



WorldPop

The Power of Population Data: Introducing WorldPop Global 2 (2015–2030)

4 September 2025



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Andy Tatem**

Founder and
Director of
WorldPop and
Professor of
Spatial
Demography
and
Epidemiology
at University of
Southampton



**Dr Jessica
Espey**

Associate
Professor in the
School of
Geography and
Environmental
Sciences at
University of
Southampton,
Deputy
Director
Research at
WorldPop



**Mr Andrew
Bob Johnny**

Statistician
General
Statistics
Sierra Leone



**Dr Mollie Van
Gordon**

Senior Program
Officer leading
the Geospatial
Insights
portfolio at the
Gates
Foundation



**Dr Sabrina
Juran**

Regional
Advisor, Data
and Population
Dynamics,
Latin America
and the
Caribbean at
the United
Nations
Population
Fund (UNFPA)



**Dr Maksym
Bondarenko**

Head of
WorldPop's
Spatial Data
Infrastructure
Team

British Summer Time

15:00 – 15:20	Part 1: Unveiling the Future: WorldPop's newest innovative global dataset Breaking new ground: introducing WorldPop Global2 <i>Professor Andy Tatem, Director of WorldPop</i>
15:20 – 15:50 moderated panel discussion	From research to real-world impact: Global development applications <i>Mollie van Gordon - Gates Foundation</i> <i>Andrew Bob Johnny - Sierra Leone</i> <i>Sabrina Juran - UNFPA</i> <i>Moderator: Jess Espey, WorldPop</i>
15:50 – 16:10	Part 2: Hands-on discovery – input data, tools and technical deep-dive <i>Dr Maksym Bondarenko, Head of WorldPop's Spatial Data Infrastructure</i>
16:10 – 16:30	Interactive Q&A with WorldPop's team <i>Questions on technical requirements, platforms, tools, access, integration and much more.</i>

Part 1 – Unveiling the Future



WorldPop Global2

WorldPop



Value of small area population data

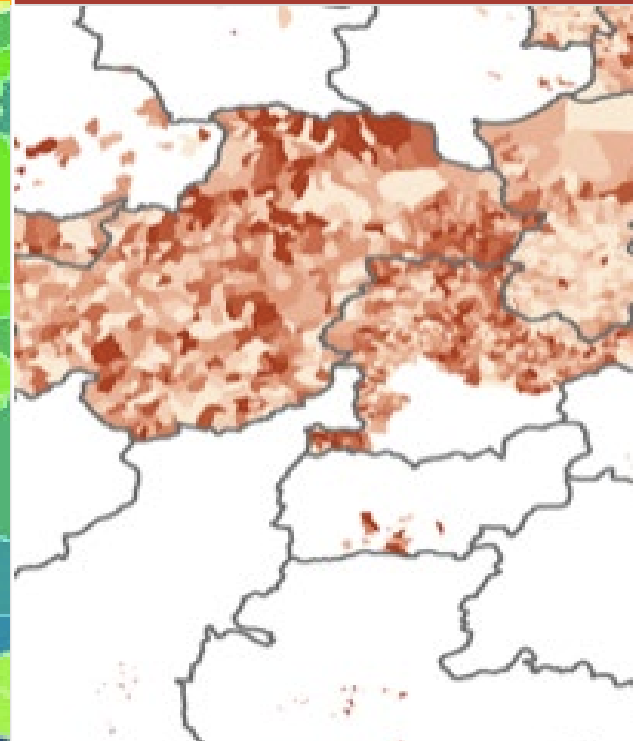
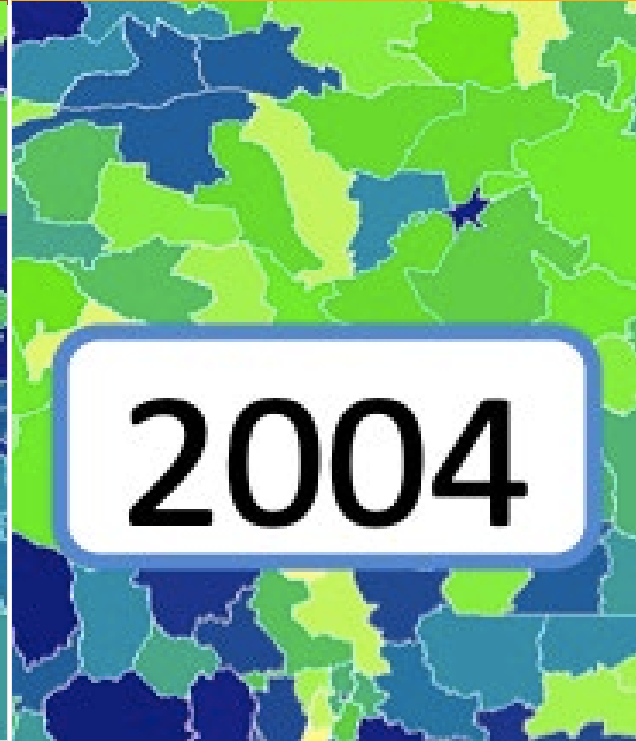
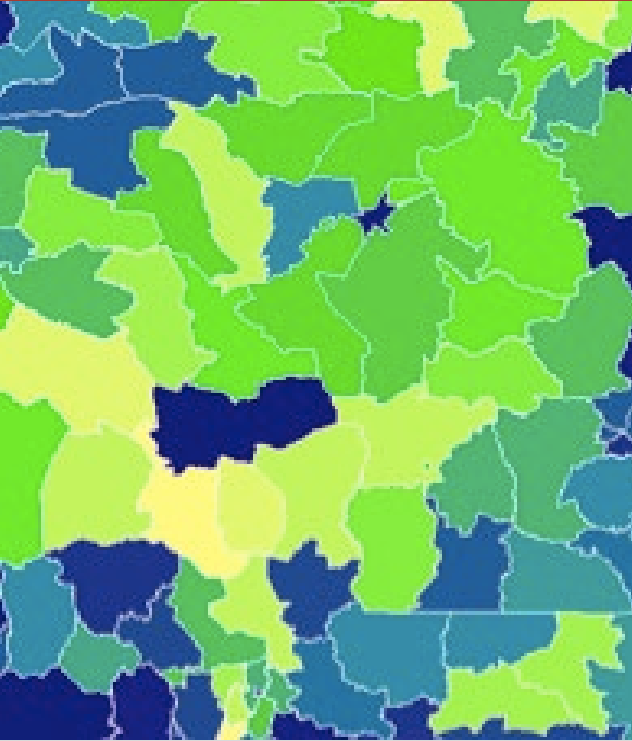
- Planning elections
- Calculating GDP
- Local governance
- Traffic planning
- Financial services
- Delivering utilities
- Agricultural subsidies
- Taxation
- Land use management
- Energy strategies
- Health system planning
- Supply chain management
- Health metrics
- Meeting SDGs
- Controlling infectious diseases
- Measuring climate change impacts
- Education planning
- Disaster preparedness

Coarse resolution

Outdated

Incomplete

Inaccuracies, missing
populations

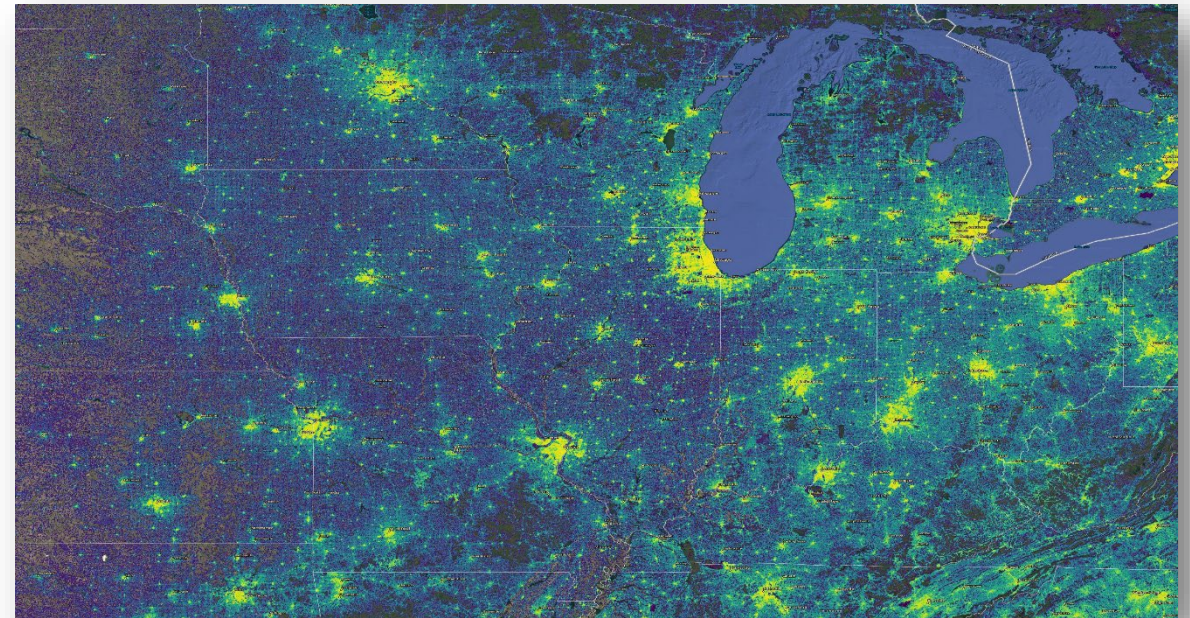


Demographic data challenges

- Applied research group of 40 staff
- Geospatial integration methods for addressing demographic data gaps

Mission: Innovative research to empower decision-makers to harness the power of reliable, inclusive and accurate spatial demographic data

Vision: A world where everyone, everywhere is counted in decision-making

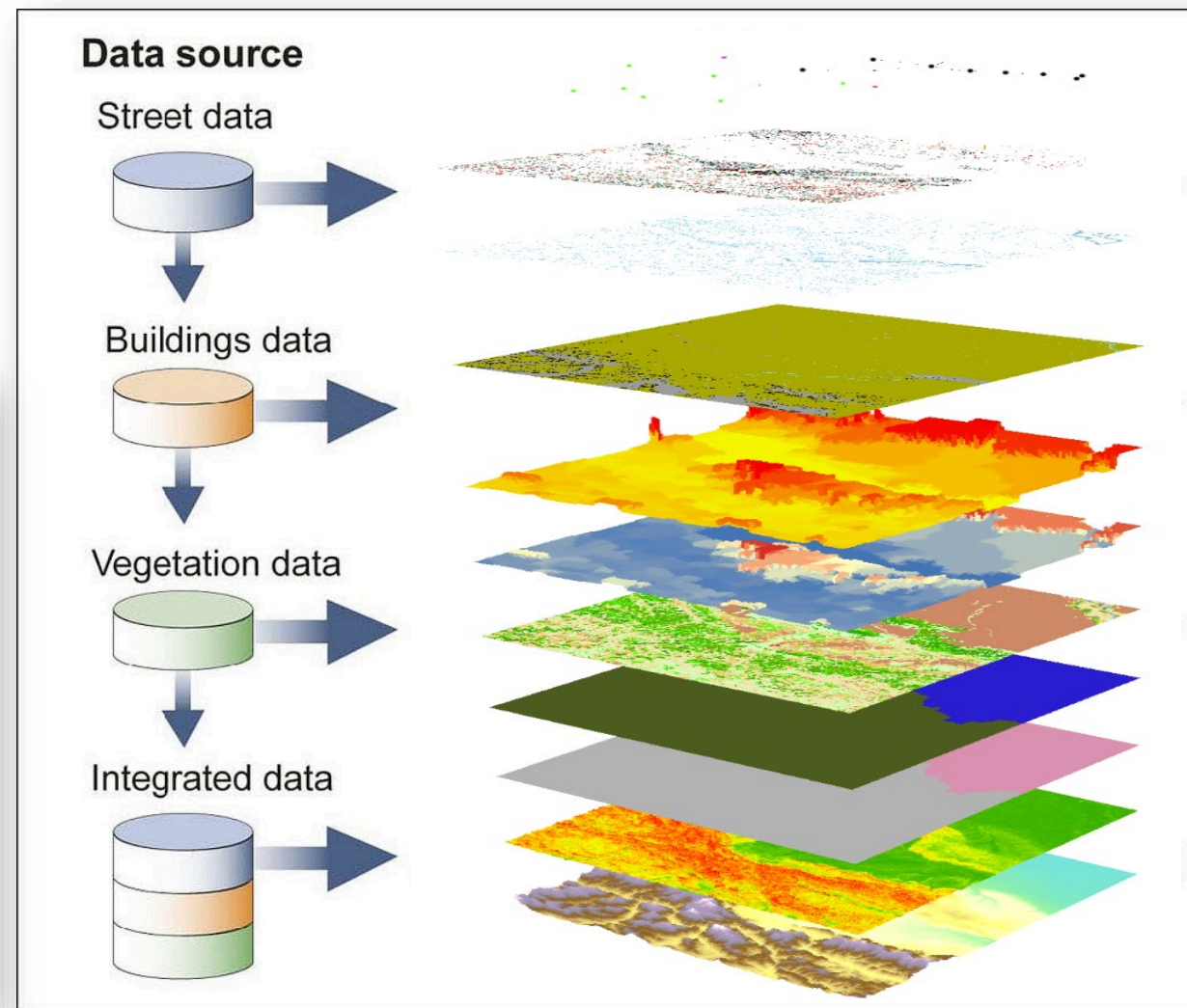
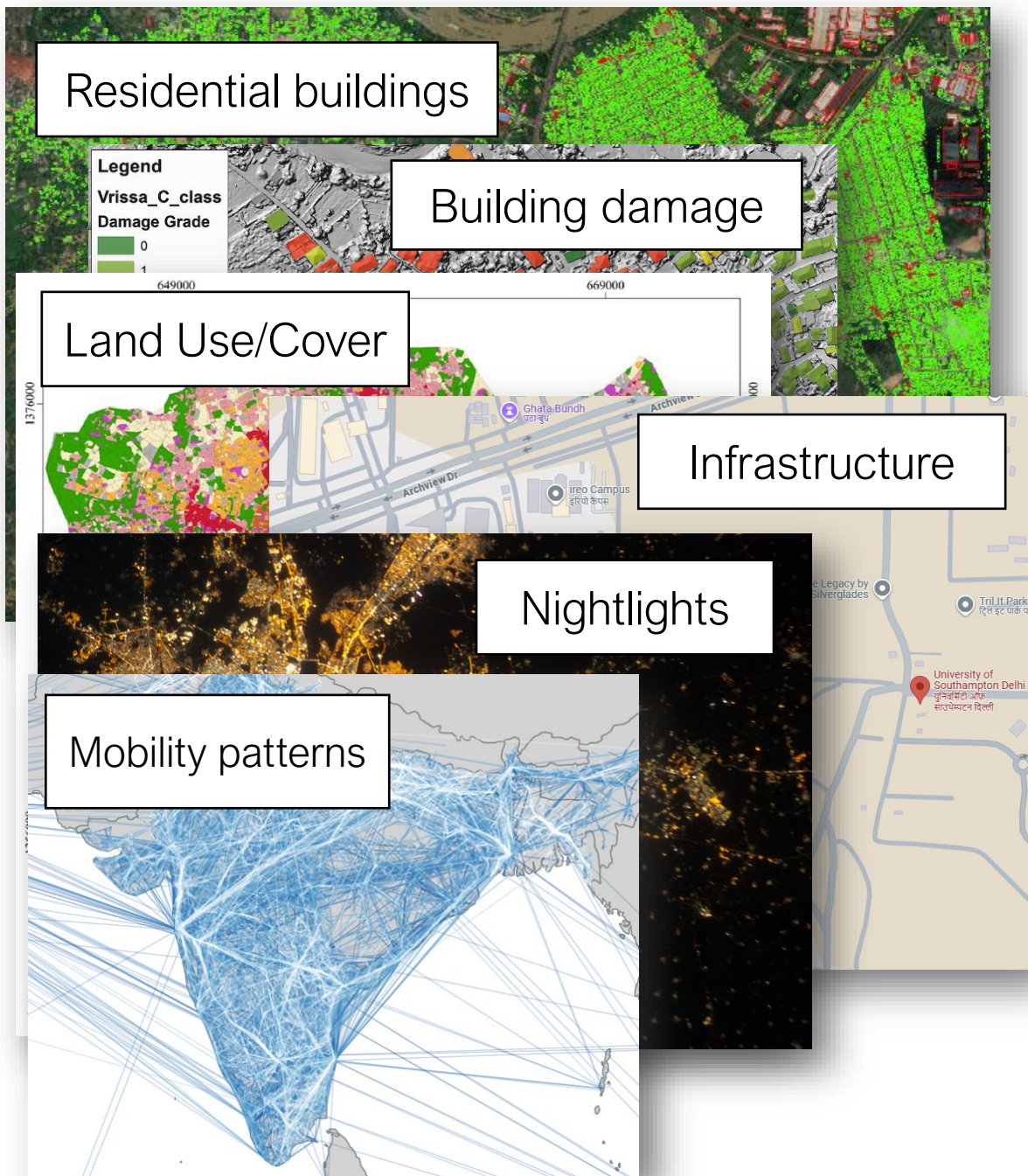






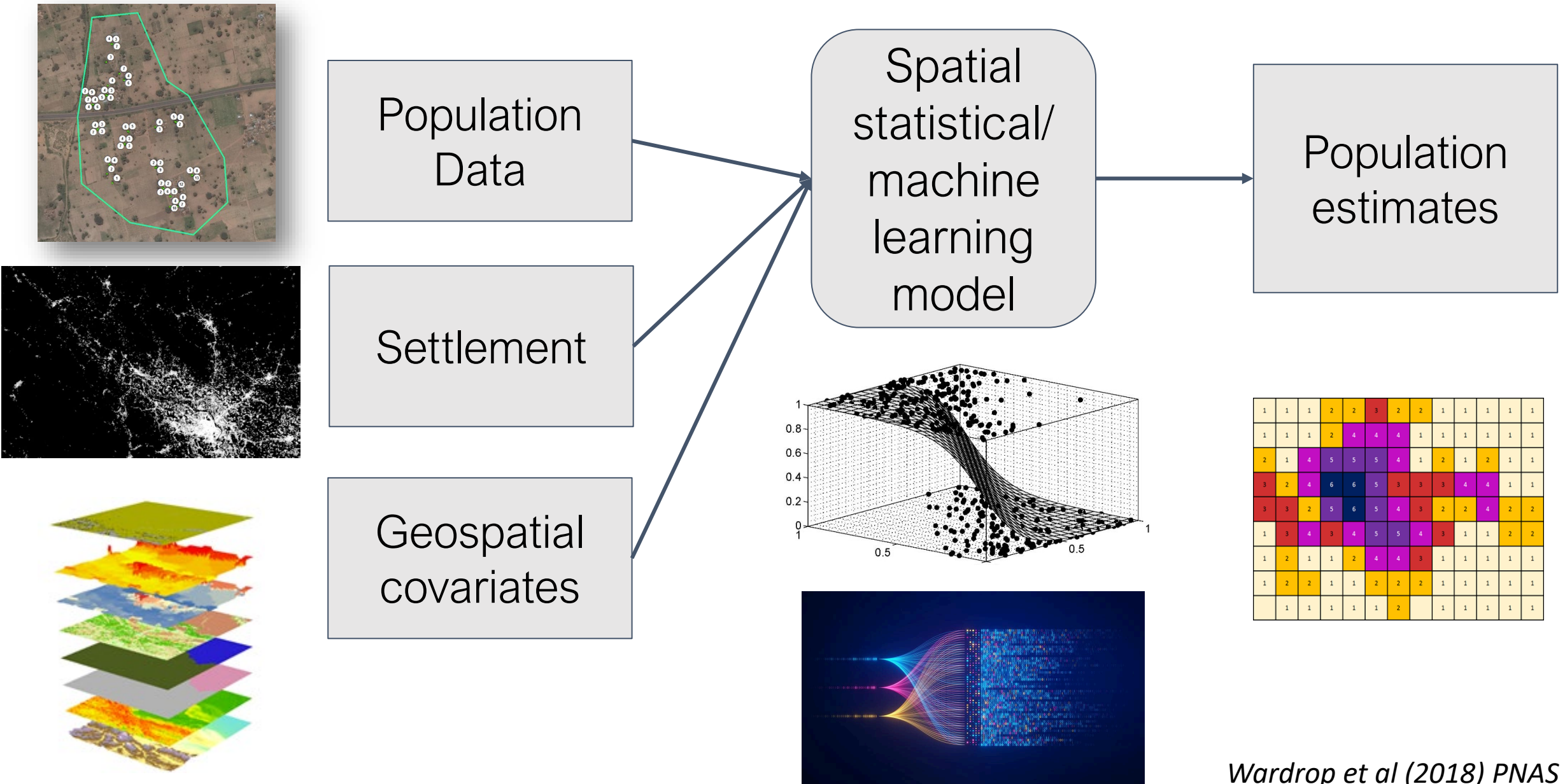
<https://blog.google/technology/research/open-buildings-ai-powered-maps-for-a-changing-world/>

2016



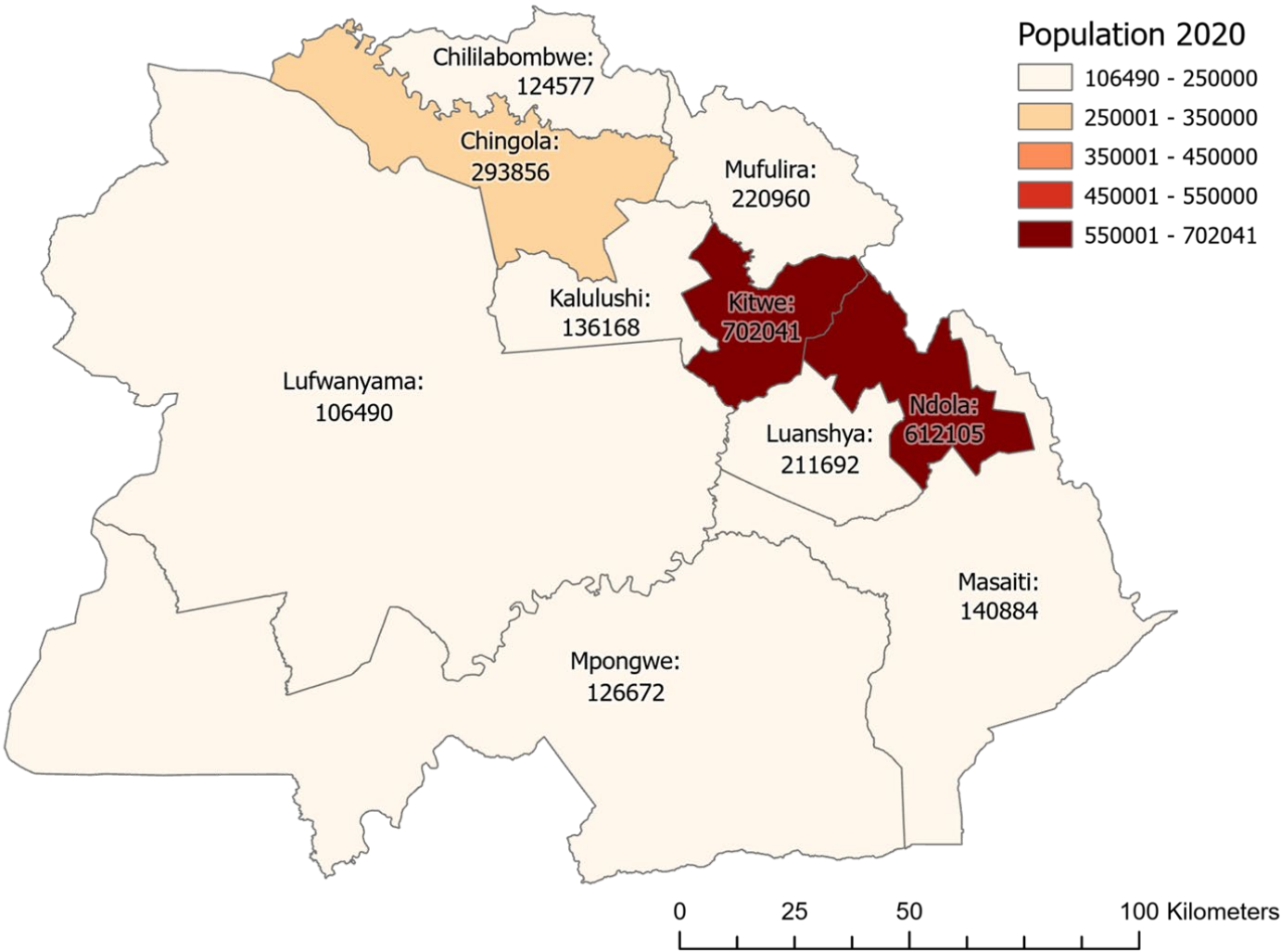
Source: GAO.

Small area population estimation



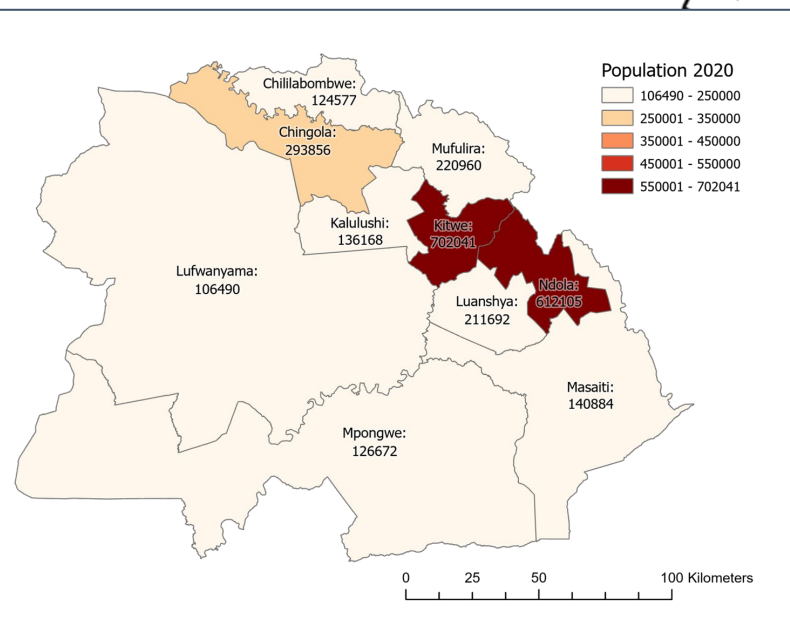
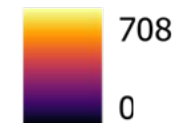
Population estimates: typical data

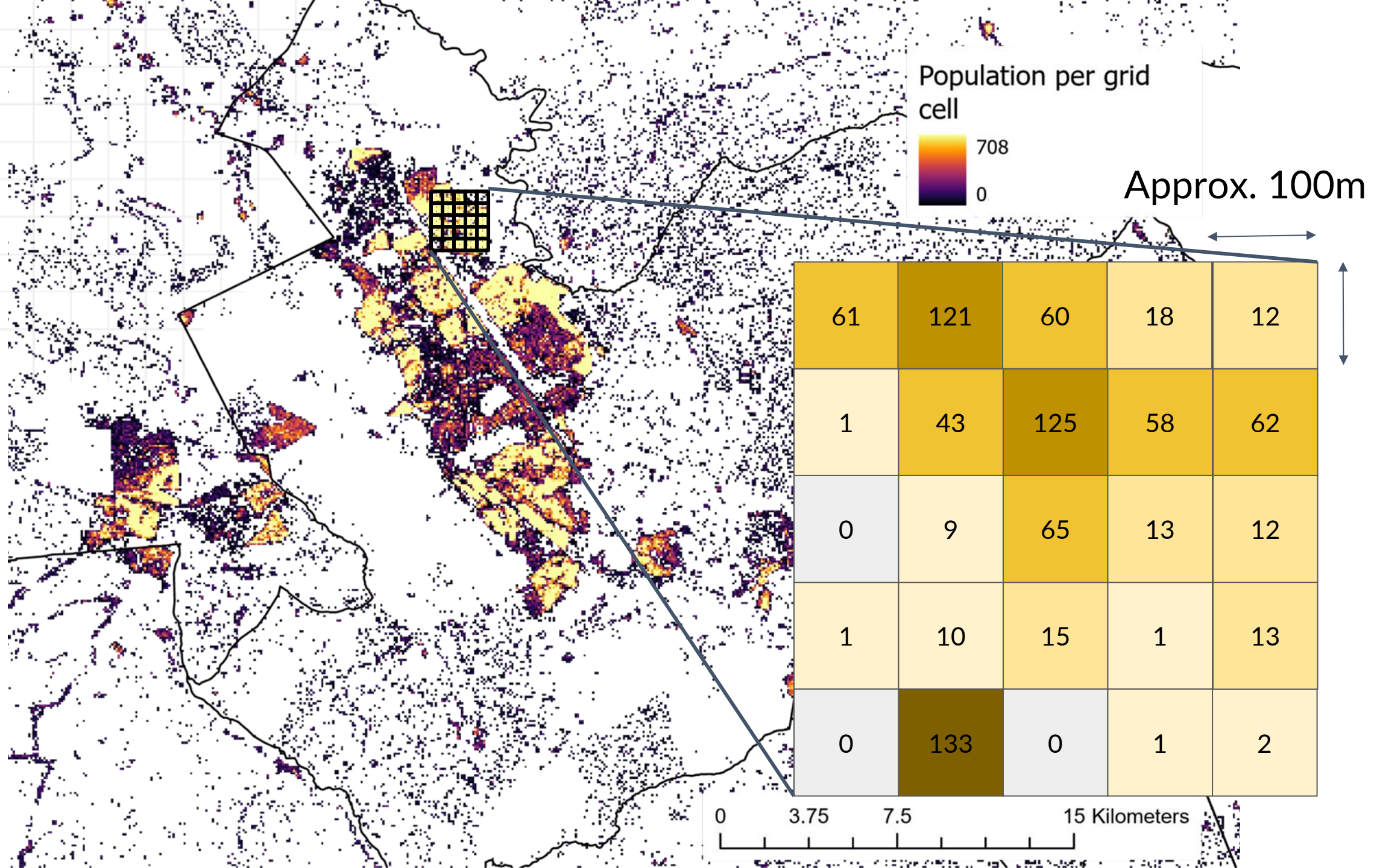
District	Province	Total
Chililabombwe	Copperbelt	124577
Chingola	Copperbelt	293856
Kalulushi	Copperbelt	136168
Kitwe	Copperbelt	702041
Luanshya	Copperbelt	211692
Lufwanyama	Copperbelt	106490
Masaiti	Copperbelt	140884
Mpongwe	Copperbelt	126672
Mufulira	Copperbelt	220960
Ndola	Copperbelt	612105



Gridded population estimates

Population per grid cell

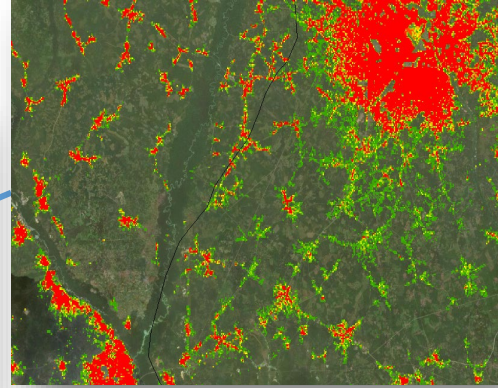
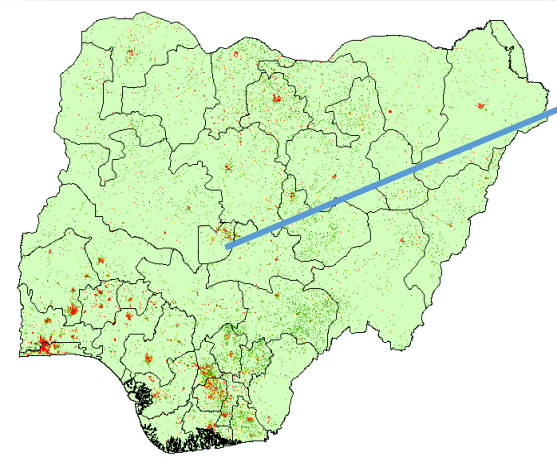




WorldPop produces two broad types of demographic datasets

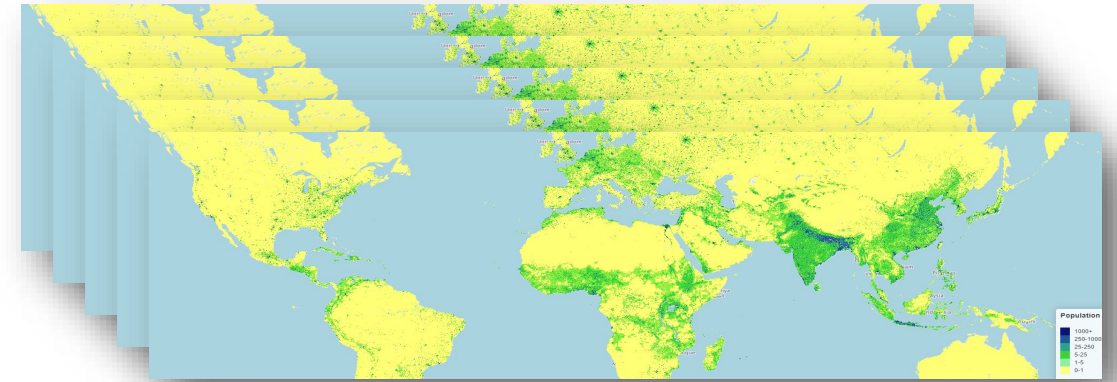
WorldPop

National



- Bespoke model design and data
- Single recent time point
- Co-developed with decision-makers for specific applications
- **Most accurate estimates for individual countries and recent timepoints**

Global



- Consistent data, methods, outputs for all countries
- Multi-temporal
- Co-developed with global demographic and geospatial data providers
- **Best for multi-country, multi-year analyses**

Government co-development, support

S. Sudan population is 12.4 million – govt estimates

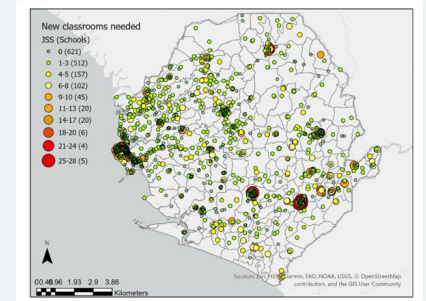
Author: Chany Ninrew | Published: Saturday, March 11, 2023

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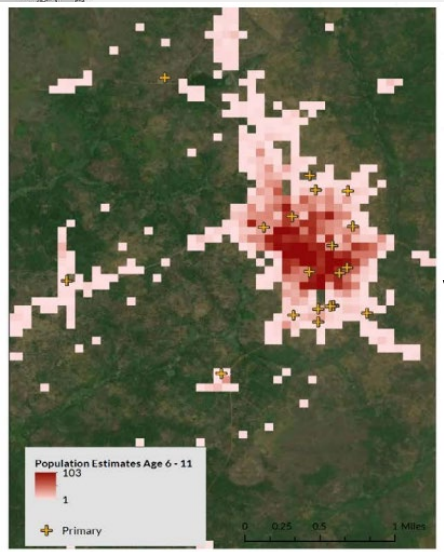


WorldPop

School Infrastructure and Catchment Area Planning Policy

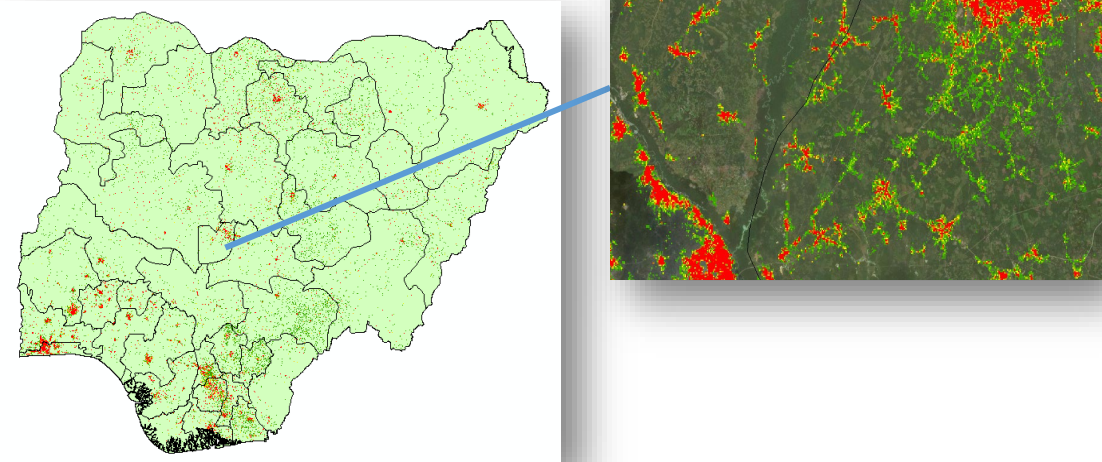


June 2021



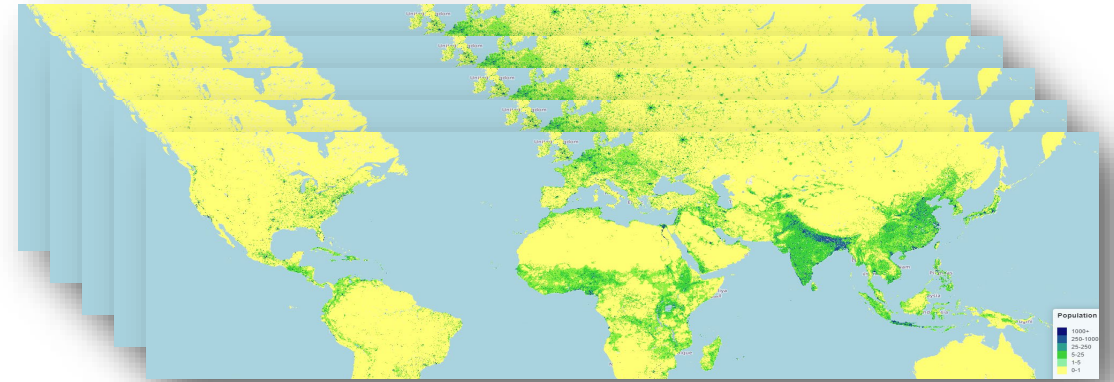
WorldPop produces two broad types of demographic datasets

National



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Global



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WorldPop
Global1 data:
2000-2020

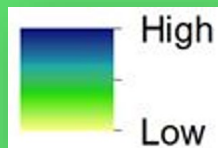
Children under 5 years

WorldPop

Openly
distributed
through
WorldPop's
website and
the platforms
below

Women of childbearing age

People over 65 years old



ArcGIS Living Atlas of the World



Population Data Portal



Food and Agriculture
Organization of the
United Nations

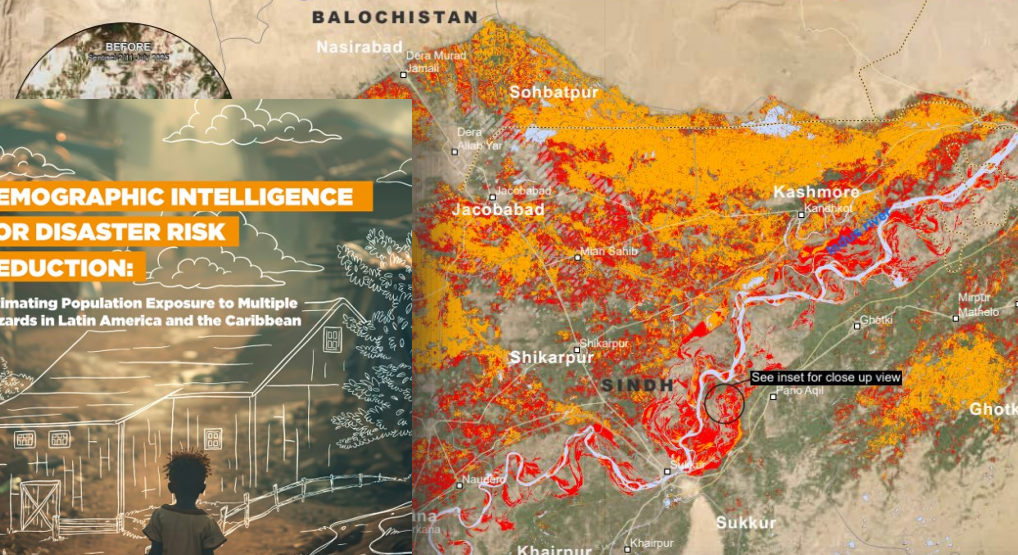


Hand-in-Hand
Initiative

PAKISTAN

SINDH, BALOCHISTAN AND PUNJAB PROVINCES

IMAGERY ANALYSIS: 31/07/2025 PUBLISHED 16/07/2025 V1.



FLOODS
FL20250630PAK

Satellite detected water extents in Sindh, Balochistan and Punjab Provinces, Pakistan as of 31 July 2025

This map illustrates the satellite-detected water extent in Sindh, Balochistan, and Punjab Provinces, Pakistan, as observed from Sentinel-2 satellite images acquired on 31 July 2025 at 13:02 local time (08:02 UTC). Within the analyzed area of approximately 83,000 km², about 6,300 km² of land appears to be affected by floodwaters. The floodwater extent appears to have increased by approximately 1,300 km² since 11 July 2025. Based on WorldPop population data and the flood extent, approximately 2.3 million people are potentially exposed or living close to the flooded areas.

