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Adrian's interest in this field grew, somewhat paradoxically, out of a visit to South Africa in 1976, the purpose of which was to study coastally trapped lows in the ocean. During a boating expedition he experienced first-hand the strong winds associated with coastally trapped atmospheric lows and decided thereupon to unravel some of their mysteries.

Shallow coastal lows regularly develop and propagate anti-clockwise around the southern African coast. They occur at all times of the year and pass a given coastal station approximately once every six days. They are characterized by sudden wind changes of up to approximately 20 m s^{-1} and with a brief drop of the low level inversion from its usual height of approximately 900 mb down to near sea level.

Adrian described a non-linear, potential vorticity equation model from which he obtained Kelvin wave solutions that reproduced many of the observed features of the coastal lows. Kelvin waves propagate only in one direction. In the southern hemisphere this direction is with the coast to the left. For a coast oriented like southern Africa, Kelvin waves would therefore travel anti-clockwise around the coast, as do the observed coastal lows. The observed lows travel at about 6 m s^{-1}, which is approximately the speed of the synoptic-scale disturbances, so the coastal lows can be regarded as Kelvin waves forced by the synoptic-scale flow.

Adrian then turned to the question of the relationship between coastally trapped lows and the 'Southerly Buster' of coastal New South Wales. Both are characterized by large and sudden wind changes; and the basic balance of forces is the same, namely, they are both flows trapped against the coastal highlands by coriolis forces. However, whereas the coastal lows act like forced Kelvin waves travelling along the inversion interface, the 'Southerly Buster' is a trapped density current.

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