AQUECIMENTO CLIMÁTICO MULTICAUSAL EM ESCALAS RURAL E URBANA NO SUDESTE DO BRASIL

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H. D. Thoreau
1817-1862

R. W. Emerson
1803-1892

Causas de aquecimento climático local e regional

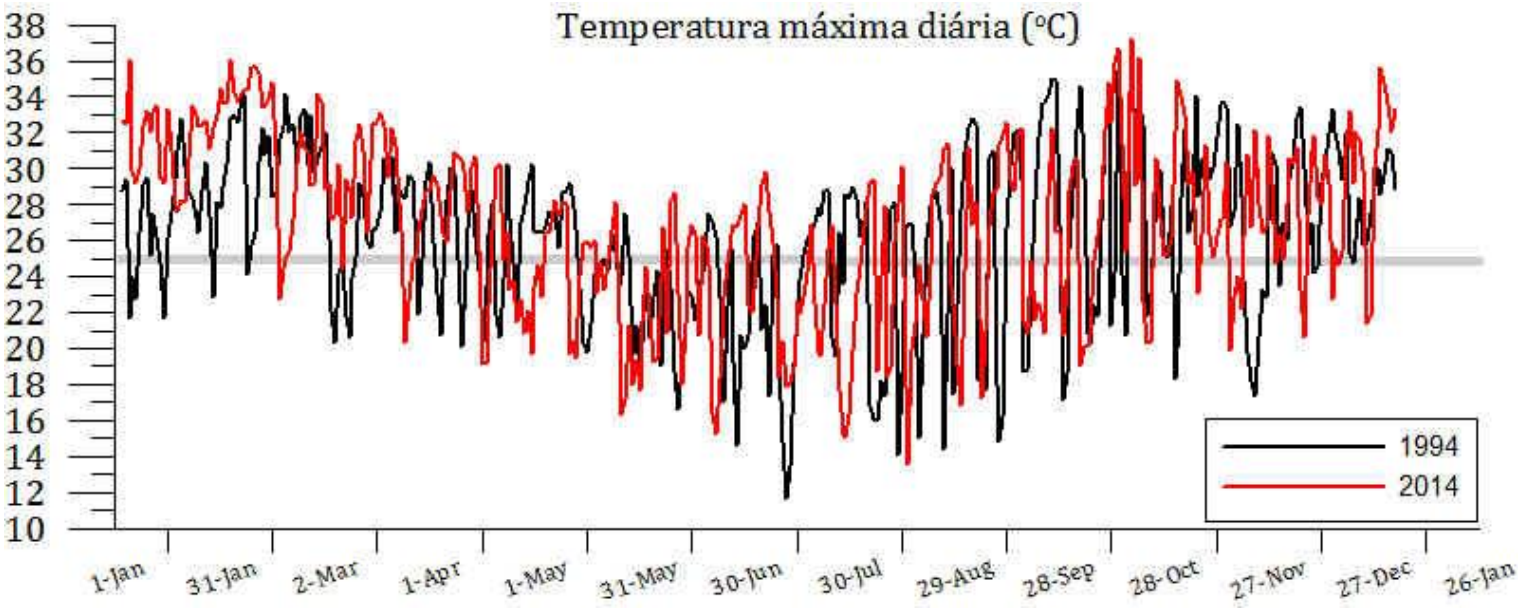
1. **Variabilidade natural**
2. **Desflorestamento**
3. **Urbanização**
4. **Efeito estufa**
5. **Incerteza de medição**

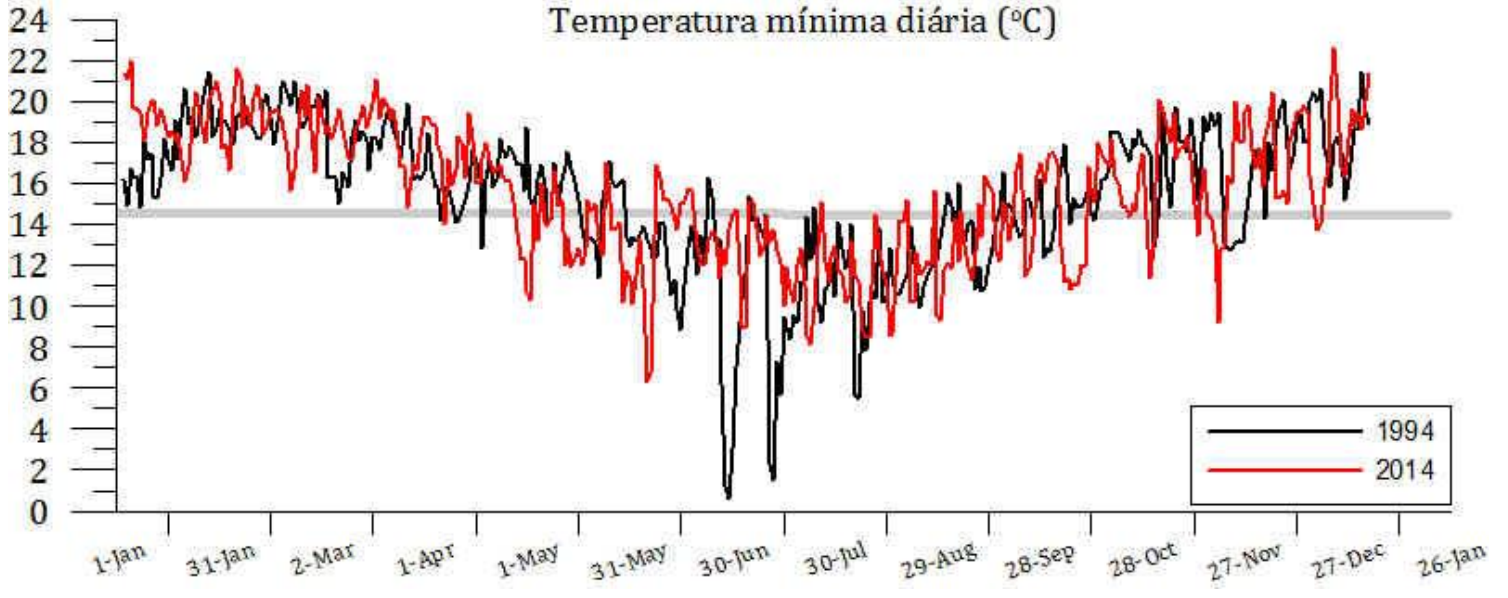
Variabilidade natural
Um ano frio e um ano quente em São Paulo, SP