This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to the United Nations Satellite Centre (UNOSAT).

Legend

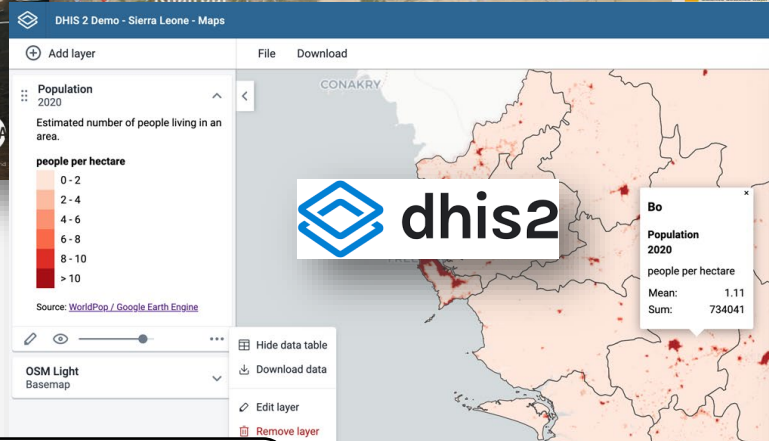
- Line of control
- Provincial boundary
- International boundary
- Distric boundary
- Line of control
- Moatway
- Primary road
- Analysis extent
- Reference water (1 Jul 2025)
- Cloud obscuration (11 Jul 2025)
- Satellite detected water (31 Jul 2025)

Disaster impacts



DEMOGRAPHIC INTELLIGENCE FOR DISASTER RISK REDUCTION:

Estimating Population Exposure to Multiple Hazards in Latin America and the Caribbean

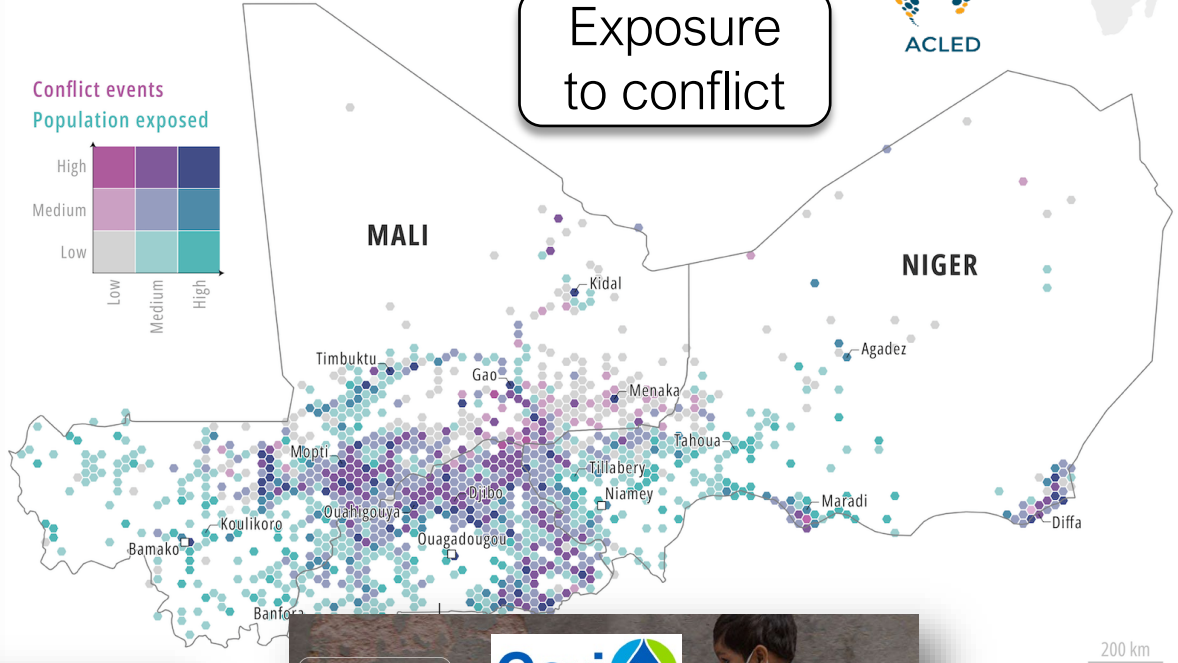


Health metric denominators

NAME	ID	TYPE	SUM POPULATIO	MEAN POPULATI
Bo	06upzGd5pu	Polygon	734041	1.11
Bombali	fdcuOvgji	Polygon	504997	0.52
Bonthe	lc3eMKXaEfw	MultiPolygon	175610	0.42
Kailahun	JUb8gELQAp	Polygon	512639	1.05
Kambia	BMx2vCupOd	MultiPolygon	368250	1.03



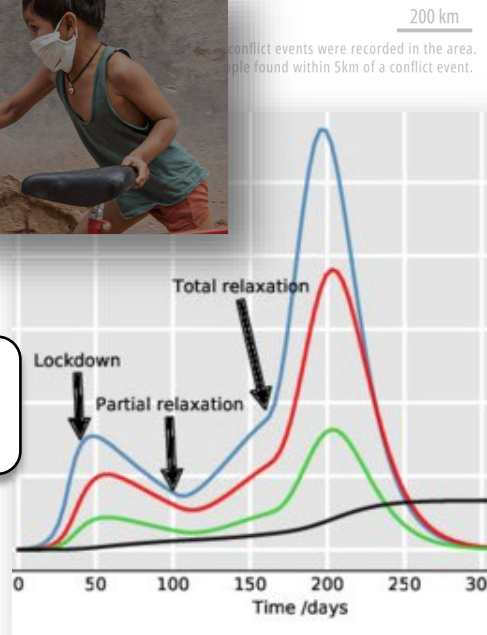
Conflict Exposure in the Sahel 2020 - 2023



Exposure to conflict



Disease control strategies





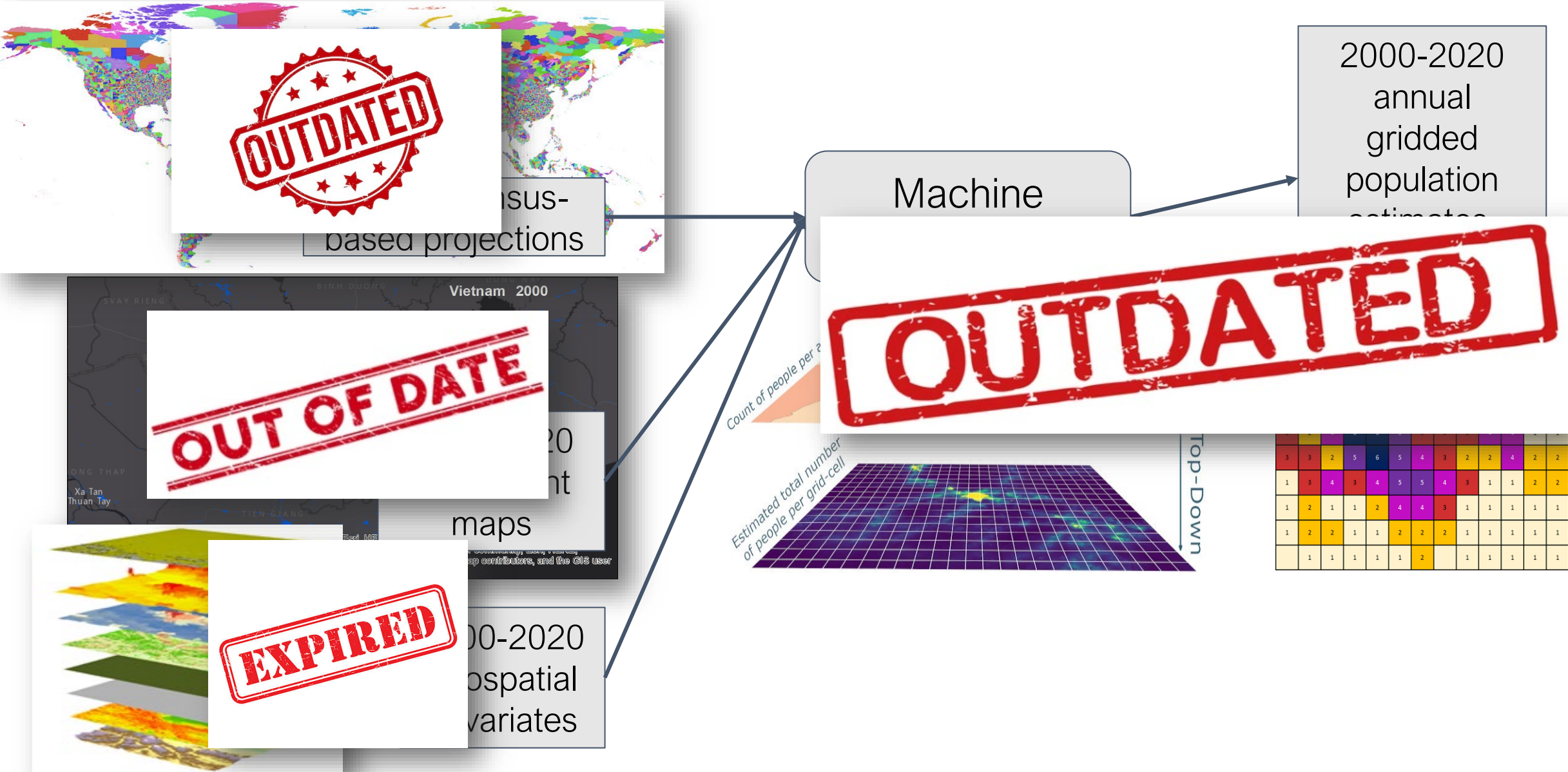
Impact Assessment Report

Prepared by **Dev-Afrique**



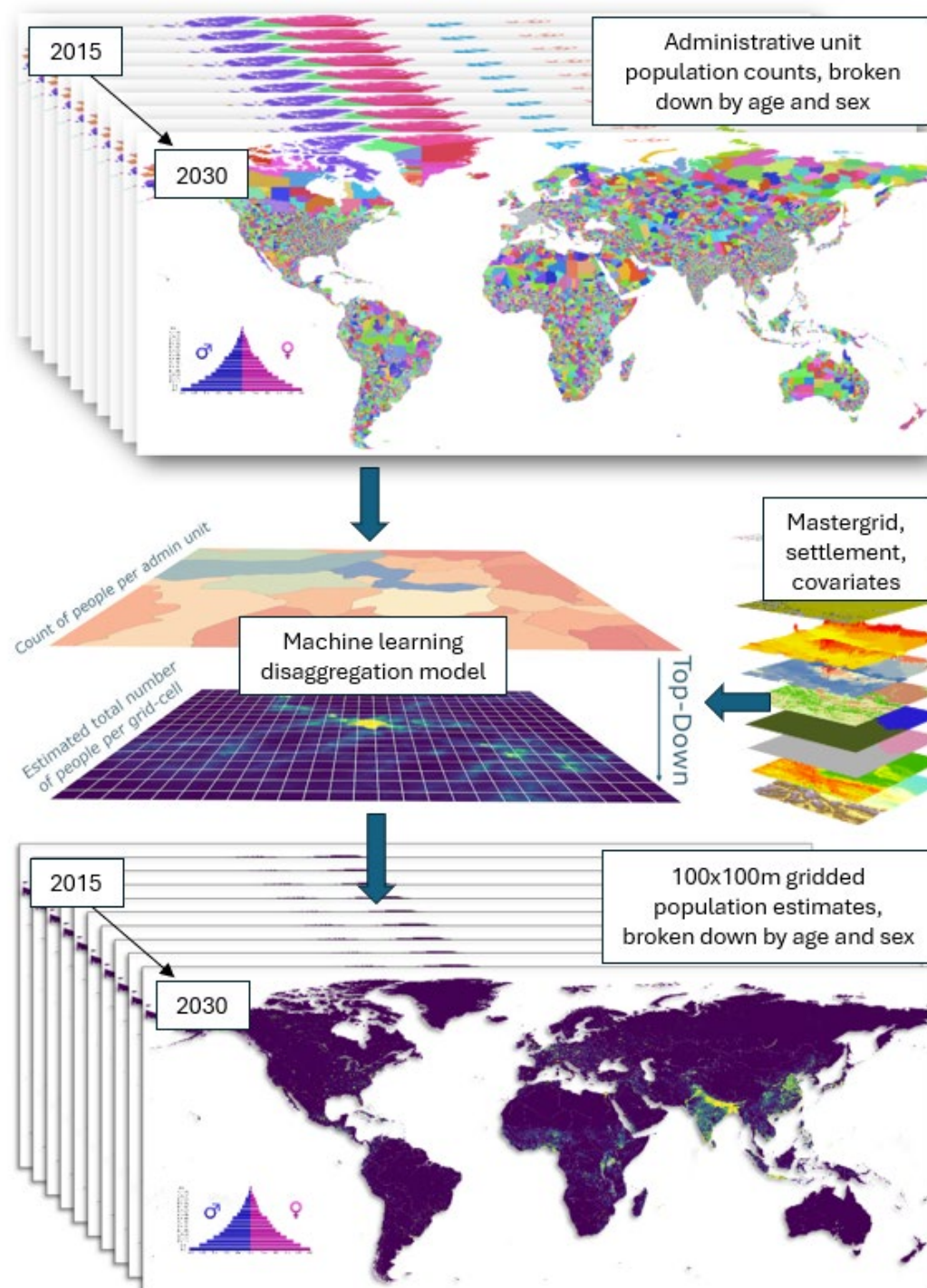
<https://www.worldpop.org/impact/dev-a/>

WorldPop 'Global1' population estimates





ALL NEW





WorldPop 'Global2': Global high-resolution population estimates for 2015-2030

/WorldPop News / By Andy Tatem

Tomorrow we're launching WorldPop's new global gridded population datasets – which we're calling 'Global 2'. In this blog I aim to provide an overview of what these new data are, why they matter, how you can use them, and a glimpse of what's coming next.

What was Global 1?

Back in 2018, the WorldPop team finished building the first ever set of multi-annual global 100x100m gridded estimates of residential population, broken down by age and sex classes – 'Global1'. This was the culmination of more than a decade of research on scalable geospatial modelling methods that could leverage satellite imagery and other mapping datasets to spatially disaggregate administrative unit-level population counts. By doing so we could produce high resolution gridded population estimates across national, continental and global scales. The annual datasets covering the 2000-2020 period were made openly available to download and have been in wide use by governments, UN agencies, academics, Non-Governmental Organisations and the private sector ever since.

Why make gridded population data?

A major advantage of gridded population data over the more traditional administrative unit-based counts is their flexibility in being able to

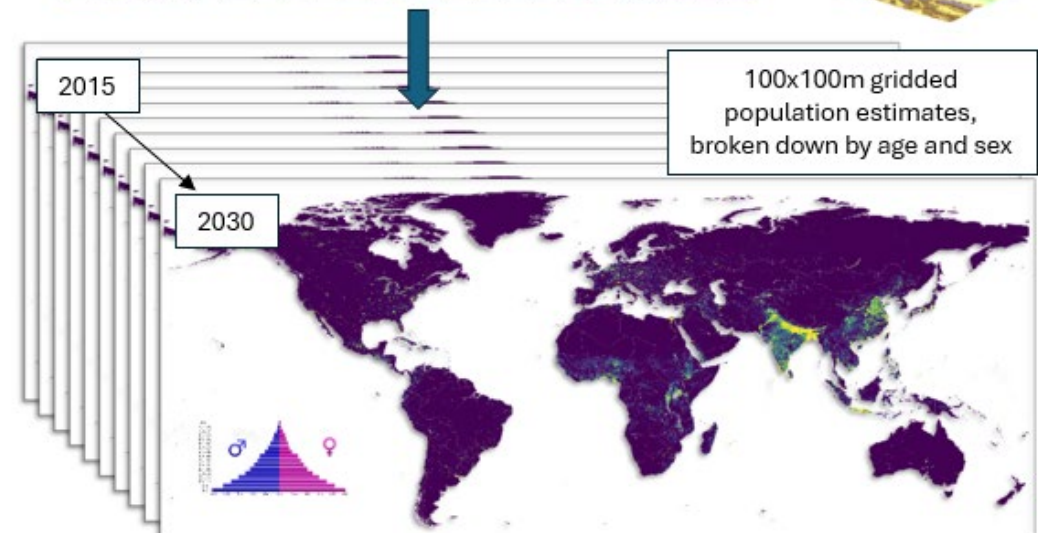
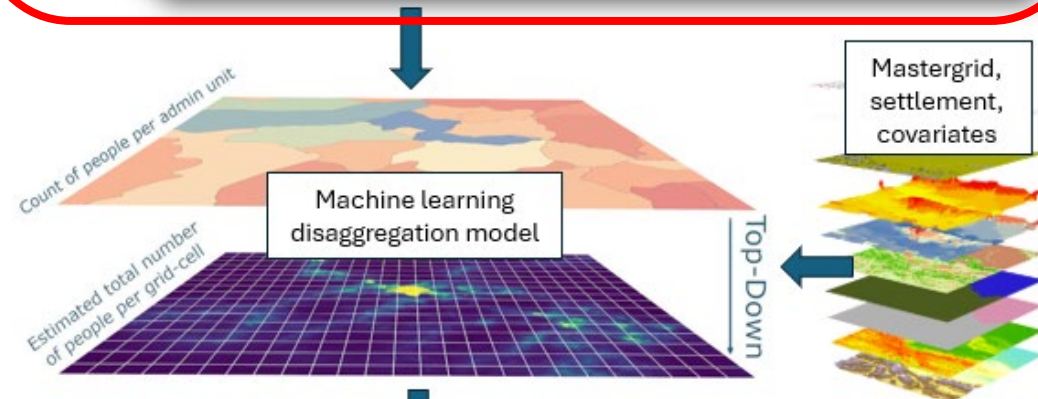
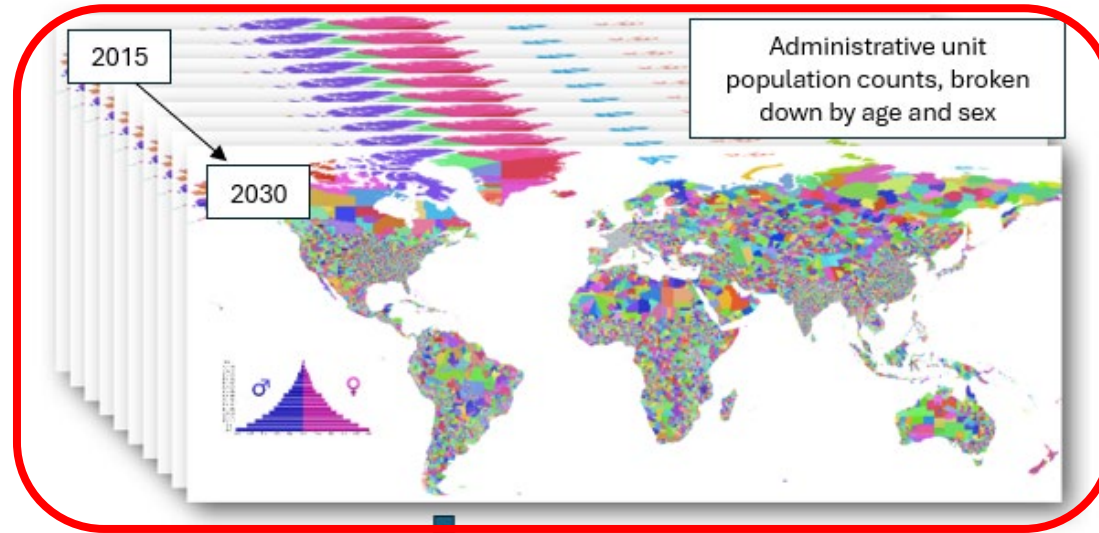


Global Demographic Data

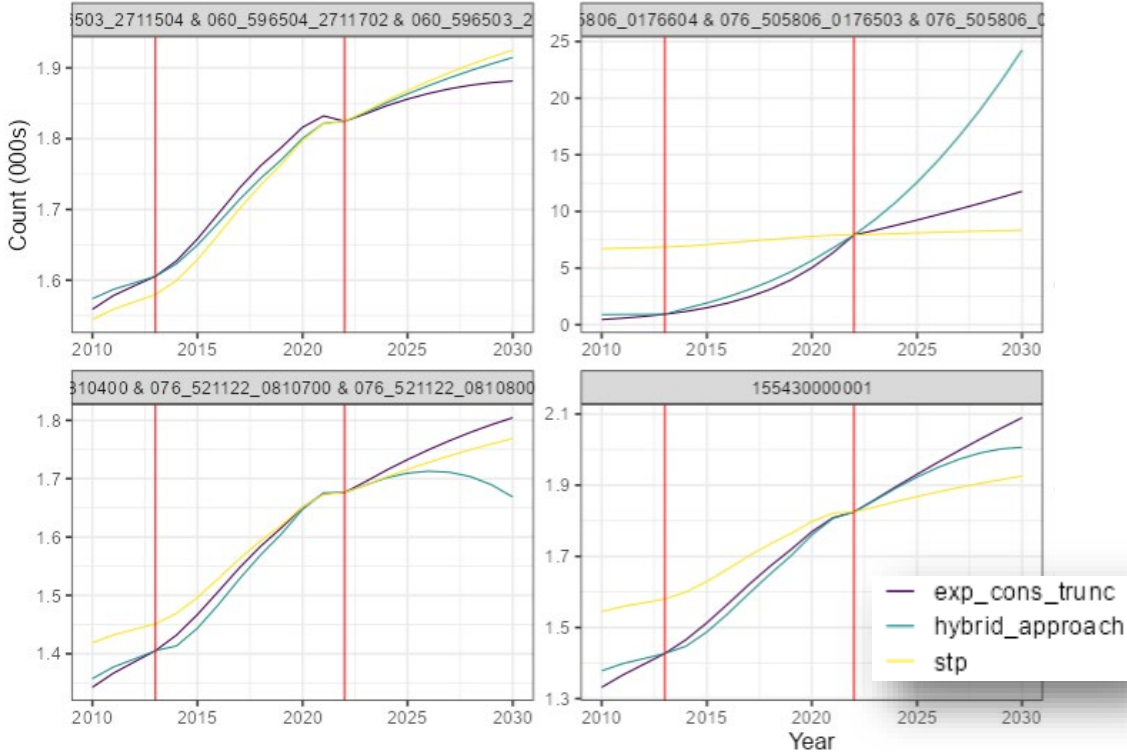
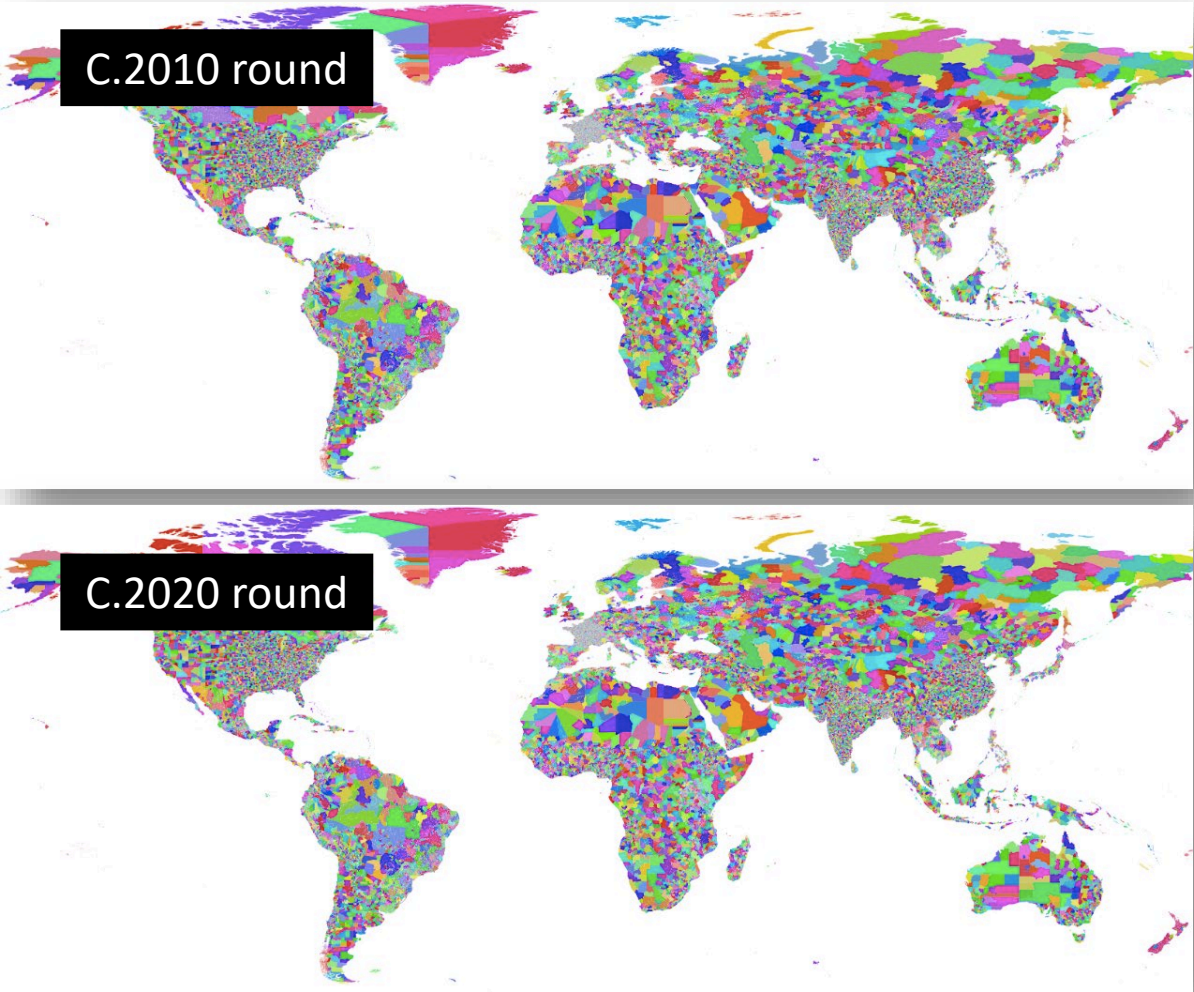
Public release R2025A V1

worldpop.org
September 2025





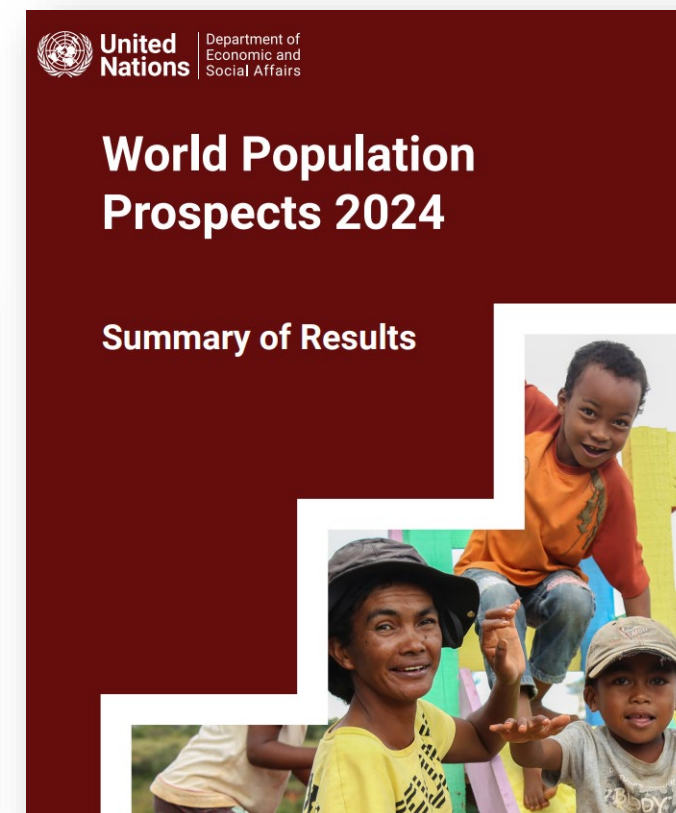
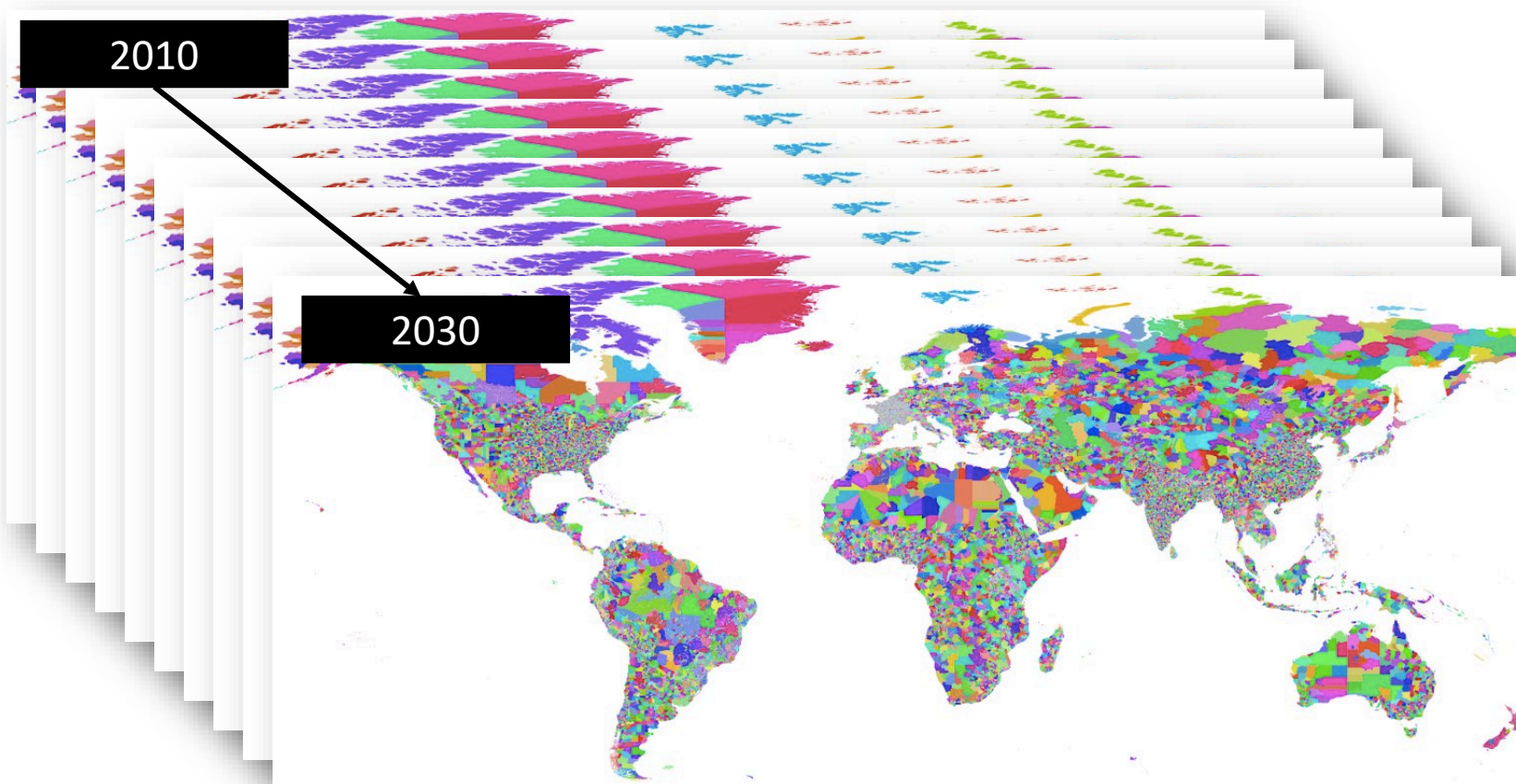
Assembly of 2010-2030 age/sex structured subnational census/projections, including c.2010 and c.2020 census rounds (>1 mill admin unit-based counts)



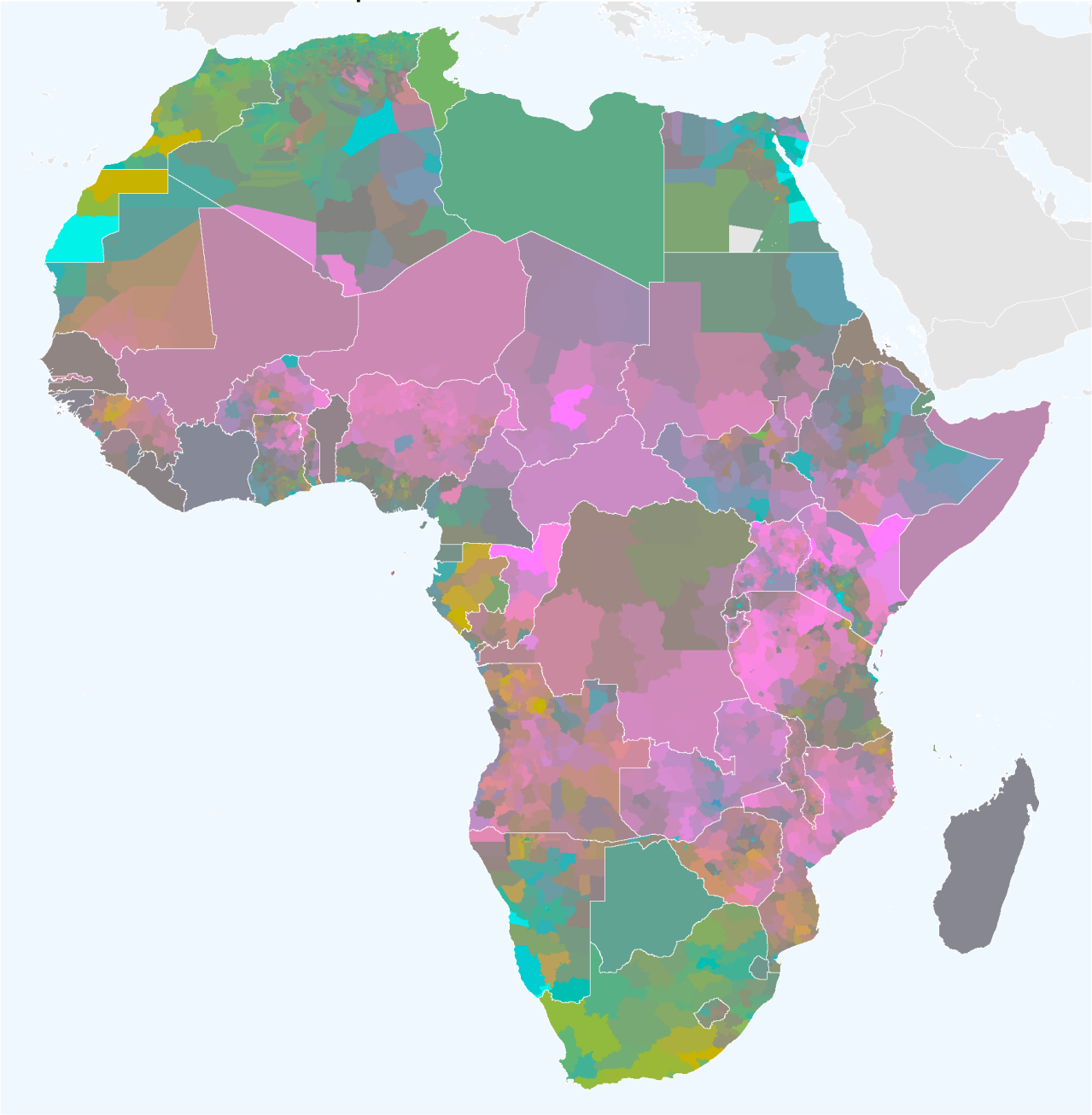
Department of
Social Statistics
and Demography



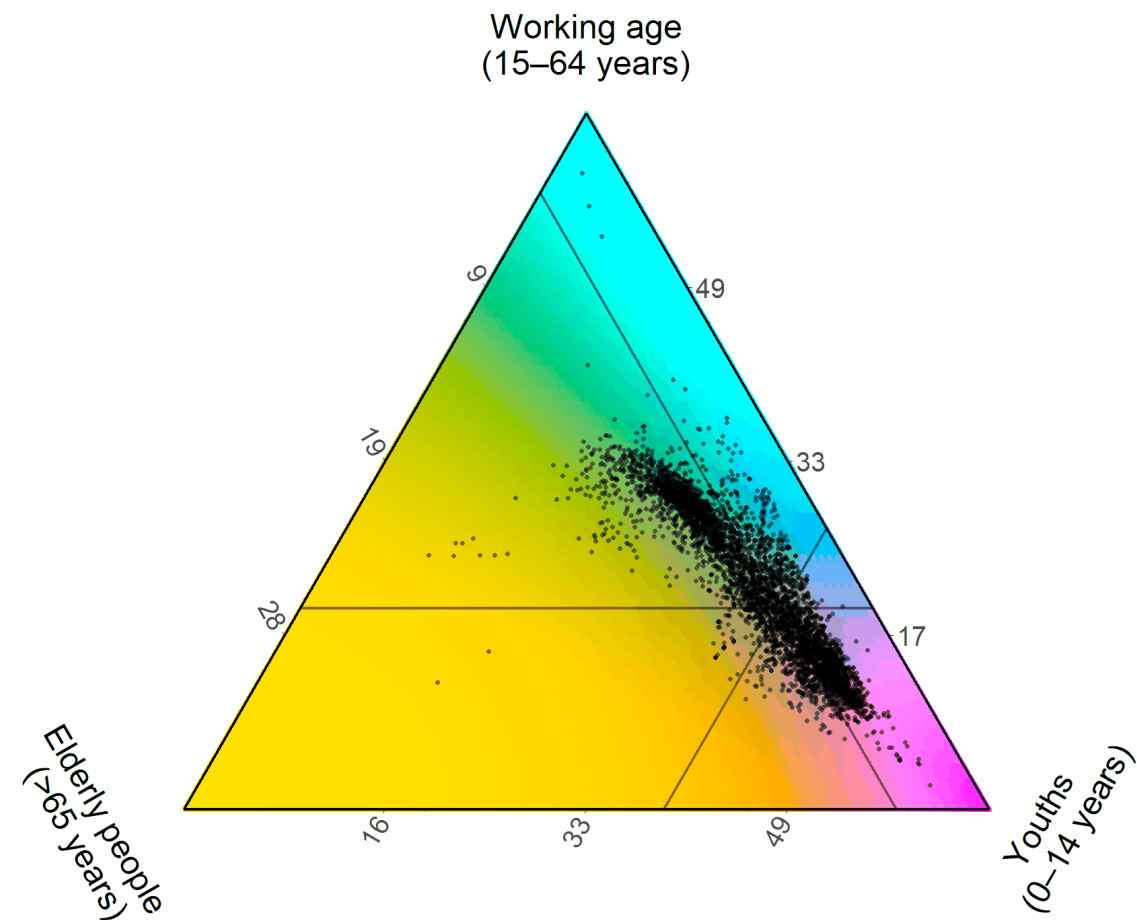
2010-2030 annual time series aligned with UN WPP 2024 national estimates

