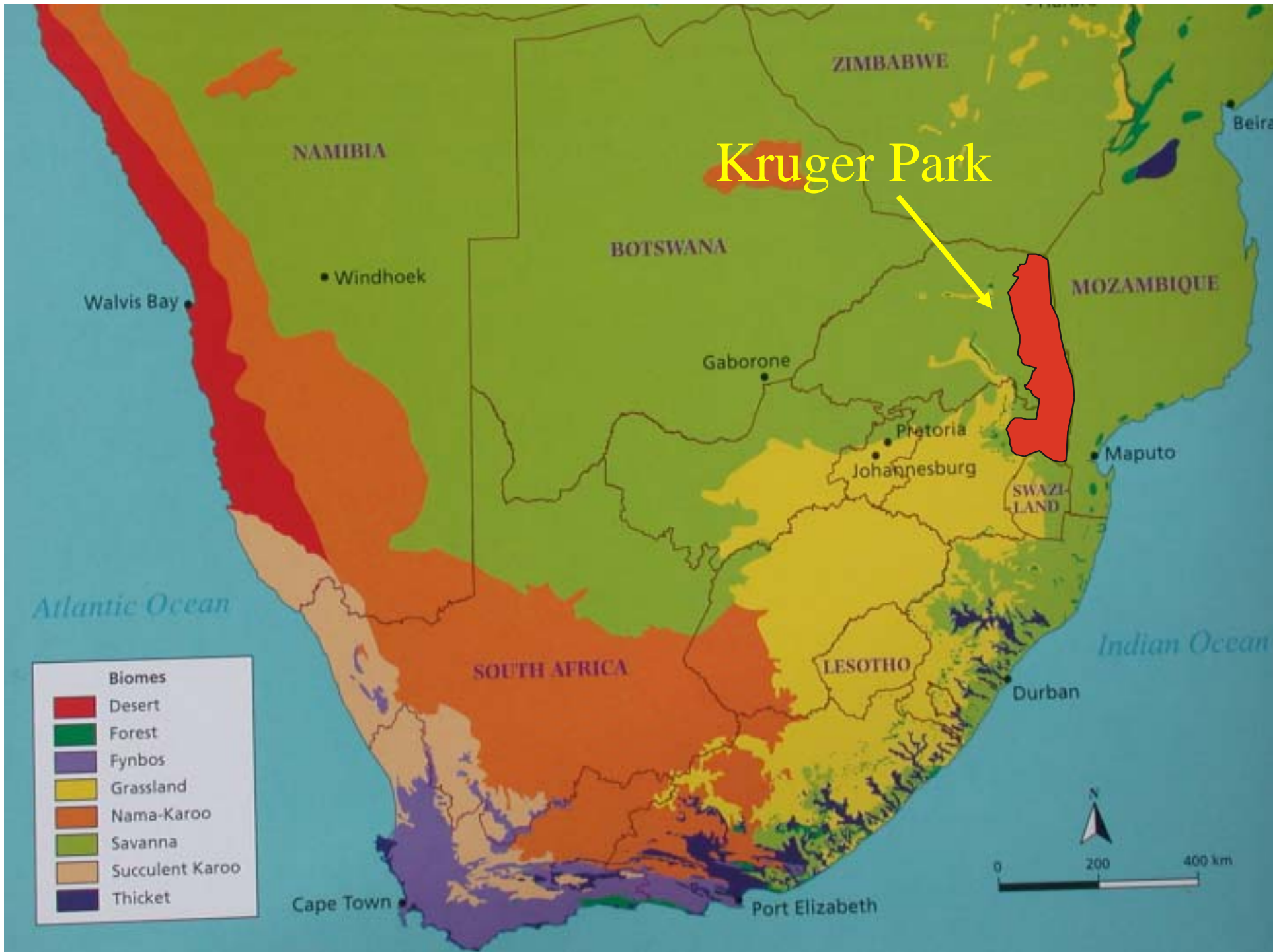


Tree size and water source. Are different sized trees using different water sources

