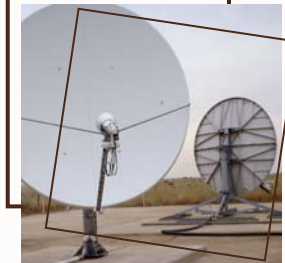
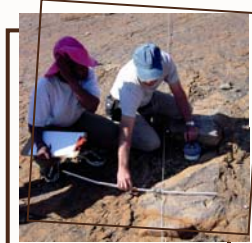


# COUNCIL FOR GEOSCIENCE: STRATEGY *PRESENTATION TO THE PORTFOLIO COMMITTEE ON MINERAL RESOURCES*

23 April 2010



leading earth-science  
solutions



# Structure

- Mandate**
- Strategy**
- Budget**
- Key National & International Programs**
- Key Challenges**



# Mandate of the CGS



# **THE MANDATE OF THE CGS**

## **The Geoscience Act, Act 100 of 1993**

- **The Mandate derived from Geoscience Act, Act 100 of 1993**
- **Mandates the CGS to undertake:**
  - **Systematic mapping, reconnaissance and documentation of the geology of the earth's surface both on shore and off shore**
  - **Basic geoscience research on the nature and origin of rocks and the earth**
- **The collection and curation of all geoscience data and information**



# MANDATE (continued)

- The rendering of geoscience knowledge services and advice to the State
- The management of a number of National Geoscience facilities on behalf of the country
  - National Geoscience Library
  - National Core Library (Information lodged by exploration companies)
  - National Geoscience Museum
  - National Seismological Network (Monitoring Earthquakes)
- Mandate allows us to render commercial geoscience services and products to national and international clients



## **VISION:**

*leading earth-science solutions*

## **MISSION:**

*To provide expert earth-science information and services to improve the management of natural resources and the environment*

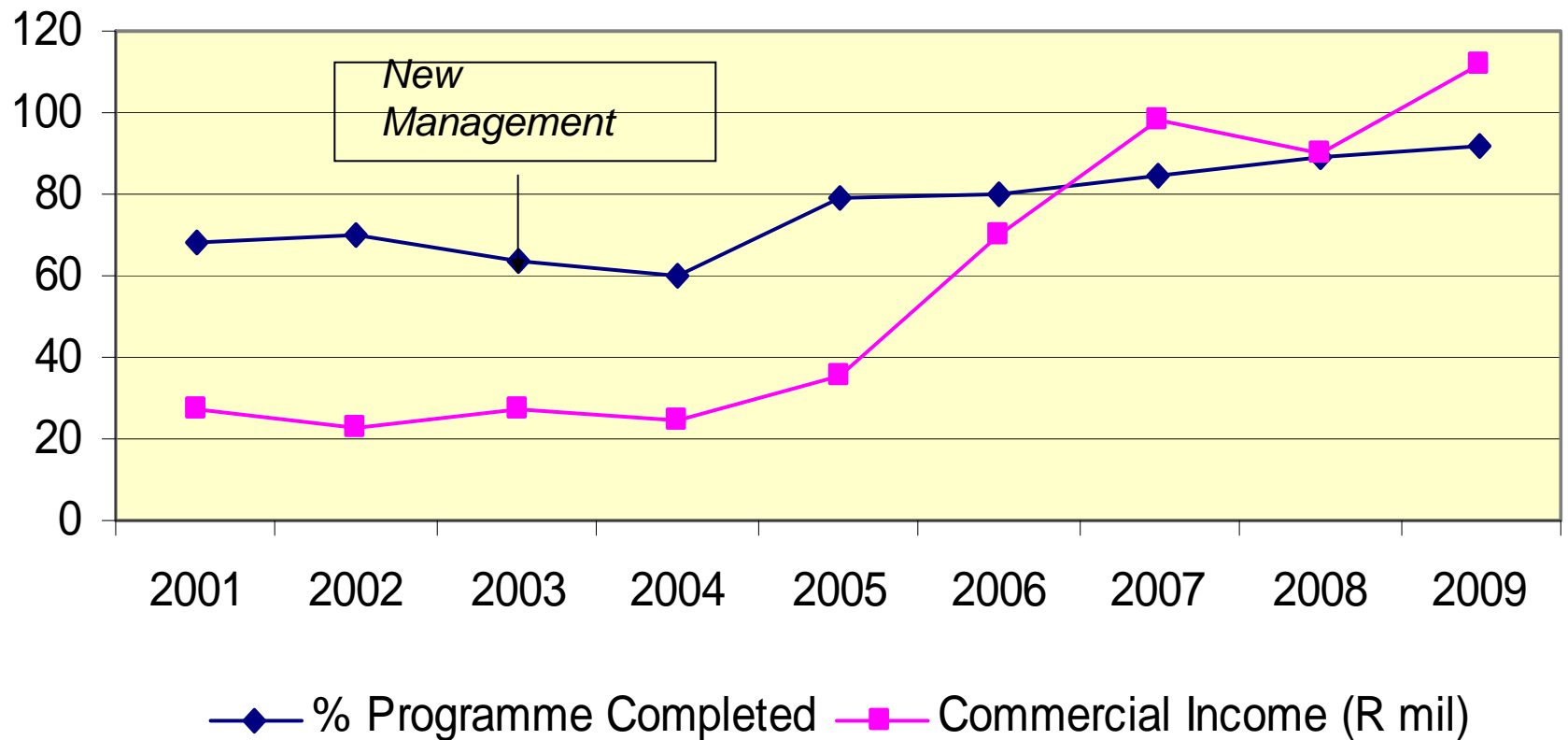
## **Values:**

- *Innovate and create through team work.*
- *Excel through quality and performance.*
- *Value diversity through trust and respect.*
- *Invest in its people.*



# CGS Statutory and Commercial Performance

## CGS Statutory and Commercial performance



# CGS : Strategic Objectives

## BSC Perspective - Market (Stakeholder/Customer) Focus

**Strategic Objective:** *To drive stakeholder and customer satisfaction by the development of world class products and services*

*1) To serve our stakeholders and customers*

Measure	2009/10	2010/11	2011/12	2012/13
Annual Scientific/Technical Program (ATP) Performance Index	85%	85%	85%	85%
# of Maps and Publications Published	38	20	25	30
% Satisfied Customers	80%	80%	80%	80%
No. of Small Scale Mining Investigations Completed	35	40	40	40
No. of Rural Dev. Projects in progress	22	25	25	25
No. of Regional and African Dev. Projects in Progress	18	20	22	22





# CGS Strategic Objectives

## BSC Perspective – Effective Systems (Organisational)

**Strategic Objective:** *To develop and maintain effective and streamlined processes, using appropriate tools and methodologies*

*1) To Develop and implement effective policies and procedures 2) To drive preferential procurement 3) To implement corporate planning and reporting procedures*

Measure	2009/10	2010/11	2011/12	2012/13
% ISO Implementation	50%	100%	-	-
Preferential (BEE/HDI) Procurement as a % Total of Procurement	37%	40%	45%	45%
Number of Audit Qualifications	0	0	0	0



# CGS Strategic Objectives

## BSC Perspective – Economic (Financial) Growth

**Strategic Objective:** *To achieve sustainable revenue and profit growth*

*1) To generate revenue; 2) Manage Overhead Efficiency*

Measure	2009/10	2010/11	2011/12	2012/13
Total Revenue (Rand)	R 221m	R233m	R237m	R253m
Grant	R129m	R135m	R133m	R141m
Contract Revenue	R 85m	R91m	R97m	R105m
Sundry Income	R 6,5m	R 6,5m	R 6,5m	R 6,5m
Commercial Surplus	R6,5m	R7m	R 7,5m	R 8,1m
Ratio of Contract Revenue to Total Revenue	38%	39%	41%	42%
Ratio of External Revenue to Total Revenue	41%	42%	44%	44%
Number of large tenders submitted (greater R1m)		40	44	48
Ratio of overheads to total costs	57,1%	55%	55%	55%
Ratio of Personnel Costs to total costs	61%	62%	63%	63%



# CGS Strategic Objectives

## BSC Perspective – World Class People (Learning and Growth)

**Strategic Objective:** *To a world class Geoscience organisation where our people can grow and perform optimally*

*1) To attract and retain a skilled workforce; 2) To build a positive organizational culture; 3) To reflect and embrace RSA diversity*

Measure	2009/10	2010/11	2011/12	2012/13
Nett Staff Turn Over	-7%	-7%	-7%	-7%
No. of Staff and Students Enrolled for MSc and PhD Degrees	24	25	28	30
No. of Papers ad Articles Published	65	30	35	40
Scientists as a % of Total Staff	44%	42%	43%	44%
% of Scientists with MSc and PhD Degrees	50%	54%	54%	54%
Number of Projects with External Collaborators	50	52	55	58



# CGS Strategic Objectives

## BSC Perspective – World Class People (Learning and Growth)

**Strategic Objective:** *To create a world class Geoscience organisation where our people can grow and perform optimally*

*1) To attract and retain a skilled workforce; 2) To build a positive organizational culture; 3) To reflect and embrace RSA diversity*

Measure	2009/10	2010/11	2011/12	2012/13
EE stats (Consolidated) W:B	45:55	43:57	40:60	40:60
EE Stats (Gender) M:F	56:44	55:45	54:46	54:46
Number of Strategic Science Partnerships	10	12	14	16
% Satisfied Protégés'	55%	60%	60%	60%
% satisfied Staff	60%	60%	60%	60%



## BUDGET FOR PERIOD 2010/11 TO 2012/13

INCOME (RANDS)	2009/10 x 1000	2010/11 x 1000	2011/12 x 1000	2012/13 x 1000
Government grant	129 486	135 365	133 463	141 471
Sales and contracts	85 000	90 950	97 317	105 102
Sundry income	6 500	6 500	6 500	6 500
Withdrawal from reserves	-	-	-	-
<b>TOTAL INCOME</b>	<b>220 986</b>	<b>232 815</b>	<b>237 280</b>	<b>253 073</b>
<b>EXPENDITURE</b>				
Personnel costs	130 009	140 409	147 430	157 750
Bursaries	2 600	1 600	1 200	1 200
Commercial project costs	38 250	40 928	42 819	47 254
Overheads and operating costs	44 127	43 878	41 830	43 369
<b>SUBTOTAL</b>	<b>214 986</b>	<b>226 815</b>	<b>233 280</b>	<b>249 573</b>
<b>CAPITAL EXPENDITURE</b>				
Vehicles	-	-	-	-
Equipment	6 000	6 000	4 000	3 500
Land and buildings	-	-	-	-
<b>SUBTOTAL</b>	<b>6 000</b>	<b>6 000</b>	<b>4 000</b>	<b>3 500</b>
<b>TOTAL EXPENDITURE</b>	<b>220 986</b>	<b>232 815</b>	<b>237 280</b>	<b>253 073</b>
Surplus (Loss)	-	-	-	-



