Utilising Wilsons Promontory weather and climate data to develop a long-term climatology of Deal Island

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1. INTRODUCTION

1.1 *Location*

Deal Island is part of the Kent Group of islands, located in Bass Strait, between Wilsons Promontory, the southernmost point on the Australian mainland, 80 km to the northwest, and Flinders Island, 80 km to the southeast.

Source: http://www.collinsmaps.com

2. ANALYSIS

2.1 *Methodology*

A long-term climatology for Deal Island was developed via a set of regression relationships, which were established between the (relatively short-term) Deal Island and the (relatively long-term) Wilsons Promontory weather and climate data sets.
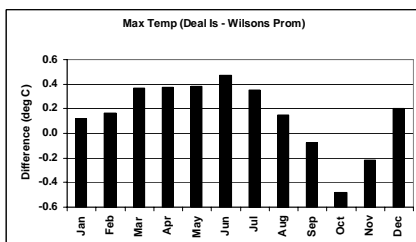
2.2 *Maximum temperature*

For example, a regression relationship was established between Deal Island mean monthly maximum temperatures (February 1984 to June 1998 - the complete set of available data) and corresponding Wilsons Promontory mean monthly maximum temperatures, sine(month), cosine(month), sine(2*month), and cosine(2*month):

Deal Is Max=3.59+0.79*Wilsons Prom Max+0.80*sine(month)

*+0.35*cosine(month)+0.11*cosine(2*month)+0.01*cosine(2*month)*
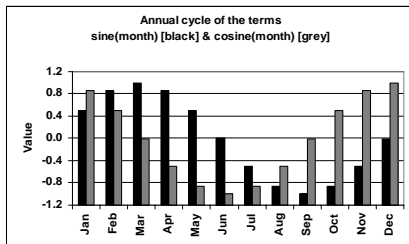
The Deal Island seasonal maximum temperature cycle lags that of Wilsons Promontory. To illustrate, the mean monthly maximum temperatures during spring are slightly lower at Deal Island than at Wilsons Promontory, and slightly higher at Deal Island than at Wilsons Promontory during the other seasons. This may be attributed to a greater thermal inertia influence of Bass Strait upon the more highly exposed Deal Island. This lag in Deal Island's seasonal temperature cycle was reflected in both the cosine(month) and sine(month) regression coefficients being highly significant and positive.

2.3 *Minimum temperature*

A regression relationship was then established between Deal Island mean monthly maximum temperatures and corresponding Wilsons Promontory mean monthly maximum temperatures, sine(month), cosine(month), sine(2*month), and cosine(2*month).

The relationship between the Deal Island seasonal minimum temperature cycle and that of Wilsons Promontory is not as significant as that for maximum temperature. To illustrate, none of the terms sine(month), cosine(month), sine(2*month), and cosine(2*month) are significant at the 5% level, although the probability that the cosine(month) regression coefficient (which is -0.13) was achieved that low, or lower, by chance, is 5.47%.
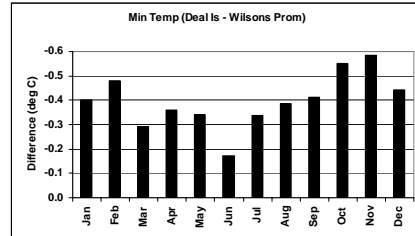

Aerial view of Deal Island Lighthouse
Photograph: Winsome Bonham

2.4 *Precipitation*

A regression relationship was established between Deal Island mean monthly precipitation and corresponding Wilsons Promontory mean monthly precipitation, sine(month), cosine(month), sine(2*month), and cosine(2*month).

Deal Island precipitation is, on average, less than that of Wilsons Promontory in all months, but this is particularly the case during late winter. This is on account of the stronger westerly flow at this time of the year being forced to rise over the more mountainous Wilsons Promontory. This is reflected in highly significant positive sine (month) and cosine (month) regression coefficients in the regression relationships.
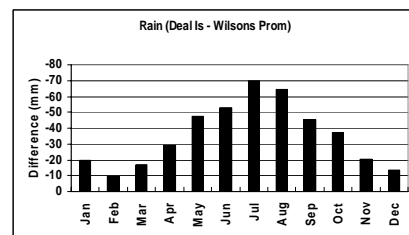
3. CONCLUSION

The set of regression relationships, established utilising the methodology outlined above, have enabled the development of a long-term climatology for Deal Island.