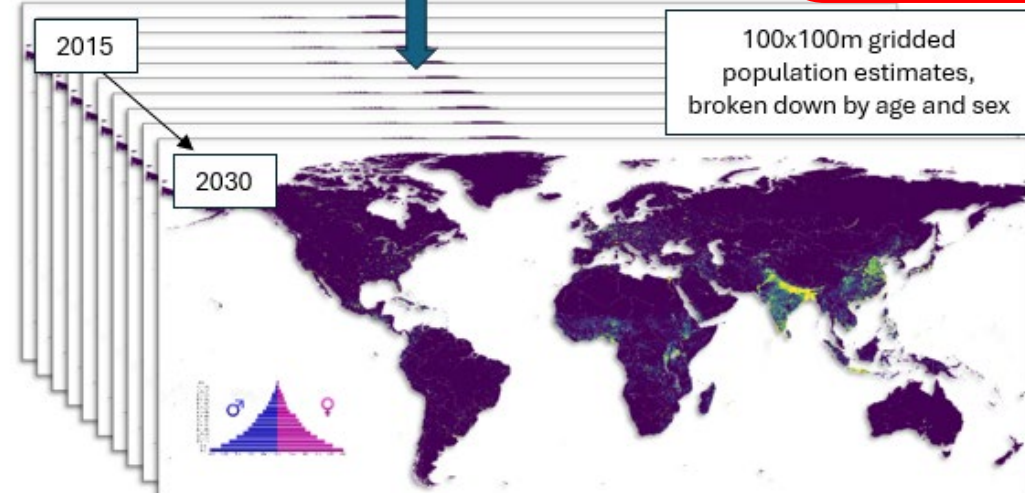
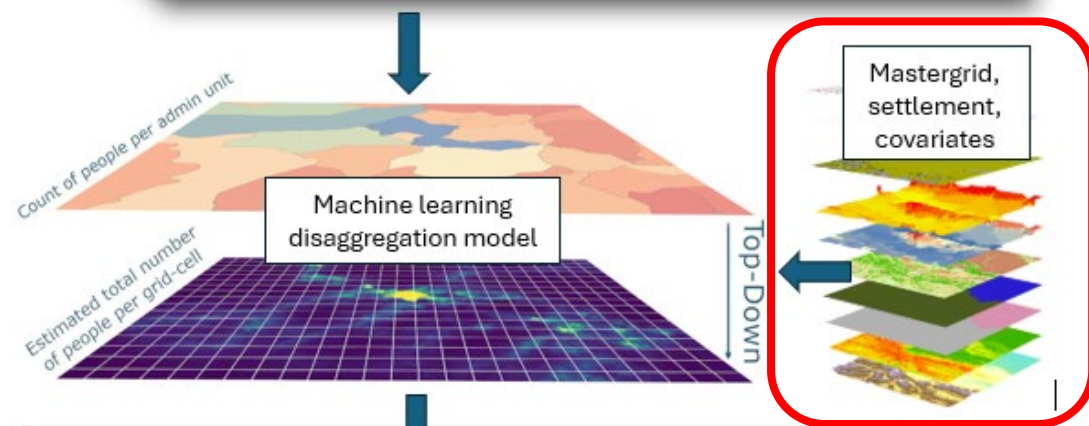
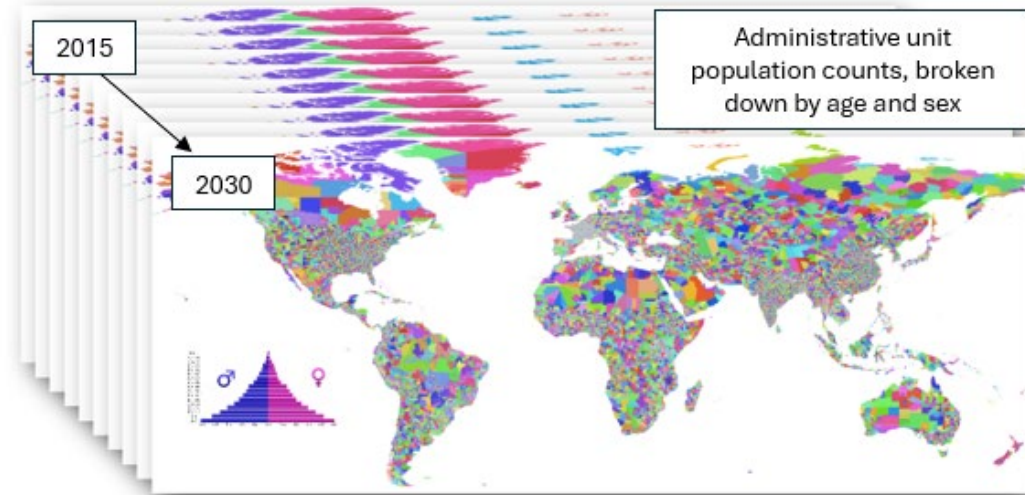


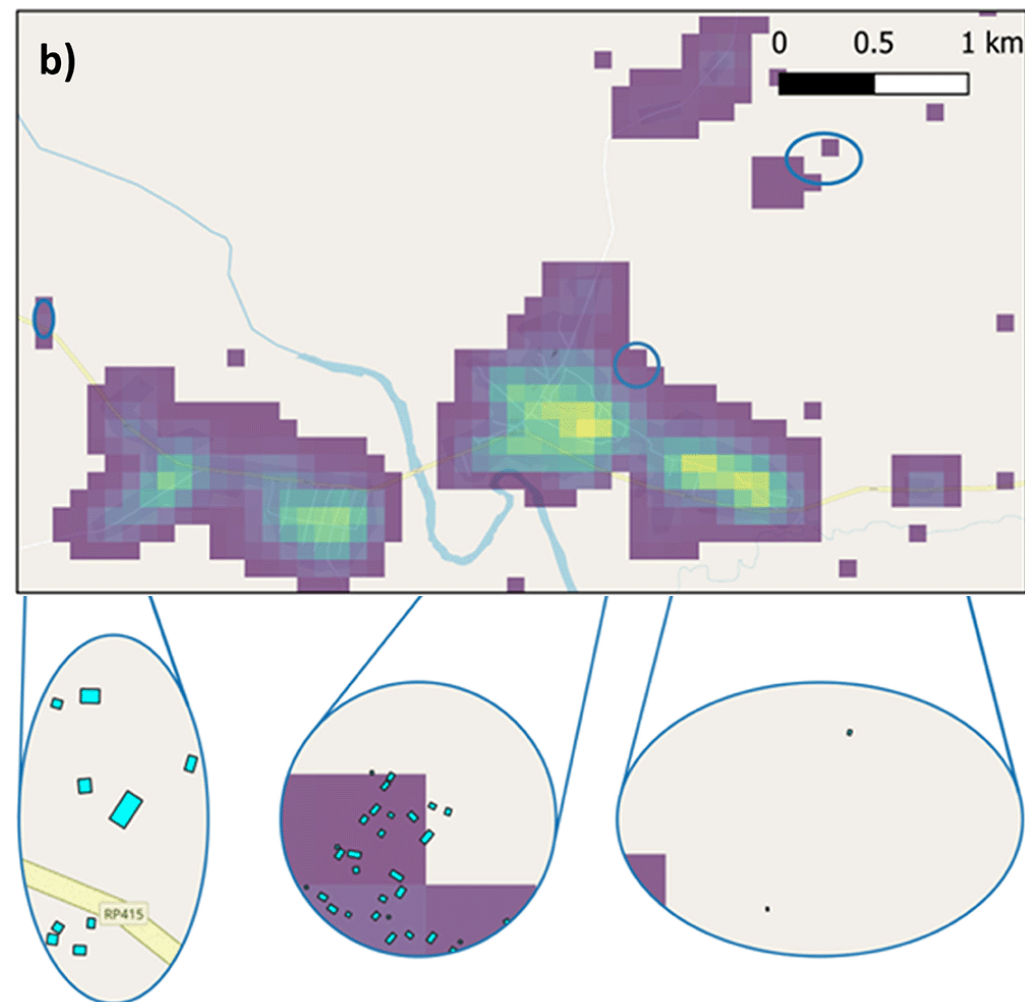
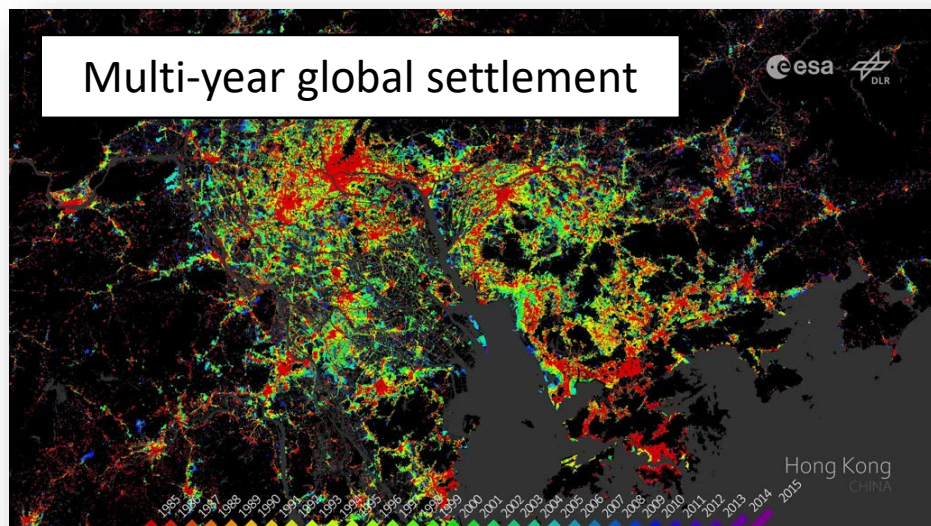
Africa Subnational Population Structures in 2015





Source: WorldPop Global 2 Data

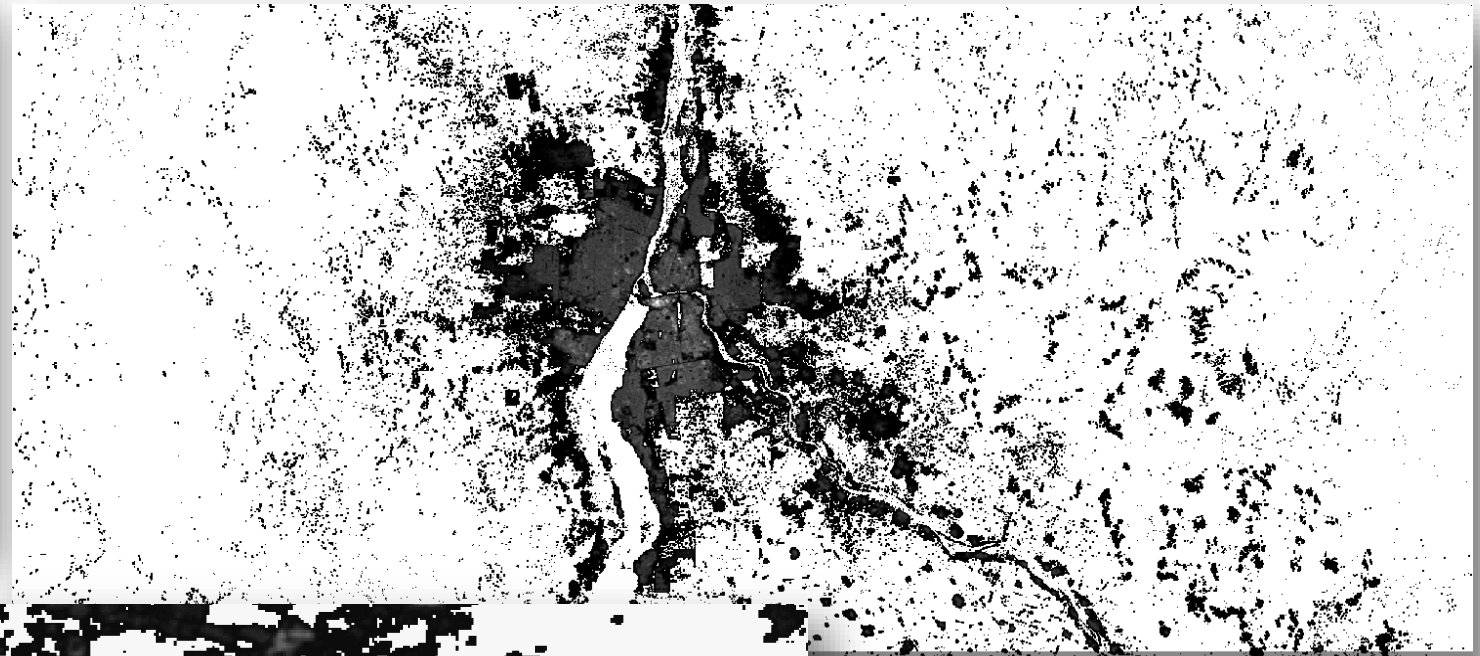




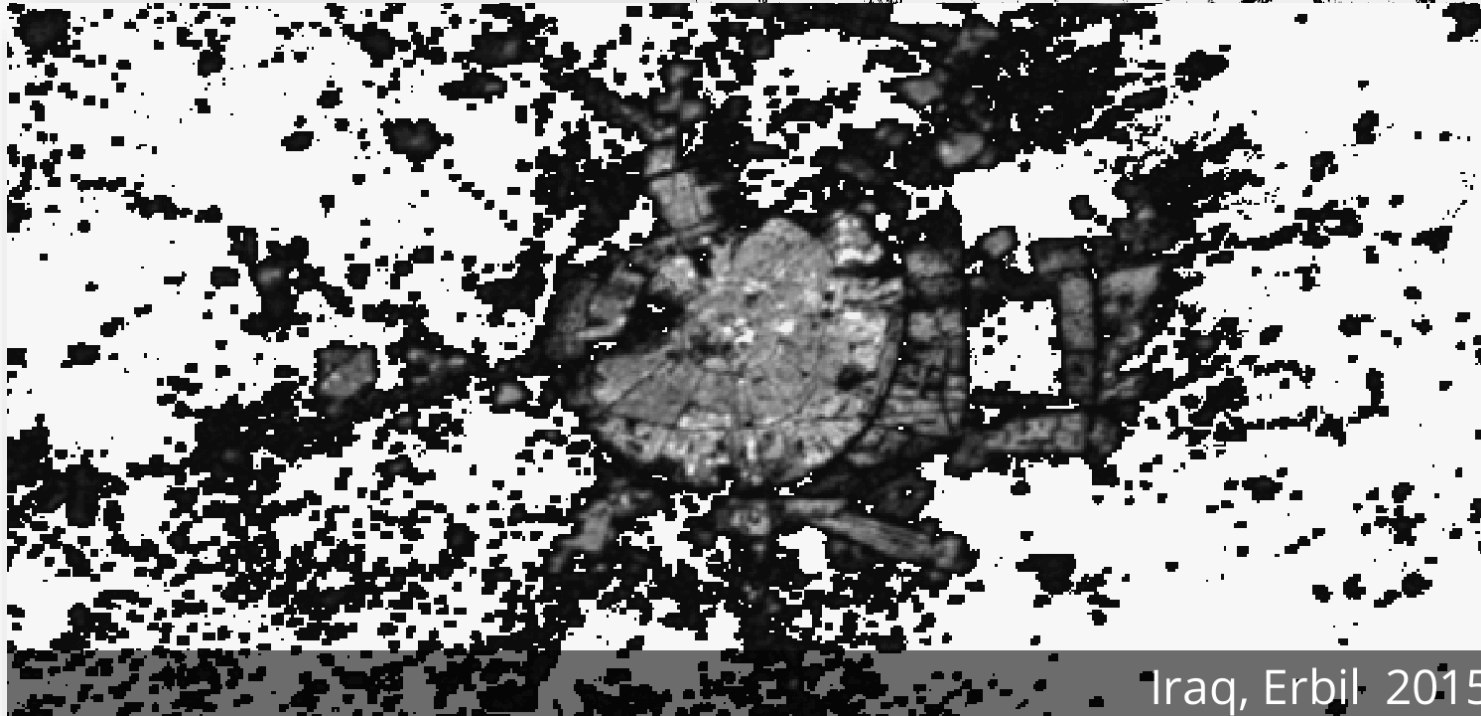


Annually modelling built-settlements between remotely-sensed observations using relative changes in subnational populations and lights at night

[Jeremiah J. Nieves](#)^{a b}  , [Alessandro Sorichetta](#)^{a b}, [Catherine Linard](#)^{a c},
[Maksym Bondarenko](#)^{a b}, [Jessica E. Steele](#)^{a b}, [Forrest R. Stevens](#)^{a d}, [Andrea E. Gaughan](#)^{a d},
[Alessandra Carioli](#)^{a b}, [Donna J. Clarke](#)^{a b}, [Thomas Esch](#)^e, [Andrew J. Tatem](#)^{a b}



Khartoum, Sudan 2015



Iraq, Erbil 2015

VeriXiv

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167 Views | 21 Downloads | 0 Citations

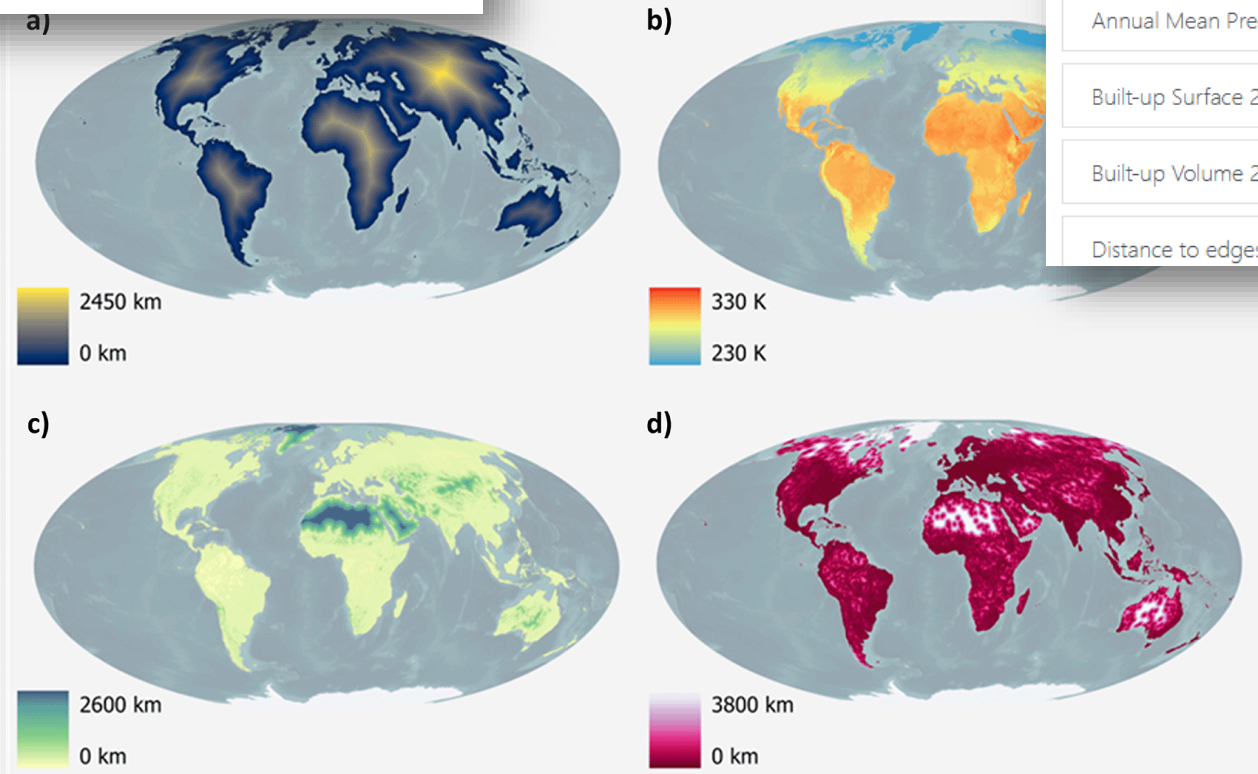
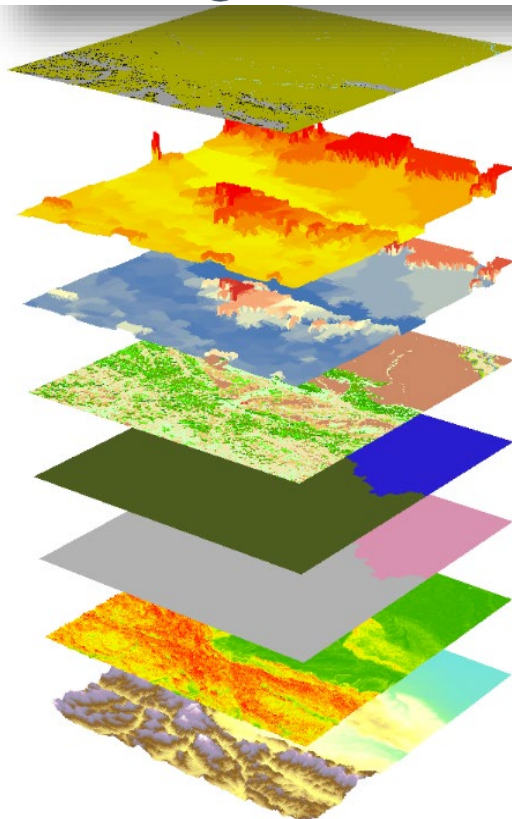
Home ▸ Articles ▸ Global gridded multi-temporal datasets to support human population ...

PREPRINT

Undergoing Peer Review

DATA NOTE 8

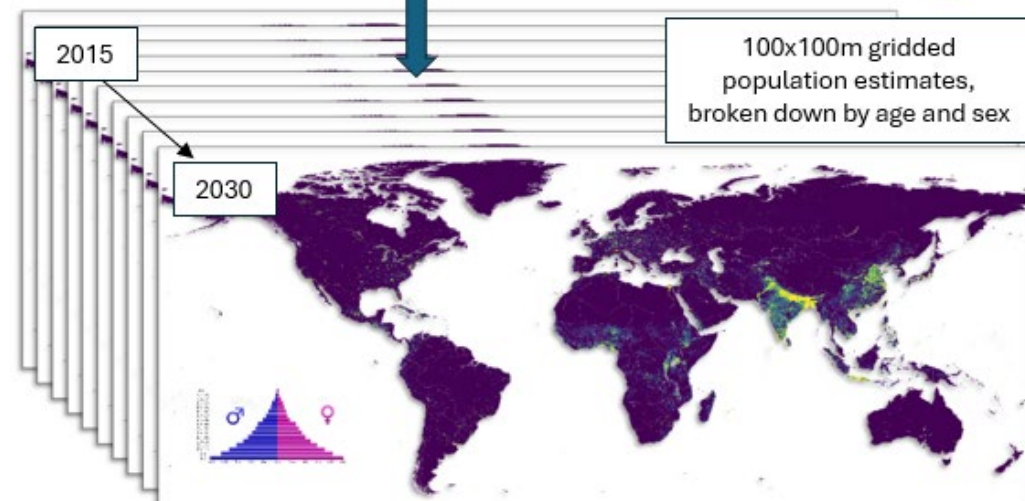
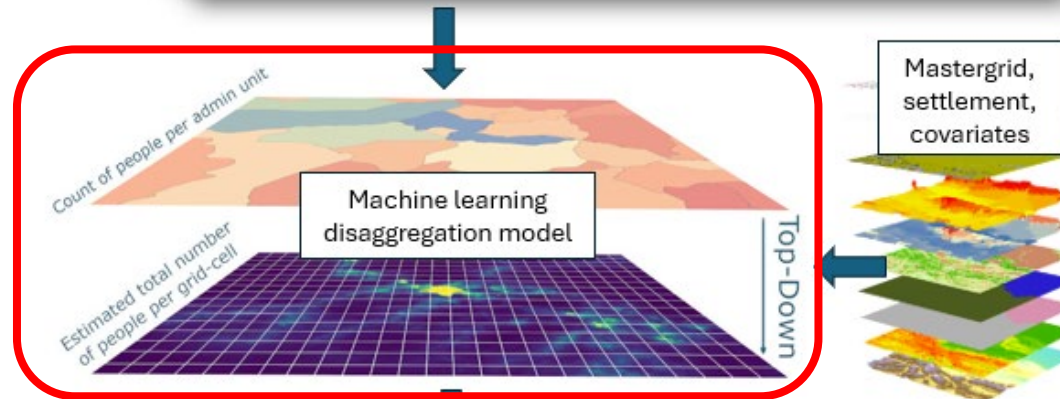
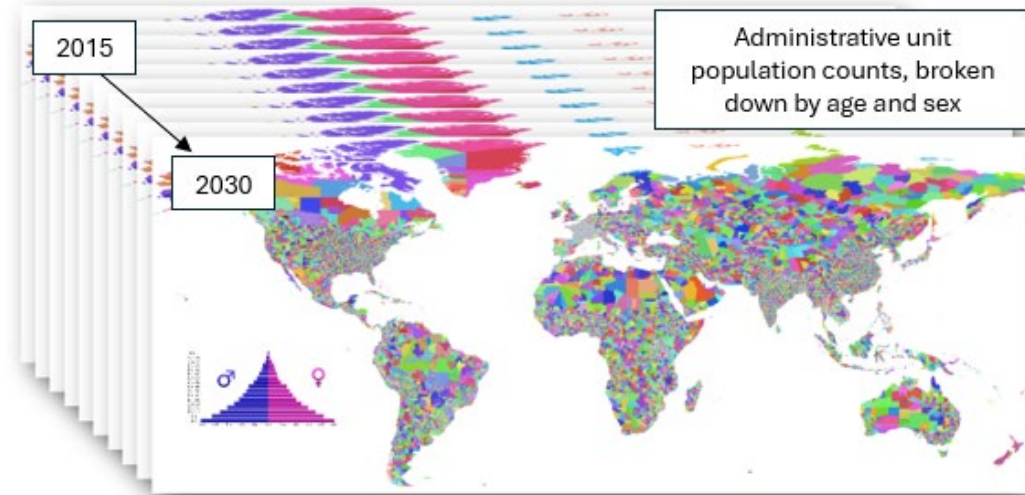
Global gridded multi-temporal datasets to support human population distribution modelling



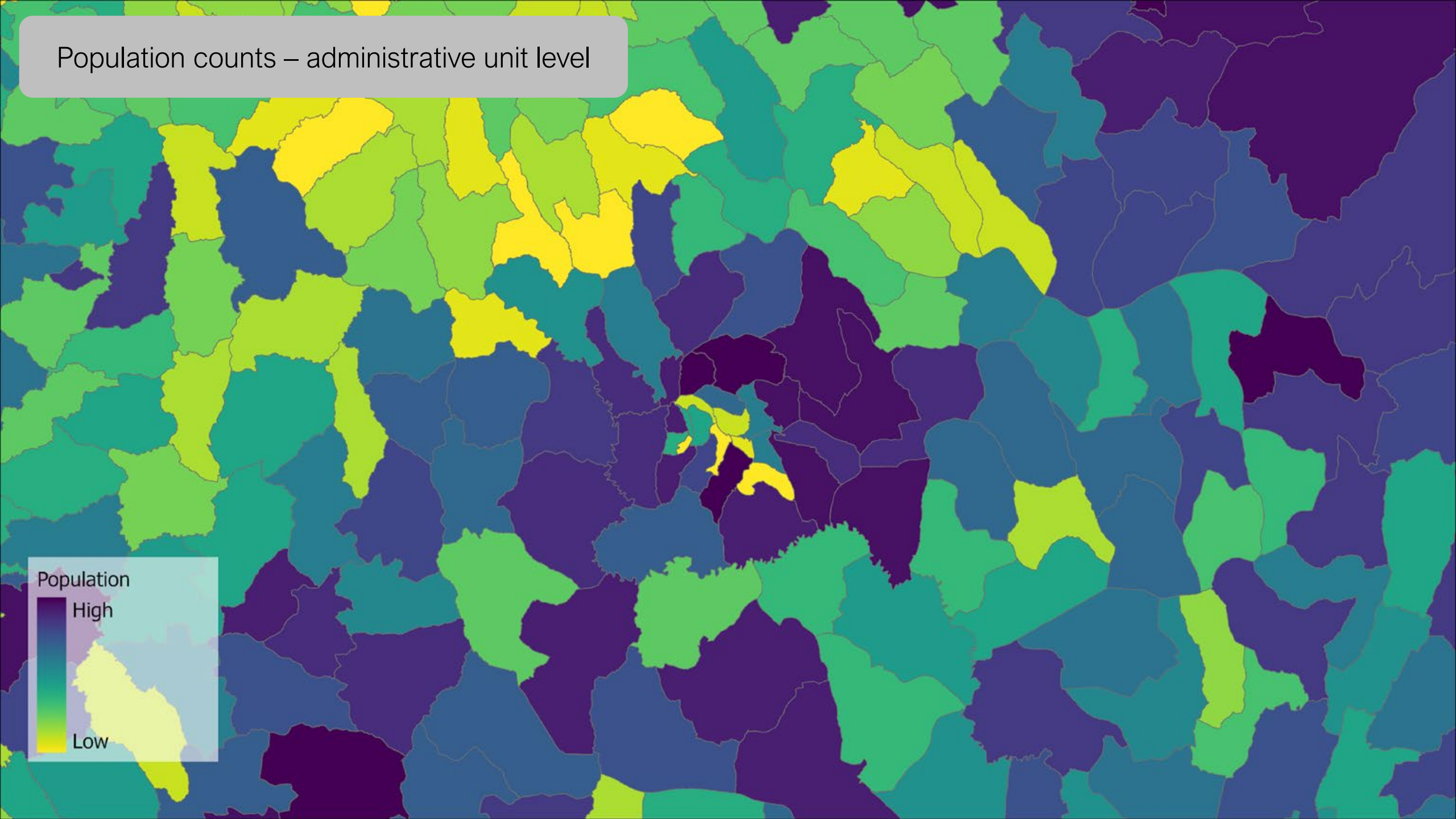
<https://hub.worldpop.org/project/categories?id=14>

WorldPop Hub

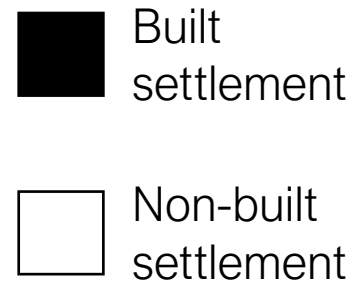
- Annual Mean Surface Temperature 2015-2023
- Distance to Built-up Surface 2015-2030
- Distance to inland water 2021
- Distance to open-water coastline 2021
- Annual Mean Precipitation 2015-2023
- Built-up Surface 2015-2030
- Built-up Volume 2015-2030
- Distance to edges of reclassified ESA-CCI-LC classes 2015 R2004V1



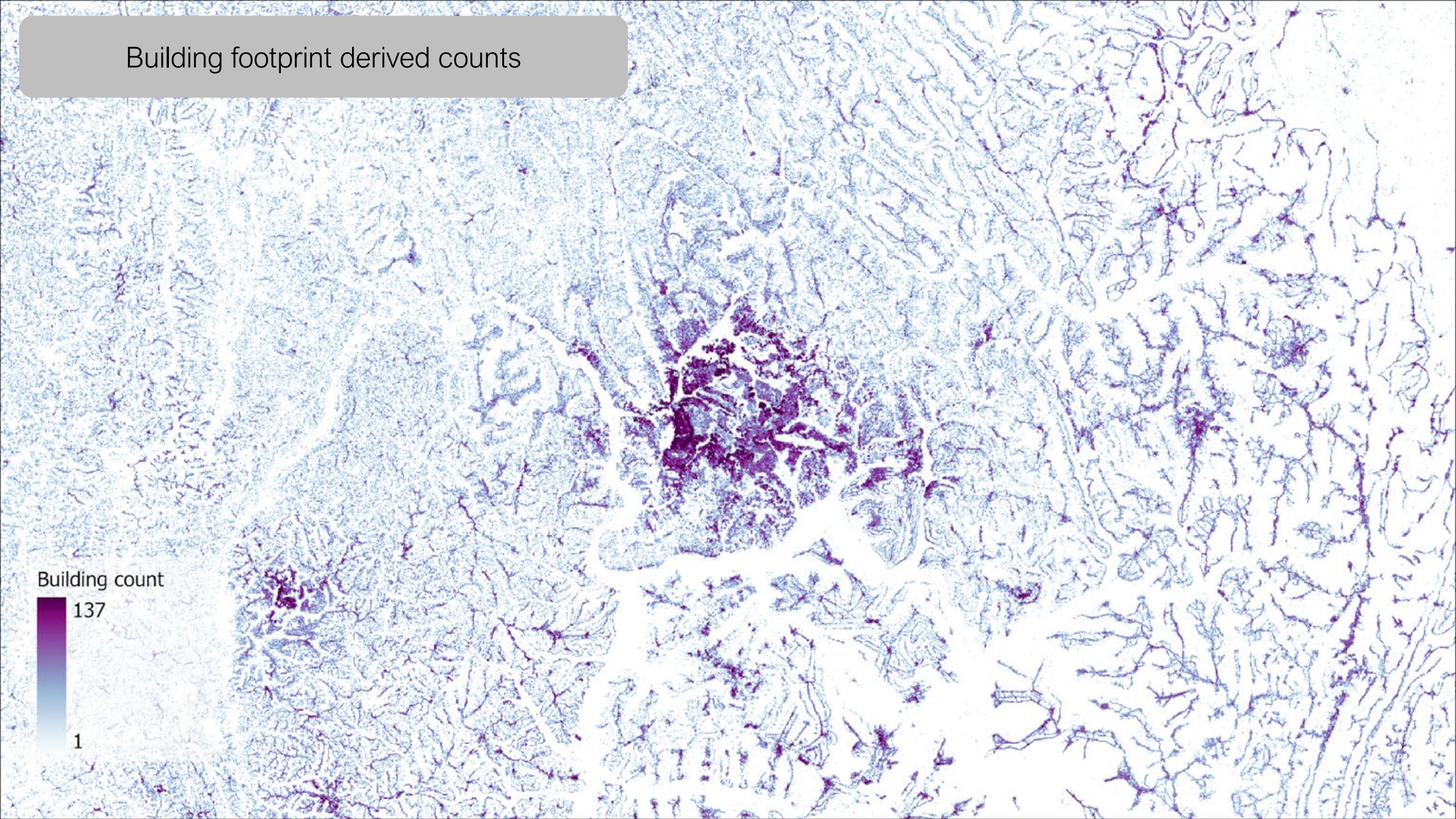
Population counts – administrative unit level



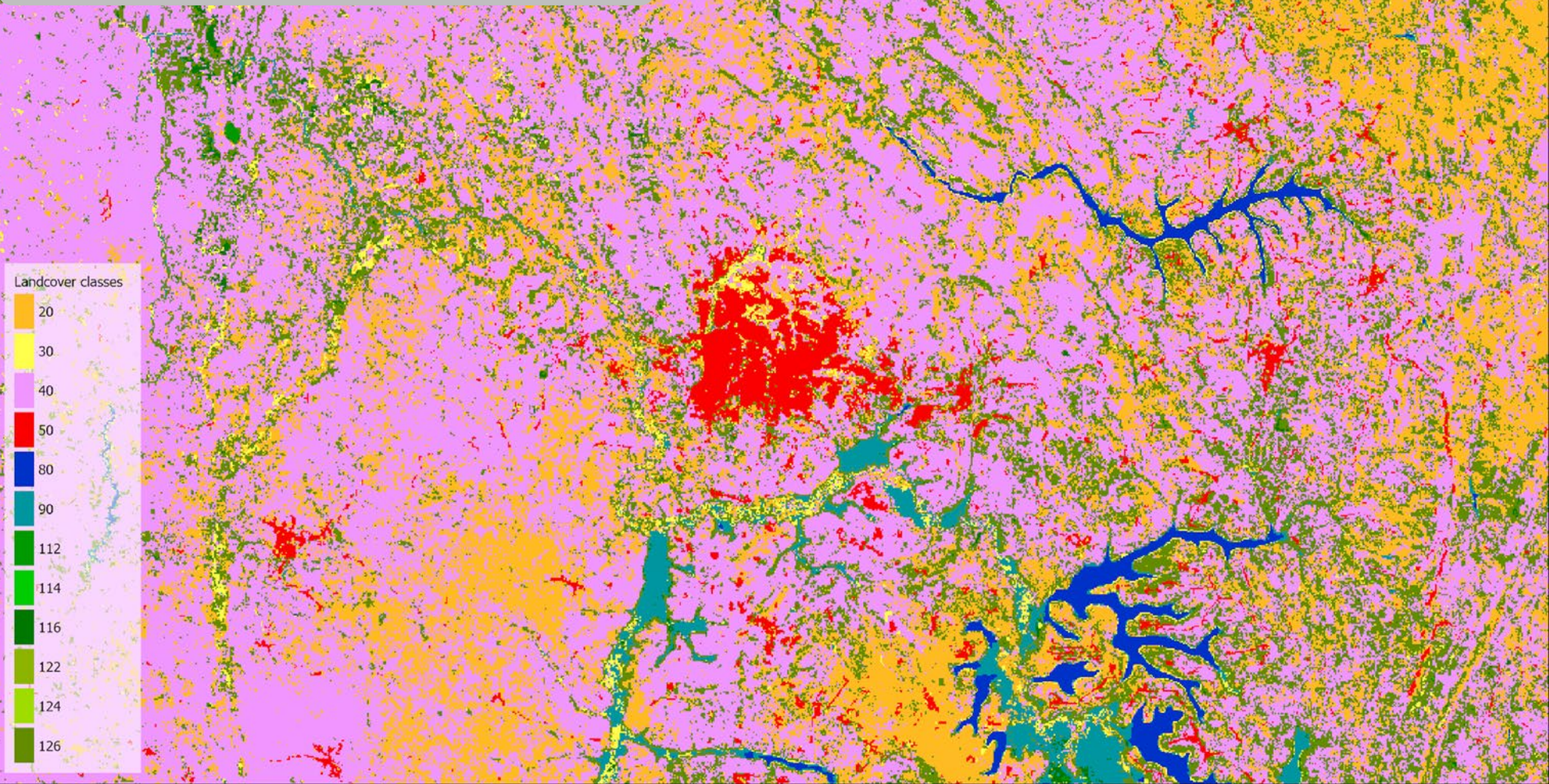
Built settlement mask



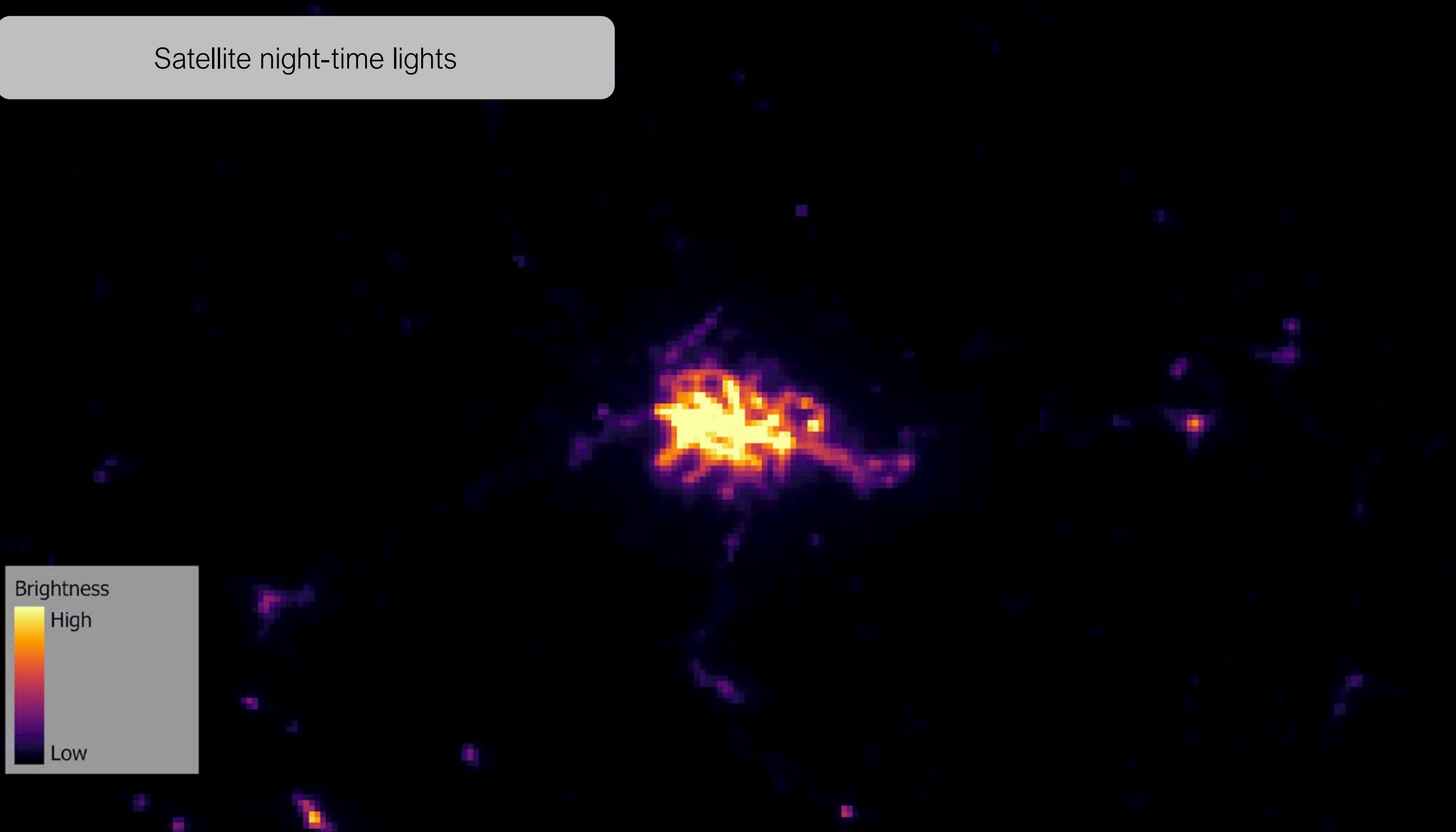
Building footprint derived counts



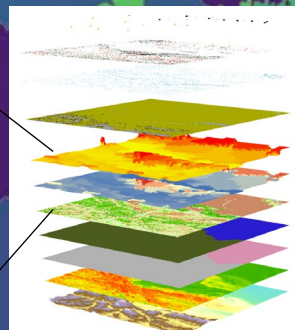
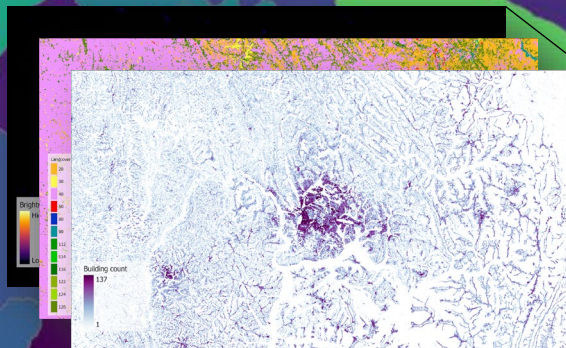
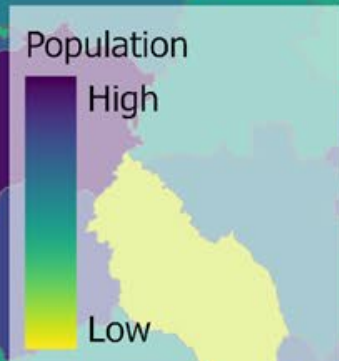
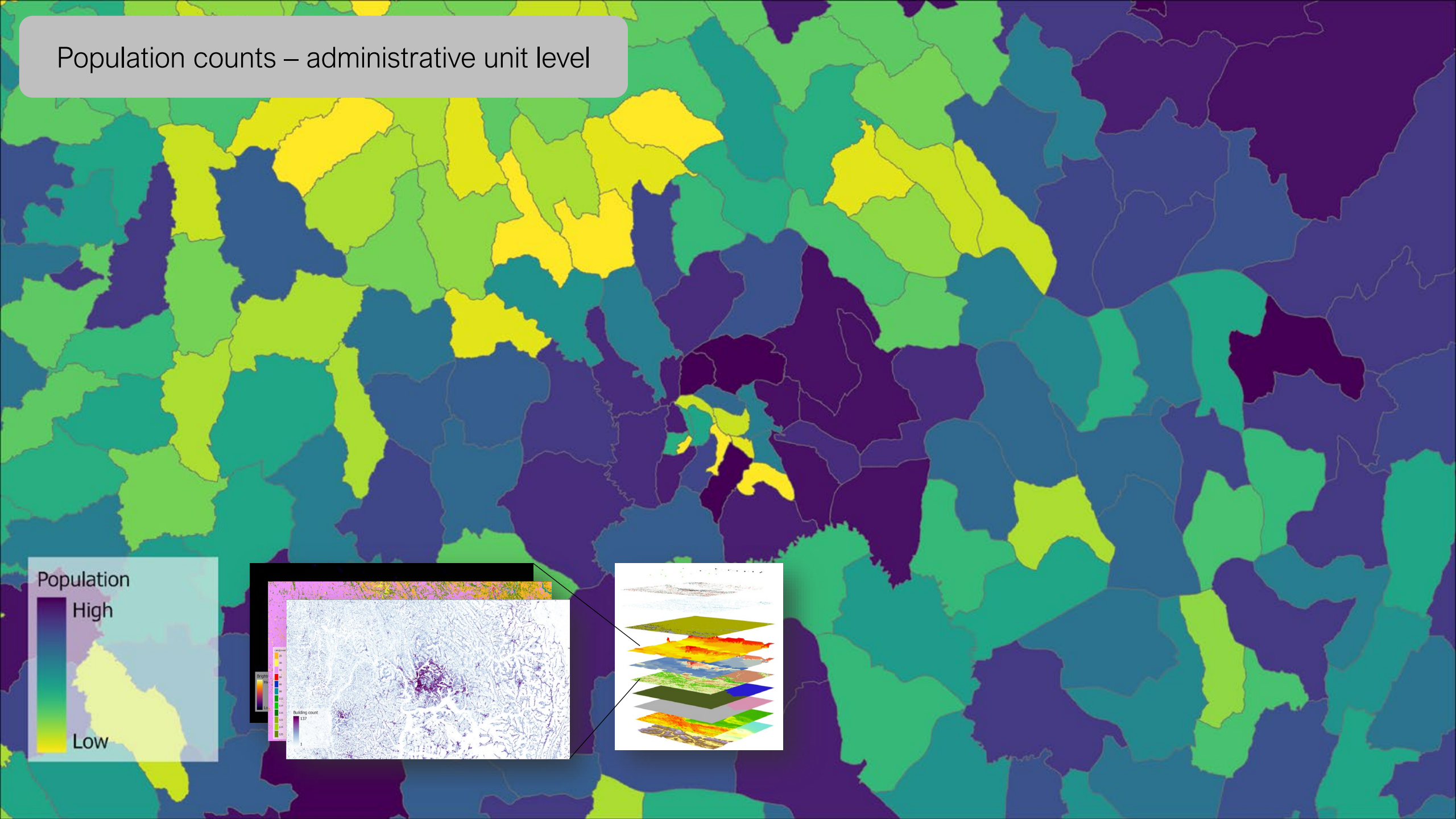
Land cover classification



