

The Woods Hole
Research Center

Vegetation structure and species diversity coupled to soil water heterogeneity in a Cerrado core area

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Objective

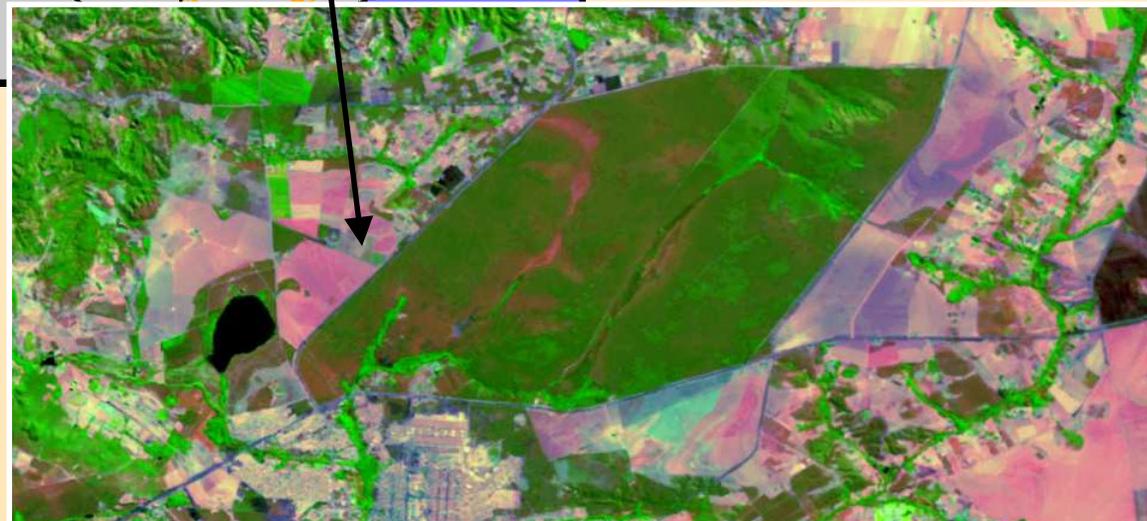
Investigate possible links between woody vegetation structure and species diversity with soil water availability at Cerrado landscapes



