Spatial Statistical Geography

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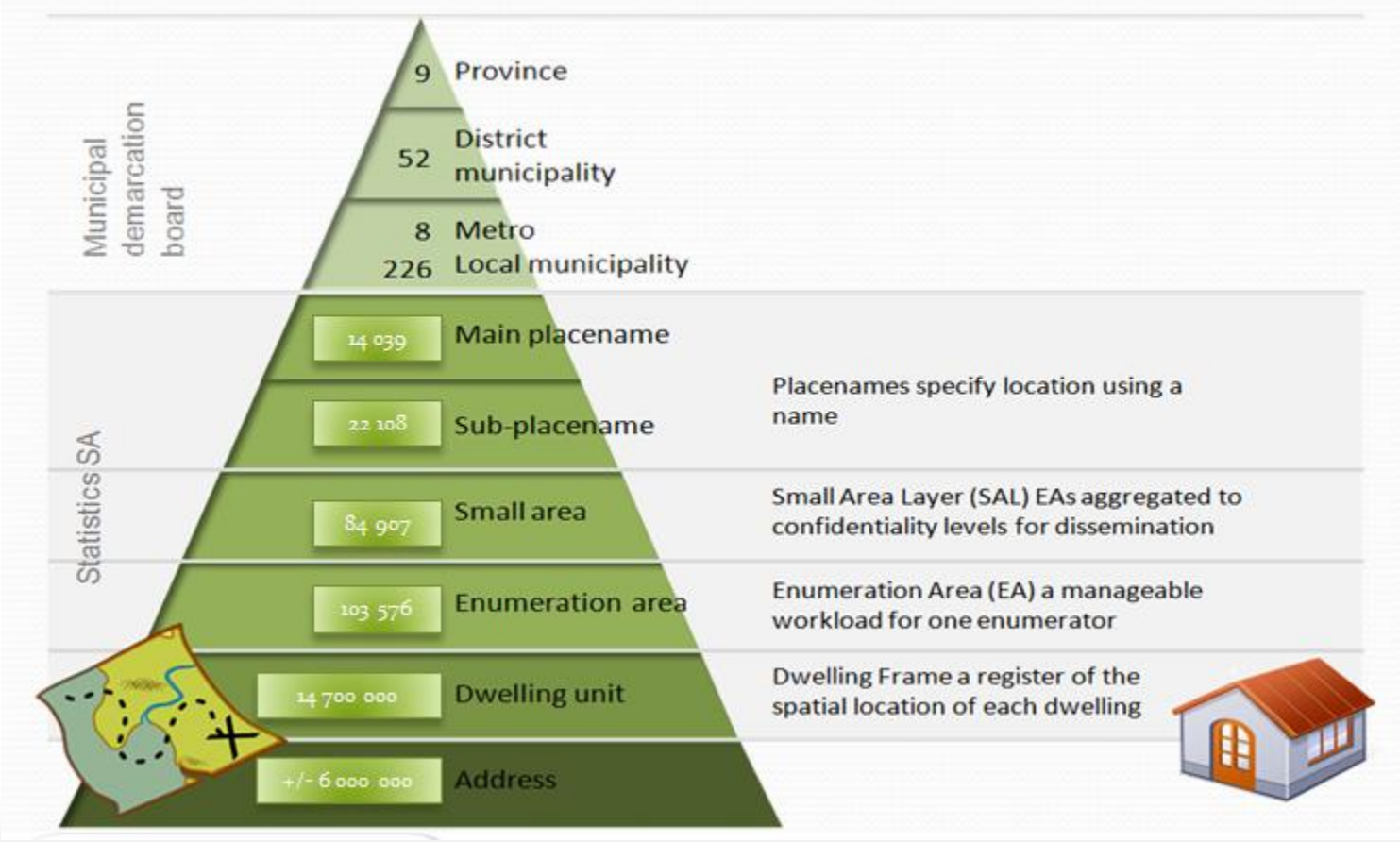
Spatial Analyst
ISIbalo July 2016

What you need to understand

- The world around you
  - Importance of Location and Geographic Space
  - Intelligence of StatsSA geographic layers

- Understanding Scale
  - Modifiable areal unit problem (MAUP)
  - Generalization
  - Inaccurate results

Stats SA Geography

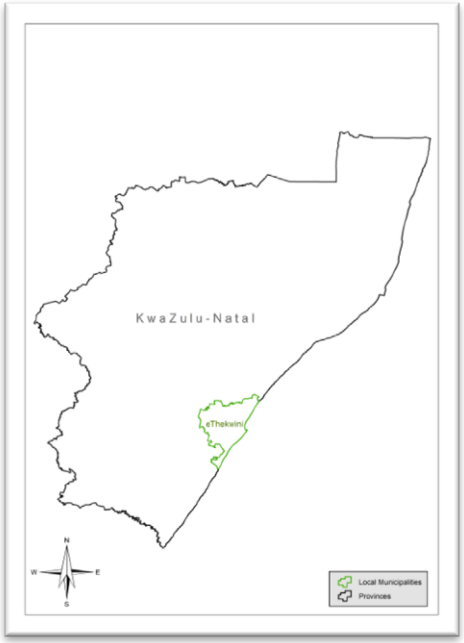


How are the Layers Intelligent

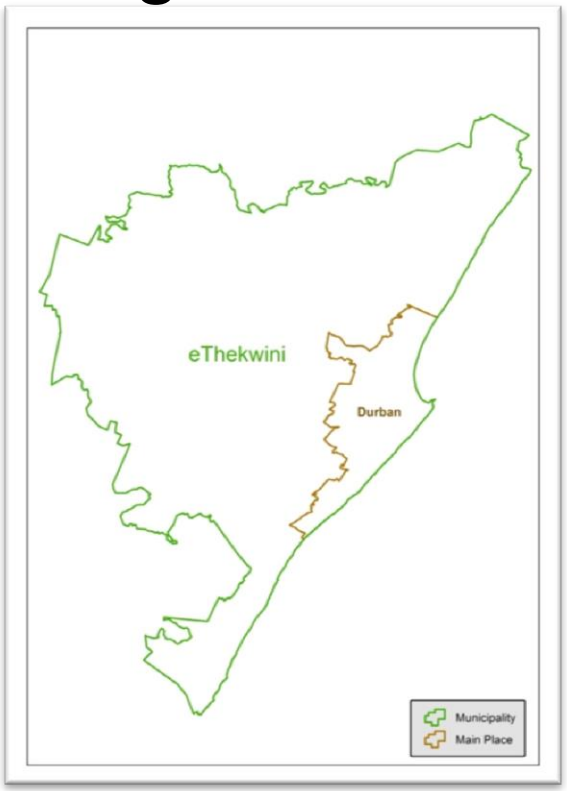
- Latest aerial photography and satellite imagery
- Remote sensing techniques
- Coded & Guided by a precise set of rules and regulations – Landuse
- Dwelling frame points
- Follow administrative boundaries