Temp Média anual

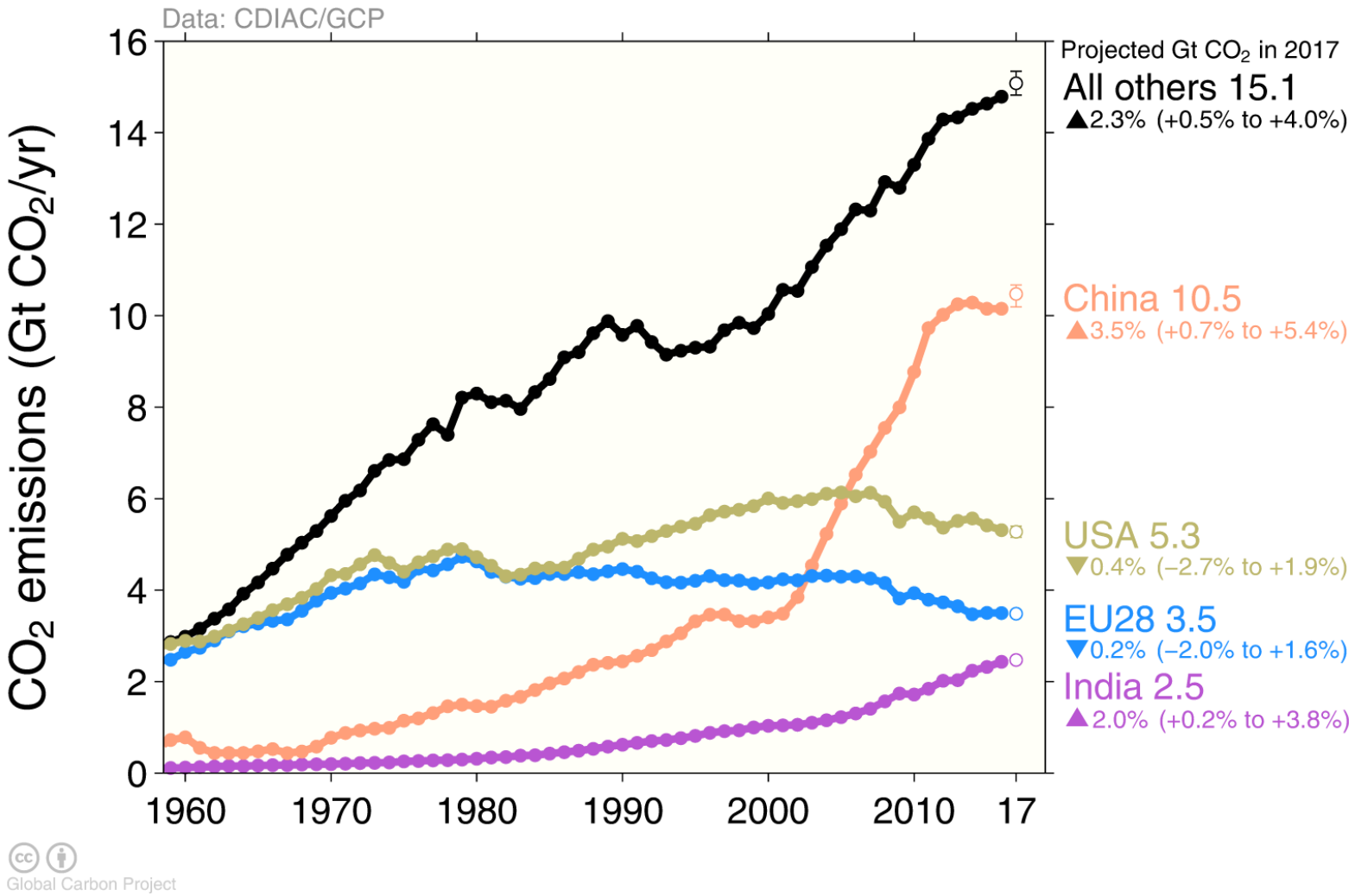
ano frio
1994 : 19,7 °C

ano quente
2014 : 20,1 °C





Emissões anuais de CO2 por país



Source: CDIAC; Jackson et al 2017; Le Quéré et al 2017; Global Carbon Budget 2017

Aquecimento histórico na região Sudeste

Geophysical Research Letters

RESEARCH LETTER
10.1029/2019GL083003

Attribution of Detected Temperature Trends in Southeast Brazil

Key Points:
- New detection and attribution method is used to attribute temperature trends for Southeast Brazil

R. C. de Abreu[1], S. F. B. Tett[2], A. Schurer[2], and H. R. Rocha[1]

[1]Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, São Paulo, Brazil, [2]School of Geosciences, University of Edinburgh, Edinburgh, UK

