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The Geological Framework and Economic Potential of the Coal-Bearing Karoo Strata in the Central Kalahari Basin, Botswana*

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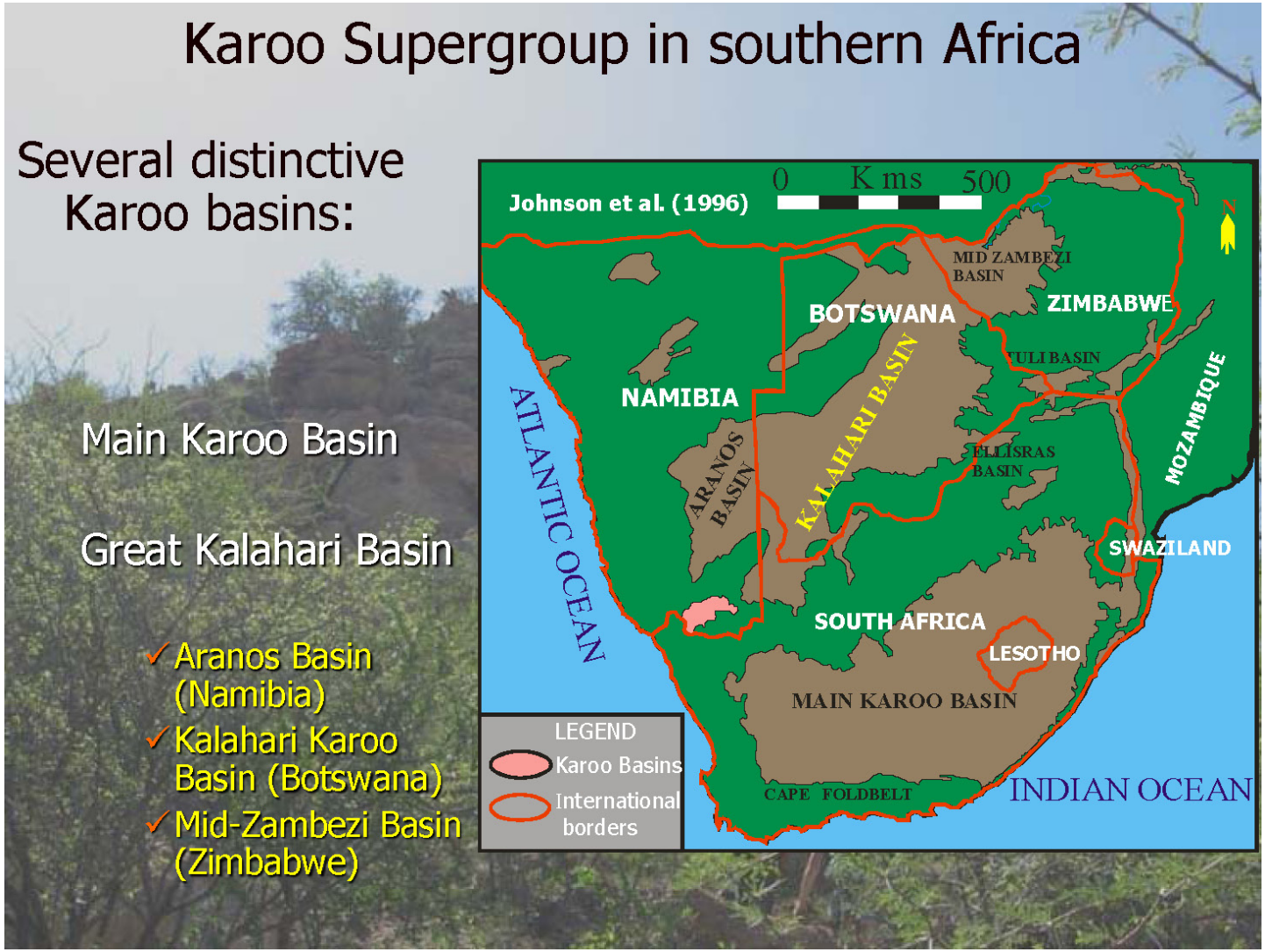
Abstract

The Permian Karoo rocks in Botswana are little known with regards to their regional and local tectonic, climatic and depositional controlling mechanisms, and hence our understanding of the distribution, thickness and lateral continuity of the contained, economically important mineral resources (e.g., coal, coalbed methane, water) is hampered.

