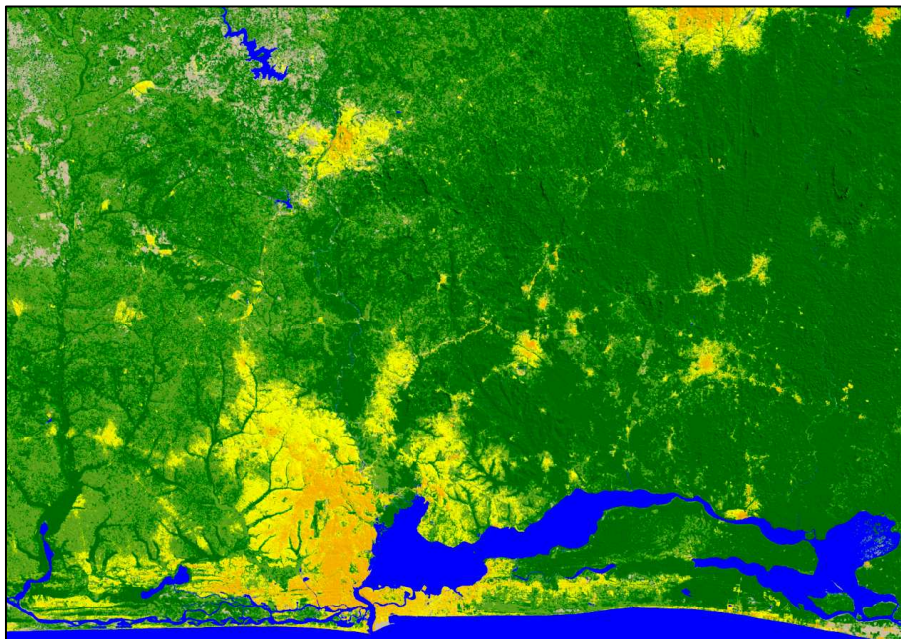


2015 Nigerian National Settlement Dataset (including Population Estimates)

Data Users Report and Meta Data

(version 2.0)



A Commercial Spatial Data Product Developed by
GeoTerraImage (Pty) Ltd, South Africa
(www.geoterraimage.com)

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1. BACKGROUND AND DATA SUMMARY

The 2015 resolution Nigerian Settlement dataset has been generated primarily from 30 m resolution Landsat 8 satellite imagery acquired during 2014-2015, and provides national coverage of Nigeria¹.

The satellite imagery has been used to identify and delineate all settlement boundaries, ranging from large urban cities to small rural villages. In addition to settlements the dataset also details the location and extent of all surface water features evident on the same 2015 imagery, and a broad delineation of the landscape vegetation characteristics. Population density estimates (circa 2011) have also been attached to each settlement unit enabling spatial interrogation of local and regional demographic patterns.

The dataset has been generated using digital desk-top image modelling and classification routines based on multi-date Landsat 8 satellite imagery, sourced from the United States Geological Survey's data archives. The Landsat 8 derived spectral classification has been modified with 2010 ALOS-PALSAR radar imagery to improve the height interpretation of the vegetation component.

The information is available in both raster and vector GIS compatible format, and can be converted into non-spatial spreadsheet report format if required. No independent verification of statistical mapping accuracy has been calculated nor established.

2. THEMATIC INFORMATION CLASSES (2015)

The dataset contains the following standard information classes:

Class	Class Name	Description
1	Tall Vegetation	Forest, dense woodland, tall dense shrubs.
2	Quasi Open Vegetation	Open woodland, bushland, shrubs, crops and wetlands.
3	Open Areas	Grasslands, low shrubs, open desert and bare ground
4	Water	Open water surfaces.

¹ The raster dataset includes mapped data within an extra 5 km buffer around the Nigerian boundary, whereas the vector based settlement data (and associated population estimates) covers only the area within the national boundary.

5	Dense Urban	Settlements, towns and cities with dense concentrations, often represented by taller building structures associated with commercial, industrial or central urban areas.
6	Urban	Other settlement, towns and cities areas, including significant villages.

