

Careers in GIS

Presented by:
<XXX>



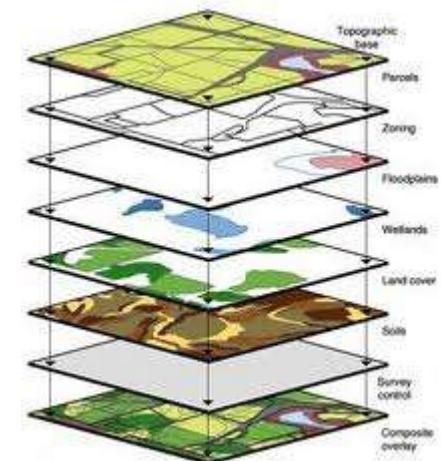
Possible School Subjects

- Geography
- Science
- Computer Science
- Mathematics
- Economics
- Biology





GIS Specific Professions



Crime Analyst

What does a crime analyst do?

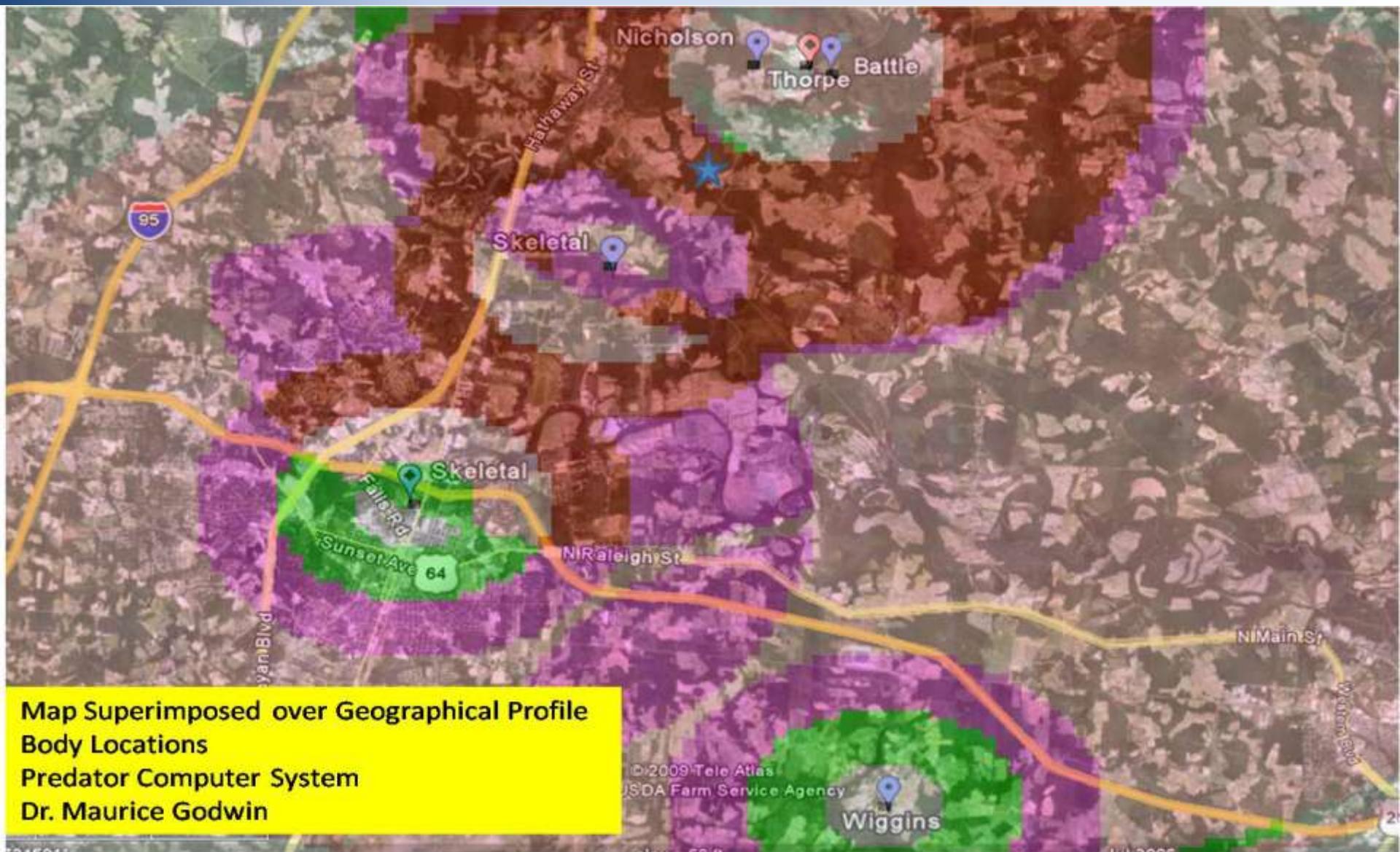
- Study crime
- Case management (Forensics)
- Analyze crime data to forecast where crime might occur
- Communicate crime patterns

Where are they employed?

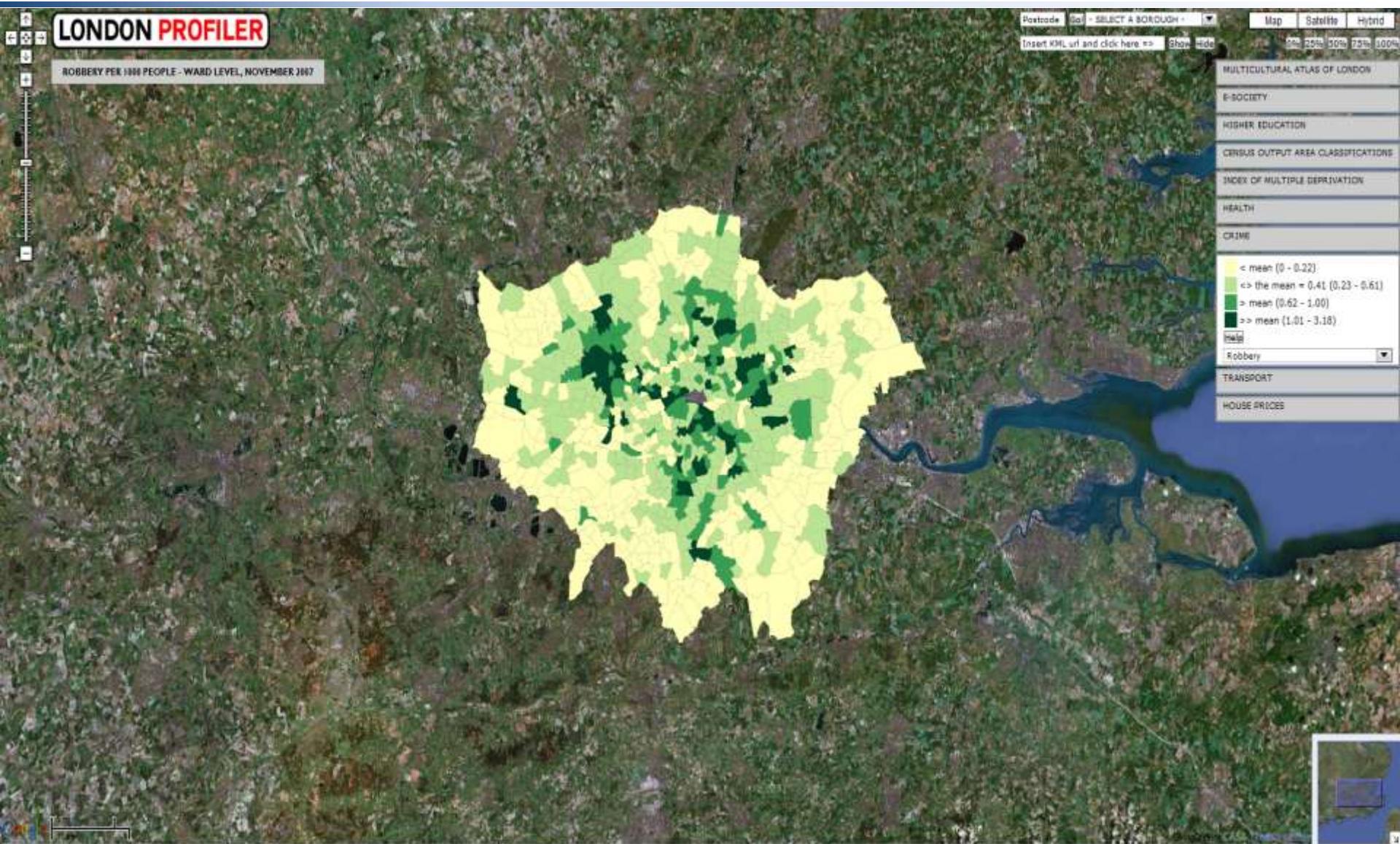
- Police Department
- Insurance Companies



Profiling Serial Killers



Crime Monitoring



Market Researcher

What does a market research analyst do?

- Analyze statistical data on sales to predict future sales
- Analyze prices, sales, marketing and distribution
- Recommend new locations for stores

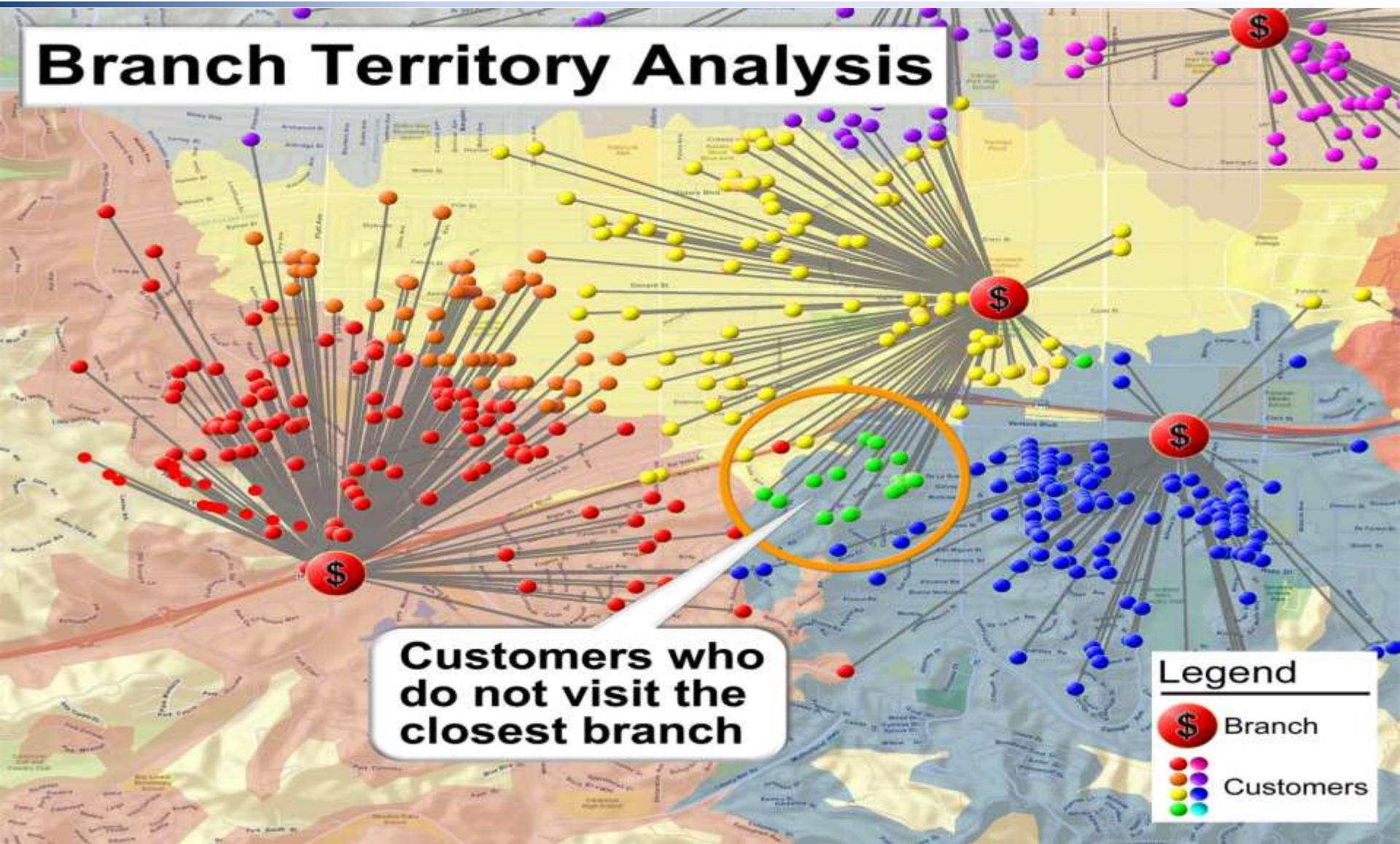
Where are they employed?

- Banks
- Fuel providers
- Retail Industries such as Massmart
- Service providers such as MTN

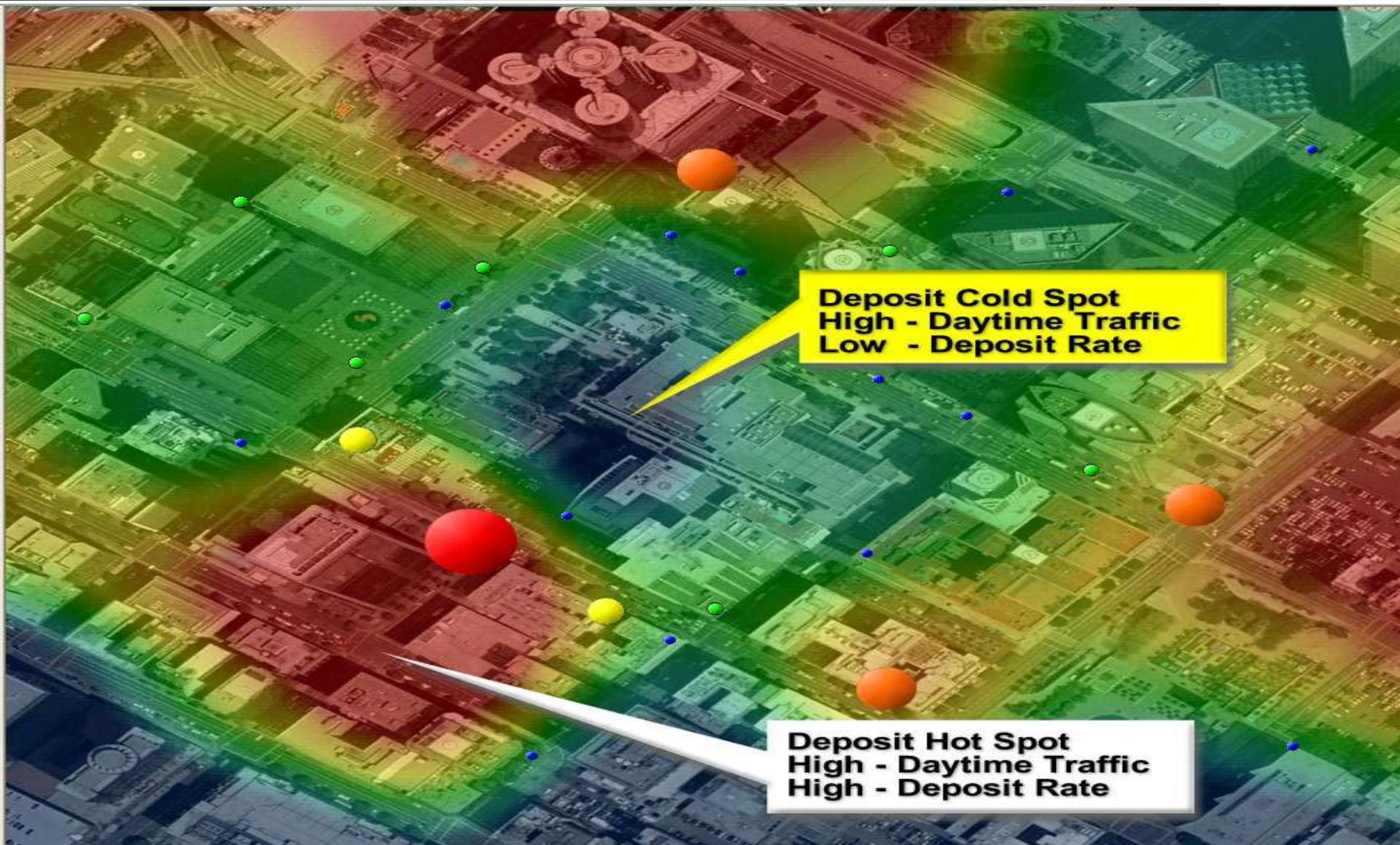


Branch Analysis

Branch Territory Analysis



ATM Analysis



GIS Military Specialist

How is GIS used in the Military?