## CGS BUDGET – GRANT VS. PERSONNEL COSTS

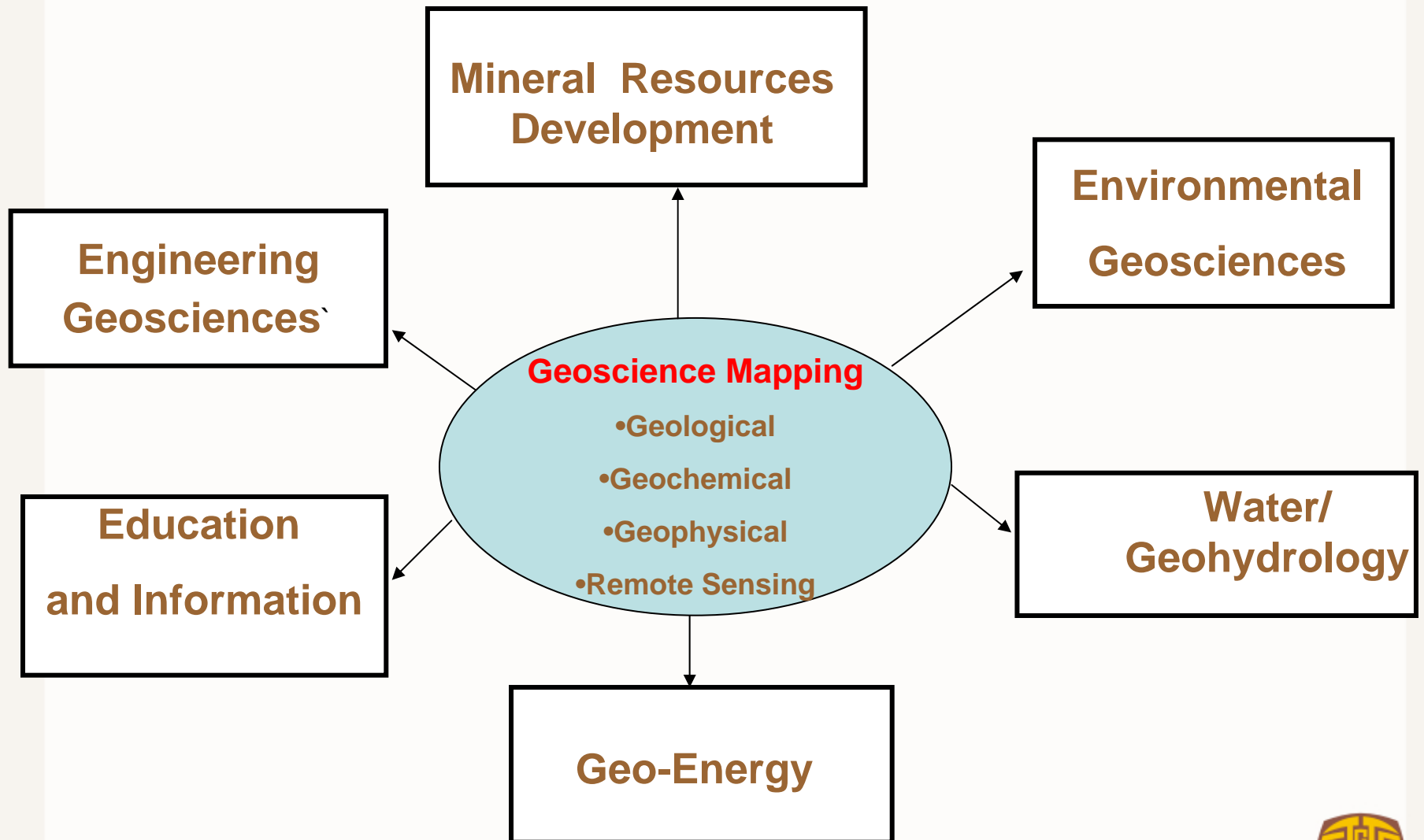
	Budget 2009/2010	Budget 2010/2011	Budget 2011/2012	Budget 2011/2013
	R'000	R'000	R'000	R'000
<b>Government grant</b>	129,486	135,365	133,463	141,471
<b>Personnel Costs</b>	130,009	140,409	147,430	157,750
<b>surplus/(Shortfall)</b>	(0,523)	(5,044)	(13,967)	(16,279)



