LIST OF FIGURES

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Chapter 1

1.1   GENERAL INFORMATION

Background

Geographic Information System is a computer-based tool that specifies the exact location of features, as well as their descriptive attributes. The descriptive attributes could be the types of land covers of an area human population of an area etc GIS is important as it integrates geographic information for display and analysis within the framework of a single consistent system

GIS is very much useful in analyzing large sets of statistical data sets especially data relating to the whole world or a continent or country, as quicker decisions and implementations of plans can be executed. The most suitable examples earthquake emergency relief plans and evacuation of the areas when a eruption of a volcano takes place

Objective

The objective of the study is to use real world data to analyze the relationship between various environments and human population

Statement of the Problem

Application of Internet Real-World Data Resources In GIS: A CASE STUDY

Methodology of study

The study was entirely based on the exhaustive Spatial Queries, which were carried out for the Nine activities. In this way a lot of knowledge about different Environments and relationship to Human Environment was acquired.

Presentation of project

The report is presented in five chapters. Chapter one describes the introduction to the study .The second discusses the Literature review, which has been carried out. The third chapter discusses the acquiring the GIS real world data. The fourth chapter describes the exhaustive Spatial Queries, which were carried out in order to understand the relationship between various environments. The fifth Chapter describes summary and recommendations.

LITERATURE REVIEW

Projections

As my project is related to geography of Africa, the types of projection are very important. For example, Universal Transverse Mercator (UTM) system

Universal Transverse Mercator (UTM) system

For the Universal Transverse Mercator System, the globe is divided into sixty zones, each spanning six degrees of longitude. Each zone has its own central meridian. This projection is a specialized application of the Transverse Mercator projection. The limits of each zone are 84° N, 80° S.

Method of projection: Each UTM zone has its own central meridian from which it spans 3 degrees west and 3 degrees east of that central meridian. The cylindrical methodology is the same as that for the Transverse projection. Note that the position of the cylinder rotates systematically around the globe. X- and y-coordinates are recorded in meters. The origin for each zone is the Equator and its central meridian. To eliminate negative coordinates, the projection alters the coordinate values at the origin. The value given to the central meridian is the false easting, and the value assigned to the Equator is the false northing. For locations in the Northern Hemisphere, the origin is assigned a false easting of 500,000, and a false northing of 0. For locations in the Southern Hemisphere, the origin is assigned a false easting of 500,000 and a false northing of 10,000,000.

Lines of Secancy: Two lines parallel to and approximately 180 km to each side of the central meridian of the UTM zone.

Linear Graticules: The central meridian and the Equator.

Properties

Shape Conformal. Accurate representation of small shapes. Minimal distortion of larger shapes within the zone.

Area Minimal distortion within each UTM zone.

Direction Local angles are true.

Distance Scale is constant along the central meridian, but at a scale factor of 0.9996 to reduce lateral distortion within each zone. With this scale factor, lines lying 180 km east and west of and parallel to the central meridian have a scale factor of 1.0.

Limitations

Designed for a scale error not exceeding 0.1 percent within each zone. This projection spans the globe from 84° N to 80° S. Error and distortion increase for regions that span more than one UTM zone.

Uses and applications

- United States topographic quadrangles, 1:100,000.

- Large-scale topographic mapping of the Soviet Union.

- Medium-scale maps of regions throughout the world.

Types of Data Format

Arcview can work directly with a variety of data formats. For data formats that are not directly supported by Arcview, data conversion utilities abound. Many data conversion utilities are listed below

ARC Digitized Raster Graphics files can be added as themes if you load the ADRG Image Support extension.

ARC/INFO .e00 interchange files

Use one of Arc View's IMPORT data conversion utilities to convert the file into a coverage, which can be used as a theme source.

ARC/INFO coverages - converting to shapefile format

Both ARC/INFO and the Data Automation Kit (Windows only) provide conversion utilities, which convert data from coverage format to shapefile, format (SHAPEARC). Information about ARC/INFO or the Data Automation Kit can be found at www.esri.com or by contacting ESRI.