Edmund February, William Bond, Steve Higgins, Mathew Britton, & Rob Taylor



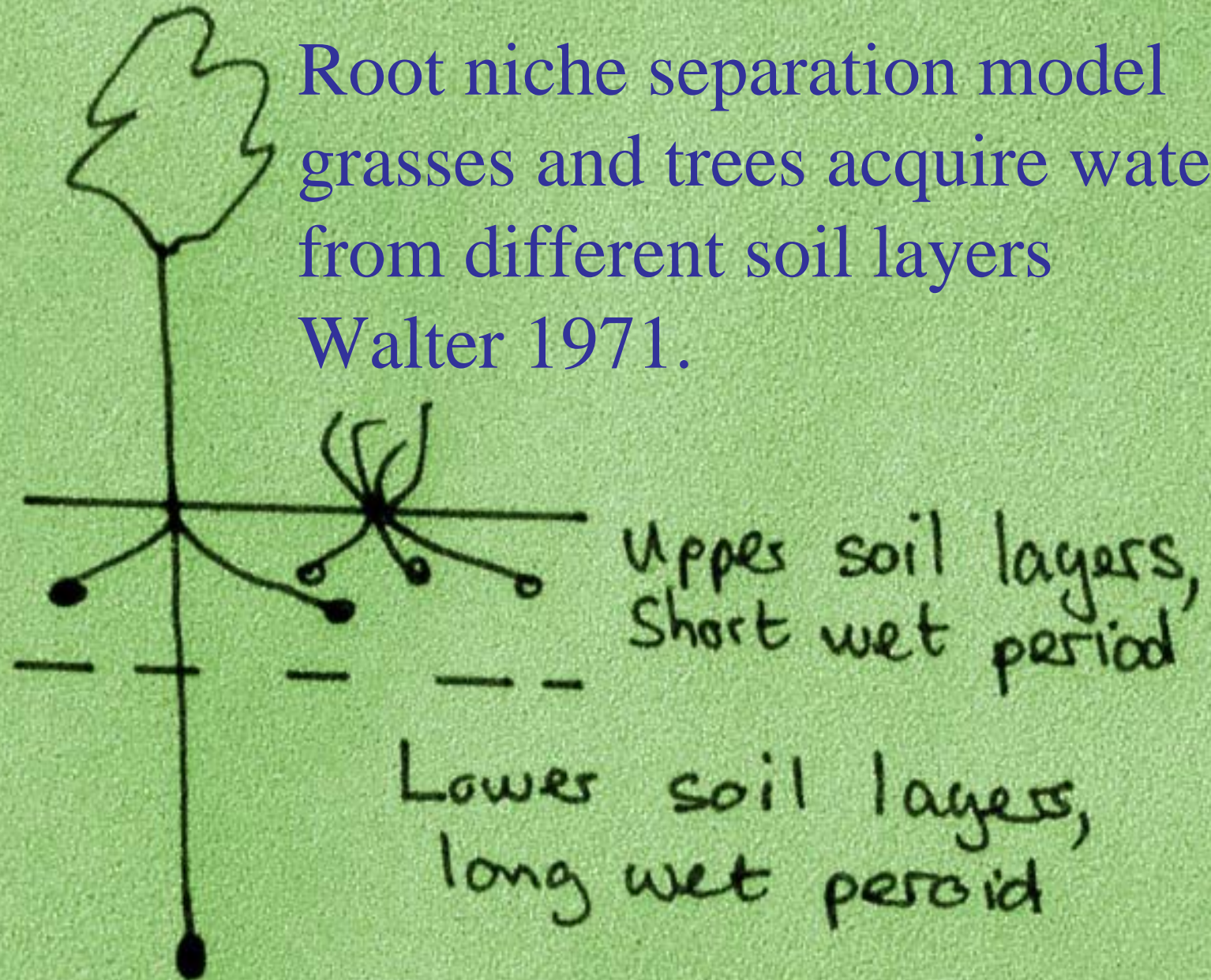
Department of Botany
University of Cape Town