# Key National and International Projects



# Business Model : SIX/SEVEN SCIENTIFIC FOCUS AREAS

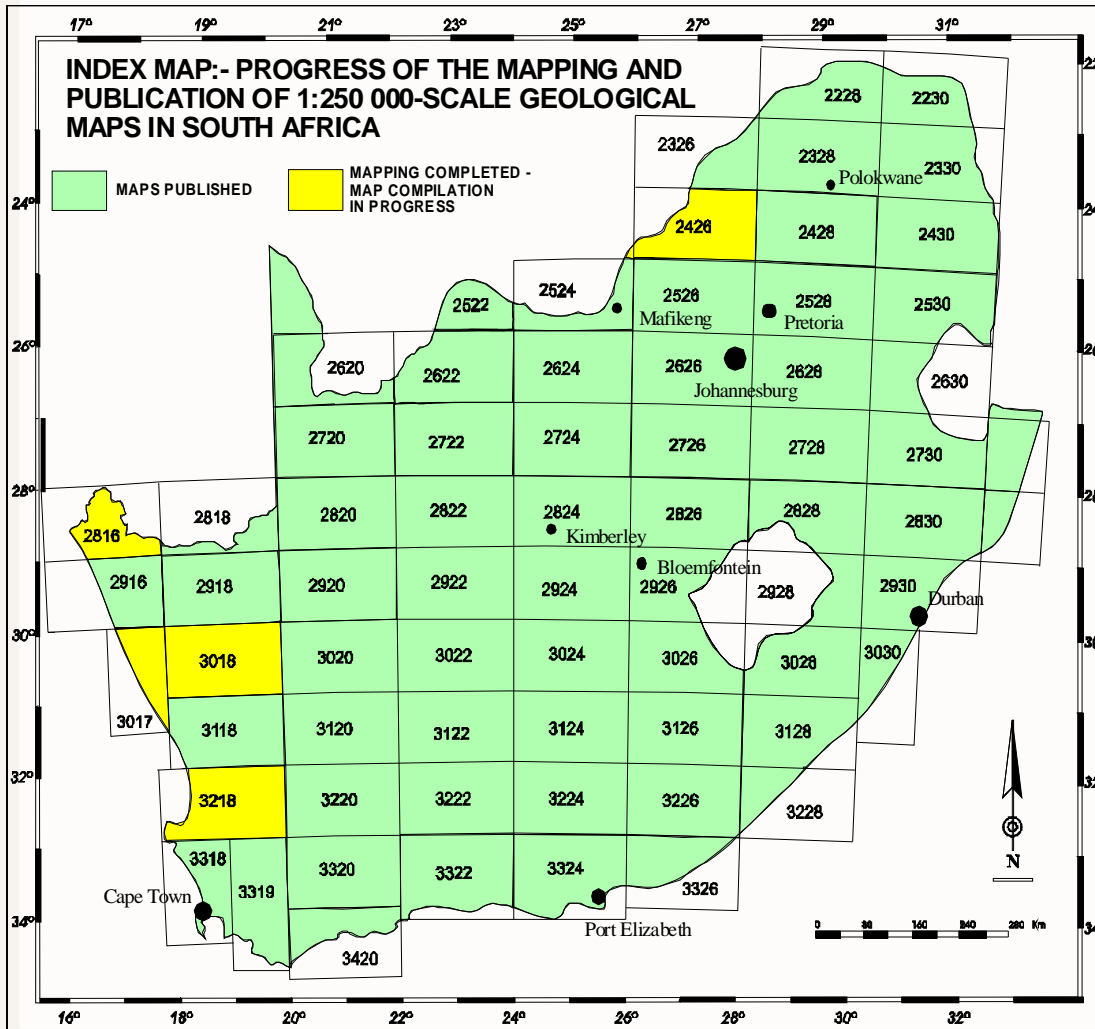


*Geosciences for Development*





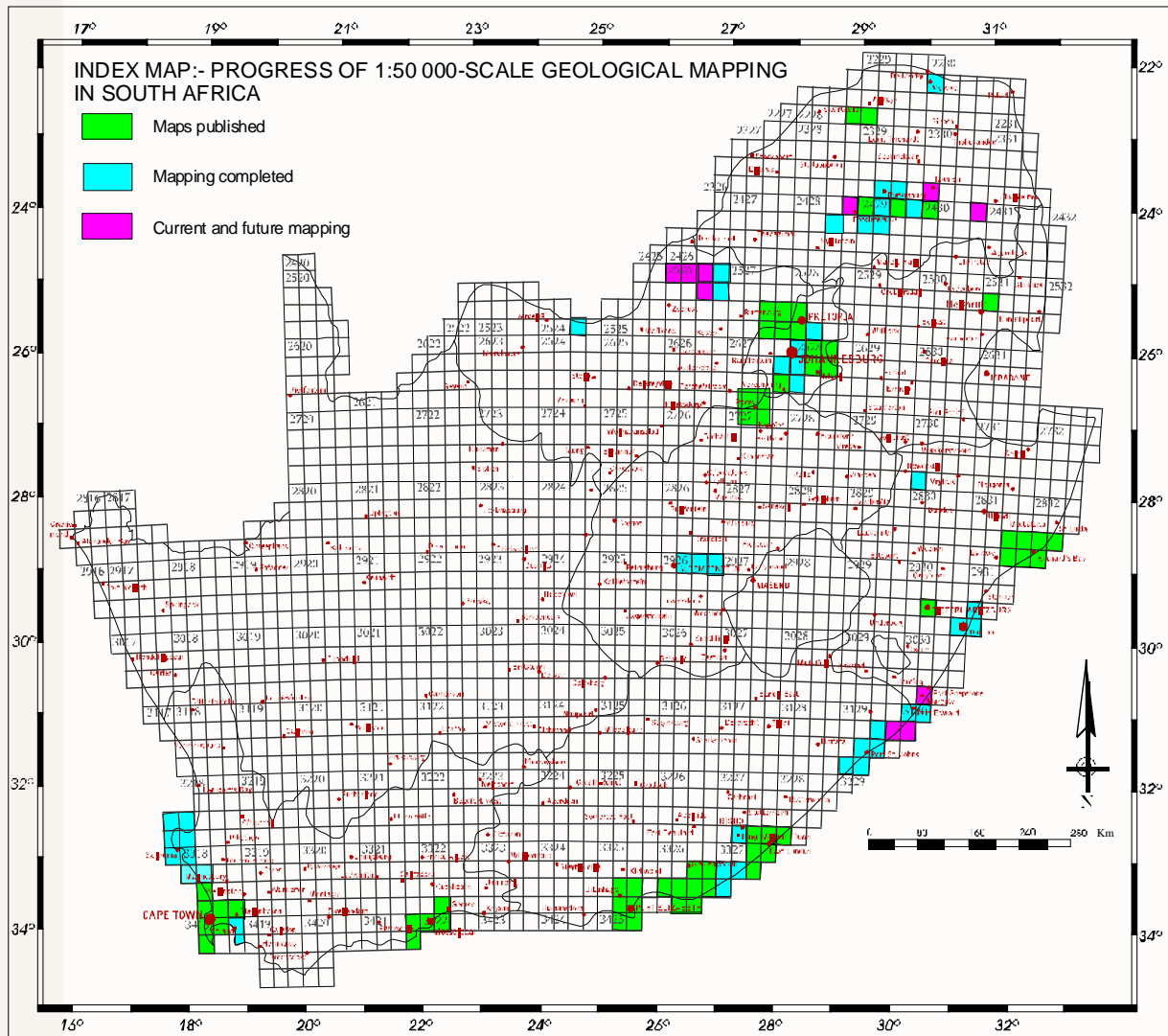
# Geological Mapping 1: 250 000



- Map SA 1: 250 000
- Started some 100 years
- About 98% SA covered



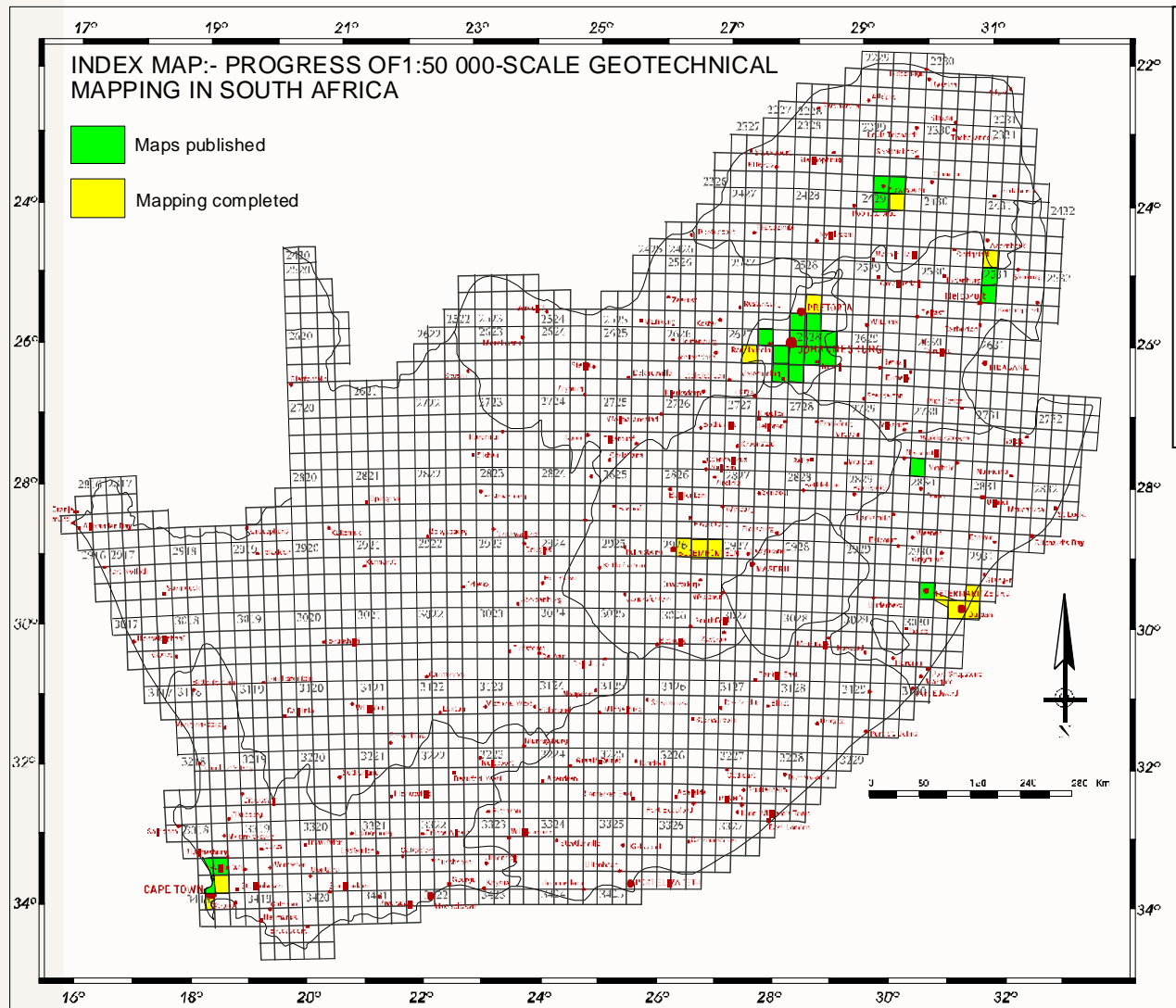
# Geological Mapping- 1:50 000



- Map SA 1:50 000
- More detailed program
- Recent Program
- The program is being prioritized



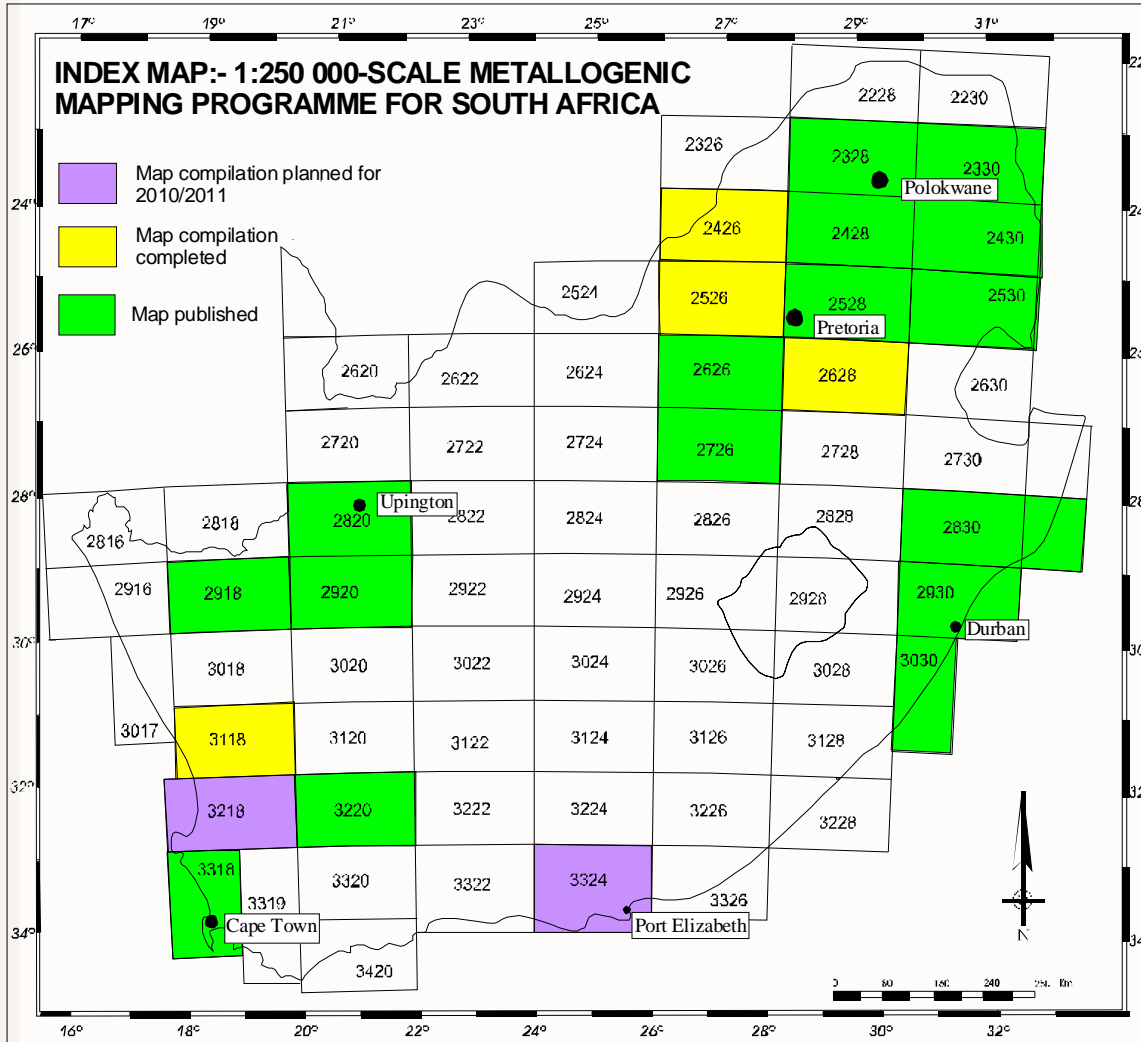
# Geotechnical Mapping- 1:50 000



- Map SA 1:50 000
- More detailed program
- Recent Program



# Metallogenic Mapping



- Map SA 1:250 000
- Recent Program



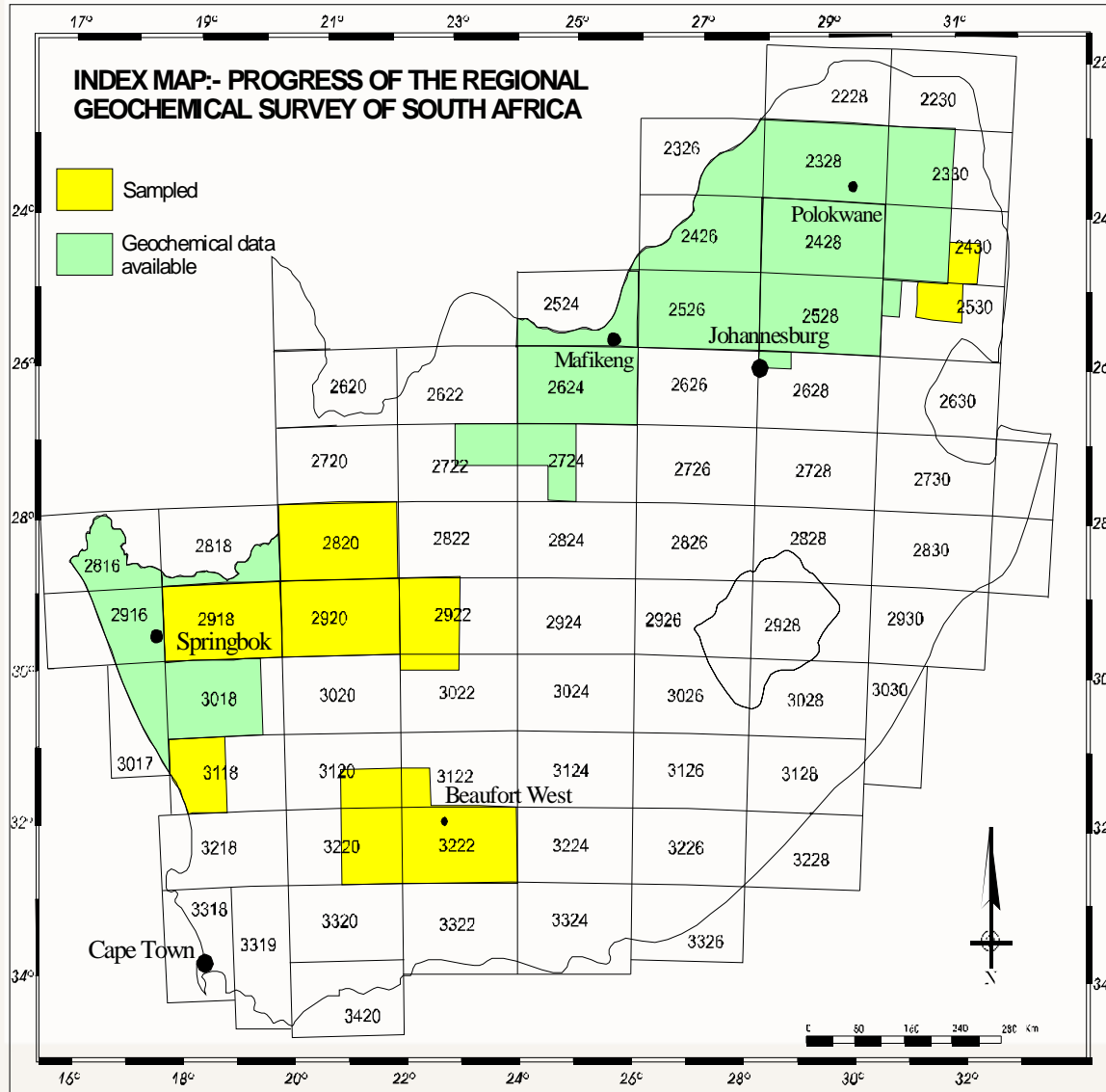
# Geochemical mapping

## Objective to:

- **Complement geological mapping**
- **Identify exploration targets**
- **Test exploration models**



