Characterization of urban water use and water demand forecasting using the Integrated Urban Water Model in Sao Paulo, Brazil

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Introduction

- Water resources under pressure in urban areas
- Urban sprawl in developing countries:
  → Unplanned growth
  → Scarce infrastructure investments
- Sao Paulo, Brazil:
  → Over 12 million people
  → Total area of 1521 km^2
  → 5 macro regions; 96 districts
  → Drought from 2013 to 2016
  → First city outside of US in IUWM

Objectives

- Understand changes in water use
- Estimate impact of conservation strategies during this period and in the future
- Predict future demand considering climate change and population growth
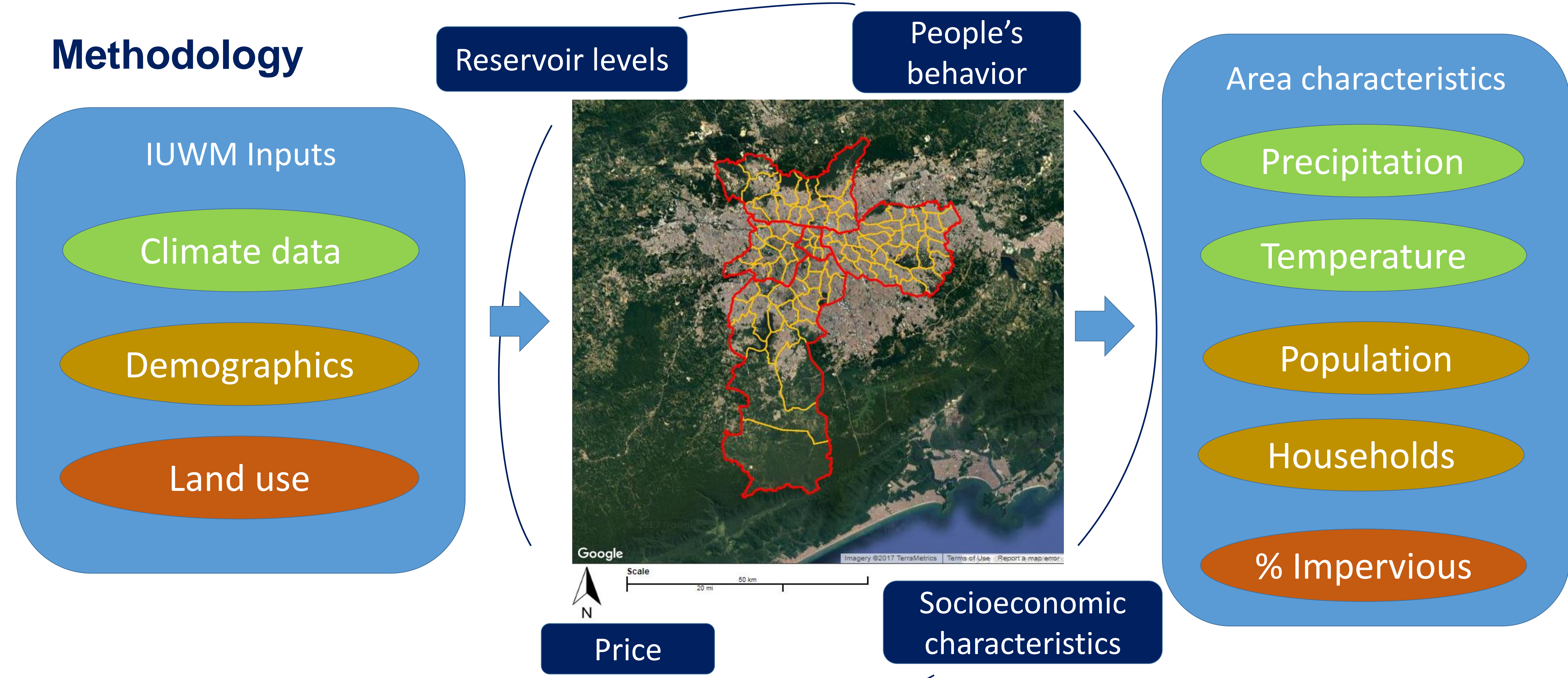
Final considerations

