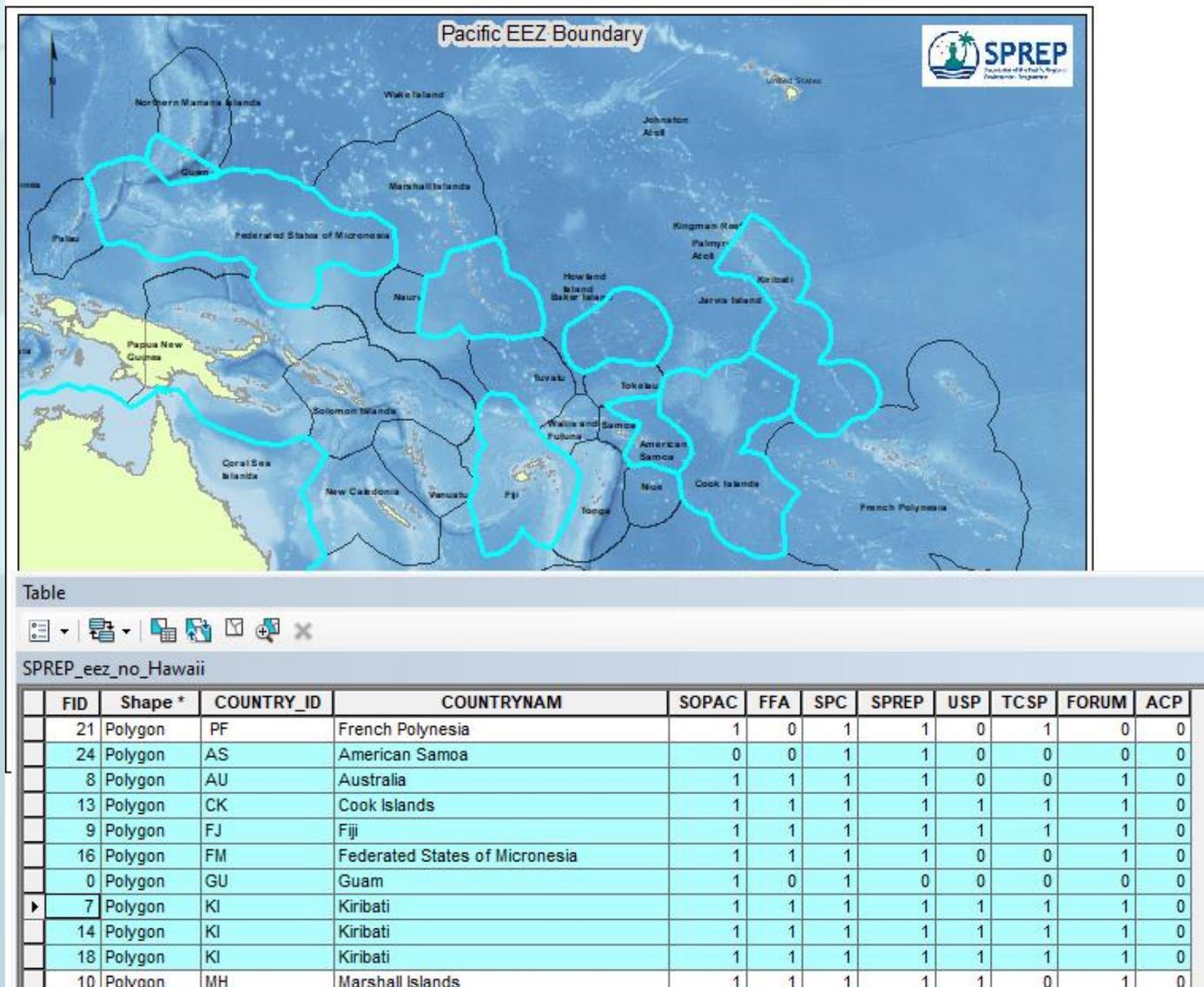


Real World Feature Representation in Raster Data Format

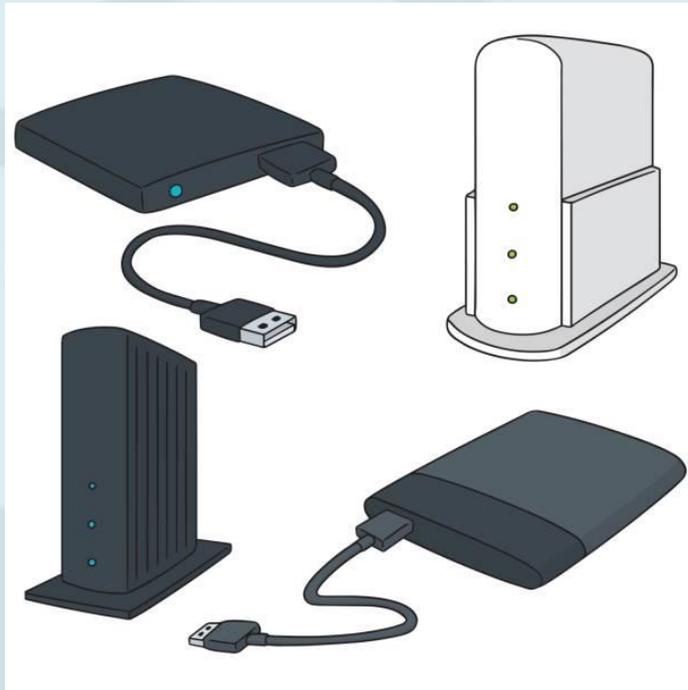


Attributes

- In the raster models, the cell value (Digital Number) is the attribute.
- For vector data, attribute records are linked to point, line & polygon features.
- Multiple attributes per feature.
- Vector features are linked to attributes by an ID.



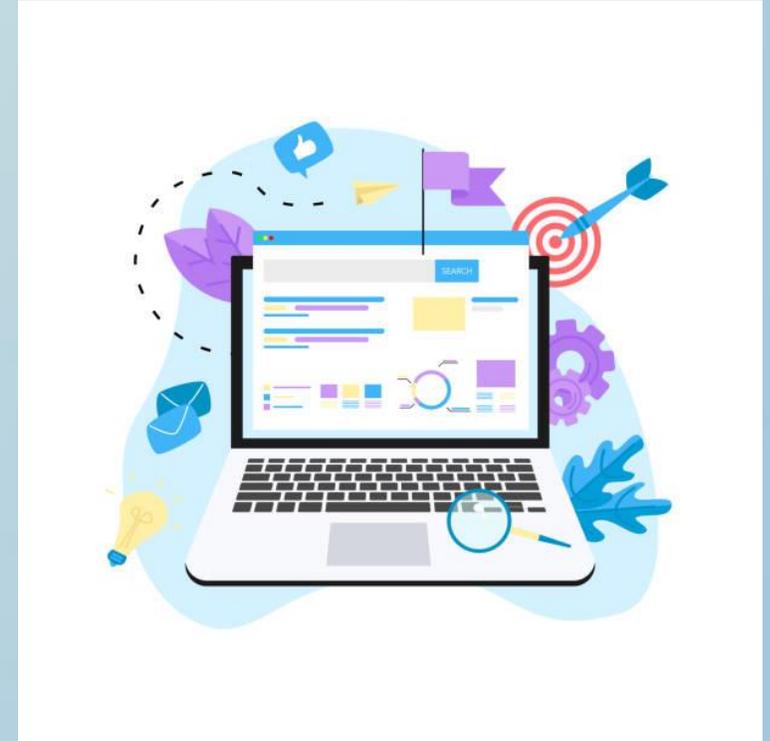
Data for GIS Use



❖ Local Drive



❖ Server (Local or Cloud)



- ❖ Other online platforms
 - UN Biodiversity Lab
 - Allen Coral Atlas



Summary

- What is GIS
- The 5 major components of GIS and the key functions it provides.
- Two data models used and how it is represented in a GIS.
- We also discussed about attribute tables.
- The different methods of accessing and storing these spatial data.



Questions

1. What is a Geographic Information System (GIS)?
2. What are the 5 key components in a GIS?
3. Give one of the main functions of a GIS?
4. What are the two data models use in GIS?