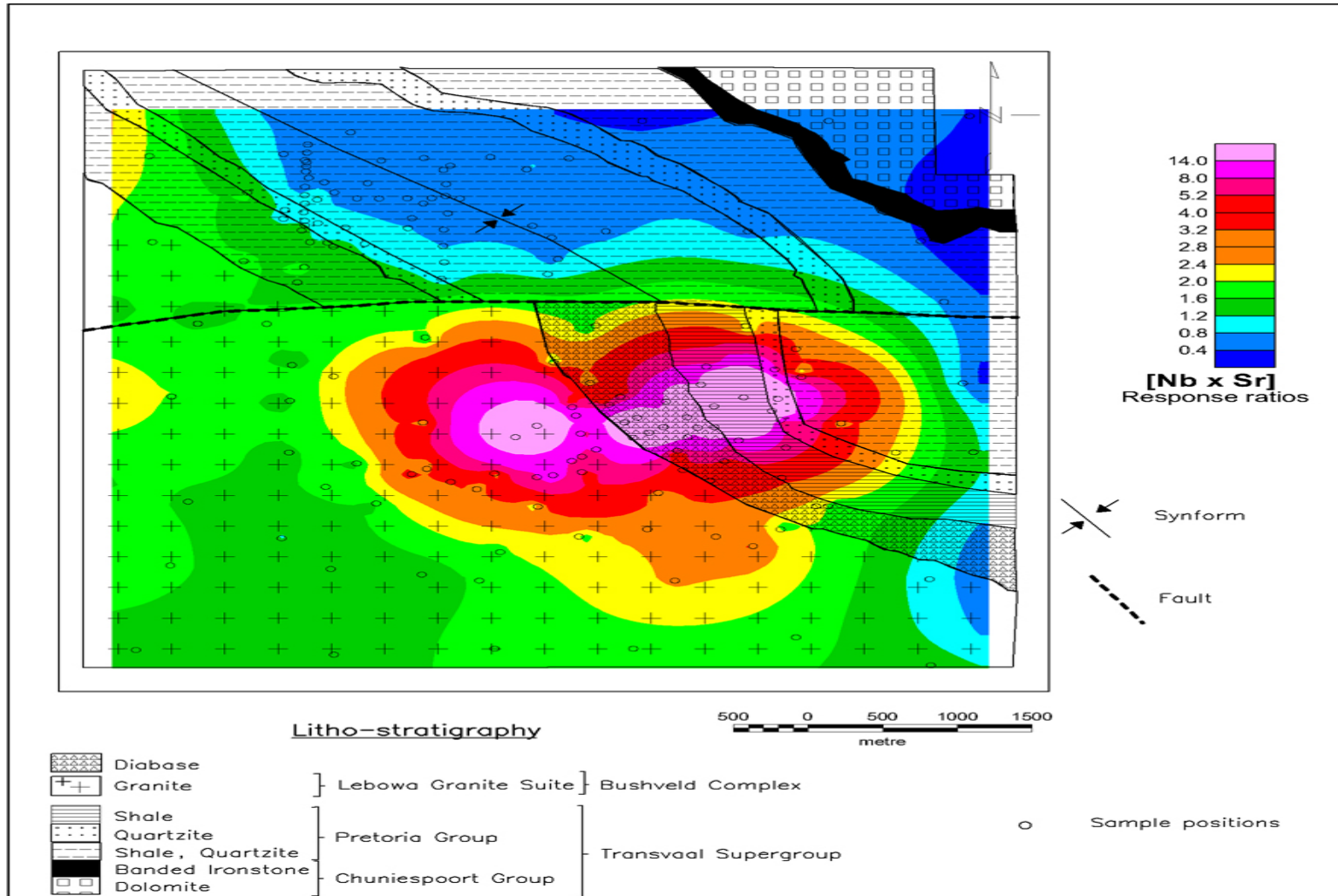
# Geochemical mapping



- Grid soil sampling 1 square Km
- Analyzing for 40 elements
- Recent Program



# Geochemical Data Using Nb\*Sr Ratios



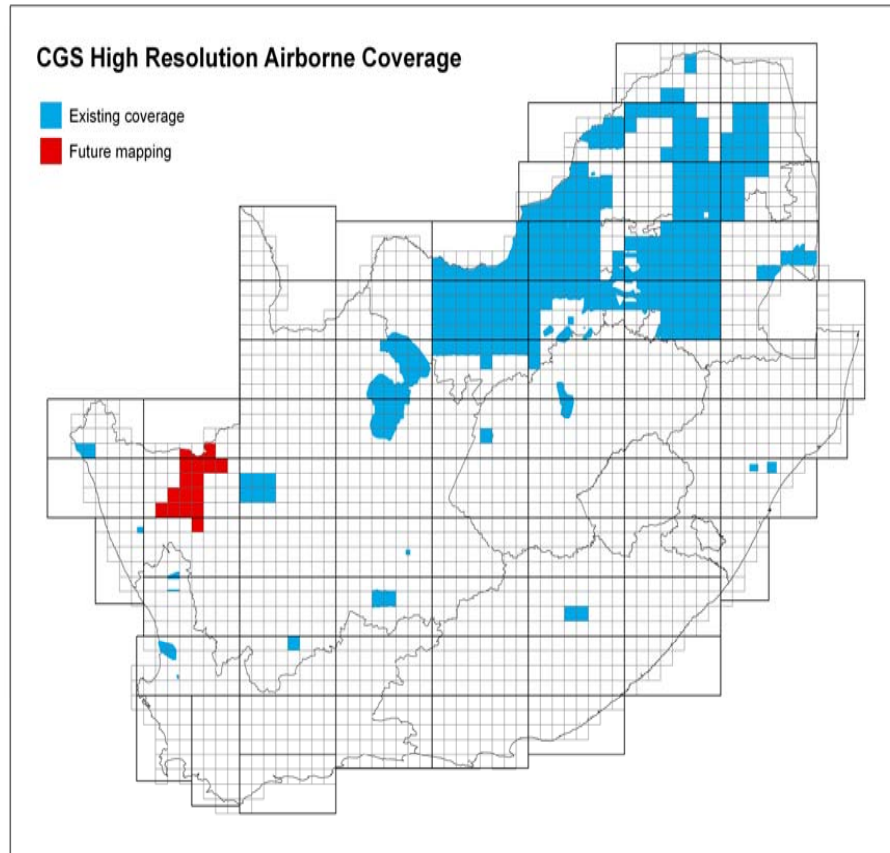
# Geophysical Mapping

- Objective to :
  - *Improve the understanding and interpretation of deep seated rocks and soil covered areas*
- SA Geophysical Mapping is in two parts:
  - *Airborne and Ground Surveys*
- Some of the methods include:
  - *Magnetic surveys*
  - *Gravity surveys*
  - *Radiometric surveys*
  - *EM surveys*





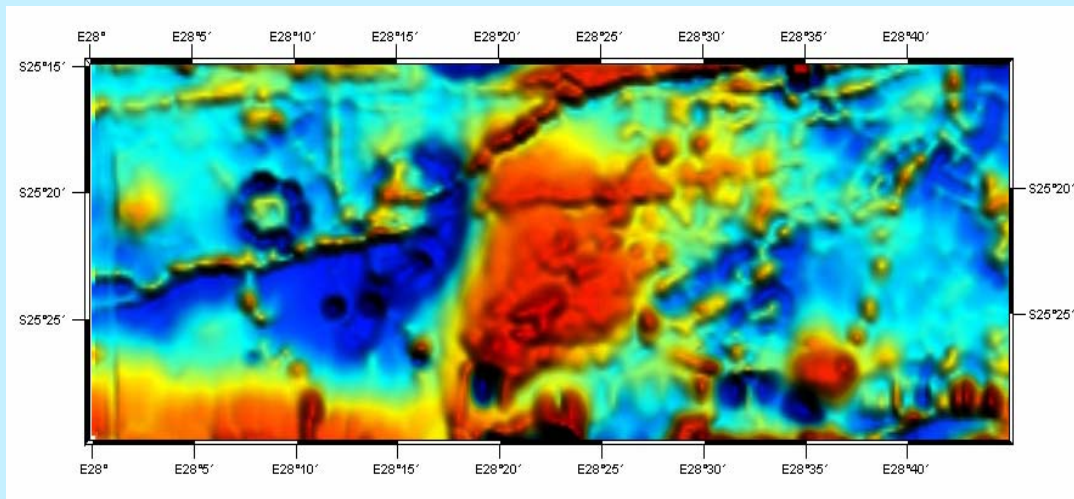
# Airborne Geophysical Survey



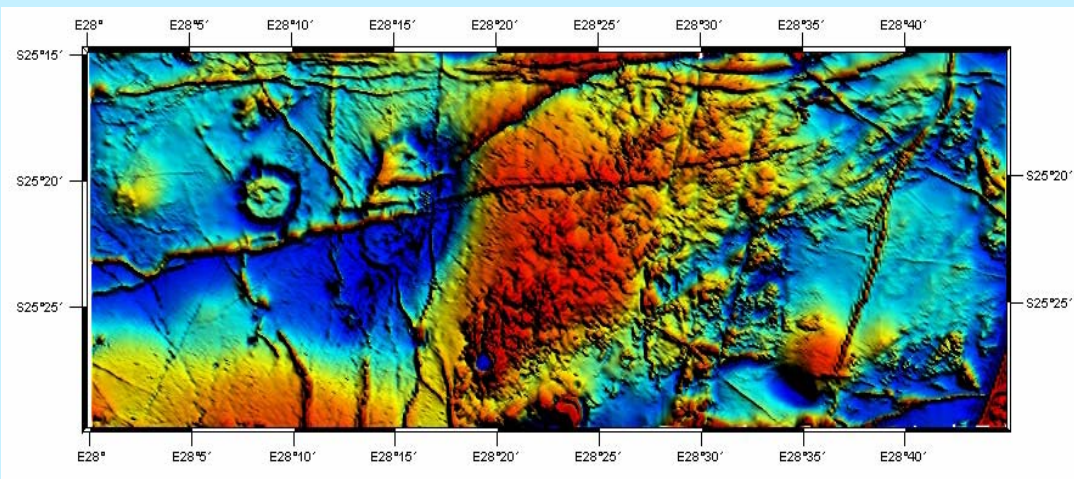
- SA covered at 1km line spacing
- New program 200m line spacing
- Focus on areas with a higher potential



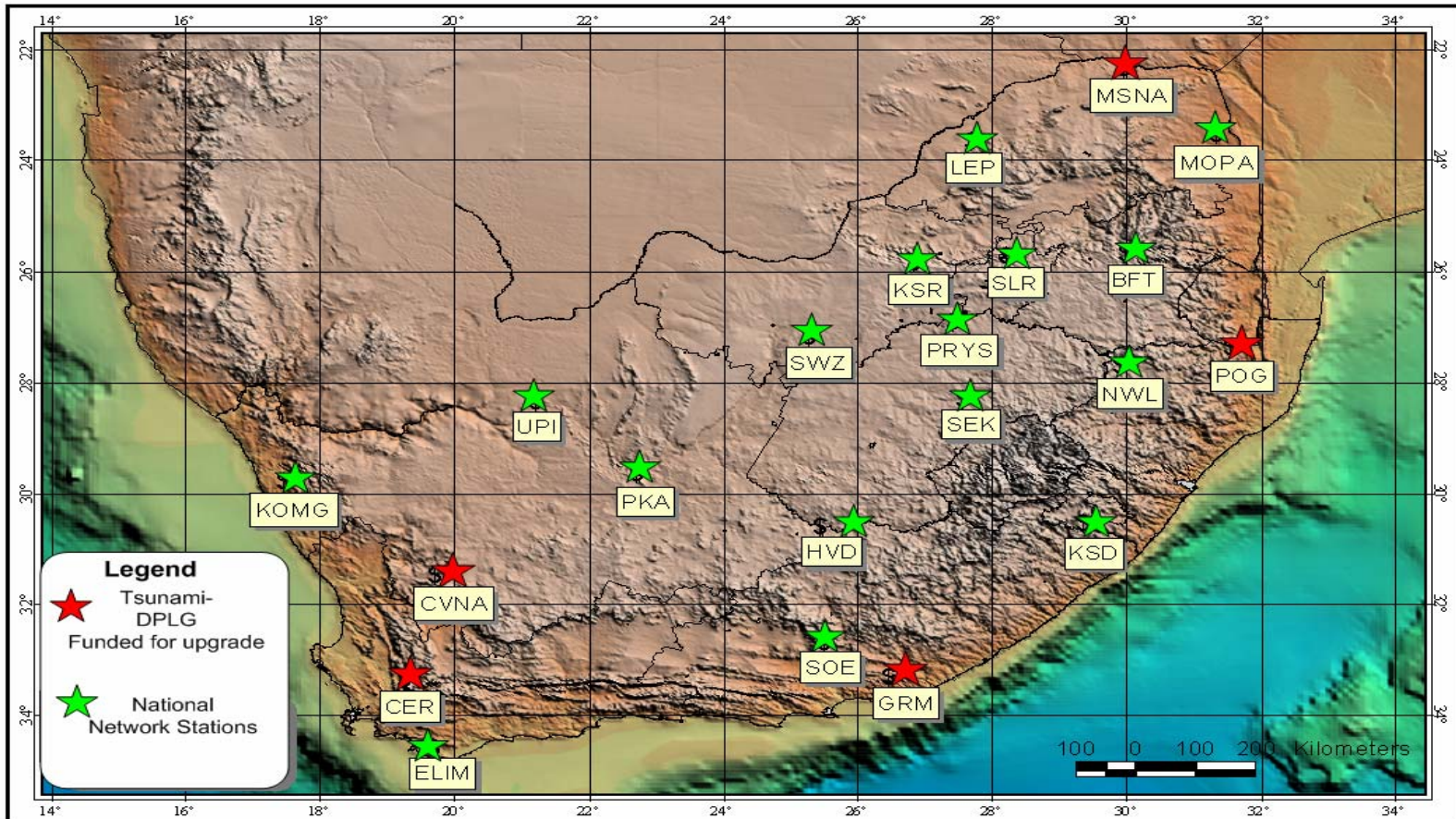
## REGIONAL AEROMAGNETIC DATA COLLECTED AT 1km LINE SPACING



## HIGH RESOLUTION AEROMAGNETIC DATA COLLECTED AT 200m LINE SPACING



# South African National Seismic Network



# Seismic Projects

- Continue to monitor earthquakes in South Africa
  - *Collaborative project with Mine Health and Safety Council (MHSC) should commence during this financial year to:*
    - *Integrate Mine Seismic Network and National Seismic Network*
    - *Undertake research on fatalities on the mines*
    - *Proposal sent to MHSC*



# Recent Global Earthquakes

- Earthquakes in China (6.9), Indonesia, Tsunami (9.0) and Mexico (7.2) in April 2010, Chile (8.0) and Japan (7.0) in February 2010, Haiti (7.0) in January 2010, Malawi (6.2) in December 2009 and Mozambique (7.0) in February 2006.
- **What about SA?**
- **Moderate seismicity** in South Africa, but have had **large earthquakes**:  
 1809 in Cape Town, approximate magnitude between 6.0 and 6.5,  
 1912 in southern Free State, approximate magnitude of 6.5,  
 1932 off Cape St Lucia, approximate magnitude between 6.0 and 6.5, and  
 1969 in Ceres-Tulbagh, magnitude 6.3.