Atteridgeville Ext 3, 7

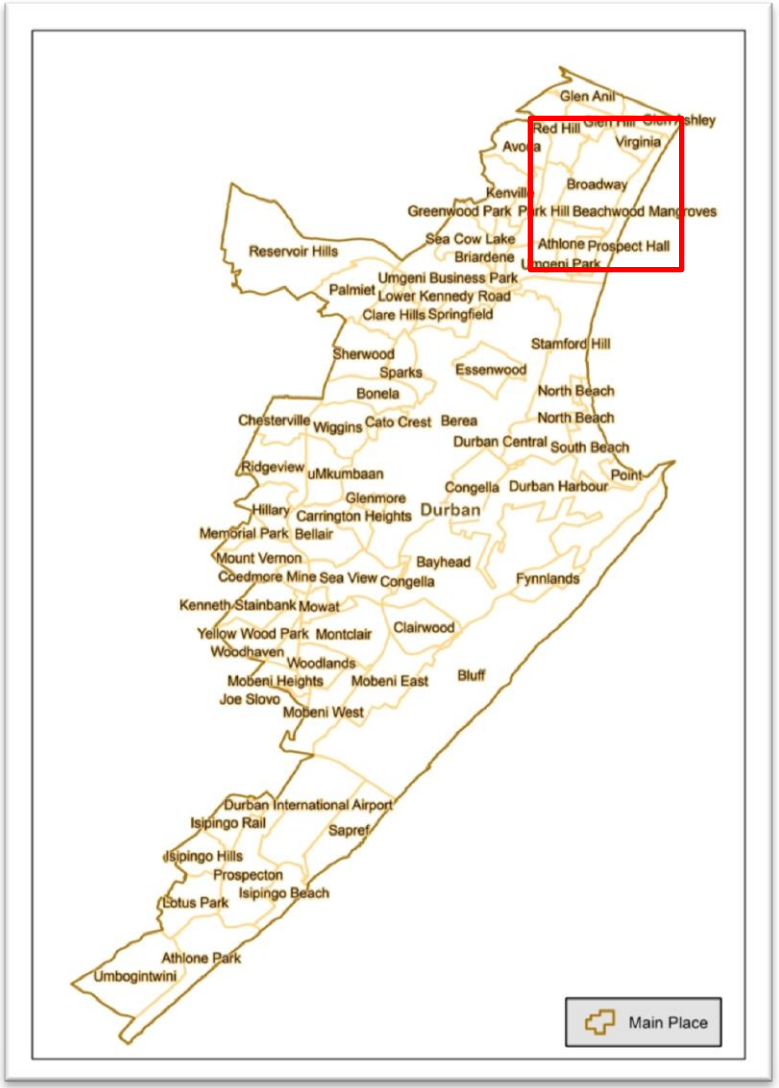
Understanding Scale



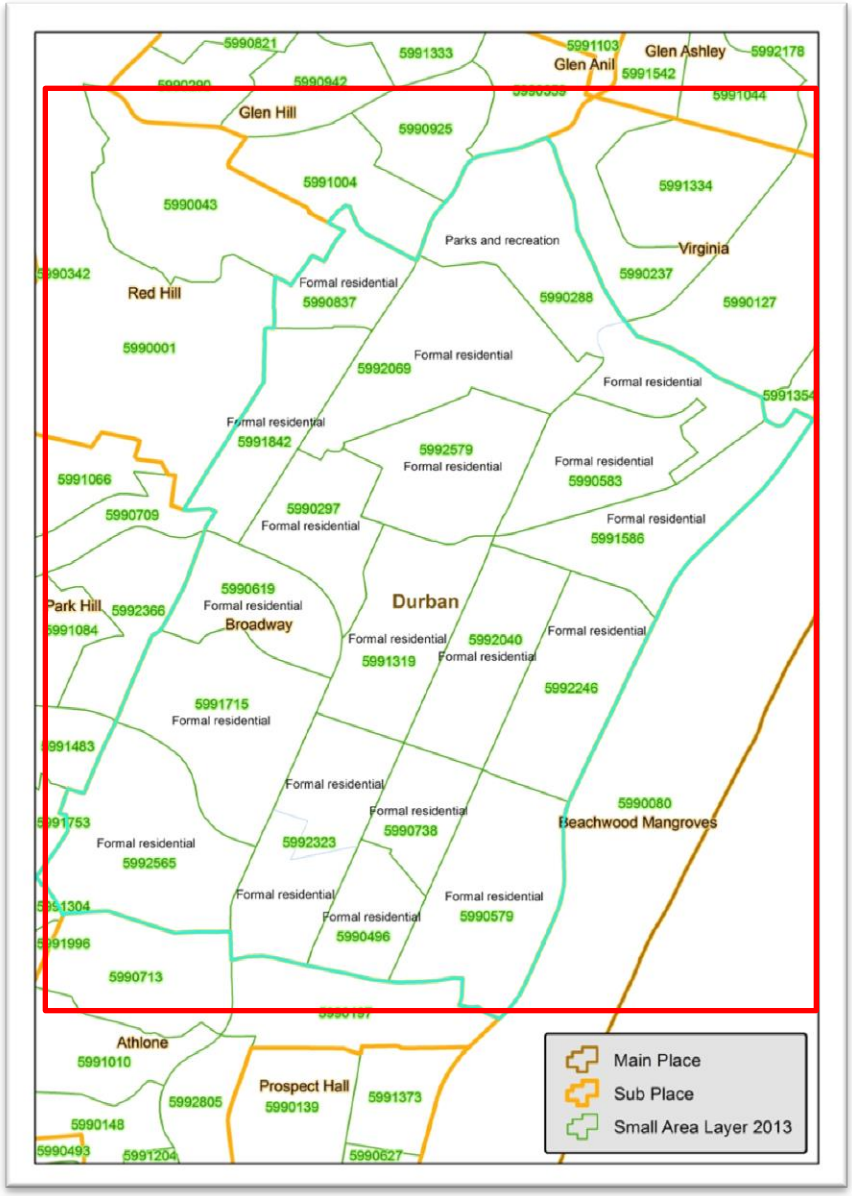
1 out of 9
Provinces



1 out of 51
Municipalities
in KZN



1 out of 197
Main Places in Ethekwini



1 out of 71 Sub Places in Durban

1 out of 18 Small Area layers in Broadway

5990290
5991333
5991103
5991542
5990942
5990359
5991044
5992178
5990925
5991436
5991004
5991334
5990043
5990237
5990837
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5990127
5990001
5992069
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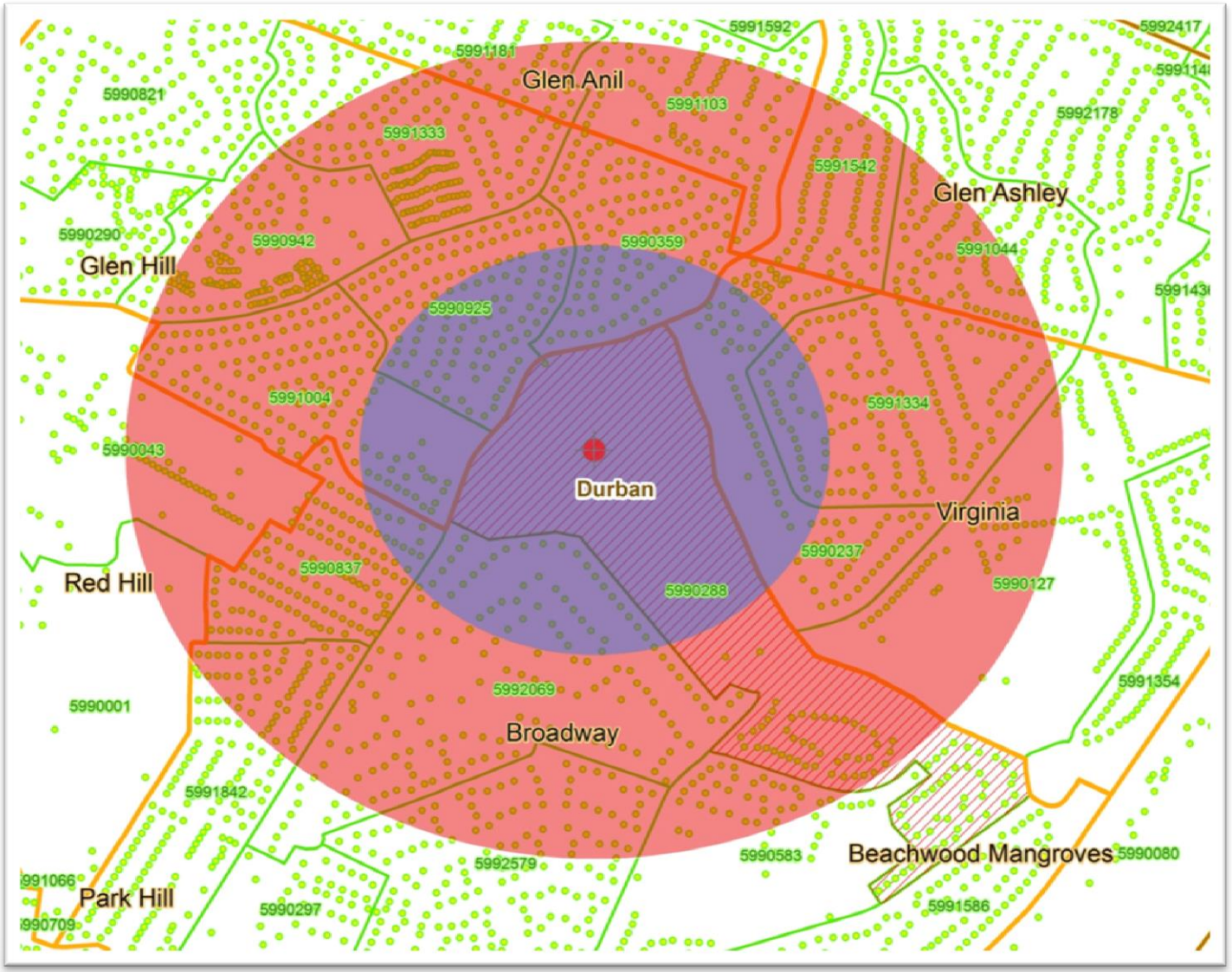
5991842
5992579
5990583
5990080
5990297
5991586


Glen Anil
Glen Ashley
Glen Hill
Durban
Virginia
Red Hill
Broadway
Park Hill
Beachwood Mangroves
5990821
5991181
5991592
5992417
5991333
5991103
5991542
5992178
5990290
5990942
5990359
5991044
5990925
5991004
5991334
5990043
5990837
5990237
5990127
5990288
5991354
5990001
5992069
5991842
5990583
5990080
5992579
5990297
5991586
5991066
5990709

