Introduction to ArcGIS Online

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Outline

- **Lecture**
  - **What is GIS?**
  - **GIS Theory**
    - **Geographic coordinate system**
    - **Projections**
    - **Spatial data types**
  - **ArcGIS Online – What is it?**
- **Hands On Portion**

What is GIS?

- **Geographic Information System**

   "A **geographic information system** (**GIS**) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data."

   https://en.wikipedia.org/wiki/Geographic_information_system

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GIS Theory – Geographic Coordinate System

GIS Theory – Geographic Coordinate System

- **How do I tell a computer where we are located on earth?**

We are here!

(42.350083 N, 71.104168 W)
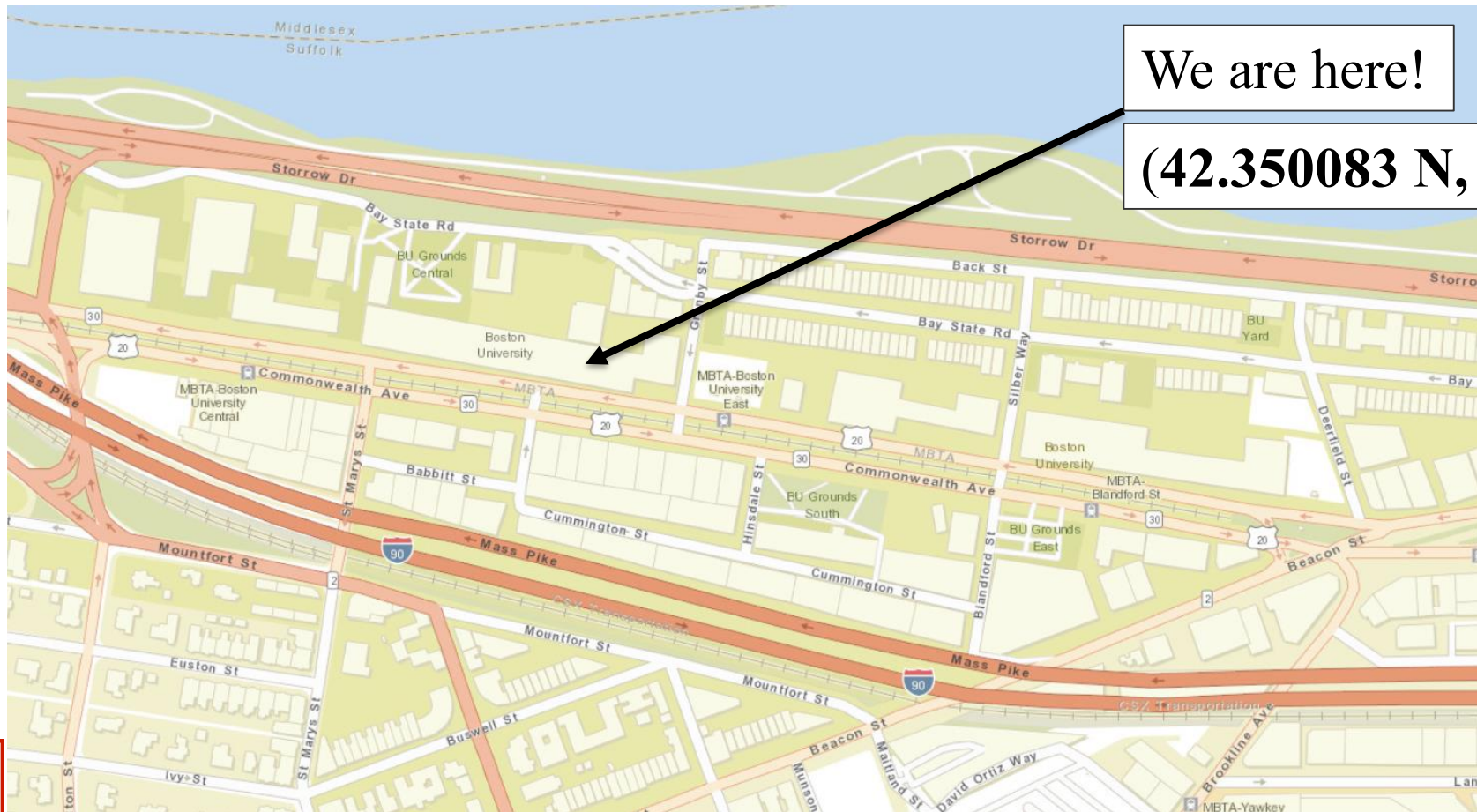
GIS Theory – Geographic Coordinate System