Table of natural earthquakes **felt by public**, but not necessarily the biggest ones recorded.

Date	Time	Latitude	Longitude	Region	Depth	Magnitude ( $M_L$ )
2009/05/21	04:03:34.2	-28.63	28.99	Mkukwini area (Border KZN – Free State)	5.0	3.4
2009/05/21	04:03:56.9	-28.63	28.98	Mkukwini area (Border KZN – Free State)	5.0	3.6
2009/05/25	22:57:15:0	-29.66	17.85	Springbok area (Northern Cape)	5.0	1.6
2009/10/16	18:32:27.7	-31.27	20.71	Williston area (Northern Cape)	5.0	3.2
2009/10/16	18:35:48.5	-31.29	20.67	Williston area (Northern Cape)	5.0	3.4
2009/12/02	17:09:23.7	-33.08	18.27	Hopefield area (Western Cape)	5.0	3.0
2010/03/29	10:54:43.5	-33.56	19.42	Worcester area (Western Cape)	5.0	2.3

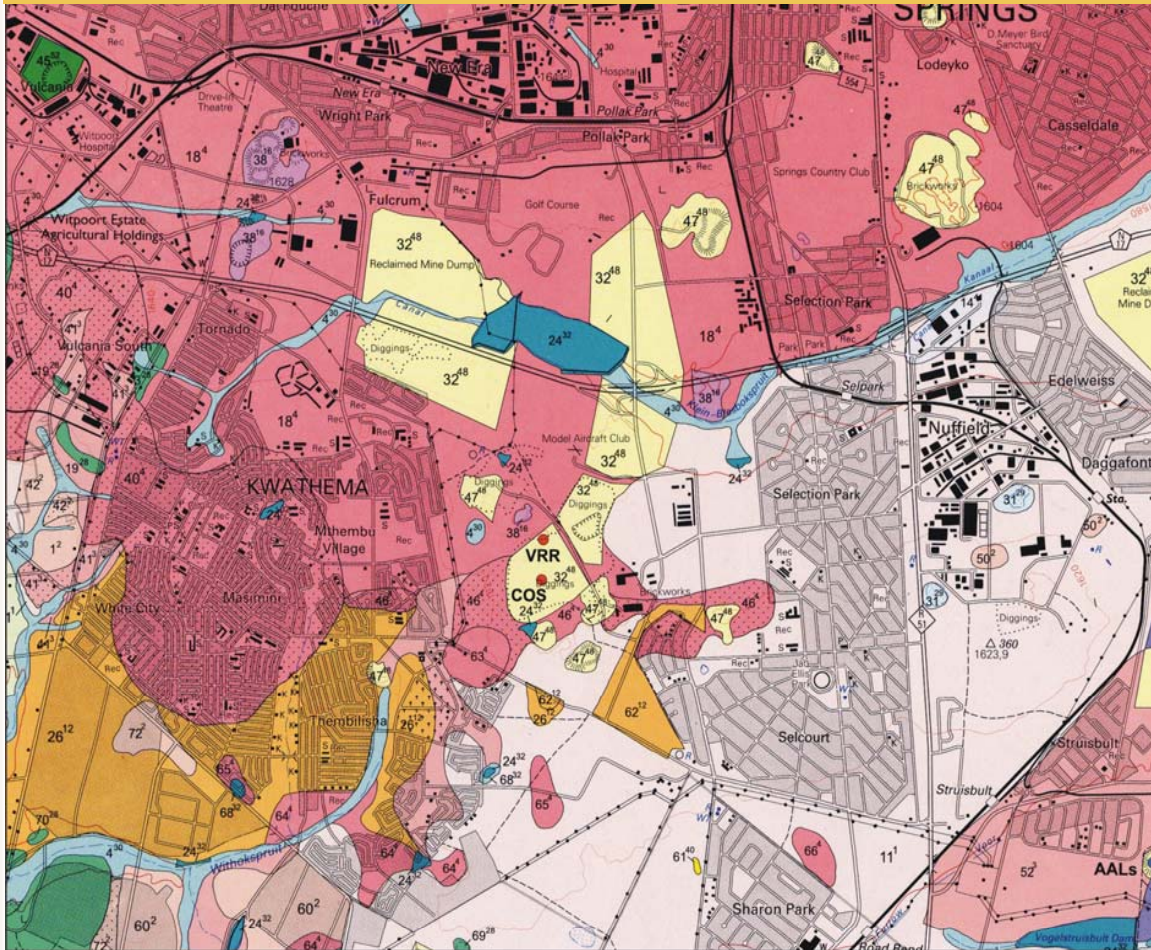










# Dolomite & Sinkholes

- *Dolomites create a massive problem in Gauteng*
- *20% of Gauteng is underlain by dolomitic land*
- *CGS will continue to provide support to other State Organs eg NHBRC, Tshwane Metro, Gautrain*
- *CGS Act is being amended to ensure that the CGS plays an important role in advising government*



# Example of Geotechnical Map



 Active, expansive or swelling soil (Act)	 Poorly consolidated soil (Con)	 Slope instability (Slo)
 Excavatability of ground (Exc)	 Subsidence (Sub)	 Inundation (flooding) (Inu)
 Erodible soil (Ero)	 Dispersive soil (Dis)	

- Produce maps of all geological and geotechnical factors that affect development
- A very important geospatial map for urban and town planners



# Mining and the Environment

## Background

- Large-scale mining has been taking place for over 100 year
- The country is facing various environmental challenges relating to mining – especially in the gold and coal mining areas
- CGS is providing advice to the Department of Mineral Resources

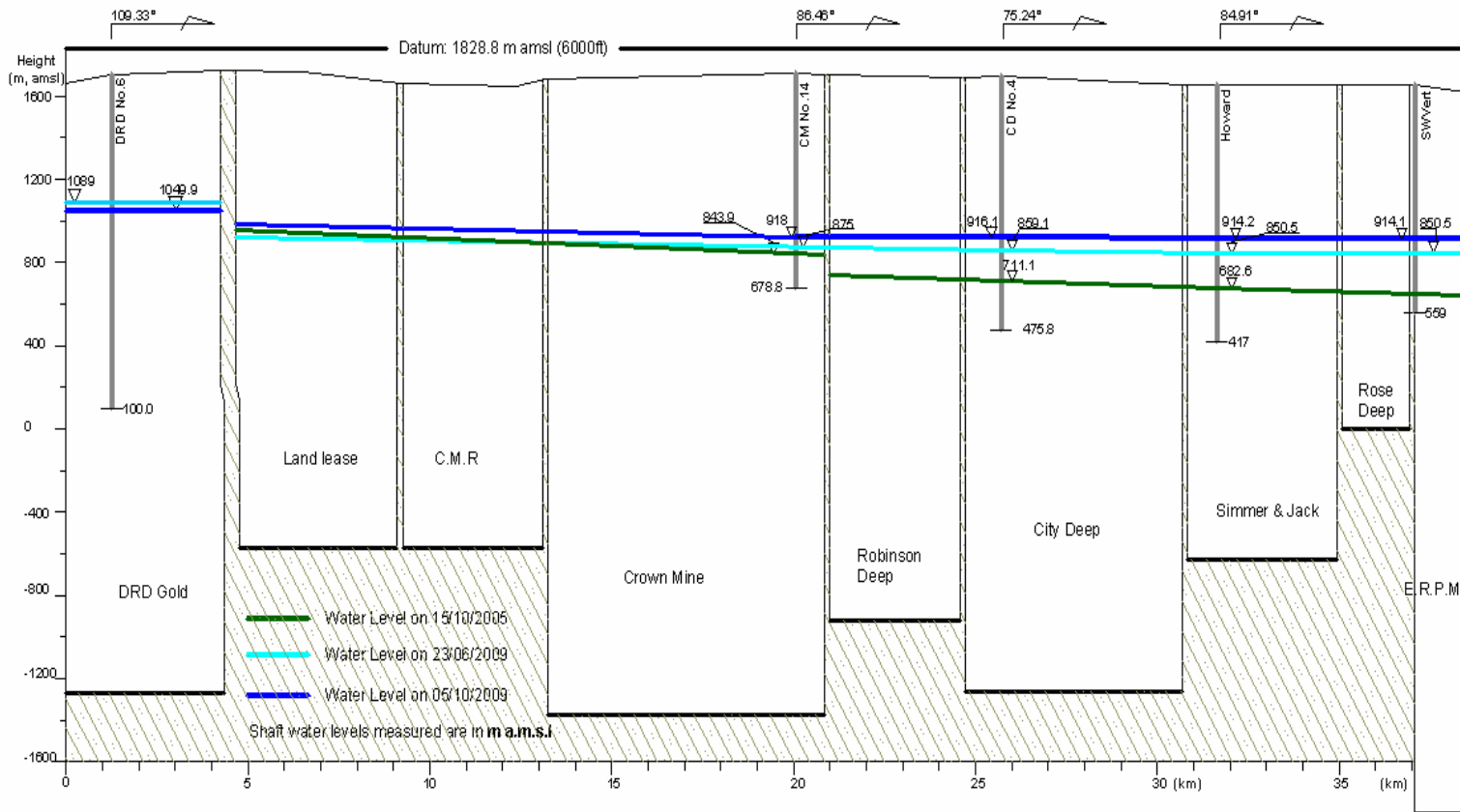
## Three Key Projects

- **Water Ingress Project in the Gold Mines. Objectives:**
  - Address polluted mine water
  - Address Decanting Mine Water
  - Reduce pumping cost
- **Closure of Abandoned Ownerless Mining Holes.**
  - Protect local communities
- **Sustainable Development Project/ Closure Strategies**
  - Generic Strategy for closure





# Rising Water Levels in Central Basin



Water levels are around 650m below the surface and are currently rising at ~30-60 cm - /day.

