

Growth dynamics of Mediterranean woodlands under climate change: a dendroecological approach in southwest Iberia



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Análisis y Planificación del Medio Natural
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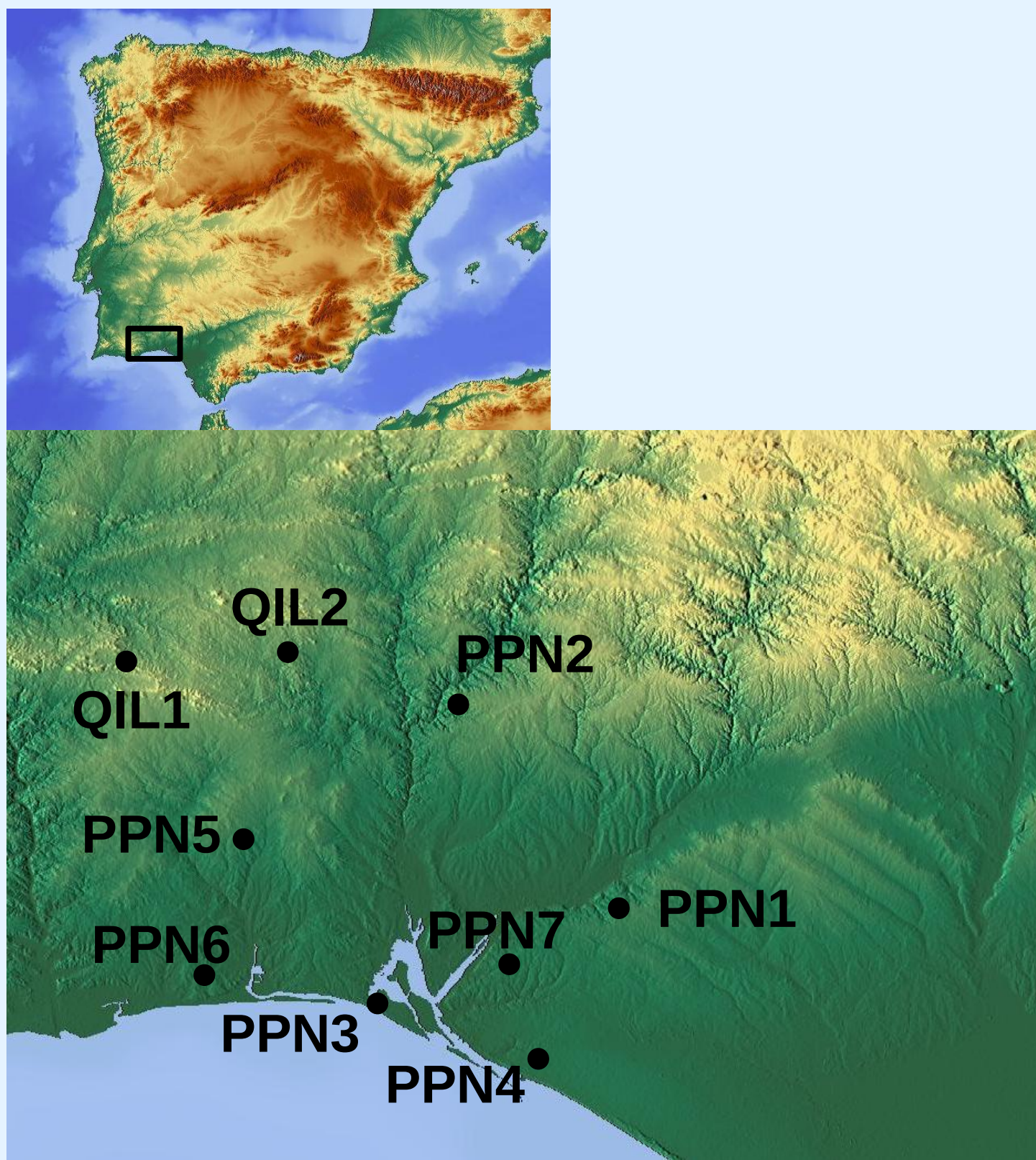
1 Introduction

Recently, vegetation in the Iberian Peninsula has exhibited global-change-type processes, e.g. species distribution shifts, altered plant phenology, enhanced forest decline and tree mortality. Tree rings provide information about the ecological behavior of forests under climate change. We studied the climate change-related signal in tree-ring chronologies of two evergreen Mediterranean species in SW Spain.