3. POPULATION ESTIMATES (2011)

Estimated population density values have been attributed to each image-defined settlement unit, using (with permission), the GEOHIVE² (©) 2011 population estimates. A standardised modelling approach was used to allocate estimated population values to each image-mapped settlement unit.

The total population for each Admin 1 area was proportionally divided amongst the 'Dense Urban', 'Urban' and remaining non-water 'Open' area as follows :

- Urban & Dense Urban : 90% of total Admin1 Estimated Population
- Open areas : 10% of total Admin1 Estimated Population

The Urban and Dense Urban areas were further subdivided as follows:

- Dense Urban : 70% of the allocated 90% of total Admin1 Estimated Population
- Urban : 30% of the allocated 90% of total Admin1 Estimated Population

The Urban and Dense Urban areas were subdivided proportionately according to the square kilometre size of the associated urban polygons.

4. DATA PRODUCTS

The GTI 2015 Nigerian Settlement dataset is supplied in both raster (ERDAS *.img and TIFF) and vector (ESRI ArcGIS) formats.

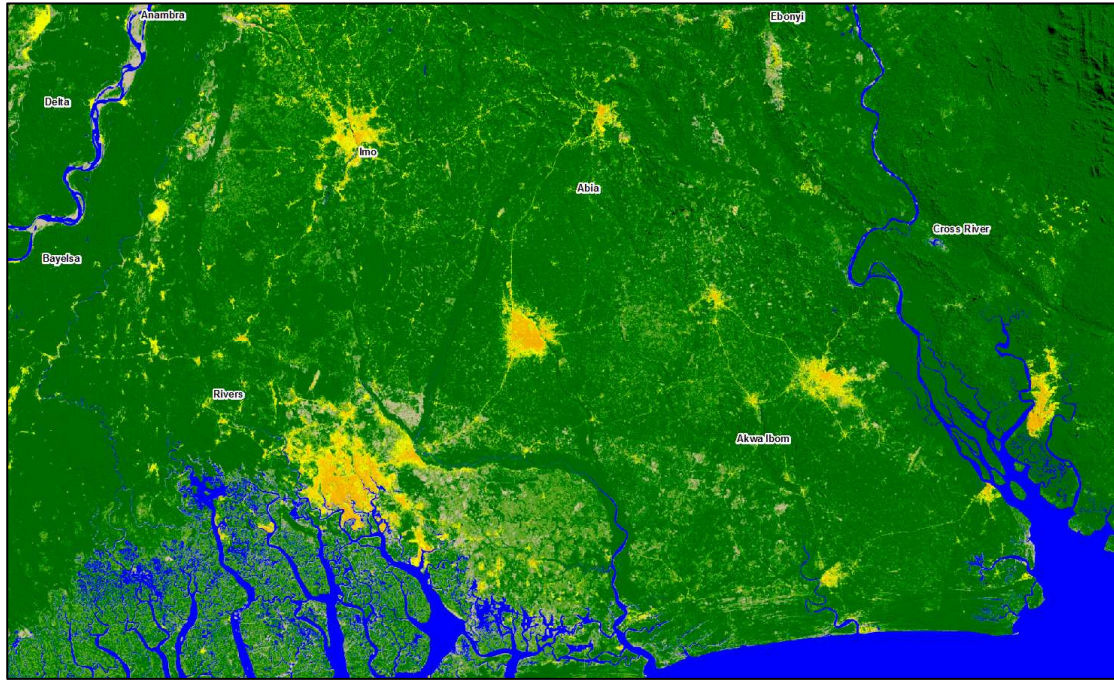
The raster dataset (which does not contain the population estimate data) is based on 30 x 30m cells, in UTM 32 (north) WGS84 map projection. The dataset contains six information classes as per the table above.

