HYDROPOWER DAMS AND URBANIZATION IN THE BRAZILIAN AMAZON — A REGIONAL ANALYSIS

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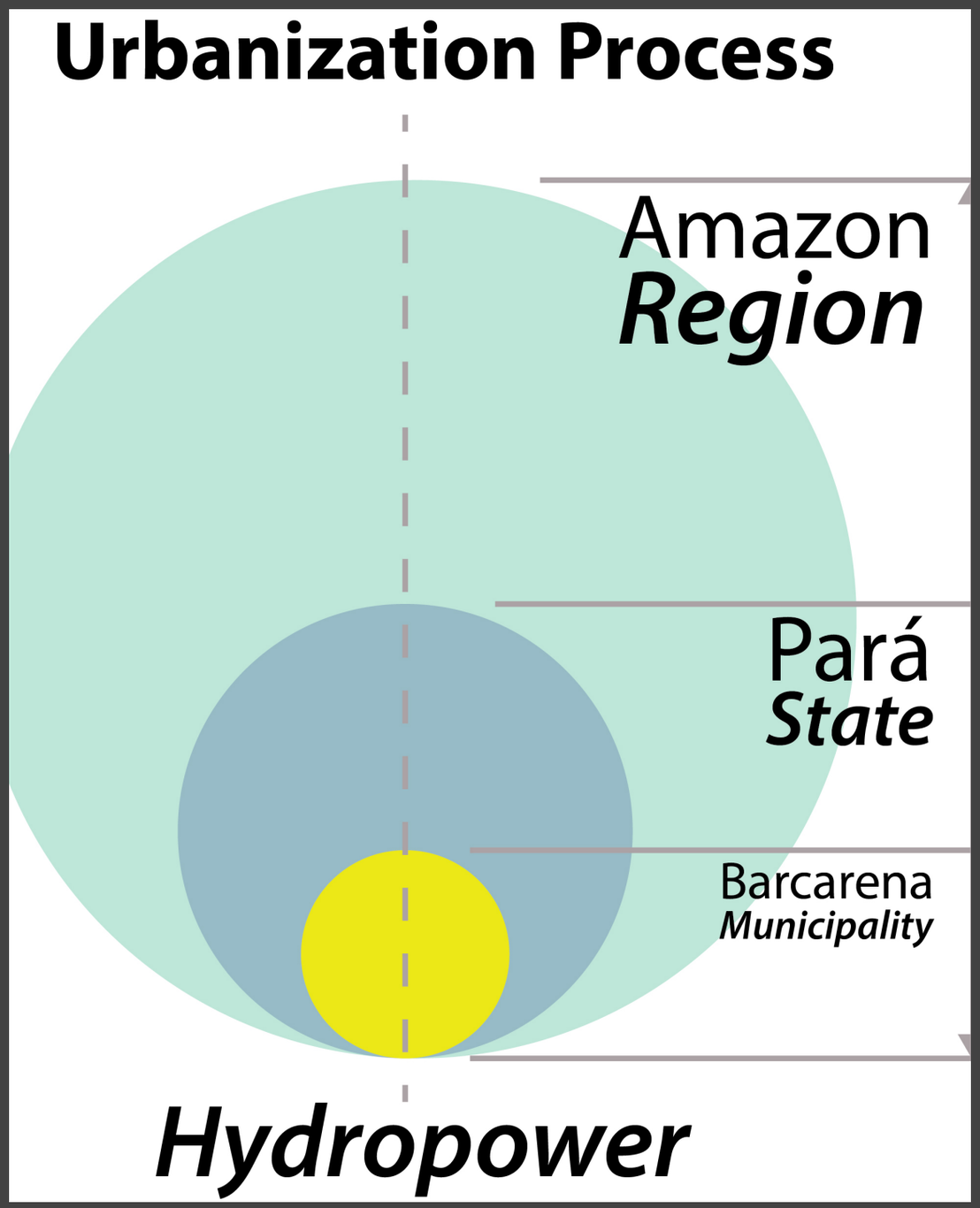
THE URBAN FOREST