2 Research questions

Is there any common growth pattern in the tree-ring chronologies explained by climate change?
Do tree rings reflect any response of growth physiology to the changing climate?

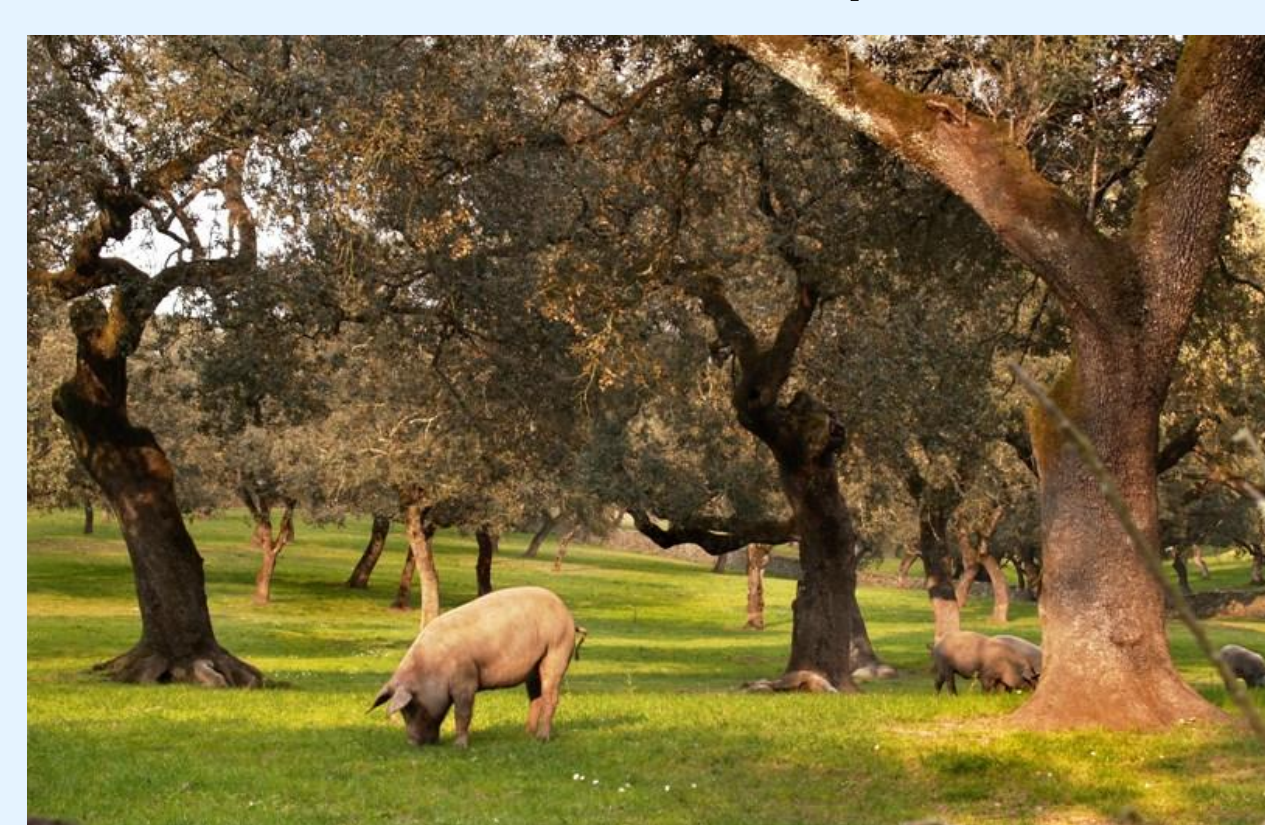
3 Materials