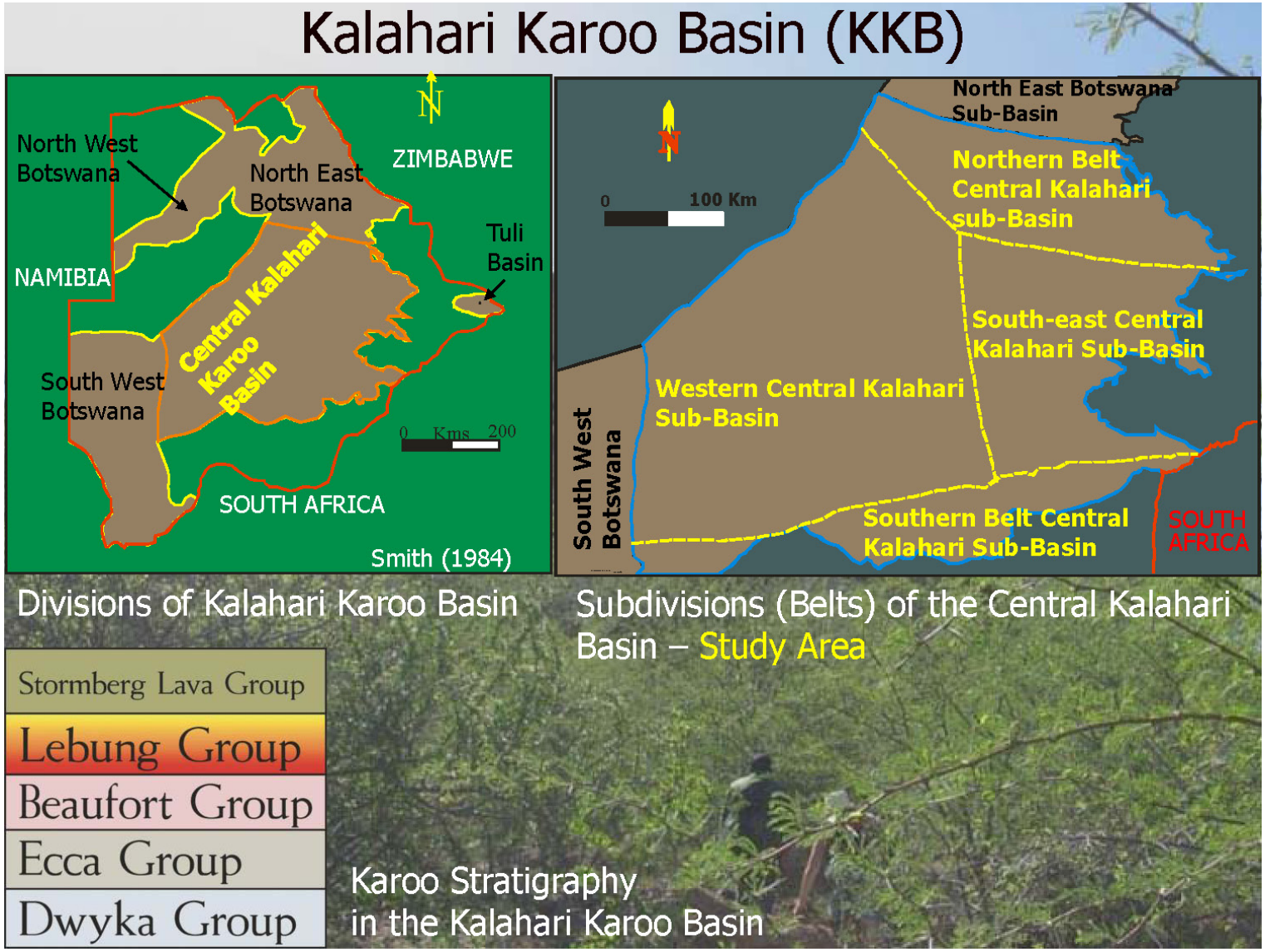
This MSc study of the coal-bearing Karoo strata in the Central Kalahari Sub-basin attempts to work out the dynamics of coal depositional environments, in particular the forces responsible for changes in the accommodation space (e.g., subsidence vs. sedimentation rates). This is hoped to be achieved by a detailed review of the temporal and spatial stratigraphic variation of the coal-bearing successions, including the analysis of facies changes based on over 800, widely distributed borehole records (e.g., core descriptions, gamma and spontaneous potential logs), field observations and palaeocurrent measurements. Utilizing RockWorks®, the subsurface data will be processed and results expressed in form of multi-log plots, cross-sections for correlation purposes (e.g., fence diagrams) and various maps (e.g., clastic to coal ratio contours, coal seam and sandstone isopach maps).