CGS scientists are actively seeking solutions which can be practically implemented within this timeframe



# Geoscience Collaborations



# Key International Scientific Collaborations

## African Front

- Lesotho
- Mozambique
- Morocco
- Madagascar
- Ghana
- Uganda
- Algeria
- Botswana and Namibia
- SADC Geological Map – has been finalised
- Organisation of African Geological Surveys – South Africa hold the Presidency and Secretariat

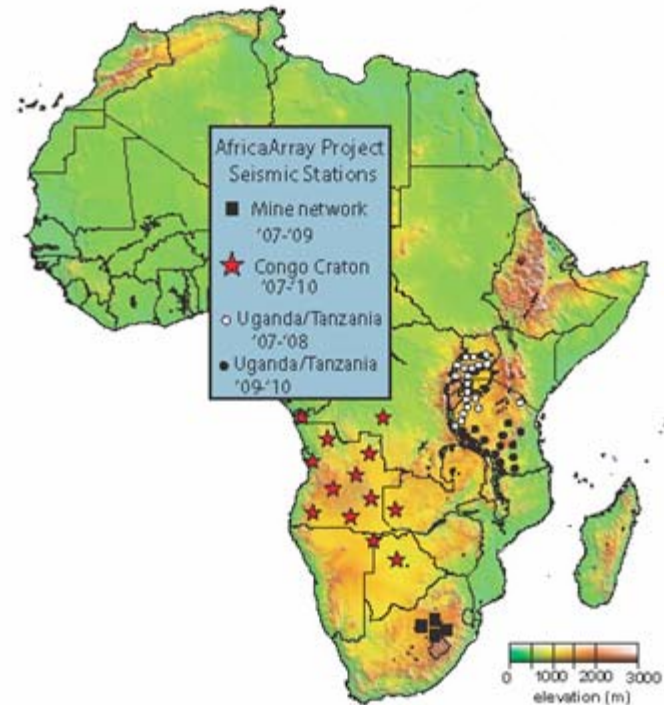
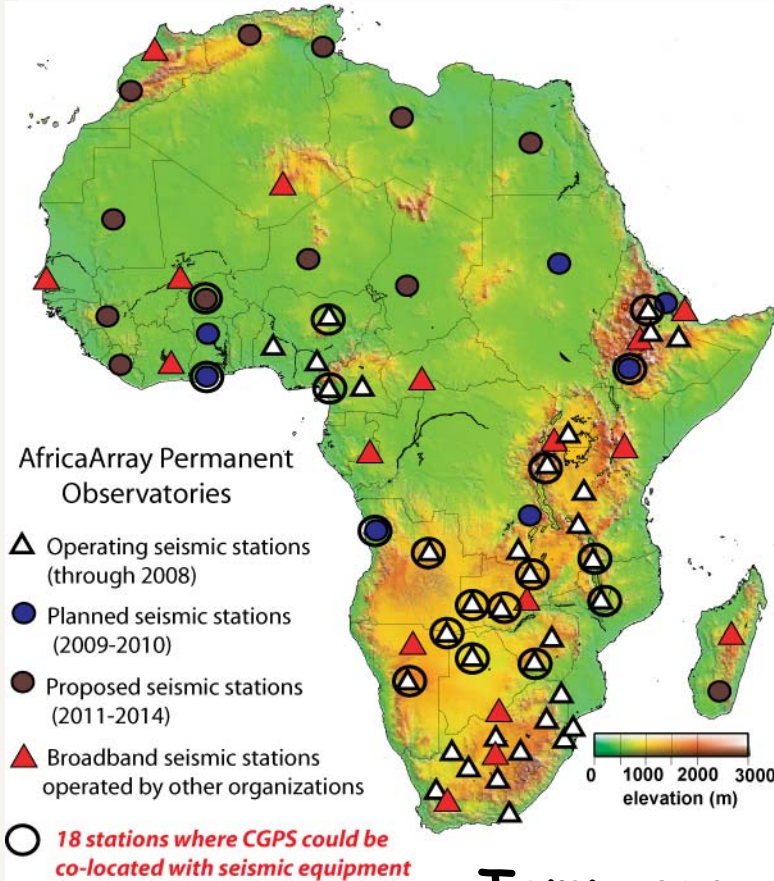
## International – Collaborative Research Projects

- India – Stratigraphic correlation
- France - Several Projects
- Japan
- China
- Poland



# AfricaArray Seismic Network

- 31 seismic stations
  - 13 countries
- Continuous recording  
Data recovery 70-80%



## Temporary stations (2-4 yrs)

- many will become permanent stations





# Carbon Capture and Sequestration - CCS

## • Geological CO<sub>2</sub> Sequestration

- Investigation of **CO<sub>2</sub> Geological Storage Potential Atlas for South Africa** (one of the most important climate-change mitigation technologies for fossil fuels)

## • Mineral Sequestration

- Develop, optimize and demonstrate an economically-viable integrated mineral sequestration



# Key International Collaborations: International Geological Congress

- SA won the bid to hold the largest geological congress in 2008 to be held in Cape Town in 2016.
- It is expected to attract over 6 000 delegates.
- Represents a great opportunity to build a legacy in the geosciences for Africa.
- Preparations will continue during the next three years.

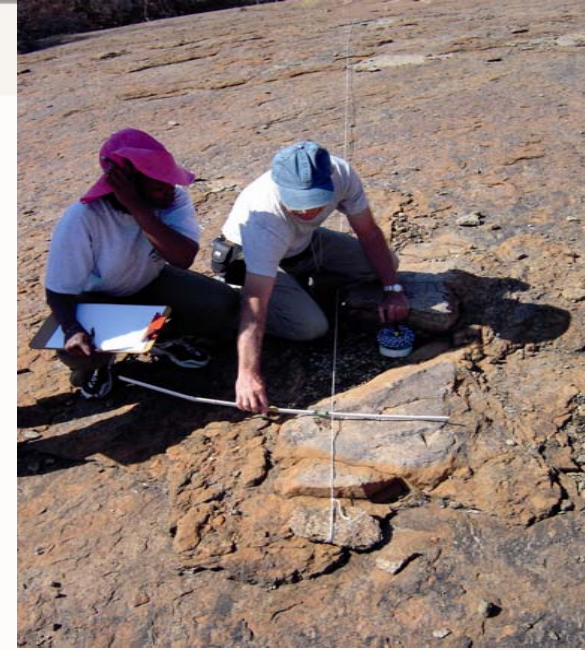


# Human Capital



# Field mapping school

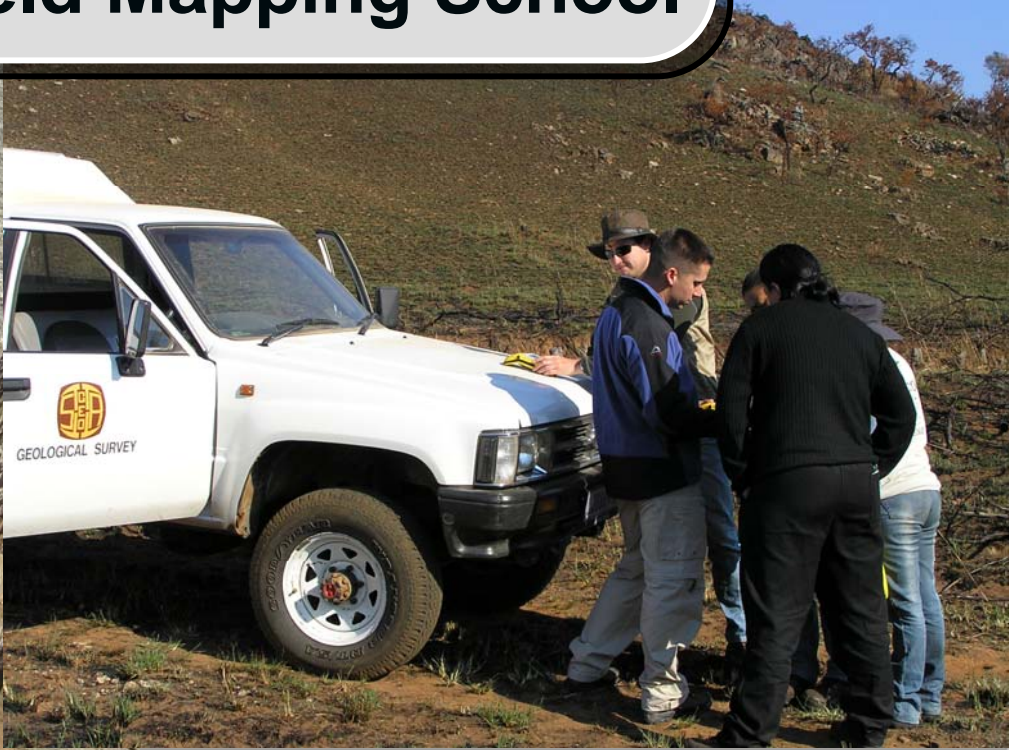
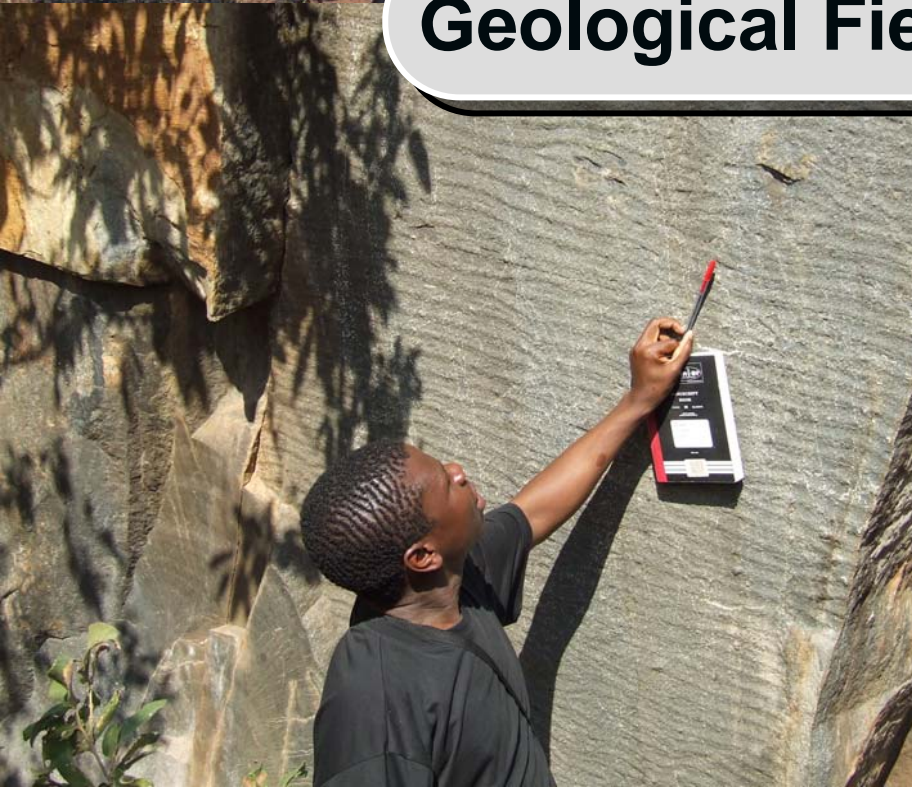
- Enhance mapping skills of young geologists
- One year full-time training at CGS Polokwane office
- *Will be expanded to include training of small-scale miners in all provinces*





