EVALUATION OF LAND USE EFFECTS IN NATURAL LANDSCAPE IN SÃO CARLOS-SP, BRAZIL

DIEGO PERUCHI TREVISAN; POLYANNA DA CONCEIÇÃO BISPO; LUIZ EDUARDO MOSCHINI; HEIKO BALZTER

Centre for Landscape and Climate Research - University of Leicester

Environmental Sciences Department – Federal University of São Carlos - diego.trevisan@ufscar.br

ABSTRACT

This study aimed to analyze the effects of land use and land cover on the spatial and temporal patterns in the landscapes of São Carlos, Brazil, from 2003 to 2013. The Environmental Quality Index of Water Resources, the Environmental Quality Index of Vegetation, and the Environmental Vulnerability Index were used to assess the condition of ecological sustainability of the landscape. A reduction in the areas of native vegetation over time was identified with loss of 31% in ten years, representing over 3,067 ha, an expansion of agricultural areas of 40% and consequently a reduction of the environmental quality in the landscapes of São Carlos.

INTRODUCTION AND OBJECTIVE

In the last decades, there has been a great search for new quantitative methods that can analyze patterns, determine the importance of spatial processes and develop reliable models (LI; WU, 2004), where modeling is established as an excellent ally to obtain knowledge and for generation of hypothesis in landscape ecology. The objective of this study was to analyze the environmental quality of vegetation in São Carlos - SP, Brazil between 2003 and 2013, using vegetation indexes.
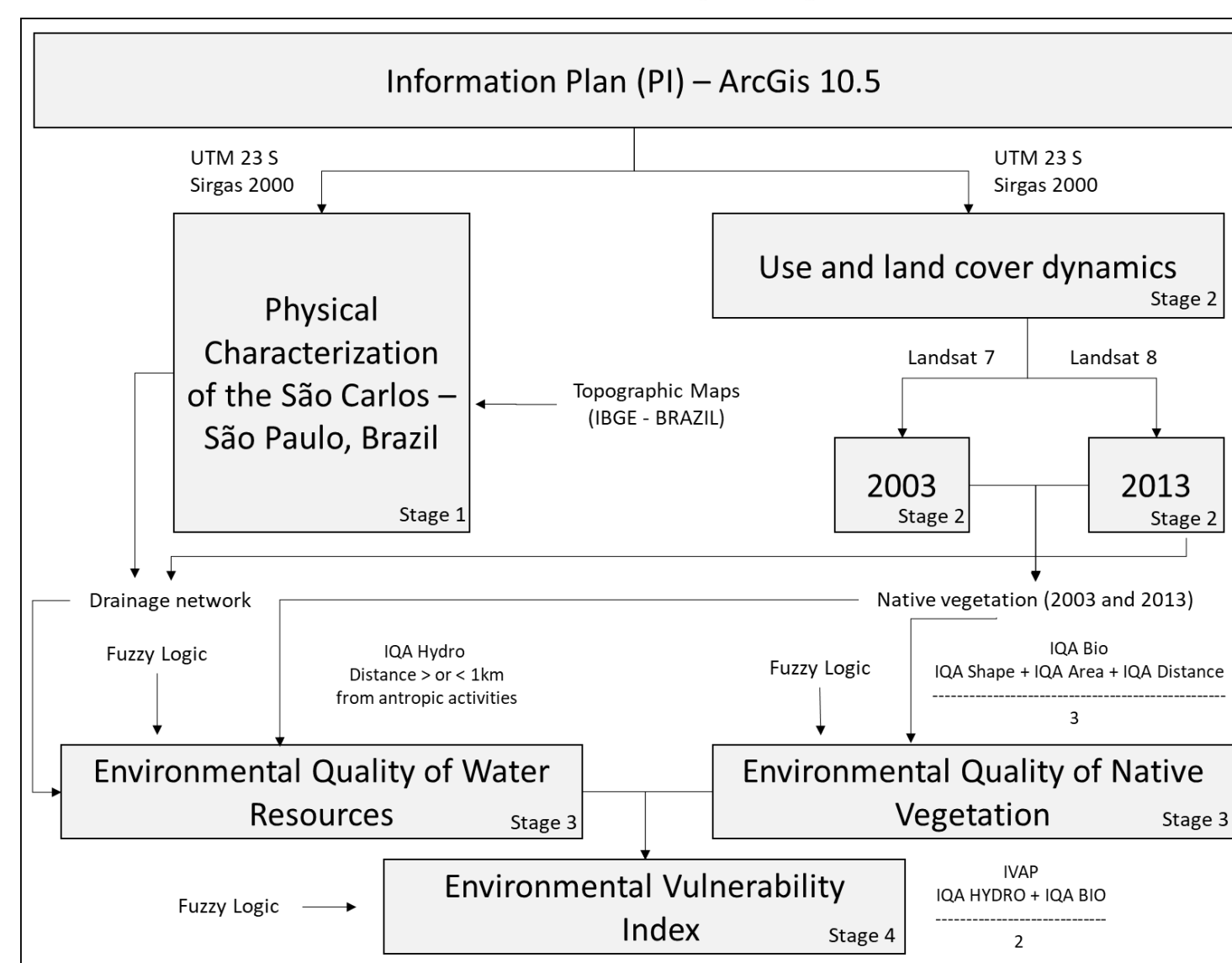
METHODS