CAD drawings

Arcview supports MicroStation design (.dgn) files and two kinds of AutoCAD drawing files, .dwg files (Windows only) and .dxf files (Drawing Interchange files). Before you use CAD drawings in ArcView you must first load the CAD Reader extension. ARC/INFO provides a conversion utility, which converts data from DXF format to a coverage (DXFARC). Information about ARC/INFO can be found at www.esri.com or by contacting ESRI.

CADRG files

Compressed ARC Digitized Raster Graphics files can be added as themes if you load the CADRG Image Support extension.

CIB files

Controlled Image Base files can be added as themes if we load the CIB Image Support extension.

GPS data

We can use the GPS2Shp sample script, which can be found in AVHOME \samples \scripts, or we can use the Tracking Analyst extension to read GPS data in ArcView.

IMAGINE files

ERDAS IMAGINE files can be added as themes if we load the IMAGINE image extension.

Vector Product Format VPF

Vector Product Format data can be read directly into ArcView as long as the VPF Viewer extension is loaded.

Spatial analysis operations available in ArcView include:

- ➢ Find point features that are nearest to the selected point or line features. See Theme on theme selection and spatial join.

- ➢ Find point features according to the polygon features they fall inside. (Point-in-polygon). See Theme on theme selection and Spatial join.

- ➢ Find line features according to the polygon features they cross. (Intersection). See Theme on theme selection and Spatial join.

- ➢ Find polygon features according to the polygon features they coincide. (Intersection; Polygon-in-polygon). See Theme on theme selection and Spatial join.

- ➢ Find features that are adjacent to the selected features. See Theme on theme selection.

- ➢ Create new features by merging a set of adjacent features into one single feature or aggregate disjunct features. .

- ➢ Select features by specifying a buffer distance. See Theme on theme selection.

Types of Thematic Maps

Single Symbol: All the features in the theme are displayed with the same colors and symbols. This is useful when you only need to show where a theme's features are located.

Graduated Color: Features are displayed with the same symbol type, but the colors represent the progression of values for a data attribute you specify. See Graduated Color Maps to learn more.

Graduated Symbol: The features are displayed with the same colors and symbols, representing a progression of values. This is the best way to symbolize data that expresses size or magnitude. Graduated symbol is only available for point and line data. See Graduated Symbol Maps to learn more.

Unique Value: Each unique value in a theme is represented with a unique symbol. This is the most effective method for displaying categorical data. See Unique Value Maps to learn more.

Dot Density: The features of a polygon theme are displayed with a number of dots corresponding to a value. This method is good for showing how particular things are distributed throughout an area. For instance, a dot map depicting population will most likely have the strongest concentrations of dots along rivers and near coastlines. See Dot Density Maps to learn more.

Chart: The features are displayed with a chart. The components of the chart correspond to data attributes you specify, and the size of each part in a chart is determined by the value of each data attribute. You can specify whether the charts are pie charts or column charts. This is a good method for displaying the values of many attributes. See Chart Maps to learn more.

Scale Bar Frame

A **Scale bar Frame** is a kind of Frame, which knows how to draw a scale bar into a layout.

Interval: The Interval is the width of one major division on the scale bar.

Preserve Interval: The preserve interval property determines whether the ScaleBarFrame will remain constant when the view that the ScaleBarFrame is linked to changes scales. If this property is set to TRUE, and the associated view changes scales, the overall size of the ScaleBarFrame will be adjusted accordingly. If this property is set to FALSE, then the ScaleBarFrame will remain the same size, but then the interval will be adjusted accordingly when the view that it is associated with changes scales.

Intervals: An interval is how many intervals are drawn to the right of zero.

Divisions: A division is how many smaller divisions are used in one interval to the left of zero. If Divisions are 0, this interval will not be drawn.

Style: The Style is the way the scale bar looks.

Units: The Units that the scale bar are in.

World Countries 1998

Introduction to the Data concerning World

GeoDataset Names: Cntry98/Country

World Countries represent 251 countries including those countries created from the former Soviet Union, Yugoslavia, and Czechoslovakia, such as Russia and Slovenia, and the new African nation of Eritrea. Country is generalized to improve draw performance and be used effectively at a global level. Cntry98 is detailed to be used effectively at national levels.