- Map troop movements
- Plan military interventions
- Map uprisings that may lead to war
- Map aid stations
- Plan search and rescue missions

Where are they employed?

- SANDF
- Military affiliates
- Intelligence Agencies



Israeli Military Map

Includes material © CNES 2004,
Distribution Spot Image S.A., France, all rights reserved.
SPOT 5, 2004 merged Satellite Image, 2.5 meter natural color, using two SPOT 5 images :
The First: Color 10 meter
The Second: Panchromatic 2.5 meter



Applied Research Institute - Jerusalem
ARII
GIS & RS Unit
www.arij.org

Military Order # 95/20/T

Israeli Checkpoints

- Israeli Outpost
- Checkpoint
- ▲ Earthmound
- Observation Tower
- Agricultural Gate
- Road Gate
- RoadBlock
- Tunnel

Qalqilya Governorate Boundary

Road System

- Road Network
- Israeli Bypass Road
- Segregation Wall
- Israeli Settlement
- Israeli Military Base

0 2.5 5 Kilometers



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Simplifying Decisions
Making a Difference

GIS Analyst: Medicine

How is GIS used in the medical industry?

- Mapping outbreaks
- Predicting disease using trends
- Mapping environmental stresses that lead to disease

Where are they employed?

- Health Agencies
- NGOs



Mapping Malaria

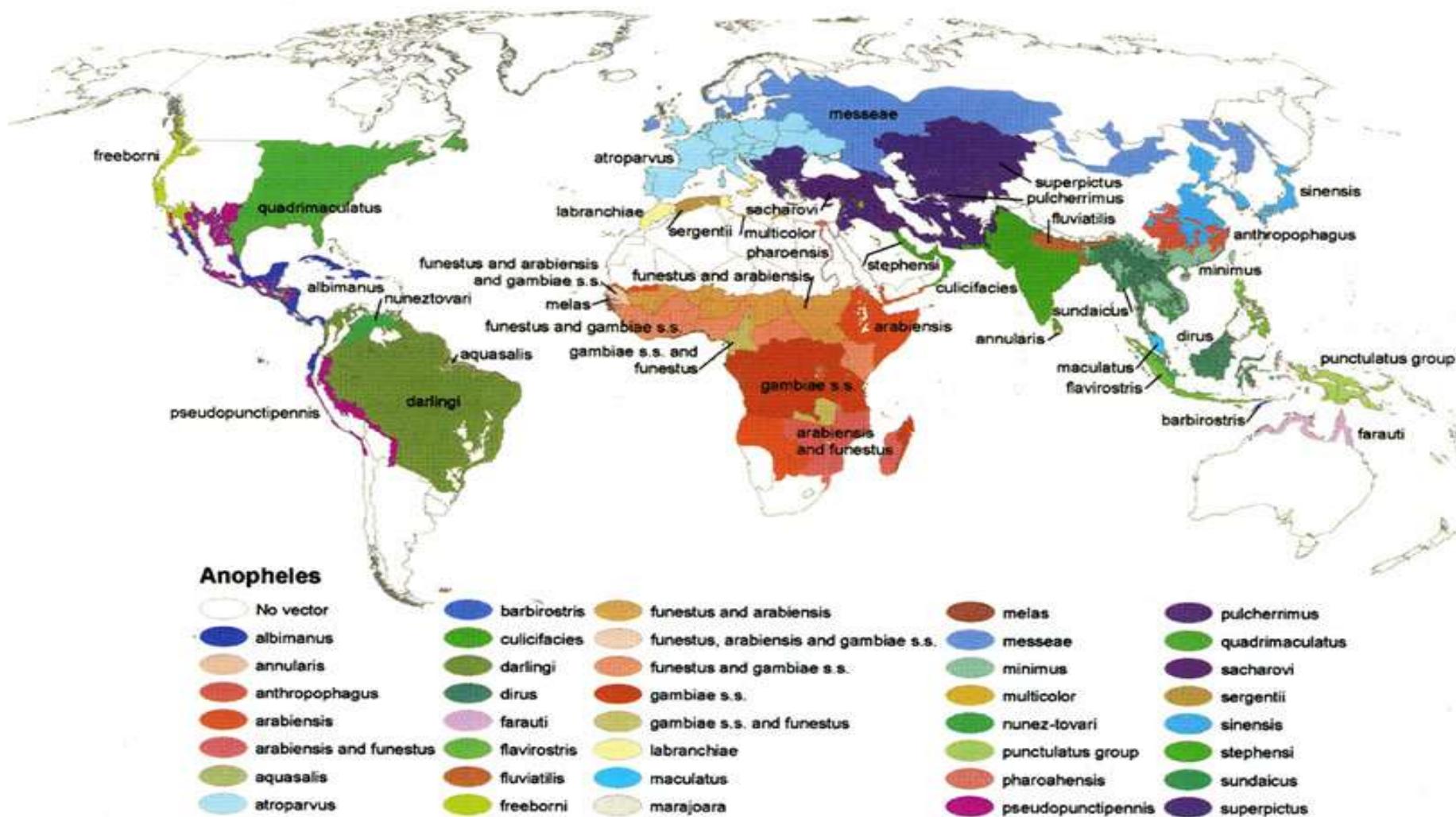


FIGURE 1. Global distribution (Robinson projection) of dominant or potentially important malaria vectors.

VGI Health Map



Username or Email: Password: Login | Register | Forgot Password?



280 Alerts Now Showing							
Dates: 27 Mar - 31 Mar Diseases: all Places: all Sources: all Categories: all							
Source	Date	Summary	Disease	Location	Cases	Deaths	Significance
	30 Mar	Xinjiang O-pig foot and mouth disease occurred	Foot and Mouth	Xinjiang Autonomous Region			★★★ 1 vote
	30 Mar	Fifth Agricultural Division of Xinjiang Corps regiment eighty-one ...	Foot and Mouth	Xinjiang Autonomous Region			★★★★ 1 vote
	30 Mar	Cases of conjunctivitis in the city continue to increase TL - Journal ...	Conjunctivitis	Estado de Mato Grosso do Sul, Mato Grosso do Sul, Brazil			★★★★★ 1 vote
	30 Mar	Estrela de Alagoas already faces dengue epidemic - Alagoas 24 Horas	Dengue	Estado de Alagoas, Alagoas, Brazil			★★★ 1 vote

Transportation Planner

What does a transportation planner do?

- Plan new transport routes
- Monitor traffic congestion
- Logistical planning for public transport systems

Where are they employed?

- Transport Agencies (SANRAL)
- Road Agencies

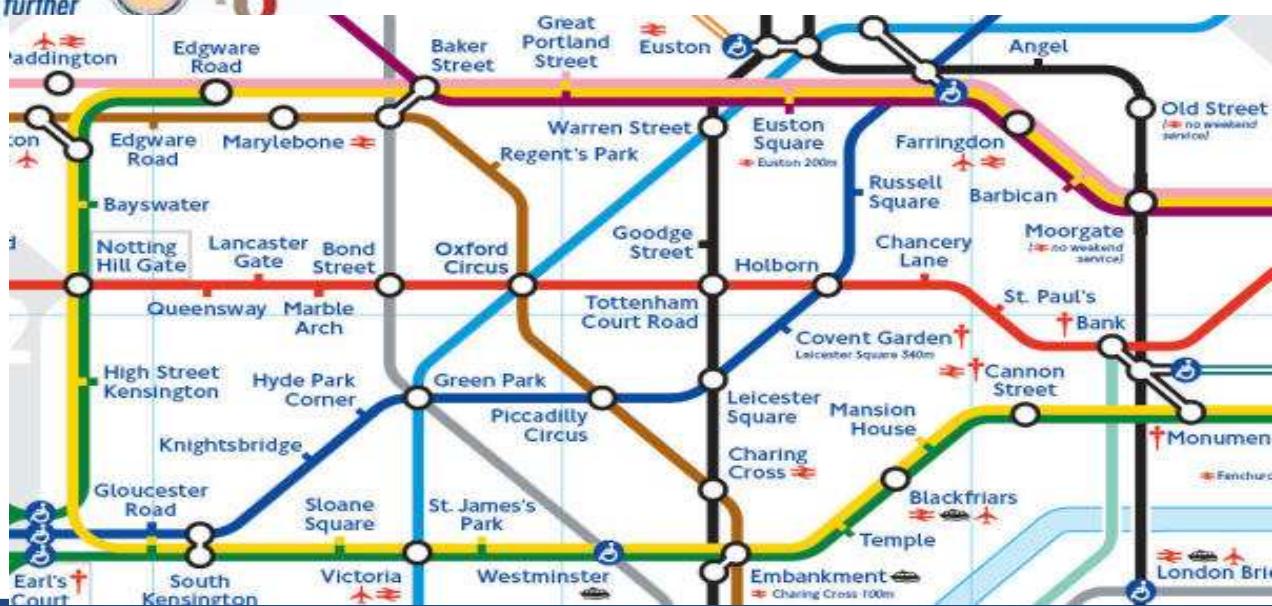


Rail Planning



Gautrain Planning

London Underground



Town Planner

What do Town Planners do?

- Prepare plans for development
 - Zoning
- Planners consider social and economic factors
- Analyze trends in population
- Property valuation
- Spatial Development Frameworks

Where are they employed?

- Municipalities
- Town Planning companies
- Private Development Firms



New Development



Tracking Analyst

What do Tracking Analysts do?

- GPS tracking of:
 - Vehicle fleets
 - Personal vehicles
 - Aircraft
 - Maritime traffic
 - Post
 - Cellphones



Where are they employed?

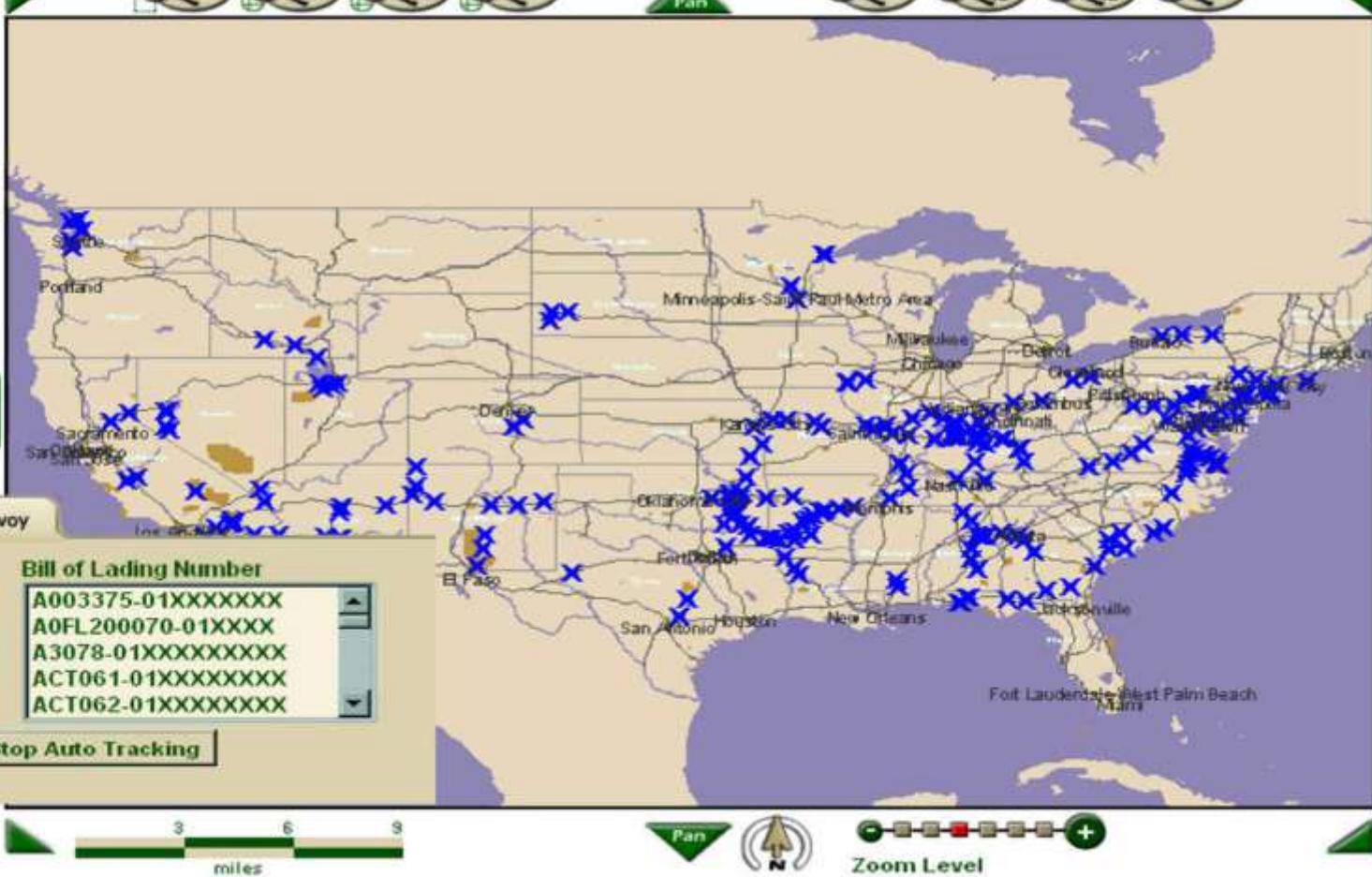
- Logistic Companies
- Car tracking companies (such as Tracker)

Vehicle Tracking

Current Location of All DTTS Vehicles

Map Legend

- Cities
- Installations
- Selected Route
- States
- Water
- City Names
- Convoy Track
- Major City Names



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Researcher

What do Researchers do?

- Development of new applications of GIS
- Investigate new GIS technologies
- Develop new Remote Sensing Techniques

Where are they employed?