Figure 1: Methodological procedures

RESULTS AND DISCUSSION

The municipality, besides losing areas of natural vegetation with a loss of 3.067ha, also lost environmental quality (Graph 1, 2 and 3). This loss is directly correlated with the decrease in the environmental quality of the compartments analyzed (Figure 2, 3 and 4).
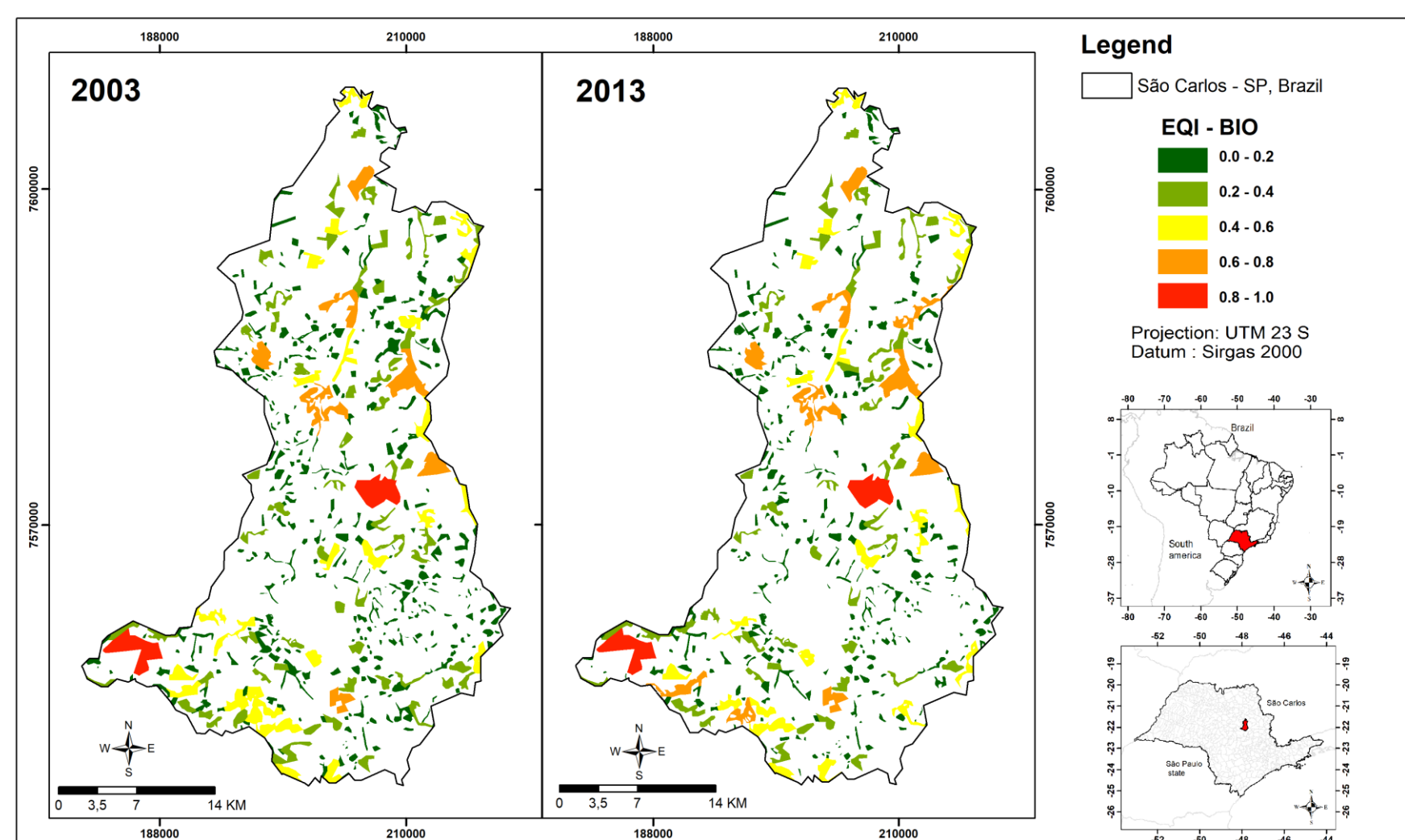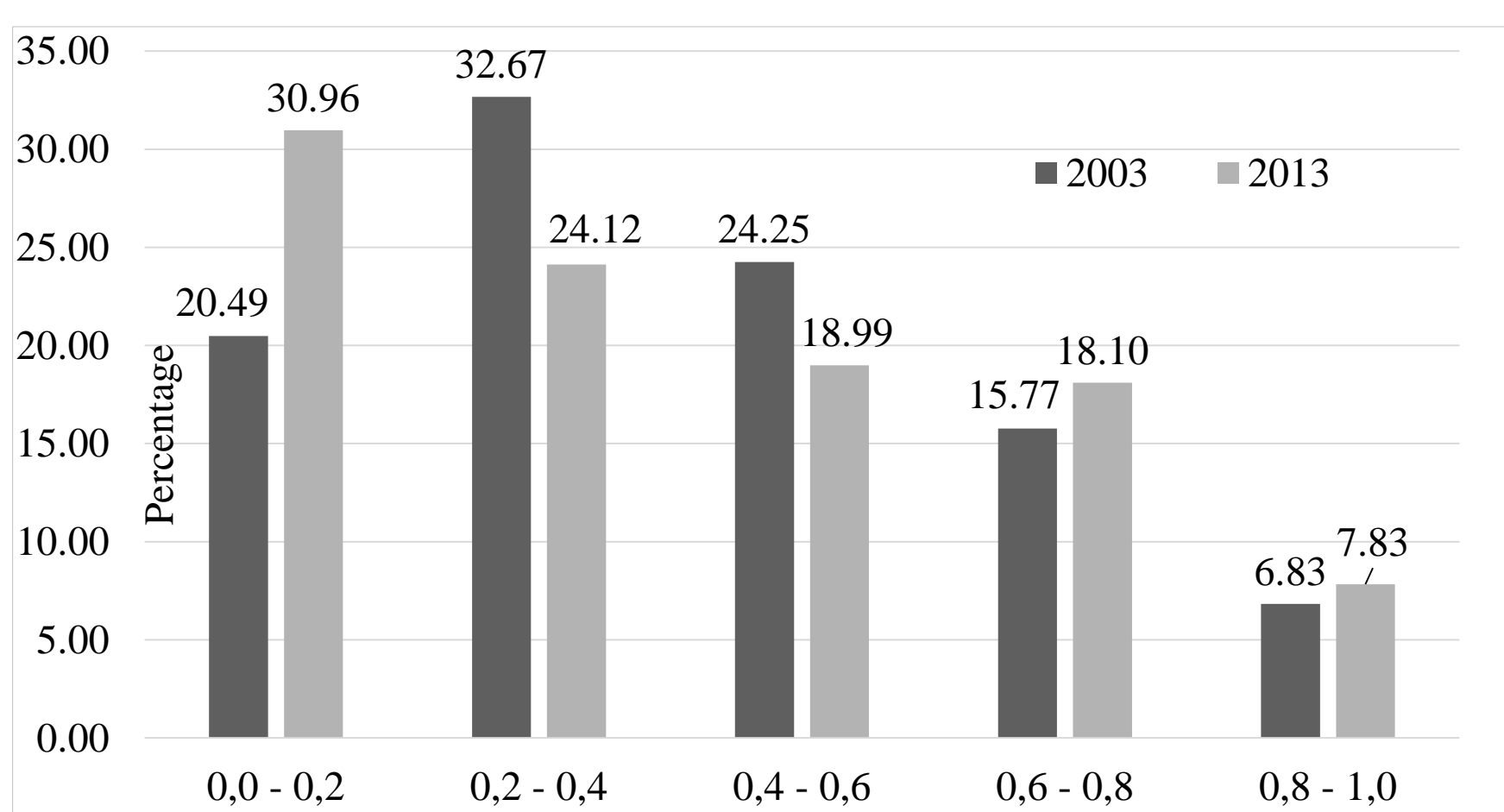