☆ **Cntry98/Country - World Countries 1998:** 251 polygons, 11 descriptive fields. Defines world countries as of 1998.

☆ **Associated table**: World Demographics

☆ **Associated table**: World Political Organization Membership

☆ **Fields:**

☆ **Fips_cntry** -- The two-letter country code from the United States Federal Information Processing Standards (FIPS) coding scheme. Example: KS for the Republic of Korea. (String)

☆ **Gmi_cntry** -- The three -letter country code from Global Mapping International. **Example**: The code for the United Kingdom is GBR. (String)

☆ **Cntry_name** -- **The country name**. These names are shortened and not necessarily official. Example: Turkey (the official name is Republic of Turkey)

The following fields indicate a country's membership in international organizations. The codes are as follows:

☆ **Y = Yes, a country is a member of the organization**

☆ **N = No, a country is not a member of the organization**

☆ **Sovereign** -- Name of the country having sovereignty. (String)

☆ **Pop_cntry** -- The population of a country. (Source: NCGIA. Currency: 1994 estimated population.) This field contains -99999 for countries for which population figures were unavailable. (Numeric)

☆ **Sqkm_cntry** -- The total area of a country in square kilometers (excluding maritime areas). (Numeric)

☆ **Sqmi_cntry** -- The total area of a country in square miles (excluding maritime areas). (Numeric)

☆ **Curr_type** -- The type of currency in use in the country. (String)

☆ **Curr_code** -- The three letter abbreviation for the country's currency. (String)

☆ **Landlocked** -- Countries without access to the sea. (String)

☆ **Color_map** -- Numbers (1 - 8) allows the country to be shaded unique from its neighbor.

CHAPTER 3

3.1   Acquiring the GIS Real -World Data

a) The whole data was acquired from the Internet.

b) The downloaded real -world data were in seven zip files.

c) The first zip files consisted the data for first three activities

d) The data for the   remaining activities were in the respective individual zip files.

e) These zip files were decompressed in respective name folders

f) The required shape files were added to each in project from the respective folders.

3.2   Internet sites used in the acquiring data

The websites, which were used in my project, are the following:

1. GIS at Boulder Homepage. Its web address is bvsd.k12.co.us

2. USGS Home page. (United States Geographical Society)

SPATIAL ANALYSIS

4.1   Activity 1

Brief Introduction about the Activity:

Africa Physical conditions:

Africa's coastline is 18,950 miles long, with very few inlets and bays. From north to south the continent measures approximately 5,000 miles (8,000 km) in length. From east to west above the Equator it measures approximately 4,600 miles.

Africa's land mass was formed by a rigid platform of rock that serves as the base for the widespread plateaus of the interior. From the higher plateaus in southeastern Africa the land descends into the plains and coastal lowlands of northeastern Africa. The average elevation is 2,200 feet (670 m). Basically the plateau can be divided into two regions. The southeastern portion includes the Ethiopian Plateau, the East African Plateau and the Drakensberg Range.

The northeastern portion contains the Sahara Desert with the Ahaggar Mountains, and in northwestern Africa, the Atlas Mountains.

Objective

Studying the relationships between components of physical environment like rivers, mountains, and plain areas by taking Africa as a case study.

Spatial Analysis:

Question 1: What is the most common relief form where the rivers begin?

Answer: By seeing the view we can analyze that tropical region is the region where most of the rivers flows

Question 2: **Where are the high mountains of the African continent?**

Answer: The high mountains of the African continent are in subequatorial region

Question 3: **From their sources, which directions are the following rivers flowing (North, southwest, etc):**

Answer
1. **Congo:** It is flowing to southwest
2. **Zambezi**: It is flowing in eastern direction
3. **Orange:** Across Africa from west to east
4**. Nile:** Directly towards south

Question 4: **In what precipitation belt do most rivers begin?**

Answer: In the precipitation belt which has the range from 601 to 1400 do the most of the rivers begin

Question 5: **What are the vegetation types north of the Atlas Mountains?**

Answer: By zooming and moving the relief theme and the vegetation theme one over the above and comparing the area we can conclude that low grass and Mediterranean are the types of north of the Atlas Mountains

Question 6: What is the influence of the Atlantic Ocean on the coastal vegetation of Western Sahara?