Study site



**Águas Emendadas
Ecological Station**

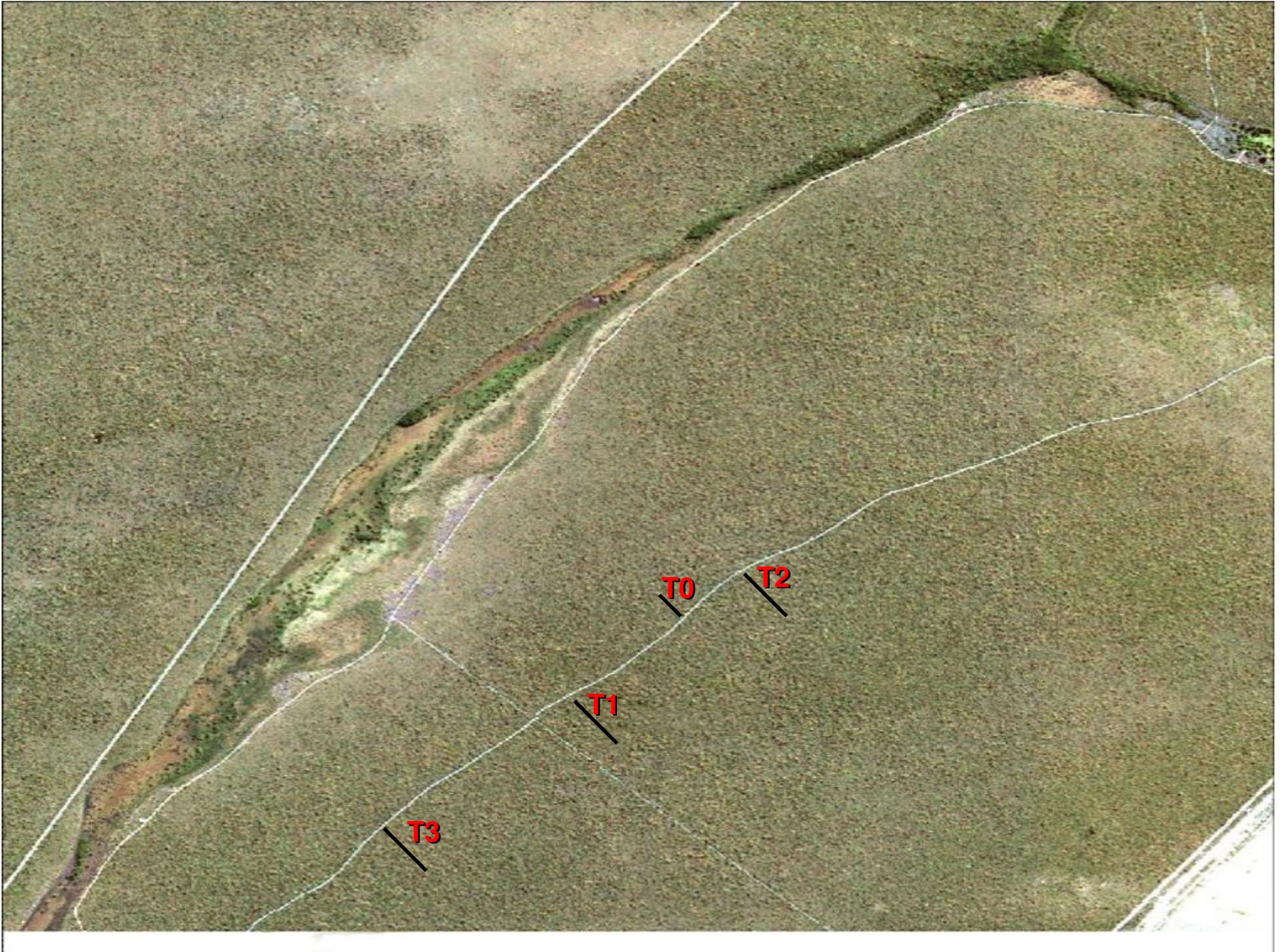




Wet season



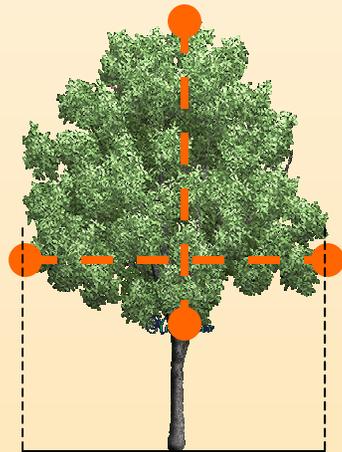
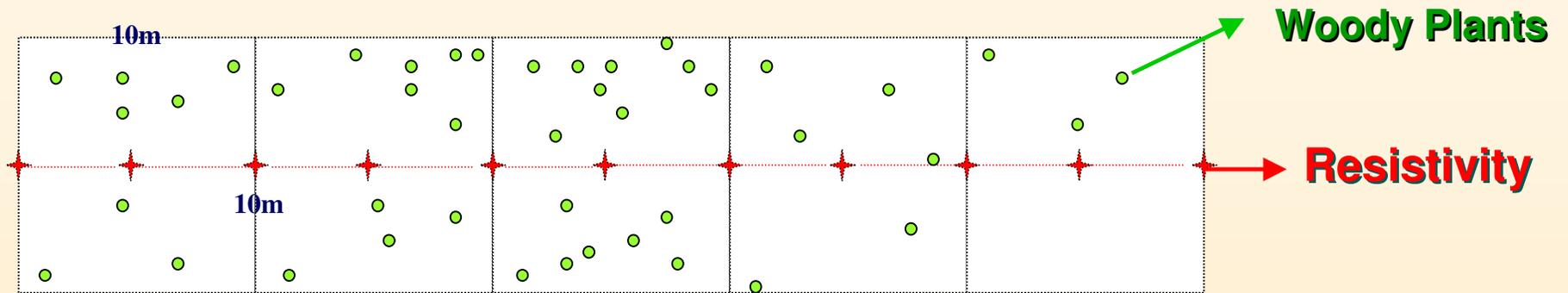
Dry season