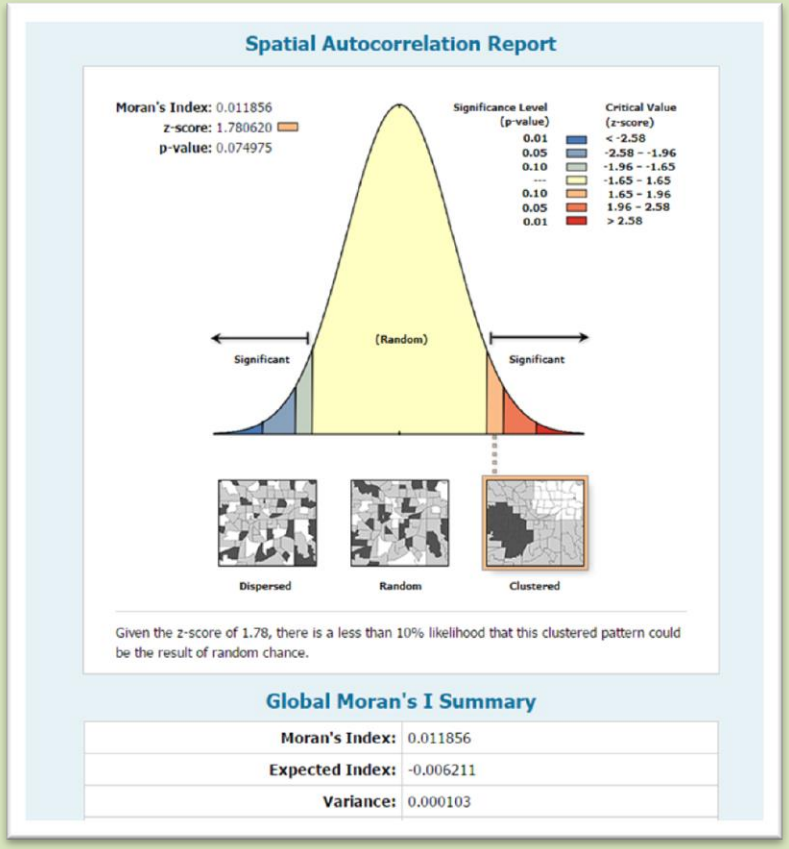
How we may assist you in research

- Understanding Space –Area of Interest
- Understanding Statistics – Characteristics of your AOI
- Integration of Space and Statistics
- Relationships between Space & Statistics
  - Cluster Analysis
  - Hot Spot Analysis
  - Cluster & Outlier Analysis

How we may assist you in research

- Analysing Patterns in your Data
  - Spatial Auto Correlation (Morans I)
- Mapping Clusters
  - Hot Spot Analysis (Getis –Ord Gi*)
  - Cluster and Outlier Analysis (Anselin Local Morans)
- Mapping Geographic Distributions
  - Directional Distribution (Standard deviational elipse)

- Analysing Patterns in your Data
  - Spatial Auto Correlation (Morans I)



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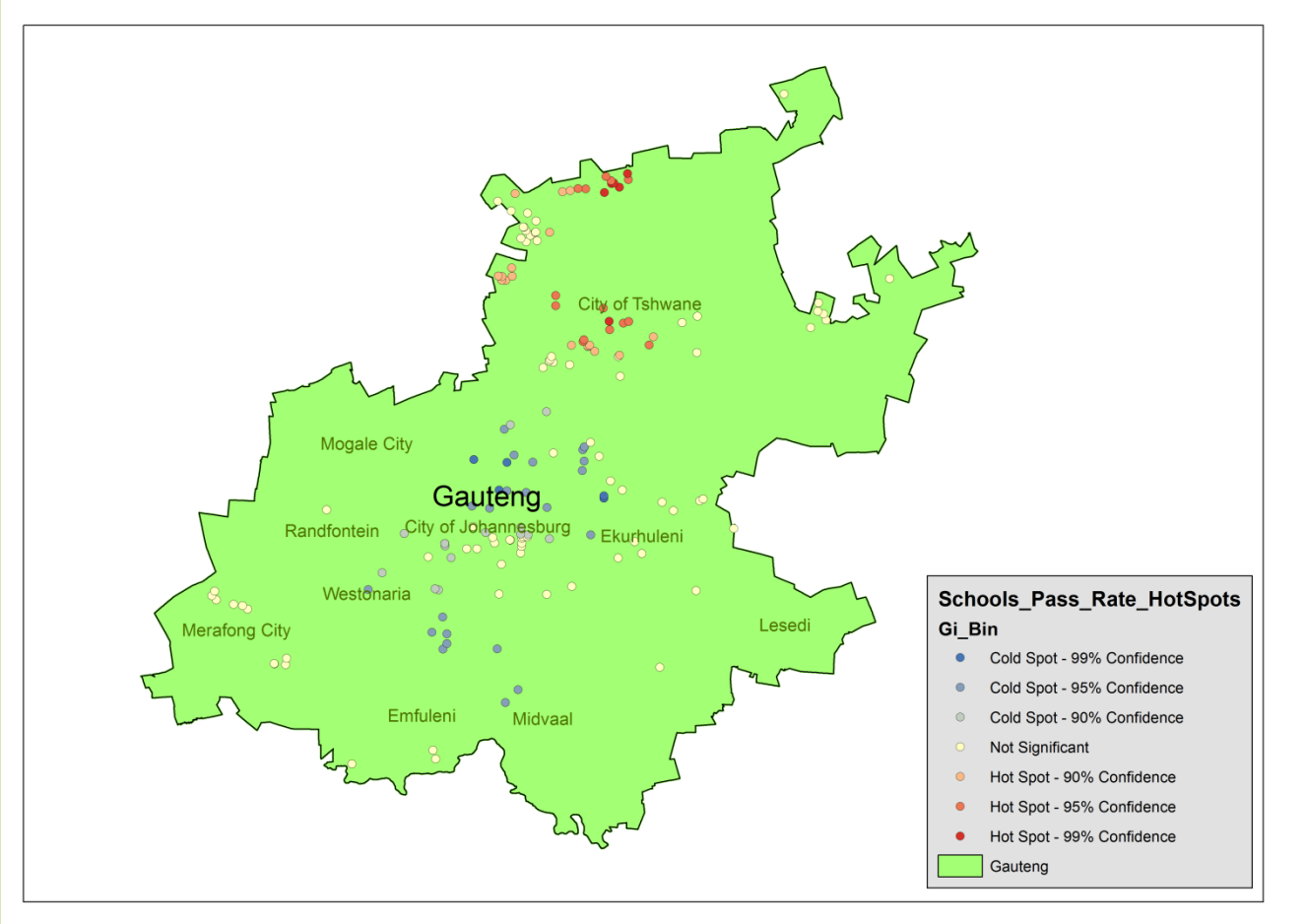

