Use of active and passive VGI data for population distribution modelling: experience from the WorldPop project

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Role of Volunteered Geographic Information in Advancing Science: Effective Utilization

world pop

www.worldpop.org.uk

Open access archive of spatial demographic datasets

Current focus: Central and South America, Africa and Asia

Transparent and shareable methods

Support development and health applications

world pop

High resolution, contemporary data on human population distributions are a prerequisite for the accurate measurement of the impacts of population growth, for monitoring changes and for planning interventions. The WorldPop project aims to meet these needs through the provision of detailed and open access population distribution datasets built using transparent approaches.

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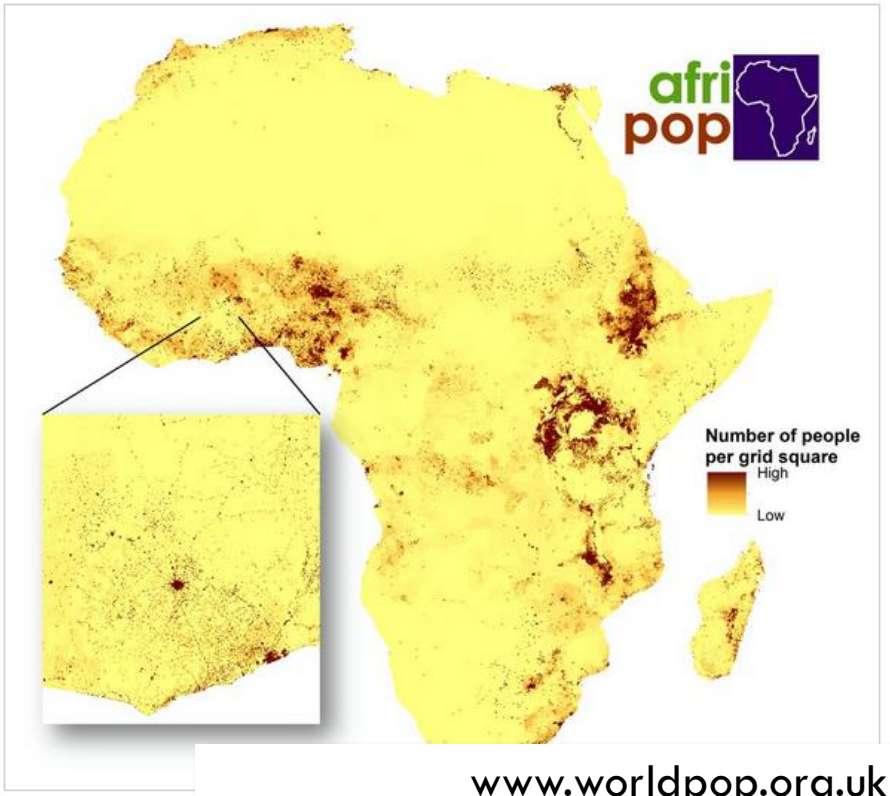
Home

The WorldPop project was initiated in October 2013 to combine the AfriPop, AsiaPop and AmeriPop population mapping projects. It aims to provide an open access archive of spatial demographic datasets for Central and South America, Africa and Asia to support development and health applications. The methods used are designed with full open access and operational application in mind, using transparent, fully documented and shareable methods to produce easily updatable maps with accompanying metadata.

Latest Map



News

Mobility mapping...

WorldPop data used in new Nature Scientific Reports human mobility study:

http://www.nature.com/srep

Coming soon.....

Coming soon are a full range of Central and South Americas datasets, births and pregnancies distribu

WorldPop launch...

The WorldPop website is now live, serving new open datasets on births, pregnancies, urban growth and

Tweets Follow @WorldPopProject

world pop WorldPopProject 23 Oct
@WorldPopProject
WorldPopProject webpage being launched soon....!