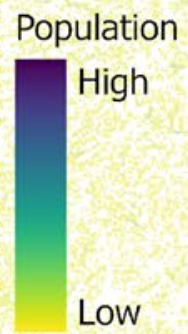
Satellite night-time lights

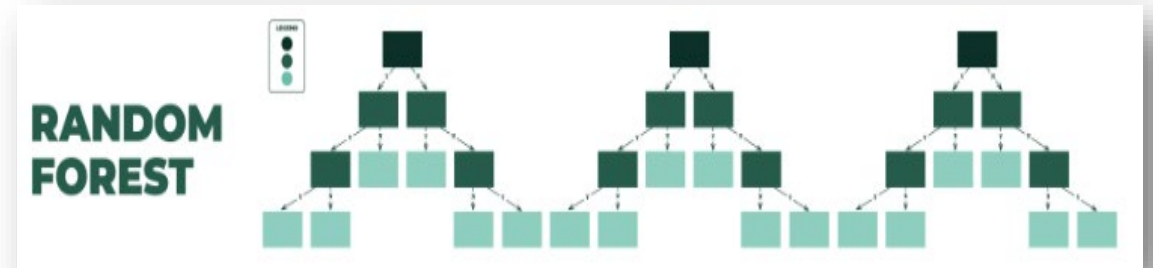
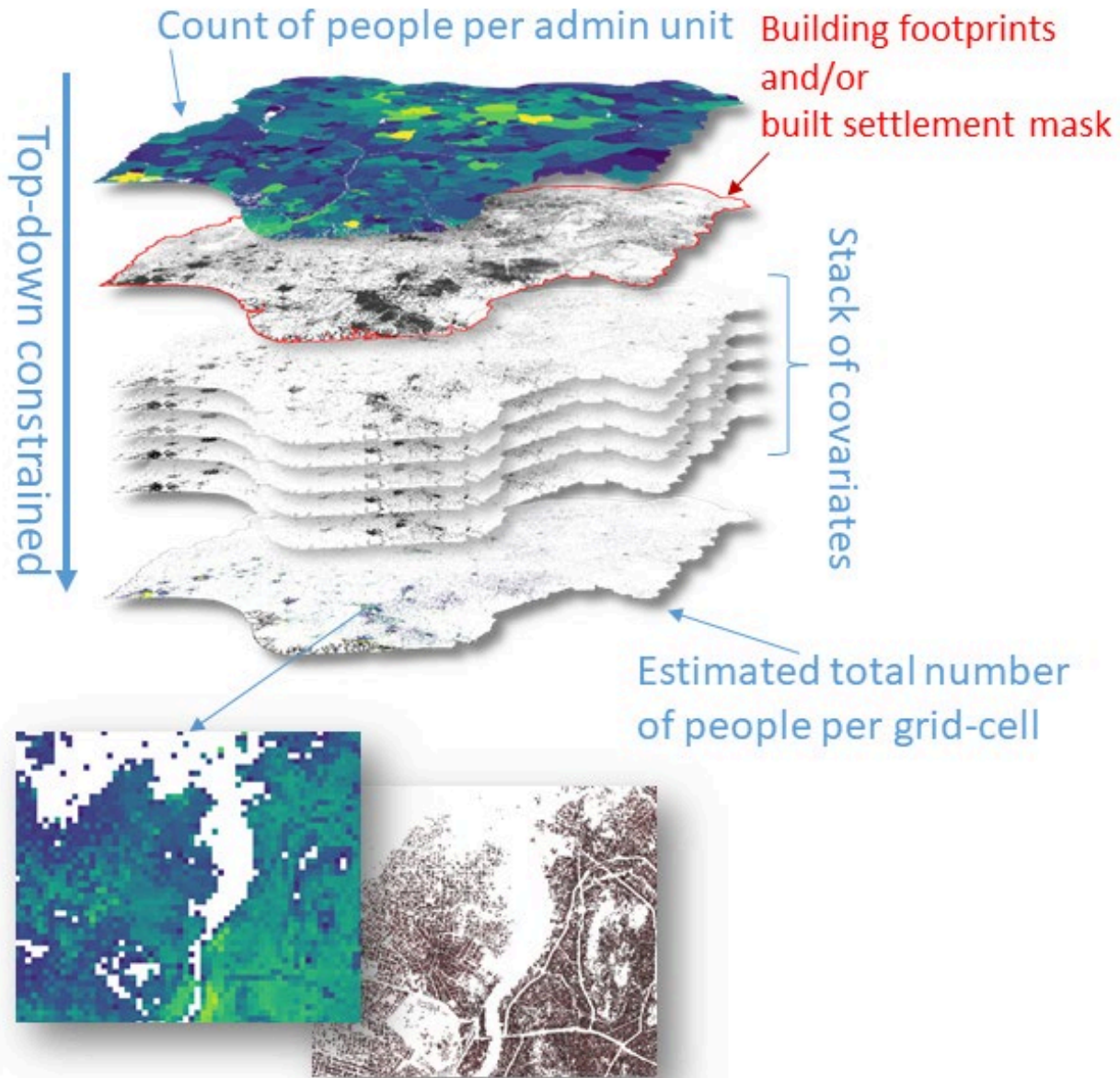


Population counts – administrative unit level



Population counts – 100m x 100m grid cells





README

popRF: Random Forest-informed Population Disaggregation R package

High resolution, recent data on human population distributions are important for measuring impacts of population growth, monitoring human-environment interactions and for planning and policy development. Many methods are used to disaggregate census data and predict population densities for finer scale, gridded population data sets.

`popRF` is a population modelling R package utilizing Random Forests to inform a dasymetric redistribution of census-based population count data. A description of using Random Forests machine learning method in `popRF` is described in [Stevens et al.](#)

Installation

The `popRF` package can be installed directly from Github.

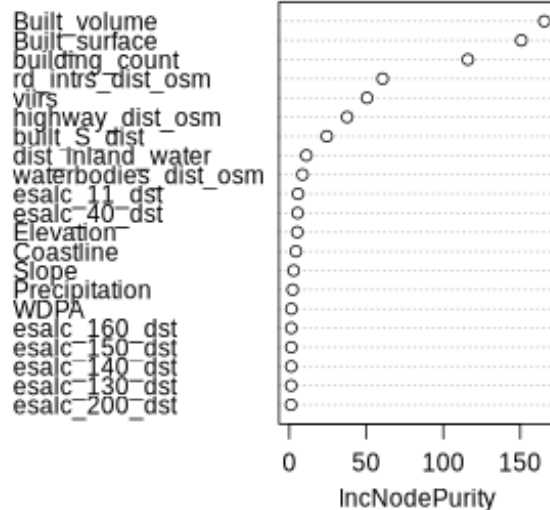
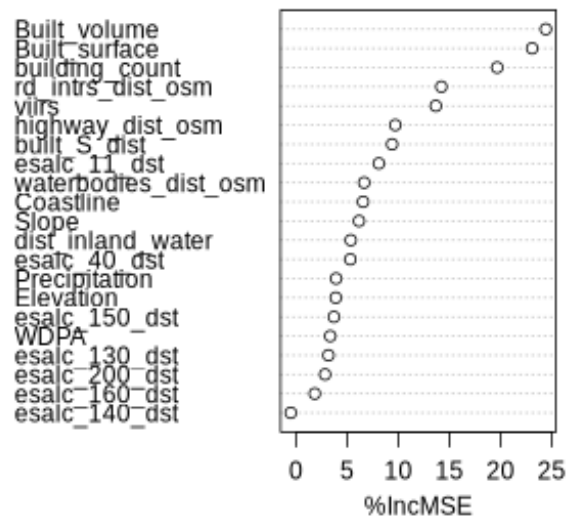
```
install.packages("devtools")
devtools::install_github("wpgp/popRF")
```

<https://github.com/wpgp/popRF>

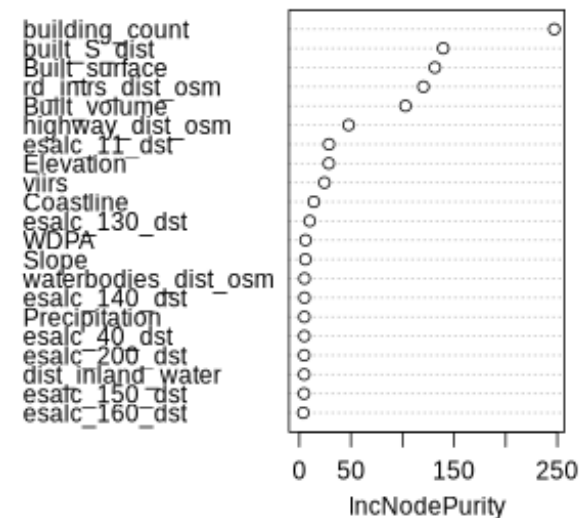
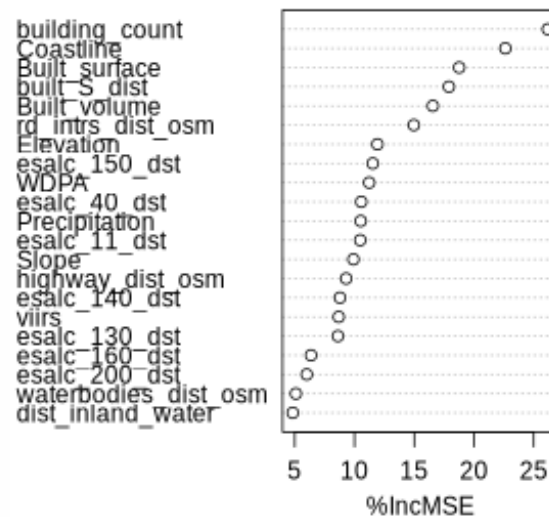
Namibia 2025 gridded estimates
Variance explained **96.4%**
(last census: 2023)

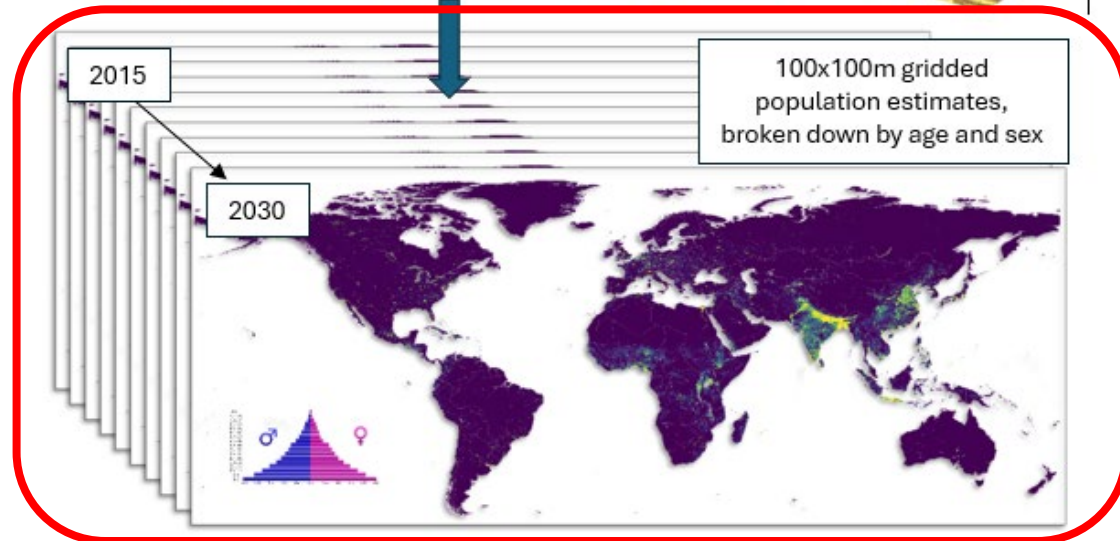
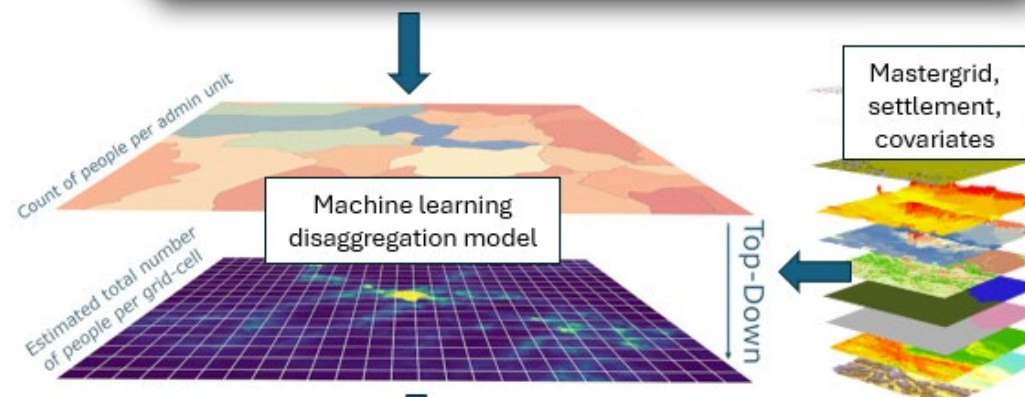
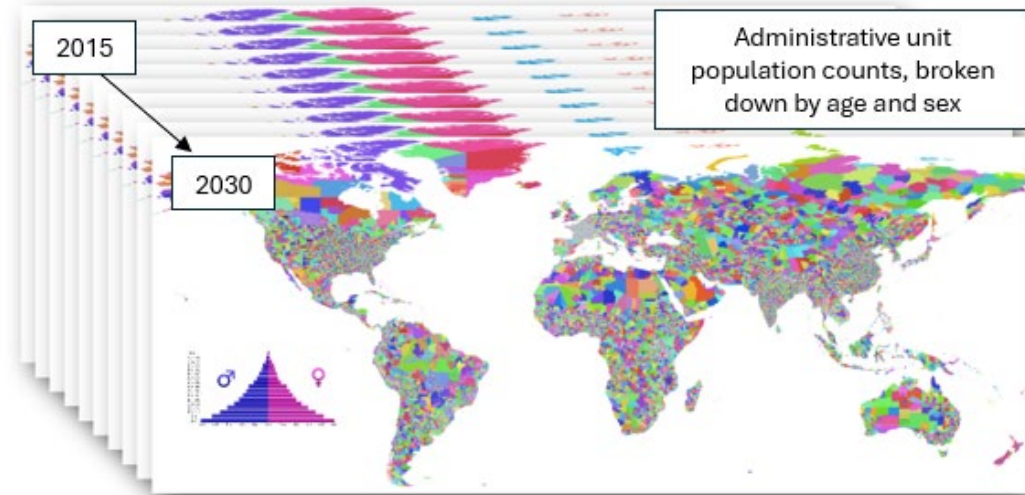
Ethiopia 2025 gridded estimates
Variance explained **90.5%**
(last census: 2007)

popfit_final

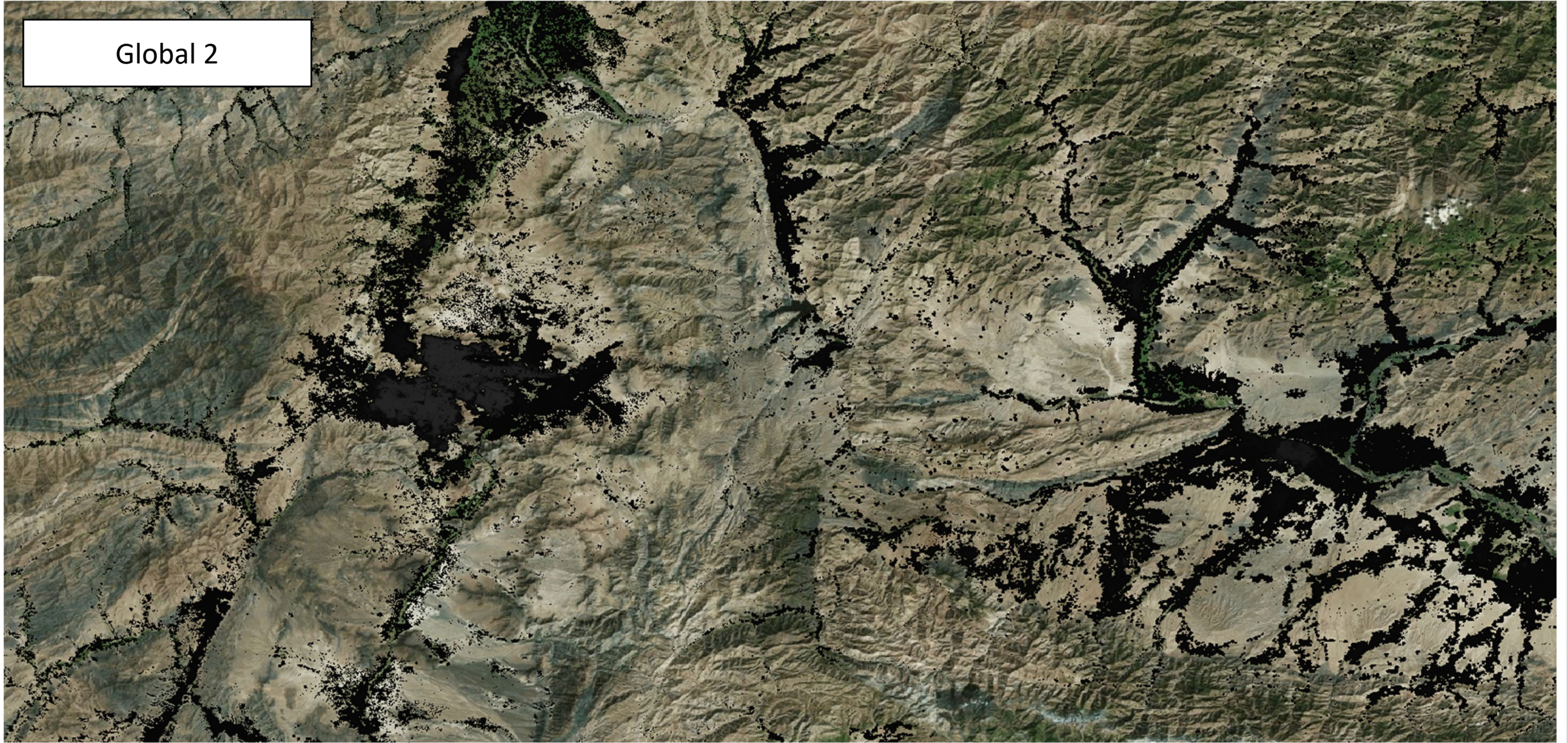


popfit_final

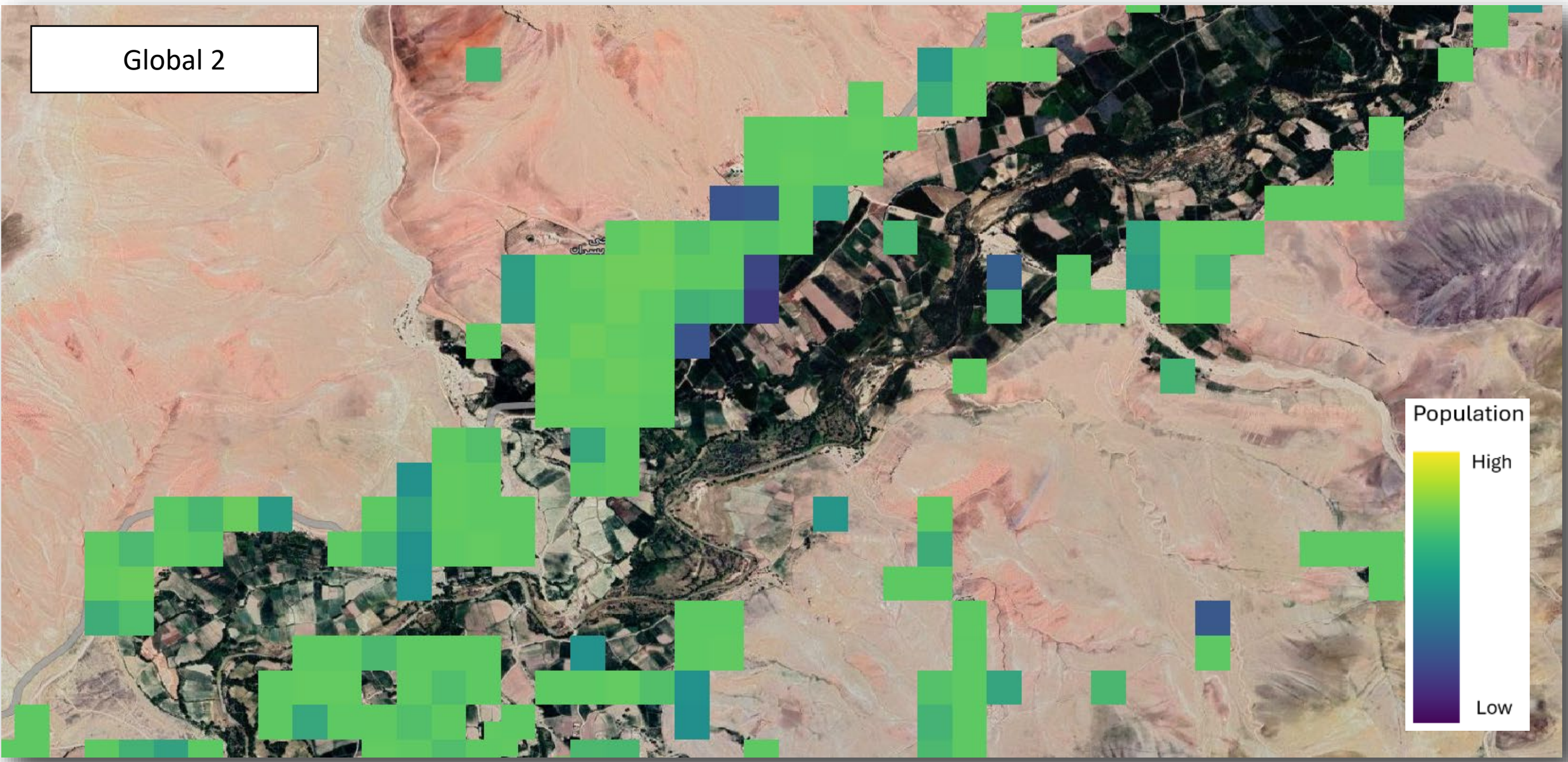




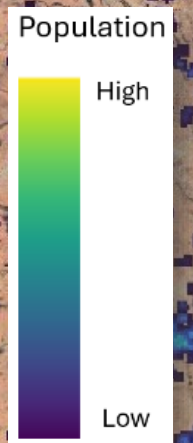
Global 2



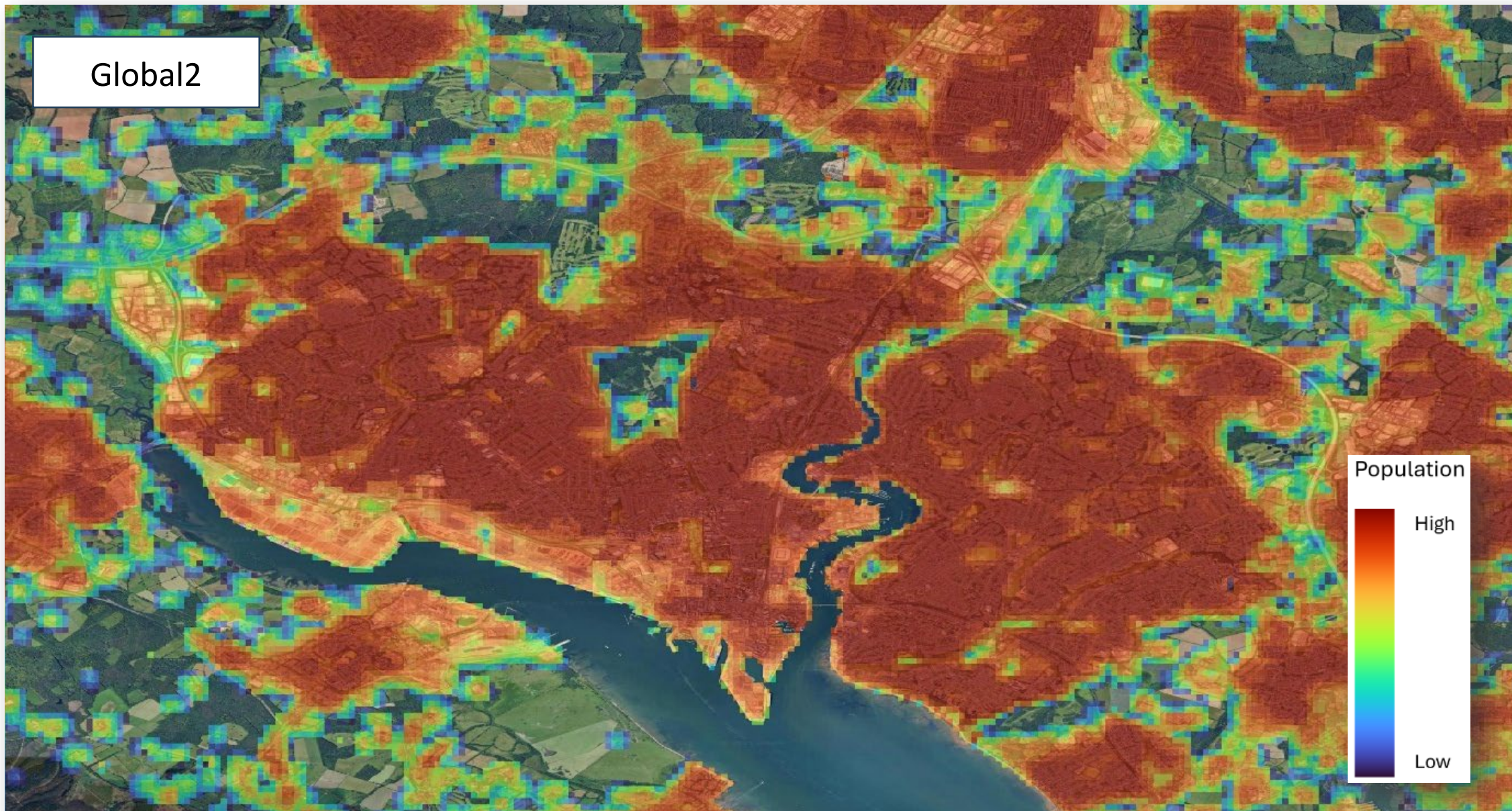
Global 2

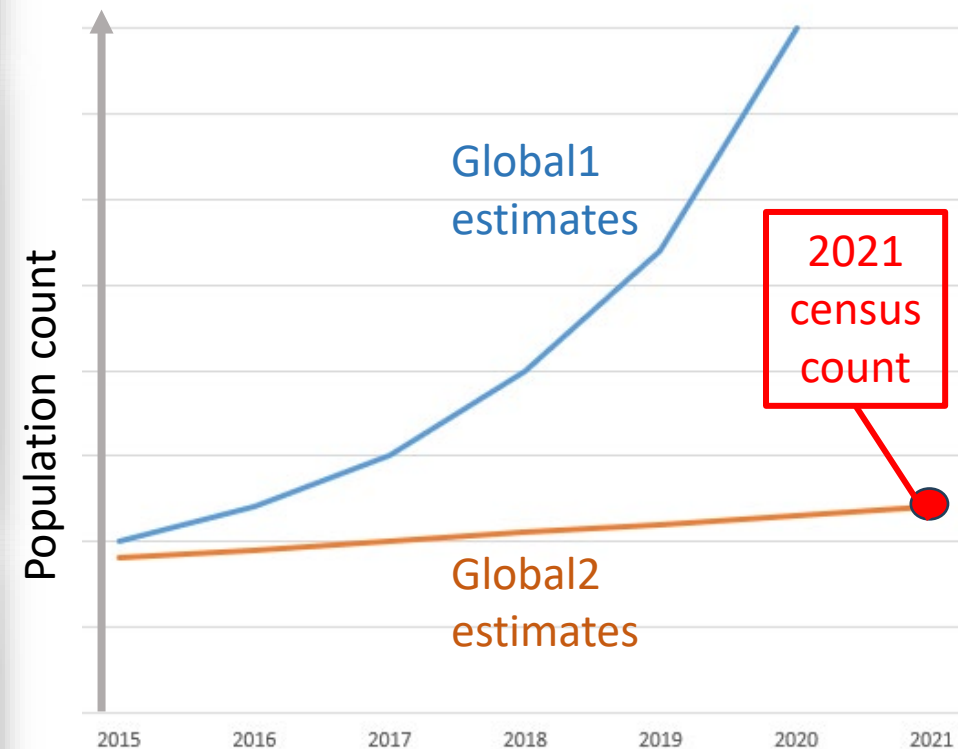
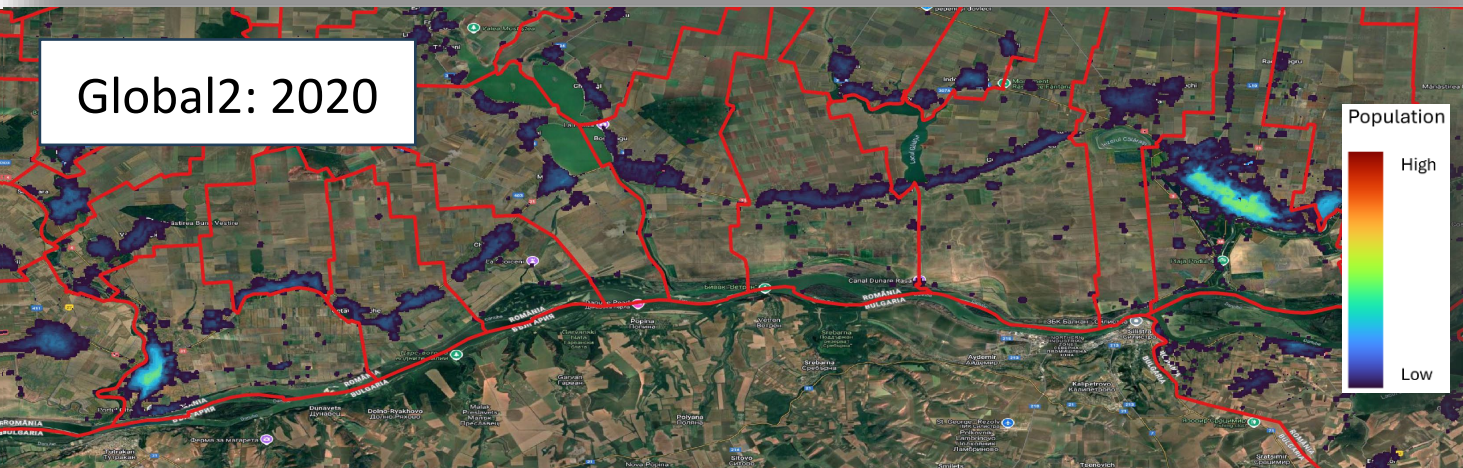
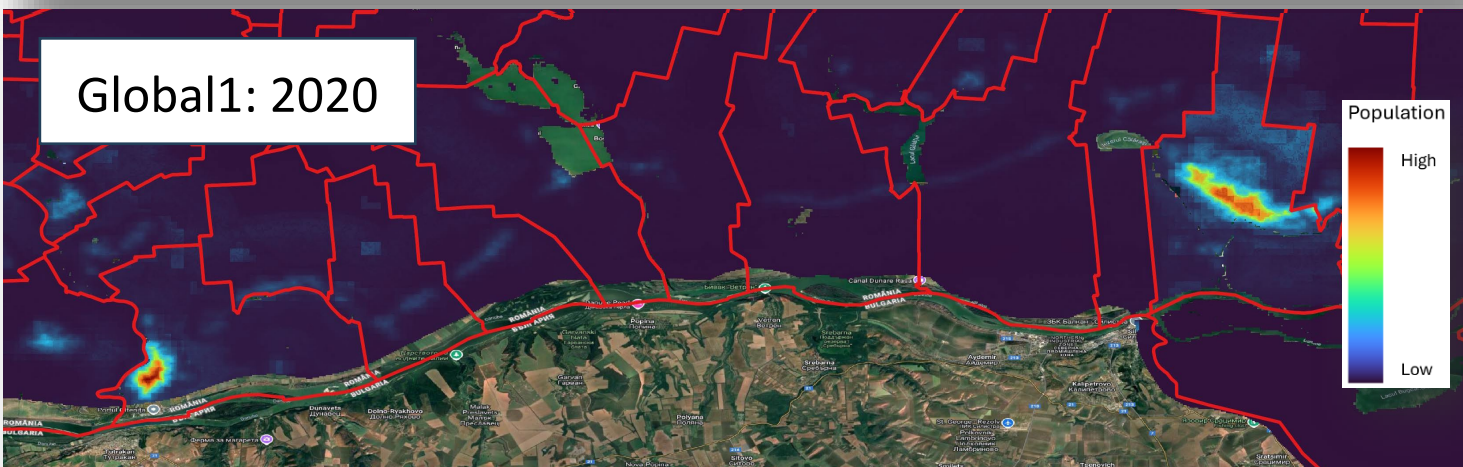


Global2



Global2





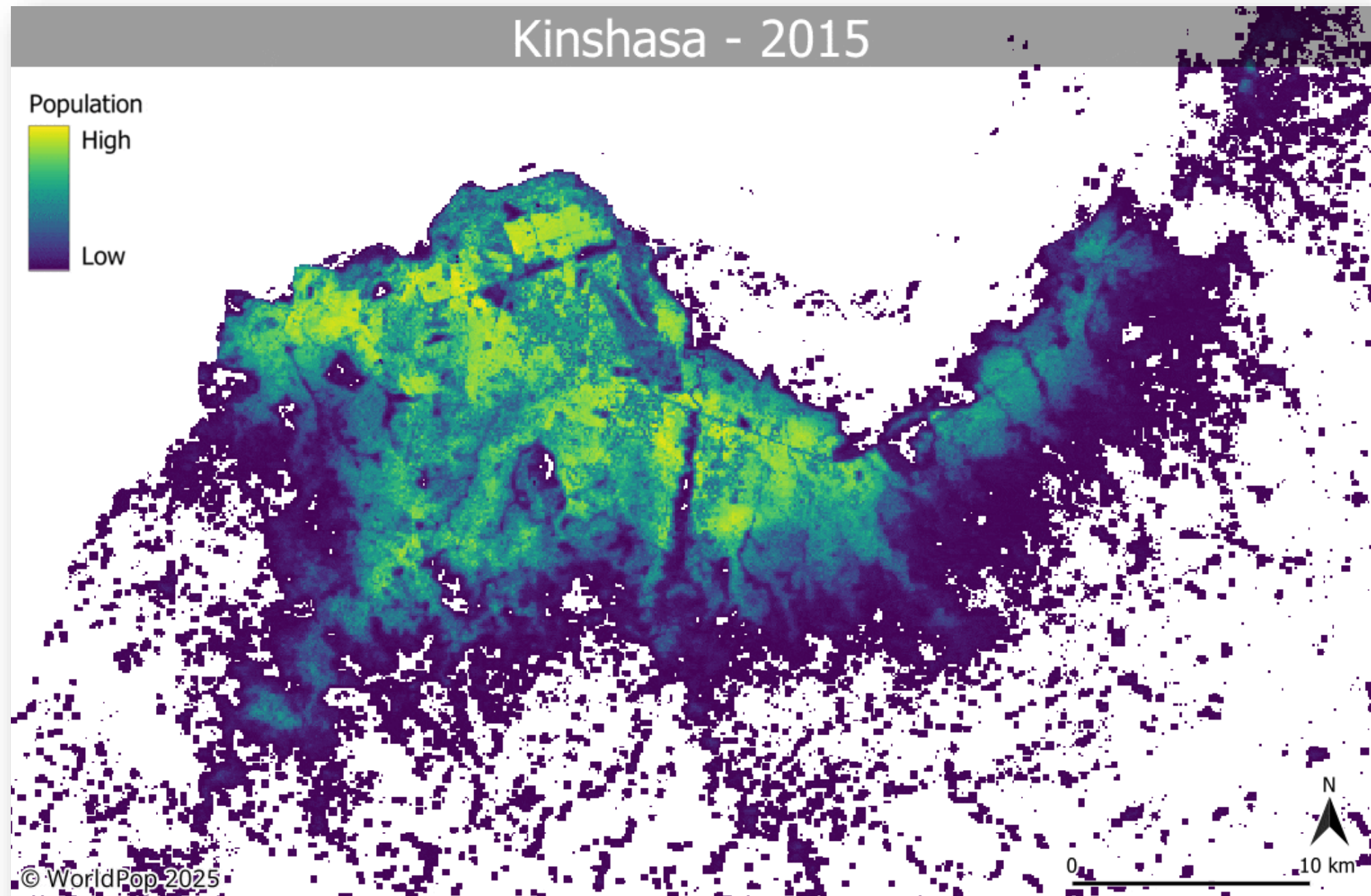
Kinshasa - 2015

Population



High

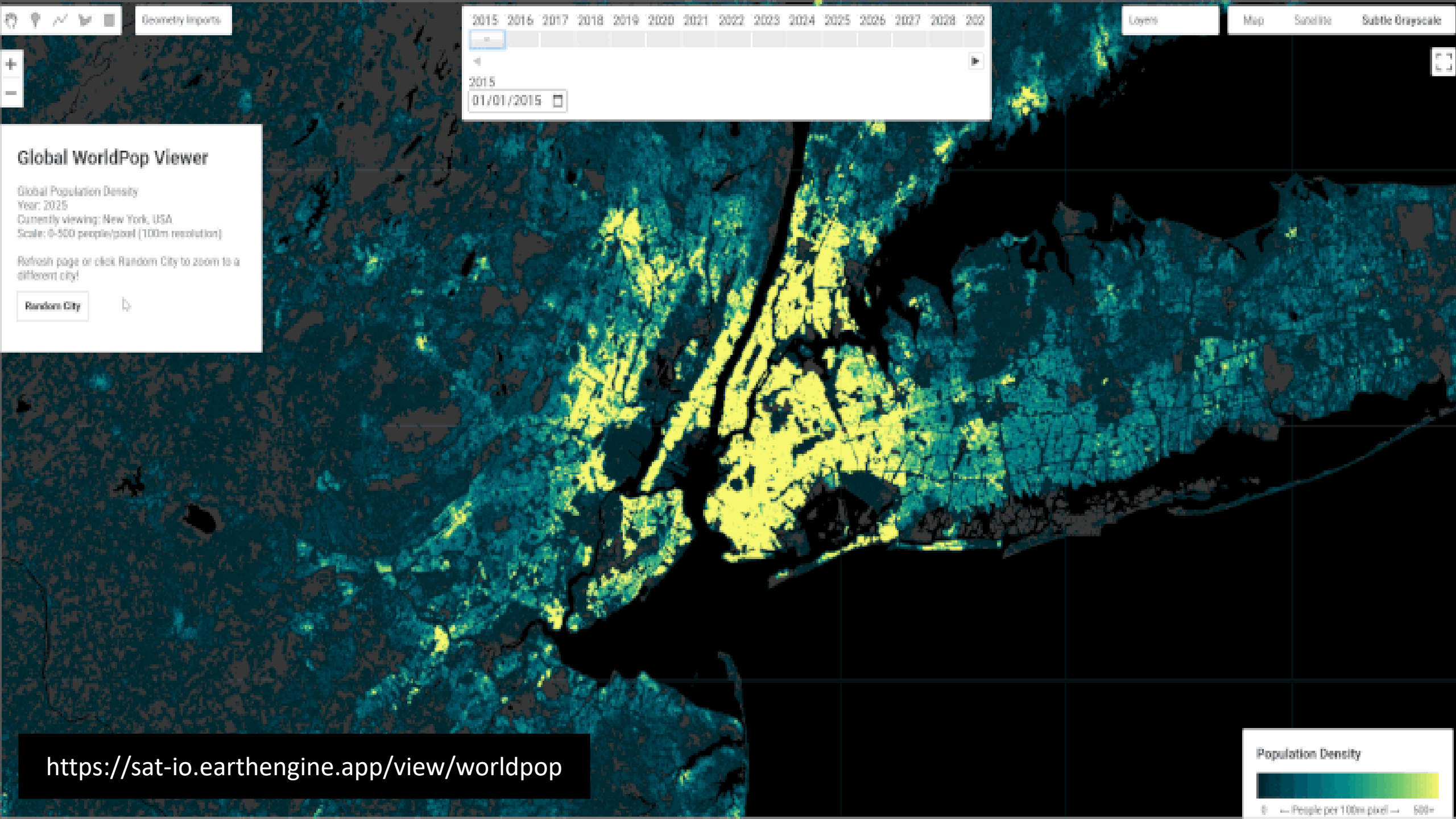
Low



© WorldPop 2025

0

10 km



Global WorldPop Viewer

Global Population Density
Year: 2015
Currently viewing: New York, USA
Scale: 0-500 people/pixel (100m resolution)

Refresh page or click Random City to zoom to a different city!