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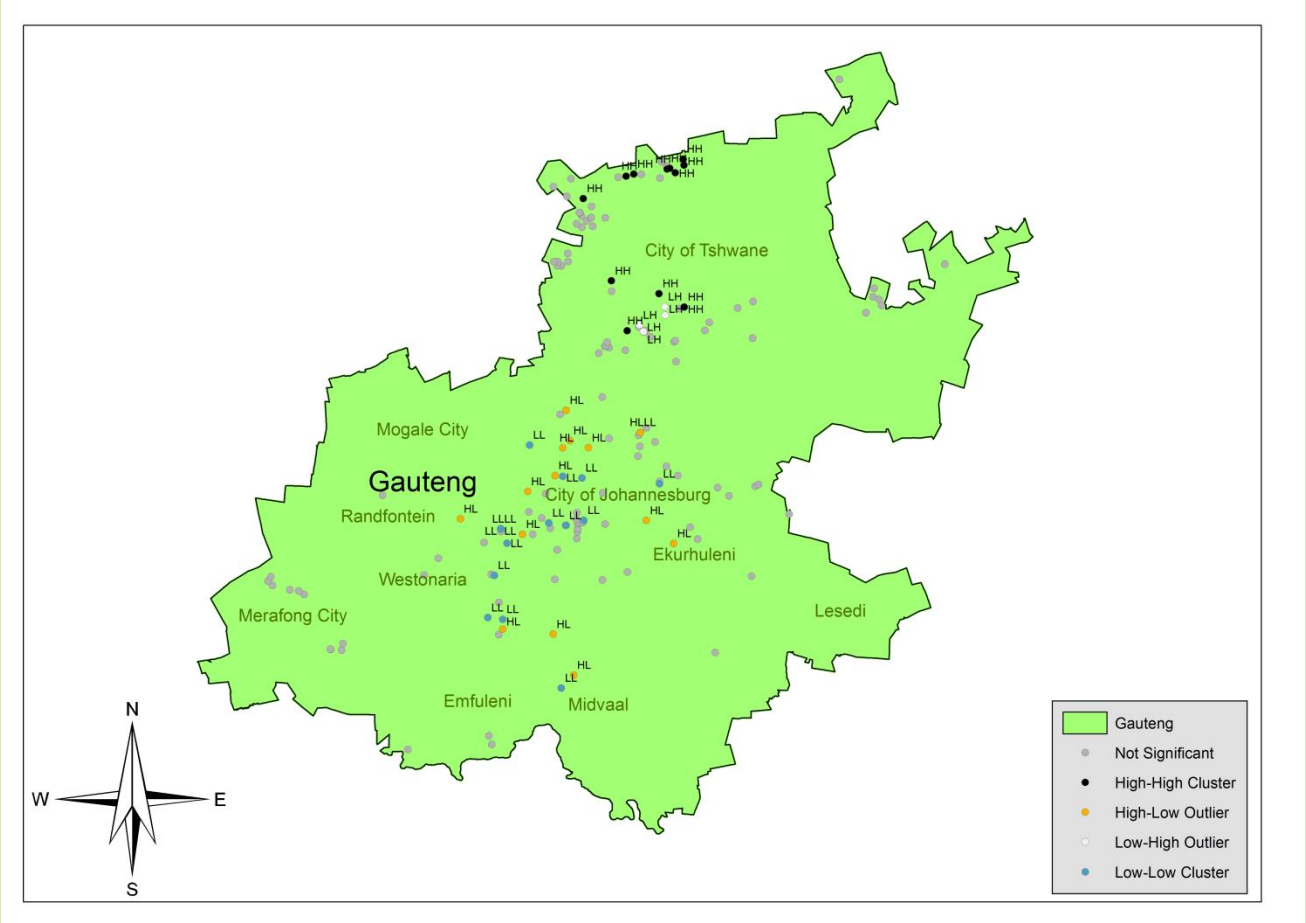
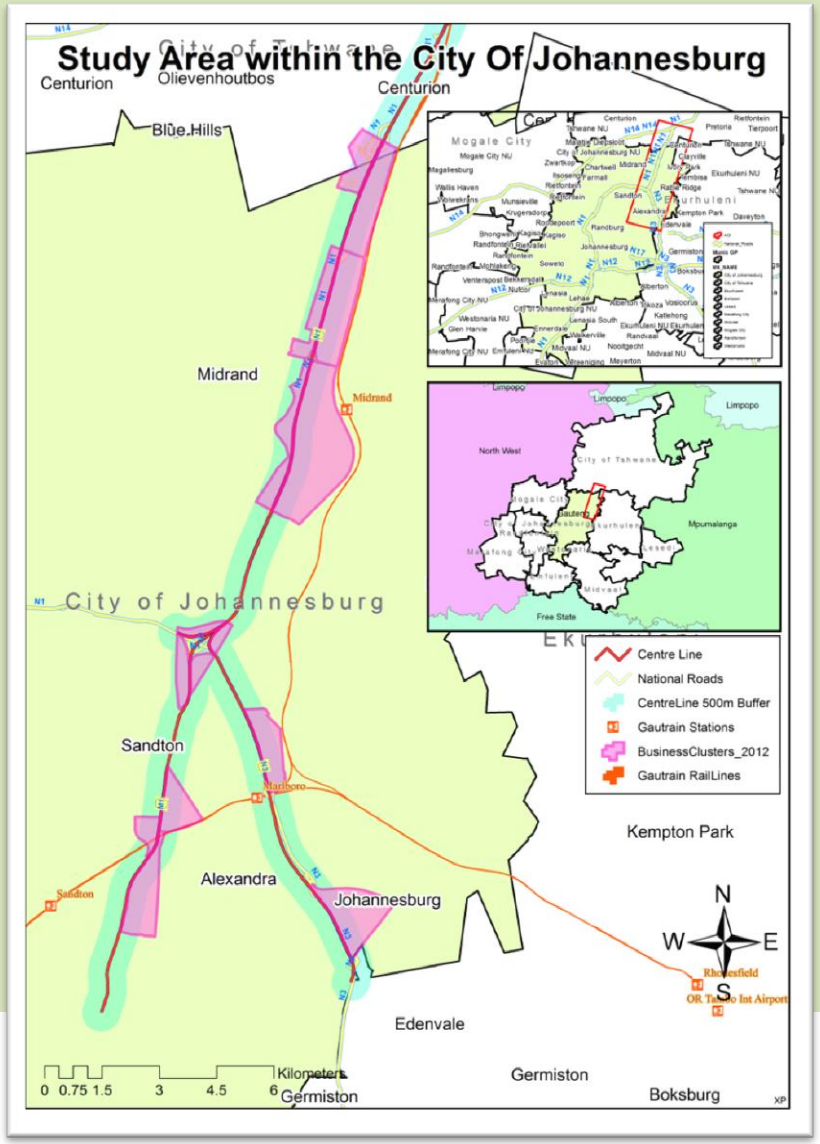
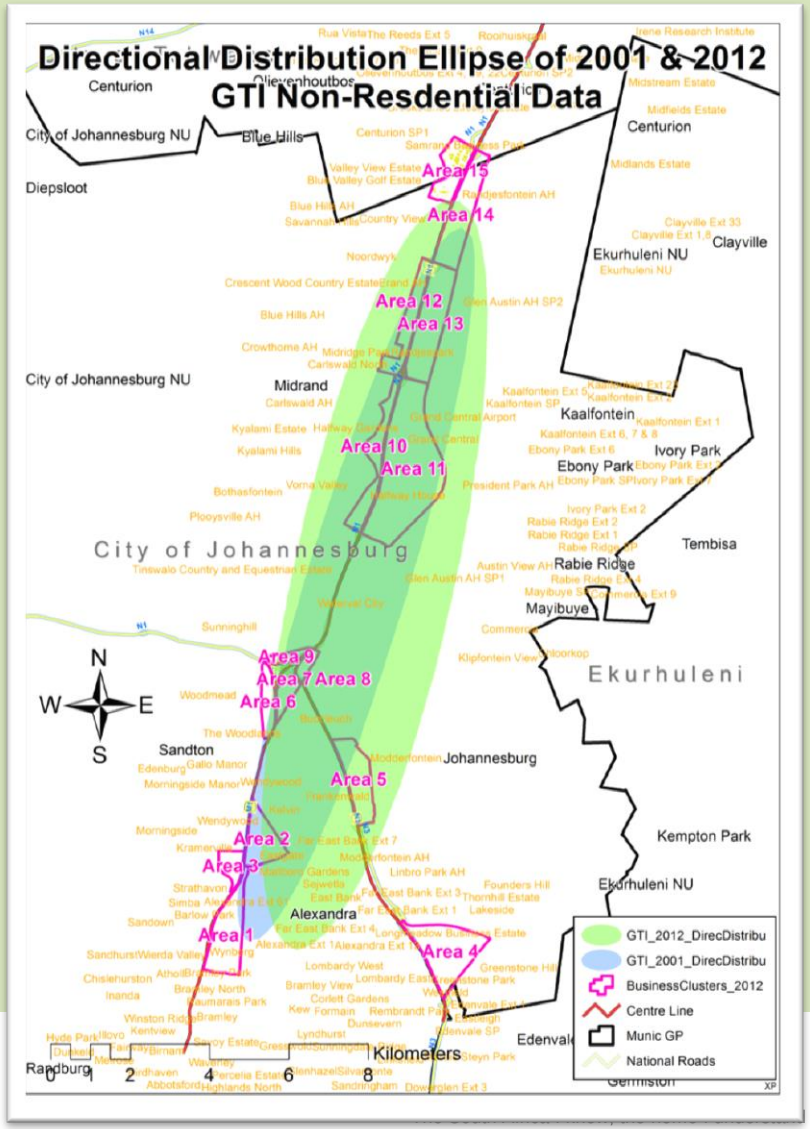
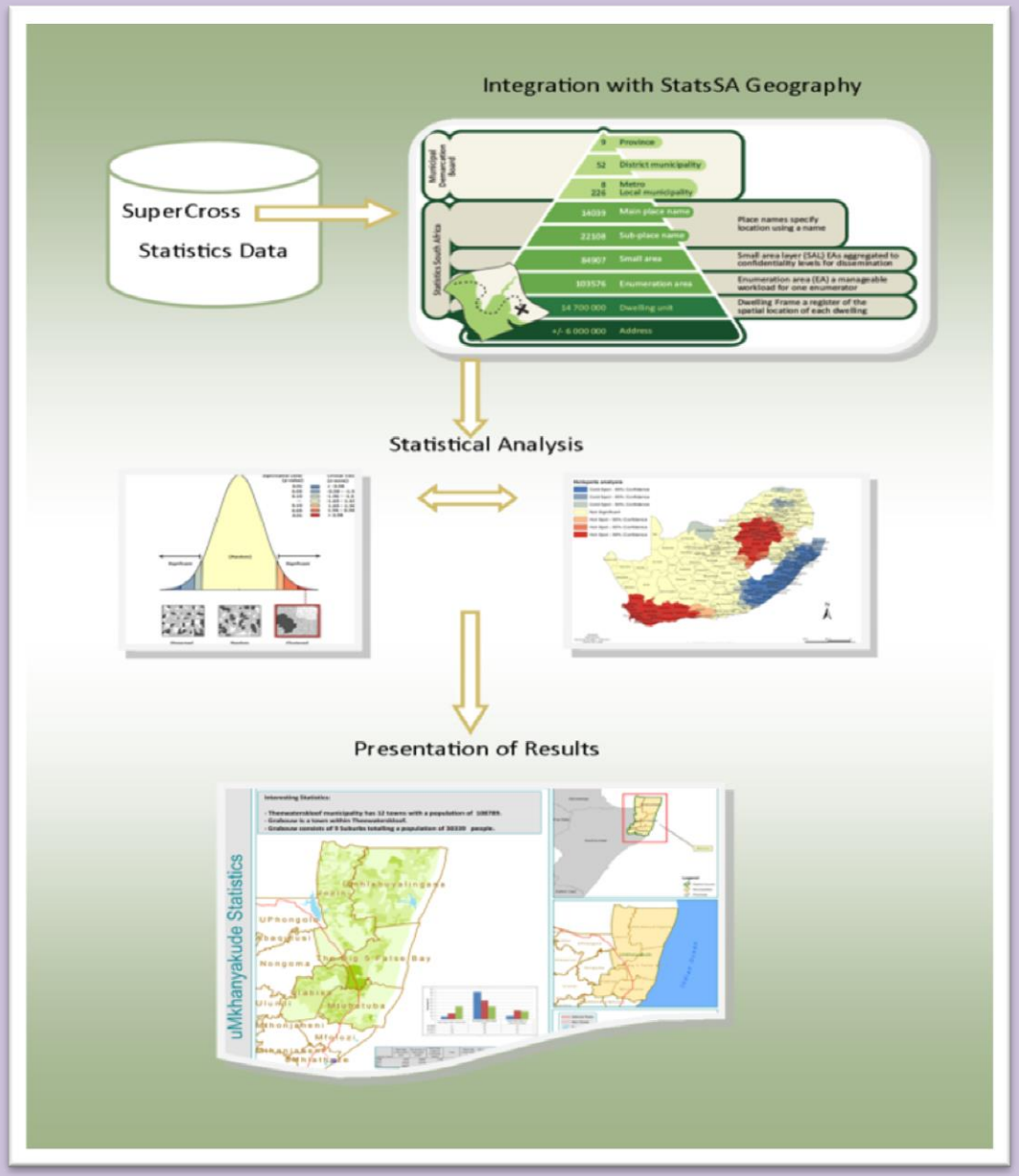