www.worldpop.org.uk

Intro to gridded population data

Census data linked to GIS administrative boundaries

↓

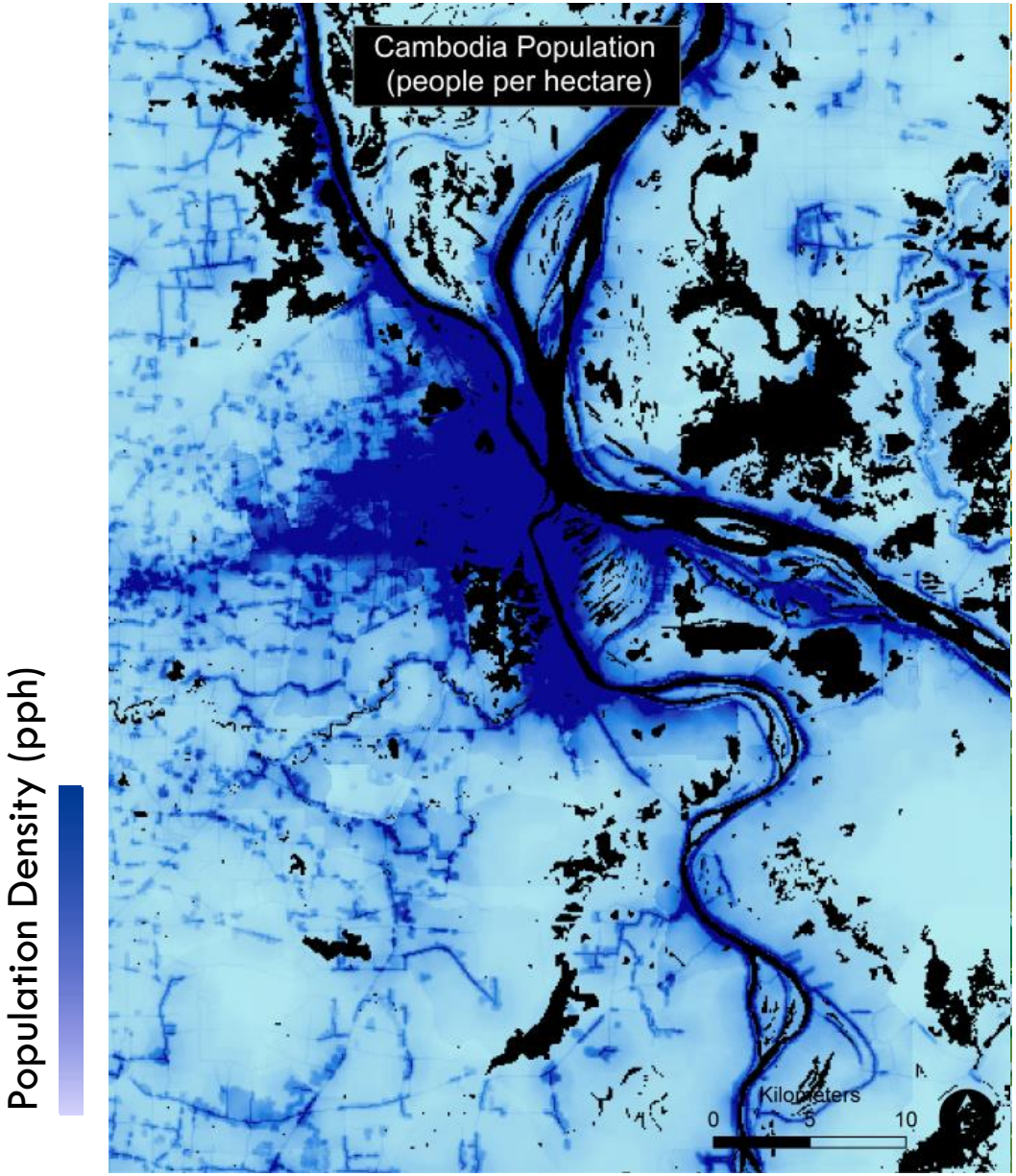
Ancillary data e.g. Settlements, roads

↓

Spatial modelling rules to disaggregate census counts

↓

Estimates of number of people in each grid cell