It is hoped that the results will lead to the development of regional tectonic and depositional models for the Permian Botswana Karoo sequences which will likely further enhance the exploration, exploitation and management of economic resources, especially that of coal, in the study area. Furthermore, it is anticipated that our results will be applicable as guidelines for future coal and stratigraphic correlation studies of the Permian Karoo strata in southern Africa.

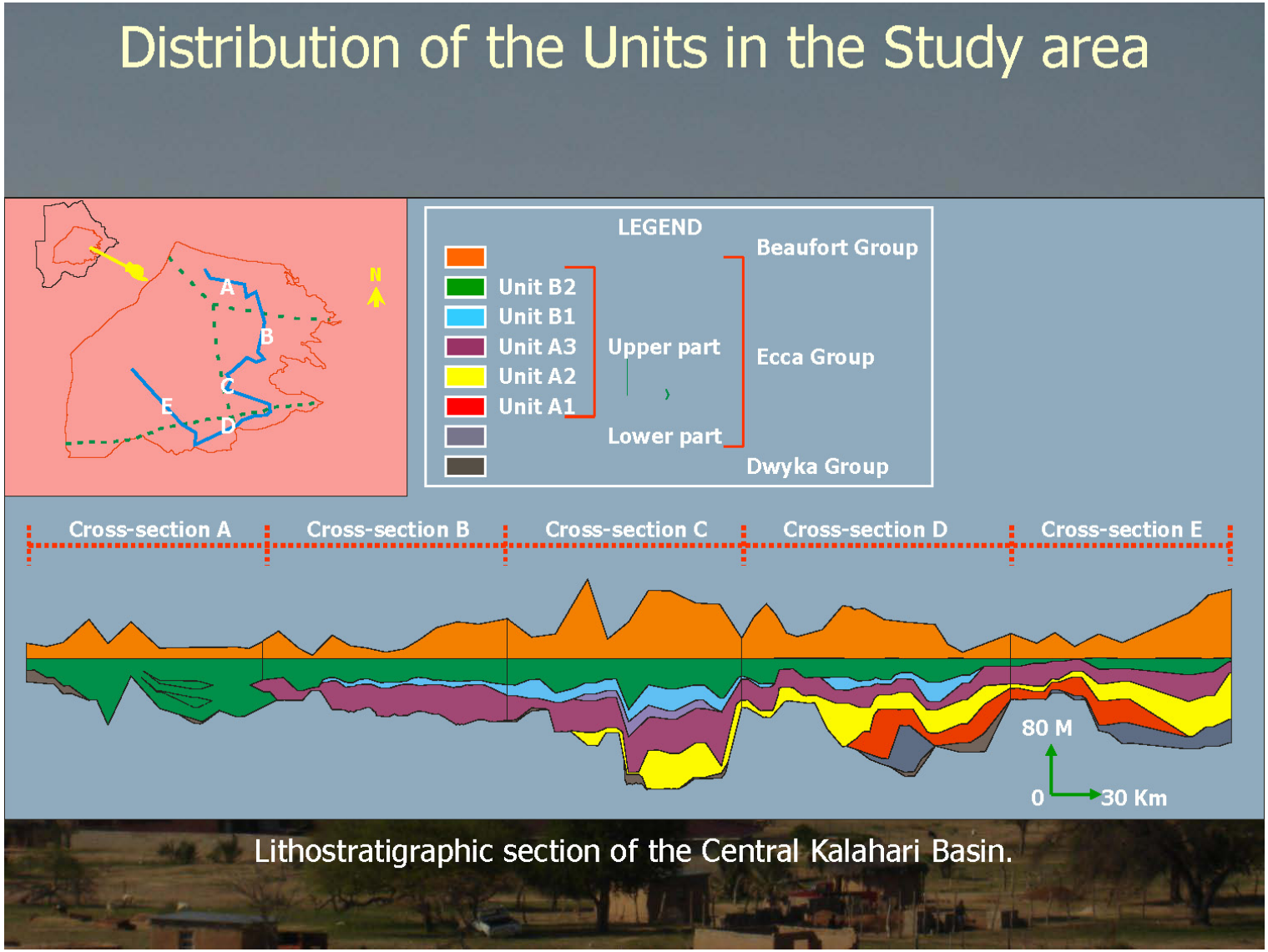
Selected Figures



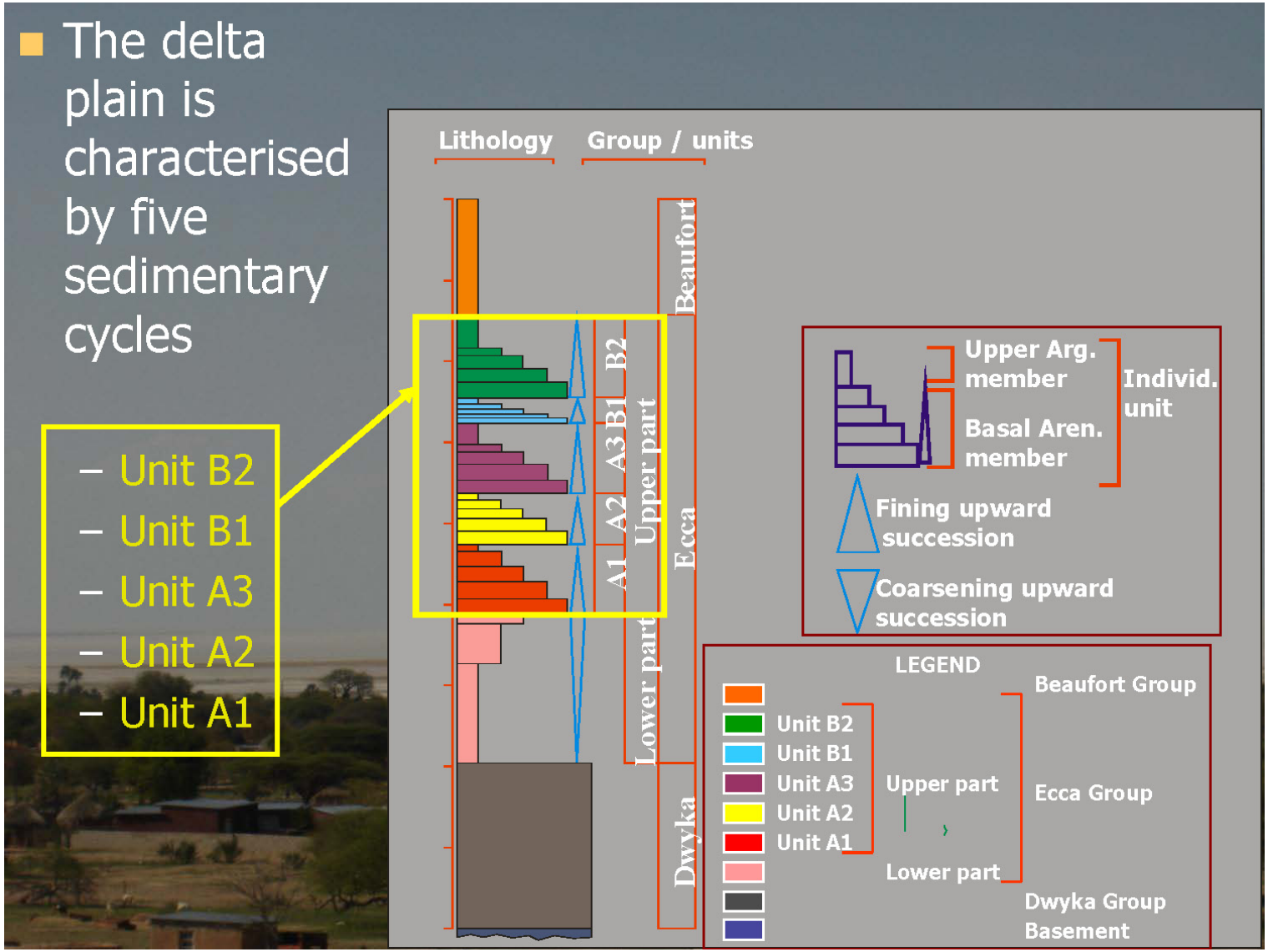
Slide 3. Location of the Karoo Supergroup in Southern Africa.



Slide 4. Subdivisions of the central Kalahari Karoo Basin (study area).



Slide 17. Distribution of the stratigraphic units in the study area.



Slide 23. Delta plain deposits are characterised by five sedimentary cycles.

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