Cartesian Coordinate System
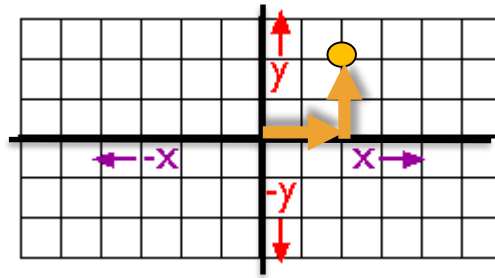
Point (2,2)

Geographic coordinate system.
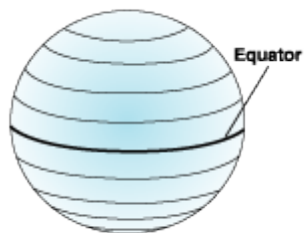
Parallels (Lines of latitude)
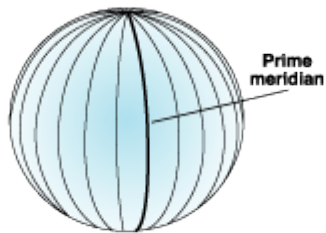
Meridians (Lines of longitude)

Graticular Network

(50 E, 40 N)
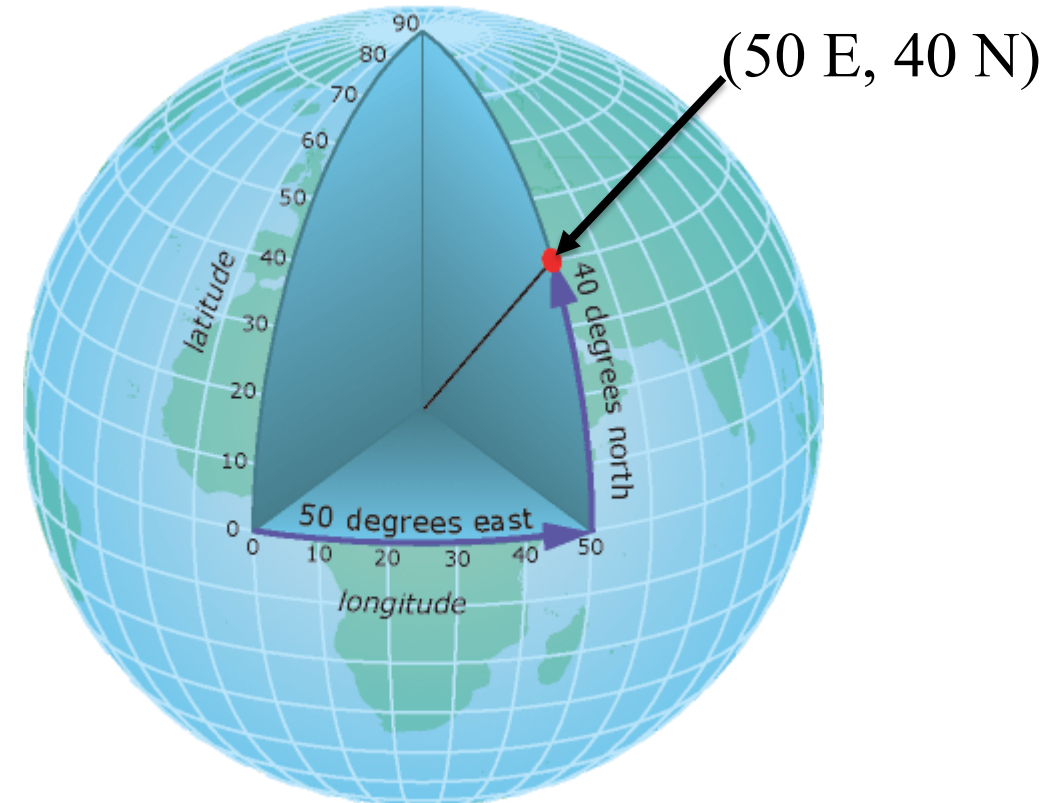
Defined by a math model.
ArcGIS Online uses WGS 1984 Mercator

