

SAEON Ndlovu Node Mopane Range Expansion Project



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Colophospermum mopane distribution patterns at the southern distribution limit

Bioclimatic models predict that the distribution of the common savanna tree, *Colophospermum mopane* will change dramatically in response to climate change, with the distribution shifting to the east and south. In order to track any future changes in mopane, SAEON is mapping and monitoring blocks along the southern boundary of mopane in Southern Africa to develop a baseline from which future distribution patterns, changes and rates of southward expansion can be determined.

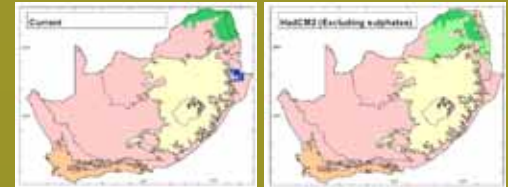


Figure 1: Current *C. mopane* distribution and predicted distribution, worst case scenario HADCM2 (excluding sulphates) (Rutherford et al, 1999).

Methods



Two teams of two people, walked belt transects 25m wide on due north/south bearings, 50m abreast. Waypoints were recorded along the transect at the beginning and end of each stand of mopane. Elevation every 2m was recorded.

To access the role of temperature in *C. mopane* distribution, a predicted temperature surface was created by determining the temperature lapse rates of the area and overlaying the surface onto a local topography map

Results

C. mopane distribution along the southern boundary, on both the granites and basalts, is patchy (fig 2) and shows a strong binomial relationship with elevation (fig 3).

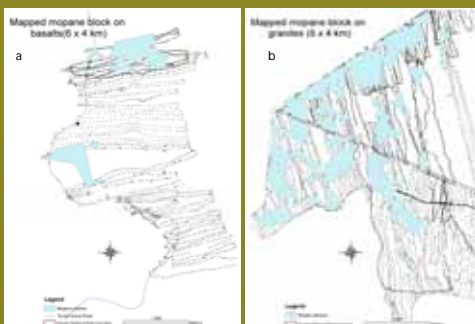


Figure 2: The map of mopane distribution on the southern boundary on the (a) granites, near Orpen Gate and (b) on the basalts, near the Timbivati picnic area

The predicted temperature surface for the coldest month, July, shows *C. mopane* distribution has a strong preference for the warmest parts in the landscape during the coldest periods for both granites and basalts (fig 4).

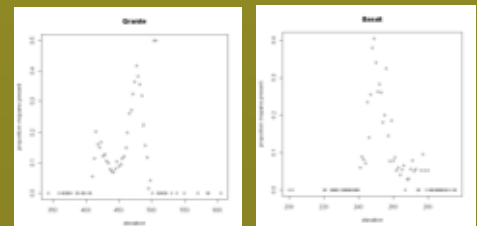


Figure 3: Proportion of *C. mopane* trees occurring across the elevation range. Both sites show a strong binomial relationship between the proportion of *C. mopane* trees and elevation (Logistic regression: basalts ($p < 0.00$, $Z = 25.58$); granites ($p < 0.00$, $Z = -9.25$))

Discussion

- The mapping will be an excellent baseline from which to detect future shifts in mopane distribution.
- The distribution at the southern boundary appears to be closely linked with temperature but is most likely confounded with soil distribution in the landscape.
- Mapping in the center of the distribution will be done to further elucidate this relationship.

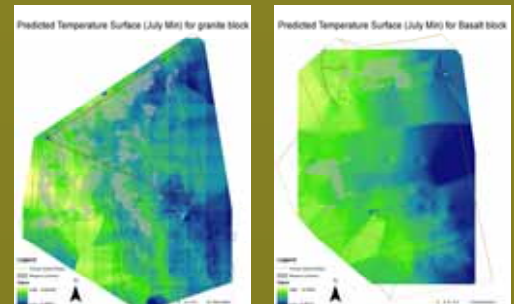


Figure 4: *C. mopane* distribution shows a strong association with areas in the landscape where the warmest minimum temperatures occur

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<http://ndlovu.saeon.ac.z>