Answer: The influence of the Atlantic Ocean is that low grass savanna is the type of vegetation in Western Sahara

Question 7: **What is the primary vegetation of the low coastal plain of Libya?**

Answer: The primary vegetation of the low coastal plain of Libya is desert club.

The analysis to get the answer is as follows

Make country theme green then use the query builder to locate the country Libya by constructing the equation "country_name = Libya" and selecting new set and then identify the type of vegetation.

Question 7: **Do all the tropical rains forest areas shares the same relief?**

Answer: Nearly all the tropical rain forests areas cover the same area relief

Question 8: **What is the dominant relief feature of the tropical grasslands**?

Answer: High plains is the dominant relief feature of the tropical grasslands

The analysis part which was carried out consists of comparing relief theme and vegetation theme in area where the tropical grasslands where located.

4.2 Activity 2

Brief Introduction about the Activity

Human environment has been very much influenced by the Physical environment of the region.

A Discussion regarding Africa

Human population:

It is generally believed that human life first began on the continent of Africa - some 7 million years ago. Today, Africa is a continent with a fascinating diversity of peoples, who make up about 10% of the world population. These peoples together make up about 50 nations. The peoples of Africa are often described in terms of their ethnic background or their languages.

Africa Climate:

Location on the African continent in relation to the Equator affects each region's climate. The desert regions north of the Equator are known for their extremely high temperatures and dry conditions. The remainder of the continent also has high temperatures throughout the year but elevation heights and the ocean currents along the southeastern and southwestern coasts influence them. Nearer the Equator there is more rainfall as well as a very rainy season. Further from the Equator, the climate will be drier and hotter during the dry season. Therefore, each country's location - north, on/near or south of the Equator will have the greatest influence on its climate. This in turn directly affects plant life, wildlife, human population and the economy of the region.

Objective:

Studying the effect of climate of Africa on population.

Spatial Analysis:

Question 1: **In which relief areas are the largest number of cities located? Why?**

Answer: In high plains located in south of Africa, the largest numbers of cities are located, as there is no hot weather due near by seashore and near to source of water and no undulating features of lands. These are the favorable conditions for a settlement and hence the largest numbers of cities are located in these regions.

Question 2: **In which relief area are the fewest number of cities located? Why?**

Answer: High plains in Central Africa note that relief feature is the same high Plains but the the region is Central Africa where the equator passes this makes the region the hottest in the world and so there are fewest number of cities.

Question 3: How **does proximity to water determine city size? Explain.**

Answer: Since the ancient time human settlements have been taken place where there is water the regions where there is water in Africa are the south central Africa and the coastal regions. So the proximity to water determines the city size.

Question 4: **Identify the cities by name and population which are greater than 3000000. List them below.**

Answer: The application and the helpfulness of geographical information systems to large data of any kind comes to real existence in this type of questions with just few clicks we can identify any thing in this the cities which have population more than 3000000. If we imagine paper work for this problem we can realize how helpful is GIS. Now coming to analysis part just make a query by constructing the equation population>3000000 and setting new set the cities are highlighted and use the promote button to make the selected cities to make them top in the attribute table

The results are

1. **Cairo**   **9300000**
2. **Johannesburg**   **3650000**
3. **Lagos**   **3800000**
4. **Alexandria**   **3350000**

Question 5: **In which precipitation areas are the least numbers of cities located?**

Answer: The precipitation area in which there is 0 range of precipitation, there are only two cities and this is the area where least number of cities are located.