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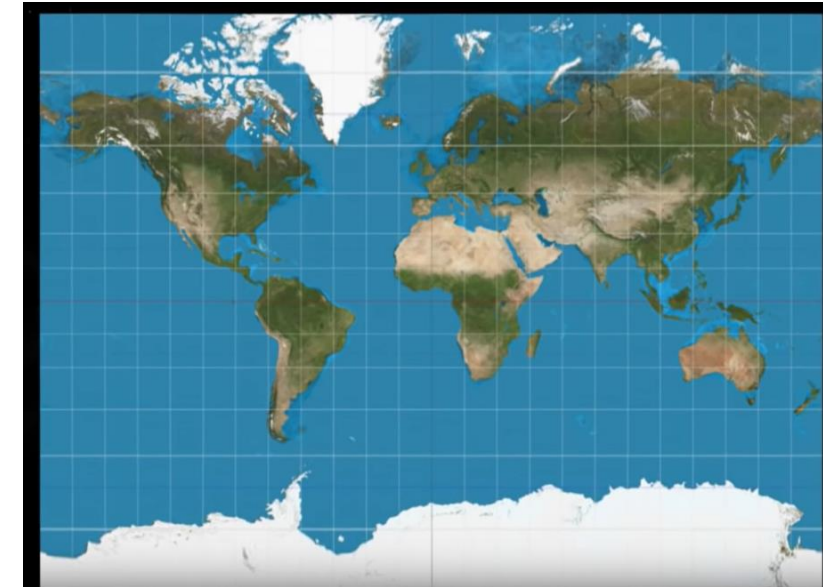# GIS Theory – Projections

GIS Theory - Projections

What is wrong with this map?

Country	Area (mi ^2)
Africa	11,730,000
Antarctica	5,405,000
Greenland	836,300

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Greenland

Africa

Antarctica

GIS Theory - Projections

https://www.youtube.com/watch?v=CPQZ7NcQ6YQ
https://laughingsquid.com/world-mercator-projection-map-country-size/
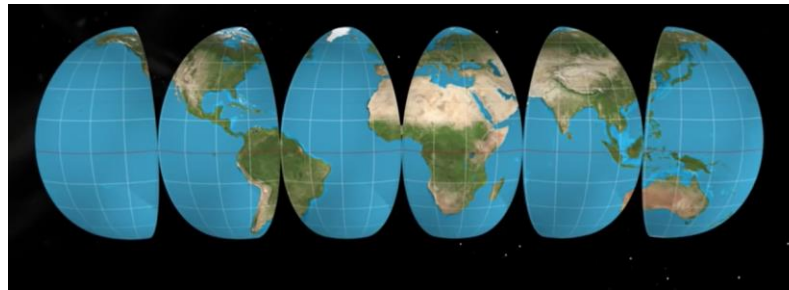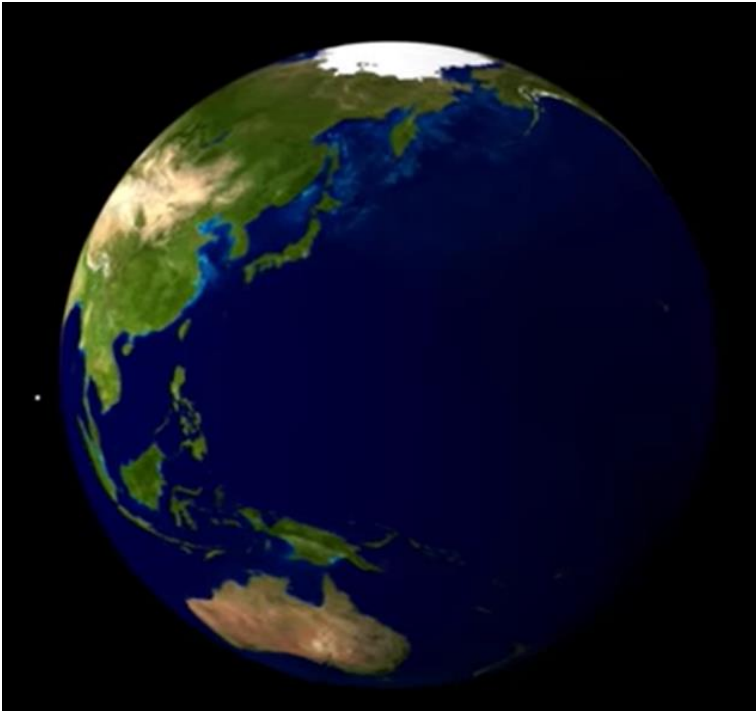
GIS Theory - Projections

