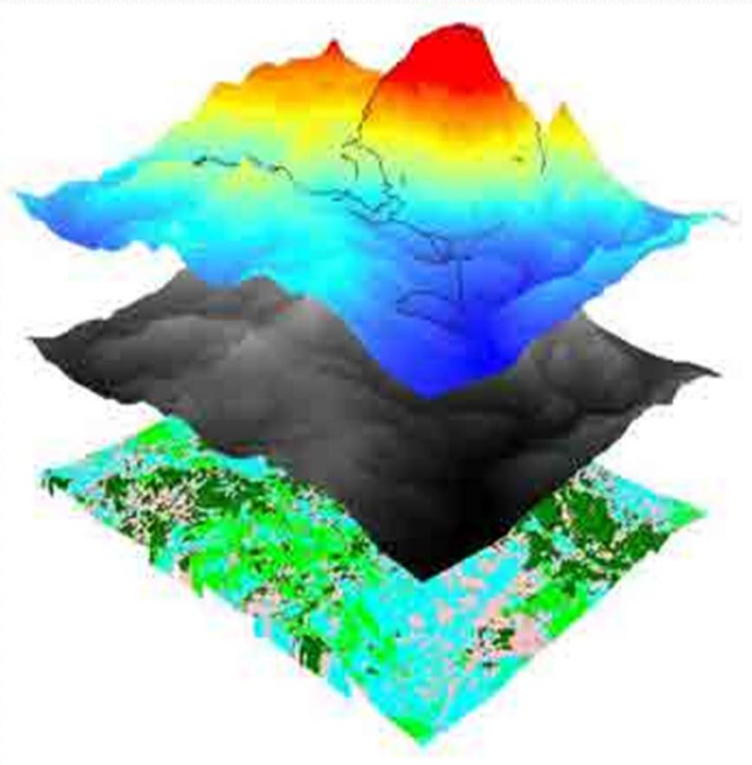


# **GEOGRAPHIC INFORMATION SYSTEM (GIS): Overview, Benefits, Applications**



**CRP-514**  
**Report Presentation**

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# What is Geographic Information System(GIS)?

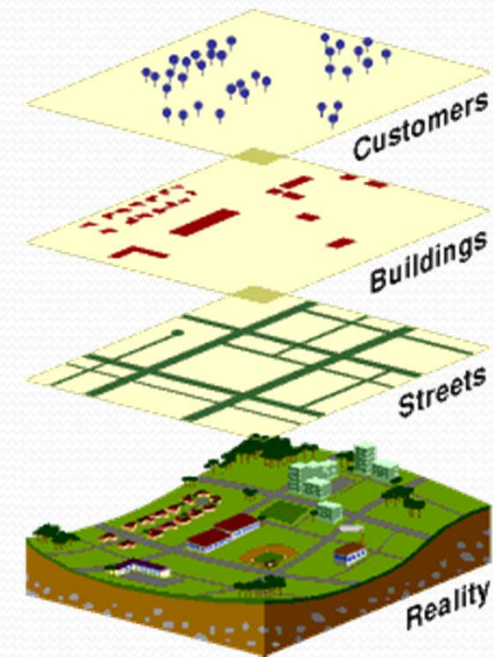
→ It is a computer tool used for gathering information ,analyzing information and storing information of a particular Geographical area.

For Example :To gather information about number of houses in a particular city.

# → Functioning of GIS

- Capture
- Store
- Query
- Analyze
- Display
- Output

- Basically it stores data in two forms.
  1. Geographic coordinate form.
  2. Attribute form



# Overview

- One of the first applications of spatial analysis in epidemiology is the 1832.
- The French geographer Charles Picquet represented the 48 districts of the city of Paris by halftone color gradient according to the percentage of deaths by [cholera](#) per 1000 inhabitants.
- In 1854, [John Snow](#) depicted a [cholera](#) outbreak in London using points to represent the locations of some individual cases, possibly the earliest use of the geographic method
- Developed in just the last 30 years or so.
- GIS technology already represents a billion dollar industry worldwide.
- It is growing at perhaps 25% per year and serving about one million persons on a daily basis in more than 100 countries.