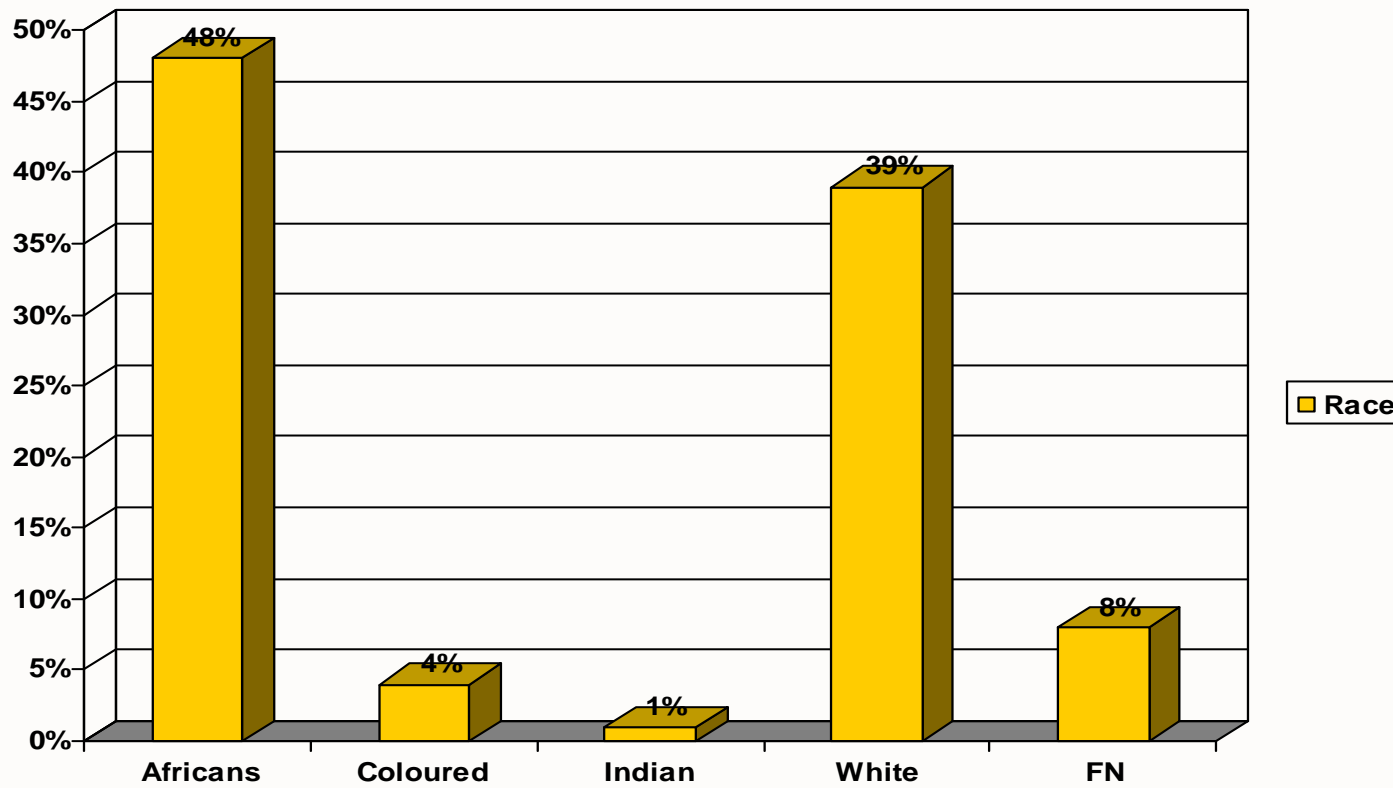


# Geological Field Mapping School



# Overall Demographic Profile by Race...

Current Status as at 31 March 2010

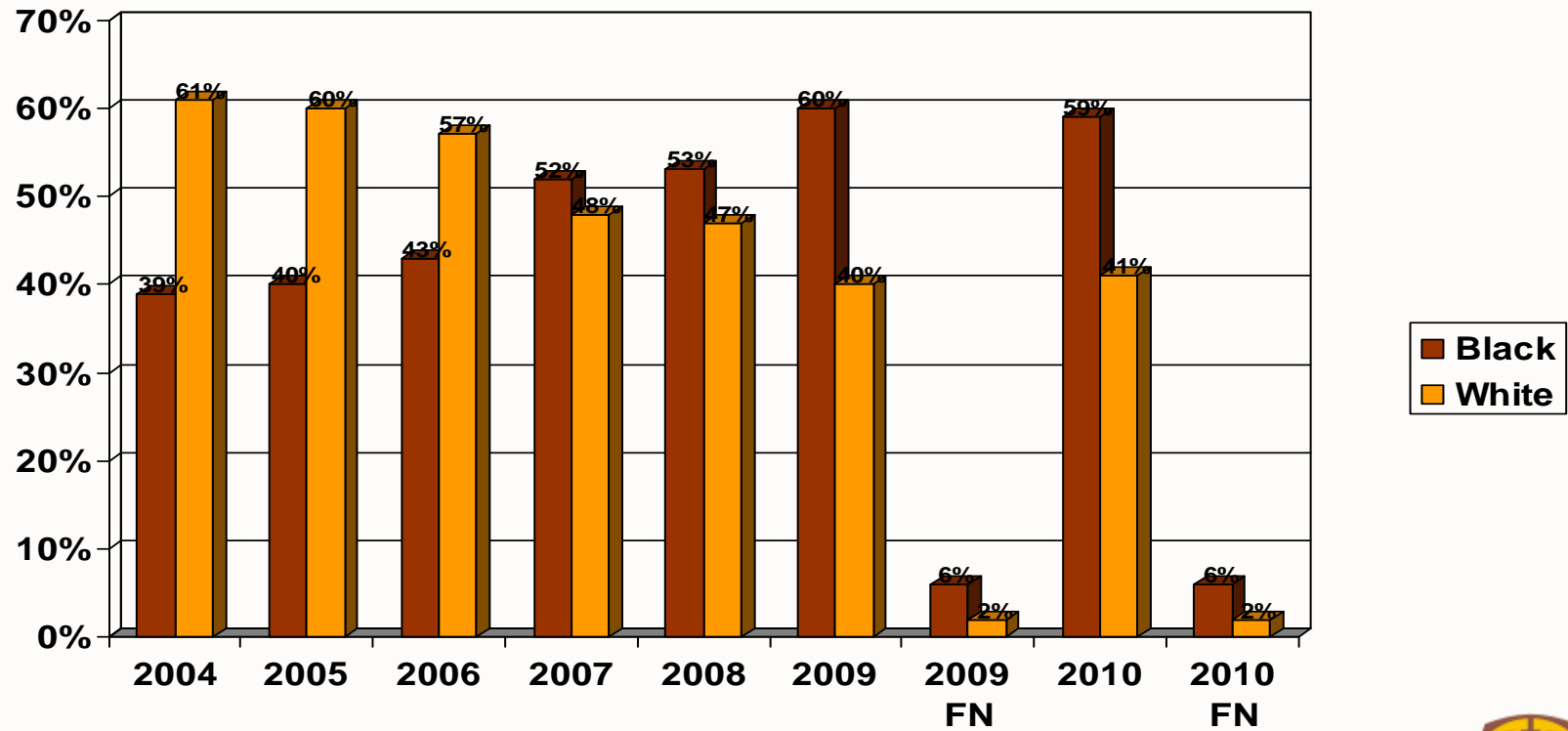


RSA Nationals: Blacks = 53% : White = 39% FN = Foreign Nationals (8%)



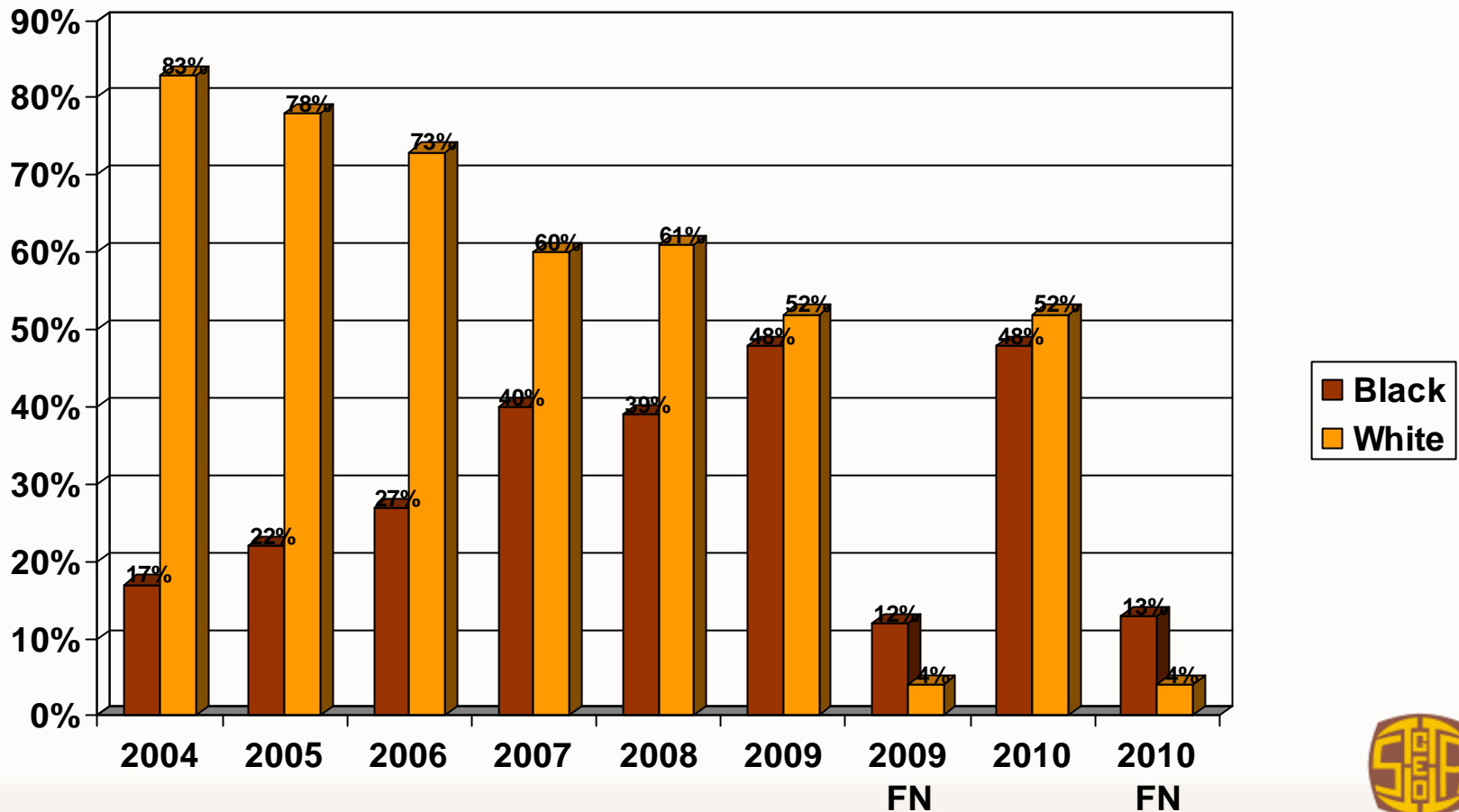
# Comparative Figures Staff Profile by Race...

Period – 2004 to 2010



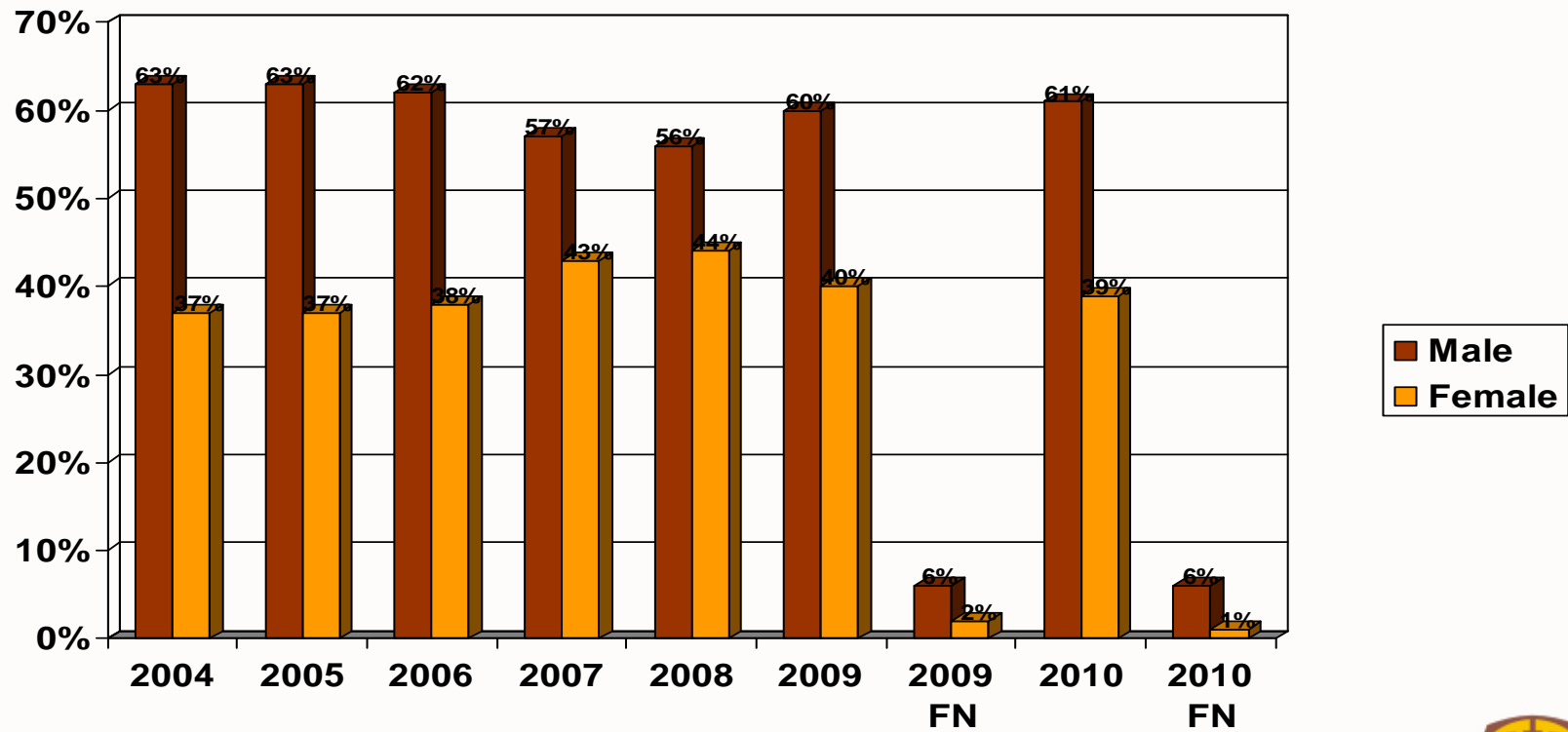
# Comparative Figures, Professional Job Category by Race...