Assessing soil water content through soil electrical resistivity profiling

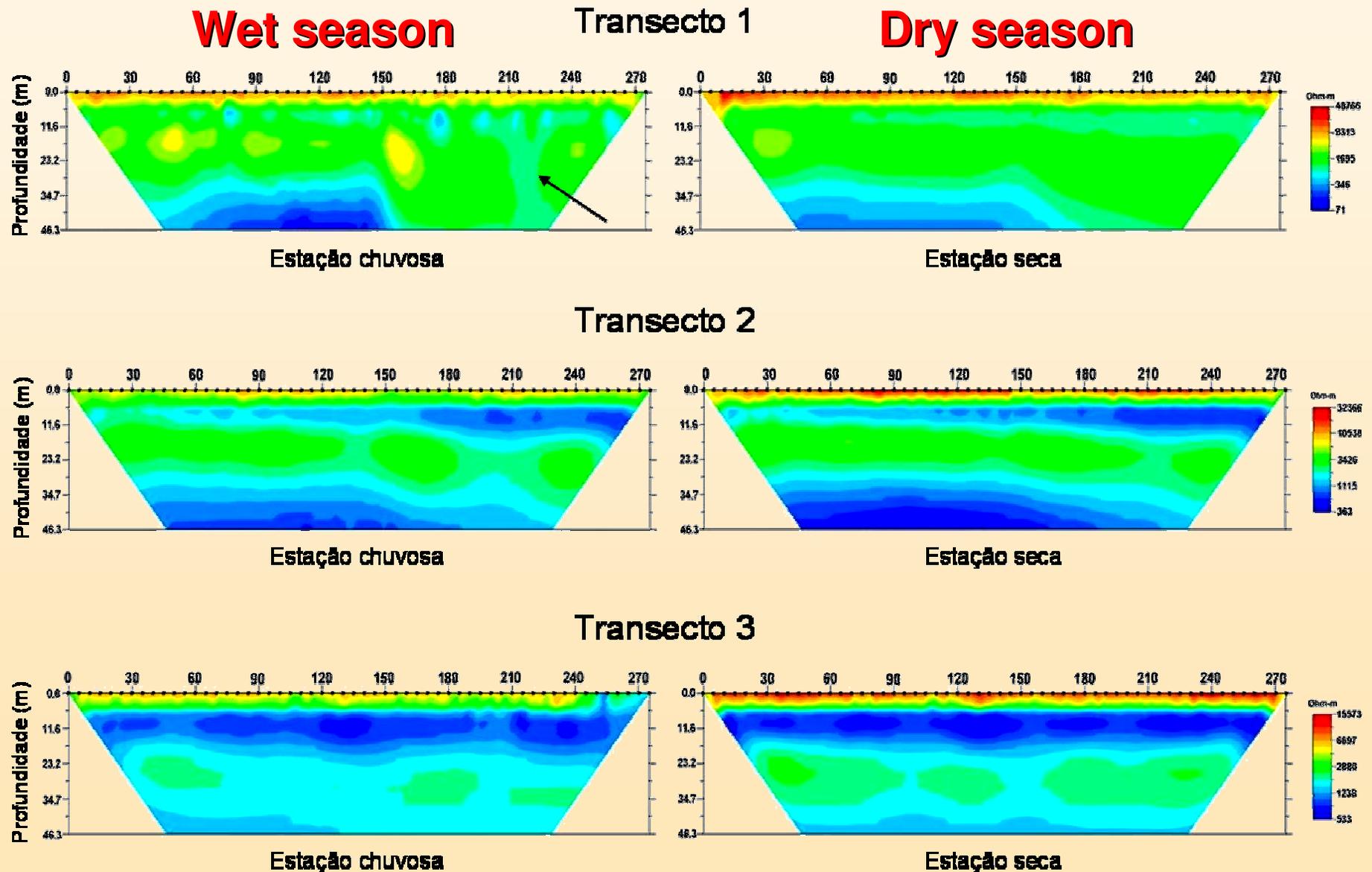


Vegetation measurements

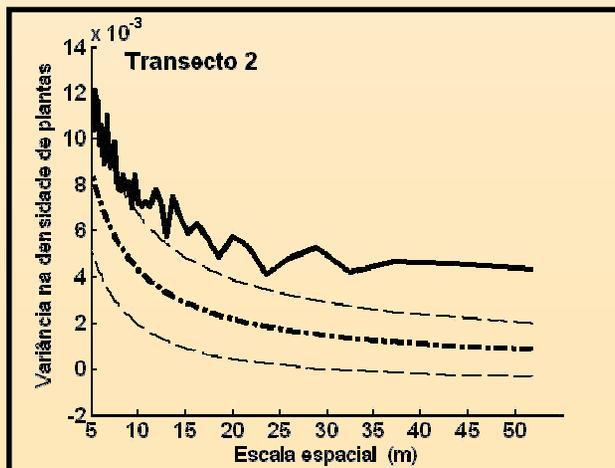
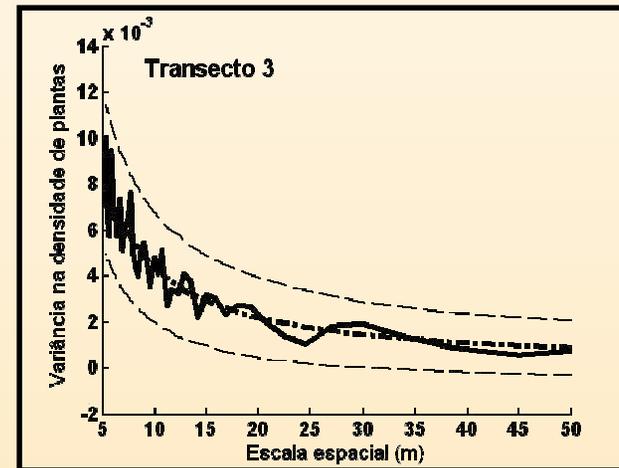
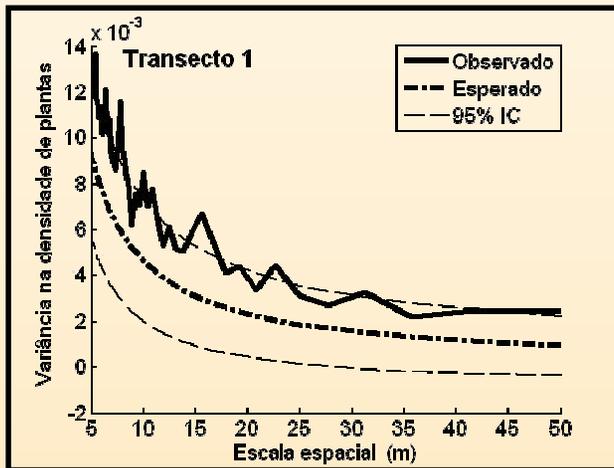