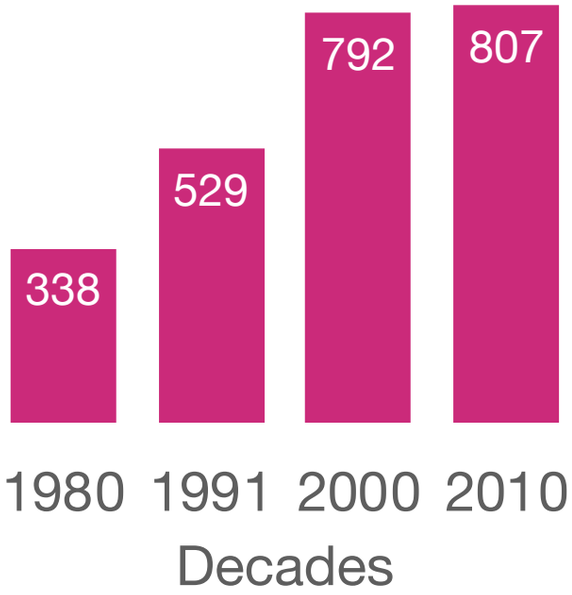
HYDROPOWER AND URBANIZATION

BROADEN THE UNDERSTANDING OF HYDROPOWER IMPACT

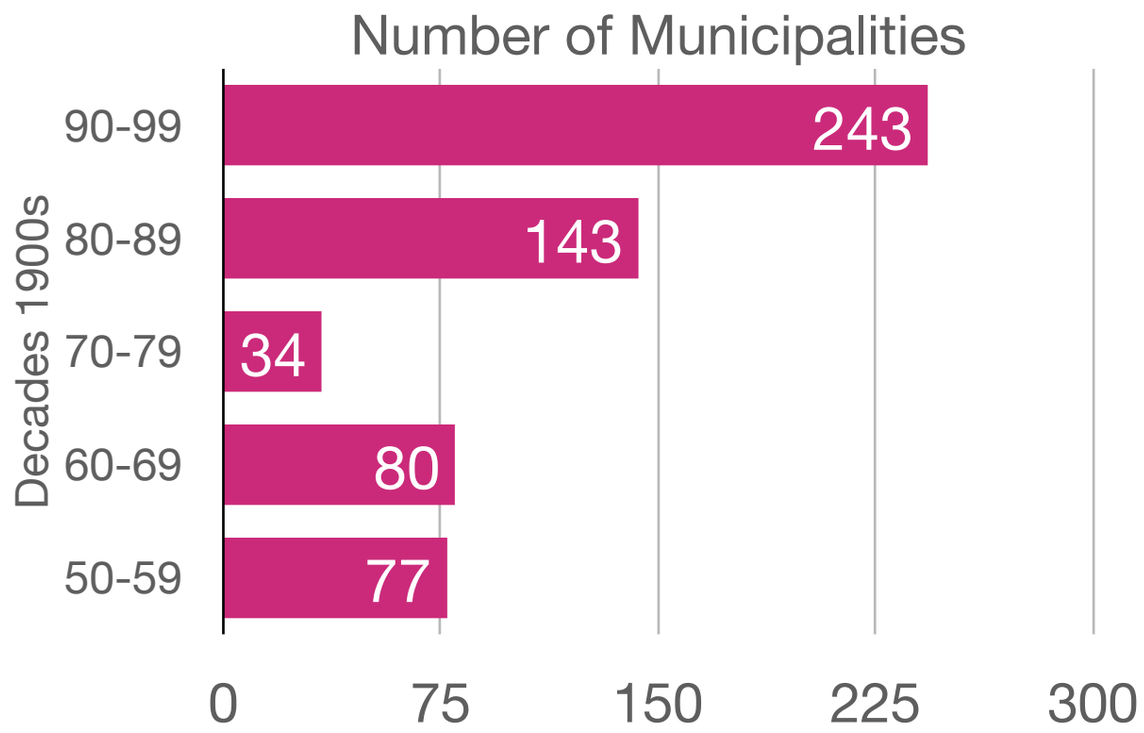
HYDROPOWER AND URBANIZATION UNDER THREE SCALES



Total Municipalities in Brazilian Amazon per Decade



New Municipalities Created in the Brazilian Amazon

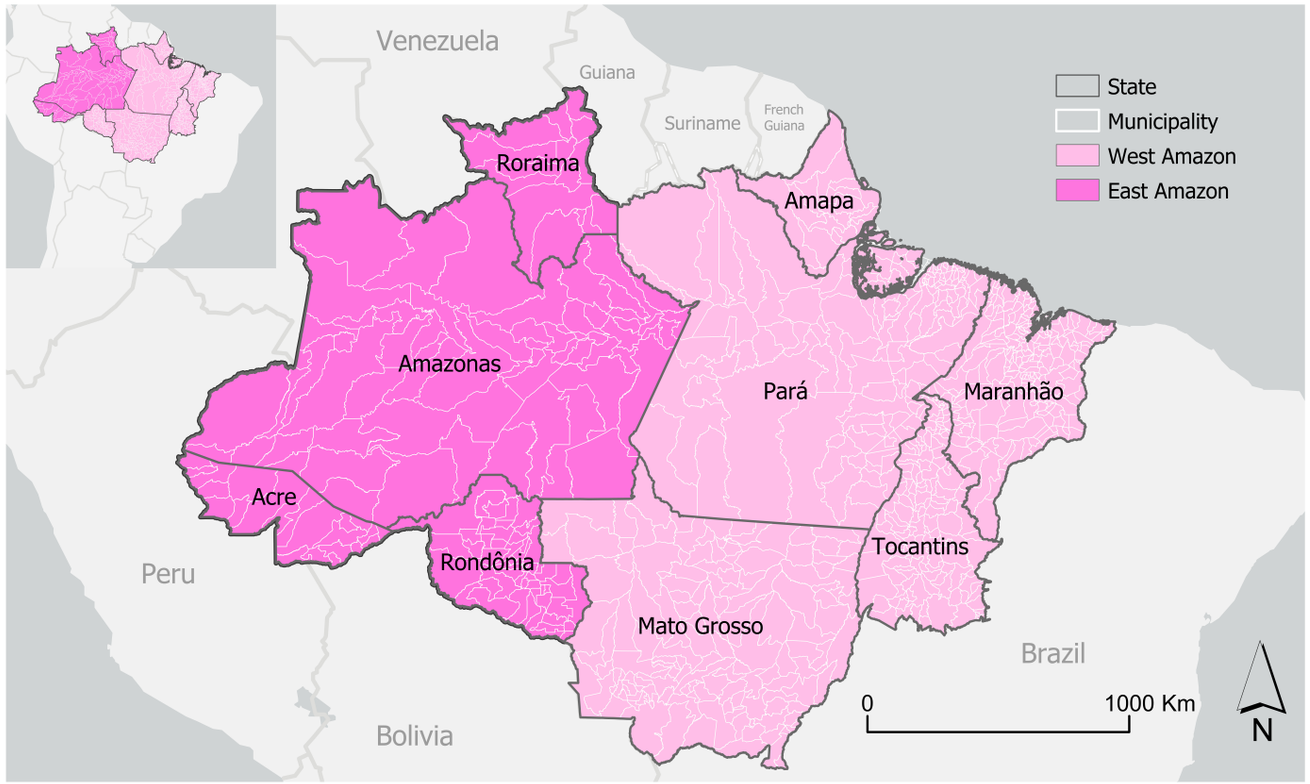