World Fuller

Cube World

Polar NSIDC EASE Grid North

NAD 1983 UTM Zone 15N

GIS Theory - Projections

- Allow creation of flat maps.
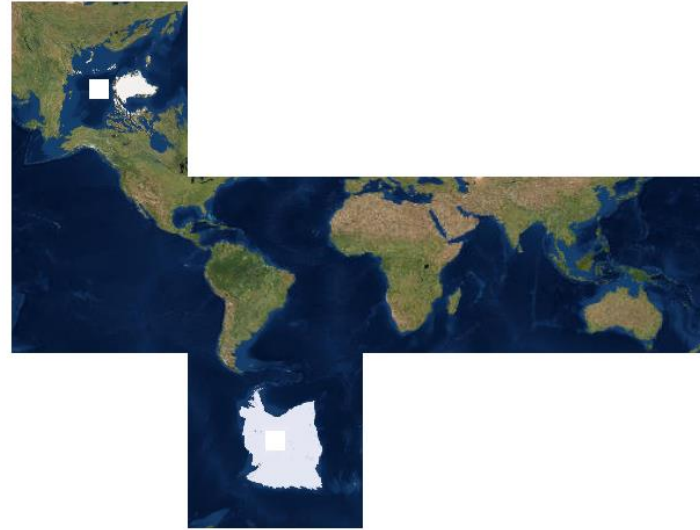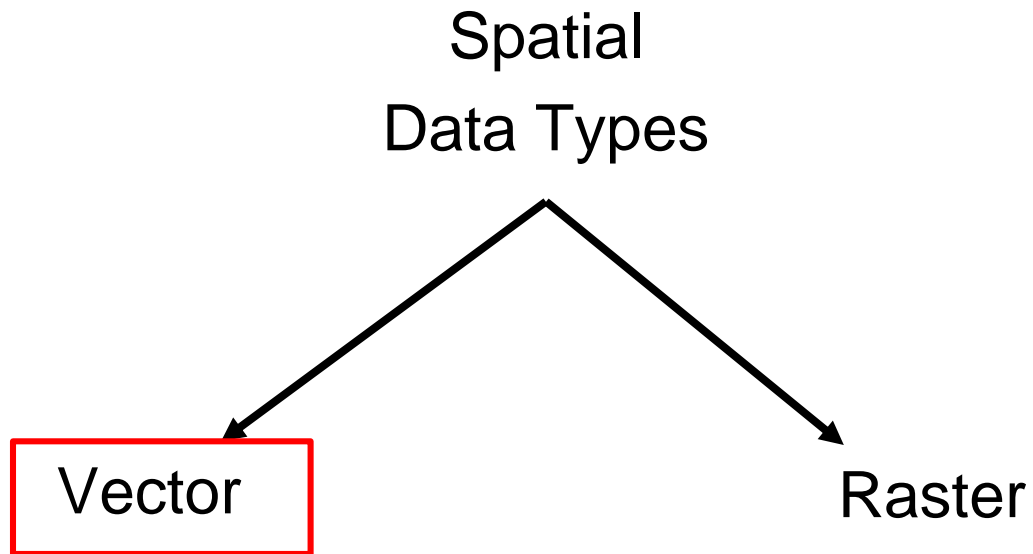
- At expense of distorting:
    - Shape
    - Area
    - Direction
    - Distance

GIS Theory – Spatial Data Types

GIS Theory – Spatial Data types

Spatial

Data Types

Vector   Raster

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GIS Theory – Spatial Data Types

Vector

(X, Y)

Points   Polylines   Polygon

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Note: Each type of vector data is put in its own group when stored. Example,
a Points Shapefile will only have points data, no polylines or polygons.