Plant measurements
Leaf Area Index
Species identification

Soil electrical resistivity profiling



Spatial patterns in plant distribution



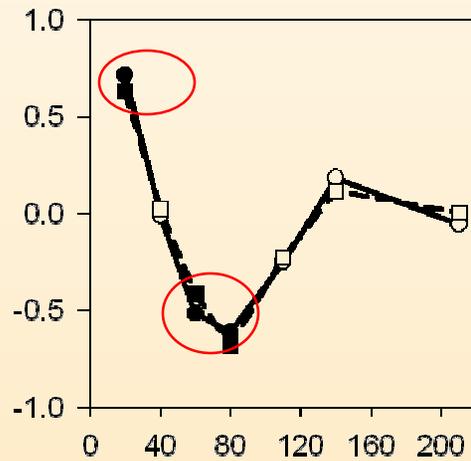
Null models approach

- 6000 simulations for random distribution

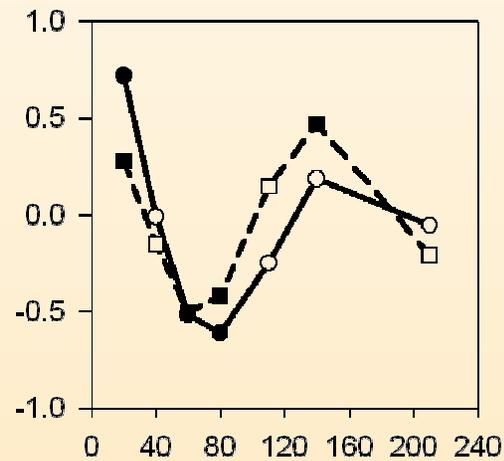
Congruence in spatial distribution of vegetation and plant available water

Moran's I coefficient

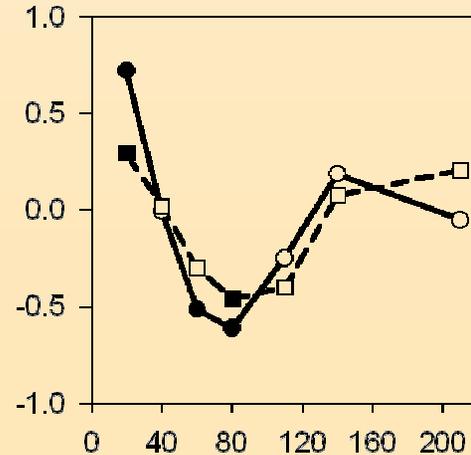
SUM OF HEIGHT



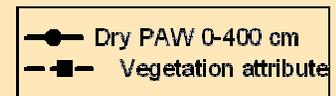
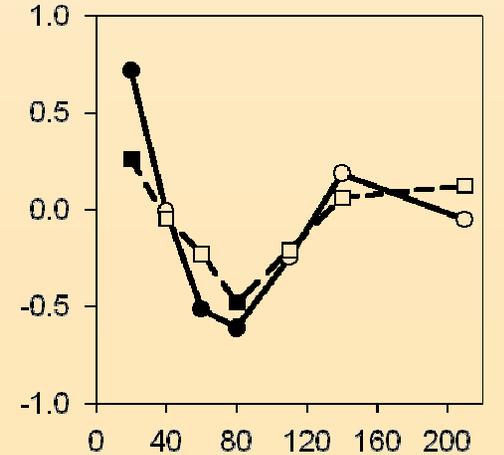
SUM OF BASAL AREA