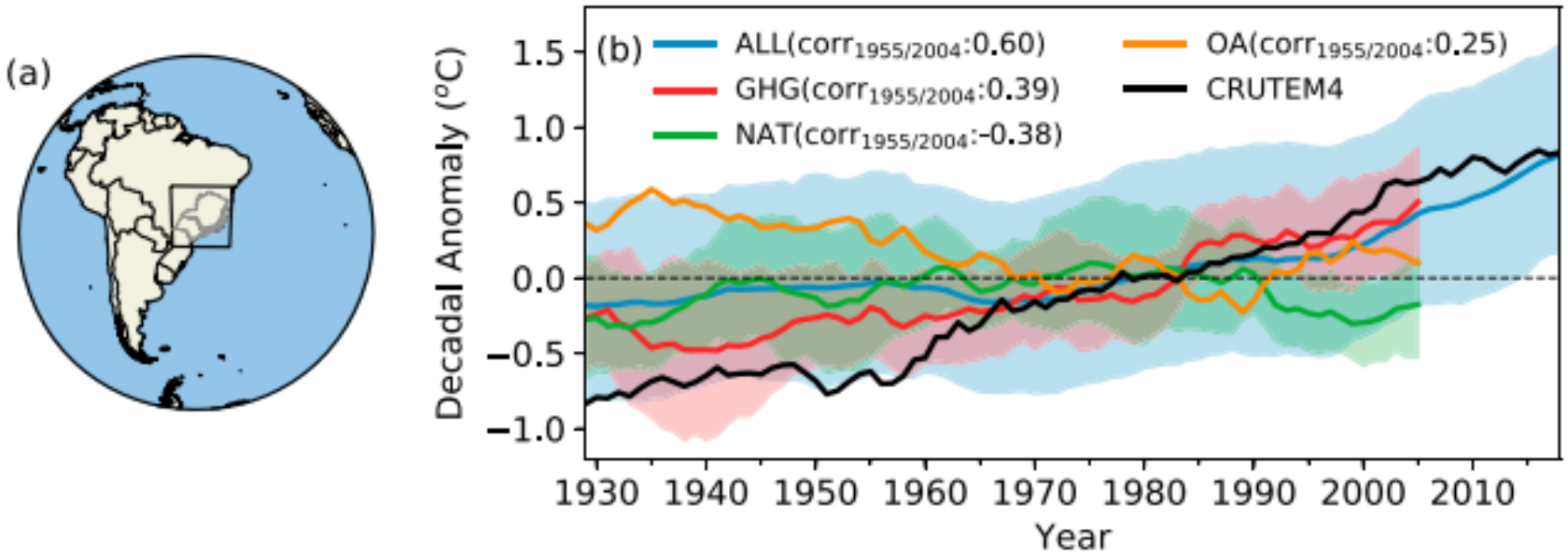


Figure 1. (a) Region of interest comprising all states in Southeast Brazil highlighted by the black box bounded by 53.4°W, 26.5°S and 39°W, 12.7°S. (b) The 10-year moving average of annual temperature anomalies, between 1920 and 2017 for CRUTEM4 (black line), ALL (blue line), GHG (red line), and NAT (green line) simulations. Other Anthropogenic (OA; orange line) is ALL minus GHG and NAT ensemble means. Shading indicates the model spread (5% to 95% range). Correlations between CRUTEM4 annual anomalies and 1955–2004 ensemble means are displayed in the labels. The anomalies are calculated with respect to 1961 to 1990 climatology.

Aquecimento histórico na região Sudeste

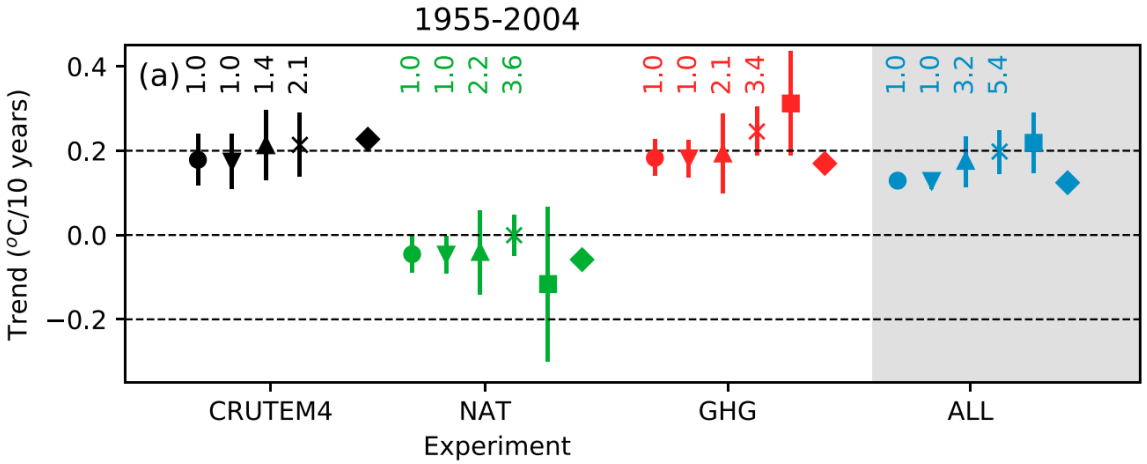
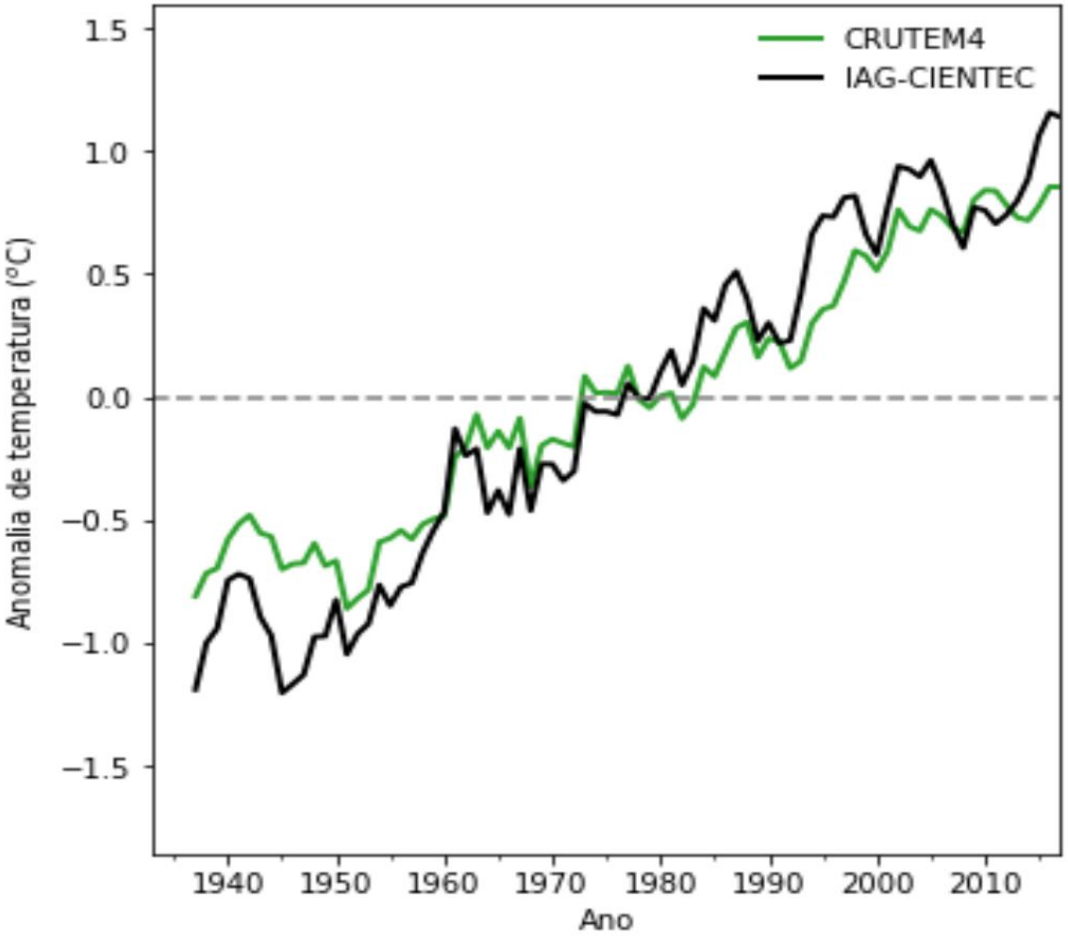