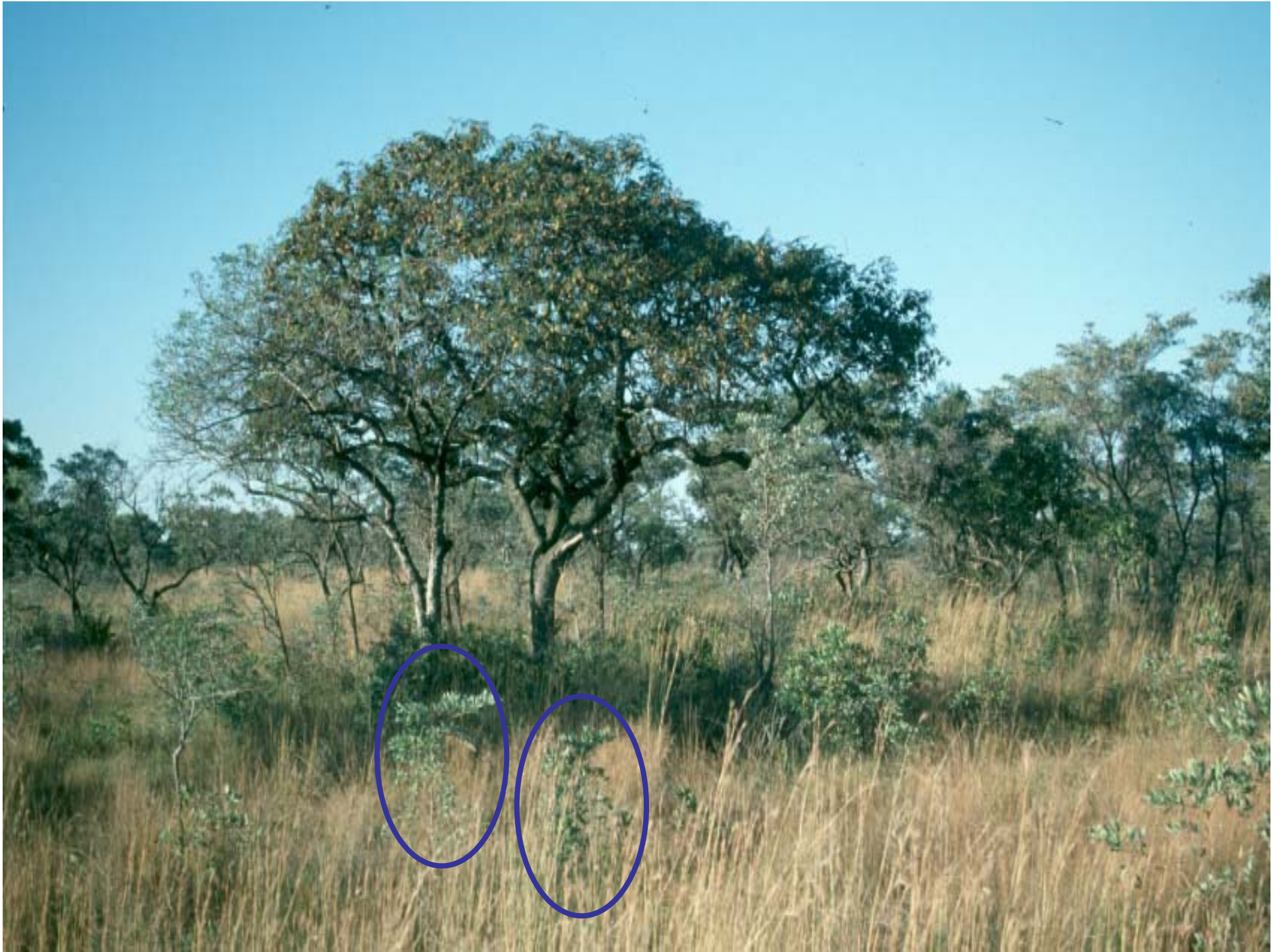




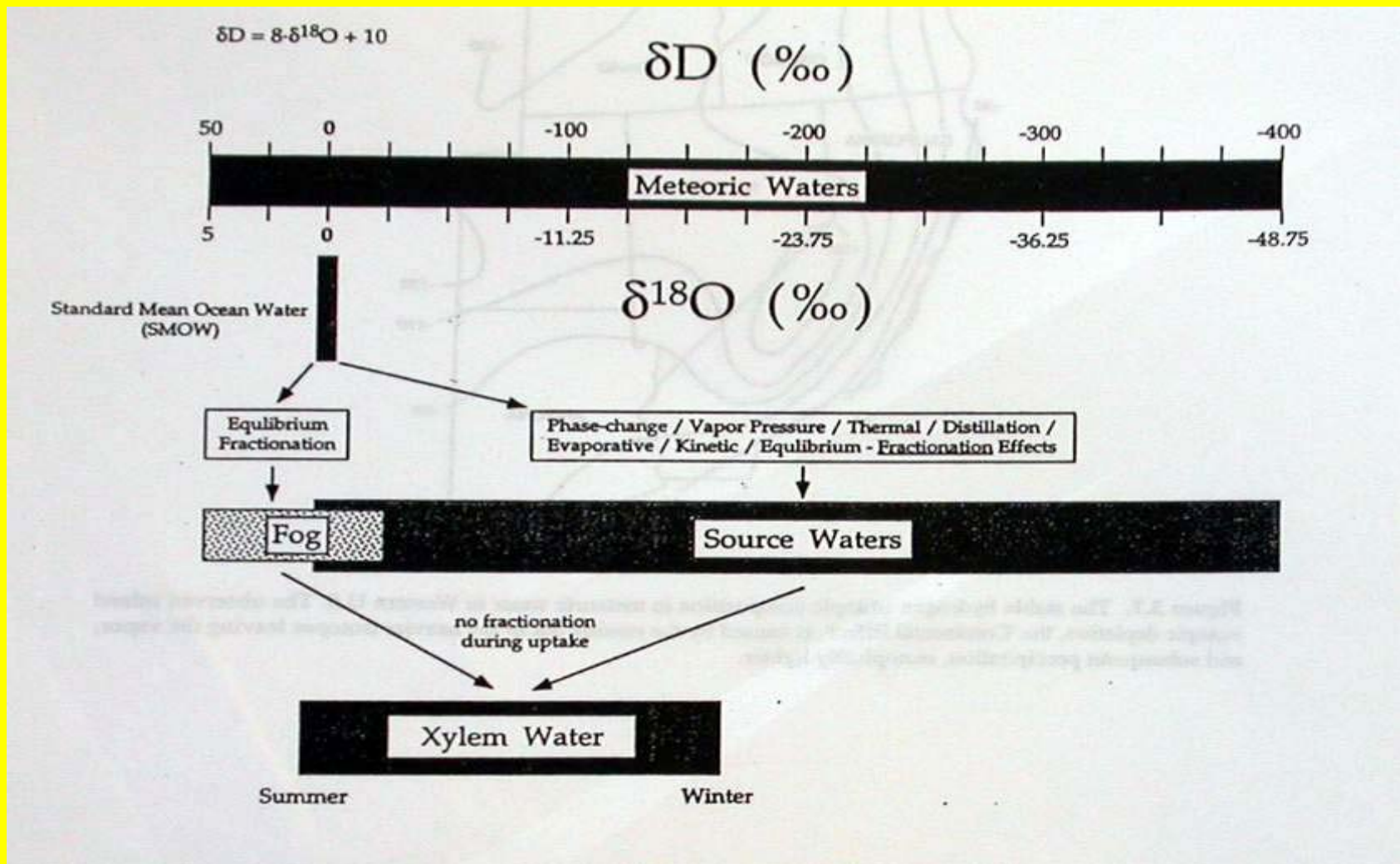
Sarmientos 1984
“savanna question”

Root niche separation model
grasses and trees acquire water
from different soil layers
Walter 1971.