Figure 2: Environmental quality of vegetation (IQA-BIO) (0: low and 1: high)

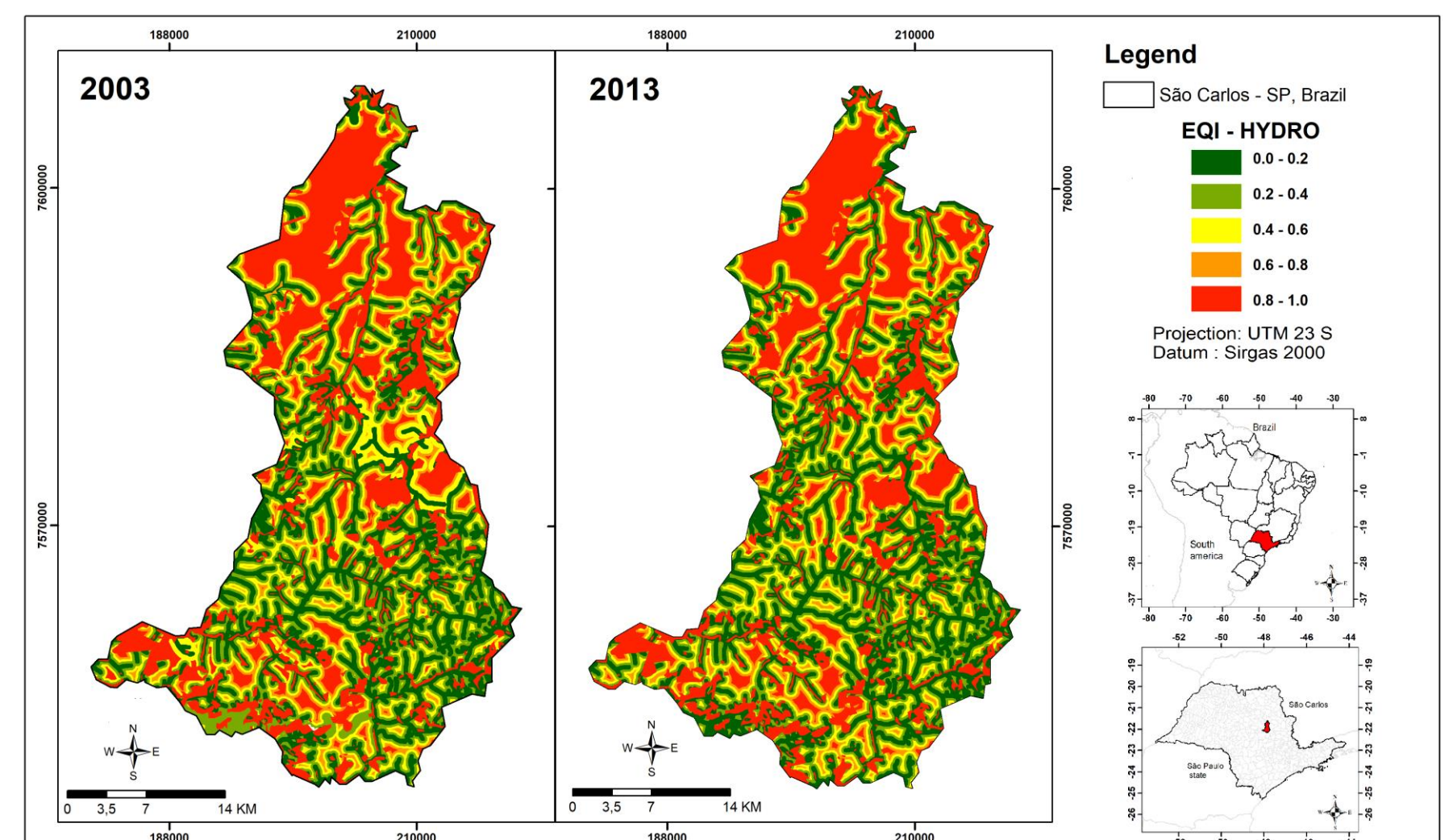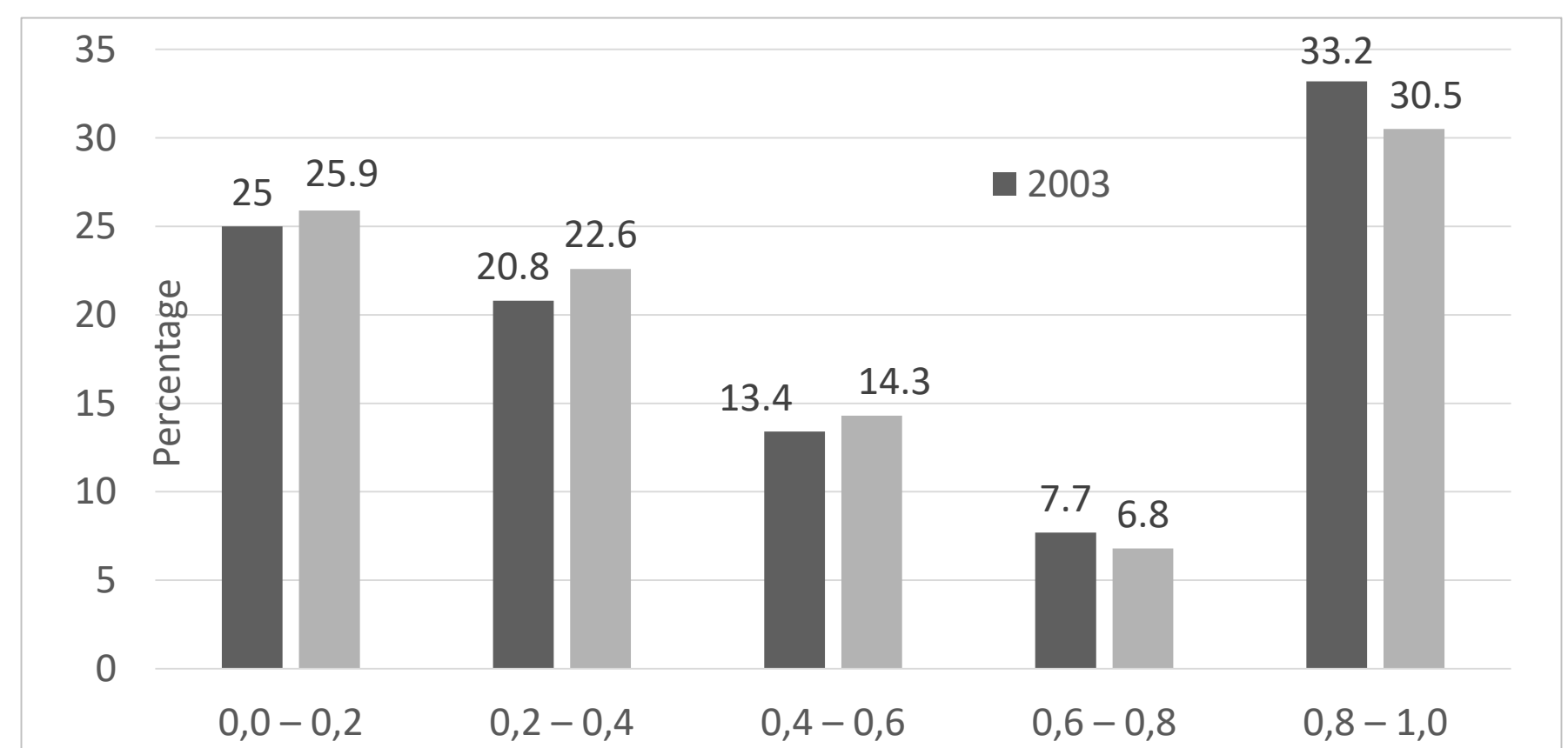**Graph 1**: Environmental quality of vegetation (IQA-BIO) (0: low and 1: high)

Figure 3: Environmental Quality of Water Resources (IQA-HYDRO) (0: low and 1: high)