² www.geohive.com

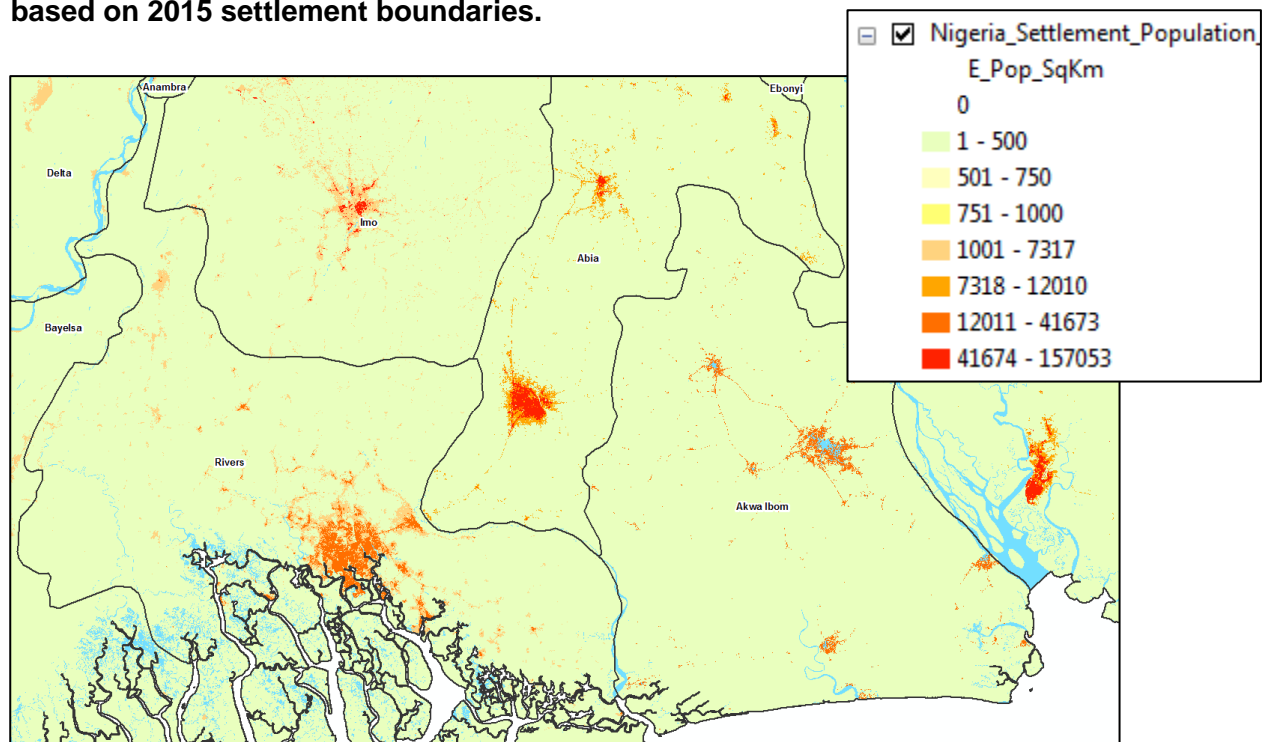
The vector dataset represents a spatially cleaned version of the original raster dataset, within which each settlement polygon has been allocated a population density value derived from the 2011 population estimates.