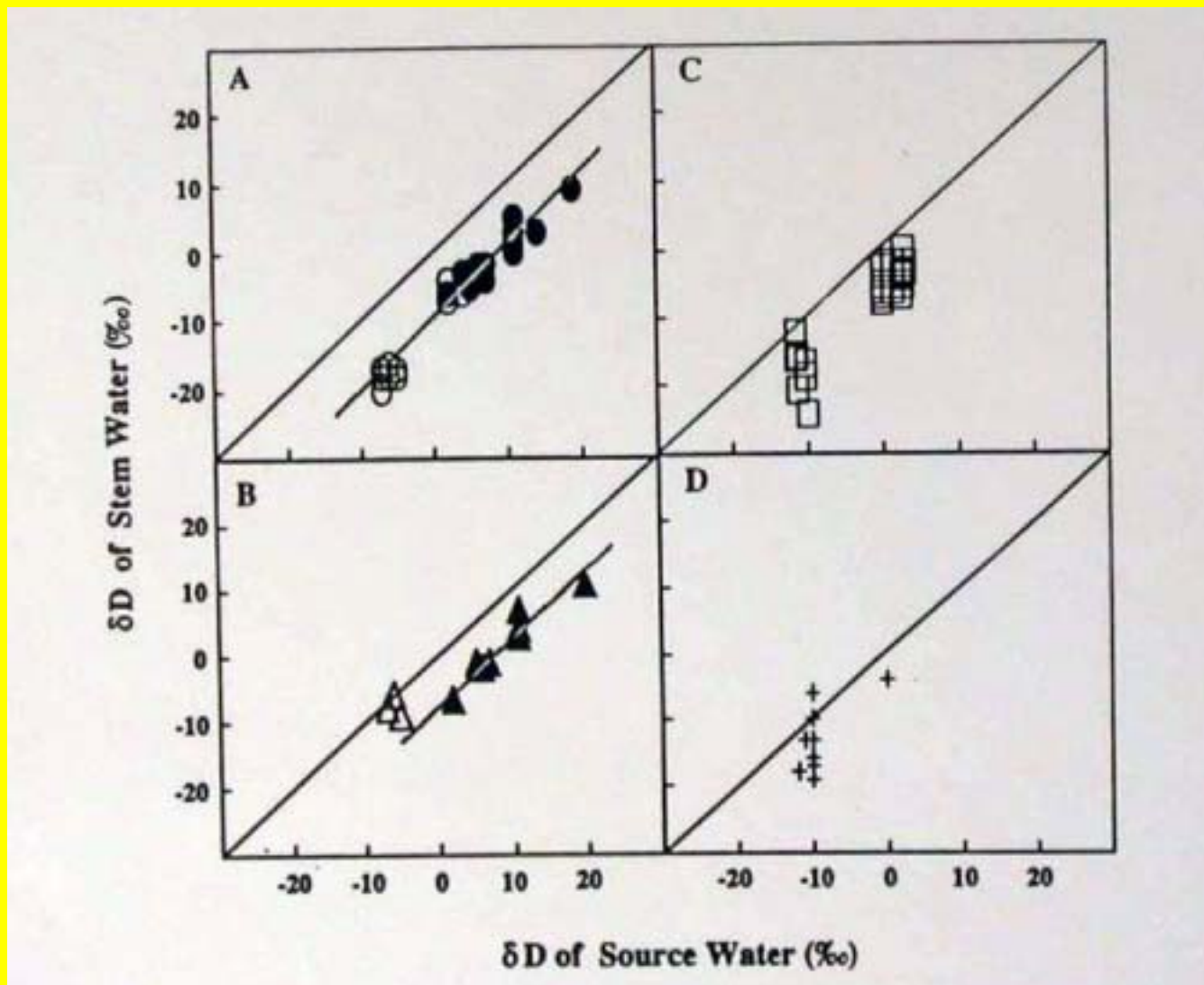




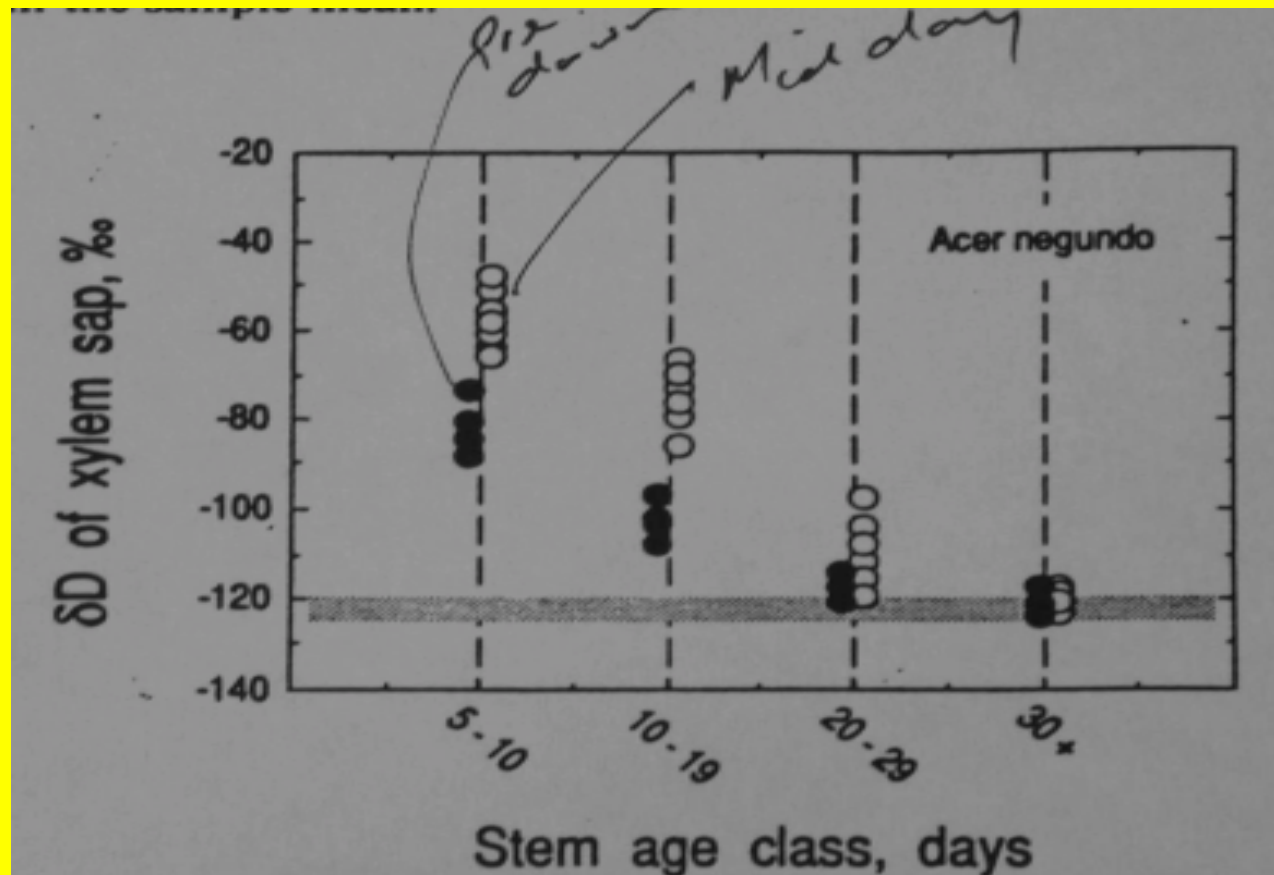
Using Hydrogen and Oxygen Isotope ratios it is possible to determine the water source of plants

