

CASE STUDY: Global Warming - the forest from the trees

Global Warming -the forest from the trees

Waugh's Australian Almanac

Climate, Indeed!

Year 1859

'Climate, indeed, is a subject upon which the most extravagant and unreasonable statements are made. Not only do many men, even of much scientific information, imagine that within the short scope of their own recollection they can detect a permanent change in weather or some other phenomenon, which would involve a connected change over all the regions of the earth, but they even assert that man's muscular strength and mental ingenuity can effect such changes. The clearing away of trees they say will render a climate dry; extensive reservoirs of water may increase the moistures of the atmosphere...'

Source: Jevons, William Stanley 1859. 'Some data concerning the climate of Australia and New Zealand' p.79 in: **Waugh's Australian Almanac for the year 1859**, James William Waugh, Sydney.



Sydney Observatory.



William Stanley Jevons.



Weather Station, Sydney.

CLIMATE, INDEED!

The year 2009 marks the 150th anniversary of the publication of the first comprehensive climate of Australia as well as the first full year of weather data at Sydney's Observatory Hill. Written by a remarkable Englishman who went on to become one of the founders of mathematical economics, William Stanley Jevons' "Climate" represented an early example of thinking about Australia as a single continental landmass subject to natural forces that recognise nothing of political boundaries. Among the contributions he made to Australian arts and sciences during his brief stint of less than five years in the colony of New South Wales, the young Jevons wrote regular weather reports for "Empire" - the Sydney newspaper of Henry Parkes, the later-day father of Australian Federation.

Nevertheless, Jevons was a man of his times, and in the extract from his "Climate" quoted above, we hear voiced, perhaps for the first time in Australia, more than a hint of scepticism about the possibilities that human endeavour and economic activity might have the potential to alter the very climate of the Earth. Jevons was perhaps Australia's first "Climate Change Sceptic".

CASE STUDY

In this Case Study, we ask the questions:

Is climate change real or a figment of the imagination?

What is the evidence that our planet is warming?

We use some of the statistical techniques pioneered by Jevons and his near contemporaries, to examine one aspect of the science of meteorology; the measurement of day-to-day local air temperature, the way in which temperature data is compiled and the way it is presented in order for inferences to be drawn about long term trends in climate. The emphasis will be on the skills of graphical presentation applied particularly to data sets derived from select meteorological stations in eastern Australia.



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STRUCTURE

The Case Study is organised in three parts:

1. **This document - “Global warming – the forest from the trees”** downloadable from http://www.blueplanet.nsw.edu.au/templates/blue_content.aspx?pageID=543
2. **The Appendices document (pdf file)** downloadable from http://www.blueplanet.nsw.edu.au/templates/blue_content.aspx?pageID=543
3. **Data Spreadsheets - (Excel® files)** downloadable from http://www.blueplanet.nsw.edu.au/templates/blue_content.aspx?pageID=542

It is possible to complete the main Activities and Questions within this document without reference to the supporting Appendices and the Excel® spreadsheets; these addenda are given to enable completion of the Extension Activities and Questions, and a deeper exploration of the techniques referred to in the case study.

CURRICULUM LINKS

This case study was written for high school students within the NSW curriculum. Each individual page within the body of the text is designed to be a stand-alone page usually centred on an activity or set of questions.

Although the case study primarily addresses the **NSW Stage 6 Advanced Mathematics Draft Syllabus**, specifically the content of the Preliminary Year topic **PMA6 Data Analysis**, many of its activities can be used in other areas of the curriculum, namely in **Stage 5 Science**, **Stage 5 Geography** and **Stage 6 Earth and Environmental Science**.

At the end of this document, the connections of individual pages of the case study to areas of the curriculum are listed in two tables

- Guidelines for use of the case study within the Stage 6 Advanced Mathematics Draft Syllabus Topic PMA6 - Data Analysis
(see page 22)
- Guidelines for use of the case study in other areas of the NSW curriculum; Stage 5 Science, Stage 5 Geography and Stage 6 Earth and Environmental Science
(see page 23)

REFERENCES

A full bibliography acknowledging all published writings and web pages referred to in this case study is listed on **pages 20-21** of this document.

ACKNOWLEDGEMENT

The concepts underpinning this case study and most of the data were drawn from the pages of the Australian Bureau of Meteorology (BOM) website (<http://www.bom.gov.au/>) and its supporting documents. The painstaking efforts of numerous staff and amateur enthusiasts down the decades and across the breadth of Australia have contributed to the massive body of weather records upon which we are now all so dependent.