Random City

<https://sat-io.earthengine.app/view/worldpop>

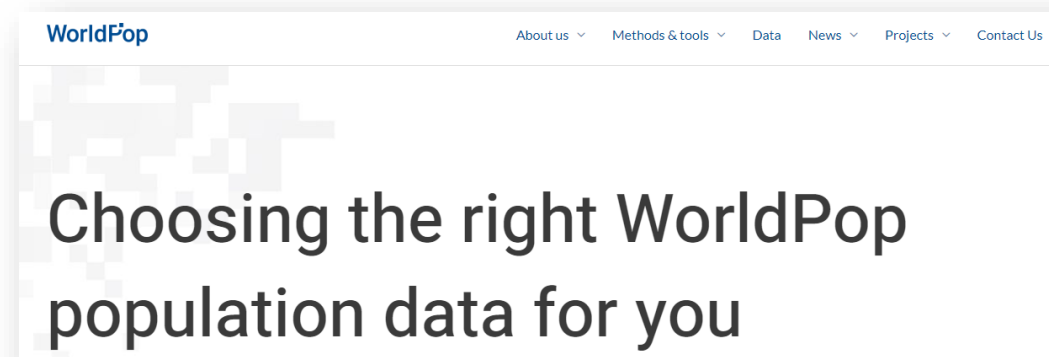
Population Density



Limitations



- These are 'top-down' disaggregations, so uncertainties and errors in input estimates feed through to the gridded outputs
- Each country is modelled separately leading to some inconsistencies between countries, depending on inputs
- Population projections can be highly uncertain, especially at subnational scales and for countries without recent censuses
- See the Global2 release statement for further details, and read our page on data choices to check which data make sense for your application



<https://www.worldpop.org/choosing-the-right-worldpop-population-data-for-you/>

Accessing Global2 data



Data Hub

Read our guide to choosing the right WorldPop population data for you

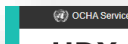
LATEST DATA RELEASES

- ✓ Global 2 (2015-2030) Population Counts
- ✓ Global 2 (2015-2030) Age and sex structures
- ✓ Modelled gridded population estimates in the Democratic Republic of the Congo 2021 (WOPR)
- ✓ Census disaggregated gridded population estimates for Niger 2021 (WOPR)

WorldPop Data

Free and open access to global development data

84,783 datasets



WorldPop

6 MEMBERS | 848 FOLLOWERS | VISIT WEBSITE

Member since 1 February 2016

WorldPop works to ensure that every person is mapped and counted in decision making. WorldPop is an applied research and implementation group based at the University of Southampton and develops open, academically peer-reviewed methods for mapping populations at high spatial resolution across the globe. Since 2013, ... [More](#)

HDX
WorldPop

WorldPop Demographics

Visualization for Males 1-4 years old in 2020

Country: Administrative Unit Name/Coder:

Total Population 2020: 3,972,802

Total Males Aged 1-4 years old: 295,221

Percentage 1-4 years old Males in Selected Administrative Unit: 7.5%

Refine your search:

FEATURED:

- ☐ HDX HAPI Data [?] [0]
- ☐ CODs [\[Learn more\]](#) [0]
- ☐ HPC [\[Learn more\]](#) [0]
- ☐ Sub-national [482]
- ☐ Geodata [482]
- ☐ Datasets with P-Codes [?] [0]

DATA SERIES [?]:

Population pyramid

Population pyramid for Males 1-4 years old in 2020

Population pyramid showing age distribution for Males 1-4 years old in 2020. The pyramid shows a high proportion of the population in the 1-4 age group, indicating a young population structure.

Males 1-4 years old estimated population change

Population change for Males 1-4 years old in 2020. The chart shows a steady increase in population over time, with a significant jump in 2020.

Demographics portal

WorldPop STAC API

Description

Welcome to the WorldPop STAC API, a specialized platform for accessing and analyzing global population distribution and count data. This API provides a standardized access to a range of geospatial data, including population counts, age and sex structures, and population change. The data is provided in a standardized format, making it easy to integrate with other systems. This API is designed to provide standardized access to a range of geospatial data, including population counts, age and sex structures, and population change. The data is provided in a standardized format, making it easy to integrate with other systems.

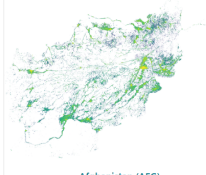
STAC

These datasets are available at a consistent resolution of 3 arc seconds (approximately 100m at the equator) and use the Geographic Coordinate System WGS84 (EPSG:4326). The data covers most countries globally, with a focus on providing detailed, up-to-date information for demographic and environmental analysis.

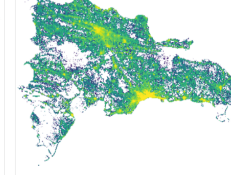
[Read more](#)

Catalogs

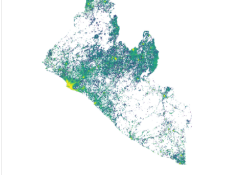
Filter catalogs by title, description or keywords



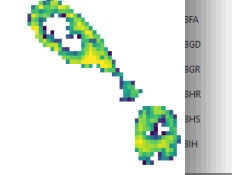
Afghanistan (AFG)



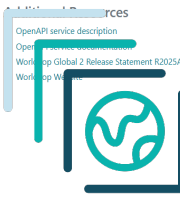
Dominican Republic (DOM)



Liberia (LBR)




Saint Kitts and Nevis (KNA)



STAC
SpatioTemporal Asset Catalog

AGO	BLZ	CUW	GEO	IRL	LTU	MWI	PRT	SVK	USA
ARE	BMU	CKR	GGY	IRN	LUX	MYS	PRY	SVN	UZB
ALA	BOL	CYM	GHA	IRQ	LVA	NAM	PSE	SWE	VAT
ALB	BRA	CYP	GIB	ISL	MAC	NER	PYF	SWZ	VCT
AND	BRB	CZE	GIN	ISR	MAF	NFK	QAT	SXM	VEN
ARG	BRN	DEU	GLP	ITA	MAR	NGA	ROU	SYC	VGB
ARM	BTN	DJI	GMB	JAM	MCO	NIC	SAU	TCA	VIR
ASM	BWA	DNK	GNQ	JOR	MDG	NIU	SDN	TGO	WLF
ATF	CAF	DOM	GRC	JPN	MDV	NLD	SDN	THA	WSA
ATG	CAN	DZA	GRD	KAZ	MEX	NOR	SEN	TKL	XDI
AUS	CCK	ECU	GRL	KEN	MHL	NPL	SGP	TKM	XIB
AUT	CHE	EGY	GTM	KGZ	MKD	NRU	SGS	TKM	XJK
CZE	CHL	ERI	GUF	KHM	MLI	OMN	SIM	TON	XMI
DEU	CHN	ESH	GUM	KIR	MLT	PAK	SLB	TTO	XSI
DNK	CIV	ESP	GUY	KNA	MMR	PAN	SLE	TUN	YEM
DZA	CMR	EST	HKG	KOR	MNE	PCN	SLV	TUR	ZAF
ECU	COD	ETH	HMD	KWT	MNG	PER	SMR	TUV	ZMB
EGY	COG	FIN	HND	LAO	MNP	PHL	SOM	TWN	ZWE
ESP	COK	FJI	HRV	LBN	MOZ	PLW	SPM	TZA	
EST	COL	FLK	HTI	LBR	MRT	PNG	SRB	UGA	
ETH				LBY	MSR	POL	SSD	UKR	
FIN				LCA	MTQ	PRI	STP	UMI	
FJI				LIE	MUS	PRK	SUR	URY	


FTP



WorldPop

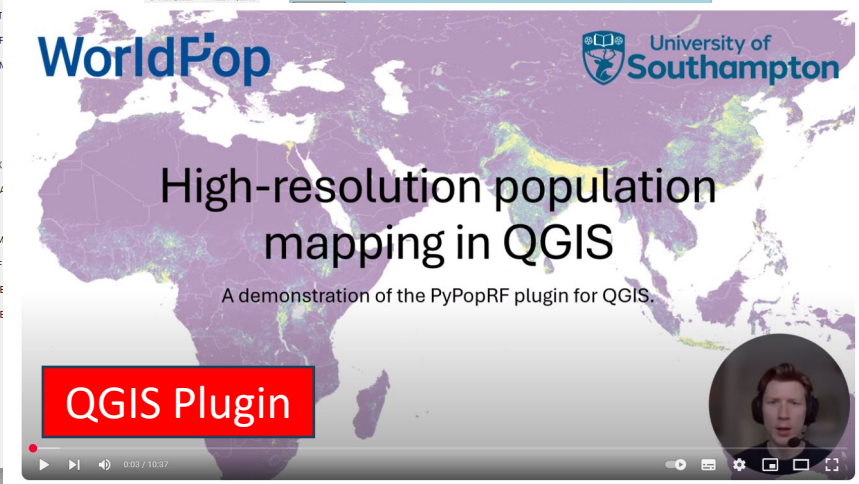
High-resolution population mapping in QGIS

A demonstration of the PyPopRF plugin for QGIS.



University of Southampton

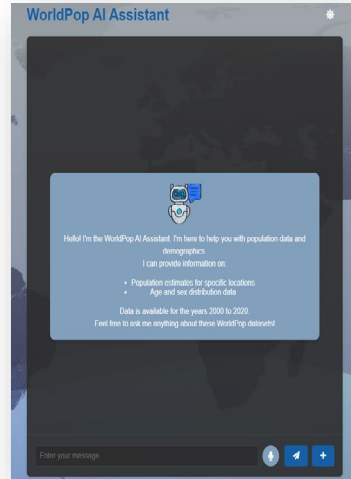
QGIS Plugin



What next?

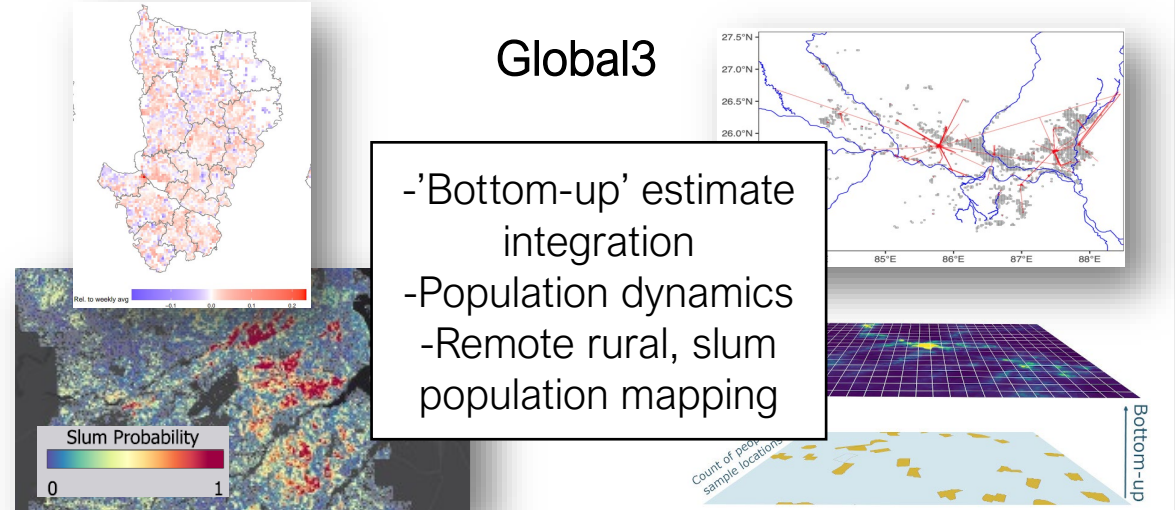


- Global2**
- Pop density
 - Admin unit totals
 - Degree of Urbanization
 - Integer versions
 - Additional age classes

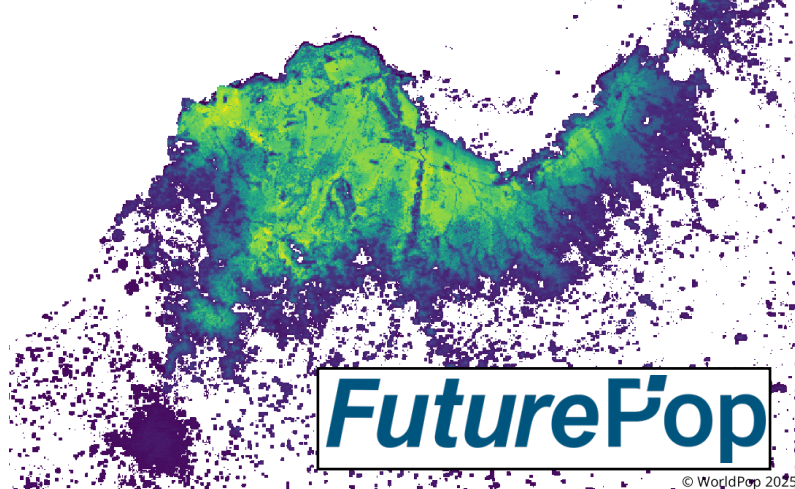


Global3

- 'Bottom-up' estimate integration
- Population dynamics
- Remote rural, slum population mapping



Population distribution of Kinshasa under SSP2 scenario, 2025



FuturePop

© WorldPop 2025



WorldPop Population Modelling Training Manual, Vol. I

WorldPop, University of Southampton

2025-07-10

Welcome

Welcome to WorldPop Population Modelling Training Manual, vol. I. This is an open book designed to help researchers and users of WorldPop small area population datasets on how to develop and implement across various contexts. It complements the WorldPop Book of Methods, which demonstrate the step-by-step processes of 'how-to-do' rather than 'how-it-is-done' by providing practical examples. The manual which was developed by the WorldPop Research Group within the Environmental Science at the University of Southampton, is made up of 11 modules tailored to the needs of researchers and users of WorldPop small area population datasets. Although mainly based on R statistical programming language, the manual is designed to allow users with expertise and backgrounds by including very basics of R and statistical methods, in addition to the later modules. The manual is licensed under a Creative Commons Attribution-NoDerivs 4.0 International License, and the lead developer and compiler was Layna Dennett, with the support of some of the WorldPop Research Group members, and supervision of Chris Nnanatu, while oversight was provided by Andrew Tatem.

To cite this manual, please use: WorldPop. 2025. WorldPop Population Modelling Training Manual, Vol. I. Gridded Population Estimates. WorldPop, University of Southampton. 08 July 2025 (<https://wppg.github.io/xxxxxx/CN1>)

WorldPop Book of Methods

Vol. I: Gridded Population Estimates



Gridded Population Estimates. This open book provides a guide to WorldPop's small area population datasets and how to use them. It was developed by the WorldPop Research Group within the Environmental Science at the University of Southampton. Each chapter recognizes individual contributors and is licensed under a Creative Commons Attribution-NoDerivs 4.0 International License.

Lead developer and compiler: Layna Dennett, with the support of some of the WorldPop Research Group members, and supervision of Chris Nnanatu, while oversight was provided by Andrew Tatem.

To cite this manual, please use: WorldPop. 2025. WorldPop Population Modelling Training Manual, Vol. I: Gridded Population Estimates. WorldPop, University of Southampton. 08 July 2025 (<https://wppg.github.io/xxxxxx/CN1>)



Acknowledgements



www.worldpop.org



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DEGLI STUDI
DI MILANO



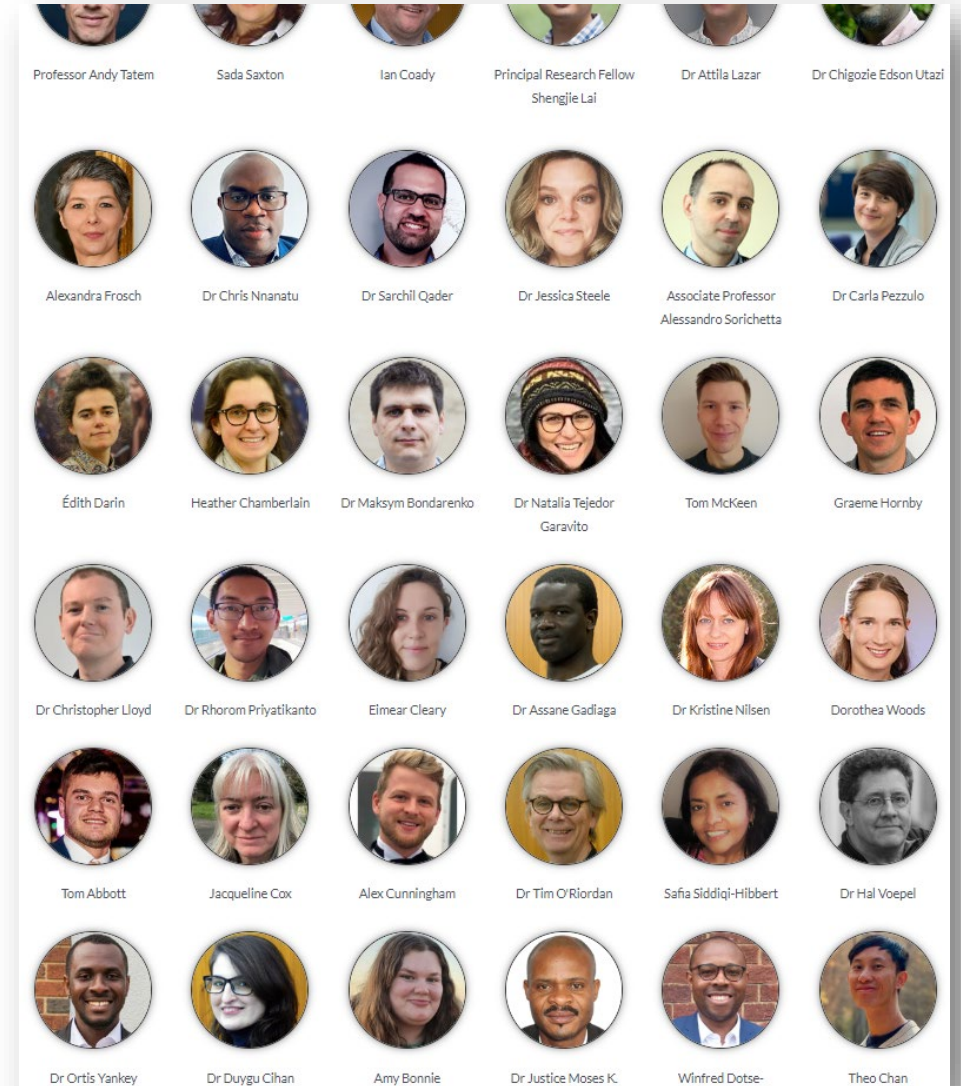
University of
Southampton

iSolutions

Iridis

JADE UNIVERSITY
OF APPLIED SCIENCES
Wilhelmshaven Oldenburg Elsfleth

Center for International Earth
Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY



<https://www.worldpop.org/team/list/>

A.J.Tatem@soton.ac.uk

Part 1 – From research to real world

Panel & Guest speakers



**Professor
Andy Tatem**

Founder and
Director of
WorldPop and
Professor of
Spatial
Demography
and
Epidemiology
at University of
Southampton



**Dr Jessica
Espey**

Associate
Professor in the
School of
Geography and
Environmental
Sciences at
University of
Southampton,
Deputy
Director
Research at
WorldPop



**Mr Andrew
Bob Johnny**

Statistician
General
Statistics
Sierra Leone



**Dr Mollie Van
Gordon**

Senior Program
Officer leading
the Geospatial
Insights
portfolio at the
Gates
Foundation



**Dr Sabrina
Juran**

Regional
Advisor, Data
and Population
Dynamics,
Latin America
and the
Caribbean at
the United
Nations
Population
Fund (UNFPA)



**Dr Maksym
Bondarenko**

Head of
WorldPop's
Spatial Data
Infrastructure
Team

Part 2 – Hands-on discovery

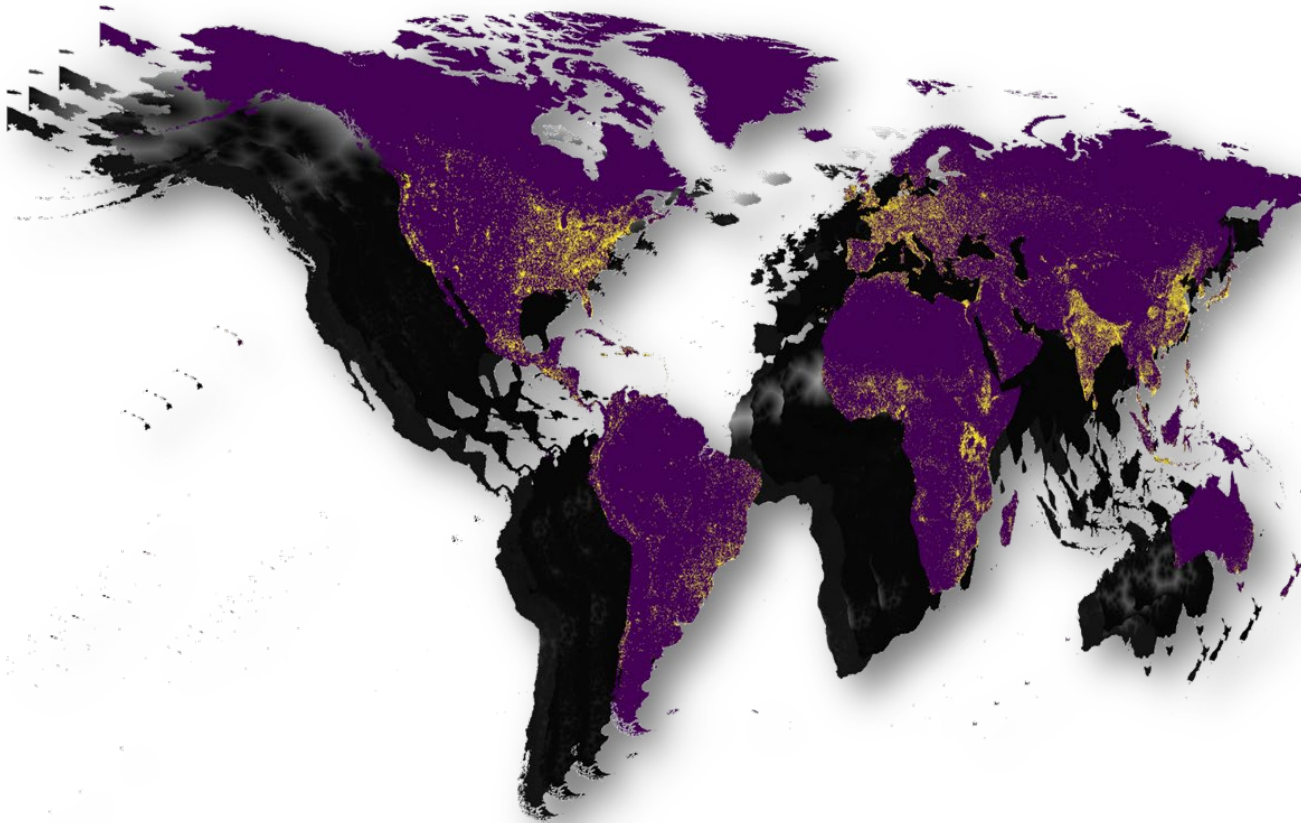
The background of the slide is a world map where the landmasses are filled with a dense, blue, network-like pattern. This pattern represents population density and connectivity, with higher concentrations in Europe, Asia, and North America.

WorldPop Global Demographic Data (Global 2)

The Power of Population Data: Introducing WorldPop Global 2015–2030

Dr. Maksym Bondarenko

Thursday, 4 September



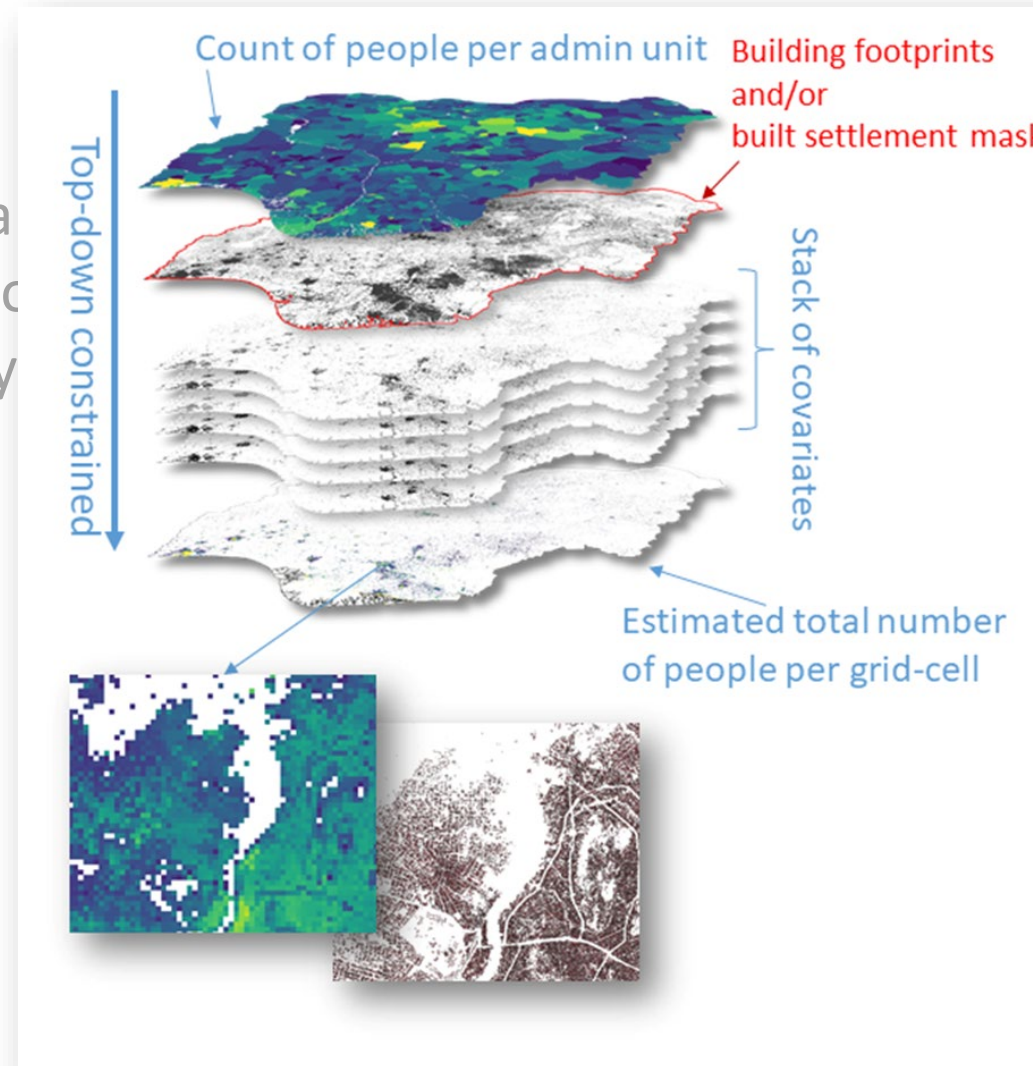
Hands-on discovery

Input data, tools, technical
deep-dive & country use cases

Random forest is a machine learning algorithm that builds an ensemble of individual regression trees to predict values of a response variable (e.g. population density) based on its relationships with geospatial covariates.

Stevens et al (2015) Disaggregating Census Data for Population Mapping Using Random Forests with Remotely-Sensed and Ancillary Data. PLoS ONE 10, e0107042 <https://doi.org/10.1371/journal.pone.0107042>

Random forest is an ensemble of individual regression models that predict population density



an ensemble of individual regression models that predict population density (e.g. population density, elevation, etc.)

data for Population Mapping and Ancillary Data. PLoS ONE 7(10): e35812. doi:10.1371/journal.pone.0107042



Global 2

Extent	-180, -59.999999424 , 179.999998559, 84
Dimensions	X: 432000 Y: 172800
Pixel Size	0.000833333329, 0.000833333329

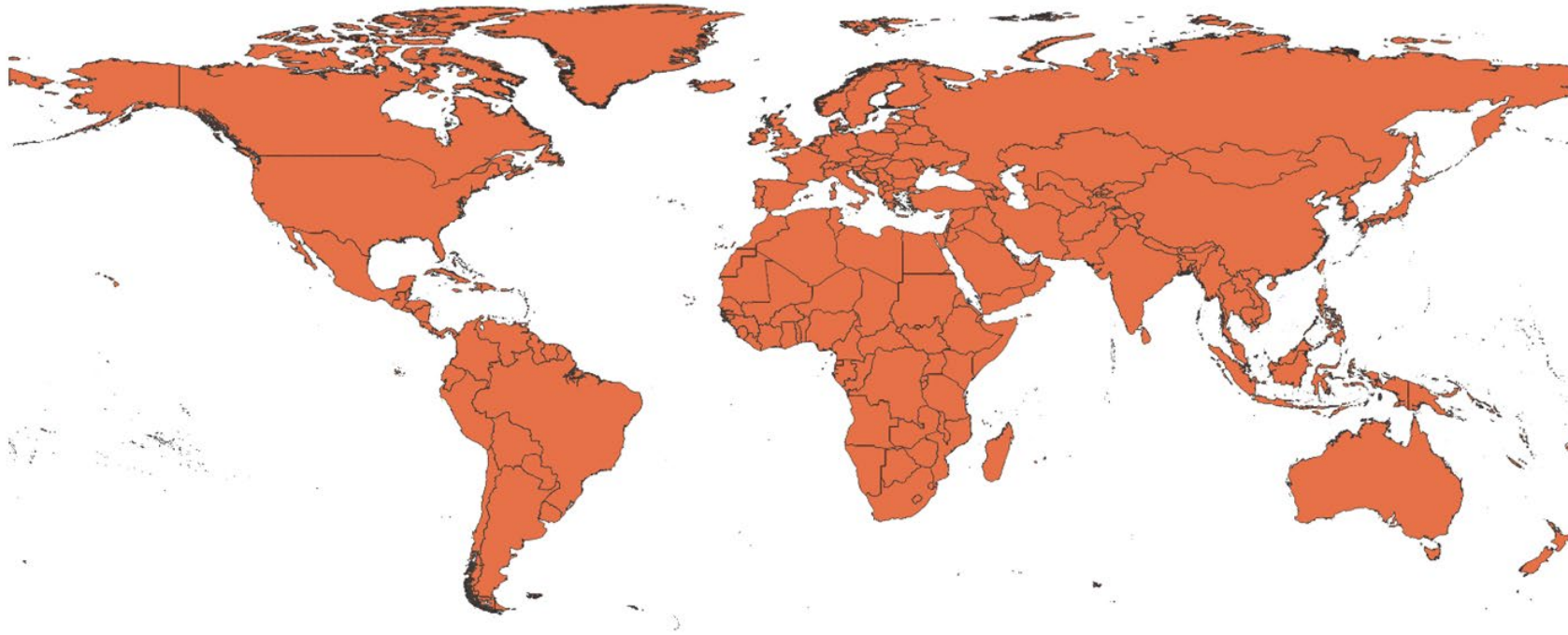


Global 2

Extent -180, -59.999999424 , 179.999998559, 84
Dimensions X: 432000 Y: 172800
Pixel Size 0.000833333329, 0.000833333329

Global 1

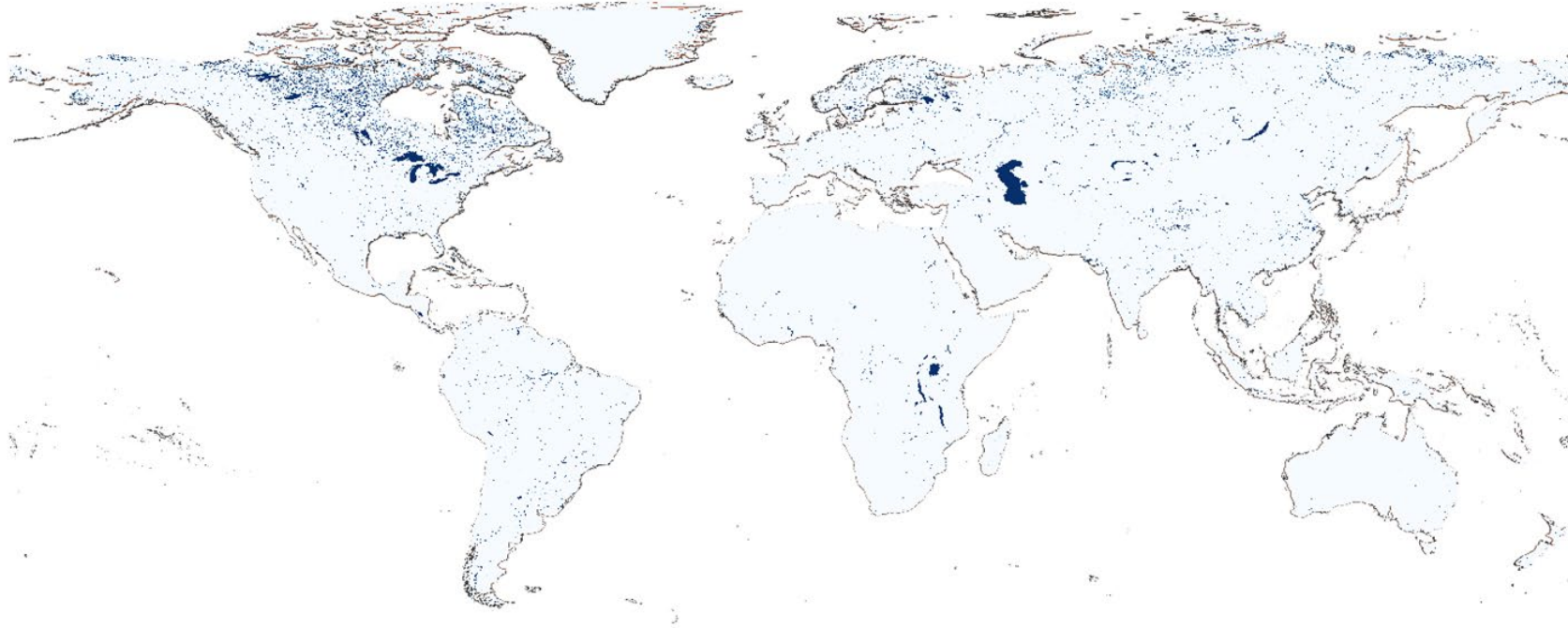
Extent -180.00124, -72.0, 180.00124, 84
Dimensions X: 432003 Y: 187203
Pixel Size 0.000833333329, 0.000833333329



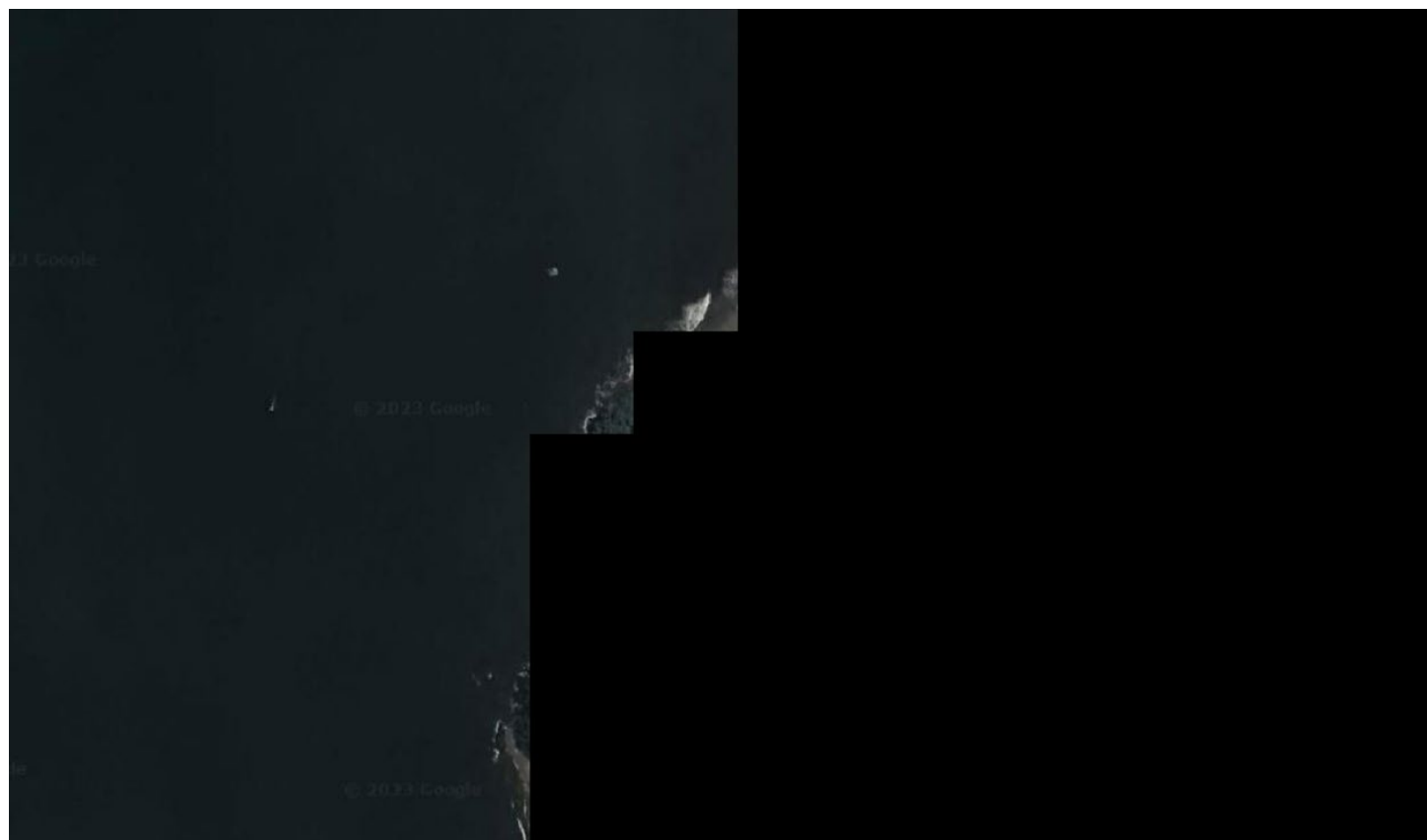
The Large Scale International Boundaries (LSIB)

The Office of the Geographer and Global Issues at the U.S. Department of State

<https://geonode.state.gov/layers/catalog:geonode:LSIB>



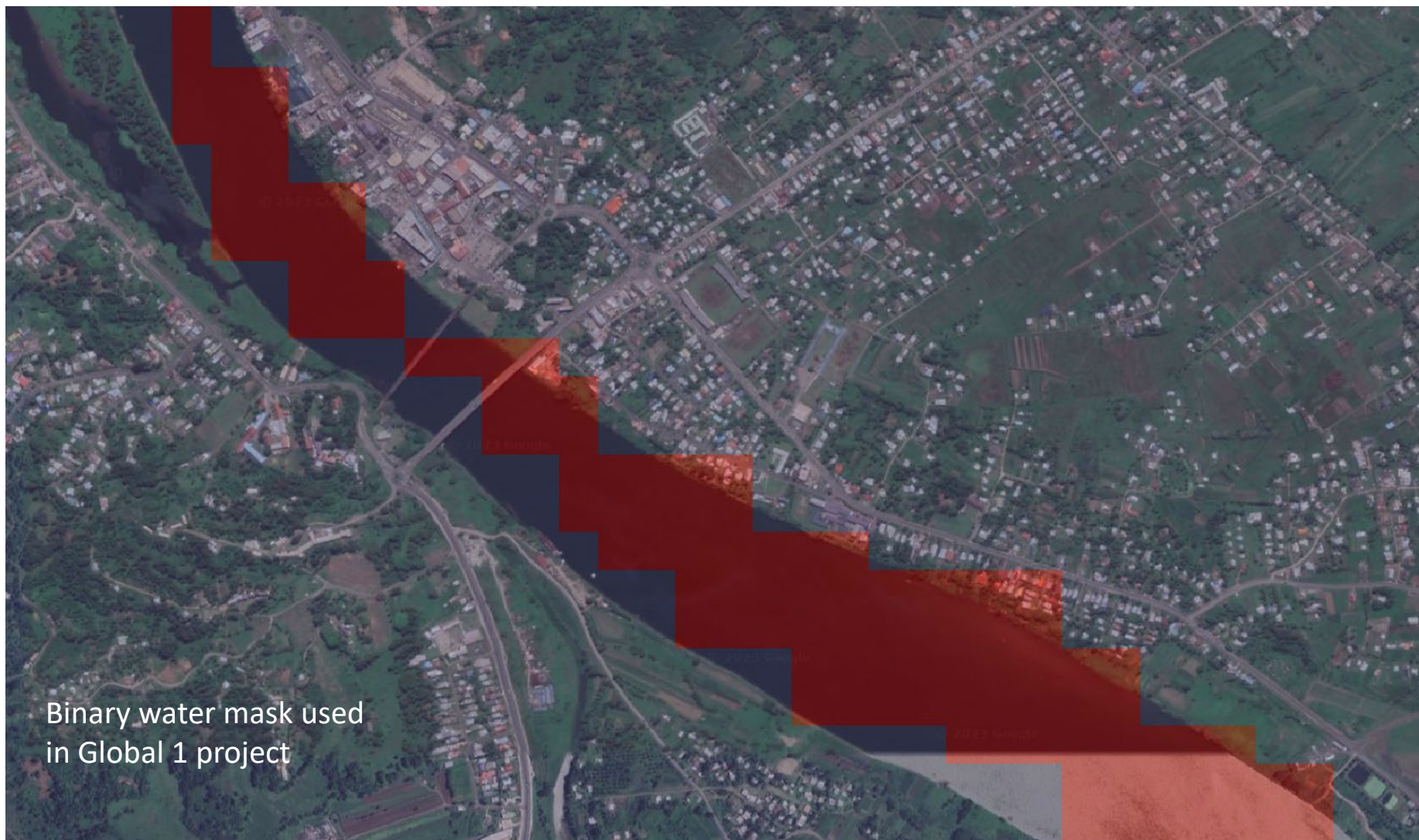
WorldCover global land cover at 10 m resolution based on Sentinel-2 data.