- CSIR
- Private Research Companies
- SANSA



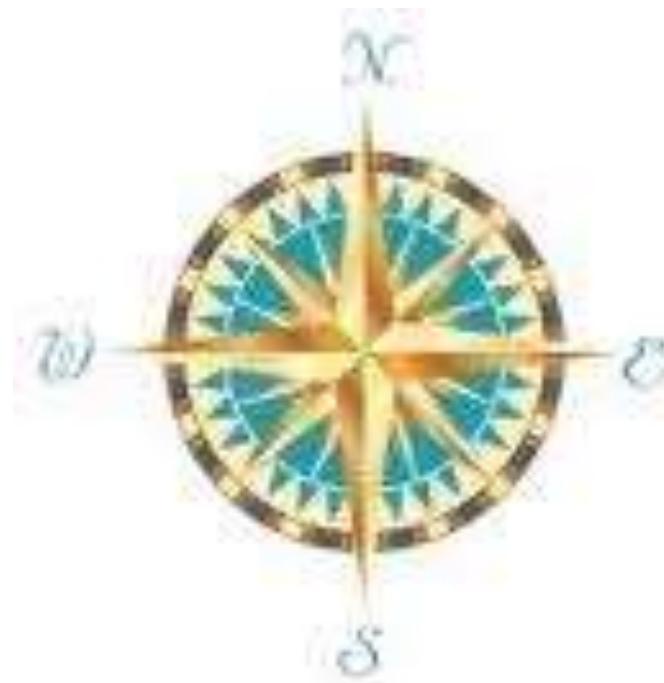
Cartographer

What does a cartographer do?

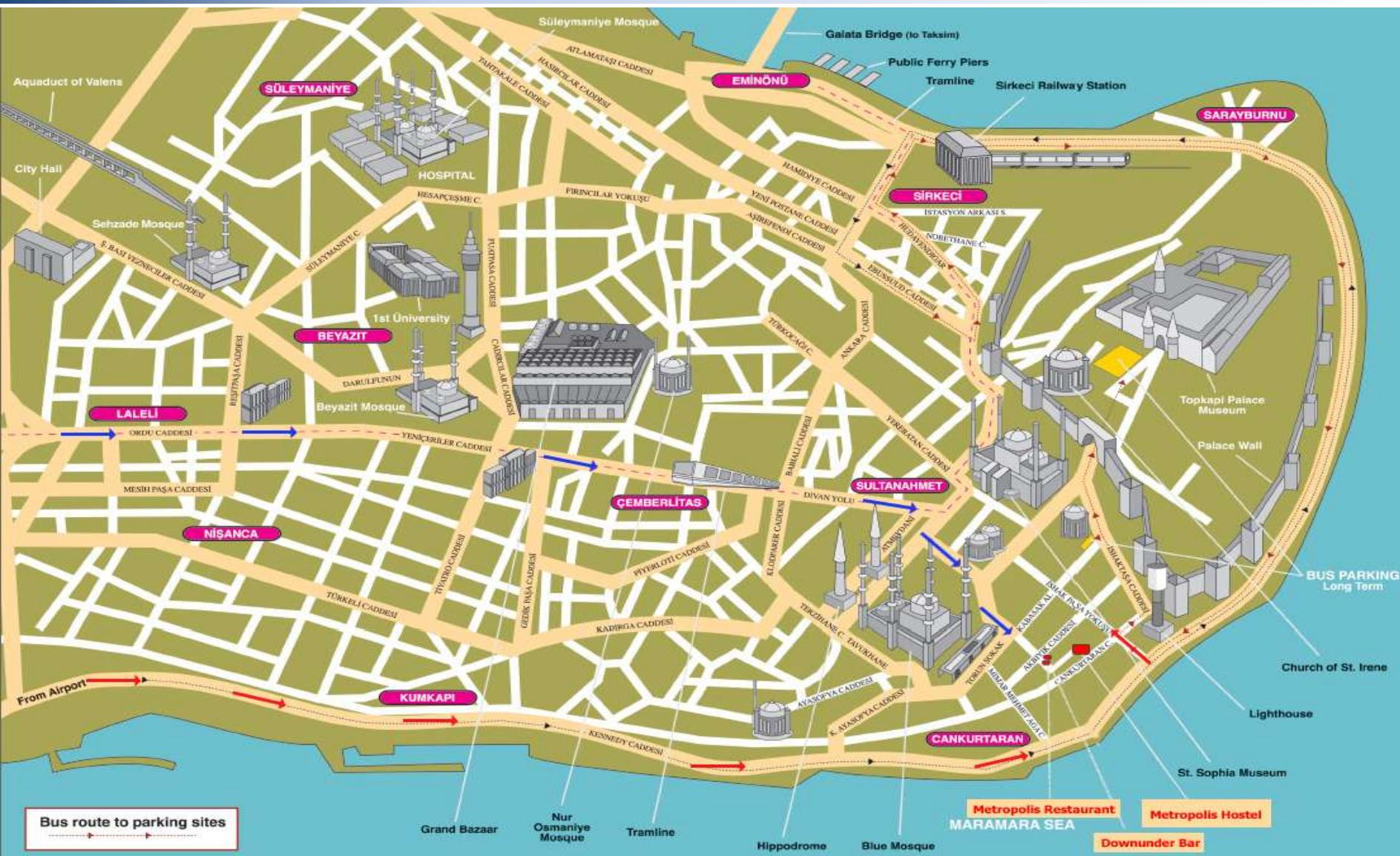
- Design high quality map products
- Define production specifications e.g. projection, scale
- Revise existing maps
- Collect, analyze and interpret geographic information

Where are they employed?

- Municipalities
- Private Companies
- Chief Directorate Surveys and Mapping
- Parastatals – CSIR, ARC, Council for Geoscience



Istanbul Tourist Map



Map of South Africa

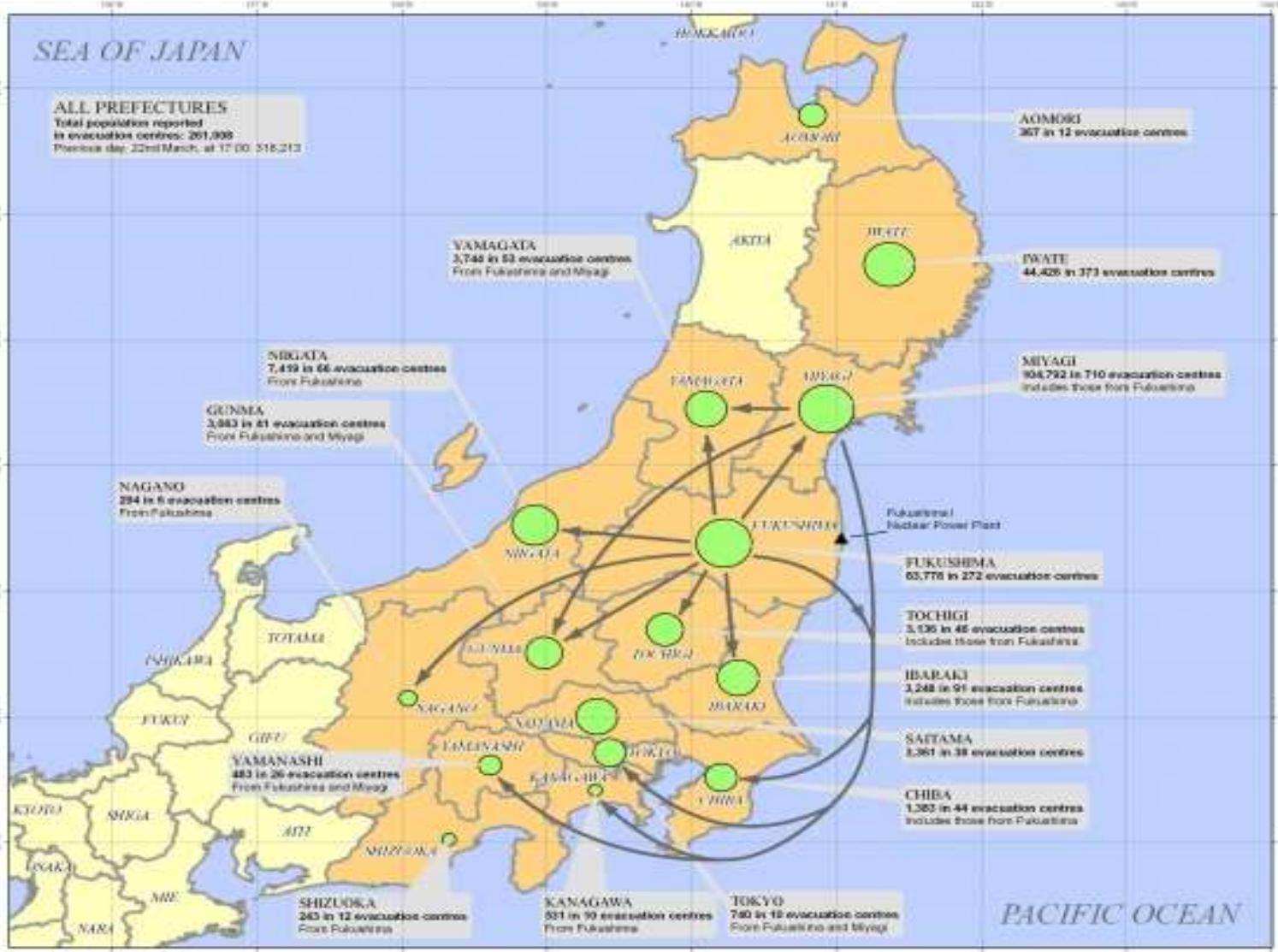
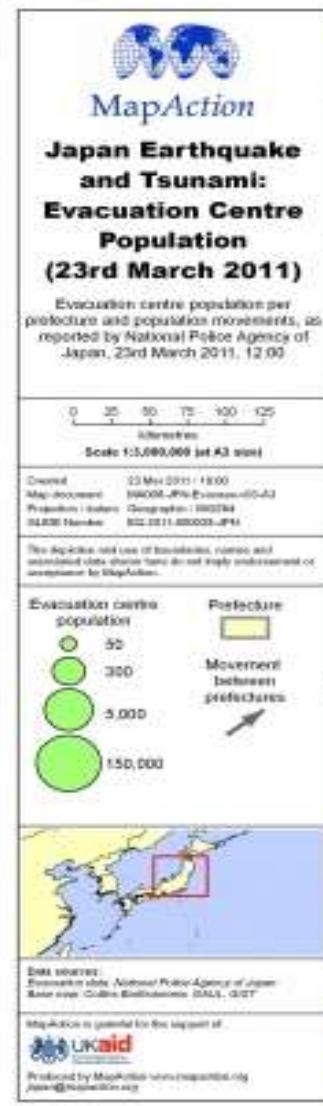


Map No. 3768 Rev. 5 UNITED NATIONS
January 2004

<http://www.ohchr.org/english/countries/maps/southafr.pdf>

Department of Peacekeeping Operations
Cartographic Section

MapAction Earthquake Map



Disaster Manager

What does a disaster planner do?

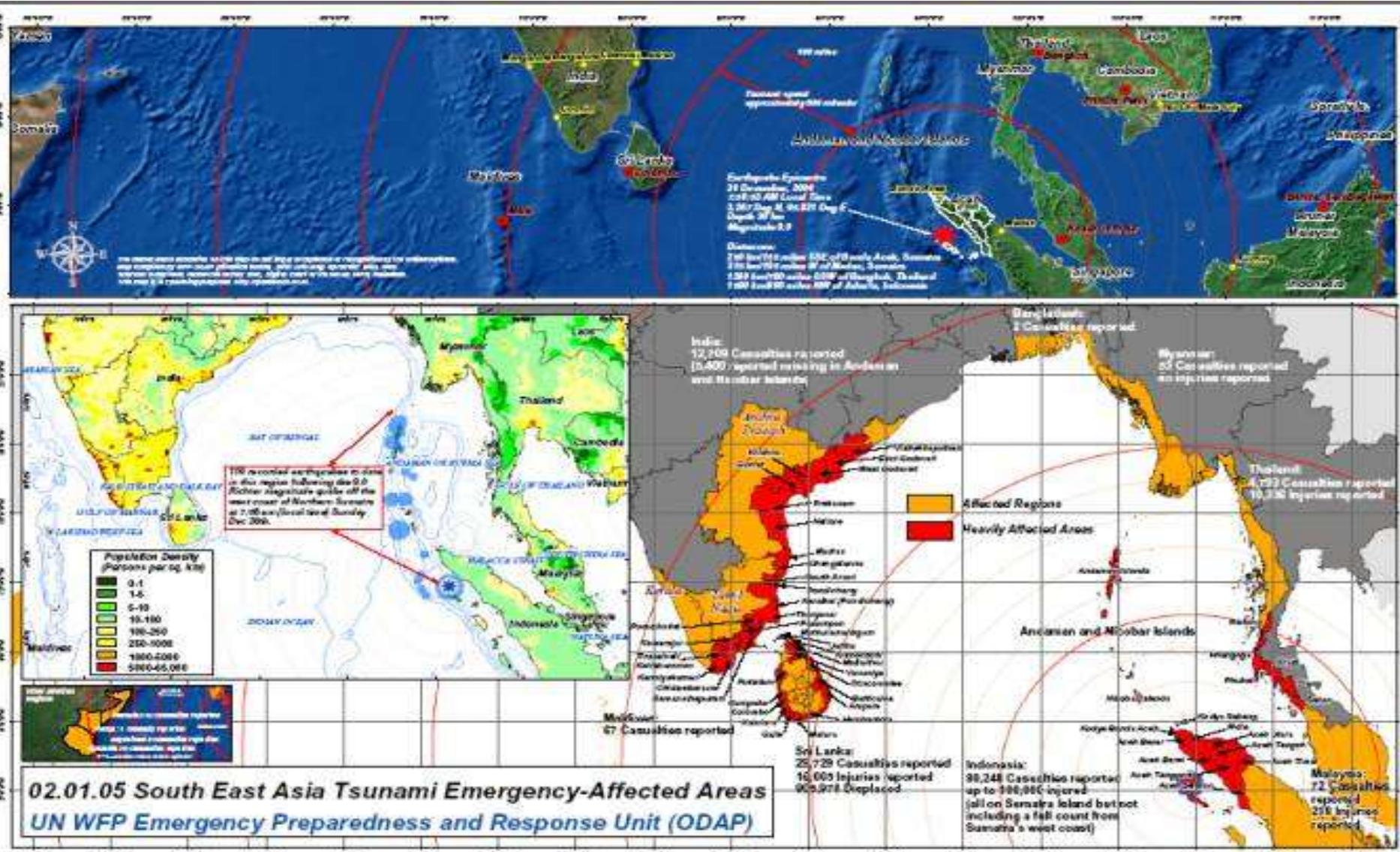
- assists people in case of natural phenomena (fires, flooding, hail, lightning)
- Predict disasters to minimize damaged

Where are they employed?