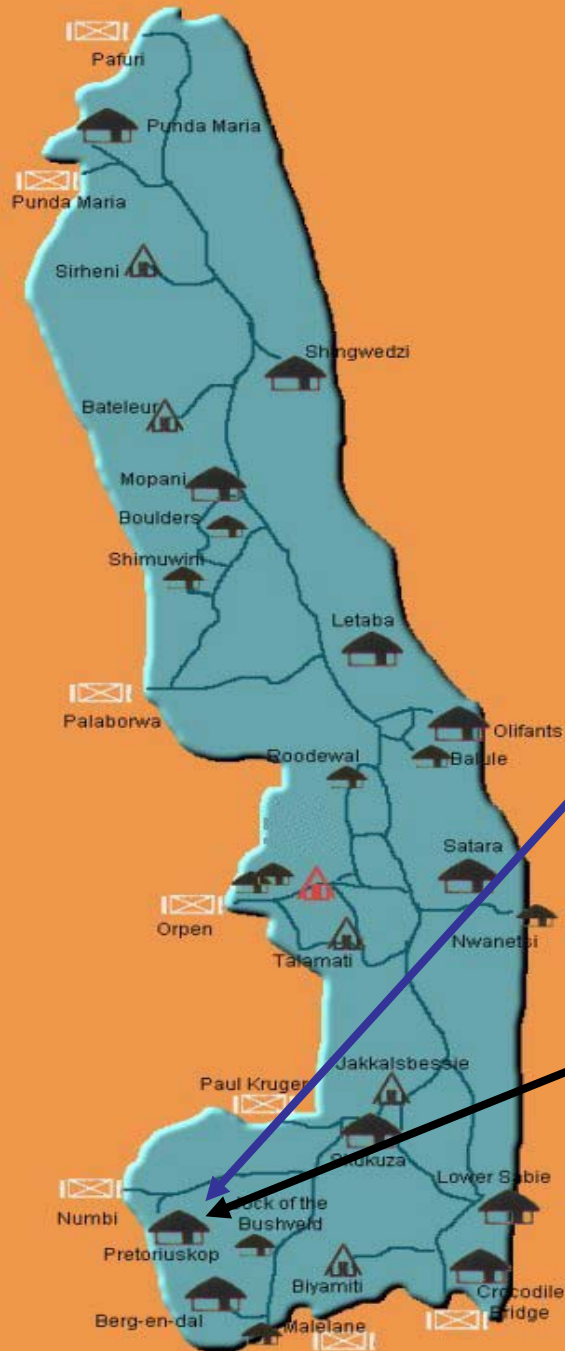


What happens when the water is taken up by the plant?



What this means is that sap water in plants is a direct reflection of the source water of the plant