## Who uses GIS?

- International organizations
  - UN HABITAT, The World Bank, UNEP, FAO, WHO, etc.
- Private industry
  - Transport, Real Estate, Insurance, etc.
- Government
  - Ministries of Environment, Housing, Agriculture, etc.
  - Local Authorities, Cities, Municipalities, etc.
  - Provincial Agencies for Planning, Parks, Transportation, etc.
- Non-profit organizations/NGO's
  - World Resources Institute, ICMA, etc.
- Academic and Research Institutions
  - Smithsonian Institution, CIESIN, etc.

# Benefits Of GIS

- Its ability to integrate different databases into one environment.
- The ability to display and manage spatial data in a spatial context.
- Rapid production of specialized map and graphic products.
- Once the spatial data are on place, complex spatial analyses may be performed more rapidly than by hand. (Automated process)

# Examples of Applied GIS

- **Urban Planning, Management & Policy**
  - Zoning, subdivision planning
  - Land acquisition
  - Economic development
  - Code enforcement
  - Housing renovation programs
  - Emergency response
  - Crime analysis
  - Tax assessment
- **Environmental Sciences**
  - Monitoring environmental risk
  - Modeling stormwater runoff
  - Management of watersheds, floodplains, wetlands, forests, aquifers
  - Environmental Impact Analysis
  - Hazardous or toxic facility siting
  - Groundwater modeling and contamination tracking
- **Political Science**
  - Redistricting
  - Analysis of election results
  - Predictive modeling
- **Civil Engineering/Utility**
  - Locating underground facilities
  - Designing alignment for freeways, transit
  - Coordination of infrastructure maintenance
- **Business**
  - Demographic Analysis
  - Market Penetration/ Share Analysis
  - Site Selection
- **Education Administration**
  - Attendance Area Maintenance
  - Enrollment Projections
  - School Bus Routing
- **Real Estate**
  - Neighborhood land prices
  - Traffic Impact Analysis
  - Determination of Highest and Best Use
- **Health Care**
  - Epidemiology
  - Needs Analysis
  - Service Inventory

# Applications

## 1. GIS for Aceh Natural Hazards

### The problem:

- On 26th December 2004 ,the tsunamis which struck the 12 countries killed over 150,000 people.
- Aceh which is prone to natural hazards such as volcanic eruptions , Earthquakes , landslides ,droughts etc .





# Applications

## The solution:

- By using Aceh Natural Hazards Information System (ANHIS) these natural disasters is minimized.
- Many data which is not available to the public is made available with the use of GIS ,so that the disasters are minimized.
- Here in ANHIS the prototype used is based on Client- Server interactive system .
- The results of ANHIS will clearly display in the map which area is prone to natural hazards.

# Applications

## The research method

The research method involved in the development of ANHIS is of many steps such as :

- Determining the System requirements:-It depends up on the end user requirements ,such as government, disaster agencies, organizations ,communities and researchers.
- Determining Software and Hardware requirements: This plays an important role in getting the information faster. Here the database server and web server are install in a computer and the software platform used is open source.