Data Examples

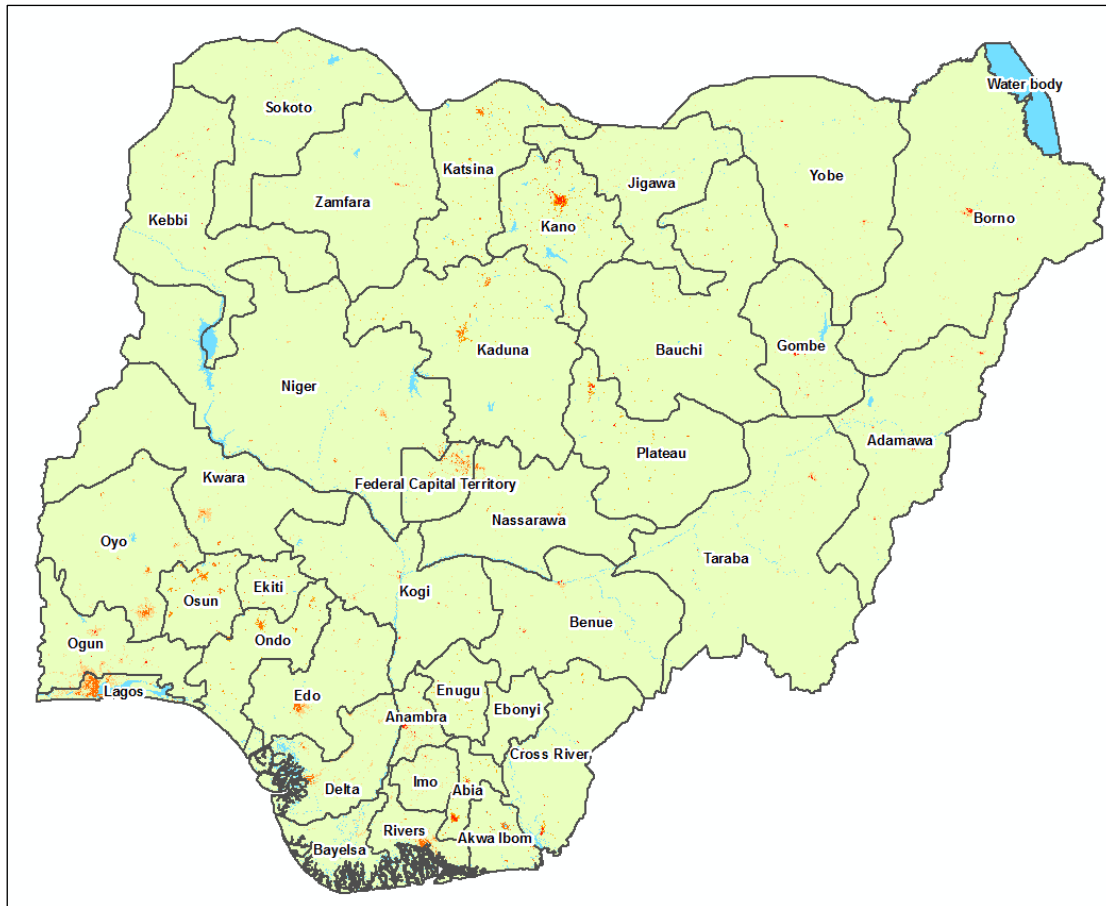
1. Regional example of raster classification of settlements, water and basic landscape vegetation cover (30m resolution data)



2. Regional example of vector-based population density estimates (circa 2011) based on 2015 settlement boundaries.



3. National coverage of vector-based population density estimates (circa2011) based on 2015 settlement boundaries.



Nigeria_Settlement_Population_Density_Estimate_Feb2016							
	FID	Shape	ET_ID	Admin_1	Descrip	Est_Pop	E_Pop_SqKm
▶	2710	Polygon	2710	Akwa Ibom	open	461207	70
	9550	Polygon	95505	Akwa Ibom	urban	291	12418
	9553	Polygon	95531	Akwa Ibom	urban	313	12418
	9557	Polygon	95578	Akwa Ibom	urban	156	12418
	9558	Polygon	95581	Akwa Ibom	urban	156	12418
	9617	Polygon	96170	Akwa Ibom	urban	291	12418
	9618	Polygon	96184	Akwa Ibom	urban	212	12418
	9624	Polygon	96243	Akwa Ibom	urban	1162	12418
	9624	Polygon	96245	Akwa Ibom	water	0	0
	9626	Polygon	96264	Akwa Ibom	urban	425	12418
	9626	Polygon	96268	Akwa Ibom	urban	179	12418
	9627	Polygon	96271	Akwa Ibom	urban	458	12418
	9627	Polygon	96275	Akwa Ibom	water	0	0
	9629	Polygon	96295	Akwa Ibom	urban	425	12418
	9630	Polygon	96303	Akwa Ibom	urban	168	12418
	9630	Polygon	96304	Akwa Ibom	urban	201	12418
	9631	Polygon	96311	Akwa Ibom	urban	402	12418

Estimated Pop sq km

GEOTERRAIMAGE (GTI) 2015 NIGERIAN SETTLEMENT DATASET : CORE METADATA ELEMENTS (SANS1878)

1(M) Dataset title: nigerian_settlement_2015_fnl_utm32n_5kmbuff.tiff

2(M) Dataset reference date: December 2015

3(O) Dataset responsible party: Produced by GeoTerra Image (GTI) Pty Ltd (Mark Thompson, www.geoterraimage.com).