Period – 2004 to 2010



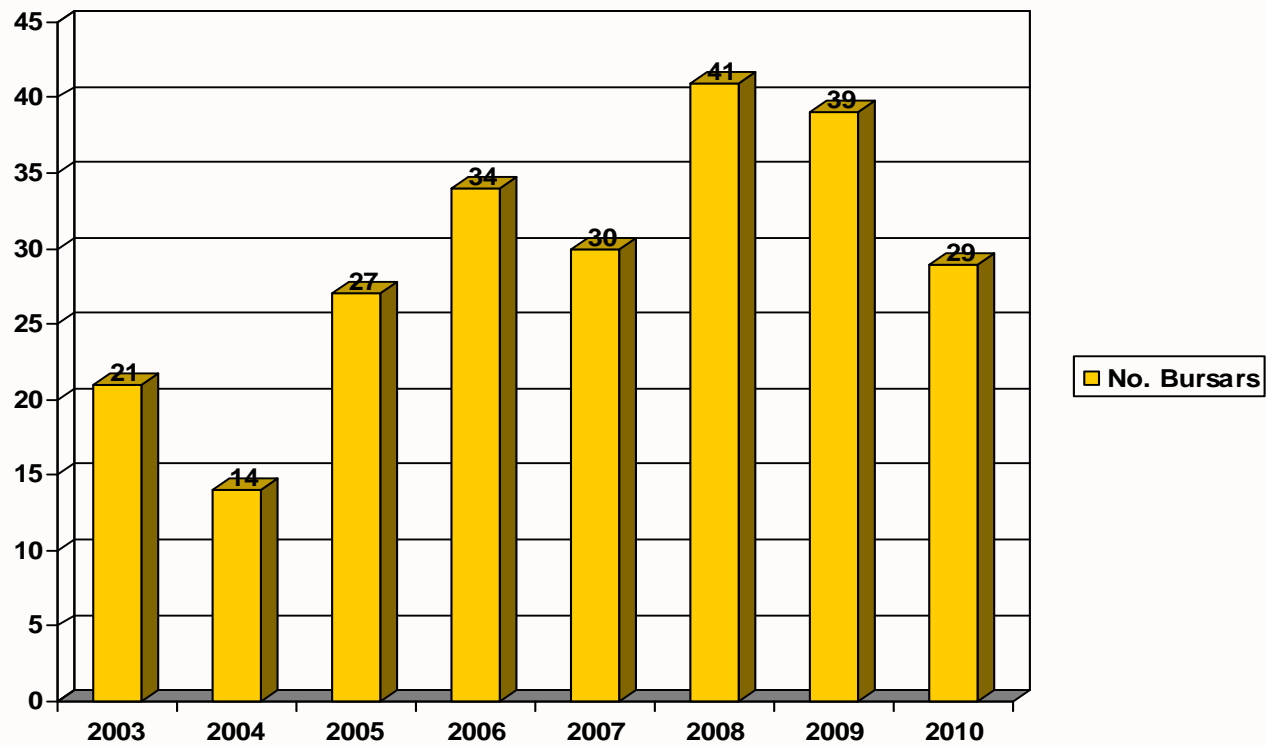
# Comparative Figures Staff Profile by Gender...

Period – 2004 to 2010



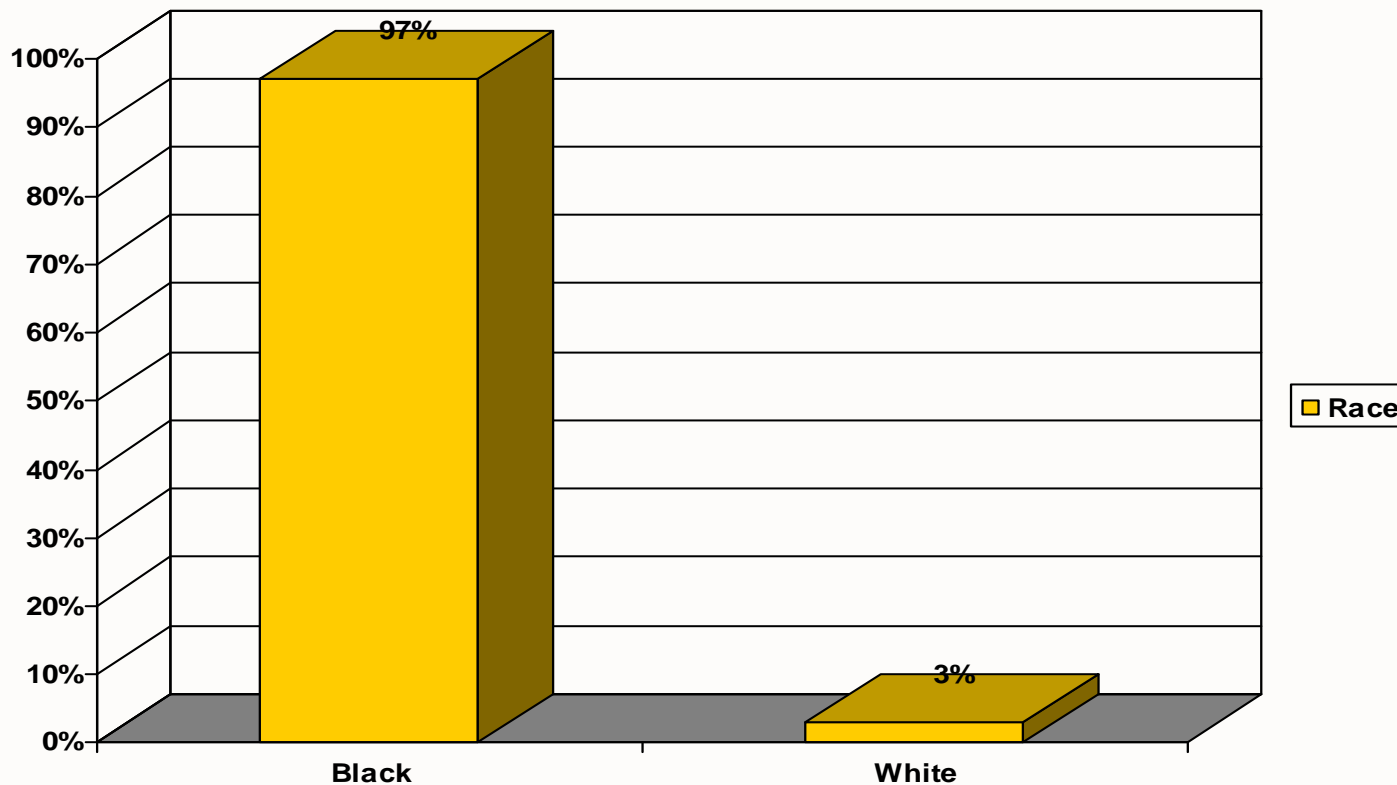
# Bursary Intake Analysis...

## Number of Bursars - 2003 to 2010



# Demographic Composition of Bursars by Race...

Period - 2009/2010 Financial Year

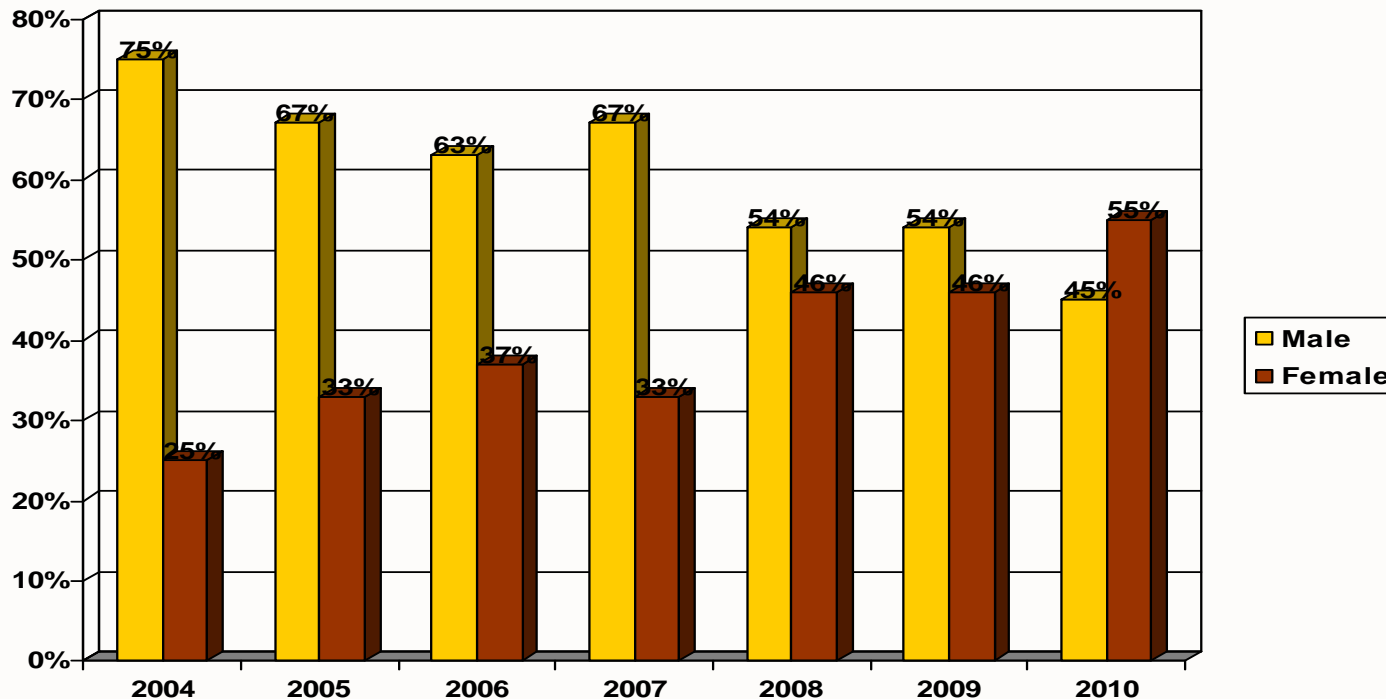


**Blacks = 97% : White = 3%**



# Demographic Composition of Bursars by Gender...

Period - 2004 to 2010





# KEY CHALLENGES : INTERNAL

- **Economic Crisis**

- **The crisis has had a negative impact in terms of revenue and cash flow**
- **We are currently working on a turnaround strategy**

- **AGEING EQUIPMENT**

- **Some instruments are 30 years old – Need to be replaced at huge costs**
- **Recapitalization and maintenance is needed**



# KEY CHALLENGES : INTERNAL

- **Lack of Resources**
  - **Not enough funds to perform the necessary research**
- **Implementation of the Act**
  - **Geoscience Amendment Bill was recently released for public comments. Its implementation is critical**



# KEY CHALLENGES – EXTERNAL

- **Reactivating exploration in South Africa**
- **Addressing environmental issues associated with mining and land usage**



**Thank You**

***Geosciences for  
Development***