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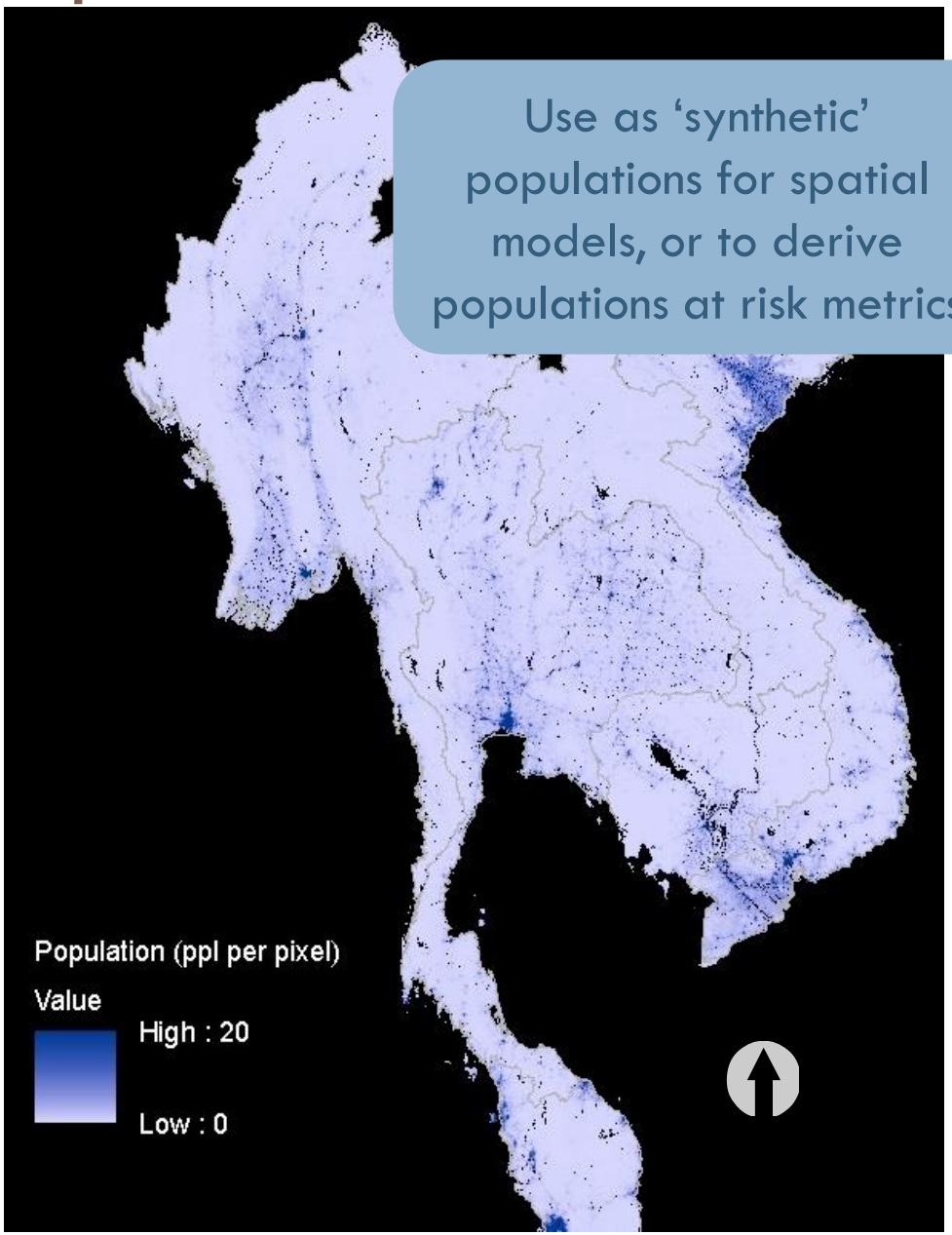
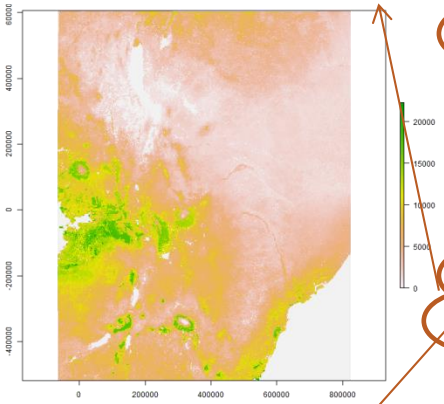
Population Density (pph)



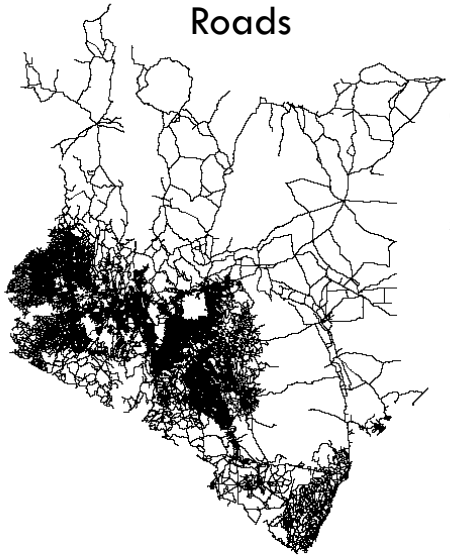
Use as 'synthetic' populations for spatial models, or to derive populations at risk metrics