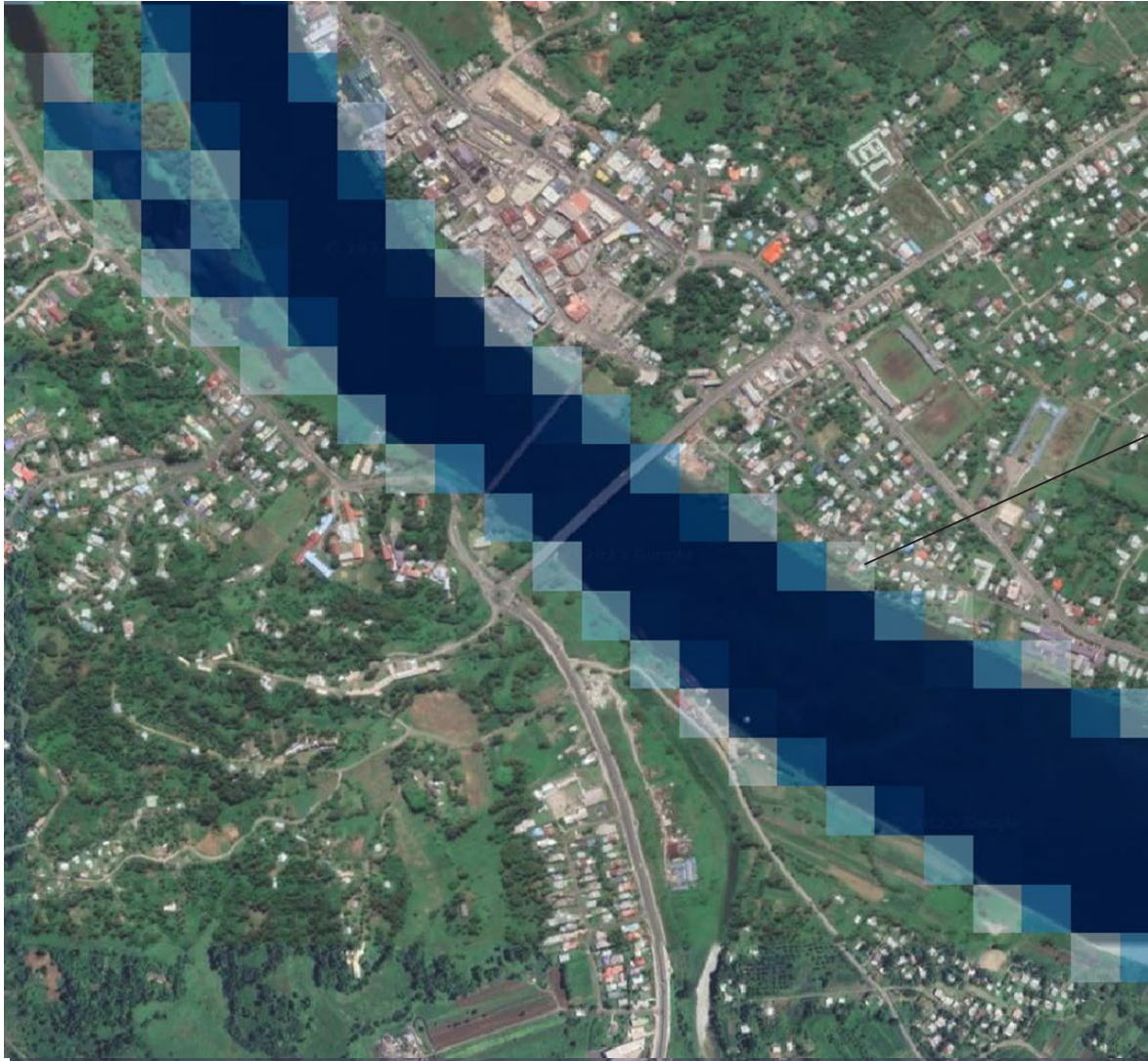


Coastline defined as if a pixel has less than 75% water



Coastline defined as if a pixel has less than 75% water

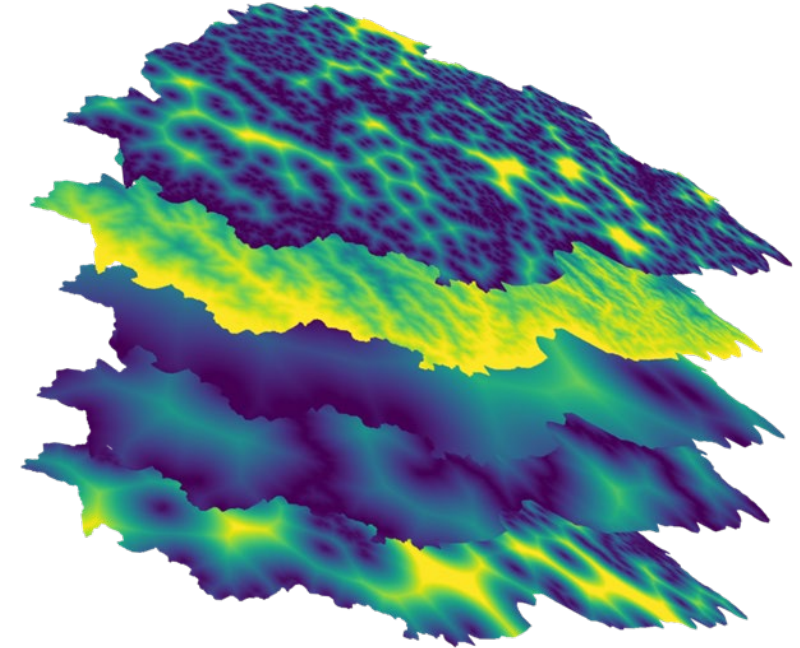




Global2 - using percentage of water per pixel as a friction surface to make sure all settled pixels are covered.

Covariates

- Distance to ESA-CCI-LC inland water per country
- Distance to IUCN strict nature reserve and wilderness area edges
- Distance to open-water coastline per country
- Distance to OSM major road intersections
- Distance to OSM major roads
- Distance to OSM major waterways
- Resampled DMSP-OLS night-time lights
- Resampled VIIRS night-time lights
- SRTM-based elevation per country
- SRTM-based slope per country
- Distance to edges of reclassified ESA-CCI-LC classes for
- Distance to ESA-CCI-LC cultivated area edges
 - Distance to ESA-CCI-LC woody-tree area edges
 - Distance to ESA-CCI-LC shrub area edges
 - Distance to ESA-CCI-LC herbaceous area edges
 - Distance to ESA-CCI-LC sparse vegetation area edges
 - Distance to ESA-CCI-LC aquatic vegetation area edges
 - Distance to ESA-CCI-LC artificial surface edges
 - Distance to ESA-CCI-LC bare area edges



Datasets are provided as global, annual time series, where pertinent at the timescale of population analyses and where data is available, for use in the construction of population distribution layers.

“Distance to” is one of the important measure for understanding and global analysis of population distance to a different covariate.

All data are gridded to 3 arc-second (0.00083333333 decimal degree) spatial resolution.

<https://www.worldpop.org/datacatalog/>

Covariates

- Distance to ESA-CCI-LC inland water per country
- Distance to IUCN strict nature reserves edges
- Distance to open-water bodies edges
- Distance to OSM major roads
- Distance to OSM minor roads
- Distance to OSM railways
- Resampled DMSP-OLS nighttime light
- Resampled VIIRS nighttime light
- SRTM-based elevation
- SRTM-based slope
- Distance to edges of land cover
- Distance to ESA-CCI-LC artificial surface edges
- Distance to ESA-CCI-LC bare area edges



Undergoing Peer Review

DATA NOTE

Global gridded multi-temporal datasets to support human population distribution modelling

[version 1; peer review: awaiting peer review]

Dorothea Woods , Tom McKeen, Alexander Cunningham, Rhorom Priyatikanto, Andrew J. Tatem, Alessandro Sorichetta, Maksym Bondarenko

This article is included in [Gates Foundation gateway](#)

BILL & MELINDA
GATES foundation

All data are gridded to 3 arc-second (0.00083333333 decimal degree) spatial resolution.

<https://www.worldpop.org/datacatalog/>

Global 2: Covariates

Covariates

- Distance to ESA-CCI-LO
- Distance to IUCN st
- edges
- Distance to open-w
- Distance to OSM m
- Distance to OSM m
- Distance to OSM m
- Resampled DMSP-o
- Resampled VIIRS n
- SRTM-based elevat
- SRTM-based slope
- Distance to edges o
- Distance to ESA-CC
 - Distance to E
 - Distance to E
 - Distance to E
 - Distance to E
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 - Distance to E
 - Distance to E
 - Distance to E
 - Distance to E
 - Distance to E

WorldPop Hub

DATACONTACT

Geospatial covariate data layers

WorldPop high resolution, harmonised annual global geospatial covariates. R2024 Version 1.0

Geospatial covariate data layers play an important role in the production of gridded population estimates where they are used as ancillary datasets to capture, inform and explain the variabilities in population densities and distributions at small area scales. WorldPop systematically collated this extensive geospatial collection of 73 annual, spatio-temporally harmonised datasets aimed at driving improvements in mapping small area population density variation. The gridded datasets address topography, climate, nighttime lights, land cover, inland water, infrastructure, protected areas as well as the built-up environment on a global level at a spatial resolution of 3 arc-seconds (approximately 100 metres). Datasets are available as annual time series from 2015 up to and including at least 2020, and as recent as 2023 where source datasets allow. Such datasets not only support population modelling but also applications across environmental, economic, and health sectors. Further details on the methods can be found in Woods D, McKeen T, Cunningham A et al. Global gridded multi-temporal datasets to support human population distribution modelling [version 1]. VeriXiv 2025, 2:149 (<https://doi.org/10.12688/verixiv.1078.1>)

Recommended data citation

D. Woods, T. McKeen, A. Cunningham, R. Priyatikanto, A. Sorichetta , A.J. Tatem and M. Bondarenko. 2024 "WorldPop high resolution, harmonised annual global geospatial covariates. Version 1.0." University of Southampton: Southampton, UK. DOI:10.5258/SOTON/WP00772

Older datasets produced for specific individual countries and continents are still available for download here: [Global 1](#)

Annual Mean Surface Temperature 2015-2023

Distance to Built-up Surface 2015-2030

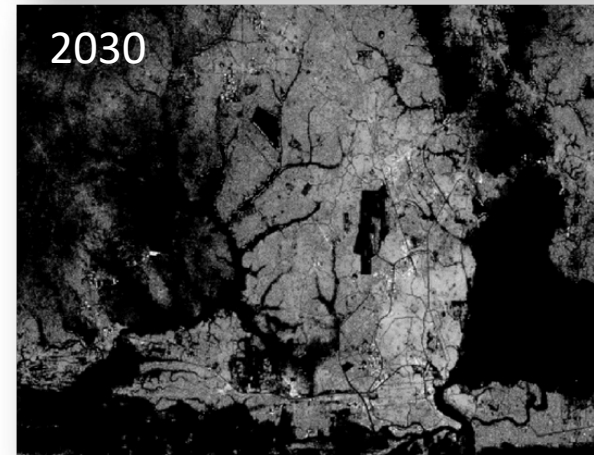
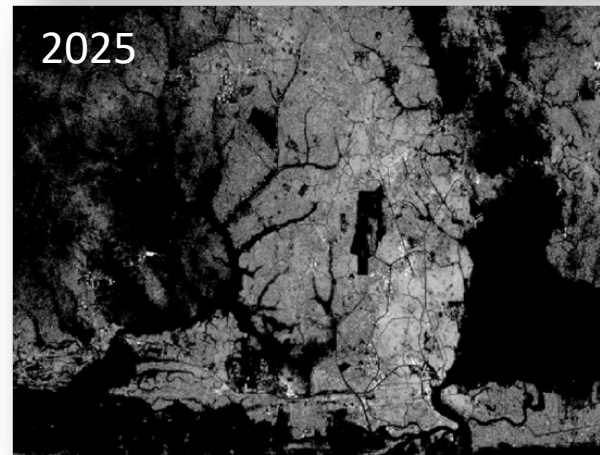
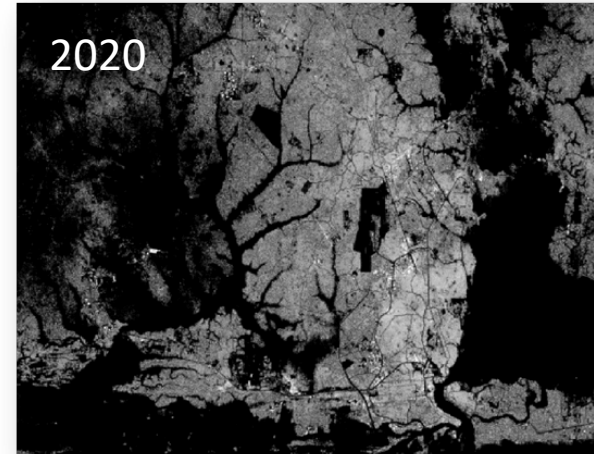
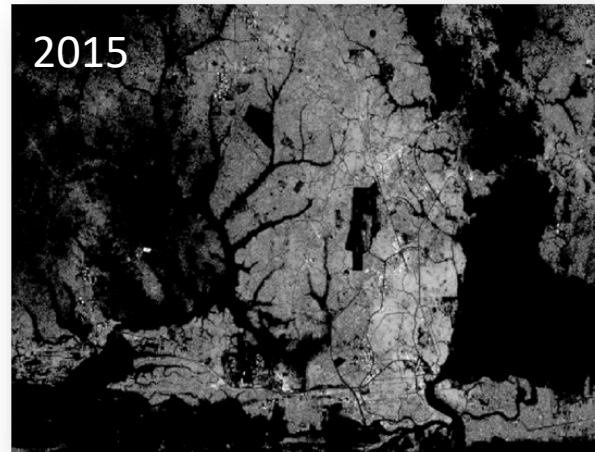
Distance to inland water 2021

Distance to open-water coastline 2021

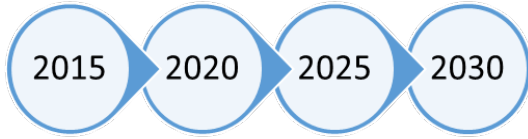
Annual Mean Precipitation 2015-2023

Built-up Surface 2015-2030

Global 2: Settlement - GHSL – 100m Height/Volume/Surface (residential / non residential)

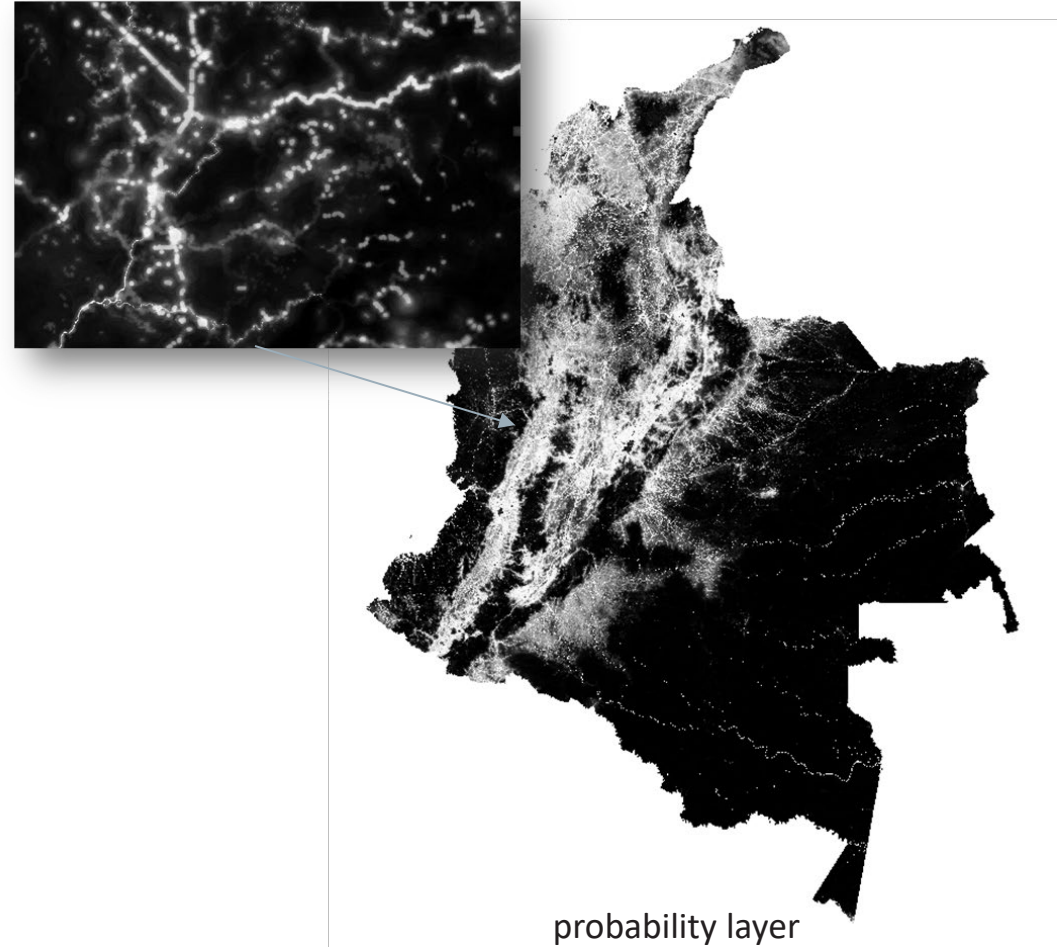


Built-settlement growth modelling



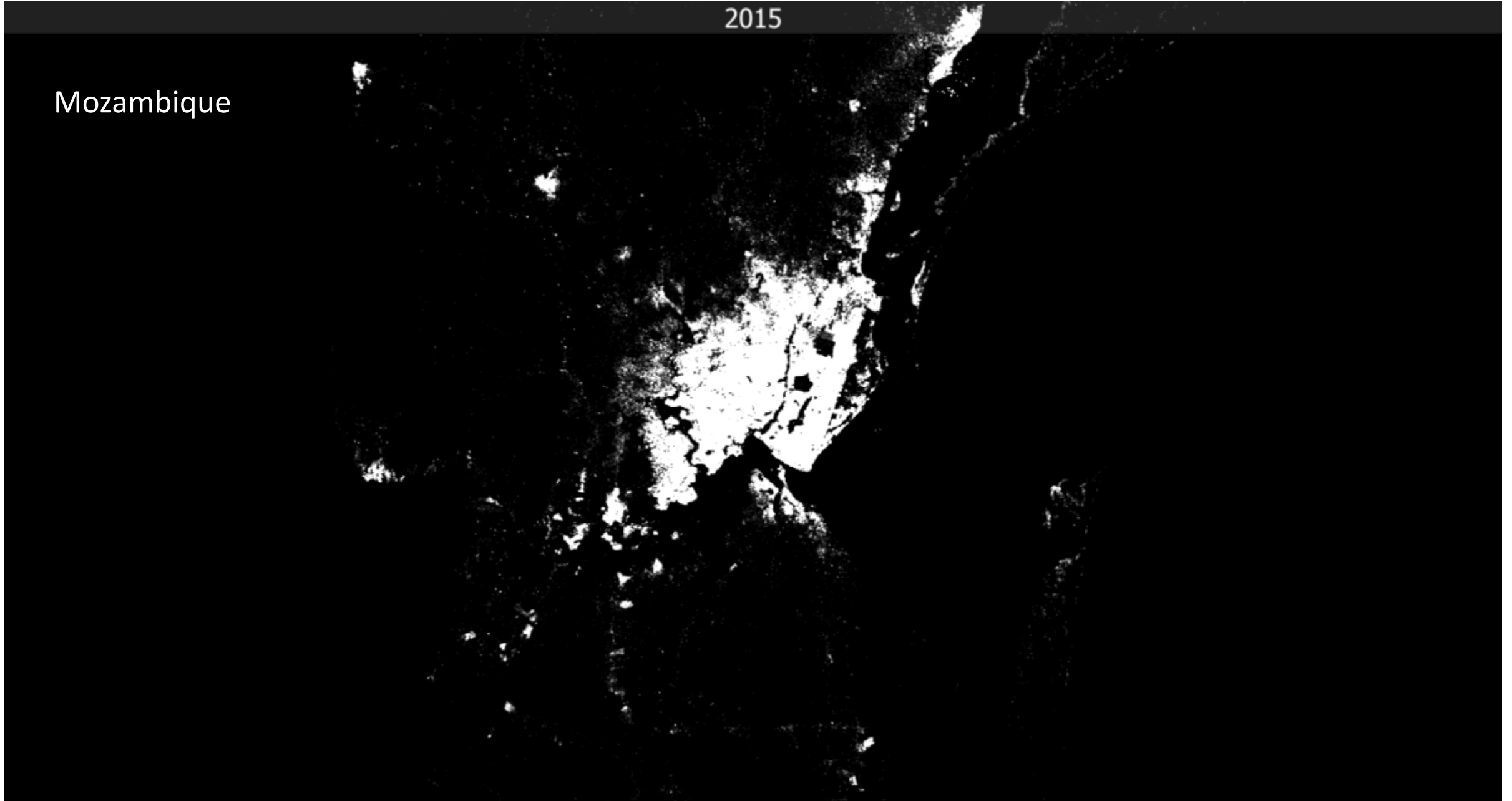
Built-Settlement Growth Model (BSGM *) interpolation for years 2015-2030 was done. We have used Random Forests with environmental covariates to predict the probability of non-settlement-to-settlement transitions and autoregressive time-series models with population growth curves to predict subnational changes in built-settlement area between the time-specific observations of the urban feature datasets. Original methods was improved using World Settlement Footprint (WSF) 2015 historical development of build-up surface 1985-2015.

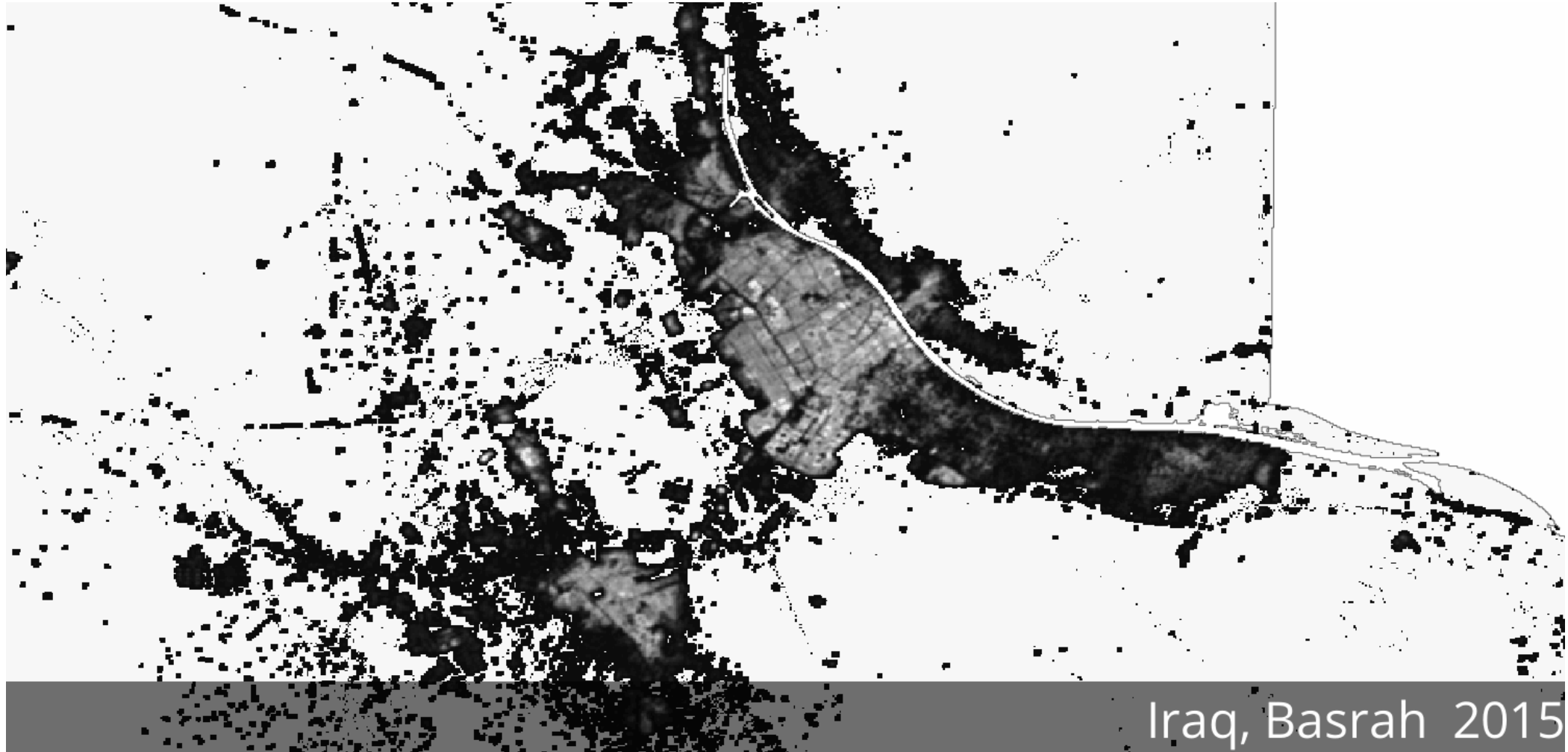
**Nieves, J.J., Bondarenko, M, Annually modelling built-settlements between remotely-sensed observations using relative changes in subnational populations and lights at night. 2020 Computers, Environment and Urban Systems, <https://doi.org/10.1016/j.compenvurbsys.2019.101444>.*