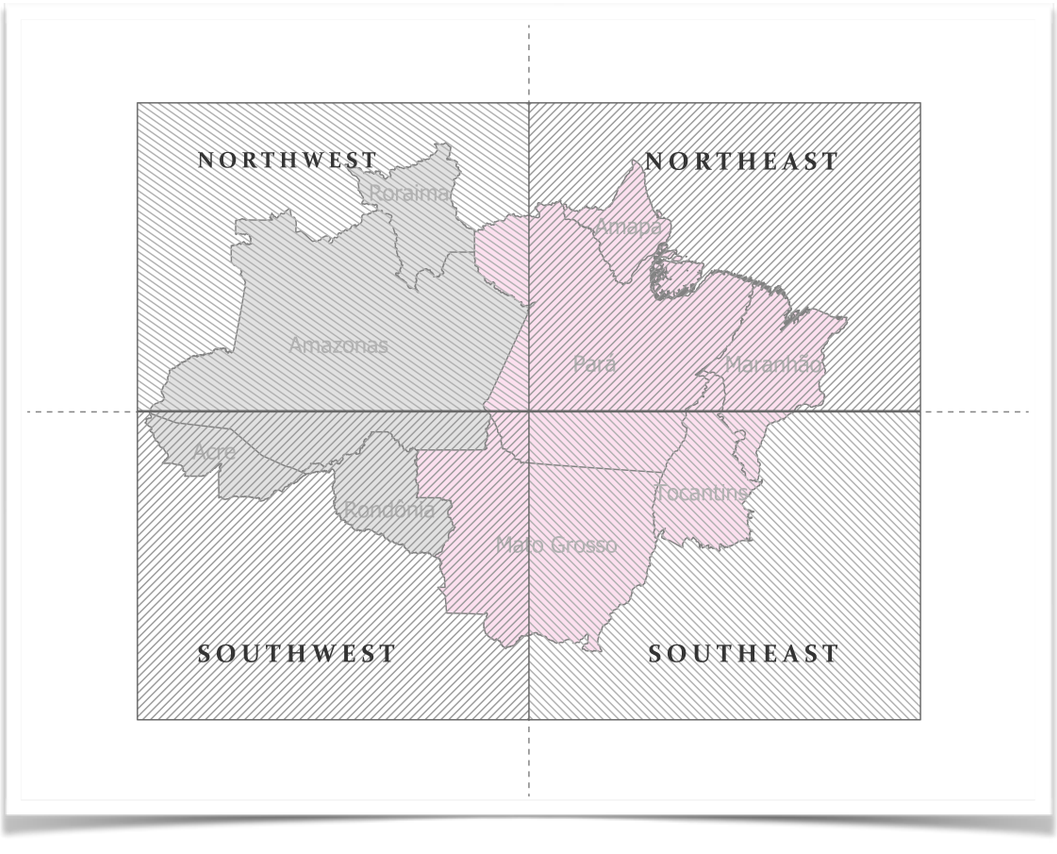
Other matters in the Amazon

No environment without other processes

REGIONAL SCALE

ALL MUNICIPALITIES IN THE AMAZON


Venezuela
Guiana
Suriname
French Guiana
Peru
Bolivia
Brazil
State
Municipality
West Amazon
East Amazon
Roraima
Amapa
Amazonas
Pará
Maranhão
Acre
Rondônia
Tocantins
Mato Grosso
0
1000 Km
N


NORTHWEST
NORTHEAST
SOUTHWEST
SOUTHEAST
Roraima
Amapa
Amazonas
Pará
Maranhão
Acre
Rondônia
Tocantins
Mato Grosso

9/59
-5.5%

39/263
8%

79/148
3.5%

113/285
6%

Hydropower Impact on Urbanization

Change in Urban Population by Quadrant

- Northwest -5.5 %
- Southeast 3.5 %
- Southwest 6 %
- Northeast 8 %
- No data
- Transmission Line
- Hydropower Plant
- State