Figure 2. Temperature trends calculated from decadal averages for the observations (CRUTEM4) and each individual forcing (OA, NAT, and GHG) using R17 three signal models best estimates ($\hat{X}_i^*$ and $\hat{Y}^*$) for the different steps of analysis that include (1) internal variability only to estimate the covariance matrices (iv only, circle), (2) inclusion of observational error (iv + obs, triangle down), and (3) inclusion of observational error and model error (iv + obs + model, triangle up). The estimated trend using the multi model ensemble mean (MMM iv + obs + model, x symbol) and the CESM/CRUTEM4 raw data (diamond) are also included (raw data; X and Y from R17 notation) as well as the OLS estimate after scaling by $\hat{\beta}_{\text{OLS}}$ (squares). The trends for ALL are based on R17 one signal model best estimates and are displayed in the shaded area in left of Figures 2a and 2b. (a) Trends between 1955 and 2004, (b) 1935 to 2004, and (c) 1955 to 2014 using RCP8.5 to extend the simulations after 2005. The numbers above the marker show the ratio between the uncertainty relative to the best estimate (X_i^* and Y^*) of the iv-only case calculated as in equation (12).

Entre 1955-2004 detectou-se um aquecimento de 1,1º C na região Sudeste dominantemente explicado pela contribuição do efeito estufa

Aquecimento histórico em São Paulo, SP e no Sudeste



Entre 1955-2004 o aquecimento na cidade de São Paulo é maior que na região Sudeste e de aproximadamente 2º C

Aquecimento por deflorestamento na Mata Atlântica de São Paulo

PLOS ONE

RESEARCH ARTICLE

Relationship between land surface temperature and fraction of anthropized area in the Atlantic forest region, Brazil

Raianny L. N. Wanderley[1,2]*, Leonardo M. Domingues[2], Carlos A. Joly[3], Humberto R. da Rocha[1,2]

1 Universidade de São Paulo, Instituto de Energia e Ambiente, Programa de Pós-Graduação em Ciência Ambiental, São Paulo, Brazil, **2** Universidade de São Paulo, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Departamento de Ciências Atmosféricas, Laboratório de Clima e Biosfera, São Paulo, Brazil, **3** Universidade de Campinas, Instituto de Biologia, Departamento de Biologia Vegetal, Campinas, São Paulo, Brazil

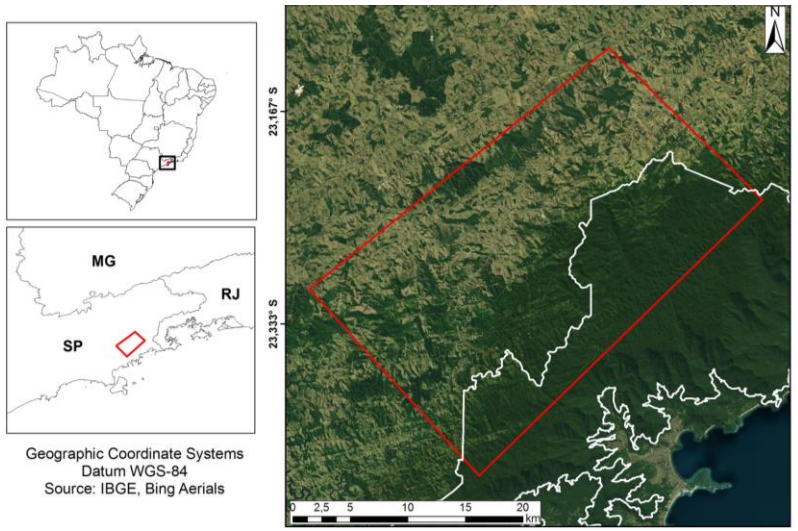
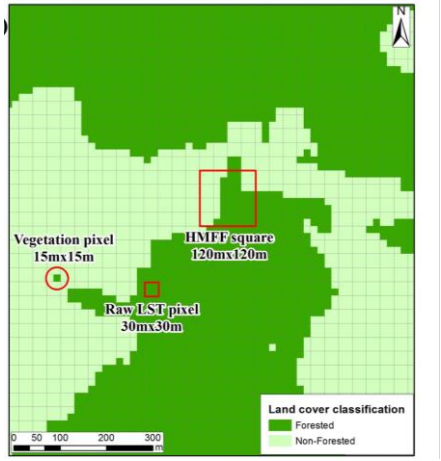


Fig 1. Location of the study area near the northern coast of the state of São Paulo (SP) (background image [25]). The Serra do Mar State Park is outlined in white.