Question 6: **Can you answer u explain the location of the 2 large cities in North Africa that are in the lowest precipitation range?**

Answer: The main reason for the location of two large cities in the lowest precipitation area is the river Nile. It is the main source of water for these two cities and also the river is the one of the longest and widest rivers in the world

Question 7: **Does climate have an effect on city size? What is this effect?**

Answer: Yes climate definitely affect the city size. For example Tomboutooo City in tropical region has population 31925 and the Bangui City in equator has population size of 473184. This clearly shows how the climate has an effect on city size

4.3   Activity 3

Brief Introduction about the Activity

Africa Resources:

At least half of the world's diamonds are in Africa. Gold is mined in Ghana, South Africa, and Zimbabwe and are considered to produce half of the world's gold.

Most of the petroleum and natural gas comes from Egypt, Nigeria, Algeria, and Libya. The following natural resources are found in Africa with an estimated amount of their share of the world's total. Uranium (29%), bauxite (27%), copper (20%), petroleum (8%), phosphorites (66%). Iron ore, chromium, manganese, cobalt, titanium and platinum are also found in large amounts. Half of the world's supply of diamonds and gold come from Africa as well.

Objective

How the mineral resources affects the human environment.

Spatial Analysis:

Question 1:   Notice the pipelines in north and West Africa, comparing them to the pipelines in east Africa. How would you determine which pipelines are being used to import oil and which pipelines are being used to export oil?

Answer: As there are more oil deposits in north and West Africa they are used to store and later export oil

Question 2:   Name three countries that are using pipelines to export oil:

Answer: Tanzania as we see the view the pipeline is down to Zaire so Tanzania is exporting

Question 3: **Name three countries that are using pipelines to import oil:**

Answer: Zambia, South Africa, Tanzania are importing oil using the pipelines

Question 4: **Notice the oil deposit in central Sudan. Give two possible hypotheses as to why this oil deposit is not connected to a pipeline.**

Answer: The reasons are as follows

Due to long distance, it is the only one of the many oil sources as many so it is neglected as there are many other sources

Question 5: **Determine the type of material mined at any three sites in different countries, being sure to list the country as well.**

Answer Copper   -Sudan

Uranium   -Niger

Diamond -Tanzania

Question 6: **Is there any correlation between the type of relief and very large mineral deposits? Explain what you found.**

Answer: By observing relief view and very large minerals deposits are located mainly in plains

Question 7: **Why are different mineral deposits found in different relief forms?**

Answer: Due to the earth internal pressures differ accordingly the pressures in the formations of minerals differs this leads different minerals, which leads to different mineral deposits.

Question 8: **Is there a correlation between manufacturing and population density? What is it? Give one hypothesis why.**

Answer: Population density is directly related manufacturing. The reason behind this is that manufacturing leads to job employment and this leads to urban settlement

4.4   Activity 4

Brief Introduction about the Activity

Plate Boundaries, Earthquakes and Volcanoes

The Earth is formed of several layers that have very different physical and chemical properties. The outer layer, which averages about 70 kilometers in thickness, consists of about a dozen large, irregularly shaped plates that slide over, under and past each other on top of the partly molten inner layer. Most earthquakes occur at the boundaries where the plates meet. In fact, the locations of earthquakes and the kinds of ruptures they produce help scientists define the plate boundaries.

Objective:

Study of plate boundaries of the earth.

Spatial Analysis:

Question 1:   Where are the majority of the earthquakes in the world located in relationship to the plate boundaries?

Answer: Along the plate boundaries

Question 2:   Where are most of the earthquakes in Africa located in relationship to the plate boundaries?

Answer: By seeing the view we can clearly say they are far away from plate boundaries

Question 3: **Compare the location of the plate boundaries and earthquakes along the coast of Africa and along the coasts of North and South America. Do you think this affects the risk from earthquakes to people in North and South America compared with Africa? Why?**

Answer: Because the volcanoes are densely located along the plate boundaries on the coasts of North and South America yes they certainly affects the risk from earthquakes to people in North and South America compared with Africa

Question 4: **Determine when (Year) and where (Country) the largest magnitude earthquake occurred?**

Answer: In the year 1996 and the country is Indonesia. The procedure for the analysis is, in query builder tick construct MAGNITUDE >9.2, say new set, yellow dot is highlighted come to view make continent theme active and identify the yellow dot by identify tool