- Mapping Geographic Distributions
  - Directional Distribution (Deviational ellipse)



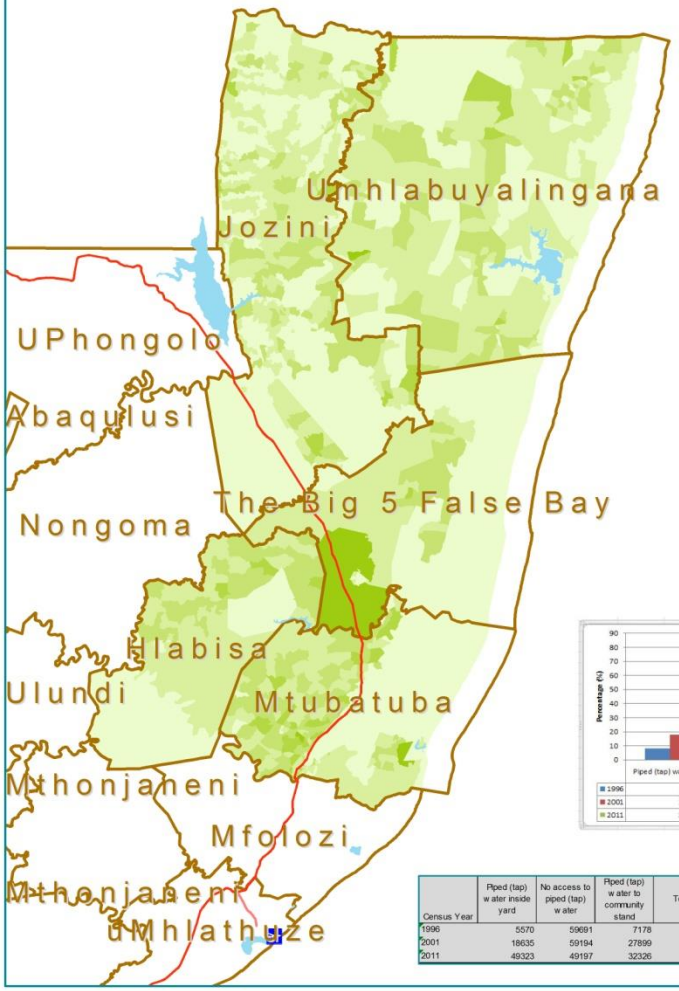


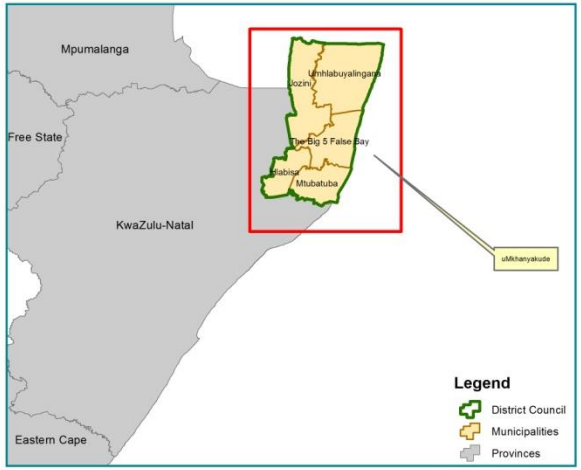

Integration with StatsSA Geography
SuperCross
Statistics Data
9 Province
52 District municipality
8 Metro
226 Local municipality
14039 Main place name
22308 Sub-place name
84907 Small area
103576 Enumeration area
14 700 000 Dwelling unit
+/- 6 000 000 Address
Place names specify location using a name
Small area layer (SAL) EAs aggregated to confidentiality levels for dissemination
Enumeration area (EA) a manageable workload for one enumerator
Dwelling Frame a register of the spatial location of each dwelling
Statistical Analysis
Presentation of Results
uMkhanyakude Statistics

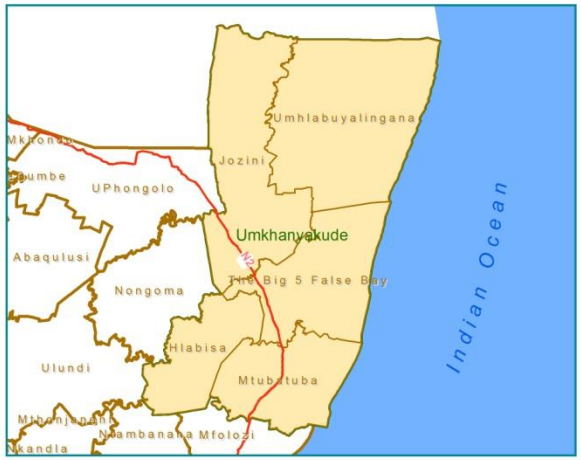
uMkhanyakude Statistics

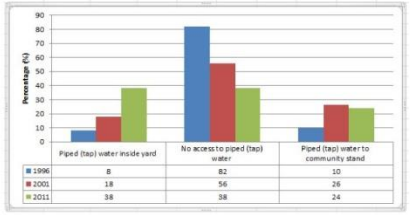
Interesting Statistics:

- **Theewaterskloof municipality has 12 towns with a population of 108789.**
- **Grabouw is a town within Theewaterskloof.**
- **Grabouw consists of 9 Suburbs totalling a population of 30339 people.**

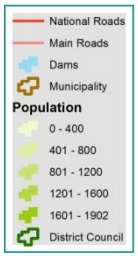








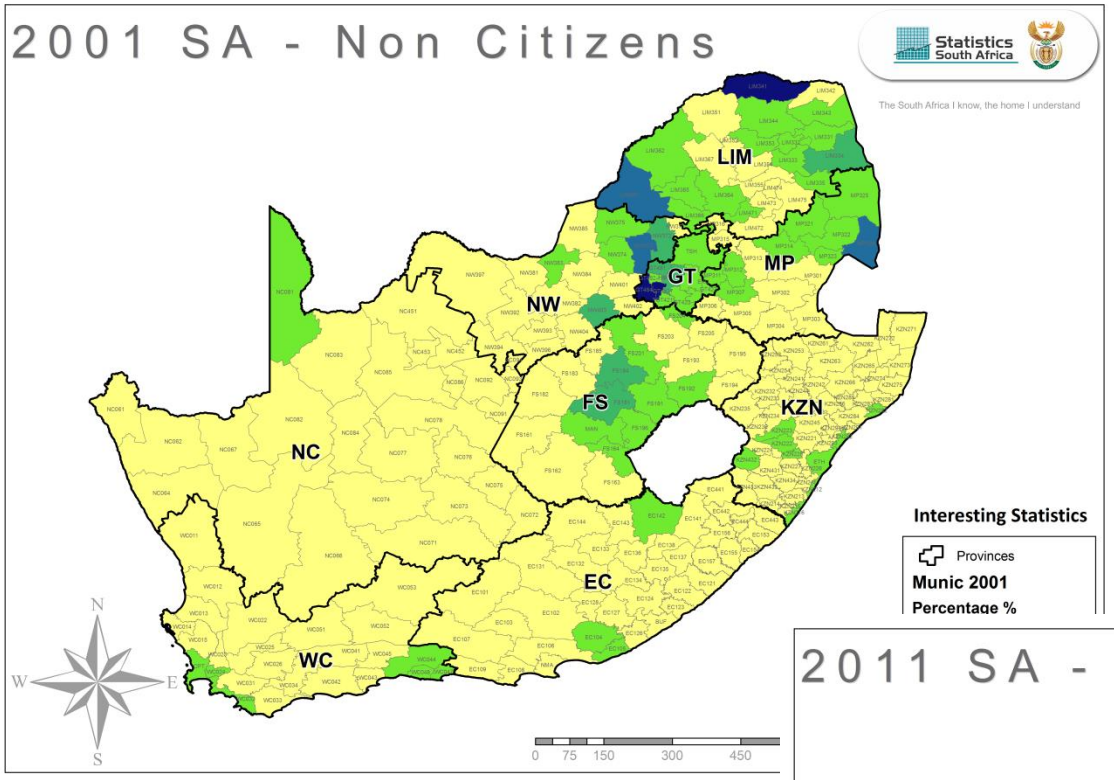
Census Year	Piped (tap) water inside yard	No access to piped (tap) water	Piped (tap) water to community stand	Total	Piped (tap) water inside yard	No access to piped (tap) water	Piped (tap) water to community stand	Total
1996	5570	59691	7178	72439	8	82	10	100
2001	18635	59194	27899	105727	18	56	26	100
2011	49323	49197	32326	130846	38	38	24	100