PPN – *Pinus pinea* managed stands



QIL – *Quercus ilex* open-woodlands



Standardized tree-ring width chronologies

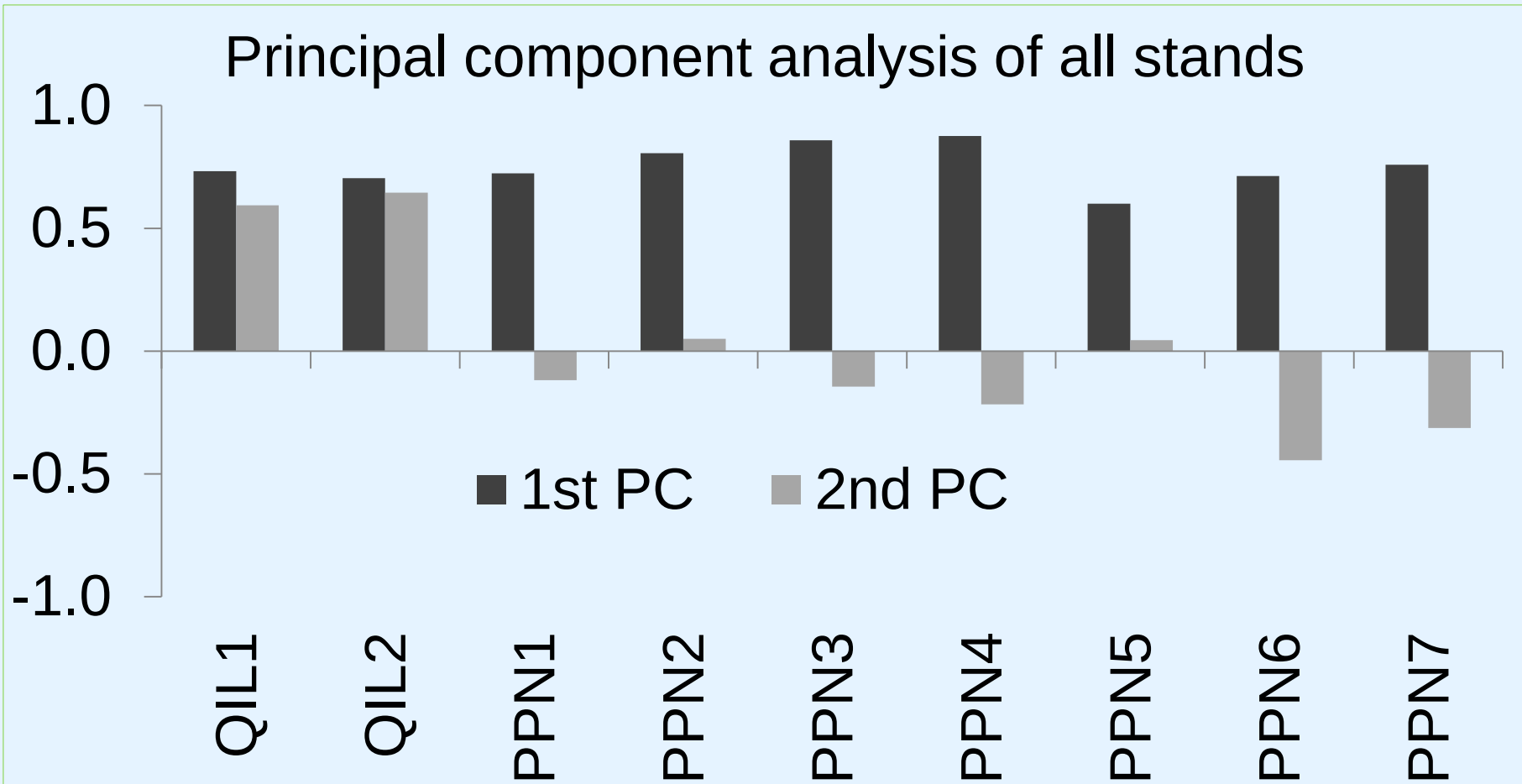
'Old' stands (age > 110 years):

QIL1
QIL2
PPN1
PPN2

'Young' stands (age < 90 years):

