# GIS Systems, Standards, and Applications

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# What is GIS?

- GIS stands for “Geographic Information Systems”
- Describes systems that can store and query geographic or geospatial information
- Attach geospatial data to non-geospatial data

# Basic GIS Concepts

- In the GIS world, there exist 2 basic data types: vector and raster
- Vector data is represented by 1 or more mathematical vector formulas grouped together
- Raster data is a digital image of sorts – a bitmap of geospatial data (such as elevations, temperatures, or even simple imagery)

# Why would someone use GIS?

- Performing spatial queries
  - How much space does this object occupy?
  - What is the distance from 'here' to the nearest police station?
  - Do these 2 items overlap, or intersect?

  Creating graphical representations
  - Weather maps
  - Traffic maps

  Analyzing graphs of data linked by location
  - How does damming a stream affect the surrounding environment?

# GIS Standards

- ESRI
  - Shapefile
- Open Geospatial Consortium
  - WMS
  - WFS

# Popular GIS Software

- GIS database backends
  - MS SQL 2008
  - Oracle 9i-11g
  - PostGIS (Postgres with GIS extension)
- GIS Viewers
  - ArcGIS by ESRI – GIS viewer
  - QuantumGIS – GIS viewer
- WMS/WFS providers
  - Geoserver
  - ArcGIS Server
  - MapServer

# Some Basic GIS Demonstrations

# How display was created