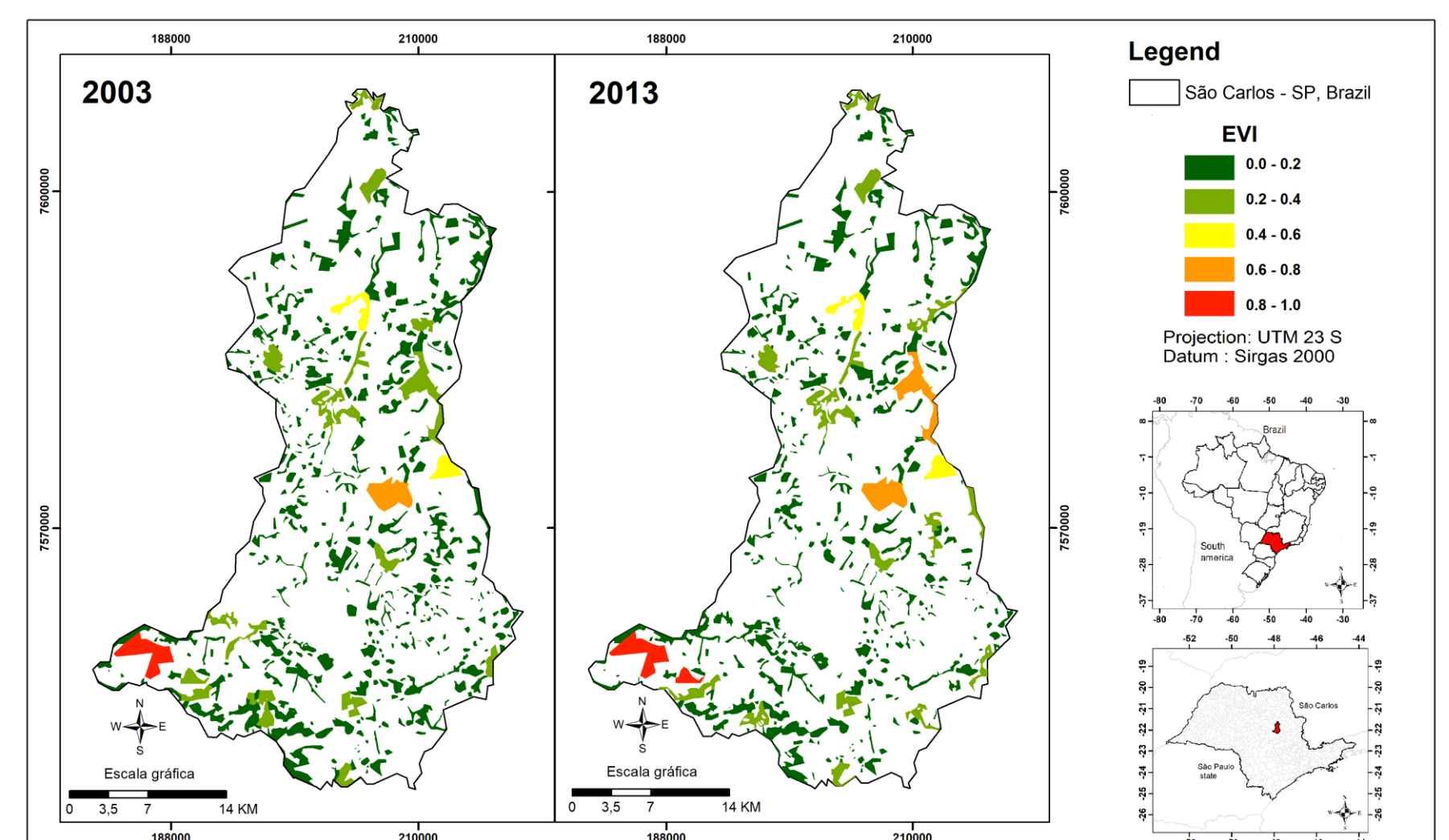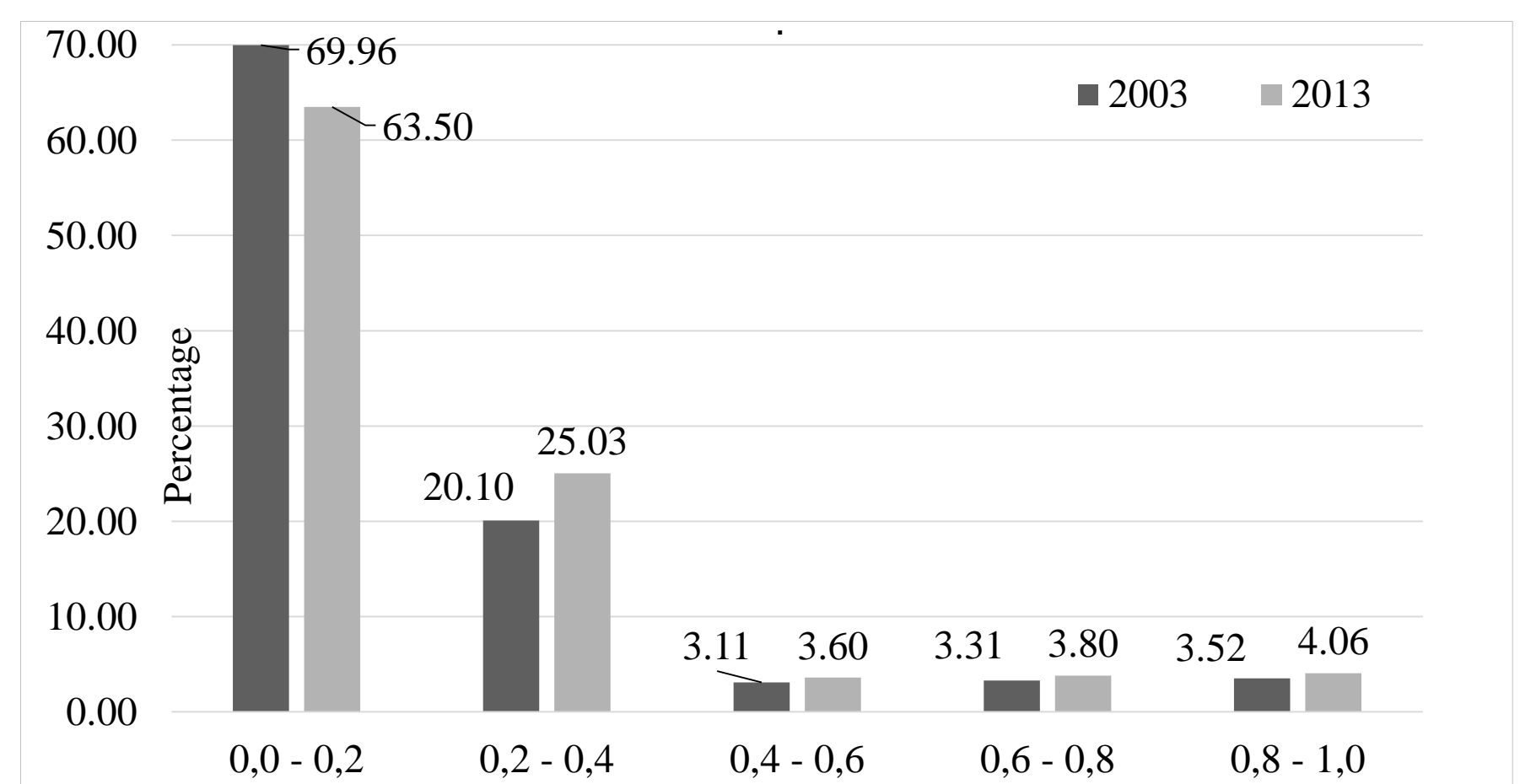**Graph 2 :** Environmental Quality of Water Resources (IQA-HYDRO) (0: low and 1: high).

Figure 4: Environmental Vulnerability Index (IVAP) (0: low and 1: high)

Graph 3 : Environmental Vulnerability Index (IVAP) (0: low and 1: high)

CONCLUSIONS

The indexes used were presented as important tools for the diagnosis aimed at the conservation of ecosystems, allowing an accurate analysis of each fragment. The municipality of São Carlos needs an immediate planning aimed at maintaining the remnants of native vegetation, prioritizing the conservation and recovery of these areas.

MAJOR REFERENCES

GRMC-BHTJ. Guia de restauração de matas ciliares da Bacia Hidrográfica do Tietê-Jacaré. **Instituto Pro-Terra**, 1ª ed, 2014, 44p.

REGO, J. C. L.; SOARES-GOMES, A.; SILVA, F. S. Loss of vegetation cover in a tropical island of the Amazon coastal zone (Maranhão Island, Brazil). **Land Use Policy**, v.71, p. 593 - 601, 2018.

TREVISAN, D. P.; MOSCHINI, L. E. Evaluation of landscape urbanity in Americana, São Paulo, Brazil. **International Journal of Development Research**. v.07, p.16177 - 16183, 2017.