

## High Resolution Settlement Layer – Ghana

### Summary

Provide detailed population estimates for research in humanitarian, disaster response, sustainability, and infrastructure planning fields.

### Description

The High Resolution Settlement Layer (HRSL) provides estimates of human population distribution at a resolution of 1 arc-second (approximately 30m) for the year 2015. The population estimates are based on recent census data and high-resolution (0.5m) satellite imagery from DigitalGlobe. The population grids provide detailed delineation of settlements in both urban and rural areas. The data were developed using computer vision techniques to classify blocks of optical satellite data as settled (containing buildings) or not. Proportional allocation was used to distribute population data from subnational census data to the settlement extents. The data are distributed as a GeoTIFF file with two bands. Band 1 represents the population estimates (in persons). Band 2 has a value of 1 where cloud was present in the source imagery.

### Credits

Connectivity Lab at Facebook. Center for International Earth Science Information Network - CIESIN - Columbia University. Source imagery provided by DigitalGlobe. Census data collected as part of the Gridded Population of the World data collection.

### Use limitations

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### Extent

**West** -3.505342    **East** 1.394380  
**North** 11.169567    **South** 4.738734

### Scale Range

**Maximum (zoomed in)** 1:5,000  
**Minimum (zoomed out)** 1:150,000,000

## Topics and Keywords ►

THEMES OR CATEGORIES OF THE RESOURCE    society

\* CONTENT TYPE    Downloadable Data

PLACE KEYWORDS    Ghana

THEME KEYWORDS    population, demography

## Citation ►

\* TITLE    High Resolution Settlement Layer  
CREATION DATE    2016-11-01 00:00:00  
PUBLICATION DATE    2016-11-15 00:00:00

EDITION 1.0  
EDITION DATE 2016-11-08

PRESENTATION FORMATS digital image

COLLECTION TITLE High Resolution Settlement Layer (HRSL)

OTHER CITATION DETAILS

Recommended citation: Facebook Connectivity Lab and Center for International Earth Science Information Network - CIESIN - Columbia University. 2016. High Resolution Settlement Layer (HRSL). Source Imagery © 2016 DigitalGlobe, Inc. Accessed [DAY MONTH YEAR]

## Locales ►

LOCALE English (UNITED STATES)

## Resource Details ►

DATASET LANGUAGES English (UNITED STATES)  
DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format

SPATIAL REPRESENTATION TYPE grid

\* PROCESSING ENVIRONMENT Version 6.2 (Build 9200) ; Esri ArcGIS 10.4.1.5686

CREDITS

Connectivity Lab at Facebook. Center for International Earth Science Information Network - CIESIN - Columbia University. Source imagery provided by DigitalGlobe. Census data collected as part of the Gridded Population of the World data collection.

ARCGIS ITEM PROPERTIES

- \* NAME hrsl\_gha.tif
- \* LOCATION <http://ciesin.columbia.edu/data/hrsl>
- \* ACCESS PROTOCOL Digital download

## Extents ►

EXTENT

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

EXTENT TYPE Extent used for searching

\* WEST LONGITUDE -3.505342

\* EAST LONGITUDE 1.394380

\* NORTH LATITUDE 11.169567

\* SOUTH LATITUDE 4.738734

\* EXTENT CONTAINS THE RESOURCE Yes

EXTENT IN THE ITEM'S COORDINATE SYSTEM

\* WEST LONGITUDE -3.505342

\* EAST LONGITUDE 1.394380

\* SOUTH LATITUDE 4.738734

- \* NORTH LATITUDE 11.169567
- \* EXTENT CONTAINS THE RESOURCE Yes

## Resource Points of Contact ►

### POINT OF CONTACT

INDIVIDUAL'S NAME CIESIN User Services  
ORGANIZATION'S NAME Center for International Earth Science Information Network - CIESIN - Columbia University  
CONTACT'S ROLE point of contact

### CONTACT INFORMATION ►

#### PHONE

VOICE +1 (845)365-8988  
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#### ADDRESS

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CITY Palisades  
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COUNTRY US  
E-MAIL ADDRESS [ciesin.info@ciesin.columbia.edu](mailto:ciesin.info@ciesin.columbia.edu)

## Resource Maintenance ►

### RESOURCE MAINTENANCE

UPDATE FREQUENCY irregular

## Resource Constraints ►

### CONSTRAINTS

#### LIMITATIONS OF USE

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*Hide Resource Constraints ▲*

## Spatial Reference ►

### ARCGIS COORDINATE SYSTEM

- \* TYPE Geographic
- \* GEOGRAPHIC COORDINATE REFERENCE GCS\_WGS\_1984
- \* COORDINATE REFERENCE DETAILS  
GEOGRAPHIC COORDINATE SYSTEM  
WELL-KNOWN IDENTIFIER 4326