4(C) Geographic location of the dataset.

WestBoundLongitude: -372534.108562381010 (Upper Left X)

EastBoundLongitude: 1289985.8914376190 (Lower Right X)

NorthBoundLongitude: 1720769.9999998390 (Upper Left Y)

SouthBoundLongitude: 363009.9999998390 (Lower Right Y)

Projection coordinates based on Universal Transverse Mercator UTM 32 North, WGS84 (datum), meters.

5(M) Dataset language : "English" (eng)

6(C) Dataset character set: UTF8 (8-bit data)

7(M) Dataset topic category: 010 = Base Map earth coverage

8(O) Scale of the dataset: The Nigerian Settlement dataset has been mapped from primarily 2014-2015 30m resolution Landsat 8 satellite imagery, modified with 20m 2010 ALOS-PALSAR imagery. The raster format dataset is based on 30m cells equivalent to the original 30m Landsat image resolution. The 30m resolution format is theoretically suitable for $\pm 1: 100,000$ scale or coarser digital modelling applications. The settlement and water vector boundaries have been derived from the original 30m raster data, and simplified using pre-determined spatial modelling.

9(M) Abstract describing the dataset: imagery. A 30m resolution national settlement, water and basic vegetation dataset has been generated for the whole of Nigeria, using primarily Landsat 8 satellite imagery acquired during 2014-15. The dataset contains 6 information classes, plus population density estimates circa 2011.

10(O) Dataset format name: TIFF raster format.

11(O) Dataset format version: version 1

12(O) Additional extent information for the dataset: (vertical and temporal)

Vertical Extent:

Minimum Value: n/a

Maximum Value: n/a

Unit Of Measure: n/a

Vertical Datum: n/a

Temporal Extent: Datasets generated in December 2015, primarily from 2014-15 satellite imagery.

14(O) Reference system: Universal Transverse Mercator (UTM) 32 North

CRS:

Projection Used: Universal Transverse Mercator (UTM) 32 North

Spheroid used: WGS84

Datum used: WGS 84

Ellipsoid parameters:

Ellipsoid semimajor axis

axis units

denominator of flattening ratio

Projection Parameters:

UTM Zone: 32 (North)

Standard parallel

Longitude of central meridian: 9:00:00.00 East

Latitude of projection origin: 00:00:00.00 North

False easting: 500000.00 meters

False northing: 0.00 meters

Scale factor at equator: 0.999600

Projection units: meters

15(O) Lineage statement: 2015 30m resolution national settlement, water and basic vegetation dataset generated in-house by GeoTerraImage (Pretoria) in December 2015, based on 2014-15 Landsat imagery, supplemented with 2010 20m resolution ALOS-PALSAR imagery for height detail. Imagery sourced from USGS GLOVIS web-based Landsat data archives.

16(O) On-line resource: n/a

17(O) Metadata file identifier: n/a

18(O) Metadata standard name: SANS I878

19(O) Metadata standard version: version 01

20(C) Metadata language: English (eng)

21(C) Metadata character set: 021 (UsAscii)

22(M) Metadata point of contact:

Name: Mark Thompson
Position Name: Director Remote Sensing
Organisation Name: GeoTerralimage Pty Ltd

Physical Address:

Building Grain Building (1st Floor)
Street Witherite
Street_Suffix Street
Street_Nr 477
Suburb Die Wilgers
City Pretoria
Zip 0041
State Gauteng
Country South Africa

Postal Address :

Box 295
Suburb Persequor Park
City Pretoria
Zip 0020
State Gauteng
Country South Africa

23(M) Metadata time stamp: 07 March 2016