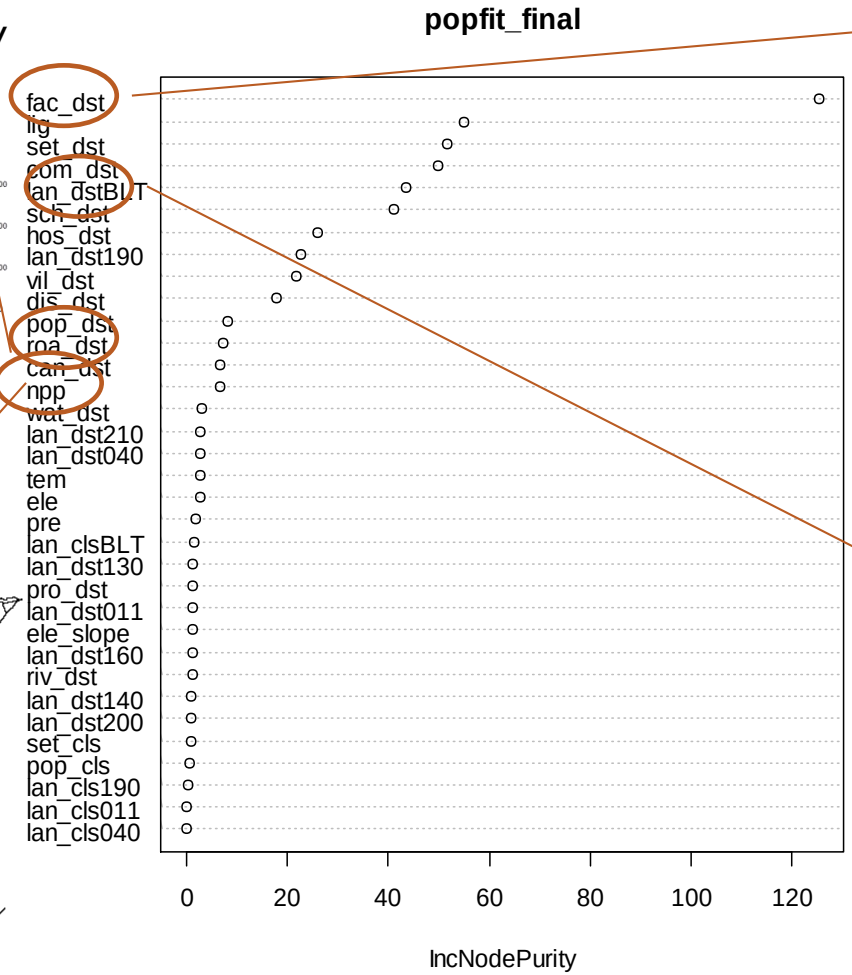
Flexible ‘random forest’ method

Net primary productivity