Question 5: **Where are the majority of the volcanoes in the world located in relationship to the plate boundaries?   Why?**

Answer: Just by viewing we can identify that the answer is South-East Asia

Question 7: **Determine which volcano is the highest in Africa (has the largest Elevation).**

Answer: OJOS Del Salado, NEVADOS, CHILE N 6887 FT

4.5   Activity 5

Brief Introduction about the Activity

Map of East Africa, showing some of the historically active volcanoes (red triangles), and the Afar Triangle (shaded, center) -- a so-called triple junction (or triple point), where three plates are pulling away from one another: the Arabian Plate, and the two parts of the African Plate (the Nubian and the Somalian) splitting along the East African Rift Zone.

In East Africa, spreading processes have already torn Saudi Arabia away from the rest of the African continent, forming the Red Sea. The actively splitting African Plate and the Arabian Plate meet in what geologists call a triple junction, where the Red Sea meets the Gulf of Aden. A new spreading center may be developing under Africa along the East African Rift Zone. When the continental crust stretches beyond its limits, tension cracks begin to appear on the Earth's surface. Magma rises and squeezes through the widening cracks, sometimes to erupt and form volcanoes. The rising magma, whether or not it erupts, puts more pressure on the crust to produce additional fractures and, ultimately, the rift zone

Objective

Study of earthquakes, Volcanoes and Faults in Africa

Spatial Analysis:

Question 1: **Which Volcano in Africa last erupted?**

Answer: The recent is Nyamuragia located in central Africa and the date of eruption is 1st of December 1996.

Question 2: **Are the volcanoes in Africa located near plate boundaries or faults?**

Answer: Volcanoes are located near the plate boundaries.

Question 3: **Which country in Africa has the most historic volcanoes?**

Answer: On observing the view we can conclude that a strip of historic volcanoes exists in Ethiopia country and is the one, which contains most of historic volcanoes.

Question 4: **Which country in Africa have the most recent volcanoes and are most at risk from volcanoes that may erupt in the future?**

Answer: On observing the view we can conclude that Tanzania is the country which is at risk from future volcanoes

Question 5: **What areas in Africa have high population densities, 5-9, and also have some risk from earthquakes and volcanoes?**

Answer: Southeast Africa is the region in Africa, which has high population densities, 5-9, and also has some risk from earthquakes and volcanoes.

4.6   Activity 6

Brief Introduction about the Activity

A **Tsunami** is a huge sea wave caused by earthquakes or other large-scale disturbances of the ocean floor. Tsunamis can be generated when the sea floor abruptly deforms and vertically displaces the overlying water. Tectonic earthquakes are a particular kind of earthquake that are associated with the earth's crustal deformation; when these earthquakes occur beneath the sea, the water above the deformed area is displaced from its equilibrium position. Waves are formed as the displaced water mass, which acts under the influence of gravity, attempts to regain its equilibrium. When large areas of the sea floor elevate or subside, a tsunami can be created.

Large vertical movements of the earth's crust can occur at plate boundaries. Plates interact along these boundaries called faults. Around the margins of the Pacific Ocean, for example, denser oceanic plates slip under continental plates in a process known as subduction. Subduction earthquakes are particularly effective in generating tsunamis.

Objective:

 To Study Tsunami Effects in Africa.

Spatial Analysis:

Question 1:   Name a city with a population greater than 2 million that may be at risk from a tsunami.

Answer: Lagos

Question 2: **Determine, which Tsunami Sources caused Tsunami Effects in more than one location.**

Answer: The details of Tsunami Sources are as follows

1755   11   1   35.57 latitude 5.36 longitude located MOROCCO STRAIT OF GIBRALTER

Question 3: **Which tsunamis actually caused some type of damage?**

Answer: The details **tsunamis** actually caused some type of damage are as follows

1303   8   8   LYBIAN SEA i.e. the tsunamis caused some type of damage near Libyan sea at height of 1303m from mean sea level

1755   11   1   PORTUGAL i.e. the tsunamis caused some type of damage near Portugal at a height of 1755 from mean sea level