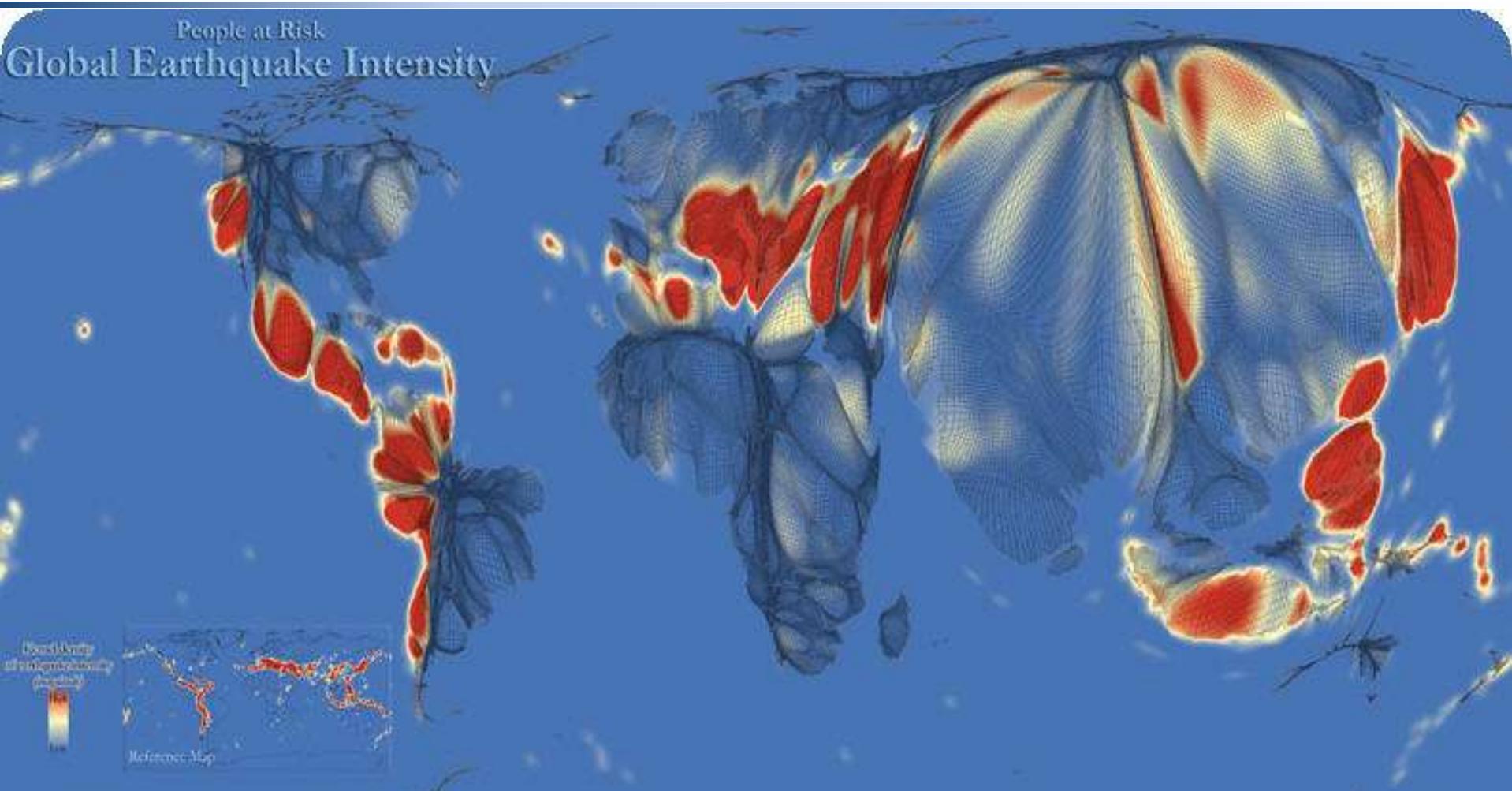
- Disaster Management Companies
- Municipalities
- Parastatal organizations such as CSIR, ESKOM, ARC



Japanese Tsunami



Global Earthquake Intensity

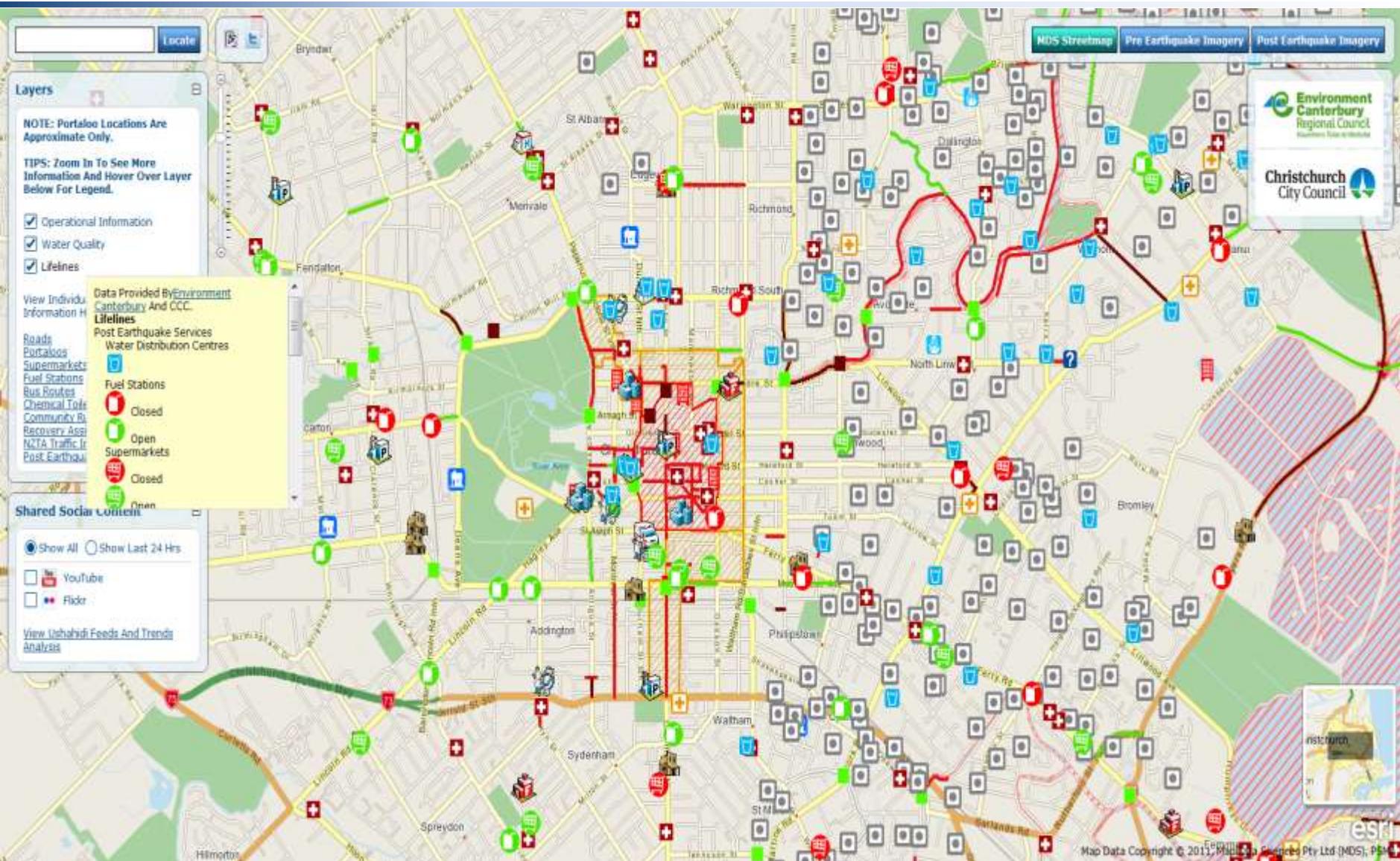


The map shows the density and magnitude of seismic activity since 2150 BC to present time projected on a gridded equal population cartogram

Data from: NO-AL Global Significant Earthquake Database (<http://pubs.usgs.gov/facets/earthquake/>) with additional information from USGS / USGS 2010

Map created by Benjamin D. Hennig (www.viewoftheworld.net), Salf Research Group, University of Sheffield

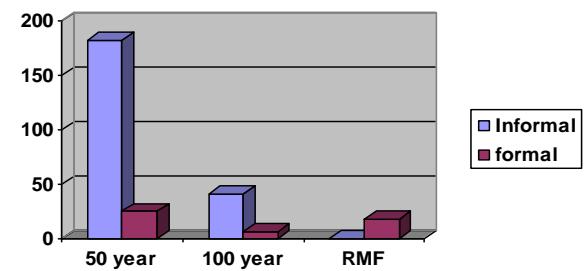
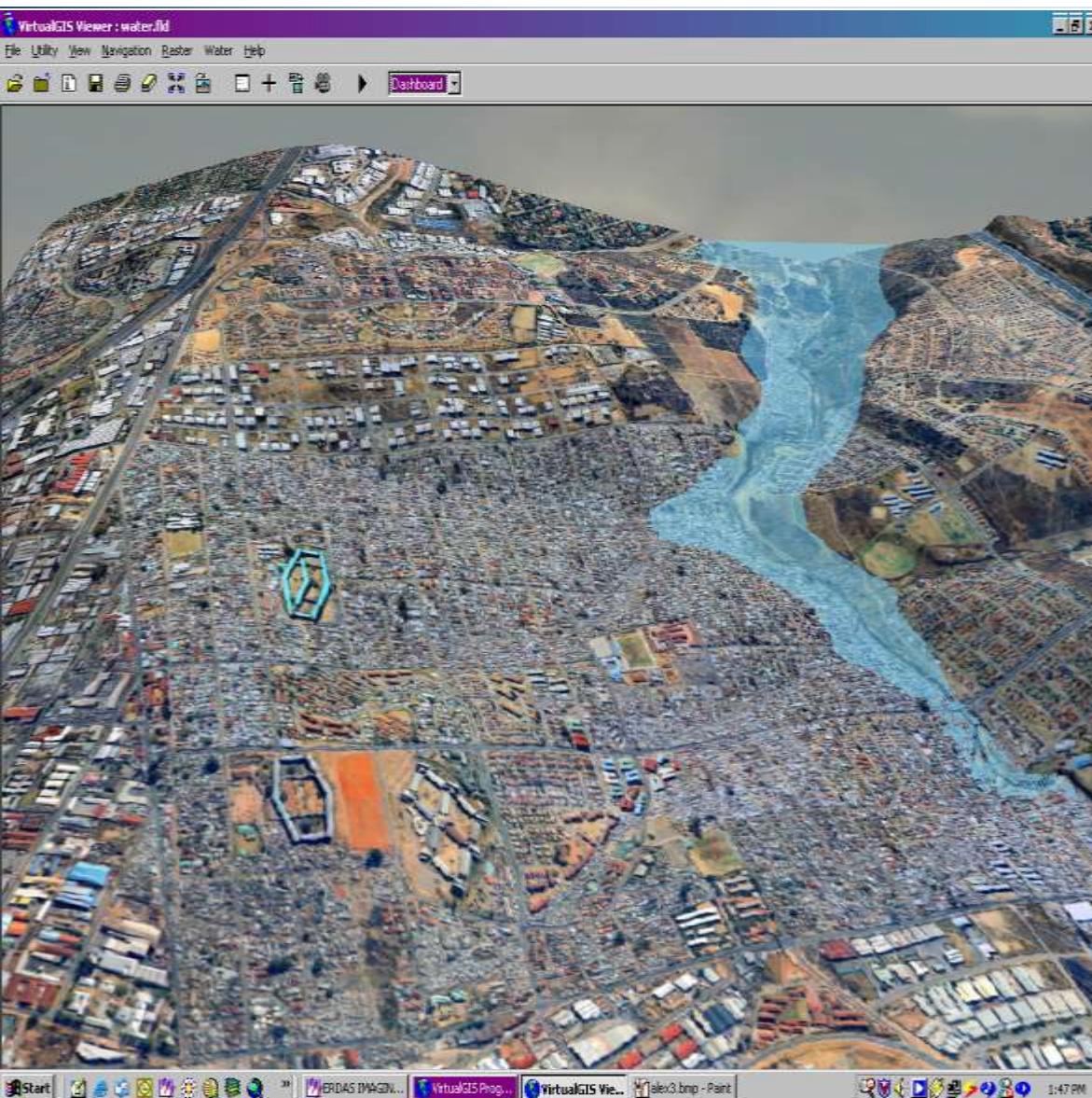
Christchurch Earthquake



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Alexandra Flooding



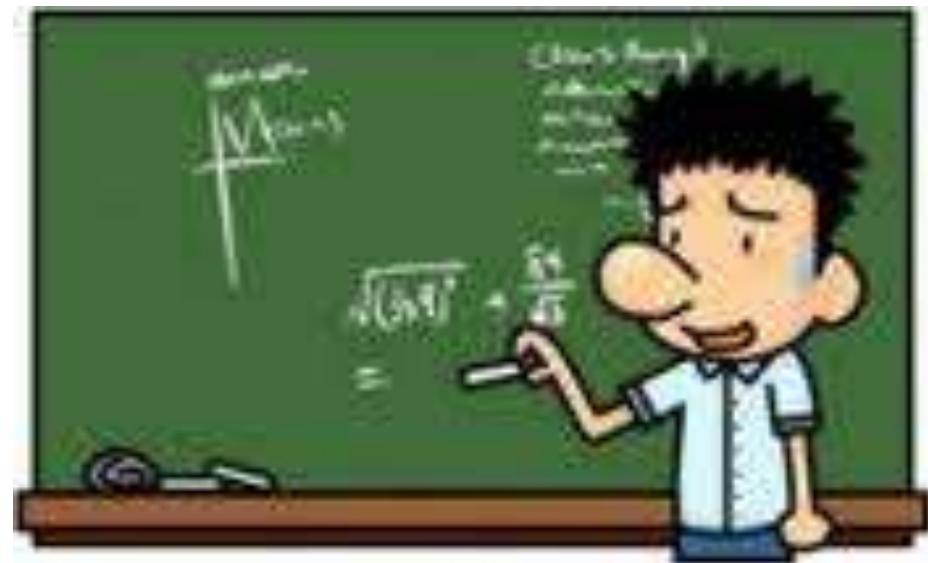
Statistician

What does a statistician do?

- Compile statistical data
- Interpret numerical results into meaningful terms
- Refine methods of analyzing data

Where are they employed?