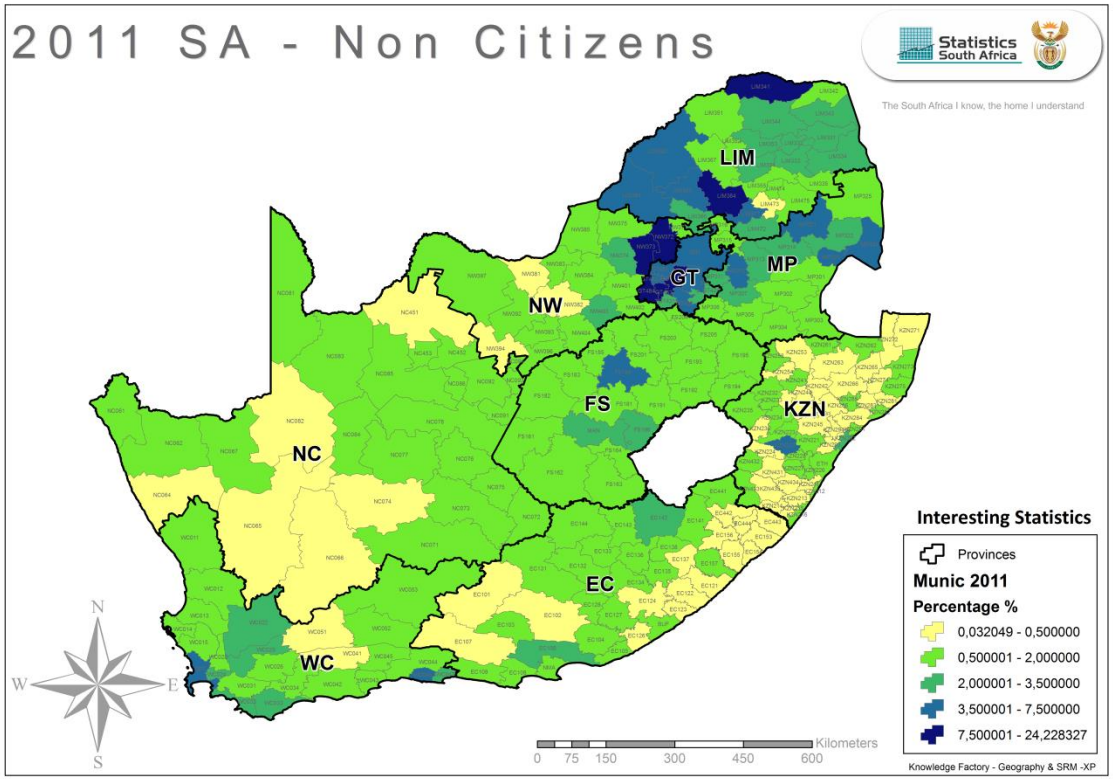


Created by Geo-Frames - XP
Date: 2 February 2015

Statistics South Africa

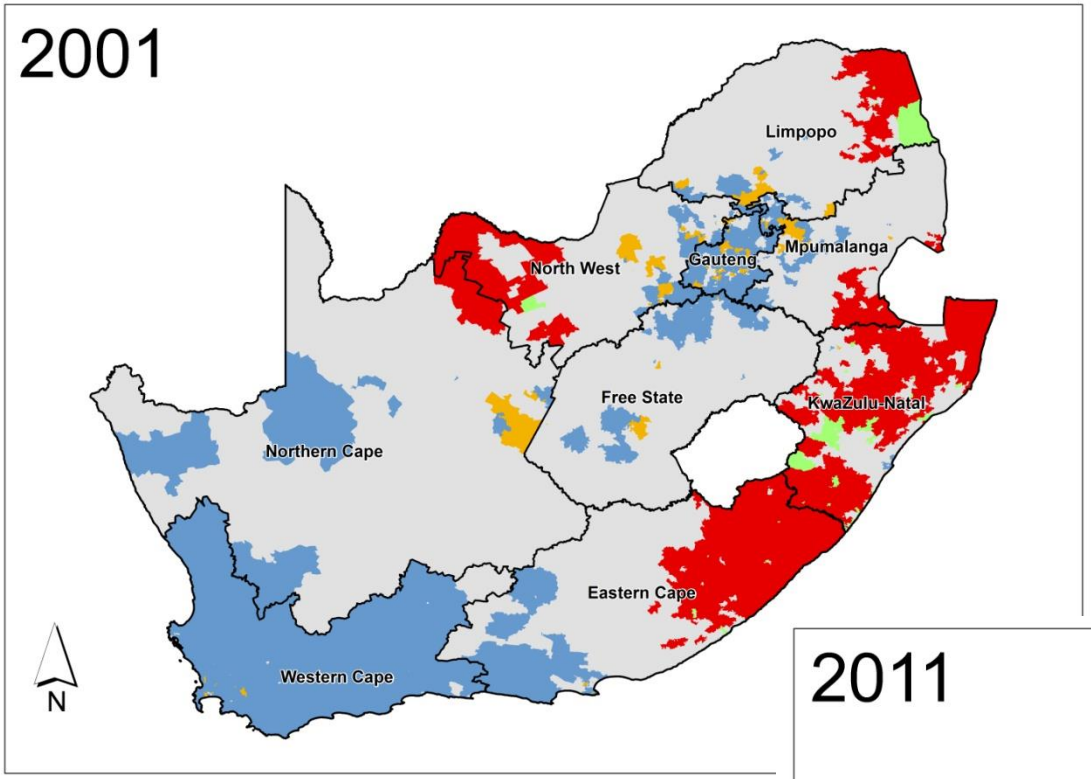
The South Africa I know, the home I understand