1911   3   11   TRINIDAD i.e. the tsunamis caused some type of damage near Trinidad at a height of 1911 from mean sea level

4.7   Activity 7

Brief Introduction about the Activity

African Fires

This quest for fire starts in a surprising place – the bottom of the ocean. For several million years, Prevailing winds have blown westwards across sub-Saharan Africa, depositing dust and detritus in the eastern Atlantic Ocean. If that dust contains ash from fires, that will be deposited too, finding its way to the bottom of the sea. Certain parts of the ocean bed are quite and stable, accumulating material from above in a steady, uninterrupted way for hundreds of thousands of years. This period has been climatically turbulent, with several major ice ages, or glacial, punctuated by warmer, interglacial intervals. Cores of finely layered ocean-floor sediment reveal much about changes in the Earth's climate, and record these climatic changes in a range of ways.

Objective:

Location of fires and their impact on land use and population

Spatial Analysis:

Question 1:   Where are most of the fires located in Africa?

Answer: The most of the fires are located in central Africa

Question 2:   What type of land cover are most of the fires in Africa associated with?

Answer: Most of the fires in Africa are associated with sawanna land cover

Question 3: **Are most of the fires in Africa located in densely populated areas?**

Answer: Yes, by observing the view we can conclude that most of the fires in Africa are located in densely populated in areas.

"The Hill" Project

Brief Introduction about the Activity

Economic, demographic, and social forces can bring about changes in neighborhoods in space and time. The University Hill, or "The Hill" neighborhood in Boulder Colorado provides an excellent case study for analyzing these forces. Lying just west of the campus of the University of Colorado, the Hill developed a reputation and the characteristics of a college neighborhood.

Objective:

Studying the changes in neighborhood due to Social, Demographic and Economical changes taking the University Hill, Boulder Colorado as a Case Study.

Spatial Analysis:

Question 1:   Does the Hill fit the ghetto model today? Yes or No? Defend your position.

Answer: Yes the hill fit ghetto model. The reasons are as follows

1. First of all there is increase in population 1970 to 1990 population

2. There is a great increase in median rent we can this by observing this table

Median Rent 70	Median Rent 80	Median Rent 90
132	306	475
108	393	502
179	334	517
140	287	680
113	247	377
141	227	548

Question 2: Explain how this area has changed since 1970. What elements is the same as in 1970? What elements are different?

Answer: The population 65+ years in 1970 has not changed until 1990

Question 3: Pick an attribute for which there is information for 1970, 1980, and 1990. Analyze how it has changed over time on the Hill and across Boulder and speculate about the reasons for these changes.

Answer: The best example for this is the housing unit

Housing Units 1970	Housing Units 1980	Housing Units 1990
0352	1027	1518
0274	0804	1438
0056	1801	2332
0519	0720	1786
0871	2172	3114
0159	0566	0824
0800	0571	0619
1795	2059	2016
0860	1923	2620
2104	2594	3058
1261	1777	1845
1511	2326	2967
1260	1060	1139
0717	0677	0666
0629	0856	1249
0272	0326	0374
0289	1028	1281
2602	3289	3881
721	738	805
1906	1889	1860
1327	1754	1838
1406	1652	1626

4.9   "Earthquakes Everyday" Project

Brief Introduction about the Activity

Internet is great source of GIS data, if we know how to edit the raw data and convert in a format, which is acceptable by the Arcview software we can solve many global and local problems.

A Discussion of the steps while Earthquakes occur

Even though people cannot stop earthquakes from happening, they can learn to live with the problems caused by earthquakes. Three major lines of defense against earthquake hazards are being developed. Buildings in earthquake-prone areas should be designed and constructed to resist earthquake shaking. Building codes that require attention to earthquake shaking have been improving in recent decades and constitute a first line of defense. In some cities, programs are underway to strengthen or tear down older buildings most likely to collapse during earthquakes. A second line of defense involves the selective use of land to minimize the effects of hazardous ground. High- occupancy or critical structures, for example, should not be placed astride the San Andreas fault or on landslide-prone areas. The third line of defense will be the accurate prediction of earthquakes. When such prediction becomes possible, it will permit timely evacuation of the most hazardous buildings. A major program aimed at learning how to predict earthquakes and to assess and minimize their hazards was initiated following the Earthquake Hazards Reduction Act of 1977 and is being carried out by the U.S. Geological Survey, other Federal Agencies, universities, and private groups.