N

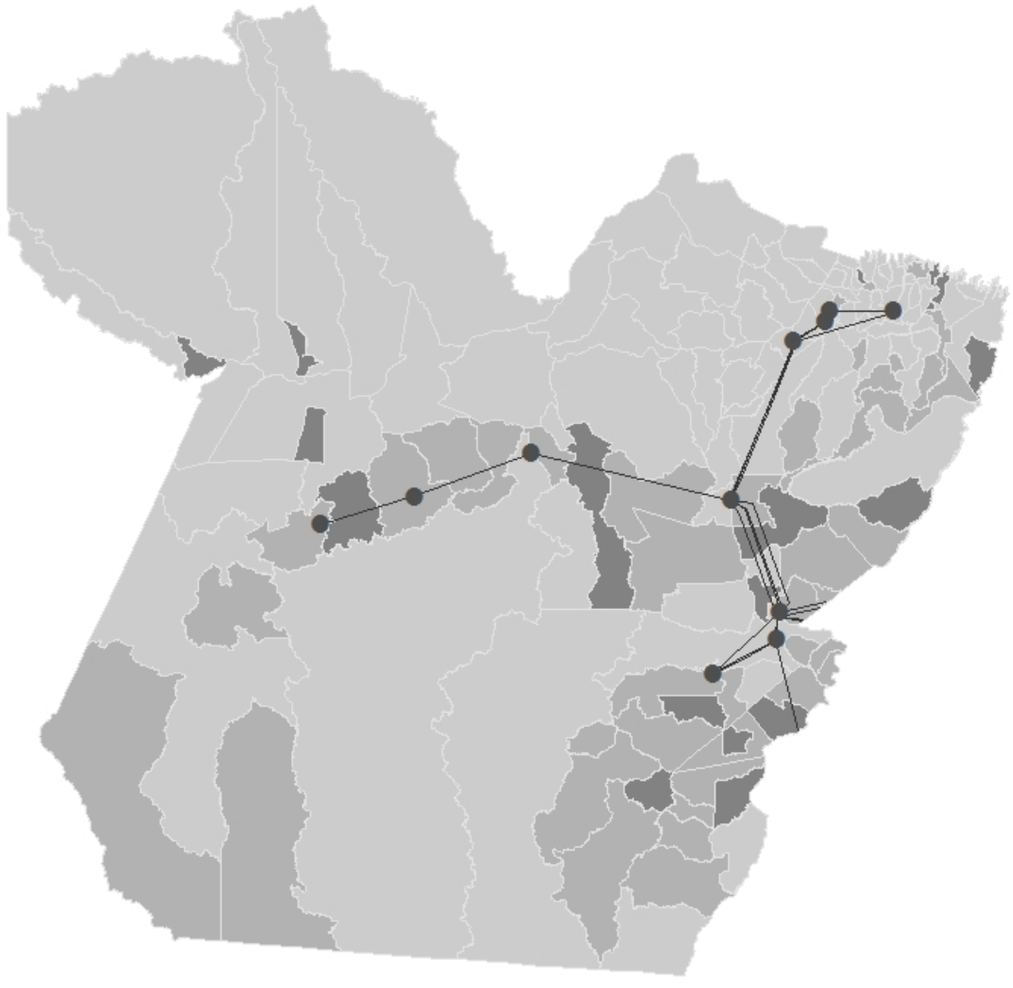
0 500 Km

STATE SCALE

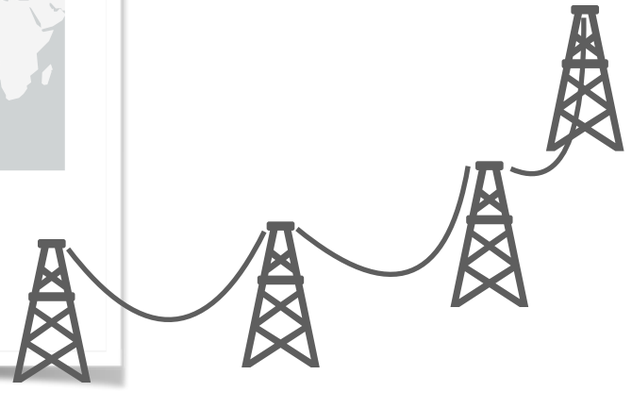
ALL MUNICIPALITIES IN A SINGLE STATE

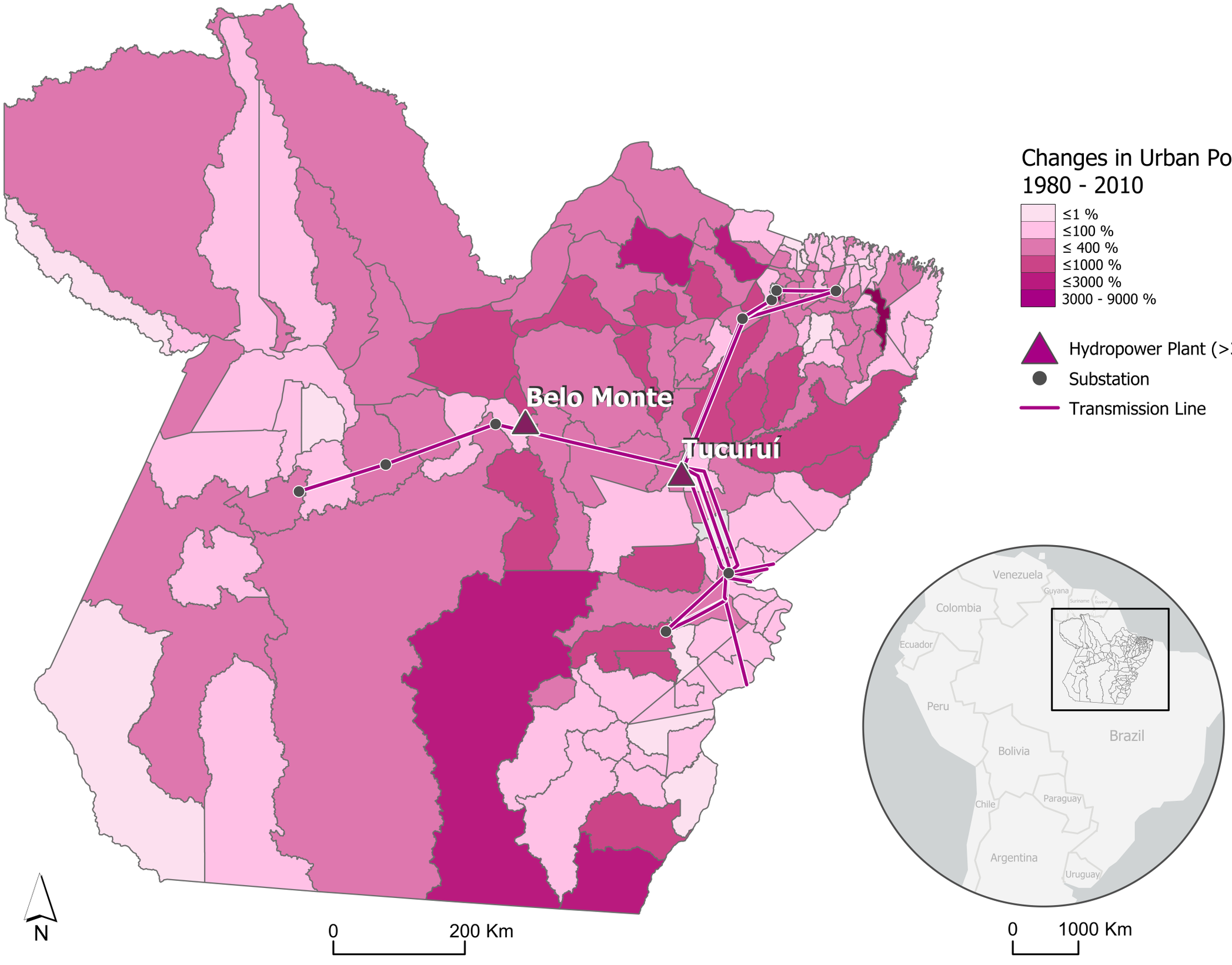
Robust hydropower system + Urbanization

1980 - Tucuruí Dam + over 60 new municipalities








Belo Monte
Tucuruí
Changes in Urban Population
1980 - 2010
≤1 %
≤100 %
≤ 400 %
≤1000 %
≤3000 %
3000 - 9000 %
Hydropower Plant (>30MW)
Substation
Transmission Line
N
0
200 Km
Venezuela
Guyana
Suriname
French Guyana
Colombia
Ecuador
Peru
Brazil
Bolivia
Chile
Paraguay
Argentina
Uruguay
0
1000 Km