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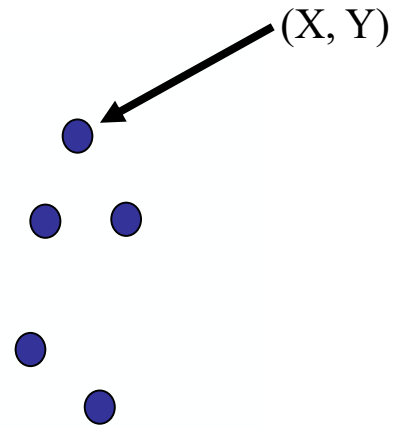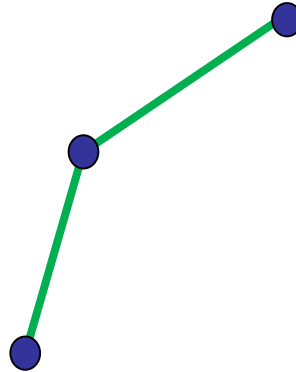
GIS Theory - Attributes

Spatial Component

(x, y)

Attribute Component

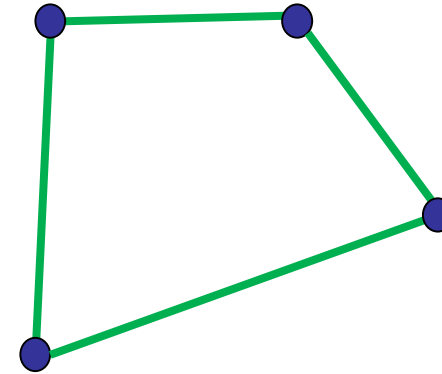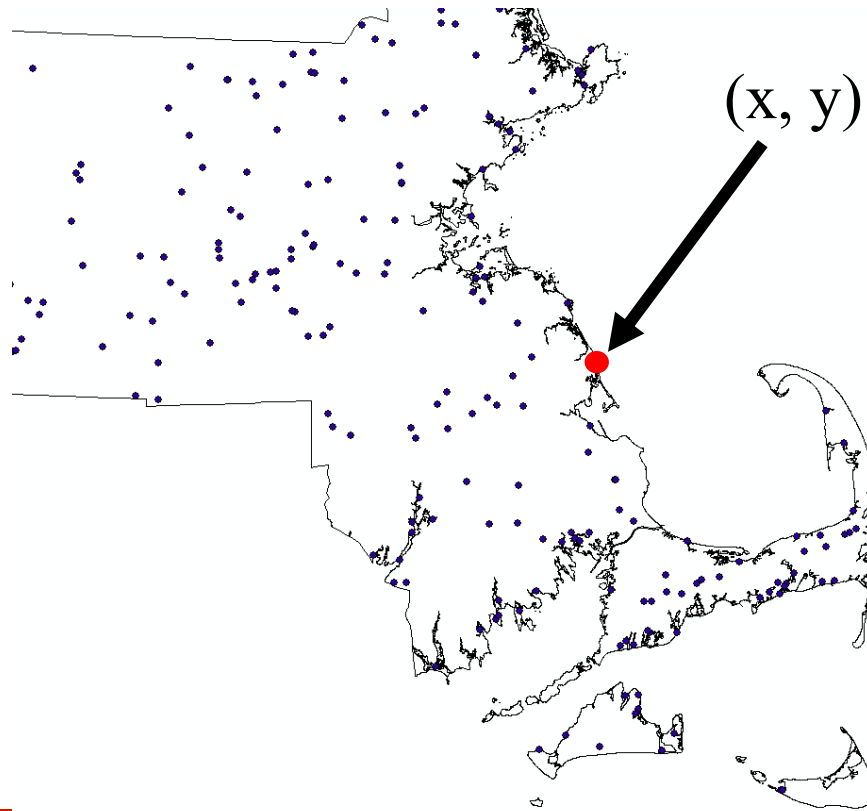| Location:	264,279.075 883,279.157 Meters
Field	**Value**
CONDITION	GOOD
FACIL_TYPE	A*
FACILTYPE1	A
FACNAME	SCITUATE HARBOR
FEE	N
FISH_CODES	10,11,16,17
MAINTRESP	TOWN OF SCITUATE
NOLANES	2
NORAMPS	1
PAGE	0
RAMPTYPE	CONCRETE
TOWN	SCITUATE