X ORIGIN -400  
Y ORIGIN -400  
XY SCALE 11258999068426.238  
Z ORIGIN -100000  
Z SCALE 10000  
M ORIGIN -100000  
M SCALE 10000  
XY TOLERANCE 8.983152841195215e-009  
Z TOLERANCE 0.001  
M TOLERANCE 0.001  
HIGH PRECISION true  
LEFT LONGITUDE -180  
LATEST WELL-KNOWN IDENTIFIER 4326  
WELL-KNOWN TEXT  
GEOGCS["GCS\_WGS\_1984",DATUM["D\_WGS\_1984",SPHEROID["WGS\_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433],AUTHORITY["EPSG",4326]]

REFERENCE SYSTEM IDENTIFIER

VALUE 4326

\* CODESPACE EPSG

\* VERSION 6.14(3.0.1)

## Spatial Data Properties ►

GEORECTIFIED GRID ►

\* NUMBER OF DIMENSIONS 2

AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE column (x-axis)

\* DIMENSION SIZE 17639

\* RESOLUTION 0.000278 deg (degree)

AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE row (y-axis)

\* DIMENSION SIZE 23151

\* RESOLUTION 0.000278 deg (degree)

\* CELL GEOMETRY area

\* POINT IN PIXEL center

\* TRANSFORMATION PARAMETERS ARE AVAILABLE Yes

\* CHECK POINTS ARE AVAILABLE No

CORNER POINTS

\* POINT -3.505342 4.738734

\* POINT -3.505342 11.169567

\* POINT 1.394380 11.169567

\* POINT 1.394380 4.738734

\* CENTER POINT -1.055481 7.954151

ARCGIS RASTER PROPERTIES ►

GENERAL INFORMATION

\* PIXEL DEPTH 64

- \* COMPRESSION TYPE LZW
- \* NUMBER OF BANDS 2
- \* RASTER FORMAT TIFF
- \* SOURCE TYPE continuous
- \* PIXEL TYPE double precision
- \* NO DATA VALUE -1.797693e+308
- \* HAS COLORMAP No
- \* HAS PYRAMIDS Yes

## Spatial Data Content ►

### IMAGE DESCRIPTION

- \* TYPE OF INFORMATION image
- ATTRIBUTE DESCRIBED BY CELL VALUES Band\_1: Persons (count); Band\_2 Cloud (Boolean)

### BAND INFORMATION

- \* DESCRIPTION Band\_1
- \* MAXIMUM VALUE 891.537841
- \* MINIMUM VALUE 0.003087

#### UNITS

##### GML PROPERTIES

- UNIQUE IDENTIFIER ID0AAAABGABA
- IDENTIFIER Unified Code of Units of Measure
- CODESPACE GML\_UomSymbol

- \* NUMBER OF BITS PER VALUE 64

### BAND INFORMATION

- \* DESCRIPTION Band\_2
- \* MAXIMUM VALUE 1.000000
- \* MINIMUM VALUE 1.000000
- \* NUMBER OF BITS PER VALUE 64

- TRIANGULATION HAS BEEN PERFORMED No
- RADIOMETRIC CALIBRATION IS AVAILABLE No
- CAMERA CALIBRATION IS AVAILABLE No
- FILM DISTORTION INFORMATION IS AVAILABLE No
- LENS DISTORTION INFORMATION IS AVAILABLE No

## Data Quality ►

### SCOPE OF QUALITY INFORMATION ►

- RESOURCE LEVEL dataset

#### SCOPE DESCRIPTION

##### DATASET

Computer vision classification quality measures and data coverage.  
Precision/recall: 0.97/0.95  
Landmass covered: 0.998  
Cloud coverage: 0.0089

Precision =  $TP / (TP + FP)$

Recall =  $TP / (TP + FN)$

Where TP = true positive, FP = false positive, FN = false negative

## Lineage ►

### SOURCE DATA ►

#### DESCRIPTION

Gridded Population of the World, version 4 (GPWv4) input census data.  
<http://sedac.ciesin.columbia.edu/gpw>

### SOURCE DATA ►

#### DESCRIPTION

DigitalGlobe Basemap +Vivid  
<http://explore.digitalglobe.com/Basemap-Vivid.html>

## Distribution ►

### DISTRIBUTION FORMAT

\* NAME Raster Dataset

VERSION 6.0

SPECIFICATION GeoTIFF

FILE DECOMPRESSION TECHNIQUE LZW

## Metadata Details ►

METADATA LANGUAGE English (UNITED STATES)

METADATA CHARACTER SET utf8 - 8 bit UCS Transfer Format

METADATA IDENTIFIER 616251C4-AE3F-4082-A7C3-9298E5CC48B9

SCOPE OF THE DATA DESCRIBED BY THE METADATA dataset

SCOPE NAME \* dataset

\* LAST UPDATE 2016-11-14

## Metadata Maintenance ►

### MAINTENANCE

UPDATE FREQUENCY as needed

## Metadata Constraints ►

### CONSTRAINTS

#### LIMITATIONS OF USE

Population estimates and distribution are indicative of general trends. Population estimates are based on census data from the circa 2010 round of censuses extrapolated to 2015 and adjusted to match United Nations country totals.