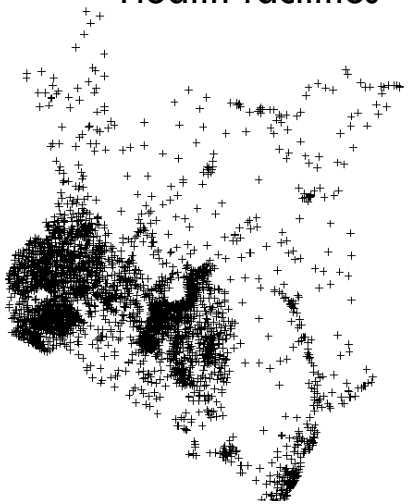


Roads

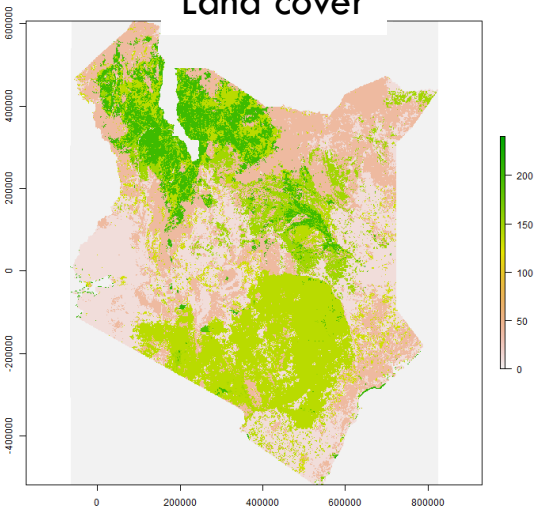