Relationship between LST & FAAI before and after topography effect correction. The annual average LST was calculated from the 8 selected images at a 30 m resolution. The 30 m resolution LST is then spatially upscaled by calculating the average LST in the 14,400 m^2 squares, totaling 49,457 squares. LST was later corrected for terrain topography (altitude and aspect, respectively) to relativize these effects and emphasize the control of land cover on the

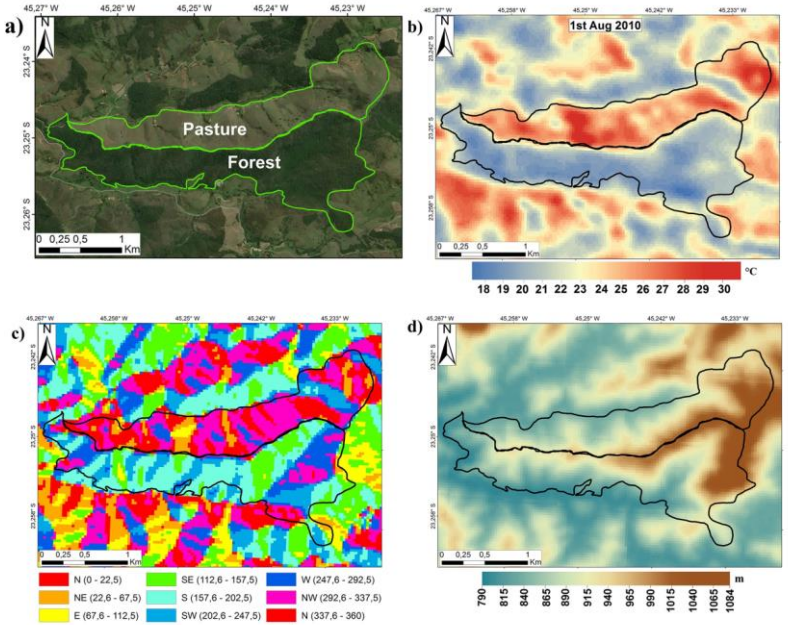


Fig 7. (a) Forest vegetation patch to the south of a pasture area (perimeters outlined in light green) (source: Microsoft Bing Maps Services) near Catuçaba district, São Luiz do Paraitinga, SP, with associated information of (b) LST (°C) (August 1, 2010), (c) aspect (°), and (d) altitude (m).

Aquecimento por deflorestamento na Mata Atlântica de São Paulo

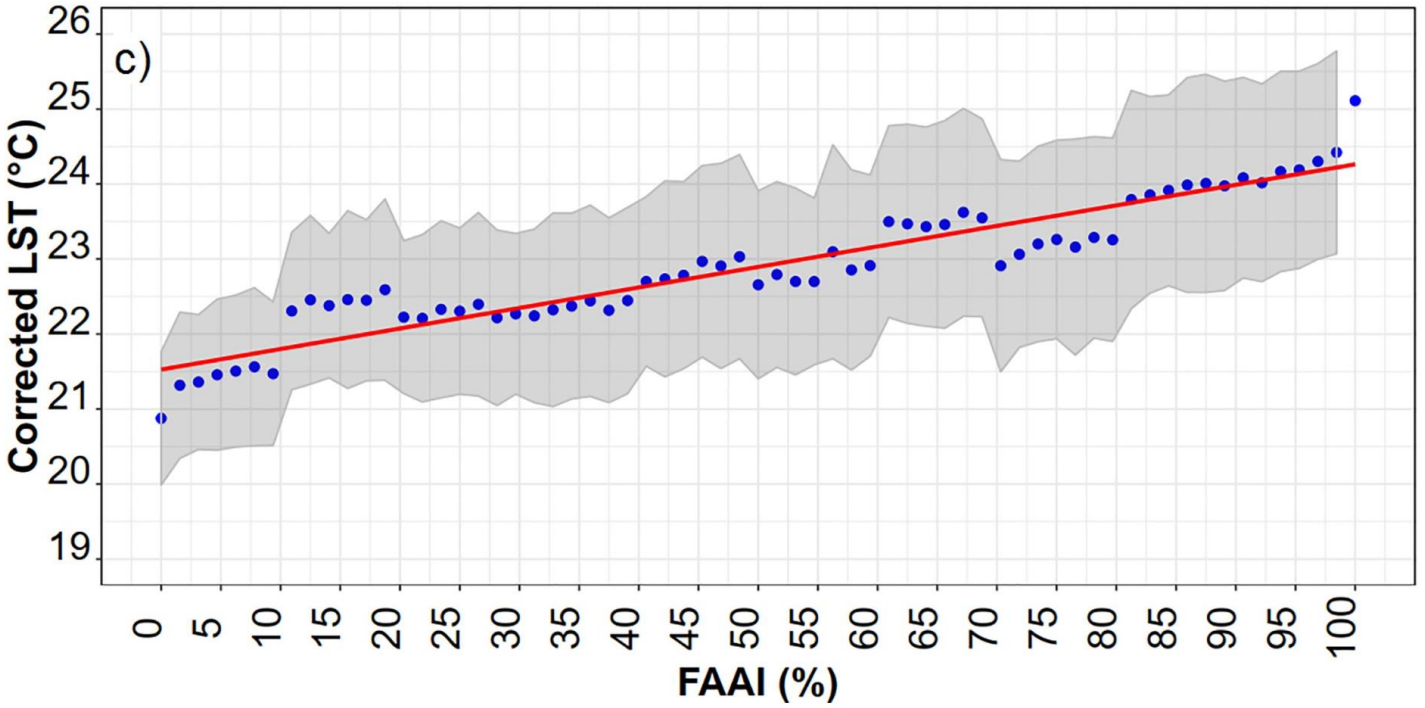
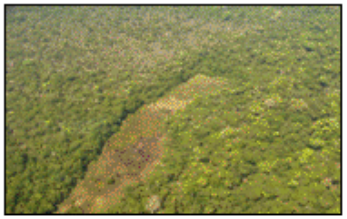


Fig 10. (a) Scatterplot of raw LST and corrected LST ($y = 4.7 + 0.83 \cdot x$); $R^2 = 0.82$, significant p-value $< 2.2e^{-16}$). (b) Quantile–quantile distribution of raw LST and corrected LST. (c) relationship of corrected LST with FAAI (%) (blue circles are average LST at each FAAI class; grey shaded area is bounded by standard deviation of LST per FAAI class; red line is linear regression of all LST data against FAAI, LST = 0.038 FAAI + 20.9; $R^2 = 0.63$, significant p-value $< 2.2e^{-16}$).