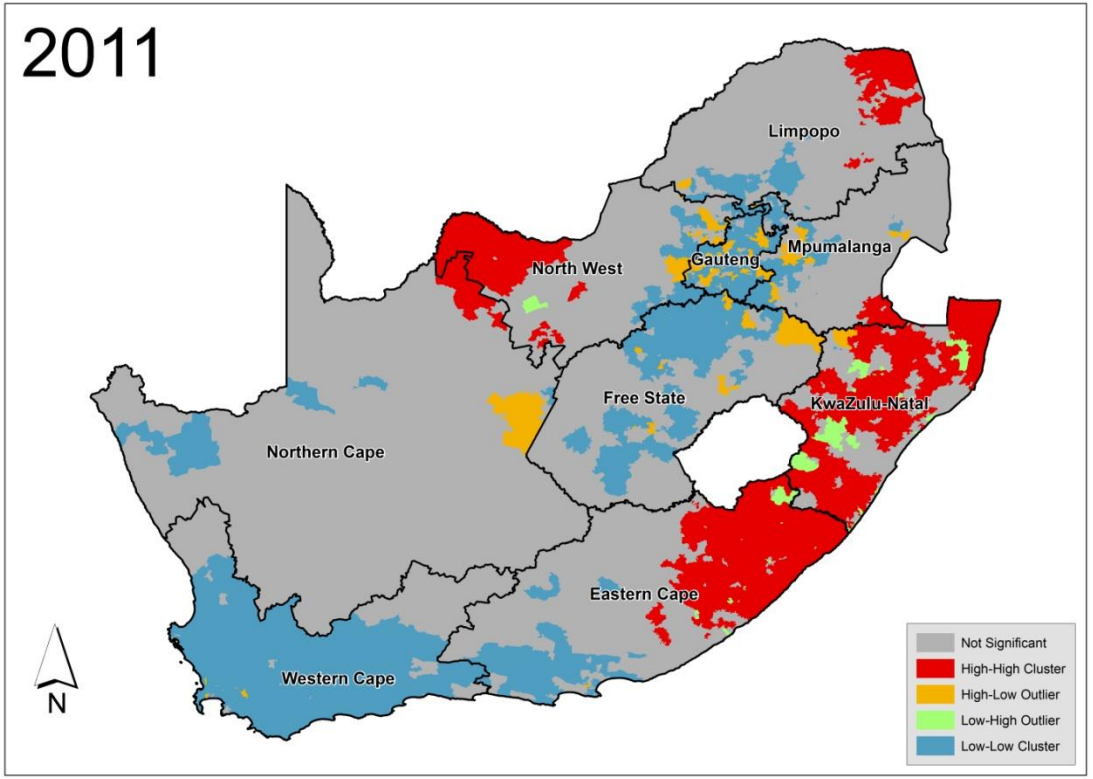




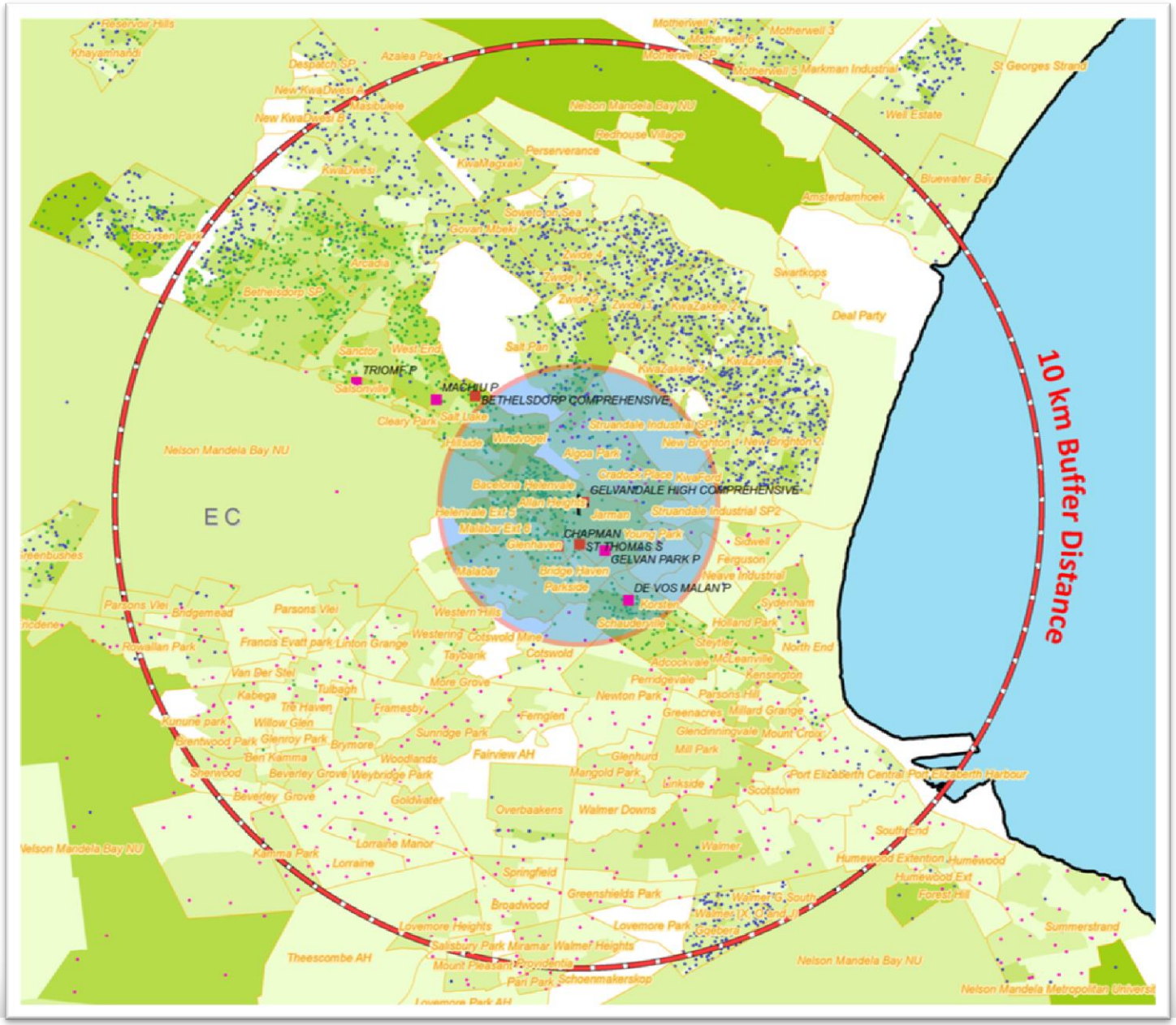
Statistics South Africa

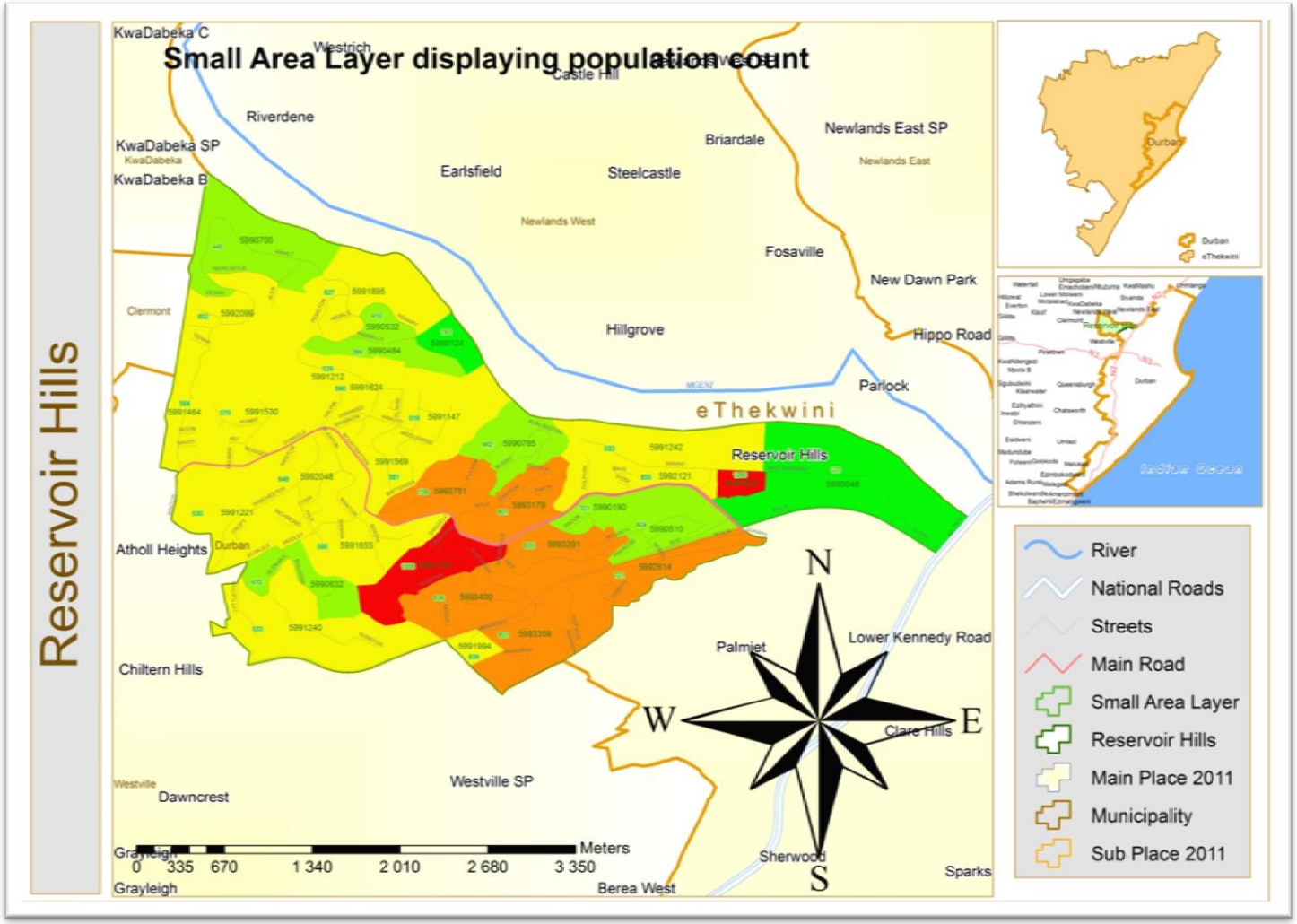
Multidimensional Poverty Index

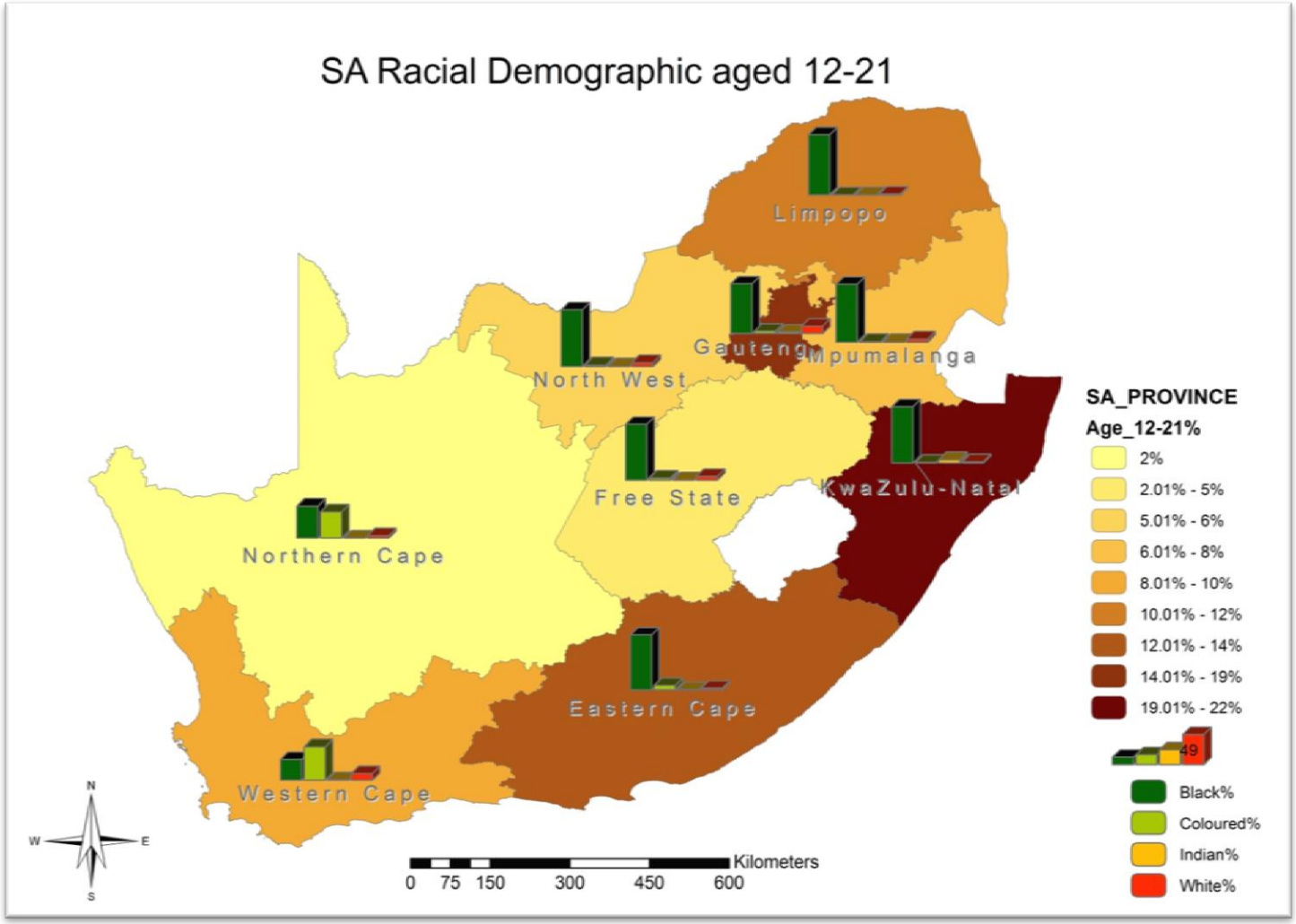


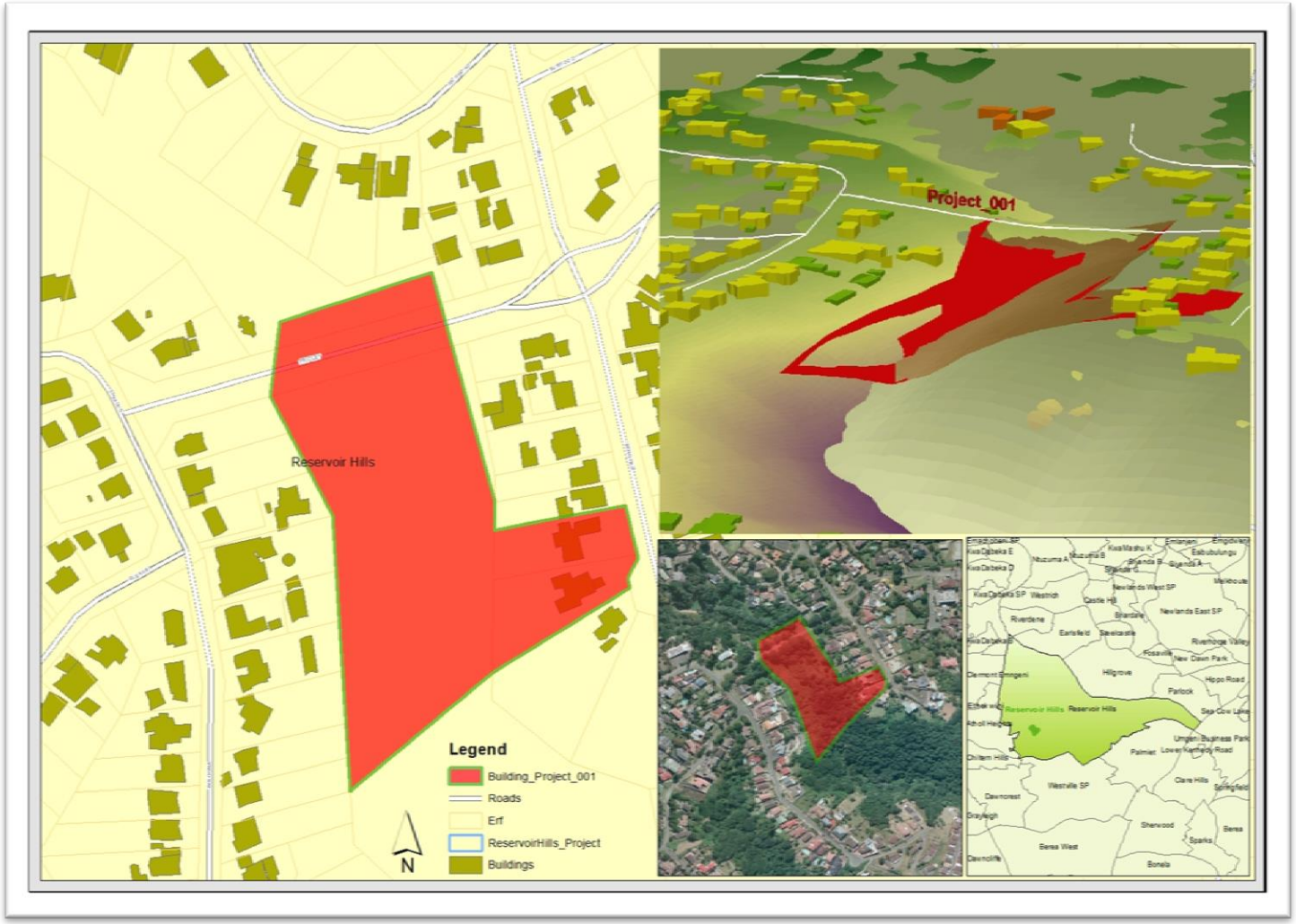


Statistics South Africa


10 km Buffer Distance
TRIOMF P
MACHIU P
BETHELSDORP COMPREHENSIVE
GELVANDALE HIGH COMPREHENSIVE
CHAPMAN
ST THOMAS S
GELVAN PARK P
DE VOS MALAN P
EC
Nelson Mandela Bay NU
Nelson Mandela Bay NU
Nelson Mandela Bay NU
Nelson Mandela Metropolitan Universit
Port Elizabeth Central
Port Elizabeth Harbour
Fairview AH
Theescombe AH
Lovemore Heights
Lovemore Park
Walmer Heights
Salisbury Park
Miramar
Mount Pleasant
Providentia
Pari Park
Schoenmakerskop
Lovemore Park AH
Walmer Downs
Overbaakens
Goldwater
Woodlands
Weybridge Park
Beverley Grove
Sunridge Park
Mangold Park
Glenhurd
Mill Park
Linkside
Scotstown
Greenacres
Millard Grange
Glendinningvale
Mount Croix
Newton Park
Parsons Hill
Perridgevale
Adcockvale
McLearnville
Kensington
Steytler
North End
Holland Park
Schauderville
Korsten
Sydenham
Neave Industrial
Ferguson
Sidwell
Struandale Industrial SP2
Struandale Industrial SP1
Algoa Park
Windvogel
Salt Lake
Salt Pan
Cleary Park
Salsonville
Sanctor
West End
Arcadia
Bethelsdorp SP
Doorsen Park
Govan Mbeki
Swartkops
Deal Party
Amsterdamhoek
Bluewater Bay
Well Estate
St Georges Strand
Markman Industrial
Motherwell 5
Motherwell 3
Motherwell 6
Motherwell SP
Motherwell 7
Redhouse Village
Perserverance
KwaMagxaki
KwaDwesi
New KwaDwesi A
New KwaDwesi B
Masibulele
Azalea Park
Despatch SP
Khayamnandi
Reservoir Hills
Parsons Vlei
Bridgemead
Rowallan Park
Francis Evatt park
Linton Grange
Taybank
Cotswold
Western Hills
Van Der Stel
Kabega
Tulbagh
Tre Haven
Willow Glen
Framesby
More Grove
Ferrglen
Kunune park
Brentwood Park
Glenroy Park
Brymore
Ben Kamma
Sherwood
Beverley Grove
Beverley Grove
Kamma Park
Lorraine Manor
Lorraine
Springfield
Broadwood
Greenshields Park
Walmer
Humewood Extention
Humewood
Humewood Ext
Forest Hill
Summerstrand
Walmer G South
Walmer IX O and J
Gqebera
Nelson Mandela Bay NU


Reservoir Hills
