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DYNAMICS OF SOME PARABOLIC DUNES  
IN THE MANAWATU REGION,  
NEW ZEALAND

A thesis presented in partial fulfillment  
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## **Abstract**

Parabolic dunes are U-shaped dunes which may be found in deserts and coastal locations around the world. They occur along much of the coastal area of the West Coast of the North Island of New Zealand, including the Manawatu Region. The parabolic dunes of the Manawatu coast comprise the largest parabolic dune fields in New Zealand.

This research was conducted to identify the rates of movement of the parabolic dunes, and establish whether there is a relationship between parabolic dune development along the Manawatu coast and El Nino Southern Oscillation. Morphological changes in parabolic dunes over time are also examined, and a model of parabolic dune development which deals specifically with the parabolic dunes of the Manawatu coast is produced.

Examination of the parabolic dunes was conducted by ground surveying using Global Positioning System (GPS) and through the use of aerial photographs and aerial photograph mapping.

Rates of parabolic dune migration along the Manawatu coast were found to be significantly higher than has been recorded elsewhere in the world. By examining the wind regime and the El Nino Southern Oscillation, and comparing these with parabolic dune migration a pattern of increased parabolic dune activity under El Nino conditions was identified. A pattern of parabolic dune formation from blowout initiation through to parabolic dune maturity was identified and a model for parabolic dune development along the Manawatu coast designed.

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