https://doi.org/10.1371/journal.pone.0225443.g010

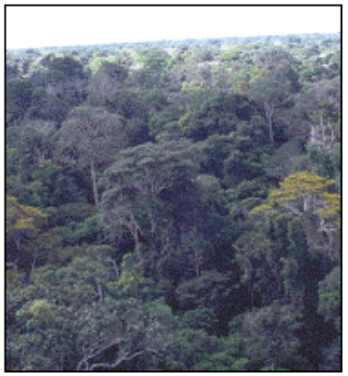
Padrão estima aproximadamente 1º C de aquecimento a cada 25% de desmatamento por ha

3. Flux tower sites in forested areas



(b) Cerrado Flood plain

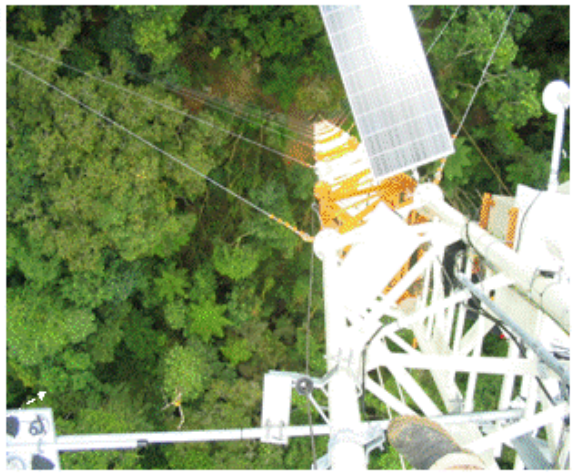
Ilha do Bananal (TO)



(a) Amazonian Tropical forest

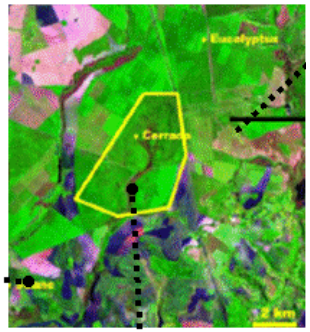
Santarem (Flona Tapajós) k83

(c) Atlantic Forest (Ubatuba & São Luis Paraitinga, SP)

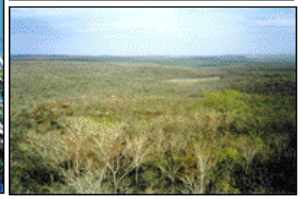


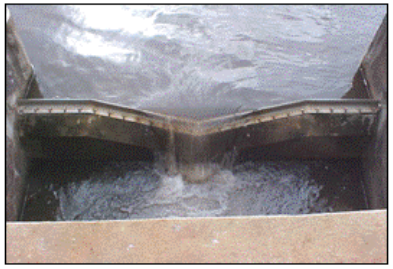
Flux tower over sugar cane, cerrado and pastureland (MogiGuaçu and Jaguari river watershed)

(a) Sugar cane



(b) Eucaliptus





(c) Cerrado *sensu stricto (Gleba Pé de Gigante)*

Pastureland (Extrema, MG)

Potencial de resfriamento em floresta urbana de Mata Atlântica de São Paulo, SP

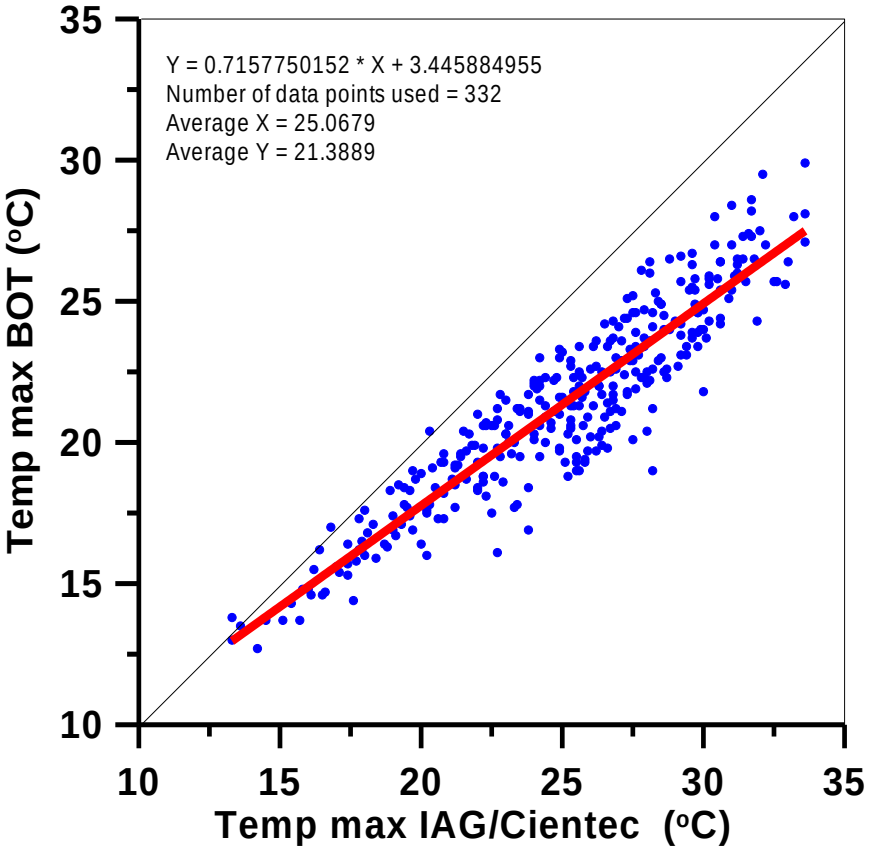
Wadt, Maria Fernanda
Floresta urbana e clima: uma análise do global ao local nos impactos socioambientais em São Paulo / Maria Fernanda Wadt; orientadora Gabriela Marques Di Giulio. - São Paulo, 2019.
201 p.

Tese (Doutorado) -- Faculdade de Saúde Pública da Universidade de São Paulo, 2019.