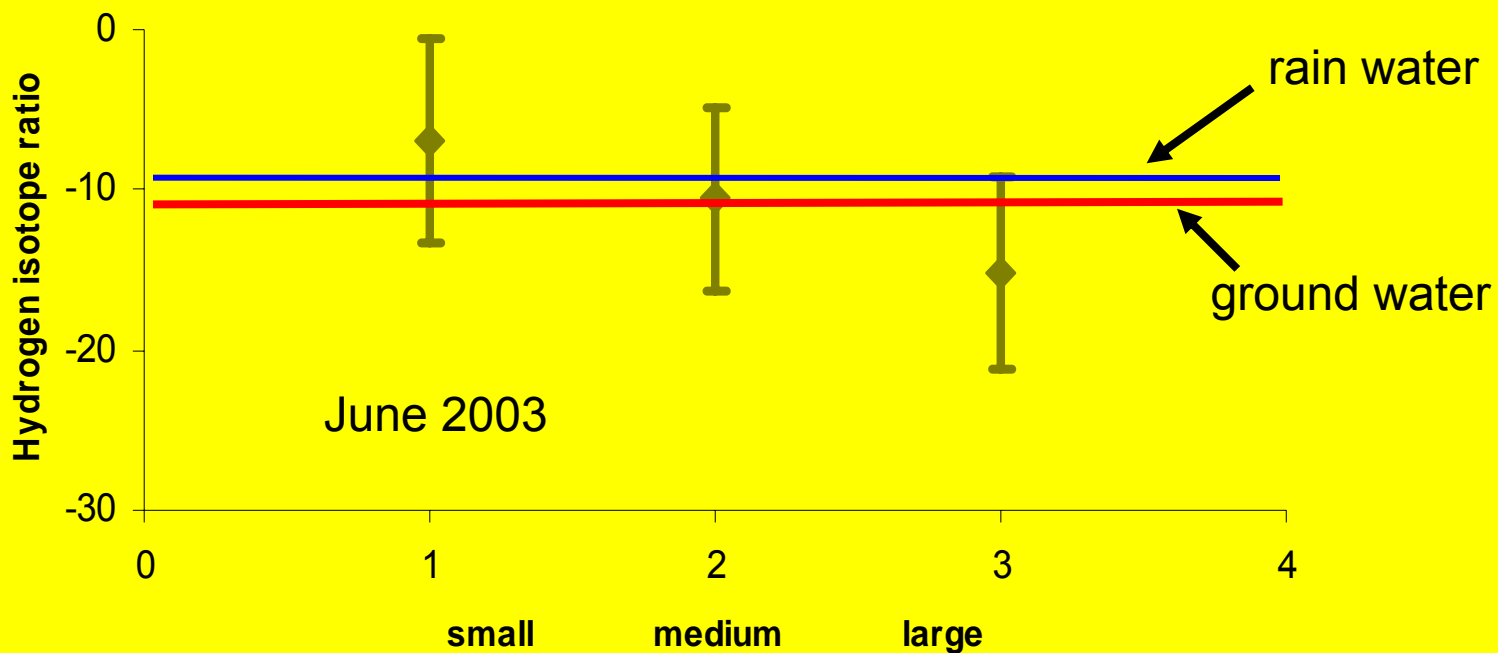




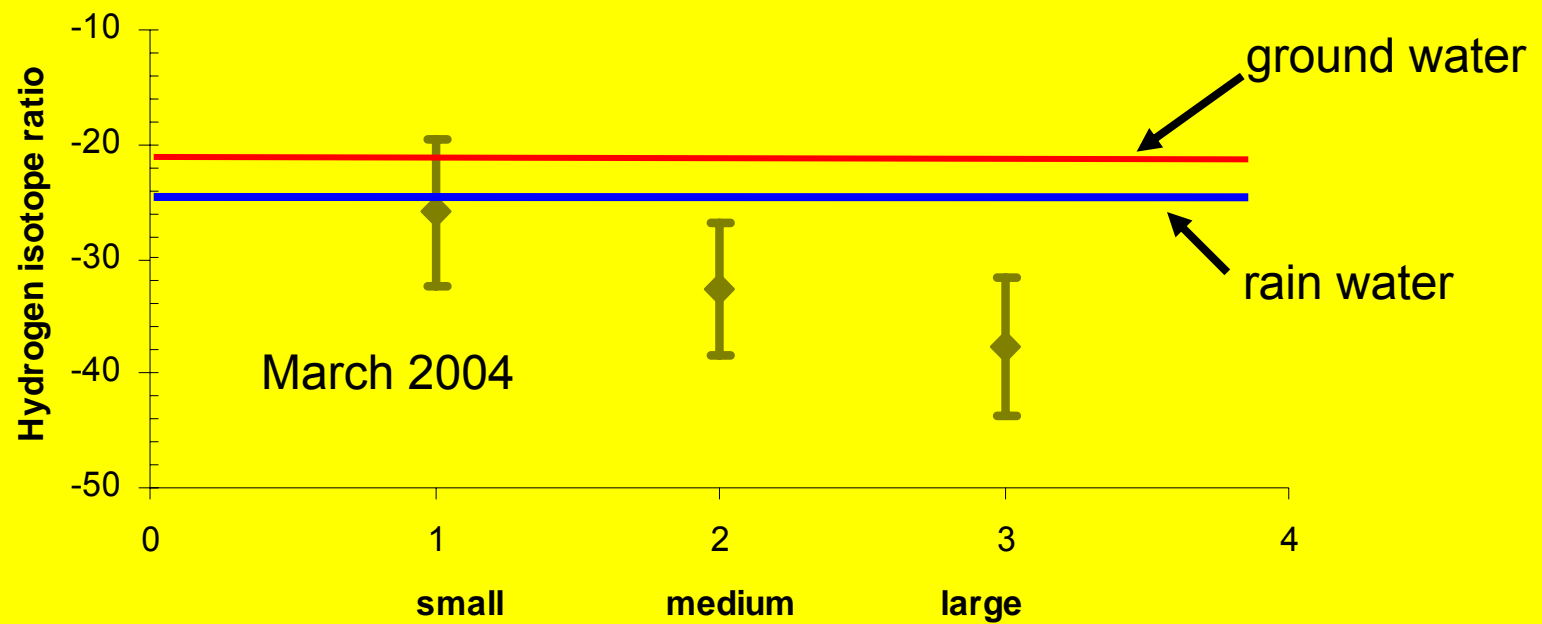
Collected both rainwater and groundwater from Pretoriuskop.

Sampled *Terminalea sericea* during the dry season of 2003 and both wet and dry seasons of 2004.