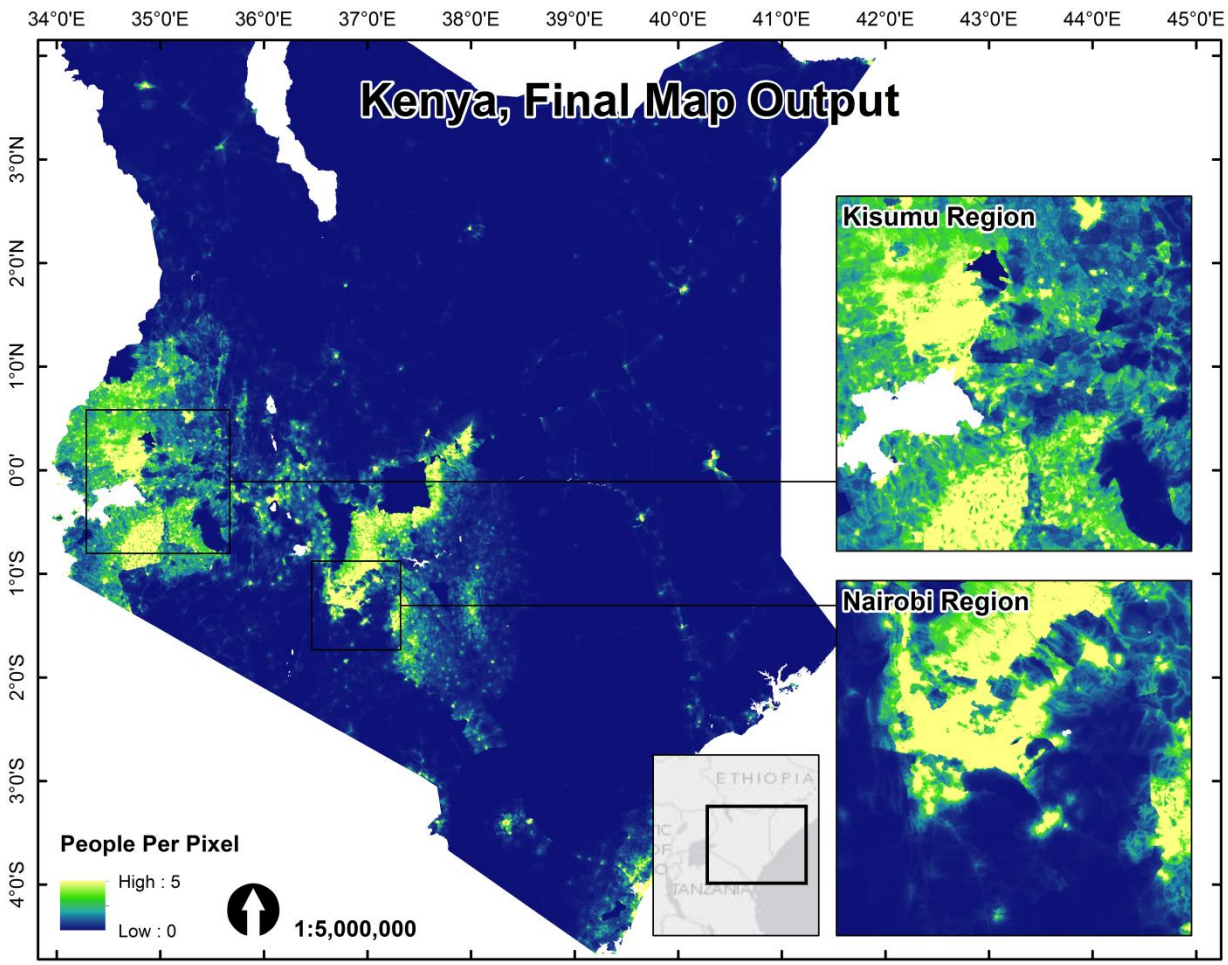
Health facilities



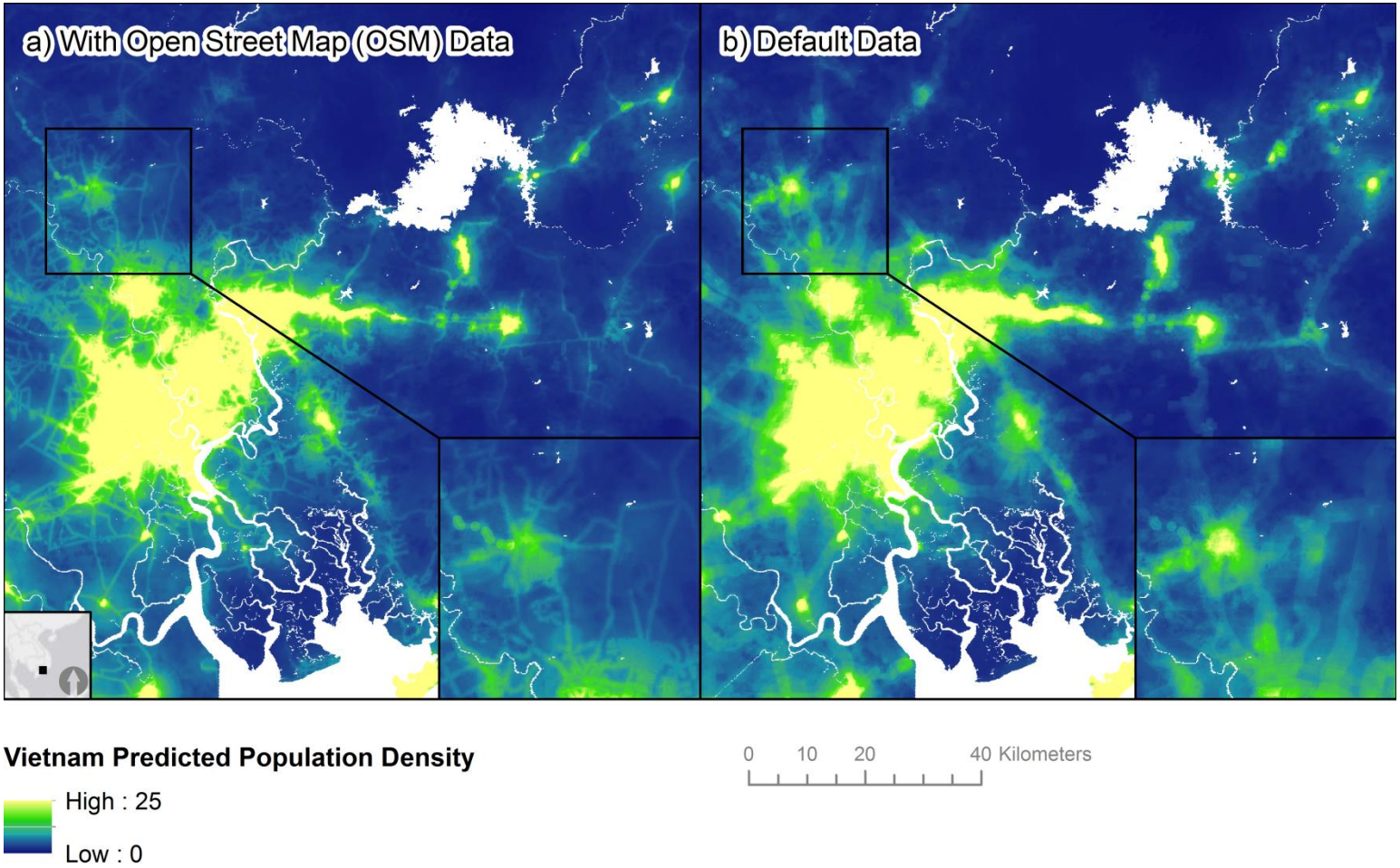