2015

Mozambique

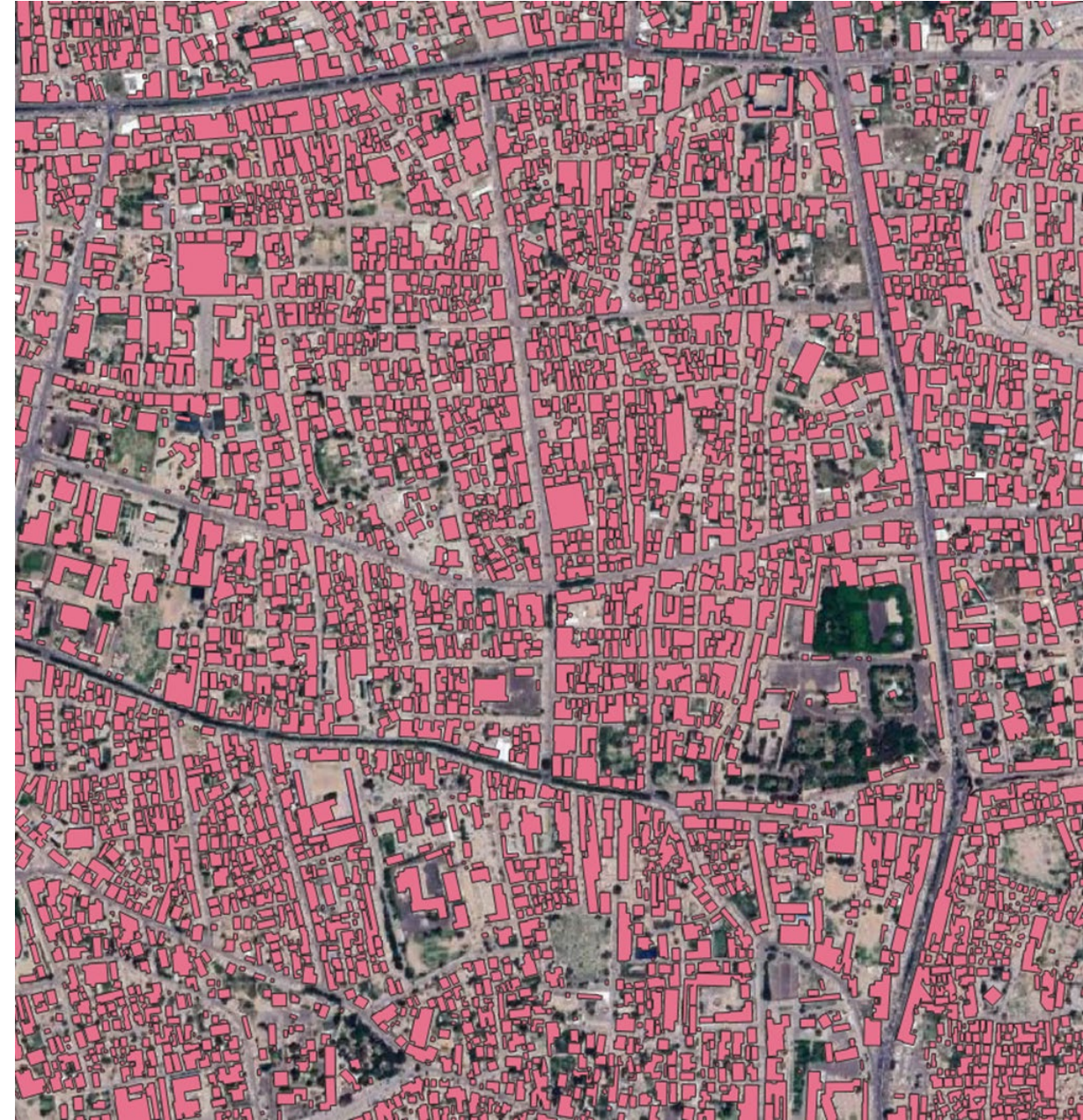




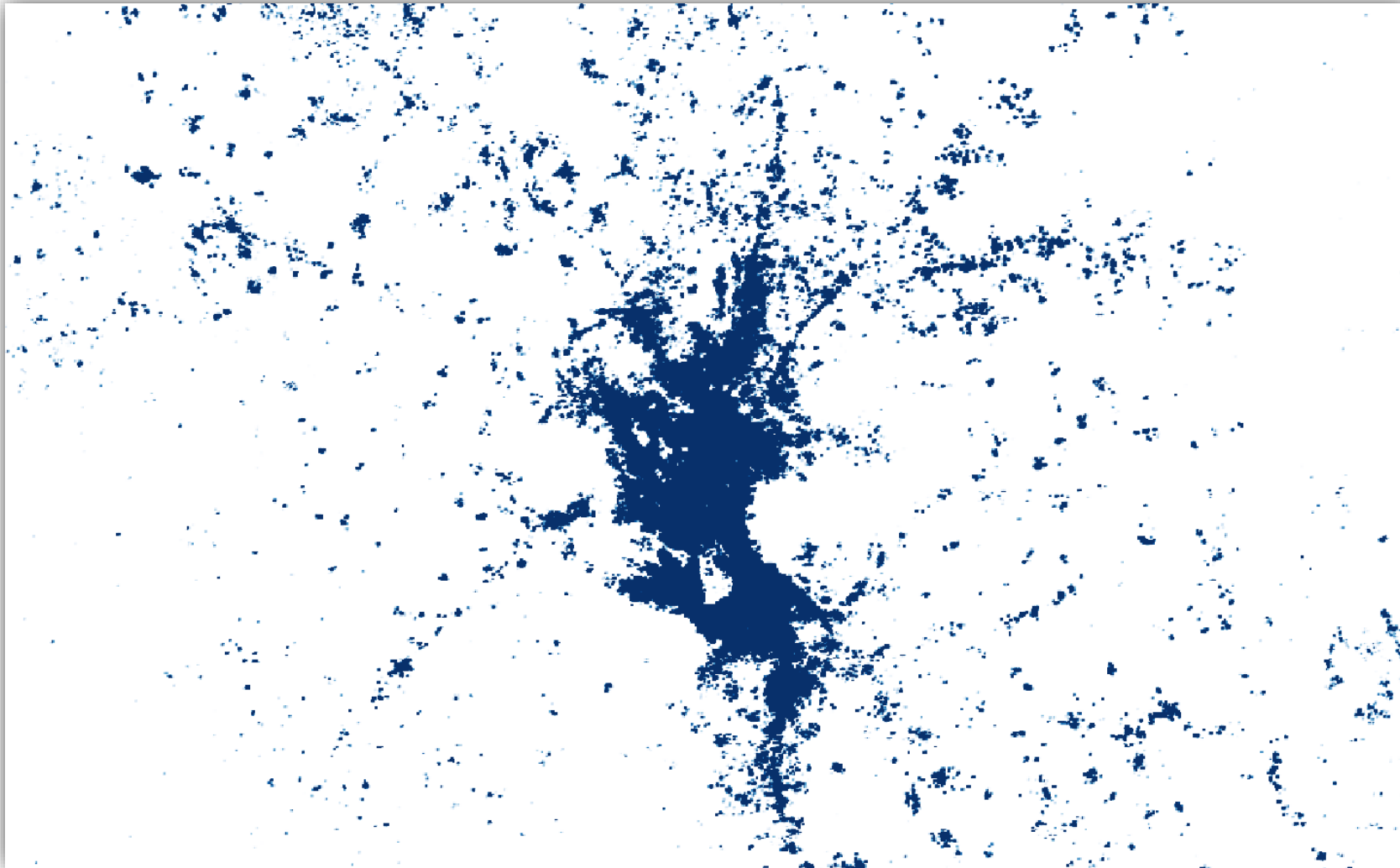
Global 2: Built-up Settlement

WorldPop

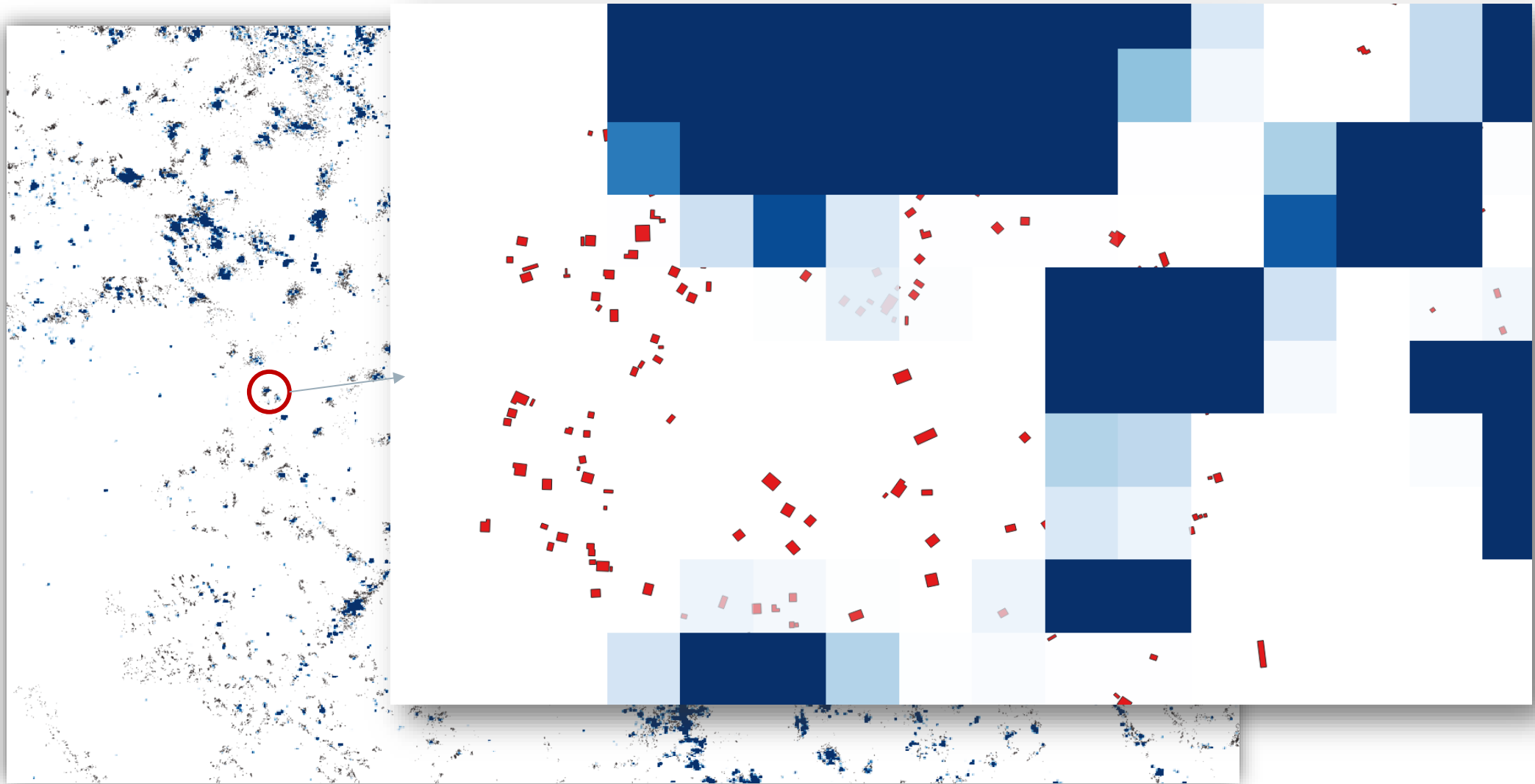
Microsoft and google building footprint



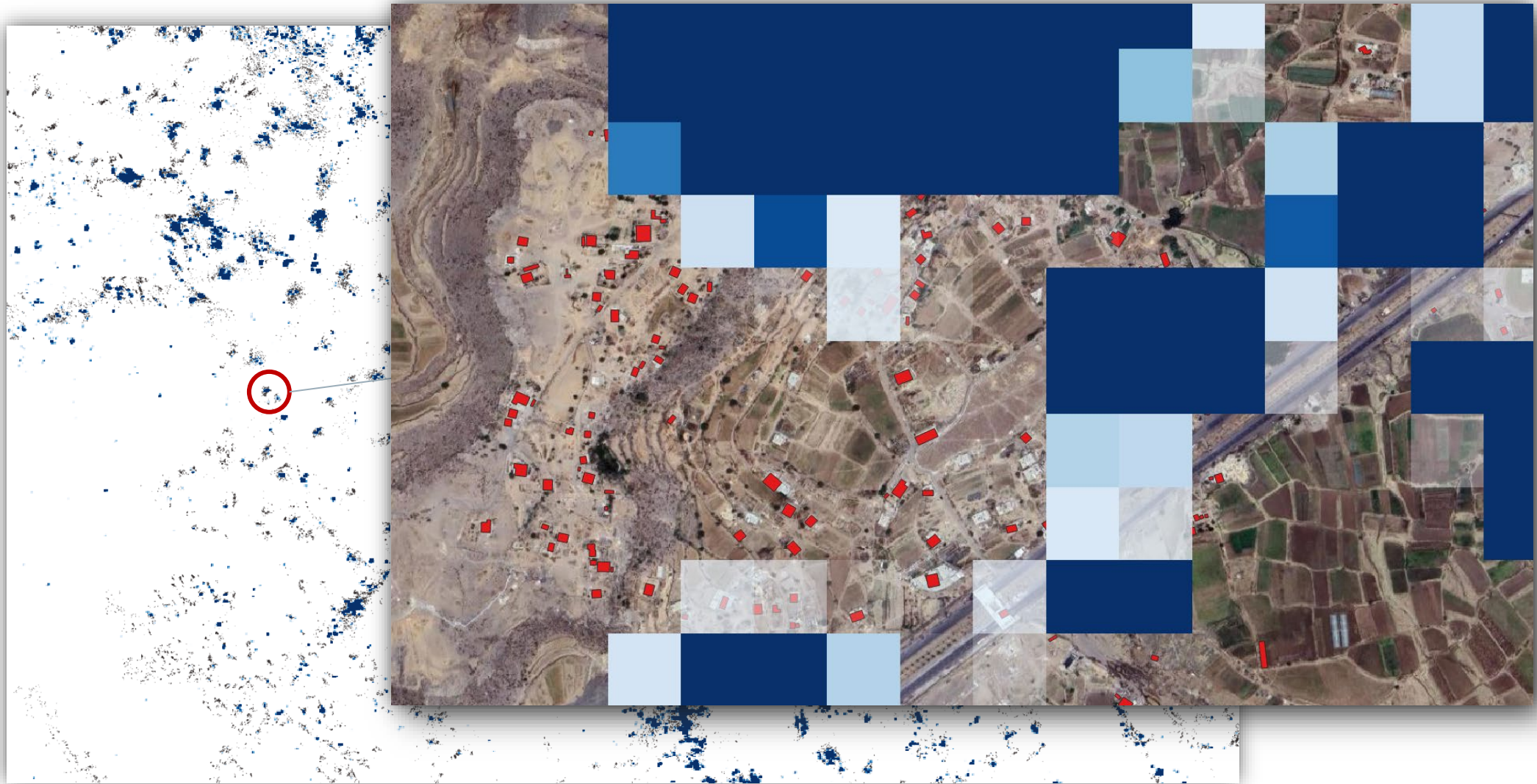
GHS built-up surface



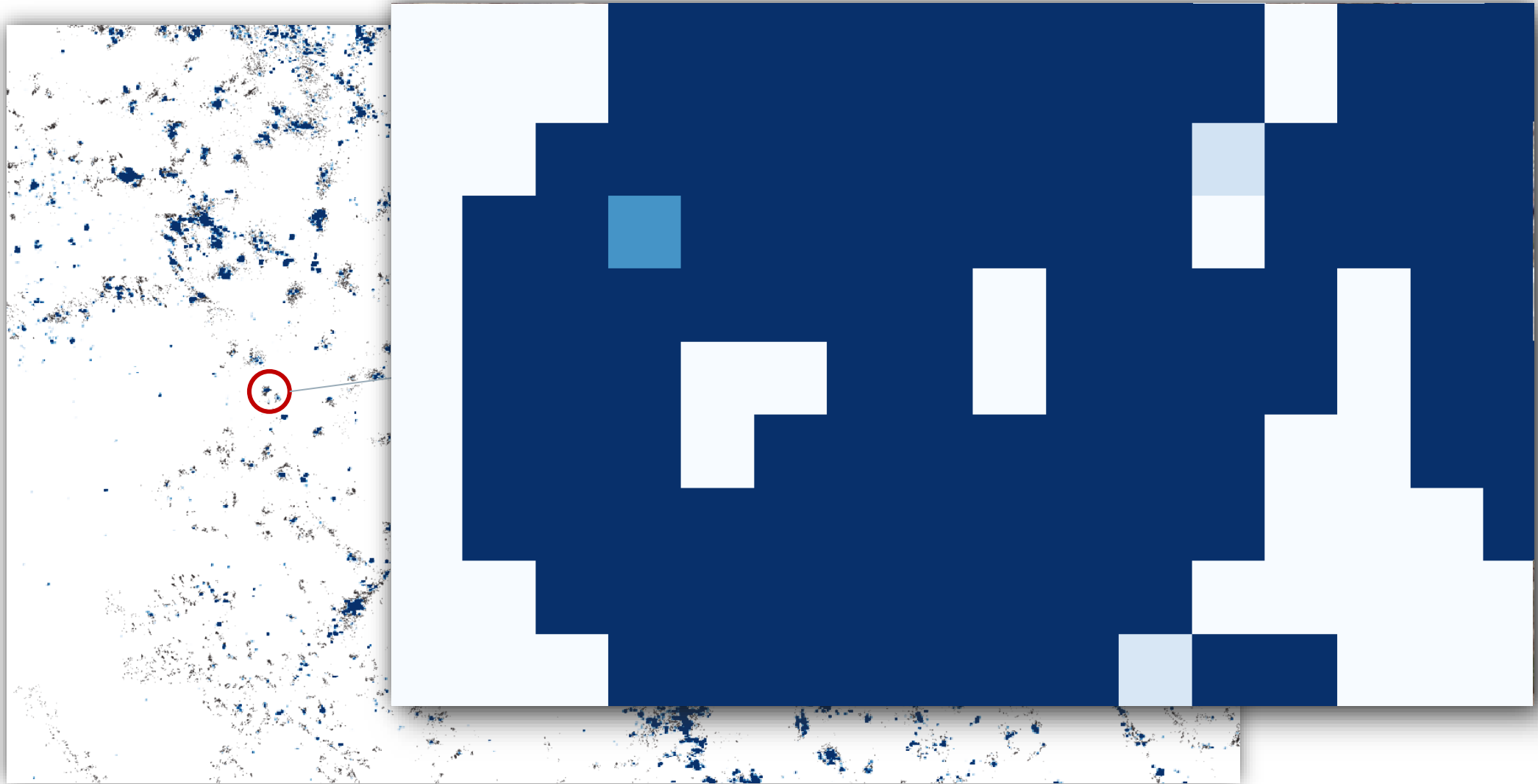
Microsoft building footprint and GHS built-up surface



Microsoft building footprint and GHS built-up surface

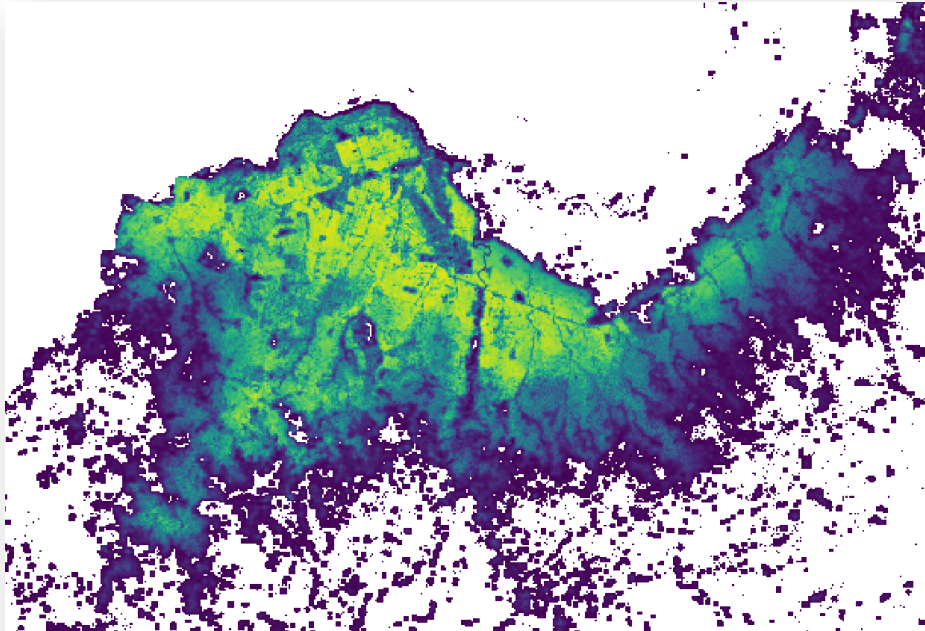


Microsoft building footprint and GHS built-up surface



Globla2 project - Non-residential settlement

Non residential settlement covariate = GHSL NRES + OSM (2024)



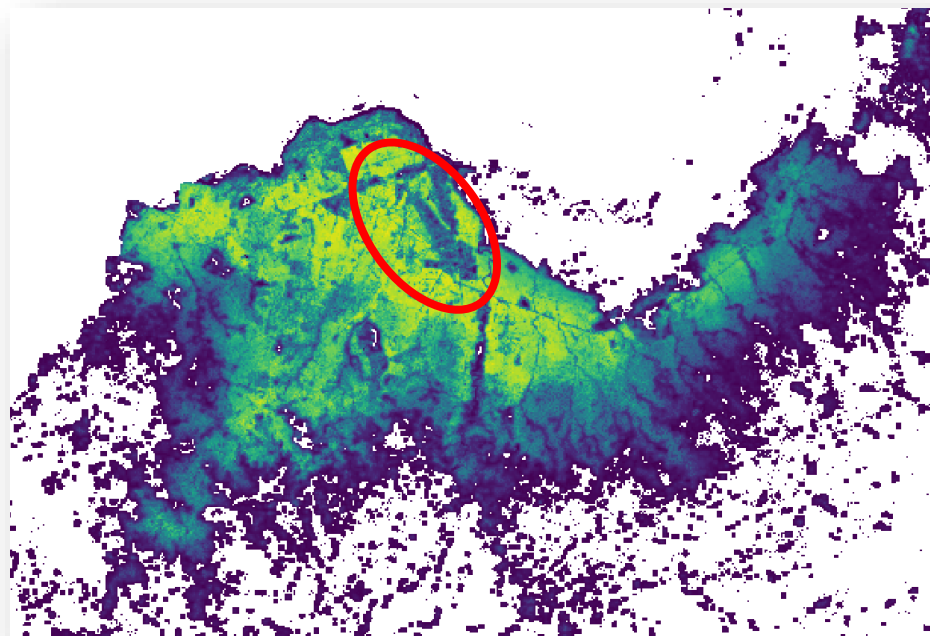
Democratic Republic of the Congo - Kinshasa



GHSL NRES + OSM (2024)

Globla2 project - Non-residential settlement

Non residential settlement covariate = GHSL NRES + OSM (2024)



Democratic Republic of the Congo - Kinshasa



GHSL N

Globla2 project - Non-residential settlement

Non residential settlement covariate = GHSL NRES + OSM (2024)



Colombia, Bogotá (grey - built-up surface , red- NRES)

Globla2 project - Non-residential settlement

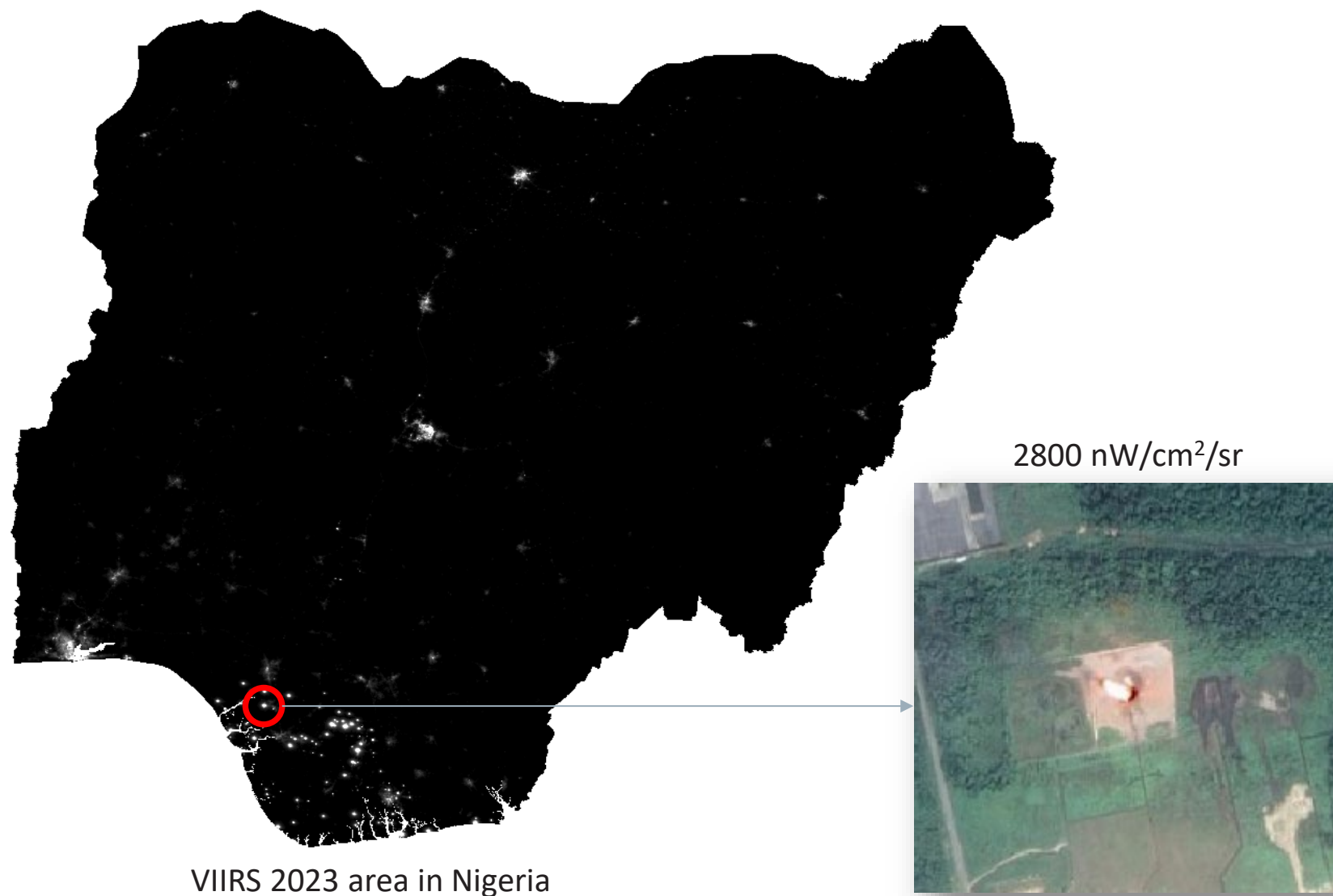
Non residential settlement covariate = GHSL NRES + OSM (2024)



Colombia, Bogotá (grey - built-up surface , red- NRES)



VIIRS 2023 area in Nigeria



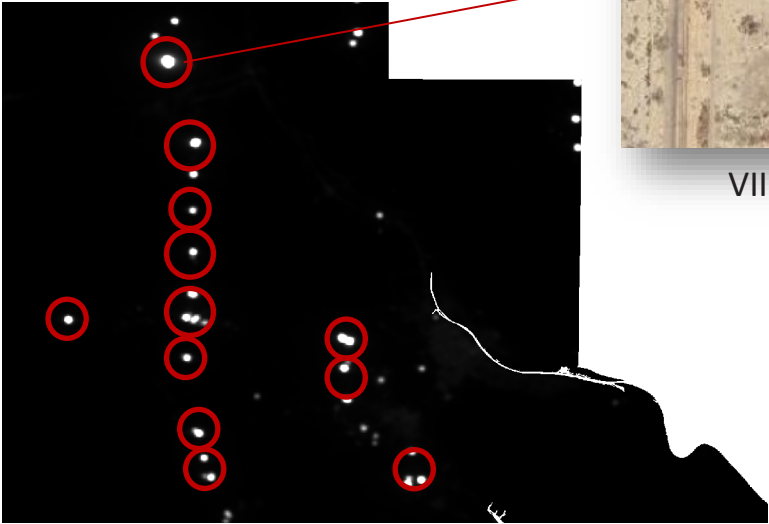


VIIRS 2023 area in Iraq (Basrah)



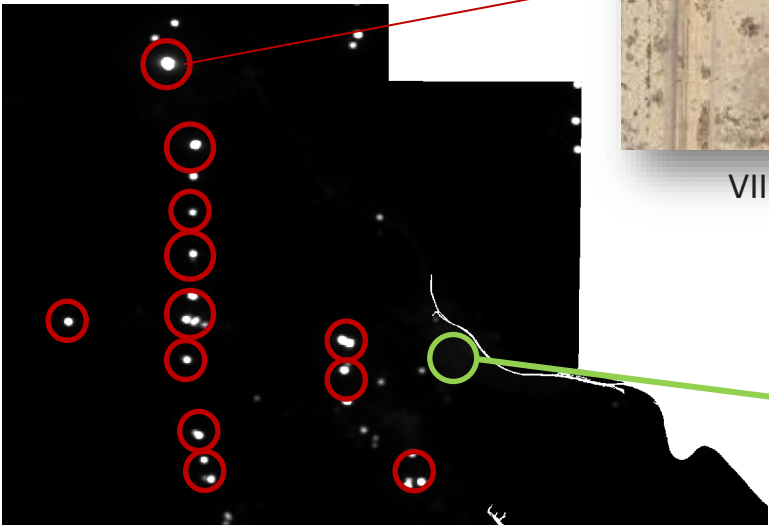
VIIRS 2023 area in Iraq (Basrah)

Global 2: Night-time light covariate



VIIRS ~ 68,000 nm

VIIRS 2023 area in Iraq (Basrah)



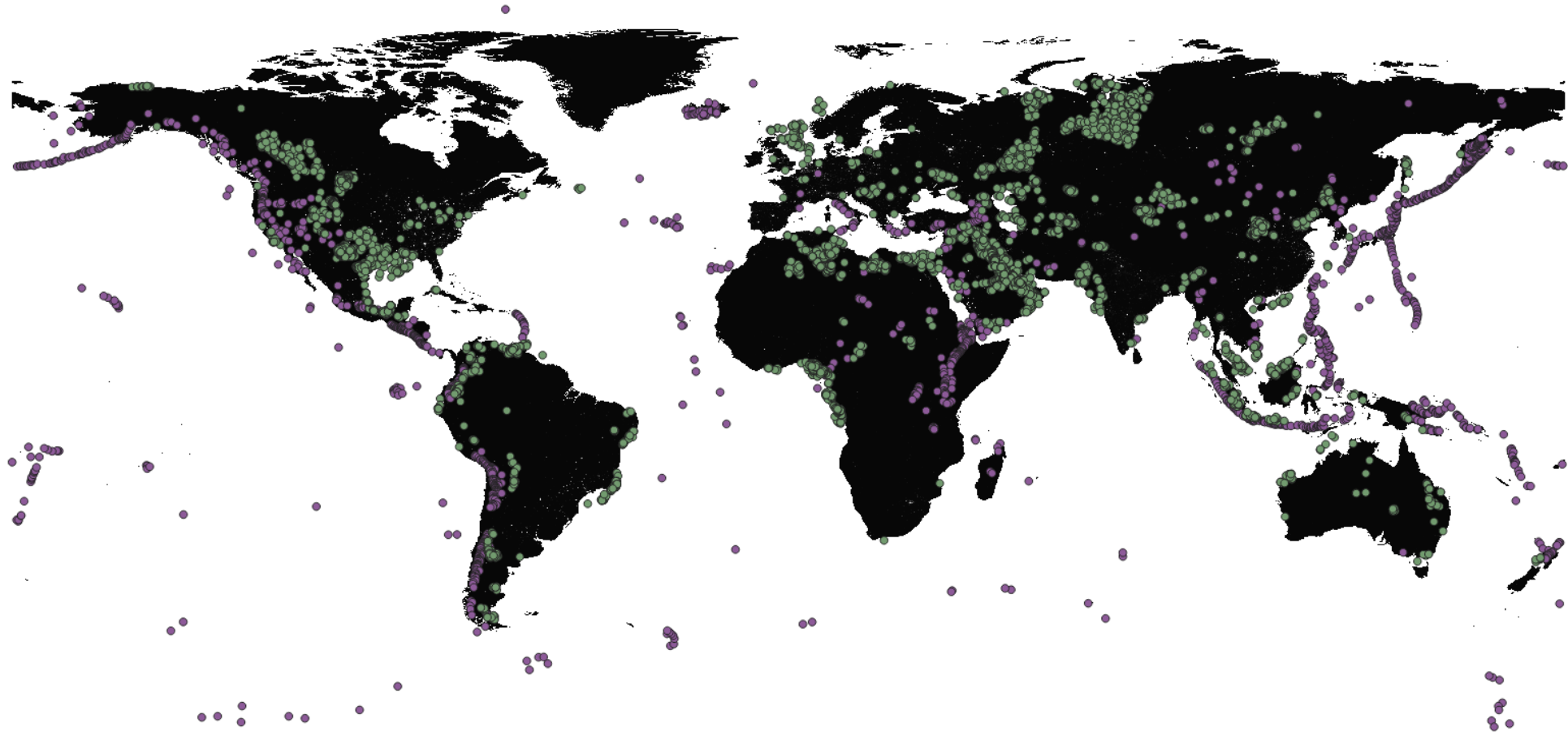
VIIRS 2023 area in Iraq (Basrah)



VIIRS ~ 68,000 nm



VIIRS ~ 150 nm



We used “Global Gas Flaring Data Database” from WorldBank and location of volcanoes “Global GIS : volcanoes of the world”. We used the outlier removal algorithm developed for DMSP-OLS night-time lights (Baugh et al. 2010).

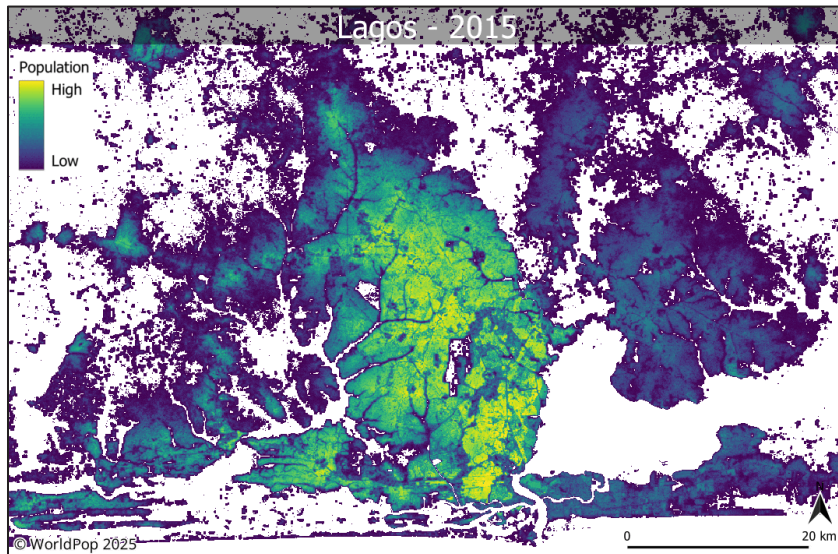
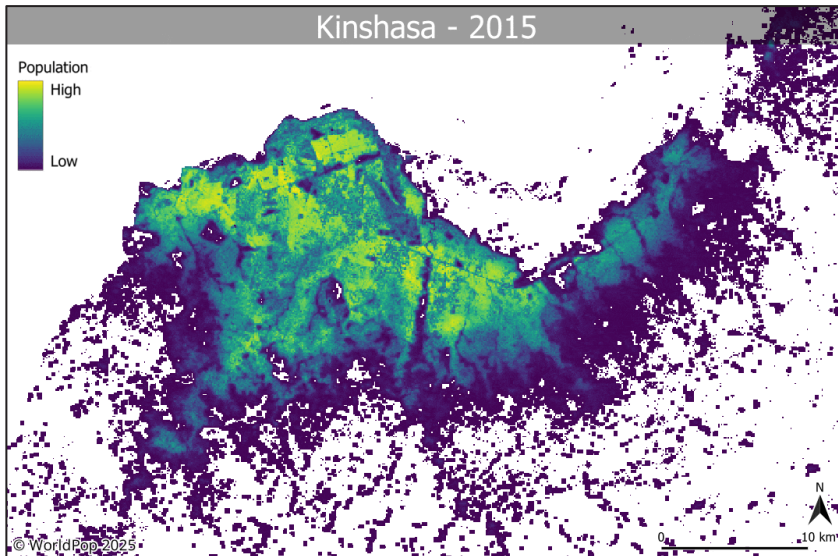


VIIRS 2023 area in Iraq (Basrah)



Filtered VIIRS 2023 area in Iraq (Basrah)

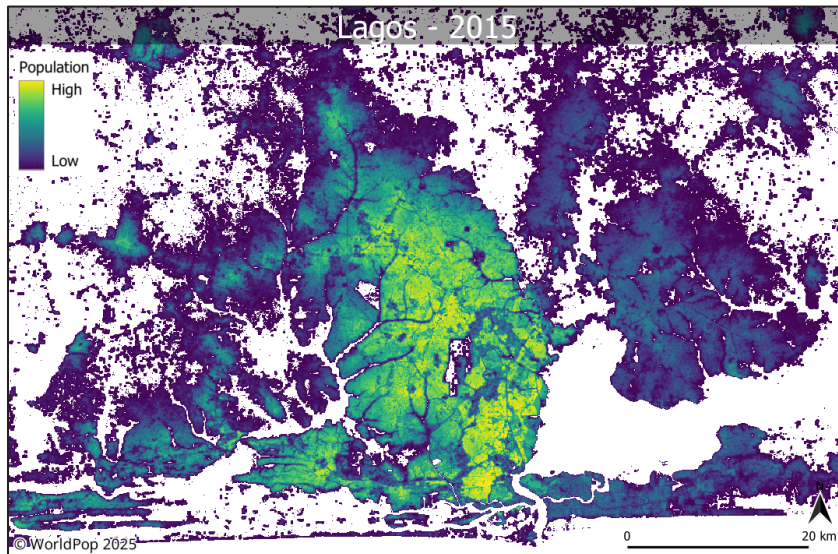
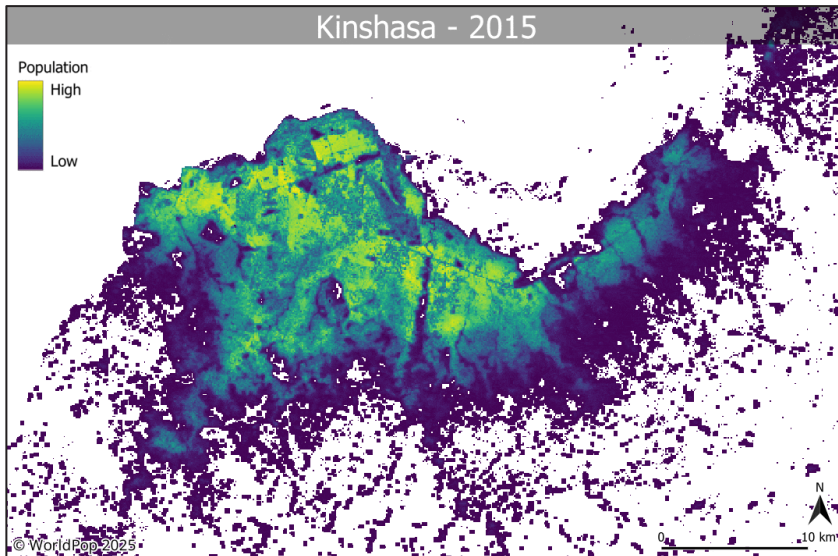
Improving method to filter night-time light data from flares and volcanoes and other abnormal reflections (e.g solar panels, greenhouses).



WorldPop Global 2015–2030

R2025A version

- Population Counts at 100m 2015-2030 (individual countries)
- Population Counts at 1km 2015-2030 (individual countries and global mosaicked)
- Estimates of total number of people per grid square at 100m and 1km broken down by gender and age groupings (including 0-1 and by 5-year up to 90+)
- Estimates of total number of people under the age of 18 years old and broken down by male and female.



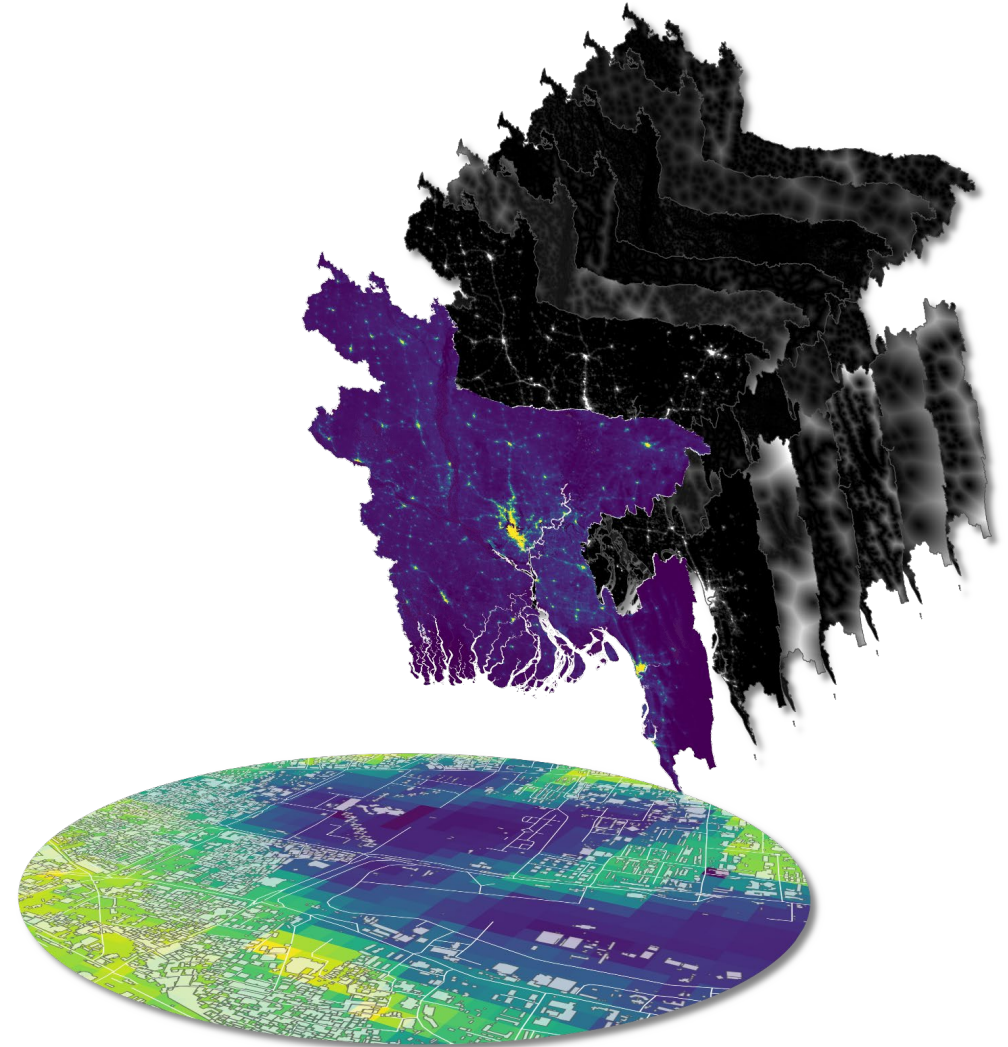
WorldPop Global 2015–2030

R2025A version

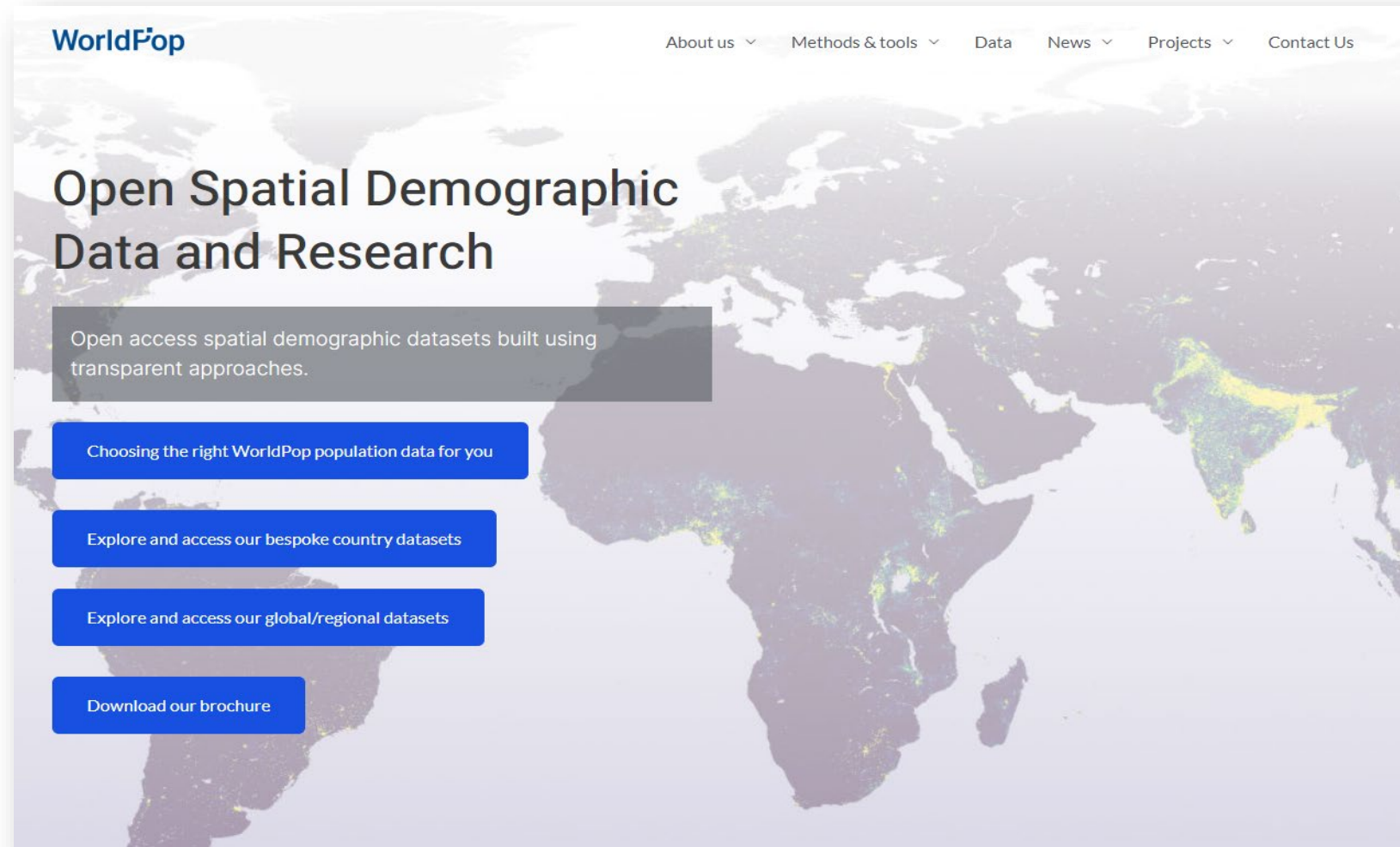
- Population Counts at 100m 2015-2030 (individual countries)
- Population Counts at 1km 2015-2030 (individual countries and global mosaicked)
- Estimates of total number of people per grid square at 100m and 1km broken down by gender and age groupings (including 0-1 and by 5-year up to 90+)
- Estimates of total number of people under the age of 18 years old and broken down by male and female.
- **Population Density** (coming soon)

Hands-on discovery

Tools and technical
deep-dive



WorldPop website <https://www.worldpop.org>



WorldPop

Hub

DATACONTACT

Open Spatial Demographic Data and Research

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Datasets

Open access spatial demographic datasets built using transparent approaches.

[total 88,610 datasets]

Population Count33,230

Age and sex structures30,473

Dynamic Mapping2

Grid-cell surface areas250

Population Density9,955

Development Indicators78

Global Flight Data3

Administrative Areas500

Population Weighted Density4

Dependency Ratios2

Global Holiday Data5

Urban change27

Births234

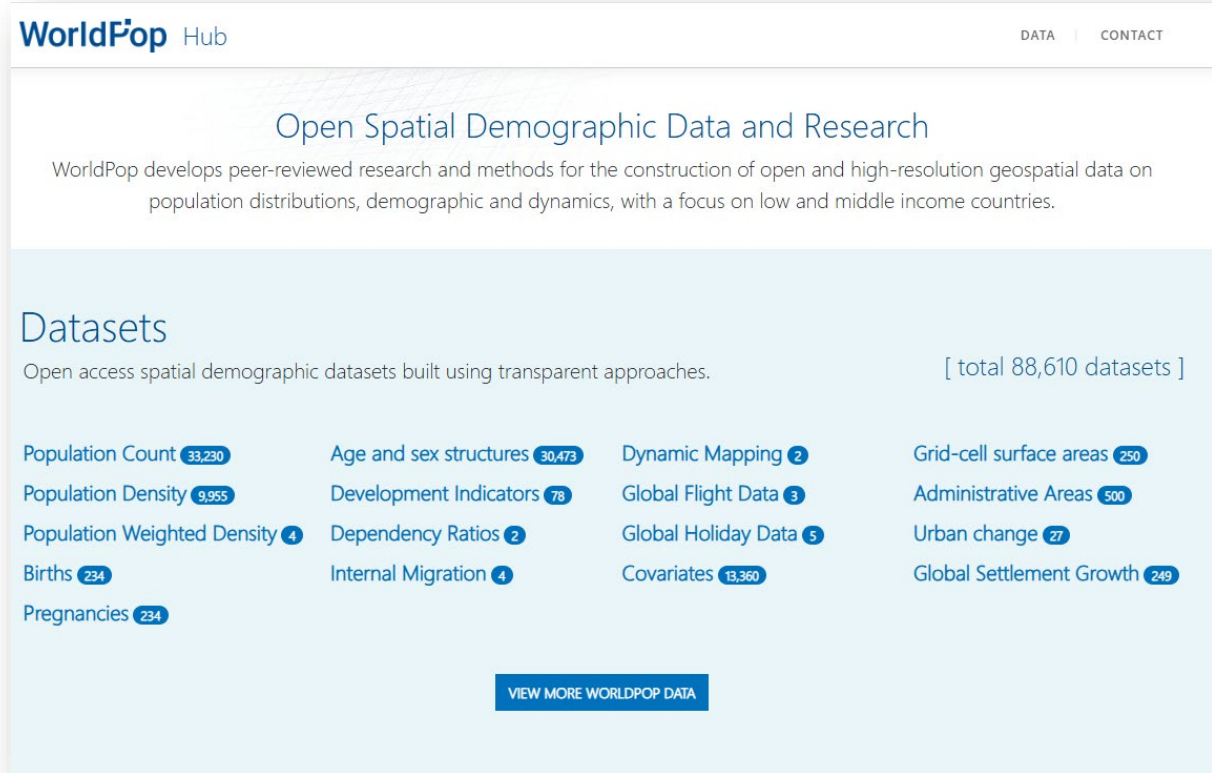
Internal Migration4

Covariates13,360

Global Settlement Growth249

Pregnancies234

VIEW MORE WORLDPOP DATA



The screenshot shows the WorldPop Data Hub website. At the top, there's a navigation bar with 'WorldPop Hub' on the left and 'DATA' and 'CONTACT' on the right. Below the navigation bar, a large heading reads 'Open Spatial Demographic Data and Research'. Underneath this, a paragraph states: 'WorldPop develops peer-reviewed research and methods for the construction of open and high-resolution geospatial data on population distributions, demographic and dynamics, with a focus on low and middle income countries.' A light blue section titled 'Datasets' follows, with the subtitle 'Open access spatial demographic datasets built using transparent approaches.' and a count '[total 88,610 datasets]'. This section contains a grid of dataset categories, each with a name and a count in a blue pill-shaped button: Population Count (33,230), Age and sex structures (30,473), Dynamic Mapping (2), Grid-cell surface areas (250), Population Density (9,955), Development Indicators (78), Global Flight Data (3), Administrative Areas (500), Population Weighted Density (4), Dependency Ratios (2), Global Holiday Data (5), Urban change (27), Births (234), Internal Migration (4), Covariates (13,360), and Global Settlement Growth (249). Pregnancies (234) is listed at the bottom left. A blue button labeled 'VIEW MORE WORLDPOP DATA' is centered at the bottom of the datasets section.