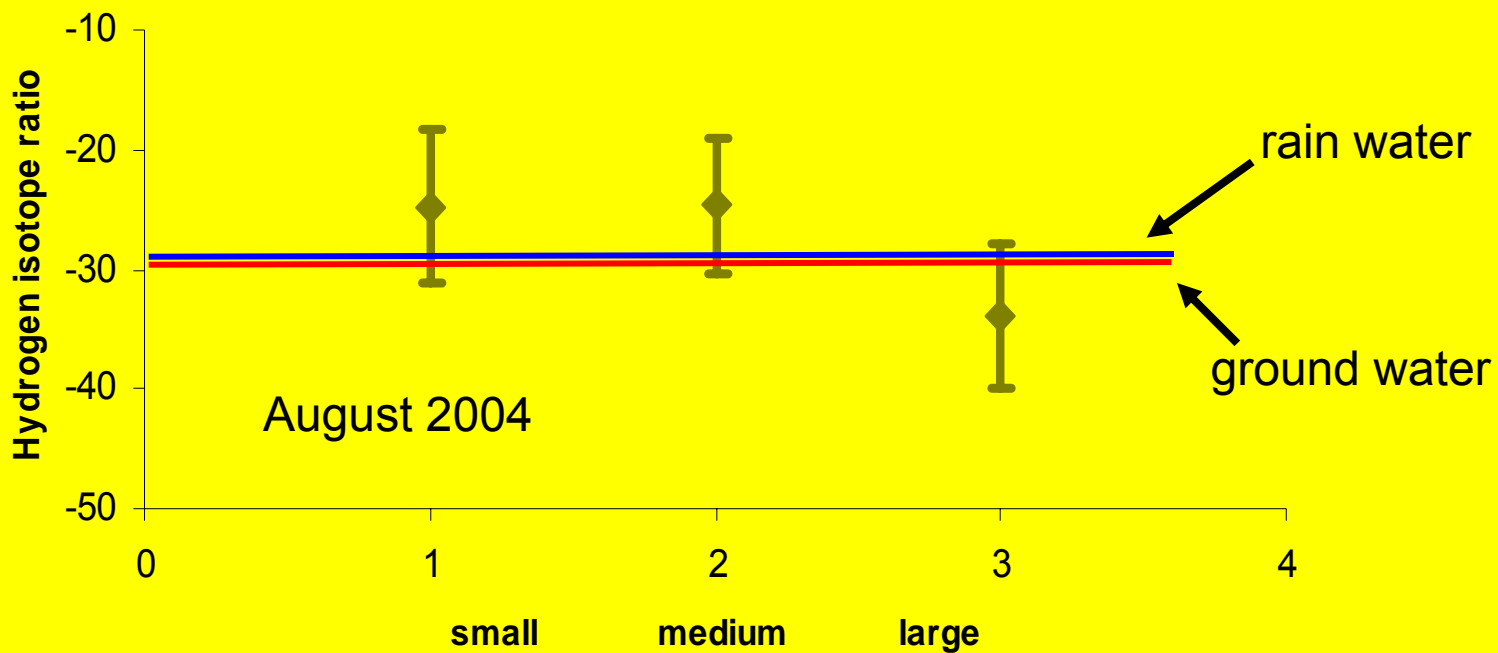
δD Results for rain water, groundwater and three size classes of *T. sericea*.



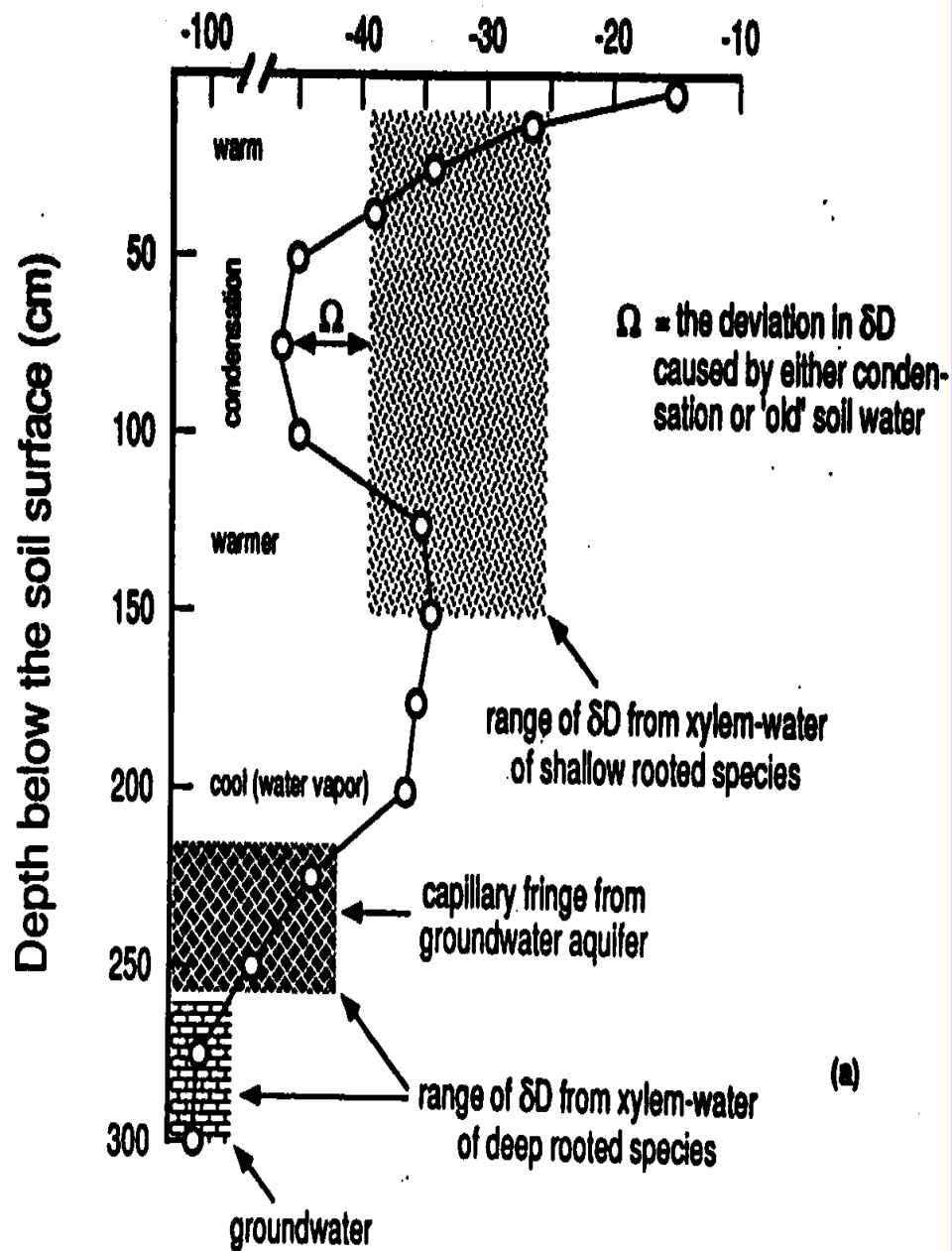
δD Results for rain water, groundwater and three size classes of *T. sericea*.



