

# Soil properties affect pinyon pine-juniper response to drought

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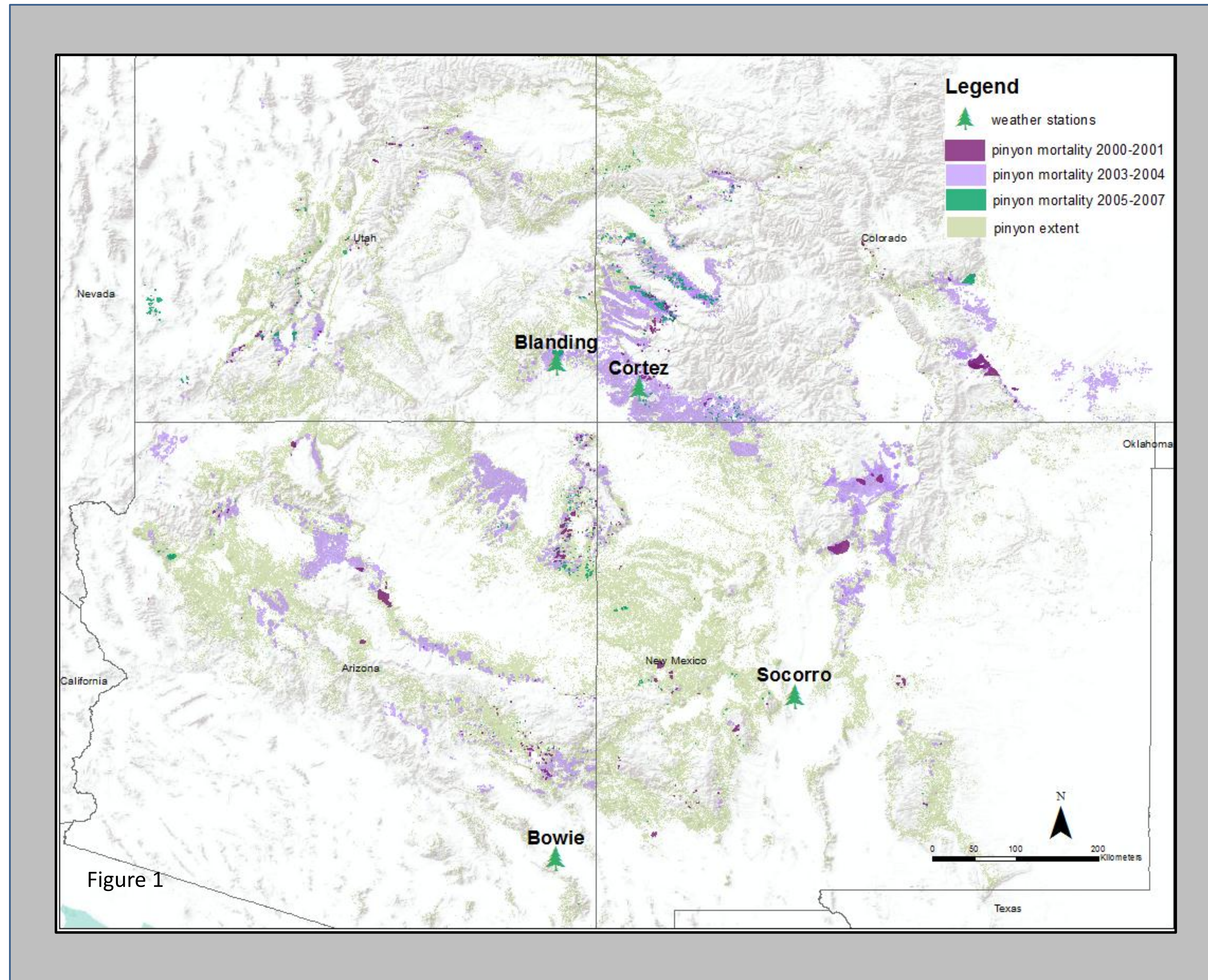


Figure 1. Map of the area where pinyon pine and juniper species occur together (green) indicate that mortality since the turn of the century was highest in the period 2003-2004 (US Forest Service, 2008).