Land cover



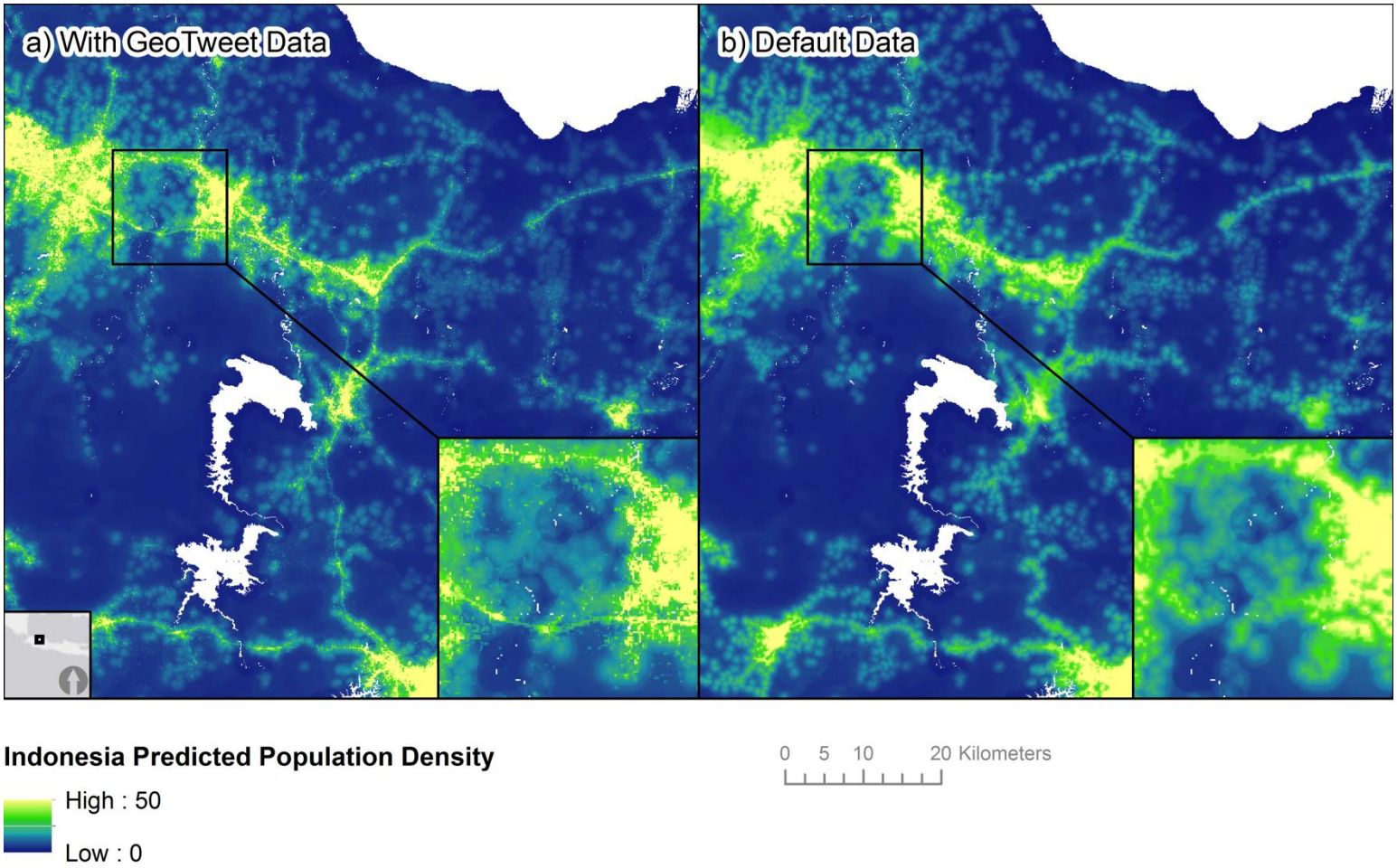
Predicted population distribution in Kenya