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GIS Theory – Spatial Data types

Spatial

Data Types

Vector
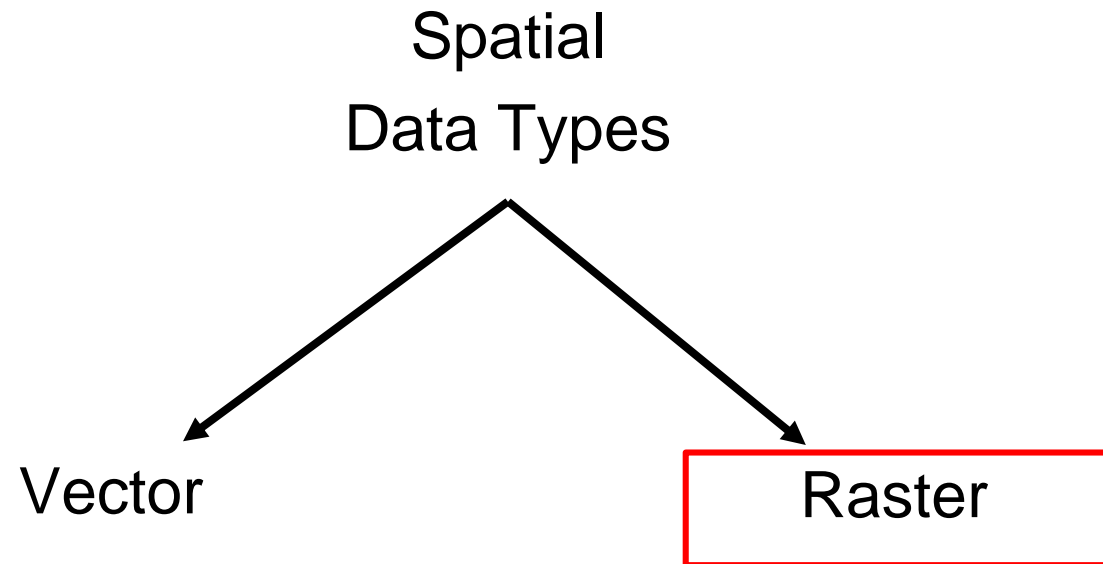
Raster

GIS Theory – Spatial Data Types

Raster Data – continuous data
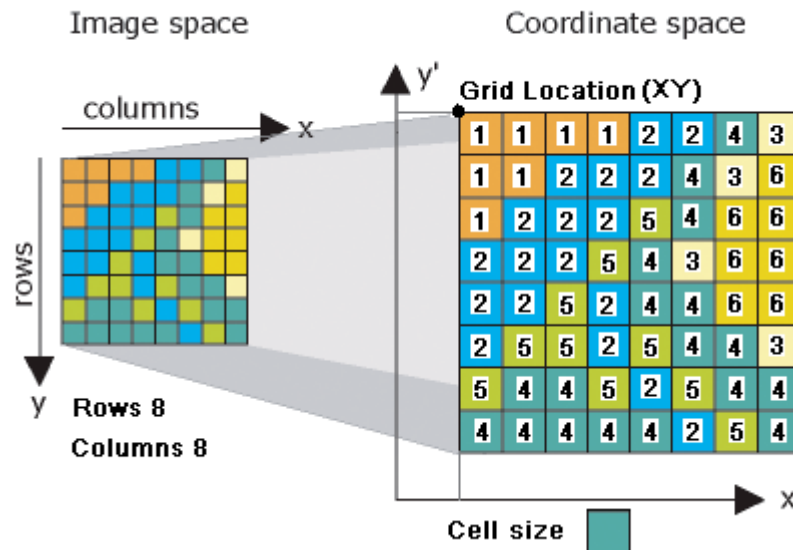
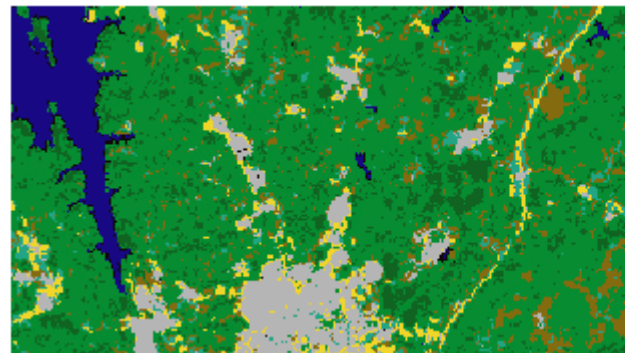Raster Spatial Properties
- Origin
- Cell Location
- Cell Size

http://desktop.arcgis.com/en/arcmap/latest/manage-data/raster-and-images/what-is-raster-data.htm
http://desktop.arcgis.com/en/arcmap/10.3/manage-data/geodatabases/raster-basics.htm