LAI - FEBRUARY

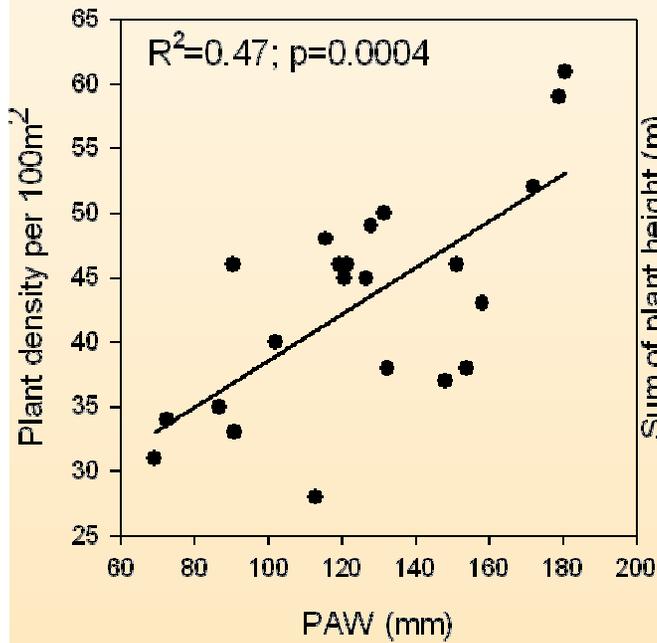


LAI - DECEMBER

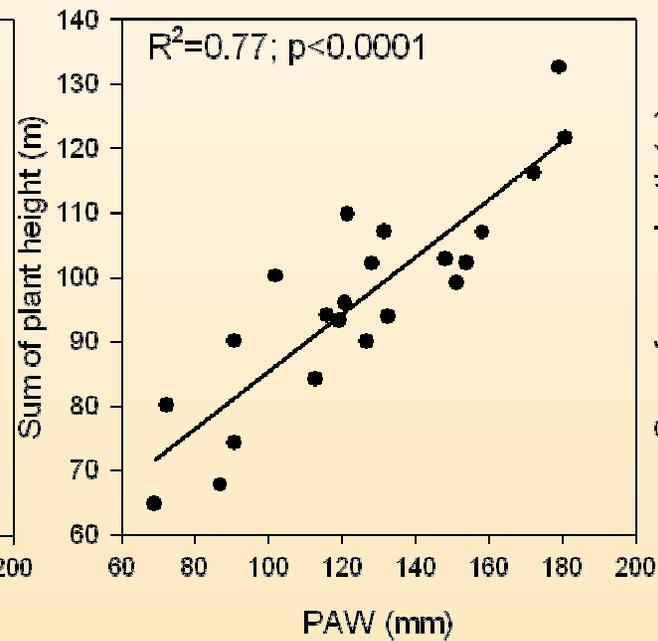


Vegetation attributes and PAW 0-400 cm

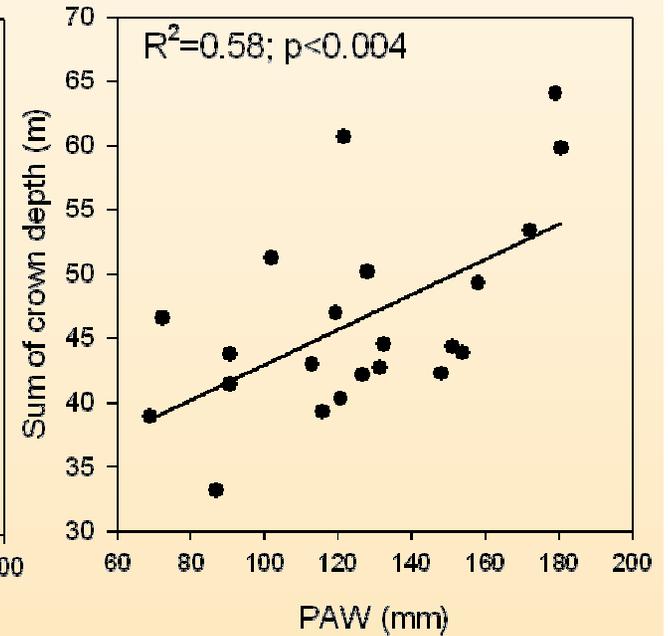
Plant density



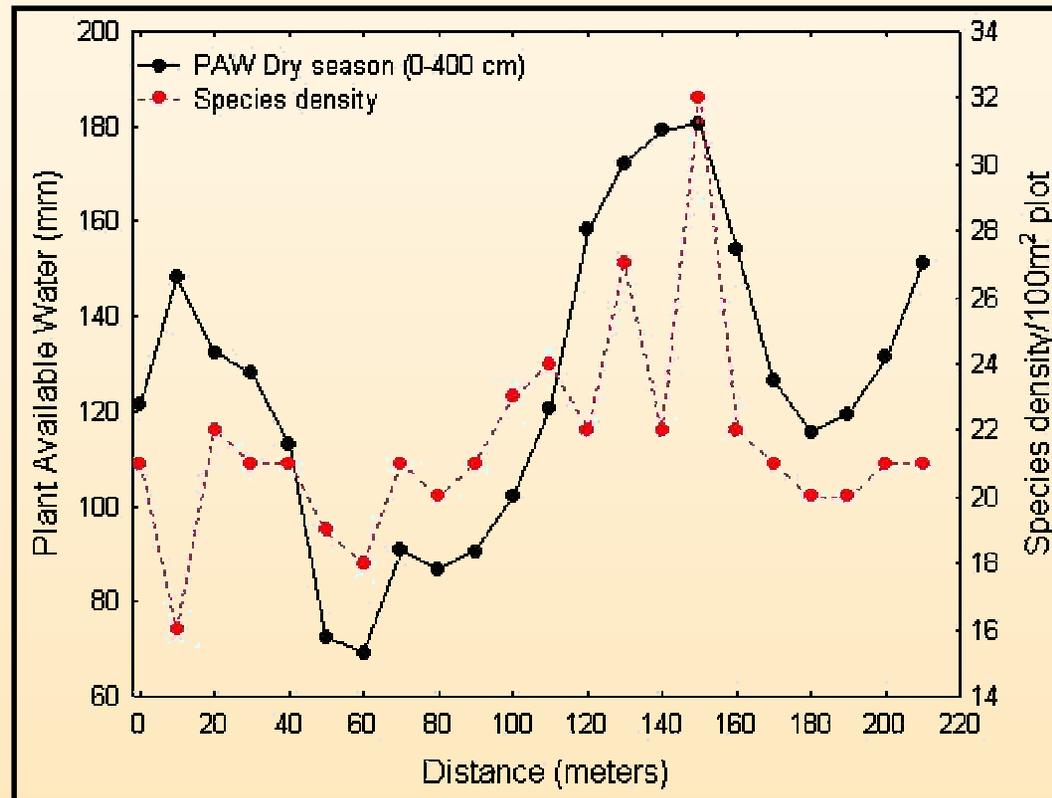
Height