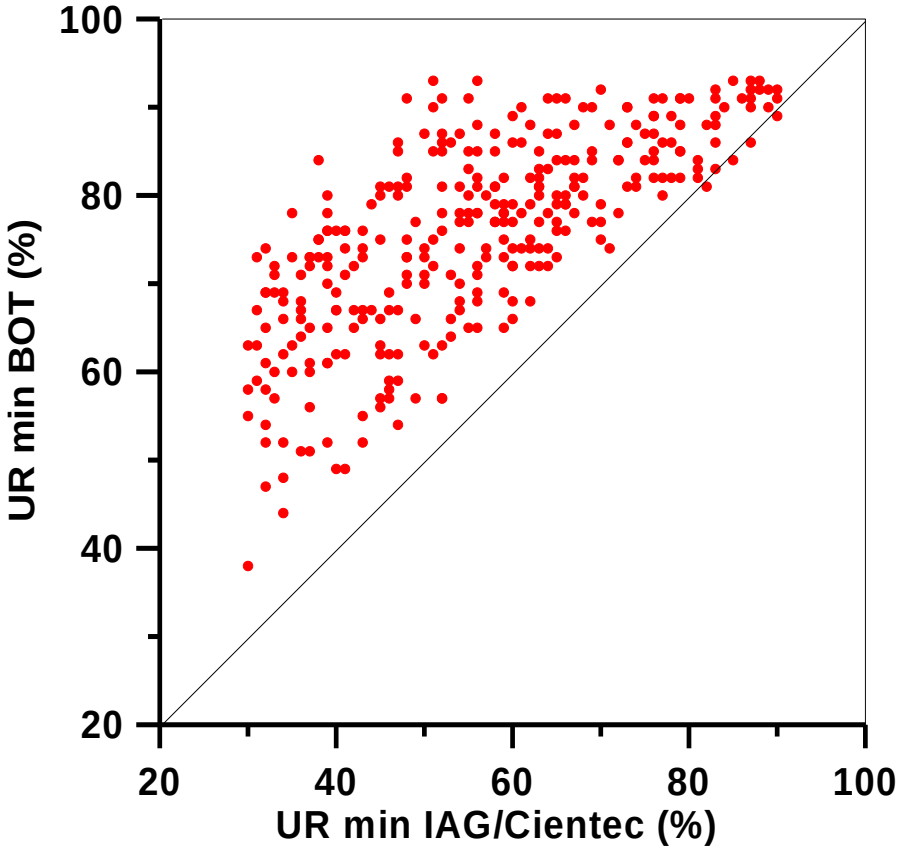
Trilha da Nascente do Riacho do Ipiranga (Jardim Botânico)

Estação meteorológica na Trilha da Nascente e estação padrão Cientec/IAG

Resfriamento e umidecimento do ar : floresta urbana de Mata Atlântica de São Paulo, SP

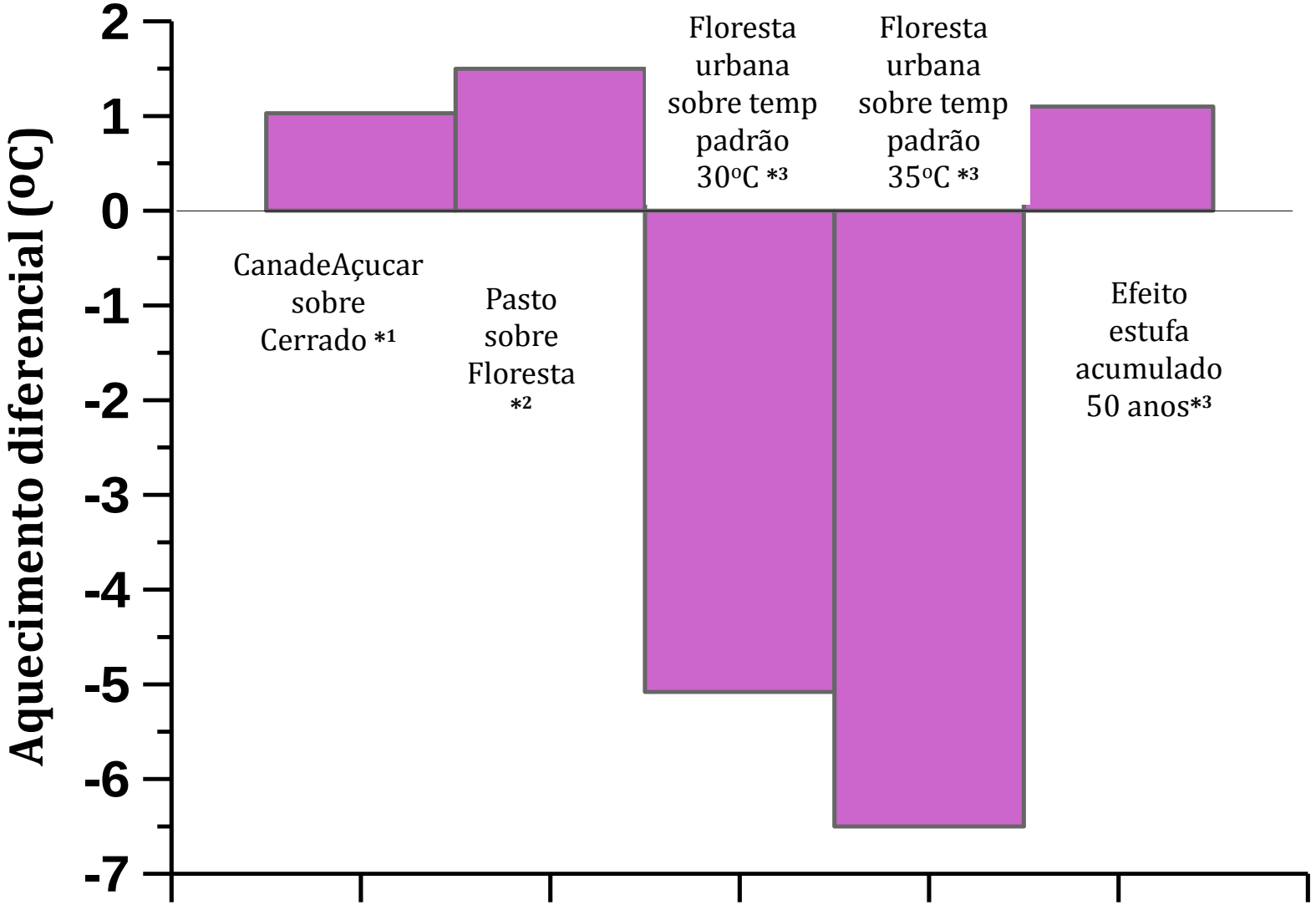


Temperatura do ar máxima diária
Medidas durante 2018



Umidade relativa do ar minima diária

Aquecimento diferencial por cobertura vegetal e efeito estufa



*1 média de 4 áreas experimentais no estado de SP (Negron-Juarez 2004; Tatsch 2006; Wanderley 2018)