Figure 2. Simulations with repeated climatic sequence (1985-2005) show leaf area index (LAI) increasing with stand age to peak at 1.5 at Cortez, Colorado with available soil water storage set at 50 mm. Interannual variation in gross photosynthesis, here expressed as a percent of maximum, showed minimum variation until LAI > 1.2.

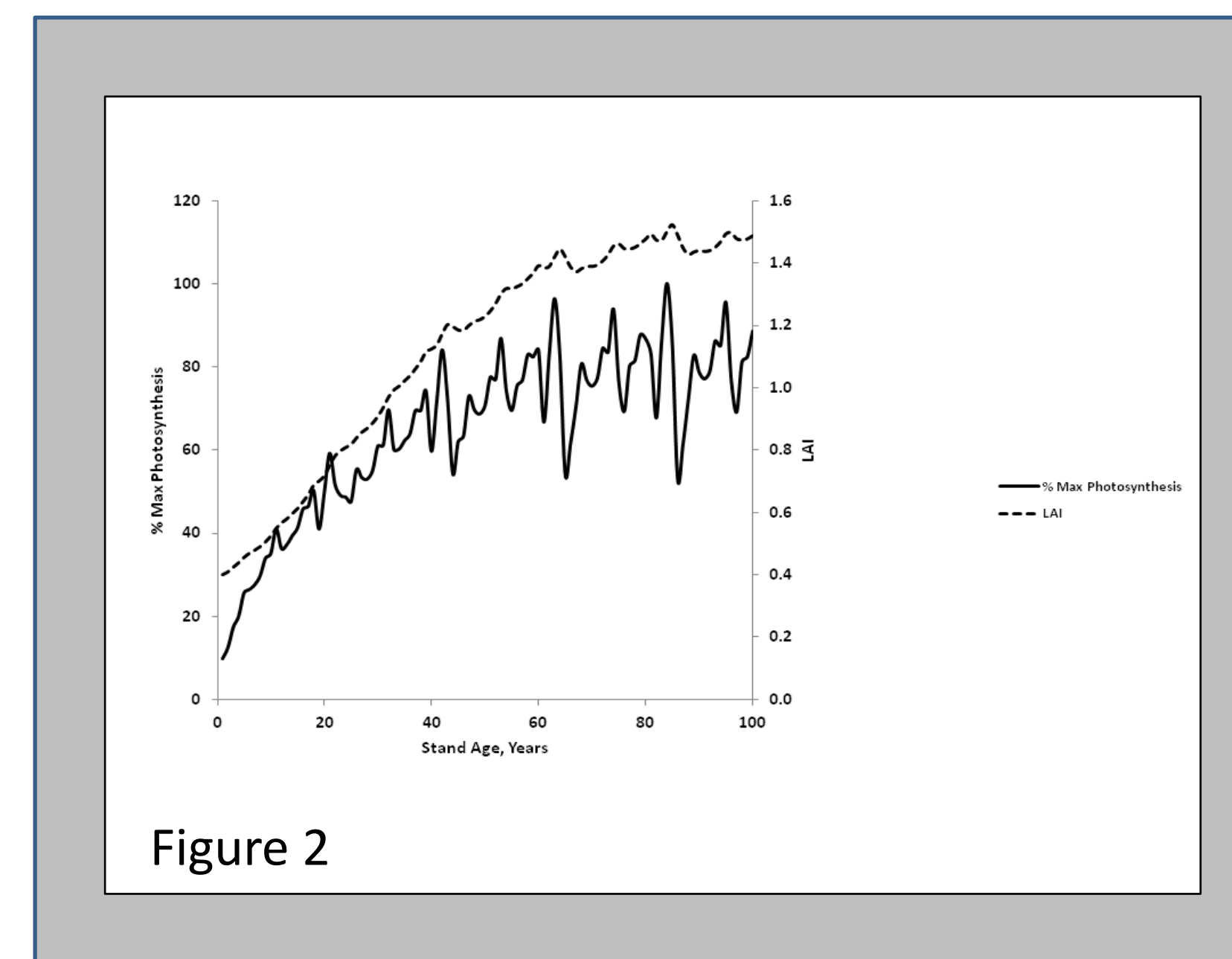


Figure 2

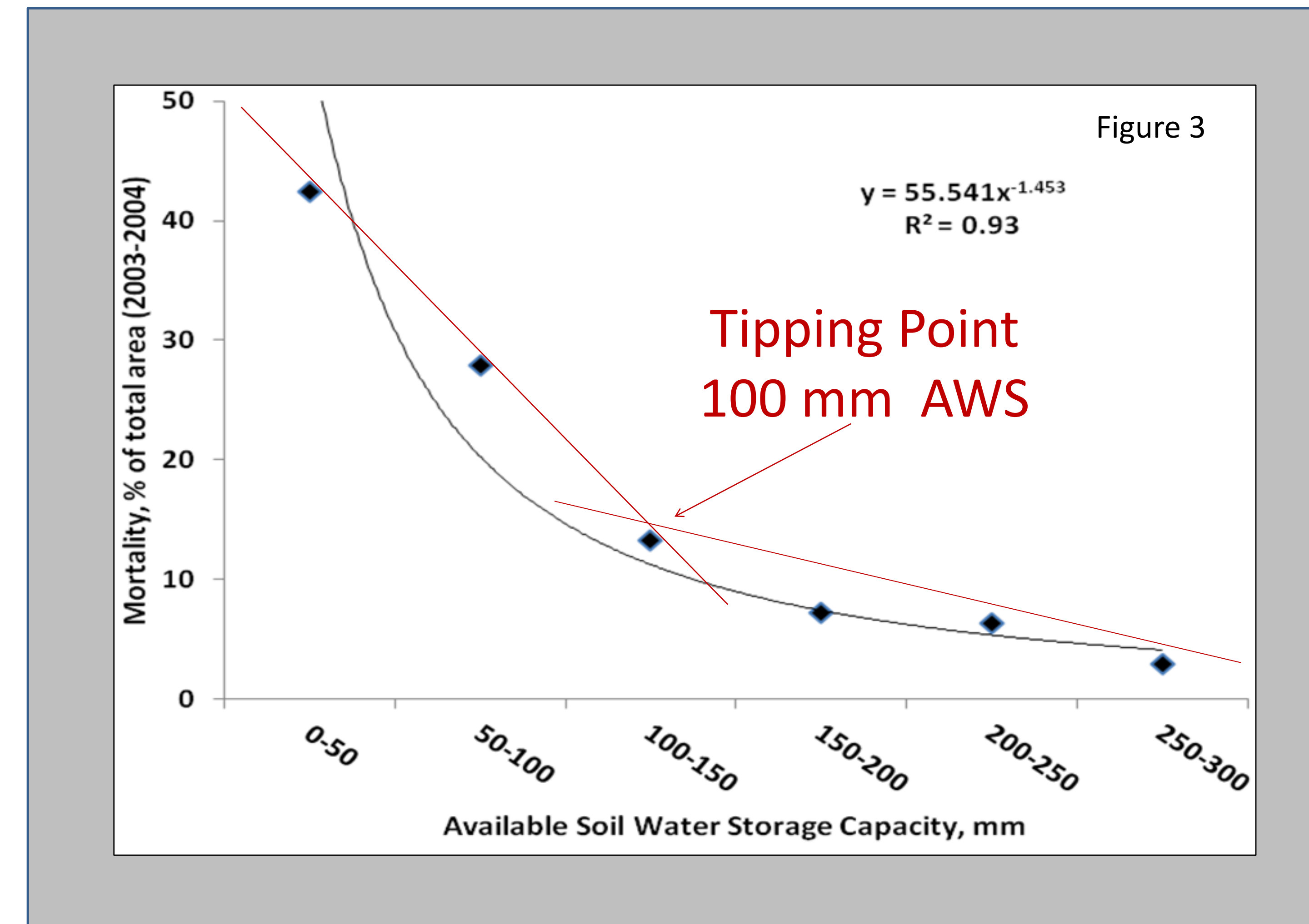


Figure 3 Graph of the relation between six mapped classes of available soil water holding capacity ( $A_s$ ) and the percentage of total area recorded with mortality in the period 2003-2004.