WorldPop Hub

DATA CONTACT

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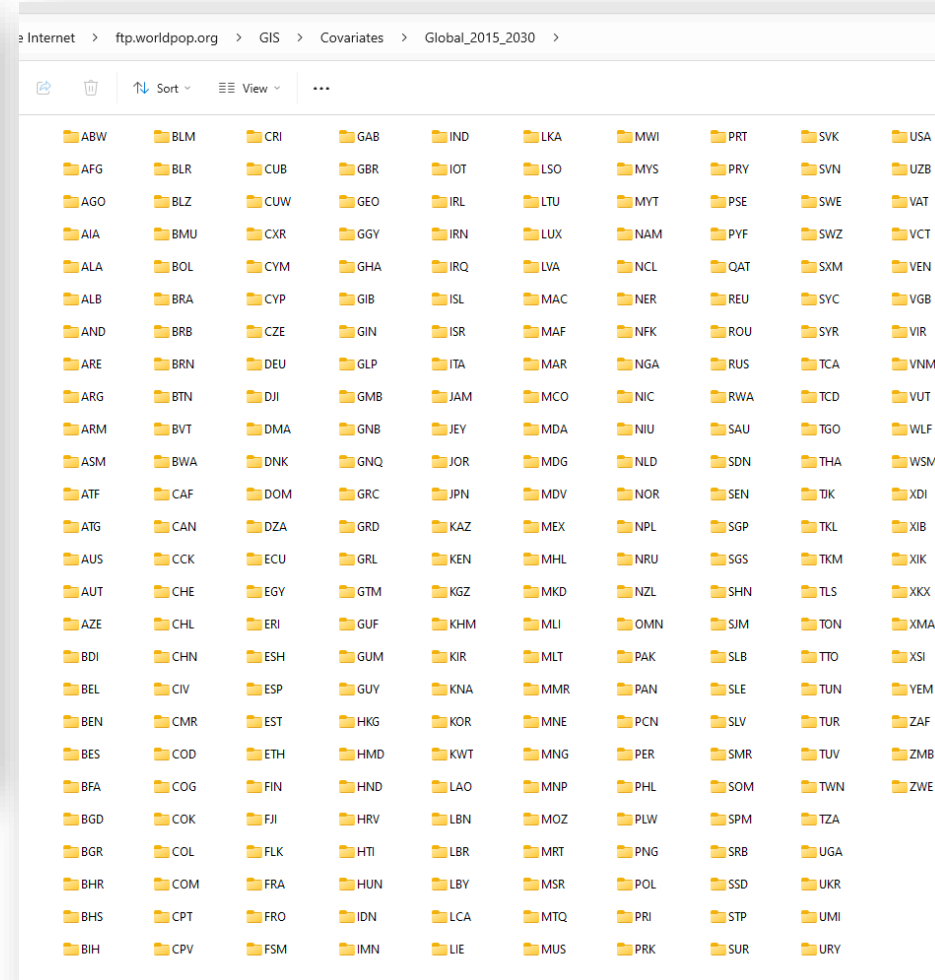
Datasets

Open access spatial demographic datasets built using transparent approaches. [total 88,610 datasets]

- Population Count 33,230
- Age and sex structures 30,473
- Dynamic Mapping 2
- Grid-cell surface areas 250
- Population Density 9,955
- Development Indicators 78
- Global Flight Data 3
- Administrative Areas 500
- Population Weighted Density 4
- Dependency Ratios 2
- Global Holiday Data 5
- Urban change 27
- Births 234
- Internal Migration 4
- Covariates 13,360
- Global Settlement Growth 249
- Pregnancies 234

VIEW MORE WORLDPOP DATA

<https://worldpop.org>



The screenshot shows the FTP directory structure of the WorldPop Data Hub. The address bar indicates the path: 'ftp.worldpop.org > GIS > Covariates > Global_2015_2030 >'. The directory view shows a grid of folders, each representing a country or region, with its three-letter code. The folders are arranged in a grid that is 10 columns wide and 20 rows high. The codes include: ABW, BLM, CRI, GAB, IND, LKA, MWI, PRT, SVK, USA; AFG, BLR, CUB, GBR, IOT, LSO, MYS, PRY, SVN, UZB; AGO, BLZ, CUW, GEO, IRL, LTU, MYT, PSE, SWE, VAT; AIA, BMU, CXR, GGY, IRN, LUX, NAM, PYF, SWZ, VCT; ALA, BOL, CYM, GHA, IRQ, LVA, NCL, QAT, SKM, VEN; ALB, BRA, CYP, GIB, ISL, MAC, NER, REU, SYC, VGB; AND, BRB, CZE, GIN, ISR, MAF, NFK, ROU, SYR, VIR; ARE, BRN, DEU, GLP, ITA, MAR, NGA, RUS, TCA, VNM; ARG, BTN, DJI, GMB, JAM, MCO, NIC, RWA, TCD, VUT; ARM, BVT, DMA, GNB, JEY, MDA, NIU, SAU, TGO, WLF; ASM, BWA, DNK, GNQ, JOR, MDG, NLD, SDN, THA, WSM; ATF, CAF, DOM, GRC, JPN, MDV, NOR, SEN, TJK, XDI; ATG, CAN, DZA, GRD, KAZ, MEX, NPL, SGP, TKL, XIB; AUS, CCK, ECU, GRL, KEN, MHL, NRU, SGS, TKM, XKI; AUT, CHE, EGY, GTM, KGZ, MKD, NZL, SHN, TLS, XKX; AZE, CHL, ERI, GUF, KHM, MLI, OMN, SJM, TON, XMA; BDI, CHN, ESH, GUM, KIR, MLT, PAK, SLB, TTO, XSI; BEL, CIV, ESP, GUY, KNA, MMR, PAN, SLE, TUN, YEM; BEN, CMR, EST, HKG, KOR, MNE, PCN, SLV, TUR, ZAF; BES, COD, ETH, HMD, KWT, MNG, PER, SMR, TUV, ZMB; BFA, COG, FIN, HND, LAO, MNP, PHL, SOM, TWN, ZWE; BGD, COK, FJI, HRV, LBN, MOZ, PLW, SPM, TZA; BGR, COL, FLK, HTI, LBR, MRT, PNG, SRB, UGA; BHR, COM, FRA, HUN, LBY, MSR, POL, SSD, UKR; BHS, CPT, FRO, IDN, LCA, MTQ, PRI, STP, UMI; BIH, CPV, FSM, IMN, LIE, MUS, PRK, SUR, URY.

Internet > ftp.worldpop.org > GIS > Covariates > Global_2015_2030 >

Sort View

ABW	BLM	CRI	GAB	IND	LKA	MWI	PRT	SVK	USA
AFG	BLR	CUB	GBR	IOT	LSO	MYS	PRY	SVN	UZB
AGO	BLZ	CUW	GEO	IRL	LTU	MYT	PSE	SWE	VAT
AIA	BMU	CXR	GGY	IRN	LUX	NAM	PYF	SWZ	VCT
ALA	BOL	CYM	GHA	IRQ	LVA	NCL	QAT	SKM	VEN
ALB	BRA	CYP	GIB	ISL	MAC	NER	REU	SYC	VGB
AND	BRB	CZE	GIN	ISR	MAF	NFK	ROU	SYR	VIR
ARE	BRN	DEU	GLP	ITA	MAR	NGA	RUS	TCA	VNM
ARG	BTN	DJI	GMB	JAM	MCO	NIC	RWA	TCD	VUT
ARM	BVT	DMA	GNB	JEY	MDA	NIU	SAU	TGO	WLF
ASM	BWA	DNK	GNQ	JOR	MDG	NLD	SDN	THA	WSM
ATF	CAF	DOM	GRC	JPN	MDV	NOR	SEN	TJK	XDI
ATG	CAN	DZA	GRD	KAZ	MEX	NPL	SGP	TKL	XIB
AUS	CCK	ECU	GRL	KEN	MHL	NRU	SGS	TKM	XIK
AUT	CHE	EGY	GTM	KGZ	MKD	NZL	SHN	TLS	XKX
AZE	CHL	ERI	GUF	KHM	MLI	OMN	SJM	TON	XMA
BDI	CHN	ESH	GUM	KIR	MLT	PAK	SLB	TTO	XSI
BEL	CIV	ESP	GUY	KNA	MMR	PAN	SLE	TUN	YEM
BEN	CMR	EST	HKG	KOR	MNE	PCN	SLV	TUR	ZAF
BES	COD	ETH	HMD	KWT	MNG	PER	SMR	TUV	ZMB
BFA	COG	FIN	HND	LAO	MNP	PHL	SOM	TWN	ZWE
BGD	COK	FJI	HRV	LBN	MOZ	PLW	SPM	TZA	
BGR	COL	FLK	HTI	LBR	MRT	PNG	SRB	UGA	
BHR	COM	FRA	HUN	LBY	MSR	POL	SSD	UKR	
BHS	CPT	FRO	IDN	LCA	MTQ	PRI	STP	UMI	
BIH	CPV	FSM	IMN	LIE	MUS	PRK	SUR	URY	

<ftp://ftp.worldpop.org>

WorldPop Hub DATA CONTACT

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Datasets

Open access spatial demographic datasets built using transparent approaches. [total 88,610 datasets]

- Population Count 33,230
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- Population Weighted Density 4
- Births 234
- Pregnancies 234
- Age and sex structures 30,47
- Development Indicators 78
- Dependency Ratios 2
- Internal Migration 4
- Covariates 13,360
- Global Settlement Growth 249

[VIEW MORE WORLDPOP DATA](#)

ftp://ftp.worldpop.org/GIS/Population/Global_2015_2030/R2025A/

Internet > ftp.worldpop.org > GIS > Covariates > Global_2015_2030 >

Sort View ...

ABW	BLM	CRI	GAB	IND	LKA	MWI	PRT	SVK	USA
AFG	BLR	CUB	GBR	IOT	LSO	MYS	PRY	SVN	UZB
AGO	BLZ	CUW	GEO	IRL	LTU	MYT	PSE	SWE	VAT
AIA	BMU	CXR	GGY	IRN	LUX	NAM	PYF	SWZ	VCT
ALA	BOL	CYM	GHA	IRQ	LVA	NCL	QAT	SXM	VEN
ALB	BRA	CYP	GIB	ISL	MAC	NER	REU	SYC	VGB
AND	BRB	CZE	GIN	ISR	MAF	NFK	ROU	SYR	VIR
ARE	BRN	DEU	GLP	ITA	MAR	NGA	RUS	TCA	VNM
								TCO	VUT
								TGO	WLF
								THA	WSM
								TJK	XDI
								TKL	XIB
								TKM	XIK
								TLS	XXK
AUT	CHE	EGY	GTM	KGZ	MKD	NZL	SHN	TON	XMA
AZE	CHL	ERI	GUF	KHM	MLI	OMN	SJM	TTO	XSI
BDI	CHN	ESH	GUM	KIR	MLT	PAK	SLB	TUN	YEM
BEL	CIV	ESP	GUY	KNA	MMR	PAN	SLE	TUR	ZAF
BEN	CMR	EST	HKG	KOR	MNE	PCN	SLV	TUV	ZMB
BES	COD	ETH	HMD	KWT	MNG	PER	SMR	TWN	ZWE
BFA	COG	FIN	HND	LAO	MNP	PHL	SOM		
BGD	COK	FJI	HRV	LBN	MOZ	PLW	SPM		
BGR	COL	FLK	HTI	LBR	MRT	PNG	SRB		
BHR	COM	FRA	HUN	LBV	MSR	POL	SSD		
BHS	CPT	FRO	IDN	LCA	MTQ	PRI	STP		
BIH	CPV	FSM	IMN	LIE	MUS	PRK	SUR		

<https://worldpop.org>

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Global Flight Data3

Global Holiday Data5

Covariates13,360

Grid-cell surface areas250

Administrative Areas500

Urban change27

Global Settlement Growth249

VIEW MORE WORLDPOP DATA

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WorldPop Hub

DATACONTACT

Age and sex structures

Age and sex structures / Individual countries 2015-2030 (100m resolution) R2025A v1 / Algeria 100m. Age structures

Algeria

Population under the age of age.
Estimated total number of people per grid-cell at a resolution of 3 arc seconds (approximately 100m at the equator).



WorldPop (www.worldpop.org) School of Geography and Environmental Science, University of Southampton
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Algeria - Age and Sex Structures

Estimates of total number of people per grid square broken down by gender and age groupings (including 0-1 and by 5-year up to 90+) in 2015 for Algeria, R2025A version v1. The dataset is available to download in Geotiff format at a resolution of 3 arc (approximately 100m at the equator). The projection is Geographic Coordinate System, WGS84. The units are estimated number of male, female or both in each age group per grid square.

File Descriptions:
(iso_[gender]_[age group]_[year]_[type]_[resolution]_[release]_[version]).tif

iso	Three-letter country code
gender	m = male, f= female, t = both genders
age group	<ul style="list-style-type: none">00 = age group 0 to 12 months01 = age group 1 to 4 years05 = age group 5 to 9 years90 = age 90 years and over
year	Year that the population represents
type	CN = Constrained
resolution	Resolution of the data e.g. 100m = 3 arc (approximately 100m at the equator)
release	Release
version	Version

Example: dza_f_00_2015_CN_100m_R2025A_v1.tif – this dataset represents constrained estimates of total number of females of age group 0 to 12 months per grid square in Algeria for 2015 at 100m resolution, version R2025A v1.

Download Entire Dataset / 3.25G

Region : Algeria

DOI : 10.5258/SOTON/WP00841

Date of production : 2025-09-01

Recommended citation
Bondarenko M., Priyatkanto R., Tejedor-Garavito N., Zhang W., McKeen T., Cunningham A., Woods T., Hilton J., Cihan D., Nosatuk B., Brinkhoff T., Tatem A., Sorichetta A., 2025. Estimates of 2015-2030 total number of people per grid square broken down by gender and age groupings at a resolution of 3 arc (approximately 100m at the equator) R2025A version v1. Global Demographic Data Project - Funded by The Bill and Melinda Gates Foundation (INV-045237). WorldPop - School of Geography and Environmental Science, University of Southampton. DOI:10.5258/SOTON/WP00841

Data Files :

Name	Size
dza_T_f_2015_CN_100m_R2025A_v1.tif	61.24 MB
dza_T_m_2015_CN_100m_R2025A_v1.tif	61.24 MB
dza_f_00_2015_CN_100m_R2025A_v1.tif	59.77 MB
dza_f_01_2015_CN_100m_R2025A_v1.tif	60.81 MB

WorldPop Hub

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Dependency Ratios2

Global Holiday Data5

Urban change27

Births234

Internal Migration4

Covariates13,360

Global Settlement Growth249

Pregnancies234

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https://worldpop.org

WorldPop Hub

DATACONTACT

Age and sex structures

Age and sex structures / Individual countries 2015-2030 (100m resolution) R2025A v1 / Algeria 100m. Age structures

Algeria

Projection: UTM, Zone 32N, Datum: WGS84, Unit: Meter, Resolution: 100m

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year	Year that the population represents
type	CN = Constrained
resolution	Resolution of the data e.g. 100m = 3 arc (approximately 100m at the equator)
release	Release
version	Version

Example: dza_f_00_2015_CN_100m_R2025A_v1.tif – this dataset represents constrained estimates of total number of females of age group 0 to 12 months per grid square in Algeria for 2015 at 100m resolution, version R2025A v1.

Download Entire Dataset / 3.25G

Region : Algeria

DOI : 10.5258/SOTON/WP00841

Date of production : 2025-09-01

Recommended citation

Bondarenko M., Priyatanto R., Tejedor-Garavito N., Zhang W., McKeen T., Cunningham A., Woods T., Hilton J., Cihan D., Nosatuk B., Brinkhoff T., Tatem A., Sorichetta A., 2025. Estimates of 2015-2030 total number of people per grid square broken down by gender and age groupings at a resolution of 3 arc (approximately 100m at the equator) R2025A version v1. Global Demographic Data Project - Funded by The Bill and Melinda Gates Foundation (INV-045237). WorldPop - School of Geography and Environmental Science, University of Southampton. DOI:10.5258/SOTON/WP00841

Name	Size
dza_T_f_2015_CN_100m_R2025A_v1.tif	61.24 MB
dza_T_m_2015_CN_100m_R2025A_v1.tif	61.24 MB
dza_f_00_2015_CN_100m_R2025A_v1.tif	59.77 MB
dza_f_01_2015_CN_100m_R2025A_v1.tif	60.93 MB

WorldPop SpatioTemporal Asset Catalogs (STAC)

The STAC specification is a **common language to describe geospatial information**, so it can more easily be worked with, indexed, and discovered <https://stacspec.org/en/about/datasets/>

STAC was created for

- Simplified data discovery and access
- Standardized metadata structure
- Enhanced interoperability
- Improved data sharing capabilities
- Better collaboration opportunities

<https://stac.worldpop.org>

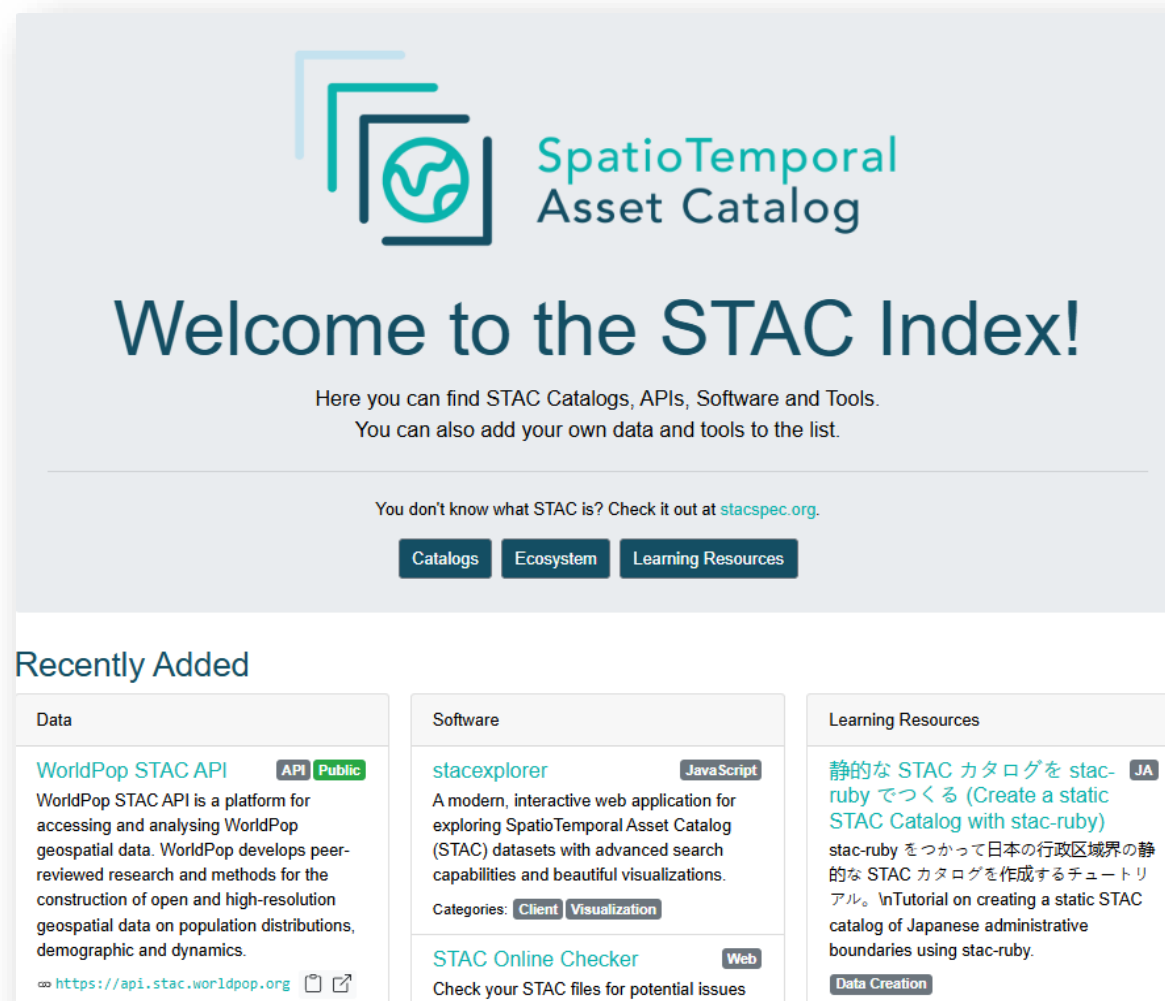
<https://api.stac.worldpop.org>

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11    "https://api.stacspec.org/v1.0.0/item-search",
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13    "http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/oas30",
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31 _url_ : _url_ : _url_ : _url_ : _url_ : _url_ : _url_ : _url_ : _url_ : _url_ :
```

- WorldPop STAC API has been listed on STAC Index

<https://stac.worldpop.org>

<https://api.stac.worldpop.org>



<https://stacindex.org/>

STAC Browser Interface

- Intuitive data exploration
- Visual preview capabilities
- Advanced filtering options
- Direct data access

<https://stac.worldpop.org>

WorldPop STAC API

[Browse](#) [Search](#)

[API](#) [Source](#) [Share](#) [Language: English](#)

Description

Welcome to the WorldPop STAC API, a specialized platform for accessing and analyzing global population distribution and covariate data. This API utilizes the SpatioTemporal Asset Catalog (STAC) specification to provide standardized access to a range of geospatial datasets related to human population and environmental factors.

Our API offers access to the following types of data: • Population estimates • Built settlement layers • Building footprints • Land cover classifications • Elevation and slope data • Climate indicators • Infrastructure data (e.g., roads, water bodies)

These datasets are available at a consistent resolution of 3 arc seconds (approximately 100m at the equator) and use the Geographic Coordinate System WGS84 (EPSG:4326). The data covers most countries globally.


[Read more](#)

Additional Resources

- [OpenAPI service description](#)
- [OpenAPI service documentation](#)

Catalogs 259


[Tiles](#) [List](#) [Ascending](#) [Descending](#)



Afghanistan

This collection provides comprehensive geospatial data for Afghanistan, including various covariates such as built settlement...


9/17/2024, 12:11:22 PM UTC



Egypt

This collection provides comprehensive geospatial data for Egypt, including various covariates such as built settlement areas,...


9/17/2024, 10:35:41 PM UTC



Liechtenstein

This collection provides comprehensive geospatial data for Liechtenstein, including various covariates such as built settlement...


9/18/2024, 8:39:51 AM UTC



Saint Vincent and the Grenadines

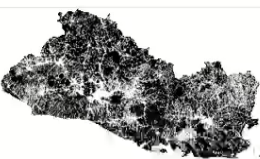
This collection provides comprehensive geospatial data for Saint Vincent and the Grenadines, including various covariates such...

9/19/2024, 11:37:55 AM UTC




Åland Islands


This collection provides comprehensive geospatial data for Åland Islands, including various covariates such as built settlement...



El Salvador



Lithuania



Samoa

Swagger Integration

- Interactive API documentation
- Real-time testing capability
- Clear endpoint descriptions
- Easy integration for developers

WorldPop STAC API1.0.0OAS 3.1

/api

Welcome to the WorldPop STAC API, a specialized platform for accessing and analyzing global population distribution and covariate data. This API utilizes the SpatioTemporal Asset Catalog (STAC) specification to provide standardized access to a range of geospatial datasets related to human population and environmental factors.

[WorldPop Support - Website](#)
[Send email to WorldPop Support](#)

STACCore STAC API endpoints

Core

GET / Landing Page

GET /conformance Conformance Classes

GET /collections/{collection_id}/items/{item_id} Get Item

POST /search Search

GET /search Search

GET /collections Get Collections

GET /collections/{collection_id} Get Collection

GET /collections/{collection_id}/items Get Itemcollection

GET /{sub_path}/{filename} Serve File

GET /{sub_path} Get By Collection Id

Liveliness/Readiness

GET /_mgmt/ping Ping

Schemas

Asset > Expand all object

Collection > Expand all object

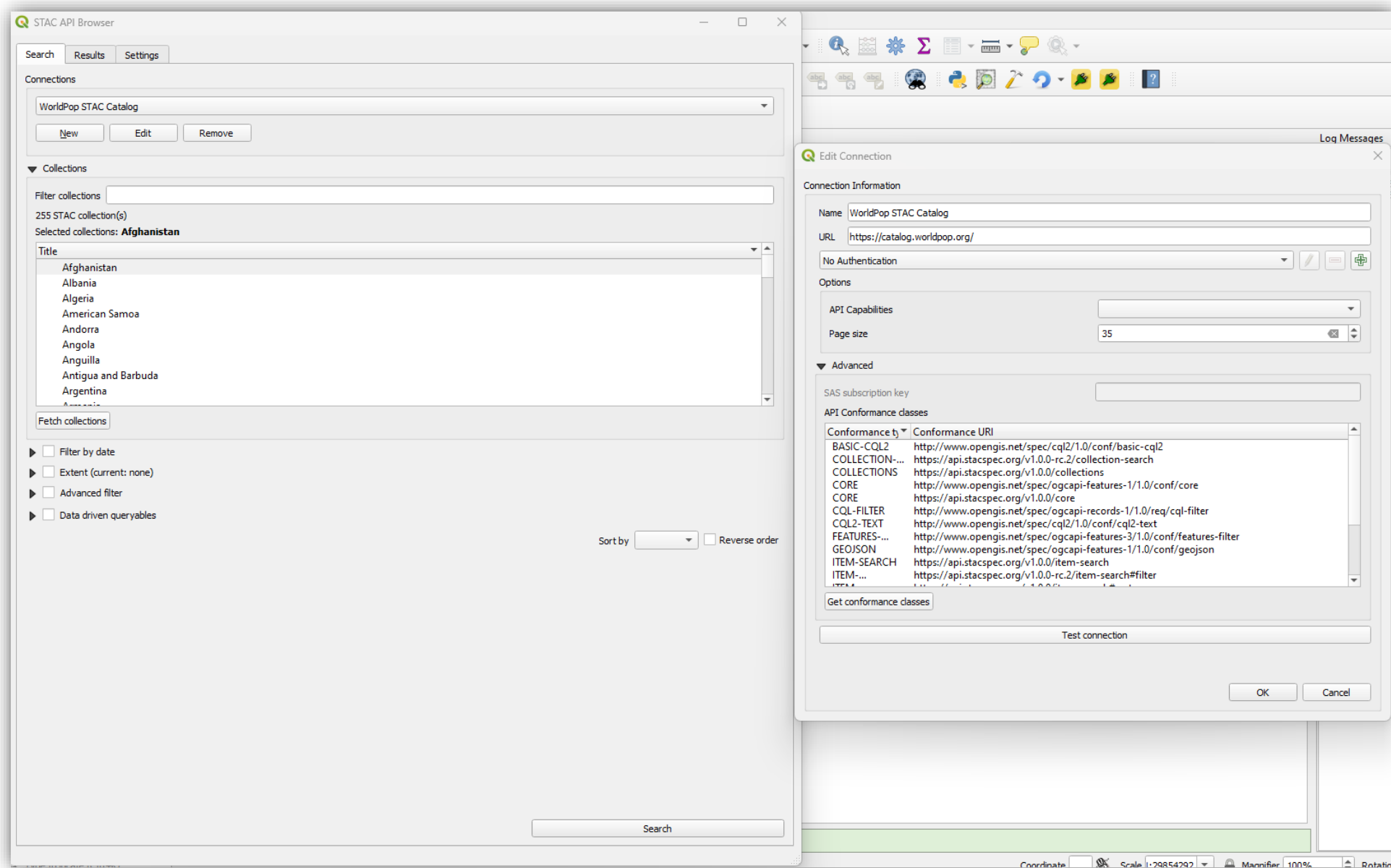
Using STAC

- STAC & Python
- STAC & QGIS
- STAC & R
- STAC & CLI

WorldPop SpatioTemporal Asset Catalogs (STAC)

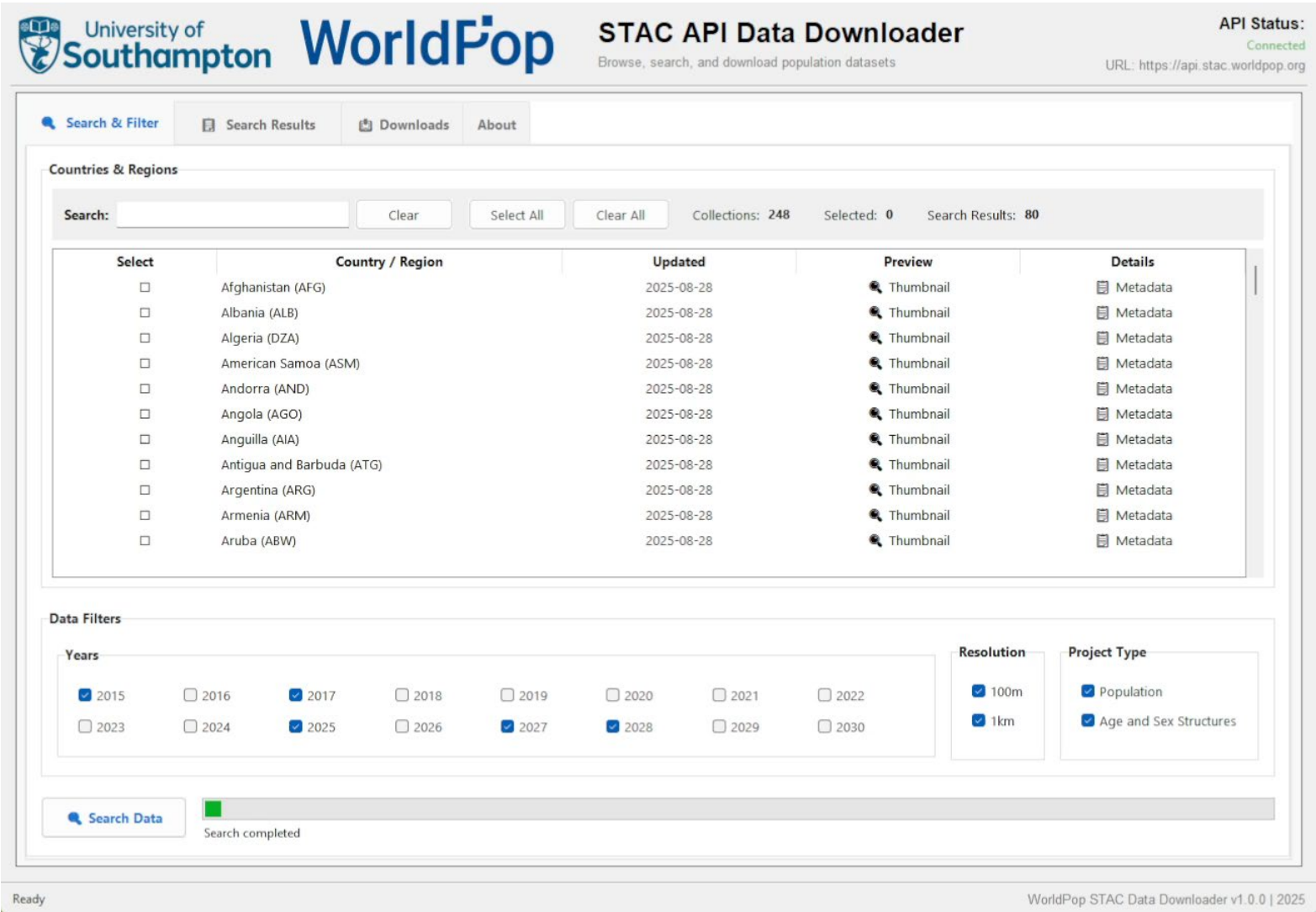
Using STAC

- STAC & Python
- **STAC & QGIS**
- STAC & R
- STAC & CLI



WorldPop STAC Data Downloader

A desktop application for downloading WorldPop population data through the STAC API.



Python package to locate and download Worldpop Global Demographic Data and acquire/summarise population count from the WorldPop Global Demographic Data.

https://github.com/wpgp/get_wp_global

[README](#)
[MIT license](#)

DOI [10.5281/zenodo.17037859](https://doi.org/10.5281/zenodo.17037859)

Get WorldPop Global Demographic Data

This repository contains some Python functions for the following purposes:

- to locate and download Worldpop Global Demographic Data in raster format. The data can be in country-wise format or global mosaic.
- to acquire and summarise population count from the WorldPop Global Demographic Data.

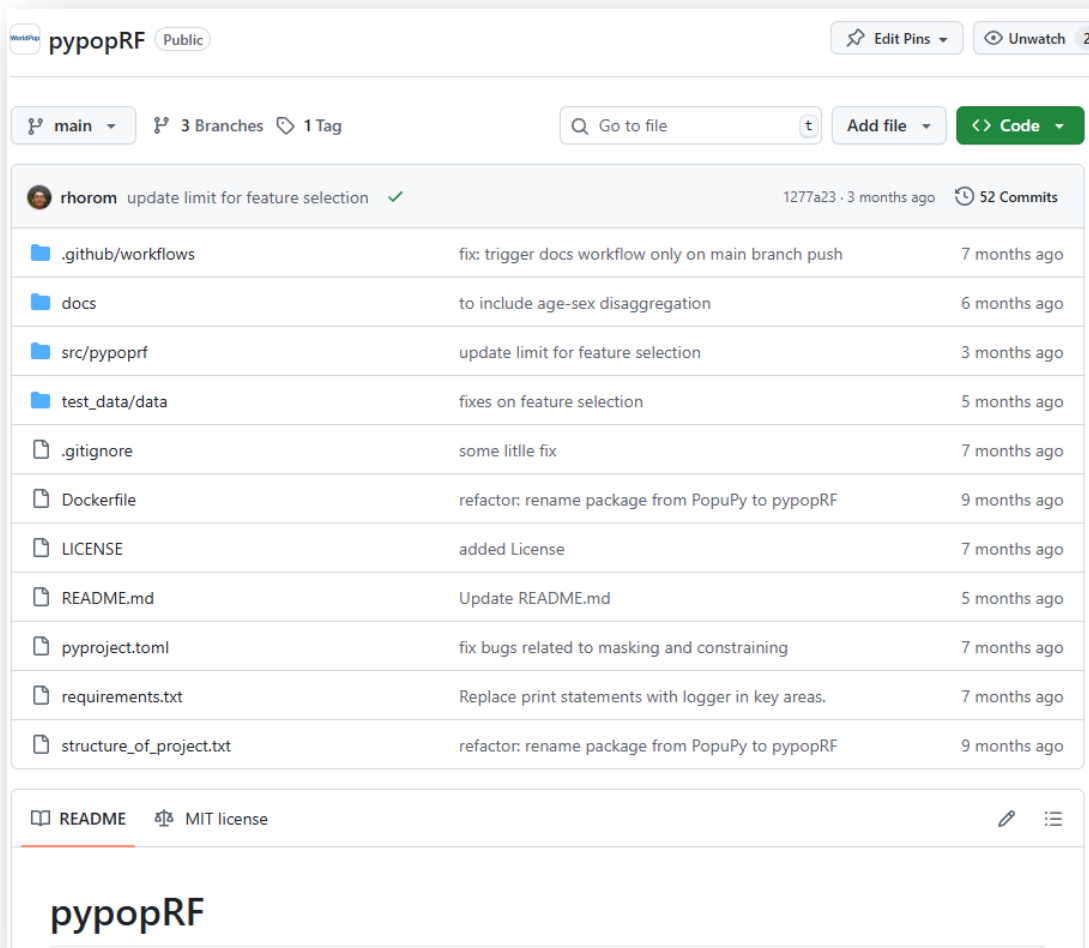
Download rasters

```
usage: get_raster [-h] [-l LAYER] [-t TLC]
                  [-d DATASET] [-v VERSION] [-y YEAR]
                  [-ar AGE_RANGE] [-dst DESTINATION]
                  [-c | --check | --no-check]
```

Simple program to download the Worldpop GlobalDemographic Data to local storage.

optional arguments:

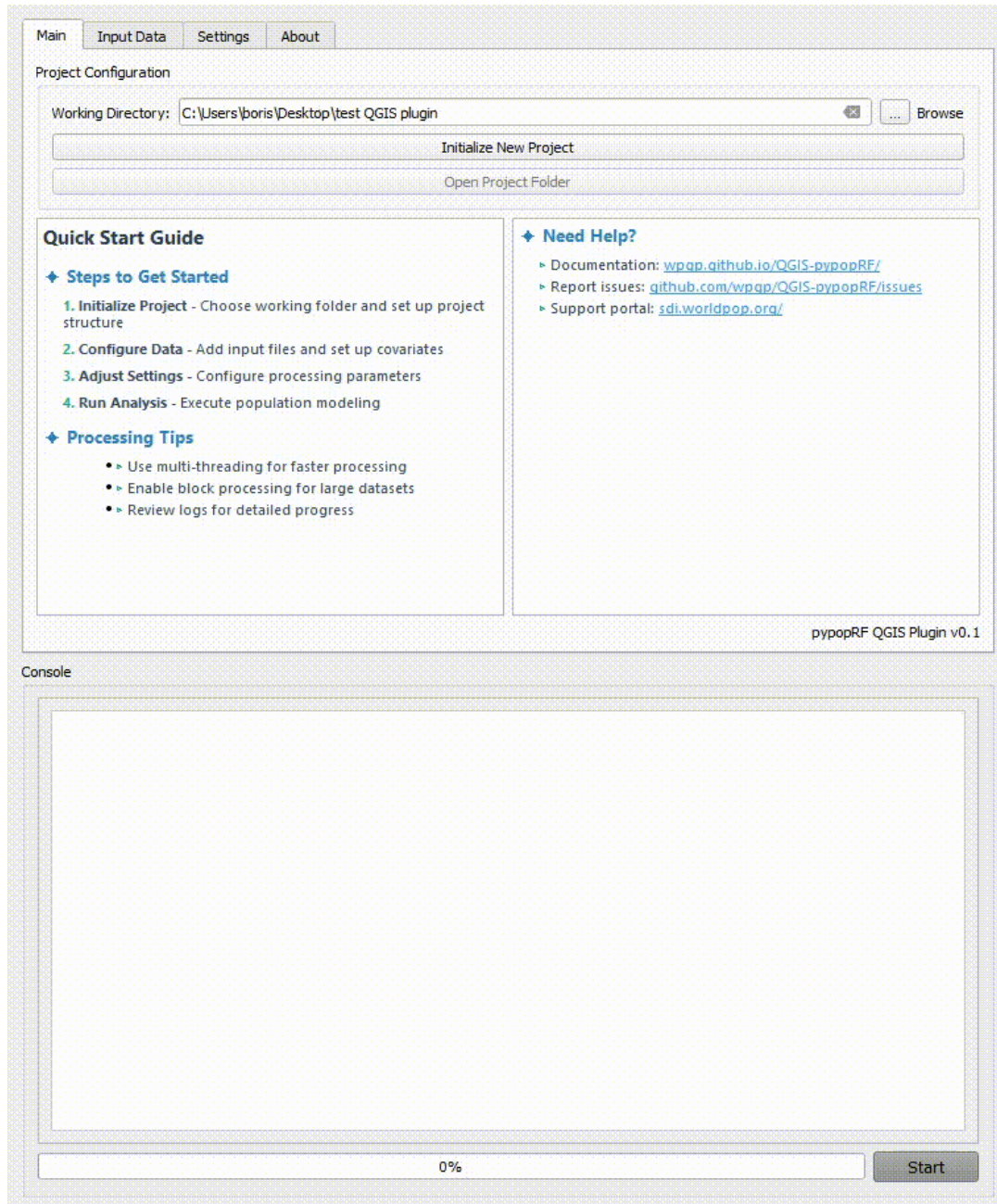
- h, --help show this help message and exit
- l LAYER, --layer LAYER selected layer to download [pop, female, male, zip]
- t TLC, --tlc TLC three letter code of the country to download
- d DATASET, --dataset DATASET dataset number
- v VERSION, --version VERSION version number
- y YEAR, --year YEAR year
- ar AGE_RANGE, --age_range AGE_RANGE min and max age group to download, separated by comma
- dst DESTINATION, --destination DESTINATION destination folder
- c, --check, --no-check list urls without downloading (default: False)



Python package for top-down population disaggregation using Random Forest

pypopRF is a Python package for population prediction and dasymetric mapping using machine learning techniques. It provides a comprehensive toolkit for processing geospatial data, training models, and generating high-resolution population distribution maps.

- Feature extraction from multiple geospatial covariates
- Random Forest-based population prediction with automatic feature selection
- Parallel processing support for large datasets
- Dissymmetric mapping for high-resolution population redistribution
- Visualization tools for analysis and validation
- Command-line interface for easy project management



QGIS pypopRF Plugin

QGIS plugin for population prediction and dissymmetric mapping.

1. Project Setup

- Initialize workspace
- Configure output directory
- Set processing parameters

2. Data Management

- Mastergrid integration
- Covariate handling
- Census data import
- Optional masks & constraints

<https://github.com/wpqp/QGIS-pypopRF>

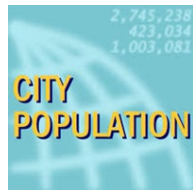
<https://www.youtube.com/watch?v=WPStOdqE8xE&t=13s>

The team behind the project.

Andy Tatem, Alessandro Sorichetta, Natalia Tejedor Garavito, Jason Hilton, Thea Woods, Tom McKeen, Alexander Cunningham, Rhorom Priyatikanto, Thomas Brinkhoff, Duygu Cihan, Wenbin Zhang, Alexandra Frosch, Jacqui Cox, Tim O'Riordan, Maksym Bondarenko



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DI MILANO



Gates Foundation

iSolutions and HPC team
at the University of Southampton

Thank you.
Any questions?
www.worldpop.org

Interactive Q&A

Thank you!

Survey: tinyurl.com/wp-survey0925



worldpop.carrrd.co