Active VGI: OpenStreetMap



Passive VGI: Twitter



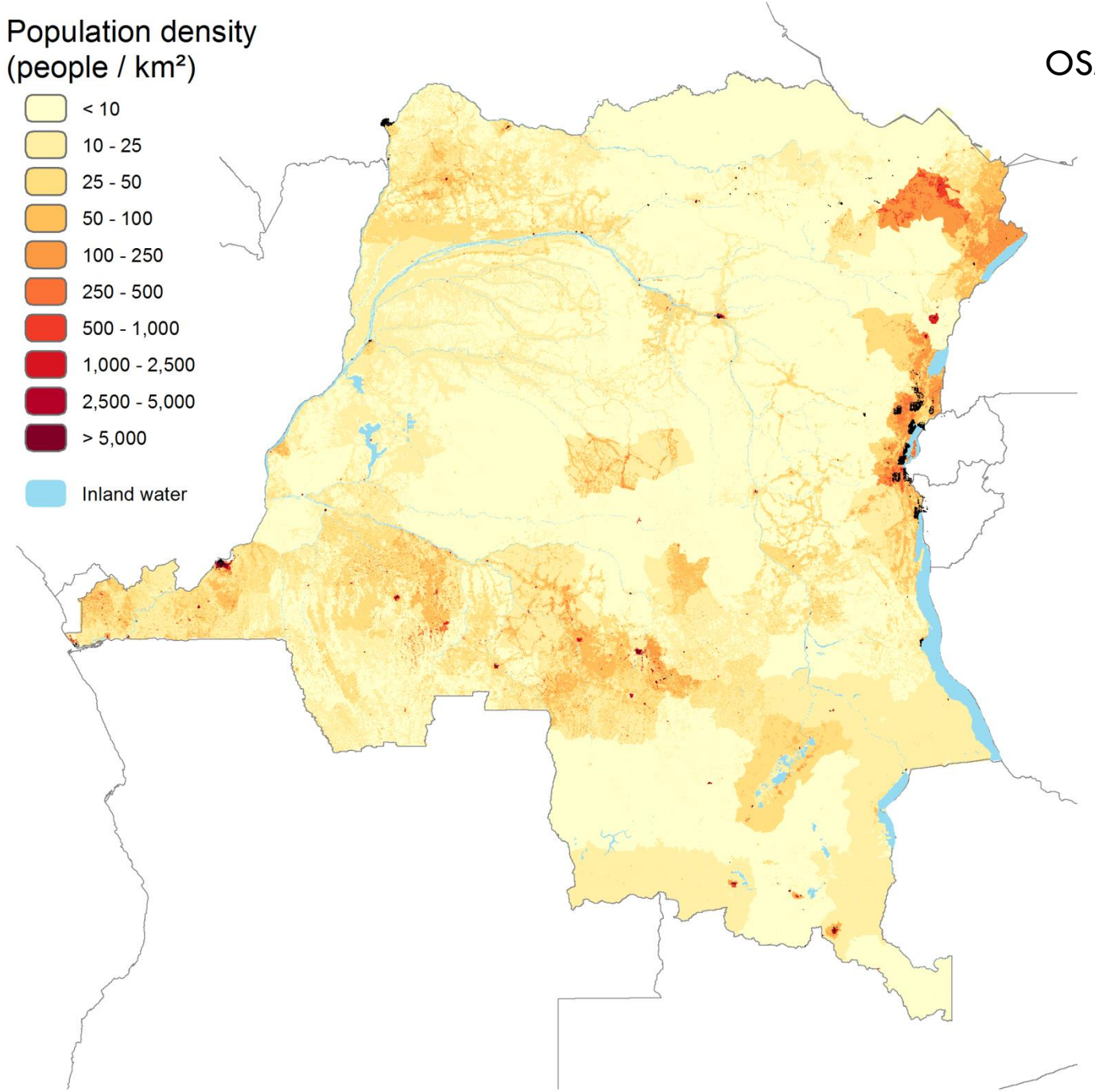
Q1. How is the spatial component, such as scale and accuracy, of VGI being handled in scientific or operational applications?

- As any other spatial dataset:
  - Applications must be adapted to the scale of data
  - Accuracy must be evaluated

- Specificity of VGI data:
  - Heterogeneous level of spatial detail and accuracy

Q2. How are the limitations of VGI being dealt with in an applied spatial modeling environment?

- Active VGI
  - Data of obvious insufficient quality/uniformity are removed



OSM: buildings

Q2. How are the limitations of VGI being dealt with in an applied spatial modeling environment?

- Active VGI
  - Data of obvious insufficient quality/uniformity are removed
  - The performance of covariates to predict the spatial distribution of human populations is evaluated in the modelling process

Q2. How are the limitations of VGI being dealt with in an applied spatial modeling environment?

- Passive VGI (GeoTweets)
  - Privacy, confidentiality
    - Use of aggregated data
  - Biases
    - More detailed analyses and data calibration needed

Q3. What would be one specific aspect that you consider missing or under-represented in the current 'VGI landscape'?

- Better inform on temporal changes :
  - include year/date of data encoding?
- A way to evaluate the representativeness:
  - A map of contributors' distribution?

Q4. Does VGI have a potential to impact governance?

- YES
  - Integration of data provides richer decision-making resources
  - Especially:
    - In developing countries where information can be incomplete or unreliable
    - At the local level
    - Collaborative governance
- But…
  - Control needed
  - Integration of authoritative and VGI data