Objective

The project is mainly concerned with the editing of the data of the earthquakes which was taken from the internet site namely United States of geographical (USGS) homepage.

Spatial Analysis:

Question 1: **What are three noticeable characteristics of your pattern of Earthquakes?**

Answer: By observing the table

We can observe three noticeable characteristics of earthquakes

☆ The minimum and the maximum of earthquakes vary from 3.2 to 5.7

☆ Most of the earthquakes epicenters are near coastal regions where the oceans meet the landmass.

☆ The earthquakes epicenter can be in the oceans also

Question 2: **What is the pattern of earthquakes related to plate boundaries?**

Answer: On observing the view we can conclude that Earth quakes occurs along the plate boundaries

Question 3: **What is the pattern of earthquakes related to cities? Are most cities near earthquake epicenters?**

Answer: Earthquakes occurs near the coastal areas, the cities which are near the coastal areas are likely to get affected

Question 4: **What other natural disasters are associated with earthquakes? How does this affect your answer to question 14?**

Answer: Tsunamis and eruption of volcanoes are other natural disasters that are associated with earthquakes

Summary and Conclusions

This study has made to realize the importance of Internet and its real world data resources and its applications in Geographical information systems

Recommendations

1. Further work can be carried out in the areas like locating optimum route by downloading the necessary data and using the network analyst extension from the WebPages like ESRI home age

2. Serious shift of concern should be carried out in utilizing Internet real- world data resources

APPENDIX 1

Military Data Reader extensions

This Arc View extension provides direct access to ARC Digitized Raster Graphics (ADRG), Compressed ARC Digitized Raster Graphics (CADRG), Controlled Image Base (CIB), and National Image Transfer Format (NITF) images as image themes.

To load the Military Data Reader extensions, make the Arc View Project window active and then choose Extensions from the File menu. You can load one or more of the above image formats.

If you don't see the ADRG Image Support, CADRG Image Support, CIB Image Support, or NITF Image Support extensions in the list, it's possible that you may not have installed the extension.

CAD Reader extension

This Arc View extension enables you to work with drawings produced by computer-aided design (CAD) applications in Arc View. CAD drawings can be added to views as themes, symbolized, queried, etc.

To load the CAD Reader extension, make the Arc View Project window active and then choose Extensions from the File menu.

Spatial Analyst extension

This Arcview extension provides tools to create, query, analyze and map cell-based raster data and to perform integrated vector-raster analysis using feature-based and grid-based themes.

To load the Spatial Analyst extension, make the Arcview Project window active and then choose Extensions from the File menu.

Appendix 2

Setting a theme's display properties

Drawn a **theme's display property** defines the range of scales at which the theme may be on a view. When the view's scale is outside this range the theme won't be drawn.

In this way you can control how the view appears at the various scales at which you may be working. For example, you can automatically hide a detailed theme that might otherwise clutter up your view when you are working at small scales. Or you can set up your view so those themes with progressively more detail are drawn as you zoom in on an area. When a theme's display property prevents it from being drawn, its check box in the Table of Contents still remains checked.

To set a theme's display property

1. Decide the range of scales at which the theme has to be drawn.

2. Click on the theme in the Table of Contents to make it active.

3. Click the Theme Properties button or from the Theme menu choose Properties.

4. On the Theme Properties dialog box, choose the Display category. By default, no display property is set, so the theme will be visible at any scale.

5. Enter your desired scale range by filling in one or both of the Minimum and Maximum scale boxes to define your desired range. For example to set one of the fields to be a scale of 1:24 000, enter "24000".

6. Choose the OK button. ArcView will immediately turn the theme off if the current scale of the view is outside the range you defined.

APPENDIX 3: THE HANDOUTS OF THE ACTIVITIES