SpELL

- Large-scale human pop. in Africa
- Urban extent modelling
- Spread models
- Spatial epidemiology (animal diseases)

ANAGEO

- VHRRS & OBIA applied in Africa
- Urban morphology and dynamics in Africa
- Geographical understanding of urban dynamics

MAUPP

SIC

- RS signal processing
- Integration from different sensors
- Large data volume processing

WorldPop

- Human population distribution, demography and mobility
- Spatial epidemiology (human diseases)

Modelling and forecasting African Urban Population Patterns for vulnerability and health assessments (MAUPP)

The Consortium

- Spatial Epidemiology Lab (SpELL), Université Libre de Bruxelles, Belgium (coordination)
- Analyse Géospatiale (ANAGEO), Institute for Environmental Management and Land-Use Planning, Université Libre de Bruxelles, Belgium
- Signal and Image Centre (SIC), Royal Military Academy (RMA), Belgium
- WorldPop, Department of Geography and Environment, University of Southampton, UK

Contact

Spatial Epidemiology Lab (SpELL)
Université Libre de Bruxelles
Professor Catherine Linard
Phone: +32 2 650 56 18
E-mail: linard.catherine@gmail.com

maupp.ulb.ac.be

Modelling and forecasting African Urban Population Patterns for vulnerability and health assessments (MAUPP)

Background

The population of Africa is predicted to double over the next 40 years. Much of this anticipated population growth is expected to be concentrated in urban areas. However, the accuracy of existing population distribution datasets is very low within African urban areas and urban sprawl is currently not taken into account in projections.

Objectives

Improve our spatial understanding and forecast of urbanization and urban population distribution in Africa through the use of remote sensing and spatial modelling. More specifically, the project aims to

- Predict urban expansion at moderate spatial resolution
- Understand and better predict intra-urban variations in human population density
- Integrate results into human population distribution models & forecasts

Methods

We use space-borne remote sensing data (optical, near infrared and microwave) at two spatial scales.

- At the continental scale, we develop a generalizable method based on statistical models to map the urban extension and the intra-urban densities of a set of ± 50 cities.
- At the city scale, we develop a semi-automated method to map urban land covers and land uses to inform spatially-detailed population distribution models.
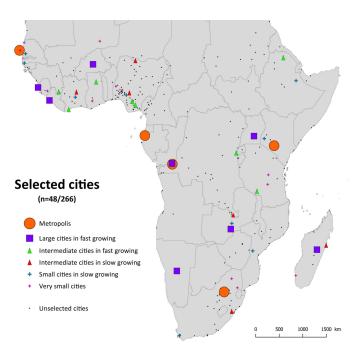- We compare results obtained at both spatial scales.

Outputs

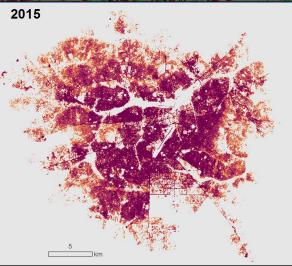**For the set of 50 sub-Saharian African cities:**

- Built-up density maps from 1985 to 2030
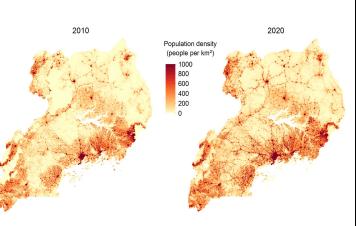- Intra-urban population distribution datasets

For 3 cities (Ouagadougou, Dakar and Saint-Louis):

- Very high resolution land cover maps
- Land use maps at street blocs level
- Detailed intra-urban population distribution datasets

Selected cities

(n=48/266)

- 🔴 Metropolis
- 🟪 Large cities in fast growing
- 🔺 Intermediate cities in fast growing
- 🔺 Intermediate cities in slow growing
- ✚ Small cities in slow growing
- ✚ Very small cities
- · Unselected cities

0   500   1000   1500 km

2015

Built-up probability
- < 0,5
- 0,5 - 0,6
- 0,6 - 0,7
- 0,7 - 0,8
- 0,8 - 0,9
- > 0,90

5 km

2010   2020

Population density
(people per km²)
- 1000
- 800
- 600
- 400
- 200
- 0