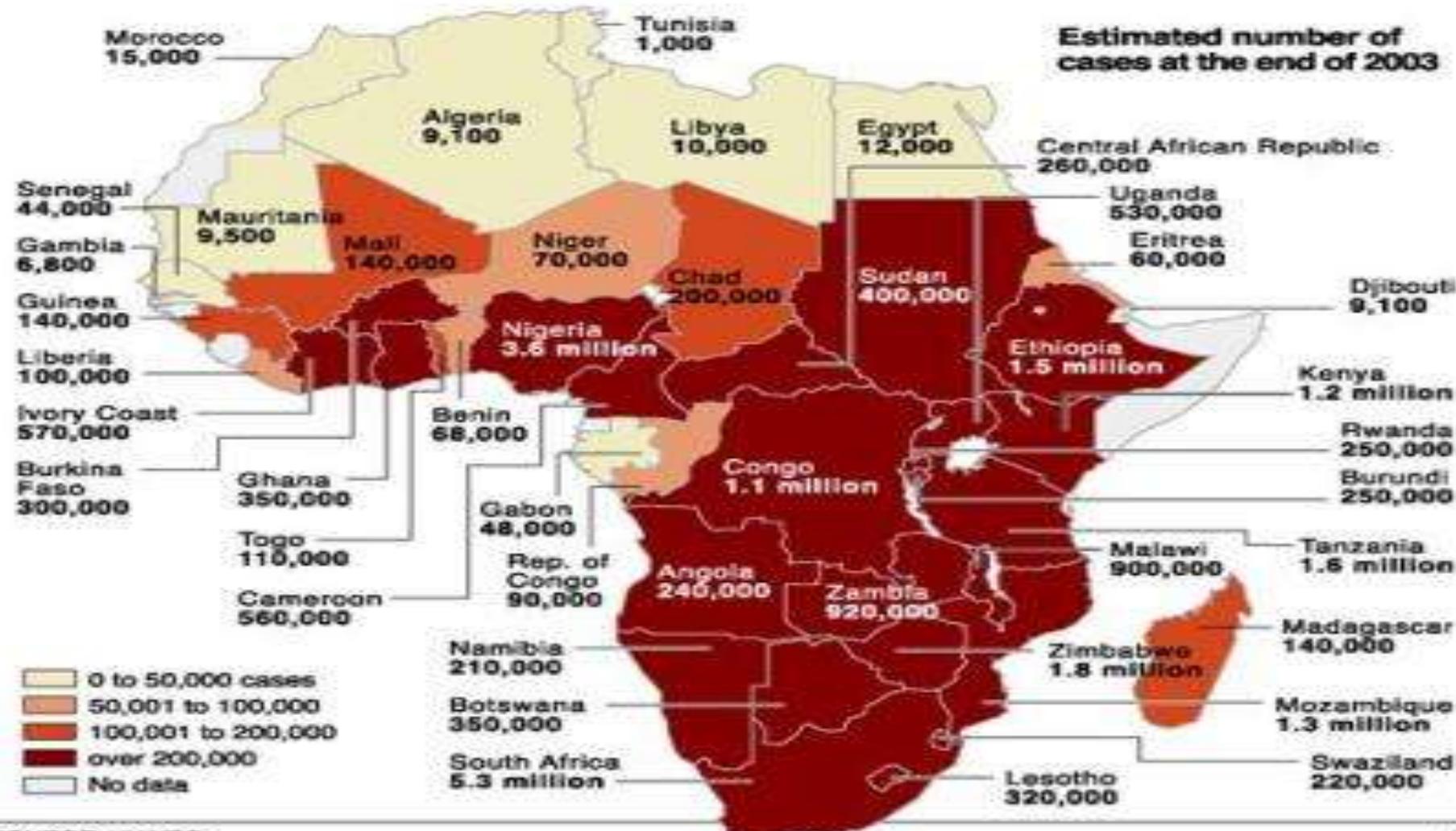
- StatsSA
- Municipalities
- HSRC



AIDS Distribution

AIDS in Africa

Of the estimated 39.4 million people living with HIV worldwide, more than two-thirds of them are in Africa.



SOURCE: UNAIDS



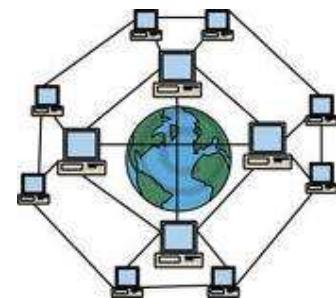
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AP



GIS Computer Science Professions



Requirements

The following professions require:

- Programming experience in multiple languages
- Computer Science/IT qualification
- GIS knowledge is preferable

GIS Database Administrator

What does a GIS DBA do?

- Maintain spatial databases
- Provide new database schemas
- Maintain Users
- Database programming

Where are they employed?

- Private GIS companies
- Eskom
- Municipalities



GIS Software Developer

What does a GIS Developer/Engineer do?

- Design and build new applications
 - Complete desktop programs
 - Application enhancements
- Technical Support for users

Where are they employed?

- GIS Software Providers (Esri)
- Private companies



Web Mapping Developer

What does a Web Mapping Developer do?

- Create online web mapping interfaces
- Create customizable web tools
- Maintain mapping websites

Where are they employed?

- Private GIS companies
- Municipalities
- Google/Bing



Ekurhuleni Flex Viewer





The Sciences



Conservationist

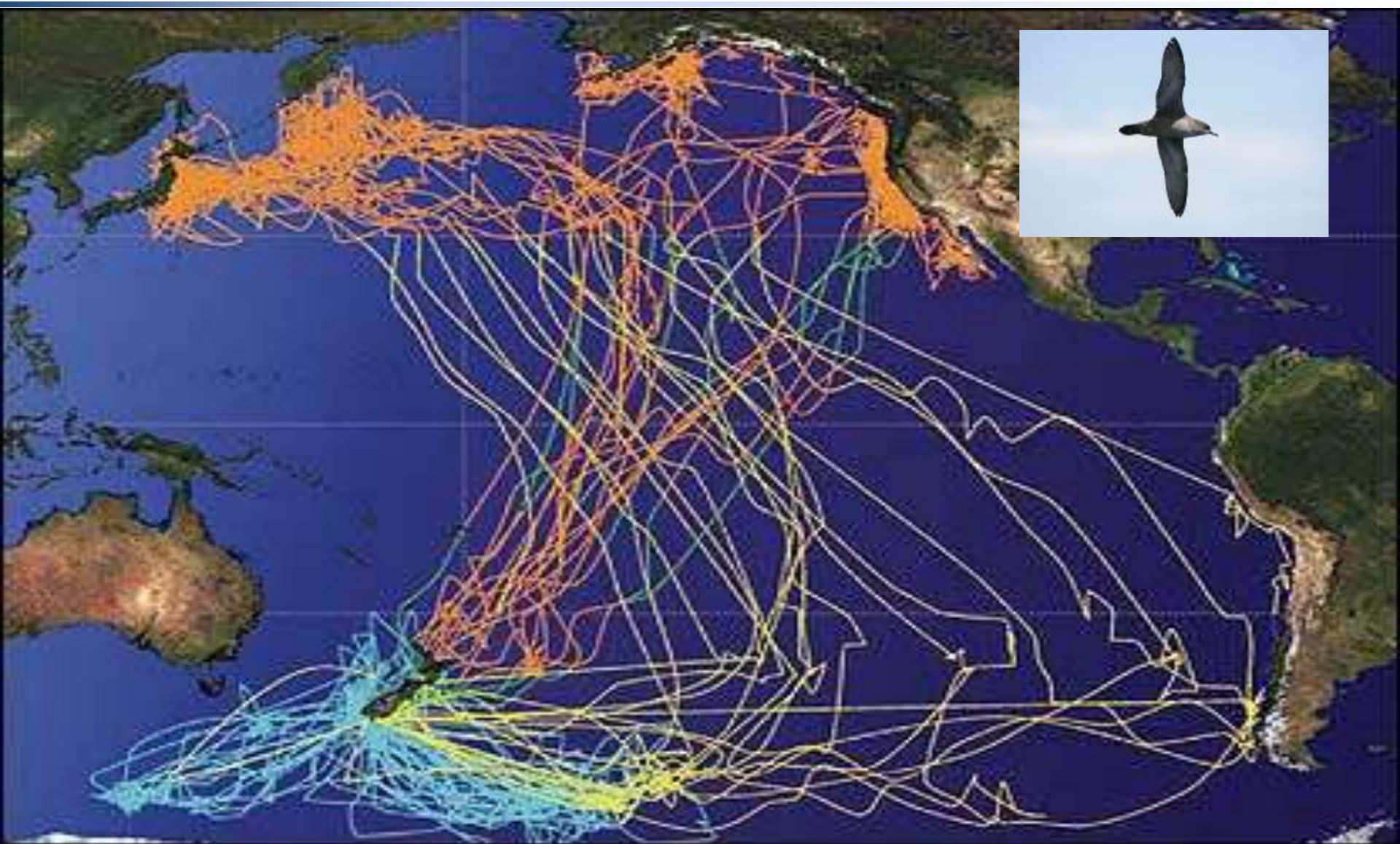
- What does a conservationist do?
- Collect information on wildlife
 - endangered species
- Supervise seasonal activities
 - removal of alien plants
 - Block burning
- Monitor animal movement
 - New animals introduced to a park, what are there movements?
- Where are they employed?
- Private game reserves
- National Parks
- Dept Nature Conservation



Animal Tracking



Migrations



Forester

What does a forester do?

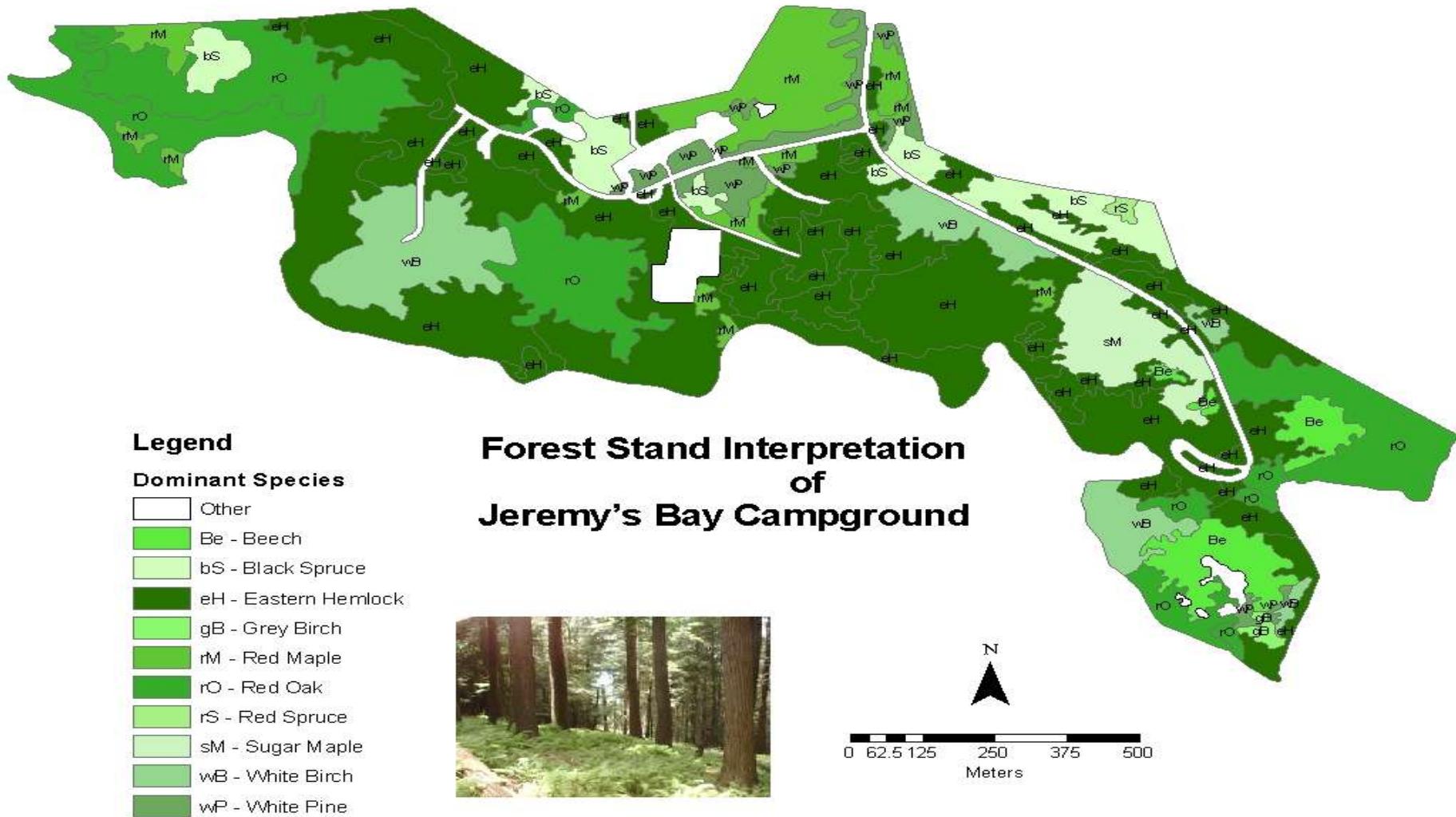
- Forests provide a number of products and services
- Forests need to be managed for
 - Timber / paper
 - poles
 - matches
 - outdoor recreation
 - wildlife
 - Water



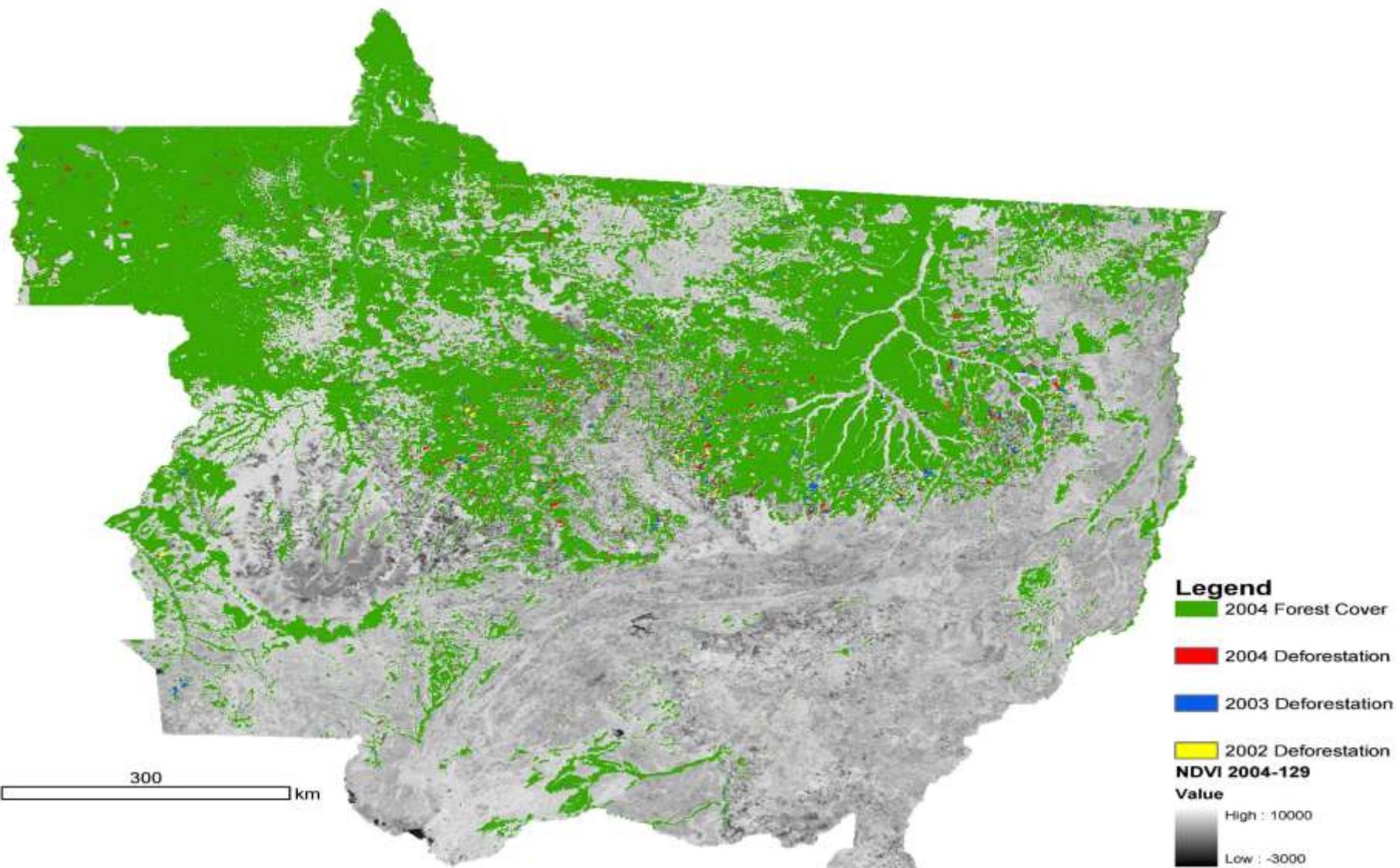
Where are they employed?