Small Area Layer displaying population count
KwaDabeka C
Westrich
Castle Hill
Riverdene
KwaDabeka SP
KwaDabeka
KwaDabeka B
Earlsfield
Steelcastle
Briardale
Newlands East SP
Newlands East
Newlands West
Fosaville
New Dawn Park
Clermont
Hillgrove
Hippo Road
Parlock
eThekwini
Reservoir Hills
Atholl Heights
Durban
Chiltern Hills
Palmiet
Lower Kennedy Road
Clare Hills
Westville
Dawncrest
Westville SP
Grayleigh
Sherwood
Berea West
Sparks
N
W
E
S
0 335 670 1 340 2 010 2 680 3 350 Meters
River
National Roads
Streets
Main Road
Small Area Layer
Reservoir Hills
Main Place 2011
Municipality
Sub Place 2011
Durban
eThekwini
Indian Ocean


SA Racial Demographic aged 12-21
Limpopo
North West
Gauteng
Mpumalanga
Free State
KwaZulu-Natal
Northern Cape
Eastern Cape
Western Cape
N
W
E
S
0 75 150 300 450 600
Kilometers
SA_PROVINCE
Age_12-21%
2%
2.01% - 5%
5.01% - 6%
6.01% - 8%
8.01% - 10%
10.01% - 12%
12.01% - 14%
14.01% - 19%
19.01% - 22%
49
Black%
Coloured%
Indian%
White%


Reservoir Hills
Project_001
Legend
Building_Project_001
Roads
Erf
ReservoirHills_Project
Buildings
N

What we have to Offer

- Stats SA Geographic Spatial Layers
- All our Statistical census data
- GIS software for your analysis –QGIS
- Database software for the census information – SuperCROSS
- Demonstrations and Training on how to use the data.

What we have to Offer (1)

- SuperCROSS – software for extracting data
  - 75 Census variables
    - Education
    - Population
    - Employment
    - Income
    - Access to basic services, etc

Thank You

Info@StatsSA.za

XavenP@StatsSA.gov.za

Visualization

- ESRI **Insights**
- **ArcGIS Online**
- **ArcGIS Pro**
- Location-based data, maps, and apps play prominent roles in today's world.
- Deliver
- Manage data so that it's timely, accurate, and authoritative. Eliminate data silos to improve operations. [PDF]
- Collaborate
- Create ways for staff in your organization to work together and eliminate duplication. Improve communication and advance projects.
- Analyze
- Provide your organization with in-depth analysis so colleagues can make more informed decisions. Help staff and citizens understand important issues.