- IUWM: asset for water resources management in urban areas
- Sao Paulo:
  - Large urban agglomeration
  - Climatic and behavioral differences
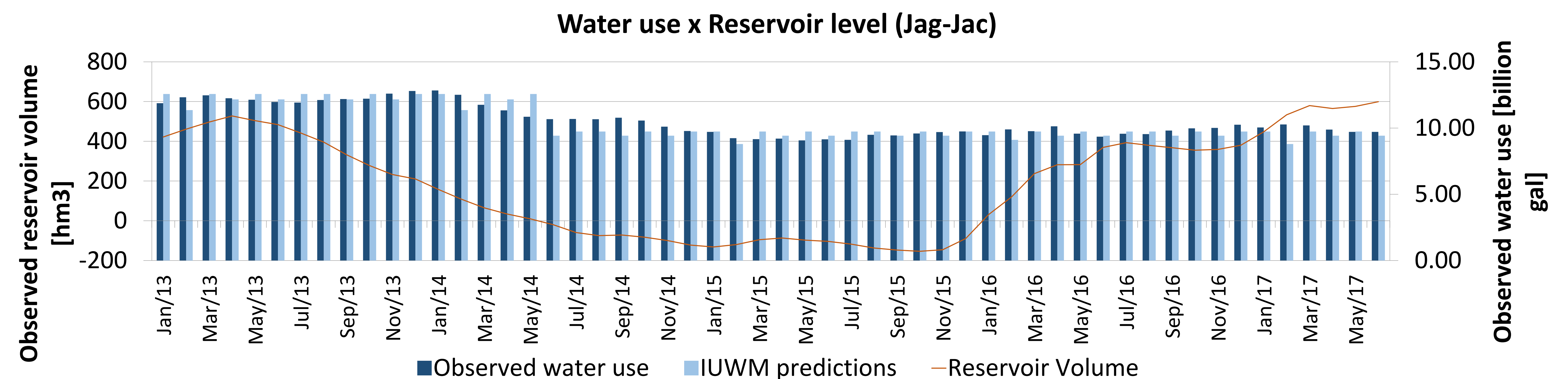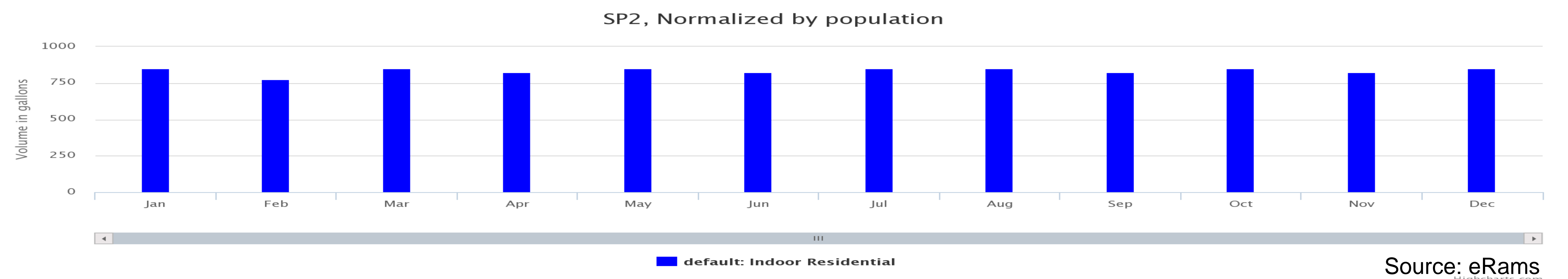 - Water supply challenge

References

eRams. www.erams.com/iuwm; IBGE Cidades. https://cidades.ibge.gov.br/;
National Water Agency. http://sar.ana.gov.br/;
Sharvelle et al. *A geospatially-enabled web tool for urban water demand forecasting and assessment of alternative urban water management strategies*. Environmental Modelling and Software, 2017

Methodology

Reservoir levels

People's behavior

IUWM Inputs

- Climate data
- Demographics
- Land use

Price

Area characteristics

- Precipitation
- Temperature
- Population
- Households
- % Impervious

Socioeconomic characteristics

Expected Results

SP2, Normalized by population
default: Indoor Residential
Source: eRams

Water use x Reservoir level (Jag-Jac)
Observed water use   IUWM predictions   Reservoir Volume

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