- SAPPI, Mondi and many private growers
- Department of Water Affairs and Forestry (DWAF)

Species Mapping



Deforestation



Archaeologist

What does an archaeologist do?

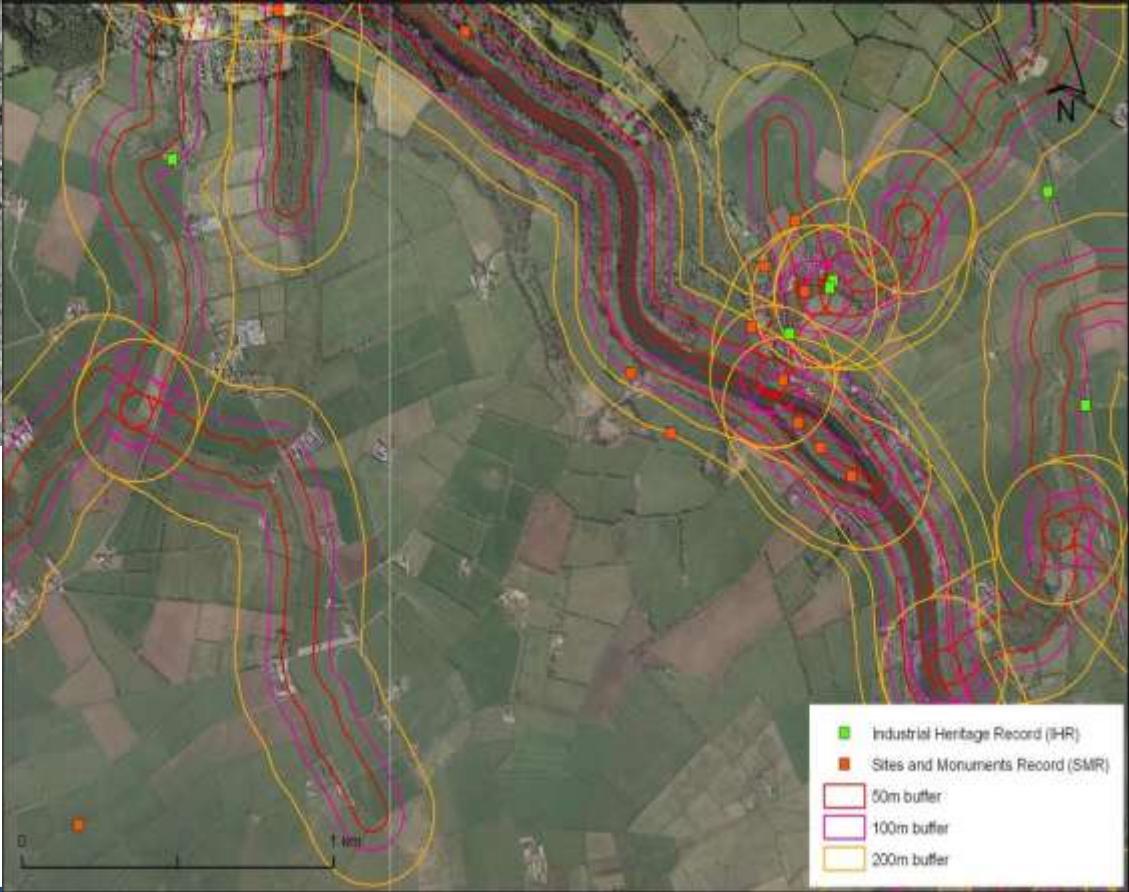
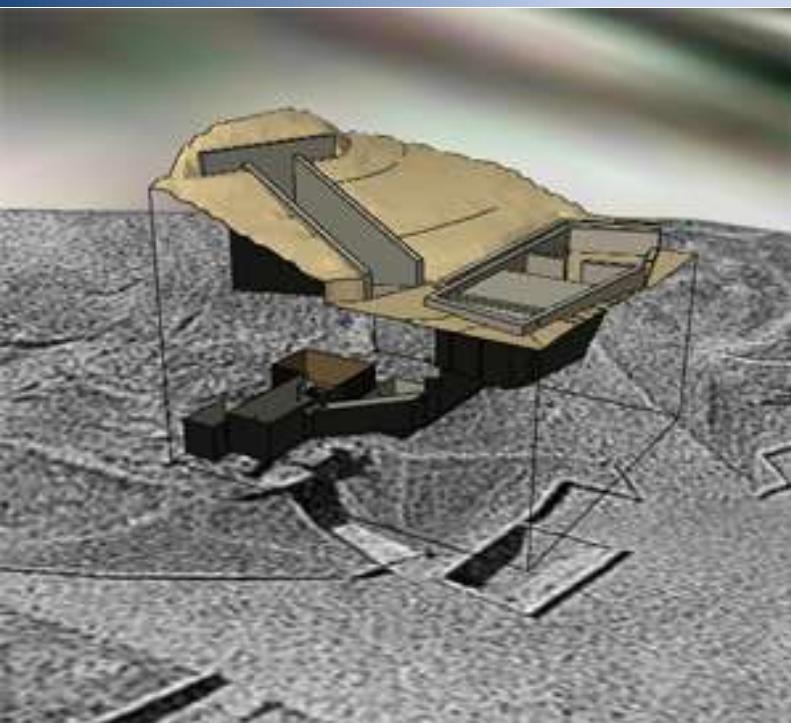
- Study past cultures
- Investigate sites and artifacts
- Fieldwork and strategic planning for dig sites
- Protection of historical sites

Where are they employed?

- Museums
- Government Agencies
- Universities



Artifact Mapping



Palaeontologist

What does a palaeontologist do?

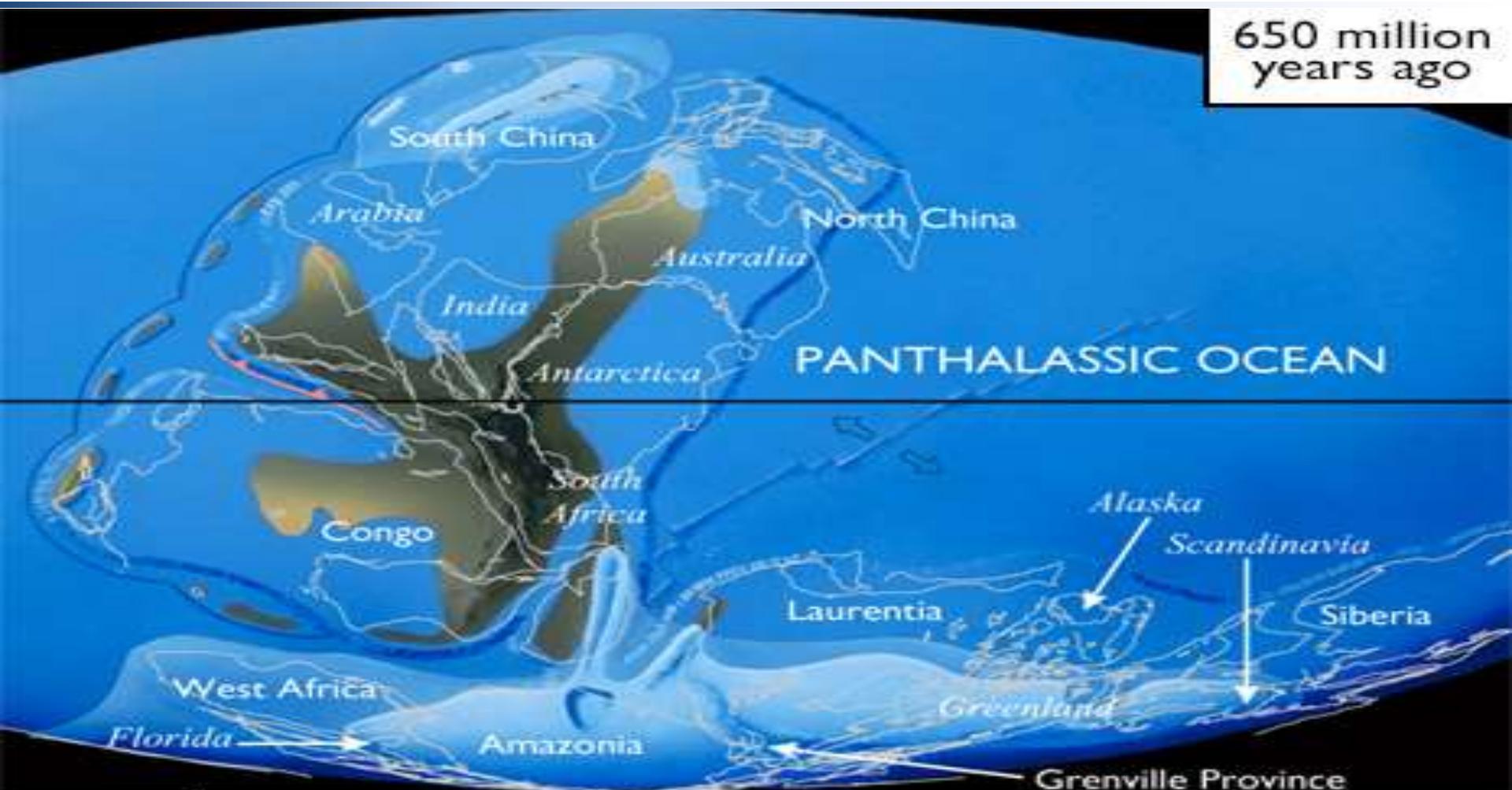
- Study prehistoric fossilised life forms
- Study geological timelines to determine the age of life forms

Where are they employed?

- Museums
- Geological Institutes
- Universities

Geological Map

650 million years ago



MAP KEY



Ancient
landmass



Modern
landmass



Ice caps
& glaciers



Subduction zone
(▼ direction of subduction)



Sea floor
spreading ridge



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Earth Scientist

What does an Earth Scientist do?

- Studies the physical characteristics of the Earth
- Natural Resource Prospecting

Types of Earth Scientists

- Glacial studies
- Mineralogist
- Volcanologist
- Geophysicist
- Oceanography
- Seismologist



Volcanologist

VIRUNGA NATIONAL PARK

Visoke - Volcano 3D Terrain Model

Congo (DRC) and Rwanda



www.satimagingcorp.com

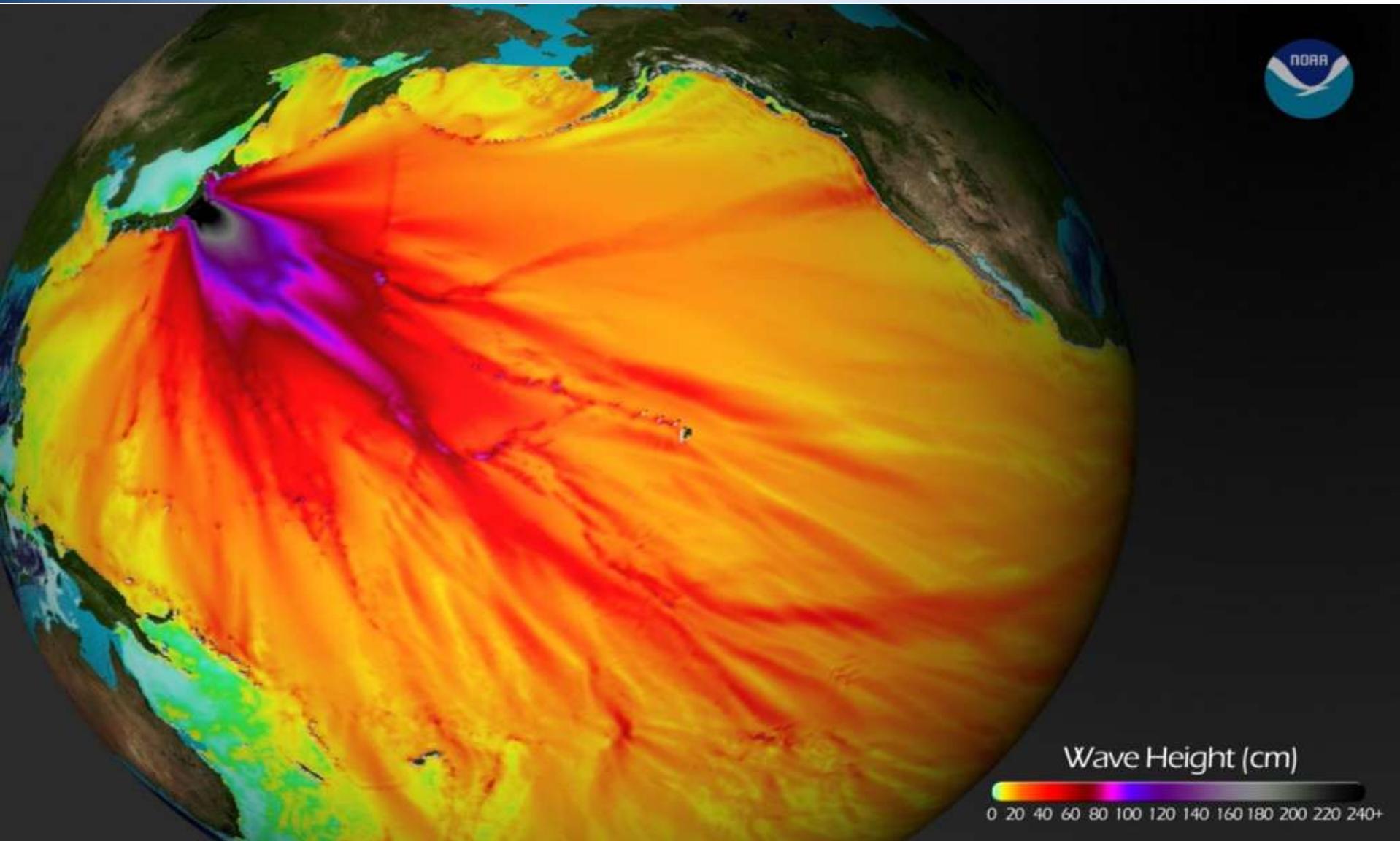
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Seismologist



Geologist

What do geologists do?