## Main Concept Of ANHIS

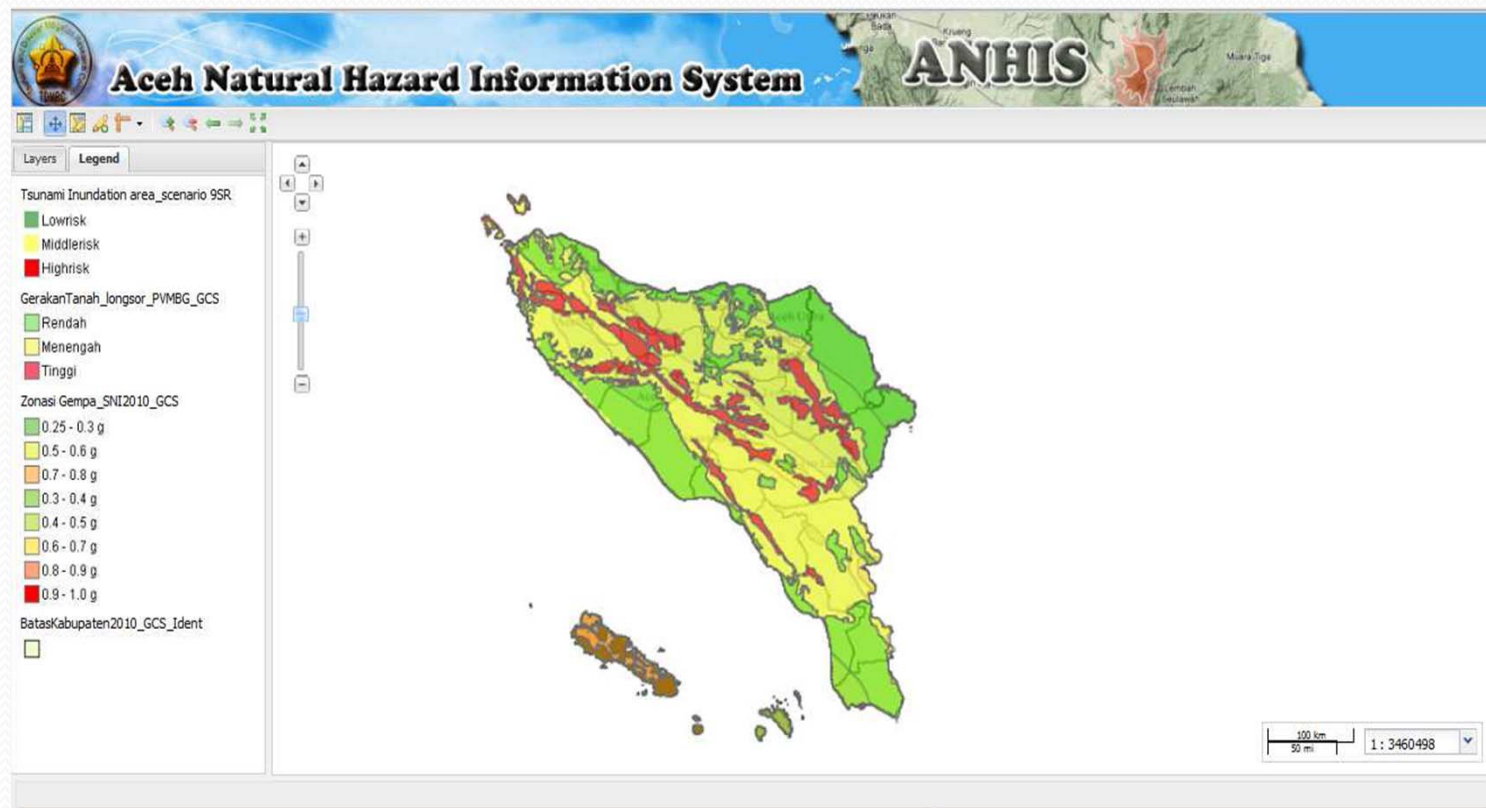
- Main Concept Of ANHIS:
  - To minimize the damage by giving the information to the decision makers, geologists and engineers with an interactive system where the client server technology is used .
  - ANHIS offers many interactive tools to review and investigate the properties of the land.
  - It can be managed easily.
  - It has five main database administrations:
    1. Base administration region database.
    2. Geography database
    3. Geology database.
    4. Hydrology database
    5. Ecology database.

## Configuration for Hardware and Software

- Hardware platform used is, database server and GeoServer and installed on notebook computer.
- Software platform used is GeoServer and Database server.
- Web application software used is open layer and GeoExt.

## Representation of data \$ Results

- In the figure below, multi-hazard map is presented to show earthquake, tsunami and landslide.
- Here the data models used to represent the data are vector and raster.
- The data represented in map is shown in three colors ,Red, Yellow and green from which we can identify the risk in the particular area.
- High risk area with multiple hazards is identified by scores from low to high.
- Here we can find high risk area by user analysis.



# Conclusion

- GIS will have increasing impact on our lives.
- Can be used to make either reliable decisions based on good data or unreliable decisions based on bad data or inappropriate methods of analysis.
- The responsibility lies entirely on the user and those who provide its data, develop its software and build its hardware.



THANK YOU