δD Results for rain water, groundwater and three size classes of *T. sericea*.



Hydrogen isotopic composition of soil water (‰)



(a)

Mean δD values for the three size classes for 2003 are;

Small -6.86

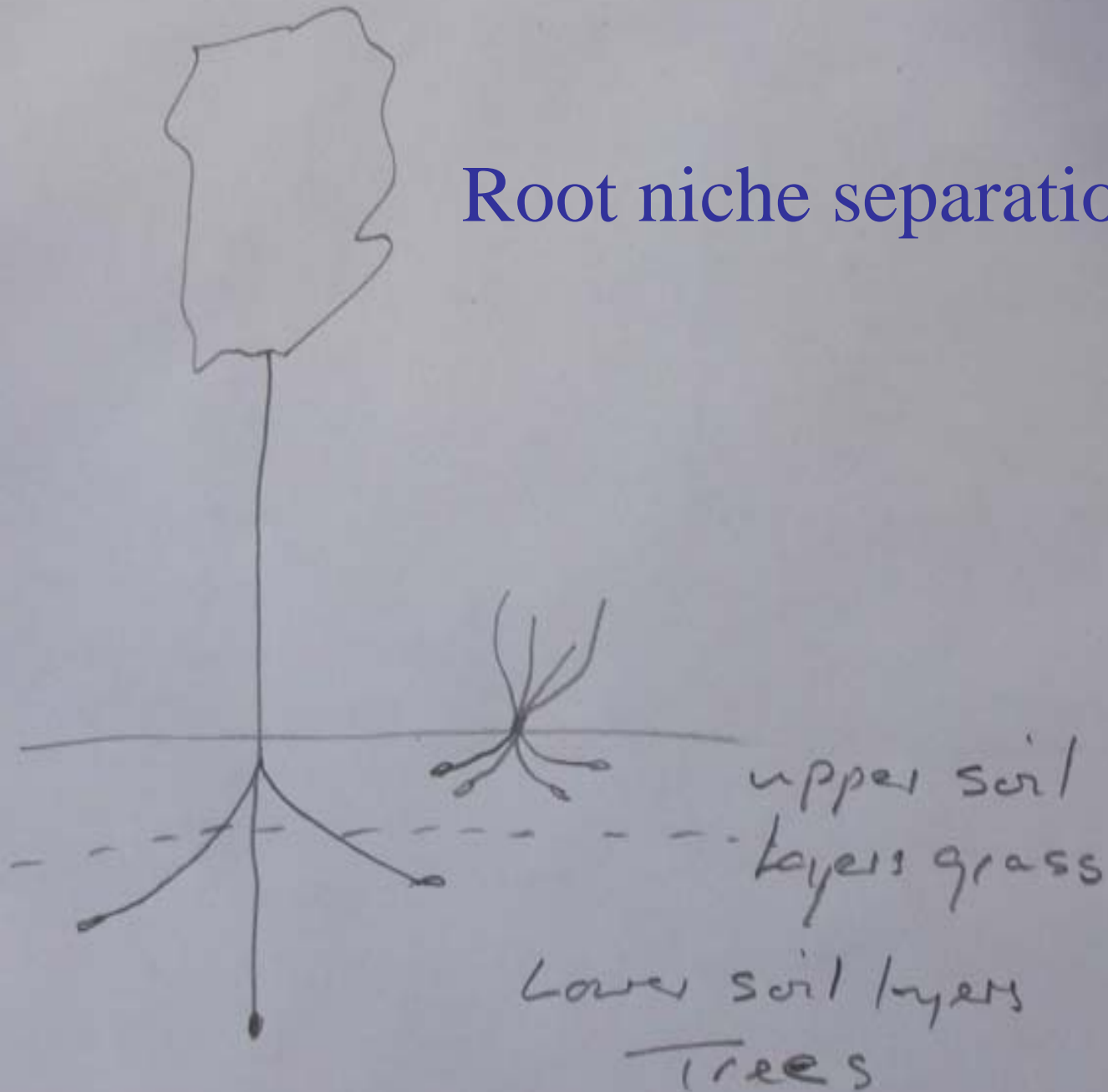
Medium -10.5833

Large -15.2

T-Test shows that the results for the small and big trees are significantly different ($P < 0.001$).

Between small, large and medium these results are not significant.

Root niche separation model



There is competition for water between trees and grasses at establishment stage.





Thanks to everyone
The Mellon Foundation
Kruger and especially Louise
Rademan and the Tree Grass
Program crew here in Kruger