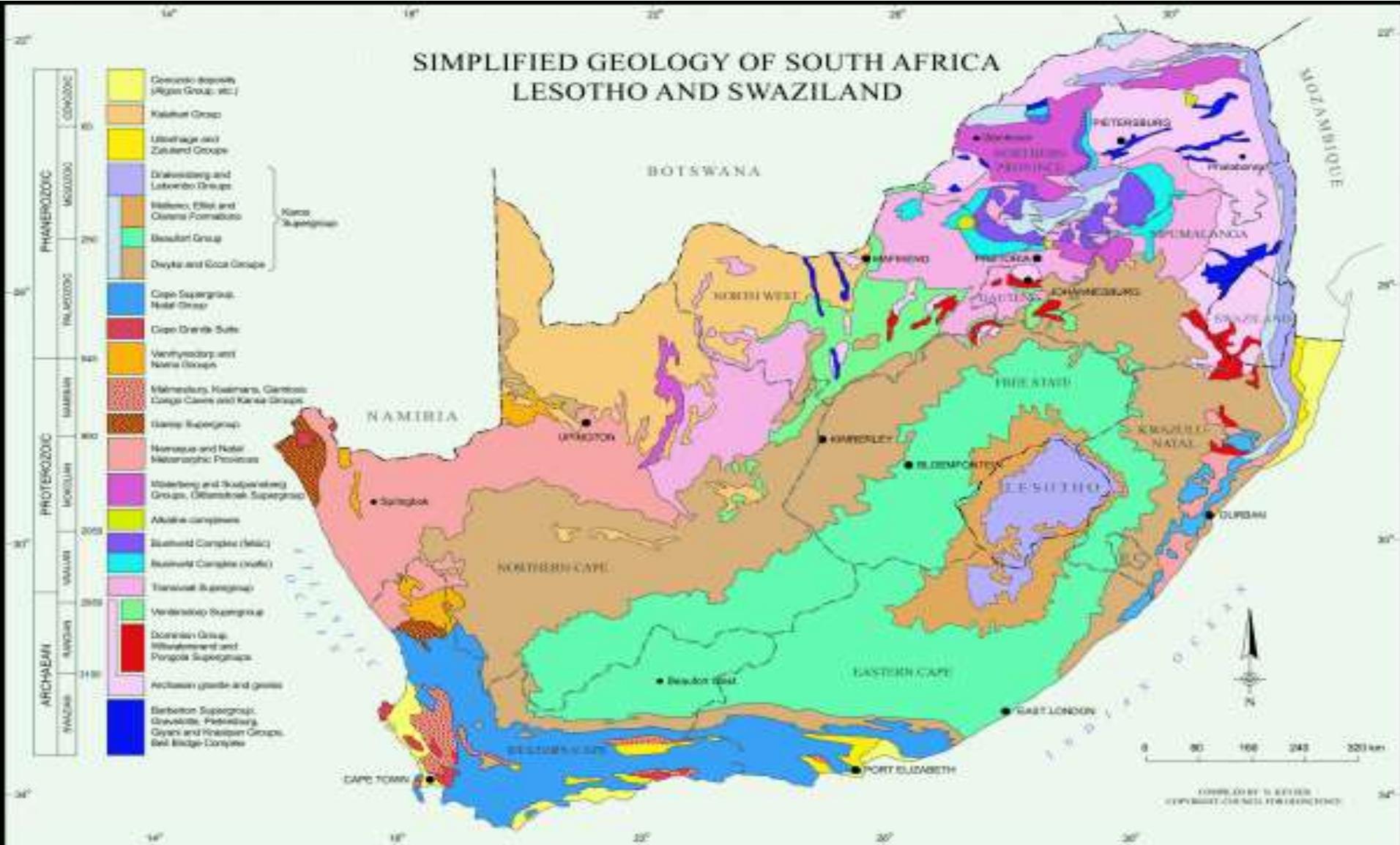
- Study composition & structure of earth's crust
- Examine rocks, minerals & fossils
- Use chemistry, physics, biology & mathematics to explain phenomena
- Locate mineral and petroleum deposits

Where are they employed?

- Council for Geoscience
- Mining Companies (Anglo American)



South African Geology



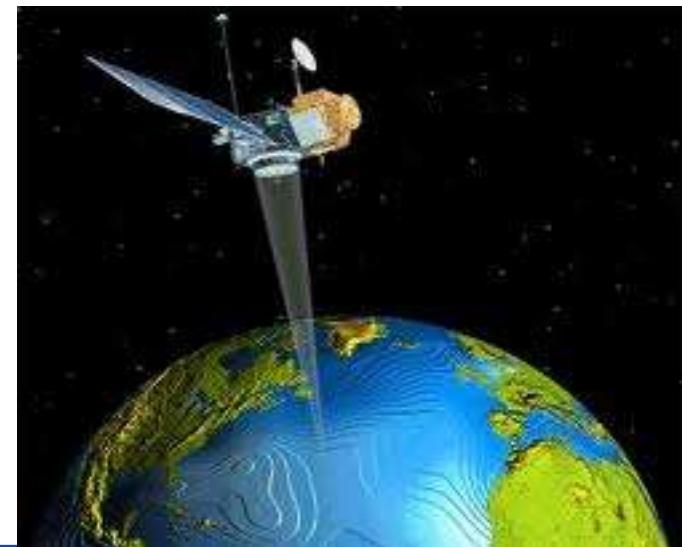
Photogrammetrist

What does a photogrammetrist do?

- Examine photographs to obtain information about geographic features
- Plan and supervise Aerial and Ground Surveys
- Map GPS and Satellite Information
- Create 3D views of geographic layouts

Where are photogrammetrists employed?

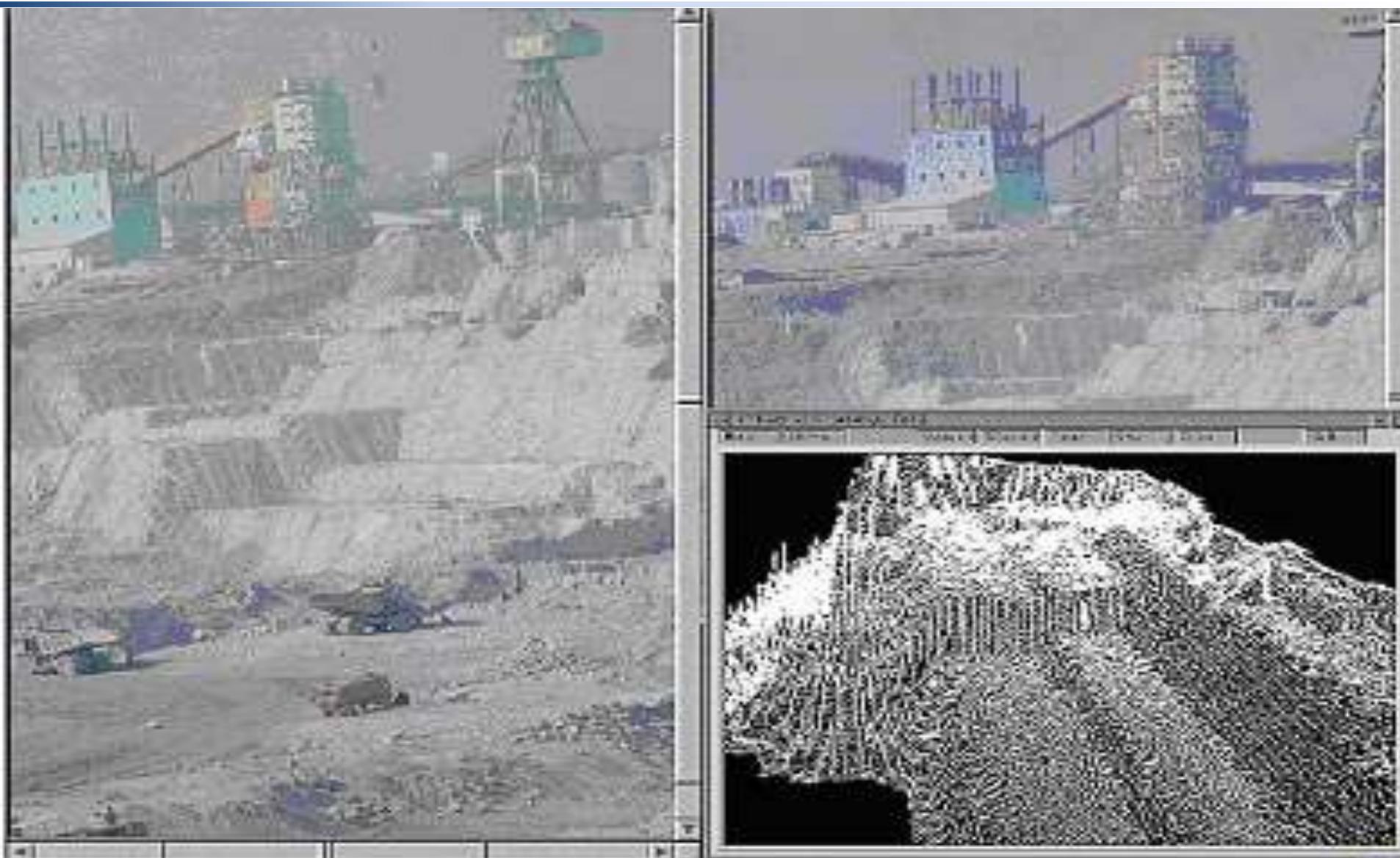
- Surveying Industries
- Mining Companies



3D view of a city



Close Range Photogrammetry



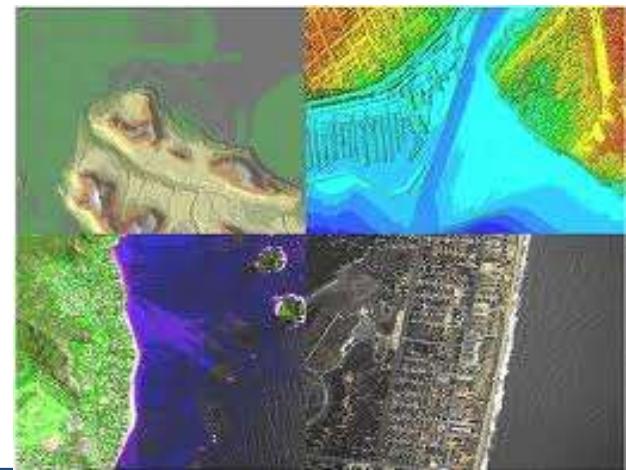
Remote Sensing Scientist

What does a remote sensing scientist do?

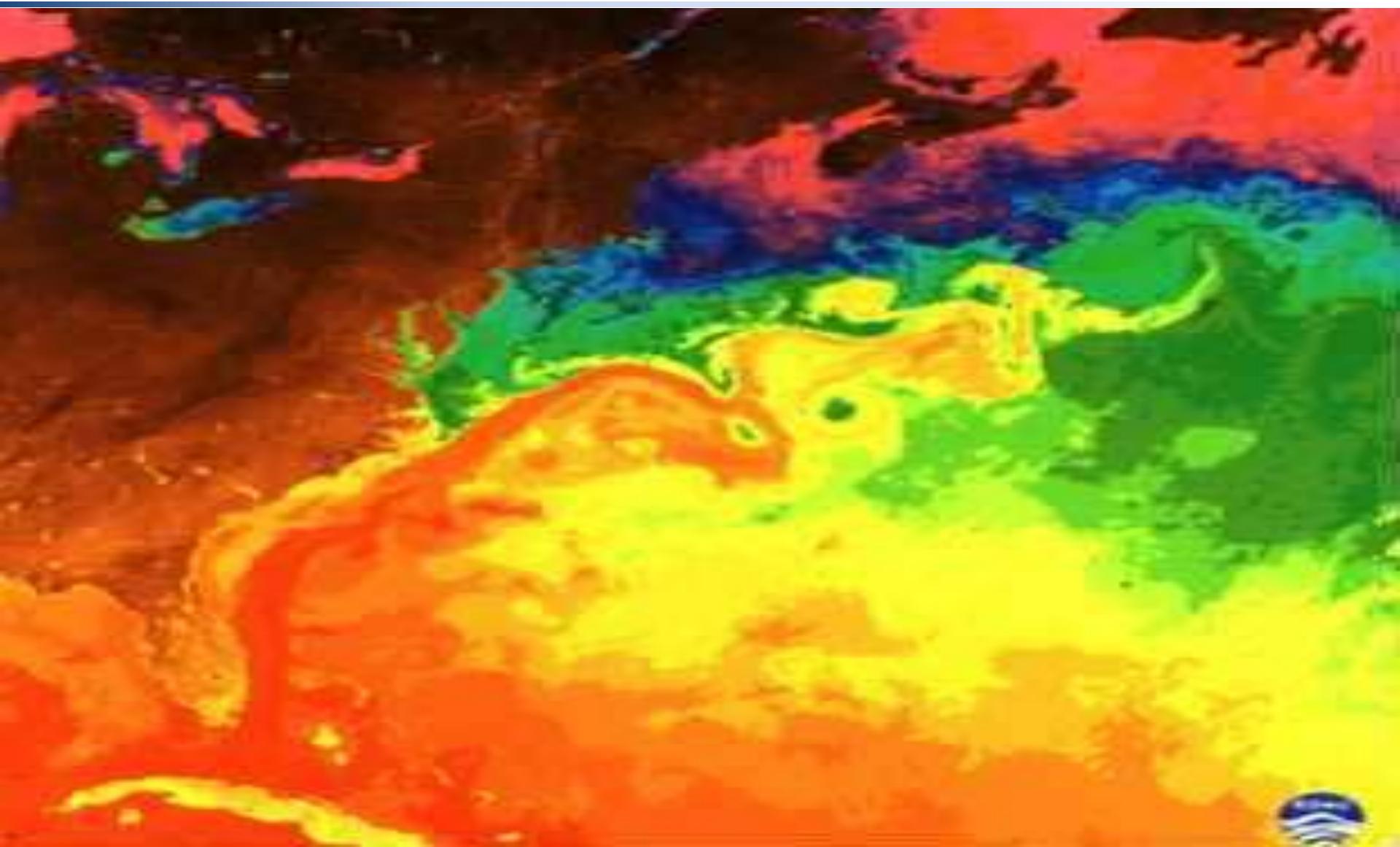
- Remotely collects information about an object
- Digital imagery processing
 - Forestry monitoring
 - Fire monitoring
 - Storm Monitoring
- 3D modelling of the Earth using Satellite/Aerial Imagery

Where are remote sensing scientists employed?