GIS Theory – Spatial Data Types

Examples of Raster Data
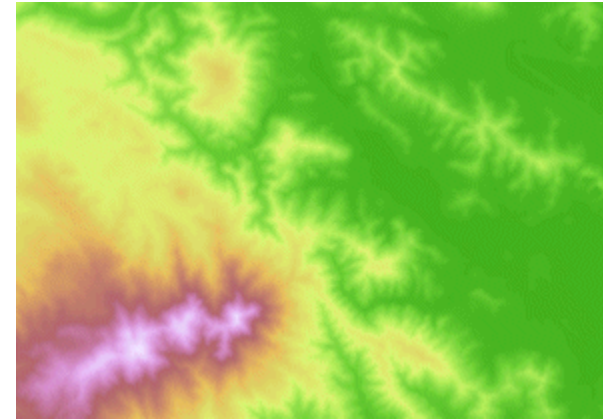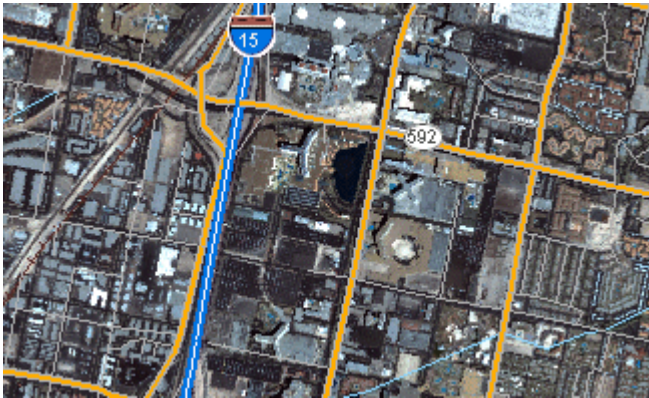
http://desktop.arcgis.com/en/arcmap/latest/manage-data/raster-and-images/what-is-raster-data.htm