*2 média de 6 áreas experimentais Amazonia e Mata Atlantica (Culf et al 1996; Randow et al 2004; Rocha et al 2009)

*4 efeito na região Sudeste (Abreu et al 2019)

*3 microclima abaixo do dossel Floreta Urbana Trilha da Nascente doRio do Ipiranga, São Paulo (Wadt 2019)

Conclusões

Acta Psychiatr Scand 2010: 121: 84–93
All rights reserved
DOI: 10.1111/j.1600-0447.2009.01438.x

ACTA PSYCHIATRICA SCANDINAVICA

Review

The current status of urban-rural differences in psychiatric disorders

Peen J, Schoevers RA, Beekman AT, Dekker J. The current status of urban–rural differences in psychiatric disorders.

J. Peen[1,2], R. A. Schoevers[1], A. T. Beekman[3], J. Dekker[1,2]

Results: Significant pooled urban–rural OR were found for the total prevalence of psychiatric disorders, and for mood disorders and anxiety disorders. No significant association with urbanization was found for substance use disorders. Adjustment for various confounders had a limited impact on the urban–rural OR.

The Open Public Health Journal, 2008, *1*, 1-7

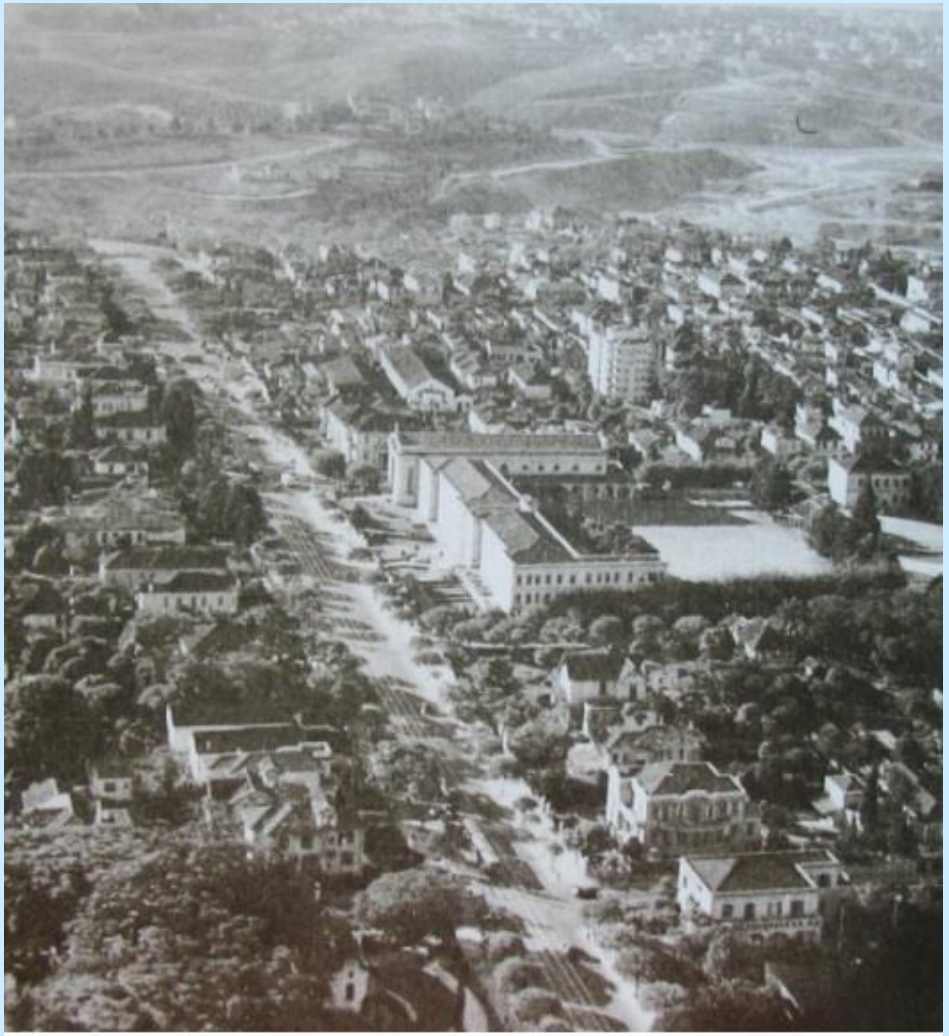
Relationships Between Percentage of Forest Coverage and Standardized Mortality Ratios (SMR) of Cancers in all Prefectures in Japan

Qing Li*, Maiko Kobayashi and Tomoyuki Kawada

Department of Hygiene and Public Health, Nippon Medical School, Tokyo, Japan

Results: People living in areas with lower forest coverage had significantly higher SMR of cancers compared with the people living in areas with higher forest coverage. There were significant inverse correlations between the percentage of forest coverage and the SMR of lung, breast, and uterine cancers in females, and the SMR of prostate, kidney, and colon cancers in males in all prefectures in Japan, even after the effects of smoking and socioeconomic status were factored in.

Conclusions: These findings indicate that increased forest coverage may partially contribute to a decrease in mortality due to cancers in Japan.



Vista aérea da Avenida Paulista do trecho que vai da Rua Minas Gerais à Rua Augusta - do lado direito, a grande construção é o Colégio São Luiz – ao fundo o bairro do Pacaembu. foto de 1935

Fim