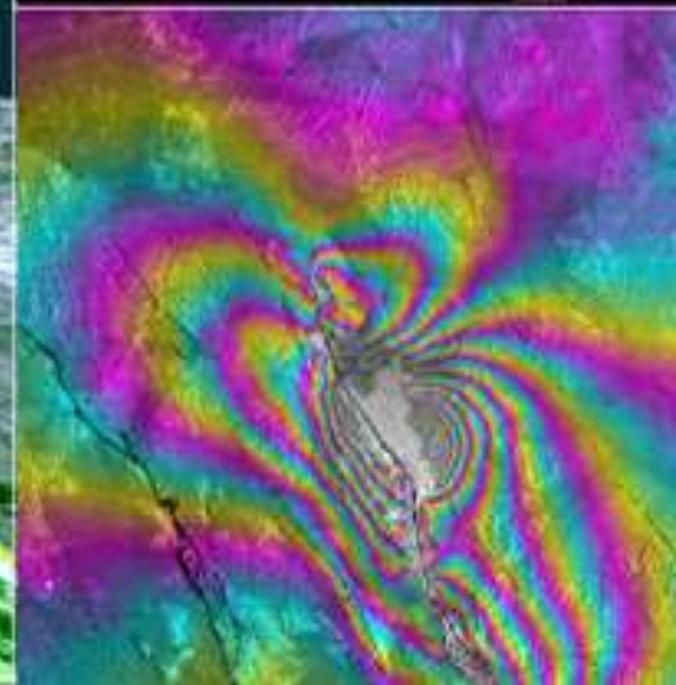
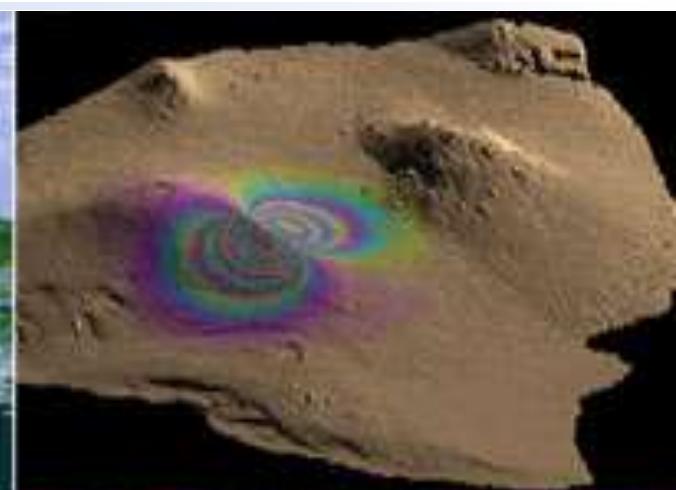
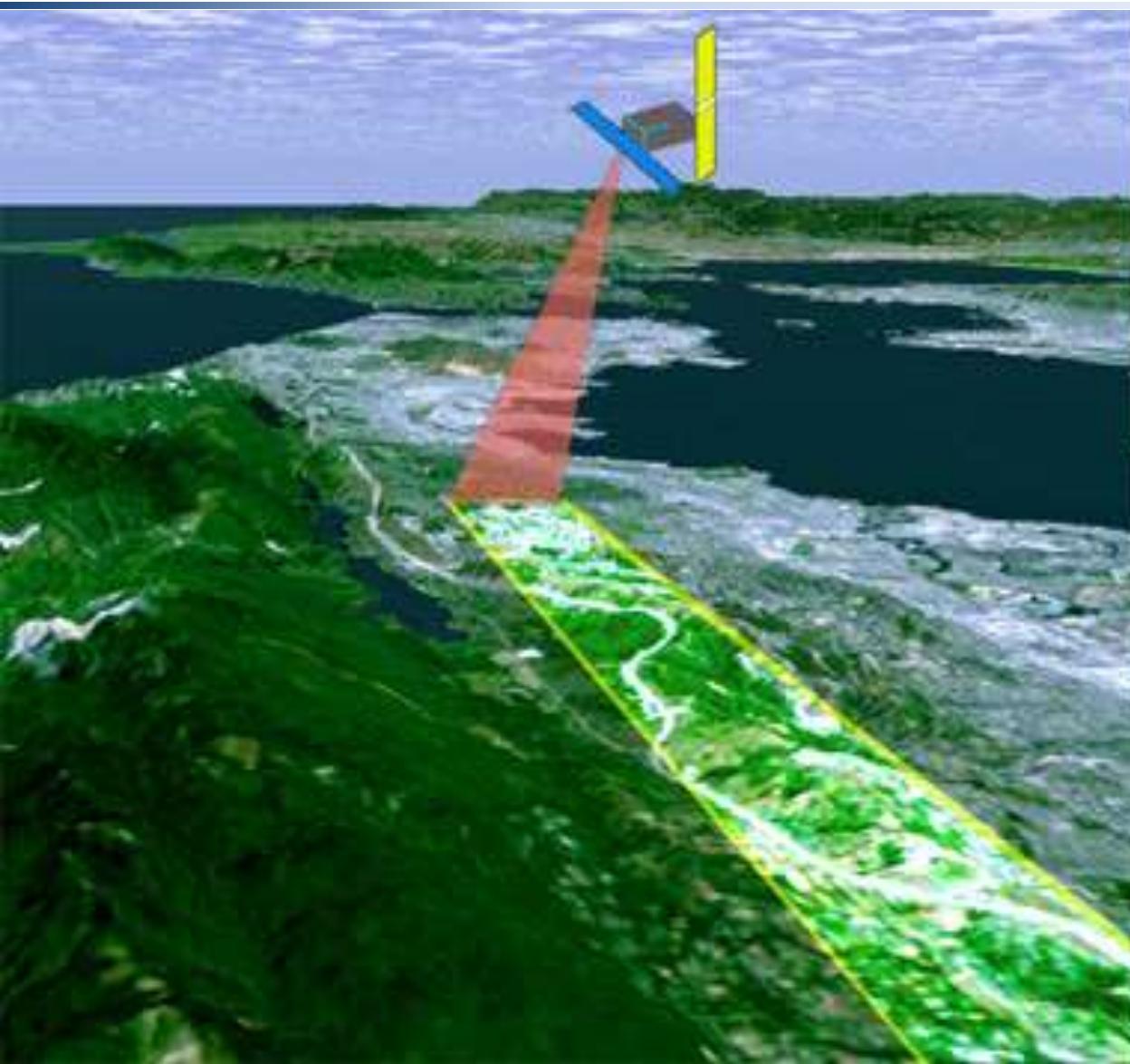
- CSIR
- SANSA
- Universities
- Military Institutions



Thermal Imagery



Satellite Imaging



Meteorologist

What does a meteorologist do?

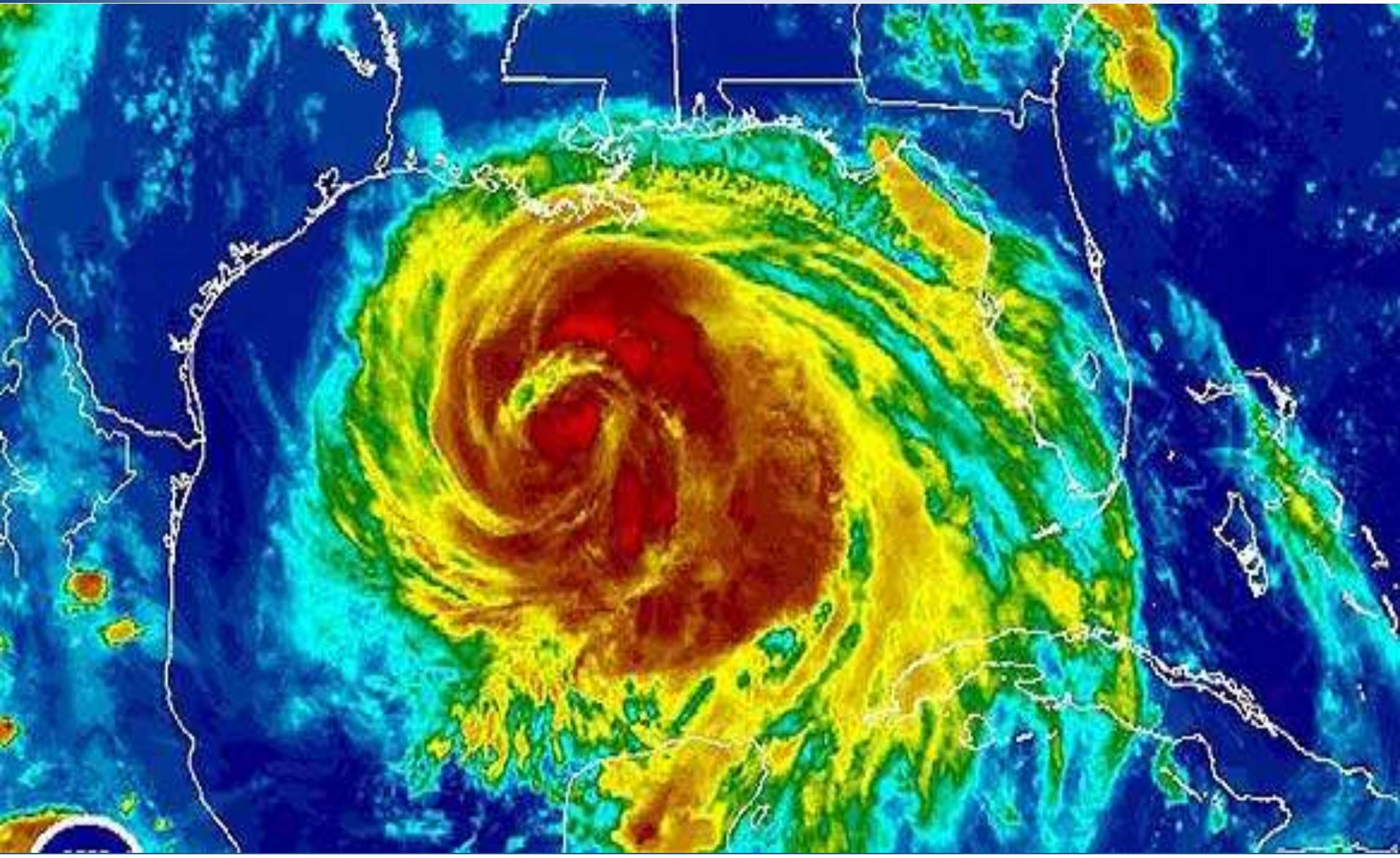
- Study of earth's atmosphere & weather in it
- Analyze information on atmospheric conditions
- Spot and interpret trends
- Early warning systems
 - Risk assessment and mitigation
 - Response

Where are they employed?

- The Weather Bureau
- Agricultural Research Council (ARC)
- Council for Scientific and Industrial Research (CSIR)



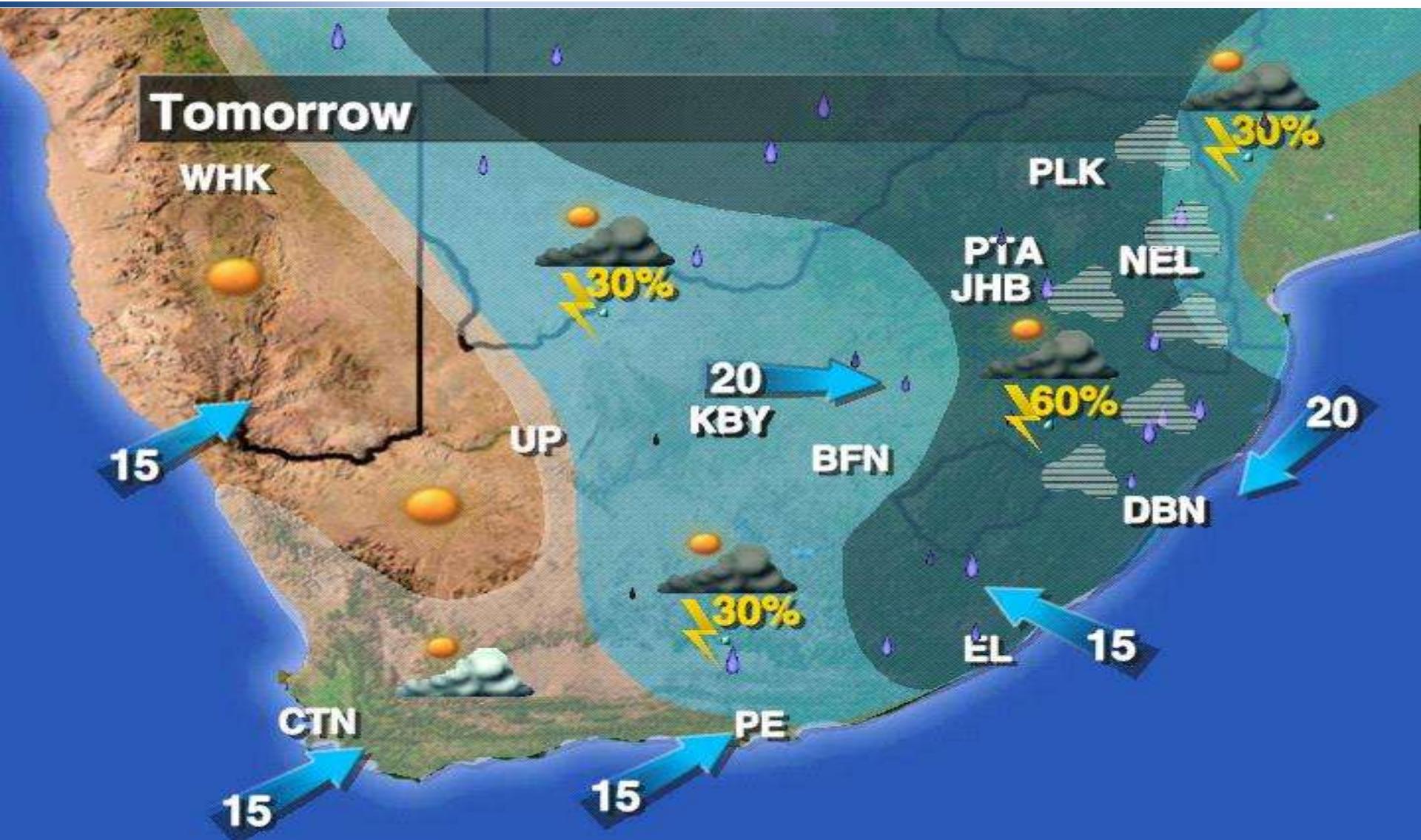
Satellite monitoring



Hurricane Prediction



Weather Mapping



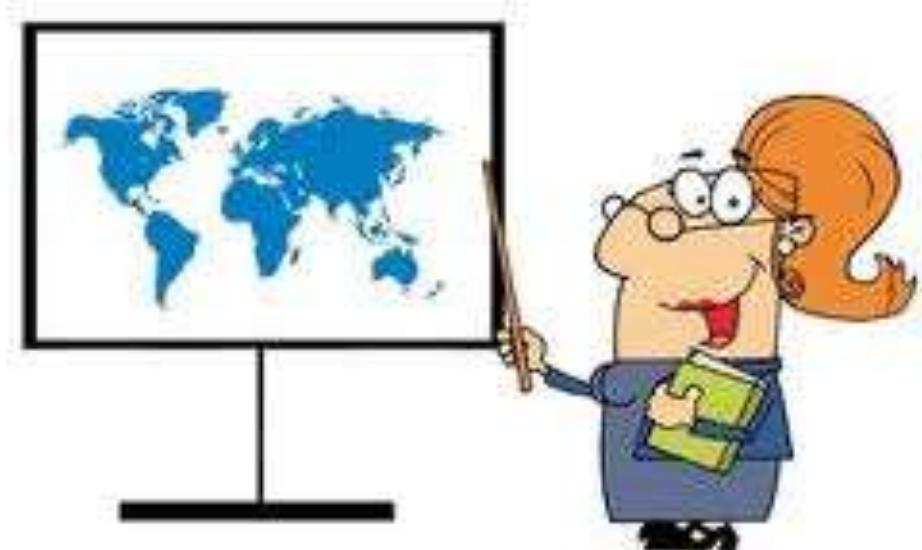
Educator

What does a educators do?

- Train the new generations in Geography, GIS, Computer Science, Remote Sensing and Cartography at all education levels

Where are educators employed?

- Schools
- Universities
- Private Institutions
- Government





Employers



Employers



Related Industries

- Surveying
- Computer Science
- Engineering
- Informatics
- Geology
- Mining