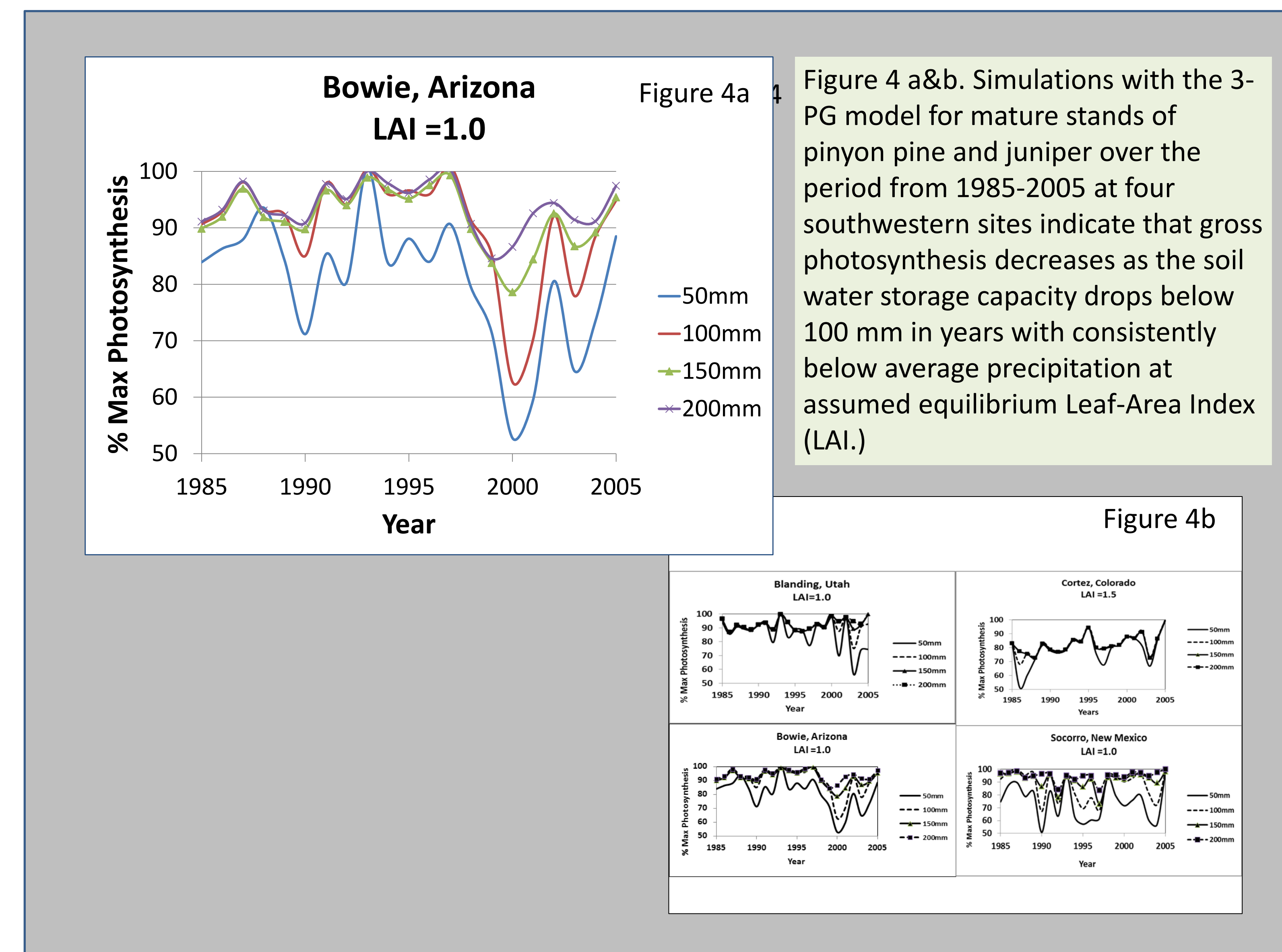


Figure 4 a&b. Simulations with the 3-PG model for mature stands of pinyon pine and juniper over the period from 1985-2005 at four southwestern sites indicate that gross photosynthesis decreases as the soil water storage capacity drops below 100 mm in years with consistently below average precipitation at assumed equilibrium Leaf-Area Index (LAI.)

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