Crown depth



Co-variation between species density and PAW

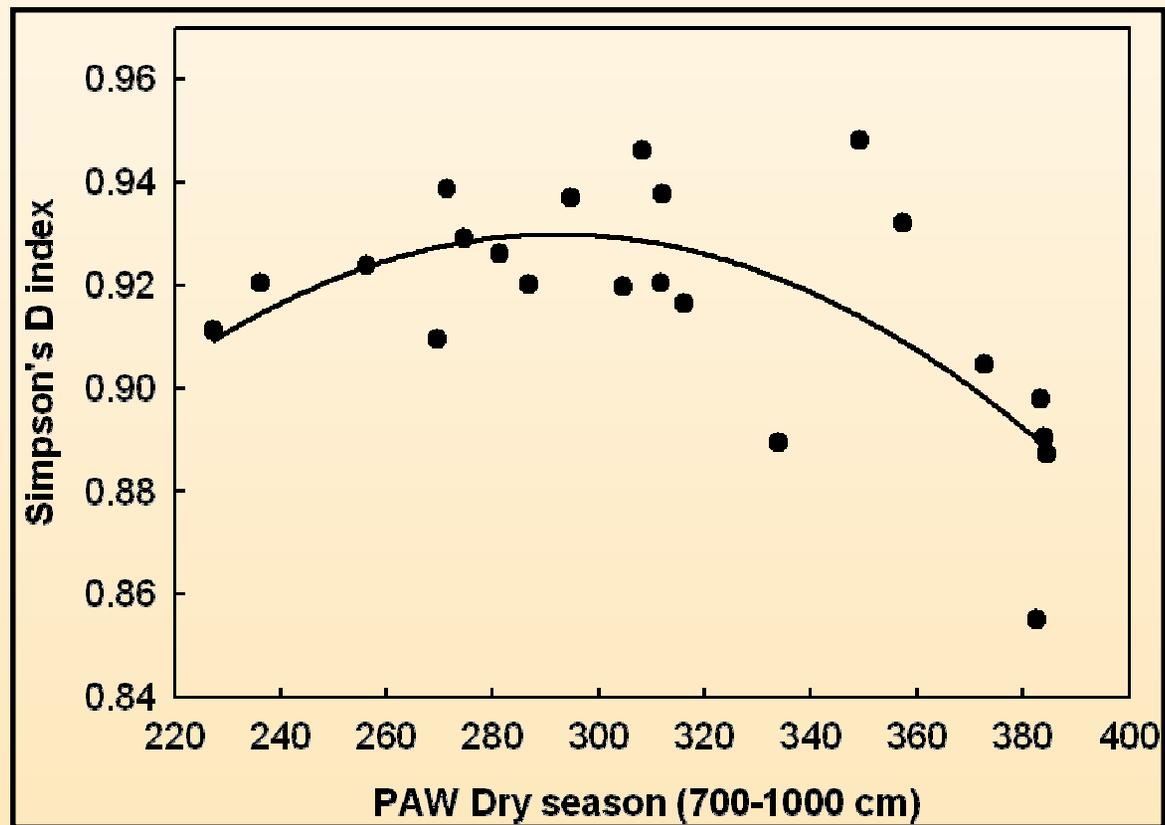


Mantel correlation

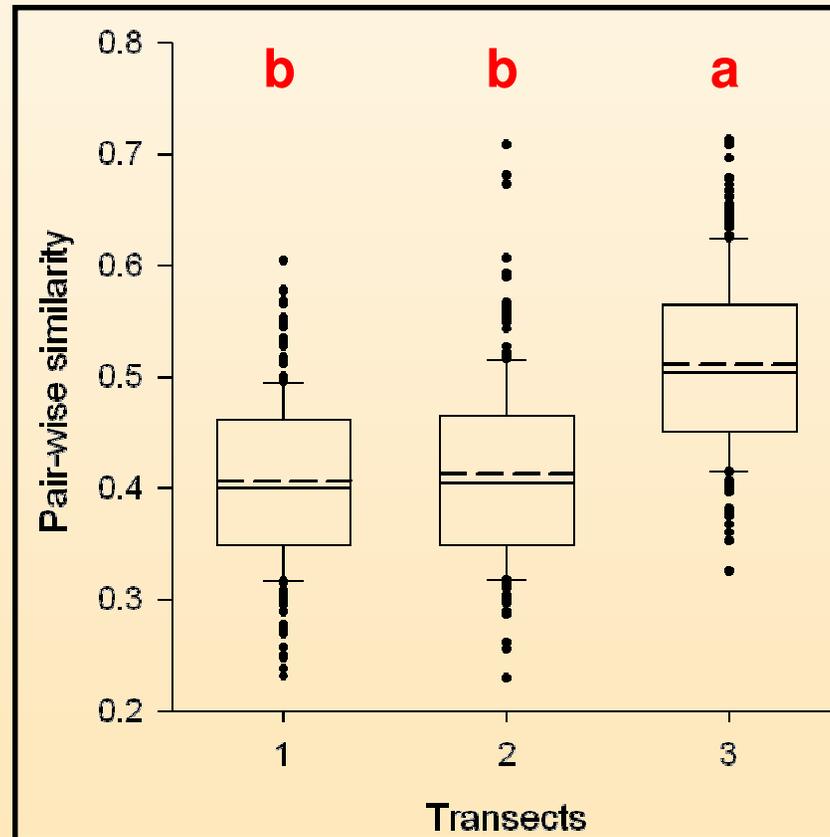
PAW 0-4 m - Dry season: $r=0.35^{}$**

Wet season: $r=0.31^{}$**

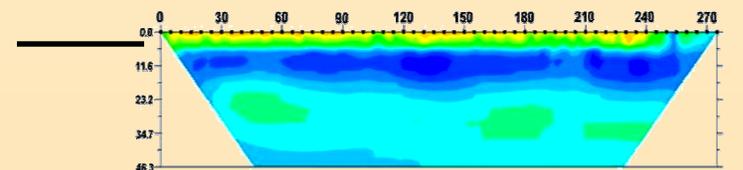