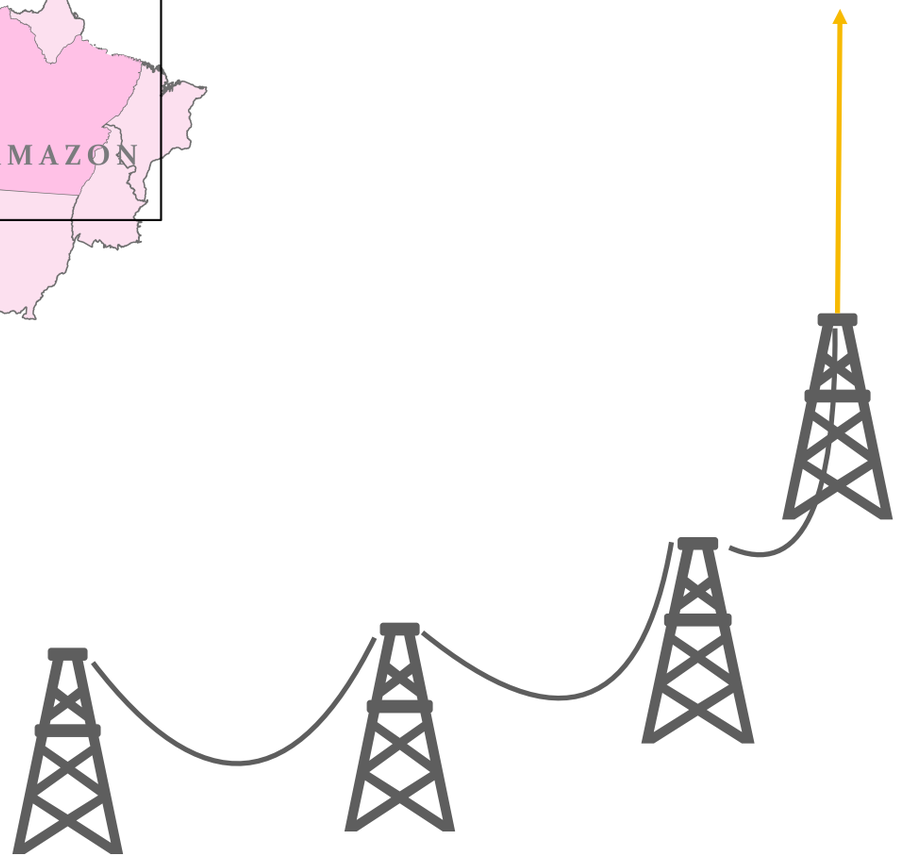
MUNICIPAL SCALE

SINGLE MUNICIPALITY CONNECTED DIRECTLY AND INDIRECTLY TO THE HYDROPOWER SYSTEM

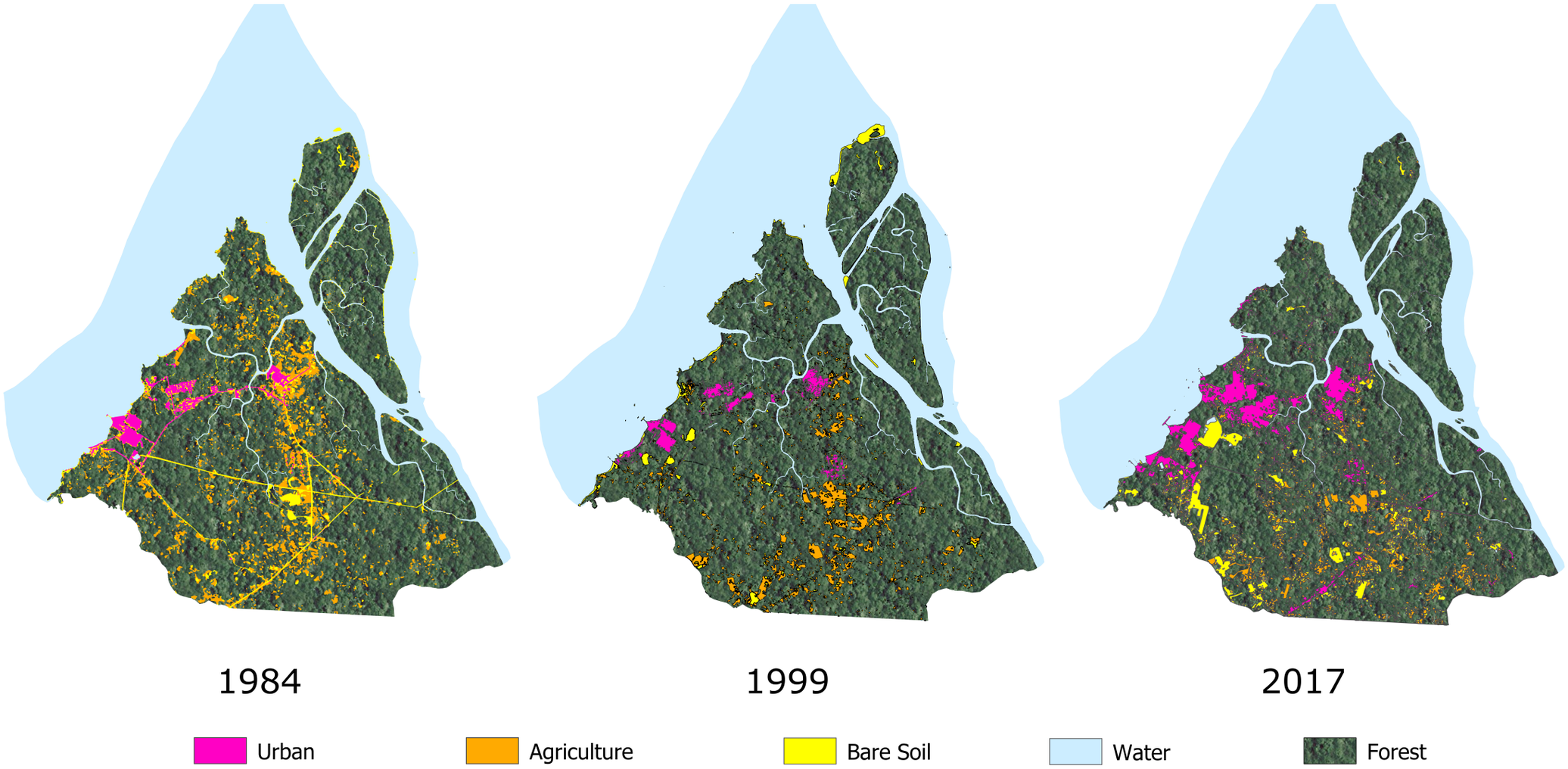








0 12 Km



Land Cover Change

CONCLUDING REMARKS

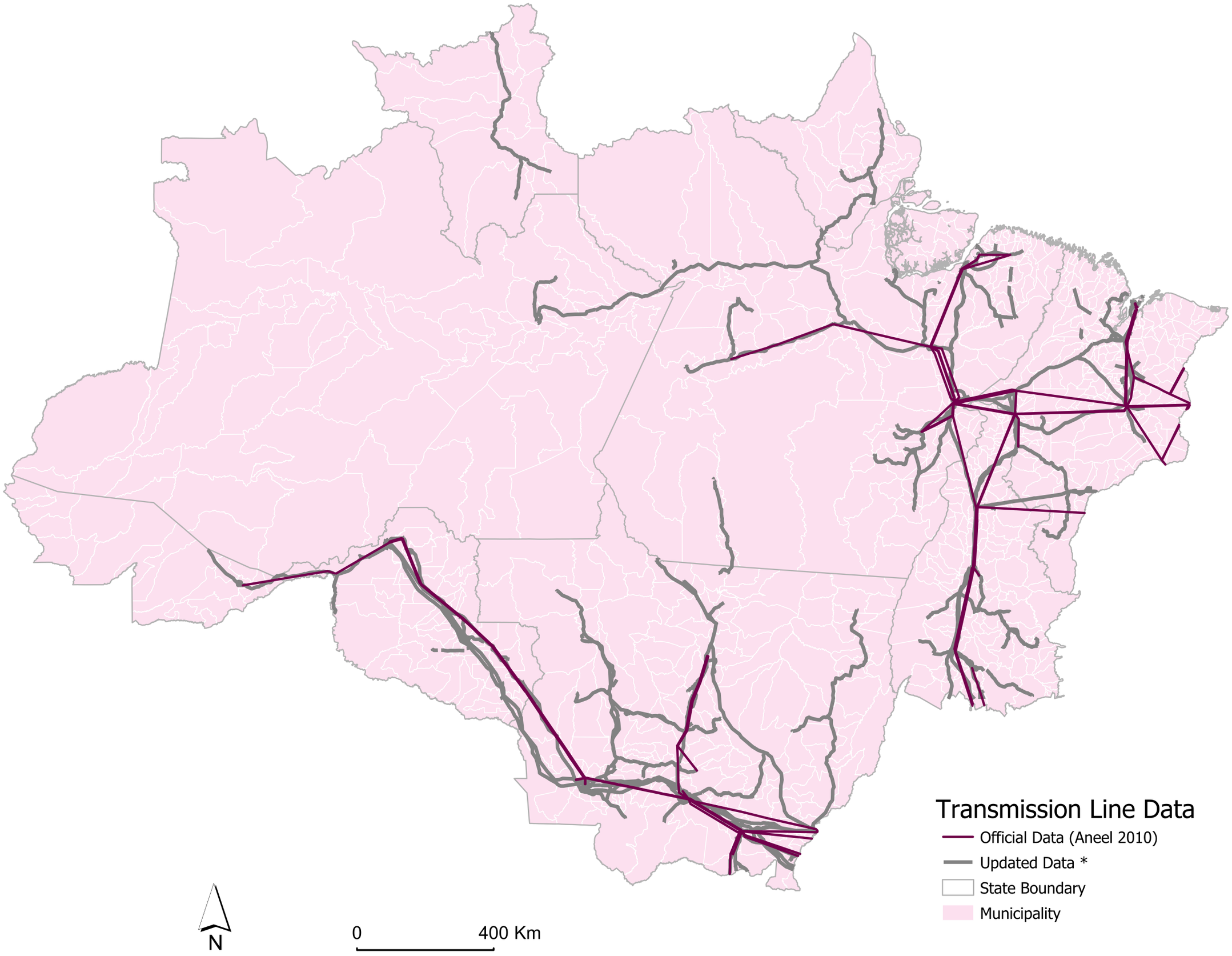


CONNECTION TO HYDROPOWER - URBANIZATION

IMPACT DESPITE PHYSICAL CONNECTION

IMPACT IN ALL THREE SCALES

URBAN PROFILE - FOREST PROFILE



*Hyde, J. L., Bohlman, S. A., & Valle, D. (2018). Transmission lines are an under-acknowledged conservation threat to the Brazilian Amazon. Biological conservation, 228, 343-356.



LESSONS LEARNED

Heterogenous, different scales

Connection hydropower - urbanization

Impact of hydropower on urbanization in all three scales

Hydropower - one driver

Urban profile - Forest component