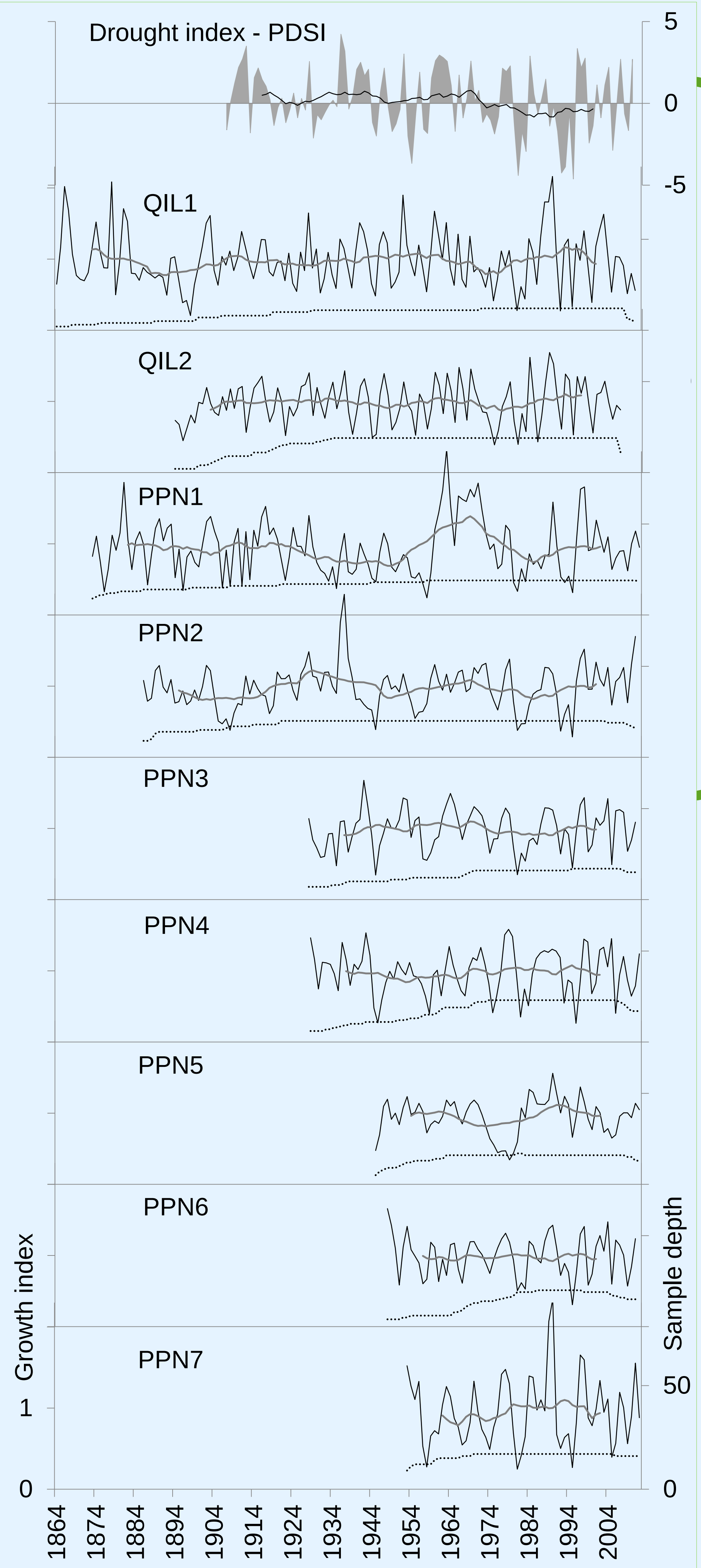
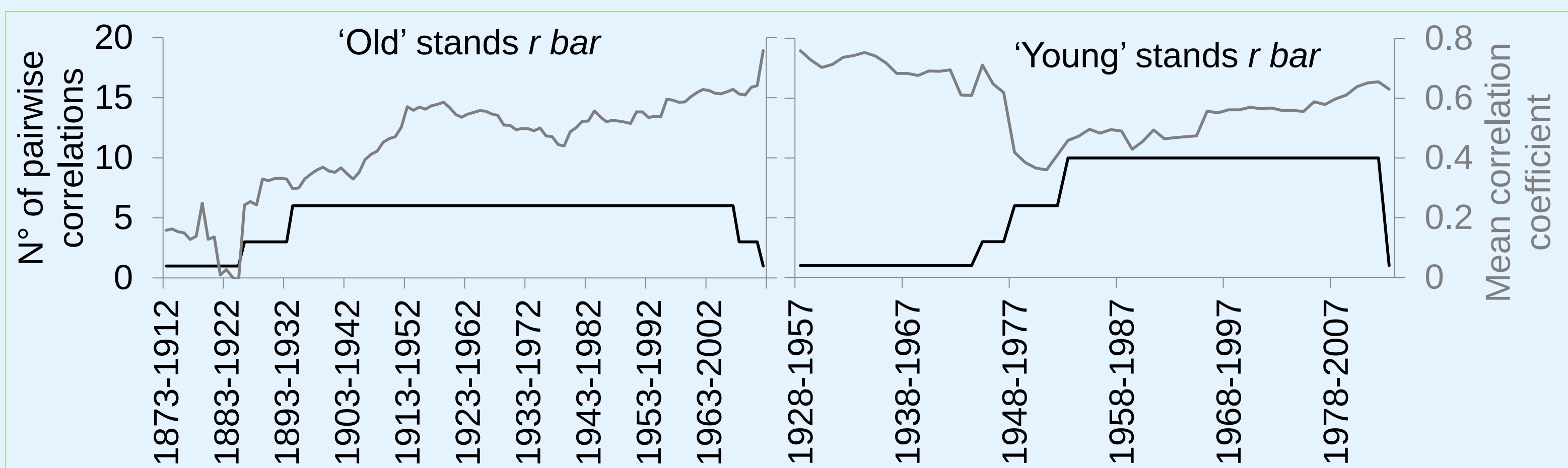
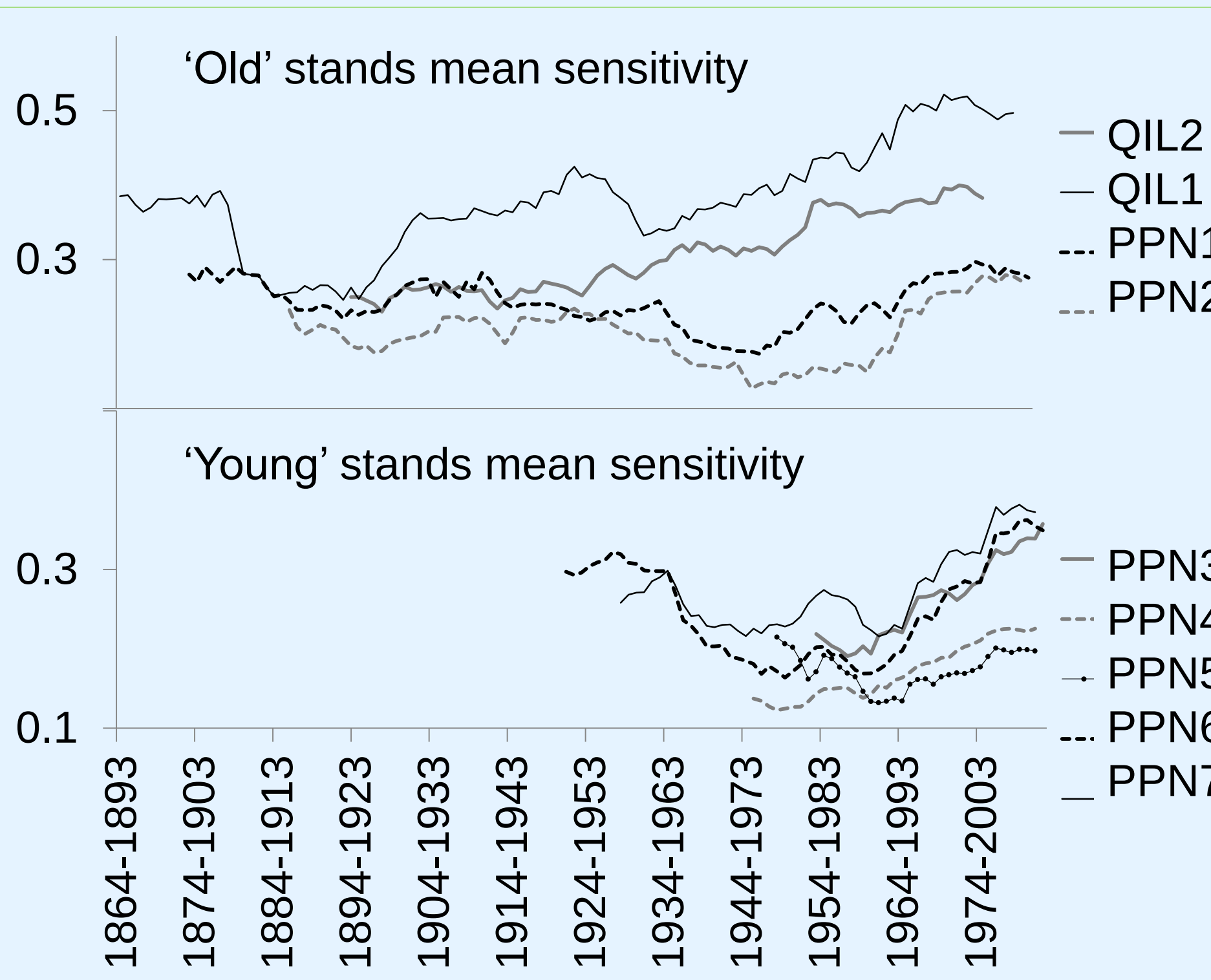
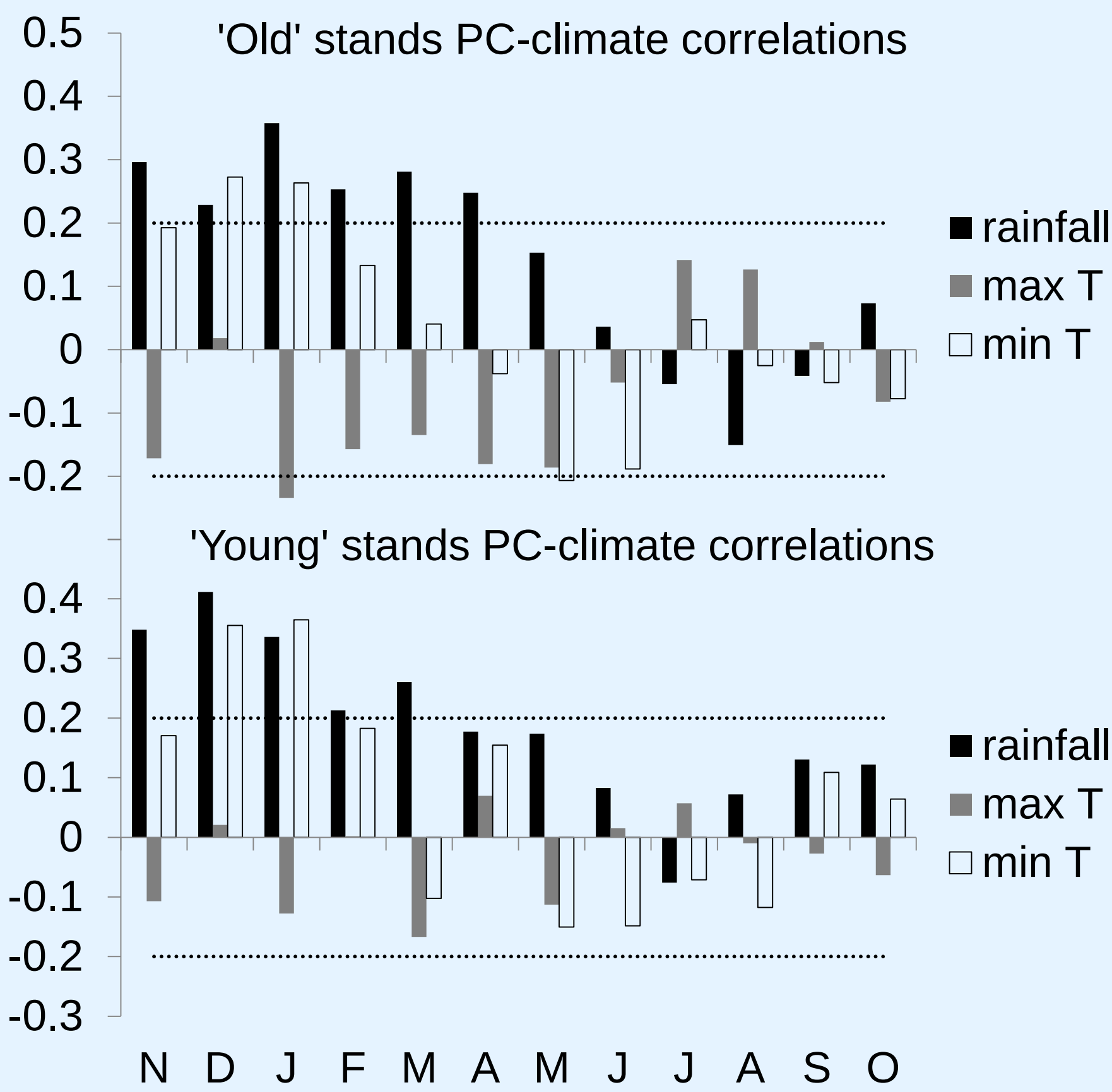
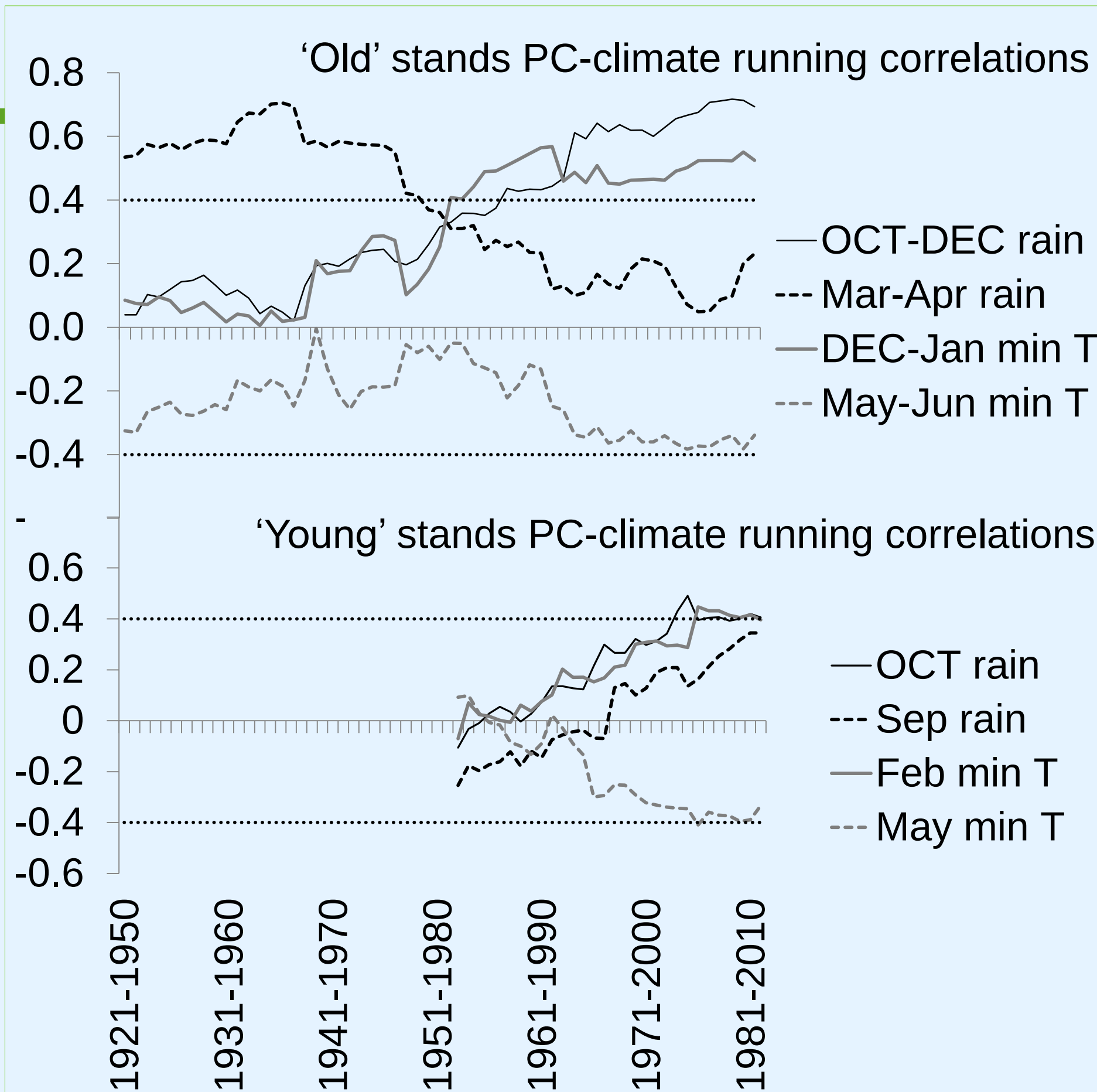
PPN3
PPN4
PPN5
PPN6
PPN7

4 Results



Principal component analysis of the age clusters

		Time span	% of variance
'Old' stands	1st PC	1894-2006	63
'Young' stands	1st PC	1953-2011	66



5 Concluding remarks

The principal component of all chronologies indicates a common climatic signal.
Water availability is the limiting factor for tree growth.
The response of growth to climate is influenced by the age of the trees.
The non-stationary response of growth to climate suggests some physiological adjustment to climate change.
The enhanced growth synchrony among stands suggests that climate has become more limiting for tree growth.