GIS Theory – Spatial Data Types

Spatial

Component

Vector

Raster

Points   Polylines   Polygon
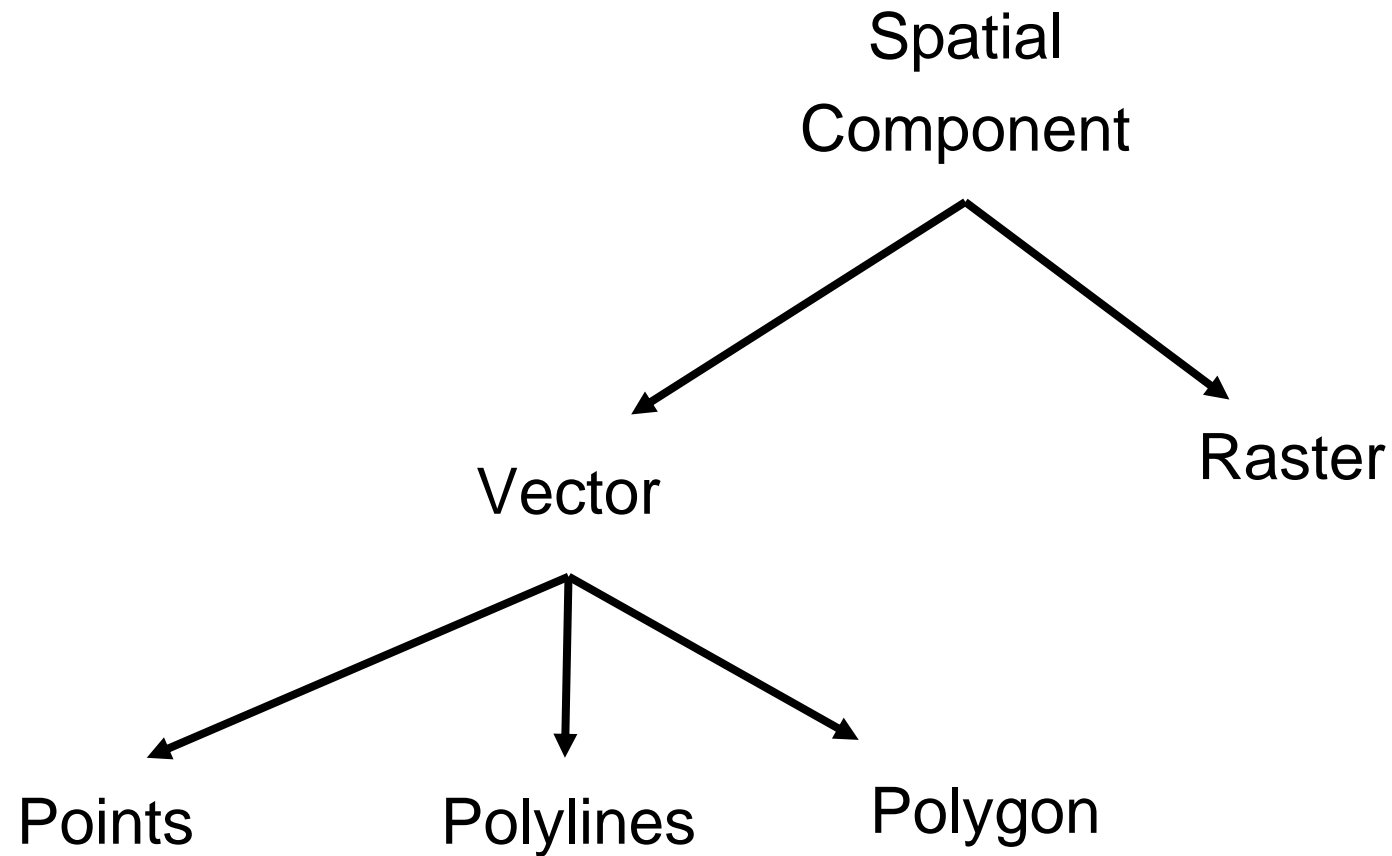
ArcGIS Online – What is it?

ArcGIS Online – What is it?

- Cloud Platform
- Create and share maps
- Create interactive map applications

- Paid service - Paid by CAS IT
- Certain processes consume "credits"

Credits by capability:
https://doc.arcgis.com/en/arcgis-online/administer/credits.htm#ESRI_SECTION1_709121D2C7694DCAB9B8592F36F7A5BA

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ArcGIS Online – What is it?

- Key Words – Workflow:

  - **Layers** – Spatial data that can be imported into Map or Scene

  - **Map** – 2D map where spatial data can be imported and viewed.
  - **Scene** – 3D map where spatial data can be imported and viewed.

  - **Application** – A custom web map layout with specialized tools for exploring Map and Scenes.

ArcGIS Online – What is it?

- Key Words – Data organization:

- **My Content** – Items you created.

- **My Favorites** – Items you marked as favorite.

- **My Groups** -   Items your group created.

- **My Organization** - Items created by BU community.

- **Living Atlas** – Items created by ESRI (trusted data)

- **ArcGIS Online** – Items created by anyone in the world.

ArcGIS Online – What is it?

- Key Words – Sharing Options:

    - **Owner/Private** – Only you can see it.

    - **My Organization** – Anyone at BU with an ArcGIS online account can see it.

    - **Everyone/Public -** The entire world can see it.

Resources

Get Started With Map Viewer
https://learn.arcgis.com/en/projects/get-started-with-map-viewer/arcgis-online/

Get Started:
https://doc.arcgis.com/en/arcgis-online/get-started/get-started.htm

Try ArcGIS Online:
https://learn.arcgis.com/en/paths/try-arcgis-online/

Lesson Gallery:
https://learn.arcgis.com/en/gallery/

Geographic coordinate system and projections.
https://www.e-education.psu.edu/natureofgeoinfo/c2.html

Let's Explore ArcGIS Online

https://bucas.maps.arcgis.com/