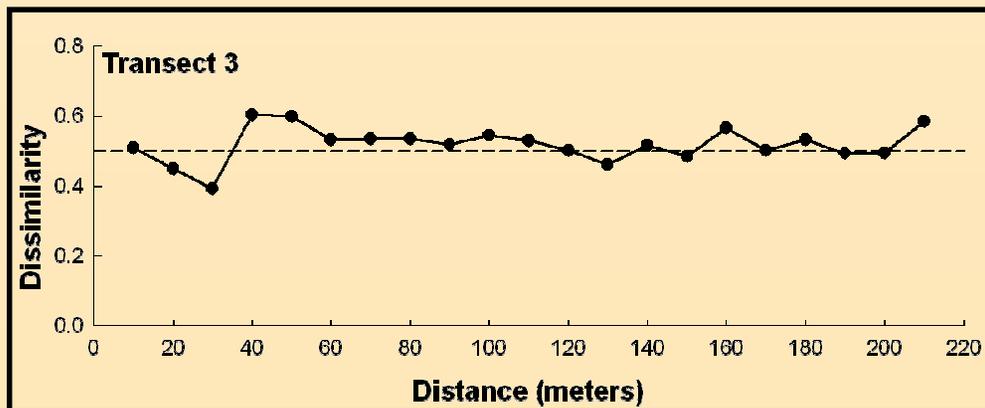
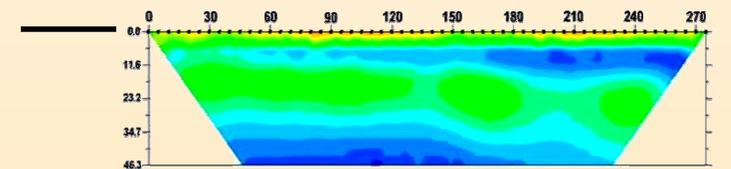
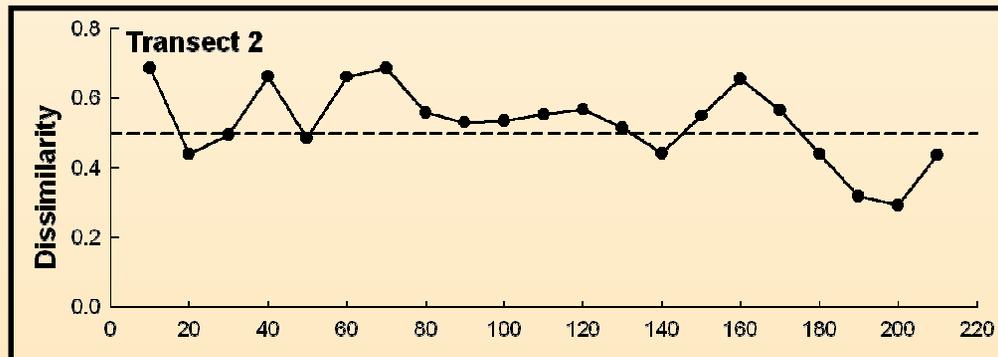
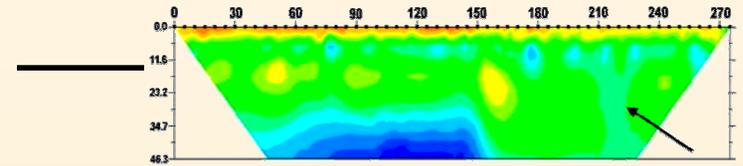
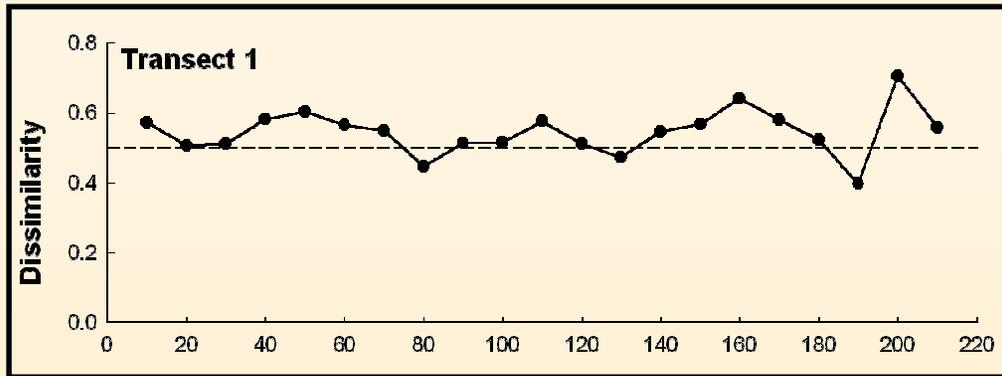
Species diversity and plant available water

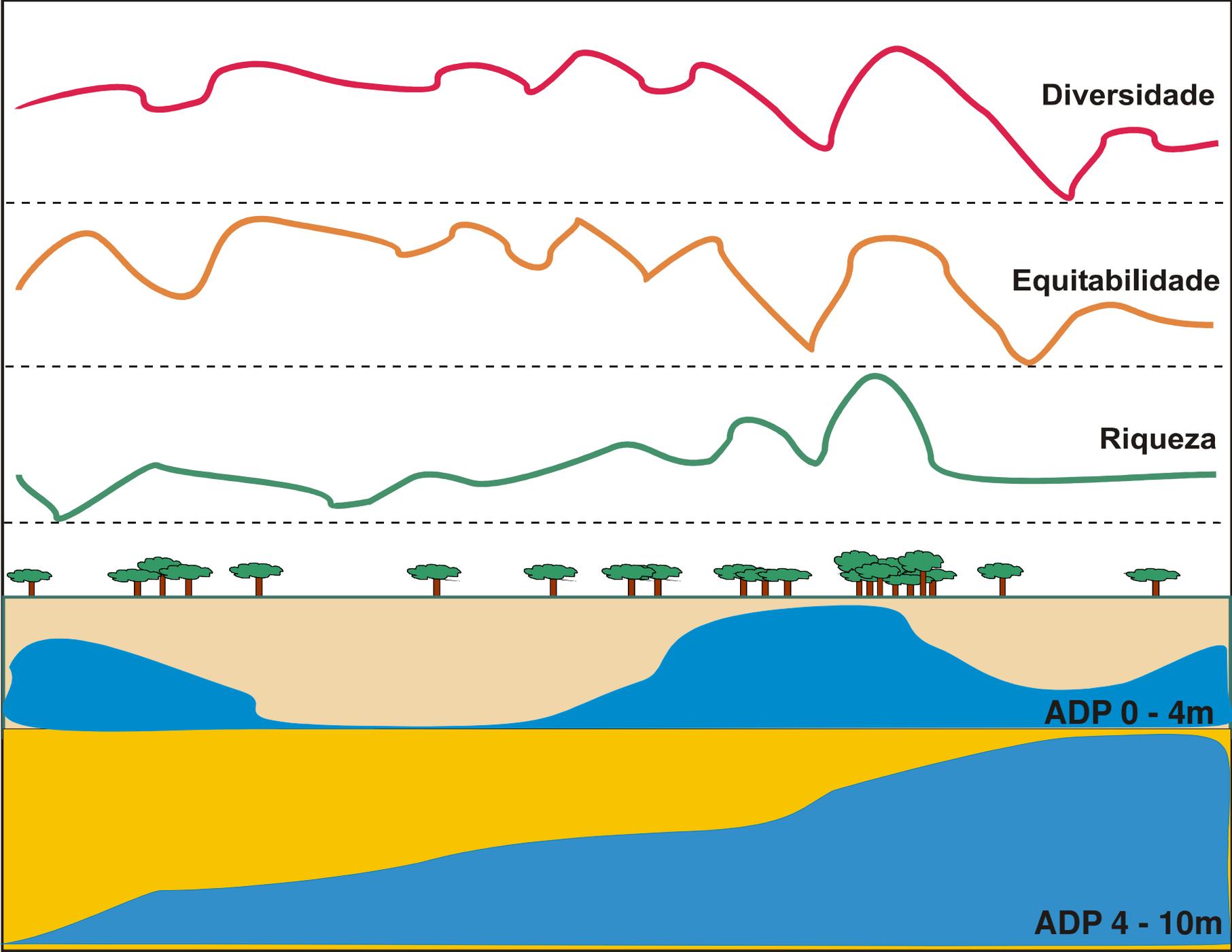


Spatial variation on species composition (Beta-diversity)



Spatial variation on species composition





Conclusions

Strong co-organization between vegetation structure and plant available water at a fine scale;

Species composition and thus species diversity co-varied with plant available water ;

Soil water availability is an important structuring factor at fine scale in the studied Cerrado.

